

Test Report 3727 A

Equipment Under Test:	Ethicon Communications Module
Requirement(s):	FCC eCFR 47 Part 15: 207, 209, 225 KDB 996369 D04 ISED: RSS-210, RSS-GEN
Test Date(s):	8/17/2023 11/20/2023
Prepared for:	Ethicon Attn: Miranda Weidner 4545 Creek Rd. Blue Ash, OH 45242

Report Issued by: Adam Alger, Sr. Manager, EMC Laboratory	
Signature: 	Date: 03/25/2025
Report Reviewed by: Adam Alger, Sr. Manager, EMC Laboratory	
Signature: 	Date: 03/24/2025
Report Constructed by: Adam Hauke, EMC Engineer	
Signature: 	Date: 11/20/2023

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Company: Ethicon	Page 1 of 36	Name: Ethicon Communications Module
Report: TR 3727 A		Model: ETHCM
Quote: NBO-03-2023-006090-1		Serial: CM22308019

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Ezurio Test Services in Review

The Ezurio laboratory located at W66 N220 Commerce Court Cedarburg, Wisconsin, 53012 USA is recognized through the following organizations:



A2LA – American Association for Laboratory Accreditation

Accreditation based on ISO/IEC 17025:2017 with Electrical (EMC) Scope

A2LA Certificate Number: 1255.01

Scope of accreditation includes all test methods listed herein unless otherwise noted



Federal Communications Commission (FCC) – USA

Accredited Test Firm Registration Number: 953492

Recognition of two 3 meter Semi-Anechoic Chambers



Innovation, Science and Economic Development Canada

Accredited U.S. Identification Number: US0218

Recognition of two 3 meter Semi-Anechoic Chambers

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1 TEST REPORT SUMMARY

During **08/17/2023-11/20/2023** the Equipment Under Test (EUT), **Ethicon Communications Module**, as provided by Ethicon was tested to the following requirements:

47 CFR Part 15 & ISED Canada – Class A

Requirements	Description	Method	Compliant
15.207 RSS-GEN	Conducted AC Emissions 0.15-30 MHz	ANSI C63.10	Yes
15.225(d) RSS-GEN	Radiated Emissions 30-40000 GHz	ANSI C63.10	Yes
15.225 RSS-210	Operation within the band 13.11-14.01 MHz	ANSI C63.10	Yes
15.31(k) RSS-247	Simultaneous Transmission NFC and 2.4, 5 GHz WLAN	ANSI C63.10	Yes
RSS-GEN	99% OBW	ANSI C63.10	Yes

Notice:

The results relate only to the item tested as configured and described in this report. Any additional configurations, modes of operation, or modifications made to the equipment under test after the specified test date(s) are at the decision of the client and may not apply to the data seen in this test report.

The decision rule for Pass / Fail assessment to the specification or standard listed in this test report has been agreed upon by the client and laboratory to be as follows:

Measurement Type	Rule
Emissions – Amplitude	1 dB below specified limit
Emissions – Frequency	1% less than the specification
Immunity	Tested at specified level

2 CLIENT INFORMATION

Company Name	Ethicon
Contact Person	Miranda Weidner
Address	4545 Creek Rd. Blue Ash, OH 45242

2.1 Equipment Under Test (EUT) Information

The following information has been supplied by the client

Product Name	Ethicon Communications Module
Model Number	ETHCM
Serial Number	CM22308019
FCC ID	2BDJP-ETHCM12
IC ID	28152- ETHCM12
Contains FCC ID	SQG-SU60SOMC
Contains IC ID	3147A-SU60SOMC

2.2 Product Description

Communications Module (ETHCM) – The communications module always sits at the top of the system. It contains the power button and speakers, controls the user screen, distributes power for the system, and provides external interfaces for other connectivity to external devices. External interfaces include Ethernet and USB. It also includes four footswitch ports and a digital accessory port, which can be used for interfacing to wired accessories of the system. The communications module communicates with other modules of the system via the downstream connector.

2.3 Modifications Incorporated for Compliance

None noted at time of test

2.4 Deviations and Exclusions from Test Specifications

None noted at time of test

2.5 Additional Information

Device powered from 120 VAC 60 Hz

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2.6 Programming / Firmware

Device is programmed using Laird LRU and BTLRU firmware (listed in 2.7) using Windows command via Ethernet connection.

60SOM Firmware:

88W8997_SOM_sdio_uart_v5.5.48.5.bin

88W8997_mfg_sdio_uart_v16.80.205.170.bin

2.7 Antenna Information

NFC utilizes a board trace antenna.

60SIPT module using approved antenna – LSR/FlexPIFA

Gain @ 2400-2483.5 – 2.5 dBi

Gain @ 5150-5850 – 3.0 dBi

3 REFERENCES

Publication	Edition	Date	AMD 1	AMD 2
FCC eCFR 47 Part 15	-	2025	-	-
ICES-003	7	2020	-	-
RSS-GEN	5	2018	2019	2021
RSS -247	3	2024	-	-
RSS-210	11	2024	-	-
ANSI C63.4	-	2014	2017	-
ANSI C63.10	-	2020	-	-

References not on Scope of Accreditation

Publication	Edition	Date	AMD 1	AMD 2
KDB 996369 D04	02	2020	-	-
KDB 174176 D01	01	2015	-	-

4 UNCERTAINTY SUMMARY

Using the guidance of the following publications the calculated measurement uncertainty represents an expanded uncertainty expressed at approximately the 95 % confidence level, using a coverage factor of $k = 2$.

References
CISPR 16-4-1
CISPR 16-4-2
CISPR 32
ANSI C63.23
A2LA P103
A2LA P103c
ETSI TR 100-028

Measurement Type	Configuration	Uncertainty $\pm$
Radiated Emissions	Biconical Antenna	5.0 dB
Radiated Emissions	Log Periodic Antenna	5.3 dB
Radiated Emissions	Horn Antenna	4.7 dB
AC Line Conducted Emissions	Artificial Mains Network	3.4 dB
Telecom Conducted Emissions	Asymmetric Artificial Network	4.9 dB
Disturbance Power Emissions	Absorbing Clamp	4.1 dB
Radiated Immunity	3 Volts/meter	2.2 dB
Conducted Immunity	CDN/EM/BCI	2.4/3.5/3.4 dB
EFT Burst/Surge	Peak pulse voltage	164 volts
ESD Immunity	15 kV level	1377 Volts

Parameter	ETSI U.C. $\pm$	U.C. $\pm$
Radio Frequency, from F0	1×10^{-7}	0.55×10^{-7}
Occupied Channel Bandwidth	5 %	2 %
RF conducted Power (Power Meter)	1.5 dB	1.2 dB
RF conducted emissions (Spectrum Analyzer)	3.0 dB	1.7 dB
All emissions, radiated	6.0 dB	5.3 dB
Temperature	1° C	0.65° C
Humidity	5 %	2.9 %
Supply voltages	3 %	1 %

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5 TEST DATA

5.1 Radiated Emissions

Description of Measurement	The frequency spectrum is investigated for intentional and / or unintentional signals emanating from the EUT by use of a standardized test site and measurement antenna. The antenna, cable, pre-amp, and other necessary measurement system correction factors are loaded onto the EMI receiver / spectrum analyzer when the measurements are performed allowing the data to be gathered and reported as corrected values. The maximum emissions from the EUT are determined by turn-table azimuth rotation (360°) and scanning of the measurement antenna. Maximized levels are noted at degree values of azimuth, measurement antenna height, and measurement antenna polarity.
Example Calculations	Measurement (dBμV) + Cable factor (dB) + Other (dB) + Antenna Factor (dB/m) = Corrected Reading (dBμV/m) Margin (dB) = Limit (dBμV/m) - Corrected Reading (dBμV/m) Example at 4000 MHz: Reading = 40 dBμV + 3.4 dB + 0.9 dB + 6.5 dB/m = 50.8 dBμV/m Average Limit = 20 log (500) = 54 dBμV/m Margin = 54 dBμV/m - 50.8 dBμV/m = 3.2 dB

Block Diagram



5.1.1 Operation within the band 13.11-14.01 MHz

Operator	Jon Dille	QA	Adam Hauke
Temperature	22.8°C	R.H. %	47.50%
Test Date	08/17/2023	Location	Chamber 5
Requirement	FCC 15.225 RSS-210	Method	ANSI C63.10

FCC 15.225 | RSS-210 Limits:

Frequency (MHz)	Field Strength (μV/m)	Measurement Distance (m)
13.553-13.567	15,848	30
13.410-13.553 13.567-13.710	334	30
13.110-13.410 13.710-14.010	106	30

FCC 15.209 | RSS-GEN Limits:

Frequency (MHz)	Field Strength (μV/m)	Measurement Distance
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30.0	30	30

Test Parameters

Frequency	9 kHz-30 MHz	Distance	3 m
Detector(s)	Peak Trace Quasi-Peak, Average – Final	Table height	80 cm
RBW	200 Hz – 9-150 kHz 9 kHz – 0.15-30 MHz	VBW	2 kHz – 9-150 kHz 90 kHz – 0.15-30 MHz
Example Calculations	See ANSI C63.10 § 6.4 for converting field strength measurement to limit distance		

Instrumentation

Asset #	Description	Manufacturer	Model #	Serial #	Date	Due Date	Status
AA 960206	Antenna – Loop	A.H. Systems, Inc.	SAS-565-H	2758	09/03/2021	09/03/2023	Active Calibration
EE 960203	Analyzer – EMI Receiver	Keysight	N9038A	MY56400072	04/11/2023	04/11/2024	Active Calibration
LSC-300	Cable	Chamber 3 Emissions	-	-	04/26/2022	04/26/2024	Active Verification

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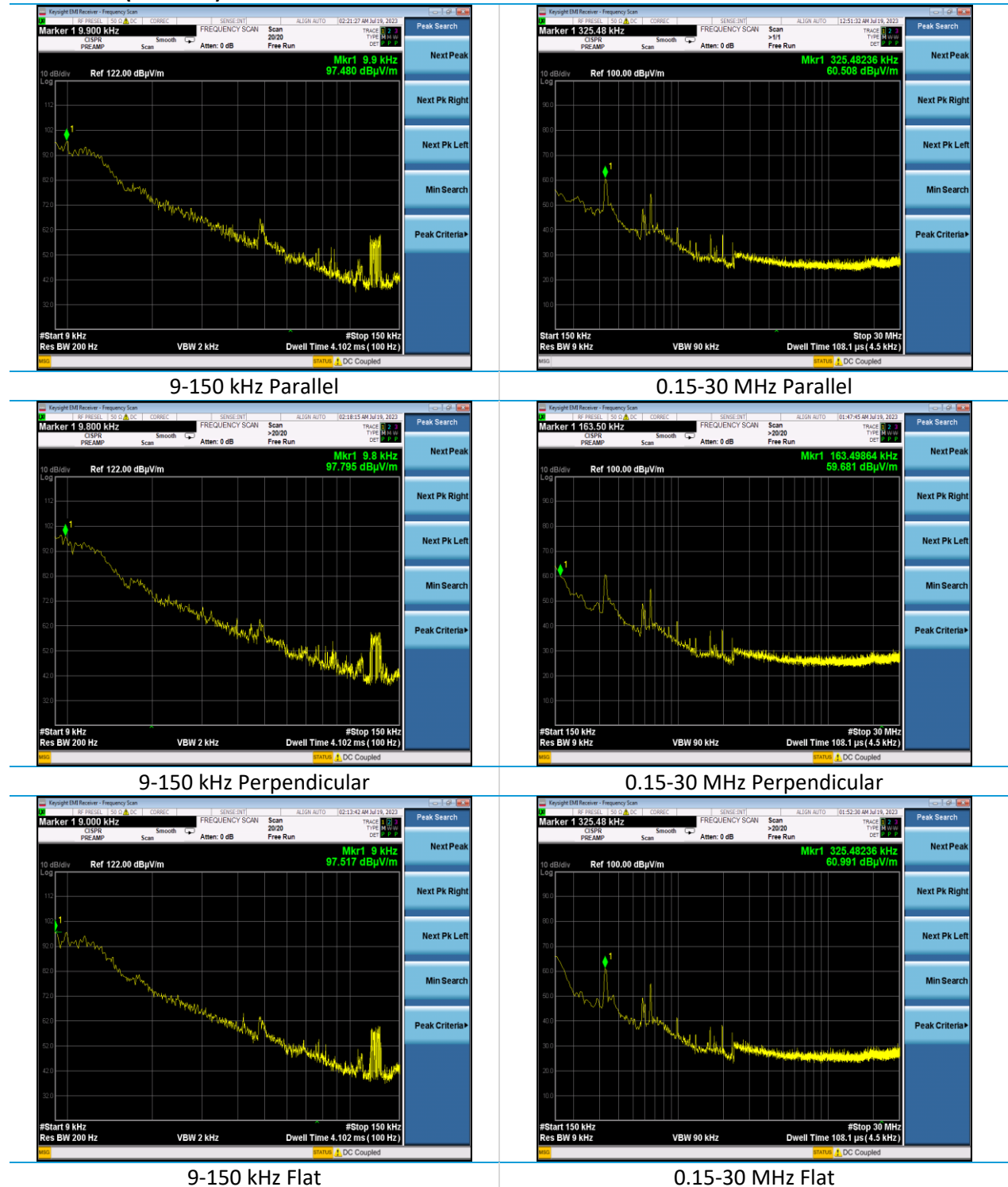
EUT Parameters

Input Power	120 VAC @ 60 Hz	Mode	NFC Active
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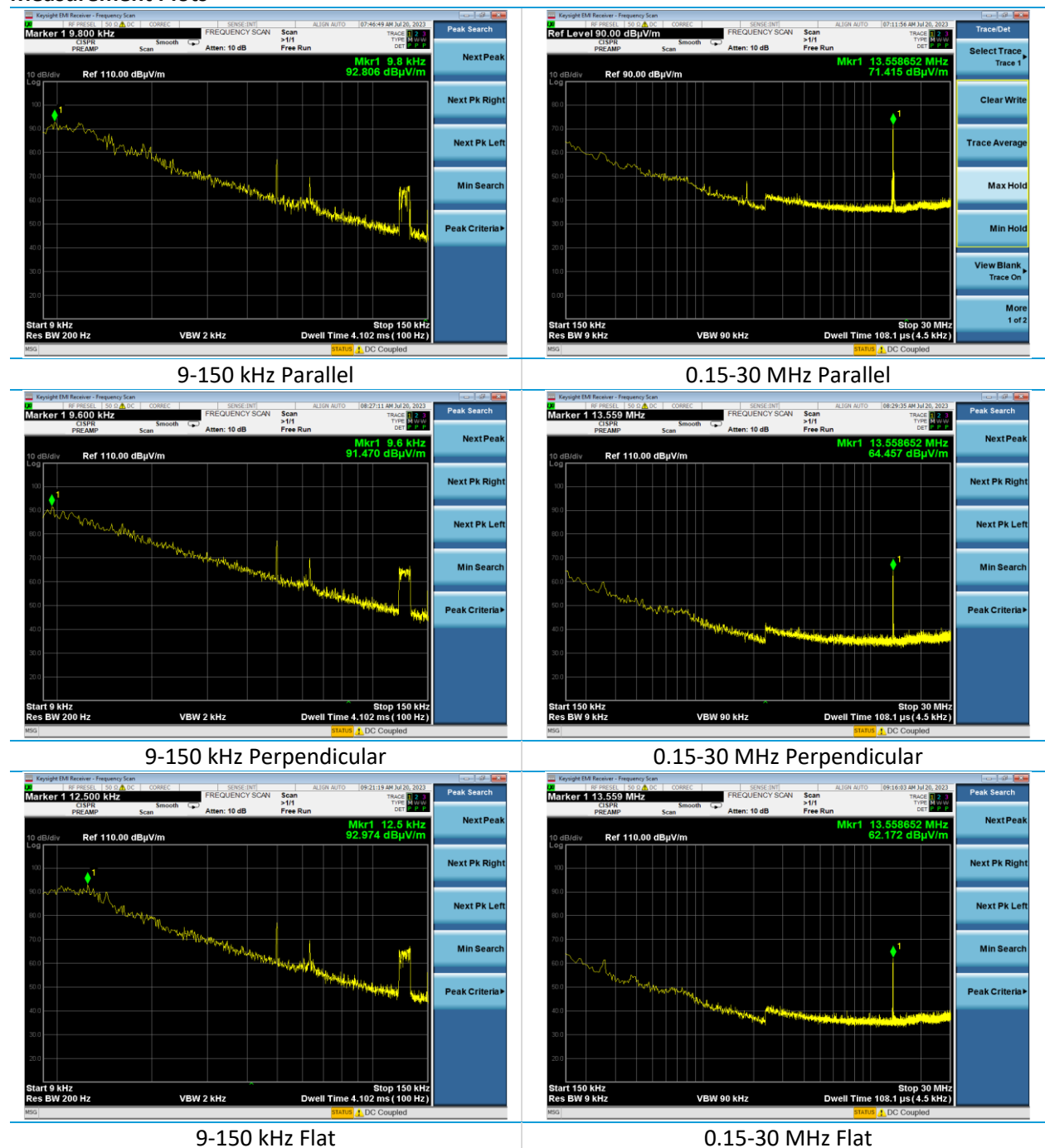
Measurements

Frequency (MHz)	Polarity	Height (cm)	Azimuth (degree)	Quasi-Peak Reading (dBμV/m)	Quasi-Peak Reading @ Limit Distance (dBμV/m)	Quasi-Peak Limit (dBμV/m)	Quasi-Peak Margin (dB)	Note)
13.56	Perpendicular	100	58	69.8	48.8	84.0	35.2	
13.56	Flat	100	0	64.9	43.9	84.0	40.1	
13.56	Parallel	100	0	69.8	48.8	84.0	35.2	
13.559	Parallel	100	0	69.8	48.8	84.0	35.2	
13.552	Parallel	100	0	51.9	30.9	84.0	53.1	
13.567	Parallel	100	0	58.9	37.9	84.0	46.1	
13.383	Parallel	100	0	42.4	20.4	40.5	20.1	
13.725	Parallel	100	0	41.7	20.7	40.5	19.8	
0.103	Parallel	100	0	68.4	-11.6	27.3	38.9	
0.490	Parallel	100	0	66.5	-3.7	13.8	17.5	
0.652	Flat	100	242	53.8	13.8	31.3	17.5	Ambient
1.96	Flat	100	242	35.1	-3.1	30.0	33.1	Ambient
0.009	Flat	100	0	93.5	13.5	48.5	35.0	Ambient
0.118	Flat	100	0	46.6	-33.4	26.2	59.6	Ambient
0.009	Parallel	100	0	97.3	17.3	48.5	31.2	Ambient
0.009	Perpendicular	100	0	94.9	14.9	48.5	33.6	Ambient

Noise Floor (Ambient) Plots



Measurement Plots



5.1.2 99% Operating Bandwidth

Operator	Adam Hauke	QA	Adam Alger
Temperature	21.4°C	R.H. %	56.00%
Test Date	09/12/2023	Location	Conducted Bench
Requirement	FCC 15.225 RSS-210	Method	ANSI C63.10

Test Parameters

Frequency	13.56 MHz	Distance	20 cm
Detector(s)	99% OBW	Table height	N/A
RBW	10 Hz	VBW	30 Hz

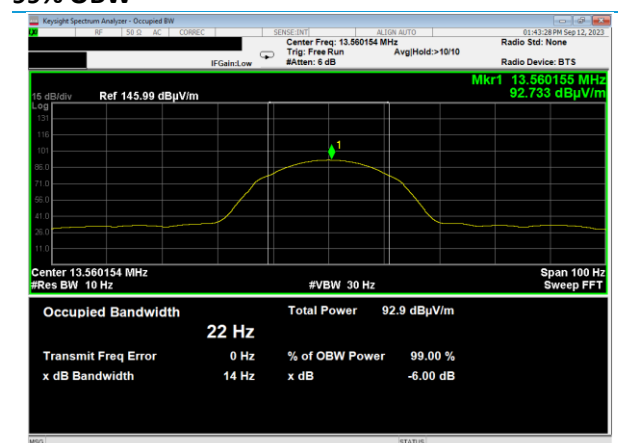
Instrumentation

Asset #	Description	Manufacturer	Model #	Serial #	Date	Due Date	Status
AA 960206	Antenna – Loop	A.H. Systems, Inc.	SAS-565-H	2758	08/31/2023	08/31/2025	Active Calibration
EE 960088	Analyzer – EMI Receiver	Agilent	N9038A	MY51210138	04/10/2023	04/10/2024	Active Calibration
LSC-211	Cable	Micro-Coax	UFB311A-0-1440-70U70U	64639 224071-002	04/25/2023	04/25/2024	Active Verification

EUT Parameters

Input Power	120 VAC @ 60 Hz	Mode	NFC Active
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99% OBW



99% OBW – 22 Hz

5.1.3 Frequency Stability

Operator	Adam Hauke	QA	Anthony Smith
Temperature	22.1°C	R.H. %	36.10%
Test Date	11/16/2023	Location	Conducted Bench
Requirement	FCC 15.225 RSS-210	Method	ANSI C63.10

Limit: The frequency tolerance of the carrier signal shall be maintained within $\pm 0.01\%$ of the operating frequency over a temperature variation of -20 degrees to +50 degrees C at normal supply voltage, and for a variation in the primary supply voltage from 85% to 115% of the rated supply voltage at a temperature of 20 degrees C.

Test Parameters

Frequency	13.56 MHz	Distance	10 cm
Detector(s)	Peak	Table height	80 cm

Results

Voltage	Center Frequency (Hz)
Nominal	13560082.4
85%	13560157.8
115%	13559592.6

Test Parameters

Temperature	-20° to 50°C	Distance	1 cm
Detector(s)	Peak	Table height	80 cm

Results

Temperature	Center Frequency (Hz)
20.0°C	13560237.6
-20.0°C	13560194.6
50.0°C	13560151.4

5.1.4 Spurious Radiated Emissions

Operator	Jon Dille	QA	Adam Hauke
Temperature	22.8°C	R.H. %	47.50%
Test Date	08/17/2023	Location	Chamber 5
Requirement	FCC 15.209 RSS-GEN	Method	ANSI C63.10

FCC 15.209 Limits:

Frequency (MHz)	Quasi-Peak Limit (dBμV/m)	Average Limit (dBμV/m)	Peak Limit (dBμV/m)
30-88	40.0	-	-
88-216	43.5	-	-
216-960	46.0	-	-
960-1000	54.0	-	-
1000-40000	-	54.0	74.0

Test Parameters

Frequency	30-40000 MHz	Distance	3 m
Detector(s)	Peak Reading Peak, QP, Avg - Final	Table height	80 cm
RBW	120 kHz 1 MHz	VBW	1.2 MHz 3 MHz
Note	No emissions above 30 MHz associated with NFC radio transmission. Device is a Class A unintentional transmitter.		

Instrumentation

Asset #	Description	Manufacturer	Model #	Serial #	Date	Due Date	Status
AA 960153	Filter – High Pass 2.4 GHz	KWM	HPF-L-14186	7272-04	04/11/2023	04/11/2024	Active Calibration
AA 960158	Antenna – Double Ridge Horn	ETS Lindgren	3117	109300	01/30/2023	01/30/2024	Active Calibration
AA 960161	Filter – Highpass 5 GHz	K&L Microwave	11SH10-8000	2	04/11/2023	04/11/2024	Active Calibration
AA 960206	Antenna – Loop	A.H. Systems, Inc.	SAS-565-H	2758	08/31/2022	08/31/2023	Active Calibration
AA 960211	Antenna – Low Noise Amplifier	Mini-Circuits	ZVA-213X-S+	977711030	01/30/2023	01/30/2024	Active Calibration
AA 960222	Cable	A.H. Systems, Inc.	SAC-26G-6	525	06/13/2023	06/13/2024	Active Verification
EE 960085	Analyzer – EMI Receiver	Agilent	85033E	MY39204103	07/07/2022	07/07/2024	Active Calibration
LSC-500	Cable	Chamber 5 Emissions	-	-	04/25/2022	04/25/2023	Active Verification

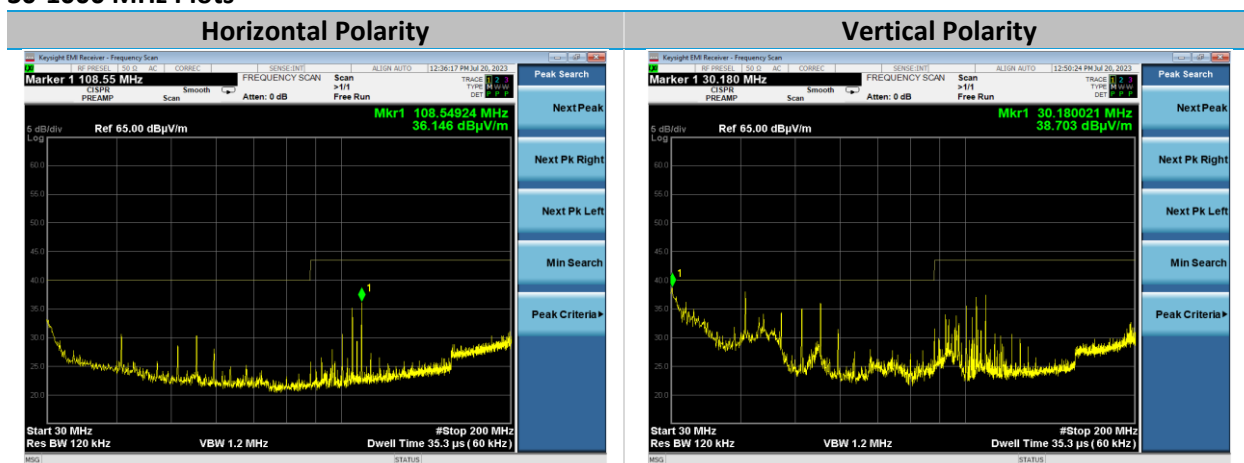
EUT Parameters

Input Power	120 VAC @ 60 Hz	Mode	WLAN Rx
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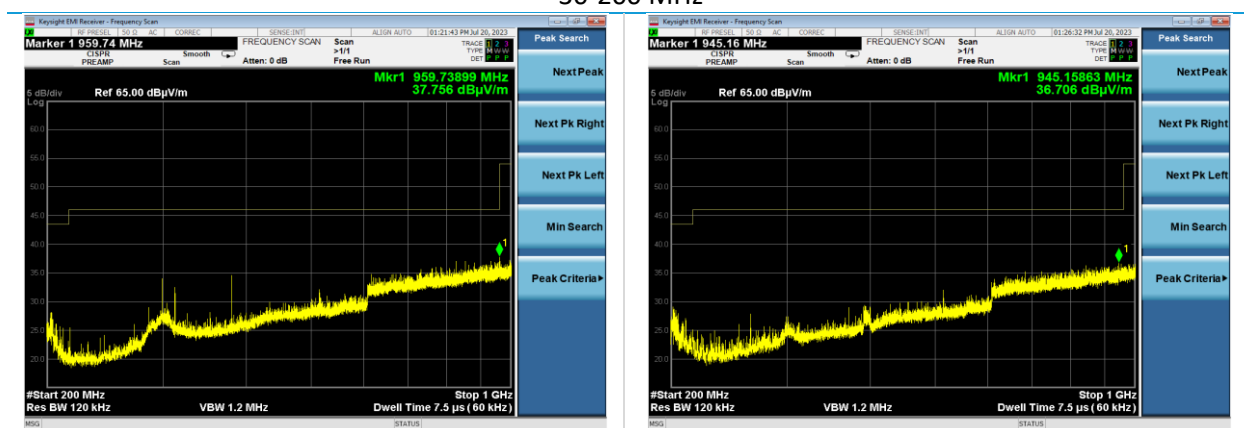
30-1000 MHz Measurements

Frequency (MHz)	Polarity	Height (cm)	Azimuth (degree)	Quasi-Peak Reading (dBμV/m)	Quasi-Peak Limit (dBμV/m)	Quasi-Peak Margin (dB)
105.9	Horizontal	176	298	23.0	54.0	31.0
112.9	Vertical	100	222	26.7	54.0	27.3
278.4	Horizontal	100	0	52.8	57.0	4.2
659.6	Vertical	100	160	41.4	57.0	15.6
806.3	Horizontal	100	33	41.1	57.0	15.9

30-1000 MHz Plots



30-200 MHz



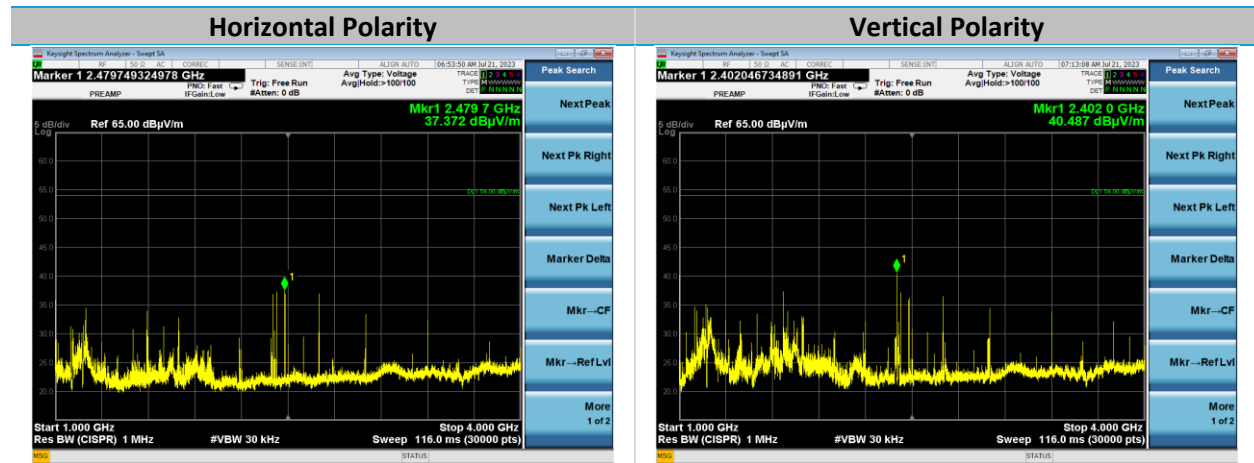
200-1000 MHz

1000-40000 MHz Measurements

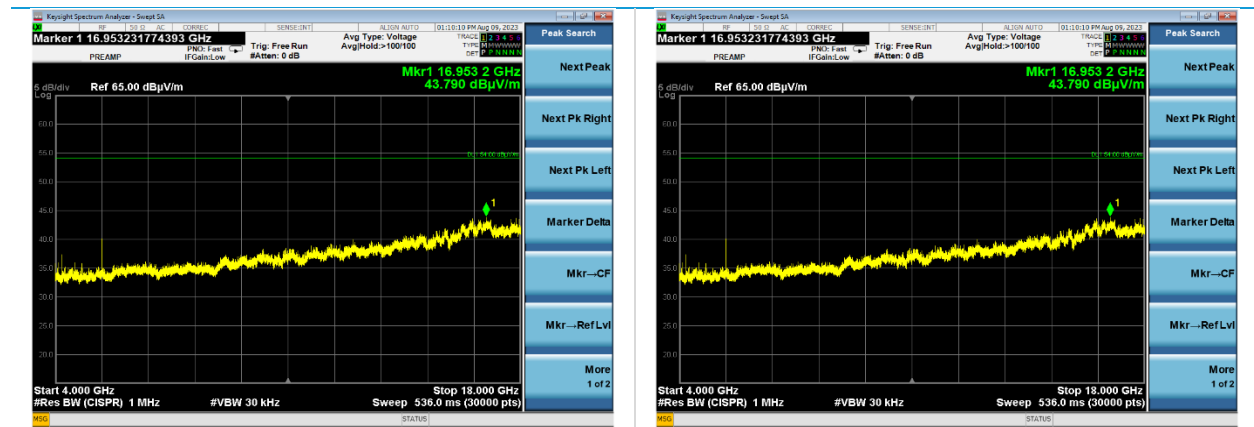
Frequency (MHz)	Polarity	Height (cm)	Azimuth (degree)	Average Reading (dB μ V/m)	Average Limit (dB μ V/m)	Average Margin (dB)	Peak Reading (dB μ V/m)	Peak Limit (dB μ V/m)	Peak Margin (dB)
1000.0	Vertical	250	170	39.9	60.0	20.1	42.0	80.0	38.0
2402.1	Horizontal	140	340	27.9	60.0	32.1	46.0	80.0	34.0

*Emissions not a function of the radio module

1000-40000 MHz Plots

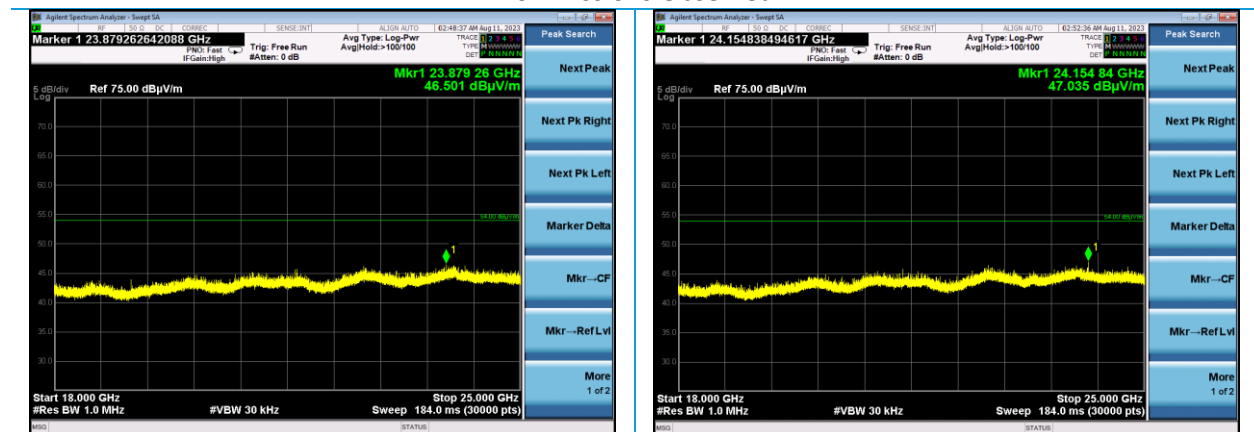


1000-4000 MHz



4000-18000 MHz

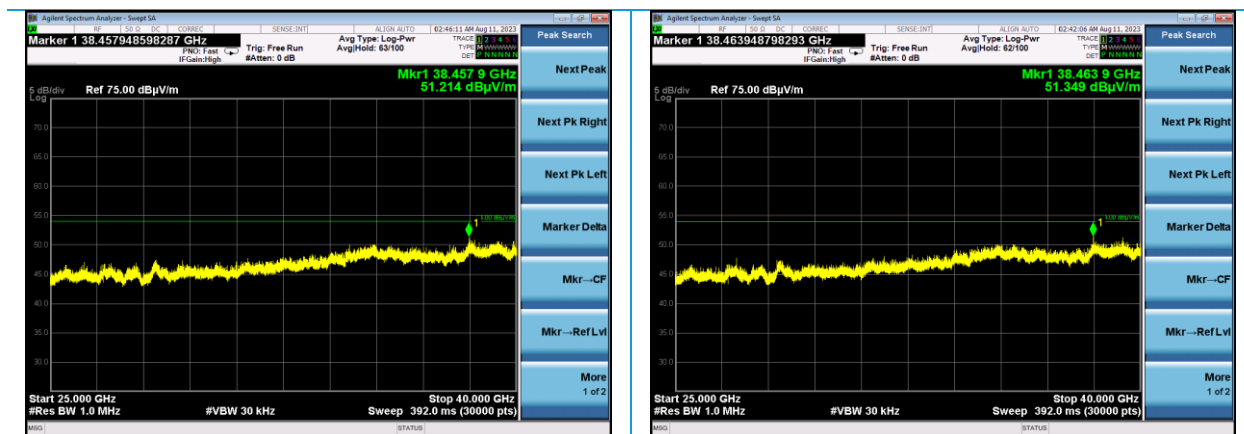
No Emissions Observed



18000-25000 MHz

No Emissions Observed

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25000-40000 MHz
No Emissions Observed

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5.1.5 Simultaneous Transmission

Operator	Adam Hauke	QA	Jon Dilley
Temperature	22.0°C	R.H. %	60.00%
Test Date	07/17/2023	Location	Chamber 3
Requirement	FCC 15.31 RSS-GEN	Method	ANSI C63.10

FCC 15.209 | RSS-GEN Limits:

Frequency (MHz)	Quasi-Peak Limit (dBμV/m)	Average Limit (dBμV/m)	Peak Limit (dBμV/m)
30-88	40.0	-	-
88-216	43.5	-	-
216-960	46.0	-	-
960-1000	54.0	-	-
1000-40000	-	54.0	74.0

Test Parameters

Frequency	2310-40000 MHz	Distance	3 m
Detector(s)	Peak Trace Peak, Average -Final	Table height	150 cm
RBW	1 MHz	VBW	3 MHz Peak 10 Hz Average

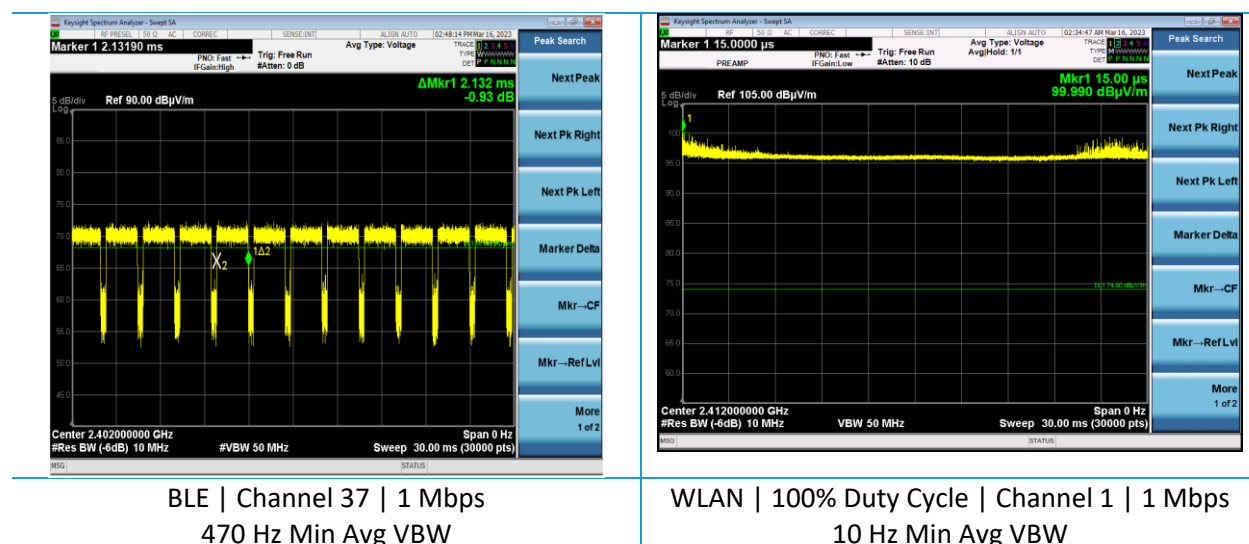
Instrumentation

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AA 960158	Antenna – Double Ridge Horn	ETS Lindgren	3117	109300	01/30/2023	01/30/2024	Active Calibration
AA 960161	Filter – Highpass 5 GHz	K&L Microwave	11SH10-8000	2	04/11/2023	04/11/2024	Active Calibration
AA 960206	Antenna – Loop	A.H. Systems, Inc.	SAS-565-H	2758	08/31/2022	08/31/2023	Active Calibration
AA 960211	Antenna – Low Noise Amplifier	Mini-Circuits	ZVA-213X-S+	977711030	01/30/2023	01/30/2024	Active Calibration
AA 960222	Cable	A.H. Systems, Inc.	SAC-26G-6	525	06/13/2023	06/13/2024	Active Verification
EE 960085	Analyzer – EMI Receiver	Agilent	85033E	MY39204103	07/07/2022	07/07/2024	Active Calibration
LSC-500	Cable	Chamber 5 Emissions	-	-	04/25/2022	04/25/2023	Active Verification

EUT Parameters

Input Power	120 VAC @ 60 Hz	Mode	Constant Tx NFC Active
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Duty Cycle Plots

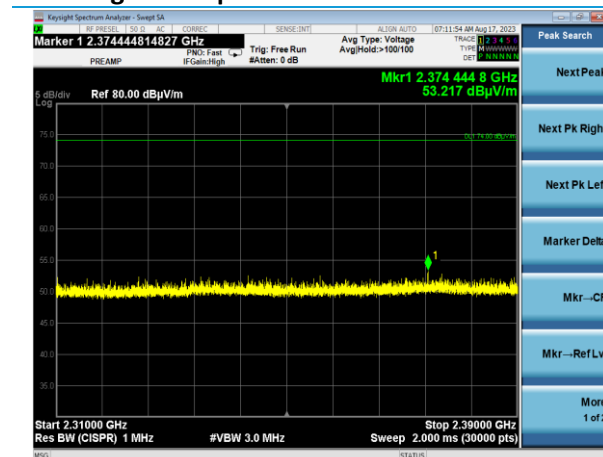


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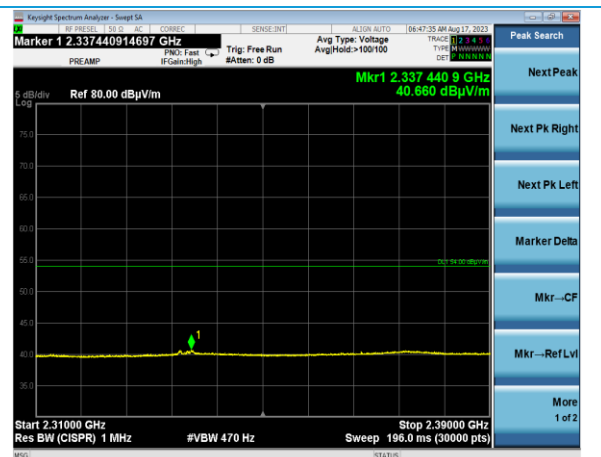
Band Edge Measurements

Frequency (MHz)	Polarity	Height (cm)	Azimuth (degree)	Average Reading (dBμV/m)	Average Limit (dBμV/m)	Average Margin (dB)	Peak Reading (dBμV/m)	Peak Limit (dBμV/m)	Peak Margin (dB)	Channel	Data Rate (Mbps)
2386.9	Horizontal	250	226	43.3	54.0	10.7	53.4	74.0	20.6	1	1
2386.8	Vertical	250	226	41.8	54.0	12.2	49.7	74.0	24.3	1	1
2487.7	Horizontal	207	176	43.9	54.0	10.1	55.9	74.0	18.1	9	MCS0
2483.9	Vertical	207	176	38.8	54.0	15.2	52.5	74.0	21.5	9	MCS0
2374.4	Horizontal	150	33	40.7	54.0	13.3	53.2	74.0	20.8	37	1
2337.7	Vertical	150	33	41.0	54.0	13.0	53.5	74.0	20.5	37	1
2485.7	Horizontal	150	33	45.9	54.0	8.1	54.8	74.0	19.2	36	1
2497.7	Vertical	150	33	41.1	54.0	12.9	53.0	74.0	21.0	36	1
4688.0	Horizontal	242	40	46.0	54.0	8.0	57.6	68.2	10.6	36	6
5149.8	Vertical	242	50	38.0	54.0	16.0	47.1	68.2	21.1	36	6
5393.9	Horizontal	152	22	45.6	54.0	8.4	58.4	68.2	9.8	64	MCS0
5405.9	Vertical	236	188	37.2	54.0	16.8	48.9	68.2	19.3	64	MCS0
5447.0	Horizontal	161	15	45.5	54.0	8.5	58.0	68.2	10.2	100	6
5444.8	Vertical	216	194	37.0	54.0	17.0	49.3	68.2	18.9	100	6
5466.0	Horizontal	161	15	-	-	-	57.7	68.2	10.5	100	6
5466.9	Vertical	216	194	-	-	-	50.2	68.2	18.0	100	6
5772.3	Horizontal	155	25	-	-	-	64.2	68.2	4.0	140	6
5790.6	Vertical	233	196	-	-	-	49.5	68.2	18.7	140	6
5725.0	Horizontal	137	20	-	-	-	77.9	122.2	44.3	149	6
5722.4	Vertical	234	200	-	-	-	78.7	116.4	37.7	149	6
5852.3	Horizontal	137	20	-	-	-	73.7	117.0	43.3	165	6
5850.0	Vertical	245	198	-	-	-	73.7	122.2	48.5	165	6

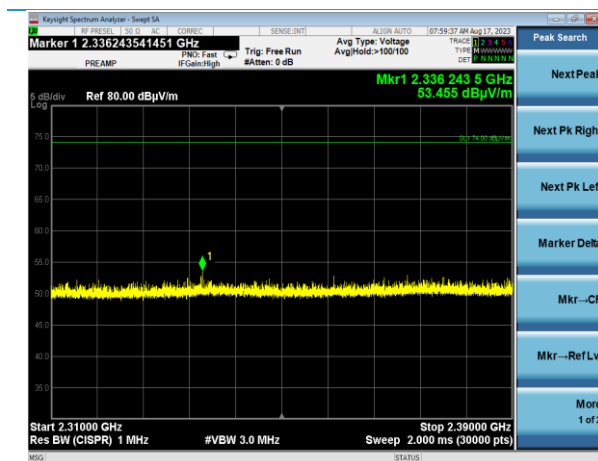
Band Edge Plots | BLE



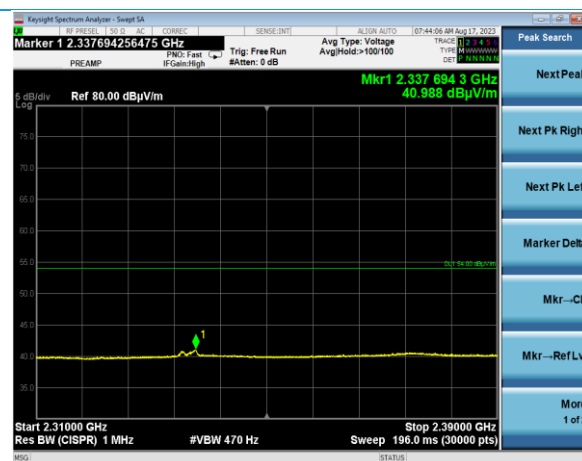
2310-2390 MHz | Peak Trace | Horizontal
Channel 37 | 1 Mbps



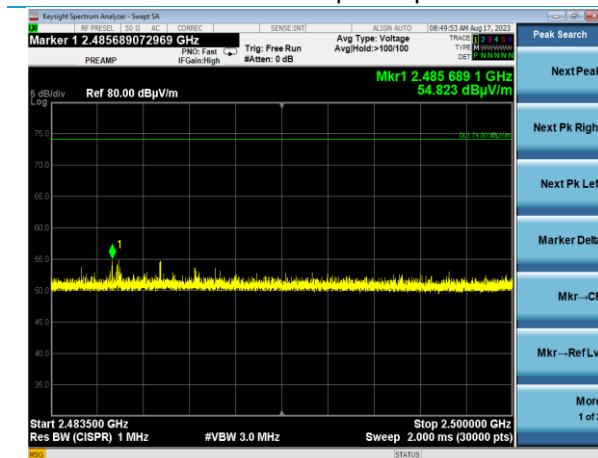
2310-2390 MHz | Average Trace | Horizontal
Channel 37 | 1 Mbps



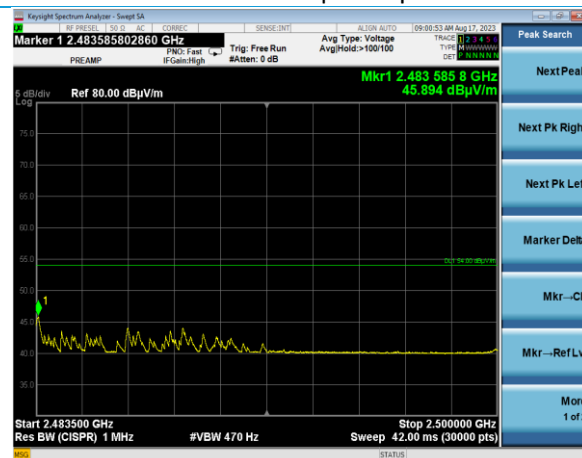
2310-2390 MHz | Peak Trace | Vertical
Channel 37 | 1 Mbps



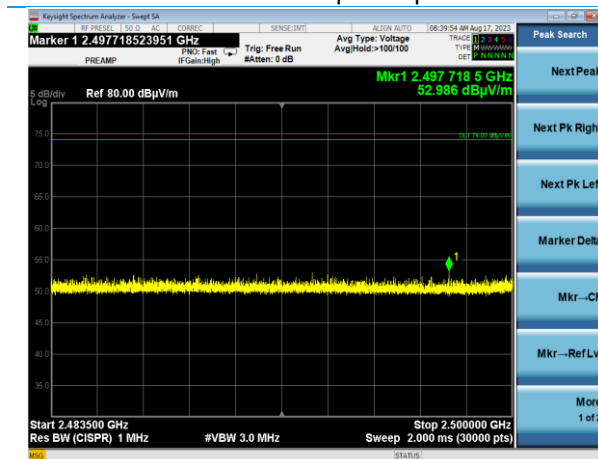
2310-2390 MHz | Average Trace | Vertical
Channel 37 | 1 Mbps



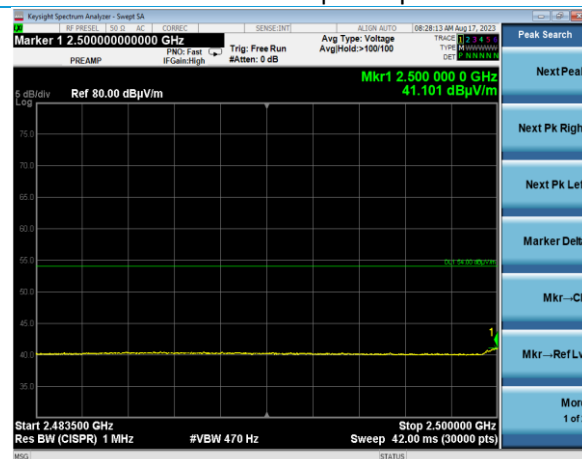
2483.5-2500 MHz | Peak Trace | Horizontal
Channel 36 | 1 Mbps



2483.5-2500 MHz | Average Trace | Horizontal
Channel 36 | 1 Mbps

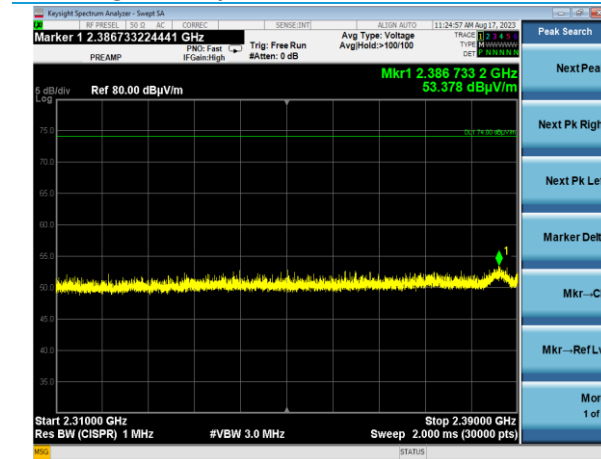


2483.5-2500 MHz | Peak Trace | Vertical
Channel 36 | 1 Mbps

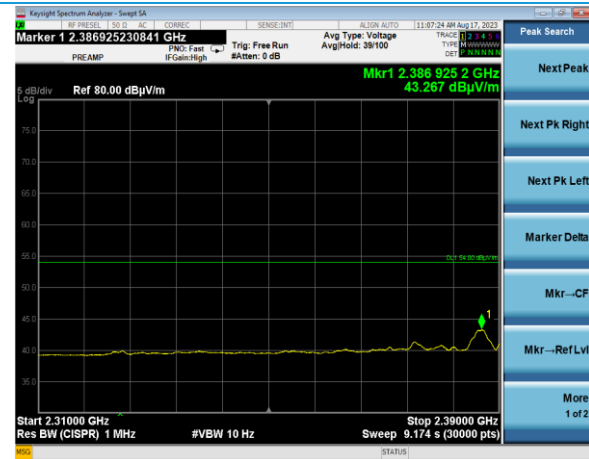


2483.5-2500 MHz | Average Trace | Vertical
Channel 36 | 1 Mbps

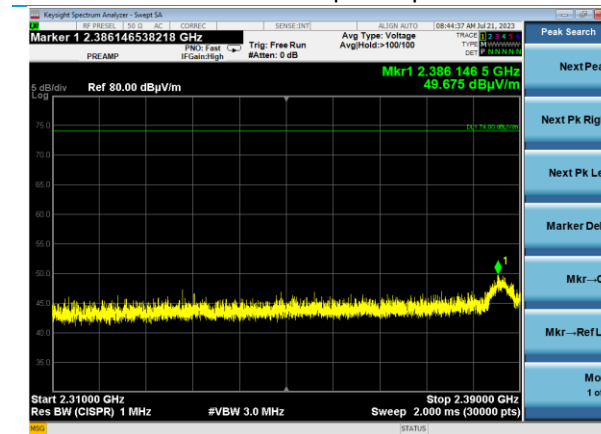
Band Edge Plots | 2.4 GHz WLAN



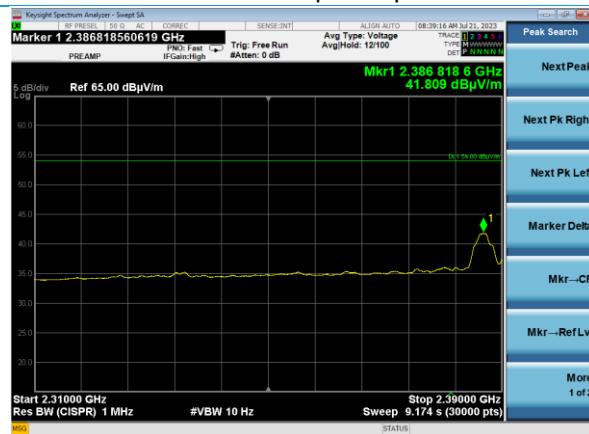
2310-2390 MHz | Peak Trace | Horizontal
Channel 1 | 1 Mbps



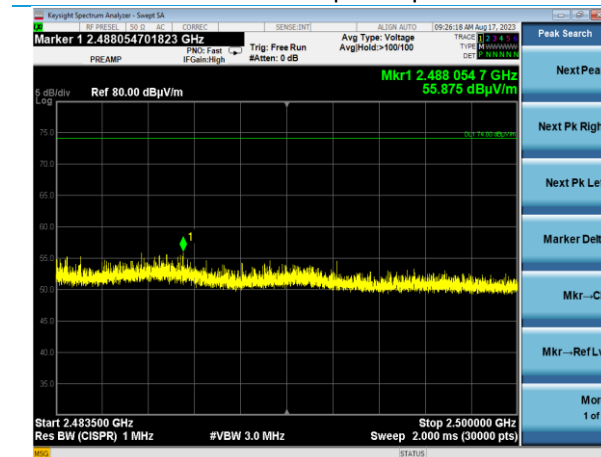
2310-2390 MHz | Average Trace | Horizontal
Channel 1 | 1 Mbps



2310-2390 MHz | Peak Trace | Vertical
Channel 1 | 1 Mbps



2310-2390 MHz | Average Trace | Vertical
Channel 1 | 1 Mbps

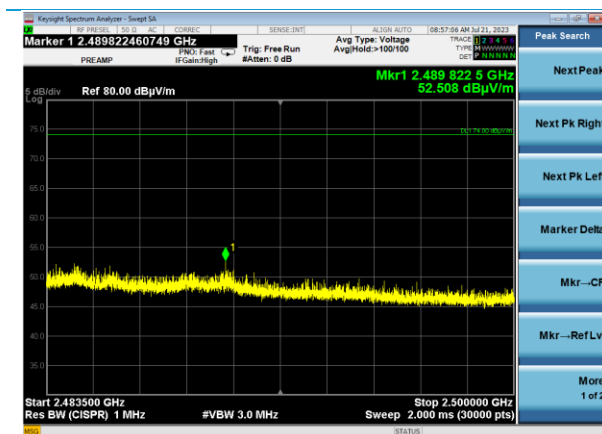


2483.5-2500 MHz | Peak Trace | Horizontal
Channel 9 | MCS0

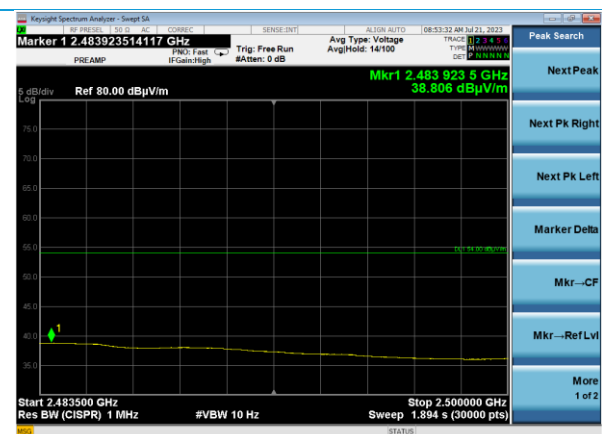


2483.5-2500 MHz | Average Trace | Horizontal
Channel 9 | MCS0

Company: Ethicon	Page 25 of 36	Name: Ethicon Communications Module
Report: TR 3727 A		Model: ETHCM
Quote: NBO-03-2023-006090-1		Serial: CM22308019

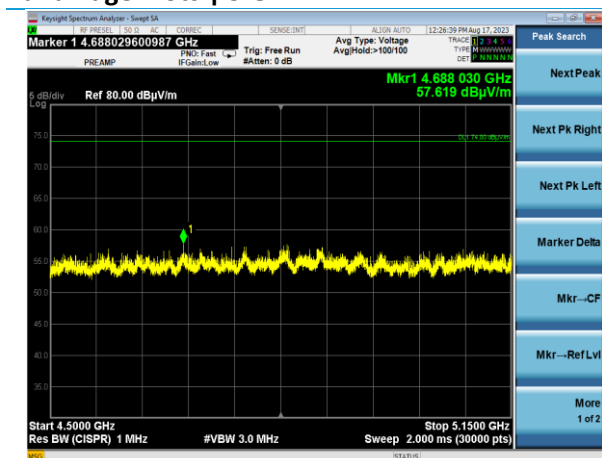


2483.5-2500 MHz | Peak Trace | Vertical
Channel 9 | MCS0

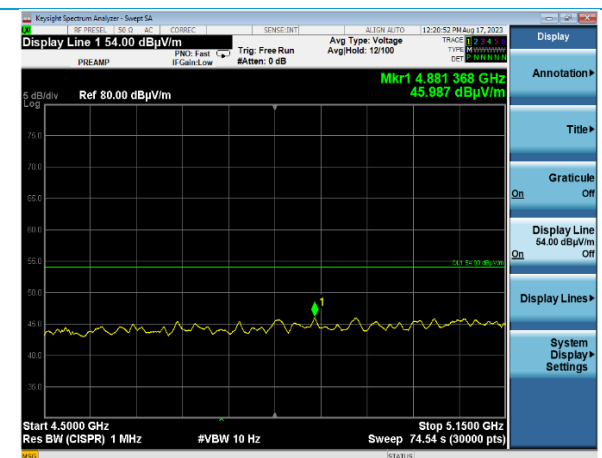


2483.5-2500 MHz | Average Trace | Vertical
Channel 9 | MCS0

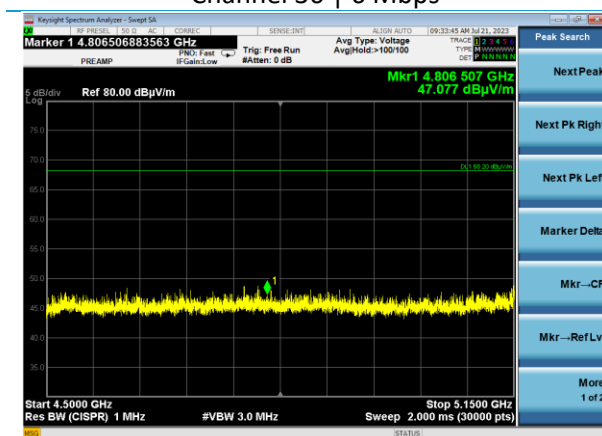
Band Edge Plots | 5 GHz WLAN



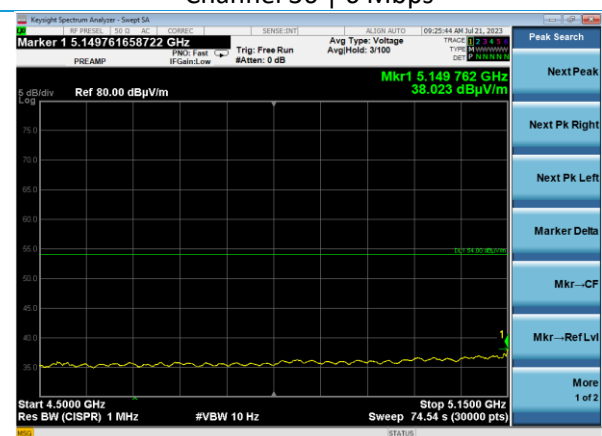
4500-5150 MHz | Peak Trace | Horizontal
Channel 36 | 6 Mbps



4500-5150 MHz | Average Trace | Horizontal
Channel 36 | 6 Mbps

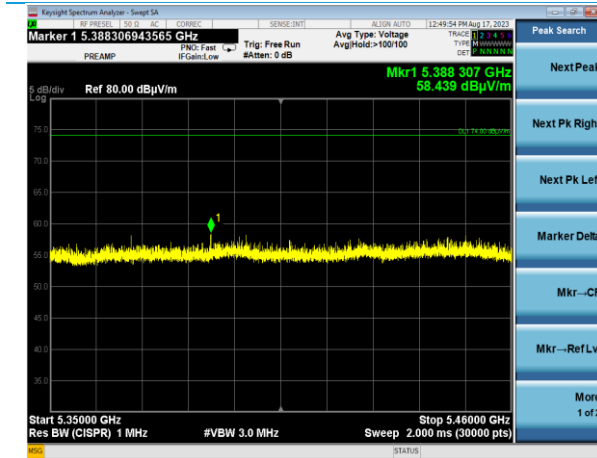


4500-5150 MHz | Peak Trace | Vertical
Channel 36 | 6 Mbps

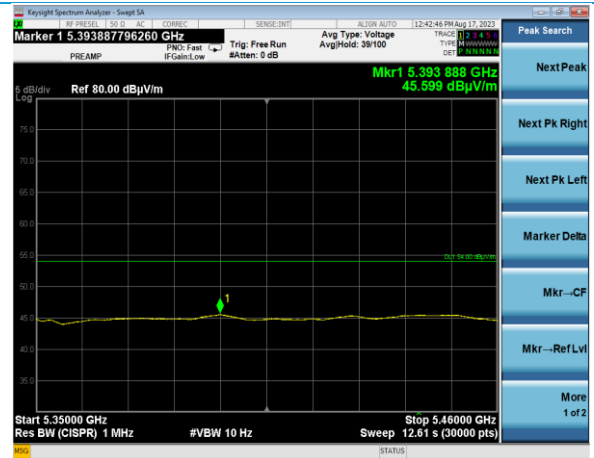


4500-5150 MHz | Average Trace | Vertical
Channel 36 | 6 Mbps

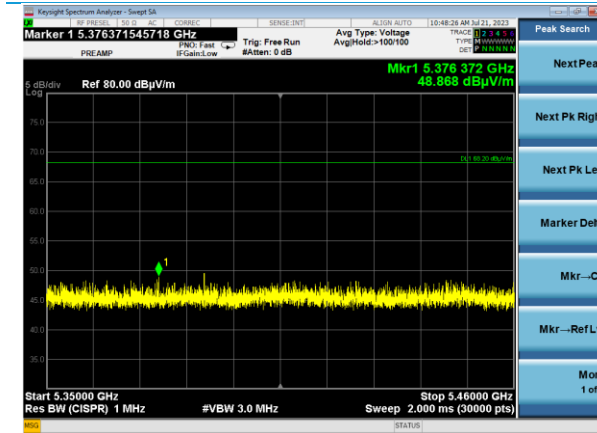
Company: Ethicon	Page 26 of 36	Name: Ethicon Communications Module
Report: TR 3727 A		Model: ETHCM
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5350-5460 MHz | Peak Trace | Horizontal
Channel 64 | MCS0



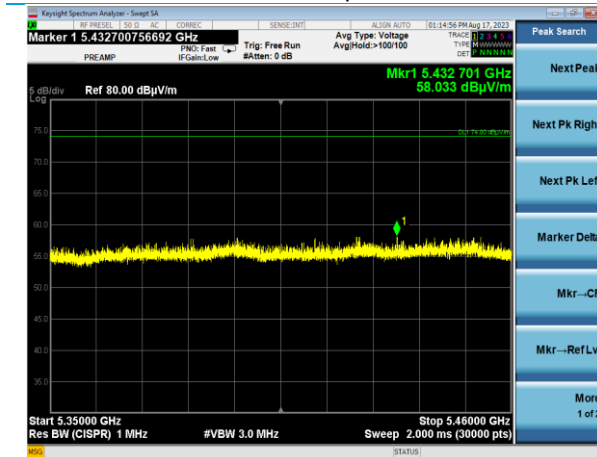
5350-5460 MHz | Average Trace | Horizontal
Channel 64 | MCS0



5350-5460 MHz | Peak Trace | Vertical
Channel 64 | MCS0



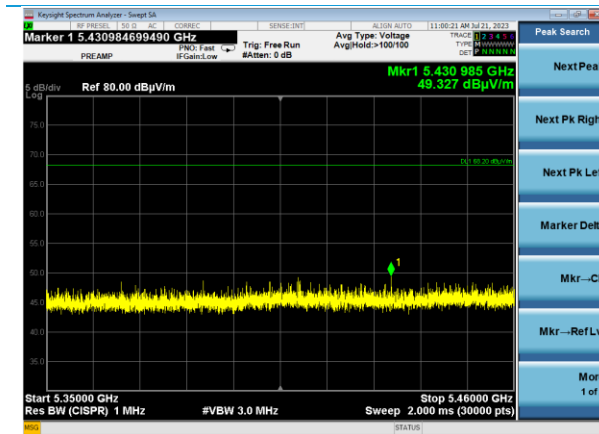
5350-5460 MHz | Average Trace | Vertical
Channel 64 | MCS0



5350-5460 MHz | Peak Trace | Horizontal
Channel 100 | 6 Mbps



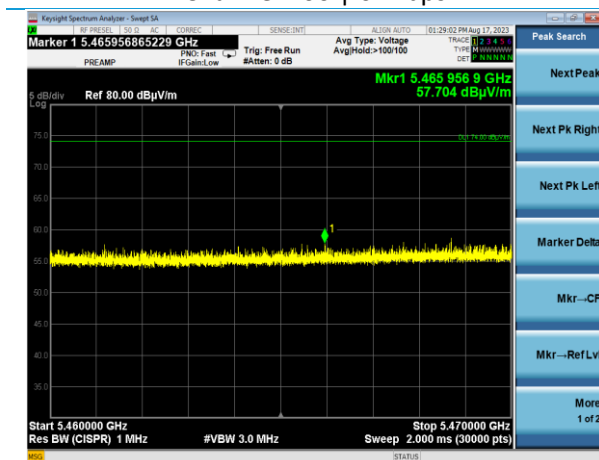
5350-5460 MHz | Average Trace | Horizontal
Channel 100 | 6 Mbps



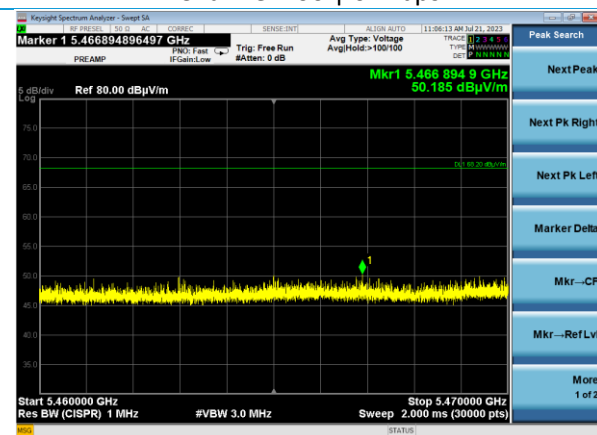
5350-5460 MHz | Peak Trace | Vertical
Channel 100 | 6 Mbps



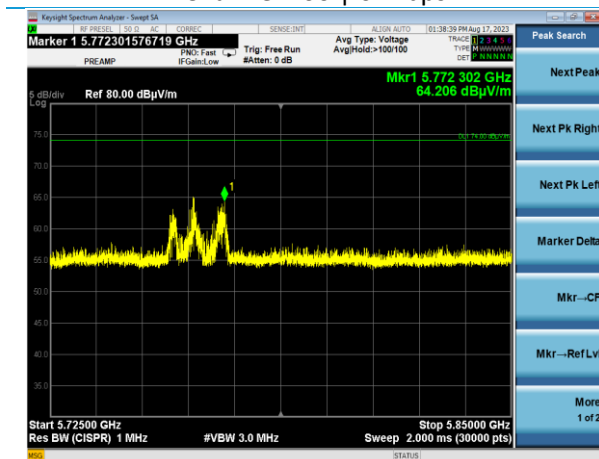
5350-5460 MHz | Average Trace | Vertical
Channel 100 | 6 Mbps



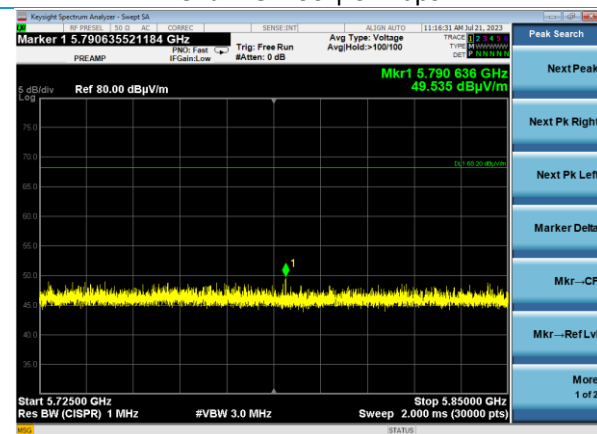
5460-5470 MHz | Peak Trace | Horizontal
Channel 100 | 6 Mbps



5460-5470 MHz | Average Trace | Vertical
Channel 100 | 6 Mbps

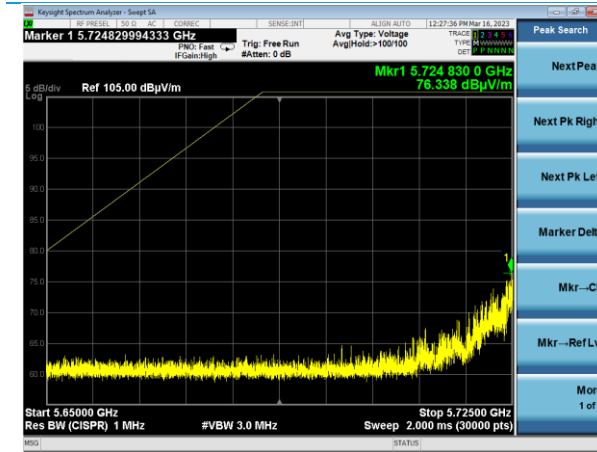


5725-5850 MHz | Peak Trace | Horizontal
Channel 140 | 6 Mbps

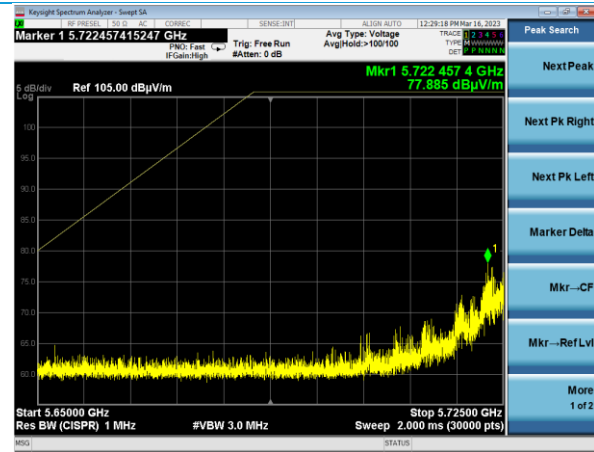


5725-5850 MHz | Average Trace | Vertical
Channel 140 | 6 Mbps

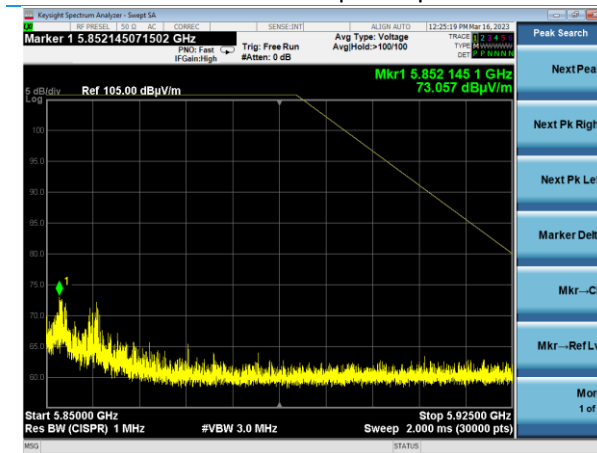
Company: Ethicon	Page 28 of 36	Name: Ethicon Communications Module
Report: TR 3727 A		Model: ETHCM
Quote: NBO-03-2023-006090-1		Serial: CM22308019



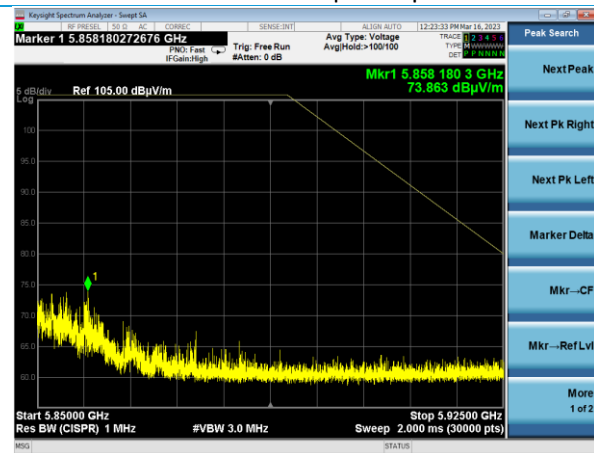
5650-5725 MHz | Peak Trace | Horizontal
Channel 149 | 6 Mbps



5650-5725 MHz | Average Trace | Vertical
Channel 149 | 6 Mbps



5850-5925 MHz | Peak Trace | Horizontal
Channel 149 | 6 Mbps

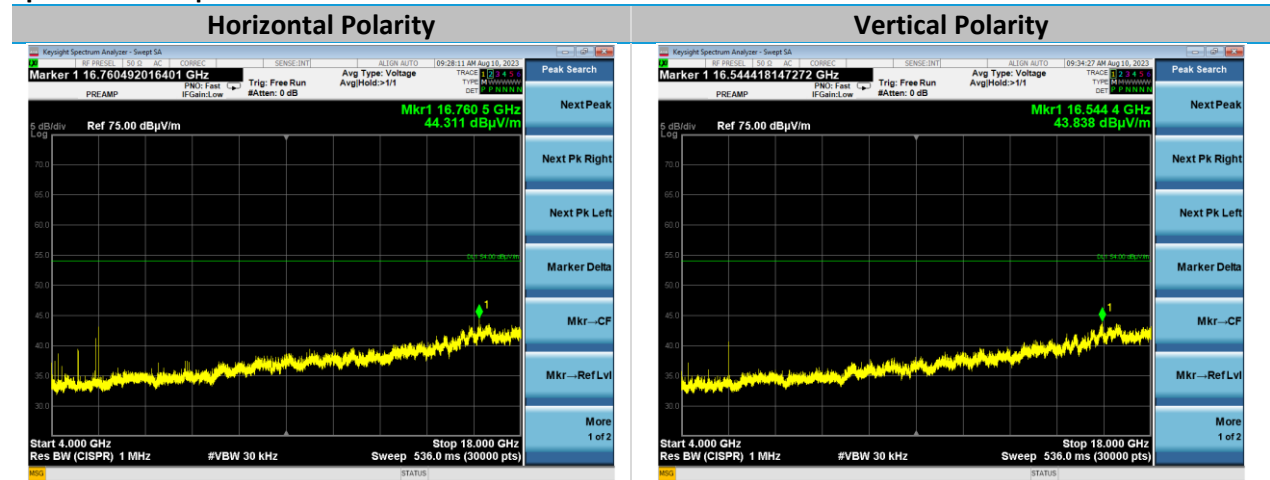


5850-5925 MHz | Average Trace | Vertical
Channel 149 | 6 Mbps

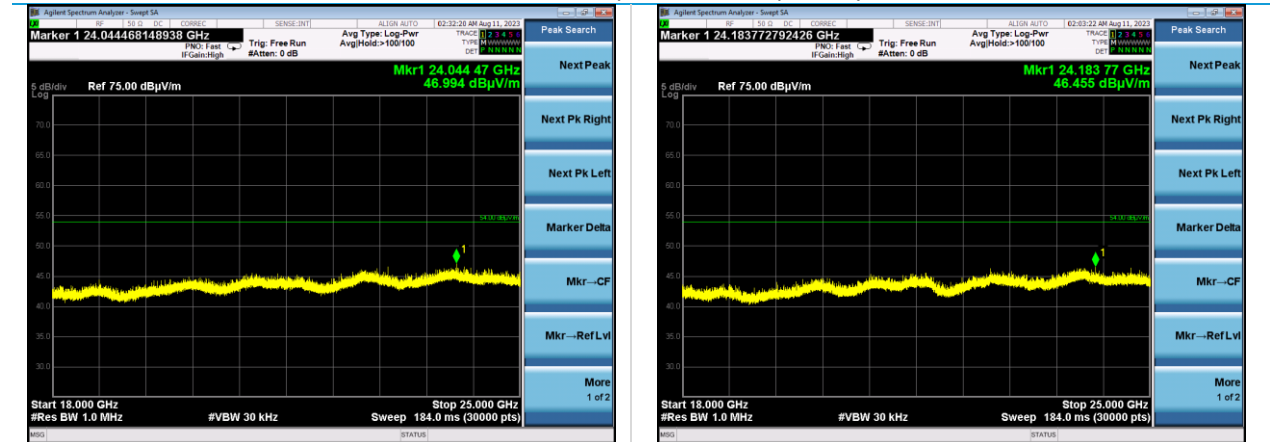
Spurious Measurements

Frequency (MHz)	Polarity	Height (cm)	Azimuth (degree)	Average Reading (dBμV/m)	Average Limit (dBμV/m)	Average Margin (dB)	Peak Reading (dBμV/m)	Peak Limit (dBμV/m)	Peak Margin (dB)	Channel	Data Rate (Mbps)
4873.9	Horizontal	233	88	41.3	54.0	12.7	46.4	74.0	27.6	6	1
4874.0	Vertical	181	62	42.5	54.0	11.5	47.4	74.0	26.6	6	1
7310.2	Horizontal	190	30	42.8	54.0	11.2	48.3	74.0	25.7	6	1
7312.7	Vertical	158	346	45.4	54.0	8.6	47.4	74.0	26.6	6	1
8281.1	Horizontal	107	37	37.4	54.0	16.6	48.2	68.2	20.0	100	6
8280.5	Vertical	375	45	40.0	54.0	14.0	50.4	68.2	17.8	100	6
11026.9	Horizontal	145	45	35.8	54.0	18.2	48.2	68.2	20.0	100	6
11026.8	Vertical	217	55	37.4	54.0	16.6	51.6	68.2	16.6	100	6

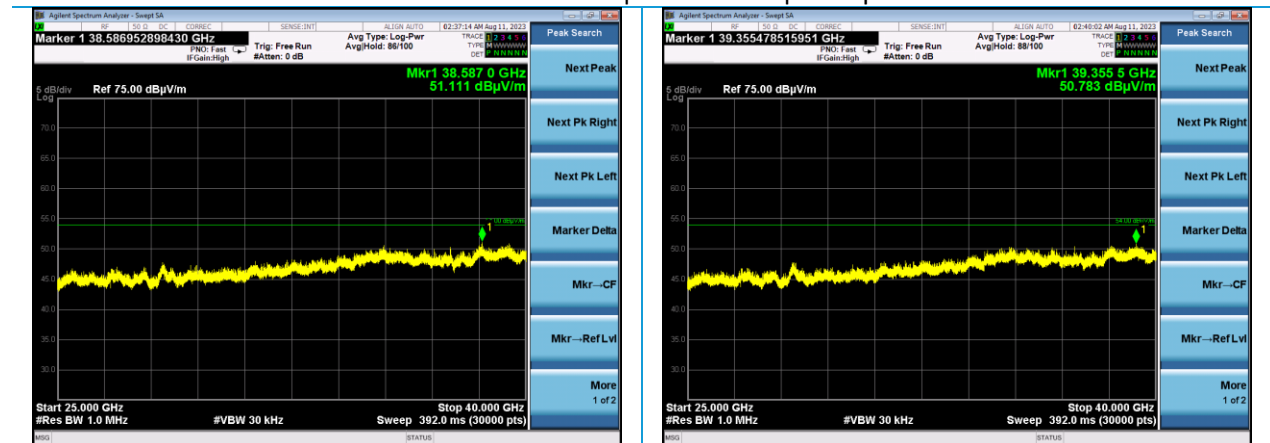
Spurious Plots | BLE



4000-18000 MHz | Channel 17 | 1 Mbps



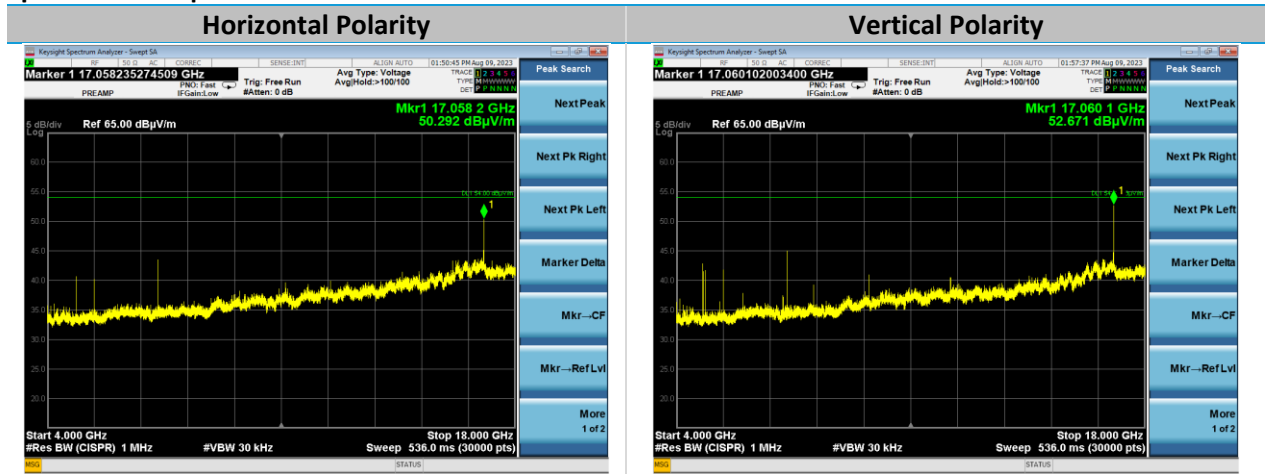
18000-25000 MHz | Channel 17 | 1 Mbps



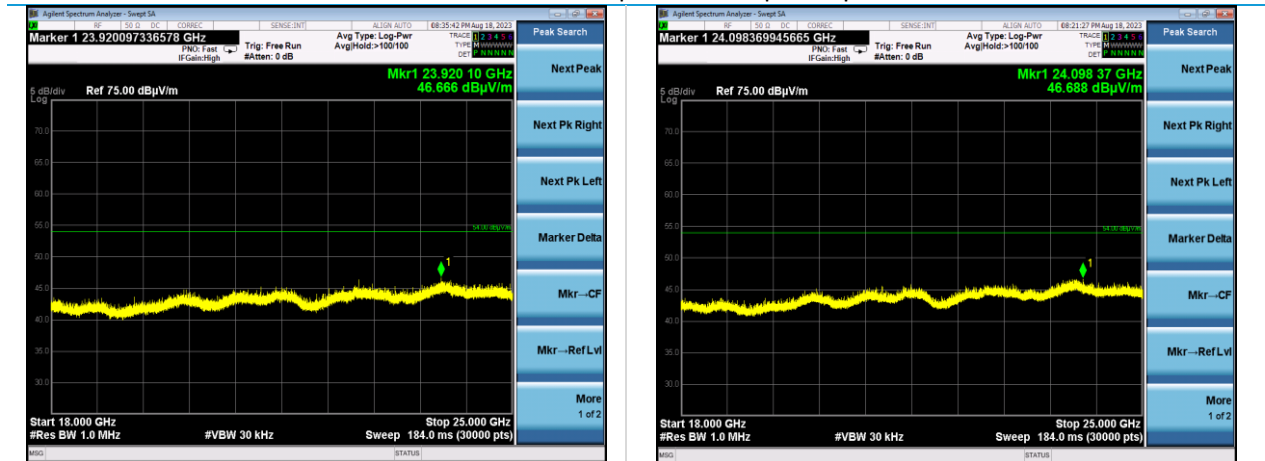
25000-40000 MHz | Channel 17 | 1 Mbps

Company: Ethicon	Page 30 of 36	Name: Ethicon Communications Module
Report: TR 3727 A		Model: ETHCM
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Spurious Plots | 2.4 GHz WLAN



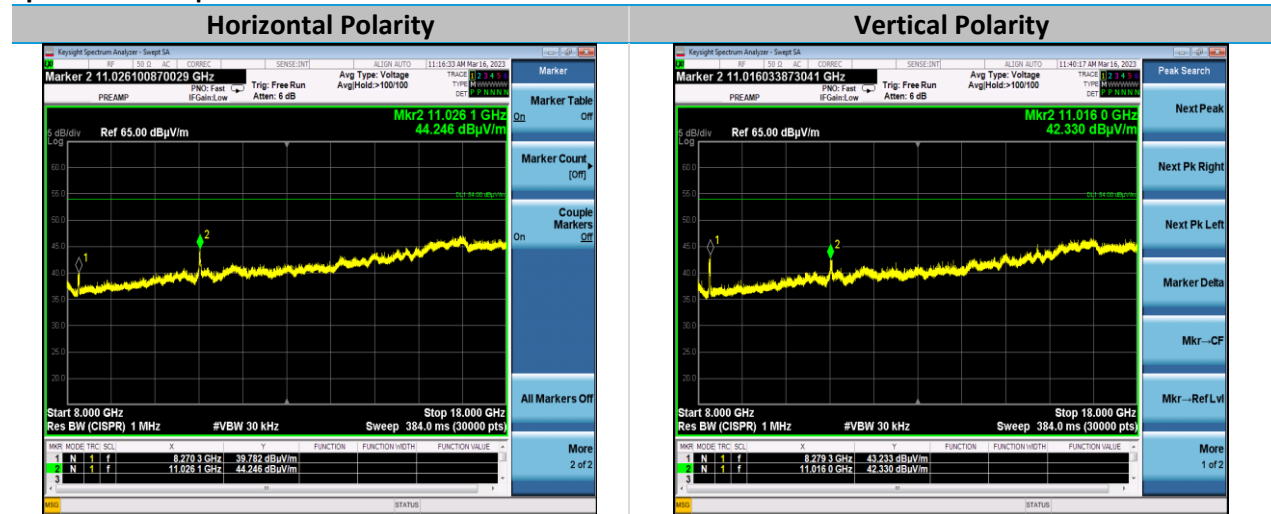
4000-18000 MHz | Channel 6 | 1 Mbps



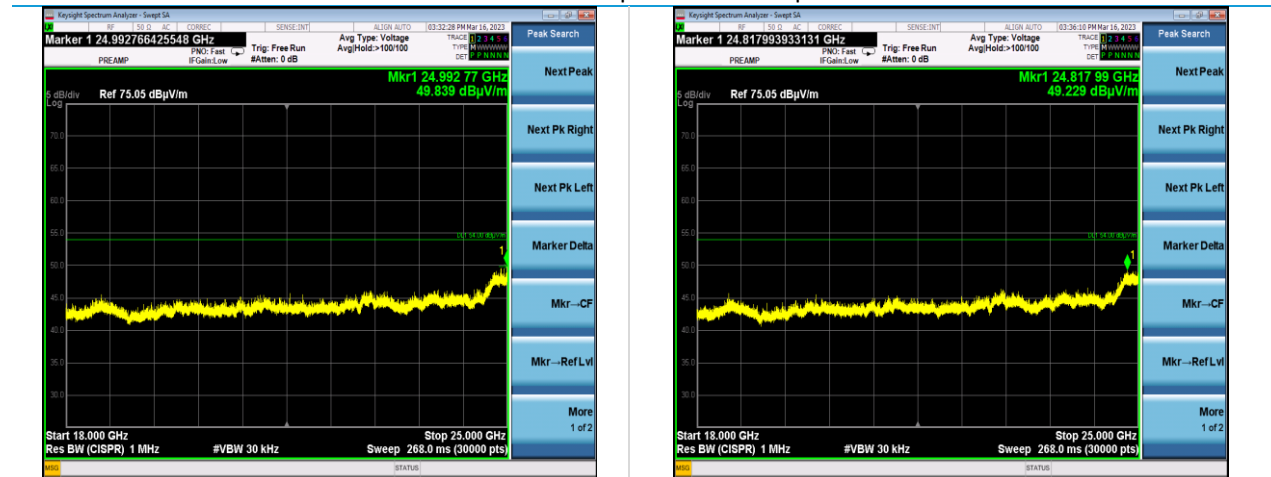
18000-25000 MHz | Channel 6 | 1 Mbps

Company: Ethicon	Page 31 of 36	Name: Ethicon Communications Module
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Spurious Plots | 5 GHz WLAN



8000-18000 MHz | Channel 102 | MCS0



18000-25000 MHz | Channel 102 | MCS0



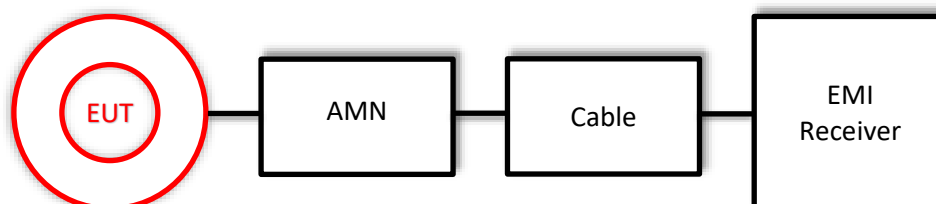
25000-40000 MHz | Channel 102 | MCS0

Company: Ethicon	Page 32 of 36	Name: Ethicon Communications Module
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5.2 AC Mains Conducted Emissions

	A line impedance stabilization network (LISN) or artificial mains network (AMN) allows the emissions of the power supply conductors to be measured while isolating the EUT from the supply mains.
Description of Measurement	The AMN, cable, and other necessary measurement system correction factors are loaded onto the EMI receiver when the measurements are performed. The data is gathered and reported as the corrected values. Maximum emissions are determined with a peak max hold trace then measurements at a selection of the highest points are made with quasi-peak and average detectors. Results are recorded and compared to limit for each line. (e.g. line and neutral)
Example Calculations	Measurement (dBμV) + Cable factor (dB) + Other (dB) = Corrected Reading (dBμV) Margin (dB) = Limit (dBμV) - Corrected Reading (dBμV)

Block Diagram



5.2.1 AC Mains Conducted Emissions

Operator	Jon Dille	QA	Anthony Smith
Temperature	21.7°C	R.H. %	20.80%
Test Date	03/14/2023	Location	Conducted Bench
Requirement	FCC 15.207 RSS-GEN	Method	ANSI C63.10

Limits:

Frequency (MHz)	Quasi-Peak Limit (dBμV/m)	Average Limit (dBμV/m)
0.15-0.5	66.0-56.0*	56.0-46.0*
0.5-5	56.0	46.0
5-30	60.0	50.0

*Decreases with the logarithm of the frequency.

Test Parameters

Frequency	0.15-30 MHz	Distance	40 cm from wall 80 cm from LISN
Detector(s)	Peak Trace Quasi-Peak, Average Final	Table height	80 cm
RBW	9 kHz	VBW	62 kHz

Instrumentation

Asset #	Description	Manufacturer	Model #	Serial #	Date	Due Date	Status
EE 960088	Analyzer – EMI Receiver	Agilent	N9038A	MY51210138	04/10/2023	04/10/2024	Active Calibration
EE 960162	LISN	COM-POWER	LI-215A	191969	04/10/2023	04/10/2024	Active Calibration
LSC-213	Cable	Micro-Coax	UFB311A-0-2160-70U70U	64639 224068-001	04/25/2022	04/25/2024	Active Verification

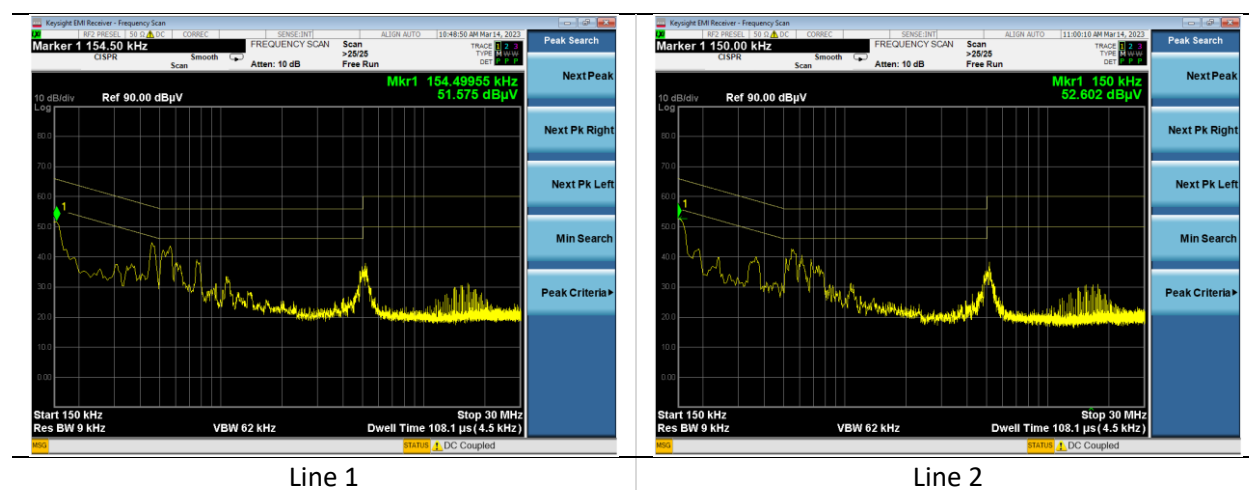
EUT Parameters

Input Power	120 VAC @ 60 Hz	Mode	NFC Read Active Antenna port shunted with 47Ω Resistor per KDB 174176
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Table

Line	Frequency (MHz)	Quasi-Peak Reading (dBμV)	Quasi-Peak Limit (dBμV)	Quasi-Peak Margin (dB)	Average Reading (dBμV)	Average Limit (dBμV)	Average Margin (dB)
1	0.154	49.5	65.8	16.3	37.7	55.8	18.1
1	0.554	38.9	65.0	17.1	27.5	46.0	18.5
1	5.135	34.8	60.0	25.2	22.2	50.0	27.8
2	0.154	52.3	65.8	13.5	40.0	55.8	15.8
2	0.588	40.2	56.0	15.8	26.7	46.0	19.3

Plots



6 REVISION HISTORY

Version	Date	Notes	Person
0.0	11/20/2023	Initial Draft	Adam Hauke
0.1	03/24/2025	Updated Draft	Adam Alger
1	03/25/2025	Final	Adam Alger

END OF REPORT