Report On

Specific Absorption Rate Testing of the
DAQRI Compute Pack

FCC ID: 2AEWMDQR002001
IC: TBC

COMMERCIAL-IN-CONFIDENCE

Document 75936979 Report 12 Issue 1 **June 2017**

TÜV SÜD Product Service, Octagon House, Concorde Way, Segensworth North,
Fareham, Hampshire, United Kingdom, PO15 5RL
Tel: +44 (0) 1489 558100. Website: www.tuv-sud.co.uk

REPORT ON

Specific Absorption Rate Testing of the
DAQRI Compute Pack

Document 75936979 Report 12 Issue 1

June 2017

PREPARED FOR

DAQRI LLC
1201 W. 5th St. Suite T-800
Los Angeles
California
90017
United States

PREPARED BY

Stephen Dodd
SAR Engineer

APPROVED BY

Nigel Grigsby
Authorised Signatory

DATED

02 June 2017

Product Service

CONTENTS

SECTION 1

REPORT SUMMARY

Specific Absorption Rate Testing of the
DAQRI Compute Pack

1.1 INTRODUCTION

The information contained in this report is intended to show verification of the Specific Absorption Rate Testing of the DAQRI Compute Pack to the requirements of KDB 447498 D01 v06 General RF Exposure Guidance.

Objective	To perform Specific Absorption Rate Testing to determine the Equipment Under Test's (EUT's) compliance with the requirements specified of KDB 447498 D01 v06 General RF Exposure Guidance, for the series of tests carried out.
Applicant	DAQRI LLC
Manufacturer	DAQRI International Ltd
Manufacturing Description	DAQRI Compute Pack is a mobile computer that powers a lightweight wearable human-machine interface that connects workers in a variety of industries and environments to real time information and augmented work instruction
Model Number	DAQRI Compute Pack
Serial/IMEI Number(s)	Sample 1 Not Serialised Sample 2 OA565-7DF-5A51EMTGNF
Number of Samples Tested	2
Hardware Version	DCP DE
Software Version	V16
Battery Cell Manufacturer	Getach
Battery Model Number	A10-00013
Test Specification/Issue/Date	KDB 447498 D01 v06 General RF Exposure Guidance
Start of Test	09 May 2017
Finish of Test	23 May 2017
Related Document(s)	FCC 47CFR 2.1093: 2016 KDB 865664 – D01 v01r04 KDB 865664 – D02 v01r02 KDB 648474 – D04 v01r03 KDB 447498 – D01 v06 KDB 941225 D07 v01r02 IEEE 1528-2013 KDB 248227 – D01 v02r02 RSS-102 Issue 5 March 2015
Name of Engineer(s)	Stephen Dodd

1.2 BRIEF SUMMARY OF RESULTS

The measurements shown in this report were made in accordance with the procedures specified KDB 447498 D01 v06 General RF Exposure Guidance.

The maximum 1g volume averaged stand-alone SAR found during this Assessment:

Max 1g SAR (W/kg) Body	**1.11** (Measured)	**1.16** (Scaled)
The maximum 1g volume averaged SAR level measured for all the tests performed did not exceed the limits for General Population/Uncontrolled Exposure (W/kg) Partial Body of 1.6 W/kg.		

The maximum 1g volume averaged stand-alone Reported SAR found during this Assessment for each supported mode:

Band	Test Configuration	Max Reported SAR (W/kg)
2450 MHz	Body	0.31
U-NII-2A	Body	1.16
U-NII-2C	Body	0.89
U-NII-3	Body	0.54
The maximum 1g volume averaged SAR level measured for all the tests performed did not exceed the limits for General Population/Uncontrolled Exposure (W/kg) Partial Body of 1.6 W/kg.		

1.3 TEST RESULTS SUMMARY

1.3.1 System Performance / Validation Check Results

Prior to formal testing being performed a System Check was performed in accordance with KDB 865664 and the results were compared against published data in Standard IEEE 1528-2013. The following results were obtained: -

System performance / Validation results

Date	Frequency (MHz)	Max 1g SAR (W/kg)*	Percentage Drift on Reference
09/05/2017	5200	73.25	-2.02
09/05/2017	5500	75.64	-4.37
10/05/2017	2450	52.95	3.42
10/05/2017	5800	67.28	-9.20
24/05/2017	5800	72.06	-2.75

*Normalised to a forward power of 1W

1.3.2 Results Summary Tables

WLAN 2450 MHz 802.11b 20MHz 1Mbps Antenna A Body Specific Absorbtion Rate (Maximum SAR) 1g Results

Test Position	Channel Number	Frequency (MHz)	Measured Average Power (dBm)	Tune Up (dBm)	Measured 1g SAR (W/kg)	Scaled 1g SAR (W/kg)	Scan Figure Number
13mm Rear Face*	6	2437	19.50	20.50	0.25	0.31	Figure 4
5mm Right Edge	6	2437	19.50	20.50	0.02	0.03	Figure 5
5mm Bottom Edge	6	2437	19.50	20.50	0.04	0.05	Figure 6
Limit for General Population (Uncontrolled Exposure) 1.6 W/kg (1g) KDB 447498 D01 - Testing of other required channels within the operation mode of a frequency band is not required when the reported 1g SAR for mid-band or highest output power channel is: ≤ 0.8W/kg when the transmission band is ≤ 100MHz ≤ 0.6W/kg when the transmission band is between 100MHz and 200MHz ≤ 0.4W/kg when the transmission band is ≥ 200MHz KDB248227 D01 v02 - Testing was not required for OFDM as per Section 5.2.2 *Separation distance between the EUT and the Elliptical Flat Phantom with the clip at 0mm from the Elliptical Flat Phantom							

WLAN 2450 MHz 802.11b 20MHz 1Mbps Antenna B Body Specific Absorbtion Rate (Maximum SAR) 1g Results

Test Position	Channel Number	Frequency (MHz)	Measured Average Power (dBm)	Tune Up (dBm)	Measured 1g SAR (W/kg)	Scaled 1g SAR (W/kg)	Scan Figure Number
13mm Rear Face*	6	2437	19.00	20.50	0.09	0.13	Figure 7
5mm Right Edge	6	2437	19.00	20.50	0.06	0.08	Figure 8
5mm Top Edge	6	2437	19.00	20.50	0.02	0.03	Figure 9
Limit for General Population (Uncontrolled Exposure) 1.6 W/kg (1g) KDB 447498 D01 - Testing of other required channels within the operation mode of a frequency band is not required when the reported 1g SAR for mid-band or highest output power channel is: ≤ 0.8W/kg when the transmission band is ≤ 100MHz ≤ 0.6W/kg when the transmission band is between 100MHz and 200MHz ≤ 0.4W/kg when the transmission band is ≥ 200MHz KDB248227 D01 v02 - Testing was not required for OFDM as per Section 5.2.2 *Separation distance between the EUT and the Elliptical Flat Phantom with the clip at 0mm from the Elliptical Flat Phantom							

WLAN U-NII-2A 802.11ac 40 MHz VHT0 Antenna A Body Specific Absorbtion Rate (Maximum SAR) 1g Results

Test Position	Channel Number	Frequency (MHz)	Measured Average Power (dBm)	Tune Up (dBm)	Measured 1g SAR (W/kg)	Scaled 1g SAR (W/kg)	Scan Figure Number
13mm Rear Face*	54	5270	20.30	20.50	1.11	**1.16**	Figure 10
5mm Right Edge	54	5270	20.30	20.50	0.13	0.14	Figure 11
5mm Bottom Edge	54	5270	20.30	20.50	0.45	0.47	Figure 12
13mm Rear Face*	62	5310	13.90	14.50	0.27	0.31	Figure 13
Limit for General Population (Uncontrolled Exposure) 1.6 W/kg (1g) KDB 447498 D01 - Testing of other required channels within the operation mode of a frequency band is not required when the reported 1g SAR for mid-band or highest output power channel is: ≤ 0.8W/kg when the transmission band is ≤ 100MHz ≤ 0.6W/kg when the transmission band is between 100MHz and 200MHz ≤ 0.4W/kg when the transmission band is ≥ 200MHz *Separation distance between the EUT and the Elliptical Flat Phantom with the clip at 0mm from the Elliptical Flat Phantom							

WLAN U-NII-2A 802.11ac 40 MHz VHT0 Antenna B Body Specific Absorbtion Rate (Maximum SAR) 1g Results

Test Position	Channel Number	Frequency (MHz)	Measured Average Power (dBm)	Tune Up (dBm)	Measured 1g SAR (W/kg)	Scaled 1g SAR (W/kg)	Scan Figure Number
13mm Rear Face	54	5270	20.40	20.50	0.68	0.70	Figure 14
5mm Right Edge	54	5270	20.40	20.50	0.07	0.07	Figure 15
5mm Top Edge	54	5270	20.40	20.50	0.24	0.25	Figure 16
Limit for General Population (Uncontrolled Exposure) 1.6 W/kg (1g) KDB 447498 D01 - Testing of other required channels within the operation mode of a frequency band is not required when the reported 1g SAR for mid-band or highest output power channel is: ≤ 0.8W/kg when the transmission band is ≤ 100MHz ≤ 0.6W/kg when the transmission band is between 100MHz and 200MHz ≤ 0.4W/kg when the transmission band is ≥ 200MHz							

UNII-2C 802.11ac 80MHz VHT0 Antenna A Body Specific Absorbtion Rate (Maximum SAR) 1g Results

Test Position	Channel Number	Frequency (MHz)	Measured Average Power (dBm)	Tune Up (dBm)	Measured 1g SAR (W/kg)	Scaled 1g SAR (W/kg)	Scan Figure Number
13mm Rear Face*	122	5610	19.40	20.50	0.69	0.89	Figure 17
5mm Right Edge	122	5610	19.40	20.50	0.24	0.31	Figure 18
5mm Bottom Edge	122	5610	19.40	20.50	0.41	0.53	Figure 19
13mm Rear Face*	138	5690	18.10	18.5	0.34	0.37	Figure 20
Limit for General Population (Uncontrolled Exposure) 1.6 W/kg (1g) An additional scan was required as per KDB 447498 D01 - Testing of other required channels within the operation mode of a frequency band is not required when the reported 1g SAR for mid-band or highest output power channel is: ≤ 0.8W/kg when the transmission band is ≤ 100MHz ≤ 0.6W/kg when the transmission band is between 100MHz and 200MHz ≤ 0.4W/kg when the transmission band is ≥ 200MHz *Separation distance between the EUT and the Elliptical Flat Phantom with the clip at 0mm from the Elliptical Flat Phantom							

WLAN UNII-2C 802.11ac 80MHz VHT0 Antenna B Body Specific Absorbtion Rate (Maximum SAR) 1g Results

Test Position	Channel Number	Frequency (MHz)	Measured Average Power (dBm)	Tune Up (dBm)	Measured 1g SAR (W/kg)	Scaled 1g SAR (W/kg)	Scan Figure Number
13mm Rear Face*	122	5610	20.10	20.50	0.67	0.73	Figure 21
5mm Right Edge	122	5610	20.10	20.50	0.06	0.07	Figure 22
5mm Top Edge	122	5610	20.10	20.50	0.33	0.36	Figure 23
Limit for General Population (Uncontrolled Exposure) 1.6 W/kg (1g) KDB 447498 D01 - Testing of other required channels within the operation mode of a frequency band is not required when the reported 1g SAR for mid-band or highest output power channel is: ≤ 0.8W/kg when the transmission band is ≤ 100MHz ≤ 0.6W/kg when the transmission band is between 100MHz and 200MHz ≤ 0.4W/kg when the transmission band is ≥ 200MHz *Separation distance between the EUT and the Elliptical Flat Phantom with the clip at 0mm from the Elliptical Flat Phantom							

WLAN UNII-3 802.11n 40MHz VHT0 Antenna A Body Specific Absorbtion Rate (Maximum SAR) 1g Results

Test Position	Channel Number	Frequency (MHz)	Measured Average Power (dBm)	Tune Up (dBm)	Measured 1g SAR (W/kg)	Scaled 1g SAR (W/kg)	Scan Figure Number
13mm Rear Face*	159	5795	20.30	20.50	0.40	0.42	Figure 24
5mm Right Edge	159	5795	20.30	20.50	0.27	0.28	Figure 25
5mm Bottom Edge	159	5795	20.30	20.50	0.26	0.27	Figure 26
Limit for General Population (Uncontrolled Exposure) 1.6 W/kg (1g) KDB 447498 D01 - Testing of other required channels within the operation mode of a frequency band is not required when the reported 1g SAR for mid-band or highest output power channel is: ≤ 0.8W/kg when the transmission band is ≤ 100MHz ≤ 0.6W/kg when the transmission band is between 100MHz and 200MHz ≤ 0.4W/kg when the transmission band is ≥ 200MHz *Separation distance between the EUT and the Elliptical Flat Phantom with the clip at 0mm from the Elliptical Flat Phantom							

WLAN UNII-3 802.11n 40MHz VHT0 Antenna B Body Specific Absorbtion Rate (Maximum SAR) 1g Results

Test Position	Channel Number	Frequency (MHz)	Measured Average Power (dBm)	Tune Up (dBm)	Measured 1g SAR (W/kg)	Scaled 1g SAR (W/kg)	Scan Figure Number
13mm Rear Face*	159	5795	20.40	20.50	0.53	0.54	Figure 27
5mm Right Edge	159	5795	20.40	20.50	0.07	0.07	Figure 28
5mm Top Edge	159	5795	20.40	20.50	0.53	0.54	Figure 29
Limit for General Population (Uncontrolled Exposure) 1.6 W/kg (1g) KDB 447498 D01 - Testing of other required channels within the operation mode of a frequency band is not required when the reported 1g SAR for mid-band or highest output power channel is: ≤ 0.8W/kg when the transmission band is ≤ 100MHz ≤ 0.6W/kg when the transmission band is between 100MHz and 200MHz ≤ 0.4W/kg when the transmission band is ≥ 200MHz *Separation distance between the EUT and the Elliptical Flat Phantom with the clip at 0mm from the Elliptical Flat Phantom							

1.3.3 Simultaneous Transmission

Position	Configuration	Channel	SISO A (Scaled 1g SAR values)	SISO B (Scaled 1g SAR values)	∑ 1g SAR (W/kg)
Rear Face	802.11b 20MHz 1Mbps	6	0.31	0.13	0.44*
Right Edge	802.11b 20MHz 1Mbps	6	0.03	0.08	0.11*
Bottom Edge	802.11b 20MHz 1Mbps	6	0.05	0.13***	0.18*
Top Edge	802.11b 20MHz 1Mbps	6	0.31***	0.03	0.34*
Rear Face	802.11ac 40MHz VHT0	54	1.16	0.7	**1.86****
Right Edge	802.11ac 40MHz VHT0	54	0.14	0.07	0.21*
Bottom Edge	802.11ac 40MHz VHT0	54	0.47	0.70***	0.88*
Top Edge	802.11ac 40MHz VHT0	54	1.16***	0.25	1.31*
Rear Face	802.11ac 80MHz VHT0	122	0.89	0.73	**1.62****
Right Edge	802.11ac 80MHz VHT0	122	0.31	0.07	**0.37***
Bottom Edge	802.11ac 80MHz VHT0	122	0.53	0.73***	1.26*
Top Edge	802.11ac 80MHz VHT0	122	0.89***	0.36	1.25**
Rear Face	802.11ac 80MHz VHT0	159	0.4	0.53	0.93*
Right Edge	802.11ac 80MHz VHT0	159	0.28	0.07	0.35*
Bottom Edge	802.11ac 80MHz VHT0	159	0.27	0.53***	0.8*
Top Edge	802.11ac 80MHz VHT0	159	0.40**	0.54	0.94*

The antennas were spatially separated to the extent that the SAR distributions did not overlap, therefore were treated independently as per KDB 248227 D01 Section 6.5. The highest reported SAR for the 802.11 transmission modes in the frequency band was used for simultaneous transmission SAR test exclusion.

* KDB 447498 D01 Section 4.3.2 Simultaneous SAR measurements were not required as the sum of the 1g SAR measurements did not exceed 1.6 W/kg
** KDB 447498 D01 Section 4.3.2 PSLR (Peak SAR Location Ratio) Assessment is required as the sum of the 1g SAR measurements exceeds 1.6 W/kg.
*** This position was not tested as the Antenna Position was > 25mm from the device edge – The worst case result for that antenna was used.

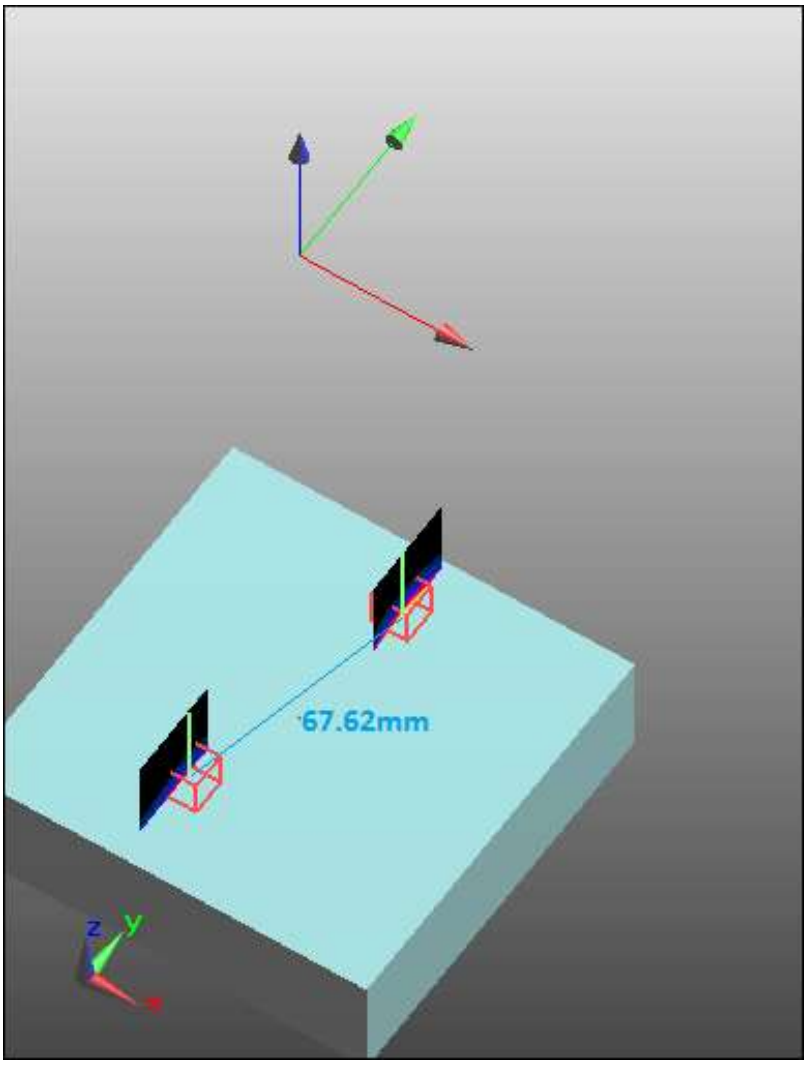


Figure 1. 802.11ac 40MHz VHT0 PSLR-distance measurement

AS Per KDB 447498 D01 Section 4.3.2

The ratio is determined by

$$\frac{(\mathrm{SAR1}+\mathrm{SAR2})^{1.5}}{\mathrm{Ri}} \leq 0.04$$

Where Ri Is the distance between the Peak SAR locations in Millimeters.

$$\frac{(1.16+0.70)^{1.5}}{67.62} = 0.04$$

Therefore no further assessment is required.

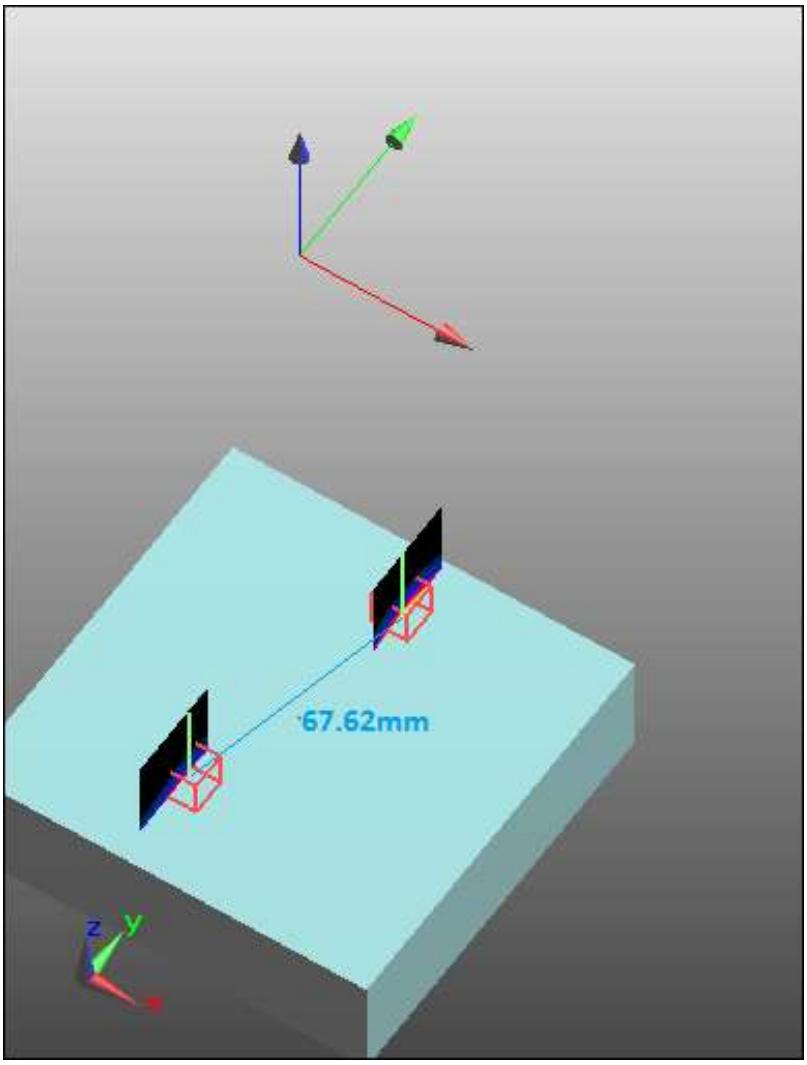


Figure 2. 802.11ac 80MHz VHT0 PSLR

AS Per KDB 447498 D01 Section 4.3.2

The ratio is determined by

$$\frac{(\mathrm{SAR1}+\mathrm{SAR2})^{1.5}}{\mathrm{Ri}} \leq 0.04$$

Where Ri Is the distance between the Peak SAR locations in Millimeters.

$$\frac{(0.89+0.73)^{1.5}}{67.62} = 0.03$$

Therefore no further assessment is required using a volume scan.

1.3.4 Standalone SAR Test Exclusion Considerations (KDB 447498 D01)

The 1g SAR Test exclusion thresholds for 100 MHz to 6 GHz *test separation distances* ≤ 50 mm are determined by:

[(*max power of channel, including tune-up tolerance, mW) / (min. test separation distance, mm)] [√f (GHz)]* ≤ 3.0, where

- f (GHz) is the RF channel transmit frequency in GHz.
- Power and distance are rounded to the nearest mW and mm before calculation.
- The result is rounded to one decimal place for comparison.
- When the maximum test separation distance is < 5 mm, a distance of 5 mm is applied.

Band	Frequency (MHz)	Power (dBm)	Power (mW)	Test Position	Distance (mm)	Threshold	Test Exclusion
2450 MHz	2437	20.5	112.2	Body	<5	35.0	No
U-NII-2a	5270	20.5	112.2	Body	<5	51.5	No
U-NII-2C	5610	20.5	112.2	Body	<5	53.2	No
U-NII-3	5795	20.5	112.2	Body	<5	54.0	No

1.3.5 Technical Description

The equipment under test (EUT) was a DAQRI Compute Pack. A full technical description can be found in the manufacturer's documentation.

1.3.6 Test Configuration and Modes of Operation

The testing was performed with an integral battery supplied and manufactured by DAQRI.

WLAN testing was achieved using the devices internal software, customer supplied software and settings supplied by the customer. For each scan the device was configured into a continuous transmission test mode.

Worst case data rates used were 2.4 GHz -802.11.b 20 MHz 1Mbps, U-NII-2A 802.11a 40 MHz VHT0, U-NII-2C 802.11ac 80 MHz VHT0, U-NII-3 802.11n 40 MHz VHT0.

Some SAR levels were found to be > 0.80 W/kg (KDB 447498 D01) therefore additional testing was required at the relevant frequencies / channels of the bands.

The part of the EUT that contains the transmitter and antennas is designed to be worn on the users belt. Due to the overall diagonal dimension of the device being less than 20 cm but greater than 16 cm the EUT was tested in conjunction with KDB 941225 D07 for UMPC Mini Tablets. Body SAR testing was performed on all faces and edges of the device that were within 25mm of each antenna. For antenna A the rear face, right edge and bottom edge were tested. For antenna B the rear face, right face and bottom edge were tested. The rear face of the device had a belt clip which was tested with a 0mm separation distance from the elliptical flat phantom, the separation distance from the rear face of the EUT to the elliptical flat phantom was 13 mm. All other faces were tested using a 5mm separation distance.

The Elliptical Phantom dimensions are 600 mm major axis and 400mm minor axis with a shell thickness of 2.00mm. The phantom was filled to a minimum depth of 150mm with the appropriate simulant liquid. The dielectric properties were in accordance with the requirements specified in KDB 865665.

Included in this report are descriptions of the test method; the equipment used and an analysis of the test uncertainties applicable and diagrams indicating the locations of maximum SAR for each test position along with photographs indicating the positioning of the handset against the body as appropriate.

1.4 FCC POWER MEASUREMENTS

1.4.1 Method

Conducted power measurements were made using a power meter.

1.4.2 Conducted Power Measurements

WLAN 2450 MHz

Mode	Frequency (MHz)	Duty Cycle (%)	Average Power (dBm) SISO A	Average Power (dBm) SISO B
802.11b - 20 MHz - 1 Mbps DSSS	2412	100	19.10	19.20
802.11b - 20 MHz - 1 Mbps DSSS	2437	100	19.50	19.00
802.11b - 20 MHz - 1 Mbps DSSS	2462	100	19.40	17.40
802.11b - 20 MHz - 6 Mbps OFDM	2412	100	17.80	17.60
802.11b - 20 MHz - 6 Mbps OFDM	2437	100	19.60	19.20
802.11b - 20 MHz - 6 Mbps OFDM	2462	100	16.50	15.60

WLAN 5000 MHz

Mode	Frequency (MHz)	Duty Cycle (%)	Average Power (dBm) SISO A	Average Power (dBm) SISO B
802.11a - 20 MHz - 6 Mbps	5180	100	17.90	18.30
802.11a - 20 MHz - 6 Mbps	5200	100	19.40	19.40
802.11a - 20 MHz - 6 Mbps	5220	100	19.40	20.40
802.11a - 20 MHz - 6 Mbps	5240	100	19.40	19.80
802.11a - 20 MHz - 6 Mbps	5260	100	19.90	19.80
802.11a - 20 MHz - 6 Mbps	5280	100	19.80	19.80
802.11a - 20 MHz - 6 Mbps	5300	100	19.60	19.80
802.11a - 20 MHz - 6 Mbps	5320	100	17.10	18.30
802.11a - 20 MHz - 6 Mbps	5500	100	17.40	17.10
802.11a - 20 MHz - 6 Mbps	5560	100	19.40	19.00
802.11a - 20 MHz - 6 Mbps	5580	100	19.50	19.00
802.11a - 20 MHz - 6 Mbps	5640	100	19.70	19.30
802.11a - 20 MHz - 6 Mbps	5660	100	19.70	19.80
802.11a - 20 MHz - 6 Mbps	5745	100	19.90	19.10
802.11a - 20 MHz - 6 Mbps	5825	100	19.50	19.30
802.11n- 40MHz-HT0	5190	100	16.20	17.20
802.11n- 40MHz-HT0	5230	100	*19.90*	20.30
802.11n- 40MHz-HT0	5270	100	20.30	20.40
802.11n- 40MHz-HT0	5310	100	14.00	15.40
802.11n- 40MHz-HT0	5510	100	14.30	15.20
802.11n- 40MHz-HT0	5550	100	17.40	17.50
802.11n- 40MHz-HT0	5590	100	19.80	19.30
802.11n- 40MHz-HT0	5630	100	19.70	20.10
802.11n- 40MHz-HT0	5670	100	17.00	17.00
802.11n- 40MHz-HT0	5710	100	20.00	19.80
802.11n- 40MHz-HT0	5755	100	20.20	20.00
802.11n- 40MHz-HT0	5795	100	20.30	20.30
802.11n-20MHz-HT0	5180	100	18.00	18.20
802.11n-20MHz-HT0	5200	100	19.50	19.30
802.11n-20MHz-HT0	5220	100	19.40	19.60
802.11n-20MHz-HT0	5240	100	19.40	19.60
802.11n-20MHz-HT0	5260	100	19.90	19.60

802.11n-20MHz-HT0	5280	100	19.80	19.70
802.11n-20MHz-HT0	5300	100	19.60	19.60
802.11n-20MHz-HT0	5320	100	17.20	18.10
802.11n-20MHz-HT0	5500	100	17.30	17.00
802.11n-20MHz-HT0	5560	100	19.40	18.90
802.11n-20MHz-HT0	5580	100	19.40	18.90
802.11n-20MHz-HT0	5640	100	19.50	19.30
802.11a-40MHz-VHT0	5190	100	16.10	17.10
802.11a-40MHz-VHT0	5230	100	19.80	20.20
802.11a-40MHz-VHT0	5270	100	20.30	20.40
802.11a-40MHz-VHT0	5310	100	13.90	14.50
802.11a-40MHz-VHT0	5510	100	14.50	15.30
802.11a-40MHz-VHT0	5550	100	17.40	17.50
802.11a-40MHz-VHT0	5590	100	19.80	19.90
802.11a-40MHz-VHT0	5630	100	19.70	20.20
802.11a-40MHz-VHT0	5670	100	17.00	17.10
802.11a-40MHz-VHT0	5710	100	20.00	19.90
802.11a-40MHz-VHT0	5755	100	20.20	20.10
802.11a-40MHz-VHT0	5795	100	20.30	20.30
802.11ac-80MHz-VHT0	5210	100	13.80	14.40
802.11ac-80MHz-VHT0	5290	100	11.80	13.40
802.11ac-80MHz-VHT0	5530	100	13.00	13.00
802.11ac-80MHz-VHT0	5610	100	19.40	20.10
802.11ac-80MHz-VHT0	5690	100	18.10	17.90
802.11ac-80MHz-VHT0	5775	100	19.70	20.30

Product Service

SECTION 2

TEST DETAILS

Specific Absorption Rate Testing of the
DAQRI Compute Pack

2.1 DASY5 MEASUREMENT SYSTEM

2.1.1 System Description

The DASY5 system for performing compliance tests consists of the following items:

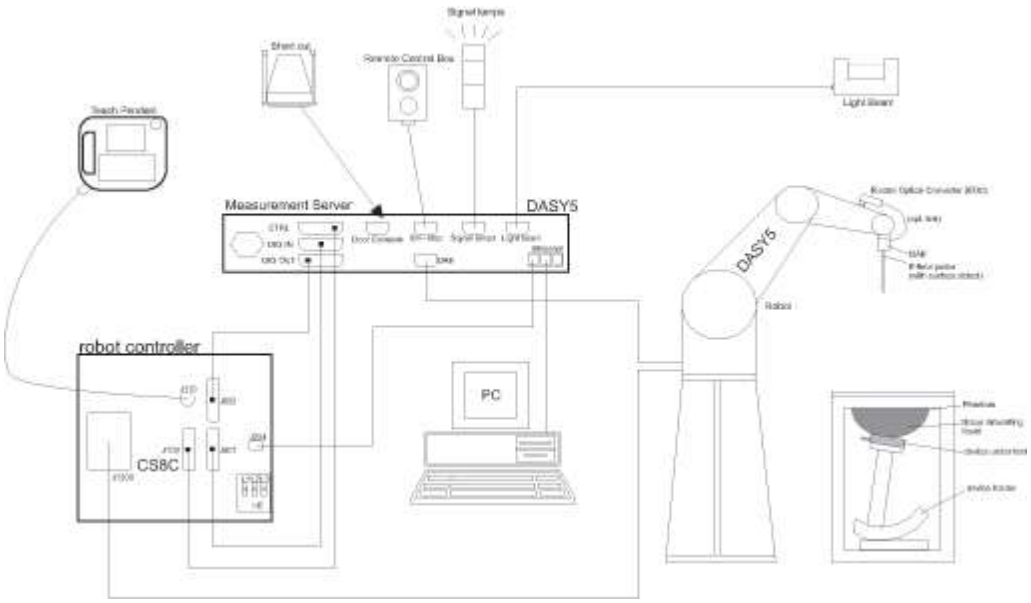


Figure 3 System Description Diagram

A standard high precision 6-axis robot (Stäubli TX=RX family) with controller, teach pendant and software. An arm extension for accommodating the data acquisition electronics (DAE).

An isotropic field probe optimized and calibrated for the targeted measurement.

A data acquisition electronics (DAE) which performs the signal amplification, signal multiplexing, AD-conversion, offset measurements, mechanical surface detection, collision detection, etc. The unit is battery powered with standard or rechargeable batteries. The signal is optically transmitted to the EOC.

The Electro-optical converter (EOC) performs the conversion from optical to electrical signals for the digital communication to the DAE. To use optical surface detection, a special version of the EOC is required. The EOC signal is transmitted to the measurement server.

The function of the measurement server is to perform the time critical tasks such as signal filtering, control of the robot operation and fast movement interrupts.

The Light Beam used is for probe alignment. This improves the (absolute) accuracy of the probe positioning.

A computer running Win7 professional operating system and the DASY5 software.

Remote control and teach pendant as well as additional circuitry for robot safety such as warning lamps, etc.

The phantom, the device holder and other accessories according to the targeted measurement.

2.1.2 Probe Specification

The probes used by the DASY system are isotropic E-field probes, constructed with a symmetric design and a triangular core. The probes have built-in shielding against static charges and are contained within a PEEK enclosure material. These probes are specially designed and calibrated for use in liquids with high permitivities. The frequency range of the probes are from 6 MHz to 6 GHz.

2.1.3 Data Acquisition Electronics

The data acquisition electronics (DAE4 or DAE3) consist of a highly sensitive electrometer-grade preamplifier with auto-zeroing, a channel and gain-switching multiplexer, a fast 16 bit AD-converter and a command decoder with a control logic unit. Transmission to the measurement server is accomplished through an optical downlink for data and status information, as well as an optical uplink for commands and the clock.

The mechanical probe mounting device includes two different sensor systems for frontal and sideways probe contacts. They are used for mechanical surface detection and probe collision detection. The input impedance of both the DAE4 as well as of the DAE3 box is 200MOhm; the inputs are symmetrical and floating. Common mode rejection is above 80 dB.

2.1.4 SAR Evaluation Description

The DASY5 software includes all numerical procedures necessary to evaluate the spatial peak SAR values.

Based on the IEEE 1528 standard, a new algorithm has been implemented. The spatial-peak SAR can be computed over any required mass.

The base for the evaluation is a "cube" measurement in a volume of 30mm3 (7x7x7 points). The measured volume must include the 1 g and 10 g cubes with the highest averaged SAR values. For that purpose, the centre of the measured volume is aligned to the interpolated peak SAR value of a previously performed area scan. If the 10g cube or both cubes are not entirely inside the measured volumes, the system issues a warning regarding the evaluated spatial peak values within the Post processing engine (SEMCAD X). This means that if the measured volume is shifted, higher values might be possible. To get the correct values you can use a finer measurement grid for the area scan. In complicated field distributions, a large grid spacing for the area scan might miss some details and give an incorrectly interpolated peak location.

The entire evaluation of the spatial peak values is performed within the Post-processing engine (SEMCAD X). The system always gives the maximum values for the 1 g and 10 g cubes. The algorithm to find the cube with highest averaged SAR is divided into the following stages:

1. extraction of the measured data (grid and values) from the Zoom Scan
2. calculation of the SAR value at every measurement point based on all stored data (A/D values and measurement parameters)
3. generation of a high-resolution mesh within the measured volume
4. interpolation of all measured values from the measurement grid to the high-resolution grid
5. extrapolation of the entire 3-D field distribution to the phantom surface over the distance from sensor to surface
6. calculation of the averaged SAR within masses of 1 g and 10 g

2.1.5 Interpolation, Extrapolation and Detection of Maxima

The probe is calibrated at the centre of the dipole sensors which is located 1 to 2.7mm away from the probe tip. During measurements, the probe stops shortly above the phantom surface, depending on the probe and the surface detecting system. Both distances are included as parameters in the probe configuration file. The software always knows exactly how far away the measured point is from the surface. As the probe cannot directly measure at the surface, the values between the deepest measured point and the surface must be extrapolated.

In DASY5, the choice of the coordinate system defining the location of the measurement points has no influence on the uncertainty of the interpolation, Maxima Search and extrapolation routines. The interpolation, extrapolation and maximum search routines are all based on the modified Quadratic Shepard's method [1].Thereby, the interpolation scheme combines a least-square fitted function method and a weighted average method which are the two basic types of computational interpolation and approximation. The DASY5 routines construct a once-continuously differentiable function that interpolates the measurement values as follows:

For each measurement point a trivariate (3-D) / bivariate (2-D) quadratic is computed.
It interpolates the measurement values at the data point and forms a least-square fit to neighbouring measurement values. The spatial location of the quadratic with respect to the measurement values is attenuated by an inverse distance weighting. This is performed since the calculated quadratic will fit measurement values at nearby points more accurate than at points located further away.

After the quadratics are calculated for at all measurement points, the interpolating function is calculated as a weighted average of the quadratics.

There are two control parameters that govern the behaviour of the interpolation method. One specifies the number of measurement points to be used in computing the least-square fits for the local quadratics. These measurement points are the ones nearest the input point for which the quadratic is being computed. The second parameter specifies the number of measurement points that will be used in calculating the weights for the quadratics to produce the final function. The input data points used there are the ones nearest the point at which the interpolation is desired. Appropriate defaults are chosen for each of the control parameters

The trivariate quadratics that have been previously computed for the 3-D interpolation and whose input data are at the closest distance from the phantom surface, are used in order to extrapolate the fields to the surface of the phantom.

In order to determine all the field maxima in 2-D (Area Scan) and 3-D (Zoom Scan), the measurement grid is refined by a default factor of 10 and the interpolation function is used to evaluate all field values between corresponding measurement points. Subsequently, a linear search is applied to find all the candidate maxima. In a last step, non physical maxima are removed and only those maxima which are within 2 dB of the global maximum value are retained.

In the Area Scan, the gradient of the interpolation function is evaluated to find all the extrema of the SAR distribution. The uncertainty on the locations of the extrema is less than 1/20 of the grid size. Only local maxima within 2 dB of the global maximum are searched and passed for the Zoom Scan measurement.

In the Zoom Scan, the interpolation function is used to extrapolate the Peak SAR from the lowest measurement points to the inner phantom surface (the extrapolation distance). The uncertainty increases with the extrapolation distance. To keep the uncertainty within 1% for the 1 g and 10 g cubes, the extrapolation distance should not be larger than 5mm.

2.1.6 Averaging and Determination of Spacial Peak SAR

The interpolated data is used to average the SAR over the 1g and 10g cubes by spatially discretising the entire measured volume. The resolution of this spatial grid used to calculate the averaged SAR is 1mm or about 42875 interpolated points. The resulting volumes are defined as cubical volumes containing the appropriate tissue parameters that are cantered at the location. The location is defined as the centre of the incremental volume (voxel).

The spatial-peak SAR must be evaluated in cubical volumes containing a mass that is within 5%of the required mass. The cubical volume centred at each location, as defined above, should be expanded in all directions until the desired value for the mass is reached, with no surface boundaries of the averaging volume extending beyond the outermost surface of the considered region. In addition, the cubical volume should not consist of more than 10% of air. If these conditions are not satisfied then the centre of the averaging volume is moved to the next location. Otherwise, the exact size of the final sampling cube is found using an inverse polynomial approximation algorithm, leading to results with improved accuracy. If one boundary of the averaging volume reaches the boundary of the measured volume during its expansion, it will not be evaluated at all. Reference is kept of all locations used and those not used for averaging the SAR. All average SAR values are finally assigned to the centred location in each valid averaging volume.

All locations included in an averaging volume are marked to indicate that they have been used at least once. If a location has been marked as used, but has never been assigned to the centre of a cube, the highest averaged SAR value of all other cubical volumes which have used this location for averaging is assigned to this location. Only those locations that are not part of any valid averaging volume should be marked as unused. For the case of an unused location, a new averaging volume must be constructed which will have the unused location centred at one surface of the cube. The remaining five surfaces are expanded evenly in all directions until the required mass is enclosed, regardless of the amount of included air. Of the six possible cubes with one surface centred on the unused location, the smallest cube is used, which still contains the required mass.

If the final cube containing the highest averaged SAR touches the surface of the measured volume, an appropriate warning is issued within the Post-processing engine.

2.2 WLAN 2450 MHz BODY SAR TEST RESULTS

SOFTWARE VERSION:	52.8.8(1258)	**AMBIENT TEMPERATURE:**	20.9 °C
DATE:	10/05/2017	**RELATIVE HUMIDITY:**	31.4 %
PHANTOM:	QD OVA 004 Ax	**CONDUCTIVITY:**	2.06 S/m
DUT CONFIGURATION:	Antenna A	**RELATIVE PERMITTIVITY:**	53.018 ε_r
DUT POSITION:	13mm Rear Face	**LIQUID TEMPERATURE:**	20.6 °C
RAT:	2.4 GHz 802.11b 20MHz	**SCAN TYPE:**	Full
FREQUENCY:	2437 MHz	**DRIFT:**	-0.37 dB
MODULATION:	1 Mbps	**PEAK SAR:**	0.50 W/kg
DUTY CYCLE:	100 %	**SAR (1g):**	0.31 W/kg

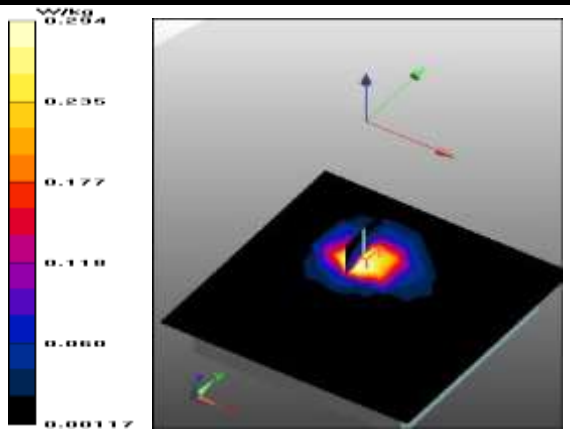


Figure 4: SAR Body Testing Results for the DAQRI Compute Pack at 2437 MHz.

SOFTWARE VERSION:	52.8.8(1258)	**AMBIENT TEMPERATURE:**	20.9 °C
DATE:	10/05/2017	**RELATIVE HUMIDITY:**	31.4 %
PHANTOM:	QD OVA 004 Ax	**CONDUCTIVITY:**	2.06 S/m
DUT CONFIGURATION:	Antenna A	**RELATIVE PERMITTIVITY:**	53.018 ε_r
DUT POSITION:	5mm - Right Edge	**LIQUID TEMPERATURE:**	20.6 °C
RAT:	2.4 GHz 802.11b 20MHz	**SCAN TYPE:**	Full
FREQUENCY:	2437 MHz	**DRIFT:**	0.55 dB
MODULATION:	1 Mbps	**PEAK SAR:**	0.03 W/kg
DUTY CYCLE:	100 %	**SAR (1g):**	0.03 W/kg

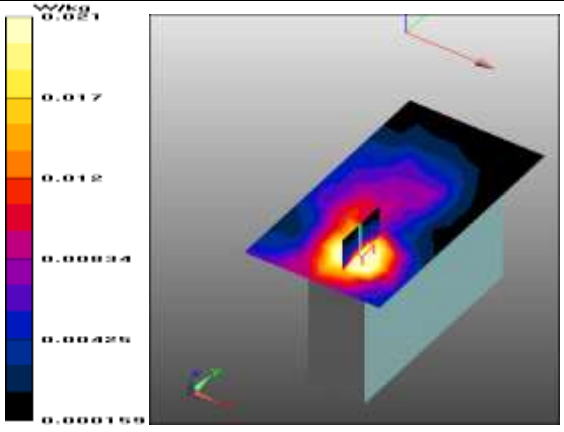


Figure 5: SAR Body Testing Results for the DAQRI Compute Pack at 2437 MHz.

SOFTWARE VERSION:	52.8.8(1258)	**AMBIENT TEMPERATURE:**	20.9 °C
DATE:	10/05/2017	**RELATIVE HUMIDITY:**	31.4 %
PHANTOM:	QD OVA 004 Ax	**CONDUCTIVITY:**	2.06 S/m
DUT CONFIGURATION:	Antenna A	**RELATIVE PERMITTIVITY:**	53.018 ε_r
DUT POSITION:	5mm - Bottom Edge	**LIQUID TEMPERATURE:**	20.6 °C
RAT:	2.4 GHz 802.11b 20MHz	**SCAN TYPE:**	Full
FREQUENCY:	2437 MHz	**DRIFT:**	0.13 dB
MODULATION:	1 Mbps	**PEAK SAR:**	0.08 W/kg
DUTY CYCLE:	100 %	**SAR (1g):**	0.05 W/kg

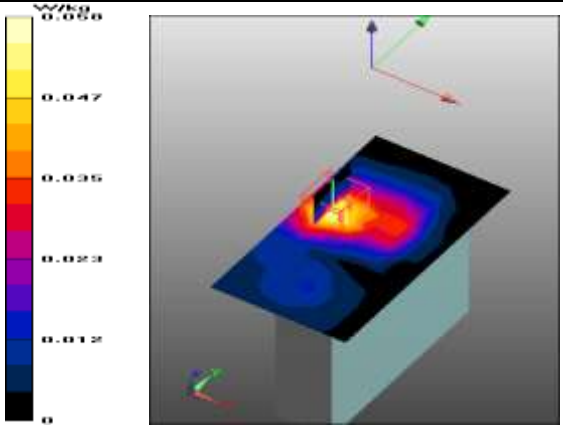


Figure 6: SAR Body Testing Results for the DAQRI Compute Pack at 2437 MHz.

SOFTWARE VERSION:	52.8.8(1258)	**AMBIENT TEMPERATURE:**	20.9 °C
DATE:	10/05/2017	**RELATIVE HUMIDITY:**	31.4 %
PHANTOM:	QD OVA 004 Ax	**CONDUCTIVITY:**	2.06 S/m
DUT CONFIGURATION:	Antenna B	**RELATIVE PERMITTIVITY:**	53.018 ε_r
DUT POSITION:	13mm Rear Face	**LIQUID TEMPERATURE:**	20.6 °C
RAT:	2.4 GHz 802.11b 20MHz	**SCAN TYPE:**	Full
FREQUENCY:	2437 MHz	**DRIFT:**	0.44 dB
MODULATION:	1 Mbps	**PEAK SAR:**	0.17 W/kg
DUTY CYCLE:	100 %	**SAR (1g):**	0.13 W/kg

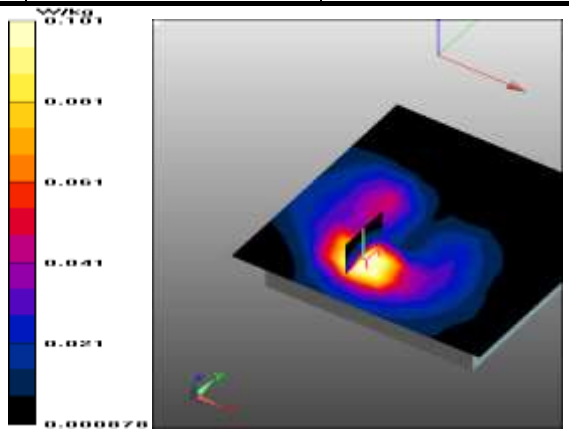


Figure 7: SAR Body Testing Results for the DAQRI Compute Pack at 2437 MHz.

SOFTWARE VERSION:	52.8.8(1258)	**AMBIENT TEMPERATURE:**	20.9 °C
DATE:	10/05/2017	**RELATIVE HUMIDITY:**	31.4 %
PHANTOM:	QD OVA 004 Ax	**CONDUCTIVITY:**	2.06 S/m
DUT CONFIGURATION:	Antenna B	**RELATIVE PERMITTIVITY:**	53.018 ε_r
DUT POSITION:	5mm - Right Edge	**LIQUID TEMPERATURE:**	20.6 °C
RAT:	2.4 GHz 802.11b 20MHz	**SCAN TYPE:**	Full
FREQUENCY:	2437 MHz	**DRIFT:**	0.00 dB
MODULATION:	1 Mbps	**PEAK SAR:**	0.12 W/kg
DUTY CYCLE:	100 %	**SAR (1g):**	0.08 W/kg

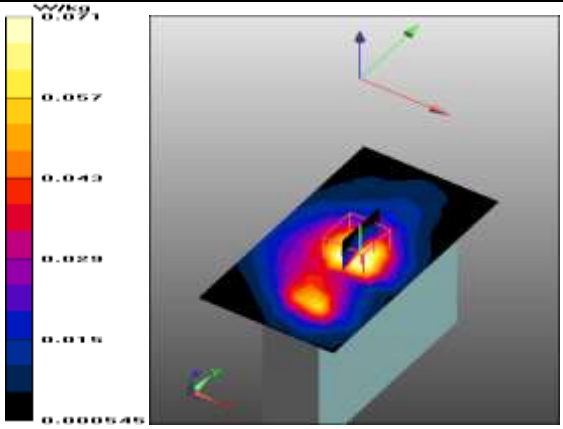


Figure 8: SAR Body Testing Results for the DAQRI Compute Pack at 2437 MHz.

SOFTWARE VERSION:	52.8.8(1258)	**AMBIENT TEMPERATURE:**	20.9 °C
DATE:	10/05/2017	**RELATIVE HUMIDITY:**	31.4 %
PHANTOM:	QD OVA 004 Ax	**CONDUCTIVITY:**	2.06 S/m
DUT CONFIGURATION:	Antenna B	**RELATIVE PERMITTIVITY:**	53.018 ε_r
DUT POSITION:	5mm - Top Edge	**LIQUID TEMPERATURE:**	20.6 °C
RAT:	2.4 GHz 802.11b 20MHz	**SCAN TYPE:**	Full
FREQUENCY:	2437 MHz	**DRIFT:**	0.14 dB
MODULATION:	1 Mbps	**PEAK SAR:**	0.04 W/kg
DUTY CYCLE:	100 %	**SAR (1g):**	0.03 W/kg

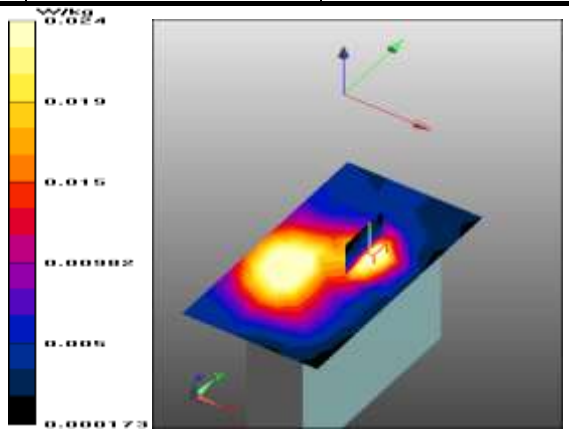


Figure 9: SAR Body Testing Results for the DAQRI Compute Pack at 2437 MHz.

2.3 WLAN U-NII-2A BODY SAR TEST RESULTS

SOFTWARE VERSION:	52.8.8(1258)	**AMBIENT TEMPERATURE:**	23.5 °C
DATE:	09/05/2017	**RELATIVE HUMIDITY:**	27.3 %
PHANTOM:	QD OVA 004 Ax	**CONDUCTIVITY:**	5.492 S/m
DUT CONFIGURATION:	Antenna A	**RELATIVE PERMITTIVITY:**	47.305 ε_r
DUT POSITION:	13mm Rear Face	**LIQUID TEMPERATURE:**	21.0 °C
RAT:	5 GHz 802.11 40 MHz	**SCAN TYPE:**	Full
FREQUENCY:	5270 MHz	**DRIFT:**	0.37 dB
MODULATION:	MCS0	**PEAK SAR:**	3.88 W/kg
DUTY CYCLE:	100 %	**SAR (1g):**	1.16 W/kg

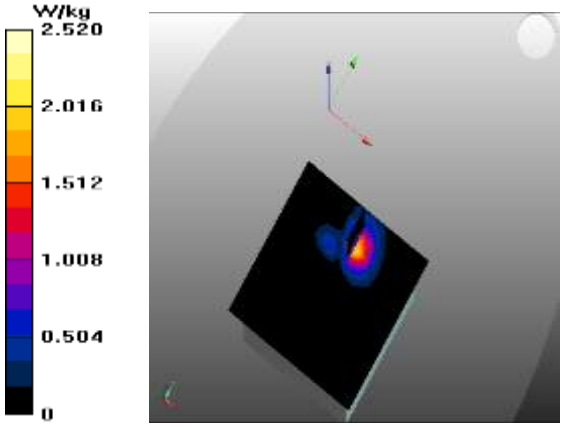


Figure 10: SAR Body Testing Results for the DAQRI Compute Pack at 5270 MHz.

SOFTWARE VERSION:	52.8.8(1258)	**AMBIENT TEMPERATURE:**	23.5 °C
DATE:	09/05/2017	**RELATIVE HUMIDITY:**	27.3 %
PHANTOM:	QD OVA 004 Ax	**CONDUCTIVITY:**	5.492 S/m
DUT CONFIGURATION:	Antenna A	**RELATIVE PERMITTIVITY:**	47.305 ε_r
DUT POSITION:	5mm - Right Edge	**LIQUID TEMPERATURE:**	21.0 °C
RAT:	5 GHz 802.11a 40 MHz	**SCAN TYPE:**	Full
FREQUENCY:	5270 MHz	**DRIFT:**	0.05 dB
MODULATION:	MSC0	**PEAK SAR:**	0.46 W/kg
DUTY CYCLE:	100 %	**SAR (1g):**	0.14 W/kg

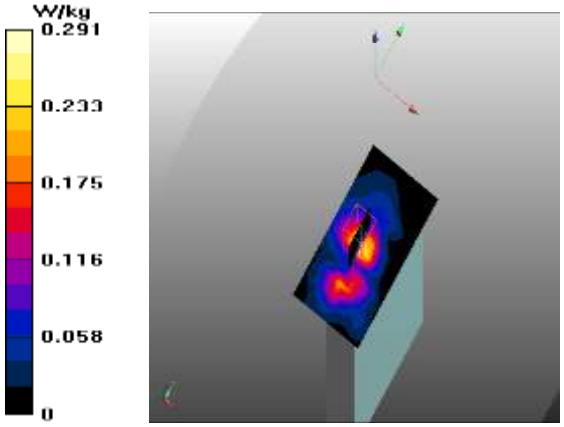


Figure 11: SAR Body Testing Results for the DAQRI Compute Pack at 5270 MHz.

SOFTWARE VERSION:	52.8.8(1258)	**AMBIENT TEMPERATURE:**	23.5 °C
DATE:	09/05/2017	**RELATIVE HUMIDITY:**	27.3 %
PHANTOM:	QD OVA 004 Ax	**CONDUCTIVITY:**	5.492 S/m
DUT CONFIGURATION:	Antenna A	**RELATIVE PERMITTIVITY:**	47.305 ε_r
DUT POSITION:	5mm - Bottom Edge	**LIQUID TEMPERATURE:**	21.0 °C
RAT:	5 GHz 802.11ac 40 MHz	**SCAN TYPE:**	Full
FREQUENCY:	5270 MHz	**DRIFT:**	1.20 dB
MODULATION:	MCS0	**PEAK SAR:**	1.57W/kg
DUTY CYCLE:	100 %	**SAR (1g):**	0.45 W/kg

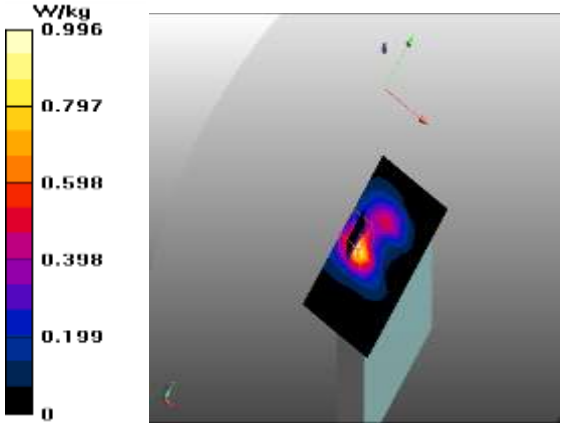


Figure 12: SAR Body Testing Results for the DAQRI Compute Pack at 5270 MHz.

SOFTWARE VERSION:	52.8.8(1258)	**AMBIENT TEMPERATURE:**	23.5 °C
DATE:	09/05/2017	**RELATIVE HUMIDITY:**	27.3 %
PHANTOM:	QD OVA 004 Ax	**CONDUCTIVITY:**	5.547 S/m
DUT CONFIGURATION:	Antenna A	**RELATIVE PERMITTIVITY:**	47.219 ε_r
DUT POSITION:	13mm Rear Face	**LIQUID TEMPERATURE:**	21.0 °C
RAT:	5 GHz 802.11ac 40 MHz	**SCAN TYPE:**	Full
FREQUENCY:	5310 MHz	**DRIFT:**	-0.18 dB
MODULATION:	MCS0	**PEAK SAR:**	0.96 W/kg
DUTY CYCLE:	100 %	**SAR (1g):**	0.27 W/kg

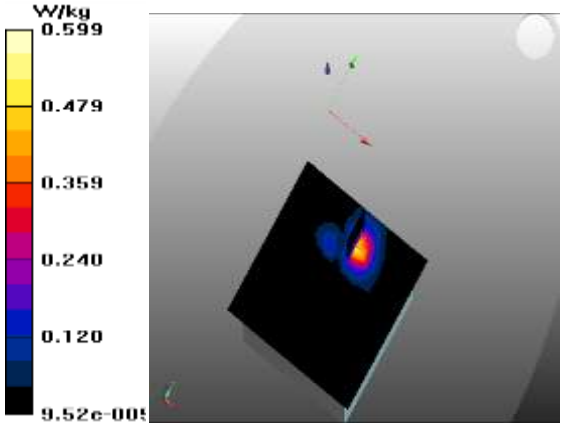


Figure 13: SAR Body Testing Results for the DAQRI Compute Pack at 5310 MHz.

SOFTWARE VERSION:	52.8.8(1258)	**AMBIENT TEMPERATURE:**	23.5 °C
DATE:	09/05/2017	**RELATIVE HUMIDITY:**	27.3 %
PHANTOM:	QD OVA 004 Ax	**CONDUCTIVITY:**	5.492 S/m
DUT CONFIGURATION:	Antenna B	**RELATIVE PERMITTIVITY:**	47.305 ε_r
DUT POSITION:	13mm Rear Face	**LIQUID TEMPERATURE:**	21.0 °C
RAT:	5 GHz 802.11ac 40 MHz	**SCAN TYPE:**	Full
FREQUENCY:	5270 MHz	**DRIFT:**	0.63 dB
MODULATION:	MCS0	**PEAK SAR:**	2.41 W/kg
DUTY CYCLE:	100 %	**SAR (1g):**	0.70 W/kg

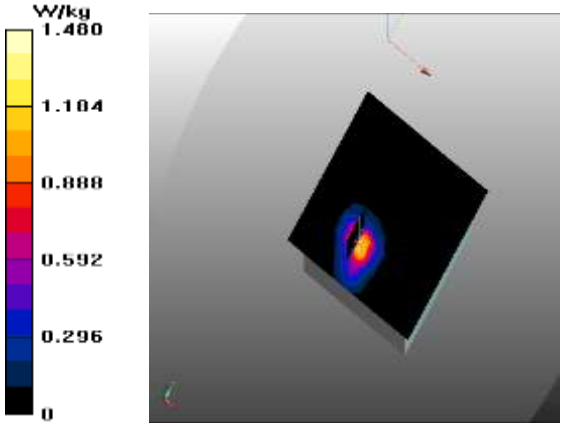


Figure 14: SAR Body Testing Results for the DAQRI Compute Pack at 5270 MHz.

SOFTWARE VERSION:	52.8.8(1258)	**AMBIENT TEMPERATURE:**	23.5 °C
DATE:	09/05/2017	**RELATIVE HUMIDITY:**	27.3 %
PHANTOM:	QD OVA 004 Ax	**CONDUCTIVITY:**	5.492 S/m
DUT CONFIGURATION:	Antenna B	**RELATIVE PERMITTIVITY:**	47.305 ε_r
DUT POSITION:	5mm - Right Edge	**LIQUID TEMPERATURE:**	21.0 °C
RAT:	5 GHz 802.11ac 40 MHz	**SCAN TYPE:**	Full
FREQUENCY:	5270 MHz	**DRIFT:**	-0.01 dB
MODULATION:	MCS0	**PEAK SAR:**	0.22W/kg
DUTY CYCLE:	100 %	**SAR (1g):**	0.07 W/kg

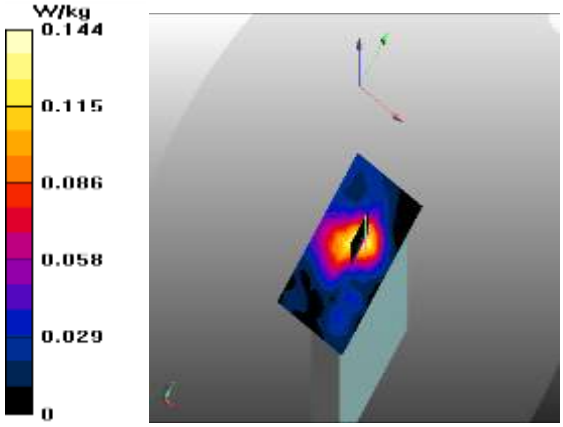


Figure 15: SAR Body Testing Results for the DAQRI Compute Pack at 5270 MHz.

SOFTWARE VERSION:	52.8.8(1258)	**AMBIENT TEMPERATURE:**	23.5 °C
DATE:	09/05/2017	**RELATIVE HUMIDITY:**	27.3 %
PHANTOM:	QD OVA 004 Ax	**CONDUCTIVITY:**	5.492 S/m
DUT CONFIGURATION:	Antenna B	**RELATIVE PERMITTIVITY:**	47.305 ε_r
DUT POSITION:	5mm - Top Edge	**LIQUID TEMPERATURE:**	21.0 °C
RAT:	5 GHz 802.11a 40 MHz	**SCAN TYPE:**	Full
FREQUENCY:	5270 MHz	**DRIFT:**	0.15 dB
MODULATION:	MCS0	**PEAK SAR:**	0.82 W/kg
DUTY CYCLE:	100 %	**SAR (1g):**	0.25 W/kg

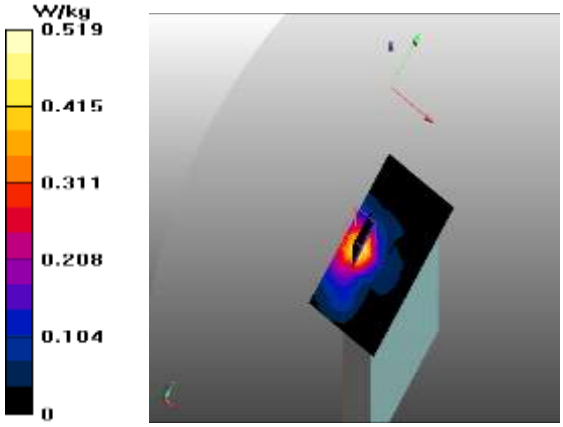


Figure 16: SAR Body Testing Results for the DAQRI Compute Pack at 5270 MHz.

2.4 WLAN U-NII-2C BODY SAR TEST RESULTS

SOFTWARE VERSION:	52.8.8(1258)	**AMBIENT TEMPERATURE:**	23.5 °C
DATE:	09/05/2017	**RELATIVE HUMIDITY:**	27.3 %
PHANTOM:	QD OVA 004 Ax	**CONDUCTIVITY:**	5.984 S/m
DUT CONFIGURATION:	Antenna A	**RELATIVE PERMITTIVITY:**	46.601 ε_r
DUT POSITION:	13mm Rear Face	**LIQUID TEMPERATURE:**	21.0 °C
RAT:	5 GHz 802.11ac 80 MHz	**SCAN TYPE:**	Full
FREQUENCY:	5610 MHz	**DRIFT:**	-0.42 dB
MODULATION:	MCS0	**PEAK SAR:**	2.46 W/kg
DUTY CYCLE:	100 %	**SAR (1g):**	0.89 W/kg

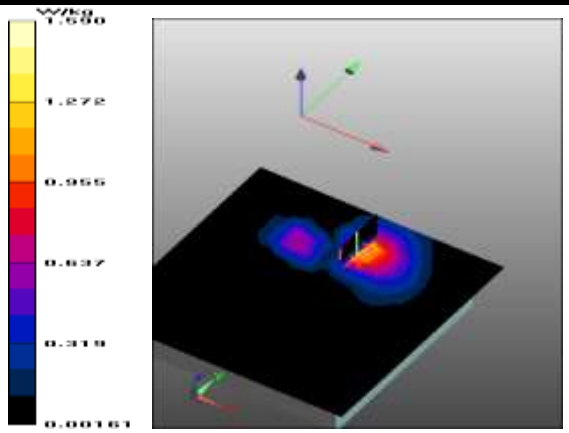


Figure 17: SAR Body Testing Results for the DAQRI Compute Pack at 5610 MHz.

SOFTWARE VERSION:	52.8.8(1258)	**AMBIENT TEMPERATURE:**	23.5 °C
DATE:	09/05/2017	**RELATIVE HUMIDITY:**	27.3 %
PHANTOM:	QD OVA 004 Ax	**CONDUCTIVITY:**	5.984 S/m
DUT CONFIGURATION:	Antenna A	**RELATIVE PERMITTIVITY:**	46.601 ε_r
DUT POSITION:	5mm - Right Edge	**LIQUID TEMPERATURE:**	21.0 °C
RAT:	5 GHz 802.11ac 80 MHz	**SCAN TYPE:**	Full
FREQUENCY:	5610 MHz	**DRIFT:**	0.18 dB
MODULATION:	MCS0	**PEAK SAR:**	0.84 W/kg
DUTY CYCLE:	100 %	**SAR (1g):**	0.31 W/kg

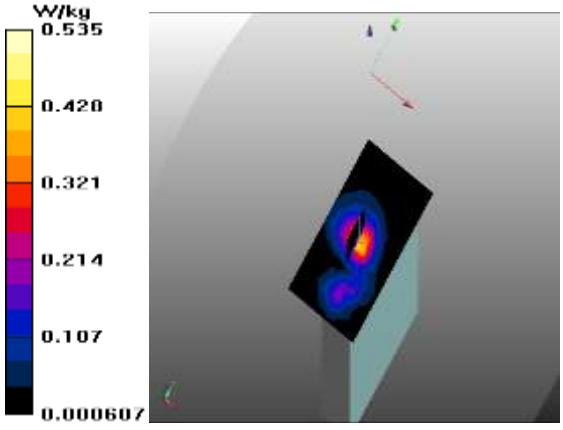


Figure 18: SAR Body Testing Results for the DAQRI Compute Pack at 5610 MHz.

SOFTWARE VERSION:	52.8.8(1258)	**AMBIENT TEMPERATURE:**	23.5 °C
DATE:	09/05/2017	**RELATIVE HUMIDITY:**	27.3 %
PHANTOM:	QD OVA 004 Ax	**CONDUCTIVITY:**	5.984 S/m
DUT CONFIGURATION:	Antenna A	**RELATIVE PERMITTIVITY:**	46.601 ε_r
DUT POSITION:	5mm - Bottom Edge	**LIQUID TEMPERATURE:**	21.0 °C
RAT:	5 GHz 802.11ac 80 MHz	**SCAN TYPE:**	Full
FREQUENCY:	5610 MHz	**DRIFT:**	-0.27 dB
MODULATION:	MCS0	**PEAK SAR:**	1.43W/kg
DUTY CYCLE:	100 %	**SAR (1g):**	0.53 W/kg

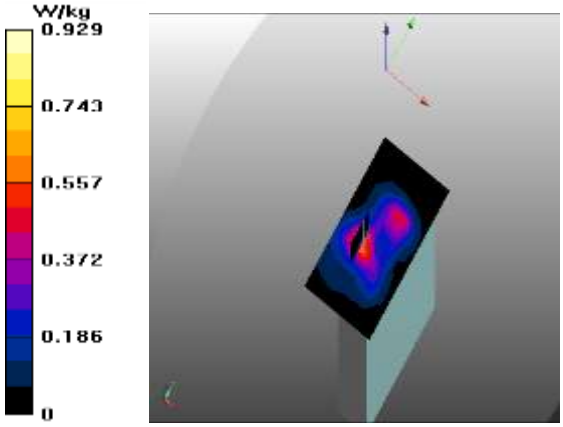


Figure 19: SAR Body Testing Results for the DAQRI Compute Pack at 5610 MHz.

SOFTWARE VERSION:	52.8.8(1258)	**AMBIENT TEMPERATURE:**	22.0 °C
DATE:	23/05/2017	**RELATIVE HUMIDITY:**	56.5 %
PHANTOM:	QD OVA 004 Ax	**CONDUCTIVITY:**	6.055 S/m
DUT CONFIGURATION:	Antenna A	**RELATIVE PERMITTIVITY:**	46.685 ε_r
DUT POSITION:	13mm Rear Face	**LIQUID TEMPERATURE:**	20.9 °C
RAT:	5 GHz 802.11ac 80 MHz	**SCAN TYPE:**	Full
FREQUENCY:	5690 MHz	**DRIFT:**	0.49 dB
MODULATION:	MCS0	**PEAK SAR:**	1.23 W/kg
DUTY CYCLE:	100 %	**SAR (1g):**	0.37 W/kg

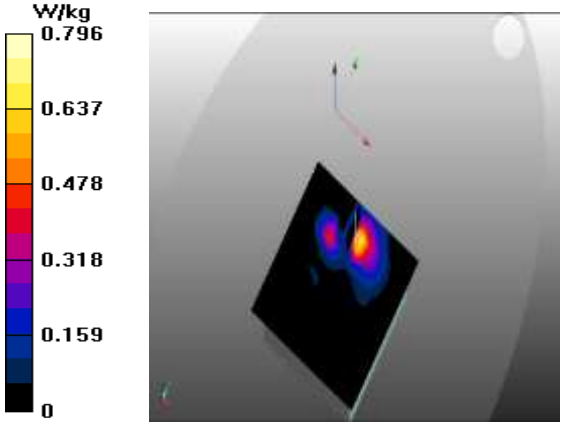


Figure 20: SAR Body Testing Results for the DAQRI Compute Pack at 5690 MHz

SOFTWARE VERSION:	52.8.8(1258)	**AMBIENT TEMPERATURE:**	23.5 °C
DATE:	09/05/2017	**RELATIVE HUMIDITY:**	27.3 %
PHANTOM:	QD OVA 004 Ax	**CONDUCTIVITY:**	5.984 S/m
DUT CONFIGURATION:	Antenna B	**RELATIVE PERMITTIVITY:**	46.601 ε_r
DUT POSITION:	13mm Rear Face	**LIQUID TEMPERATURE:**	21.0 °C
RAT:	5 GHz 802.11ac 80 MHz	**SCAN TYPE:**	Full
FREQUENCY:	5610 MHz	**DRIFT:**	0.62 dB
MODULATION:	MCS0	**PEAK SAR:**	2.32 W/kg
DUTY CYCLE:	100 %	**SAR (1g):**	0.73 W/kg

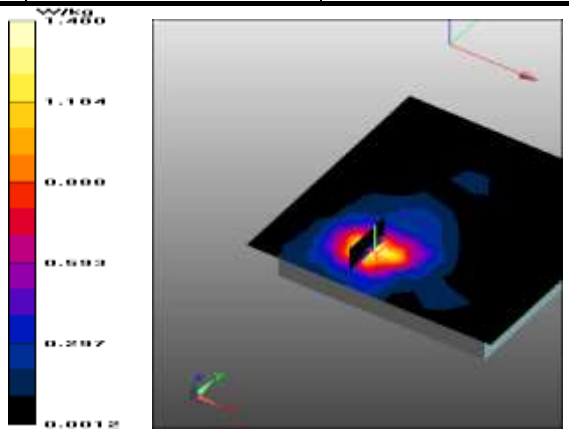


Figure 21: SAR Body Testing Results for the DAQRI Compute Pack at 5610 MHz.

SOFTWARE VERSION:	52.8.8(1258)	**AMBIENT TEMPERATURE:**	23.5 °C
DATE:	09/05/2017	**RELATIVE HUMIDITY:**	27.3 %
PHANTOM:	QD OVA 004 Ax	**CONDUCTIVITY:**	5.984 S/m
DUT CONFIGURATION:	5 GHz 802.11ac 80 MHz Antenna B U-NII 2C	**RELATIVE PERMITTIVITY:**	46.601 ε_r
DUT POSITION:	5mm - Right Edge	**LIQUID TEMPERATURE:**	21.0 °C
RAT:	WLAN	**SCAN TYPE:**	Full
FREQUENCY:	5610 MHz	**DRIFT:**	0.09 dB
MODULATION:	MCS0	**PEAK SAR:**	0.226 W/kg
DUTY CYCLE:	100 %	**SAR (1g):**	0.07 W/kg

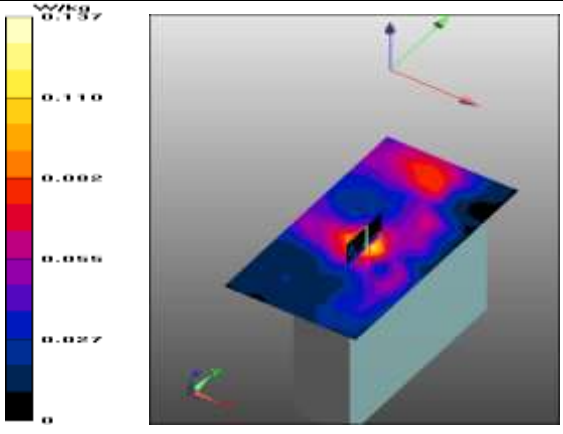


Figure 22: SAR Body Testing Results for the DAQRI Compute Pack at 5610 MHz.

SOFTWARE VERSION:	52.8.8(1258)	**AMBIENT TEMPERATURE:**	23.5 °C
DATE:	09/05/2017	**RELATIVE HUMIDITY:**	27.3 %
PHANTOM:	QD OVA 004 Ax	**CONDUCTIVITY:**	5.984 S/m
DUT CONFIGURATION:	Antenna B	**RELATIVE PERMITTIVITY:**	46.601 ε_r
DUT POSITION:	5mm - Top Edge	**LIQUID TEMPERATURE:**	21.0 °C
RAT:	5 GHz 802.11ac 80 MHz	**SCAN TYPE:**	Full
FREQUENCY:	5610 MHz	**DRIFT:**	1.17 dB
MODULATION:	MCS0	**PEAK SAR:**	1.13 W/kg
DUTY CYCLE:	100 %	**SAR (1g):**	0.36 W/kg

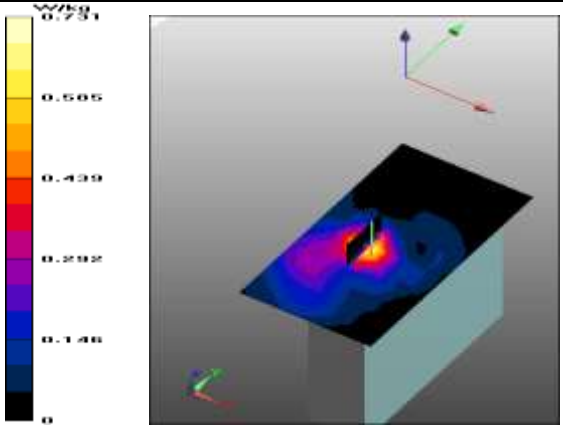


Figure 23: SAR Body Testing Results for the DAQRI Compute Pack at 5610 MHz.

2.5 WLAN U-NII-3 BODY SAR TEST RESULTS

SOFTWARE VERSION:	52.8.8(1258)	**AMBIENT TEMPERATURE:**	20.9 °C
DATE:	10/05/2017	**RELATIVE HUMIDITY:**	31.4 %
PHANTOM:	QD OVA 004 Ax	**CONDUCTIVITY:**	6.264 S/m
DUT CONFIGURATION:	Antenna A	**RELATIVE PERMITTIVITY:**	46.223 ε_r
DUT POSITION:	13mm Rear Face	**LIQUID TEMPERATURE:**	20.6 °C
RAT:	5 GHz 802.11n 40 MHz	**SCAN TYPE:**	Full
FREQUENCY:	5795 MHz	**DRIFT:**	-0.95 dB
MODULATION:	MCS0	**PEAK SAR:**	1.48 W/kg
DUTY CYCLE:	100 %	**SAR (1g):**	0.42 W/kg

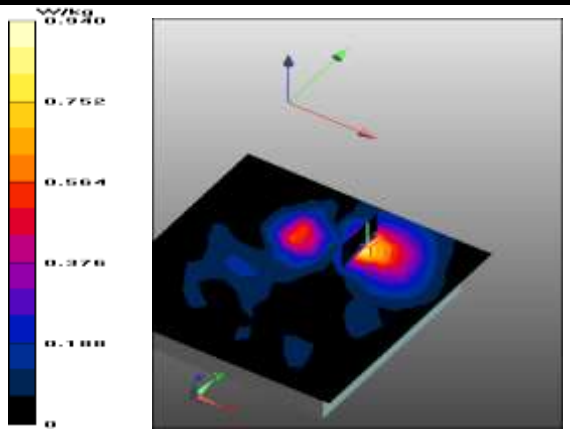


Figure 24: SAR Body Testing Results for the DAQRI Compute Pack at 5795 MHz.

SOFTWARE VERSION:	52.8.8(1258)	**AMBIENT TEMPERATURE:**	20.9 °C
DATE:	10/05/2017	**RELATIVE HUMIDITY:**	31.4 %
PHANTOM:	QD OVA 004 Ax	**CONDUCTIVITY:**	6.264 S/m
DUT CONFIGURATION:	Antenna A	**RELATIVE PERMITTIVITY:**	46.223 ε_r
DUT POSITION:	5mm - Right Edge	**LIQUID TEMPERATURE:**	20.6 °C
RAT:	5 GHz 802.11n 40 MHz	**SCAN TYPE:**	Full
FREQUENCY:	5795 MHz	**DRIFT:**	0.11 dB
MODULATION:	MCS0	**PEAK SAR:**	0.98 W/kg
DUTY CYCLE:	100 %	**SAR (1g):**	0.28 W/kg

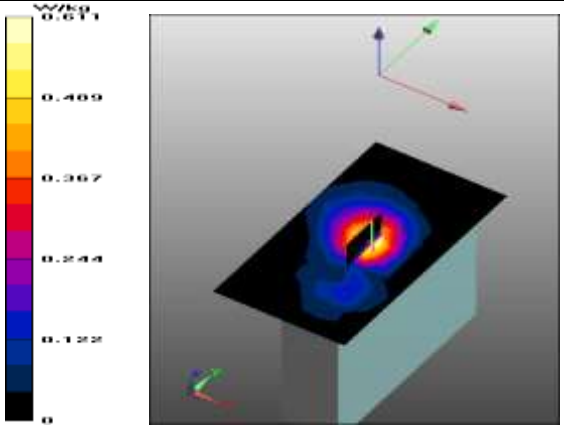


Figure 25: SAR Body Testing Results for the DAQRI Compute Pack at 5795 MHz.

SOFTWARE VERSION:	52.8.8(1258)	**AMBIENT TEMPERATURE:**	20.9°C
DATE:	10/05/2017	**RELATIVE HUMIDITY:**	31.4 %
PHANTOM:	QD OVA 004 Ax	**CONDUCTIVITY:**	6.264 S/m
DUT CONFIGURATION:	Antenna A	**RELATIVE PERMITTIVITY:**	46.223 ε_r
DUT POSITION:	5mm - Bottom Edge	**LIQUID TEMPERATURE:**	20.6 °C
RAT:	5 GHz 802.11n 40 MHz	**SCAN TYPE:**	Full
FREQUENCY:	5795 MHz	**DRIFT:**	0.29 dB
MODULATION:	MCS0	**PEAK SAR:**	0.98 W/kg
DUTY CYCLE:	100 %	**SAR (1g):**	0.27 W/kg

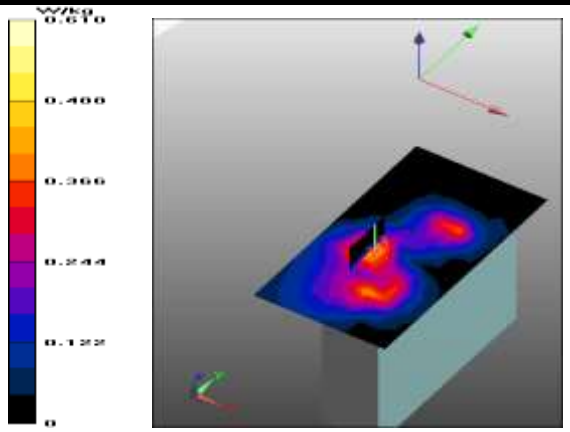


Figure 26: SAR Body Testing Results for the DAQRI Compute Pack at 5795 MHz.

SOFTWARE VERSION:	52.8.8(1258)	**AMBIENT TEMPERATURE:**	23.5 °C
DATE:	10/05/2017	**RELATIVE HUMIDITY:**	27.3 %
PHANTOM:	QD OVA 004 Ax	**CONDUCTIVITY:**	6.264 S/m
DUT CONFIGURATION:	Antenna B	**RELATIVE PERMITTIVITY:**	46.223 ε_r
DUT POSITION:	13mm Rear Face	**LIQUID TEMPERATURE:**	21.0 °C
RAT:	5 GHz 802.11n 40 MHz	**SCAN TYPE:**	Full
FREQUENCY:	5795 MHz	**DRIFT:**	0.04 dB
MODULATION:	MCS0	**PEAK SAR:**	1.89 W/kg
DUTY CYCLE:	100 %	**SAR (1g):**	0.54 W/kg

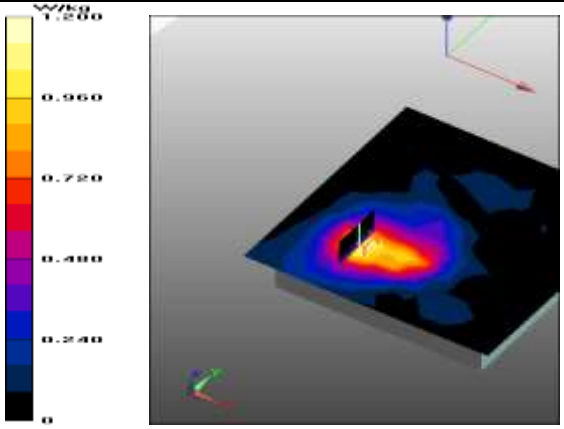


Figure 27: SAR Body Testing Results for the DAQRI Compute Pack at 5795 MHz.

SOFTWARE VERSION:	52.8.8(1258)	**AMBIENT TEMPERATURE:**	23.5 °C
DATE:	10/05/2017	**RELATIVE HUMIDITY:**	27.3 %
PHANTOM:	QD OVA 004 Ax	**CONDUCTIVITY:**	6.264 S/m
DUT CONFIGURATION:	Antenna B	**RELATIVE PERMITTIVITY:**	46.223 ε_r
DUT POSITION:	5mm - Right Edge	**LIQUID TEMPERATURE:**	21.0 °C
RAT:	5 GHz 802.11n 40 MHz	**SCAN TYPE:**	Full
FREQUENCY:	5795 MHz	**DRIFT:**	-0.46 dB
MODULATION:	MCS0	**PEAK SAR:**	0.27 W/kg
DUTY CYCLE:	100 %	**SAR (1g):**	0.07 W/kg

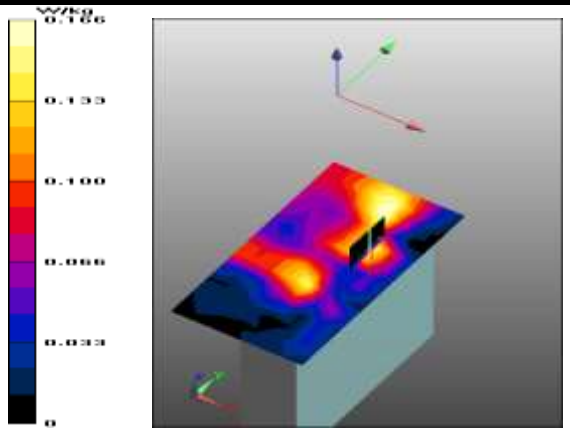


Figure 28: SAR Body Testing Results for the DAQRI Compute Pack at 5795 MHz.

SOFTWARE VERSION:	52.8.8(1258)	**AMBIENT TEMPERATURE:**	23.5 °C
DATE:	10/05/2017	**RELATIVE HUMIDITY:**	27.3 %
PHANTOM:	QD OVA 004 Ax	**CONDUCTIVITY:**	6.264 S/m
DUT CONFIGURATION:	Antenna B	**RELATIVE PERMITTIVITY:**	46.223 ε_r
DUT POSITION:	5mm - Top Edge	**LIQUID TEMPERATURE:**	21.0 °C
RAT:	5 GHz 802.11n 40 MHz	**SCAN TYPE:**	Full
FREQUENCY:	5795 MHz	**DRIFT:**	0.04 dB
MODULATION:	MCS0	**PEAK SAR:**	1.89 W/kg
DUTY CYCLE:	100 %	**SAR (1g):**	0.54 W/kg

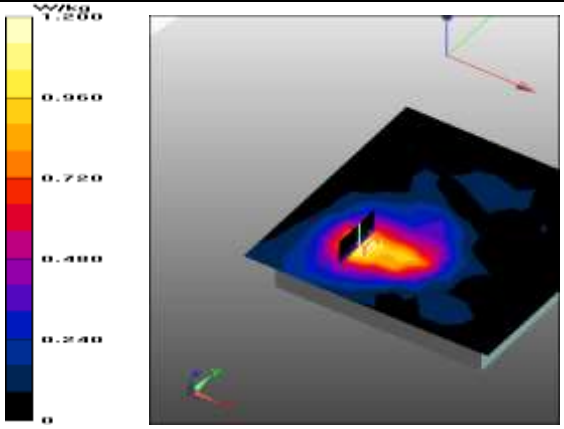


Figure 29: SAR Body Testing Results for the DAQRI Compute Pack at 5795 MHz.

Product Service

SECTION 3

TEST EQUIPMENT USED

3.1 TEST EQUIPMENT USED

The following test equipment was used at TÜV SÜD Product Service:

Instrument Description	Manufacturer	Model Type	TE Number	Cal Period (months)	Calibration Due Date
10MHz - 2.5GHz, 3W, Amplifier	Vectawave Technology	VTL5400	51	-	TU
Power Sensor	Rohde & Schwarz	NRV-Z1	60	12	16-Jun-2017
Signal Generator	Hewlett Packard	ESG4000A	61	12	12-Jul-2017
Attenuator (20dB, 10W)	Weinschel	37-20-34	482	12	26-Oct-2017
Bi-directional Coupler	IndexSar Ltd	7401 (VDC0830-20)	2414	-	TU
Thermometer	Digitron	T208	64	12	13-May-2017
Hygrometer	Rotronic	I-1000	2784	12	26-Apr-2017
Power Sensor	Rohde & Schwarz	NRV- Z5	2878	12	16-Jun-2017
Dual Channel Power Meter	Rohde & Schwarz	NRVD	3259	12	16-Jun-2017
Data Acquisition Electronics	Speag	DAE 4 - SD 000 D04 BM	4689	12	12-Dec-2017
Measurement Server	Speag	DASY 5 Measurement Server	4692	-	TU
Elliptical Phantom	Speag	ELI Phantom	4699	-	TU
Dosimetric SAR Probe	Speag	EX3DV4	4700	12	16-Dec-2017
Mounting Platform for TX90XL Robot and Phantoms	Speag	MP6C-TX90XL Mounting Platform Extended	4702	-	TU
Robot	Speag	TX90 XLspeag Robot	4704	-	TU
2450MHz Dipole	Speag	D2450V2	3875	12	14-Dec-2017
5000 MHz Dipole	Speag	D5000V2	4796	12	14-Dec-2017
MBBL Fluid	Speag	Batch 2	N/A	Weekly	29-May-2017

TU = Traceability Unscheduled

3.2 TEST SOFTWARE

The following software was used to control the TÜV SÜD Product Service DASY System.

Instrument	Version Number
DASY system	52.8.8(1258)

3.3 DIELECTRIC PROPERTIES OF SIMULANT LIQUIDS

The fluid properties of the simulant fluids used during routine SAR evaluation meet the dielectric properties required KDB 865665.

The dielectric properties of the tissue simulant liquids used for the SAR testing at TÜV SÜD Product Service are as follows:-

Fluid Type and Frequency	Relative Permittivity Target	Relative Permittivity Measured	Conductivity Target	Conductivity Measured
2450 MHz MBBL	52.70	52.62	1.95	2.05
5300 MHz MBBL	48.89	47.24	5.42	4.60
5600 MHz MBBL	48.47	46.62	5.76	6.04
5800 MHz MBBL	48.20	46.21	6.00	6.34
5800 MHz MBBL	48.20	46.72	6.00	6.52

3.4 TEST CONDITIONS

3.4.1 Test Laboratory Conditions

Ambient temperature: Within +15°C to +35°C.
The actual temperature during the testing ranged from 20.9°C to 23.5°C.
The actual humidity during the testing ranged from 27.3% to 31.4% RH.

3.4.2 Test Fluid Temperature Range

Frequency	Fluid	Min Temperature °C	Max Temperature °C
2450 MHz	MBBL	20.6	20.6
5300 MHz	MBBL	21.0	21.0
5600 MHz	MBBL	21.0	21.0
5800 MHz	MBBL	20.6	21.0

3.4.3 SAR Drift

The maximum SAR Drift was recorded as 1.20 dB

Product Service

3.5 MEASUREMENT UNCERTAINTY

Body, Full SAR Measurements, 300 MHz to 3 GHz Using Probe EX3DV4 - SN3759

Source of Uncertainty	Uncertainty ± %	Probability distribution	Div	c_i (1g)	Standard Uncertainty ± % (1g)	v_i (v_{eff})
Measurement System						
Probe calibration	6.0	N	1.00	1.00	6.0	Infinity
Axial Isotropy	4.7	R	1.73	0.70	1.9	Infinity
Hemispherical Isotropy	9.6	R	1.73	0.70	3.9	Infinity
Boundary effect	1.0	R	1.73	1.00	0.6	Infinity
Linearity	4.7	R	1.73	1.00	2.7	Infinity
System Detection limits	1.0	R	1.73	1.00	0.6	Infinity
Modulation response	2.4	R	1.73	1.00	1.4	Infinity
Readout electronics	0.3	N	1.00	1.00	0.3	Infinity
Response time	0.8	R	1.73	1.00	0.5	Infinity
Integration time	2.6	R	1.73	1.00	1.5	Infinity
RF ambient noise	3.0	R	1.73	1.00	1.7	Infinity
RF ambient reflections	3.0	R	1.73	1.00	1.7	Infinity
Probe positioner	0.4	R	1.73	1.00	0.2	Infinity
Probe positioning	2.9	R	1.73	1.00	1.7	Infinity
Max SAR Evaluation	2.0	R	1.73	1.00	1.2	Infinity
Test sample related						
Device Positioning	2.9	N	1.00	1.00	2.9	145
Device Holder	3.6	N	1.00	1.00	3.6	5
Input Power and SAR Drift	5.0	R	1.73	1.00	0.7	Infinity
Phantom and Setup						
Phantom uncertainty	6.1	R	1.73	1.00	3.5	Infinity
SAR Correction	1.9	R	1.73	1.00	1.1	Infinity
Liquid conductivity Meas.	2.5	R	1.73	0.78	1.1	Infinity
Liquid Permittivity Meas.	2.5	R	1.73	0.23	0.3	Infinity
Temp. Unc. Conductivity	3.4	R	1.73	0.78	1.5	Infinity
Temp. Unc. Permittivity	0.4	R	1.73	0.23	0.1	Infinity
Combined Standard Uncertainty		**RSS**			10.8	361
Expanded Standard Uncertainty		**K=2**			21.6	

Product Service

Body, Full SAR Measurements, 3 GHz to 6 GHz Using Probe EX3DV4 - SN3759

Source of Uncertainty	Uncertainty ± %	Probability distribution	Div	c_i (1g)	Standard Uncertainty ± % (1g)	v_i (v_{eff})
Measurement System						
Probe calibration	6.6	N	1.00	1.00	6.6	Infinity
Axial Isotropy	4.7	R	1.73	0.70	1.9	Infinity
Hemispherical Isotropy	9.6	R	1.73	0.70	3.9	Infinity
Boundary effect	2.0	R	1.73	1.00	1.2	Infinity
Linearity	4.7	R	1.73	1.00	2.7	Infinity
System Detection limits	1.0	R	1.73	1.00	0.6	Infinity
Modulation response	2.4	R	1.73	1.00	1.4	Infinity
Readout electronics	0.3	N	1.00	1.00	0.3	Infinity
Response time	0.8	R	1.73	1.00	0.5	Infinity
Integration time	2.6	R	1.73	1.00	1.5	Infinity
RF ambient noise	3.0	R	1.73	1.00	1.7	Infinity
RF ambient reflections	3.0	R	1.73	1.00	1.7	Infinity
Probe positioner	0.8	R	1.73	1.00	0.5	Infinity
Probe positioning	6.7	R	1.73	1.00	3.9	Infinity
Max SAR Evaluation	4.0	R	1.73	1.00	2.3	Infinity
Test sample related						
Device Positioning	2.9	N	1.00	1.00	2.9	145
Device Holder	3.6	N	1.00	1.00	3.6	5
Input Power and SAR Drift	5.0	R	1.73	1.00	0.7	Infinity
Phantom and Setup						
Phantom uncertainty	6.6	R	1.73	1.00	3.8	Infinity
SAR Correction	1.9	R	1.73	1.00	1.1	Infinity
Liquid conductivity Meas.	2.5	R	1.73	0.78	1.1	Infinity
Liquid Permittivity Meas.	2.5	R	1.73	0.23	0.3	Infinity
Temp. Unc. Conductivity	3.4	R	1.73	0.78	1.5	Infinity
Temp. Unc. Permittivity	0.4	R	1.73	0.23	0.1	Infinity
Combined Standard Uncertainty		**RSS**			12.0	748
Expanded Standard Uncertainty		**K=2**			23.9	

SECTION 4

ACCREDITATION, DISCLAIMERS AND COPYRIGHT

4.1 ACCREDITATION, DISCLAIMERS AND COPYRIGHT

This report relates only to the actual item/items tested.

Our UKAS Accreditation does not cover opinions and interpretations and any expressed are outside the scope of our UKAS Accreditation.

Results of tests not covered by our UKAS Accreditation Schedule are marked NUA (Not UKAS Accredited).

Product Service

ANNEX A

PROBE CALIBRATION REPORT

Product Service

Calibration Laboratory of
Schmid & Partner
Engineering AG
Zeughausstrasse 43, 8004 Zurich, Switzerland

S Schweizerischer Kalibrierdienst
C Service suisse d'étalonnage
S Servizio svizzero di taratura
Swiss Calibration Service

Accredited by the Swiss Accreditation Service (SAS)
The Swiss Accreditation Service is one of the signatories to the EA Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: SCS 0108

Client TüV SÜD UK

Certificate No: EX3-3759_Dec16

CALIBRATION CERTIFICATE

Object EX3DV4 - SN:3759

Calibration procedure(s) QA CAL-01.v9, QA CAL-12.v9, QA CAL-14.v4, QA CAL-23.v5, QA CAL-25.v6
Calibration procedure for dosimetric E-field probes

Calibration date: December 16, 2016

This calibration certificate documents the traceability to national standards, which realize the physical units of measurements (SI). The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.

All calibrations have been conducted in the closed laboratory facility: environment temperature (22 ± 3)°C and humidity < 70%.

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID	Cal Date (Certificate No.)	Scheduled Calibration
Power meter NRP	SN: 104778	06-Apr-16 (No. 217-02288/02289)	Apr-17
Power sensor NRP-Z91	SN: 103244	06-Apr-16 (No. 217-02288)	Apr-17
Power sensor NRP-Z91	SN: 103245	06-Apr-16 (No. 217-02289)	Apr-17
Reference 20 dB Attenuator	SN: 55277 (20x)	05-Apr-16 (No. 217-02293)	Apr-17
Reference Probe ES3DV2	SN: 3013	31-Dec-15 (No. ES3-3013_Dec15)	Dec-16
DAE4	SN: 660	7-Dec-16 (No. DAE4-660_Dec16)	Dec-17
Secondary Standards	ID	Check Date (in house)	Scheduled Check
Power meter E4419B	SN: GB41293874	06-Apr-16 (in house check Jun-16)	In house check: Jun-18
Power sensor E4412A	SN: MY41498087	06-Apr-16 (in house check Jun-16)	In house check: Jun-18
Power sensor E4412A	SN: 000110210	06-Apr-16 (in house check Jun-16)	In house check: Jun-18
RF generator HP 8648C	SN: US3642U01700	04-Aug-99 (in house check Jun-16)	In house check: Jun-18
Network Analyzer HP 8753E	SN: US37390585	18-Oct-01 (in house check Oct-16)	In house check: Oct-17

	Name	Function	Signature
Calibrated by:	Michael Weber	Laboratory Technician	
Approved by:	Katja Pokovic	Technical Manager	

Issued: December 19, 2016

Product Service

Calibration Laboratory of
Schmid & Partner
Engineering AG
Zeughausstrasse 43, 8004 Zurich, Switzerland

S Schweizerischer Kalibrierdienst
C Service suisse d'étalonnage
S Servizio svizzero di taratura
S Swiss Calibration Service

Accredited by the Swiss Accreditation Service (SAS)
The Swiss Accreditation Service is one of the signatories to the EA Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: SCS 0108

Glossary:

TSL	tissue simulating liquid
NORMx,y,z	sensitivity in free space
ConvF	sensitivity in TSL / NORMx,y,z
DCP	diode compression point
CF	crest factor (1/duty_cycle) of the RF signal
A, B, C, D	modulation dependent linearization parameters
Polarization φ	φ rotation around probe axis
Polarization ϑ	ϑ rotation around an axis that is in the plane normal to probe axis (at measurement center), i.e., ϑ = 0 is normal to probe axis
Connector Angle	information used in DASY system to align probe sensor X to the robot coordinate system

Calibration is Performed According to the Following Standards:

a) IEEE Std 1528-2013, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", June 2013
b) IEC 62209-1, "Procedure to measure the Specific Absorption Rate (SAR) for hand-held devices used in close proximity to the ear (frequency range of 300 MHz to 3 GHz)", February 2005
c) IEC 62209-2, "Procedure to determine the Specific Absorption Rate (SAR) for wireless communication devices used in close proximity to the human body (frequency range of 30 MHz to 6 GHz)", March 2010
d) KDB 865664, "SAR Measurement Requirements for 100 MHz to 6 GHz"

Methods Applied and Interpretation of Parameters:

- *NORMx,y,z:* Assessed for E-field polarization ϑ = 0 (f ≤ 900 MHz in TEM-cell; f > 1800 MHz: R22 waveguide). NORMx,y,z are only intermediate values, i.e., the uncertainties of NORMx,y,z does not affect the E^2-field uncertainty inside TSL (see below *ConvF*).
- *NORM(f)x,y,z = NORMx,y,z * frequency_response* (see Frequency Response Chart). This linearization is implemented in DASY4 software versions later than 4.2. The uncertainty of the frequency response is included in the stated uncertainty of *ConvF*.
- *DCPx,y,z:* DCP are numerical linearization parameters assessed based on the data of power sweep with CW signal (no uncertainty required). DCP does not depend on frequency nor media.
- *PAR:* PAR is the Peak to Average Ratio that is not calibrated but determined based on the signal characteristics
- *Ax,y,z; Bx,y,z; Cx,y,z; Dx,y,z; VRx,y,z: A, B, C, D* are numerical linearization parameters assessed based on the data of power sweep for specific modulation signal. The parameters do not depend on frequency nor media. *VR* is the maximum calibration range expressed in RMS voltage across the diode.
- *ConvF and Boundary Effect Parameters:* Assessed in flat phantom using E-field (or Temperature Transfer Standard for f ≤ 800 MHz) and inside waveguide using analytical field distributions based on power measurements for f > 800 MHz. The same setups are used for assessment of the parameters applied for boundary compensation (alpha, depth) of which typical uncertainty values are given. These parameters are used in DASY4 software to improve probe accuracy close to the boundary. The sensitivity in TSL corresponds to *NORMx,y,z * ConvF* whereby the uncertainty corresponds to that given for *ConvF*. A frequency dependent *ConvF* is used in DASY version 4.4 and higher which allows extending the validity from ± 50 MHz to ± 100 MHz.
- *Spherical isotropy (3D deviation from isotropy):* in a field of low gradients realized using a flat phantom exposed by a patch antenna.
- *Sensor Offset:* The sensor offset corresponds to the offset of virtual measurement center from the probe tip (on probe axis). No tolerance required.
- *Connector Angle:* The angle is assessed using the information gained by determining the *NORMx* (no uncertainty required).

Product Service

Probe EX3DV4

SN:3759

Manufactured: March 16, 2010
Calibrated: December 16, 2016

Calibrated for DASY/EASY Systems
(Note: non-compatible with DASY2 system!)

Product Service

DASY/EASY - Parameters of Probe: EX3DV4 - SN:3759

Basic Calibration Parameters

	Sensor X	Sensor Y	Sensor Z	Unc (k=2)
Norm ($\mu V/(V/m)^2$)[A]	0.47	0.42	0.45	± 10.1 %
DCP (mV)[B]	101.1	99.1	101.2	

Modulation Calibration Parameters

UID	Communication System Name		A dB	B dB√μV	C	D dB	VR mV	Unc[E] (k=2)
0	CW	X	0.0	0.0	1.0	0.00	149.0	±3.5 %
		Y	0.0	0.0	1.0		147.4	
		Z	0.0	0.0	1.0		138.4	

Note: For details on UID parameters see Appendix.

Sensor Model Parameters

	C1 fF	C2 fF	α V^{-1}	T1 $ms.V^{-2}$	T2 $ms.V^{-1}$	T3 ms	T4 V^{-2}	T5 V^{-1}	T6
X	45.34	339.8	35.83	13.18	1.015	4.992	0.942	0.363	1.005
Y	51.23	384.3	35.89	14.75	0.946	5.017	1.083	0.33	1.006
Z	48.36	361.1	35.6	14.31	1.297	4.99	0.629	0.453	1.004

The reported uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor k=2, which for a normal distribution corresponds to a coverage probability of approximately 95%.

[A] The uncertainties of Norm X,Y,Z do not affect the E^2-field uncertainty inside TSL (see Pages 5 and 6).
[B] Numerical linearization parameter: uncertainty not required.
[E] Uncertainty is determined using the max. deviation from linear response applying rectangular distribution and is expressed for the square of the field value.

Product Service

DASY/EASY - Parameters of Probe: EX3DV4 - SN:3759

Calibration Parameter Determined in Head Tissue Simulating Media

f (MHz) [C]	Relative Permittivity [F]	Conductivity (S/m) [F]	ConvF X	ConvF Y	ConvF Z	Alpha [G]	Depth [G] (mm)	Unc (k=2)
450	43.5	0.87	10.95	10.95	10.95	0.15	1.30	± 13.3 %
750	41.9	0.89	10.45	10.45	10.45	0.28	1.01	± 12.0 %
835	41.5	0.90	10.04	10.04	10.04	0.16	1.40	± 12.0 %
900	41.5	0.97	9.94	9.94	9.94	0.24	0.97	± 12.0 %
1640	40.3	1.29	8.63	8.63	8.63	0.19	0.80	± 12.0 %
1750	40.1	1.37	8.58	8.58	8.58	0.18	0.96	± 12.0 %
1900	40.0	1.40	8.32	8.32	8.32	0.14	0.86	± 12.0 %
2100	39.8	1.49	8.45	8.45	8.45	0.23	0.84	± 12.0 %
2300	39.5	1.67	7.80	7.80	7.80	0.15	1.07	± 12.0 %
2450	39.2	1.80	7.42	7.42	7.42	0.23	0.86	± 12.0 %
2600	39.0	1.96	7.16	7.16	7.16	0.20	1.08	± 12.0 %
5200	36.0	4.66	5.68	5.68	5.68	0.30	1.80	± 13.1 %
5300	35.9	4.76	5.46	5.46	5.46	0.30	1.80	± 13.1 %
5500	35.6	4.96	5.05	5.05	5.05	0.35	1.80	± 13.1 %
5600	35.5	5.07	4.72	4.72	4.72	0.40	1.80	± 13.1 %
5800	35.3	5.27	5.02	5.02	5.02	0.40	1.80	± 13.1 %

[C] Frequency validity above 300 MHz of ± 100 MHz only applies for DASY v4.4 and higher (see Page 2), else it is restricted to ± 50 MHz. The uncertainty is the RSS of the ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band. Frequency validity below 300 MHz is ± 10, 25, 40, 50 and 70 MHz for ConvF assessments at 30, 64, 128, 150 and 220 MHz respectively. Above 5 GHz frequency validity can be extended to ± 110 MHz.

[F] At frequencies below 3 GHz, the validity of tissue parameters (ε and α) can be relaxed to ± 10% if liquid compensation formula is applied to measured SAR values. At frequencies above 3 GHz, the validity of tissue parameters (ε and α) is restricted to ± 5%. The uncertainty is the RSS of the ConvF uncertainty for indicated target tissue parameters.

[G] Alpha/Depth are determined during calibration. SPEAG warrants that the remaining deviation due to the boundary effect after compensation is always less than ± 1% for frequencies below 3 GHz and below ± 2% for frequencies between 3-6 GHz at any distance larger than half the probe tip diameter from the boundary.

Product Service

DASY/EASY - Parameters of Probe: EX3DV4 - SN:3759

Calibration Parameter Determined in Body Tissue Simulating Media

f (MHz) [C]	Relative Permittivity [F]	Conductivity (S/m) [F]	ConvF X	ConvF Y	ConvF Z	Alpha [G]	Depth [G] (mm)	Unc (k=2)
450	56.7	0.94	11.67	11.67	11.67	0.05	1.20	± 13.3 %
750	55.5	0.96	10.25	10.25	10.25	0.31	0.85	± 12.0 %
835	55.2	0.97	9.85	9.85	9.85	0.16	1.31	± 12.0 %
900	55.0	1.05	9.83	9.83	9.83	0.29	0.86	± 12.0 %
1640	53.8	1.40	8.63	8.63	8.63	0.26	0.80	± 12.0 %
1750	53.4	1.49	8.16	8.16	8.16	0.27	0.86	± 12.0 %
1900	53.3	1.52	7.87	7.87	7.87	0.21	0.96	± 12.0 %
2100	53.2	1.62	8.26	8.26	8.26	0.16	1.04	± 12.0 %
2300	52.9	1.81	7.56	7.56	7.56	0.29	0.80	± 12.0 %
2450	52.7	1.95	7.49	7.49	7.49	0.11	0.99	± 12.0 %
2600	52.5	2.16	7.31	7.31	7.31	0.14	1.10	± 12.0 %
5200	49.0	5.30	5.00	5.00	5.00	0.35	1.90	± 13.1 %
5300	48.9	5.42	4.78	4.78	4.78	0.35	1.90	± 13.1 %
5500	48.6	5.65	4.27	4.27	4.27	0.40	1.90	± 13.1 %
5600	48.5	5.77	3.98	3.98	3.98	0.50	1.90	± 13.1 %
5800	48.2	6.00	4.20	4.20	4.20	0.50	1.90	± 13.1 %

[C] Frequency validity above 300 MHz of ± 100 MHz only applies for DASY v4.4 and higher (see Page 2), else it is restricted to ± 50 MHz. The uncertainty is the RSS of the ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band. Frequency validity below 300 MHz is ± 10, 25, 40, 50 and 70 MHz for ConvF assessments at 30, 64, 128, 150 and 220 MHz respectively. Above 5 GHz frequency validity can be extended to ± 110 MHz.

[F] At frequencies below 3 GHz, the validity of tissue parameters (ε and σ) can be relaxed to ± 10% if liquid compensation formula is applied to measured SAR values. At frequencies above 3 GHz, the validity of tissue parameters (ε and σ) is restricted to ± 5%. The uncertainty is the RSS of the ConvF uncertainty for indicated target tissue parameters.

[G] Alpha/Depth are determined during calibration. SPEAG warrants that the remaining deviation due to the boundary effect after compensation is always less than ± 1% for frequencies below 3 GHz and below ± 2% for frequencies between 3-6 GHz at any distance larger than half the probe tip diameter from the boundary.

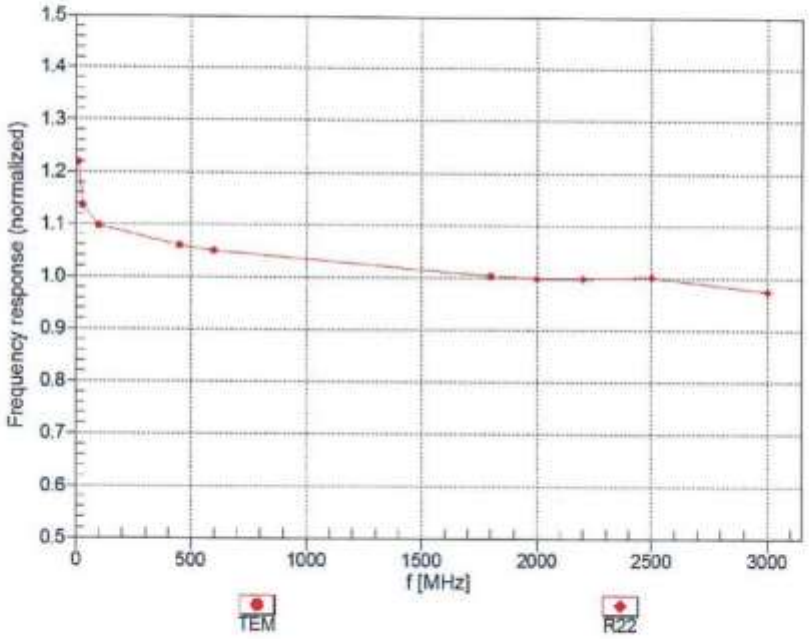
Product Service

EX3DV4– SN:3759

December 16, 2016

Frequency Response of E-Field

(TEM-Cell:ifi110 EXX, Waveguide: R22)



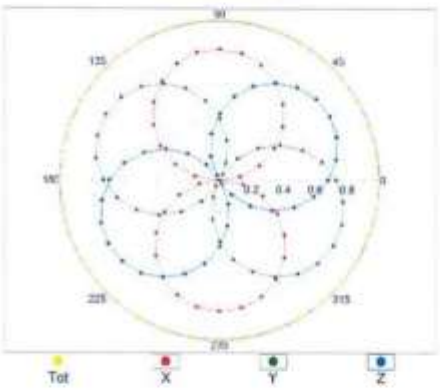
Uncertainty of Frequency Response of E-field: ± 6.3% (k=2)

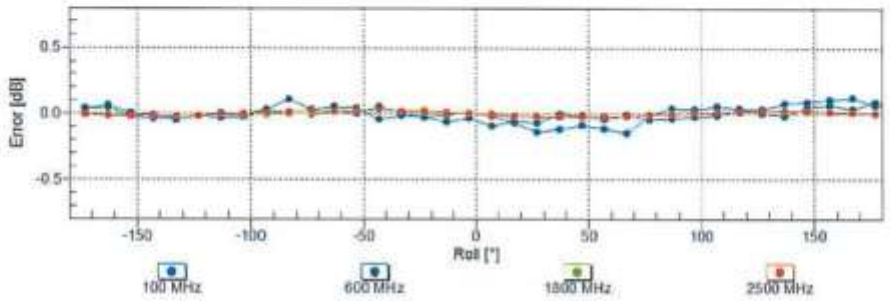
Product Service

Receiving Pattern (ϕ), ϑ = 0°

f=600 MHz,TEM

f=1800 MHz,R22

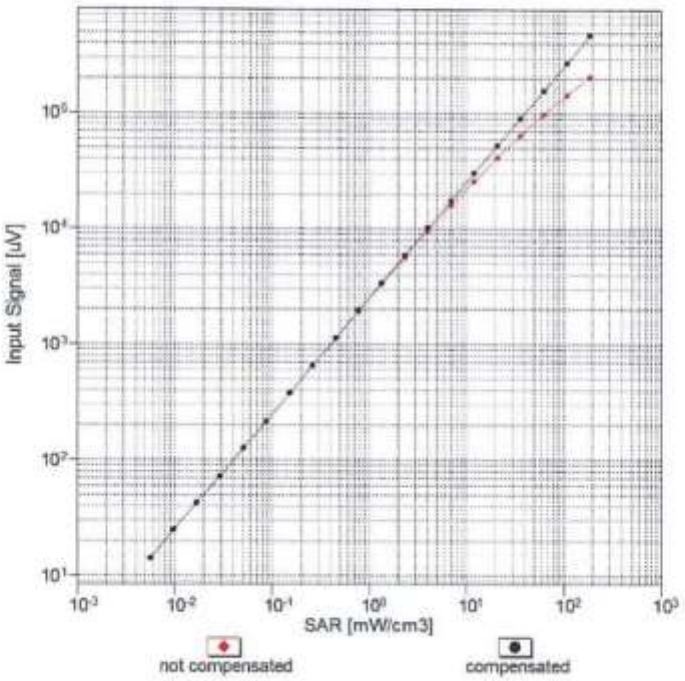


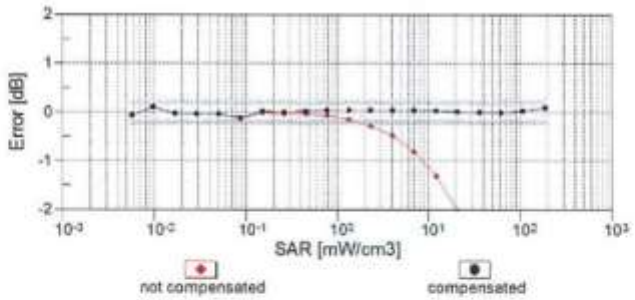


Uncertainty of Axial Isotropy Assessment: ± 0.5% (k=2)

Product Service

Dynamic Range f(SAR$_{head}$)
(TEM cell , f_{eval}= 1900 MHz)





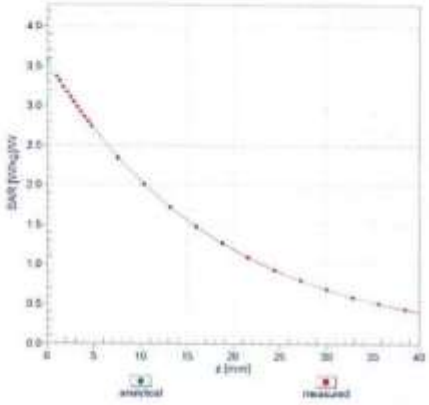
Uncertainty of Linearity Assessment: ± 0.6% (k=2)

Product Service

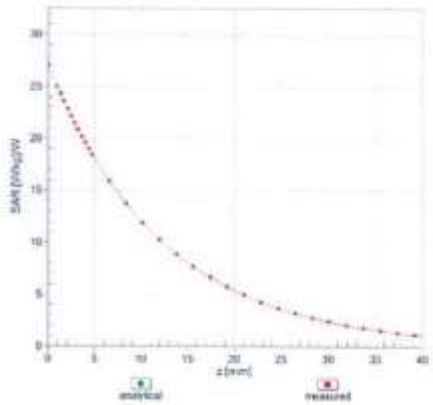
EX3DV4– SN:3759 December 16, 2016

Conversion Factor Assessment

f = 900 MHz,WGLS R9 (H_convF)

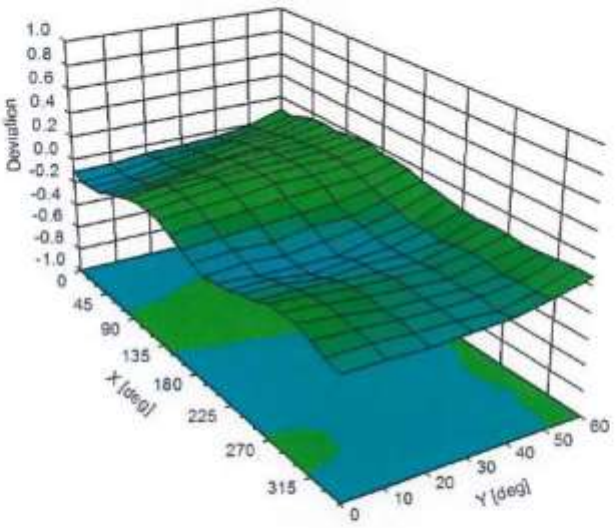


f = 1750 MHz,WGLS R22 (H_convF)



Deviation from Isotropy in Liquid

Error (ϕ, ϑ), f = 900 MHz



Uncertainty of Spherical Isotropy Assessment: ± 2.6% (k=2)

Product Service

DASY/EASY - Parameters of Probe: EX3DV4 - SN:3759

Other Probe Parameters

Sensor Arrangement	Triangular
Connector Angle (°)	-3
Mechanical Surface Detection Mode	enabled
Optical Surface Detection Mode	disabled
Probe Overall Length	337 mm
Probe Body Diameter	10 mm
Tip Length	9 mm
Tip Diameter	2.5 mm
Probe Tip to Sensor X Calibration Point	1 mm
Probe Tip to Sensor Y Calibration Point	1 mm
Probe Tip to Sensor Z Calibration Point	1 mm
Recommended Measurement Distance from Surface	1.4 mm

Product Service

Appendix: Modulation Calibration Parameters

UID	Communication System Name		A dB	B dB√μV	C	D dB	VR mV	Max Unc[E] (k=2)
0	CW	X	0.00	0.00	1.00	0.00	149.0	± 3.5 %
		Y	0.00	0.00	1.00		147.4	
		Z	0.00	0.00	1.00		138.4	
10010-CAA	SAR Validation (Square, 100ms, 10ms)	X	3.04	67.74	11.79	10.00	20.0	± 9.6 %
		Y	3.27	68.79	12.30		20.0	
		Z	3.42	68.76	12.60		20.0	
10011-CAB	UMTS-FDD (WCDMA)	X	0.99	66.30	14.68	0.00	150.0	± 9.6 %
		Y	1.02	66.67	14.90		150.0	
		Z	0.99	66.23	14.64		150.0	
10012-CAB	IEEE 802.11b WiFi 2.4 GHz (DSSS, 1 Mbps)	X	1.17	63.37	14.79	0.41	150.0	± 9.6 %
		Y	1.18	63.58	14.98		150.0	
		Z	1.18	63.40	14.78		150.0	
10013-CAB	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 6 Mbps)	X	4.83	66.46	16.84	1.46	150.0	± 9.6 %
		Y	4.90	66.50	16.94		150.0	
		Z	4.87	66.45	16.82		150.0	
10021-DAC	GSM-FDD (TDMA, GMSK)	X	27.32	96.15	23.00	9.39	50.0	± 9.6 %
		Y	100.00	113.48	27.55		50.0	
		Z	18.13	91.34	22.13		50.0	
10023-DAC	GPRS-FDD (TDMA, GMSK, TN 0)	X	17.75	90.44	21.39	9.57	50.0	± 9.6 %
		Y	64.93	107.78	26.22		50.0	
		Z	13.93	87.63	21.03		50.0	
10024-DAC	GPRS-FDD (TDMA, GMSK, TN 0-1)	X	100.00	110.23	24.91	6.56	60.0	± 9.6 %
		Y	100.00	111.43	25.52		60.0	
		Z	66.71	106.54	24.55		60.0	
10025-DAC	EDGE-FDD (TDMA, 8PSK, TN 0)	X	4.69	70.97	25.39	12.57	50.0	± 9.6 %
		Y	9.43	92.86	36.24		50.0	
		Z	4.57	69.11	24.07		50.0	
10026-DAC	EDGE-FDD (TDMA, 8PSK, TN 0-1)	X	8.47	87.67	30.15	9.56	60.0	± 9.6 %
		Y	11.37	95.44	33.46		60.0	
		Z	8.88	87.57	29.82		60.0	
10027-DAC	GPRS-FDD (TDMA, GMSK, TN 0-1-2)	X	100.00	109.77	23.94	4.80	80.0	± 9.6 %
		Y	100.00	111.14	24.62		80.0	
		Z	100.00	110.40	24.46		80.0	
10028-DAC	GPRS-FDD (TDMA, GMSK, TN 0-1-2-3)	X	100.00	110.50	23.60	3.55	100.0	± 9.6 %
		Y	100.00	111.94	24.31		100.0	
		Z	100.00	110.79	23.94		100.0	
10029-DAC	EDGE-FDD (TDMA, 8PSK, TN 0-1-2)	X	5.65	79.24	25.77	7.80	80.0	± 9.6 %
		Y	6.78	83.68	27.89		80.0	
		Z	6.05	79.84	25.79		80.0	
10030-CAA	IEEE 802.15.1 Bluetooth (GFSK, DH1)	X	100.00	108.40	23.61	5.30	70.0	± 9.6 %
		Y	100.00	109.85	24.34		70.0	
		Z	39.21	99.31	21.96		70.0	
10031-CAA	IEEE 802.15.1 Bluetooth (GFSK, DH3)	X	100.00	109.64	22.00	1.88	100.0	± 9.6 %
		Y	100.00	111.22	22.73		100.0	
		Z	100.00	109.98	22.33		100.0	

Product Service

10032-CAA	IEEE 802.15.1 Bluetooth (GFSK, DH5)	X	100.00	115.35	23.50	1.17	100.0	± 9.6 %
		Y	100.00	116.40	23.97		100.0	
		Z	100.00	114.90	23.50		100.0	
10033-CAA	IEEE 802.15.1 Bluetooth (PI/4-DQPSK, DH1)	X	5.50	80.43	20.01	5.30	70.0	± 9.6 %
		Y	6.76	88.43	23.32		70.0	
		Z	5.52	79.91	19.94		70.0	
10034-CAA	IEEE 802.15.1 Bluetooth (PI/4-DQPSK, DH3)	X	2.26	72.05	15.71	1.88	100.0	± 9.6 %
		Y	2.75	75.11	17.48		100.0	
		Z	2.35	72.23	15.94		100.0	
10035-CAA	IEEE 802.15.1 Bluetooth (PI/4-DQPSK, DH5)	X	1.71	69.83	14.64	1.17	100.0	± 9.6 %
		Y	1.95	71.69	15.93		100.0	
		Z	1.77	69.99	14.88		100.0	
10036-CAA	IEEE 802.15.1 Bluetooth (8-DPSK, DH1)	X	6.42	82.93	20.96	5.30	70.0	± 9.6 %
		Y	11.14	92.31	24.62		70.0	
		Z	6.34	82.16	20.81		70.0	
10037-CAA	IEEE 802.15.1 Bluetooth (8-DPSK, DH3)	X	2.14	71.45	15.43	1.88	100.0	± 9.6 %
		Y	2.61	74.51	17.21		100.0	
		Z	2.24	71.69	15.69		100.0	
10038-CAA	IEEE 802.15.1 Bluetooth (8-DPSK, DH5)	X	1.72	70.07	14.85	1.17	100.0	± 9.6 %
		Y	1.96	72.01	16.17		100.0	
		Z	1.78	70.24	15.09		100.0	
10039-CAB	CDMA2000 (1xRTT, RC1)	X	1.67	70.78	15.04	0.00	150.0	± 9.6 %
		Y	1.78	71.15	15.56		150.0	
		Z	1.72	70.94	15.32		150.0	
10042-CAB	IS-54 / IS-136 FDD (TDMA/FDM, PI/4-DQPSK, Halfrate)	X	22.45	92.22	20.50	7.78	50.0	± 9.6 %
		Y	100.00	109.74	25.02		50.0	
		Z	17.06	89.50	20.18		50.0	
10044-CAA	IS-91/EIA/TIA-553 FDD (FDMA, FM)	X	0.00	92.98	2.04	0.00	150.0	± 9.6 %
		Y	0.00	94.50	2.19		150.0	
		Z	0.00	94.03	3.01		150.0	
10048-CAA	DECT (TDD, TDMA/FDM, GFSK, Full Slot, 24)	X	8.86	78.37	18.88	13.80	25.0	± 9.6 %
		Y	12.87	84.32	21.06		25.0	
		Z	8.56	78.04	19.28		25.0	
10049-CAA	DECT (TDD, TDMA/FDM, GFSK, Double Slot, 12)	X	9.63	81.59	18.85	10.79	40.0	± 9.6 %
		Y	15.92	88.65	21.37		40.0	
		Z	9.22	81.13	19.17		40.0	
10056-CAA	UMTS-TDD (TD-SCDMA, 1.28 Mcps)	X	9.68	84.10	21.63	9.03	50.0	± 9.6 %
		Y	14.40	91.26	24.48		50.0	
		Z	8.89	82.35	21.22		50.0	
10058-DAC	EDGE-FDD (TDMA, 8PSK, TN 0-1-2-3)	X	4.44	74.95	23.28	6.55	100.0	± 9.6 %
		Y	5.07	77.93	24.80		100.0	
		Z	4.74	75.63	23.39		100.0	
10059-CAB	IEEE 802.11b WiFi 2.4 GHz (DSSS, 2 Mbps)	X	1.20	64.26	15.22	0.61	110.0	± 9.6 %
		Y	1.22	64.64	15.52		110.0	
		Z	1.22	64.34	15.22		110.0	
10060-CAB	IEEE 802.11b WiFi 2.4 GHz (DSSS, 5.5 Mbps)	X	3.05	83.81	21.08	1.30	110.0	± 9.6 %
		Y	6.45	94.80	24.64		110.0	
		Z	3.16	83.51	20.82		110.0	

Product Service

10061-CAB	IEEE 802.11b WiFi 2.4 GHz (DSSS, 11 Mbps)	X	2.26	74.64	19.29	2.04	110.0	± 9.6 %
		Y	2.80	78.34	20.99		110.0	
		Z	2.40	74.91	19.27		110.0	
10062-CAB	IEEE 802.11a/h WiFi 5 GHz (OFDM, 6 Mbps)	X	4.64	66.51	16.35	0.49	100.0	± 9.6 %
		Y	4.71	66.52	16.41		100.0	
		Z	4.68	66.50	16.34		100.0	
10063-CAB	IEEE 802.11a/h WiFi 5 GHz (OFDM, 9 Mbps)	X	4.65	66.58	16.42	0.72	100.0	± 9.6 %
		Y	4.72	66.60	16.50		100.0	
		Z	4.69	66.57	16.41		100.0	
10064-CAB	IEEE 802.11a/h WiFi 5 GHz (OFDM, 12 Mbps)	X	4.93	66.82	16.63	0.86	100.0	± 9.6 %
		Y	5.02	66.89	16.73		100.0	
		Z	4.98	66.83	16.63		100.0	
10065-CAB	IEEE 802.11a/h WiFi 5 GHz (OFDM, 18 Mbps)	X	4.80	66.69	16.70	1.21	100.0	± 9.6 %
		Y	4.89	66.77	16.81		100.0	
		Z	4.84	66.71	16.69		100.0	
10066-CAB	IEEE 802.11a/h WiFi 5 GHz (OFDM, 24 Mbps)	X	4.81	66.69	16.83	1.46	100.0	± 9.6 %
		Y	4.90	66.80	16.97		100.0	
		Z	4.86	66.71	16.83		100.0	
10067-CAB	IEEE 802.11a/h WiFi 5 GHz (OFDM, 36 Mbps)	X	5.10	66.85	17.25	2.04	100.0	± 9.6 %
		Y	5.19	66.91	17.37		100.0	
		Z	5.15	66.85	17.23		100.0	
10068-CAB	IEEE 802.11a/h WiFi 5 GHz (OFDM, 48 Mbps)	X	5.14	66.87	17.43	2.55	100.0	± 9.6 %
		Y	5.25	67.04	17.62		100.0	
		Z	5.21	66.92	17.43		100.0	
10069-CAB	IEEE 802.11a/h WiFi 5 GHz (OFDM, 54 Mbps)	X	5.22	66.88	17.62	2.67	100.0	± 9.6 %
		Y	5.33	67.01	17.80		100.0	
		Z	5.29	66.91	17.62		100.0	
10071-CAB	IEEE 802.11g WiFi 2.4 GHz (DSSS/OFDM, 9 Mbps)	X	4.92	66.52	17.10	1.99	100.0	± 9.6 %
		Y	4.99	66.58	17.23		100.0	
		Z	4.96	66.52	17.09		100.0	
10072-CAB	IEEE 802.11g WiFi 2.4 GHz (DSSS/OFDM, 12 Mbps)	X	4.90	66.80	17.28	2.30	100.0	± 9.6 %
		Y	4.98	66.91	17.43		100.0	
		Z	4.95	66.83	17.27		100.0	
10073-CAB	IEEE 802.11g WiFi 2.4 GHz (DSSS/OFDM, 18 Mbps)	X	4.96	66.95	17.56	2.83	100.0	± 9.6 %
		Y	5.04	67.07	17.74		100.0	
		Z	5.01	66.98	17.56		100.0	
10074-CAB	IEEE 802.11g WiFi 2.4 GHz (DSSS/OFDM, 24 Mbps)	X	4.95	66.85	17.70	3.30	100.0	± 9.6 %
		Y	5.02	66.97	17.89		100.0	
		Z	5.01	66.89	17.70		100.0	
10075-CAB	IEEE 802.11g WiFi 2.4 GHz (DSSS/OFDM, 36 Mbps)	X	4.99	66.96	17.98	3.82	90.0	± 9.6 %
		Y	5.08	67.14	18.22		90.0	
		Z	5.06	67.04	18.00		90.0	
10076-CAB	IEEE 802.11g WiFi 2.4 GHz (DSSS/OFDM, 48 Mbps)	X	5.01	66.78	18.11	4.15	90.0	± 9.6 %
		Y	5.08	66.91	18.32		90.0	
		Z	5.08	66.85	18.11		90.0	
10077-CAB	IEEE 802.11g WiFi 2.4 GHz (DSSS/OFDM, 54 Mbps)	X	5.04	66.85	18.20	4.30	90.0	± 9.6 %
		Y	5.10	66.97	18.41		90.0	
		Z	5.10	66.92	18.20		90.0	

Product Service

10081-CAB	CDMA2000 (1xRTT, RC3)	X	0.80	65.24	12.08	0.00	150.0	± 9.6 %
		Y	0.85	65.56	12.59		150.0	
		Z	0.82	65.35	12.34		150.0	
10082-CAB	IS-54 / IS-136 FDD (TDMA/FDM, PI/4-DQPSK, Fullrate)	X	0.68	58.27	3.79	4.77	80.0	± 9.6 %
		Y	0.66	60.00	4.99		80.0	
		Z	0.80	58.87	4.46		80.0	
10090-DAC	GPRS-FDD (TDMA, GMSK, TN 0-4)	X	100.00	110.24	24.94	6.56	60.0	± 9.6 %
		Y	100.00	111.45	25.55		60.0	
		Z	61.75	105.66	24.37		60.0	
10097-CAB	UMTS-FDD (HSDPA)	X	1.80	67.24	15.39	0.00	150.0	± 9.6 %
		Y	1.81	67.18	15.46		150.0	
		Z	1.80	67.11	15.37		150.0	
10098-CAB	UMTS-FDD (HSUPA, Subtest 2)	X	1.76	67.18	15.35	0.00	150.0	± 9.6 %
		Y	1.78	67.13	15.43		150.0	
		Z	1.76	67.04	15.33		150.0	
10099-DAC	EDGE-FDD (TDMA, 8PSK, TN 0-4)	X	8.51	87.74	30.17	9.56	60.0	± 9.6 %
		Y	11.43	95.53	33.48		60.0	
		Z	8.91	87.61	29.83		60.0	
10100-CAC	LTE-FDD (SC-FDMA, 100% RB, 20 MHz, QPSK)	X	3.05	69.78	16.46	0.00	150.0	± 9.6 %
		Y	3.13	70.04	16.53		150.0	
		Z	3.07	69.82	16.43		150.0	
10101-CAC	LTE-FDD (SC-FDMA, 100% RB, 20 MHz, 16-QAM)	X	3.21	67.25	15.76	0.00	150.0	± 9.6 %
		Y	3.26	67.38	15.84		150.0	
		Z	3.23	67.28	15.77		150.0	
10102-CAC	LTE-FDD (SC-FDMA, 100% RB, 20 MHz, 64-QAM)	X	3.31	67.26	15.89	0.00	150.0	± 9.6 %
		Y	3.37	67.35	15.94		150.0	
		Z	3.34	67.28	15.89		150.0	
10103-CAC	LTE-TDD (SC-FDMA, 100% RB, 20 MHz, QPSK)	X	5.95	73.98	19.42	3.98	65.0	± 9.6 %
		Y	6.46	75.28	20.05		65.0	
		Z	5.88	73.30	19.04		65.0	
10104-CAC	LTE-TDD (SC-FDMA, 100% RB, 20 MHz, 16-QAM)	X	6.15	72.74	19.68	3.98	65.0	± 9.6 %
		Y	6.50	73.70	20.23		65.0	
		Z	6.36	72.92	19.68		65.0	
10105-CAC	LTE-TDD (SC-FDMA, 100% RB, 20 MHz, 64-QAM)	X	5.78	71.44	19.39	3.98	65.0	± 9.6 %
		Y	6.20	72.69	20.09		65.0	
		Z	6.26	72.53	19.82		65.0	
10108-CAD	LTE-FDD (SC-FDMA, 100% RB, 10 MHz, QPSK)	X	2.66	69.02	16.27	0.00	150.0	± 9.6 %
		Y	2.74	69.24	16.34		150.0	
		Z	2.69	69.04	16.24		150.0	
10109-CAD	LTE-FDD (SC-FDMA, 100% RB, 10 MHz, 16-QAM)	X	2.86	67.09	15.67	0.00	150.0	± 9.6 %
		Y	2.92	67.19	15.74		150.0	
		Z	2.89	67.10	15.67		150.0	
10110-CAD	LTE-FDD (SC-FDMA, 100% RB, 5 MHz, QPSK)	X	2.15	68.08	15.82	0.00	150.0	± 9.6 %
		Y	2.23	68.29	15.94		150.0	
		Z	2.18	68.07	15.80		150.0	
10111-CAD	LTE-FDD (SC-FDMA, 100% RB, 5 MHz, 16-QAM)	X	2.58	67.97	15.95	0.00	150.0	± 9.6 %
		Y	2.63	67.86	15.99		150.0	
		Z	2.60	67.91	15.97		150.0	

Product Service

10112-CAD	LTE-FDD (SC-FDMA, 100% RB, 10 MHz, 64-QAM)	X	2.99	67.13	15.75	0.00	150.0	± 9.6 %
		Y	3.05	67.18	15.80		150.0	
		Z	3.01	67.13	15.74		150.0	
10113-CAD	LTE-FDD (SC-FDMA, 100% RB, 5 MHz, 64-QAM)	X	2.73	68.15	16.11	0.00	150.0	± 9.6 %
		Y	2.78	68.00	16.13		150.0	
		Z	2.76	68.09	16.12		150.0	
10114-CAB	IEEE 802.11n (HT Greenfield, 13.5 Mbps, BPSK)	X	5.12	67.14	16.40	0.00	150.0	± 9.6 %
		Y	5.16	67.11	16.38		150.0	
		Z	5.14	67.13	16.37		150.0	
10115-CAB	IEEE 802.11n (HT Greenfield, 81 Mbps, 16-QAM)	X	5.39	67.23	16.45	0.00	150.0	± 9.6 %
		Y	5.47	67.32	16.49		150.0	
		Z	5.43	67.27	16.45		150.0	
10116-CAB	IEEE 802.11n (HT Greenfield, 135 Mbps, 64-QAM)	X	5.20	67.31	16.41	0.00	150.0	± 9.6 %
		Y	5.26	67.33	16.42		150.0	
		Z	5.23	67.32	16.39		150.0	
10117-CAB	IEEE 802.11n (HT Mixed, 13.5 Mbps, BPSK)	X	5.08	66.99	16.34	0.00	150.0	± 9.6 %
		Y	5.13	67.01	16.35		150.0	
		Z	5.10	67.00	16.32		150.0	
10118-CAB	IEEE 802.11n (HT Mixed, 81 Mbps, 16-QAM)	X	5.47	67.43	16.56	0.00	150.0	± 9.6 %
		Y	5.55	67.51	16.60		150.0	
		Z	5.51	67.48	16.56		150.0	
10119-CAB	IEEE 802.11n (HT Mixed, 135 Mbps, 64-QAM)	X	5.19	67.27	16.40	0.00	150.0	± 9.6 %
		Y	5.23	67.26	16.40		150.0	
		Z	5.21	67.26	16.38		150.0	
10140-CAC	LTE-FDD (SC-FDMA, 100% RB, 15 MHz, 16-QAM)	X	3.35	67.26	15.81	0.00	150.0	± 9.6 %
		Y	3.41	67.36	15.86		150.0	
		Z	3.37	67.28	15.80		150.0	
10141-CAC	LTE-FDD (SC-FDMA, 100% RB, 15 MHz, 64-QAM)	X	3.47	67.39	16.00	0.00	150.0	± 9.6 %
		Y	3.53	67.45	16.03		150.0	
		Z	3.50	67.41	15.99		150.0	
10142-CAD	LTE-FDD (SC-FDMA, 100% RB, 3 MHz, QPSK)	X	1.92	68.04	15.43	0.00	150.0	± 9.6 %
		Y	2.00	68.21	15.62		150.0	
		Z	1.95	68.01	15.47		150.0	
10143-CAD	LTE-FDD (SC-FDMA, 100% RB, 3 MHz, 16-QAM)	X	2.43	68.67	15.60	0.00	150.0	± 9.6 %
		Y	2.48	68.53	15.74		150.0	
		Z	2.46	68.63	15.70		150.0	
10144-CAD	LTE-FDD (SC-FDMA, 100% RB, 3 MHz, 64-QAM)	X	2.19	66.27	13.92	0.00	150.0	± 9.6 %
		Y	2.28	66.45	14.25		150.0	
		Z	2.23	66.33	14.07		150.0	
10145-CAD	LTE-FDD (SC-FDMA, 100% RB, 1.4 MHz, QPSK)	X	1.16	64.50	11.31	0.00	150.0	± 9.6 %
		Y	1.29	65.42	12.29		150.0	
		Z	1.24	65.05	11.89		150.0	
10146-CAD	LTE-FDD (SC-FDMA, 100% RB, 1.4 MHz, 16-QAM)	X	1.75	64.91	10.68	0.00	150.0	± 9.6 %
		Y	2.10	66.86	12.19		150.0	
		Z	1.85	65.40	11.22		150.0	
10147-CAD	LTE-FDD (SC-FDMA, 100% RB, 1.4 MHz, 64-QAM)	X	1.99	66.41	11.55	0.00	150.0	± 9.6 %
		Y	2.48	68.95	13.31		150.0	
		Z	2.12	67.01	12.15		150.0	

Product Service

10149-CAC	LTE-FDD (SC-FDMA, 50% RB, 20 MHz, 16-QAM)	X	2.87	67.16	15.72	0.00	150.0	± 9.6 %
		Y	2.93	67.25	15.78		150.0	
		Z	2.90	67.17	15.71		150.0	
10150-CAC	LTE-FDD (SC-FDMA, 50% RB, 20 MHz, 64-QAM)	X	3.00	67.19	15.79	0.00	150.0	± 9.6 %
		Y	3.05	67.23	15.84		150.0	
		Z	3.02	67.19	15.79		150.0	
10151-CAC	LTE-TDD (SC-FDMA, 50% RB, 20 MHz, QPSK)	X	6.19	76.09	20.32	3.98	65.0	± 9.6 %
		Y	6.72	77.39	20.98		65.0	
		Z	6.36	75.98	20.19		65.0	
10152-CAC	LTE-TDD (SC-FDMA, 50% RB, 20 MHz, 16-QAM)	X	5.64	72.49	19.24	3.98	65.0	± 9.6 %
		Y	6.02	73.58	19.91		65.0	
		Z	5.85	72.65	19.26		65.0	
10153-CAC	LTE-TDD (SC-FDMA, 50% RB, 20 MHz, 64-QAM)	X	6.03	73.53	20.06	3.98	65.0	± 9.6 %
		Y	6.38	74.47	20.65		65.0	
		Z	6.24	73.66	20.07		65.0	
10154-CAD	LTE-FDD (SC-FDMA, 50% RB, 10 MHz, QPSK)	X	2.20	68.51	16.09	0.00	150.0	± 9.6 %
		Y	2.28	68.70	16.20		150.0	
		Z	2.23	68.51	16.09		150.0	
10155-CAD	LTE-FDD (SC-FDMA, 50% RB, 10 MHz, 16-QAM)	X	2.58	67.98	15.97	0.00	150.0	± 9.6 %
		Y	2.63	67.87	16.01		150.0	
		Z	2.61	67.92	15.98		150.0	
10156-CAD	LTE-FDD (SC-FDMA, 50% RB, 5 MHz, QPSK)	X	1.76	68.06	15.17	0.00	150.0	± 9.6 %
		Y	1.85	68.29	15.45		150.0	
		Z	1.80	68.08	15.26		150.0	
10157-CAD	LTE-FDD (SC-FDMA, 50% RB, 5 MHz, 16-QAM)	X	2.02	66.77	13.91	0.00	150.0	± 9.6 %
		Y	2.12	66.99	14.30		150.0	
		Z	2.07	66.86	14.11		150.0	
10158-CAD	LTE-FDD (SC-FDMA, 50% RB, 10 MHz, 64-QAM)	X	2.74	68.22	16.16	0.00	150.0	± 9.6 %
		Y	2.79	68.06	16.17		150.0	
		Z	2.77	68.16	16.17		150.0	
10159-CAD	LTE-FDD (SC-FDMA, 50% RB, 5 MHz, 64-QAM)	X	2.12	67.25	14.20	0.00	150.0	± 9.6 %
		Y	2.23	67.45	14.59		150.0	
		Z	2.18	67.37	14.42		150.0	
10160-CAC	LTE-FDD (SC-FDMA, 50% RB, 15 MHz, QPSK)	X	2.69	68.25	16.09	0.00	150.0	± 9.6 %
		Y	2.75	68.31	16.13		150.0	
		Z	2.71	68.19	16.05		150.0	
10161-CAC	LTE-FDD (SC-FDMA, 50% RB, 15 MHz, 16-QAM)	X	2.89	67.14	15.71	0.00	150.0	± 9.6 %
		Y	2.95	67.16	15.77		150.0	
		Z	2.92	67.13	15.72		150.0	
10162-CAC	LTE-FDD (SC-FDMA, 50% RB, 15 MHz, 64-QAM)	X	3.00	67.31	15.83	0.00	150.0	± 9.6 %
		Y	3.06	67.29	15.87		150.0	
		Z	3.03	67.28	15.83		150.0	
10166-CAD	LTE-FDD (SC-FDMA, 50% RB, 1.4 MHz, QPSK)	X	3.52	69.26	18.89	3.01	150.0	± 9.6 %
		Y	3.63	69.41	18.97		150.0	
		Z	3.54	68.96	18.65		150.0	
10167-CAD	LTE-FDD (SC-FDMA, 50% RB, 1.4 MHz, 16-QAM)	X	4.34	72.30	19.40	3.01	150.0	± 9.6 %
		Y	4.53	72.61	19.56		150.0	
		Z	4.33	71.71	19.05		150.0	

Product Service

10168-CAD	LTE-FDD (SC-FDMA, 50% RB, 1.4 MHz, 64-QAM)	X	4.92	75.00	20.95	3.01	150.0	± 9.6 %
		Y	5.05	74.92	20.91		150.0	
		Z	4.86	74.20	20.52		150.0	
10169-CAC	LTE-FDD (SC-FDMA, 1 RB, 20 MHz, QPSK)	X	2.94	68.69	18.63	3.01	150.0	± 9.6 %
		Y	3.06	69.43	19.00		150.0	
		Z	2.97	68.51	18.42		150.0	
10170-CAC	LTE-FDD (SC-FDMA, 1 RB, 20 MHz, 16-QAM)	X	4.15	75.29	21.28	3.01	150.0	± 9.6 %
		Y	4.43	76.35	21.68		150.0	
		Z	4.11	74.52	20.83		150.0	
10171-AAC	LTE-FDD (SC-FDMA, 1 RB, 20 MHz, 64-QAM)	X	3.30	70.50	18.18	3.01	150.0	± 9.6 %
		Y	3.54	71.68	18.72		150.0	
		Z	3.31	70.02	17.86		150.0	
10172-CAC	LTE-TDD (SC-FDMA, 1 RB, 20 MHz, QPSK)	X	5.72	82.17	24.47	6.02	65.0	± 9.6 %
		Y	9.41	91.72	28.09		65.0	
		Z	7.05	84.62	25.03		65.0	
10173-CAC	LTE-TDD (SC-FDMA, 1 RB, 20 MHz, 16-QAM)	X	10.09	89.06	25.03	6.02	65.0	± 9.6 %
		Y	16.80	97.79	27.98		65.0	
		Z	9.48	86.64	24.01		65.0	
10174-CAC	LTE-TDD (SC-FDMA, 1 RB, 20 MHz, 64-QAM)	X	7.37	83.04	22.50	6.02	65.0	± 9.6 %
		Y	11.94	90.83	25.26		65.0	
		Z	6.31	79.38	21.04		65.0	
10175-CAD	LTE-FDD (SC-FDMA, 1 RB, 10 MHz, QPSK)	X	2.90	68.35	18.36	3.01	150.0	± 9.6 %
		Y	3.02	69.11	18.74		150.0	
		Z	2.93	68.17	18.15		150.0	
10176-CAD	LTE-FDD (SC-FDMA, 1 RB, 10 MHz, 16-QAM)	X	4.15	75.31	21.29	3.01	150.0	± 9.6 %
		Y	4.43	76.38	21.69		150.0	
		Z	4.12	74.55	20.84		150.0	
10177-CAF	LTE-FDD (SC-FDMA, 1 RB, 5 MHz, QPSK)	X	2.92	68.51	18.47	3.01	150.0	± 9.6 %
		Y	3.05	69.27	18.84		150.0	
		Z	2.95	68.34	18.26		150.0	
10178-CAD	LTE-FDD (SC-FDMA, 1 RB, 5 MHz, 16-QAM)	X	4.11	75.05	21.16	3.01	150.0	± 9.6 %
		Y	4.38	76.11	21.55		150.0	
		Z	4.07	74.28	20.70		150.0	
10179-CAD	LTE-FDD (SC-FDMA, 1 RB, 10 MHz, 64-QAM)	X	3.67	72.68	19.56	3.01	150.0	± 9.6 %
		Y	3.93	73.84	20.04		150.0	
		Z	3.66	72.05	19.16		150.0	
10180-CAD	LTE-FDD (SC-FDMA, 1 RB, 5 MHz, 64-QAM)	X	3.29	70.43	18.13	3.01	150.0	± 9.6 %
		Y	3.53	71.60	18.66		150.0	
		Z	3.30	69.94	17.80		150.0	
10181-CAC	LTE-FDD (SC-FDMA, 1 RB, 15 MHz, QPSK)	X	2.92	68.49	18.46	3.01	150.0	± 9.6 %
		Y	3.04	69.25	18.83		150.0	
		Z	2.95	68.32	18.25		150.0	
10182-CAC	LTE-FDD (SC-FDMA, 1 RB, 15 MHz, 16-QAM)	X	4.10	75.03	21.14	3.01	150.0	± 9.6 %
		Y	4.37	76.08	21.54		150.0	
		Z	4.06	74.26	20.69		150.0	
10183-AAB	LTE-FDD (SC-FDMA, 1 RB, 15 MHz, 64-QAM)	X	3.29	70.40	18.12	3.01	150.0	± 9.6 %
		Y	3.52	71.58	18.65		150.0	
		Z	3.30	69.92	17.79		150.0	

Product Service

10184-CAD	LTE-FDD (SC-FDMA, 1 RB, 3 MHz, QPSK)	X	2.93	68.54	18.48	3.01	150.0	± 9.6 %
		Y	3.05	69.29	18.86		150.0	
		Z	2.96	68.36	18.28		150.0	
10185-CAD	LTE-FDD (SC-FDMA, 1 RB, 3 MHz, 16-QAM)	X	4.12	75.11	21.19	3.01	150.0	± 9.6 %
		Y	4.39	76.16	21.58		150.0	
		Z	4.08	74.34	20.73		150.0	
10186-AAD	LTE-FDD (SC-FDMA, 1 RB, 3 MHz, 64-QAM)	X	3.30	70.47	18.15	3.01	150.0	± 9.6 %
		Y	3.54	71.65	18.69		150.0	
		Z	3.31	69.98	17.83		150.0	
10187-CAD	LTE-FDD (SC-FDMA, 1 RB, 1.4 MHz, QPSK)	X	2.94	68.60	18.55	3.01	150.0	± 9.6 %
		Y	3.06	69.34	18.92		150.0	
		Z	2.97	68.41	18.34		150.0	
10188-CAD	LTE-FDD (SC-FDMA, 1 RB, 1.4 MHz, 16-QAM)	X	4.28	75.90	21.62	3.01	150.0	± 9.6 %
		Y	4.56	76.93	22.00		150.0	
		Z	4.23	75.10	21.16		150.0	
10189-AAD	LTE-FDD (SC-FDMA, 1 RB, 1.4 MHz, 64-QAM)	X	3.38	70.93	18.45	3.01	150.0	± 9.6 %
		Y	3.63	72.12	18.98		150.0	
		Z	3.39	70.42	18.11		150.0	
10193-CAB	IEEE 802.11n (HT Greenfield, 6.5 Mbps, BPSK)	X	4.51	66.56	16.08	0.00	150.0	± 9.6 %
		Y	4.56	66.52	16.10		150.0	
		Z	4.53	66.54	16.07		150.0	
10194-CAB	IEEE 802.11n (HT Greenfield, 39 Mbps, 16-QAM)	X	4.67	66.86	16.21	0.00	150.0	± 9.6 %
		Y	4.74	66.84	16.22		150.0	
		Z	4.71	66.85	16.19		150.0	
10195-CAB	IEEE 802.11n (HT Greenfield, 65 Mbps, 64-QAM)	X	4.71	66.89	16.23	0.00	150.0	± 9.6 %
		Y	4.78	66.87	16.24		150.0	
		Z	4.75	66.88	16.21		150.0	
10196-CAB	IEEE 802.11n (HT Mixed, 6.5 Mbps, BPSK)	X	4.51	66.61	16.10	0.00	150.0	± 9.6 %
		Y	4.57	66.59	16.12		150.0	
		Z	4.54	66.60	16.09		150.0	
10197-CAB	IEEE 802.11n (HT Mixed, 39 Mbps, 16-QAM)	X	4.68	66.88	16.22	0.00	150.0	± 9.6 %
		Y	4.75	66.87	16.23		150.0	
		Z	4.72	66.87	16.21		150.0	
10198-CAB	IEEE 802.11n (HT Mixed, 65 Mbps, 64-QAM)	X	4.71	66.91	16.24	0.00	150.0	± 9.6 %
		Y	4.78	66.89	16.25		150.0	
		Z	4.75	66.90	16.22		150.0	
10219-CAB	IEEE 802.11n (HT Mixed, 7.2 Mbps, BPSK)	X	4.45	66.63	16.06	0.00	150.0	± 9.6 %
		Y	4.52	66.60	16.08		150.0	
		Z	4.49	66.61	16.05		150.0	
10220-CAB	IEEE 802.11n (HT Mixed, 43.3 Mbps, 16-QAM)	X	4.68	66.85	16.21	0.00	150.0	± 9.6 %
		Y	4.75	66.84	16.23		150.0	
		Z	4.71	66.84	16.20		150.0	
10221-CAB	IEEE 802.11n (HT Mixed, 72.2 Mbps, 64-QAM)	X	4.72	66.84	16.22	0.00	150.0	± 9.6 %
		Y	4.79	66.82	16.24		150.0	
		Z	4.76	66.83	16.21		150.0	
10222-CAB	IEEE 802.11n (HT Mixed, 15 Mbps, BPSK)	X	5.05	67.00	16.34	0.00	150.0	± 9.6 %
		Y	5.11	67.02	16.35		150.0	
		Z	5.08	67.01	16.32		150.0	

Product Service

10223-CAB	IEEE 802.11n (HT Mixed, 90 Mbps, 16-QAM)	X	5.36	67.23	16.47	0.00	150.0	± 9.6 %
		Y	5.41	67.21	16.46		150.0	
		Z	5.38	67.21	16.44		150.0	
10224-CAB	IEEE 802.11n (HT Mixed, 150 Mbps, 64-QAM)	X	5.10	67.11	16.32	0.00	150.0	± 9.6 %
		Y	5.15	67.13	16.33		150.0	
		Z	5.13	67.12	16.30		150.0	
10225-CAB	UMTS-FDD (HSPA+)	X	2.77	65.98	15.15	0.00	150.0	± 9.6 %
		Y	2.83	65.95	15.28		150.0	
		Z	2.80	65.95	15.20		150.0	
10226-CAA	LTE-TDD (SC-FDMA, 1 RB, 1.4 MHz, 16-QAM)	X	10.78	90.30	25.53	6.02	65.0	± 9.6 %
		Y	18.21	99.33	28.54		65.0	
		Z	10.03	87.70	24.46		65.0	
10227-CAA	LTE-TDD (SC-FDMA, 1 RB, 1.4 MHz, 64-QAM)	X	10.09	87.96	24.17	6.02	65.0	± 9.6 %
		Y	15.63	95.15	26.65		65.0	
		Z	9.34	85.43	23.15		65.0	
10228-CAA	LTE-TDD (SC-FDMA, 1 RB, 1.4 MHz, QPSK)	X	7.31	87.01	26.28	6.02	65.0	± 9.6 %
		Y	10.95	94.84	29.18		65.0	
		Z	7.62	86.37	25.74		65.0	
10229-CAB	LTE-TDD (SC-FDMA, 1 RB, 3 MHz, 16-QAM)	X	10.17	89.17	25.07	6.02	65.0	± 9.6 %
		Y	16.93	97.90	28.02		65.0	
		Z	9.55	86.74	24.06		65.0	
10230-CAB	LTE-TDD (SC-FDMA, 1 RB, 3 MHz, 64-QAM)	X	9.50	86.91	23.74	6.02	65.0	± 9.6 %
		Y	14.60	93.92	26.19		65.0	
		Z	8.69	84.56	22.78		65.0	
10231-CAB	LTE-TDD (SC-FDMA, 1 RB, 3 MHz, QPSK)	X	7.01	86.13	25.89	6.02	65.0	± 9.6 %
		Y	10.42	93.80	28.76		65.0	
		Z	7.31	85.54	25.36		65.0	
10232-CAC	LTE-TDD (SC-FDMA, 1 RB, 5 MHz, 16-QAM)	X	10.15	89.15	25.07	6.02	65.0	± 9.6 %
		Y	16.90	97.89	28.02		65.0	
		Z	9.53	86.72	24.05		65.0	
10233-CAC	LTE-TDD (SC-FDMA, 1 RB, 5 MHz, 64-QAM)	X	9.48	86.89	23.74	6.02	65.0	± 9.6 %
		Y	14.57	93.90	26.19		65.0	
		Z	8.87	84.54	22.78		65.0	
10234-CAC	LTE-TDD (SC-FDMA, 1 RB, 5 MHz, QPSK)	X	6.75	85.32	25.48	6.02	65.0	± 9.6 %
		Y	9.96	92.79	28.31		65.0	
		Z	7.05	84.75	24.97		65.0	
10235-CAC	LTE-TDD (SC-FDMA, 1 RB, 10 MHz, 16-QAM)	X	10.16	89.18	25.07	6.02	65.0	± 9.6 %
		Y	16.93	97.93	28.03		65.0	
		Z	9.53	86.74	24.06		65.0	
10236-CAC	LTE-TDD (SC-FDMA, 1 RB, 10 MHz, 64-QAM)	X	9.56	87.00	23.77	6.02	65.0	± 9.6 %
		Y	14.74	94.06	26.23		65.0	
		Z	8.94	84.63	22.80		65.0	
10237-CAC	LTE-TDD (SC-FDMA, 1 RB, 10 MHz, QPSK)	X	7.01	86.17	25.90	6.02	65.0	± 9.6 %
		Y	10.44	93.88	28.79		65.0	
		Z	7.31	85.57	25.38		65.0	
10238-CAC	LTE-TDD (SC-FDMA, 1 RB, 15 MHz, 16-QAM)	X	10.13	89.13	25.06	6.02	65.0	± 9.6 %
		Y	16.87	97.87	28.01		65.0	
		Z	9.51	86.70	24.04		65.0	

Product Service

10239-CAC	LTE-TDD (SC-FDMA, 1 RB, 15 MHz, 64-QAM)	X	9.45	86.85	23.73	6.02	65.0	± 9.6 %
		Y	14.53	93.88	26.18		65.0	
		Z	8.85	84.51	22.77		65.0	
10240-CAC	LTE-TDD (SC-FDMA, 1 RB, 15 MHz, QPSK)	X	6.99	86.13	25.89	6.02	65.0	± 9.6 %
		Y	10.41	93.83	28.77		65.0	
		Z	7.29	85.53	25.36		65.0	
10241-CAA	LTE-TDD (SC-FDMA, 50% RB, 1.4 MHz, 16-QAM)	X	7.79	79.73	24.31	6.98	65.0	± 9.6 %
		Y	8.42	81.17	25.17		65.0	
		Z	7.92	79.16	23.95		65.0	
10242-CAA	LTE-TDD (SC-FDMA, 50% RB, 1.4 MHz, 64-QAM)	X	6.94	77.37	23.25	6.98	65.0	± 9.6 %
		Y	7.74	79.42	24.37		65.0	
		Z	7.57	78.24	23.48		65.0	
10243-CAA	LTE-TDD (SC-FDMA, 50% RB, 1.4 MHz, QPSK)	X	5.66	74.09	22.69	6.98	65.0	± 9.6 %
		Y	6.19	75.82	23.73		65.0	
		Z	6.21	75.30	23.08		65.0	
10244-CAB	LTE-TDD (SC-FDMA, 50% RB, 3 MHz, 16-QAM)	X	4.96	72.07	16.30	3.98	65.0	± 9.6 %
		Y	5.84	74.71	17.98		65.0	
		Z	5.20	72.29	16.57		65.0	
10245-CAB	LTE-TDD (SC-FDMA, 50% RB, 3 MHz, 64-QAM)	X	4.88	71.59	16.05	3.98	65.0	± 9.6 %
		Y	5.75	74.21	17.72		65.0	
		Z	5.14	71.89	16.35		65.0	
10246-CAB	LTE-TDD (SC-FDMA, 50% RB, 3 MHz, QPSK)	X	4.47	73.89	17.41	3.98	65.0	± 9.6 %
		Y	5.47	77.07	19.20		65.0	
		Z	4.77	74.32	17.73		65.0	
10247-CAC	LTE-TDD (SC-FDMA, 50% RB, 5 MHz, 16-QAM)	X	4.63	71.67	17.14	3.98	65.0	± 9.6 %
		Y	5.15	73.39	18.35		65.0	
		Z	4.89	72.04	17.43		65.0	
10248-CAC	LTE-TDD (SC-FDMA, 50% RB, 5 MHz, 64-QAM)	X	4.65	71.25	16.95	3.98	65.0	± 9.6 %
		Y	5.17	72.96	18.15		65.0	
		Z	4.91	71.65	17.25		65.0	
10249-CAC	LTE-TDD (SC-FDMA, 50% RB, 5 MHz, QPSK)	X	5.53	77.21	19.69	3.98	65.0	± 9.6 %
		Y	6.51	79.92	21.12		65.0	
		Z	5.73	77.18	19.73		65.0	
10250-CAC	LTE-TDD (SC-FDMA, 50% RB, 10 MHz, 16-QAM)	X	5.62	74.50	20.04	3.98	65.0	± 9.6 %
		Y	6.03	75.68	20.80		65.0	
		Z	5.84	74.62	20.08		65.0	
10251-CAC	LTE-TDD (SC-FDMA, 50% RB, 10 MHz, 64-QAM)	X	5.39	72.60	18.87	3.98	65.0	± 9.6 %
		Y	5.81	73.80	19.68		65.0	
		Z	5.61	72.77	18.95		65.0	
10252-CAC	LTE-TDD (SC-FDMA, 50% RB, 10 MHz, QPSK)	X	6.09	77.92	20.96	3.98	65.0	± 9.6 %
		Y	6.81	79.77	21.91		65.0	
		Z	6.26	77.73	20.83		65.0	
10253-CAC	LTE-TDD (SC-FDMA, 50% RB, 15 MHz, 16-QAM)	X	5.55	72.06	19.02	3.98	65.0	± 9.6 %
		Y	5.89	73.04	19.68		65.0	
		Z	5.75	72.20	19.06		65.0	
10254-CAC	LTE-TDD (SC-FDMA, 50% RB, 15 MHz, 64-QAM)	X	5.90	73.00	19.76	3.98	65.0	± 9.6 %
		Y	6.23	73.89	20.36		65.0	
		Z	6.10	73.13	19.78		65.0	

Product Service

10255-CAC	LTE-TDD (SC-FDMA, 50% RB, 15 MHz, QPSK)	X	5.95	75.57	20.30	3.98	65.0	± 9.6 %
		Y	6.42	76.79	20.97		65.0	
		Z	6.12	75.49	20.20		65.0	
10256-CAA	LTE-TDD (SC-FDMA, 100% RB, 1.4 MHz, 16-QAM)	X	3.81	68.27	13.54	3.98	65.0	± 9.6 %
		Y	4.62	71.09	15.45		65.0	
		Z	4.13	68.93	14.09		65.0	
10257-CAA	LTE-TDD (SC-FDMA, 100% RB, 1.4 MHz, 64-QAM)	X	3.75	67.76	13.21	3.98	65.0	± 9.6 %
		Y	4.53	70.48	15.09		65.0	
		Z	4.08	68.47	13.80		65.0	
10258-CAA	LTE-TDD (SC-FDMA, 100% RB, 1.4 MHz, QPSK)	X	3.43	69.78	14.77	3.98	65.0	± 9.6 %
		Y	4.26	73.06	16.79		65.0	
		Z	3.77	70.67	15.39		65.0	
10259-CAB	LTE-TDD (SC-FDMA, 100% RB, 3 MHz, 16-QAM)	X	5.02	72.74	18.20	3.98	65.0	± 9.6 %
		Y	5.50	74.25	19.24		65.0	
		Z	5.25	72.99	18.38		65.0	
10260-CAB	LTE-TDD (SC-FDMA, 100% RB, 3 MHz, 64-QAM)	X	5.06	72.55	18.12	3.98	65.0	± 9.6 %
		Y	5.54	74.03	19.16		65.0	
		Z	5.30	72.82	18.32		65.0	
10261-CAB	LTE-TDD (SC-FDMA, 100% RB, 3 MHz, QPSK)	X	5.53	76.85	19.97	3.98	65.0	± 9.6 %
		Y	6.33	79.10	21.18		65.0	
		Z	5.72	76.78	19.95		65.0	
10262-CAC	LTE-TDD (SC-FDMA, 100% RB, 5 MHz, 16-QAM)	X	5.61	74.44	19.99	3.98	65.0	± 9.6 %
		Y	6.02	75.63	20.76		65.0	
		Z	5.82	74.57	20.04		65.0	
10263-CAC	LTE-TDD (SC-FDMA, 100% RB, 5 MHz, 64-QAM)	X	5.38	72.58	18.86	3.98	65.0	± 9.6 %
		Y	5.80	73.78	19.67		65.0	
		Z	5.60	72.75	18.94		65.0	
10264-CAC	LTE-TDD (SC-FDMA, 100% RB, 5 MHz, QPSK)	X	6.03	77.74	20.87	3.98	65.0	± 9.6 %
		Y	6.76	79.60	21.82		65.0	
		Z	6.20	77.56	20.75		65.0	
10265-CAC	LTE-TDD (SC-FDMA, 100% RB, 10 MHz, 16-QAM)	X	5.64	72.49	19.24	3.98	65.0	± 9.6 %
		Y	6.02	73.58	19.91		65.0	
		Z	5.85	72.65	19.26		65.0	
10266-CAC	LTE-TDD (SC-FDMA, 100% RB, 10 MHz, 64-QAM)	X	6.02	73.52	20.05	3.98	65.0	± 9.6 %
		Y	6.38	74.46	20.65		65.0	
		Z	6.24	73.65	20.06		65.0	
10267-CAC	LTE-TDD (SC-FDMA, 100% RB, 10 MHz, QPSK)	X	6.18	76.05	20.30	3.98	65.0	± 9.6 %
		Y	6.71	77.35	20.96		65.0	
		Z	6.35	75.94	20.17		65.0	
10268-CAC	LTE-TDD (SC-FDMA, 100% RB, 15 MHz, 16-QAM)	X	6.32	72.70	19.77	3.98	65.0	± 9.6 %
		Y	6.64	73.53	20.28		65.0	
		Z	6.53	72.85	19.78		65.0	
10269-CAC	LTE-TDD (SC-FDMA, 100% RB, 15 MHz, 64-QAM)	X	6.32	72.36	19.68	3.98	65.0	± 9.6 %
		Y	6.62	73.14	20.18		65.0	
		Z	6.52	72.52	19.69		65.0	
10270-CAC	LTE-TDD (SC-FDMA, 100% RB, 15 MHz, QPSK)	X	6.25	74.18	19.71	3.98	65.0	± 9.6 %
		Y	6.62	75.06	20.19		65.0	
		Z	6.43	74.17	19.63		65.0	

Product Service

10274-CAB	UMTS-FDD (HSUPA, Subtest 5, 3GPP Rel8.10)	X	2.56	66.31	15.06	0.00	150.0	± 9.6 %
		Y	2.60	66.23	15.15		150.0	
		Z	2.58	66.22	15.07		150.0	
10275-CAB	UMTS-FDD (HSUPA, Subtest 5, 3GPP Rel8.4)	X	1.56	67.20	15.15	0.00	150.0	± 9.6 %
		Y	1.60	67.39	15.30		150.0	
		Z	1.57	67.13	15.13		150.0	
10277-CAA	PHS (QPSK)	X	2.51	62.11	7.79	9.03	50.0	± 9.6 %
		Y	2.65	62.75	8.40		50.0	
		Z	2.62	62.87	8.60		50.0	
10278-CAA	PHS (QPSK, BW 884MHz, Rolloff 0.5)	X	4.25	69.59	14.12	9.03	50.0	± 9.6 %
		Y	5.28	73.26	16.24		50.0	
		Z	4.70	70.64	14.97		50.0	
10279-CAA	PHS (QPSK, BW 884MHz, Rolloff 0.38)	X	4.36	69.82	14.27	9.03	50.0	± 9.6 %
		Y	5.43	73.55	16.40		50.0	
		Z	4.80	70.86	15.10		50.0	
10290-AAB	CDMA2000, RC1, SO55, Full Rate	X	1.34	67.70	13.35	0.00	150.0	± 9.6 %
		Y	1.45	68.27	13.99		150.0	
		Z	1.39	67.96	13.69		150.0	
10291-AAB	CDMA2000, RC3, SO55, Full Rate	X	0.79	65.05	11.96	0.00	150.0	± 9.6 %
		Y	0.83	65.36	12.46		150.0	
		Z	0.81	65.16	12.22		150.0	
10292-AAB	CDMA2000, RC3, SO32, Full Rate	X	0.99	68.85	14.23	0.00	150.0	± 9.6 %
		Y	1.02	68.99	14.65		150.0	
		Z	1.00	68.77	14.41		150.0	
10293-AAB	CDMA2000, RC3, SO3, Full Rate	X	1.54	75.17	17.42	0.00	150.0	± 9.6 %
		Y	1.47	74.27	17.42		150.0	
		Z	1.49	74.55	17.40		150.0	
10295-AAB	CDMA2000, RC1, SO3, 1/8th Rate 25 fr.	X	7.71	79.88	21.20	9.03	50.0	± 9.6 %
		Y	8.10	81.66	22.53		50.0	
		Z	7.32	78.59	20.91		50.0	
10297-AAB	LTE-FDD (SC-FDMA, 50% RB, 20 MHz, QPSK)	X	2.67	69.12	16.34	0.00	150.0	± 9.6 %
		Y	2.75	69.34	16.40		150.0	
		Z	2.70	69.14	16.31		150.0	
10298-AAC	LTE-FDD (SC-FDMA, 50% RB, 3 MHz, QPSK)	X	1.48	66.88	13.56	0.00	150.0	± 9.6 %
		Y	1.59	67.41	14.16		150.0	
		Z	1.54	67.14	13.88		150.0	
10299-AAC	LTE-FDD (SC-FDMA, 50% RB, 3 MHz, 16-QAM)	X	2.42	68.39	13.40	0.00	150.0	± 9.6 %
		Y	2.73	69.76	14.46		150.0	
		Z	2.44	68.28	13.57		150.0	
10300-AAC	LTE-FDD (SC-FDMA, 50% RB, 3 MHz, 64-QAM)	X	1.84	64.34	10.71	0.00	150.0	± 9.6 %
		Y	2.07	65.41	11.70		150.0	
		Z	1.91	64.53	11.04		150.0	
10301-AAA	IEEE 802.16e WiMAX (29:18, 5ms, 10MHz, QPSK, PUSC)	X	4.69	65.32	17.32	4.17	50.0	± 9.6 %
		Y	4.87	65.71	17.64		50.0	
		Z	4.69	65.00	17.16		50.0	
10302-AAA	IEEE 802.16e WiMAX (29:18, 5ms, 10MHz, QPSK, PUSC, 3 CTRL symbols)	X	5.14	65.80	17.95	4.96	50.0	± 9.6 %
		Y	5.30	66.07	18.21		50.0	
		Z	5.24	65.91	18.01		50.0	

10303-AAA	IEEE 802.16e WiMAX (31:15, 5ms, 10MHz, 64QAM, PUSC)	X	4.90	65.45	17.79	4.96	50.0	± 9.6 %
		Y	5.05	65.75	18.08		50.0	
		Z	5.00	65.59	17.87		50.0	
10304-AAA	IEEE 802.16e WiMAX (29:18, 5ms, 10MHz, 64QAM, PUSC)	X	4.70	65.32	17.29	4.17	50.0	± 9.6 %
		Y	4.84	65.53	17.51		50.0	
		Z	4.79	65.41	17.35		50.0	
10305-AAA	IEEE 802.16e WiMAX (31:15, 10ms, 10MHz, 64QAM, PUSC, 15 symbols)	X	4.47	67.68	19.47	6.02	35.0	± 9.6 %
		Y	4.61	68.07	20.00		35.0	
		Z	4.68	68.32	19.86		35.0	
10306-AAA	IEEE 802.16e WiMAX (29:18, 10ms, 10MHz, 64QAM, PUSC, 18 symbols)	X	4.73	66.49	18.99	6.02	35.0	± 9.6 %
		Y	4.86	66.77	19.40		35.0	
		Z	4.88	66.88	19.24		35.0	
10307-AAA	IEEE 802.16e WiMAX (29:18, 10ms, 10MHz, QPSK, PUSC, 18 symbols)	X	4.64	66.69	18.98	6.02	35.0	± 9.6 %
		Y	4.78	67.05	19.42		35.0	
		Z	4.81	67.17	19.27		35.0	
10308-AAA	IEEE 802.16e WiMAX (29:18, 10ms, 10MHz, 16QAM, PUSC)	X	4.62	66.91	19.13	6.02	35.0	± 9.6 %
		Y	4.76	67.26	19.56		35.0	
		Z	4.80	67.40	19.42		35.0	
10309-AAA	IEEE 802.16e WiMAX (29:18, 10ms, 10MHz, 16QAM, AMC 2x3, 18 symbols)	X	4.77	66.66	19.12	6.02	35.0	± 9.6 %
		Y	4.93	67.03	19.56		35.0	
		Z	4.94	67.08	19.38		35.0	
10310-AAA	IEEE 802.16e WiMAX (29:18, 10ms, 10MHz, QPSK, AMC 2x3, 18 symbols)	X	4.68	66.58	18.98	6.02	35.0	± 9.6 %
		Y	4.82	66.87	19.39		35.0	
		Z	4.85	67.00	19.24		35.0	
10311-AAB	LTE-FDD (SC-FDMA, 100% RB, 15 MHz, QPSK)	X	3.03	68.47	16.02	0.00	150.0	± 9.6 %
		Y	3.11	68.68	16.08		150.0	
		Z	3.06	68.51	16.00		150.0	
10313-AAA	iDEN 1:3	X	3.20	70.67	15.02	6.99	70.0	± 9.6 %
		Y	3.67	72.42	15.81		70.0	
		Z	3.35	70.57	14.98		70.0	
10314-AAA	iDEN 1:6	X	4.25	75.97	19.87	10.00	30.0	± 9.6 %
		Y	4.80	78.06	20.77		30.0	
		Z	4.31	75.23	19.53		30.0	
10315-AAB	IEEE 802.11b WiFi 2.4 GHz (DSSS, 1 Mbps, 96pc duty cycle)	X	1.08	63.30	14.76	0.17	150.0	± 9.6 %
		Y	1.09	63.43	14.89		150.0	
		Z	1.09	63.30	14.74		150.0	
10316-AAB	IEEE 802.11g WiFi 2.4 GHz (ERP-OFDM, 6 Mbps, 96pc duty cycle)	X	4.54	66.52	16.14	0.17	150.0	± 9.6 %
		Y	4.61	66.53	16.19		150.0	
		Z	4.58	66.51	16.12		150.0	
10317-AAB	IEEE 802.11a WiFi 5 GHz (OFDM, 6 Mbps, 96pc duty cycle)	X	4.54	66.52	16.14	0.17	150.0	± 9.6 %
		Y	4.61	66.53	16.19		150.0	
		Z	4.58	66.51	16.12		150.0	
10400-AAC	IEEE 802.11ac WiFi (20MHz, 64-QAM, 99pc duty cycle)	X	4.65	66.89	16.19	0.00	150.0	± 9.6 %
		Y	4.73	66.90	16.22		150.0	
		Z	4.69	66.88	16.17		150.0	
10401-AAC	IEEE 802.11ac WiFi (40MHz, 64-QAM, 99pc duty cycle)	X	5.37	67.10	16.37	0.00	150.0	± 9.6 %
		Y	5.42	67.08	16.37		150.0	
		Z	5.40	67.08	16.34		150.0	

Product Service

10402-AAC	IEEE 802.11ac WiFi (80MHz, 64-QAM, 99pc duty cycle)	X	5.62	67.39	16.39	0.00	150.0	± 9.6 %
		Y	5.68	67.44	16.41		150.0	
		Z	5.65	67.42	16.38		150.0	
10403-AAB	CDMA2000 (1xEV-DO, Rev. 0)	X	1.34	67.70	13.35	0.00	115.0	± 9.6 %
		Y	1.45	68.27	13.99		115.0	
		Z	1.39	67.96	13.69		115.0	
10404-AAB	CDMA2000 (1xEV-DO, Rev. A)	X	1.34	67.70	13.35	0.00	115.0	± 9.6 %
		Y	1.45	68.27	13.99		115.0	
		Z	1.39	67.96	13.69		115.0	
10406-AAB	CDMA2000, RC3, SO32, SCH0, Full Rate	X	100.00	119.44	29.25	0.00	100.0	± 9.6 %
		Y	100.00	119.94	29.56		100.0	
		Z	22.65	100.63	25.07		100.0	
10410-AAB	LTE-TDD (SC-FDMA, 1 RB, 10 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	X	9.31	88.57	21.07	3.23	80.0	± 9.6 %
		Y	31.52	104.08	25.47		80.0	
		Z	6.87	83.66	19.48		80.0	
10415-AAA	IEEE 802.11b WiFi 2.4 GHz (DSSS, 1 Mbps, 99pc duty cycle)	X	1.02	62.66	14.35	0.00	150.0	± 9.6 %
		Y	1.01	62.70	14.40		150.0	
		Z	1.01	62.61	14.31		150.0	
10416-AAA	IEEE 802.11g WiFi 2.4 GHz (ERP-OFDM, 6 Mbps, 99pc duty cycle)	X	4.51	66.59	16.15	0.00	150.0	± 9.6 %
		Y	4.56	66.56	16.16		150.0	
		Z	4.54	66.57	16.14		150.0	
10417-AAA	IEEE 802.11a/h WiFi 5 GHz (OFDM, 6 Mbps, 99pc duty cycle)	X	4.51	66.59	16.15	0.00	150.0	± 9.6 %
		Y	4.56	66.56	16.16		150.0	
		Z	4.54	66.57	16.14		150.0	
10418-AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 6 Mbps, 99pc duty cycle, Long preambule)	X	4.50	66.76	16.18	0.00	150.0	± 9.6 %
		Y	4.55	66.71	16.17		150.0	
		Z	4.53	66.73	16.15		150.0	
10419-AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 6 Mbps, 99pc duty cycle, Short preambule)	X	4.52	66.71	16.18	0.00	150.0	± 9.6 %
		Y	4.57	66.66	16.18		150.0	
		Z	4.55	66.68	16.16		150.0	
10422-AAA	IEEE 802.11n (HT Greenfield, 7.2 Mbps, BPSK)	X	4.63	66.70	16.19	0.00	150.0	± 9.6 %
		Y	4.69	66.67	16.20		150.0	
		Z	4.67	66.68	16.17		150.0	
10423-AAA	IEEE 802.11n (HT Greenfield, 43.3 Mbps, 16-QAM)	X	4.79	67.00	16.30	0.00	150.0	± 9.6 %
		Y	4.87	66.99	16.32		150.0	
		Z	4.83	66.99	16.29		150.0	
10424-AAA	IEEE 802.11n (HT Greenfield, 72.2 Mbps, 64-QAM)	X	4.71	66.95	16.27	0.00	150.0	± 9.6 %
		Y	4.78	66.94	16.29		150.0	
		Z	4.75	66.94	16.26		150.0	
10425-AAA	IEEE 802.11n (HT Greenfield, 15 Mbps, BPSK)	X	5.32	67.24	16.45	0.00	150.0	± 9.6 %
		Y	5.38	67.26	16.47		150.0	
		Z	5.35	67.25	16.44		150.0	
10426-AAA	IEEE 802.11n (HT Greenfield, 90 Mbps, 16-QAM)	X	5.33	67.30	16.48	0.00	150.0	± 9.6 %
		Y	5.38	67.27	16.47		150.0	
		Z	5.35	67.28	16.45		150.0	

Product Service

10427-AAA	IEEE 802.11n (HT Greenfield, 150 Mbps, 64-QAM)	X	5.34	67.25	16.45	0.00	150.0	± 9.6 %
		Y	5.40	67.26	16.46		150.0	
		Z	5.37	67.26	16.43		150.0	
10430-AAA	LTE-FDD (OFDMA, 5 MHz, E-TM 3.1)	X	4.31	71.33	18.36	0.00	150.0	± 9.6 %
		Y	4.26	70.45	18.05		150.0	
		Z	4.35	71.18	18.37		150.0	
10431-AAA	LTE-FDD (OFDMA, 10 MHz, E-TM 3.1)	X	4.17	67.12	16.11	0.00	150.0	± 9.6 %
		Y	4.25	67.08	16.16		150.0	
		Z	4.21	67.09	16.11		150.0	
10432-AAA	LTE-FDD (OFDMA, 15 MHz, E-TM 3.1)	X	4.48	67.00	16.21	0.00	150.0	± 9.6 %
		Y	4.55	66.97	16.23		150.0	
		Z	4.51	66.98	16.20		150.0	
10433-AAA	LTE-FDD (OFDMA, 20 MHz, E-TM 3.1)	X	4.73	66.99	16.29	0.00	150.0	± 9.6 %
		Y	4.80	66.98	16.31		150.0	
		Z	4.76	66.98	16.28		150.0	
10434-AAA	W-CDMA (BS Test Model 1, 64 DPCH)	X	4.44	72.28	18.34	0.00	150.0	± 9.6 %
		Y	4.35	71.26	18.02		150.0	
		Z	4.47	72.13	18.38		150.0	
10435-AAB	LTE-TDD (SC-FDMA, 1 RB, 20 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	X	8.80	87.73	20.77	3.23	80.0	± 9.6 %
		Y	28.63	102.67	25.07		80.0	
		Z	6.61	83.07	19.24		80.0	
10447-AAA	LTE-FDD (OFDMA, 5 MHz, E-TM 3.1, Clipping 44%)	X	3.44	67.05	15.33	0.00	150.0	± 9.6 %
		Y	3.54	67.05	15.51		150.0	
		Z	3.49	67.04	15.41		150.0	
10448-AAA	LTE-FDD (OFDMA, 10 MHz, E-TM 3.1, Clippin 44%)	X	4.01	66.90	15.97	0.00	150.0	± 9.6 %
		Y	4.09	66.85	16.02		150.0	
		Z	4.05	66.87	15.97		150.0	
10449-AAA	LTE-FDD (OFDMA, 15 MHz, E-TM 3.1, Cliping 44%)	X	4.29	66.83	16.11	0.00	150.0	± 9.6 %
		Y	4.36	66.80	16.13		150.0	
		Z	4.33	66.81	16.10		150.0	
10450-AAA	LTE-FDD (OFDMA, 20 MHz, E-TM 3.1, Clipping 44%)	X	4.50	66.75	16.15	0.00	150.0	± 9.6 %
		Y	4.55	66.74	16.16		150.0	
		Z	4.53	66.74	16.13		150.0	
10451-AAA	W-CDMA (BS Test Model 1, 64 DPCH, Clipping 44%)	X	3.31	67.15	14.88	0.00	150.0	± 9.6 %
		Y	3.44	67.23	15.15		150.0	
		Z	3.38	67.19	15.02		150.0	
10456-AAA	IEEE 802.11ac WiFi (160MHz, 64-QAM, 99pc duty cycle)	X	6.20	67.82	16.62	0.00	150.0	± 9.6 %
		Y	6.24	67.83	16.62		150.0	
		Z	6.21	67.82	16.60		150.0	
10457-AAA	UMTS-FDD (DC-HSDPA)	X	3.79	65.25	15.85	0.00	150.0	± 9.6 %
		Y	3.81	65.20	15.87		150.0	
		Z	3.80	65.22	15.84		150.0	
10458-AAA	CDMA2000 (1xEV-DO, Rev. B, 2 carriers)	X	3.12	66.40	14.19	0.00	150.0	± 9.6 %
		Y	3.27	66.59	14.61		150.0	
		Z	3.20	66.49	14.40		150.0	
10459-AAA	CDMA2000 (1xEV-DO, Rev. B, 3 carriers)	X	4.15	64.59	15.15	0.00	150.0	± 9.6 %
		Y	4.37	64.97	15.56		150.0	
		Z	4.34	65.08	15.49		150.0	

10460-AAA	UMTS-FDD (WCDMA, AMR)	X	0.86	66.78	15.35	0.00	150.0	± 9.6 %
		Y	0.87	67.12	15.55		150.0	
		Z	0.85	66.64	15.28		150.0	
10461-AAA	LTE-TDD (SC-FDMA, 1 RB, 1.4 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	X	3.92	79.50	19.11	3.29	80.0	± 9.6 %
		Y	11.43	93.56	23.62		80.0	
		Z	3.33	76.15	17.77		80.0	
10462-AAA	LTE-TDD (SC-FDMA, 1 RB, 1.4 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	X	1.13	61.41	8.85	3.23	80.0	± 9.6 %
		Y	1.51	63.93	10.23		80.0	
		Z	1.26	61.69	9.13		80.0	
10463-AAA	LTE-TDD (SC-FDMA, 1 RB, 1.4 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	X	0.98	60.00	7.66	3.23	80.0	± 9.6 %
		Y	1.14	61.02	8.36		80.0	
		Z	1.07	60.00	7.84		80.0	
10464-AAA	LTE-TDD (SC-FDMA, 1 RB, 3 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	X	3.04	75.75	17.25	3.23	80.0	± 9.6 %
		Y	8.41	88.42	21.50		80.0	
		Z	2.68	73.06	16.13		80.0	
10465-AAA	LTE-TDD (SC-FDMA, 1 RB, 3 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	X	1.07	60.96	8.56	3.23	80.0	± 9.6 %
		Y	1.39	63.13	9.80		80.0	
		Z	1.20	61.26	8.86		80.0	
10466-AAA	LTE-TDD (SC-FDMA, 1 RB, 3 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	X	0.99	60.00	7.61	3.23	80.0	± 9.6 %
		Y	1.10	60.63	8.14		80.0	
		Z	1.07	60.00	7.79		80.0	
10467-AAB	LTE-TDD (SC-FDMA, 1 RB, 5 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	X	3.20	76.51	17.55	3.23	80.0	± 9.6 %
		Y	9.35	89.88	21.96		80.0	
		Z	2.78	73.61	16.36		80.0	
10468-AAB	LTE-TDD (SC-FDMA, 1 RB, 5 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	X	1.08	61.07	8.64	3.23	80.0	± 9.6 %
		Y	1.41	63.32	9.90		80.0	
		Z	1.21	61.36	8.93		80.0	
10469-AAB	LTE-TDD (SC-FDMA, 1 RB, 5 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	X	0.98	60.00	7.61	3.23	80.0	± 9.6 %
		Y	1.10	60.64	8.14		80.0	
		Z	1.07	60.00	7.79		80.0	
10470-AAB	LTE-TDD (SC-FDMA, 1 RB, 10 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	X	3.20	76.50	17.54	3.23	80.0	± 9.6 %
		Y	9.36	89.91	21.97		80.0	
		Z	2.77	73.60	16.35		80.0	
10471-AAB	LTE-TDD (SC-FDMA, 1 RB, 10 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	X	1.08	61.04	8.61	3.23	80.0	± 9.6 %
		Y	1.41	63.27	9.86		80.0	
		Z	1.21	61.33	8.90		80.0	
10472-AAB	LTE-TDD (SC-FDMA, 1 RB, 10 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	X	0.98	60.00	7.60	3.23	80.0	± 9.6 %
		Y	1.09	60.60	8.11		80.0	
		Z	1.07	60.00	7.78		80.0	
10473-AAB	LTE-TDD (SC-FDMA, 1 RB, 15 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	X	3.19	76.46	17.52	3.23	80.0	± 9.6 %
		Y	9.33	89.85	21.94		80.0	
		Z	2.77	73.57	16.34		80.0	
10474-AAB	LTE-TDD (SC-FDMA, 1 RB, 15 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	X	1.08	61.02	8.60	3.23	80.0	± 9.6 %
		Y	1.40	63.25	9.85		80.0	
		Z	1.20	61.32	8.89		80.0	
10475-AAB	LTE-TDD (SC-FDMA, 1 RB, 15 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	X	0.98	60.00	7.60	3.23	80.0	± 9.6 %
		Y	1.09	60.59	8.10		80.0	
		Z	1.07	60.00	7.78		80.0	

Product Service

10477-AAB	LTE-TDD (SC-FDMA, 1 RB, 20 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	X	1.06	60.92	8.53	3.23	80.0	± 9.6 %
		Y	1.38	63.07	9.75		80.0	
		Z	1.19	61.22	8.82		80.0	
10478-AAB	LTE-TDD (SC-FDMA, 1 RB, 20 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	X	0.98	60.00	7.59	3.23	80.0	± 9.6 %
		Y	1.09	60.56	8.08		80.0	
		Z	1.07	60.00	7.77		80.0	
10479-AAA	LTE-TDD (SC-FDMA, 50% RB, 1.4 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	X	4.14	76.27	16.98	3.23	80.0	± 9.6 %
		Y	4.79	78.30	20.13		80.0	
		Z	3.76	74.09	18.13		80.0	
10480-AAA	LTE-TDD (SC-FDMA, 50% RB, 1.4 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	X	3.67	71.15	15.30	3.23	80.0	± 9.6 %
		Y	4.79	74.51	17.04		80.0	
		Z	3.56	70.15	15.03		80.0	
10481-AAA	LTE-TDD (SC-FDMA, 50% RB, 1.4 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	X	3.10	68.67	13.94	3.23	80.0	± 9.6 %
		Y	4.07	71.92	15.71		80.0	
		Z	3.13	68.19	13.89		80.0	
10482-AAA	LTE-TDD (SC-FDMA, 50% RB, 3 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	X	2.13	66.78	14.04	2.23	80.0	± 9.6 %
		Y	2.63	69.43	15.68		80.0	
		Z	2.28	67.25	14.40		80.0	
10483-AAA	LTE-TDD (SC-FDMA, 50% RB, 3 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	X	2.80	67.01	13.58	2.23	80.0	± 9.6 %
		Y	3.57	70.12	15.47		80.0	
		Z	2.93	67.15	13.81		80.0	
10484-AAA	LTE-TDD (SC-FDMA, 50% RB, 3 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	X	2.73	66.47	13.34	2.23	80.0	± 9.6 %
		Y	3.45	69.45	15.20		80.0	
		Z	2.87	66.70	13.61		80.0	
10485-AAB	LTE-TDD (SC-FDMA, 50% RB, 5 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	X	2.55	66.83	15.94	2.23	80.0	± 9.6 %
		Y	2.98	70.92	17.16		80.0	
		Z	2.67	68.99	16.05		80.0	
10486-AAB	LTE-TDD (SC-FDMA, 50% RB, 5 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	X	2.67	66.45	14.37	2.23	80.0	± 9.6 %
		Y	3.02	67.96	15.47		80.0	
		Z	2.81	66.75	14.64		80.0	
10487-AAB	LTE-TDD (SC-FDMA, 50% RB, 5 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	X	2.70	66.22	14.25	2.23	80.0	± 9.6 %
		Y	3.04	67.69	15.34		80.0	
		Z	2.84	66.54	14.53		80.0	
10488-AAB	LTE-TDD (SC-FDMA, 50% RB, 10 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	X	3.02	69.31	16.93	2.23	80.0	± 9.6 %
		Y	3.39	70.86	17.76		80.0	
		Z	3.14	69.41	16.93		80.0	
10489-AAB	LTE-TDD (SC-FDMA, 50% RB, 10 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	X	3.17	67.21	16.05	2.23	80.0	± 9.6 %
		Y	3.40	68.06	16.65		80.0	
		Z	3.28	67.32	16.10		80.0	
10490-AAB	LTE-TDD (SC-FDMA, 50% RB, 10 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	X	3.27	67.16	16.05	2.23	80.0	± 9.6 %
		Y	3.50	67.96	16.63		80.0	
		Z	3.38	67.27	16.11		80.0	
10491-AAB	LTE-TDD (SC-FDMA, 50% RB, 15 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	X	3.39	68.71	16.86	2.23	80.0	± 9.6 %
		Y	3.69	69.68	17.49		80.0	
		Z	3.50	68.83	16.85		80.0	
10492-AAB	LTE-TDD (SC-FDMA, 50% RB, 15 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	X	3.59	66.97	16.31	2.23	80.0	± 9.6 %
		Y	3.79	67.64	16.77		80.0	
		Z	3.69	67.09	16.34		80.0	

Product Service

10493-AAB	LTE-TDD (SC-FDMA, 50% RB, 15 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	X	3.66	66.91	16.30	2.23	80.0	± 9.6 %
		Y	3.86	67.55	16.75		80.0	
		Z	3.77	67.03	16.34		80.0	
10494-AAB	LTE-TDD (SC-FDMA, 50% RB, 20 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	X	3.57	69.75	17.16	2.23	80.0	± 9.6 %
		Y	3.95	71.16	17.86		80.0	
		Z	3.69	69.87	17.14		80.0	
10495-AAB	LTE-TDD (SC-FDMA, 50% RB, 20 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	X	3.60	67.26	16.48	2.23	80.0	± 9.6 %
		Y	3.81	68.00	16.94		80.0	
		Z	3.71	67.39	16.50		80.0	
10496-AAB	LTE-TDD (SC-FDMA, 50% RB, 20 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	X	3.70	67.12	16.46	2.23	80.0	± 9.6 %
		Y	3.90	67.79	16.90		80.0	
		Z	3.81	67.25	16.48		80.0	
10497-AAA	LTE-TDD (SC-FDMA, 100% RB, 1.4 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	X	1.56	63.22	11.36	2.23	80.0	± 9.6 %
		Y	1.97	65.90	13.24		80.0	
		Z	1.73	64.01	11.99		80.0	
10498-AAA	LTE-TDD (SC-FDMA, 100% RB, 1.4 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	X	1.39	60.03	8.67	2.23	80.0	± 9.6 %
		Y	1.73	61.98	10.36		80.0	
		Z	1.57	60.86	9.43		80.0	
10499-AAA	LTE-TDD (SC-FDMA, 100% RB, 1.4 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	X	1.41	60.00	8.53	2.23	80.0	± 9.6 %
		Y	1.69	61.56	10.00		80.0	
		Z	1.54	60.51	9.11		80.0	
10500-AAA	LTE-TDD (SC-FDMA, 100% RB, 3 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	X	2.73	68.91	16.30	2.23	80.0	± 9.6 %
		Y	3.11	70.67	17.33		80.0	
		Z	2.84	69.01	16.36		80.0	
10501-AAA	LTE-TDD (SC-FDMA, 100% RB, 3 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	X	2.90	66.88	15.08	2.23	80.0	± 9.6 %
		Y	3.20	68.06	15.95		80.0	
		Z	3.02	67.06	15.24		80.0	
10502-AAA	LTE-TDD (SC-FDMA, 100% RB, 3 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	X	2.96	66.81	14.99	2.23	80.0	± 9.6 %
		Y	3.26	67.97	15.86		80.0	
		Z	3.09	67.00	15.16		80.0	
10503-AAB	LTE-TDD (SC-FDMA, 100% RB, 5 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	X	2.99	69.14	16.84	2.23	80.0	± 9.6 %
		Y	3.36	70.70	17.68		80.0	
		Z	3.11	69.25	16.84		80.0	
10504-AAB	LTE-TDD (SC-FDMA, 100% RB, 5 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	X	3.16	67.12	15.99	2.23	80.0	± 9.6 %
		Y	3.39	67.99	16.60		80.0	
		Z	3.26	67.23	16.05		80.0	
10505-AAB	LTE-TDD (SC-FDMA, 100% RB, 5 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	X	3.26	67.07	15.99	2.23	80.0	± 9.6 %
		Y	3.49	67.88	16.58		80.0	
		Z	3.36	67.18	16.05		80.0	
10506-AAB	LTE-TDD (SC-FDMA, 100% RB, 10 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	X	3.54	69.63	17.10	2.23	80.0	± 9.6 %
		Y	3.92	71.03	17.79		80.0	
		Z	3.67	69.75	17.08		80.0	
10507-AAB	LTE-TDD (SC-FDMA, 100% RB, 10 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	X	3.59	67.20	16.44	2.23	80.0	± 9.6 %
		Y	3.80	67.94	16.91		80.0	
		Z	3.70	67.33	16.46		80.0	

Product Service

10508-AAB	LTE-TDD (SC-FDMA, 100% RB, 10 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	X	3.69	67.05	16.42	2.23	80.0	± 9.6 %
		Y	3.89	67.73	16.86		80.0	
		Z	3.79	67.18	16.44		80.0	
10509-AAB	LTE-TDD (SC-FDMA, 100% RB, 15 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	X	4.00	69.12	16.94	2.23	80.0	± 9.6 %
		Y	4.31	70.17	17.46		80.0	
		Z	4.11	69.24	16.92		80.0	
10510-AAB	LTE-TDD (SC-FDMA, 100% RB, 15 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	X	4.11	67.23	16.60	2.23	80.0	± 9.6 %
		Y	4.31	67.87	16.99		80.0	
		Z	4.22	67.38	16.62		80.0	
10511-AAB	LTE-TDD (SC-FDMA, 100% RB, 15 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	X	4.18	67.07	16.58	2.23	80.0	± 9.6 %
		Y	4.37	67.66	16.94		80.0	
		Z	4.28	67.21	16.60		80.0	
10512-AAB	LTE-TDD (SC-FDMA, 100% RB, 20 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	X	4.04	70.10	17.19	2.23	80.0	± 9.6 %
		Y	4.44	71.46	17.84		80.0	
		Z	4.16	70.23	17.17		80.0	
10513-AAB	LTE-TDD (SC-FDMA, 100% RB, 20 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	X	3.98	67.37	16.64	2.23	80.0	± 9.6 %
		Y	4.19	68.10	17.06		80.0	
		Z	4.09	67.53	16.66		80.0	
10514-AAB	LTE-TDD (SC-FDMA, 100% RB, 20 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	X	4.03	67.08	16.58	2.23	80.0	± 9.6 %
		Y	4.22	67.73	16.97		80.0	
		Z	4.13	67.24	16.60		80.0	
10515-AAA	IEEE 802.11b WiFi 2.4 GHz (DSSS, 2 Mbps, 99pc duty cycle)	X	0.98	62.80	14.38	0.00	150.0	± 9.6 %
		Y	0.97	62.85	14.44		150.0	
		Z	0.97	62.75	14.34		150.0	
10516-AAA	IEEE 802.11b WiFi 2.4 GHz (DSSS, 5.5 Mbps, 99pc duty cycle)	X	0.54	67.42	15.76	0.00	150.0	± 9.6 %
		Y	0.55	68.23	16.12		150.0	
		Z	0.53	67.19	15.61		150.0	
10517-AAA	IEEE 802.11b WiFi 2.4 GHz (DSSS, 11 Mbps, 99pc duty cycle)	X	0.81	64.28	14.78	0.00	150.0	± 9.6 %
		Y	0.82	64.48	14.91		150.0	
		Z	0.81	64.21	14.72		150.0	
10518-AAA	IEEE 802.11a/h WiFi 5 GHz (OFDM, 9 Mbps, 99pc duty cycle)	X	4.50	66.67	16.13	0.00	150.0	± 9.6 %
		Y	4.56	66.63	16.14		150.0	
		Z	4.53	66.65	16.11		150.0	
10519-AAA	IEEE 802.11a/h WiFi 5 GHz (OFDM, 12 Mbps, 99pc duty cycle)	X	4.67	66.89	16.24	0.00	150.0	± 9.6 %
		Y	4.75	66.87	16.26		150.0	
		Z	4.71	66.88	16.23		150.0	
10520-AAA	IEEE 802.11a/h WiFi 5 GHz (OFDM, 18 Mbps, 99pc duty cycle)	X	4.52	66.84	16.16	0.00	150.0	± 9.6 %
		Y	4.60	66.83	16.18		150.0	
		Z	4.56	66.83	16.15		150.0	
10521-AAA	IEEE 802.11a/h WiFi 5 GHz (OFDM, 24 Mbps, 99pc duty cycle)	X	4.46	66.82	16.14	0.00	150.0	± 9.6 %
		Y	4.53	66.83	16.17		150.0	
		Z	4.50	66.82	16.13		150.0	
10522-AAA	IEEE 802.11a/h WiFi 5 GHz (OFDM, 36 Mbps, 99pc duty cycle)	X	4.52	66.94	16.24	0.00	150.0	± 9.6 %
		Y	4.59	66.90	16.25		150.0	
		Z	4.56	66.92	16.22		150.0	

Product Service

10523-AAA	IEEE 802.11a/h WiFi 5 GHz (OFDM, 48 Mbps, 99pc duty cycle)	X	4.41	66.82	16.10	0.00	150.0	± 9.6 %
		Y	4.47	66.77	16.09		150.0	
		Z	4.44	66.79	16.07		150.0	
10524-AAA	IEEE 802.11a/h WiFi 5 GHz (OFDM, 54 Mbps, 99pc duty cycle)	X	4.46	66.85	16.20	0.00	150.0	± 9.6 %
		Y	4.53	66.82	16.21		150.0	
		Z	4.50	66.83	16.19		150.0	
10525-AAA	IEEE 802.11ac WiFi (20MHz, MCS0, 99pc duty cycle)	X	4.46	65.92	15.81	0.00	150.0	± 9.6 %
		Y	4.51	65.87	15.81		150.0	
		Z	4.49	65.89	15.79		150.0	
10526-AAA	IEEE 802.11ac WiFi (20MHz, MCS1, 99pc duty cycle)	X	4.61	66.26	15.94	0.00	150.0	± 9.6 %
		Y	4.69	66.24	15.95		150.0	
		Z	4.65	66.25	15.92		150.0	
10527-AAA	IEEE 802.11ac WiFi (20MHz, MCS2, 99pc duty cycle)	X	4.54	66.22	15.88	0.00	150.0	± 9.6 %
		Y	4.61	66.20	15.89		150.0	
		Z	4.57	66.21	15.87		150.0	
10528-AAA	IEEE 802.11ac WiFi (20MHz, MCS3, 99pc duty cycle)	X	4.55	66.23	15.91	0.00	150.0	± 9.6 %
		Y	4.62	66.22	15.92		150.0	
		Z	4.59	66.22	15.90		150.0	
10529-AAA	IEEE 802.11ac WiFi (20MHz, MCS4, 99pc duty cycle)	X	4.55	66.23	15.91	0.00	150.0	± 9.6 %
		Y	4.62	66.22	15.92		150.0	
		Z	4.59	66.22	15.90		150.0	
10531-AAA	IEEE 802.11ac WiFi (20MHz, MCS6, 99pc duty cycle)	X	4.54	66.31	15.91	0.00	150.0	± 9.6 %
		Y	4.62	66.33	15.94		150.0	
		Z	4.58	66.32	15.90		150.0	
10532-AAA	IEEE 802.11ac WiFi (20MHz, MCS7, 99pc duty cycle)	X	4.40	66.17	15.85	0.00	150.0	± 9.6 %
		Y	4.48	66.18	15.87		150.0	
		Z	4.44	66.17	15.84		150.0	
10533-AAA	IEEE 802.11ac WiFi (20MHz, MCS8, 99pc duty cycle)	X	4.56	66.29	15.91	0.00	150.0	± 9.6 %
		Y	4.63	66.26	15.91		150.0	
		Z	4.60	66.27	15.89		150.0	
10534-AAA	IEEE 802.11ac WiFi (40MHz, MCS0, 99pc duty cycle)	X	5.10	66.34	15.99	0.00	150.0	± 9.6 %
		Y	5.15	66.35	15.99		150.0	
		Z	5.13	66.34	15.97		150.0	
10535-AAA	IEEE 802.11ac WiFi (40MHz, MCS1, 99pc duty cycle)	X	5.16	66.51	16.07	0.00	150.0	± 9.6 %
		Y	5.22	66.51	16.06		150.0	
		Z	5.19	66.51	16.04		150.0	
10536-AAA	IEEE 802.11ac WiFi (40MHz, MCS2, 99pc duty cycle)	X	5.03	66.46	16.02	0.00	150.0	± 9.6 %
		Y	5.09	66.47	16.02		150.0	
		Z	5.06	66.46	16.00		150.0	
10537-AAA	IEEE 802.11ac WiFi (40MHz, MCS3, 99pc duty cycle)	X	5.09	66.43	16.01	0.00	150.0	± 9.6 %
		Y	5.15	66.44	16.01		150.0	
		Z	5.12	66.43	15.99		150.0	
10538-AAA	IEEE 802.11ac WiFi (40MHz, MCS4, 99pc duty cycle)	X	5.17	66.44	16.05	0.00	150.0	± 9.6 %
		Y	5.24	66.47	16.07		150.0	
		Z	5.21	66.45	16.04		150.0	
10540-AAA	IEEE 802.11ac WiFi (40MHz, MCS6, 99pc duty cycle)	X	5.10	66.43	16.07	0.00	150.0	± 9.6 %
		Y	5.17	66.48	16.08		150.0	
		Z	5.14	66.46	16.06		150.0	

Product Service

10541-AAA	IEEE 802.11ac WiFi (40MHz, MCS7, 99pc duty cycle)	X	5.08	66.33	16.00	0.00	150.0	± 9.6 %
		Y	5.14	66.35	16.01		150.0	
		Z	5.11	66.34	15.99		150.0	
10542-AAA	IEEE 802.11ac WiFi (40MHz, MCS8, 99pc duty cycle)	X	5.24	66.41	16.06	0.00	150.0	± 9.6 %
		Y	5.30	66.42	16.06		150.0	
		Z	5.27	66.42	16.04		150.0	
10543-AAA	IEEE 802.11ac WiFi (40MHz, MCS9, 99pc duty cycle)	X	5.31	66.43	16.09	0.00	150.0	± 9.6 %
		Y	5.38	66.46	16.10		150.0	
		Z	5.34	66.45	16.08		150.0	
10544-AAA	IEEE 802.11ac WiFi (80MHz, MCS0, 99pc duty cycle)	X	5.42	66.46	15.99	0.00	150.0	± 9.6 %
		Y	5.46	66.47	15.99		150.0	
		Z	5.44	66.47	15.97		150.0	
10545-AAA	IEEE 802.11ac WiFi (80MHz, MCS1, 99pc duty cycle)	X	5.60	66.86	16.14	0.00	150.0	± 9.6 %
		Y	5.65	66.87	16.14		150.0	
		Z	5.62	66.86	16.11		150.0	
10546-AAA	IEEE 802.11ac WiFi (80MHz, MCS2, 99pc duty cycle)	X	5.47	66.63	16.04	0.00	150.0	± 9.6 %
		Y	5.53	66.69	16.07		150.0	
		Z	5.50	66.67	16.03		150.0	
10547-AAA	IEEE 802.11ac WiFi (80MHz, MCS3, 99pc duty cycle)	X	5.54	66.68	16.06	0.00	150.0	± 9.6 %
		Y	5.60	66.73	16.07		150.0	
		Z	5.57	66.71	16.05		150.0	
10548-AAA	IEEE 802.11ac WiFi (80MHz, MCS4, 99pc duty cycle)	X	5.75	67.47	16.43	0.00	150.0	± 9.6 %
		Y	5.84	67.61	16.49		150.0	
		Z	5.78	67.52	16.42		150.0	
10550-AAA	IEEE 802.11ac WiFi (80MHz, MCS6, 99pc duty cycle)	X	5.50	66.68	16.08	0.00	150.0	± 9.6 %
		Y	5.55	66.69	16.07		150.0	
		Z	5.53	66.68	16.05		150.0	
10551-AAA	IEEE 802.11ac WiFi (80MHz, MCS7, 99pc duty cycle)	X	5.50	66.70	16.05	0.00	150.0	± 9.6 %
		Y	5.56	66.74	16.06		150.0	
		Z	5.53	66.73	16.04		150.0	
10552-AAA	IEEE 802.11ac WiFi (80MHz, MCS8, 99pc duty cycle)	X	5.43	66.53	15.97	0.00	150.0	± 9.6 %
		Y	5.47	66.54	15.97		150.0	
		Z	5.45	66.54	15.95		150.0	
10553-AAA	IEEE 802.11ac WiFi (80MHz, MCS9, 99pc duty cycle)	X	5.50	66.55	16.01	0.00	150.0	± 9.6 %
		Y	5.56	66.59	16.02		150.0	
		Z	5.53	66.58	16.00		150.0	
10554-AAA	IEEE 1602.11ac WiFi (160MHz, MCS0, 99pc duty cycle)	X	5.83	66.82	16.08	0.00	150.0	± 9.6 %
		Y	5.86	66.84	16.08		150.0	
		Z	5.85	66.83	16.06		150.0	
10555-AAA	IEEE 1602.11ac WiFi (160MHz, MCS1, 99pc duty cycle)	X	5.95	67.09	16.20	0.00	150.0	± 9.6 %
		Y	5.99	67.13	16.20		150.0	
		Z	5.97	67.11	16.18		150.0	
10556-AAA	IEEE 1602.11ac WiFi (160MHz, MCS2, 99pc duty cycle)	X	5.97	67.15	16.22	0.00	150.0	± 9.6 %
		Y	6.01	67.18	16.22		150.0	
		Z	5.99	67.16	16.20		150.0	
10557-AAA	IEEE 1602.11ac WiFi (160MHz, MCS3, 99pc duty cycle)	X	5.93	67.04	16.18	0.00	150.0	± 9.6 %
		Y	5.98	67.10	16.20		150.0	
		Z	5.95	67.07	16.17		150.0	

Product Service

10558-AAA	IEEE 1602.11ac WiFi (160MHz, MCS4, 99pc duty cycle)	X	5.98	67.19	16.27	0.00	150.0	± 9.6 %
		Y	6.03	67.25	16.30		150.0	
		Z	6.00	67.22	16.26		150.0	
10560-AAA	IEEE 1602.11ac WiFi (160MHz, MCS6, 99pc duty cycle)	X	5.97	67.05	16.24	0.00	150.0	± 9.6 %
		Y	6.03	67.11	16.26		150.0	
		Z	6.00	67.09	16.23		150.0	
10561-AAA	IEEE 1602.11ac WiFi (160MHz, MCS7, 99pc duty cycle)	X	5.90	67.03	16.26	0.00	150.0	± 9.6 %
		Y	5.95	67.07	16.28		150.0	
		Z	5.92	67.05	16.25		150.0	
10562-AAA	IEEE 1602.11ac WiFi (160MHz, MCS8, 99pc duty cycle)	X	6.00	67.34	16.42	0.00	150.0	± 9.6 %
		Y	6.07	67.46	16.47		150.0	
		Z	6.03	67.39	16.42		150.0	
10563-AAA	IEEE 1602.11ac WiFi (160MHz, MCS9, 99pc duty cycle)	X	6.12	67.33	16.37	0.00	150.0	± 9.6 %
		Y	6.33	67.84	16.62		150.0	
		Z	6.22	67.58	16.47		150.0	
10564-AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 9 Mbps, 99pc duty cycle)	X	4.82	66.72	16.26	0.46	150.0	± 9.6 %
		Y	4.88	66.71	16.29		150.0	
		Z	4.85	66.70	16.25		150.0	
10565-AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 12 Mbps, 99pc duty cycle)	X	5.04	67.16	16.59	0.46	150.0	± 9.6 %
		Y	5.12	67.16	16.62		150.0	
		Z	5.08	67.16	16.58		150.0	
10566-AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 18 Mbps, 99pc duty cycle)	X	4.87	66.99	16.39	0.46	150.0	± 9.6 %
		Y	4.95	67.00	16.43		150.0	
		Z	4.91	66.99	16.38		150.0	
10567-AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 24 Mbps, 99pc duty cycle)	X	4.91	67.40	16.77	0.46	150.0	± 9.6 %
		Y	4.98	67.39	16.78		150.0	
		Z	4.95	67.42	16.77		150.0	
10568-AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 36 Mbps, 99pc duty cycle)	X	4.78	66.73	16.14	0.46	150.0	± 9.6 %
		Y	4.86	66.77	16.20		150.0	
		Z	4.82	66.72	16.12		150.0	
10569-AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 48 Mbps, 99pc duty cycle)	X	4.87	67.52	16.84	0.46	150.0	± 9.6 %
		Y	4.92	67.45	16.82		150.0	
		Z	4.90	67.50	16.82		150.0	
10570-AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 54 Mbps, 99pc duty cycle)	X	4.90	67.36	16.78	0.46	150.0	± 9.6 %
		Y	4.97	67.31	16.76		150.0	
		Z	4.94	67.35	16.75		150.0	
10571-AAA	IEEE 802.11b WiFi 2.4 GHz (DSSS, 1 Mbps, 90pc duty cycle)	X	1.15	63.68	14.91	0.46	130.0	± 9.6 %
		Y	1.16	63.96	15.15		130.0	
		Z	1.16	63.74	14.90		130.0	
10572-AAA	IEEE 802.11b WiFi 2.4 GHz (DSSS, 2 Mbps, 90pc duty cycle)	X	1.16	64.17	15.22	0.46	130.0	± 9.6 %
		Y	1.18	64.46	15.46		130.0	
		Z	1.17	64.22	15.21		130.0	
10573-AAA	IEEE 802.11b WiFi 2.4 GHz (DSSS, 5.5 Mbps, 90pc duty cycle)	X	1.12	74.63	18.77	0.46	130.0	± 9.6 %
		Y	1.36	77.97	20.13		130.0	
		Z	1.14	74.59	18.64		130.0	
10574-AAA	IEEE 802.11b WiFi 2.4 GHz (DSSS, 11 Mbps, 90pc duty cycle)	X	1.20	68.65	17.56	0.46	130.0	± 9.6 %
		Y	1.24	69.24	17.90		130.0	
		Z	1.22	68.76	17.56		130.0	

Product Service

10575-AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 6 Mbps, 90pc duty cycle)	X	4.59	66.43	16.23	0.46	130.0	± 9.6 %
		Y	4.66	66.45	16.30		130.0	
		Z	4.63	66.42	16.22		130.0	
10576-AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 9 Mbps, 90pc duty cycle)	X	4.62	66.61	16.31	0.46	130.0	± 9.6 %
		Y	4.68	66.61	16.36		130.0	
		Z	4.65	66.59	16.29		130.0	
10577-AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 12 Mbps, 90pc duty cycle)	X	4.81	66.89	16.48	0.46	130.0	± 9.6 %
		Y	4.89	66.92	16.54		130.0	
		Z	4.85	66.89	16.47		130.0	
10578-AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 18 Mbps, 90pc duty cycle)	X	4.71	67.05	16.59	0.46	130.0	± 9.6 %
		Y	4.79	67.06	16.63		130.0	
		Z	4.75	67.05	16.58		130.0	
10579-AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 24 Mbps, 90pc duty cycle)	X	4.46	66.25	15.84	0.46	130.0	± 9.6 %
		Y	4.55	66.36	15.95		130.0	
		Z	4.50	66.26	15.83		130.0	
10580-AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 36 Mbps, 90pc duty cycle)	X	4.51	66.30	15.86	0.46	130.0	± 9.6 %
		Y	4.60	66.39	15.97		130.0	
		Z	4.55	66.30	15.85		130.0	
10581-AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 48 Mbps, 90pc duty cycle)	X	4.60	67.07	16.52	0.46	130.0	± 9.6 %
		Y	4.68	67.08	16.55		130.0	
		Z	4.64	67.07	16.50		130.0	
10582-AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 54 Mbps, 90pc duty cycle)	X	4.40	66.00	15.61	0.46	130.0	± 9.6 %
		Y	4.50	66.13	15.74		130.0	
		Z	4.45	66.01	15.61		130.0	
10583-AAA	IEEE 802.11a/h WiFi 5 GHz (OFDM, 6 Mbps, 90pc duty cycle)	X	4.59	66.43	16.23	0.46	130.0	± 9.6 %
		Y	4.66	66.45	16.30		130.0	
		Z	4.63	66.42	16.22		130.0	
10584-AAA	IEEE 802.11a/h WiFi 5 GHz (OFDM, 9 Mbps, 90pc duty cycle)	X	4.62	66.61	16.31	0.46	130.0	± 9.6 %
		Y	4.68	66.61	16.36		130.0	
		Z	4.65	66.59	16.29		130.0	
10585-AAA	IEEE 802.11a/h WiFi 5 GHz (OFDM, 12 Mbps, 90pc duty cycle)	X	4.81	66.89	16.48	0.46	130.0	± 9.6 %
		Y	4.89	66.92	16.54		130.0	
		Z	4.85	66.89	16.47		130.0	
10586-AAA	IEEE 802.11a/h WiFi 5 GHz (OFDM, 18 Mbps, 90pc duty cycle)	X	4.71	67.05	16.59	0.46	130.0	± 9.6 %
		Y	4.79	67.06	16.63		130.0	
		Z	4.75	67.05	16.58		130.0	
10587-AAA	IEEE 802.11a/h WiFi 5 GHz (OFDM, 24 Mbps, 90pc duty cycle)	X	4.46	66.25	15.84	0.46	130.0	± 9.6 %
		Y	4.55	66.36	15.95		130.0	
		Z	4.50	66.26	15.83		130.0	
10588-AAA	IEEE 802.11a/h WiFi 5 GHz (OFDM, 36 Mbps, 90pc duty cycle)	X	4.51	66.30	15.86	0.46	130.0	± 9.6 %
		Y	4.60	66.39	15.97		130.0	
		Z	4.55	66.30	15.85		130.0	
10589-AAA	IEEE 802.11a/h WiFi 5 GHz (OFDM, 48 Mbps, 90pc duty cycle)	X	4.60	67.07	16.52	0.46	130.0	± 9.6 %
		Y	4.68	67.08	16.55		130.0	
		Z	4.64	67.07	16.50		130.0	
10590-AAA	IEEE 802.11a/h WiFi 5 GHz (OFDM, 54 Mbps, 90pc duty cycle)	X	4.40	66.00	15.61	0.46	130.0	± 9.6 %
		Y	4.50	66.13	15.74		130.0	
		Z	4.45	66.01	15.61		130.0	

Product Service

10591-AAA	IEEE 802.11n (HT Mixed, 20MHz, MCS0, 90pc duty cycle)	X	4.75	66.52	16.35	0.46	130.0	± 9.6 %
		Y	4.81	66.52	16.40		130.0	
		Z	4.78	66.51	16.34		130.0	
10592-AAA	IEEE 802.11n (HT Mixed, 20MHz, MCS1, 90pc duty cycle)	X	4.89	66.84	16.48	0.46	130.0	± 9.6 %
		Y	4.97	66.86	16.53		130.0	
		Z	4.93	66.84	16.47		130.0	
10593-AAA	IEEE 802.11n (HT Mixed, 20MHz, MCS2, 90pc duty cycle)	X	4.81	66.73	16.35	0.46	130.0	± 9.6 %
		Y	4.89	66.77	16.41		130.0	
		Z	4.85	66.73	16.34		130.0	
10594-AAA	IEEE 802.11n (HT Mixed, 20MHz, MCS3, 90pc duty cycle)	X	4.86	66.91	16.51	0.46	130.0	± 9.6 %
		Y	4.94	66.93	16.56		130.0	
		Z	4.90	66.91	16.50		130.0	
10595-AAA	IEEE 802.11n (HT Mixed, 20MHz, MCS4, 90pc duty cycle)	X	4.83	66.85	16.40	0.46	130.0	± 9.6 %
		Y	4.91	66.88	16.46		130.0	
		Z	4.87	66.85	16.39		130.0	
10596-AAA	IEEE 802.11n (HT Mixed, 20MHz, MCS5, 90pc duty cycle)	X	4.76	66.83	16.40	0.46	130.0	± 9.6 %
		Y	4.85	66.87	16.46		130.0	
		Z	4.80	66.83	16.38		130.0	
10597-AAA	IEEE 802.11n (HT Mixed, 20MHz, MCS6, 90pc duty cycle)	X	4.71	66.72	16.27	0.46	130.0	± 9.6 %
		Y	4.79	66.78	16.35		130.0	
		Z	4.75	66.73	16.26		130.0	
10598-AAA	IEEE 802.11n (HT Mixed, 20MHz, MCS7, 90pc duty cycle)	X	4.70	66.97	16.55	0.46	130.0	± 9.6 %
		Y	4.78	67.01	16.60		130.0	
		Z	4.74	66.98	16.54		130.0	
10599-AAA	IEEE 802.11n (HT Mixed, 40MHz, MCS0, 90pc duty cycle)	X	5.41	67.02	16.56	0.46	130.0	± 9.6 %
		Y	5.48	67.08	16.61		130.0	
		Z	5.45	67.06	16.56		130.0	
10600-AAA	IEEE 802.11n (HT Mixed, 40MHz, MCS1, 90pc duty cycle)	X	5.53	67.40	16.73	0.46	130.0	± 9.6 %
		Y	5.61	67.47	16.78		130.0	
		Z	5.56	67.40	16.70		130.0	
10601-AAA	IEEE 802.11n (HT Mixed, 40MHz, MCS2, 90pc duty cycle)	X	5.43	67.18	16.64	0.46	130.0	± 9.6 %
		Y	5.50	67.24	16.68		130.0	
		Z	5.46	67.19	16.61		130.0	
10602-AAA	IEEE 802.11n (HT Mixed, 40MHz, MCS3, 90pc duty cycle)	X	5.54	67.27	16.59	0.46	130.0	± 9.6 %
		Y	5.59	67.24	16.60		130.0	
		Z	5.55	67.21	16.54		130.0	
10603-AAA	IEEE 802.11n (HT Mixed, 40MHz, MCS4, 90pc duty cycle)	X	5.60	67.54	16.87	0.46	130.0	± 9.6 %
		Y	5.68	67.57	16.90		130.0	
		Z	5.63	67.52	16.83		130.0	
10604-AAA	IEEE 802.11n (HT Mixed, 40MHz, MCS5, 90pc duty cycle)	X	5.46	67.15	16.66	0.46	130.0	± 9.6 %
		Y	5.48	67.04	16.62		130.0	
		Z	5.46	67.05	16.58		130.0	
10605-AAA	IEEE 802.11n (HT Mixed, 40MHz, MCS6, 90pc duty cycle)	X	5.53	67.33	16.74	0.46	130.0	± 9.6 %
		Y	5.59	67.35	16.77		130.0	
		Z	5.55	67.31	16.70		130.0	
10606-AAA	IEEE 802.11n (HT Mixed, 40MHz, MCS7, 90pc duty cycle)	X	5.26	66.63	16.24	0.46	130.0	± 9.6 %
		Y	5.35	66.76	16.34		130.0	
		Z	5.30	66.67	16.24		130.0	

Product Service

10607-AAA	IEEE 802.11ac WiFi (20MHz, MCS0, 90pc duty cycle)	X	4.58	65.82	15.97	0.46	130.0	± 9.6 %
		Y	4.64	65.82	16.01		130.0	
		Z	4.61	65.80	15.95		130.0	
10608-AAA	IEEE 802.11ac WiFi (20MHz, MCS1, 90pc duty cycle)	X	4.75	66.20	16.13	0.46	130.0	± 9.6 %
		Y	4.83	66.22	16.18		130.0	
		Z	4.79	66.19	16.11		130.0	
10609-AAA	IEEE 802.11ac WiFi (20MHz, MCS2, 90pc duty cycle)	X	4.64	66.03	15.95	0.46	130.0	± 9.6 %
		Y	4.72	66.07	16.02		130.0	
		Z	4.68	66.02	15.94		130.0	
10610-AAA	IEEE 802.11ac WiFi (20MHz, MCS3, 90pc duty cycle)	X	4.69	66.20	16.12	0.46	130.0	± 9.6 %
		Y	4.77	66.23	16.17		130.0	
		Z	4.73	66.19	16.11		130.0	
10611-AAA	IEEE 802.11ac WiFi (20MHz, MCS4, 90pc duty cycle)	X	4.61	65.99	15.96	0.46	130.0	± 9.6 %
		Y	4.69	66.03	16.02		130.0	
		Z	4.64	65.99	15.95		130.0	
10612-AAA	IEEE 802.11ac WiFi (20MHz, MCS5, 90pc duty cycle)	X	4.61	66.12	16.00	0.46	130.0	± 9.6 %
		Y	4.70	66.18	16.06		130.0	
		Z	4.65	66.12	15.98		130.0	
10613-AAA	IEEE 802.11ac WiFi (20MHz, MCS6, 90pc duty cycle)	X	4.61	65.99	15.87	0.46	130.0	± 9.6 %
		Y	4.70	66.08	15.96		130.0	
		Z	4.65	66.00	15.86		130.0	
10614-AAA	IEEE 802.11ac WiFi (20MHz, MCS7, 90pc duty cycle)	X	4.56	66.21	16.12	0.46	130.0	± 9.6 %
		Y	4.64	66.25	16.18		130.0	
		Z	4.60	66.21	16.11		130.0	
10615-AAA	IEEE 802.11ac WiFi (20MHz, MCS8, 90pc duty cycle)	X	4.60	65.81	15.72	0.46	130.0	± 9.6 %
		Y	4.69	65.87	15.81		130.0	
		Z	4.64	65.79	15.71		130.0	
10616-AAA	IEEE 802.11ac WiFi (40MHz, MCS0, 90pc duty cycle)	X	5.23	66.28	16.18	0.46	130.0	± 9.6 %
		Y	5.29	66.33	16.22		130.0	
		Z	5.26	66.29	16.17		130.0	
10617-AAA	IEEE 802.11ac WiFi (40MHz, MCS1, 90pc duty cycle)	X	5.29	66.46	16.24	0.46	130.0	± 9.6 %
		Y	5.36	66.48	16.27		130.0	
		Z	5.32	66.45	16.21		130.0	
10618-AAA	IEEE 802.11ac WiFi (40MHz, MCS2, 90pc duty cycle)	X	5.18	66.47	16.26	0.46	130.0	± 9.6 %
		Y	5.24	66.50	16.29		130.0	
		Z	5.21	66.46	16.24		130.0	
10619-AAA	IEEE 802.11ac WiFi (40MHz, MCS3, 90pc duty cycle)	X	5.19	66.25	16.09	0.46	130.0	± 9.6 %
		Y	5.26	66.32	16.14		130.0	
		Z	5.22	66.26	16.07		130.0	
10620-AAA	IEEE 802.11ac WiFi (40MHz, MCS4, 90pc duty cycle)	X	5.28	66.29	16.16	0.46	130.0	± 9.6 %
		Y	5.36	66.37	16.22		130.0	
		Z	5.31	66.31	16.14		130.0	
10621-AAA	IEEE 802.11ac WiFi (40MHz, MCS5, 90pc duty cycle)	X	5.29	66.47	16.37	0.46	130.0	± 9.6 %
		Y	5.35	66.48	16.39		130.0	
		Z	5.32	66.47	16.35		130.0	
10622-AAA	IEEE 802.11ac WiFi (40MHz, MCS6, 90pc duty cycle)	X	5.30	66.62	16.44	0.46	130.0	± 9.6 %
		Y	5.36	66.63	16.45		130.0	
		Z	5.33	66.61	16.41		130.0	

Product Service

10623-AAA	IEEE 802.11ac WiFi (40MHz, MCS7, 90pc duty cycle)	X	5.18	66.12	16.05	0.46	130.0	± 9.6 %
		Y	5.24	66.18	16.11		130.0	
		Z	5.21	66.13	16.03		130.0	
10624-AAA	IEEE 802.11ac WiFi (40MHz, MCS8, 90pc duty cycle)	X	5.37	66.33	16.23	0.46	130.0	± 9.6 %
		Y	5.43	66.38	16.27		130.0	
		Z	5.40	66.34	16.21		130.0	
10625-AAA	IEEE 802.11ac WiFi (40MHz, MCS9, 90pc duty cycle)	X	5.66	67.10	16.66	0.46	130.0	± 9.6 %
		Y	5.80	67.35	16.80		130.0	
		Z	5.73	67.22	16.70		130.0	
10626-AAA	IEEE 802.11ac WiFi (80MHz, MCS0, 90pc duty cycle)	X	5.54	66.36	16.15	0.46	130.0	± 9.6 %
		Y	5.58	66.40	16.18		130.0	
		Z	5.56	66.37	16.13		130.0	
10627-AAA	IEEE 802.11ac WiFi (80MHz, MCS1, 90pc duty cycle)	X	5.76	66.90	16.39	0.46	130.0	± 9.6 %
		Y	5.82	66.93	16.41		130.0	
		Z	5.78	66.89	16.35		130.0	
10628-AAA	IEEE 802.11ac WiFi (80MHz, MCS2, 90pc duty cycle)	X	5.55	66.39	16.06	0.46	130.0	± 9.6 %
		Y	5.62	66.51	16.13		130.0	
		Z	5.58	66.43	16.05		130.0	
10629-AAA	IEEE 802.11ac WiFi (80MHz, MCS3, 90pc duty cycle)	X	5.63	66.46	16.09	0.46	130.0	± 9.6 %
		Y	5.71	66.59	16.17		130.0	
		Z	5.65	66.47	16.07		130.0	
10630-AAA	IEEE 802.11ac WiFi (80MHz, MCS4, 90pc duty cycle)	X	5.98	67.71	16.72	0.46	130.0	± 9.6 %
		Y	6.12	68.01	16.88		130.0	
		Z	6.03	67.80	16.73		130.0	
10631-AAA	IEEE 802.11ac WiFi (80MHz, MCS5, 90pc duty cycle)	X	5.93	67.68	16.90	0.46	130.0	± 9.6 %
		Y	6.03	67.84	16.98		130.0	
		Z	5.98	67.75	16.91		130.0	
10632-AAA	IEEE 802.11ac WiFi (80MHz, MCS6, 90pc duty cycle)	X	5.74	67.01	16.58	0.46	130.0	± 9.6 %
		Y	5.79	67.00	16.58		130.0	
		Z	5.76	66.99	16.55		130.0	
10633-AAA	IEEE 802.11ac WiFi (80MHz, MCS7, 90pc duty cycle)	X	5.62	66.59	16.20	0.46	130.0	± 9.6 %
		Y	5.68	66.67	16.24		130.0	
		Z	5.65	66.62	16.18		130.0	
10634-AAA	IEEE 802.11ac WiFi (80MHz, MCS8, 90pc duty cycle)	X	5.60	66.63	16.28	0.46	130.0	± 9.6 %
		Y	5.67	66.70	16.32		130.0	
		Z	5.64	66.66	16.27		130.0	
10635-AAA	IEEE 802.11ac WiFi (80MHz, MCS9, 90pc duty cycle)	X	5.47	65.91	15.63	0.46	130.0	± 9.6 %
		Y	5.56	66.05	15.73		130.0	
		Z	5.51	65.94	15.62		130.0	
10636-AAA	IEEE 1602.11ac WiFi (160MHz, MCS0, 90pc duty cycle)	X	5.95	66.72	16.24	0.46	130.0	± 9.6 %
		Y	5.99	66.78	16.28		130.0	
		Z	5.97	66.73	16.22		130.0	
10637-AAA	IEEE 1602.11ac WiFi (160MHz, MCS1, 90pc duty cycle)	X	6.10	67.09	16.41	0.46	130.0	± 9.6 %
		Y	6.14	67.14	16.44		130.0	
		Z	6.11	67.09	16.38		130.0	
10638-AAA	IEEE 1602.11ac WiFi (160MHz, MCS2, 90pc duty cycle)	X	6.10	67.06	16.37	0.46	130.0	± 9.6 %
		Y	6.15	67.12	16.41		130.0	
		Z	6.12	67.07	16.35		130.0	

Product Service

10639-AAA	IEEE 1602.11ac WiFi (160MHz, MCS3, 90pc duty cycle)	X	6.07	67.01	16.39	0.46	130.0	± 9.6 %
		Y	6.13	67.09	16.44		130.0	
		Z	6.10	67.03	16.38		130.0	
10640-AAA	IEEE 1602.11ac WiFi (160MHz, MCS4, 90pc duty cycle)	X	6.07	66.99	16.32	0.46	130.0	± 9.6 %
		Y	6.14	67.11	16.39		130.0	
		Z	6.09	67.02	16.31		130.0	
10641-AAA	IEEE 1602.11ac WiFi (160MHz, MCS5, 90pc duty cycle)	X	6.13	66.94	16.31	0.46	130.0	± 9.6 %
		Y	6.17	66.99	16.35		130.0	
		Z	6.14	66.93	16.28		130.0	
10642-AAA	IEEE 1602.11ac WiFi (160MHz, MCS6, 90pc duty cycle)	X	6.17	67.20	16.62	0.46	130.0	± 9.6 %
		Y	6.22	67.26	16.65		130.0	
		Z	6.19	67.22	16.61		130.0	
10643-AAA	IEEE 1602.11ac WiFi (160MHz, MCS7, 90pc duty cycle)	X	6.00	66.86	16.34	0.46	130.0	± 9.6 %
		Y	6.05	66.94	16.39		130.0	
		Z	6.02	66.87	16.31		130.0	
10644-AAA	IEEE 1602.11ac WiFi (160MHz, MCS8, 90pc duty cycle)	X	6.13	67.25	16.56	0.46	130.0	± 9.6 %
		Y	6.22	67.46	16.67		130.0	
		Z	6.17	67.33	16.57		130.0	
10645-AAA	IEEE 1602.11ac WiFi (160MHz, MCS9, 90pc duty cycle)	X	6.30	67.39	16.59	0.46	130.0	± 9.6 %
		Y	6.61	68.18	16.99		130.0	
		Z	6.44	67.75	16.73		130.0	
10646-AAC	LTE-TDD (SC-FDMA, 1 RB, 5 MHz, QPSK, UL Subframe=2,7)	X	11.76	96.35	31.88	9.30	60.0	± 9.6 %
		Y	19.05	107.46	35.85		60.0	
		Z	11.88	94.80	30.95		60.0	
10647-AAB	LTE-TDD (SC-FDMA, 1 RB, 20 MHz, QPSK, UL Subframe=2,7)	X	10.62	94.79	31.49	9.30	60.0	± 9.6 %
		Y	16.98	105.61	35.43		60.0	
		Z	10.96	93.72	30.71		60.0	
10648-AAA	CDMA2000 (1x Advanced)	X	0.66	63.03	10.35	0.00	150.0	± 9.6 %
		Y	0.70	63.32	10.86		150.0	
		Z	0.69	63.19	10.65		150.0	

[f] Uncertainty is determined using the max. deviation from linear response applying rectangular distribution and is expressed for the square of the field value.

Product Service

ANNEX B

DIPOLE CALIBRATION REPORTS

Product Service

Calibration Laboratory of
Schmid & Partner
Engineering AG
Zeughausstrasse 43, 8004 Zurich, Switzerland

S Schweizerischer Kalibrierdienst
C Service suisse d'étalonnage
S Servizio svizzero di taratura
S Swiss Calibration Service

Accredited by the Swiss Accreditation Service (SAS)
The Swiss Accreditation Service is one of the signatories to the EA Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: **SCS 0108**

Client **TÜV SÜD UK**

Certificate No: **D2450V2-715_Dec16**

CALIBRATION CERTIFICATE

Object	D2450V2 - SN:715
Calibration procedure(s)	QA CAL-05.v9 Calibration procedure for dipole validation kits above 700 MHz
Calibration date:	December 09, 2016

This calibration certificate documents the traceability to national standards, which realize the physical units of measurements (SI).
The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.

All calibrations have been conducted in the closed laboratory facility: environment temperature (22 ± 3)°C and humidity < 70%.

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Certificate No.)	Scheduled Calibration
Power meter NRP	SN: 104778	06-Apr-16 (No. 217-02288/02289)	Apr-17
Power sensor NRP-Z91	SN: 103244	06-Apr-16 (No. 217-02288)	Apr-17
Power sensor NRP-Z91	SN: 103245	06-Apr-16 (No. 217-02289)	Apr-17
Reference 20 dB Attenuator	SN: 5058 (20k)	05-Apr-16 (No. 217-02292)	Apr-17
Type-N mismatch combination	SN: 5047.2 / 06327	05-Apr-16 (No. 217-02295)	Apr-17
Reference Probe EX3DV4	SN: 7349	15-Jun-16 (No. EX3-7349_Jun16)	Jun-17
DAE4	SN: 601	30-Dec-15 (No. DAE4-601_Dec15)	Dec-16

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Power meter EPM-442A	SN: GB37480704	07-Oct-15 (in house check Oct-16)	In house check: Oct-18
Power sensor HP 8481A	SN: US37292783	07-Oct-15 (in house check Oct-16)	In house check: Oct-18
Power sensor HP 8481A	SN: MY41092317	07-Oct-15 (in house check Oct-16)	In house check: Oct-18
RF generator R&S SMT-06	SN: 100972	15-Jun-15 (in house check Oct-16)	In house check: Oct-18
Network Analyzer HP 8753E	SN: US37390585	18-Oct-01 (in house check Oct-16)	In house check: Oct-17

	Name	Function	Signature
Calibrated by:	Johannes Kurikka	Laboratory Technician	
Approved by:	Katja Pokovic	Technical Manager	

Issued: December 13, 2016

Product Service

Calibration Laboratory of
Schmid & Partner
Engineering AG
Zeughausstrasse 43, 8004 Zurich, Switzerland

S Schweizerischer Kalibrierdienst
C Service suisse d'étalonnage
S Servizio svizzero di taratura
S Swiss Calibration Service

Accredited by the Swiss Accreditation Service (SAS)
The Swiss Accreditation Service is one of the signatories to the EA Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: SCS 0108

Glossary:

TSL	tissue simulating liquid
ConvF	sensitivity in TSL / NORM x,y,z
N/A	not applicable or not measured

Calibration is Performed According to the Following Standards:

a) IEEE Std 1528-2013, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", June 2013
b) IEC 62209-1, "Procedure to measure the Specific Absorption Rate (SAR) for hand-held devices used in close proximity to the ear (frequency range of 300 MHz to 3 GHz)", February 2005
c) IEC 62209-2, "Procedure to determine the Specific Absorption Rate (SAR) for wireless communication devices used in close proximity to the human body (frequency range of 30 MHz to 6 GHz)", March 2010
d) KDB 865664, "SAR Measurement Requirements for 100 MHz to 6 GHz"

Additional Documentation:

e) DASY4/5 System Handbook

Methods Applied and Interpretation of Parameters:

- *Measurement Conditions:* Further details are available from the Validation Report at the end of the certificate. All figures stated in the certificate are valid at the frequency indicated.
- *Antenna Parameters with TSL:* The dipole is mounted with the spacer to position its feed point exactly below the center marking of the flat phantom section, with the arms oriented parallel to the body axis.
- *Feed Point Impedance and Return Loss:* These parameters are measured with the dipole positioned under the liquid filled phantom. The impedance stated is transformed from the measurement at the SMA connector to the feed point. The Return Loss ensures low reflected power. No uncertainty required.
- *Electrical Delay:* One-way delay between the SMA connector and the antenna feed point. No uncertainty required.
- *SAR measured:* SAR measured at the stated antenna input power.
- *SAR normalized:* SAR as measured, normalized to an input power of 1 W at the antenna connector.
- *SAR for nominal TSL parameters:* The measured TSL parameters are used to calculate the nominal SAR result.

The reported uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor k=2, which for a normal distribution corresponds to a coverage probability of approximately 95%.

Product Service

Measurement Conditions

DASY system configuration, as far as not given on page 1.

DASY Version	DASY5	V52.8.8
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom	
Distance Dipole Center - TSL	10 mm	with Spacer
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	2450 MHz ± 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	39.2	1.80 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	37.8 ± 6 %	1.85 mho/m ± 6 %
Head TSL temperature change during test	< 0.5 °C	----	----

SAR result with Head TSL

SAR averaged over 1 cm³ (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	13.2 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**51.7 W/kg ± 17.0 % (k=2)**

SAR averaged over 10 cm³ (10 g) of Head TSL	condition	
SAR measured	250 mW input power	6.14 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**24.2 W/kg ± 16.5 % (k=2)**

Body TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Body TSL parameters	22.0 °C	52.7	1.95 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	50.7 ± 6 %	1.99 mho/m ± 6 %
Body TSL temperature change during test	< 0.5 °C	----	----

SAR result with Body TSL

SAR averaged over 1 cm³ (1 g) of Body TSL	Condition	
SAR measured	250 mW input power	12.9 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**50.6 W/kg ± 17.0 % (k=2)**

SAR averaged over 10 cm³ (10 g) of Body TSL	condition	
SAR measured	250 mW input power	6.00 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**23.7 W/kg ± 16.5 % (k=2)**

Product Service

Appendix (Additional assessments outside the scope of SCS 0108)

Antenna Parameters with Head TSL

Impedance, transformed to feed point	54.3 Ω + 0.5 jΩ
Return Loss	- 27.6 dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	49.8 Ω + 1.7 jΩ
Return Loss	- 35.5 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.157 ns

After long term use with 100W radiated power, only a slight warming of the dipole near the feedpoint can be measured.

The dipole is made of standard semirigid coaxial cable. The center conductor of the feeding line is directly connected to the second arm of the dipole. The antenna is therefore short-circuited for DC-signals. On some of the dipoles, small end caps are added to the dipole arms in order to improve matching when loaded according to the position as explained in the "Measurement Conditions" paragraph. The SAR data are not affected by this change. The overall dipole length is still according to the Standard.
No excessive force must be applied to the dipole arms, because they might bend or the soldered connections near the feedpoint may be damaged.

Additional EUT Data

Manufactured by	SPEAG
Manufactured on	July 05, 2002

Product Service

DASY5 Validation Report for Head TSL

Date: 09.12.2016

Test Laboratory: SPEAG, Zurich, Switzerland

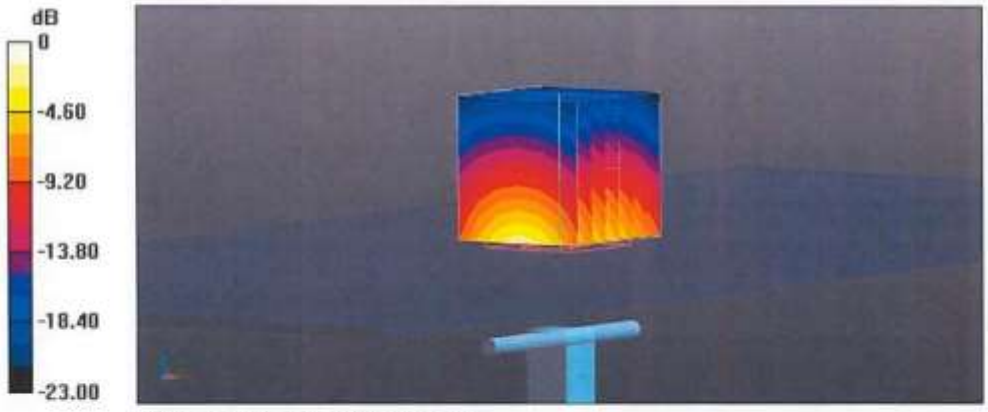
DUT: Dipole 2450 MHz; Type: D2450V2; Serial: D2450V2 - SN:715

Communication System: UID 0 - CW; Frequency: 2450 MHz
Medium parameters used: f = 2450 MHz; σ = 1.85 S/m; ε_r = 37.8; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN7349; ConvF(7.72, 7.72, 7.72); Calibrated: 15.06.2016;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 30.12.2015
- Phantom: Flat Phantom 5.0 (front); Type: QD 000 P50 AA; Serial: 1001
- DASY52 52.8.8(1258); SEMCAD X 14.6.10(7372)

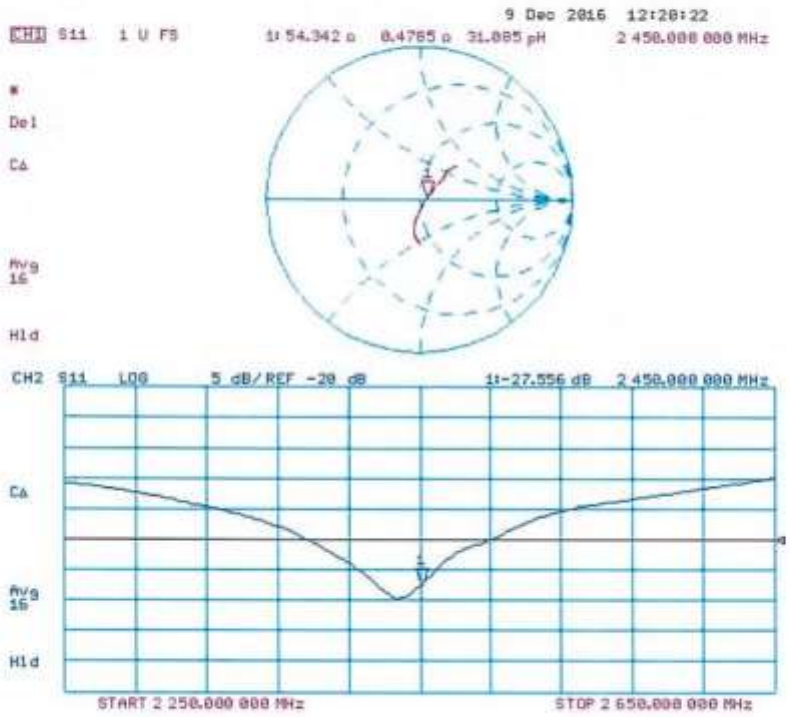
Dipole Calibration for Head Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 113.9 V/m; Power Drift = -0.02 dB
Peak SAR (extrapolated) = 26.6 W/kg
SAR(1 g) = 13.2 W/kg; SAR(10 g) = 6.14 W/kg
Maximum value of SAR (measured) = 21.7 W/kg



0 dB = 21.7 W/kg = 13.36 dBW/kg

Product Service

Impedance Measurement Plot for Head TSL



Product Service

DASY5 Validation Report for Body TSL

Date: 09.12.2016

Test Laboratory: SPEAG, Zurich, Switzerland

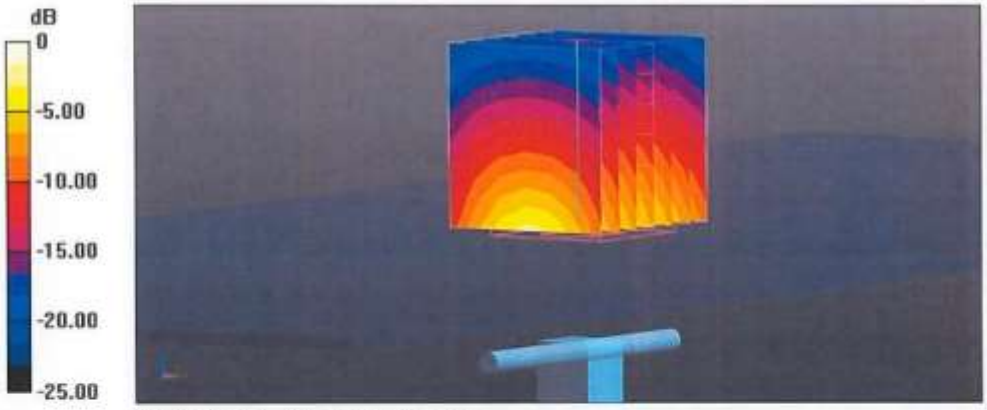
DUT: Dipole 2450 MHz; Type: D2450V2; Serial: D2450V2 - SN:715

Communication System: UID 0 - CW; Frequency: 2450 MHz
Medium parameters used: f = 2450 MHz; σ = 1.99 S/m; ε_r = 50.7; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN7349; ConvF(7.79, 7.79, 7.79); Calibrated: 15.06.2016;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 30.12.2015
- Phantom: Flat Phantom 5.0 (back); Type: QD 000 P50 AA; Serial: 1002
- DASY52 52.8.8(1258); SEMCAD X 14.6.10(7372)

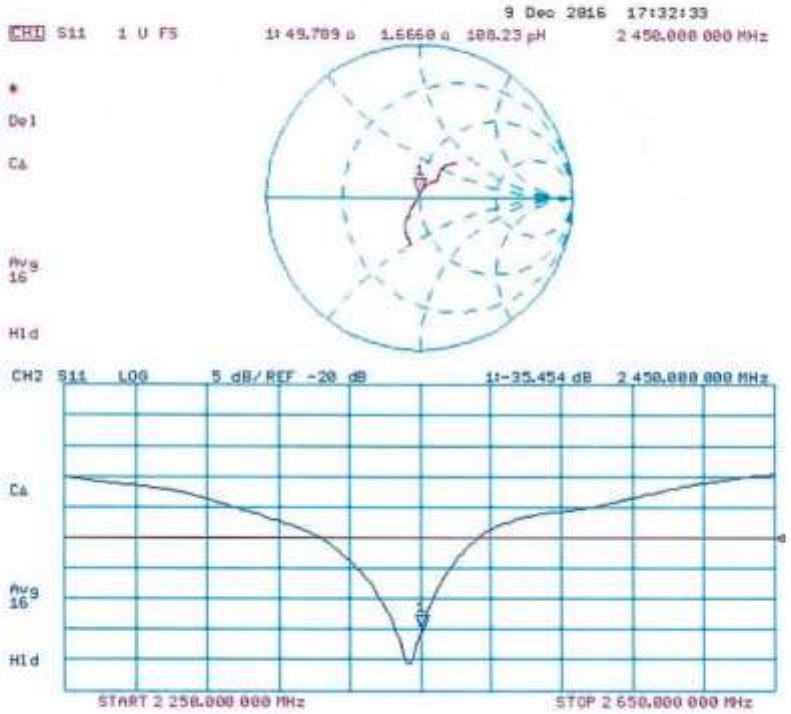
Dipole Calibration for Body Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 107.1 V/m; Power Drift = -0.04 dB
Peak SAR (extrapolated) = 25.7 W/kg
SAR(1 g) = 12.9 W/kg; SAR(10 g) = 6 W/kg
Maximum value of SAR (measured) = 21.1 W/kg



0 dB = 21.1 W/kg = 13.24 dBW/kg

Product Service

Impedance Measurement Plot for Body TSL



Product Service

Calibration Laboratory of
Schmid & Partner
Engineering AG
Zeughausstrasse 43, 8004 Zurich, Switzerland

S Schweizerischer Kalibrierdienst
C Service suisse d'étalonnage
S Servizio svizzero di taratura
S Swiss Calibration Service

Accredited by the Swiss Accreditation Service (SAS)
The Swiss Accreditation Service is one of the signatories to the EA Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: **SCS 0108**

Client **TÜV SÜD UK**

Certificate No: **D5GHzV2-1100_Dec16**

CALIBRATION CERTIFICATE

Object	D5GHzV2 - SN:1100
Calibration procedure(s)	QA CAL-22.v2 Calibration procedure for dipole validation kits between 3-6 GHz
Calibration date:	December 13, 2016

This calibration certificate documents the traceability to national standards, which realize the physical units of measurements (SI).
The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.

All calibrations have been conducted in the closed laboratory facility: environment temperature (22 ± 3)°C and humidity < 70%.

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Certificate No.)	Scheduled Calibration
Power meter NRP	SN: 104778	06-Apr-16 (No. 217-02288/02289)	Apr-17
Power sensor NRP-Z91	SN: 103244	06-Apr-16 (No. 217-02288)	Apr-17
Power sensor NRP-Z91	SN: 103245	06-Apr-16 (No. 217-02289)	Apr-17
Reference 20 dB Attenuator	SN: 5058 (20k)	05-Apr-16 (No. 217-02292)	Apr-17
Type-N mismatch combination	SN: 5047.2 / 06327	05-Apr-16 (No. 217-02295)	Apr-17
Reference Probe EX3DV4	SN: 3503	30-Jun-16 (No. EX3-3503_Jun16)	Jun-17
DAE4	SN: 601	30-Dec-15 (No. DAE4-601_Dec15)	Dec-16

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Power meter EPM-442A	SN: GB37480704	07-Oct-15 (in house check Oct-16)	In house check: Oct-18
Power sensor HP 8481A	SN: US37292783	07-Oct-15 (in house check Oct-16)	In house check: Oct-18
Power sensor HP 8481A	SN: MY41092317	07-Oct-15 (in house check Oct-16)	In house check: Oct-18
RF generator R&S SMT-06	SN: 100972	15-Jun-15 (in house check Oct-16)	In house check: Oct-18
Network Analyzer HP 8753E	SN: US37390585	18-Oct-01 (in house check Oct-16)	In house check: Oct-17

	Name	Function	Signature
Calibrated by:	Michael Weber	Laboratory Technician	
Approved by:	Katja Pokovic	Technical Manager	

Issued: December 15, 2016

Product Service

Measurement Conditions

DASY system configuration, as far as not given on page 1.

DASY Version	DASY5	V52.8.8
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom V5.0	
Distance Dipole Center - TSL	10 mm	with Spacer
Zoom Scan Resolution	dx, dy = 4.0 mm, dz = 1.4 mm	Graded Ratio = 1.4 (Z direction)
Frequency	5200 MHz ± 1 MHz 5300 MHz ± 1 MHz 5500 MHz ± 1 MHz 5600 MHz ± 1 MHz 5800 MHz ± 1 MHz	

Head TSL parameters at 5200 MHz

The following parameters and calculations were applied.

	Temperature	**Permittivity**	**Conductivity**
Nominal Head TSL parameters	22.0 °C	36.0	4.66 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	34.8 ± 6 %	4.53 mho/m ± 6 %
Head TSL temperature change during test	< 0.5 °C	----	----

SAR result with Head TSL at 5200 MHz

SAR averaged over 1 cm³ (1 g) of Head TSL	Condition	
SAR measured	100 mW input power	7.64 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**75.8 W/kg ± 19.9 % (k=2)**

SAR averaged over 10 cm³ (10 g) of Head TSL	condition	
SAR measured	100 mW input power	2.20 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**21.8 W/kg ± 19.5 % (k=2)**

Product Service

Head TSL parameters at 5300 MHz

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	35.9	4.76 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	34.6 ± 6 %	4.63 mho/m ± 6 %
Head TSL temperature change during test	< 0.5 °C	----	----

SAR result with Head TSL at 5300 MHz

SAR averaged over 1 cm³ (1 g) of Head TSL	Condition	
SAR measured	100 mW input power	8.17 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**81.0 W / kg ± 19.9 % (k=2)**

SAR averaged over 10 cm³ (10 g) of Head TSL	condition	
SAR measured	100 mW input power	2.36 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**23.3 W/kg ± 19.5 % (k=2)**

Head TSL parameters at 5500 MHz

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	35.6	4.96 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	34.4 ± 6 %	4.82 mho/m ± 6 %
Head TSL temperature change during test	< 0.5 °C	----	----

SAR result with Head TSL at 5500 MHz

SAR averaged over 1 cm³ (1 g) of Head TSL	Condition	
SAR measured	100 mW input power	8.02 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**79.5 W/kg ± 19.9 % (k=2)**

SAR averaged over 10 cm³ (10 g) of Head TSL	condition	
SAR measured	100 mW input power	2.29 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**22.7 W/kg ± 19.5 % (k=2)**

Product Service

Head TSL parameters at 5600 MHz

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	35.5	5.07 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	34.2 ± 6 %	4.93 mho/m ± 6 %
Head TSL temperature change during test	< 0.5 °C	----	----

SAR result with Head TSL at 5600 MHz

SAR averaged over 1 cm³ (1 g) of Head TSL	Condition	
SAR measured	100 mW input power	8.15 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**80.8 W/kg ± 19.9 % (k=2)**

SAR averaged over 10 cm³ (10 g) of Head TSL	condition	
SAR measured	100 mW input power	2.34 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**23.1 W/kg ± 19.5 % (k=2)**

Head TSL parameters at 5800 MHz

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	35.3	5.27 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	33.9 ± 6 %	5.13 mho/m ± 6 %
Head TSL temperature change during test	< 0.5 °C	----	----

SAR result with Head TSL at 5800 MHz

SAR averaged over 1 cm³ (1 g) of Head TSL	Condition	
SAR measured	100 mW input power	7.67 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**76.0 W/kg ± 19.9 % (k=2)**

SAR averaged over 10 cm³ (10 g) of Head TSL	condition	
SAR measured	100 mW input power	2.19 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**21.7 W/kg ± 19.5 % (k=2)**

Product Service

Body TSL parameters at 5200 MHz

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Body TSL parameters	22.0 °C	49.0	5.30 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	47.1 ± 6 %	5.46 mho/m ± 6 %
Body TSL temperature change during test	< 0.5 °C	----	----

SAR result with Body TSL at 5200 MHz

SAR averaged over 1 cm³ (1 g) of Body TSL	Condition	
SAR measured	100 mW input power	7.23 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**71.8 W/kg ± 19.9 % (k=2)**

SAR averaged over 10 cm³ (10 g) of Body TSL	condition	
SAR measured	100 mW input power	2.03 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**20.1 W/kg ± 19.5 % (k=2)**

Body TSL parameters at 5300 MHz

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Body TSL parameters	22.0 °C	48.9	5.42 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	46.9 ± 6 %	5.59 mho/m ± 6 %
Body TSL temperature change during test	< 0.5 °C	----	----

SAR result with Body TSL at 5300 MHz

SAR averaged over 1 cm³ (1 g) of Body TSL	Condition	
SAR measured	100 mW input power	7.76 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**77.0 W/kg ± 19.9 % (k=2)**

SAR averaged over 10 cm³ (10 g) of Body TSL	condition	
SAR measured	100 mW input power	2.18 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**21.6 W/kg ± 19.5 % (k=2)**

Product Service

Body TSL parameters at 5500 MHz

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Body TSL parameters	22.0 °C	48.6	5.65 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	46.5 ± 6 %	5.86 mho/m ± 6 %
Body TSL temperature change during test	< 0.5 °C	----	----

SAR result with Body TSL at 5500 MHz

SAR averaged over 1 cm³ (1 g) of Body TSL	Condition	
SAR measured	100 mW input power	7.90 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**78.4 W/kg ± 19.9 % (k=2)**

SAR averaged over 10 cm³ (10 g) of Body TSL	condition	
SAR measured	100 mW input power	2.19 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**21.7 W/kg ± 19.5 % (k=2)**

Body TSL parameters at 5600 MHz

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Body TSL parameters	22.0 °C	48.5	5.77 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	46.4 ± 6 %	6.00 mho/m ± 6 %
Body TSL temperature change during test	< 0.5 °C	----	----

SAR result with Body TSL at 5600 MHz

SAR averaged over 1 cm³ (1 g) of Body TSL	Condition	
SAR measured	100 mW input power	7.83 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**77.7 W/kg ± 19.9 % (k=2)**

SAR averaged over 10 cm³ (10 g) of Body TSL	condition	
SAR measured	100 mW input power	2.19 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**21.7 W/kg ± 19.5 % (k=2)**

Product Service

Body TSL parameters at 5800 MHz

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Body TSL parameters	22.0 °C	48.2	6.00 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	46.0 ± 6 %	6.28 mho/m ± 6 %
Body TSL temperature change during test	< 0.5 °C	----	----

SAR result with Body TSL at 5800 MHz

SAR averaged over 1 cm³ (1 g) of Body TSL	Condition	
SAR measured	100 mW input power	7.46 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**74.0 W/kg ± 19.9 % (k=2)**

SAR averaged over 10 cm³ (10 g) of Body TSL	condition	
SAR measured	100 mW input power	2.07 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**20.5 W/kg ± 19.5 % (k=2)**

Product Service

Calibration Laboratory of
Schmid & Partner
Engineering AG
Zeughausstrasse 43, 8004 Zurich, Switzerland

S Schweizerischer Kalibrierdienst
C Service suisse d'étalonnage
S Servizio svizzero di taratura
S Swiss Calibration Service

Accredited by the Swiss Accreditation Service (SAS)
The Swiss Accreditation Service is one of the signatories to the EA Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: SCS 0108

Glossary:

TSL	tissue simulating liquid
ConvF	sensitivity in TSL / NORM x,y,z
N/A	not applicable or not measured

Calibration is Performed According to the Following Standards:

a) IEEE Std 1528-2013, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", June 2013
b) IEC 62209-2, "Procedure to determine the Specific Absorption Rate (SAR) for wireless communication devices used in close proximity to the human body (frequency range of 30 MHz to 6 GHz)", March 2010
c) KDB 865664, "SAR Measurement Requirements for 100 MHz to 6 GHz"

Additional Documentation:

d) DASY4/5 System Handbook

Methods Applied and Interpretation of Parameters:

- *Measurement Conditions:* Further details are available from the Validation Report at the end of the certificate. All figures stated in the certificate are valid at the frequency indicated.
- *Antenna Parameters with TSL:* The dipole is mounted with the spacer to position its feed point exactly below the center marking of the flat phantom section, with the arms oriented parallel to the body axis.
- *Feed Point Impedance and Return Loss:* These parameters are measured with the dipole positioned under the liquid filled phantom. The impedance stated is transformed from the measurement at the SMA connector to the feed point. The Return Loss ensures low reflected power. No uncertainty required.
- *Electrical Delay:* One-way delay between the SMA connector and the antenna feed point. No uncertainty required.
- *SAR measured:* SAR measured at the stated antenna input power.
- *SAR normalized:* SAR as measured, normalized to an input power of 1 W at the antenna connector.
- *SAR for nominal TSL parameters:* The measured TSL parameters are used to calculate the nominal SAR result.

The reported uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor k=2, which for a normal distribution corresponds to a coverage probability of approximately 95%.

Product Service

Appendix (Additional assessments outside the scope of SCS 0108)

Antenna Parameters with Head TSL at 5200 MHz

Impedance, transformed to feed point	51.0 Ω - 7.1 jΩ
Return Loss	- 23.0 dB

Antenna Parameters with Head TSL at 5300 MHz

Impedance, transformed to feed point	50.7 Ω - 0.2 jΩ
Return Loss	- 43.2 dB

Antenna Parameters with Head TSL at 5500 MHz

Impedance, transformed to feed point	49.4 Ω - 2.7 jΩ
Return Loss	- 31.1 dB

Antenna Parameters with Head TSL at 5600 MHz

Impedance, transformed to feed point	55.2 Ω + 0.3 jΩ
Return Loss	- 26.2 dB

Antenna Parameters with Head TSL at 5800 MHz

Impedance, transformed to feed point	52.3 Ω + 2.7 jΩ
Return Loss	- 29.1 dB

Antenna Parameters with Body TSL at 5200 MHz

Impedance, transformed to feed point	51.7 Ω - 7.3 jΩ
Return Loss	- 22.6 dB

Antenna Parameters with Body TSL at 5300 MHz

Impedance, transformed to feed point	50.4 Ω + 1.6 jΩ
Return Loss	- 35.9 dB

Antenna Parameters with Body TSL at 5500 MHz

Impedance, transformed to feed point	49.2 Ω - 1.3 jΩ
Return Loss	- 36.2 dB

Product Service

Antenna Parameters with Body TSL at 5600 MHz

Impedance, transformed to feed point	56.3 Ω + 0.7 jΩ
Return Loss	- 24.5 dB

Antenna Parameters with Body TSL at 5800 MHz

Impedance, transformed to feed point	52.6 Ω + 2.8 jΩ
Return Loss	- 28.6 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.206 ns

After long term use with 100W radiated power, only a slight warming of the dipole near the feedpoint can be measured.

The dipole is made of standard semirigid coaxial cable. The center conductor of the feeding line is directly connected to the second arm of the dipole. The antenna is therefore short-circuited for DC-signals. On some of the dipoles, small end caps are added to the dipole arms in order to improve matching when loaded according to the position as explained in the "Measurement Conditions" paragraph. The SAR data are not affected by this change. The overall dipole length is still according to the Standard.
No excessive force must be applied to the dipole arms, because they might bend or the soldered connections near the feedpoint may be damaged.

Additional EUT Data

Manufactured by	SPEAG
Manufactured on	September 24, 2010

Product Service

DASY5 Validation Report for Head TSL

Date: 13.12.2016

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole D5GHzV2; Type: D5GHzV2; Serial: D5GHzV2 - SN: 1100

Communication System: UID 0 - CW; Frequency: 5200 MHz, Frequency: 5300 MHz, Frequency: 5500 MHz, Frequency: 5600 MHz, Frequency: 5800 MHz
Medium parameters used: f = 5200 MHz; σ = 4.53 S/m; ε_r = 34.8; ρ = 1000 kg/m^3 ,
Medium parameters used: f = 5300 MHz; σ = 4.63 S/m; ε_r = 34.6; ρ = 1000 kg/m^3 ,
Medium parameters used: f = 5500 MHz; σ = 4.82 S/m; ε_r = 34.4; ρ = 1000 kg/m^3 ,
Medium parameters used: f = 5600 MHz; σ = 4.93 S/m; ε_r = 34.2; ρ = 1000 kg/m^3 ,
Medium parameters used: f = 5800 MHz; σ = 5.13 S/m; ε_r = 33.9; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN3503; ConvF(5.59, 5.59, 5.59); Calibrated: 30.06.2016, ConvF(5.14, 5.14, 5.14); Calibrated: 30.06.2016, ConvF(5.02, 5.02, 5.02); Calibrated: 30.06.2016, ConvF(4.89, 4.89, 4.89); Calibrated: 30.06.2016, ConvF(4.85, 4.85, 4.85); Calibrated: 30.06.2016;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 30.12.2015
- Phantom: Flat Phantom 5.0 (front); Type: QD 000 P50 AA; Serial: 1001
- DASY52 52.8.8(1258); SEMCAD X 14.6.10(7372)

Dipole Calibration for Head Tissue/Pin=100mW, dist=10mm, f=5200 MHz/Zoom Scan, dist=1.4mm (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 69.19 V/m; Power Drift = -0.02 dB
Peak SAR (extrapolated) = 27.1 W/kg
SAR(1 g) = 7.64 W/kg; SAR(10 g) = 2.2 W/kg
Maximum value of SAR (measured) = 17.7 W/kg

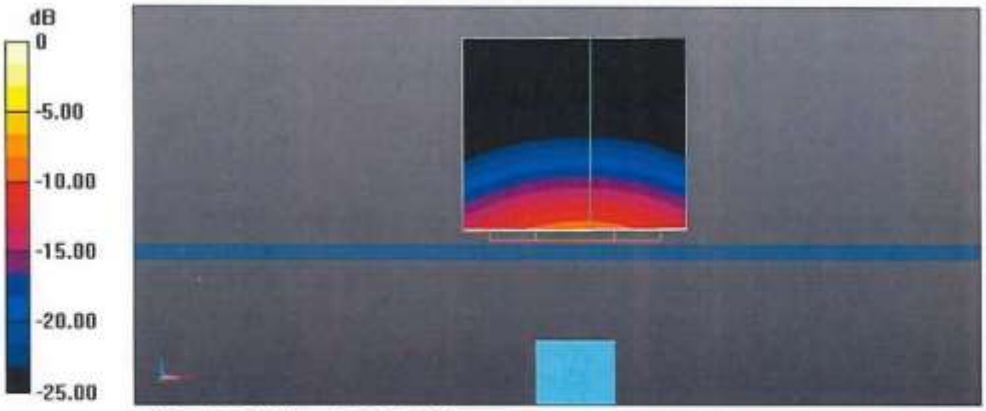
Dipole Calibration for Head Tissue/Pin=100mW, dist=10mm, f=5300 MHz/Zoom Scan, dist=1.4mm (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 71.45 V/m; Power Drift = -0.05 dB
Peak SAR (extrapolated) = 30.0 W/kg
SAR(1 g) = 8.17 W/kg; SAR(10 g) = 2.36 W/kg
Maximum value of SAR (measured) = 19.1 W/kg

Dipole Calibration for Head Tissue/Pin=100mW, dist=10mm, f=5500 MHz/Zoom Scan, dist=1.4mm (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 70.03 V/m; Power Drift = -0.02 dB
Peak SAR (extrapolated) = 30.9 W/kg
SAR(1 g) = 8.02 W/kg; SAR(10 g) = 2.29 W/kg

Product Service

Dipole Calibration for Head Tissue/Pin=100mW, dist=10mm, f=5600 MHz/Zoom Scan, dist=1.4mm (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 70.52 V/m; Power Drift = -0.07 dB
Peak SAR (extrapolated) = 31.7 W/kg
SAR(1 g) = 8.15 W/kg; SAR(10 g) = 2.34 W/kg
Maximum value of SAR (measured) = 19.6 W/kg

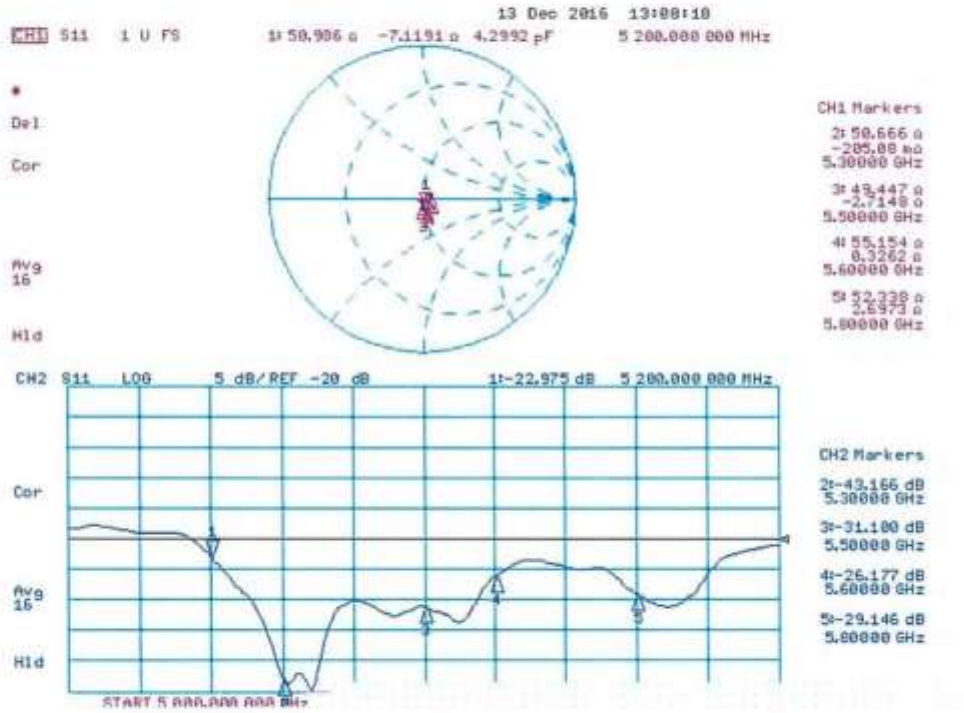
Dipole Calibration for Head Tissue/Pin=100mW, dist=10mm, f=5800 MHz/Zoom Scan, dist=1.4mm (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 67.49 V/m; Power Drift = -0.03 dB
Peak SAR (extrapolated) = 31.1 W/kg
SAR(1 g) = 7.67 W/kg; SAR(10 g) = 2.19 W/kg
Maximum value of SAR (measured) = 18.7 W/kg



0 dB = 18.7 W/kg = 12.72 dBW/kg

Product Service

Impedance Measurement Plot for Head TSL



Product Service

DASY5 Validation Report for Body TSL

Date: 13.12.2016

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole D5GHzV2; Type: D5GHzV2; Serial: D5GHzV2 - SN: 1100

Communication System: UID 0 - CW; Frequency: 5200 MHz, Frequency: 5300 MHz, Frequency: 5500 MHz, Frequency: 5600 MHz, Frequency: 5800 MHz
Medium parameters used: f = 5200 MHz; σ = 5.46 S/m; ε_r = 47.1; ρ = 1000 kg/m^3 ,
Medium parameters used: f = 5300 MHz; σ = 5.59 S/m; ε_r = 46.9; ρ = 1000 kg/m^3 ,
Medium parameters used: f = 5500 MHz; σ = 5.86 S/m; ε_r = 46.5; ρ = 1000 kg/m^3 ,
Medium parameters used: f = 5600 MHz; σ = 6 S/m; ε_r = 46.4; ρ = 1000 kg/m^3 ,
Medium parameters used: f = 5800 MHz; σ = 6.28 S/m; ε_r = 46; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN3503; ConvF(4.99, 4.99, 4.99); Calibrated: 30.06.2016, ConvF(4.75, 4.75, 4.75); Calibrated: 30.06.2016, ConvF(4.4, 4.4, 4.4); Calibrated: 30.06.2016, ConvF(4.35, 4.35, 4.35); Calibrated: 30.06.2016, ConvF(4.27, 4.27, 4.27); Calibrated: 30.06.2016;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 30.12.2015
- Phantom: Flat Phantom 5.0 (back); Type: QD 000 P50 AA; Serial: 1002
- DASY52 52.8.8(1258); SEMCAD X 14.6.10(7372)

Dipole Calibration for Body Tissue/Pin=100mW, dist=10mm, f=5200 MHz/Zoom Scan, dist=1.4mm (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 65.90 V/m; Power Drift = -0.04 dB
Peak SAR (extrapolated) = 26.9 W/kg
SAR(1 g) = 7.23 W/kg; SAR(10 g) = 2.03 W/kg
Maximum value of SAR (measured) = 16.5 W/kg

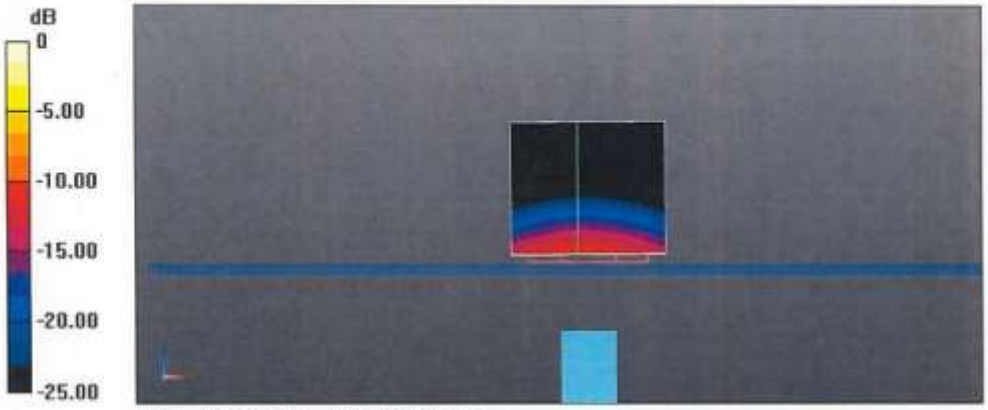
Dipole Calibration for Body Tissue/Pin=100mW, dist=10mm, f=5300 MHz/Zoom Scan, dist=1.4mm (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 67.72 V/m; Power Drift = -0.03 dB
Peak SAR (extrapolated) = 29.7 W/kg
SAR(1 g) = 7.76 W/kg; SAR(10 g) = 2.18 W/kg
Maximum value of SAR (measured) = 18.1 W/kg

Product Service

Dipole Calibration for Body Tissue/Pin=100mW, dist=10mm, f=5500 MHz/Zoom Scan, dist=1.4mm (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 67.42 V/m; Power Drift = -0.02 dB
Peak SAR (extrapolated) = 31.9 W/kg
SAR(1 g) = 7.9 W/kg; SAR(10 g) = 2.19 W/kg
Maximum value of SAR (measured) = 18.7 W/kg

Dipole Calibration for Body Tissue/Pin=100mW, dist=10mm, f=5600 MHz/Zoom Scan, dist=1.4mm (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 66.84 V/m; Power Drift = -0.05 dB
Peak SAR (extrapolated) = 32.0 W/kg
SAR(1 g) = 7.83 W/kg; SAR(10 g) = 2.19 W/kg

Dipole Calibration for Body Tissue/Pin=100mW, dist=10mm, f=5800 MHz/Zoom Scan, dist=1.4mm (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 64.37 V/m; Power Drift = -0.05 dB
Peak SAR (extrapolated) = 32.4 W/kg
SAR(1 g) = 7.46 W/kg; SAR(10 g) = 2.07 W/kg
Maximum value of SAR (measured) = 18.2 W/kg



0 dB = 18.2 W/kg = 12.60 dBW/kg

Product Service

Impedance Measurement Plot for Body TSL