Laboratories GSD srl

CE **MARKING**

ELECTROMAGNETIC COMPATIBILITY
ELECTRICAL SAFETY
LASER SPECTROSCOPY
ENVIRONMENTAL PHYSIC

www.tuv.com TÜVRheinland ID:9105021519

Organizzazione con Sistema di Gestione certificato
Company with Management System certified
ISO 9001:2008
SINCERT

G.S.D. Srl **PISA - Italy**	***Test Report n. FCC-16516***	Rev. 01

Manufacturer	**Power-One Italy S.p.A.**
Address	Via San Giorgio, 642 52028 Terranuova Bracciolini (AR) Italy
Test Family Name	**VSN400 CELLULAR LOGGER CARD**
Testing Laboratory Name	**G.S.D. S.r.l.**
Address	Via Marmiceto, 8 56121 Ospedaletto Pisa (PI) Italy
Tel/Fax	+39 050 984254 / +39 050 984262
P.IVA/VAT	01343950505
http – e-mail	www.gsd.it - info@gsd.it
	FCC Listed: Registration Number: 424037
Location and Date of Issue	Pisa, 2016 April 01

G.S.D. s.r.l.
Via Marmiceto, 8
56121 OSPEDALETTO - PISA
Tel. 050.984254 - Fax 050.984262
P. IVA 01343950505

SENIOR EMC TEST MANAGER
Dr. Gian Luca Genovesi

QUALITY MANAGER
Dr. David Pelliccia

INDEX

1. MANUFACTURER AND EUT IDENTIFICATION 3

2. REFERENCE STANDARDS.....5

3. TEST GENERALITY, RESULT, CONDITION, MEASUREMENT UNCERTAINTY.....6

4. RADIATED EMISSIONS.....8

5. PHOTO.....17

1. MANUFACTURER AND EUT IDENTIFICATION [1]

Manufacturer	**Power-One Italy S.p.A..**
Address	Via San Giorgio, 642 52028 Terranuova Bracciolini (AR) Italy
Test Family Name	**VSN400 CELLULAR LOGGER CARD**
Date of reception	**2016 January 20**
Sampling	**Laboratory sample for certification**
Test Item Description	**WiFi and Cellular Device**
Nominal Input Voltage	**12 Vdc**
FCC ID	**X6W-3N89E** **contains FCC ID: UDV-SIM7100A**

[1] A detailed documentation is preserved in the internal fascicle.

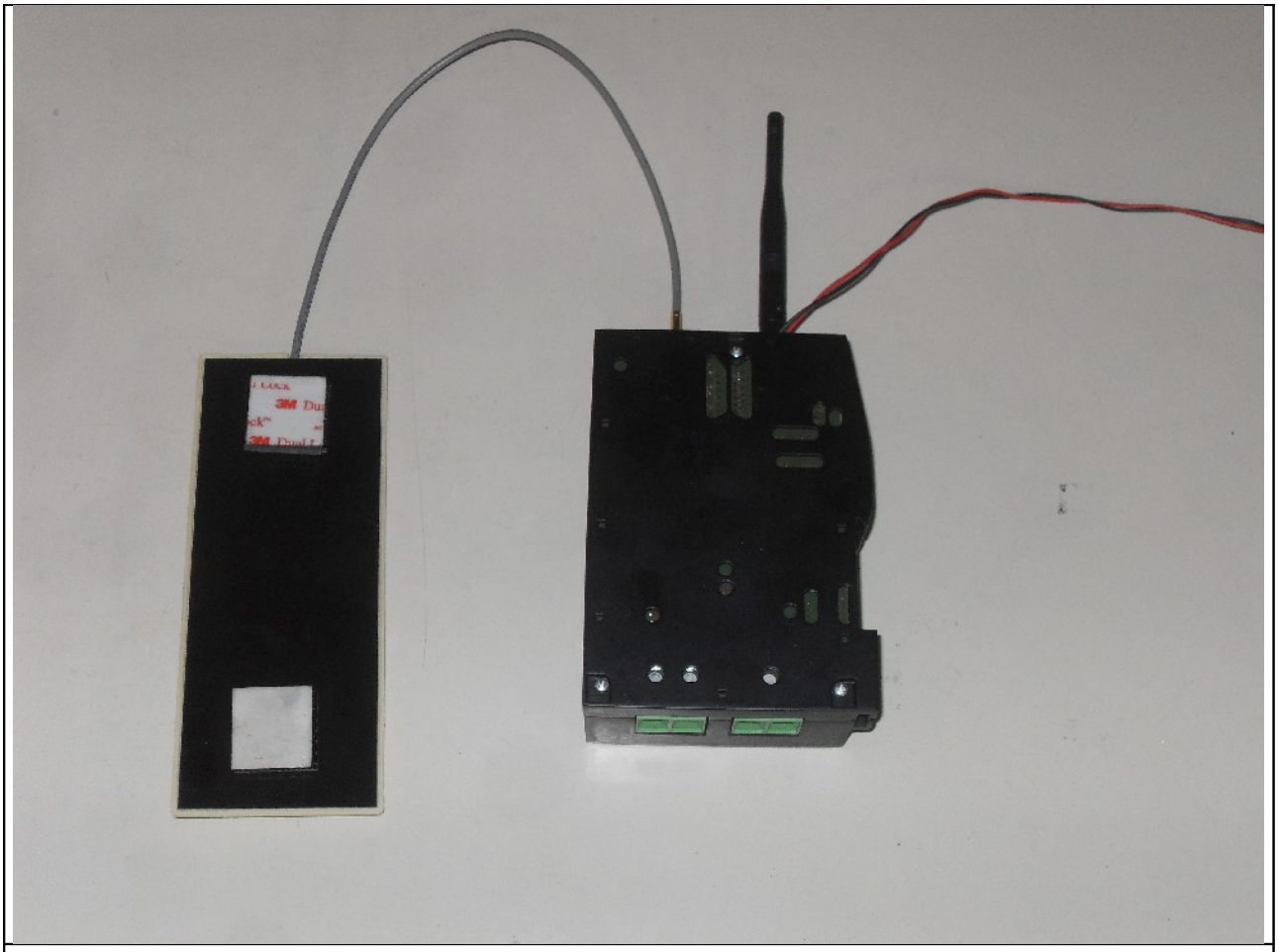


Fig. 1.1
Equipment Photo

2. REFERENCE STANDARDS

Tests and measurements are performed accordingly to the reference standards given in the table below:

TEST	***STANDARD***
Emissions: Radiated – Section 15.209	FCC Rules ad Regulations, Title 47 Part 15 – Sub part C ANSI C63.4 (2014) – American National Standard for Methods of Measuring of Radio-Noise Emissions from Low Voltage Electrical and Electronic Equipment in the Range of 9 kHz – 40 GHz

3. TEST GENERALITY, RESULT, CONDITION, MEASUREMENT UNCERTAINTY

Sub-part 2.1033(b)

Test And Measurement Data

All tests and measurement data shown were performed in accordance with FCC Rules and Regulations, Volume II; Part 2 and the following individual Parts: 15.209; Intentional Radiators

Standard Test Conditions and Engineering Practices

Except as noted herein, the following conditions and procedures were observed during the testing:
In accordance with ANSI C63.4-2014, and unless otherwise indicated in the specific measurement results, the ambient temperature of the actual EUT was maintained within the range of 10° to 40°C (50° to 104 °F) unless the particular equipment requirements specify testing over a different temperature range. Also, unless otherwise indicated, the humidity levels were in the range of 10% to 90% relative humidity.
Prior to testing, the EUT was tuned up in accordance with the manufacturer's alignment procedures.
All external gain controls were maintained at the position of maximum and/or optimum gain throughout the testing.
Measurement results, unless otherwise noted, are worst-case measurements.

Summary of Test Results

TEST	*RESULT*
Emissions: radiated *Section 15.209*	*Pass*

Measurement uncertainty

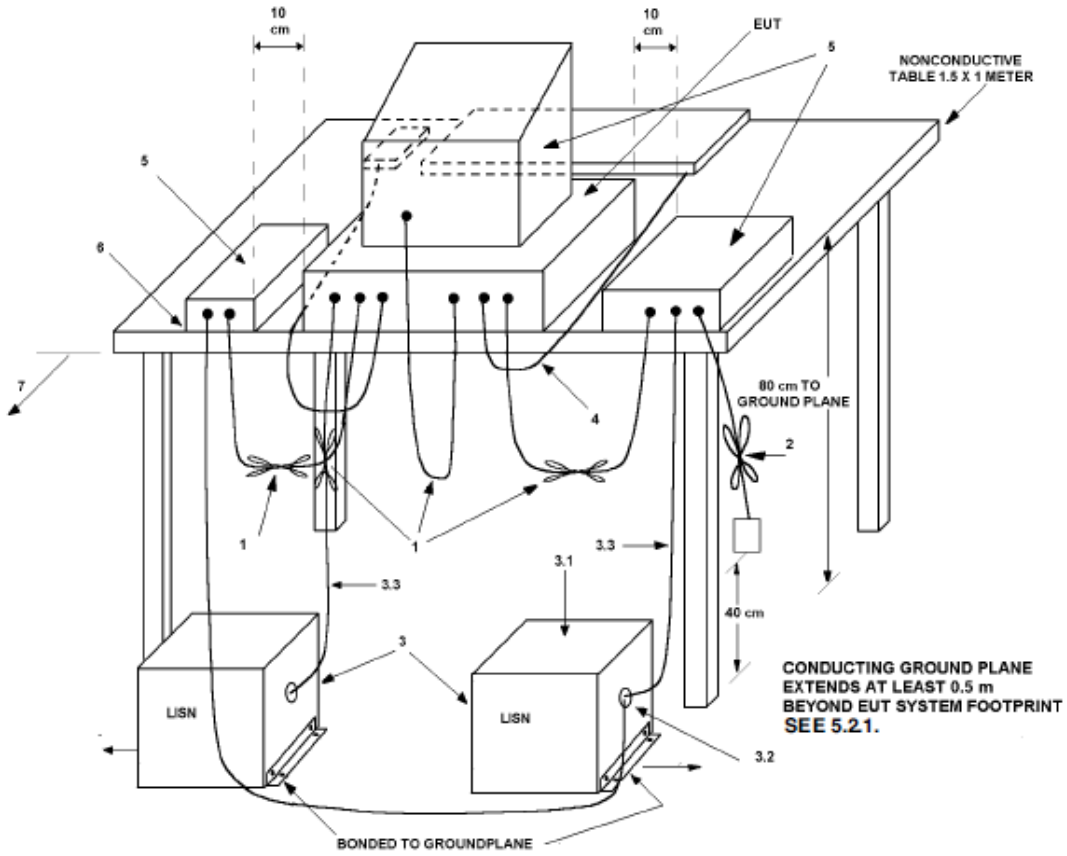
TEST	*EXPANDED UNCERTAINTY*
Conducted Emission – 50Ω/50µH (150 kHz - 30 MHz)	± 3.5 dB
Radiated Emission – (Semianechoic Room) (30 MHz - 18 GHz)	± 4.7 dB

Climatic Conditions

PARAMETER	*VALUE*
Temperature	(293 ± 3) K
Relative humidity	(50 ± 5) %

Extensions

The results refer only to the sampled EUT and under the specified conditions.



Conducted and Radiated EUT Test Set-up example (ANSI C63.4 2014)

Test Mode: the EUT was powered by 12Vdc.
WiFi ON
LTE/WCDMA ON

4. RADIATED EMISSIONS

In the following table you can find the limits established by the reference standard:

FREQUENCY RANGE *(MHz)*	***Field Strenght*** *QUASI-PEAK LIMITS* *[dB (μV/m)]*
0.009 ÷ 0.490	48.15 ÷ 13.8 @ 300m
0.490 ÷ 1.705	33.8 ÷ 23 @ 30m
1.705 ÷ 30	29.5 @ 30m
30 ÷ 88	40
88 ÷ 216	43,5
216 ÷ 960	46
Above 960	54

Test Equipment

EQUIPMENT	MANUFACTURER	MODEL	CAL. DUE
EMI Receiver	Keysight	N9038A	01/2017
Anechoic Chamber	Comtest	CSA01	01/2017
High Pass Filter	MiniCircuits	VHP-39	01/2017
Notch Filter	K&L	3N45-2442/T84	01/2017
Notch Filter	Wainwright	WRTC10-1700-2100-20-40-40	01/2017
Preamplifier	SHF	97AP	01/2017
Loop Antenna	ETS	6509	01/2017
Horn Antenna	Alpha Industries	61932500	01/2017
Bilog Antenna	Schaffner	CBL6112B	01/2017
Horn Antenna	EMCO	3115	01/2017
Controller	Deisel	HD100	01/2017
Turn Table	Deisel	MA240	01/2017
LISN	GSD	NTW06	01/2017

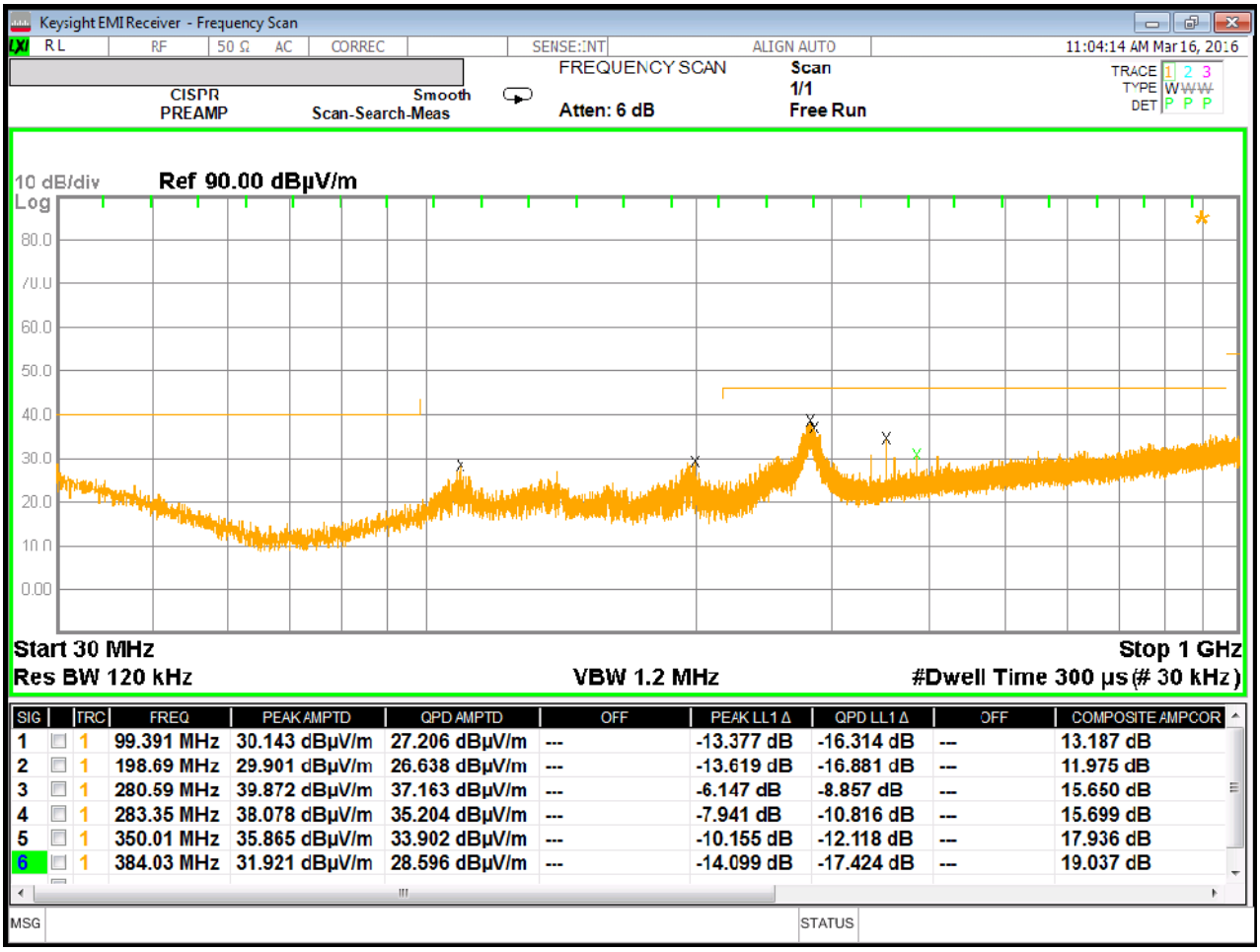
Test procedure: RE22R02

Notes

Azimuth position EUT-Antenna corresponding to 0° identifies the rotating table orientation (TT) in which the instrument to be tested shows the front part turned towards the antenna. Positive grades individuate clockwise rotations of TT when this one is observed from the top. For negative degrees, TT rotation is anticlockwise.
Antenna height respect to the mass plane is conventionally individuated with: MA=XXX where XXX indicates the height (always positive for e>100) expressed in cm.
Antenna horizontal polarization is indicated by POL=H.
Antenna vertical polarization is indicated by POL=V.

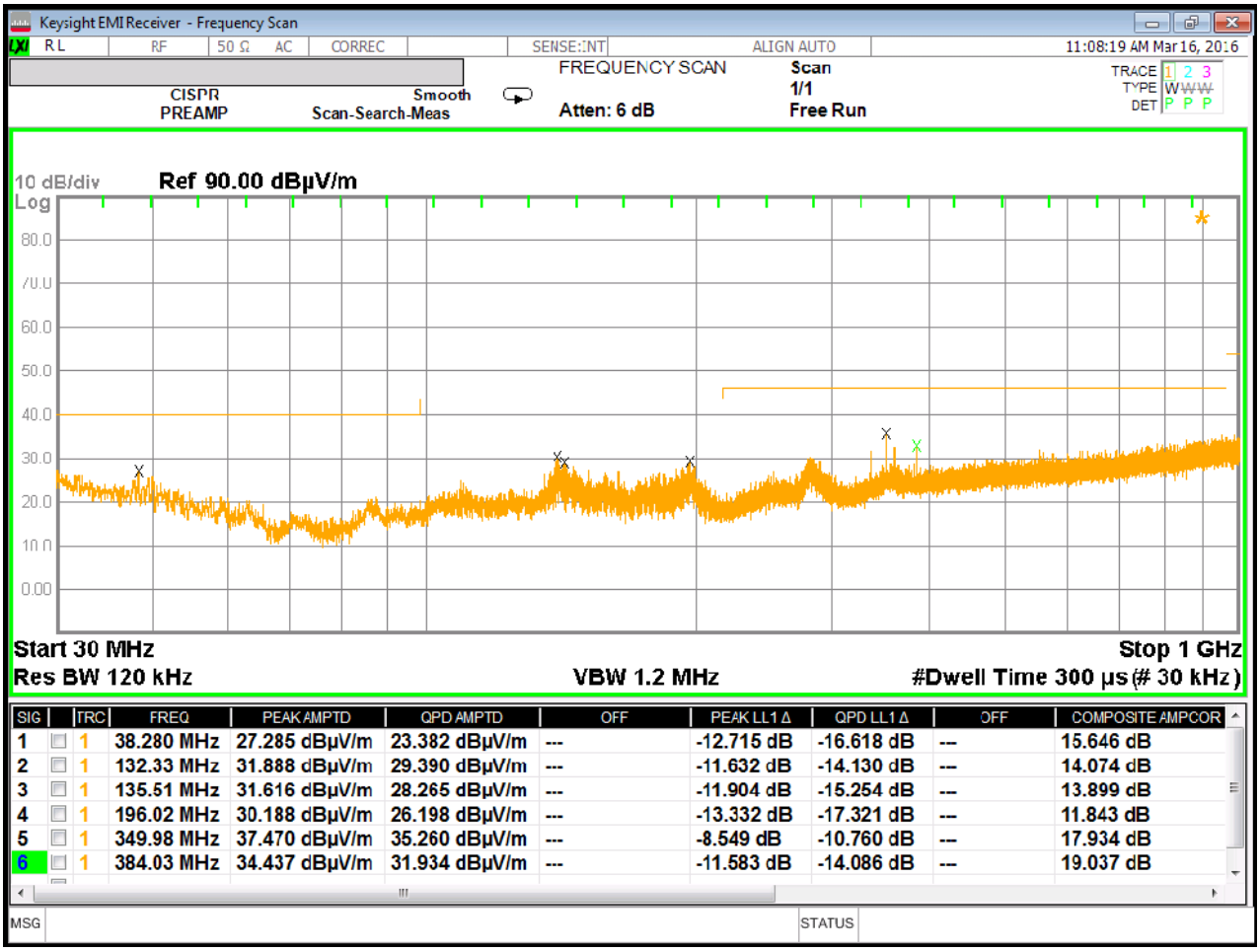
EUT was tested in the three orthogonal planes.
Results and conclusions
In all the operative conditions, equipment complied with the standard limits. Graphics in following figures show the most significant registrations of the performed measurements.

Radiated Emissions



Note:
Horizontal Polarization
EUT operating, WiFi and LTE ON

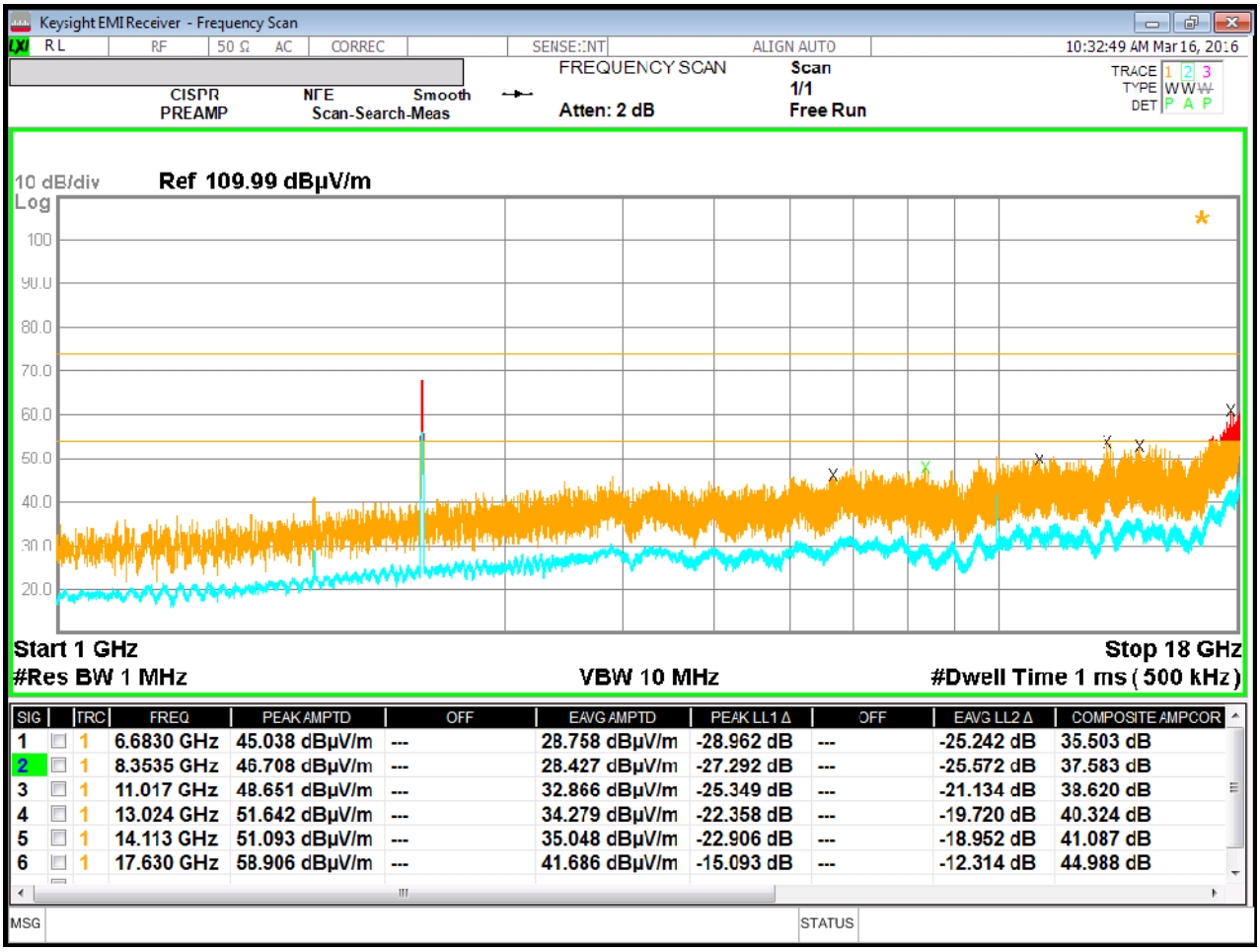
Radiated Emissions



SIG	TRC	FREQ	PEAK AMPTD	QPD AMPTD	OFF	PEAK LL1 Δ	QPD LL1 Δ	OFF	COMPOSITE AMPCOR
1	1	38.280 MHz	27.285 dBµV/m	23.382 dBµV/m	---	-12.715 dB	-16.618 dB	---	15.646 dB
2	1	132.33 MHz	31.888 dBµV/m	29.390 dBµV/m	---	-11.632 dB	-14.130 dB	---	14.074 dB
3	1	135.51 MHz	31.616 dBµV/m	28.265 dBµV/m	---	-11.904 dB	-15.254 dB	---	13.899 dB
4	1	196.02 MHz	30.188 dBµV/m	26.198 dBµV/m	---	-13.332 dB	-17.321 dB	---	11.843 dB
5	1	349.98 MHz	37.470 dBµV/m	35.260 dBµV/m	---	-8.549 dB	-10.760 dB	---	17.934 dB
6	1	384.03 MHz	34.437 dBµV/m	31.934 dBµV/m	---	-11.583 dB	-14.086 dB	---	19.037 dB

Note:
Horizontal Polarization
EUT operating, WiFi and LTE ON

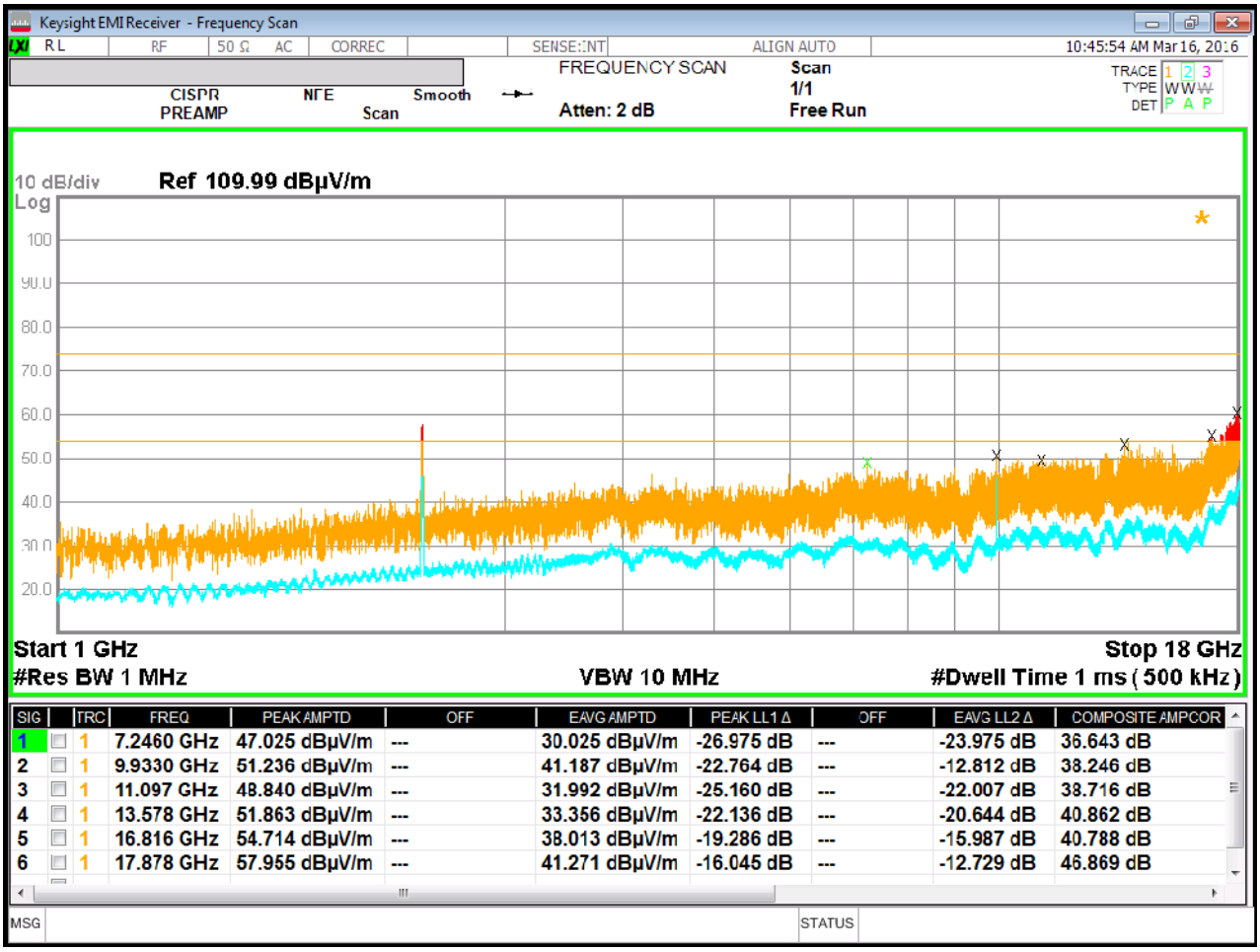
Radiated Emissions



SIG	TRC	FREQ	PEAK AMPTD	OFF	EAVG AMPTD	PEAK LL1 Δ	OFF	EAVG LL2 Δ	COMPOSITE AMPCOR
1	1	6.6830 GHz	45.038 dBµV/m	---	28.758 dBµV/m	-28.962 dB	---	-25.242 dB	35.503 dB
2	1	8.3535 GHz	46.708 dBµV/m	---	28.427 dBµV/m	-27.292 dB	---	-25.572 dB	37.583 dB
3	1	11.017 GHz	48.651 dBµV/m	---	32.866 dBµV/m	-25.349 dB	---	-21.134 dB	38.620 dB
4	1	13.024 GHz	51.642 dBµV/m	---	34.279 dBµV/m	-22.358 dB	---	-19.720 dB	40.324 dB
5	1	14.113 GHz	51.093 dBµV/m	---	35.048 dBµV/m	-22.906 dB	---	-18.952 dB	41.087 dB
6	1	17.630 GHz	58.906 dBµV/m	---	41.686 dBµV/m	-15.093 dB	---	-12.314 dB	44.988 dB

Note:
Vertical Polarization
EUT operating, WiFi and LTE ON

Radiated Emissions

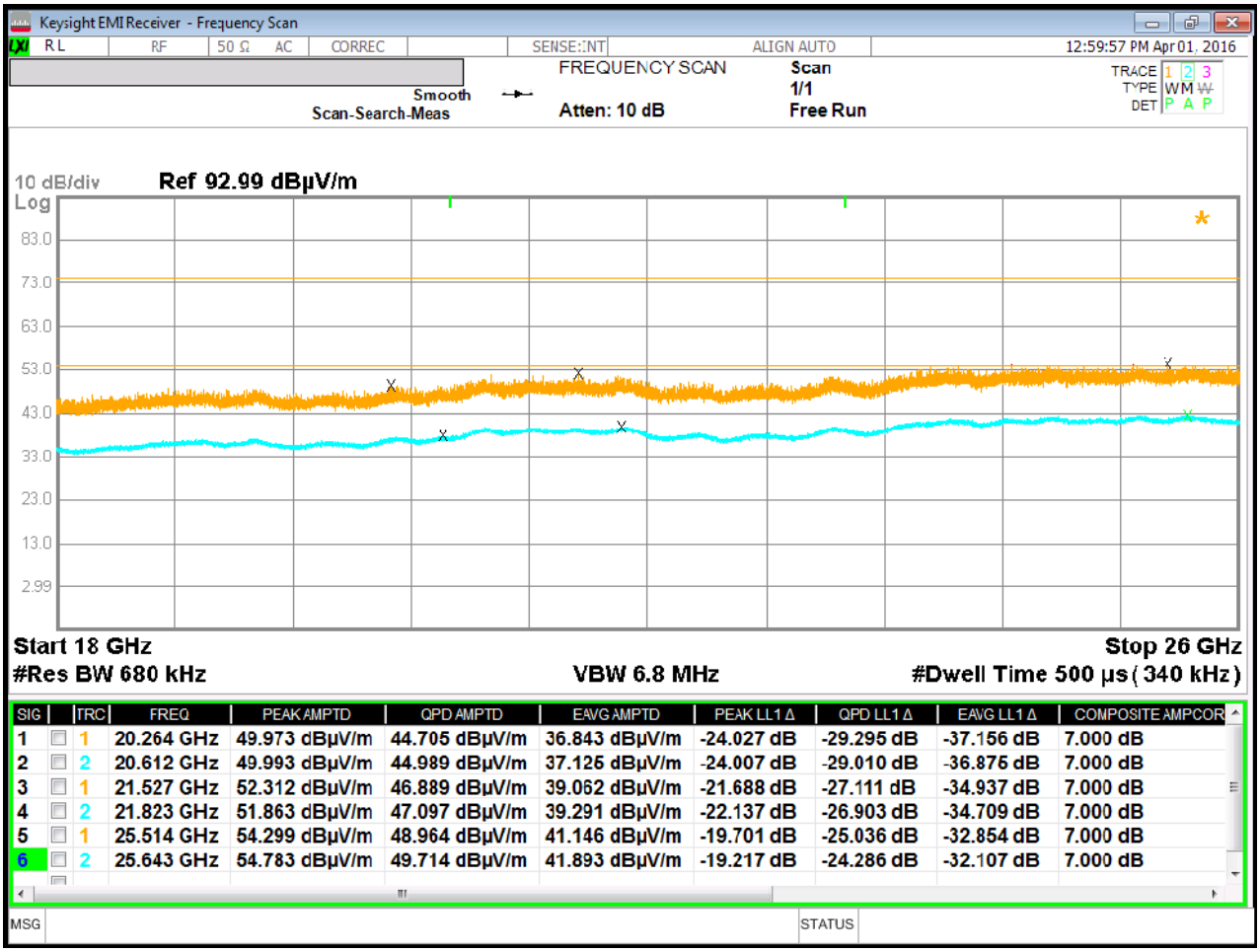


SIG	TRC	FREQ	PEAK AMPTD	OFF	EAVG AMPTD	PEAK LL1 Δ	OFF	EAVG LL2 Δ	COMPOSITE AMPCOR
1	1	7.2460 GHz	47.025 dBµV/m	---	30.025 dBµV/m	-26.975 dB	---	-23.975 dB	36.643 dB
2	1	9.9330 GHz	51.236 dBµV/m	---	41.187 dBµV/m	-22.764 dB	---	-12.812 dB	38.246 dB
3	1	11.097 GHz	48.840 dBµV/m	---	31.992 dBµV/m	-25.160 dB	---	-22.007 dB	38.716 dB
4	1	13.578 GHz	51.863 dBµV/m	---	33.356 dBµV/m	-22.136 dB	---	-20.644 dB	40.862 dB
5	1	16.816 GHz	54.714 dBµV/m	---	38.013 dBµV/m	-19.286 dB	---	-15.987 dB	40.788 dB
6	1	17.878 GHz	57.955 dBµV/m	---	41.271 dBµV/m	-16.045 dB	---	-12.729 dB	46.869 dB

Note:
Horizontal Polarization
EUT operating, WiFi and LTE ON

–

Radiated Emissions

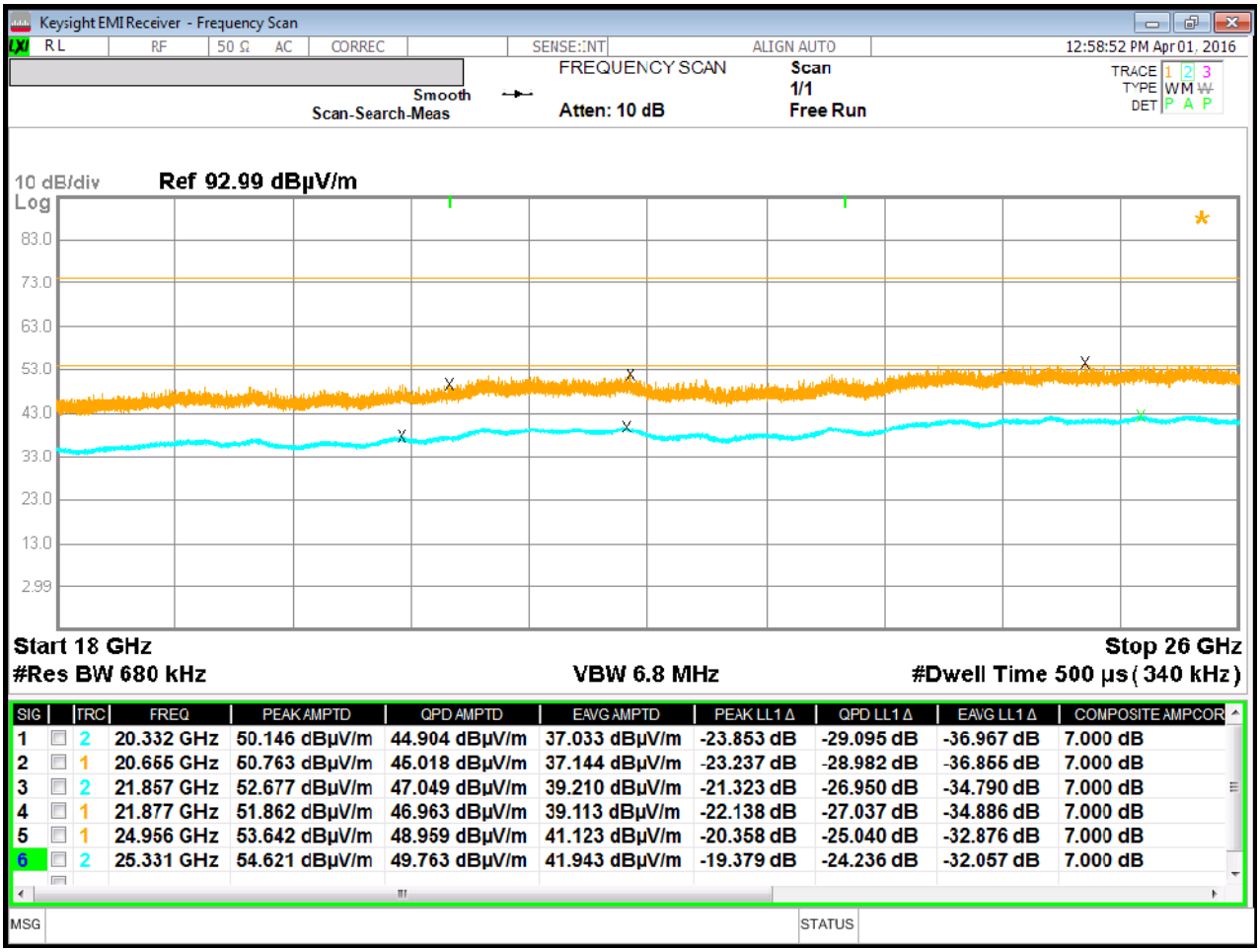


SIG	TRC	FREQ	PEAK AMPTD	QPD AMPTD	EAVG AMPTD	PEAK LL1 Δ	QPD LL1 Δ	EAVG LL1 Δ	COMPOSITE AMPCOR
1	1	20.264 GHz	49.973 dBµV/m	44.705 dBµV/m	36.843 dBµV/m	-24.027 dB	-29.295 dB	-37.156 dB	7.000 dB
2	2	20.612 GHz	49.993 dBµV/m	44.989 dBµV/m	37.126 dBµV/m	-24.007 dB	-29.010 dB	-36.875 dB	7.000 dB
3	1	21.527 GHz	52.312 dBµV/m	46.889 dBµV/m	39.062 dBµV/m	-21.688 dB	-27.111 dB	-34.937 dB	7.000 dB
4	2	21.823 GHz	51.863 dBµV/m	47.097 dBµV/m	39.291 dBµV/m	-22.137 dB	-26.903 dB	-34.709 dB	7.000 dB
5	1	25.514 GHz	54.299 dBµV/m	48.964 dBµV/m	41.146 dBµV/m	-19.701 dB	-25.036 dB	-32.854 dB	7.000 dB
6	2	25.643 GHz	54.783 dBµV/m	49.714 dBµV/m	41.893 dBµV/m	-19.217 dB	-24.286 dB	-32.107 dB	7.000 dB

Note:
Horizontal Polarization
EUT operating, WiFi and LTE ON

–

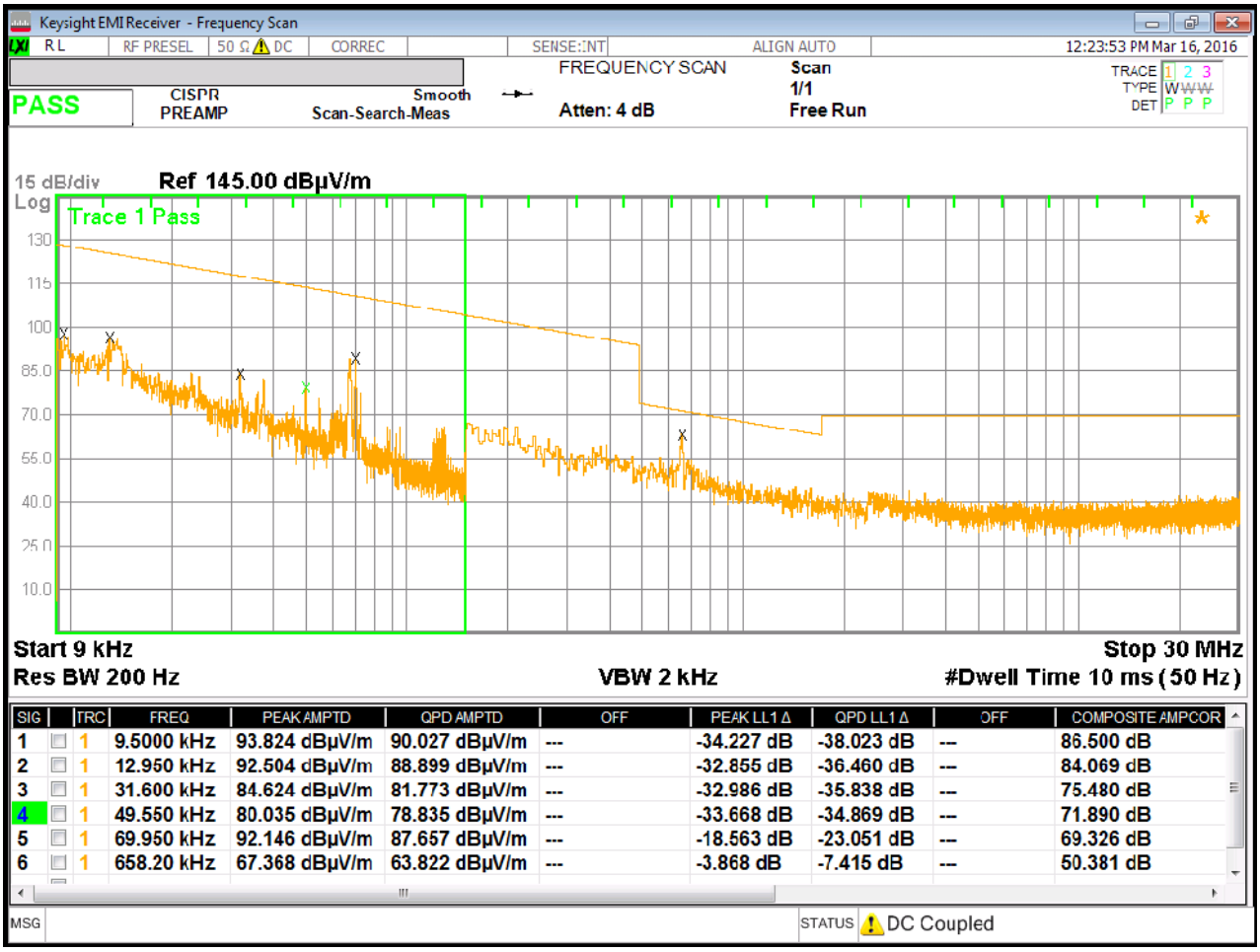
Radiated Emissions



SIG	TRC	FREQ	PEAK AMPTD	QPD AMPTD	EAVG AMPTD	PEAK LL1 Δ	QPD LL1 Δ	EAVG LL1 Δ	COMPOSITE AMPCOR
1	2	20.332 GHz	50.146 dBµV/m	44.904 dBµV/m	37.033 dBµV/m	-23.853 dB	-29.095 dB	-36.967 dB	7.000 dB
2	1	20.666 GHz	50.763 dBµV/m	46.018 dBµV/m	37.144 dBµV/m	-23.237 dB	-28.982 dB	-36.856 dB	7.000 dB
3	2	21.857 GHz	52.677 dBµV/m	47.049 dBµV/m	39.210 dBµV/m	-21.323 dB	-26.950 dB	-34.790 dB	7.000 dB
4	1	21.877 GHz	51.862 dBµV/m	46.963 dBµV/m	39.113 dBµV/m	-22.138 dB	-27.037 dB	-34.886 dB	7.000 dB
5	1	24.956 GHz	53.642 dBµV/m	48.959 dBµV/m	41.123 dBµV/m	-20.358 dB	-25.040 dB	-32.876 dB	7.000 dB
6	2	25.331 GHz	54.621 dBµV/m	49.763 dBµV/m	41.943 dBµV/m	-19.379 dB	-24.236 dB	-32.057 dB	7.000 dB

Note:
Vertical Polarization
EUT operating, WiFi and LTE ON

Radiated Emissions



SIG	TRC	FREQ	PEAK AMPTD	QPD AMPTD	OFF	PEAK LL1 Δ	QPD LL1 Δ	OFF	COMPOSITE AMPCOR
1	1	9.5000 kHz	93.824 dBµV/m	90.027 dBµV/m	---	-34.227 dB	-38.023 dB	---	86.500 dB
2	1	12.950 kHz	92.504 dBµV/m	88.899 dBµV/m	---	-32.855 dB	-36.460 dB	---	84.069 dB
3	1	31.600 kHz	84.624 dBµV/m	81.773 dBµV/m	---	-32.986 dB	-35.838 dB	---	75.480 dB
4	1	49.550 kHz	80.035 dBµV/m	78.835 dBµV/m	---	-33.668 dB	-34.869 dB	---	71.890 dB
5	1	69.950 kHz	92.146 dBµV/m	87.657 dBµV/m	---	-18.563 dB	-23.051 dB	---	69.326 dB
6	1	658.20 kHz	67.368 dBµV/m	63.822 dBµV/m	---	-3.868 dB	-7.415 dB	---	50.381 dB

Note:
Horizontal Polarization
EUT operating, WiFi and LTE ON

5. PHOTO

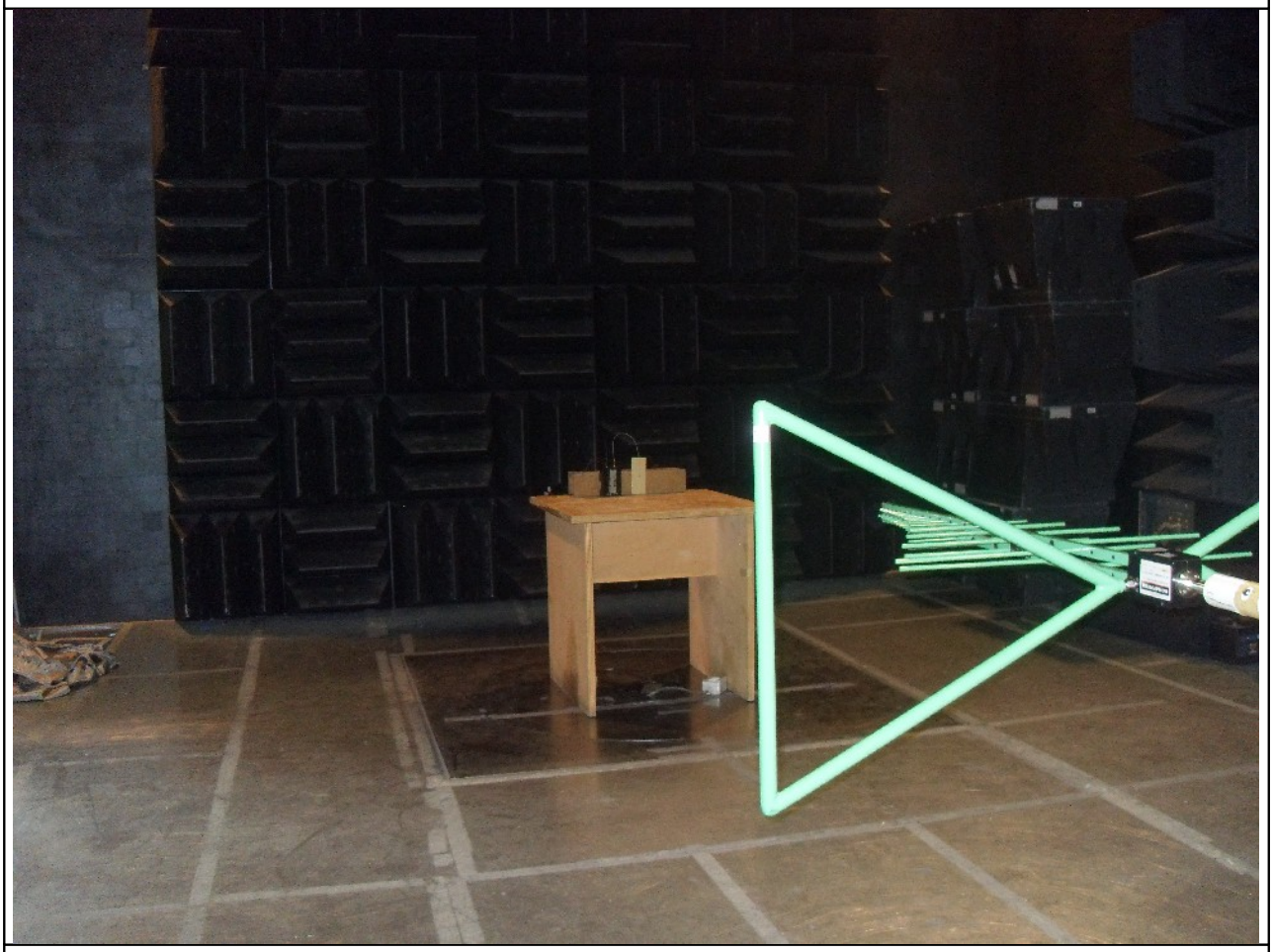


Fig. 5.1

Radiated Emissions Test Set-up

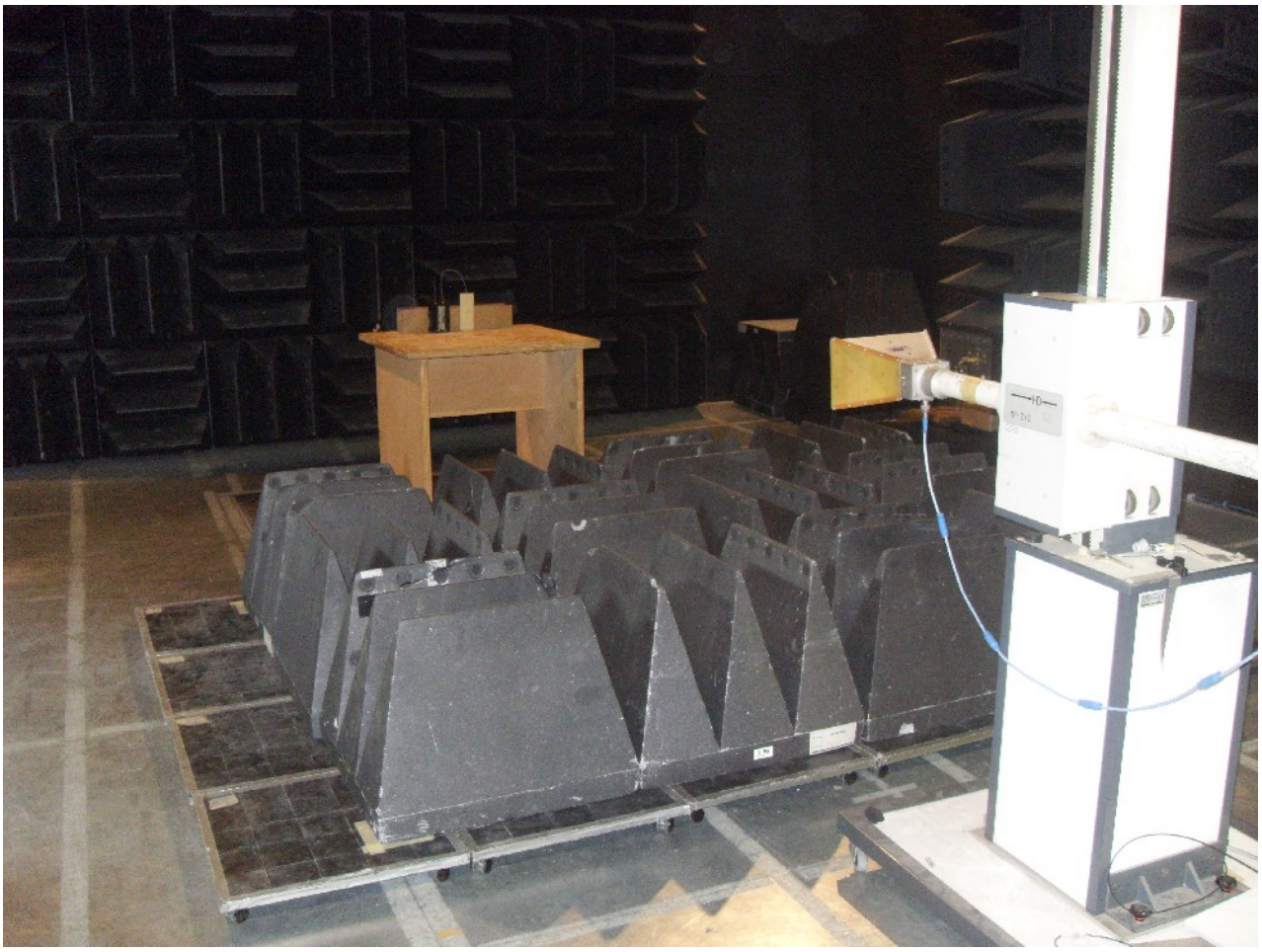


Fig. 5.2

Radiated Emissions Test Set-up

Fig. 5.3

Radiated Emissions Test Set-up

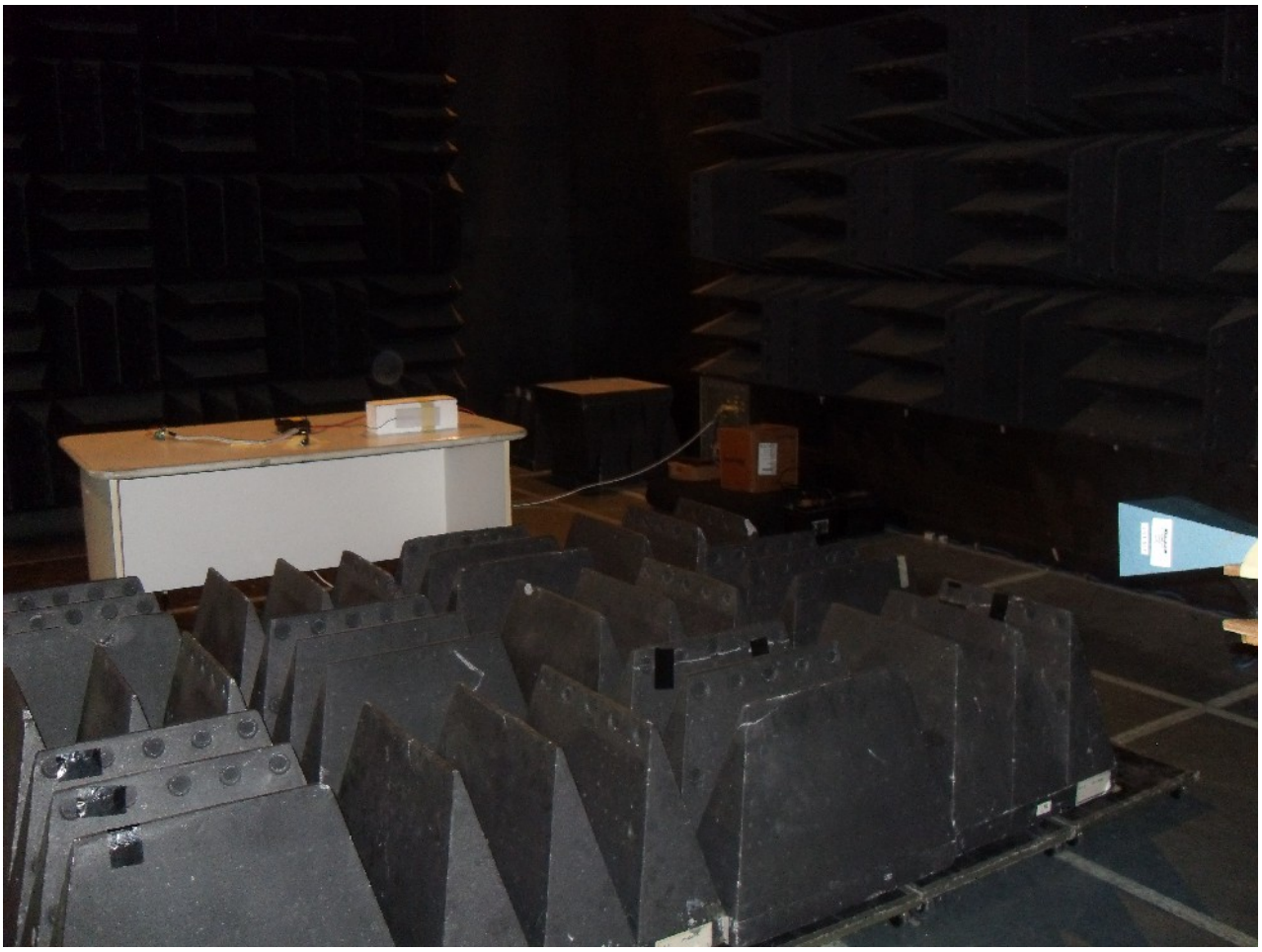


Fig. 5.4

Radiated Emissions Test Set-up