TEST REPORT

Report Number: 15090562HKG-003R1

Application
for
Original Grant of 47 CFR Part 15 Certification

CDMA Module

FCC ID: RI7CE910B-DUAL

This report supersedes previous report with report number 15090562HKG-003 dated November 16, 2015.

Prepared and Checked by:

Signed on file
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Location: Intertek Testing Services Hong Kong Ltd.

Koo Wai Ip
Assistant Supervisor
November 16, 2015

GENERAL INFORMATION

Applicant Name:	Telit Communications S.p.A.
Applicant Address:	Via Stazione di Prosecco 5/B Trieste 34010 Italy
FCC Specification Standard:	FCC Part 15, October 1, 2014 Edition
FCC ID:	RI7CE910B-DUAL
FCC Model(s):	CE910B-DUAL, CE910B-DUAL-XY
Type of EUT:	Class B Personal Computers and Peripherals
Description of EUT:	CDMA Module
Serial Number:	N/A
Sample Receipt Date:	September 09, 2015
Date of Test:	September 09, 2015 to September 29, 2015
Report Date:	November 16, 2015
Environmental Conditions:	Temperature: +10 to 40°C Humidity: 10 to 90%

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EXHIBIT 1

TEST RESULTS SUMMARY & STATEMENT OF COMPLIANCE

1.0 Test Results Summary & Statement of Compliance

1.1 Summary of Test Results

Test Items	FCC Part 15 Section	Results	Details see section
Radiated Emission from Class B Personal Computers and Peripherals	15.109	Pass	4.2
AC Power Line Conducted Emission	15.107	Pass	4.3

Note: Pursuant to FCC Part 15 Section 15.215(c), the 20dB bandwidth of the emission was contained within the frequency band designated (mentioned as above) which the EUT operated. The effects, if any, from frequency sweeping, frequency hopping, other modulation techniques and frequency stability over expected variations in temperature and supply voltage were considered.

Remark: Please refer TC-SP1099 Letter issued on November 26, 2015 for amendment/ supersede notification.

1.2 Statement of Compliance

The equipment under test is found to be complying with the following standard:

FCC Part 15, October 1, 2014 Edition

EXHIBIT 2
GENERAL DESCRIPTION

2.0 General Description

2.1 Product Description

The CE910B-DUAL is a CDMA modular supports (BC 0, BC 1 & BC 10) 850 and 1900 MHz.

The Cellular radiotelephone service and personal communications services frequency ranges of the EUT are as below:
CDMA BC 0:
Tx: 824.70- 848.31MHz (at intervals of 1.25MHz)
Rx: 869.70 - 893.31MHz (at intervals of 1.25MHz)
CDMA BC 1:
Tx: 1851.25 - 1908.75MHz (at intervals of 1.25MHz)
Rx: 1931.25 - 1988.75MHz (at intervals of 1.25MHz)
CDMA BC10: (FCC only)
Tx: 817.90- 822.75MHz (at intervals of 1.25MHz)
Rx: 862.90 – 867.75MHz (at intervals of 1.25MHz)

The EUT equipped with a USB port. The USB port provides an interface for PC to use and control the hardware. Its purpose is to abstract all hardware or device dependent parts by defining a set of data structures, macros and functions.

The EUT is powered by a DC power supply (3.8VDC). The antenna used in the EUT is external, and the test sample is a prototype. The circuit description is attached in the Appendix and saved with filename: descri.pdf.

2.2 Test Methodology

Both AC power line-conducted and radiated emission measurements were performed according to the procedures in ANSI C63.4 (2009). Preliminary radiated scans and all radiated measurements were performed in Open Area Test Sites. All Radiated tests were performed at an antenna to EUT distance of 3 meters, unless stated otherwise in the "**Justification Section**" of this Application.

2.3 Test Facility

The open area test site facility used to collect the radiated data is respectively of Intertek Testing Services Taiwan Ltd., which is located at 11, Ln. 275, Ko Nan 1st st. Shiang-Shan District, Hsinchu 300 Taiwan. This test facility and site measurement data have been fully placed on file with the FCC.

The conducted measurement facility used to collect the conducted data is respectively of Intertek Testing Services Hong Kong Ltd., which is located at World-Wide Industrial Centre 43-47 Shan Mei Street, Fo Tan ShaTin, New Territories, Hong Kong. This test facility and site measurement data have been fully placed on file with the FCC.

EXHIBIT 3
SYSTEM TEST CONFIGURATION

3.0 System Test Configuration

3.1 Justification

For radiated emissions testing, the equipment under test (EUT) was setup to normal mode to simplify the measurement methodology. Care was taken to ensure proper power supply voltages during testing. During testing, all cables (if any) were manipulated to produce worst case emissions.

The EUT was powered by 3.8VDC Power supply.

For the measurements, the EUT was attached to a plastic stand if necessary and placed on the wooden turntable. If the EUT attached to peripherals, they were connected and operational to simulate typical use.

The signal was maximized through rotation and placement in the three orthogonal axes. The antenna height and polarization were varied during the search for maximum signal level. The antenna height was varied from 1 to 4 meters. Radiated emissions were taken at three meters unless the signal level was too low for measurement at that distance. If necessary, a pre-amplifier was used and/or the test was conducted at a closer distance.

For radiated measurement, the spectrum analyzer resolution bandwidth was 100 kHz for frequencies below 1000 MHz.

For radiated measurement, the spectrum analyzer resolution bandwidth was 1MHz for frequencies above 1000 MHz.

Radiated emission measurement was performed from the frequency 30MHz to 1GHz.

3.1 Justification - Cont'd

Detector function for radiated emissions is in peak mode.

For AC line conducted emission test, the EUT along with its peripherals were placed on a 1.0m(W)x1.5m(L) and 0.8m in height wooden table and the EUT was adjusted to maintain a 0.4 meter space from a vertical reference plane. The EUT was connected to power mains through a line impedance stabilization network (LISN), which provided 50ohm coupling impedance for measuring instrument. The LISN housing, measuring instrument case, reference ground plane, and vertical ground plane were bounded together. The excess power cable between the EUT and the LISN was bundled.

All connecting cables of EUT and peripherals were manipulated to find the maximum emission.

All relevant operation modes have been tested, and the worst case data was included in this report.

3.2 EUT Exercising Software

The EUT exercise program used during radiated and conducted testing was designed to exercise the various system components in a manner similar to a typical use.

There was no special software to exercise the device.

3.3 Details of EUT and Description of Accessories

Description of Peripherals:

(1) 1.2m USB cable. (Provided by client)
(2) 2.2m antenna with SMA connector.(Provided by client)
(3) HP notebook.(Provided by Intertek)
Module: 820G1
S/N: CG4423320
Adaptor Module: HSTNN-CA40
Adaptor S/N: WDWRR0BNJ7E0K8

3.4 Measurement Uncertainty

When determining of the test conclusion, the Measurement Uncertainty of test has been considered.

Uncertainty and Compliance - Unless the standard specifically states that measured values are to be extended by the measurement uncertainty in determining compliance, all compliance determinations are based on the actual measured value.

EXHIBIT 4
TEST RESULTS

4.0 **Test Results**

Data is included of the worst case configuration (the configuration which resulted in the highest emission levels). A sample calculation, configuration photographs and data tables of the emissions are included.

4.1 Field Strength Calculation

The field strength is calculated by adding the reading on the Spectrum Analyzer to the factors associated with preamplifiers (if any), antennas, cables, pulse desensitization and average factors (when specified limit is in average and measurements are made with peak detectors). A sample calculation is included below.

FS = RA + AF + CF - AG + PD + AV

where FS = Field Strength in dBμV/m
RA = Receiver Amplitude (including preamplifier) in dBμV
CF = Cable Attenuation Factor in dB
AF = Antenna Factor in dB
AG = Amplifier Gain in dB
PD = Pulse Desensitization in dB
AV = Average Factor in -dB

In the radiated emission table which follows, the reading shown on the data table may reflects the preamplifier gain. An example of the calculations, where the reading does not reflect the preamplifier gain, follows:

FS = RA + AF + CF - AG + PD +AV

Example
Assume a receiver reading of 62.0 dBμV is obtained. The antenna factor of 7.4 dB and cable factor of 1.6 dB is added. The amplifier gain of 29 dB is subtracted. The pulse desensitization factor of the spectrum analyzer was 0 dB, and the resultant average factor was -10 dB. The net field strength for comparison to the appropriate emission limit is 32 dBμV/m. This value in dBμV/m was converted to its corresponding level in μV/m.

RA = 62.0 dBμV
AF = 7.4 dB
CF = 1.6 dB
AG = 29 dB
PD = 0 dB
AV = -10 dB
FS = 62 + 7.4 +1.6 -29 +0 + (-10) = 32 dBμV/m

Level in μV/m = Common Antilogarithm [(32 dBμV/m)/20] = 39.8 μV/m

4.2 Radiated Emissions

4.2.1 Radiated Emission Configuration Photograph

Worst Case Radiated Emission
at

45.0 MHz

The worst case radiated emission configuration photographs are attached in the Appendix and saved with filename: config photos.pdf

4.2.2 Radiated Emission Data

The data in table 1-3 list the significant emission frequencies, the limit and the margin of compliance.

Judgement -

Passed by 0.9 dB margin

Mode: TX (BC0) with PC Connection

Table 2

Radiated Emission Data

Polarization	Frequency (MHz)	Reading (dBµV)	Pre-amp (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Limit at 3m (dBµV/m)	Margin (dB)
V	45.000	40.7	16	14.4	39.1	40.0	***0.9***
V	59.500	40.1	16	13.8	37.9	40.0	***2.2***
V	232.400	41.7	16	11.7	37.4	46.0	***8.6***
V	281.600	38.4	16	15.3	37.7	46.0	***8.3***
V	349.100	36.1	16	18.4	38.5	46.0	***7.5***

NOTES:

1. Peak detector is used for the emission measurement.

2. All measurements were made at 3 meters. Radiated emissions not detected at the 3-meter distance were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other radiated emissions than those reported were detected at a test distance of 0.3-meter.

3. Positive value in the margin column shows emission below limit.

4. Horn antenna is used for the emission over 1000MHz.

Mode: TX (BC1) with PC Connection

Table 3

Radiated Emission Data

Polarization	Frequency (MHz)	Reading (dBµV)	Pre-amp (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Limit at 3m (dBµV/m)	Margin (dB)
V	41.900	39.6	16	14.4	38.0	40.0	***2.0***
V	92.500	42.9	16	13.8	40.7	43.5	***2.8***
V	211.800	44.3	16	11.7	40.0	43.5	***3.5***
V	353.600	39.2	16	15.3	38.5	46.0	***7.5***
V	492.500	38.6	16	18.4	41.0	46.0	***5.0***

NOTES:

1. Peak detector is used for the emission measurement.

2. All measurements were made at 3 meters. Radiated emissions not detected at the 3-meter distance were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other radiated emissions than those reported were detected at a test distance of 0.3-meter.

3. Positive value in the margin column shows emission below limit.

4. Horn antenna is used for the emission over 1000MHz.

Mode: TX (BC10) with PC Connection

Table 1

Radiated Emission Data

Polarization	Frequency (MHz)	Reading (dBµV)	Pre-amp (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Limit at 3m (dBµV/m)	Margin (dB)
V	45.000	41.3	16	13.8	39.1	40.0	***0.9***
V	59.500	42.9	16	11.7	38.6	40.0	***1.4***
V	233.400	38.1	16	15.3	37.4	46.0	***8.6***
V	281.300	35.3	16	18.4	37.7	46.0	***8.3***
V	347.000	30.5	16	24.0	38.5	46.0	***7.5***

NOTES:

1. Peak detector is used for the emission measurement.

2. All measurements were made at 3 meters. Radiated emissions not detected at the 3-meter distance were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other radiated emissions than those reported were detected at a test distance of 0.3-meter.

3. Positive value in the margin column shows emission below limit.

4. Horn antenna is used for the emission over 1000MHz.

4.3 AC Power Line Conducted Emission

[ ] Not applicable – EUT is only powered by battery for operation.

[×] EUT connects with PC through USB cable. Emission Data is listed in following pages.

[ ] Base Unit connects to AC power line and has transmission. Handset connects to AC power line but has no transmission. Emission Data of Base Unit is listed in following pages.

4.3.1 AC Power Line Conducted Emission Configuration Photograph

Worst Case Line-Conducted Configuration
at

0.523 MHz

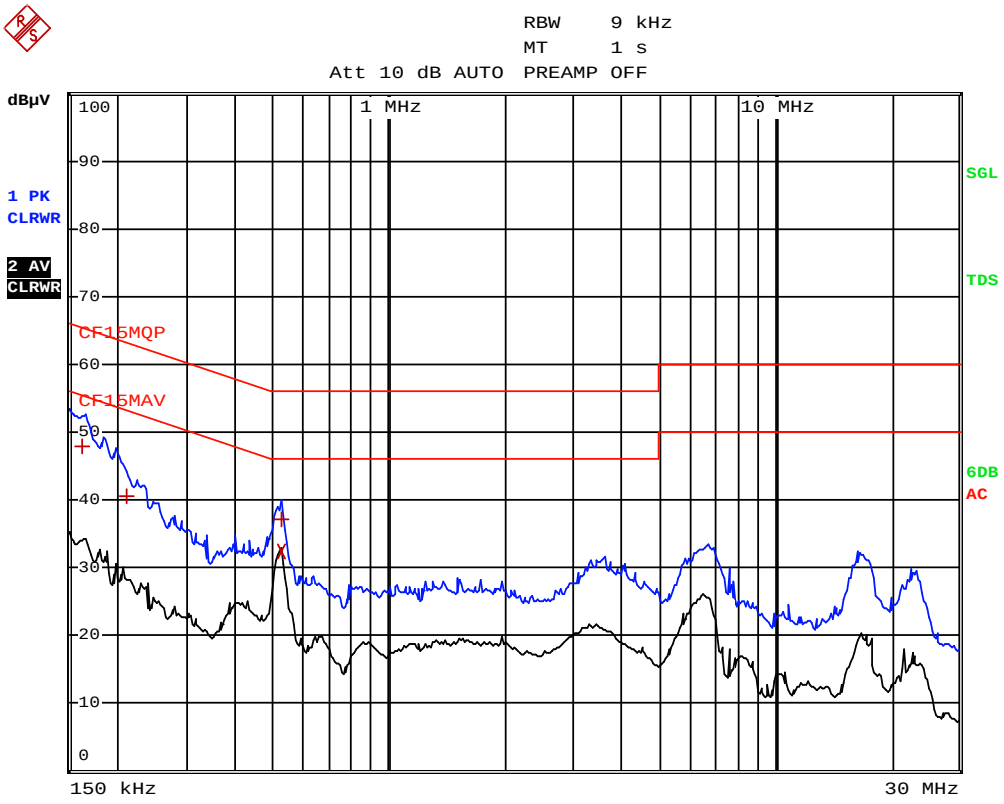
The worst case line conducted configuration photographs are saved with filename: config photos.pdf

4.3.2 AC Power Line Conducted Emission Data

The plot(s) and data in the following pages list the significant emission frequencies, the limit and the margin of compliance

Passed by 13.55 dB margin compare with average limit

Worst Case: TX (BC0) with PC connection



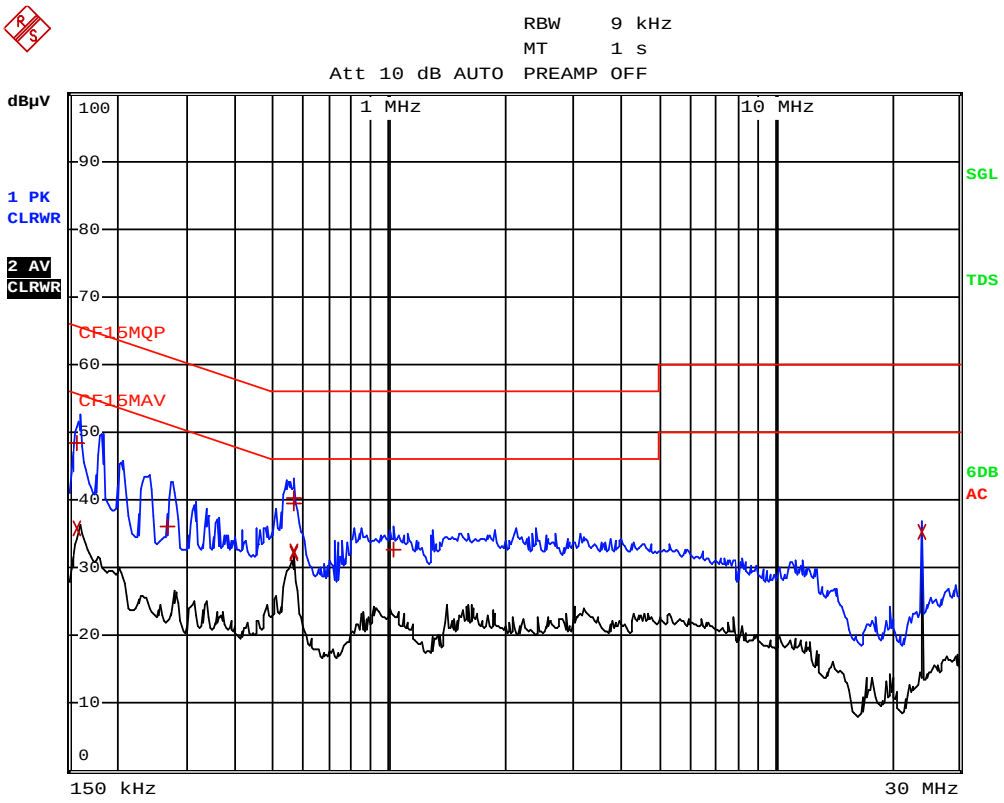
Worst Case: TX (BC0) with PC connection

EDIT PEAK LIST (Final Measurement Results)

Trace1: CF15MQP
Trace2: CF15MAV
Trace3: ---

	TRACE	FREQUENCY	LEVEL dBµV		DELTA LIMIT dB
1	Quasi Peak	163.5 kHz	47.79	N	-17.48
1	Quasi Peak	213 kHz	40.50	N	-22.58
1	Quasi Peak	523.5 kHz	37.20	L1	-18.79
2	CISPR Average	523.5 kHz	32.44	N	-13.55

Worst Case: TX (BC1) with PC connection



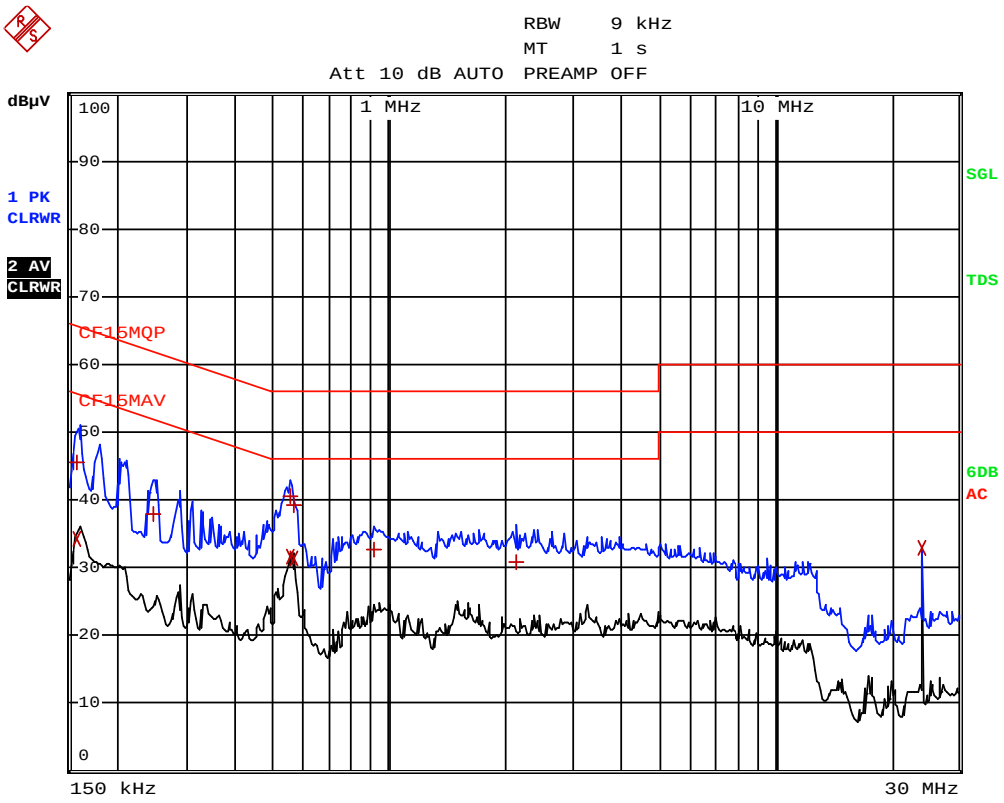
Worst Case: TX (BC1) with PC connection

EDIT PEAK LIST (Final Measurement Results)

Trace1: CF15MQP
Trace2: CF15MAV
Trace3: ---

	TRACE	FREQUENCY	LEVEL dBµV		DELTA LIMIT dB
1	Quasi Peak	159 kHz	48.44	N	-17.07
2	CISPR Average	159 kHz	35.78	N	-19.73
1	Quasi Peak	271.5 kHz	36.20	N	-24.87
1	Quasi Peak	564 kHz	40.22	L1	-15.77
2	CISPR Average	564 kHz	32.28	N	-13.71
1	Quasi Peak	568.5 kHz	39.58	L1	-16.41
2	CISPR Average	568.5 kHz	32.22	N	-13.78
1	Quasi Peak	1.032 MHz	32.72	N	-23.27
2	CISPR Average	24 MHz	35.29	N	-14.71

Worst Case: TX (BC10) with PC connection



Worst Case: TX (BC10) with PC connection

EDIT PEAK LIST (Final Measurement Results)

Trace1: CF15MQP
Trace2: CF15MAV
Trace3: ---

	TRACE	FREQUENCY	LEVEL dBµV		DELTA LIMIT dB
1	Quasi Peak	159 kHz	45.59	L1	-19.92
2	CISPR Average	159 kHz	34.34	L1	-21.16
1	Quasi Peak	249 kHz	37.88	N	-23.90
1	Quasi Peak	555 kHz	40.42	L1	-15.57
2	CISPR Average	555 kHz	31.71	L1	-14.28
1	Quasi Peak	568.5 kHz	39.33	N	-16.66
2	CISPR Average	568.5 kHz	31.34	L1	-14.65
1	Quasi Peak	915 kHz	32.63	N	-23.36
1	Quasi Peak	2.13 MHz	30.72	N	-25.27
2	CISPR Average	24 MHz	32.84	N	-17.15

EXHIBIT 5
EQUIPMENT LIST

5.0 **Equipment List**

1) Radiated Emissions Test

Equipment	EMI Test Receiver	Spectrum Analyzer	Signal Generator
Equipment No.	EC1468	EC1353	EC1354
Brand	Rohde & Schwarz	Rohde & Schwarz	Rohde & Schwarz
Model No	ESR-7	FSP30	SMR27
Calibration Date	01/12/2014	18/08/2015	03/11/2014
Calibration Due Date	30/11/2015	16/08/2016	02/11/2015

Equipment	Horn Antenna (1-18G)	Broadband Antenna	Active Loop Antenna
Equipment No.	EC1332	EC1347	EC1471
Brand	EMCO	SCHWARZBECK	SCHWARZBECK
Model No	3115	VULB 9168	FMZB1519
Calibration Date	05/06/2017	08/08/2013	30/04/2015
Calibration Due Date	03/06/2017	06/08/2016	28/04/2016

Equipment	Pre-Amplifier(1-26.5G)	966-2_3m Semi-Anechoic Chamber	966-2(A) Cable
Equipment No.	EC1373	EC1350	EC1447
Brand	EMCO	966_2	SUHNER
Model No	EMC12635SE	CEM-966_2	SMA/EX100
Calibration Date	07/10/2015	24/02/2015	06/05/2015
Calibration Due Date	05/10/2016	23/02/2016	04/05/2016

Equipment	966-2(B) Cable	Universal Radio Communication Tester
Equipment No.	EC1448	EC1501
Brand	JUNFLON	Rohde & Schwarz
Model No	SMA/ J12J100880-00	CMU200
Calibration Date	09/05/2015	28/04/2015
Calibration Due Date	07/05/2016	27/04/2016

2) Conducted Emissions Test

Equipment	EMI Test Receiver	Artificial Mains Network	Artificial Mains Network
Registration No.	EW-2500	EW-2501	EW-2874
Manufacturer	R&S	R&S	R&S
Model No.	ESCI	ENV-216	ENV-216
Calibration Date	Nov. 6, 2014	Dec. 25, 2013	Dec. 8, 2014
Calibration Due Date	Nov. 6, 2015	Nov. 30, 2014	Dec. 8, 2015

END OF TEST REPORT