

Radio Test report – Radiated Emissions

349368-1TRFWL-R1

Date of issue: March 16, 2018

Applicant:

Ericsson Canada

Product:

Radio DOT Transceiver

Model:

RD 4442 B48

Part number:

KRY 901 385/1

FCC ID:

TA8AKRY901385-1

Requirements/Summary:

Standard	Clause	Compliance
FCC CFR 47 Part 15, Subpart B	§15.109 Radiated emission limits.	Yes
FCC 47 CFR Part 96 – Citizens Broadband Radio Service	§96.41 (e)(2) 3.5 GHz Emissions and Interference Limits <i>Additional protection levels</i>	Yes

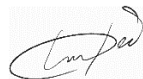


Nemko Canada Inc., a testing laboratory, is accredited by the Standards Council of Canada. The tests included in this report are within the scope of this accreditation

Custom.docx: June 6, 2016

www.nemko.com

Lab and test locations

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Tested by	Predrag Golic, EMC Specialist, Shawn He, Senior EMC Specialist		
Reviewed by	Andrey Adelberg, Senior Wireless/EMC Specialist		
Review date	March 16, 2018		
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 Canada's ISO/IEC 17025 accreditation.

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Section 1 Report summary

1.1 Test specifications

FCC 47 CFR Part 96	Citizens Broadband Radio Service
FCC CFR 47 Part 15, Subpart B	Title 47: Telecommunication; Part 15—Radio Frequency Devices

1.2 Exclusions

None

1.3 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.

1.4 Test report revision history

Table 1.4-1: Test report revision history

Revision #	Details of changes made to test report
TRF	Original report issued

Section 2 Summary of test results

2.1 Results

Table 2.1-1: FCC 47 CFR Part 15, Subpart B results

Part	Test description	Verdict
§15.109	Radiated emission limits (Class B)	Pass

Notes: None

Table 2.1-2: FCC Part 96 results

Part	Test description	Verdict
§96.41 (e)(2)	3.5 GHz Emissions and Interference Limits – Additional protection levels	Pass

Notes: None

Section 3 Equipment under test (EUT) details

3.1 Applicant/Manufacturer

Company name	Ericsson Canada Inc.
Address	349 Terry Fox Drive, Ottawa, ON, Canada, K2K 2V6

3.2 Sample information

Receipt date	January 22, 2018
Nemko sample ID number	1

3.3 EUT information

Product name	Radio DOT Transceiver
Model	RD 4442 B48
Part number	KRY 901 385/1
Revision	R1B
Serial number	TD3T384491
Antenna ports	4 TX/RX Ports
IBW	40 MHz (Contiguous operation only)
Frequency:	TX/RX: 3550–3700 MHz
Nominal O/P per Antenna Port:	Single Carrier: 1 × 50 mW (17 dBm)
	Multi-Carrier: 2 × 25 mW (14 dBm)
	Multi-Carrier: 3 × 16.7 mW (12.2 dBm)
	Multi-Carrier: 4 × 12.5 mW (11 dBm)
Accuracy (Nominal):	±0.1 ppm
Nominal Voltage:	–48 V _{DC} @ 0.5 A
RAT:	LTE
Modulation:	QPSK, 16QAM, 64QAM, 256QAM
Channel Bandwidth:	5, 10, 15, 20 MHz
Maximum Combined OBW per Port:	40 MHz
IF Interface:	DL: 110–150 MHz
	UL: 40–80 MHz
Channel Raster:	100 kHz
Regulatory Requirements	Radio: FCC Part 2 and 96
	EMC: FCC Part 15
Multi-carrier:	Single Antenna, Tx Diversity, MIMO
Operating Temperature:	5–40°C
Total Power based on IBW:	2 × 50 mW for each side
Supported Carrier Configurations:	BW = 5, 10, 15, 20 MHz (1-4)

3.3 EUT information, continued

Description/theory of operation	The test object is an RD 4442 B48 (Radio DOT) designed for use in LTE Radio Base Station (RBS) equipment. The RD 4442 product provides radio access for mobile and fixed devices and is intended for the indoor environment. The RD 4442 is a Radio Unit (RU) forming part of the Ericsson RBS equipment and RDS (Radio DOT System) RBS consisting of a Digital Unit (DU), an IRU 2242 (Indoor Radio Unit) and Radio DOT (RD 4442). The IRU and RD are connected over a CAT 6 Interface (Radio DOT Interface (RDI) with a capacity of 8 DOTs per IRU. The IRU provides DC, control and the baseband to IF conversion while the RD 4442 provides the IF to RF conversion and wireless transceiver functions. The RD supports two TX/RX RF-branches. The RD 4442 B48 operates in TDD mode at a maximum RF output of 4 x 17 dBm and supports single carrier (SC) and multi-carrier (MC) LTE, configured for a maximum of 4 carriers per port. The RDS IRU 2242 can support either TDD or FDD operation, but not simultaneously.								
Port description	<table><tr><th>Port</th><th>Description</th></tr><tr><td>RDI</td><td>Shielded RJ45 (CAT6)</td></tr><tr><td>Antenna A/B</td><td>RF Probe</td></tr></table>	Port	Description	RDI	Shielded RJ45 (CAT6)	Antenna A/B	RF Probe		
Port	Description								
RDI	Shielded RJ45 (CAT6)								
Antenna A/B	RF Probe								
Physical	<table><tr><td>Dimensions</td><td>95 × 140 × 140 mm [H × W × D]</td></tr><tr><td>Weight</td><td>439 g</td></tr><tr><td>Cooling</td><td>Convection</td></tr><tr><td>Mounting</td><td>Ceiling or Wall Mount</td></tr></table>	Dimensions	95 × 140 × 140 mm [H × W × D]	Weight	439 g	Cooling	Convection	Mounting	Ceiling or Wall Mount
Dimensions	95 × 140 × 140 mm [H × W × D]								
Weight	439 g								
Cooling	Convection								
Mounting	Ceiling or Wall Mount								
Software details	CXP 901 3268/14 R70AK								
Label product ID									

3.4 Test Frequencies

<i>Single Carrier</i>						
Bandwidth	Transmit / Receive / DL /UL (MHz)					
(MHz)	B	EARFCN	M	EARFCN	T	EARFCN
5	3552.5	55265	3625	55990	3697.5	56715
10	3555.0	55290	3625	55990	3695.0	56690
15	3557.5	55315	3625	55990	3692.5	56665
20	3560.0	55340	3625	55990	3690.0	56640

<i>Multiple-Carriers (2x)</i>												
Bandwidth	Transmit / Receive / DL /UL (MHz)											
(MHz)	B1	EARFCN	B2	EARFCN	M1	EARFCN	M2	EARFCN	T1	EARFCN	T2	EARFCN
5	3552.5	55265	3557.5	55315	3622.5	55965	3627.5	56015	3692.5	56665	3697.5	56715
10	3555.0	55290	3565.0	55390	3620.0	55940	3630.0	56040	3685.0	56590	3695.0	56690
15	3557.5	55315	3572.5	55465	3617.5	55915	3632.5	56065	3677.5	56515	3692.5	56665
20	3560.0	55340	3580.0	55540	3615.0	55890	3635.0	56090	3670.0	56440	3690.0	56640

3.5 EMC Test Bed Test Parameters

RAT	Modulation	Test Model / Configuration
LTE	QPSK	E-TM1.1

3.6 EUT setup details

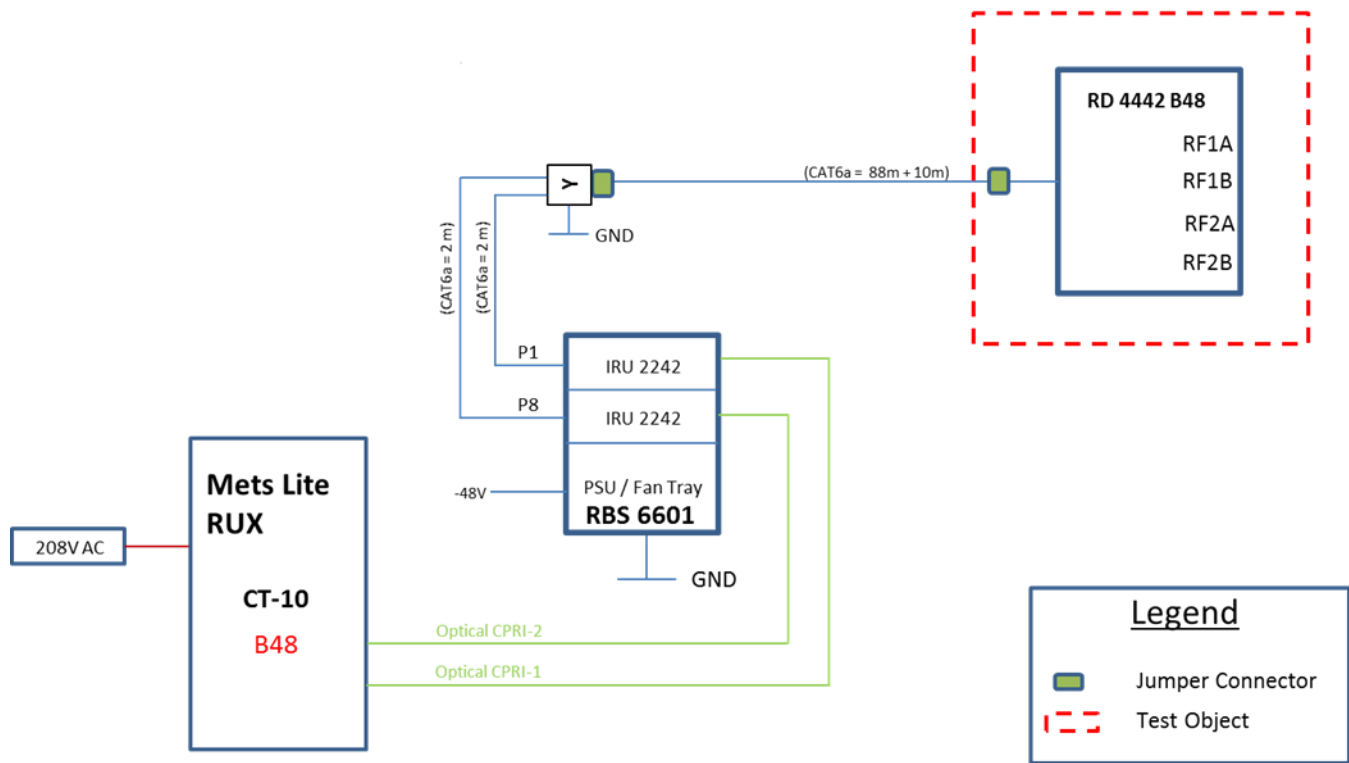


Figure 3.6-1: Setup diagram

Test Object:				
	Product Name	Model Number	R-State	Serial Number
	RD 4442 B48	KRY 901 385/1	R1B	TD3T384491
Associated Equipment:				
	Product Name	Model Number	R-State	Serial Number
	RBS-6601	BFL 901 009/4	R2A	BR83523705
	IRU 2242	KRC 161 444/2	R2B	D822456537
	IRU 2242	KRC 161 444/2	R2B	D822439694
	METS-Lite	n/a	n/a	n/a

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 $\pm 5\%$, for which the equipment was designed.

Section 6 Measurement uncertainty

6.1 Uncertainty of measurement

Nemko Canada Inc. has calculated measurement uncertainty and is documented in EMC/MUC/001 "Uncertainty in EMC measurements." Measurement uncertainty was calculated using the methods described in CISPR 16-4 Specification for radio disturbance and immunity measuring apparatus and methods – Part 4: Uncertainty in EMC measurements; as well as described in UKAS LAB34: The expression of Uncertainty in EMC Testing. Measurement uncertainty calculations assume a coverage factor of K=2 with 95% certainty.

Test name	Measurement uncertainty, dB
Radiated electromagnetic fields	3.78

Section 7 Testing data

7.1 FCC §96.41 (e)(2) and FCC §15.109 – Emissions testing

7.1.1 Definitions and limits

FCC §96.41 (e)(2):

- (e)(2) Notwithstanding paragraph (d)(1) of this section, the conducted power of any emissions below 3530 MHz or above 3720 MHz shall not exceed -40dBm/MHz.

FCC §15.109:

- (a) Except for Class A digital devices, the field strength of radiated emissions from unintentional radiators at a distance of 3 meters shall not exceed the following values:

Table 7.1-1: Requirements as per FCC Part 15 Subpart B Class B

Frequency range [MHz]	Distance [m]	Measurement	limits
		Detector type/ bandwidth	[dBμV/m]
30–88	3	Quasi Peak/120 kHz	40.0
88–216			43.5
216–960			46.0
960–1000			54.0
>1000	3	Linear average/1 MHz	54.0
		Peak/1 MHz	74.0

Notes: Where there is a step in the relevant limit, the lower value was applied at the transition frequency.

7.1.2 Test summary

Verdict	Pass		
Test date	February 22, 2018, March 2, 2018	Temperature	22 °C
Test engineer	Predrag Golic and Shawn He	Air pressure	1010 mbar
Test location	Ottawa	Relative humidity	35 %

7.1.3 Observations/special notes

EUT can operate in single and dual mode.

- In a single carrier mode, 4 different channel BW were pre-scanned and 15 MHz mode was formally tested as the worst-case representative;
- In a multi-carrier mode 3 options [2-channel, 3-channels, 4-channels] were pre-scanned and dual carrier mode was formally tested as the worst-case representative.

7.1.4 Setup details

Test facility	3 m Semi anechoic chamber
Measuring distance (m)	3
Antenna height variation (m)	1–4
Turn table position (°)	0–360
Spectrum analyzer settings	30 MHz to 1 GHz: Spectrum analyzer bandwidth (3 dB) Settings: 100 kHz RBW and 300 kHz VBW, positive peak detector. 1 GHz to 40 GHz: Spectrum analyzer bandwidth (3 dB) Settings: 1 MHz RBW and 3 MHz VBW, positive peak detector
A preview measurement was generated with receiver in continuous scan or sweep mode while the EUT was rotated and antenna adjusted to maximize radiated emission. Emissions detected within 10 dB or above the limit were re-measured with the appropriate detector against the correlating limit and recorded as the final measurement.	

Table 7.1-2: Modes assessed

Single Carrier – 5 MHz Channel
Single Carrier – 10 MHz Channel
Single Carrier – 15 MHz Channel
Single Carrier – 20 MHz Channel
Dual Carrier
Triple Carrier
Quadruple Carrier

7.1.5 Test equipment list

Table 7.1-3: Equipment list

Equipment	Manufacturer	Model no.	Asset no.	Cal cycle	Next cal.
3 m EMI test chamber	TDK	SAC-3	FA002047	1 year	Dec. 09/18
Receiver/spectrum analyzer	Rohde & Schwarz	ESU 26	FA002043	1 year	March 1/18 ¹
Receiver/spectrum analyzer	Rohde & Schwarz	ESW 8	SN: 101009	1 year	May 10 /18
Spectrum analyzer	Rohde & Schwarz	FSU	FA001877	1 year	Jul. 18/18
Bilog antenna (20–3000 MHz)	Sunol	JB3	FA002108	1 year	June 27/18
Horn with Preamp (1–18 GHz)	ETS-Lindgren	3117	FA002840	1 year	Dec. 07/18
Horn antenna (1–18 GHz)	EMCO	3115	FA000825	1 year	June 21/18
Preamp (1–18 GHz)	ETS-Lindgren	124334	FA002877	1 year	Nov. 14/18
Horn antenna (18–40 GHz)	EMCO	3116	FA001847	1 year	June 27/18
Pre-amplifier (5–18 GHz)	Narda	DWT-186N23U40	FA001409	—	VOU
Pre-amplifier (26–40 GHz)	Narda	DBL-2640N610	FA001556	—	VOU
Pre-amplifier (18–26 GHz)	Narda	BBS-1826N612	FA001550	—	VOU
50 Ω coax cable	C.C.A.	None	FA002555	1 year	May 2/18
50 Ω coax cable	Huber + Suhner	None	FA002074	1 year	May 12/18

Notes: VOU - verify on use

¹ Equipment used for February 22, 2018 testing

7.1.6 Test data

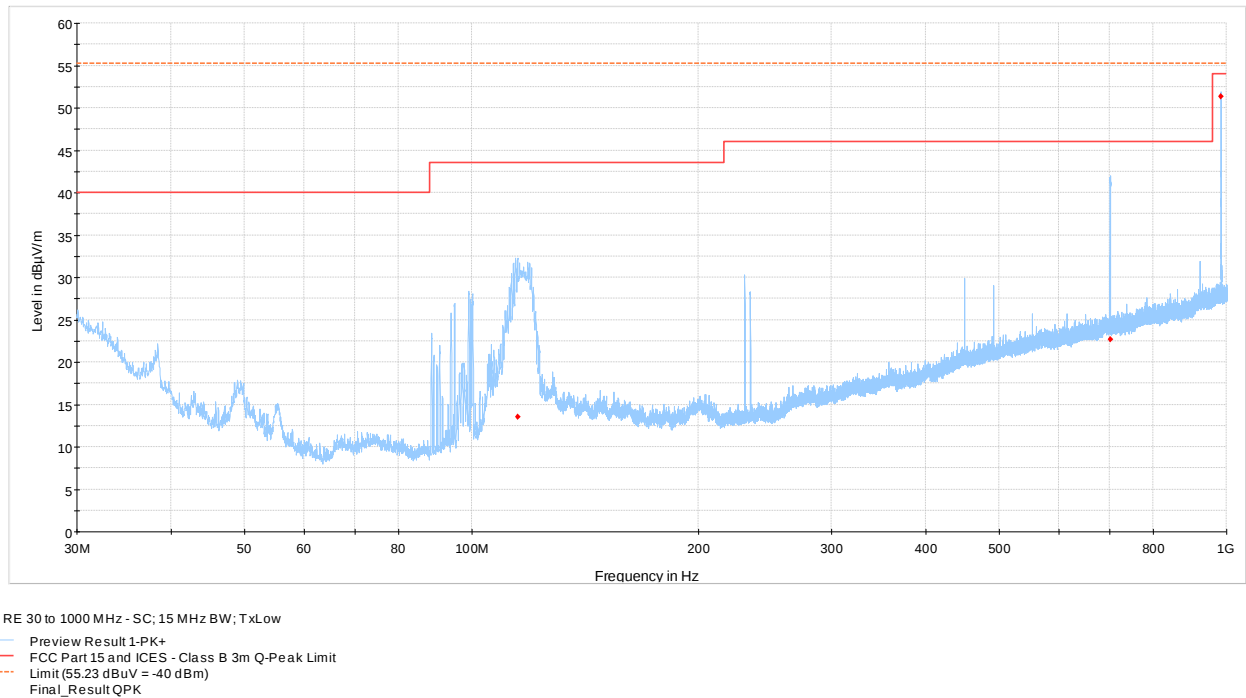


Figure 7.1-1: Emissions testing spectral plot (30 to 1000 MHz) – Single carrier 15 MHz channel [bottom]

Table 7.1-4: Emissions testing results per FCC Part 15 – Single carrier 15 MHz channel [bottom]

Frequency (MHz)	QuasiPeak field strength ^{1 and 3} (dBμV/m)	3 m QuasiPeak limit (dBμV/m)	Margin (dB)	Measurement time (ms)	Bandwidth (kHz)	Antenna height (cm)	Pol. (V/H)	Turn table position (°)	Correction factor ² (dB)
983.04	51.4	54.0	2.6	100	120	100	V	10	26.8

Notes: ¹ Field strength (dBμV/m) = receiver/spectrum analyzer value (dBμV) + correction factor (dB)

² Correction factor = antenna factor ACF (dB) + cable loss (dB) – amplifier gain (dB)

³ Emissions that were continuously present for a minimum of 1 second and occurred more than once for every 15 seconds observation period were considered valid emissions. The maximum value of valid emissions have been recorded.

Sample calculation: 51.4 dBμV/m (field strength) = 24.6 dBμV (receiver reading) + 26.8 dB (Correction factor)

Table 7.1-5: Emissions testing results per FCC part 96 – Single carrier 15 MHz channel [bottom]

Frequency (MHz)	RMS power (dBm)	RMS power limit (dBm)	Margin (dB)	Measurement time (ms)	Bandwidth (kHz)
982.88	-53.8	-40.0	13.8	100	1000

7.1.6 Test data, continued

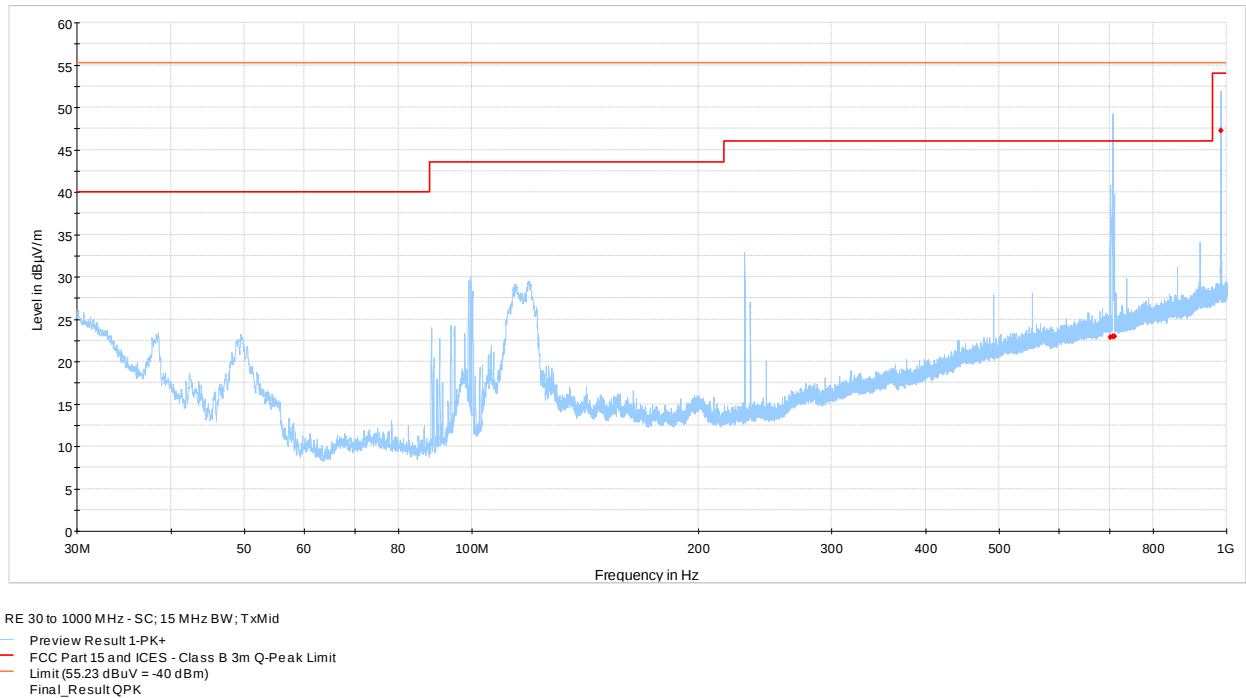


Figure 7.1-2: Radiated emissions spectral plot (30 to 1000 MHz) – Single carrier 15 MHz channel [middle]

Table 7.1-6: Emissions testing results per FCC part 15 – Single carrier 15 MHz channel [middle]

Frequency (MHz)	QuasiPeak field strength ^{1 and 3} (dBµV/m)	3 m QuasiPeak limit (dBµV/m)	Margin (dB)	Measurement time (ms)	Bandwidth (kHz)	Antenna height (cm)	Pol. (V/H)	Turn table position (°)	Correction factor ² (dB)
983.04	47.2	54.0	6.8	100	120	104	V	10	26.8

Notes:

¹ Field strength (dBµV/m) = receiver/spectrum analyzer value (dBµV) + correction factor (dB)

² Correction factor = antenna factor ACF (dB) + cable loss (dB) – amplifier gain (dB)

³ Emissions that were continuously present for a minimum of 1 second and occurred more than once for every 15 seconds observation period were considered valid emissions. The maximum value of valid emissions have been recorded.

Sample calculation: 47.2 dBµV/m (field strength) = 20.4 dBµV (receiver reading) + 26.8 dB (Correction factor)

Table 7.1-7: Emissions testing results per FCC part 96 – Single carrier 15 MHz channel [middle]

Frequency (MHz)	RMS power (dBm)	RMS power limit (dBm)	Margin (dB)	Measurement time (ms)	Bandwidth (kHz)
983.07	-51.5	-40.0	11.5	100	1000

7.1.6 Test data, continued

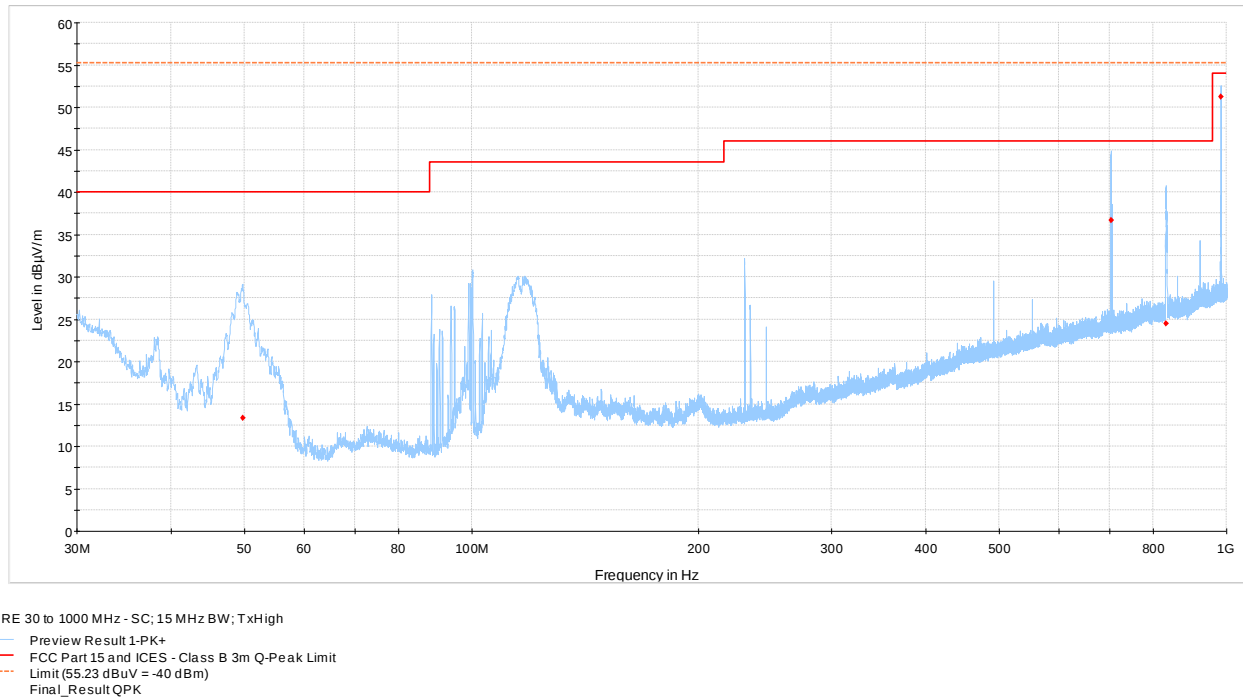


Figure 7.1-3: Radiated emissions spectral plot (30 to 1000 MHz) – Single carrier 15 MHz channel [top]

Table 7.1-8: Emissions testing results per FCC part 15 – Single carrier 15 MHz channel [top]

Frequency (MHz)	QuasiPeak field strength ^{1 and 3} (dBµV/m)	3 m QuasiPeak limit (dBµV/m)	Margin (dB)	Measurement time (ms)	Bandwidth (kHz)	Antenna height (cm)	Pol. (V/H)	Turn table position (°)	Correction factor ² (dB)
FCC Part 15									
983.04	51.2	54.0	2.8	100	120	200	H	43	26.8
702.69	36.7	46.0	9.3	100	120	120	V	86	23.5

Notes: ¹ Field strength (dBµV/m) = receiver/spectrum analyzer value (dBµV) + correction factor (dB)
² Correction factor = antenna factor ACF (dB) + cable loss (dB) – amplifier gain (dB)
³ Emissions that were continuously present for a minimum of 1 second and occurred more than once for every 15 seconds observation period were considered valid emissions. The maximum value of valid emissions have been recorded.

Sample calculation: 51.2 dBµV/m (field strength) = 24.4 dBµV (receiver reading) + 26.8 dB (Correction factor)

Table 7.1-9: Emissions testing results per FCC Part 96 – Single carrier 15 MHz channel [top]

Frequency (MHz)	RMS power (dBm)	RMS power limit (dBm)	Margin (dB)	Measurement time (ms)	Bandwidth (kHz)
983.03	-53.32	-40	13.32	100	1000

7.1.6 Test data, continued

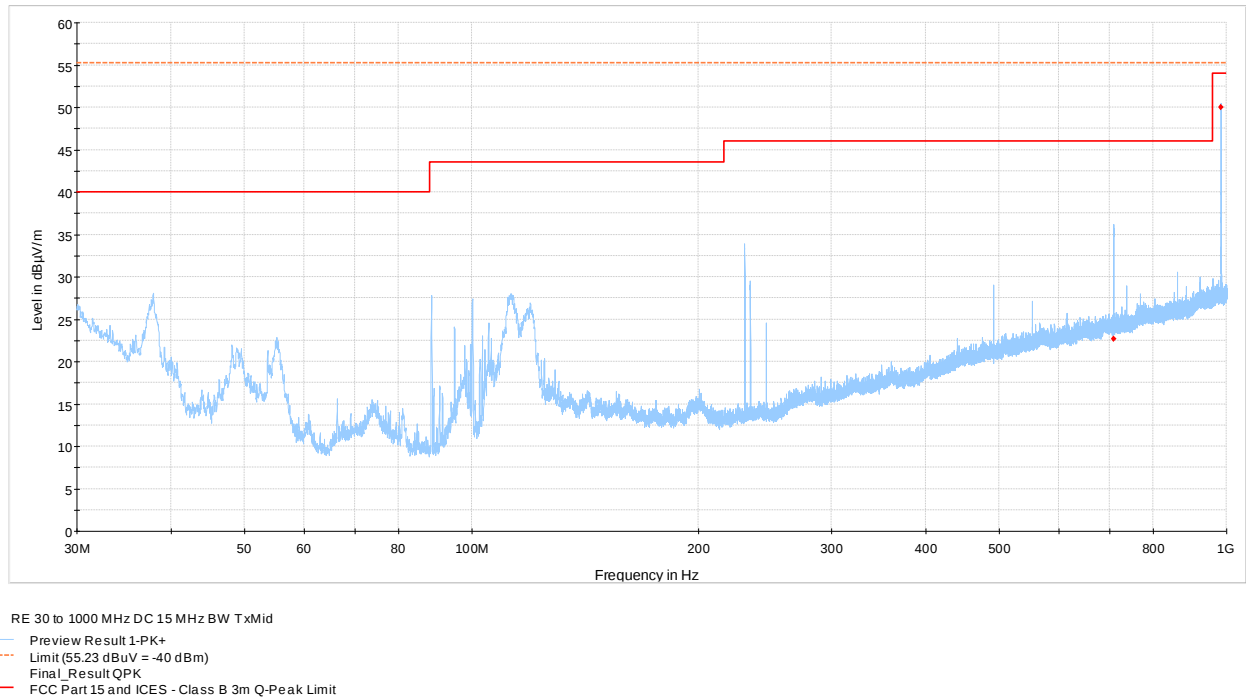


Figure 7.1-4: Radiated emissions spectral plot (30 to 1000 MHz) – Dual Carrier

Table 7.1-10: Emissions testing results per FCC part 15 – Dual Carrier

Frequency (MHz)	QuasiPeak field strength ^{1 and 3} (dBµV/m)	3 m QuasiPeak limit (dBµV/m)	Margin (dB)	Measurement time (ms)	Bandwidth (kHz)	Antenna height (cm)	Pol. (V/H)	Turn table position (°)	Correction factor ² (dB)
983.04	50.0	54.0	4.0	100	120	104	V	9	26.8

Notes: ¹ Field strength (dBµV/m) = receiver/spectrum analyzer value (dBµV) + correction factor (dB)

² Correction factor = antenna factor ACF (dB) + cable loss (dB) – amplifier gain (dB)

³ Emissions that were continuously present for a minimum of 1 second and occurred more than once for every 15 seconds observation period were considered valid emissions. The maximum value of valid emissions have been recorded.

Sample calculation: 51.4 dBµV/m (field strength) = 24.6 dBµV (receiver reading) + 26.8 dB (Correction factor)

Table 7.1-11: Emissions testing results per FCC part 96 – Dual Carrier

Frequency (MHz)	RMS power (dBm)	RMS power limit (dBm)	Margin (dB)	Measurement time (ms)	Bandwidth (kHz)
983.03	-59.4	-40	19.4	100	1000

7.1.6 Test data, continued

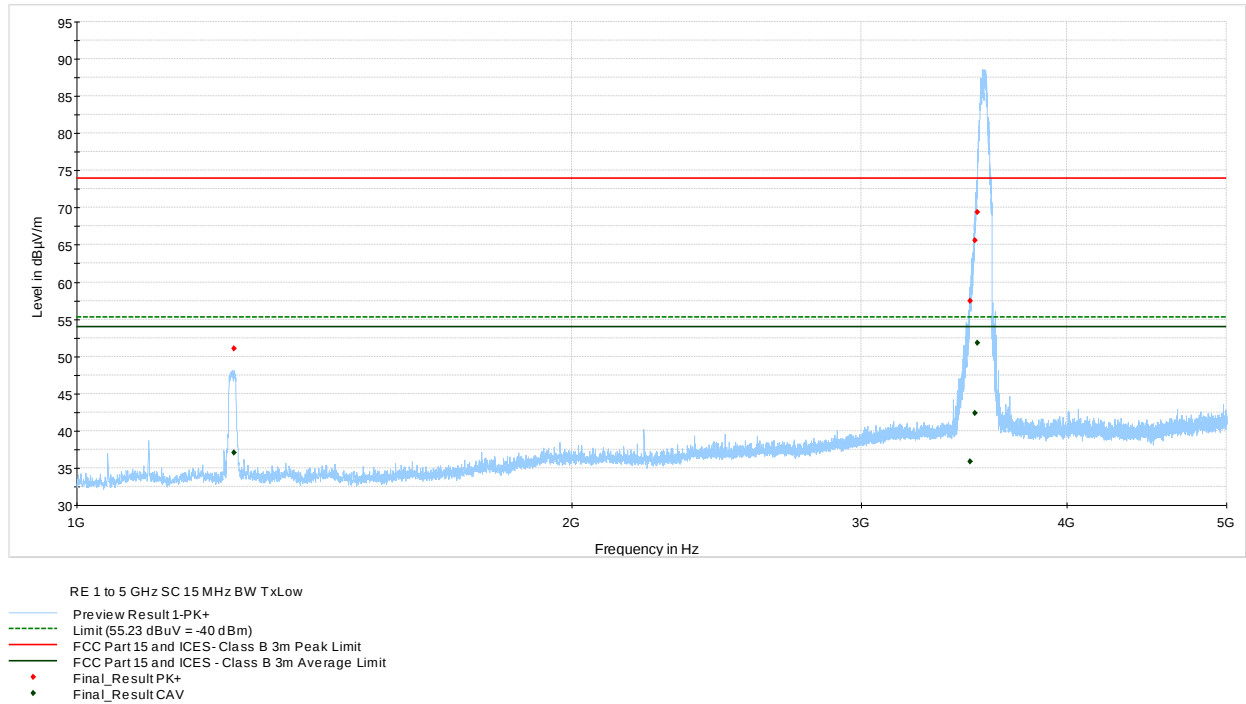


Figure 7.1-5: Radiated emissions spectral plot (1 to 5 GHz) – Single carrier 15 MHz channel [bottom]

7.1.6 Test data, continued

Table 7.1-12: Radiated emissions (CAverage) results – Single carrier 15 MHz channel [bottom]

Frequency (MHz)	CAverage field strength ^{1 and 3} (dBμV/m)	3 m CAverage limit (dBμV/m)	Margin (dB)	Measurement time (ms)	Bandwidth (kHz)	Antenna height (cm)	Pol. (V/H)	Turn table position (°)	Correction factor ² (dB)
FCC Part 15									
3529.35	51.8	54.0	2.2	100	1000	131	H	194	-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) – amplifier gain (dB)
³ Emissions that were continuously present for a minimum of 1 second and occurred more than once for every 15 seconds observation period were considered valid emissions. The maximum value of valid emissions have been recorded.

Sample calculation: 51.8 dBμV/m (field strength) = 63.2 dBμV (receiver reading) + (-11.4) dB (Correction factor)

Table 7.1-13: Radiated emissions (MaxPeak) results – Single carrier 15 MHz channel [bottom]

Frequency (MHz)	MaxPeak field strength ^{1 and 3} (dBμV/m)	3 m MaxPeak limit (dBμV/m)	Margin (dB)	Measurement time (ms)	Bandwidth (kHz)	Antenna height (cm)	Pol. (V/H)	Turn table position (°)	Correction factor ² (dB)
FCC Part 15									
3529.35	69.3	74.0	4.7	100	1000	131	H	194	-11.4
3515.34	65.6	74.0	8.4	100	1000	175	H	190	-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) – amplifier gain (dB)
³ Emissions that were continuously present for a minimum of 1 second and occurred more than once for every 15 seconds observation period were considered valid emissions. The maximum value of valid emissions have been recorded.

Sample calculation: 69.3 dBμV/m (field strength) = 80.7 dBμV (receiver reading) + (-11.4) dB (Correction factor)

Table 7.1-14: Radiated emissions (RMS) results – Single carrier 15 MHz channel [bottom]

Frequency (MHz)	RMS power (dBm)	RMS power limit (dBm)	Margin (dB)	Measurement time (ms)	Bandwidth (kHz)
FCC Part 96					
3529.50	52.6	55.2	2.7	100	1000

7.1.6 Test data, continued

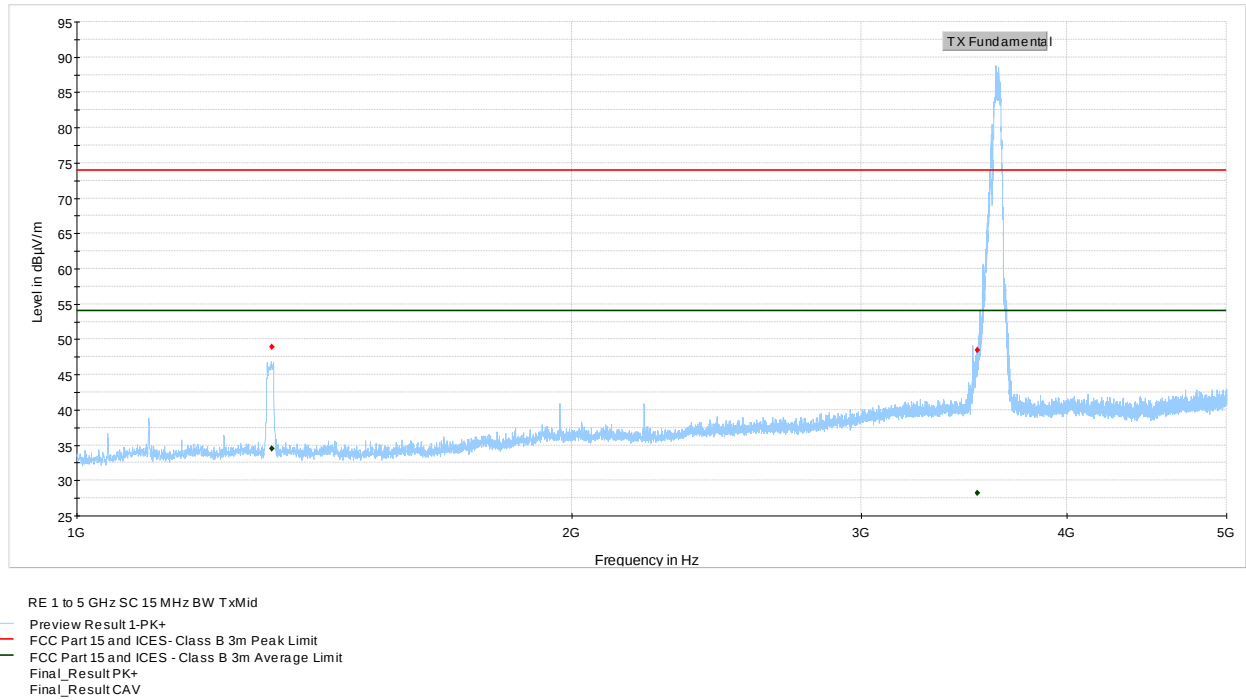


Figure 7.1-6: Radiated emissions spectral plot (1 to 5 GHz) – Single carrier 15 MHz channel [middle]

7.1.6 Test data, continued

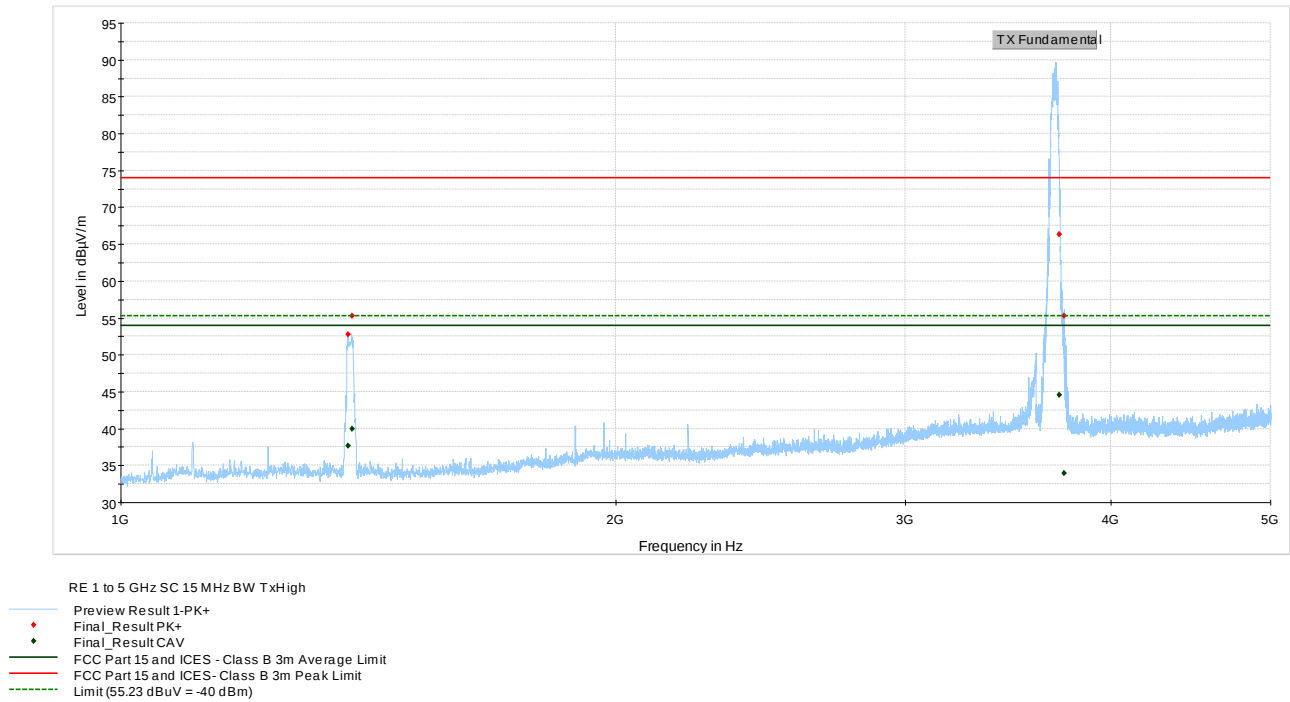


Figure 7.1-7: Radiated emissions spectral plot (1 to 5 GHz) – Single carrier 15 MHz channel [top]

7.1.6 Test data, continued

Table 7.1-15: Radiated emissions (CAverage) results – Single carrier 15 MHz channel [top]

Frequency (MHz)	CAverage field strength ^{1 and 3} (dBμV/m)	3 m CAverage limit (dBμV/m)	Margin (dB)	Measurement time (ms)	Bandwidth (kHz)	Antenna height (cm)	Pol. (V/H)	Turn table position (°)	Correction factor ² (dB)
FCC Part 15									
3721.69	44.5	54.0	9.5	100	1000	136	H	190	-10.0

Notes: ¹ Field strength (dBμV/m) = receiver/spectrum analyzer value (dBμV) + correction factor (dB)
² Correction factor = antenna factor ACF (dB) + cable loss (dB) – amplifier gain (dB)
³ Emissions that were continuously present for a minimum of 1 second and occurred more than once for every 15 seconds observation period were considered valid emissions. The maximum value of valid emissions have been recorded.

Sample calculation: 44.5 dBμV/m (field strength) = 54.5 dBμV (receiver reading) + (-10.0) dB (Correction factor)

Table 7.1-16: Radiated emissions (MaxPeak) results – Single carrier 15 MHz channel [top]

Frequency (MHz)	MaxPeak field strength ^{1 and 3} (dBμV/m)	3 m MaxPeak limit (dBμV/m)	Margin (dB)	Measurement time (ms)	Bandwidth (kHz)	Antenna height (cm)	Pol. (V/H)	Turn table position (°)	Correction factor ² (dB)
FCC Part 15									
3721.69	66.4	74.0	7.6	100	1000	136	H	190	-10.0

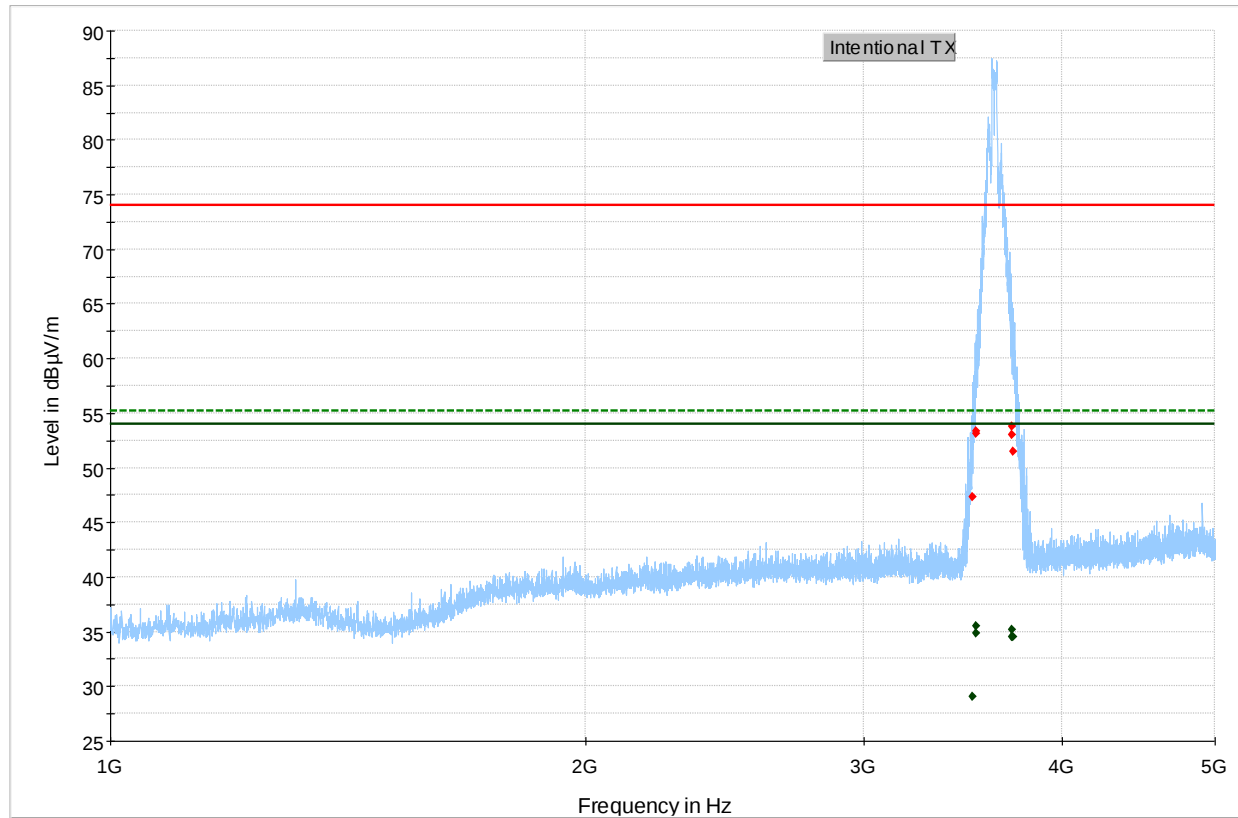
Notes: ¹ Field strength (dBμV/m) = receiver/spectrum analyzer value (dBμV) + correction factor (dB)
² Correction factor = antenna factor ACF (dB) + cable loss (dB) – amplifier gain (dB)
³ Emissions that were continuously present for a minimum of 1 second and occurred more than once for every 15 seconds observation period were considered valid emissions. The maximum value of valid emissions have been recorded.

Sample calculation: 66.4 dBμV/m (field strength) = 76.4 dBμV (receiver reading) + (-10.0) dB (Correction factor)

Table 7.1-17: Radiated emissions (RMS) results – Single carrier 15 MHz channel [top]

Frequency (MHz)	RMS power (dBm)	RMS power limit (dBm)	Margin (dB)	Measurement time (ms)	Bandwidth (kHz)
FCC Part 96					
3720.50	46.3	55.2	8.9	100	1000

7.1.6 Test data, continued



RE 1 to 5 GHz DC 15 MHz BW TxMid

- Preview Result 1-PK+
- Final Measurement MaxPeak
- Final Measurement CAverage
- FCC Part 15 and ICES - Class B 3m Peak Limit
- FCC Part 15 and ICES - Class B 3m Average Limit
- Limit (55.23 dBuV = -40 dBm)

Figure 7.1-8: Radiated emissions spectral plot (1 to 5 GHz) – Dual Carrier

7.1.6 Test data, continued

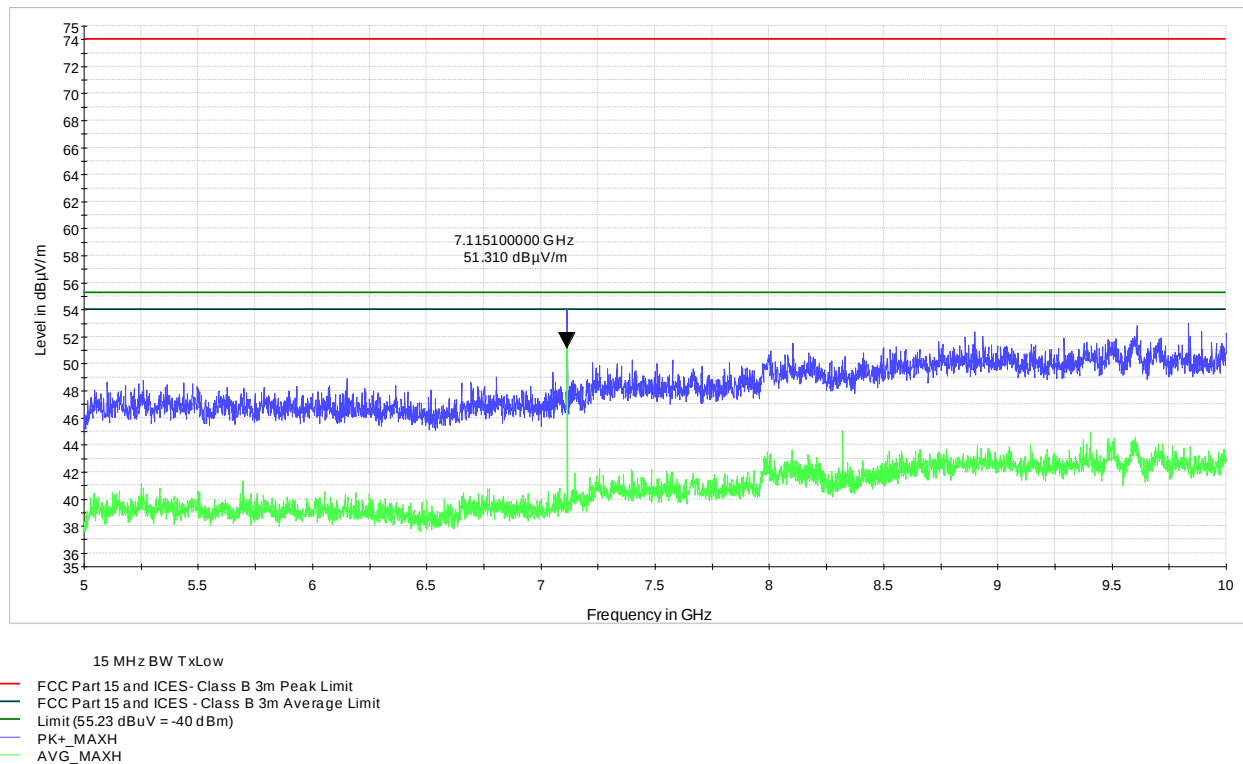


Figure 7.1-9: Radiated emissions spectral plot (5 to 10 GHz) – Single carrier 15 MHz channel [bottom]

Table 7.1-18: Emissions testing results – Single carrier 15 MHz channel [bottom]

Frequency (MHz)	CAverage field strength ¹ and ³ (dBμV/m)	3 m CAverage limit (dBμV/m)	Margin (dB)	Measurement time (ms)	Bandwidth (kHz)	Antenna height (cm)	Pol. (V/H)	Turn table position (°)	Correction factor ² (dB)
FCC Part 15									
7115.10	51.3	54.0	2.7	100	1000	N/A	N/A	N/A	11.0

Notes: ¹ Field strength (dBμV/m) = receiver/spectrum analyzer value (dBμV) + correction factor (dB)
² Correction factor = antenna factor ACF (dB) + cable loss (dB) – amplifier gain (dB)
³ Emissions that were continuously present for a minimum of 1 second and occurred more than once for every 15 seconds observation period were considered valid emissions. The maximum value of valid emissions have been recorded.

Sample calculation: 51.4 dBμV/m (field strength) = 24.6 dBμV (receiver reading) + 26.8 dB (Correction factor)

Table 7.1-19: Emissions testing results – Single carrier 15 MHz channel [bottom]

Frequency (MHz)	RMS power (dBm)	RMS power limit (dBm)	Margin (dB)	Measurement time (ms)	Bandwidth (kHz)
FCC part 96					
7115.10	52.0	55.2	3.2	100	1000

7.1.6 Test data, continued

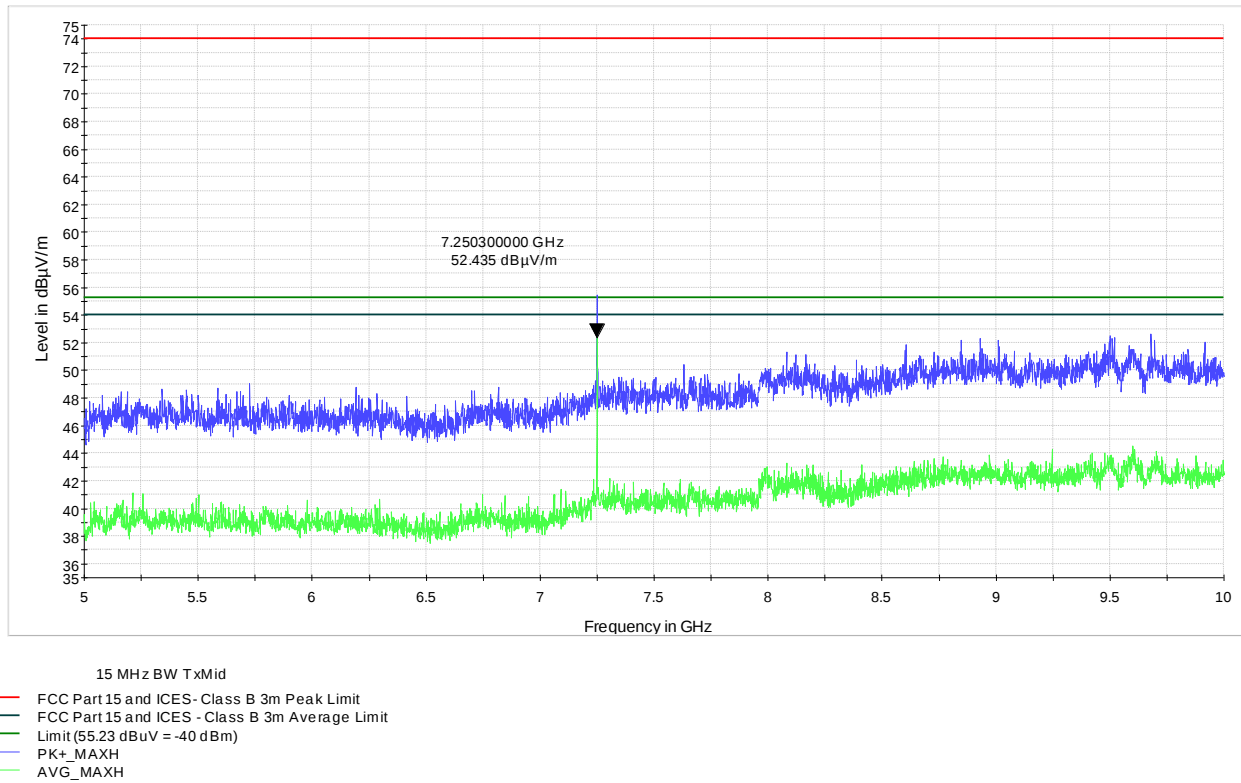


Figure 7.1-10: Radiated emissions spectral plot (5 to 10 GHz) – Single carrier 15 MHz channel [middle]

Table 7.1-20: Emissions testing results – Single carrier 15 MHz channel [middle]

Frequency (MHz)	CAverage field strength ¹ and ³ (dBμV/m)	3 m CAverage limit (dBμV/m)	Margin (dB)	Measurement time (ms)	Bandwidth (kHz)	Antenna height (cm)	Pol. (V/H)	Turn table position (°)	Correction factor ² (dB)
FCC Part 15									
7250.30	52.4	54.0	1.6	100	1000	N/A	N/A	N/A	11.0

Notes: ¹ Field strength (dBμV/m) = receiver/spectrum analyzer value (dBμV) + correction factor (dB)

² Correction factor = antenna factor ACF (dB) + cable loss (dB) – amplifier gain (dB)

³ Emissions that were continuously present for a minimum of 1 second and occurred more than once for every 15 seconds observation period were considered valid emissions. The maximum value of valid emissions have been recorded.

Sample calculation: 52.4 dBμV/m (field strength) = 41.4 dBμV (receiver reading) + 11.0 dB (Correction factor)

Table 7.1-21: Emissions testing results – Single carrier 15 MHz channel [middle]

Frequency (MHz)	RMS power (dBm)	RMS power limit (dBm)	Margin (dB)	Measurement time (ms)	Bandwidth (kHz)
FCC part 96					
7250.30	50.0	55.2	5.2	100	1000

7.1.6 Test data, continued

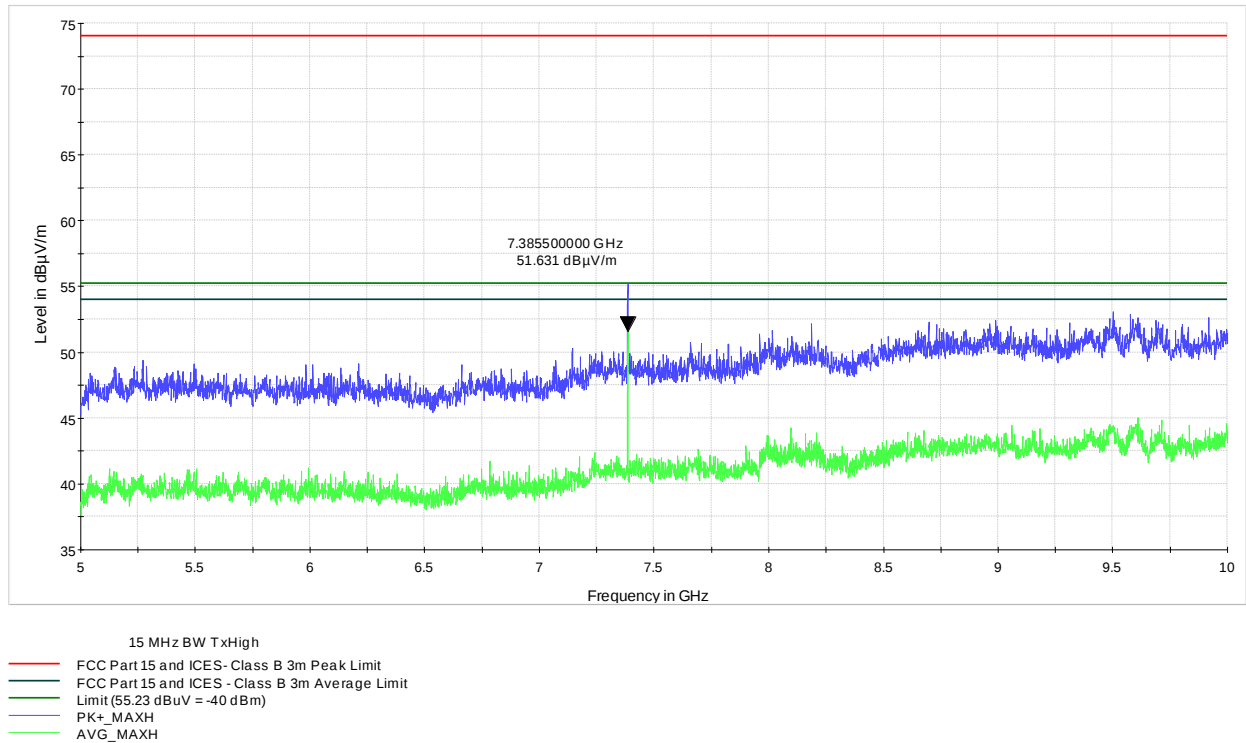


Figure 7.1-11: Radiated emissions spectral plot (5 to 10 GHz) – Single carrier 15 MHz channel [top]

Table 7.1-22: Emissions testing results – Single carrier 15 MHz channel [top]

Frequency (MHz)	CAverage field strength ¹ and ³ (dBμV/m)	3 m CAverage limit (dBμV/m)	Margin (dB)	Measurement time (ms)	Bandwidth (kHz)	Antenna height (cm)	Pol. (V/H)	Turn table position (°)	Correction factor ² (dB)
FCC Part 15									
7385.50	51.6	54.0	2.4	100	1000	N/A	N/A	N/A	11.0

Notes: ¹ Field strength (dBμV/m) = receiver/spectrum analyzer value (dBμV) + correction factor (dB)
² Correction factor = antenna factor ACF (dB) + cable loss (dB) – amplifier gain (dB)
³ Emissions that were continuously present for a minimum of 1 second and occurred more than once for every 15 seconds observation period were considered valid emissions. The maximum value of valid emissions have been recorded.

Sample calculation: 52.4 dBμV/m (field strength) = 41.4 dBμV (receiver reading) + 11.0 dB (Correction factor)

Table 7.1-23: Emissions testing results – Single carrier 15 MHz channel [middle]

Frequency (MHz)	RMS power (dBm)	RMS power limit (dBm)	Margin (dB)	Measurement time (ms)	Bandwidth (kHz)
FCC part 96					
7250.30	48.4	55.2	6.8	100	1000

7.1.6 Test data, continued

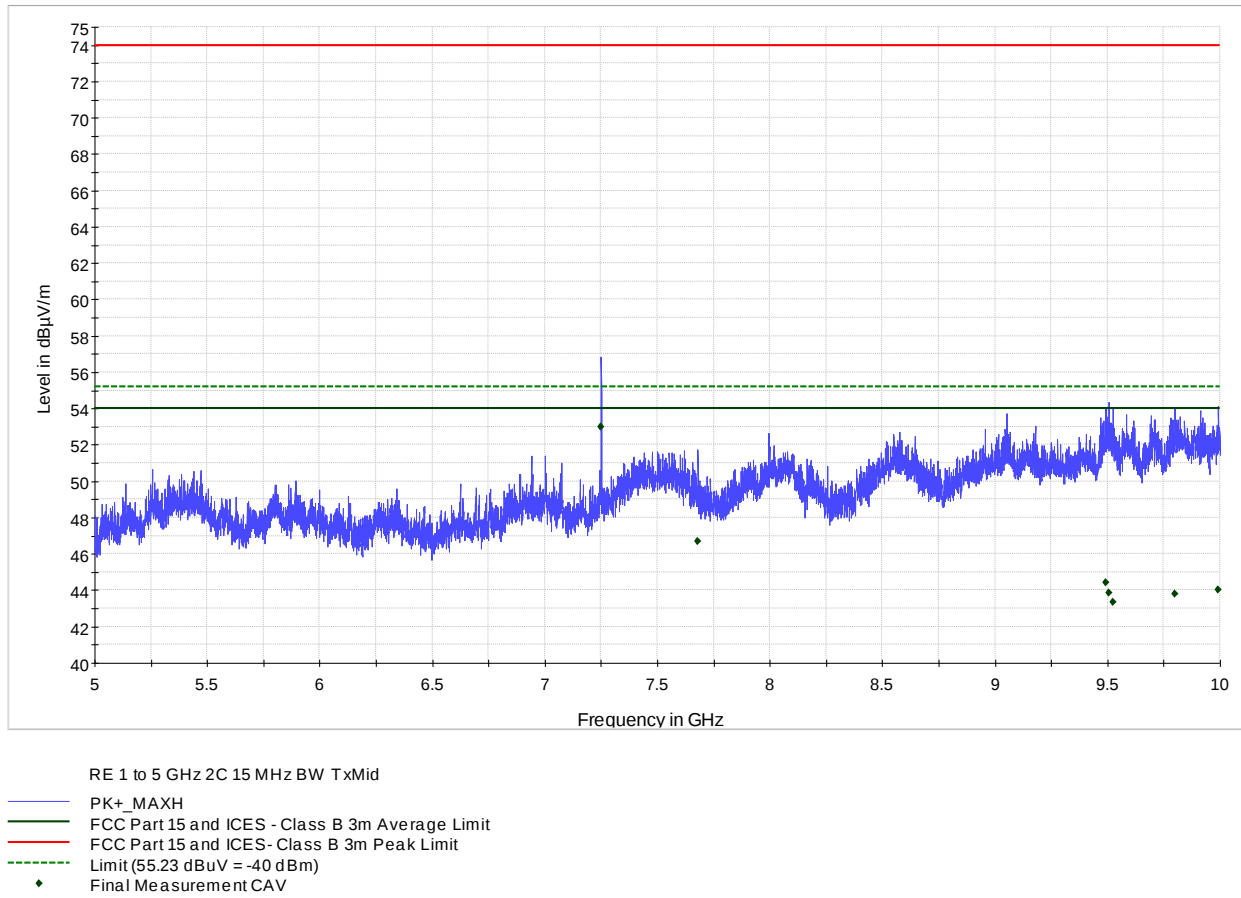


Figure 7.1-12: Radiated emissions spectral plot (5 to 10 GHz) – Dual Carrier

Table 7.1-24: Emissions testing results – Single carrier 15 MHz channel [top]

Frequency (MHz)	CAverage field strength ¹ and ³ (dBμV/m)	3 m CAverage limit (dBμV/m)	Margin (dB)	Measurement time (ms)	Bandwidth (kHz)	Antenna height (cm)	Pol. (V/H)	Turn table position (°)	Correction factor ² (dB)
FCC Part 15									
7250.00	53.0	54.0	1.0	100	1000	150	V	217	10.3

Notes:

¹ Field strength (dBμV/m) = receiver/spectrum analyzer value (dBμV) + correction factor (dB)

² Correction factor = antenna factor ACF (dB) + cable loss (dB) – amplifier gain (dB)

³ Emissions that were continuously present for a minimum of 1 second and occurred more than once for every 15 seconds observation period were considered valid emissions. The maximum value of valid emissions have been recorded.

Sample calculation: 53.0 dBμV/m (field strength) = 42.7 dBμV (receiver reading) + 10.3 dB (Correction factor)

Table 7.1-25: Emissions testing results – Single carrier 15 MHz channel [top]

Frequency (MHz)	RMS power (dBm)	RMS power limit (dBm)	Margin (dB)	Measurement time (ms)	Bandwidth (kHz)
FCC part 96					
7250.00	53.6	55.2	1.6	100	1000

7.1.6 Test data, continued

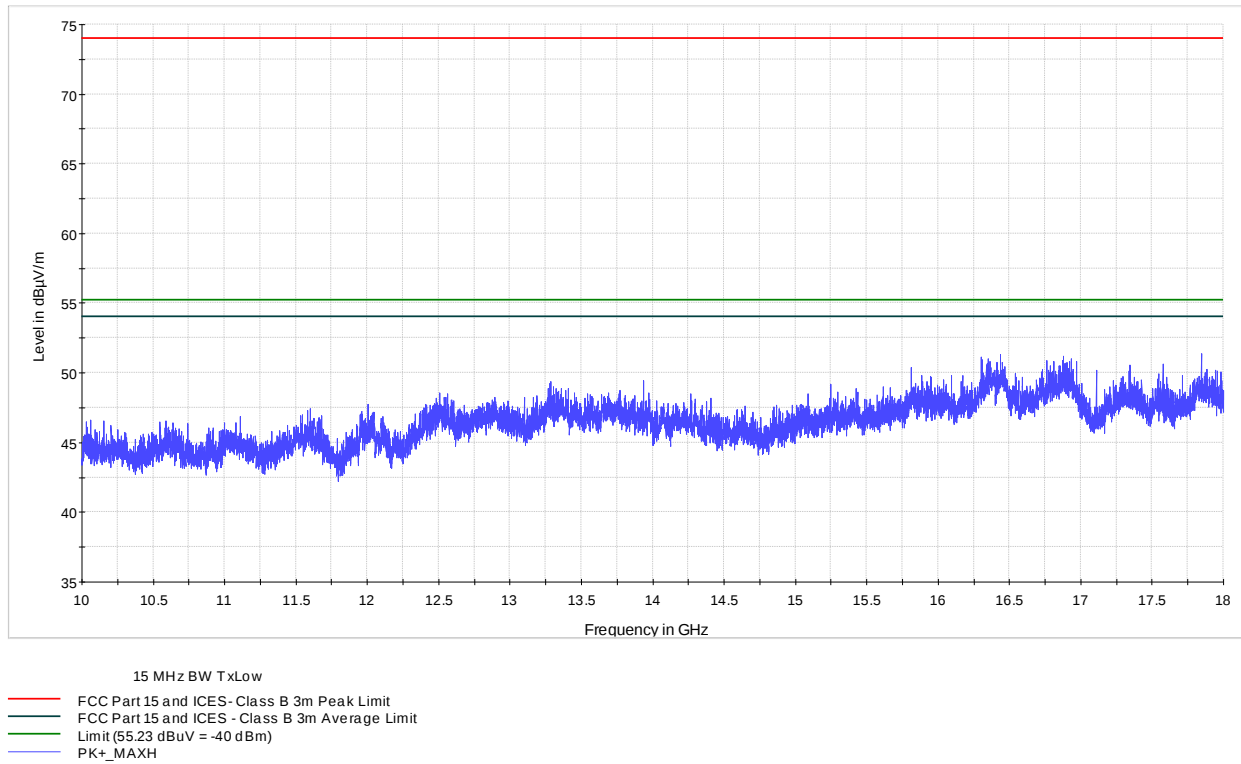
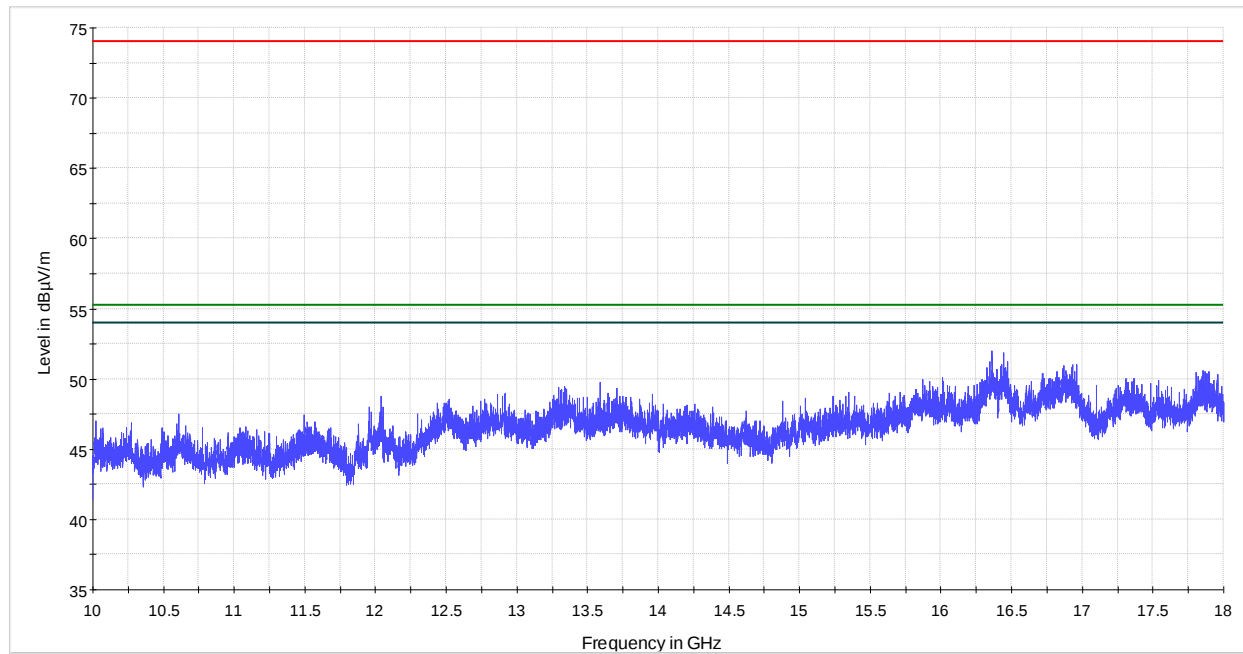


Figure 7.1-13: Radiated emissions spectral plot (10 to 18 GHz) – Single carrier 15 MHz channel [bottom]

7.1.6 Test data, continued



15 MHz BW TxMid
 — FCC Part 15 and ICES - Class B 3m Peak Limit
 — FCC Part 15 and ICES - Class B 3m Average Limit
 — Limit (55.23 dBμV = -40 dBm)
 — PK+_MAXH

Figure 7.1-14: Radiated emissions spectral plot (10 to 18 GHz) – Single carrier 15 MHz channel [middle]

7.1.6 Test data, continued

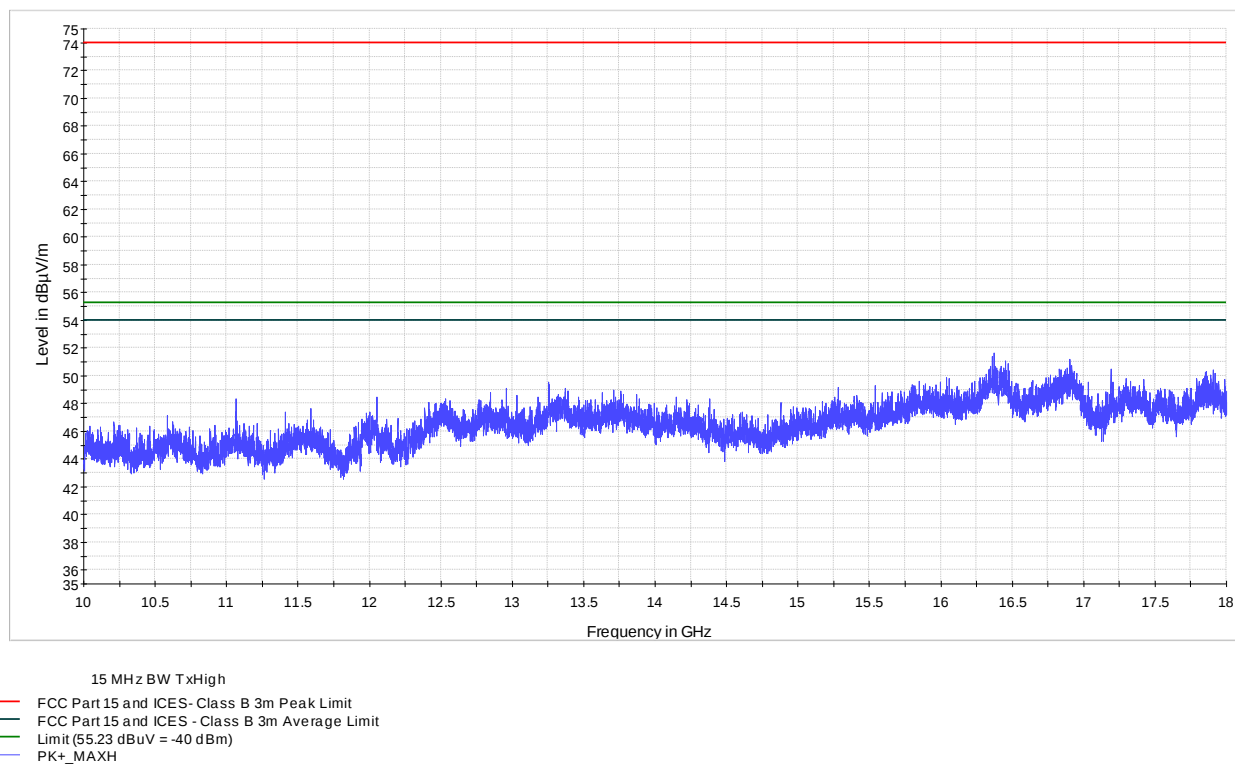


Figure 7.1-15: Radiated emissions spectral plot (10 to 18 GHz) – Single carrier 15 MHz channel [top]

7.1.6 Test data, continued

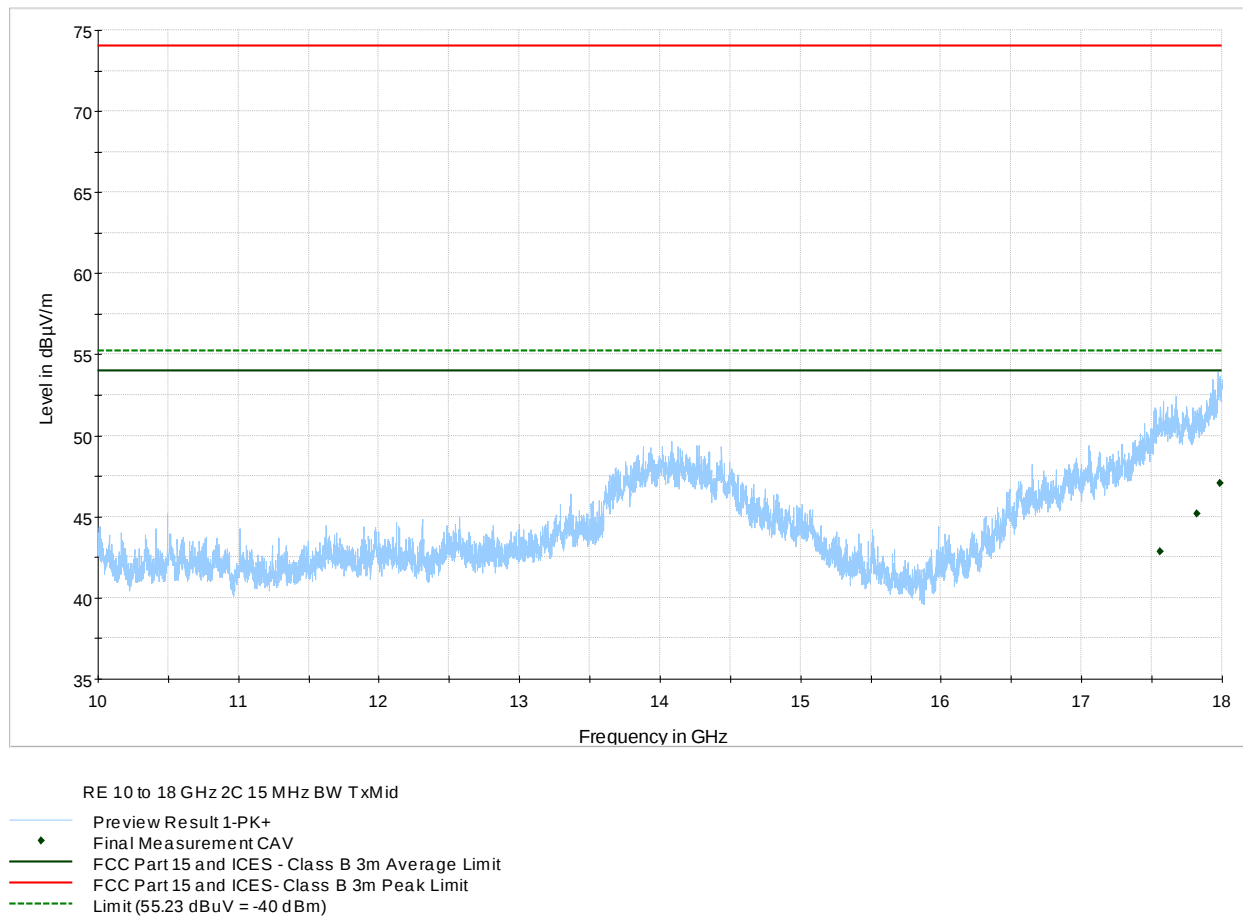
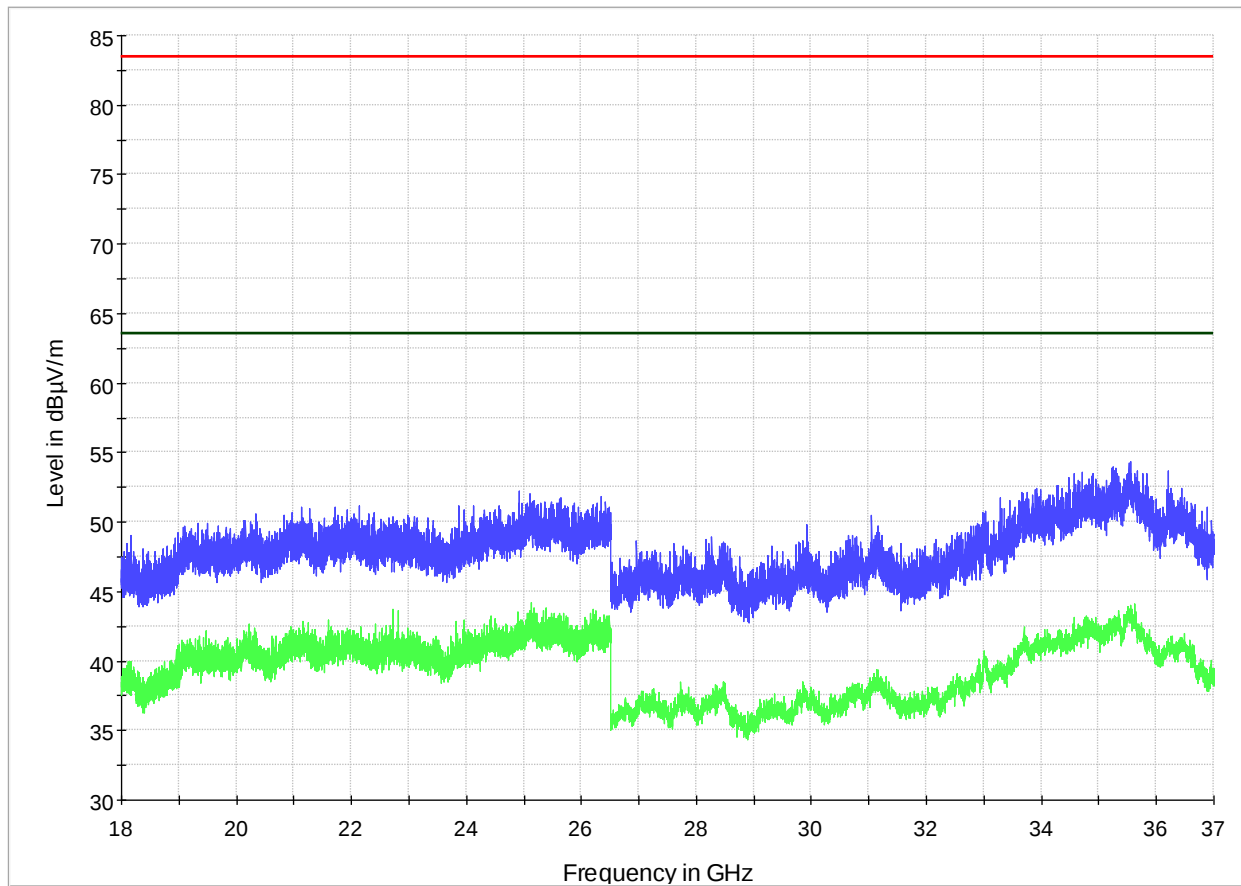


Figure 7.1-16: Radiated emissions spectral plot (10 to 18 GHz) – Dual Carrier

7.1.6 Test data, continued

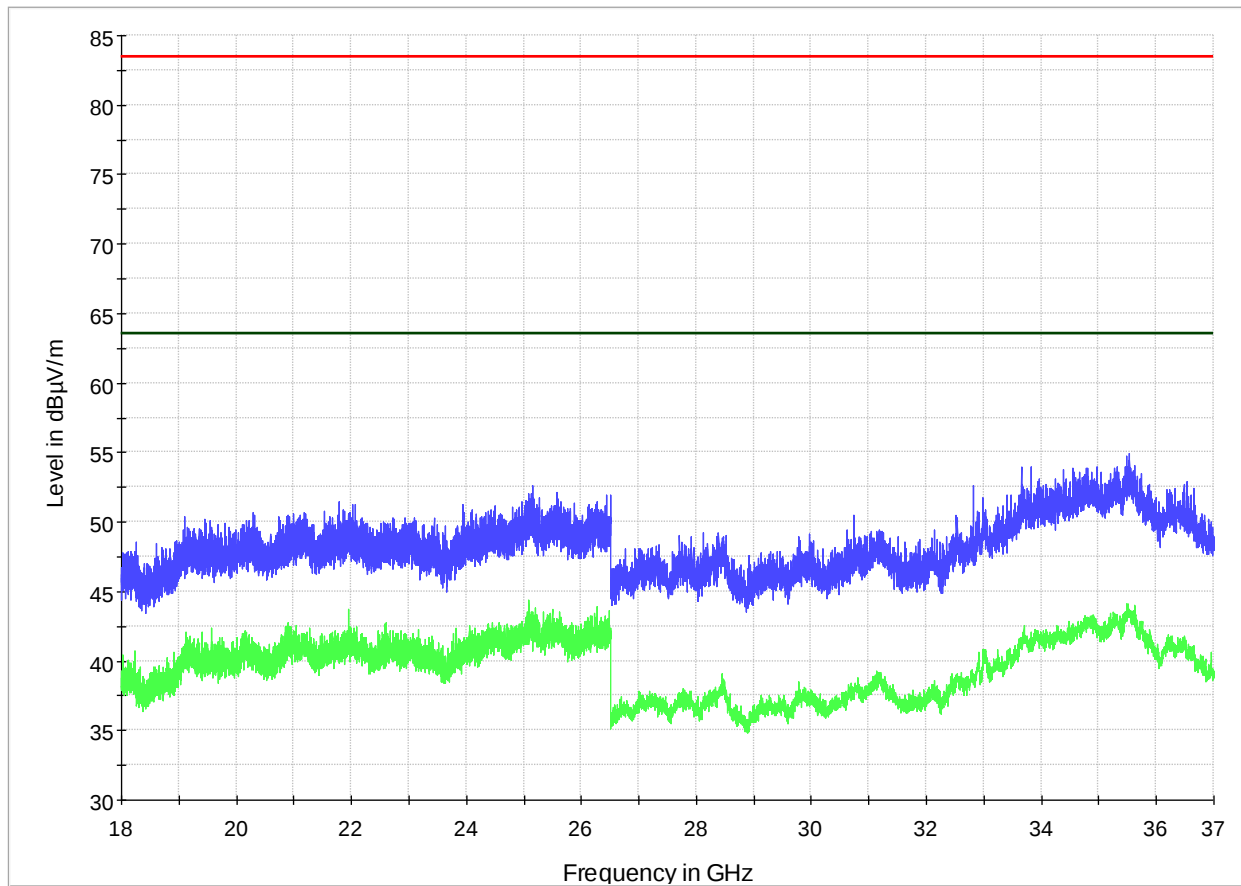


RE 18 to 37 GHz - SC; 15 MHz BW; TxLow

- AVG_MAXH
- PK+_MAXH
- FCC Part 15 and ICES - Class B 1m Peak Limit
- FCC Part 15 and ICES - Class B 1m Average Limit

Figure 7.1-17: Radiated emissions spectral plot (18 to 37 GHz) – Single carrier 15 MHz channel [bottom]

7.1.6 Test data, continued

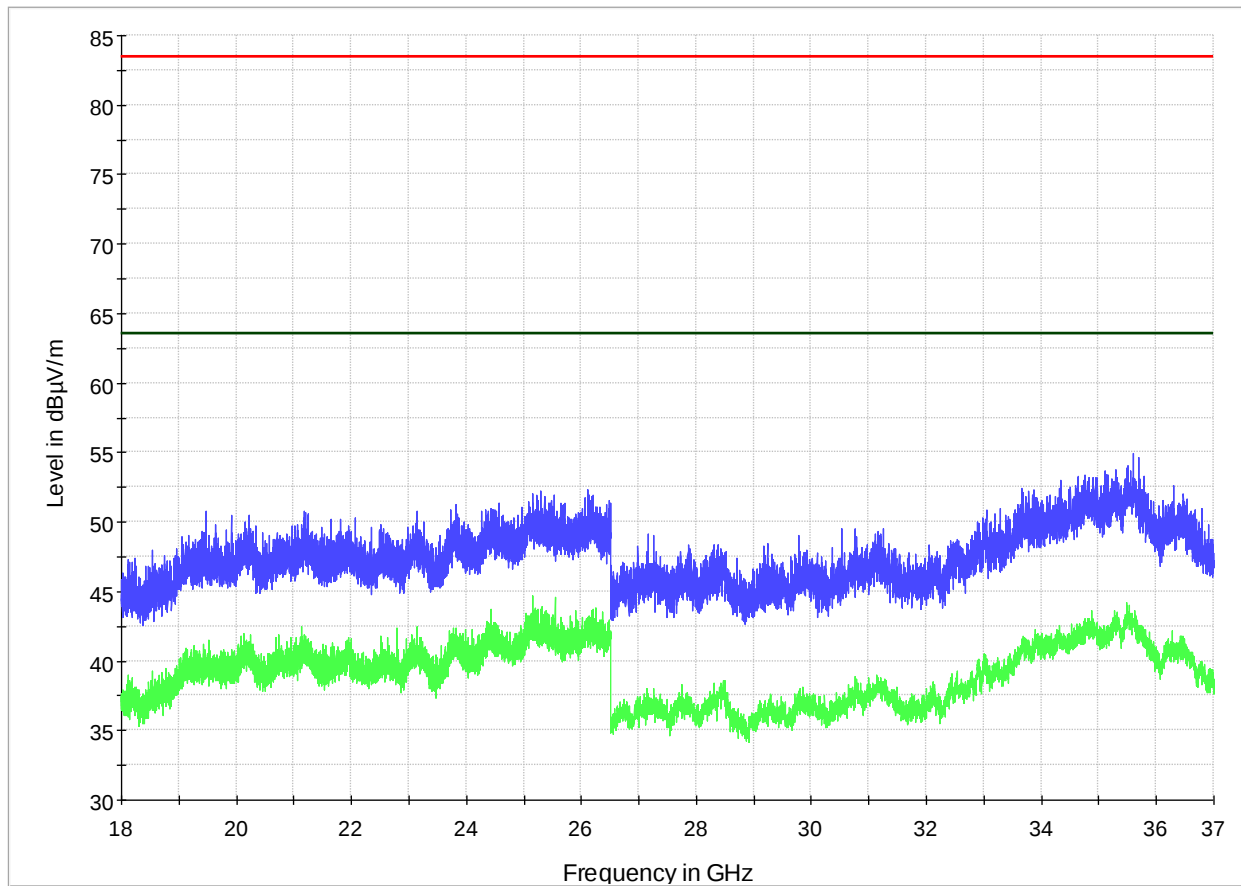


RE 18 to 37 GHz - SC; 15 MHz BW; TxMid

- AVG_MAXH
- PK+_MAXH
- FCC Part 15 and ICES - Class B 1m Peak Limit
- FCC Part 15 and ICES - Class B 1m Average Limit

Figure 7.1-18: Radiated emissions spectral plot (18 to 37 GHz) – Single carrier 15 MHz channel [middle]

7.1.6 Test data, continued

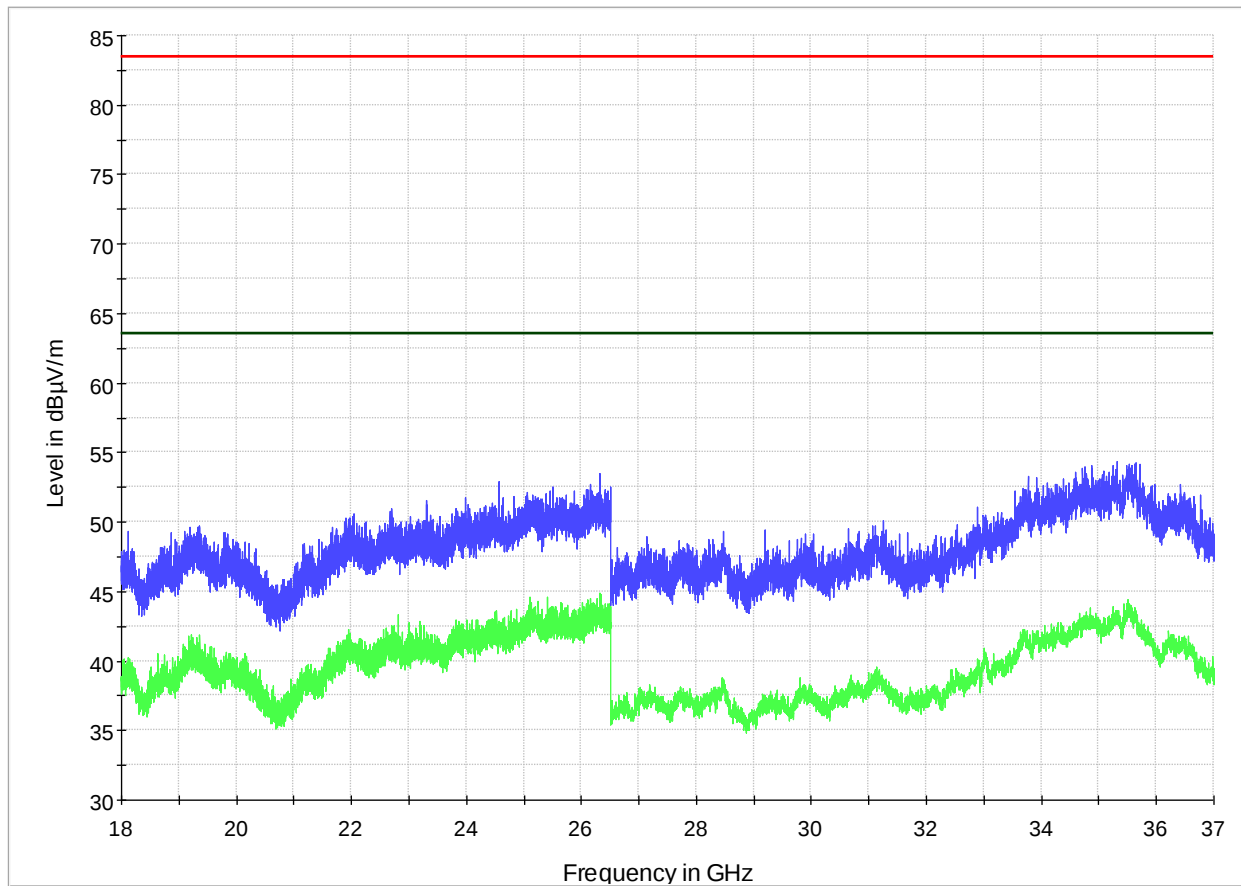


RE 18 to 37 GHz - SC; 15 MHz BW; TxHigh

- AVG_MAXH
- PK+_MAXH
- FCC Part 15 and ICES - Class B 1m Peak Limit
- FCC Part 15 and ICES - Class B 1m Average Limit

Figure 7.1-19: Radiated emissions spectral plot (18 to 37 GHz) – Single carrier 15 MHz channel [top]

7.1.6 Test data, continued



RE 18 to 37 GHz - DC; 15 MHz BW; TxMid

- AVG_MAXH
- PK+_MAXH
- FCC Part 15 and ICES - Class B 1m Peak Limit
- FCC Part 15 and ICES - Class B 1m Average Limit

Figure 7.1-20: Radiated emissions spectral plot (18 to 37 GHz) – Dual carrier

7.1.7 Setup photos



Figure 7.1-21: Radiated emissions setup photo



Figure 7.1-22: Radiated emissions setup photo

7.1.6 Setup photos, continued



Figure 7.1-23: Radiated emissions setup photo



Figure 7.1-24: Radiated emissions setup photo