

TEST REPORT

Report Number: 15314553-E2V4

Applicant : LEVITON MANUFACTURING CO., INC.
10385 SW AVERY
TUALATIN, OR 97062-2210
USA

Models : LRF3-C3648-1, LRF3-C3648-2, LRF3-C3648-3, LRF3-C3648-4,
LRF3-C3648-5, LRF3-C3648-6, LRF3-C3648-7, LRF3-C3648-8

Brand : Leviton

FCC ID : 2ASLN-C3648

IC : 25037-C3648

EUT Description : Logic Board C3648 – BLE and Zigbee

Test Standard(s) : FCC 47 CFR PART 15 SUBPART C
ISED RSS-247 ISSUE 3
ISED RSS-GEN ISSUE 5 + A1 + A2

Date Of Issue:
2024-09-16

Prepared by:
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REPORT REVISION HISTORY

Rev.	Issue Date	Revisions	Revised By
V1	2024-06-28	Initial Issue	---
V2	2024-08-22	Updated Model Numbers on Cover Page, Section 1 and Section 6.1	Tina Chu
V3	2024-09-09	Updated antenna gain on Section 6.3	Tina Chu
V4	2024-09-16	Updated Section 6.1, 6.5	Tina Chu

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1. ATTESTATION OF TEST RESULTS

COMPANY NAME: LEVITON MANUFACTURING CO., INC.
10385 SW AVERY
TUALATIN, OR 97062-2210
USA

EUT DESCRIPTION: Logic Board C3648 – BLE and Zigbee

MODELS: LRF3-C3648-1, LRF3-C3648-2, LRF3-C3648-3, LRF3-C3648-4,
LRF3-C3648-5, LRF3-C3648-6, LRF3-C3648-7, LRF3-C3648-8

BRAND: Leviton

SERIAL NUMBER: ZBM00-10z: 1MR (Radiated)
ZKM00-10z: 2MR (Radiated)
ZBM00-10z: 1MC (Conducted)
ZKM00-10z: 2MC (Conducted)

SAMPLE RECEIPT DATE: 2024-06-10

DATE TESTED: 2024-06-10 – 2024-06-25

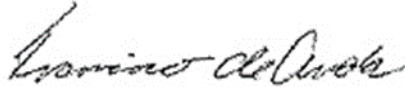
APPLICABLE STANDARDS	
STANDARD	TEST RESULTS
CFR 47 Part 15 Subpart C	Complies
ISED RSS-247 Issue 3	Complies
ISED RSS-GEN Issue 5 + A1 + A2	Complies

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

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

This document may not be altered or revised in any way unless done so by UL Verification Services Inc. and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by UL Verification Services Inc. will constitute fraud and shall nullify the document.

Approved & Released For
UL Verification Services Inc. By:



Francisco de Anda
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Consumer Technology Division
UL Verification Services Inc.

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Consumer Technology Division
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Reviewed By:



Tina Chu
Senior Project Engineer
Consumer Technology Division
UL Verification Services Inc.

2. TEST RESULTS SUMMARY

This report contains data provided by the customer which can impact the validity of results. UL Verification Services Inc. is only responsible for correctly integrating customer-provided data with measurements performed by UL Verification Services Inc.

Below is a list of the data provided by the customer:

- 1) Antenna gain and type (see section 6.3)
- 2) Cable loss (see section 6.3)

FCC Clause	ISED Clause	Requirement	Result	Comment
See Comment		Duty Cycle	Reporting purposes only	ANSI C63.10 Section 11.6.
-	RSS-GEN 6.7	99% OBW	Reporting purposes only	ANSI C63.10 Section 6.9.3.
15.247 (a) (2)	RSS-247 5.2 (a)	6dB BW	Complies	None.
15.247 (b) (3)	RSS-247 5.4 (d)	Output Power	Complies	None.
See Comment		Average power	Reporting purposes only	Per ANSI C63.10, Section 11.9.2.3.2.
15.247 (e)	RSS-247 5.2 (b)	PSD	Complies	None.
15.247 (d)	RSS-247 5.5	Conducted Spurious Emissions	Complies	None.
15.209, 15.205	RSS-GEN 8.9, 8.10	Radiated Emissions	Complies	None.
15.207	RSS-Gen 8.8	AC Mains Conducted Emissions	Complies	None.

3. TEST METHODOLOGY

The tests documented in this report were performed in accordance with FCC CFR 47 Part 2, FCC CFR 47 Part 15, ANSI C63.10-2013, KDB 558074 D01 15.247 Meas Guidance, KDB 414788 D01 Radiated Test Site, RSS-GEN Issue 5 + A1 + A2, and RSS-247 Issue 3.

4. FACILITIES AND ACCREDITATION

UL Verification Services Inc. is accredited by A2LA, Certificate Number 0751.05, for all testing performed within the scope of this report. Testing was performed at the locations noted below.

	Address	ISED CABID	ISED Company Number	FCC Registration
☐	Building 1: 47173 Benicia Street, Fremont, CA 94538, USA	US0104	2324A	550739
☒	Building 2: 47266 Benicia Street, Fremont, CA 94538, USA			
☒	Building 4: 47658 Kato Rd, Fremont, CA 94538, USA			

5. DECISION RULES AND MEASUREMENT UNCERTAINTY

5.1. METROLOGICAL TRACEABILITY

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

5.2. DECISION RULES

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

5.3. MEASUREMENT UNCERTAINTY

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

PARAMETER	U _{Lab}
Radio Frequency (Spectrum Analyzer)	141.16 Hz
Occupied Bandwidth	1.22%
RF Power Measurement Direct Method Using Power Meter	1.3 dB (PK) / 0.45 dB (AV)
Unwanted Emissions, Conducted	1.94 dB
Power Spectral Density	2.466 dB
Worst Case Conducted Disturbance, 9kHz to 0.15 MHz	3.78 dB
Worst Case Conducted Disturbance, 0.15 to 30 MHz	3.40 dB
Worst Case Radiated Disturbance, 9kHz to 30 MHz	2.87 dB
Worst Case Radiated Disturbance, 30 to 1000 MHz	6.01 dB
Worst Case Radiated Disturbance, 1000 to 18000 MHz	4.73 dB
Worst Case Radiated Disturbance, 18000 to 26000 MHz	4.51 dB
Worst Case Radiated Disturbance, 26000 to 40000 MHz	5.29 dB
Time Domain Measurements	3.39%
Temperature	0.57°C
Relative Humidity	3.39%
DC Supply Voltages	0.57%

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

5.4. SAMPLE CALCULATION

RADIATED EMISSIONS

Where relevant, the following sample calculation is provided:

Field Strength (dBuV/m) = Measured Voltage (dBuV) + Antenna Factor (dB/m) + Cable
Loss (dB) – Preamp Gain (dB)
 $36.5 \text{ dBuV} + 18.7 \text{ dB/m} + 0.6 \text{ dB} - 26.9 \text{ dB} = 28.9 \text{ dBuV/m}$

MAINS CONDUCTED EMISSIONS

Where relevant, the following sample calculation is provided:

Final Voltage (dBuV) = Measured Voltage (dBuV) + Cable Loss (dB) + Limiter Factor (dB) +
LISN Insertion Loss.
 $36.5 \text{ dBuV} + 0 \text{ dB} + 10.1 \text{ dB} + 0 \text{ dB} = 46.6 \text{ dBuV}$

6. EQUIPMENT UNDER TEST

6.1. EUT DESCRIPTION

The EUT is a logic board module that supports both BLE and Zigbee technologies or BLE only technology. It is a limited module and tested inside host models.

Listed module's model numbers that support both BLE and Zigbee technologies with different flash, ram size and security features. All model numbers have same architecture, RF power and setting. Model numbers:

- LRF3-C3648-1
- LRF3-C3648-2
- LRF3-C3648-3
- LRF3-C3648-4
- LRF3-C3648-5
- LRF3-C3648-6

Listed module's model numbers that support BLE only technology with different flash, ram size and security features. Both model numbers have same architecture, RF power and setting. The Zigbee radio is disabled in firmware set by the manufacturer. Model numbers:

- LRF3-C3648-7
- LRF3-C3648-8

This application will cover 14 hosts, ceiling mount host has higher Zigbee power than wall mount host, model numbers:

BLE/Zigbee hosts (with EUT model number: LRF-C3648-1, chosen as worst-case for testing):

- ZBM00-10z (Wall Mount Host)
- ZKM00-10z (Ceiling Mount Host)
- ZB700-D0z (Wall Mount Host)
- ZB700-30z (Wall Mount Host)
- ZK700-D0z (Ceiling Mount Host)
- ZBS00-D0z (Wall Mount Host)
- ZKS00-D0z (Ceiling Mount Host)

BLE only hosts (with EUT model number: LRF-C3648-7, chosen as worst-case for spot check testing):

- SBM00-10z (Wall Mount Host)
- SKM00-10z (Ceiling Mount Host)
- SB700-D0z (Wall Mount Host)
- SB700-30z (Wall Mount Host)
- SK700-D0z (Ceiling Mount Host)
- SBS00-D0z (Wall Mount Host)
- SKS00-D0z (Ceiling Mount Host)

Both BLE/Zigbee hosts and BLE only hosts are identical in terms of enclosure and PCB board, the only difference is that in BLE only hosts, the Zigbee radio is disabled in firmware set by the manufacturer.

This report covers Zigbee radio.

6.2. MAXIMUM OUTPUT POWER

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

Frequency Range (MHz)	Mode	Output Power (dBm)	Output Power (mW)
2405 - 2480	Zigbee (Low Power)	6.68	4.66
	Zigbee (High Power)	8.52	7.11

6.3. DESCRIPTION OF AVAILABLE ANTENNAS AND CABLE LOSS

The antenna(s) gain, type and cable loss, as provided by the manufacturer' are as follows:

The radio utilizes a PCB antenna, with a maximum gain of 1.6 dBi.

Cable loss: 0.5dB

6.4. SOFTWARE AND FIRMWARE

The EUT firmware installed during testing was RailTest", version 1.0

The test utility software used during testing was RealTerm version 2.0.0.70

6.5. WORST-CASE CONFIGURATION AND MODE

Host model number: ZBM00-10z and model number: ZKM00-10z with both BLE/Zigbee protocol were tested for full bandedge and radiated emissions 1G to 18G testing. Radiated emissions below 30MHz, 30MHz to 1GHz , 18G to 26G and AC powerline conducted emissions were tested on model number: ZKM00-10z (Ceiling Mount Host) as worst case.

Host model number: ZKM00-10z (Ceiling Mount Host) was set for full conducted test due higher power as worst case.

Host model number: ZBM00-10z (Wall Mount Host) was set for additional power and conducted emissions test due to lower power.

Radiated harmonic spurious spot check verification has been done on all of the rest of the BLE/Zigbee 5 hosts and BLE only 7 hosts.

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

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

The fundamental of the EUT was investigated in three orthogonal orientations X,Y,Z, it was determined that Y orientation (Landscape orientation) was worst-case orientation; therefore, all final radiated testing was performed with the EUT in Y orientation (Landscape orientation).

6.6. DESCRIPTION OF TEST SETUP

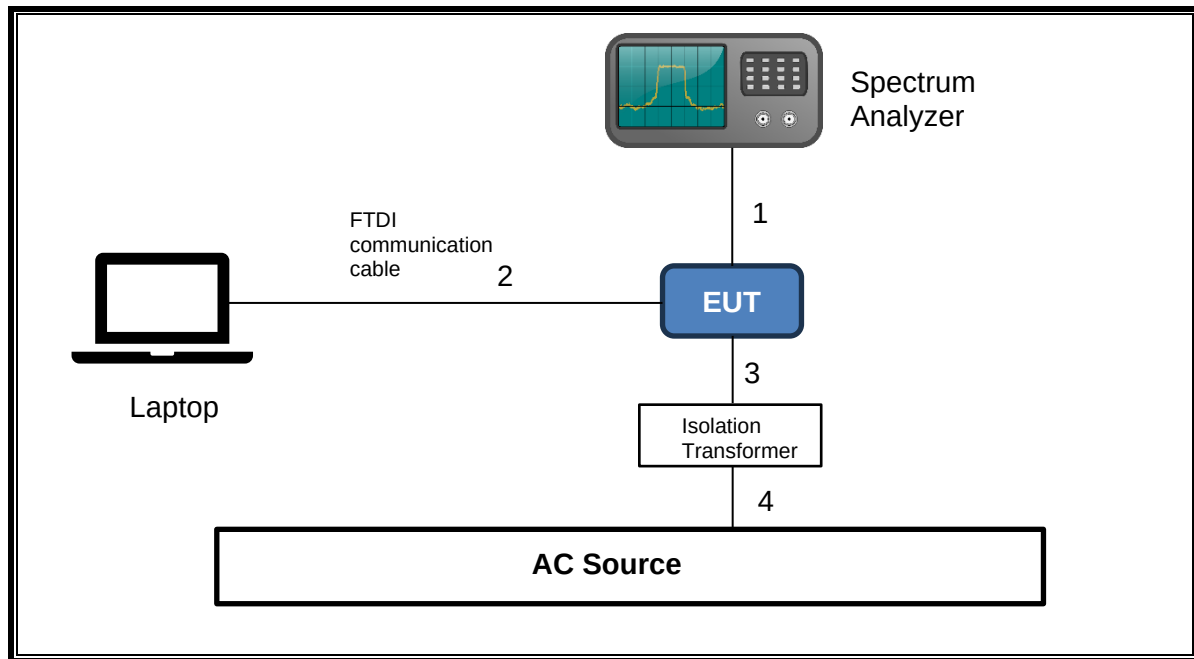
SUPPORT TEST EQUIPMENT						
Description		Manufacturer	Model	Serial Number		FCC ID/ DoC
Laptop		Toshiba	PSCMLU-09G0KU	8F022903P		PPD-QCNFA335
Isolation Transformer		Hammond Manufacturing	167G120	N/A		DoC
I/O CABLES (CONDUCTED TEST)						
Cable No.	Port	# of Identical Ports	Connector Type	Cable Type	Cable Length (m)	Remarks
1	Antenna Port	1	SMA	Unshielded	0.15	EUT to Analyzer
2	FTDI cable	1	Type A USB	Unshielded	2	EUT to Laptop (maintenance cable)
3	AC	1	2-wires	Unshielded	0.6	Isolation Transformer to EUT
4	AC	1	3-prong	Unshielded	1	AC Main to Isolation Transformer
I/O CABLES (RADIATED EMISSIONS/ AC LINE CONDUCTED)						
Cable No.	Port	# of Identical Ports	Connector Type	Cable Type	Cable Length (m)	Remarks
1	AC	1	3-prong	Unshielded	2.5	AC Main to EUT (floating ground)
2	FTDI cable	1	Type A USB	Unshielded	2	EUT to Laptop (maintenance cable)

TEST SETUP

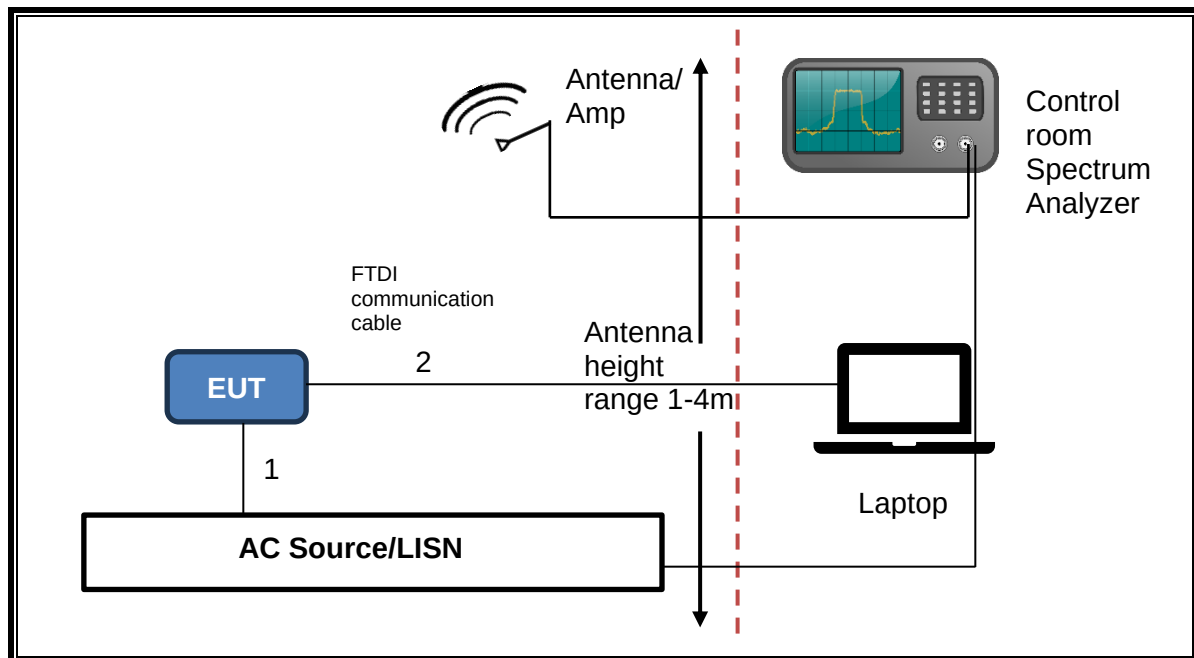
The EUT is powered by AC. Test software exercised the radio card. The laptop was used for setup and removed during radiated emissions/AC powerline emissions testing.

SETUP DIAGRAMS

CONDUCTED TEST



RADIATED EMISSIONS/AC POWERLINE EMISSIONS



7. MEASUREMENT METHOD

Test Item	Test Method
On Time and Duty Cycle	ANSI C63.10 Section 11.6
6 dB BW	ANSI C63.10 Subclause -11.8.1 RBW $\geq$ DTS BW
99% BW	ANSI C63.10-2013, Subclause 6.9.3.
Output Power	ANSI C63.10 Section 11.9.1.3 Method PKPM1 Peak-reading power meter ANSI C63.10 Section 11.9.2.3.2 Method AVGPM-G (Measurement using a gated RF average-reading power meter)
PSD	ANSI C63.10 Section 11.10.2. Method PKPSD (peak PSD)
Radiated emissions non-restricted frequency bands	ANSI C63.10 Subclause -11.11
Radiated emissions restricted frequency bands	ANSI C63.10 Subclause -11.12.1
Conducted emissions in restricted frequency bands	ANSI C63.10 Section -11.12.2 and KDB558074 Section 11, Question 3 (a)
Band-edge	ANSI C63.10 Subclause -11.13.3.2: Integration method - Peak detection
Band-edge	ANSI C63.10 Subclause -11.13.3.4: Integration method - Trace averaging across ON and OFF times DC correction
Radiated Spurious Emissions Below 30MHz	ANSI C63.10-2013 Subclause 6.4
AC Power Line Conducted Emissions	ANSI C63.10-2013, Subclause 6.2

8. TEST AND MEASUREMENT EQUIPMENT

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

TEST EQUIPMENT LIST					
Description	Manufacturer	Model	ID Num	Cal Due	Last Cal
Antenna, Passive Loop 30Hz - 1MHz	ELECTRO METRICS	EM-6871	219909	2024-06-30	2023-06-20
Antenna, Passive Loop 100KHz - 30MHz	ELECTRO METRICS	EM-6872	219911	2024-12-31	2023-12-05
Antenna, Broadband Hybrid, 30MHz to 2000MHz	Sunol Sciences Corp.	JB3	203089	2025-04-30	2024-04-09
Amplifier, 9KHz to 1GHz, 32dB	SONOMA INSTRUMENT	310	175953	2025-03-31	2024-04-04
Antenna, Horn 1-18GHz	ETS-Lindgren	3117	80404	2024-08-31	2022-08-22
RF Filter Box, 1-18GHz	UL-FR1	SAC 8 port rf box 1	197920	2025-03-31	2024-03-30
EMI TEST RECEIVER	Rohde & Schwarz	ESW44	225688	2025-02-29	2024-02-11
Antenna, Horn 18 to 26.5GHz	A.R.A.	MWH-1826/B	199659	2024-12-31	2022-12-06
Amplifier 18-26.5GHz, +5Vdc, -54dBm P1dB	AMPLICAL	AMP18G26.5-60	234683	2025-05-31	2024-05-13
Spectrum Analyzer, PXA, 3Hz to 44GHz	Keysight Technologies Inc	N9030A	85201	2025-02-29	2023-02-02
10dB Fixed Attenuator, up to 26GHz	Pasternack Enterprises	PE7087-10	236189	Verified/characterized before use	
Power Meter, P-series single channel	Keysight Technologies Inc	N1911A	90719	2025-01-31	2024-01-25
Power Sensor, P - series, 50MHz to 18GHz, Wideband	Keysight Technologies Inc	N1921A	90389	2025-01-31	2024-01-25
AC Line Conducted					
LISN	Fischer Custom Communications, Inc	FCC-LISN-50/250-25-2-01-480V	175764	2025-01-31	2024-01-26
EMI TEST RECEIVER	Rohde & Schwarz	ESR	171646	2025-02-28	2024-02-27
Transient Limiter	TE	TBFL1	207996	2024-08-31	2023-08-10
UL TEST SOFTWARE LIST					
Radiated Software	UL	UL EMC	Ver 2023-05-01		
Antenna Port Software	UL	UL RF	Ver 2022-08-16		
AC Line Conducted Software	UL	UL EMC	Rev 9.5 2023-03-03		

9. ANTENNA PORT TEST RESULTS

9.1. ON TIME AND DUTY CYCLE

LIMITS

None; for reporting purposes only.

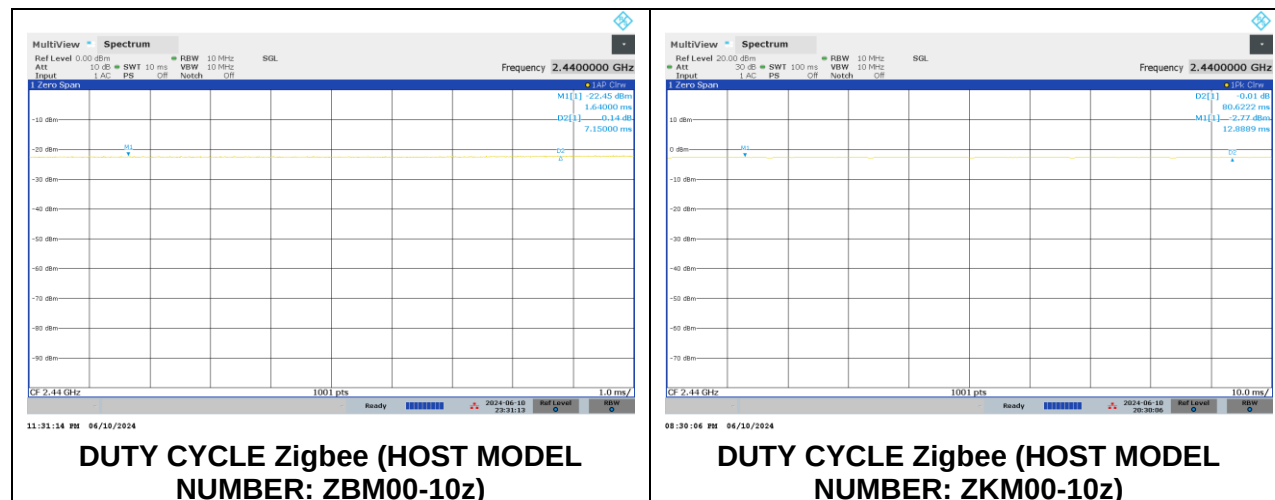
PROCEDURE

KDB 558074 Zero-Span Spectrum Analyzer Method.

ON TIME AND DUTY CYCLE RESULTS

Mode	ON Time T (msec)	Period (msec)	Duty Cycle x (linear)	Duty Cycle (%)	Duty Cycle Correction Factor (dB)	1/T Minimum VBW (kHz)
2.4GHz Band						
Zigbee:ZBM00-10z	1.000	1.000	1.000	100.00	0.00	0.010
Zigbee: ZKM00-10z	1.000	1.000	1.000	100.00	0.00	0.010

Note: For testing purposes, the EUT is transmitting continuously
For DCCF used for radiated harmonic average measurements, DCCF is based on manufacturer's declared operational duty cycle of 46.16%
DCCF = $20 \cdot \log(0.28) = -6.71$ dB



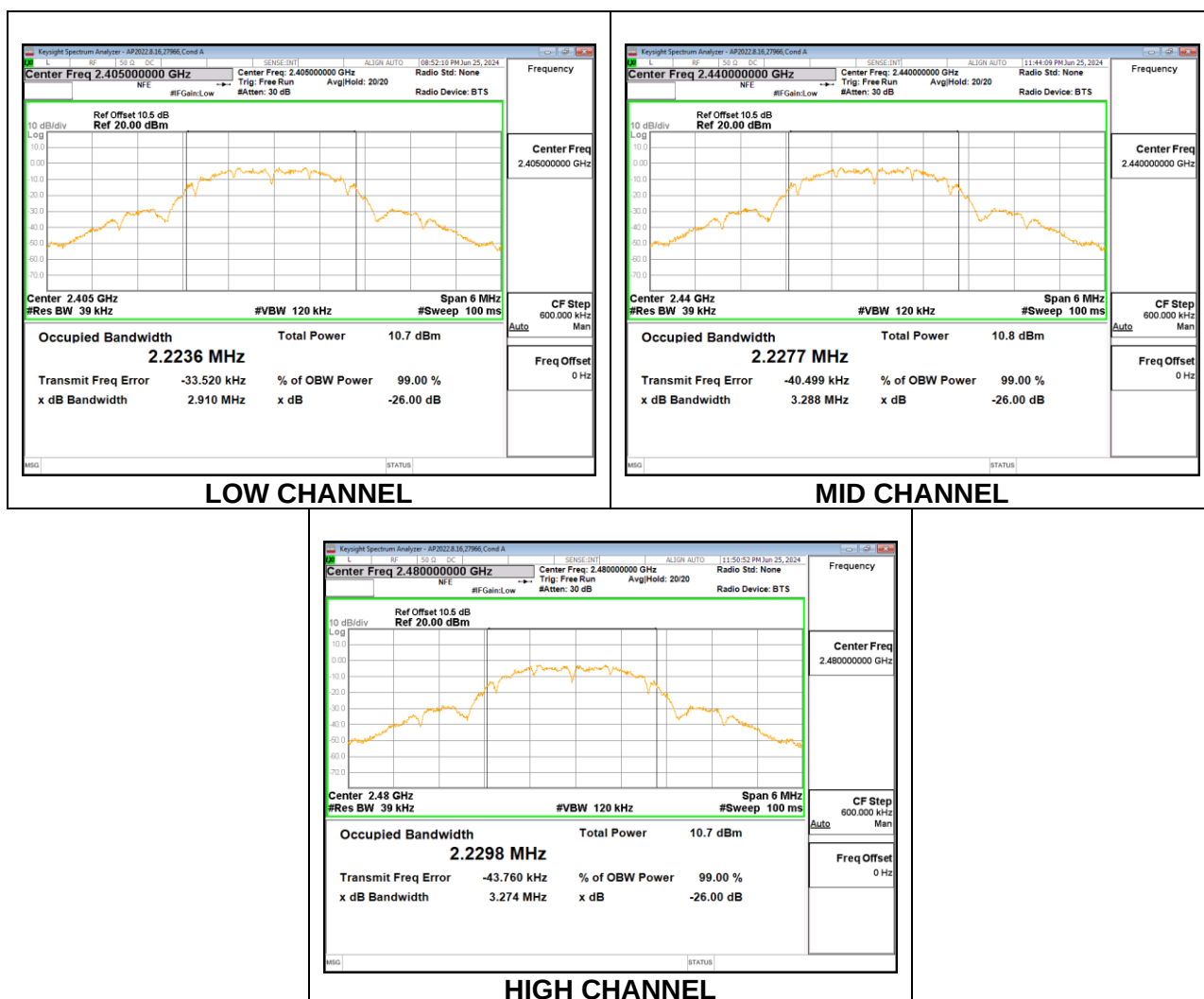
9.2. 99% BANDWIDTH

LIMITS

None; for reporting purposes only.

RESULTS

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	2405	2.2236
Middle	2440	2.2277
High	2480	2.2298



9.3. 6 dB BANDWIDTH

LIMITS

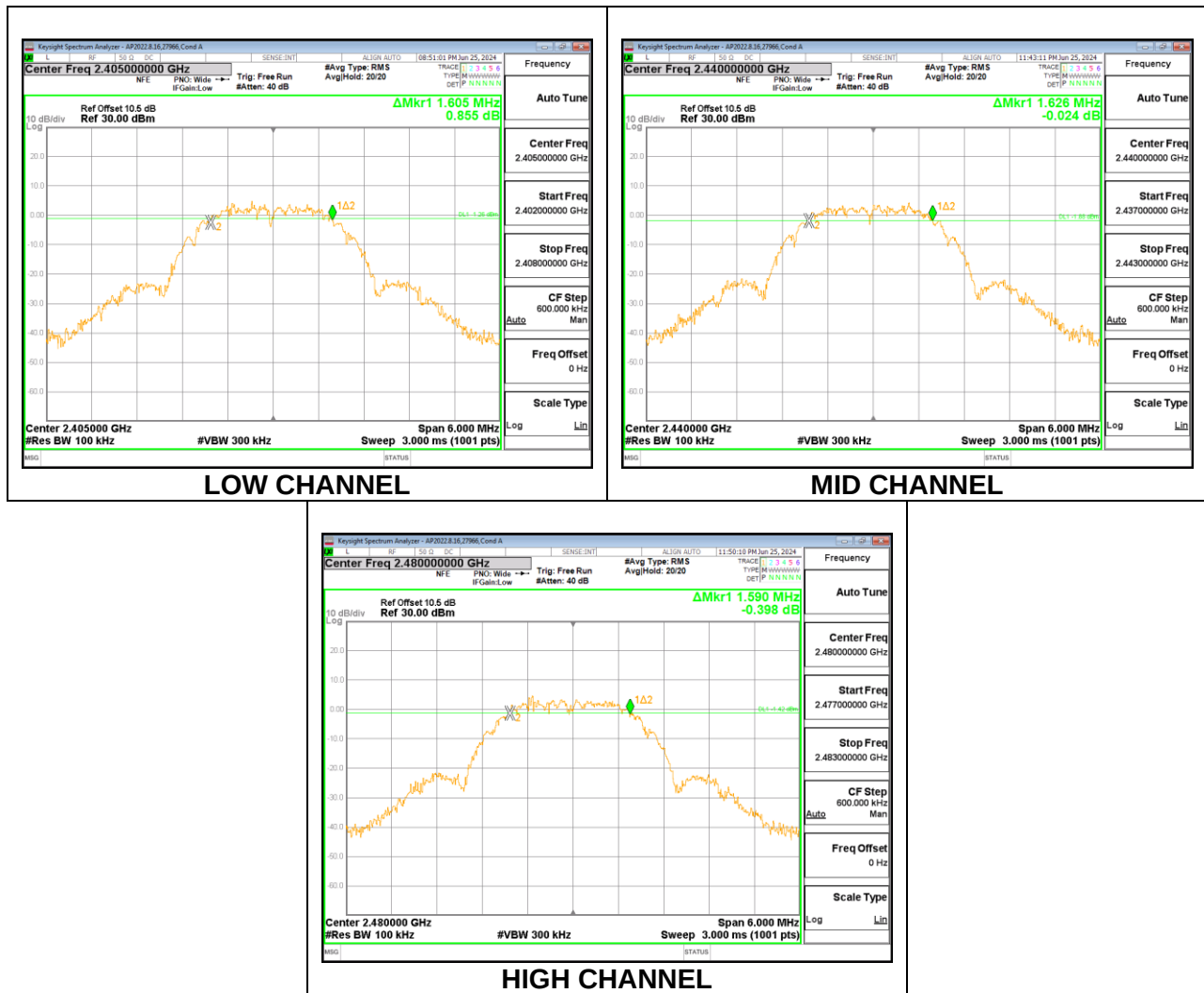
FCC §15.247 (a) (2)

RSS-247 5.2 (a)

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

RESULTS

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)
Low	2405	1.6050	0.5
Middle	2440	1.6260	0.5
High	2480	1.5900	0.5



9.4. OUTPUT POWER

LIMITS

FCC §15.247 (b) (3)

RSS-247 5.4 (d)

The maximum antenna gain is less than or equal to 6 dBi, therefore the limit is 30 dBm.

TEST PROCEDURE

The transmitter output is connected to a power meter.

The power output was measured on the EUT antenna port using SMA cable with 10dB attenuator connected to a power meter via wideband power sensor. Peak output power was read directly from power meter.

RESULTS

HOST MODEL NUMBER: ZBM00-10z (Low Power)

Tested By:	27966 PV
Date:	2024-06-25

Channel	Frequency (MHz)	Peak Power Reading (dBm)	Limit (dBm)	Margin (dB)
Low	2405	6.670	30	-23.330
Middle	2440	6.680	30	-23.320
High	2480	6.660	30	-23.340

HOST MODEL NUMBER: ZKM00-10z (High Power)

Tested By:	27966 PV
Date:	2024-06-25

Channel	Frequency (MHz)	Peak Power Reading (dBm)	Limit (dBm)	Margin (dB)
Low	2405	8.520	30	-21.480
Middle	2440	8.480	30	-21.520
High	2480	8.410	30	-21.590

9.5. AVERAGE POWER

LIMITS

None; for reporting purposes only.

TEST PROCEDURE

The transmitter output is connected to a power meter.

The power output was measured on the EUT antenna port using SMA cable with 10dB attenuator connected to a power meter via wideband power sensor. Gated average output power was read directly from power meter.

RESULTS

HOST MODEL NUMBER: ZBM00-10z (Low Power)

Tested By:	27966 PV
Date:	2024-06-25

Channel	Frequency (MHz)	AV power (dBm)
Low	2405	6.56
Middle	2440	6.58
High	2480	6.56

HOST MODEL NUMBER: ZKM00-10z (High Power)

Tested By:	27966 PV
Date:	2024-06-25

Channel	Frequency (MHz)	AV power (dBm)
Low	2405	8.44
Middle	2440	8.4
High	2480	8.33

9.6. POWER SPECTRAL DENSITY

LIMITS

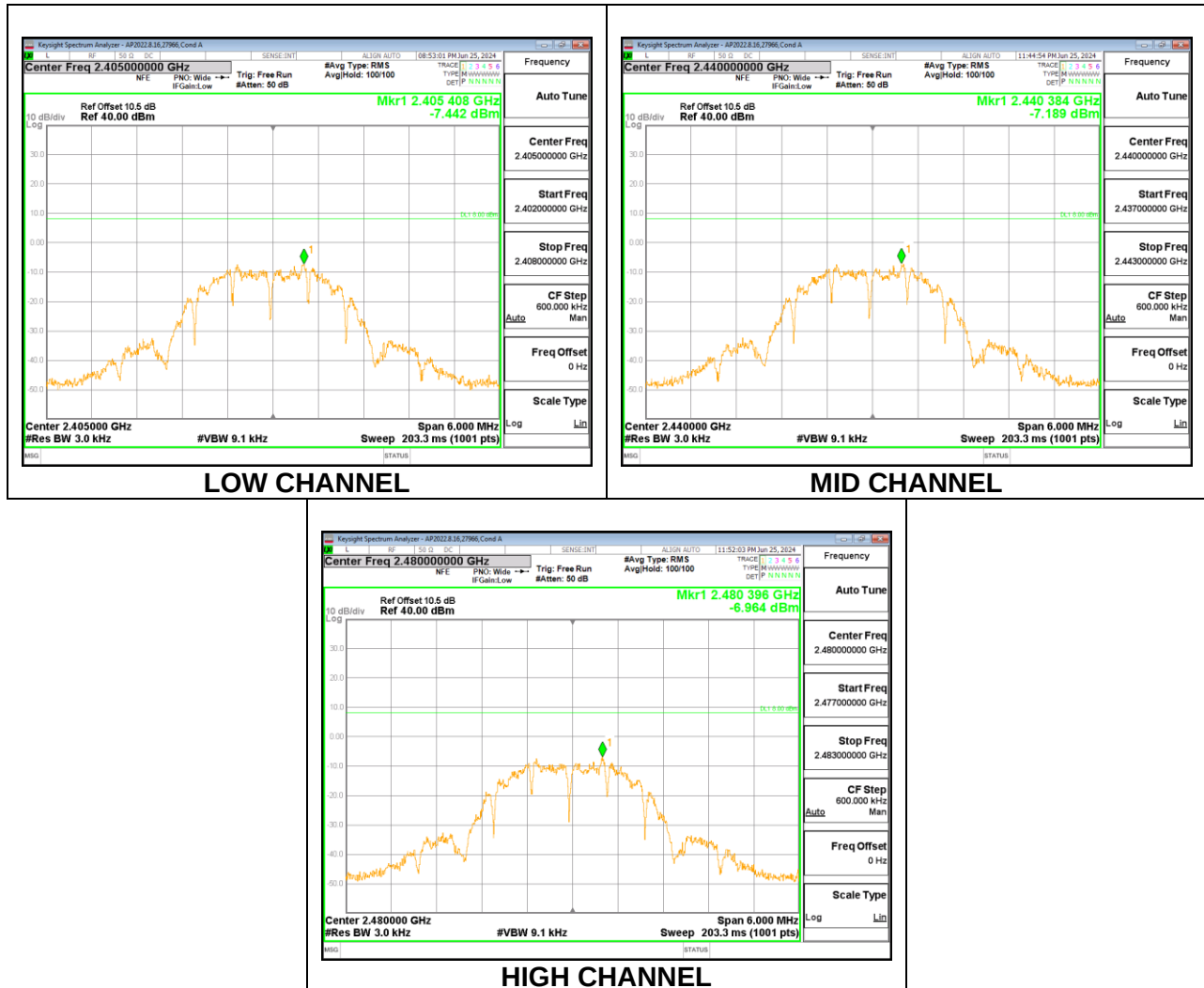
FCC §15.247 (e)

RSS-247 (5.2) (b)

The power spectral density conducted from the transmitter to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

RESULTS

Channel	Frequency (MHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)	Margin (dB)
Low	2405	-7.44	8	-15.44
Middle	2440	-7.19	8	-15.19
High	2480	-6.69	8	-14.69



9.7. CONDUCTED SPURIOUS EMISSIONS

LIMITS

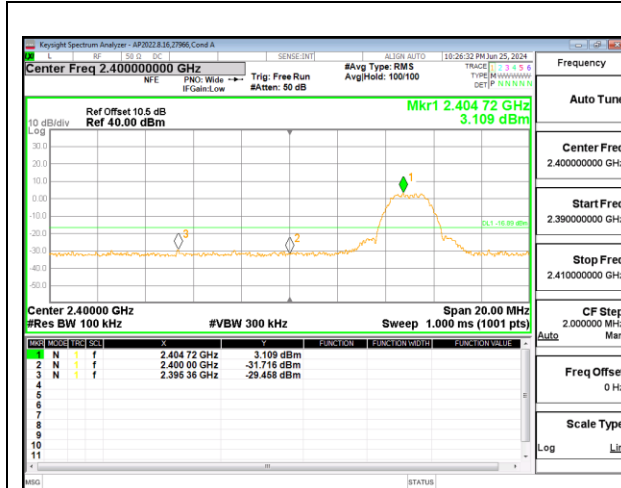
FCC §15.247 (d)

RSS-247 5.5

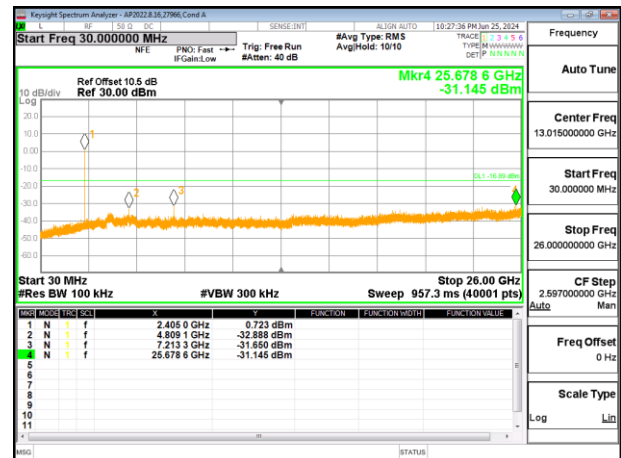
Output power was measured based on the use of a peak measurement, therefore the required attenuation is 20 dBc.

RESULTS

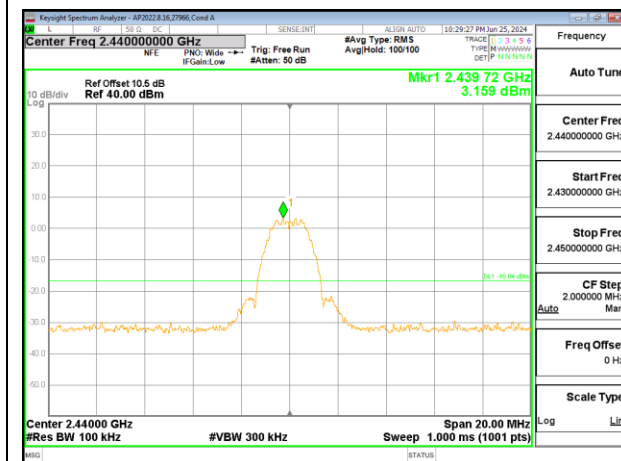
HOST MODEL NUMBER: ZBM00-10z (Low Power)



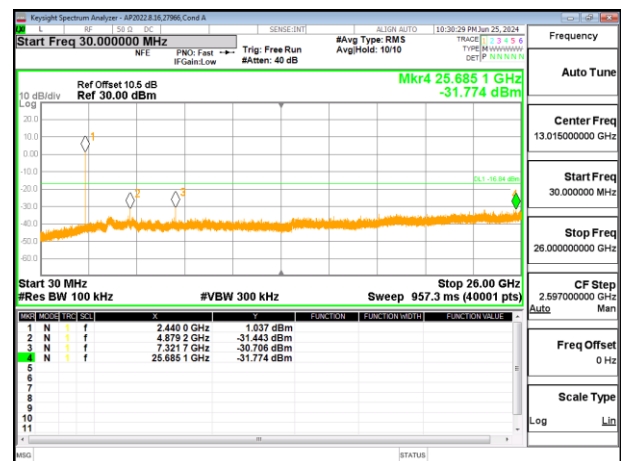
LOW CHANNEL BANDEDGE



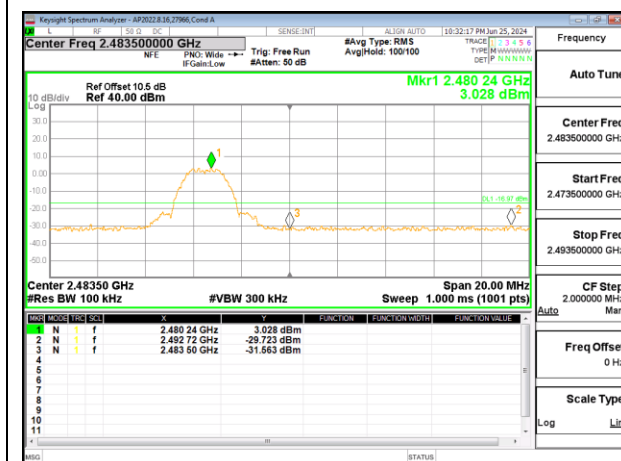
OUT-OF-BAND LOW CHANNEL



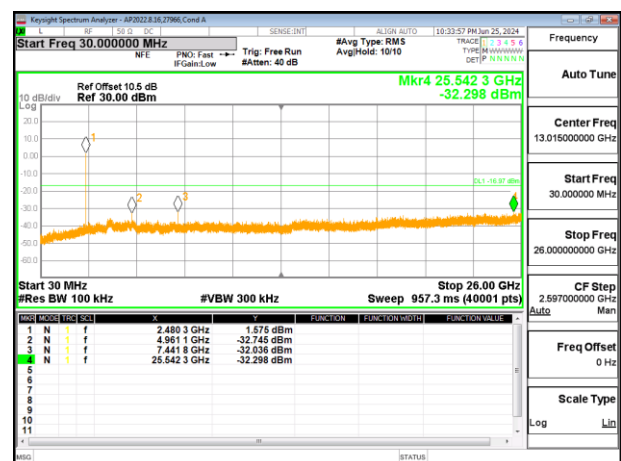
IN-BAND REFERENCE LEVEL



OUT-OF-BAND MID CHANNEL

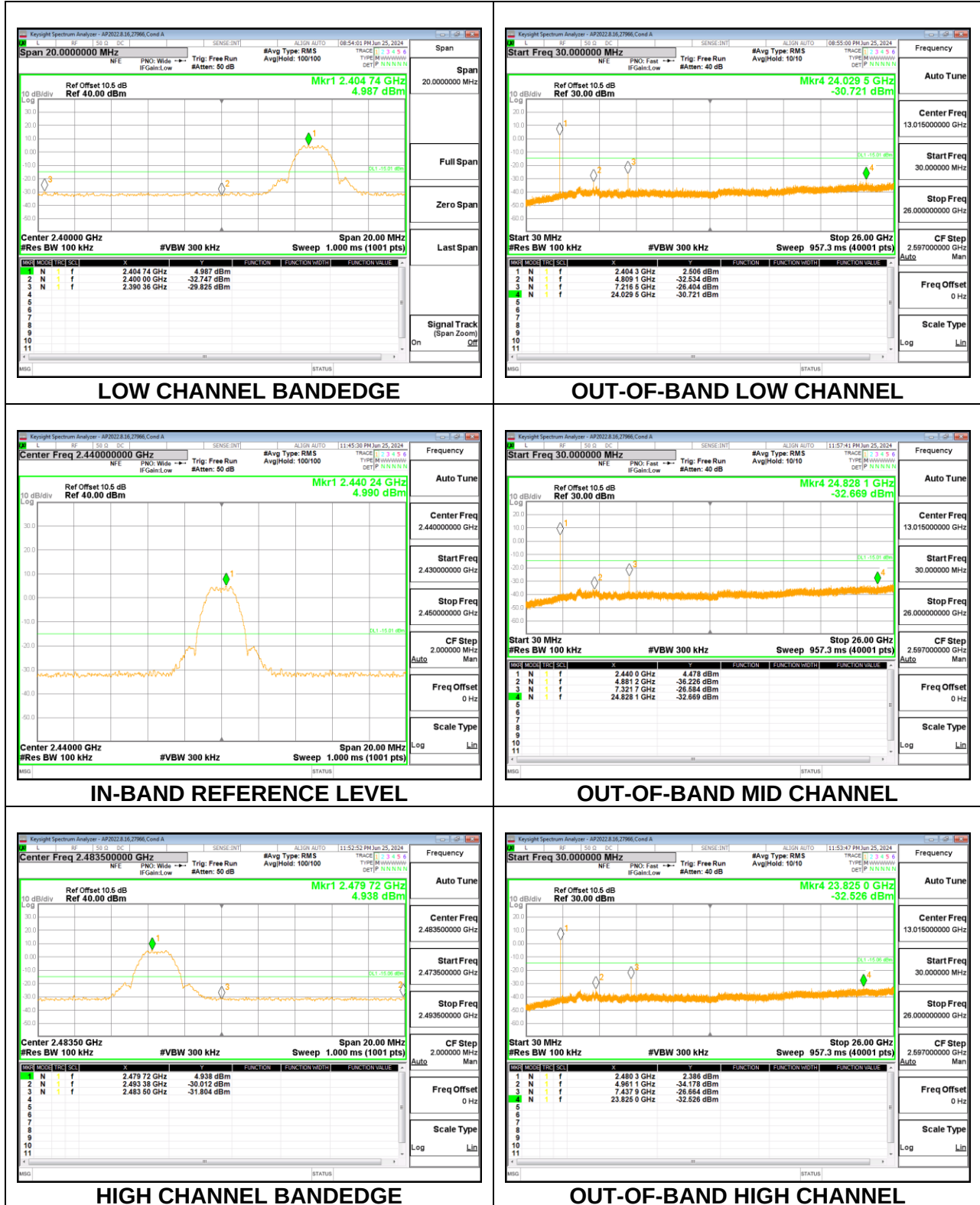


HIGH CHANNEL BANDEDGE



OUT-OF-BAND HIGH CHANNEL

HOST MODEL NUMBER: ZKM00-10z (High Power)



10. RADIATED TEST RESULTS

10.1. LIMITS AND PROCEDURE

LIMITS

FCC §15.205 and §15.209

RSS-GEN, Section 8.9 and 8.10.

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

TEST PROCEDURE

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

For measurements below 30MHz, the resolution bandwidth 9kHz to 150kHz is set to 300Hz, video bandwidth is set to 1kHz. 150kHz to 30MHz, the resolution bandwidth is set to 10kHz, video bandwidth is set to 30kHz.

For measurements below 1 GHz the resolution bandwidth is set to 100 kHz for peak detection measurements or 120 kHz for quasi-peak detection measurements in the 30-1000MHz range, 9kHz for peak and/or quasi-peak detection measurements in the 0.15-30MHz range and 200Hz for peak and/or quasi-peak detection measurements in the 9 to 150kHz range. Peak detection is used unless otherwise noted as quasi-peak or average (9-90kHz and 110-490kHz).

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

For final measurements above 1 GHz the resolution bandwidth is set to 1 MHz; the video bandwidth is set to 3 MHz for peak measurements and as applicable for average measurements.

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

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

For below 30MHz testing, investigation was done on three antenna orientations (parallel, perpendicular, and ground-parallel), parallel and perpendicular are the worst orientations, therefore testing was performed on these two orientations only. Blue color trace on plots: Parallel orientation (face on). Green color trace on plots: Perpendicular orientation (face off).

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

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

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

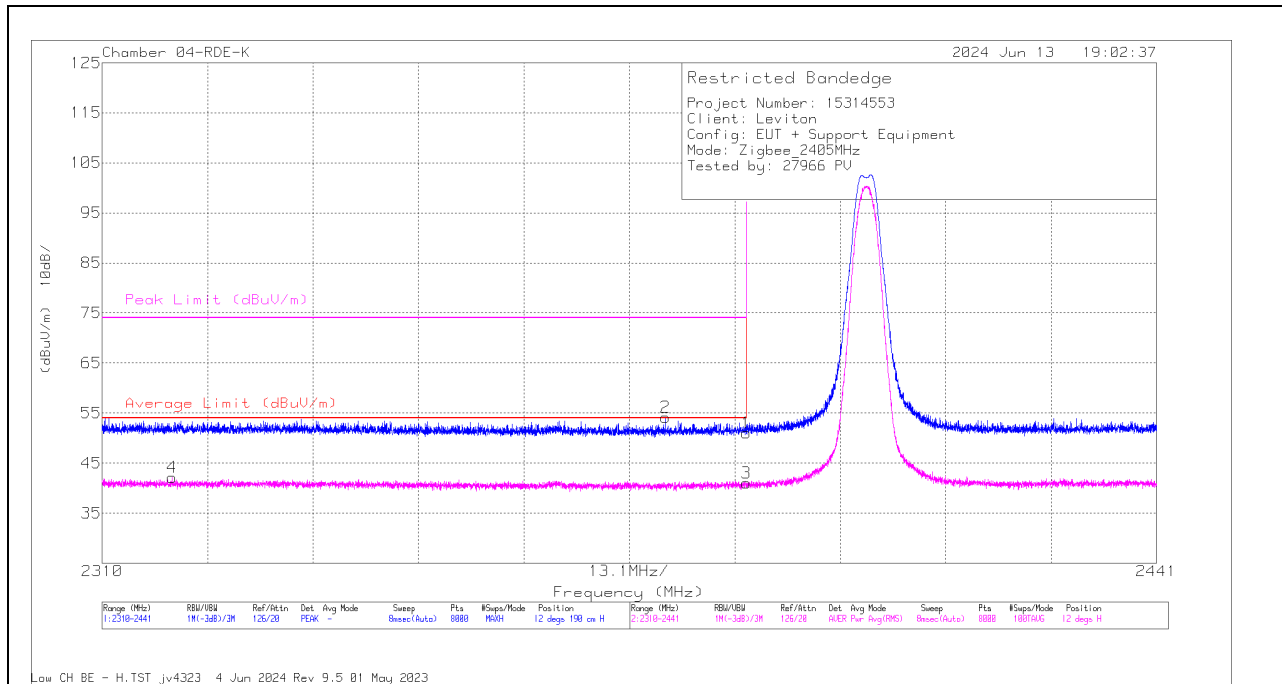
NOTE: The limits in CFR 47, Part 15, Subpart C, paragraph 15.209(a), are identical to those in RSS-Gen section 8.9, Table 6, since the measurements are performed in terms of magnetic field strength and converted to electric field strength levels (as reported in the table), using the free space impedance of 377 Ohms. For example the measurement at frequency X kHz resulted in a level of Y dBuV/m, which is equivalent to $Y - 51.5 = Z$ dBuA/m, which has the same margin, W dB, to the corresponding RSS-Gen Table 6 limit as it has to 15.209(a) limit.

10.2. TRANSMITTER ABOVE 1 GHz

10.2.1. HOST MODEL NUMBER: ZBM00-10z

BANDEDGE (LOW CHANNEL)

HORIZONTAL RESULT



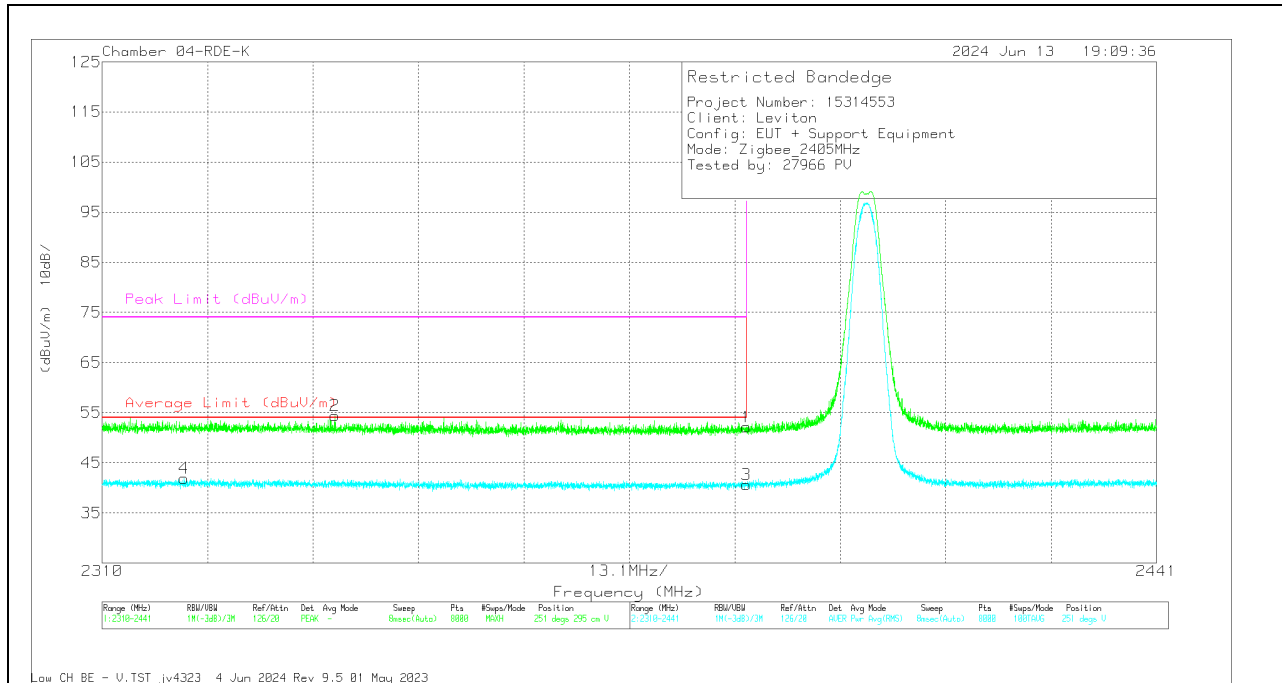
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	80404 3m ACF(dB/m)	Amp/Cbl/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2390	54.02	Pk	32.2	-35.2	51.02	-	-	74	-22.98	12	190	H
2	* 2380.012	57.11	Pk	32.2	-35.2	54.11	-	-	74	-19.89	12	190	H
3	* 2390	43.97	RMS	32.2	-35.2	40.97	54	-13.03	-	-	12	190	H
4	* 2318.68	44.91	RMS	32.7	-35.5	42.11	54	-11.89	-	-	12	190	H

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

Pk - Peak detector

RMS - RMS detection

VERTICAL RESULT



Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	80404 3m ACF(dB/m)	Amp/Cbl/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2390	55.1	PK	32.2	-35.2	52.1	-	-	74	-21.9	251	295	V
2	* 2338.922	57.16	PK	32.5	-35.3	54.36	-	-	74	-19.64	251	295	V
3	* 2390	43.6	RMS	32.2	-35.2	40.6	54	-13.4	-	-	251	295	V
4	* 2320.203	44.68	RMS	32.6	-35.4	41.88	54	-12.12	-	-	251	295	V

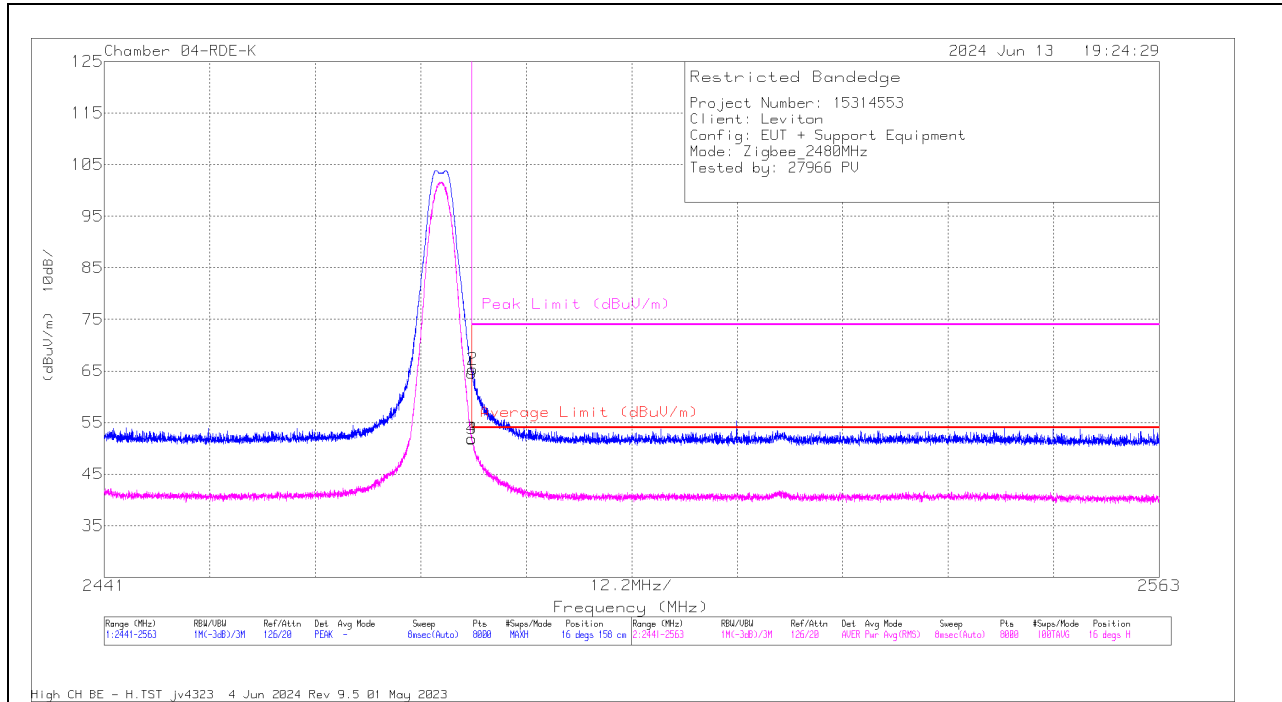
* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

PK - Peak detector

RMS - RMS detection

BANDEDGE (HIGH CHANNEL)

HORIZONTAL RESULT



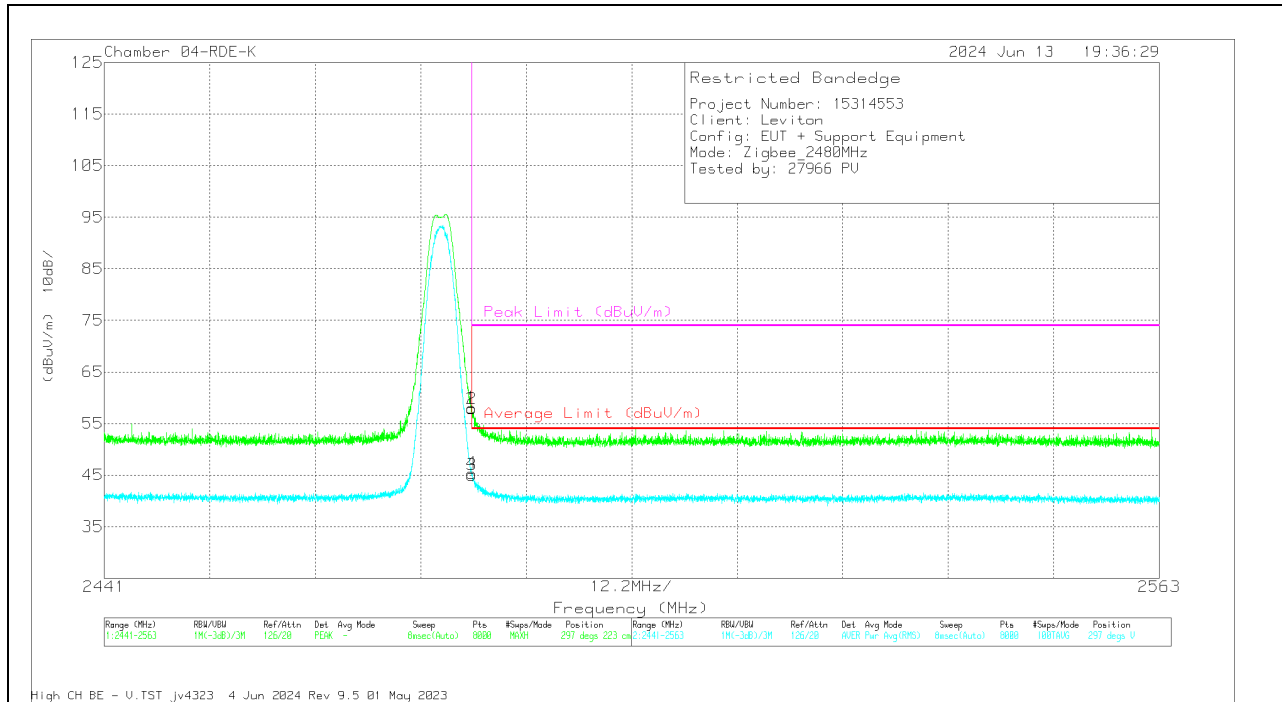
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	80404 3m ACF(dB/m)	Amp/Cbl/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2483.5	67.24	PK	32.2	-34.8	64.64	-	-	74	-9.36	16	158	H
2	* 2483.614	67.95	PK	32.2	-34.8	65.35	-	-	74	-8.65	16	158	H
3	* 2483.5	54.49	RMS	32.2	-34.8	51.89	54	-2.11	-	-	16	158	H
4	* 2483.523	54.45	RMS	32.2	-34.8	51.85	54	-2.15	-	-	16	158	H

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

PK - Peak detector

RMS - RMS detection

VERTICAL RESULT



Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	80404 3m ACF(dB/m)	Amp/Cbl/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2483.5	60.6	Pk	32.2	-34.8	58	-	-	74	-16	297	223	V
2	* 2483.507	60.46	Pk	32.2	-34.8	57.86	-	-	74	-16.14	297	223	V
3	* 2483.5	47.63	RMS	32.2	-34.8	45.03	54	-8.97	-	-	297	223	V
4	* 2483.523	47.93	RMS	32.2	-34.8	45.33	54	-8.67	-	-	297	223	V

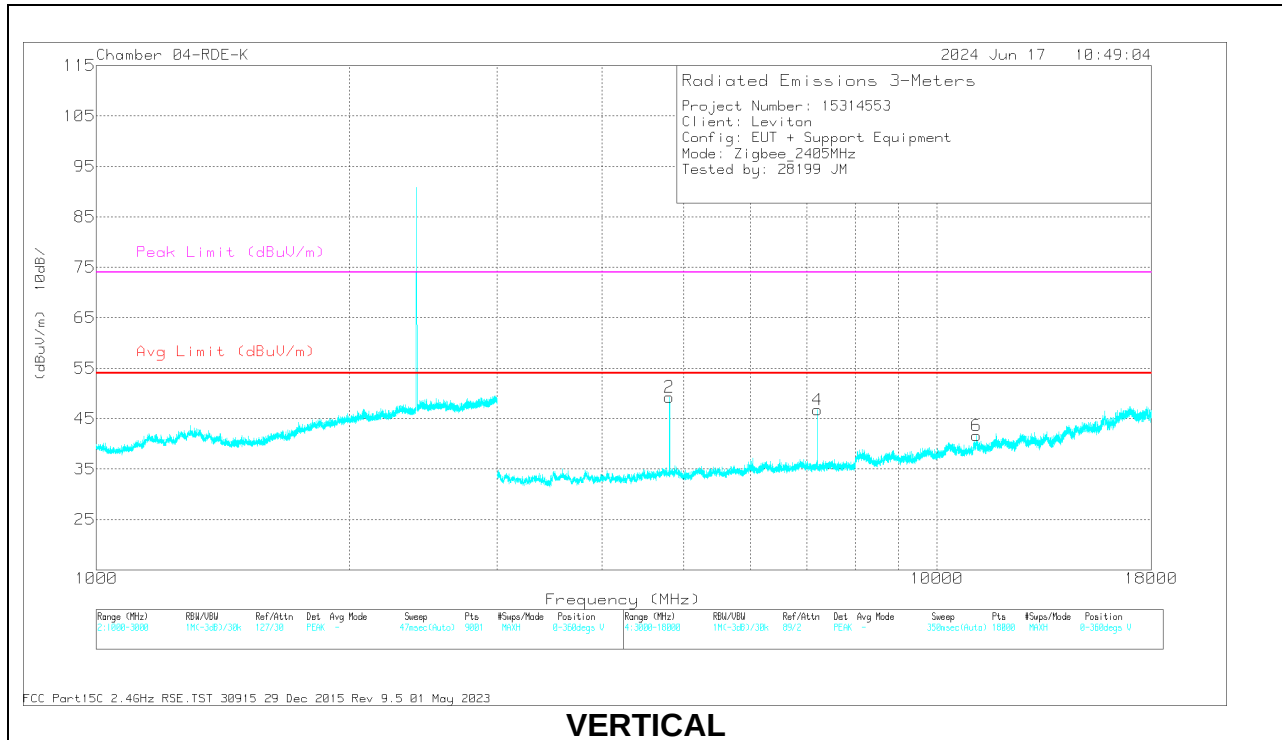
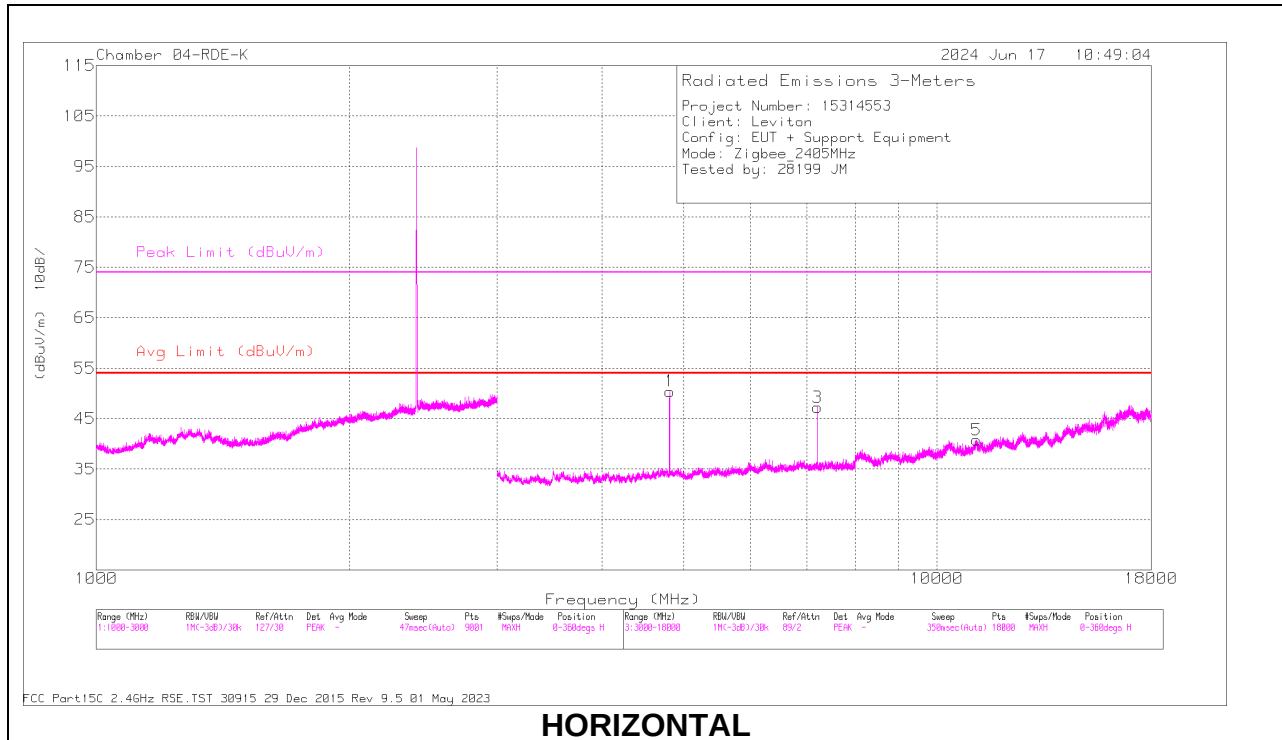
* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

Pk - Peak detector

RMS - RMS detection

HARMONICS AND SPURIOUS EMISSIONS

LOW CHANNEL RESULTS



RADIATED EMISSIONS

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	80404 3m ACF(dB/m)	Amp/Cbl/Fitr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 4810.935	56.41	Pk	34.9	-40.9	50.41	-	-	74	-23.59	0-360	101	H
2	* 4808.435	55.34	Pk	34.9	-41	49.24	-	-	74	-24.76	0-360	200	V
3	7212.736	50.11	Pk	36.1	-39	47.21	-	-	-	-	0-360	101	H
4	7213.569	49.63	Pk	36.1	-39	46.73	-	-	-	-	0-360	101	V
5	* 11149.623	39.06	Pk	38	-36.3	40.76	-	-	74	-33.24	0-360	101	H
6	* 11147.956	39.94	Pk	38	-36.3	41.64	-	-	74	-32.36	0-360	200	V

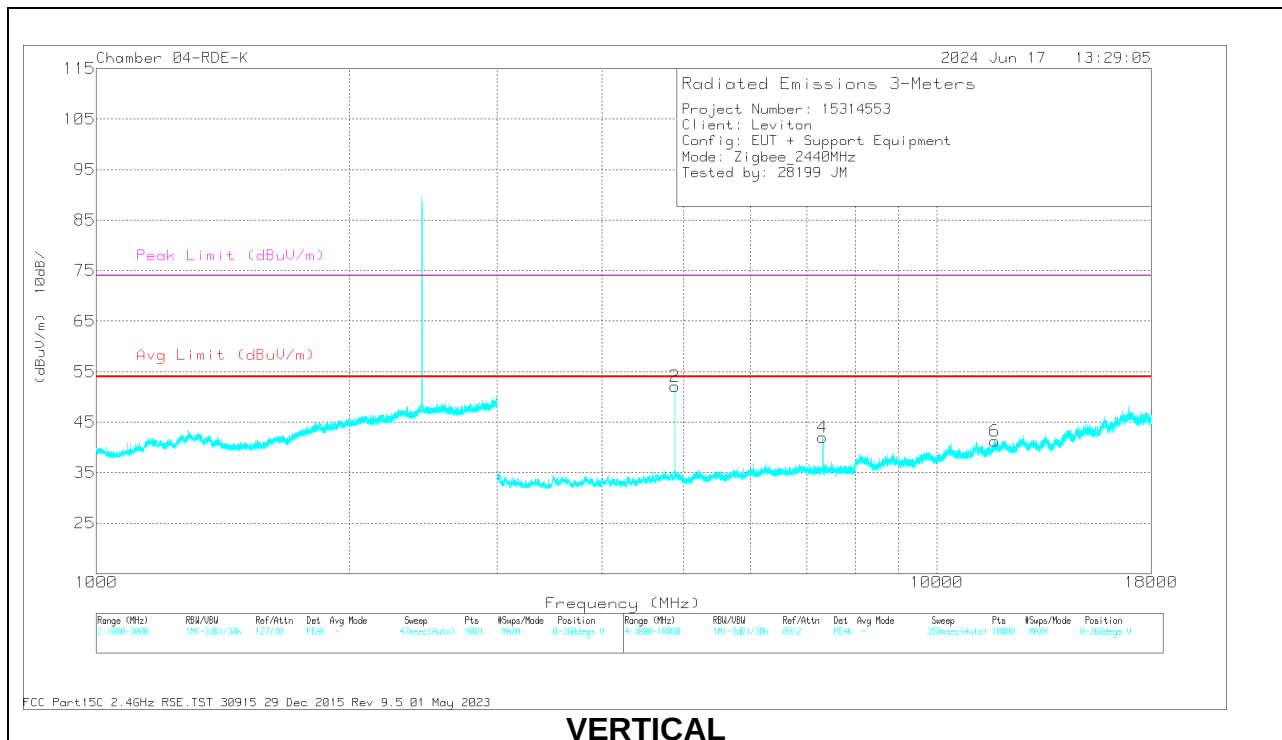
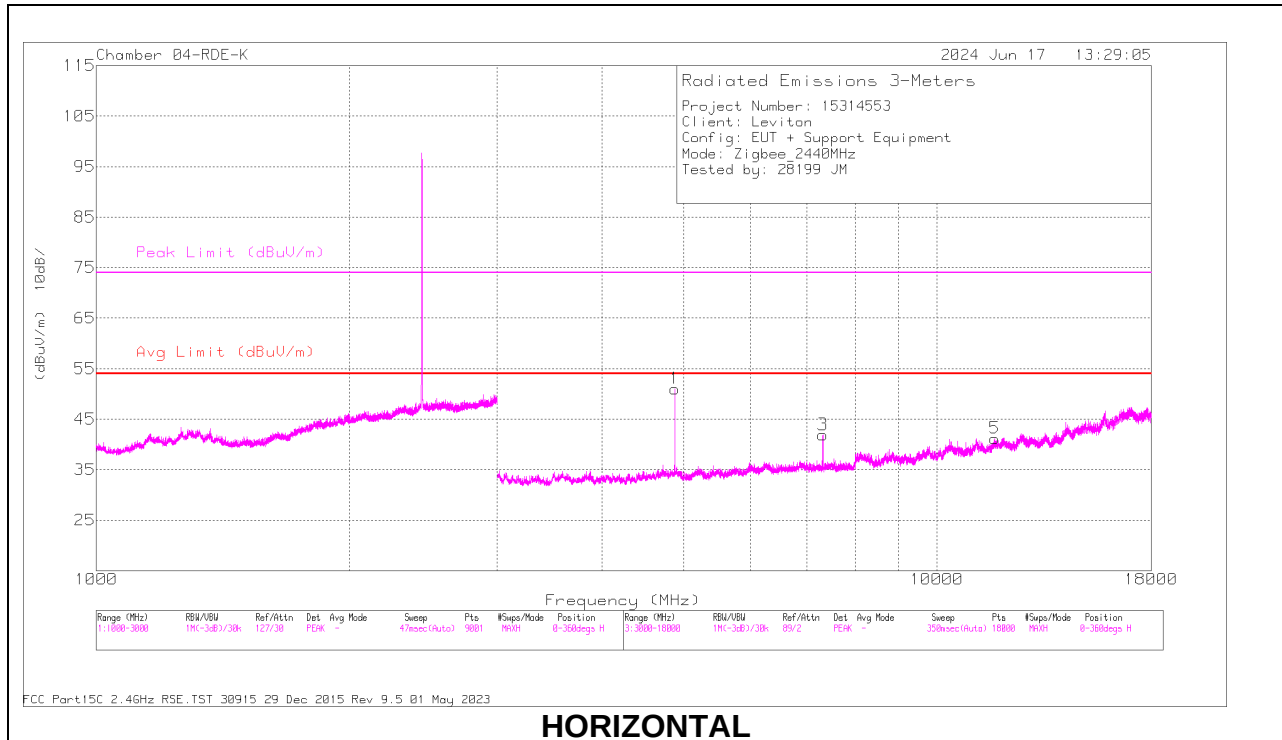
* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
Pk - Peak detector

Radiated Emissions

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	80404 3m ACF(dB/m)	Amp/Cbl/Fitr (dB)	DCCF (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 4808.666	61.98	PK2	34.9	-41	-	55.88	-	-	74	-18.12	2	128	H
	* 4808.666	61.98	AV	34.9	-41	-6.71	49.17	54	-4.83	-	-	2	128	H
2	* 4808.609	61.64	PK2	34.9	-41	-	55.54	-	-	74	-18.46	160	315	V
	* 4808.609	61.64	AV	34.9	-41	-6.71	48.83	54	-5.17	-	-	160	315	V
3	7213.16	57.52	PK2	36.1	-39	-	54.62	-	-	-	-	305	115	H
	7213.16	57.52	AV	36.1	-39	-6.71	47.91	-	-	-	-	305	115	H
4	7213.373	58.44	PK2	36.1	-39	-	55.54	-	-	-	-	89	120	V
	7213.373	58.44	AV	36.1	-39	-6.71	48.83	-	-	-	-	89	120	V
5	* 11146.732	49.3	PK2	38	-36.3	-	51	-	-	74	-23	24	266	H
	* 11146.732	49.3	AV	38	-36.3	-6.71	44.29	54	-9.71	-	-	24	266	H
6	* 11145.554	49.36	PK2	38	-36.3	-	51.06	-	-	74	-22.94	48	150	V
	* 11145.554	49.36	AV	38	-36.3	-6.71	44.35	54	-9.65	-	-	48	150	V

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
PK2 - KDB558074 Method: Maximum Peak
AV = Peak reading + Duty Cycle Correction Factor (KDB558074 Section 11, Question 3 (a))
Duty Cycle Correction Factor = -6.71 dB. (46%)

MID CHANNEL RESULTS



RADIATED EMISSIONS

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	80404 3m ACF(dB/m)	Amp/Cbl/Fitr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 4880.939	57.63	PK	34.4	-41	51.03	-	-	74	-22.97	0-360	101	H
2	* 4880.105	58.67	PK	34.4	-41	52.07	-	-	74	-21.93	0-360	200	V
3	* 7321.075	44.53	PK	36	-38.6	41.93	-	-	74	-32.07	0-360	101	H
4	* 7317.742	44.39	PK	36.1	-38.5	41.99	-	-	74	-32.01	0-360	101	V
5	* 11717.988	38.2	PK	38.5	-35.5	41.2	-	-	74	-32.8	0-360	101	H
6	* 11727.155	38.46	PK	38.4	-35.6	41.26	-	-	74	-32.74	0-360	200	V

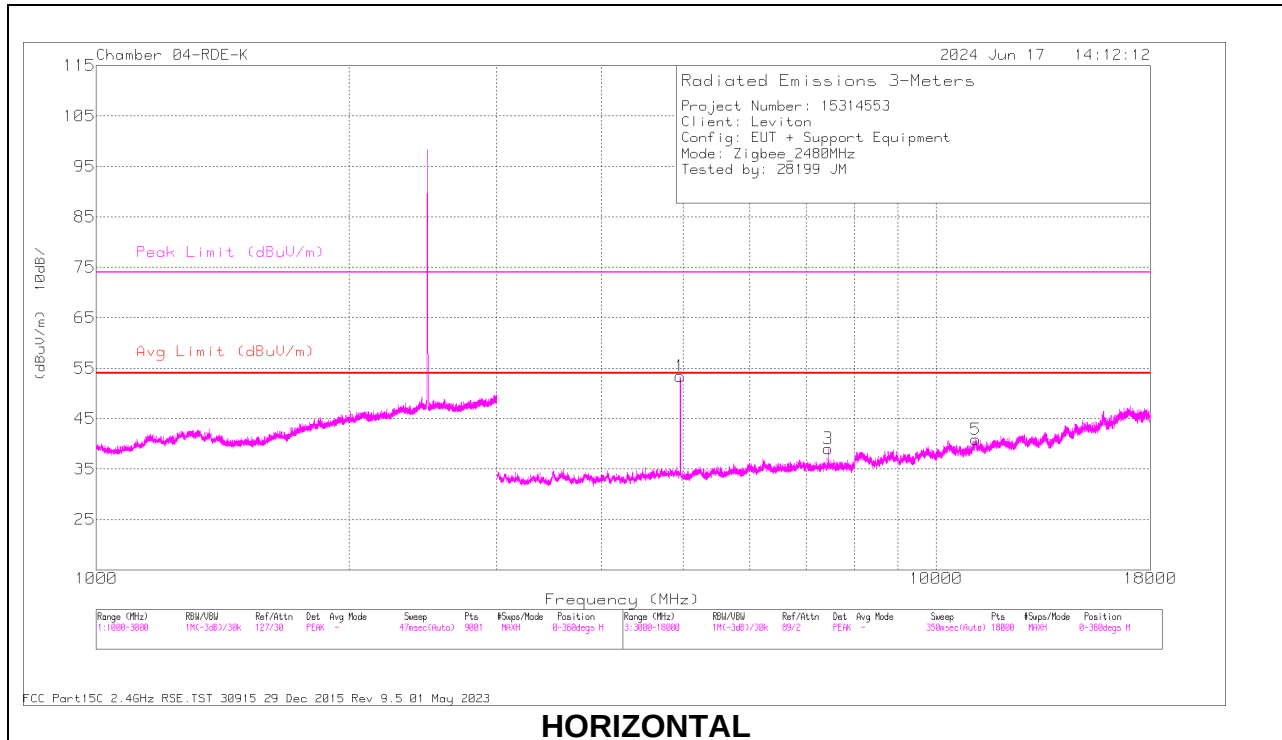
* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
PK - Peak detector

Radiated Emissions

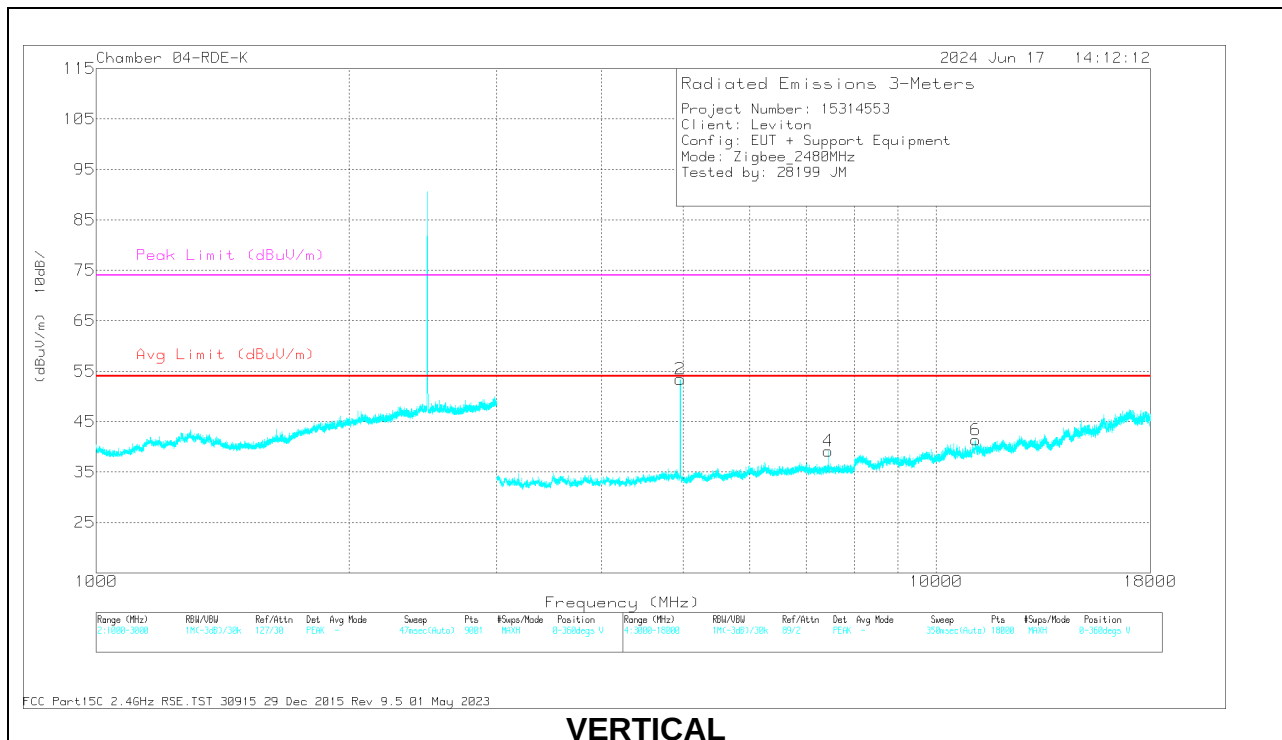
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	80404 3m ACF(dB/m)	Amp/Cbl/Fitr (dB)	DCCF (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 4878.709	64.44	PK2	34.4	-41	-	57.84	-	-	74	-16.16	311	105	H
	* 4878.709	64.44	AV	34.4	-41	-6.71	51.13	54	-2.87	-	-	311	105	H
2	* 4880.872	64.19	PK2	34.4	-41	-	57.59	-	-	74	-16.41	161	284	V
	* 4880.872	64.19	AV	34.4	-41	-6.71	50.88	54	-3.12	-	-	161	284	V
3	* 7318.4	53.75	PK2	36	-38.5	-	51.25	-	-	74	-22.75	309	104	H
	* 7318.4	53.75	AV	36	-38.5	-6.71	44.54	54	-9.46	-	-	309	104	H
4	* 7318.137	53.53	PK2	36.1	-38.5	-	51.13	-	-	74	-22.87	109	119	V
	* 7318.137	53.53	AV	36.1	-38.5	-6.71	44.42	54	-9.58	-	-	109	119	V
5	* 11720.048	47.82	PK2	38.5	-35.5	-	50.82	-	-	74	-23.18	5	321	H
	* 11720.048	47.82	AV	38.5	-35.5	-6.71	44.11	54	-9.89	-	-	5	321	H
6	* 11725.475	48.25	PK2	38.4	-35.6	-	51.05	-	-	74	-22.95	88	174	V
	* 11725.475	48.25	AV	38.4	-35.6	-6.71	44.34	54	-9.66	-	-	88	174	V

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
PK2 - KDB558074 Method: Maximum Peak
AV = Peak reading + Duty Cycle Correction Factor (KDB558074 Section 11, Question 3 (a))
Duty Cycle Correction Factor = -6.71 dB. (46%)

HIGH CHANNEL RESULTS



HORIZONTAL



VERTICAL

RADIATED EMISSIONS

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	80404 3m ACF(dB/m)	Amp/Cbl/Fitr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 4960.11	60.31	PK	34.1	-41	53.41	-	-	74	-20.59	0-360	101	H
2	* 4960.11	60.32	PK	34.1	-41	53.42	-	-	74	-20.58	0-360	200	V
3	* 7437.749	41.54	PK	35.8	-38.3	39.04	-	-	74	-34.96	0-360	101	H
4	* 7441.082	41.57	PK	35.9	-38.3	39.17	-	-	74	-34.83	0-360	101	V
5	* 11157.957	39.26	PK	37.9	-36.3	40.86	-	-	74	-33.14	0-360	200	H
6	* 11151.29	39.69	PK	38	-36.3	41.39	-	-	74	-32.61	0-360	200	V

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
PK - Peak detector

Radiated Emissions

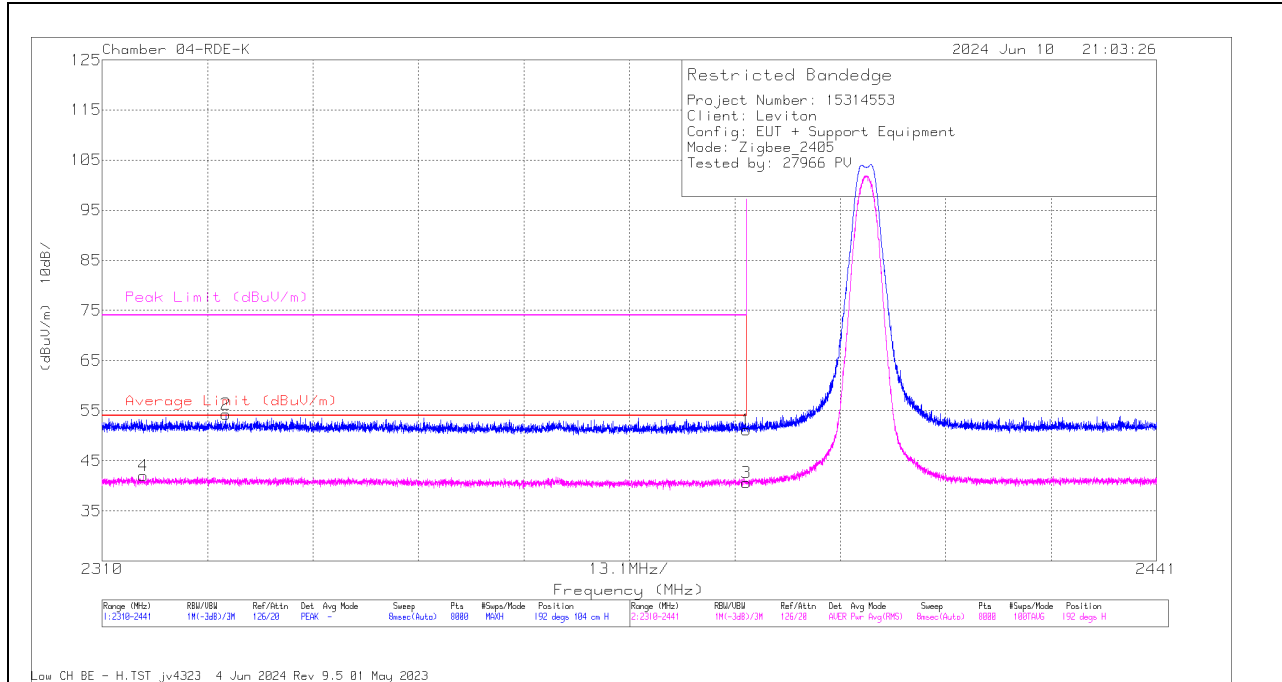
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	80404 3m ACF(dB/m)	Amp/Cbl/Fitr (dB)	DCCF (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 4960.991	65.68	PK2	34.1	-41	-	58.78	-	-	74	-15.22	314	129	H
	* 4960.991	65.68	AV	34.1	-41	-6.71	52.07	54	-1.93	-	-	314	129	H
2	* 4960.982	66.13	PK2	34.1	-41	-	59.23	-	-	74	-14.77	159	197	V
	* 4960.982	66.13	AV	34.1	-41	-6.71	52.52	54	-1.48	-	-	159	197	V
3	* 7438.166	50.63	PK2	35.8	-38.3	-	48.13	-	-	74	-25.87	46	126	H
	* 7438.166	50.63	AV	35.8	-38.3	-6.71	41.42	54	-12.58	-	-	46	126	H
4	* 7441.321	51.22	PK2	35.8	-38.3	-	48.72	-	-	74	-25.28	133	117	V
	* 7441.321	51.22	AV	35.8	-38.3	-6.71	42.01	54	-11.99	-	-	133	117	V
5	* 11159.688	48.67	PK2	38	-36.3	-	50.37	-	-	74	-23.63	94	331	H
	* 11159.688	48.67	AV	38	-36.3	-6.71	43.66	54	-10.34	-	-	94	331	H
6	* 11152.722	49.23	PK2	38.1	-36.3	-	51.03	-	-	74	-22.97	340	375	V
	* 11152.722	49.23	AV	38.1	-36.3	-6.71	44.32	54	-9.68	-	-	340	375	V

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
PK2 - KDB558074 Method: Maximum Peak
AV = Peak reading + Duty Cycle Correction Factor (KDB558074 Section 11, Question 3 (a))
Duty Cycle Correction Factor = -6.71 dB. (46%)

10.2.2. HOST MODEL NUMBER: ZKM00-10z

BANDEGE (LOW CHANNEL)

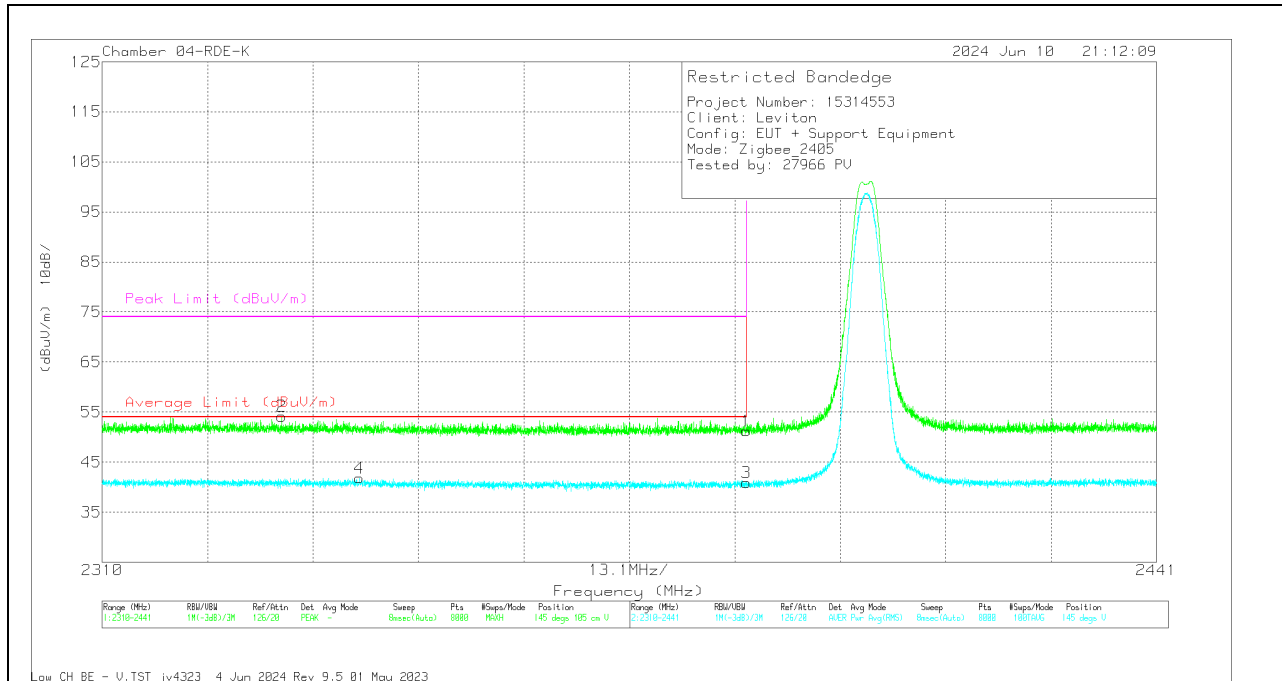
HORIZONTAL RESULT



Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	80404 3m ACF(dB/m)	Amp/Cbl/Par d (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	2390	54.17	Pk	32.2	-35.2	51.17	-	-	74	-22.83	192	104	H
2	2325.362	56.98	Pk	32.7	-35.4	54.28	-	-	74	-19.72	192	104	H
3	2390	43.67	RMS	32.2	-35.2	40.67	54	-13.33	-	-	192	104	H
4	2315.126	44.81	RMS	32.6	-35.4	42.01	54	-11.99	-	-	192	104	H

Pk - Peak detector
RMS - RMS detection

VERTICAL RESULT

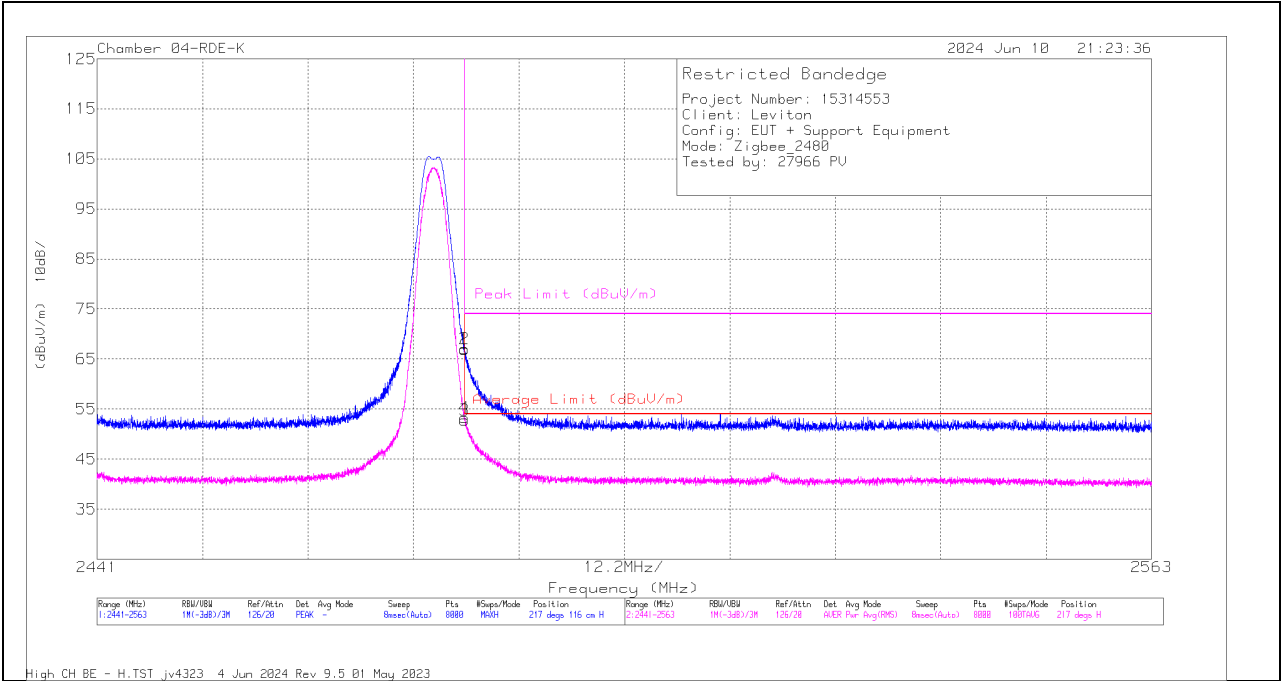


Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	80404 3m ACF(dB/m)	Amp/Cbl/Pa d (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	2390	54.21	Pk	32.2	-35.2	51.21	-	-	74	-22.79	145	105	V
2	2332.289	56.97	Pk	32.6	-35.4	54.17	-	-	74	-19.83	145	105	V
3	2390	43.9	RMS	32.2	-35.2	40.9	54	-13.1	-	-	145	105	V
4	2341.952	44.72	RMS	32.4	-35.3	41.82	54	-12.18	-	-	145	105	V

Pk - Peak detector
RMS - RMS detection

BANDEDGE (HIGH CHANNEL)

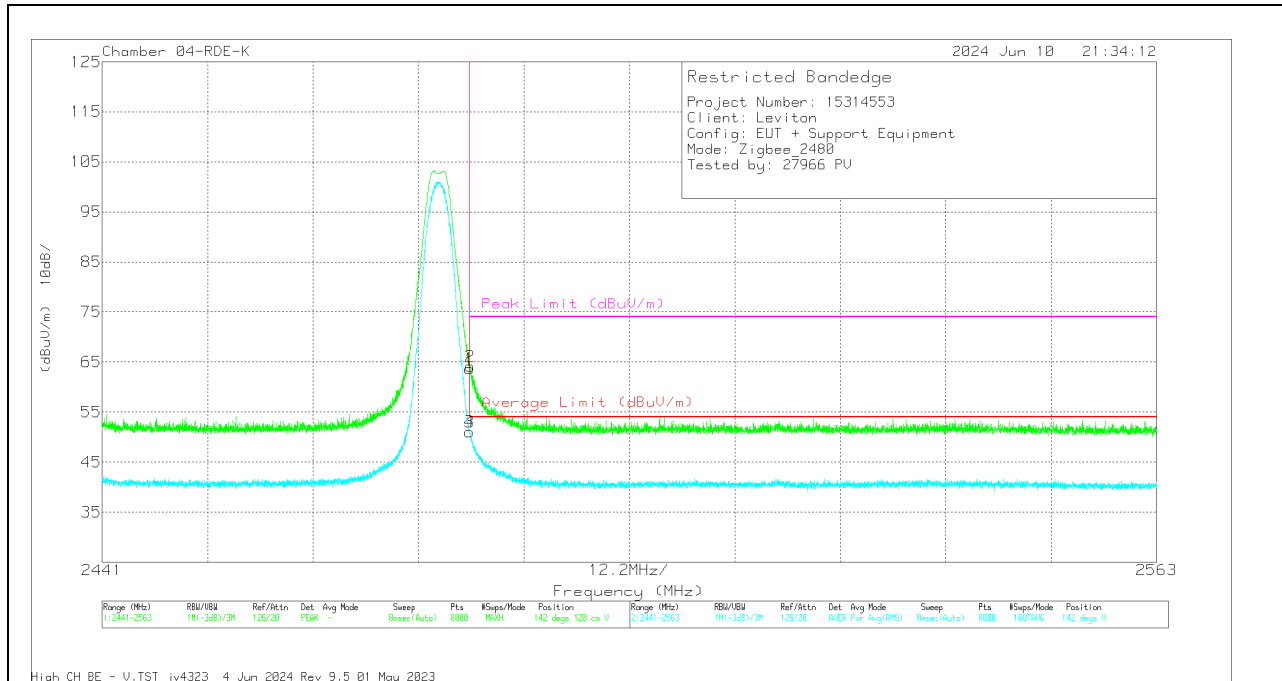
HORIZONTAL RESULT



Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	80404 3m ACF(dB/m)	Amp/Cbl/Pa d (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	2483.5	69.57	Pk	32.2	-34.8	66.97	-	-	74	-7.03	217	116	H
2	2483.507	69.61	Pk	32.2	-34.8	67.01	-	-	74	-6.99	217	116	H
3	2483.5	55.43	RMS	32.2	-34.8	52.83	54	-1.17	-	-	217	116	H
4	2483.538	55.86	RMS	32.2	-34.8	53.26	54	-1.74	-	-	217	116	H

Pk - Peak detector
RMS - RMS detection

VERTICAL RESULT

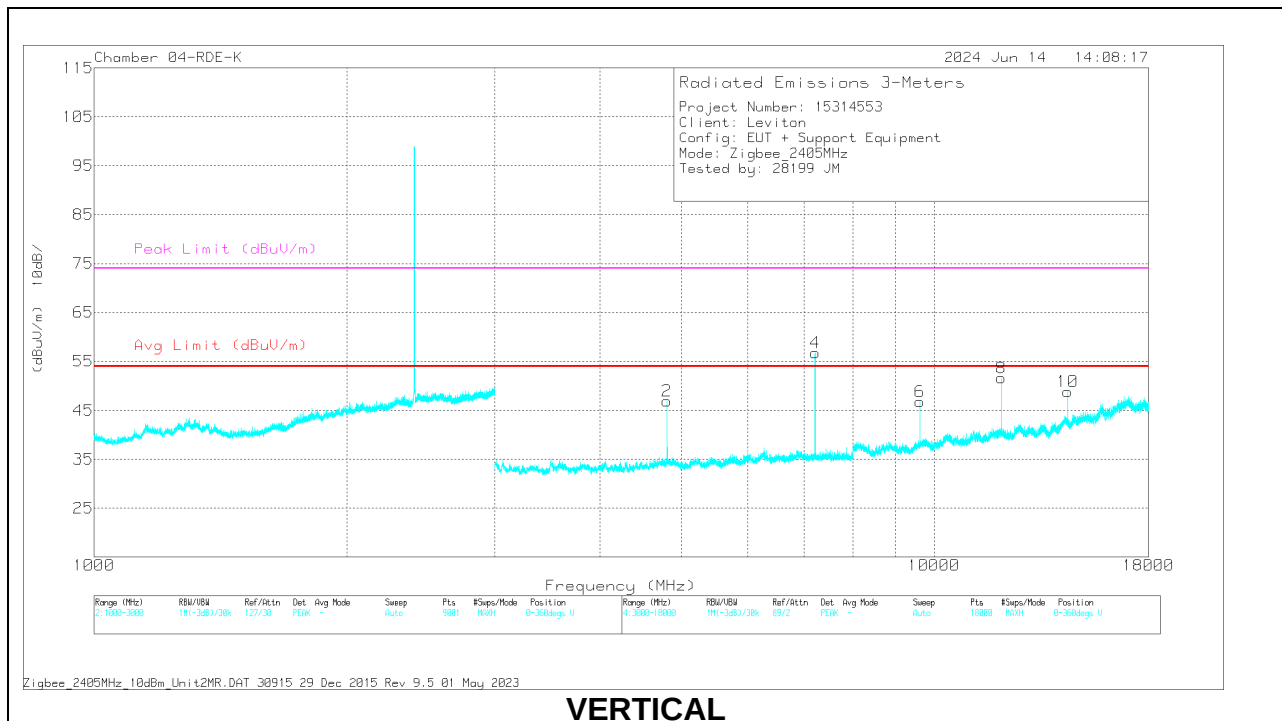
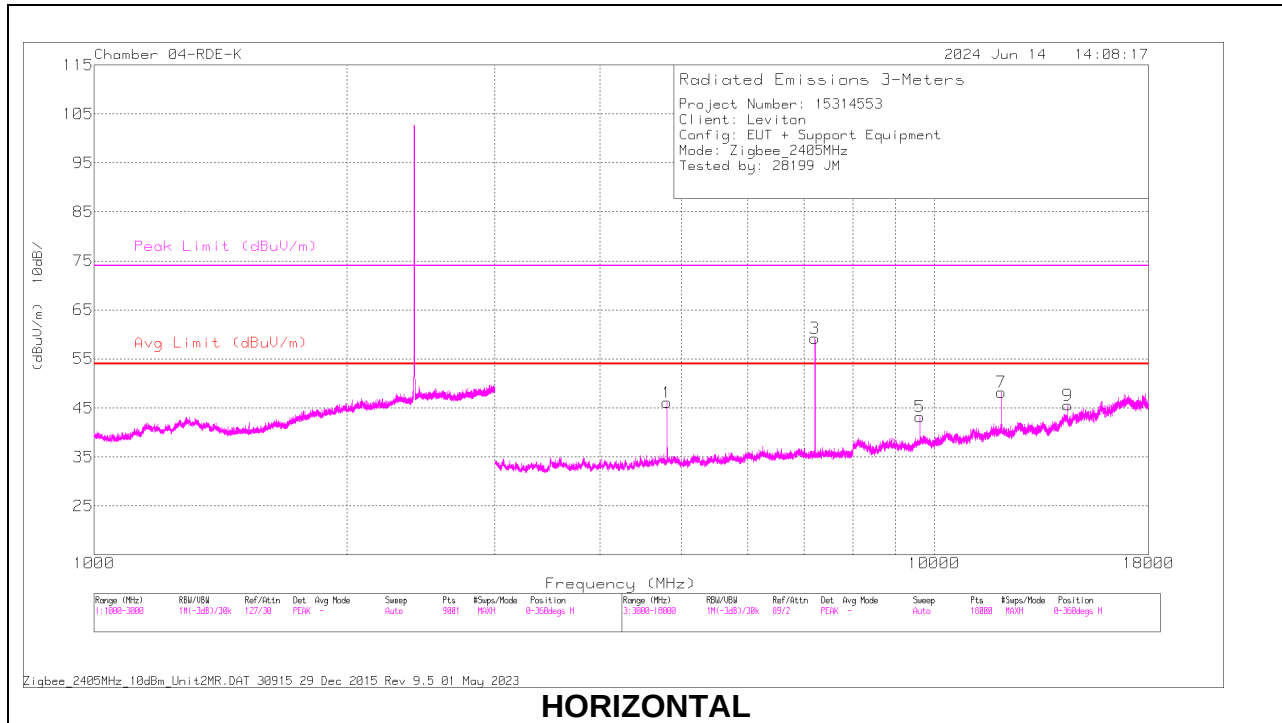


Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	80404 3m ACF(dB/m)	Amp/Cbl/Pa d (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	2483.5	66.28	Pk	32.2	-34.8	63.68	-	-	74	-10.32	142	120	V
3	2483.5	53.65	RMS	32.2	-34.8	51.05	54	-2.95	-	-	142	120	V
4	2483.507	53.67	RMS	32.2	-34.8	51.07	54	-2.93	-	-	142	120	V
2	2483.568	66.71	Pk	32.2	-34.8	64.11	-	-	74	-9.89	142	120	V

Pk - Peak detector
RMS - RMS detection

HARMONICS AND SPURIOUS EMISSIONS

LOW CHANNEL RESULTS



RADIATED EMISSIONS

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	80404 3m ACF(dB/m)	Amp/Cbl/Fitr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 4808.435	52.2	Pk	34.9	-41	46.1	-	-	74	-27.9	0-360	200	H
2	* 4810.935	52.9	Pk	34.9	-40.9	46.9	-	-	74	-27.1	0-360	200	V
3	7212.736	62.15	Pk	36.1	-39	59.25	-	-	-	-	0-360	200	H
4	7216.069	59.7	Pk	36.1	-39	56.8	-	-	-	-	0-360	200	V
5	9622.037	43.58	Pk	36.8	-37.2	43.18	-	-	-	-	0-360	101	H
6	9621.204	47.2	Pk	36.8	-37.2	46.8	-	-	-	-	0-360	101	V
7	* 12021.339	44.55	Pk	38.8	-35.1	48.25	-	-	74	-25.75	0-360	101	H
8	* 12022.172	47.8	Pk	38.8	-35	51.6	-	-	74	-22.4	0-360	101	V
9	14426.473	41.37	Pk	39.5	-35.3	45.57	-	-	-	-	0-360	101	H
10	14433.14	44.64	Pk	39.5	-35.3	48.84	-	-	-	-	0-360	101	V

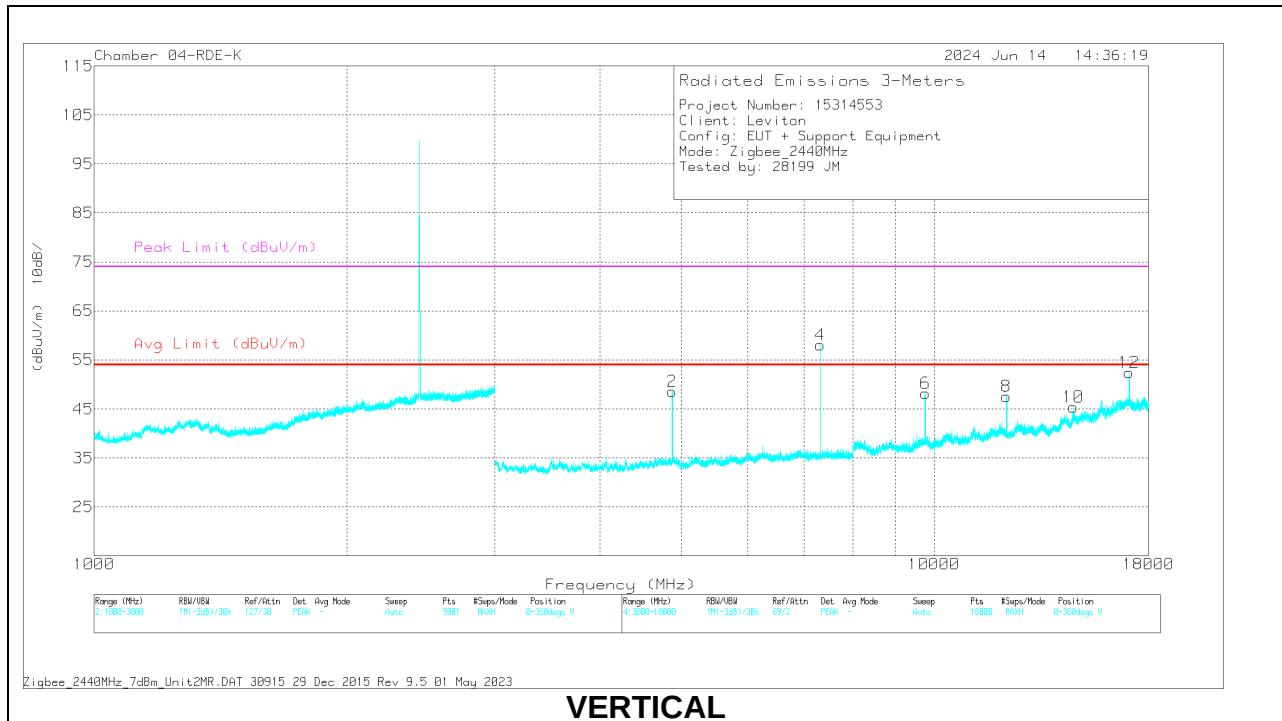
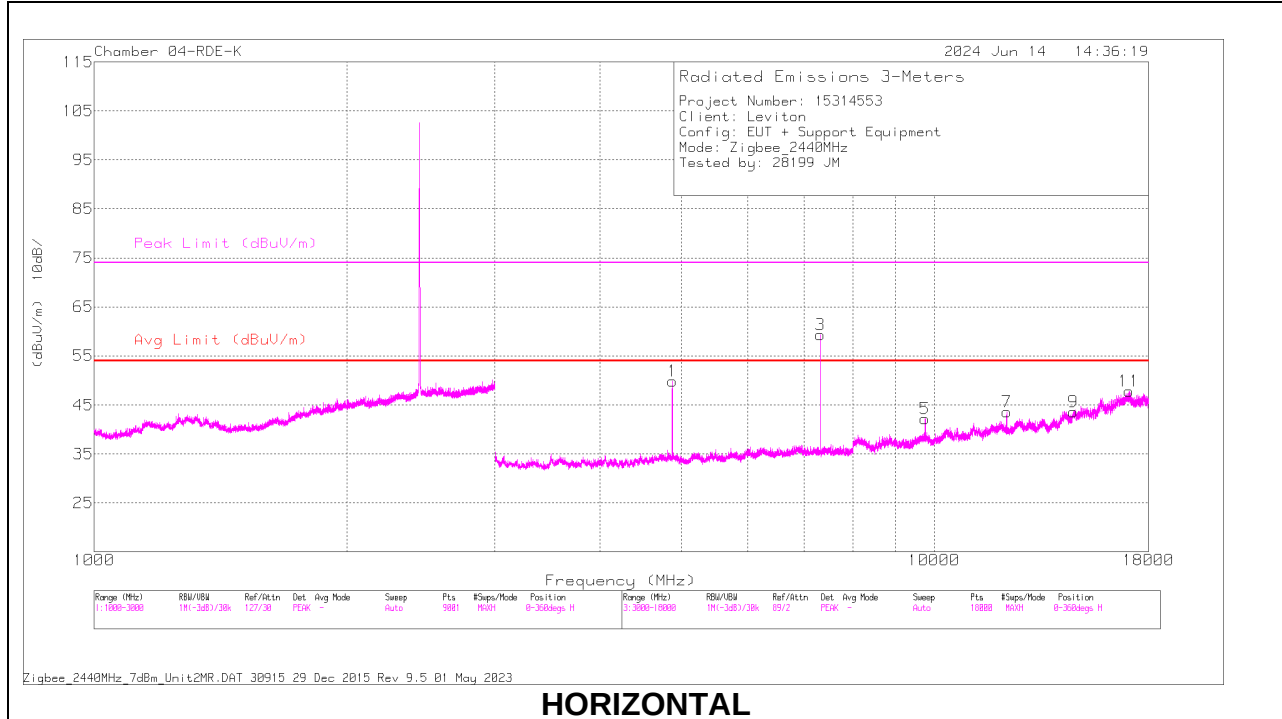
* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
Pk - Peak detector

Radiated Emissions

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	80404 3m ACF(dB/m)	Amp/Cbl/Fitr (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 4808.789	59.67	PK2	34.9	-40.9	0	53.67	-	-	74	-20.33	46	156	H
	* 4808.789	-	AV	-	-	-6.71	46.96	54	-7.04	-	-	46	156	H
2	* 4810.933	60.35	PK2	34.9	-40.9	0	54.35	-	-	74	-19.65	9	257	V
	* 4810.933	-	AV	-	-	-6.71	47.64	54	-6.36	-	-	9	257	V
3	7213.165	68.6	PK2	36.1	-39	0	65.7	-	-	-	-	49	205	H
	7213.165	-	AV	-	-	-6.71	58.99	-	-	-	-	49	205	H
4	7216.367	66.66	PK2	36.1	-39	0	63.76	-	-	-	-	66	146	V
	7216.367	-	AV	-	-	-6.71	57.05	-	-	-	-	66	146	V
7	* 12021.615	52.6	PK2	38.8	-35.1	0	56.3	-	-	74	-17.7	83	105	H
	* 12021.615	-	AV	-	-	-6.71	49.59	54	-4.41	-	-	83	105	H
8	* 12021.997	55.57	PK2	38.8	-35.1	0	59.27	-	-	74	-14.73	287	114	V
	* 12021.997	-	AV	-	-	-6.71	52.56	54	-1.44	-	-	287	114	V

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
PK2 - KDB558074 Method: Maximum Peak
AV = Peak reading + Duty Cycle Correction Factor (KDB558074 Section 11, Question 3 (a))
Duty Cycle Correction Factor = -6.71 dB.

MID CHANNEL RESULTS



RADIATED EMISSIONS

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	80404 3m ACF(dB/m)	Amp/Cbl/Fitr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 4880.105	56.5	Pk	34.4	-41	49.9	-	-	74	-24.1	0-360	101	H
2	* 4878.439	55.17	Pk	34.4	-41	48.57	-	-	74	-25.43	0-360	199	V
3	* 7318.575	61.05	Pk	36	-38.5	59.35	-	-	74	-14.65	0-360	199	H
4	* 7321.075	60.62	Pk	36	-38.6	58.02	-	-	74	-15.98	0-360	101	V
5	9757.878	42.53	Pk	36.9	-37.2	42.23	-	-	-	-	0-360	199	H
6	9762.045	48.41	Pk	36.9	-37.1	48.21	-	-	-	-	0-360	101	V
7	* 12202.182	39.98	Pk	38.9	-35.3	43.58	-	-	74	-30.42	0-360	199	H
8	* 12197.182	43.93	Pk	38.9	-35.3	47.53	-	-	74	-26.47	0-360	101	V
9	14643.985	37.8	Pk	39.7	-33.9	43.6	-	-	-	-	0-360	199	H
10	14643.152	39.63	Pk	39.7	-33.9	45.43	-	-	-	-	0-360	101	V
11	17075.788	38.09	Pk	43	-33.3	47.79	-	-	-	-	0-360	199	H
12	17076.622	42.88	Pk	42.9	-33.3	52.48	-	-	-	-	0-360	101	V

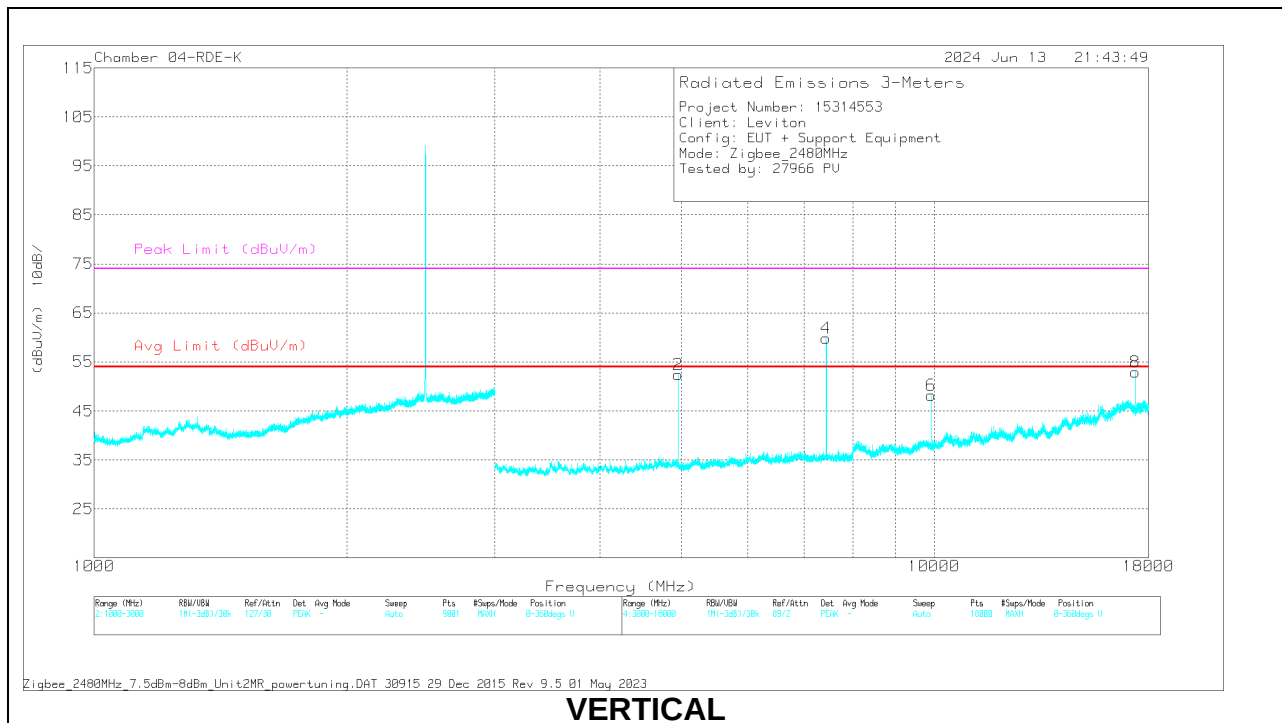
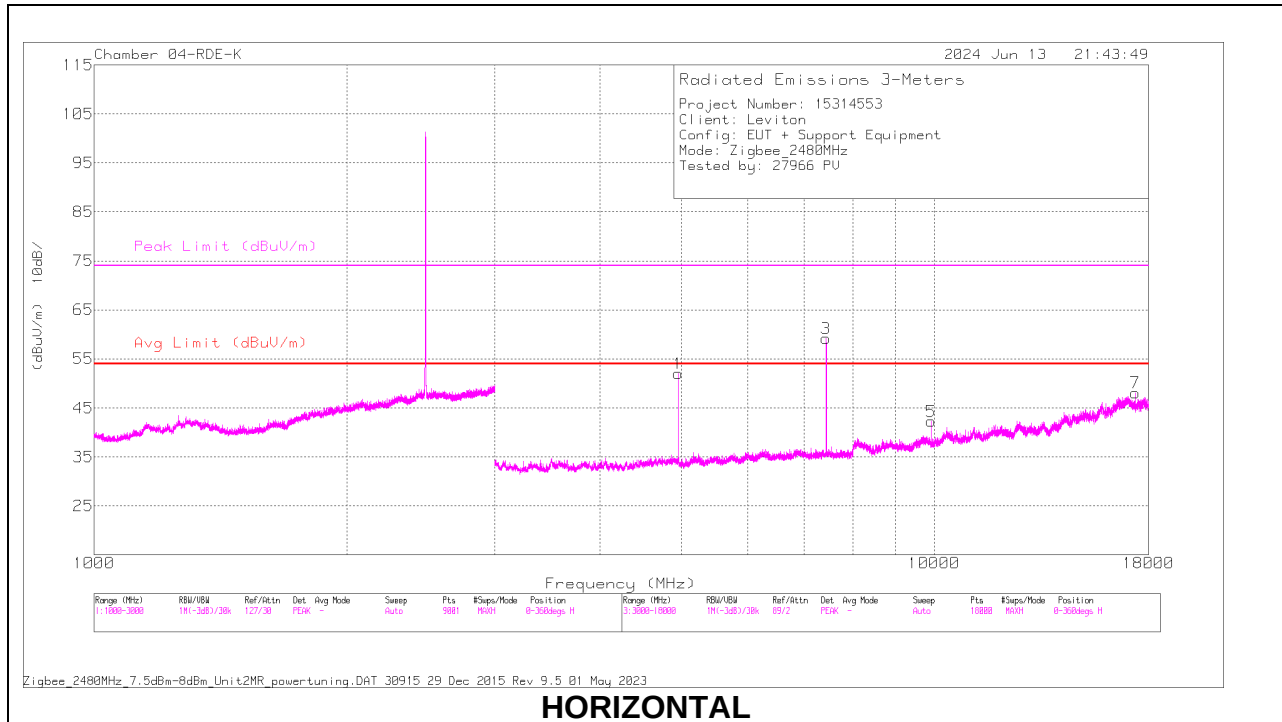
* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
Pk - Peak detector

Radiated Emissions

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	80404 3m ACF(dB/m)	Amp/Cbl/Fitr (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 4878.823	61.81	PK2	34.4	-41	0	55.21	-	-	74	-18.79	54	257	H
	* 4878.823	-	AV	-	-	-6.71	48.5	54	-5.5	-	-	54	257	H
2	* 4880.835	61.52	PK2	34.4	-41	0	54.92	-	-	74	-19.08	23	188	V
	* 4880.835	-	AV	-	-	-6.71	48.21	54	-5.79	-	-	23	188	V
3	* 7318.084	62.29	PK2	36.1	-38.5	0	59.89	-	-	74	-14.11	54	231	H
	* 7318.084	-	AV	-	-	-6.71	53.18	54	-0.82	-	-	54	231	H
4	* 7321.283	60.72	PK2	36	-38.6	0	58.12	-	-	74	-15.88	29	101	V
	* 7321.283	-	AV	-	-	-6.71	51.41	54	-2.59	-	-	29	101	V
7	* 12203.173	46.64	PK2	38.9	-35.3	0	50.24	-	-	74	-23.76	251	344	H
	* 12203.173	-	AV	-	-	-6.71	43.53	54	-10.47	-	-	251	344	H
8	* 12196.978	47.34	PK2	38.9	-35.3	0	50.94	-	-	74	-23.06	340	103	V
	* 12196.978	-	AV	-	-	-6.71	44.23	54	-9.77	-	-	340	103	V

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
PK2 - KDB558074 Method: Maximum Peak
AV = Peak reading + Duty Cycle Correction Factor (KDB558074 Section 11, Question 3 (a))
Duty Cycle Correction Factor = -6.71 dB.

HIGH CHANNEL RESULTS



RADIATED EMISSIONS

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	80404 3m ACF(dB/m)	Amp/Cbl/Fitr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 4960.11	58.88	Pk	34.1	-41	51.98	-	-	74	-22.02	0-360	101	H
2	* 4960.943	59.31	Pk	34.1	-41	52.41	-	-	74	-21.59	0-360	200	V
3	* 7441.082	61.55	Pk	35.9	-38.3	59.15	-	-	74	-14.85	0-360	200	H
4	* 7441.082	62.29	Pk	35.9	-38.3	59.89	-	-	74	-14.11	0-360	101	V
5	9922.054	42.15	Pk	37.2	-37.1	42.25	-	-	-	-	0-360	200	H
6	9922.054	48.15	Pk	37.2	-37.1	48.25	-	-	-	-	0-360	101	V
7	17355.804	38.24	Pk	42.4	-32.6	48.04	-	-	-	-	0-360	200	H
8	17356.637	43.14	Pk	42.4	-32.6	52.94	-	-	-	-	0-360	101	V

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

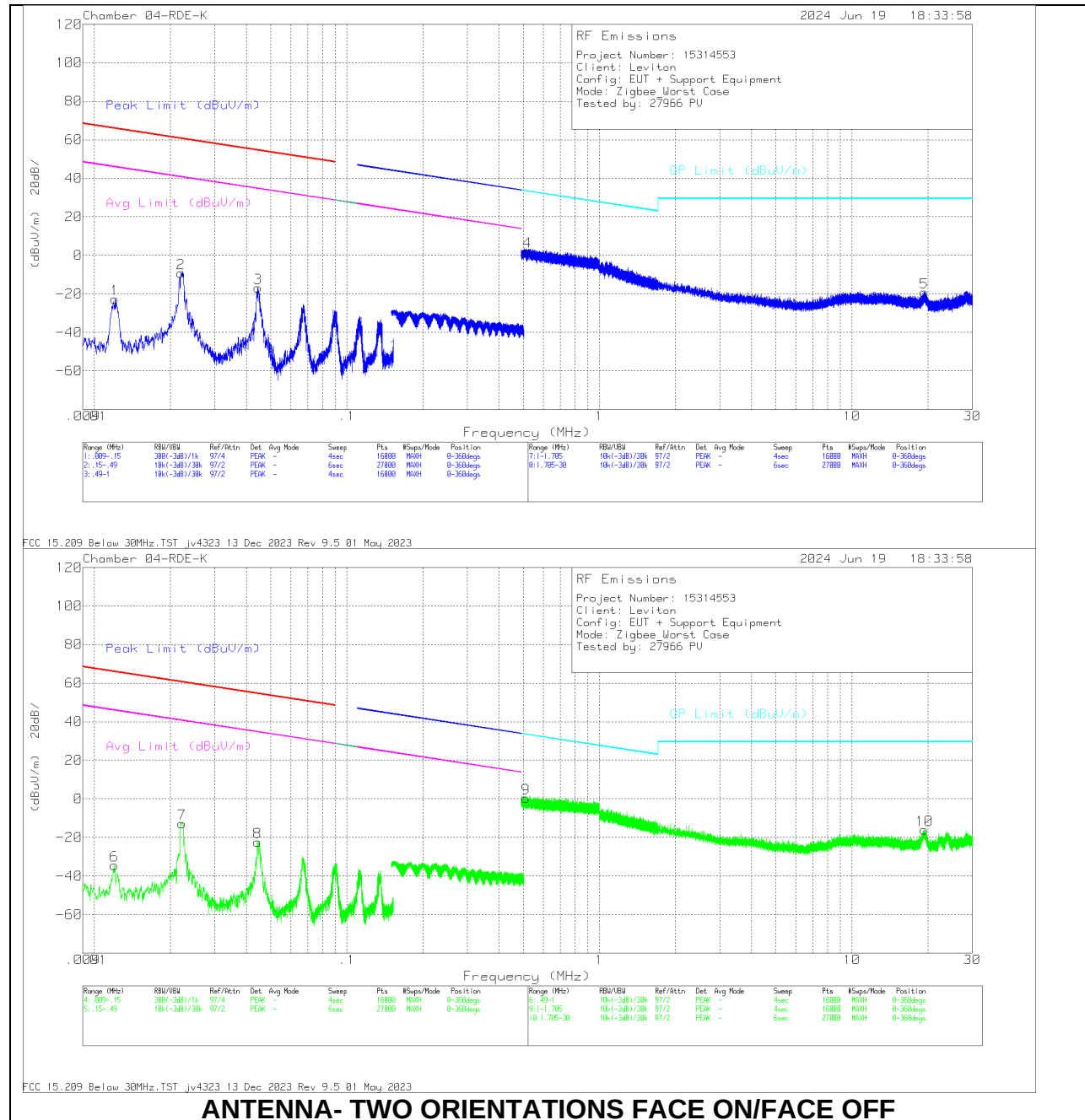
Radiated Emissions

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	80404 3m ACF(dB/m)	Amp/Cbl/Fitr (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 4960.809	63.55	PK2	34.1	-41	0	56.65	-	-	74	-17.35	55	202	H
	* 4960.809	-	AV	-	-	-6.71	49.94	54	-4.06	-	-	55	202	H
2	* 4960.866	63.05	PK2	34.1	-41	0	56.15	-	-	74	-17.85	15	283	V
	* 4960.866	-	AV	-	-	-6.71	49.44	54	-4.56	-	-	15	283	V
3	* 7441.358	60.73	PK2	35.8	-38.3	0	58.23	-	-	74	-15.77	39	275	H
	* 7441.358	-	AV	-	-	-6.71	51.52	54	-2.48	-	-	39	275	H
4	* 7441.44	59.95	PK2	35.8	-38.3	0	57.45	-	-	74	-16.55	34	101	V
	* 7441.44	-	AV	-	-	-6.71	50.74	54	-3.26	-	-	34	101	V
7	17356.214	46.47	PK2	42.4	-32.6	0	56.27	-	-	-	-	20	249	H
	17356.214	-	AV	-	-	-6.71	49.56	-	-	-	-	20	249	H
8	17353.815	45.5	PK2	42.4	-32.6	0	55.3	-	-	-	-	341	137	V
	17353.815	-	AV	-	-	-6.71	48.59	-	-	-	-	341	137	V

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
PK2 - KDB558074 Method: Maximum Peak
AV = Peak reading + Duty Cycle Correction Factor (KDB558074 Section 11, Question 3 (a))
Duty Cycle Correction Factor = -6.71 dB.

10.3. WORST CASE BELOW 30MHZ

SPURIOUS EMISSIONS BELOW 30 MHz (WORST-CASE CONFIGURATION)



Below 30MHz Data

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	Loop Antenna E(ACF)	Amp/Cbl (dB)	Dist Corr 300m	Corrected Reading (dBuV/m)	Peak Limit (dBuV/m)	Margin (dB)	Avg Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Antenna orientation
1	.0121	28.5	Pk	60	-31.1	-80	-22.6	65.94	-88.54	45.94	-68.54	0-360	Face on
2	.0221	43.59	Pk	58.8	-31.7	-80	-9.31	60.71	-70.02	40.71	-50.02	0-360	Face on
3	.0444	38.27	Pk	57.2	-32.3	-80	-16.83	54.64	-71.47	34.64	-51.47	0-360	Face on
6	.012	16.65	Pk	60	-31.1	-80	-34.45	65.98	-100.43	45.98	-80.43	0-360	Face off
7	.0222	40.29	Pk	58.8	-31.8	-80	-12.71	60.65	-73.36	40.65	-53.36	0-360	Face off
8	.0442	32.75	Pk	57.2	-32.3	-80	-22.35	54.67	-77.02	34.67	-57.02	0-360	Face off

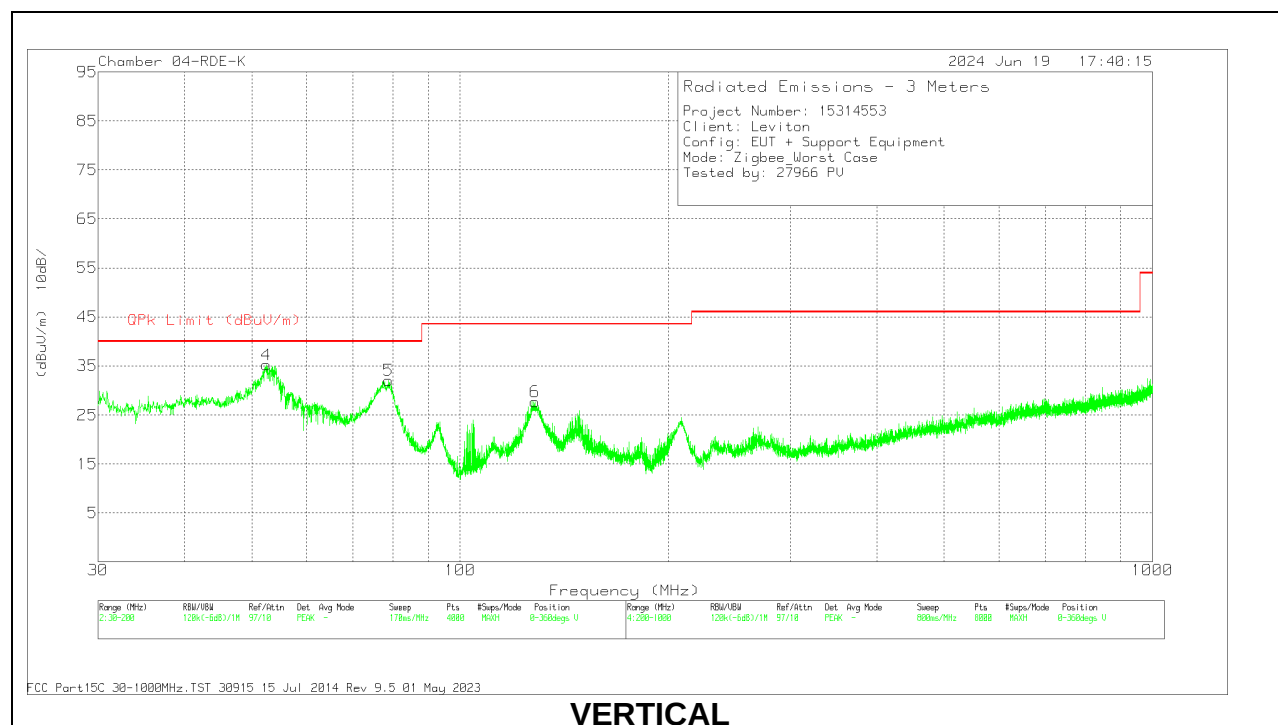
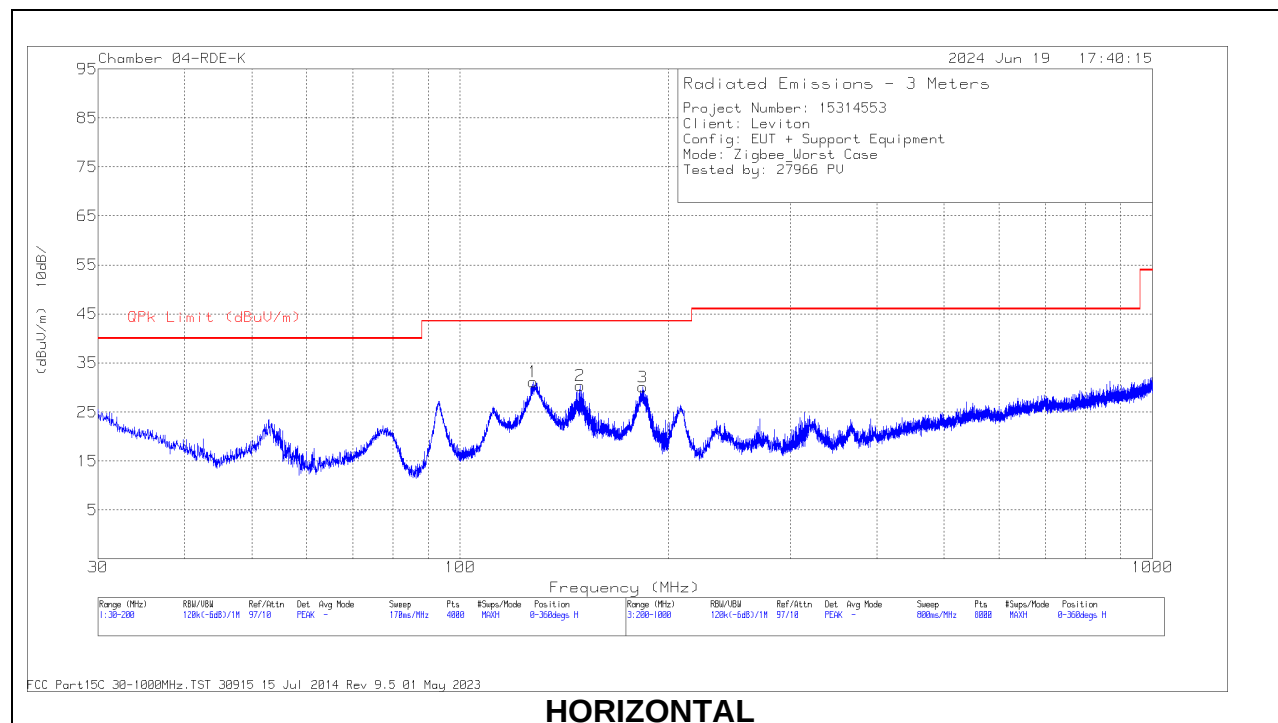
Pk - Peak detector

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	Loop Antenna E(ACF)	Amp/Cbl (dB)	Dist Corr 30m (dB) 40Log	Corrected Reading (dBuV/m)	QP Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Antenna orientation
4	.5192	18.16	Pk	56.1	-32.2	-40	2.06	33.3	-31.24	0-360	Face on
5	19.3869	17.88	Pk	34.2	-31.3	-40	-19.22	29.5	-48.72	0-360	Face on
9	.5118	16.49	Pk	56.1	-32.2	-40	.39	33.42	-33.03	0-360	Face off
10	19.389	21.06	Pk	34.2	-31.3	-40	-16.04	29.5	-45.54	0-360	Face off

Pk - Peak detector

10.4. WORST CASE BELOW 1 GHZ

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



Below 1GHz Data

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	203089 ACF (dB/m)	Amp/Cbl (dB)	Corrected Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 127.52	41.6	Pk	20	-30.4	31.2	43.52	-12.32	0-360	199	H
2	149.073	42.21	Pk	18.4	-30.2	30.41	43.52	-13.11	0-360	199	H
3	183.507	42.96	Pk	17	-29.9	30.06	43.52	-13.46	0-360	199	H
4	53.1184	48.25	Qp	13.1	-31	30.35	40	-9.65	18	117	V
5	78.8026	49.46	Pk	13.6	-31	32.06	40	-7.94	0-360	101	V
6	* 128.285	38.24	Pk	20	-30.5	27.74	43.52	-15.78	0-360	101	V

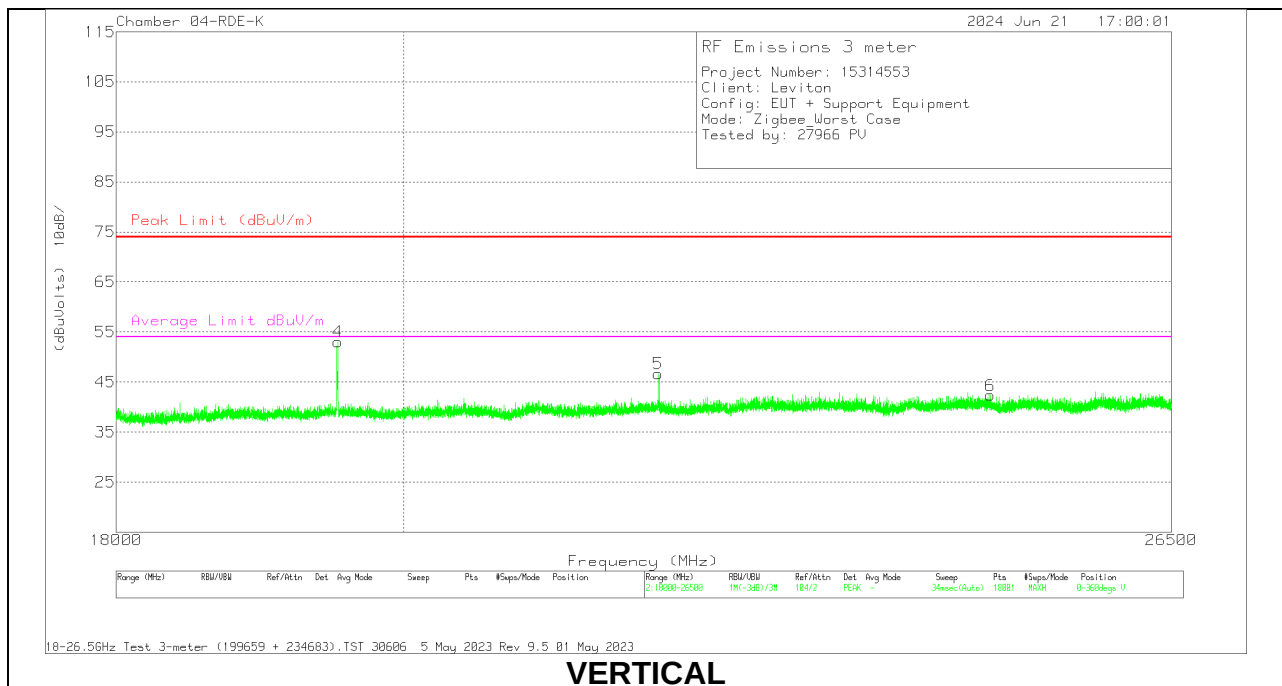
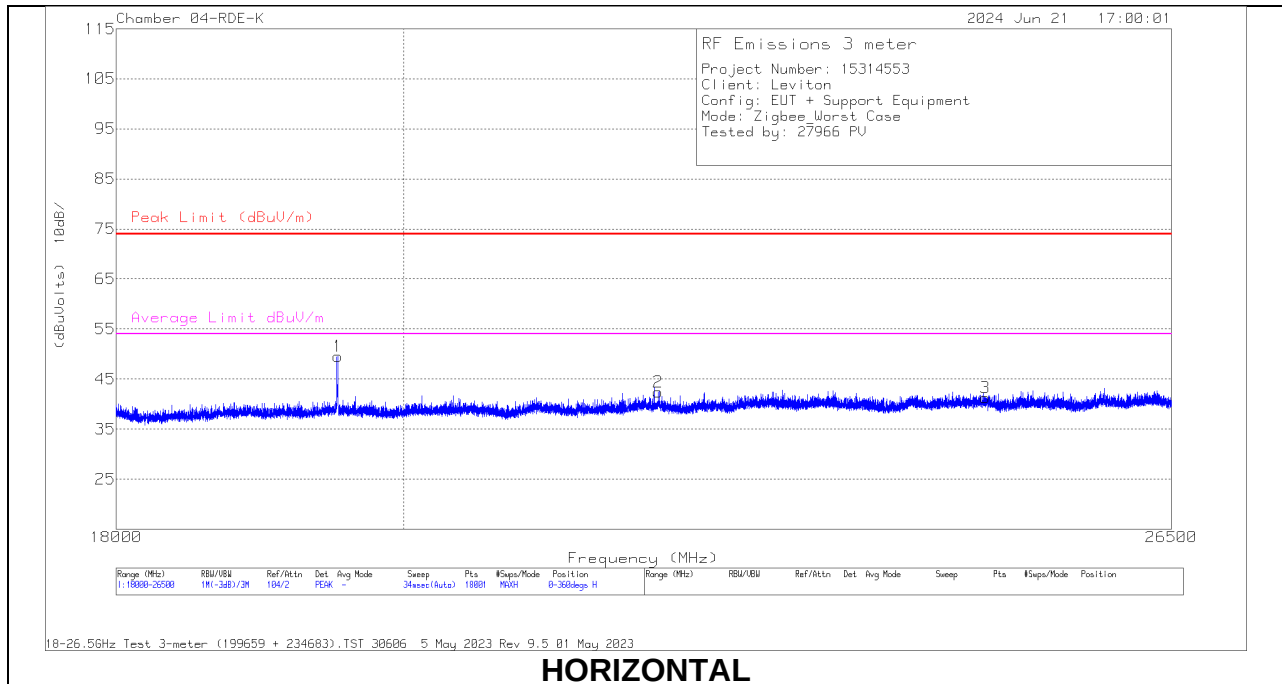
* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

Pk - Peak detector

Qp - Quasi-Peak detector

10.5. WORST CASE 18-26 GHz

SPURIOUS EMISSIONS 18-26 GHz (WORST-CASE CONFIGURATION)



18 – 26GHz Data

Trace Markers

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	Horn ACF (dB/m)	234683 Amp/Cbl (dB)	Cable (dB)	Corrected Reading (dBuVolts)	Peak Limit (dBuV/m)	PK Margin (dB)	Average Limit dBuV/m	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	19523.388	60.79	Pk	32.6	-62.7	18.9	49.59	74	-24.41	-	-	0-360	200	H
2	21954.387	51.93	Pk	33.2	-62.5	19.8	42.43	74	-31.57	-	-	0-360	101	H
3	24752.302	48.47	Pk	33.9	-62.2	21.1	41.27	74	-32.73	-	-	0-360	200	H
4	19523.388	64.2	Pk	32.6	-62.7	18.9	53	74	-21	-	-	0-360	101	V
5	21954.859	56.16	Pk	33.2	-62.5	19.8	46.66	74	-27.34	-	-	0-360	101	V
6	24797.163	49.54	Pk	33.9	-62.2	21.1	42.34	74	-31.66	-	-	0-360	199	V

Pk - Peak detector

Radiated Emissions

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	Horn ACF (dB/m)	234683 Amp/Cbl (dB)	Cable (dB)	Corrected Reading (dBuVolts)	Peak Limit (dBuV/m)	PK Margin (dB)	Average Limit dBuV/m	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	19523.983	62.4	Pk	32.6	-62.7	18.9	51.2	74	-22.8	-	-	51	211	H
2	21953.965	54.95	Pk	33.2	-62.5	19.8	45.45	74	-28.55	-	-	61	101	H
4	19523.721	65.24	Pk	32.6	-62.7	18.9	54.04	74	-19.96	-	-	356	101	V
	19523.721	57.69	RMS	32.6	-62.7	18.9	46.49	-	-	54	-7.51	356	101	V
5	21954.071	57.5	Pk	33.2	-62.5	19.8	48	74	-26	-	-	349	112	V

Pk - Peak detector

RMS - RMS detection

NOTE: According to ANSI C63.10 Section 6.6.4.3 NOTE 1— Where limits are specified by regulations for both average and peak detection, if the maximized peak measured value complies with the average limit, then it is unnecessary to perform an average measurement.

11. AC POWER LINE CONDUCTED EMISSIONS

LIMITS

FCC §15.207 (a)

RSS-Gen 8.8

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

*Decreases with the logarithm of the frequency.

TEST PROCEDURE

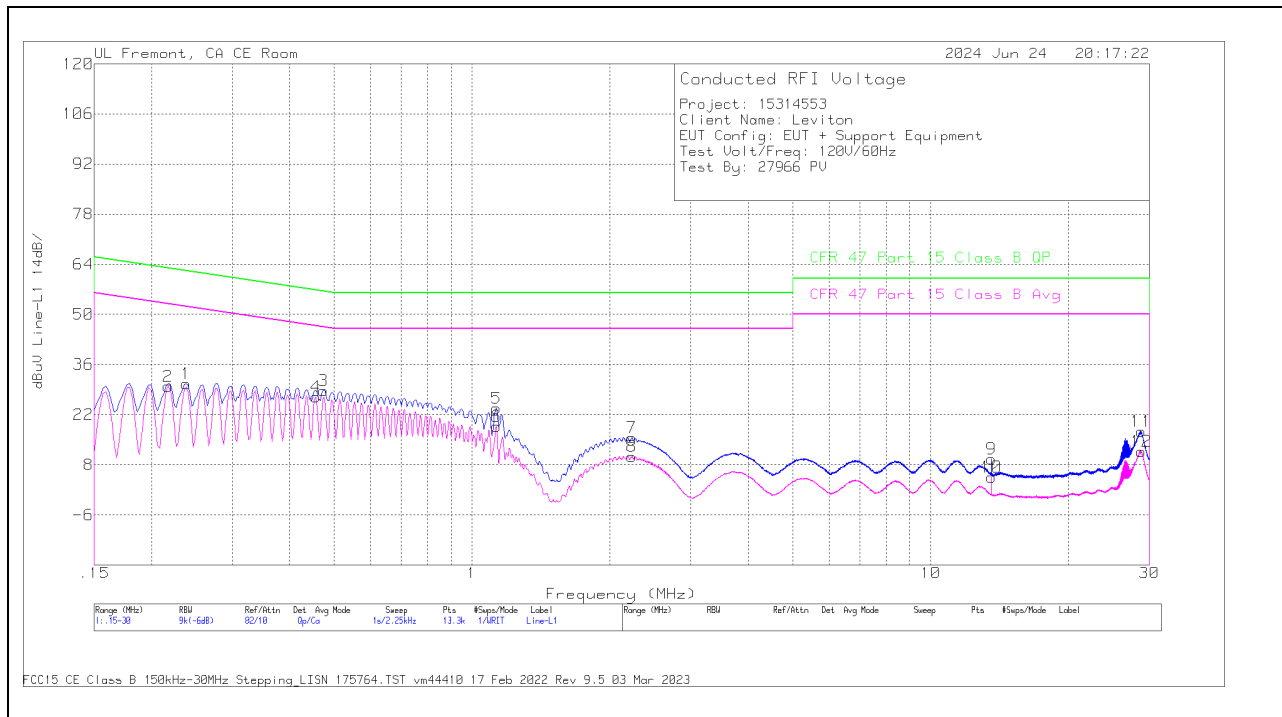
The EUT is placed on a non-conducting table 40 cm from the vertical ground plane and 80 cm above the horizontal ground plane. The EUT is configured in accordance with ANSI C63.10.

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

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

RESULTS

LINE 1 RESULTS



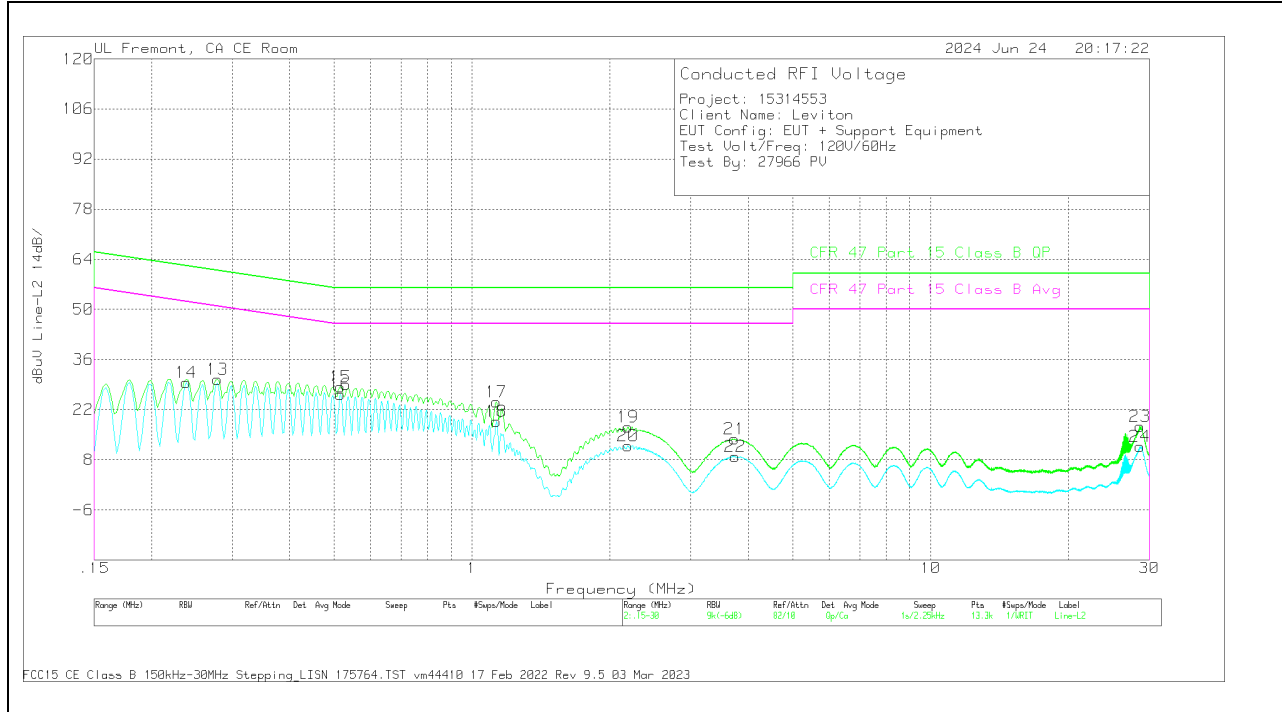
Trace Markers

Range 1: Line-L1 .15 - 30MHz											
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	175764 LISN L1	Cbl (dB)	Trns Limiter (dB)	Corrected Reading (dBuV)	CFR 47 Part 15C QP (dBuV)	QP Margin (dB)	CFR 47 Part 15C Avg (dBuV)	Av(CISPR) Margin (dB)
2	.2175	20.26	Ca	.1	.1	9.4	29.86	-	-	52.91	-23.05
4	.456	17.49	Ca	0	.1	9.3	26.89	-	-	46.77	-19.88
6	1.1288	9.18	Ca	0	.1	9.4	18.68	-	-	46	-27.32
8	2.2313	.78	Ca	0	.1	9.5	10.38	-	-	46	-35.62
10	13.56	-5.33	Ca	.1	.3	9.5	4.57	-	-	50	-45.43
12	28.788	1.5	Ca	.3	.4	9.5	11.7	-	-	50	-38.3
1	.2378	21.2	Qp	.1	0	9.4	30.7	62.17	-31.47	-	-
3	.474	19.32	Qp	0	.1	9.3	28.72	56.44	-27.72	-	-
5	1.1288	14.23	Qp	0	.1	9.4	23.73	56	-32.27	-	-
7	2.229	6	Qp	0	.1	9.5	15.6	56	-40.4	-	-
9	13.56	-.24	Qp	.1	.3	9.5	9.66	60	-50.34	-	-
11	28.7858	7.05	Qp	.3	.4	9.5	17.25	60	-42.75	-	-

Qp - Quasi-Peak detector

Ca - CISPR average detection

LINE 2 RESULTS



Trace Markers

Range 2: Line-L2 .15 - 30MHz											
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	175764 LISN L2	Cbl (dB)	Trns Limiter (dB)	Corrected Reading (dBuV)	CFR 47 Part 15C QP (dBuV)	QP Margin (dB)	CFR 47 Part 15C Avg (dBuV)	Av(CISPR) Margin (dB)
14	.2378	20.12	Ca	.1	0	9.4	29.62	-	-	52.17	-22.55
16	.5168	17.01	Ca	0	0	9.3	26.31	-	-	46	-19.69
18	1.131	9.12	Ca	0	.2	9.4	18.72	-	-	46	-27.28
20	2.1851	2.43	Ca	0	.1	9.4	11.93	-	-	46	-34.07
22	3.7478	-.57	Ca	0	.1	9.4	8.93	-	-	46	-37.07
24	28.635	1.58	Ca	.3	.3	9.5	11.68	-	-	50	-38.32
13	.2783	20.9	Qp	.1	.1	9.4	30.5	60.87	-30.37	-	-
15	.5168	19.09	Qp	0	0	9.3	28.39	56	-27.61	-	-
17	1.1288	14.59	Qp	0	.2	9.4	24.19	56	-31.81	-	-
19	2.1863	7.63	Qp	0	.1	9.4	17.13	56	-38.87	-	-
21	3.7365	4.26	Qp	0	.1	9.4	13.76	56	-42.24	-	-
23	28.635	7.19	Qp	.3	.3	9.5	17.29	60	-42.71	-	-

Qp - Quasi-Peak detector

Ca - CISPR average detection

12. SETUP PHOTOS

Please refer to 15314553-EP1 for setup photos

END OF TEST REPORT