TEST REPORT

Report Number: 15107858-E8V3

Applicant	:	Google LLC 1600 Amphitheatre Parkway Mountain View, CA 94043 U.S.A.
Model	:	GGX8B
FCC ID	:	A4RGGX8B
EUT Description	:	Phone
Test Standard(s)	:	FCC 47 CFR PART 15 SUBPART C

Date Of Issue:
2024-05-03

Prepared by:
UL VERIFICATION SERVICES INC.
47173 Benicia Street
Fremont, CA 94538 U.S.A.
TEL: (510) 319-4000
FAX: (510) 661-0888

ACCREDITED
CERT #0751.05

REPORT REVISION HISTORY

Rev.	Issue Date	Revisions	Revised By
V1	2024-04-16	Initial Issue	--
V2	2024-04-25	Revised report Section 6.3, 8, 9.4.1 to address TCB's questions	Tina Chu
V3	2024-05-03	Updated Section 10 test procedure	Tina Chu

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1. ATTESTATION OF TEST RESULTS

COMPANY NAME: Google LLC
1600 Amphitheatre Parkway
Mountain View, CA 94043 U.S.A.

EUT DESCRIPTION: Phone

MODEL NUMBER: GGX8B

SERIAL NUMBER: 41031FDAS000A7 (Radiated)
41121FDAS000BS, 41121FDAS00093 (Conducted)

SAMPLE RECEIPT DATE: 2024-01-23

DATE TESTED: 2024-03-12 TO 2024-04-23

APPLICABLE STANDARDS	
STANDARD	**TEST RESULTS**
CFR 47 Part 15 Subpart C	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.

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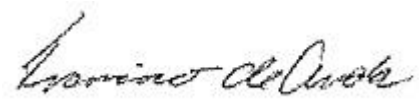
Approved & Released For
UL Verification Services Inc. By:



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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)

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

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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

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 3: 843 Auburn Court, Fremont, CA 94538, USA			
☒	Building 4: 47658 Kato Rd, Fremont, CA 94538, USA			
☒	Building 5: 47670 Kato Rd, Fremont, CA 94538, USA			

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5. DECISION RULES AND MEASUREMENT UNCERTAINTY

5.1. METROLOGICAL TRACEABILITY

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

5.2. DECISION RULES

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

5.3. MEASUREMENT UNCERTAINTY

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

PARAMETER	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
Humidity	3.39%
DC Supply Voltages	0.57%

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

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5.4. SAMPLE CALCULATION

RADIATED EMISSIONS

Where relevant, the following sample calculation is provided:
Field Strength (dBuV/m) = Measured Voltage (dBuV) + Antenna Factor (dB/m) + Cable Loss (dB) – Preamp Gain (dB)
36.5 dBuV + 18.7 dB/m + 0.6 dB – 26.9 dB = 28.9 dBuV/m

MAINS CONDUCTED EMISSIONS

Where relevant, the following sample calculation is provided:
Final Voltage (dBuV) = Measured Voltage (dBuV) + Cable Loss (dB) + Limiter Factor (dB) + LISN Insertion Loss.
36.5 dBuV + 0 dB +10.1 dB+ 0 dB = 46.6 dBuV

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6. EQUIPMENT UNDER TEST

6.1. EUT DESCRIPTION

The EUT is a phone.

6.2. MAXIMUM OUTPUT POWER

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

Frequency Range (MHz)	Mode	Output Power (dBm)	Output Power (mW)
2405-2480	802.15.4 Thread	18.50	70.79

6.3. DESCRIPTION OF AVAILABLE ANTENNAS

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

The radio utilizes one IFA antenna for this Tx0 antenna port (Ant3).

Band	Antenna Peak Gain
	Tx0 (Ant3) (dBi)
802.15.4 Thread	-3.30

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6.4. WORST-CASE CONFIGURATION AND MODE

802.15.4 supports SISO Tx0 antenna.

Radiated emissions below 1GHz, above 18GHz, and power line conducted emission were performed with the EUT set to transmit at the channel with highest output power as worst-case scenario. There were no emissions found with less than 20dB of margin from 9kHz to 30MHz and above 18GHz.

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.

Investigation was performed with/without adapter. Also, the fundamental of the EUT was investigated in three orthogonal orientations X,Y,Z, the following is the worst-case orientation:

- For 1Tx:

  Tx0: X (Flatbed) orientation was worst-case orientation with adapter

Plots included in the report are representative of the method and settings parameters used for the test.

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7. MEASUREMENT METHOD

Test Item	Test Method
On Time and Duty Cycle	ANSI C63.10 Section 7.5
6 dB BW	ANSI C63.10 Subclause -11.8.1 RBW ≥ DTS BW
99% BW	ANSI C63.10-2013, Subclause 6.9.3.
Output Power	ANSI C63.10 Subclause -11.9.2.3.2 Method AVGPM-G (Measurement using a gated RF average-reading power meter)
PSD	ANSI C63.10 Subclause -11.10.5 Method AVGPSD-1
Radiated emissions non-restricted frequency bands	ANSI C63.10 Subclause -11.11 & Clause 13
Radiated emissions restricted frequency bands	ANSI C63.10 Subclause -11.12.1 & Clause 13
Conducted emissions in restricted frequency bands	ANSI C63.10 Subclause -11.12.2
Band-edge	ANSI C63.10 Subclause - ANSI C63.10-2013 Section 6.10.5
Radiated Spurious Emissions Below 30MHz	ANSI C63.10-2013 Subclause 6.4 & Clause 13
AC Power Line Conducted Emissions	ANSI C63.10-2013, Subclause 6.2

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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	219908	2024-09-30	2023-09-13
Antenna, Passive Loop 100KHz - 30MHz	ELECTRO METRICS	EM-6872	219910	2024-05-31	2023-05-31
Antenna, Broadband Hybrid, 30MHz to 2000MHz	Sunol Sciences Corp.	JB1	80293	2024-04-30	2023-04-11
Amplifier,9KHz to 1GHz, 32dB	SONOMA INSTRUMENT	310	213877	2024-12-31	2023-12-27
Antenna, Horn 1-18GHz (Chamber J)	ETS-Lindgren	3117	222741	2024-08-31	2022-08-22
RF Filter Box, 1-18GHz (Chamber J)	UL-FR1	NA	171875	2024-05-31	2023-05-30
EMI TEST RECEIVER (Chamber T)	Rohde & Schwarz	ESW44	169935	2025-02-28	2024-02-11
EMI TEST RECEIVER (Chamber J)	Rohde & Schwarz	ESW44	171875	2024-05-31	2023-05-30
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	*2024-03-31	2023-03-18
Spectrum Analyzer, PXA, 3Hz to 44GHz	Keysight Technologies Inc	N9030B	222074	2024-08-31	2023-08-14
Spectrum Analyzer, PXA, 3Hz to 44GHz	Keysight Technologies Inc	N9030B	222073	2024-08-31	2023-08-14
10dB Fixed Attenuator, up to 26GHz	Pasternack Enterprises	PE7087-10	236189	Verified/characterized before use	
Power Meter, P-series single channel	Keysight Technologies Inc	N1921A	90731	2025-01-31	2024-01-25
Power Sensor, P - series, 50MHz to 18GHz, Wideband	Keysight Technologies Inc	N1911A	90388	2024-06-30	2023-06-23
AC Line Conducted					
LISN	Fischer Custom Communications, Inc	FCC-LISN-50/250-25-2-01-480V	175765	2025-01-31	2024-01-26
EMI TEST RECEIVER	Rohde & Schwarz	ESR	171646	2025-02-28	2024-02-27
Transient Limiter	TE	TBFL1	127455	2025-02-28	2024-02-27
UL TEST SOFTWARE LIST					
Radiated Software	UL	UL EMC	Ver 2023-01-18, 2023-03-03, 2023-05-01		
Antenna Port Software	UL	UL RF	Ver 2022-08-16		
AC Line Conducted Software	UL	UL EMC	Rev 9.5, 2022-02-17		

*Test was performed before calibration due date.

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9. ANTENNA PORT TEST RESULTS

9.1. ON TIME AND DUTY CYCLE

LIMITS

None; for reporting purposes only.

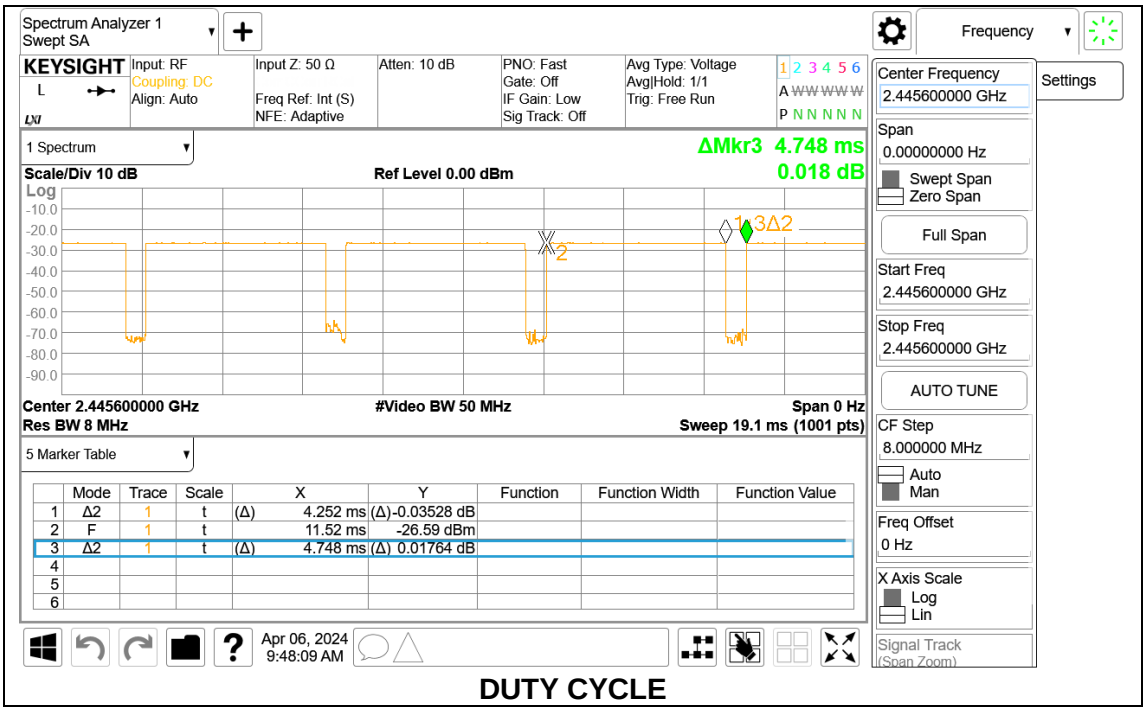
PROCEDURE

ANSI C63.10, Section 7.5

ON TIME AND DUTY CYCLE RESULTS

Test Engineer:	NM 19232	2024-04-06

Mode	ON Time T (msec)	Period (msec)	Duty Cycle X (linear)	Duty Cycle (%)	DCCF 10log(1/X) (dB)	1/T Minimum VBW (kHz)
802.15.4 Thread	4.252	4.748	0.90	89.55	0.48	0.24



DUTY CYCLE

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9.2. 99% BANDWIDTH & 6dB BANDWIDTH

99% BANDWIDTH LIMITS

None; for reporting purposes only.

6dB BANDWIDTH LIMITS

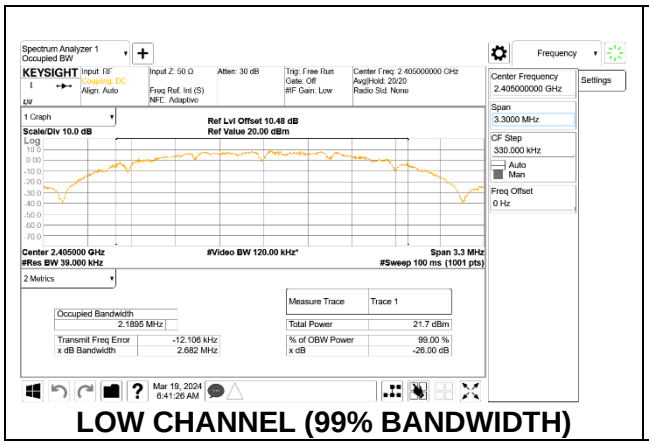
FCC §15.247 (a) (2)

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

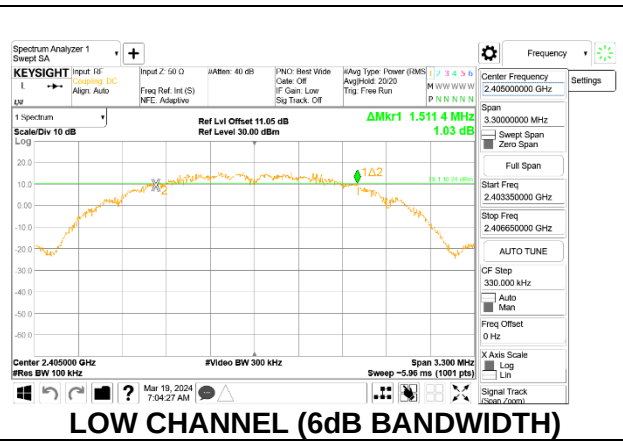
RESULTS

Tx0

Mode	No. of Tx	Freq (MHz)	99% Bandwidth (MHz) Tx0	6dB Bandwidth (MHz) Tx0	6dB Minimum Limit (MHz)
802.15.4 Thread (High Power)	1 (Tx0)	2405	2.19	1.51	0.5
		2440	2.20	1.58	0.5
		2480	2.20	1.55	0.5



LOW CHANNEL (99% BANDWIDTH)



LOW CHANNEL (6dB BANDWIDTH)

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9.3. OUTPUT POWER & POWER SPECTRAL DENSITY

AVERAGE OUTPUT POWER LIMITS

FCC §15.247 (b) (3)

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

AVERAGE OUTPUT POWER 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.

POWER SPECTRAL DENSITY LIMITS

FCC §15.247 (e)

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.

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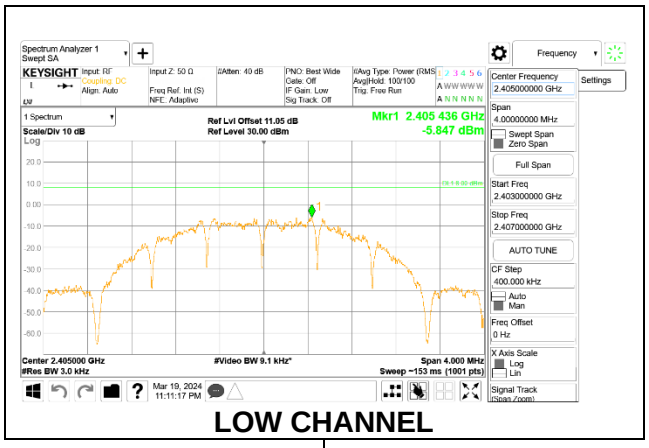
RESULTS

Test Engineer:	24971 BN	**Test Date:**	2024-03-19 TO 2024-04-02

Mode	No. of Tx	Freq (MHz)	Measured Conducted Avg Power (dBm)	Power Limit (dBm)	Power Margin (dB)	Measured PSD (dBm/3kHz)	Corrected PSD with DCCF (dBm/3kHz)	PSD Limit (dBm/3kHz)	PSD Margin (dB)
802.15.4 Thread	1 (Tx0)	2405	17.87	30.00	-12.13	-5.847	-3.69	8	-11.69
		2440	**18.50**	30.00	-11.50	-5.709	-3.55	8	-11.55
		2480	**18.50**	30.00	-11.50	-5.017	-2.86	8	-10.86



LOW CHANNEL

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9.4. CONDUCTED SPURIOUS EMISSIONS

LIMITS

FCC §15.247 (d)

RSS-247 5.5

Output power was measured based on the use of an average measurement; therefore, the required attenuation is 30 dBc.

RESULTS

Test Engineer:	24971 BN

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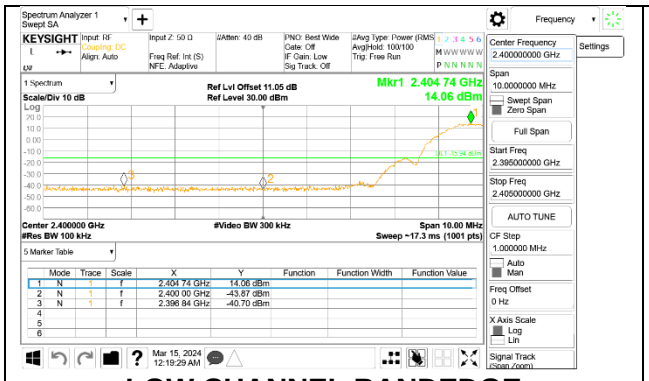
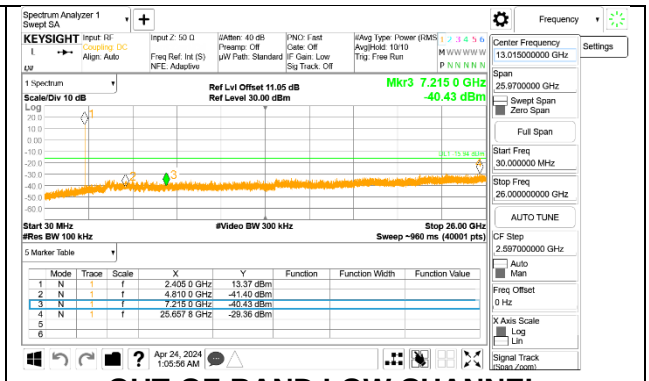
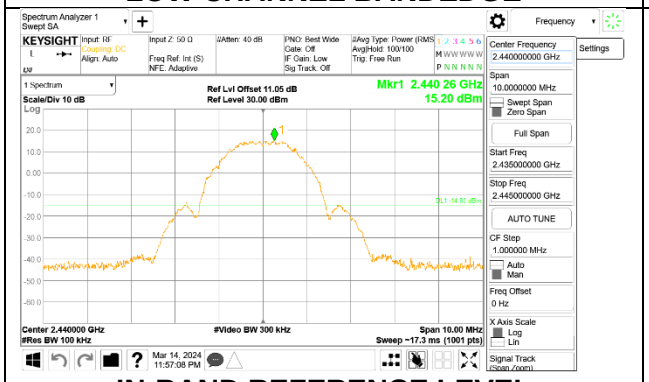
Tx0



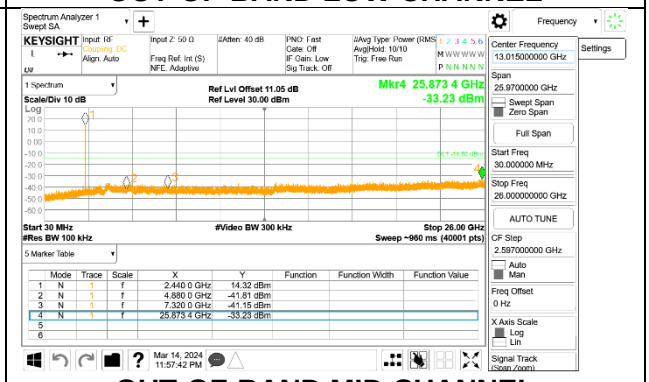
LOW CHANNEL BANDEDGE



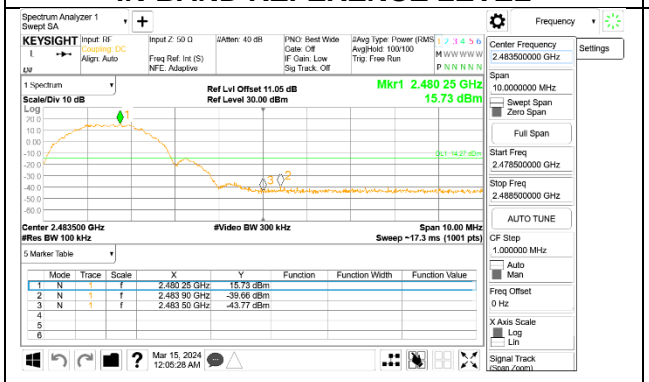
OUT-OF-BAND LOW CHANNEL



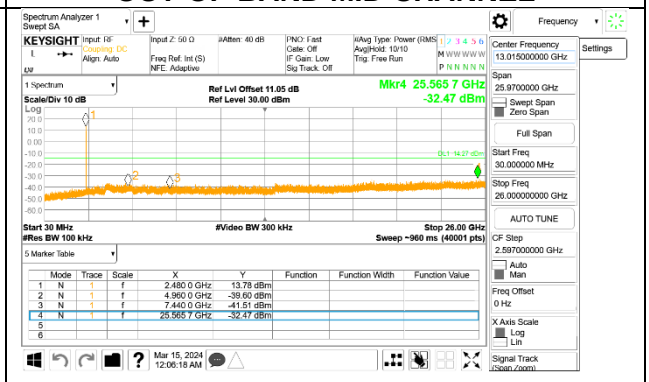
IN-BAND REFERENCE LEVEL



OUT-OF-BAND MID CHANNEL



HIGH CHANNEL BANDEDGE



OUT-OF-BAND HIGH CHANNEL

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10. RADIATED TEST RESULTS

10.1. LIMITS AND PROCEDURE

LIMITS

FCC §15.205 and §15.209

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

TEST PROCEDURE

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

For measurements below 1 GHz the resolution bandwidth is set to 100 kHz for peak detection measurements or 120 kHz for quasi-peak detection measurements in the 30-1000MHz range, 9kHz for peak and/or quasi-peak detection measurements in the 0.15-30MHz range and 200Hz for peak and/or quasi-peak detection measurements in the 9 to 150kHz range. Peak detection is used unless otherwise noted as quasi-peak 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. 1MHz resolution bandwidth with 1/T video bandwidth with peak detector for average measurements where the actual VBW set for tests is 300Hz.

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.

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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. Green color trace on plots: Perpendicular orientation.

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.

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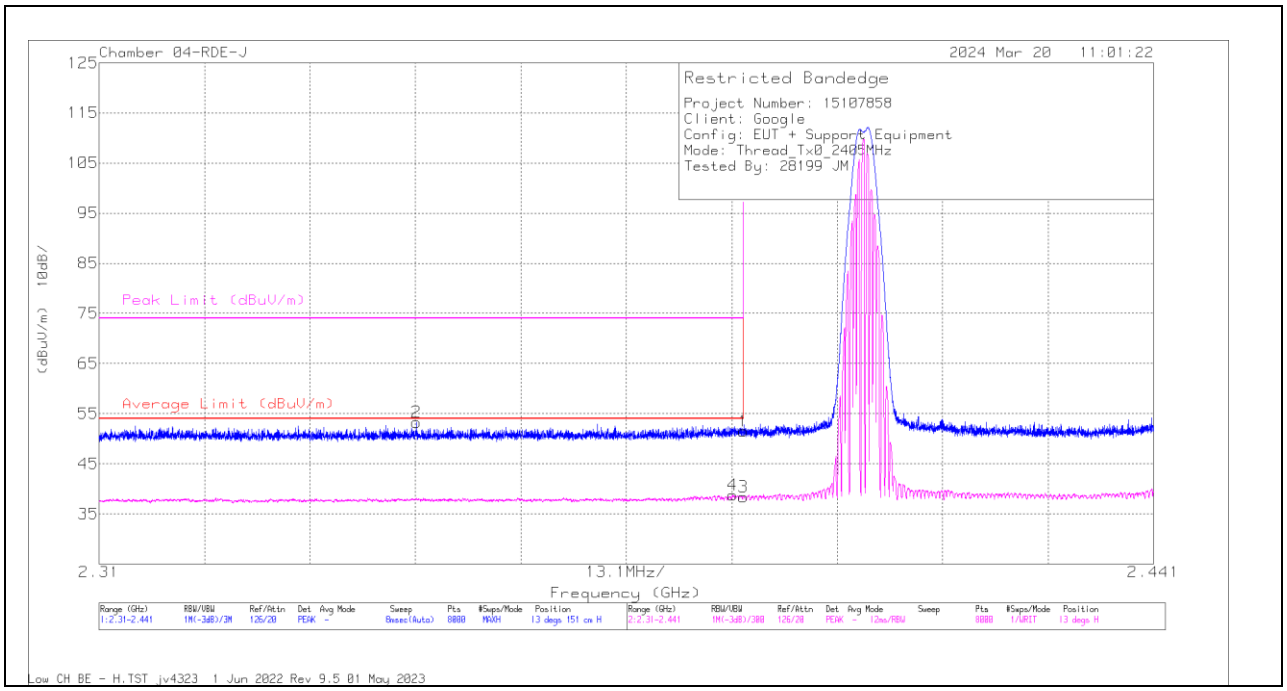
10.2. TRANSMITTER ABOVE 1 GHz

Tx0

BANDEDGE (LOW CHANNEL)

HORIZONTAL RESULT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	222741 ACF 3m (dB/m)	Cbl/Amp (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* ** 2.39	56.58	Pk	32	-37.1	51.48	-	-	74	-22.52	13	151	H
2	* ** 2.349419	58.35	Pk	31.9	-37	53.25	-	-	74	-20.75	13	151	H
3	* ** 2.39	43.52	VA1T	32	-37.1	38.42	54	-15.58	-	-	13	151	H
4	* ** 2.388708	43.83	VA1T	32	-37.1	38.73	54	-15.27	-	-	13	151	H

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
** - indicates frequency in Taiwan NCC LP0002 Restricted Band
Pk - Peak detector
VA1T - FHSS: Linear Voltage Average VB=1/Ton where: Ton is transmit duration

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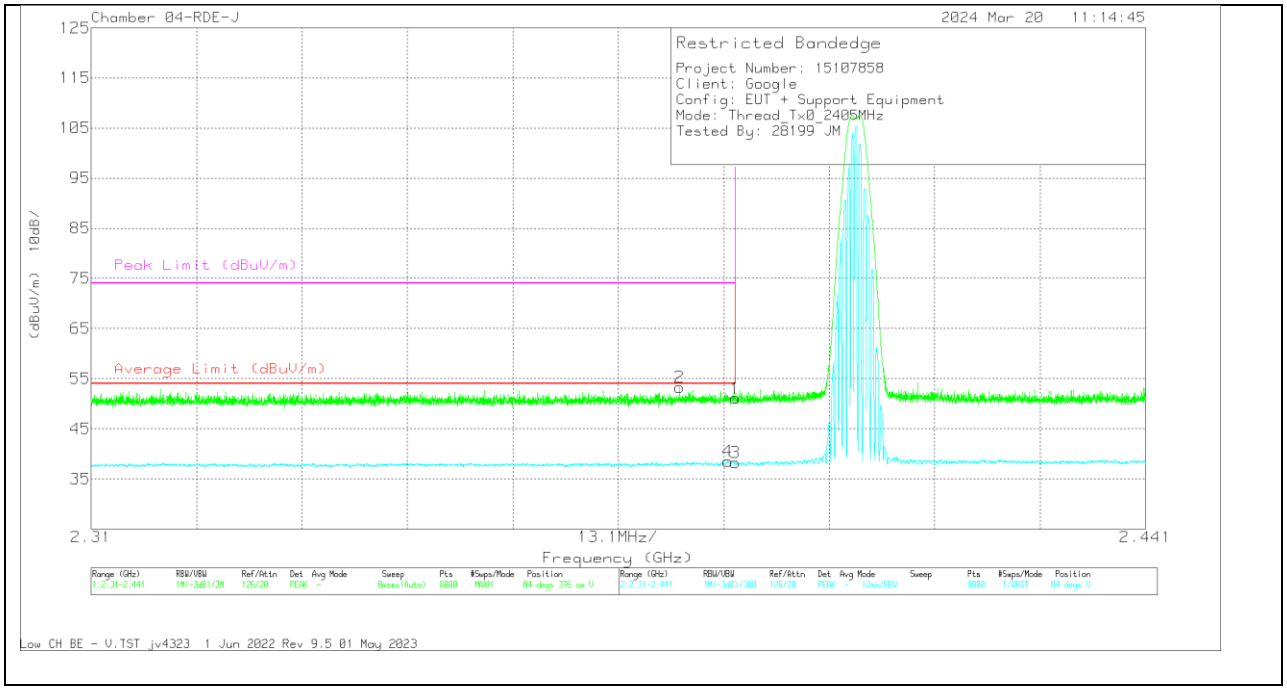
VERTICAL RESULT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	222741 ACF 3m (dB/m)	Cbl/Amp (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* ** 2.39	56.19	Pk	32	-37.1	51.09	-	-	74	-22.91	84	376	V
2	* ** 2.383091	58.43	Pk	32	-37.1	53.33	-	-	74	-20.67	84	376	V
3	* ** 2.39	43.31	VA1T	32	-37.1	38.21	54	-15.79	-	-	84	376	V
4	* ** 2.389068	43.64	VA1T	32	-37.1	38.54	54	-15.46	-	-	84	376	V

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
** - indicates frequency in Taiwan NCC LP0002 Restricted Band
Pk - Peak detector
VA1T - FHSS: Linear Voltage Average VB=1/Ton where: Ton is transmit duration

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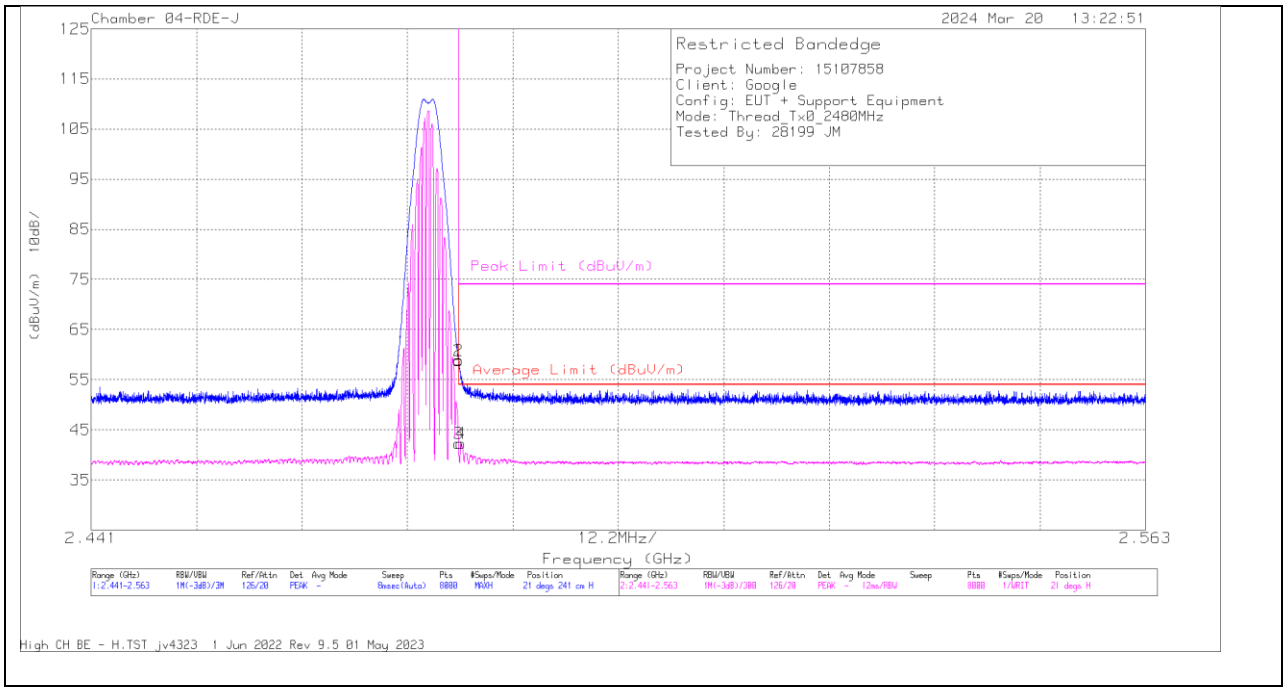
BANDEDGE (HIGH CHANNEL)

HORIZONTAL RESULT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	222741 ACF 3m (dB/m)	Cbl/Amp (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* ** 2.4835	63.66	Pk	32.2	-37	58.86	-	-	74	-15.14	21	241	H
2	* ** 2.483507	63.54	Pk	32.2	-37	58.74	-	-	74	-15.26	21	241	H
3	* ** 2.4835	47.03	VA1T	32.2	-37	42.23	54	-11.77	-	-	21	241	H
4	* ** 2.483797	46.92	VA1T	32.3	-37	42.22	54	-11.78	-	-	21	241	H

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
** - indicates frequency in Taiwan NCC LP0002 Restricted Band
Pk - Peak detector
VA1T - FHSS: Linear Voltage Average VB=1/Ton where: Ton is transmit duration

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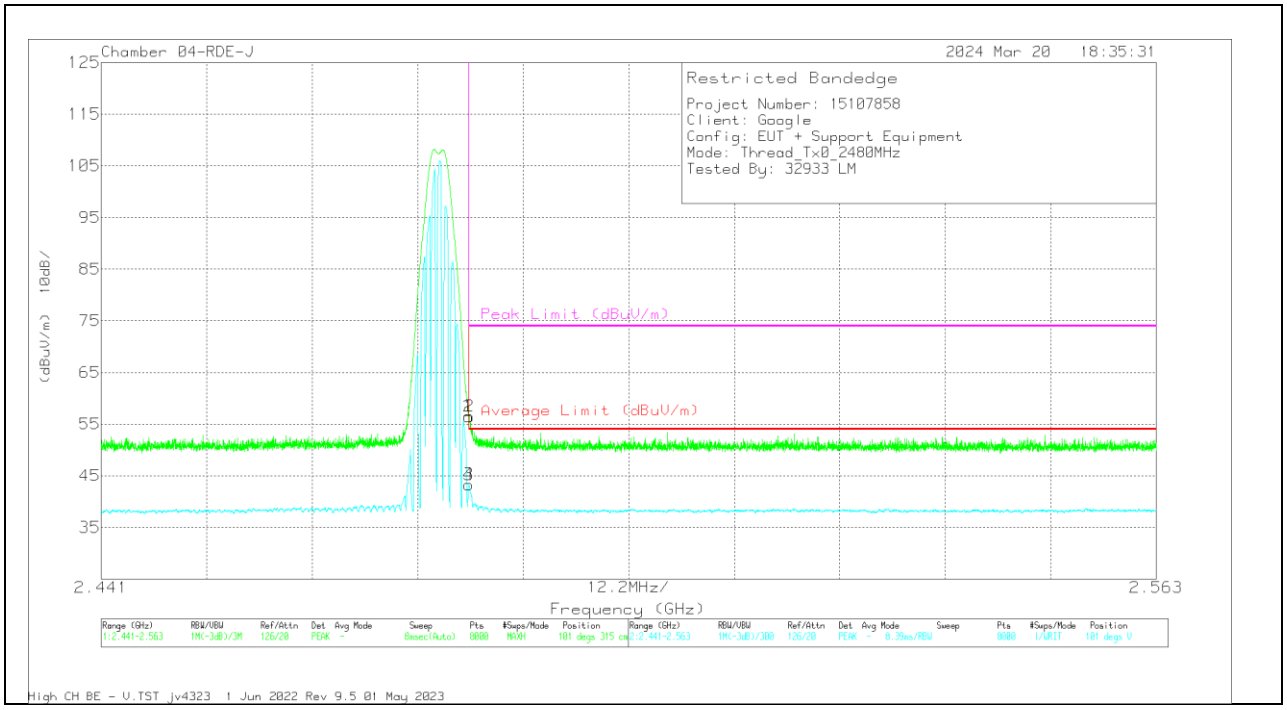
VERTICAL RESULT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	222741 ACF 3m (dB/m)	Cbl/Amp (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* ** 2.4835	61.26	Pk	32.2	-37	56.46	-	-	74	-17.54	101	315	V
2	* ** 2.483538	61.28	Pk	32.2	-37	56.48	-	-	74	-17.52	101	315	V
3	* ** 2.4835	48.08	VA1T	32.2	-37	43.28	54	-10.72	-	-	101	315	V
4	* ** 2.483507	48.08	VA1T	32.2	-37	43.28	54	-10.72	-	-	101	315	V

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
** - indicates frequency in Taiwan NCC LP0002 Restricted Band
Pk - Peak detector
VA1T - FHSS: Linear Voltage Average VB=1/Ton where: Ton is transmit duration

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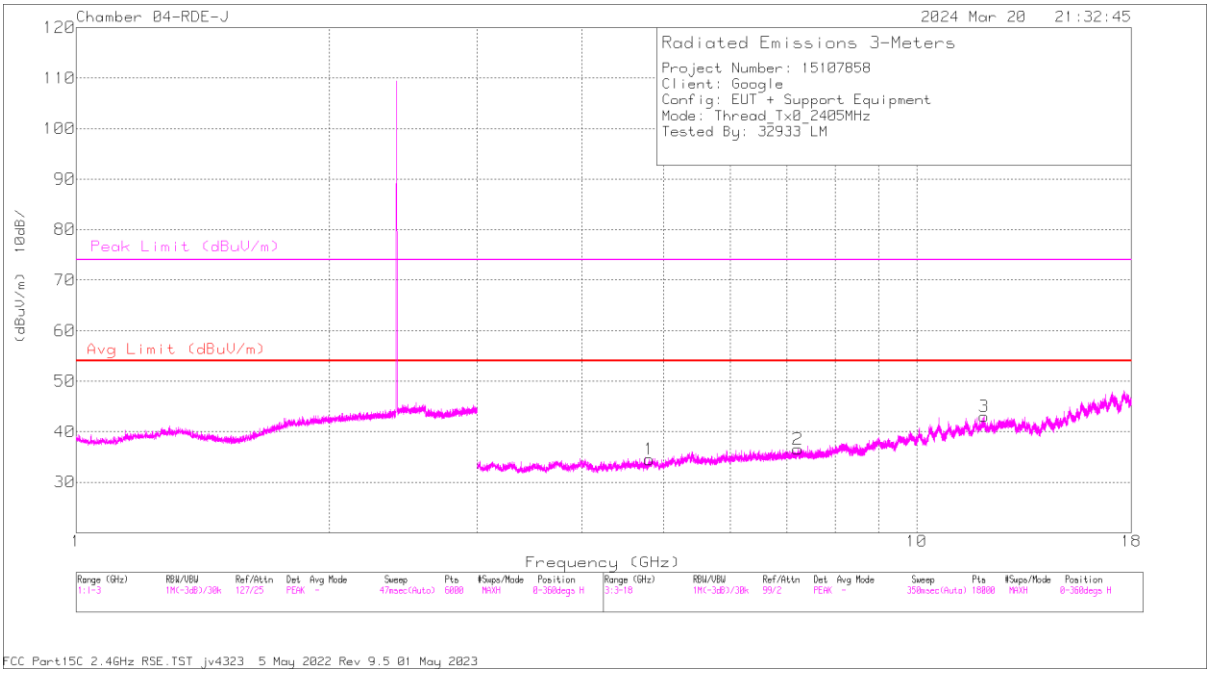
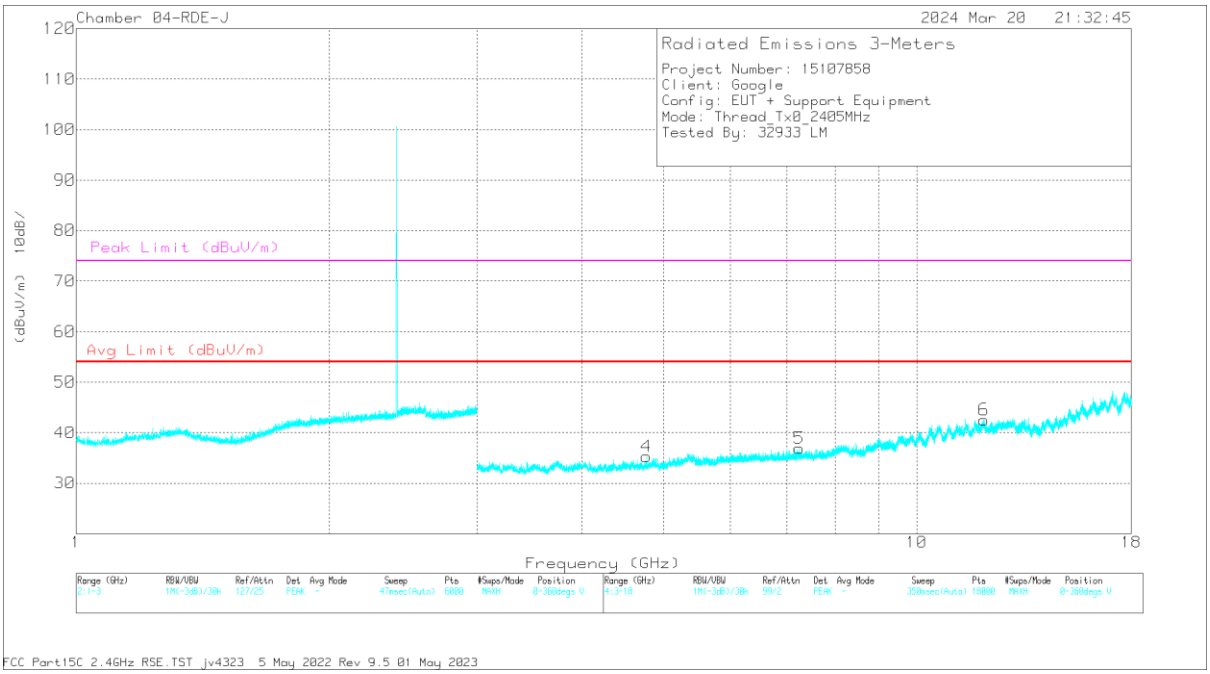
HARMONICS AND SPURIOUS EMISSIONS

LOW CHANNEL RESULTS



HORIZONTAL



VERTICAL

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RADIATED EMISSIONS

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	222741 ACF 3m (dB/m)	Cbl/Amp (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* ** 4.805952	55.24	PK2	34	-45	44.24	-	-	74	-29.76	3	239	H
	* ** 4.806682	40.54	V1TR	34	-45	29.54	54	-24.46	-	-	3	239	H
2	7.220495	52.34	PK2	35.8	-42.4	45.74	-	-	74	-28.26	30	272	H
3	* ** 12.020188	53.08	PK2	38.7	-38.8	52.98	-	-	74	-21.02	222	253	H
	* ** 12.022387	37.92	V1TR	38.7	-38.8	37.82	54	-16.18	-	-	222	253	H
4	* ** 4.76624	55.16	PK2	34	-45	44.16	-	-	74	-29.84	358	174	V
	* ** 4.765575	40.26	V1TR	34	-45	29.26	54	-24.74	-	-	358	174	V
5	7.242479	52.98	PK2	35.8	-42.5	46.28	-	-	74	-27.72	321	103	V
6	* ** 12.017841	52.81	PK2	38.7	-38.8	52.71	-	-	74	-21.29	160	216	V
	* ** 12.01924	38.04	V1TR	38.7	-38.9	37.84	54	-16.16	-	-	160	216	V

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
** - indicates frequency in Taiwan NCC LP0002 Restricted Band
PK2 - KDB558074 Method: Maximum Peak
V1TR - U-NII: VB=1/Ton, RMS Average where: Ton is packet duration

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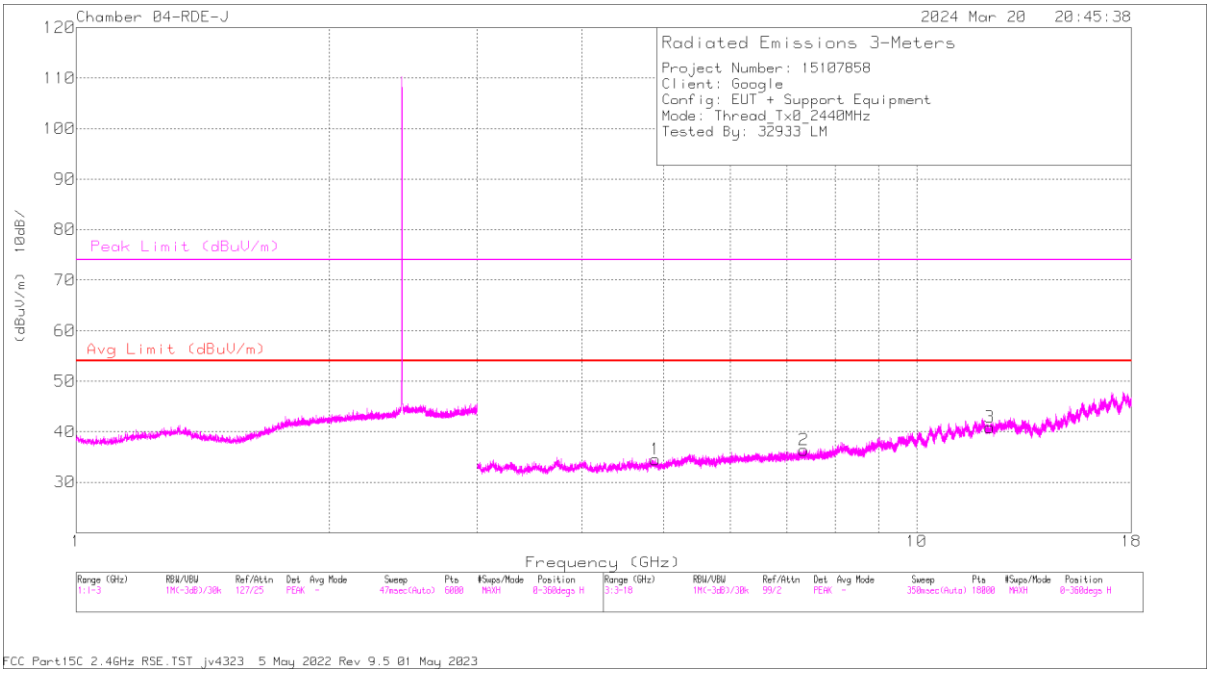
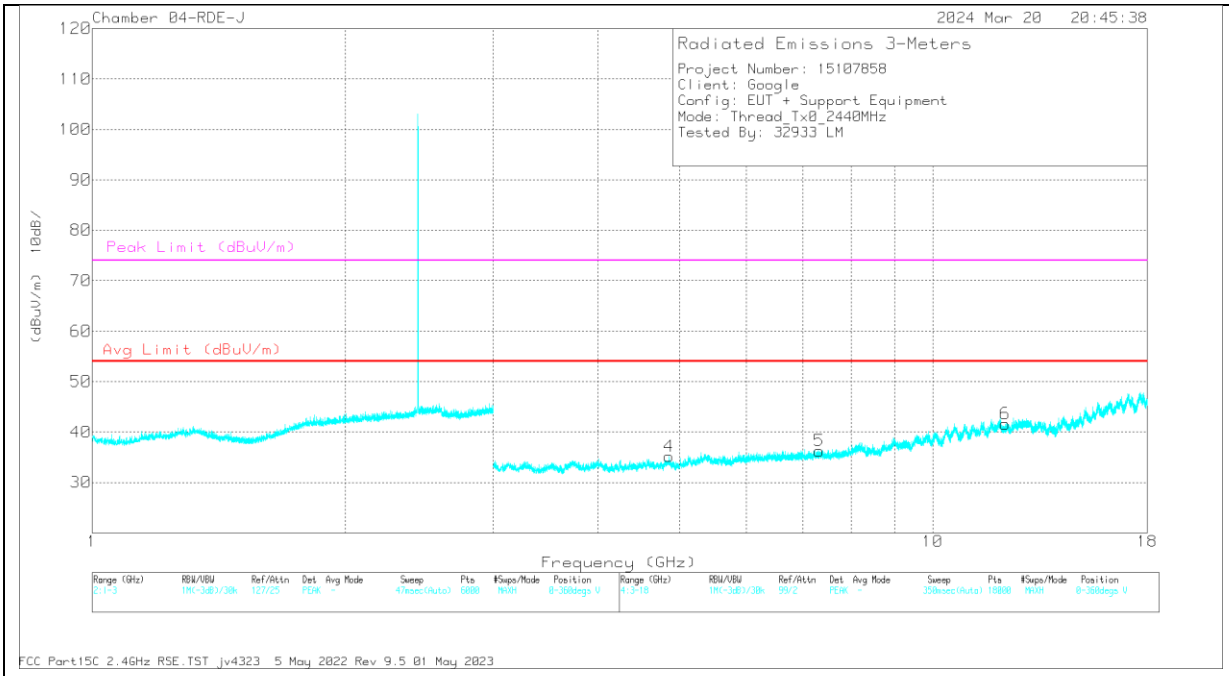
MID CHANNEL RESULTS



HORIZONTAL



VERTICAL

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RADIATED EMISSIONS

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	222741 ACF 3m (dB/m)	Cbl/Amp (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* ** 4.886818	54.62	PK2	34	-44.6	44.02	-	-	74	-29.98	224	121	H
	* ** 4.883875	39.9	V1TR	34	-44.5	29.4	54	-24.6	-	-	224	121	H
2	* ** 7.3369	52.46	PK2	35.8	-42.3	45.96	-	-	74	-28.04	116	242	H
	* ** 7.336026	37.99	V1TR	35.8	-42.3	31.49	54	-22.51	-	-	116	242	H
3	* ** 12.210508	52.12	PK2	38.8	-39.6	51.32	-	-	74	-22.68	16	180	H
	* ** 12.211272	37.5	V1TR	38.8	-39.6	36.7	54	-17.3	-	-	16	180	H
4	* ** 4.857609	55.67	PK2	34	-44.5	45.17	-	-	74	-28.83	320	188	V
	* ** 4.856386	40.47	V1TR	34	-44.5	29.97	54	-24.03	-	-	320	188	V
5	* ** 7.3321	52.67	PK2	35.8	-42.3	46.17	-	-	74	-27.83	334	191	V
	* ** 7.32997	38.07	V1TR	35.8	-42.3	31.57	54	-22.43	-	-	334	191	V
6	* ** 12.190151	52.03	PK2	38.8	-39.6	51.23	-	-	74	-22.77	29	234	V
	* ** 12.187464	37.57	V1TR	38.8	-39.6	36.77	54	-17.23	-	-	29	234	V

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
** - indicates frequency in Taiwan NCC LP0002 Restricted Band
PK2 - KDB558074 Method: Maximum Peak
V1TR - U-NII: VB=1/Ton, RMS Average where: Ton is packet duration

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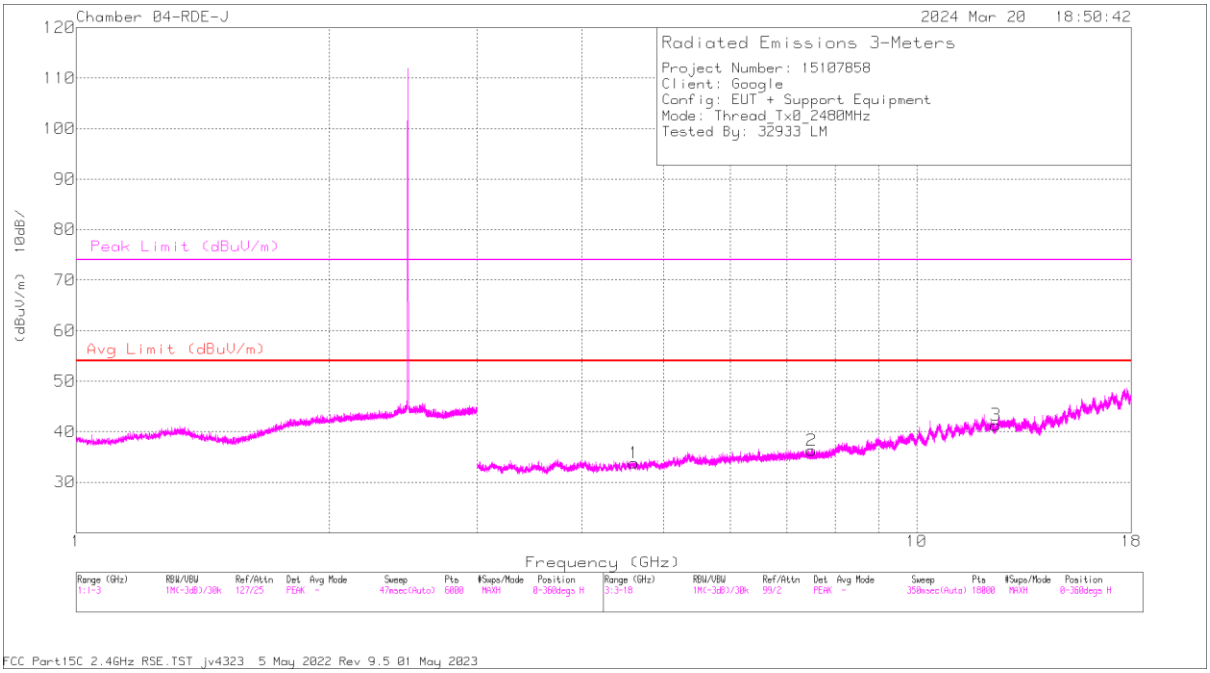
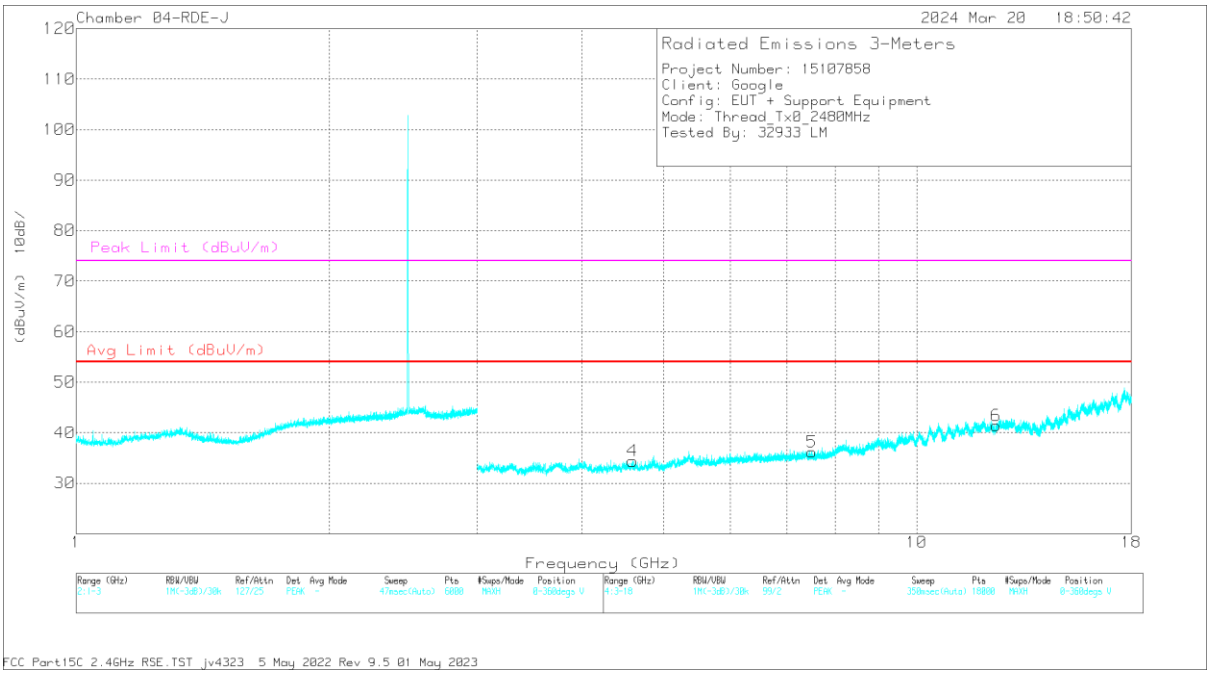
HIGH CHANNEL RESULTS



HORIZONTAL



VERTICAL

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RADIATED EMISSIONS

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	222741 ACF 3m (dB/m)	Cbl/Amp (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* ** 4.610712	54.75	PK2	34	-44.8	43.95	-	-	74	-30.05	1	340	H
	* ** 4.610775	39.77	V1TR	34	-44.8	28.97	54	-25.03	-	-	1	340	H
2	* ** 7.497369	51.99	PK2	35.8	-42.1	45.69	-	-	74	-28.31	275	384	H
	* ** 7.496232	37.62	V1TR	35.8	-42.1	31.32	54	-22.68	-	-	275	384	H
3	* ** 12.415524	51.31	PK2	38.9	-39.3	50.91	-	-	74	-23.09	20	385	H
	* ** 12.413749	36.81	V1TR	38.9	-39.4	36.31	54	-17.69	-	-	20	385	H
4	* ** 4.590448	55.56	PK2	34	-44.9	44.66	-	-	74	-29.34	190	400	V
	* ** 4.5887	40.53	V1TR	34	-45	29.53	54	-24.47	-	-	190	400	V
5	* ** 7.501295	53.31	PK2	35.8	-42.1	47.01	-	-	74	-26.99	86	106	V
	* ** 7.502055	37.6	V1TR	35.8	-42	31.4	54	-22.6	-	-	86	106	V
6	* ** 12.427337	50.87	PK2	38.9	-39.3	50.47	-	-	74	-23.53	271	131	V
	* ** 12.42672	36.84	V1TR	38.9	-39.3	36.44	54	-17.56	-	-	271	131	V

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
** - indicates frequency in Taiwan NCC LP0002 Restricted Band
PK2 - KDB558074 Method: Maximum Peak
V1TR - U-NII: VB=1/Ton, RMS Average where: Ton is packet duration

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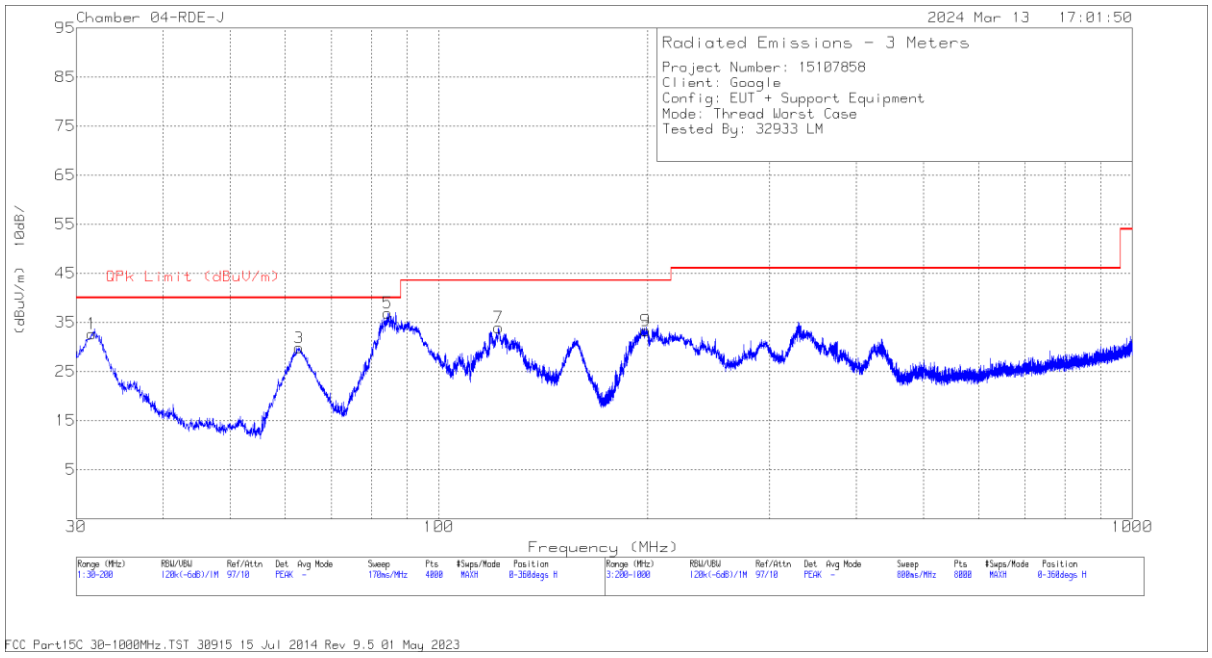
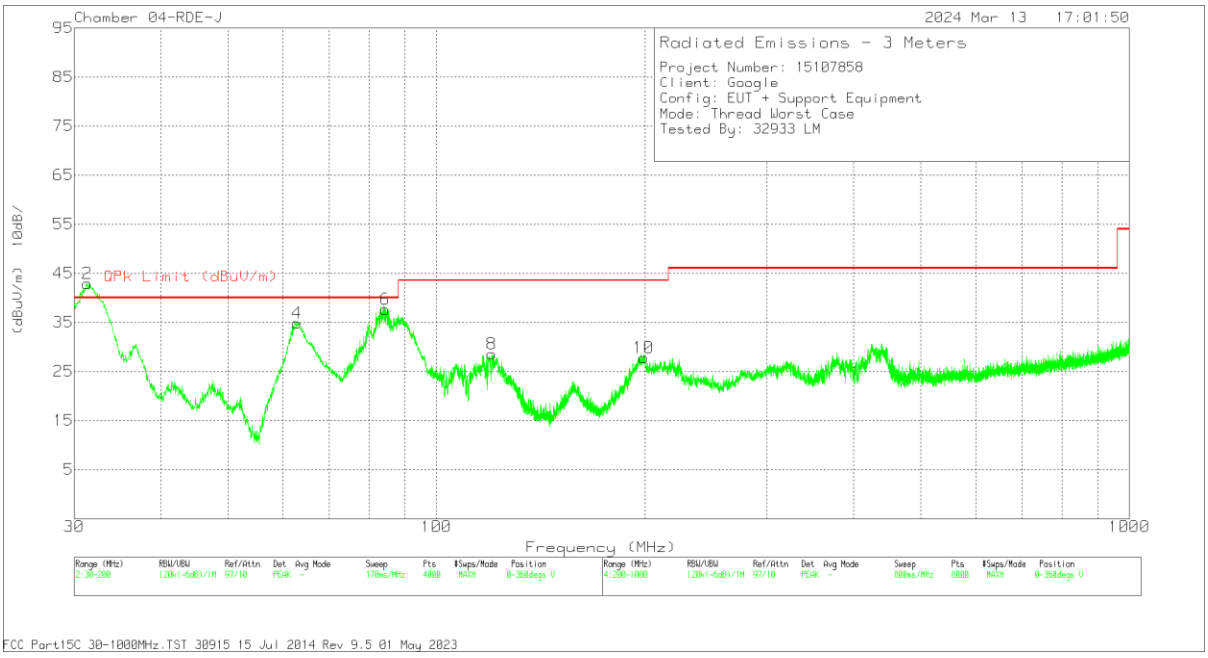
10.3. WORST CASE BELOW 1 GHz

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



HORIZONTAL



VERTICAL

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Below 1GHz Data

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	80293 ACF (dB/m)	CBL/AMP (dB)	Corrected Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
7	* 121.994	45.27	Pk	19.9	-31.2	33.97	43.52	-9.55	0-360	199	H
8	* 120.251	39.7	Pk	19.8	-30.9	28.6	43.52	-14.92	0-360	100	V
2	31.6099	44.9	Qp	25.6	-31.5	39	40	-1	265	104	V
1	31.5729	38.56	Pk	25.6	-31.5	32.66	40	-7.34	0-360	199	H
3	62.861	47.7	Pk	13.6	-31.5	29.8	40	-10.2	0-360	199	H
4	63.0032	49.98	Qp	13.6	-31.6	31.98	40	-8.02	229	100	V
5	84.643	51.66	Qp	13.5	-31.2	33.96	40	-6.04	136	242	H
6	84.0253	51.04	Qp	13.5	-31.1	33.44	40	-6.56	121	134	V
9	198.641	45.46	Pk	18.2	-30.3	33.36	43.52	-10.16	0-360	99	H
10	198.939	39.69	Pk	18.2	-30.1	27.79	43.52	-15.73	0-360	100	V

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

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11. AC POWER LINE CONDUCTED EMISSIONS

LIMITS

FCC §15.207 (a)

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

*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

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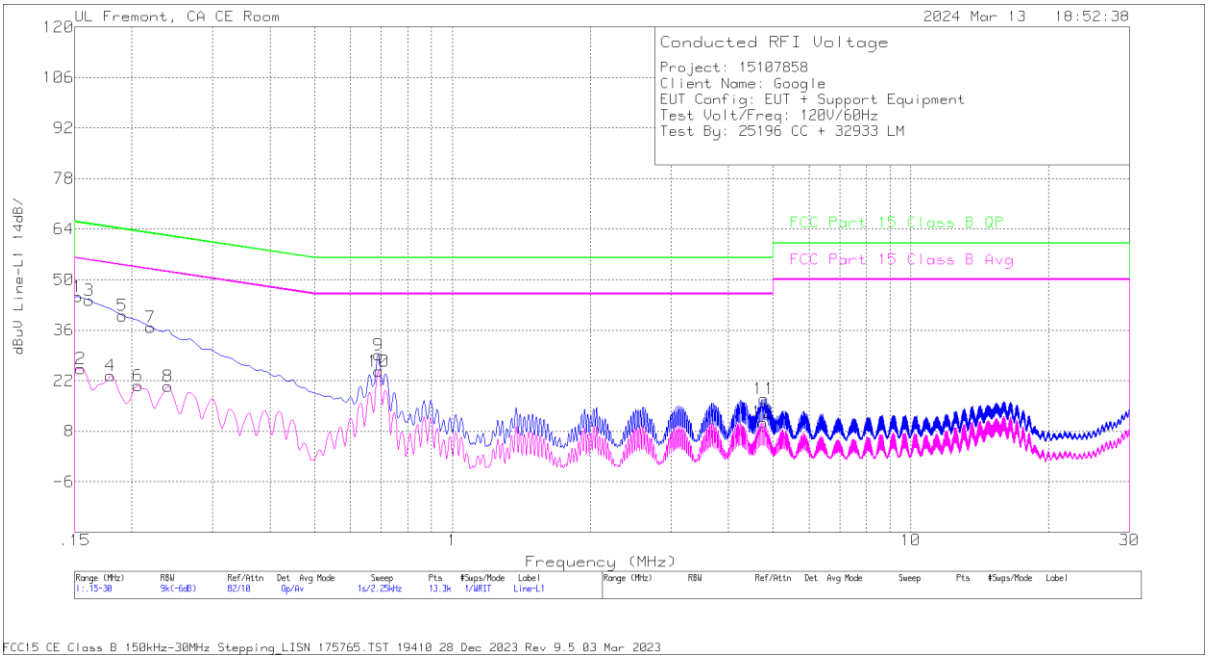
LINE 1 RESULTS



Range 1: Line-L1 .15 - 30MHz											
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	LISN (dB)	Cbl (dB)	Trns Limiter (dB)	Corrected Reading (dBuV)	FCC Part 15C QP Limit (dBuV)	QP Margin (dB)	FCC Part 15C Avg Limit (dBuV)	Av Margin (dB)
2	.1545	15.83	Av	0	0	9.5	25.33	-	-	55.75	-30.42
4	.1793	13.83	Av	0	.1	9.4	23.33	-	-	54.52	-31.19
6	.2063	11.07	Av	0	.1	9.4	20.57	-	-	53.35	-32.78
8	.24	11.1	Av	0	0	9.4	20.5	-	-	52.1	-31.6
10	.69	15.18	Av	0	.1	9.3	24.58	-	-	46	-21.42
12	4.7558	.95	Av	0	.1	9.4	10.45	-	-	46	-35.55
1	.1523	35.78	Qp	0	0	9.5	45.28	65.88	-20.6	-	-
3	.1613	34.72	Qp	0	0	9.5	44.22	65.4	-21.18	-	-
5	.1905	30.51	Qp	0	.1	9.4	40.01	64.01	-24	-	-
7	.2198	27.35	Qp	0	.1	9.4	36.85	62.83	-25.98	-	-
9	.69	19.76	Qp	0	.1	9.3	29.16	56	-26.84	-	-
11	4.785	7.45	Qp	0	.1	9.4	16.95	56	-39.05	-	-

Qp - Quasi-Peak detector
Av - Average detection

UL VERIFICATION SERVICES INC.
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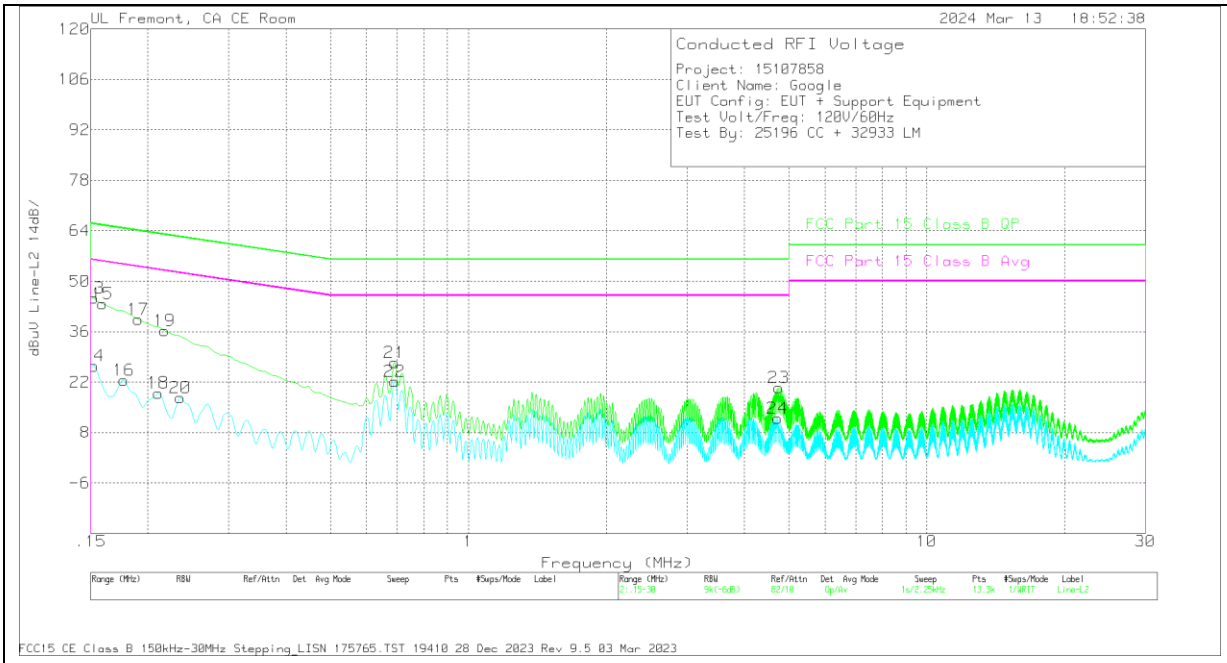
LINE 2 RESULTS



Range 2: Line-L2 .15 - 30MHz											
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	LISN (dB)	Cbl (dB)	Trns Limiter (dB)	Corrected Reading (dBuV)	FCC Part 15C QP Limit (dBuV)	QP Margin (dB)	FCC Part 15C Avg Limit (dBuV)	Av Margin (dB)
14	.1523	16.95	Av	0	0	9.5	26.45	-	-	55.88	-29.43
16	.177	13	Av	0	.1	9.4	22.5	-	-	54.63	-32.13
18	.2108	9.47	Av	0	.1	9.4	18.97	-	-	53.18	-34.21
20	.2355	8.22	Av	0	0	9.4	17.62	-	-	52.25	-34.63
22	.69	12.9	Av	0	0	9.3	22.2	-	-	46	-23.8
24	4.7243	2.37	Av	0	.1	9.4	11.87	-	-	46	-34.13
13	.1523	35.84	Qp	0	0	9.5	45.34	65.88	-20.54	-	-
15	.159	34.18	Qp	0	0	9.5	43.68	65.52	-21.84	-	-
17	.1905	29.92	Qp	0	.1	9.4	39.42	64.01	-24.59	-	-
19	.2175	26.78	Qp	0	.1	9.4	36.28	62.91	-26.63	-	-
21	.69	18.11	Qp	0	0	9.3	27.41	56	-28.59	-	-
23	4.7535	10.91	Qp	0	.1	9.4	20.41	56	-35.59	-	-

Qp - Quasi-Peak detector
Av - Average detection

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12. DESCRIPTION OF TEST SETUP AND SETUP PHOTOS

Please refer to 15107858-EP1 for test setup description and setup photos

END OF TEST REPORT

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