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EMC TEST REPORT

COMPANY: AGA RANGEMASTER LIMITED

PRODUCT : TESTING TO CFR47 PART15:249 and RSS210 ISSUE 8 ON A TOTAL CONTROL (COOKER)

REPORT : 101111084LHD-001b

WRITTEN BY: **G Aldridge**

REVIEWED BY: **D Legge**

TEST ENGINEER: **G Aldridge**

ISSUE: 5 **DATE: 10th June 2014** **TOTAL PAGES: 81**

TABLES

GRAPHS

1. JOB DESCRIPTION

Equipment: Total Control Cooker

Equipment Model No.: AGATC3TEK

Equipment Serial No.: None

Phase: Compliance

Customer:
AGA Rangemaster Limited
Station Road
Ketley
Telford
TF1 5AQ
United Kingdom

Test Plan Reference: -

Test Standards:
CFR 47 Part 15:249,
RSS 210 Issue 8 Annex 2.9

FCC : Ident A2M-AGA-TC3TEK
IC: Ident 10181A-AGATC3TEK
Test Location:
Intertek Testing & Certification
Unit D, Imperial Park
Randalls Way
Leatherhead
Surrey KT22 7SB
United Kingdom

Test Work Started: 22nd May 2013

Test Work Completed: 11th July 2013

2. TEST SUMMARY

2.1. AGA Total Control Cooker

2.1.1. CFR 47 Part 15:249 and RSS210 Issue 8

TEST STANDARD	TEST	COMMENT
CFR47:Part15:249.a	Fundamental Radiated Field Strength	Pass
CFR47:Part15:249.a & d	Harmonic Radiated Field Strength	Pass
CFR47:Part15:207	Conducted Emissions	Pass
CFR47:Part15:205	Restricted Band Emissions	Pass
RSS 210: Annex 2.9	Transmitter Effective Radiated Power	Pass
RSS 210: Annex 2.9	100kHz out of band emissions	Pass
RSS 210: Annex 2.9	Restricted Band Emissions	Pass
RSS – Gen: 4.6.1	Occupied Bandwidth	Pass

2.1.2. CFR 47 Part 15 and RSS 210 Issue 8

TEST STANDARD	TEST	COMMENT
CFR47 15: 209	Radiated Emissions (Note 1)	Pass
CFR47 15: 205	Restricted Bands of Operation	Pass
RSS 210:2.2	Restricted Bands of Operation	Pass
RSS 210.2.5	Radiated Emissions (Note1)	Pass

Note 1: This test was carried out in a FCC registered test chamber, which complies with FCC limits for Radiated Emissions over the frequency range 30MHz to 1000MHz. The test chamber is also registered with Industry Canada.

All the above tests have been carried out to meet the requirements of ANSI C63.4:2009 Test procedures.

3. EQUIPMENT UNDER TEST (EUT)

3.1. Description of the EUT

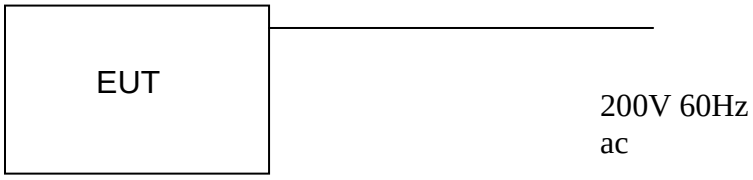
The Equipment Under Test (EUT) was an electric cooker using a remote wireless control. The cooker required 200vac 60Hz power supply and the remote handset was battery powered (tested under report number 11055686LHD-001b).

3.2. EUT's Modes of Operation

Mode 1: Continuously transmitting for transmit mode – No cooker controls.

Mode 2: Powered and on but not transmitting – All heating elements on.

3.3. EUT Configuration Diagram



3.4. EUT Support Equipment

Power Supply Unit – EF20SFC/16.0Kw/3:1

3.5. Cables Associated With the EUT

None

4. TESTS

4.1. Transmitter Output Power (Conducted)

There was no external antenna connector and therefore this test was not carried out.

4.2. Radiated Peak Powers: CFR47 Part 15:249a

These tests were carried out in a semi lined Anechoic chamber at a distance of three metres, using a Bi-log antenna and N type/micro wave cables. The radiated peak power test was with the transmitter in continuous transmit mode for both horizontal and vertical polarisations and average and peak detectors.

5. CONDUCTED EMISSIONS – CFR 47 PART15:207

5.1. AC Conducted Emissions Test Method

The testing was performed in accordance with ANSI C63.4:2009, American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9kHz to 40GHz.

The test was performed in a screened room using a Line Impedance Stabilising Network (LISN).

5.2. Conducted Emissions Test Results

The final measurements within 6dB below the average and quasi-peak limit lines performed with the average and quasi-peak detectors respectively are given in Tables 1-6. The emissions signature is given in Graphs 1-4.

5.3. Conducted Emissions Conclusions

The EUT complied with the limits of FCC Part 15 Clause 207 Class B.

5.4. Measurement Uncertainty

150kHz to 30MHz ±3.8dB

The measurement uncertainties have been determined at a confidence level of not less than 95%.

Table 1 Conducted Emissions Test Results – Live Line – Transmit Mode

Standard: FCC Part 15

Test: Conducted Emissions

Port: AC Power

Units of measurement:
Frequency: MHz Amplitude: dBµV

Bandwidth: 9kHz

EDIT PEAK LIST (Final Measurement Results)			
Trace1:	COND_B_Q		
Trace2:	COND_B_A		
Trace3:	---		
TRACE	FREQUENCY	LEVEL dBµV	DELTA LIMIT dB
2 Average	290 kHz	32.00	-18.52
1 Quasi Peak	310 kHz	40.83	-19.13
2 Average	310 kHz	37.19	-12.77
1 Quasi Peak	330 kHz	43.11	-16.34
2 Average	330 kHz	38.77	-10.67
1 Quasi Peak	350 kHz	42.61	-16.34
2 Average	350 kHz	39.71	-9.24
1 Quasi Peak	370 kHz	41.30	-17.20
2 Average	370 kHz	38.34	-10.15
1 Quasi Peak	394 kHz	40.14	-17.83
2 Average	394 kHz	36.35	-11.62
1 Quasi Peak	414 kHz	40.15	-17.41
2 Average	414 kHz	35.54	-12.02
1 Quasi Peak	434 kHz	40.33	-16.84
2 Average	434 kHz	37.09	-10.08
1 Quasi Peak	454 kHz	40.64	-16.15
2 Average	454 kHz	37.33	-9.46
1 Quasi Peak	474 kHz	39.77	-16.66
2 Average	474 kHz	36.65	-9.78
2 Average	494 kHz	36.37	-9.72

Table 1 Conducted Emissions Test Results – Live Line – Transmit Mode (continued)

Standard: FCC Part 15

Test: Conducted Emissions

Port: AC Power

Units of measurement:
Frequency: MHz Amplitude: dBµV

Bandwidth: 9kHz

EDIT PEAK LIST (Final Measurement Results)

Trace1: COND_B_Q
Trace2: COND_B_A
Trace3: ---

TRACE		FREQUENCY	LEVEL dBµV	DELTA LIMIT dB
1	Quasi Peak	498 kHz	39.89	-16.14
1	Quasi Peak	518 kHz	42.27	-13.72
2	Average	518 kHz	38.57	-7.42
1	Quasi Peak	538 kHz	45.35	-10.64
2	Average	538 kHz	41.56	-4.43
1	Quasi Peak	558 kHz	47.29	-8.70
2	Average	558 kHz	43.76	-2.23
2	Average	578 kHz	39.70	-6.29
2	Average	598 kHz	31.26	-14.74
2	Average	662 kHz	33.87	-12.12
1	Quasi Peak	682 kHz	43.02	-12.97
2	Average	682 kHz	39.43	-6.56
1	Quasi Peak	702 kHz	45.37	-10.62
2	Average	702 kHz	42.07	-3.92
1	Quasi Peak	722 kHz	42.38	-13.61
2	Average	722 kHz	39.96	-6.03
2	Average	742 kHz	36.27	-9.72
1	Quasi Peak	746 kHz	38.45	-17.54
2	Average	762 kHz	34.11	-11.88
1	Quasi Peak	766 kHz	36.91	-19.08

Table 1 Conducted Emissions Test Results – Live Line – Transmit Mode (continued)

Standard: FCC Part 15

Test: Conducted Emissions

Port: AC Power

Units of measurement:
Frequency: MHz Amplitude: dBµV

Bandwidth: 9kHz

EDIT PEAK LIST (Final Measurement Results)

Trace1: COND_B_Q
Trace2: COND_B_A
Trace3: ---

TRACE	FREQUENCY	LEVEL dBµV	DELTA LIMIT dB
1 Quasi Peak	786 kHz	35.68	-20.31
2 Average	786 kHz	31.95	-14.04
1 Quasi Peak	1.078 MHz	18.73	-37.26
2 Average	2.022 MHz	31.06	-14.93
1 Quasi Peak	2.086 MHz	39.37	-16.62
2 Average	2.106 MHz	35.34	-10.65

Graph 1 Conducted Emissions Test Results – Live Line – Transmit Mode

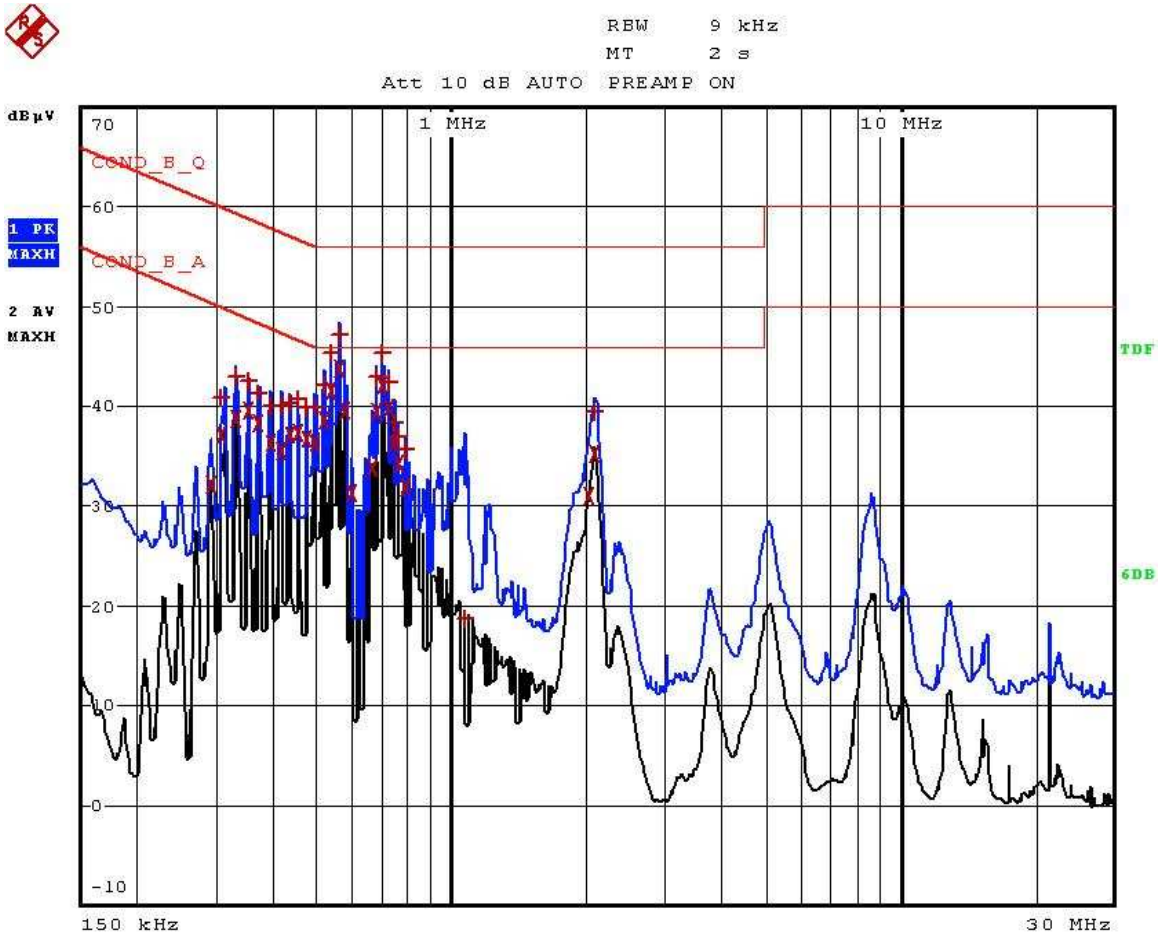


Table 2 Conducted Emissions Test Results – Neutral Line – Transmit Mode

Standard: FCC Part 15

Test: Conducted Emissions

Port: AC Power

Units of measurement:
Frequency: MHz Amplitude: dBµV

Bandwidth: 9kHz

EDIT PEAK LIST (Final Measurement Results)

Trace1: COND_B_Q
Trace2: COND_B_A
Trace3: ---

TRACE	FREQUENCY	LEVEL dBµV	DELTA LIMIT dB
2 Average	310 kHz	34.85	-15.12
1 Quasi Peak	330 kHz	40.55	-18.89
2 Average	330 kHz	36.21	-13.23
1 Quasi Peak	350 kHz	39.85	-19.11
2 Average	350 kHz	36.93	-12.02
2 Average	370 kHz	35.37	-13.12
1 Quasi Peak	374 kHz	38.13	-20.27
1 Quasi Peak	394 kHz	37.00	-20.97
2 Average	394 kHz	33.22	-14.75
1 Quasi Peak	414 kHz	36.84	-20.72
2 Average	414 kHz	32.23	-15.33
1 Quasi Peak	434 kHz	36.86	-20.31
2 Average	434 kHz	33.62	-13.55
1 Quasi Peak	454 kHz	37.03	-19.76
2 Average	454 kHz	33.72	-13.07
1 Quasi Peak	474 kHz	36.04	-20.40
2 Average	474 kHz	32.91	-13.53
1 Quasi Peak	494 kHz	36.43	-19.66
2 Average	494 kHz	32.49	-13.60
1 Quasi Peak	518 kHz	38.29	-17.70

Table 3 Conducted Emissions Test Results – Neutral Line – Transmit Mode (continued)

Standard: FCC Part 15

Test: Conducted Emissions

Port: AC Power

Units of measurement:
Frequency: MHz Amplitude: dBµV

Bandwidth: 9kHz

EDIT PEAK LIST (Final Measurement Results)

Trace1: COND_B_Q
Trace2: COND_B_A
Trace3: ---

TRACE		FREQUENCY	LEVEL dBµV	DELTA LIMIT dB
2	Average	518 kHz	34.55	-11.44
1	Quasi Peak	538 kHz	41.24	-14.75
2	Average	538 kHz	37.46	-8.53
1	Quasi Peak	558 kHz	43.18	-12.81
2	Average	558 kHz	39.62	-6.37
1	Quasi Peak	578 kHz	39.68	-16.31
2	Average	578 kHz	35.89	-10.10
2	Average	598 kHz	27.52	-18.47
2	Average	662 kHz	28.74	-17.25
1	Quasi Peak	682 kHz	37.94	-18.05
2	Average	682 kHz	34.33	-11.66
1	Quasi Peak	702 kHz	40.68	-15.31
2	Average	702 kHz	37.35	-8.65
1	Quasi Peak	722 kHz	38.08	-17.91
2	Average	722 kHz	35.63	-10.36
2	Average	742 kHz	31.91	-14.08
1	Quasi Peak	746 kHz	34.11	-21.88
2	Average	762 kHz	29.61	-16.38
2	Average	786 kHz	27.39	-18.60
2	Average	2.042 MHz	26.65	-19.35

Table 4 Conducted Emissions Test Results – Neutral Line – Transmit Mode (continued)

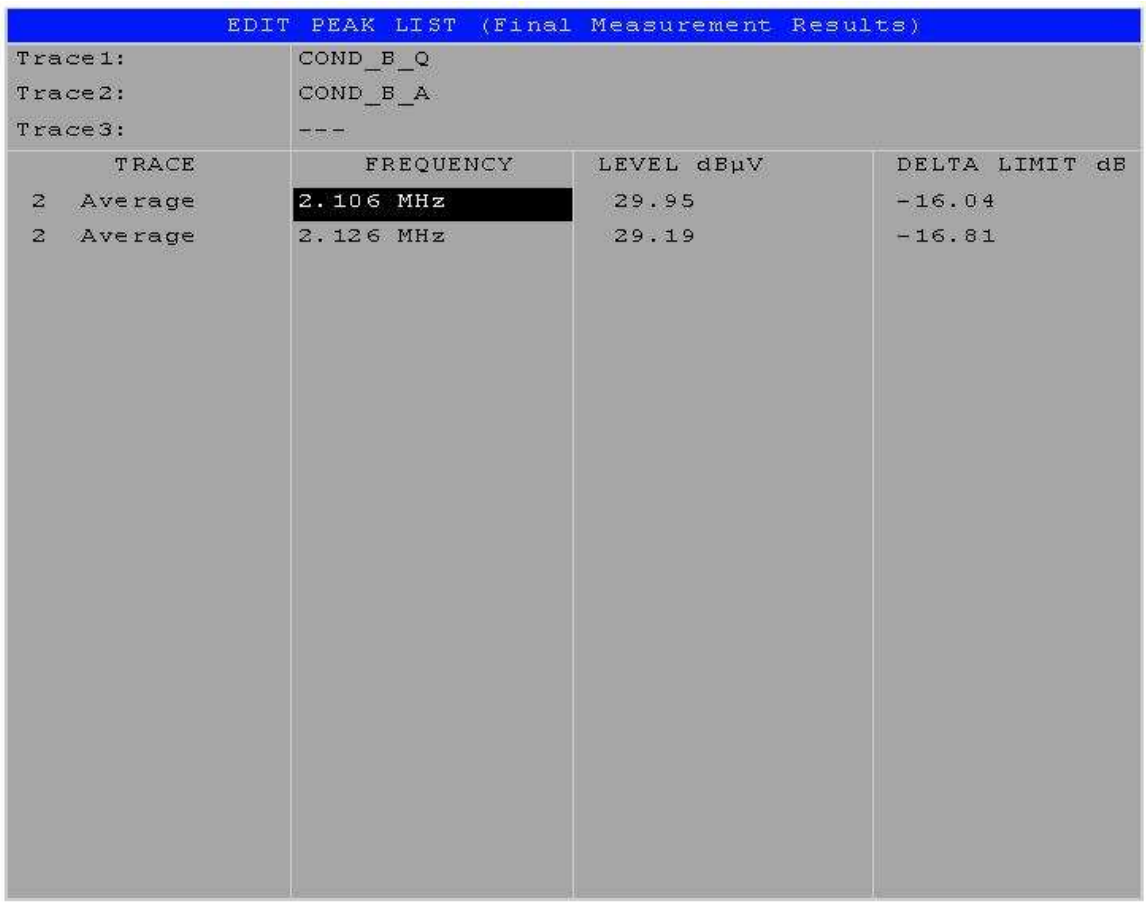
Standard: FCC Part 15

Test: Conducted Emissions

Port: AC Power

Units of measurement:
Frequency: MHz Amplitude: dBµV

Bandwidth: 9kHz



Graph 2 Conducted Emissions Test Results – Neutral Line – Transmit Mode

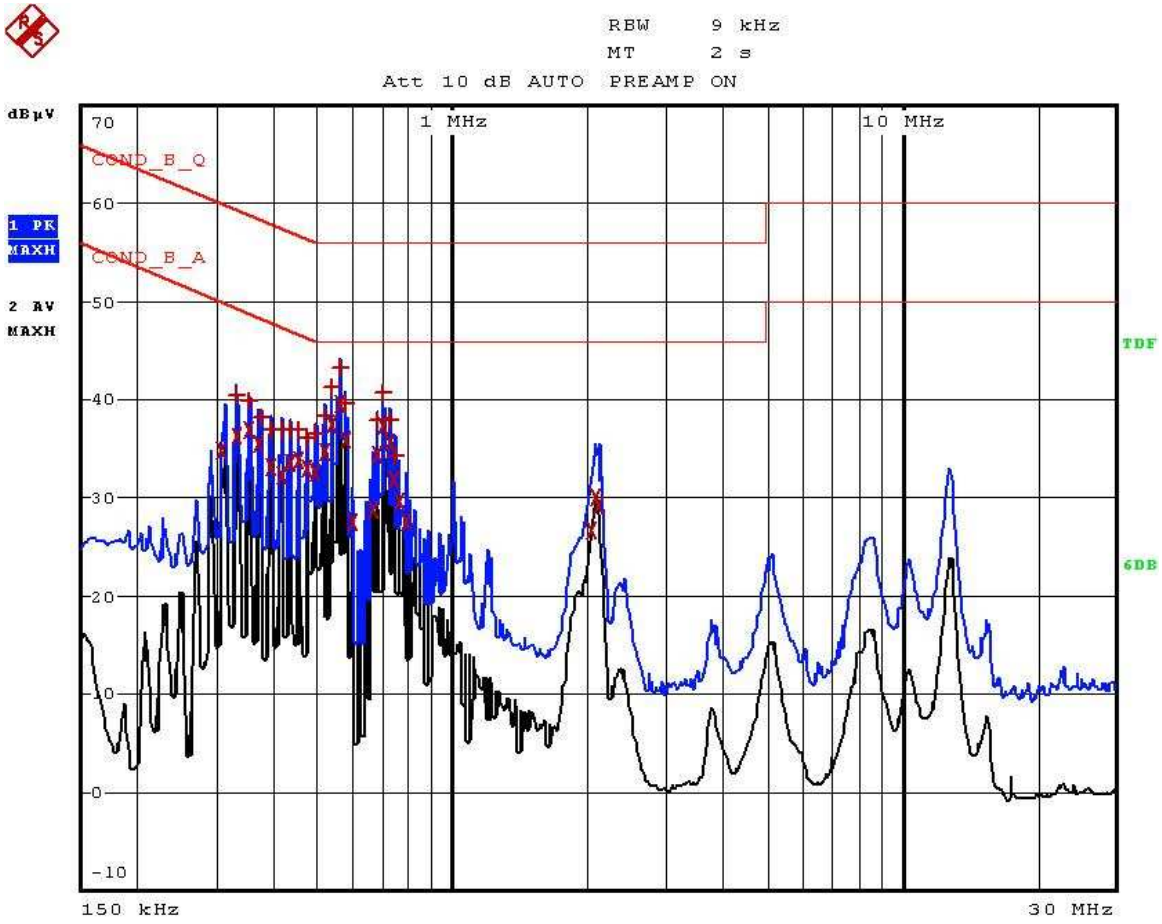


Table 5 Conducted Emissions Test Results – Neutral Line – Standby Mode

Standard: FCC Part 15

Test: Conducted Emissions

Port: AC Power

Units of measurement:
Frequency: MHz Amplitude: dBµV

Bandwidth: 9kHz

EDIT PEAK LIST (Final Measurement Results)

Trace1: COND_B_Q
Trace2: COND_B_A
Trace3: ---

TRACE		FREQUENCY	LEVEL dBµV	DELTA LIMIT dB
1	Quasi Peak	206 kHz	55.99	-7.36
2	Average	210 kHz	24.32	-28.87
2	Average	566 kHz	-3.36	-49.37
1	Quasi Peak	1.054 MHz	1.56	-54.44
1	Quasi Peak	1.866 MHz	-0.60	-56.60
2	Average	1.866 MHz	-3.64	-49.64
1	Quasi Peak	1.874 MHz	-0.44	-56.44
2	Average	1.878 MHz	-2.29	-48.29
2	Average	2.454 MHz	-5.34	-51.34
1	Quasi Peak	12.962 MHz	23.62	-36.37
2	Average	13.022 MHz	17.45	-32.54

Graph 3 Conducted Emissions Test Results – Neutral Line – Standby Mode

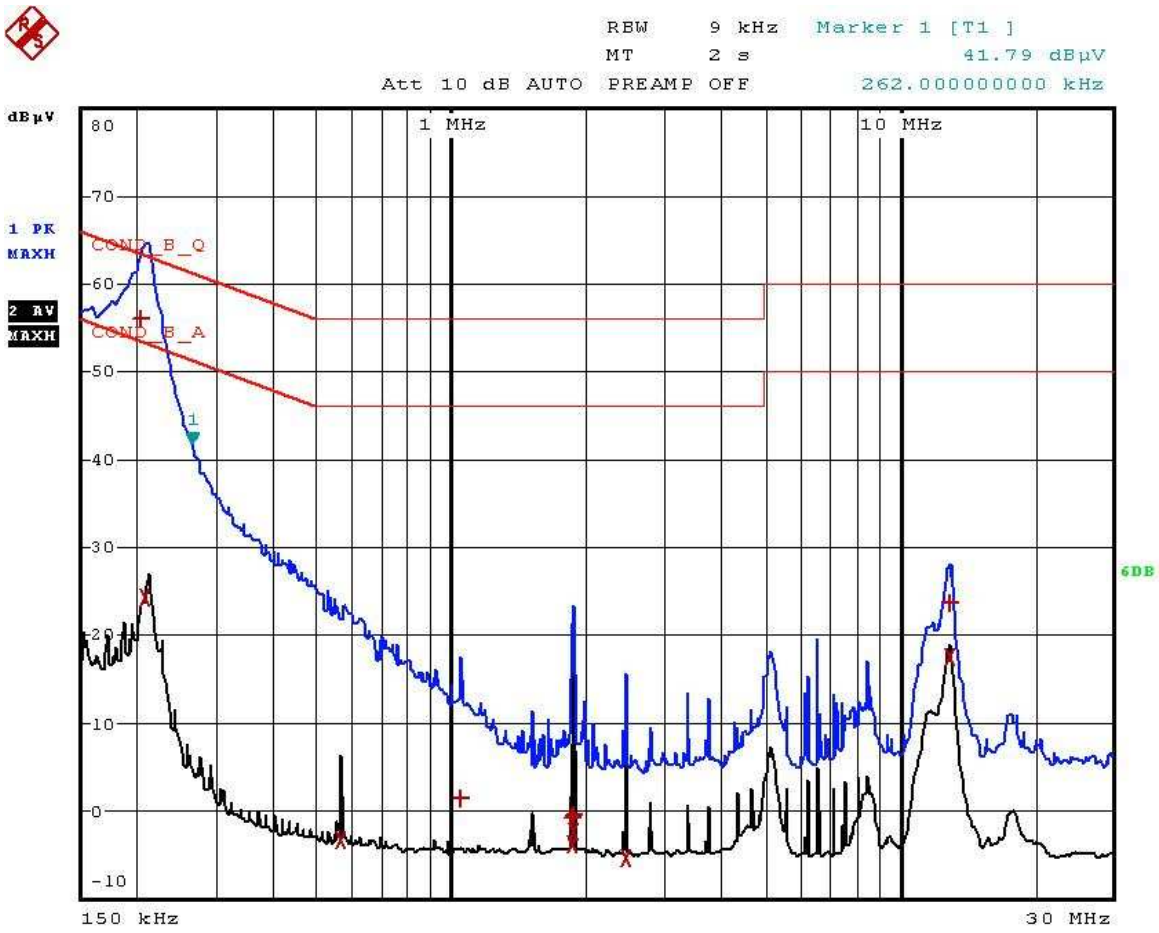


Table 6 Conducted Emissions Test Results – Live Line – Standby Mode

Standard: FCC Part 15

Test: Conducted Emissions

Port: AC Power

Units of measurement:
Frequency: MHz Amplitude: dBµV

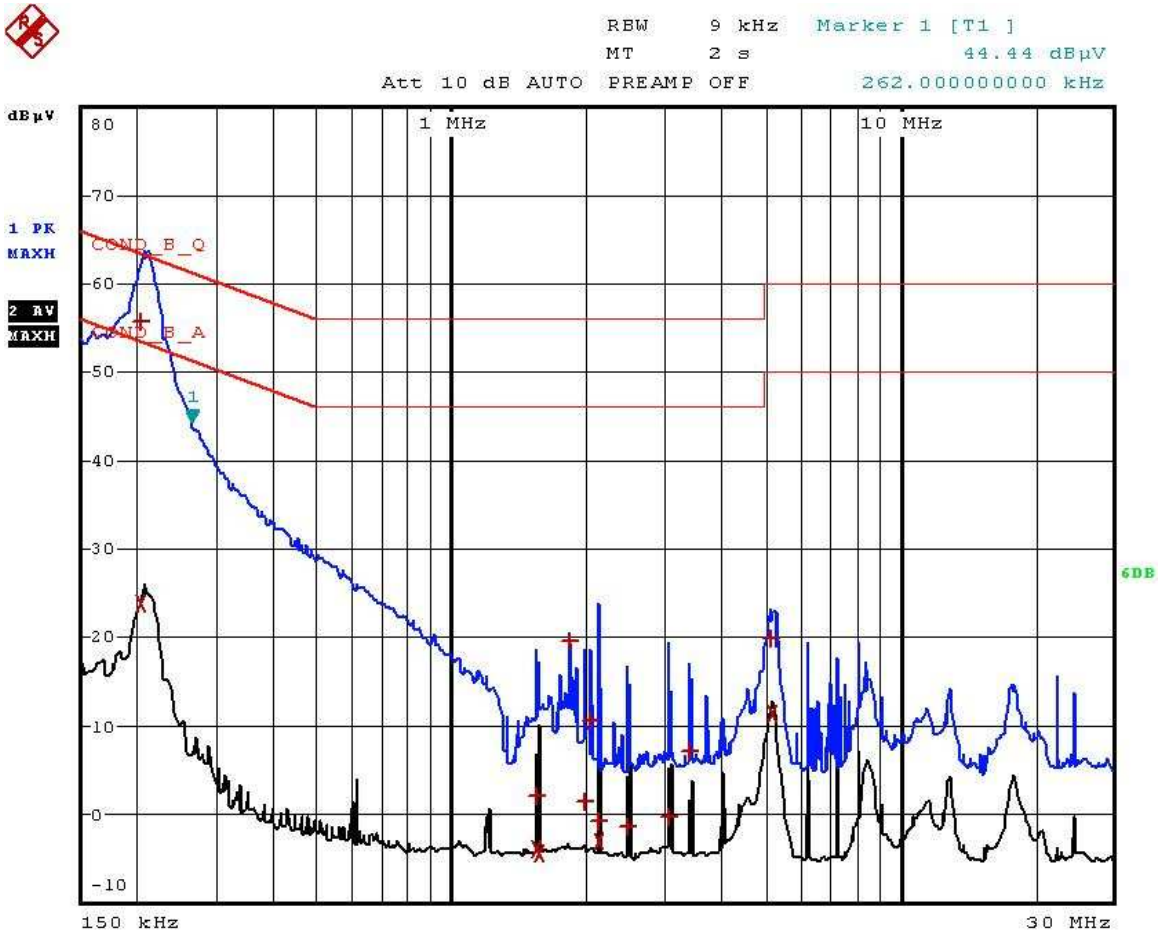
Bandwidth: 9kHz

EDIT PEAK LIST (Final Measurement Results)

Trace1: COND_B_Q
Trace2: COND_B_A
Trace3: ---

TRACE		FREQUENCY	LEVEL dBµV	DELTA LIMIT dB
1	Quasi Peak	206 kHz	55.77	-7.58
2	Average	206 kHz	23.86	-29.49
1	Quasi Peak	1.562 MHz	2.12	-53.87
2	Average	1.562 MHz	-3.87	-49.88
2	Average	1.57 MHz	-4.52	-50.52
1	Quasi Peak	1.838 MHz	19.75	-36.24
1	Quasi Peak	1.998 MHz	1.43	-54.56
1	Quasi Peak	2.054 MHz	10.61	-45.38
1	Quasi Peak	2.142 MHz	-0.66	-56.66
2	Average	2.146 MHz	-3.09	-49.09
1	Quasi Peak	2.49 MHz	-1.28	-57.28
1	Quasi Peak	3.082 MHz	-0.14	-56.14
1	Quasi Peak	3.43 MHz	7.03	-48.96
1	Quasi Peak	5.186 MHz	19.90	-40.09
2	Average	5.206 MHz	11.39	-38.61

Graph 4 Conducted Emissions Test Results – Live Line – Standby Mode



Sample Calculation 5MHz = set rdg dBuv + Lisn vcr + cable insertion loss

9.2 +10.2 + 0.5 = 19.9dBuV

6. RADIATED EMISSIONS – CFR 47 PART15:249A

6.1. Transmitter Output Power (Conducted)

There was no external antenna connector. This test was not carried out.

6.2. Radiated Peak Powers: CFR47 Part 15:249a

The testing was performed in accordance with ANSI C63.4:2009, American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9kHz to 40GHz.

Testing was conducted in a semi-lined anechoic chamber which meets the NSA requirements of CISPR 16 and CISPR 22. An emissions signature was obtained with the measuring antenna placed 3m from the EUT using a bi-log antenna and N type cables. All transducer factors were incorporated into the final result.

The radiated peak power test was carried out with the transmitter in continuous transmit mode for both horizontal and vertical polarisations using quasi peak detectors and peak detectors. The test results were optimised by rotating the EUT through 360 degrees and traversing the measuring antenna from 1 to 4m.
The following tables 7 - 8 and graphs 5 – 6 show the results.

Table 7 Radiated Emissions Test Results – TX Mode - 30-1000MHz - Vertical

Standard: FCC Part 15

Test: Radiated Emissions

Port: Enclosure

Units of measurement:
Frequency: MHz Amplitude: dBµV/m

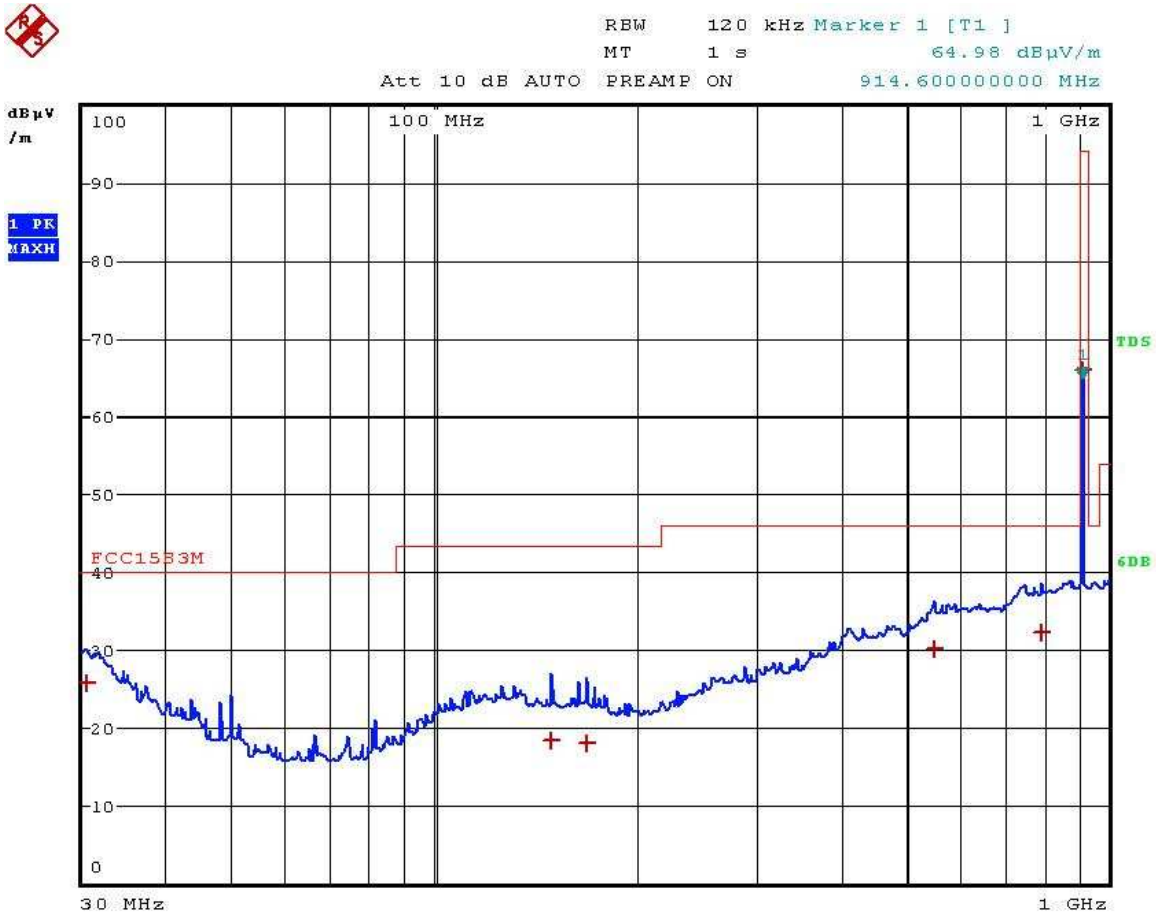
Bandwidth: 120kHz

EDIT PEAK LIST (Final Measurement Results)

Trace1: FCC15B3M
Trace2: ---
Trace3: ---

TRACE	FREQUENCY	LEVEL dBµV/m	DELTA LIMIT dB
1 Quasi Peak	30.56 MHz	25.97	-14.02
1 Quasi Peak	149.68 MHz	18.44	-25.07
1 Quasi Peak	168.52 MHz	18.28	-25.23
1 Quasi Peak	549.6 MHz	30.37	-15.64
1 Quasi Peak	790.76 MHz	32.32	-13.70
1 Quasi Peak	914.6 MHz	65.98	-28.01

Graph 5 Radiated Emissions Test Results – TX Mode - 30-1000MHz - Vertical



Sample calculation at 914MHz = Set rdg dBuv + ACF + cable(s) loss

41.0 +19.8 + 5.6 = 66dBuV

Table 8 Radiated Emissions Test Results – TX Mode - 30-1000MHz - Horizontal

Standard: FCC Part 15

Test: Radiated Emissions

Port: Enclosure

Units of measurement:
Frequency: MHz Amplitude: dBµV/m

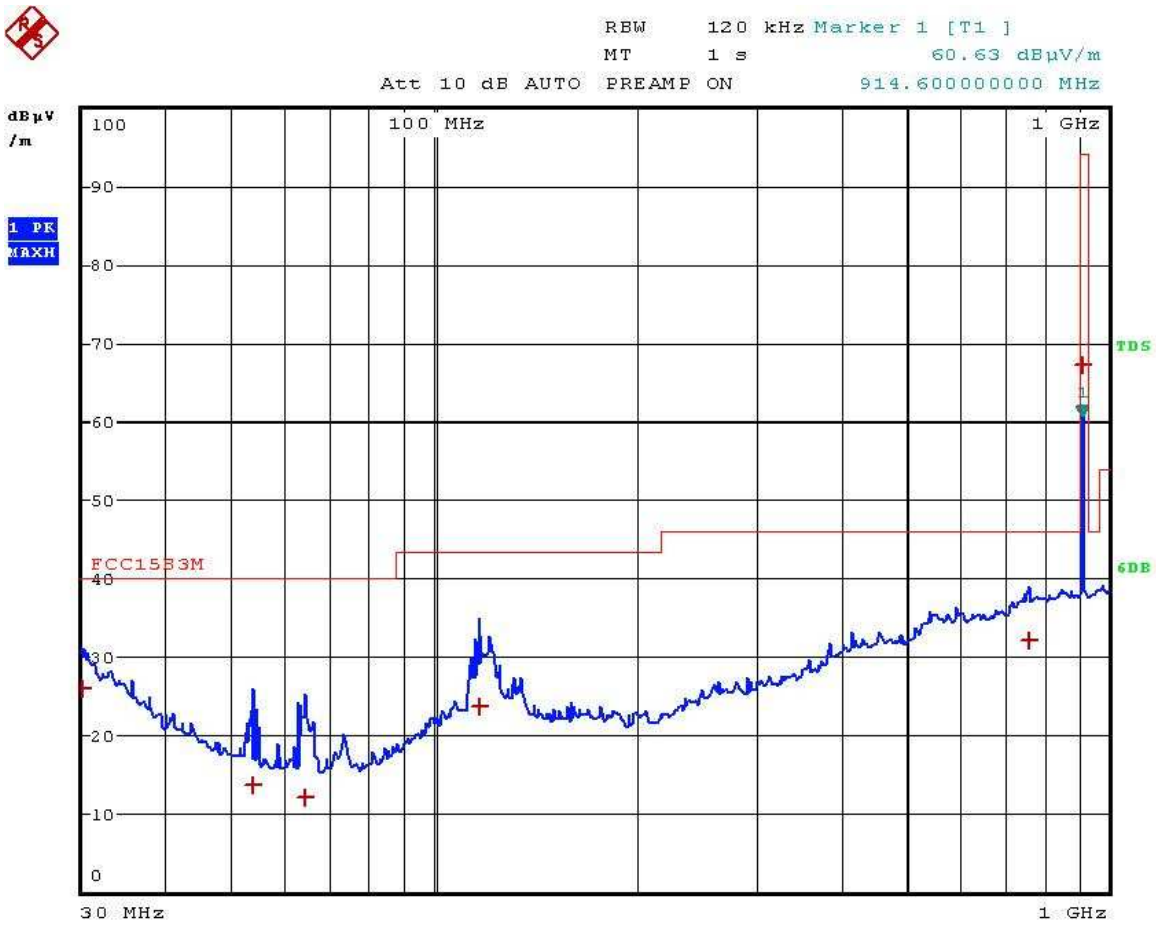
Bandwidth: 120kHz

EDIT PEAK LIST (Final Measurement Results)

Trace1: FCC15B3M
Trace2: ---
Trace3: ---

TRACE	FREQUENCY	LEVEL dBµV/m	DELTA LIMIT dB
1 Quasi Peak	30.12 MHz	26.20	-13.79
1 Quasi Peak	54 MHz	13.67	-26.32
1 Quasi Peak	64.56 MHz	12.20	-27.79
1 Quasi Peak	116.52 MHz	23.75	-19.76
1 Quasi Peak	760.16 MHz	32.25	-13.76
1 Quasi Peak	914.6 MHz	67.31	-26.68

Graph 6 Radiated Emissions Test Results – TX Mode - 30-1000MHz – Horizontal



6.3. Radiated Emissions Test Method: CFR47 Part 15:249a & d

The testing was performed in accordance with ANSI C63.4:2009, American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9kHz to 40GHz.

Testing was carried out in a semi-anechoic chamber which meets the NSA requirements of CISPR 16 and CISPR 22 for the frequency range 30MHz to 1000MHz. An emissions signature was obtained with the measuring antenna placed 3m from the EUT. Final measurements were carried out at frequencies falling within 10dB of the limit line.

6.4. Radiated Emissions Test Results

The results are given in Tables 9 to 14 and Graphs 7 to 46.

6.5. Radiated Emissions Conclusions

The EUT complied with the limits of FCC part 15, Clause 209 Class B.

6.6. Measurement Uncertainty

30MHz to 1000MHz ±5.7dB

The measurement uncertainties have been determined at a confidence level of not less than 95%.

Table 9 Radiated Spurious Emissions Test Results – TX Mode - 30-1000MHz Vertical Polarisation

Standard: FCC Part 15

Test: Radiated Emissions

Port: Enclosure

Units of measurement:
Frequency: MHz Amplitude: dBµV/m

Bandwidth: 120kHz

EDIT PEAK LIST (Final Measurement Results)

Trace1: FCC15B3M
Trace2: ---
Trace3: ---

TRACE	FREQUENCY	LEVEL dBµV/m	DELTA LIMIT dB
1 Quasi Peak	30.56 MHz	25.97	-14.02
1 Quasi Peak	149.68 MHz	18.44	-25.07
1 Quasi Peak	168.52 MHz	18.28	-25.23
1 Quasi Peak	549.6 MHz	30.37	-15.64
1 Quasi Peak	790.76 MHz	32.32	-13.70
1 Quasi Peak	914.6 MHz	65.98	-28.01

Graph 7 Radiated Emissions Test Results – TX Mode - 30-1000MHz - Vertical

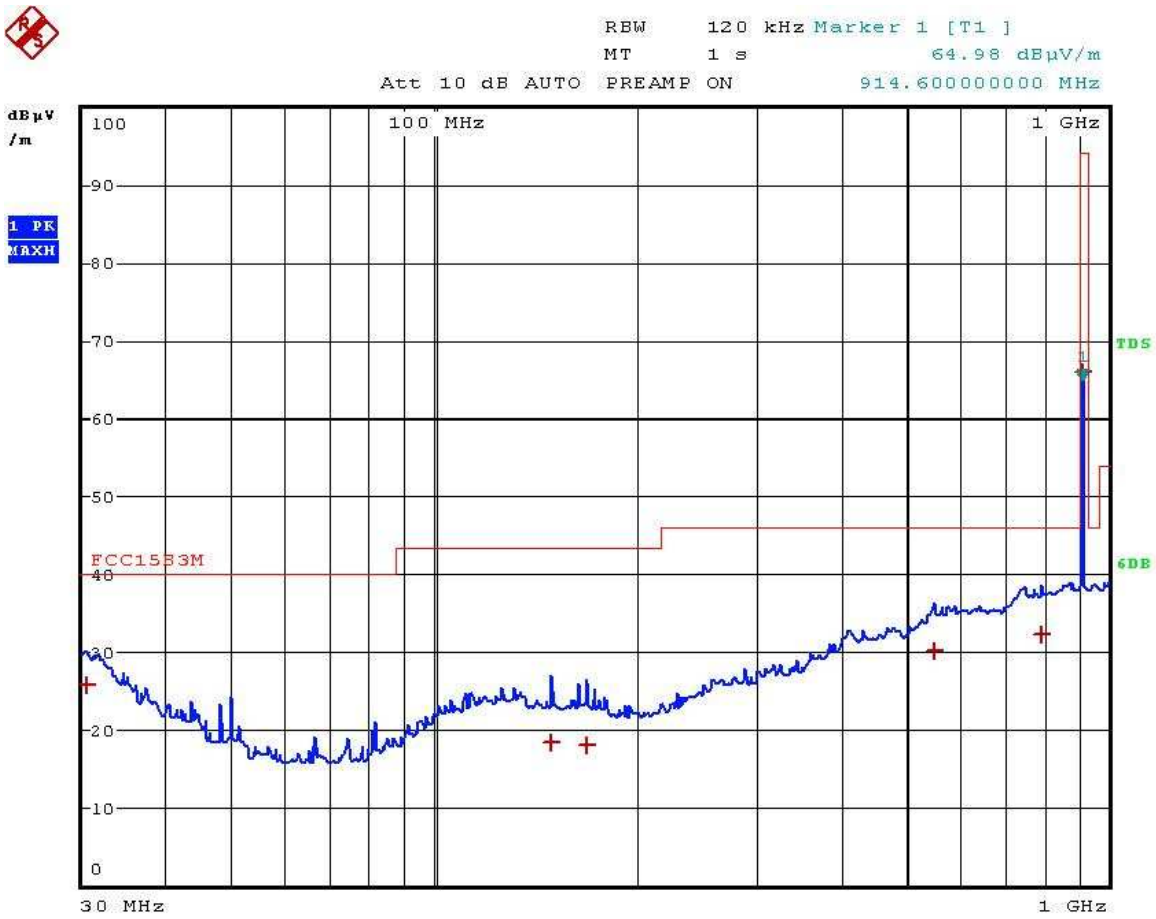


Table 10 Radiated Spurious Emissions Test Results – TX Mode - 30-1000MHz Horizontal Polarisation

Standard: FCC Part 15

Test: Radiated Emissions

Port: Enclosure

Units of measurement:
Frequency: MHz Amplitude: dBµV/m

Bandwidth: 120kHz

EDIT PEAK LIST (Final Measurement Results)

Trace1: FCC15B3M
Trace2: ---
Trace3: ---

TRACE	FREQUENCY	LEVEL dBµV/m	DELTA LIMIT dB
1 Quasi Peak	30.12 MHz	26.20	-13.79
1 Quasi Peak	54 MHz	13.67	-26.32
1 Quasi Peak	64.56 MHz	12.20	-27.79
1 Quasi Peak	116.52 MHz	23.75	-19.76
1 Quasi Peak	760.16 MHz	32.25	-13.76
1 Quasi Peak	914.6 MHz	67.31	-26.68

Graph 8 Radiated Emissions Test Results – TX Mode - 30-1000MHz - Horizontal

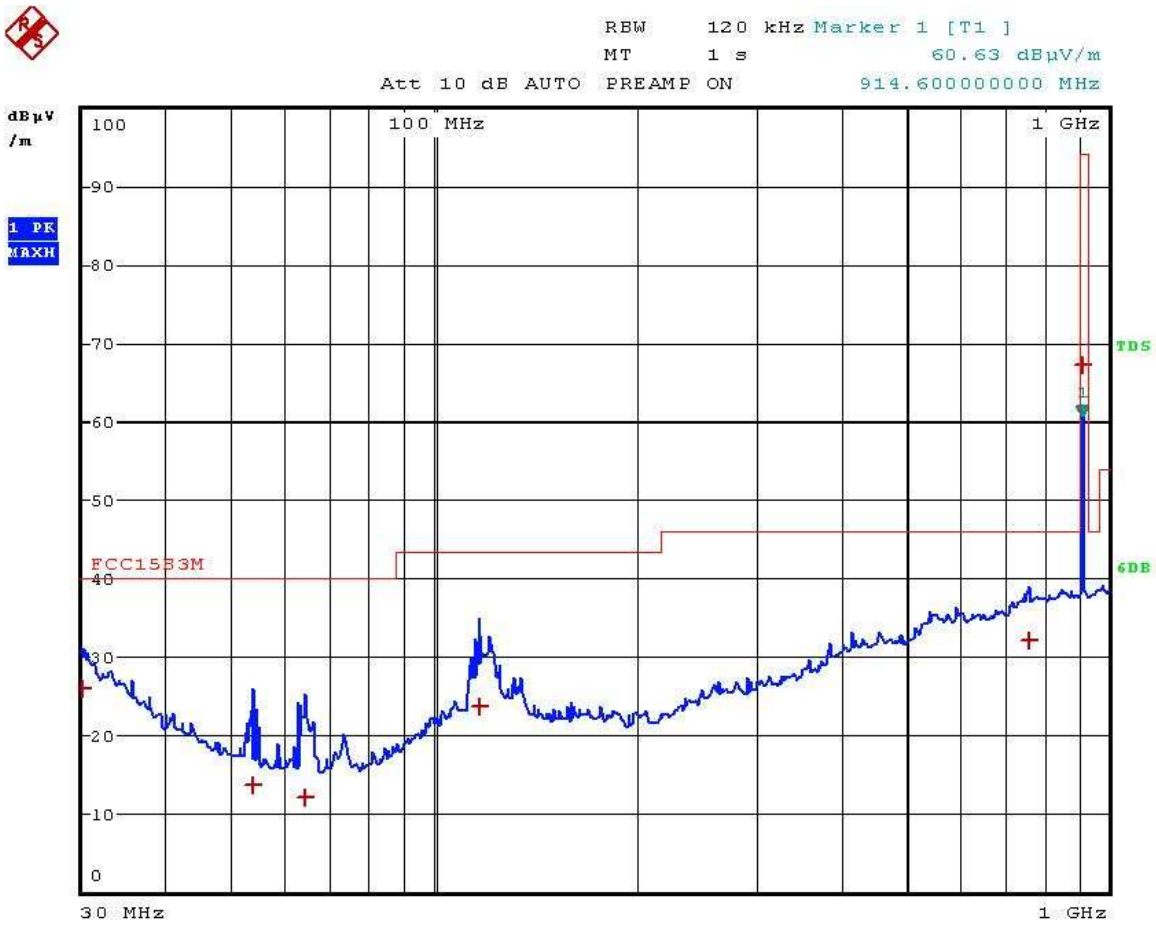


Table 11 Radiated Spurious Emissions Test Results – Standby Mode 30-1000MHz – Vertical Polarisation

Standard: FCC Part 15

Test: Radiated Emissions

Port: Enclosure

Units of measurement:
Frequency: MHz Amplitude: dBµV/m

Bandwidth: 120kHz

EDIT PEAK LIST (Final Measurement Results)

Trace1: FCC15B3M
Trace2: ---
Trace3: ---

TRACE	FREQUENCY	LEVEL dBµV/m	DELTA LIMIT dB
1 Quasi Peak	30.48 MHz	26.11	-13.89
1 Quasi Peak	38.44 MHz	31.55	-8.44
1 Quasi Peak	48.6 MHz	14.58	-25.41
1 Quasi Peak	52.2 MHz	15.28	-24.71
1 Quasi Peak	171 MHz	18.50	-25.01
1 Quasi Peak	873.84 MHz	33.42	-12.60

Graph 9 Radiated Emissions Test Results – Standby Mode - 30-1000MHz - Vertical

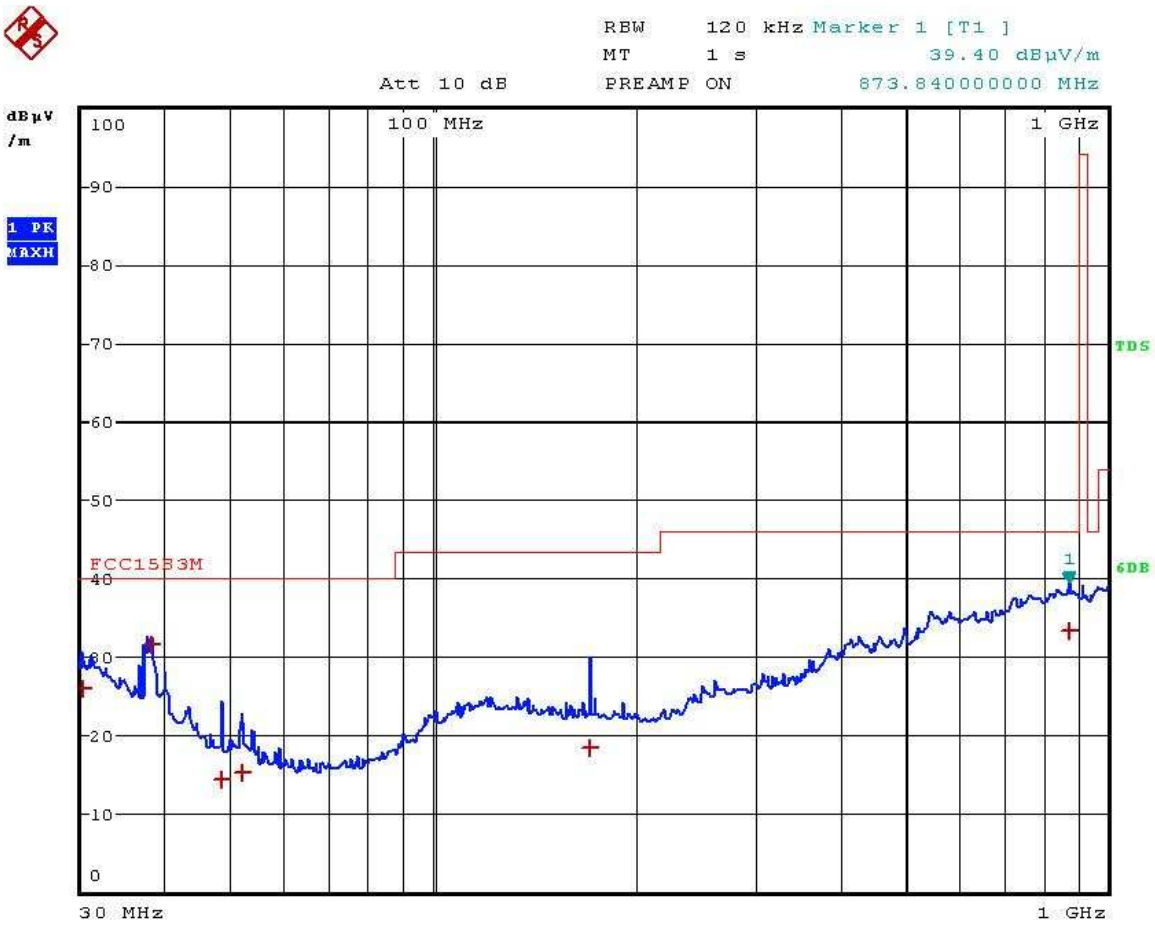


Table 12 Radiated Spurious Emissions Test Results – Standby Mode 30-1000MHz – Horizontal Polarisation

Standard: FCC Part 15

Test: Radiated Emissions

Port: Enclosure

Units of measurement:
Frequency: MHz Amplitude: dBµV/m

Bandwidth: 120kHz

EDIT PEAK LIST (Final Measurement Results)

Trace1: FCC15B3M
Trace2: ---
Trace3: ---

TRACE	FREQUENCY	LEVEL dBµV/m	DELTA LIMIT dB
1 Quasi Peak	30.28 MHz	26.30	-13.69
1 Quasi Peak	118.32 MHz	19.66	-23.86
1 Quasi Peak	287.56 MHz	21.50	-24.51
1 Quasi Peak	775.96 MHz	32.41	-13.61
1 Quasi Peak	971.52 MHz	33.56	-20.43
1 Quasi Peak	996.92 MHz	34.02	-19.97

Graph 10 Radiated Emissions Test Results – Standby Mode - 30-1000MHz - Horizontal

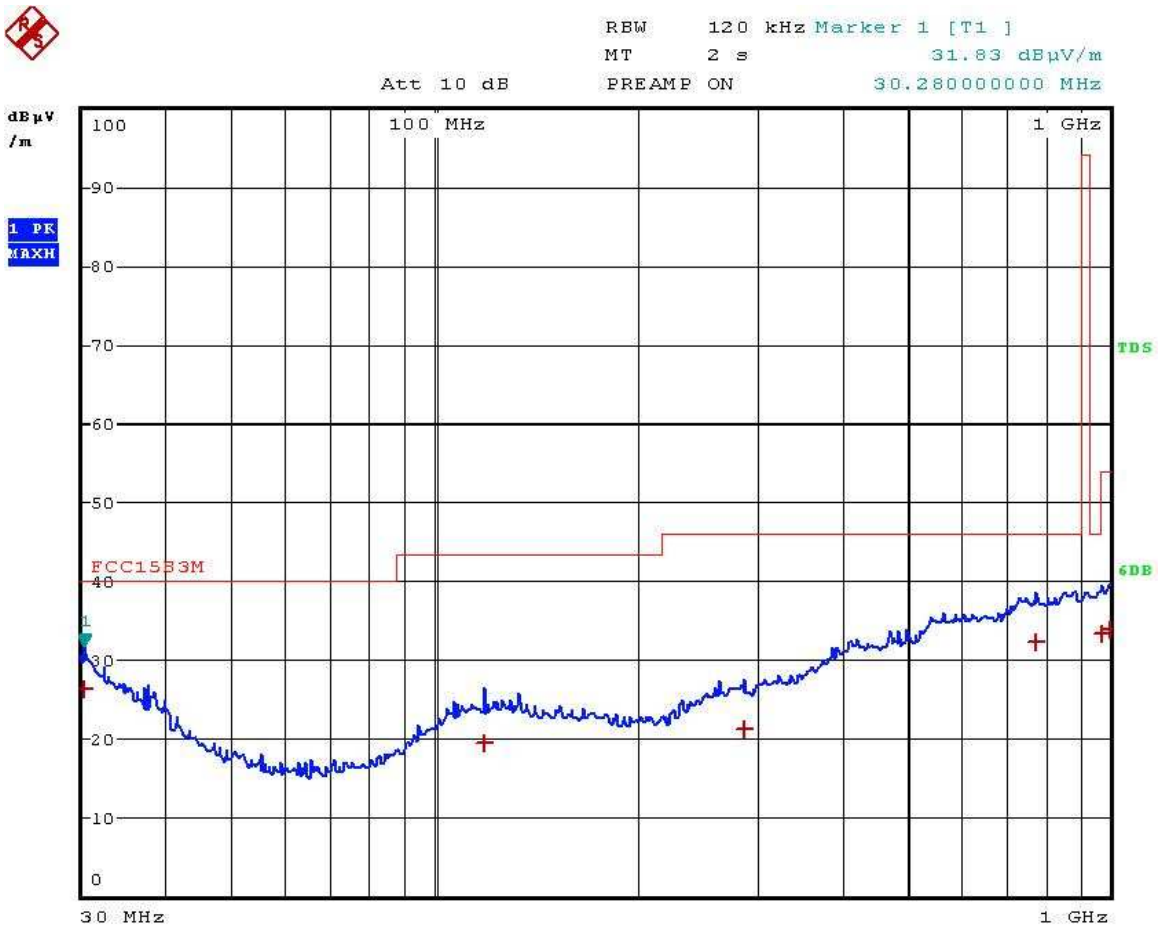


Table 13 Radiated Spurious Emissions Test Results – TX Mode - 1 - 10GHz Vertical & Horizontal Polarisations

Standard: FCC Part 15

Test: Radiated Emissions

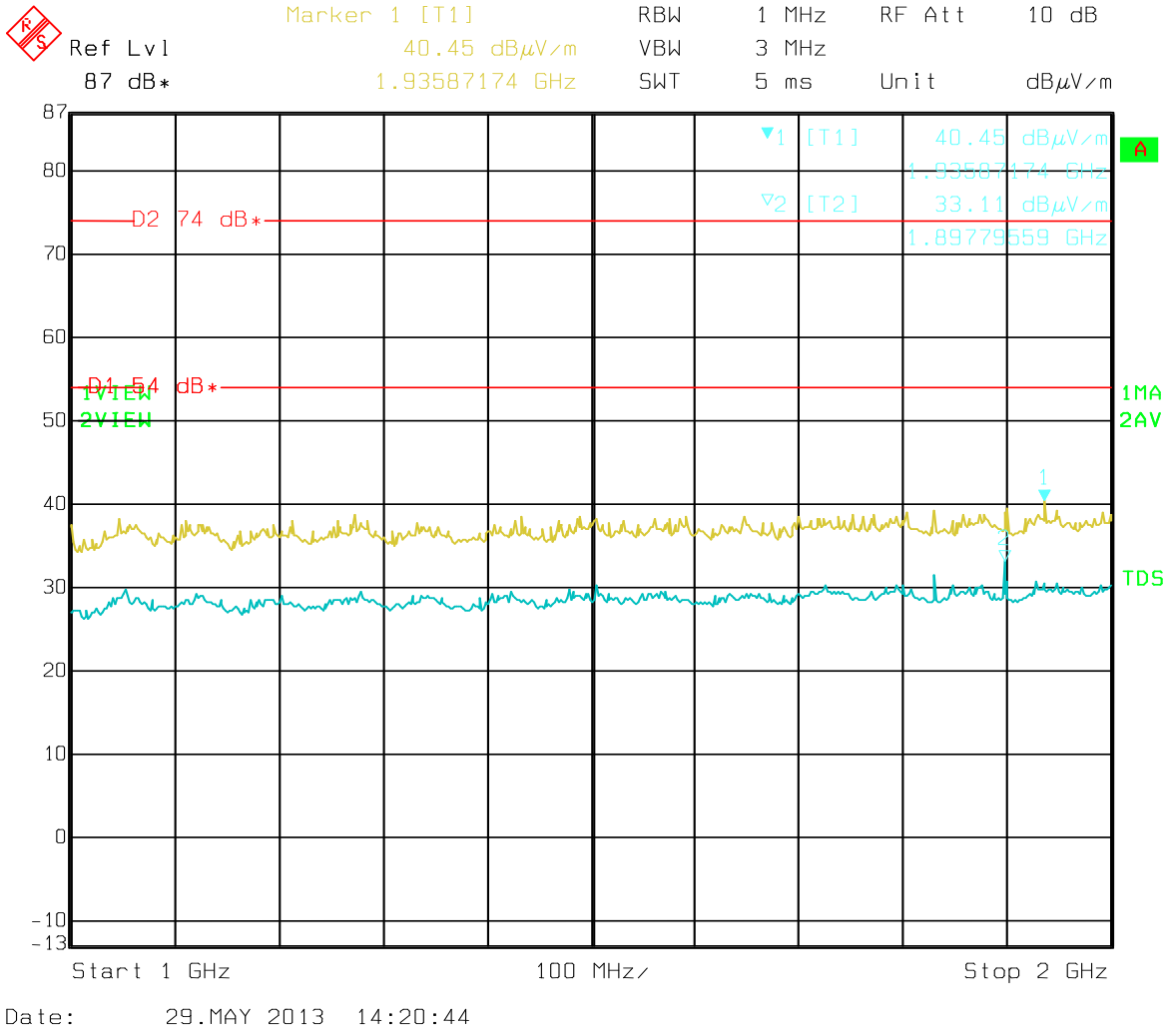
Port: Enclosure

Units of measurement:
Frequency: MHz Amplitude: dBµV/m

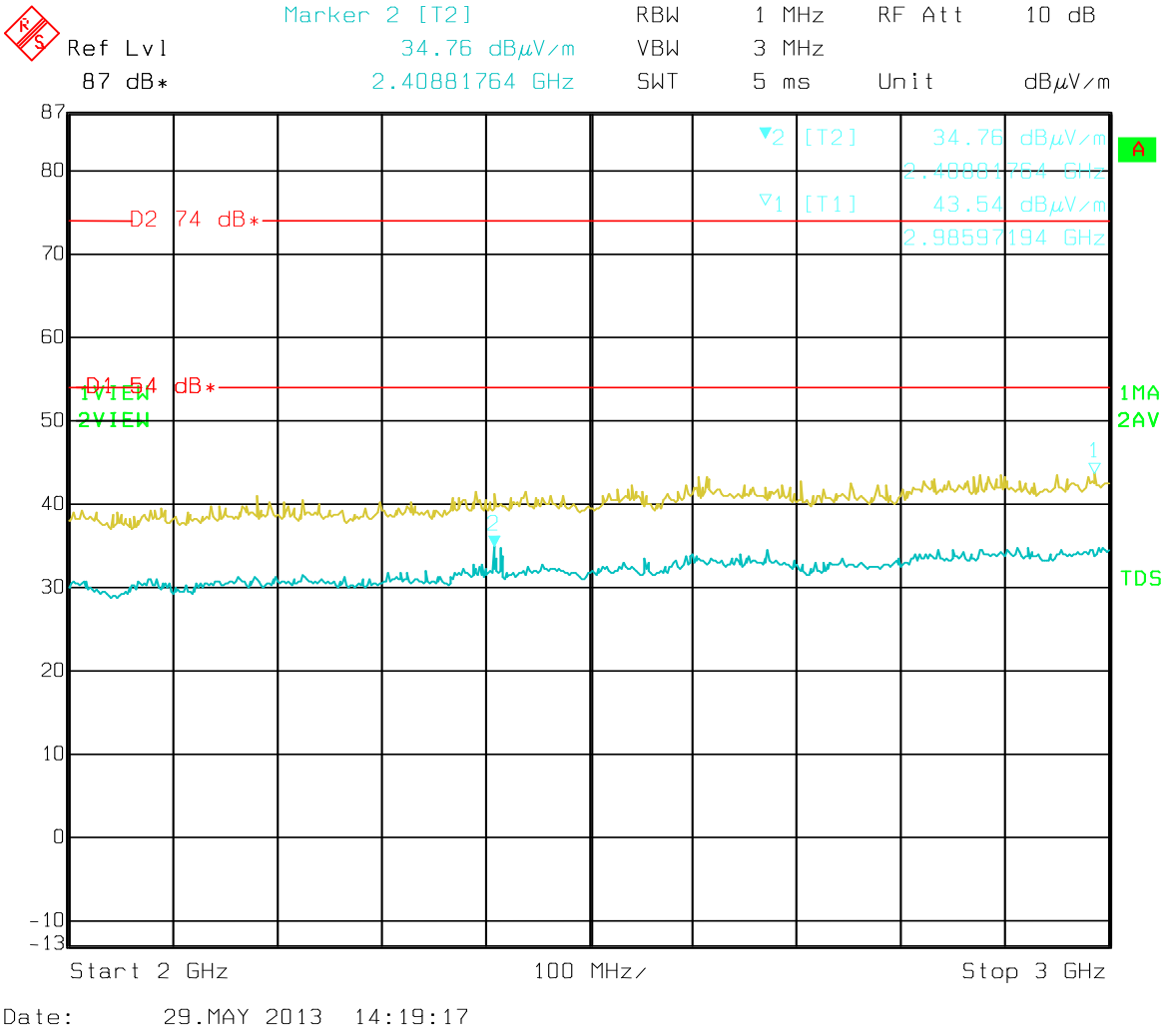
Bandwidth: 1MHz

No measurements were made as all emissions were >6dB from the limit line.

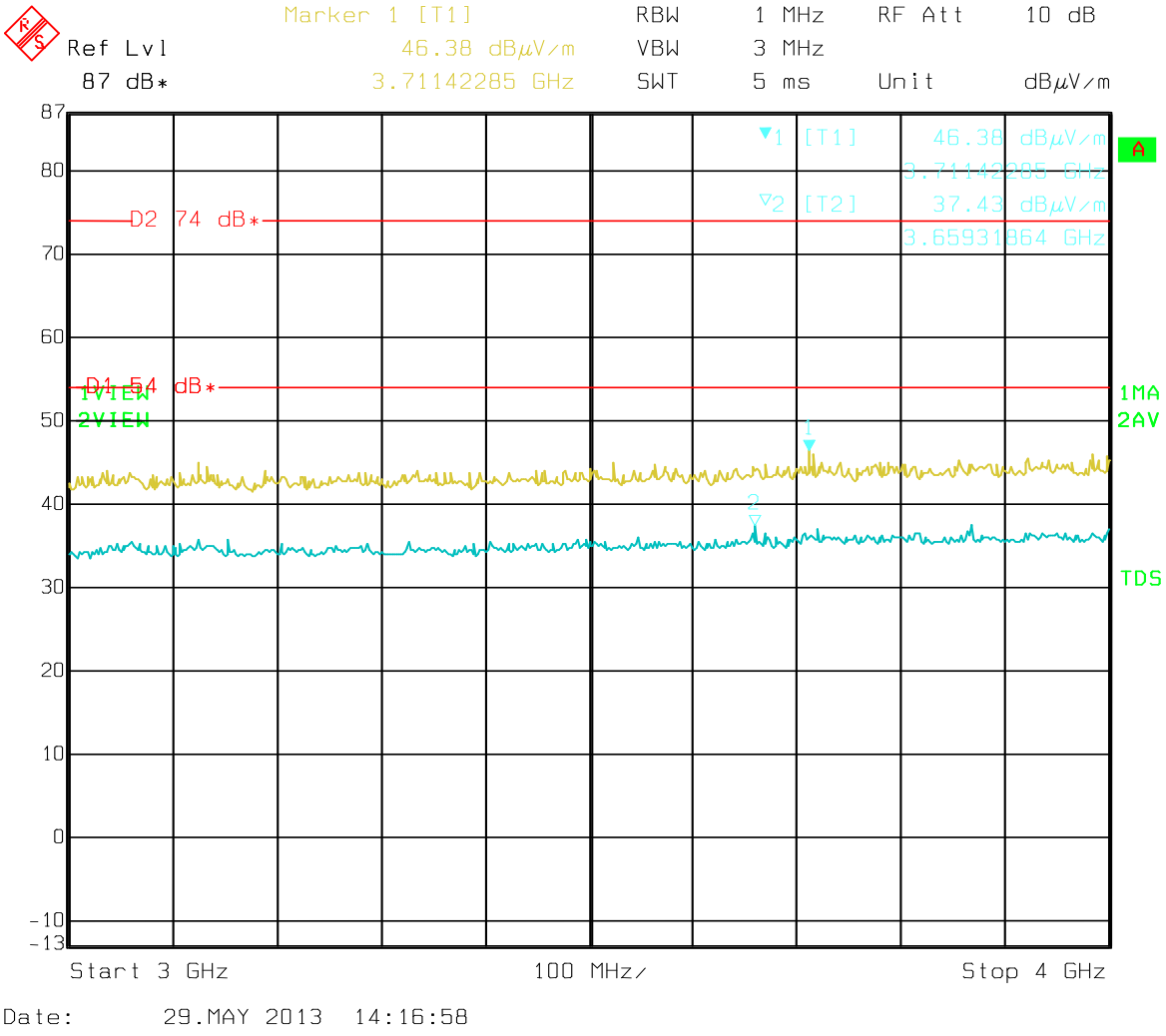
Graph 11 Radiated Emissions Test Results – TX Mode - 1 - 2GHz Vertical – Peak & Average



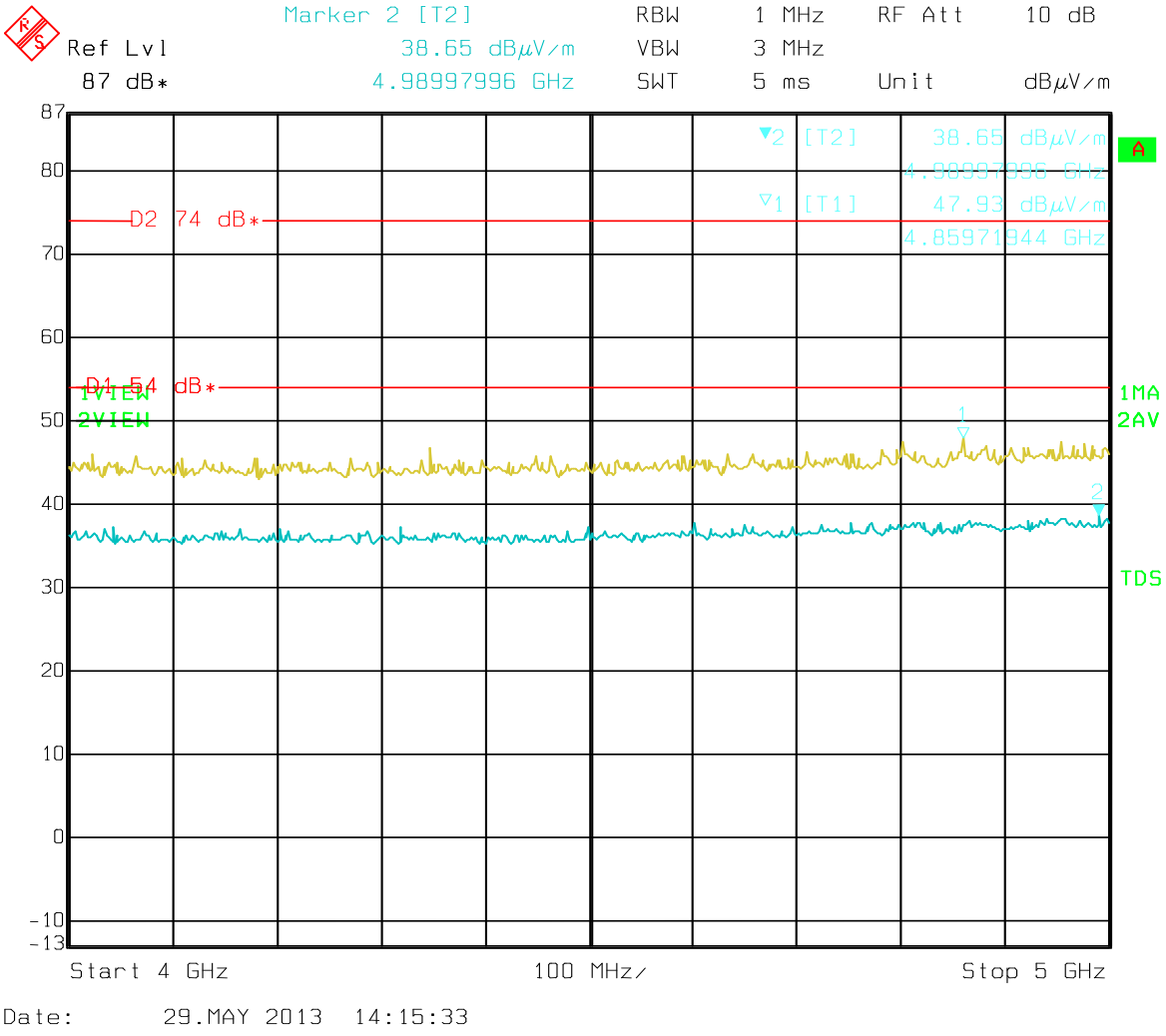
Graph 12 Radiated Emissions Test Results – TX Mode - 2 - 3GHz Vertical – Peak & Average



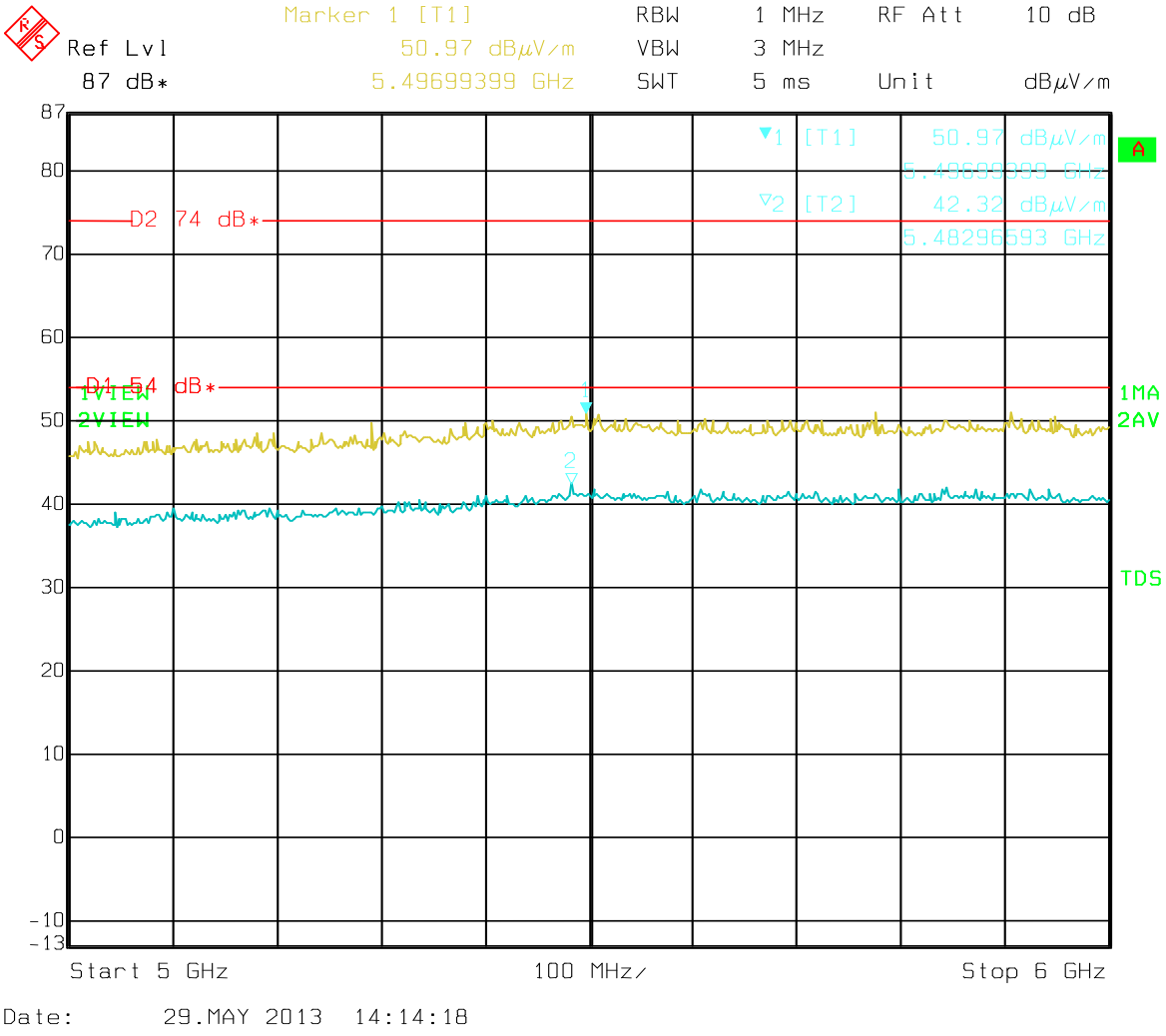
Graph 13 Radiated Emissions Test Results – TX Mode 3 - 4GHz Vertical – Peak & Average



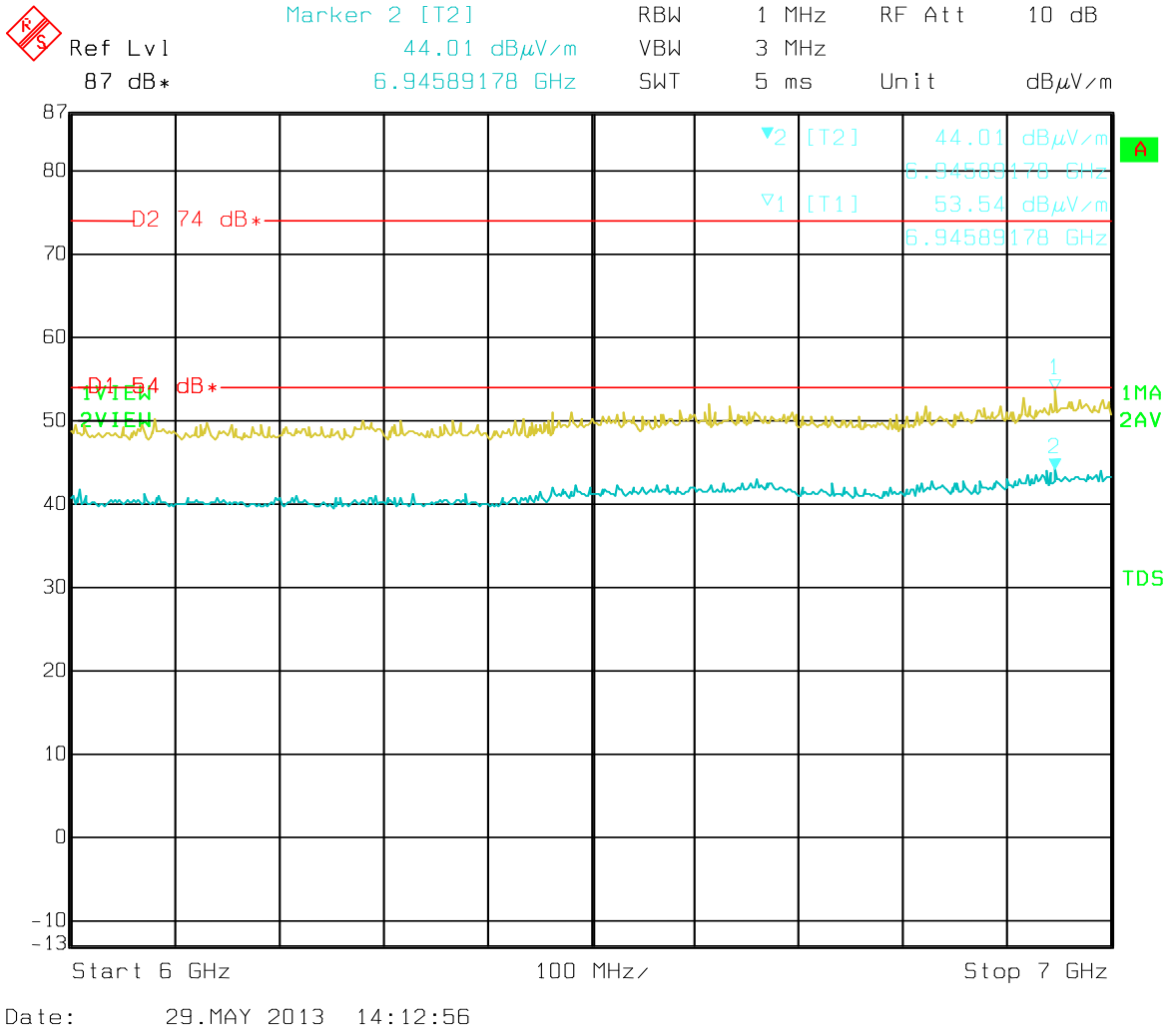
Graph 14 Radiated Emissions Test Results – TX Mode 4 - 5GHz Vertical – Peak & Average



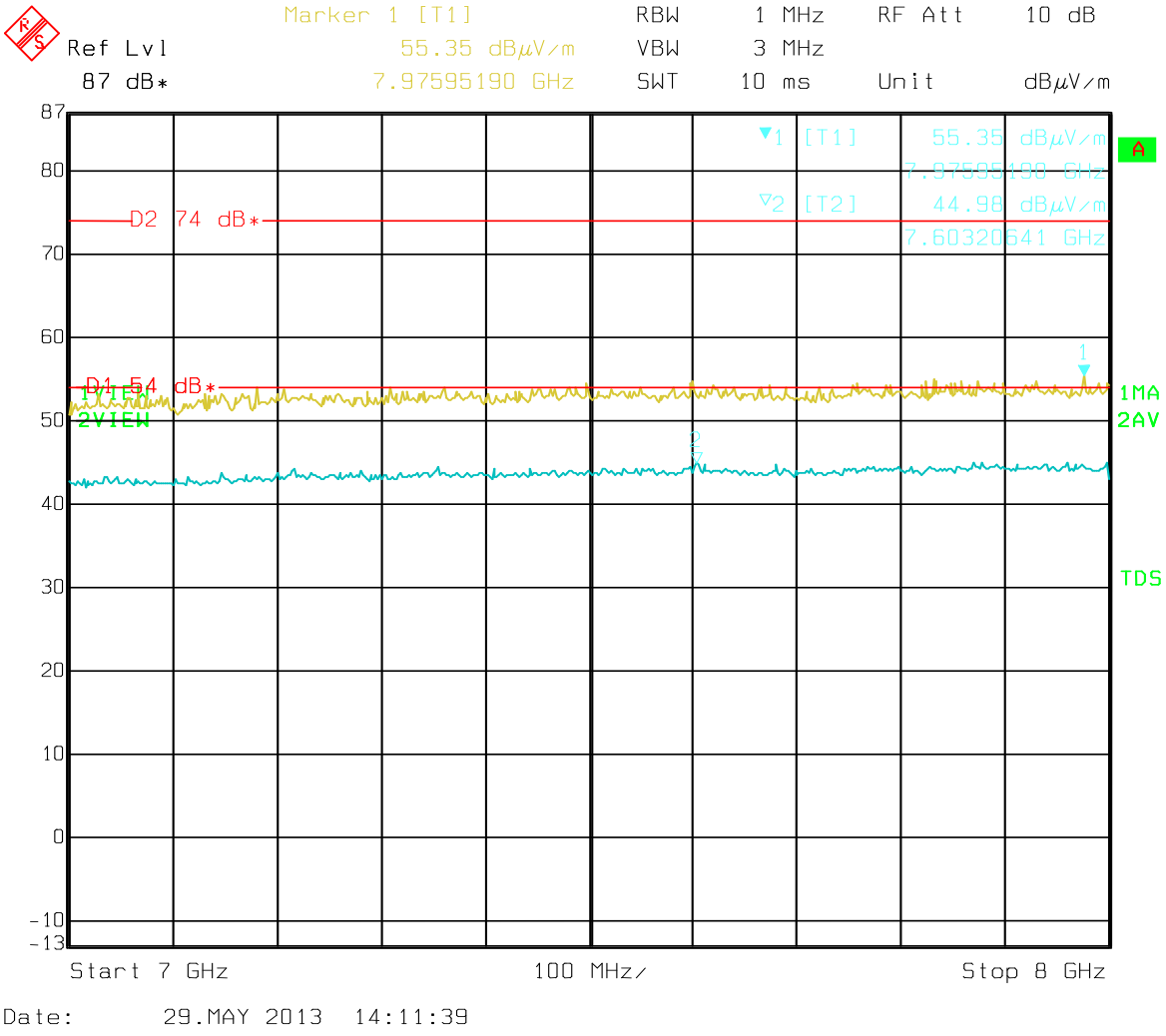
Graph 15 Radiated Emissions Test Results – TX Mode 5 - 6GHz Vertical – Peak & Average



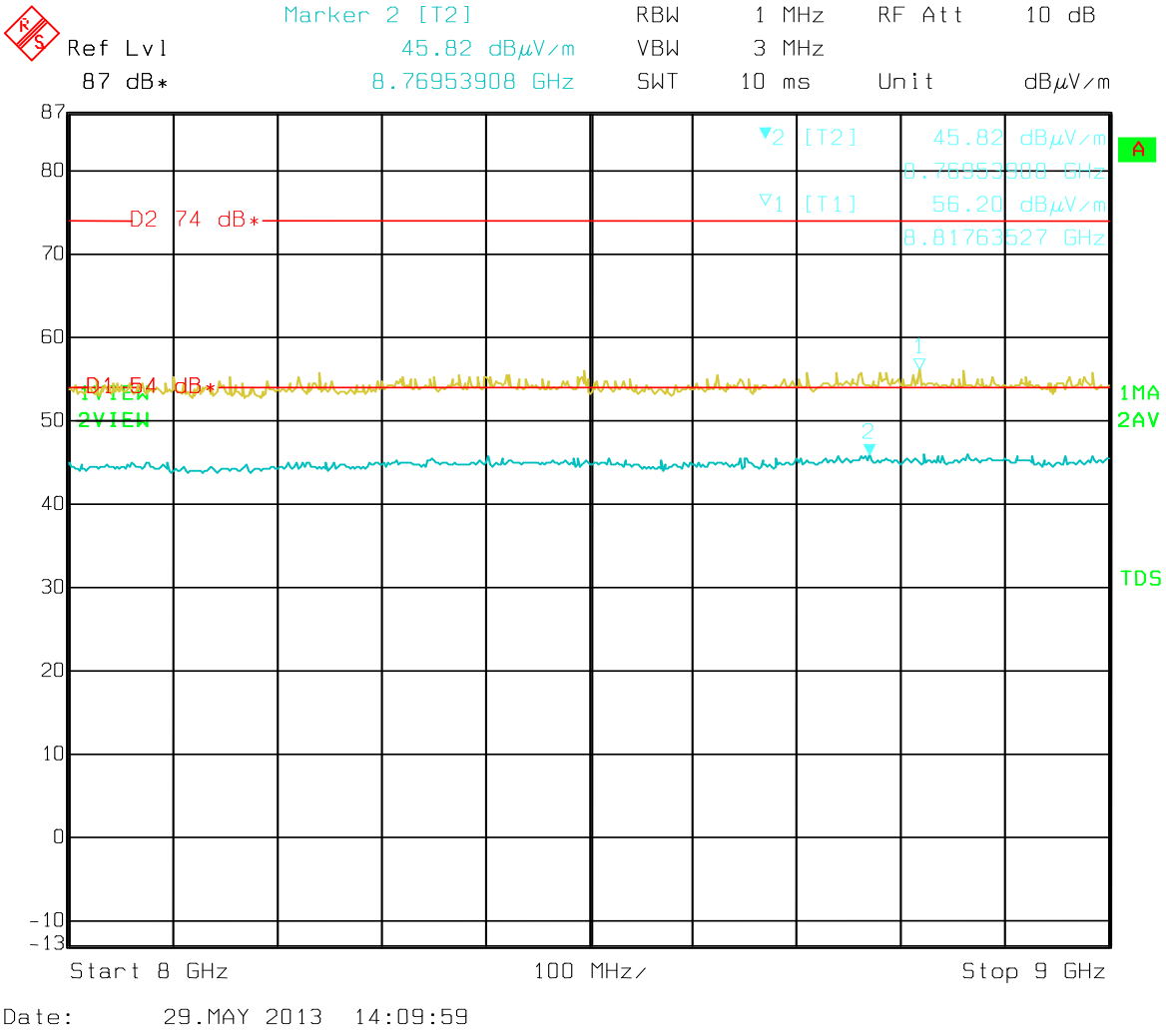
Graph 16 Radiated Emissions Test Results – TX Mode 6 - 7GHz Vertical – Peak & Average



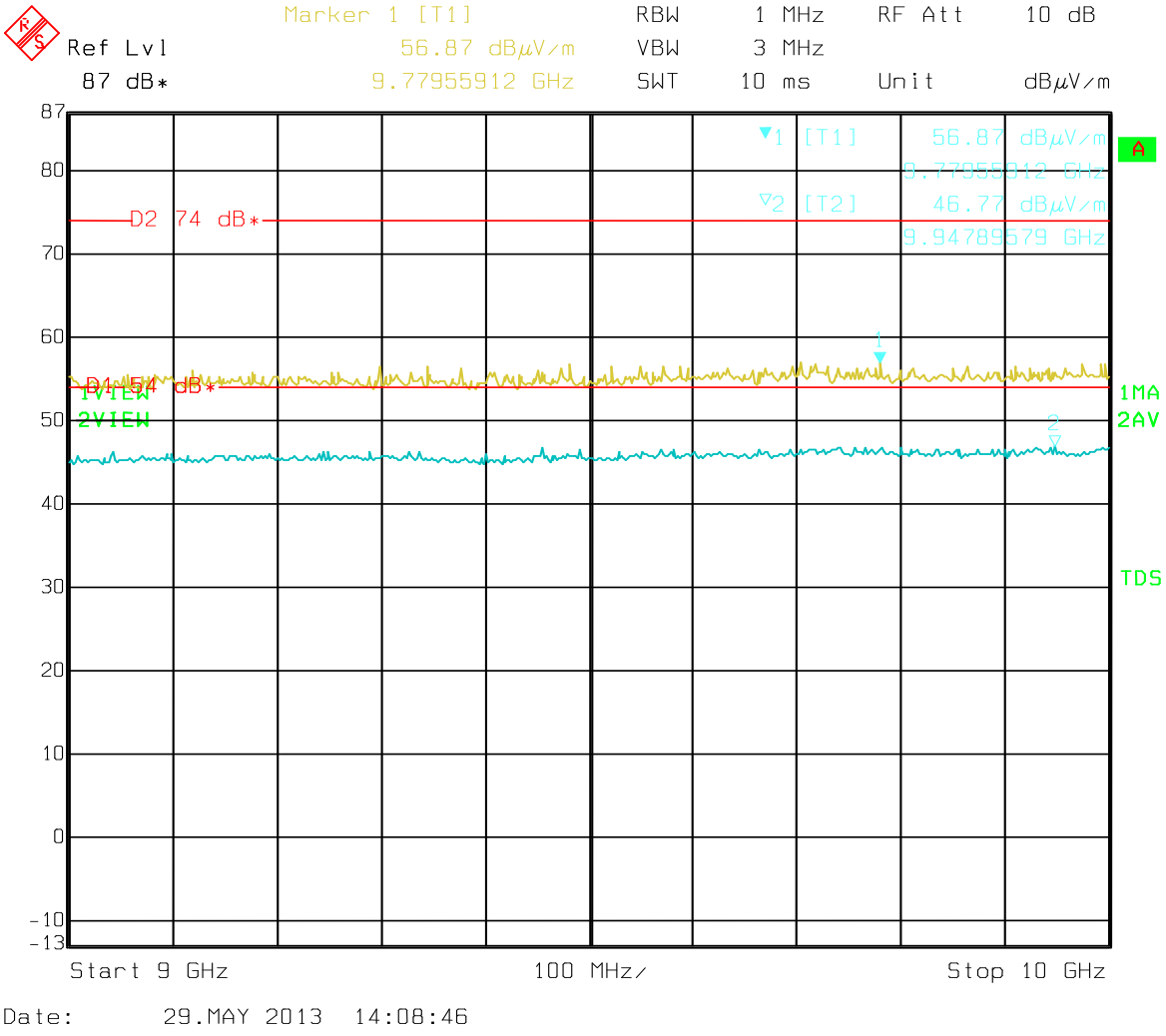
Graph 17 Radiated Emissions Test Results – TX Mode 7 - 8GHz Vertical – Peak & Average



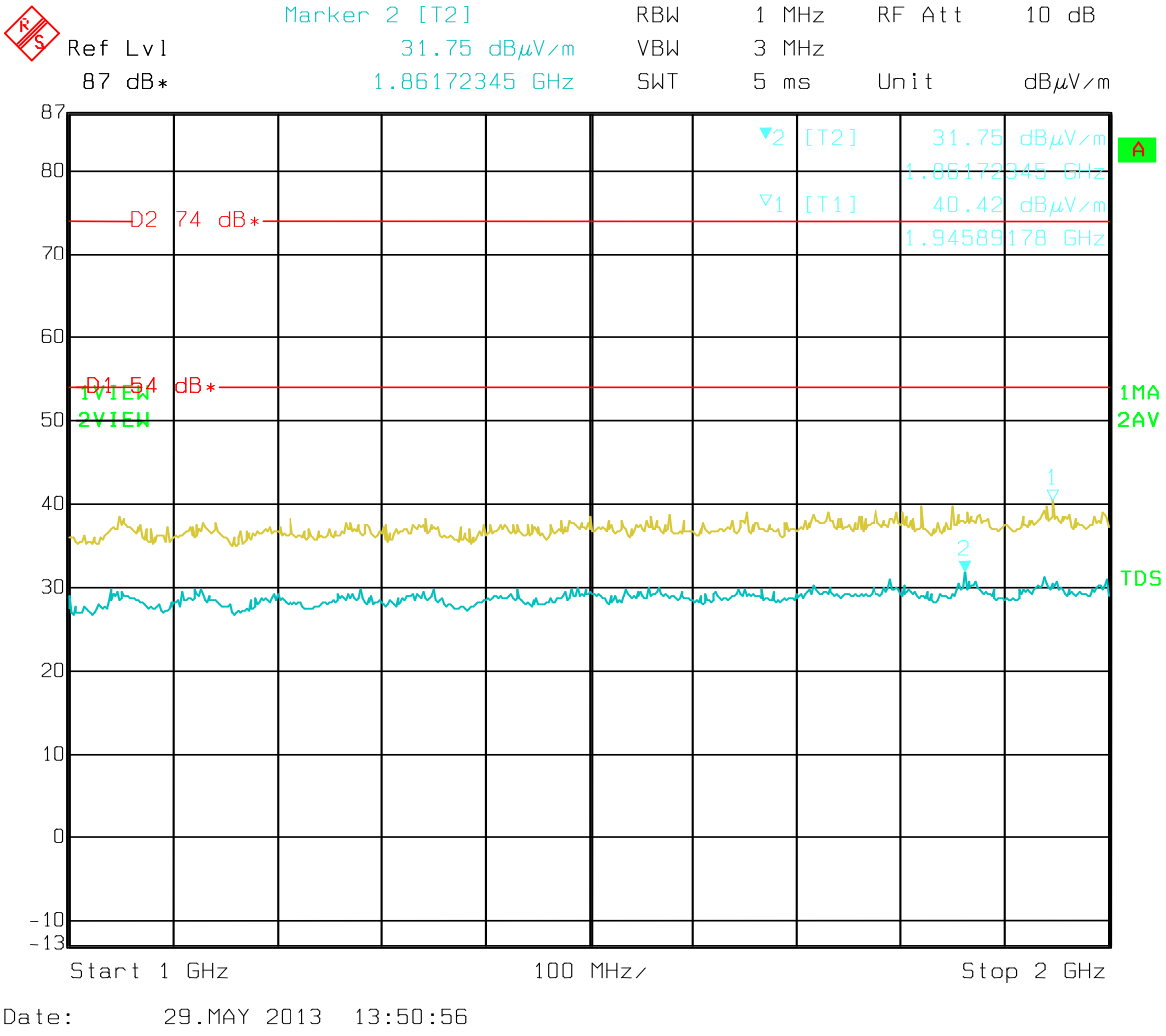
Graph 18 Radiated Emissions Test Results Tx Mode 8 - 9GHz Vertical – Peak & Average



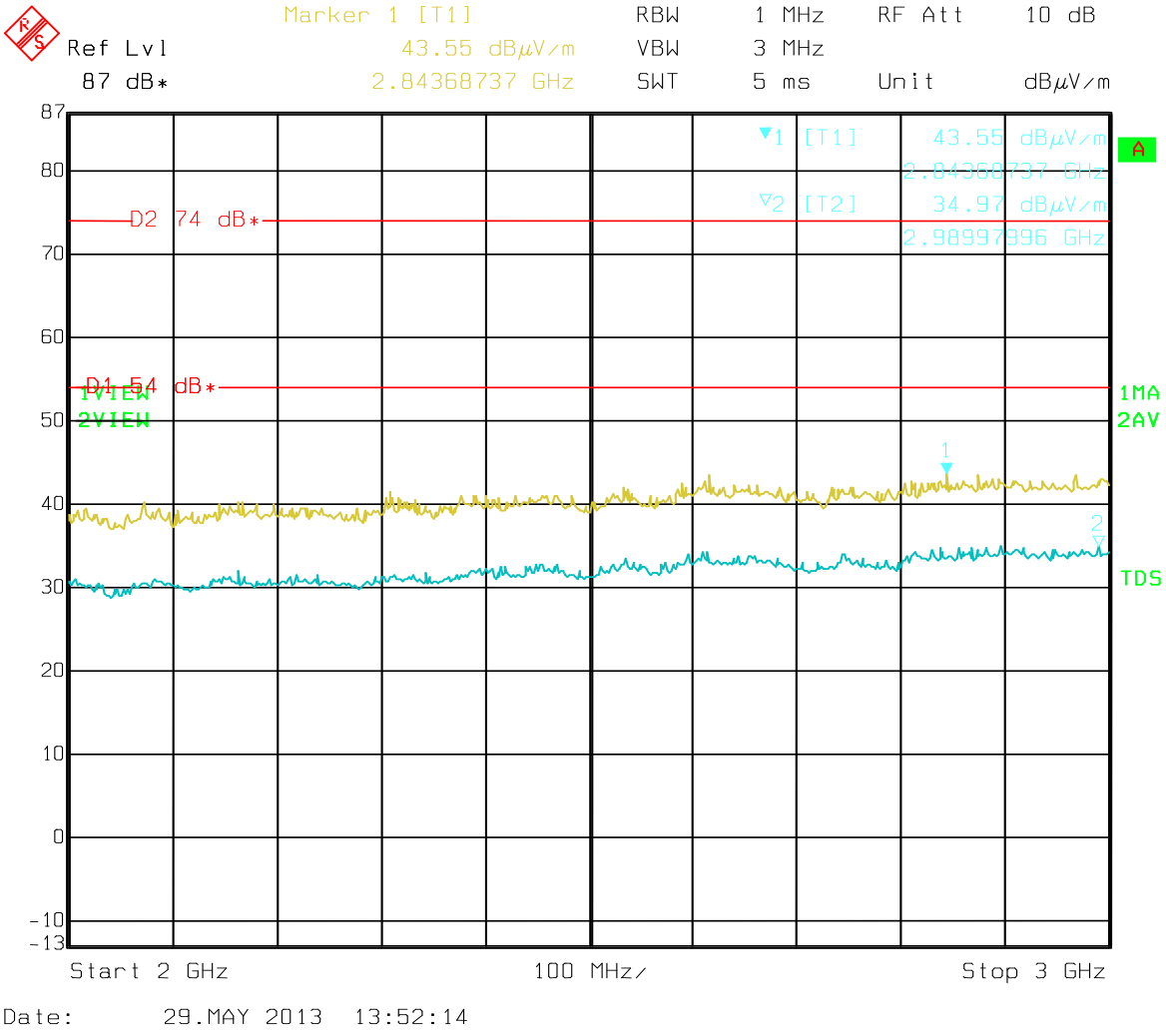
Graph 19 Radiated Emissions Test Results – TX Mode 9 - 10GHz Vertical – Peak & Average



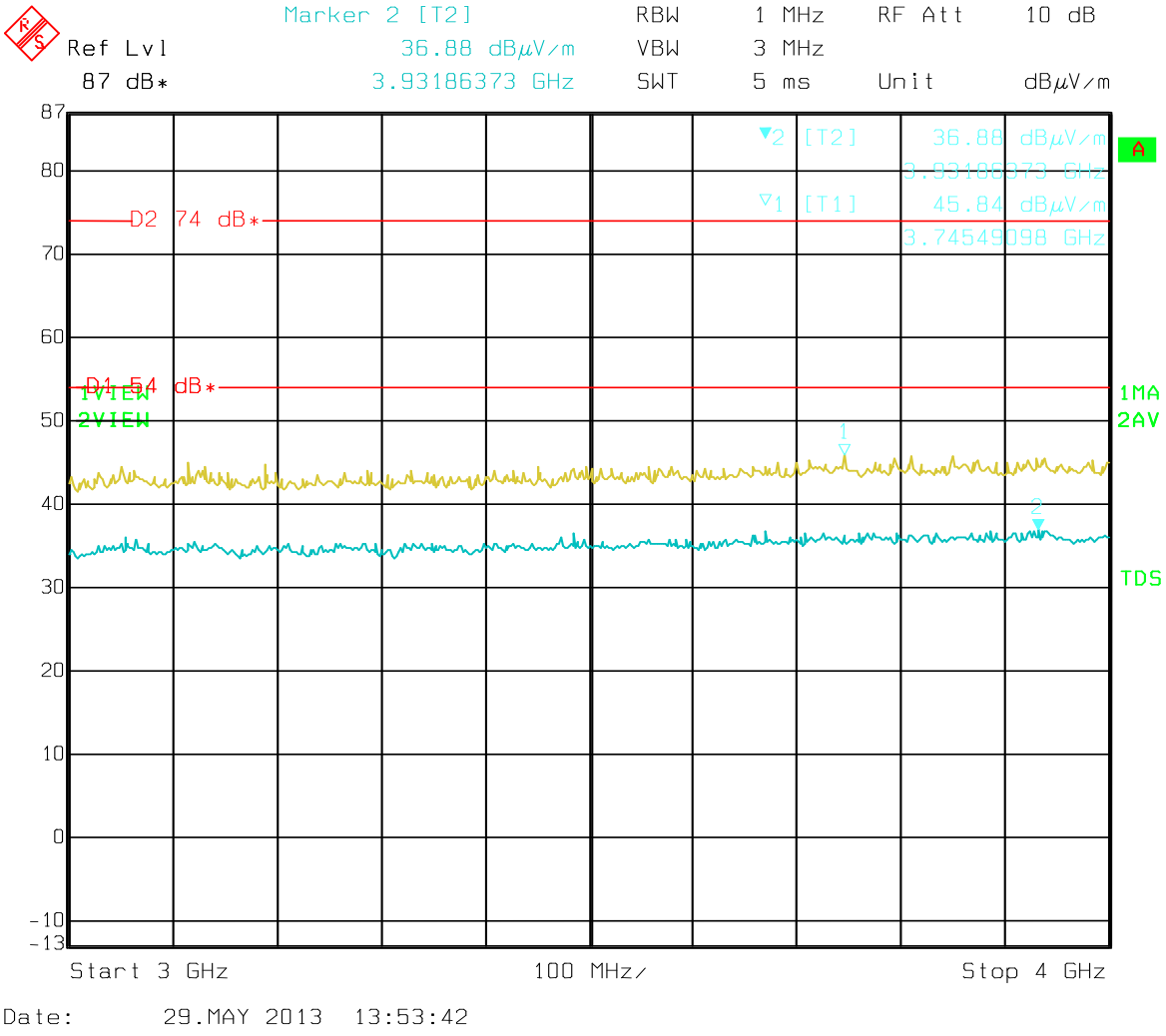
Graph 20 Radiated Emissions Test Results – TX Mode 1 - 2GHz Horizontal – Peak & Average



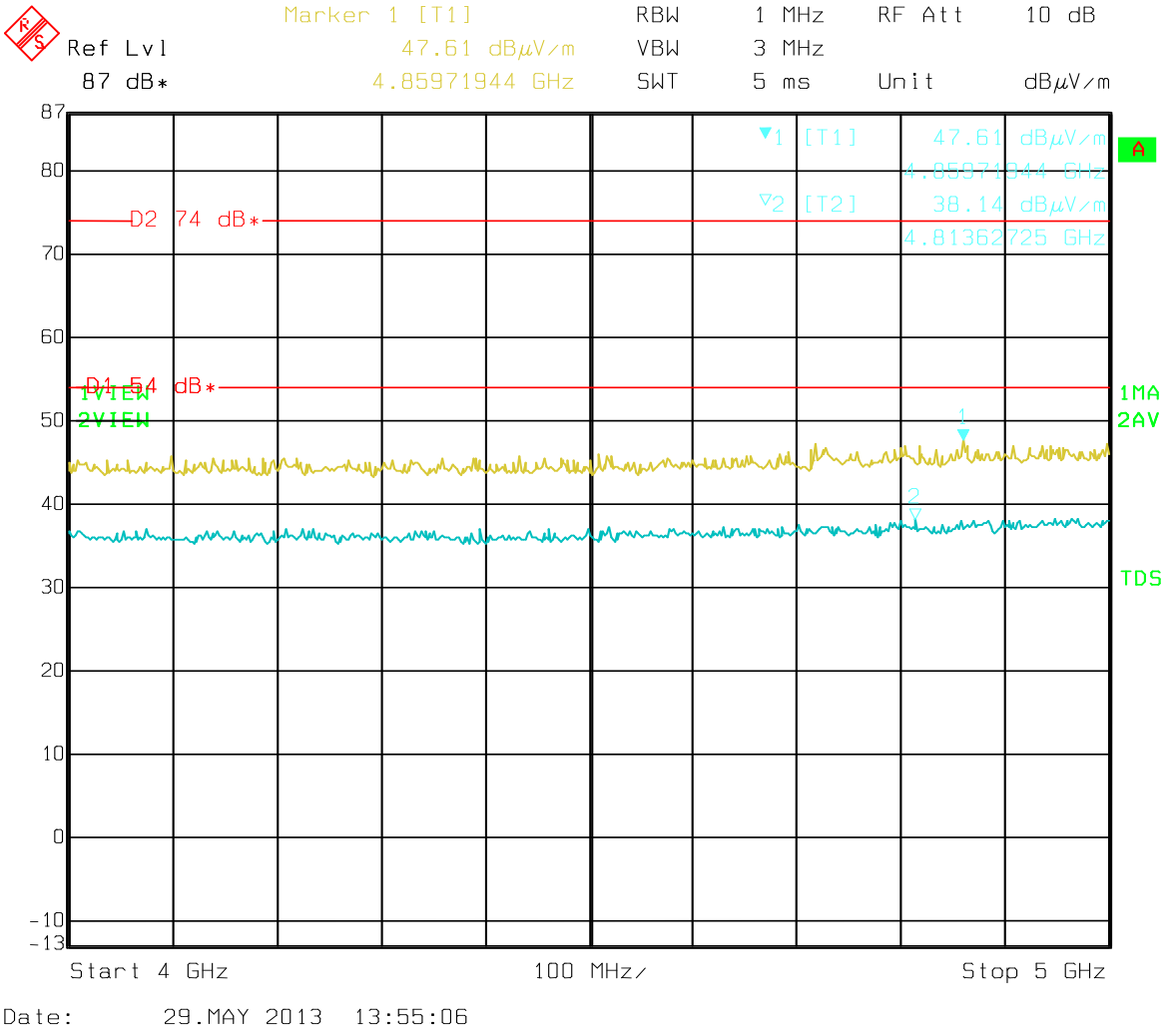
Graph 21 Radiated Emissions Test Results – TX Mode 2 - 3GHz Horizontal – Peak & Average



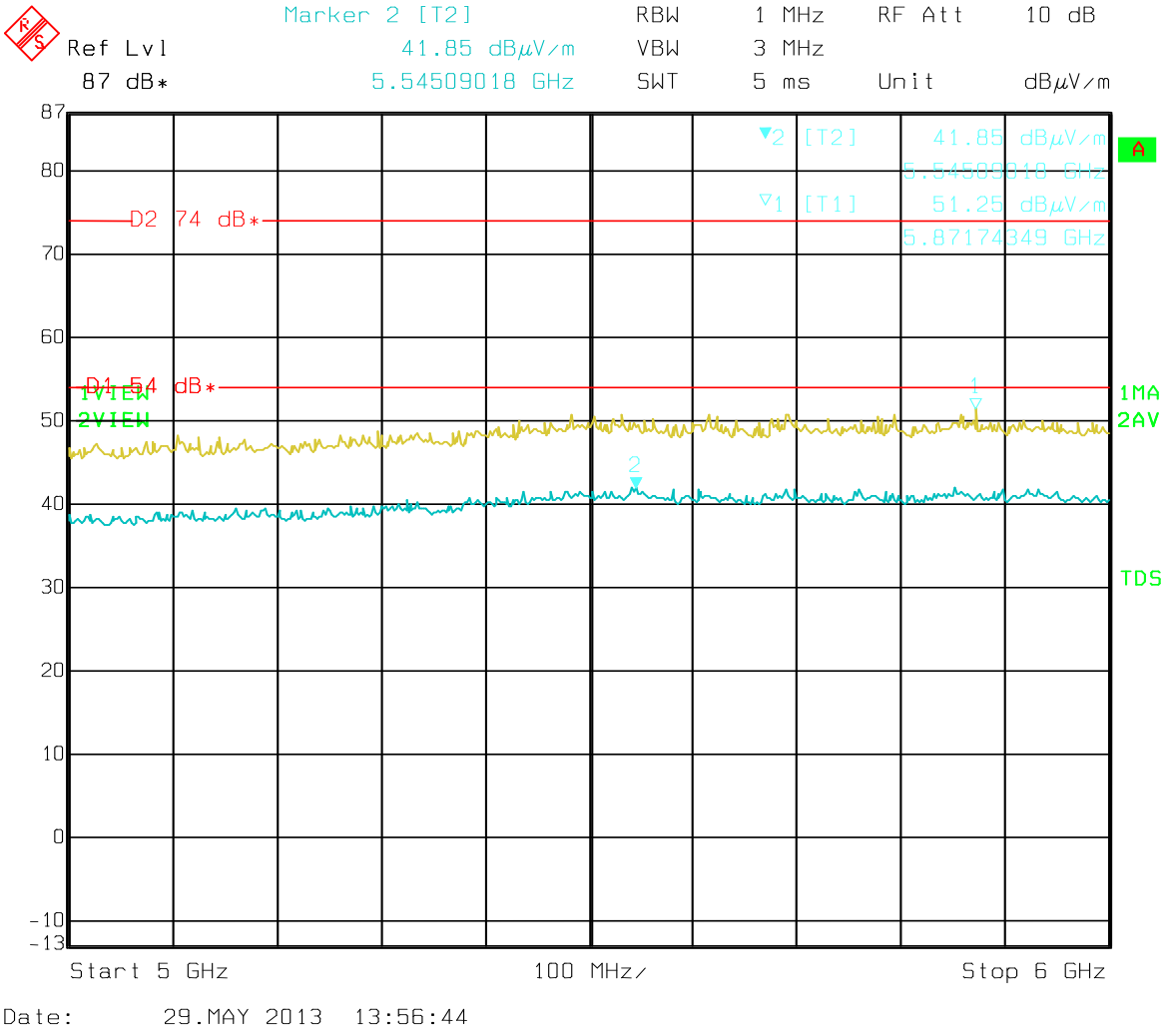
Graph 22 Radiated Emissions Test Results – TX Mode 3 - 4GHz Horizontal – Peak & Average



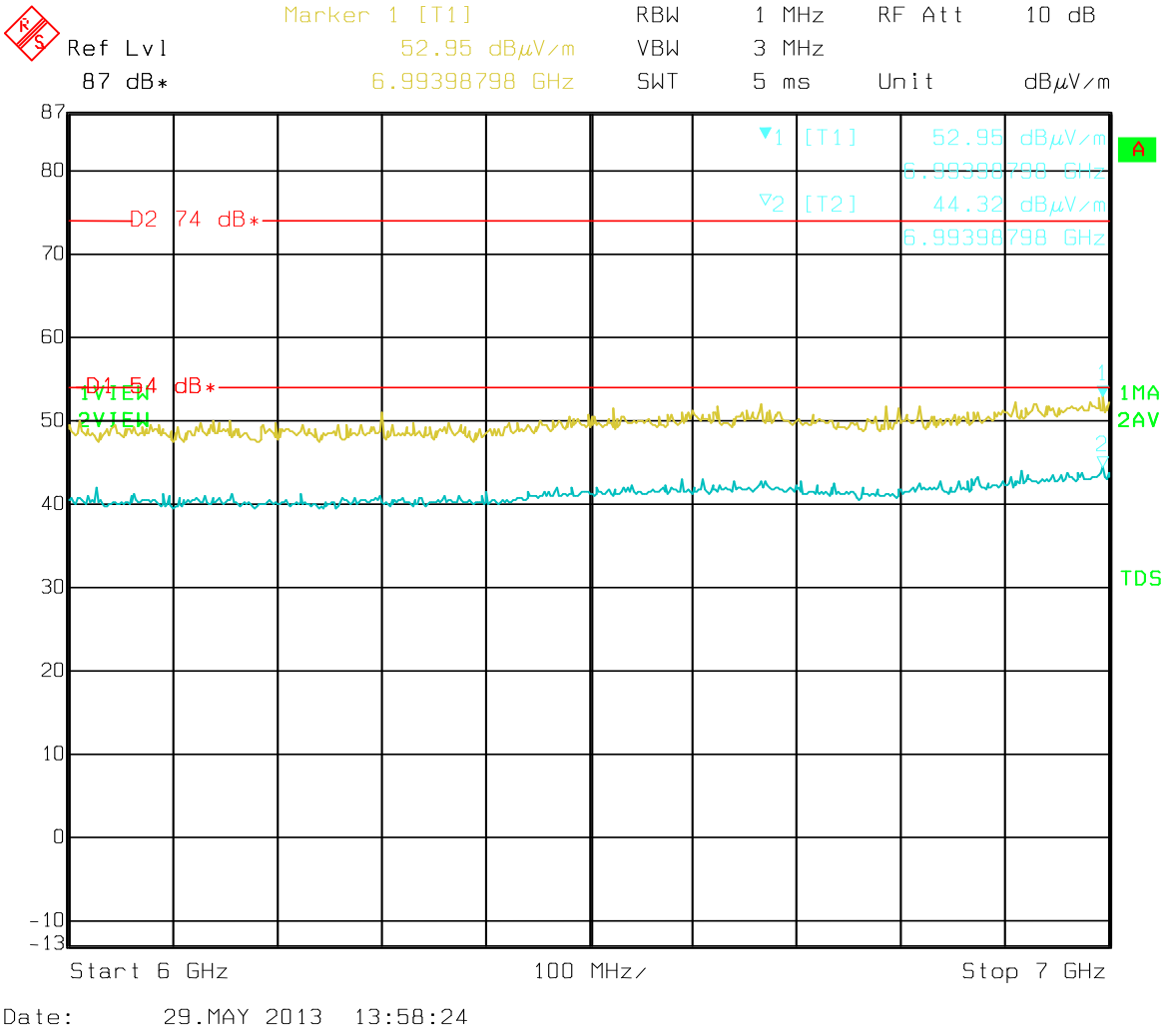
Graph 23 Radiated Emissions Test Results – TX Mode 4 - 5GHz Horizontal – Peak & Average



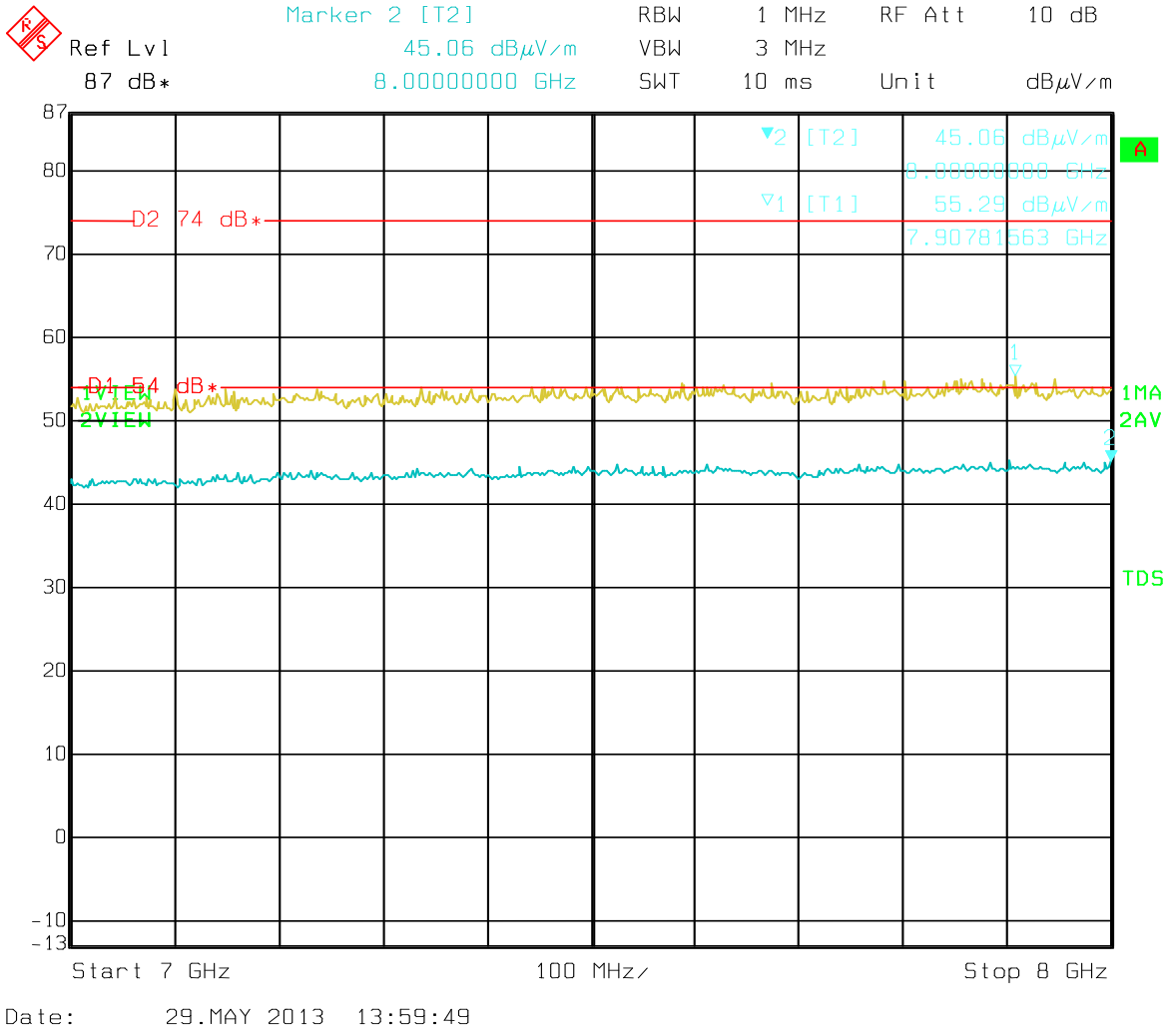
Graph 24 Radiated Emissions Test Results – TX Mode 5 - 6GHz Horizontal – Peak & Average



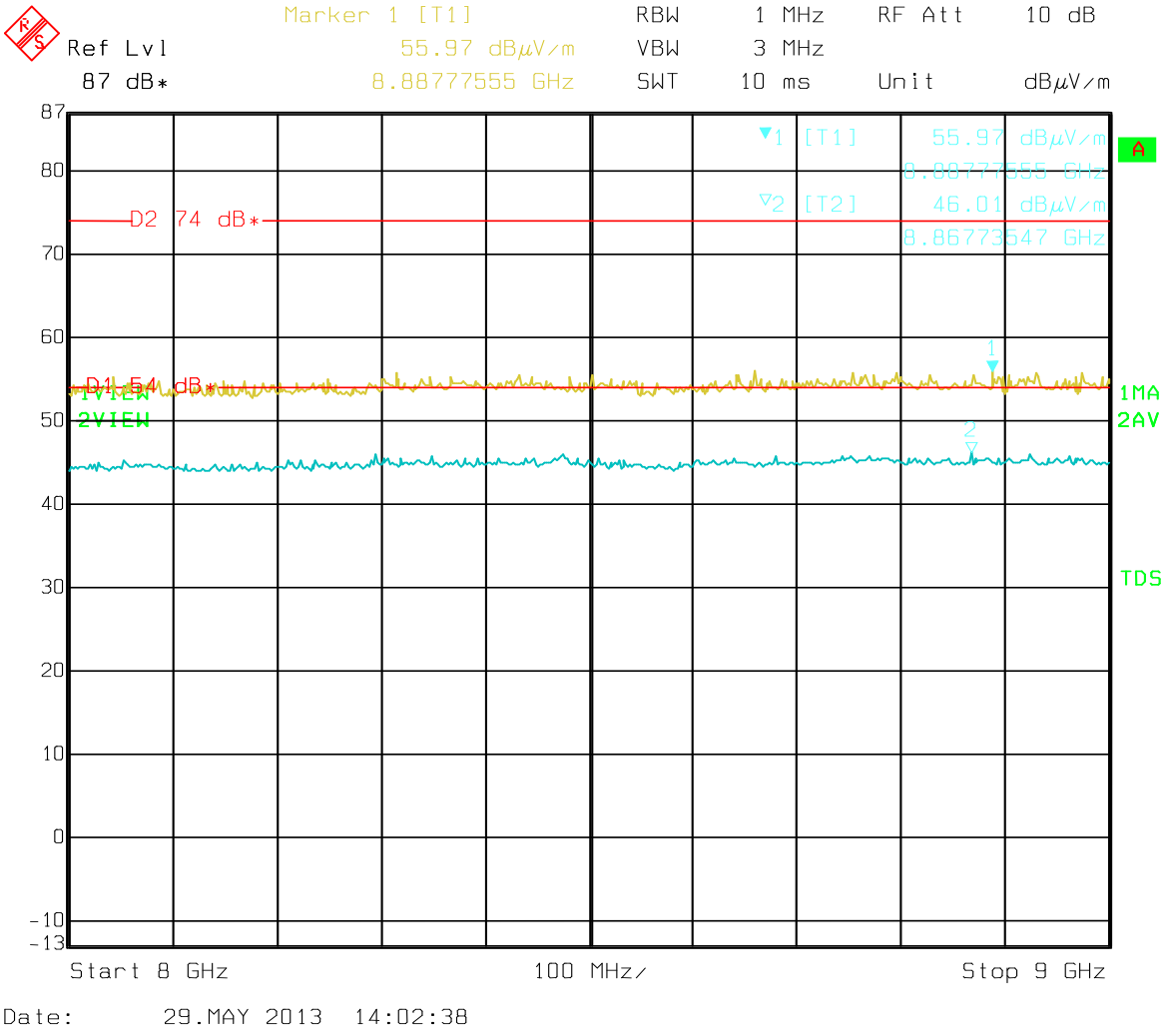
Graph 25 Radiated Emissions Test Results – TX Mode 6 - 7GHz Horizontal – Peak & Average



Graph 26 Radiated Emissions Test Results – TX Mode 7 - 8GHz Horizontal – Peak & Average



Graph 27 Radiated Emissions Test Results – TX Mode 8 - 9GHz Horizontal – Peak & Average



Graph 28 Radiated Emissions Test Results – TX Mode 9 - 10GHz Horizontal – Peak & Average

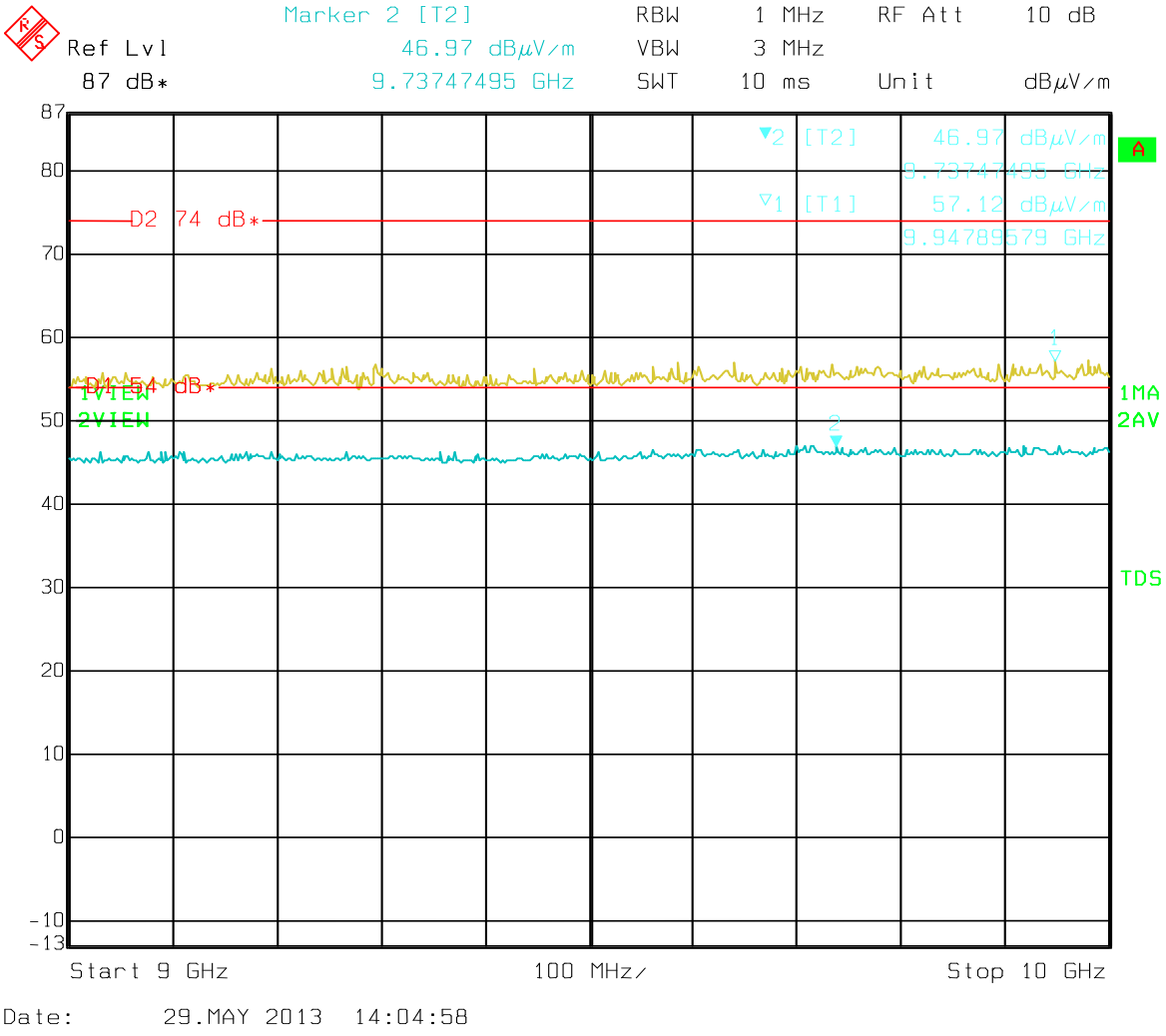


Table 14 Radiated Emissions Test Results – Standby Mode 1 - 10GHz Vertical & Horizontal

Standard: FCC Part 15

Test: Radiated Emissions

Port: Enclosure

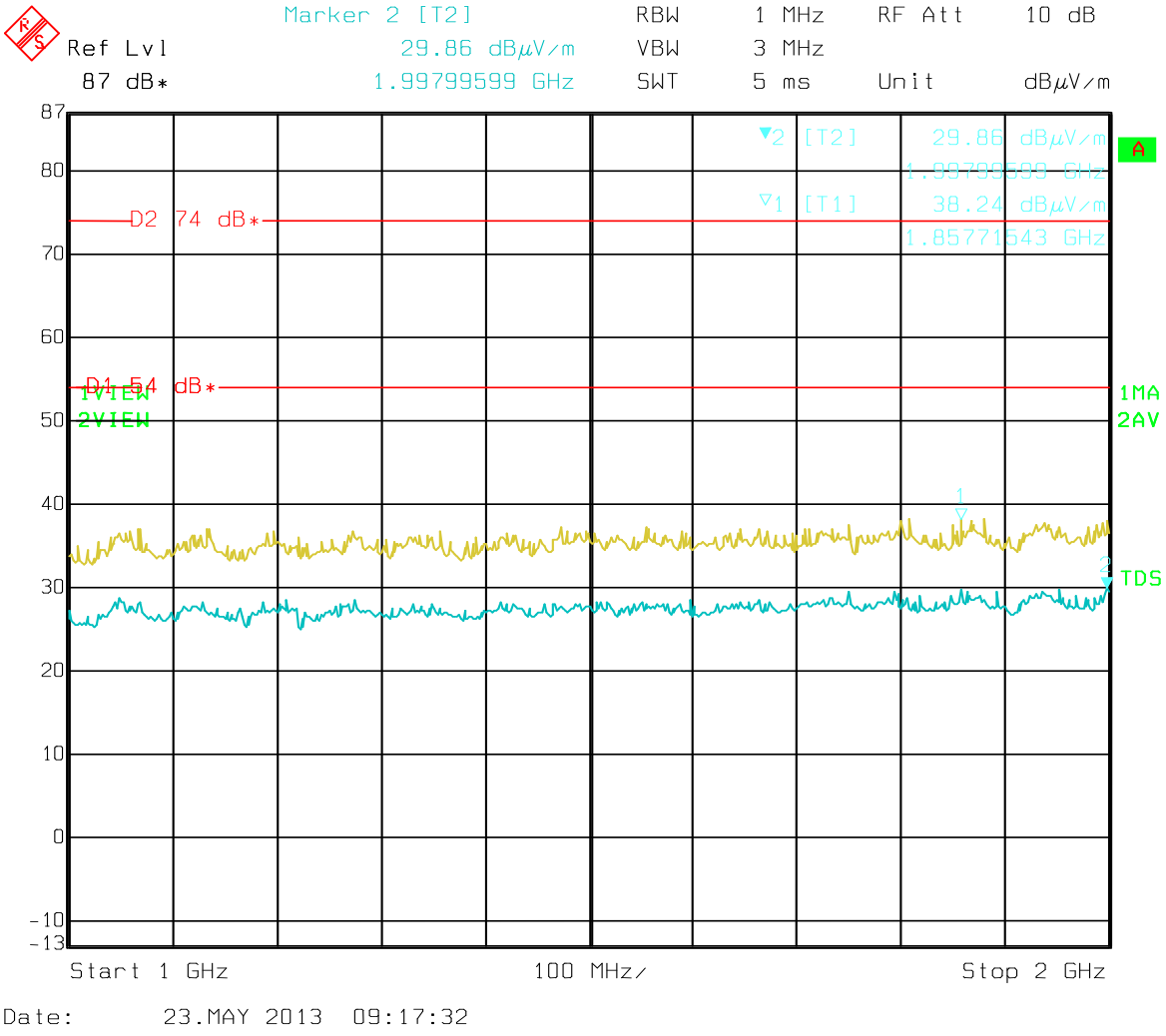
Units of measurement:

Frequency: MHz Amplitude: dBµV/m

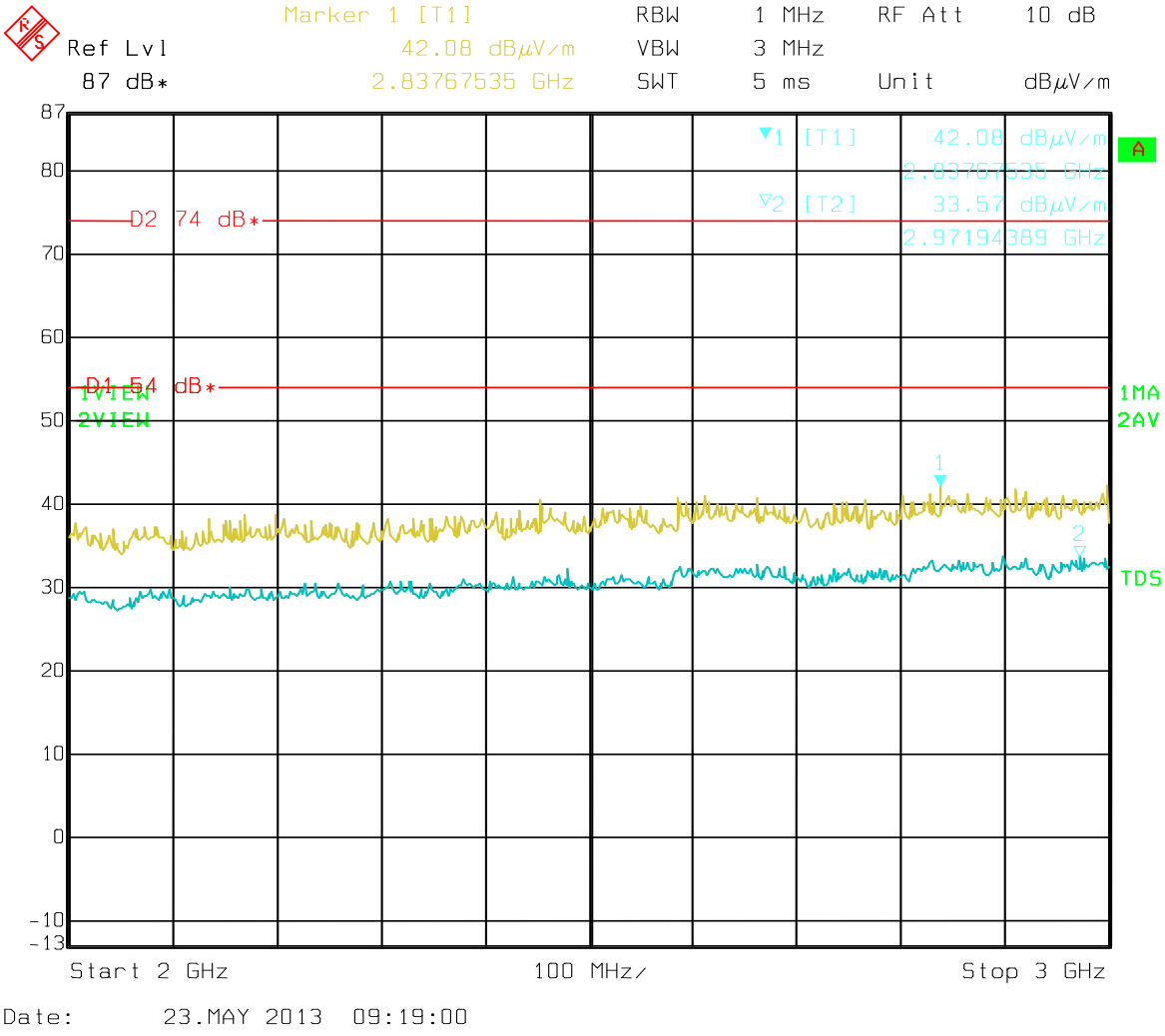
Bandwidth: 1MHz

No measurements were made as all emissions were >6dB from the limit line.

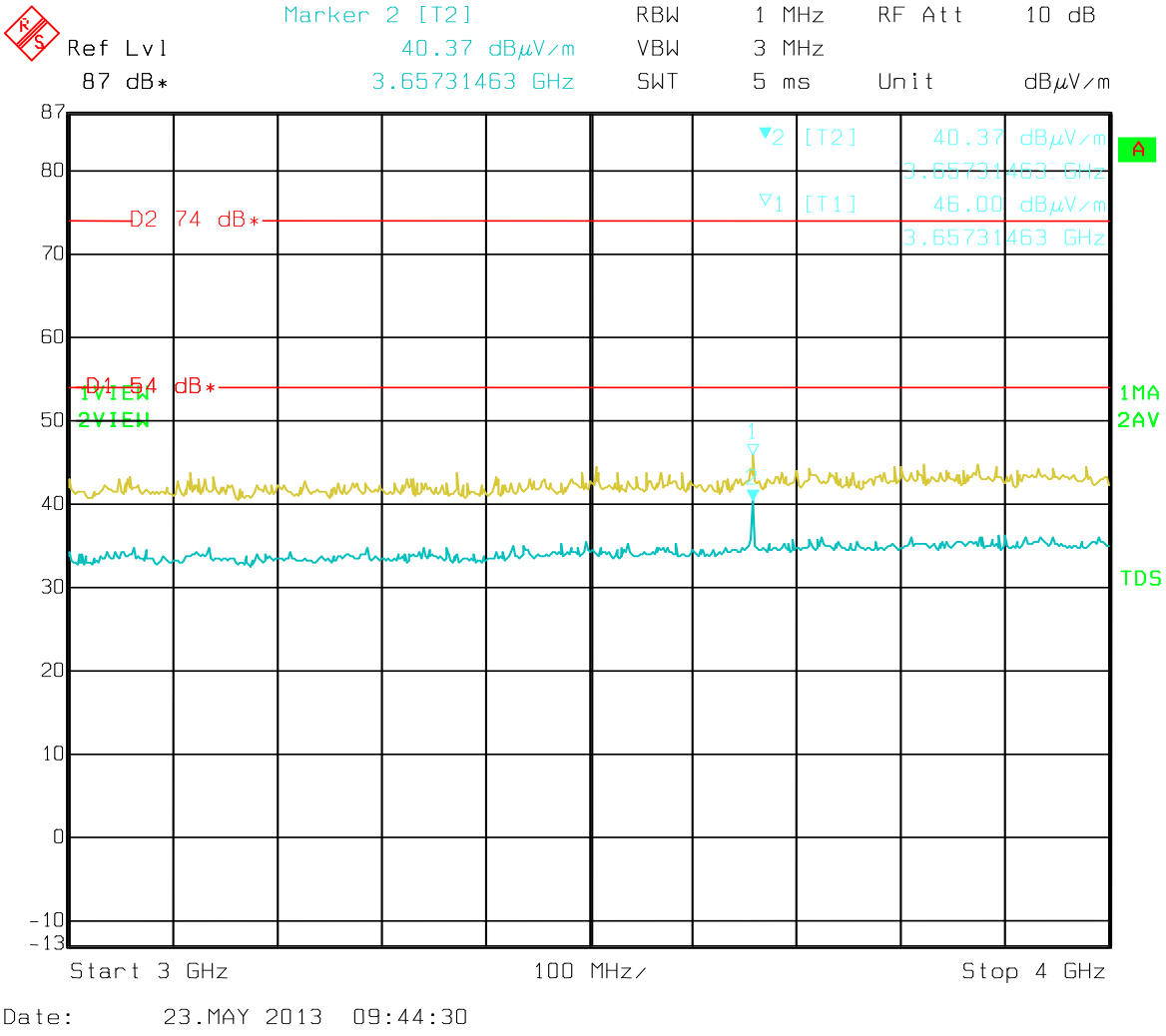
Graph 29 Radiated Emissions Test Results – Standby Mode 1 - 2GHz Vertical – Peak & Average



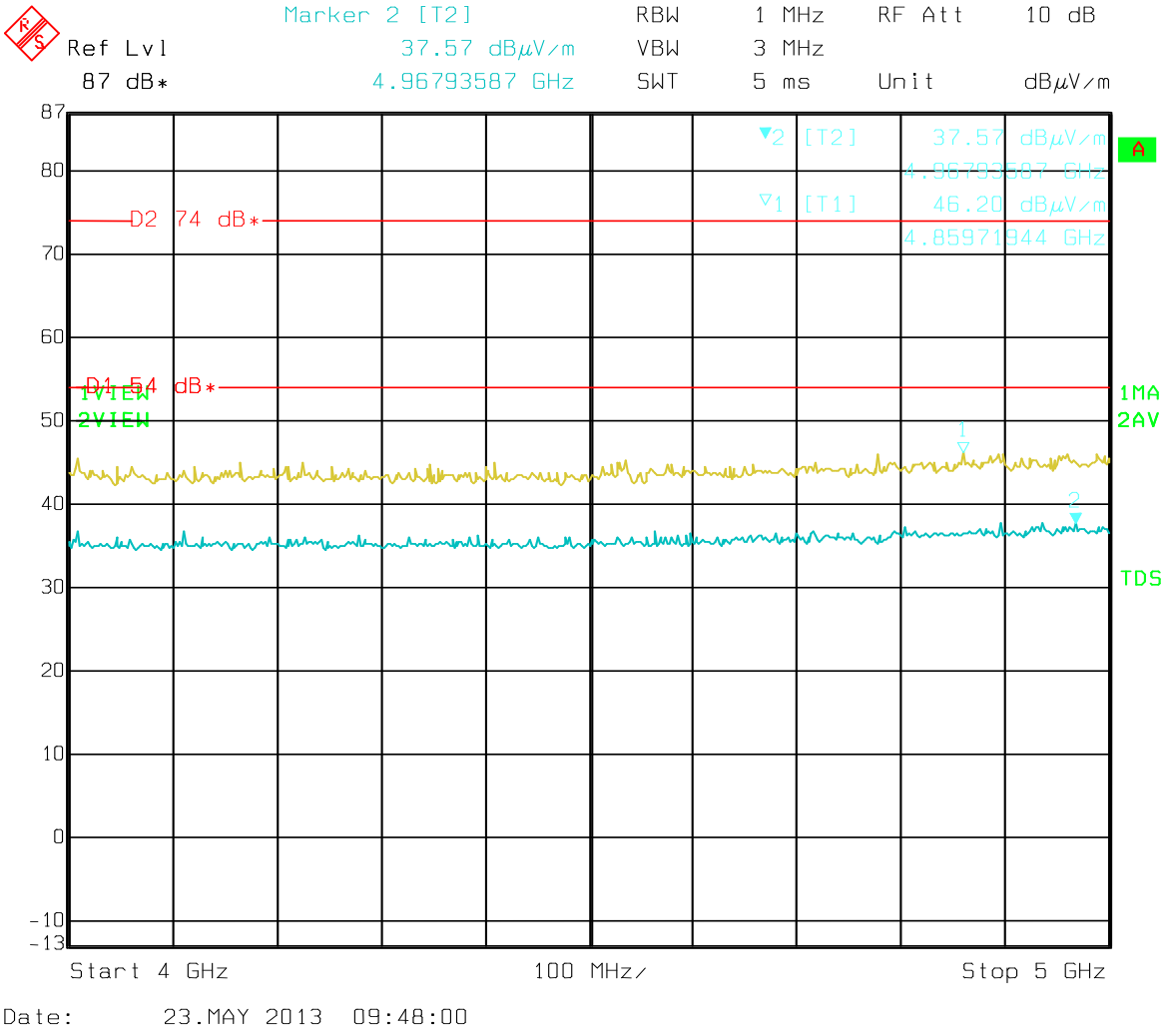
Graph 30 Radiated Emissions Test Results – Standby Mode 2 - 3GHz Vertical – Peak & Average



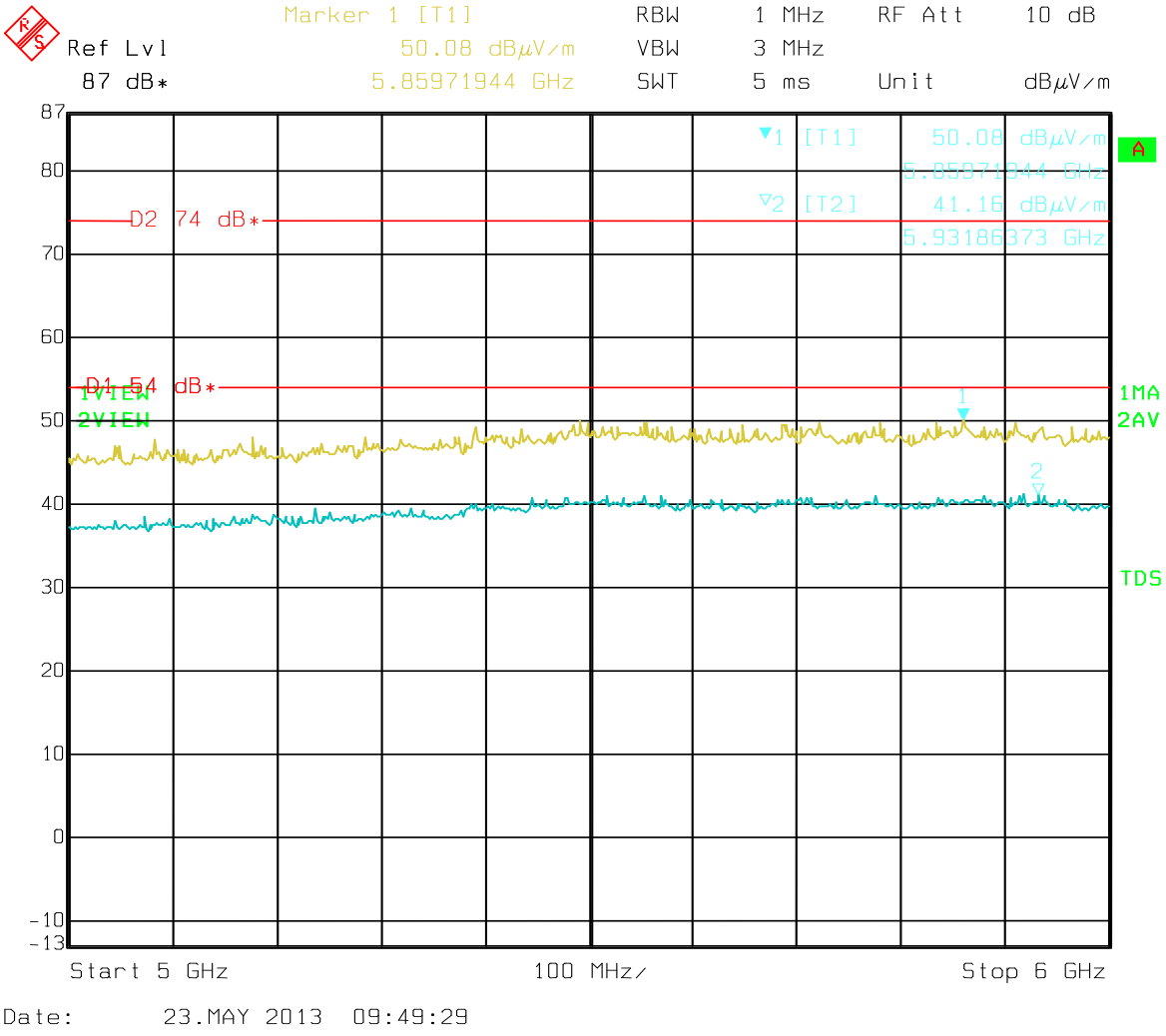
Graph 31 Radiated Emissions Test Results – Standby Mode 3 - 4GHz Vertical – Peak & Average



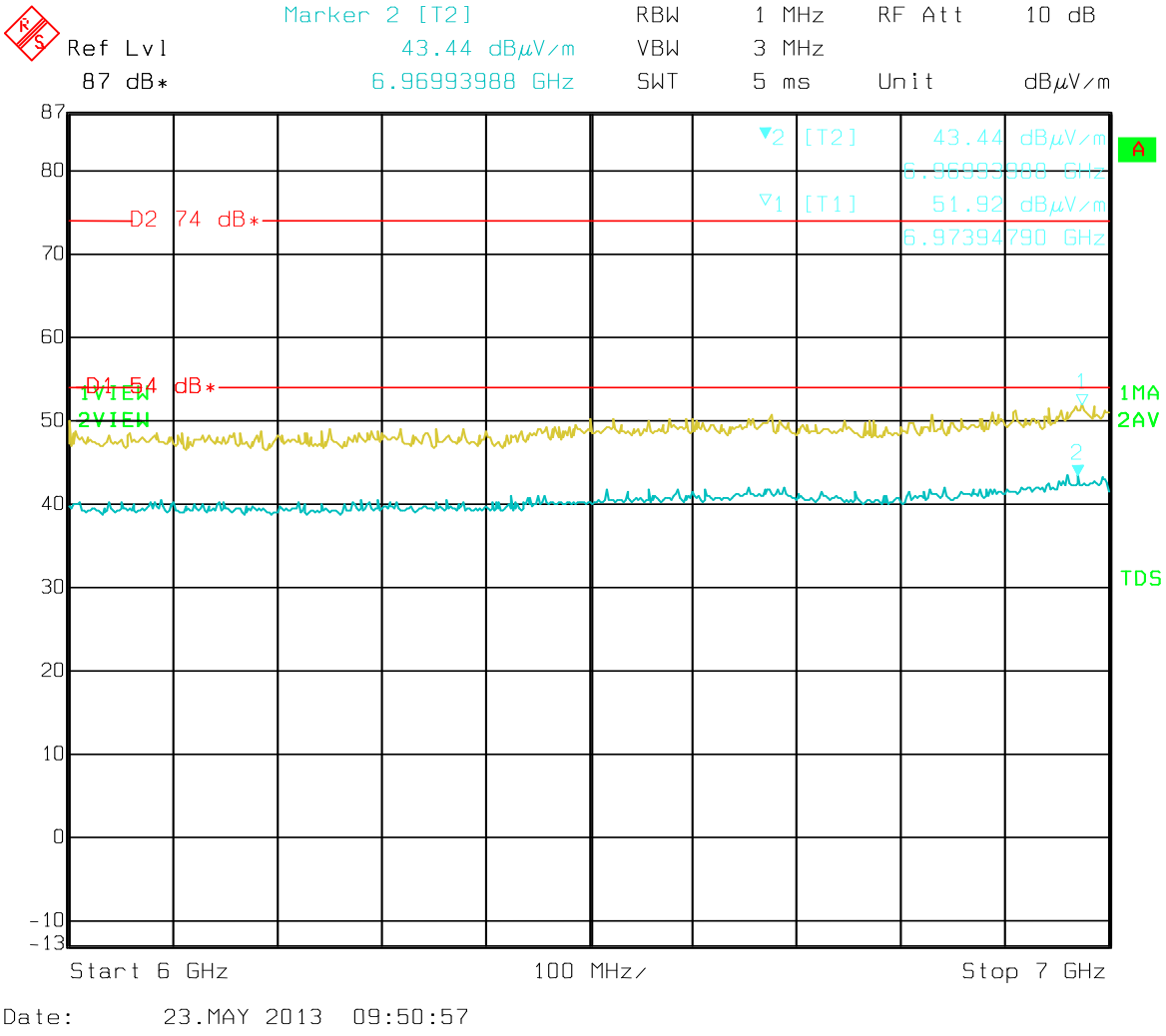
Graph 32 Radiated Emissions Test Results – Standby Mode 4 - 5GHz Vertical – Peak & Average



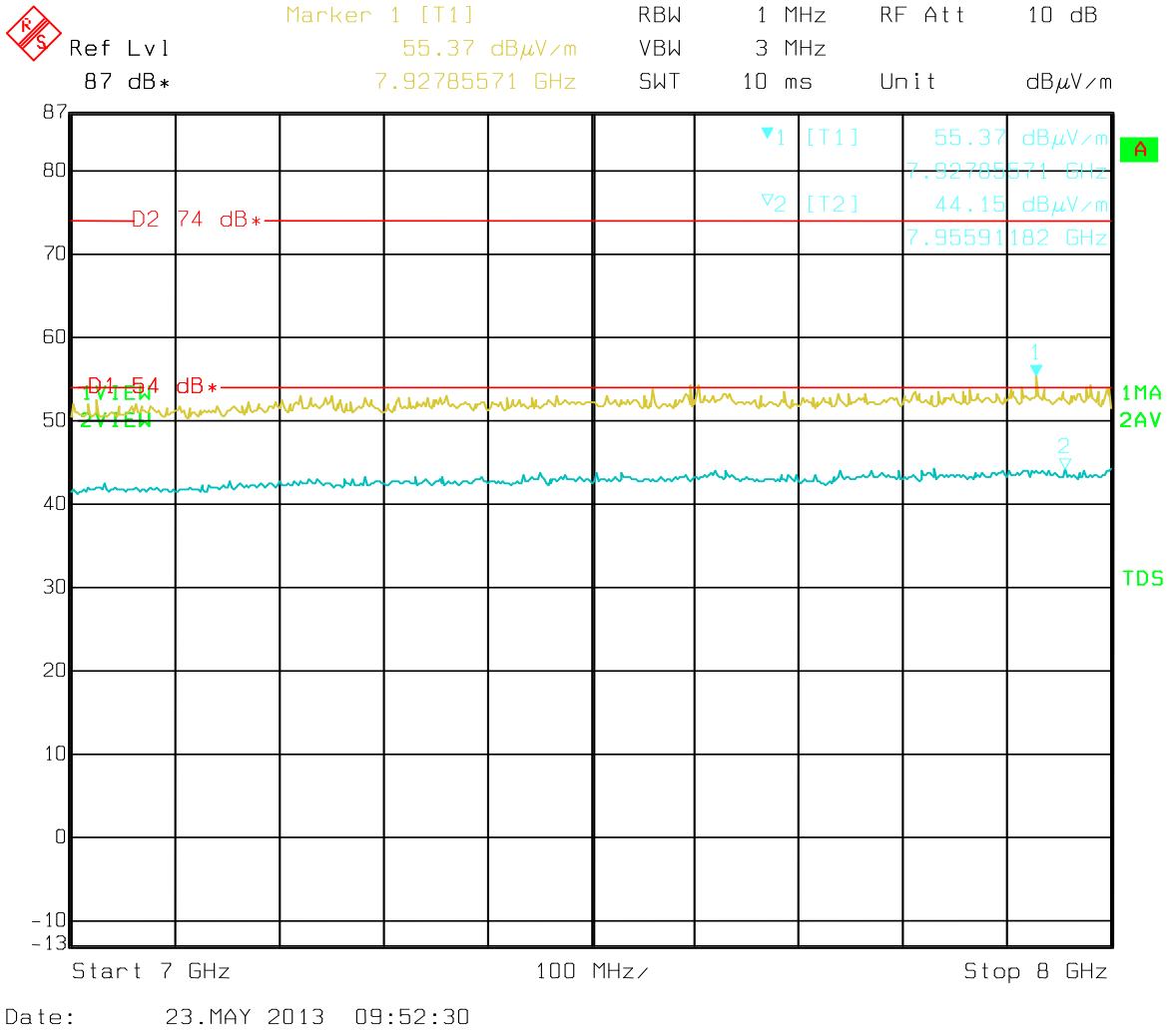
Graph 33 Radiated Emissions Test Results – Standby Mode 5 - 6GHz Vertical – Peak & Average



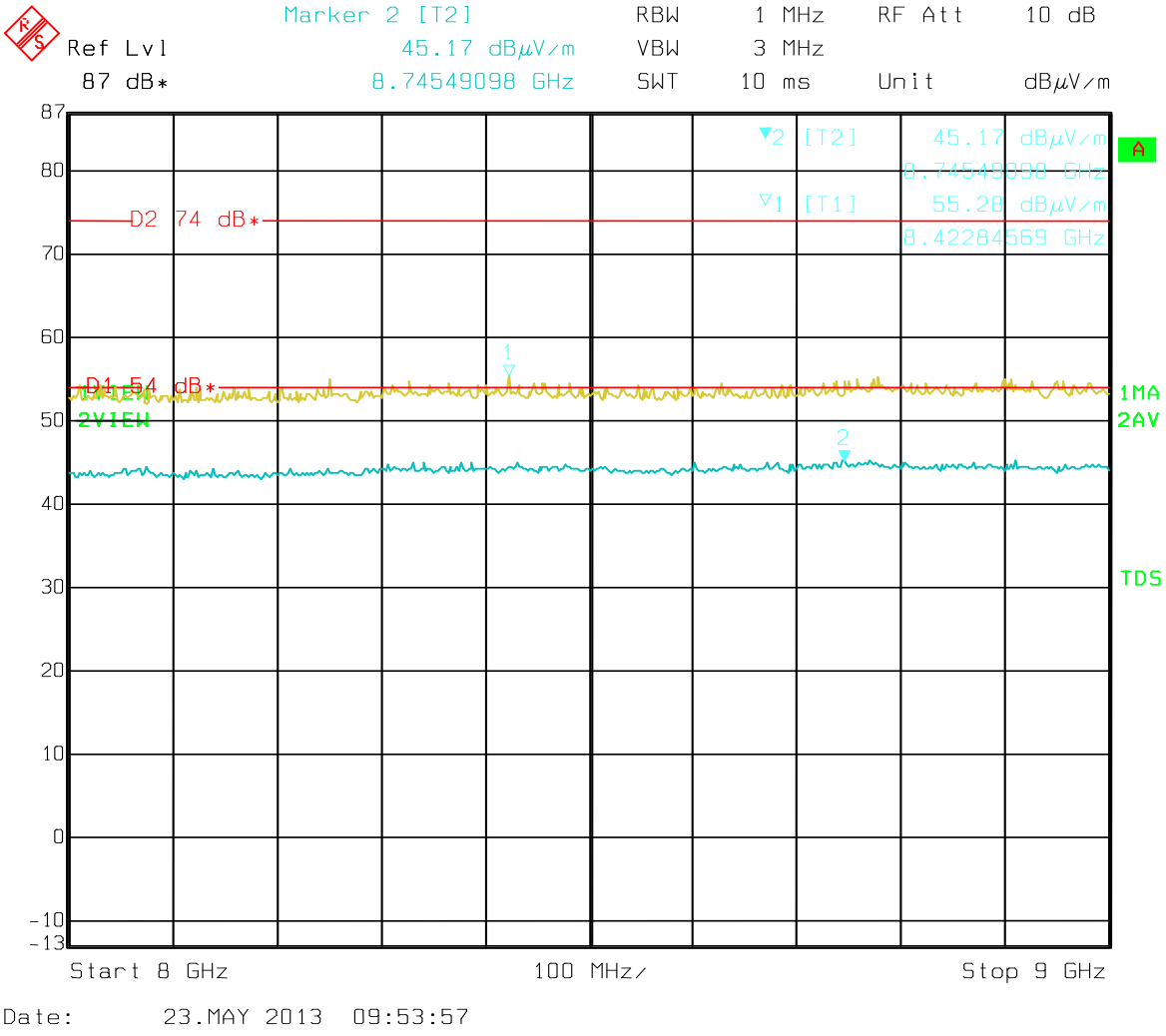
Graph 34 Radiated Emissions Test Results – Standby Mode 6 - 7GHz Vertical – Peak & Average



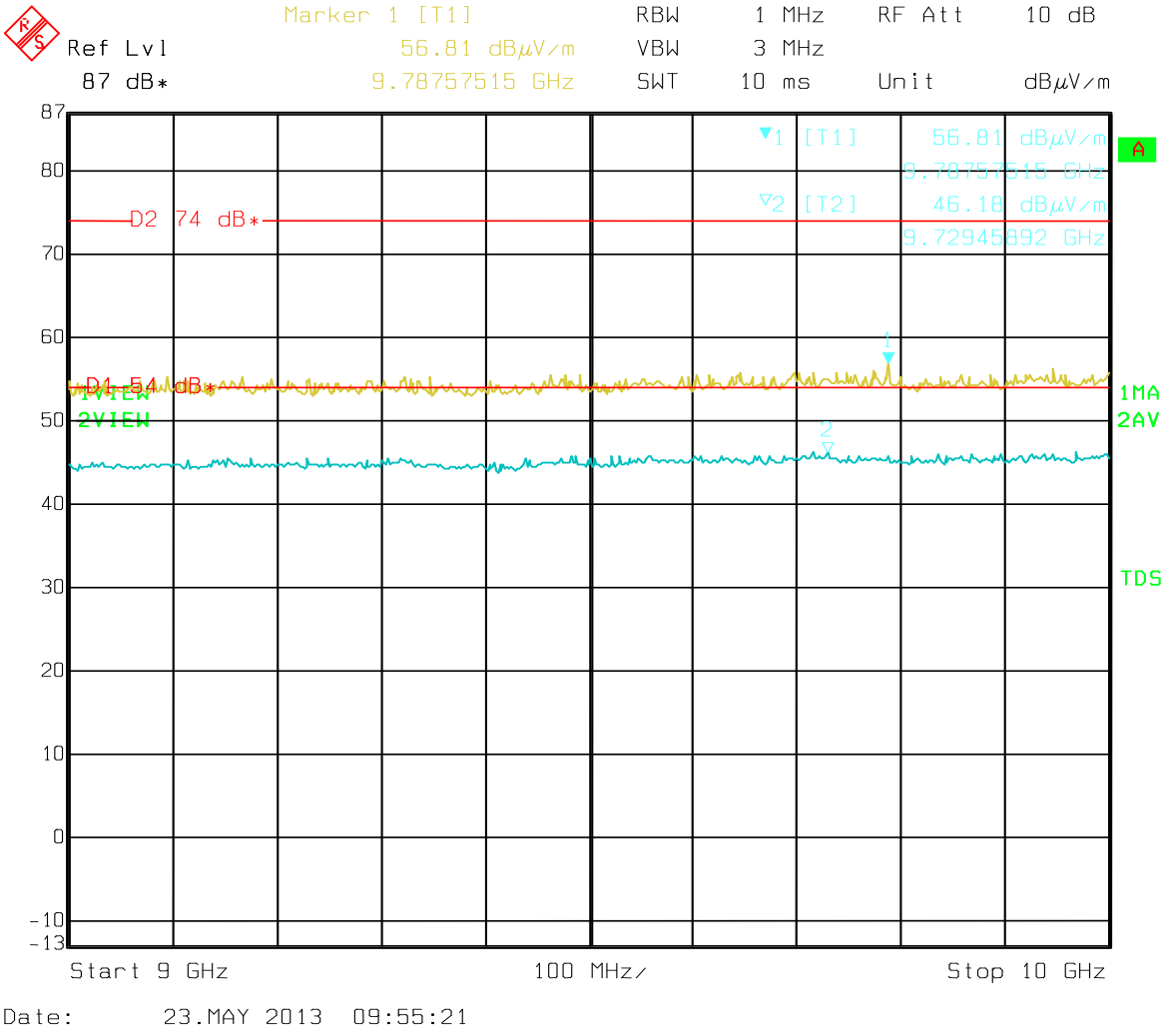
Graph 35 Radiated Emissions Test Results – Standby Mode 7 - 8GHz Vertical – Peak & Average



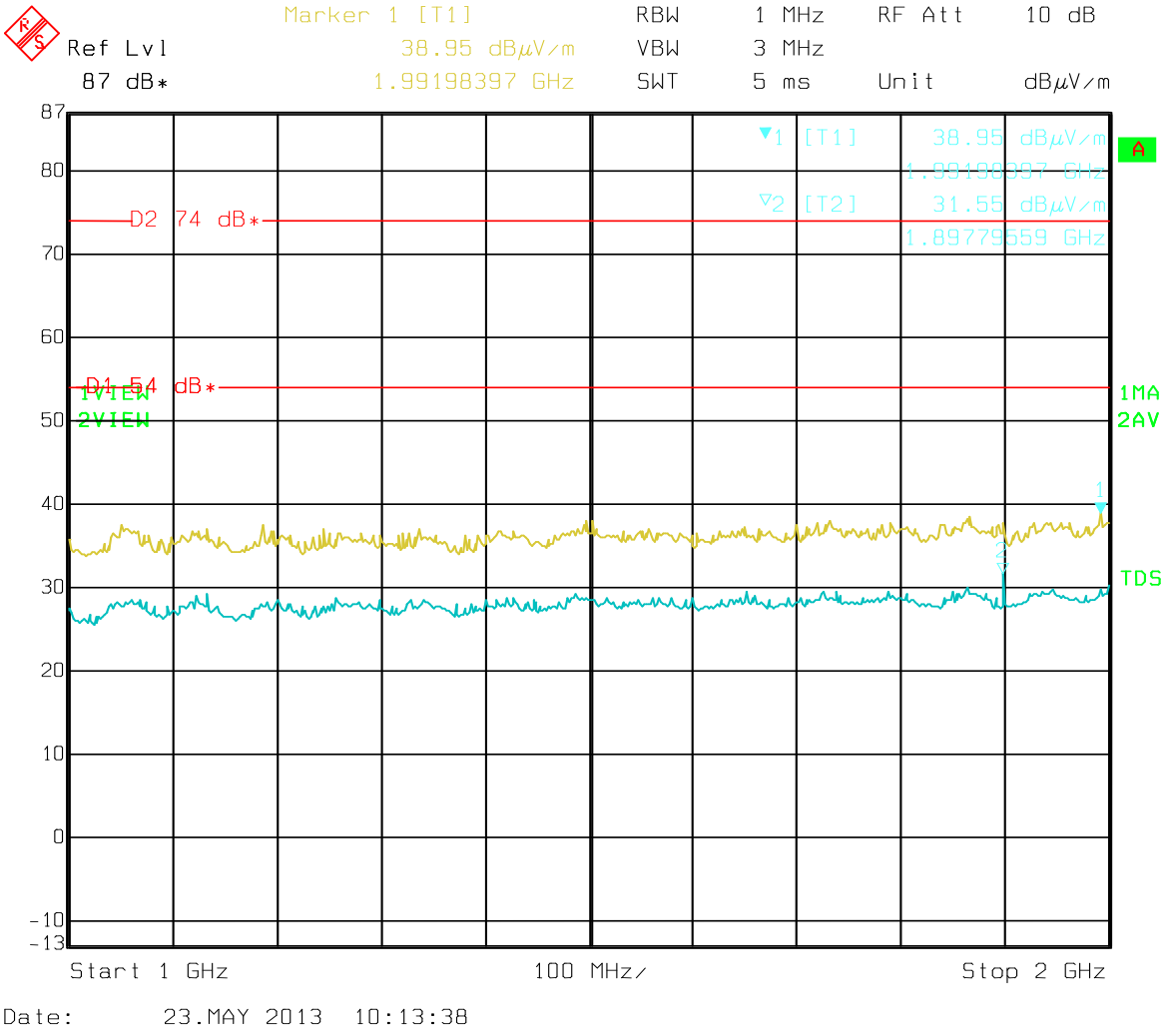
Graph 36 Radiated Emissions Test Results – Standby Mode 8 - 9GHz Vertical – Peak & Average



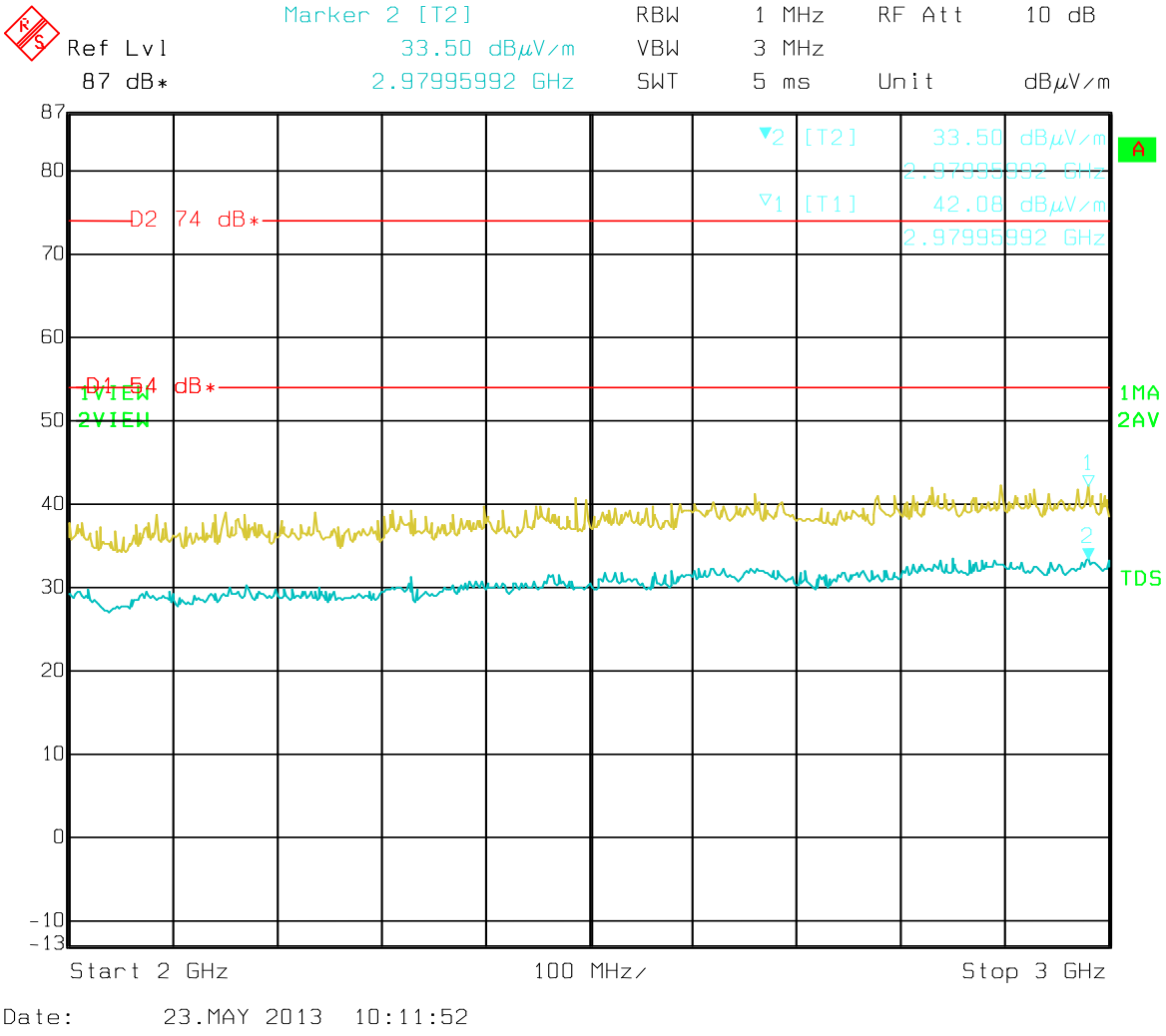
Graph 37 Radiated Emissions Test Results – Standby Mode 9 - 10GHz Vertical – Peak & Average



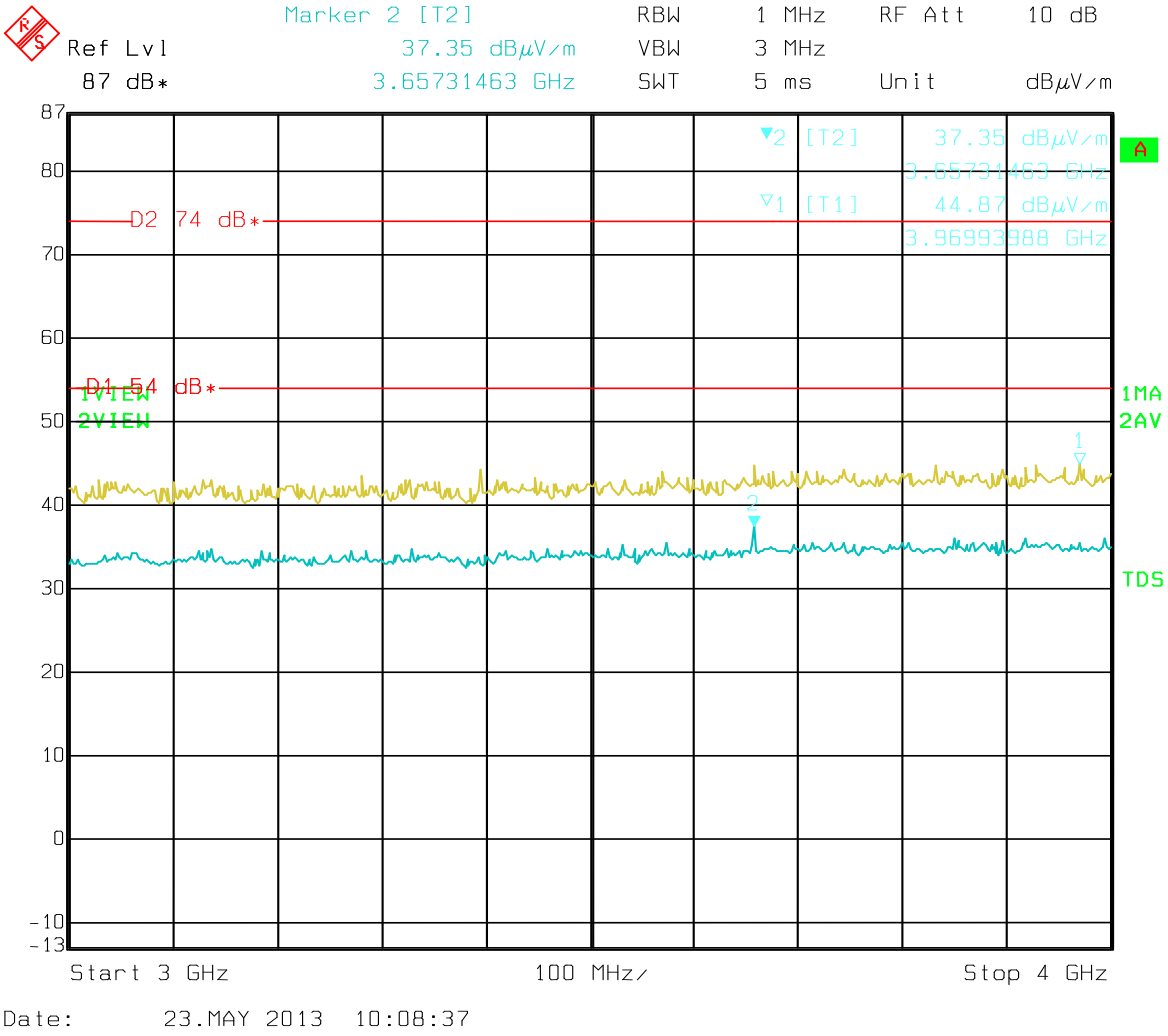
Graph 38 Radiated Emissions Test Results – Standby Mode 1 - 2GHz Horizontal – Peak & Average



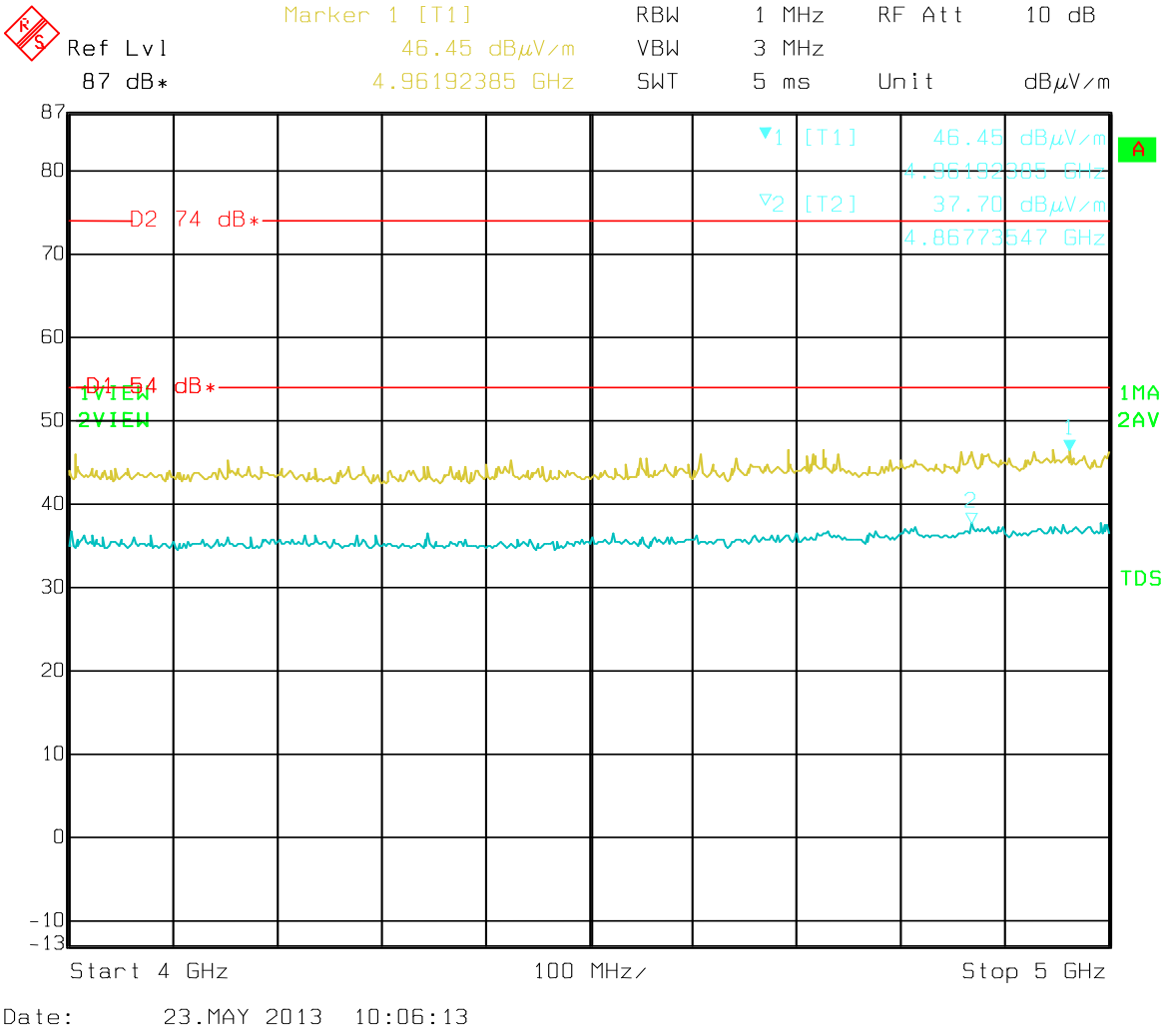
Graph 39 Radiated Emissions Test Results – Standby Mode 2 - 3GHz Horizontal – Peak & Average



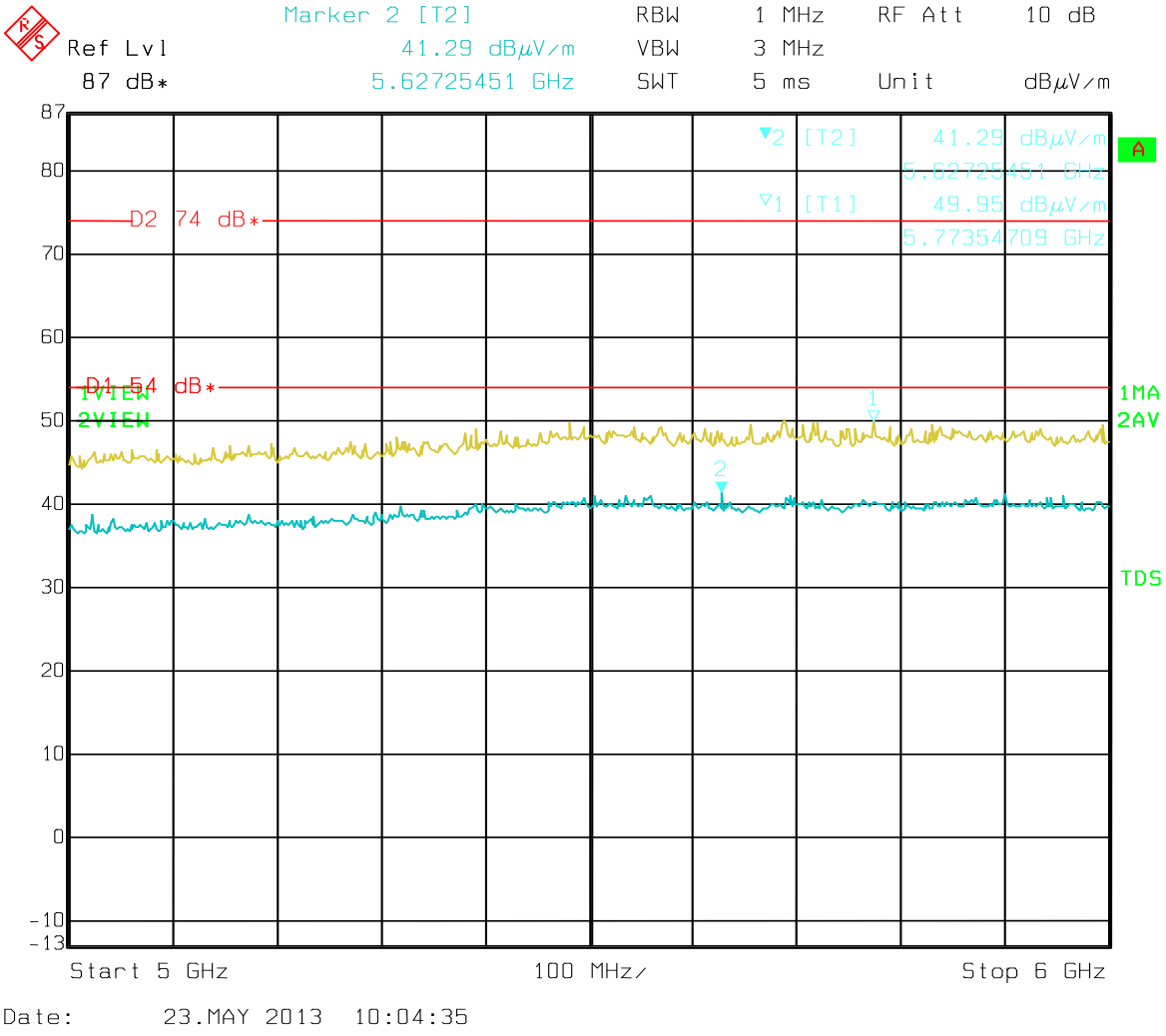
Graph 40 Radiated Emissions Test Results – Standby Mode 3 - 4GHz Horizontal – Peak & Average



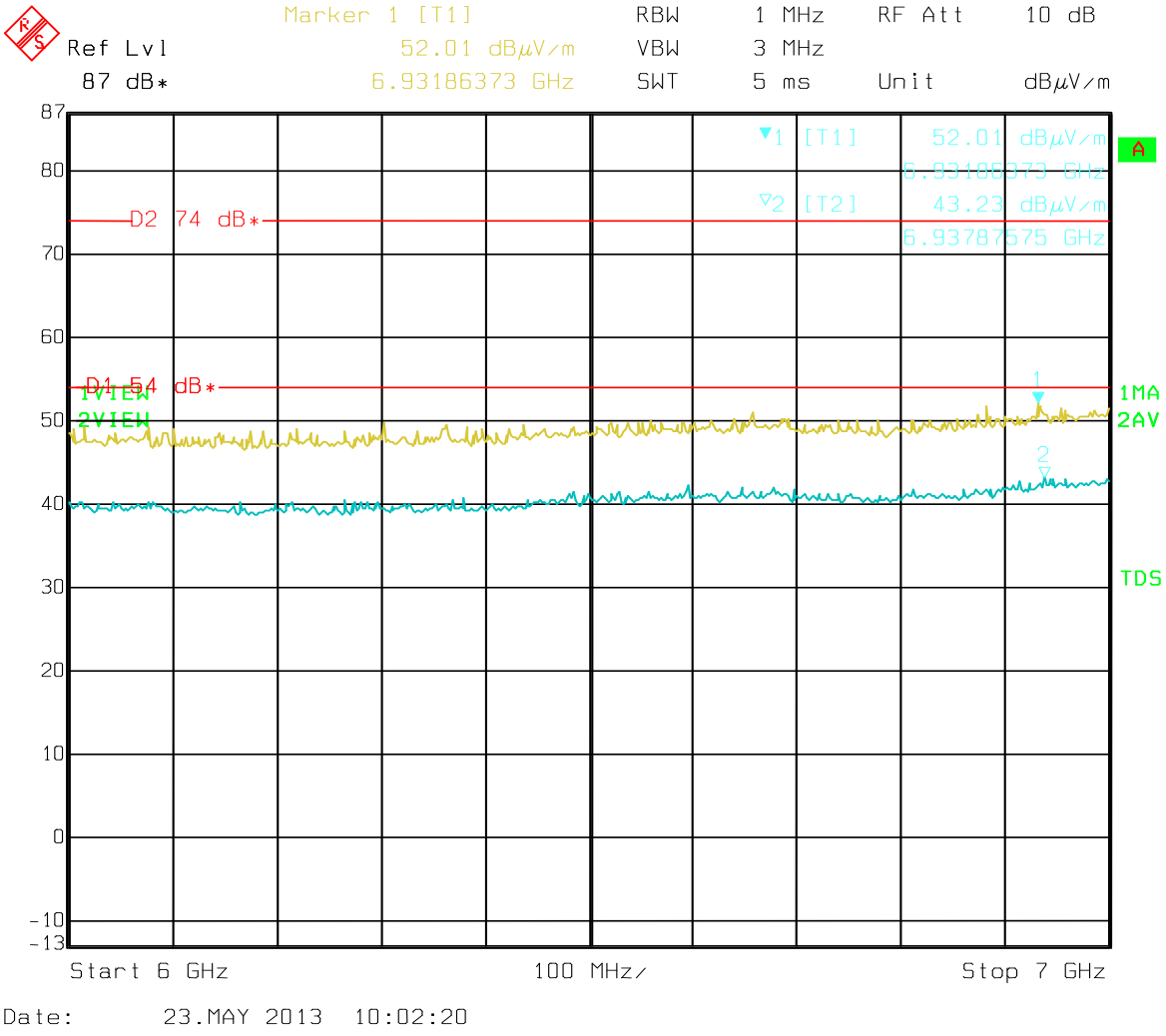
Graph 41 Radiated Emissions Test Results – Standby Mode 4 - 5GHz Horizontal – Peak & Average



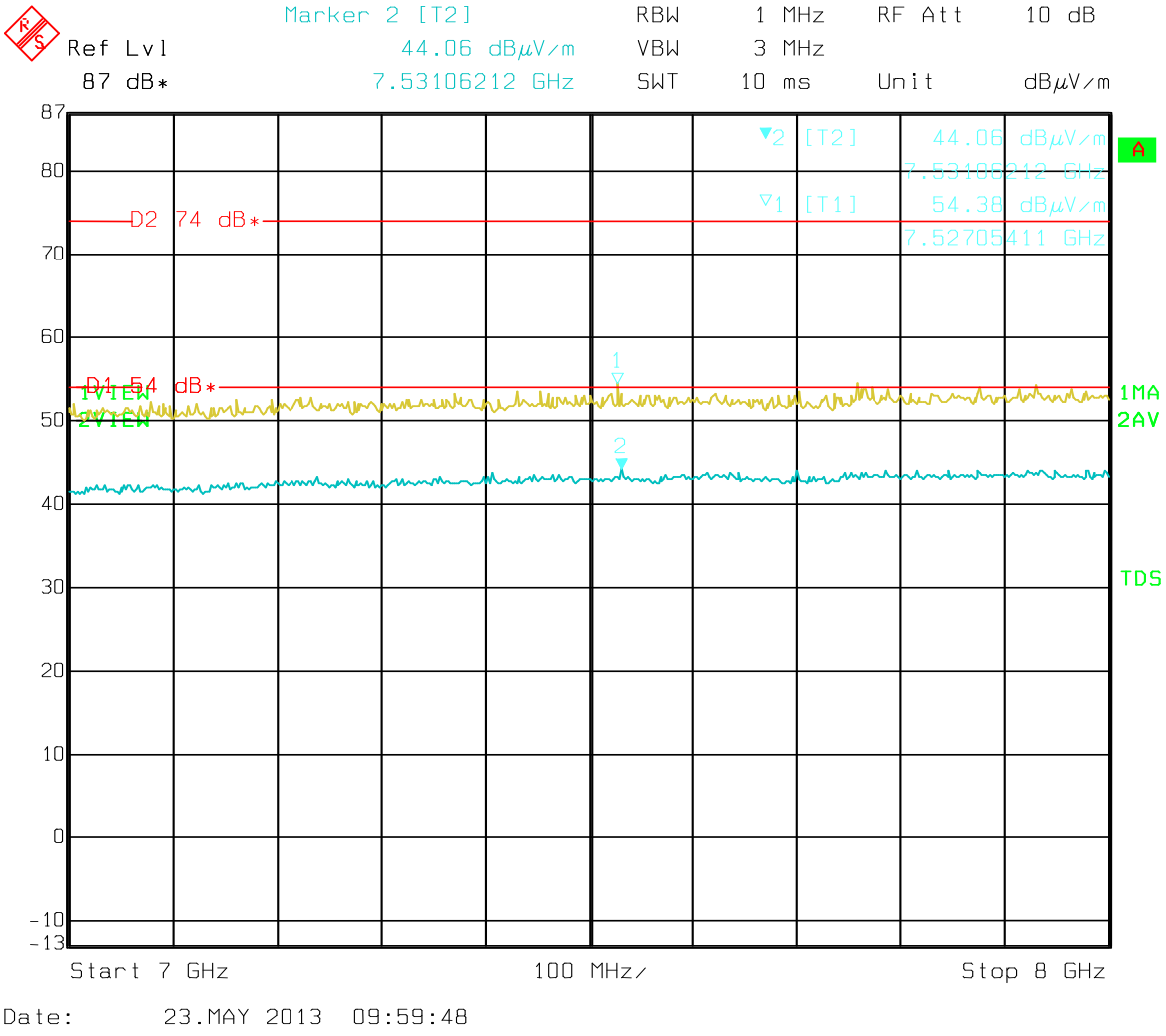
Graph 42 Radiated Emissions Test Results – Standby Mode 5 - 6GHz Horizontal – Peak & Average



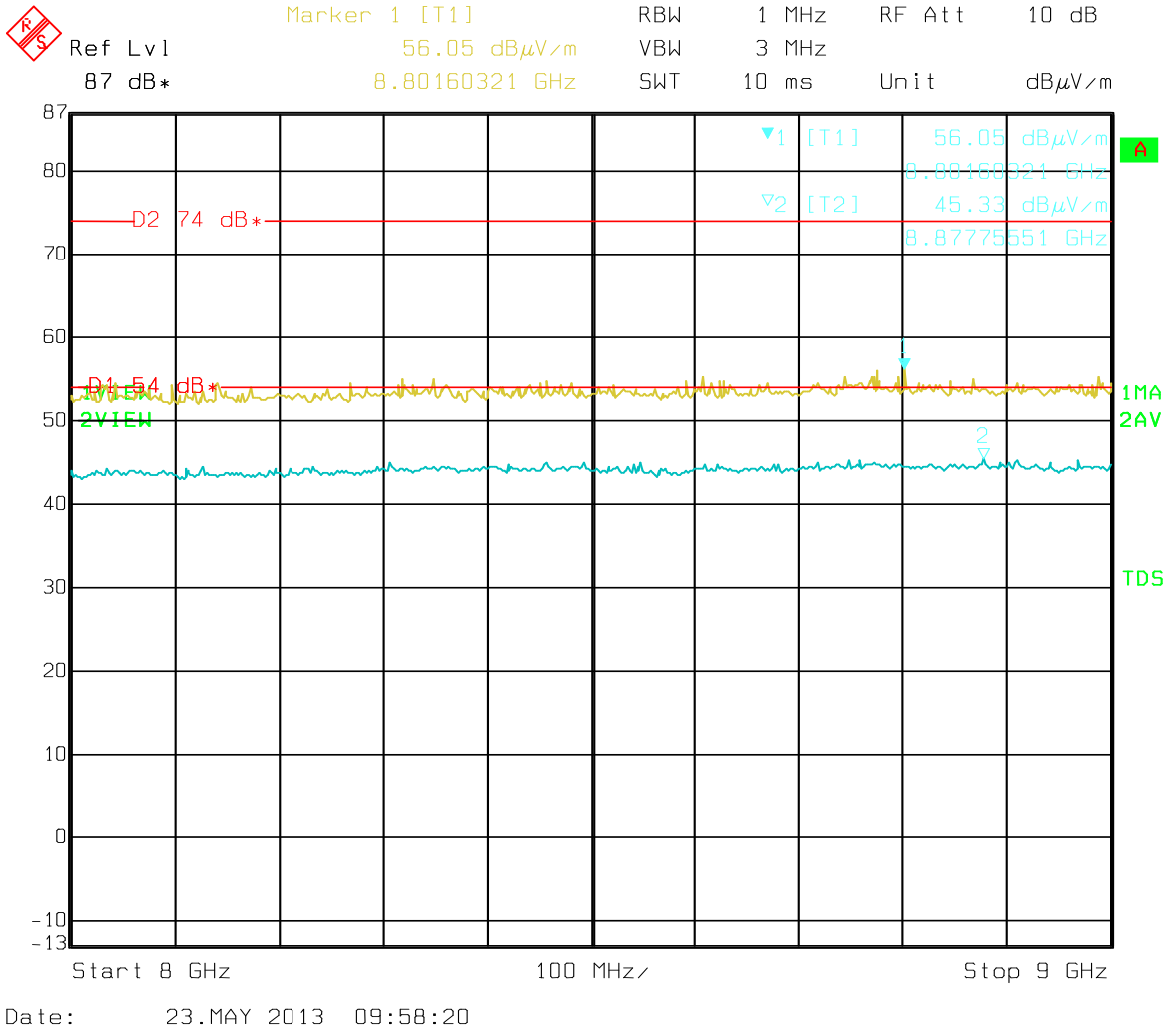
Graph 43 Radiated Emissions Test Results – Standby Mode 6 - 7GHz Horizontal – Peak & Average



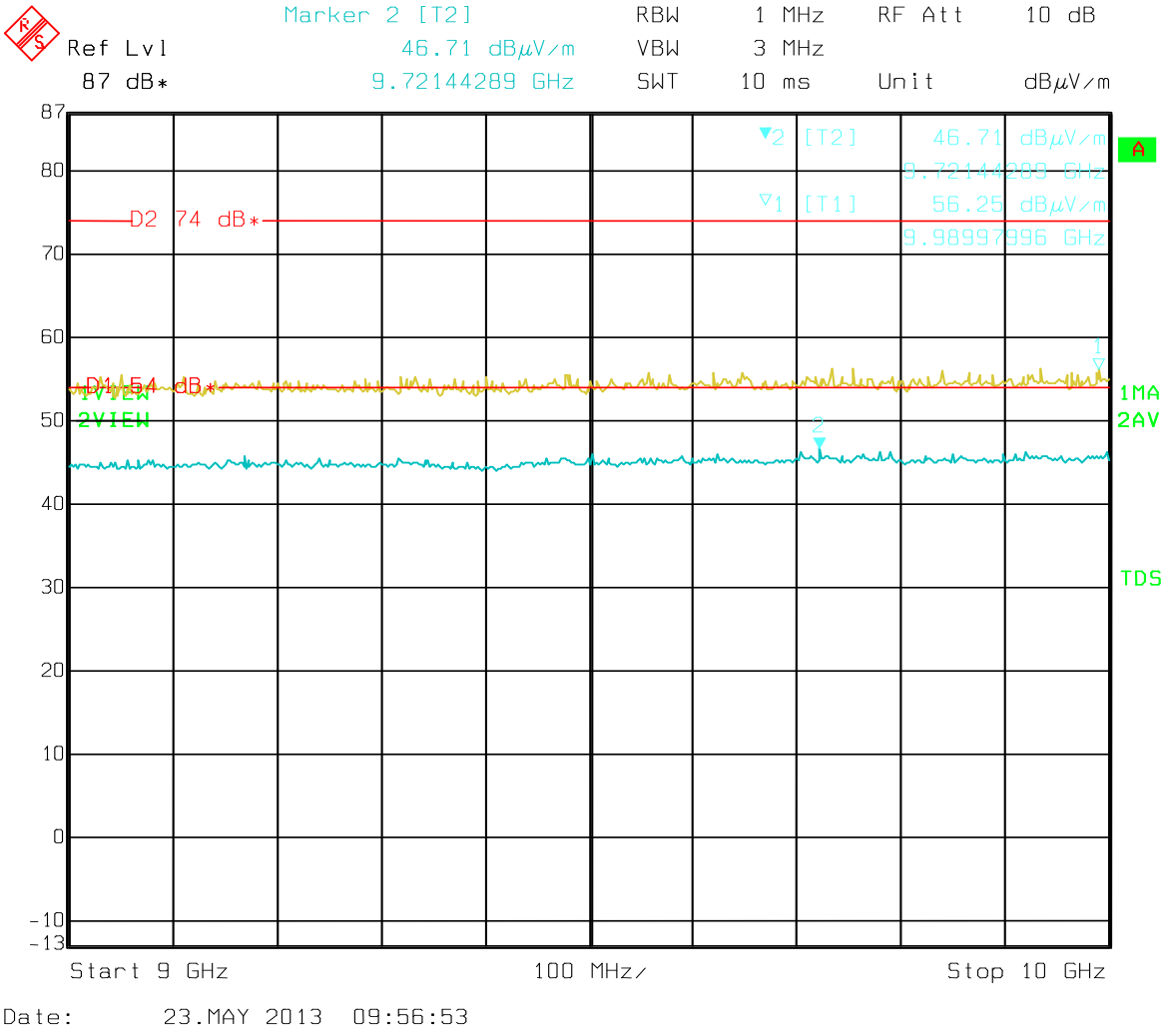
Graph 44 Radiated Emissions Test Results – Standby Mode 7 - 8GHz Horizontal – Peak & Average



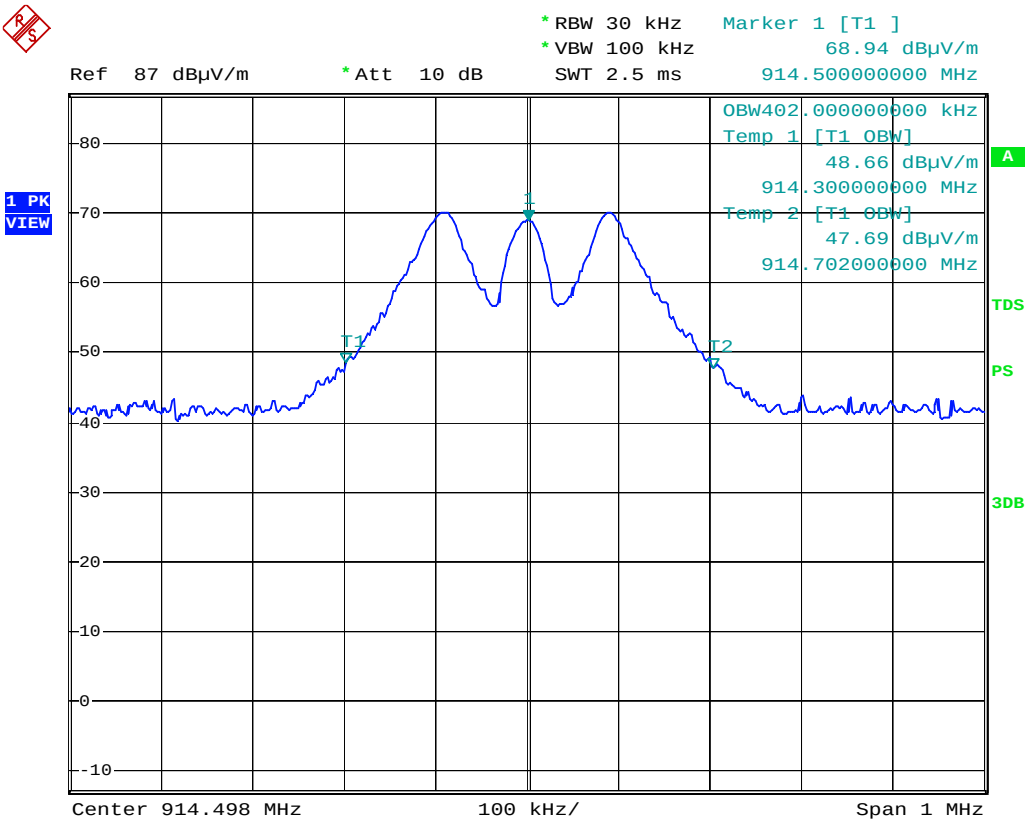
Graph 45 Radiated Emissions Test Results – Standby Mode 8 - 9GHz Horizontal – Peak & Average



Graph 46 Radiated Emissions Test Results – Standby Mode 9 - 10GHz Horizontal – Peak & Average



Graph 47 - Occupied Bandwidth



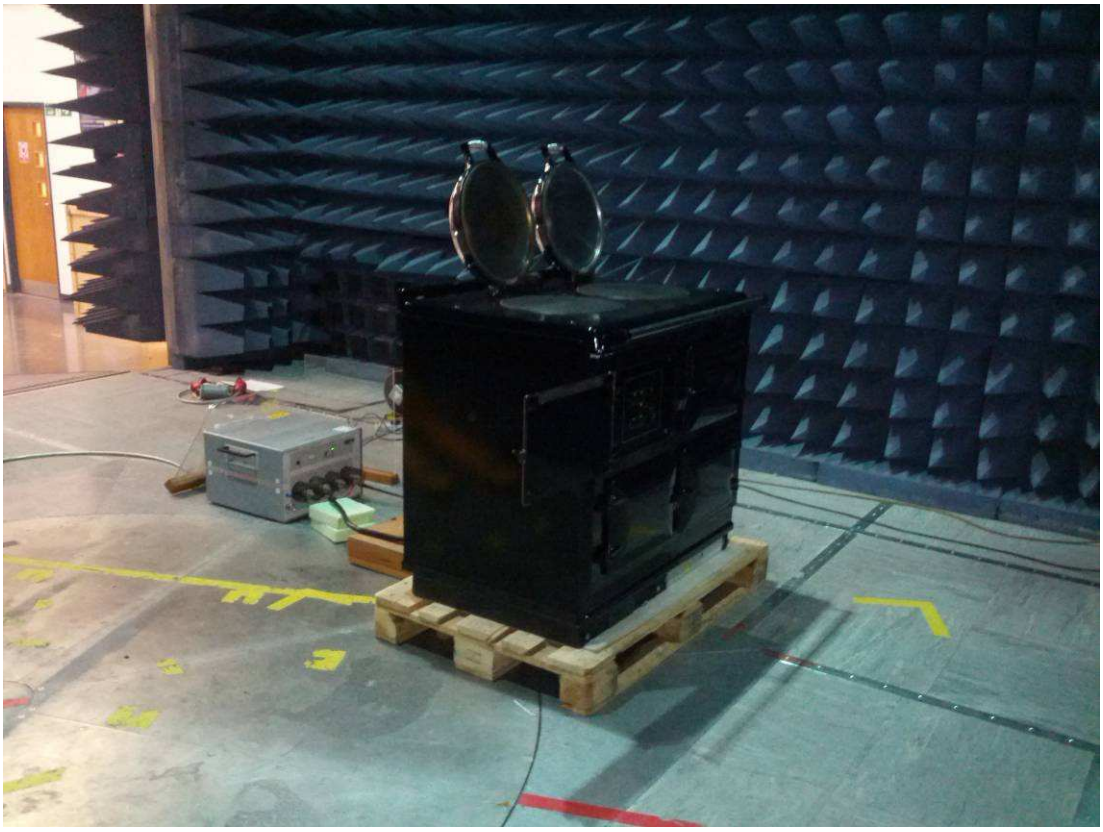
Date: 11.JUL.2013 13:31:48

Occupied Bandwidth = 402kHz

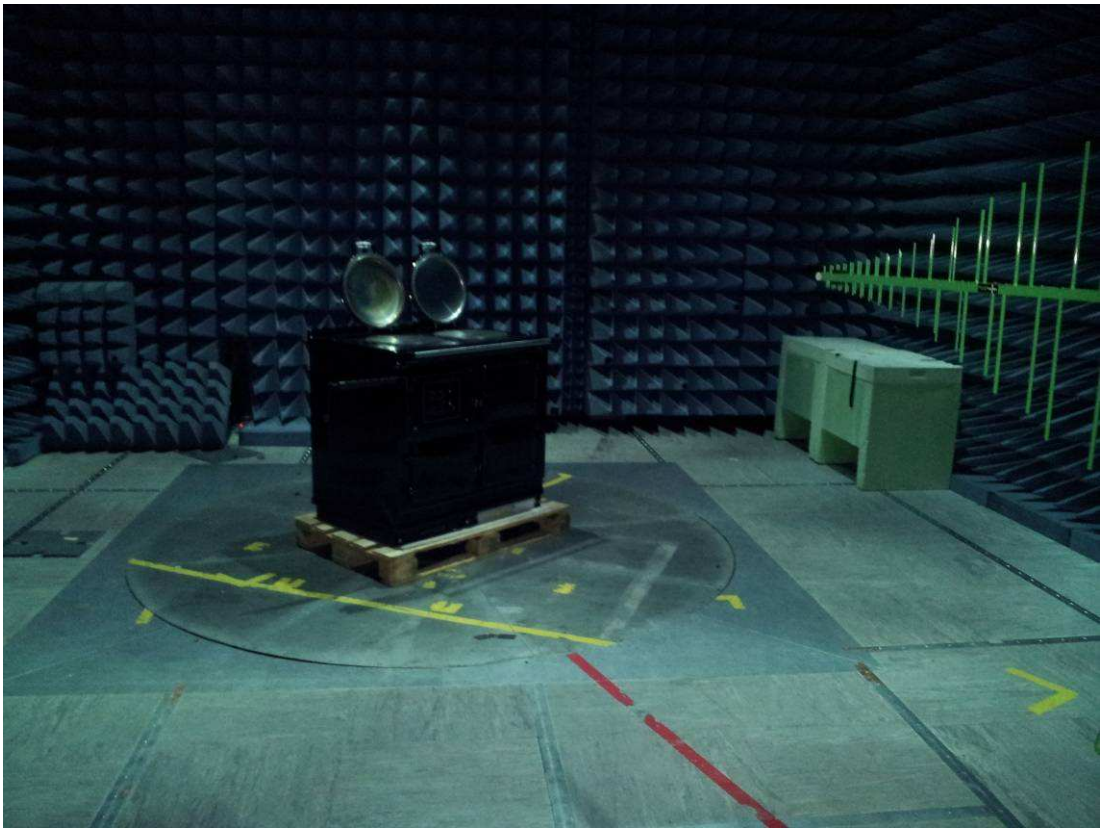
Uncertainty Budget Calculation(s)

Symbol	Source of Uncertainty	Value	Probability distribution	Divisor	c_i	u_i(y)	$(u_i(y))^2$	v_i or v_{eff}	ui^4(y)
RI	Receiver Indication	0.05	normal 2	2.000	1	0.03	0.001	∞	0
dVsw	Receiver Sine Wave	1.60	normal 2	2.000	1	0.80	0.640	∞	0
dVpa	Receiver Pulse Amplitude	1.60	normal 2	2.000	1	0.80	0.640	∞	0
dVpr	Receiver Pulse repetition	1.60	normal 2	2.000	1	0.80	0.640	∞	0
dVnf	Noise Floor Proximity	1.60	normal 2	2.000	1	0.80	0.640	∞	0
AF	Antenna Factor Calibration	1.20	normal 2	2.000	1	0.60	0.360	∞	0
CL	Cable Loss	0.50	normal 2	2.000	1	0.25	0.063	∞	0
AD	Antenna Directivity	3.00	rectangular	1.732	1	1.73	3.000	∞	0
AH	Antenna Factor Height Dependence	1.00	rectangular	1.732	1	0.58	0.333	∞	0
AP	Antenna Phase Centre Variation	0.50	rectangular	1.732	1	0.29	0.083	∞	0
AI	Antenna Factor Frequency Interpolation	0.68	rectangular	1.732	1	0.39	0.154	∞	0
SI	Site Imperfections	4.00	triangular	2.449	1	1.63	2.667	∞	0
DV	Measurement Distance Variation	0.60	rectangular	1.732	1	0.35	0.120	∞	0
Fstep	Frequency step error	0.00	rectangular	1.732	1	0.00	0.000	∞	0
M	Mismatch	-1.99	U-shaped	1.414	1	-1.41	1.990	∞	0
	Receiver VRC 0.216		-						0
	Antenna +Cable VRC 0.95		-						0
R_S	Measurement System Repeatability	0.96	normal 1	1.000	1	0.96	0.922	13	0.0653343 51
R_{EUT}	Repeatability of EUT	0.00	normal 1	1.000	1	0.00	0.000		0
$u_c(F_S)$	Combined Standard Uncertainty		normal			3.50	12.252	2298	0.0653343 51
$U(F_S)$	**Expanded Uncertainty**		**normal k=**	**1.64**		**5.7**		2298	

7. PHOTOGRAPHS OF TEST SETUP



Conducted Emissions 0.15 – 30MHz



Radiated Power and Spurious Emissions < 1GHz

Radiated Power and Spurious Emissions 1- 10GHz

8. TEST EQUIPMENT

Equipment	Type	ID	Cal Date	Cal Period
Test Bay 1	Semi Anechoic Room	7400	April 2012	3yrs
Chase Bilog Antenna	CB 6112	8164	May 2013	2yrs
EMCO Double Ridge Antenna	3115	7512	June 2013	2yrs
Rohde & Schwarz FSEK	Spectrum Analyser	8267	June 2013	1yr
Rohde & Schwarz ESCI	EMC Receiver	8283	Nov 2013	1yr
ERA Microwave Pre-amp	WBA3-4	8426	April 2014	1yr
Oregon Scientific Environmental sensor	Meteoscop 3	7729	Aug 2014	1yr
R&S 3Ø Lisn	ENV4200	7061	Sept 2013	1yr
N type Cable	UR 76	7602	April 2014	1yr
N type Cable	UR 76	8183	April 2014	1yr
N type Cable	UR 76	7569	April 2014	1yr
N type Cable	UR 76	7287	April 2014	1yr
Microwave Cable	Sucoflex 104	7176	July 2014	1yr
Microwave Cable	Sucoflex 104	7177	Nov 2013	1yr
K&L Band Reject Filter	3TNF – 800/1000	8452	Jan 2014	1yr

All test equipment used was within its calibration period.

ANNEX A REGISTRATION SITES

FEDERAL COMMUNICATIONS COMMISSION

Laboratory Division
7435 Oakland Mills Road
Columbia, MD 21046

April 19, 2012

Registration Number: 737726

Intertek
Unit D,
Imperial Park,
Leatherhead, KT22 7TS
United Kingdom

Attention: David Feasey, Consultant Engineer

Re: Measurement facility located at Leatherhead, United Kingdom
Anechoic chamber (3 meters)
Date of Renewal: April 19, 2012

Dear Sir or Madam:

Your request for renewal of the registration of the subject measurement facility has been received. The information submitted has been placed in your file and the registration has been renewed. The name of your organization will remain on the list of facilities whose measurement data will be accepted in conjunction with applications for Certification under Parts 15 or 18 of the Commission's Rules. Please note that the file must be updated for any changes made to the facility and the registration must be renewed at least every three years.

Measurement facilities that have indicated that they are available to the public to perform measurement services on a fee basis may be found on the FCC website www.fcc.gov under E-Filing, OET Equipment Authorization Electronic Filing, Test Firms.

Sincerely,

Phyllis Parrish
Industry Analyst

Industry Canada Industrie Canada

February 7, 2011

OUR FILE: 46405-2042
Submission No: 145396

Intertek Commercial & Electrical
Unit D Imperial Park Randalls Way
Leatherhead, SRY, KT22 7SB
United Kingdom

Attention: Dave Feasey

Dear Sir/Madame:

The Bureau has received your application for the renewal of a 3m alternative test site. Be advised that the information received was satisfactory to Industry Canada. The following number(s) is now associated to the site(s) for which registration / renewal was sought **(Site# 2042F-1).** Please reference the appropriate site number in the body of test reports containing measurements performed on the site. In addition, please keep for your records the following information;

- The company address code associated to the site(s) located at the above address is: **2042F**

Furthermore, to obtain or renew a unique site number, the applicant shall demonstrate that the site has been accredited to ANSI C63.4-2003 or later. A scope of accreditation indicating the accreditation by a recognized accreditation body to ANSI C63.4-2003 or later shall be accepted. Please indicate in a letter the previous assigned site number if applicable and the type of site (example: 3 metre OATS or 3 metre chamber). If the test facility is not accredited to ANSI C63.4-2003 or later, the test facility shall submit test data demonstrating full compliance with the ANSI standard. The Bureau will evaluate the filing to determine if recognition shall be granted.

The frequency for re-validation of the test site and the information that is required to be filed or retained by the testing party shall comply with the requirements established by the accrediting organization. However, in all cases, test site re-validation shall occur on an interval not to **exceed three years**. There is no fee or form associated with an OATS filing. OATS submissions are encouraged to be submitted electronically to the Bureau using the following URL;
http://strategis.ic.gc.ca/epic/internet/inceb-bhst.nsf/en/h_tt00052e.html.

If you have any questions, you may contact the Bureau by e-mail at certification.bureau@ic.gc.ca Please reference our file and submission number above for all correspondence.

Yours sincerely,

Dalwinder Gill

Dalwinder Gill
For: Wireless Laboratory Manager
Certification and Engineering Bureau
3701 Carling Ave., Building 94
P.O. Box 11490, Station "H"
Ottawa, Ontario K2H 8S2
Email: dalwinder.gill@ic.gc.ca
Tel. No. (613) 998-8363
Fax. No. (613) 990-4752