

FCC 15.247 & RSS-247 2.4 GHz Test Report

for

FUTABA Corporation

**1080 Yabutsuka Chosei-mura Chosei-gun Chiba-ken 299-4395
JAPAN**

Product Name : Radio Control
Model Name : CGY760R
Brand : Futaba
FCC ID : AZPCGY760R-24G
IC : 2914D-CGY760R

**Prepared by: : AUDIX Technology Corporation,
EMC Department**



The statement is based on a single evaluation of one sample of the above-mentioned products. It does not imply an assessment of the whole production and does not permit the use of the test lab logo.

The report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, TAF or any government agencies.

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TEST REPORT CERTIFICATION

Applicant : FUTABA Corporation
Factory : FUTABA Corporation
EUT Description
(1) Product : Radio Control
(2) Model : CGY760R
(3) Brand : Futaba
(4) Power Rating : DC 6.6V

Applicable Standards:

47 CFR FCC Part 15 Subpart C
RSS-Gen (Issue 4), November 2014
RSS-247 (Issue 2), February 2017
ANSI C63.10:2013
KDB 558074 D01 DTS Meas Guidance v04

Audix Technology Corp. tested the equipment mentioned in accordance with the requirements set forth in the above standards. Test results indicate that the equipment tested is capable of demonstrating compliance with the requirements as documented within this report.

Audix Technology Corp. does not assume responsibility for any conclusions and generalizations drawn from the test results with regard to other specimens and samples.

Date of Report: 2018. 03. 20

Reviewed by:



(Sabrina Wang/Administrator)

Approved by:



(Ben Cheng/Manager)

1. REVISION RECORD OF TEST REPORT

Edition No	Issued Data	Revision Summary	Report Number
0	2018. 03. 20	Original Report	EM-F180104

2. SUMMARY OF TEST RESULTS

Rule		Description	Results
FCC	IC		
15.207	RSS-Gen §8.8	Conducted Emission	N/A, Note
15.247(d)/ 15.205	RSS-Gen §8.9 RSS-247 §5.5	Radiated Band Edge and Radiated Spurious Emission	PASS
15.247(a)(2)	RSS-247 §5.2(1)	6dB Bandwidth	PASS
15.247(b)(3)	RSS-247 §5.4(4)	Maximum Peak Output	PASS
15.247(d)	RSS-247 §5.5	Conducted Band Edges and Conducted Spurious Emission	PASS
15.247 (e)	RSS-247 §5.2(2)	Peak Power Spectral Density	PASS
15.203	RSS-Gen §8.3	Antenna Requirement	Compliance

Note: The EUT only employs battery power for operation, so it is unnecessary to test.

3. GENERAL INFORMATION

3.1. Description of Application

Applicant	FUTABA Corporation 1080 Yabutsuka Chosei-mura Chosei-gun Chiba-ken 299-4395 JAPAN
Factory	FUTABA Corporation 1080 Yabutsuka Chosei-mura Chosei-gun Chiba-ken 299-4395 JAPAN
Product	Radio Control
Model	CGY760R
Brand	Futaba

3.2. Description of EUT

Test Model	CGY760R
Serial Number	N/A
Power Rating	DC 6.6V
Firmware Version	N/A
Sample Status	Production
RF Features	<ul style="list-style-type: none">• DSSS (FASSTest)• FHSS (T-FHSS)
Date of Receipt	2018. 01. 12
Date of Test	2018. 01. 22 ~ 03. 16
Interface Ports of EUT	None
Accessories Supplied	None

3.3. Antenna Information

Antenna Part Number	Manufacture	Antenna Type	Frequency (GHz)	Max Gain (dBi)
JA1R0227A	Wanshih	1/4 λ antenna	2.4	Ant A: -5.16 Ant B: -5.16

3.4. EUT Specifications Assessed in Current Report

Mode	Fundamental Range (MHz)	Channel Number	Modulation	Data Rate (kbps)
DSSS	2405.376 to 2472.960	23	FASSTest	136

Mode: FASSTest					
Channel List					
Channel Number	Frequency (MHz)	Channel Number	Frequency (MHz)	Channel Number	Frequency (MHz)
02	2045.376	26	2429.952	50	2454.528
05	2408.448	29	2433.024	53	2457.600
08	2411.520	32	2436.096	56	2460.672
11	2414.592	35	2439.168	59	2463.744
14	2417.664	38	2442.240	62	2466.816
17	2420.736	41	2445.312	65	2469.888
20	2423.808	44	2448.384	68	2472.960
23	2426.880	47	2451.456		

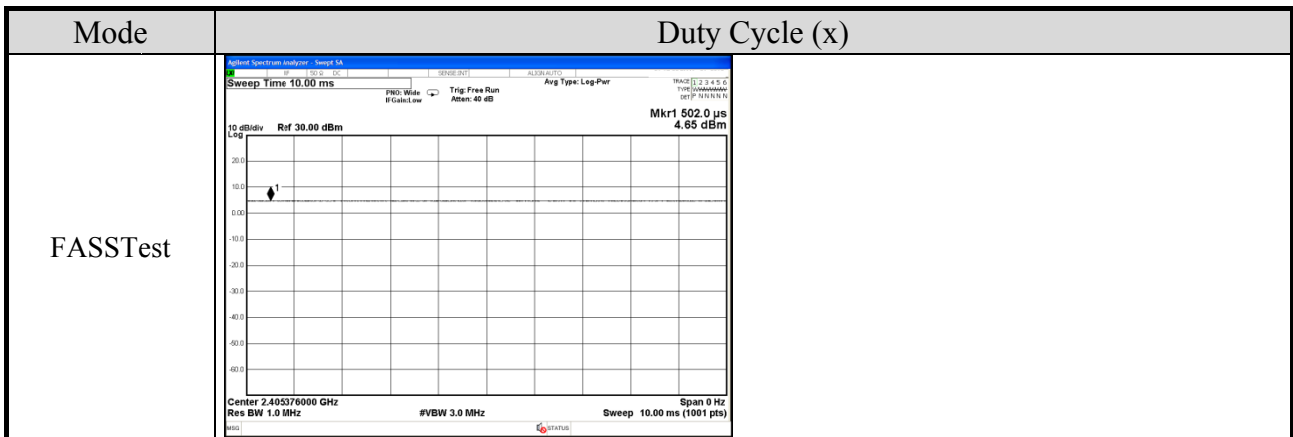
3.5. Descriptions of Key Components

None

3.6. Test Configuration

Mode	Duty Cycle (x)	T (ms)	Duty Cycle Factor (dB)
FASSTest	1.00	0	0

Note: When duty cycle is less than 98% (0.98) that duty cycle factor $10\log(1/x)$ is needed to add in conducted test items measured in average detector.



Item	Mode	Test Channel
Radiated Test Case	Radiated Band Edge ^{Note 1, 3}	FASSTest 02/68
	Radiated Spurious Emission ^{Note 1, 2, 3}	FASSTest 02/35/68
Conducted Test Case	6dB Bandwidth	FASSTest 02/35/68
	Peak Output Power	FASSTest 02/35/68
	Band Edge	FASSTest 02/68
	Spurious Emission	FASSTest 02/35/68
	Peak Power Spectral Density ^{Note 3}	FASSTest 02/35/68

Note 1: Mobile Device

Portable Device, and 3 axis were assessed. The worst scenario for Radiated Spurious Emission as follow: Lie Side Stand

Note 2: Low, mid, and high channels were measured, only the worst channel of each modulation was presented in this report.

Note 3: The worst antenna B was tested on this test item.

3.7. Tested Supporting System List

3.7.1. Support Peripheral Unit

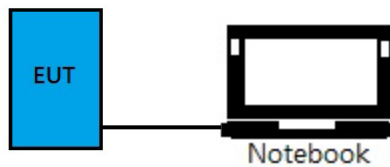
No.	Product	Brand	Model No.	Serial No.	Approval
1.	DC Power Supply	TOP WARD	3303A	N/A	N/A
2.	Notebook PC	acer	MS2343	N/A	Contains FCC ID: (1)PPD-AAR5B22 (2)HLZ-AR5B97
3.	Digital Servo #1 ~ #7	Futaba	S3003	N/A	N/A
4.	Battery (DC 6.6V)	Futaba	FT2F2100BV2	N/A	N/A

3.7.2. Cable Lists

No.	Cable Description Of The Above Support Units
1.	USB Jig Cable: Unshielded, Detachable, 0.5m DC Power Cord*2: Unshielded, Detachable, 0.7m AC Power Cord: Unshielded, Undetectable, 1.8m
2.	Adapter: Chicony, M/N CPA09-A065N1 AC Power Cord: Shielded, Detachable, 1.8m DC Power Cord: Unshielded, Undetectable, 1.8m, Bonded a ferrite core
3.	Power Wire: Unshielded, Undetectable, 0.20m*7
4.	Power Wire: Unshielded, Undetectable, 0.50m*2

3.8. Setup Configuration

3.8.1. EUT Configuration for Radiated Emission



3.8.2. EUT Configuration for RF Conducted Test Items



3.9. Operating Condition of EUT

Test program “Futaba Term” is used for enabling EUT RF function under continues transmitting and choosing channel.

3.10. Description of Test Facility

Name of Test Firm	Audix Technology Corporation / EMC Department No. 53-11, Dingfu, Linkou Dist., New Taipei City 244, Taiwan Tel: +886-2-26092133 Fax: +886-2-26099303 Website : www.audixtech.com Contact e-mail: attemc_report@audixtech.com
Accreditations	The laboratory is accredited by following organizations under ISO/IEC 17025:2005 (1) NVLAP(USA) NVLAP Lab Code 200077-0 (2) TAF(Taiwan) No. 1724 (3) FCC OET Designation No. TW1004 & TW1090 & TW1724
Test Facilities	(1) Semi-Anechoic Chamber (IC Test Site Registration No.: 5183B-1) (2) Fully Anechoic Chamber (IC Test Site Registration No.: 5183B-4)

3.11. Measurement Uncertainty

Test Item	Frequency Range	Uncertainty
Radiation Test (Distance: 3m)	30MHz~1000MHz	± 3.68dB
	Above 1GHz	± 5.82dB

Remark : Uncertainty = $ku_c(y)$

Test Item	Uncertainty
6dB Bandwidth	± 0.05kHz
Maximum peak output power	± 0.33dB
Power spectral density	± 0.13dB
Conducted Emission Limitations	± 0.13dB

4. MEASUREMENT EQUIPMENT LIST

4.1. Radiated Emission Measurement

Item	Type	Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Interval
1.	Spectrum Analyzer	Agilent	N9010A-526	MY53400071	2017. 09. 13	1 Year
2.	Spectrum Analyzer	Agilent	N9010A-526	MY52220368	2017. 11. 18	1 Year
3.	Amplifier	HP	8447D	2944A06305	2018. 01. 30	1 Year
4.	Amplifier	Agilent	8449B	3008A02678	2018. 03. 06	1 Year
5.	Test Receiver	R&S	ESCS30	100338	2017. 06. 19	1 Year
6.	Bilog Antenna	CHASE	CBL6112D	33821	2018. 01. 21	1 Year
7.	Horn Antenna	ETS-Lindgren	3117	00135902	2018. 03. 07	1 Year
8.	Horn Antenna	EMCO	3116	2653	2017. 12. 19	1 Year
9.	2.4GHz Notch Filter	K&L	7NSL10-2441. 5E130.5-00	1	2017. 07. 26	1 Year
10.	3GHz Notch Filter	Microwave	H3G018G1	484798	2017. 08. 25	1 Year
11.	Digital Thermo-Hygro Meter	EVERY DAY	E-512	RF-02	2017. 04. 21	1 Year
12.	Digital Thermo-Hygro Meter	IMax	HTC-1	No.1 3m A/C	2017. 04. 21	1 Year
13.	Test Software	Audix	e3	V.6.110601	N.C.R.	N.C.R.

4.2. RF Conducted Measurement

Item	Type	Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due
1.	Spectrum Analyzer	Agilent	N9030A-544	US51350140	2017. 06. 20	1 Year

5. CONDUCTED EMISSION

【The EUT only employs battery power for operation, no conductive emission limits are required according to FCC Part 15 Section §15.207 & RSS-Gen §8.8】

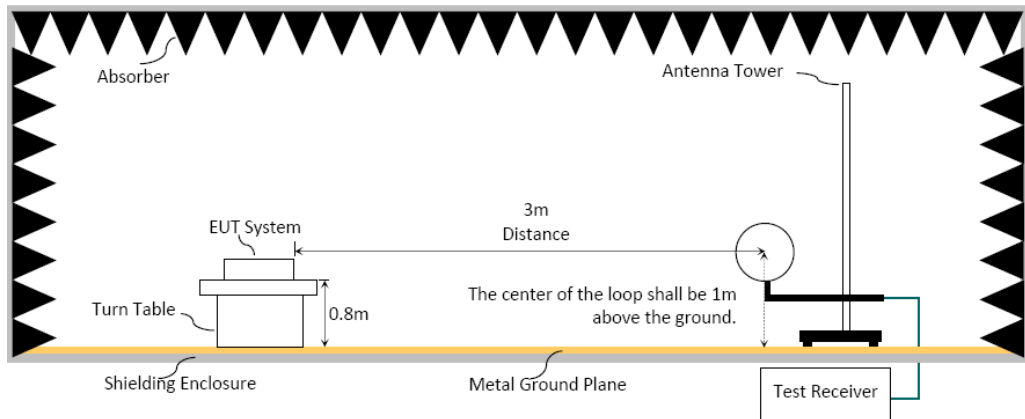
6. RADIATED EMISSION

6.1. Block Diagram of Test Setup

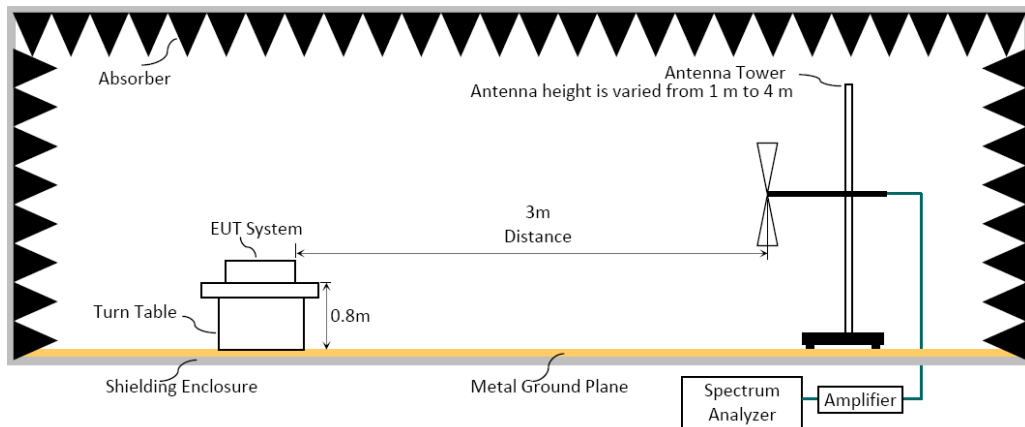
6.1.1. Block Diagram of EUT

Indicated as section 3.8

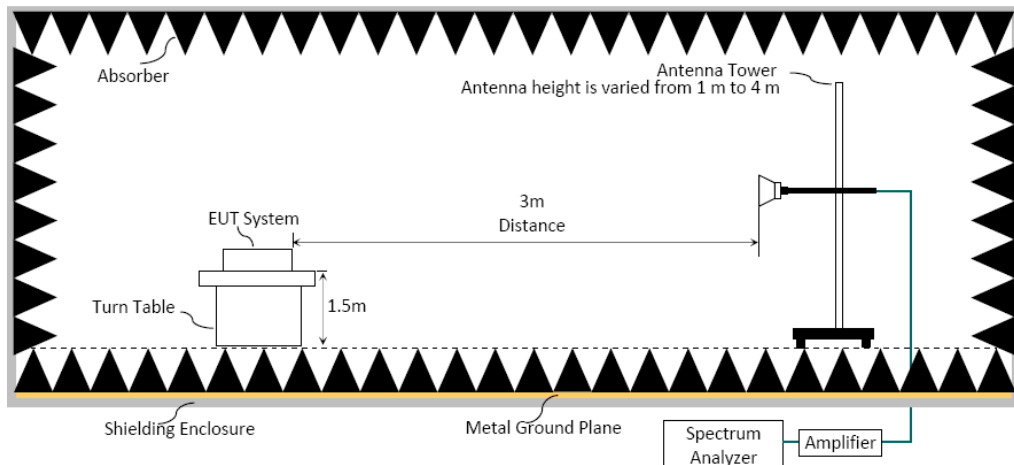
6.1.2. Setup Diagram for 9kHz-30MHz



6.1.3. Setup Diagram for 30-1000 MHz



6.1.4. Setup Diagram for above 1GHz



6.2. Radiated Emission Limits

In any 100kHz bandwidth outside the frequency band, the radio frequency power produced by the intentional radiator shall be at least 20dB below that in the 100kHz bandwidth within the band that contains the highest level. In addition, radiated emissions which fall in restricted bands, as defined in Section 15.205/RSS-Gen Section 8.10 table 6, must also comply with the radiated emission limits specified as below.

Frequency (MHz)	Distance (m)	Limits	
		dB μ V/m	μ V/m
0.009 - 0.490	300	67.6	2400/kHz
0.490 - 1.705	30	87.6	24000/kHz
1.705 - 30	30	29.5	30
30 - 88	3	40.0	100
88- 216	3	43.5	150
216- 960	3	46.0	200
Above 960	3	54.0	500
Above 1000	3	74.0 dB μ V/m (Peak) 54.0 dB μ V/m (Average)	

Remark : (1) dB μ V/m = 20 log (μ V/m)

- (2) The tighter limit applies to the edge between two frequency bands.
- (3) Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system.
- (4) Fundamental and emission fall within operation band are exempted from this section.
- (5) Pursuant to ANSI C63.10: 6.6.4.3, if the maximized peak measured value complies with the average limit, then it is unnecessary to perform an average measurement.

6.3. Test Procedure

Frequency Range 9kHz~30MHz:

The EUT setup on the turn table which has 0.8 m height to the ground. The turn table rotated 360 degrees and antenna fixed to 1 m to find the maximum emission level. In order to find the maximum emission, all of the interface cables were manipulated according to ANSI C63.10-2013 regulation.

- (1) RBW = 9kHz with peak and average detector.
- (2) Detector: average and peak (9kHz-490kHz)
Q.P. (490kHz-30MHz)

Frequency Range 30MHz ~ 25GHz:

The EUT setup on the turn table which has 80 cm (for 30-1000 MHz) and 1.5m (for above 1GHz) height to the ground. The turn table rotated 360 degrees and antenna varied from 1 m to 4 m to find the maximum emission level. Both horizontal and vertical polarization are required. In order to find the maximum emission, all of the interface cables were manipulated according to ANSI C63.10-2013 regulation.

Frequency below 1 GHz:

Spectrum Analyzer is used for pre-testing with following setting:

- (1)RBW = 120KHz
- (2)VBW $\geq 3 \times$ RBW.
- (3)Detector = Peak.
- (4)Sweep time = auto.
- (5)Trace mode = max hold.
- (6)Allow sweeps to continue until the trace stabilizes.
- (7)When peak-detected value is lower than limit that the measurement using the Q.P. detector is not required, otherwise using Q.P. detector for final measurement.

Frequency above 1GHz to 10th harmonic (up to 25 GHz):

Peak Detector:

- (1)RBW = 1MHz
- (2)VBW $\geq 3 \times$ RBW.
- (3)Detector = Peak.
- (4)Sweep time = auto.
- (5)Trace mode = max hold.
- (6)Allow sweeps to continue until the trace stabilizes.
- (7)When peak-detected value is lower than limit that the measurement using the average detector is not required, Otherwise using average detector for final measurement.

Average Detector: **Option 1:**

(1) RBW = 1MHz

(2) VBW \geq 1/ T.

Modulation Type	T (ms)	1/ T (kHz)	VBW Setting (kHz)
FASSTest	0	0	10Hz

N/A: 1/ T is not implemented when duty cycle presented in section 3.7 is \geq 98 %.

(1) Detector = Peak.

(2) Sweep time = auto.

(3) Trace mode = max hold.

(4) Allow sweeps to continue until the trace stabilizes.

 Option 2:

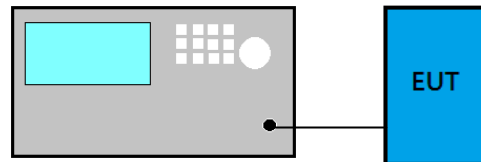
Average Emission Level = Peak Emission Level + D.C.C.F.

6.4. Measurement Result Explanation Peak Emission Level = Antenna Factor + Cable Loss + Meter Reading Average Emission Level = Antenna Factor + Cable Loss + Meter Reading Average Emission Level = Peak Emission Level + DCCFDuty Cycle Correction Factor (DCCF) = $20\log(TX_{on}/TX_{on+off})$ presented in section 3.7 ERP = Peak Emission Level - 95.2dB - 2.14dB**6.5. Test Results**

Please refer to Appendix A.

7. 6dB BANDWIDTH

7.1. Block Diagram of Test Setup



7.2. Specification Limits

The minimum 6dB bandwidth shall be at least 500kHz.

7.3. Test Procedure

Following measurement procedure is reference to KDB 558074 D01 DTS Meas Guidance v04:

- (1) Set RBW = 100 kHz.
- (2) Set the video bandwidth (VBW) $\geq 3 \times$ RBW.
- (3) Detector = Peak.
- (4) Trace mode = max hold.
- (5) Sweep = auto couple.
- (6) Allow the trace to stabilize.
- (7) Setting channel bandwidth function x dB to -6 dB to record the final bandwidth.

7.4. Test Results

Please refer to Appendix A

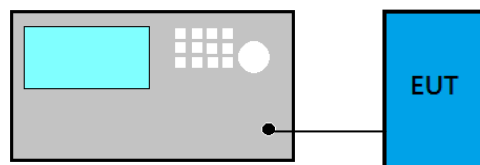
8. MAXIMUM PEAK OUTPUT POWER

8.1. Block Diagram of Test Setup

- For WLAN Function



- For BLE Function



8.2. Specification Limits

The Limits of maximum Peak Output Power for digital modulation in 2400-2483.5MHz is : 1Watt. (30dBm), and E.I.R.P.: 4Watt (36dBm)

8.3. Test Procedure

Following measurement procedure is reference to KDB 558074 D01 DTS Meas Guidance v04:

PKPM1 Peak power meter method:

EUT is connected to power sensor and record the maximum output power.

Maximum peak conducted output power method:

- (1) Set the RBW \geq DTS bandwidth
- (2) Set VBW $\geq 3 \times$ RBW
- (3) Set span $\geq 3 \times$ RBW.
- (4) Sweep time = auto couple
- (5) Detector = peak.
- (6) Trace mode = max hold.
- (7) Allow trace to fully stabilize.
- (8) Use peak marker function to determine the peak amplitude level.

Method AVGPM (Measurement using an RF average power meter):

EUT is connected to power sensor and record the maximum average output power and duty cycle factor is added when duty cycle presented in section 3.7 is $< 98\%$.

Method AVGSA-2 (Spectrum channel power)

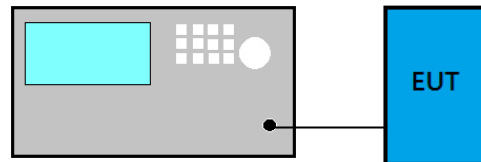
- (1) Set span to at least 1.5 times the OBW
- (2) Set RBW = 1 -5% of OBW
- (3) Set the video bandwidth (VBW) $\geq 3 \times$ RBW.
- (4) Detector = RMS.
- (5) Trace mode = trace average at least 100 traces
- (6) Sweep = auto couple.
- (7) Compute power by integrating the spectrum across the OBW of the signal using the instrument's band power measurement function with band limits set equal to the OBW band edges.
- (8) Duty cycle factor is added when duty cycle presented in section 3.7 is $< 98\%$.

8.4. Test Results

Please refer to Appendix A

9. EMISSION LIMITATIONS

9.1. Block Diagram of Test Setup



9.2. Specification Limits

In any 100kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20dB below that in the 100kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, that the required attenuation shall be 30 dB instead of 20 dB.

Attenuation below the general limits specified in Section 15.209(a)/RSS-Gen Section 8.9 table 4 is not required. In addition, radiated emissions which fall in restricted bands, as defined in Section 15.205(a)/RSS-Gen Section 8.10 table 6, must also comply with the radiated emission limits specified in Section 15.209(a)/RSS-Gen Section 8.9 table 4 (See Section 15.205(c)).

9.3. Test Procedure

Following measurement procedure is reference to KDB 558074 D01 DTS Meas Guidance v04:

■ Reference Level

- (1) Set analyzer center frequency to DTS channel center frequency.
- (2) Set the span to 1.5 times the DTS bandwidth.
- (3) Set the RBW to: 100 kHz.
- (4) Set the VBW $\geq 3 \times$ RBW.
- (5) Detector = peak.
- (6) Sweep time = auto couple.
- (7) Trace mode = max hold.
- (8) Allow trace to fully stabilize to find the max PSD as reference level.

■ Emission Level Measurement

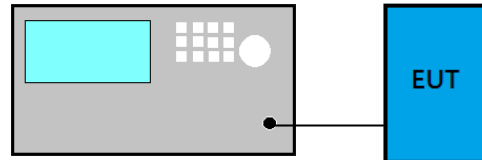
- (1) Set analyzer center frequency to DTS channel center frequency.
- (2) Set the span to 1.5 times the DTS bandwidth.
- (3) Set the RBW to: 100 kHz.
- (4) Set the VBW $\geq 3 \times$ RBW.
- (5) Detector = peak.
- (6) Sweep time = auto couple.
- (7) Trace mode = max hold.
- (8) Allow trace to fully stabilize to find the max level.

9.4. Test Results

Please refer to Appendix A

10. POWER SPECTRAL DENSITY

10.1. Block Diagram of Test Setup



10.2. Specification Limits

The peak power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8dBm in any 3kHz band.

10.3. Test Procedure

Following measurement procedure is reference to KDB 558074 D01 DTS Meas Guidance v04:

■ Method PKPSD (peak PSD)

- (1) Set analyzer center frequency to DTS channel center frequency.
- (2) Set the span to 1.5 times the DTS bandwidth.
- (3) Set the RBW to: $3 \text{ kHz} \leq \text{RBW} \leq 100 \text{ kHz}$.
- (4) Set the VBW $\geq 3 \times \text{RBW}$.
- (5) Detector = peak.
- (6) Sweep time = auto couple.
- (7) Trace mode = max hold.
- (8) Allow trace to fully stabilize.
- (9) Use the peak marker function to determine the maximum amplitude level.
- (10) If measured value exceeds limit, reduce RBW (no less than 3 kHz) and repeat.

□ Method AVGPSD-2

- (1) Using peak PSD procedure step 1 to step 4.
- (2) Detector = RMS detector
- (3) Sweep time = auto couple
- (4) Trace mode = trace averaging over a minimum of 100 traces
- (5) Use the peak marker function to determine the maximum amplitude level.
- (6) Duty cycle factor is added when duty cycle presented in section 3.7 < 98%.
- (7) If measured value exceeds limit, reduce RBW (no less than 3 kHz) and repeat.

10.4. Test Results

Please refer to Appendix A

11. DEVIATION TO TEST SPECIFICATIONS

【NONE】



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APPDNDIX A

TEST DATA AND PLOTS

(Model: CGY760R)

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A.1 RADIATED EMISSION

Test Date	2018/03/16	Temp./Hum.	23°C/50%
Test Voltage	DC 6.6V (via Battery)		

A.1.1 Emissions within Restricted Frequency Bands

A.2.1.1 Frequency 9kHz~30MHz

The emissions (9kHz~30MHz) not reported for there is no emission be found.

A.2.1.2 Frequency Below 1 GHz

Mode	FASSTest	Frequency	TX 2439.168MHz
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Antenna at Horizontal Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dB μ V)	Emission Level (dB μ V/m)	Limits (dB μ V/m)	Margin (dB)	Detector
101.78	17.60	2.29	2.60	22.49	43.50	21.01	Peak
249.22	19.11	3.80	2.42	25.33	46.00	20.67	Peak
455.83	22.70	6.07	2.31	31.08	46.00	14.92	Peak
641.10	24.74	6.89	-0.06	31.57	46.00	14.43	Peak
790.48	25.83	7.56	0.02	33.41	46.00	12.59	Peak
885.54	26.68	8.09	0.69	35.46	46.00	10.54	Peak

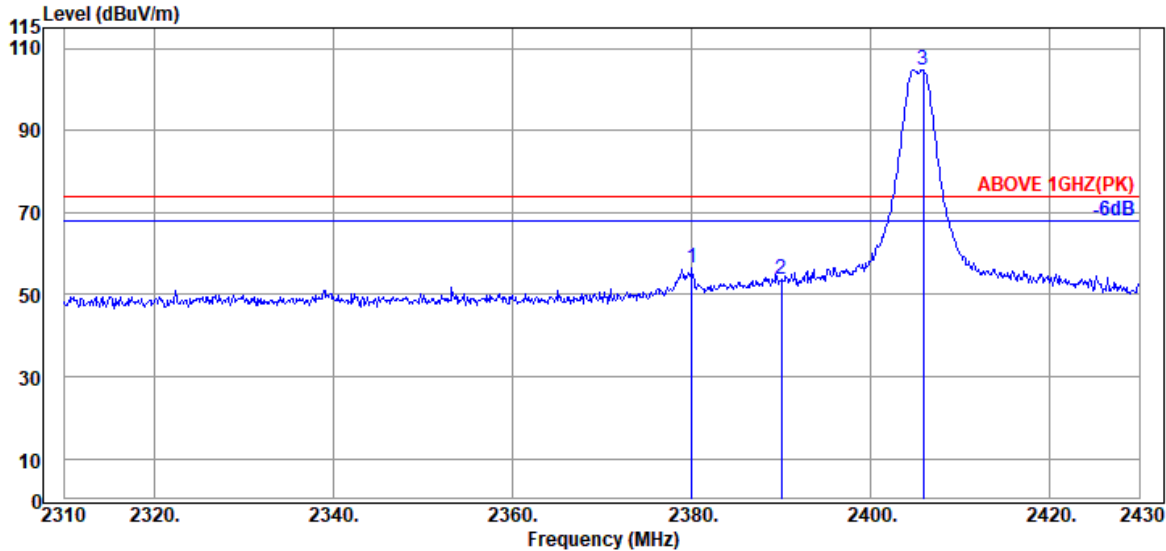
Antenna at Vertical Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dB μ V)	Emission Level (dB μ V/m)	Limits (dB μ V/m)	Margin (dB)	Detector
101.78	17.60	2.29	4.51	24.40	43.50	19.10	Peak
247.28	19.00	3.79	1.68	24.47	46.00	21.53	Peak
333.61	20.43	4.77	4.25	29.45	46.00	16.55	Peak
604.24	24.65	6.76	1.29	32.70	46.00	13.30	Peak
804.06	25.96	7.63	0.94	34.53	46.00	11.47	Peak
997.09	27.80	8.81	0.66	37.27	54.00	16.73	Peak

A.2.1.3 Frequency Above 1 GHz to 10th harmonics

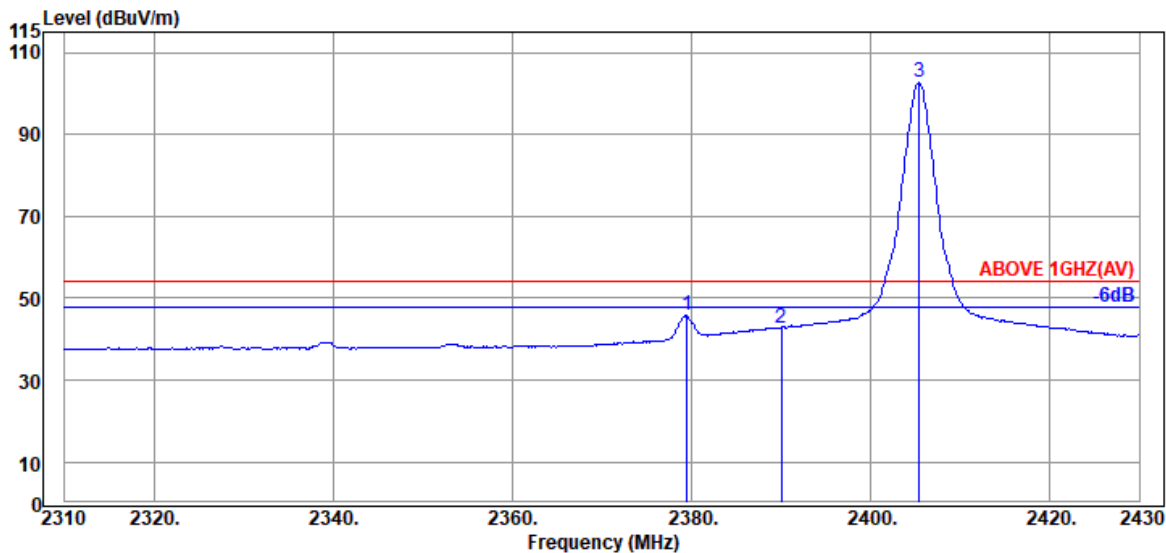
Band Edge:

Mode	FASSTest	Frequency	TX 2045.376MHz
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Antenna at Horizontal Polarization

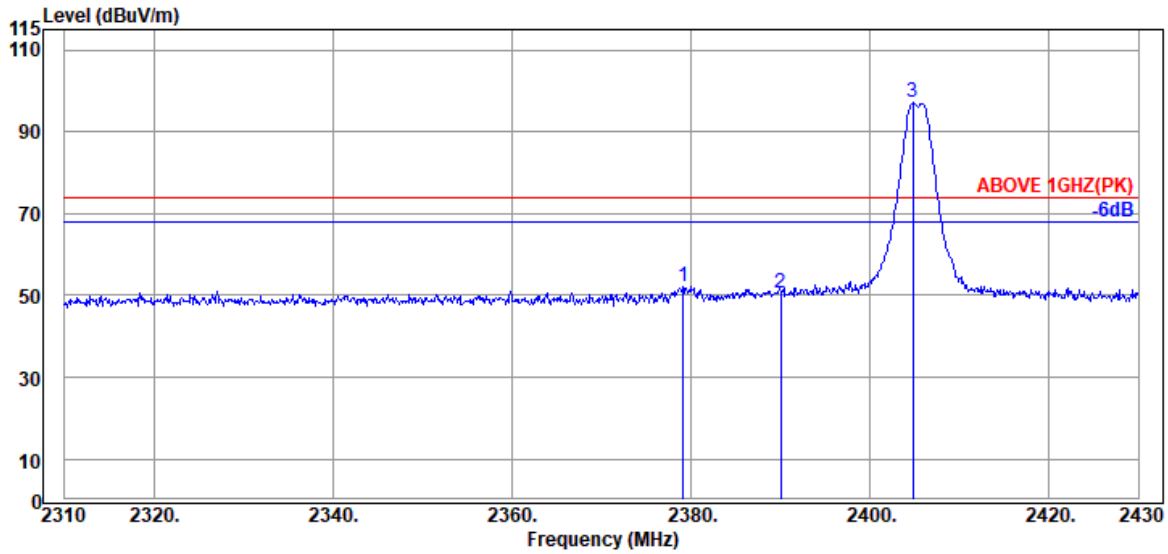
Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
2380.08	32.12	6.55	17.65	56.32	74.00	17.68	Peak
2390.04	32.13	6.57	14.85	53.55	74.00	20.45	Peak
2405.88	32.16	6.59	65.94	104.69	---	---	Peak



Antenna at Horizontal Polarization

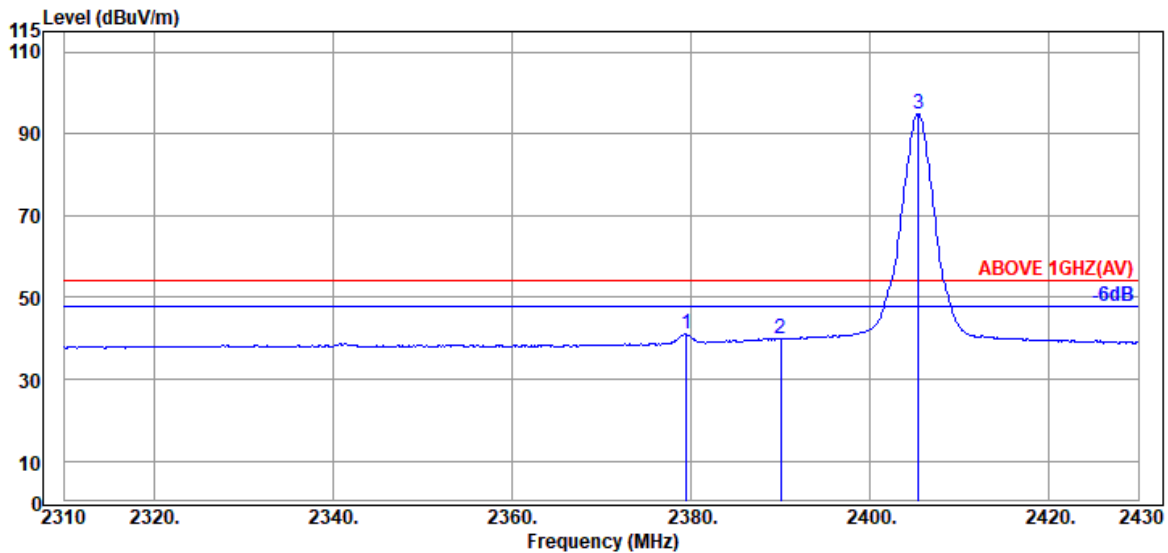
Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
2379.48	32.12	6.55	7.13	45.80	54.00	8.20	Average
2390.04	32.13	6.57	4.07	42.77	54.00	11.23	Average
2405.40	32.16	6.59	63.84	102.59	---	---	Average

Mode	FASSTest	Frequency	TX 2045.376MHz
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Antenna at Vertical Polarization

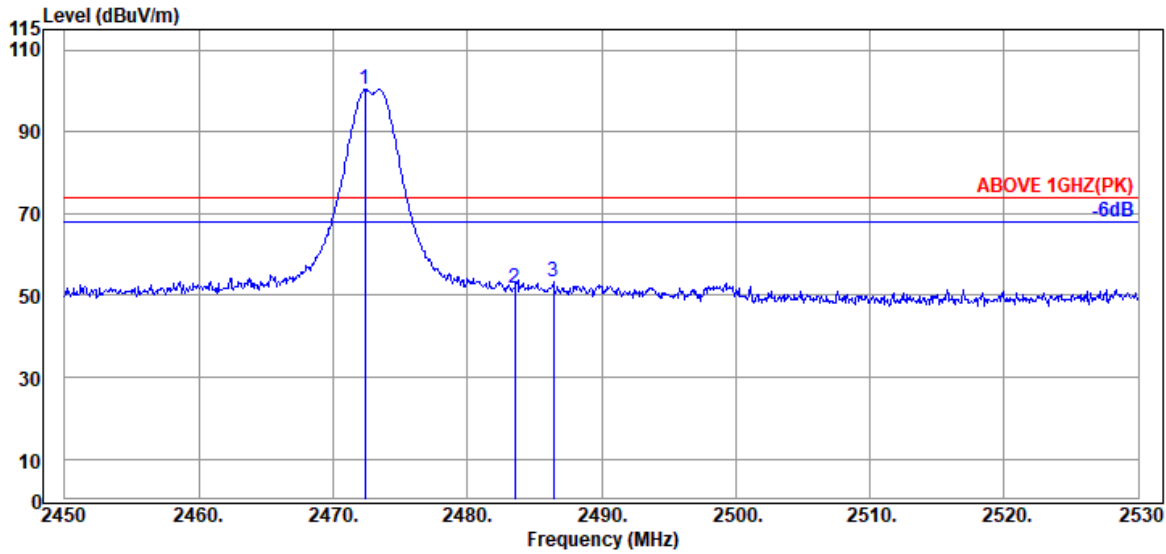
Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
2379.12	32.12	6.55	13.57	52.24	74.00	21.76	Peak
2390.04	32.13	6.57	11.80	50.50	74.00	23.50	Peak
2404.80	32.16	6.59	58.28	97.03	---	---	Peak



Antenna at Vertical Polarization

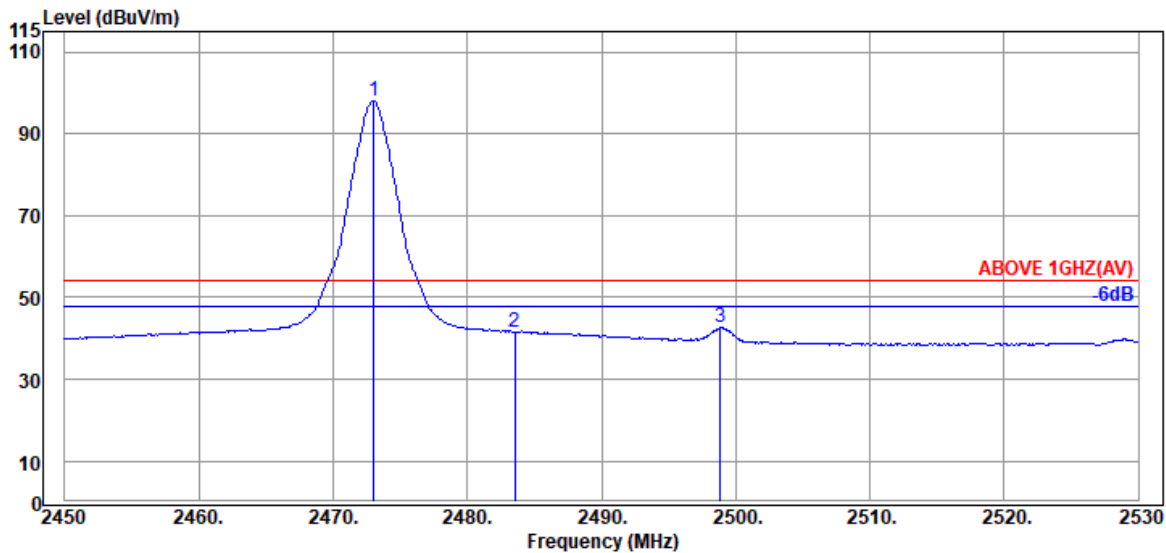
Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
2379.48	32.12	6.55	2.38	41.05	54.00	12.95	Average
2390.04	32.13	6.57	1.07	39.77	54.00	14.23	Average
2405.40	32.16	6.59	56.15	94.90	---	---	Average

Mode	FASSTest	Frequency	TX 2472.960MHz
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Antenna at Horizontal Polarization

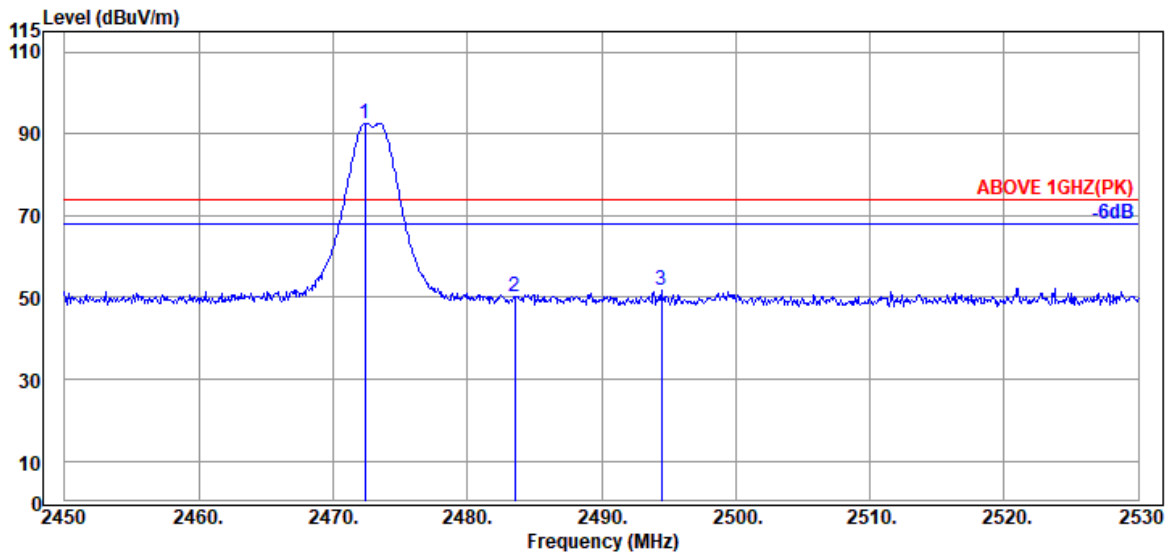
Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
2472.40	32.26	6.67	61.33	100.26	---	---	Peak
2483.52	32.28	6.67	12.93	51.88	74.00	22.12	Peak
2486.40	32.28	6.67	14.43	53.38	74.00	20.62	Peak



Antenna at Horizontal Polarization

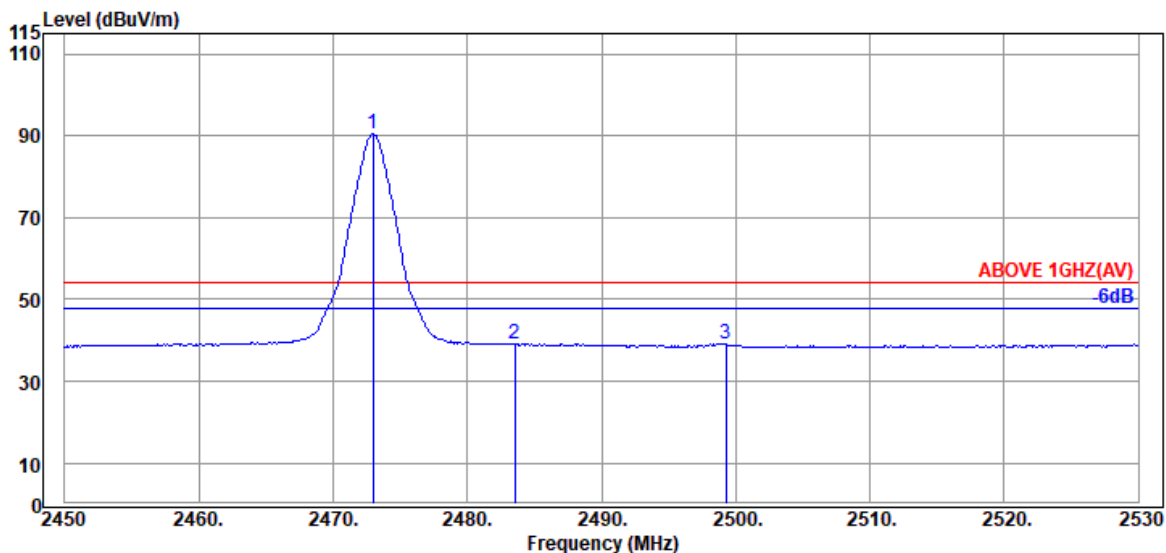
Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
2473.04	32.26	6.67	59.08	98.01	---	---	Average
2483.52	32.28	6.67	2.68	41.63	54.00	12.37	Average
2498.88	32.30	6.69	3.58	42.57	54.00	11.43	Average

Mode	FASSTest	Frequency	TX 2472.960MHz
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Antenna at Vertical Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
2472.40	32.26	6.67	53.73	92.66	---	---	Peak
2483.52	32.28	6.67	11.25	50.20	74.00	23.80	Peak
2494.48	32.29	6.69	12.81	51.79	74.00	22.21	Peak



Antenna at Vertical Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
2472.96	32.26	6.67	51.45	90.38	---	---	Average
2483.52	32.28	6.67	0.06	39.01	54.00	14.99	Average
2499.28	32.30	6.69	0.10	39.09	54.00	14.91	Average

A.1.2 Emissions outside the frequency band:

The emissions (up to 25GHz) not reported for there is no emission be found.

Mode	FASSTest	Frequency	TX 2405.376MHz
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Antenna at Horizontal Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
4810.00	34.09	9.54	11.97	55.60	74.00	18.40	Peak
4810.00	34.09	9.54	2.32	45.95	54.00	8.05	Average
7220.00	35.85	11.82	13.86	61.53	74.00	12.47	Peak
7220.00	35.85	11.82	3.89	51.56	54.00	2.44	Average
9620.00	36.83	15.28	-0.10	52.01	54.00	1.99	Peak

Antenna at Vertical Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
4810.00	34.09	9.54	13.94	57.57	74.00	16.43	Peak
4810.00	34.09	9.54	4.46	48.09	54.00	5.91	Average
7215.00	35.85	11.82	15.23	62.90	74.00	11.10	Peak
7215.00	35.85	11.82	5.05	52.72	54.00	1.28	Average
9620.00	36.83	15.28	2.44	54.55	74.00	19.45	Peak
9620.00	36.83	15.28	-8.09	44.02	54.00	9.98	Average

Mode	FASSTest	Frequency	TX 2439.168MHz
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Antenna at Horizontal Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
4875.00	34.13	9.56	12.81	56.50	74.00	17.50	Peak
4875.00	34.13	9.56	3.08	46.77	54.00	7.23	Average
7315.00	35.84	11.90	15.93	63.67	74.00	10.33	Peak
7315.00	35.84	11.90	5.44	53.18	54.00	0.82	Average
9760.00	37.00	15.47	0.43	52.90	54.00	1.10	Peak

Antenna at Vertical Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
4875.00	34.13	9.56	8.06	51.75	54.00	2.25	Peak
7320.00	35.83	11.92	14.36	62.11	74.00	11.89	Peak
7320.00	35.83	11.92	3.91	51.66	54.00	2.34	Average

Mode	FASSTest	Frequency	TX 2472.960MHz
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Antenna at Horizontal Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dB μ V)	Emission Level (dB μ V/m)	Limits (dB μ V/m)	Margin (dB)	Detector
4945.00	34.17	9.59	11.97	55.73	74.00	18.27	Peak
4945.00	34.17	9.59	2.78	46.54	54.00	7.46	Average
7415.00	35.82	12.01	15.02	62.85	74.00	11.15	Peak
7415.00	35.82	12.01	4.63	52.46	54.00	1.54	Average

Antenna at Vertical Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dB μ V)	Emission Level (dB μ V/m)	Limits (dB μ V/m)	Margin (dB)	Detector
4945.00	34.17	9.59	6.46	50.22	54.00	3.78	Peak
7420.00	35.82	12.02	11.63	59.47	74.00	14.53	Peak
7420.00	35.82	12.02	1.28	49.12	54.00	4.88	Average

A.1.3 Emissions in Non-restricted Frequency Bands:

Pursuant to KDB 558074 D01 DTS Meas Guidance v04 that emission levels below the 15.209 & RSS-Gen §8.9 general radiated emissions limits is not required.

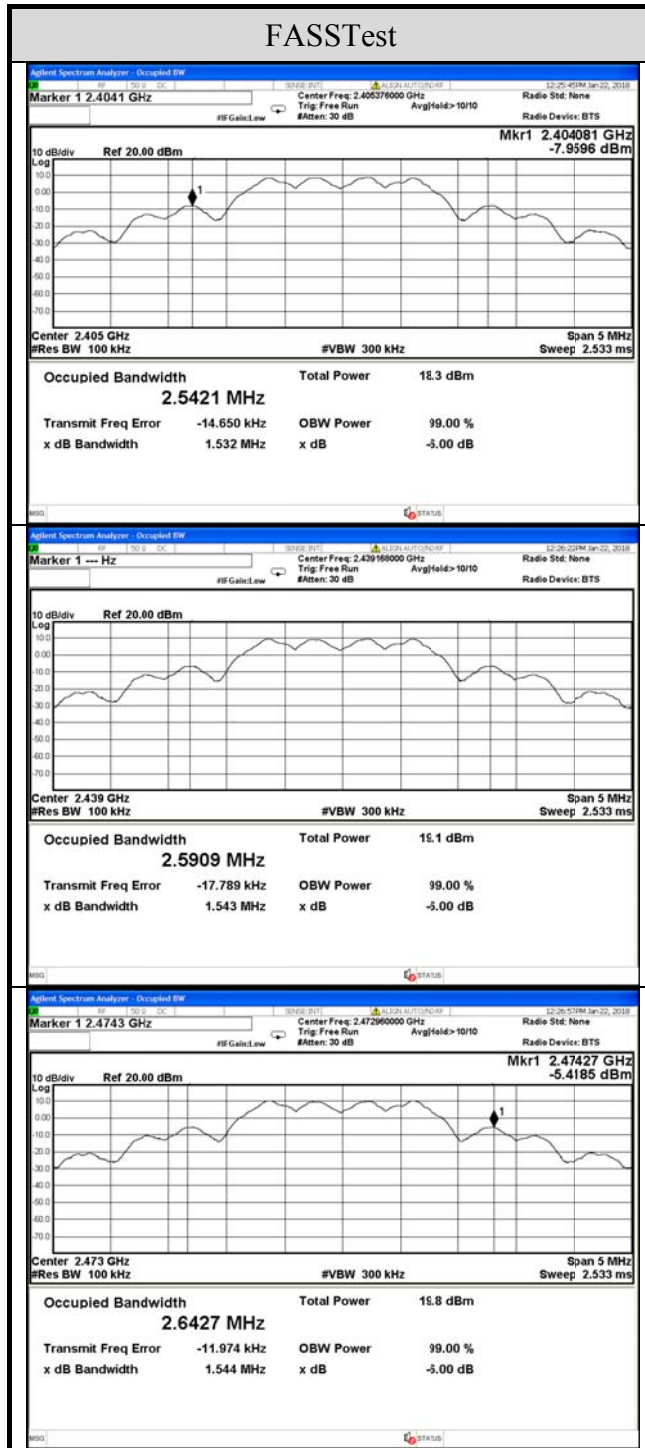
A.2 6dB BANDWIDTH

Test Date	2018/01/22	Temp./Hum.	23°C/55%
Cable Loss	1.6dB	Test Voltage	DC 6.6V (via Battery)

A.2.1 6dB Bandwidth Result

Mode	Centre Frequency (MHz)	6 dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz) (Reference only)	Limit
FASSTest	2405.376	1.532	2.5421	>500kHz
	2439.168	1.543	2.5909	
	2472.960	1.544	2.6427	

A.2.2 Measurement Plots



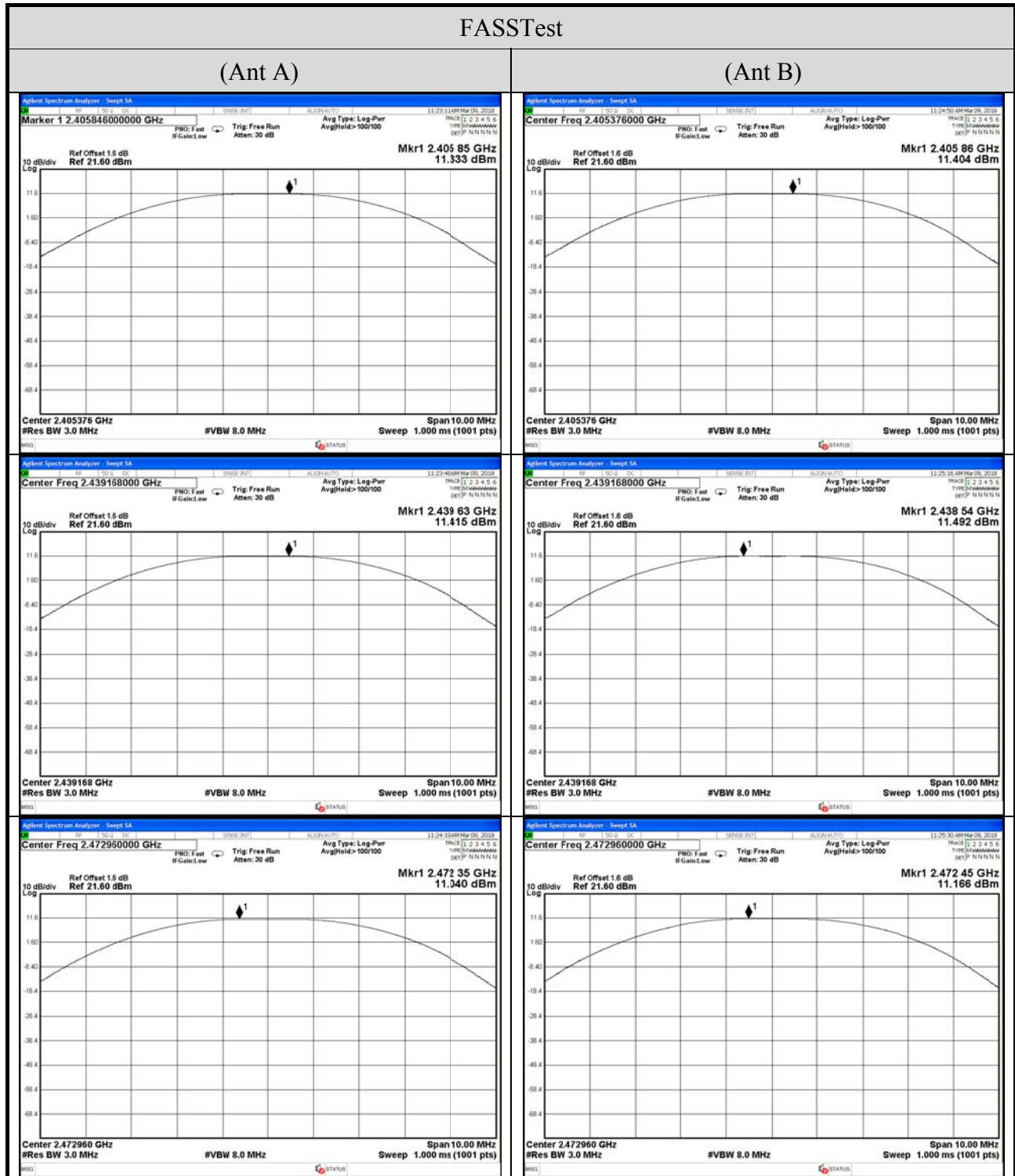
A.3 MAXIMUM PEAK OUTPUT POWER

Test Date	2018/03/09	Temp./Hum.	23°C/55%
Cable Loss	1.6dB	Test Voltage	DC 6.6V

A.3.1 Peak Output Power

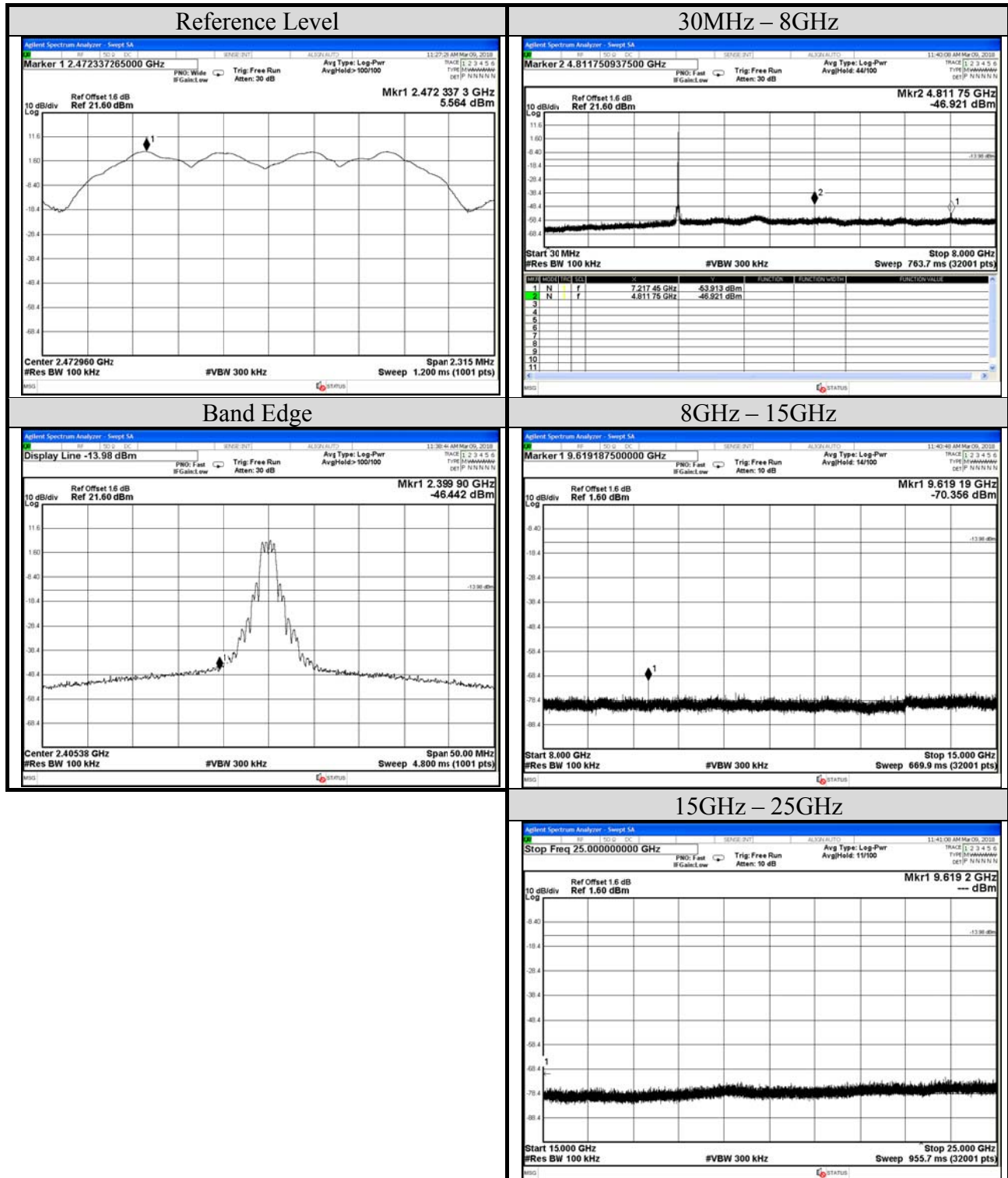
Mode	Centre Frequency (MHz)	Maximum Peak Output Power		Limit
		dBm	W	
FASSTest (Ant A)	2405.376	11.333	0.0136	< 30dBm (1W) (Maximum Peak Output Power) < 36dBm (4W) (E.I.R.P)
	2439.168	11.415	0.0139	
	2472.960	11.040	0.0127	
FASSTest (Ant B)	2405.376	11.404	0.0138	< 30dBm (1W) (Maximum Peak Output Power) < 36dBm (4W) (E.I.R.P)
	2439.168	11.492	0.0141	
	2472.960	11.166	0.0131	

A.3.2 Measurement Plots

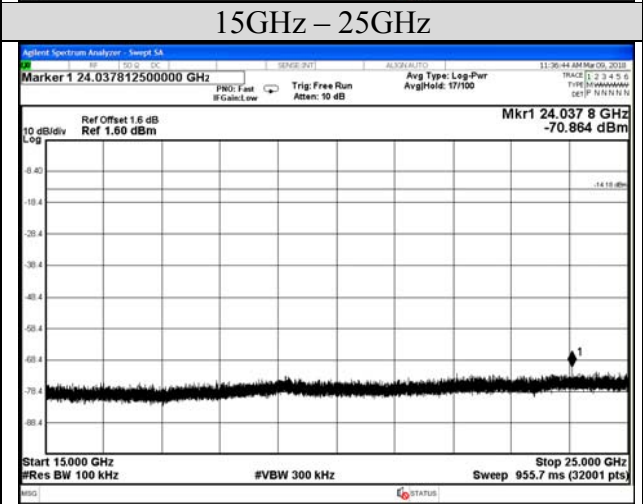
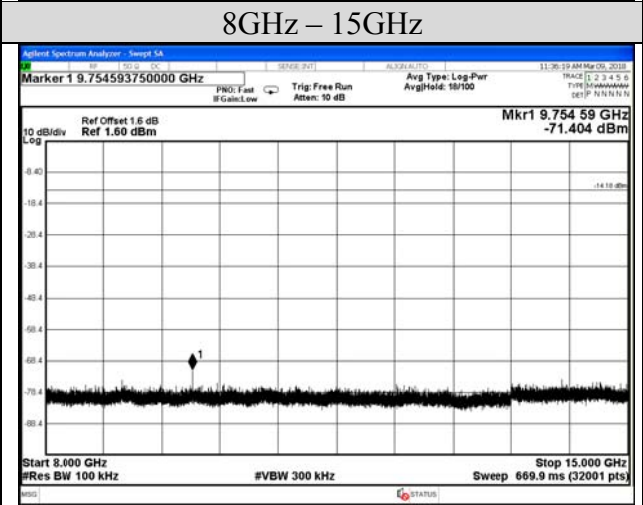
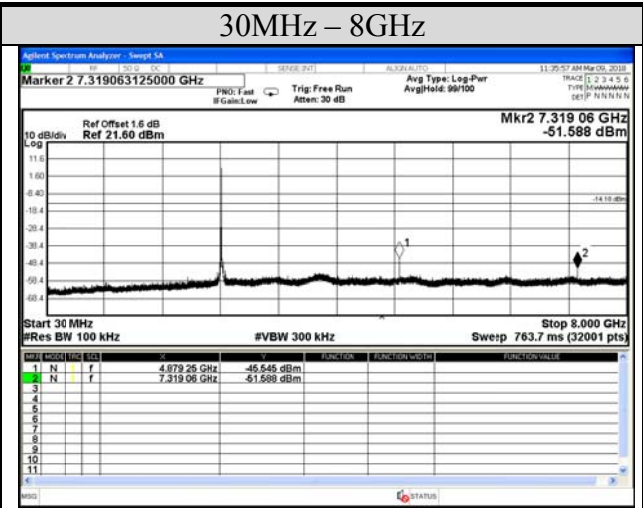
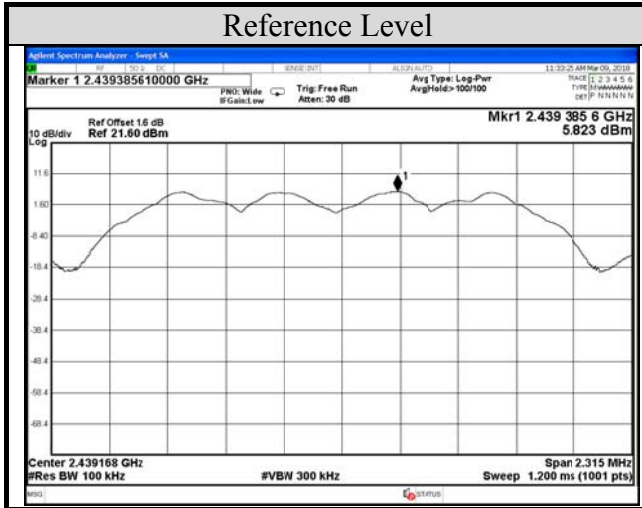


A.4 EMISSION LIMITATIONS

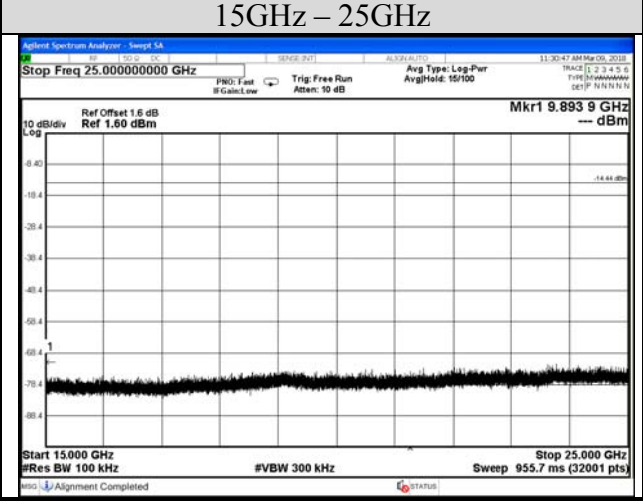
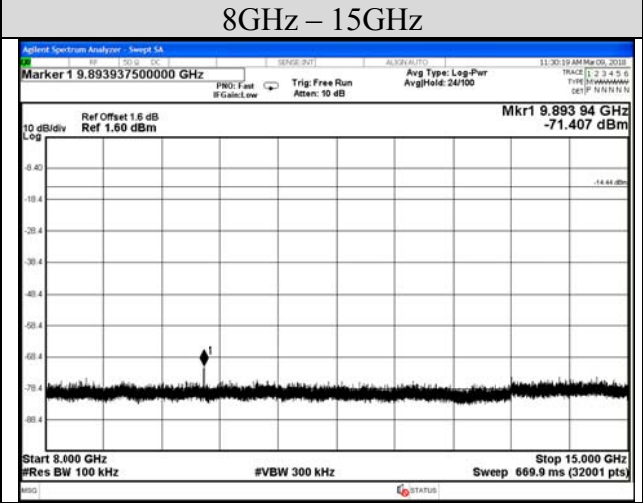
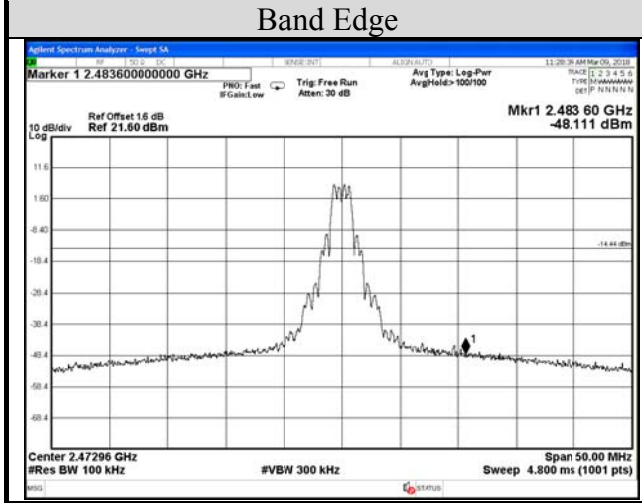
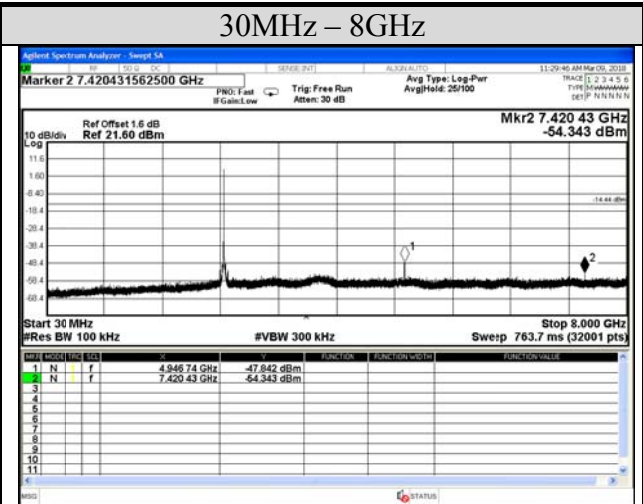
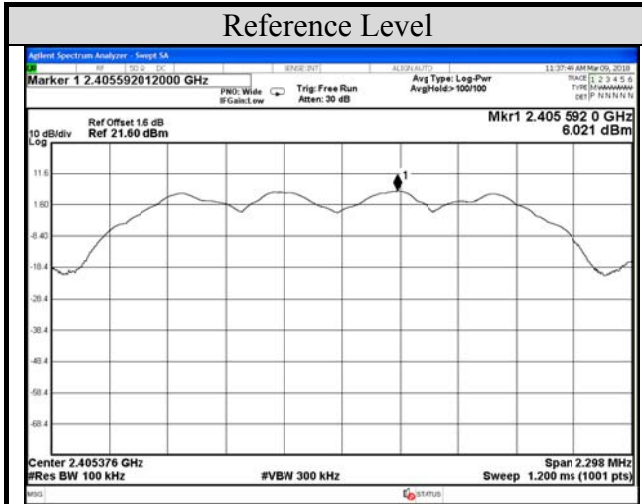
Test Date	2018/03/09	Temp./Hum.	23°C/55%
Cable Loss	1.6dB	Test Voltage	DC 6.6V
Mode	FASSTest	Frequency	TX 2405.376MHz
Simultaneous Factor 10 log(n) (Note: "n" is antenna number)			0



Test Date	2018/03/09	Temp./Hum.	23°C/55%
Cable Loss	1.6dB	Test Voltage	DC 6.6V
Mode	FASSTest	Frequency	TX 2439.168MHz
Simultaneous Factor10 log(n) (Note: “n” is antenna number)			0



Test Date	2018/03/09	Temp./Hum.	23°C/55%
Cable Loss	1.6dB	Test Voltage	DC 6.6V
Mode	FASSTest	Frequency	TX 2472.960MHz
Simultaneous Factor10 log(n) (Note: "n" is antenna number)			0



A.5 POWER SPECTRAL DENSITY

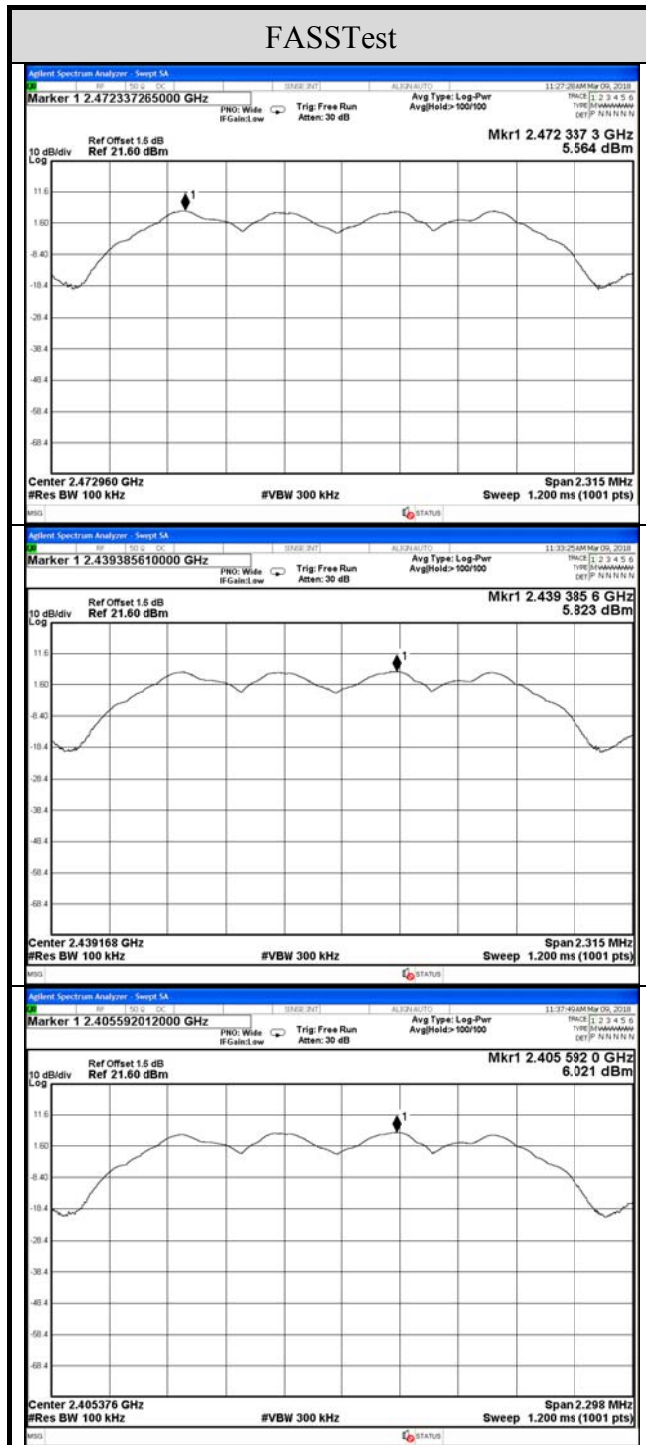
Test Date	2018/03/09	Temp./Hum.	23°C/55%
Cable Loss	1.6dB	Test Voltage	DC 6.6V

A.5.1 Power Spectral Density Result

Mode	Centre Frequency (MHz)	Power Spectral Density (dBm)	Limit
FASSTest	2405.376	5.564	< 8 dBm/3kHz
	2439.168	5.823	
	2472.960	6.021	

- Note: 1. All results have been included cable loss.
2. For KDB558074 D01V04, in the test result, when RBW set at 100kHz is stricter than 3kHz.

A.5.2 Measurement Plots





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No. 53-11, Dingfu, Linkou, Dist.,
New Taipei City 244, Taiwan

APPENDIX B

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APPDNDIX B

TEST PHOTOGRAPHS

(Model: CGY760R)