

## F2 Labs 16740 Peters Road Middlefield, Ohio 44062 United States of America www.f2labs.com

**PCII TEST REPORT** 

Manufacturer: LSI Industries, Inc.

10000 Alliance Road

Cincinnati, Ohio 45242 USA

Applicant: Same as Above

Product Name: Stand-alone Bluetooth 5 Low Energy Module

Model: BMD-341

**Operating Voltage/Freq.** 

of EUT During Testing: 5VDC from USB

FCC ID: 2AWNNBMD341

Testing Commenced: 2022-03-15

**Testing Ended:** 2023-01-27

**Summary of Test Results: In Compliance, with Modifications** 

The EUT complies with the EMC requirements when manufactured identically as the unit tested in this report, including any required modifications and/or manufacturer's statement. Any changes to the design or build of this unit subsequent to this

testing may deem it non-compliant.

Note: Test report reflects Radiated Spurious measurements only

for PCII due to custom antenna.

#### Standards:

• FCC Part 15 Subpart C, Section 15.247

ANSI C63.10:2020



Applicant: LSI Industries, Inc.

Model: BMD-341

**Evaluation Conducted by:** 

Julius Chiller, Senior Wireless Project Engineer

**Report Reviewed by:** 

Ken Littell, Vice President of Operations

F2 Labs 26501 Ridge Road Damascus, MD 20872 Ph 301.253.4500 F2 Labs 16740 Peters Road Middlefield, OH 44062 Ph 440.632.5541

flischill

F2 Labs 8583 Zionsville Road Indianapolis, IN 46268 Ph 317.610.0611

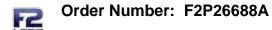
This test report may be reproduced in full; partial reproduction only may be made with the written consent of F2 Labs. The results in this report apply only to the equipment tested.

Report Number: F2P26688A-01E Page 2 of 60 Issue Date: 2023-01-27

Applicant: LSI Industries, Inc. Model: BMD-341

## **TABLE OF CONTENTS**

Section		Title	Page
1	AD	MINISTRATIVE INFORMATION	4
2	SU	MMARY OF TEST RESULTS / EUT MODIFICATIONS	5
3	TA	BLE OF MEASURED RESULTS	6
4	EN	GINEERING STATEMENT	7
5	EU	T INFORMATION AND DATA	8
6	LIS	T OF MEASUREMENT INSTRUMENTATION	9
7	•	DIATED SPURIOUS EMISSIONS Measurements, Band Edge Measurements – BLE 2nd Harmonic Measurements, 30 MHz to 1000 MHz: QuasiPeak Plots, Low Channel (0.009 MHz to 26 GHz) Plots, Mid Channel (0.009 MHz to 26 GHz) Plots, High Channel (0.009 MHz to 26 GHz)	10 12 17 18 19 24 29
8	ОС	CUPIED BANDWIDTH	33
9	СО	NDUCTED OUTPUT POWER	37
10	PE	AK POWER SPECTRAL DENSITY (PSD)	47
11	TES	ST SETUP PHOTOGRAPHS	57



Applicant: LSI Industries, Inc.

Model: BMD-341

#### 1 ADMINISTRATIVE INFORMATION

#### 1.1 Measurement Location:

F2 Labs in Middlefield, Ohio. Site description and attenuation data are on file with the FCC's Sampling and Measurement Branch at the FCC Laboratory in Columbia, MD.

#### 1.2 Measurement Procedure:

All measurements were performed according to ANSI C63.10 and recommended FCC procedure of measurement under Section 15.247 and in KDB558074. A list of the measurement equipment can be found in Section 5.

#### 1.3 Uncertainty Budget:

The uncertainty in EMC measurements arises from several factors which affect the results, some associated with environmental conditions in the measurement room, the test equipment being used, and the measurement techniques adopted.

The measurement uncertainty budgets detailed below are calculated from the test and calibration data and are expressed with a 95% confidence factor. Note: Only measurements listed below which relate to tests included in this Test Report are applicable to it.

Measurement Range	Expanded Uncertainty	Combined Uncertainly
Radiated Emissions <1 GHz @ 3m	±5.07dB	±2.54
Radiated Emissions <1 GHz @10m	±5.09dB	±2.55
Radiated Emissions 1 GHz to 2.7 GHz	±3.62dB	±1.81
Radiated Emissions 2.7 GHz to 18 GHz	±3.10dB	±1.55
AC Power Line Conducted Emissions, 150kHz to 30 MHz	±2.76dB	±1.38

This Uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

#### 1.4 Document History

Document Number Description		Issue Date	Approved By	
F2P26688A-01E	First Issue	2023-01-27	K. Littell	

Report Number: F2P26688A-01E Page 4 of 60 Issue Date: 2023-01-27



Applicant: LSI Industries, Inc. Model: BMD-341 Order Number: F2P26688A

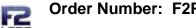
#### 2 **SUMMARY OF TEST RESULTS / EUT MODIFICATIONS**

Test Name	Standard(s)	Results
Radiated Spurious Emission	CFR 47 Part 15.247(d) / Part 15.209 / KDB558074	Complies
Occupied Bandwidth	CFR 47 Part 15.247(a)(2) / KDB558074	Complies
Conducted Output Power	CFR 47 Part 15.247(b)(3) / KDB558074	Complies
Peak Power Spectral Density	CFR 47 Part 15.247(e) / KDB558074	Complies

Power setting reduced to "0" due to 2<sup>nd</sup> Harmonic Level.

051816

Page 5 of 60 Report Number: F2P26688A-01E Issue Date: 2023-01-27



Applicant: LSI Industries, Inc. Model: BMD-341 Order Number: F2P26688A

#### 3 **TABLE OF MEASURED RESULTS**

Te	Test		Mid Channel 2.440 GHz	High Channel 2.480 GHz
0 1 1 10 1 1	BLE GFSK	3.32mW / 5.21 dBm	3.40mW / 5.32 dBm	2.79mW / 4.46 dBm
Conducted Output Power	BLE GFSK 2Mbps	2.98 / 4.74	2.81 / 4.48	3.01 / 4.79
1 OWCI	Other OQPSK	2.52 / 4.02	2.49 / 3.96	2.34 / 3.70
Conducted Output Power Limit*		6.7dBm	6.7dBm	6.7dBm
Peak Power	BLE GFSK	-11.27 dBm	-12.15 dBm	-12.66 dBm
Spectral Density	BLE GFSK 2Mbps	-12.81	-13.03	-13.39
Opecital Density	Other OQPSK	-13.59	-13.83	-14.19
Peak Power Spectral Density Limit		8 dBm	8 dBm	8 dBm
-20dB Occupied Bandwidth		1.163 MHz	1.162 MHz	1.165 MHz
-20dB Occupied	Bandwidth Limit	≥ 500KHz	≥ 500KHz	≥ 500KHz

<sup>\*</sup>The original grant of certification is authorized up to 6.7dBm.

Page 6 of 60 Report Number: F2P26688A-01E Issue Date: 2023-01-27



Order Number: F2P26688A Applicant: LSI Industries, Inc.

Model: BMD-341

#### 4 ENGINEERING STATEMENT

This report has been prepared on behalf of **LSI Industries**, **Inc.**, to provide documentation for the testing described herein. This equipment has been tested and found to comply with Part 15.247 of the FCC Rules using ANSI C63.10 and KDB558074 standards. The test results found in this test report relate only to the items tested.

051816

Report Number: F2P26688A-01E Page 7 of 60 Issue Date: 2023-01-27



Order Number: F2P26688A Applicant: LSI Industries, Inc.

Model: BMD-341

#### 5 EUT INFORMATION AND DATA

### 5.1 Equipment Under Test:

Product: Stand-alone Bluetooth 5 Low Energy

Model: BMD-341 Serial No.: 408730

FCC ID: 2AWNNBMD341

#### 5.2 Power Supply:

USB

#### 5.3 Applicable Rules:

CFR 47, Part 15.247, subpart C

#### 5.4 Equipment Category:

Radio Module-DTS

#### 5.5 Antenna:

Monopole, -2.5dBi Gain

#### 5.6 Accessories:

Device	Manufacturer	Model Number	Serial Number
Antenna	IPEX	Custom	None

#### 5.7 Test Item Condition:

The equipment to be tested was received in good condition.

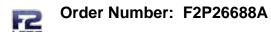
#### 5.8 Testing Algorithm:

EUT was set to transmit continuously on the low, mid and high channel in the 2.4 GHz BLE band.

1 Mbps GFSK modulation was used for testing as worst-case due to the higher power output and high channel band edge margin.

051816

Report Number: F2P26688A-01E Page 8 of 60 Issue Date: 2023-01-27

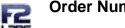


Applicant: LSI Industries, Inc. Model: BMD-341

#### 6 LIST OF MEASUREMENT INSTRUMENTATION

Equipment Type	Asset Number	Manufacturer	Model	Serial Number	Calibration Due Date	
Shielded Chamber	CL166-E	AlbatrossProjects	B83117-DF435- T261	US140023	2022-06-09	
Temp/Hum. Recorder	CL232	Extech	445814	01	2022-04-01	
Receiver	Receiver CL151		ESU40	100319	2023-03-31	
Horn Antenna CL098		Emco	3115	9809-5580	2023-01-26	
Antenna, JB3 Combination	CL175	Sunol Sciences	JB3	A030315	2022-09-14	
Antenna, Horn	CL114	A. H. Systems, Inc.	SAS-572	237	2023-07-30	
Amplifier CL163- w/Monopole & 18" Loop		A.H. Systems, Inc.	EHA-52B	100	2023-10-23	
Software:	Tile	e Version 3.4.B.3.	Software Verified: 2022-03-15; 2023-01-11			
Software:	EMC	32, Version 8.53.0	Software Verified: 2022-03-15; 2023-01-11			

Page 9 of 60 Report Number: F2P26688A-01E Issue Date: 2023-01-27



Order Number: F2P26688A Applicant: LSI Industries, Inc.

Model: BMD-341

#### 7 RADIATED SPURIOUS EMISSION

Radiated emissions were measured in a Semi-Anechoic Chamber. All emissions generated that fall in the restricted bands per FCC Part 15.205 were examined.

### 7.1 Requirements:

All emissions that fall in the restricted bands defined in FCC Part 15.205 shall not exceed the maximum field strength listed in FCC Part 15.209(a).

051816

Report Number: F2P26688A-01E Page 10 of 60 Issue Date: 2023-01-27



Order Number: F2P26688A Applicant: LSI Industries, Inc.

Model: BMD-341

#### 7.2 Radiated Spurious Emission Test Data

	Test Date(s):	2022-03-15	Test Engineer:	J. Chiller
	Standard(s):	CFR 47 Part 15.247(d);	Air Temperature:	21.8°C
		D	Relative Humidity:	28%

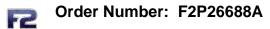
Notes: Plots are peak, max hold prescan data included only to determine what frequencies to investigate and measure. The EUT was initially placed in a semi-anechoic chamber and rotated in all three orthogonal positions to maximize the emissions. Characterization measurements were then performed to determine at which frequencies significant emissions occurred. These graphs are shown below.

The equipment was fully exercised with all cabling attached to the EUT and was positioned for maximum emissions. While the equipment was energized, the receiving antenna was scanned from 1.0 meter to 4.0 meters in both vertical and horizontal polarities while the turntable was adjusted 360 degrees to determine the maximum field strength. The tables of measured results can be found below.

In the following plots, the black line indicates ambient noise, and the red line indicates the measurement with the EUT on. Emissions to be found by the EUT were measured and listed in tables. The plots are for reference only and the limit lines are not actual limit lines but merely a quide.

051816

Banart Number: F2B26688 A 01E



Applicant: LSI Industries, Inc. Model: BMD-341

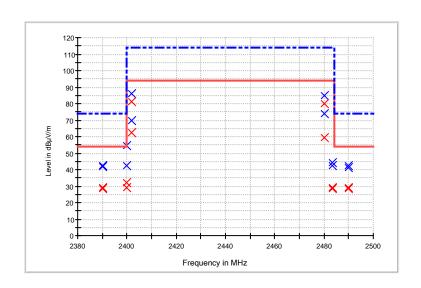
## Measurements, Band Edge

#### MaxPeak

Frequency (MHz)	Antenna Polarization	Antenna Height (cm)	Azimuth (deg)	Reading (dBµV)	Cable Loss & Antenna Factor (dB)	Emission (dBµV/m)	Limit (dBµV/m)	Margin (dB)
2390.000000	Н	150.00	168.00	36.4	5.9	42.3	74.0	-31.7
2390.000000	V	150.00	32.00	36.1	5.9	42.0	74.0	-32.0
2400.000000	Н	150.00	168.00	48.7	5.8	54.5	74.0	-19.5
2400.000000	V	150.00	32.00	36.7	5.8	42.5	74.0	-31.5
2483.500000	V	150.00	226.00	36.6	5.8	42.4	74.0	-31.6
2483.500000	Н	150.00	175.00	38.7	5.8	44.5	74.0	-29.5
2490.000000	V	150.00	226.00	36.4	5.8	42.2	74.0	-31.8
2490.000000	Н	150.00	175.00	35.5	5.8	41.3	74.0	-32.7

#### **AVG**

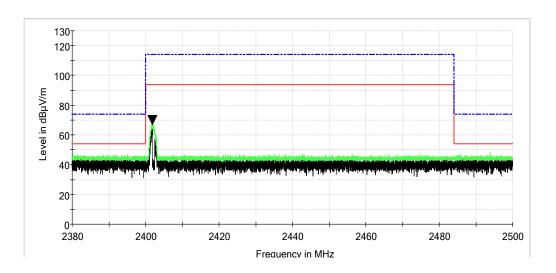
Frequency (MHz)	Antenna Polarization	Antenna Height (cm)	Azimuth (deg)	Reading (dBµV)	Cable Loss & Antenna Factor (dB)	Emission (dBµV/m)	Limit (dBµV/m)	Margin (dB)
2390.000000	Н	150.00	168.00	22.9	5.9	28.8	54.0	-25.2
2390.000000	V	150.00	32.00	22.9	5.9	28.8	54.0	-25.2
2400.000000	Н	150.00	168.00	26.5	5.8	32.3	54.0	-21.7
2400.000000	V	150.00	32.00	23.1	5.8	28.9	54.0	-25.1
2483.500000	V	150.00	226.00	22.9	5.8	28.7	54.0	-25.3
2483.500000	Н	150.00	175.00	23.4	5.8	29.2	54.0	-24.8
2490.000000	V	150.00	226.00	22.9	5.8	28.7	54.0	-25.3
2490.000000	Н	150.00	175.00	35.5	5.8	41.3	74.0	-32.7



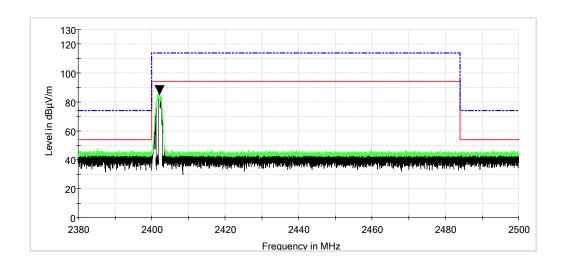
Report Number: F2P26688A-01E Page 12 of 60 Issue Date: 2023-01-27

**Band Edge** 

Low Channel: Vertical



#### Low Channel: Horizontal

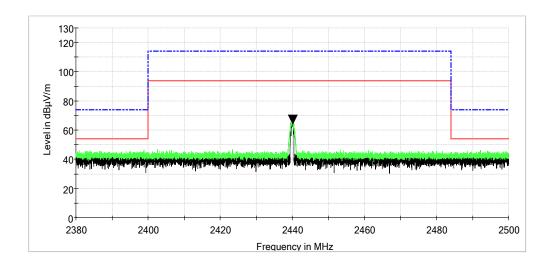


Report Number: F2P26688A-01E Page 13 of 60 Issue Date: 2023-01-27

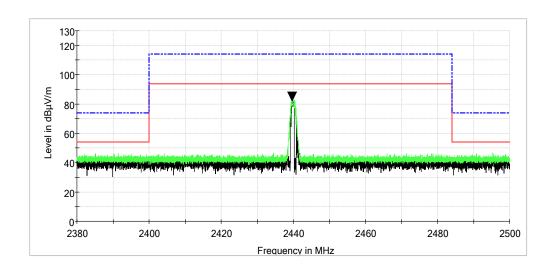


**Band Edge** 

#### Mid Channel: Vertical



#### Mid Channel: Horizontal

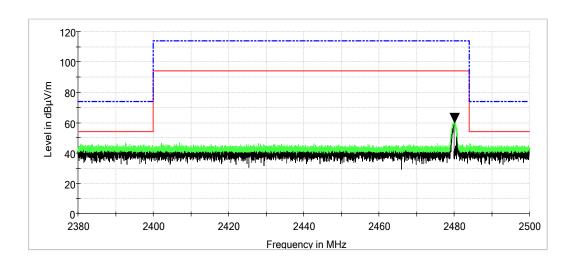


Report Number: F2P26688A-01E Page 14 of 60 Issue Date: 2023-01-27

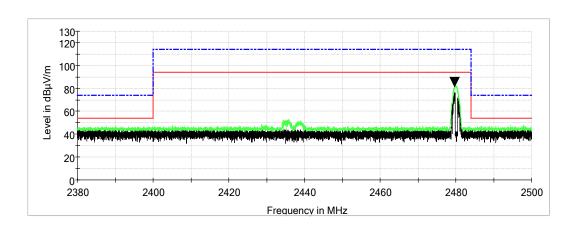


## **Band Edge**

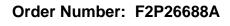
## **High Channel: Vertical**



### **High Channel: Horizontal**



Report Number: F2P26688A-01E Page 15 of 60 Issue Date: 2023-01-27



Applicant: LSI Industries, Inc. Model: BMD-341

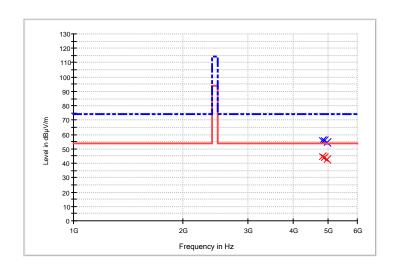
## Measurements – BLE 2<sup>nd</sup> Harmonic

### **Measurements – MaxPeak**

Frequency (MHz)	Antenna Polarization	Antenna Height (cm)	Azimuth (deg)	Reading (dBµV)	Cable Loss & Antenna Factor (dB)	Emission (dBµV/m)	Limit (dBµV/m)	Margin (dB)
4804.000000	Н	150.00	176.00	44.3	11.2	55.5	74.0	-18.5
4880.000000	Н	150.00	176.00	44.2	11.4	55.6	74.0	-18.4
4960.000000	Н	150.00	176.00	42.7	11.6	54.3	74.0	-19.7

#### **Measurements – AVG**

Frequency (MHz)	Antenna Polarization	Antenna Height (cm)	Azimuth (deg)	Reading (dBµV)	Cable Loss & Antenna Factor (dB)	Emission (dBµV/m)	Limit (dBµV/m)	Margin (dB)
4804.000000	Н	150.00	176.00	33.2	11.2	44.4	54.0	-9.6
4880.000000	Н	150.00	176.00	32.3	11.4	43.7	54.0	-10.3
4960.000000	Н	150.00	176.00	30.7	11.6	42.3	54.0	-11.7



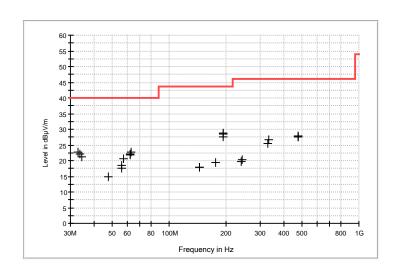
Report Number: F2P26688A-01E Page 16 of 60 Issue Date: 2023-01-27

Applicant: LSI Industries, Inc. Model: BMD-341

## Measurements, 30 MHz to 1000 MHz: QuasiPeak

Note: Measurements include data from all channels.

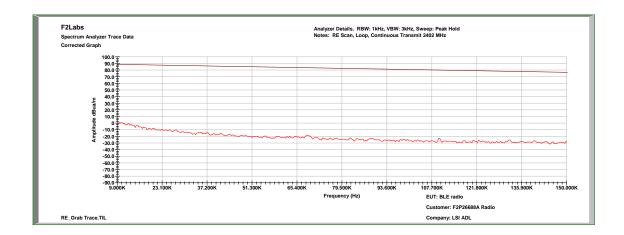
Frequency (MHz)	Antenna Polarization	Antenna Height (cm)	Azimuth (deg)	Reading (dBµV)	Cable Loss & Antenna Factor (dB)	Emission (dBµV/m)	Limit (dBµV/m)	Margin (dB)
32.720000	V	100.00	0.00	25.9	-3.2	22.70	40.0	-17.3
33.480000	V	100.00	0.00	26.0	-3.8	22.20	40.0	-17.8
34.640000	V	100.00	0.00	25.9	-4.6	21.30	40.0	-18.7
47.480000	V	100.00	0.00	28.2	-13.3	14.90	40.0	-25.1
55.800000	V	100.00	303.00	33.3	-14.9	18.40	40.0	-21.6
55.800000	V	100.00	31.00	32.4	-14.9	17.50	40.0	-22.5
56.960000	V	100.00	23.00	35.6	-15.0	20.60	40.0	-19.4
62.400000	V	100.00	334.00	36.6	-14.9	21.70	40.0	-18.3
62.400000	V	100.00	108.00	37.1	-14.9	22.20	40.0	-17.8
62.800000	V	100.00	0.00	37.5	-14.8	22.70	40.0	-17.3
144.080000	V	100.00	127.00	27.0	-9.1	17.90	43.5	-25.6
144.080000	V	100.00	2.00	27.0	-9.1	17.90	43.5	-25.6
175.520000	Н	100.00	111.00	29.7	-10.3	19.40	43.5	-24.1
192.000000	Н	100.00	156.00	38.6	-10.0	28.60	43.5	-14.9
192.000000	Н	100.00	145.00	38.9	-10.0	28.90	43.5	-14.6
192.000000	Н	100.00	118.00	37.7	-10.0	27.70	43.5	-15.8
238.560000	Н	100.00	216.00	29.3	-9.6	19.70	46.0	-26.3
241.480000	Н	100.00	222.00	29.7	-9.5	20.20	46.0	-25.8
331.880000	V	100.00	155.00	31.8	-6.4	25.40	46.0	-20.6
333.240000	V	100.00	156.00	33.0	-6.4	26.60	46.0	-19.4
480.080000	Н	100.00	205.00	29.8	-2.2	27.60	46.0	-18.4
480.080000	Н	100.00	262.00	30.0	-2.2	27.80	46.0	-18.2
480.080000	Н	100.00	263.00	29.9	-2.2	27.70	46.0	-18.3



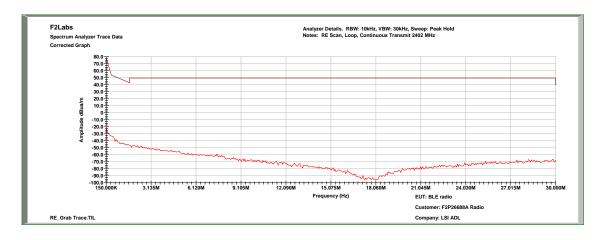
Report Number: F2P26688A-01E Page 17 of 60 Issue Date: 2023-01-27



# Low Channel: 0.009 MHz to 0.15 MHz



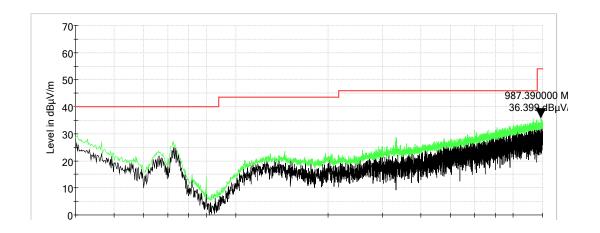
### Low Channel: 0.15 MHz to 30.0 MHz



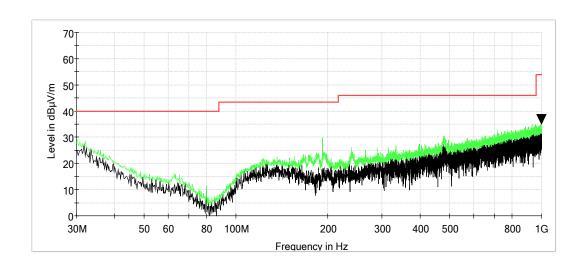
Report Number: F2P26688A-01E Page 18 of 60 Issue Date: 2023-01-27

Order Number: F2P26688A Model: BMD-341

#### Low Channel: 30 MHz to 1000 MHz - Vertical



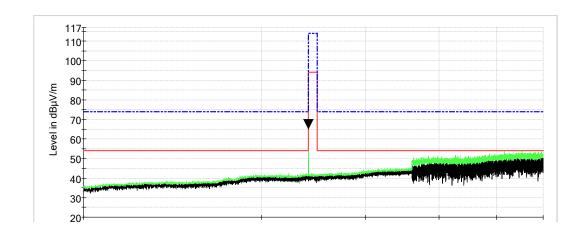
### Low Channel: 30 MHz to 1000 MHz - Horizontal



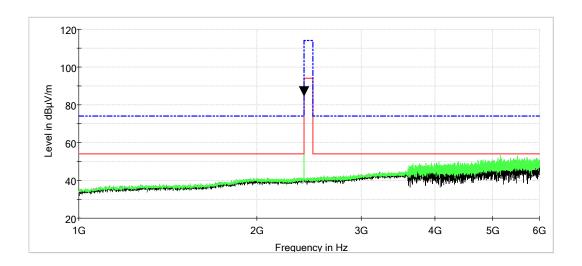
Report Number: F2P26688A-01E Page 19 of 60 Issue Date: 2023-01-27



Low Channel: 1 GHz to 6 GHz - Vertical



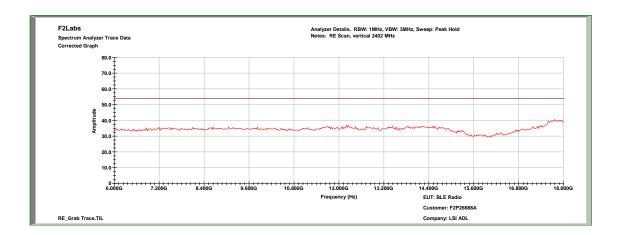
### Low Channel: 1 GHz to 6 GHz - Horizontal



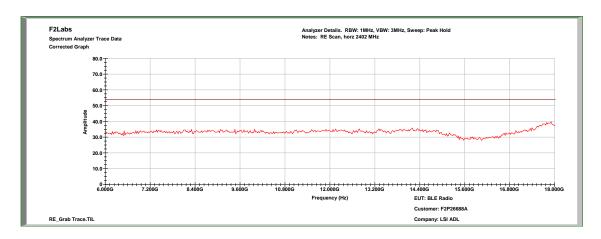
Report Number: F2P26688A-01E Page 20 of 60 Issue Date: 2023-01-27



## Low Channel: 6 GHz to 18 GHz - Vertical



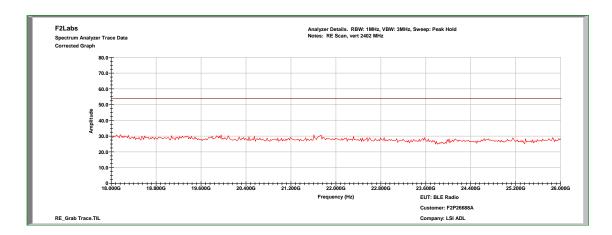
#### Low Channel: 6 GHz to 18 GHz - Horizontal



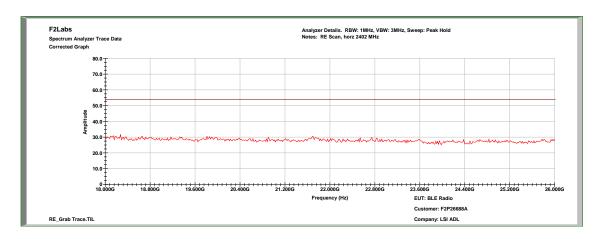
Report Number: F2P26688A-01E Page 21 of 60 Issue Date: 2023-01-27



#### Low Channel: 18 GHz to 26 GHz - Vertical



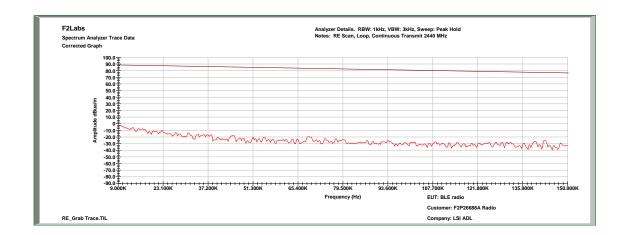
#### Low Channel: 18 GHz to 26 GHz - Horizontal



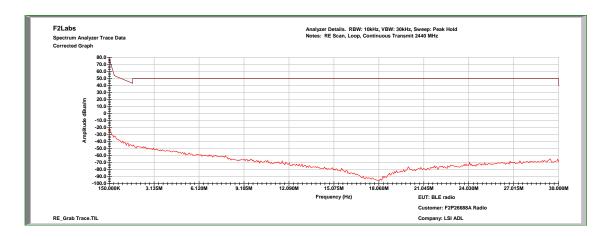
Report Number: F2P26688A-01E Page 22 of 60 Issue Date: 2023-01-27



# Mid Channel: 0.009 MHz to 0.15 MHz

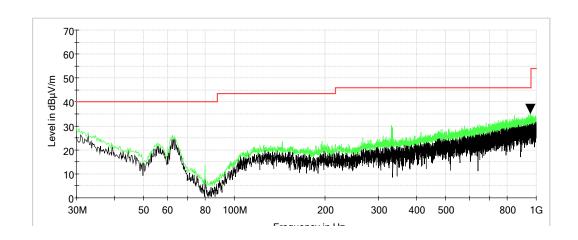


#### Mid Channel: 0.15 MHz to 30.0 MHz

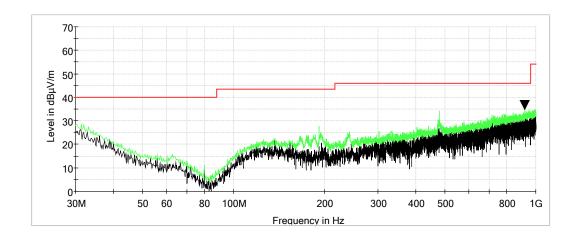


Report Number: F2P26688A-01E Page 23 of 60 Issue Date: 2023-01-27

Mid Channel: 30 MHz to 1000 MHz - Vertical

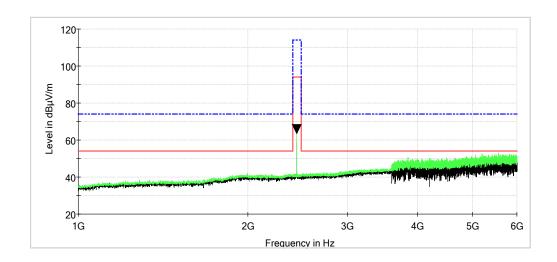


#### Mid Channel: 30 MHz to 1000 MHz - Horizontal

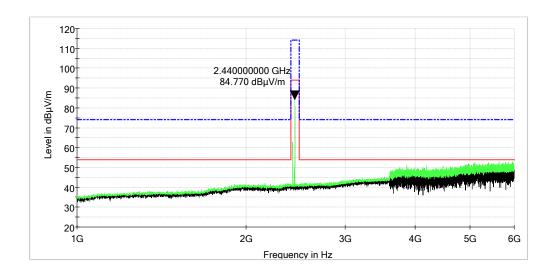


Report Number: F2P26688A-01E Page 24 of 60 Issue Date: 2023-01-27

### Mid Channel: 1 GHz to 6 GHz - Vertical



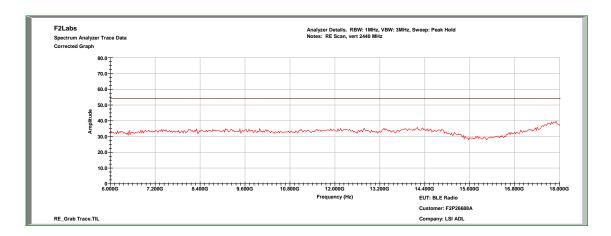
### Mid Channel: 1 GHz to 6 GHz - Horizontal



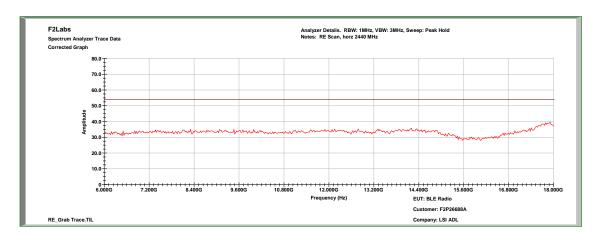
Report Number: F2P26688A-01E Page 25 of 60 Issue Date: 2023-01-27



### Mid Channel: 6 GHz to 18 GHz - Vertical



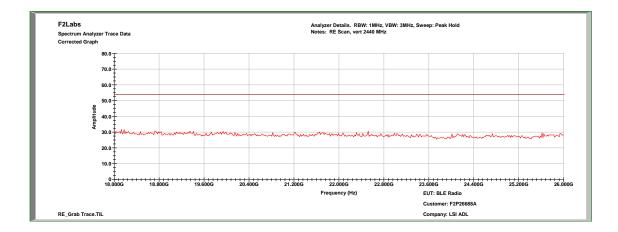
#### Mid Channel: 6 GHz to 18 GHz - Horizontal



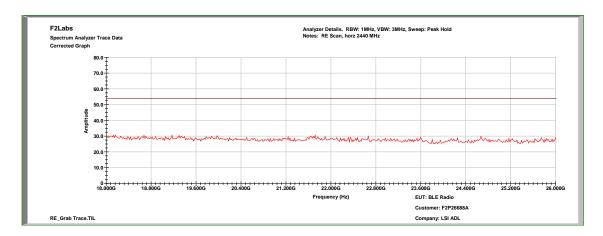
Report Number: F2P26688A-01E Page 26 of 60 Issue Date: 2023-01-27



Mid Channel: 18 GHz to 26 GHz - Vertical



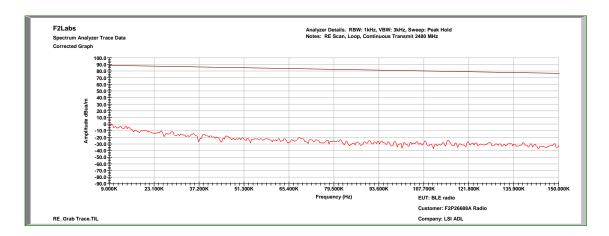
#### Mid Channel: 18 GHz to 26 GHz - Horizontal



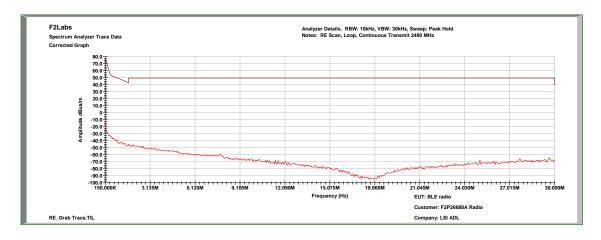
Report Number: F2P26688A-01E Page 27 of 60 Issue Date: 2023-01-27



### High Channel: 0.009 MHz to 0.15 MHz

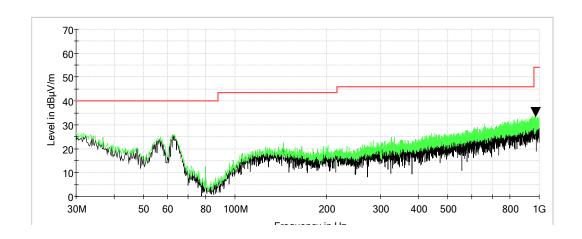


### High Channel: 0.15 MHz to 30.0 MHz

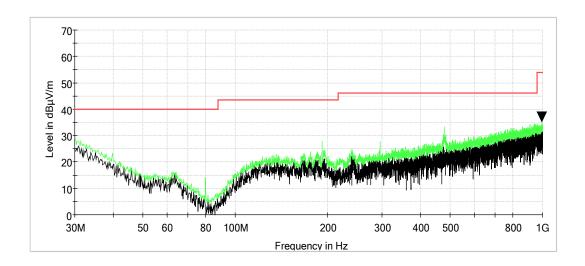


Report Number: F2P26688A-01E Page 28 of 60 Issue Date: 2023-01-27

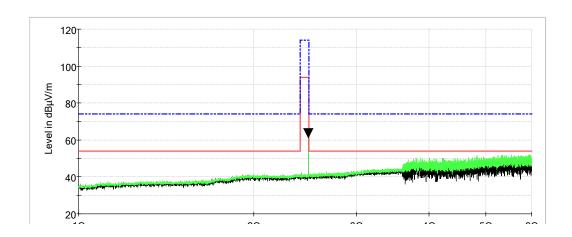
High Channel: 30 MHz to 1000 MHz - Vertical



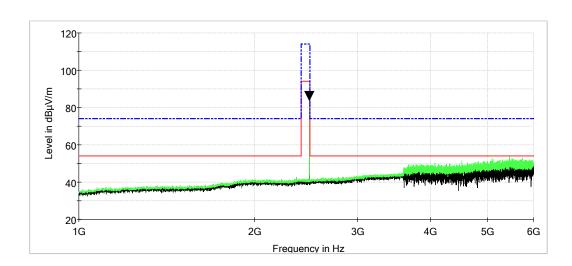
High Channel: 30 MHz to 1000 MHz - Horizontal



High Channel: 1 GHz to 6 GHz - Vertical



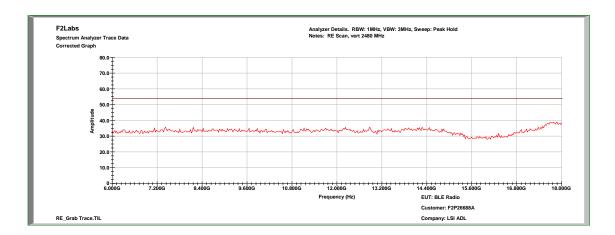
High Channel: 1 GHz to 6 GHz - Horizontal



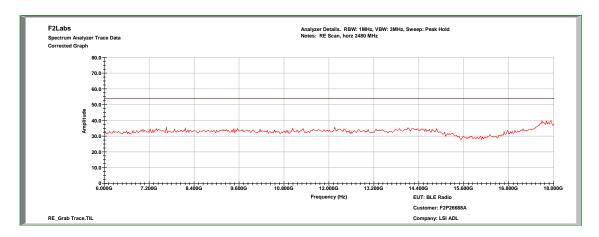
Report Number: F2P26688A-01E Page 30 of 60 Issue Date: 2023-01-27



# High Channel: 6 GHz to 18 GHz - Vertical



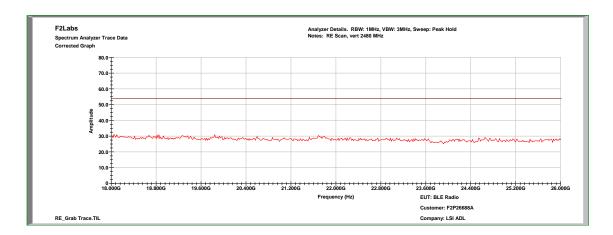
### High Channel: 6 GHz to 18 GHz - Horizontal



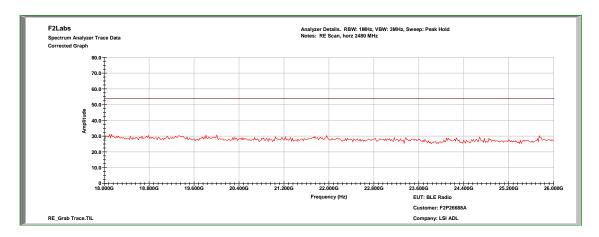
Report Number: F2P26688A-01E Page 31 of 60 Issue Date: 2023-01-27



# High Channel: 18 GHz to 26 GHz - Vertical



### High Channel: 18 GHz to 26 GHz - Horizontal



Report Number: F2P26688A-01E Page 32 of 60 Issue Date: 2023-01-27

Applicant: LSI Industries, Inc.

Model: BMD-341

### 8 FCC PART 15.247(a)(2) - OCCUPIED BANDWIDTH

### 8.1 Requirements:

The 6dB bandwidth shall be greater than 500 kHz.

Bandwidth measurements were made at the low (2.405 GHz), mid (2.440 GHz) and upper (2.480 GHz) frequencies with the resolution Bandwidth set at 20 kHz (video bandwidth set at 50 kHz) while the span was set at 3 MHz. The bandwidth was measured using the marker delta method.

051816

Report Number: F2P26688A-01E Page 33 of 60 Issue Date: 2023-01-27



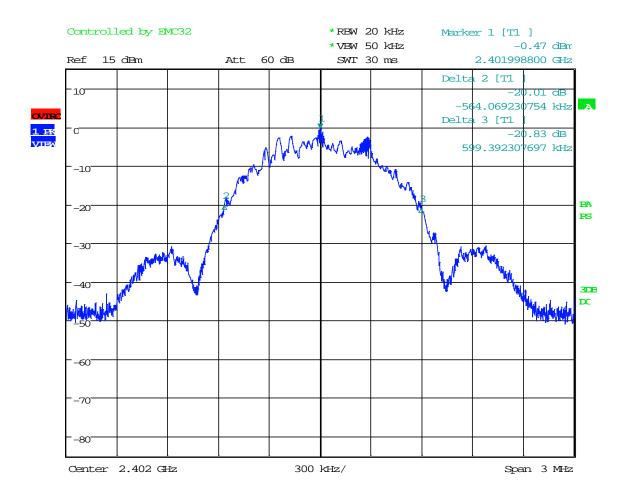
Applicant: LSI Industries, Inc. Order Number: F2P26688A

Model: BMD-341

#### **Occupied Bandwidth Test Data** 8.2

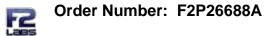
Test Date(s):	2023-01-11	Test Engineer:	J. Chiller
Standards:	CFR 47 Part 15.247(a)(2); KDB558074	Air Temperature:	21.2°C
		Relative Humidity:	33%

GFSK, 1 Mbps: Low Channel

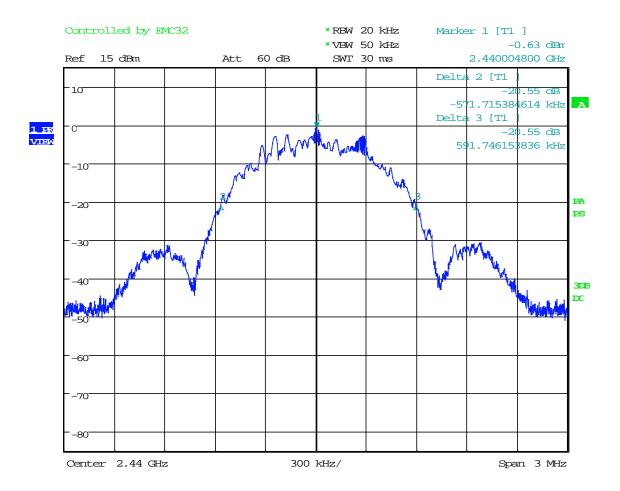


Date: 11.JAN.2023 11:41:06

Report Number: F2P26688A-01E Page 34 of 60 Issue Date: 2023-01-27



### GFSK, 1 Mbps: Mid Channel

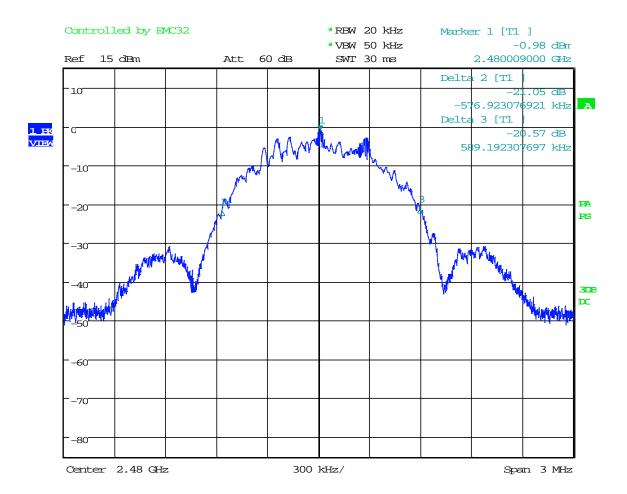


Date: 11.JAN.2023 11:44:24

051816



GFSK, 1 Mbps: High Channel



Date: 11.JAN.2023 11:46:28

Report Number: F2P26688A-01E Page 36 of 60 Issue Date: 2023-01-27



Order Number: F2P26688A Applicant: LSI Industries, Inc.

Model: BMD-341

#### 9 FCC PART 15.247(b)(3) – CONDUCTED OUTPUT POWER

The EUT antenna port was fitted with an SMA connector and directly connected to the input of the receiver. The peak power output was measured.

#### 9.1 Requirements:

The peak power output shall be 1 watt (30 dBm) or less when using an antenna with a gain of less than 6dBi. For antennas having a gain of more than 6dBi, the limit is reduced by 1dB for every dB the antenna gain is over 6dBi.

051816

Report Number: F2P26688A-01E Page 37 of 60 Issue Date: 2023-01-27



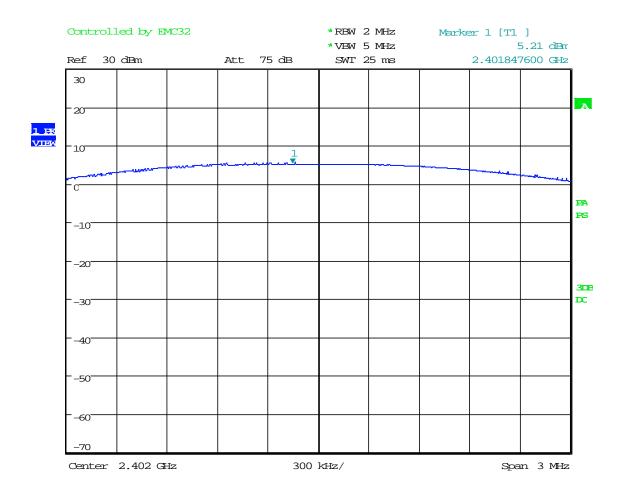
Applicant: LSI Industries, Inc. Order Number: F2P26688A

Model: BMD-341

#### **Conducted Output Power Test Data** 9.2

Test Date:	2023-01-11	Test Engineer:	J. Chiller
Standards:	CFR 47 Part 15.247(b)(3); KDB558074	Air Temperature:	21.2°C
		Relative Humidity:	33%

#### GFSK, 1Mbps: Low Channel

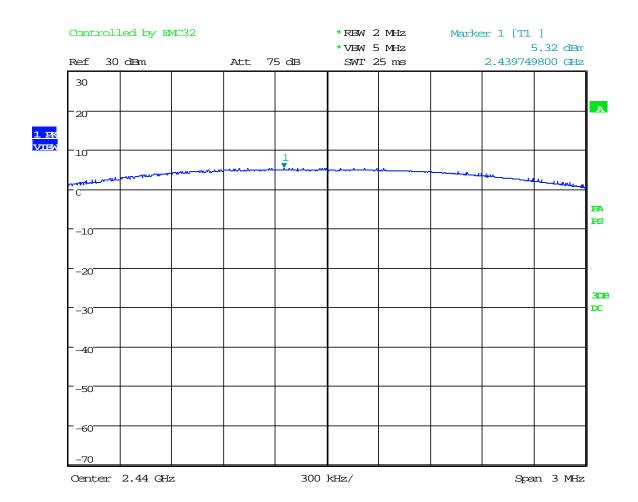


Date: 11.JAN.2023 11:12:42

Report Number: F2P26688A-01E Page 38 of 60 Issue Date: 2023-01-27



# GFSK, 1Mbps: Mid Channel

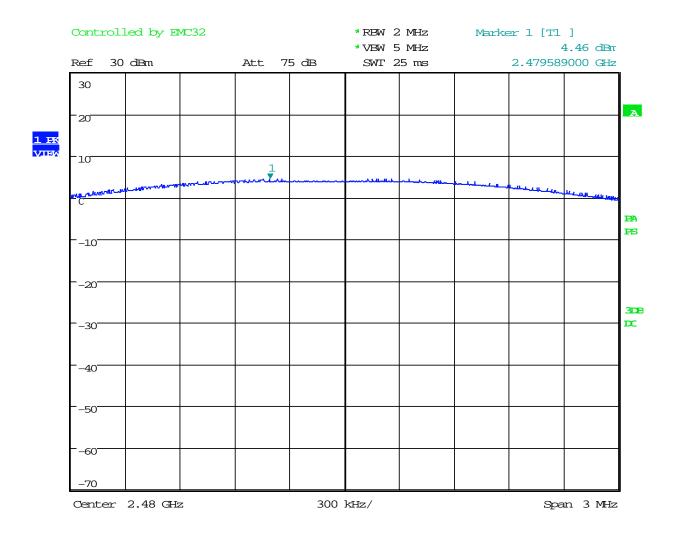


Date: 11.JAN.2023 11:14:39

Report Number: F2P26688A-01E Page 39 of 60 Issue Date: 2023-01-27

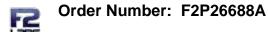


## GFSK, 1Mbps: High Channel



Date: 11.JAN.2023 11:16:56

Report Number: F2P26688A-01E Page 40 of 60 Issue Date: 2023-01-27



Applicant: LSI Industries, Inc. Model: BMD-341

Test Date:	2023-01-27	Test Engineer:	J. Chiller
Standards:	CFR 47 Part 15.247(b)(3); KDB558074	Air Temperature:	21.4°C
		Relative Humidity:	30%

GFSK, 2Mbps: Low Channel

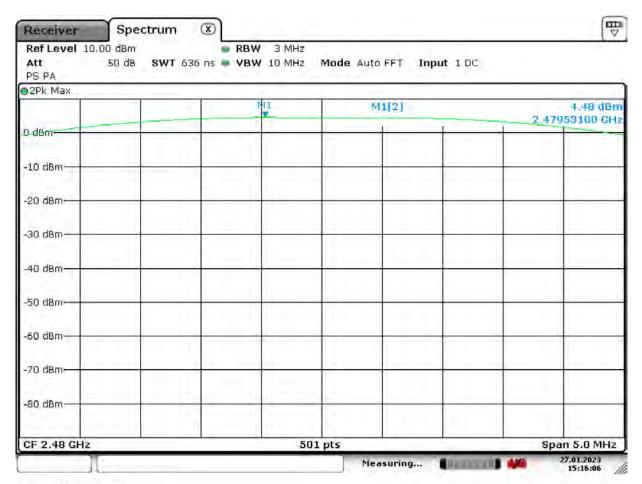


Date: 27.JAN.2023 15:15:28

Page 41 of 60 Issue Date: 2023-01-27



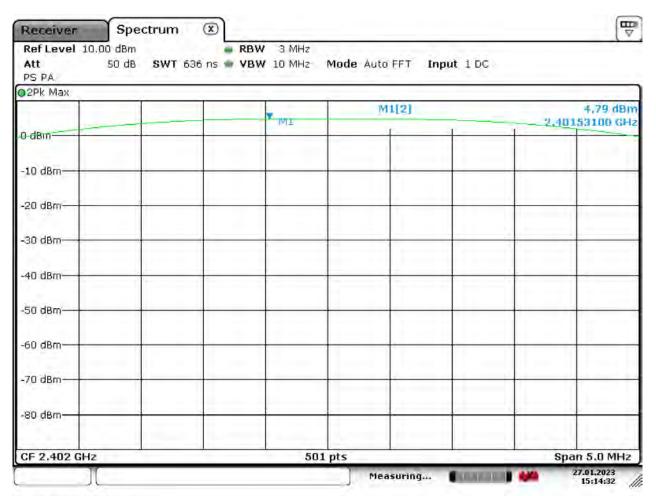
#### GFSK, 2Mbps: Mid Channel



Date: 27.JAN.2023 15:16:06



#### GFSK, 2Mbps: High Channel

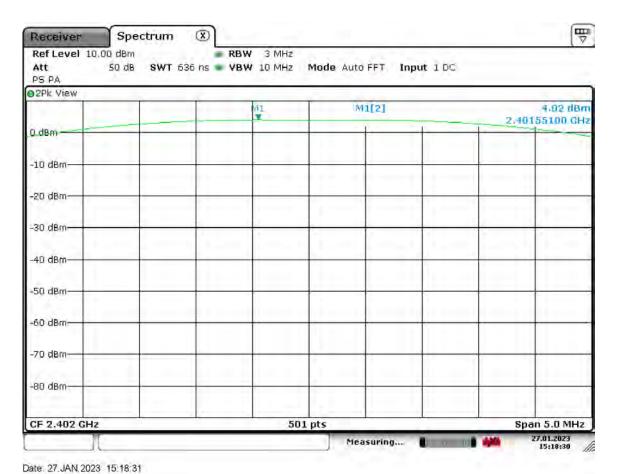


Date: 27.JAN.2023 15:14:32

Report Number: F2P26688A-01E Page 43 of 60 Issue Date: 2023-01-27



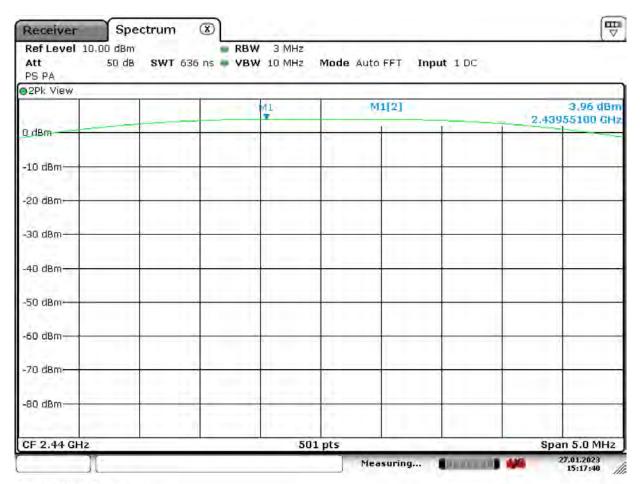
#### **OQPSK, 2Mbps: Low Channel**



Account to the second s



#### **OQPSK, 2Mbps: Mid Channel**

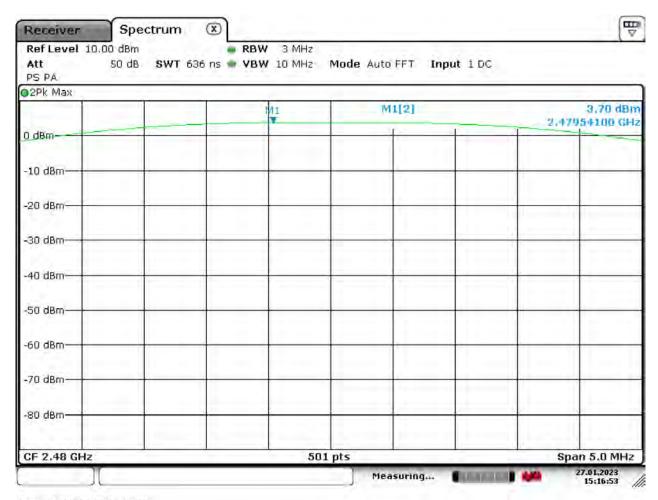


Date: 27.JAN.2023 15:17:39

Report Number: F2P26688A-01E Page 45 of 60 Issue Date: 2023-01-27



#### **OQPSK, 2Mbps: High Channel**



Date: 27.JAN.2023 15:16:53

Report Number: F2P26688A-01E Page 46 of 60 Issue Date: 2023-01-27



Order Number: F2P26688A Applicant: LSI Industries, Inc.

Model: BMD-341

#### 10 FCC PART 15.247(e) – PEAK POWER SPECTRAL DENSITY (PSD)

Peak power spectral density measurements were performed.

#### 10.1 Requirements:

The peak power spectral density shall not exceed +8dBm in any 3 kHz band during any time interval of continuous transmission.

Power spectral density measurements were performed at a resolution bandwidth of 3 kHz (video bandwidth set at 10 KHz). The peak spectral densities were measured at the low, mid, and upper channels.

051816

Report Number: F2P26688A-01E Page 47 of 60 Issue Date: 2023-01-27



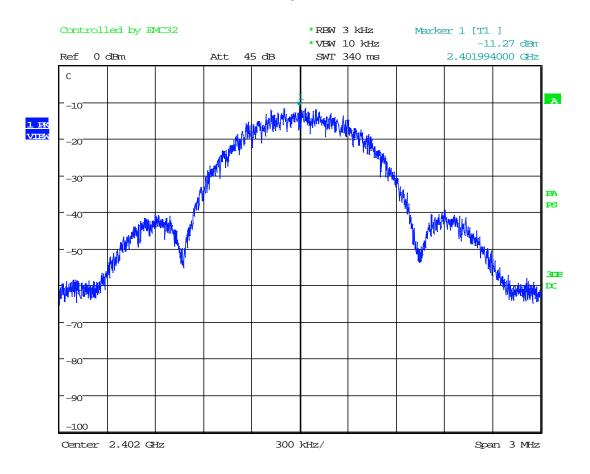
Order Number: F2P26688A Applicant: LSI Industries, Inc.

Model: BMD-341

#### 10.2 Peak Power Spectral Density Test Data

Test Date(s):	2023-01-11	Test Engineer:	J. Chiller
Standards:	CFR 47 Part 15.247(e); KDB558074	Air Temperature:	21.2°C
		Relative Humidity:	33%

#### GFSK, 1Mbps: Low Channel

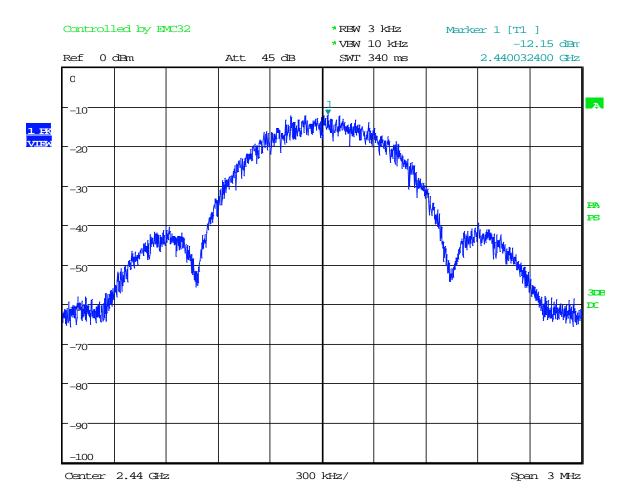


Date: 11.JAN.2023 11:20:26

Report Number: F2P26688A-01E Page 48 of 60 Issue Date: 2023-01-27

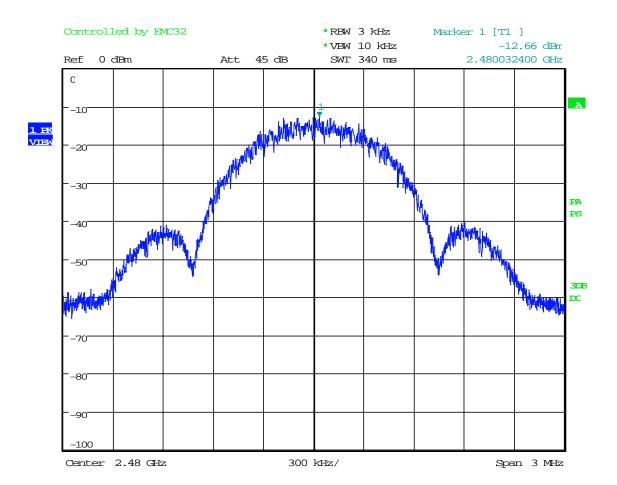


## **GFSK**, 1Mbps: Mid Channel



Date: 11.JAN.2023 11:19:15





GFSK, 1Mbps: High Channel

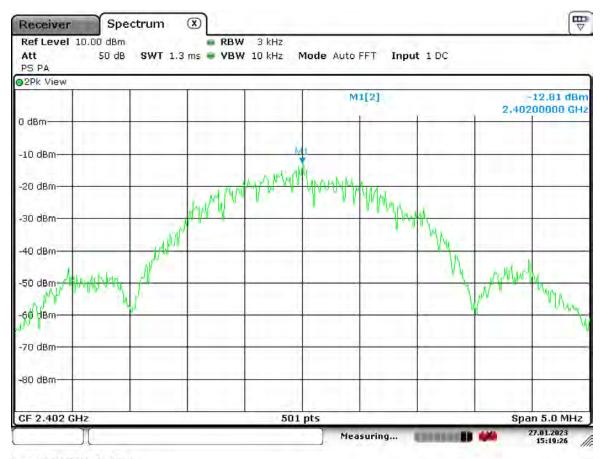
Date: 11.JAN.2023 11:18:26



Applicant: LSI Industries, Inc. Model: BMD-341

Test Date(s):	2023-01-27	Test Engineer:	J. Chiller
Standards:	CFR 47 Part 15.247(e); KDB558074	Air Temperature:	21.4°C
Test Results:	Pass	Relative Humidity:	30%

GFSK, 2 Mbps: Low Channel

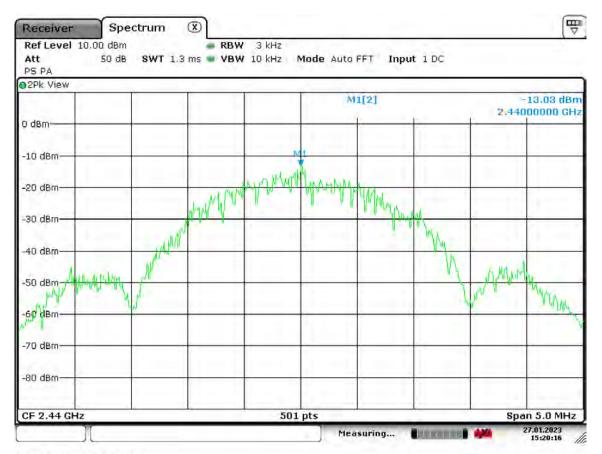


Date: 27.JAN.2023 15:19:26

Report Number: F2P26688A-01E Page 51 of 60 Issue Date: 2023-01-27



GFSK, 2 Mbps: Mid Channel

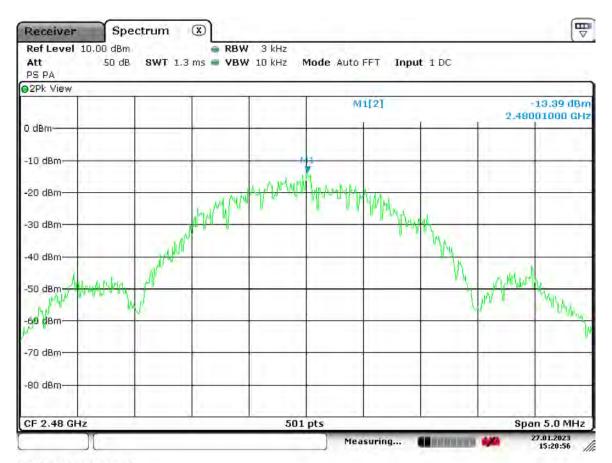


Date: 27.JAN.2023 15:20:16

Report Number: F2P26688A-01E Page 52 of 60 Issue Date: 2023-01-27



#### GFSK, 2 Mbps: High Channel

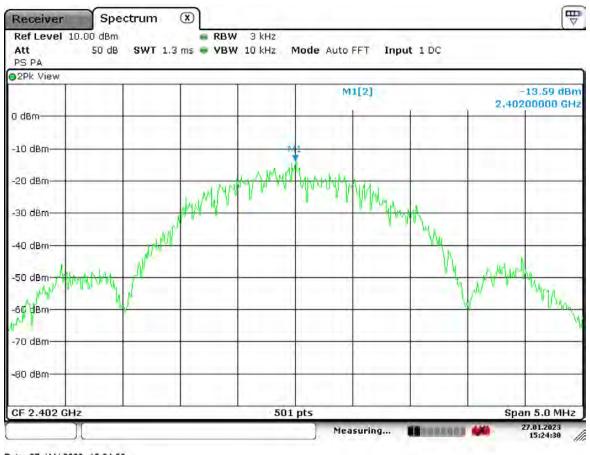


Date: 27.JAN.2023 15:20:57

Report Number: F2P26688A-01E Page 53 of 60 Issue Date: 2023-01-27

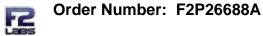


#### **OQPSK, 2 Mbps: Low Channel**

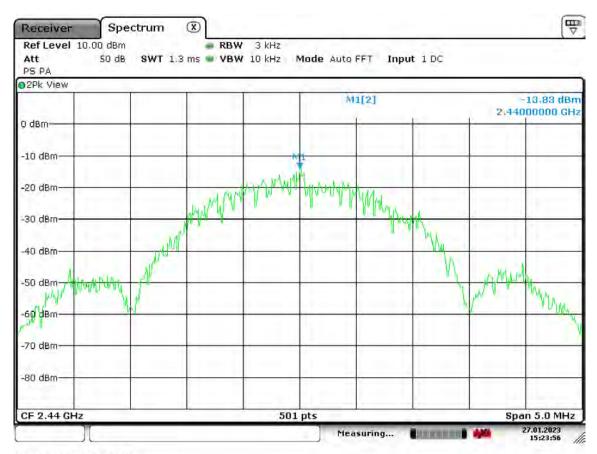


Date: 27.JAN.2023 15:24:30

Report Number: F2P26688A-01E Page 54 of 60 Issue Date: 2023-01-27



OQPSK, 2 Mbps: Mid Channel

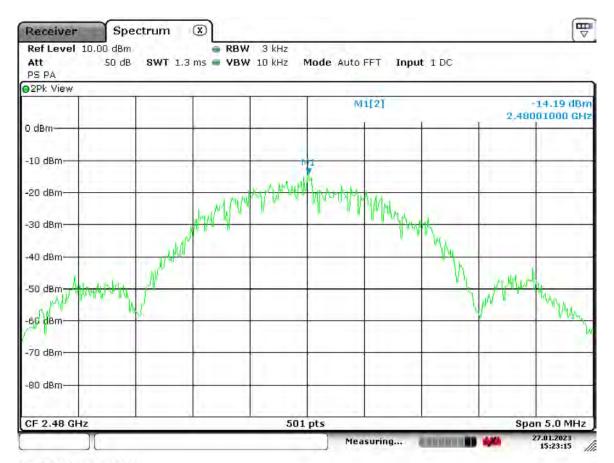


Date: 27.JAN.2023 15:23:56

Report Number: F2P26688A-01E Page 55 of 60 Issue Date: 2023-01-27



#### **OQPSK, 2 Mbps: High Channel**



Date: 27 JAN.2023 15:23:15

Report Number: F2P26688A-01E Page 56 of 60 Issue Date: 2023-01-27

Applicant: LSI Industries, Inc. Model: BMD-341

#### 11 **TEST SETUP PHOTOGRAPHS**

## Radiated Spurious Emission, 0.009 MHz to 30 MHz



Page 57 of 60 Report Number: F2P26688A-01E Issue Date: 2023-01-27

Applicant: LSI Industries, Inc. Model: BMD-341

# Radiated Spurious Emission, 30 MHz to 1000 MHz



Radiated Spurious Emission, 1 GHz to 18 GHz



Applicant: LSI Industries, Inc. Model: BMD-341

# Radiated Spurious Emission, 18 GHz to 26 GHz



Page 59 of 60 Report Number: F2P26688A-01E Issue Date: 2023-01-27



Applicant: LSI Industries, Inc. Model: BMD-341



