CERTIFICATION TEST REPORT

Report Number: R13179001-E2

Applicant	:	iRobot Corporation 8 Crosby Drive Bedford, MA 01730, USA
Model	:	AXG-Y1
FCC ID	:	UFE-AXGY1
IC	:	6652A-AXGY1
EUT Description	:	Dual Band Radio Module This report covers the BT testing.
Test Standard(s)	:	FCC 47 CFR PART 15 SUBPART C ISED RSS-247 ISSUE 2 ISED RSS-GEN ISSUE 5

Date Of Issue:
2020-09-09

Prepared by:
UL LLC
12 Laboratory Dr.
Research Triangle Park, NC 27709 U.S.A.
TEL: (919) 549-1400

NVLAP TESTING
NVLAP Lab code: 200246-0

REPORT REVISION HISTORY

Rev.	Issue Date	Revisions	Revised By
1	2020-05-20	Initial Issue	Brian T. Kiewra
2	2020-06-16	Revised cover page to include radio covered by report.	Brian T. Kiewra
3	2020-07-24	Revised PCB antenna gain.	Brian T. Kiewra
4	2020-08-13	Added Low power Bluetooth data.	Jeff Moser
5	2020-09-09	Revised external antenna gain	Cristian Melara

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1. ATTESTATION OF TEST RESULTS

COMPANY NAME: iRobot Corporation
8 Crosby Drive
Bedford, MA 01730, USA

EUT DESCRIPTION: Dual Band Radio Module

MODEL: AXG-Y1

SERIAL NUMBER: SS0040BWW, SS0040BHN, SS040B86, SS0040B59, SS0040BXP, SS0040BHN

DATE TESTED: 2020-05-05 to 2020-05-19, 2020-08-04

APPLICABLE STANDARDS	
STANDARD	**TEST RESULTS**
CFR 47 Part 15 Subpart C	Complies
ISED RSS-247 Issue 2	Complies
ISED RSS-GEN Issue 5	Complies

UL LLC tested the above equipment in accordance with the requirements set forth in the above standards. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. It is the manufacturer's responsibility to assure that additional production units of this model are manufactured with identical electrical and mechanical components. All samples tested were in good operating condition throughout the entire test program. Measurement Uncertainties are published for informational purposes only and were not taken into account unless noted otherwise.

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Approved & Released
For UL LLC By:

Jeffrey Moser
Operations Manager
Consumer Technology Division
UL LLC

Prepared By:

Brian T. Kiewra
Project Engineer
Consumer Technology Division
UL LLC

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2. TEST RESULTS SUMMARY

FCC Clause	ISED Clause	Requirement	Result	Comment
See Comment		Duty Cycle	Reporting purposes only	Per ANSI C63.10, Section 11.6.
See Comment	RSS-GEN 6.7	20dB BW/99% OBW	Reporting purposes only	ANSI C63.10 Sections 6.9.2 and 6.9.3
15.247 (a)(1)	RSS-247 (5.1) (b)	Hopping Frequency Separation	Compliant	None.
15.247 (a)(1)(iii)	RSS-247 (5.1) (d)	Number of Hopping Channels	Compliant	None.
15.247 (a)(1)(iii)	RSS-247 (5.1) (d)	Average Time of Occupancy	Compliant	None.
15.247 (b)(1)	RSS-247 (5.4) (b)	Output Power	Compliant	None.
See Comment		Average Power	Reporting purposes only	Per ANSI C63.10, Section 11.9.2.3.2.
15.247 (d)	RSS-247 (5.5)	Conducted Spurious Emissions	Compliant	None.
15.209, 15.205	RSS-GEN 8.9, 8.10	Radiated Emissions	Compliant	None.
15.207	RSS-Gen 8.8	AC Mains Conducted Emissions	Compliant	None.

3. TEST METHODOLOGY

The tests documented in this report were performed in accordance with FCC CFR 47 Part 2, FCC CFR 47 Part 15, ANSI C63.10-2013, KDB 558074 D01 15.247 Meas Guidance v05r02, RSS-GEN Issue 5, and RSS-247 Issue 2.

4. FACILITIES AND ACCREDITATION

The test sites and measurement facilities used to collect data are located at 12 Laboratory Drive, Research Triangle Park, NC 27709, USA and 2800 Perimeter Park Dr., Suite B, Morrisville, NC 27560, USA. The following table identifies which facilities were utilized for radiated emission measurements documented in this report. Specific facilities are also identified in the test results sections.

12 Laboratory Dr.	**2800 Perimeter Park Dr.**
Site Code: 2180C	
☐ Chamber A RTP	☒ North Chamber
☐ Chamber C RTP	☒ South Chamber

The above test sites and facilities are covered under FCC Test Firm Registration # 703469. Chambers above are covered under Industry Canada company address and respective code.

UL LLC (RTP) is accredited by NVLAP, Laboratory Code 200246-0

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5. DECISION RULES AND MEASUREMENT UNCERTAINTY

5.1. METROLOGICAL TRACEABILITY

All test and measuring equipment utilized to perform the tests documented in this report are calibrated on a regular basis, with a maximum time between calibrations of one year or the manufacturers' recommendation, whichever is less, and where applicable is traceable to recognized national standards.

5.2. DECISION RULES

The Decision Rule is based on Simple Acceptance in accordance with ISO Guide 98-4:2012 Clause 8.2. (Measurement uncertainty is not taken into account when stating conformity with a specified requirement.)

5.3. MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus:

PARAMETER	UNCERTAINTY
Radio Frequency (Spectrum Analyzer)	141.2 Hz
Occupied Channel Bandwidth	2.00%
RF output power, conducted	1.3 dB (PK) 0.45 dB (AV)
Power Spectral Density, conducted	2.47 dB
Unwanted Emissions, conducted	1.94 dB
All emissions, radiated	4.88 dB
Conducted Emissions (0.150-30MHz) - LISN	3.07 dB
Temperature	2.26°C
Humidity	6.79%
DC Supply voltages	1.70%
Time	3.39%

Uncertainty figures are valid to a confidence level of 95%.

5.4. SAMPLE CALCULATION

RADIATED EMISSIONS

Where relevant, the following sample calculation is provided:
Field Strength (dBuV/m) = Measured Voltage (dBuV) + Antenna Factor (dB/m) + Cable Loss (dB) – Preamp Gain (dB)

36.5 dBuV + 18.7 dB/m + 0.6 dB – 26.9 dB = 28.9 dBuV/m

MAINS CONDUCTED EMISSIONS

Where relevant, the following sample calculation is provided:
Final Voltage (dBuV) = Measured Voltage (dBuV) + Cable Loss (dB) + Limiter Factor (dB) + LISN Insertion Loss.

36.5 dBuV + 0 dB +10.1 dB+ 0 dB = 46.6 dBuV

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6. EQUIPMENT UNDER TEST

6.1. EUT DESCRIPTION

The EUT is a Dual band Radio module supporting 2.4WLAN and 5WLAN as well as BT and BLE. This report covers the BT testing.

6.2. MAXIMUM OUTPUT POWER

The transmitter has a maximum peak conducted output power as follows:

Frequency Range (MHz)	Mode	Output Power (dBm)	Output Power (mW)
External Antenna			
2402 - 2480	Basic GFSK	10.30	10.72
2402 - 2480	Enhanced DQPSK	9.28	8.47
2402 - 2480	Enhanced 8PSK	10.22	10.52
PCB Antenna			
2402 - 2480	Basic GFSK	11.86	15.35
2402 - 2480	Enhanced DQPSK	11.15	13.03
2402 - 2480	Enhanced 8PSK	11.66	14.66

Note: GFSK, DQPSK, 8PSK Power are all investigated, The GFSK & 8PSK Power are the worst case. Testing is based on these modes to showing compliance. For power data of all modes please refer to section 9.6.

6.3. DESCRIPTION OF AVAILABLE ANTENNAS

The radio utilizes a PCB and a flexible external antennas for diversity, with a maximum gain of 2.91 dBi (PCB) and 3.5 dBi (external).

6.4. SOFTWARE AND FIRMWARE

The EUT firmware installed during testing was v sapphire+0.0.0+qcs405-som1+0000
The test utility software used during testing was QRCT version: 4.0.00127.0.

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6.5. WORST-CASE CONFIGURATION AND MODE

Radiated emissions below 1GHz, above 18GHz, and power line conducted emission were performed with the EUT set to transmit at the channel with highest output power as worst-case scenario.

Band edge and radiated emissions between 1GHz and 18GHz were performed with the EUT set to transmit at the highest power on low, middle and high channels.

The fundamental of the EUT was investigated with each antenna, external and PCB, in three orthogonal orientations X,Y,Z, it was determined that X orientation was worst-case orientation for both the external and PCB antennas; therefore, all final radiated testing was performed with both antennas in the X orientation.

Conducted testing was performed using PCB antenna port as worst-case, with the exception of power and duty cycle which were done on both ports.

Radiated and AC mains emissions testing were performed using both antennas.

Worst-case data rates as measured were:

GFSK mode: DH5
8PSK mode: 3-DH5

6.6. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

Support Equipment List				
Description	**Manufacturer**	**Model**	**Serial Number**	**FCC ID**
Laptop	Lenovo	T450	PC-OA2UQS	PD97265NGU
Laptop Charger	Lenovo	ADLX65NCC2A	11S36200284ZZ1005380J8	NA

I/O CABLES

I/O Cable List						
Cable No.	**Port**	**# of Identical Ports**	**Connector Type**	**Cable Type**	**Cable Length (m)**	**Remarks**
1	Mains	1	Terminal	Single conductor	<3m	Provides DC power to PCB
2	Antenna port	1	u.fl	Coaxial	<1m	Cable to external antenna

SETUP DIAGRAMS

Please refer to R13179001-EP1 for setup diagrams

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7. TEST AND MEASUREMENT EQUIPMENT

The following test and measurement equipment was utilized for the tests documented in this report:

Note – All equipment was in calibration at time of test.

Test Equipment Used - Radiated Disturbance Emissions Test Equipment (Morrisville - South Chamber)

Equipment ID	Description	Manufacturer	Model Number	Last Cal.	Next Cal.
0.009-30MHz (Loop Ant.)					
AT0079	Active Loop Antenna	ETS-Lindgren	6502	2019-08-08	2020-08-08
30-1000 MHz					
AT0074	Hybrid Broadband Antenna	Sunol Sciences Corp.	JB3	2019-07-16	2020-07-16
1-18 GHz					
AT0078	Double-Ridged Waveguide Horn Antenna, 1 to 18 GHz	ETS Lindgren	3117	2019-10-28	2020-10-28
18-40 GHz					
AT0076	Horn Antenna, 18-26.5GHz	ARA	MWH-1826/B	2019-11-07	2020-11-07
Gain-Loss Chains					
S-SAC01	Gain-loss string: 0.009-30MHz	Various	Various	2020-04-23	2021-04-23
S-SAC02	Gain-loss string: 25-1000MHz	Various	Various	2020-04-23	2021-04-23
S-SAC03 (Out of service on 05/14/2020)	Gain-loss string: 1-18GHz	Various	Various	2020-04-12	2021-04-12
S-SAC03 (In service on 05/15/2020)	Gain-loss string: 1-18GHz	Various	Various	2020-05-15	2021-05-15
S-SAC04	Gain-loss string: 18-40GHz	Various	Various	2019-03-23	2021-03-23
Receiver & Software					
SA0027	Spectrum Analyzer	Agilent	N9030A	2019-05-15	2020-05-31
SOFTEMI	EMI Software	UL	Version 9.5 (2019-06-12)		
Additional Equipment used					
s/n 181474409	Environmental Meter	Fisher Scientific	15-077-963	2018-07-27	2020-07-27
76022	DC Regulated Power Supply	Circuit Specialists	CSI3005X5	N/A	N/A
76021	DC Regulated Power Supply	Circuit Specialists	CSI3005X5	N/A	N/A

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Test Equipment Used - Radiated Disturbance Emissions Test Equipment (Morrisville - North Chamber)

Equipment ID	Description	Manufacturer	Model Number	Last Cal.	Next Cal.
1-18 GHz					
AT0072	Double-Ridged Waveguide Horn Antenna, 1 to 18 GHz	ETS Lindgren	3117	2020-04-27	2021-04-27
Gain-Loss Chains					
N-SAC03	Gain-loss string: 1-18GHz	Various	Various	2020-03-15	2021-03-15
Receiver & Software					
SA0025	Spectrum Analyzer	Agilent	N9030A	2020-03-17	2021-03-17
SOFTEMI	EMI Software	UL	Version 9.5	NA	NA
Additional Equipment used					
s/n 181474341	Environmental Meter	Fisher Scientific	15-077-963	2018-07-27	2020-07-27
76021	DC Regulated Power Supply	CircuitSpecialists.Com	CSI3005X5	N/A	N/A
76022	DC Regulated Power Supply	CircuitSpecialists.Com	CSI3005X5	N/A	N/A

Test Equipment Used - Conducted Disturbance Emissions Test Equipment (Morrisville – Conducted 1)

Equipment ID	Description	Manufacturer	Model Number	Last Cal.	Next Cal.
CBL087	Coax cable, RG223, N-male to BNC-male, 20-ft.	Pasternack	PE3W06143-240	2019-05-29	2020-05-29
s/n 161024885	Environmental Meter	Fisher Scientific	15-0770-963	2018-09-04	2020-09-04
LISN003	LISN, 50-ohm/50-uH, 2-conductor, 25A	Fischer Custom Com.	FCC-LISN-50-25-2-01-550V	2019-08-19	2020-08-19
75141 (PRE0101521)	EMI Test Receiver 9kHz-7GHz	Rohde & Schwarz	ESCI 7	2019-08-20	2020-08-20
TL001	Transient Limiter, 0.009-30MHz	Com-Power	LIT-930A	2019-05-29	2020-05-29
PS214	AC Power Source	Elgar	CW2501M (s/n 1523A02396)	NA	NA
SOFTEMI	EMI Software	UL	Version 9.5 (2019-06-12)		
76021	DC Power Supply	Circuit Specialists	CSI3005X5	NA	NA

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Test Equipment Used - Wireless Conducted Measurement Equipment

Equipment ID	Description	Manufacturer	Model Number	Last Cal.	Next Cal.
72822 (PRE0100902)	Spectrum Analyzer	Agilent Technologies	E4446A	2020-01-02	2021-01-02
PWM004 (PRE0137346)	RF Power Meter	Keysight Technologies	N1911A	2019-08-23	2020-08-23
PWS001 (PRE0137347)	Peak and Avg Power Sensor, 50MHz to 18GHz	Keysight Technologies	E1921A	2019-05-06	2020-05-06
PWM003 (PRE0137345)	RF Power Meter	Keysight Technologies	N1911A	2019-08-23	2020-08-23
PWS005 (PRE0126445)	Peak and Avg Power Sensor, 50MHz to 18GHz	Keysight Technologies	E1921A	2020-05-26	2021-05-26
HI0090	Environmental Meter	Fisher Scientific	15-077-963	2019-06-17	2020-06-17
SN 181562858	Environmental Meter	Fisher Scientific	14-650-118	2018-09-04	2020-09-04
76022	DC Regulated Power Supply	Circuit Specialists	CSI3005X5	N/A	N/A
SOFTEMI	EMC Software	UL	Version 2020.3.11 and 2020.4.17	NA	NA
76023 (EC0225)	Temp/Humid Chamber	Cincinnati Sub-Zero	ZPH-8-3.5-SCT/AC	2019-06-14	2020-06-14
SN 181474341	Environmental Meter	Fisher Scientific	15-077-963	2018-07-27	2020-07-27
30811	DC Regulated Power Supply	Tenma	72-6180A	N/A	N/A

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8. MEASUREMENT METHODS

On Time and Duty Cycle: ANSI C63.10-2013 Section 11.6

Occupied BW (20dB and 99%): ANSI C63.10-2013 Section 6.9.2 and 6.9.3

Carrier Frequency Separation: ANSI C63.10-2013 Section 7.8.2

Number of Hopping Frequencies: ANSI C63.10-2013 Section 7.8.3

Time of Occupancy (Dwell Time): ANSI C63.10-2013 Section 7.8.4

Peak Output Power: ANSI C63.10-2013 Section 7.8.5

Conducted Spurious Emissions: ANSI C63.10-2013 Section 7.8.8

Band-Edge: ANSI C63.10-2013 Section 7.8.6, 6.10.4 and 6.10.5

Radiated Spurious Emissions: ANSI C63.10-2013 Section 6.3 to 6.6

AC Power-line conducted emissions: ANSI C63.10-2013, Section 6.2

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9. ANTENNA PORT TEST RESULTS

9.1. ON TIME AND DUTY CYCLE

LIMITS

None; for reporting purposes only.

PROCEDURE

ANSI C63.10, Section 11.6 : Zero-Span Spectrum Analyzer Method.

ON TIME AND DUTY CYCLE RESULTS

Mode	ON Time B (msec)	Period (msec)	Duty Cycle x (linear)	Duty Cycle (%)	Duty Cycle Correction Factor (dB)	1/T Minimum VBW (kHz)
External Antenna						
Bluetooth GFSK	2.89	3.75	0.771	77.1%	1.13	0.346
Bluetooth 8PSK	2.89	3.75	0.771	77.1%	1.13	0.346
PCB Antenna						
Bluetooth GFSK	2.89	3.75	0.771	77.1%	1.13	0.346
Bluetooth 8PSK	2.88	3.75	0.768	76.8%	1.15	0.347

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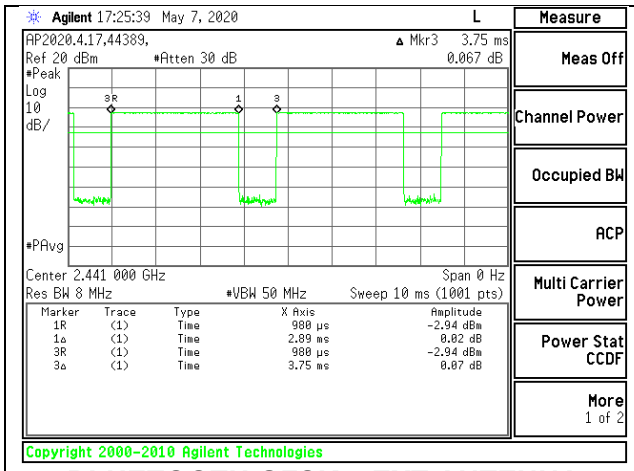
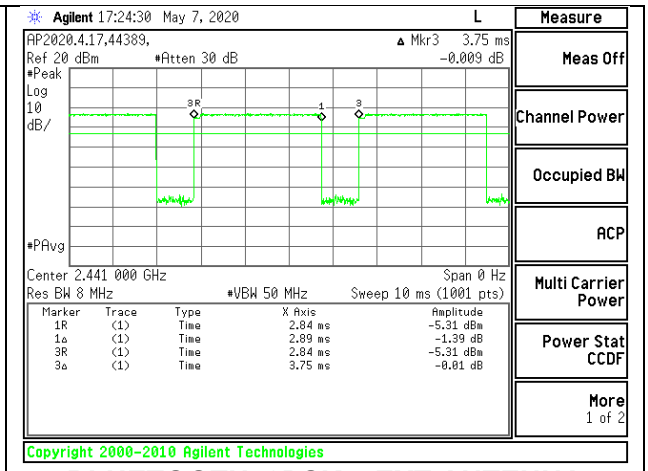
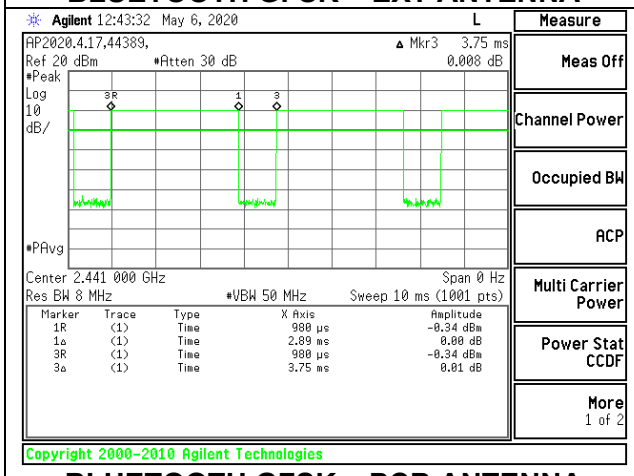


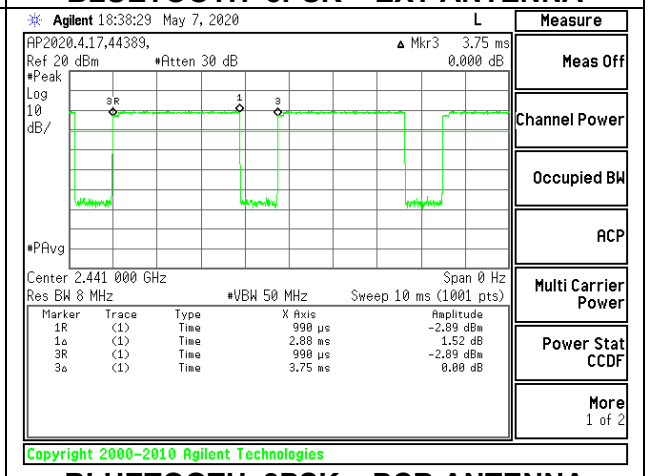
BLUETOOTH GFSK – EXT ANTENNA



BLUETOOTH 8PSK – EXT ANTENNA



BLUETOOTH GFSK – PCB ANTENNA



BLUETOOTH 8PSK – PCB ANTENNA

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9.2.20 dB AND 99% BANDWIDTH

LIMITS

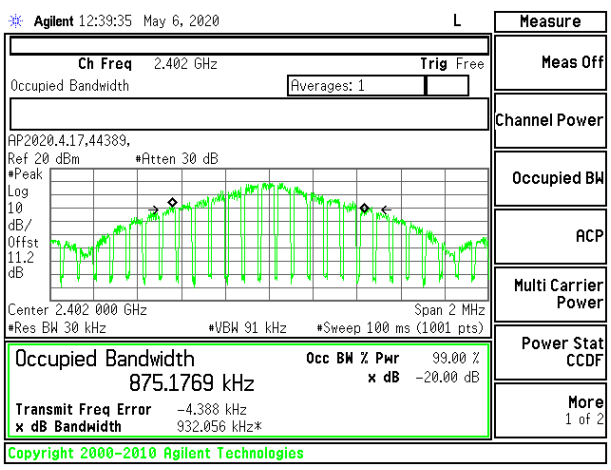
None; for reporting purposes only.

TEST PROCEDURE

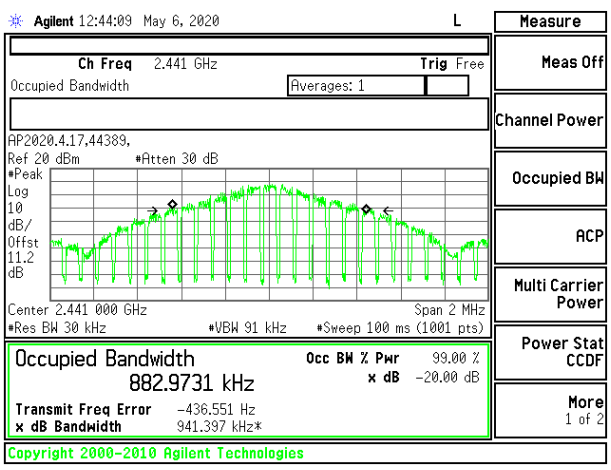
The transmitter output is connected to a spectrum analyzer. The RBW is set to 1-5% of the 20 dB and 99% occupied bandwidth. The VBW is set to ≥ 3x RBW. The sweep time is coupled.

9.2.1. BLUETOOTH BASIC DATA RATE GFSK MODULATION

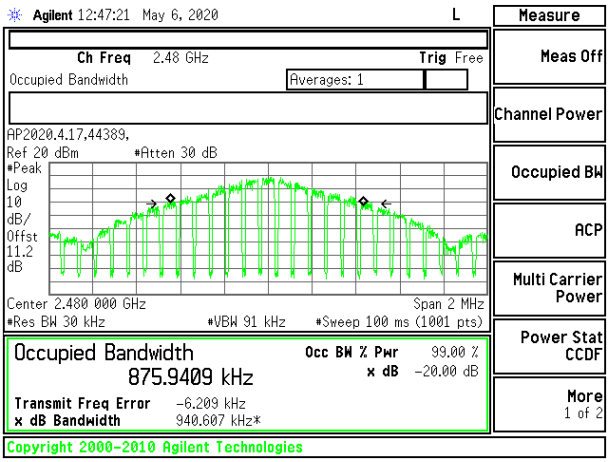
Channel	Frequency (MHz)	20dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	2402	0.856	0.875
Mid	2441	0.926	0.883
High	2480	0.89	0.876



LOW CHANNEL (99% OBW)



MID CHANNEL (99% OBW)



HIGH CHANNEL (99% OBW)

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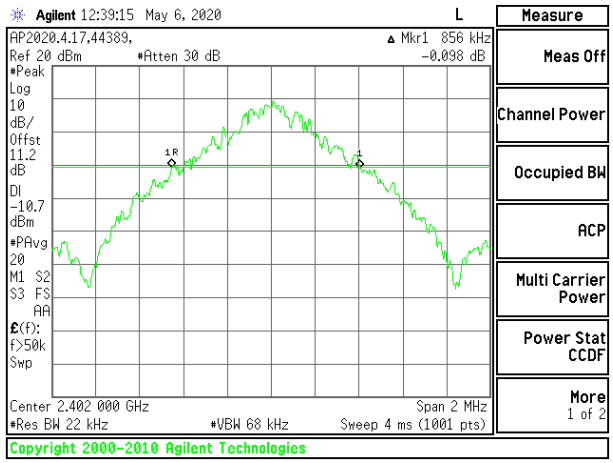
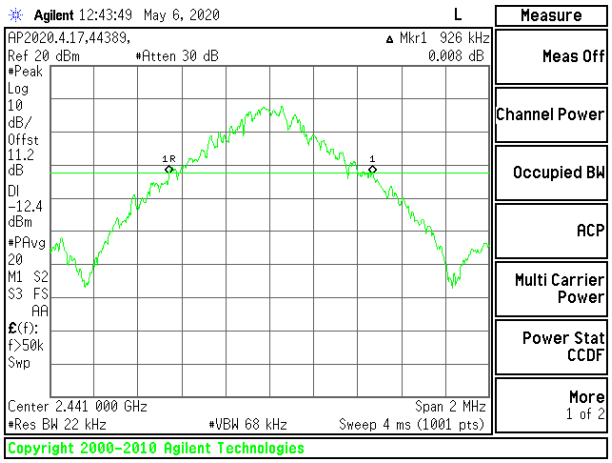
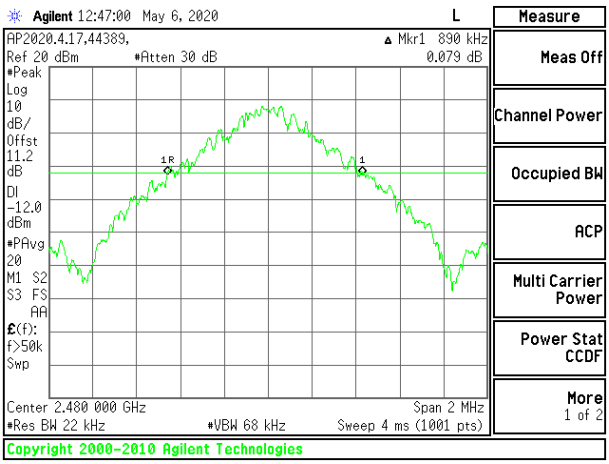


LOW CHANNEL (20 dB EBW)



MID CHANNEL (20 dB EBW)



HIGH CHANNEL (20 dB EBW)

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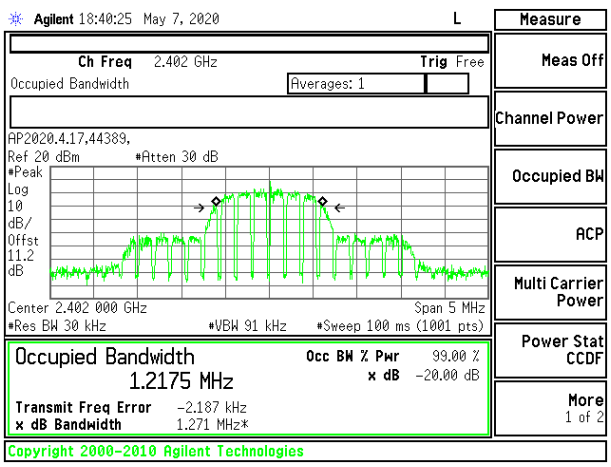
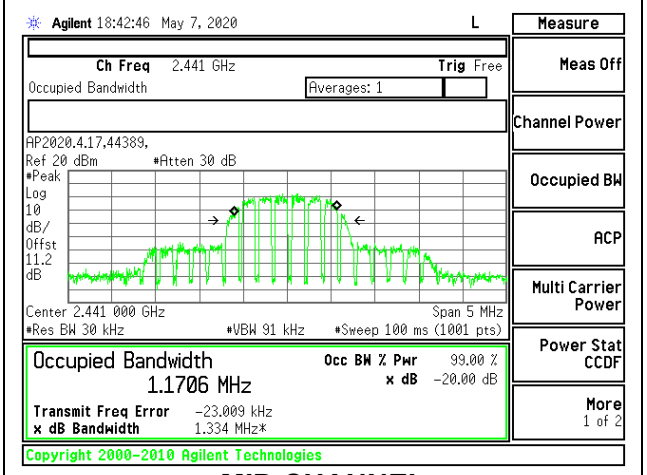
9.2.2. BLUETOOTH ENHANCED DATA RATE 8PSK MODULATION

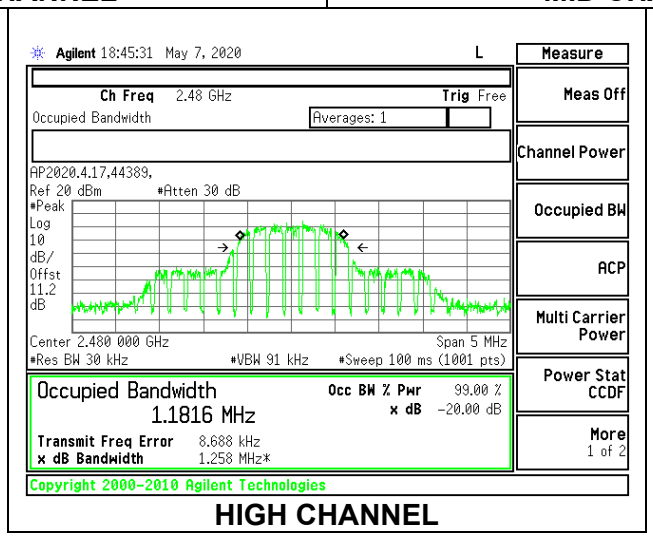
Channel	Frequency (MHz)	20dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	2402	1.34	1.218
Mid	2441	1.306	1.171
High	2480	1.26	1.182



LOW CHANNEL



MID CHANNEL



HIGH CHANNEL

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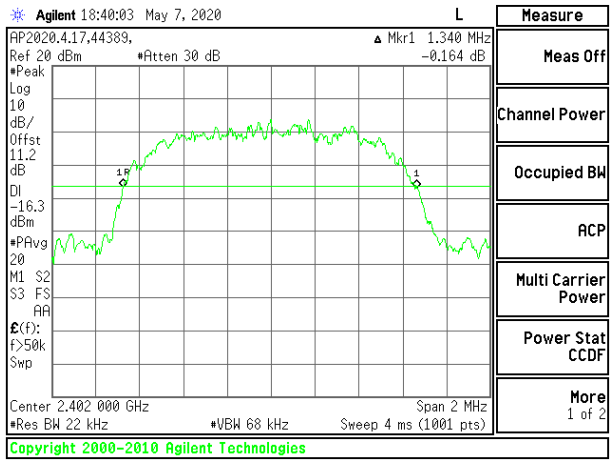
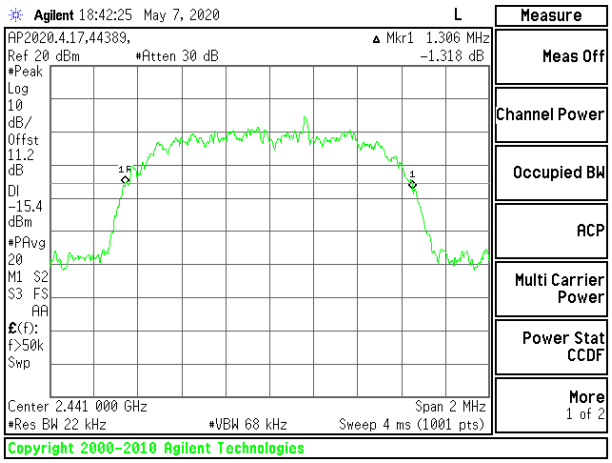
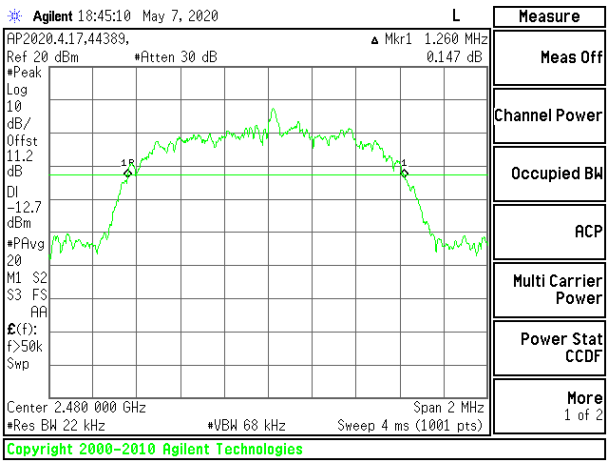


LOW CHANNEL (20 dB EBW)



MID CHANNEL (20 dB EBW)



HIGH CHANNEL (20 dB EBW)

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9.3. HOPPING FREQUENCY SEPARATION

LIMITS

FCC §15.247 (a) (1)

RSS-247 (5.1) (b)

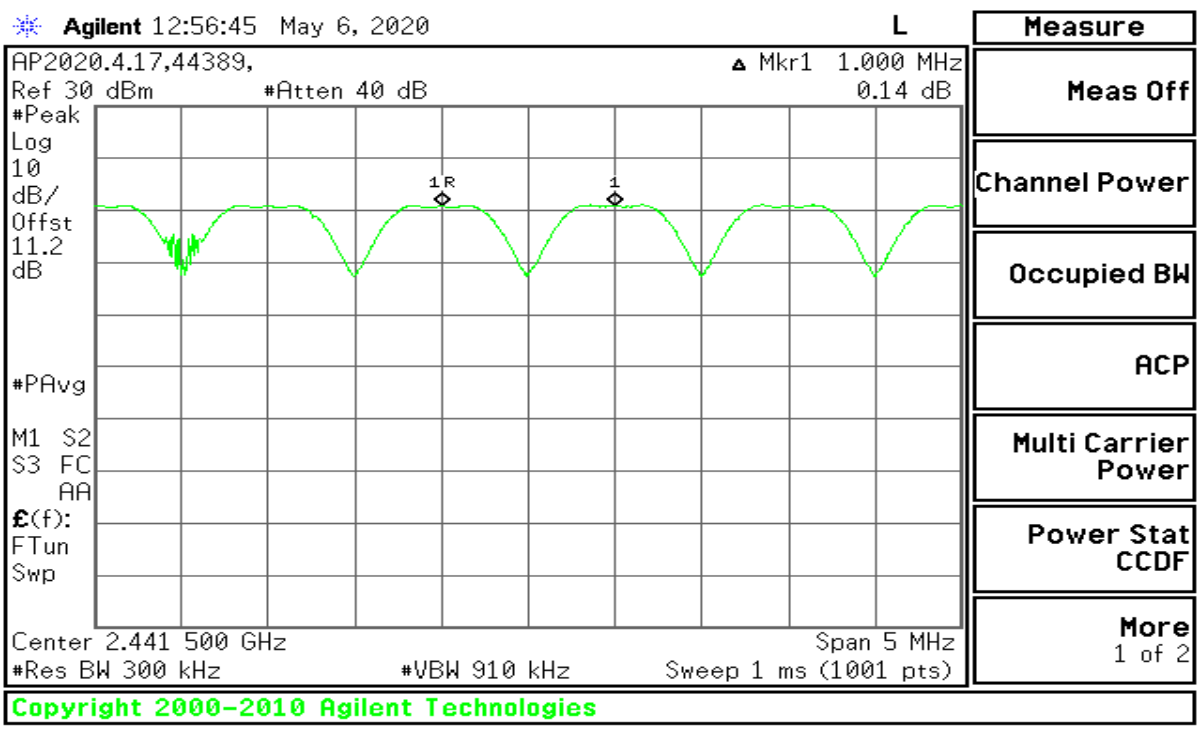
Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hoping channel, whichever is greater.

Alternatively, frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than 125 mW.

TEST PROCEDURE

The transmitter output is connected to a spectrum analyzer. The RBW is set to approx. 30% of the channel spacing (300 kHz) and the VBW is set to VBW >= RBW. The sweep time is coupled.

9.3.1. BLUETOOTH BASIC DATA RATE GFSK MODULATION



HOPPING FREQUENCY SEPARATION PLOT

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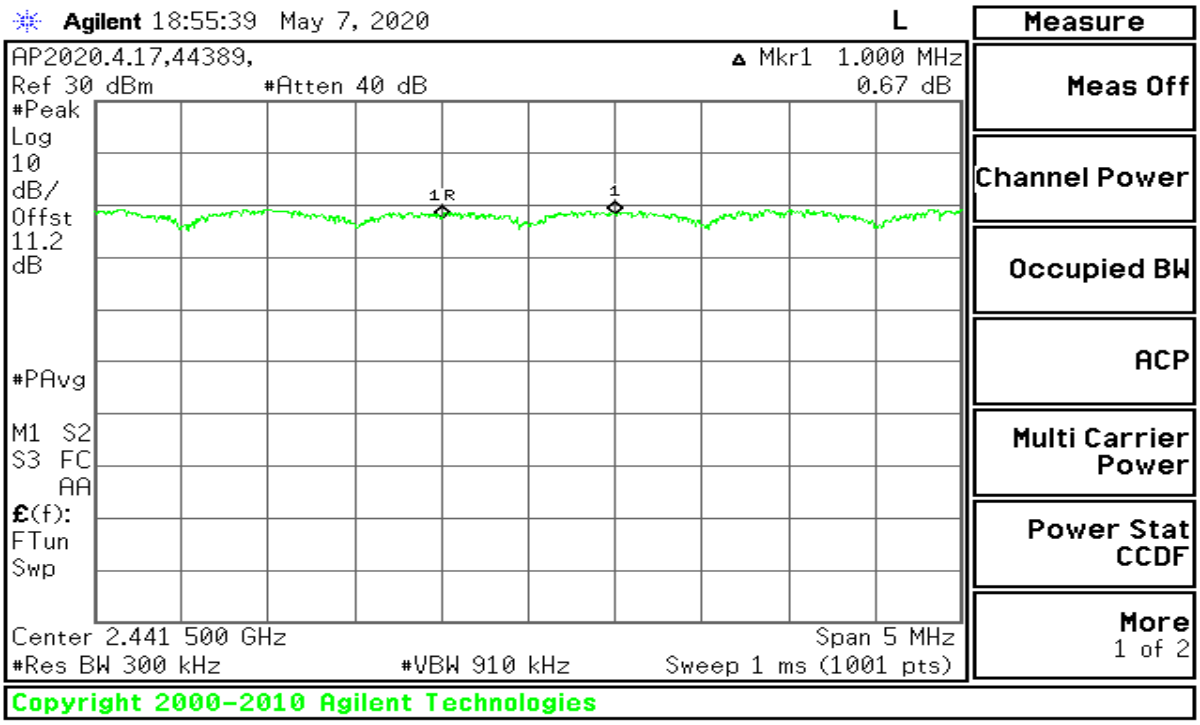
9.3.2. BLUETOOTH ENHANCED DATA RATE 8PSK MODULATION



HOPPING FREQUENCY SEPARATION PLOT

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9.4. NUMBER OF HOPPING CHANNELS

LIMITS

FCC §15.247 (a) (1) (iii)

RSS-247 (5.1) (d)

Frequency hopping systems in the 2400 – 2483.5 MHz band shall use at least 15 non-overlapping channels.

TEST PROCEDURE

The transmitter output is connected to a spectrum analyzer. The span is set to cover the entire authorized band, in either a single sweep or in multiple contiguous sweeps. The RBW is set to approx. 30% of the channel spacing (300 kHz) and the VBW is set to VBW >= RBW. The analyzer is set to Max Hold.

RESULTS

Normal Mode: All Channels Observed

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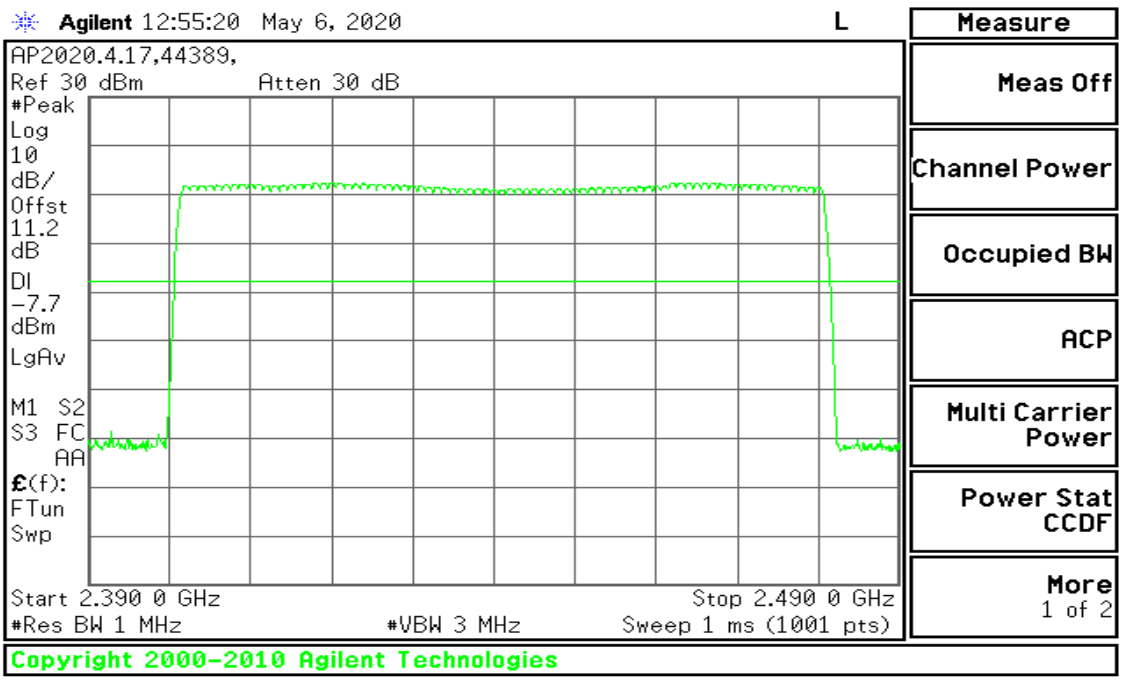
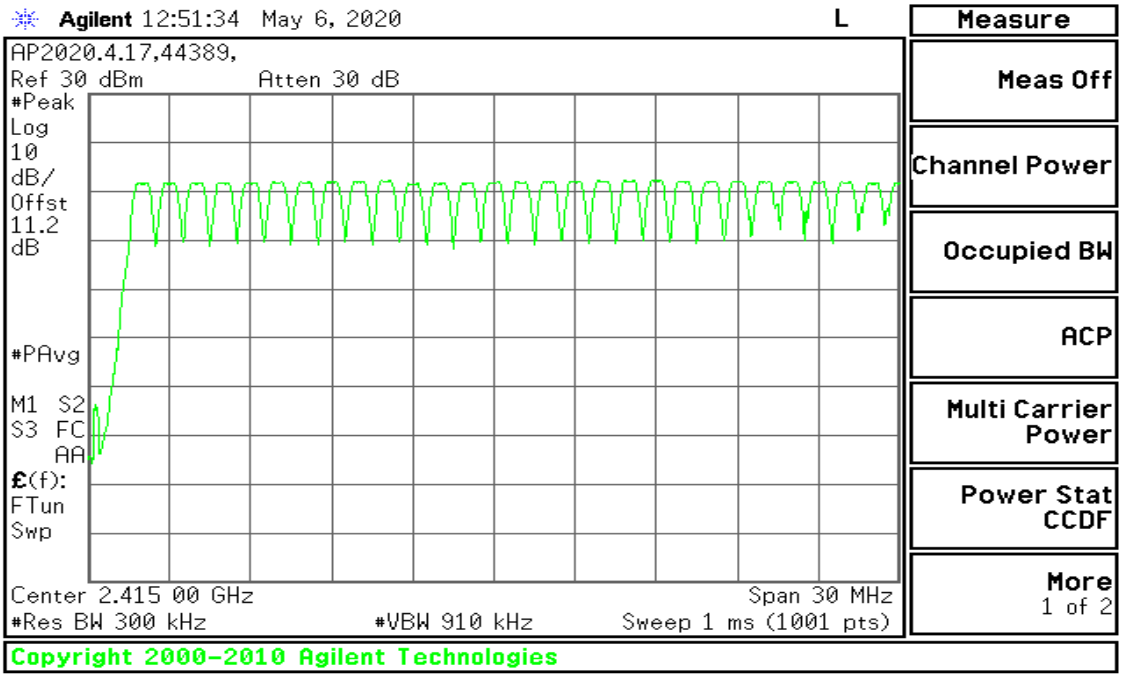
9.4.1. BLUETOOTH BASIC DATA RATE GFSK MODULATION



100MHz SPAN



30MHz SPAN, SEGMENT 1 OF 3

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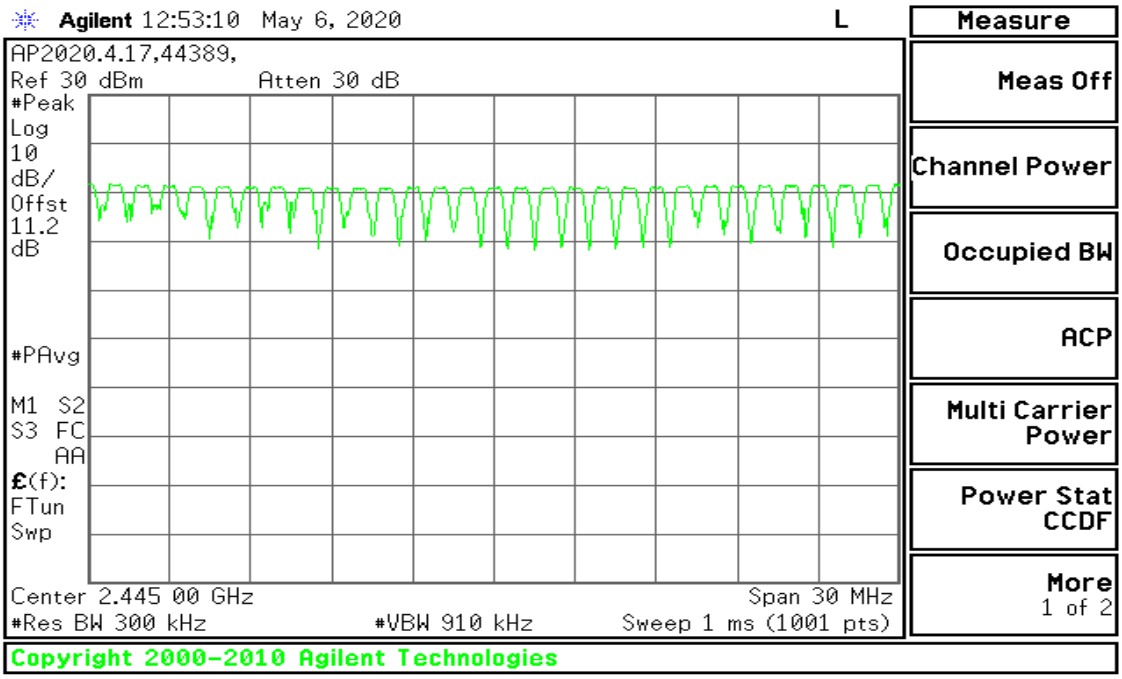
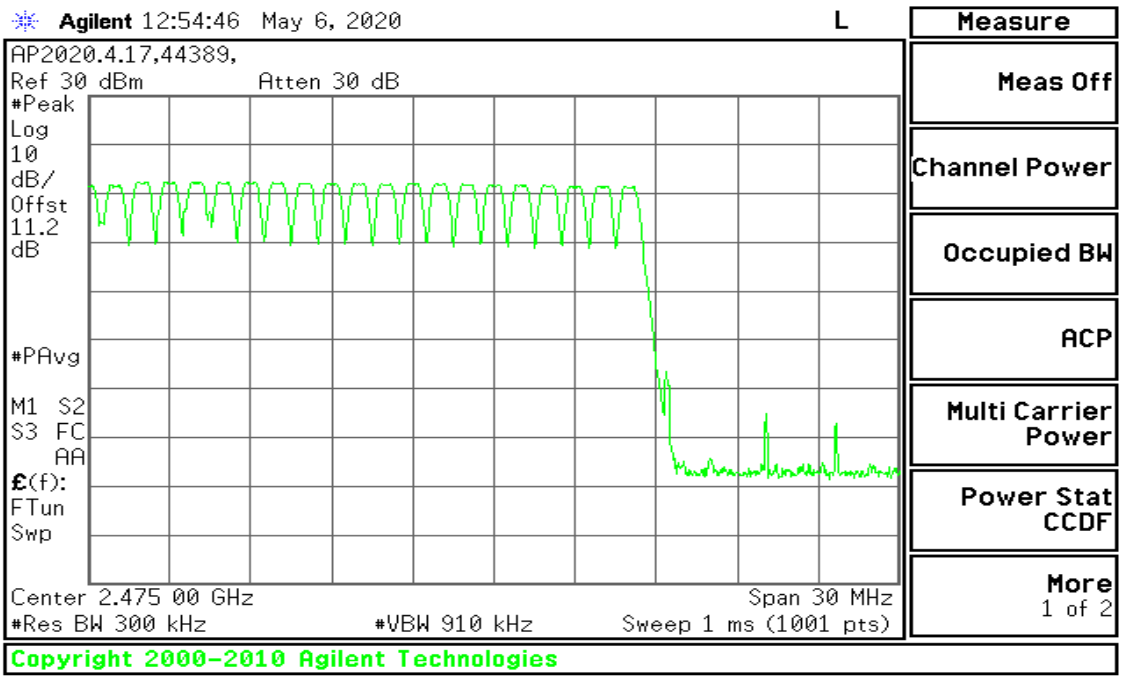


30MHz SPAN, SEGMENT 2 OF 3



30MHz SPAN, SEGMENT 3 OF 3

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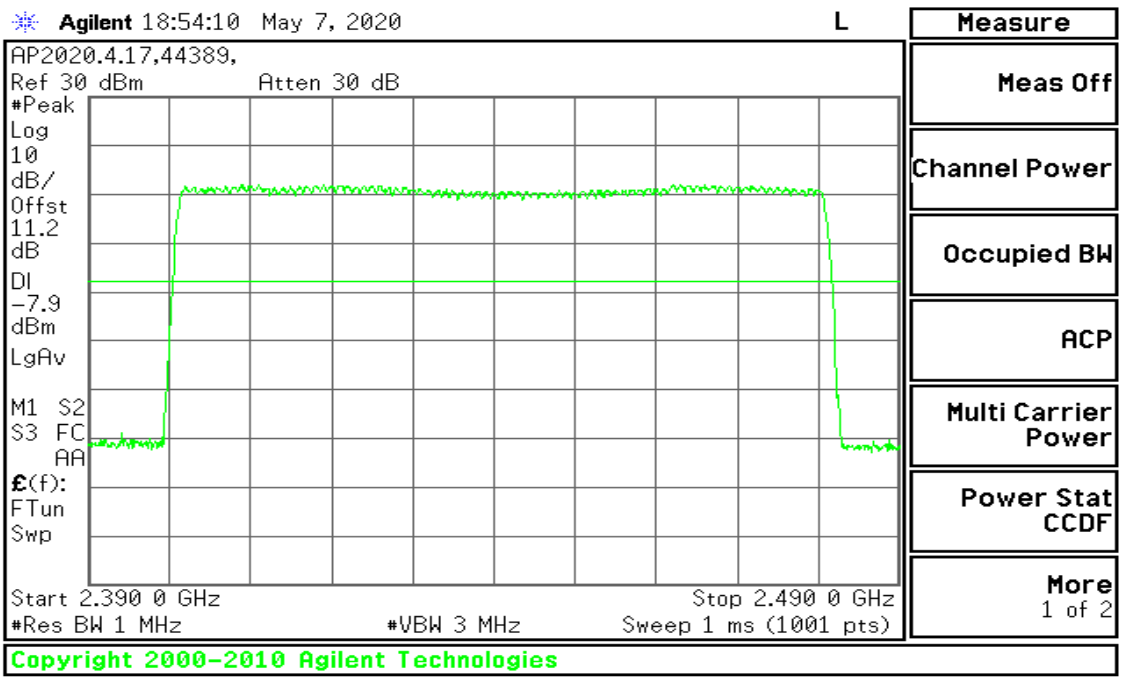
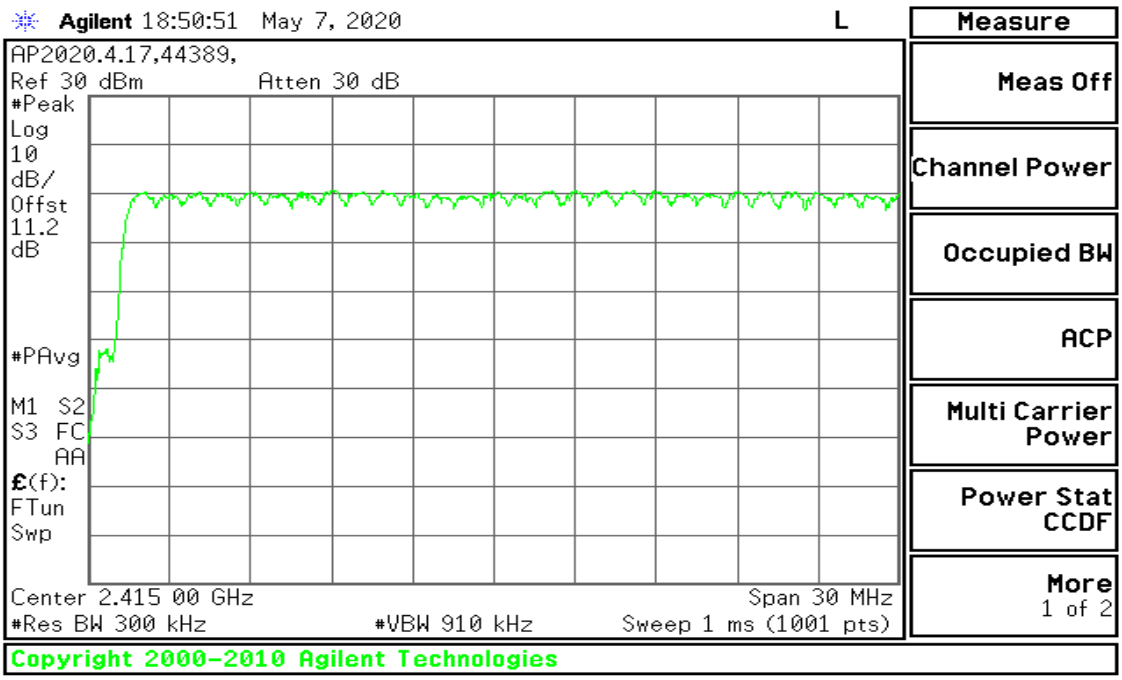
9.4.2. BLUETOOTH ENHANCED DATA RATE 8PSK MODULATION



100MHz SPAN



30MHz SPAN, SEGMENT 1 OF 3

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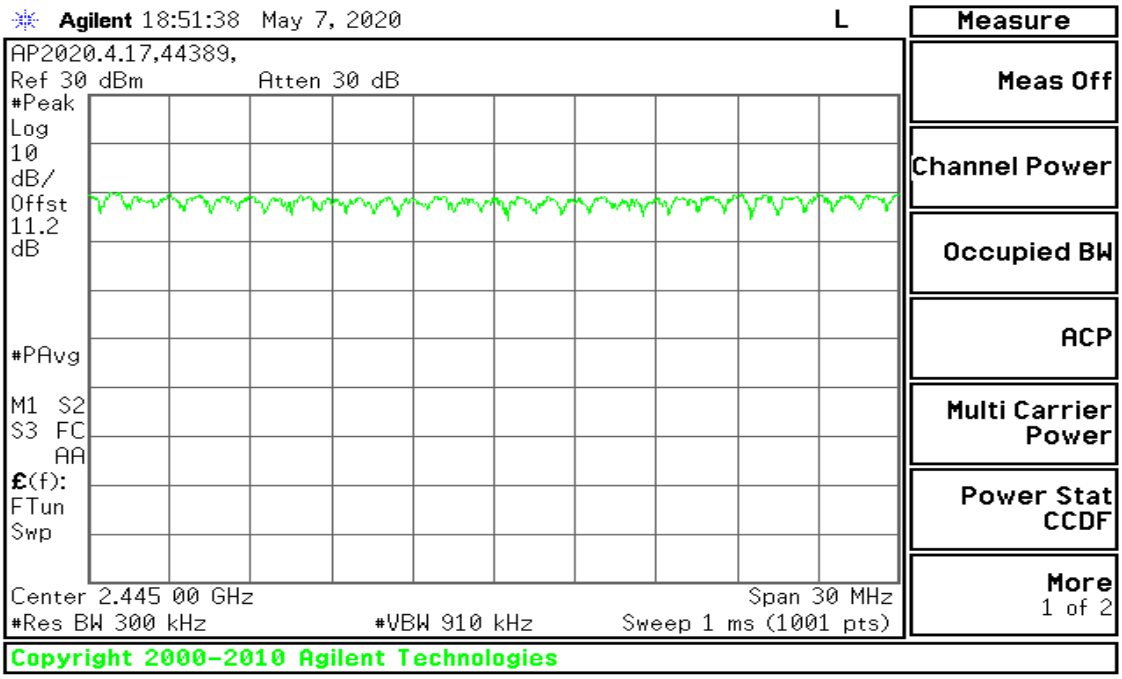
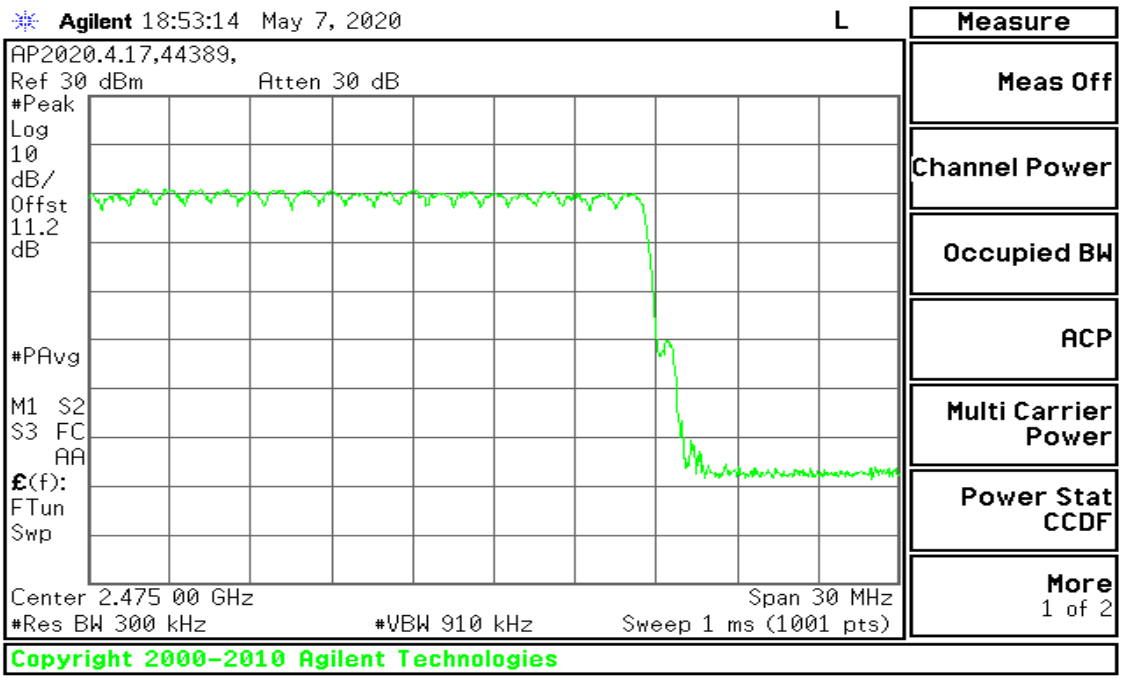


30MHz SPAN, SEGMENT 2 OF 3



30MHz SPAN, SEGMENT 3 OF 3

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9.5. AVERAGE TIME OF OCCUPANCY

LIMITS

FCC §15.247 (a) (1) (iii)

RSS-247 (5.1) (d)

The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed.

TEST PROCEDURE

The transmitter output is connected to a spectrum analyzer. The span is set to 0 Hz, centered on a single, selected hopping channel. The width of a single pulse is measured in a fast scan. The number of pulses is measured in a 3.16 second scan, to enable resolution of each occurrence.

The average time of occupancy in the specified 3.16 second period (79 channels * 0.4 s) is equal to 10 * (# of pulses in 3.16 s) * pulse width.

For AFH mode, the average time of occupancy in the specified 8 second period (20 channels * 0.4 seconds) is equal to 10 * (# of pulses in 0.8 s) * pulse width.

RESULTS

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9.5.1. BLUETOOTH BASIC DATA RATE GFSK MODULATION

DH Packet	Pulse Width (msec)	Number of Pulses in 3.16 seconds	Average Time of Occupancy (sec)	Limit (sec)	Margin (sec)
GFSK Normal Mode					
DH1	0.377	31	0.1169	0.4	-0.2831
DH3	1.630	15	0.2445	0.4	-0.1555
DH5	2.872	12	0.3446	0.4	-0.0554
DH Packet	Pulse Width (sec)	Number of Pulses in 0.8 seconds	Average Time of Occupancy (sec)	Limit (sec)	Margin (sec)
GFSK AFH Mode					
DH1	0.377	7.75	0.02922	0.4	-0.3708
DH3	1.63	3.75	0.06113	0.4	-0.3389
DH5	2.872	3	0.08616	0.4	-0.3138

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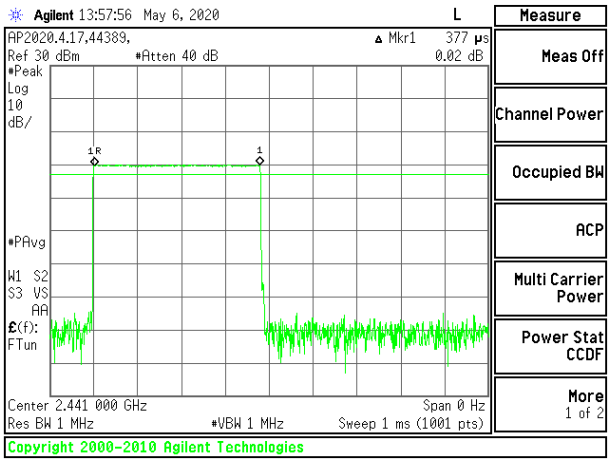
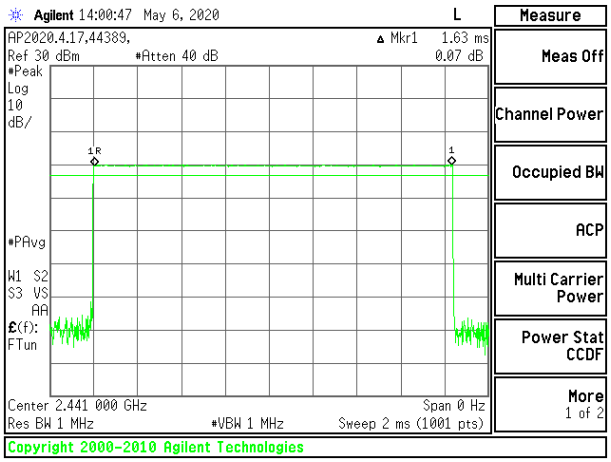
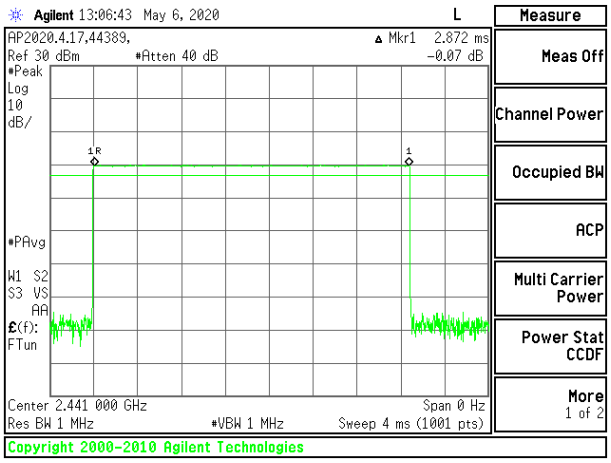


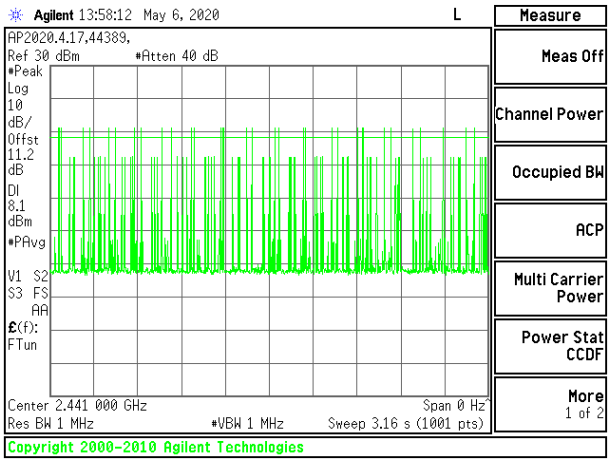
PULSE WIDTH – DH1



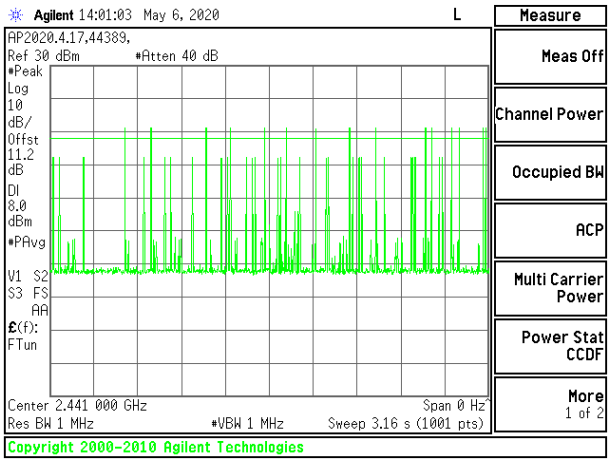
PULSE WIDTH – DH3



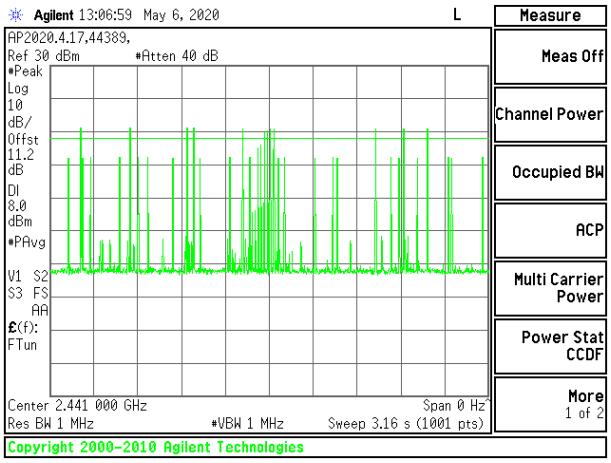
PULSE WIDTH – DH5



NUMBER OF PULSES IN 3.16 SECOND OBSERVATION PERIOD – DH1



NUMBER OF PULSES IN 3.16 SECOND OBSERVATION PERIOD – DH3



NUMBER OF PULSES IN 3.16 SECOND OBSERVATION PERIOD – DH5

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9.5.2. BLUETOOTH ENHANCED DATA RATE 8PSK MODULATION

DH Packet	Pulse Width (msec)	Number of Pulses in 3.16 seconds	Average Time of Occupancy (sec)	Limit (sec)	Margin (sec)
8PSK Normal Mode					
3DH1	0.383	31	0.11873	0.4	-0.28127
3DH3	1.139	5	0.05695	0.4	-0.34305
3DH5	2.876	13	0.37388	0.4	-0.02612

Note: for AFH(8PSK) mode, please refer to the results of AFH(GFSK) mode; the channel selection and hopping rate are the same for both EDR and Basic Rate operation, data for Basic Rate demonstrates compliance with channel occupancy when AFH is employed.

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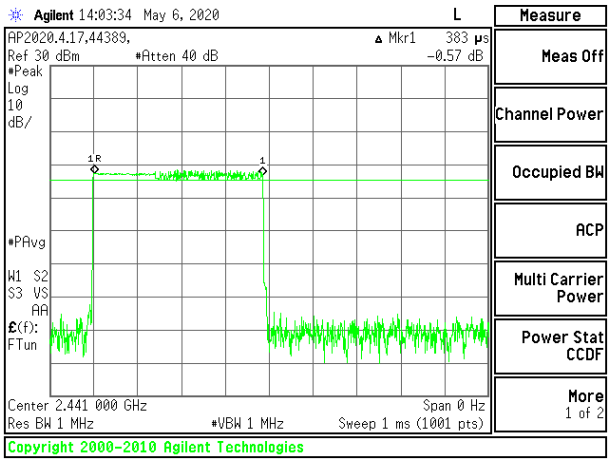
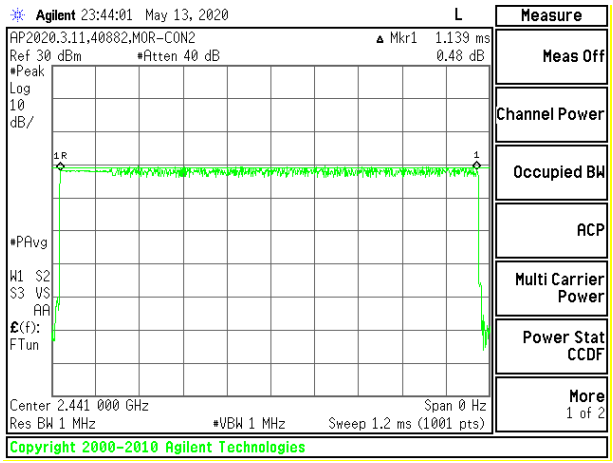
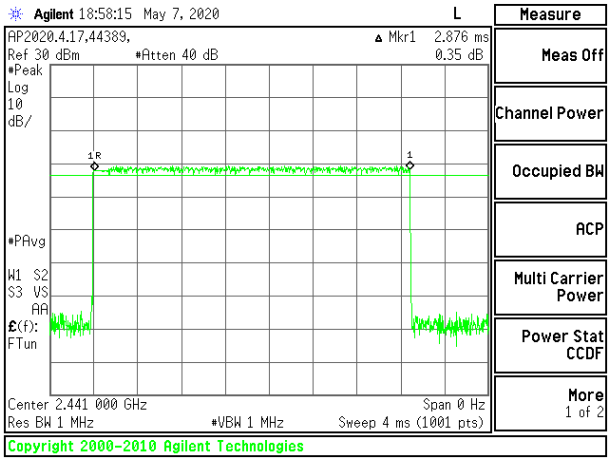


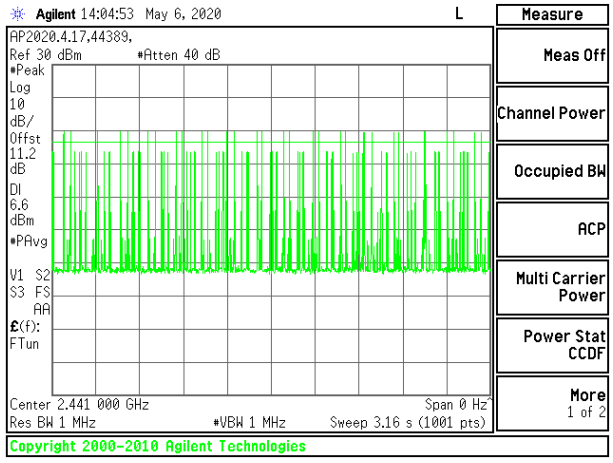
PULSE WIDTH – 3DH1



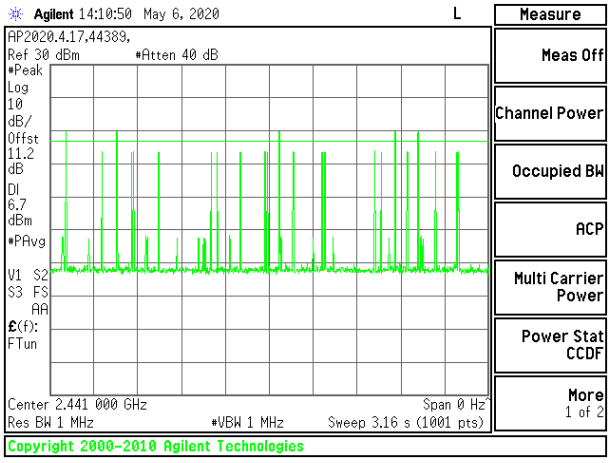
PULSE WIDTH – 3DH3



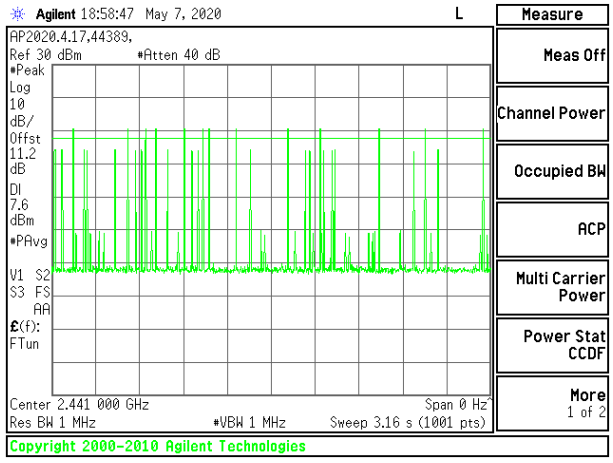
PULSE WIDTH – 3DH5



NUMBER OF PULSES IN 3.16 SECOND OBSERVATION PERIOD – 3DH1



NUMBER OF PULSES IN 3.16 SECOND OBSERVATION PERIOD – 3DH3



NUMBER OF PULSES IN 3.16 SECOND OBSERVATION PERIOD – 3DH5

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9.6. OUTPUT POWER

LIMITS

§15.247 (b) (1)

RSS-247 (5.4) (b)

The maximum antenna gain is less than 6 dBi, therefore the limit is 30 dBm. Alternatively, frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than 125 mW.

For frequency hopping systems operating in the 2400-2483.5 MHz band employing at least 75 non-overlapping hopping channels, and all frequency hopping systems in the 5725-5850 MHz band: 1 watt. For all other frequency hopping systems in the 2400-2483.5 MHz band: 0.125 watts

TEST PROCEDURE

Measurements perform using a wideband gated RF power meter.

The cable assembly insertion loss of 11.39 dB (including 10 dB pad and 1.39dB cable) was entered as an offset in the power meter to allow for a peak reading of power.

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9.6.1. BLUETOOTH BASIC DATA RATE GFSK MODULATION

External

Tested By:	44389
Date:	2020-05-05 to 2020-05-06

Ext. High

Channel	Frequency (MHz)	Output Power (dBm)	Limit (dBm)	Margin (dB)
Low	2402	10.30	21	-10.7
Middle	2441	8.85	21	-12.15
High	2480	9.44	21	-11.56

Tested By:	40882
Date:	2020-08-04

Ext. Low

Channel	Frequency (MHz)	Output Power (dBm)	Limit (dBm)	Margin (dB)
Low	2402	-1.86	21	-22.86
Middle	2441	-2.89	21	-23.89
High	2480	-1.44	21	-22.44

PCB

Tested By:	44389
Date	2020-05-05 to 2020-05-06

PCB High

Channel	Frequency (MHz)	Output Power (dBm)	Limit (dBm)	Margin (dB)
Low	2402	11.86	21	-9.14
Middle	2441	10.82	21	-10.18
High	2480	11.63	21	-9.37

Tested By:	40882
Date	2020-08-04

PCB Low

Channel	Frequency (MHz)	Output Power (dBm)	Limit (dBm)	Margin (dB)
Low	2402	2.08	21	-18.92
Middle	2441	1.5	21	-19.5
High	2480	3.06	21	-17.94

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9.6.2. BLUETOOTH ENHANCED DATA RATE 8PSK MODULATION

External

Tested By:	44389
Date:	2020-05-05 to 2020-05-06

Ext. High

Channel	Frequency (MHz)	Output Power (dBm)	Limit (dBm)	Margin (dB)
Low	2402	10.22	21	-10.78
Middle	2441	8.74	21	-12.26
High	2480	8.90	21	-12.1

Tested By:	40882
Date:	2020-08-04

Ext. Low

Channel	Frequency (MHz)	Output Power (dBm)	Limit (dBm)	Margin (dB)
Low	2402	-2.44	21	-23.44
Middle	2441	-3.65	21	-24.65
High	2480	-1.82	21	-22.82

PCB

Tested By:	44389
Date	2020-05-05 to 2020-05-06

PCB High

Channel	Frequency (MHz)	Output Power (dBm)	Limit (dBm)	Margin (dB)
Low	2402	11.66	21	-9.34
Middle	2441	10.62	21	-10.38
High	2480	11.29	21	-9.71

Tested By:	40882
Date	2020-08-04

PCB Low

Channel	Frequency (MHz)	Output Power (dBm)	Limit (dBm)	Margin (dB)
Low	2402	2.59	21	-18.41
Middle	2441	2.04	21	-18.96
High	2480	2.73	21	-18.27

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9.6.3. BLUETOOTH ENHANCED DATA RATE DQPSK MODULATION

External

Tested By:	44389
Date:	2020-05-05 to 2020-05-06

Ext. High

Channel	Frequency (MHz)	Output Power (dBm)	Limit (dBm)	Margin (dB)
Low	2402	9.28	21	-11.72
Middle	2441	8.52	21	-12.48
High	2480	8.77	21	-12.23

Tested By:	40882
Date:	2020-08-04

Ext. Low

Channel	Frequency (MHz)	Output Power (dBm)	Limit (dBm)	Margin (dB)
Low	2402	-2.75	21	-23.75
Middle	2441	-3.99	21	-24.99
High	2480	-2.15	21	-23.15

PCB

Tested By:	44389
Date	2020-05-05 to 2020-05-06

PCB High

Channel	Frequency (MHz)	Output Power (dBm)	Limit (dBm)	Margin (dB)
Low	2402	11.15	21	-9.85
Middle	2441	10.17	21	-10.83
High	2480	10.95	21	-10.05

Tested By:	40882
Date	2020-08-04

PCB Low

Channel	Frequency (MHz)	Output Power (dBm)	Limit (dBm)	Margin (dB)
Low	2402	2.21	21	-18.79
Middle	2441	1.62	21	-19.38
High	2480	2.47	21	-18.53

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9.7. AVERAGE POWER

LIMITS

None; for reporting purposes only

TEST PROCEDURE

Measurements perform using a wideband gated RF power meter.

The cable assembly insertion loss of 11.39 dB (including 10 dB pad and 1.39dB cable) was entered as an offset in the power meter to allow for a gated average reading of power.

9.7.1. BLUETOOTH BASIC DATA RATE GFSK MODULATION

External

Tested By:	44389
Date	2020-05-05 to 2020-05-06

Ext. High

Channel	Frequency (MHz)	Average Power (dBm)
Low	2402	10.21
Middle	2441	8.70
High	2480	9.31

Tested By:	40882
Date	2020-08-04

Ext. Low

Channel	Frequency (MHz)	Average Power (dBm)
Low	2402	-2.33
Middle	2441	-3.48
High	2480	-2.26

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PCB

Tested By:	44389
Date	2020-05-05 to 2020-05-06

PCB High

Channel	Frequency (MHz)	Average Power (dBm)
Low	2402	11.51
Middle	2441	10.63
High	2480	11.29

Tested By:	40882
Date	2020-08-04

PCB Low

Channel	Frequency (MHz)	Average Power (dBm)
Low	2402	1.75
Middle	2441	1.13
High	2480	2.14

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9.7.2. BLUETOOTH ENHANCED DATA RATE 8PSK MODULATION

External

Tested By:	44389
Date	2020-05-05 to 2020-05-06

Ext. High

Channel	Frequency (MHz)	Average Power (dBm)
Low	2402	7.79
Middle	2441	6.03
High	2480	6.17

Tested By:	40882
Date	2020-08-04

Ext. Low

Channel	Frequency (MHz)	Average Power (dBm)
Low	2402	-5.83
Middle	2441	-7.03
High	2480	-4.9

PCB

Tested By:	44389
Date	2020-05-05 to 2020-05-06

PCB High

Channel	Frequency (MHz)	Average Power (dBm)
Low	2402	8.86
Middle	2441	7.68
High	2480	7.27

Tested By:	40882
Date	2020-08-04

PCB Low

Channel	Frequency (MHz)	Average Power (dBm)
Low	2402	-0.42
Middle	2441	-1.2
High	2480	-1.04

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9.7.3. BLUETOOTH ENHANCED DATA RATE DQPSK MODULATION

External

Tested By:	44389
Date	2020-05-05 to 2020-05-06

Ext. High

Channel	Frequency (MHz)	Average Power (dBm)
Low	2402	6.82
Middle	2441	6.09
High	2480	6.58

Tested By:	40882
Date	2020-08-04

Ext. Low

Channel	Frequency (MHz)	Average Power (dBm)
Low	2402	-6.97
Middle	2441	-6.99
High	2480	-4.87

PCB

Tested By:	44389
Date	2020-05-05 to 2020-05-06

PCB High

Channel	Frequency (MHz)	Average Power (dBm)
Low	2402	8.75
Middle	2441	7.55
High	2480	8.68

Tested By:	40882
Date	2020-08-04

PCB Low

Channel	Frequency (MHz)	Average Power (dBm)
Low	2402	-0.38
Middle	2441	-1.19
High	2480	-2.73

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9.8. CONDUCTED SPURIOUS EMISSIONS

LIMITS

FCC §15.247 (d)
RSS-247 5.5

Limit = -20 dBc

TEST PROCEDURE

The transmitter output is connected to a spectrum analyzer. The resolution bandwidth is set to 100 kHz. The video bandwidth is set to 300 kHz.

The spectrum from 30 MHz to 26 GHz is investigated with the transmitter set to the lowest, middle, and highest channels.

The bandedges at 2.4 and 2.4835 GHz are investigated with the transmitter set to the normal hopping mode and non-hopping modes.

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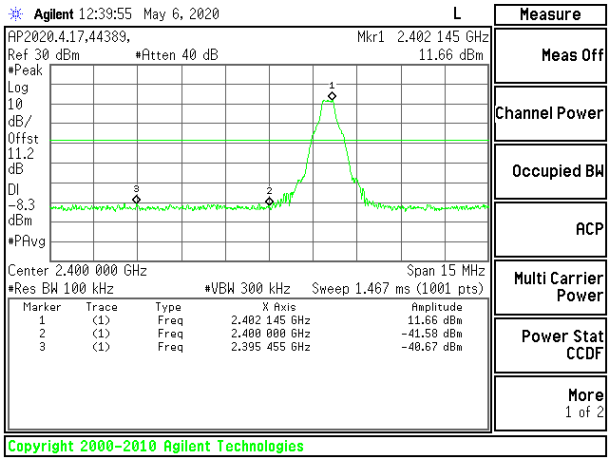
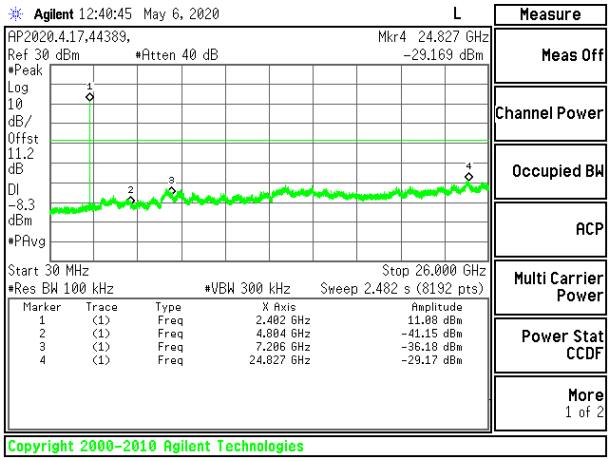
9.8.1. BLUETOOTH BASIC DATA RATE GFSK MODULATION

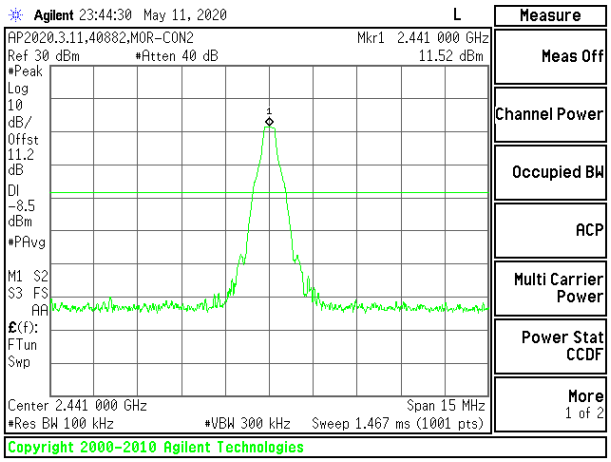
PCB SPURIOUS EMISSIONS, NON-HOPPING



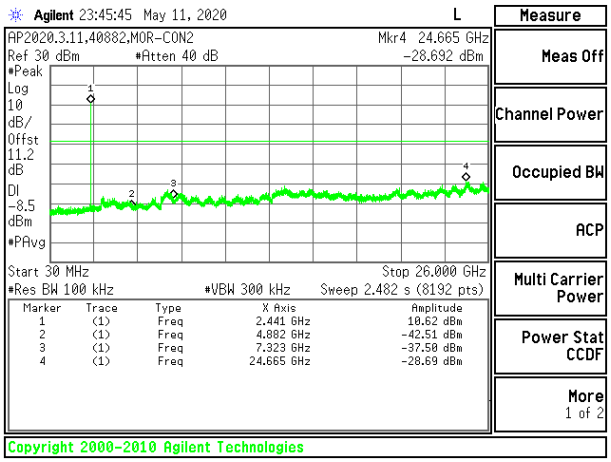
LOW CHANNEL BANDEDGE



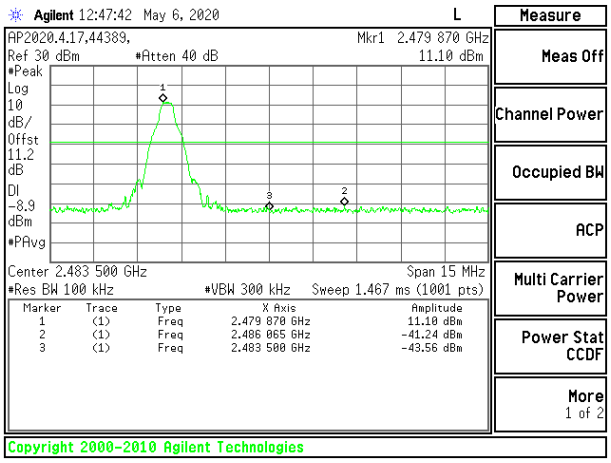
OUT-OF-BAND LOW CHANNEL



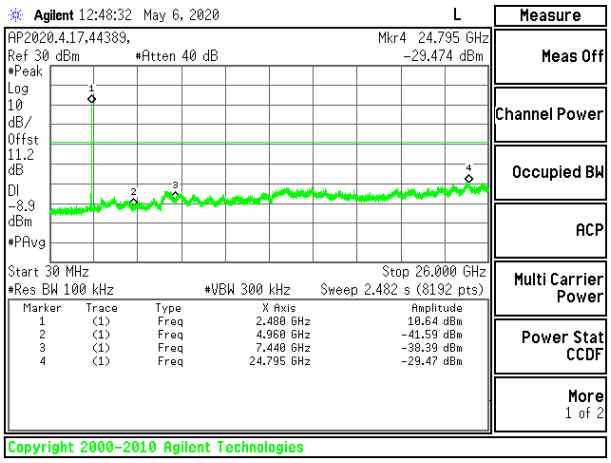
IN-BAND REFERENCE LEVEL



OUT-OF-BAND MID CHANNEL



HIGH CHANNEL BANDEDGE



OUT-OF-BAND HIGH CHANNEL

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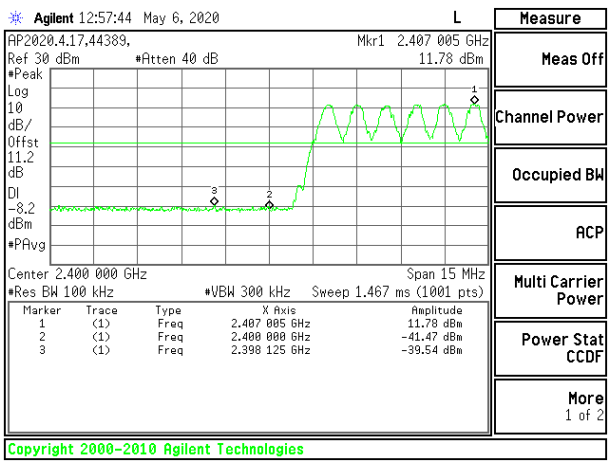
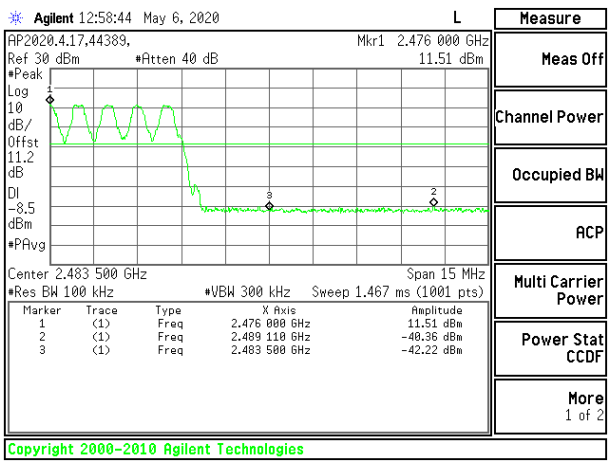
PCB SPURIOUS BANDEDGE EMISSIONS WITH HOPPING ON



LOW BANDEDGE



HIGH BANDEDGE

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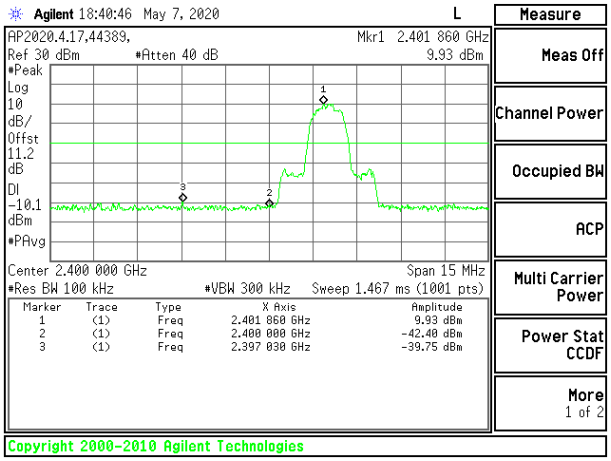
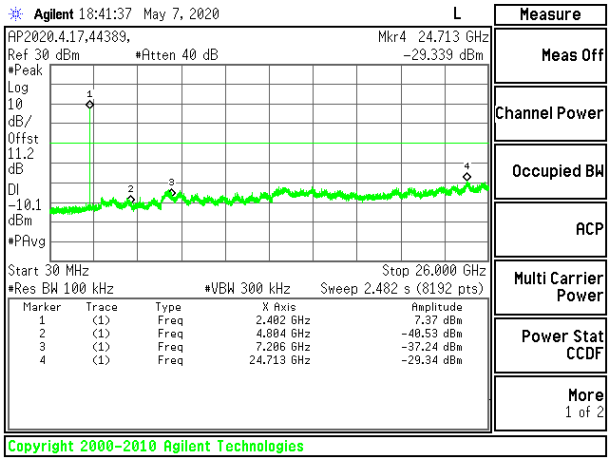
9.8.2. BLUETOOTH ENHANCED DATA RATE 8PSK MODULATION

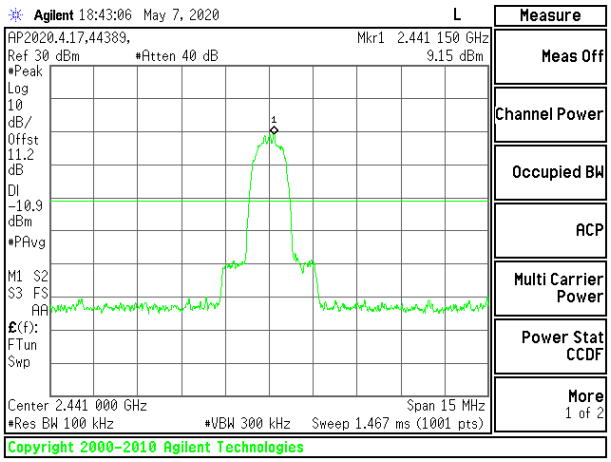
PCB SPURIOUS EMISSIONS, NON-HOPPING



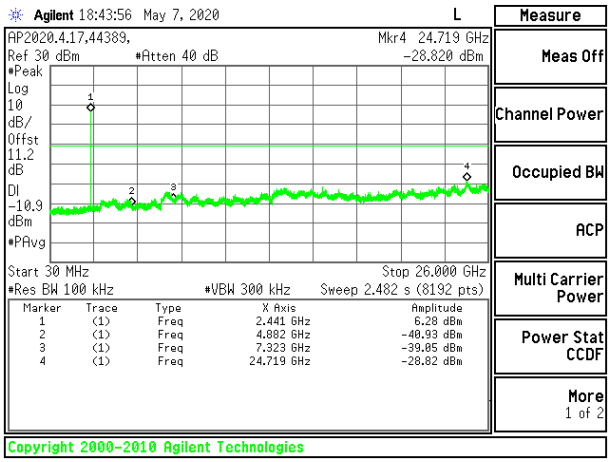
LOW CHANNEL BANDEDGE



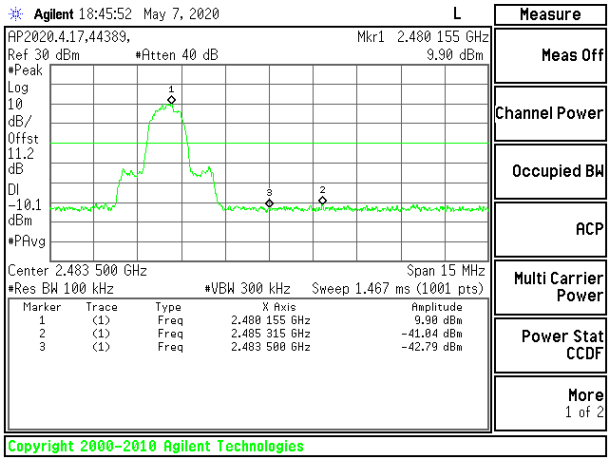
OUT-OF-BAND LOW CHANNEL



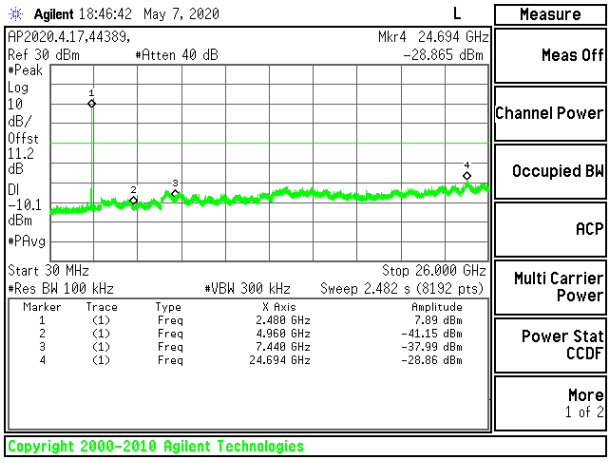
IN-BAND REFERENCE LEVEL



OUT-OF-BAND MID CHANNEL



HIGH CHANNEL BANDEDGE



OUT-OF-BAND HIGH CHANNEL

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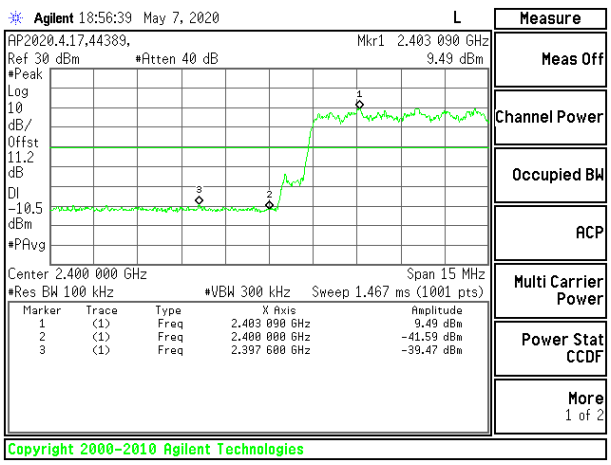
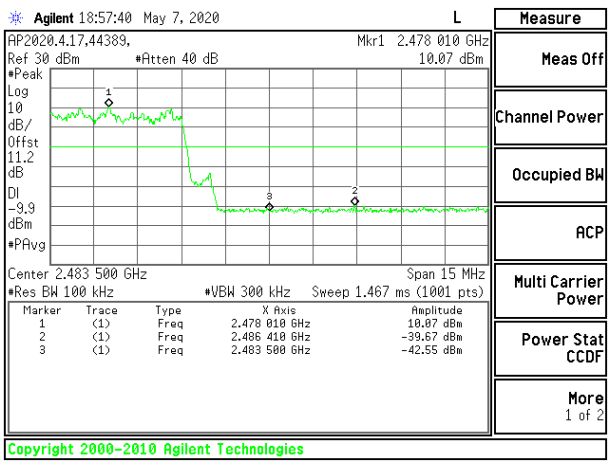
PCB SPURIOUS BANDEDGE EMISSIONS WITH HOPPING ON



LOW BANDEDGE



HIGH BANDEDGE

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10. RADIATED TEST RESULTS

LIMITS

FCC §15.205 and §15.209
RSS-GEN, Section 8.9 and 8.10.

Frequency Range (MHz)	Field Strength Limit (uV/m) at 3 m	Field Strength Limit (dBuV/m) at 3 m
0.009-0.490	2400/F(kHz) @ 300 m	-
0.490-1.705	24000/F(kHz) @ 30 m	-
1.705 - 30	30 @ 30m	-
30 - 88	100	40
88 - 216	150	43.5
216 - 960	200	46
Above 960	500	54

TEST PROCEDURE

The EUT is placed on a non-conducting table 80 cm above the ground plane for measurement below 1GHz; 1.5 m above the ground plane for measurement above 1GHz. The antenna to EUT distance is 3 meters. The EUT is configured in accordance with ANSI C63.10. The EUT is set to transmit in a continuous mode.

For measurements below 1 GHz the resolution bandwidth is set to 100 kHz for peak detection measurements or 120 kHz for quasi-peak detection measurements in the 30-1000MHz range, 9kHz for peak and/or quasi-peak detection measurements in the 0.15-30MHz range and 200Hz for peak and/or quasi-peak detection measurements in the 9 to 150kHz range. Peak detection is used unless otherwise noted as quasi-peak.

For pre-scans above 1 GHz the resolution bandwidth is set to 1 MHz; the video bandwidth is set to 30 KHz for peak measurements.

For final measurements above 1 GHz the resolution bandwidth is set to 1 MHz; the video bandwidth is set to 3 MHz for peak measurements and 1 MHz resolution bandwidth with 1/T video bandwidth with peak detection, for average measurements.

The spectrum from 1 GHz to 18 GHz is investigated with the transmitter set to the lowest, middle, and highest channels in each applicable band. Below 1GHz and above 18GHz emissions, the channel with the highest output power was tested.

The frequency range of interest is monitored at a fixed antenna height and EUT azimuth. The EUT is rotated through 360 degrees to maximize emissions received. The antenna is scanned from 1 to 4 meters above the ground plane to further maximize the emission. Measurements are made with the antenna polarized in both the vertical and the horizontal positions.

3D antenna use - For below 30MHz testing, investigation was done on three antenna orientations (parallel, perpendicular, and ground-parallel).

Base on FCC 15.31 (f) (2): measurements may be performed at a distance closer than that specified in the regulations; however, an attempt should be made to avoid making measurements in the near field.

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KDB 414788 Open Field Site(OFS) and Chamber Correlation Justification

OFS and chamber correlation testing had been performed and chamber measured test result is the worst case test result.

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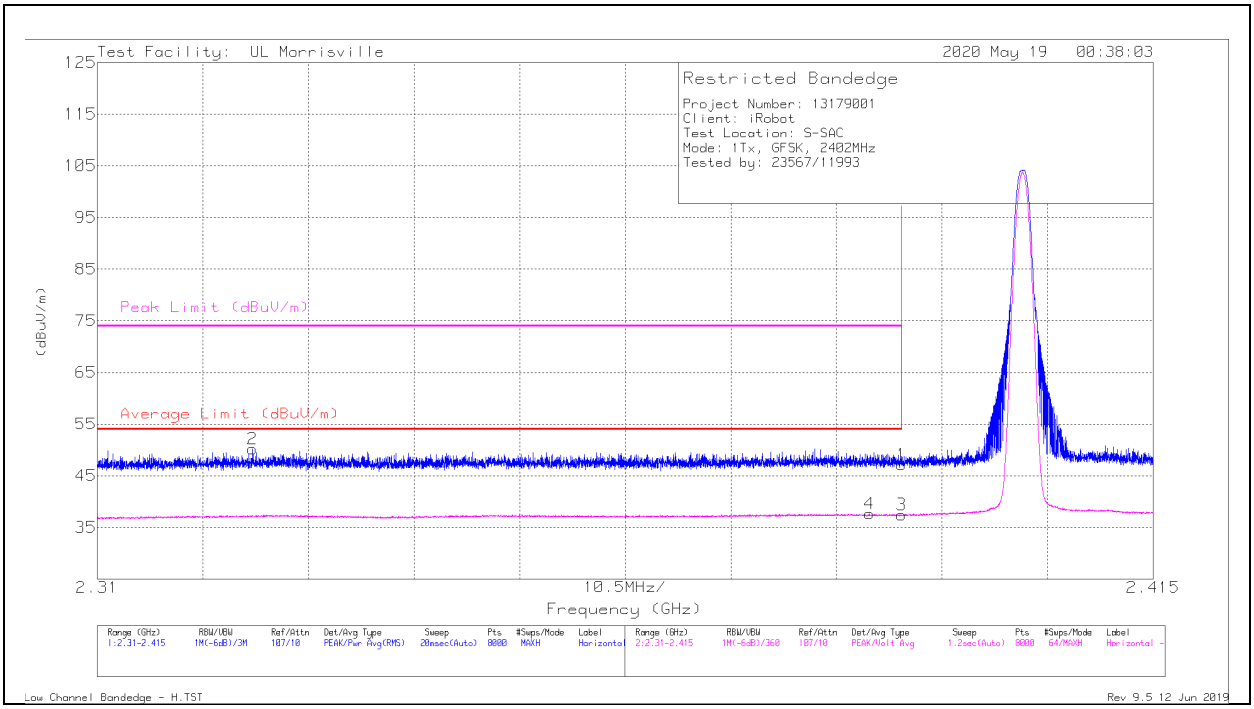
10.1. TRANSMITTER ABOVE 1 GHz

10.1.1. BLUETOOTH BASIC DATA RATE GFSK MODULATION

External

BANDEDGE (LOW CHANNEL)

HORIZONTAL RESULT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AT0078 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* ** 2.39	39.53	Pk	32	-24.4	47.13	-	-	74	-26.87	37	131	H
2	* ** 2.32545	42.7	Pk	31.7	-24.2	50.2	-	-	74	-23.8	37	131	H
3	* ** 2.39	29.83	V1TV	32	-24.4	37.43	54	-16.57	-	-	37	131	H
4	* ** 2.38678	30.03	V1TV	32	-24.4	37.63	54	-16.37	-	-	37	131	H

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
** - indicates frequency in Taiwan NCC LP0002 Restricted Band
Pk - Peak detector
V1TV: VB=1/Ton, Linear Voltage Average where: Ton is packet duration

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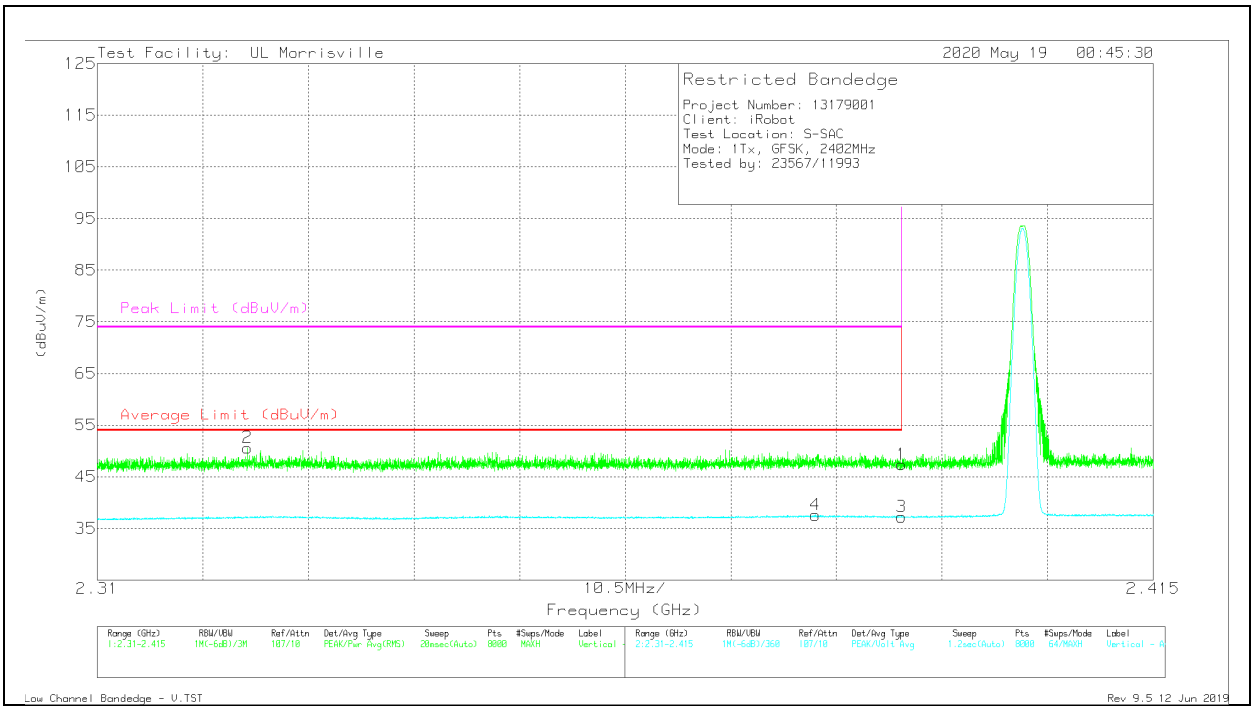
VERTICAL RESULT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AT0078 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* ** 2.39	39.79	Pk	32	-24.4	47.39	-	-	74	-26.61	135	400	V
2	* ** 2.32493	43.22	Pk	31.7	-24.3	50.62	-	-	74	-23.38	135	400	V
3	* ** 2.39	29.65	V1TV	32	-24.4	37.25	54	-16.75	-	-	135	400	V
4	* ** 2.38142	29.91	V1TV	32	-24.3	37.61	54	-16.39	-	-	135	400	V

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
** - indicates frequency in Taiwan NCC LP0002 Restricted Band
Pk - Peak detector
V1TV: VB=1/Ton, Linear Voltage Average where: Ton is packet duration

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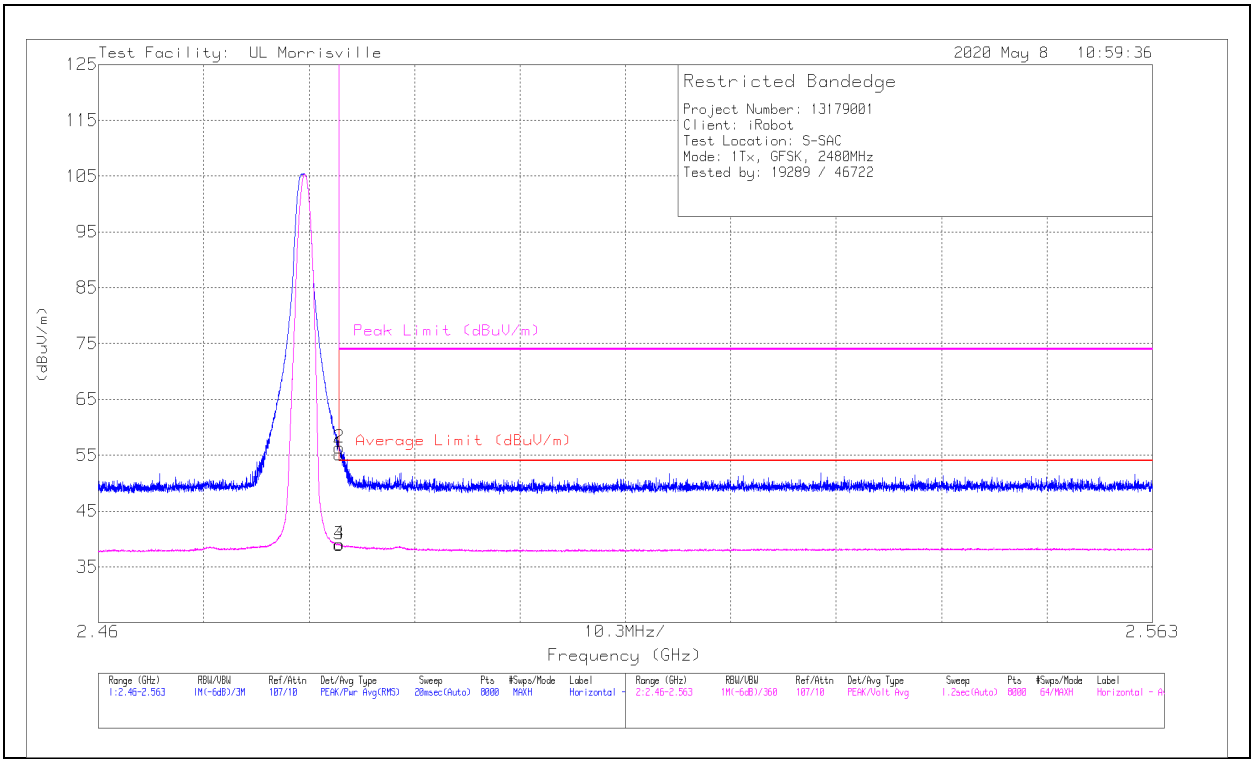
BANDEDGE (HIGH CHANNEL)

HORIZONTAL RESULT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AT0078 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* ** 2.4835	47.06	Pk	32.1	-24	55.16	-	-	74	-18.84	4	204	H
2	* ** 2.48354	48.23	Pk	32.1	-24	56.33	-	-	74	-17.67	4	204	H
3	* ** 2.4835	30.89	V1TV	32.1	-24	38.99	54	-15.01	-	-	4	204	H
4	* ** 2.48355	30.98	V1TV	32.1	-24	39.08	54	-14.92	-	-	4	204	H

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
** - indicates frequency in Taiwan NCC LP0002 Restricted Band
Pk - Peak detector
V1TV: VB=1/Ton, Linear Voltage Average where: Ton is packet duration

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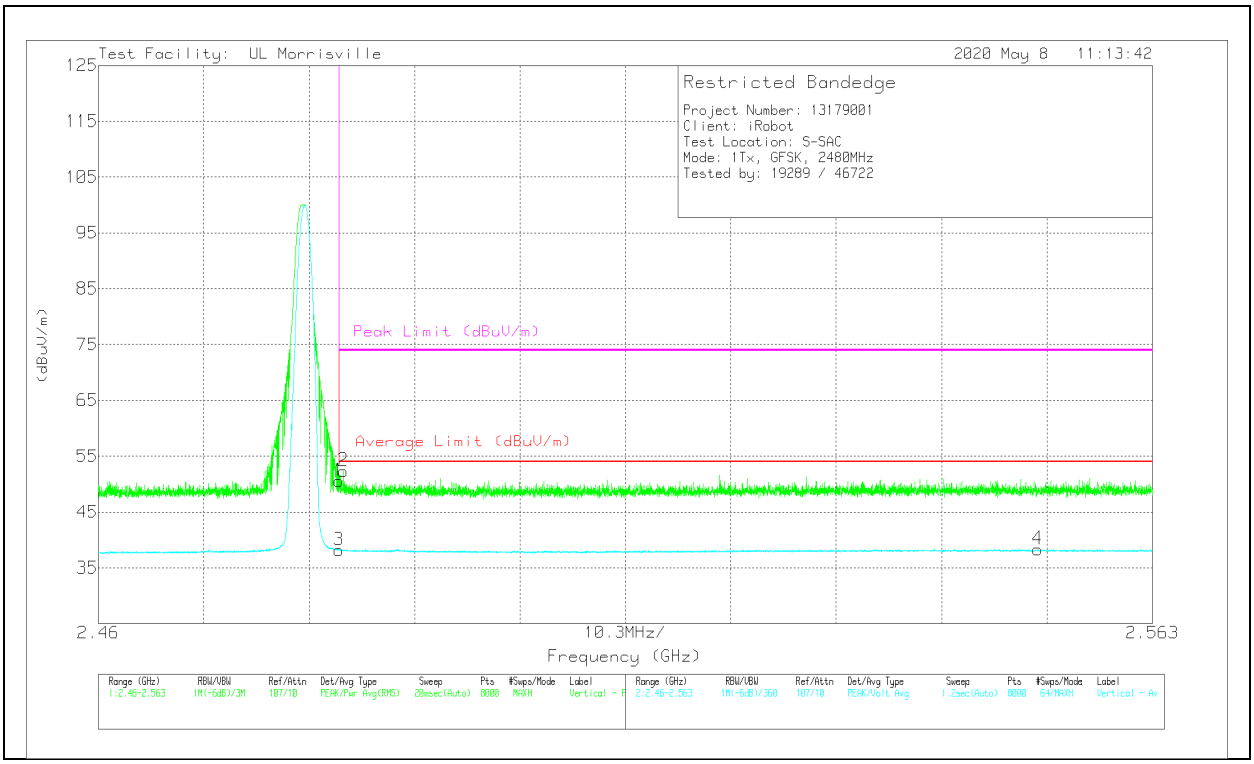
VERTICAL RESULT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AT0078 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* ** 2.4835	42.48	Pk	32.1	-24	50.58	-	-	74	-23.42	311	371	V
2	* ** 2.48391	44.25	Pk	32.1	-24	52.35	-	-	74	-21.65	311	371	V
3	* ** 2.4835	30.07	V1TV	32.1	-24	38.17	54	-15.83	-	-	311	371	V
4	** 2.55179	30.03	V1TV	32.4	-24.1	38.33	54	-15.67	-	-	311	371	V

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
** - indicates frequency in Taiwan NCC LP0002 Restricted Band
Pk - Peak detector
V1TV: VB=1/Ton, Linear Voltage Average where: Ton is packet duration

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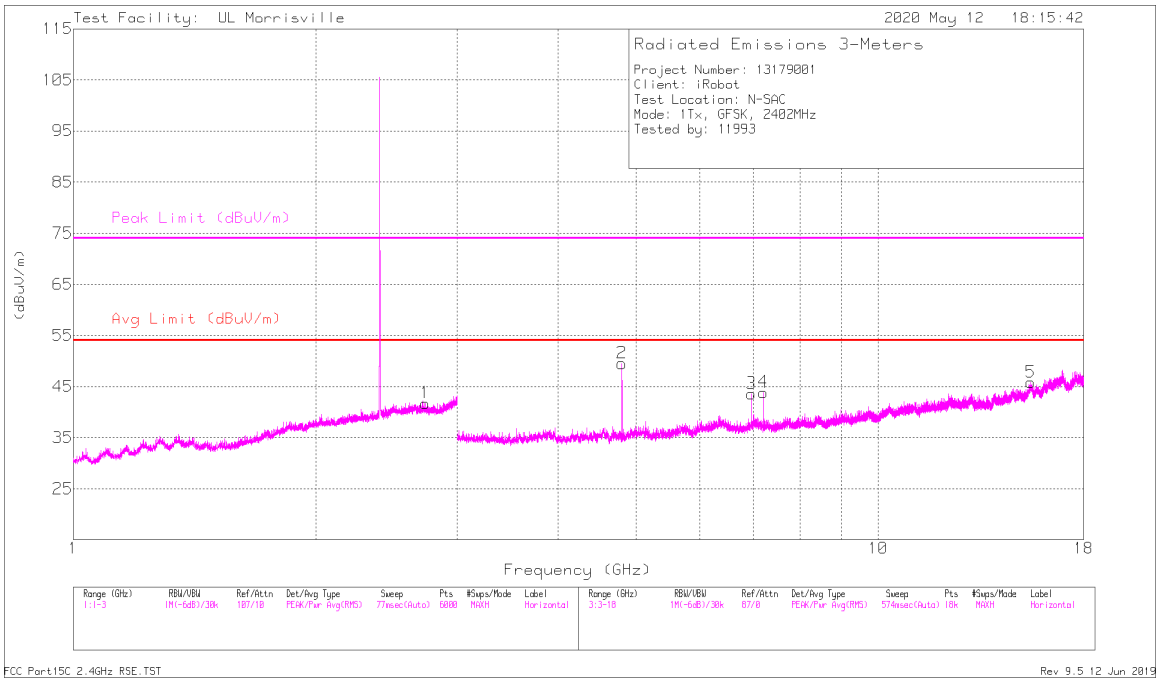
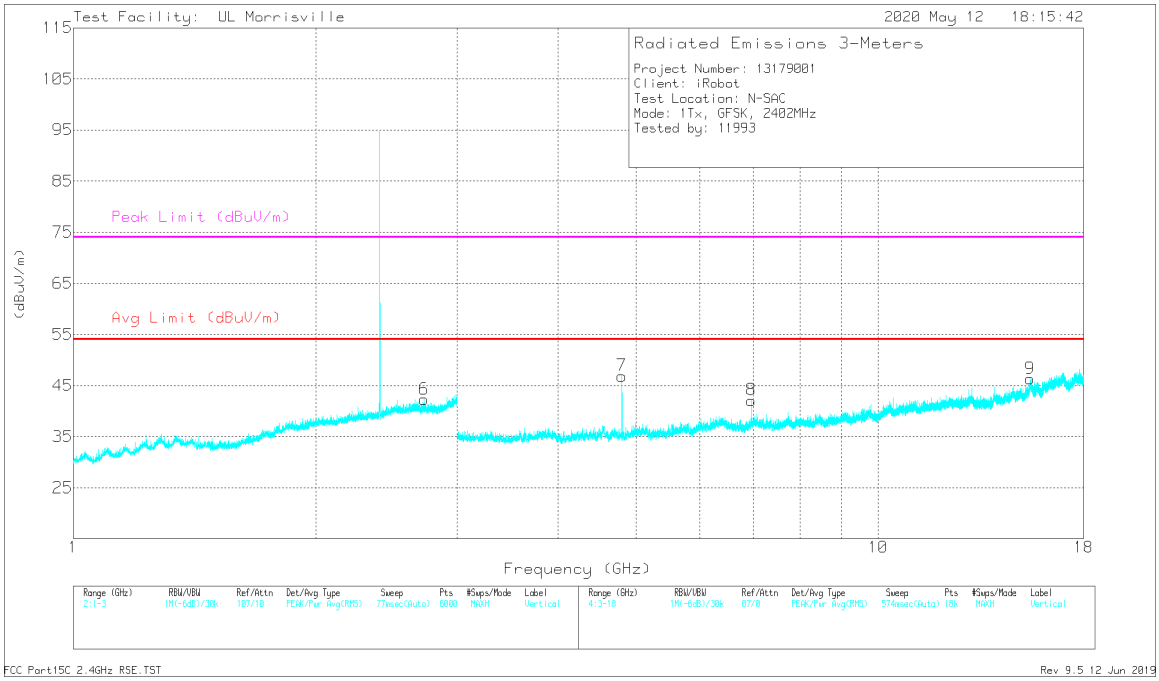
HARMONICS AND SPURIOUS EMISSIONS

LOW CHANNEL RESULTS



HORIZONTAL



VERTICAL

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RADIATED EMISSIONS

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AT0072 dB(/m)	Amp/Cbl/Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* ** 2.7341	37.27	PK2	32.3	-23	46.57	-	-	74	-27.43	264	216	H
	* ** 2.73448	24.63	V1TV	32.3	-23	33.93	54	-20.07	-	-	264	216	H
6	* ** 2.7266	37.88	PK2	32.3	-23	47.18	-	-	74	-26.82	66	310	V
	* ** 2.72561	24.84	V1TV	32.3	-23	34.14	54	-19.86	-	-	66	310	V
2	* ** 4.80364	49.21	PK2	34.3	-31.2	52.31	-	-	74	-21.69	9	108	H
	* ** 4.80401	45.36	V1TV	34.3	-31.2	48.46	54	-5.54	-	-	9	108	H
5	* ** 15.46982	34.74	PK2	40.2	-23.1	51.84	-	-	74	-22.16	46	270	H
	* ** 15.46988	23	V1TV	40.2	-23.1	40.1	54	-13.9	-	-	46	270	H
7	* ** 4.80439	47.16	PK2	34.3	-31.2	50.26	-	-	74	-23.74	54	259	V
	* ** 4.80404	42.7	V1TV	34.3	-31.2	45.8	54	-8.2	-	-	54	259	V
9	* ** 15.45698	35.8	PK2	40.2	-23.3	52.7	-	-	74	-21.3	255	274	V
	* ** 15.45871	23.24	V1TV	40.2	-23.2	40.24	54	-13.76	-	-	255	274	V
3	6.95939	36.51	Pk	35.7	-28.6	43.61	-	-	-	-	0-360	102	H
8	6.96022	35.03	Pk	35.7	-28.6	42.13	-	-	-	-	0-360	198	V
4	7.20524	37.48	Pk	35.6	-29.2	43.88	-	-	-	-	0-360	102	H

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
** - indicates frequency in Taiwan NCC LP0002 Restricted Band
PK2 - Maximum Peak
V1TV: VB=1/Ton, Linear Voltage Average where: Ton is packet duration
Pk - Peak detector

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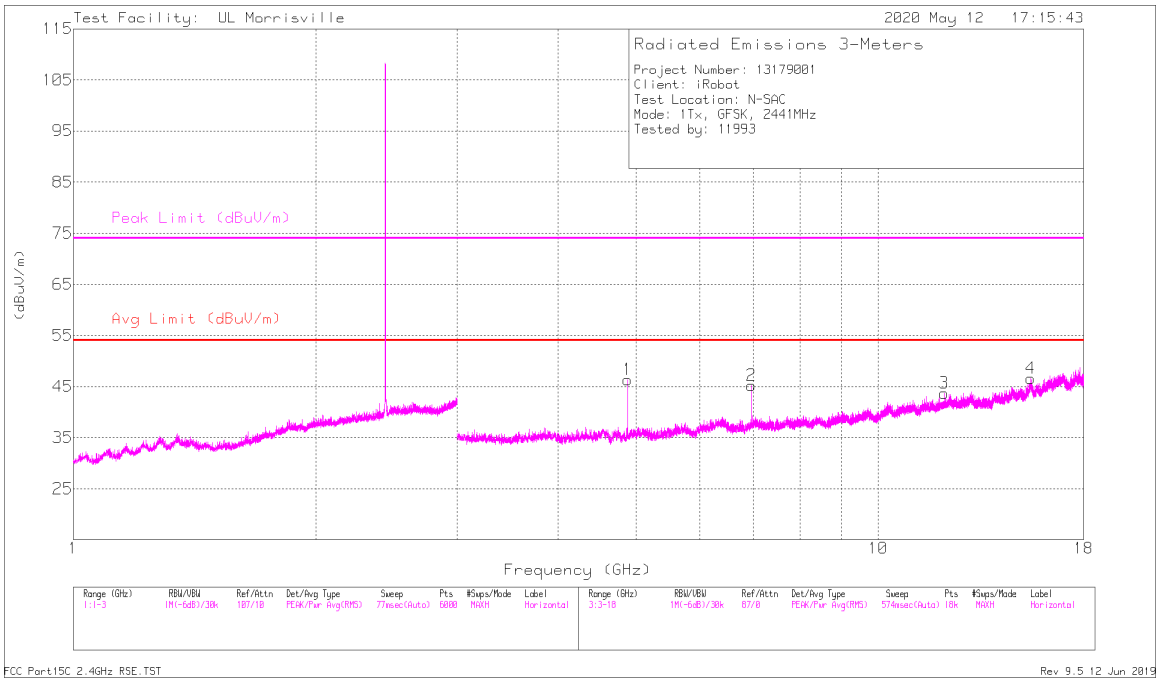
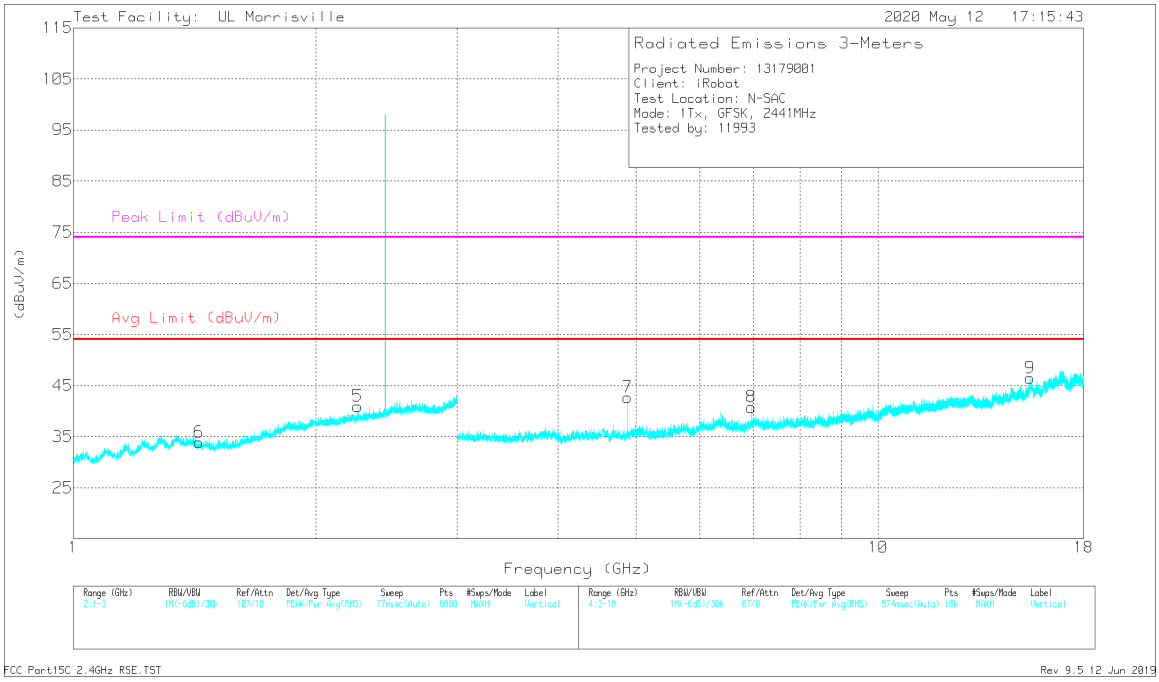
MID CHANNEL RESULTS



HORIZONTAL



VERTICAL

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RADIATED EMISSIONS

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AT0072 dB(/m)	Amp/Cbl/Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
5	* ** 2.25411	37.07	PK2	31.7	-23.6	45.17	-	-	74	-28.83	88	309	V
	* ** 2.25397	24.26	V1TV	31.7	-23.6	32.36	54	-21.64	-	-	88	309	V
3	* ** 12.08046	35.06	PK2	38.7	-25.1	48.66	-	-	74	-25.34	300	381	H
	* ** 12.08078	22.81	V1TV	38.8	-25.1	36.51	54	-17.49	-	-	300	381	H
4	* ** 15.47002	34.96	PK2	40.2	-23.1	52.06	-	-	74	-21.94	168	264	H
	* ** 15.47133	23.08	V1TV	40.3	-23.1	40.28	54	-13.72	-	-	168	264	H
1	* ** 4.8819	45.75	PK2	34.1	-30.8	49.05	-	-	74	-24.95	263	111	H
	* ** 4.88198	40.65	V1TV	34.1	-30.8	43.95	54	-10.05	-	-	263	111	H
7	* ** 4.88178	43.96	PK2	34.1	-30.8	47.26	-	-	74	-26.74	39	317	V
	* ** 4.882	37.78	V1TV	34.1	-30.8	41.08	54	-12.92	-	-	39	317	V
9	* ** 15.4578	36.04	PK2	40.2	-23.3	52.94	-	-	74	-21.06	216	285	V
	* ** 15.45822	23.22	V1TV	40.2	-23.2	40.22	54	-13.78	-	-	216	285	V
6	1.43207	29.79	Pk	28.3	-24.2	33.89	-	-	-	-	0-360	198	V
2	6.95939	38.12	Pk	35.7	-28.6	45.22	-	-	-	-	0-360	102	H
8	6.96022	33.66	Pk	35.7	-28.6	40.76	-	-	-	-	0-360	102	V

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
** - indicates frequency in Taiwan NCC LP0002 Restricted Band
PK2 - Maximum Peak
V1TV: VB=1/Ton, Linear Voltage Average where: Ton is packet duration
Pk - Peak detector

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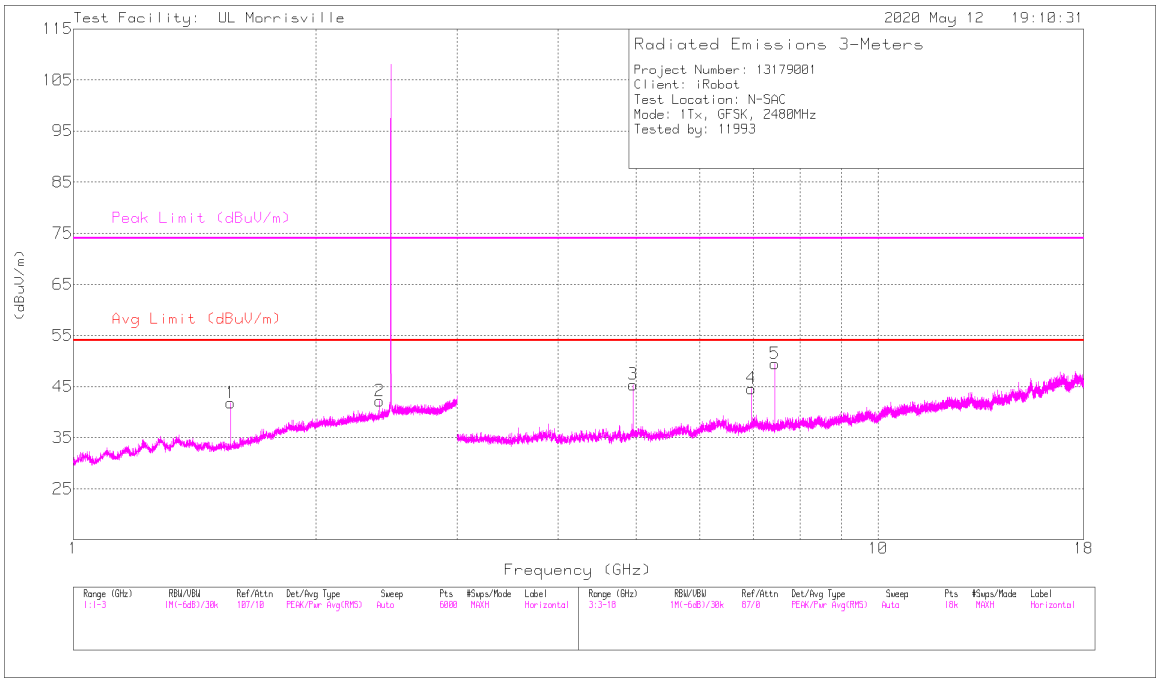
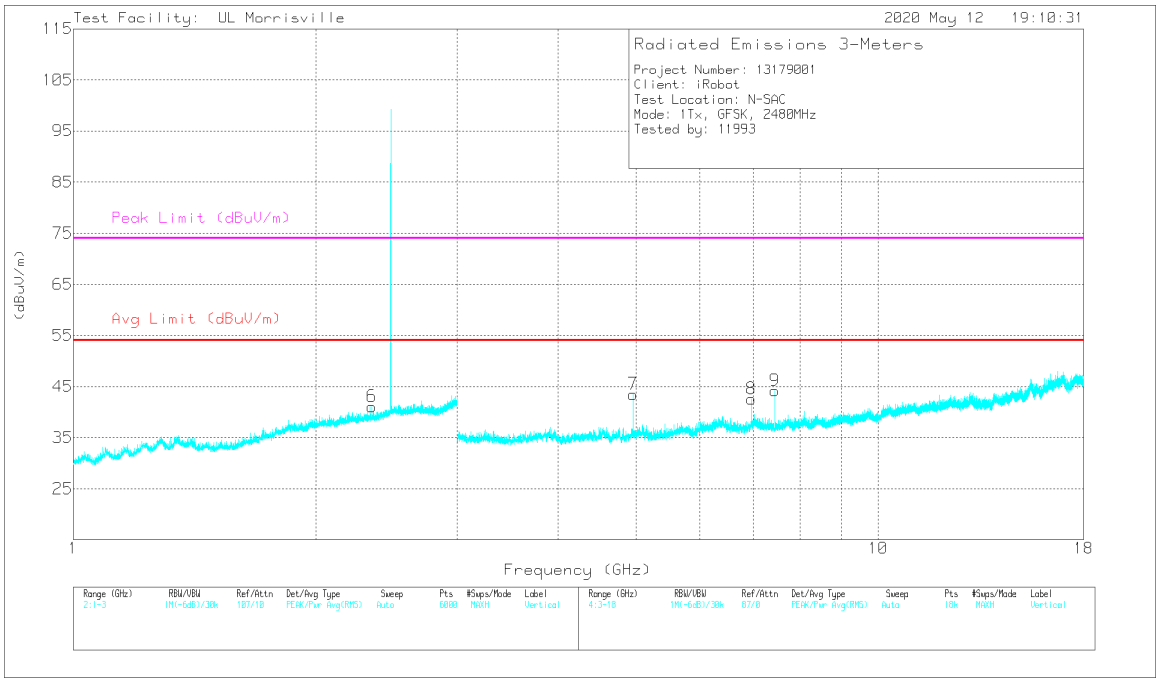
HIGH CHANNEL RESULTS



HORIZONTAL



VERTICAL

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RADIATED EMISSIONS

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AT0072 dB(/m)	Amp/Cbl/Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* ** 1.56771	36.03	PK2	27.7	-23.8	39.93	-	-	74	-34.07	16	311	H
	* ** 1.56542	23.65	V1TV	27.7	-23.8	27.55	54	-26.45	-	-	16	311	H
6	* ** 2.34709	36.7	PK2	31.7	-23.5	44.9	-	-	74	-29.1	204	332	V
	* ** 2.34581	24.59	V1TV	31.7	-23.5	32.79	54	-21.21	-	-	204	332	V
3	* ** 4.96036	46.55	PK2	34.1	-31.7	48.95	-	-	74	-25.05	263	227	H
	* ** 4.95995	41.1	V1TV	34.1	-31.7	43.5	54	-10.5	-	-	263	227	H
5	* ** 7.43952	44.77	PK2	35.7	-28.4	52.07	-	-	74	-21.93	315	115	H
	* ** 7.44001	38.83	V1TV	35.7	-28.4	46.13	54	-7.87	-	-	315	115	H
7	* ** 4.96019	45.74	PK2	34.1	-31.7	48.14	-	-	74	-25.86	42	227	V
	* ** 4.95995	39.93	V1TV	34.1	-31.7	42.33	54	-11.67	-	-	42	227	V
9	* ** 7.43957	43.14	PK2	35.7	-28.4	50.44	-	-	74	-23.56	49	104	V
	* ** 7.44008	35.56	V1TV	35.7	-28.4	42.86	54	-11.14	-	-	49	104	V
2	2.40223	33.81	Pk	31.9	-23.5	42.21	-	-	-	-	0-360	198	H
8	6.95939	35.5	Pk	35.7	-28.6	42.6	-	-	-	-	0-360	198	V
4	6.96022	37.53	Pk	35.7	-28.6	44.63	-	-	-	-	0-360	101	H

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
** - indicates frequency in Taiwan NCC LP0002 Restricted Band
PK2 - Maximum Peak
V1TV: VB=1/Ton, Linear Voltage Average where: Ton is packet duration
Pk - Peak detector

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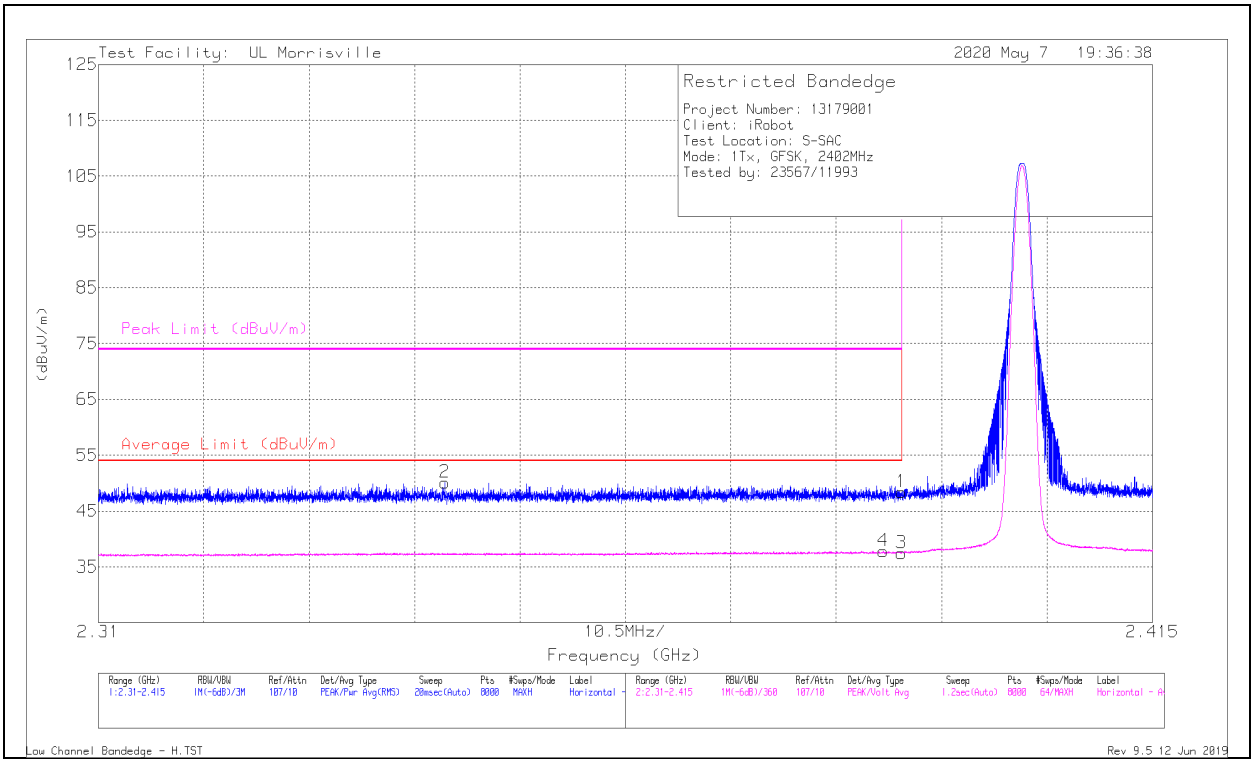
PCB

BANDEDGE (LOW CHANNEL)

HORIZONTAL RESULT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AT0078 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* ** 2.39	40.57	Pk	32	-24.2	48.37	-	-	74	-25.63	286	346	H
2	* ** 2.34452	42.56	Pk	31.8	-24.3	50.06	-	-	74	-23.94	286	346	H
3	* ** 2.39	29.66	V1TV	32	-24.2	37.46	54	-16.54	-	-	286	346	H
4	* ** 2.38818	30	V1TV	32	-24.2	37.8	54	-16.2	-	-	286	346	H

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V1TV: VB=1/Ton, Linear Voltage Average where: Ton is packet duration

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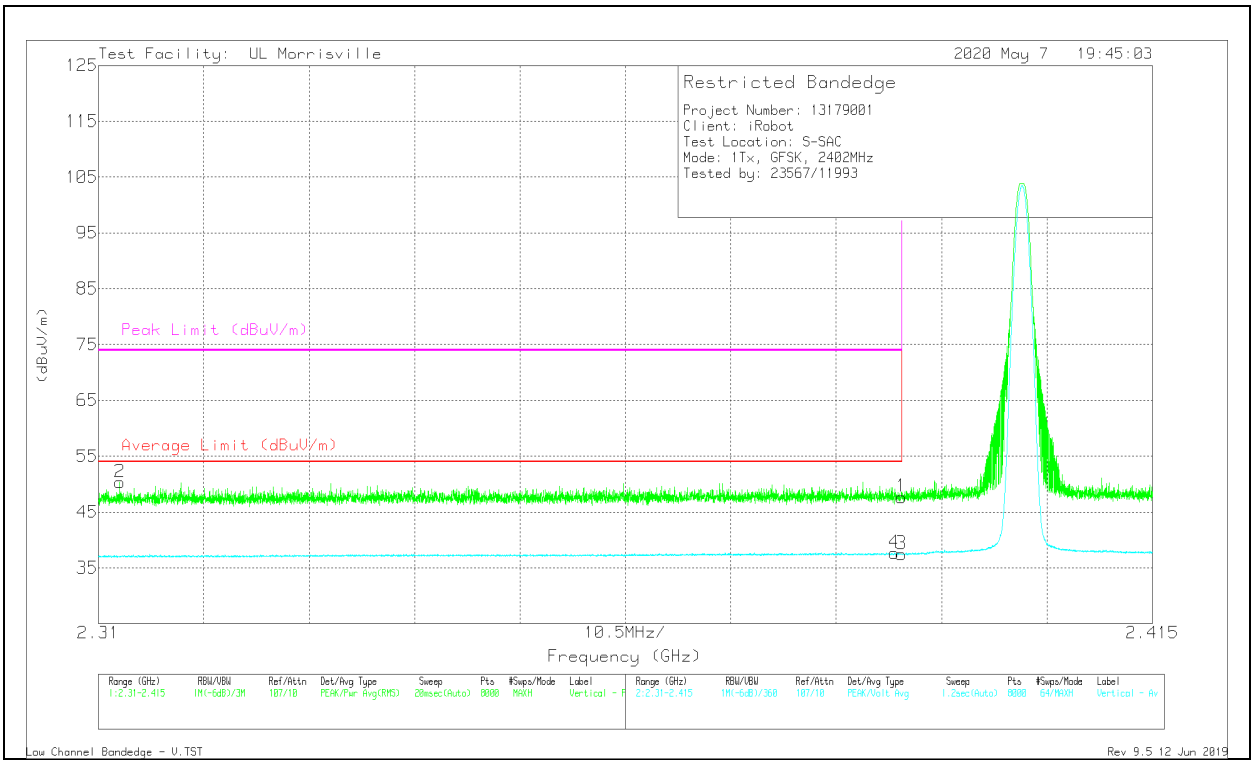
VERTICAL RESULT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AT0078 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* ** 2.39	39.9	Pk	32	-24.2	47.7	-	-	74	-26.3	348	344	V
2	* ** 2.31214	42.85	Pk	31.7	-24.2	50.35	-	-	74	-23.65	348	344	V
3	* ** 2.39	29.68	V1TV	32	-24.2	37.48	54	-16.52	-	-	348	344	V
4	* ** 2.38929	29.89	V1TV	32	-24.2	37.69	54	-16.31	-	-	348	344	V

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Pk - Peak detector
V1TV: VB=1/Ton, Linear Voltage Average where: Ton is packet duration

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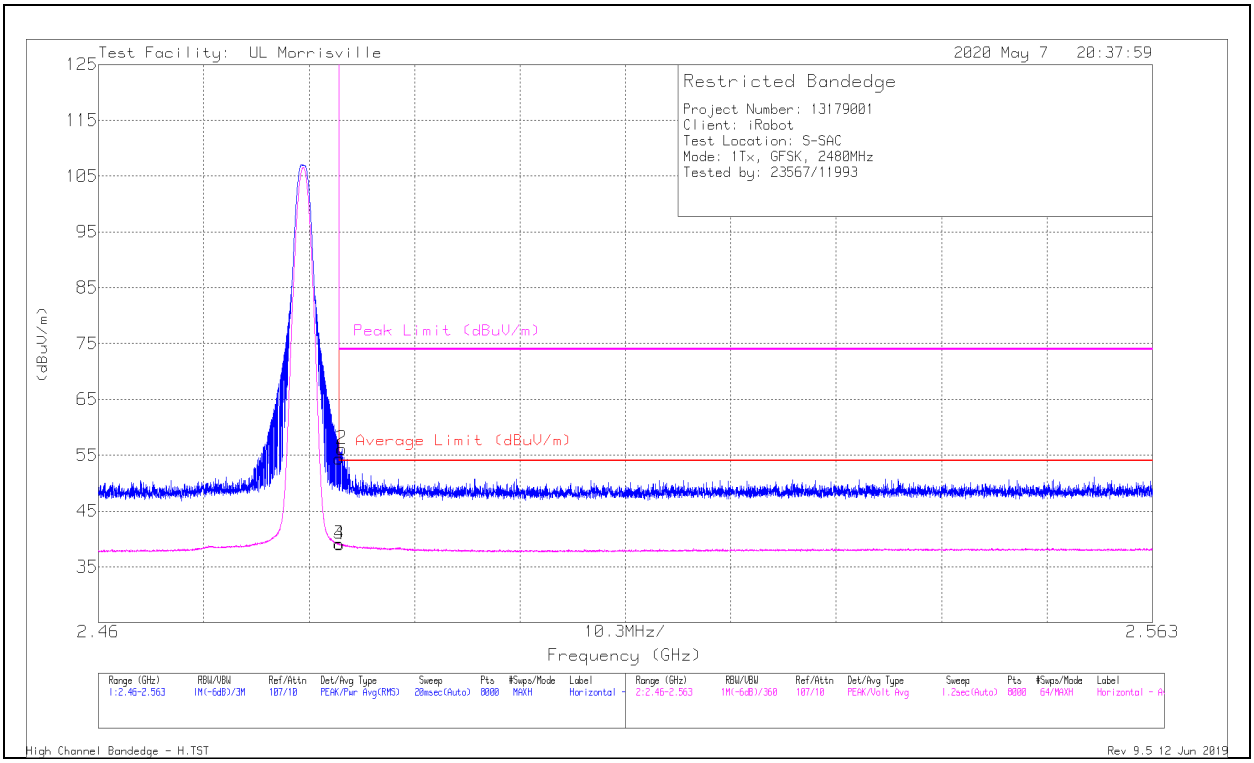
BANDEDGE (HIGH CHANNEL)

HORIZONTAL RESULT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AT0078 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* ** 2.4835	46.29	Pk	32.1	-24	54.39	-	-	74	-19.61	265	265	H
2	* ** 2.48378	48.06	Pk	32.1	-24	56.16	-	-	74	-17.84	265	265	H
3	* ** 2.4835	31.03	V1TV	32.1	-24	39.13	54	-14.87	-	-	265	265	H
4	* ** 2.48358	30.98	V1TV	32.1	-24	39.08	54	-14.92	-	-	265	265	H

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V1TV: VB=1/Ton, Linear Voltage Average where: Ton is packet duration

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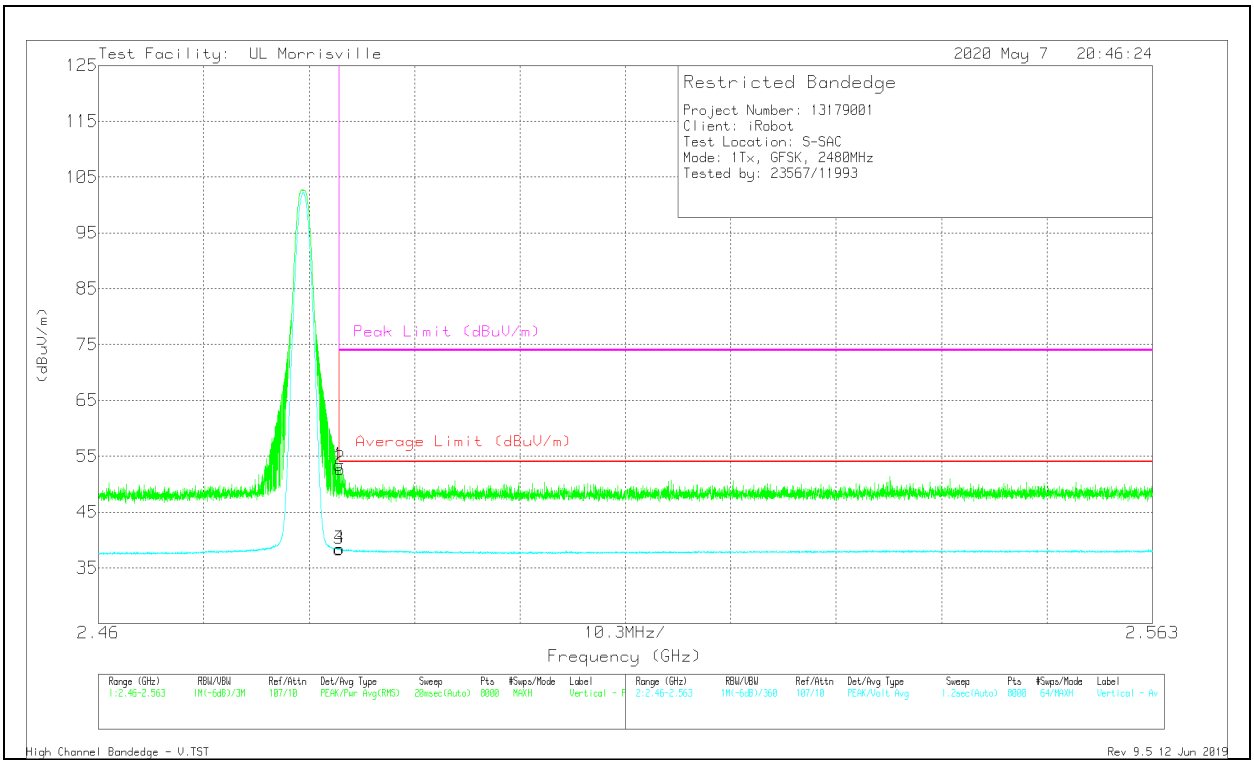
VERTICAL RESULT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AT0078 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* ** 2.4835	45.34	Pk	32.1	-24	53.44	-	-	74	-20.56	156	383	V
2	* ** 2.48362	44.63	Pk	32.1	-24	52.73	-	-	74	-21.27	156	383	V
3	* ** 2.4835	30.26	V1TV	32.1	-24	38.36	54	-15.64	-	-	156	383	V
4	* ** 2.48358	30.38	V1TV	32.1	-24	38.48	54	-15.52	-	-	156	383	V

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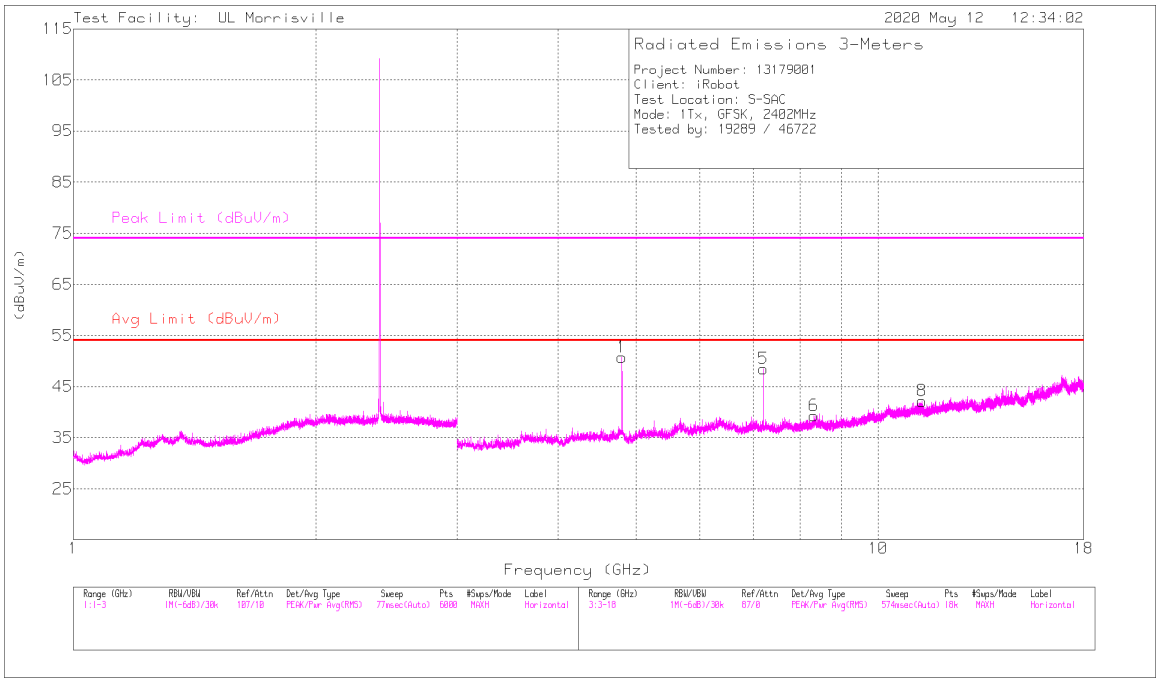
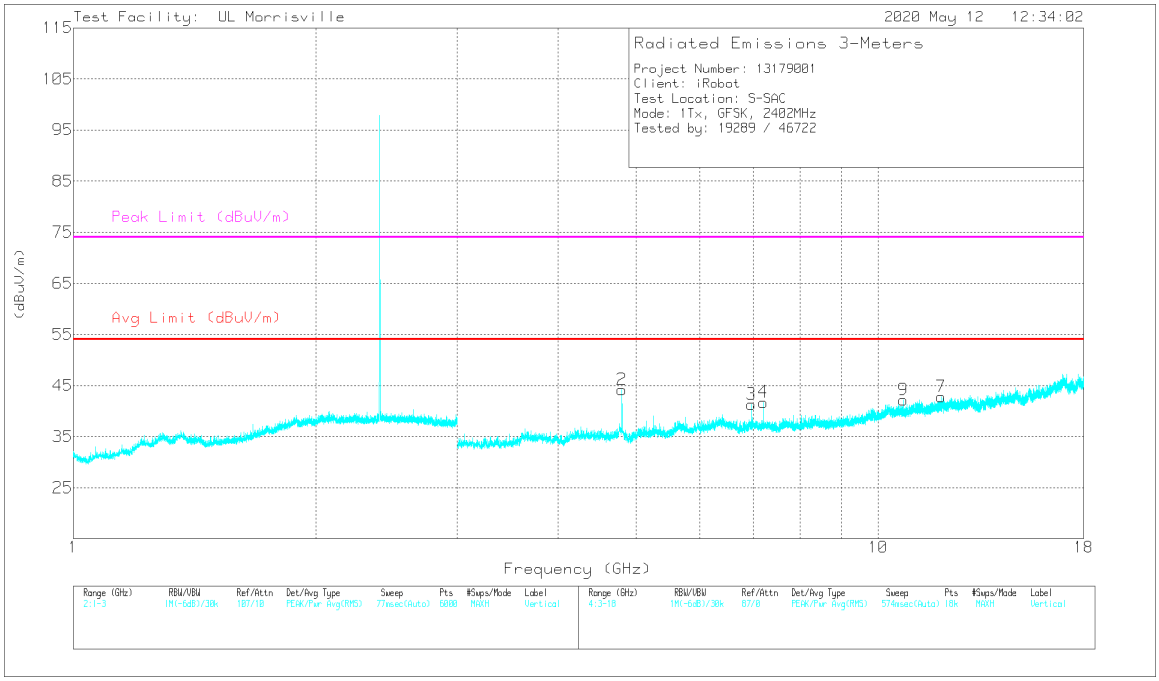
HARMONICS AND SPURIOUS EMISSIONS

LOW CHANNEL RESULTS



HORIZONTAL



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RADIATED EMISSIONS

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AT0078 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* ** 4.80436	50.06	PK2	33.9	-30.9	53.06	-	-	74	-20.94	95	117	H
	* ** 4.80431	47.01	V1TV	33.9	-30.9	50.01	54	-3.99	-	-	95	117	H
6	* ** 8.32085	36.59	PK2	35.7	-27.4	44.89	-	-	74	-29.11	256	379	H
	* ** 8.32014	24.13	V1TV	35.7	-27.4	32.43	54	-21.57	-	-	256	379	H
8	* ** 11.32862	32.72	PK2	38	-23.4	47.32	-	-	74	-26.68	257	263	H
	* ** 11.32879	20.59	V1TV	38	-23.4	35.19	54	-18.81	-	-	257	263	H
2	* ** 4.8043	48.81	PK2	33.9	-30.9	51.81	-	-	74	-22.19	166	341	V
	* ** 4.80435	45.73	V1TV	33.9	-30.9	48.73	54	-5.27	-	-	166	341	V
7	* ** 11.98158	34.49	PK2	38.6	-24.3	48.79	-	-	74	-25.21	267	395	V
	* ** 11.98159	21.28	V1TV	38.6	-24.3	35.58	54	-18.42	-	-	267	395	V
9	* ** 10.75414	34.54	PK2	37.7	-24.7	47.54	-	-	74	-26.46	38	230	V
	* ** 10.75364	21.73	V1TV	37.7	-24.7	34.73	54	-19.27	-	-	38	230	V
3	6.95939	33.73	Pk	35.5	-27.9	41.33	-	-	-	-	0-360	101	V
5	7.20607	41	Pk	35.6	-28.1	48.5	-	-	-	-	0-360	101	H
4	7.20607	34.24	Pk	35.6	-28.1	41.74	-	-	-	-	0-360	199	V

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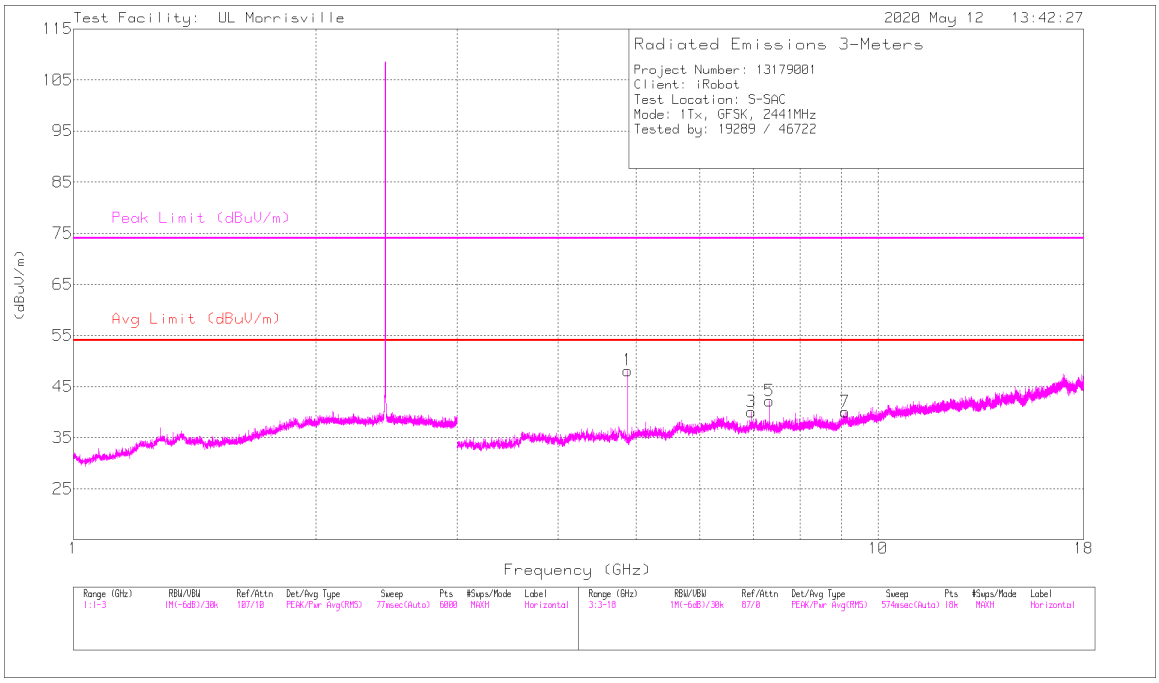
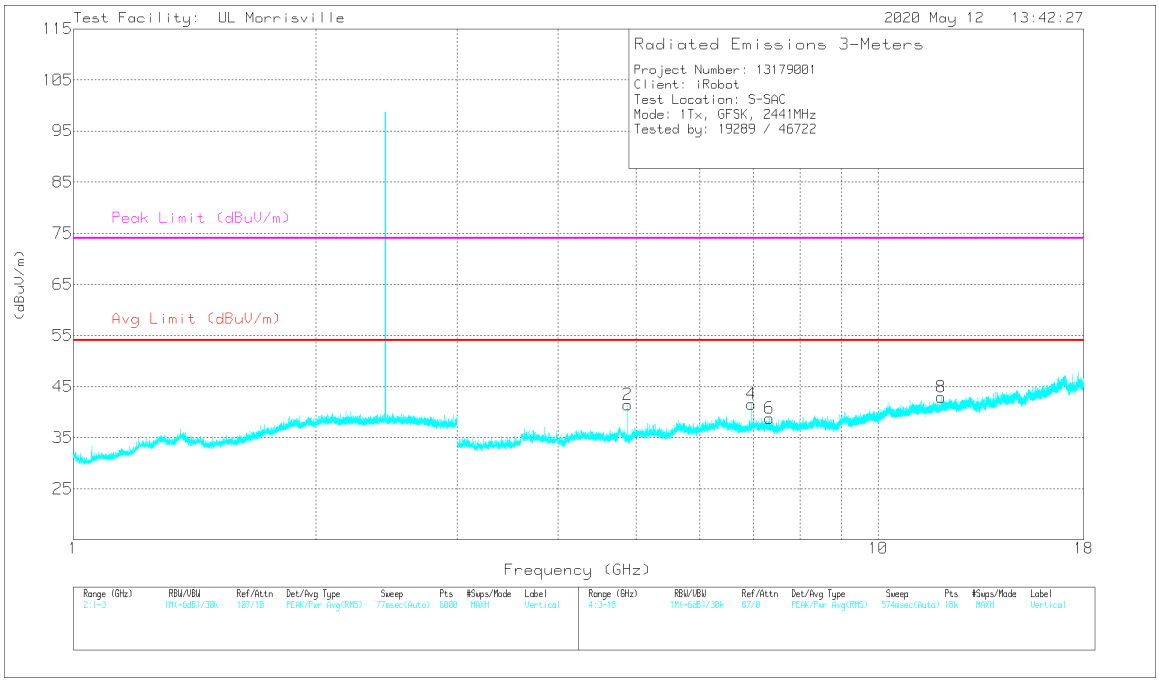
MID CHANNEL RESULTS



HORIZONTAL



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RADIATED EMISSIONS

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AT0078 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* ** 4.88227	47.81	PK2	33.8	-31	50.61	-	-	74	-23.39	4	115	H
	* ** 4.8823	44.63	V1TV	33.8	-31	47.43	54	-6.57	-	-	4	115	H
5	* ** 7.32347	40.97	PK2	35.6	-27.7	48.87	-	-	74	-25.13	95	114	H
	* ** 7.32347	34.47	V1TV	35.6	-27.7	42.37	54	-11.63	-	-	95	114	H
7	* ** 9.09939	35.47	PK2	36.2	-26.1	45.57	-	-	74	-28.43	80	280	H
	* ** 9.09946	23.05	V1TV	36.2	-26.1	33.15	54	-20.85	-	-	80	280	H
2	* ** 4.88229	46.56	PK2	33.8	-31	49.36	-	-	74	-24.64	176	297	V
	* ** 4.88228	42.64	V1TV	33.8	-31	45.44	54	-8.56	-	-	176	297	V
6	* ** 7.32372	39.03	PK2	35.6	-27.6	47.03	-	-	74	-26.97	160	290	V
	* ** 7.32344	29.62	V1TV	35.6	-27.7	37.52	54	-16.48	-	-	160	290	V
8	* ** 11.97446	34.08	PK2	38.5	-24.3	48.28	-	-	74	-25.72	327	109	V
	* ** 11.97058	21.58	V1TV	38.5	-24.3	35.78	54	-18.22	-	-	327	109	V
3	6.95939	32.43	Pk	35.5	-27.9	40.03	-	-	-	-	0-360	101	H
4	6.95939	33.96	Pk	35.5	-27.9	41.56	-	-	-	-	0-360	101	V

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
** - indicates frequency in Taiwan NCC LP0002 Restricted Band
PK2 - Maximum Peak
V1TV: VB=1/Ton, Linear Voltage Average where: Ton is packet duration
Pk - Peak detector

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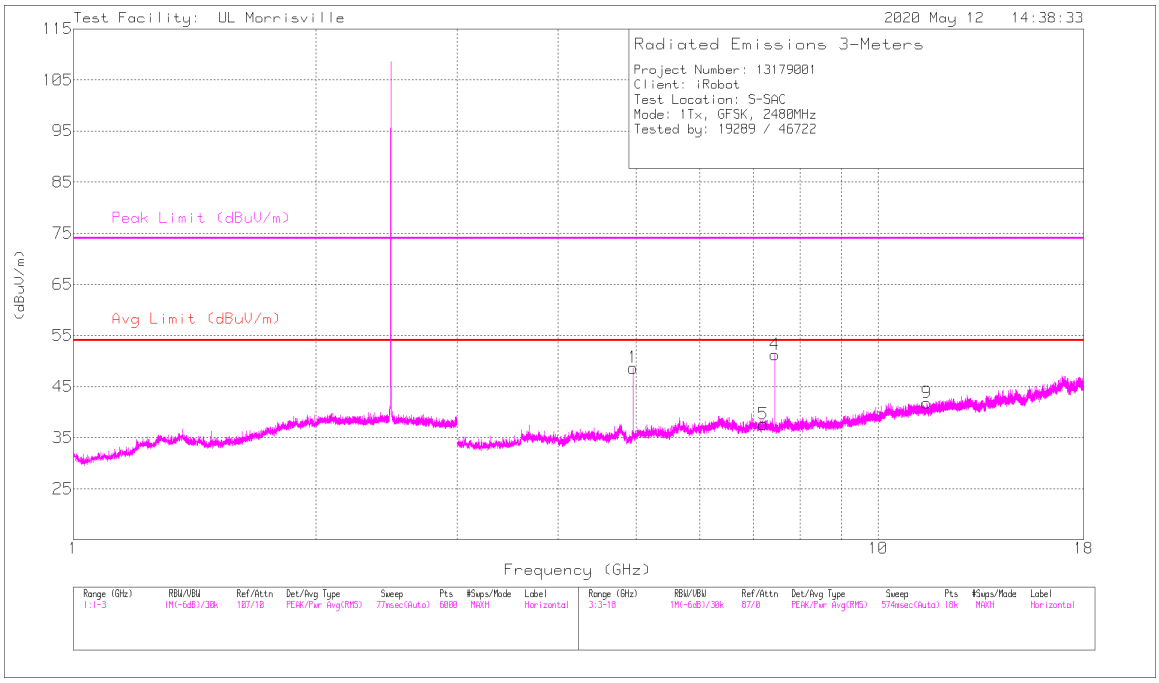
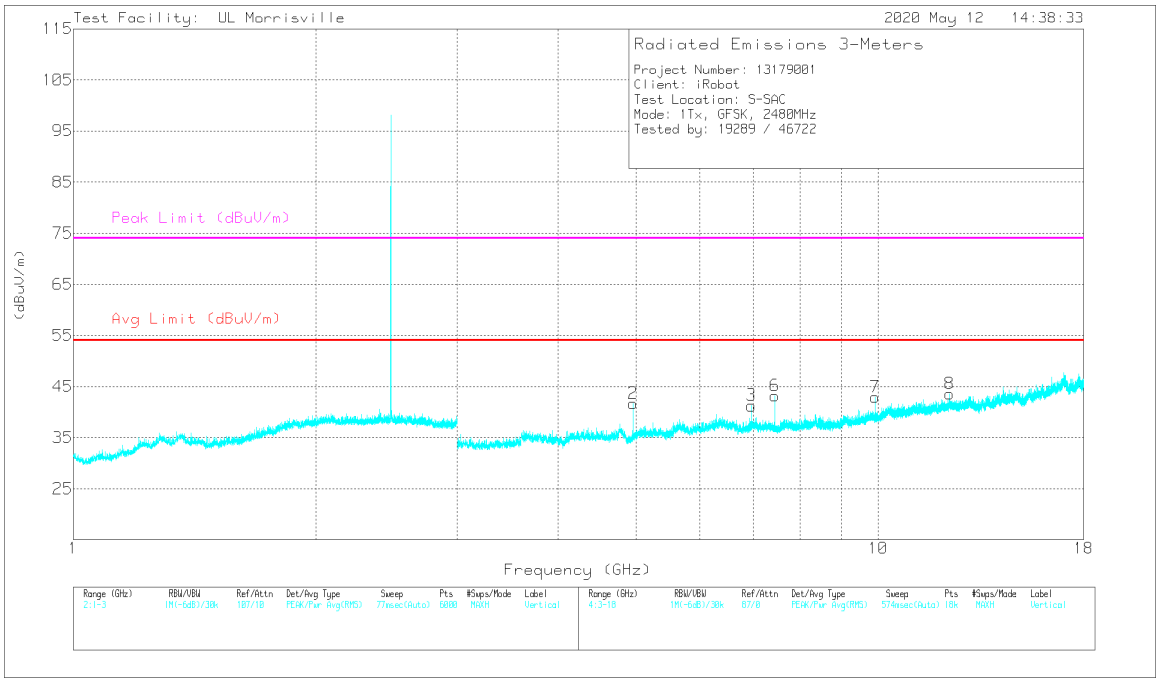
HIGH CHANNEL RESULTS



HORIZONTAL



VERTICAL

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RADIATED EMISSIONS

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AT0078 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* ** 4.96026	47.91	PK2	34	-31.1	50.81	-	-	74	-23.19	358	115	H
	* ** 4.96034	44.96	V1TV	34	-31.1	47.86	54	-6.14	-	-	358	115	H
4	* ** 7.44039	46.14	PK2	35.6	-28	53.74	-	-	74	-20.26	92	107	H
	* ** 7.44045	43.04	V1TV	35.6	-28	50.64	54	-3.36	-	-	92	107	H
9	* ** 11.50045	34.4	PK2	38.2	-24.7	47.9	-	-	74	-26.1	42	211	H
	* ** 11.50057	21.67	V1TV	38.2	-24.7	35.17	54	-18.83	-	-	42	211	H
2	* ** 4.96017	46.7	PK2	34	-31.1	49.6	-	-	74	-24.4	168	303	V
	* ** 4.96029	42.96	V1TV	34	-31.1	45.86	54	-8.14	-	-	168	303	V
6	* ** 7.44046	44.04	PK2	35.6	-28	51.64	-	-	74	-22.36	152	303	V
	* ** 7.44045	40.2	V1TV	35.6	-28	47.8	54	-6.2	-	-	152	303	V
8	* ** 12.2606	34.49	PK2	38.8	-24.2	49.09	-	-	74	-24.91	110	125	V
	* ** 12.26057	21.68	V1TV	38.8	-24.2	36.28	54	-17.72	-	-	110	125	V
3	6.96022	33.66	Pk	35.5	-27.9	41.26	-	-	-	-	0-360	101	V
5	7.2044	30.12	Pk	35.6	-28.1	37.62	-	-	-	-	0-360	199	H
7	9.92039	31.87	Pk	37	-25.9	42.97	-	-	-	-	0-360	101	V

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
** - indicates frequency in Taiwan NCC LP0002 Restricted Band
PK2 - Maximum Peak
V1TV: VB=1/Ton, Linear Voltage Average where: Ton is packet duration
Pk - Peak detector

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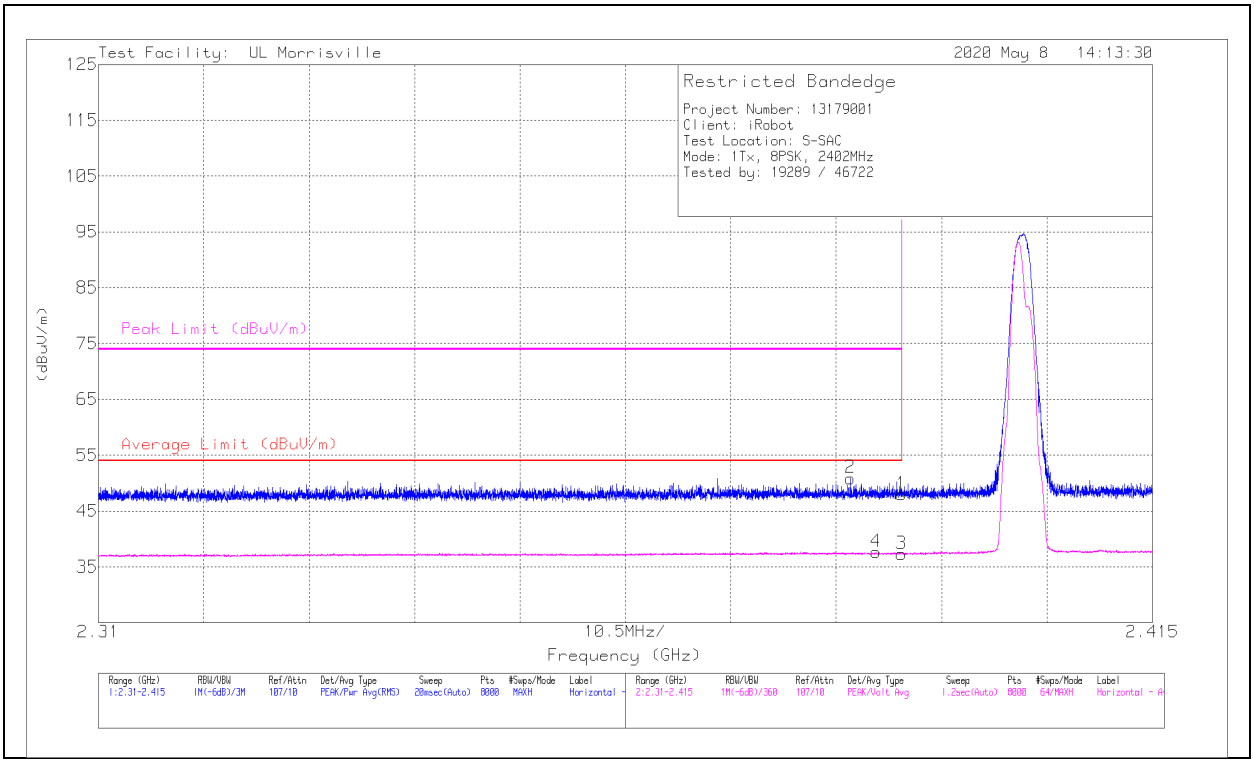
10.1.2. BLUETOOTH ENHANCED DATA RATE 8PSK MODULATION

External

BANDEDGE (LOW CHANNEL)

HORIZONTAL RESULT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AT0078 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* ** 2.39	40.17	Pk	32	-24.2	47.97	-	-	74	-26.03	142	382	H
2	* ** 2.38493	43.1	Pk	32	-24.2	50.9	-	-	74	-23.1	142	382	H
3	* ** 2.39	29.5	V1TV	32	-24.2	37.3	54	-16.7	-	-	142	382	H
4	* ** 2.38749	29.85	V1TV	32	-24.2	37.65	54	-16.35	-	-	142	382	H

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
** - indicates frequency in Taiwan NCC LP0002 Restricted Band
Pk - Peak detector
V1TV: VB=1/Ton, Linear Voltage Average where: Ton is packet duration

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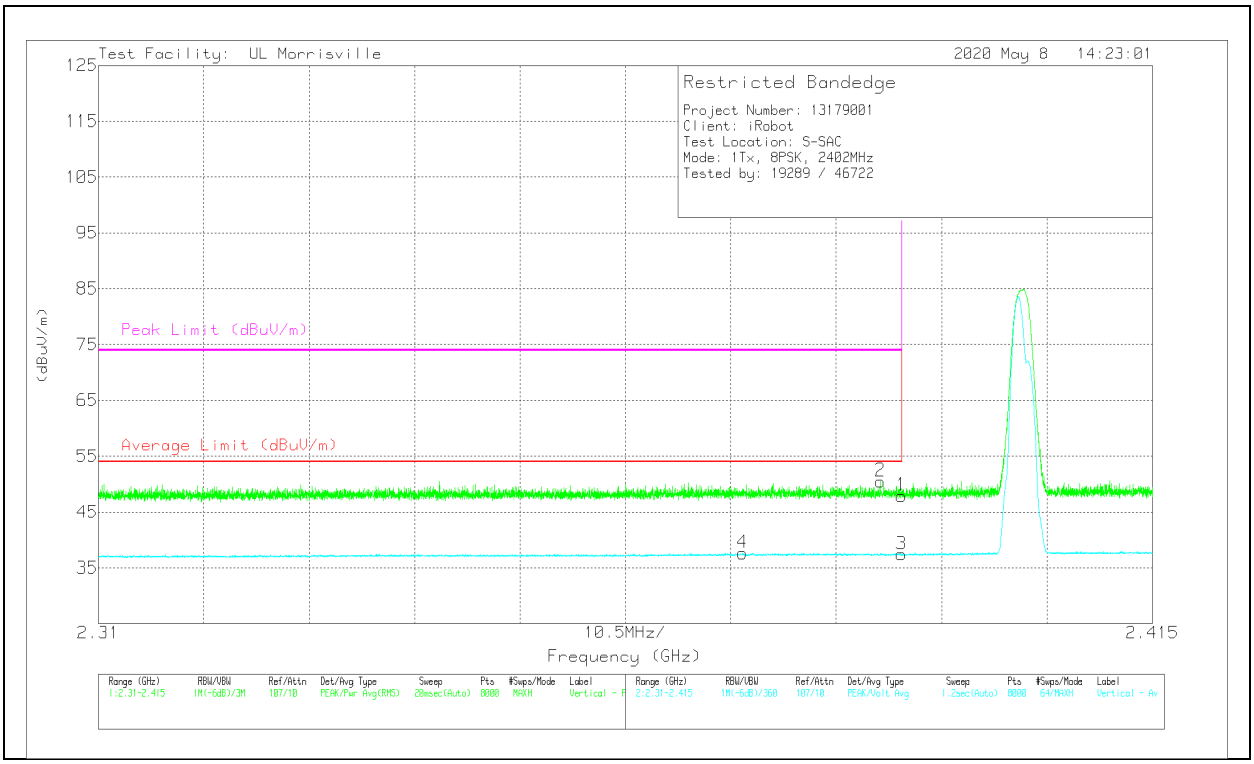
VERTICAL RESULT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AT0078 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* ** 2.39	40.14	Pk	32	-24.2	47.94	-	-	74	-26.06	353	196	V
2	* ** 2.38791	42.71	Pk	32	-24.2	50.51	-	-	74	-23.49	353	196	V
3	* ** 2.39	29.6	V1TV	32	-24.2	37.4	54	-16.6	-	-	353	196	V
4	* ** 2.37419	29.84	V1TV	32	-24.2	37.64	54	-16.36	-	-	353	196	V

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
** - indicates frequency in Taiwan NCC LP0002 Restricted Band
Pk - Peak detector
V1TV: VB=1/Ton, Linear Voltage Average where: Ton is packet duration

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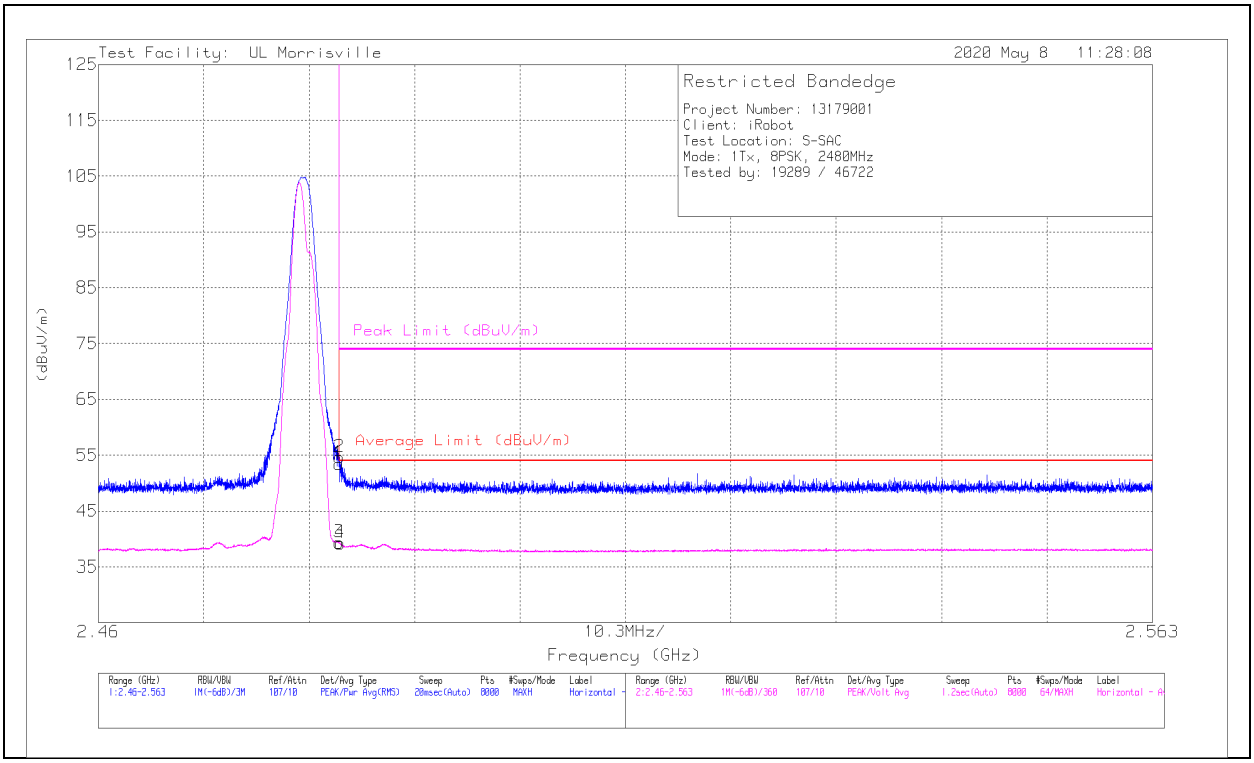
BANDEDGE (HIGH CHANNEL)

HORIZONTAL RESULT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AT0078 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* ** 2.4835	45.37	Pk	32.1	-24	53.47	-	-	74	-20.53	33	100	H
2	* ** 2.48354	46.51	Pk	32.1	-24	54.61	-	-	74	-19.39	33	100	H
3	* ** 2.4835	31.26	V1TV	32.1	-24	39.36	54	-14.64	-	-	33	100	H
4	* ** 2.48362	31.13	V1TV	32.1	-24	39.23	54	-14.77	-	-	33	100	H

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
** - indicates frequency in Taiwan NCC LP0002 Restricted Band
Pk - Peak detector
V1TV: VB=1/Ton, Linear Voltage Average where: Ton is packet duration

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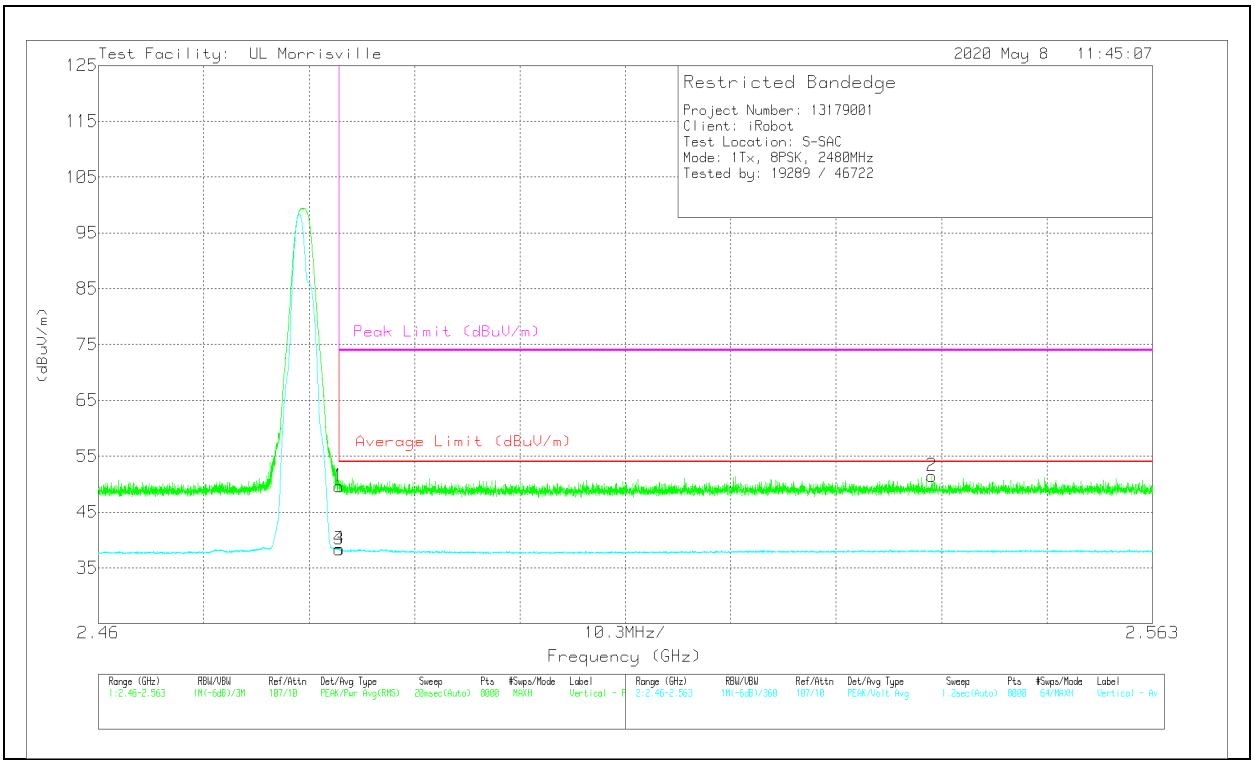
VERTICAL RESULT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AT0078 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* ** 2.4835	41.51	Pk	32.1	-24	49.61	-	-	74	-24.39	109	267	V
2	** 2.54146	43.15	Pk	32.4	-24.1	51.45	-	-	74	-22.55	109	267	V
3	* ** 2.4835	30.16	V1TV	32.1	-24	38.26	54	-15.74	-	-	109	267	V
4	* ** 2.48354	30.27	V1TV	32.1	-24	38.37	54	-15.63	-	-	109	267	V

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
** - indicates frequency in Taiwan NCC LP0002 Restricted Band
Pk - Peak detector
V1TV: VB=1/Ton, Linear Voltage Average where: Ton is packet duration

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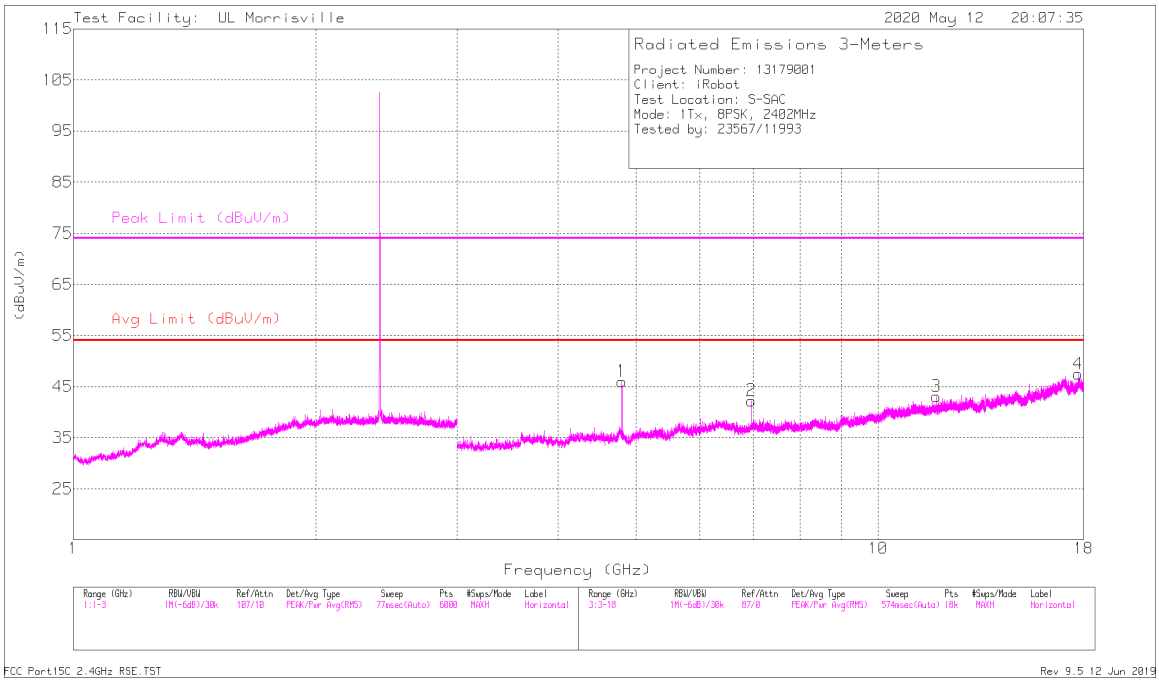
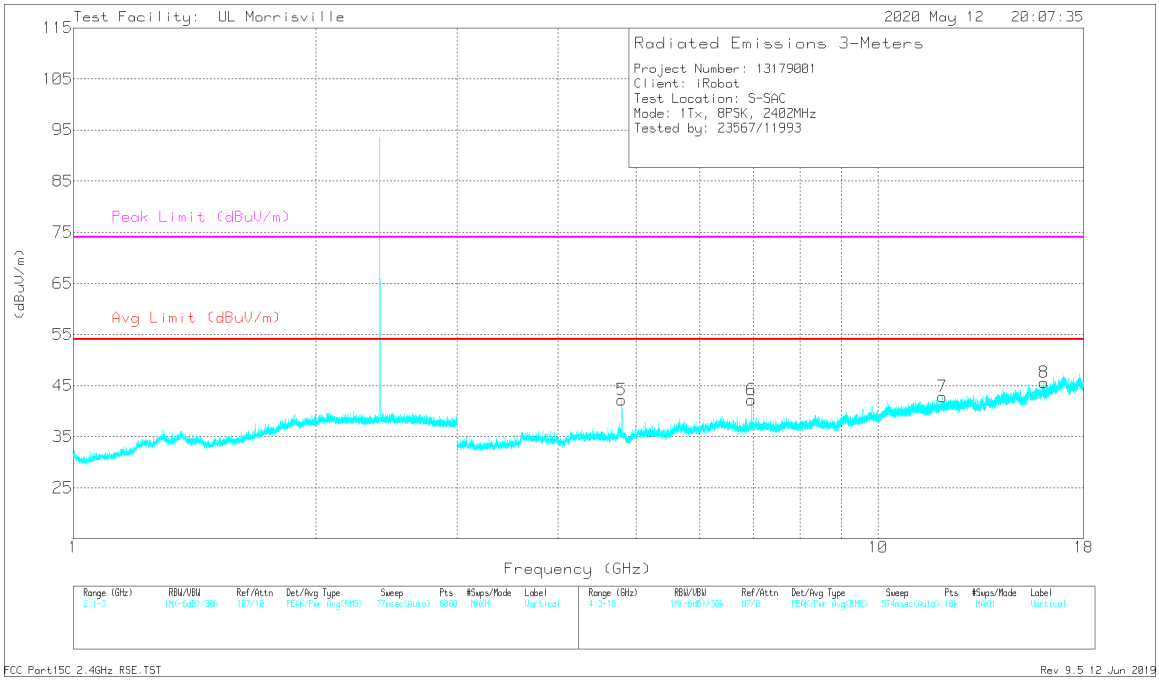
HARMONICS AND SPURIOUS EMISSIONS

LOW CHANNEL RESULTS



HORIZONTAL



VERTICAL

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RADIATED EMISSIONS

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AT0078 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* ** 4.80406	49.25	PK2	33.9	-30.9	52.25	-	-	74	-21.75	247	114	H
	* ** 4.80404	42.17	V1TV	33.9	-30.9	45.17	54	-8.83	-	-	247	114	H
3	* ** 11.80815	33.91	PK2	38.4	-24.4	47.91	-	-	74	-26.09	142	129	H
	* ** 11.80816	21.5	V1TV	38.4	-24.4	35.5	54	-18.5	-	-	142	129	H
4	* ** 17.73004	34.51	PK2	41	-22.4	53.11	-	-	74	-20.89	319	320	H
	* ** 17.72902	22.19	V1TV	41	-22.4	40.79	54	-13.21	-	-	319	320	H
5	* ** 4.80438	46.4	PK2	33.9	-30.9	49.4	-	-	74	-24.6	103	101	V
	* ** 4.80403	37.77	V1TV	33.9	-30.9	40.77	54	-13.23	-	-	103	101	V
7	* ** 12.0114	34.31	PK2	38.6	-24.1	48.81	-	-	74	-25.19	30	151	V
	* ** 12.01187	21.39	V1TV	38.6	-24.1	35.89	54	-18.11	-	-	30	151	V
8	* ** 16.06894	35.6	PK2	40.5	-24.5	51.6	-	-	74	-22.4	346	237	V
	* ** 16.06757	22.6	V1TV	40.5	-24.5	38.6	54	-15.4	-	-	346	237	V
2	6.95939	34.65	Pk	35.5	-27.9	42.25	-	-	-	-	0-360	101	H
6	6.95939	34.55	Pk	35.5	-27.9	42.15	-	-	-	-	0-360	101	V

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
** - indicates frequency in Taiwan NCC LP0002 Restricted Band
PK2 - Maximum Peak
V1TV: VB=1/Ton, Linear Voltage Average where: Ton is packet duration
Pk - Peak detector

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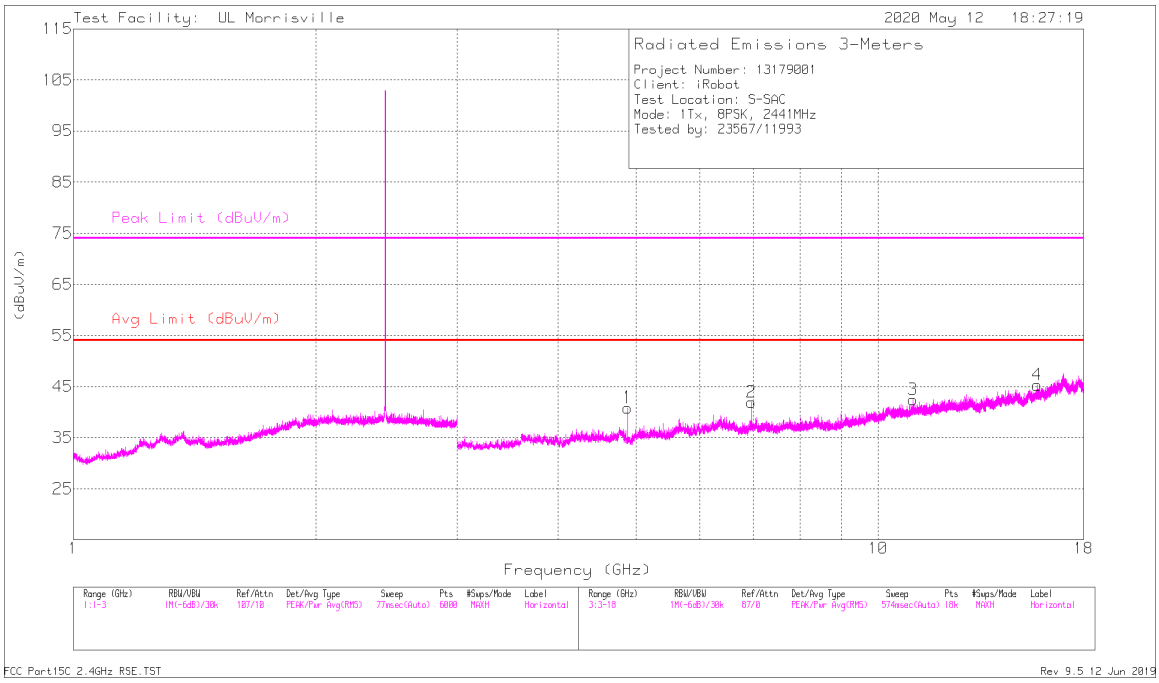
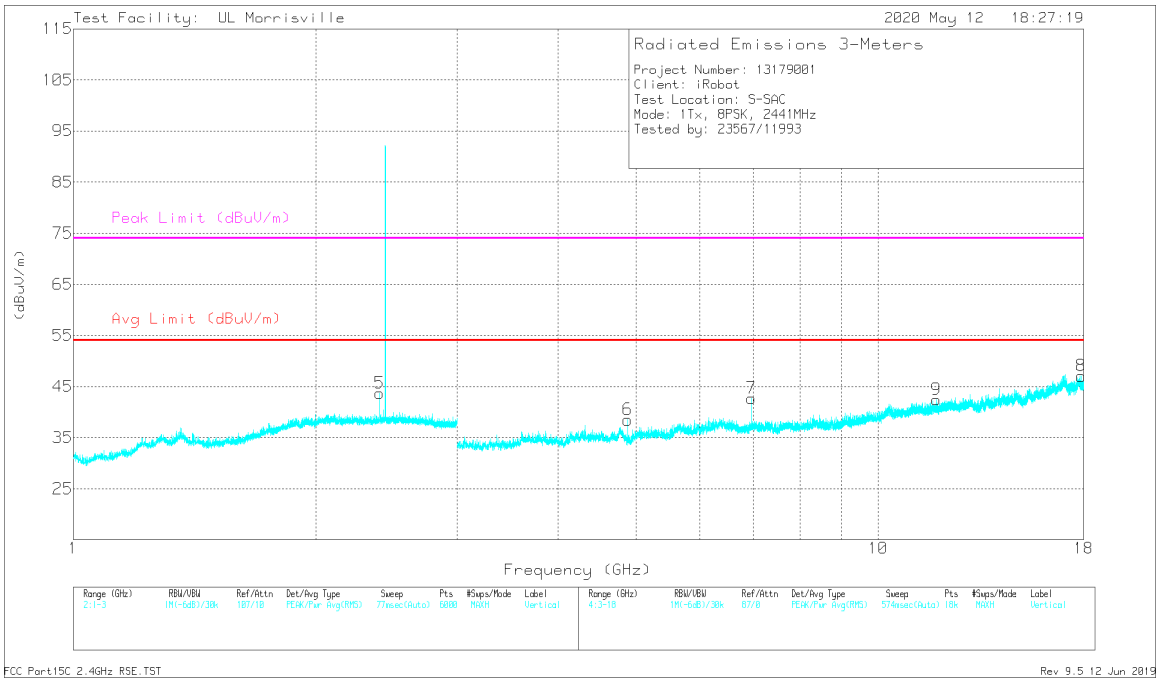
MID CHANNEL RESULTS



HORIZONTAL



VERTICAL

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RADIATED EMISSIONS

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AT0078 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* ** 4.8822	44.03	PK2	33.8	-31	46.83	-	-	74	-27.17	248	182	H
	* ** 4.88202	35.32	V1TV	33.8	-31	38.12	54	-15.88	-	-	248	182	H
3	* ** 11.05391	34.58	PK2	37.8	-24.3	48.08	-	-	74	-25.92	13	373	H
	* ** 11.05245	21.79	V1TV	37.8	-24.3	35.29	54	-18.71	-	-	13	373	H
4	* ** 15.77476	34.36	PK2	40.2	-23.4	51.16	-	-	74	-22.84	114	250	H
	* ** 15.77504	21.55	V1TV	40.2	-23.4	38.35	54	-15.65	-	-	114	250	H
6	* ** 4.88205	42.71	PK2	33.8	-31	45.51	-	-	74	-28.49	109	101	V
	* ** 4.88193	32.94	V1TV	33.8	-31	35.74	54	-18.26	-	-	109	101	V
8	* ** 17.87197	33.99	PK2	41.3	-22	53.29	-	-	74	-20.71	142	221	V
	* ** 17.87107	21	V1TV	41.3	-22	40.3	54	-13.7	-	-	142	221	V
9	* ** 11.81752	34.34	PK2	38.4	-24.5	48.24	-	-	74	-25.76	344	342	V
	* ** 11.81761	21.36	V1TV	38.4	-24.5	35.26	54	-18.74	-	-	344	342	V
5	2.4019	35.73	Pk	32	-24	43.73	-	-	-	-	0-360	199	V
2	6.95939	34.3	Pk	35.5	-27.9	41.9	-	-	-	-	0-360	101	H
7	6.95939	35.09	Pk	35.5	-27.9	42.69	-	-	-	-	0-360	199	V

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
** - indicates frequency in Taiwan NCC LP0002 Restricted Band
PK2 - Maximum Peak
V1TV: VB=1/Ton, Linear Voltage Average where: Ton is packet duration
Pk - Peak detector

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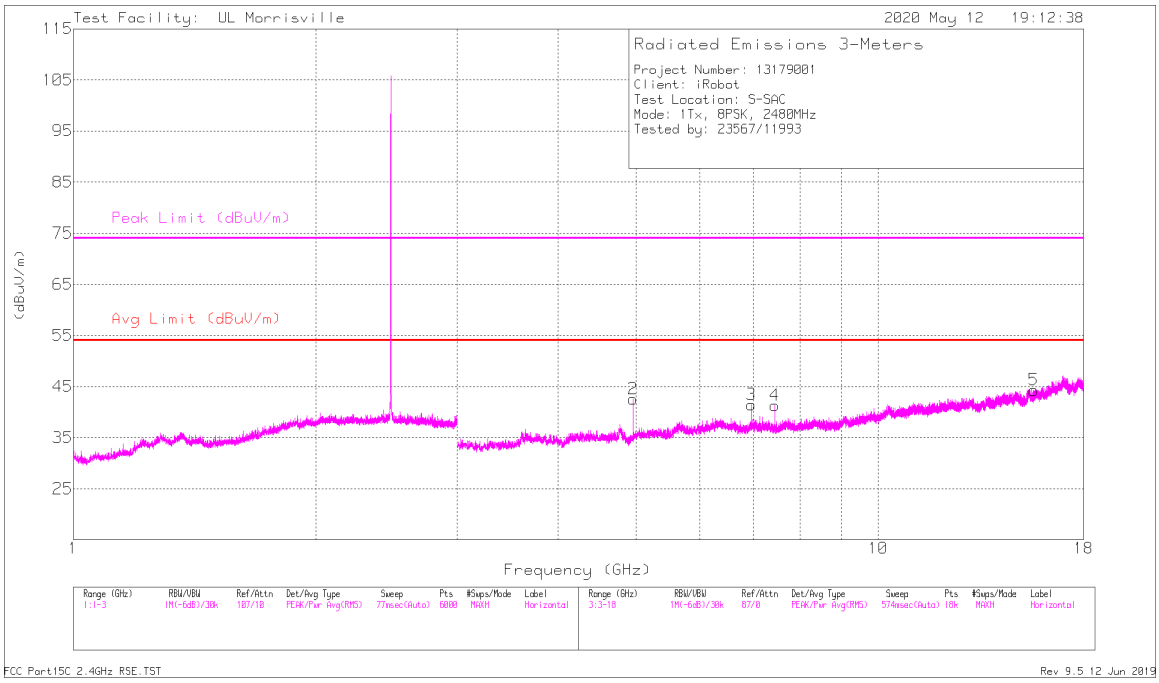
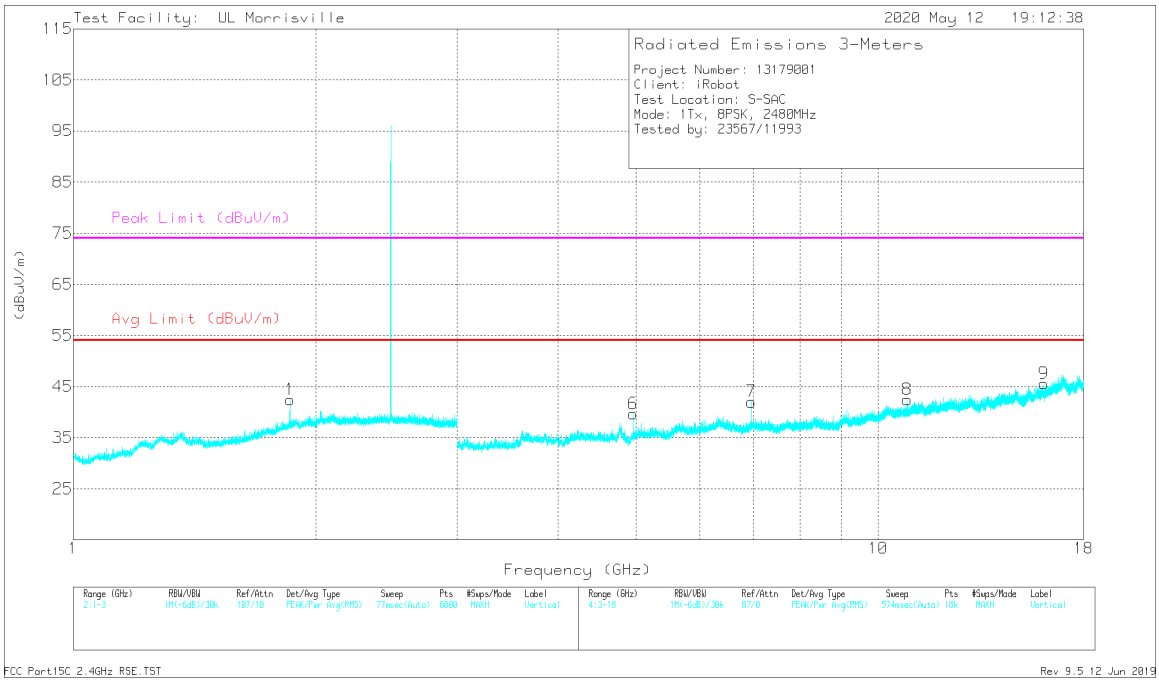
HIGH CHANNEL RESULTS



HORIZONTAL



VERTICAL

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RADIATED EMISSIONS

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AT0078 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	** 1.8579	35.4	PK2	31.2	-22.2	44.4	-	-	74	-29.6	37	373	V
	** 1.85874	22.7	V1TV	31.2	-22.2	31.7	54	-22.3	-	-	37	373	V
2	* ** 4.95983	45.04	PK2	34	-31.1	47.94	-	-	74	-26.06	67	111	H
	* ** 4.96	36.85	V1TV	34	-31.1	39.75	54	-14.25	-	-	67	111	H
4	* ** 7.43994	42.98	PK2	35.6	-28	50.58	-	-	74	-23.42	72	119	H
	* ** 7.43995	31.13	V1TV	35.6	-28	38.73	54	-15.27	-	-	72	119	H
5	* ** 15.6048	35.45	PK2	40	-24.8	50.65	-	-	74	-23.35	222	385	H
	* ** 15.60574	22.48	V1TV	40	-24.7	37.78	54	-16.22	-	-	222	385	H
6	* ** 4.95976	42.69	PK2	34	-31.1	45.59	-	-	74	-28.41	107	105	V
	* ** 4.95997	33.19	V1TV	34	-31.1	36.09	54	-17.91	-	-	107	105	V
8	* ** 10.86867	34.2	PK2	37.7	-24.9	47	-	-	74	-27	63	216	V
	* ** 10.86914	21.72	V1TV	37.7	-24.9	34.52	54	-19.48	-	-	63	216	V
9	* ** 16.06972	35.3	PK2	40.5	-24.5	51.3	-	-	74	-22.7	57	379	V
	* ** 16.07052	22.49	V1TV	40.5	-24.5	38.49	54	-15.51	-	-	57	379	V
3	6.96022	33.84	Pk	35.5	-27.9	41.44	-	-	-	-	0-360	101	H
7	6.96022	34.42	Pk	35.5	-27.9	42.02	-	-	-	-	0-360	199	V

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
** - indicates frequency in Taiwan NCC LP0002 Restricted Band
PK2 - Maximum Peak
V1TV: VB=1/Ton, Linear Voltage Average where: Ton is packet duration
Pk - Peak detector

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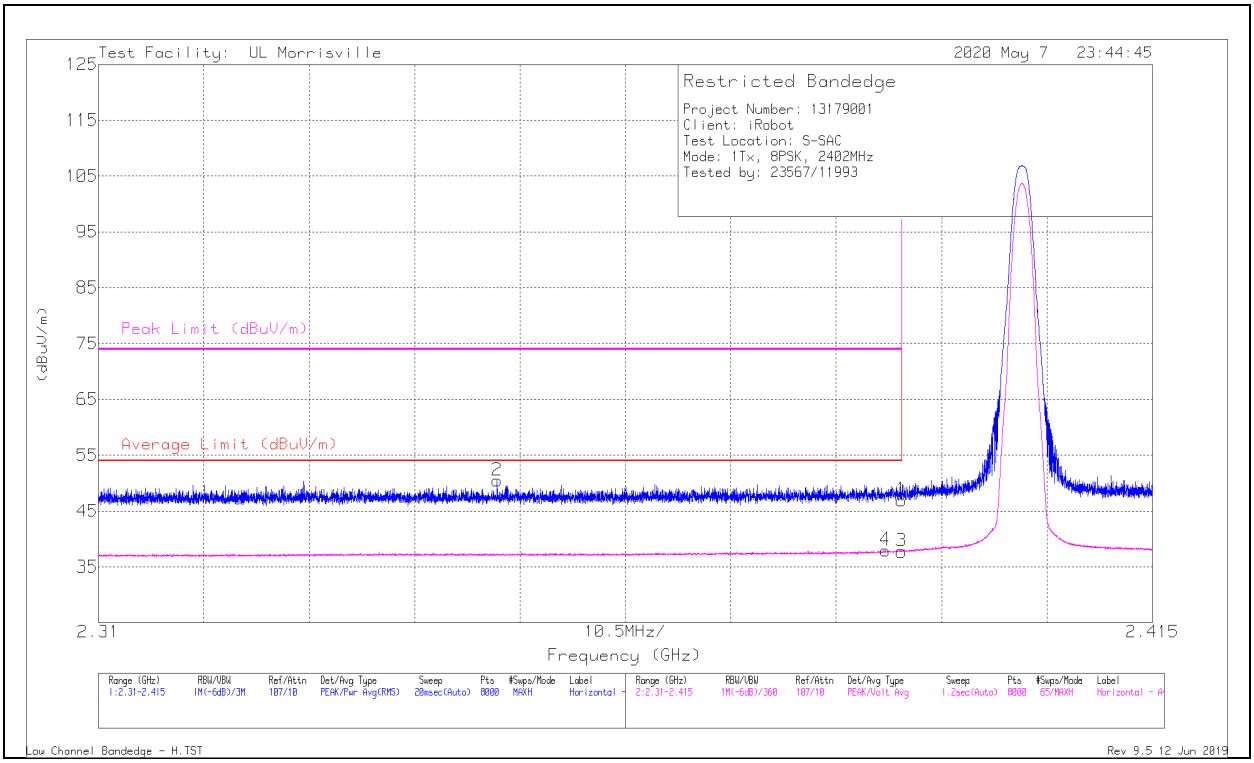
PCB

BANDEDGE (LOW CHANNEL)

HORIZONTAL RESULT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AT0078 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* ** 2.39	39.14	Pk	32	-24.2	46.94	-	-	74	-27.06	68	139	H
2	* ** 2.34972	42.93	Pk	31.8	-24.3	50.43	-	-	74	-23.57	68	139	H
3	* ** 2.39	29.95	V1TV	32	-24.2	37.75	54	-16.25	-	-	68	139	H
4	* ** 2.38838	30.16	V1TV	32	-24.2	37.96	54	-16.04	-	-	68	139	H

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
** - indicates frequency in Taiwan NCC LP0002 Restricted Band
Pk - Peak detector
V1TV: VB=1/Ton, Linear Voltage Average where: Ton is packet duration

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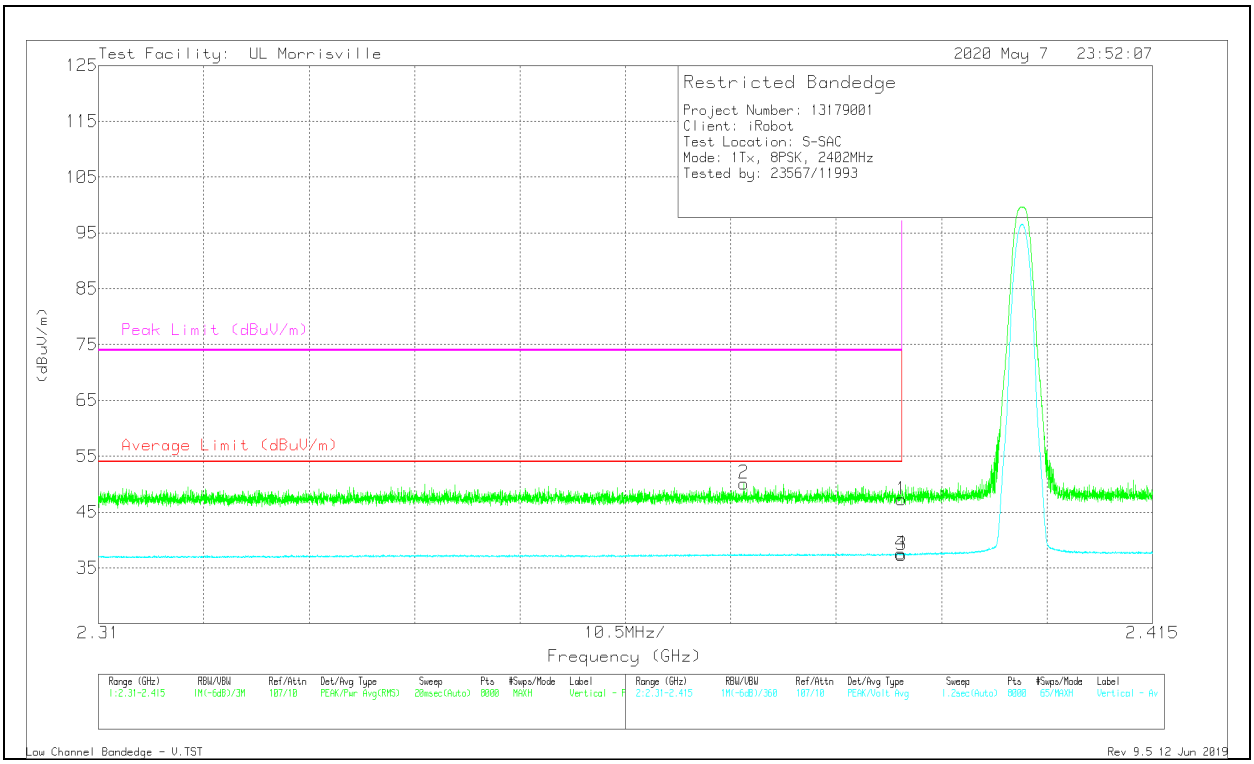
VERTICAL RESULT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AT0078 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* ** 2.39	39.43	Pk	32	-24.2	47.23	-	-	74	-26.77	17	345	V
2	* ** 2.37431	42.35	Pk	32	-24.2	50.15	-	-	74	-23.85	17	345	V
3	* ** 2.39	29.56	V1TV	32	-24.2	37.36	54	-16.64	-	-	17	345	V
4	* ** 2.38993	29.79	V1TV	32	-24.2	37.59	54	-16.41	-	-	17	345	V

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
** - indicates frequency in Taiwan NCC LP0002 Restricted Band
Pk - Peak detector
V1TV: VB=1/Ton, Linear Voltage Average where: Ton is packet duration

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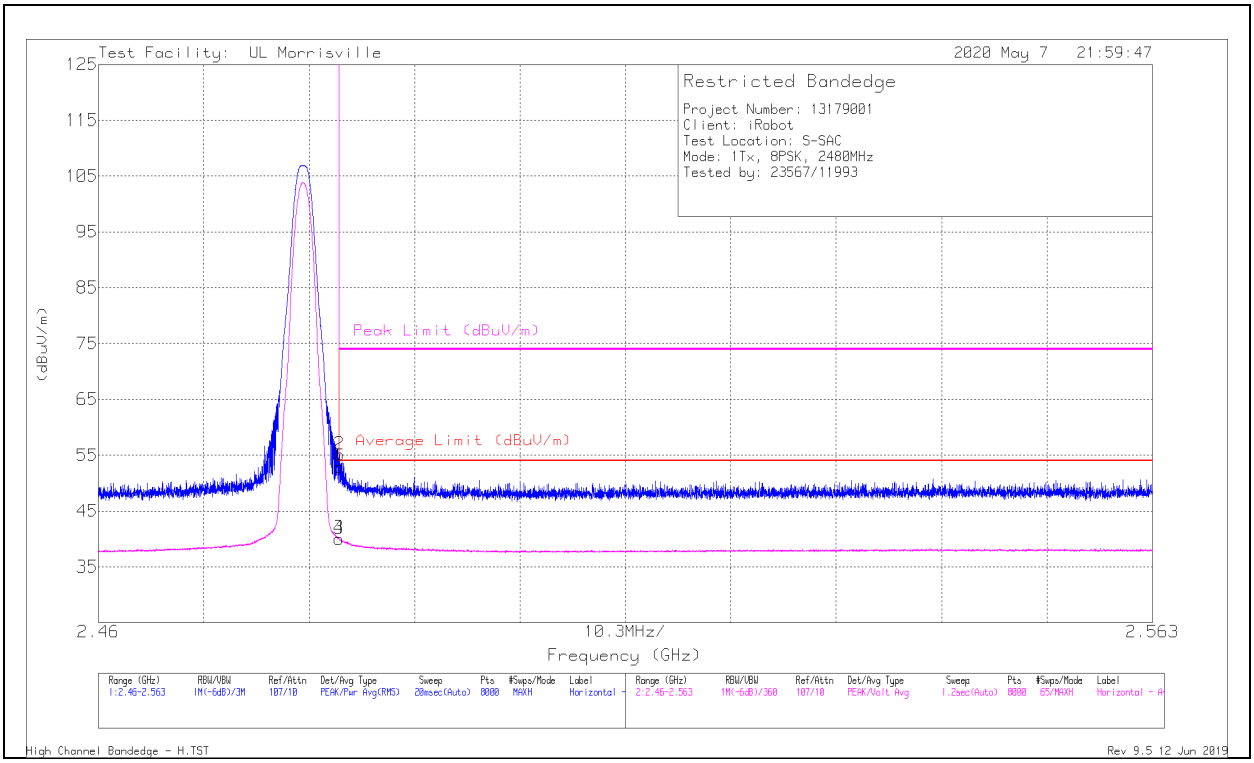
BANDEDGE (HIGH CHANNEL)

HORIZONTAL RESULT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AT0078 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* ** 2.4835	44.84	Pk	32.1	-24	52.94	-	-	74	-21.06	68	103	H
2	* ** 2.48359	47.05	Pk	32.1	-24	55.15	-	-	74	-18.85	68	103	H
3	* ** 2.4835	31.97	V1TV	32.1	-24	40.07	54	-13.93	-	-	68	103	H
4	* ** 2.48353	31.95	V1TV	32.1	-24	40.05	54	-13.95	-	-	68	103	H

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
** - indicates frequency in Taiwan NCC LP0002 Restricted Band
Pk - Peak detector
V1TV: VB=1/Ton, Linear Voltage Average where: Ton is packet duration

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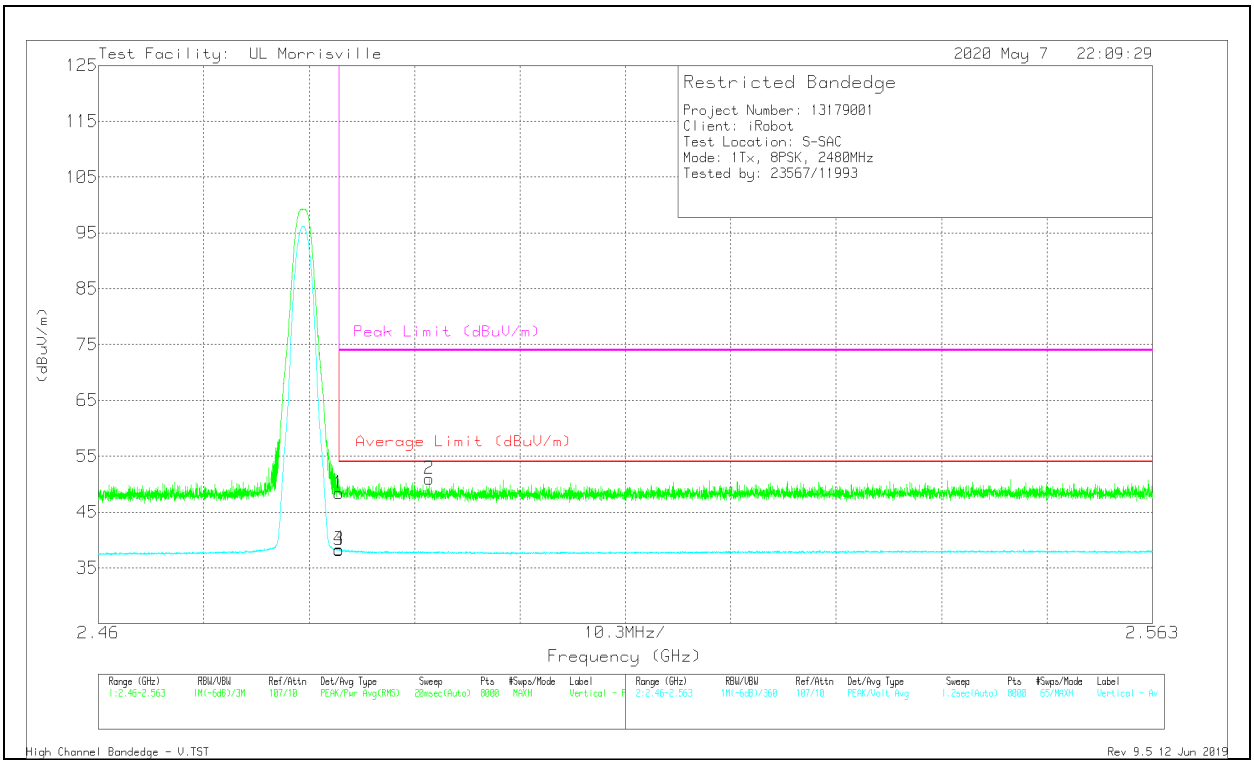
VERTICAL RESULT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AT0078 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* ** 2.4835	40.25	Pk	32.1	-24	48.35	-	-	74	-25.65	219	340	V
2	* ** 2.49232	42.72	Pk	32.2	-24	50.92	-	-	74	-23.08	219	340	V
3	* ** 2.4835	30.12	V1TV	32.1	-24	38.22	54	-15.78	-	-	219	340	V
4	* ** 2.48353	30.23	V1TV	32.1	-24	38.33	54	-15.67	-	-	219	340	V

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
** - indicates frequency in Taiwan NCC LP0002 Restricted Band
Pk - Peak detector
V1TV: VB=1/Ton, Linear Voltage Average where: Ton is packet duration

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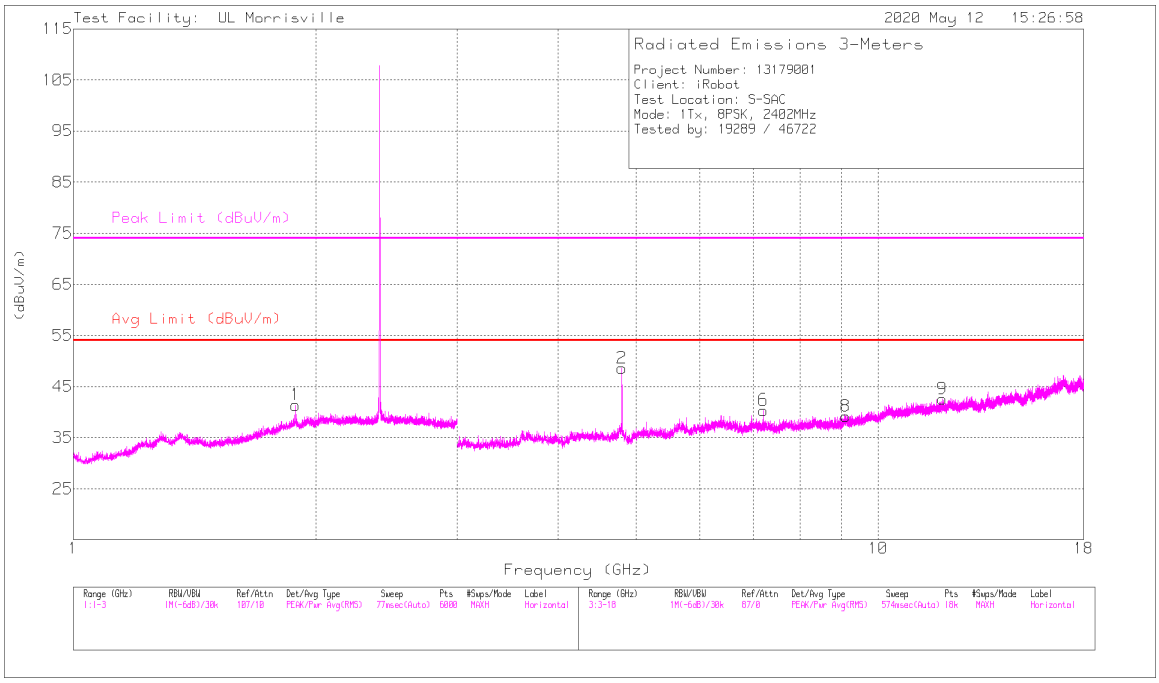
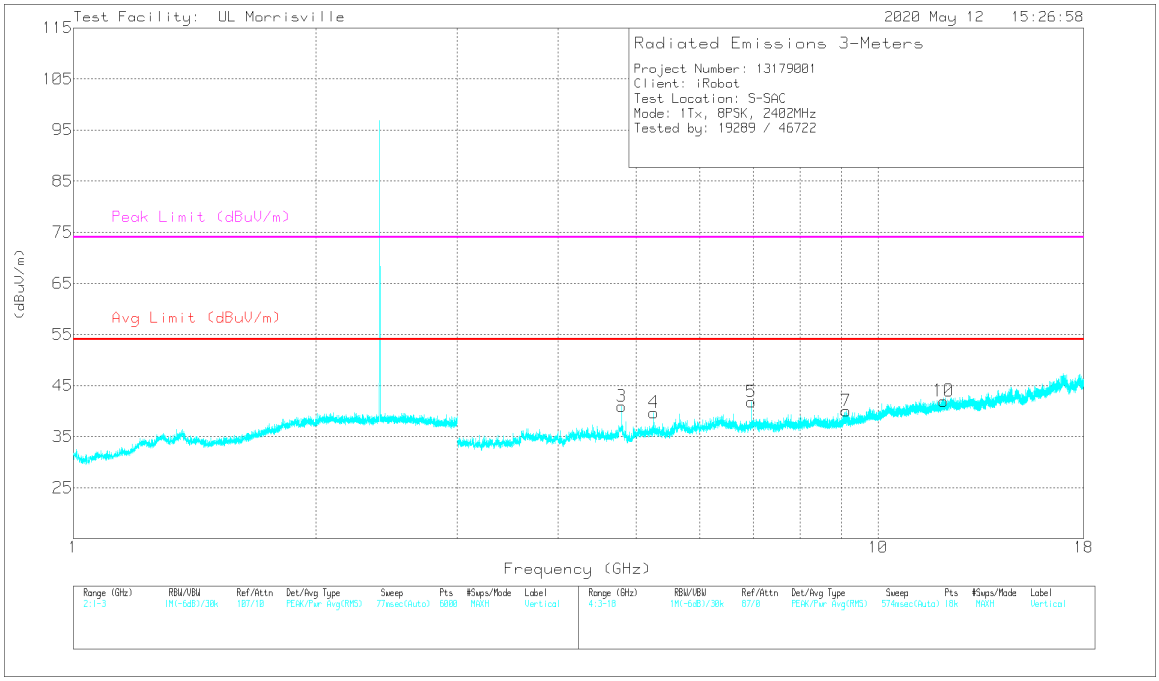
HARMONICS AND SPURIOUS EMISSIONS

LOW CHANNEL RESULTS



HORIZONTAL



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RADIATED EMISSIONS

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AT0078 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Fixture Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
2	* **4.80391	48.78	PK2	33.9	-31	0	51.68	-	-	74	-22.32	97	113	H
	* **4.8033	44.35	V1TV	33.9	-31	0	47.25	54	-6.75	-	-	97	113	H
8	* **9.11305	35.08	PK2	36.2	-26.2	0	45.08	-	-	74	-28.92	192	333	H
	* **9.11103	22.64	V1TV	36.2	-26.1	0	32.74	54	-21.26	-	-	192	333	H
9	* **12.02179	33.21	PK2	38.6	-24.1	0	47.71	-	-	74	-26.29	265	268	H
	* **12.02018	21.52	V1TV	38.6	-24.1	0	36.02	54	-17.98	-	-	265	268	H
3	* **4.80371	48.52	PK2	33.9	-31	0	51.42	-	-	74	-22.58	167	344	V
	* **4.80327	43.68	V1TV	33.9	-31	0	46.58	54	-7.42	-	-	167	344	V
7	* **9.12403	34.74	PK2	36.3	-26	0	45.04	-	-	74	-28.96	352	274	V
	* **9.12412	22.6	V1TV	36.3	-26	0	32.9	54	-21.1	-	-	352	274	V
10	* **12.06133	33.09	PK2	38.6	-24.1	0	47.59	-	-	74	-26.41	305	108	V
	* **12.06382	21.36	V1TV	38.6	-24.1	0	35.86	54	-18.14	-	-	305	108	V
1	1.88748	32.38	Pk	31.3	-22.3	0	41.38	-	-	-	-	0-360	101	H
4	5.26263	35.42	Pk	34.3	-30	0	39.72	-	-	-	-	0-360	199	V
5	6.95939	34.19	Pk	35.5	-27.9	0	41.79	-	-	-	-	0-360	101	V
6	7.20524	32.86	Pk	35.6	-28.1	0	40.36	-	-	-	-	0-360	101	H

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
** - indicates frequency in Taiwan NCC LP0002 Restricted Band
PK2 - Maximum Peak
V1TV - VB=1/Ton, Linear Voltage Average where: Ton is packet duration
Pk - Peak detector

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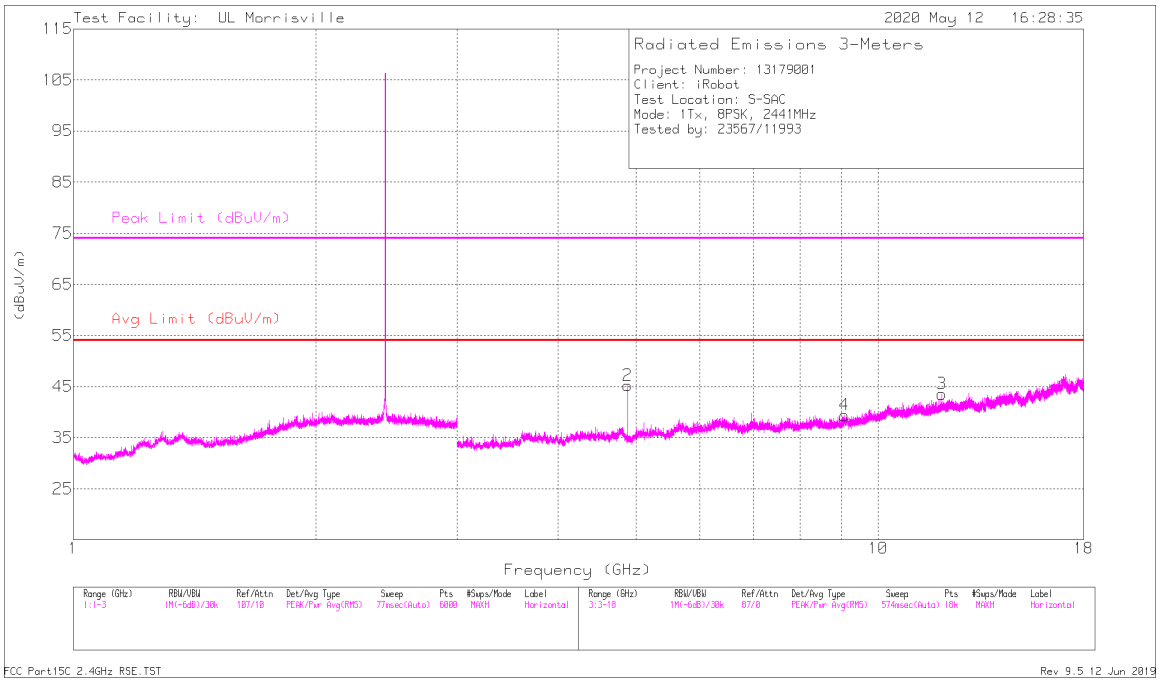
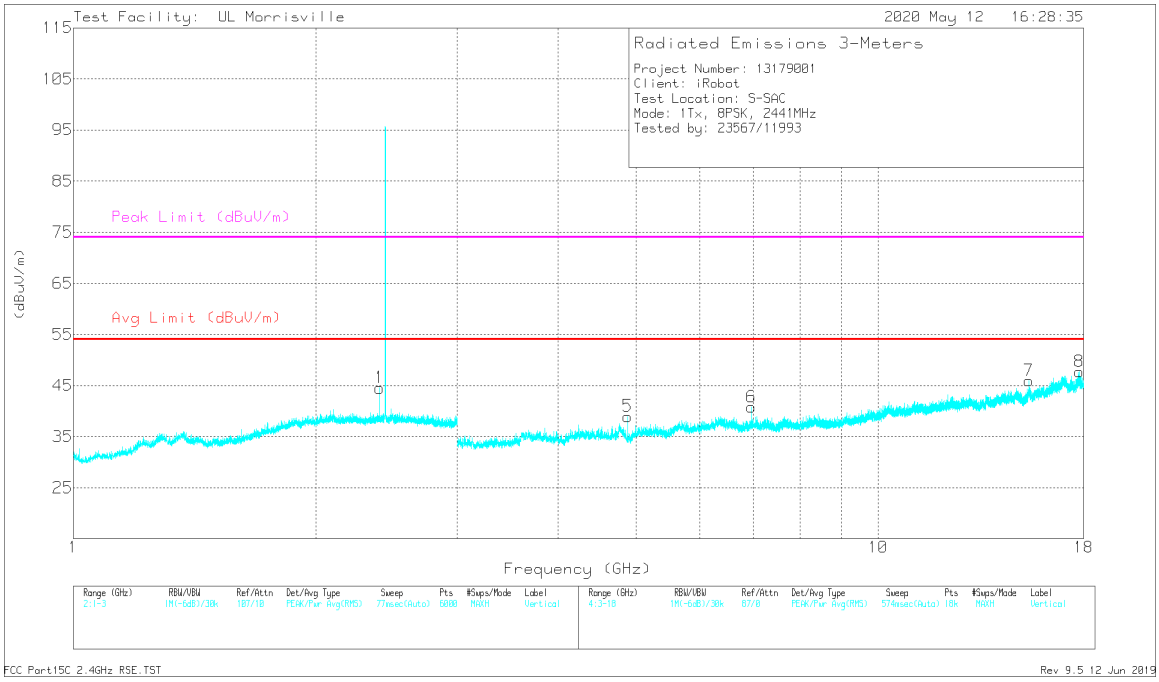
MID CHANNEL RESULTS



HORIZONTAL



VERTICAL

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RADIATED EMISSIONS

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AT0078 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
2	* ** 4.88172	46.69	PK2	33.8	-31	49.49	-	-	74	-24.51	7	109	H
	* ** 4.88204	39.17	V1TV	33.8	-31	41.97	54	-12.03	-	-	7	109	H
3	* ** 12.00034	34.23	PK2	38.6	-24.2	48.63	-	-	74	-25.37	1	186	H
	* ** 11.99959	21.47	V1TV	38.6	-24.2	35.87	54	-18.13	-	-	1	186	H
4	* ** 9.08646	35.46	PK2	36.2	-26.1	45.56	-	-	74	-28.44	4	362	H
	* ** 9.08519	22.7	V1TV	36.2	-26.1	32.8	54	-21.2	-	-	4	362	H
5	* ** 4.88205	43.39	PK2	33.8	-31	46.19	-	-	74	-27.81	128	329	V
	* ** 4.88194	34.44	V1TV	33.8	-31	37.24	54	-16.76	-	-	128	329	V
7	* ** 15.3848	33.37	PK2	39.8	-22.1	51.07	-	-	74	-22.93	347	209	V
	* ** 15.3836	20.69	V1TV	39.8	-22.2	38.29	54	-15.71	-	-	347	209	V
8	* ** 17.78207	34.18	PK2	41.1	-22.3	52.98	-	-	74	-21.02	17	131	V
	* ** 17.78165	21.68	V1TV	41.1	-22.3	40.48	54	-13.52	-	-	17	131	V
1	2.40223	36.53	Pk	32	-24	44.53	-	-	-	-	0-360	101	V
6	6.95939	33.19	Pk	35.5	-27.9	40.79	-	-	-	-	0-360	101	V

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
** - indicates frequency in Taiwan NCC LP0002 Restricted Band
PK2 - Maximum Peak
V1TV - VB=1/Ton, Linear Voltage Average where: Ton is packet duration
Pk - Peak detector

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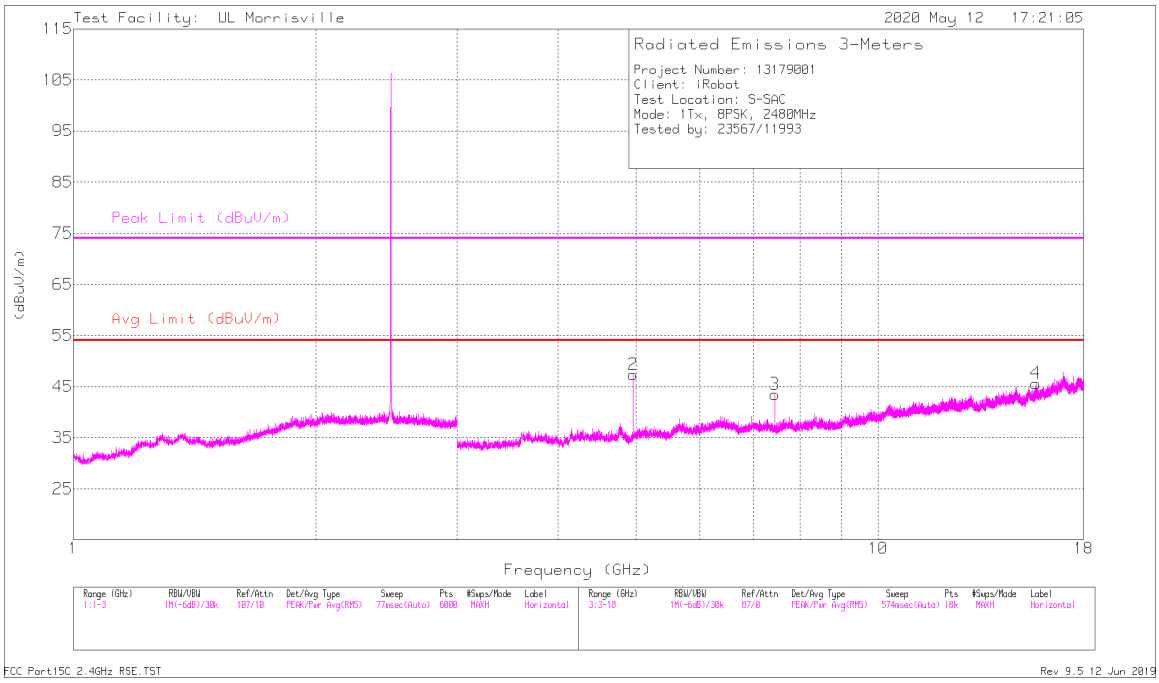
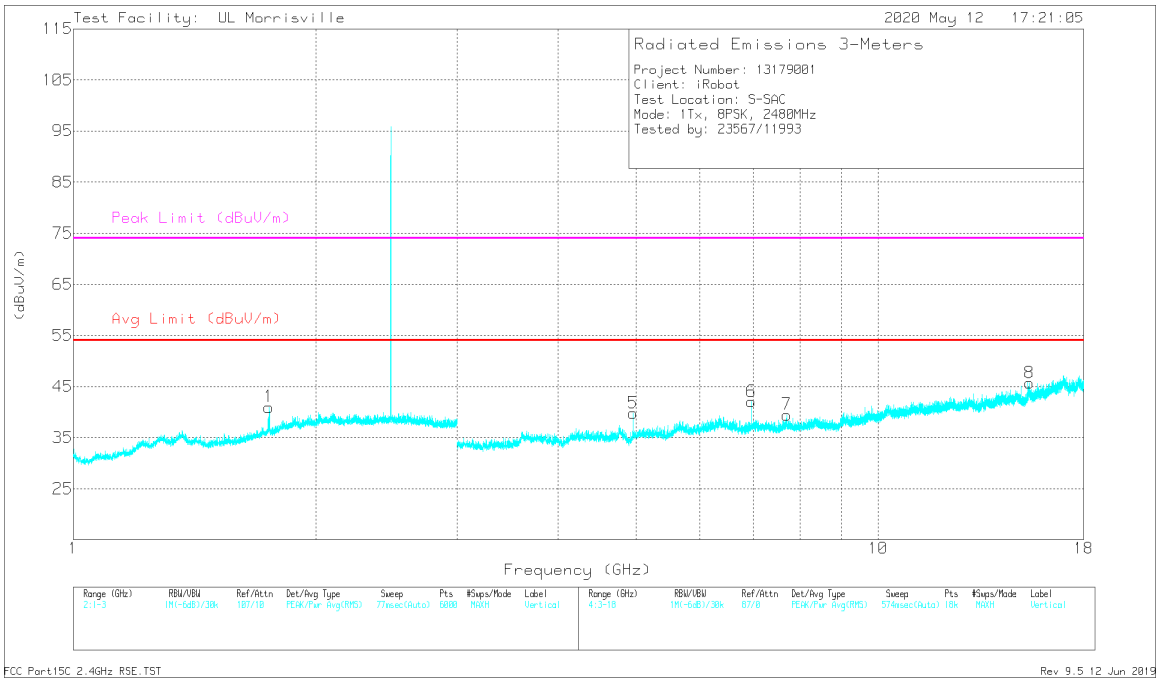
HIGH CHANNEL RESULTS



HORIZONTAL



VERTICAL

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RADIATED EMISSIONS

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AT0078 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	** 1.74856	35.51	PK2	29.8	-22.2	43.11	-	-	74	-30.89	175	255	V
	** 1.74982	23.55	V1TV	29.8	-22.2	31.15	54	-22.85	-	-	175	255	V
2	* ** 4.95995	47.13	PK2	34	-31.1	50.03	-	-	74	-23.97	9	114	H
	* ** 4.95999	39.93	V1TV	34	-31.1	42.83	54	-11.17	-	-	9	114	H
3	* ** 7.43941	42.61	PK2	35.6	-28	50.21	-	-	74	-23.79	91	109	H
	* ** 7.44	31.59	V1TV	35.6	-28	39.19	54	-14.81	-	-	91	109	H
4	* ** 15.70085	34.46	PK2	40.1	-23.5	51.06	-	-	74	-22.94	274	190	H
	* ** 15.70051	21.77	V1TV	40.1	-23.5	38.37	54	-15.63	-	-	274	190	H
5	* ** 4.96035	45.16	PK2	34	-31.1	48.06	-	-	74	-25.94	117	280	V
	* ** 4.95996	36.45	V1TV	34	-31.1	39.35	54	-14.65	-	-	117	280	V
7	* ** 7.70635	37.1	PK2	35.7	-27.7	45.1	-	-	74	-28.9	316	308	V
	* ** 7.70514	24.09	V1TV	35.7	-27.7	32.09	54	-21.91	-	-	316	308	V
8	* ** 15.41978	32.69	PK2	39.8	-21.9	50.59	-	-	74	-23.41	95	152	V
	* ** 15.41934	20.33	V1TV	39.8	-21.9	38.23	54	-15.77	-	-	95	152	V
6	6.95939	34.43	Pk	35.5	-27.9	42.03	-	-	-	-	0-360	199	V

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
** - indicates frequency in Taiwan NCC LP0002 Restricted Band
PK2 - Maximum Peak
V1TV - VB=1/Ton, Linear Voltage Average where: Ton is packet duration
Pk - Peak detector

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10.2. WORST CASE BELOW 30MHZ

Note for below 30 MHz scans: All measurements were made at a test distance of 3 m. The measured data was extrapolated from the test distance (3m) to the specification distance (300 m from 9-490 kHz and 30 m from 490 kHz – 30 MHz) to clearly show the relative levels of fundamental and spurious emissions and demonstrate compliance with the requirement that the level of any spurious emissions be below the level of the intentionally transmitted signal. The extrapolation factor for the limits were 40*Log (test distance / specification distance).

The below 30 MHz limits in CFR 47, Part 15, Subpart C, paragraph 15.209 (a), are identical to those in RSS-GEN Section 8.9, Table 6, since the measurements are performed in terms of magnetic field strength and converted to electric field strength levels (as reported in the table) using the free space impedance of 377Ω. For example, the measurement frequency 40.81 kHz resulted in a level of -25.28 dBuV/m, which is equivalent to -25.28-51.5 = -76.78 dBuA/m, which has the same margin, -60.67 dB, to the corresponding RSS-GEN Table 6 limit as it has to be 15.209(a) limit.

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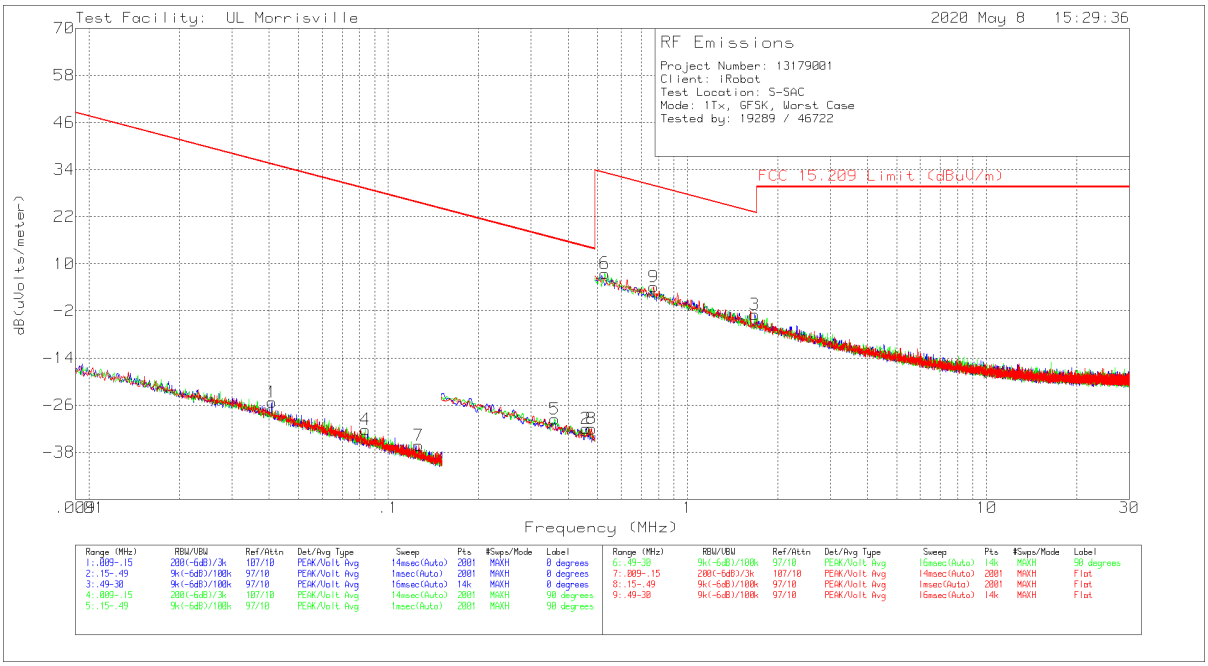
SPURIOUS EMISSIONS BELOW 30 MHz (WORST-CASE CONFIGURATION – EXT ANTENNA)



ANTENNA- THREE ORIENTATIONS

BELOW 30MHz DATA

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	AT0079 AF (dB/m)	Cbl (dB)	Dist. Corr. Factor (dB)	Corrected Reading dB(uVolts/meter)	FCC 15.209 QP/AV Limit (dBuV/m)	FCC 15.209 PK Limit (dBuV/m)	Worst-Case Margin (dB)	Azimuth (Degs)
1	.04081	42.32	Pk	12.3	.1	-80	-25.28	35.39	55.39	-60.67	0-360
4	.08383	36.46	Pk	11.2	.1	-80	-32.24	29.14	49.14	-61.38	0-360
7	.12665	32.58	Pk	11	.1	-80	-36.32	25.55	45.55	-61.87	0-360
5	.35987	39.28	Pk	11	.1	-80	-29.62	16.48	36.48	-46.1	0-360
2	.45796	36.96	Pk	11	.1	-80	-31.94	14.39	34.39	-46.33	0-360
8	.47785	36.87	Pk	11	.1	-80	-32.03	14.02	34.02	-46.05	0-360
6	.53005	36.44	Pk	11	.1	-40	7.54	33.12	-	-25.58	0-360
9	.77036	32.98	Pk	11	.1	-40	4.08	29.87	-	-25.79	0-360
3	1.67891	25.84	Pk	11.1	.2	-40	-2.86	23.1	-	-25.96	0-360

Pk - Peak detector

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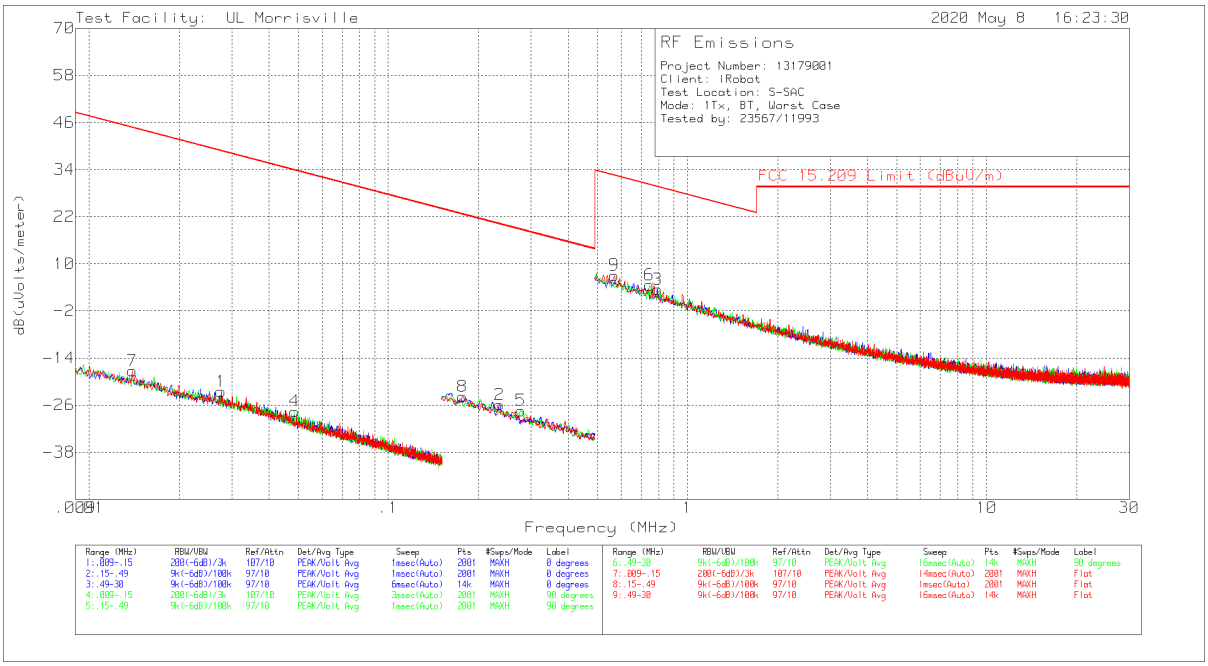
SPURIOUS EMISSIONS BELOW 30 MHz (WORST-CASE CONFIGURATION – PCB ANTENNA)



ANTENNA- THREE ORIENTATIONS

BELOW 30MHz DATA

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	AT0079 AF (dB/m)	Cbl (dB)	Dist. Corr. Factor (dB)	Corrected Reading dB(uVolts/meter)	FCC 15.209 QP/AV Limit (dBuV/m)	FCC 15.209 PK Limit (dBuV/m)	Worst-Case Margin (dB)	Azimuth (Degs)
7	.01397	46.15	Pk	16.5	.1	-80	-17.25	44.7	64.7	-61.95	0-360
1	.0276	43.91	Pk	13.4	.1	-80	-22.59	38.79	58.79	-61.38	0-360
4	.04855	40.63	Pk	11.7	.1	-80	-27.57	33.88	53.88	-61.45	0-360
8	.17746	45.03	Pk	11	.1	-80	-23.87	22.62	42.62	-46.49	0-360
2	.23509	43.03	Pk	11	.1	-80	-25.87	20.18	40.18	-46.05	0-360
5	.27759	41.49	Pk	11	.1	-80	-27.41	18.74	38.74	-46.15	0-360
9	.5701	35.97	Pk	11	.1	-40	7.07	32.48	-	-25.41	0-360
6	.74718	33.44	Pk	11	.1	-40	4.54	30.14	-	-25.6	0-360
3	.79355	32.42	Pk	11	.1	-40	3.52	29.61	-	-26.09	0-360

Pk - Peak detector

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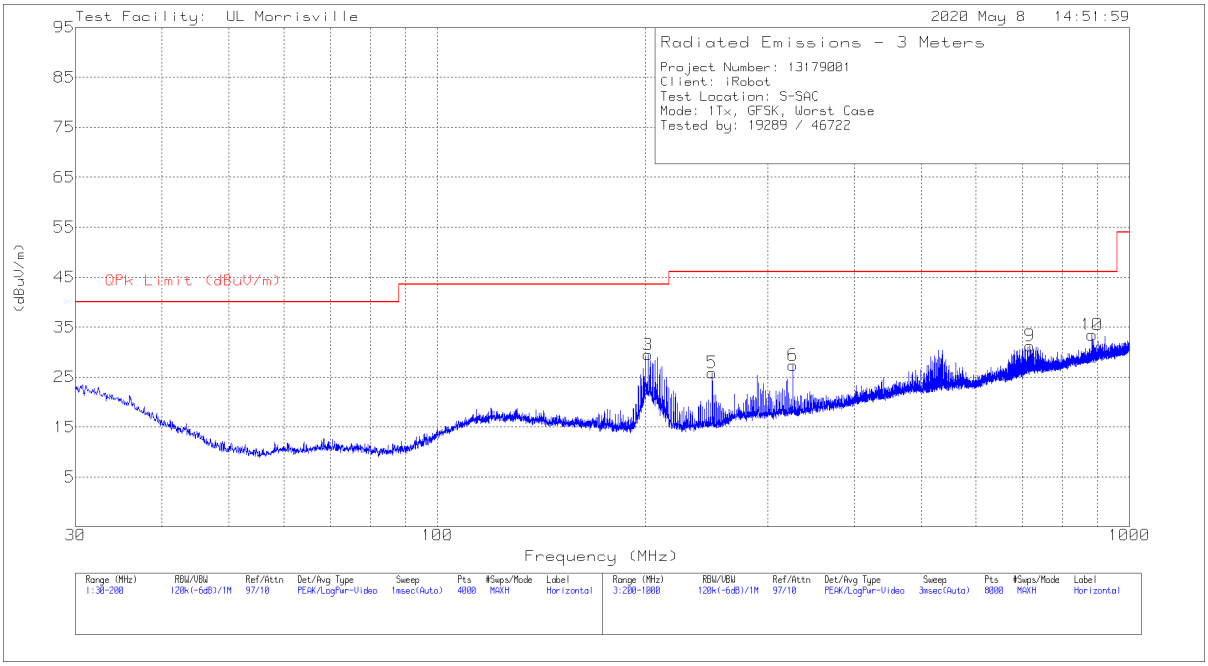
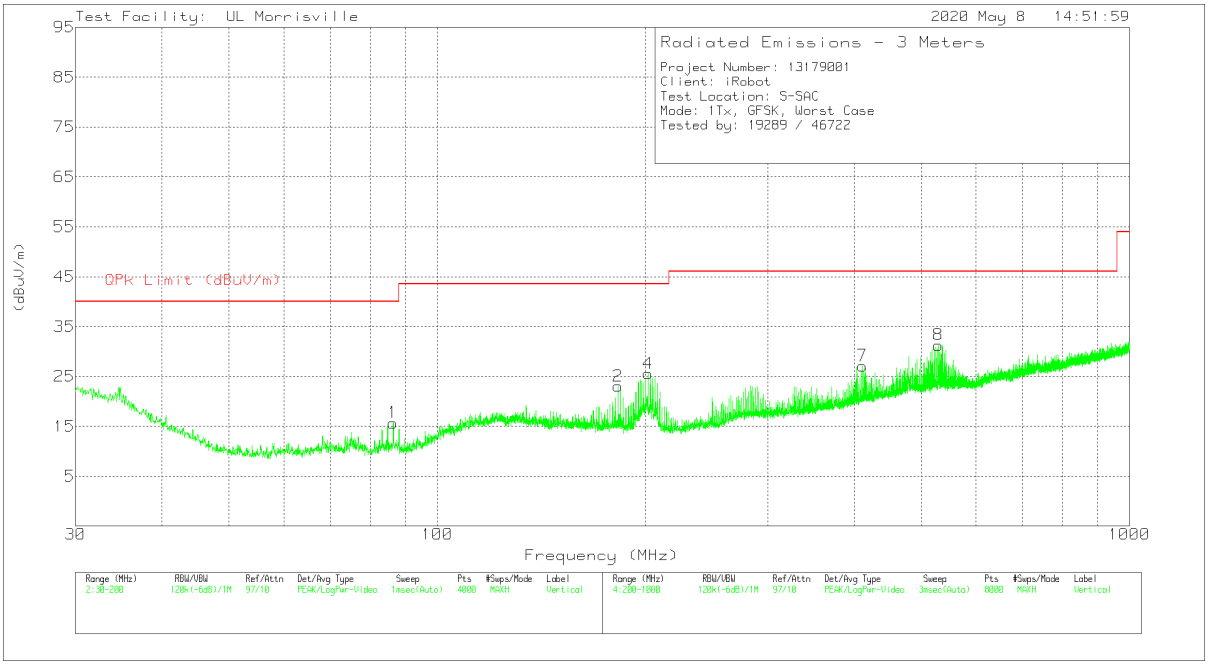
10.3. WORST CASE BELOW 1 GHZ

SPURIOUS EMISSIONS 30 TO 1000 MHz (WORST-CASE CONFIGURATION – EXT ANTENNA)



HORIZONTAL



VERTICAL

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BELOW 1GHz DATA

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	AT0074 AF (dB/m)	Cbl/Amp (dB)	Corrected Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
5	* ** 249.6064	38.28	Pk	17.5	-29.9	25.88	46.02	-20.14	0-360	101	H
6	* ** 326.4164	36.79	Pk	20	-29.4	27.39	46.02	-18.63	0-360	101	H
9	** 718.3674	32.99	Pk	26.6	-28.3	31.29	46.02	-14.73	0-360	101	H
10	** 883.1888	32.55	Pk	28.1	-27.2	33.45	46.02	-12.57	0-360	101	H
1	86.3696	33.52	Pk	13.3	-31.1	15.72	40	-24.28	0-360	101	V
2	182.4019	36.07	Pk	17.3	-30.3	23.07	43.52	-20.45	0-360	101	V
3	201.6002	41.28	Pk	18.4	-30.2	29.48	43.52	-14.04	0-360	199	H
4	201.6002	37.37	Pk	18.4	-30.2	25.57	43.52	-17.95	0-360	101	V
7	411.2275	34.24	Pk	22.1	-29.2	27.14	46.02	-18.88	0-360	101	V
8	529.6428	36	Pk	24	-28.7	31.3	46.02	-14.72	0-360	101	V

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
** - indicates frequency in Taiwan NCC LP0002 Restricted Band
Pk - Peak detector

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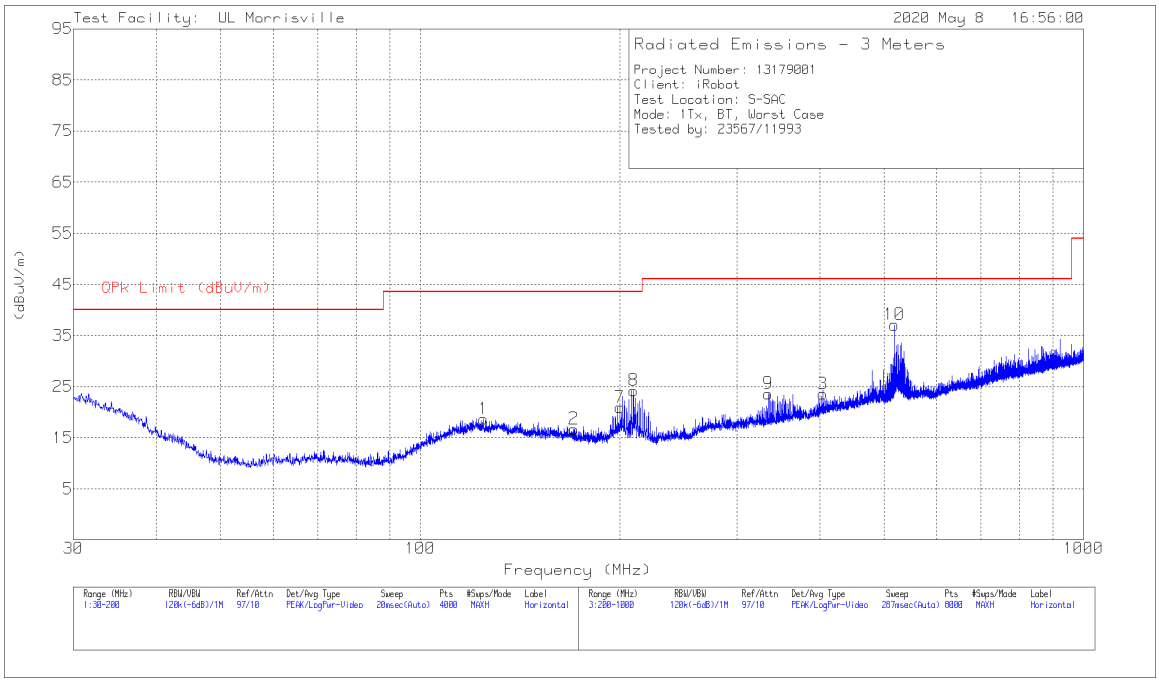
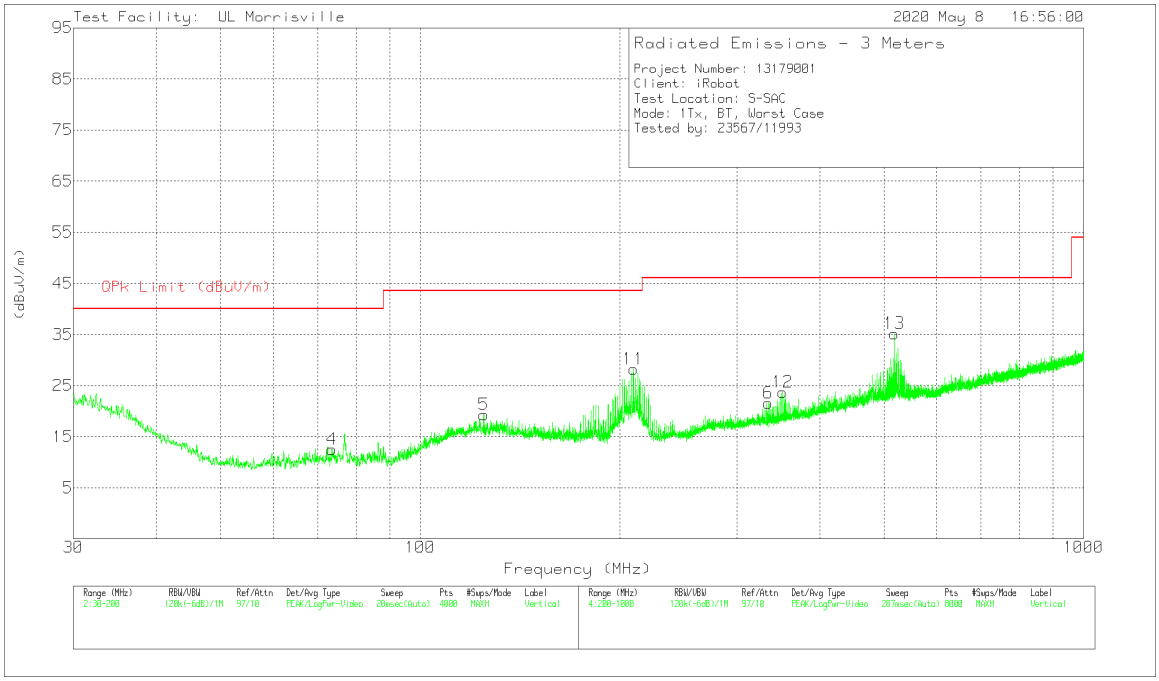
SPURIOUS EMISSIONS 30 TO 1000 MHz (WORST-CASE CONFIGURATION – PCB ANTENNA)



HORIZONTAL



VERTICAL

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BELOW 1GHz DATA

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	AT0074 AF (dB/m)	Cbl/Amp (dB)	Corrected Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* ** 124.5445	29.54	Pk	19.9	-30.8	18.64	43.52	-24.88	0-360	198	H
2	* ** 170.4563	29.11	Pk	18	-30.4	16.71	43.52	-26.81	0-360	299	H
4	* ** 73.5738	29.6	Pk	14.1	-31.2	12.5	40	-27.5	0-360	102	V
5	* ** 124.7145	30.2	Pk	19.9	-30.8	19.3	43.52	-24.22	0-360	102	V
3	* ** 404.9266	30.8	Pk	21.9	-29.1	23.6	46.02	-22.42	0-360	102	H
9	* ** 334.4175	33.02	Pk	20	-29.4	23.62	46.02	-22.4	0-360	102	H
6	* ** 334.4175	30.98	Pk	20	-29.4	21.58	46.02	-24.44	0-360	102	V
7	200	32.1	Pk	19	-30.2	20.9	-	-	0-360	198	H
8	209.6012	37.94	Pk	16.4	-30.1	24.24	-	-	0-360	198	H
11	209.6012	41.93	Pk	16.4	-30.1	28.23	-	-	0-360	102	V
12	352.0198	32.48	Pk	20.5	-29.3	23.68	-	-	0-360	102	V
13	518.3414	40.37	Pk	23.7	-28.9	35.17	-	-	0-360	102	V
10	518.4414	42.29	Pk	23.7	-28.9	37.09	-	-	0-360	102	H

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
** - indicates frequency in Taiwan NCC LP0002 Restricted Band
Pk - Peak detector

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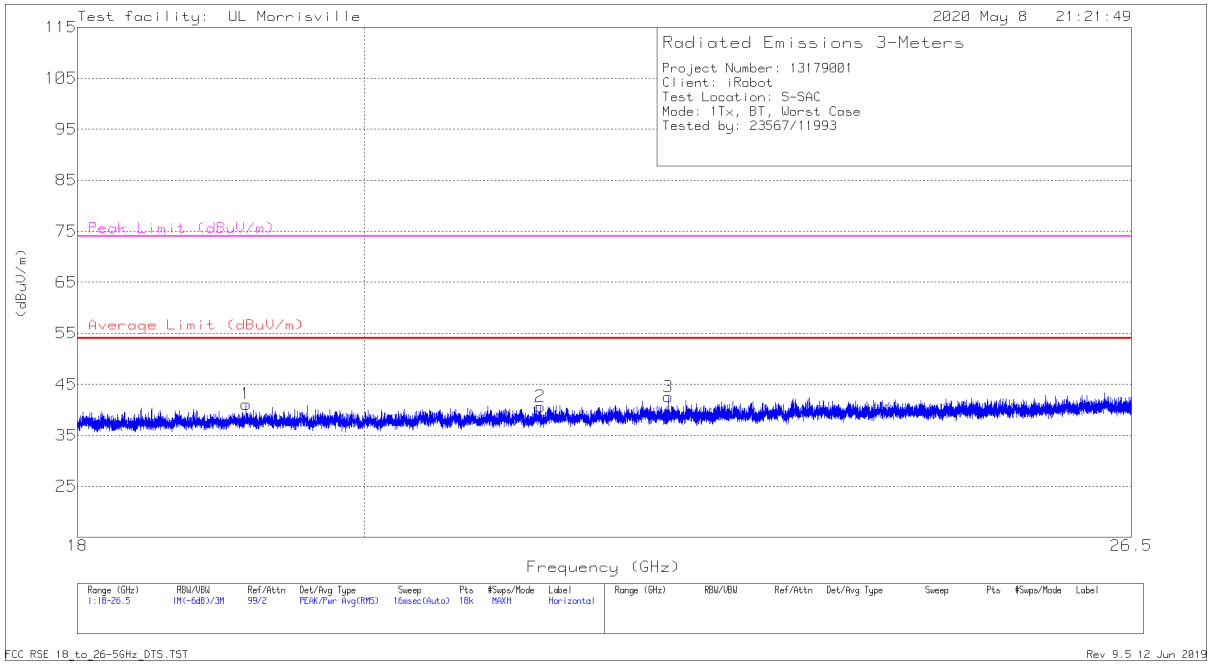
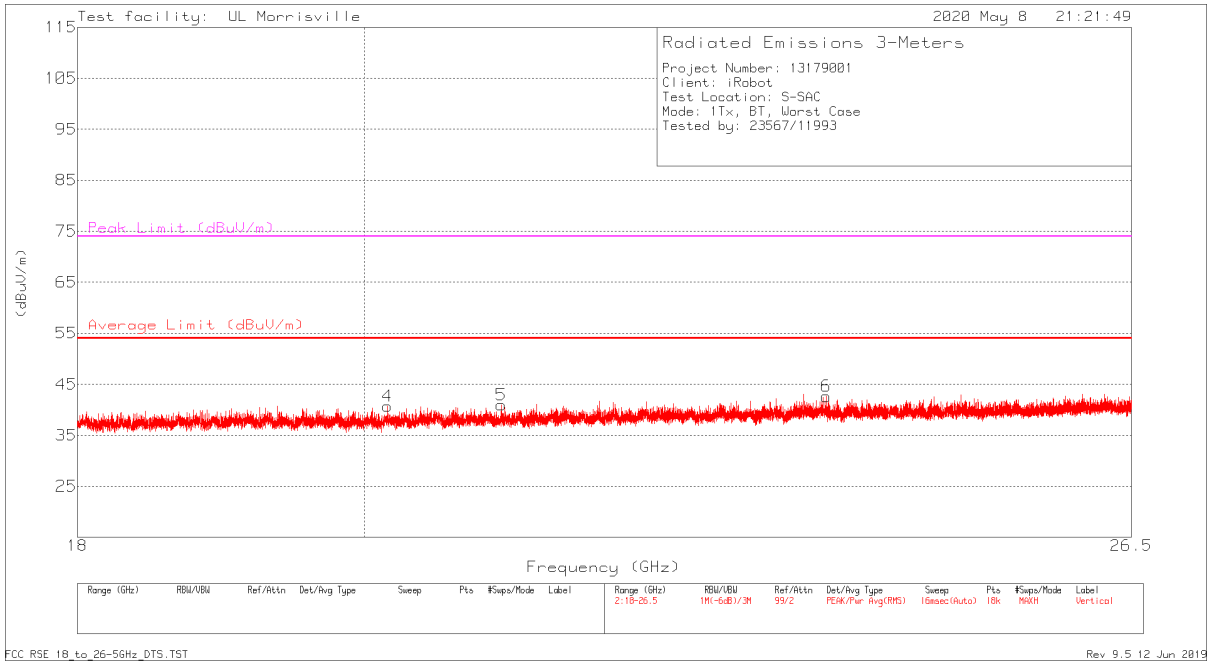
10.4. WORST CASE 18-26 GHZ

SPURIOUS EMISSIONS 18-26 GHz (WORST-CASE CONFIGURATION – EXT ANTENNA)



HORIZONTAL



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18 – 26GHz DATA

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AT0076 AF (dB/m)	Amp/Cbl (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* ** 19.14992	46.34	Pk	32.7	-37.9	41.14	54	-12.86	74	-32.86	0-360	102	H
2	* ** 21.33124	44.94	Pk	33.1	-37.4	40.64	54	-13.36	74	-33.36	0-360	298	H
3	* ** 22.35979	45.93	Pk	33.5	-36.9	42.53	54	-11.47	74	-31.47	0-360	148	H
4	* ** 20.16856	45.31	Pk	32.8	-37.4	40.71	54	-13.29	74	-33.29	0-360	152	V
5	* ** 21.029	45.32	Pk	33.2	-37.6	40.92	54	-13.08	74	-33.08	0-360	298	V
6	* ** 23.69106	45.13	Pk	34	-36.5	42.63	54	-11.37	74	-31.37	0-360	252	V

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
** - indicates frequency in Taiwan NCC LP0002 Restricted Band
Pk - Peak detector

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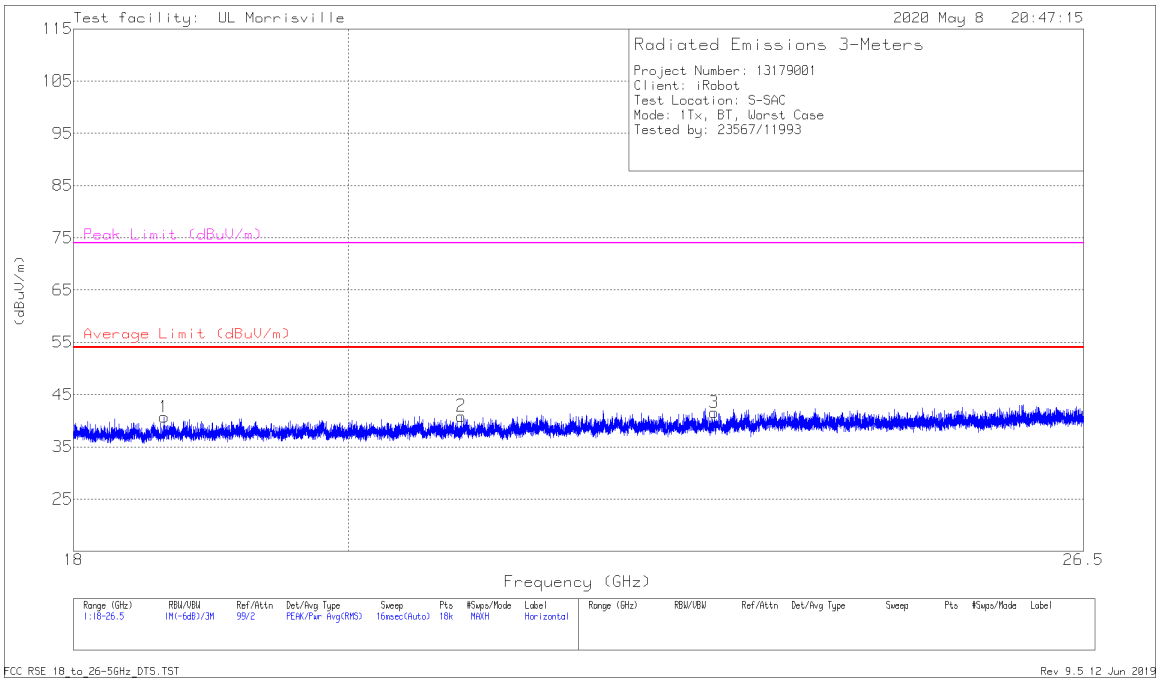
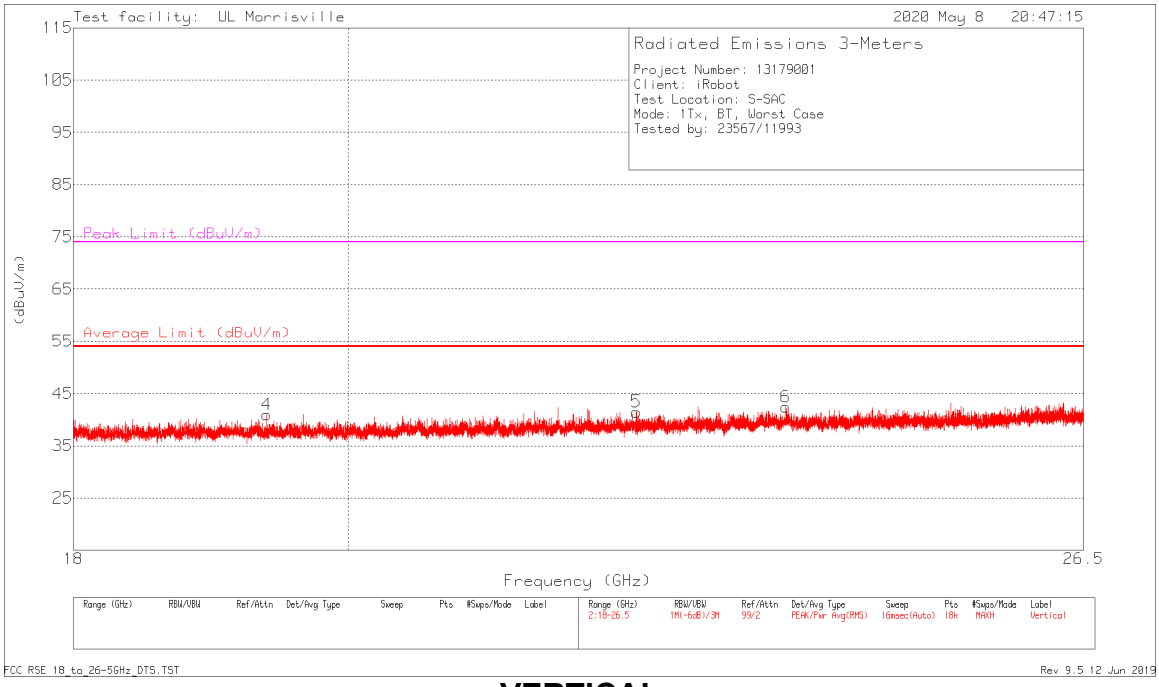
SPURIOUS EMISSIONS 18-26 GHz (WORST-CASE CONFIGURATION – PCB ANTENNA)



HORIZONTAL



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18 – 26GHz DATA

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AT0076 AF (dB/m)	Amp/Cbl (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* ** 18.63706	46.22	Pk	32.6	-38.1	40.72	54	-13.28	74	-33.28	0-360	102	H
2	* ** 20.88119	45.28	Pk	33.1	-37.5	40.88	54	-13.12	74	-33.12	0-360	148	H
3	* ** 23.00347	44.68	Pk	33.7	-36.8	41.58	54	-12.42	74	-32.42	0-360	102	H
4	* ** 19.38274	46.16	Pk	32.7	-37.9	40.96	54	-13.04	74	-33.04	0-360	298	V
5	* ** 22.32957	45.19	Pk	33.5	-37.2	41.49	54	-12.51	74	-32.51	0-360	152	V
6	* ** 23.64242	45.01	Pk	33.9	-36.5	42.41	54	-11.59	74	-31.59	0-360	252	V

Pk - Peak detector

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11. AC POWER LINE CONDUCTED EMISSIONS

LIMITS

FCC §15.207 (a)

RSS-Gen 8.8

Frequency of Emission (MHz)	Conducted Limit (dBuV)	
	Quasi-peak	Average
0.15-0.5	66 to 56 *	56 to 46 *
0.5-5	56	46
5-30	60	50

* Decreases with the logarithm of the frequency.

TEST PROCEDURE

The EUT is placed on a non-conducting table 40 cm from the vertical ground plane and 80 cm above the horizontal ground plane. The EUT is configured in accordance with ANSI C63.10.

The receiver is set to a resolution bandwidth of 9 kHz. Peak detection is used unless otherwise noted as quasi-peak or average.

Line conducted data is recorded for both NEUTRAL and HOT lines.

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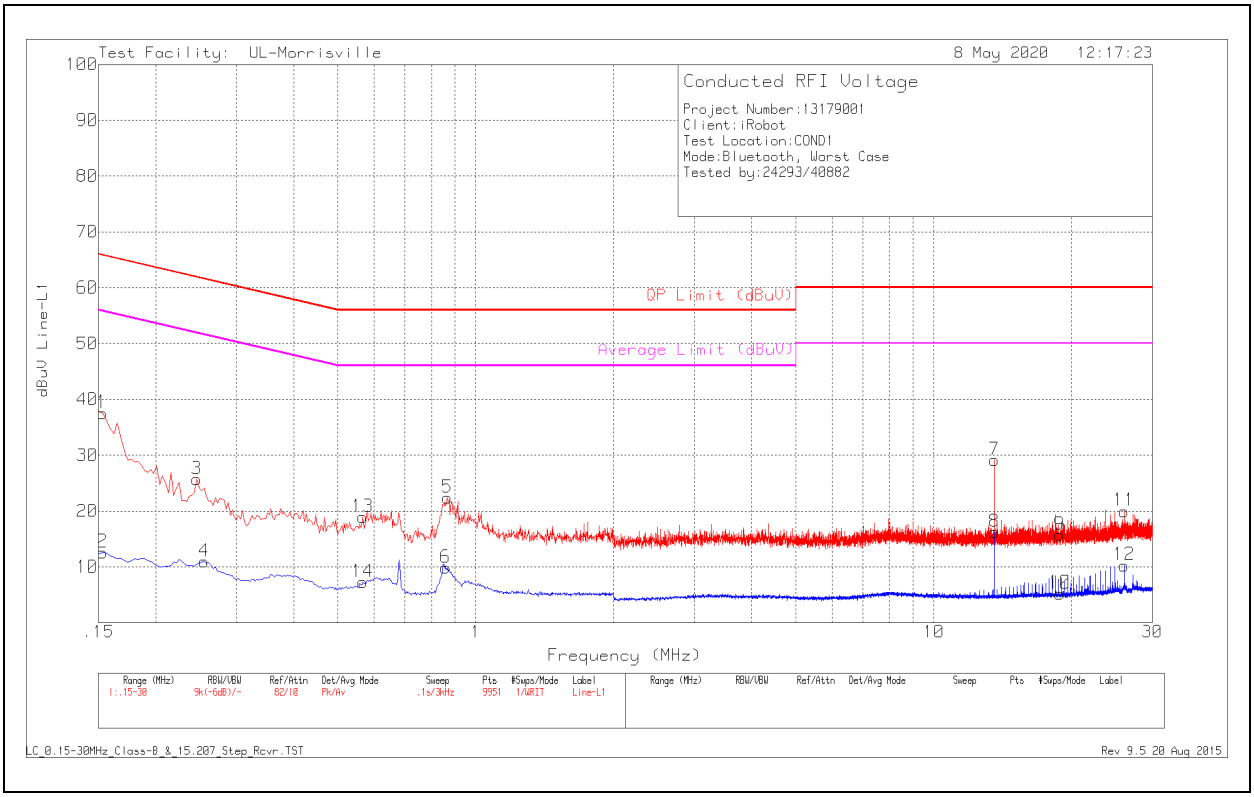
11.1.1. AC Power Line Norm

LINE 1 RESULTS – EXTERNAL ANTENNA



Range 1: Line-L1 .15 - 30MHz										
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	LISN VCF (dB)	Cbl/Limiter (dB)	Corrected Reading dBuV	QP Limit (dBuV)	Margin (dB)	Average Limit (dBuV)	Margin (dB)
1	.153	27.66	Pk	.2	9.7	37.56	65.84	-28.28	-	-
2	.153	2.71	Av	.2	9.7	12.61	-	-	55.84	-43.23
3	.246	15.87	Pk	.1	9.7	25.67	61.89	-36.22	-	-
4	.255	1.15	Av	.1	9.7	10.95	-	-	51.59	-40.64
5	.867	12.6	Pk	0	9.8	22.4	56	-33.6	-	-
6	.858	.02	Av	0	9.8	9.82	-	-	46	-36.18
7	13.56	19.04	Pk	.1	10	29.14	60	-30.86	-	-
8	13.56	6.16	Av	.1	10	16.26	-	-	50	-33.74
9	18.807	5.54	Pk	.1	10.1	15.74	60	-44.26	-	-
10	18.816	-4.96	Av	.1	10.1	5.24	-	-	50	-44.76
11	26.016	9.5	Pk	.3	10.2	20	60	-40	-	-
12	26.016	-.21	Av	.3	10.2	10.29	-	-	50	-39.71
13	.567	9.05	Pk	.1	9.8	18.95	56	-37.05	-	-
14	.567	-2.61	Av	.1	9.8	7.29	-	-	46	-38.71

Pk - Peak detector
Av – Average detector

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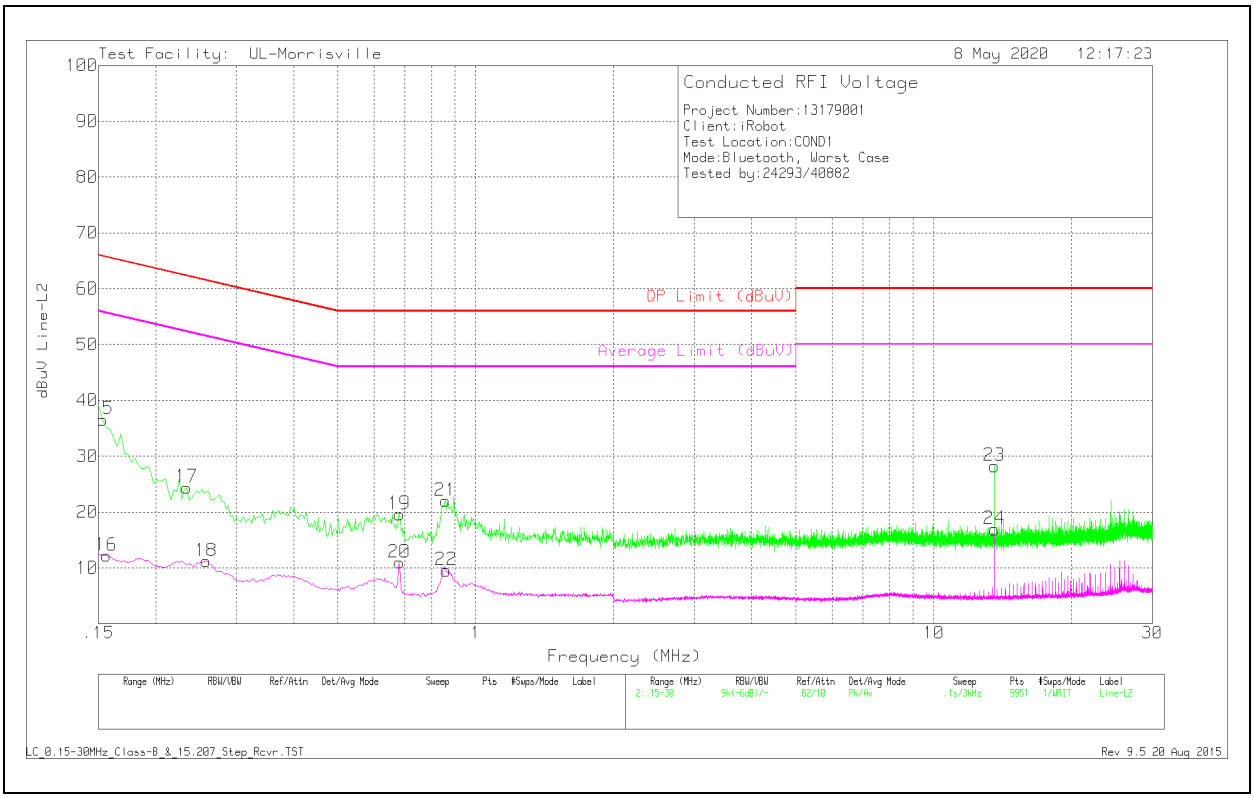
LINE 2 RESULTS – EXTERNAL ANTENNA



Range 2: Line-L2 .15 - 30MHz										
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	LISN VCF (dB)	Cbl/Limiter (dB)	Corrected Reading dBuV	QP Limit (dBuV)	Margin (dB)	Average Limit (dBuV)	Margin (dB)
15	.153	26.69	Pk	.2	9.7	36.59	65.84	-29.25	-	-
16	.156	2.3	Av	.2	9.7	12.2	-	-	55.67	-43.47
17	.234	14.61	Pk	.1	9.7	24.41	62.31	-37.9	-	-
18	.258	1.43	Av	.1	9.7	11.23	-	-	51.5	-40.27
19	.681	9.8	Pk	0	9.8	19.6	56	-36.4	-	-
20	.681	1.19	Av	0	9.8	10.99	-	-	46	-35.01
21	.858	12.24	Pk	0	9.8	22.04	56	-33.96	-	-
22	.861	-.24	Av	0	9.8	9.56	-	-	46	-36.44
23	13.56	18.14	Pk	.1	10	28.24	60	-31.76	-	-
24	13.56	6.83	Av	.1	10	16.93	-	-	50	-33.07

Pk - Peak detector
Av – Average detector

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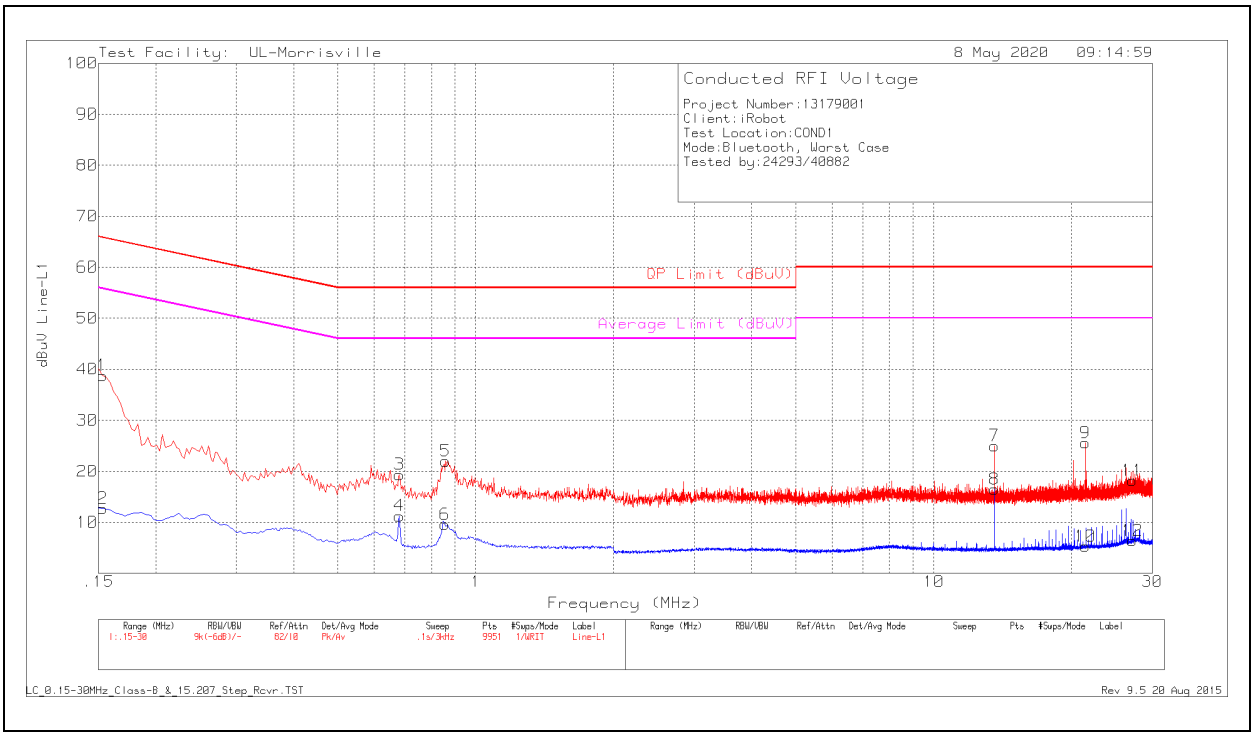
LINE 1 RESULTS – PCB ANTENNA



Range 1: Line-L1 .15 - 30MHz										
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	LISN VCF (dB)	Cbl/Limiter (dB)	Corrected Reading dBuV	QP Limit (dBuV)	Margin (dB)	Average Limit (dBuV)	Margin (dB)
1	.153	28.88	Pk	.2	9.7	38.78	65.84	-27.06	-	-
2	.153	2.82	Av	.2	9.7	12.72	-	-	55.84	-43.12
3	.681	9.48	Pk	.1	9.8	19.38	56	-36.62	-	-
4	.681	1.37	Av	.1	9.8	11.27	-	-	46	-34.73
5	.858	12.18	Pk	0	9.8	21.98	56	-34.02	-	-
6	.855	-.21	Av	0	9.8	9.59	-	-	46	-36.41
7	13.56	14.92	Pk	.1	10	25.02	60	-34.98	-	-
8	13.56	6.36	Av	.1	10	16.46	-	-	50	-33.54
9	21.417	15.28	Pk	.2	10.1	25.58	60	-34.42	-	-
10	21.411	-4.97	Av	.2	10.1	5.33	-	-	50	-44.67
11	27.117	7.69	Pk	.3	10.2	18.19	60	-41.81	-	-
12	27.12	-4.11	Av	.3	10.2	6.39	-	-	50	-43.61

Pk - Peak detector
Av – Average detector

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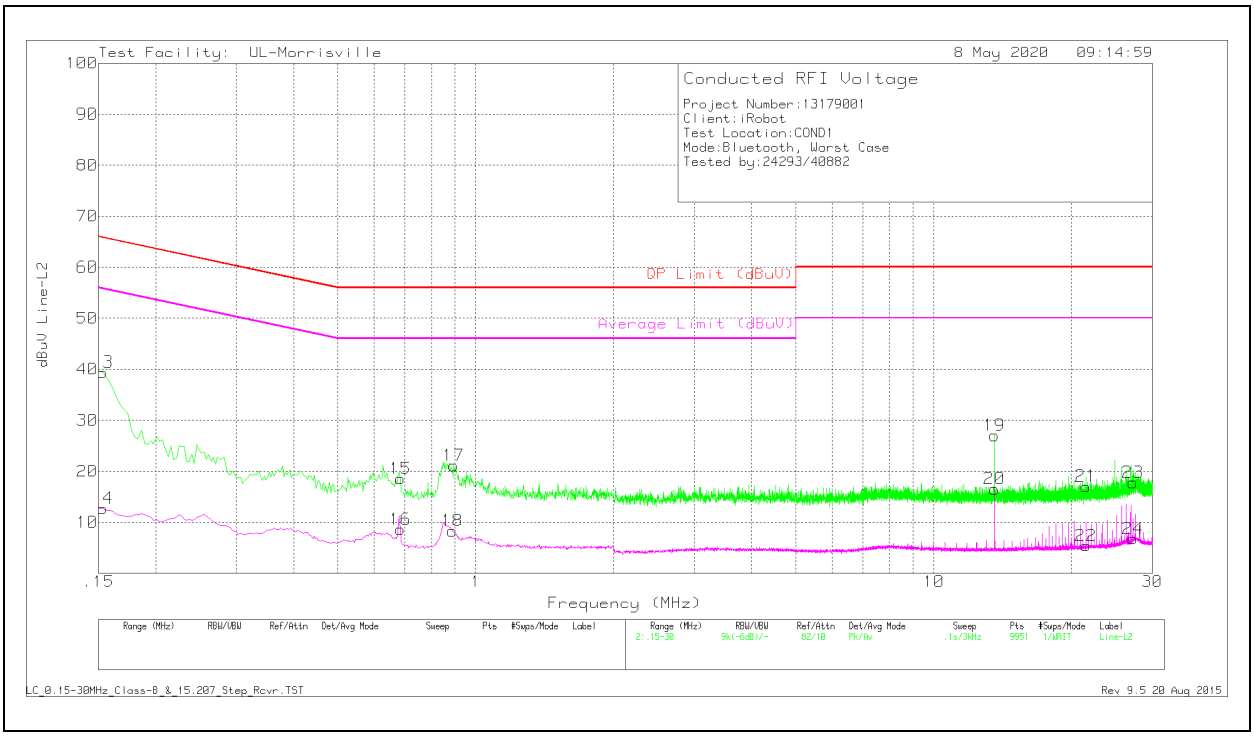
LINE 2 RESULTS – PCB ANTENNA



Range 2: Line-L2 .15 - 30MHz										
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	LISN VCF (dB)	Cbl/Limiter (dB)	Corrected Reading dBuV	QP Limit (dBuV)	Margin (dB)	Average Limit (dBuV)	Margin (dB)
13	.153	29.5	Pk	.2	9.7	39.4	65.84	-26.44	-	-
14	.153	2.84	Av	.2	9.7	12.74	-	-	55.84	-43.1
15	.684	8.77	Pk	0	9.8	18.57	56	-37.43	-	-
16	.684	-1.16	Av	0	9.8	8.64	-	-	46	-37.36
17	.894	11.32	Pk	0	9.8	21.12	56	-34.88	-	-
18	.888	-1.47	Av	0	9.8	8.33	-	-	46	-37.67
19	13.563	16.92	Pk	.1	10	27.02	60	-32.98	-	-
20	13.56	6.46	Av	.1	10	16.56	-	-	50	-33.44
21	21.477	6.74	Pk	.2	10.1	17.04	60	-42.96	-	-
22	21.498	-4.85	Av	.2	10.1	5.45	-	-	50	-44.55
23	27.222	7.4	Pk	.2	10.2	17.8	60	-42.2	-	-
24	27.234	-3.64	Av	.2	10.2	6.76	-	-	50	-43.24

Pk - Peak detector
Av – Average detector

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12. SETUP PHOTOS

Please refer to R13179001-EP1 for setup photos

END OF TEST REPORT

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