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Report On

Specific Absorption Rate Testing of the
Symetrica Inc, VeriFinder Radiation Detector

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Specific Absorption Rate Testing of the
Symetrica Inc, VeriFinder Radiation Detector.

Document 75941251 Report 04 Issue 3

May 2025

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SECTION 1

REPORT SUMMARY

Specific Absorption Rate Testing of the
Symetrica Inc, VeriFinder Radiation Detector



1.1 INTRODUCTION

The information contained in this report is intended to show verification of the Specific Absorption Rate Testing of the Symetrica Inc, VeriFinder Radiation Detector.

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	Symetrica Inc
Manufacturer	Symetrica Inc
Manufacturing Description	Handheld gamma and neutron radiation detector
Model	SN23-N
Serial/IMEI Number(s)	172001
Number of Samples Tested	1
Hardware Version	05
Software Version	2.28
Battery Cell Manufacturer	Inspired Energy
Battery Model Number	NB2037
Test Specification/Issue/Date	KDB 447498 D01 v06 General RF Exposure Guidance
Start of Test	09 February 2018
Finish of Test	20 February 2018
Related Document(s)	FCC 47CFR 2.1093:2023 KDB 865664 – D01 v01r04 KDB 865664 – D02 v01r02 KDB 941225 – D01 v03r01 KDB 248227 – D01 v02r02 IEEE 1528-2013
Name of Engineer	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 1 g volume averaged stand-alone SAR found during this Assessment:

Max 1 g SAR (W/kg) Body	1.10 (Measured)	1.54 (Scaled)
The maximum 1 g 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 1 g volume averaged stand-alone Reported SAR found during this Assessment for each supported mode:

Band	Test Configuration	Max Reported Scaled SAR (W/kg)	Highest Simultaneous Transmission Scaled SAR (W/kg)
GSM 835 / GPRS	Body	0.15	1.54
PCS 1900 / GPRS	Body	1.27	
FDD II / WCDMA	Body	1.54	
FDD IV / WCDMA	Body	1.49	
FDD V / WCDMA	Body	0.05	
2.4 GHz WLAN	Body	0.28	
2.4 GHz Bluetooth	Body	0.08	
The maximum 1 g volume averaged SAR level measured for all the tests performed (including simultaneous transmission analysis results) 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 1 g SAR (W/kg)*	Percentage Drift on Reference
09/02/2018	2450	50.56	-0.15
12/02/2018	2450	49.76	-2.81
13/02/2018	2450	49.76	-2.81
13/02/2018	835	9.95	2.47
14/02/2018	835	9.91	2.06
15/02/2018	835	9.95	2.47
15/02/2018	835	9.95	2.47
16/02/2018	1900	37.78	-5.08
19/02/2018	835	10.15	4.53
19/02/2018	1800	37.70	-2.08
20/02/2018	2450	48.57	-5.14

*Normalised to a forward power of 1 W



1.3.2 Results Summary Tables

GSM 835 – GPRS 4 Timeslots - Body Specific Absorbnt Rate (Maximum SAR) 1 g Results

Test Position	Channel Number	Frequency (MHz)	Measured Average Power (dBm)	Tune Up (dBm)	Measured 1 g SAR (W/kg)	Scaled 1 g SAR (W/kg)	Scan Figure Number
0 mm Front Face	251	848.8	30.30	31.50	0.00	0.00	Figure 2
0 mm Right Face	251	848.8	30.30	31.50	0.11	0.15	Figure 3
0 mm Top Face (Handle)	251	848.8	30.30	31.50	0.00	0.00	Figure 4
0 mm Top Face (Screen)	251	848.8	30.30	31.50	0.00	0.00	Figure 5
0 mm Bottom Face	251	848.8	30.30	31.50	0.00	0.00	Figure 6
0 mm Left Face	251	848.8	30.30	31.50	0.00	0.00	Figure 7
Limit for General Population (Uncontrolled Exposure) 1.6 W/kg (1 g) KDB 447498 D01 - Testing of other required channels within the operation mode of a frequency band is not required when the reported 1 g SAR for mid-band or highest output power channel is: ≤ 0.8 W/kg when the transmission band is ≤ 100 MHz ≤ 0.6 W/kg when the transmission band is between 100 MHz and 200 MHz ≤ 0.4 W/kg when the transmission band is ≥ 200 MHz 4 timeslots were used due to maximum source-based time-averaged output power measured across the frame.							

PCS 1900 – GPRS 4 Timeslots - Body Specific Absorbnt Rate (Maximum SAR) 1 g Results

Test Position	Channel Number	Frequency (MHz)	Measured Average Power (dBm)	Tune Up (dBm)	Measured 1 g SAR (W/kg)	Scaled 1 g SAR (W/kg)	Scan Figure Number
0 mm Front Face	661	1880	26.97	28.50	0.02	0.03	Figure 8
0 mm Right Face	661	1880	26.97	28.50	0.89	1.27	Figure 9
0 mm Top Face (Handle)	661	1880	26.97	28.50	0.00	0.00	Figure 10
0 mm Top Face (Screen)	661	1880	26.97	28.50	0.00	0.00	Figure 11
0 mm Bottom Face	661	1880	26.97	28.50	0.01	0.01	Figure 12
0 mm Left Face	661	1880	26.97	28.50	0.00	0.00	Figure 13
0 mm Right Face	512	1835.2	26.87	28.50	0.75	1.09	Figure 14
0 mm Right Face	810	1909.8	26.94	28.50	0.88	1.26	Figure 15
Limit for General Population (Uncontrolled Exposure) 1.6 W/kg (1 g) KDB 447498 D01 - Testing of other required channels within the operation mode of a frequency band is not required when the reported 1 g SAR for mid-band or highest output power channel is: ≤ 0.8 W/kg when the transmission band is ≤ 100 MHz ≤ 0.6 W/kg when the transmission band is between 100 MHz and 200 MHz ≤ 0.4 W/kg when the transmission band is ≥ 200 MHz 4 timeslots were used due to maximum source-based time-averaged output power measured across the frame.							



FDD V - WCDMA 12.2kbps RMC - Body Specific Absorbtion Rate (Maximum SAR) 1 g Results

Test Position	Channel Number	Frequency (MHz)	Measured Average Power (dBm)	Tune Up (dBm)	Measured 1 g SAR (W/kg)	Scaled 1 g SAR (W/kg)	Scan Figure Number
0 mm Front Face	4132	826.4	22.98	24.00	0.00	0.00	Figure 16
0 mm Right Face	4132	826.4	22.98	24.00	0.04	0.05	Figure 17
0 mm Top Face (Handle)	4132	826.4	22.98	24.00	0.00	0.00	Figure 18
0 mm Top Face (Screen)	4132	826.4	22.98	24.00	0.00	0.00	Figure 19
0 mm Bottom Face	4132	826.4	22.98	24.00	0.00	0.00	Figure 20
0 mm Left Face	4132	826.4	22.98	24.00	0.00	0.00	Figure 21
Limit for General Population (Uncontrolled Exposure) 1.6 W/kg (1 g) KDB 447498 D01 - Testing of other required channels within the operation mode of a frequency band is not required when the reported 1 g SAR for mid-band or highest output power channel is: ≤ 0.8 W/kg when the transmission band is ≤ 100 MHz ≤ 0.6 W/kg when the transmission band is between 100 MHz and 200 MHz ≤ 0.4 W/kg when the transmission band is ≥ 200 MHz 4 timeslots were used due to maximum source-based time-averaged output power measured across the frame.							

FDD IV - WCDMA 12.2kbps RMC - Body Specific Absorbtion Rate (Maximum SAR) 1 g Results

Test Position	Channel Number	Frequency (MHz)	Measured Average Power (dBm)	Tune Up (dBm)	Measured 1 g SAR (W/kg)	Scaled 1 g SAR (W/kg)	Scan Figure Number
0 mm Front Face	1312	1712.4	23.20	24.00	0.02	0.02	Figure 22
0 mm Right Face	1312	1712.4	23.20	24.00	1.16	1.39	Figure 23
0 mm Top Face (Handle)	1312	1714.2	23.20	24.00	0.00	0.00	Figure 24
0 mm Top Face (Screen)	1312	1714.2	23.20	24.00	0.00	0.00	Figure 25
0 mm Bottom Face	1312	1712.4	23.20	24.00	0.00	0.00	Figure 26
0 mm Left Face	1312	1712.4	23.20	24.00	0.00	0.00	Figure 27
0 mm Right Face	1412	1732.6	22.98	24.00	1.18	1.49	Figure 28
0 mm Right Edge	1512	1752.6	22.95	24.00	1.09	1.39	Figure 29
Limit for General Population (Uncontrolled Exposure) 1.6 W/kg (1 g) KDB 447498 D01 - Testing of other required channels within the operation mode of a frequency band is not required when the reported 1 g SAR for mid-band or highest output power channel is: ≤ 0.8 W/kg when the transmission band is ≤ 100 MHz ≤ 0.6 W/kg when the transmission band is between 100 MHz and 200 MHz ≤ 0.4 W/kg when the transmission band is ≥ 200 MHz 4 timeslots were used due to maximum source-based time-averaged output power measured across the frame.							



FDD II - WCDMA 12.2 kbps RMC - Body Specific Absorbtion Rate (Maximum SAR) 1 g Results

Test Position	Channel Number	Frequency (MHz)	Measured Average Power (dBm)	Tune Up (dBm)	Measured 1 g SAR (W/kg)	Scaled 1 g SAR (W/kg)	Scan Figure Number
0 mm Front Face	9262	1852.4	22.93	24.00	0.02	0.03	Figure 30
0 mm Right Face	9262	1852.4	22.93	24.00	1.18	1.51	Figure 31
0 mm Top Face (Handle)	9262	1852.4	22.93	24.00	0.00	0.00	Figure 32
0 mm Top Face (Screen)	9262	1852.4	22.93	24.00	0.01	0.01	Figure 33
0 mm Bottom Face	9262	1852.4	22.93	24.00	0.01	0.01	Figure 34
0 mm Left Face	9262	1852.4	22.93	24.00	0.00	0.00	Figure 35
0 mm Right Face	9400	1880.0	22.81	24.00	0.89	1.17	Figure 36
0 mm Right Face	9538	1907.6	22.53	24.00	1.10	1.54	Figure 37
Limit for General Population (Uncontrolled Exposure) 1.6 W/kg (1 g) KDB 447498 D01 - Testing of other required channels within the operation mode of a frequency band is not required when the reported 1 g SAR for mid-band or highest output power channel is: ≤ 0.8 W/kg when the transmission band is ≤ 100 MHz ≤ 0.6 W/kg when the transmission band is between 100 MHz and 200 MHz ≤ 0.4 W/kg when the transmission band is ≥ 200 MHz 4 timeslots were used due to maximum source-based time-averaged output power measured across the frame.							

2450 MHz - Bluetooth Classic GFSK DH5 - Body Specific Absorbtion Rate (Maximum SAR) 1 g Results

Test Position	Channel Number	Frequency (MHz)	Measured Average Power (dBm)	Tune Up (dBm)	Measured 1 g SAR (W/kg)	Scaled 1 g SAR (W/kg)	Scan Figure Number
0 mm Front Face	79	2480	11.60	11.70	0.00	0.00	Figure 38
0 mm Right Face	79	2480	11.60	11.70	0.00	0.00	Figure 39
0 mm Top Face (Screen)	79	2480	11.60	11.70	0.00	0.00	Figure 40
0 mm Top Face (Handle)	79	2480	11.60	11.70	0.00	0.00	Figure 41
0 mm Bottom Face	79	2480	11.60	11.70	0.00	0.00	Figure 42
0 mm Left Face	79	2480	11.60	11.70	0.08	0.08	Figure 43
Limit for General Population (Uncontrolled Exposure) 1.6 W/kg (1 g) KDB 447498 D01 - Testing of other required channels within the operation mode of a frequency band is not required when the reported 1 g SAR for mid-band or highest output power channel is: ≤ 0.8 W/kg when the transmission band is ≤ 100 MHz ≤ 0.6 W/kg when the transmission band is between 100 MHz and 200 MHz ≤ 0.4 W/kg when the transmission band is ≥ 200 MHz 4 timeslots were used due to maximum source-based time-averaged output power measured across the frame.							



2450 MHz - WLAN 802.11b 20 MHz 1 Mbps - SISO Antenna 1 - Body Specific
Absorption Rate (Maximum SAR) 1 g Results

Test Position	Channel Number	Frequency (MHz)	Measured Average Power (dBm)	Tune Up (dBm)	Measured 1 g SAR (W/kg)	Scaled 1 g SAR (W/kg)	Scan Figure Number
0 mm Front Face	6	2437	16.00	16.00	0.00	0.00	Figure 44
0 mm Right Face	6	2437	16.00	16.00	0.00	0.00	Figure 45
0 mm Top Face (Screen)	6	2437	16.00	16.00	0.00	0.00	Figure 46
0 mm Top Face (Handle)	6	2437	16.00	16.00	0.00	0.00	Figure 47
0 mm Bottom Face	6	2437	16.00	16.00	0.00	0.00	Figure 48
0 mm Left Face	6	2437	16.00	16.00	0.21	0.21	Figure 49
0 mm Left Face	6	2437	16.00	16.00	0.23	0.23	Figure 50
Limit for General Population (Uncontrolled Exposure) 1.6 W/kg (1 g) KDB 447498 D01 - Testing of other required channels within the operation mode of a frequency band is not required when the reported 1 g SAR for mid-band or highest output power channel is: ≤ 0.8 W/kg when the transmission band is ≤ 100 MHz ≤ 0.6 W/kg when the transmission band is between 100 MHz and 200 MHz ≤ 0.4 W/kg when the transmission band is ≥ 200 MHz KDB 248227 D01 v02 – Fast SAR was used to determine the initial test position as per Section 5.1.1 KDB 248227 D01 v02 - Testing was not required for OFDM as per Section 5.2.2							



2450 MHz - WLAN 802.11n 20 MHz 39 Mbps – MIMO Antenna 1 and 2 -
Specific Absorption Rate (Maximum SAR) 1 g Results

Test Position	Antenna	Channel Number	Frequency (MHz)	Measured Average Power (dBm)	Tune Up (dBm)	Measured 1 g SAR (W/kg)	Scaled 1 g SAR (W/kg)	Scan Figure Number
0 mm Front Face	1	6	2437	13.10	14.00	0.00	0.00	Figure 51
	2	6	2437	13.70	14.00	0.00	0.00	
0 mm Right Face	1	6	2437	13.10	14.00	0.00	0.00	Figure 52
	2	6	2437	13.70	14.00	0.00	0.00	
0 mm Top Face (Screen)	1	6	2437	13.10	14.00	0.00	0.00	Figure 53
	2	6	2437	13.70	14.00	0.00	0.00	
0 mm Top Face (Handle)	1	6	2437	13.10	14.00	0.00	0.00	Figure 54
	2	6	2437	13.70	14.00	0.00	0.00	
0 mm Bottom Face	1	6	2437	13.10	14.00	0.00	0.00	Figure 55
	2	6	2437	13.70	14.00	0.09	0.10	
0 mm Left Face	1	6	2437	13.10	14.00	0.07	0.09	Figure 56
	2	6	2437	13.70	14.00	0.19	0.20	
0 mm Left Face	1	6	2437	13.10	14.00	0.07	0.09	Figure 57
	2	6	2437	13.70	14.00	0.22	0.24	
Limit for General Population (Uncontrolled Exposure) 1.6 W/kg (1 g) KDB 447498 D01 - Testing of other required channels within the operation mode of a frequency band is not required when the reported 1 g SAR for mid-band or highest output power channel is: ≤ 0.8 W/kg when the transmission band is ≤ 100 MHz ≤ 0.6 W/kg when the transmission band is between 100 MHz and 200 MHz ≤ 0.4 W/kg when the transmission band is ≥ 200 MHz KDB 248227 D01 v02 – Fast SAR was used to determine the initial test position as per Section 5.1.1 Scan shows highest recorded SAR distribution								



1.3.3 Simultaneous Transmission

Position	GPRS 835 MHz 1 g SAR (W/kg) (Scaled SAR values)	WLAN 2.4 GHz 1 g SAR (W/kg) (Scaled SAR values)	Σ 1 g SAR (W/kg)
Front Face	0.00	0.00	0.00
Right Face°	0.15	0.00	0.15
Top Face (Handle)	0.00	0.00	0.00
Top Face (Screen)	0.00	0.00	0.00
Bottom Face	0.00	0.00	0.00
Left Face	0.00	0.23	0.23
Simultaneous Transmission KDB 447498 D01			

Simultaneous SAR measurements were not required as the sum of the 1 g SAR measurements did not exceed 1.6 W/kg.

Position	GPRS 1900MHz 1 g SAR (W/kg) (Scaled SAR values)	WLAN 2.4GHz 1 g SAR (W/kg) (Scaled SAR values)	Σ 1 g SAR (W/kg)
Front Face	0.02	0.00	0.02
Right Face°	1.27	0.00	0.127
Top Face (Handle)	0.00	0.00	0.00
Top Face (Screen)	0.00	0.00	0.00
Bottom Face	0.01	0.00	0.01
Left Face	0.00	0.23	0.23
Simultaneous Transmission KDB 447498 D01			

Simultaneous SAR measurements were not required as the sum of the 1 g SAR measurements did not exceed 1.6 W/kg.

Position	WCDMA FDD V 1 g SAR (W/kg) (Scaled SAR values)	WLAN 2.4 GHz 1 g SAR (W/kg) (Scaled SAR values)	Σ 1 g SAR (W/kg)
Front Face	0.00	0.00	0.00
Right Face°	0.05	0.00	0.05
Top Face (Handle)	0.00	0.00	0.00
Top Face (Screen)	0.00	0.00	0.00
Bottom Face	0.00	0.00	0.00
Left Face	0.00	0.23	0.23
Simultaneous Transmission KDB 447498 D01			

Simultaneous SAR measurements were not required as the sum of the 1 g SAR measurements did not exceed 1.6 W/kg.



Position	WCDMA FDD IV 1 g SAR (W/kg) (Scaled SAR values)	WLAN 2.4 GHz 1 g SAR (W/kg) (Scaled SAR values)	Σ 1 g SAR (W/kg)
Front Face	0.02	0.00	0.02
Right Face°	1.49	0.00	1.49
Top Face (Handle)	0.00	0.00	0.00
Top Face (Screen)	0.01	0.00	0.01
Bottom Face	0.00	0.00	0.00
Left Face	0.00	0.23	0.23
Simultaneous Transmission KDB 447498 D01			

Simultaneous SAR measurements were not required as the sum of the 1 g SAR measurements did not exceed 1.6 W/kg.

Position	WCDMA FDD II 1 g SAR (W/kg) (Scaled SAR values)	WLAN 2.4 GHz 1 g SAR (W/kg) (Scaled SAR values)	Σ 1 g SAR (W/kg)
Front Face	0.02	0.00	0.02
Right Face°	1.54	0.00	1.54
Top Face (Handle)	0.00	0.00	0.00
Top Face (Screen)	0.01	0.00	0.01
Bottom Face	0.01	0.00	0.01
Left Face	0.00	0.23	0.23
Simultaneous Transmission KDB 447498 D01			

Simultaneous SAR measurements were not required as the sum of the 1 g SAR measurements did not exceed 1.6 W/kg.

Position	GPRS 835 MHz 1 g SAR (W/kg) (Scaled SAR values)	Bluetooth 2.4 GHz 1 g SAR (W/kg) (Scaled SAR values)	Σ 1 g SAR (W/kg)
Front Face	0.00	0.00	0.00
Right Face°	0.15	0.00	0.15
Top Face (Handle)	0.00	0.00	0.00
Top Face (Screen)	0.00	0.00	0.00
Bottom Face	0.00	0.00	0.00
Left Face	0.00	0.08	0.08
Simultaneous Transmission KDB 447498 D01			

Simultaneous SAR measurements were not required as the sum of the 1 g SAR measurements did not exceed 1.6 W/kg.



Position	GPRS 1900 MHz 1 g SAR (W/kg) (Scaled SAR values)	Bluetooth 2.4 GHz 1 g SAR (W/kg) (Scaled SAR values)	Σ 1 g SAR (W/kg)
Front Face	0.03	0.00	0.03
Right Face°	1.27	0.00	1.27
Top Face (Handle)	0.00	0.00	0.00
Top Face (Screen)	0.00	0.00	0.00
Bottom Face	0.01	0.00	0.01
Left Face	0.00	0.08	0.08
Simultaneous Transmission KDB 447498 D01			

Simultaneous SAR measurements were not required as the sum of the 1 g SAR measurements did not exceed 1.6 W/kg.

Position	WCDMA FDD V 1 g SAR (W/kg) (Scaled SAR values)	Bluetooth 2.4GHz 1 g SAR (W/kg) (Scaled SAR values)	Σ 1 g SAR (W/kg)
Front Face	0.00	0.00	0.00
Right Face°	0.05	0.00	0.05
Top Face (Handle)	0.00	0.00	0.00
Top Face (Screen)	0.00	0.00	0.00
Bottom Face	0.00	0.00	0.00
Left Face	0.00	0.08	0.08
Simultaneous Transmission KDB 447498 D01			

Simultaneous SAR measurements were not required as the sum of the 1 g SAR measurements did not exceed 1.6 W/kg.

Position	WCDMA FDD IV 1 g SAR (W/kg) (Scaled SAR values)	Bluetooth 2.4GHz 1 g SAR (W/kg) (Scaled SAR values)	Σ 1 g SAR (W/kg)
Front Face	0.02	0.00	0.02
Right Face°	1.49	0.00	1.49
Top Face (Handle)	0.00	0.00	0.00
Top Face (Screen)	0.00	0.00	0.00
Bottom Face	0.00	0.00	0.00
Left Face	0.00	0.08	0.08
Simultaneous Transmission KDB 447498 D01			



Simultaneous SAR measurements were not required as the sum of the 1 g SAR measurements did not exceed 1.6 W/kg

Position	WCDMA FDD II 1 g SAR (W/kg) (Scaled SAR values)	Bluetooth 2.4GHz 1 g SAR (W/kg) (Scaled SAR values)	Σ 1 g SAR (W/kg)
Front Face	0.03	0.00	0.03
Right Face°	1.54	0.00	1.54
Top Face (Handle)	0.00	0.00	0.00
Top Face (Screen)	0.01	0.00	0.01
Bottom Face	0.01	0.00	0.01
Left Face	0.00	0.08	0.08
Simultaneous Transmission KDB 447498 D01			

Simultaneous SAR measurements were not required as the sum of the 1 g SAR measurements did not exceed 1.6 W/kg

1.3.4 Standalone SAR Test Exclusion Considerations (KDB 447498 D01)

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

$[(\text{max power of channel, including tune-up tolerance, mW}) / (\text{min. test separation distance, mm})] [\sqrt{f_{\text{GHz}}}] \leq 3.0$, 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 and Technology	Frequency (MHz)	Max Power		Test Position	Distance (mm)	Threshold	Test Exclusion
		(dBm)	(mW)				
GSM 835 - GPRS	848.8	33	1995.26	Body	< 5	367.6	No
PCS 1900 - GPRS	1880	30	1000.00	Body	< 5	268.3	No
FDD II - WCDMA	1852.4	24	251.19	Body	< 5	68.4	No
FDD IV - WCDMA	1712.4	24	251.19	Body	< 5	65.7	No
FDD V - WCDMA	826.4	24	251.19	Body	< 5	45.7	No
2.4 GHz WLAN	2437	16.5	44.67	Body	< 5	19.9	No
2.4 GHz Bluetooth	2480	11.7	14.79	Body	< 5	4.7	No



1.3.5 Technical Description

The equipment under test (EUT) was a Symetrica Inc VeriFinder Radiation Detector. 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 by Symetrica and manufactured by Inspired Energy. There were no external connections to the device.

For body SAR assessment, testing was performed for GSM 835MHz (GPRS), PCS 1900MHz (GPRS), FDD V (WCDMA), FDD IV (WCDMA), FDD II (WCDMA) and 2.4 GHz (WLAN and Bluetooth) frequency bands at maximum power. The device was placed at a distance of 0 mm from the bottom of the Elliptical flat phantom for all body testing. The Elliptical Phantom has dimensions of: 600 mm major axis and a 400 mm minor axis with a shell thickness of 2.00 mm. The phantom was filled to a minimum depth of 150 mm with the appropriate Body simulant liquid. The dielectric properties were in accordance with the requirements specified in KDB 865665.

Due to the form factor, the top face of the EUT was scanned in two parts (referred to throughout the report as: Top Face (Screen) and Top Face (Handle). Images of each surface against the phantom, an antenna location diagram and a diagram of test surfaces, can be found in the SAR Test Set Up Exhibit document.

The product contains a Texas Instruments pre-approved 2.4 GHz WLAN and Bluetooth module which is FCC and Industry Canada certified (FCC ID: Z64-WL18DBMOD) and a UBLOX pre-approved cellular module (FCC ID: XPYLISAU200).

The EUT supports 802.11b, 802.11g and 802.11n for the 2.4 GHz WLAN frequency band in SISO and MIMO modes. In the real time function of the EUT the WLAN Antenna 2 is never used in SISO mode therefore MIMO test exclusion was not applied.

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

Worst case data rates used for 2.4 GHz was 802.11b ,1 mbps (SISO mode) and 802.11n MCS10. For Bluetooth the worst case mode was Bluetooth classic, DH5. The worst case was deemed as the data rate which produced the highest level of conducted average power

SAR testing for UMTS bands FDD II, FDD IV and FDD V was measured using 12.2 kbps RMC with the TPC bits configured to all 1's. SAR testing for HSDPA and HSUPA was not required based on the measured maximum average output of each RF channel with HSDPA/HSUPA active being less than ¼ dB higher than that measured without HSDPA using 12.2 kbps RMC.

All EUT test configurations were configured by the customer.

Testing was performed in each position at the frequency that gave the highest output power for each band. 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.

Low SAR levels were found for GPRS in the GSM 835 band and for WCDMA in the FDD V band, upon investigation it was found the antenna used for these band had a low insertion loss and had increased performance for the higher frequency bands.

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.



1.4 FCC POWER MEASUREMENTS

1.4.1 Method

Conducted power measurements were made using a power meter.

1.4.2 Conducted Power Measurements

GSM 835

Mode	Frequency (MHz)	Duty Cycle (%)	Burst Average Power (dBm)	Frame Average Power (dBm)
GPRS - 1 Timeslot	824.2	12.5	32.33	22.86
GPRS - 1 Timeslot	836.4	12.5	32.34	22.86
GPRS - 1 Timeslot	848.8	12.5	32.26	22.77
GPRS - 2 Timeslot	824.2	25.0	32.29	25.83
GPRS - 2 Timeslot	836.4	25.0	32.31	25.83
GPRS - 2 Timeslot	848.8	25.0	32.24	25.76
GPRS - 3 Timeslot	824.2	37.5	31.46	26.76
GPRS - 3 Timeslot	836.4	37.5	31.46	26.74
GPRS - 3 Timeslot	848.8	37.5	31.36	26.65
GPRS - 4 Timeslot	824.2	50.0	30.24	26.80
GPRS - 4 Timeslot	836.4	50.0	30.27	26.81
GPRS - 4 Timeslot	848.8	50.0	30.30	26.82

PCS 1900

Mode	Frequency (MHz)	Duty Cycle (%)	Burst Average Power (dBm)	Frame Average Power (dBm)
GPRS - 1 Timeslot	1835.2	12.5	28.86	19.38
GPRS - 1 Timeslot	1880.0	12.5	29.01	19.54
GPRS - 1 Timeslot	1909.8	12.5	28.97	19.50
GPRS - 2 Timeslot	1835.2	25.0	28.84	22.37
GPRS - 2 Timeslot	1880.0	25.0	29.00	22.55
GPRS - 2 Timeslot	1909.8	25.0	28.95	22.49
GPRS - 3 Timeslot	1835.2	37.5	28.01	23.32
GPRS - 3 Timeslot	1880.0	37.5	28.17	23.46
GPRS - 3 Timeslot	1909.8	37.5	28.13	23.42
GPRS - 4 Timeslot	1835.2	50.0	26.81	23.36
GPRS - 4 Timeslot	1880.0	50.0	26.97	23.53
GPRS - 4 Timeslot	1909.8	50.0	26.94	23.49

**WCDMA FDD V**

Mode	Frequency (MHz)	Duty Cycle (%)	Peak Power (dBm)	Burst Average Power (dBm)
12.2 kbps RMC	826.4	100	25.93	22.98
12.2 kbps RMC	835	100	25.95	22.78
12.2 kbps RMC	846.6	100	25.92	22.84
12.2 kbps AMR with 3.4 kbps SRB	826.4	100	25.76	22.87
12.2 kbps AMR with 3.4 kbps SRB	835	100	25.64	22.78
12.2 kbps AMR with 3.4 kbps SRB	846.6	100	25.66	22.78
HSDPA - Subtest 1	826.4	100	26.81	22.82
HSDPA - Subtest 1	835	100	26.7	22.73
HSDPA - Subtest 1	846.6	100	26.65	22.74
HSDPA - Subtest 2	826.4	100	27.2	21.77
HSDPA - Subtest 2	835	100	27.13	21.7
HSDPA - Subtest 2	846.6	100	26.9	21.68
HSDPA - Subtest 3	826.4	100	27.07	21.84
HSDPA - Subtest 3	835	100	27.06	21.77
HSDPA - Subtest 3	846.6	100	27.04	21.79
HSDPA - Subtest 4	826.4	100	26.89	20.93
HSDPA - Subtest 4	835	100	26.87	20.85
HSDPA - Subtest 4	846.6	100	26.71	20.93
HSUPA - Subtest 1	826.4	100	27.21	22.31
HSUPA - Subtest 1	835	100	27.29	22.23
HSUPA - Subtest 1	846.6	100	27.34	22.28
HSUPA - Subtest 2	826.4	100	27.4	22.34
HSUPA - Subtest 2	835	100	27.41	22.25
HSUPA - Subtest 2	846.6	100	27.48	22.25
HSUPA - Subtest 3	826.4	100	27.25	22.33
HSUPA - Subtest 3	835	100	27.43	22.3
HSUPA - Subtest 3	846.6	100	27.47	22.29
HSUPA - Subtest 4	826.4	100	27.39	22.33
HSUPA - Subtest 4	835	100	27.35	22.31
HSUPA - Subtest 4	846.6	100	27.6	22.25
HSUPA - Subtest 5	826.4	100	27.78	22.95
HSUPA - Subtest 5	835	100	27.7	22.88
HSUPA - Subtest 5	846.6	100	27.79	22.86



WCDMA FDD IV

Mode	Frequency (MHz)	Duty Cycle (%)	Peak Power (dBm)	Burst Average Power (dBm)
12.2 kbps RMC	1712.4	100	26.38	23.20
12.2 kbps RMC	1732.6	100	25.95	22.98
12.2 kbps RMC	1752.6	100	25.94	22.95
12.2 kbps AMR with 3.4 kbps SRB	1712.4	100	26.23	23.24
12.2 kbps AMR with 3.4 kbps SRB	1732.6	100	25.84	22.99
12.2 kbps AMR with 3.4 kbps SRB	1752.6	100	25.79	23.07
HSDPA - Subtest 1	1712.4	100	26.32	23.12
HSDPA - Subtest 1	1732.6	100	26.37	22.86
HSDPA - Subtest 1	1752.6	100	26.03	22.93
HSDPA - Subtest 2	1712.4	100	26.87	22.07
HSDPA - Subtest 2	1732.6	100	26.48	21.87
HSDPA - Subtest 2	1752.6	100	26.6	21.95
HSDPA - Subtest 3	1712.4	100	26.83	22.23
HSDPA - Subtest 3	1732.6	100	26.49	22.00
HSDPA - Subtest 3	1752.6	100	26.52	22.08
HSDPA - Subtest 4	1712.4	100	26.67	22.17
HSDPA - Subtest 4	1732.6	100	26.35	21.07
HSDPA - Subtest 4	1752.6	100	26.44	21.17
HSUPA - Subtest 1	1712.4	100	27.01	22.65
HSUPA - Subtest 1	1732.6	100	26.66	22.44
HSUPA - Subtest 1	1752.6	100	26.74	22.52
HSUPA - Subtest 2	1712.4	100	27.07	22.26
HSUPA - Subtest 2	1732.6	100	26.68	22.40
HSUPA - Subtest 2	1752.6	100	26.76	22.50
HSUPA - Subtest 3	1712.4	100	27.03	22.69
HSUPA - Subtest 3	1732.6	100	26.64	22.43
HSUPA - Subtest 3	1752.6	100	26.76	22.52
HSUPA - Subtest 4	1712.4	100	27.05	22.61
HSUPA - Subtest 4	1732.6	100	26.63	22.45
HSUPA - Subtest 4	1752.6	100	26.81	22.48
HSUPA - Subtest 5	1712.4	100	26.81	22.46
HSUPA - Subtest 5	1732.6	100	26.24	22.22
HSUPA - Subtest 5	1752.6	100	26.46	22.34



WCDMA FDD II

Mode	Frequency (MHz)	Duty Cycle (%)	Peak Power (dBm)	Burst Average Power (dBm)
12.2 kbps RMC	1852.4	100	25.46	22.93
12.2 kbps RMC	1880	100	25.12	22.81
12.2 kbps RMC	1907.6	100	25	22.53
12.2 kbps AMR with 3.4 kbps SRB	1852.4	100	25.47	22.94
12.2 kbps AMR with 3.4 kbps SRB	1880	100	25.15	22.8
12.2 kbps AMR with 3.4 kbps SRB	1907.6	100	25.02	22.59
HSDPA - Subtest 1	1852.4	100	25.57	22.82
HSDPA - Subtest 1	1880	100	25.41	22.71
HSDPA - Subtest 1	1907.6	100	25.14	22.53
HSDPA - Subtest 2	1852.4	100	25.7	21.8
HSDPA - Subtest 2	1880	100	25.85	21.72
HSDPA - Subtest 2	1907.7	100	25.57	21.55
HSDPA - Subtest 3	1852.4	100	25.8	21.92
HSDPA - Subtest 3	1880	100	25.87	21.83
HSDPA - Subtest 3	1907.6	100	25.66	21.67
HSDPA - Subtest 4	1852.4	100	25.75	21.05
HSDPA - Subtest 4	1880	100	25.77	20.95
HSDPA - Subtest 4	1907.6	100	25.53	20.78
HSUPA - Subtest 1	1852.4	100	25.91	22.34
HSUPA - Subtest 1	1880	100	26.09	22.31
HSUPA - Subtest 1	1907.6	100	25.65	22.13
HSUPA - Subtest 2	1852.4	100	25.9	22.33
HSUPA - Subtest 2	1880	100	26.19	22.29
HSUPA - Subtest 2	1907.7	100	26.96	22.14
HSUPA - Subtest 3	1852.4	100	25.94	22.36
HSUPA - Subtest 3	1880	100	26.26	22.3
HSUPA - Subtest 3	1907.6	100	25.76	22.12
HSUPA - Subtest 4	1852.4	100	25.96	22.39
HSUPA - Subtest 4	1880	100	26.29	22.31
HSUPA - Subtest 4	1907.6	100	25.76	22.13
HSUPA - Subtest 5	1852.4	100	25.79	22.14
HSUPA - Subtest 5	1880	100	25.78	22.11
HSUPA - Subtest 5	1907.5	100	25.62	21.95

**WLAN 2450 MHz**

Mode	Frequency (MHz)	Duty Cycle (%)	Burst Average Power (dBm) 2.4 GHz Antenna 1	Burst Average Power (dBm) 2.4 GHz Antenna 2
802.11b - 20 MHz - 1 Mbps - SISO	2402	100	15.60	n/a
802.11b - 20 MHz - 1 Mbps - SISO	2437	100	16.00	n/a
802.11b - 20 MHz - 1 Mbps - SISO	2462	100	15.60	n/a
802.11 g - 20 MHz - 6 Mbps - SISO	2402	100	15.40	n/a
802.11 g - 20 MHz - 6 Mbps - SISO	2437	100	15.70	n/a
802.11 g - 20 MHz - 6 Mbps - SISO	2462	100	15.20	n/a
802.11n - 20 MHz – MCS10	2402	100	13.00	13.60
802.11n - 20 MHz – MCS10	2437	100	13.10	13.70
802.11n - 20 MHz – MCS10	2462	100	12.90	13.60

Bluetooth 2450 MHz

Mode	Frequency (MHz)	Packet Type	Burst Average Power (dBm) 2.4 GHz Antenna 1
Classic - GFSK	2402	DH5	11.50
Classic - GFSK	2441	DH5	11.50
Classic - GFSK	2480	DH5	11.60



SECTION 2

TEST DETAILS

Specific Absorption Rate Testing of the
Symetrica Inc, VeriFinder Radiation Detector

2.1 DASY5 MEASUREMENT SYSTEM

2.1.1 System Description

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

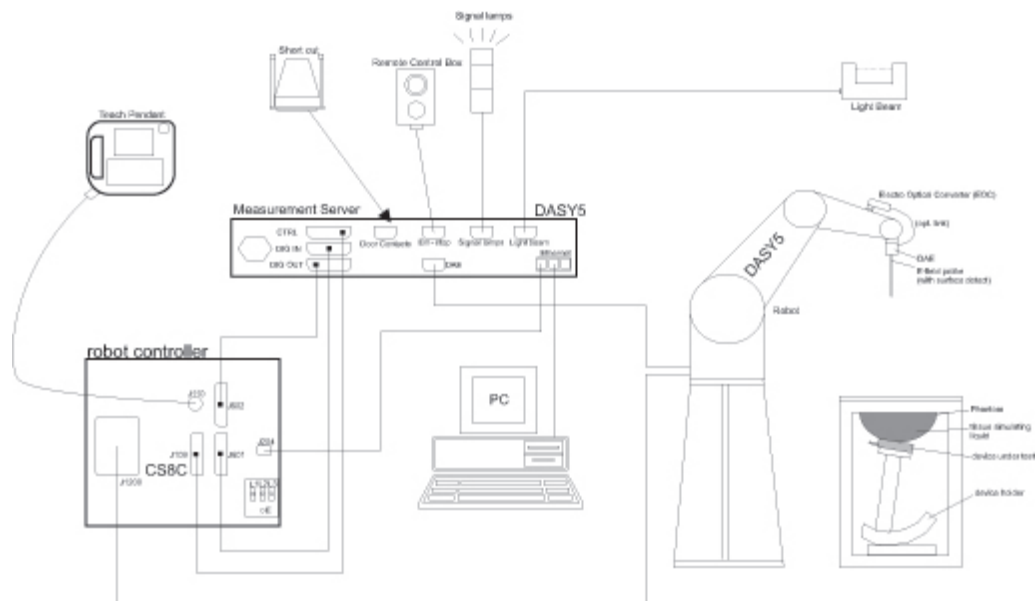


Figure 1 System Description Diagram

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 permittivities. 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 200 MOhm; 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 30 mm³ (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 10 g 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 2.7 mm 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. 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 10g cubes, the extrapolation distance should not be larger than 5 mm.

2.1.6 Averaging and Determination of Spatial Peak SAR

The interpolated data is used to average the SAR over the 1 g and 10 g cubes by spatially discretising the entire measured volume. The resolution of this spatial grid used to calculate the averaged SAR is 1 mm or about 42875 interpolated points. The resulting volumes are defined



as cubical volumes containing the appropriate tissue parameters that are centered 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 centered 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 GSM 835 GPRS - BODY SAR TEST RESULTS

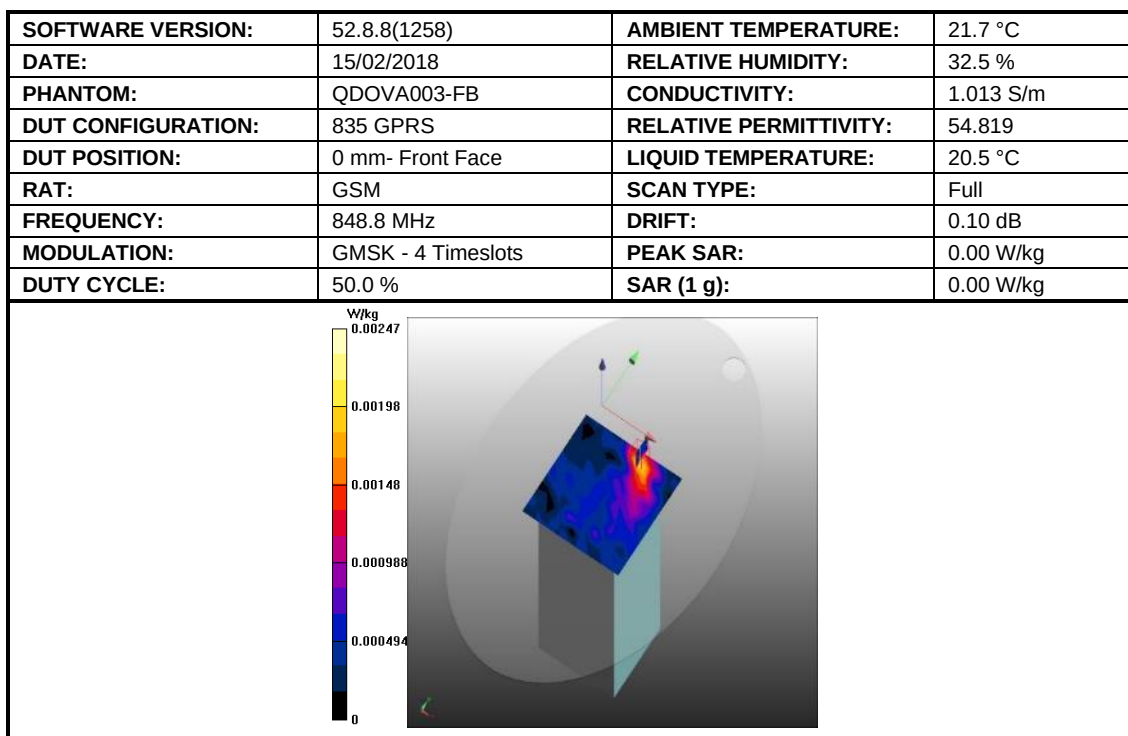


Figure 2: SAR Body Testing Results for the VeriFinder Radiation Detector at 848.8 MHz

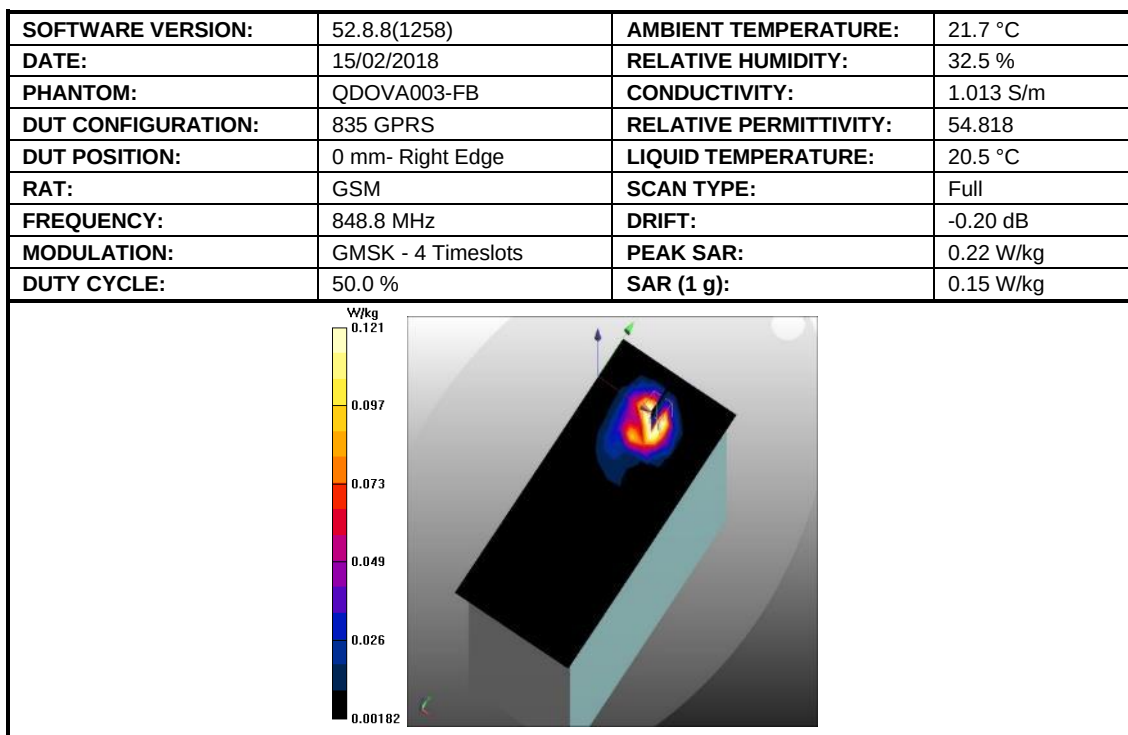


Figure 3: SAR Body Testing Results for the VeriFinder Radiation Detector at 848.8 MHz

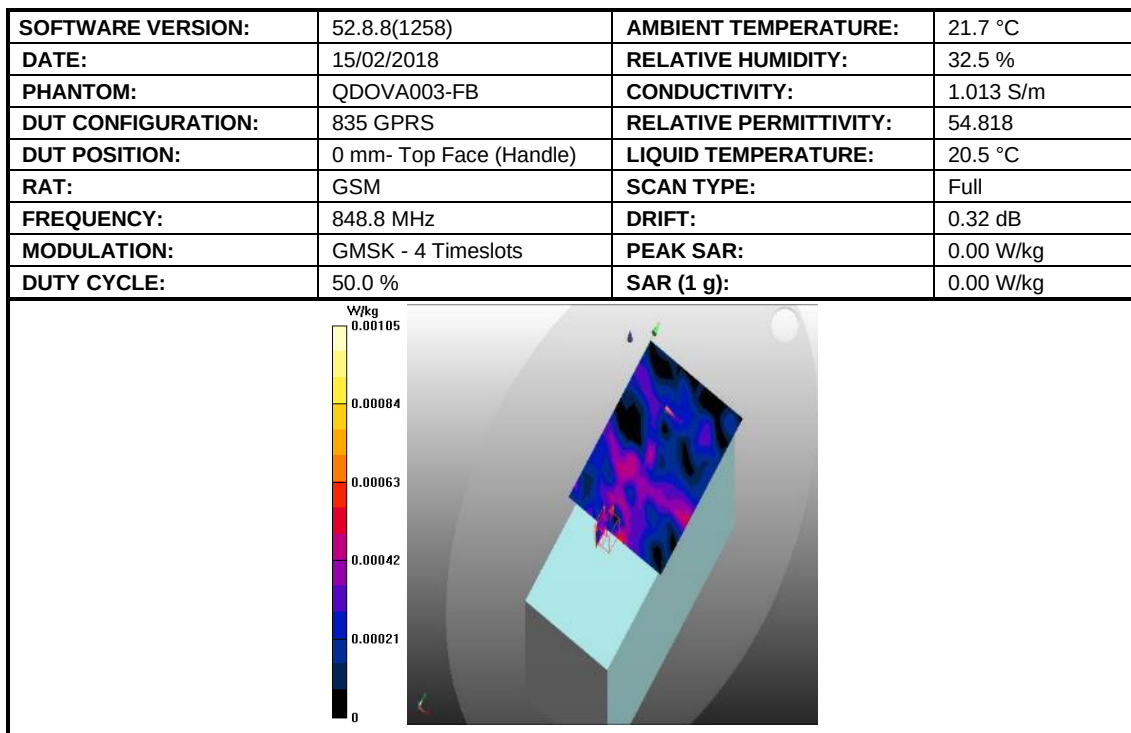


Figure 4: SAR Body Testing Results for the VeriFinder Radiation Detector at 848.8 MHz

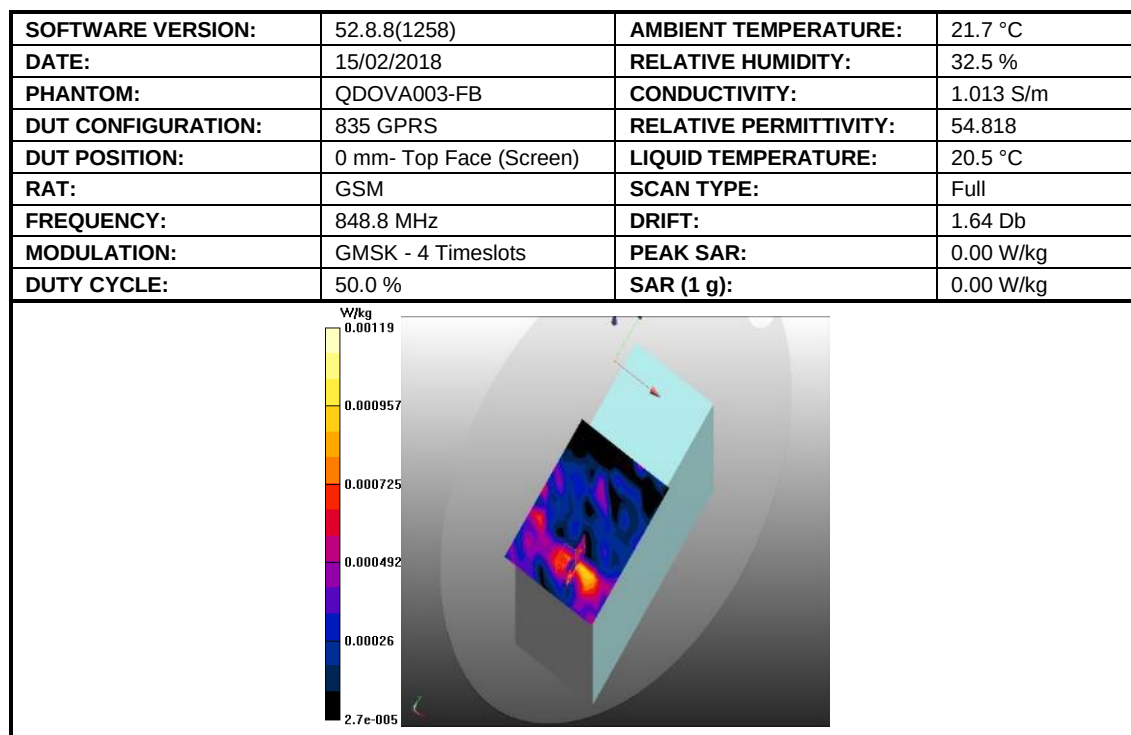


Figure 5: SAR Body Testing Results for the VeriFinder Radiation Detector at 848.8 MHz

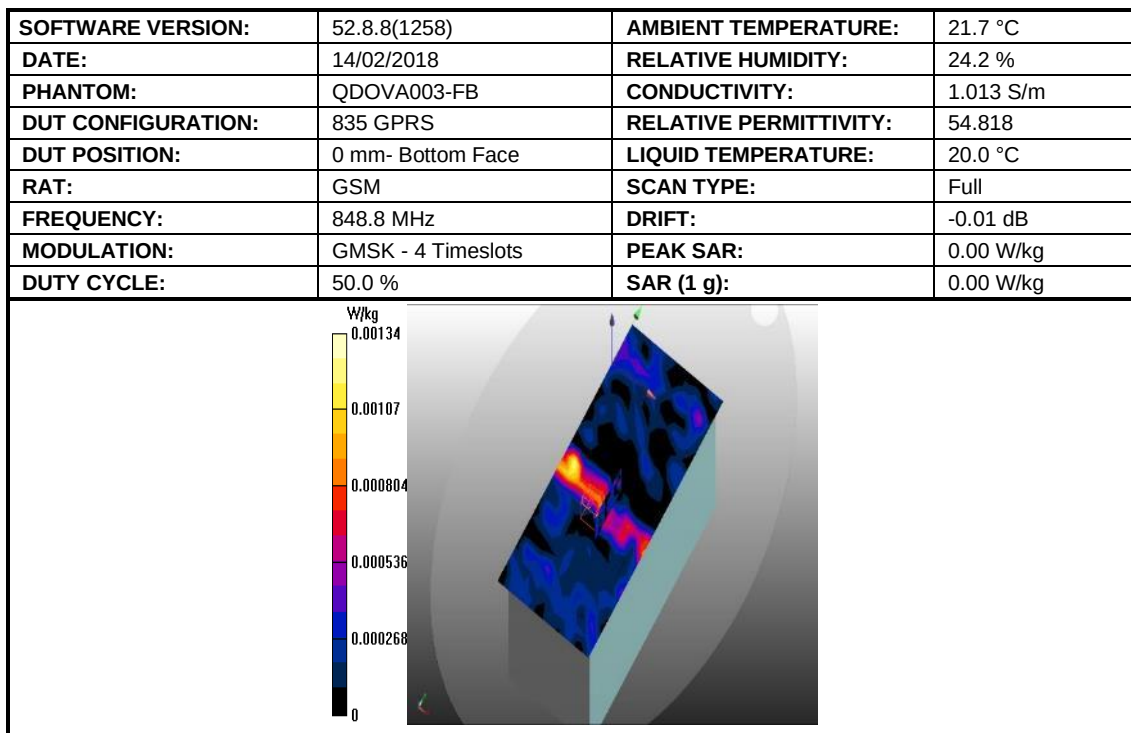


Figure 6: SAR Body Testing Results for the VeriFinder Radiation Detector at 848.8 MHz

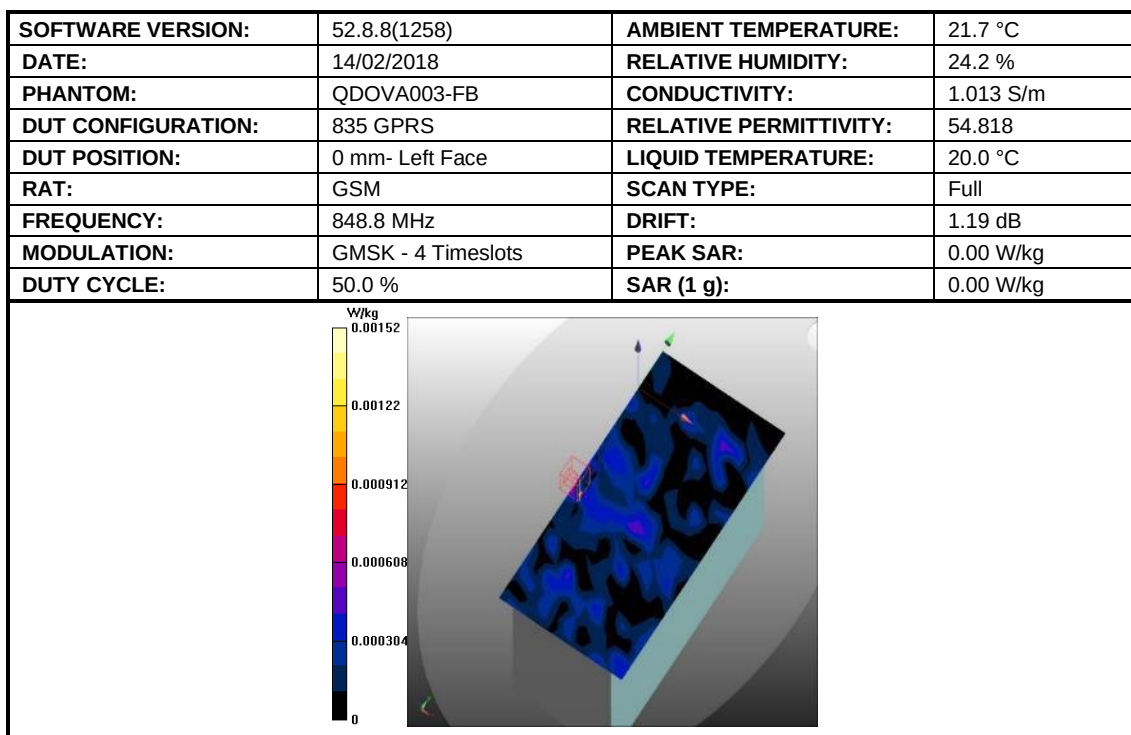


Figure 7: SAR Body Testing Results for the VeriFinder Radiation Detector at 848.8 MHz

2.3 PCS 1900 GPRS - BODY SAR TEST RESULTS

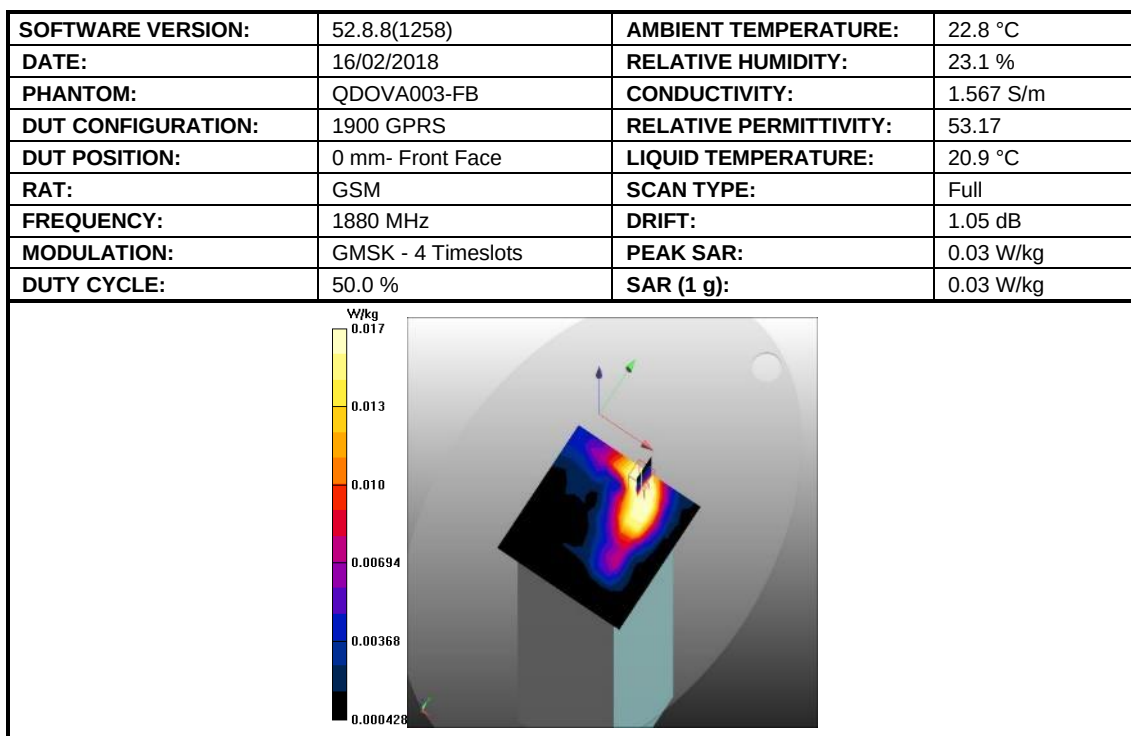


Figure 8: SAR Body Testing Results for the VeriFinder Radiation Detector at 1880 MHz

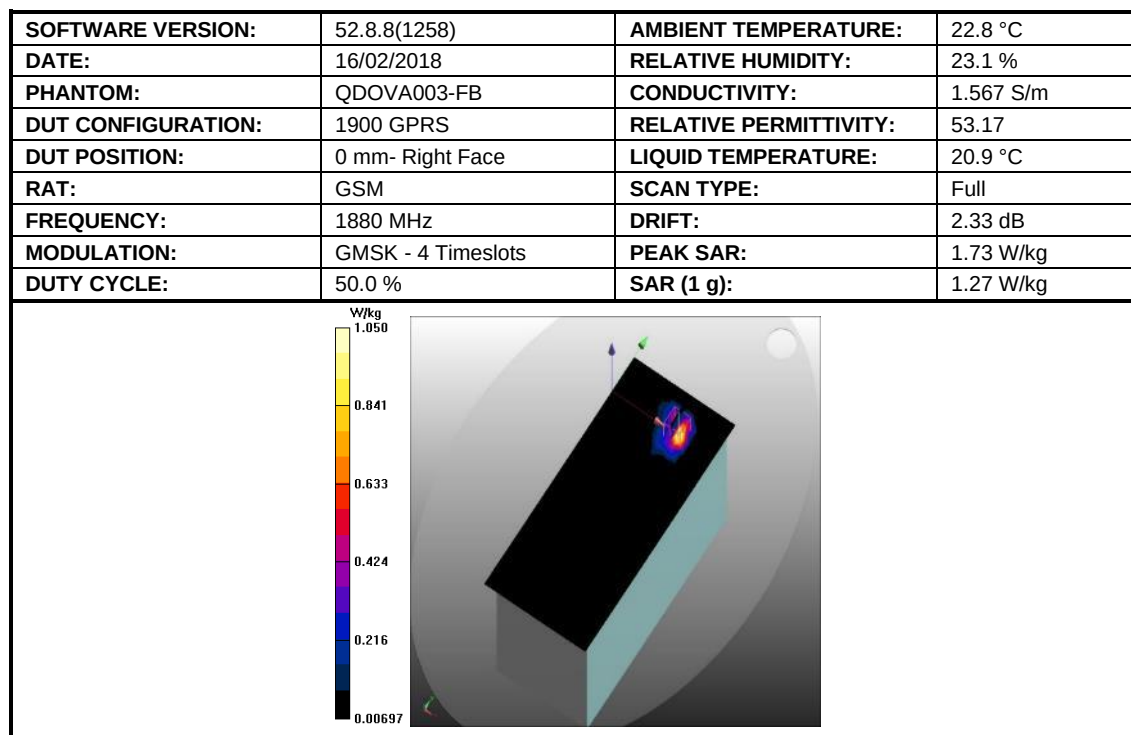


Figure 9: SAR Body Testing Results for the VeriFinder Radiation Detector at 1880 MHz

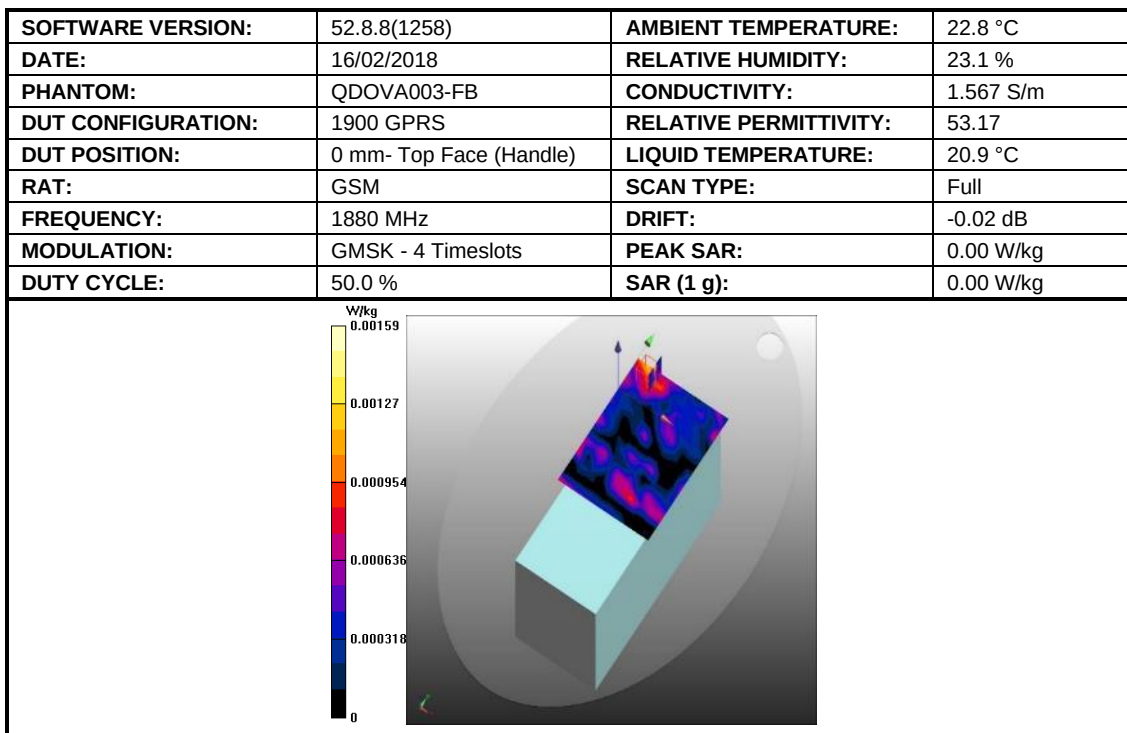


Figure 10: SAR Body Testing Results for the VeriFinder Radiation Detector at 1880 MHz

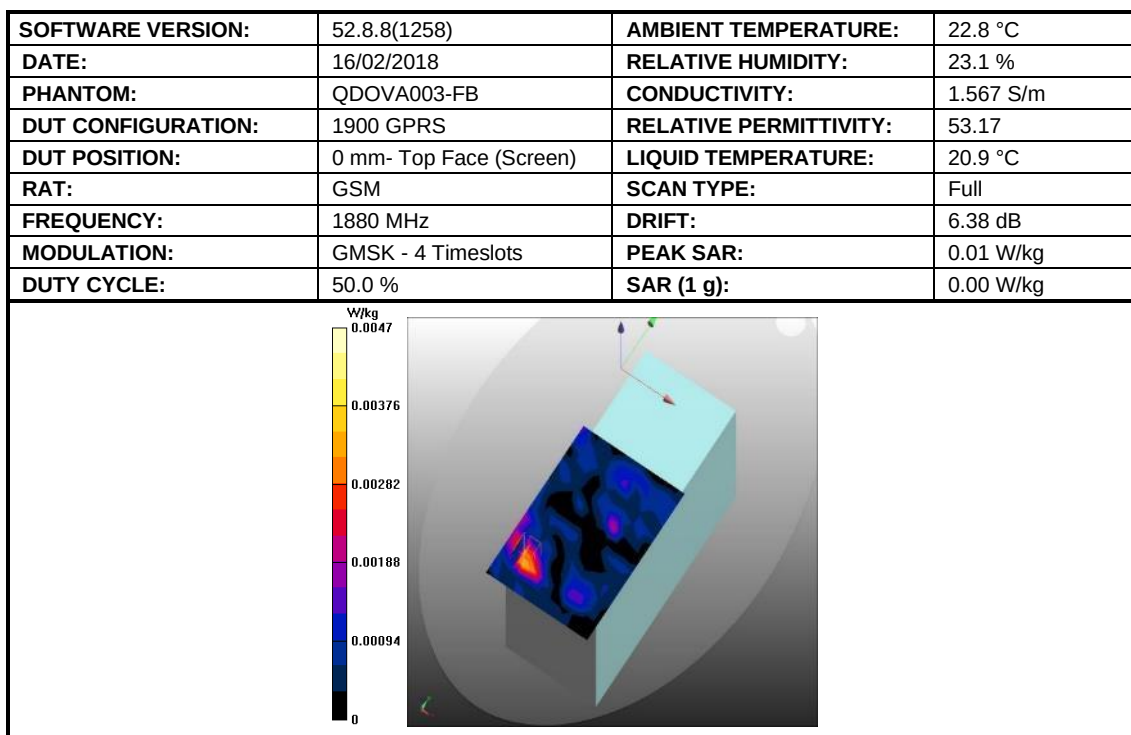


Figure 11: SAR Body Testing Results for the VeriFinder Radiation Detector at 1880 MHz.

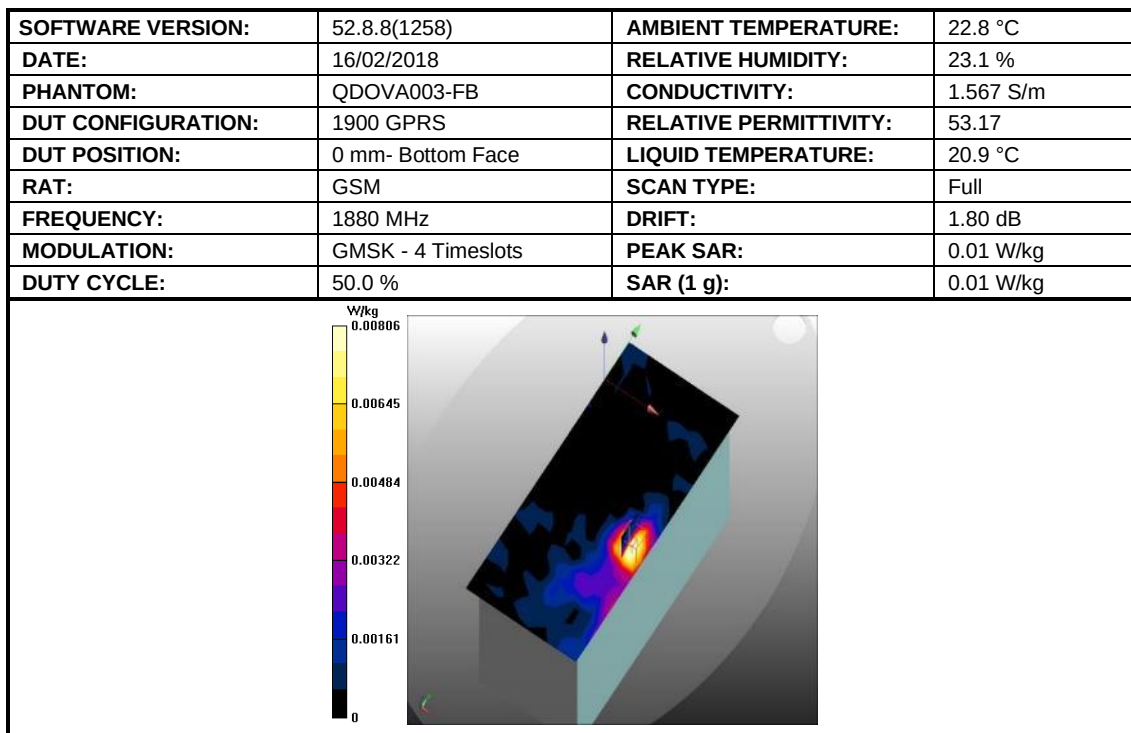


Figure 12: SAR Body Testing Results for the VeriFinder Radiation Detector at 1880 MHz

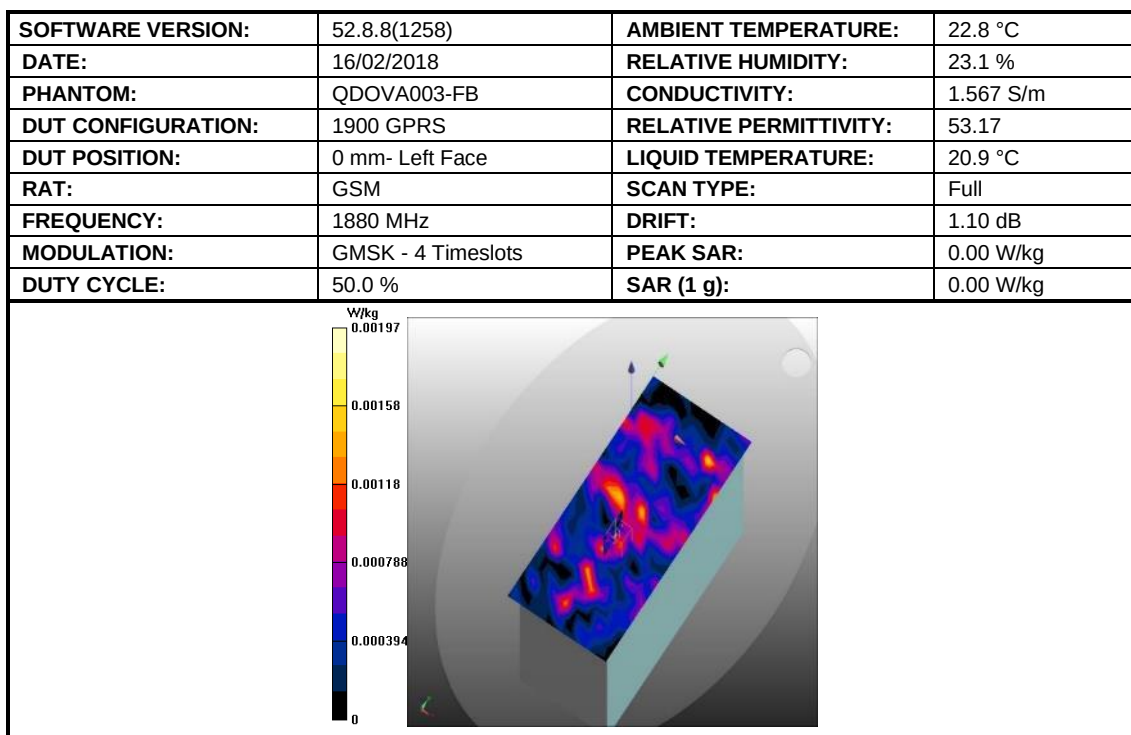


Figure 13: SAR Body Testing Results for the VeriFinder Radiation Detector at 1880 MHz

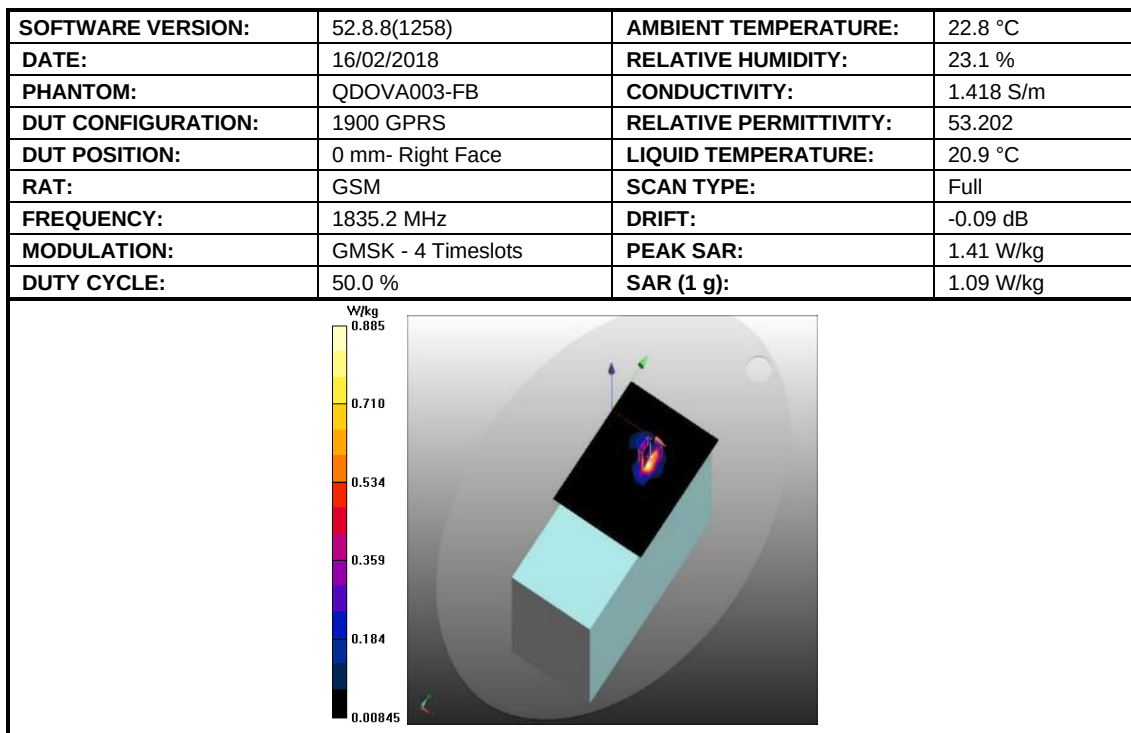


Figure 14: SAR Body Testing Results for the VeriFinder Radiation Detector at 1835.2 MHz

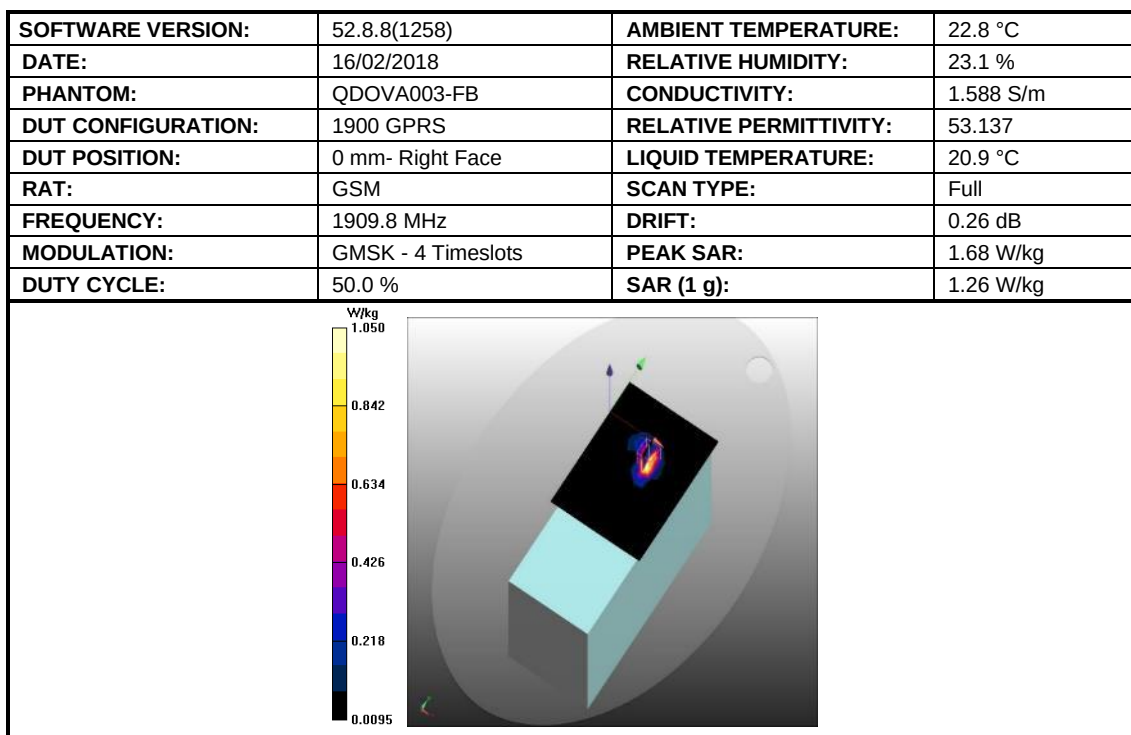


Figure 15: SAR Body Testing Results for the VeriFinder Radiation Detector at 1909.8 MHz

2.4 FDD V WCDMA - BODY SAR TEST RESULTS

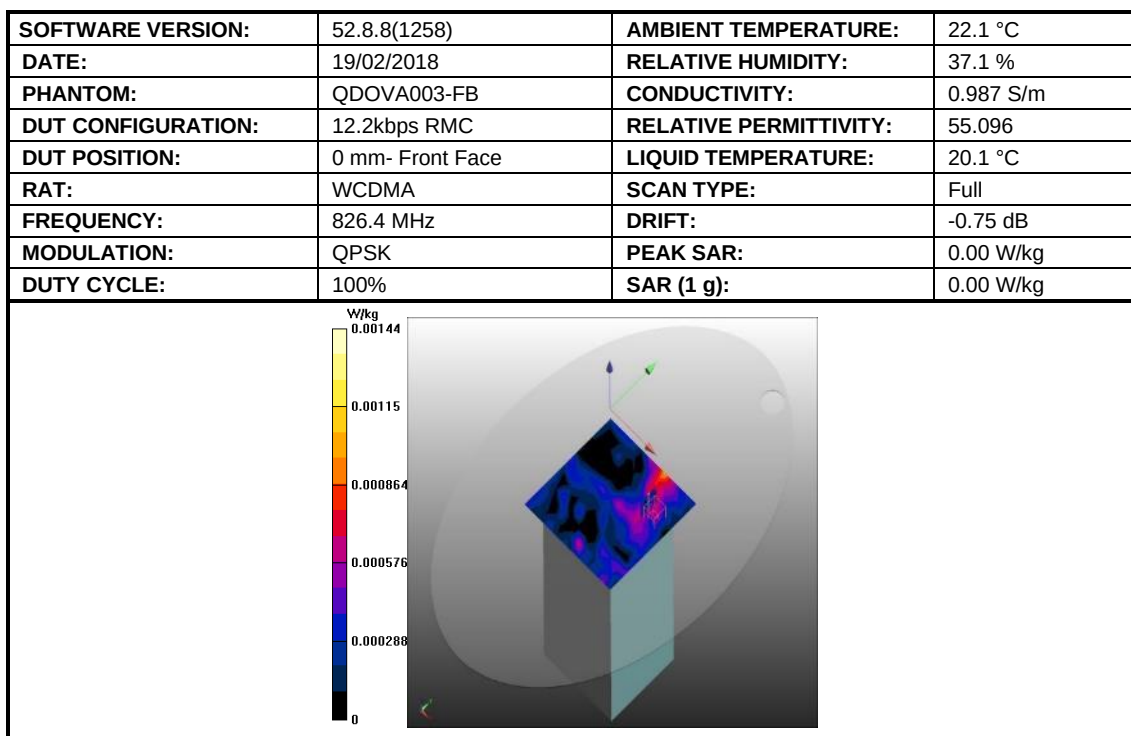


Figure 16: SAR Body Testing Results for the VeriFinder Radiation Detector at 826.4 MHz

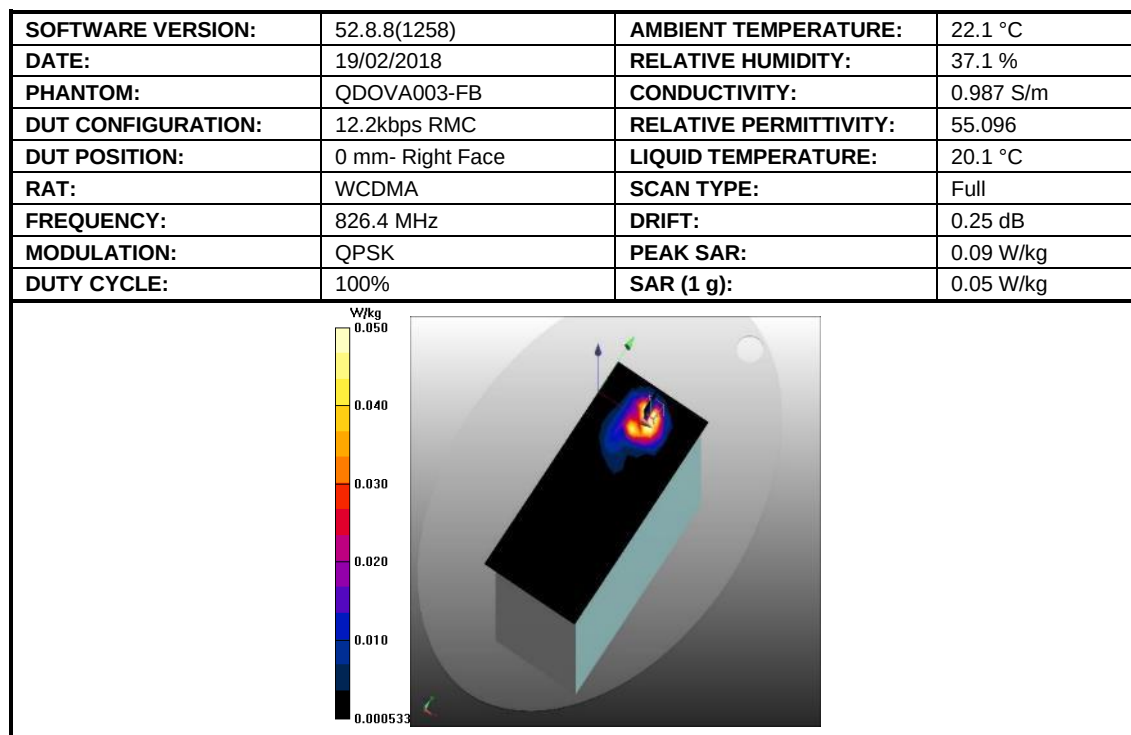


Figure 17: SAR Body Testing Results for the VeriFinder Radiation Detector at 826.4 MHz

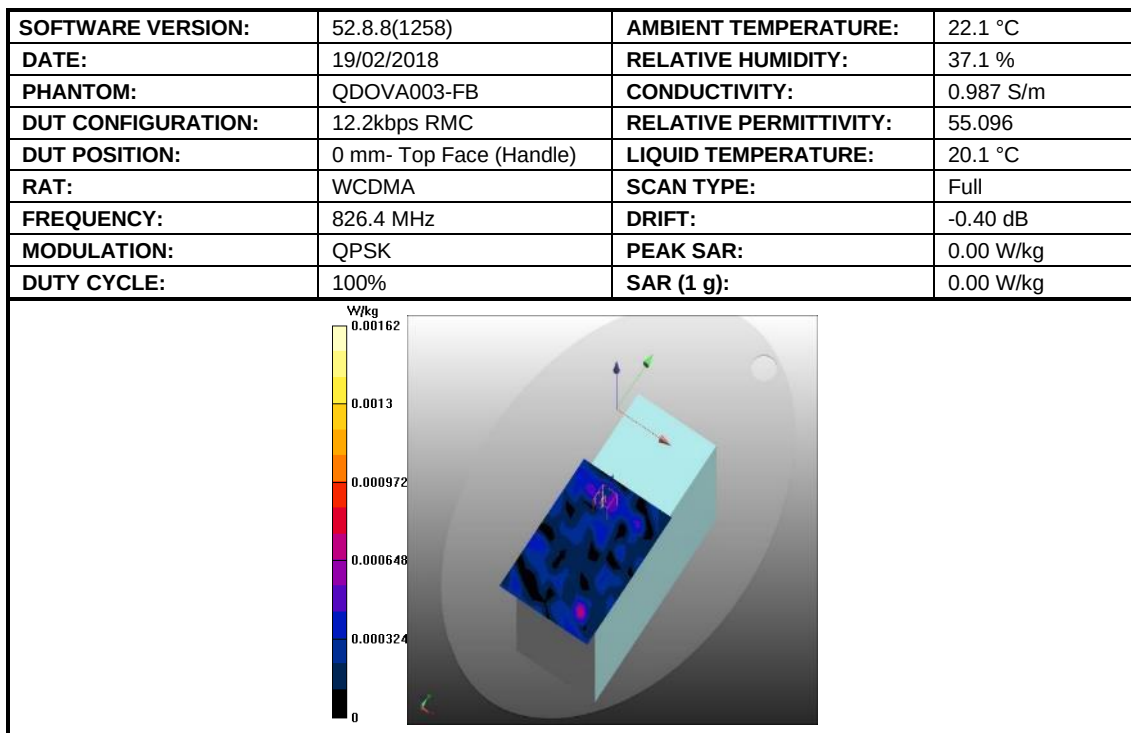


Figure 18: SAR Body Testing Results for the VeriFinder Radiation Detector at 826.4 MHz

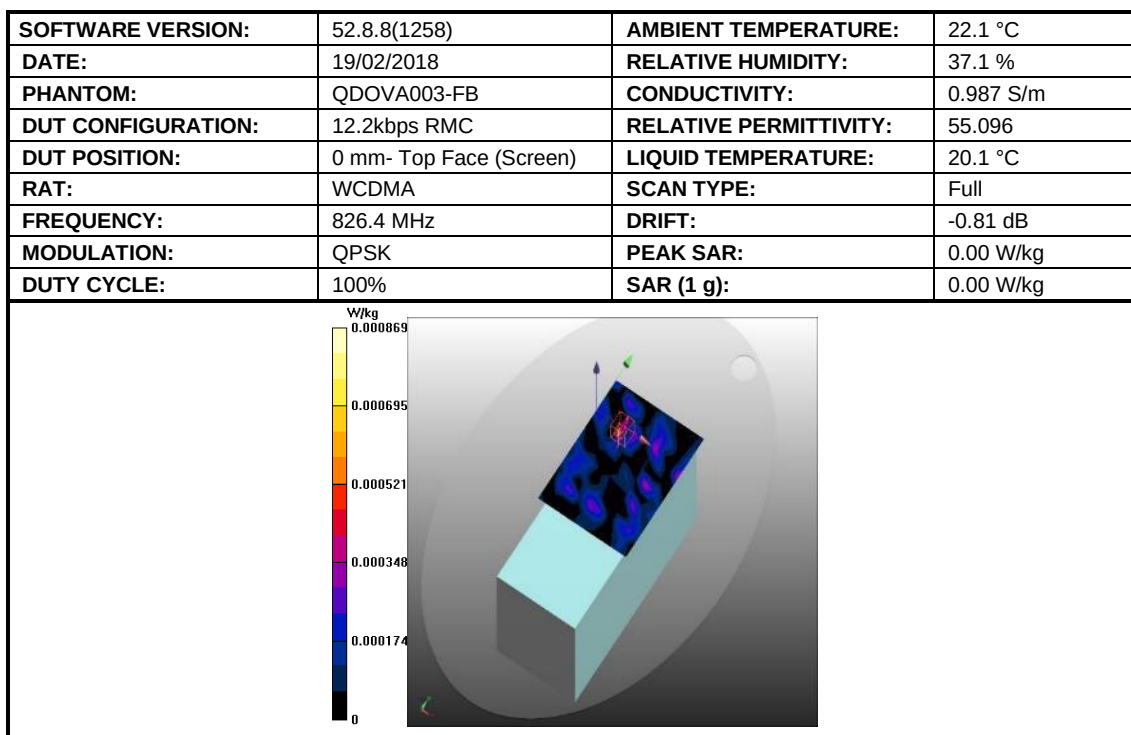


Figure 19: SAR Body Testing Results for the VeriFinder Radiation Detector at 826.4 MHz

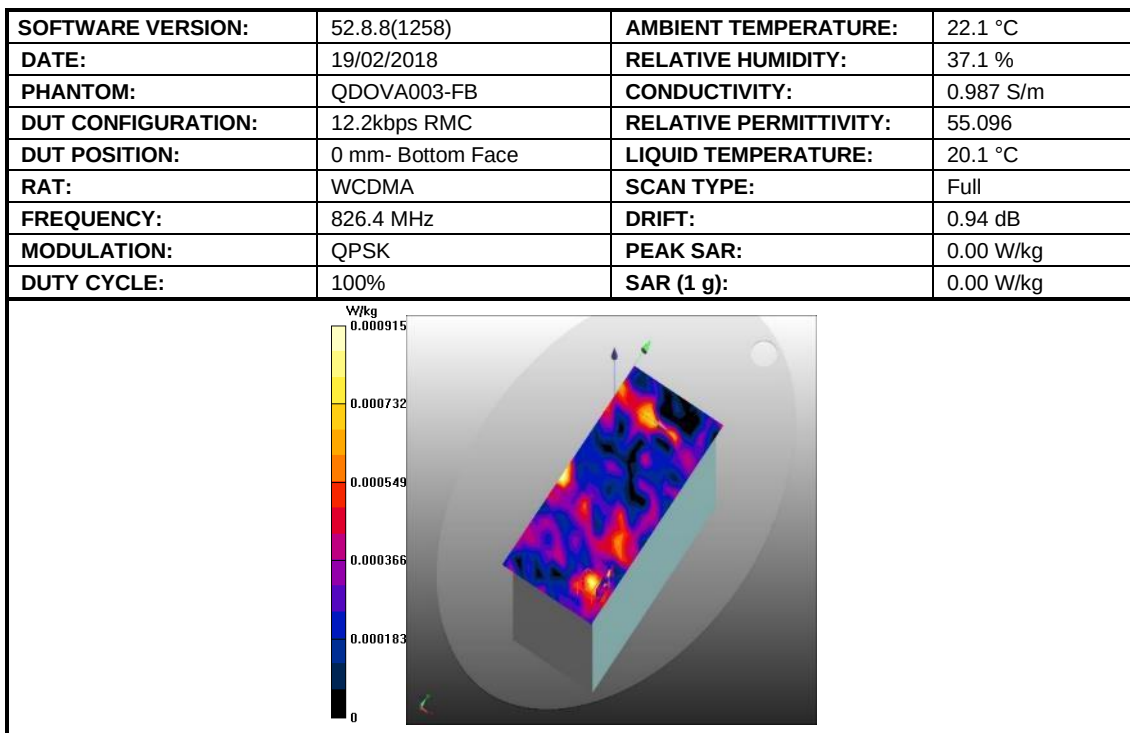


Figure 20: SAR Body Testing Results for the VeriFinder Radiation Detector at 826.4 MHz

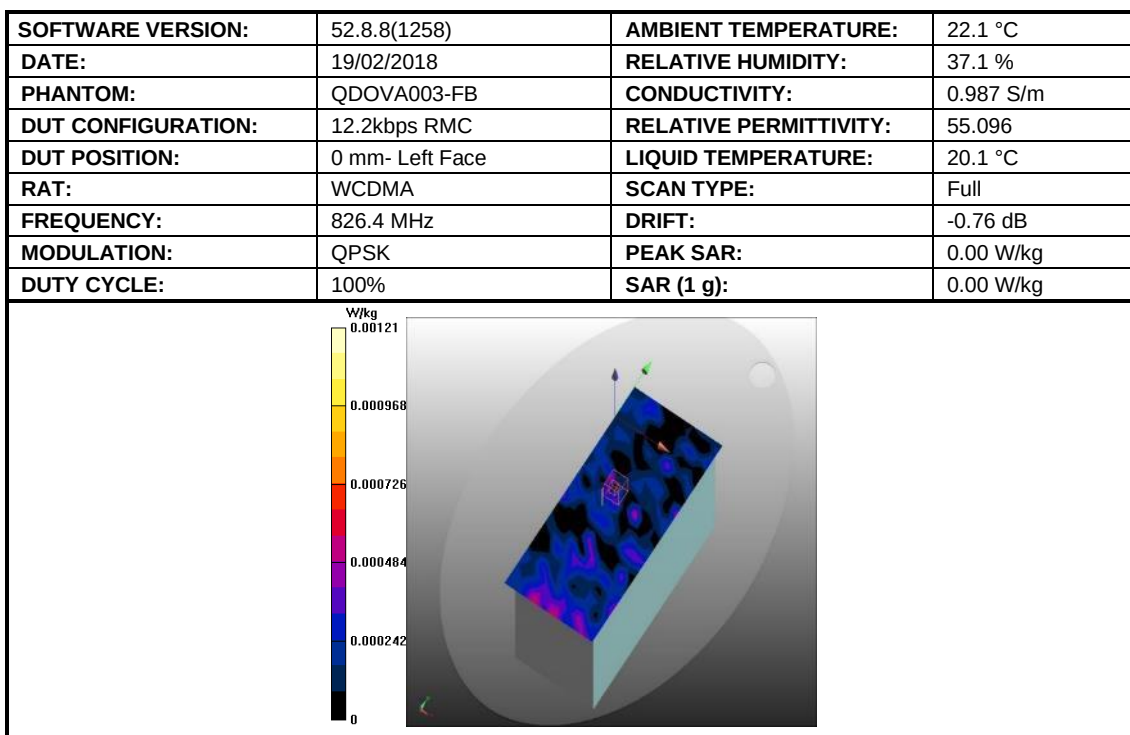


Figure 21: SAR Body Testing Results for the VeriFinder Radiation Detector at 826.4 MHz

2.5 FDD IV WCDMA BODY SAR TEST RESULTS

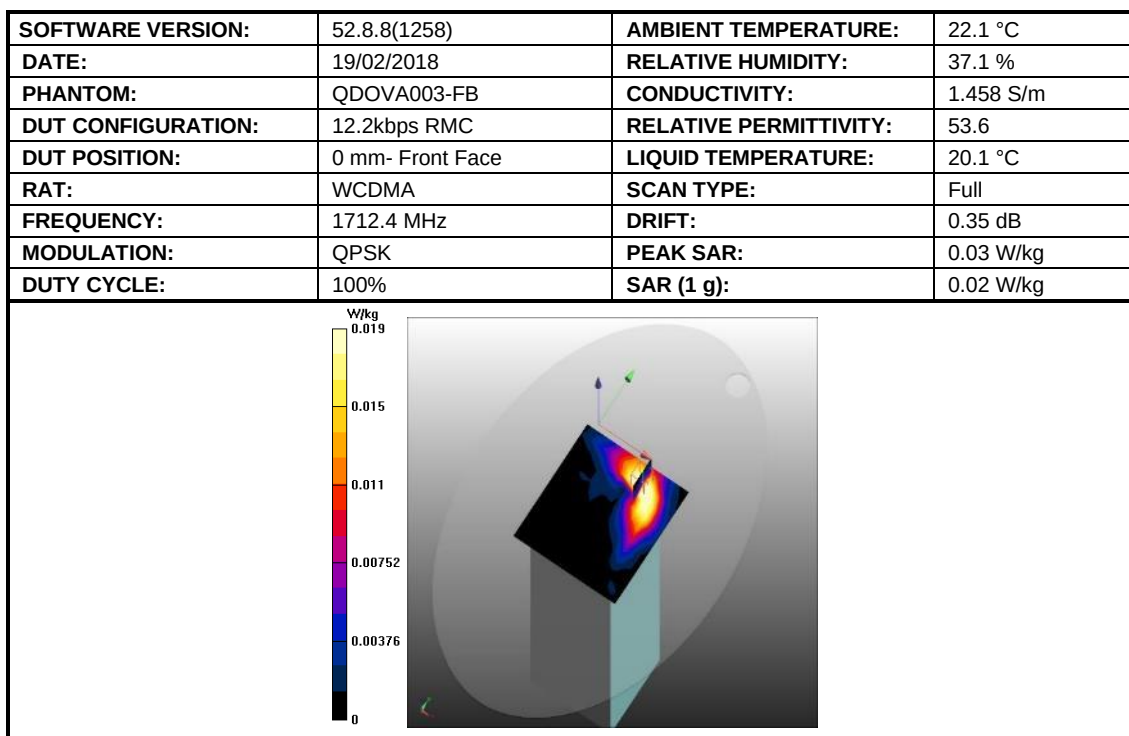


Figure 22: SAR Body Testing Results for the VeriFinder Radiation Detector at 1712.4 MHz

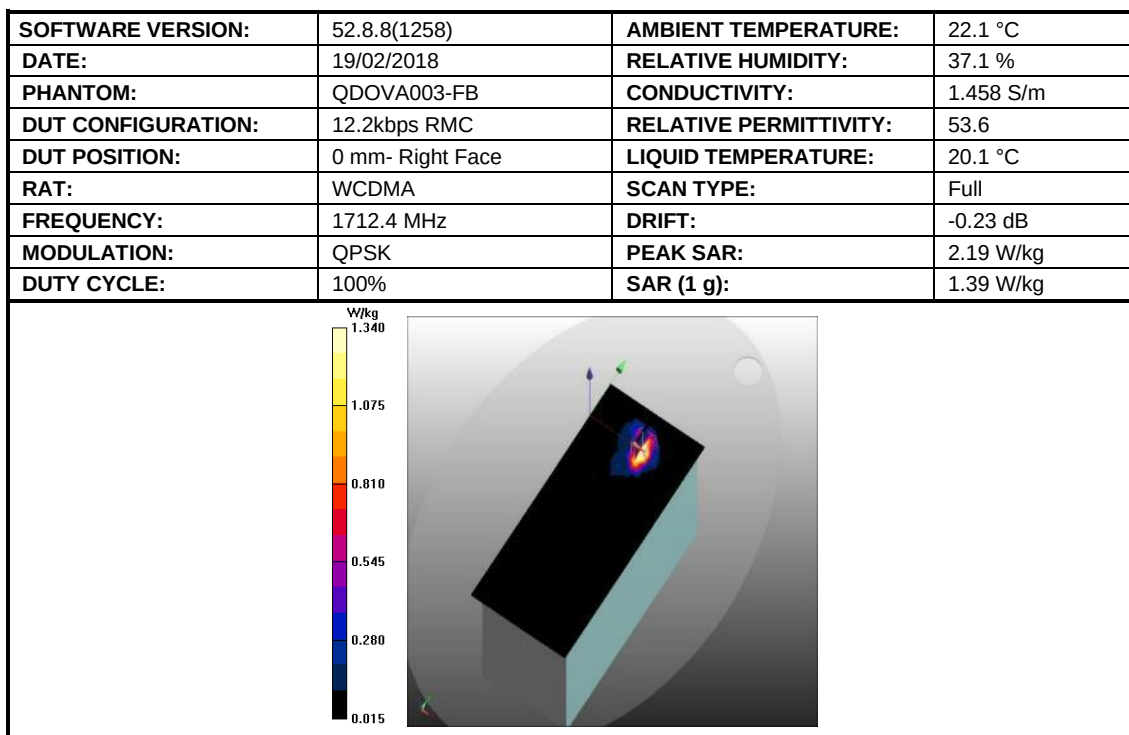


Figure 23: SAR Body Testing Results for the VeriFinder Radiation Detector at 1712.4 MHz

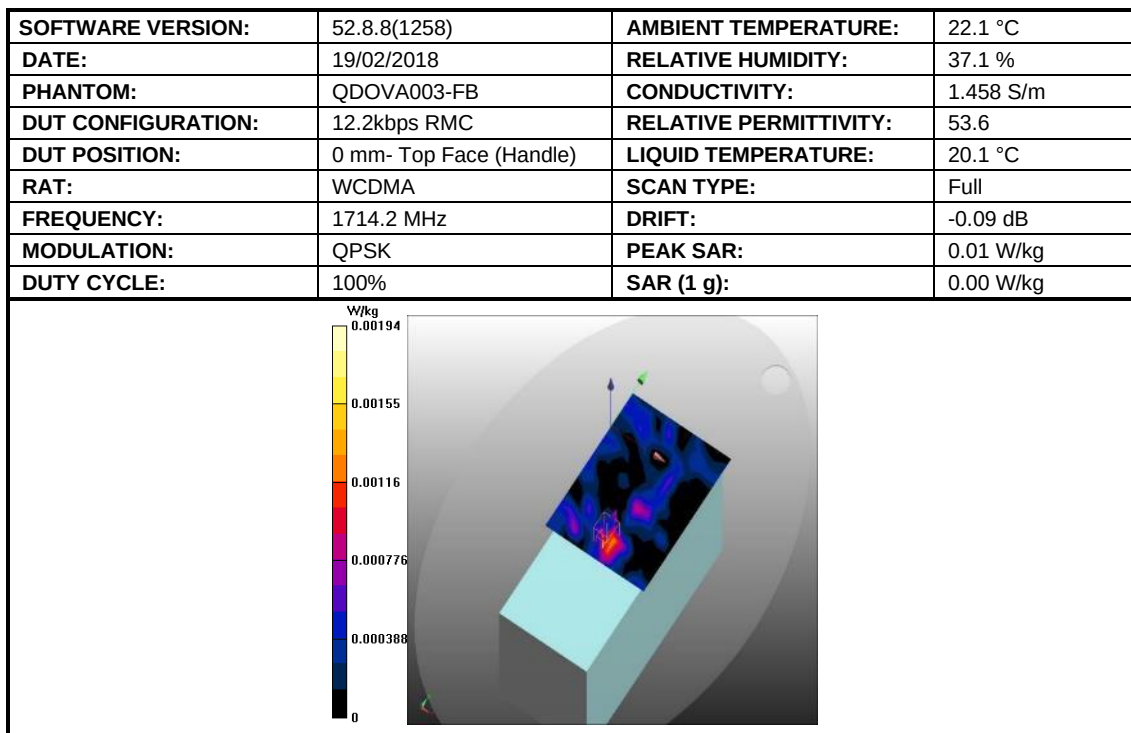


Figure 24: SAR Body Testing Results for the VeriFinder Radiation Detector at 1714.2 MHz

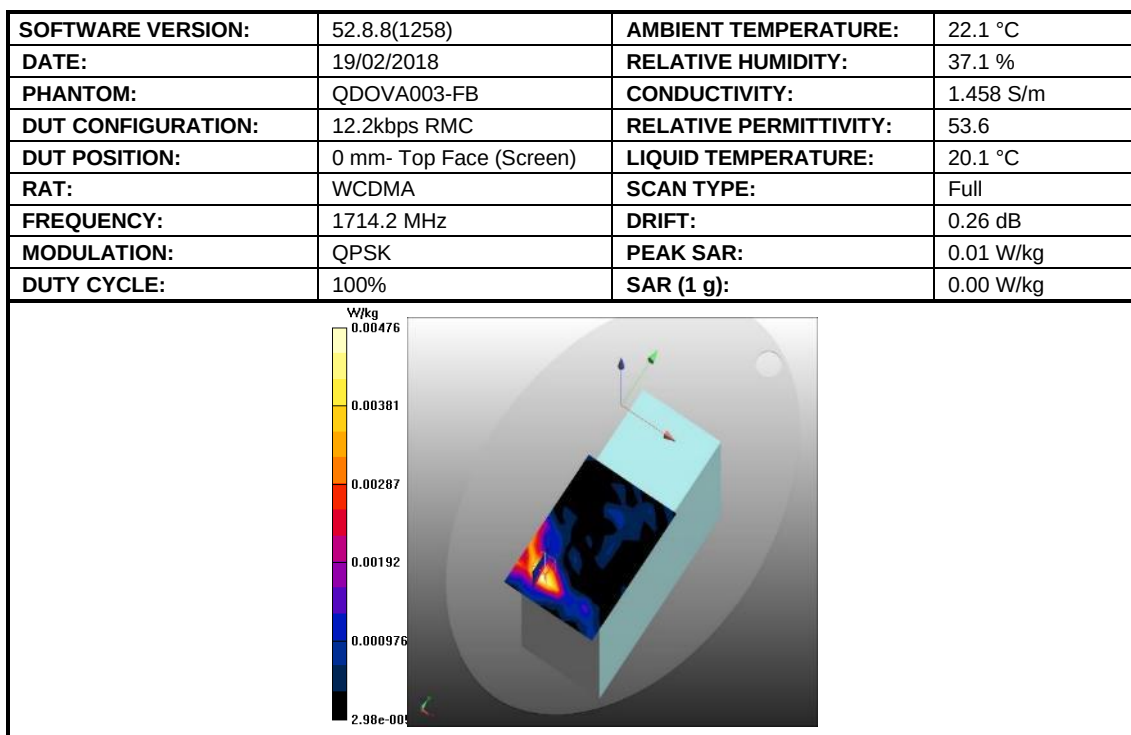


Figure 25: SAR Body Testing Results for the VeriFinder Radiation Detector at 1714.2 MHz

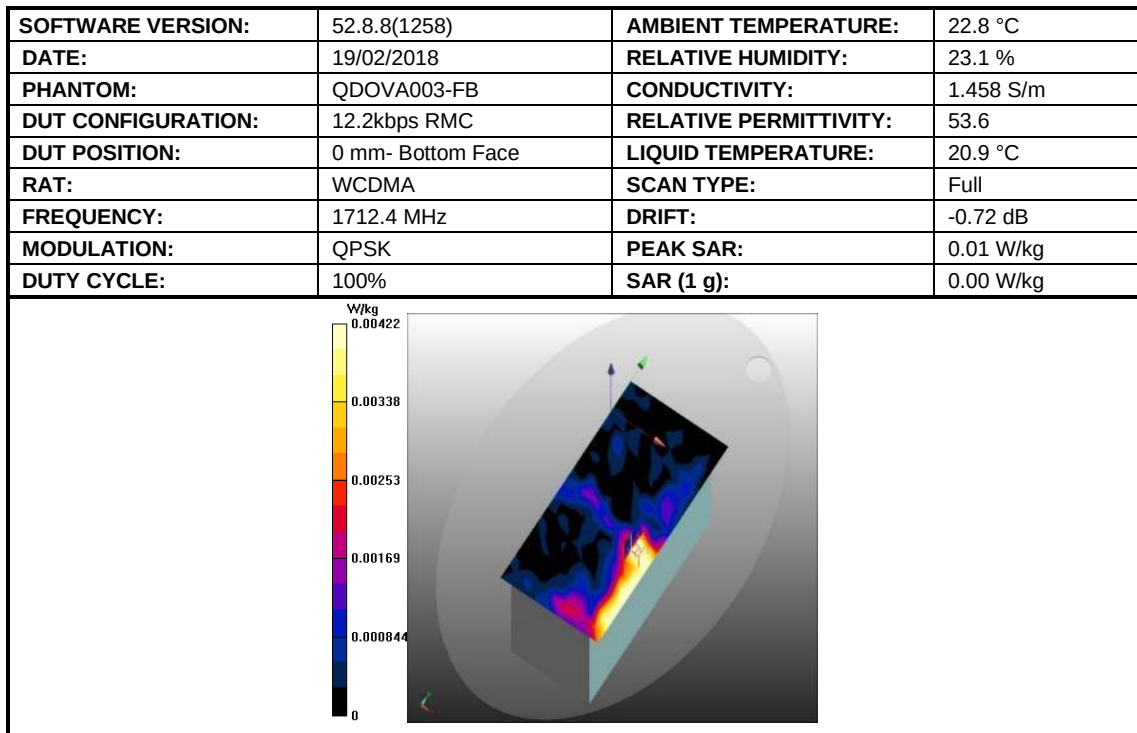


Figure 26: SAR Body Testing Results for the VeriFinder Radiation Detector at 1712.4 MHz

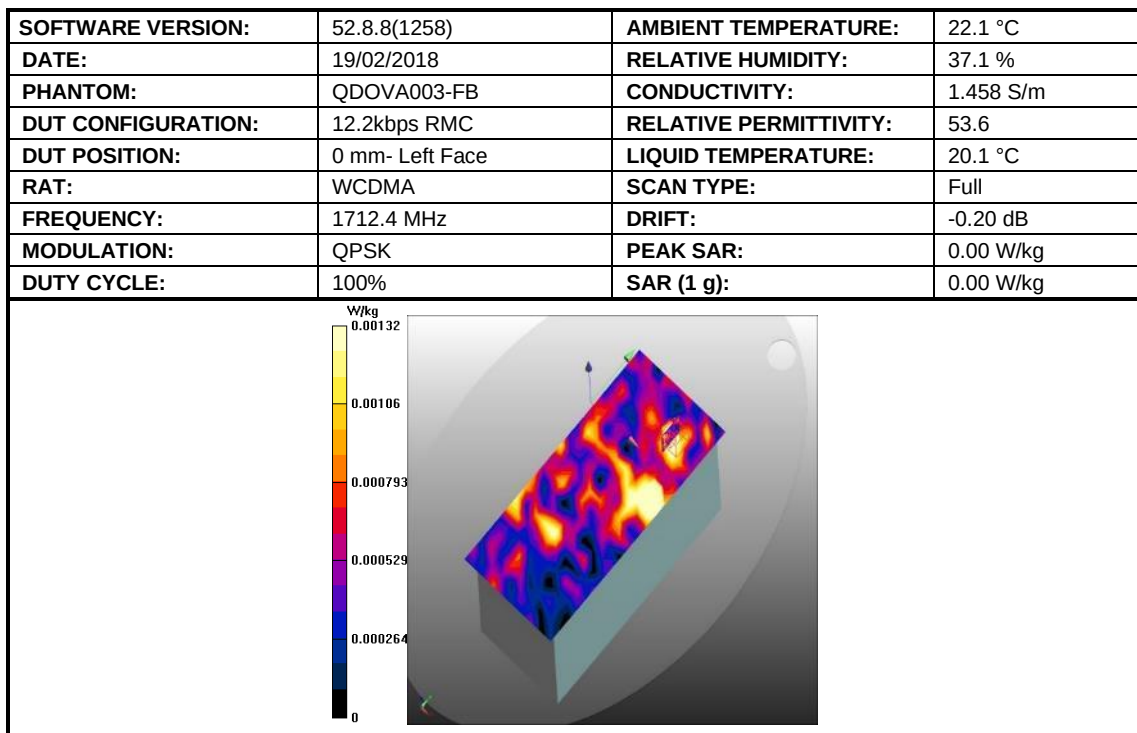


Figure 27: SAR Body Testing Results for the VeriFinder Radiation Detector at 1712.4 MHz

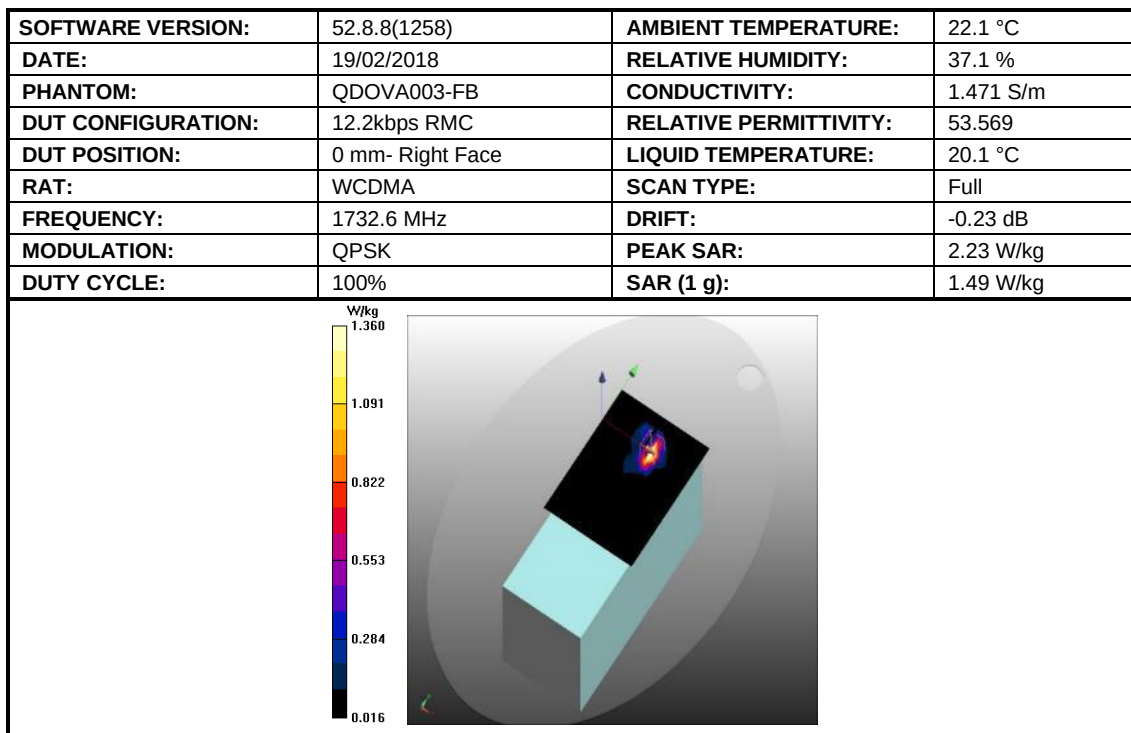


Figure 28: SAR Body Testing Results for the VeriFinder Radiation Detector at 1732.6 MHz.

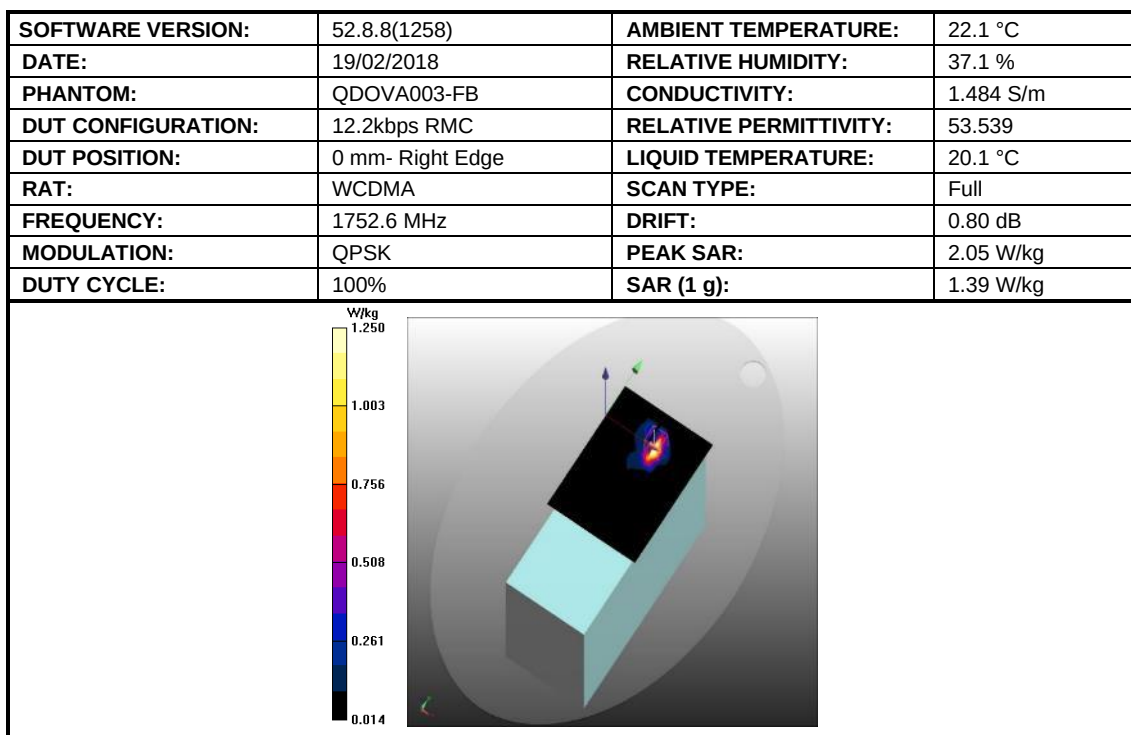


Figure 29: SAR Body Testing Results for the VeriFinder Radiation Detector at 1752.6 MHz

2.6 FDD II WCDMA BODY SAR TEST RESULTS

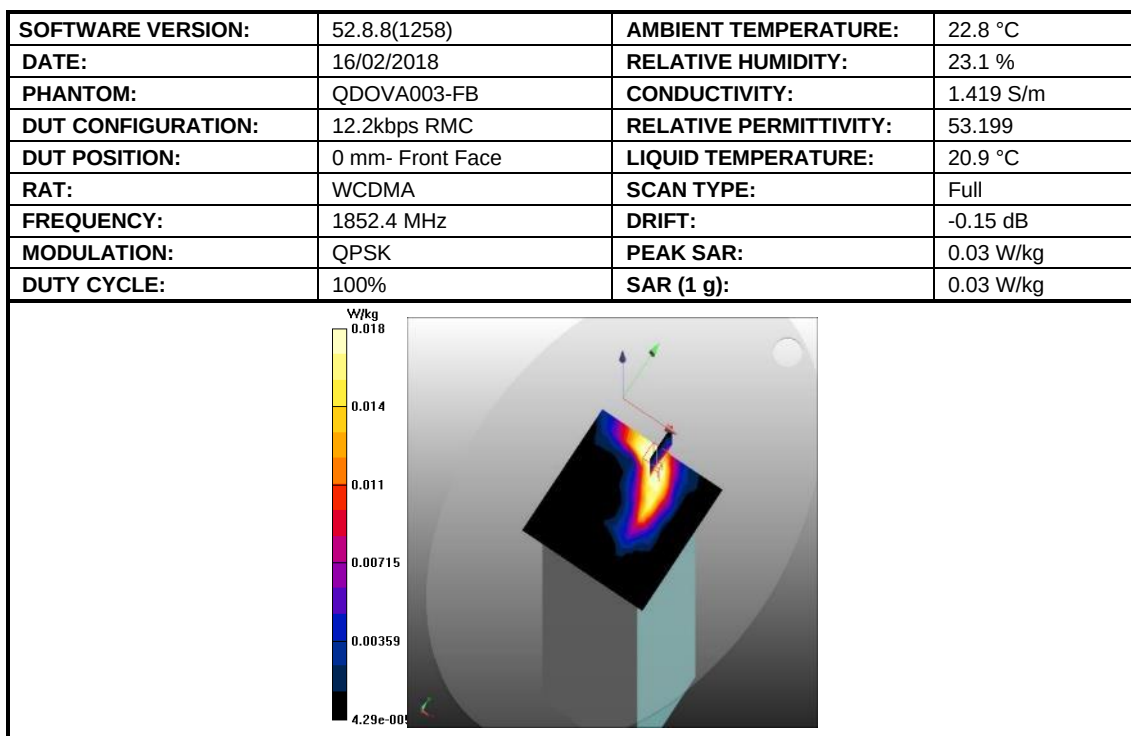


Figure 30: SAR Body Testing Results for the VeriFinder Radiation Detector at 1852.4 MHz

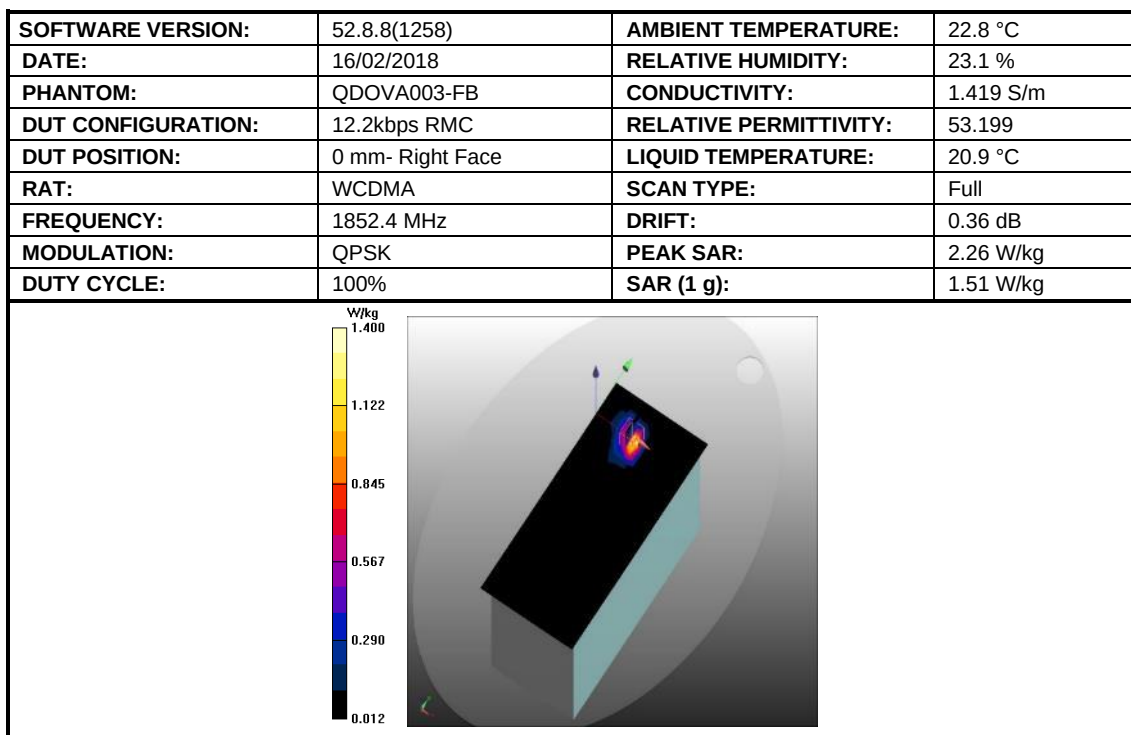


Figure 31: SAR Body Testing Results for the VeriFinder Radiation Detector at 1852.4 MHz

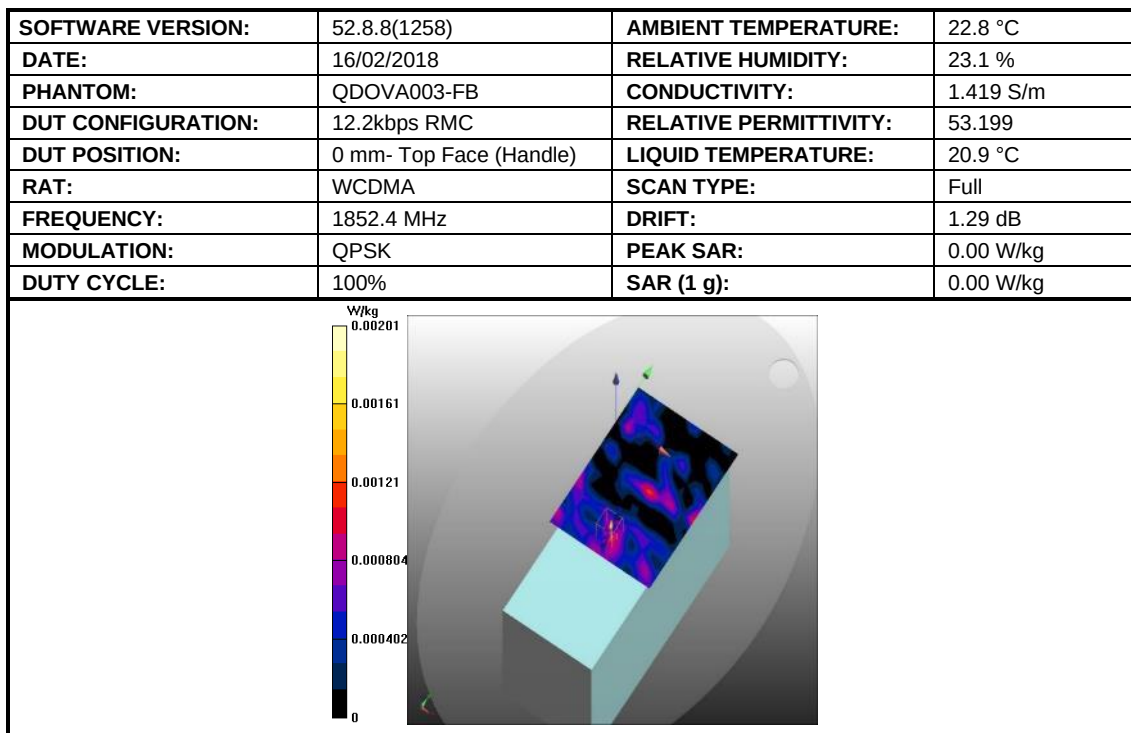


Figure 32: SAR Body Testing Results for the VeriFinder Radiation Detector at 1852.4 MHz

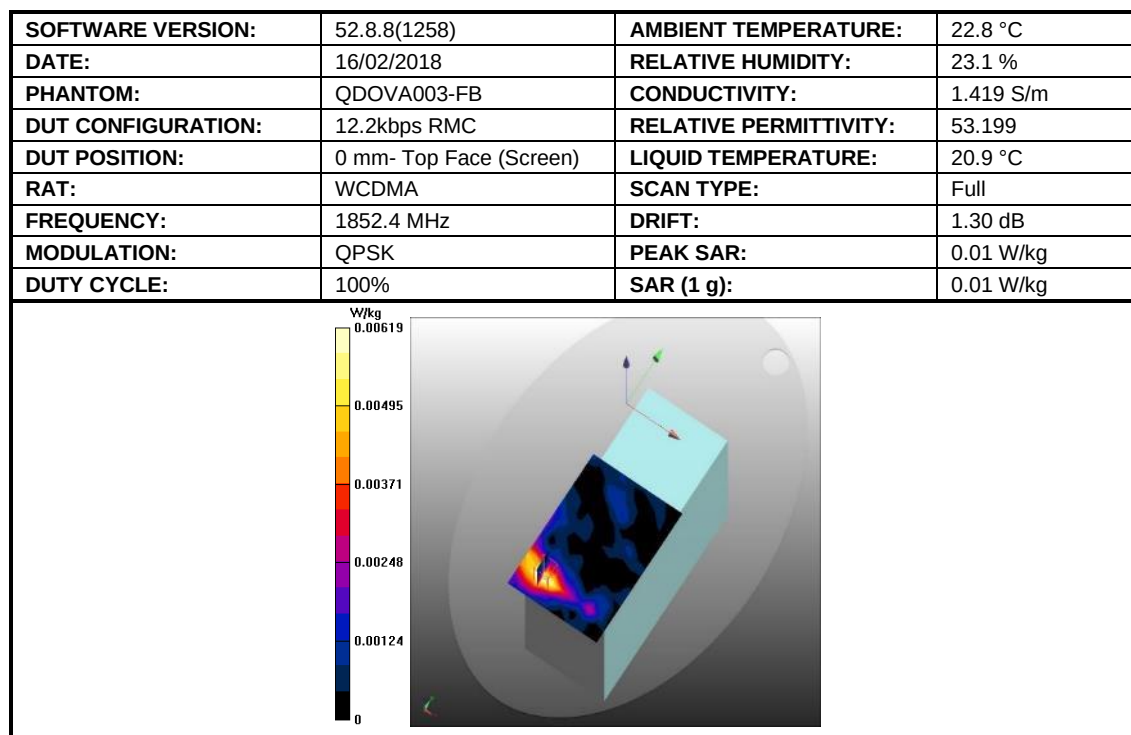


Figure 33: SAR Body Testing Results for the VeriFinder Radiation Detector at 1852.4 MHz

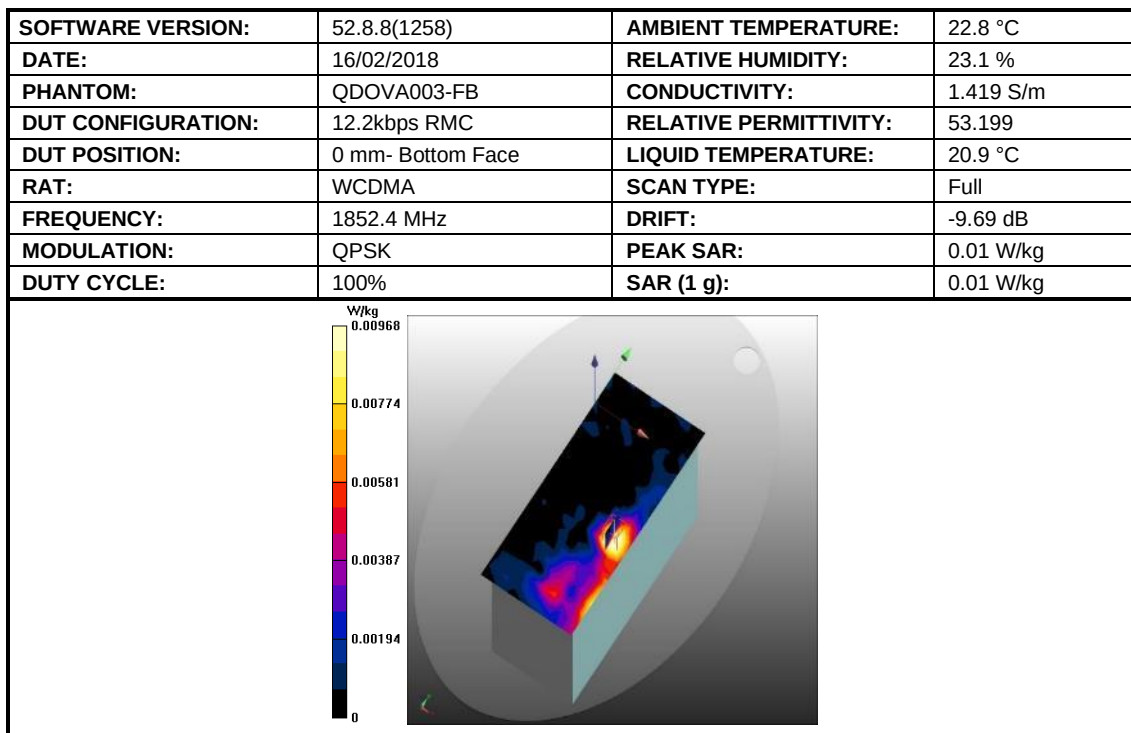


Figure 34: SAR Body Testing Results for the VeriFinder Radiation Detector at 1852.4 MHz

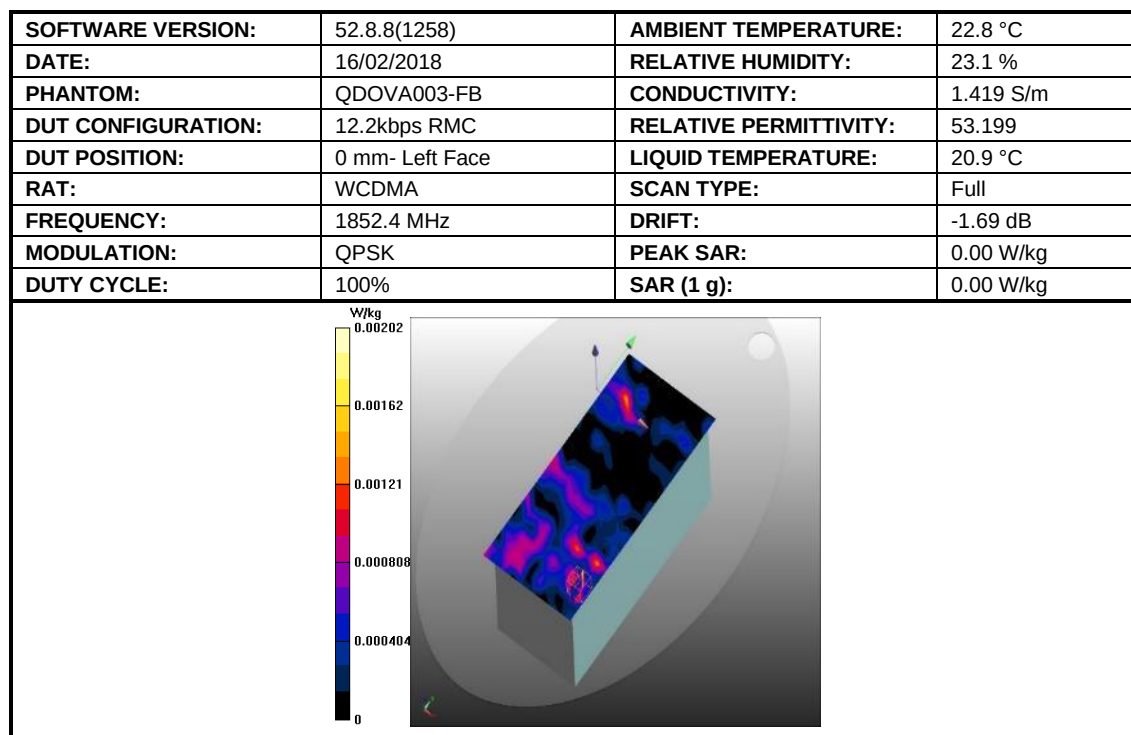


Figure 35: SAR Body Testing Results for the VeriFinder Radiation Detector at 1852.4 MHz

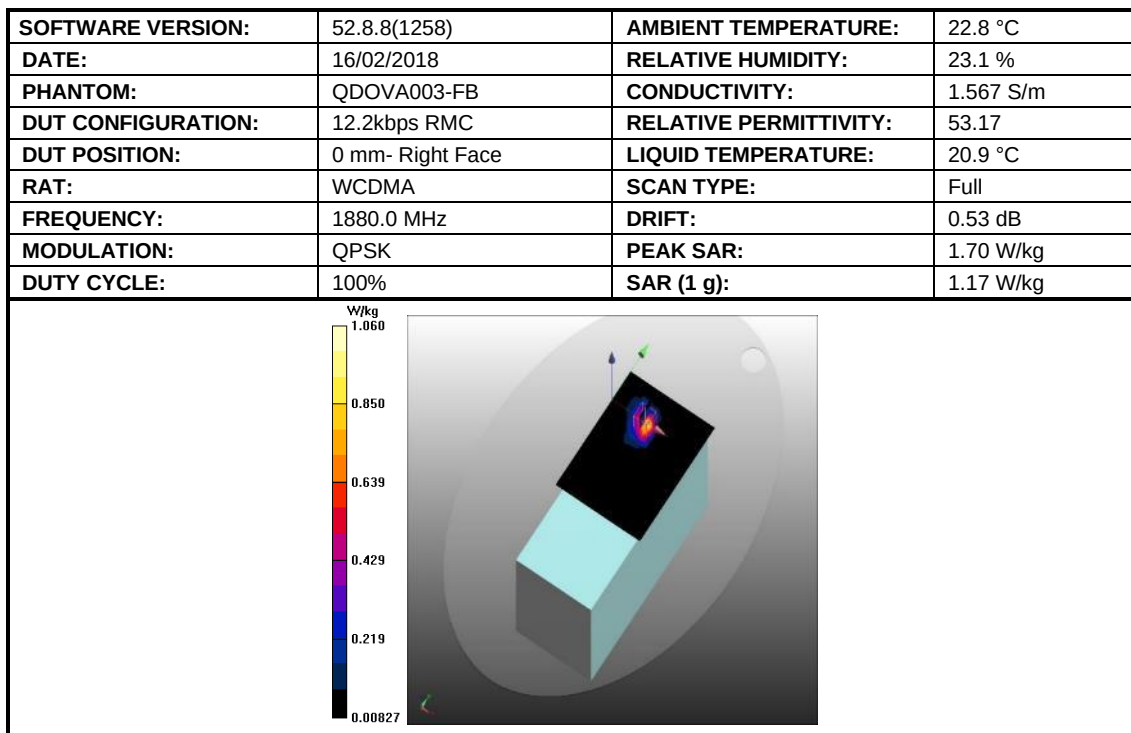


Figure 36: SAR Body Testing Results for the VeriFinder Radiation Detector at 1880.0 MHz

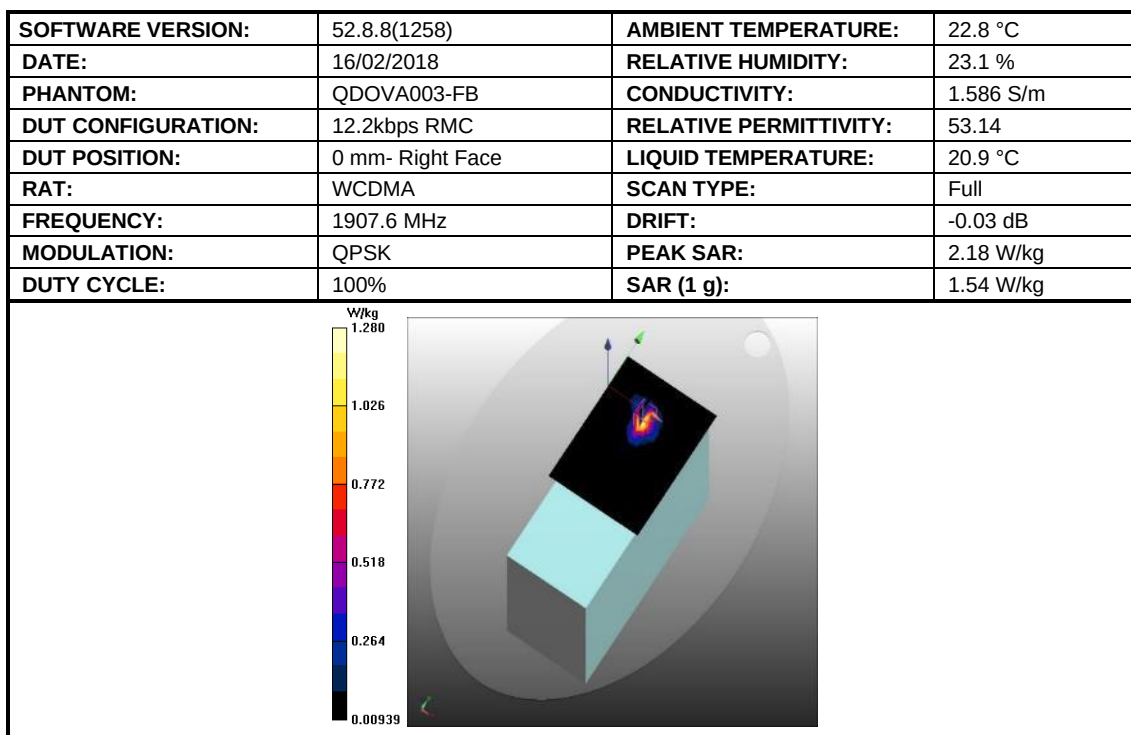


Figure 37: SAR Body Testing Results for the VeriFinder Radiation Detector at 1907.6 MHz

2.7 2450 MHz BLUETOOTH - BODY SAR TEST RESULTS

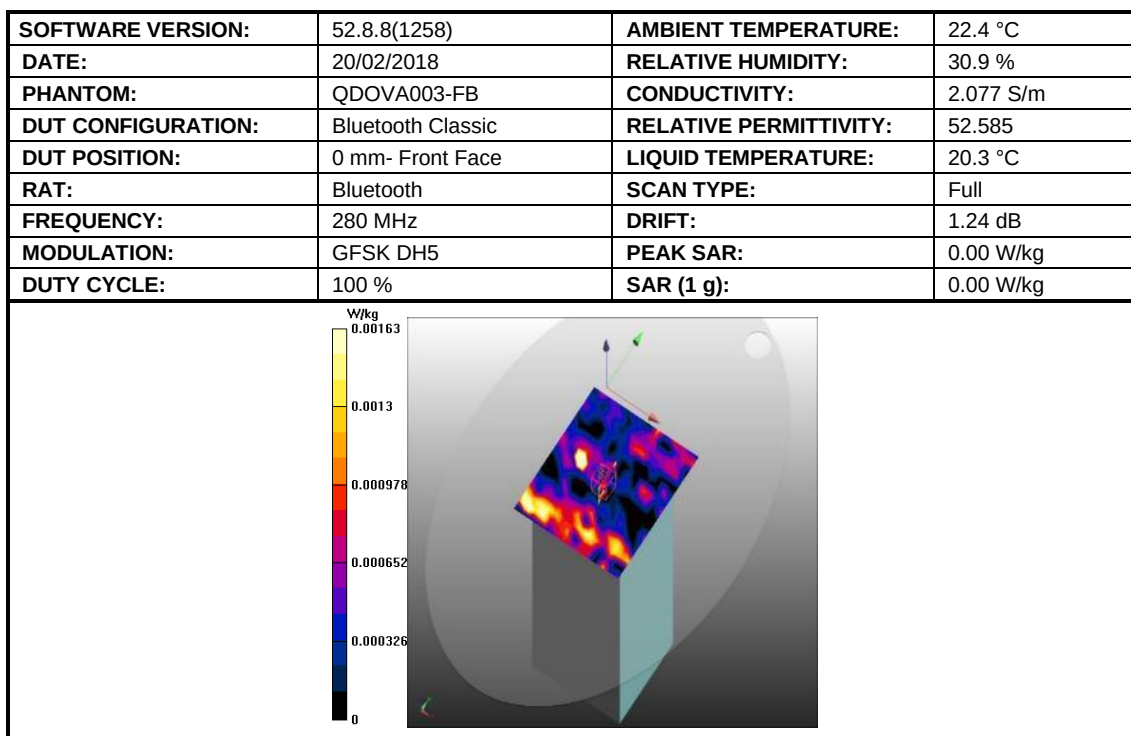


Figure 38: SAR Body Testing Results for the VeriFinder Radiation Detector at 2480 MHz

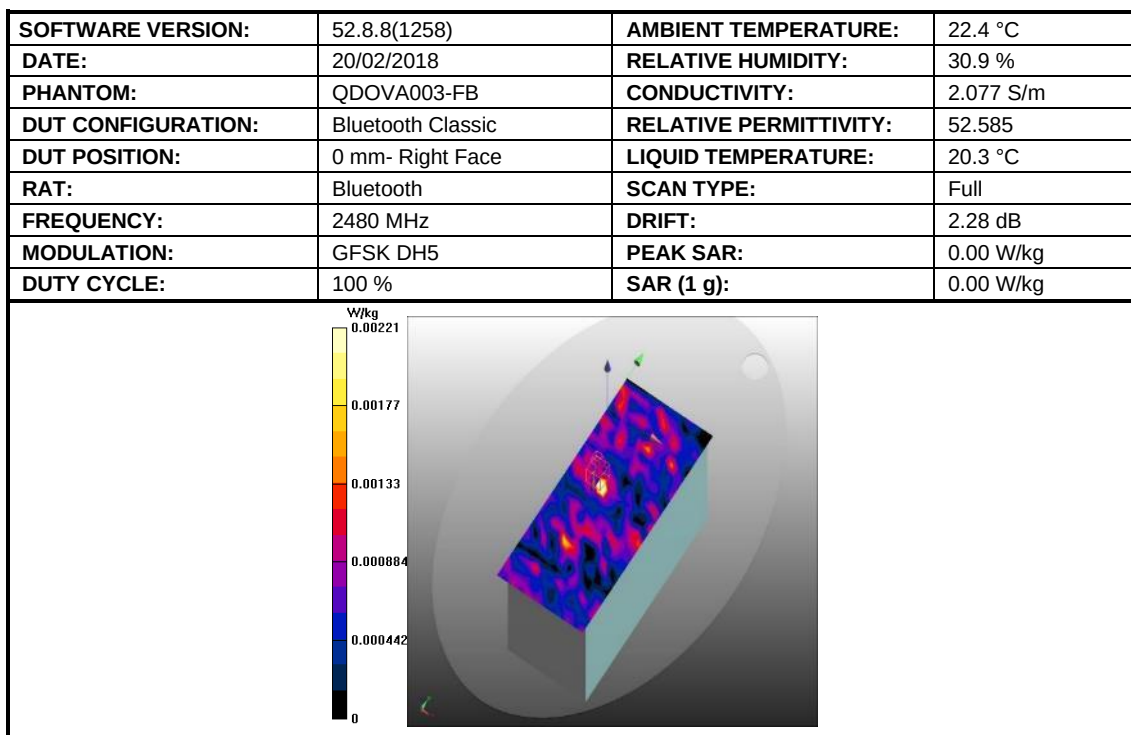


Figure 39: SAR Body Testing Results for the VeriFinder Radiation Detector at 2480 MHz

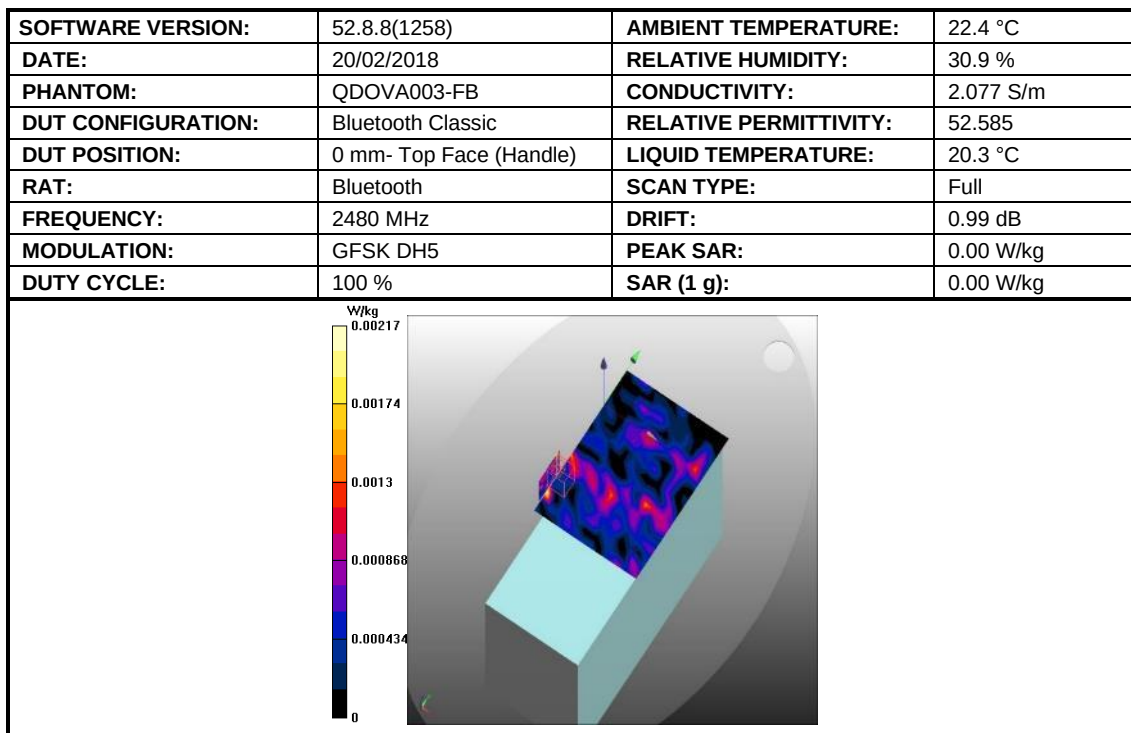


Figure 40: SAR Body Testing Results for the VeriFinder Radiation Detector at 2480 MHz

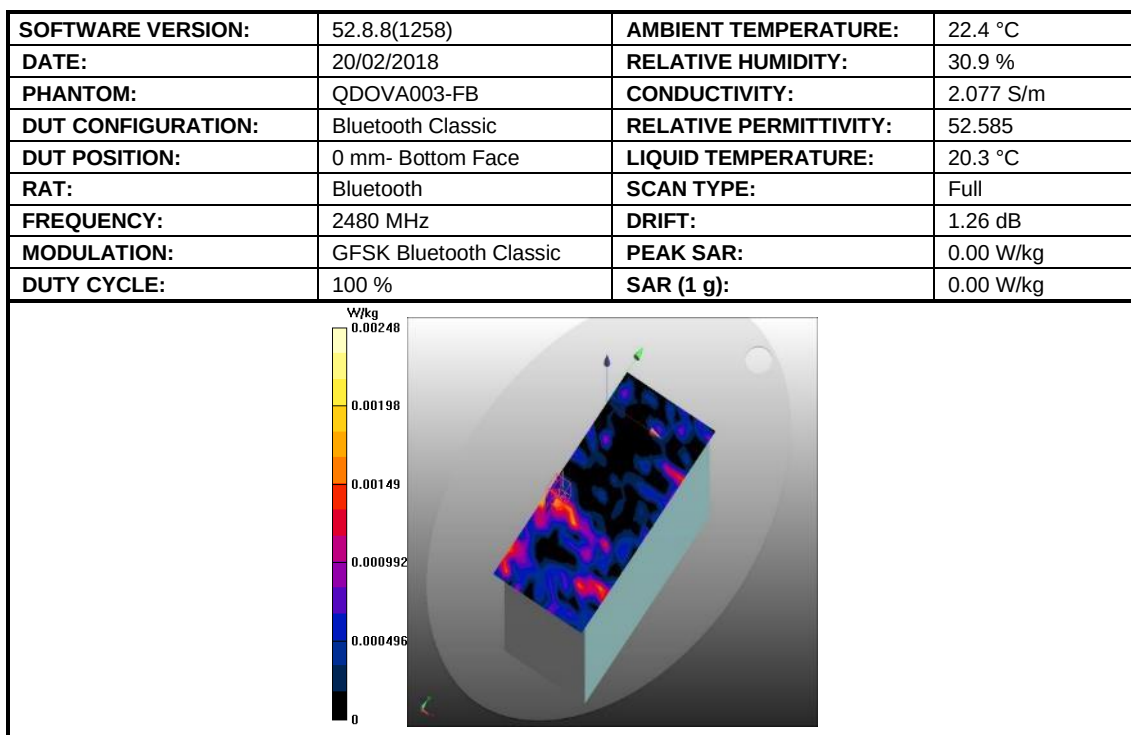


Figure 41: SAR Body Testing Results for the VeriFinder Radiation Detector at 2480 MHz

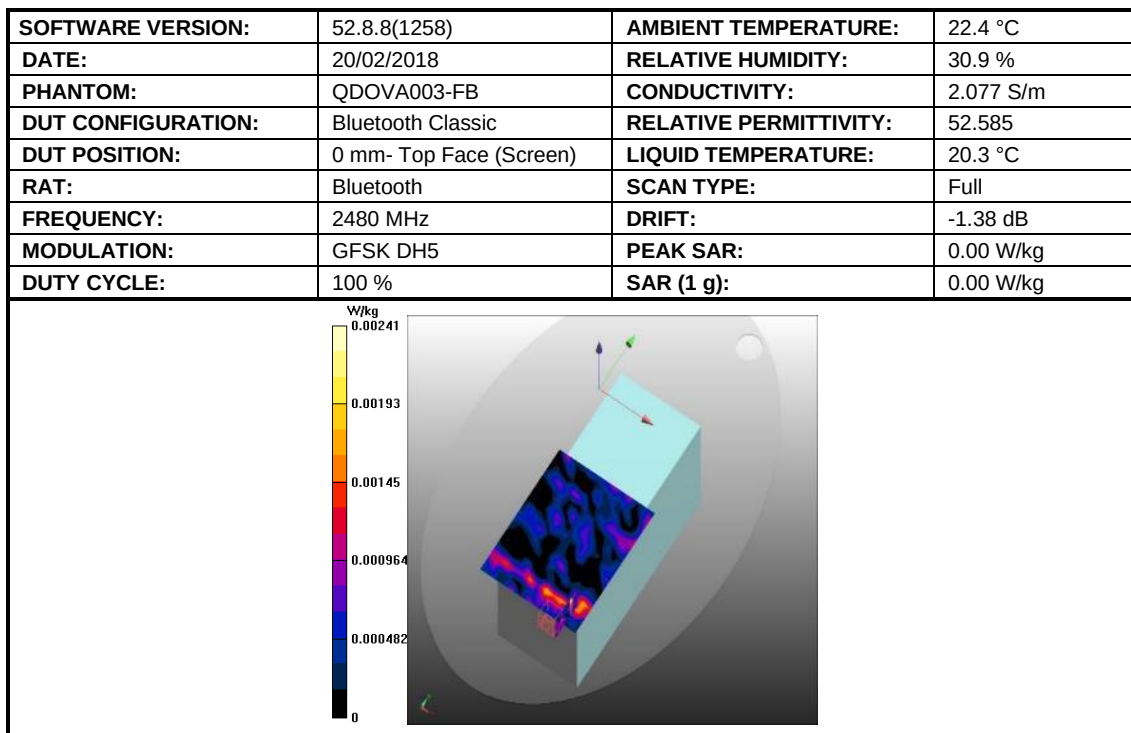


Figure 42: SAR Body Testing Results for the VeriFinder Radiation Detector at 2480 MHz

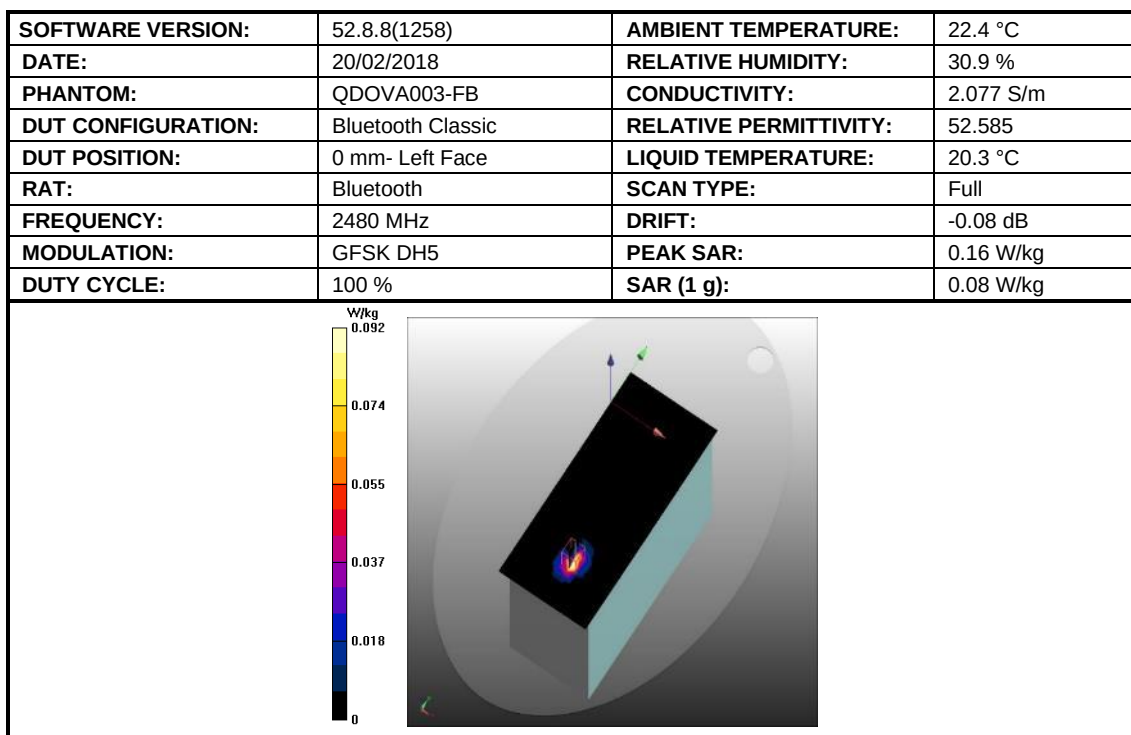


Figure 43: SAR Body Testing Results for the VeriFinder Radiation Detector at 2480 MHz

2.8 2450 MHz WLAN 802.11b 20 MHz 1 Mbps - SISO ANTENNA 1 - BODY SAR TEST RESULTS

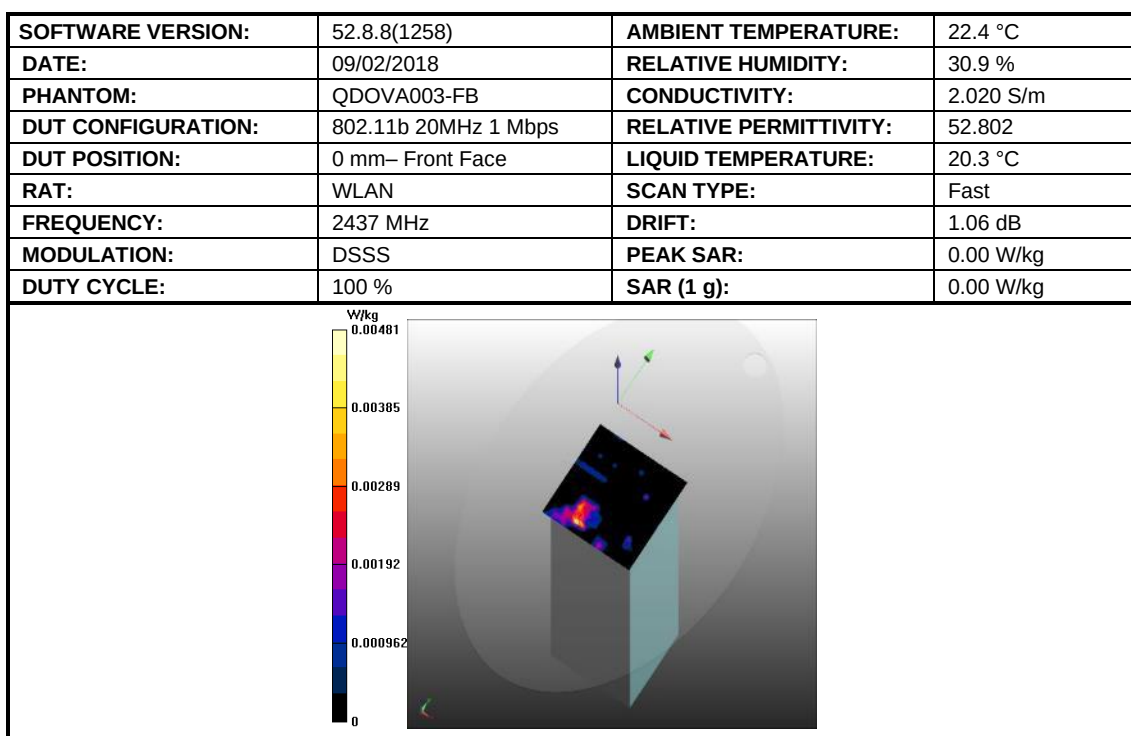


Figure44: SAR Body Testing Results for the VeriFinder Radiation Detector at 2437 MHz

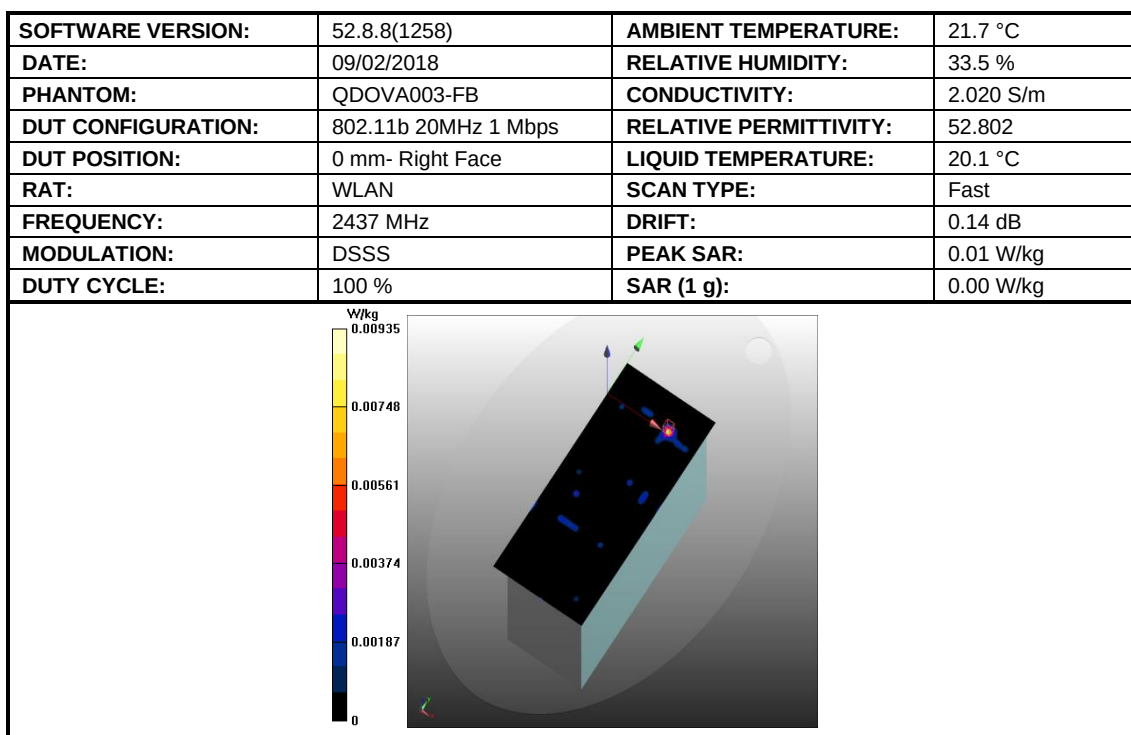


Figure45: SAR Body Testing Results for the VeriFinder Radiation Detector at 2437 MHz

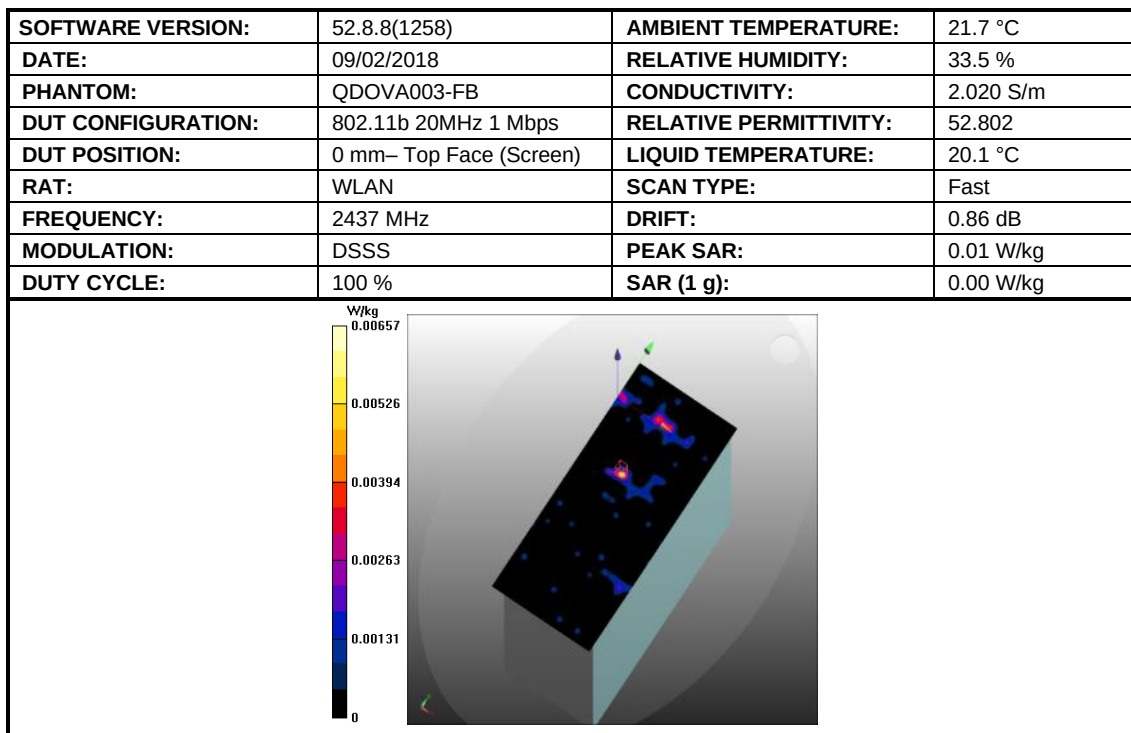


Figure 46: SAR Body Testing Results for the VeriFinder Radiation Detector at 2437 MHz

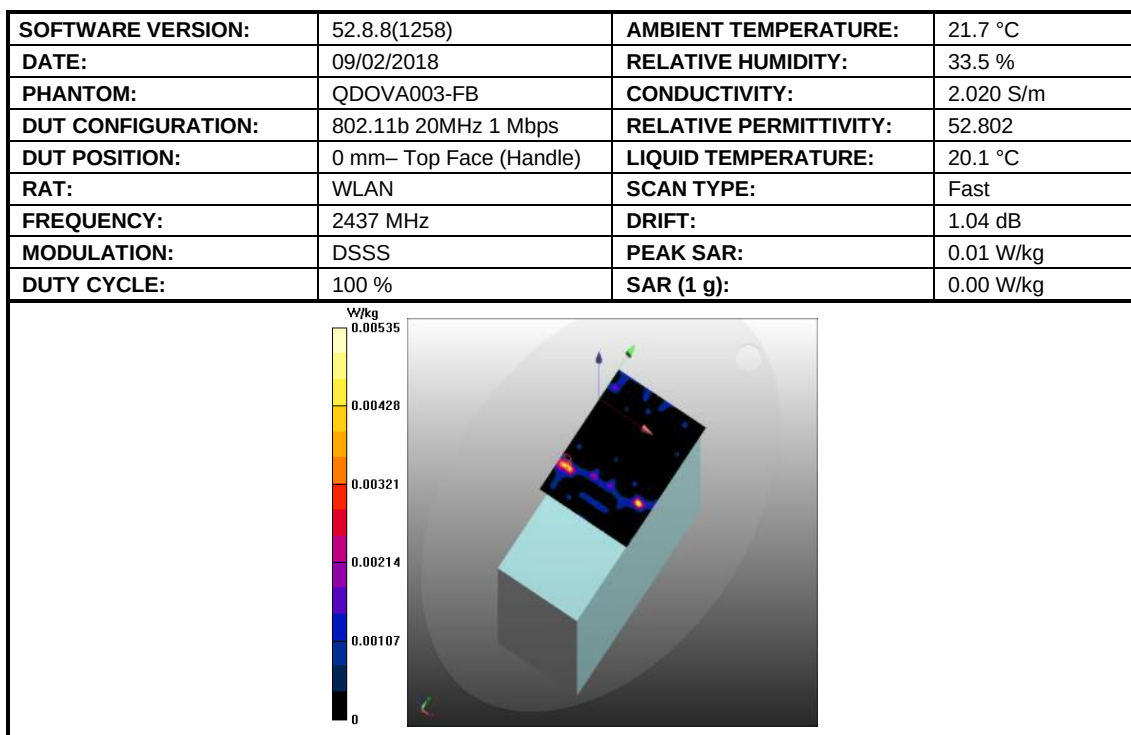


Figure 47: SAR Body Testing Results for the VeriFinder Radiation Detector at 2437 MHz

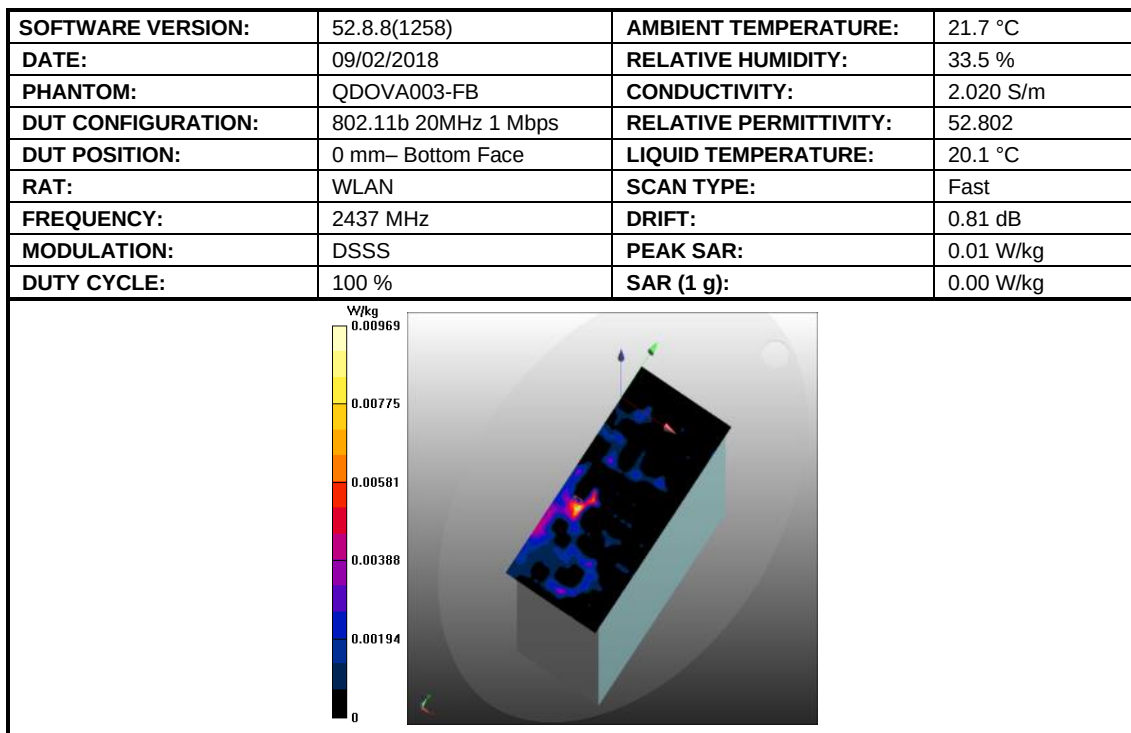


Figure 48: SAR Body Testing Results for the VeriFinder Radiation Detector at 2437 MHz

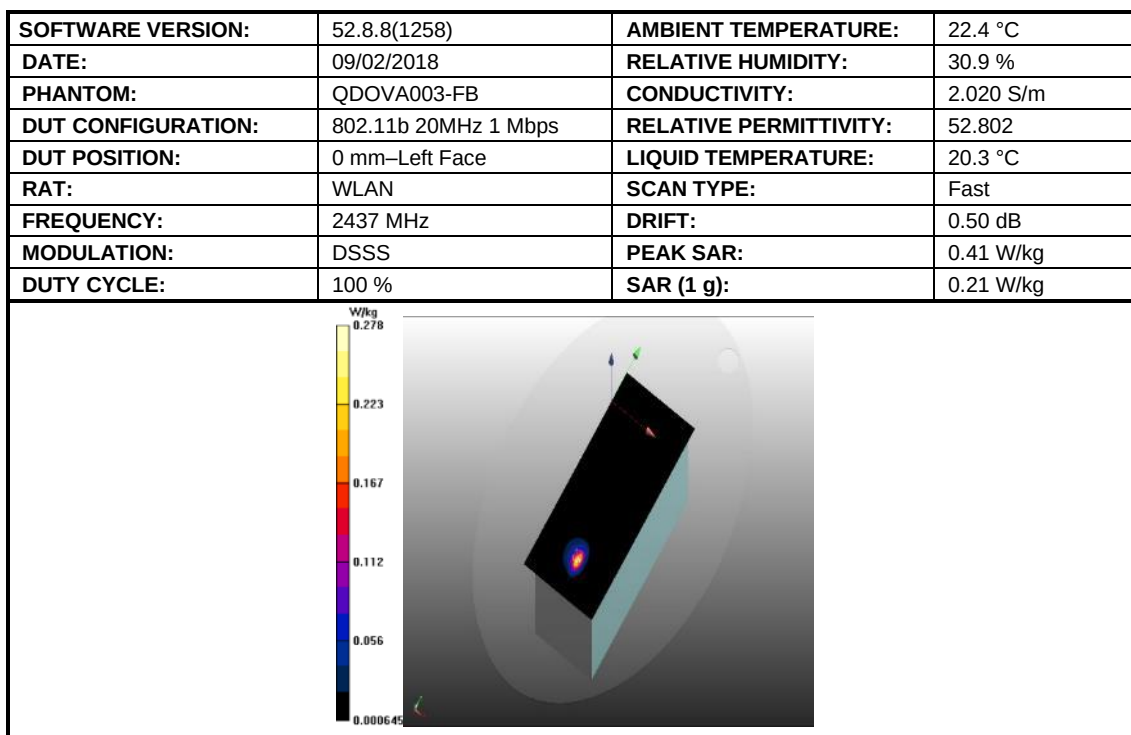


Figure 49: SAR Body Testing Results for the VeriFinder Radiation Detector at 2437 MHz

SOFTWARE VERSION:	52.8.8(1258)	AMBIENT TEMPERATURE:	22.4 °C
DATE:	09/02/2018	RELATIVE HUMIDITY:	30.9 %
PHANTOM:	QDOVA003-FB	CONDUCTIVITY:	2.020 S/m

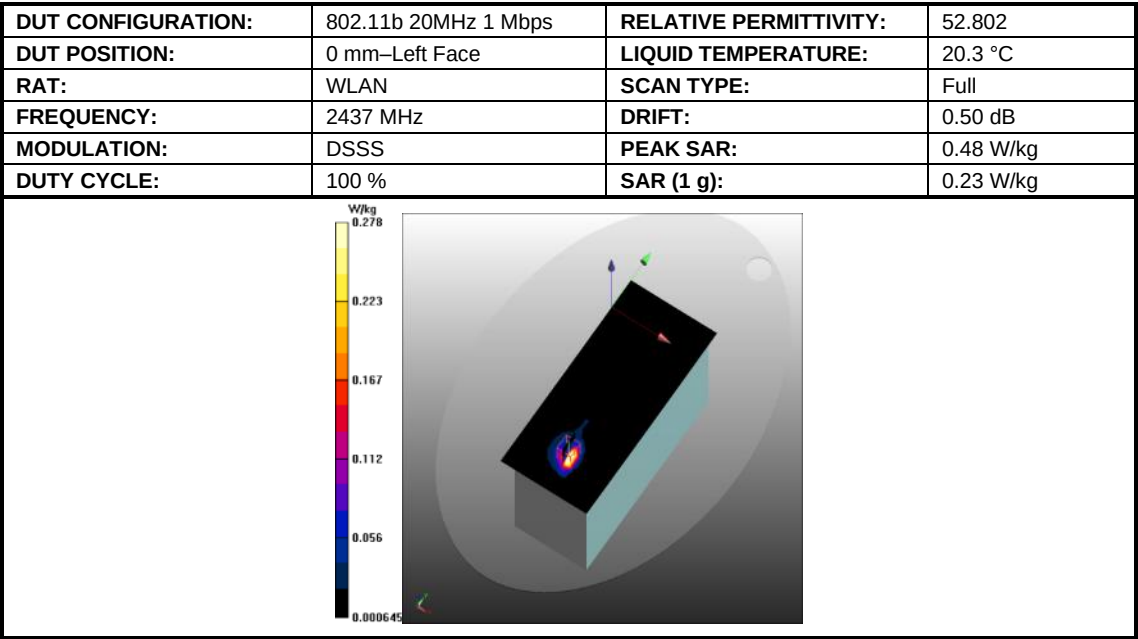


Figure 50: SAR Body Testing Results for the VeriFinder Radiation Detector at 2437 MHz

2.9 2450 MHz WLAN 802.11n 20 MHz 39 Mbps - MIMO - BODY SAR TEST RESULTS

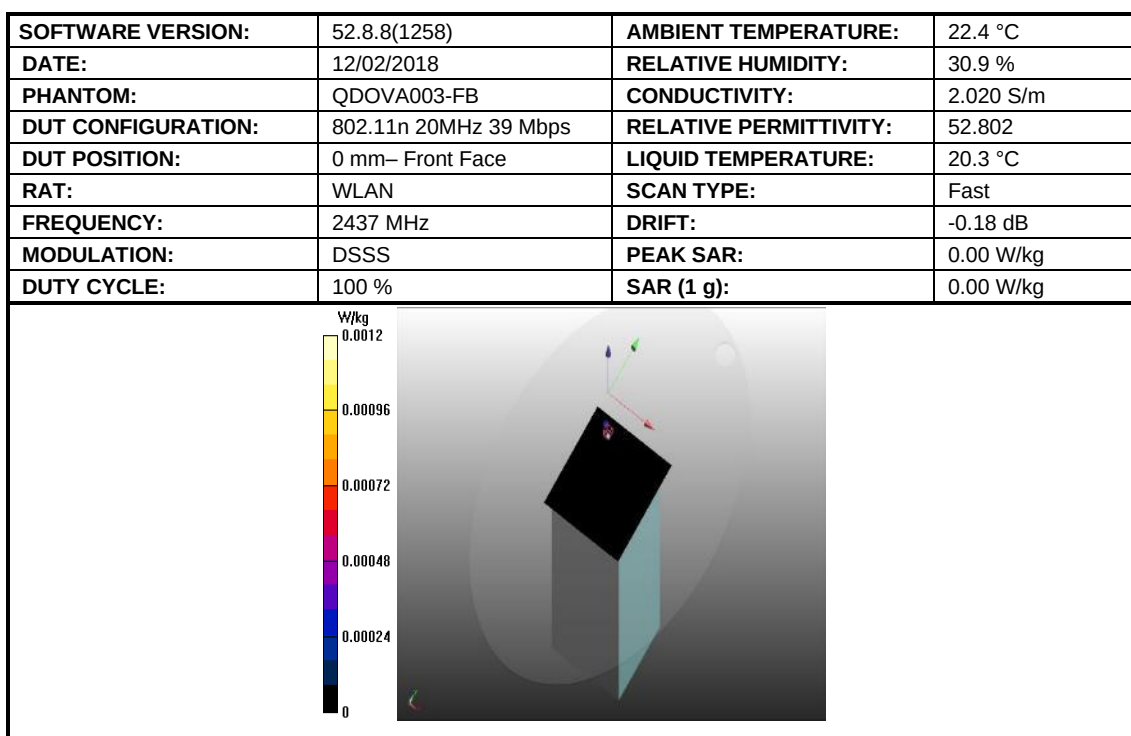


Figure 51: SAR Body Testing Results for the VeriFinder Radiation Detector at 2437 MHz

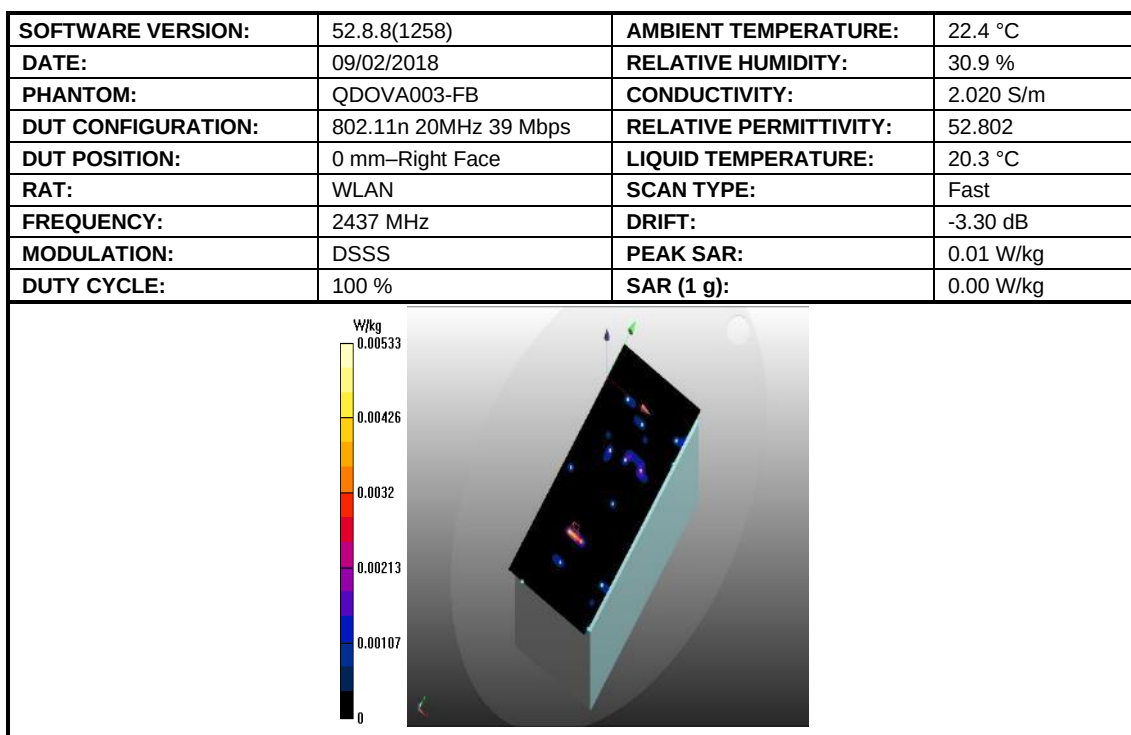


Figure 52: SAR Body Testing Results for the VeriFinder Radiation Detector at 2437 MHz

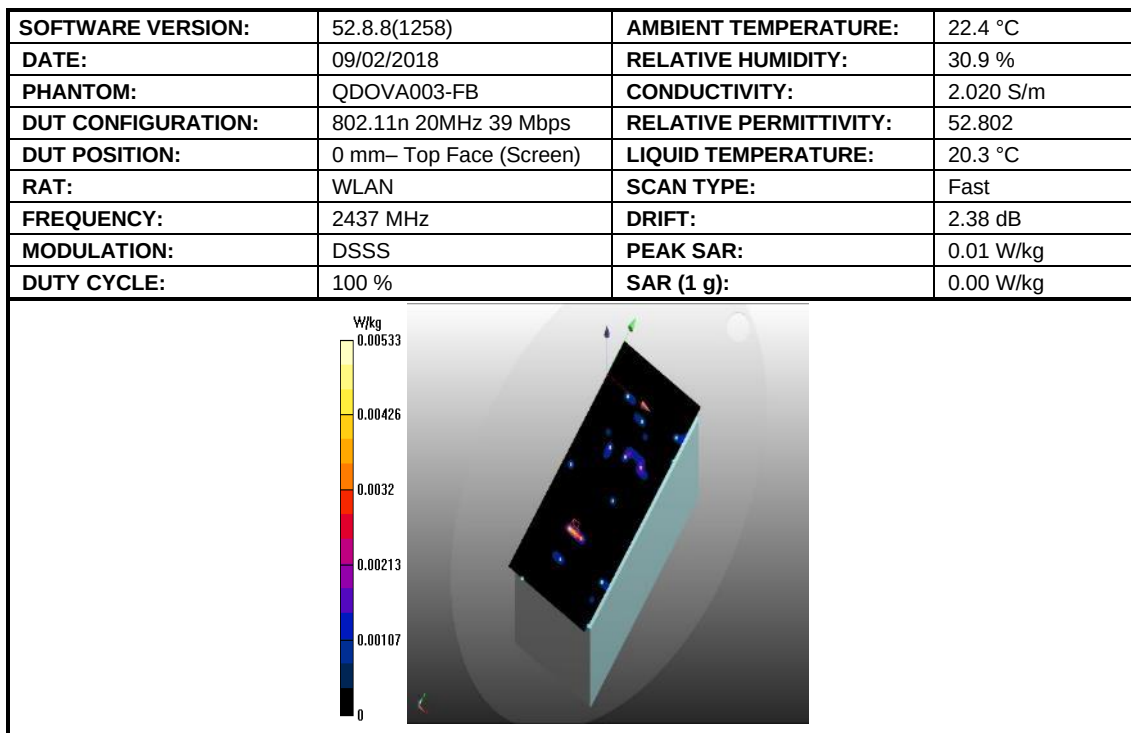


Figure 53: SAR Body Testing Results for the VeriFinder Radiation Detector at 2437 MHz

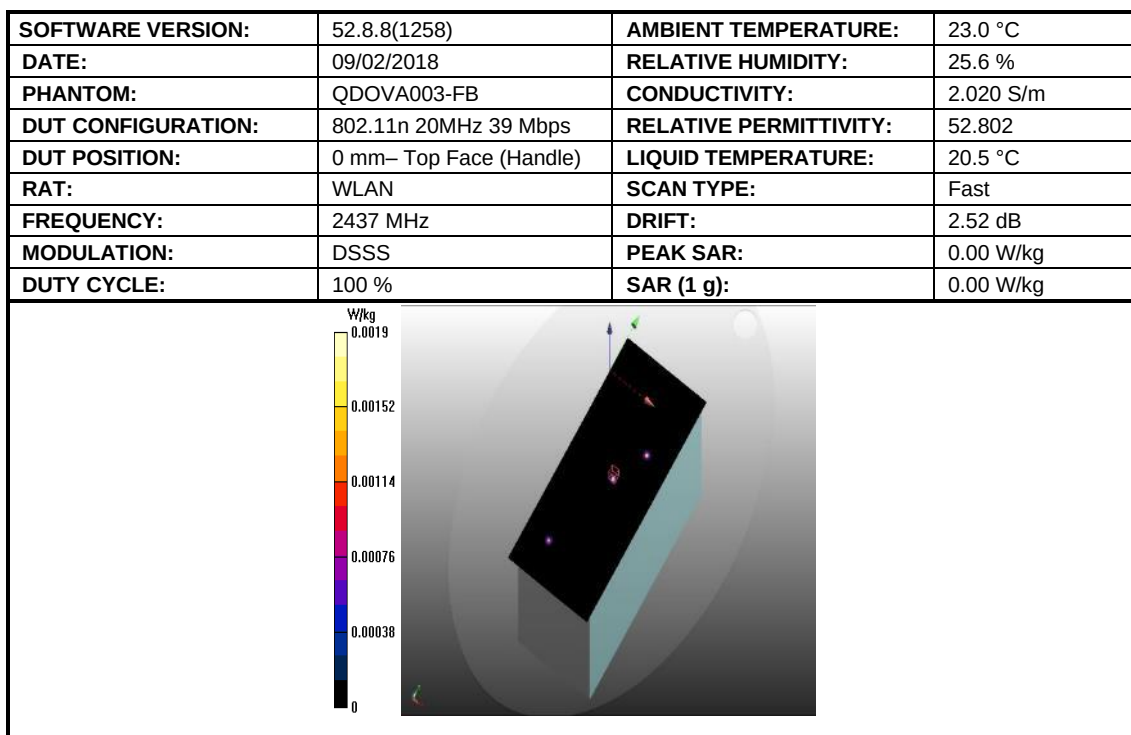


Figure 54: SAR Body Testing Results for the VeriFinder Radiation Detector at 2437 MHz

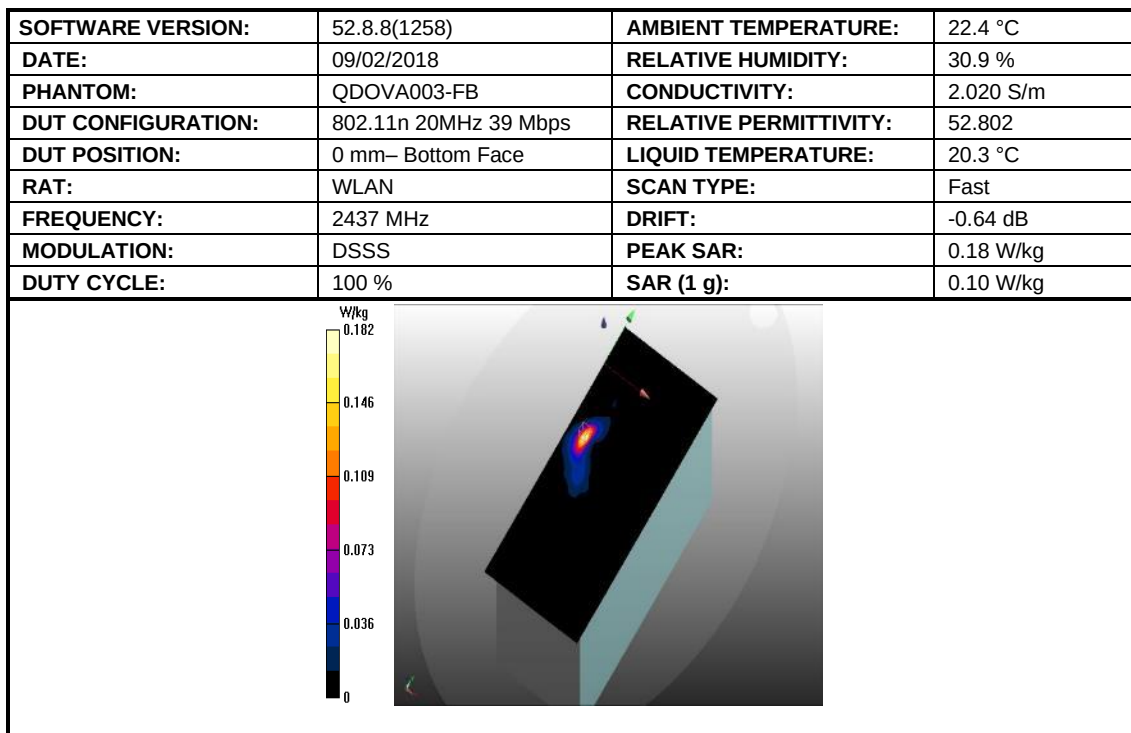


Figure 55: SAR Body Testing Results for the VeriFinder Radiation Detector at 2437 MHz

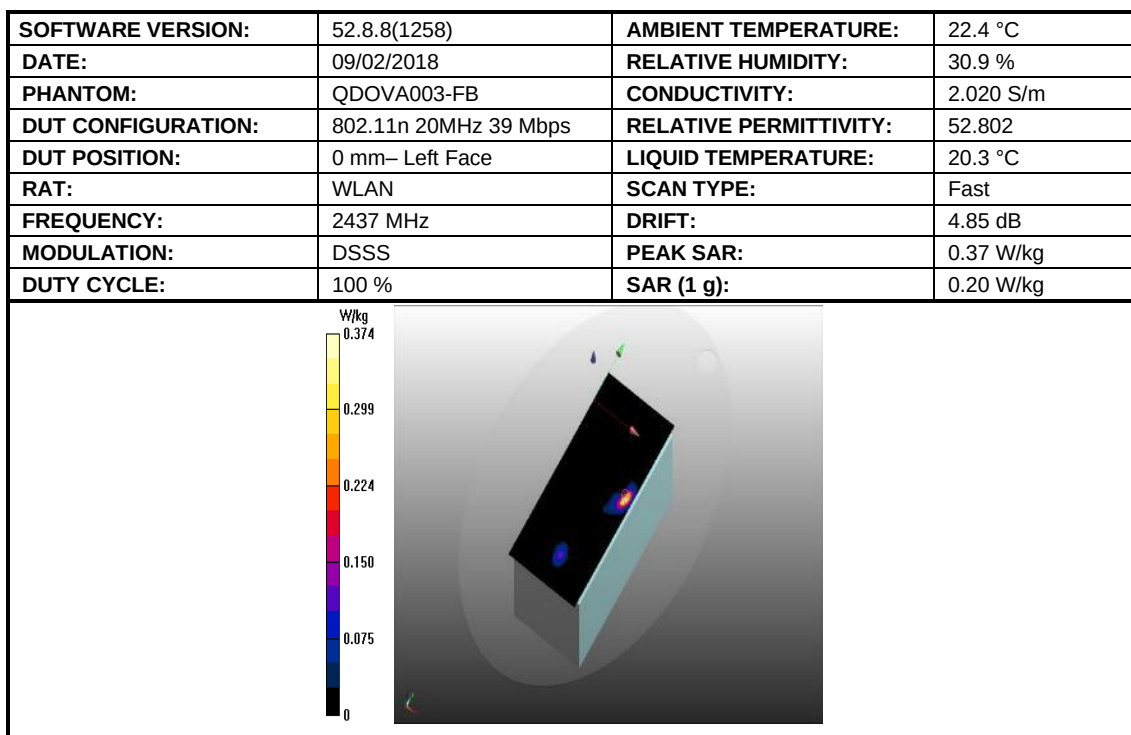


Figure 56: SAR Body Testing Results for the VeriFinder Radiation Detector at 2437 MHz

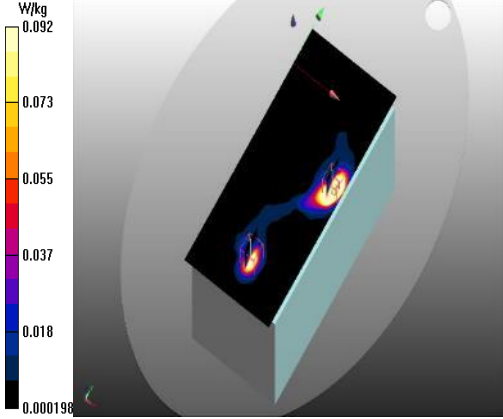
SOFTWARE VERSION:	52.8.8(1258)	AMBIENT TEMPERATURE:	22.4 °C
DATE:	09/02/2018	RELATIVE HUMIDITY:	30.9 %
PHANTOM:	QDOVA003-FB	CONDUCTIVITY:	2.020 S/m
DUT CONFIGURATION:	802.11n 20MHz 39 Mbps	RELATIVE PERMITTIVITY:	52.802
DUT POSITION:	0 mm— Left Face	LIQUID TEMPERATURE:	20.3 °C
RAT:	WLAN	SCAN TYPE:	Full
FREQUENCY:	2437 MHz	DRIFT:	4.85 dB
MODULATION:	DSSS	PEAK SAR:	0.16 W/kg
DUTY CYCLE:	100 %	SAR (1 g):	0.24 W/kg
			

Figure 57: SAR Body Testing Results for the VeriFinder Radiation Detector at 2437 MHz



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, Amplifier	IndexSar Ltd	VBM2500-3	2415	-	O/P Mon
Amplifier	IndexSar Ltd	5GHz	157	-	O/P Mon
Power Sensor	Rohde & Schwarz	NRV-Z1	60	12	12-Jun-2018
Power Sensor	Rohde & Schwarz	NRV- Z5	2878	12	12-Jun-2018
Signal Generator	Hewlett Packard	ESG4000A	61	12	14-Jul-2018
Signal Generator	Rohde & Schwarz	SMR40	1002	12	20-Oct-2018
Attenuator (20dB, 10W)	Weinschel	37-20-34	482	12	1-Nov -2018
Bi-directional Coupler	IndexSar Ltd	7401 (VDC0830-20)	2414	-	O/P Mon
Bi-directional Coupler	Hewlett Packard	11692D	0452	-	O/P Mon
Cable	Reynolds	262-0248-2000	2400	-	O/P Mon
Thermometer	Digitron	T208	64	12	18-May-2018
Hygrometer	Rotronic	I-1000	2784	12	04-May-2018
Dual Channel Power Meter	Rohde & Schwarz	NRVD	3259	12	12-Jun-2018
Data Acquisition Electronics	Speag	DAE 4 - SD 000 D04 BM	4689	12	15-Dec-2018
Measurement Server	Speag	DASY 5 Measurement Server	4692	-	TU
Sam Phantom	Speag	Sam Phantom	4703	-	TU
Elliptical Phantom	Speag	ELI Phantom	4699	-	TU
Dosimetric SAR Probe	Speag	EX3DV4	4700	12	15-Dec-2018
Mounting Platform for TX90XL Robot and Phantoms	Speag	MP6C-TX90XL Mounting Platform Extended	4702	-	TU
Robot	Speag	TX90 XL speag Robot	4704	-	TU
Communications Test Set	Rohde & Schwarz	CMU 200	0039	12	09-Jan-2019
MBBL Fluid	Speag	Batch 1	N/A	Weekly	27-Feb-2018
835 MHz Dipole	Speag	D835V2	3857	12	11-Dec-2018
1800 MHz Dipole	Speag	D1800V2	3855	12	12-Dec-2018
1900 MHz Dipole	Speag	D1900V2	3876	12	12-Dec-2018
2450 MHz Dipole	Speag	D2450V2	3875	12	8-Dec-2018

TU – Traceability Unscheduled

O/P Mon – Output Monitored using calibrated equipment.



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 865664 D01.

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
835 MHz Body	41.55	43.58	0.91	0.92
1800 MHz Body	40.00	41.77	1.40	1.41
1900 MHz Body	40.00	41.61	1.40	1.48
2450 MHz Body	39.20	20.78	1.80	1.90
835 MHz Body	41.55	42.34	0.91	0.95
1800 MHz Body	40.00	40.64	1.40	1.40
1900 MHz Body	40.00	40.53	1.40	1.45
2450 MHz Body	39.20	39.88	1.80	1.84
835 MHz Body	41.55	41.78	0.91	0.94
1800 MHz Body	40.00	40.27	1.40	1.37
1900 MHz Body	40.00	40.16	1.40	1.42
2450 MHz Body	39.20	39.56	1.80	1.81

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 21.7°C to 22.8°C.

The actual humidity during the testing ranged from 23.1% to 37.1% RH.

3.4.2 Test Fluid Temperature Range

Fluid Type	Min Temperature °C	Max Temperature °C
MBBL	20.0	20.9



3.5 MEASUREMENT UNCERTAINTY

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

Source of Uncertainty	Uncertainty $\pm$ %	Probability distribution	Div	c_i (1 g)	Standard Uncertainty $\pm$ % (1 g)	V_i (V_{eff})
Measurement System						
Probe calibration	6.0	N	1.00	0.00	0.0	
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	0.00	0.0	
Response time	0.8	R	1.73	0.00	0.0	
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	0.00	0.0	
Probe positioner	0.4	R	1.73	1.00	0.2	Infinity
Probe positioning	2.9	R	1.73	1.00	1.7	Infinity
Spatial x-y-Resolution	10.0	R	1.73	1.00	5.8	Infinity
Fast SAR z-Approximation	7.0	R	1.73	1.00	4.0	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	2.9	Infinity
Phantom and Setup						
Phantom uncertainty	6.1	R	1.73	1.00	3.5	Infinity
SAR Correction	1.9	R	1.73	0.00	0.0	
Liquid conductivity Meas.	2.5	R	1.73	0.00	0.0	
Liquid Permittivity Meas.	2.5	R	1.73	0.00	0.0	
Temp. Unc. Conductivity	3.4	R	1.73	0.00	0.0	
Temp. Unc. Permittivity	0.4	R	1.73	0.00	0.0	
Combined Standard Uncertainty		RSS			11.4	
Expanded Standard Uncertainty		K=2			22.7	



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

Source of Uncertainty	Uncertainty $\pm$ %	Probability distribution	Div	c_i (1 g)	Standard Uncertainty $\pm$ % (1 g)	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	2.9	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			11.1	361
Expanded Standard Uncertainty		K=2			22.2	



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.

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ANNEX A

PROBE CALIBRATION REPORT



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



S Schweizerischer Kalibrierdienst
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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: **EX3-3759_Dec17**

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 15, 2017**

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	04-Apr-17 (No. 217-02521/02522)	Apr-18
Power sensor NRP-Z91	SN: 103244	04-Apr-17 (No. 217-02521)	Apr-18
Power sensor NRP-Z91	SN: 103245	04-Apr-17 (No. 217-02525)	Apr-18
Reference 20 dB Attenuator	SN: S5277 (20x)	07-Apr-17 (No. 217-02528)	Apr-18
Reference Probe ES3DV2	SN: 3013	31-Dec-16 (No. ES3-3013_Dec16)	Dec-17
DAE4	SN: 654	24-Jul-17 (No. DAE4-654_Jul17)	Jul-18
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-17)	In house check: Oct-18

Calibrated by:	Name Michael Weber	Function Laboratory Technician	Signature
Approved by:	Katja Pokovic	Technical Manager	
This calibration certificate shall not be reproduced except in full without written approval of the laboratory.			

Issued: December 15, 2017

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Glossary:

TSL	tissue simulating liquid
NORM _{x,y,z}	sensitivity in free space
ConvF	sensitivity in TSL / NORM _{x,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., $\vartheta = 0$ 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:

- 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
- IEC 62209-1, "Measurement procedure for the assessment of Specific Absorption Rate (SAR) from hand-held and body-mounted devices used next to the ear (frequency range of 300 MHz to 6 GHz)", July 2016
- 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
- KDB 865664, "SAR Measurement Requirements for 100 MHz to 6 GHz"

Methods Applied and Interpretation of Parameters:

- NORM_{x,y,z}**: Assessed for E-field polarization $\vartheta = 0$ ($f \leq 900$ MHz in TEM-cell; $f > 1800$ MHz: R22 waveguide). NORM_{x,y,z} are only intermediate values, i.e., the uncertainties of NORM_{x,y,z} does not affect the E²-field uncertainty inside TSL (see below ConvF).
- NORM(f)_{x,y,z}** = NORM_{x,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.
- DCP_{x,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
- A_{x,y,z}; B_{x,y,z}; C_{x,y,z}; D_{x,y,z}; VR_{x,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 $f \leq 800$ 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 NORM_{x,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 NORM_x (no uncertainty required).



EX3DV4 – SN:3759

December 15, 2017

Probe EX3DV4

SN:3759

Manufactured: March 16, 2010
Calibrated: December 15, 2017

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

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

Basic Calibration Parameters

	Sensor X	Sensor Y	Sensor Z	Unc (k=2)
Norm ($\mu\text{V}/(\text{V}/\text{m})^2$) ^A	0.47	0.43	0.44	$\pm 10.1 \%$
DCP (mV) ^B	96.3	101.3	104.4	

Modulation Calibration Parameters

UID	Communication System Name		A dB	B dB $\sqrt{\mu\text{V}}$	C	D dB	VR mV	Unc ^E (k=2)
0	CW	X	0.0	0.0	1.0	0.00	175.9	$\pm 2.7 \%$
		Y	0.0	0.0	1.0		176.6	
		Z	0.0	0.0	1.0		190.7	

Note: For details on UID parameters see Appendix.

Sensor Model Parameters

	C1 fF	C2 fF	α V^{-1}	T1 $\text{ms} \cdot \text{V}^{-2}$	T2 $\text{ms} \cdot \text{V}^{-1}$	T3 ms	T4 V^{-2}	T5 V^{-1}	T6
X	41.32	316.6	37.15	11.64	0.646	5.078	0.000	0.575	1.008
Y	45.97	342.8	35.45	15.74	0.369	5.100	0.925	0.377	1.008
Z	41.91	321.1	37.19	13.86	1.049	5.067	0.000	0.617	1.009

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.

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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	11.17	11.17	11.17	0.13	1.20	± 13.3 %
750	41.9	0.89	10.54	10.54	10.54	0.26	1.13	± 12.0 %
835	41.5	0.90	10.15	10.15	10.15	0.20	1.15	± 12.0 %
900	41.5	0.97	9.96	9.96	9.96	0.22	1.12	± 12.0 %
1640	40.2	1.31	8.76	8.76	8.76	0.17	1.00	± 12.0 %
1750	40.1	1.37	8.66	8.66	8.66	0.24	0.87	± 12.0 %
1900	40.0	1.40	8.34	8.34	8.34	0.16	0.99	± 12.0 %
2100	39.8	1.49	8.38	8.38	8.38	0.17	0.90	± 12.0 %
2300	39.5	1.67	7.66	7.66	7.66	0.23	0.86	± 12.0 %
2450	39.2	1.80	7.32	7.32	7.32	0.25	0.86	± 12.0 %
2600	39.0	1.96	7.06	7.06	7.06	0.25	0.92	± 12.0 %
5200	36.0	4.66	4.51	4.51	4.51	0.40	1.80	± 13.1 %
5300	35.9	4.76	4.36	4.36	4.36	0.40	1.80	± 13.1 %
5500	35.6	4.96	3.87	3.87	3.87	0.40	1.80	± 13.1 %
5600	35.5	5.07	3.83	3.83	3.83	0.40	1.80	± 13.1 %
5800	35.3	5.27	3.88	3.88	3.88	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 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.

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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	11.45	11.45	11.45	0.05	1.20	± 13.3 %
750	55.5	0.96	10.23	10.23	10.23	0.21	1.15	± 12.0 %
835	55.2	0.97	9.95	9.95	9.95	0.21	1.08	± 12.0 %
900	55.0	1.05	9.83	9.83	9.83	0.17	1.25	± 12.0 %
1640	53.7	1.42	8.79	8.79	8.79	0.26	0.83	± 12.0 %
1750	53.4	1.49	8.24	8.24	8.24	0.28	0.80	± 12.0 %
1900	53.3	1.52	7.95	7.95	7.95	0.14	1.20	± 12.0 %
2100	53.2	1.62	8.35	8.35	8.35	0.22	0.95	± 12.0 %
2300	52.9	1.81	7.64	7.64	7.64	0.26	0.86	± 12.0 %
2450	52.7	1.95	7.49	7.49	7.49	0.25	0.85	± 12.0 %
2600	52.5	2.16	7.20	7.20	7.20	0.22	0.90	± 12.0 %
5200	49.0	5.30	4.03	4.03	4.03	0.40	1.90	± 13.1 %
5300	48.9	5.42	3.88	3.88	3.88	0.40	1.90	± 13.1 %
5500	48.6	5.65	3.38	3.38	3.38	0.45	1.90	± 13.1 %
5600	48.5	5.77	3.29	3.29	3.29	0.45	1.90	± 13.1 %
5800	48.2	6.00	3.34	3.34	3.34	0.45	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.

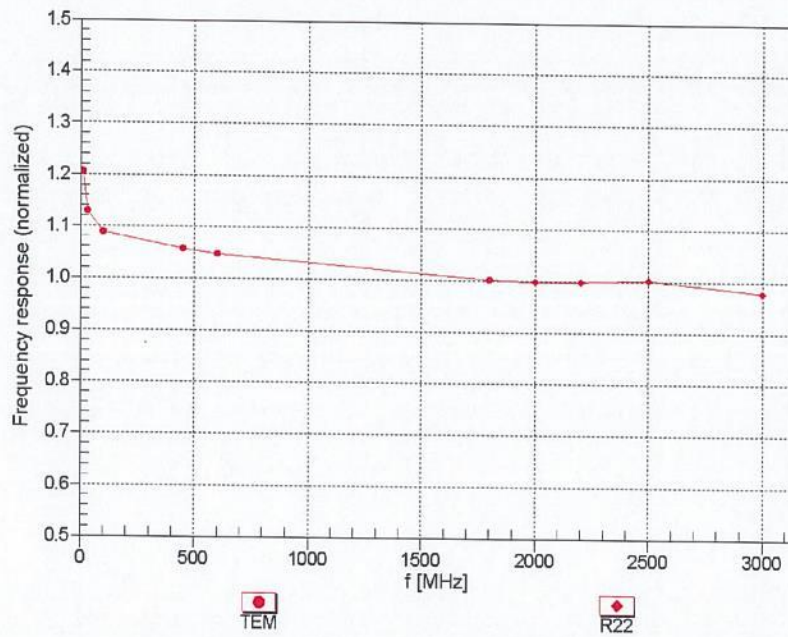
^F At frequencies below 3 GHz, the validity of tissue parameters (ϵ and σ) can be relaxed to ± 10% if liquid compensation formula is applied to measured SAR values. At frequencies above 3 GHz, the validity of tissue parameters (ϵ and σ) is restricted to ± 5%. The uncertainty is the RSS of the ConvF uncertainty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

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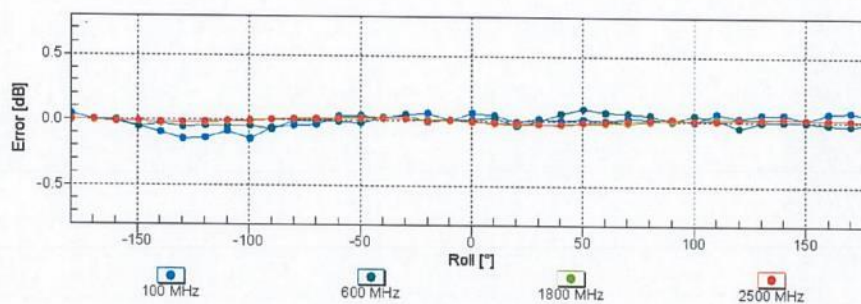
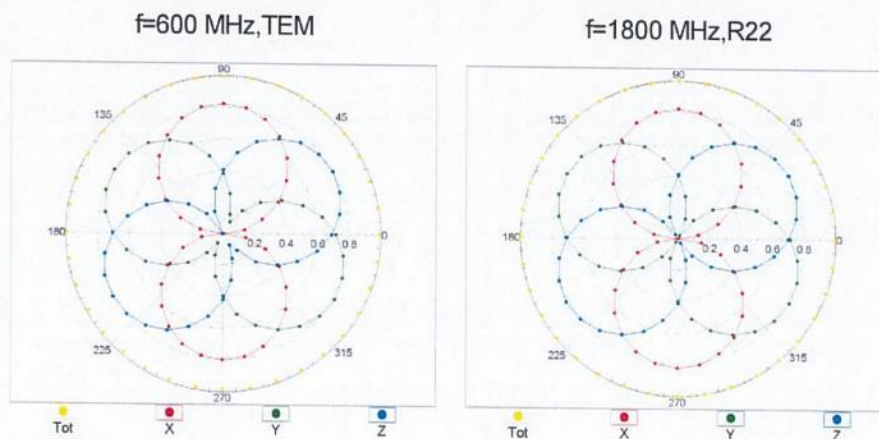
Frequency Response of E-Field (TEM-Cell: ifi110 EXX, Waveguide: R22)

Uncertainty of Frequency Response of E-field: $\pm 6.3\%$ ($k=2$)

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Receiving Pattern (ϕ), $\theta = 0^\circ$

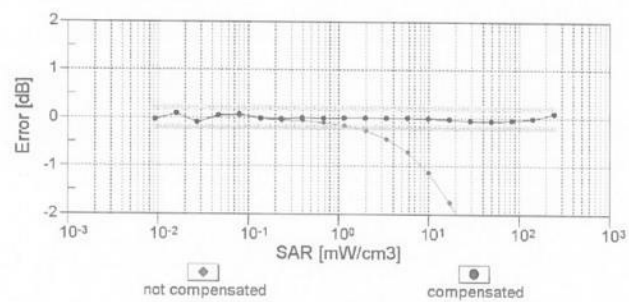
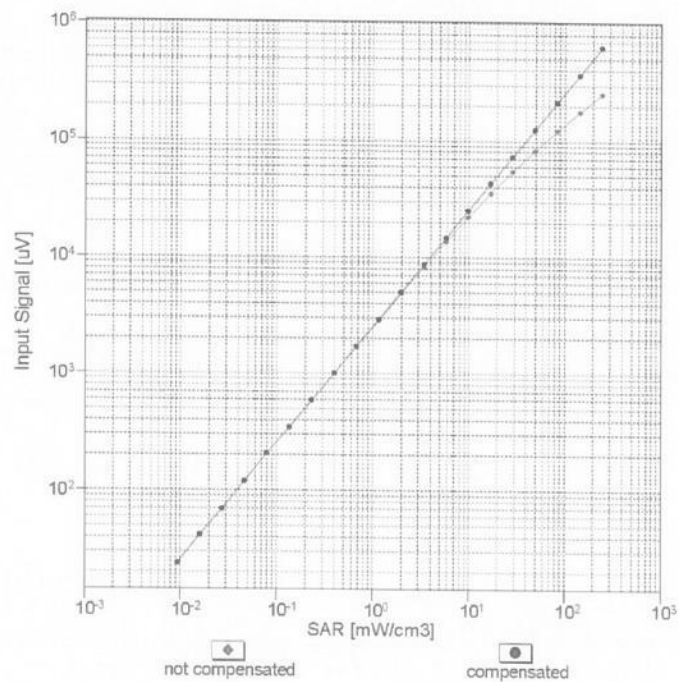


Uncertainty of Axial Isotropy Assessment: $\pm 0.5\%$ ($k=2$)

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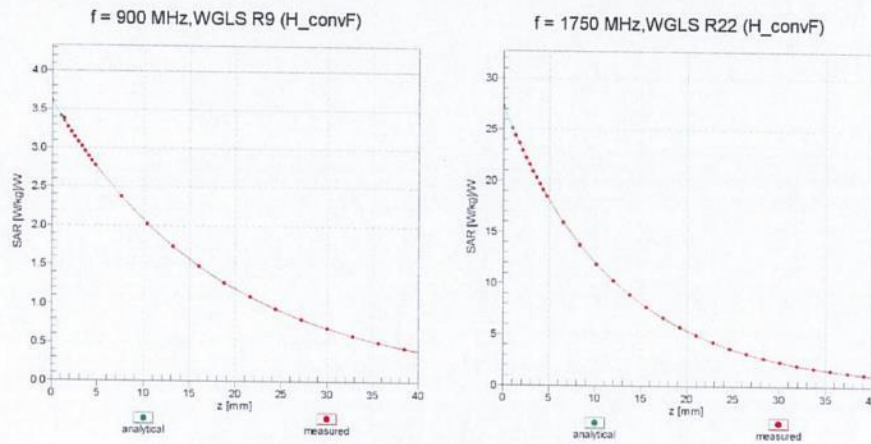
Dynamic Range $f(\text{SAR}_{\text{head}})$ (TEM cell, $f_{\text{eval}} = 1900 \text{ MHz}$)

Uncertainty of Linearity Assessment: $\pm 0.6\%$ ($k=2$)

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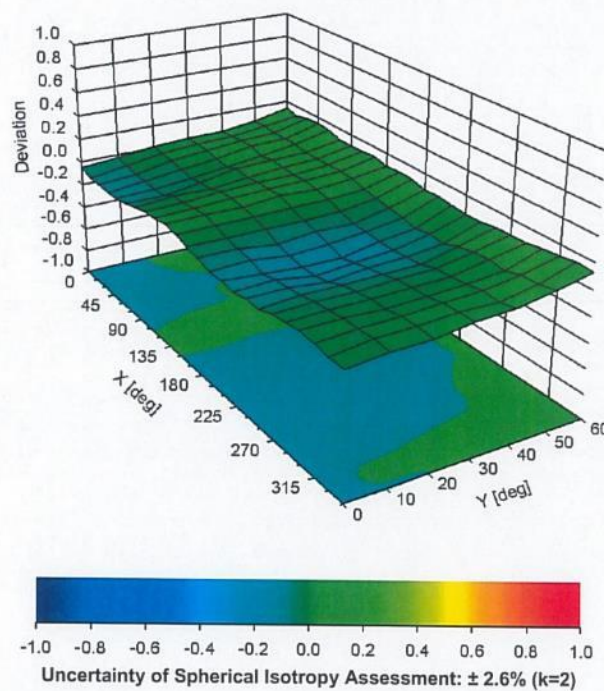
December 15, 2017

Conversion Factor Assessment



Deviation from Isotropy in Liquid

Error (ϕ , θ), f = 900 MHz



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

Sensor Arrangement	Triangular
Connector Angle (°)	0.3
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



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Appendix: Modulation Calibration Parameters

UID	Communication System Name		A dB	B dB μ V	C	D dB	VR mV	Max Unc ^E (k=2)
0	CW	X	0.00	0.00	1.00	0.00	175.9	$\pm 2.7\%$
		Y	0.00	0.00	1.00		176.6	
		Z	0.00	0.00	1.00		190.7	
10010- CAA	SAR Validation (Square, 100ms, 10ms)	X	2.16	64.99	9.77	10.00	20.0	$\pm 9.6\%$
		Y	3.58	71.18	12.76		20.0	
		Z	2.56	66.02	10.70		20.0	
10011- CAB	UMTS-FDD (WCDMA)	X	0.82	64.99	13.21	0.00	150.0	$\pm 9.6\%$
		Y	0.93	65.90	14.15		150.0	
		Z	0.83	65.44	13.47		150.0	
10012- CAB	IEEE 802.11b WiFi 2.4 GHz (DSSS, 1 Mbps)	X	1.05	62.93	14.36	0.41	150.0	$\pm 9.6\%$
		Y	1.14	63.57	14.90		150.0	
		Z	1.06	63.23	14.54		150.0	
10013- CAB	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 6 Mbps)	X	4.72	66.54	16.95	1.46	150.0	$\pm 9.6\%$
		Y	4.84	66.70	17.07		150.0	
		Z	4.74	66.60	16.98		150.0	
10021- DAC	GSM-FDD (TDMA, GMSK)	X	100.00	112.49	26.59	9.39	50.0	$\pm 9.6\%$
		Y	100.00	116.38	28.37		50.0	
		Z	100.00	113.68	27.56		50.0	
10023- DAC	GPRS-FDD (TDMA, GMSK, TN 0)	X	100.00	112.09	26.45	9.57	50.0	$\pm 9.6\%$
		Y	100.00	115.90	28.18		50.0	
		Z	100.00	113.42	27.49		50.0	
10024- DAC	GPRS-FDD (TDMA, GMSK, TN 0-1)	X	100.00	110.48	24.56	6.56	60.0	$\pm 9.6\%$
		Y	100.00	115.96	27.23		60.0	
		Z	100.00	110.52	24.97		60.0	
10025- DAC	EDGE-FDD (TDMA, 8PSK, TN 0)	X	3.88	67.91	24.69	12.57	50.0	$\pm 9.6\%$
		Y	5.94	82.56	33.20		50.0	
		Z	3.91	66.61	23.43		50.0	
10026- DAC	EDGE-FDD (TDMA, 8PSK, TN 0-1)	X	8.32	90.19	32.05	9.56	60.0	$\pm 9.6\%$
		Y	12.26	100.74	36.43		60.0	
		Z	9.34	91.12	31.85		60.0	
10027- DAC	GPRS-FDD (TDMA, GMSK, TN 0-1-2)	X	100.00	109.42	23.29	4.80	80.0	$\pm 9.6\%$
		Y	100.00	117.00	26.96		80.0	
		Z	100.00	108.73	23.36		80.0	
10028- DAC	GPRS-FDD (TDMA, GMSK, TN 0-1-2-3)	X	100.00	108.14	22.04	3.55	100.0	$\pm 9.6\%$
		Y	100.00	118.82	27.05		100.0	
		Z	100.00	107.04	21.91		100.0	
10029- DAC	EDGE-FDD (TDMA, 8PSK, TN 0-1-2)	X	5.36	80.23	26.94	7.80	80.0	$\pm 9.6\%$
		Y	6.85	86.01	29.59		80.0	
		Z	6.12	81.98	27.25		80.0	
10030- CAA	IEEE 802.15.1 Bluetooth (GFSK, DH1)	X	100.00	107.97	22.96	5.30	70.0	$\pm 9.6\%$
		Y	100.00	114.46	26.13		70.0	
		Z	100.00	107.89	23.28		70.0	
10031- CAA	IEEE 802.15.1 Bluetooth (GFSK, DH3)	X	100.00	94.76	15.26	1.88	100.0	$\pm 9.6\%$
		Y	100.00	115.48	24.25		100.0	
		Z	9.25	80.85	12.65		100.0	

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10032-CAA	IEEE 802.15.1 Bluetooth (GFSK, DH5)	X	0.19	60.00	4.06	1.17	100.0	± 9.6 %
		Y	100.00	117.02	23.90		100.0	
		Z	0.22	60.00	4.29		100.0	
10033-CAA	IEEE 802.15.1 Bluetooth (PI/4-DQPSK, DH1)	X	17.87	99.83	26.24	5.30	70.0	± 9.6 %
		Y	100.00	129.86	35.03		70.0	
		Z	12.52	92.73	23.92		70.0	
10034-CAA	IEEE 802.15.1 Bluetooth (PI/4-DQPSK, DH3)	X	2.49	74.13	15.92	1.88	100.0	± 9.6 %
		Y	5.30	85.11	20.98		100.0	
		Z	2.68	74.20	15.81		100.0	
10035-CAA	IEEE 802.15.1 Bluetooth (PI/4-DQPSK, DH5)	X	1.53	69.18	13.51	1.17	100.0	± 9.6 %
		Y	2.50	75.76	17.30		100.0	
		Z	1.66	69.63	13.61		100.0	
10036-CAA	IEEE 802.15.1 Bluetooth (8-DPSK, DH1)	X	33.45	109.44	28.89	5.30	70.0	± 9.6 %
		Y	100.00	130.34	35.25		70.0	
		Z	19.06	99.10	25.84		70.0	
10037-CAA	IEEE 802.15.1 Bluetooth (8-DPSK, DH3)	X	2.28	73.14	15.52	1.88	100.0	± 9.6 %
		Y	4.71	83.61	20.45		100.0	
		Z	2.46	73.29	15.43		100.0	
10038-CAA	IEEE 802.15.1 Bluetooth (8-DPSK, DH5)	X	1.55	69.55	13.79	1.17	100.0	± 9.6 %
		Y	2.54	76.23	17.60		100.0	
		Z	1.69	70.07	13.91		100.0	
10039-CAB	CDMA2000 (1xRTT, RC1)	X	1.05	65.59	11.28	0.00	150.0	± 9.6 %
		Y	1.46	69.03	13.93		150.0	
		Z	1.09	66.10	11.54		150.0	
10042-CAB	IS-54 / IS-136 FDD (TDMA/FDM, PI/4-DQPSK, Halfrate)	X	100.00	107.37	23.43	7.78	50.0	± 9.6 %
		Y	100.00	111.98	25.64		50.0	
		Z	100.00	108.29	24.22		50.0	
10044-CAA	IS-91/EIA/TIA-553 FDD (FDMA, FM)	X	0.15	122.74	12.16	0.00	150.0	± 9.6 %
		Y	0.00	114.17	0.26		150.0	
		Z	0.24	126.15	5.88		150.0	
10048-CAA	DECT (TDD, TDMA/FDM, GFSK, Full Slot, 24)	X	35.92	97.18	23.96	13.80	25.0	± 9.6 %
		Y	100.00	115.10	29.09		25.0	
		Z	14.63	86.41	21.72		25.0	
10049-CAA	DECT (TDD, TDMA/FDM, GFSK, Double Slot, 12)	X	78.89	108.38	25.78	10.79	40.0	± 9.6 %
		Y	100.00	114.52	27.83		40.0	
		Z	19.09	91.43	22.08		40.0	
10056-CAA	UMTS-TDD (TD-SCDMA, 1.28 Mcps)	X	30.58	103.53	27.64	9.03	50.0	± 9.6 %
		Y	100.00	125.91	34.38		50.0	
		Z	14.97	91.44	24.12		50.0	
10058-DAC	EDGE-FDD (TDMA, 8PSK, TN 0-1-2-3)	X	4.20	75.52	24.15	6.55	100.0	± 9.6 %
		Y	5.07	79.42	26.03		100.0	
		Z	4.73	77.19	24.56		100.0	
10059-CAB	IEEE 802.11b WiFi 2.4 GHz (DSSS, 2 Mbps)	X	1.08	64.00	14.98	0.61	110.0	± 9.6 %
		Y	1.19	64.87	15.66		110.0	
		Z	1.11	64.48	15.21		110.0	
10060-CAB	IEEE 802.11b WiFi 2.4 GHz (DSSS, 5.5 Mbps)	X	11.06	103.11	26.31	1.30	110.0	± 9.6 %
		Y	100.00	137.46	35.45		110.0	
		Z	23.10	110.82	27.74		110.0	

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10061-CAB	IEEE 802.11b WiFi 2.4 GHz (DSSS, 11 Mbps)	X	2.76	80.30	21.89	2.04	110.0	± 9.6 %
		Y	4.09	86.73	24.67		110.0	
		Z	3.43	82.67	22.40		110.0	
10062-CAC	IEEE 802.11a/h WiFi 5 GHz (OFDM, 6 Mbps)	X	4.50	66.42	16.30	0.49	100.0	± 9.6 %
		Y	4.62	66.61	16.42		100.0	
		Z	4.51	66.47	16.33		100.0	
10063-CAC	IEEE 802.11a/h WiFi 5 GHz (OFDM, 9 Mbps)	X	4.52	66.53	16.41	0.72	100.0	± 9.6 %
		Y	4.65	66.72	16.54		100.0	
		Z	4.53	66.58	16.44		100.0	
10064-CAC	IEEE 802.11a/h WiFi 5 GHz (OFDM, 12 Mbps)	X	4.79	66.79	16.65	0.86	100.0	± 9.6 %
		Y	4.93	66.99	16.78		100.0	
		Z	4.80	66.84	16.68		100.0	
10065-CAC	IEEE 802.11a/h WiFi 5 GHz (OFDM, 18 Mbps)	X	4.66	66.69	16.75	1.21	100.0	± 9.6 %
		Y	4.81	66.92	16.91		100.0	
		Z	4.68	66.75	16.78		100.0	
10066-CAC	IEEE 802.11a/h WiFi 5 GHz (OFDM, 24 Mbps)	X	4.69	66.73	16.94	1.46	100.0	± 9.6 %
		Y	4.83	66.96	17.10		100.0	
		Z	4.71	66.81	16.97		100.0	
10067-CAC	IEEE 802.11a/h WiFi 5 GHz (OFDM, 36 Mbps)	X	4.99	67.00	17.44	2.04	100.0	± 9.6 %
		Y	5.13	67.17	17.58		100.0	
		Z	5.02	67.08	17.47		100.0	
10068-CAC	IEEE 802.11a/h WiFi 5 GHz (OFDM, 48 Mbps)	X	5.03	67.00	17.65	2.55	100.0	± 9.6 %
		Y	5.18	67.24	17.83		100.0	
		Z	5.07	67.10	17.68		100.0	
10069-CAC	IEEE 802.11a/h WiFi 5 GHz (OFDM, 54 Mbps)	X	5.11	67.03	17.85	2.67	100.0	± 9.6 %
		Y	5.26	67.24	18.02		100.0	
		Z	5.15	67.14	17.88		100.0	
10071-CAB	IEEE 802.11g WiFi 2.4 GHz (DSSS/OFDM, 9 Mbps)	X	4.82	66.65	17.28	1.99	100.0	± 9.6 %
		Y	4.94	66.82	17.41		100.0	
		Z	4.85	66.72	17.30		100.0	
10072-CAB	IEEE 802.11g WiFi 2.4 GHz (DSSS/OFDM, 12 Mbps)	X	4.80	66.96	17.50	2.30	100.0	± 9.6 %
		Y	4.93	67.17	17.66		100.0	
		Z	4.83	67.06	17.53		100.0	
10073-CAB	IEEE 802.11g WiFi 2.4 GHz (DSSS/OFDM, 18 Mbps)	X	4.87	67.16	17.86	2.83	100.0	± 9.6 %
		Y	5.00	67.37	18.02		100.0	
		Z	4.91	67.29	17.89		100.0	
10074-CAB	IEEE 802.11g WiFi 2.4 GHz (DSSS/OFDM, 24 Mbps)	X	4.87	67.10	18.02	3.30	100.0	± 9.6 %
		Y	4.99	67.29	18.20		100.0	
		Z	4.92	67.25	18.06		100.0	
10075-CAB	IEEE 802.11g WiFi 2.4 GHz (DSSS/OFDM, 36 Mbps)	X	4.90	67.19	18.33	3.82	90.0	± 9.6 %
		Y	5.03	67.42	18.54		90.0	
		Z	4.97	67.38	18.37		90.0	
10076-CAB	IEEE 802.11g WiFi 2.4 GHz (DSSS/OFDM, 48 Mbps)	X	4.93	67.03	18.48	4.15	90.0	± 9.6 %
		Y	5.04	67.21	18.67		90.0	
		Z	5.00	67.24	18.53		90.0	
10077-CAB	IEEE 802.11g WiFi 2.4 GHz (DSSS/OFDM, 54 Mbps)	X	4.96	67.11	18.58	4.30	90.0	± 9.6 %
		Y	5.06	67.28	18.77		90.0	
		Z	5.04	67.33	18.64		90.0	

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10081-CAB	CDMA2000 (1xRTT, RC3)	X	0.53	61.78	8.60	0.00	150.0	± 9.6 %
		Y	0.71	64.03	11.02		150.0	
		Z	0.52	61.92	8.65		150.0	
10082-CAB	IS-54 / IS-136 FDD (TDMA/FDM, PI/4-DQPSK, Fullrate)	X	3.64	66.77	6.58	4.77	80.0	± 9.6 %
		Y	0.77	60.00	4.67		80.0	
		Z	0.81	60.00	4.63		80.0	
10090-DAC	GPRS-FDD (TDMA, GMSK, TN 0-4)	X	100.00	110.59	24.63	6.56	60.0	± 9.6 %
		Y	100.00	116.02	27.28		60.0	
		Z	100.00	110.63	25.04		60.0	
10097-CAB	UMTS-FDD (HSDPA)	X	1.61	66.33	14.40	0.00	150.0	± 9.6 %
		Y	1.72	66.87	15.01		150.0	
		Z	1.62	66.63	14.60		150.0	
10098-CAB	UMTS-FDD (HSUPA, Subtest 2)	X	1.57	66.26	14.36	0.00	150.0	± 9.6 %
		Y	1.69	66.81	14.97		150.0	
		Z	1.58	66.56	14.55		150.0	
10099-DAC	EDGE-FDD (TDMA, 8PSK, TN 0-4)	X	8.38	90.33	32.10	9.56	60.0	± 9.6 %
		Y	12.39	100.98	36.50		60.0	
		Z	9.40	91.22	31.88		60.0	
10100-CAD	LTE-FDD (SC-FDMA, 100% RB, 20 MHz, QPSK)	X	2.79	68.83	15.78	0.00	150.0	± 9.6 %
		Y	2.97	69.56	16.19		150.0	
		Z	2.82	69.11	15.92		150.0	
10101-CAD	LTE-FDD (SC-FDMA, 100% RB, 20 MHz, 16-QAM)	X	3.01	66.69	15.35	0.00	150.0	± 9.6 %
		Y	3.15	67.12	15.60		150.0	
		Z	3.02	66.82	15.43		150.0	
10102-CAD	LTE-FDD (SC-FDMA, 100% RB, 20 MHz, 64-QAM)	X	3.13	66.73	15.48	0.00	150.0	± 9.6 %
		Y	3.25	67.12	15.71		150.0	
		Z	3.13	66.85	15.57		150.0	
10103-CAD	LTE-TDD (SC-FDMA, 100% RB, 20 MHz, QPSK)	X	5.88	75.21	20.34	3.98	65.0	± 9.6 %
		Y	6.97	77.87	21.50		65.0	
		Z	6.29	75.72	20.38		65.0	
10104-CAD	LTE-TDD (SC-FDMA, 100% RB, 20 MHz, 16-QAM)	X	5.85	73.04	20.17	3.98	65.0	± 9.6 %
		Y	6.55	74.85	21.04		65.0	
		Z	6.18	73.51	20.24		65.0	
10105-CAD	LTE-TDD (SC-FDMA, 100% RB, 20 MHz, 64-QAM)	X	5.43	71.43	19.75	3.98	65.0	± 9.6 %
		Y	6.19	73.62	20.81		65.0	
		Z	5.82	72.23	19.98		65.0	
10108-CAE	LTE-FDD (SC-FDMA, 100% RB, 10 MHz, QPSK)	X	2.41	68.13	15.58	0.00	150.0	± 9.6 %
		Y	2.59	68.78	15.99		150.0	
		Z	2.44	68.41	15.73		150.0	
10109-CAE	LTE-FDD (SC-FDMA, 100% RB, 10 MHz, 16-QAM)	X	2.66	66.50	15.15	0.00	150.0	± 9.6 %
		Y	2.80	66.92	15.46		150.0	
		Z	2.67	66.65	15.25		150.0	
10110-CAE	LTE-FDD (SC-FDMA, 100% RB, 5 MHz, QPSK)	X	1.92	67.16	14.98	0.00	150.0	± 9.6 %
		Y	2.08	67.83	15.51		150.0	
		Z	1.94	67.46	15.16		150.0	
10111-CAE	LTE-FDD (SC-FDMA, 100% RB, 5 MHz, 16-QAM)	X	2.35	67.19	15.19	0.00	150.0	± 9.6 %
		Y	2.50	67.61	15.63		150.0	
		Z	2.37	67.44	15.36		150.0	

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10112-CAE	LTE-FDD (SC-FDMA, 100% RB, 10 MHz, 64-QAM)	X	2.79	66.58	15.25	0.00	150.0	± 9.6 %
		Y	2.93	66.95	15.54		150.0	
		Z	2.80	66.72	15.35		150.0	
10113-CAE	LTE-FDD (SC-FDMA, 100% RB, 5 MHz, 64-QAM)	X	2.50	67.43	15.39	0.00	150.0	± 9.6 %
		Y	2.65	67.79	15.79		150.0	
		Z	2.52	67.68	15.55		150.0	
10114-CAC	IEEE 802.11n (HT Greenfield, 13.5 Mbps, BPSK)	X	4.95	66.85	16.21	0.00	150.0	± 9.6 %
		Y	5.06	67.04	16.27		150.0	
		Z	4.95	66.90	16.25		150.0	
10115-CAC	IEEE 802.11n (HT Greenfield, 81 Mbps, 16-QAM)	X	5.21	66.93	16.27	0.00	150.0	± 9.6 %
		Y	5.33	67.15	16.34		150.0	
		Z	5.21	66.98	16.30		150.0	
10116-CAC	IEEE 802.11n (HT Greenfield, 135 Mbps, 64-QAM)	X	5.04	67.04	16.23	0.00	150.0	± 9.6 %
		Y	5.14	67.22	16.29		150.0	
		Z	5.04	67.09	16.27		150.0	
10117-CAC	IEEE 802.11n (HT Mixed, 13.5 Mbps, BPSK)	X	4.92	66.74	16.17	0.00	150.0	± 9.6 %
		Y	5.02	66.90	16.22		150.0	
		Z	4.92	66.78	16.21		150.0	
10118-CAC	IEEE 802.11n (HT Mixed, 81 Mbps, 16-QAM)	X	5.29	67.15	16.38	0.00	150.0	± 9.6 %
		Y	5.41	67.35	16.45		150.0	
		Z	5.29	67.20	16.42		150.0	
10119-CAC	IEEE 802.11n (HT Mixed, 135 Mbps, 64-QAM)	X	5.02	67.01	16.23	0.00	150.0	± 9.6 %
		Y	5.12	67.17	16.28		150.0	
		Z	5.03	67.05	16.27		150.0	
10140-CAD	LTE-FDD (SC-FDMA, 100% RB, 15 MHz, 16-QAM)	X	3.15	66.73	15.39	0.00	150.0	± 9.6 %
		Y	3.29	67.12	15.63		150.0	
		Z	3.16	66.85	15.47		150.0	
10141-CAD	LTE-FDD (SC-FDMA, 100% RB, 15 MHz, 64-QAM)	X	3.28	66.89	15.60	0.00	150.0	± 9.6 %
		Y	3.41	67.25	15.81		150.0	
		Z	3.29	67.01	15.69		150.0	
10142-CAD	LTE-FDD (SC-FDMA, 100% RB, 3 MHz, QPSK)	X	1.66	66.78	14.23	0.00	150.0	± 9.6 %
		Y	1.85	67.64	15.04		150.0	
		Z	1.68	67.14	14.44		150.0	
10143-CAD	LTE-FDD (SC-FDMA, 100% RB, 3 MHz, 16-QAM)	X	2.11	67.26	14.31	0.00	150.0	± 9.6 %
		Y	2.32	68.10	15.16		150.0	
		Z	2.15	67.60	14.52		150.0	
10144-CAD	LTE-FDD (SC-FDMA, 100% RB, 3 MHz, 64-QAM)	X	1.90	65.04	12.67	0.00	150.0	± 9.6 %
		Y	2.11	65.93	13.60		150.0	
		Z	1.92	65.23	12.81		150.0	
10145-CAE	LTE-FDD (SC-FDMA, 100% RB, 1.4 MHz, QPSK)	X	0.80	61.27	8.23	0.00	150.0	± 9.6 %
		Y	1.06	63.61	10.59		150.0	
		Z	0.80	61.38	8.31		150.0	
10146-CAE	LTE-FDD (SC-FDMA, 100% RB, 1.4 MHz, 16-QAM)	X	1.28	62.17	8.51	0.00	150.0	± 9.6 %
		Y	1.77	65.15	10.79		150.0	
		Z	1.35	62.63	8.87		150.0	
10147-CAE	LTE-FDD (SC-FDMA, 100% RB, 1.4 MHz, 64-QAM)	X	1.38	62.84	8.99	0.00	150.0	± 9.6 %
		Y	2.03	66.75	11.70		150.0	
		Z	1.47	63.45	9.42		150.0	

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10149-CAD	LTE-FDD (SC-FDMA, 50% RB, 20 MHz, 16-QAM)	X	2.67	66.56	15.19	0.00	150.0	± 9.6 %
		Y	2.81	66.98	15.50		150.0	
		Z	2.68	66.72	15.30		150.0	
10150-CAD	LTE-FDD (SC-FDMA, 50% RB, 20 MHz, 64-QAM)	X	2.79	66.63	15.30	0.00	150.0	± 9.6 %
		Y	2.93	67.01	15.58		150.0	
		Z	2.81	66.78	15.40		150.0	
10151-CAD	LTE-TDD (SC-FDMA, 50% RB, 20 MHz, QPSK)	X	6.35	78.26	21.62	3.98	65.0	± 9.6 %
		Y	7.58	81.02	22.83		65.0	
		Z	6.73	78.52	21.54		65.0	
10152-CAD	LTE-TDD (SC-FDMA, 50% RB, 20 MHz, 16-QAM)	X	5.38	73.00	19.79	3.98	65.0	± 9.6 %
		Y	6.11	74.99	20.82		65.0	
		Z	5.70	73.46	19.84		65.0	
10153-CAD	LTE-TDD (SC-FDMA, 50% RB, 20 MHz, 64-QAM)	X	5.78	74.16	20.68	3.98	65.0	± 9.6 %
		Y	6.51	76.00	21.62		65.0	
		Z	6.14	74.67	20.75		65.0	
10154-CAE	LTE-FDD (SC-FDMA, 50% RB, 10 MHz, QPSK)	X	1.95	67.52	15.22	0.00	150.0	± 9.6 %
		Y	2.13	68.20	15.75		150.0	
		Z	1.98	67.86	15.41		150.0	
10155-CAE	LTE-FDD (SC-FDMA, 50% RB, 10 MHz, 16-QAM)	X	2.35	67.22	15.22	0.00	150.0	± 9.6 %
		Y	2.50	67.63	15.65		150.0	
		Z	2.37	67.47	15.38		150.0	
10156-CAE	LTE-FDD (SC-FDMA, 50% RB, 5 MHz, QPSK)	X	1.47	66.38	13.62	0.00	150.0	± 9.6 %
		Y	1.68	67.54	14.70		150.0	
		Z	1.50	66.78	13.86		150.0	
10157-CAE	LTE-FDD (SC-FDMA, 50% RB, 5 MHz, 16-QAM)	X	1.69	65.05	12.29	0.00	150.0	± 9.6 %
		Y	1.93	66.27	13.50		150.0	
		Z	1.71	65.29	12.45		150.0	
10158-CAE	LTE-FDD (SC-FDMA, 50% RB, 10 MHz, 64-QAM)	X	2.51	67.50	15.44	0.00	150.0	± 9.6 %
		Y	2.66	67.86	15.84		150.0	
		Z	2.53	67.75	15.60		150.0	
10159-CAE	LTE-FDD (SC-FDMA, 50% RB, 5 MHz, 64-QAM)	X	1.77	65.37	12.51	0.00	150.0	± 9.6 %
		Y	2.03	66.70	13.76		150.0	
		Z	1.79	65.65	12.69		150.0	
10160-CAD	LTE-FDD (SC-FDMA, 50% RB, 15 MHz, QPSK)	X	2.49	67.67	15.54	0.00	150.0	± 9.6 %
		Y	2.62	68.01	15.83		150.0	
		Z	2.51	67.90	15.68		150.0	
10161-CAD	LTE-FDD (SC-FDMA, 50% RB, 15 MHz, 16-QAM)	X	2.68	66.56	15.17	0.00	150.0	± 9.6 %
		Y	2.83	66.94	15.49		150.0	
		Z	2.70	66.71	15.28		150.0	
10162-CAD	LTE-FDD (SC-FDMA, 50% RB, 15 MHz, 64-QAM)	X	2.79	66.77	15.32	0.00	150.0	± 9.6 %
		Y	2.94	67.11	15.61		150.0	
		Z	2.81	66.92	15.43		150.0	
10166-CAE	LTE-FDD (SC-FDMA, 50% RB, 1.4 MHz, QPSK)	X	3.35	69.05	18.82	3.01	150.0	± 9.6 %
		Y	3.55	69.60	19.05		150.0	
		Z	3.42	69.49	19.09		150.0	
10167-CAE	LTE-FDD (SC-FDMA, 50% RB, 1.4 MHz, 16-QAM)	X	4.02	71.54	19.06	3.01	150.0	± 9.6 %
		Y	4.43	72.79	19.60		150.0	
		Z	4.17	72.13	19.36		150.0	

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10168-CAE	LTE-FDD (SC-FDMA, 50% RB, 1.4 MHz, 64-QAM)	X	4.54	74.20	20.62	3.01	150.0	± 9.6 %
		Y	4.98	75.29	21.02		150.0	
		Z	4.76	75.03	21.02		150.0	
10169-CAD	LTE-FDD (SC-FDMA, 1 RB, 20 MHz, QPSK)	X	2.76	67.82	18.24	3.01	150.0	± 9.6 %
		Y	2.98	69.21	18.88		150.0	
		Z	2.85	68.40	18.57		150.0	
10170-CAD	LTE-FDD (SC-FDMA, 1 RB, 20 MHz, 16-QAM)	X	3.64	73.02	20.34	3.01	150.0	± 9.6 %
		Y	4.26	75.86	21.46		150.0	
		Z	3.89	74.12	20.86		150.0	
10171-AAD	LTE-FDD (SC-FDMA, 1 RB, 20 MHz, 64-QAM)	X	3.00	68.98	17.51	3.01	150.0	± 9.6 %
		Y	3.42	71.30	18.53		150.0	
		Z	3.14	69.62	17.83		150.0	
10172-CAD	LTE-TDD (SC-FDMA, 1 RB, 20 MHz, QPSK)	X	5.94	85.46	26.73	6.02	65.0	± 9.6 %
		Y	11.21	98.40	31.41		65.0	
		Z	7.76	89.35	27.77		65.0	
10173-CAD	LTE-TDD (SC-FDMA, 1 RB, 20 MHz, 16-QAM)	X	12.18	95.27	28.11	6.02	65.0	± 9.6 %
		Y	41.92	117.86	34.72		65.0	
		Z	14.14	96.40	28.17		65.0	
10174-CAD	LTE-TDD (SC-FDMA, 1 RB, 20 MHz, 64-QAM)	X	8.79	88.48	25.35	6.02	65.0	± 9.6 %
		Y	24.68	106.58	31.03		65.0	
		Z	8.87	87.40	24.76		65.0	
10175-CAE	LTE-FDD (SC-FDMA, 1 RB, 10 MHz, QPSK)	X	2.72	67.51	17.98	3.01	150.0	± 9.6 %
		Y	2.94	68.89	18.63		150.0	
		Z	2.81	68.06	18.29		150.0	
10176-CAE	LTE-FDD (SC-FDMA, 1 RB, 10 MHz, 16-QAM)	X	3.65	73.04	20.35	3.01	150.0	± 9.6 %
		Y	4.26	75.89	21.48		150.0	
		Z	3.90	74.15	20.87		150.0	
10177-CAG	LTE-FDD (SC-FDMA, 1 RB, 5 MHz, QPSK)	X	2.74	67.65	18.07	3.01	150.0	± 9.6 %
		Y	2.97	69.04	18.72		150.0	
		Z	2.83	68.22	18.39		150.0	
10178-CAE	LTE-FDD (SC-FDMA, 1 RB, 5 MHz, 16-QAM)	X	3.62	72.86	20.24	3.01	150.0	± 9.6 %
		Y	4.22	75.66	21.36		150.0	
		Z	3.86	73.93	20.75		150.0	
10179-CAE	LTE-FDD (SC-FDMA, 1 RB, 10 MHz, 64-QAM)	X	3.28	70.83	18.77	3.01	150.0	± 9.6 %
		Y	3.79	73.43	19.85		150.0	
		Z	3.47	71.66	19.17		150.0	
10180-CAE	LTE-FDD (SC-FDMA, 1 RB, 5 MHz, 64-QAM)	X	3.00	68.92	17.47	3.01	150.0	± 9.6 %
		Y	3.41	71.23	18.48		150.0	
		Z	3.14	69.56	17.78		150.0	
10181-CAD	LTE-FDD (SC-FDMA, 1 RB, 15 MHz, QPSK)	X	2.74	67.63	18.06	3.01	150.0	± 9.6 %
		Y	2.96	69.02	18.71		150.0	
		Z	2.83	68.20	18.38		150.0	
10182-CAD	LTE-FDD (SC-FDMA, 1 RB, 15 MHz, 16-QAM)	X	3.61	72.84	20.23	3.01	150.0	± 9.6 %
		Y	4.21	75.63	21.34		150.0	
		Z	3.86	73.90	20.74		150.0	
10183-AAC	LTE-FDD (SC-FDMA, 1 RB, 15 MHz, 64-QAM)	X	2.99	68.90	17.46	3.01	150.0	± 9.6 %
		Y	3.40	71.20	18.47		150.0	
		Z	3.13	69.53	17.77		150.0	

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10184-CAD	LTE-FDD (SC-FDMA, 1 RB, 3 MHz, QPSK)	X	2.75	67.67	18.09	3.01	150.0	± 9.6 %
		Y	2.97	69.07	18.73		150.0	
		Z	2.84	68.24	18.41		150.0	
10185-CAD	LTE-FDD (SC-FDMA, 1 RB, 3 MHz, 16-QAM)	X	3.63	72.91	20.27	3.01	150.0	± 9.6 %
		Y	4.23	75.71	21.38		150.0	
		Z	3.87	73.98	20.78		150.0	
10186-AAD	LTE-FDD (SC-FDMA, 1 RB, 3 MHz, 64-QAM)	X	3.00	68.96	17.49	3.01	150.0	± 9.6 %
		Y	3.42	71.27	18.50		150.0	
		Z	3.15	69.60	17.80		150.0	
10187-CAE	LTE-FDD (SC-FDMA, 1 RB, 1.4 MHz, QPSK)	X	2.76	67.74	18.16	3.01	150.0	± 9.6 %
		Y	2.98	69.13	18.80		150.0	
		Z	2.85	68.31	18.48		150.0	
10188-CAE	LTE-FDD (SC-FDMA, 1 RB, 1.4 MHz, 16-QAM)	X	3.74	73.54	20.65	3.01	150.0	± 9.6 %
		Y	4.38	76.43	21.78		150.0	
		Z	4.01	74.70	21.19		150.0	
10189-AAE	LTE-FDD (SC-FDMA, 1 RB, 1.4 MHz, 64-QAM)	X	3.06	69.34	17.75	3.01	150.0	± 9.6 %
		Y	3.50	71.73	18.79		150.0	
		Z	3.21	70.02	18.09		150.0	
10193-CAC	IEEE 802.11n (HT Greenfield, 6.5 Mbps, BPSK)	X	4.33	66.30	15.85	0.00	150.0	± 9.6 %
		Y	4.45	66.46	15.96		150.0	
		Z	4.33	66.34	15.90		150.0	
10194-CAC	IEEE 802.11n (HT Greenfield, 39 Mbps, 16-QAM)	X	4.49	66.58	15.99	0.00	150.0	± 9.6 %
		Y	4.62	66.77	16.08		150.0	
		Z	4.49	66.63	16.03		150.0	
10195-CAC	IEEE 802.11n (HT Greenfield, 65 Mbps, 64-QAM)	X	4.53	66.61	16.01	0.00	150.0	± 9.6 %
		Y	4.66	66.80	16.10		150.0	
		Z	4.53	66.66	16.05		150.0	
10196-CAC	IEEE 802.11n (HT Mixed, 6.5 Mbps, BPSK)	X	4.32	66.33	15.86	0.00	150.0	± 9.6 %
		Y	4.45	66.51	15.97		150.0	
		Z	4.33	66.38	15.90		150.0	
10197-CAC	IEEE 802.11n (HT Mixed, 39 Mbps, 16-QAM)	X	4.50	66.60	16.00	0.00	150.0	± 9.6 %
		Y	4.63	66.79	16.10		150.0	
		Z	4.50	66.64	16.04		150.0	
10198-CAC	IEEE 802.11n (HT Mixed, 65 Mbps, 64-QAM)	X	4.52	66.62	16.02	0.00	150.0	± 9.6 %
		Y	4.66	66.81	16.11		150.0	
		Z	4.53	66.67	16.06		150.0	
10219-CAC	IEEE 802.11n (HT Mixed, 7.2 Mbps, BPSK)	X	4.27	66.34	15.81	0.00	150.0	± 9.6 %
		Y	4.40	66.52	15.93		150.0	
		Z	4.28	66.39	15.86		150.0	
10220-CAC	IEEE 802.11n (HT Mixed, 43.3 Mbps, 16-QAM)	X	4.49	66.56	15.99	0.00	150.0	± 9.6 %
		Y	4.62	66.75	16.09		150.0	
		Z	4.49	66.61	16.03		150.0	
10221-CAC	IEEE 802.11n (HT Mixed, 72.2 Mbps, 64-QAM)	X	4.54	66.56	16.01	0.00	150.0	± 9.6 %
		Y	4.67	66.75	16.10		150.0	
		Z	4.54	66.61	16.05		150.0	
10222-CAC	IEEE 802.11n (HT Mixed, 15 Mbps, BPSK)	X	4.89	66.73	16.16	0.00	150.0	± 9.6 %
		Y	5.00	66.91	16.22		150.0	
		Z	4.90	66.77	16.20		150.0	

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10223-CAC	IEEE 802.11n (HT Mixed, 90 Mbps, 16-QAM)	X	5.19	66.98	16.31	0.00	150.0	± 9.6 %
		Y	5.29	67.12	16.34		150.0	
		Z	5.19	67.02	16.35		150.0	
10224-CAC	IEEE 802.11n (HT Mixed, 150 Mbps, 64-QAM)	X	4.93	66.83	16.14	0.00	150.0	± 9.6 %
		Y	5.04	67.02	16.20		150.0	
		Z	4.94	66.87	16.17		150.0	
10225-CAB	UMTS-FDD (HSPA+)	X	2.58	65.45	14.55	0.00	150.0	± 9.6 %
		Y	2.72	65.79	14.95		150.0	
		Z	2.58	65.57	14.65		150.0	
10226-CAA	LTE-TDD (SC-FDMA, 1 RB, 1.4 MHz, 16-QAM)	X	13.21	96.88	28.71	6.02	65.0	± 9.6 %
		Y	48.32	120.69	35.56		65.0	
		Z	15.42	98.09	28.79		65.0	
10227-CAA	LTE-TDD (SC-FDMA, 1 RB, 1.4 MHz, 64-QAM)	X	12.96	95.10	27.51	6.02	65.0	± 9.6 %
		Y	42.82	116.12	33.61		65.0	
		Z	14.64	95.75	27.45		65.0	
10228-CAA	LTE-TDD (SC-FDMA, 1 RB, 1.4 MHz, QPSK)	X	7.91	91.63	29.01	6.02	65.0	± 9.6 %
		Y	15.33	105.12	33.58		65.0	
		Z	9.96	94.76	29.71		65.0	
10229-CAB	LTE-TDD (SC-FDMA, 1 RB, 3 MHz, 16-QAM)	X	12.28	95.39	28.16	6.02	65.0	± 9.6 %
		Y	42.32	118.01	34.77		65.0	
		Z	14.25	96.52	28.22		65.0	
10230-CAB	LTE-TDD (SC-FDMA, 1 RB, 3 MHz, 64-QAM)	X	11.97	93.63	26.97	6.02	65.0	± 9.6 %
		Y	37.57	113.66	32.89		65.0	
		Z	13.49	94.26	26.91		65.0	
10231-CAB	LTE-TDD (SC-FDMA, 1 RB, 3 MHz, QPSK)	X	7.51	90.51	28.54	6.02	65.0	± 9.6 %
		Y	14.32	103.60	33.03		65.0	
		Z	9.38	93.48	29.20		65.0	
10232-CAD	LTE-TDD (SC-FDMA, 1 RB, 5 MHz, 16-QAM)	X	12.26	95.37	28.15	6.02	65.0	± 9.6 %
		Y	42.27	118.00	34.76		65.0	
		Z	14.22	96.50	28.21		65.0	
10233-CAD	LTE-TDD (SC-FDMA, 1 RB, 5 MHz, 64-QAM)	X	11.93	93.59	26.96	6.02	65.0	± 9.6 %
		Y	37.45	113.62	32.88		65.0	
		Z	13.46	94.22	26.90		65.0	
10234-CAD	LTE-TDD (SC-FDMA, 1 RB, 5 MHz, QPSK)	X	7.21	89.55	28.08	6.02	65.0	± 9.6 %
		Y	13.54	102.26	32.49		65.0	
		Z	8.94	92.35	28.71		65.0	
10235-CAD	LTE-TDD (SC-FDMA, 1 RB, 10 MHz, 16-QAM)	X	12.27	95.41	28.17	6.02	65.0	± 9.6 %
		Y	42.45	118.10	34.79		65.0	
		Z	14.25	96.54	28.23		65.0	
10236-CAD	LTE-TDD (SC-FDMA, 1 RB, 10 MHz, 64-QAM)	X	12.08	93.76	27.01	6.02	65.0	± 9.6 %
		Y	38.28	113.96	32.96		65.0	
		Z	13.60	94.38	26.94		65.0	
10237-CAD	LTE-TDD (SC-FDMA, 1 RB, 10 MHz, QPSK)	X	7.52	90.56	28.56	6.02	65.0	± 9.6 %
		Y	14.38	103.73	33.07		65.0	
		Z	9.40	93.55	29.23		65.0	
10238-CAD	LTE-TDD (SC-FDMA, 1 RB, 15 MHz, 16-QAM)	X	12.23	95.34	28.14	6.02	65.0	± 9.6 %
		Y	42.21	117.99	34.76		65.0	
		Z	14.20	96.48	28.21		65.0	

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10239-CAD	LTE-TDD (SC-FDMA, 1 RB, 15 MHz, 64-QAM)	X	11.89	93.55	26.95	6.02	65.0	± 9.6 %
		Y	37.31	113.58	32.87		65.0	
		Z	13.42	94.19	26.89		65.0	
10240-CAD	LTE-TDD (SC-FDMA, 1 RB, 15 MHz, QPSK)	X	7.50	90.52	28.55	6.02	65.0	± 9.6 %
		Y	14.33	103.67	33.05		65.0	
		Z	9.37	93.50	29.21		65.0	
10241-CAA	LTE-TDD (SC-FDMA, 50% RB, 1.4 MHz, 16-QAM)	X	7.72	81.00	25.36	6.98	65.0	± 9.6 %
		Y	8.93	83.90	26.72		65.0	
		Z	8.35	81.91	25.55		65.0	
10242-CAA	LTE-TDD (SC-FDMA, 50% RB, 1.4 MHz, 64-QAM)	X	6.86	78.55	24.27	6.98	65.0	± 9.6 %
		Y	8.10	81.84	25.82		65.0	
		Z	7.56	79.84	24.62		65.0	
10243-CAA	LTE-TDD (SC-FDMA, 50% RB, 1.4 MHz, QPSK)	X	5.57	75.12	23.69	6.98	65.0	± 9.6 %
		Y	6.32	77.64	25.00		65.0	
		Z	6.12	76.56	24.16		65.0	
10244-CAB	LTE-TDD (SC-FDMA, 50% RB, 3 MHz, 16-QAM)	X	5.08	73.71	17.06	3.98	65.0	± 9.6 %
		Y	7.25	79.22	19.87		65.0	
		Z	5.48	74.15	17.22		65.0	
10245-CAB	LTE-TDD (SC-FDMA, 50% RB, 3 MHz, 64-QAM)	X	4.89	72.89	16.65	3.98	65.0	± 9.6 %
		Y	6.91	78.19	19.41		65.0	
		Z	5.28	73.35	16.83		65.0	
10246-CAB	LTE-TDD (SC-FDMA, 50% RB, 3 MHz, QPSK)	X	4.76	76.38	18.35	3.98	65.0	± 9.6 %
		Y	7.68	83.90	21.89		65.0	
		Z	4.98	76.12	18.11		65.0	
10247-CAD	LTE-TDD (SC-FDMA, 50% RB, 5 MHz, 16-QAM)	X	4.47	72.51	17.50	3.98	65.0	± 9.6 %
		Y	5.60	76.01	19.56		65.0	
		Z	4.75	72.71	17.48		65.0	
10248-CAD	LTE-TDD (SC-FDMA, 50% RB, 5 MHz, 64-QAM)	X	4.42	71.82	17.18	3.98	65.0	± 9.6 %
		Y	5.49	75.14	19.17		65.0	
		Z	4.69	72.06	17.18		65.0	
10249-CAD	LTE-TDD (SC-FDMA, 50% RB, 5 MHz, QPSK)	X	6.44	81.59	21.53	3.98	65.0	± 9.6 %
		Y	9.29	87.62	24.21		65.0	
		Z	6.78	81.37	21.26		65.0	
10250-CAD	LTE-TDD (SC-FDMA, 50% RB, 10 MHz, 16-QAM)	X	5.53	75.83	20.90	3.98	65.0	± 9.6 %
		Y	6.42	78.16	22.13		65.0	
		Z	5.92	76.34	20.95		65.0	
10251-CAD	LTE-TDD (SC-FDMA, 50% RB, 10 MHz, 64-QAM)	X	5.17	73.33	19.42	3.98	65.0	± 9.6 %
		Y	5.99	75.59	20.68		65.0	
		Z	5.50	73.74	19.45		65.0	
10252-CAD	LTE-TDD (SC-FDMA, 50% RB, 10 MHz, QPSK)	X	6.66	81.53	22.77	3.98	65.0	± 9.6 %
		Y	8.45	85.35	24.44		65.0	
		Z	7.14	81.76	22.64		65.0	
10253-CAD	LTE-TDD (SC-FDMA, 50% RB, 15 MHz, 16-QAM)	X	5.29	72.55	19.53	3.98	65.0	± 9.6 %
		Y	5.97	74.40	20.54		65.0	
		Z	5.60	72.99	19.59		65.0	
10254-CAD	LTE-TDD (SC-FDMA, 50% RB, 15 MHz, 64-QAM)	X	5.65	73.58	20.31	3.98	65.0	± 9.6 %
		Y	6.34	75.34	21.26		65.0	
		Z	5.99	74.07	20.39		65.0	

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10255-CAD	LTE-TDD (SC-FDMA, 50% RB, 15 MHz, QPSK)	X	6.02	77.52	21.52	3.98	65.0	± 9.6 %
		Y	7.10	80.07	22.69		65.0	
		Z	6.42	77.87	21.47		65.0	
10256-CAA	LTE-TDD (SC-FDMA, 100% RB, 1.4 MHz, 16-QAM)	X	3.54	68.37	13.49	3.98	65.0	± 9.6 %
		Y	5.29	74.03	16.69		65.0	
		Z	3.86	68.87	13.74		65.0	
10257-CAA	LTE-TDD (SC-FDMA, 100% RB, 1.4 MHz, 64-QAM)	X	3.42	67.60	13.01	3.98	65.0	± 9.6 %
		Y	4.99	72.81	16.07		65.0	
		Z	3.73	68.11	13.28		65.0	
10258-CAA	LTE-TDD (SC-FDMA, 100% RB, 1.4 MHz, QPSK)	X	3.13	69.87	14.54	3.98	65.0	± 9.6 %
		Y	5.24	77.34	18.52		65.0	
		Z	3.34	69.92	14.48		65.0	
10259-CAB	LTE-TDD (SC-FDMA, 100% RB, 3 MHz, 16-QAM)	X	4.91	73.87	18.79	3.98	65.0	± 9.6 %
		Y	5.94	76.85	20.50		65.0	
		Z	5.22	74.16	18.78		65.0	
10260-CAB	LTE-TDD (SC-FDMA, 100% RB, 3 MHz, 64-QAM)	X	4.92	73.53	18.64	3.98	65.0	± 9.6 %
		Y	5.92	76.42	20.33		65.0	
		Z	5.23	73.83	18.64		65.0	
10261-CAB	LTE-TDD (SC-FDMA, 100% RB, 3 MHz, QPSK)	X	6.15	80.57	21.67	3.98	65.0	± 9.6 %
		Y	8.19	85.26	23.83		65.0	
		Z	6.54	80.61	21.49		65.0	
10262-CAD	LTE-TDD (SC-FDMA, 100% RB, 5 MHz, 16-QAM)	X	5.51	75.75	20.85	3.98	65.0	± 9.6 %
		Y	6.40	78.10	22.09		65.0	
		Z	5.90	76.26	20.89		65.0	
10263-CAD	LTE-TDD (SC-FDMA, 100% RB, 5 MHz, 64-QAM)	X	5.16	73.31	19.41	3.98	65.0	± 9.6 %
		Y	5.98	75.56	20.68		65.0	
		Z	5.49	73.72	19.45		65.0	
10264-CAD	LTE-TDD (SC-FDMA, 100% RB, 5 MHz, QPSK)	X	6.58	81.27	22.65	3.98	65.0	± 9.6 %
		Y	8.34	85.09	24.32		65.0	
		Z	7.05	81.50	22.52		65.0	
10265-CAD	LTE-TDD (SC-FDMA, 100% RB, 10 MHz, 16-QAM)	X	5.38	73.01	19.80	3.98	65.0	± 9.6 %
		Y	6.11	74.99	20.82		65.0	
		Z	5.70	73.46	19.85		65.0	
10266-CAD	LTE-TDD (SC-FDMA, 100% RB, 10 MHz, 64-QAM)	X	5.78	74.14	20.67	3.98	65.0	± 9.6 %
		Y	6.51	75.99	21.61		65.0	
		Z	6.13	74.65	20.74		65.0	
10267-CAD	LTE-TDD (SC-FDMA, 100% RB, 10 MHz, QPSK)	X	6.33	78.21	21.60	3.98	65.0	± 9.6 %
		Y	7.56	80.96	22.81		65.0	
		Z	6.72	78.46	21.52		65.0	
10268-CAD	LTE-TDD (SC-FDMA, 100% RB, 15 MHz, 16-QAM)	X	6.01	72.96	20.24	3.98	65.0	± 9.6 %
		Y	6.67	74.61	21.04		65.0	
		Z	6.33	73.43	20.31		65.0	
10269-CAD	LTE-TDD (SC-FDMA, 100% RB, 15 MHz, 64-QAM)	X	6.00	72.55	20.10	3.98	65.0	± 9.6 %
		Y	6.62	74.12	20.89		65.0	
		Z	6.32	73.03	20.19		65.0	
10270-CAD	LTE-TDD (SC-FDMA, 100% RB, 15 MHz, QPSK)	X	6.14	75.26	20.57	3.98	65.0	± 9.6 %
		Y	6.99	77.24	21.47		65.0	
		Z	6.48	75.59	20.55		65.0	

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10274-CAB	UMTS-FDD (HSUPA, Subtest 5, 3GPP Rel8.10)	X	2.38	65.77	14.42	0.00	150.0	± 9.6 %
		Y	2.50	66.11	14.84		150.0	
		Z	2.38	65.91	14.53		150.0	
10275-CAB	UMTS-FDD (HSUPA, Subtest 5, 3GPP Rel8.4)	X	1.36	66.07	14.03	0.00	150.0	± 9.6 %
		Y	1.49	66.85	14.75		150.0	
		Z	1.37	66.42	14.23		150.0	
10277-CAA	PHS (QPSK)	X	2.00	60.93	6.54	9.03	50.0	± 9.6 %
		Y	2.12	61.80	7.32		50.0	
		Z	2.35	61.71	7.39		50.0	
10278-CAA	PHS (QPSK, BW 884MHz, Rolloff 0.5)	X	3.87	69.34	13.60	9.03	50.0	± 9.6 %
		Y	7.52	79.85	18.67		50.0	
		Z	4.12	69.28	13.80		50.0	
10279-CAA	PHS (QPSK, BW 884MHz, Rolloff 0.38)	X	3.98	69.65	13.80	9.03	50.0	± 9.6 %
		Y	7.72	80.17	18.86		50.0	
		Z	4.22	69.53	13.97		50.0	
10290-AAB	CDMA2000, RC1, SO55, Full Rate	X	0.89	63.74	10.06	0.00	150.0	± 9.6 %
		Y	1.20	66.45	12.44		150.0	
		Z	0.91	64.02	10.22		150.0	
10291-AAB	CDMA2000, RC3, SO55, Full Rate	X	0.52	61.67	8.51	0.00	150.0	± 9.6 %
		Y	0.69	63.86	10.91		150.0	
		Z	0.52	61.79	8.56		150.0	
10292-AAB	CDMA2000, RC3, SO32, Full Rate	X	0.59	63.56	9.86	0.00	150.0	± 9.6 %
		Y	0.83	66.87	12.83		150.0	
		Z	0.60	63.91	10.02		150.0	
10293-AAB	CDMA2000, RC3, SO3, Full Rate	X	0.80	66.95	12.03	0.00	150.0	± 9.6 %
		Y	1.20	71.76	15.51		150.0	
		Z	0.86	68.00	12.49		150.0	
10295-AAB	CDMA2000, RC1, SO3, 1/8th Rate 25 fr.	X	12.96	89.74	24.64	9.03	50.0	± 9.6 %
		Y	13.49	93.15	26.96		50.0	
		Z	10.90	85.76	23.20		50.0	
10297-AAC	LTE-FDD (SC-FDMA, 50% RB, 20 MHz, QPSK)	X	2.43	68.23	15.64	0.00	150.0	± 9.6 %
		Y	2.60	68.88	16.05		150.0	
		Z	2.45	68.52	15.80		150.0	
10298-AAC	LTE-FDD (SC-FDMA, 50% RB, 3 MHz, QPSK)	X	1.11	64.06	11.08	0.00	150.0	± 9.6 %
		Y	1.37	66.07	12.92		150.0	
		Z	1.13	64.37	11.27		150.0	
10299-AAC	LTE-FDD (SC-FDMA, 50% RB, 3 MHz, 16-QAM)	X	1.86	65.69	11.54	0.00	150.0	± 9.6 %
		Y	2.49	68.84	13.59		150.0	
		Z	2.01	66.59	12.08		150.0	
10300-AAC	LTE-FDD (SC-FDMA, 50% RB, 3 MHz, 64-QAM)	X	1.49	62.59	9.22	0.00	150.0	± 9.6 %
		Y	1.85	64.50	10.79		150.0	
		Z	1.55	62.97	9.52		150.0	
10301-AAA	IEEE 802.16e WiMAX (29:18, 5ms, 10MHz, QPSK, PUSC)	X	4.67	65.81	17.39	4.17	50.0	± 9.6 %
		Y	4.91	66.35	17.80		50.0	
		Z	4.81	66.37	17.68		50.0	
10302-AAA	IEEE 802.16e WiMAX (29:18, 5ms, 10MHz, QPSK, PUSC, 3 CTRL symbols)	X	5.07	65.96	17.83	4.96	50.0	± 9.6 %
		Y	5.25	66.31	18.15		50.0	
		Z	5.15	66.23	17.95		50.0	

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