Test report

396072-2TRFWL

Date of issue: September 21, 2020

Applicant:

ShadeCraft Robotics, Inc.

Product:

Solar Charging Table with Bluetooth Speaker and Inductive Charger

Model:

SHADECRAFT SUNTABLE

FCC ID: 2AWYN-SUNTABLE IC: 26285-SUNTABLE

Specifications:

- FCC 47 CFR Part 15, Subpart C – §15.247
  Operation within the bands 902 – 928 MHz, 2400 – 2483.5 MHz, 5727 – 5850 MHz
- Industry Canada RSS-247, Issue 2
  Digital Transmission Systems (DTSs), Frequency Hopping Systems (FHSs) and Licence-Exempt Local Area Network (LE-LAN) Devices

Lab and test locations

Company name	Nemko USA Inc.
Address	2210 Faraday Ave, Suite 150
City	Carlsbad
State	California
Postal code	92008
Country	USA
Telephone	+1 760 444 3500
Website	www.nemko.com
FCC Site Number	Test Firm Registration Number: 392943 Designation Number: US5058
ISED Test Site	2040B-3

Tested by	David Hewitt, EMC Specialist
Reviewed by	James Cunningham, EMC/MIL/WL Supervisor
Review date	September 21, 2020
Reviewer signature	

Limits of responsibility

Note that the results contained in this report relate only to the items tested and were obtained in the period between the date of initial receipt of samples and the date of issue of the report.
This test report has been completed in accordance with the requirements of ISO/IEC 17025. All results contain in this report are within Nemko USA's ISO/IEC 17025 accreditation.
This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the U.S. Government.

Copyright notification

Table of Contents

Section 1 Report summary

1.1 Applicant

Company name	ShadeCraft Robotics, Inc.
Address	116 W Del Mar Blvd
City	Pasadena
State	CA
Postal/Zip code	91105
Country	USA

1.2 Manufacturer

Company name	ShadeCraft Robotics, Inc.
Address	116 W Del Mar Blvd
City	Pasadena
State	CA
Postal/Zip code	91105
Country	USA

1.3 Test specifications

FCC 47 CFR Part 15, Subpart C – §15.247	Operation within the bands 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz
IC RSS-247 Issue 2	Digital Transmission Systems (DTSs), Frequency Hopping Systems (FHSs) and Licence-Exempt Local Area Network (LE-LAN) Devices

1.4 Test methods

ANSI C63.10-2013	American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices
558074 D01 DTS Measurement Guidance v03r02 (June 5, 2014)	Guidance for Performing Compliance Measurements on Digital Transmission Systems (DTS) Operating Under §15.247

1.5 Exclusions

None

1.6 Statement of compliance

In the configuration tested, the EUT was found compliant.

Testing was performed against all relevant requirements of the test standard. Results obtained indicate that the product under test complies in full with the requirements tested. The test results relate only to the items tested.

See "Summary of test results" for full details.

1.7 Test report revision history

Table 1.7-1: *Test report revision history*

Revision #	Details of changes made to test report
396072-2TRFWL	Original report issued

Notes: None

Section 2 Summary of test results

2.1 FCC Part 15 Subpart C, general requirements

Part	Test description	Verdict
§15.207(a)	Conducted limits	Pass
§15.31(e)	Variation of power source	Pass
§15.203	Antenna requirement	Pass

Notes: EUT is AC powered, Battery powered, and Solar powered which charges the battery
The EUT uses a unique antenna coupling/ non-detachable antenna to the intentional radiator.

2.2 FCC Part 15.247

Part	Test description	Verdict
§15.247(a)(1)(i)	Frequency hopping systems operating in the 902–928 MHz band	Not applicable
§15.247(a)(1)(ii)	Frequency hopping systems operating in the 5725–5850 MHz band	Not applicable
§15.247(a)(1)(iii)	Frequency hopping systems operating in the 2400–2483.5 MHz band	Pass
§15.247(a)(2)	Minimum 6 dB bandwidth for systems using digital modulation techniques	Not applicable
§15.247(b)(1)	Maximum peak output power of frequency hopping systems operating in the 2400–2483.5 MHz band and 5725–5850 MHz band	Pass
§15.247(b)(2)	Maximum peak output power of Frequency hopping systems operating in the 902–928 MHz band	Not applicable
§15.247(b)(3)	Maximum peak output power of systems using digital modulation in the 902–928 MHz, 2400–2483.5 MHz, and 5725–5850 MHz bands	Not applicable
§15.247(b)(4)	Transmitting antennas of directional gain greater than 6 dBi	Not applicable
§15.247(c)(1)	Fixed point-to-point operation with directional antenna gains greater than 6 dBi	Not applicable
§15.247(c)(2)	Transmitters operating in the 2400–2483.5 MHz band that emit multiple directional beams	Not applicable
§15.247(d)	Spurious emissions	Pass
§15.247(e)	Power spectral density for digitally modulated devices	Not applicable
§15.247(f)	Time of occupancy for hybrid systems	Not applicable

2.3 IC RSS-247, Issue 2

Part	Test description	Verdict
5.1 (a)	Bandwidth of a frequency hopping channel	Pass
5.1 (b)	Minimum channel spacing for frequency hopping systems	Pass
5.1 (c)	Frequency hopping systems operating in the 902–928 MHz band	Not applicable
5.1 (d)	Frequency hopping systems operating in the 2400–2483.5 MHz band	Pass
5.1 (e)	Frequency hopping systems operating in the 5725–5850 MHz band	Not applicable
5.2 (a)	Minimum 6 dB bandwidth	Not applicable
5.2 (b)	Maximum power spectral density	Not applicable
5.3 (a)	Digital modulation turned off	Not applicable
5.3 (b)	Frequency hopping turned off	Not applicable
5.4 (a)	Frequency hopping systems operating in the 902–928 MHz band	Not applicable
5.4 (b)	Frequency hopping systems operating in the 2400–2483.5 MHz band	Pass
5.4 (c)	Frequency hopping systems operating in the 5725–5850 MHz	Not applicable
5.4 (d)	Systems employing digital modulation techniques	Not applicable
5.4 (e)	Point-to-point systems in 2400–2483.5 MHz and 5725–5850 MHz band	Not applicable
5.4 (f)	Transmitters which operate in the 2400–2483.5 MHz band with multiple directional beams	Not applicable
5.5	Out-of-band emissions	Pass

2.4 IC RSS-GEN, Issue 5

Part	Test description	Verdict
7.3	Receiver radiated emission limits	Not applicable
7.4	Receiver conducted emission limits	Not applicable
8.8	Power Line Conducted Emissions Limits for License-Exempt Radio Apparatus	Pass

Section 3 Equipment under test (EUT) details

3.1 Sample information

Receipt date	July 15, 2020
Nemko sample ID number	NEx: 396072

3.2 EUT information

Product name	Solar Charging Table with Bluetooth Speaker and Inductive Charger
Model	ShadeCraft Suntable
Serial number	N/A – prototype sample
Part number	N/A – prototype sample

3.3 Technical information

Used IC test site(s) reg. number	2040A
RSS number and issue	RSS-247 issue 2 (February 2017)
Frequency band	2400 – 2483.5 MHz
Bluetooth specification	V4.2
Minimum frequency (MHz)	2402
Maximum frequency (MHz)	2480
Output power class	Class 1
Max output power	8.11 dBm
Number of Channels	79
Type of modulation	GFSK, π/4 DQPSK, 8DPSK
Bluetooth operating voltage	3.3 V_{DC}
Power requirements	100-240 V_{AC}, 50/60 Hz; 14.4 V_{DC} battery; Solar
Antenna information	The EUT uses a unique antenna coupling/ non-detachable antenna to the intentional radiator.

3.4 EUT exercise and monitoring details

EUT was tested both in battery powered and AC powered modes. For AC Mains conducted emissions testing, EUT was connected to a Bluetooth device as well as having the inductive charger activated in order to fully exercise the EUT. Intentional radiated emissions testing was tested with the Bluetooth module transmitting at the lowest (2402 MHz), middle (2441 MHz), and highest (2480 MHz) channels.

Table 3.4-1: *EUT sub assemblies*

Description	Brand name	Model/Part number	Serial number	Rev.
Suntable	ShadeCraft	Suntable	N/A – prototype sample	--
Power supply	ShadeCraft	FY0421682000	--	--

Table 3.4-2: *EUT interface ports*

Description	Qty.
USB	1

Table 3.4-3: *Support equipment*

Description	Brand name	Model/Part number	Serial number	Rev.
Support Laptop	Dell	Latitude E7470	12258194222	--
Cell phone	Motorola	Droid Turbo II	--	--

Table 3.4-4: *Inter-connection cables*

Cable description	From	To	Length (m)
--	--	--	--

3.5 EUT setup diagram

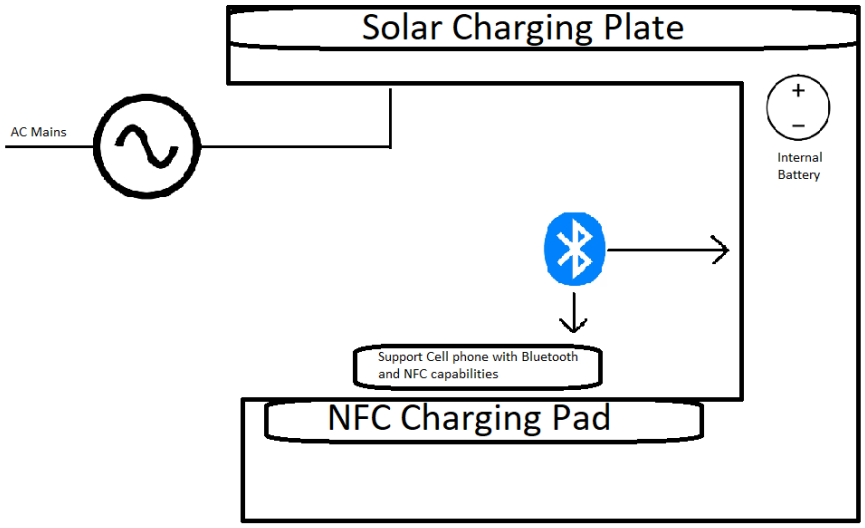


Figure 3.5-1: *Setup diagram*

3.6 EUT exercise details

The EUT was operated at 100% duty cycle for this testing. CSR BlueSuite 2.6.8 software was used to set up the test parameters. This software allowed the setting of the transmit mode and set frequency or hopping mode.

Section 4 Engineering considerations

4.1 Modifications incorporated in the EUT

There were no modifications performed to the EUT during this assessment.

4.2 Technical judgment

None

4.3 Deviations from laboratory tests procedures

No deviations were made from laboratory procedures.

Section 5 Test conditions

5.1 Atmospheric conditions

Temperature	15-30 °C
Relative humidity	20-75 %
Air pressure	86–106 kPa

When it is impracticable to carry out tests under these conditions, a note to this effect stating the ambient temperature and relative humidity during the tests shall be recorded and stated.

5.2 Power supply range

The normal test voltage for equipment to be connected to the mains shall be the nominal mains voltage. For the purpose of the present document, the nominal voltage shall be the declared voltage, or any of the declared voltages ±5 %, for which the equipment was designed.

Section 6 Measurement uncertainty

6.1 Uncertainty of measurement

Measurement uncertainty budgets for the tests are detailed below. Measurement uncertainty calculations assume a coverage factor of K = 2 with 95% certainty.

Test name	Measurement uncertainty, dB
Radiated spurious emissions	3.78
Powerline conducted emissions	1.38
All antenna port measurements	0.55
Conducted spurious emissions	1.13

Section 7 Test Equipment

Table 6.1-1: *Test Equipment List*

Equipment	Manufacturer	Model no.	Asset no.	Cal cycle	Next cal.
EMI Test Receiver	Rohde & Schwarz	ESCI 7	E1026	2 yr	29 May 2021
Transient Limiter (10 dB pad)	Hewlett-Packard	11947A	681	1 yr	20 Jan 2021
Two Line V-Network	Rohde & Schwarz	ENV216	E1020	1 yr	29 Aug 2020
Two Line V-Network	Rohde & Schwarz	ENV216	E1019	1 yr	04 Aug 2021
Signal and Spectrum Analyzer	Rohde & Schwarz	FSV 40	E1120	1 yr	19 Nov 2020
Signal and Spectrum Analyzer	Rohde & Schwarz	FSW43	E1302	1 yr	13 Jan 2021
EMI Test Receiver	Rohde & Schwarz	ESU40	E1121	1 yr	25 Nov 2020
System Controller	Sunol Sciences	SC104V	E1129	NCR	NCR
Bilog Antenna	Schaffner	CBL6111C	1480	1 yr	18 Oct 2020
DRG Horn	ETS-Lindgren	3117-PA	E1160	2 yr	30 Oct 2020
Horn antenna (18-26GHz)	SAGE	SAR-2309-42-S2	E1143	2 yr	5 Jul 2020*
Low Noise Amplifier	SAGE	SBL-1834034030-KFKF	E1228	1 yr	3 Jul 2020*

Notes: NCR - no calibration required

Note: * Horn antenna and Low Noise Amplifier calibration date extended until completion of testing

Table 6.1-2: *Test Software*

Manufacturer of Software	Details
Rohde & Schwarz	EMC 32 V10.20.01 (AC conducted emissions)
Rohde & Schwarz	EMC 32 V10.60.15 (radiated emissions)

Notes: None

Section 8 Testing data

8.1 FCC 15.207(a) and IC RSS-GEN, Issue 5 8.8 AC power line conducted emissions

8.1.1 Definition and limits

Title 47 → Chapter I → Subchapter A → Part 15 → Subpart C → §15.207(a)
RSS-Gen → §8.8

- For Low-power radio-frequency devices that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies, within the band 150 kHz to 30 MHz, shall not exceed the limits in the following table, as measured using a 50 µH/50 Ω line impedance stabilization network (LISN). The lower limit applies at the boundary between the frequency ranges.

Table 8.1-1: *Conducted emissions limit*

Frequency of emission, MHz	Conducted limit, dBµV	
	Quasi-peak	Average
0.15–0.5	66 to 56*	56 to 46*
0.5–5	56	46
5–30	60	50

Note: * - Decreases with the logarithm of the frequency.

8.1.2 Test summary

Verdict	Pass		
Test date	September 4, 2020	Temperature	22 °C
Test engineer	David Hewitt, EMC Specialist	Air pressure	1003 mbar
Test location	Ground Plane	Relative humidity	64 %

8.1.1 Notes

Testing was performed with the BLE transmitter operating on a fixed channel at full power. Low, middle and high channels with all three modulation schemes—GFSK, π/4 DQPSK, 8DPSK— were tested; the worst case (2402 MHz, GFSK modulation) reported here.

Testing was performed according to ANSI C63.10 §6.2.

8.1.2 Setup details

Port under test	AC mains
EUT setup configuration	Floor standing
Measurement details	A preview measurement was generated with the receiver in continuous scan mode. Emissions detected within 6 dB or above limit were re-measured with the appropriate detector against the correlating limit and recorded as the final measurement.

Receiver settings:

Resolution bandwidth	9 kHz
Video bandwidth	30 kHz
Detector mode	– Peak and Average (Preview measurement) – Quasi-peak and CAverage (Final measurement)
Trace mode	Max Hold
Measurement time	– 100 ms (Peak and Average preview measurement) – 5000 ms (Quasi-peak final measurement) – 5000 ms (CAverage final measurement)

8.1.3 Test data

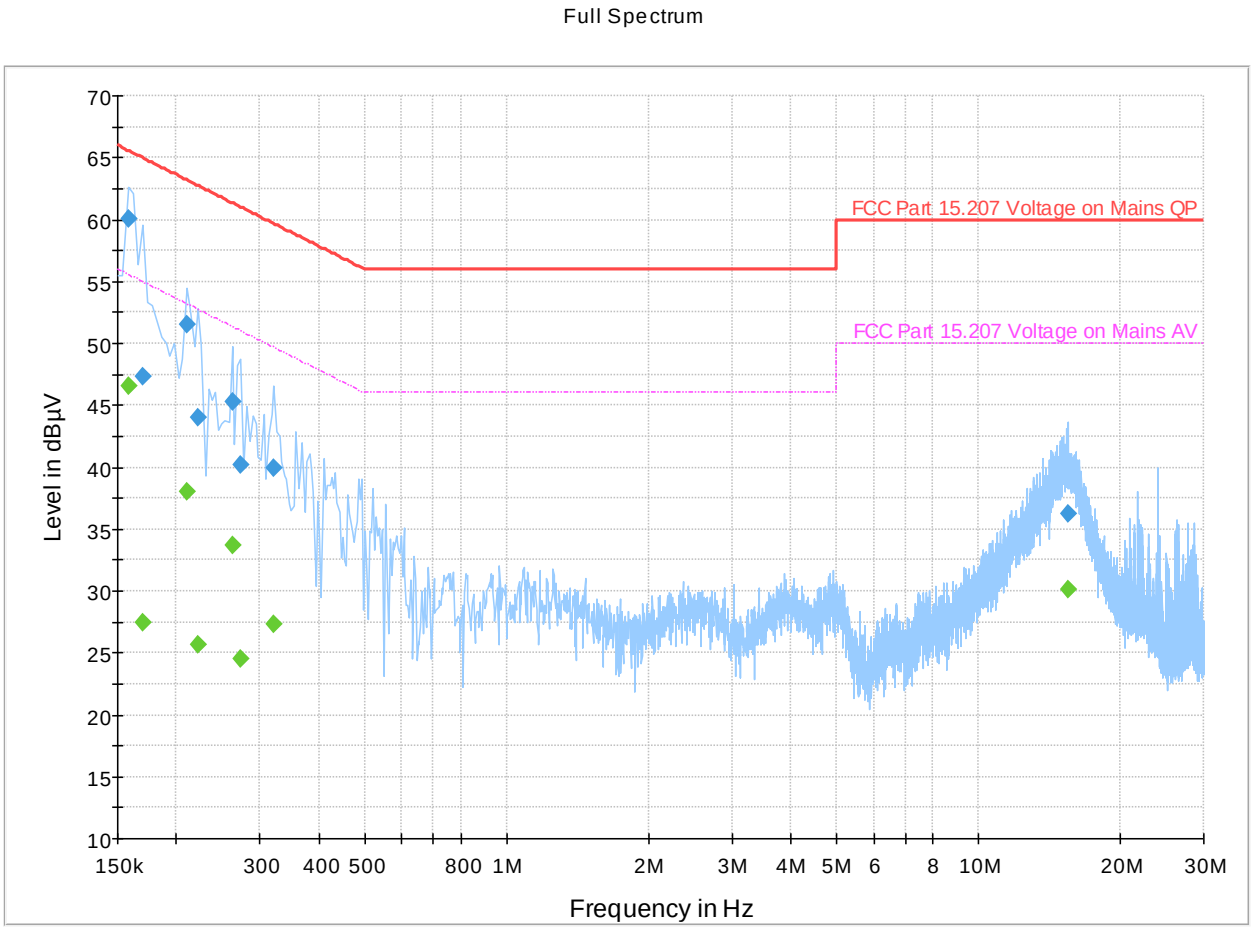


Figure 8.1-1: *AC conducted emissions*

Table 8.1-2: *AC conducted emissions, 150 kHz – 30 MHz*

Frequency (MHz)	QuasiPeak (dBµV)	CAverage (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Filter	Corr. (dB)
0.158000	60.11	---	65.57	5.46	5000.0	9.000	N	ON	19.6
0.158000	---	46.61	55.57	8.95	5000.0	9.000	N	ON	19.6
0.170000	47.34	---	64.96	17.62	5000.0	9.000	L1	ON	19.6
0.170000	---	27.41	54.96	27.55	5000.0	9.000	L1	ON	19.6
0.210000	51.48	---	63.21	11.73	5000.0	9.000	L1	ON	19.5
0.210000	---	37.98	53.21	15.23	5000.0	9.000	L1	ON	19.5
0.222000	---	25.68	52.74	27.07	5000.0	9.000	L1	ON	19.5
0.222000	44.06	---	62.74	18.69	5000.0	9.000	L1	ON	19.5
0.262000	45.33	---	61.37	16.03	5000.0	9.000	N	ON	19.4
0.262000	---	33.71	51.37	17.66	5000.0	9.000	N	ON	19.4
0.274000	---	24.47	51.00	26.52	5000.0	9.000	N	ON	19.4
0.274000	40.25	---	61.00	20.75	5000.0	9.000	N	ON	19.4
0.322000	---	27.37	49.66	22.29	5000.0	9.000	L1	ON	19.5
0.322000	39.95	---	59.66	19.70	5000.0	9.000	L1	ON	19.5
15.498000	---	30.08	50.00	19.92	5000.0	9.000	L1	ON	20.2
15.498000	36.24	---	60.00	23.76	5000.0	9.000	L1	ON	20.2

Notes: Result (dBµV) = receiver/spectrum analyzer value (dBµV) + correction factor (dB)
Correction factor (dB) = LISN factor IL (dB) + cable loss (dB) + transient limiter (dB)
The maximum measured value observed over a period of 5 seconds was recorded.

8.2 FCC 15.247(a)(1)(iii) and RSS-247 5.1(d) – Number of Hopping Channels

8.2.1 Definition and limits

Title 47 → Chapter I → Subchapter A → Part 15 → Subpart C → §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 channels.

8.2.2 Test summary

Test date	July 3, 2020	Temperature	23 °C
Test engineer	David Hewitt, EMC Specialist	Air pressure	1005 mbar
Test location	Wireless workbench	Relative humidity	60 %

8.2.3 Notes

79 channels exist in the FHS system from 2402 to 2480 MHz.

8.2.4 Setup details

EUT setup configuration	Floor standing
Test facility	Nemko San Diego
Measurement method	ANSI C63.10 §7.8.3

Receiver/spectrum analyzer settings:

Resolution bandwidth	300 kHz
Video bandwidth	300 kHz
Detector mode	Peak
Trace mode	Max Hold
Measurement time	Long enough for trace to stabilize

8.2.5 Test data

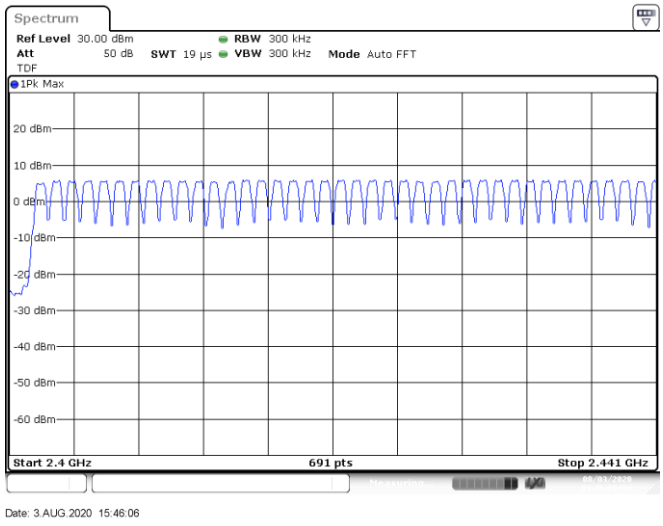


Figure 8.2-1: *Hopping channels, 2402 – 2441 MHz*

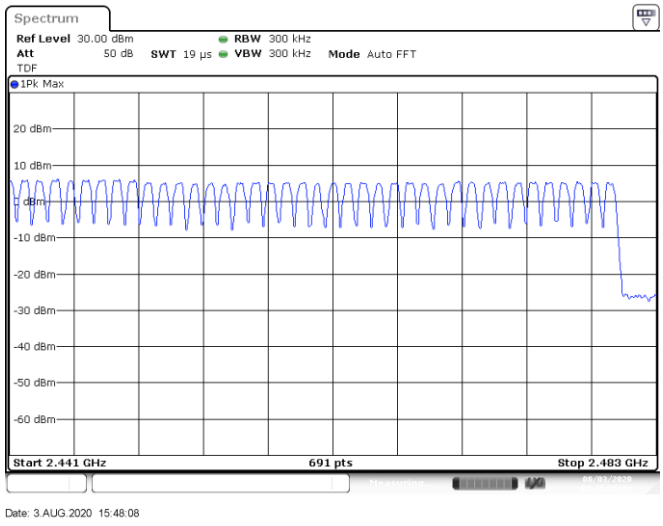


Figure 8.2-2: *Hopping channels, 2441 – 2480 MHz*

8.3 RSS-Gen (6.7) – 99% Occupied Bandwidth

8.3.1 Definition and limits

RSS-Gen → §6.7

- The occupied bandwidth or the "99% emission bandwidth" is defined as the frequency range between two points, one above and the other below the carrier frequency, within which 99% of the total transmitted power of the fundamental transmitted emission is contained. The occupied bandwidth shall be reported for all equipment in addition to the specified bandwidth required in the applicable RSSs.

8.3.2 Test summary

Test date	July 30, 2020	Temperature	23 °C
Test engineer	David Hewitt, EMC Specialist	Air pressure	1005 mbar
Test location	Wireless workbench	Relative humidity	65 %

8.3.3 Notes

None

8.3.4 Setup details

EUT setup configuration	Floor standing
Test facility	Nemko San Diego
Measurement method	ANSI C63.10 §6.9.3 using built-in marker function of the spectrum analyzer

Receiver/spectrum analyzer settings:

Resolution bandwidth	30 kHz
Video bandwidth	100 kHz
Detector mode	Peak
Trace mode	Max Hold
Measurement time	Long enough for trace to stabilize

8.3.5 Test data

Table 8.3-1: *99% occupied bandwidth test data*

Data Packet Type	Modulation Type	Frequency (MHz)	99% Occupied Bandwidth (MHz)
DH5	GFSK	2402	0.88567
DH5	GFSK	2441	0.87988
DH5	GFSK	2480	0.87410
2DH5	π/4 DQPSK	2402	1.17511
2DH5	π/4 DQPSK	2441	1.18090
2DH5	π/4 DQPSK	2480	1.17511
3DH5	8DPSK	2402	1.16932
3DH5	8DPSK	2441	1.17511
3DH5	8DPSK	2480	1.16932

8.3.5 Test data, continued

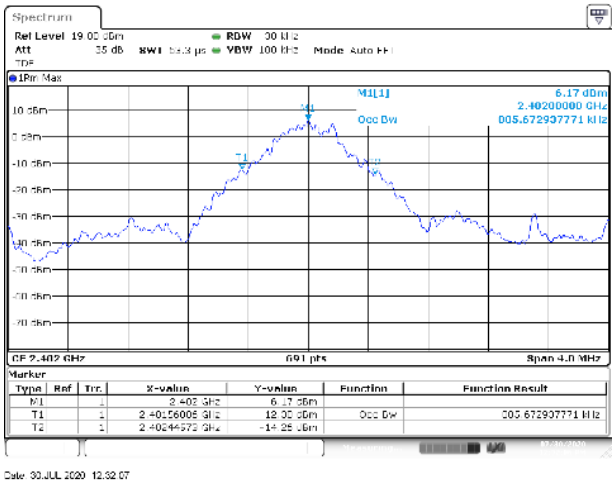


Figure 8.3-1: GFSK modulation @ 2402 MHz

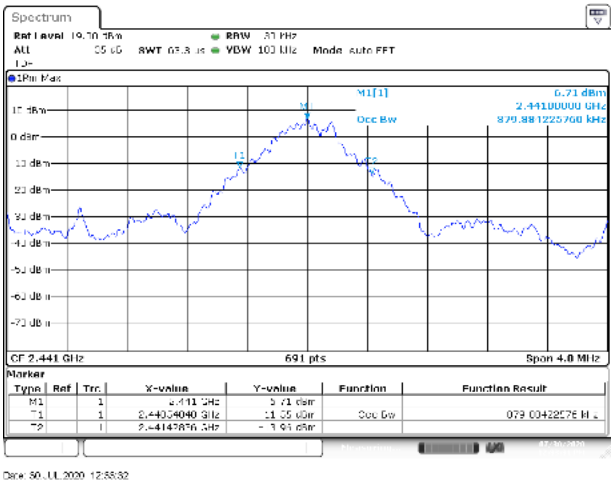


Figure 8.3-2: GFSK modulation @ 2441 MHz

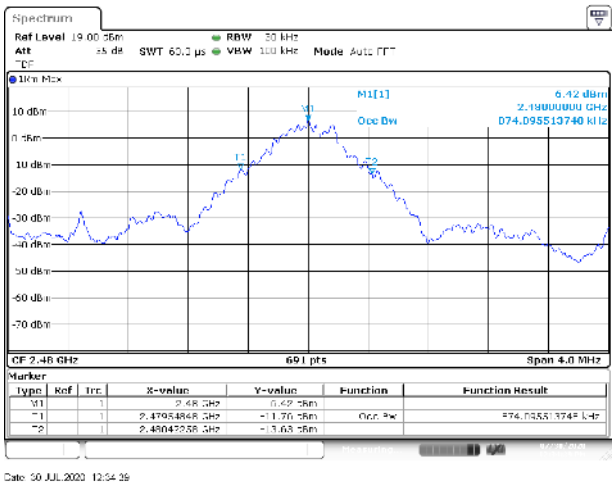


Figure 8.3-3: GFSK modulation @ 2480 MHz

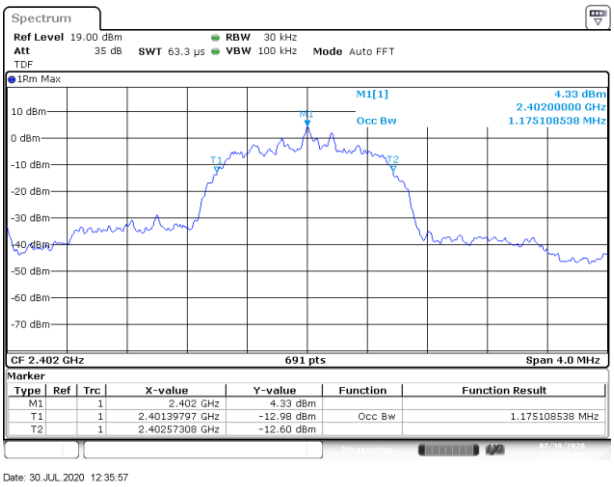


Figure 8.3-4: π/4 DQPSK modulation @ 2402 MHz

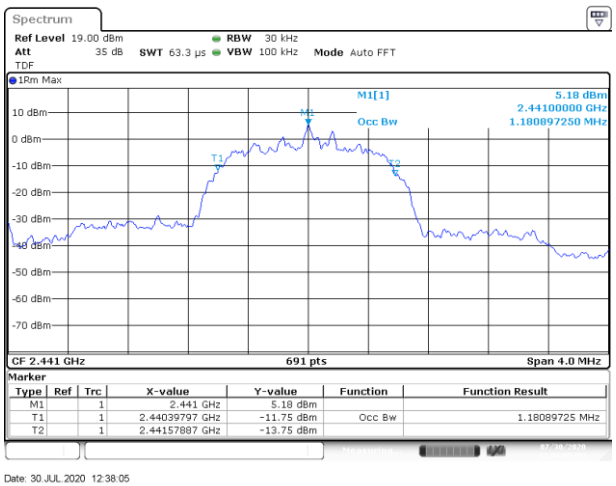


Figure 8.3-5: π/4 DQPSK modulation @ 2441 MHz

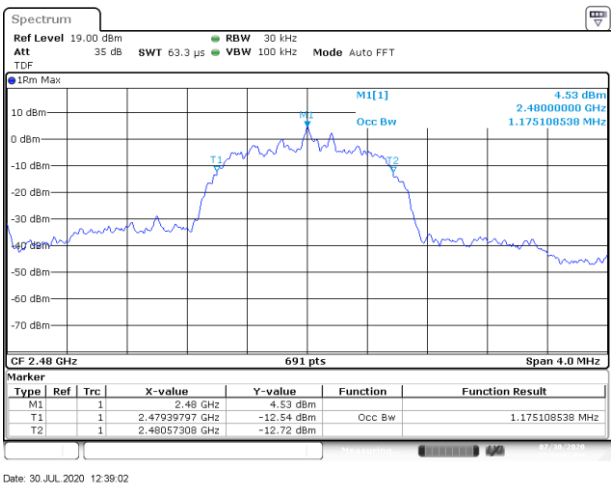


Figure 8.3-6: π/4 DQPSK modulation @ 2480 MHz

8.3.5 Test data, continued

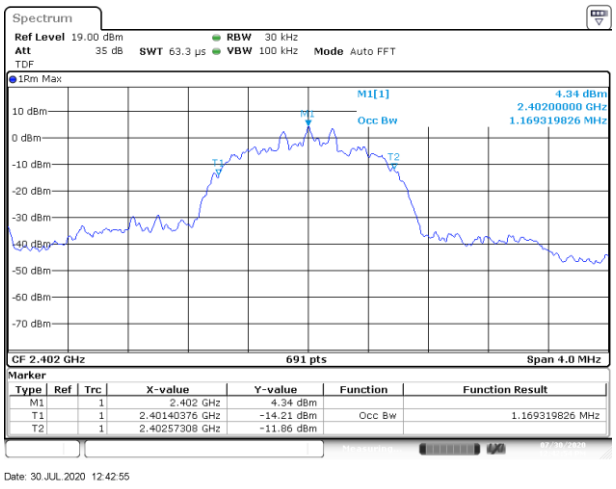


Figure 8.3-7: 8DPSK modulation @ 2402 MHz

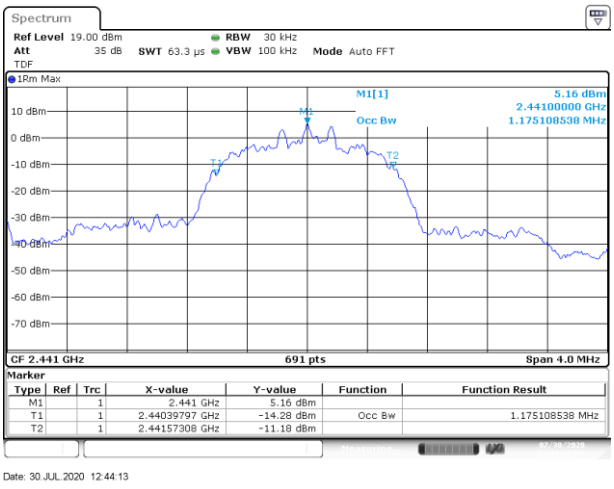


Figure 8.3-8: 8DPSK modulation @ 2441 MHz

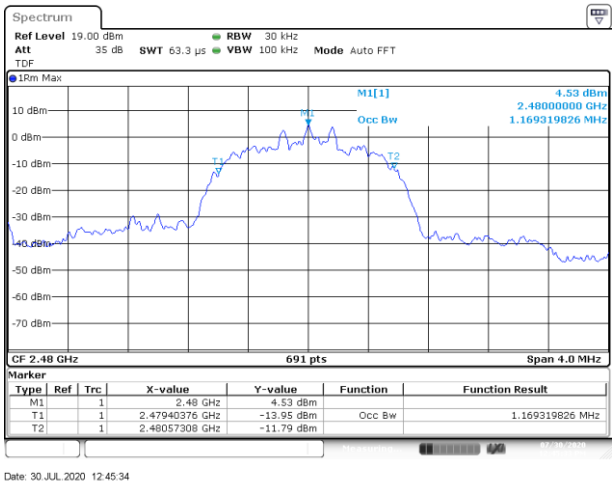


Figure 8.3-9: 8DPSK modulation @ 2480 MHz

8.4 FCC 15.215(c) and RSS-247 5.1(a) – 20 dB Bandwidth for Frequency Hopping Systems

8.4.1 Definition and limits

Title 47 → Chapter I → Subchapter A → Part 15 → Subpart C → §15.215(c)

- Intentional radiators operating under the alternative provisions to the general emission limits, as contained in §§ 15.217 through 15.257 and in subpart E of this part, must be designed to ensure that the 20 dB bandwidth of the emission, or whatever bandwidth may otherwise be specified in the specific rule section under which the equipment operates, is contained within the frequency band designated in the rule section under which the equipment is operated. In the case of intentional radiators operating under the provisions of subpart E, the emission bandwidth may span across multiple contiguous frequency bands identified in that subpart. The requirement to contain the designated bandwidth of the emission within the specified frequency band includes the effects from frequency sweeping, frequency hopping and other modulation techniques that may be employed as well as the frequency stability of the transmitter over expected variations in temperature and supply voltage. If a frequency stability is not specified in the regulations, it is recommended that the fundamental emission be kept within at least the central 80% of the permitted band in order to minimize the possibility of out-of-band operation.

RSS-247 → §5.1(a)

- The bandwidth of a frequency hopping channel is the 20 dB emission bandwidth, measured with the hopping stopped. The system's radio frequency (RF) bandwidth is equal to the channel bandwidth multiplied by the number of channels in the hopset. The system shall hop to channel frequencies that are selected at the system hopping rate from a pseudo randomly ordered list of hopping frequencies. The system receivers shall have input bandwidths that match the hopping channel bandwidths of their corresponding transmitters and shall shift frequencies in synchronization with the transmitted signals.

8.4.2 Test summary

Test date	July 30, 2020	Temperature	23 °C
Test engineer	David Hewitt, EMC Specialist	Air pressure	1005 mbar
Test location	Wireless workbench	Relative humidity	65 %

8.4.3 Notes

None

8.4.4 Setup details

EUT setup configuration	Floor standing
Test facility	Nemko San Diego
Measurement method	ANSI C63.10 §6.9.2 using built-in marker function of the spectrum analyzer

Receiver/spectrum analyzer settings:

Resolution bandwidth	30 kHz
Video bandwidth	100 kHz
Detector mode	Peak
Trace mode	Max Hold
Measurement time	Long enough for trace to stabilize

8.4.5 Test data

Table 8.4-1: *20 dB occupied bandwidth test data*

Data Packet Type	Modulation Type	Frequency (MHz)	20 dB Bandwidth (MHz)
DH5	GFSK	2402	0.8336
DH5	GFSK	2441	0.9899
DH5	GFSK	2480	0.8220
2DH5	π/4 DQPSK	2402	1.3256
2DH5	π/4 DQPSK	2441	1.2388
2DH5	π/4 DQPSK	2480	1.2388
3DH5	8DPSK	2402	1.2619
3DH5	8DPSK	2441	1.2619
3DH5	8DPSK	2480	1.2677

8.4.5 Test data, continued

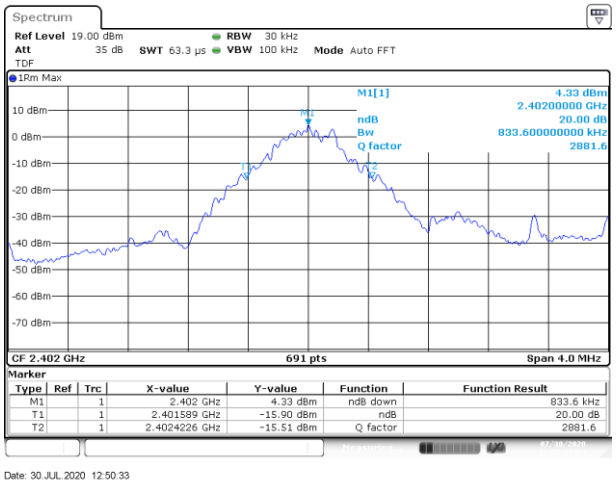


Figure 8.4-1: GFSK modulation @ 2402 MHz

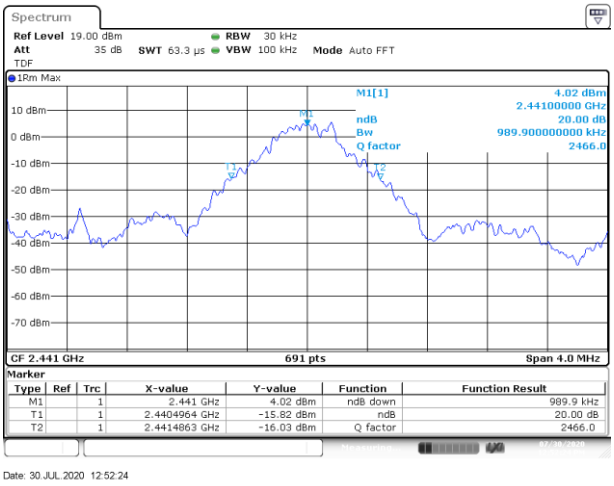


Figure 8.4-2: GFSK modulation @ 2441 MHz

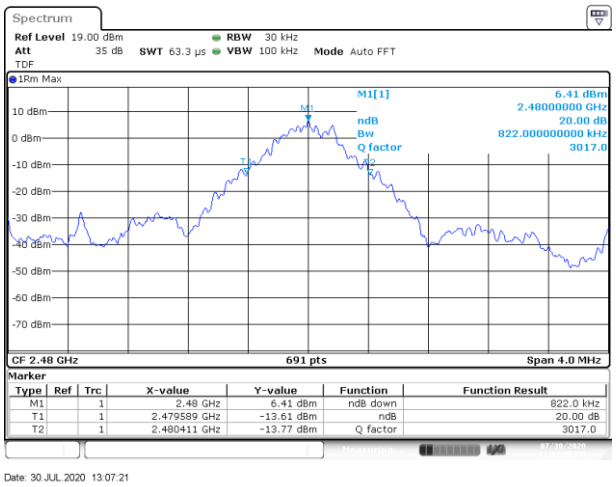


Figure 8.4-3: GFSK modulation @ 2480 MHz

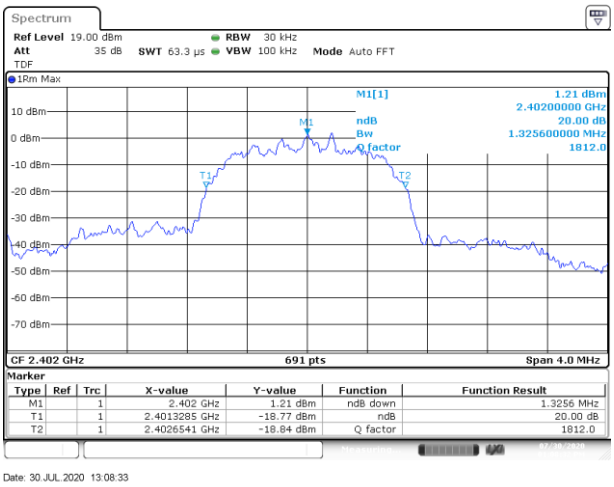


Figure 8.4-4: π/4 DQPSK modulation @ 2402 MHz

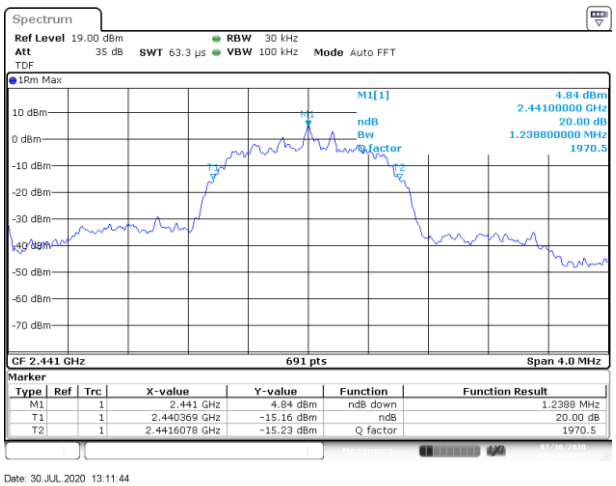


Figure 8.4-5: π/4 DQPSK modulation @ 2441 MHz

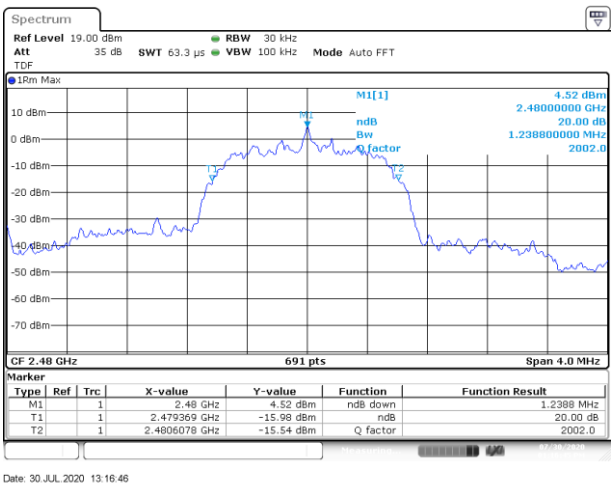


Figure 8.4-6: π/4 DQPSK modulation @ 2480 MHz

8.4.5 Test data, continued

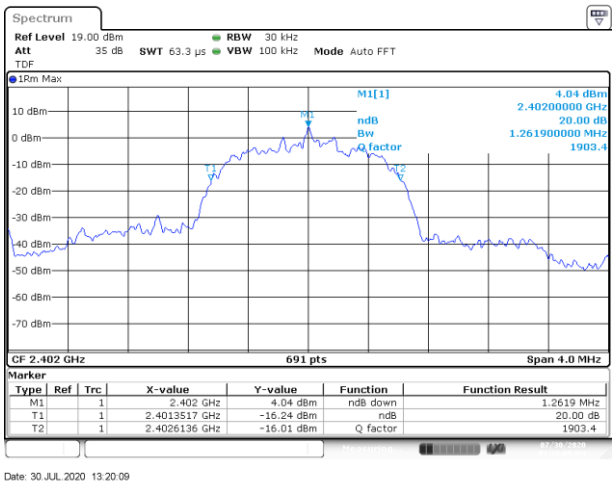


Figure 8.4-7: 8DPSK modulation @ 2402 MHz

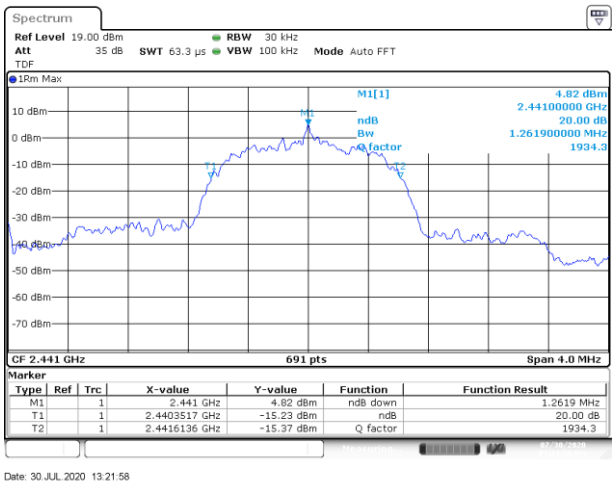


Figure 8.4-8: 8DPSK modulation @ 2441 MHz

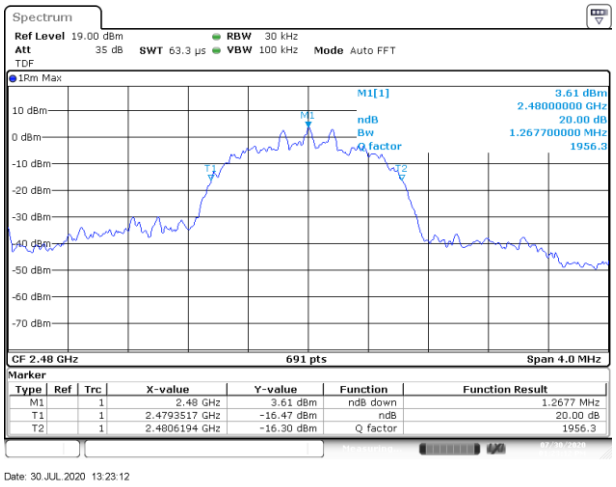


Figure 8.4-9: 8DPSK modulation @ 2480 MHz

8.5 FCC 15.247(a)(1) and RSS-247 5.1(d) – Minimum Channel Spacing for Frequency Hopping Systems

8.5.1 Definition and limits

Title 47 → Chapter I → Subchapter A → Part 15 → Subpart C → §15.247(a)(1)
RSS-247 → §5.1(d)

- Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater. 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. The system shall hop to channel frequencies that are selected at the system hopping rate from a pseudo randomly ordered list of hopping frequencies. Each frequency must be used equally on the average by each transmitter. The system receivers shall have input bandwidths that match the hopping channel bandwidths of their corresponding transmitters and shall shift frequencies in synchronization with the transmitted signals.

8.5.2 Test summary

Verdict	Pass		
Test date	July 3, 2020	Temperature	23 °C
Test engineer	David Hewitt, EMC Specialist	Air pressure	1005 mbar
Test location	Wireless workbench	Relative humidity	60 %

8.5.3 Notes

Hopping channel separation limit calculated as two-thirds of the 20 dB bandwidth, which is greater than 25 kHz.

8.5.4 Setup details

EUT setup configuration	Floor standing
Test facility	Nemko San Diego
Measurement method	ANSI C63.10 §7.8.2 using built-in marker function of the spectrum analyzer

Receiver/spectrum analyzer settings:

Resolution bandwidth	300 kHz
Video bandwidth	300 kHz
Detector mode	Peak
Trace mode	Max Hold
Measurement time	Long enough for trace to stabilize

8.5.5 Test data

Table 8.5-1: *Carrier frequency separation*

Data Packet Type	Modulation Type	Frequency (MHz)	Hopping channel separation measurement (MHz)	Hopping channel separation limit (MHz)
DH5	GFSK	2402	0.88567	0.555733333
DH5	GFSK	2441	0.87988	0.659933333
DH5	GFSK	2480	0.87410	0.548
2DH5	π/4 DQPSK	2402	1.17511	0.883733333
2DH5	π/4 DQPSK	2441	1.18090	0.825866667
2DH5	π/4 DQPSK	2480	1.17511	0.825866667
3DH5	8DPSK	2402	1.16932	0.841266667
3DH5	8DPSK	2441	1.17511	0.841266667
3DH5	8DPSK	2480	1.16932	0.845133333

8.5.6 Test data, continued

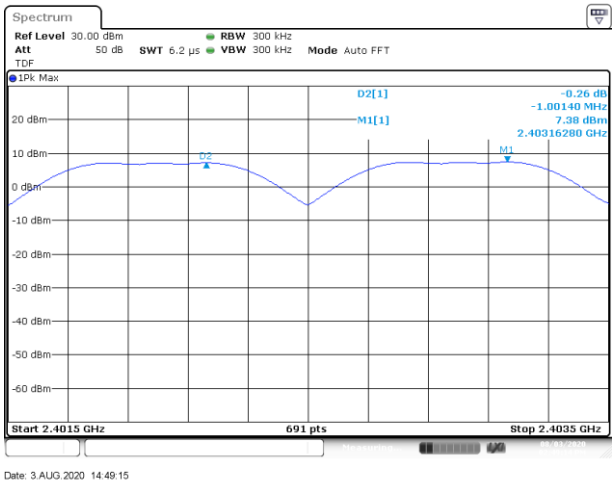


Figure 8.5-1: Carrier separation 2402-2403 MHz , GFSK modulation

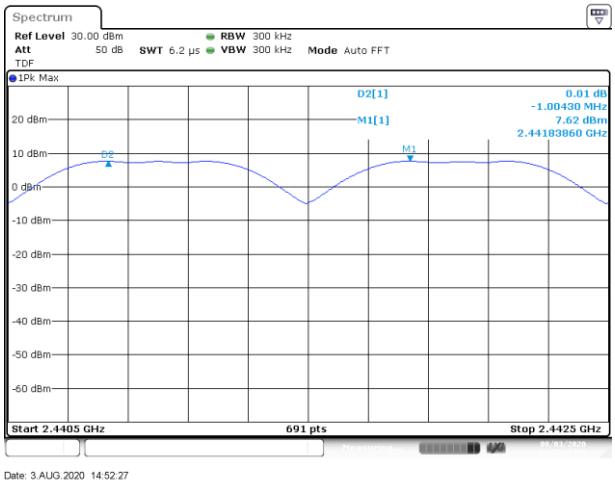


Figure 8.5-2: Carrier separation 2441-2442 MHz , GFSK modulation

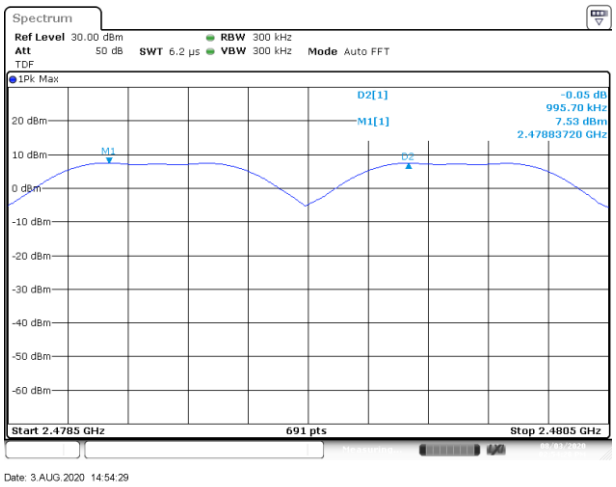


Figure 8.5-3: Carrier separation 2479-2480 MHz , GFSK modulation

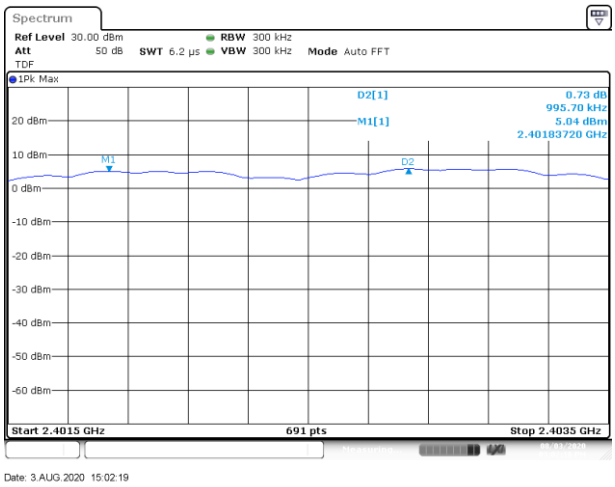


Figure 8.5-4: Carrier separation 2402-2403 MHz , π/4 DQPSK modulation

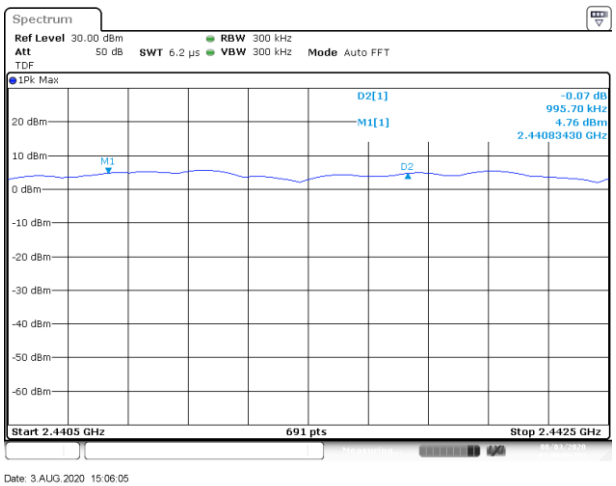


Figure 8.5-5: Carrier separation 2441-2442 MHz , π/4 DQPSK modulation

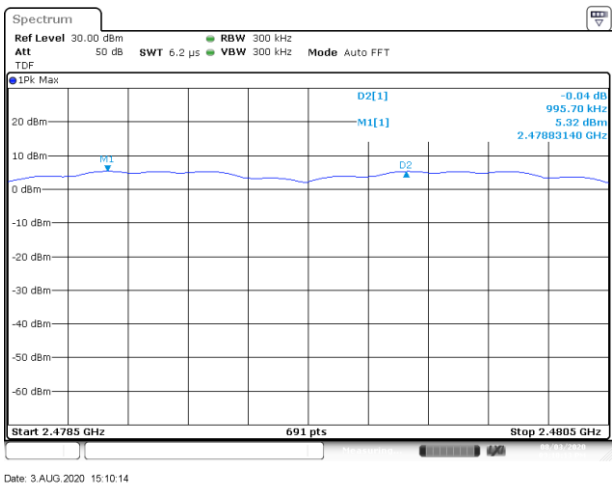


Figure 8.5-6: Carrier separation 2479-2480 MHz , π/4 DQPSK modulation

8.5.7 Test data, continued

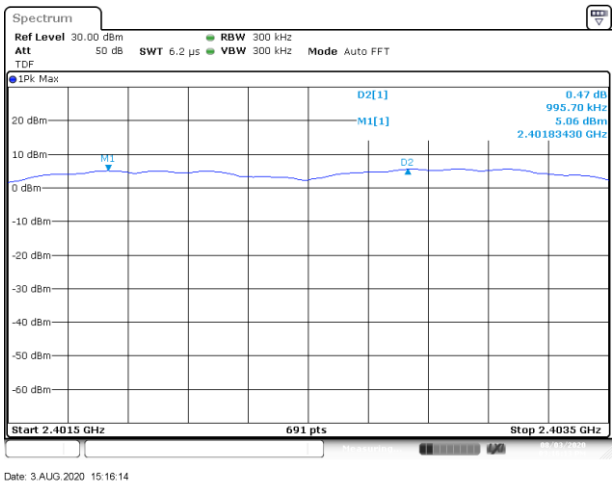


Figure 8.5-7: Carrier separation 2402-2403 MHz , 8DPSK modulation

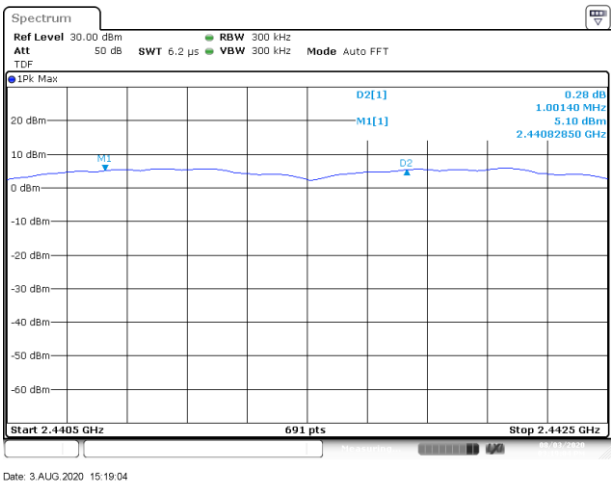


Figure 8.5-8: Carrier separation 2441-2442 MHz , 8DPSK modulation

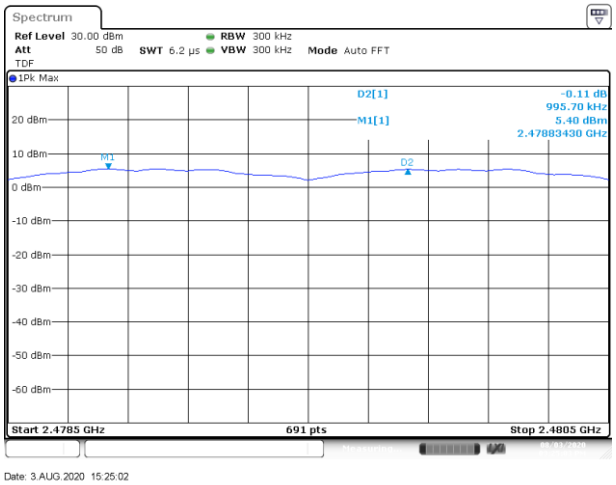


Figure 8.5-9: Carrier separation 2479-2480 MHz , 8DPSK modulation

8.6 FCC 15.247(a)(1)(iii) and RSS-247 5.1(d) – Time of Occupancy

8.6.1 Definition and limits

Title 47 → Chapter I → Subchapter A → Part 15 → Subpart C → §15.247(a)(1)

- Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater. 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. The system shall hop to channel frequencies that are selected at the system hopping rate from a pseudo randomly ordered list of hopping frequencies. Each frequency must be used equally on the average by each transmitter. The system receivers shall have input bandwidths that match the hopping channel bandwidths of their corresponding transmitters and shall shift frequencies in synchronization with the transmitted signals.

Title 47 → Chapter I → Subchapter A → Part 15 → Subpart C → §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 channels. 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. Frequency hopping systems may avoid or suppress transmissions on a particular hopping frequency provided that a minimum of 15 channels are used.

8.6.2 Test summary

Verdict	Pass		
Test date	July 3, 2020	Temperature	23 °C
Test engineer	David Hewitt, EMC Specialist	Air pressure	1005 mbar
Test location	Wireless workbench	Relative humidity	60 %
Test date	September 3, 2020	Temperature	22 °C
Test engineer	David Hewitt, EMC Specialist	Air pressure	1003 mbar
Test location	Wireless workbench	Relative humidity	61 %

8.6.3 Notes

Calculations for the time of occupancy of the Bluetooth device under test in normal hopping mode are as follows:
Occupancy limit = (time limit per standard) x (number of channels) = (0.4 sec) x (79 channels) = **31.6 sec**
Hopping rate = (hopping rate) ÷ (Bluetooth time period) ÷ (number of channels) = (1600 Hz) ÷ (6 slots) ÷ (79 channels) = **3.3755 hops per sec per period**
Hops within the occupancy period = (Occupancy limit) x (Hopping rate) = (31.6 sec) x (3.376 hops per sec per period) = **106.67 hops per period**
Average Time of Occupancy = (hops within the occupancy period) x (measured transmit time per hop)

Calculation for the time of occupancy of the Bluetooth device under test in Adaptive Frequency Hopping (AFH) mode are as follows:
Occupancy limit = (time limit per standard) x (number of channels) = (0.4 sec) x (20 channels) = **8 sec**
Hopping rate = (hopping rate) ÷ (Bluetooth time period) ÷ (number of channels) = (800 Hz) ÷ (6 periods) ÷ (20 channels) = **6.6667 hops per sec per period**
Hops within the occupancy period = (Occupancy limit) x (Hopping rate) = (8 sec) x (6.667 hops per sec per period) = **53.33 hops per period**
Average Time of Occupancy = (hops within the occupancy period) x (measured transmit time per hop)

8.6.4 Setup details

EUT setup configuration	Floor standing
Test facility	Nemko San Diego
Measurement method	ANSI C63.10 §7.8.4 using built-in marker function of the spectrum analyzer

Receiver/spectrum analyzer settings:

Resolution bandwidth	1 MHz
Video bandwidth	1 MHz
Detector mode	Peak
Trace mode	Max Hold
Measurement time	Triggered to capture the entire dwell time of the hopping channel

8.6.5 Test data

Table 8.6-1: *Time of occupancy*

Bluetooth mode	Modulation Type	Frequency (MHz)	Occupancy limit (sec)	Hopping rate (hop/s/period)	Hops within occupancy period (hop/period)	Measured transmit time (s/period)	Average time of occupancy (s/period)
Normal	GFSK	2441	31.6	3.3755	106.67	0.0028957	0.30887
Normal	π/4 DQPSK	2441	31.6	3.3755	106.67	0.0028957	0.30887
Normal	8DPSK	2441	31.6	3.3755	106.67	0.0028904	0.30831
AFH	GFSK	2441	8	6.6667	53.33	0.0028944	0.15437
AFH	π/4 DQPSK	2441	8	6.6667	53.33	0.0028980	0.15456
AFH	8DPSK	2441	8	6.6667	53.33	0.0029016	0.15475

8.6.6 Test data, continued

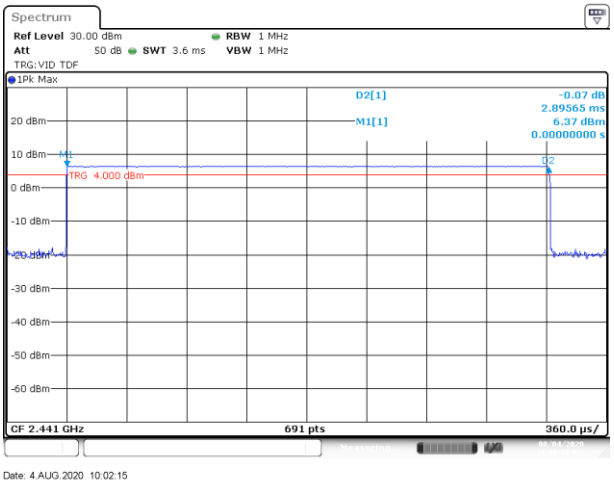


Figure 8.6-1: Normal operational mode, GFSK modulation

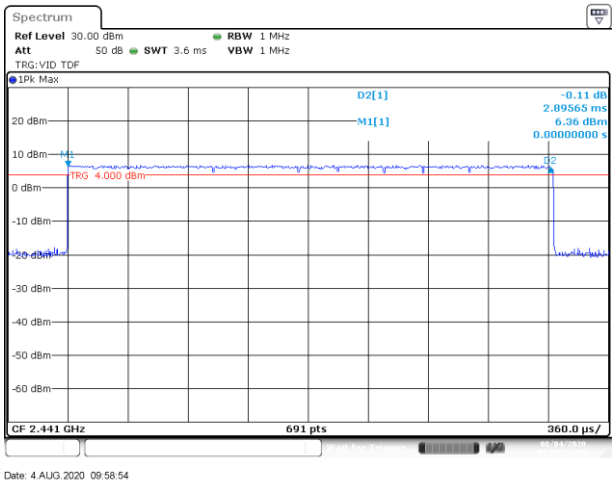


Figure 8.6-2: Normal operational mode, π/4 DQPSK modulation

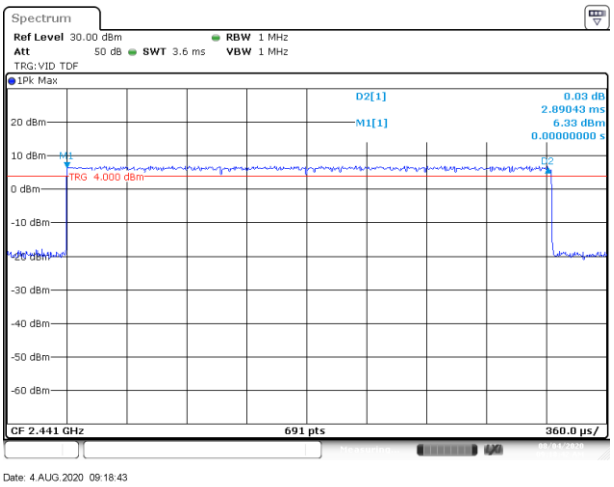


Figure 8.6-3: Normal operational mode, DQPSK modulation

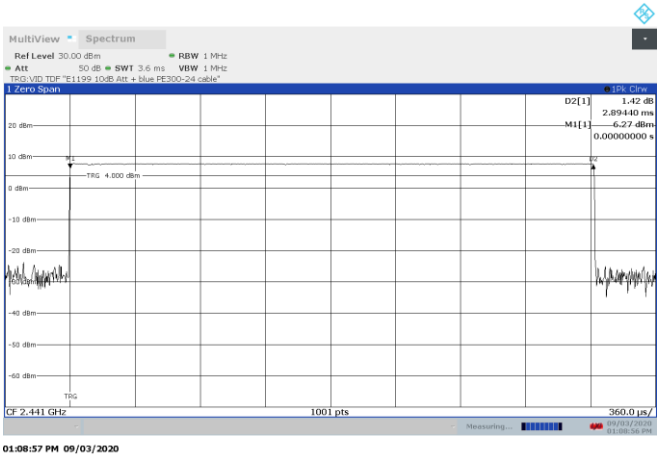


Figure 8.6-4: Adaptive Frequency Hopping mode, GFSK modulation

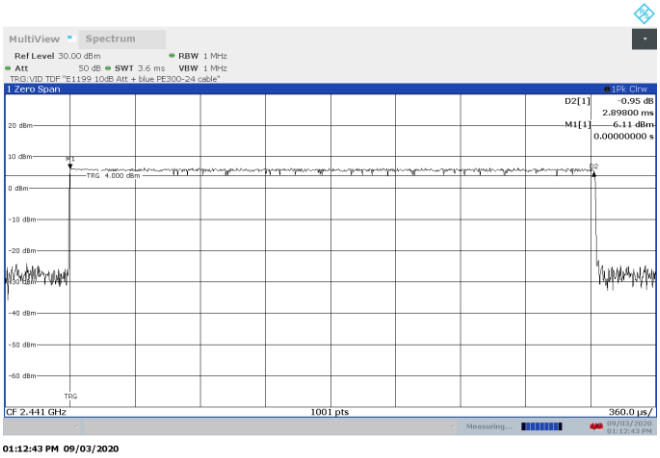


Figure 8.6-5: Adaptive Frequency Hopping mode, π/4 DQPSK modulation

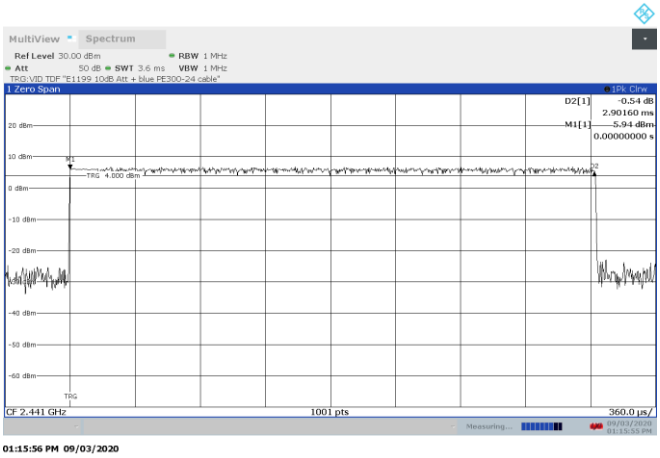


Figure 8.6-6: Adaptive Frequency Hopping mode, DQPSK modulation

8.7 FCC 15.247(b)(1) and RSS-247 5.4(b) Transmitter output power and e.i.r.p. requirements

8.7.1 Definition and limits

Title 47 → Chapter I → Subchapter A → Part 15 → Subpart C → §15.247(b)(1)

(b) The maximum peak conducted output power of the intentional radiator shall not exceed the following:

(1) 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

RSS-247 → §5.4(b)

- For FHSs operating in the band 2400-2483.5 MHz, the maximum peak conducted output power shall not exceed 1.0 W if the hopset uses 75 or more hopping channels; the maximum peak conducted output power shall not exceed 0.125 W if the hopset uses less than 75 hopping channels. The e.i.r.p. shall not exceed 4 W, except as provided in section 5.4(e).

8.7.2 Test summary

Verdict	Pass		
Test date	July 4, 2013	Temperature	22 °C
Test engineer	David Hewitt, EMC Specialist	Air pressure	1006 mbar
Test location	Wireless bench	Relative humidity	58 %

8.7.3 Notes

The attenuation of the interconnecting cable was included in the power meter software as a correction factor.

The maximum peak output power limit of 0.125 Watts was converted to 20.97 dBm.

8.7.4 Setup details

EUT setup configuration	Tabletop
Test facility	Nemko San Diego
Measurement method	ANSI C63.10 §7.8.5

8.7.5 Test data

Table 8.7-1: *Maximum peak conducted output power*

Data Packet Type	Modulation Type	Frequency (MHz)	Peak power (dBm)	Power Limit (dBm)
DH5	GFSK	2402	7.71	30
DH5	GFSK	2441	8.11	30
DH5	GFSK	2480	8.07	30
2DH5	π/4 DQPSK	2402	6.60	30
2DH5	π/4 DQPSK	2441	7.10	30
2DH5	π/4 DQPSK	2480	7.01	30
3DH5	8DPSK	2402	6.72	30
3DH5	8DPSK	2441	7.38	30
3DH5	8DPSK	2480	7.10	30

8.7.5 Test data, continued

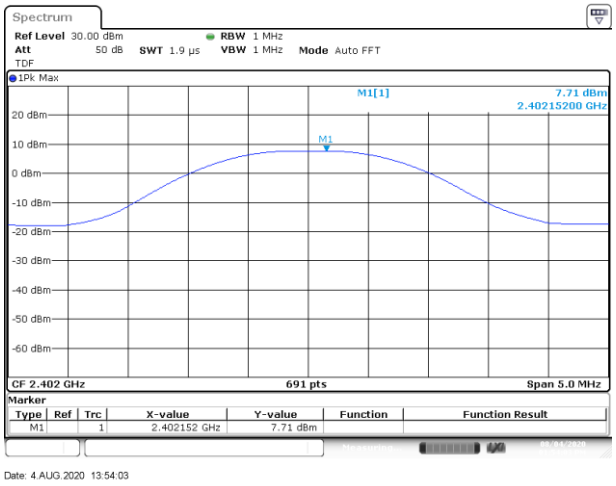


Figure 8.7-1: Max peak output power, 2402 MHz, GFSK modulation

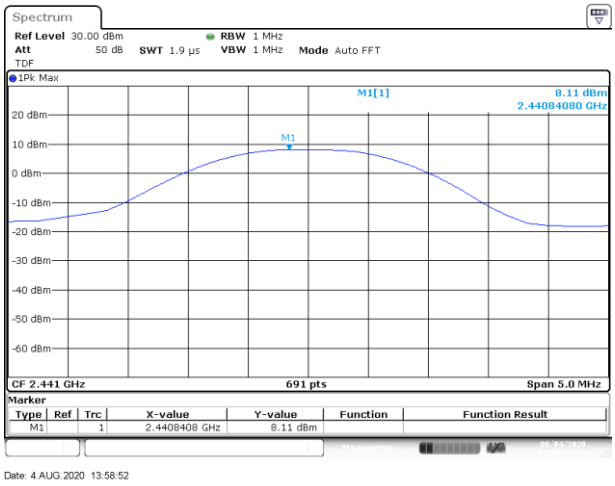


Figure 8.7-2: Max peak output power, 2441 MHz, GFSK modulation

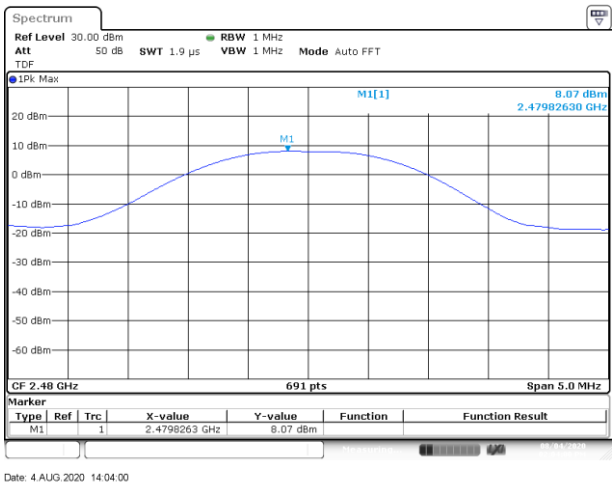


Figure 8.7-3: Max peak output power, 2480 MHz, GFSK modulation

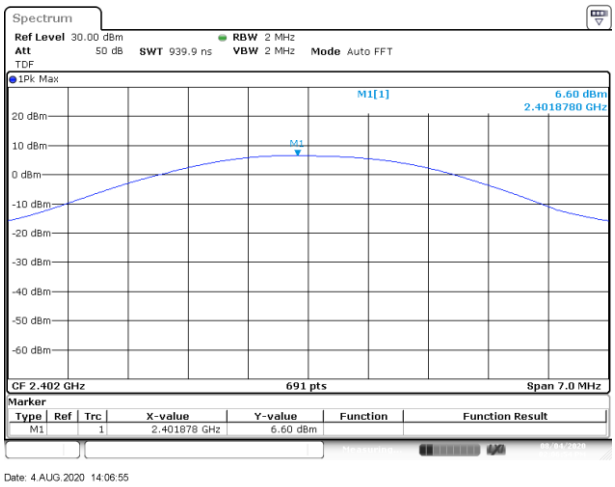


Figure 8.7-4: Max peak output power, 2402 MHz, π/4 DQPSK modulation

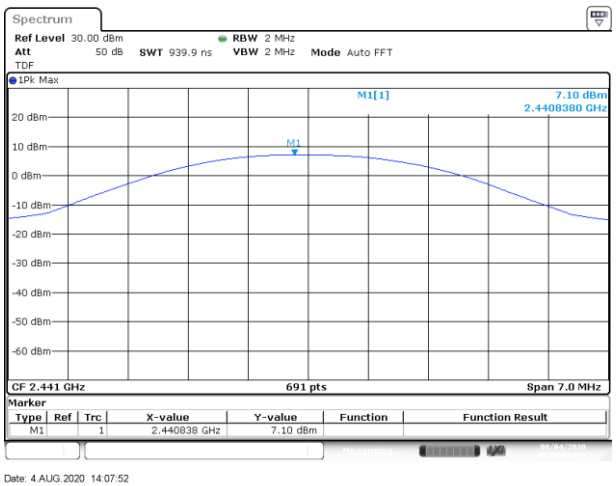


Figure 8.7-5: Max peak output power, 2441 MHz, π/4 DQPSK modulation

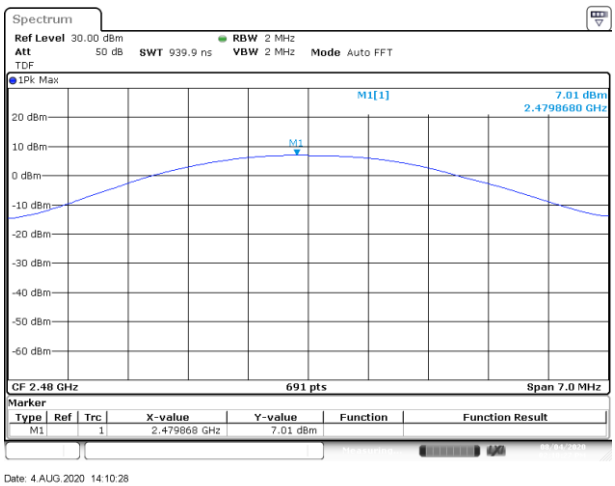


Figure 8.7-6: Max peak output power, 2480 MHz, π/4 DQPSK modulation

8.7.5 Test data, continued

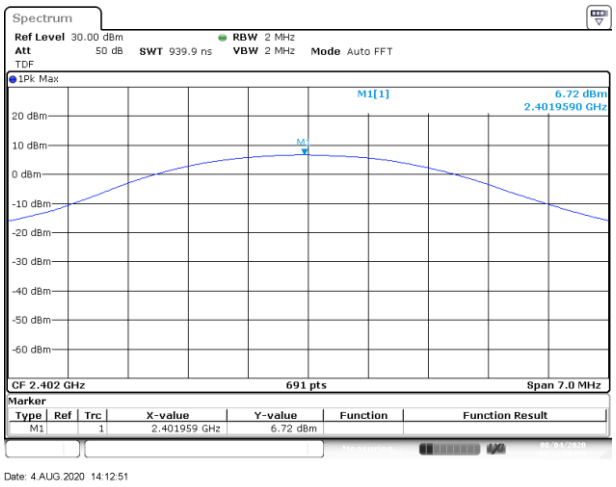


Figure 8.7-7: Max peak output power, 2402 MHz, 8DPSK modulation

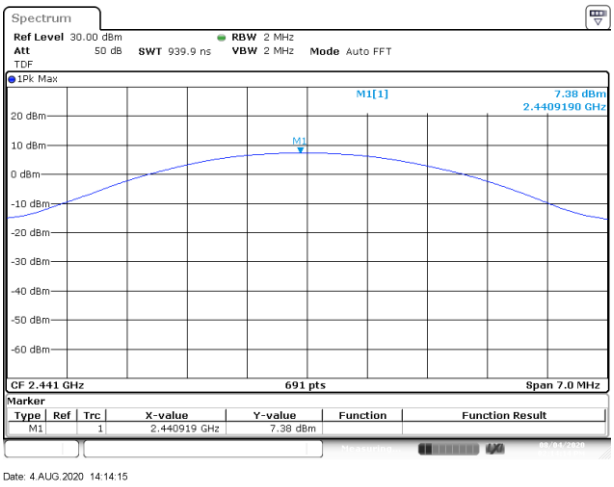


Figure 8.7-8: Max peak output power, 2441 MHz, 8DPSK modulation

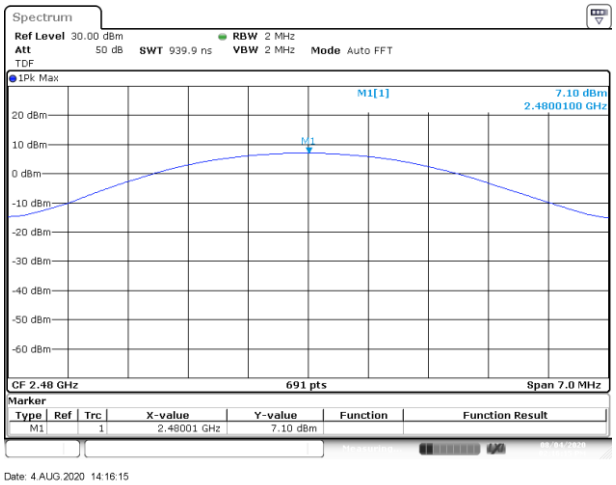


Figure 8.7-9: Max peak output power, 2441 MHz, 8DPSK modulation

8.8 FCC 15.247(d) and RSS-247 5.5 Spurious (out-of-band) emissions

8.8.1 Definition and limits

Title 47 → Chapter I → Subchapter A → Part 15 → Subpart C → §15.247(d)

- In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).

RSS-247 → §5.5

- In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated device is operating, the RF power that is produced shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided that the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of root-mean-square averaging over a time interval, as permitted under section 5.4(d), the attenuation required shall be 30 dB instead of 20 dB. Attenuation below the general field strength limits specified in RSS-Gen is not required.

Table 8.8-1: *FCC §15.209– Radiated emission limits*

Frequency, MHz	Field strength of emissions		Measurement distance, m
	µV/m	dBµV/m	
0.009–0.490	2400/F	$67.6 - 20 \times \log_{10}(F)$	300
0.490–1.705	24000/F	$87.6 - 20 \times \log_{10}(F)$	30
1.705–30.0	30	29.5	30
30–88	100	40.0	3
88–216	150	43.5	3
216–960	200	46.0	3
above 960	500	54.0	3

Notes: In the emission table above, the tighter limit applies at the band edges.
For frequencies above 1 GHz the limit on peak RF emissions is 20 dB above the maximum permitted average emission limit applicable to the equipment under test.

Table 8.8-2: *FCC restricted frequency bands*

MHz	MHz	MHz	GHz
0.090–0.110	16.42–16.423	399.9–410	4.5–5.15
0.495–0.505	16.69475–16.69525	608–614	5.35–5.46
2.1735–2.1905	16.80425–16.80475	960–1240	7.25–7.75
4.125–4.128	25.5–25.67	1300–1427	8.025–8.5
4.17725–4.17775	37.5–38.25	1435–1626.5	9.0–9.2
4.20725–4.20775	73–74.6	1645.5–1646.5	9.3–9.5
6.215–6.218	74.8–75.2	1660–1710	10.6–12.7
6.26775–6.26825	108–121.94	1718.8–1722.2	13.25–13.4
6.31175–6.31225	123–138	2200–2300	14.47–14.5
8.291–8.294	149.9–150.05	2310–2390	15.35–16.2
8.362–8.366	156.52475–156.52525	2483.5–2500	17.7–21.4
8.37625–8.38675	156.7–156.9	2690–2900	22.01–23.12
8.41425–8.41475	162.0125–167.17	3260–3267	23.6–24.0
12.29–12.293	167.72–173.2	3332–3339	31.2–31.8
12.51975–12.52025	240–285	3345.8–3358	36.43–36.5
12.57675–12.57725	322–335.4	3600–4400	Above 38.6
13.36–13.41			

8.8.2 Test summary

Verdict	Pass		
Test date (conducted)	July 30, 2020	Temperature (conducted)	23 °C
Test engineer (conducted)	David Hewitt, EMC Specialist	Air pressure (conducted)	1005 mbar
Test location (conducted)	Wireless bench	Relative humidity (conducted)	65 %
Test date (conducted)	September 3, 2020	Temperature (conducted)	22 °C
Test engineer (conducted)	David Hewitt, EMC Specialist	Air pressure (conducted)	1003 mbar
Test location (conducted)	Wireless bench	Relative humidity (conducted)	61 %
Test date (radiated)	September 11, 2020	Temperature (radiated)	22 °C
Test engineer (radiated)	David Hewitt, EMC Specialist	Air pressure (radiated)	1006 mbar
Test location (radiated)	3m semi anechoic chamber	Relative humidity (radiated)	53 %

8.8.3 Notes

The EUT was configured to transmit continuously on the low, middle and high channels, or in channel hopping mode as necessary. Scans were made for all supported modulation types (GFSK, π/4-DPSK and 8-DPSK). Only results for the worst case with respect to radiated spurious emissions (GFSK) are reported here.

The spectrum was search from 30 MHz to 26 GHz (above the 10th harmonic of the highest transmit frequency of 2480 MHz).

Radiated measurements were performed at a 3 m measurement distance.

For conducted measurements, the loss of the connected cable and attenuator was input into the spectrum analyzer as a transducer factor.

8.8.4 Setup details

EUT setup configuration	Tabletop
Test facility	Nemko San Diego
Measurement details	Conducted band edge measurement performed as per C63.10 §6.10.4 Conducted spurious emissions measurement performed as per C63.10 §7.8.8 Radiated spurious emissions measurement performed as per C63.10 §6.5-6.6

Spectrum analyzer settings for conducted spurious and band-edge emissions measurements:

Resolution bandwidth	100 kHz
Video bandwidth	300 kHz
Detector mode	Peak
Trace mode	Max Hold
Measurement time	Long enough for trace to stabilize

Receiver settings for radiated measurements below 1 GHz:

Resolution bandwidth	120 kHz
Video bandwidth	300 kHz
Detector mode	Peak (preview measurements) Quasi-Peak (final measurements)
Trace mode	Max Hold
Measurement time	5 s (final measurements)

Receiver settings for radiated measurements above 1 GHz:

Resolution bandwidth	1 MHz
Video bandwidth	3 MHz
Detector mode	Peak (preview measurements) Peak and Average (final measurements)
Trace mode	Max Hold
Measurement time	5 s (final measurements)

8.8.5 Test data

Duty Cycle Calculations (worst case scenario presented)

Duty Cycle: $\delta = on\ time / Time\ of\ period$

$\delta = 2.9/3.76 = 0.7713$

Duty Cycle Correction Factor: $\delta(\mathrm{dB}) = 20 \times \log(\delta)$

$\delta(\mathrm{dB}) = 20 \times \log(0.7713) = -2.256\ \mathrm{dB}$ (will be added to Radiated Emissions PK measurements on the harmonics of the fundamental)

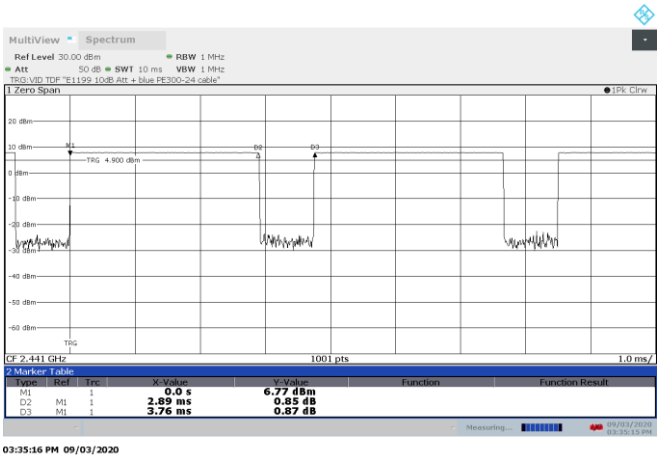


Figure 8.8-1: Duty Cycle, 2441 MHz, GFSK modulation

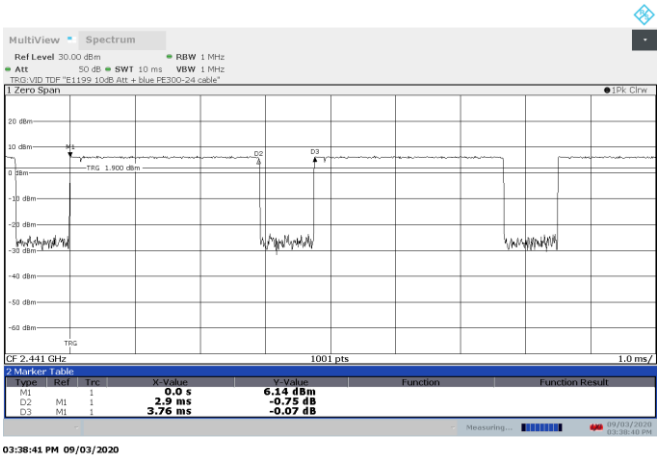


Figure 8.8-2: Duty Cycle, 2441 MHz, π/4 DQPSK modulation

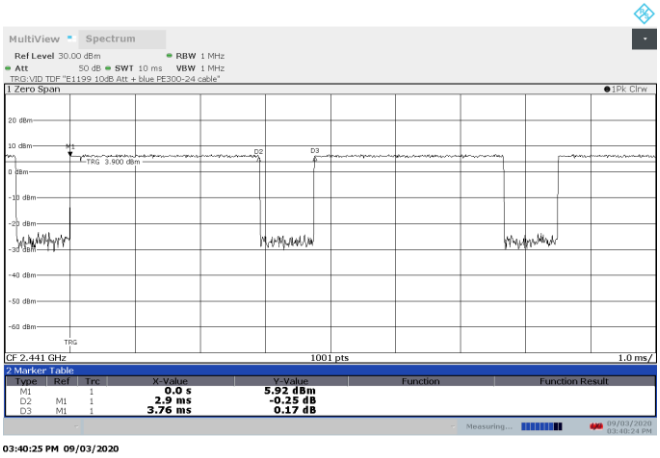


Figure 8.8-3: Duty Cycle, 2441 MHz, 8DPSK modulation

8.8.5 Test data, continued

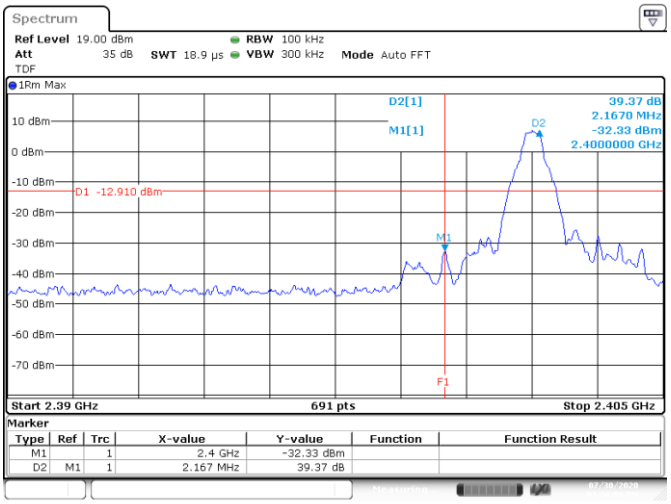


Figure 8.8-4: *Band edge measurement, 2402 MHz, GFSK*

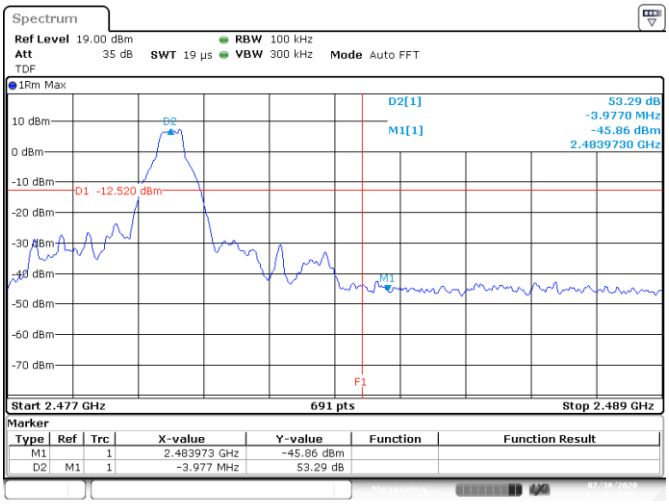


Figure 8.8-5: *Band edge measurement, 2480 MHz, GFSK*

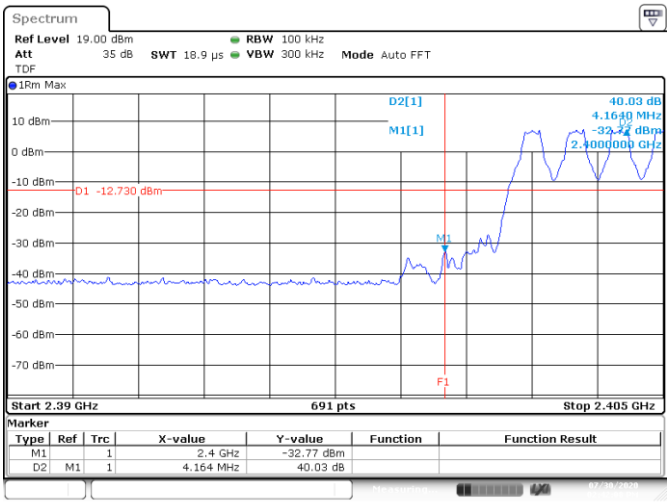


Figure 8.8-6: *Band edge measurement (low), hopping, GFSK*

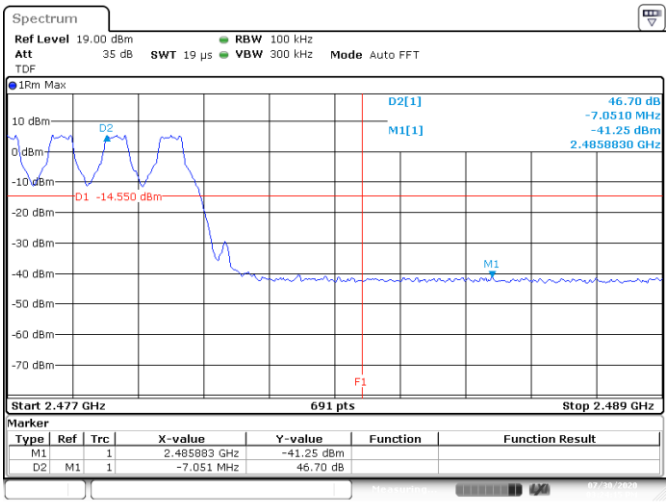


Figure 8.8-7: *Band edge measurement (high), hopping, GFSK*

Note: For conducted emissions plots above, peaks within 2400-2483.5MHz are transmitter fundamentals signals and are not evaluated against the relevant limits.

8.8.5 Test data, continued

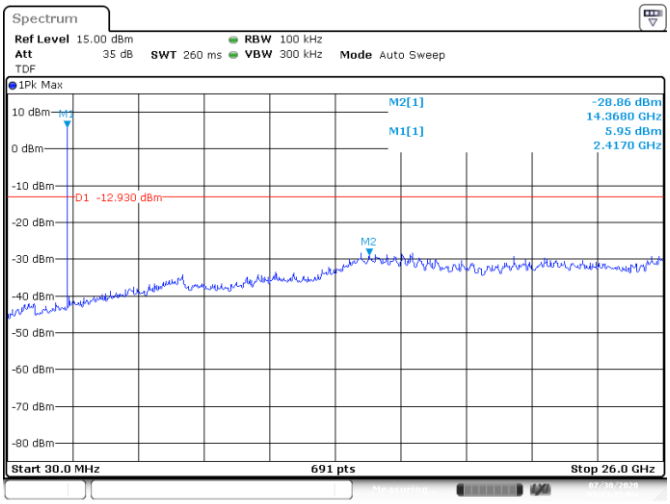


Figure 8.8-8: *Conducted spurious emissions, 2402 MHz, GFSK*

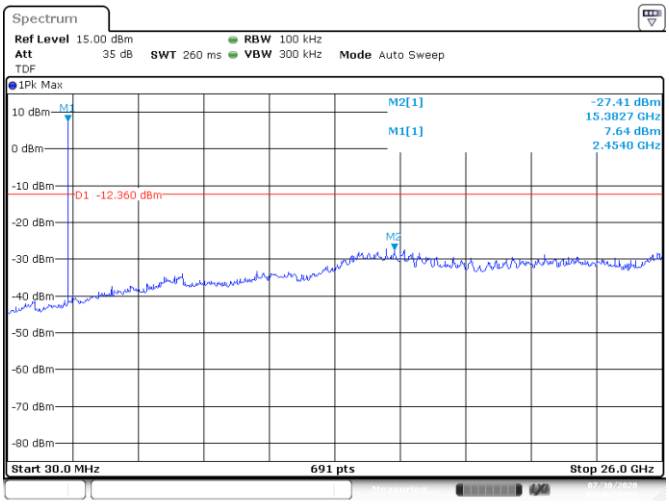


Figure 8.8-9: *Conducted spurious emissions, 2441 MHz, GFSK*

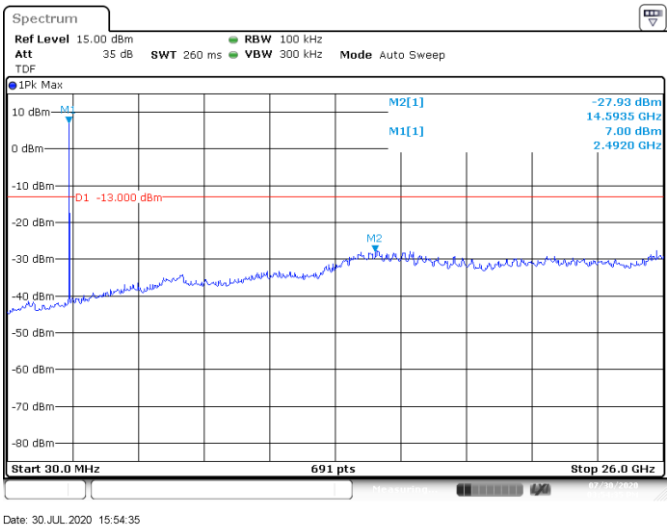


Figure 8.8-10: *Conducted spurious emissions, 2480 MHz, GFSK*

Note: For conducted emissions plots above, peaks within 2400-2483.5MHz are transmitter fundamentals signals and are not evaluated against the relevant limits.

8.8.5 Test data, continued

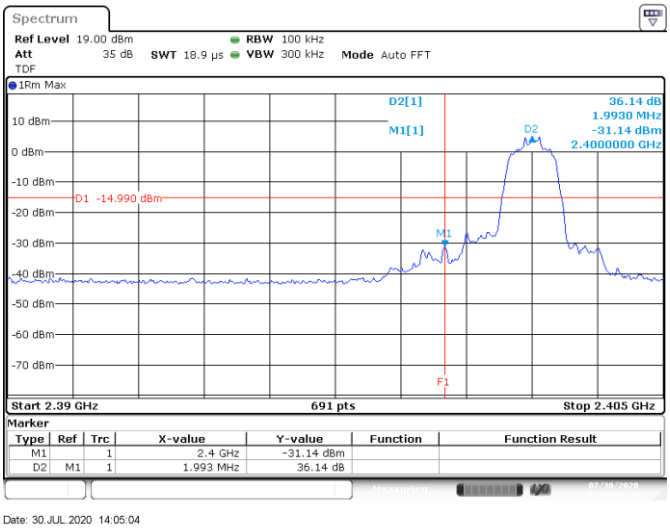


Figure 8.8-11: *Band edge measurement, 2402 MHz, π/4 DQPSK*

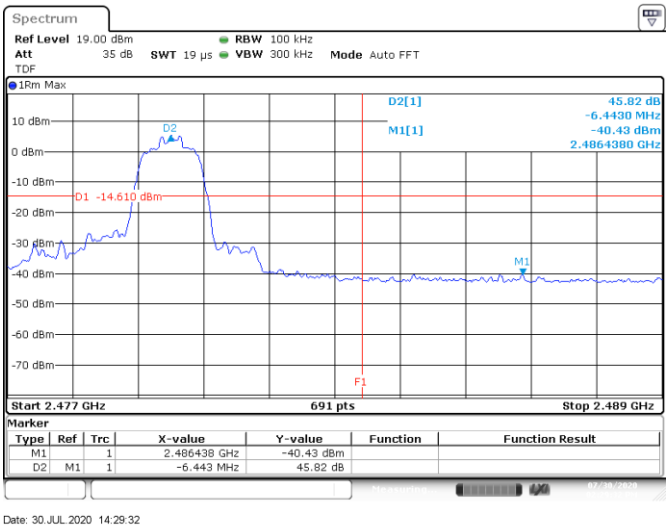


Figure 8.8-12: *Band edge measurement, 2480 MHz, π/4 DQPSK*

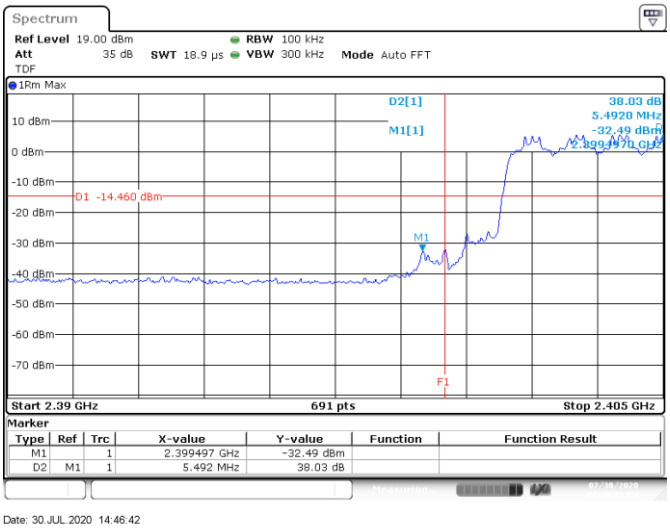


Figure 8.8-13: *Band edge measurement (low), hopping, π/4 DQPSK*

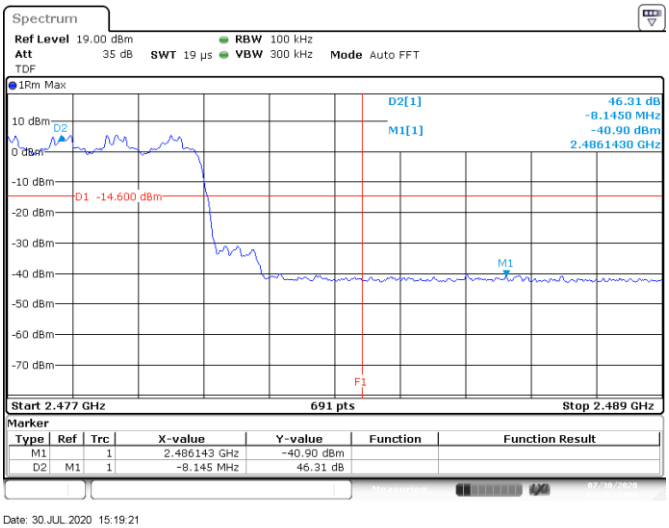


Figure 8.8-14: *Band edge measurement (high), hopping, π/4 DQPSK*

Note: For conducted emissions plots above, peaks within 2400-2483.5MHz are transmitter fundamentals signals and are not evaluated against the relevant limits.

8.8.5 Test data, continued

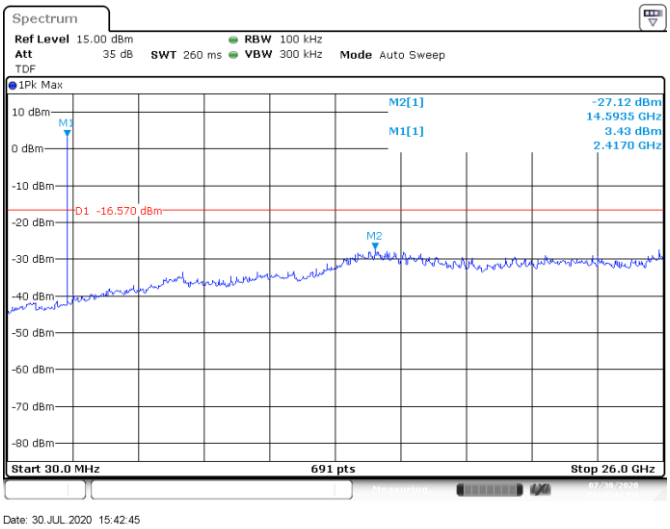


Figure 8.8-15: *Conducted spurious emissions, 2402 MHz, π/4 DQPSK*

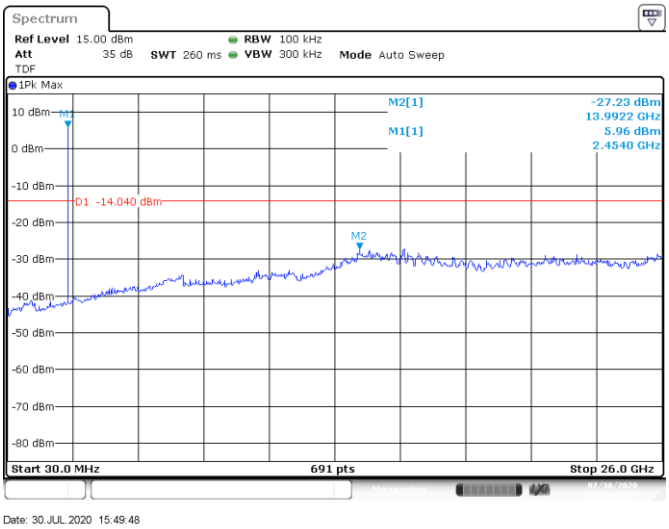


Figure 8.8-16: *Conducted spurious emissions, 2441 MHz, π/4 DQPSK*

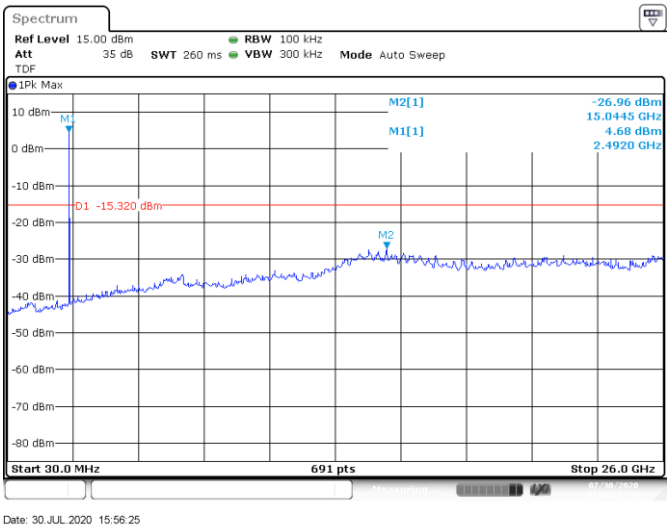


Figure 8.8-17: *Conducted spurious emissions, 2480 MHz, π/4 DQPSK*

Note: For conducted emissions plots above, peaks within 2400-2483.5MHz are transmitter fundamentals signals and are not evaluated against the relevant limits.

8.8.5 Test data, continued

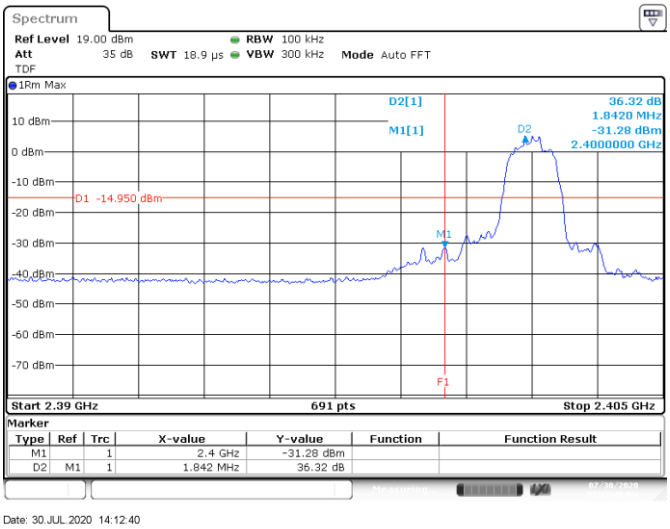


Figure 8.8-18: *Band edge measurement, 2402 MHz, 8DPSK*

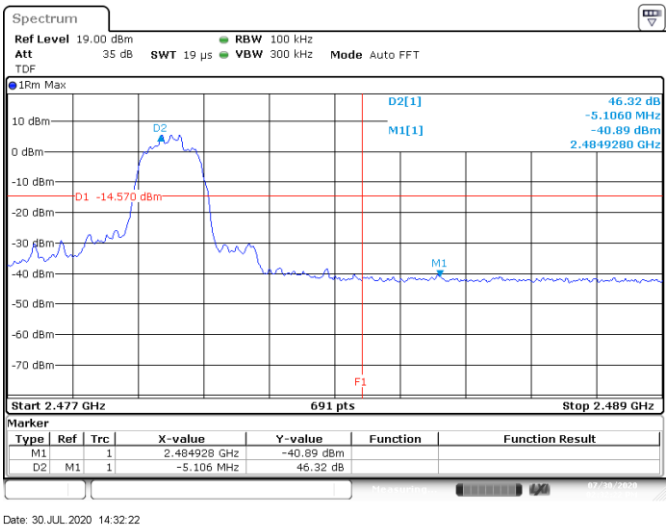


Figure 8.8-19: *Band edge measurement, 2480 MHz, 8DPSK*

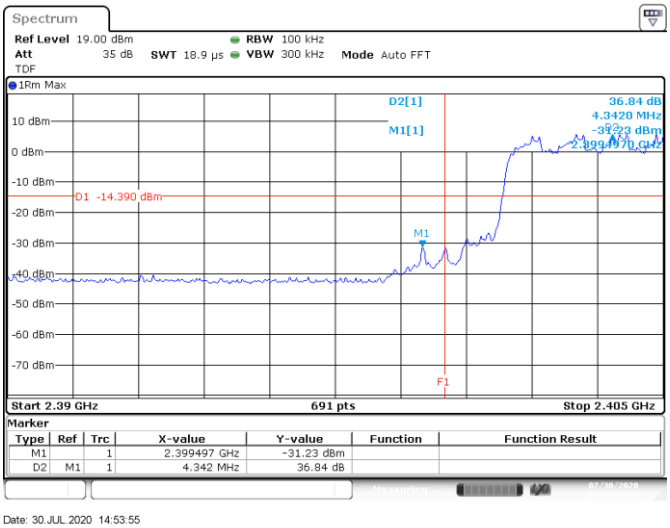


Figure 8.8-20: *Band edge measurement (low), hopping, 8DPSK*

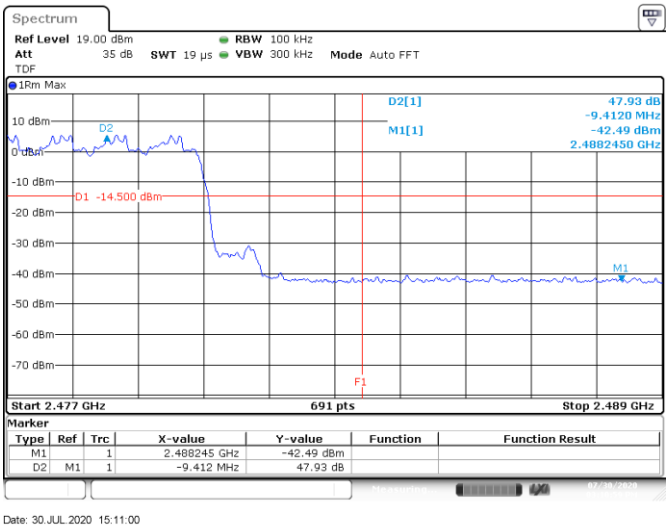


Figure 8.8-21: *Band edge measurement (high), hopping, 8DPSK*

Note: For conducted emissions plots above, peaks within 2400-2483.5MHz are transmitter fundamentals signals and are not evaluated against the relevant limits.

8.8.5 Test data, continued

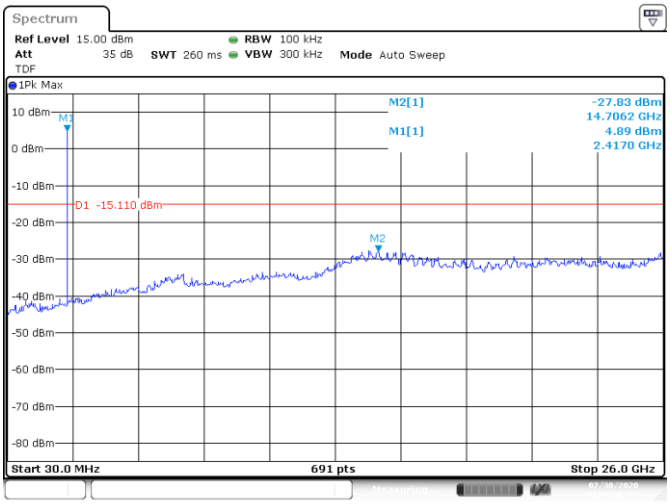


Figure 8.8-22: *Conducted spurious emissions, 2402 MHz, 8DPSK*

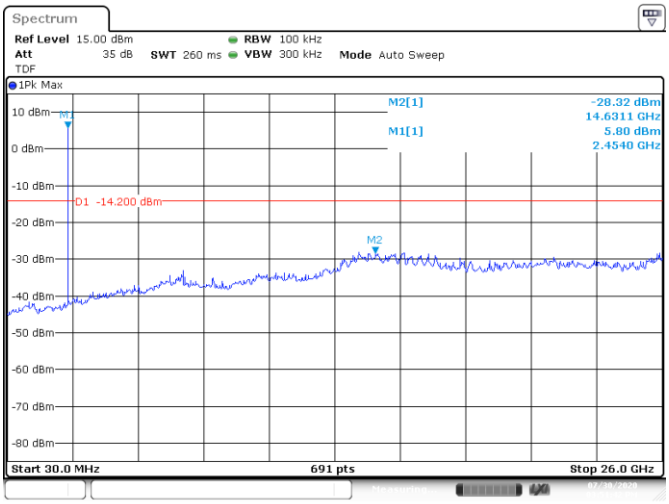


Figure 8.8-23: *Conducted spurious emissions, 2441 MHz, 8DPSK*

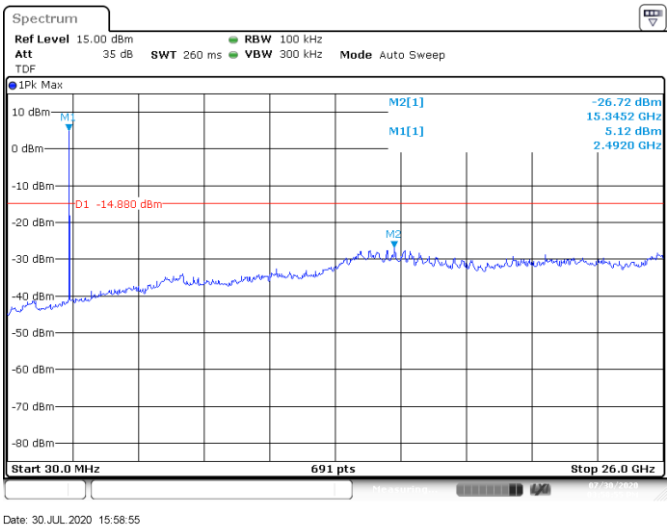
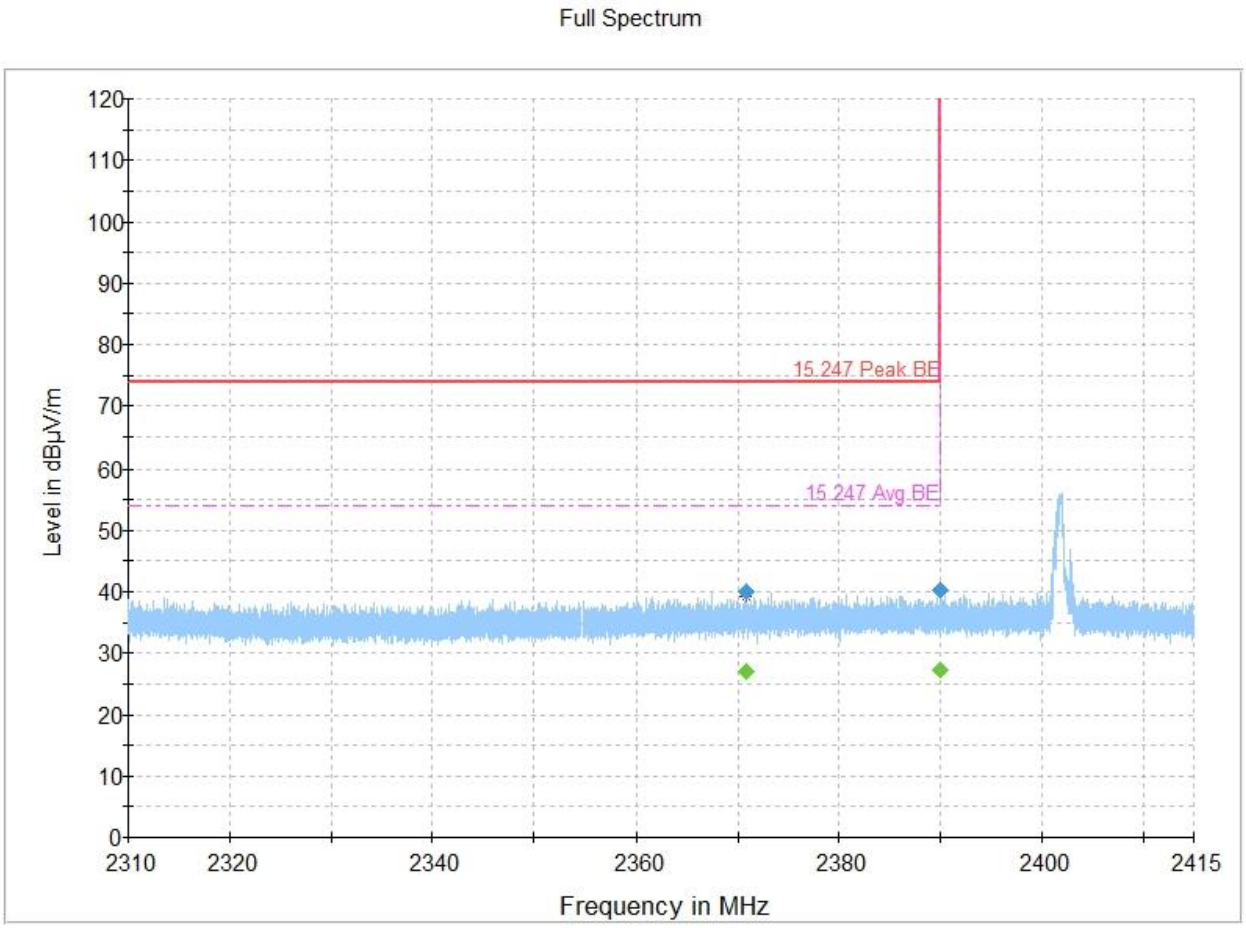


Figure 8.8-24: *Conducted spurious emissions, 2480 MHz, 8DPSK*

Note: For conducted emissions plots above, peaks within 2400-2483.5MHz are transmitter fundamentals signals and are not evaluated against the relevant limits.

8.8.5 Test data, continued



The spectral plot is a summation of a vertical and horizontal scan. The spectral scan has been corrected with the associated transducer factors (i.e. antenna factors, cable loss, amplifier gains, and attenuators).

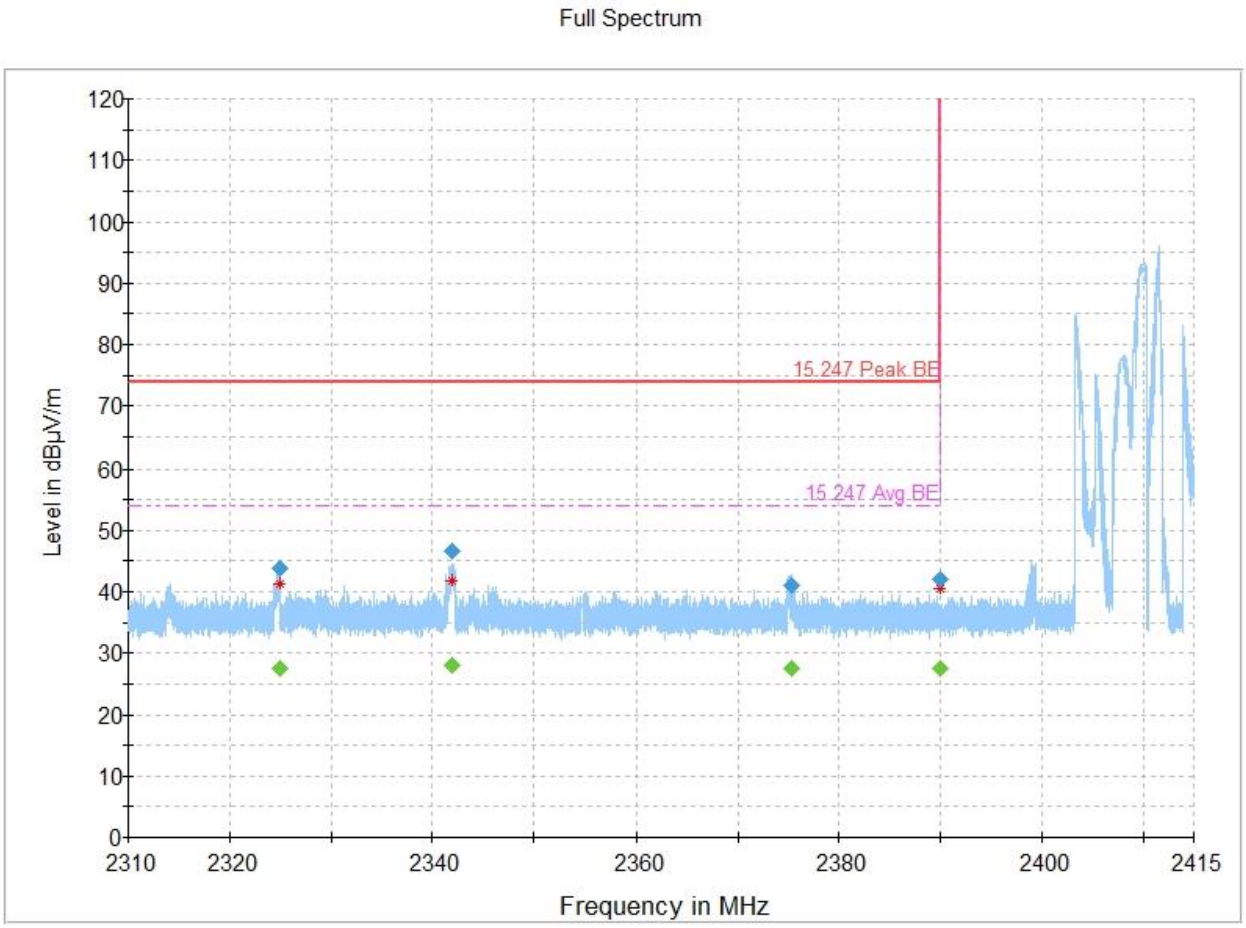
Figure 8.8-25: *Radiated lower band-edge measurement, 2402 MHz channel, spectral plot*

Table 8.8-2: *Radiated lower band-edge measurement, 2402 MHz channel, (Peak and Average) results*

Frequency (MHz)	MaxPeak (dBµV/m)	CAverage (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2370.896500	---	27.08	53.90	26.82	5000.0	1000.000	318.0	V	60.0	-9.1
2370.896500	40.11	---	73.90	33.79	5000.0	1000.000	318.0	V	60.0	-9.1
2390.000000	---	27.34	53.90	26.56	5000.0	1000.000	289.0	V	154.0	-9.0
2390.000000	40.36	---	73.90	33.54	5000.0	1000.000	289.0	V	154.0	-9.0

Notes: [1] Field strength (dBµV/m) = receiver/spectrum analyzer value (dBµV) + correction factor (dB)
[2] Correction factor = antenna factor ACF (dB) + cable loss (dB) - pre amp (dB)
[3] The maximum measured value observed over a period of 5 seconds was recorded.

8.8.5 Test data, continued



The spectral plot is a summation of a vertical and horizontal scan. The spectral scan has been corrected with the associated transducer factors (i.e. antenna factors, cable loss, amplifier gains, and attenuators).

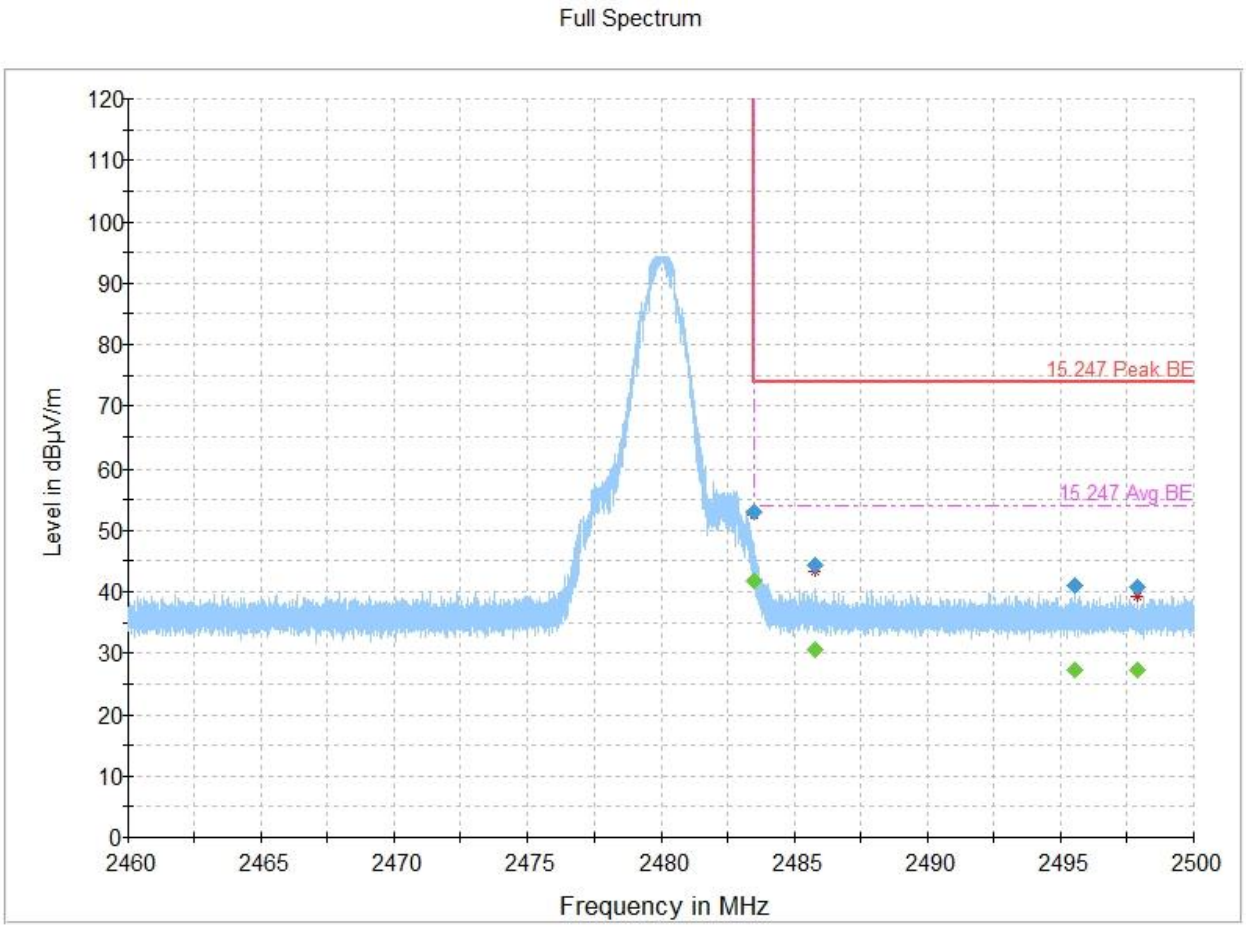
Figure 8.8-26: *Radiated lower band-edge measurement, channel hopping, spectral plot*

Table 8.8-3: *Radiated lower band-edge measurement, channel hopping, (Peak and Average) results*

Frequency (MHz)	MaxPeak (dBµV/m)	CAverage (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2324.948500	---	27.63	53.90	26.27	5000.0	1000.000	361.0	H	156.0	-9.3
2324.948500	43.88	---	73.90	30.02	5000.0	1000.000	361.0	H	156.0	-9.3
2341.930500	46.54	---	73.90	27.36	5000.0	1000.000	123.0	V	246.0	-9.2
2341.930500	---	28.04	53.90	25.86	5000.0	1000.000	123.0	V	246.0	-9.2
2375.243500	41.07	---	73.90	32.83	5000.0	1000.000	381.0	H	216.0	-9.0
2375.243500	---	27.39	53.90	26.51	5000.0	1000.000	381.0	H	216.0	-9.0
2390.000000	---	27.50	53.90	26.40	5000.0	1000.000	298.0	V	232.0	-9.0
2390.000000	41.96	---	73.90	31.94	5000.0	1000.000	298.0	V	232.0	-9.0

Notes: [1] Field strength (dBµV/m) = receiver/spectrum analyzer value (dBµV) + correction factor (dB)
[2] Correction factor = antenna factor ACF (dB) + cable loss (dB) - pre amp (dB)
[3] The maximum measured value observed over a period of 5 seconds was recorded.

8.8.5 Test data, continued



The spectral plot is a summation of a vertical and horizontal scan. The spectral scan has been corrected with the associated transducer factors (i.e. antenna factors, cable loss, amplifier gains, and attenuators).

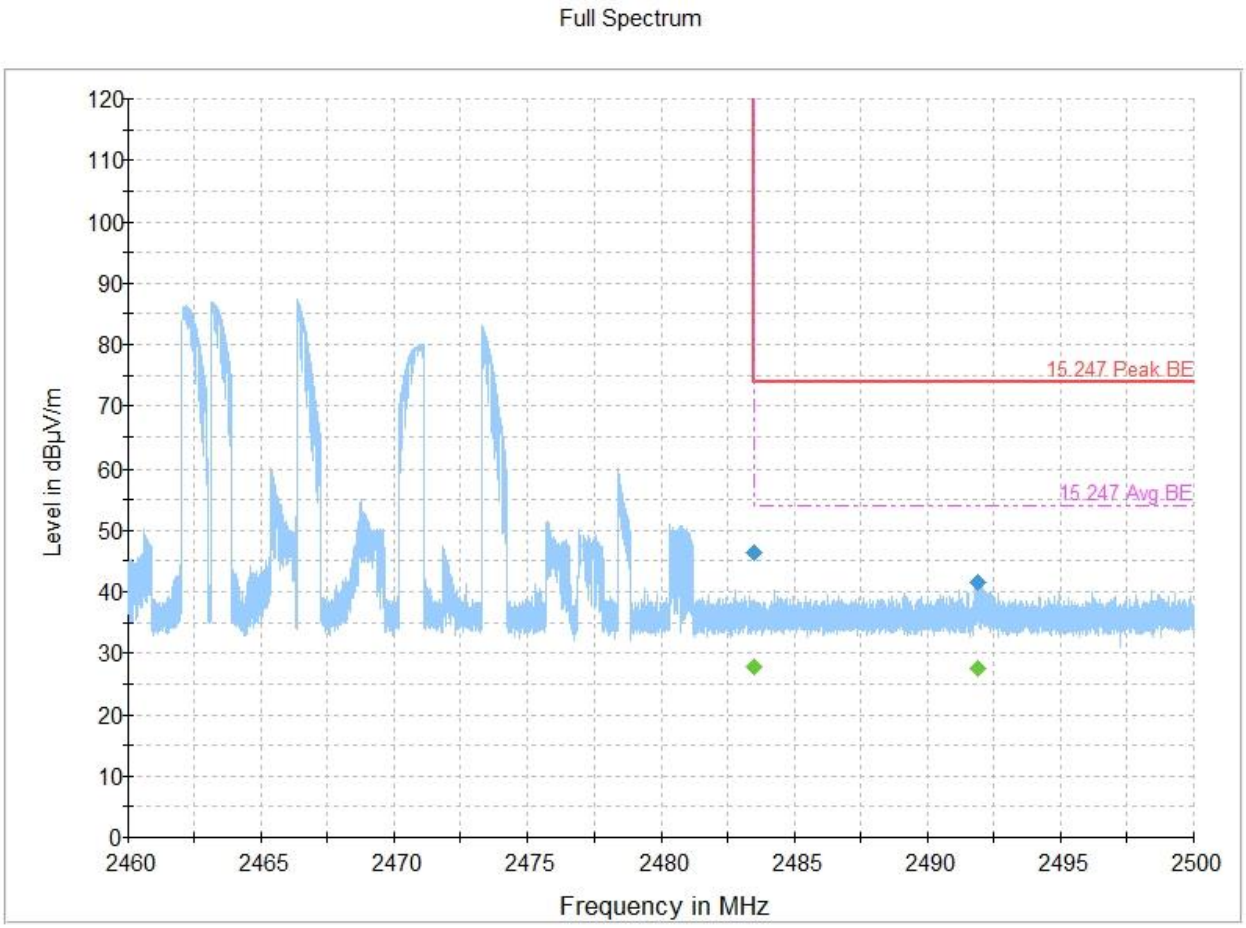
Figure 8.8-27: *Radiated upper band-edge measurement, 2480 MHz channel, spectral plot*

Table 8.8-4: *Radiated upper band-edge measurement, 2480 MHz channel, (Peak and Average) results*

Frequency (MHz)	MaxPeak (dBµV/m)	CAverage (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2483.500000	52.89	---	73.90	21.01	5000.0	1000.000	247.0	V	299.0	-8.6
2483.500000	---	41.68	53.90	12.22	5000.0	1000.000	247.0	V	299.0	-8.6
2485.756000	---	30.56	53.90	23.34	5000.0	1000.000	250.0	V	295.0	-8.6
2485.756000	44.29	---	73.90	29.61	5000.0	1000.000	250.0	V	295.0	-8.6
2495.537333	---	27.23	53.90	26.67	5000.0	1000.000	111.0	H	0.0	-8.6
2495.537333	40.99	---	73.90	32.91	5000.0	1000.000	281.0	V	173.0	-8.6
2497.888000	---	27.34	53.90	26.56	5000.0	1000.000	203.0	H	22.0	-8.6
2497.888000	40.72	---	73.90	33.18	5000.0	1000.000	203.0	H	22.0	-8.6

Notes: [1] Field strength (dBµV/m) = receiver/spectrum analyzer value (dBµV) + correction factor (dB)
[2] Correction factor = antenna factor ACF (dB) + cable loss (dB) - pre amp (dB)
[3] The maximum measured value observed over a period of 5 seconds was recorded.

8.8.5 Test data, continued



The spectral plot is a summation of a vertical and horizontal scan. The spectral scan has been corrected with the associated transducer factors (i.e. antenna factors, cable loss, amplifier gains, and attenuators).

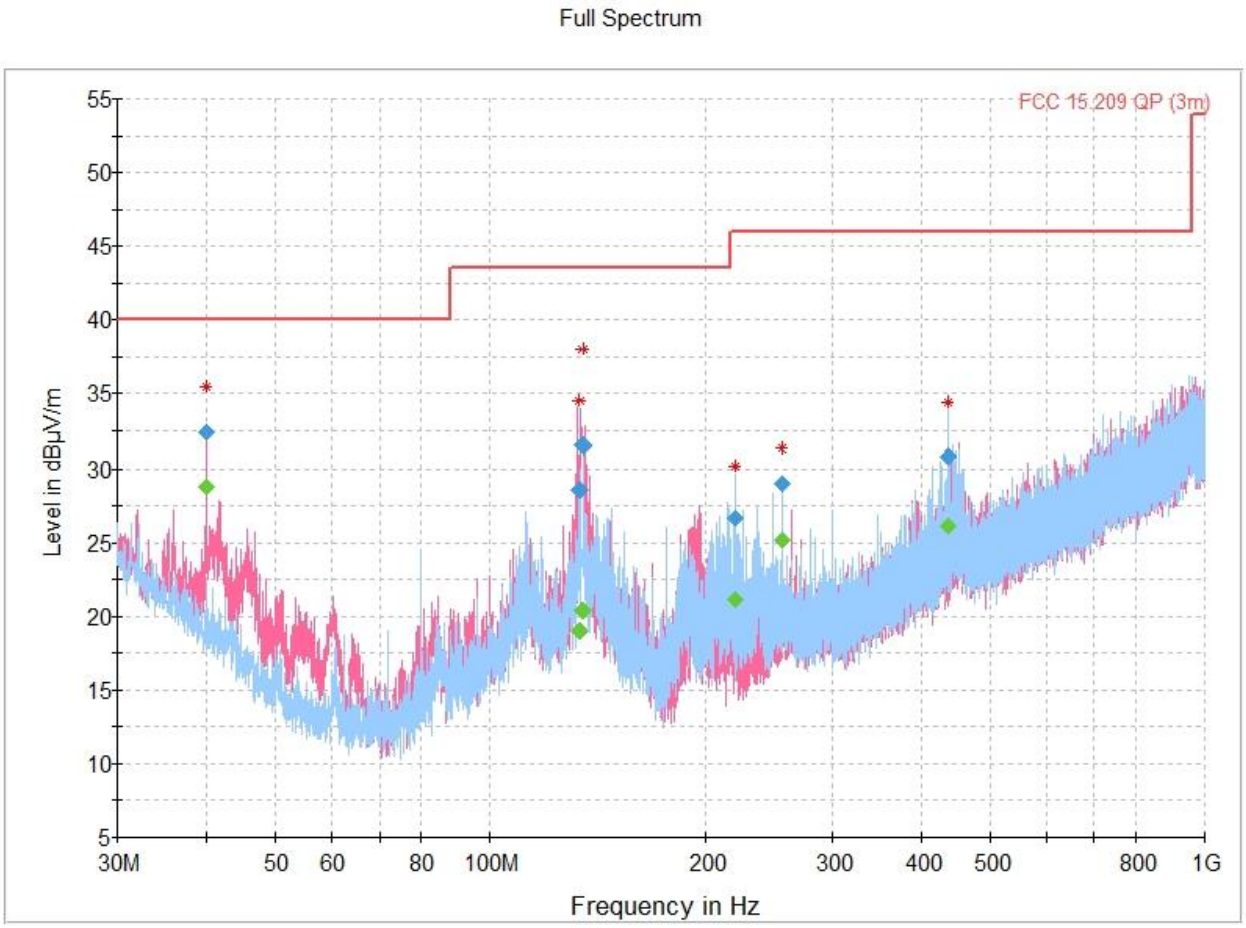
Figure 8.8-28: *Radiated upper band-edge measurement, channel hopping, spectral plot*

Table 8.8-5: *Radiated upper band-edge measurement, channel hopping, (Peak and Average) results*

Frequency (MHz)	MaxPeak (dBµV/m)	CAverage (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2483.500000	---	27.71	53.90	26.19	5000.0	1000.000	209.0	H	58.0	-8.6
2483.500000	46.38	---	73.90	27.52	5000.0	1000.000	209.0	H	58.0	-8.6
2491.910667	41.51	---	73.90	32.39	5000.0	1000.000	176.0	H	119.0	-8.6
2491.910667	---	27.56	53.90	26.34	5000.0	1000.000	176.0	H	119.0	-8.6

Notes: [1] Field strength (dBµV/m) = receiver/spectrum analyzer value (dBµV) + correction factor (dB)
[2] Correction factor = antenna factor ACF (dB) + cable loss (dB) - pre amp (dB)
[3] The maximum measured value observed over a period of 5 seconds was recorded.

8.8.5 Test data, continued



The spectral plot is a summation of a vertical and horizontal scan. The spectral scan has been corrected with the associated transducer factors (i.e. antenna factors, cable loss, amplifier gains, and attenuators).

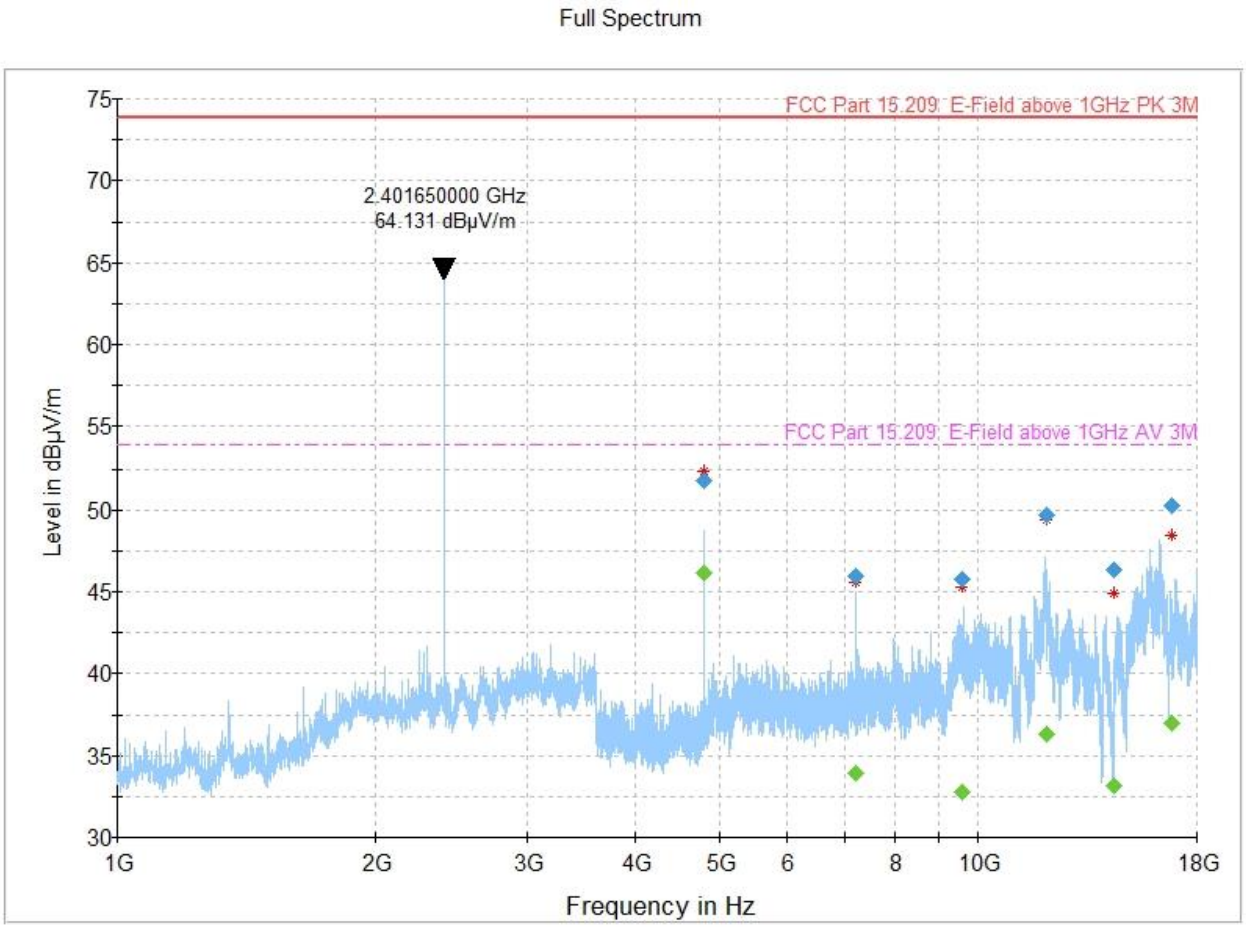
Figure 8.8-29: *Radiated emissions, 2402 MHz channel, 30 – 1000 MHz spectral plot*

Table 8.8-6: *Radiated emissions, 2402 MHz channel, 30 – 1000 MHz (Quasi-Peak) results*

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
40.018667	32.40	40.00	7.60	5000.0	120.000	107.0	V	21.0	20.9
132.852000	28.61	43.50	14.89	5000.0	120.000	130.0	V	179.0	19.4
134.405667	31.51	43.50	11.99	5000.0	120.000	104.0	V	192.0	19.4
220.050667	26.69	46.00	19.31	5000.0	120.000	100.0	H	154.0	17.8
256.030000	28.94	46.00	17.06	5000.0	120.000	107.0	H	68.0	21.3
435.989667	30.84	46.00	15.16	5000.0	120.000	118.0	H	44.0	25.3

Notes: [1] Field strength (dBµV/m) = receiver/spectrum analyzer value (dBµV) + correction factor (dB)
[2] Correction factor = antenna factor ACF (dB) + cable loss (dB)
[3] The maximum measured value observed over a period of 5 seconds was recorded.

8.8.5 Test data, continued



The spectral plot is a summation of a vertical and horizontal scan. The spectral scan has been corrected with the associated transducer factors (i.e. antenna factors, cable loss, amplifier gains, and attenuators).

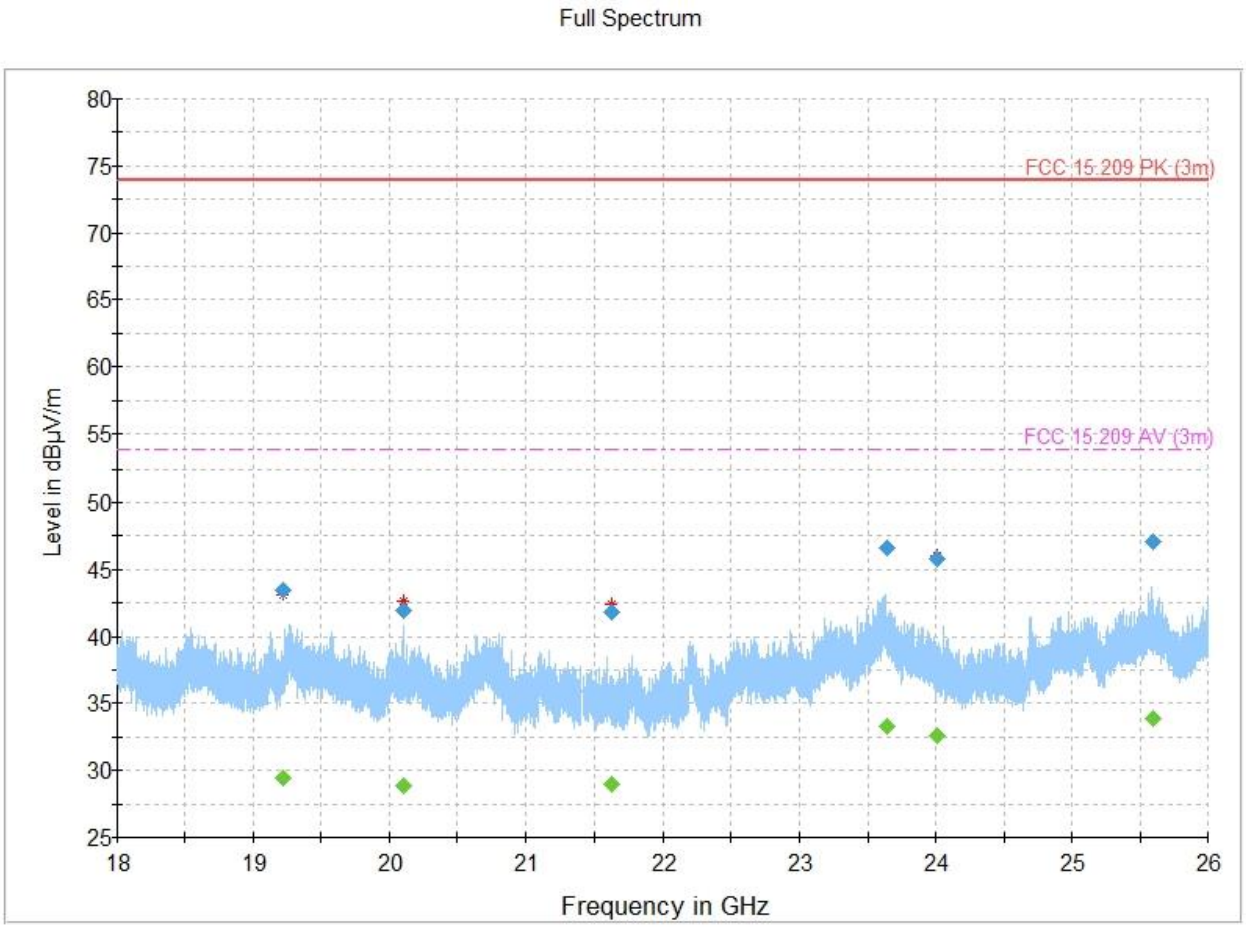
Figure 8.8-30: *Radiated emissions, 2402 MHz channel, 1 – 18 GHz spectral plot*

Table 8.8-7: *Radiated emissions, 2402 MHz channel, 1 – 18 GHz (Peak and Average) results*

Frequency (MHz)	MaxPeak (dBµV/m)	CAverage (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
4803.869550	---	49.55 [5]	53.90	4.35	5000.0	1000.000	243.0	H	207.0	-3.7
4803.869550	51.81	---	73.90	22.09	5000.0	1000.000	243.0	H	207.0	-3.7
7205.676300	---	43.67 [5]	53.90	10.23	5000.0	1000.000	291.0	V	114.0	-1.1
7205.676300	45.93	---	73.90	27.97	5000.0	1000.000	291.0	V	114.0	-1.1
9607.076550	---	43.52 [5]	53.90	10.38	5000.0	1000.000	365.0	V	103.0	3.4
9607.076550	45.78	---	73.90	28.12	5000.0	1000.000	365.0	V	103.0	3.4
12009.974750	---	47.43 [5]	53.90	6.47	5000.0	1000.000	129.0	V	22.0	7.2
12009.974750	49.69	---	73.90	24.21	5000.0	1000.000	129.0	V	22.0	7.2
14414.758200	---	44.12 [5]	53.90	9.78	5000.0	1000.000	282.0	V	351.0	8.0
14414.758200	46.38	---	73.90	27.52	5000.0	1000.000	282.0	V	351.0	8.0
16812.151650	---	48.03 [5]	53.90	5.87	5000.0	1000.000	263.0	V	233.0	12.0
16812.151650	50.29	---	73.90	23.61	5000.0	1000.000	263.0	V	233.0	12.0

Notes:
[1] Field strength (dBµV/m) = receiver/spectrum analyzer value (dBµV) + correction factor (dB)
[2] Correction factor = antenna factor ACF (dB) + cable loss (dB) - pre amp (dB)
[3] The maximum measured value observed over a period of 5 seconds was recorded.
[4] A 2.4 GHz notch filter was used to suppress the transmit carrier frequency.
[5] Average computed by adding $\delta(\mathrm{dB}) = 20 \times \log(0.7713) = -2.256$ dB to the measured Peak value.

8.8.5 Test data, continued



The spectral plot is a summation of a vertical and horizontal scan. The spectral scan has been corrected with the associated transducer factors (i.e. antenna factors, cable loss, amplifier gains, and attenuators).

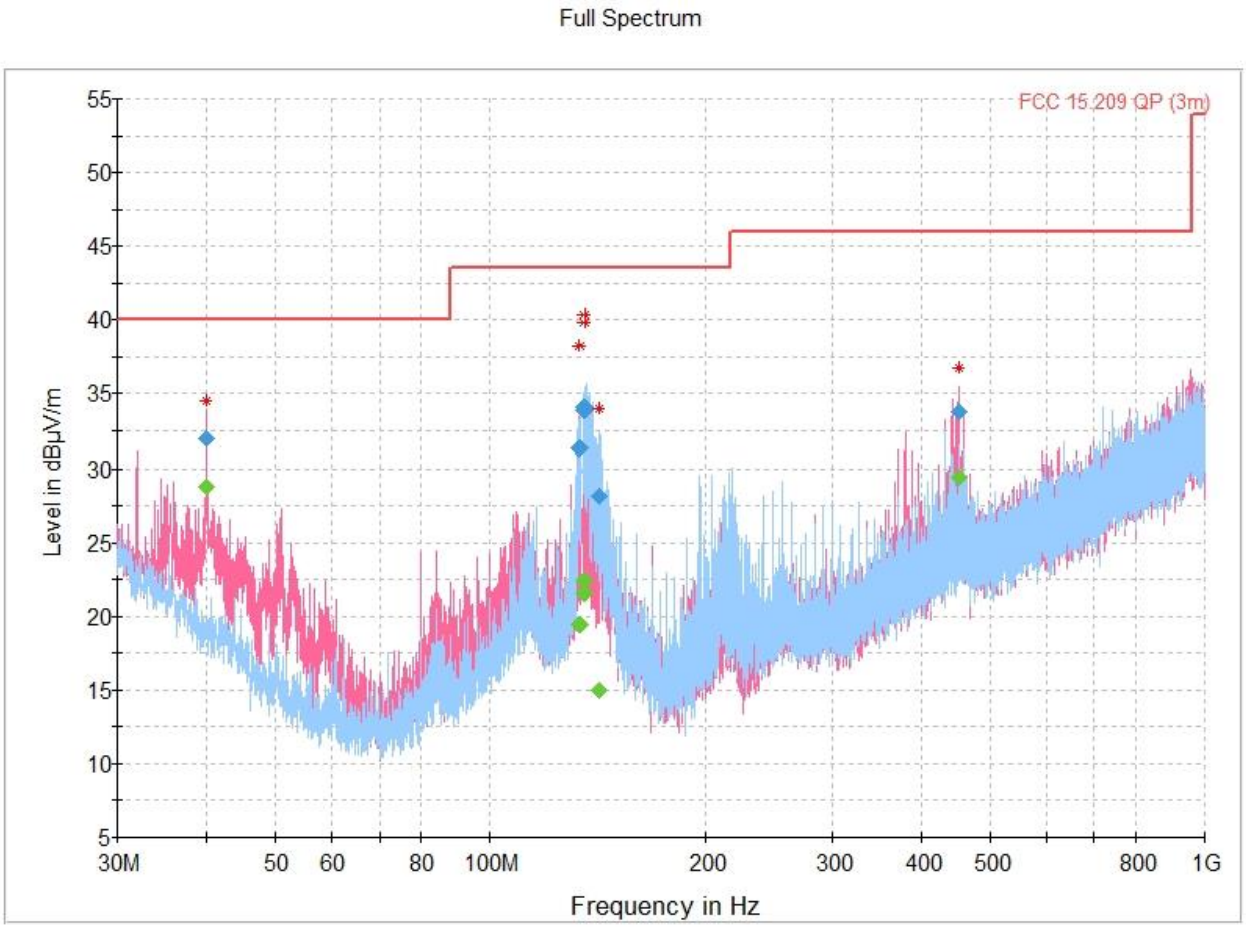
Figure 8.8-31: *Radiated emissions, 2402 MHz channel, 18 – 26 GHz spectral plot*

Table 8.8-8: *Radiated emissions, 2402 MHz channel, 18 – 26 GHz (Peak and Average) results*

Frequency (MHz)	MaxPeak (dBµV/m)	CAverage (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
19220.100000	---	41.23 [4]	53.90	12.67	5000.0	1000.000	329.0	H	11.0	14.2
19220.100000	43.49	---	73.90	30.41	5000.0	1000.000	329.0	H	11.0	14.2
20103.900000	41.99	---	73.90	31.91	5000.0	1000.000	249.0	V	0.0	13.7
20103.900000	---	28.83	53.90	25.07	5000.0	1000.000	249.0	V	0.0	13.7
21621.700000	---	39.59 [4]	53.90	14.31	5000.0	1000.000	114.0	H	88.0	14.9
21621.700000	41.85	---	73.90	32.05	5000.0	1000.000	114.0	H	88.0	14.9
23640.500000	---	33.30	53.90	20.60	5000.0	1000.000	344.0	V	38.0	20.1
23640.500000	46.61	---	73.90	27.29	5000.0	1000.000	344.0	V	38.0	20.1
24016.500000	---	43.47 [4]	53.90	10.43	5000.0	1000.000	369.0	H	155.0	19.1
24016.500000	45.73	---	73.90	28.17	5000.0	1000.000	369.0	H	155.0	19.1
25594.100000	47.10	---	73.90	26.80	5000.0	1000.000	284.0	V	102.0	19.2
25594.100000	---	33.92	53.90	19.98	5000.0	1000.000	284.0	V	102.0	19.2

Notes:
[1] Field strength (dBµV/m) = receiver/spectrum analyzer value (dBµV) + correction factor (dB)
[2] Correction factor = antenna factor ACF (dB) + cable loss (dB) - pre amp (dB)
[3] The maximum measured value observed over a period of 5 seconds was recorded.
[4] Average computed by adding $\delta(\mathrm{dB}) = 20 \times \log(0.7713) = -2.256$ dB to the measured Peak values.

8.8.5 Test data, continued



The spectral plot is a summation of a vertical and horizontal scan. The spectral scan has been corrected with the associated transducer factors (i.e. antenna factors, cable loss, amplifier gains, and attenuators).

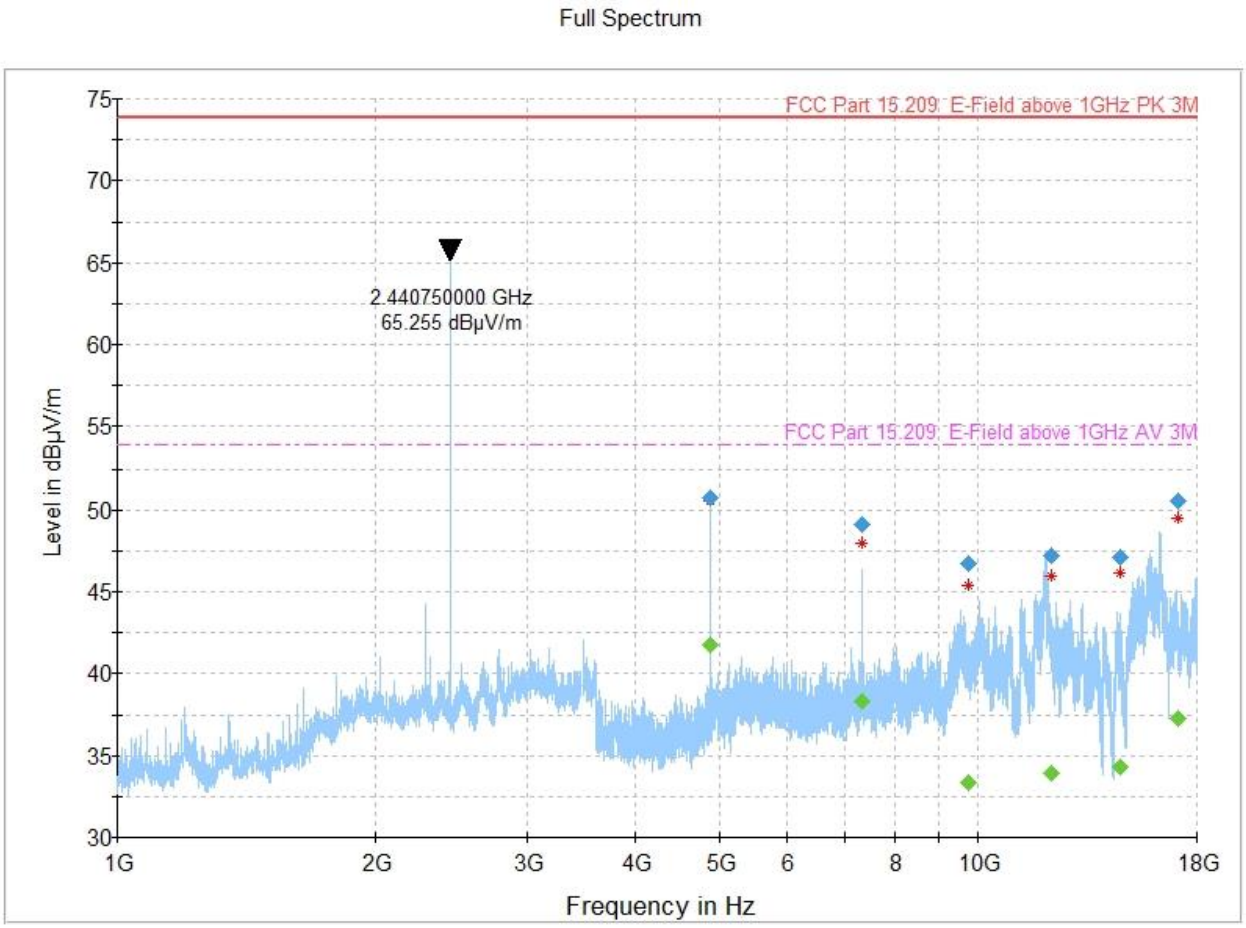
Figure 8.8-32: *Radiated emissions, 2441 MHz channel, 30 – 1000 MHz spectral plot*

Table 8.8-9: *Radiated emissions, 2441 MHz channel, 30 – 1000 MHz (Quasi-Peak) results*

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
40.011000	---	---	---	5000.0	120.000	115.0	V	67.0	21.0
40.011000	31.93	40.00	8.07	5000.0	120.000	115.0	V	67.0	21.0
133.428000	---	---	---	5000.0	120.000	222.0	H	105.0	19.4
133.428000	31.29	43.50	12.21	5000.0	120.000	222.0	H	105.0	19.4
135.431667	---	---	---	5000.0	120.000	117.0	H	109.0	19.4
135.431667	34.13	43.50	9.37	5000.0	120.000	117.0	H	109.0	19.4
135.465000	33.92	43.50	9.58	5000.0	120.000	184.0	H	254.0	19.4
135.465000	---	---	---	5000.0	120.000	184.0	H	254.0	19.4
141.268667	---	---	---	5000.0	120.000	159.0	H	58.0	19.3
141.268667	28.19	43.50	15.31	5000.0	120.000	159.0	H	58.0	19.3
452.002333	33.80	46.00	12.20	5000.0	120.000	176.0	V	93.0	25.5
452.002333	---	---	---	5000.0	120.000	176.0	V	93.0	25.5

Notes: [1] Field strength (dBµV/m) = receiver/spectrum analyzer value (dBµV) + correction factor (dB)
[2] Correction factor = antenna factor ACF (dB) + cable loss (dB)
[3] The maximum measured value observed over a period of 5 seconds was recorded.

8.8.5 Test data, continued



The spectral plot is a summation of a vertical and horizontal scan. The spectral scan has been corrected with the associated transducer factors (i.e. antenna factors, cable loss, amplifier gains, and attenuators).

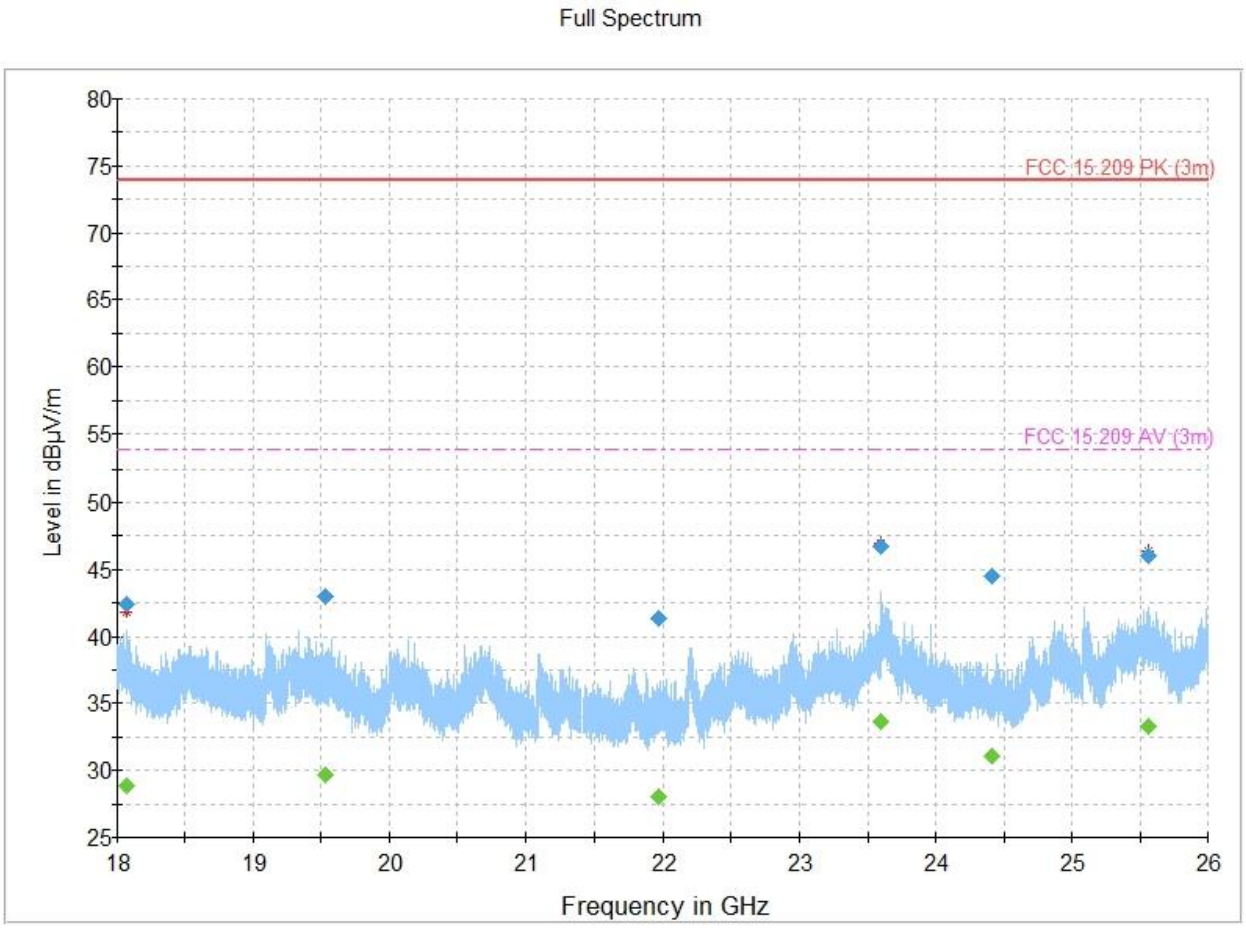
Figure 8.8-33: *Radiated emissions, 2441 MHz channel, 1 – 18 GHz spectral plot*

Table 8.8-10: *Radiated emissions, 2441 MHz channel, 1 – 18 GHz (Peak and Average) results*

Frequency (MHz)	MaxPeak (dBµV/m)	CAverage (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
4882.394600	---	48.46 [5]	53.90	5.44	5000.0	1000.000	154.0	H	322.0	-3.6
4882.394600	50.72	---	73.90	23.18	5000.0	1000.000	154.0	H	322.0	-3.6
7322.524600	---	46.82 [5]	53.90	7.08	5000.0	1000.000	104.0	V	316.0	-0.7
7322.524600	49.08	---	73.90	24.82	5000.0	1000.000	104.0	V	316.0	-0.7
9761.969500	---	44.44 [5]	53.90	9.46	5000.0	1000.000	113.0	V	274.0	3.5
9761.969500	46.70	---	73.90	27.20	5000.0	1000.000	113.0	V	274.0	3.5
12200.193750	---	44.97 [5]	53.90	8.93	5000.0	1000.000	121.0	V	140.0	7.3
12200.193750	47.23	---	73.90	26.67	5000.0	1000.000	121.0	V	140.0	7.3
14641.064450	---	44.85 [5]	53.90	9.05	5000.0	1000.000	187.0	V	46.0	8.1
14641.064450	47.11	---	73.90	26.79	5000.0	1000.000	187.0	V	46.0	8.1
17089.226650	---	48.26 [5]	53.90	5.64	5000.0	1000.000	193.0	V	63.0	11.1
17089.226650	50.52	---	73.90	23.38	5000.0	1000.000	193.0	V	63.0	11.1

Notes:
[1] Field strength (dBµV/m) = receiver/spectrum analyzer value (dBµV) + correction factor (dB)
[2] Correction factor = antenna factor ACF (dB) + cable loss (dB) - pre amp (dB)
[3] The maximum measured value observed over a period of 5 seconds was recorded.
[4] A 2.4 GHz notch filter was used to suppress the transmit carrier frequency.
[5] Average computed by adding $\delta(\mathrm{dB}) = 20 \times \log(0.7713) = -2.256$ dB to the measured Peak value.

8.8.5 Test data, continued



The spectral plot is a summation of a vertical and horizontal scan. The spectral scan has been corrected with the associated transducer factors (i.e. antenna factors, cable loss, amplifier gains, and attenuators).

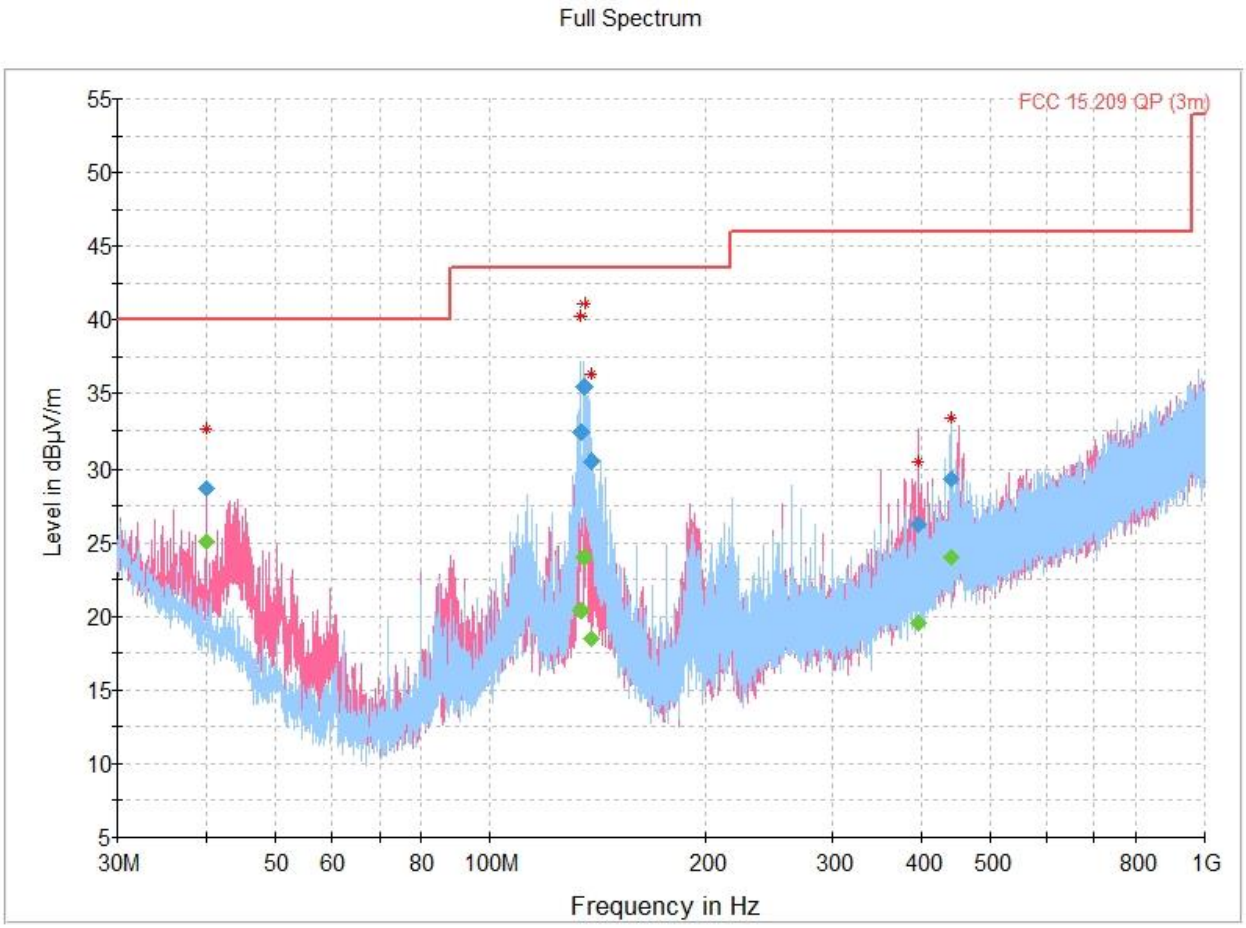
Figure 8.8-34: *Radiated emissions, 2441 MHz channel, 18 – 26 GHz spectral plot*

Table 8.8-11: *Radiated emissions, 2441 MHz channel, 18 – 26 GHz (Peak and Average) results*

Frequency (MHz)	MaxPeak (dBµV/m)	CAverage (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
18065.900000	---	28.89	53.90	25.01	5000.0	1000.000	410.0	H	180.0	13.4
18065.900000	42.45	---	73.90	31.45	5000.0	1000.000	410.0	H	180.0	13.4
19524.100000	42.93	---	73.90	30.97	5000.0	1000.000	318.0	V	9.0	14.1
19524.100000	---	40.67 [4]	53.90	13.23	5000.0	1000.000	318.0	V	9.0	14.1
21967.900000	41.34	---	73.90	32.56	5000.0	1000.000	228.0	H	0.0	14.6
21967.900000	---	39.08 [4]	53.90	14.82	5000.0	1000.000	228.0	H	0.0	14.6
23598.833333	---	33.61	53.90	20.29	5000.0	1000.000	280.0	V	75.0	20.5
23598.833333	46.78	---	73.90	27.12	5000.0	1000.000	280.0	V	75.0	20.5
24413.300000	44.50	---	73.90	29.40	5000.0	1000.000	137.0	H	90.0	17.9
24413.300000	---	42.24 [4]	53.90	11.66	5000.0	1000.000	137.0	H	90.0	17.9
25566.366667	46.07	---	73.90	27.83	5000.0	1000.000	106.0	H	298.0	19.2
25566.366667	---	33.32	53.90	20.58	5000.0	1000.000	106.0	H	298.0	19.2

Notes: [1] Field strength (dBµV/m) = receiver/spectrum analyzer value (dBµV) + correction factor (dB)
[2] Correction factor = antenna factor ACF (dB) + cable loss (dB) - pre amp (dB)
[3] The maximum measured value observed over a period of 5 seconds was recorded.
[4] Average computed by adding $\delta(\mathrm{dB}) = 20 \times \log(0.7713) = -2.256$ dB to the measured Peak values.

8.8.5 Test data, continued



The spectral plot is a summation of a vertical and horizontal scan. The spectral scan has been corrected with the associated transducer factors (i.e. antenna factors, cable loss, amplifier gains, and attenuators).

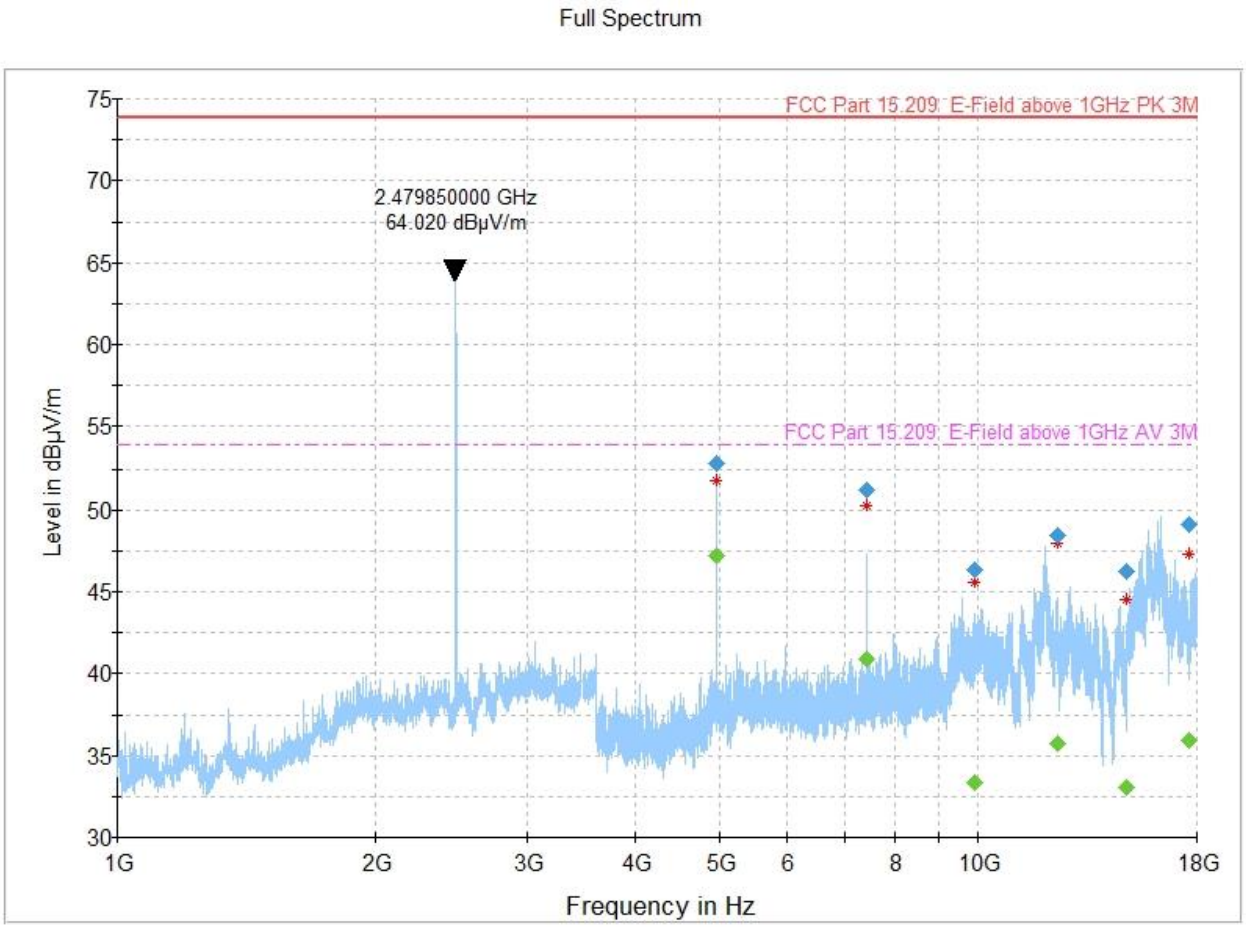
Figure 8.8-35: *Radiated emissions, 2480 MHz channel, 30 – 1000 MHz spectral plot*

Table 8.8-12: *Radiated emissions, 2480 MHz channel, 30 – 1000 MHz (Quasi-Peak) results*

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
40.011000	28.72	40.00	11.28	5000.0	120.000	140.0	V	180.0	21.0
40.011000	---	---	---	5000.0	120.000	140.0	V	180.0	21.0
134.044000	32.38	43.50	11.12	5000.0	120.000	242.0	H	154.0	19.4
134.044000	---	---	---	5000.0	120.000	242.0	H	154.0	19.4
135.180000	---	---	---	5000.0	120.000	195.0	H	141.0	19.4
135.180000	35.46	43.50	8.04	5000.0	120.000	195.0	H	141.0	19.4
137.633000	30.43	43.50	13.07	5000.0	120.000	196.0	H	106.0	19.4
137.633000	---	---	---	5000.0	120.000	196.0	H	106.0	19.4
396.153333	---	---	---	5000.0	120.000	109.0	V	123.0	24.5
396.153333	26.24	46.00	19.76	5000.0	120.000	109.0	V	123.0	24.5
439.966667	29.26	46.00	16.74	5000.0	120.000	107.0	H	334.0	25.3
439.966667	---	---	---	5000.0	120.000	107.0	H	334.0	25.3

Notes: [1] Field strength (dBµV/m) = receiver/spectrum analyzer value (dBµV) + correction factor (dB)
[2] Correction factor = antenna factor ACF (dB) + cable loss (dB)
[3] The maximum measured value observed over a period of 5 seconds was recorded.

8.8.5 Test data, continued



The spectral plot is a summation of a vertical and horizontal scan. The spectral scan has been corrected with the associated transducer factors (i.e. antenna factors, cable loss, amplifier gains, and attenuators).

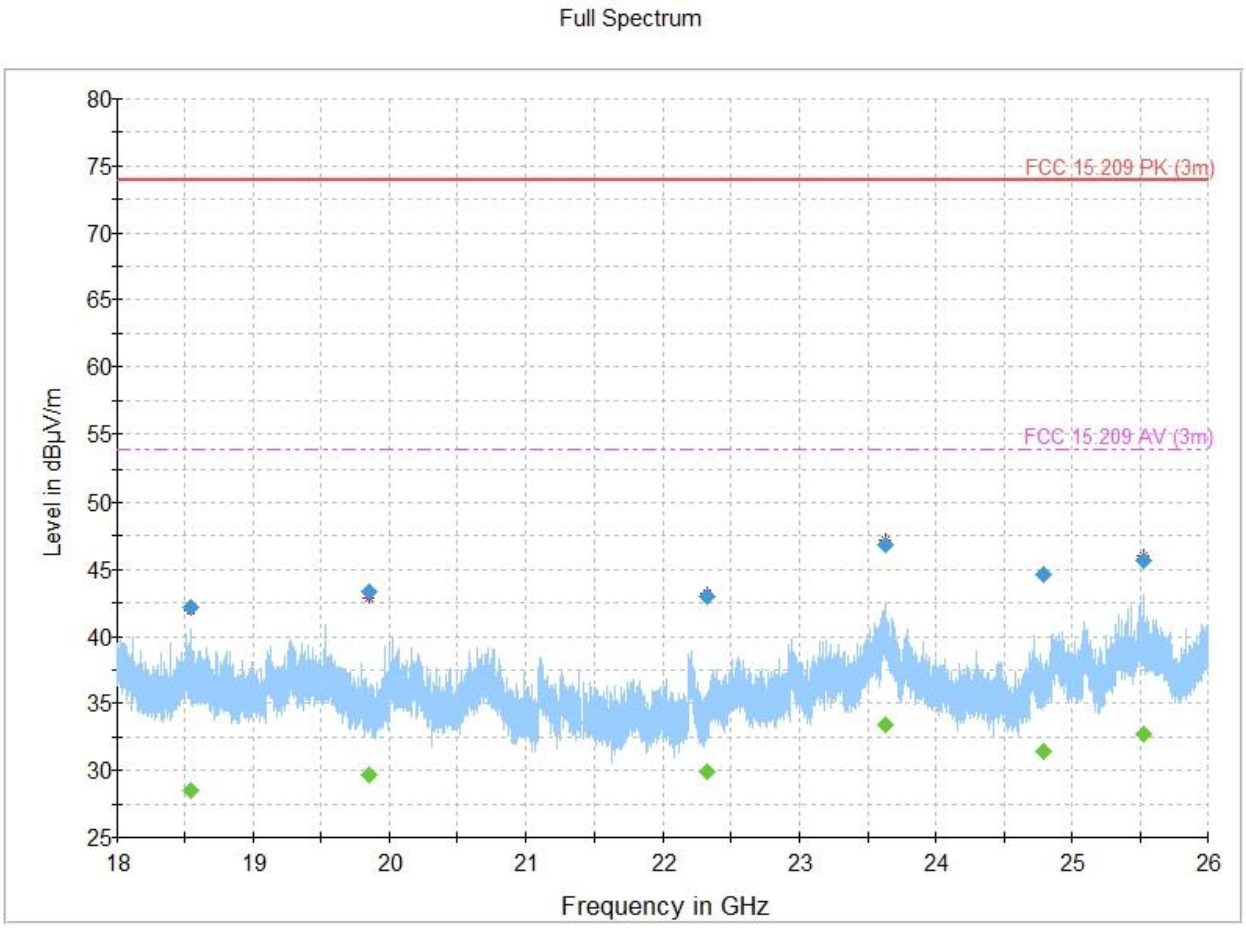
Figure 8.8-36: *Radiated emissions, 2480 MHz channel, 1 – 18 GHz spectral plot*

Table 8.8-13: *Radiated emissions, 2480 MHz channel, 1 – 18 GHz (Peak and Average) results*

Frequency (MHz)	MaxPeak (dBµV/m)	CAverage (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
4960.130550	---	50.60 [5]	53.90	3.30	5000.0	1000.000	302.0	H	0.0	-3.4
4960.130550	52.86	---	73.90	21.04	5000.0	1000.000	302.0	H	0.0	-3.4
7439.542200	---	48.98 [5]	53.90	4.92	5000.0	1000.000	164.0	H	118.0	-0.2
7439.542200	51.24	---	73.90	22.66	5000.0	1000.000	164.0	H	118.0	-0.2
9924.462200	---	44.06 [5]	53.90	9.84	5000.0	1000.000	403.0	H	0.0	3.7
9924.462200	46.32	---	73.90	27.58	5000.0	1000.000	403.0	H	0.0	3.7
12404.988800	---	46.23 [5]	53.90	7.67	5000.0	1000.000	212.0	V	146.0	7.3
12404.988800	48.49	---	73.90	25.41	5000.0	1000.000	212.0	V	146.0	7.3
14881.644100	---	43.94 [5]	53.90	9.96	5000.0	1000.000	377.0	V	262.0	8.3
14881.644100	46.20	---	73.90	27.70	5000.0	1000.000	377.0	V	262.0	8.3
17625.566500	---	46.89 [5]	53.90	7.01	5000.0	1000.000	125.0	V	330.0	11.4
17625.566500	49.15	---	73.90	24.75	5000.0	1000.000	125.0	V	330.0	11.4

Notes:
[1] Field strength (dBµV/m) = receiver/spectrum analyzer value (dBµV) + correction factor (dB)
[2] Correction factor = antenna factor ACF (dB) + cable loss (dB) - pre amp (dB)
[3] The maximum measured value observed over a period of 5 seconds was recorded.
[4] A 2.4 GHz notch filter was used to suppress the transmit carrier frequency.
[5] Average computed by adding $\delta(\mathrm{dB}) = 20 \times \log(0.7713) = -2.256$ dB to the measured Peak value.

8.8.5 Test data, continued



The spectral plot is a summation of a vertical and horizontal scan. The spectral scan has been corrected with the associated transducer factors (i.e. antenna factors, cable loss, amplifier gains, and attenuators).

Figure 8.8-37: *Radiated emissions, 2480 MHz channel, 18 – 26 GHz spectral plot*

Table 8.8-14: *Radiated emissions, 2480 MHz channel, 18 – 26 GHz (Peak and Average) results*

Frequency (MHz)	MaxPeak (dBµV/m)	CAverage (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
18543.966667	42.15	---	73.90	31.75	5000.0	1000.000	212.0	V	169.0	13.7
18543.966667	---	28.54	53.90	25.36	5000.0	1000.000	212.0	V	169.0	13.7
19845.500000	43.32	---	73.90	30.58	5000.0	1000.000	275.0	H	211.0	13.5
19845.500000	---	41.06 [4]	53.90	12.84	5000.0	1000.000	275.0	H	211.0	13.5
22322.100000	43.00	---	73.90	30.90	5000.0	1000.000	153.0	H	140.0	15.3
22322.100000	---	40.74 [4]	53.90	13.16	5000.0	1000.000	153.0	H	140.0	15.3
23629.033333	46.79	---	73.90	27.11	5000.0	1000.000	207.0	V	227.0	20.2
23629.033333	---	33.42	53.90	20.48	5000.0	1000.000	207.0	V	227.0	20.2
24797.300000	---	42.32 [4]	53.90	11.58	5000.0	1000.000	358.0	V	0.0	18.5
24797.300000	44.58	---	73.90	29.32	5000.0	1000.000	358.0	V	0.0	18.5
25528.500000	---	32.68	53.90	21.22	5000.0	1000.000	322.0	H	206.0	19.2
25528.500000	45.69	---	73.90	28.21	5000.0	1000.000	322.0	H	206.0	19.2

Notes: [1] Field strength (dBµV/m) = receiver/spectrum analyzer value (dBµV) + correction factor (dB)
[2] Correction factor = antenna factor ACF (dB) + cable loss (dB) - pre amp (dB)
[3] The maximum measured value observed over a period of 5 seconds was recorded.
[4] Average computed by adding $\delta(\mathrm{dB}) = 20 \times \log(0.7713) = -2.256$ dB to the measured Peak values.

Section 9 Block diagrams of test set-ups

9.1 Radiated emissions set-up

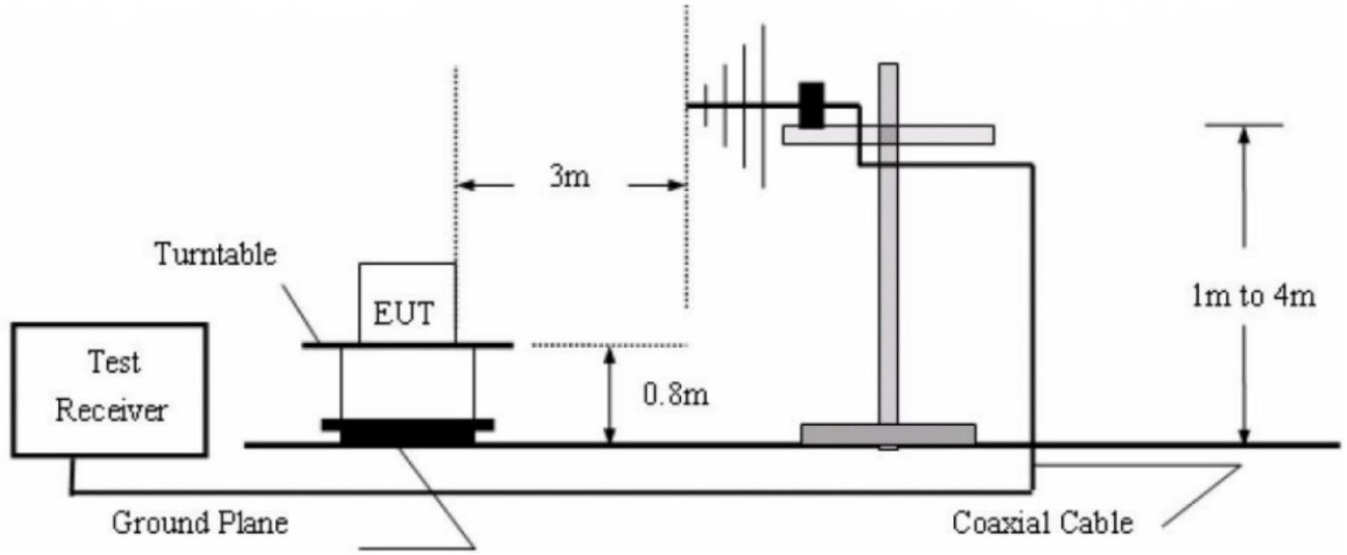


Figure 9.1-1: *30 MHz - 1000 MHz Setup*

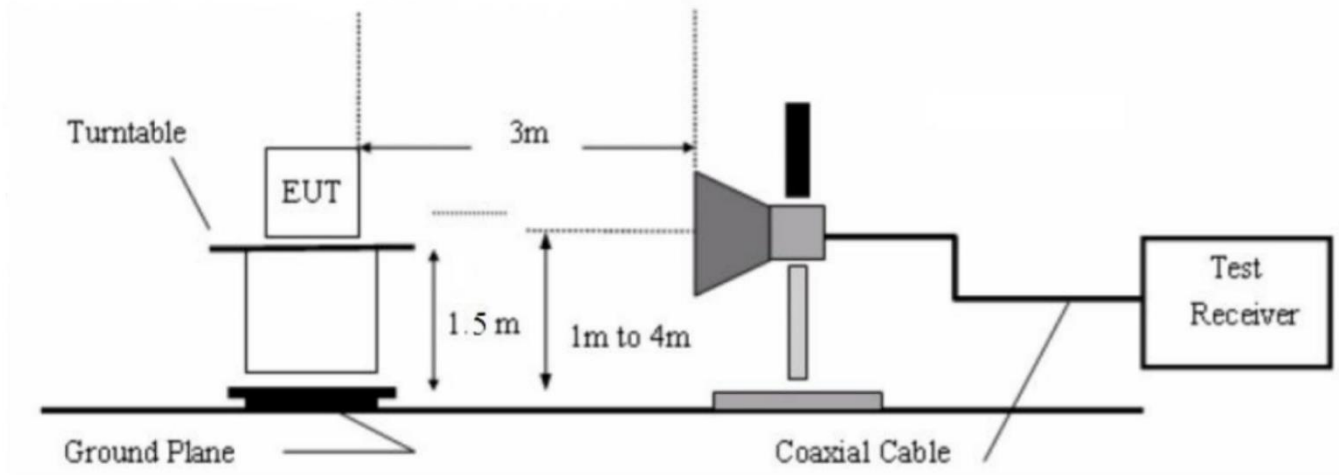


Figure 9.1-2: 1 GHz - 26 GHz Setup

9.2 AC Conducted emissions set-up

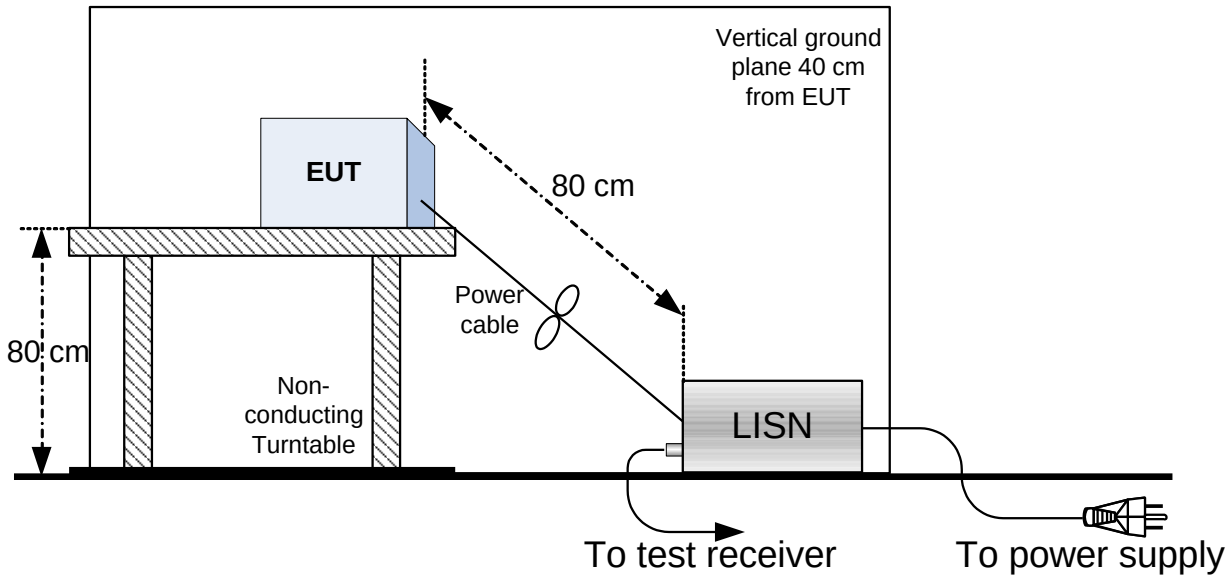


Figure 9.2-1: *150 kHz to 30 MHz Conducted Emissions Setup*