

EMC Test Report

Project Number: 4115134**Report Number: 4115134EMC01****Revision Level: 0****Client: Arris Group, Inc.****Equipment Under Test: Telephone Gateway Modem****Model: TG3452****FCC ID: UIDTG3452****IC ID: 6670A-TG3452****Applicable Standards: FCC Part 15 Subpart C, § 15.247****RSS-247, Issue 2****ANSI C63.10: 2013****Report issued on: 14 April 2017****Test Result: Compliant**

Tested by:



Jeremy O. Pickens, Senior EMC Engineer

Reviewed by:



David Schramm, EMC/RF/SAR/HAC Manager**Remarks:**

This report details the results of the testing carried out on one sample, the results contained in this test report do not relate to other samples of the same product. The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report.

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1 Summary of Test Results

Test Description	Test Specification		Test Result
Bandwidth	15.247(d)	RSS-247 S5.2 (1) RSS-GEN S6.6	Compliant
Transmitter Output Power	15.247(b)(3)	RSS-247 S5.4 (4)	Compliant
Power Spectral Density	15.247(e)	RSS-247 S5.2 (2)	Compliant
Conducted Spurious Emissions / Band edge	15.247(d)	RSS-247 S5.5	Compliant
Radiated Spurious Emissions / Restricted Bands	15.35(b),15.209	RSS-GEN S6.13 RSS-GEN S8.10	Compliant
AC Powerline Conducted Emission	15.107, 15.207	RSS-GEN S8.8	Compliant

1.1 Modifications Required for Compliance

None

2 General Information

2.1 Client Information

Name: ARRIS Group, Inc.
Address: 3871 Lakefield Drive, Suite 300
City, State, Zip, Country: Suwanee, GA 30024, USA

2.1 Test Laboratory

Name: SGS North America, Inc.
Address: 620 Old Peachtree Road NW, Suite 100
City, State, Zip, Country: Suwanee, GA 30024, USA

Accrediting Body: A2LA
Type of lab: Testing Laboratory
Certificate Number: 3212.01

2.2 General Information of EUT

Type of Product: Telephone Gateway Modem
Model Number: TG3452
Serial Number: 71G2M1222202306 (Conducted)
71G2M1222202391 (Radiated)
Power Supply: M/N: PA-1500-6AR1, P/N: AREP05678

Frequency Range: 2400-2483.5MHz
Data Modes: 802.11b, 802.11g, 802.11n (HT20), 802.11n (HT40),
Antenna: Internal, 3x3 MIMO

Rated Voltage: 100-240Vac, 50/60Hz (AC to 12VDC Adapter)
Test Voltage: 120Vac, 60Hz

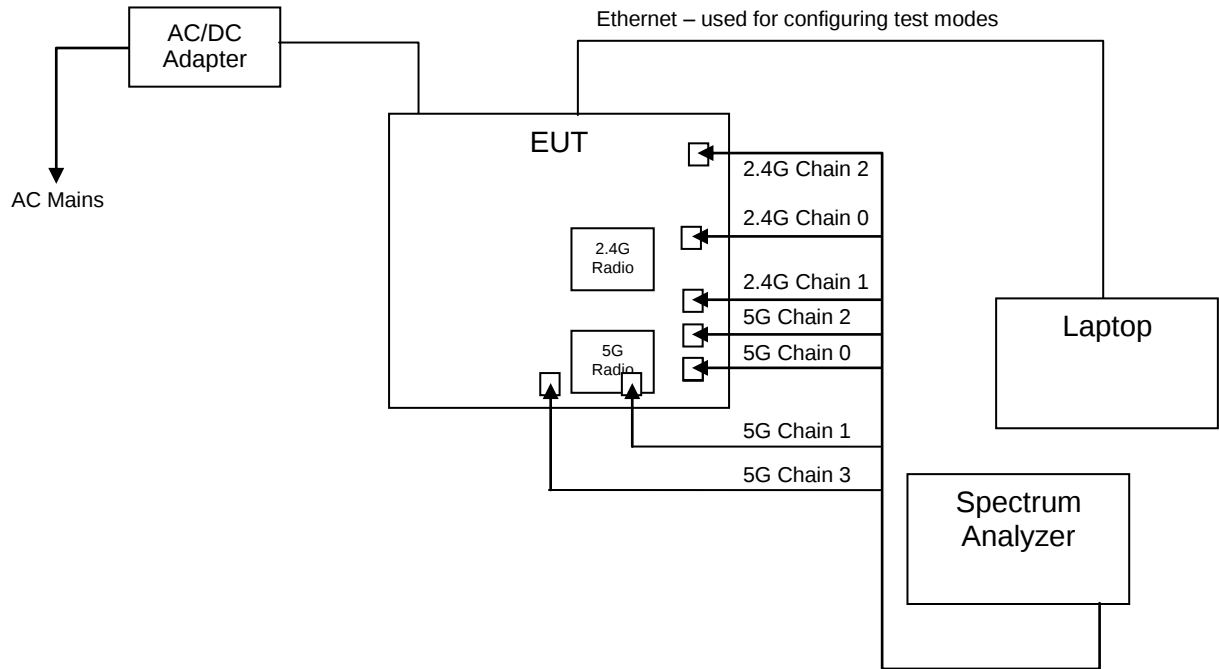
Sample Received Date: 08 March 2017
Dates of testing: 08 March - 12 April 2017

2.3 Operating Modes and Conditions

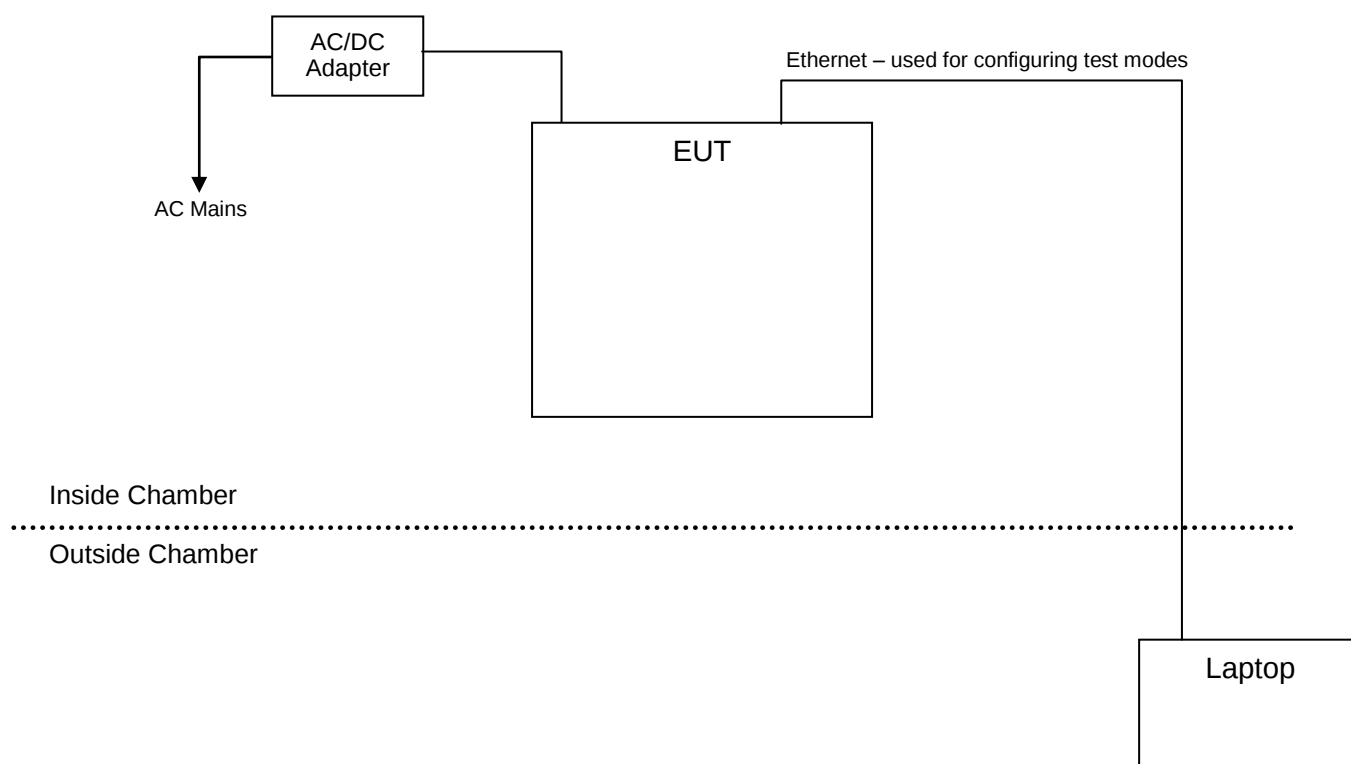
For spurious emissions measurements, only the worst-case mode with respect to peak power was investigated: 802.11b, 1Mbps. Investigations covered the low, middle, and high channels in the 2400-2483.5MHz band.

Continuous traffic was generated using test commands. Where the duty cycle measured below 99% and an RMS detector was employed, corrections of $10 \cdot \log(1/D)$ were applied according to KDB publication 558074 D01 DTS Meas Guidance v04.

2.4 EUT Connection Block Diagram – Conducted Measurements



2.5 EUT Connection Block Diagram – Radiated Measurements



2.6 System Configurations

Device reference	Manufacturer	Description	Model Number	Serial Number
A	Arris	Telephone Gateway Modem	TG3452	73B2M1333301099 (Conducted) 71G2M1222202391 (Radiated)
B	LiteOn	AC/DC Supply	PA-1500-6AR1 P/N: AREP05678	Not Labeled

3 Bandwidth

3.1 Test Result

Test Description	Test Specification		Test Result
6 dB bandwidth / 99% OBW	15.247(d)	RSS-247 S5.2 (1) RSS-GEN S6.6	Compliant

3.2 Test Method

The procedures from ANSI C63.10: 2013 clause 11.8 and 558074 D01 DTS Meas Guidance v04 were used to determine the 6 dB bandwidth and 99% OBW.

3.3 Test Site

SGS EMC Laboratory, Suwanee, GA

Environmental Conditions

Temperature: 23.1 °C

Relative Humidity: 29.3 %

3.4 Test Equipment

Test Date: 7-Apr-2017

Tester: JOP

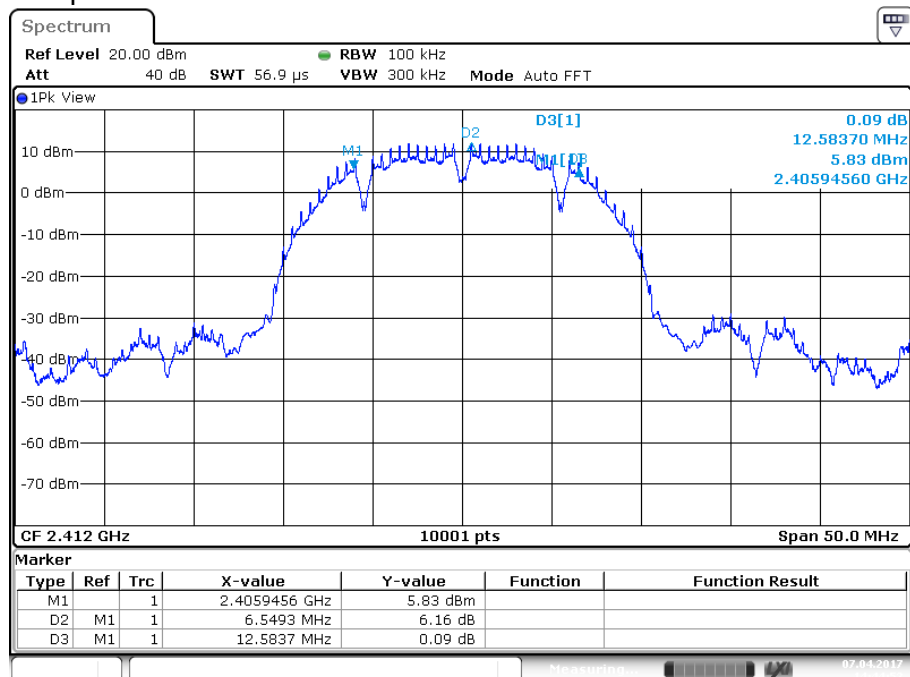
Equipment	Model	Manufacturer	Asset Number	Cal Due Date
SIGNAL ANALYZER	FSV30	ROHDE & SCHWARZ	B085749	8-Oct-2017
RF CABLE	141	HUBER & SUHNER	B095585	26-Jul-2017

Note: The equipment calibration period is 1 year except for the FSV which is on a 2 year cycle.

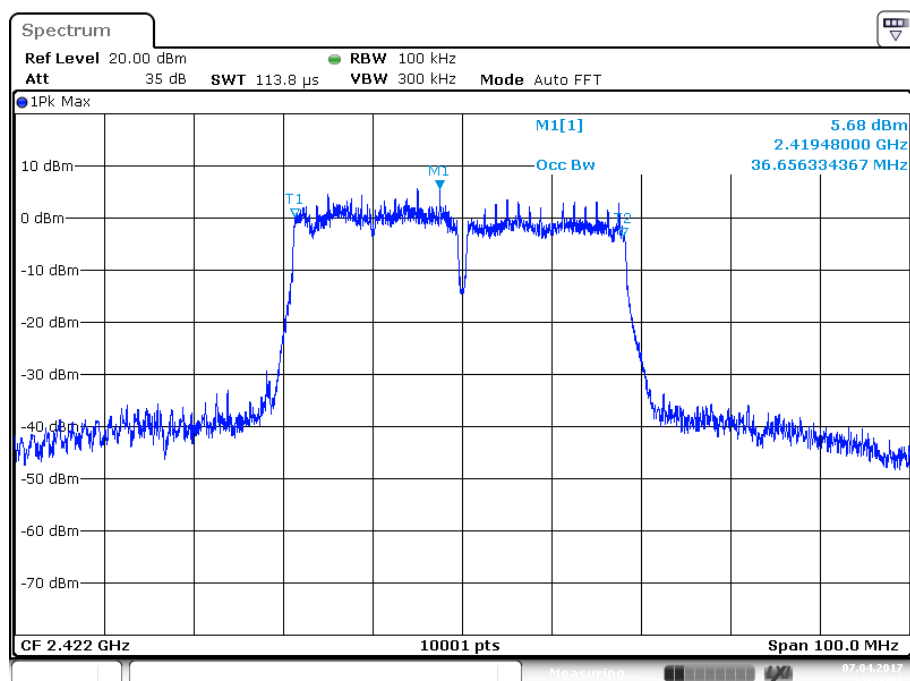
3.5 Test Data

Protocol	Channel	Data Rate	6dB Bandwidth (MHz)	Occupied Bandwidth (99%) (MHz)
802.11b	1	1 Mbps	12.584	16.168
802.11b	6	1 Mbps	13.446	16.248
802.11b	11	1 Mbps	12.996	16.228
802.11g	1	6 Mbps	16.613	16.343
802.11g	6	6 Mbps	16.286	16.448
802.11g	11	6 Mbps	16.616	16.343
802.11n (HT20)	1	MCS0	16.418	17.528
802.11n (HT20)	6	MCS0	16.513	17.513
802.11n (HT20)	11	MCS0	17.861	17.518
802.11n (HT40)	3	MCS0	37.207	36.656
802.11n (HT40)	6	MCS0	37.096	36.641
802.11n (HT40)	9	MCS0	37.21	36.646

Sample Plots



Date: 7.APR.2017 14:44:53



Date: 7.APR.2017 14:53:03

4 Output Power

4.1 Test Result

Test Description	Test Specification		Test Result
Peak Output Power	15.247(b) (3)	RSS-247 S5.4 (4)	Compliant

4.2 Test Method

Fundamental power measurements were recorded using the peak power procedures from ANSI C63.10: 2013 clause 11.9 and KDB 558074 D01 Measurement Guidance v04. The lowest data rate for each modulation was found to be the worst-case.

Limit

(3) For systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands: 1 Watt. For using antennas with greater than 6dBi of gain, the limit is reduced in dB by the amount the gain exceeds 6dBi (e.g. for a 7.4dBi antenna, the limit is reduced from 30dBm to 28.6dBm)

4.3 Test Site

SGS EMC Laboratory, Suwanee, GA

Environmental Conditions

Temperature: 22.6 °C

Relative Humidity: 40.1 %

4.4 Test Equipment

Test End Date: 3-Apr-2017

Tester: JOP

Equipment	Model	Manufacturer	Asset Number	Cal Due Date
SIGNAL ANALYZER	FSV30	ROHDE & SCHWARZ	B085749	8-Oct-2017
RF CABLE	141	HUBER & SUHNER	B095585	26-Jul-2017

Note: The equipment calibration period is 1 year except for the FSV30 which is on a 2-year cycle.

4.5 Test Data

802.11b 20MHz								
Frequency (MHz)	Channel (WLAN)	Chain 0 (dBm)	Chain 1 (dBm)	Chain 2 (dBm)	Total Power (dBm)	Antenna Gain (dBi)	Limit (dBm)	Margin (dB)
2412	1	20.3	20.8	18.5	24.75	6.3	29.7	-4.95
2437	6	23.5	24.1	21.9	28.04	6.3	29.7	-1.66
2462	11	21	21.6	19.7	25.61	6.3	29.7	-4.09

802.11g 20MHz								
Frequency (MHz)	Channel (WLAN)	Chain 0 (dBm)	Chain 1 (dBm)	Chain 2 (dBm)	Total Power	Antenna Gain(dBi)	Power Limit dBm	Margin
2412	1	20.3	20.8	18.6	24.77	6.3	29.7	-4.93
2437	6	23.6	24.2	22.2	28.19	6.3	29.7	-1.51
2462	11	19.2	19.7	17.7	23.72	6.3	29.7	-5.98

802.11n 20MHz								
Frequency (MHz)	Channel (WLAN)	Chain 0 (dBm)	Chain 1 (dBm)	Chain 2 (dBm)	Total Power	Antenna Gain(dBi)	Power Limit dBm	Margin
2412	1	21	21.6	19.5	25.56	4	30	-4.44
2437	6	25.6	25.9	23.8	29.97	4	30	-0.03
2462	11	19.6	20.1	18.2	24.15	4.2	30	-5.85

802.11n 40MHz								
Frequency (MHz)	Channel (WLAN)	Chain 0 (dBm)	Chain 1 (dBm)	Chain 2 (dBm)	Total Power	Antenna Gain(dBi)	Power Limit dBm	Margin
2422	3	19	19.6	17.5	23.56	4	30	-6.44
2437	6	21.7	22.4	20.1	26.28	4	30	-3.72
2452	9	18.1	18.7	16.6	22.66	4.2	30	-7.34

Note: Antenna gain values were provided by Arris. The values were maximum measured gains from the EUT. For correlated streams used in legacy 802.11 (b/g), the gain is higher because it represents the peak composite gain of all three antennas combined. For uncorrelated streams used in MIMO 802.11 (n), the gain shown is the max peak gain when comparing all three antennas.

5 Power Spectral Density

5.1 Test Result

Test Description	Test Specification		Test Result
Power Spectral Density	15.247(e)	RSS-247 S5.2 (2)	Compliant

5.2 Test Method

Fundamental power measurements were recorded using the peak PSD procedures from ANSI C63.10: 2013 clause 11.10 and KDB 558074 D01 Measurement Guidance v04. The lowest data rate for each modulation was determined to be the worst-case.

Limit

The limit is 8 dBm.

5.3 Test Site

SGS EMC Laboratory, Suwanee, GA

Environmental Conditions

Temperature: 23.1 °C
Relative Humidity: 29.3 %

5.4 Test Equipment

Test Date: 7-Apr-2017

Tester: JOP

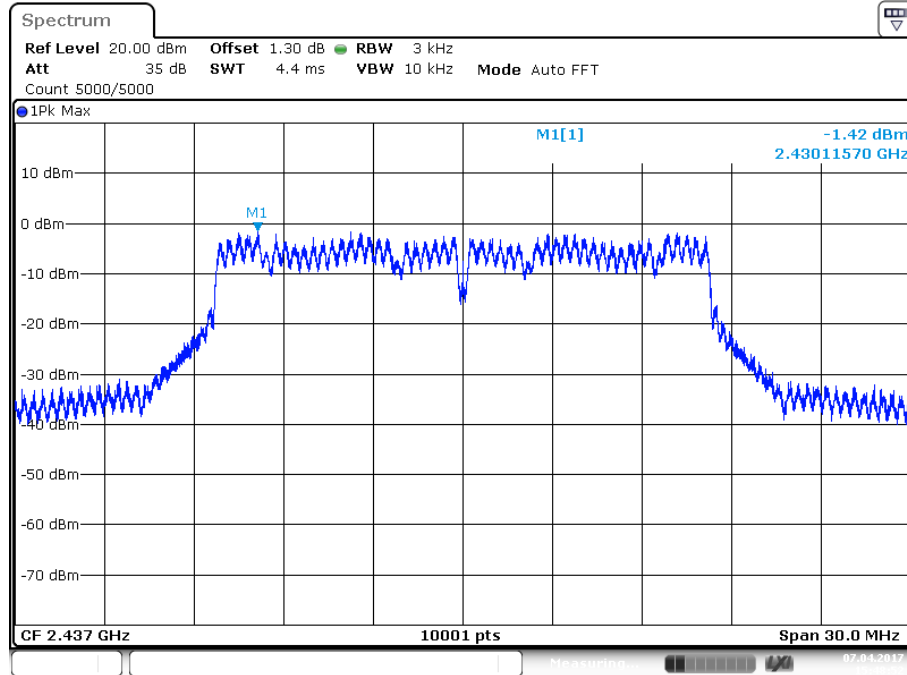
Equipment	Model	Manufacturer	Asset Number	Cal Due Date
SIGNAL ANALYZER	FSV30	ROHDE & SCHWARZ	B085749	8-Oct-2017
RF CABLE	141	HUBER & SUHNER	B095585	26-Jul-2017

Note: The equipment calibration period is 1 year except for the FSV which is on a 2 year cycle.

5.5 Test Data

Protocol	Channel	PSD Chain 0 (dBm)	PSD Chain 1 (dBm)	PSD Chain 2 (dBm)	PSD Summed (dBm)	Limit (dBm)	Margin (dB)
802.11b	1	-0.7	-0.2	-2.5	3.74	8	-4.26
802.11b	6	3.15	3.75	1.55	7.68	8	-0.32
802.11b	11	1.19	1.79	-0.11	5.80	8	-2.20
802.11g	1	-6.32	-5.82	-8.02	-1.85	8	-9.85
802.11g	6	-2.02	-1.42	-3.42	2.56	8	-5.44
802.11g	11	-5.88	-5.38	-7.38	-1.36	8	-9.36
(HT20)	1	-5.09	-4.49	-6.59	-0.53	8	-8.53
(HT20)	6	0.45	0.75	-1.35	4.82	8	-3.18
(HT20)	11	-6.9	-6.4	-8.3	-2.36	8	-10.36
(HT40)	3	-8.57	-7.97	-10.07	-4.01	8	-12.01
(HT40)	6	-6.34	-5.64	-7.94	-1.77	8	-9.77
(HT40)	9	-9.36	-8.76	-10.86	-4.80	8	-12.80

Sample Plot



Date: 7.APR.2017 15:48:52

6 Conducted Spurious Emissions

6.1 Test Result

Test Description	Test Specification		Test Result
Conducted Spurious Emissions	15.247(d)	RSS-247 S5.5	Compliant

6.2 Test Method

Spurious emissions in non-restricted frequency bands were recorded using the methods defined in ANSI C63.10: 2013 clause 11.11 and KDB 558074 D01 Measurement Guidance v04.

Lowest, middle, and highest channels were investigated. Only the worst-case (lowest data rate) for each modulation was reported.

Because the average conducted peak output power was used to determine compliance with the output power limits, the limit is 30 dB below the maximum in-band peak PSD level in 100 kHz.

6.3 Test Site

SGS EMC Laboratory, Suwanee, GA

Environmental Conditions

Temperature: 23.1 °C

Relative Humidity: 29.3 %

6.4 Test Equipment

Test Date: 7-Apr-2017

Tester: JOP

Equipment	Model	Manufacturer	Asset Number	Cal Due Date
SIGNAL ANALYZER	FSV30	ROHDE & SCHWARZ	B085749	8-Oct-2017
RF CABLE	141	HUBER & SUHNER	B095585	26-Jul-2017

Note: The equipment calibration period is 1 year except for the FSV which is on a 2 year cycle.

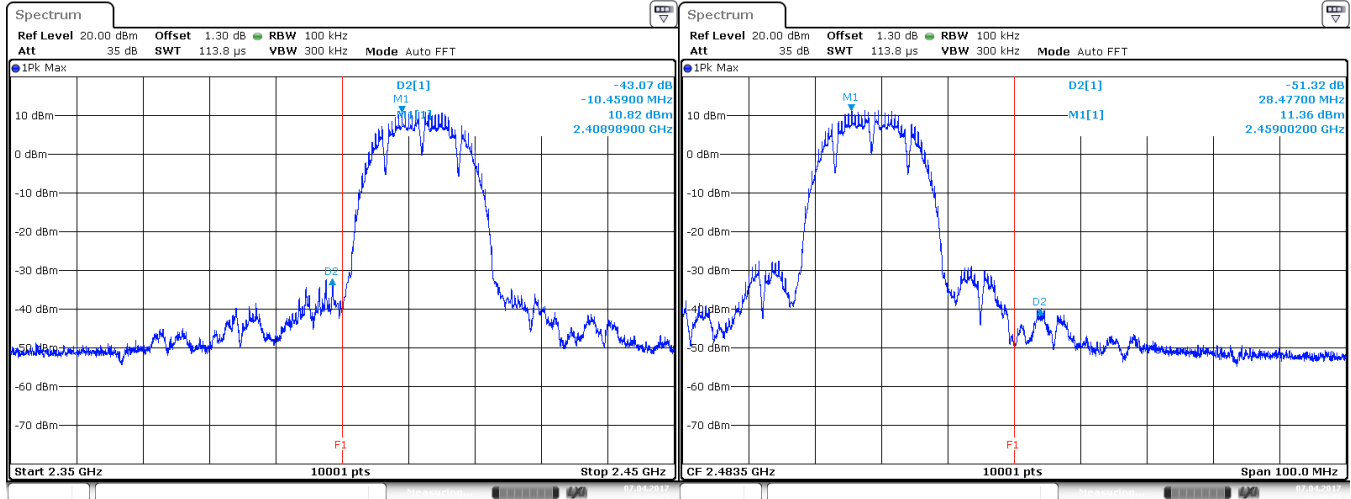
6.5 Test Data – DTS Bandedge

802.11b

Lower band edge / Upper band edge

Channel 1 / Channel 11

1Mbit/s



Date: 7.APR.2017 16:16:13

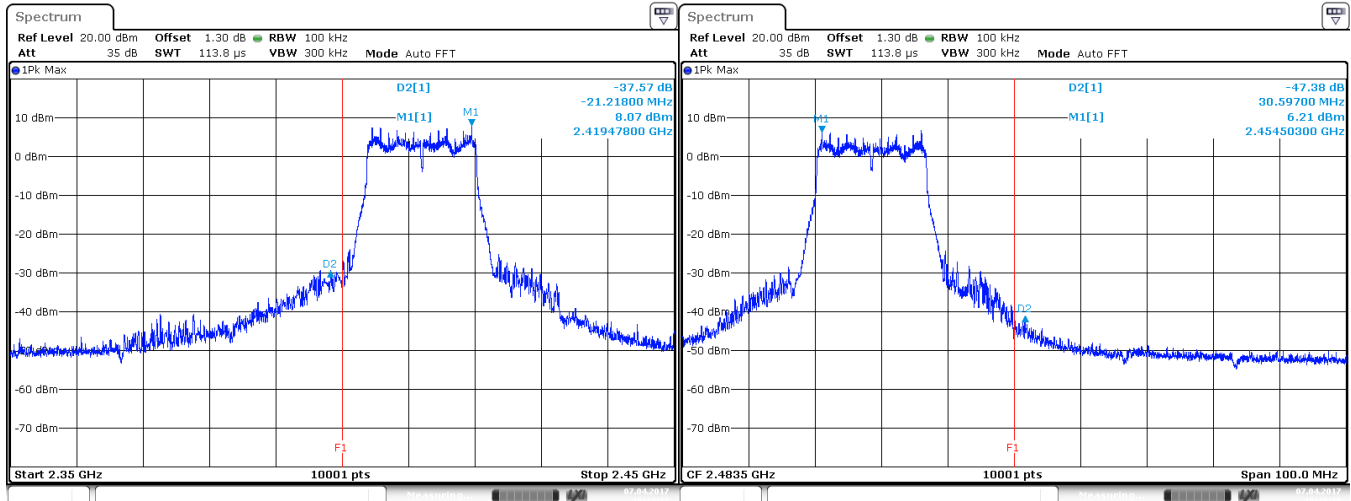
Date: 7.APR.2017 16:18:02

802.11g

Lower band edge / Upper band edge

Channel 1 / Channel 11

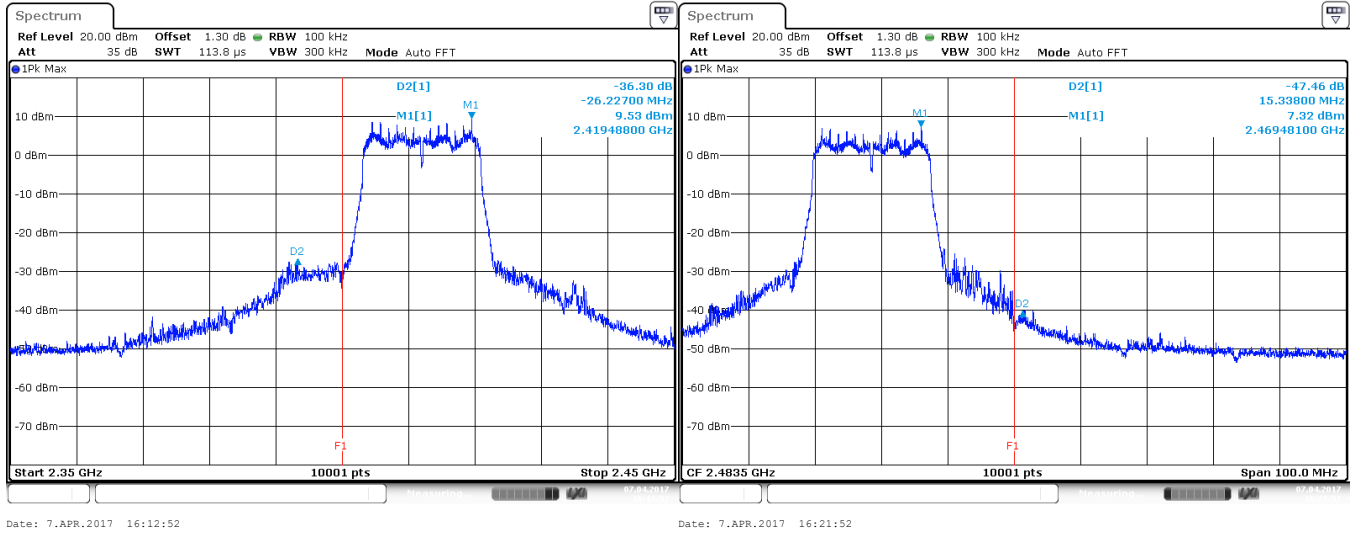
6Mbit/s



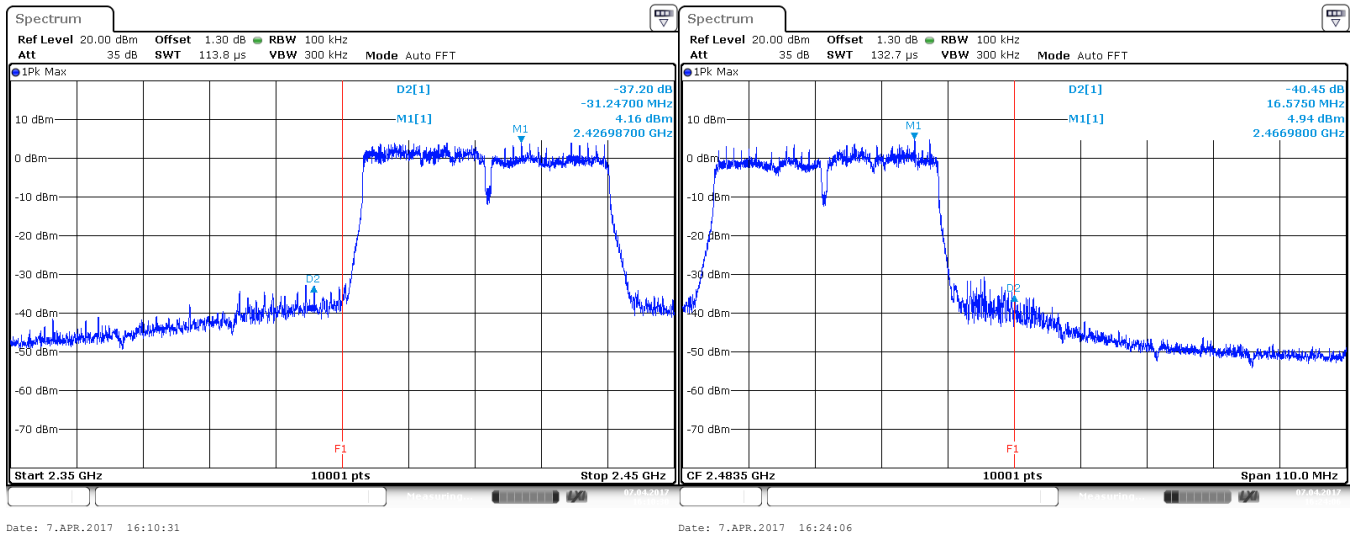
Date: 7.APR.2017 16:14:33

Date: 7.APR.2017 16:19:36

802.11n (HT20)
Lower band edge / Upper band edge
Channel 1 / Channel 11
MCS0

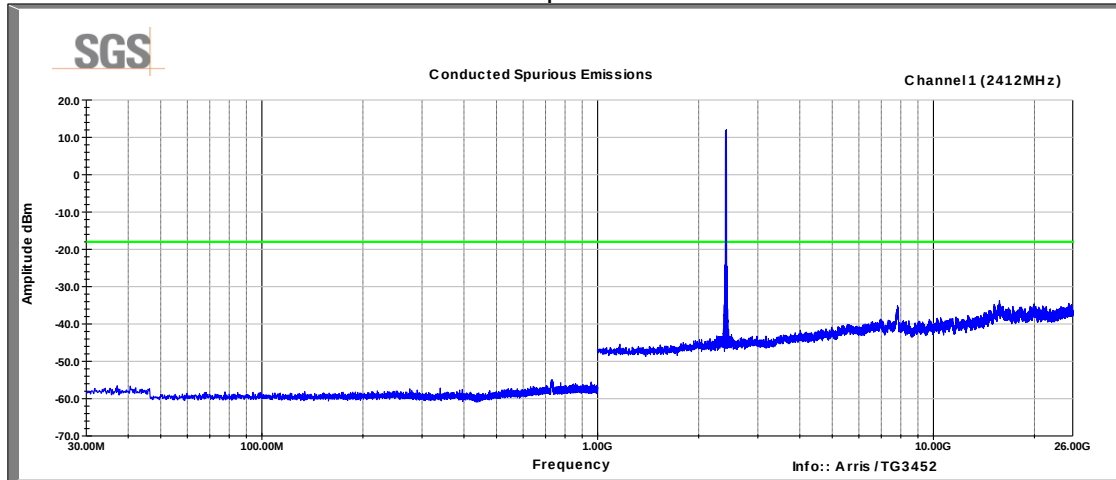


802.11n (HT20)
Lower band edge / Upper band edge
Channel 3 / Channel 9
MCS0

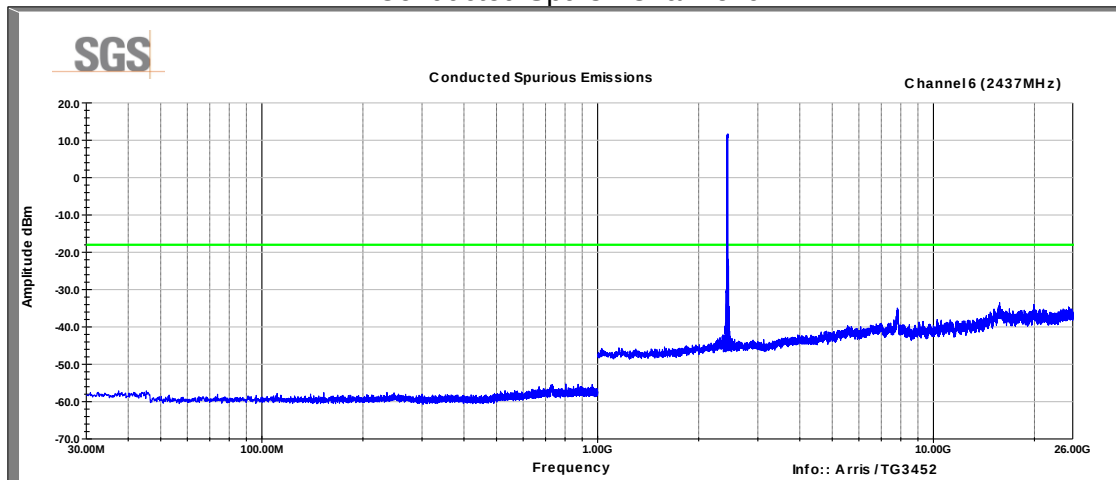


6.6 Test Data – Conducted Spurious Emissions

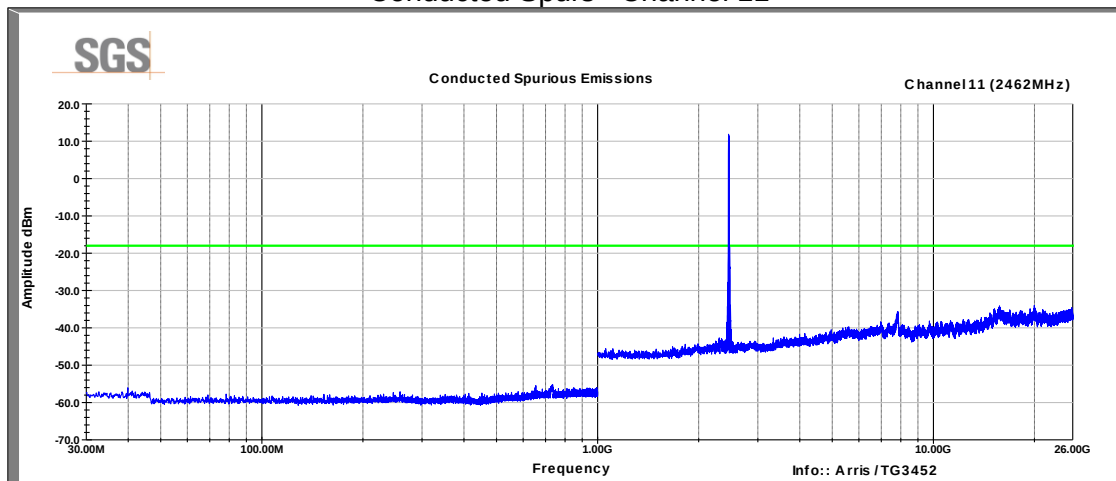
Conducted Spurs –Channel 1



Conducted Spurs –Channel 6



Conducted Spurs –Channel 11



7 Field Strength of Spurious Radiation

7.1 Test Result

Test Description	Test Specification		Test Result
Spurious Emissions	15.247 (d) and 15.209	RSS-247 S5.5	Compliant

7.2 Test Method

Radiated spurious emissions measurements were recorded with the device configured to transmit at the lowest, middle, and highest channels. The frequency range investigated was up through the 10th harmonic of the fundamental transmit frequency. The methods defined in ANSI C63.10: 2013 were used.

Lowest, middle, and highest channels were investigated. Only the worst-case (802.11b, 1Mbps) was reported except at the restricted band edges where all three modulations were measured.

Test distance:

- 9k to 30 MHz – Near field prescan to determine if there were any emissions.
- 30 to 1000 MHz - The EUT to measurement antenna distance was 3 meters
- 1 to 18 GHz - The EUT to measurement antenna distance was 3 meters
- 18 to 26 GHz - The EUT to measurement antenna distance was 1 meter

Limits within restricted bands of operation:

Frequency	Limits ⁽¹⁾		Peak Limits dBuV/m
	Microvolts/m	dBuV/m	
30 - 88 MHz	100	40 ⁽²⁾	--
88 - 216 MHz	150	43.5 ⁽²⁾	--
216 - 960 MHz	200	46 ⁽²⁾	--
960 - 1000 MHz	500	54 ⁽²⁾	--
1 - 40 GHz	500	54 ⁽³⁾	74

(1) These limits are applicable to emissions outside of the intentional transmit frequency band.

(2) Quasi-peak limit

(3) Average limit

7.3 Test Site

SGS EMC Laboratory, Suwanee, GA

Environmental Conditions

Temperature: 24.0 °C

Relative Humidity: 46.3 %

7.4 Test Equipment

Test End Date: 27-Mar-2017

Tester: FN

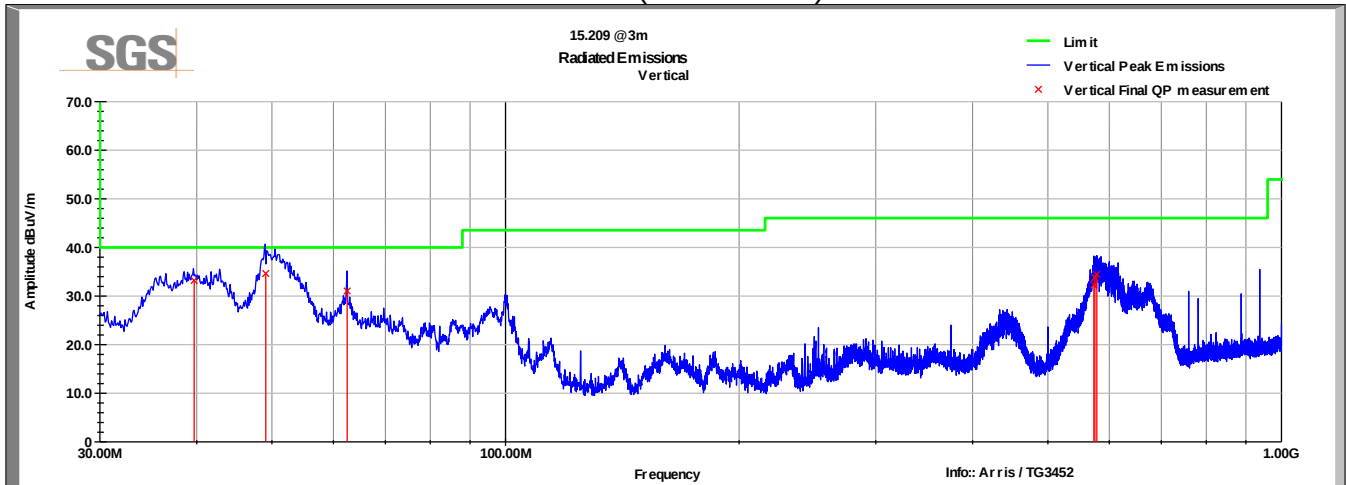
Equipment	Model	Manufacturer	Asset Number	Cal Due Date
EMI TEST RECEIVER	ESU40	ROHDE & SCHWARZ	B079629	20-Jun-2017
ANTENNA, DRG HORN (MEDIUM)	3117	ETS LINDGREN	B079699	26-Apr-2017
RF CABLE	NFS-290-78.7-NFS	FLORIDA RF LABS	B095019	28-Jul-2017
RF CABLE	NMS-290-236.2-NMS	FLORIDA RF LABS	B095020	29-Jul-2017
RF CABLE	SF106	HUBER & SUHNER	B079661	29-Jul-2017
RF CABLE	SUCOFLEX 100	HUBER & SUHNER	B108523	4-Aug-2017
ANTENNA, DRG HORN (SMALL)	3116B	ETS LINDGREN	B079695	15-Jul-2017
RF CABLE	SF102	HUBER & SUHNER	B079822	27-Jul-2017
RF CABLE	SF102	HUBER & SUHNER	B079824	27-Jul-2017
LOW NOISE AMPLIFIER	NSP1840-HG	MITEQ	B087572	29-Jul-2017
ANTENNA, BILOG	JB6	SUNOL	B079690	10-Nov-2017
RF CABLE	CBL-25FT-NMNM	MINI-CIRCUITS	B094941	25-Jul-2017
RF CABLE	SF106	HUBER & SUHNER	B079713	27-Jul-2017
RF CABLE	SF106	HUBER & SUHNER	B085892	27-Jul-2017
RF CABLE	104PE	HUBER & SUHNER	B079793	27-Jul-2017
LOW NOISE AMPLIFIER	TS-PR18	ROHDE & SCHWARZ	B094463	22-Feb-2018
FILTER, BAND REJECT	BRM50702	MICRO-TRONICS	B079791	29-Jul-2017

Note: The equipment calibration period is 1 year.

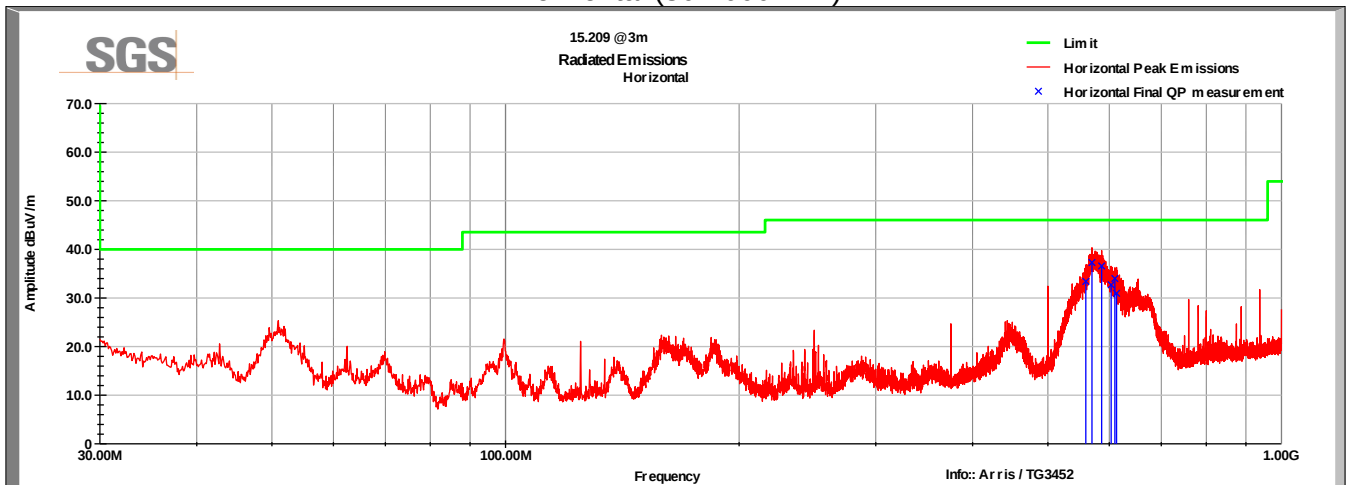
7.5 Peak Plots

No emissions were detected in the range 9kHz to 30MHz.

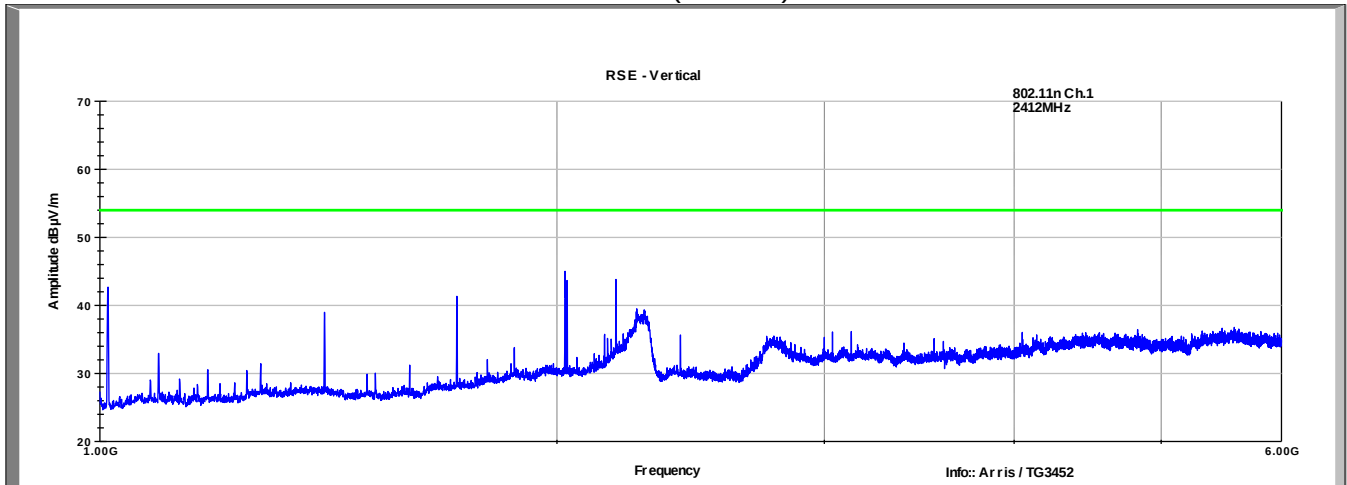
Channel 1
Vertical (30-1000MHz)



Horizontal (30-1000MHz)

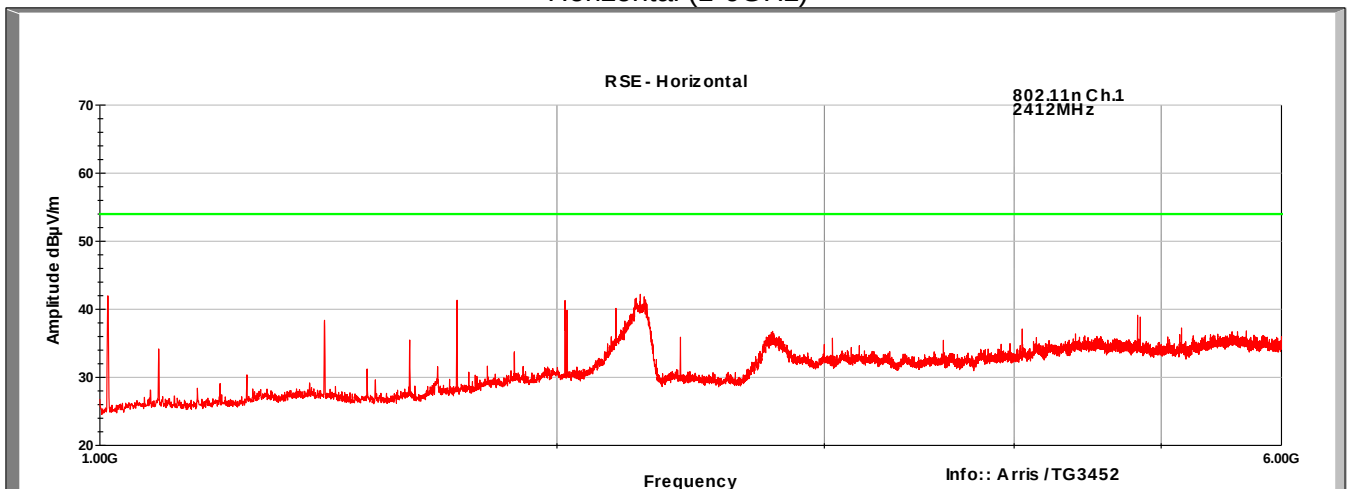


Channel 1 Vertical (1-6GHz)



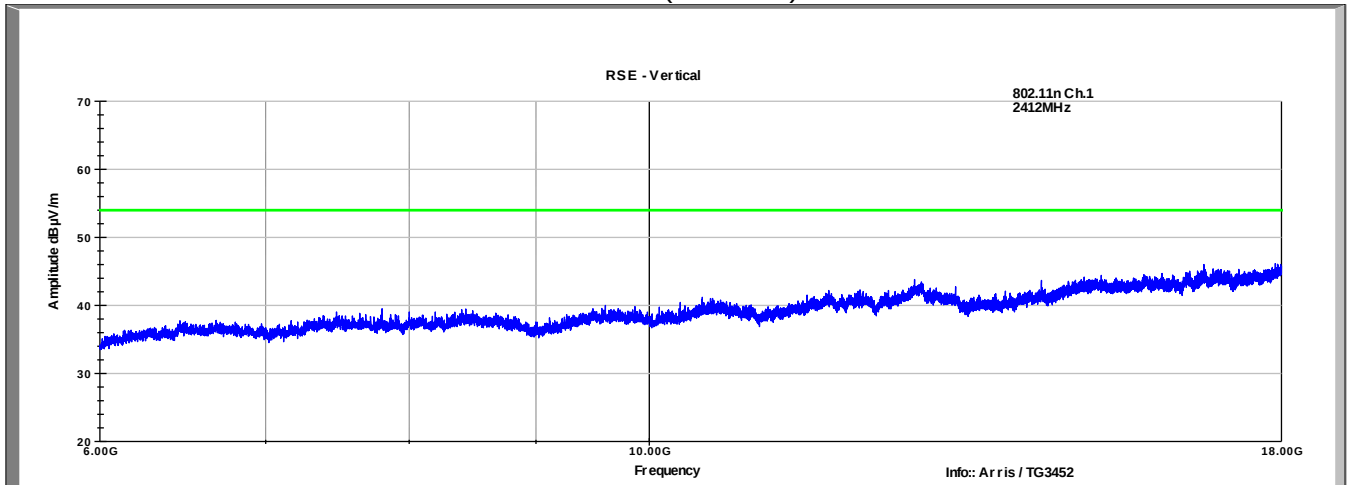
Worst-case peak emission (digital): 45.0dBµV/m @ 2.025GHz

Horizontal (1-6GHz)

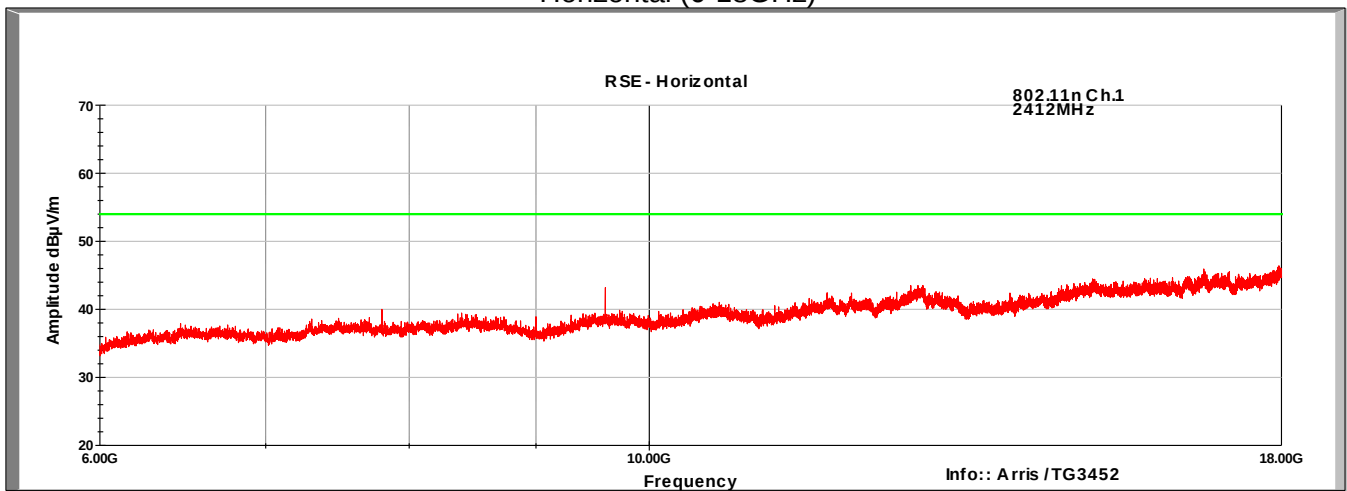


Worst-case peak emission (digital): 42.0dBµV/m @ 1.012GHz

Channel 1
Vertical (6-18GHz)

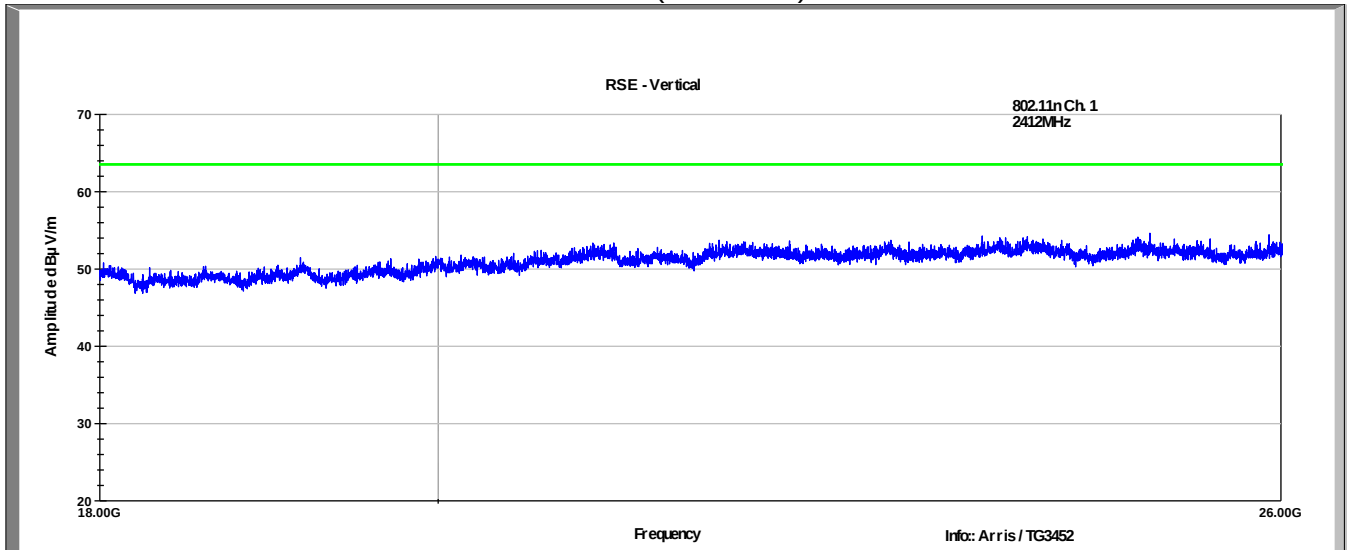


Horizontal (6-18GHz)

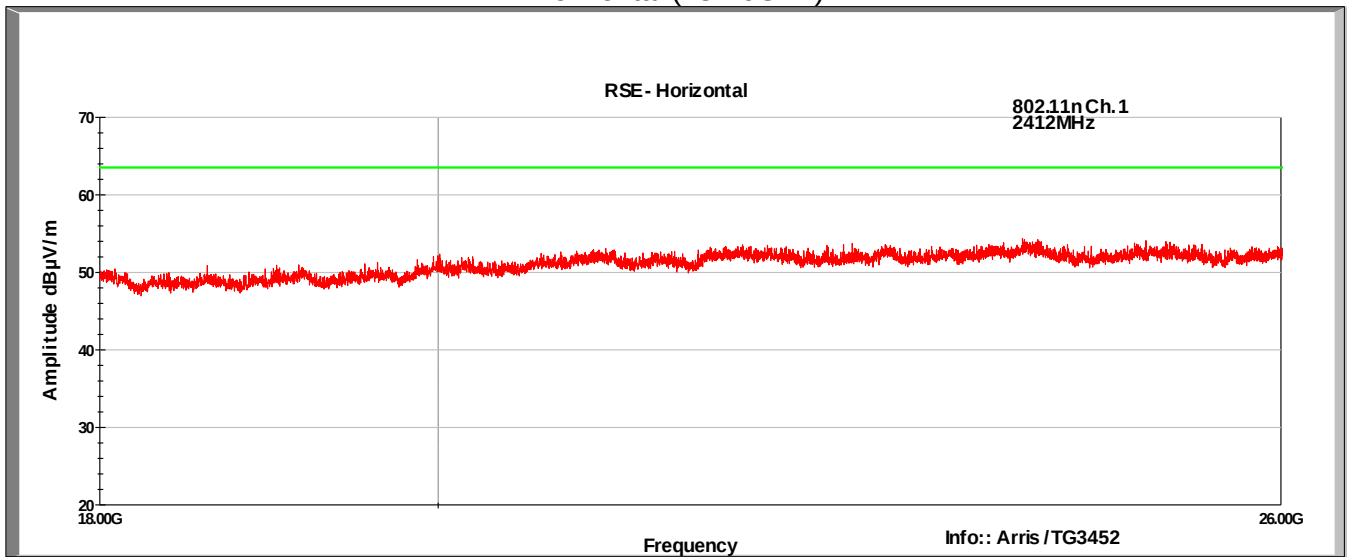


Worst-case peak emission (digital): 43.2dBµV/m @ 9.6GHz

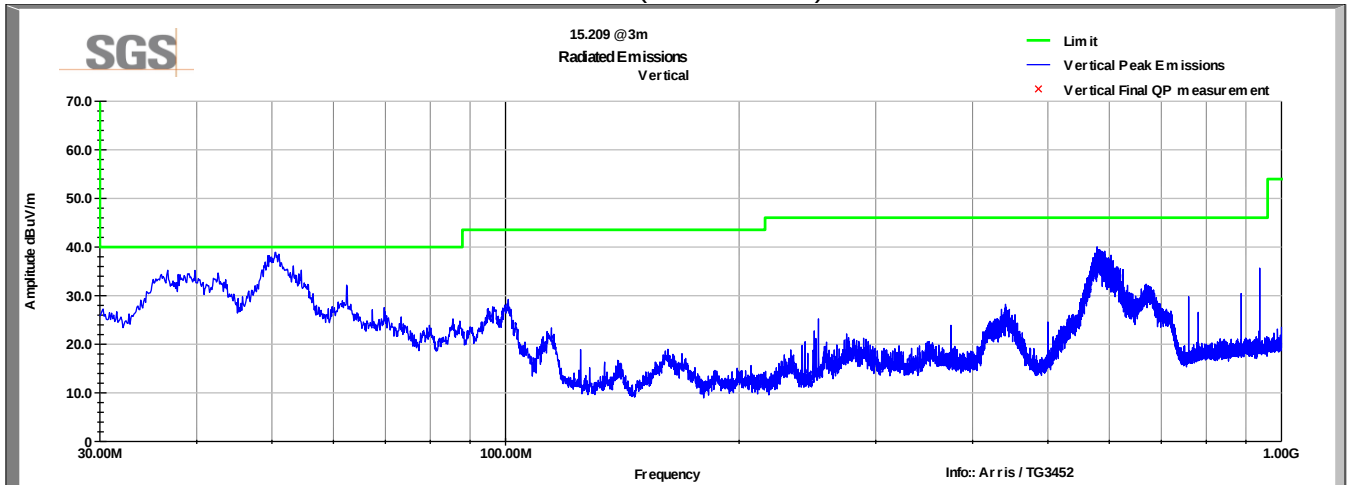
Channel 1
Vertical (18-26GHz)



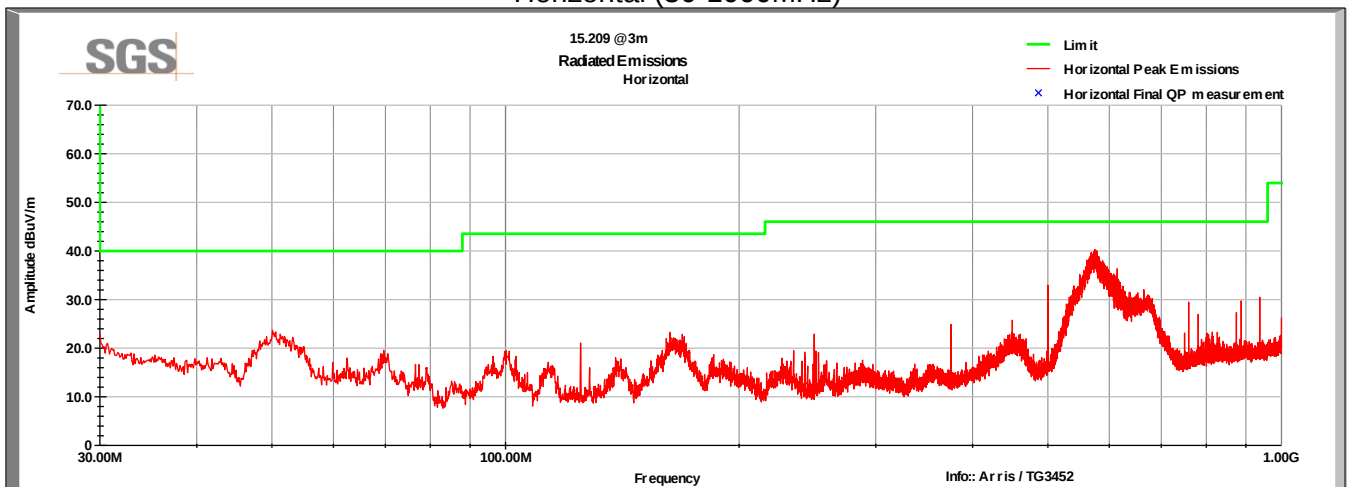
Horizontal (18-26GHz)



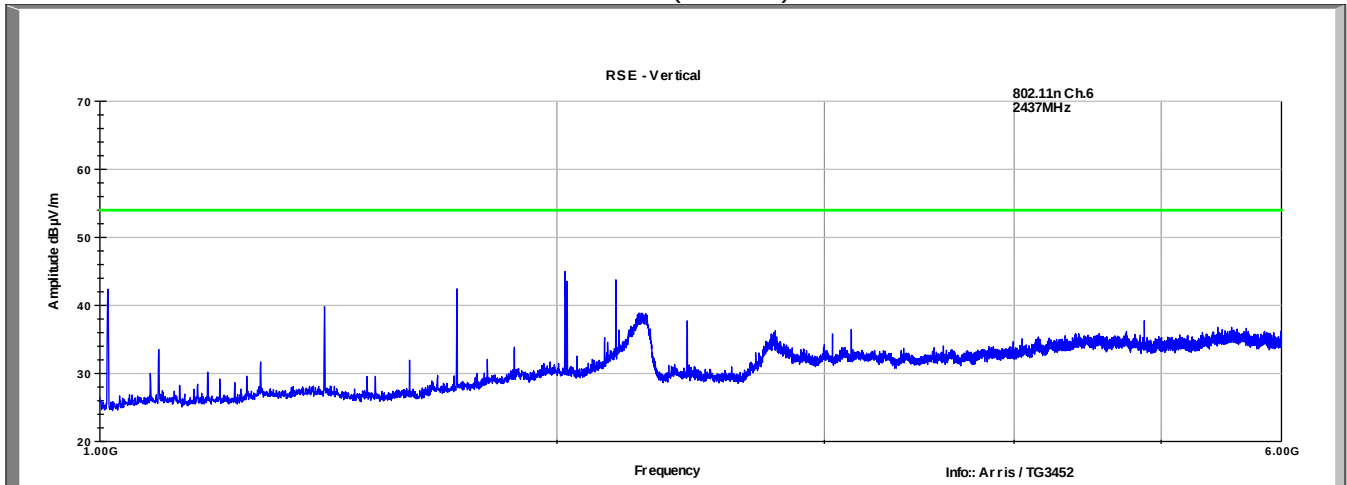
Channel 6 Vertical (30-1000MHz)



Horizontal (30-1000MHz)

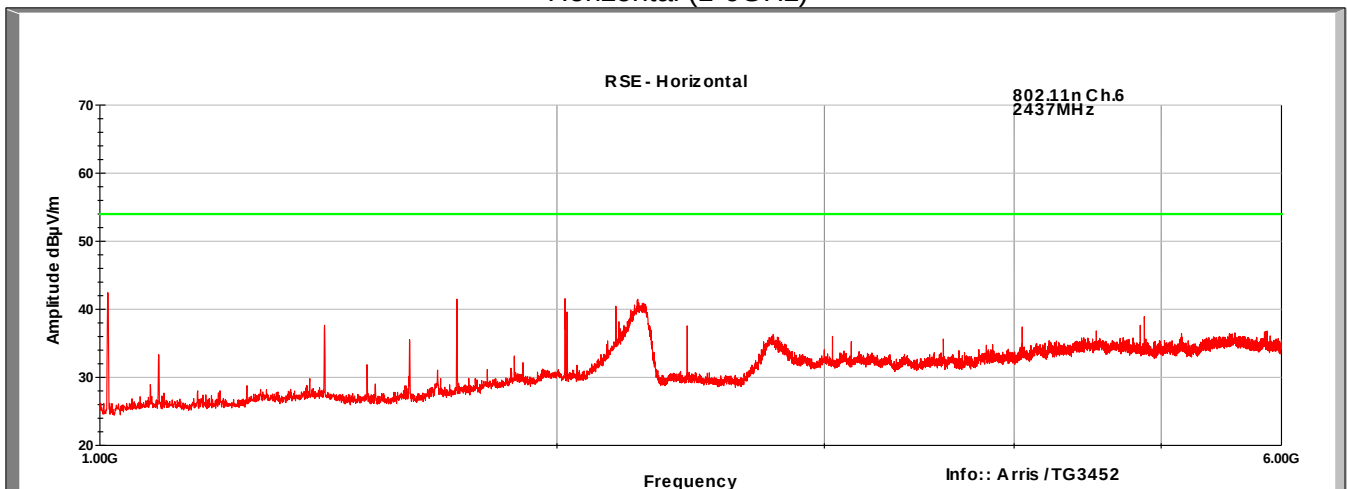


Channel 6
Vertical (1-6GHz)



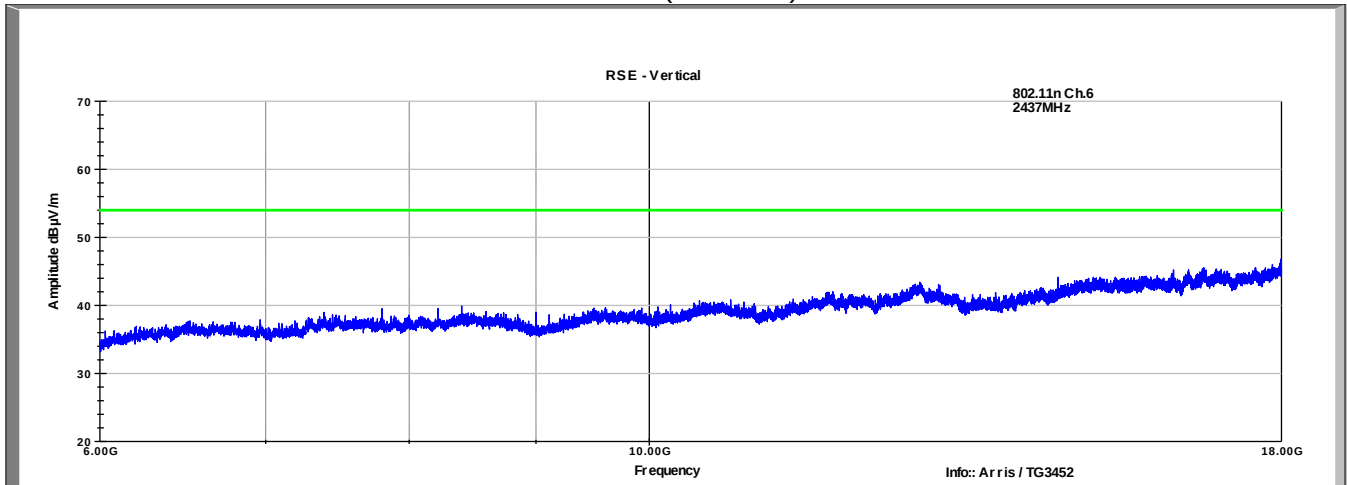
Worst-case peak emission (digital): 45.0dBµV/m @ 2.025GHz

Horizontal (1-6GHz)

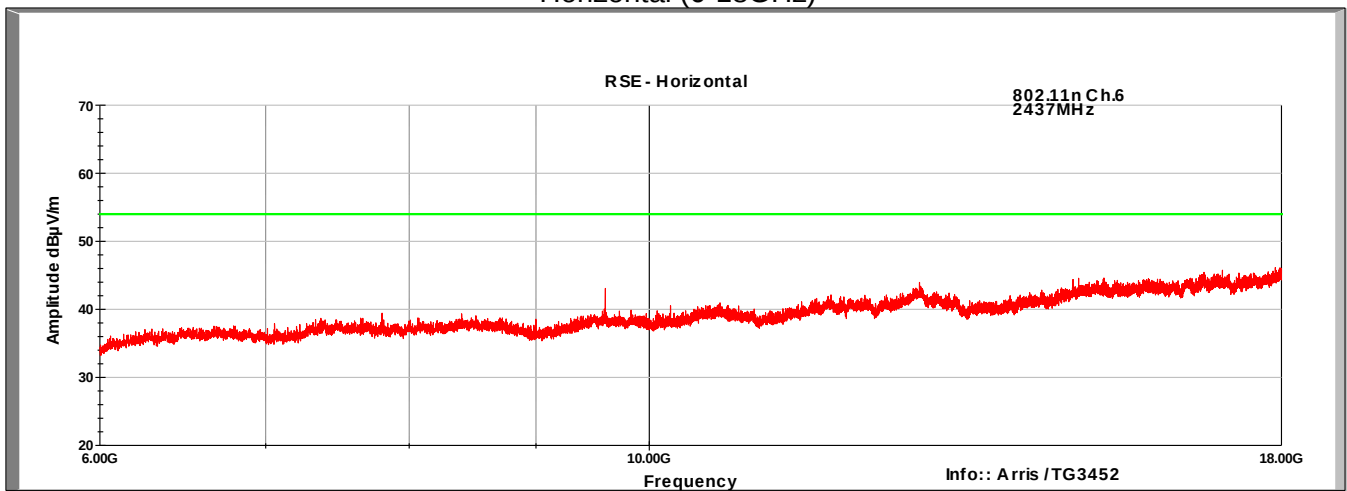


Worst-case peak emission (digital): 41.6dBµV/m @ 2.025GHz

Channel 6
Vertical (6-18GHz)

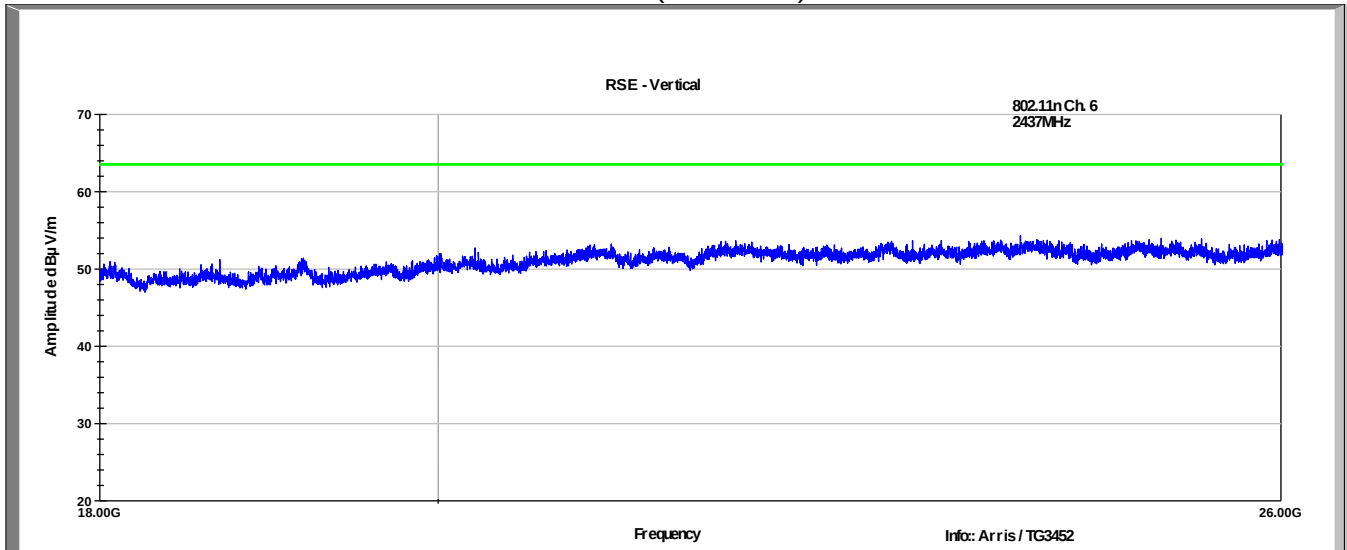


Horizontal (6-18GHz)

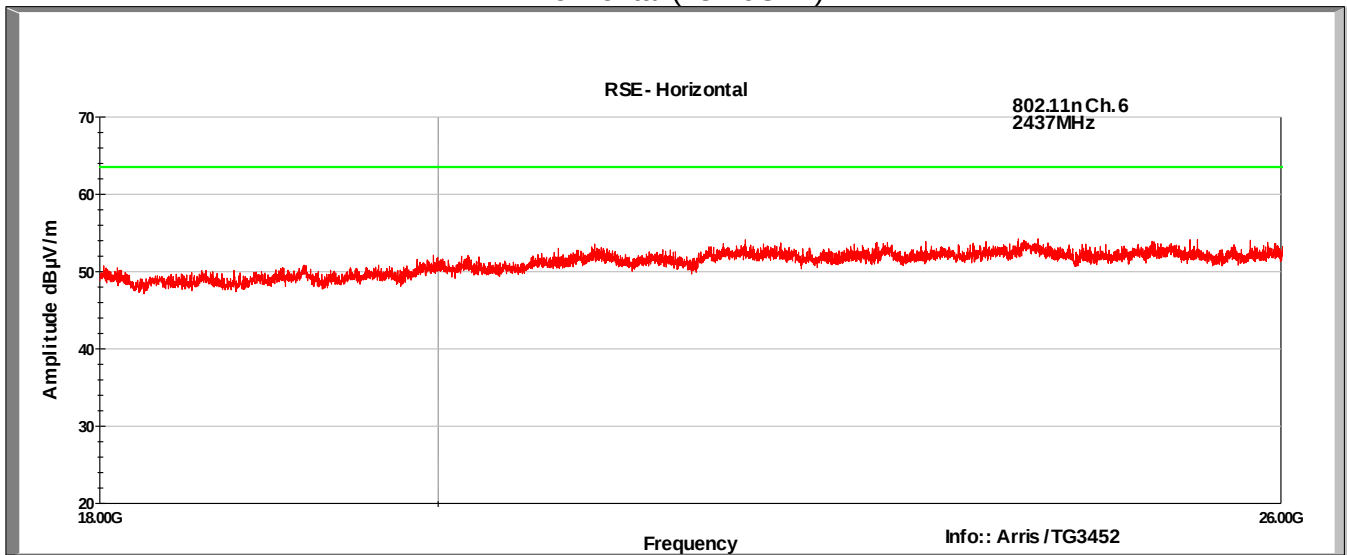


Worst-case peak emission (digital): 43.1dBµV/m @ 9.6GHz

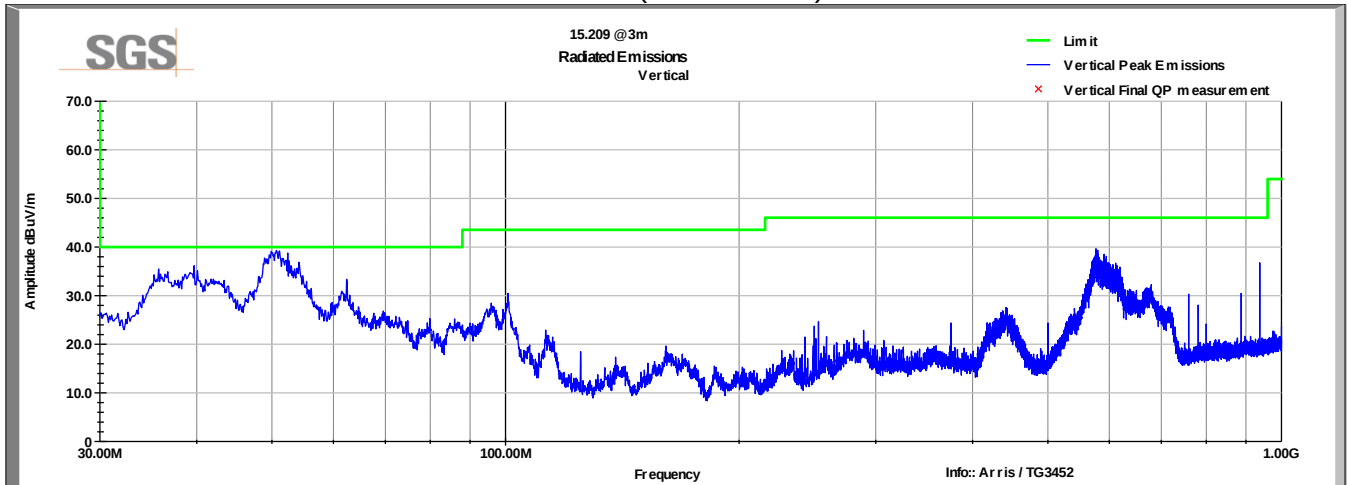
Channel 6
Vertical (18-26GHz)



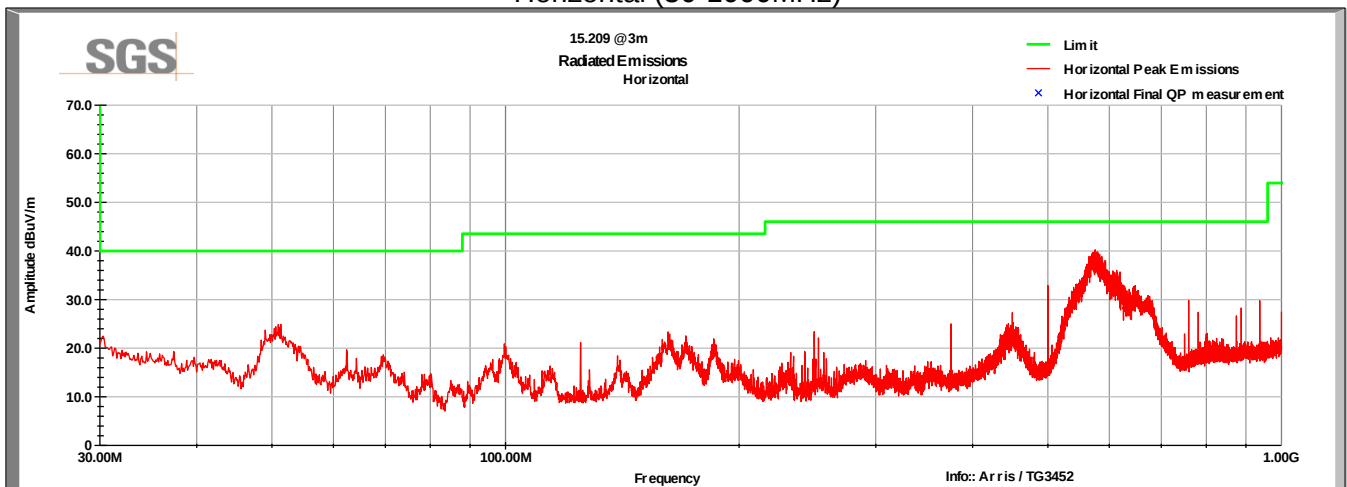
Horizontal (18-26GHz)



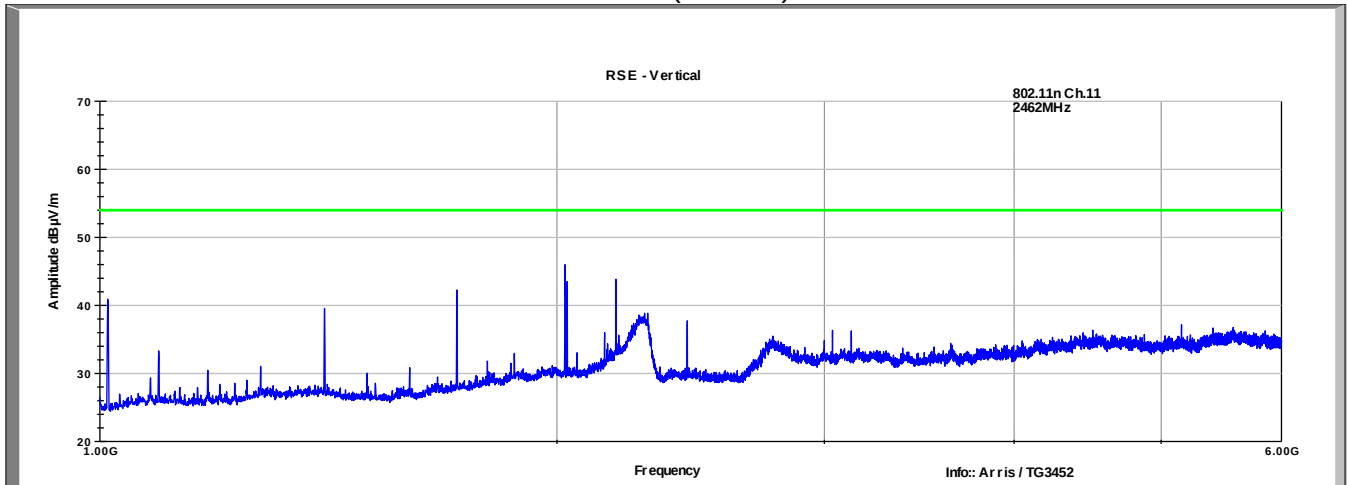
Channel 11
Vertical (30-1000MHz)



Horizontal (30-1000MHz)

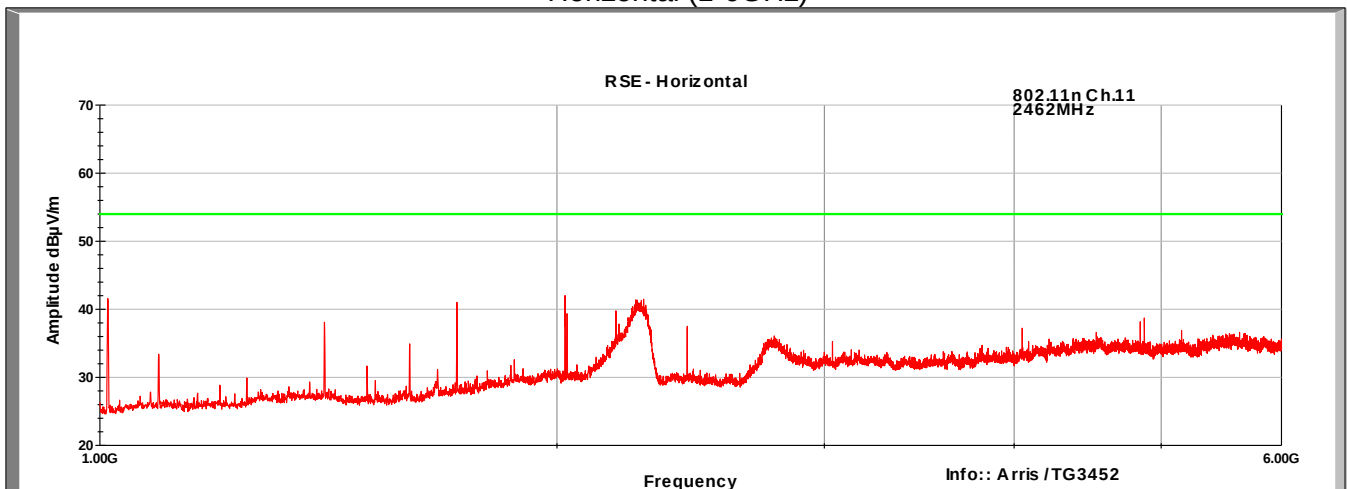


Channel 11
Vertical (1-6GHz)



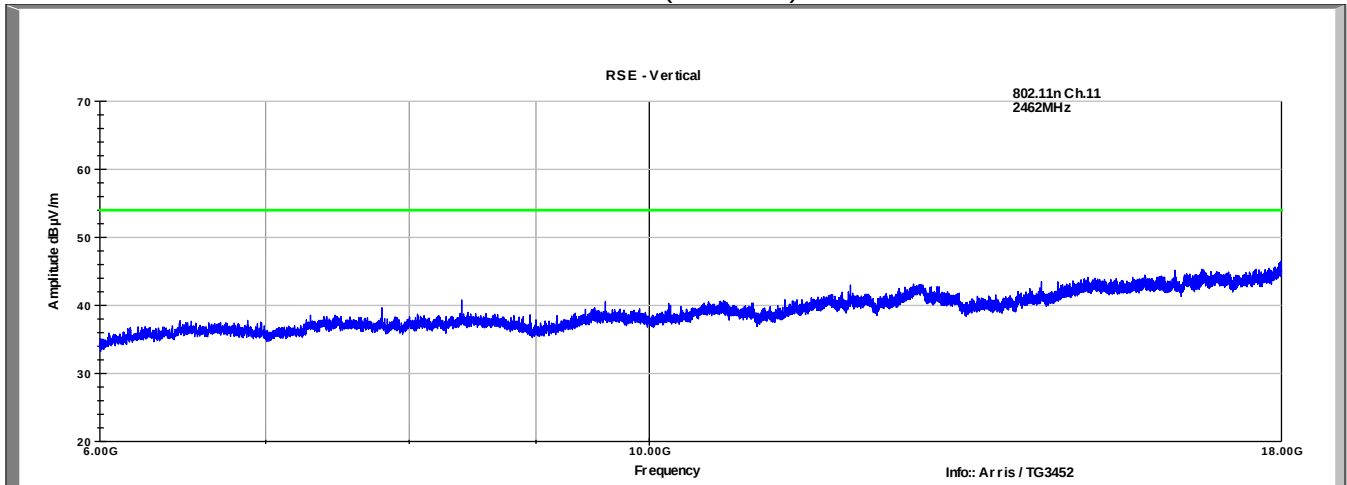
Worst-case peak emission (digital): 46.0dBµV/m @ 2.025GHz

Horizontal (1-6GHz)

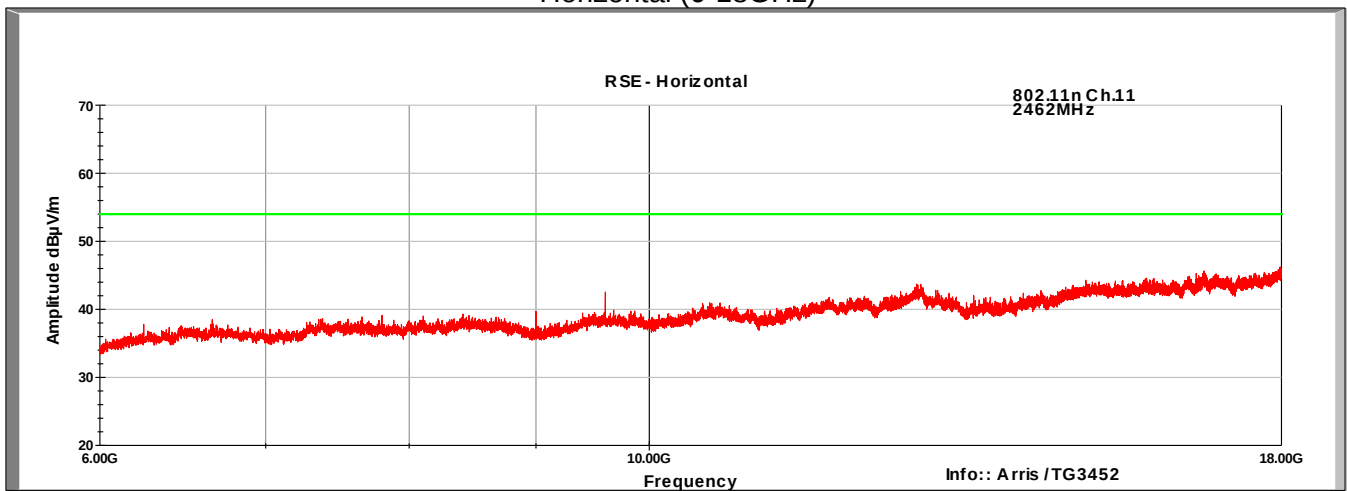


Worst-case peak emission (digital): 41.7dBµV/m @ 2.025GHz

Channel 11
Vertical (6-18GHz)

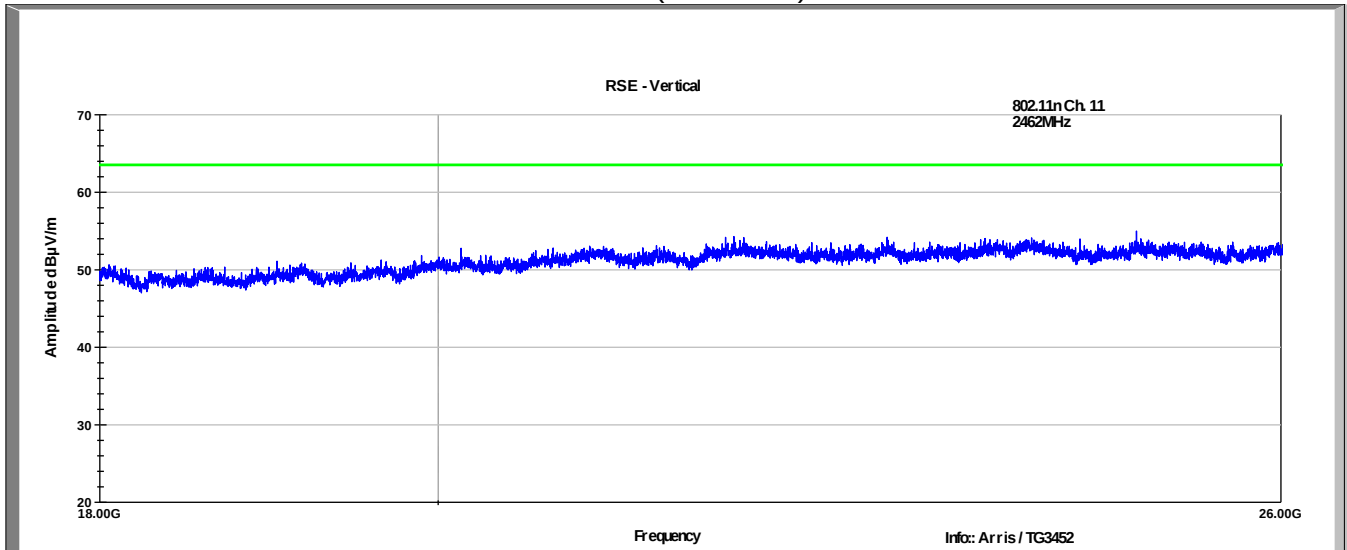


Horizontal (6-18GHz)

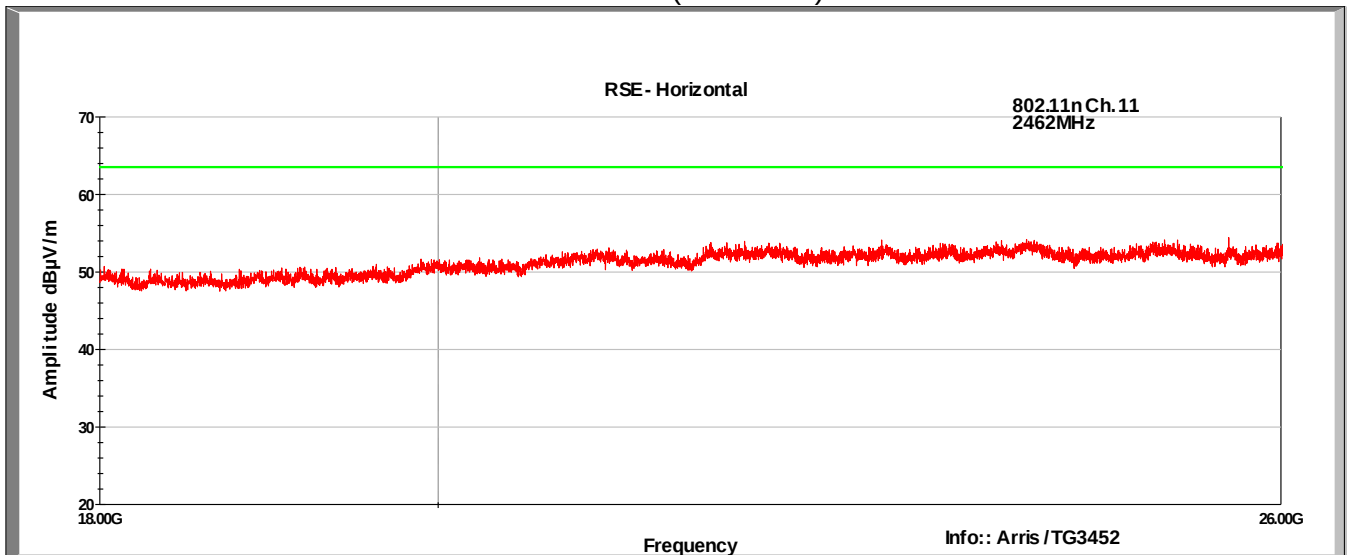


Worst-case peak emission (digital): 42.6dBµV/m @ 9.6GHz

Channel 11
Vertical (18-26GHz)



Horizontal (18-26GHz)



7.6 Tabular Data

Frequency MHz	Raw QP (dBuV)	Polarity (V/H)	Azimuth (degrees)	Height (cm)	AF (dB/m)	Loss (dB)	Amp (dB)	QP Value (dBuV/m)	Limit (dBuV/m)	Margin (dB)
39.69	50.3	V	312.0	121.0	14.4	0.3	31.9	33.2	40.0	-6.8
49.08	57.8	V	308.0	115.0	9.1	0.4	32.6	34.6	40.0	-5.4
62.51	56.1	V	183.0	150.0	7.7	0.4	33.2	31.0	40.0	-9.0
573.26	44.8	V	293.0	123.0	19.5	1.5	33.5	32.3	46.0	-13.7
574.77	46.3	V	267.0	177.0	19.5	1.5	33.5	33.8	46.0	-12.3
578.22	47.0	V	275.0	196.0	19.5	1.5	33.5	34.5	46.0	-11.6
QP Value = Level + AF + CL - Amp										
Margin = QP Value - Limit										

Frequency MHz	Raw QP (dBuV)	Polarity (V/H)	Azimuth (degrees)	Height (cm)	AF (dB/m)	Loss (dB)	Amp (dB)	QP Value (dBuV/m)	Limit (dBuV/m)	Margin (dB)
559.72	46.5	H	294.0	168.0	19.0	1.5	33.5	33.4	46.0	-12.6
569.97	49.8	H	306.0	141.0	19.5	1.5	33.5	37.3	46.0	-8.7
586.51	48.9	H	189.0	160.0	19.6	1.6	33.5	36.6	46.0	-9.4
603.24	44.9	H	0.0	150.0	19.8	1.6	33.5	32.7	46.0	-13.3
610.06	46.2	H	29.0	187.0	19.7	1.6	33.5	34.0	46.0	-12.0
612.97	43.1	H	52.0	171.0	19.8	1.6	33.5	30.9	46.0	-15.1
QP Value = Level + AF + CL - Amp										
Margin = QP Value - Limit										

Note: There was no discernible difference in the measurement data below 1GHz when transmitting at different channels. QP measurements were only recorded with the device transmitting on Channel 1.

8 Radiated Emissions at Band Edge / Restricted Band

8.1 Test Result

Test Description	Test Specification	Test Result
Field strength of spurious radiation	15.247 (d) and 15.209	Compliant

8.2 Test Method

Peak and average field strength measurements were performed at the restricted band edges of 2390MHz and 2483.5MHz. Measurements were made using the radiated methods defined in FCC KDB publication 558074 D01 DTS Meas Guidance v04.

8.3 Test Site

3m Absorber Lined Shielded Enclosure (ALSE), Suwanee, GA

Environmental Conditions

Temperature: 21.8°C

Relative Humidity: 32.4 %

8.4 Test Equipment

Test End Date: 21-Mar-2017

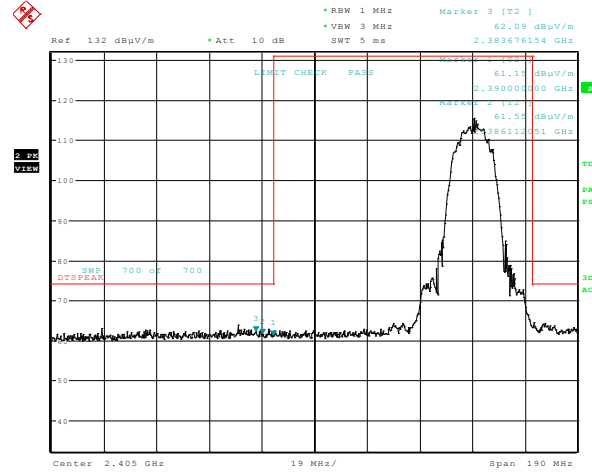
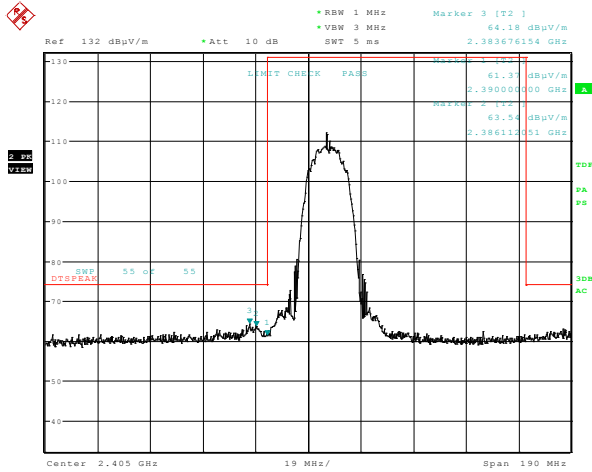
Tester: FN

Equipment	Model	Manufacturer	Asset Number	Cal Due Date
EMI TEST RECEIVER	ESU40	ROHDE & SCHWARZ	B079629	20-Jun-2017
ANTENNA, DRG HORN (MEDIUM)	3117	ETS LINDGREN	B079699	26-Apr-2017
RF CABLE	NFS-290-78.7-NFS	FLORIDA RF LABS	B095019	28-Jul-2017
RF CABLE	NMS-290-236.2-NMS	FLORIDA RF LABS	B095020	29-Jul-2017
RF CABLE	SF106	HUBER & SUHNER	B079661	29-Jul-2017
LOW NOISE AMPLIFIER	TS-PR18	ROHDE & SCHWARZ	B094463	22-Feb-2018

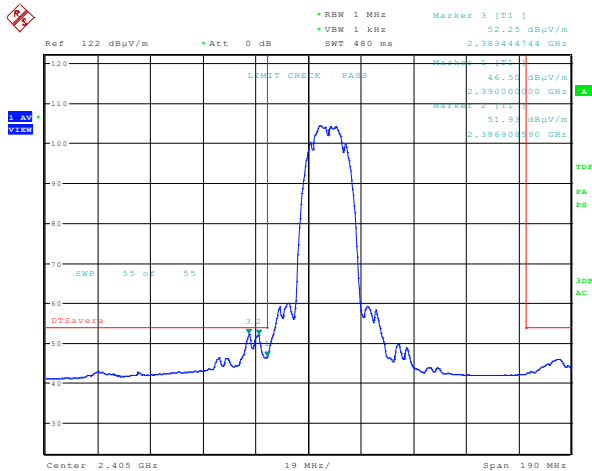
Note: The equipment calibration period is 1 year.

8.5 Test Data

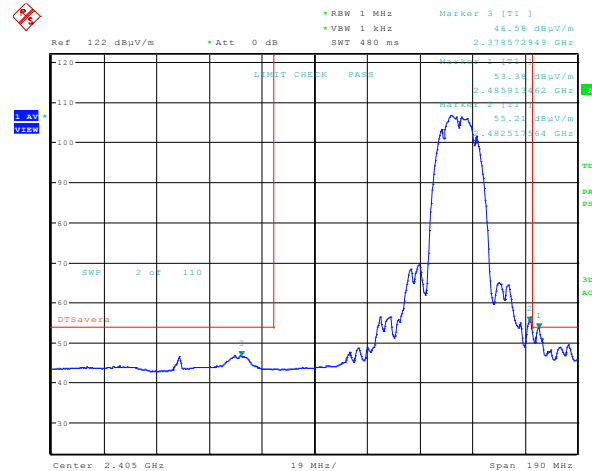
802.11b



Date: 8.MAR.2017 14:43:37



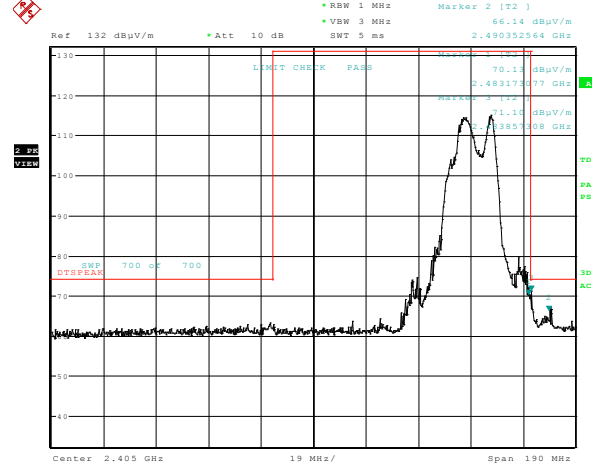
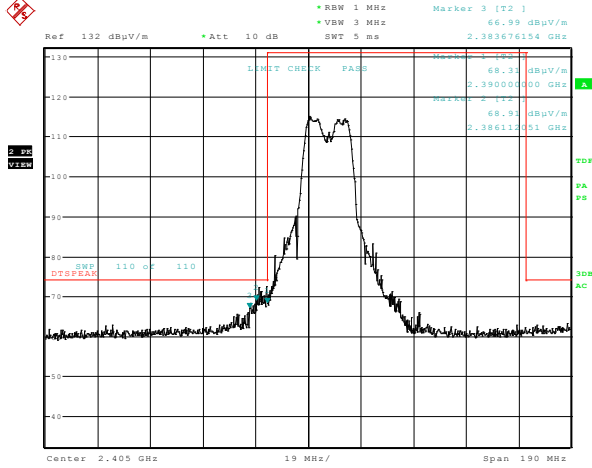
Date: 20.MAR.2017 14:55:08



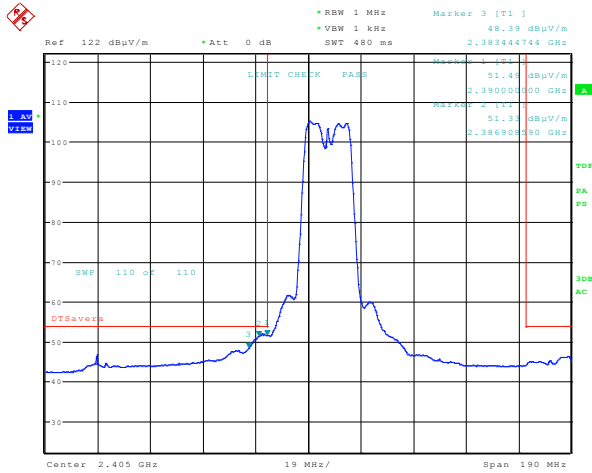
Date: 8.MAR.2017 14:41:55

Date: 20.MAR.2017 14:17:10

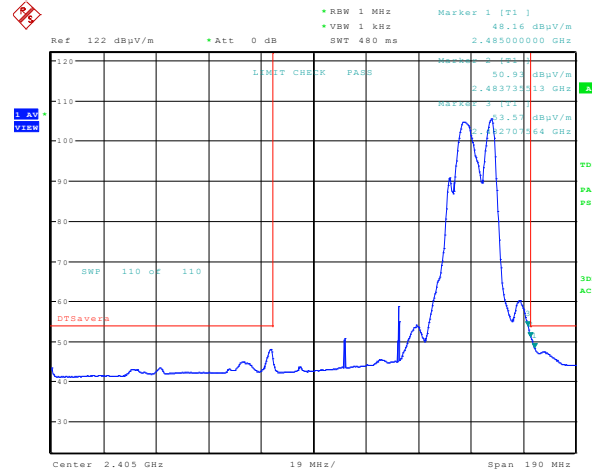
802.11g



Date: 8.MAR.2017 15:51:50



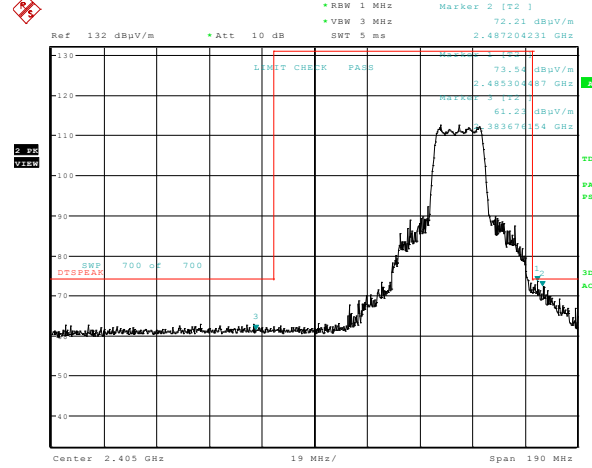
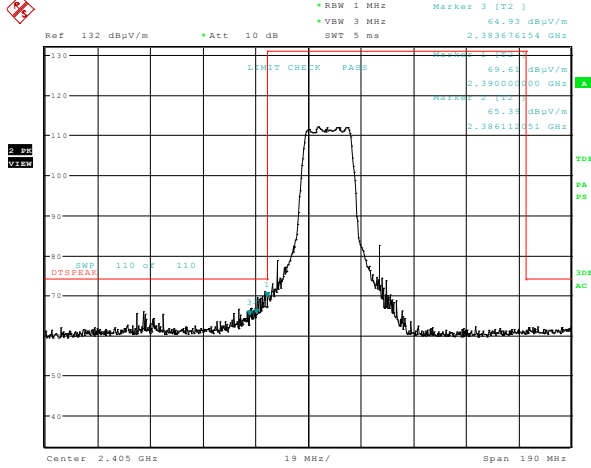
Date: 21.MAR.2017 09:13:40



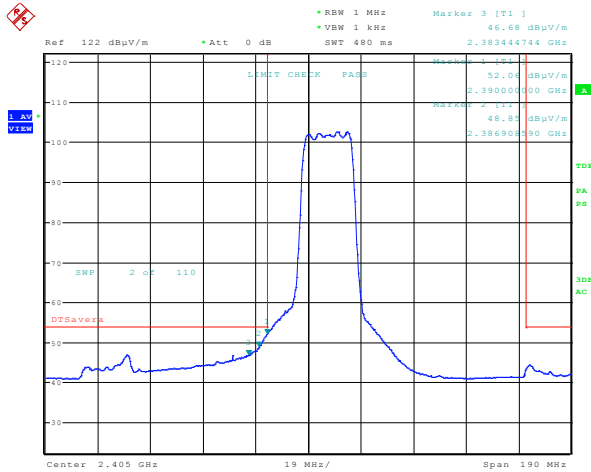
Date: 8.MAR.2017 15:55:27

Date: 21.MAR.2017 09:22:49

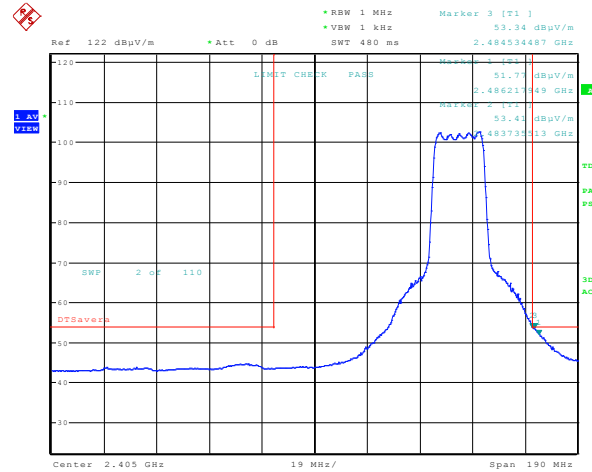
802.11n (HT20)



Date: 8.MAR.2017 17:23:19



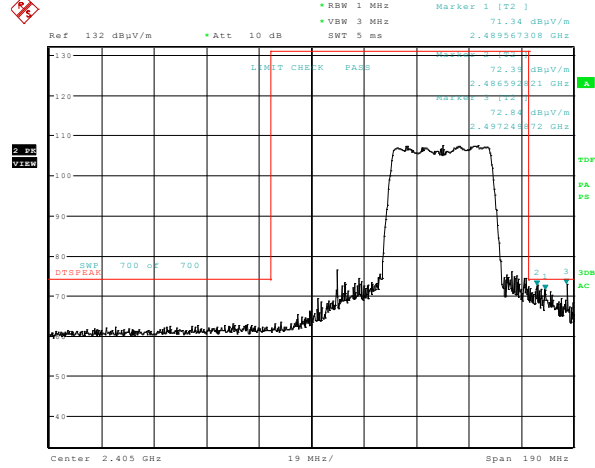
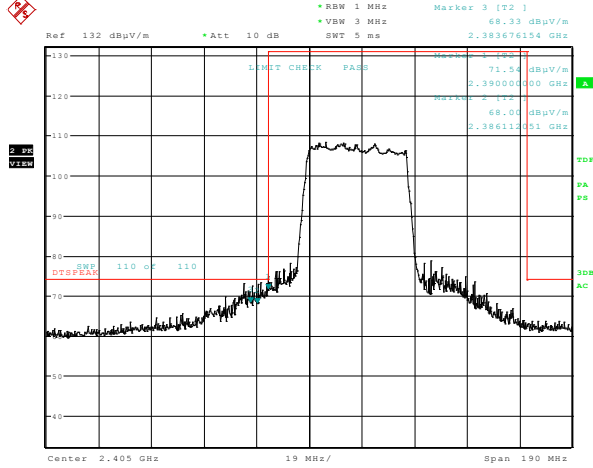
Date: 15.MAR.2017 09:51:19



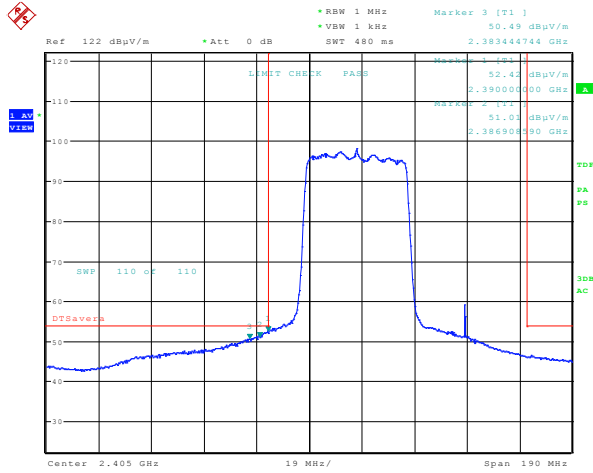
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Date: 15.MAR.2017 09:52:53

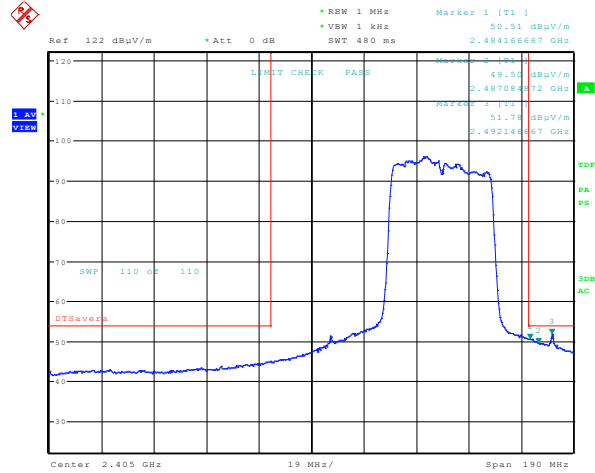
802.11n (HT40)



Date: 9.MAR.2017 09:04:17



Date: 21.MAR.2017 14:11:29



Date: 9.MAR.2017 09:21:12

Date: 21.MAR.2017 13:53:44

9 Conducted Emissions

9.1 Test Result

Test Description	Basic Standards	Test Result
Conducted Emissions, Class B	RSS-GEN, Issue 4 ANSI C63.4:2014	Compliant

9.2 Test Method

With the receivers resolution bandwidth was set to 9 kHz the initial preliminary exploratory scans were performed over the measuring frequency range (0.15MHz to 30MHz) using a max hold mode incorporating a Peak detector and Average detector and using the TILE! software. The final test data was measured using a Quasi-Peak detector and Average detector and compared against the limits indicated in the table below.

Frequency Range	Class A Limits (dBuV)	Class B Limits (dBuV) CISPR
0.15 to 0.5 MHz	Avg 66 QP 79	Avg 56 to 46 QP 66 to 56
0.5 to 5 MHz	Avg 60 QP 73	Avg 46 Pk 56
5 to 30 MHz	Avg 60 QP 73	Avg 50 Pk 60

9.3 Test Site

SGS EMC Laboratory, Suwanee, GA

Environmental Conditions

Temperature: 23.5°C

Relative Humidity: 42.8%

9.4 Test Equipment

Test Date: 13-Apr-2017

Tester: FRN

Equipment	Model	Manufacturer	Asset Number	Cal Due Date
EMI TEST RECEIVER	ESU8	ROHDE & SCHWARZ	B085759	21-Jul-2017
LINE IMPEDANCE STABILIZATION NETWORK	NNB 51	TESEQ	B087573	16-Nov-2017
RF CABLE	SF106	HUBER & SUHNER	B079661	29-Jul-2017

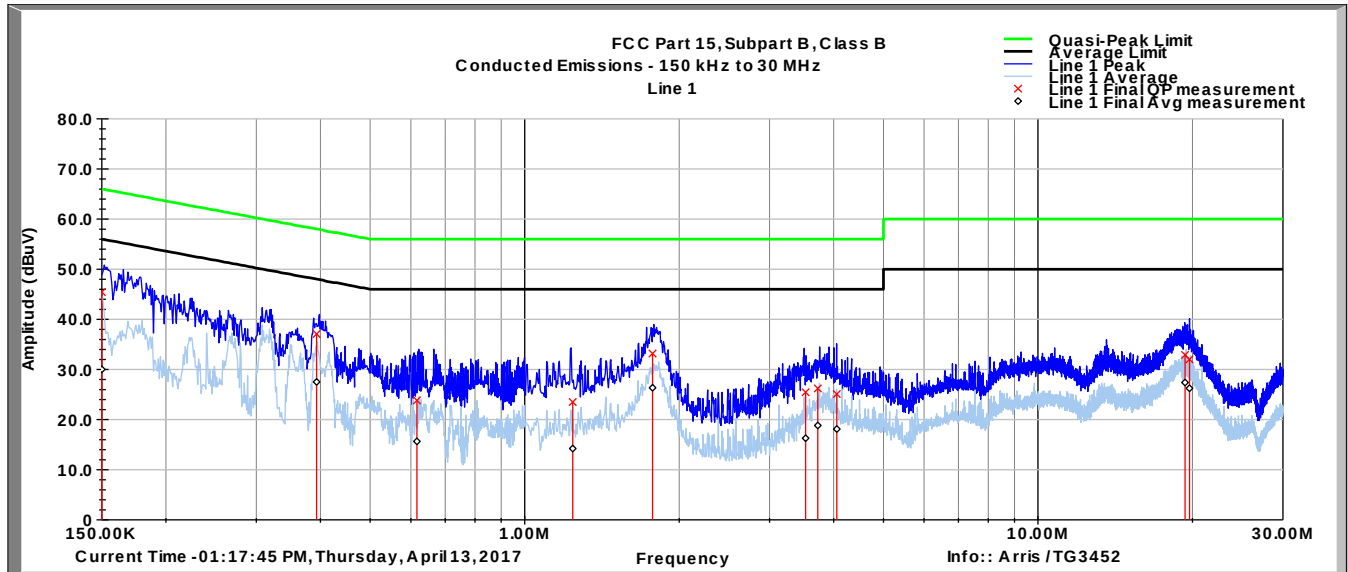
Note: The equipment calibration period is 1 year.

Software:

“Conducted Emissions” TILE! profile dated Dec 2015

9.5 Test Data

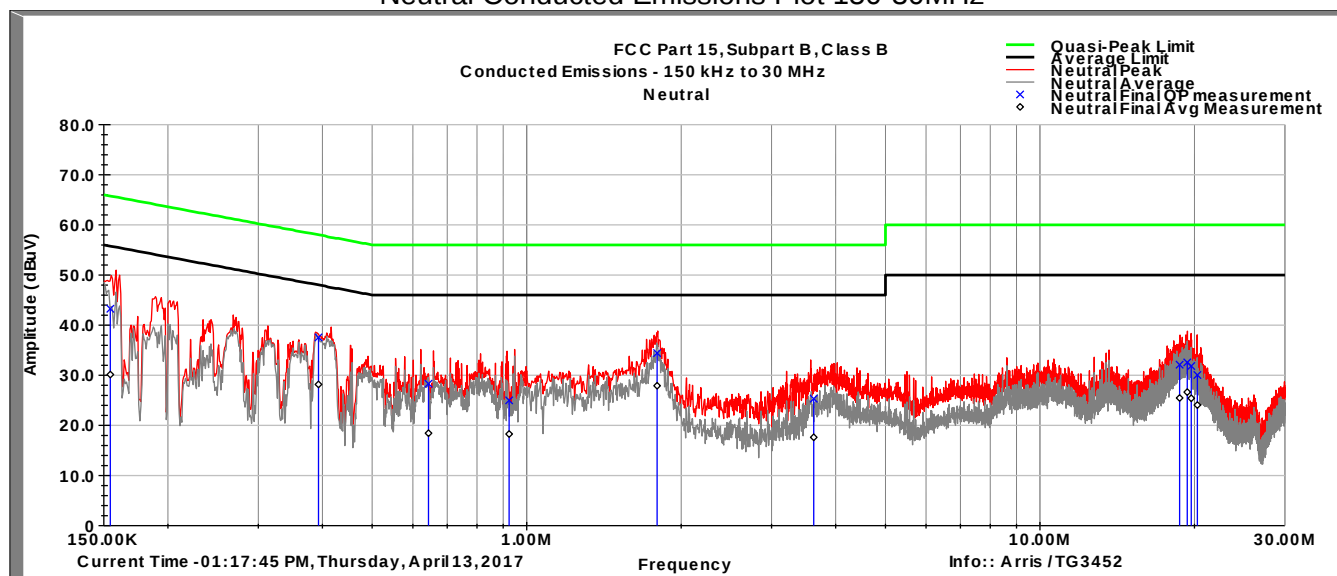
Line 1 Conducted Emissions Plot 150-30MHz



Line 1 Conducted Emissions Data 150-30MHz

Frequency MHz	QP Value dBuV	QP Limit dBuV	QP Margin dB	Avg Value dBuV	Avg Limit dBuV	Avg Margin dB
0.150	45.4	66.0	-20.6	30.0	56.0	-26.0
0.393	37.1	58.0	-21.0	27.5	48.0	-20.5
0.617	23.8	56.0	-32.2	15.6	46.0	-30.4
1.240	23.5	56.0	-32.5	14.2	46.0	-31.8
1.775	33.2	56.0	-22.8	26.3	46.0	-19.7
3.526	25.4	56.0	-30.6	16.3	46.0	-29.7
3.724	26.2	56.0	-29.8	18.8	46.0	-27.2
4.056	25.1	56.0	-30.9	18.1	46.0	-27.9
19.342	32.9	60.0	-27.1	27.4	50.0	-22.6
19.735	32.0	60.0	-28.0	26.2	50.0	-23.8

Neutral Conducted Emissions Plot 150-30MHz



Neutral Conducted Emissions Data 150-30MHz

Frequency MHz	QP Value dBuV	QP Limit dBuV	QP Margin dB	Avg Value dBuV	Avg Limit dBuV	Avg Margin dB
0.155	43.2	65.7	-22.5	30.1	55.7	-25.6
0.393	37.5	58.0	-20.5	28.2	48.0	-19.9
0.644	28.3	56.0	-27.7	18.4	46.0	-27.6
0.924	25.0	56.0	-31.0	18.3	46.0	-27.7
1.795	34.4	56.0	-21.6	27.9	46.0	-18.1
3.625	25.3	56.0	-30.7	17.6	46.0	-28.4
18.712	32.1	60.0	-27.9	25.5	50.0	-24.5
19.366	32.6	60.0	-27.4	26.6	50.0	-23.4
19.715	31.8	60.0	-28.2	25.4	50.0	-24.6
20.258	30.1	60.0	-29.9	24.1	50.0	-25.9

10 Revision History

Revision Level	Description of changes	Revision Date
0	Initial release	14 April 2017