

Test Report C-3625A

Equipment Under Test: 3350 ADV Series Auto-Darkening Filter Bluetooth Module

Requirement(s): FCC 15.247, RSS-247

Test Date(s): 9/13/2022-12/1/2022

Prepared for: Lincoln Electric
Attn: Hank Rumpke
22801 St. Clair Avenue
Cleveland, OH 44117

Report Issued by: Anthony Smith, EMC Engineering Specialist

Signature: 

Date: 12/7/2022

Report Reviewed by: Adam Alger, Laboratory Manager

Signature: 

Date: 12/7/2022

Report Constructed by: Anthony Smith, EMC Engineering Specialist

Signature: 

Date: 12/7/2022

This test report may not be reproduced, except in full, without approval of Laird Connectivity LLC

Company: Lincoln Electric	Page 1 of 42	Name: 3350 ADV Series Auto-Darkening Filter Bluetooth Module
Report: TR3625A		Model: M29670
Quote: NBO-04-2022-004928		Serial:Engineering Sample

CONTENTS

Contents	2
Laird Connectivity Test Services in Review	3
1 Test Report Summary	4
2 Client Information	5
2.1 Equipment Under Test (EUT) Information	5
2.2 Product Description	5
2.3 Modifications Incorporated for Compliance.....	5
2.4 Deviations and Exclusions from Test Specifications	5
2.5 Additional Information.....	5
3 References	6
4 Uncertainty Summary	7
5 Test Data	8
5.1 Antenna Port Conducted Emissions.....	8
5.2 Radiated Emissions	31
6 Revision History	42

Company: Lincoln Electric	Page 2 of 42	Name: 3350 ADV Series Auto-Darkening Filter Bluetooth Module
Report: TR3625A		Model: M29670
Quote: NBO-04-2022-004928		Serial:Engineering Sample

Laird Connectivity Test Services in Review

The Laird Connectivity LLC 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



**Government
of Canada**

Innovation, Science and Economic Development Canada

Accredited U.S. Identification Number: US0218

Recognition of two 3 meter Semi-Anechoic Chambers

Company: Lincoln Electric	Page 3 of 42	Name: 3350 ADV Series Auto-Darkening Filter Bluetooth Module
Report: TR3625A		Model: M29670
Quote: NBO-04-2022-004928		Serial:Engineering Sample

1 TEST REPORT SUMMARY

During **9/13/2022-12/1/2022** the Equipment Under Test (EUT), **3350 ADV Series Auto-Darkening Filter Bluetooth Module**, as provided by **Lincoln Electric** was tested to the following requirements:

FCC 15.247 / RS-247, DTS

Requirement	Description	Specification	Method	Result
FCC: 15.247 (a)(2) IC: RSS-247 5.2 (a)	Digital Modulation System 6 dB bandwidth	500 kHz	ANSI C63.10	Compliant
FCC: 2.1049 IC: RSS-GEN 6.7	Occupied Bandwidth	Reported	ANSI C63.10	Compliant
FCC: 15.247 (b)(3) IC: RSS-247 5.4 (d)	Maximum Conducted Output Power	30 dBm	ANSI C63.10	Compliant
FCC: 15.247 (e) IC: RSS-247 5.2 (b)	Digital Modulation System Power Spectral Density	8 dBm / 3 kHz	ANSI C63.10	Compliant
FCC: 15.247 (d) IC: RSS-247 5.5	RF Spurious Emissions at the Transmitter Antenna Terminal	20 dBc	ANSI C63.10	Compliant
FCC: 15.247 (d) IC: RSS-GEN 8.10	Spurious Radiated Emissions in Restricted Bands	FCC 15.209 RSS-GEN 8.9	ANSI C63.10	Compliant
FCC: 2.1055 (d) IC: RSS-GEN 6.11	Frequency Stability	Reported	ANSI C63.10	Compliant

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	Lincoln Electric
Contact Person	Hank Rumpke
Address	22801 St. Clair Avenue Cleveland, OH 44117

2.1 Equipment Under Test (EUT) Information

The following information has been supplied by the client

Product Name	3350 ADV Series Auto-Darkening Filter Bluetooth Module
Model Number	M29670
Serial Number	Engineering Sample
Additional Information	FCC ID: 2AJY8-LEB00030451 IC ID: 22017-LEB00030451

2.2 Product Description

The 3350 ADV Series Auto-Darkening Filter Bluetooth Module gives fifth generation VIKING™ welding helmets modern communication capabilities for data collection and connection to the Internet-of-Things. It also provides a simple display and user interface. Antenna is a Yageo 2.4 GHz ceramic chip antenna.

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

Program device with a Laptop via USB to a translator board to the EUT. Test software used is Silicon Labs Direct Test Mode Tool version 0.10.2. Channels tested were 37 (2402 MHz), 17 (2440 MHz), and 39 (2480 MHz) with a 1M and 2M Data Rate.

Company: Lincoln Electric	Page 5 of 42	Name: 3350 ADV Series Auto-Darkening Filter Bluetooth Module
Report: TR3625A		Model: M29670
Quote: NBO-04-2022-004928		Serial: Engineering Sample

3 REFERENCES

Publication	Edition	Date	AMD 1	AMD 2
FCC eCFR	-	2022	-	-
RSS-247	2	2017	-	-
RSS-GEN	5	2018	2019	2021
ANSI C63.10	-	2013	-	-

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 ±
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

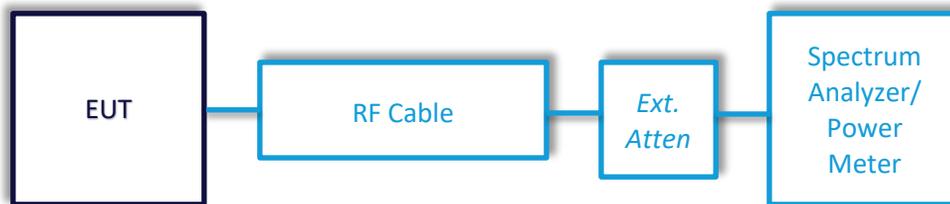
Parameter	ETSI U.C. ±	U.C. ±
Radio Frequency, from F0	1x10 ⁻⁷	0.55x10 ⁻⁷
Occupied Channel Bandwidth	5 %	2 %
RF conducted Power (Power Meter)	1.5 dB	1.2 dB
RF conducted emissions (Spectrum Analyzer)	3.0 dB	1.7 dB
All emissions, radiated	6.0 dB	5.3 dB
Temperature	1° C	0.65° C
Humidity	5 %	2.9 %
Supply voltages	3 %	1 %

5 TEST DATA

5.1 Antenna Port Conducted Emissions

Description of Measurement	<p>The direct measurement of emissions at the antenna port of the EUT is achieved by use of a RF connection to a spectrum analyzer or power meter.</p> <p>The cable and attenuator factors are loaded into the analyzer or power meter allowing for direct measurement readings without the need for further corrections.</p>
Example Calculations	<p>Measurement (dBm) + Cable factor (dB) + External Attenuator (dB) = Corrected Reading (dBm)</p> <p>Margin (dB) = Limit (dBm) – Corrected Reading (dBm)</p>

Block Diagram



Instrumentation

Asset #	Description	Manufacturer	Model #	Serial #	Date	Due Date	Status
AA 960173	Cable	A.H. Systems, Inc.	SAC-26G-1	388	3/22/2022	3/22/2023	Active Verification
EE 960085	Analyzer - EMI Receiver	Agilent	N9038A	MY51210148	4/11/2022	4/11/2023	Active Calibration
EE 960087	Analyzer - Spectrum	Agilent	N9010A	MY53400296	4/12/2022	4/12/2023	Active Calibration

Company: Lincoln Electric	Page 8 of 42	Name: 3350 ADV Series Auto-Darkening Filter Bluetooth Module
Report: TR3625A		Model: M29670
Quote: NBO-04-2022-004928		Serial:Engineering Sample

5.1.1 DTS Bandwidth

Operator	Anthony Smith	QA	Adam Alger
Temperature	22.2°C, 22.8°C	R.H. %	44%, 42.8%
Test Date	10/4/2022, 10/5/2022	Location	Bench
Requirement	FCC 15.247, RSS-247	Method	ANSI C63.10

Limits: Bandwidth greater than 500 kHz

Test Parameters

Frequency	2402, 2440 2480 MHz	Setup	Conducted
RBW	100 kHz	VBW	300 kHz
Detector(s)	Max Peak Hold	Sweep Time	Auto

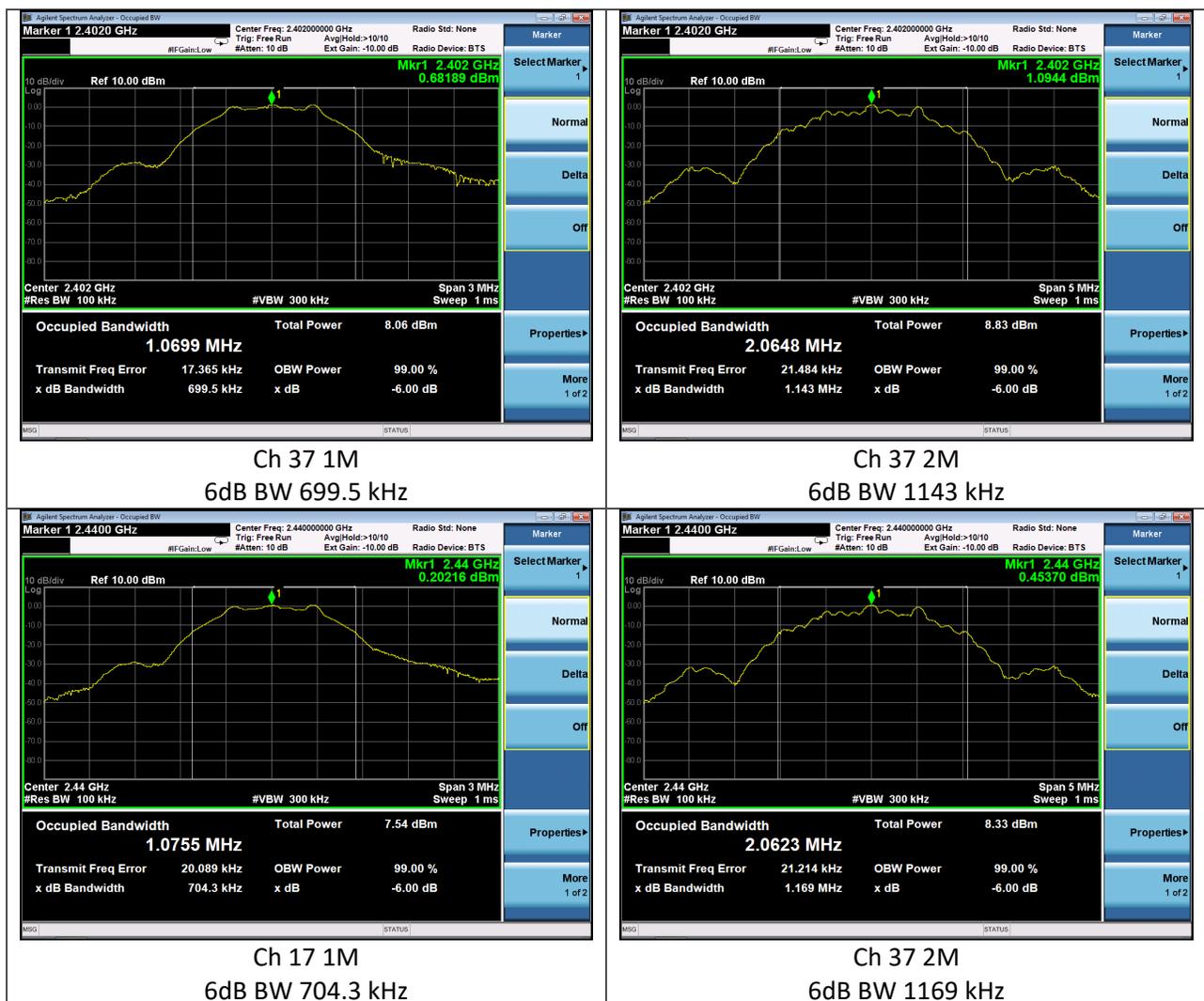
EUT Parameters

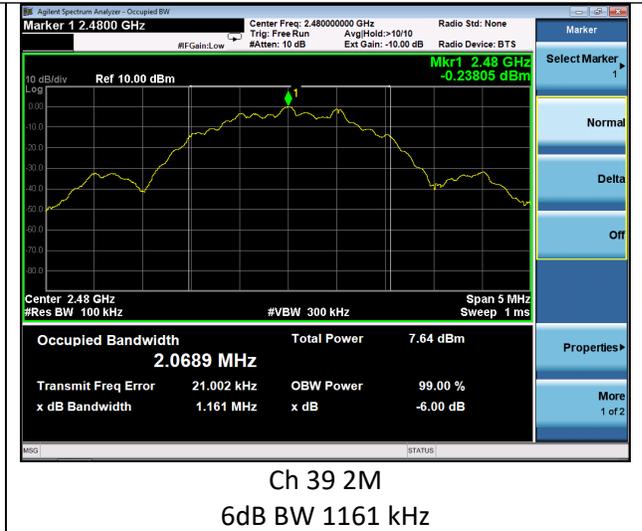
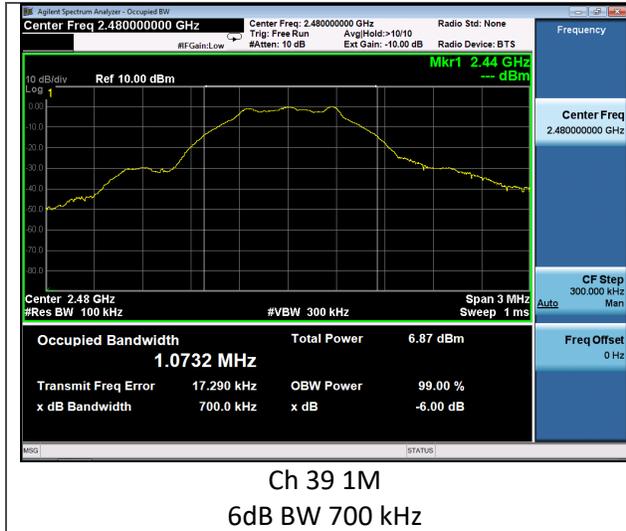
Input Power	USB	Mode	BLE Transmit
Frequency	2402, 2440, 2480 MHz	Channel	37, 17, 39
Data Rate/Modulation	BLE: 1M and 2M		

Data Table

Channel	Data Rate	DTS BW (kHz)	Limit (kHz)	Margin (kHz)
37	BLE 1M	699.5	500	199.5
17	BLE 1M	704.3	500	204.3
39	BLE 1M	700.0	500	200.0
37	BLE 2M	1143	500	643.0
17	BLE 2M	1169	500	669.0
39	BLE 2M	1161	500	661.0

Plots





5.1.2 99% Occupied Bandwidth

Operator	Anthony Smith	QA	Adam Alger
Temperature	22.2°C, 22.8°C	R.H. %	44%, 42.8%
Test Date	10/4/2022, 10/5/2022	Location	Bench
Requirement	FCC 15.247, RSS-247	Method	ANSI C63.10

Limits: Reported

Test Parameters

Frequency	2402, 2440, 2480 MHz	Setup	Conducted
RBW	30 kHz	VBW	100 kHz
Detector(s)	Max Peak Hold	Sweep Time	Auto

EUT Parameters

Input Power	USB	Mode	BLE Transmit
Frequency	2402, 2440, 2480 MHz	Channel	37, 17, 39
Data Rate/Modulation	BLE: 1M and 2M		

Data Table

Channel	Data Rate	99% OBW (MHz)
37	1M	1.05
17	1M	1.05
39	1M	1.05
37	2M	2.06
17	2M	2.06
39	2M	1.99

Plots



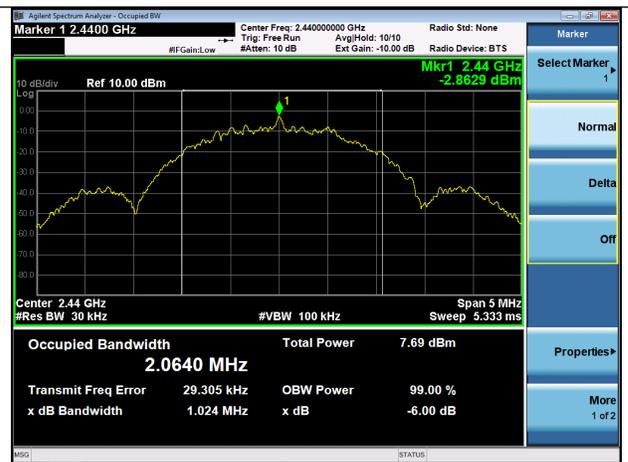
Ch 37 1M
99% OBW 1.05 MHz



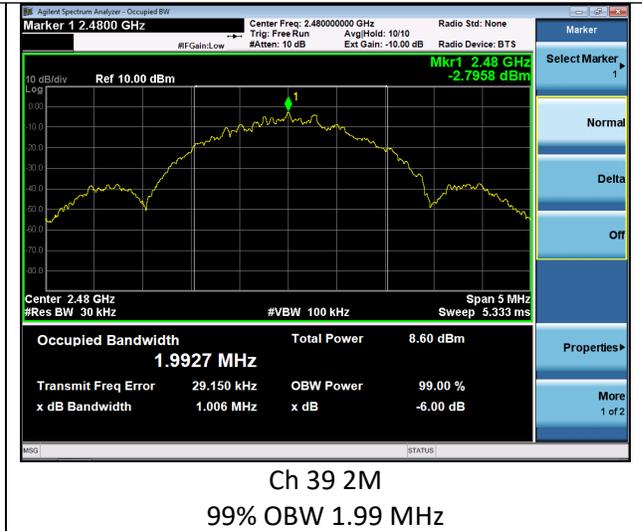
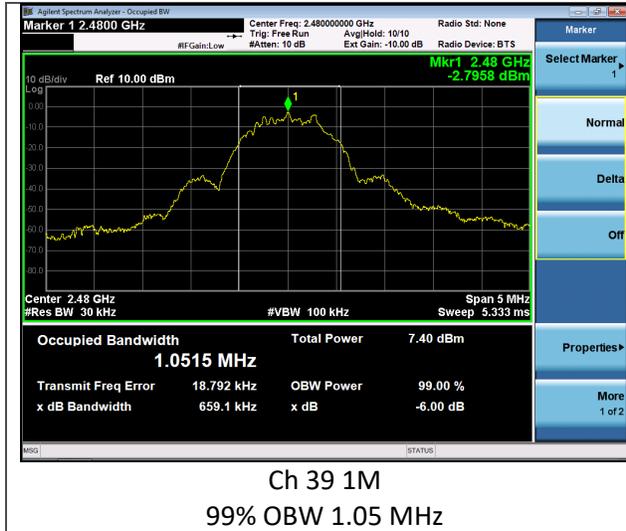
Ch 37 2M
99% OBW 2.06 MHz



Ch 17 1M
99% OBW 1.05 MHz



Ch 17 2M
99% OBW 2.06 MHz



Company: Lincoln Electric	Page 14 of 42	Name: 3350 ADV Series Auto-Darkening Filter Bluetooth Module
Report: TR3625A		Model: M29670
Quote: NBO-04-2022-004928		Serial: Engineering Sample

5.1.3 Peak Output Power

Operator	Anthony Smith	QA	Adam Alger
Temperature	22.2°C, 22.8°C	R.H. %	44%, 42.8%
Test Date	10/4/2022, 10/5/2022	Location	Bench
Requirement	FCC 15.247, RSS-247	Method	ANSI C63.10

Limits: 30 dBm

Test Parameters

Frequency	2402, 2440, 2480 MHz	Setup	Conducted
RBW	3 MHz	VBW	50 MHz
Detector(s)	Max Peak Hold	Sweep Time	Auto

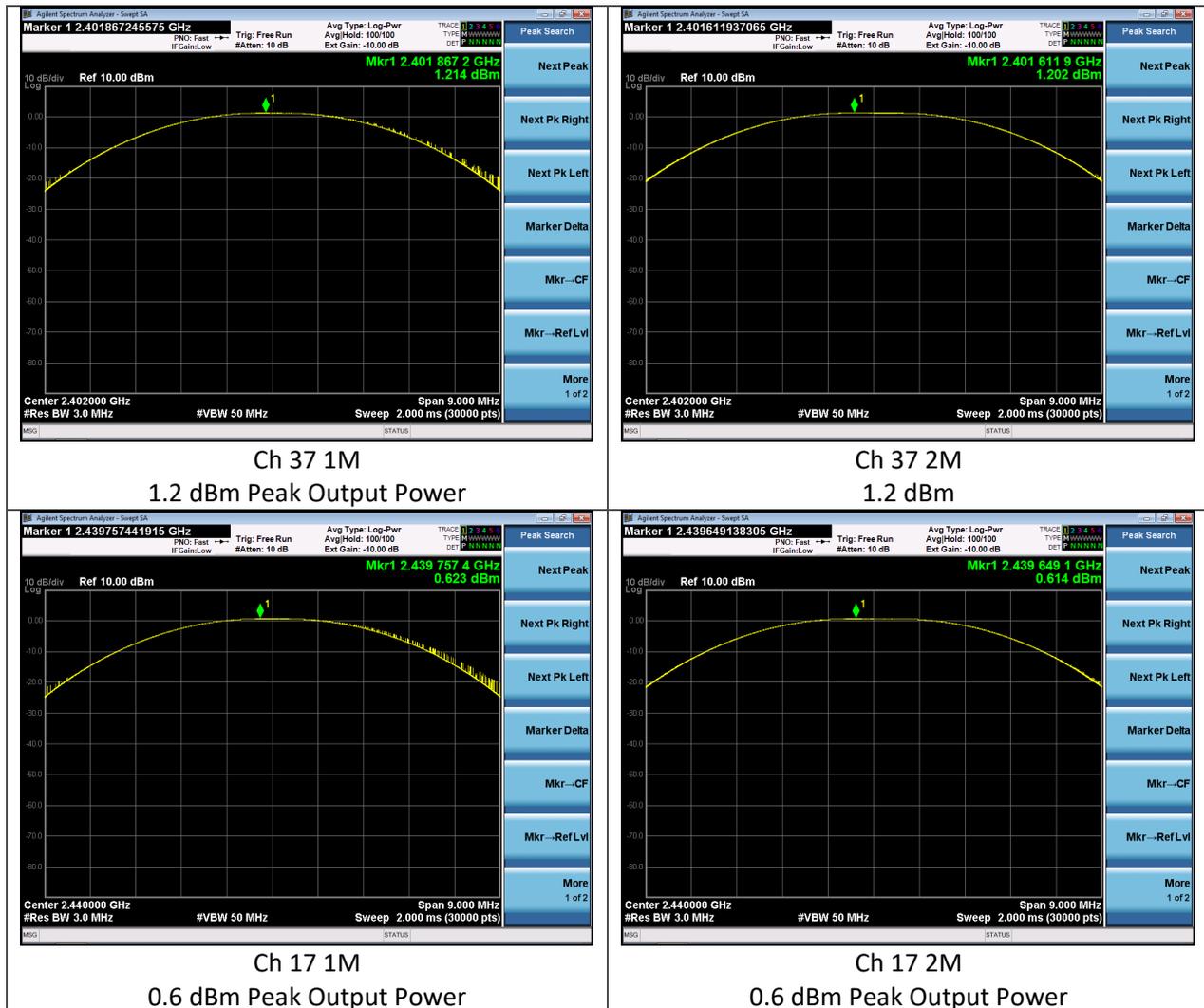
EUT Parameters

Input Power	USB	Mode	BLE Transmit
Frequency	2402, 2440, 2480 MHz	Channel	37, 17, 39
Data Rate/Modulation	BLE: 1M and 2M		

Data Table

Channel	Data Rate	Transmit Power Setting	Peak Output Power (dBm)	Limit (dBm)	Margin (dB)
37	1M	4	1.2	30	28.8
17	1M	4	0.6	30	29.4
39	1M	4	0.0	30	30.0
37	2M	4	1.2	30	28.8
17	2M	4	0.6	30	29.4
39	2M	4	0.0	30	30.0

Plots





Ch 39 1M
0 dBm Peak Output Power



Ch 39 2M
0 dBm Peak Output Power

Company: Lincoln Electric	Page 17 of 42	Name: 3350 ADV Series Auto-Darkening Filter Bluetooth Module
Report: TR3625A		Model: M29670
Quote: NBO-04-2022-004928		Serial: Engineering Sample

5.1.4 Peak Power Spectral Density

Operator	Anthony Smith	QA	Adam Alger
Temperature	22.2°C, 22.8°C	R.H. %	44%, 42.8%
Test Date	10/4/2022, 10/5/2022	Location	Bench
Requirement	FCC 15.247, RSS-247	Method	ANSI C63.10

Limits: 8 dBm / 3 kHz

Test Parameters

Frequency	2402, 2440, 2480 MHz	Setup	Conducted
RBW	100 kHz	VBW	300 kHz
Detector(s)	Max Peak Hold	Sweep Time	Auto

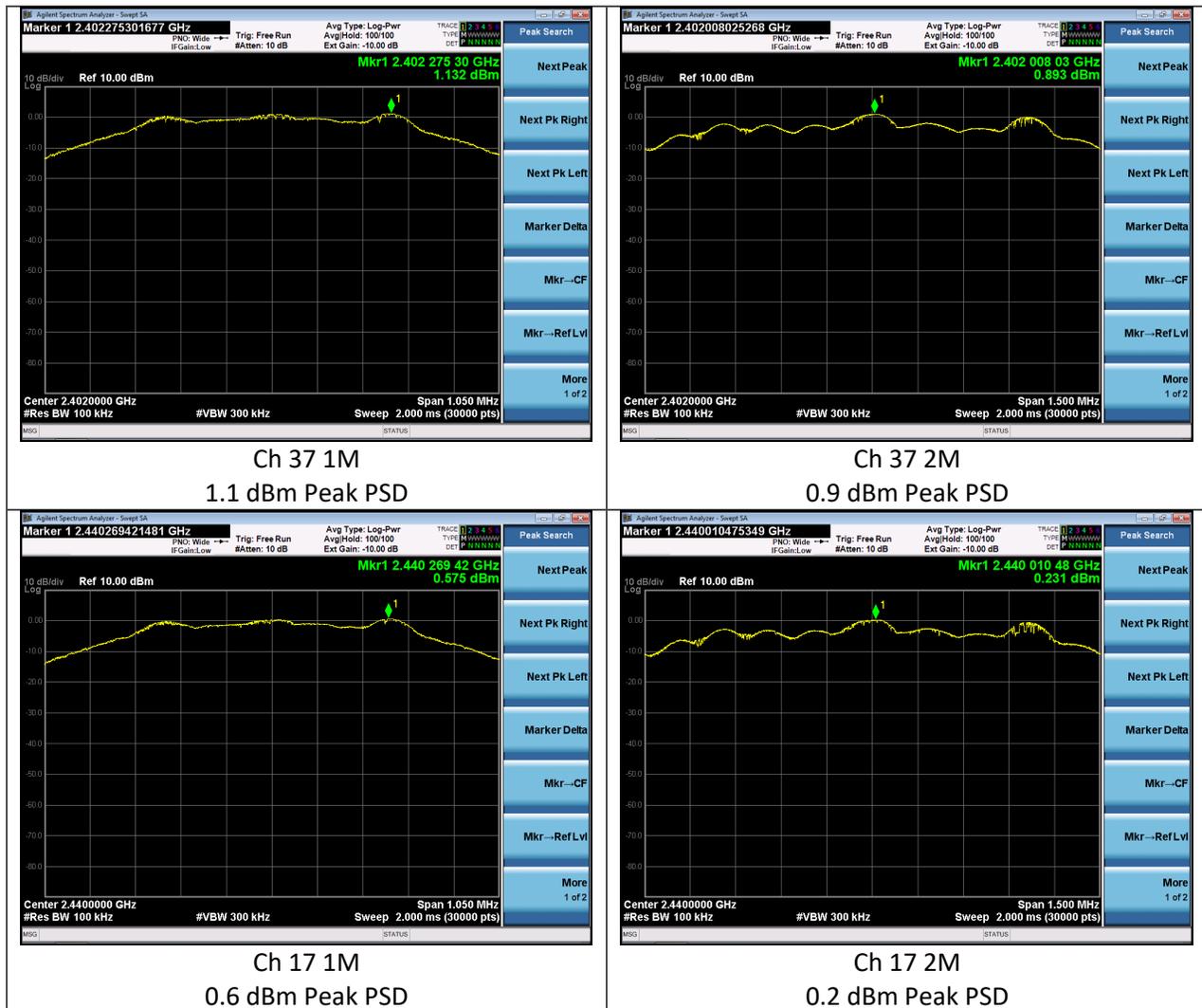
EUT Parameters

Input Power	USB	Mode	BLE Transmit
Frequency	2402, 2440, 2480 MHz	Channel	37, 17, 39
Data Rate/Modulation	BLE: 1M and 2M		

Data Table

Channel	Data Rate	PSD Reading (dBm/100 kHz)	Limit (dBm/3 kHz)	Margin (dB)
37	1M	1.1	8.0	6.9
17	1M	0.6	8.0	7.4
39	1M	-0.1	8.0	8.1
37	2M	0.9	8.0	7.1

Plots



5.1.5 Duty Cycle

Operator	Anthony Smith	QA	Adam Alger
Temperature	20.4°C	R.H. %	38.8%
Test Date	10/14/2022	Location	Bench
Requirement	FCC 15.247, RSS-247	Method	ANSI C63.10

Limits: Reported

Test Parameters

Frequency	2440	Setup	Conducted
RBW	8 MHz	VBW	50 MHz
Detector(s)	Peak	Sweep	5ms

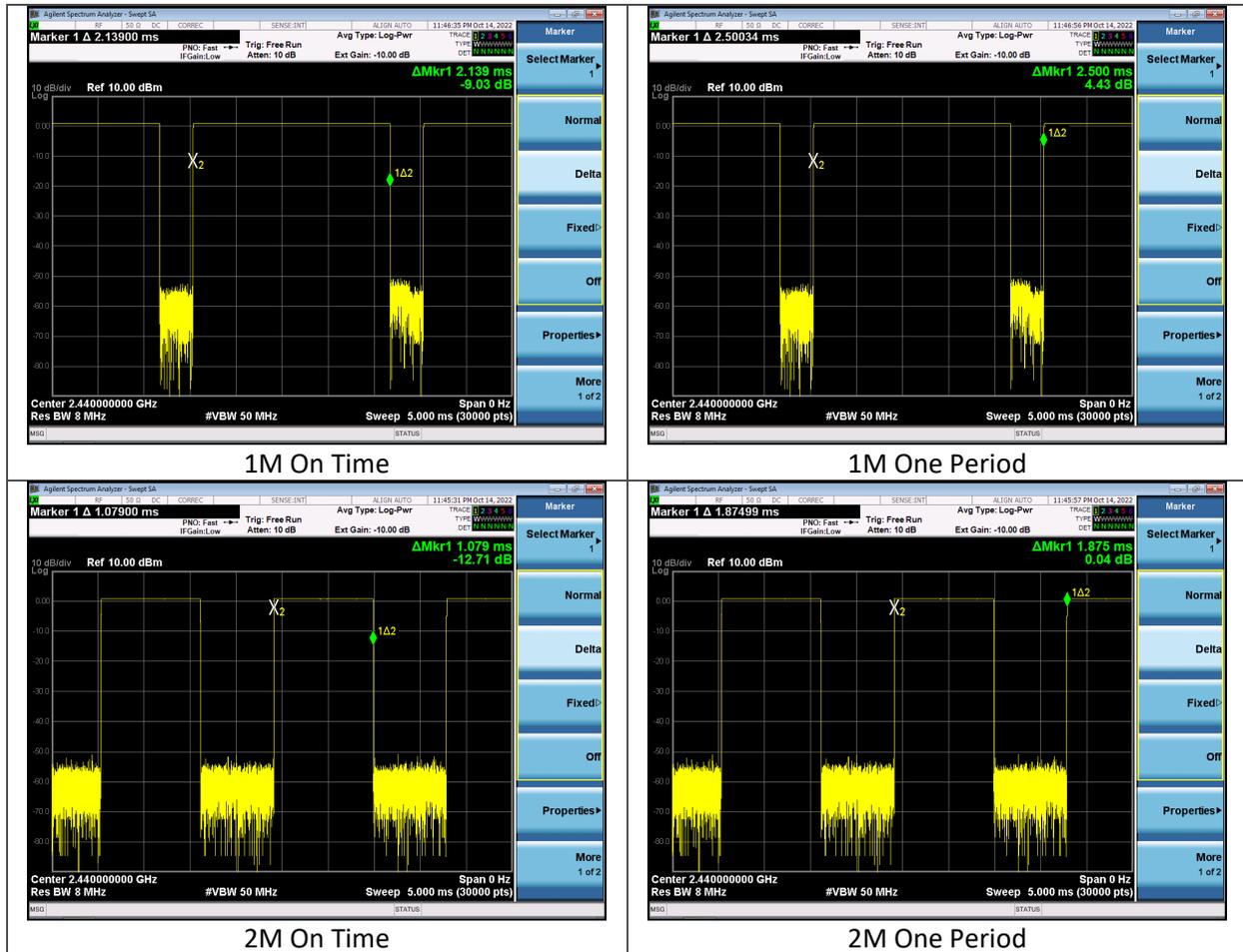
EUT Parameters

Input Power	USB	Mode	BLE Transmit
Frequency	2440 MHz (1M Data Rate) 2440 MHz (2M Data Rate)	Channel	17 (1M Data Rate) 17 (2M Data Rate)
Data Rate/Modulation	BLE: 1M and 2M		

Data Table

Data Rate	Observation Period (ms)	On Time (ms)	One Period (ms)	Duty Cycle (%)
1M	5	2.139	2.500	85.6
2M	5	1.079	1.875	57.5

Plots



5.1.6 Conducted Spurious Emissions

Operator	Anthony Smith	QA	Adam Alger
Temperature	22.2°C, 22.8°C, 20.4°C	R.H. %	44%, 42.8%, 38.8%
Test Date	10/4/2022, 10/5/2022, 10/14/2022	Location	Bench
Requirement	FCC 15.247, RSS-247	Method	ANSI C63.10

Limits: 20 dBc

Reference Level = 1.1 dBm for Data Rate 1M. 0.9 dBm for Data Rate 2M.

Limit = -18.9 dBm for Data Rate 1M. -19.1 dBm for Data Rate 2M.

Test Parameters

Frequency	30 MHz – 25 GHz	Setup	Conducted
RBW	100 kHz	VBW	300 kHz
Detector(s)	Max Peak Hold	Sweep Time	Auto
Limit Calculation	Reference Level (dBm) – 20 dB = Limit (dBm)		

EUT Parameters

Input Power	USB	Mode	BLE Transmit
Frequency	2402, 2440, 2480 MHz	Channel	37, 17, 39
Data Rate/Modulation	BLE: 1M and 2M		

Reference Level Plots

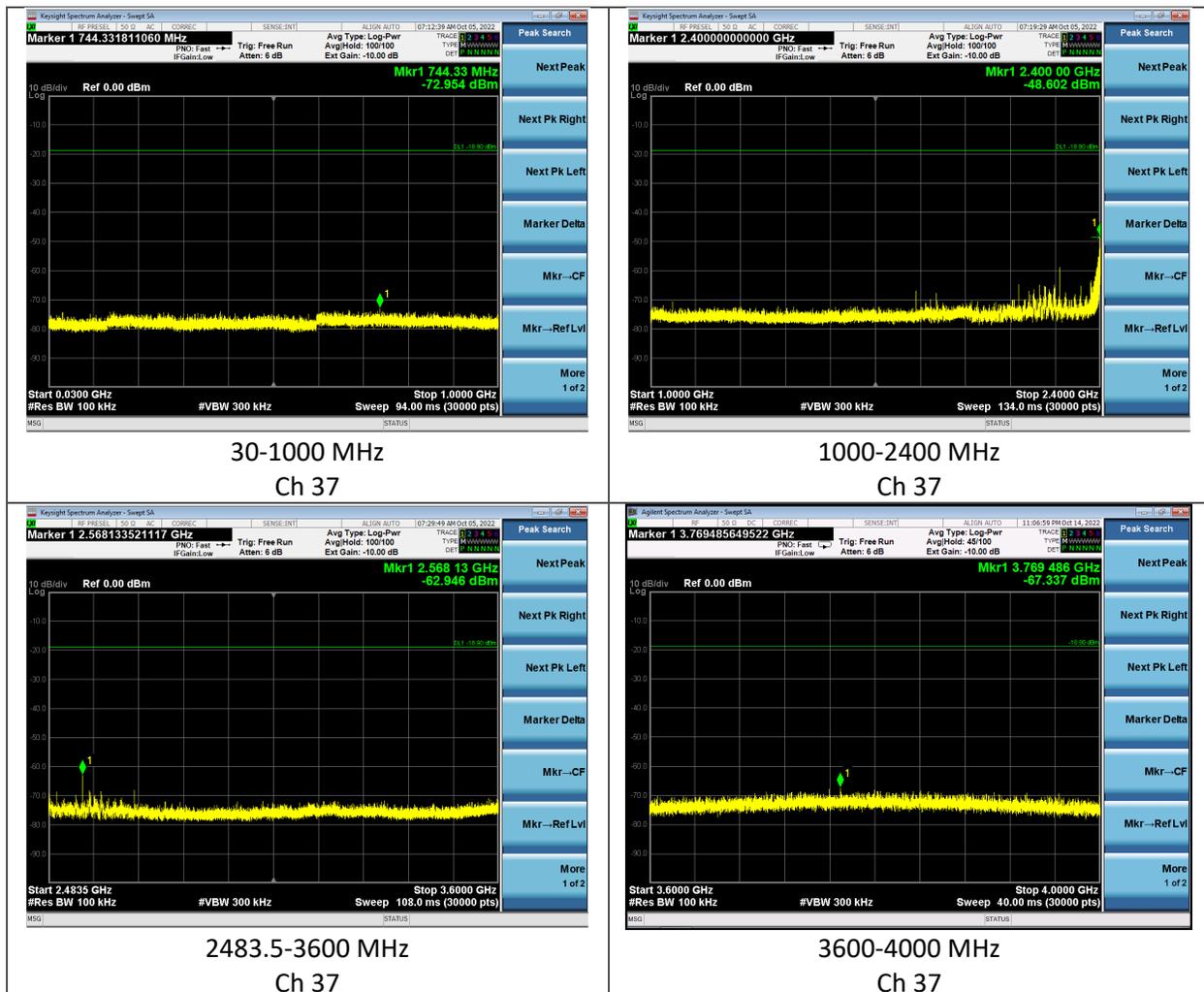


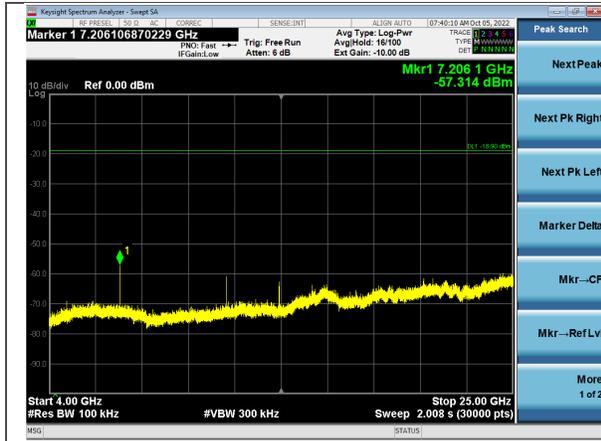
Data Table

Frequency (MHz)	Emission Measurement (dBm)	Limit (dBm)	Margin (dB)	Channel	Data Rate
2400	-48.6	-18.9	29.7	37	1M
7206.1	-57.3	-18.9	38.4	37	1M
2483.5	-51.8	-18.9	32.9	39	1M
7320.9	-57.3	-18.9	38.4	17	1M
2400	-31.2	-19.1	12.1	37	2M
2483.5	-52.2	-19.1	33.1	39	2M
7439.9	-58.7	-19.1	39.6	39	2M

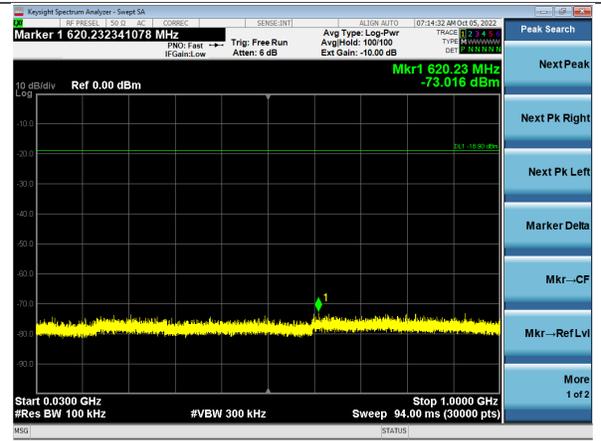
Plots

Data Rate 1M

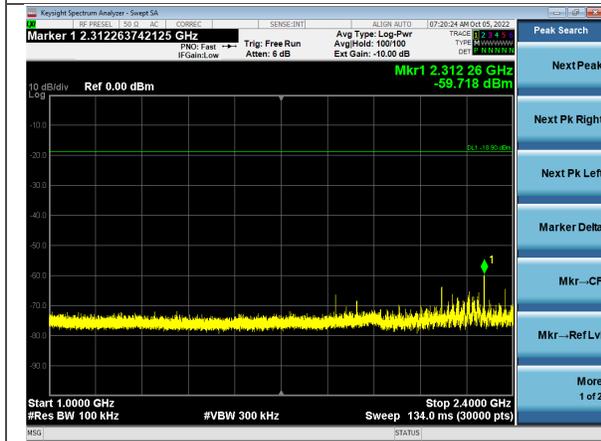




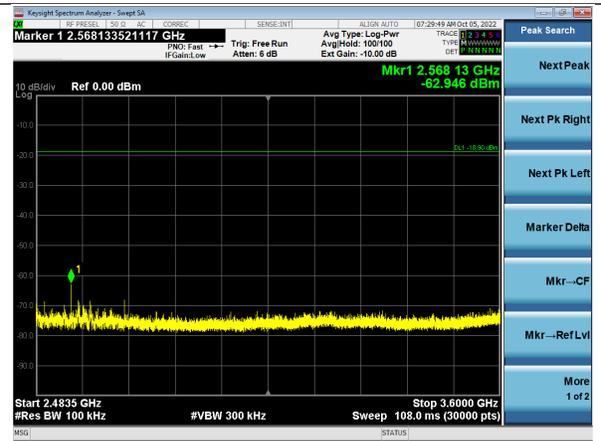
4000-25000 MHz
Ch 37



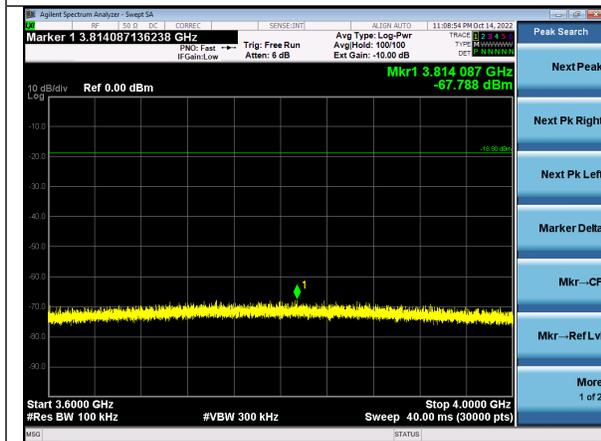
30-1000 MHz
Ch 17



1000-2400 MHz
Ch 17



2483.5-3600 MHz
Ch 17



3600-4000 MHz
Ch 17



4000-25000 MHz
Ch 17

Company: Lincoln Electric

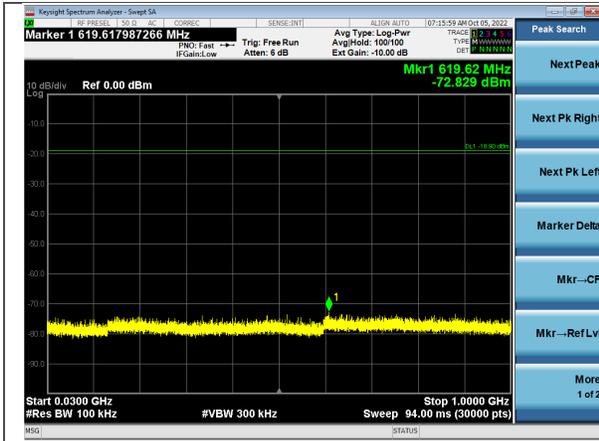
Report: TR3625A

Quote: NBO-04-2022-004928

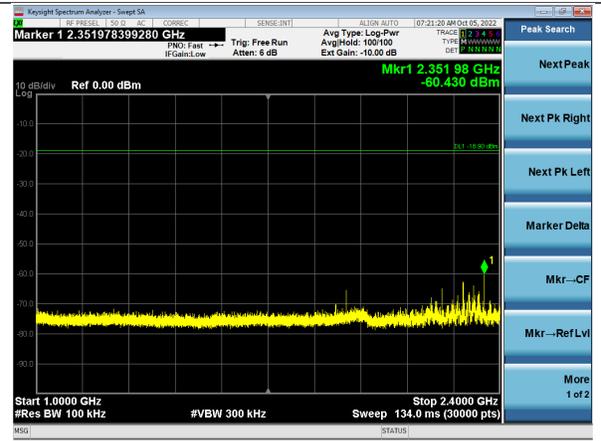
Name: 3350 ADV Series Auto-Darkening
Filter Bluetooth Module

Model: M29670

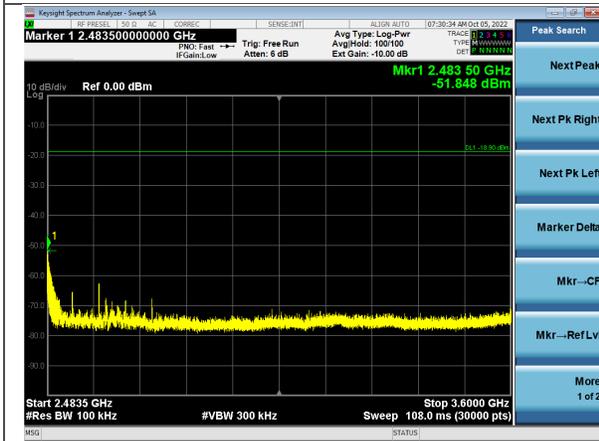
Serial: Engineering Sample



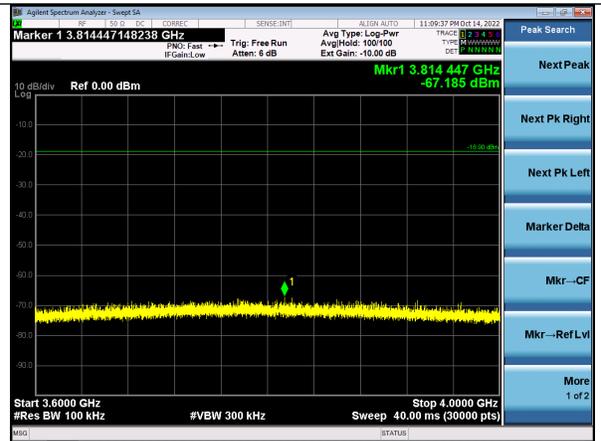
30-1000 MHz
Ch 39



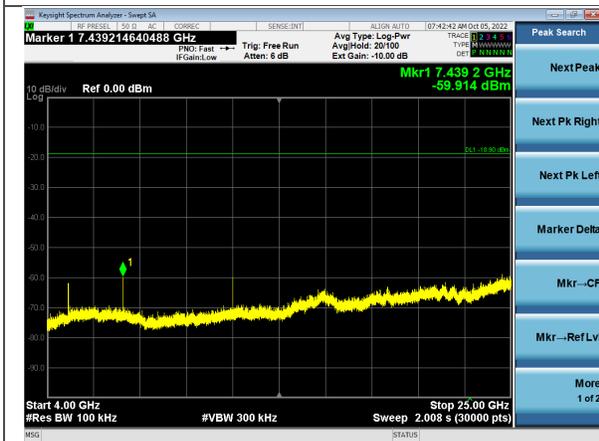
1000-2400 MHz
Ch 39



2483.5-3600 MHz
Ch 39



3600-4000 MHz
Ch 39



4000-25000 MHz
Ch 39

Company: Lincoln Electric

Report: TR3625A

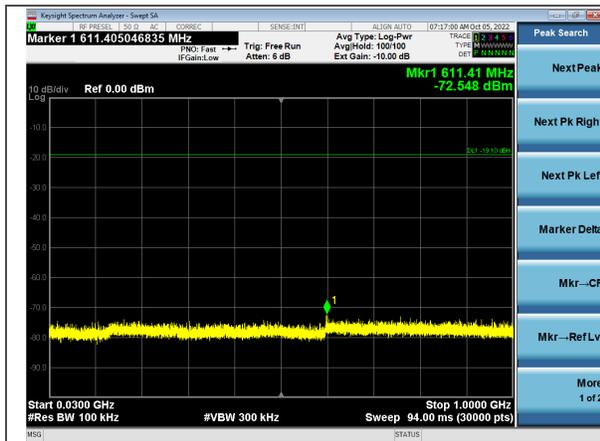
Quote: NBO-04-2022-004928

Name: 3350 ADV Series Auto-Darkening
Filter Bluetooth Module

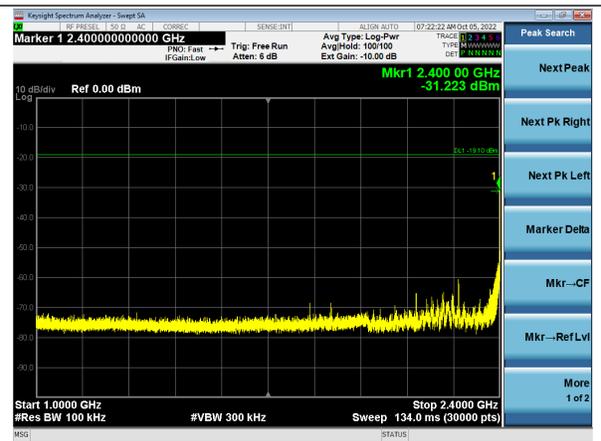
Model: M29670

Serial: Engineering Sample

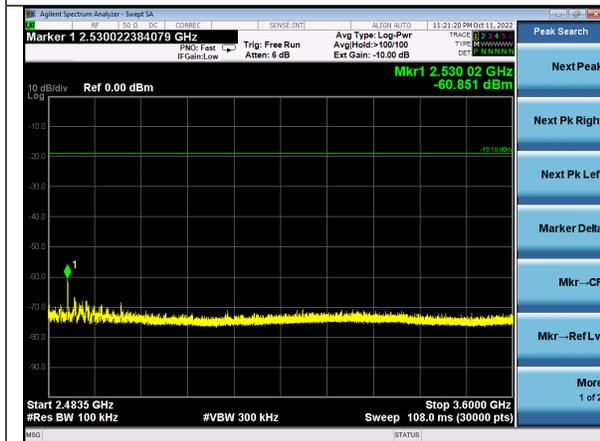
Data Rate 2M



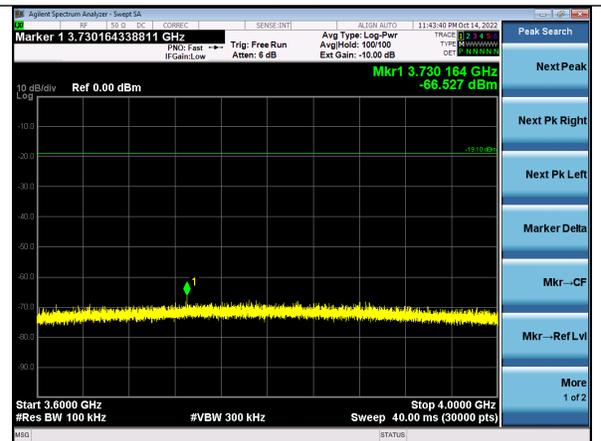
30-1000 MHz
Ch 37



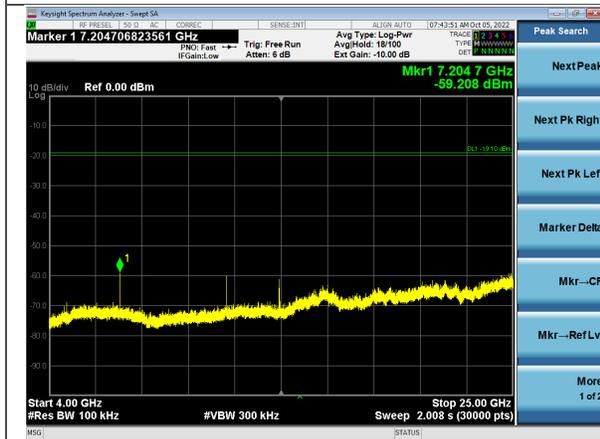
1000-2400 MHz
Ch 37



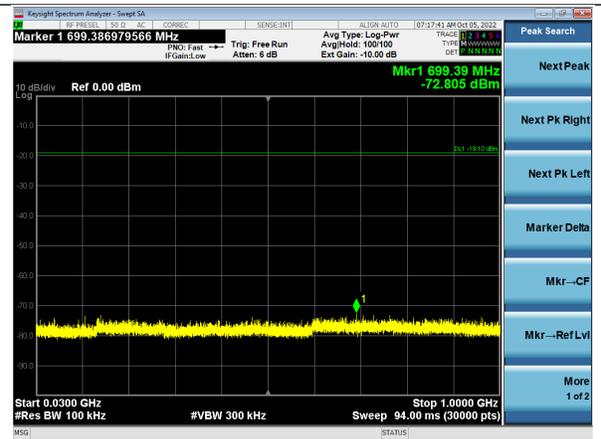
2483.5-3600 MHz
Ch 37



3600-4000 MHz
Ch 37



4000-25000 MHz
Ch 37



30-1000 MHz
Ch 17

Company: Lincoln Electric

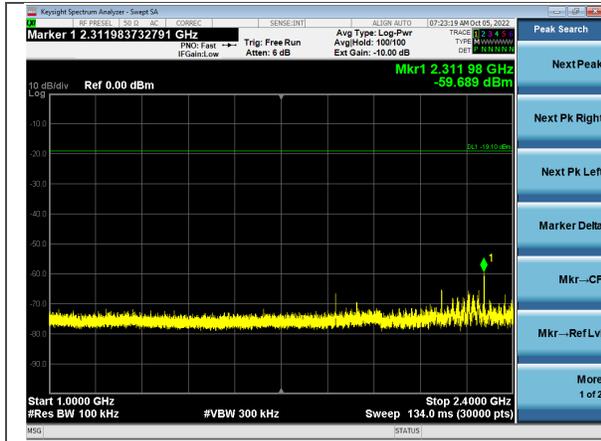
Report: TR3625A

Quote: NBO-04-2022-004928

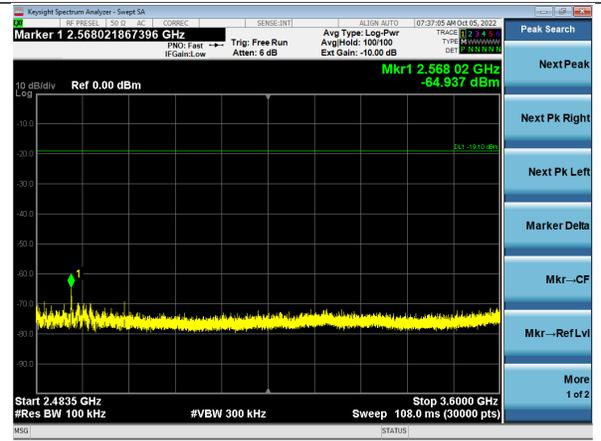
Name: 3350 ADV Series Auto-Darkening
Filter Bluetooth Module

Model: M29670

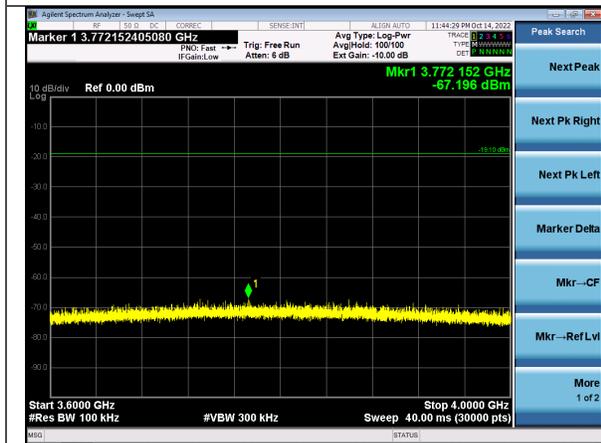
Serial: Engineering Sample



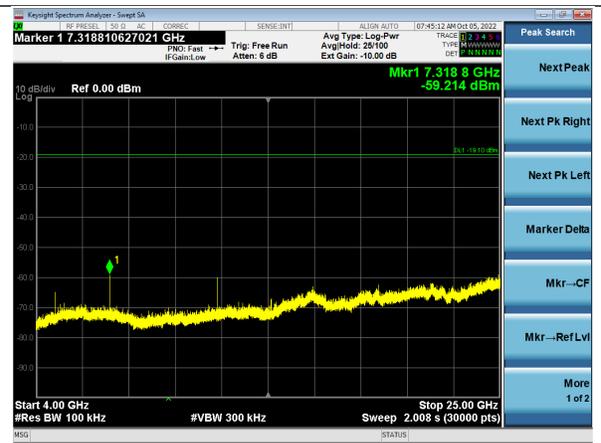
1000-2400 MHz
Ch 17



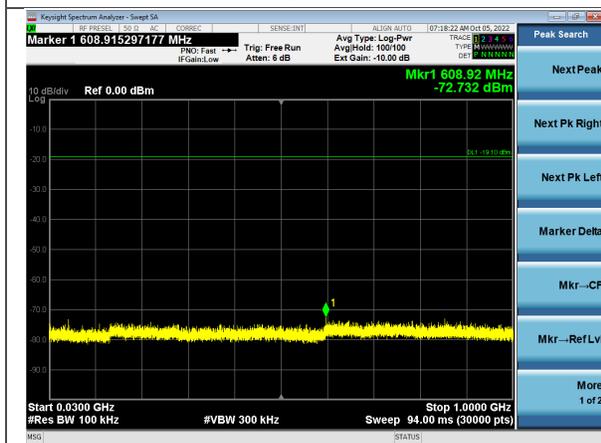
2483.5-3600 MHz
Ch 17



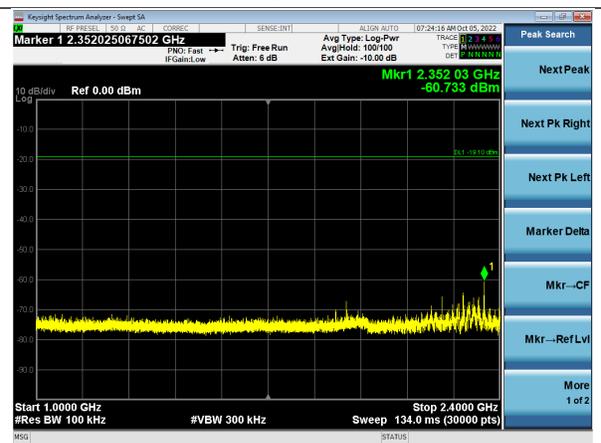
3600-4000 MHz
Ch 17



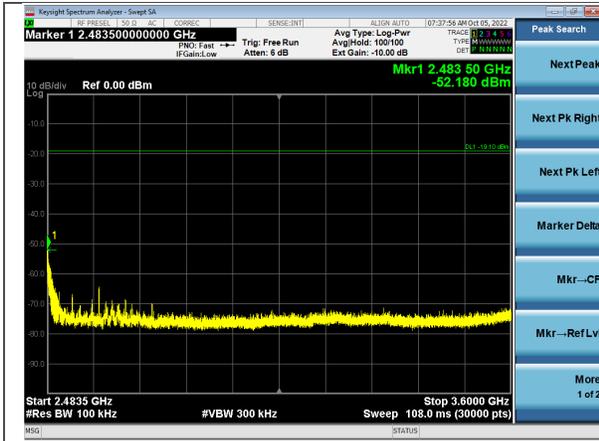
4000-25000 MHz
Ch 17



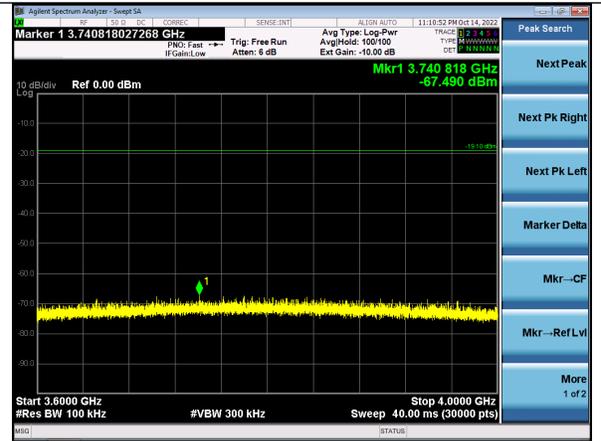
30-1000 MHz
Ch 39



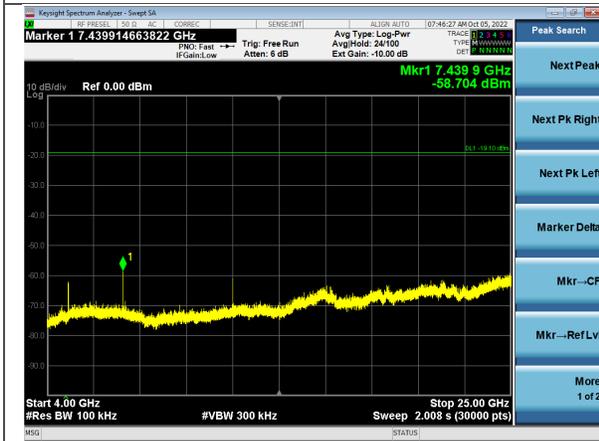
1000-2400 MHz
Ch 39



2483.5-3600 MHz
Ch 39



3600-4000 MHz
Ch 39



4000-25000 MHz
Ch 39

Company: Lincoln Electric

Report: TR3625A

Quote: NBO-04-2022-004928

Name: 3350 ADV Series Auto-Darkening
Filter Bluetooth Module

Model: M29670

Serial: Engineering Sample

5.1.7 Frequency Stability

Operator	Anthony Smith	QA	Adam Alger
Temperature	21.4°C	R.H. %	31.2%
Test Date	12/1/2022	Location	Bench
Requirement	FCC 2.1055 (d) RSS-GEN 6.11	Method	ANSI C63.10 §6.8

Limits: Reported

Test Parameters

Frequency	2402, 2440, 2480 MHz	Setup	Conducted
RBW	1 kHz	VBW	3 kHz

EUT Parameters

Input Power	2.55, 3.00, 3.45VDC via DC Lab Supply	Mode	BLE CW
Frequency	2402, 2440, 2480 MHz	Channel	37, 17, 39

Data Table

Channel	Frequency (Hz) 2.55VDC	Frequency (Hz) 3VDC	Frequency (Hz) 3.45VDC	Deviation (Hz)	Limit (Hz)	Margin (Hz)
37	2402012523	2402012433	2402012574	141	141719	141578
17	2440012571	2440012580	2440012513	67	143961	143894
39	2480012852	2480012851	2480012864	13	146321	146308

5.2 Radiated Emissions

<p>Description of Measurement</p>	<p>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.</p> <p>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.</p> <p>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.</p>
<p>Example Calculations</p>	<p>Measurement (dBμV) + Cable factor (dB) + Other (dB) + Antenna Factor (dB/m) = Corrected Reading (dBμV/m)</p> <p>Margin (dB) = Limit (dBμV/m) - Corrected Reading (dBμV/m)</p> <p>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</p>

Block Diagram



5.2.1 Radiated Emissions – Intentional Radiators

Operator	Anthony Smith	QA	Jon Dilley
Temperature (°C)	24.2, 24.6, 22.3, 22.6, 24.3	R.H. %	47.2, 60.2, 59.1, 41.8, 44.4
Test Date	9/13/2022, 9/14/2022, 9/16/2022, 10/5/2022, 10/6/2022	Location	Chamber 5, Chamber 3
Requirement	FCC 15.247, RSS-247	Method	ANSI C63.10

Limits:

Frequency (MHz)	Quasi Peak Limit (dBuV/m)	Average Limit (dBuV/m)	Peak Limit (dBuV/m)
30-88	40.0	-	-
88-216	43.5	-	-
216-960	46.0	-	-
960-1000	54.0	-	-
1000-25000	-	54.0	74.0

Test Parameters

Frequency	30 MHz – 25 GHz	Distance	3m
Detector(s)	Peak, Quasi-Peak, Average	Table height	80cm Below 1 GHz 150cm Above 1 GHz
RBW	120 kHz Below 1 GHz 1 MHz Above 1 GHz	VBW	1.2 MHz Below 1 GHz 3 MHz Above 1 GHz 1 kHz for Average Measurements 2M Data Rate 470 Hz for Average Measurements 1M Data Rate
Notes	Narrow-Band emissions seen below 1 GHz result from USB programming cable and translator board. Those emissions not present when device powered via DC Bench Power Supply.		

EUT Parameters

Input Power	USB	Mode	BLE Transmit
Data Rate/Modulation	BLE: 1M and 2M	Channels	37, 17, 39

Instrumentation

Asset #	Description	Manufacturer	Model #	Serial #	Date	Due Date	Status
AA 960007	Antenna - Double Ridge Horn	EMCO	3115	9311-4138	8/23/2022	8/23/2023	Active Calibration
AA 960081	Antenna - Double Ridge Horn	EMCO	3115	6907	9/27/2022	9/27/2023	Active Calibration
AA 960153	Filter - High Pass 2.4 GHz	KWM	HPF-L-14186	7272-04	4/13/2022	4/13/2023	Active Calibration
AA 960158	Antenna - Double Ridge Horn	ETS Lindgren	3117	109300	9/27/2021	9/27/2023	Active Calibration
AA 960163	Antenna - Log Periodic	A.H. Systems, Inc.	SAS-512-2	500	8/25/2022	8/25/2023	Active Calibration
AA 960171	Cable	A.H. Systems, Inc.	SAC-26G-6	386	3/22/2022	3/22/2023	Active Verification
AA 960174	Antenna - Small Horn	ETS Lindgren	3116C-PA	00206880	9/27/2022	9/27/2023	Active Calibration
AA 960211	Antenna - Low Noise Amplifier	Mini-Circuits	ZVA-213X-S+	977711030	9/27/2021	9/27/2023	Active Calibration
AA 960218	Antenna - Biconical	A.H. Systems, Inc.	SAS-540	853	6/9/2022	6/9/2023	Active Calibration
EE 960085	Analyzer - EMI Receiver	Agilent	N9038A	MY51210148	4/11/2022	4/11/2023	Active Calibration
EE 960203	Analyzer - EMI Receiver	Keysight	N9038A	MY56400072	4/13/2022	4/13/2023	Active Calibration
LSC-300	Cable	Chamber 3 Emissions	-	-	4/26/2022	4/26/2023	Active Verification
LSC-500	Cable	Chamber 5 Emissions	-	-	4/25/2022	4/25/2023	Active Verification

Company: Lincoln Electric	Page 33 of 42	Name: 3350 ADV Series Auto-Darkening Filter Bluetooth Module
Report: TR3625A		Model: M29670
Quote: NBO-04-2022-004928		Serial: Engineering Sample

Data Tables

30-1000 MHz

Frequency (MHz)	Antenna Polarity	Height (cm)	Azimuth (degree)	Quasi-Peak Reading (dB μ V/m)	Quasi-Peak Limit (dB μ V/m)	Quasi-Peak Margin (dB)	EUT Orientation	Channel
107.9	V	100	87	35.4	43.5	8.1	Vertical	17
84.1	V	100	223	30.4	40.0	9.6	Vertical	17
107.9	H	141	107	31.5	43.5	12.0	Vertical	17
227.5	H	130	251	36.6	46.0	9.4	Vertical	17
408.5	V	116	199	32.1	46.0	13.9	Vertical	17

Fundamental Emissions

1M Data Rate

Frequency (MHz)	Antenna Polarity	Height (cm)	Azimuth (degree)	Peak Reading (dB μ V/m)	EUT Orientation	Channel
2402.2	H	363	207	94.0	Vertical	37
2402.1	V	237	200	92.0	Vertical	37
2402.2	V	363	139	94.9	Horizontal	37
2402.1	H	141	157	92.0	Horizontal	37
2401.8	H	145	33	91.8	Flat	37
2402.1	V	262	238	86.0	Flat	37
2480.4	V	124	214	92.3	Horizontal	39

2M Data Rate

Frequency (MHz)	Antenna Polarity	Height (cm)	Azimuth (degree)	Peak Reading (dB μ V/m)	EUT Orientation	Channel
2401.6	H	150	197	93.4	Vertical	37
2402.4	V	150	49	97.3	Vertical	37
2402.5	V	150	214	93.9	Horizontal	37
2402.4	H	150	310	95.4	Horizontal	37
2402.4	H	150	54	95.8	Flat	37
2402.5	V	150	153	91.2	Flat	37
2480.5	V	150	59	99.7	Vertical	39
2440.5	V	150	54	98.8	Vertical	17

Band Edges

Frequency (MHz)	Antenna Polarity	Height (cm)	Azimuth (degree)	Average Reading (dBµV/m)	Average Limit (dBµV/m)	Average Margin (dB)	EUT Orientation	Data Rate	Channel
2484.2	V	124	214	40.7	54.0	13.3	Horizontal	1M	39
2377.3	V	363	139	40.7	54.0	13.3	Horizontal	1M	37
2389.3	V	150	49	39.6	54.0	14.4	Vertical	2M	37
2483.5	V	150	59	44.5	54.0	9.5	Vertical	2M	39

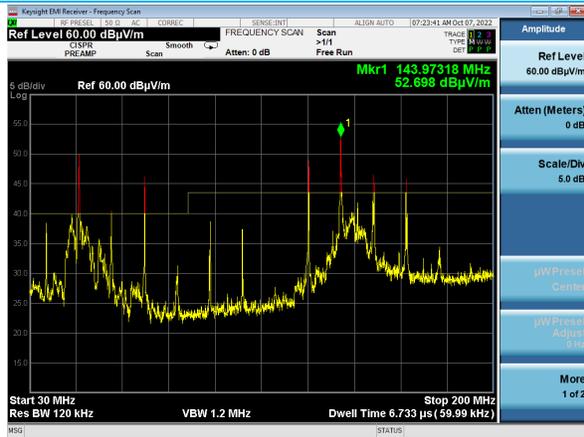
Frequency (MHz)	Antenna Polarity	Height (cm)	Azimuth (degree)	Peak Reading (dBµV/m)	Peak Limit (dBµV/m)	Peak Margin (dB)	EUT Orientation	Data Rate	Channel
2483.8	V	124	214	56.6	74.0	17.4	Horizontal	1M	39
2380.6	V	363	139	52.1	74.0	21.9	Horizontal	1M	37
2387.8	V	150	49	53.6	74.0	20.4	Vertical	2M	37
2483.5	V	150	59	63.0	74.0	11.0	Vertical	2M	39

Spurious Emissions 1-25 GHz

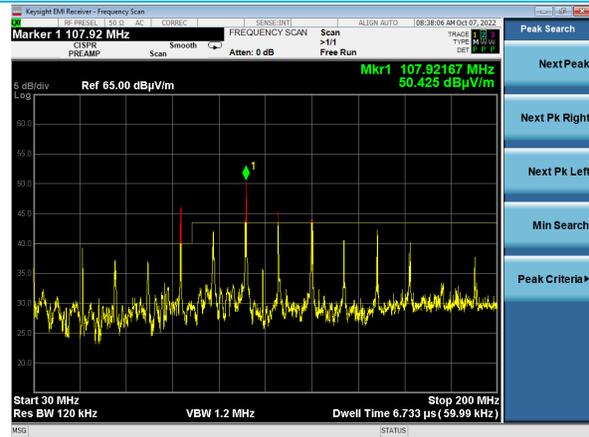
Frequency (MHz)	Antenna Polarity	Height (cm)	Azimuth (degree)	Average Reading (dBµV/m)	Average Limit (dBµV/m)	Average Margin (dB)	EUT Orientation	Channel
7319.4	H	106	156	41.4	54.0	12.6	Vertical	17
7320.7	V	115	197	44.9	54.0	9.1	Vertical	17
7320.6	V	342	99	47.7	54.0	6.4	Horizontal	17
7320.7	H	100	68	47.2	54.0	6.9	Horizontal	17
7320.7	H	100	32	49.0	54.0	5.0	Flat	17
7320.7	V	346	0	49.1	54.0	4.9	Flat	17
7205.4	V	283	334	49.6	54.0	4.4	Flat	37
7440.7	V	282	337	50.9	54.0	3.1	Flat	39
4879.9	V	100	211	43.6	54.0	10.4	Vertical	17
4879.9	H	161	193	38.9	54.0	15.1	Vertical	17
4880.0	V	133	108	43.4	54.0	10.6	Horizontal	17
4880.1	H	392	178	42.4	54.0	11.6	Horizontal	17
4880.1	H	100	97	42.5	54.0	11.5	Flat	17
4879.9	V	359	33	39.7	54.0	14.3	Flat	17
4959.9	V	147	182	34.5	54.0	19.5	Vertical	39
4804.0	V	107	306	49.1	54.0	4.9	Vertical	37

Frequency (MHz)	Antenna Polarity	Height (cm)	Azimuth (degree)	Peak Reading (dBµV/m)	Peak Limit (dBµV/m)	Peak Margin (dB)	EUT Orientation	Channel
7319.4	H	106	156	49.3	74.0	24.7	Vertical	17
7320.7	V	115	197	51.9	74.0	22.1	Vertical	17
7320.6	V	342	99	53.9	74.0	20.1	Horizontal	17
7320.7	H	100	68	53.4	74.0	20.6	Horizontal	17
7320.7	H	100	32	55.4	74.0	18.6	Flat	17
7320.7	V	346	0	55.6	74.0	18.4	Flat	17
7205.4	V	283	334	56.0	74.0	18.0	Flat	37
7440.7	V	282	337	57.2	74.0	16.8	Flat	39
4879.9	V	100	211	49.1	74.0	24.9	Vertical	17
4879.9	H	161	193	45.6	74.0	28.4	Vertical	17
4880.0	V	133	108	49.1	74.0	24.9	Horizontal	17
4880.1	H	392	178	48.4	74.0	25.6	Horizontal	17
4880.1	H	100	97	48.1	74.0	25.9	Flat	17
4879.9	V	359	33	46.1	74.0	27.9	Flat	17
4959.9	V	147	182	43.5	74.0	30.5	Vertical	39
4804.0	V	107	306	53.9	74.0	20.1	Vertical	37

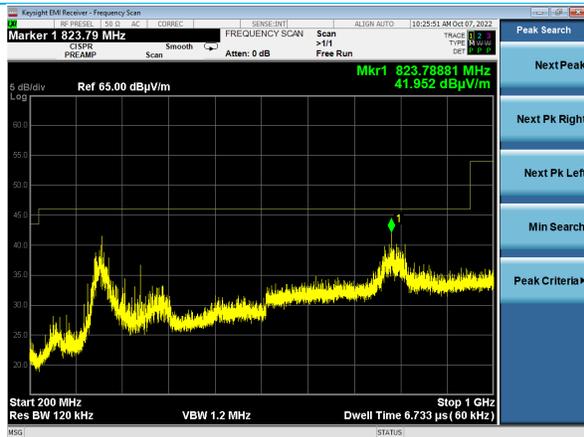
Plots



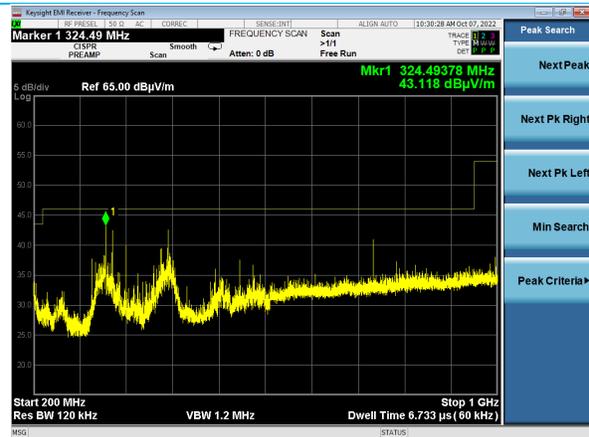
30-200 MHz Horizontal Polarity
EUT Vertical Ch 17



30-200 MHz Vertical Polarity
EUT Vertical Ch 17



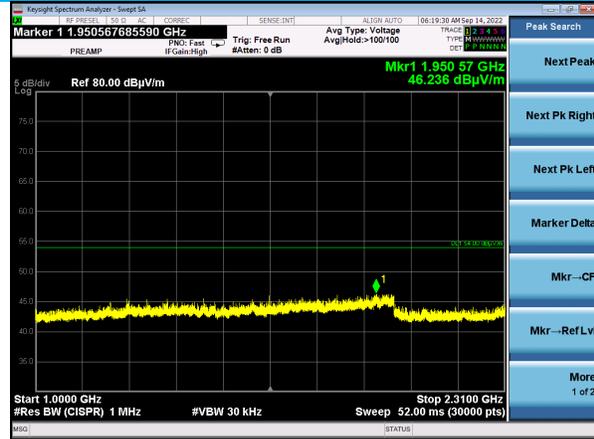
200-1000 MHz Horizontal Polarity
EUT Vertical Ch 17



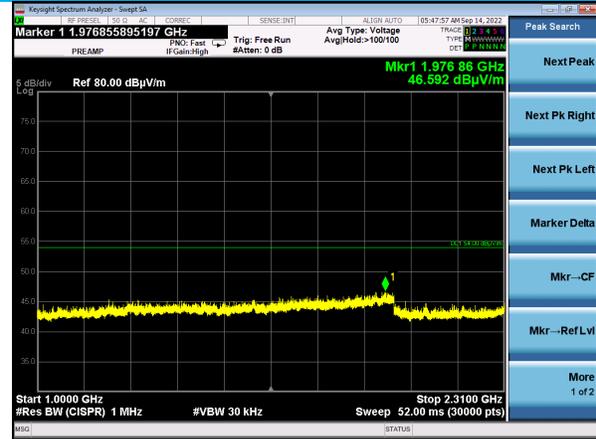
200-1000 MHz Vertical Polarity
EUT Vertical Ch 17

Company: Lincoln Electric
Report: TR3625A
Quote: NBO-04-2022-004928

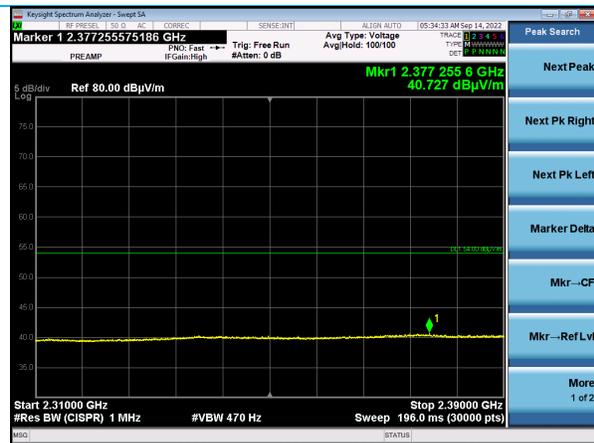
Name: 3350 ADV Series Auto-Darkening Filter Bluetooth Module
Model: M29670
Serial: Engineering Sample



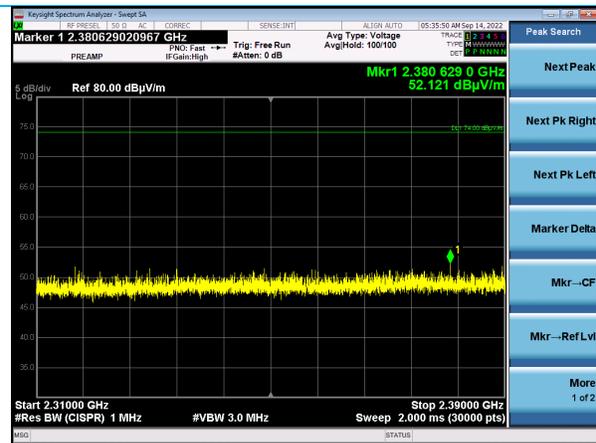
1000-2310 MHz Horizontal Polarity
EUT Horizontal Ch 37



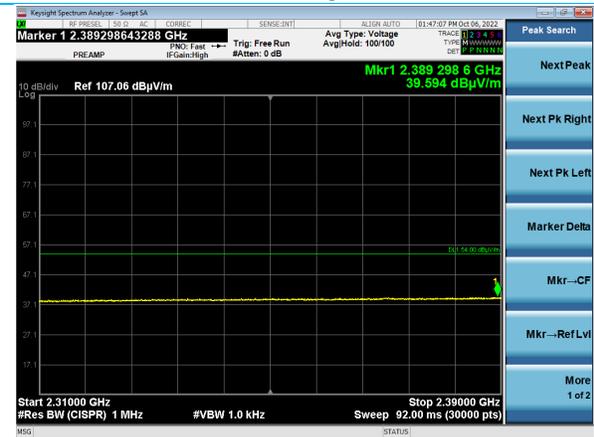
1000-2310 MHz Vertical Polarity
EUT Horizontal Ch 37



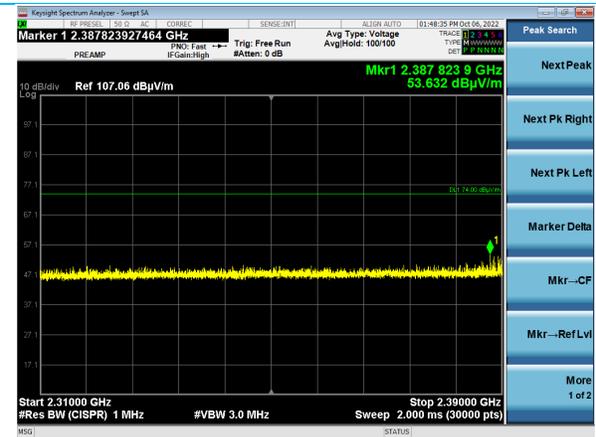
2310-2390 MHz Vertical Polarity
EUT Horizontal Ch 37 1M
Average



2310-2390 MHz Vertical Polarity
EUT Horizontal Ch 37 1M
Peak



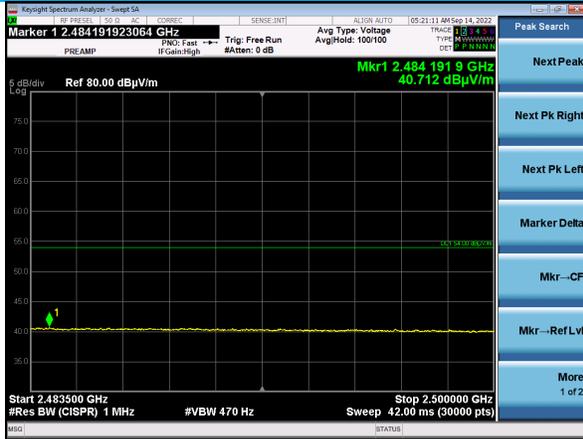
2310-2390 MHz Vertical Polarity
EUT Vertical Ch 37 2M
Average



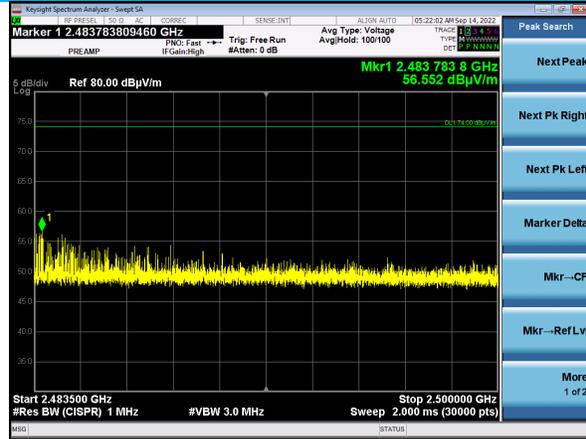
2310-2390 MHz Vertical Polarity
EUT Vertical Ch 37 2M
Peak

Company: Lincoln Electric
Report: TR3625A
Quote: NBO-04-2022-004928

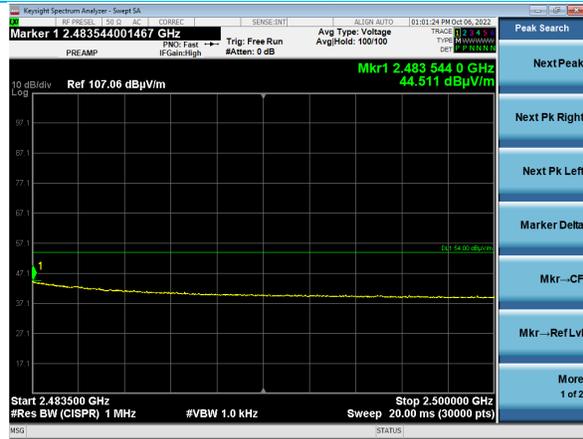
Name: 3350 ADV Series Auto-Darkening Filter Bluetooth Module
Model: M29670
Serial: Engineering Sample



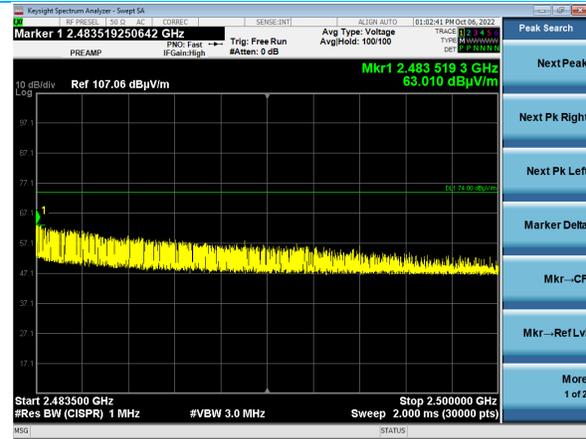
2483.5-2500 MHz Vertical Polarity
EUT Horizontal Ch 39 1M
Average



2483.5-2500 MHz Vertical Polarity
EUT Horizontal Ch 39 1M
Peak



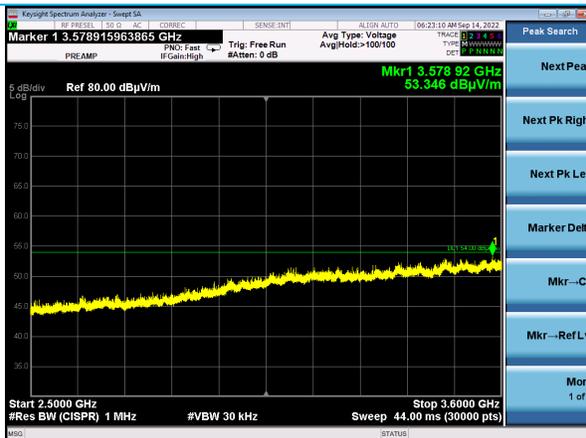
2483.5-2500 MHz Vertical Polarity
EUT Vertical Ch 39 2M
Average



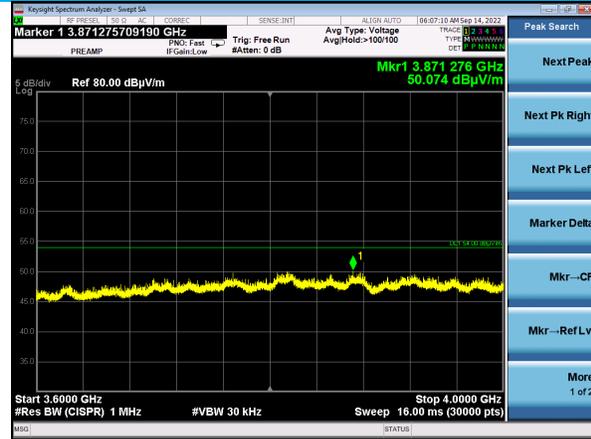
2483.5-2500 MHz Vertical Polarity
EUT Vertical Ch 39 2M
Peak



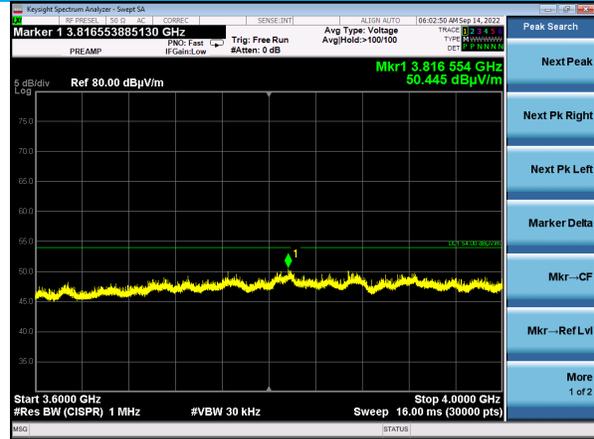
2500-3600 MHz Horizontal Polarity
EUT Horizontal Ch 37



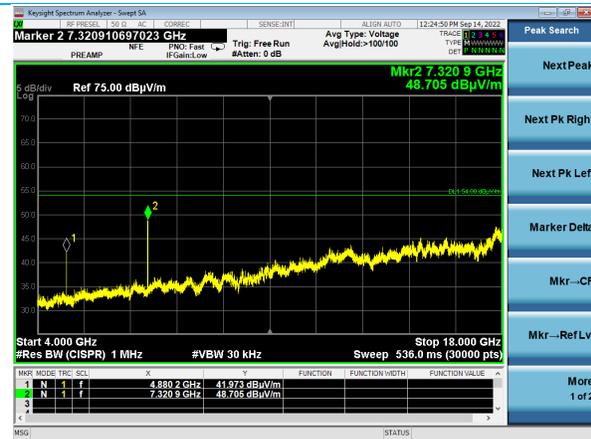
2500-3600 MHz Vertical Polarity
EUT Horizontal Ch 37



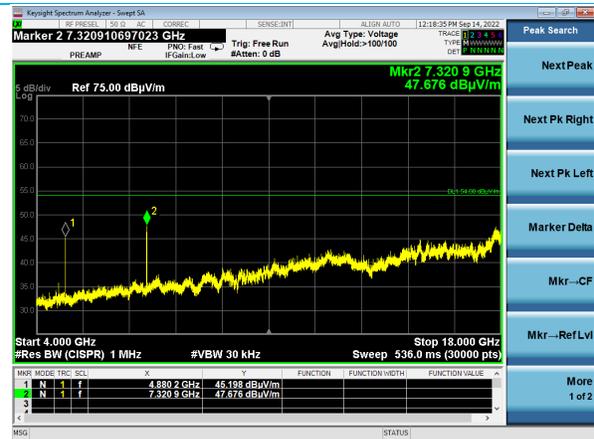
3600-4000 MHz Horizontal Polarity
EUT Horizontal Ch 37



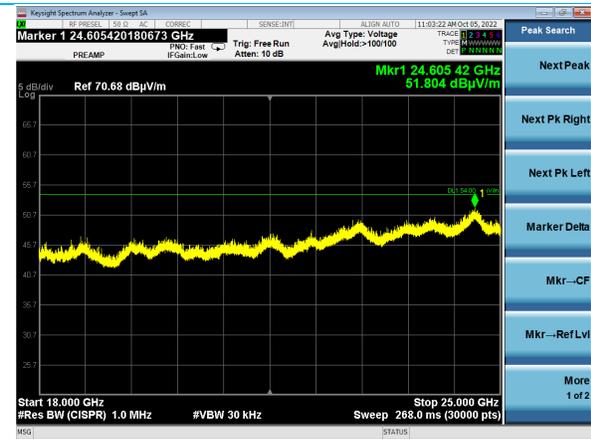
3600-4000 MHz Vertical Polarity
EUT Horizontal Ch 37



4000-18000 MHz Horizontal Polarity
EUT Vertical Ch 17



4000-18000 MHz Vertical Polarity
EUT Vertical Ch 17

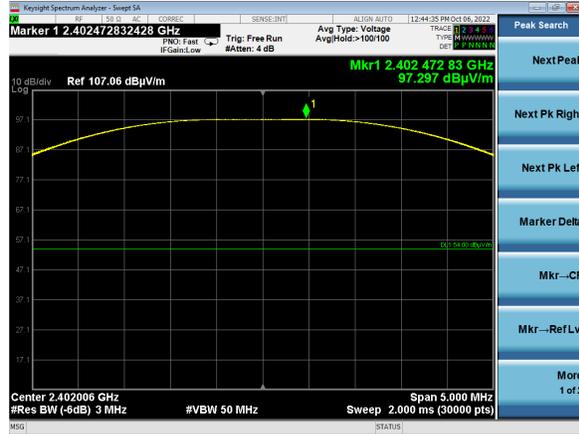


18000-25000 MHz Horizontal Polarity
EUT Vertical Ch 17



18000-25000 MHz Vertical Polarity
EUT Vertical Ch 17

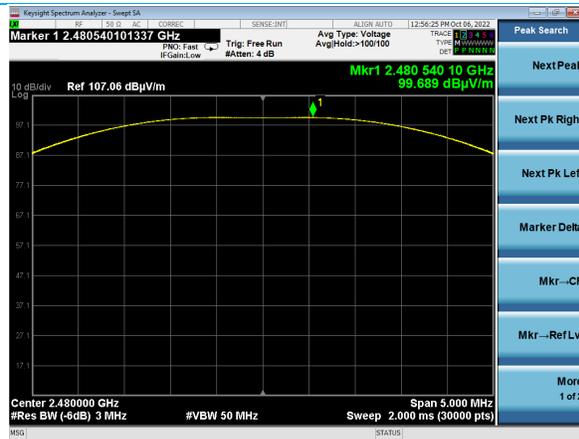
Company: Lincoln Electric	Page 40 of 42	Name: 3350 ADV Series Auto-Darkening Filter Bluetooth Module
Report: TR3625A		Model: M29670
Quote: NBO-04-2022-004928		Serial: Engineering Sample



2402 MHz Data Rate 2M
Fundamental Emission Ch 37



2440 MHz Data Rate 2M
Fundamental Emission Ch 17



2480 MHz Data Rate 2M
Fundamental Emission Ch 39

Company: Lincoln Electric	Page 41 of 42	Name: 3350 ADV Series Auto-Darkening Filter Bluetooth Module
Report: TR3625A		Model: M29670
Quote: NBO-04-2022-004928		Serial: Engineering Sample

6 REVISION HISTORY

Version	Date	Notes	Person
0.0	12/7/2022	Initial Draft	Anthony Smith

END OF REPORT