# **BluStor PMC**

**TEST REPORT FOR** 

Powered Smart Card Model: DFM2.0A

**Tested To The Following Standards:** 

FCC Part 15 Subpart C Section 15.249

Report No.: 98130-7

Date of issue: April 18, 2016



This test report bears the accreditation symbol indicating that the testing performed herein meets the test and reporting requirements of ISO/IEC 17025 under the applicable scope of EMC testing for CKC Laboratories, Inc.

We strive to create long-term, trust based relationships by providing sound, adaptive, customer first testing services. We embrace each of our customers' unique EMC challenges, not as an interruption to set processes, but rather as the reason we are in business.

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## **ADMINISTRATIVE INFORMATION**

## **Test Report Information**

REPORT PREPARED FOR: REPORT PREPARED BY:

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8307 42nd Ave CKC Laboratories, Inc.
Kenosha WI 53142 5046 Sierra Pines Drive
Mariposa, CA 95338

Representative: Mark Bennett Project Number: 98130

DATE OF EQUIPMENT RECEIPT: April 7, 2016

DATE(S) OF TESTING: April 7-8 2016

Report Authorization

The test data contained in this report documents the observed testing parameters pertaining to and are relevant for only the sample equipment tested in the lagreed upon operational mode(s) and configuration(s) as identified herein. Compliance assessment remains the client's responsibility. This report may not be used to claim product endorsement by A2LA or any government agencies. This test report has been authorized for release under quality control from CKC Laboratories, Inc.

Steve Behm
Director of Quality Assurance & Engineering Services
CKC Laboratories, Inc.

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# **Test Facility Information**



Our laboratories are configured to effectively test a wide variety of product types. CKC utilizes first class test equipment, anechoic chambers, data acquisition and information services to create accurate, repeatable and affordable test results.

TEST LOCATION(S): CKC Laboratories, Inc. 110 Olinda Place Brea, CA 92823

**Software Versions** 

CKC Laboratories Proprietary Software	Version
EMITest Emissions	5.03.02

# **Site Registration & Accreditation Information**

Location	CB#	TAIWAN	CANADA	FCC	JAPAN
Brea D	US0060	SL2-IN-E-1146R	3082D-2	100638	A-0147



### **SUMMARY OF RESULTS**

## Standard / Specification: FCC Part 15 Subpart C - 15.249

Test Procedure	Description	Modifications	Results
15.215(c)	Occupied Bandwidth	NA	Pass
15.249(a)	Field Strength of Fundamental	NA	Pass
15.249(a)	Field Strength of Spurious Emissions	NA	Pass
15.207	AC Conducted Emissions	NA	NA <sup>1</sup>

NA = Not applicable

NA<sup>1</sup> = Not applicable because this equipment is battery powered and the manufacturer declares the equipment cannot operate while charging.

Modifications During Testing

This list is a summary of the modifications made to the equipment during testing.

Summary	of /	Cond	ditions
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No modifications were made during testing.

Modifications listed above must be incorporated into all production units.

**Conditions During Testing** 

This list is a summary of the conditions noted to the equipment during testing.

## **Summary of Conditions**

None

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# **EQUIPMENT UNDER TEST (EUT)**

During testing numerous configurations may have been utilized. The configurations listed below support compliance to the standard(s) listed in the Summary of Results section.

#### **Configuration 1**

#### **Equipment Tested:**

Device	Manufacturer	Model #	S/N
Powered Smart Card	BluStor PMC	DFM2.0A	NA

#### **Support Equipment:**

Device	Manufacturer	Model #	S/N
USB Charger	Samsung	EP-TA20JWE	NA

## **General Product Information:**

Product Information	Manufacturer-Provided Details
Equipment Type:	Stand-Alone Equipment
Rated Transmit Power:	+2dBm
Operating Frequency Range:	2402-2480MHz
OBW and Emissions Type(s):	1.2MHz, G7W
Modulation Type(s):	Bluetooth V4 modulation: GFSK, 8DPSK, pi/4-DQPSK
Modulation Type(s):	BLE modulation: GFSK
Maximum Duty Cycle:	25%
Frequency Stability Info:	Remains within band in accordance with FCC 215(c)
Antenna Type(s) and Gain:	Taiyo Uden chip antenna, 1.9dBi
Antenna Connection Type:	Integral
Nominal Input Voltage:	3.7VDC
Firmware / Software used for Test:	99.1

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# **FCC Part 15 Subpart C**

# 15.215(c) Occupied Bandwidth (20dB BW)

Test Setup/Conditions					
Test Location:	Brea Lab D	Test Engineer:	Don Nguyen		
Test Method:	ANSI C63.10 (2013)	Test Date(s):	4/7/2016		
Configuration:	1				

Environmental Conditions					
Temperature (°C)	17	Relative Hum dty /%: 45			

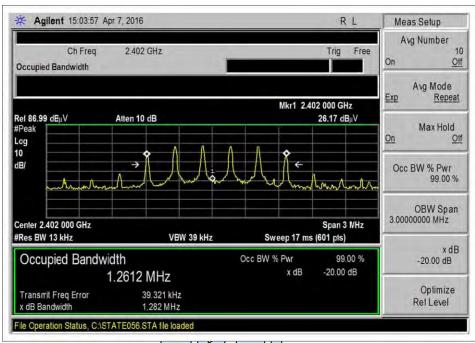
Test Equipment					
Asset#	# Description Manufacturer Model				Cal Due
AN00787	Preamp	HP	83017A	6/10/2015	6/10/2017
AN01646	Horn Antenna	Emco	3115	3/4/2016	3/4/2018
ANP04382	Cable	Andrew	LDF-50	7/30/2014	7/30/2016
ANP06360	Cable	Andrew	L1-PNMNM-48	7/29/2014	7/29/2016
AN02869	Spectrum Analyzer	Agilent	E4440A	7/17/2015	7/17/2016
AN02946	Cable	Astrolab Inc.	32022-2-2909K-36TC	11/2/2015	11/2/2017

Test Data Summary					
Frequency (MHz)	Antenna Port	Modulation	Measured (kHz)	Limit (kHz)	Results
2402	NA	Bluetooth V4, pi4-DQPSK	1282	None	Pass
2480	NA	Bluetooth V4, pi4-DQPSK	1282	None	Pass
2402	NA	Bluetooth V4, GFSK	523.2	None	Pass
2480	NA	Bluetooth V4, GFSK	523.1	None	Pass
2402	NA	Bluetooth V4, 8DPSK	1269	None	Pass
2480	NA	Bluetooth V4, 8DPSK	1270	None	Pass
2402	NA	BLE, GFSK	777.3	None	Pass
2480	NA	BLE, GFSK	777.0	None	Pass

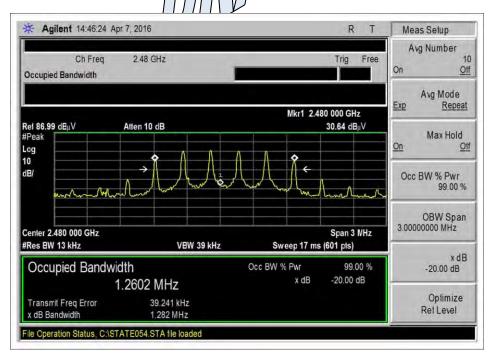
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#### Plot(s)

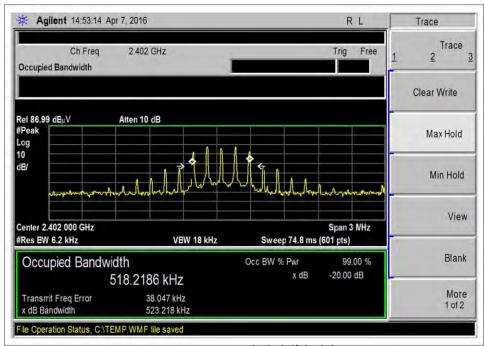




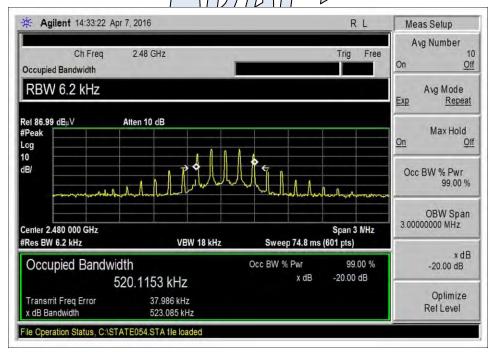


Bluetooth V4, pi4-DQPSK, 2480MHz



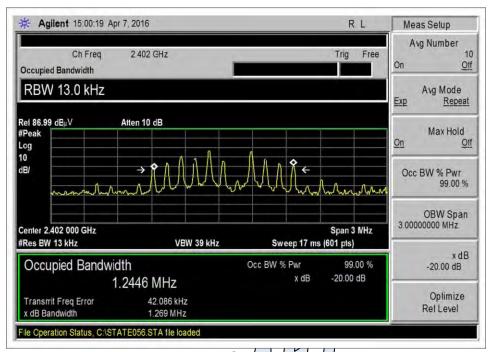




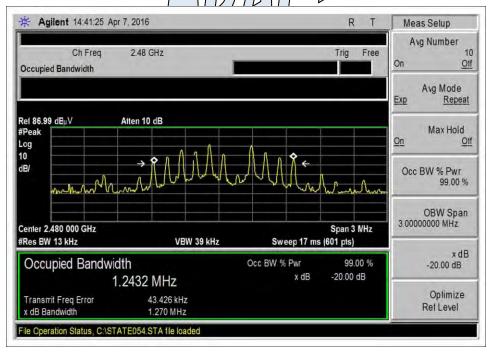


Bluetooth V4, GFSK, 2480MHz



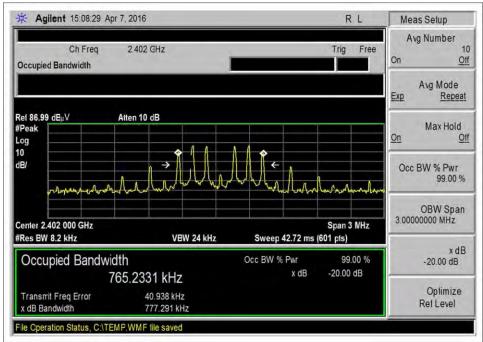




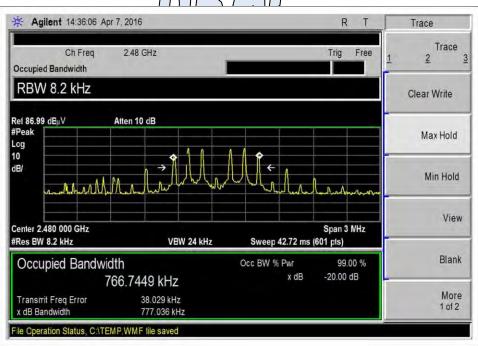


Bluetooth V4, 8DPSK, 2480MHz









BLE, GFSK, 2480MHz



# Test Setup Photo(s)



Y Axis





ZAxis







Test Setup, View #2





Test Setup, View #4





Test Setup, View #5



# 15.249(a) Field Strength of Fundamental

#### **Test Setup/Conditions/ Data**

Test Location: CKC Laboratories, Inc. • 110 N. Olinda Pl • Brea, CA 92823 • 7149936112

Customer: BluStor PMC

Specification: 15.249 Carrier and Spurious Emissions (2400-2483.5 MHz Transmitter)

 Work Order #:
 98130
 Date:
 4/7/2016

 Test Type:
 Maximized Emissions
 Time:
 14:12:09

Tested By: Don Nguyen Sequence#: 0

Software: EMITest 5.03.02

**Equipment Tested:** 

Device Manufacturer Model # S/N
Configuration 1

Support Equipment:

Device Manufacturer Model # S/N
Configuration 1

Test Conditions / Notes:

The EUT is place on Styrofoam platform at 1.5m height. The EUT is set to transmit continuously at 99% duty cycle. USB charge is connected to the EUT during jest. The manufacturer declares that the EUT will not be

marketed with the USB charger.

Operating frequency: 2402-2480MHz

Bluetooth V4 modulation: GFSK, 8DPSK, and

BLE modulation: GFSK

Tested frequency: 2402MHz, 2441MHz, 2480MHz

RBW=VBW=1MHz;

Temperature, 17°C Relative Humidity, 45%

Test Method: ANSI C63.10 (2013)

Site D

Note: The EUT is tested in three orthogonal axes.

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Test Equipment:

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
T1	AN00787	Preamp	83017A	6/10/2015	6/10/2017
T2	AN01646	Horn Antenna	3115	3/4/2016	3/4/2018
Т3	ANP04382	Cable	LDF-50	7/30/2014	7/30/2016
T4	ANP06360	Cable	L1-PNMNM-48	7/29/2014	7/29/2016
T5	AN02869	Spectrum Analyzer	E4440A	7/17/2015	7/17/2016
Т6	AN02946	Cable	32022-2-	11/2/2015	11/2/2017
			2909K-36TC		

# Freq Rdng T1 T2 T3 T4 Dist Corr Spec Margin Polar T5 T6	Measu	rement Data:	Re	eading list	ted by ma	ırgin.	Test Distance: 3 Meters					
MHz	#	Freq	Rdng	T1	T2	Т3	T4	Dist	Corr	Spec	Margin	Polar
1 2480.000M 75.7 -39.7 +25.2 +6.5 +3.4 +0.0 71.9 94.0 -22.1 Vert Bluetooth V4, 8DPSK, Y axis   2 2441.000M 76.0 -39.7 +25.1 +6.5 +3.3 +0 71.9 94.0 -22.1 Horiz Bluetooth V4, GFSK, Y axis   3 2480.000M 75.5 -39.7 +25.2 +6.5 +3.4 +0.0 71.0 94.0 -22.3 Horiz Bluetooth V4, GFSK, X axis   4 2441.000M 75.7 -39.7 +25.1 +6.5 +3.3 +0.0 71.0 94.0 -23.0 Horiz Bluetooth V4, GFSK, X axis   5 2441.000M 75.1 -39.7 +25.1 +6.5 +3.4 +0.0 71.0 94.0 -23.0 Horiz Bluetooth V4, GFSK, Z axis   6 2480.130M 74.8 -39.7 +25.1 +6.5 +3.4 +0.0 71.0 94.0 -23.0 Horiz Bluetooth V4, GFSK, Z axis   7 2441.000M 75.1 -39.7 +25.1 +6.5 +3.3 +0.0 71.0 94.0 -23.0 Horiz Bluetooth V4, BDPSK, Z axis   8 2480.000M 74.7 -39.7 +25.1 +6.5 +3.3 +0.0 71.0 94.0 -23.0 Vert Bluetooth V4, BDPSK, Y axis   8 2480.000M 74.7 -39.7 +25.2 +6.5 +3.4 +0.0 70.9 94.0 -23.1 Horiz Bluetooth V4, BDPSK, X axis   9 2480.000M 74.4 -39.7 +25.2 +6.5 +3.4 +0.0 70.9 94.0 -23.1 Horiz Bluetooth V4, BDPSK, X axis   10 2441.000M 74.4 -39.7 +25.2 +6.5 +3.4 +0.0 70.6 94.0 -23.4 Horiz Bluetooth V4, GFSK, X axis   11 2441.000M 74.3 -39.7 +25.1 +6.5 +3.3 +0.0 70.2 94.0 -23.7 Vert Bluetooth V4, GFSK, X axis   11 2441.000M 74.3 -39.7 +25.1 +6.5 +3.3 +0.0 70.2 94.0 -23.7 Vert Bluetooth V4, GFSK, X axis   11 2441.000M 74.3 -39.7 +25.1 +6.5 +3.3 +0.0 70.2 94.0 -23.8 Vert Bluetooth V4, GFSK, X axis   11 2441.000M 74.3 -39.7 +25.1 +6.5 +3.3 +0.0 70.2 94.0 -23.8 Vert Bluetooth V4, GFSK, X axis   11 2441.000M 74.3 -39.7 +25.1 +6.5 +3.3 +0.0 70.2 94.0 -23.8 Vert Bluetooth V4, GFSK, X axis   12 2480.000M 74.6 -39.7 +25.2 +6.5 +3.4 +0.0 69.8 94.0 -24.2 Horiz Bluetooth V4, GFSK, X axis   13 2480.000M 74.6 -39.7 +25.2 +6.5 +3.4 +0.0 69.8 94.0 -24.2 Horiz Bluetooth V4, GFSK, X axis   14 2441.000M 75.6 -39.7 +25.2 +6.5 +3.4 +0.0 69.8 94.0 -24.2 Horiz Bluetooth V4, GFSK, X axis   15 2480.000M 75.1 -39.7 +25.1 +6.5 +3.3 +0.0 69.8 94.0 -24.2 Horiz Bluetooth V4, GFSK, X axis   16 2480.000M 75.1 -39.7 +25.2 +6.5 +3.4 +0.0 69.8 94.0 -24.2 Horiz Bluetooth V4, GFSK, X axis   17 2480.000M 75.1 -39.7 +25.1 +6.5 +3.4 +0.0				T5	T6							
10		MHz	$dB\mu V$	dB	dB	dB	dB	Table	$dB\mu V/m$	$dB\mu V/m$	dB	Ant
2 2441.000M 76.0 -39.7 +25.1 +6.5 +3.3 +0	1	2480.000M	75.7	-39.7	+25.2	+6.5	+3.4	+0.0	71.9	94.0	-22.1	Vert
2 2441.000M 76.0 -39.7 +25.1 +6.5 +3.3 +0.0 11.9 94.0 -22.1 Horiz Bluetooth V4, GFSK, Y axis  3 2480.000M 75.5 -39.7 +25.2 +6.5 +3.4 +0.0 71.6 94.0 -22.3 Horiz Bluetooth V4, GFSK, X axis  4 2441.000M 75.7 -39.7 +25.1 +6.5 +3.3 +0.0 71.0 94.0 -22.4 Horiz Bluetooth V4, GFSK, X axis  5 2441.000M 75.1 -39.7 +25.1 +6.5 +3.4 +0.0 71.0 94.0 -23.0 Horiz Bluetooth V4, pi/4 DQPSK, Z axis  6 2480.130M 74.8 -39.7 +25.2 +6.5 +3.4 +0.0 71.0 94.0 -23.0 Horiz Bluetooth V4, pi/4 DQPSK, Z axis  7 2441.000M 75.1 -39.7 +25.1 +6.5 +3.3 +0.0 71.0 94.0 -23.0 Vert Bluetooth V4, pi/4 DQPSK, X axis  8 2480.000M 74.7 -39.7 +25.2 +6.5 +3.4 +0.0 70.9 94.0 -23.1 Horiz Bluetooth V4, gFSK, X axis  9 2480.000M 74.4 -39.7 +25.2 +6.5 +3.4 +0.0 70.9 94.0 -23.1 Horiz Bluetooth V4, gFSK, X axis  10 2441.000M 74.4 -39.7 +25.2 +6.5 +3.4 +0.0 70.6 94.0 -23.4 Horiz Bluetooth V4, gFSK, X axis  11 2441.000M 74.3 -39.7 +25.1 +6.5 +3.3 +0.0 70.2 94.0 -23.7 Vert Bluetooth V4, GFSK, X axis  11 2441.000M 74.3 -39.7 +25.1 +6.5 +3.3 +0.0 70.2 94.0 -23.7 Vert Bluetooth V4, GFSK, X axis  11 2441.000M 74.3 -39.7 +25.1 +6.5 +3.3 +0.0 70.2 94.0 -23.8 Vert Bluetooth V4, GFSK, X axis  11 2441.000M 74.3 -39.7 +25.1 +6.5 +3.3 +0.0 70.2 94.0 -23.8 Vert Bluetooth V4, GFSK, X axis  12 2480.000M 73.6 -39.7 +25.2 +6.5 +3.4 +0.0 69.8 94.0 -24.2 Horiz Bluetooth V4, GFSK, X axis  12 2480.000M 73.6 -39.7 +25.2 +6.5 +3.4 +0.0 69.8 94.0 -24.2 Horiz Bluetooth V4, GFSK, X axis				+0.0	+0.8					Bluetooth \	V4,	
10									1	8DPSK, Y	axis	
3 2480.000M 75.5 -39.7 +25.2 +6.5 +3.4 +0.0 71.6 94.0 -22.3 Horiz Bluetooth V4, 8DPSK, Z axis  4 2441.000M 75.7 -39.7 +25.1 +6.5 +3.3 +0.0 71.6 94.0 -22.4 Horiz Bluetooth V4, GFSK, Z axis  5 2441.000M 75.1 -39.7 +25.1 +6.5 +3.4 +0.0 71.0 94.0 -23.0 Horiz Bluetooth V4, pi/4- DQPSK, Z axis  6 2480.130M 74.8 -39.7 +25.1 +6.5 +3.3 +0.0 71.0 94.0 -23.0 Horiz Bluetooth V4, pi/4- DQPSK, Z axis  7 2441.000M 75.1 -39.7 +25.1 +6.5 +3.3 +0.0 71.0 94.0 -23.0 Vert Bluetooth V4, pi/4- DQPSK, Z axis  8 2480.000M 74.7 -39.7 +25.2 +6.5 +3.4 +0.0 70.9 94.0 -23.1 Horiz Bluetooth V4, BDPSK, X axis  9 2480.000M 74.4 -39.7 +25.2 +6.5 +3.4 +0.0 70.9 94.0 -23.1 Horiz Bluetooth V4, BDPSK, X axis  10 2441.000M 74.4 -39.7 +25.2 +6.5 +3.4 +0.0 70.9 94.0 -23.4 Horiz Bluetooth V4, GFSK, X axis  11 2441.000M 74.4 -39.7 +25.1 +6.5 +3.3 +0.0 70.3 94.0 -23.7 Vert Bluetooth V4, GFSK, X axis  11 2441.000M 74.3 -39.7 +25.1 +6.5 +3.3 +0.0 70.2 94.0 -23.8 Vert Bluetooth V4, GFSK, X axis  11 2441.000M 74.3 -39.7 +25.1 +6.5 +3.3 +0.0 70.2 94.0 -23.8 Vert Bluetooth V4, GFSK, X axis  12 2480.000M 73.6 -39.7 +25.2 +6.5 +3.4 +0.0 69.8 94.0 -23.8 Vert Bluetooth V4, GFSK, X axis  12 2480.000M 73.6 -39.7 +25.2 +6.5 +3.4 +0.0 69.8 94.0 -24.2 Horiz Bluetooth V4, GFSK, X axis  12 2480.000M 73.6 -39.7 +25.2 +6.5 +3.4 +0.0 69.8 94.0 -24.2 Horiz Bluetooth V4, GFSK, X axis	2	2441.000M	76.0	-39.7	+25.1	+6.5	+3.3	+0.0	71.9	94.0	-22.1	Horiz
3 2480.000M 75.5 -39.7 +25.2 +6.5 +3.4 +0.0 71.7 94.0 -22.3 Horiz Bluetooth V4, 8DPSK, Z axis SPSK, X axis SP				+0.0	+0.7					Bluetooth \	V4,	
+0.0							1			GFSK, Y a	xis	
SDPSK, Z axis   SUPSK, Z axi	3	2480.000M	75.5	-39.7	+25.2	+6.5	+3.4	L+0.0	71.7	94.0	-22.3	Horiz
4 2441.000M       75.7       -39.7       +25.1       +6.5       +3.3       +0.0       71.6       94.0       -22.4       Horiz Bluetooth V4, GFSK, X axis         5 2441.000M       75.1       -39.7       +25.1       +6.5       +3.3       +0.0       71.0       94.0       -23.0       Horiz Bluetooth V4, GFSK, Z axis         6 2480.130M       74.8       -39.7       +25.2       +6.5       +3.4       +0.0       71.0       94.0       -23.0       Horiz Bluetooth V4, pi/4-DQPSK, Z axis         7 2441.000M       75.1       -39.7       +25.1       +6.5       +3.3       +0.0       71.0       94.0       -23.0       Vert Bluetooth V4, pi/4-DQPSK, Z axis         8 2480.000M       74.7       -39.7       +25.2       +6.5       +3.4       +0.0       70.9       94.0       -23.0       Vert Bluetooth V4, RDPSK, Y axis         9 2480.000M       74.4       -39.7       +25.2       +6.5       +3.4       +0.0       70.9       94.0       -23.1       Horiz Bluetooth V4, RDPSK, X axis         10 2441.000M       74.4       -39.7       +25.2       +6.5       +3.4       +0.0       70.6       94.0       -23.7       Vert Bluetooth V4, GFSK, X axis         11 2441.000M       74.3       -39.7				+0.0	+0.8		/ / / /	1		Bluetooth \	V4,	
## 10.0 ## 10.						101	$I/I \mid I$			8DPSK, Z	axis	
Second	4	2441.000M	75.7	-39.7	+2\$.1	+6.5/	1433	+0.6	71.6	94.0	-22.4	Horiz
5         2441.000M         75.1         -39.7         +25.1         +0.0         +3.3         +0.0         71.0         94.0         -23.0         Horiz Bluetooth V4, GFSK, Z axis           6         2480.130M         74.8         -39.7         +25.2         +6.5         +3.4         +0.0         71.0         94.0         -23.0         Horiz Bluetooth V4, pi/4-DQPSK, Z axis           7         2441.000M         75.1         -39.7         +25.1         +6.5         +3.3         +0.0         71.0         94.0         -23.0         Vert Bluetooth V4, pi/4-DQPSK, Z axis           8         2480.000M         74.7         -39.7         +25.2         +6.5         +3.4         +0.0         70.9         94.0         -23.0         Vert Bluetooth V4, RDPSK, Y axis           9         2480.000M         74.7         -39.7         +25.2         +6.5         +3.4         +0.0         70.9         94.0         -23.1         Horiz Bluetooth V4, RDPSK, X axis           9         2480.000M         74.4         -39.7         +25.2         +6.5         +3.4         +0.0         70.6         94.0         -23.4         Horiz Bluetooth V4, GFSK, X axis           10         2441.000M         74.4         -39.7         +25.1				+0.0	+0.17	11 . 37		l		Bluetooth \	V4,	
Ho.0						$H \cap M$				GFSK, X a	xis	
GFSK, Z axis  6 2480.130M 74.8 -39.7 +25.2 +6.5 +3.4 +0.0 71.0 94.0 -23.0 Horiz	5	2441.000M	75.1	-39.7	+25.1	1 +6.5	+3.3	+0.0	71.0	94.0	-23.0	Horiz
6 2480.130M 74.8 -39.7 +25.2 +6.5 +3.4 +0.0 71.0 94.0 -23.0 Horiz Bluetooth V4, pi/4-DQPSK, Z axis  7 2441.000M 75.1 -39.7 +25.1 +6.5 +3.3 +0.0 71.0 94.0 -23.0 Vert Bluetooth V4, 8DPSK, Y axis  8 2480.000M 74.7 -39.7 +25.2 +6.5 +3.4 +0.0 70.9 94.0 -23.1 Horiz Bluetooth V4, 8DPSK, X axis  9 2480.000M 74.4 -39.7 +25.2 +6.5 +3.4 +0.0 70.6 94.0 -23.4 Horiz Bluetooth V4, GFSK, X axis  10 2441.000M 74.4 -39.7 +25.1 +6.5 +3.3 +0.0 70.3 94.0 -23.7 Vert Bluetooth V4, GFSK, X axis  11 2441.000M 74.3 -39.7 +25.1 +6.5 +3.3 +0.0 70.3 94.0 -23.7 Vert Bluetooth V4, GFSK, X axis  12 2480.000M 73.6 -39.7 +25.2 +6.5 +3.3 +0.0 70.2 94.0 -23.8 Vert Bluetooth V4, GFSK, Z axis  12 2480.000M 73.6 -39.7 +25.2 +6.5 +3.4 +0.0 69.8 94.0 -24.2 Horiz Bluetooth V4, GFSK, Z axis				+0.0	+0.4/					Bluetooth \	V4,	
Ho.0										GFSK, Z a	xis	
7 2441.000M 75.1 -39.7 +25.1 +6.5 +3.3 +0.0 71.0 94.0 -23.0 Vert Bluetooth V4, 8DPSK, Y axis  8 2480.000M 74.7 -39.7 +25.2 +6.5 +3.4 +0.0 70.9 94.0 -23.1 Horiz Bluetooth V4, 8DPSK, X axis  9 2480.000M 74.4 -39.7 +25.2 +6.5 +3.4 +0.0 70.6 94.0 -23.4 Horiz Bluetooth V4, GFSK, X axis  10 2441.000M 74.4 -39.7 +25.1 +6.5 +3.3 +0.0 70.3 94.0 -23.7 Vert H0.0 +0.0 +0.7 Bluetooth V4, GFSK, X axis  11 2441.000M 74.3 -39.7 +25.1 +6.5 +3.3 +0.0 70.2 94.0 -23.8 Vert H0.0 +0.7 Bluetooth V4, GFSK, Z axis  12 2480.000M 73.6 -39.7 +25.2 +6.5 +3.4 +0.0 69.8 94.0 -24.2 Horiz Bluetooth V4, GFSK, Z axis  12 2480.000M 73.6 -39.7 +25.2 +6.5 +3.4 +0.0 69.8 94.0 -24.2 Horiz Bluetooth V4, GFSK, Z axis	6	2480.130M	74.8	-39.7	+25.2	+6.5	+3.4	+0.0	71.0	94.0	-23.0	Horiz
7 2441.000M 75.1 -39.7 +25.1 +6.5 +3.3 +0.0 71.0 94.0 -23.0 Vert House Holder V4, 8DPSK, Y axis  8 2480.000M 74.7 -39.7 +25.2 +6.5 +3.4 +0.0 70.9 94.0 -23.1 Horiz Bluetooth V4, 8DPSK, X axis  9 2480.000M 74.4 -39.7 +25.2 +6.5 +3.4 +0.0 70.6 94.0 -23.4 Horiz Holder V4, GFSK, X axis  10 2441.000M 74.4 -39.7 +25.1 +6.5 +3.3 +0.0 70.3 94.0 -23.7 Vert +0.0 +0.7 Bluetooth V4, GFSK, X axis  11 2441.000M 74.3 -39.7 +25.1 +6.5 +3.3 +0.0 70.2 94.0 -23.8 Vert +0.0 +0.7 GFSK, Z axis  12 2480.000M 73.6 -39.7 +25.2 +6.5 +3.4 +0.0 69.8 94.0 -24.2 Horiz Holder V4, GFSK, Z axis  12 2480.000M 73.6 -39.7 +25.2 +6.5 +3.4 +0.0 69.8 94.0 -24.2 Horiz Bluetooth V4, GFSK, Z axis				+0.0	+0.8					Bluetooth \	V4, pi/4-	
Honder   H										DQPSK, Z	axis	
8 2480.000M 74.7 -39.7 +25.2 +6.5 +3.4 +0.0 70.9 94.0 -23.1 Horiz Bluetooth V4, 8DPSK, X axis  9 2480.000M 74.4 -39.7 +25.2 +6.5 +3.4 +0.0 70.6 94.0 -23.4 Horiz Bluetooth V4, GFSK, X axis  10 2441.000M 74.4 -39.7 +25.1 +6.5 +3.3 +0.0 70.3 94.0 -23.7 Vert Bluetooth V4, GFSK, X axis  11 2441.000M 74.3 -39.7 +25.1 +6.5 +3.3 +0.0 70.2 94.0 -23.8 Vert Bluetooth V4, GFSK, Z axis  12 2480.000M 73.6 -39.7 +25.2 +6.5 +3.4 +0.0 69.8 94.0 -24.2 Horiz Bluetooth V4, GFSK, Z axis  13 2480.000M 73.6 -39.7 +25.2 +6.5 +3.4 +0.0 69.8 94.0 -24.2 Horiz Bluetooth V4, GFSK, Z axis	7	2441.000M	75.1	-39.7	+25.1	+6.5	+3.3	+0.0	71.0	94.0	-23.0	Vert
8 2480.000M       74.7       -39.7       +25.2       +6.5       +3.4       +0.0       70.9       94.0       -23.1       Horiz Bluetooth V4, 8DPSK, X axis         9 2480.000M       74.4       -39.7       +25.2       +6.5       +3.4       +0.0       70.6       94.0       -23.4       Horiz Bluetooth V4, GFSK, X axis         10 2441.000M       74.4       -39.7       +25.1       +6.5       +3.3       +0.0       70.3       94.0       -23.7       Vert Bluetooth V4, GFSK, X axis         11 2441.000M       74.3       -39.7       +25.1       +6.5       +3.3       +0.0       70.2       94.0       -23.8       Vert Bluetooth V4, GFSK, Z axis         12 2480.000M       73.6       -39.7       +25.2       +6.5       +3.4       +0.0       69.8       94.0       -24.2       Horiz Bluetooth V4, GFSK, Z axis				+0.0	+0.7					Bluetooth Y	V4,	
Hone										8DPSK, Y	axis	
9 2480.000M 74.4 -39.7 +25.2 +6.5 +3.4 +0.0 70.6 94.0 -23.4 Horiz Bluetooth V4, GFSK, X axis  10 2441.000M 74.4 -39.7 +25.1 +6.5 +3.3 +0.0 70.3 94.0 -23.7 Vert H0.0 +0.7 Bluetooth V4, GFSK, X axis  11 2441.000M 74.3 -39.7 +25.1 +6.5 +3.3 +0.0 70.2 94.0 -23.8 Vert H0.0 +0.7 Bluetooth V4, GFSK, Z axis  12 2480.000M 73.6 -39.7 +25.2 +6.5 +3.4 +0.0 69.8 94.0 -24.2 Horiz Bluetooth V4, Bluetooth V4, GFSK, Z axis	8	2480.000M	74.7	-39.7	+25.2	+6.5	+3.4	+0.0	70.9	94.0	-23.1	Horiz
9 2480.000M 74.4 -39.7 +25.2 +6.5 +3.4 +0.0 70.6 94.0 -23.4 Horiz Bluetooth V4, GFSK, X axis  10 2441.000M 74.4 -39.7 +25.1 +6.5 +3.3 +0.0 70.3 94.0 -23.7 Vert H0.0 +0.7 Bluetooth V4, GFSK, X axis  11 2441.000M 74.3 -39.7 +25.1 +6.5 +3.3 +0.0 70.2 94.0 -23.8 Vert H0.0 +0.7 Bluetooth V4, GFSK, Z axis  12 2480.000M 73.6 -39.7 +25.2 +6.5 +3.4 +0.0 69.8 94.0 -24.2 Horiz Bluetooth V4, Bluetooth V4, GFSK, Z axis				+0.0	+0.8							
Hole										8DPSK, X	axis	
The image of the	9	2480.000M	74.4	-39.7		+6.5	+3.4	+0.0	70.6	94.0	-23.4	Horiz
10 2441.000M 74.4 -39.7 +25.1 +6.5 +3.3 +0.0 70.3 94.0 -23.7 Vert +0.0 +0.7 Bluetooth V4, GFSK, X axis  11 2441.000M 74.3 -39.7 +25.1 +6.5 +3.3 +0.0 70.2 94.0 -23.8 Vert +0.0 +0.7 Bluetooth V4, GFSK, Z axis  12 2480.000M 73.6 -39.7 +25.2 +6.5 +3.4 +0.0 69.8 94.0 -24.2 Horiz +0.0 +0.8 Bluetooth V4, Bluetooth V4,				+0.0	+0.8							
+0.0 +0.7 Bluetooth V4, GFSK, X axis  11 2441.000M 74.3 -39.7 +25.1 +6.5 +3.3 +0.0 70.2 94.0 -23.8 Vert +0.0 +0.7 Bluetooth V4, GFSK, Z axis  12 2480.000M 73.6 -39.7 +25.2 +6.5 +3.4 +0.0 69.8 94.0 -24.2 Horiz +0.0 +0.8 Bluetooth V4, GFSK, Z axis Bluetooth V4,										GFSK, X a	xis	
GFSK, X axis  11 2441.000M 74.3 -39.7 +25.1 +6.5 +3.3 +0.0 70.2 94.0 -23.8 Vert  +0.0 +0.7 Bluetooth V4,  GFSK, Z axis  12 2480.000M 73.6 -39.7 +25.2 +6.5 +3.4 +0.0 69.8 94.0 -24.2 Horiz +0.0 +0.8 Bluetooth V4,  Bluetooth V4,	10	2441.000M	74.4	-39.7	+25.1	+6.5	+3.3	+0.0	70.3	94.0	-23.7	Vert
11 2441.000M 74.3 -39.7 +25.1 +6.5 +3.3 +0.0 70.2 94.0 -23.8 Vert +0.0 +0.7 Bluetooth V4, GFSK, Z axis  12 2480.000M 73.6 -39.7 +25.2 +6.5 +3.4 +0.0 69.8 94.0 -24.2 Horiz +0.0 +0.8 Bluetooth V4,				+0.0	+0.7					Bluetooth \	V4,	
+0.0 +0.7 Bluetooth V4, GFSK, Z axis  12 2480.000M 73.6 -39.7 +25.2 +6.5 +3.4 +0.0 69.8 94.0 -24.2 Horiz +0.0 +0.8 Bluetooth V4,										GFSK, X a		
GFSK, Z axis  12 2480.000M 73.6 -39.7 +25.2 +6.5 +3.4 +0.0 69.8 94.0 -24.2 Horiz +0.0 +0.8 Bluetooth V4,	11	2441.000M	74.3	-39.7	+25.1	+6.5	+3.3	+0.0	70.2	94.0	-23.8	Vert
12 2480.000M 73.6 -39.7 +25.2 +6.5 +3.4 +0.0 69.8 94.0 -24.2 Horiz +0.0 +0.8 Bluetooth V4,				+0.0	+0.7					Bluetooth \	V4,	
+0.0 $+0.8$ Bluetooth V4,										GFSK, Z a		
	12	2480.000M	73.6	-39.7	+25.2	+6.5	+3.4	+0.0	69.8	94.0	-24.2	Horiz
8DPSK, Y axis				+0.0	+0.8					Bluetooth Y	V4,	
<u> </u>										8DPSK, Y	axis	



13	2441.130M	73.8	-39.7	+25.1	+6.5	+3.3	+0.0	69.7	94.0 -24.3	Vert
			+0.0	+0.7					Bluetooth V4, pi/4-	
									DQPSK, Y axis	
14	2480.000M	73.5	-39.7	+25.2	+6.5	+3.4	+0.0	69.7	94.0 -24.3	Vert
			+0.0	+0.8					Bluetooth V4,	
									8DPSK, X axis	
15	2480.130M	73.4	-39.7	+25.2	+6.5	+3.4	+0.0	69.6	94.0 -24.4	Vert
13	2400.13011	73.4	+0.0	+0.8	10.5	13.4	10.0	07.0	Bluetooth V4, pi/4-	VCIt
			10.0	10.0					DQPSK, Z axis	
16	2441.130M	72.5	20.7	125.1	+6.5	+3.3	+0.0	69.4		Horiz
10	2441.130M	73.5	-39.7	+25.1	+0.3	<b>⊤3.3</b>	±0.0	09.4		попи
			+0.0	+0.7					Bluetooth V4, pi/4-	
									DQPSK, Z axis	
17	2480.130M	73.1	-39.7	+25.2	+6.5	+3.4	+0.0	69.3	94.0 -24.7	Horiz
			+0.0	+0.8					Bluetooth V4, pi/4-	
									DQPSK, X axis	
18	2441.130M	73.3	-39.7	+25.1	+6.5	+3.3	+0.0	69.2	94.0 -24.8	Horiz
			+0.0	+0.7					Bluetooth V4, pi/4-	
								1	DQPSK, Y axis	
19	2480.130M	72.9	-39.7	+25.2	+6.5	+3.4	+0.0+	69.1	94.0 -24.9	Vert
			+0.0	+0.8			/		Bluetooth V4, pi/4-	
						4		'	DQPSK, Y axis	
20	2402.130M	73.3	-39.6	+25.0	+6.5	+3.2	[+0.0]	69.1	94.0 -24.9	Horiz
20	2 102.13011	73.3	+0.0	+0.7		1.3.2	V 4.0	07.1	Bluetooth V4, pi/4-	HOHZ
			. 0.0	. 0.7		IIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIII			DQPSK, Z axis	
21	2441.000M	73.1	-39.7	+2\$.1	+6.5/	133	+0.0	69.0	94.0 -25.0	Vert
21	2441.000M	73.1	+0.0	+0.7	1 /2.3/	ا در در ا	10.8	09.0	Bluetooth V4,	VEIT
			10.0	'19.1'	$11 \land 11$	11	l .		GFSK, Y axis	
22	2490 12014	72.5	20.7	13512	H I	+3.4	+0.0	68.7		Horiz
22	2480.130M	72.5	-39.7	+25 2  +0.8	1 79.31	±3.4	±0.0	08.7		попи
			+0.0	Tuo/	$\nu$				Bluetooth V4, pi/4-	
	2441.0003.5	<b>70</b> 0	20.5	1001			. 0. 0	60.5	DQPSK, Y axis	TT '
23	2441.000M	72.8	-39.7	+25.1	+6.5	+3.3	+0.0	68.7	94.0 -25.3	Horiz
			+0.0	+0.7					Bluetooth V4,	
									8DPSK, Z axis	
24	2480.000M	72.3	-39.7	+25.2	+6.5	+3.4	+0.0	68.5	94.0 -25.5	Horiz
			+0.0	+0.8					BLE, GFSK, Z axis	
25	2441.000M	72.5	-39.7	+25.1	+6.5	+3.3	+0.0	68.4	94.0 -25.6	Vert
			+0.0	+0.7					Bluetooth V4,	
									8DPSK, Z axis	
26	2441.130M	72.4	-39.7	+25.1	+6.5	+3.3	+0.0	68.3	94.0 -25.7	Vert
			+0.0	+0.7			-		Bluetooth V4, pi/4-	
									DQPSK, Z axis	
2.7	2441.000M	72.1	-39.7	+25.1	+6.5	+3.3	+0.0	68.0	94.0 -26.0	Horiz
- '	2	, 2.1	+0.0	+0.7	. 0.5	. 5.5	. 0.0	50.0	Bluetooth V4,	110112
			. 0.0	. 0.7					8DPSK, Y axis	
20	2480.000M	71.8	-39.7	+25.2	+6.5	+3.4	+0.0	68.0	94.0 -26.0	Vert
20	∠+00.000IVI	/1.0	+0.0	+23.2 $+0.8$	10.5	13.4	10.0	08.0	Bluetooth V4,	v ei i
			±0.0	±0.8						
20	2441 12034	72.0	20.7	125.1	165	12.2	100	(7.0	8DPSK, Z axis	77.
29	2441.130M	72.0	-39.7	+25.1	+6.5	+3.3	+0.0	67.9	94.0 -26.1	Vert
			+0.0	+0.7					Bluetooth V4, pi/4-	
	2.400.00=====								DQPSK, X axis	**
30	2480.000M	71.7	-39.7	+25.2	+6.5	+3.4	+0.0	67.9	94.0 -26.1	Vert
			+0.0	+0.8					BLE, GFSK, Y axis	



	• 400 000 5								212	
31	2480.000M	71.7	-39.7	+25.2	+6.5	+3.4	+0.0	67.9	94.0 -26.1	Vert
			+0.0	+0.8					Bluetooth V4,	
									GFSK, X axis	
32	2441.000M	71.8	-39.7	+25.1	+6.5	+3.3	+0.0	67.7	94.0 -26.3	Horiz
			+0.0	+0.7					Bluetooth V4,	
									8DPSK, X axis	
33	2441.130M	71.8	-39.7	+25.1	+6.5	+3.3	+0.0	67.7	94.0 -26.3	Horiz
			+0.0	+0.7					Bluetooth V4, pi/4-	
									DQPSK, X axis	
34	2402.000M	71.8	-39.6	+25.0	+6.5	+3.2	+0.0	67.6	94.0 -26.4	Vert
			+0.0	+0.7					Bluetooth V4,	
									8DPSK, Y axis	
35	2441.030M	71.7	-39.7	+25.1	+6.5	+3.3	+0.0	67.6	94.0 -26.4	Horiz
			+0.0	+0.7					BLE, GFSK, Z axis	
36	2402.100M	71.8	-39.6	+25.0	+6.5	+3.2	+0.0	67.6	94.0 -26.4	Horiz
			+0.0	+0.7					Bluetooth V4, pi/4-	
									DQPSK, Y axis	
37	2402.130M	71.7	-39.6	+25.0	+6.5	+3.2	+0.0	7.5	94.0 -26.5	Vert
			+0.0	+0.7			1		Bluetooth V4, pi/4-	
						,			DQPSK, Z axis	
38	2441.030M	71.5	-39.7	+25.1	+6.5	+313	≠0.0	67.4	94.0 -26.6	Vert
			+0.0	+0.7	_	/   /	411		BLE, GFSK, Z axis	
39	2402.000M	71.5	-39.6	+25.0	<del>+6.5</del>	/#3.2/	+0.0	67.3	94.0 -26.7	Horiz
			+0.0	+0.7	$\sqrt{ \alpha }$	$I/I \cup I$	$\Gamma$		Bluetooth V4,	
					11VI	IU   I			8DPSK, X axis	
40	2480.000M	71.1	-39.7	+25.2	+6.5	+34	+0.0	67.3	94.0 -26.7	Vert
			+0.0	+ 0  8	// N //				Bluetooth V4,	
					11 N				GFSK, Y axis	
41	2480.000M	70.8	-39.7	+2512/	J+6.5	+3.4	+0.0	67.0	94.0 -27.0	Horiz
			+0.0	⊬0.8∕					BLE, GFSK, Y axis	
42	2480.000M	70.7	-39.7	+25.2	+6.5	+3.4	+0.0	66.9	94.0 -27.1	Horiz
			+0.0	+0.8					BLE, GFSK, X axis	
43	2480.000M	70.3	-39.7	+25.2	+6.5	+3.4	+0.0	66.5	94.0 -27.5	Vert
			+0.0	+0.8					Bluetooth V4,	
									GFSK, Z axis	
44	2402.100M	70.5	-39.6	+25.0	+6.5	+3.2	+0.0	66.3	94.0 -27.7	Horiz
			+0.0	+0.7					Bluetooth V4, pi/4-	
									DQPSK, X axis	
45	2402.030M	70.5	-39.6	+25.0	+6.5	+3.2	+0.0	66.3	94.0 -27.7	Horiz
			+0.0	+0.7					BLE, GFSK, Z axis	
46	2402.130M	70.4	-39.6	+25.0	+6.5	+3.2	+0.0	66.2	94.0 -27.8	Vert
			+0.0	+0.7					Bluetooth V4, pi/4-	
									DQPSK, Y axis	
47	2480.000M	70.0	-39.7	+25.2	+6.5	+3.4	+0.0	66.2	94.0 -27.8	Horiz
			+0.0	+0.8					Bluetooth V4,	
									GFSK, Z axis	
48	2402.030M	70.3	-39.6	+25.0	+6.5	+3.2	+0.0	66.1	94.0 -27.9	Vert
			+0.0	+0.7					BLE, GFSK, Y axis	
49	2441.030M	70.2	-39.7	+25.1	+6.5	+3.3	+0.0	66.1	94.0 -27.9	Vert
			+0.0	+0.7					BLE, GFSK, Y axis	
									, ,	



	• 100 0007 5								24.0	
50	2480.000M	69.8	-39.7	+25.2	+6.5	+3.4	+0.0	66.0	94.0 -28.0	Horiz
			+0.0	+0.8					Bluetooth V4,	
									GFSK, Y axis	
51	2441.030M	69.9	-39.7	+25.1	+6.5	+3.3	+0.0	65.8	94.0 -28.2	Horiz
			+0.0	+0.7					BLE, GFSK, Y axis	
52	2402.000M	69.9	-39.6	+25.0	+6.5	+3.2	+0.0	65.7	94.0 -28.3	Horiz
			+0.0	+0.7					Bluetooth V4,	
									8DPSK, Z axis	
53	2402.000M	69.8	-39.6	+25.0	+6.5	+3.2	+0.0	65.6	94.0 -28.4	Vert
			+0.0	+0.7					Bluetooth V4,	
									GFSK, Y axis	
54	2402.000M	69.7	-39.6	+25.0	+6.5	+3.2	+0.0	65.5	94.0 -28.5	Horiz
			+0.0	+0.7					Bluetooth V4,	
									GFSK, X axis	
55	2441.000M	69.2	-39.7	+25.1	+6.5	+3.3	+0.0	65.1	94.0 -28.9	Vert
			+0.0	+0.7					Bluetooth V4,	
									8DPSK, X axis	
56	2402.000M	69.1	-39.6	+25.0	+6.5	+3.2	+0.0	<b>6</b> 4.9	94.0 -29.1	Horiz
			+0.0	+0.7					Bluetooth V4,	
							<u> </u>		8DPSK, Y axis	
57	2402.000M	69.0	-39.6	+25.0	+6.5	+31.2	+0.01	64.8	94.0 -29.2	Horiz
	2.02.000111	0,.0	+0.0	+0.7	0.0			0	Bluetooth V4,	110112
			0.0	017		$I_{\bullet} I_{\bullet} I_{\bullet}$			GFSK, Z axis	
58	2402.030M	69.0	-39.6	+25.0	+6.5	/ // 3 2	T+0.0	64.8	94.0 -29.2	Vert
	2102.030111	07.0	+0.0	+Ø.7	1777	/ /) [[ [		00	BLE, GFSK, Z axis	, 611
59	2402.000M	68.8	-39.6	+25.0)	+6.5	+32	+0.0	64.6	94.0 -29.4	Horiz
	2 102.000111	00.0	+0.0	+0.7	// n		. 0.0	01.0	Bluetooth V4,	HOHE
			. 0.0		עווי				GFSK, Y axis	
60	2441.030M	68.2	-39.7	+251	J+6.5	+3.3	+0.0	64.1	94.0 -29.9	Horiz
	2111.050111	00.2	+0.0	+0.7	V 0.5	. 5.5	. 0.0	0 1.1	BLE, GFSK, X axis	HOHE
61	2480.000M	67.8	-39.7	+25.2	+6.5	+3.4	+0.0	64.0	94.0 -30.0	Vert
01	2400.000WI	07.0	+0.0	+0.8	10.5	13.4	10.0	04.0	BLE, GFSK, Z axis	VCIT
62	2402.000M	68.2	-39.6	+25.0	+6.5	+3.2	+0.0	64.0	94.0 -30.0	Vert
02	2402.000W	08.2	+0.0	+0.7	10.5	13.2	10.0	04.0	Bluetooth V4,	Vert
			10.0	10.7					8DPSK, X axis	
62	2480.130M	67.6	-39.7	+25.2	+6.5	+3.4	+0.0	63.8	94.0 -30.2	Vert
03	2400.130W	07.0		+23.2	±0.3	<b>⊤3.4</b>	±0.0	03.8	94.0 -30.2 Bluetooth V4, pi/4-	vert
			+0.0	±0.8					DQPSK, X axis	
<u> </u>	2402 02014	67.9	20.6	±25 ∩	<b>⊥6.5</b>	+3.2	+0.0	63.7		Цота
04	2402.030M	0/.9	-39.6 +0.0	+25.0	+6.5	<b>⊤3.</b> ∠	±0.0	03./		Horiz
(5	2402 02014	67.0	+0.0	+0.7	16.5	12.2	100	62.6	BLE, GFSK, Y axis	IIa!-
65	2402.030M	67.8	-39.6	+25.0	+6.5	+3.2	+0.0	63.6	94.0 -30.4	Horiz
	2402 0003 5	(7.5	+0.0	+0.7	16.5	12.2	100	(2.2	BLE, GFSK, X axis	<b>T7</b> ·
66	2402.000M	67.5	-39.6	+25.0	+6.5	+3.2	+0.0	63.3	94.0 -30.7	Vert
			+0.0	+0.7					Bluetooth V4,	
	• • • • • • • • • • • • • • • • • • • •		• -						GFSK, Z axis	
67	2480.000M	65.8	-39.7	+25.2	+6.5	+3.4	+0.0	62.0	94.0 -32.0	Vert
			+0.0	+0.8					BLE, GFSK, X axis	
68	2402.000M	66.1	-39.6	+25.0	+6.5	+3.2	+0.0	61.9	94.0 -32.1	Vert
			+0.0	+0.7					Bluetooth V4,	
									8DPSK, Z axis	



69 2402.000M	65.1	-39.6	+25.0	+6.5	+3.2	+0.0	60.9	94.0	-33.1	Vert
		+0.0	+0.7					Bluetooth \	V4,	
								GFSK, X a	xis	
70 2402.000M	65.1	-39.6	+25.0	+6.5	+3.2	+0.0	60.9	94.0	-33.1	Vert
		+0.0	+0.7					Bluetooth \	V4, pi/4-	
								DQPSK, X	axis	
71 2441.130M	62.4	-39.7	+25.1	+6.5	+3.3	+0.0	58.3	94.0	-35.7	Vert
		+0.0	+0.7					BLE, GFSI	X, X axis	
72 2402.030M	60.2	-39.6	+25.0	+6.5	+3.2	+0.0	56.0	94.0	-38.0	Vert
		+0.0	+0.7					BLE, GFSI	X, X axis	

	Test Data	Summary - Vo	oltage Variatio	ons						
Frequency (MHz)	Modulation / Ant Port	V <sub>Minimum</sub> (dBuV/m)	V <sub>Nominal</sub> (dBuV/m)	V <sub>Maximum</sub> (dBuV/m)	Max Deviation from V <sub>Nominal</sub> (dB)					
NA NA NA NA NA										

Test performed using operational mode with the highest output power, representing worst case.

NA: This equipment is battery powered and manufacturer declares the equipment cannot operate while charging.

The EUT was fully charged while testing.

## **Parameter Definitions:**

Measurements performed at input voltage

Parameter	Value	
V <sub>Nominal</sub> :	3.7VDC	
V <sub>Minimum</sub> :	NA	
V <sub>Maximum</sub> :	NA	

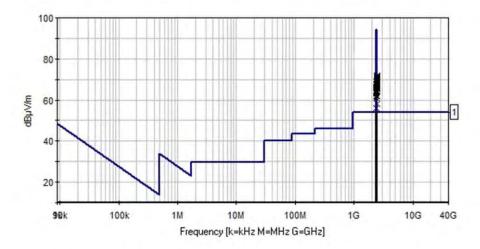
	Test Data Summary – Radiated Field Strength Measurement										
Frequency (MHz)	Modulation	(dBuV/m @ 3m) (dBuV/m @ 3m)									
2480	Bluetooth V4, 8DPSK	Chip antenna	71.9	≤94	Pass						
2441	Bluetooth V4, GFSK	Chip antenna	71.9	≤94	Pass						
2480	Bluetooth V4, pi/ 4-DQPSK	Chip antenna	71.0	≤94	Pass						
2480	BLE, GFSK	Chip antenna	68.5	≤94	Pass						

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#### **Plot Data**

BluStor PMC WO#: 98130 Sequence#: 0 Date: 4/7/2016 15.249 Carrier and Spurious Emissions (2400-2483.5 MHz Transmitter) Test Distance: 3 Meters Vert



Readings
1 - 15.249 Carrier and Spurious Emissions (2400-2483.5 MHz Transmitter)

× Peak Readings
Software Version; 5.03.02





## Test Setup Photo(s)





Y Axis





ZAxis





Test Setup, View #2





Test Setup, View #4





Test Setup, View #5



## 15.249(a) Radiated Emissions

#### **Test Setup/Conditions / Data**

Test Location: CKC Laboratories, Inc. • 110 N. Olinda Pl • Brea, CA 92823 • 7149936112

Customer: BluStor PMC

Specification: 15.249 Carrier and Spurious Emissions (2400-2483.5 MHz Transmitter)

 Work Order #:
 98130
 Date:
 4/8/2016

 Test Type:
 Maximized Emissions
 Time:
 11:52:52

Tested By: Don Nguyen Sequence#: 1

Software: EMITest 5.03.02

**Equipment Tested:** 

Device Manufacturer Model # S/N
Configuration 1

Support Equipment:

Device Manufacturer Model # S/N
Configuration 1

Configuration 1

Test Conditions / Notes:

The EUT is place on Styrofoam platform at 1.5m height (above 1 GHz) and 0.8m height (below 1 GHz). The EUT is set to transmit continuously at 99% duty cycle. OSB charge is connected to the EUT during test. The manufacturer declares that the EUT will not be marketed with the USB charger.

Operating frequency: 2402-2480MHz

Tested frequencies: 2402MHz, 2441MHz, 2480MHz

Bluetooth V4 modulation: GFSK, 8DPSK, and/pi/4-DQPSK

BLE modulation: GFSK

Frequency range of measurement = 9k-25000MHz 0.009MHz to 0.15MHz RBW=VBW=0.2kHz. 0.15MHz to 30MHz RBW=VBW=9kHz. 30MHz to 1000MHz RBW=VBW=120kHz. 1000MHz to 25000MHz RBW=VBW=1MHz.

Temperature, 17°C Relative Humidity, 45%

Test Method: ANSI C63.10 (2013)

Site D

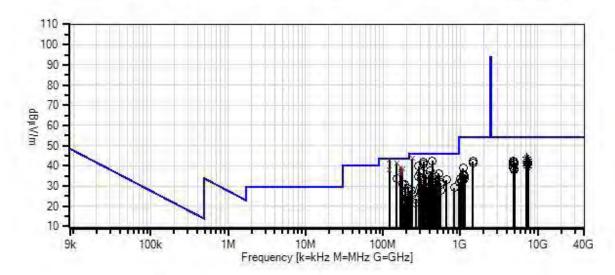
Note: The EUT is tested in three orthogonal axes. Data represents worst case emissions. Tested modes: BLE (GFSK) and Bluetooth V4 (8DPSK)

The EUT will not transmit when charging with normal firmware in normal operation mode.

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BluStor PMC WO#: 98130 Sequence#: 1 Date: 4/8/2016 15,249 Carrier and Spurious Emissions (2400-2483.5 MHz Transmitter) Test Distance: 3 Meters Vert



Readings

- Peak Readings QP Readings
- Average Readings
- Ambient

Software Version: 5.03.02

1 - 15.249 Carrier and Spurious Emissions (2400-2483.5 MHz Transmitter)



7	٠,	•			
1	PST	Ha	uip	me	nt:

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
	AN00314	Loop Antenna	6502	7/2/2014	7/2/2016
	AN01413	Horn Antenna	84125-80008	11/25/2014	11/25/2016
T1	AN00787	Preamp	83017A	6/10/2015	6/10/2017
T2	AN01646	Horn Antenna	3115	3/4/2016	3/4/2018
T3	ANP06360	Cable	L1-PNMNM-48	7/29/2014	7/29/2016
T4	AN02946	Cable	32022-2-	11/2/2015	11/2/2017
			2909K-36TC		
T5	AN03385	High Pass Filter	11SH10-	6/15/2015	6/15/2017
			3000/T10000-		
			O/O		
T6	AN02869	Spectrum Analyzer	E4440A	7/17/2015	7/17/2016
T7	AN00010	Preamp	8447D	3/14/2016	3/14/2018
T8	ANP04382	Cable	LDF-50	7/30/2014	7/30/2016
Т9	AN01992	Biconilog Antenna	CBL6111C	12/4/2014	12/4/2016
T10	ANP05555	Cable	RG223/U	<i>5/7</i> / <b>2</b> 014	5/7/2016
T11	ANP05569	Cable	RG-214/U	5/7/2014	5/7/2016

11.	I ANI US	309	Cabic		ICC	J-214/ U	_1	3/1/2014		3/ //2010	
Mogsu	rement Data:	D.	andina lis	ted by ma	rain	4		ost Distance	e: 3 Meters		
						<i>-</i>					D 1
#	Freq	Rdng	T1	T2	T3	74	Dist	Corr	Spec	Margin	Polar
			T5	T6	T/7	/T/B   /					
			T9	T10	\T/1}) /	$II \cap I$	1 1.	J			
	MHz	dΒμV	dB	dB∫	dB//	/ dens	Table	$dB\mu V/m$	dBμV/m	dB	Ant
1	120.003M	56.0	+0.0	+0.6	\\+0.\dot\	<b>≠</b> 0 <b>0</b>	+0.0	42.9	43.5	-0.6	Vert
	QP		+0.0	+0.0	//-27v.d/	[ <del>  1</del> .2			BLE, low	CH, USB	
			+11.5	+0/.1/	/	,			cable unpli	ugged	
^	120.003M	56.6	+0.0	+0.0/	+0.0	+0.0	+0.0	43.5	43.5	+0.0	Vert
			+0.0	+0,0	-27.0	+1.2			BLE, low	CH, USB	
			+11.5	40.1	+1.1				cable unpli	ugged	
3	150.004M	54.2	+0.0	+0.0	+0.0	+0.0	+0.0	41.4	43.5	-2.1	Horiz
	QP		+0.0	+0.0	-26.9	+1.4			8DPSK, lo	w CH	
			+11.2	+0.2	+1.3						
^	150.004M	54.4	+0.0	+0.0	+0.0	+0.0	+0.0	41.6	43.5	-1.9	Horiz
			+0.0	+0.0	-26.9	+1.4			8DPSK, lo	w CH	
			+11.2	+0.2	+1.3						
^	150.000M	48.8	+0.0	+0.0	+0.0	+0.0	+0.0	36.0	43.5	-7.5	Horiz
			+0.0	+0.0	-26.9	+1.4			BLE, low	CH	
			+11.2	+0.2	+1.3						
6	240.000M	54.7	+0.0	+0.0	+0.0	+0.0	+0.0	43.7	46.0	-2.3	Horiz
	QP		+0.0	+0.0	-26.6	+1.8			8DPSK, lo	w CH	
			+12.0	+0.2	+1.6						
^	240.000M	55.0	+0.0	+0.0	+0.0	+0.0	+0.0	44.0	46.0	-2.0	Horiz
			+0.0	+0.0	-26.6	+1.8			8DPSK, lo	w CH	
			+12.0	+0.2	+1.6						
^	240.000M	52.9	+0.0	+0.0	+0.0	+0.0	+0.0	41.9	46.0	-4.1	Horiz
			+0.0	+0.0	-26.6	+1.8			BLE, low	CH	
			+12.0	+0.2	+1.6						
9	432.000M	48.3	+0.0	+0.0	+0.0	+0.0	+0.0	42.5	46.0	-3.5	Vert
			+0.0	+0.0	-27.6	+2.3			BLE, low	CH	
			+16.9	+0.4	+2.2						



10	336.000M	50.1	+0.0	+0.0	+0.0	+0.0	+0.0	42.0	46.0 -4.0	Vert
			+0.0	+0.0	-26.8	+2.0			BLE, low CH	
1.1	167.00514	52.0	+14.5	+0.3	+1.9			20.2	12.5	<b>T</b> 7 4
11	167.995M	53.0	$^{+0.0}_{+0.0}$	$^{+0.0}_{-0.0}$	+0.0 -26.9	+0.0	+0.0	39.2	43.5 -4.3	Vert
(	QP		+10.1	+0.0	-20.9 +1.3	+1.5			BLE, low CH	
12	180.005M	53.4	+0.0	+0.2	+0.0	+0.0	+0.0	38.6	43.5 -4.9	Horiz
	QP	33.4	+0.0	+0.0	-26.9	+1.5	10.0	36.0	8DPSK, low CH	110112
	ζ1		+9.1	+0.2	+1.3	11.5			obl sk, low cli	
^	180.005M	53.6	+0.0	+0.0	+0.0	+0.0	+0.0	38.8	43.5 -4.7	Horiz
	100.005141	33.0	+0.0	+0.0	-26.9	+1.5	. 0.0	30.0	8DPSK, low CH	HOHE
			+9.1	+0.2	+1.3	1.0			021 511, 10 11 611	
^	180.000M	48.7	+0.0	+0.0	+0.0	+0.0	+0.0	33.9	43.5 -9.6	Horiz
	100.000111	10.7	+0.0	+0.0	-26.9	+1.5	. 0.0	33.9	BLE, low CH	110112
			+9.1	+0.2	+1.3				,	
15	336.000M	49.1	+0.0	+0.0	+0.0	+0.0	+0.0	41.0	46.0 -5.0	Horiz
			+0.0	+0.0	-26.8	+2.0			BLE, low CH	
			+14.5	+0.3	+1.9			1		
16	120.009M	51.2	+0.0	+0.0	+0.0	+0.0	+0,0	38.1	43.5 -5.4	Horiz
(	QP		+0.0	+0.0	-27.0	+1.2			8DPSK, low CH	
			+11.5	+0.1	+1.1	4				
^	120.009M	51.8	+0.0	+0.0	+0.0	/+0.0 <i>/</i>	<b>₩0.0</b>	38.7	43.5 -4.8	Horiz
			+0.0	+0.0	-27.0	/#1 2/	<i>7</i> 11		8DPSK, low CH	
			+11.5	+0.1	HH	H				
^	120.000M	49.4	+0.0	+Ø.0	1+0.0/	1409	+0.0	36.3	43.5 -7.2	Horiz
			+0.0	+0.0	<del>  27.6</del>	+112	1		BLE, low CH	
			+11.5	+0.1	<del>   +</del> [].1 /					
19	288.000M	49.2	+0.0	<del>+</del> 010/ /	1 to.01	+0.0	+0.0	39.8	46.0 -6.2	Horiz
			+0.0	+do/	-26.6	+1.9			BLE, low CH	
20	160,00014	<b>50.0</b>	+13.2	+0.3/	+1.8	100	100	27.0	12.5	TT '-
20	168.000M QP	50.8	$^{+0.0}$	₩0.0 +0.0	+0.0 -26.9	+0.0 +1.5	+0.0	37.0	43.5 -6.5 8DPSK, low CH	Horiz
(	ŹΓ		+10.1	+0.0	+1.3	⊤1.3			odrsk, iow ch	
٨	168.000M	51.4	+0.0	+0.2	+0.0	+0.0	+0.0	37.6	43.5 -5.9	Horiz
	100.000101	31.4	+0.0	+0.0	-26.9	+1.5	10.0	37.0	8DPSK, low CH	110112
			+10.1	+0.2	+1.3	11.5			obl sk, low cli	
^	168.000M	34.6	+0.0	+0.0	+0.0	+0.0	+0.0	20.8	43.5 -22.7	Horiz
	100.000141	34.0	+0.0	+0.0	-26.9	+1.5	10.0	20.0	BLE, low CH, USB	HOHZ
			+10.1	+0.2	+1.3	1.5			cable unplugged	
23	167.999M	49.8	+0.0	+0.0	+0.0	+0.0	+0.0	36.0	43.5 -7.5	Vert
	QP	.,,,	+0.0	+0.0	-26.9	+1.5	•••	20.0	8DPSK, low CH	. 511
`	~		+10.1	+0.2	+1.3				,	
٨	167.995M	54.0	+0.0	+0.0	+0.0	+0.0	+0.0	40.2	43.5 -3.3	Vert
			+0.0	+0.0	-26.9	+1.5			BLE, low CH	
			+10.1	+0.2	+1.3					
٨	167.999M	51.1	+0.0	+0.0	+0.0	+0.0	+0.0	37.3	43.5 -6.2	Vert
			+0.0	+0.0	-26.9	+1.5			8DPSK, low CH	
			+10.1	+0.2	+1.3					
26	408.000M	43.7	+0.0	+0.0	+0.0	+0.0	+0.0	37.3	46.0 -8.7	Horiz
			+0.0	+0.0	-27.5	+2.2			8DPSK, low CH,	
			+16.5	+0.3	+2.1				USB cable unplugged	



27	300.010M	46.0	+0.0	+0.0	+0.0	+0.0	+0.0	36.7	46.0 -9.3	Vert
21	300.010101	40.0	+0.0 +0.0	+0.0 +0.0	-26.6	+0.0 +1.9	+0.0	30.7	8DPSK, low CH,	VEIL
			+13.3	+0.3	+1.8	11.7			USB cable	
			13.3	. 0.5	11.0				unplugged	
28	7206.100M	33.4	-40.2	+32.5	+5.9	+1.4	+0.0	44.4	54.0 -9.6	Horiz
	Ave		+0.2	+0.0	+0.0	+11.2			8DPSK, low CH	
			+0.0	+0.0	+0.0					
^	7206.100M	41.0	-40.2	+32.5	+5.9	+1.4	+0.0	52.0	54.0 -2.0	Horiz
			+0.2	+0.0	+0.0	+11.2			8DPSK, low CH	
	4 40 00 57 5		+0.0	+0.0	+0.0					
30	149.995M	46.4	+0.0	+0.0	+0.0	+0.0	+0.0	33.6	43.5 -9.9	Vert
			+0.0	+0.0	-26.9	+1.4			BLE, low CH	
2.1	505.0053.6	40.0	+11.2	+0.2	+1.3		. 0. 0	25.0	46.0 10.1	T.7
31	525.005M	40.0	+0.0	+0.0	+0.0	+0.0	+0.0	35.9	46.0 -10.1	Vert
			+0.0	+0.0	-28.1	+2.6			8DPSK, low CH,	
			+18.5	+0.4	+2.5				USB cable	
32	360.000M	42.0	+0.0	+0.0	+0.0	10.0	+0.0	<b>2</b> 5.5	unplugged 46.0 -10.5	Horiz
32	360.000M	43.0	+0.0 +0.0	+0.0 +0.0	+0.0 -27.0	+0.0 +2.1	+0.0	73.3	46.0 -10.5 8DPSK, low CH,	Horiz
			+15.2	+0.0	+1.9	±2.1	1		USB cable	
			113.2	10.5	11.9				unplugged	
33	7440.100M	31.4	-40.4	+33.1	+6.0	#1.4	D.0	43.4	54.0 -10.6	Horiz
	Ave	31.4	+0.3	+0.0	+0.0	<i>+</i> 11 6	[ [ ] · [	43.4	8DPSK, hi CH	HOHZ
			+0.0	+0.0	(HO.0)	/////	$\langle      $		021 212, III 211	
^	7440.100M	38.9	-40.4	+33.1	1+60/	114	+0.0	50.9	54.0 -3.1	Horiz
			+0.3	+b.	+0.0	/ +11 <b>6</b>			8DPSK, hi CH	
			+0.0	+0.0	/ p.q+				,	
35	390.650M	41.7	+0.0	+0.0/	1 +0.0	+0.0	+0.0	35.1	46.0 -10.9	Horiz
			+0.0	fdø/	1-27.3	+2.2			BLE, low CH	
			+16.1	+0.3/	+2.1					
36	288.000M	44.2	+0.0	+0.0	+0.0	+0.0	+0.0	34.8	46.0 -11.2	Vert
			+0.0	+0.0	-26.6	+1.9			BLE, low CH	
			+13.2	+0.3	+1.8					
37	480.010M	39.5	+0.0	+0.0	+0.0	+0.0	+0.0	34.6	46.0 -11.4	Horiz
			+0.0	+0.0	-27.9	+2.5			8DPSK, low CH,	
			+17.7	+0.4	+2.4				USB cable	
			40.0						unplugged	
	7205.383M	31.5	-40.2	+32.5	+5.9		+0.0	42.5	54.0 -11.5	Horiz
	Ave		+0.2	+0.0	+0.0	+11.2			BLE, low CH	
	7205 292NA	40.3	+0.0	+0.0	+0.0	±1 <i>1</i>	+0.0	512	54.0 -2.7	Цоміл
	7205.383M	40.3	-40.2 +0.2	+32.5 +0.0	+5.9 +0.0	+1.4	±0.0	51.3	54.0 -2.7 BLE, low CH	Horiz
			+0.2 +0.0	+0.0 +0.0	+0.0 +0.0	+11.2			DLE, IOW CH	
40	7439.317M	30.4	-40.4	+33.1	+6.0	+1.4	+0.0	42.4	54.0 -11.6	Horiz
	Ave	50.7	+0.3	+0.0	+0.0	+11.6	10.0	74.7	BLE, hi CH	110112
			+0.0	+0.0	+0.0	11.0			22L, iii 011	
^	7439.317M	38.8	-40.4	+33.1	+6.0	+1.4	+0.0	50.8	54.0 -3.2	Horiz
	, 137.31/141	20.0	+0.3	+0.0	+0.0	+11.6	. 0.0	20.0	BLE, hi CH	110112
			+0.0	+0.0	+0.0				,	
42	4804.100M	37.7	-40.5	+30.0	+4.7	+1.2	+0.0	42.4	54.0 -11.6	Horiz
1			+0.1	+0.0	+0.0	+9.2	-		8DPSK, low CH	
			+0.0	+0.0	+0.0				*	



43	1440.100M	51.4	-39.8	+23.3	+2.4	+0.6	+0.0	42.3	54.0 -11.7	Horiz
			+0.0	+0.0	+0.0	+4.4			8DPSK, hi CH	
	7222 0001 (	20.0	+0.0	+0.0	+0.0	. 1 4	. 0. 0	10.0	540 117	X7 .
44	7323.000M	30.9	-40.3	+32.8	+5.9	+1.4	+0.0	42.3	54.0 -11.7	Vert
	Ave		+0.3	+0.0	+0.0	+11.3			8DPSK, mid CH	
	7222 00014	20.6	+0.0	+0.0	+0.0	+1.4	100	51.0	540 20	<b>T</b> 7 4
	7323.000M	39.6	-40.3 +0.3	$+32.8 \\ +0.0$	+5.9 +0.0	+1.4 +11.3	+0.0	51.0	54.0 -3.0 8DPSK, mid CH	Vert
			+0.5	$^{+0.0}$	+0.0 +0.0	⊤11.3			odpok, iiila Ch	
16	4882.000M	36.7	-40.2	+30.0	+4.8	+1.2	+0.0	41.9	54.0 -12.1	Horiz
40	4002.000101	30.7	+0.1	+30.0 $+0.0$	+0.0	+9.3	+0.0	41.9	8DPSK, mid CH	попи
			+0.0	+0.0	+0.0	19.3			obi six, illiu cii	
47	7323.033M	30.4	-40.3	+32.8	+5.9	+1.4	+0.0	41.8	54.0 -12.2	Horiz
<b>- - '</b>	Ave	30.4	+0.3	+0.0	+0.0	+11.3	10.0	71.0	8DPSK, mid CH	110112
	1110		+0.0	+0.0	+0.0	111.5			obi sik, ilid cii	
^	7323.033M	38.7	-40.3	+32.8	+5.9	+1.4	+0.0	50.1	54.0 -3.9	Horiz
	7323.033141	30.7	+0.3	+0.0	+0.0	+11.3	10.0	50.1	8DPSK, mid CH	HOHZ
			+0.0	+0.0	+0.0	11.5		1	obi sii, iiiu cii	
49	312.009M	42.6	+0.0	+0.0	+0.0	+0.0	+0.0	33.7	46.0 -12.3	Horiz
.,	012.0031.1		+0.0	+0.0	-26.7	+2.0		75.7	8DPSK, low CH,	110112
			+13.7	+0.3	+1.8	1		1	USB cable	
								1	unplugged	
50	7322.375M	30.2	-40.3	+32.8	± <b>5</b> .9	/ <del>*</del> 1.4/	+0.0	41.6	54.0 -12.4	Horiz
	Ave		+0.3	+0.0	\ <del> +</del> 9.0	<del>                                    </del>			BLE, mid CH	
			+0.0	+0.0	\/+b/b/	1111				
^	7322.375M	38.5	-40.3	+32.87	+5. <b>9</b>	+14	+0.0	49.9	54.0 -4.1	Horiz
			+0.3	+0.0	/ p.q+	1+11.5			BLE, mid CH	
			+0.0	+0,0/	<del>                                    </del>	J				
52	4804.100M	36.9	-40.5	+306/	J+4.7	+1.2	+0.0	41.6	54.0 -12.4	Vert
			+0.1	+0.9	+0.0	+9.2			8DPSK, low CH	
			+0.0	HO.0	+0.0					
53	7206.100M	30.5	-40.2	+32.5	+5.9	+1.4	+0.0	41.5	54.0 -12.5	Vert
	Ave		+0.2	+0.0	+0.0	+11.2			8DPSK, low CH	
			+0.0	+0.0	+0.0					
^	7206.100M	38.0	-40.2	+32.5	+5.9	+1.4	+0.0	49.0	54.0 -5.0	Vert
			+0.2	+0.0	+0.0	+11.2			8DPSK, low CH	
<u></u>	400.0003.5	20.2	+0.0	+0.0	+0.0			22.1	16.0	¥7 ·
55	480.000M	38.3	+0.0	+0.0	+0.0	+0.0	+0.0	33.4	46.0 -12.6	Vert
			+0.0	+0.0	-27.9	+2.5			BLE, low CH, USB	
5.0	102.00434	15 1	+17.7	+0.4	+2.4	100	100	20.0	cable unplugged	<b>1</b> 7. 4
56	192.004M	45.4	+0.0	+0.0	+0.0	+0.0	+0.0	30.9	43.5 -12.6	Vert
			+0.0	+0.0 +0.2	-26.8 +1.4	+1.6			8DPSK, low CH	
57	180.004M	45.7	+9.1	+0.2	+1.4	+0.0	+0.0	30.9	43.5 -12.6	Vert
3/	100.004101	₩3./	+0.0 +0.0	+0.0 +0.0	±0.0 -26.9	+1.5	10.0	30.9	8DPSK, low CH	v CI t
			+9.1	+0.0	+1.3	11.3			obi six, iow cii	
58	191.995M	45.4	+0.0	+0.2	+0.0	+0.0	+0.0	30.9	43.5 -12.6	Vert
] 30	171.773111	73.4	+0.0	+0.0 +0.0	-26.8	+1.6	10.0	30.7	43.3 -12.0 BLE, low CH	v CI t
			+9.1	+0.2	+1.4	1.0			DDD, IOW CII	
50	1440.000M	50.4	-39.8	+23.3	+2.4	+0.6	+0.0	41.3	54.0 -12.7	Vert
	1 1 10.000111	50.7	+0.0	+0.0	+0.0	+4.4	. 0.0	71.3	8DPSK, hi CH	V 011
			+0.0	+0.0	+0.0				(2) 511, III 611	
			0.0	3.0	3.0					



60	4882.000M	35.9	-40.2	+30.0	+4.8	+1.2	+0.0	41.1	54.0 -12.9	Vert
			+0.1	+0.0	+0.0	+9.3			8DPSK, mid CH	
	660.00.73.5	240	+0.0	+0.0	+0.0	. 0 0	. 0. 0	22.0	460 120	**
61	660.005M	34.9	+0.0	+0.0	+0.0	+0.0	+0.0	33.0	46.0 -13.0	Vert
			+0.0	+0.0	-28.1	+2.9			8DPSK, low CH,	
			+20.1	+0.4	+2.8				USB cable	
62	4960.100M	35.6	-40.1	+30.0	+4.8	+1.2	+0.0	41.0	unplugged 54.0 -13.0	Vert
02	4900.100M	33.0	+0.1	+30.0 $+0.0$	$^{+4.8}$	+9.4	+0.0	41.0	8DPSK, hi CH	vert
			+0.1	+0.0	+0.0	1 7.4			obi sk, iii cii	
63	390.625M	39.5	+0.0	+0.0	+0.0	+0.0	+0.0	32.9	46.0 -13.1	Horiz
03	370.023W	37.3	+0.0	+0.0	-27.3	+2.2	10.0	32.7	8DPSK, low CH	110112
			+16.1	+0.3	+2.1	. 2.2			obi six, iow cir	
64	4960.000M	35.4	-40.1	+30.0	+4.8	+1.2	+0.0	40.8	54.0 -13.2	Horiz
0.	1,000.000111	33.1	+0.1	+0.0	+0.0	+9.4	. 0.0	10.0	8DPSK, hi CH	HOHE
			+0.0	+0.0	+0.0	<i>7.1</i>			, OII	
65	7322.400M	29.4	-40.3	+32.8	+5.9	+1.4	+0.0	40.8	54.0 -13.2	Vert
	Ave		+0.3	+0.0	+0.0	+11.3		1	BLE, mid CH	
			+0.0	+0.0	+0.0				,	
^	7322.400M	38.1	-40.3	+32.8	+5.9	+1.4	100	49.5	54.0 -4.5	Vert
			+0.3	+0.0	+0.0	+14.3			BLE, mid CH	
			+0.0	+0.0	$+0.0_{-}$		h I			
67	7439.400M	28.3	-40.4	+33.1	±6.0	/ <del>*</del> 1.4/	+0.0	40.3	54.0 -13.7	Vert
	Ave		+0.3	+0.0	\ H9:0	/ <del>+/</del> 116/			BLE, hi CH	
			+0.0	+Ø.0	1+0.0/	111		·		
^	7439.400M	37.3	-40.4	+3 <b>\beta.</b> [	\rightarrow{+6.6}	+14	+0.0	49.3	54.0 -4.7	Vert
			+0.3	+0.0	/  <del>/</del> /0.0	1+12.6			BLE, hi CH	
			+0.0	+0[0] /	1 +0.0V	<i>)</i>				
69	480.005M	37.1	+0.0	+d0/	+0.0	+0.0	+0.0	32.2	46.0 -13.8	Vert
			+0.0	+0.0	-27.9	+2.5			8DPSK, low CH,	
			+17.7	₩0.4	+2.4				USB cable	
70	7205.322M	20.0	40.2	122.5	15.0	+1.4	100	40.0	unplugged	<b>X</b> 74
/0		29.0	-40.2 +0.2	+32.5	+5.9		+0.0	40.0	54.0 -14.0	Vert
	Ave		+0.2 +0.0	$^{+0.0}_{+0.0}$	$^{+0.0}_{+0.0}$	+11.2			BLE, low CH	
^	7205.322M	38.1	-40.2	+32.5	+5.9	+1.4	+0.0	49.1	54.0 -4.9	Vert
	1 405.544IVI	30.1	+0.2	+32.3 $+0.0$	+0.0	+11.2	10.0	77.1	BLE, low CH	v CI t
			+0.2	+0.0	+0.0	111.2			DDD, IOW CIT	
72	480.005M	36.7	+0.0	+0.0	+0.0	+0.0	+0.0	31.8	46.0 -14.2	Horiz
, ,	100.000111	50.7	+0.0	+0.0	-27.9	+2.5	. 0.0	51.0	BLE, low CH, USB	110112
			+17.7	+0.4	+2.4	2.0			cable unplugged	
73	552.000M	35.3	+0.0	+0.0	+0.0	+0.0	+0.0	31.7	46.0 -14.3	Vert
			+0.0	+0.0	-28.1	+2.6	-	-	BLE, low CH, USB	
			+19.0	+0.4	+2.5				cable unplugged	
74	4803.867M	35.0	-40.5	+30.0	+4.7	+1.2	+0.0	39.7	54.0 -14.3	Horiz
			+0.1	+0.0	+0.0	+9.2			BLE, low CH	
			+0.0	+0.0	+0.0					
75	210.004M	42.6	+0.0	+0.0	+0.0	+0.0	+0.0	29.0	43.5 -14.5	Vert
			+0.0	+0.0	-26.7	+1.6			8DPSK, low CH	
			+9.9	+0.2	+1.4					
	·	·								



76 7440.100M											
+0.0			27.2	-40.4	+33.1	+6.0	+1.4	+0.0	39.2	54.0 -14.8	Vert
A 7440.100M   35.8		Ave					+11.6			8DPSK, hi CH	
Ho											
100   100	^	7440.100M	35.8					+0.0	47.8		Vert
Text							+11.6			8DPSK, hi CH	
Ho.1											
100   100	78	4803.872M	34.3					+0.0	39.0		Vert
No.   No.							+9.2			BLE, low CH	
Head	70	<b>50400035</b>	27.7				. 0. 0	. 0. 0	20.0	460 151	
18.1	/9	504.000M	35.5					+0.0	30.9		Horiz
S0   552,000M   34.5   +0.0   +0.0   +0.0   +0.0   +0.0   +0.0   30.9   46.0   -15.1   Horiz   Horiz							+2.5				
80   552,000M   34.5   +0.0   +0.0   +0.0   +0.0   +0.0   30.9   46.0   -15.1   Horiz   +0.0   +0.0   +0.0   -28.1   +2.6   8DPSK, low CH,   USB cable unplugged   19.0   +0.0				+18.1	+0.4	+2.4					
Ho	90	552 000M	245	+0.0	100	10.0	100	10.0	20.0		Howin
19.0	80	332.000M	34.3					+0.0	30.9		Horiz
81 1079.850M   51.3   41.1   +22.2   +2.1   +0.5   +0.0   88.8   54.0   -15.2   Horiz							+2.0				
81 1079.850M 51.3 -41.1 +22.2 +2.1 +0.5 +0.0 88.8 54.0 -15.2 Horiz +0.0 +0.0 +0.0 +0.0 +0.0 +0.0 +0.0 +0.				119.0	10.4	12.3					
Ho.0	<b>Ω</b> 1	1079 850M	51.3	_41 1	+22.2	+2 1	+0.5	+0.0	28.8	1 00	Horiz
10.0   10.0	01	10/9.850W	31.3					10.0	70.0		110112
82 330.020M 39.0 +0.0 +0.0 +0.0 +0.0 +0.0 +0.0 +0.0 +							13.0	/		obi six, ili cii	
10.0	82	330 020M	39.0				+0.0	+ak1	30.7	46.0 -15.3	Vert
14.3	02	330.020W	37.0					[0.0]	30.7		VCIT
83   4882.030M   33.4   -40.2   +30.0   +0.6   +0.0   +0								~ I I I	'		
83   4882.030M   33.4   -40.2   +30.0   +0				1113	. 0.5		IIIII	$/ \parallel$			
Ho.1	83	4882.030M	33.4	-40.2	+30.0	1+48/	1/1/1/2	+0.0	38.6	1 00	Horiz
Ho.0		.002.0201.1					-	0.0	20.0		110112
84 4960.000M       33.0       -40.1       +30.0       +4.8       +1.2       +0.0       38.4       54.0       -15.6       Vert         85 4882.000M       33.0       -40.2       +30.0       +4.8       +1.2       +0.0       38.2       54.0       -15.8       Vert         86 456.010M       35.3       +0.0       +0.0       +0.0       +0.0       +0.0       +0.0       +0.0       Ho.0       +0.0       +0.0       +0.0       +0.0       +0.0       +0.0       +0.0       +0.0       Ho.0       +0.0 <td></td> <td></td> <td></td> <td></td> <td></td> <td>11 \ /</td> <td></td> <td></td> <td></td> <td>,</td> <td></td>						11 \ /				,	
+0.1	84	4960.000M	33.0				+1.2	+0.0	38.4	54.0 -15.6	Vert
85 4882.000M       33.0       -40.2       +20.0       +4.8       +1.2       +0.0       38.2       54.0       -15.8       Vert         86 456.010M       35.3       +0.0       +0.0       +0.0       +0.0       +0.0       +0.0       +0.0       40.0       +0.0       40.0       -16.0       Horiz         87 4959.917M       32.5       -40.1       +30.0       +4.8       +1.2       +0.0       37.9       54.0       -16.1       Horiz         88 360.000M       36.9       +0.0 <td< td=""><td></td><td></td><td></td><td>+0.1</td><td>tal /</td><td></td><td>+9.4</td><td></td><td></td><td>BLE, hi CH</td><td></td></td<>				+0.1	tal /		+9.4			BLE, hi CH	
## Hourize				+0.0	<del> </del> +0.9	$\nu_{+0.0}$					
Ho.0	85	4882.000M	33.0	-40.2	+30.0	+4.8	+1.2	+0.0	38.2	54.0 -15.8	Vert
86       456.010M       35.3       +0.0       +0.0       +0.0       +0.0       +0.0       +0.0       30.0       46.0       -16.0       Horiz         +0.0       +0.0       +0.0       -27.7       +2.4       8DPSK, low CH, USB cable unplugged         87       4959.917M       32.5       -40.1       +30.0       +4.8       +1.2       +0.0       37.9       54.0       -16.1       Horiz         +0.1       +0.0       +0.0       +9.4       BLE, hi CH         88       360.000M       36.9       +0.0       +0.0       +0.0       +0.0       29.4       46.0       -16.6       Horiz         +0.0       +0.0       +0.0       -27.0       +2.1       BLE, low CH, USB cable unplugged         89       840.010M       27.7       +0.0       +0.0       +0.0       +0.0       +0.0       29.2       46.0       -16.8       Vert         +0.0       +0.0       -27.7       +3.3       8DPSK, low CH, USB cable unplugged         90       300.000M       38.5       +0.0       +0.0       +0.0       +0.0       29.2       46.0       -16.8       Horiz         +0.0       +0.0       +0.0       -26.6       +1.9       8DPS				+0.1	+0.0	+0.0	+9.3			BLE, mid CH	
+0.0				+0.0	+0.0	+0.0					
H17.3	86	456.010M	35.3	+0.0	+0.0	+0.0	+0.0	+0.0	30.0		Horiz
S7 4959.917M   32.5							+2.4				
87 4959.917M 32.5 -40.1 +30.0 +4.8 +1.2 +0.0 37.9 54.0 -16.1 Horiz +0.1 +0.0 +0.0 +0.0 +9.4 BLE, hi CH  88 360.000M 36.9 +0.0 +0.0 +0.0 +0.0 +0.0 +0.0 29.4 46.0 -16.6 Horiz +0.0 +0.0 +0.0 -27.0 +2.1 BLE, low CH, USB cable unplugged  89 840.010M 27.7 +0.0 +0.0 +0.0 +0.0 +0.0 +0.0 29.2 46.0 -16.8 Vert +0.0 +0.0 +0.0 -27.7 +3.3 BDPSK, low CH, USB cable unplugged  90 300.000M 38.5 +0.0 +0.0 +0.0 +0.0 +0.0 +0.0 29.2 46.0 -16.8 Horiz +0.0 +0.0 +0.0 -26.6 +1.9 8DPSK, low CH				+17.3	+0.4	+2.3					
## Hours											
Head	87	4959.917M	32.5					+0.0	37.9		Horiz
88 360.000M 36.9 +0.0 +0.0 +0.0 +0.0 +0.0 29.4 46.0 -16.6 Horiz +0.0 +0.0 +0.0 -27.0 +2.1 BLE, low CH, USB cable unplugged  89 840.010M 27.7 +0.0 +0.0 +0.0 +0.0 +0.0 29.2 46.0 -16.8 Vert +0.0 +0.0 +0.0 -27.7 +3.3 8DPSK, low CH, USB cable unplugged  90 300.000M 38.5 +0.0 +0.0 +0.0 +0.0 +0.0 29.2 46.0 -16.8 Horiz +0.0 +0.0 +0.0 -26.6 +1.9 8DPSK, low CH							+9.4			BLE, hi CH	
+0.0 +0.0 -27.0 +2.1 BLE, low CH, USB cable unplugged  89 840.010M 27.7 +0.0 +0.0 +0.0 +0.0 +0.0 29.2 46.0 -16.8 Vert  +0.0 +0.0 -27.7 +3.3 8DPSK, low CH,  +22.2 +0.5 +3.2 USB cable unplugged  90 300.000M 38.5 +0.0 +0.0 +0.0 +0.0 +0.0 29.2 46.0 -16.8 Horiz  +0.0 +0.0 -26.6 +1.9 8DPSK, low CH											
15.2	88	360.000M	36.9					+0.0	29.4		Horiz
89 840.010M 27.7 +0.0 +0.0 +0.0 +0.0 +0.0 29.2 46.0 -16.8 Vert +0.0 +0.0 +0.0 -27.7 +3.3 8DPSK, low CH, USB cable unplugged  90 300.000M 38.5 +0.0 +0.0 +0.0 +0.0 +0.0 29.2 46.0 -16.8 Horiz +0.0 +0.0 +0.0 -26.6 +1.9 8DPSK, low CH							+2.1				
+0.0 +0.0 -27.7 +3.3 8DPSK, low CH, +22.2 +0.5 +3.2 USB cable unplugged 90 300.000M 38.5 +0.0 +0.0 +0.0 +0.0 +0.0 29.2 46.0 -16.8 Horiz +0.0 +0.0 -26.6 +1.9 8DPSK, low CH		0.40.0::									
+22.2 +0.5 +3.2 USB cable unplugged  90 300.000M 38.5 +0.0 +0.0 +0.0 +0.0 +0.0 29.2 46.0 -16.8 Horiz +0.0 +0.0 +0.0 -26.6 +1.9 8DPSK, low CH	89	840.010M	27.7					+0.0	29.2		Vert
90 300.000M 38.5 +0.0 +0.0 +0.0 +0.0 +0.0 29.2 46.0 -16.8 Horiz +0.0 +0.0 +0.0 -26.6 +1.9 8DPSK, low CH							+3.3				
90 300.000M 38.5 +0.0 +0.0 +0.0 +0.0 +0.0 29.2 46.0 -16.8 Horiz +0.0 +0.0 +0.0 -26.6 +1.9 8DPSK, low CH				+22.2	+0.5	+3.2					
+0.0 +0.0 -26.6 +1.9 8DPSK, low CH		200 0003 5	20.7						20.2	1 00	TT '
· · · · · · · · · · · · · · · · · · ·	90	300.000M	38.5					+0.0	29.2		Horiz
+15.5 +0.5 +1.8							+1.9			8DPSK, low CH	
				+13.3	+0.3	+1.8					



_										
91	330.000M	37.2	+0.0	+0.0	+0.0	+0.0	+0.0	28.9	46.0 -17.1	Horiz
			+0.0	+0.0	-26.8	+2.0			8DPSK, low CH	
			+14.3	+0.3	+1.9					
92	552.000M	31.4	+0.0	+0.0	+0.0	+0.0	+0.0	27.8	46.0 -18.2	Horiz
			+0.0	+0.0	-28.1	+2.6			BLE, low CH, USB	
			+19.0	+0.4	+2.5				cable unplugged	
93	1080.000M	48.3	-41.1	+22.2	+2.1	+0.5	+0.0	35.8	54.0 -18.2	Vert
			+0.0	+0.0	+0.0	+3.8			8DPSK, hi CH	
			+0.0	+0.0	+0.0					
94	192.010M	39.8	+0.0	+0.0	+0.0	+0.0	+0.0	25.3	43.5 -18.2	Horiz
			+0.0	+0.0	-26.8	+1.6			8DPSK, low CH	
			+9.1	+0.2	+1.4					
95	233.375M	39.4	+0.0	+0.0	+0.0	+0.0	+0.0	27.7	46.0 -18.3	Horiz
			+0.0	+0.0	-26.7	+1.7			BLE, low CH	
			+11.6	+0.2	+1.5					
96	216.014M	40.5	+0.0	+0.0	+0.0	+0.0	+0.0	27.5	46.0 -18.5	Horiz
			+0.0	+0.0	-26.7	+1.7			8DPSK, low CH,	
			+10.3	+0.2	+1.5			1	USB cable	
									unplugged	
97	450.005M	32.9	+0.0	+0.0	+0.0	+0.0	100	27.5	46.0 -18.5	Vert
			+0.0	+0.0	-27.7	+2,4			8DPSK, low CH,	
			+17.2	+0.4	+2.3			1	USB cable	
			-,	***		/,   /			unplugged	
98	1128.000M	47.2	-40.8	+22.4	+21	/ 40.5/	(+0.0	35.3	54.0 -18.7	Vert
, ,			+0.0	+0.0	+2-1  +00/	1 43 9			8DPSK, hi CH	
			+0.0	+0.0	\+0.\@\				·,	
99	1104.350M	47.3	-40.9	+22.3	( <del>1</del> +2.1)	10.5	+0.0	35.1	54.0 -18.9	Horiz
			+0.0	+0[0] /	#2.1 +0.0	+3.8			8DPSK, hi CH	
			+0.0	tod/	1 40.0				,	
100	504.000M	31.6	+0.0	+0.0	+0.0	+0.0	+0.0	27.0	46.0 -19.0	Vert
			+0.0	40.0	-28.0	+2.5			BLE, low CH, USB	
			+18.1	+0.4	+2.4				cable unplugged	
101	360.005M	34.3	+0.0	+0.0	+0.0	+0.0	+0.0	26.8	46.0 -19.2	Vert
101	2001002111	<i>55</i>	+0.0	+0.0	-27.0	+2.1	0.0	_0.0	8DPSK, low CH,	
			+15.2	+0.3	+1.9				USB cable	
			10.2	0.2	1.,,				unplugged	
102	312.000M	35.6	+0.0	+0.0	+0.0	+0.0	+0.0	26.7	46.0 -19.3	Vert
102	512.0001.1	22.0	+0.0	+0.0	-26.7	+2.0	0.0	_0.,	BLE, low CH, USB	. 510
			+13.7	+0.3	+1.8	. 2.0			cable unplugged	
103	204.420M	38.0	+0.0	+0.0	+0.0	+0.0	+0.0	24.0	43.5 -19.5	Horiz
103	20 1. 120111	50.0	+0.0	+0.0	-26.7	+1.6	. 0.0	2 1.0	BLE, low CH	110112
			+9.5	+0.2	+1.4	1.0			, .5 011	
104	390.005M	33.2	+0.0	+0.0	+0.0	+0.0	+0.0	26.5	46.0 -19.5	Vert
107	370.003141	33.2	+0.0	+0.0	-27.3	+2.2	. 0.0	20.5	8DPSK, low CH,	, 011
			+16.0	+0.3	+2.1	. 2.2			USB cable	
			10.0	. 0.5	- 2.1				unplugged	
105	312.000M	35.2	+0.0	+0.0	+0.0	+0.0	+0.0	26.3	46.0 -19.7	Horiz
103	J12.0001VI	33.2	+0.0	+0.0	-26.7	+2.0	. 0.0	20.3	BLE, low CH, USB	110112
			+13.7	+0.3	+1.8	. 2.0			cable unplugged	
106	408.000M	32.6	+0.0	+0.0	+0.0	+0.0	+0.0	26.2	46.0 -19.8	Horiz
100	-TUU.UUUIVI	32.0	+0.0	+0.0	-27.5	+2.2	10.0	20.2	BLE, low CH, USB	110112
			+16.5	+0.0	+2.1	1 4.4			cable unplugged	



107	375.005M	33.2	+0.0	+0.0	+0.0	+0.0	+0.0	26.1	46.0 -19.9	Vert
			+0.0	+0.0	-27.2	+2.2			8DPSK, low CH,	
			+15.6	+0.3	+2.0				USB cable	
100	260,00014	22.2	. 0. 0	. 0. 0		. 0. 0	. 0. 0	27.0	unplugged	<b>T</b> 7
108	360.000M	33.3	+0.0	+0.0	+0.0	+0.0	+0.0	25.8	46.0 -20.2	Vert
			+0.0	+0.0	-27.0	+2.1			BLE, low CH, USB	
100	240.0103.5	260	+15.2	+0.3	+1.9	. 0. 0	. 0. 0	27.0	cable unplugged	**
109	240.010M	36.8	+0.0	+0.0	+0.0	+0.0	+0.0	25.8	46.0 -20.2	Vert
			+0.0	+0.0	-26.6	+1.8			8DPSK, low CH,	
			+12.0	+0.2	+1.6				USB cable	
110	106.04514	27.6	100	100	100	100	100	22.2	unplugged	<b>3</b> 7 4
110	196.945M	37.6	+0.0	+0.0	+0.0	+0.0	+0.0	23.2	43.5 -20.3	Vert
			+0.0	+0.0	-26.7	+1.6			BLE, low CH	
111	1000 1003 6	47.0	+9.1	+0.2	+1.4	. 0. 5	. 0. 0	22.5	540 205	TT '
111	1008.100M	47.0	-41.5	+21.9	+2.0	+0.5	+0.0	33.5	54.0 -20.5	Horiz
			+0.0	+0.0	+0.0	+3.6			8DPSK, hi CH	
110	1120 2503 5	45.4	+0.0	+0.0	+0.0	10.5	100	22.5	540 205	тт .
112	1128.350M	45.4	-40.8	+22.4	+2.1	+0.5	+0.0	33.5	54.0 -20.5	Horiz
			+0.0	+0.0	+0.0	+3.9	1	ノ	8DPSK, hi CH	
112	456,00034	20.0	+0.0	+0.0	+0.0			25.5	46.0 20.5	<b>3</b> 7 4
113	456.000M	30.8	+0.0	+0.0	+0.0	+0.0	0.0+	25.5	46.0 -20.5	Vert
			+0.0	+0.0	-27.7	f+2.4	ИП		BLE, low CH, USB	
114	400 0003 4	21.7	+17.3	+0.4	+2.3			25.2	cable unplugged	<b>3</b> 7 4
114	408.000M	31.7	+0.0	+0.0	12.0	/ #0.0/	$\int +0.0$	25.3	46.0 -20.7	Vert
			+0.0	+0.0	12/5/	1422			BLE, low CH, USB	
115	216,00014	25.7	+16.5	+0.8	+2. <b>\( \)</b>	11/	100	22.7	cable unplugged	<b>3</b> 7 4
115	216.000M	35.7	+0.0	+0.0	// <del>f</del> p.d/	10.0	+0.0	22.7	43.5 -20.8	Vert
			+0.0	#0 0  #0 2	1-26.71	+1.7			BLE, low CH, USB	
116	204 41 414	26.4	+10.3		J+1.5	100	100	22.4	cable unplugged	<b>3</b> 7 4
116	204.414M	36.4	+0.0	+0.0	+0.0	+0.0	+0.0	22.4	43.5 -21.1	Vert
			+0.0 +9.5	₩0.0 +0.2	-26.7	+1.6			8DPSK, low CH	
117	456.000M	20.1			+1.4	+0.0	ΙΛΛ	24.0	46.0 -21.2	II!-
117	436.000M	30.1	+0.0	+0.0	+0.0	+0.0	+0.0	24.8		Horiz
			+0.0 +17.3	$+0.0 \\ +0.4$	-27.7 +2.3	+2.4			BLE, low CH, USB	
110	105 2001	267				10.0	+ 0. 0	22.0	cable unplugged 43.5 -21.5	IIai-
118	185.380M	36.7	+0.0	+0.0	+0.0	+0.0	+0.0	22.0		Horiz
			+0.0	$+0.0 \\ +0.2$	-26.8 +1.3	+1.5			8DPSK, low CH	
110	216.01014	27.5	+9.1		+1.3	±0 0	±0.0	24.5	46.0 -21.5	Цо≈і≂
119	216.010M	37.5	$+0.0 \\ +0.0$	$^{+0.0}$	+0.0 -26.7	$+0.0 \\ +1.7$	+0.0	24.3	BLE, low CH, USB	Horiz
			+0.0 $+10.3$	+0.0 $+0.2$	-20.7 +1.5	⊤1./			cable unplugged	
1			110.5			10.5	+0.0	32.5	54.0 -21.5	
120	1056 00014	15.2		⊥つつ 1						17200
120	1056.000M	45.3	-41.2	+22.1	+2.1	+0.5	±0.0	32.3		Vert
120	1056.000M	45.3	-41.2 +0.0	+0.0	+0.0	+0.5	+0.0	32.3	8DPSK, hi CH	Vert
			-41.2 +0.0 +0.0	+0.0 +0.0	+0.0 +0.0	+3.7			8DPSK, hi CH	
120	1056.000M 432.000M	45.3 30.2	-41.2 +0.0 +0.0 +0.0	+0.0 +0.0 +0.0	+0.0 +0.0 +0.0	+3.7	+0.0	24.4	8DPSK, hi CH 46.0 -21.6	Vert Horiz
			-41.2 +0.0 +0.0 +0.0 +0.0	+0.0 +0.0 +0.0 +0.0	+0.0 +0.0 +0.0 -27.6	+3.7			8DPSK, hi CH 46.0 -21.6 8DPSK, low CH,	
			-41.2 +0.0 +0.0 +0.0	+0.0 +0.0 +0.0	+0.0 +0.0 +0.0	+3.7			8DPSK, hi CH  46.0 -21.6 8DPSK, low CH, USB cable	
121	432.000M	30.2	-41.2 +0.0 +0.0 +0.0 +0.0 +16.9	+0.0 +0.0 +0.0 +0.0 +0.4	+0.0 +0.0 +0.0 -27.6 +2.2	+3.7 +0.0 +2.3	+0.0	24.4	8DPSK, hi CH  46.0 -21.6 8DPSK, low CH, USB cable unplugged	Horiz
121			-41.2 +0.0 +0.0 +0.0 +0.0 +16.9	+0.0 +0.0 +0.0 +0.0 +0.4 +22.1	+0.0 +0.0 +0.0 -27.6 +2.2 +2.1	+3.7 +0.0 +2.3 +0.5			8DPSK, hi CH  46.0 -21.6 8DPSK, low CH, USB cable unplugged  54.0 -21.8	
121	432.000M	30.2	-41.2 +0.0 +0.0 +0.0 +0.0 +16.9	+0.0 +0.0 +0.0 +0.0 +0.4	+0.0 +0.0 +0.0 -27.6 +2.2	+3.7 +0.0 +2.3	+0.0	24.4	8DPSK, hi CH  46.0 -21.6 8DPSK, low CH, USB cable unplugged	Horiz



123	1031.850M	45.2	-41.4	+22.0	+2.0	+0.5	+0.0	32.0	54.0 -22.0	Horiz
			+0.0	+0.0	+0.0	+3.7			8DPSK, hi CH	
			+0.0	+0.0	+0.0					
124	210.005M	34.9	+0.0	+0.0	+0.0	+0.0	+0.0	21.3	43.5 -22.2	Horiz
			+0.0	+0.0	-26.7	+1.6			8DPSK, low CH	
			+9.9	+0.2	+1.4					
125	264.000M	33.7	+0.0	+0.0	+0.0	+0.0	+0.0	23.7	46.0 -22.3	Vert
			+0.0	+0.0	-26.6	+1.8			BLE, low CH, USB	
			+12.9	+0.2	+1.7				cable unplugged	
126	960.005M	28.2	+0.0	+0.0	+0.0	+0.0	+0.0	31.5	54.0 -22.5	Vert
			+0.0	+0.0	-27.5	+3.5			8DPSK, low CH,	
			+23.2	+0.6	+3.5				USB cable	
									unplugged	
127	420.005M	29.4	+0.0	+0.0	+0.0	+0.0	+0.0	23.4	46.0 -22.6	Vert
			+0.0	+0.0	-27.5	+2.3			8DPSK, low CH,	
			+16.7	+0.3	+2.2				USB cable	
									unplugged	
128	504.000M	27.9	+0.0	+0.0	+0.0	+0.0	+0.0	43.3	46.0 -22.7	Horiz
			+0.0	+0.0	-28.0	+2.5	1		BLE, low CH, USB	
			+18.1	+0.4	+2.4				cable unplugged	
129	435.005M	29.1	+0.0	+0.0	+0.0	+0,0	±0.6	23.3	46.0 -22.7	Vert
			+0.0	+0.0	-27.6	<i> </i> +2 3	h I	1	8DPSK, low CH,	
			+16.9	+0.4	+2.2	$I_{I} \setminus I$			USB cable	
					$\sqrt{a}$				unplugged	
130	375.000M	29.9	+0.0	+Ø.0	+0.0/	10g	+0.0	22.8	46.0 -23.2	Horiz
			+0.0	+b.0	1-27.2	+2 2			8DPSK, low CH	
			+15.6	+0.3	/ p.4+					
131	192.834M	33.8	+0.0	+0.0/	1 +0.0	$f_{+0.0}$	+0.0	19.3	43.5 -24.2	Vert
			+0.0	tdø/	1-26.8	+1.6			8DPSK, low CH	
			+9.1	+0.2/	+1.4					
132	263.990M	31.8	+0.0	H0.0	+0.0	+0.0	+0.0	21.8	46.0 -24.2	Horiz
			+0.0	+0.0	-26.6	+1.8			BLE, low CH, USB	
			+12.9	+0.2	+1.7				cable unplugged	
133	185.379M	33.9	+0.0	+0.0	+0.0	+0.0	+0.0	19.2	43.5 -24.3	Vert
			+0.0	+0.0	-26.8	+1.5			8DPSK, low CH	
			+9.1	+0.2	+1.3					
134	384.000M	25.4	+0.0	+0.0	+0.0	+0.0	+0.0	18.6	46.0 -27.4	Horiz
			+0.0	+0.0	-27.2	+2.2			BLE, low CH, USB	
			+15.9	+0.3	+2.0				cable unplugged	
									1 00	

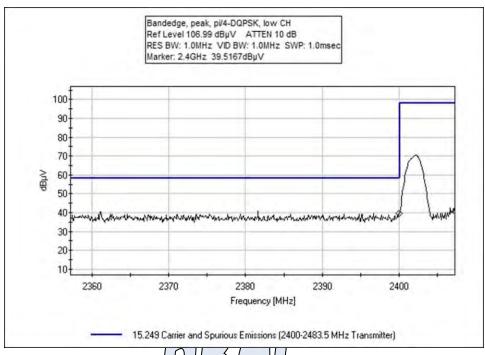


# **Band Edge**

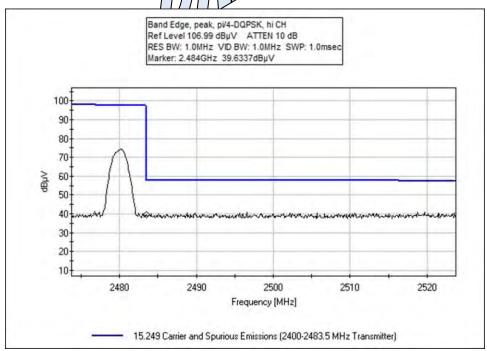
Band Edge Summary									
Frequency (MHz)	Modulation	Ant. Type	Field Strength (dBuV/m @3m)	Limit (dBuV/m @3m)	Results				
2400	Bluetooth V4, pi/4-DQPSK	Chip antenna	39.5167	<54	Pass				
2483.5	Bluetooth V4, pi/4-DQPSK	Chip antenna	39.6337	<54	Pass				
2400	Bluetooth V4, GFSK	Chip antenna	37.4517	<54	Pass				
2483.5	Bluetooth V4, GFSK	Chip antenna	38.8097	<54	Pass				
2400	Bluetooth V4, 8DPSK	Chip antenna	37.6367	<54	Pass				
2483.5	Bluetooth V4, 8DPSK	Chip antenna	39.3187	<54	Pass				
2400	BLE, GFSK	Chip antenna	37.9457	<54	Pass				
2483.5	BLE, GFSK	Chip antenna	39.5437	<54	Pass				



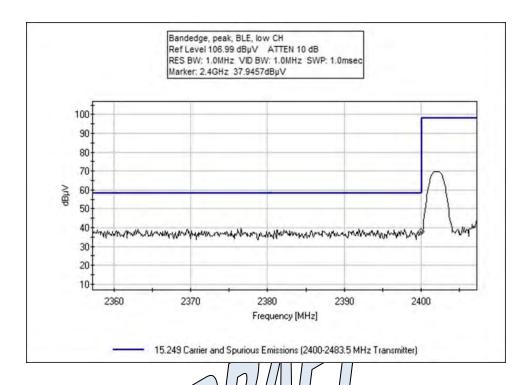
## **Band Edge Plots**

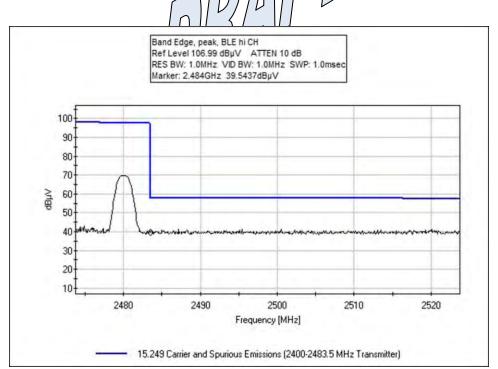




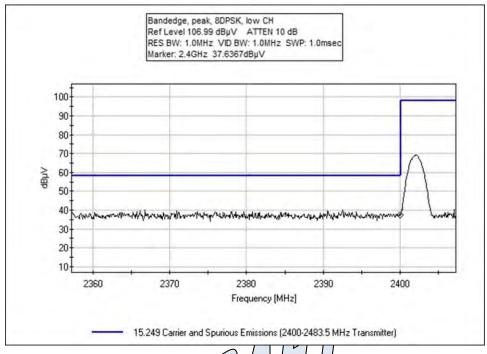


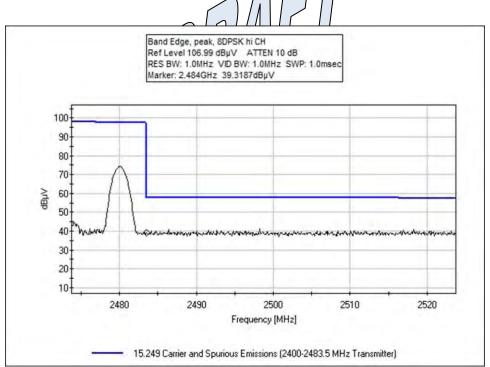




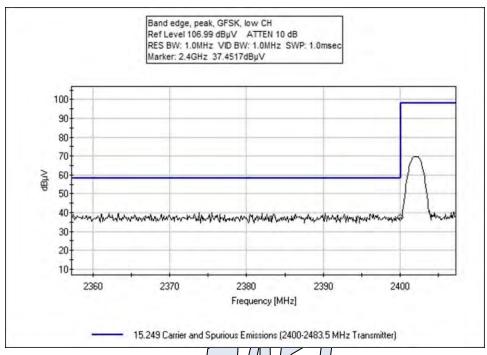


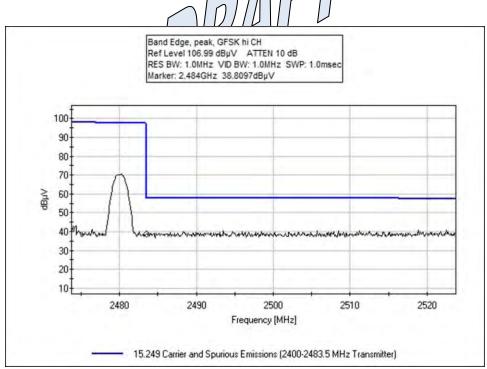














# Test Setup Photo(s)



Y Axis





ZAxis





Test Setup, View #2









Test Setup, View #4





Test Setup, View #6



# SUPPLEMENTAL INFORMATION

# **Measurement Uncertainty**

Uncertainty Value	Parameter			
4.73 dB	Radiated Emissions			
3.34 dB	Mains Conducted Emissions			
3.30 dB	Disturbance Power			

Reported uncertainties represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor of k=2. Compliance is deemed to occur provided measurements are below the specified limits.

## **Emissions Test Details**

### **TESTING PARAMETERS**

Unless otherwise indicated, the following configuration parameters are used for equipment setup: The cables were routed consistent with the typical application by varying the configuration of the test sample. Interface cables were connected to the available ports of the test unit. The effect of varying the position of the cables was investigated to find the configuration that produced maximum emissions. Cables were of the type and length specified in the individual requirements. The length of cable that produced maximum emissions was selected.

The equipment under test (EUT) was set up in a manner that represented its normal use, as shown in the setup photographs. Any special conditions required for the EUT to operate normally are identified in the comments that accompany the emissions tables.

The emissions data was taken with a spectrum analyzer or receiver. Incorporating the applicable correction factors for distance, antenna, cable loss and amplifier gain, the data was reduced as shown in the table below. The corrected data was then compared to the applicable emission limits. Preliminary and final measurements were taken in order to ensure that all emissions from the EUT were found and maximized.

## **CORRECTION FACTORS**

The basic spectrum analyzer reading was converted using correction factors as shown in the highest emissions readings in the tables. For radiated emissions in  $dB\mu V/m$ , the spectrum analyzer reading in  $dB\mu V$  was corrected by using the following formula. This reading was then compared to the applicable specification limit. Individual measurements were compared with the displayed limit value in the margin column. The margin was calculated based on the limit value subtracting the corrected measured value; a negative margin represents a measurement less than the limit while a positive margin represents a measurement exceeding the limit.

SAMPLE CALCULATIONS							
	Meter reading (dBμV)						
+	Antenna Factor	(dB/m)					
+	Cable Loss	(dB)					
-	Distance Correction	(dB)					
-	Preamplifier Gain	(dB)					
=	Corrected Reading	(dBμV/m)					

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#### TEST INSTRUMENTATION AND ANALYZER SETTINGS

The test instrumentation and equipment listed were used to collect the emissions data. A spectrum analyzer or receiver was used for all measurements. Unless otherwise specified, the following table shows the measuring equipment bandwidth settings that were used in designated frequency bands. For testing emissions, an appropriate reference level and a vertical scale size of 10 dB per division were used.

MEASURING EQUIPMENT BANDWIDTH SETTINGS PER FREQUENCY RANGE							
TEST	BEGINNING FREQUENCY	ENDING FREQUENCY	BANDWIDTH SETTING				
CONDUCTED EMISSIONS	150 kHz	30 MHz	9 kHz				
RADIATED EMISSIONS	9 kHz	150 kHz	200 Hz				
RADIATED EMISSIONS	150 kHz	30 MHz	9 kHz				
RADIATED EMISSIONS	30 MHz	1000 MHz	120 kHz				
RADIATED EMISSIONS	1000 MHz	>1 GHz	1 MHz				

## SPECTRUM ANALYZER/RECEIVER DETECTOR FUNCTIONS

The notes that accompany the measurements contained in the emissions tables indicate the type of detector function used to obtain the given readings. Unless otherwise noted, all readings were made in the "positive peak" detector mode. Whenever a "quasi-peak" or "average" reading was recorded, the measurement was annotated with a "QP" or an "Ave" on the appropriate rows of the data sheets. In cases where quasi-peak or average limits were employed and data exists for multiple measurement types for the same frequency then the peak measurement was retained in the report for reference, however the numbering for the affected row was removed and an arrow or caret ("^") was placed in the far left-hand column indicating that the row above takes procedence for comparison to the limit. The following paragraphs describe in more detail the detector functions and when they were used to obtain the emissions data.

#### Peak

In this mode, the spectrum analyzer or receiver recorded all emissions at their peak value as the frequency band selected was scanned. By combining this function with another feature called "peak hold," the measurement device had the ability to measure intermittent or low duty cycle transient emission peak levels. In this mode the measuring device made a slow scan across the frequency band selected and measured the peak emission value found at each frequency across the band.

### **Quasi-Peak**

Quasi-peak measurements were taken using the quasi-peak detector when the true peak values exceeded or were within 2 dB of a quasi-peak specification limit. Additional QP measurements may have been taken at the discretion of the operator.

#### <u>Average</u>

Average measurements were taken using the average detector when the true peak values exceeded or were within 2 dB of an average specification limit. Additional average measurements may have been taken at the discretion of the operator. If the specification or test procedure requires trace averaging, then the averaging was performed using 100 samples or as required by the specification. All other average measurements are performed using video bandwidth averaging. To make these measurements, the test engineer reduces the video bandwidth on the measuring device until the modulation of the signal is filtered out. At this point the measuring device is set into the linear mode and the scan time is reduced.

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