FCC 47 CFR PART 15 SUBPART C

TEST REPORT

For

Photocontroller

Model: iSLC3100-7P-C

Trade Name: CIMCON

Issued to

CIMCON Lighting, Inc.
600 Technology Park Drive, Billerica, MA 01821 USA

Issued by

Compliance Certification Services Inc.
Wugu Laboratory
No.11, Wugong 6th Rd., Wugu Dist.,
New Taipei City 24891, Taiwan. (R.O.C.)
http://www.ccsrf.com
service@ccsrf.com
Issued Date: April 25, 2017

Testing Laboratory
1309

Revision History

Rev.		Issue Date		Revisions	Effect Page	Revised By
00		April 25, 2017		Initial Issue	ALL	Doris Chu
01		May 11, 2017		1. Added duty cycle table and notes to explain duty cycle calculator. .	P.35	Angel Cheng

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1. TEST RESULT CERTIFICATION

Applicant: CIMCON Lighting, Inc.
600 Technology Park Drive, Billerica, MA 01821 USA

Equipment Under Test: Photocontroller

Model Number: iSLC3100-7P-C

Trade Name: CIMCON

Date of Test: March 1 ~ April 10, 2017

APPLICABLE STANDARDS	
STANDARD	**TEST RESULT**
FCC 47 CFR Part 15 Subpart C	No non-compliance noted

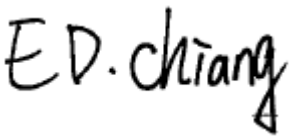
We hereby certify that:

The above equipment was tested by Compliance Certification Services Inc. The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI C63.10: 2013 and the energy emitted by the sample EUT tested as described in this report is in compliance with the requirements set forth in the above standards. The test results of this report relate only to the tested sample EUT identified in this report.

Approved by:

Sam Chuang
Manager
Compliance Certification Services Inc.

Tested by:



Ed Chiang
Engineer
Compliance Certification Services Inc.

2. EUT DESCRIPTION

Product	Photocontroller
Model Number	iSLC3100-7P-C
Trade Name	CIMCON
Model Discrepancy	N/A
Received Date	March 7, 2017
Power Supply	Power from host device.
Frequency Range	902.4 MHz ~ 927.6 MHz
Transmit Power	29.27 dBm
Modulation Technique	FHSS
Number of Channels	64 Channels
Antenna Specification	Print Antenna / Gain: -1.34dBi

Remark:

1. *The sample selected for test was engineering sample that approximated to production product and was provided by manufacturer.*

3. TEST METHODOLOGY

The tests documented in this report were performed in accordance with ANSI C63.10: 2013 and FCC Part 15.205, Part 15.207, Part 15.209, Part 15.247, DA00-705.

3.1 EUT CONFIGURATION

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner that intends to maximize its emission characteristics in a continuous normal application.

3.2 FCC PART 15.205 RESTRICTED BANDS OF OPERATIONS

(a) Except as shown in paragraph (d) of this section, only spurious emissions are permitted in any of the frequency bands listed below:

MHz	MHz	MHz	GHz
0.090 - 0.110	16.42 - 16.423	399.9 - 410	4.5 - 5.15
[1]0.495 - 0.505	16.69475 - 16.69525	608 - 614	5.35 - 5.46
2.1735 - 2.1905	16.80425 - 16.80475	960 - 1240	7.25 - 7.75
4.125 - 4.128	25.5 - 25.67	1300 - 1427	8.025 - 8.5
4.17725 - 4.17775	37.5 - 38.25	1435 - 1626.5	9.0 - 9.2
4.20725 - 4.20775	73 - 74.6	1645.5 - 1646.5	9.3 - 9.5
6.215 - 6.218	74.8 - 75.2	1660 - 1710	10.6 - 12.7
6.26775 - 6.26825	108 - 121.94	1718.8 - 1722.2	13.25 - 13.4
6.31175 - 6.31225	123 - 138	2200 - 2300	14.47 - 14.5
8.291 - 8.294	149.9 - 150.05	2310 - 2390	15.35 - 16.2
8.362 - 8.366	156.52475 -	2483.5 - 2500	17.7 - 21.4
8.37625 - 8.38675	156.52525	2655 - 2900	22.01 - 23.12
8.41425 - 8.41475	156.7 - 156.9	3260 - 3267	23.6 - 24.0
12.29 - 12.293	162.0125 - 167.17	3332 - 3339	31.2 - 31.8
12.51975 - 12.52025	167.72 - 173.2	3345.8 - 3358	36.43 - 36.5
12.57675 - 12.57725	240 - 285	3600 - 4400	([2])
13.36 - 13.41	322 - 335.4		

[1] Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz.

[2] Above 38.6

(b) Except as provided in paragraphs (d) and (e), the field strength of emissions appearing within these frequency bands shall not exceed the limits shown in Section 15.209. At frequencies equal to or less than 1000 MHz, compliance with the limits in Section 15.209 shall be demonstrated using measurement instrumentation employing a CISPR quasi-peak detector. Above 1000 MHz, compliance with the emission limits in Section 15.209 shall be demonstrated based on the average value of the measured emissions. The provisions in Section 15.35 apply to these measurements.

3.3 DESCRIPTION OF TEST MODES

The EUT (model: iSLC3100-7P-C) had been tested under operating condition.

Software used to control the EUT for staying in continuous transmitting and receiving mode was programmed.

Channel Low (902.4MHz), Mid (915.2MHz) and High (927.6MHz) with 1Mbps data rate was chosen for full testing.

The field strength of spurious emission was measured in the following position: EUT stand-up position (Z axis- H-Plane), lie-down position (X axis- E2 Plane) and lie-down position (Y axis- E1-Plane). The worst emission was found in lie-down position (X axis- E2 Plane) and the worst case was recorded.

4. INSTRUMENT CALIBRATION

4.1 MEASURING INSTRUMENT CALIBRATION

The measuring equipment, which was utilized in performing the tests documented herein, has been calibrated in accordance with the manufacturer's recommendations for utilizing calibration equipment, which is traceable to recognized national standards.

4.2 MEASUREMENT EQUIPMENT USED

Equipment Used for Emissions Measurement

Remark: *Each piece of equipment is scheduled for calibration once a year and Loop Antenna is scheduled for calibration once three years.*

RF Conducted Test Site					
Name of Equipment	**Manufacturer**	**Model**	**Serial Number**	**Calibration Date**	**Calibration Due**
Power Meter	Anritsu	ML2495A	1012009	07/04/2016	07/03/2017
Power Meter	Anritsu	MA2411B	917072	07/04/2016	07/03/2017
Spectrum Analyzer	R&S	FSV 40	101073	08/01/2016	07/31/2017

Wugu 966 Chamber A					
Name of Equipment	**Manufacturer**	**Model**	**Serial Number**	**Calibration Date**	**Calibration Due**
Bilog Antenna	Sunol Sciences	JB3	A030105	07/03/2016	07/02/2017
Horn Antenna	EMCO	3117	00055165	02/20/2017	02/19/2018
Pre-Amplifier	EMCI	EMC 012635	980151	06/23/2016	06/22/2017
Pre-Amplifier	EMEC	EM330	060609	06/08/2016	06/07/2017
Spectrum Analyzer	Agilent	E4446A	US42510252	12/05/2016	12/04/2017
Antenna Tower	CCS	CC-A-1F	N/A	N.C.R	N.C.R
Controller	CCS	CC-C-1F	N/A	N.C.R	N.C.R
Turn Table	CCS	CC-T-1F	N/A	N.C.R	N.C.R
Software	EZ-EMC (CCS-3A1RE)				

Conducted Emission Room # B					
Name of Equipment	**Manufacturer**	**Model**	**Serial Number**	**Calibration Date**	**Calibration Due**
LISN	R&S	ENV216	101054	05/11/2016	05/10/2017
LISN	SCHWARZBECK	NSLK8128	5012	04/15/2016	04/14/2017
Receiver	R&S	ESCI	101073	08/20/2016	08/19/2017
Software	CCS-3A1-CE				

Remark:

1. Each piece of equipment is scheduled for calibration once a year and Precision Dipole is scheduled for calibration once three years.

2. N.C.R. = No Calibration Request.

4.3 MEASUREMENT UNCERTAINTY

PARAMETER	UNCERTAINTY
Powerline Conducted Emission	+/- 1.2575
3M Semi Anechoic Chamber / 30M~200M	+/- 4.0138
3M Semi Anechoic Chamber / 200M~1000M	+/- 3.9483
3M Semi Anechoic Chamber / 1G~8G	+/- 2.5975
3M Semi Anechoic Chamber / 8G~18G	+/- 2.6112
3M Semi Anechoic Chamber / 18G~26G	+/- 2.7389
3M Semi Anechoic Chamber / 26G~40G	+/- 2.9683

***Remark**: This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.*

5. FACILITIES AND ACCREDITATIONS

5.1 FACILITIES

All measurement facilities used to collect the measurement data are located at

☐ No.199, Chunghsen Road, Hsintien City, Taipei Hsien, Taiwan, R.O.C.
Tel: 886-2-2217-0894 / Fax: 886-2-2217-1029

☒ No.11, Wugong 6th Rd., Wugu Dist., New Taipei City 24891, Taiwan. (R.O.C.)
Tel: 886-2-2299-9720 / Fax: 886-2-2298-4045

☐ No.81-1, Lane 210, Bade 2nd Rd., Lujhu Township, Taoyuan County 33841, TAIWAN, R.O.C.
Tel: 886-3-324-0332 / Fax: 886-3-324-5235

The sites are constructed in conformance with the requirements of ANSI C63.7, ANSI C63.10: 2013 and CISPR Publication 22.

5.2 EQUIPMENT

Radiated emissions are measured with one or more of the following types of linearly polarized antennas: tuned dipole, biconical, log periodic, bi-log, ridged waveguide, horn and/or Loop. Spectrum analyzers with pre-selectors and quasi-peak detectors are used to perform radiated measurements.

Conducted emissions are measured with Line Impedance Stabilization Networks and EMI Test Receivers.

Calibrated wideband preamplifiers, coaxial cables, and coaxial attenuators are also used for making measurements.

All receiving equipment conforms to CISPR Publication 16-1, “Radio Interference Measuring Apparatus and Measurement Methods.”

5.3 TABLE OF ACCREDITATIONS AND LISTINGS

Country	Agency	Scope of Accreditation	Logo
USA	FCC	3M Semi Anechoic Chamber (FCC MRA: TW1039) to perform FCC Part 15 measurements	FCC MRA: TW1039
Taiwan	TAF	LP0002, RTTE01, FCC Method-47 CFR Part 15 Subpart C, D, E, RSS-247, RSS-310 IDA TS SRD, AS/NZS 4268, AS/NZS 4771, TS 12.1 & 12,2, ETSI EN 300 440-1, ETSI EN 300 440-2, ETSI EN 300 328, ETSI EN 300 220-1, ETSI EN 300 220-2, ETSI EN 301 893, ETSI EN 301 489-1/3/7/17 FCC OET Bulletin 65 + Supplement C, EN 50360, EN 50361, EN 50371, RSS 102, EN 50383, EN 50385, EN 50392, IEC 62209, CNS 14958-1, CNS 14959 FCC Method –47 CFR Part 15 Subpart B IEC / EN 61000-3-2, IEC / EN 61000-3-3, IEC / EN 61000-4-2/3/4/5/6/8/11	TAF Testing Laboratory 1309
Canada	Industry Canada	3M Semi Anechoic Chamber (IC 2324G-1 / IC 2324G-2) to perform	Canada IC 2324G-1 IC 2324G-2

** No part of this report may be used to claim or imply product endorsement by A2LA or any agency of the US Government.*

6. SETUP OF EQUIPMENT UNDER TEST

6.1 SETUP CONFIGURATION OF EUT

See test photographs attached in Appendix I for the actual connections between EUT and support equipment.

6.2 SUPPORT EQUIPMENT

No	Equipment	Brand	Model	Series No.	FCC ID	Data Cable	Power Cord
1	Notebook PC	Acer	Aspire 4320 series	N/A	QDS-BRCM1018	N/A	AC I/P: Unshielded, 1.8m DC O/P: Unshielded, 1.8m with a core

Remark:

1. *All the equipment/cables were placed in the worst-case configuration to maximize the emission during the test.*
2. *Grounding was established in accordance with the manufacturer's requirements and conditions for the intended use.*

7. FCC PART 15.247 REQUIREMENTS

7.1 OCCUPIED BANDWIDTH(99%) AND 20 DB BANDWIDTH

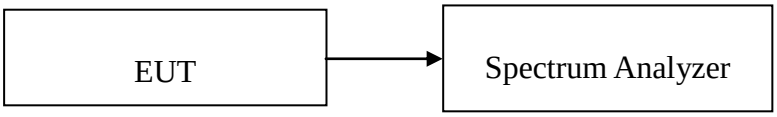
TEST LIMIT

According to FCC §15.247(a)(1)(i).

For frequency hopping systems operating in the 902-928 MHz band: if the 20 dB bandwidth of the hopping channel is less than 250 kHz, the system shall use at least 50 hopping frequencies and the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 20 second period; if the 20 dB bandwidth of the hopping channel is 250 kHz or greater, the system shall use at least 25 hopping frequencies and the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 10 second period. The maximum allowed 20 dB bandwidth of the hopping channel is 500 kHz.

And 99% Occupied Bandwidth is recorded only

Test Configuration



TEST PROCEDURE

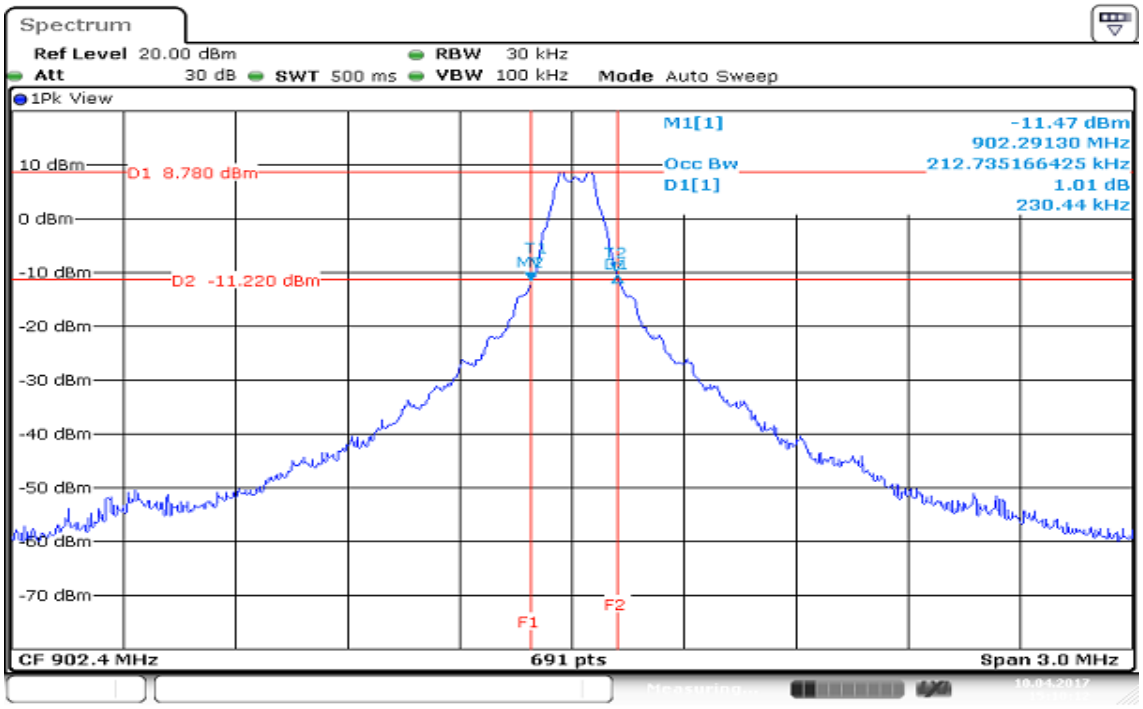
1. Place the EUT on the table and set it in the transmitting mode.
2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
3. Set the spectrum analyzer as RBW=30 kHz, VBW = 100 kHz, ,Detector = Peak,
4. Set the spectrum analyzer as OBW(99%) function
5. Mark the peak frequency and 20dB (upper and lower) frequency.
6. Repeat until all the rest channels are investigated.

TEST RESULTS

Channel	Frequency (MHz)	99% Bandwidth (MHz)	20dB Bandwidth (MHz)
Low	902.4	0.2127	0.2304
Mid	915.2	0.2083	0.2304
High	927.6	0.2127	0.2347

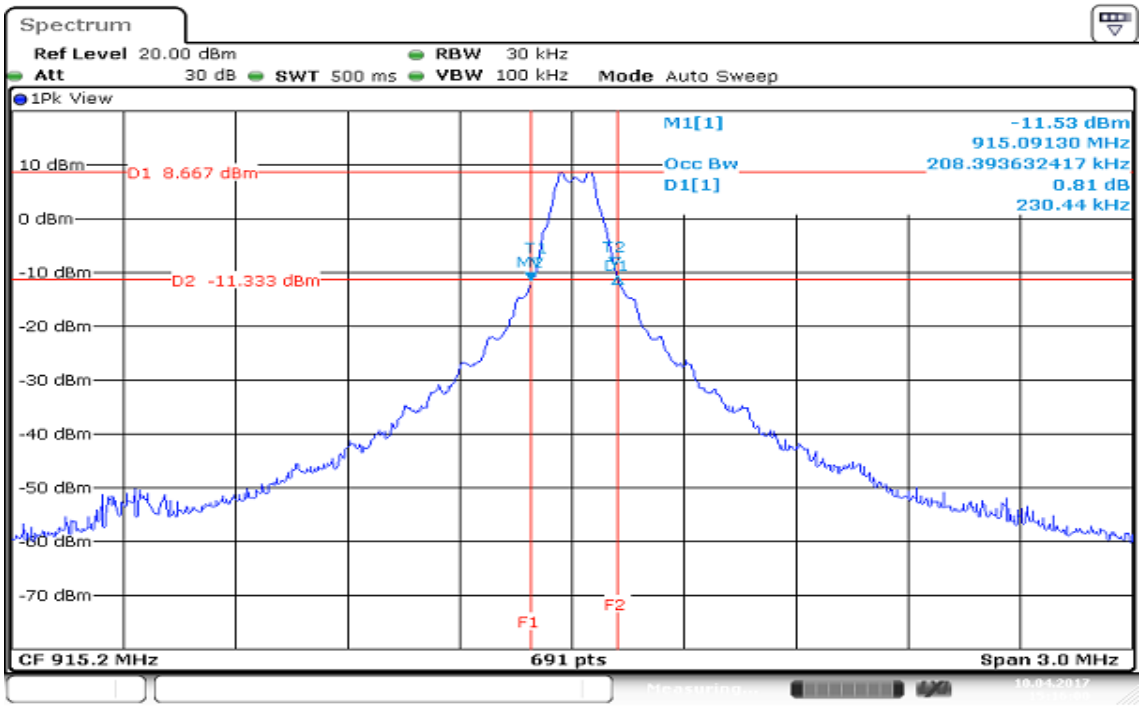
Test Plot

CH Low



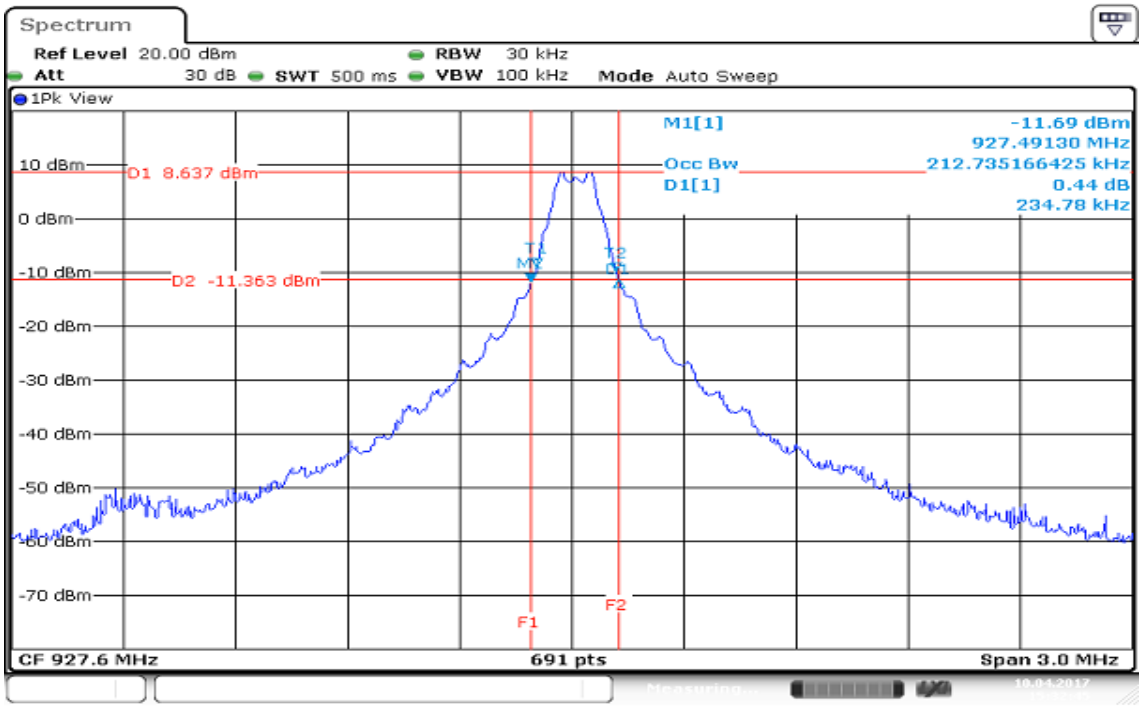
Date: 10.APR.2017 15:10:12

CH Mid



Date: 10.APR.2017 15:16:00

CH High



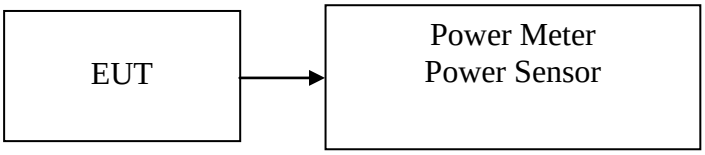
Date: 10.APR.2017 15:32:46

7.2 PEAK POWER

LIMIT

According to Part 15.247(b)(2).
For frequency hopping systems operating in the 902-928 MHz band: Maximum peak conducted output power shall not exceed 1 Watt for hopset uses 50 or more hopping cahnnels.

TEST CONFIGURATION



TEST PROCEDURE

The transmitter output is connected to the Power Meter. The Power Meter is set to the peak power detection.

TEST RESULTS

No non-compliance noted.

Test Data

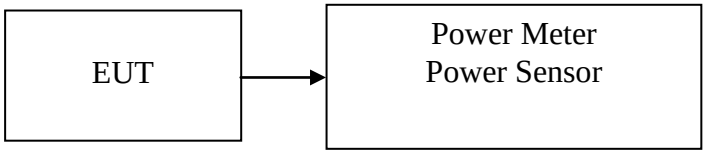
Channel	Frequency (MHz)	Output Power (dBm)	Output Power (W)	Limit (W)	Result
Low	902.4	***29.27**	0.8453	1	PASS
Mid	915.2	29.22	0.8356		PASS
High	927.6	29.13	0.8185		PASS

7.3 AVERAGE POWER

LIMIT

None; for reporting purposes only.

Test Configuration



TEST PROCEDURE

The transmitter output is connected to the Power Meter. The Power Meter is set to the average power detection.

TEST RESULTS

No non-compliance noted.

Test Data

Channel	Frequency (MHz)	Output Power (dBm)	Output Power (W)
Low	902.4	29.20	0.8318
Mid	915.2	29.16	0.8241
High	927.6	29.08	0.8091

7.4 CONDUCTED BAND EDGE AND SPURIOUS EMISSION

LIMIT

According to 15.247(d), In any 100 kHz bandwidth outside the authorized frequency band,Non-restricted bands shall be attenuated at least 20 dB/30 dB relative to the maximum PSD level in 100 kHz by RF conducted or a radiated measurement which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a)

TEST PROCEDURE

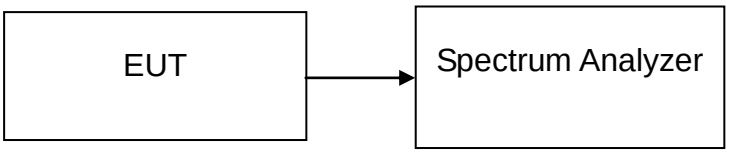
According to 15.247(d), ANSI C63.10:2013 clause 7.8.6 and clause 7.8.8.

1. EUT RF output port connected to the SA by RF cable, and the path loss was compensated to result.

2. SA setting, RBW=100kHz, VBW=300kHz, Detector=Peak, Trace mode = max hold, SWT = Auto.

3. In any 100 kHz bandwidth outside the authorized frequency band, shall be attenuated at least 20 dB relative to the maximum in-band peak PSD level in 100 kHz when conducted power procedure is used. f the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, the attenuation required under this paragraph shall be 30 dB instead of 20 dB.

TEST CONFIGURATION

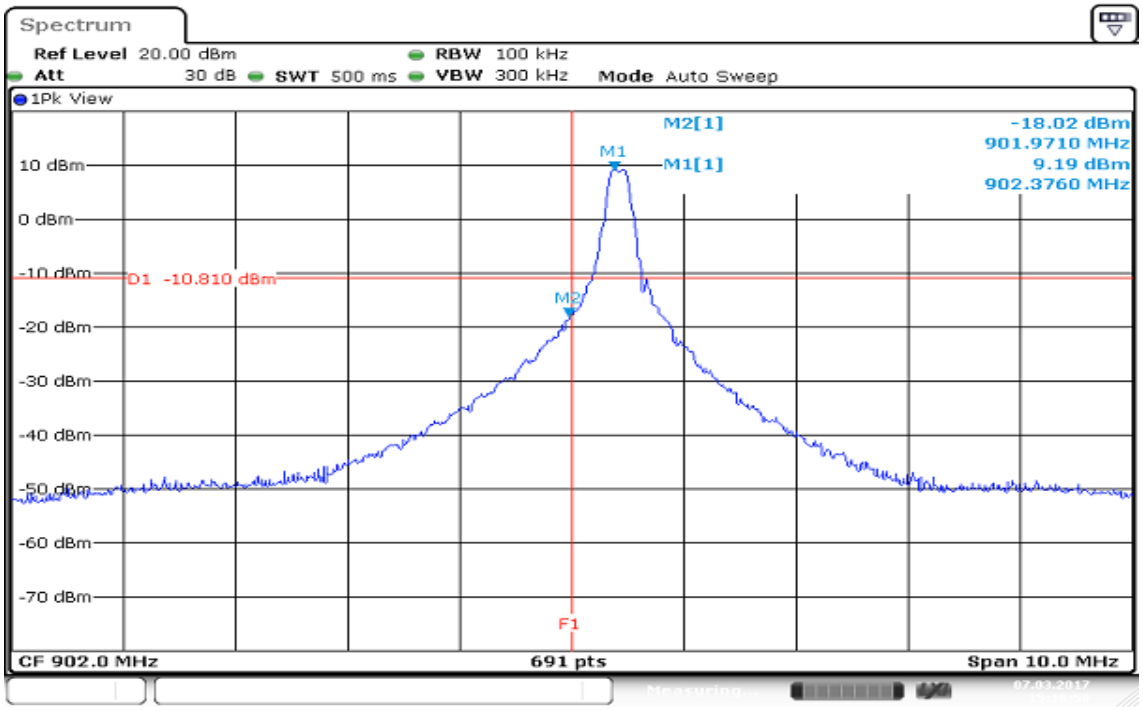


TEST RESULTS

Refer to attach spectrum analyzer data chart.

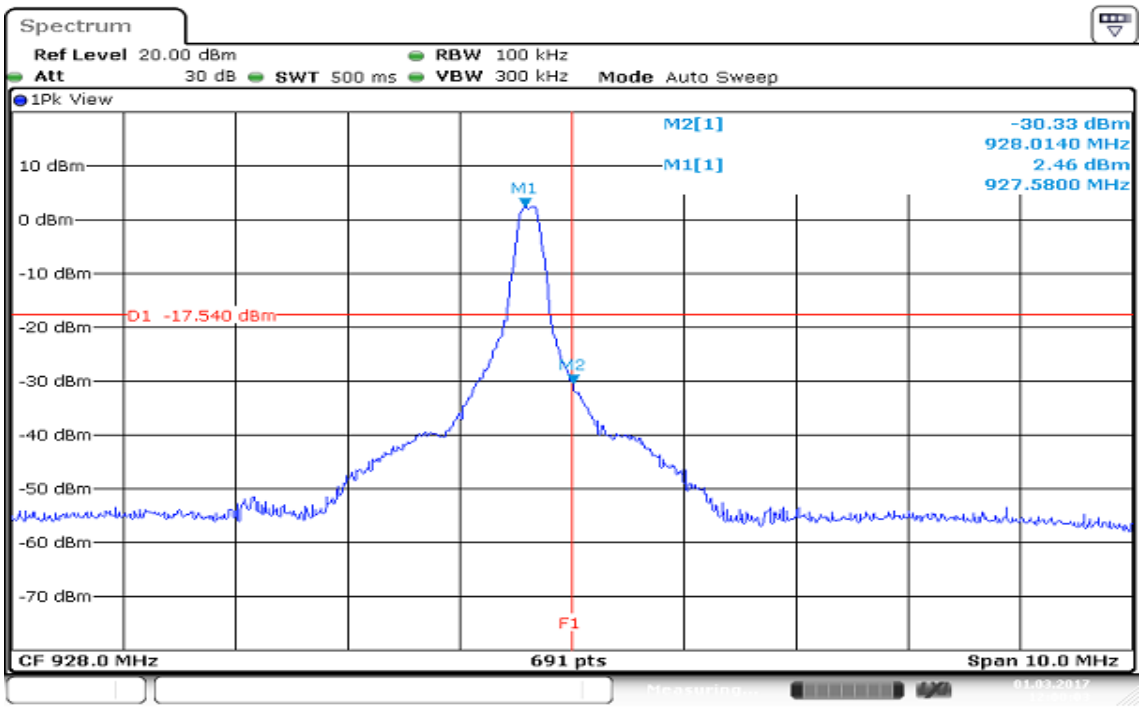
Test Data

Low CH_Conducted Band edge



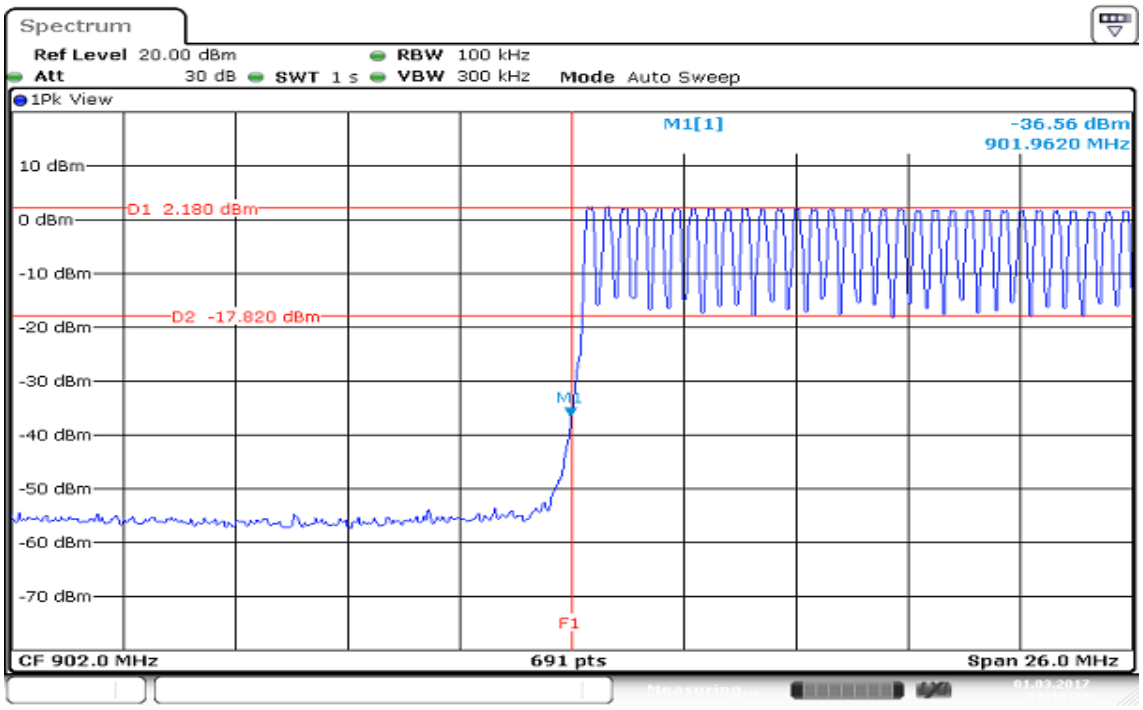
Date: 7.MAR.2017 15:16:51

High CH_Conducted Band edge



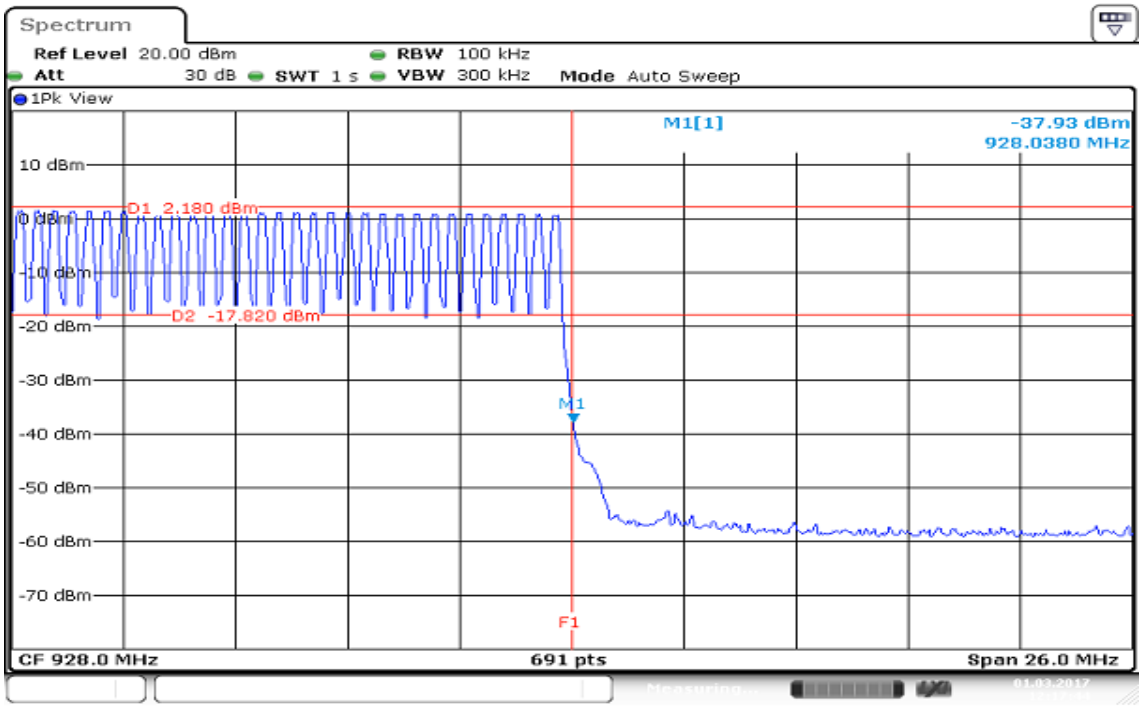
Date: 1.MAR.2017 12:00:03

Hopping Low CH_Conducted Band edge



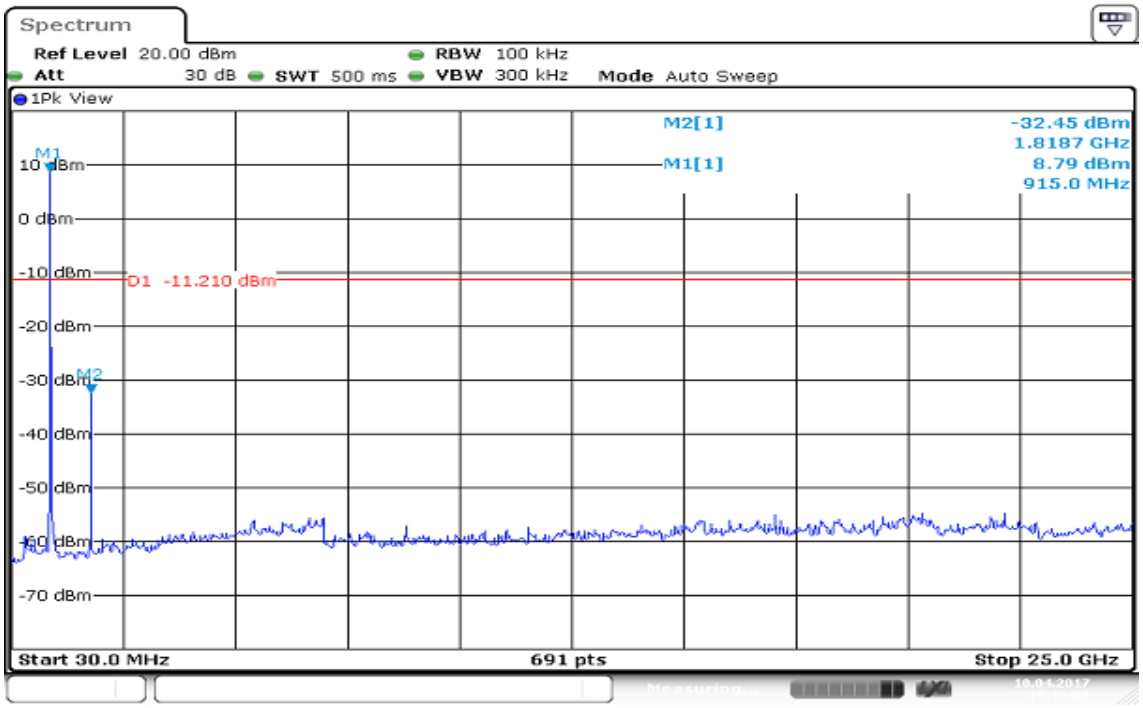
Date: 1MAR.2017 12:15:32

Hopping High CH_Conducted Band edge



Date: 1MAR.2017 12:17:44

Low CH_ Conducted spurious emission



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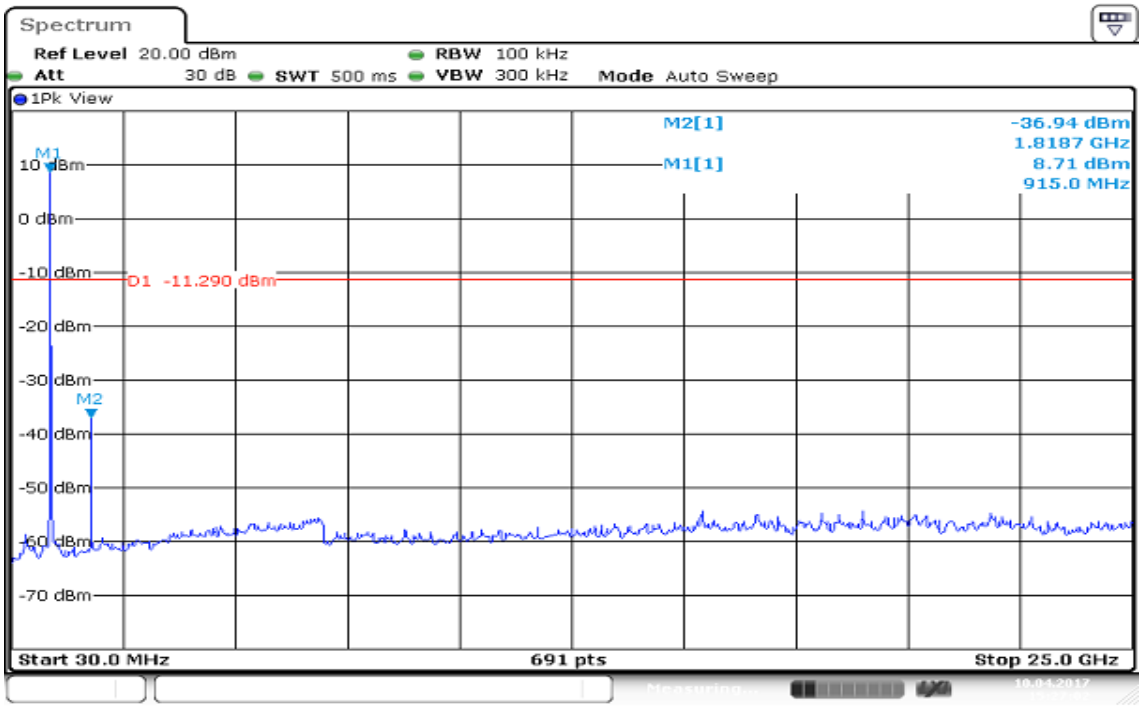
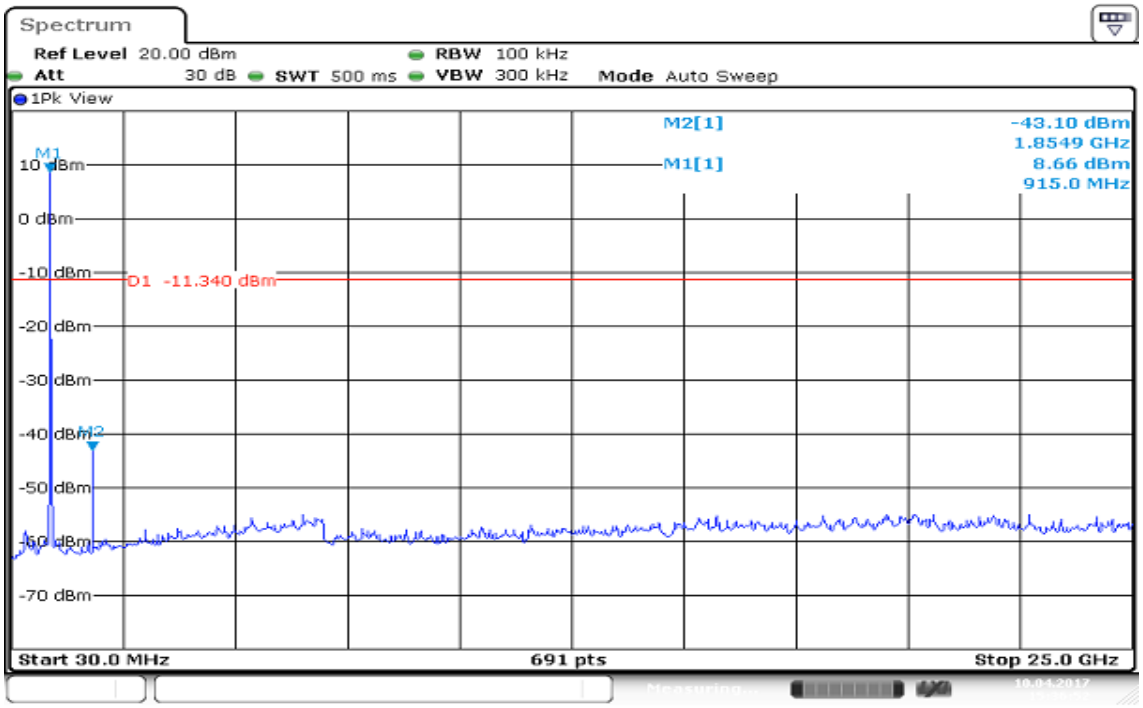
Mid CH_ Conducted spurious emission



Date: 10.APR.2017 15:27:02

High CH_ Conducted spurious emission



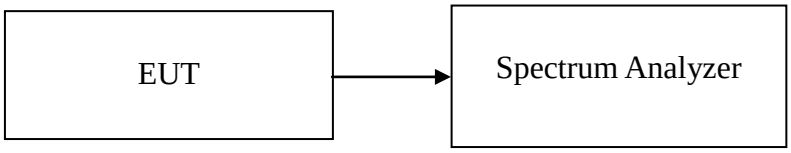
Date: 10.APR.2017 15:36:52

7.5 FREQUENCY SEPARATION

LIMIT

According to §15.247(a)(1), Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater.

Test Configuration



TEST PROCEDURE

1. Place the EUT on the table and set it in transmitting mode.
2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
3. Set center frequency of spectrum analyzer = middle of hopping channel.
4. Set the spectrum analyzer as RBW = 100kHz, VBW = 300kHz, Sweep = auto.
5. Max hold, mark 3 peaks of hopping channel and record the 3 peaks frequency.

TEST RESULTS

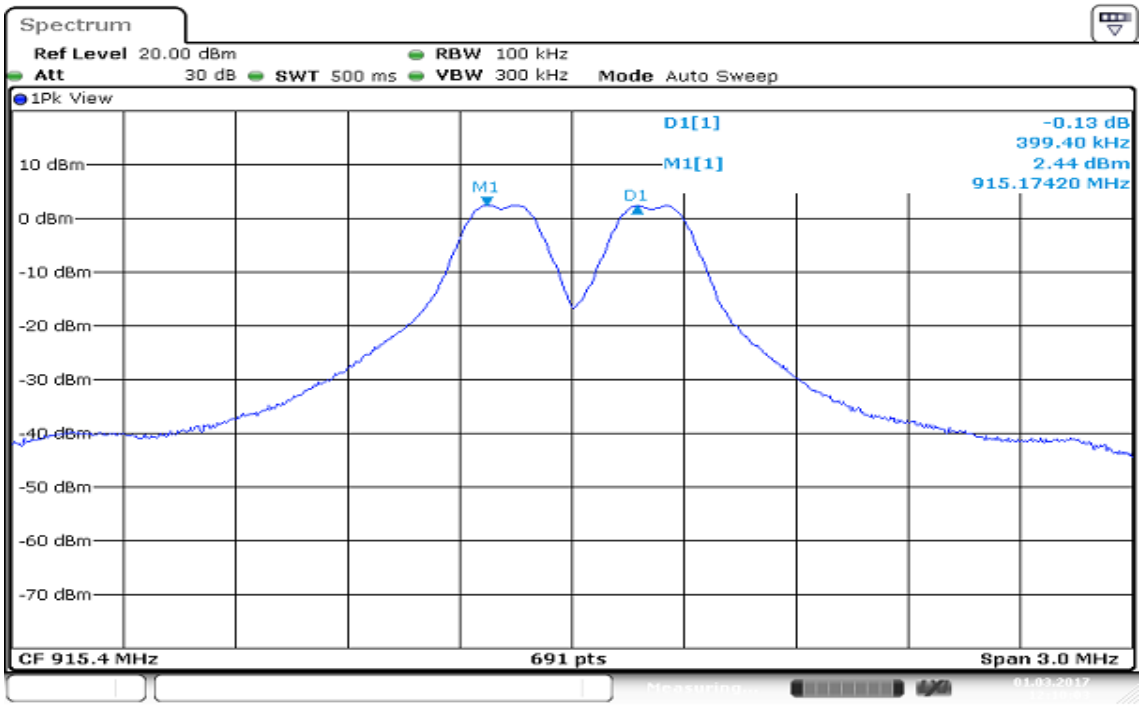
No non-compliance noted

Test Data

Channel	Channel Separation (MHz)	20 dB bandwidth (MHz)	Channel Separation Limit	Result
Low	0.3994	0.2304	25KHz or 20 dB bandwidth	Pass
Mid	0.3994	0.2304	25KHz or 20 dB bandwidth	Pass
High	0.3994	0.2347	25KHz or 20 dB bandwidth	Pass

Test Plot

Measurement of Channel Separation

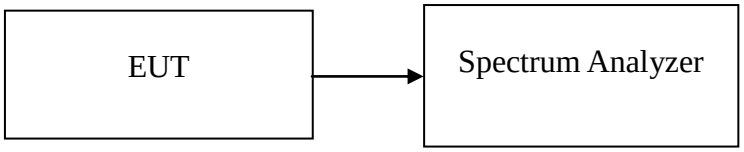


7.6 NUMBER OF HOPPING FREQUENCY

LIMIT

According to §15.247(a)(1)(i), For frequency hopping systems operating in the 902-928 MHz band: if the 20 dB bandwidth of the hopping channel is less than 250 kHz, the system shall use at least 50 hopping frequencies ; if the 20 dB bandwidth of the hopping channel is 250 kHz or greater, the system shall use at least 25 hopping frequencies.

Test Configuration



TEST PROCEDURE

1. Place the EUT on the table and set it in transmitting mode.
2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
3. RBW < 30% or channel spacing or 20 dB bandwidth, whichever is smaller.
4. Set spectrum analyzer Start Freq. = 902 MHz, Stop Freq. = 928 MHz, RBW =100KHz, VBW = 300KHz
5. Max hold, view and count how many channel in the band.

TEST RESULTS

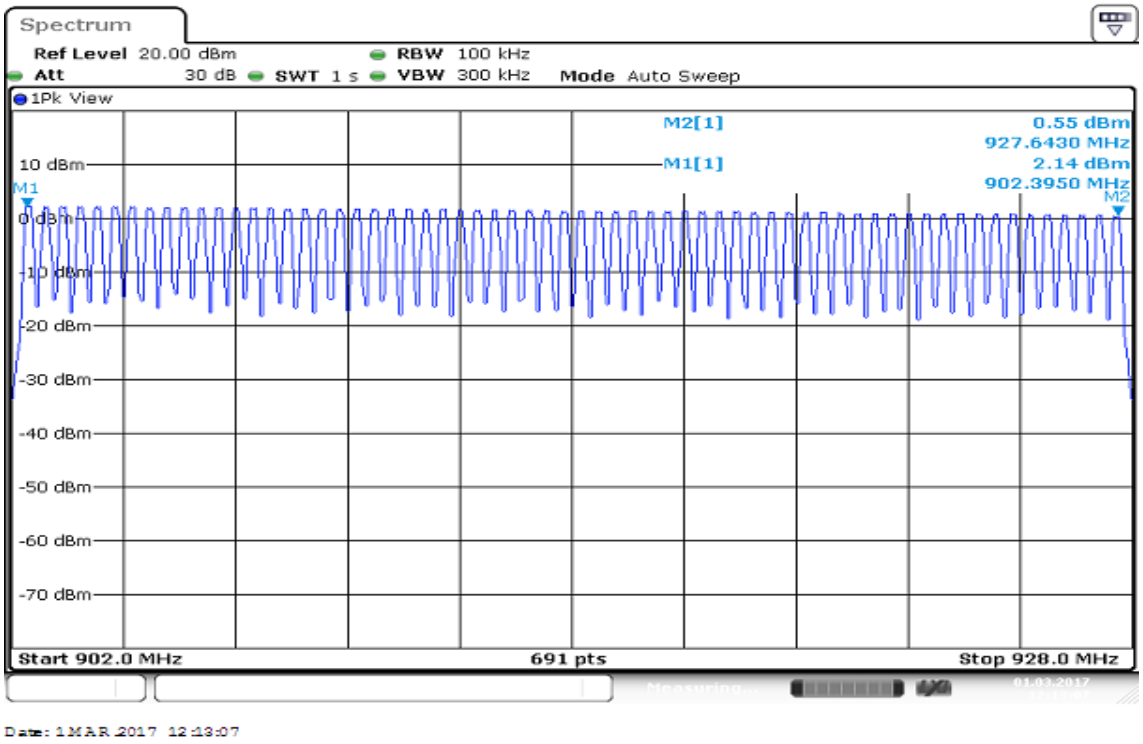
No non-compliance noted

Test Data

Number of Hopping				
Mode	**Frequency (MHz)**	**Hopping Channel Number**	**Hopping Channel Number Limits**	**Result**
FHSS	902.4 ~ 927.6	64	15	Pass

Test Plot

Channel Number

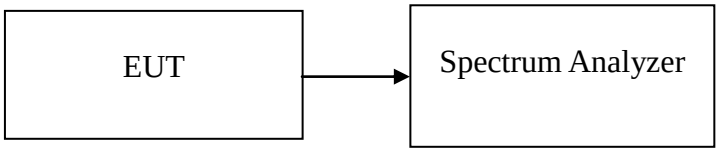


7.7 TIME OF OCCUPANCY (DWELL TIME)

LIMIT

According to §15.247(a)(1)(i), For frequency hopping systems operating in the 902-928 MHz band: if the 20 dB bandwidth of the hopping channel is less than 250 kHz, the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 20 second period; if the 20 dB bandwidth of the hopping channel is 250 kHz or greater, the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 10 second period.

Test Configuration



TEST PROCEDURE

1. Place the EUT on the table and set it in transmitting mode.
2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
3. Set center frequency of spectrum analyzer = operating frequency.
4. Span: Zero span, centered on a hopping channel.
5. RBW shall be ≤ channel spacing and where possible RBW should be set >> 1 / T, where T is the expected dwell time per channel.
6. Sweep: As necessary to capture the entire dwell time per hopping channel
7. Detector function: Peak.
8. Use the marker-delta function to determine the transmit time per hop.
9. Repeat the measurement using a longer sweep time to determine the number of hops over the period specified in the requirements.
10. (Number of hops in the period specified in the requirements) = (number of hops on spectrum analyzer) × (period specified in the requirements / analyzer sweep time)

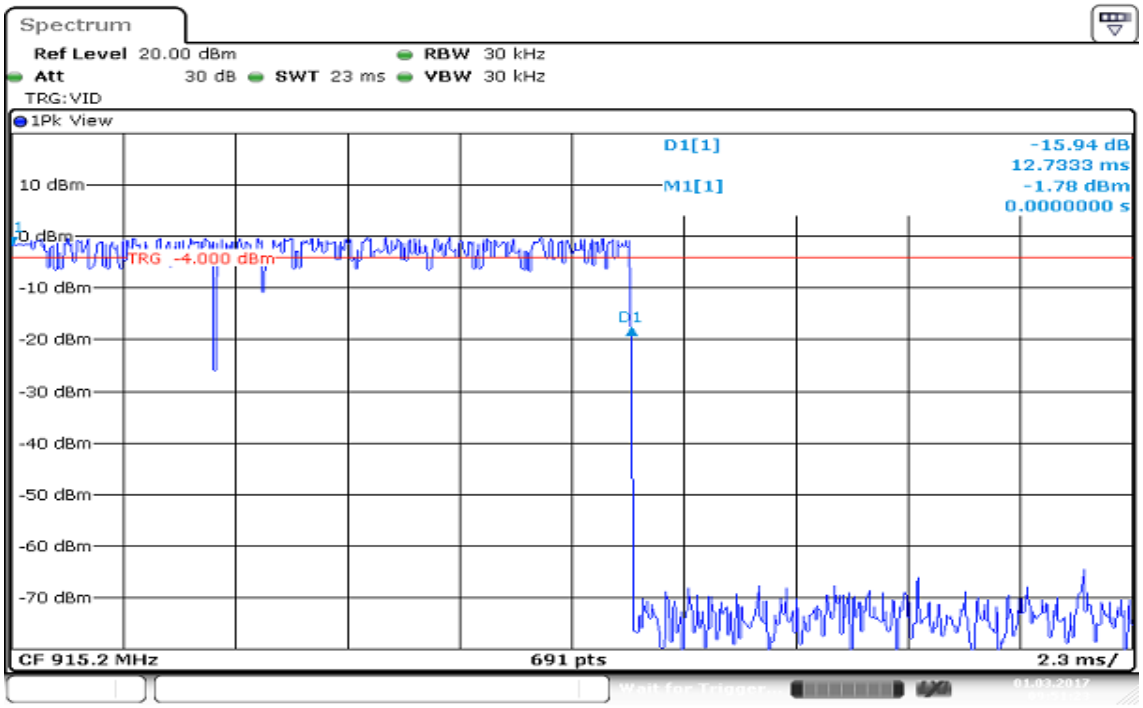
TEST RESULTS

No non-compliance noted

Test Data

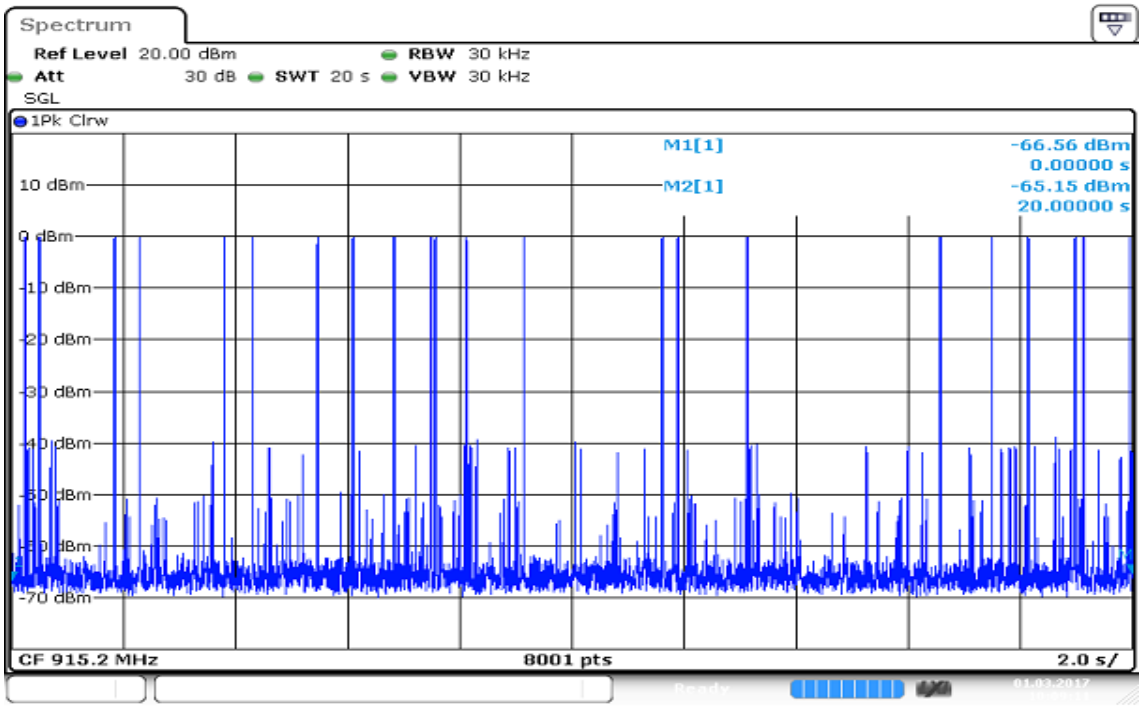
Time of Occupancy (Dwell Time)					
Mode	**Frequency (MHz)**	**Individual occupancy time (ms)**	**Number of hops observed**	**Average time of occupancy (s)**	**Result**
FHSS	915.2	12.7333	22	0.280133	Pass

Individual occupancy time



Date: 1.MAR.2017 09:51:24

Number of hops observed



Date: 1.MAR.2017 10:09:11

7.8 RADIATED EMISSIONS

LIMIT

1. According to §15.209(a), except as provided elsewhere in this Subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

Frequency (MHz)	Field Strength (μV/m)	Measurement Distance (m)
0.009 - 0.490	2400/F(kHz)	300
0.490 - 1.705	24000/F(kHz)	30
1.705 – 30.0	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

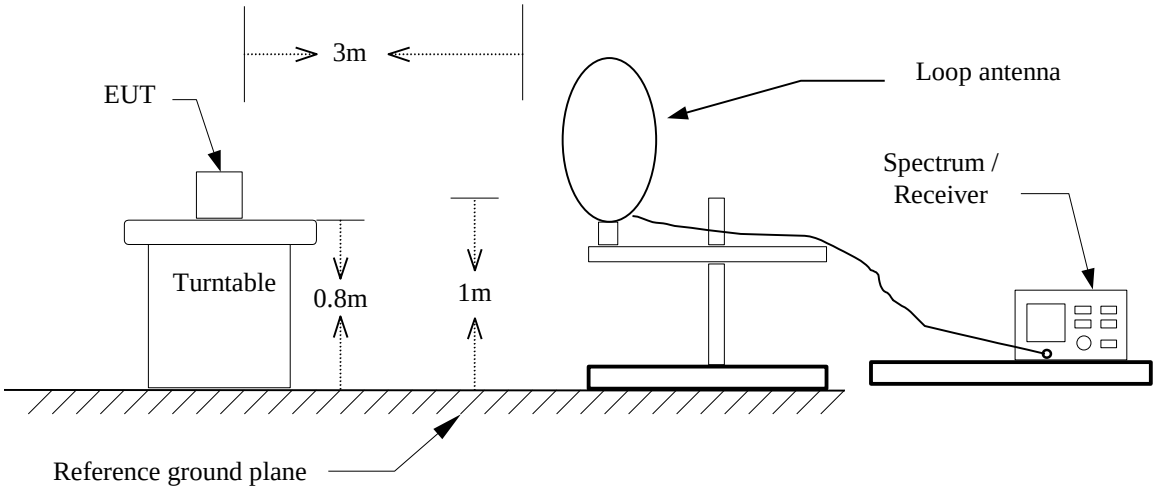
Remark: *Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this Section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this Part, e.g., Sections 15.231 and 15.241.*

2. In the emission table above, the tighter limit applies at the band edges.

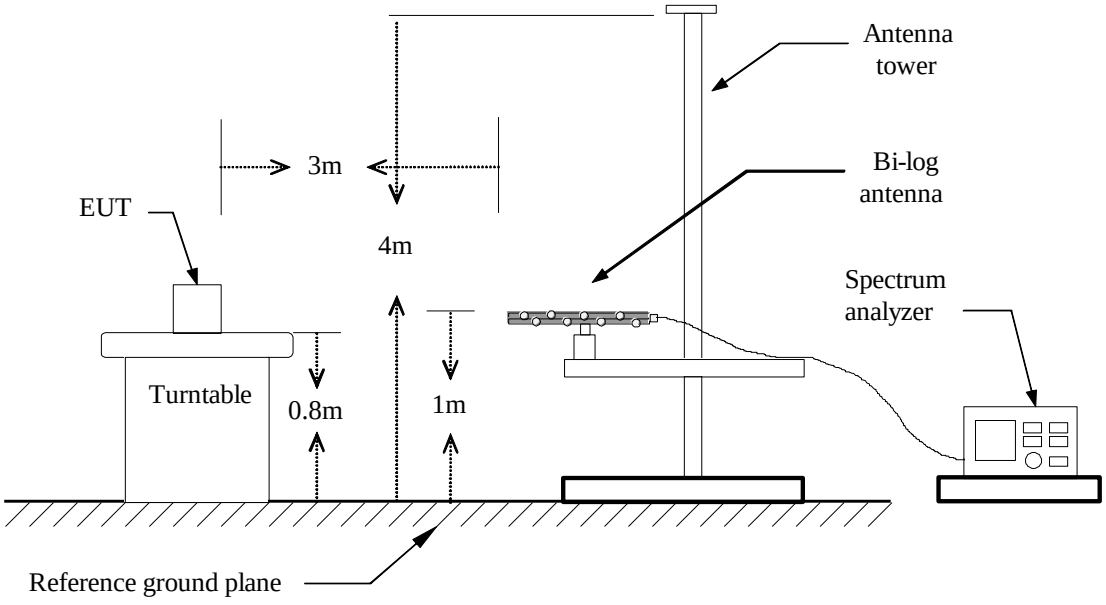
Frequency (MHz)	Field Strength (μV/m at 3-meter)	Field Strength (dBμV/m at 3-meter)
0.009 - 0.490	2400/F(kHz) +80	20LOG((2400/F(kHz))+80)
0.490 - 1.705	24000/F(kHz) +40	20LOG((24000/F(kHz))+40)
1.705 – 30.0	30	69.54
30-88	100	40
88-216	150	43.5
216-960	200	46
Above 960	500	54

Test Configuration

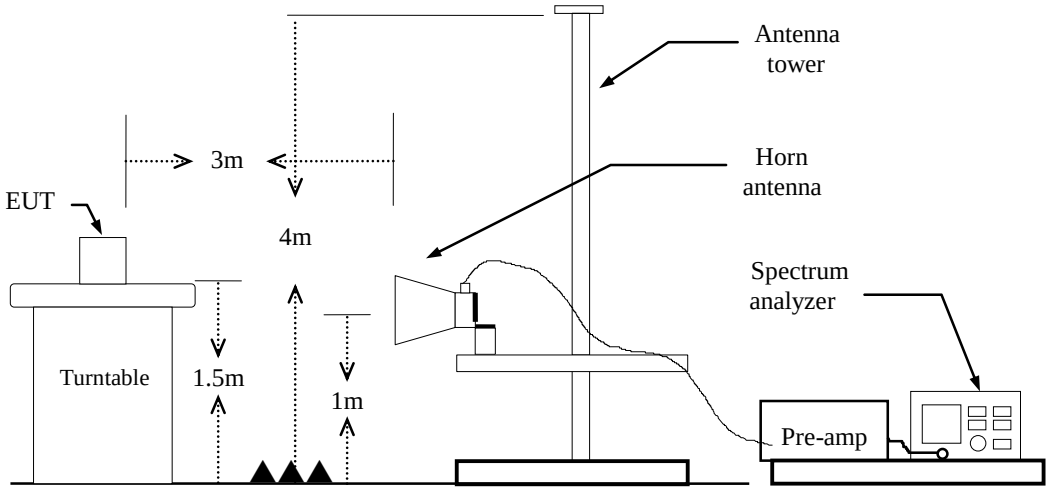
9kHz ~ 30MHz



30MHz ~ 1GHz



Above 1 GHz


Antenna
tower
Horn
antenna
Spectrum
analyzer
3m
EUT
4m
Turntable
1.5m
1m
Pre-amp

TEST PROCEDURE

1. The EUT is placed on a turntable, Above 1 GHz is 1.5m high and below 1 GHz is 0.8m high above ground plane.
2. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
3. EUT is set 3m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emissions.
4. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
5. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
6. Set the spectrum analyzer in the following setting as:

   Below 1GHz:

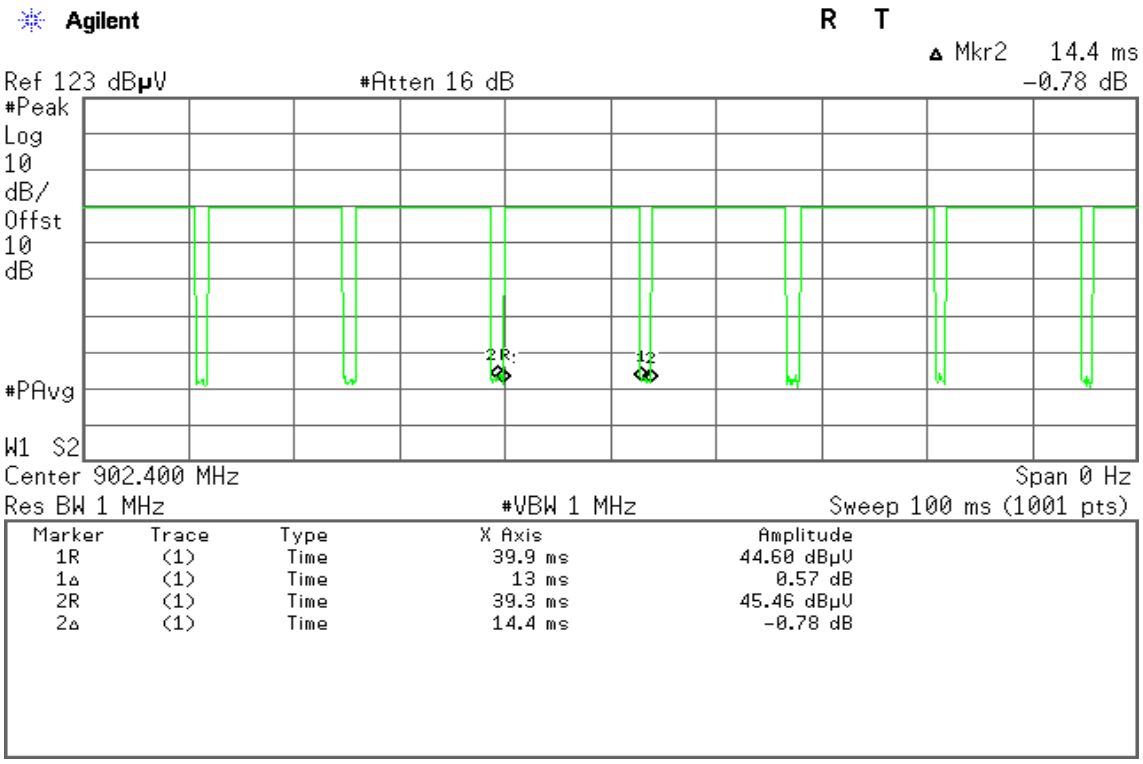
   RBW=100kHz / VBW=300kHz / Sweep=AUTO

   Above 1GHz:

   (a) PEAK: RBW=1MHz / VBW=3MHz / Sweep=AUTO
   (b) AVERAGE: RBW=1MHz,
   if duty cycle $\geqq$ 98%, VBW=10Hz.
   if duty cycle<98% VBW=1/T.
   FHSS: = 90%, VBW= 76Hz
7. Repeat above procedures until the measurements for all frequencies are complete.
8. Result = Spectrum Reading + cable loss(spectrum to Amp) - Amp Gain + Cable loss(Amp to receive Ant)+ Receive Ant
9. Transmitter Radiated Unwanted Emissions: For test mode BR and EDR were pretest. The worst case was BR-1Mbps in this test report.

Note: We checked every harmonics frequencies from Fundamental frequencies with reduced VBW, and we mark a point to prove pass or not if we find any emission. For this case, there are no emissions hidden in the noise floor.

Duty Cycle
FHSS

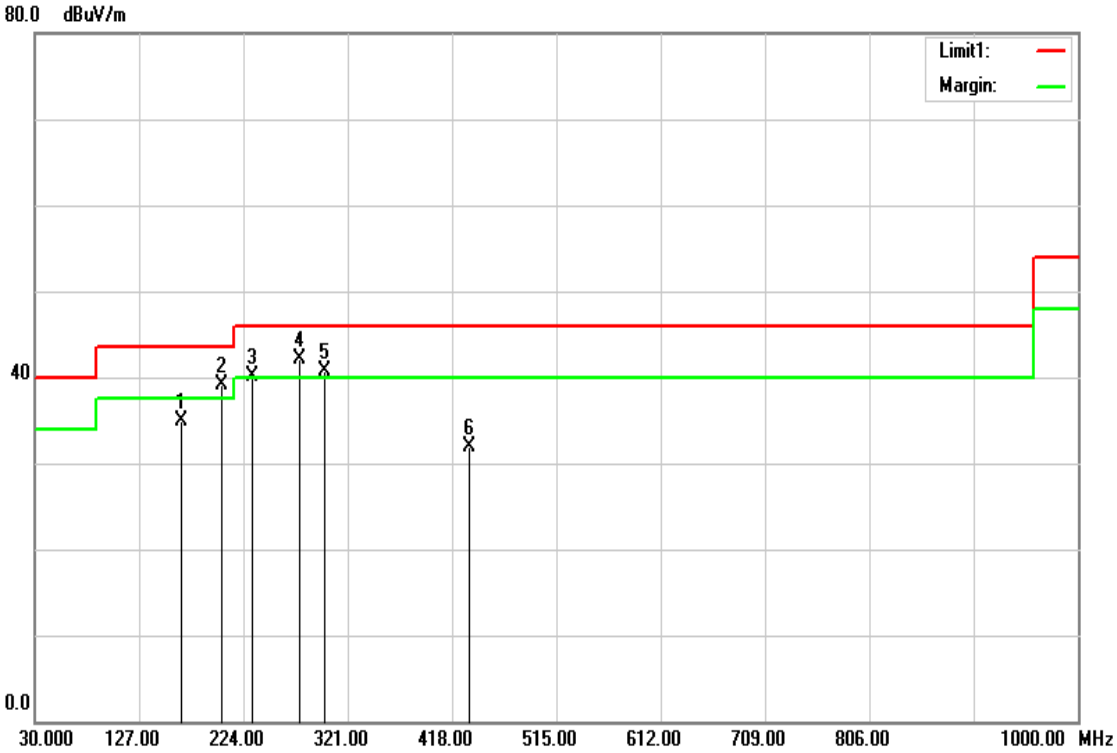


Duty Cycle (%)	TX ON (ms)	1/T(KHz)	VBW
90%	13.0000	76.923	300Hz

Notes: Duty cycle = TXon/TXall

TEST RESULTS
Below 1GHz

Operation Mode:	902.4 MHz	**Test Date:**	March 13, 2017
Temperature:	27°C	**Tested by:**	Ed Chiang
Humidity:	53% RH	**Polarity:**	Ver.

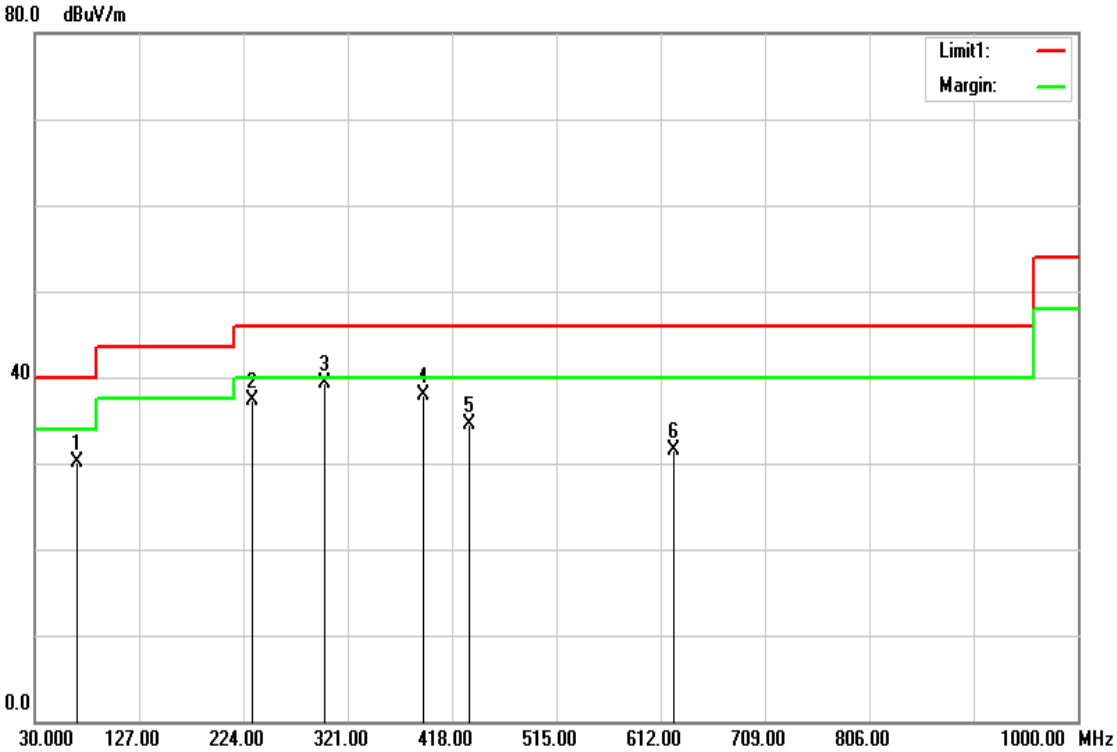


Frequency (MHz)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Pol. (H/V)
166.7700	51.65	-16.69	34.96	43.50	-8.54	QP	V
203.6300	54.83	-15.81	39.02	43.50	-4.48	QP	V
232.7300	56.86	-16.67	40.19	46.00	-5.81	QP	V
276.3800	56.76	-14.68	42.08	46.00	-3.92	QP	V
299.6600	54.95	-14.25	40.70	46.00	-5.30	QP	V
433.5200	42.64	-10.69	31.95	46.00	-14.05	peak	V

Remark:

1. *No emission found between lowest internal used/generated frequency to 30MHz (9kHz~30MHz)*
2. *Radiated emissions measured in frequency range from 30 MHz to 1000MHz were made with an instrument using peak/quasi-peak detector mode.*
3. *Quasi-peak test would be performed if the peak result were greater than the quasi-peak limit or as required by the applicant.*
4. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
5. *Margin (dB) = Remark result (dBuV/m) – Quasi-peak limit (dBuV/m).*

Operation Mode:	902.4 MHz	**Test Date:**	March 13, 2017
Temperature:	27°C	**Tested by:**	Ed Chiang
Humidity:	53% RH	**Polarity:**	Hor.

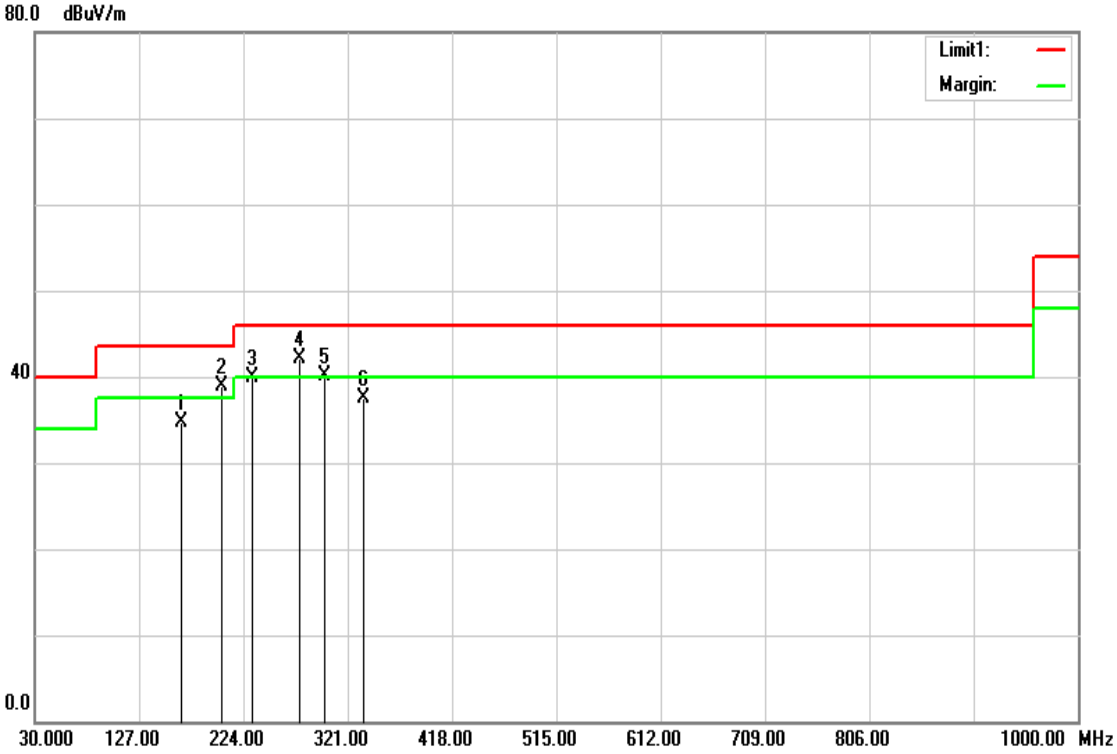


Frequency (MHz)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Pol. (H/V)
68.8000	51.07	-20.89	30.18	40.00	-9.82	QP	H
232.7300	53.97	-16.67	37.30	46.00	-8.70	peak	H
299.6600	53.60	-14.25	39.35	46.00	-6.65	peak	H
390.8400	49.80	-11.92	37.88	46.00	-8.12	peak	H
433.5200	45.26	-10.69	34.57	46.00	-11.43	peak	H
623.6400	38.80	-7.20	31.60	46.00	-14.40	peak	H

Remark:

1. *No emission found between lowest internal used/generated frequency to 30MHz (9kHz~30MHz)*
2. *Radiated emissions measured in frequency range from 30 MHz to 1000MHz were made with an instrument using peak/quasi-peak detector mode.*
3. *Quasi-peak test would be performed if the peak result were greater than the quasi-peak limit or as required by the applicant.*
4. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
5. *Margin (dB) = Remark result (dBuV/m) – Quasi-peak limit (dBuV/m).*

Operation Mode:	915.2 MHz	**Test Date:**	March 13, 2017
Temperature:	27°C	**Tested by:**	Ed Chiang
Humidity:	53% RH	**Polarity:**	Ver.

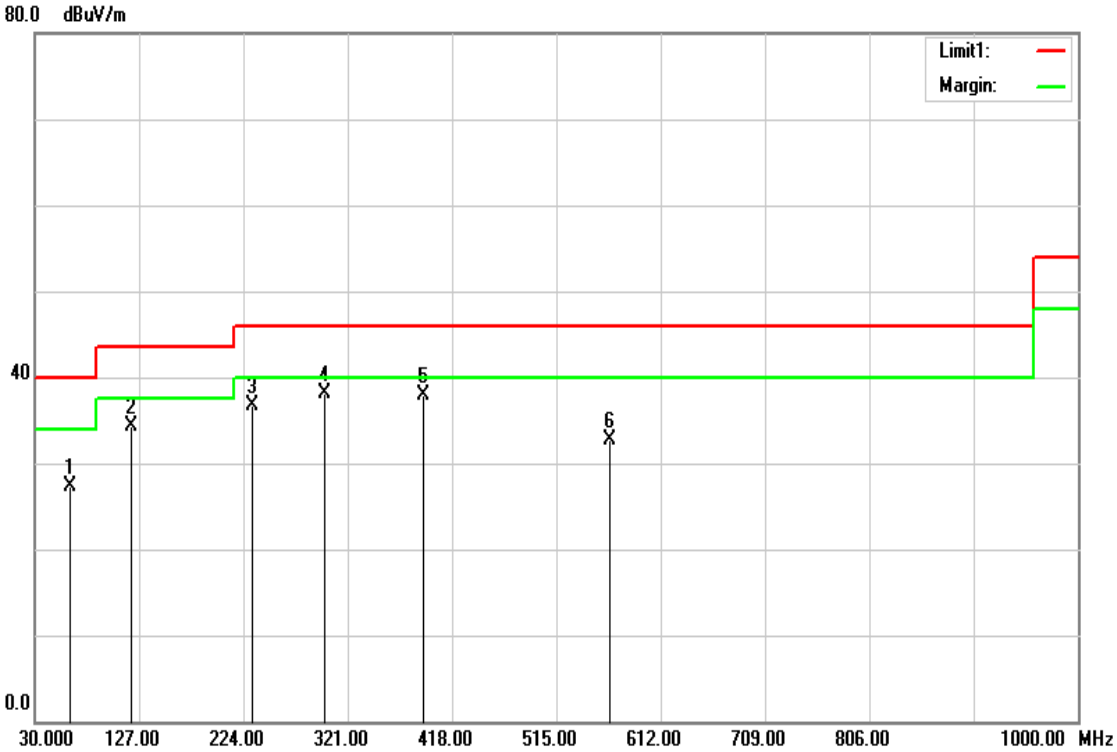


Frequency (MHz)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Pol. (H/V)
166.7700	51.36	-16.69	34.67	43.50	-8.83	QP	V
203.6300	54.78	-15.81	38.97	43.50	-4.53	QP	V
232.7300	56.51	-16.67	39.84	46.00	-6.16	QP	V
276.3800	56.73	-14.68	42.05	46.00	-3.95	QP	V
299.6600	54.37	-14.25	40.12	46.00	-5.88	QP	V
335.5500	50.80	-13.28	37.52	46.00	-8.48	peak	V

Remark:

1. *No emission found between lowest internal used/generated frequency to 30MHz (9kHz~30MHz)*
2. *Radiated emissions measured in frequency range from 30 MHz to 1000MHz were made with an instrument using peak/quasi-peak detector mode.*
3. *Quasi-peak test would be performed if the peak result were greater than the quasi-peak limit or as required by the applicant.*
4. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
5. *Margin (dB) = Remark result (dBuV/m) – Quasi-peak limit (dBuV/m).*

Operation Mode:	915.2 MHz	**Test Date:**	March 13, 2017
Temperature:	27°C	**Tested by:**	Ed Chiang
Humidity:	53% RH	**Polarity:**	Hor.

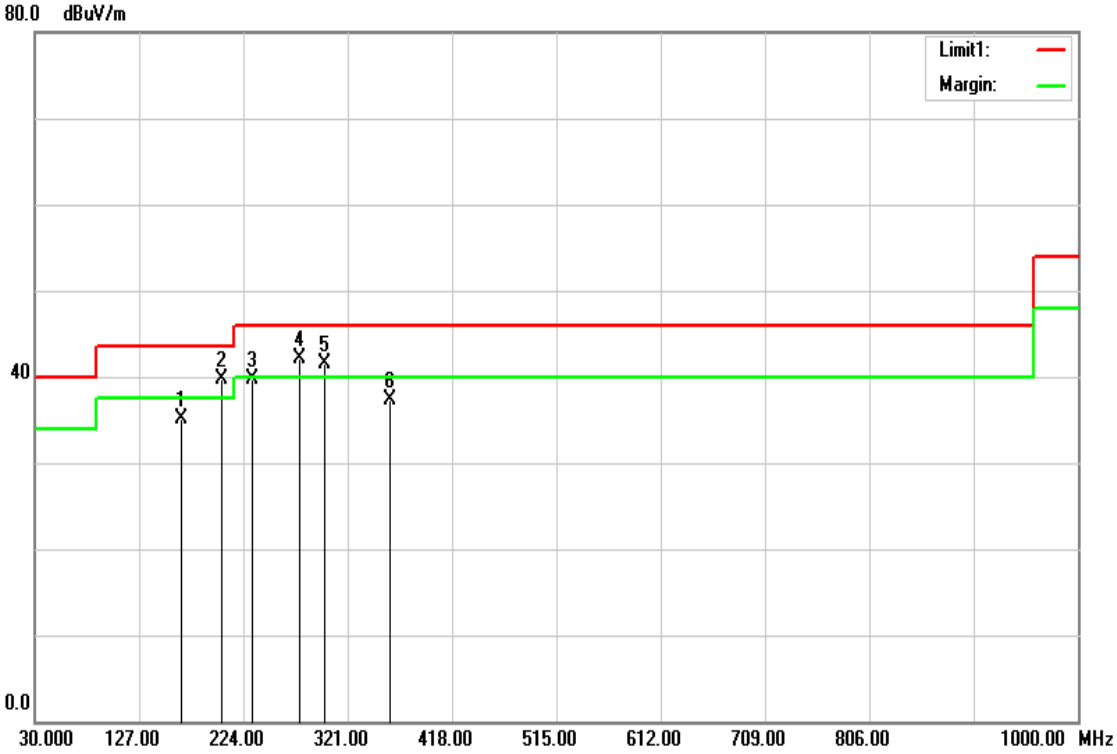


Frequency (MHz)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Pol. (H/V)
62.9800	48.93	-21.70	27.23	40.00	-12.77	QP	H
120.2100	49.90	-15.50	34.40	43.50	-9.10	peak	H
232.7300	53.42	-16.67	36.75	46.00	-9.25	peak	H
299.6600	52.28	-14.25	38.03	46.00	-7.97	peak	H
390.8400	49.87	-11.92	37.95	46.00	-8.05	peak	H
564.4700	40.96	-8.28	32.68	46.00	-13.32	peak	H

Remark:

1. *No emission found between lowest internal used/generated frequency to 30MHz (9kHz~30MHz)*
2. *Radiated emissions measured in frequency range from 30 MHz to 1000MHz were made with an instrument using peak/quasi-peak detector mode.*
3. *Quasi-peak test would be performed if the peak result were greater than the quasi-peak limit or as required by the applicant.*
4. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
5. *Margin (dB) = Remark result (dBuV/m) – Quasi-peak limit (dBuV/m).*

Operation Mode:	927.6 MHz	**Test Date:**	March 13, 2017
Temperature:	27°C	**Tested by:**	Ed Chiang
Humidity:	53% RH	**Polarity:**	Ver.

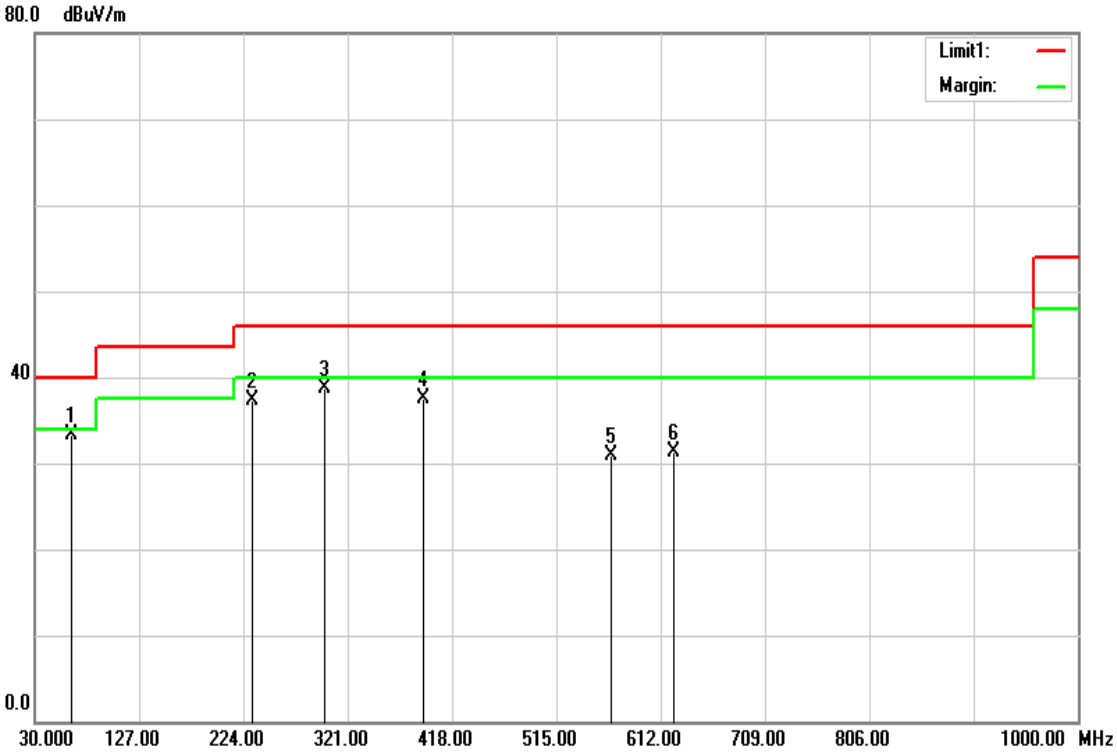


Frequency (MHz)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Pol. (H/V)
165.8000	51.66	-16.64	35.02	43.50	-8.48	QP	V
203.6300	55.47	-15.81	39.66	43.50	-3.84	QP	V
232.7300	56.41	-16.67	39.74	46.00	-6.26	QP	V
276.3800	56.80	-14.68	42.12	46.00	-3.88	QP	V
299.6600	55.83	-14.25	41.58	46.00	-4.42	QP	V
359.8000	49.95	-12.66	37.29	46.00	-8.71	peak	V

Remark:

1. *No emission found between lowest internal used/generated frequency to 30MHz (9kHz~30MHz)*
2. *Radiated emissions measured in frequency range from 30 MHz to 1000MHz were made with an instrument using peak/quasi-peak detector mode.*
3. *Quasi-peak test would be performed if the peak result were greater than the quasi-peak limit or as required by the applicant.*
4. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
5. *Margin (dB) = Remark result (dBuV/m) – Quasi-peak limit (dBuV/m).*

Operation Mode:	927.6 MHz	**Test Date:**	March 13, 2017
Temperature:	27°C	**Tested by:**	Ed Chiang
Humidity:	53% RH	**Polarity:**	Hor.



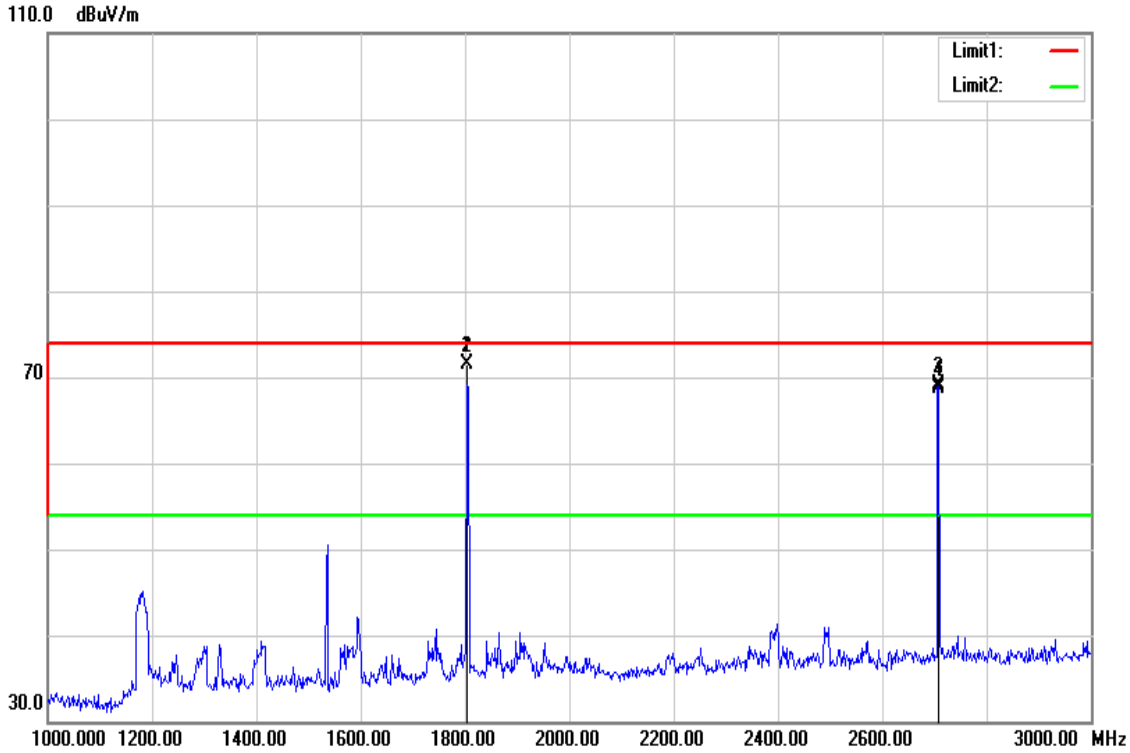
Frequency (MHz)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Pol. (H/V)
63.9500	54.89	-21.56	33.33	40.00	-6.67	peak	H
232.7300	53.94	-16.67	37.27	46.00	-8.73	peak	H
299.6600	52.87	-14.25	38.62	46.00	-7.38	peak	H
390.8400	49.52	-11.92	37.60	46.00	-8.40	peak	H
566.4100	39.10	-8.25	30.85	46.00	-15.15	peak	H
623.6400	38.41	-7.20	31.21	46.00	-14.79	peak	H

Remark:

1. *No emission found between lowest internal used/generated frequency to 30MHz (9kHz~30MHz)*
2. *Radiated emissions measured in frequency range from 30 MHz to 1000MHz were made with an instrument using peak/quasi-peak detector mode.*
3. *Quasi-peak test would be performed if the peak result were greater than the quasi-peak limit or as required by the applicant.*
4. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
5. *Margin (dB) = Remark result (dBuV/m) – Quasi-peak limit (dBuV/m).*

Above 1 GHz

Operation Mode:	TX / CH Low / 1G-3G	**Test Date:**	April 7, 2017
Temperature:	27°C	**Tested by:**	Ed Chiang
Humidity:	53 % RH	**Polarity:**	Ver.

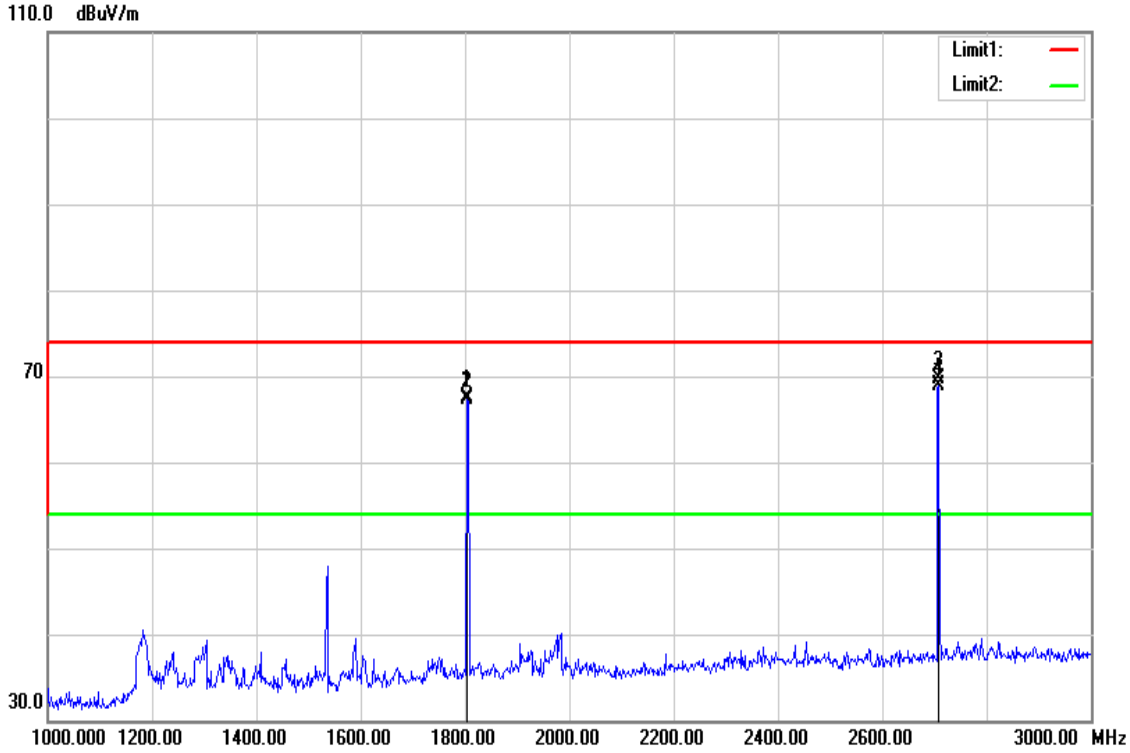


No	Frequency (MHz)	Reading (dBuV)	Correction (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Pol. (H/V)
1	1804.000	76.12	-4.62	71.50	74.00	-2.50	peak	V
#2	1804.000	76.09	-4.62	71.47	54.00	17.47	AVG	V
3	2708.000	70.52	-1.33	69.19	74.00	-4.81	peak	V
#4	2708.000	70.10	-1.33	68.77	54.00	14.77	AVG	V

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.*
3. *Average test would be performed if the peak result were greater than the average limit .*
4. *Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.*
5. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
6. *Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).*
7. *#2 Duty Cycle=11.11%, Duty Factor=19.09dB, Result=71.47-19.09=52.38dBuV/m*
8. *#4 Duty Cycle=11.11%, Duty Factor=19.09dB, Result=68.77-19.09=49.68dBuV/m*

Operation Mode:	TX / CH Low / 1G-3G	**Test Date:**	April 7, 2017
Temperature:	27°C	**Tested by:**	Ed Chiang
Humidity:	53 % RH	**Polarity:**	Hor.

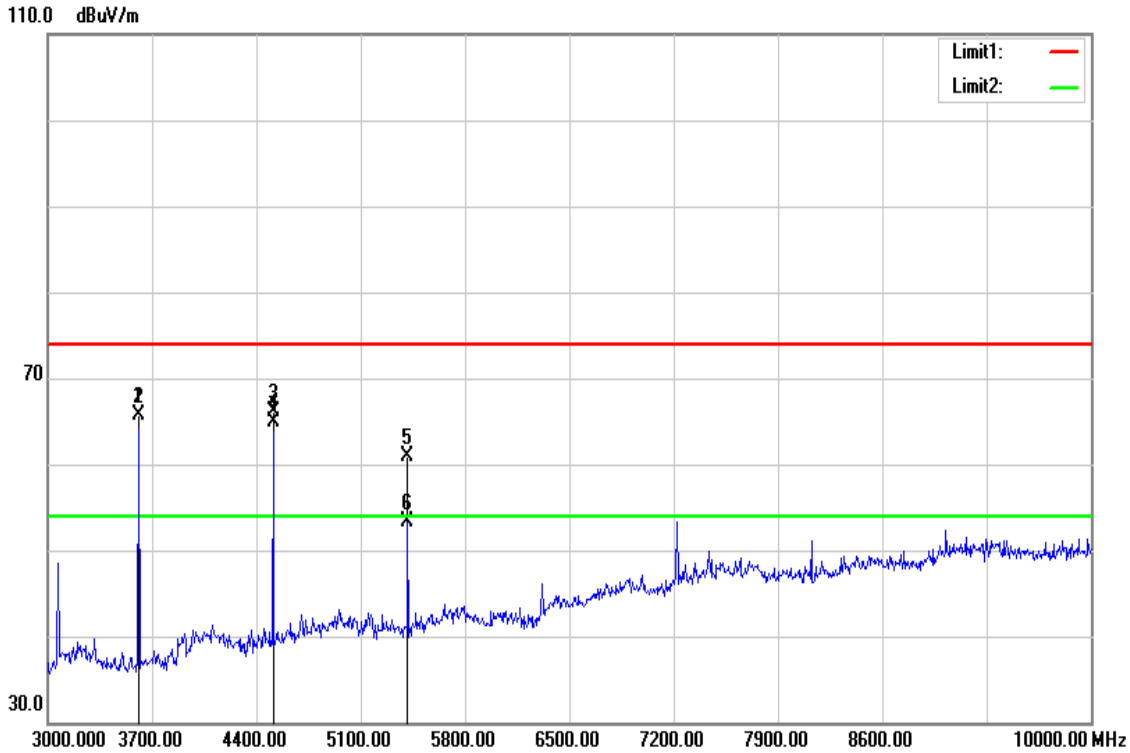


No	Frequency (MHz)	Reading (dBuV)	Correction (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Pol. (H/V)
1	1804.000	72.19	-4.62	67.57	74.00	-6.43	peak	H
#2	1804.000	71.83	-4.62	67.21	54.00	13.21	AVG	H
3	2708.000	70.95	-1.33	69.62	74.00	-4.38	peak	H
#4	2708.000	70.16	-1.33	68.83	54.00	14.83	AVG	H

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.*
3. *Average test would be performed if the peak result were greater than the average limit .*
4. *Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.*
5. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
6. *Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).*
7. *#2 Duty Cycle=11.11%, Duty Factor=19.09dB, Result=67.21-19.09=48.12dBuV/m*
8. *#4 Duty Cycle=11.11%, Duty Factor=19.09dB, Result=68.83-19.09=49.74dBuV/m*

Operation Mode:	TX / CH Low / 3G-10G	**Test Date:**	April 7, 2017
Temperature:	27°C	**Tested by:**	Ed Chiang
Humidity:	53 % RH	**Polarity:**	Ver.

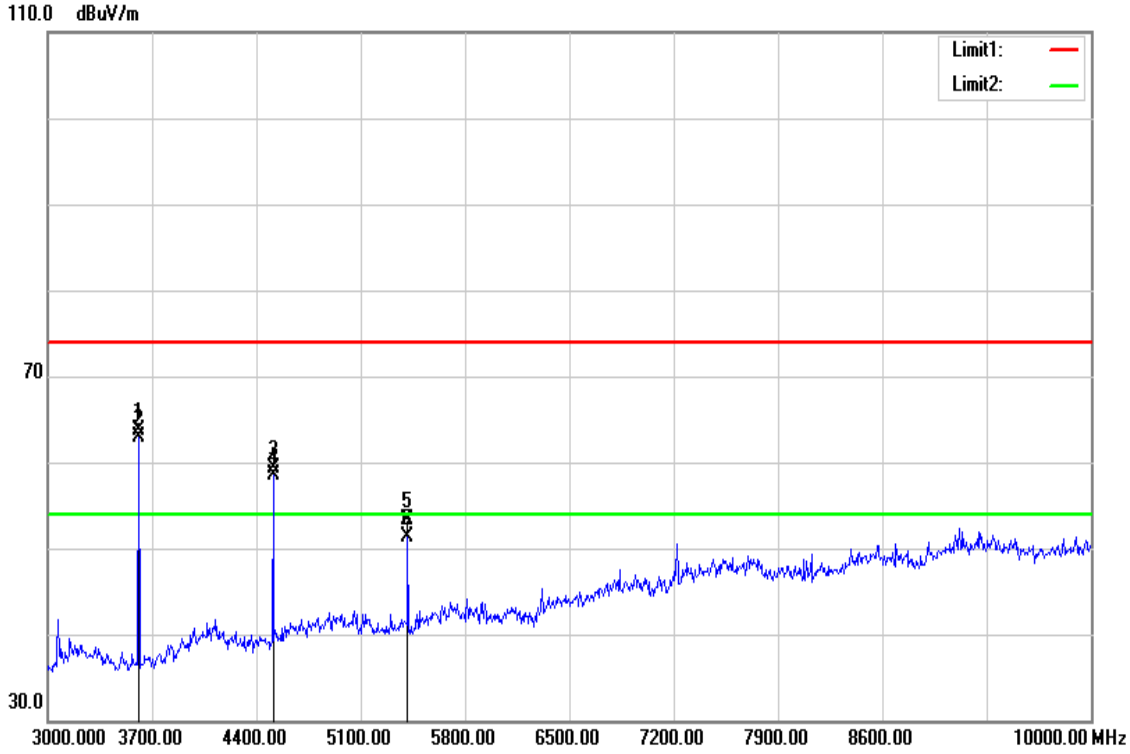


No	Frequency (MHz)	Reading (dBuV)	Correction (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Pol. (H/V)
1	3609.000	64.79	1.00	65.79	74.00	-8.21	peak	V
#2	3609.000	64.63	1.00	65.63	54.00	11.63	AVG	V
3	4512.000	61.79	4.26	66.05	74.00	-7.95	peak	V
#4	4512.000	60.63	4.26	64.89	54.00	10.89	AVG	V
5	5415.000	54.49	6.34	60.83	74.00	-13.17	peak	V
6	5415.000	47.05	6.34	53.39	54.00	-0.61	AVG	V

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.*
3. *Average test would be performed if the peak result were greater than the average limit .*
4. *Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.*
5. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
6. *Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).*
7. *#2 Duty Cycle=11.11%, Duty Factor=19.09dB, Result=65.63-19.09=46.54dBuV/m*
8. *#4 Duty Cycle=11.11%, Duty Factor=19.09dB, Result=64.89-19.09=45.80dBuV/m*

Operation Mode:	TX / CH Low / 3G-10G	**Test Date:**	April 7, 2017
Temperature:	27°C	**Tested by:**	Ed Chiang
Humidity:	53 % RH	**Polarity:**	Hor.

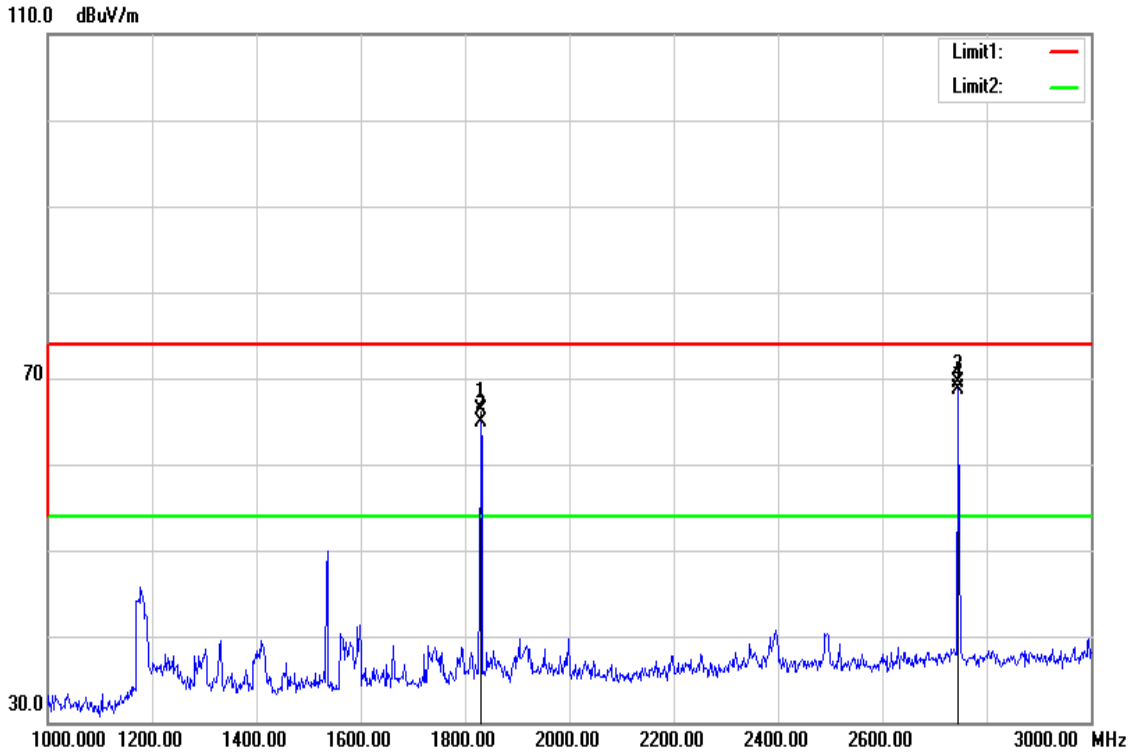


No	Frequency (MHz)	Reading (dBuV)	Correction (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Pol. (H/V)
1	3609.000	62.72	1.00	63.72	74.00	-10.28	peak	H
#2	3609.000	61.95	1.00	62.95	54.00	8.95	AVG	H
3	4512.000	54.98	4.26	59.24	74.00	-14.76	peak	H
#4	4512.000	54.32	4.26	58.58	54.00	4.58	AVG	H
5	5415.000	47.02	6.34	53.36	74.00	-20.64	peak	H
6	5415.000	45.04	6.34	51.38	54.00	-2.62	AVG	H

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.*
3. *Average test would be performed if the peak result were greater than the average limit .*
4. *Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.*
5. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
6. *Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).*
7. *#2 Duty Cycle=11.11%, Duty Factor=19.09dB, Result=62.95-19.09=43.86dBuV/m*
8. *#4 Duty Cycle=11.11%, Duty Factor=19.09dB, Result=58.58-19.09=39.49dBuV/m*

Operation Mode:	TX / CH Mid / 1G-3G	**Test Date:**	April 7, 2017
Temperature:	26°C	**Tested by:**	Ed Chiang
Humidity:	50 % RH	**Polarity:**	Ver.

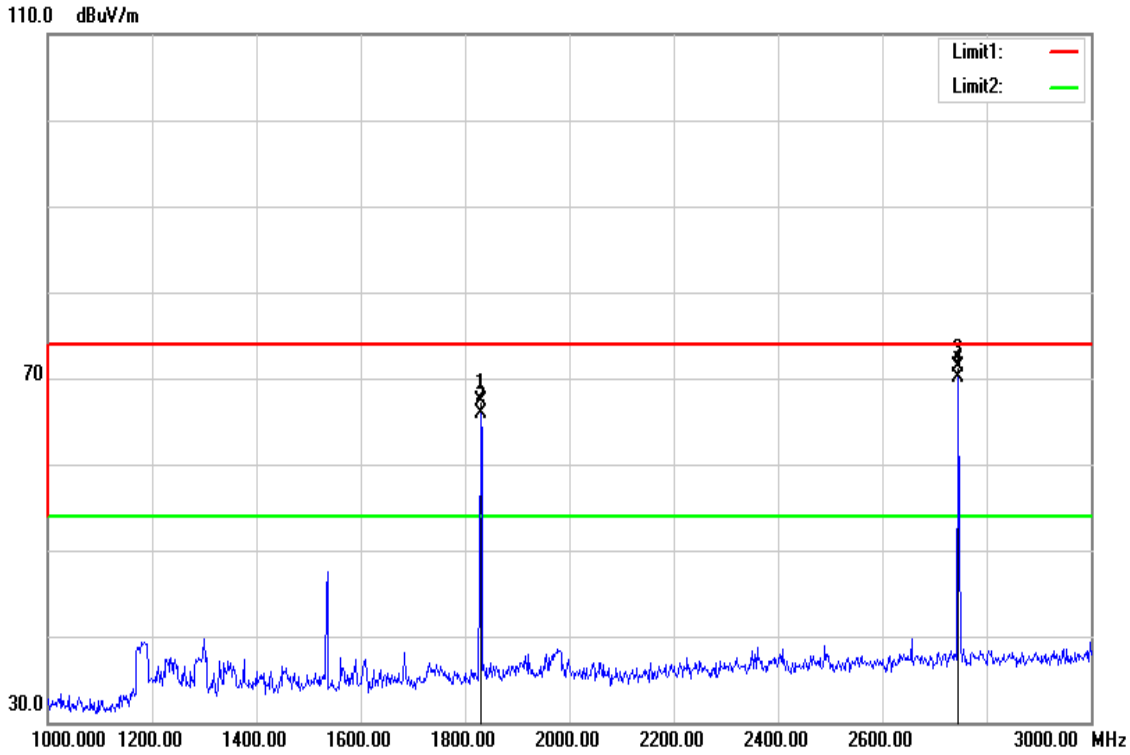


No	Frequency (MHz)	Reading (dBuV)	Correction (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Pol. (H/V)
1	1830.000	70.69	-4.48	66.21	74.00	-7.79	peak	V
#2	1830.000	69.32	-4.48	64.84	54.00	10.84	AVG	V
3	2746.000	70.76	-1.24	69.52	74.00	-4.48	peak	V
#4	2746.000	69.97	-1.24	68.73	54.00	14.73	AVG	V

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.*
3. *Average test would be performed if the peak result were greater than the average limit.*
4. *Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.*
5. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
6. *Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).*
7. *#2 Duty Cycle=11.11%, Duty Factor=19.09dB, Result=64.84-19.09=45.75dBuV/m*
8. *#4 Duty Cycle=11.11%, Duty Factor=19.09dB, Result=68.73-19.09=49.64dBuV/m*

Operation Mode:	TX / CH Mid / 1G-3G	**Test Date:**	April 7, 2017
Temperature:	26°C	**Tested by:**	Ed Chiang
Humidity:	50 % RH	**Polarity:**	Hor.

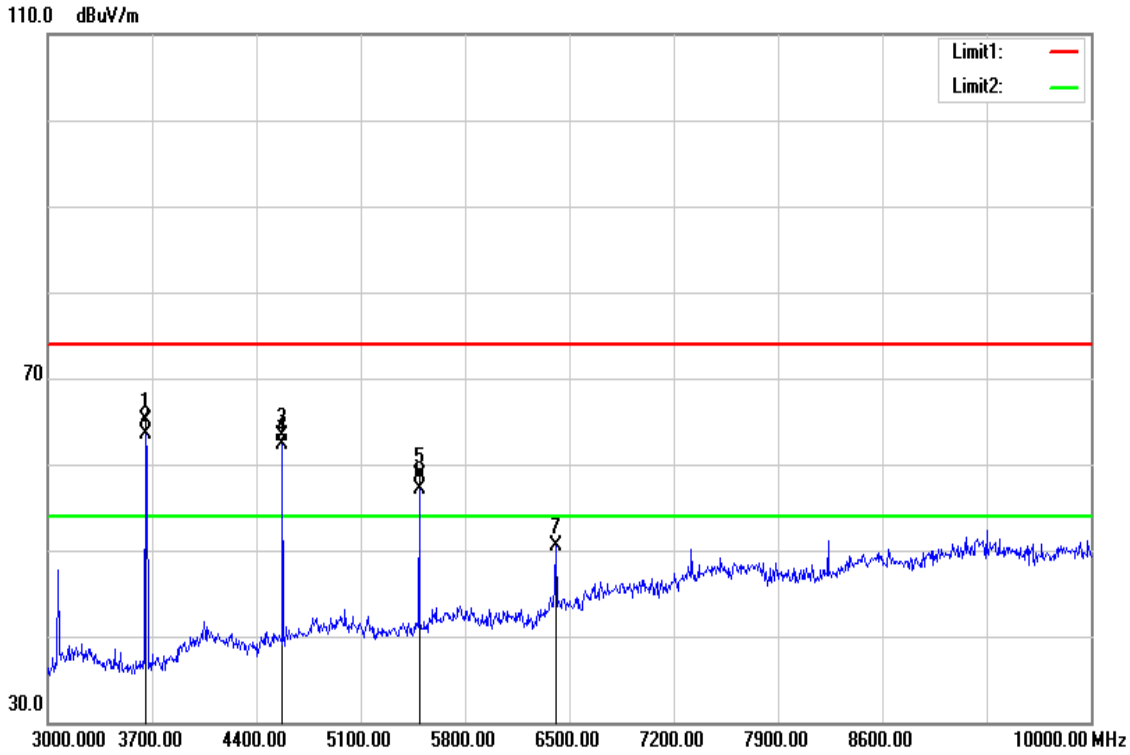


No	Frequency (MHz)	Reading (dBuV)	Correction (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Pol. (H/V)
1	1830.000	71.79	-4.48	67.31	74.00	-6.69	peak	H
#2	1830.000	70.42	-4.48	65.94	54.00	11.94	AVG	H
3	2746.000	72.48	-1.24	71.24	74.00	-2.76	peak	H
#4	2746.000	71.34	-1.24	70.10	54.00	16.10	AVG	H

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.*
3. *Average test would be performed if the peak result were greater than the average limit.*
4. *Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.*
5. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
6. *Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).*
7. *#2 Duty Cycle=11.11%, Duty Factor=19.09dB, Result=65.94-19.09=46.85dBuV/m*
8. *#4 Duty Cycle=11.11%, Duty Factor=19.09dB, Result=70.10-19.09=51.01dBuV/m*

Operation Mode:	TX / CH Mid / 3G-10G	**Test Date:**	April 7, 2017
Temperature:	26°C	**Tested by:**	Ed Chiang
Humidity:	50 % RH	**Polarity:**	Ver.

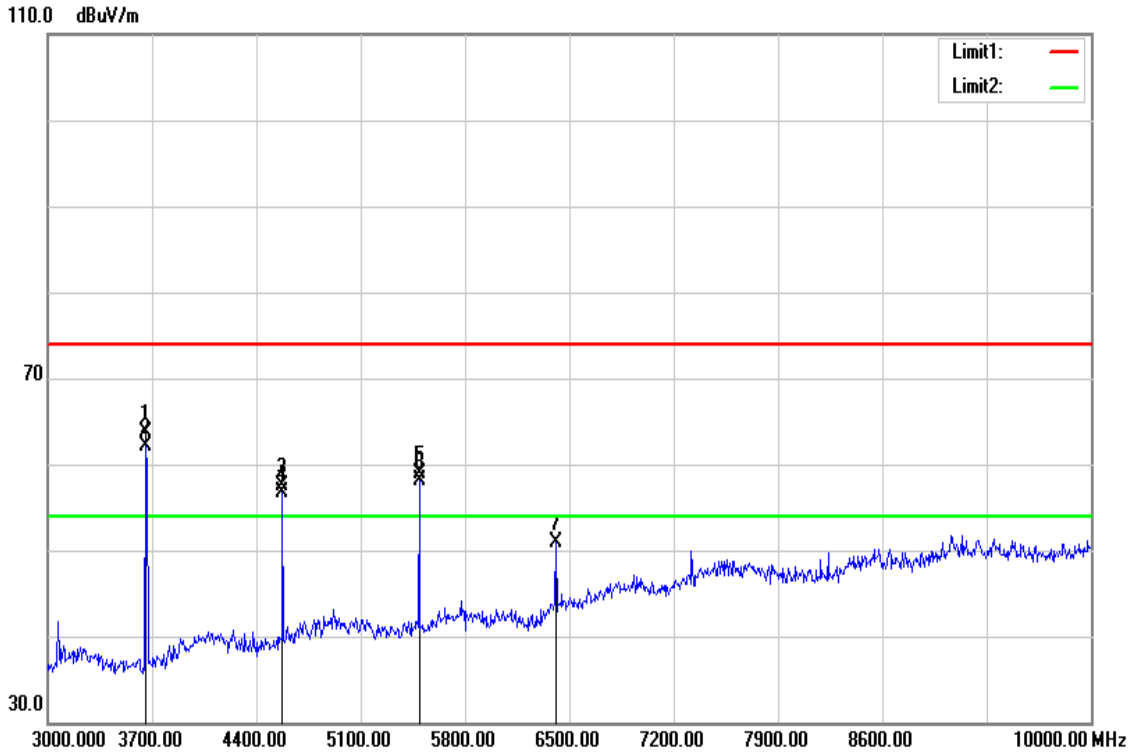


No	Frequency (MHz)	Reading (dBuV)	Correction (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Pol. (H/V)
1	3658.000	63.93	1.20	65.13	74.00	-8.87	peak	V
#2	3658.000	62.24	1.20	63.44	54.00	9.44	AVG	V
3	4575.000	58.84	4.43	63.27	74.00	-10.73	peak	V
#4	4575.000	57.91	4.43	62.34	54.00	8.34	AVG	V
5	5492.000	52.27	6.49	58.76	74.00	-15.24	peak	V
#6	5492.000	50.67	6.49	57.16	54.00	3.16	AVG	V
7	6409.000	41.02	9.46	50.48	74.00	-23.52	peak	V

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.*
3. *Average test would be performed if the peak result were greater than the average limit.*
4. *Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.*
5. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
6. *Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).*
7. *#2 Duty Cycle=11.11%, Duty Factor=19.09dB, Result=63.44-19.09=44.35dBuV/m*
8. *#4 Duty Cycle=11.11%, Duty Factor=19.09dB, Result=62.34-19.09=43.25dBuV/m*
9. *#6 Duty Cycle=11.11%, Duty Factor=19.09dB, Result=57.16-19.09=38.07dBuV/m*

Operation Mode:	TX / CH Mid / 3G-10G	**Test Date:**	April 7, 2017
Temperature:	26°C	**Tested by:**	Ed Chiang
Humidity:	50 % RH	**Polarity:**	Hor.

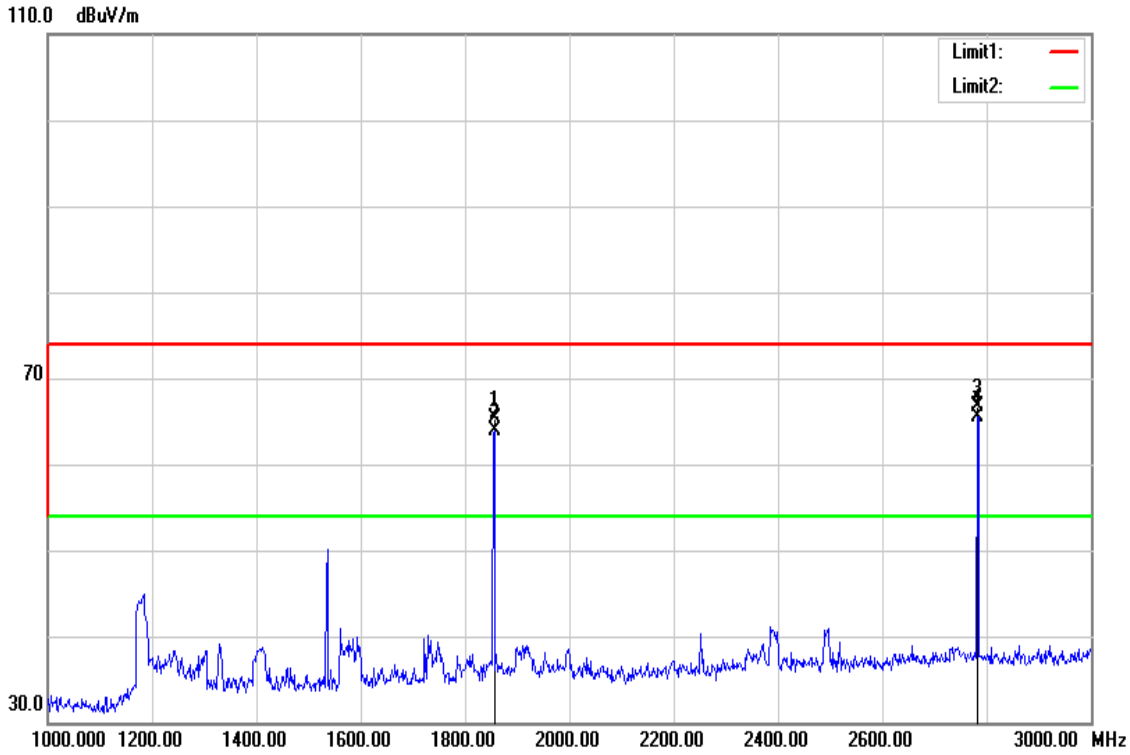


No	Frequency (MHz)	Reading (dBuV)	Correction (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Pol. (H/V)
1	3658.000	62.54	1.20	63.74	74.00	-10.26	peak	H
#2	3658.000	60.98	1.20	62.18	54.00	8.18	AVG	H
3	4575.000	52.99	4.43	57.42	74.00	-16.58	peak	H
#4	4575.000	52.22	4.43	56.65	54.00	2.65	AVG	H
5	5492.000	52.48	6.49	58.97	74.00	-15.03	peak	H
#6	5492.000	51.64	6.49	58.13	54.00	4.13	AVG	H
7	6409.000	41.43	9.46	50.89	74.00	-23.11	peak	H

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.*
3. *Average test would be performed if the peak result were greater than the average limit.*
4. *Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.*
5. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
6. *Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).*
7. *#2 Duty Cycle=11.11%, Duty Factor=19.09dB, Result=62.18-19.09=43.09dBuV/m*
8. *#4 Duty Cycle=11.11%, Duty Factor=19.09dB, Result=56.65-19.09=37.56dBuV/m*
9. *#6 Duty Cycle=11.11%, Duty Factor=19.09dB, Result=58.13-19.09=39.04dBuV/m*

Operation Mode:	TX / CH High / 1G-3G	**Test Date:**	April 7, 2017
Temperature:	26°C	**Tested by:**	Ed Chiang
Humidity:	50 % RH	**Polarity:**	Ver.

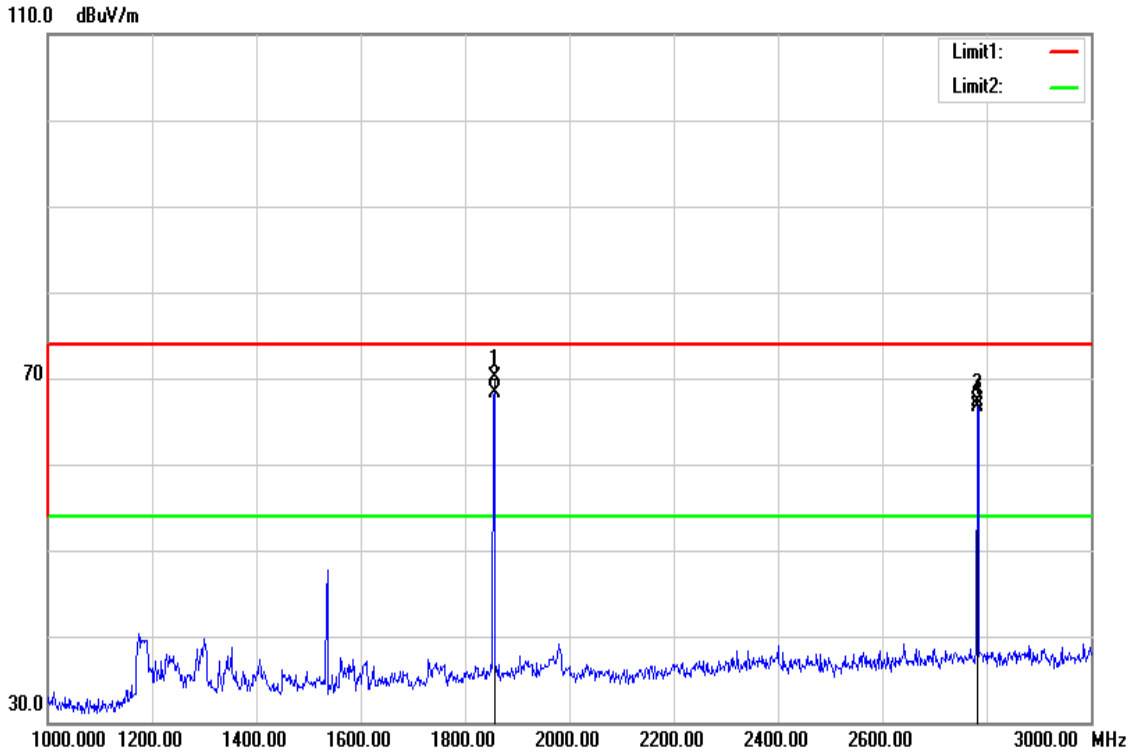


No	Frequency (MHz)	Reading (dBuV)	Correction (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Pol. (H/V)
1	1856.000	69.72	-4.35	65.37	74.00	-8.63	peak	V
#2	1856.000	68.23	-4.35	63.88	54.00	9.88	AVG	V
3	2782.000	67.84	-1.14	66.70	74.00	-7.30	peak	V
#4	2782.000	66.65	-1.14	65.51	54.00	11.51	AVG	V

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.*
3. *Average test would be performed if the peak result were greater than the average limit.*
4. *Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.*
5. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
6. *Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).*
7. *#2 Duty Cycle=11.11%, Duty Factor=19.09dB, Result=63.88-19.09=44.79dBuV/m*
8. *#4 Duty Cycle=11.11%, Duty Factor=19.09dB, Result=65.51-19.09=46.42dBuV/m*

Operation Mode:	TX / CH High / 1G-3G	**Test Date:**	April 7, 2017
Temperature:	26°C	**Tested by:**	Ed Chiang
Humidity:	50 % RH	**Polarity:**	Hor.

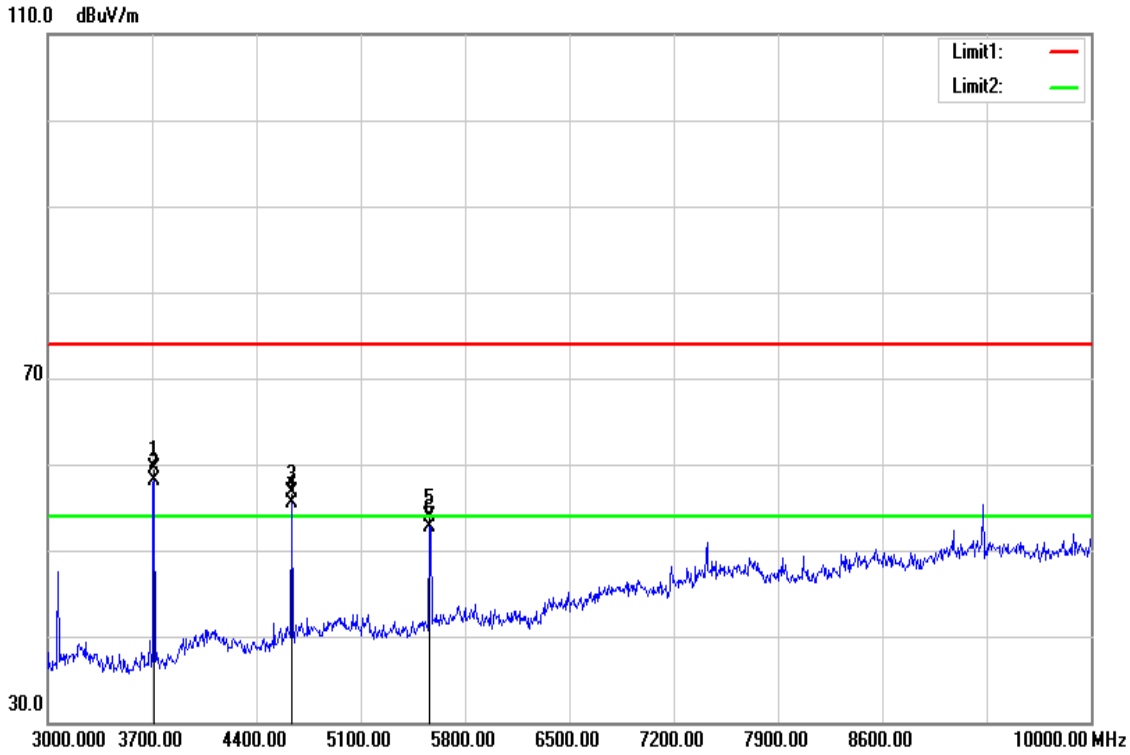


No	Frequency (MHz)	Reading (dBuV)	Correction (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Pol. (H/V)
1	1856.000	74.50	-4.35	70.15	74.00	-3.85	peak	H
#2	1856.000	72.74	-4.35	68.39	54.00	14.39	AVG	H
3	2782.000	68.48	-1.14	67.34	74.00	-6.66	peak	H
#4	2782.000	67.78	-1.14	66.64	54.00	12.64	AVG	H

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.*
3. *Average test would be performed if the peak result were greater than the average limit.*
4. *Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.*
5. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
6. *Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).*
7. *#2 Duty Cycle=11.11%, Duty Factor=19.09dB, Result=68.39-19.09=49.30dBuV/m*
8. *#4 Duty Cycle=11.11%, Duty Factor=19.09dB, Result=66.64-19.09=47.55dBuV/m*

Operation Mode:	TX / CH High / 3G-10G	**Test Date:**	April 7, 2017
Temperature:	26°C	**Tested by:**	Ed Chiang
Humidity:	50 % RH	**Polarity:**	Ver.

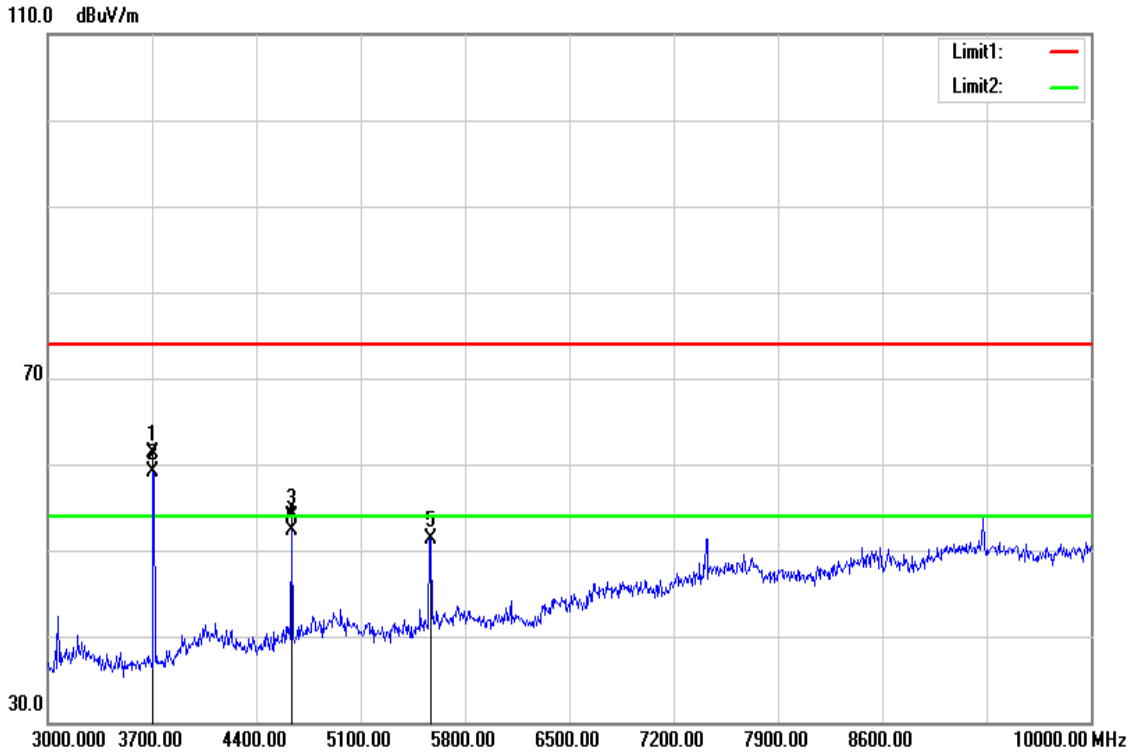


No	Frequency (MHz)	Reading (dBuV)	Correction (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Pol. (H/V)
1	3714.000	58.06	1.42	59.48	74.00	-14.52	peak	V
#2	3714.000	56.67	1.42	58.09	54.00	4.09	AVG	V
3	4638.000	52.17	4.60	56.77	74.00	-17.23	peak	V
#4	4638.000	50.85	4.60	55.45	54.00	1.45	AVG	V
5	5562.000	47.24	6.70	53.94	74.00	-20.06	peak	V
6	5562.000	46.03	6.70	52.73	54.00	-1.27	AVG	V

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.*
3. *Average test would be performed if the peak result were greater than the average limit.*
4. *Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.*
5. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
6. *Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).*
7. *#2 Duty Cycle=11.11%, Duty Factor=19.09dB, Result=58.09-19.09=39.00dBuV/m*
8. *#4 Duty Cycle=11.11%, Duty Factor=19.09dB, Result=55.45-19.09=36.36dBuV/m*

Operation Mode:	TX / CH High / 3G-10G	**Test Date:**	April 7, 2017
Temperature:	26°C	**Tested by:**	Ed Chiang
Humidity:	50 % RH	**Polarity:**	Hor.



No	Frequency (MHz)	Reading (dBuV)	Correction (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Pol. (H/V)
1	3707.000	59.92	1.39	61.31	74.00	-12.69	peak	H
#2	3707.000	57.72	1.39	59.11	54.00	5.11	AVG	H
3	4638.000	49.24	4.60	53.84	74.00	-20.16	peak	H
4	4638.000	47.66	4.60	52.26	54.00	-1.74	AVG	H
5	5569.000	44.61	6.73	51.34	74.00	-22.66	peak	H

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.*
3. *Average test would be performed if the peak result were greater than the average limit.*
4. *Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.*
5. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
6. *Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).*
7. *#2 Duty Cycle=11.11%, Duty Factor=19.09dB, Result=59.11-19.09=40.02dBuV/m*

7.9 POWERLINE CONDUCTED EMISSIONS

LIMIT

According to §15.207(a), for an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed the limits in the following table, as measured using a 50 μH/50 ohms line impedance stabilization network (LISN). Compliance with the provisions of this paragraph shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminal. The lower limit applies at the boundary between the frequency ranges.

Frequency Range (MHz)	Limits (dBμV)	
	Quasi-peak	Average
0.15 to 0.50	66 to 56*	56 to 46*
0.50 to 5	56	46
5 to 30	60	50

***** *Decreases with the logarithm of the frequency.*

Test Configuration

See test photographs attached in Appendix II for the actual connections between EUT and support equipment.

TEST PROCEDURE

1. The EUT was placed on a table, which is 0.8m above ground plane.
2. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
3. Repeat above procedures until all frequency measured were complete.

TEST RESULTS

Test Data

Operation Mode:	Normal Link	**Test Date:**	March 14, 2017
Temperature:	24°C	**Tested by:**	Eric Lee
Humidity:	56% RH		

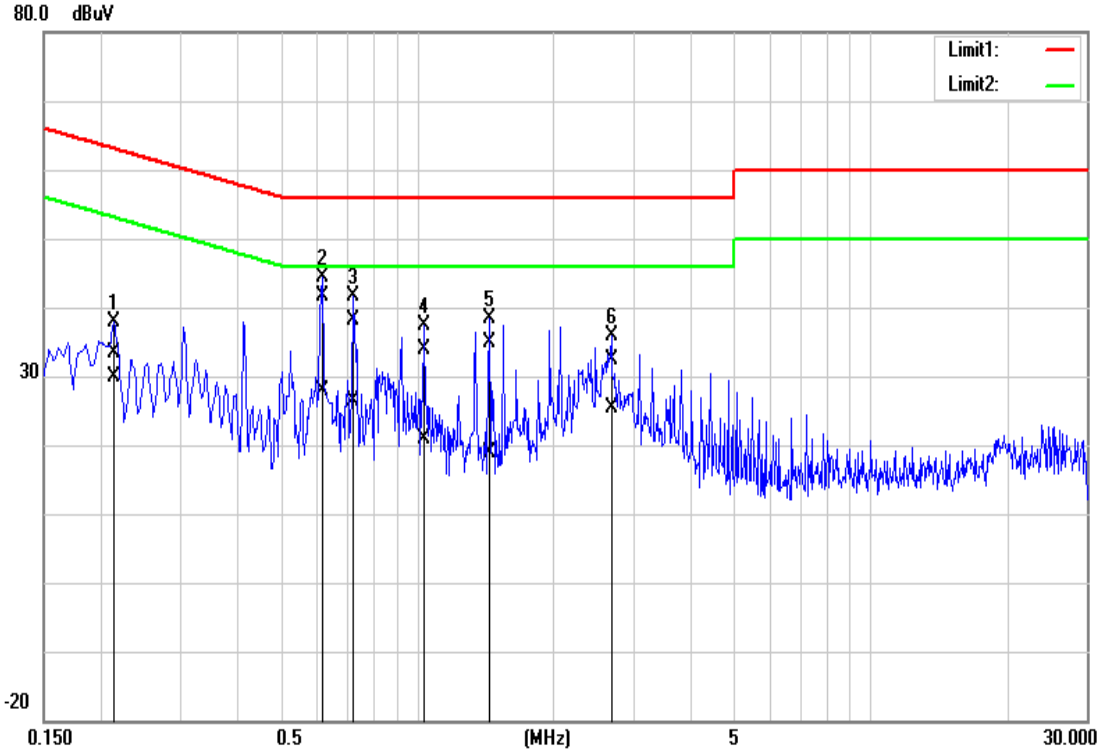
Freq. (MHz)	QP Reading (dBuV)	AV Reading (dBuV)	Corr. factor (dB/m)	QP Result (dBuV/m)	AV Result (dBuV/m)	QP Limit (dBuV)	AV Limit (dBuV)	QP Margin (dB)	AV Margin (dB)	Note
0.2140	23.79	20.26	9.69	33.48	29.95	63.04	53.05	-29.56	-23.10	L1
0.6180	31.97	18.20	9.68	41.65	27.88	56.00	46.00	-14.35	-18.12	L1
0.7220	28.44	16.64	9.69	38.13	26.33	56.00	46.00	-17.87	-19.67	L1
1.0339	24.10	11.29	9.69	33.79	20.98	56.00	46.00	-22.21	-25.02	L1
1.4460	25.11	9.14	9.69	34.80	18.83	56.00	46.00	-21.20	-27.17	L1
2.6900	22.61	15.68	9.70	32.31	25.38	56.00	46.00	-23.69	-20.62	L1
0.2020	25.60	20.86	9.70	35.30	30.56	63.53	53.53	-28.23	-22.97	L2
0.4180	19.59	12.82	9.69	29.28	22.51	57.49	47.49	-28.21	-24.98	L2
0.6220	26.34	14.70	9.69	36.03	24.39	56.00	46.00	-19.97	-21.61	L2
0.7260	23.69	13.62	9.69	33.38	23.31	56.00	46.00	-22.62	-22.69	L2
1.4500	20.97	5.92	9.69	30.66	15.61	56.00	46.00	-25.34	-30.39	L2
2.7180	19.55	13.72	9.70	29.25	23.42	56.00	46.00	-26.75	-22.58	L2

Remark:

1. *Measuring frequencies from 0.15 MHz to 30MHz.*
2. *The emissions measured in frequency range from 0.15 MHz to 30MHz were made with an instrument using Quasi-peak detector and average detector.*
3. *The IF bandwidth of SPA between 0.15MHz to 30MHz was 10kHz; the IF bandwidth of Test Receiver between 0.15MHz to 30MHz was 9kHz;*
4. *L1 = Line One (Live Line) / L2 = Line Two (Neutral Line)*

Test Plots

Conducted emissions (Line 1)



Conducted emissions (Line 2)