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FCC 47 CFR PART 15 SUBPART C AND ANSI C63.10: 2013

TEST REPORT

For

Cherry Wireless Mouse

Model: JF-81

Brand: CHERRY

Issued for

Cherry Europe GmbH

Cherrystraße, 91275 Auerbach, Deutschland/Germany

Issued by:

Compliance Certification Services Inc.

Tainan Lab. No.8, Jiucengling, Xinhua Dist., Tainan City , Taiwan Issued Date: November 15, 2021

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REVISION HISTORY

Rev.	Issue Date	Revisions	Effect Page	Revised By
00	November 15, 2021	Initial Issue	ALL	Gina Lin



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1. TEST REPORT CERTIFICATION

Applicant Manufacturer	:	Cherry Europe GmbH Cherrystraße, 91275 Auerbach, Deutschland/Germany Jing Mold Electronic Tech. (Shen Zhen) Co., Ltd Xin Qiao 3rd Industrial Estate, Sha Jing, Bao An, Shenzhen, Guangdong, P.R. China
Equipment Under Test	:	Cherry Wireless Mouse
Model Number	:	JF-81
Brand Name	:	CHERRY
Date of Test	:	October 05, 2021 ~ October 06, 2021

APPLICABLE STANDARD				
STANDARD TEST RESULT				
FCC 47 CFR Part 15 Subpart C ANSI C63.10: 2013	No non-compliance noted			

Statements of Conformity

Determining compliance shall be based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.

FCC Standard Section	Report Section	Test Item	Result
15.247(a)	8.1	6dB BANDWIDTH	Pass
15.247(b)	8.2	MAXIMUM PEAK OUTPUT POWER	Pass
-	8.3	DUTY CYCLE	-
15.247(e)	8.4	POWER SPECTRAL DENSITY	Pass
15.247(d)	8.5	CONDUCTED SPURIOUS EMISSION	Pass
15.205(a)	8.6	RADIATED EMISSIONS	Pass
15.207(a)	8.7	POWERLINE CONDUCTED EMISSIONS	Pass
15.203	9	ANTENNA REQUIREMENT	Pass

Approved by:

Eric Huang Section Manager



2. EUT DESCRIPTION

2.1 DESCRIPTION OF EUT & POWER

Product Name	Cherry Wireless Mouse
Model Number	JF-81
Brand Name	CHERRY
Received Date	September 28, 2021
Reported Date	October 21, 2021
Operating Frequency Range	2402MHz~2480MHz
Transmit Power	BT: -10.54dBm (0.088mW) RF: -10.60dBm (0.087mW)
Average Power	BT: -10.93dBm (0.081mW) RF: -12.62dBm (0.055mW)
Channel Spacing	2 MHz
Channel Number	BT: 39 Channels RF: 79 Channels
Transmit Data Rate	BT: 2 Mbps RF: 1 Mbps
Type of Modulation	GFSK
Antenna Type	Manufacturer: Sunrex Type: PCB Model: JD-85M Gain: 0.37 dBi
RF Module Model	nRF51802
Power Source	DC3.7V
Temperature Range	0°C ~ +40°C
Firmware Version	1
Software Version	N/A

- **REMARK:** 1. The sample selected for test was engineering sample that approximated to production product and was provided by manufacturer.
 - 2. This submittal(s) (test report) is intended for FCC ID: <u>GDDJF-81</u> filing to comply with Section 15.207, 15.209 and 15.247 of the FCC Part 15, Subpart C Rules.
 - 3. For more details, please refer to the user manual.
 - 4. According to customer declaration Cherry Wireless Dongle (**JR-91 / FCC ID: GDDJR-91**) for sale.



3. DESCRIPTION OF TEST MODES

The EUT is a Cherry Wireless Mouse.

The RF Chip is manufactured by Nordic

The antenna peak gain 0.37 dBi (highest gain) were chosen for full testing.

GFSK mode

The EUT had been tested under operating condition.

There are three channels have been tested as following:

Channel	Frequency (MHz)
Low	2402
Middle	2442
High	2480

GFSK mode: 1Mbps long data rates (worst case) were chosen for full testing.

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4. TEST METHODOLOGY

The tests documented in this report were performed in accordance with ANSI C63.10 and FCC CFR 47 15.207, 15.209 and 15.247 and KDB 558074.

5. FACILITIES AND ACCREDITATIONS

5.1 FACILITIES

All measurement facilities used to collect the measurement data are located at

No.8, Jiucengling, Xinhua Dist., Tainan City 712, Taiwan (R.O.C.)

The sites are constructed in conformance with the requirements of ANSI C63.7:1992, ANSI C63.10: 2013 and CISPR Publication 22.

5.2 EQUIPMENT

Radiated emissions are measured with one or more of the following types of linearly polarized antennas: tuned dipole, biconical, log periodic, bi-log, and/or ridged waveguide, horn. Spectrum analyzers with preselectors and quasi-peak detectors are used to perform radiated measurements.

Conducted emissions are measured with Line Impedance Stabilization Networks and EMI Test Receivers.

Calibrated wideband preamplifiers, coaxial cables, and coaxial attenuators are also used for making measurements.

All receiving equipment conforms to CISPR Publication 16-1, "Radio Interference Measuring Apparatus and Measurement Methods."

5.3 LABORATORY ACCREDITATIONS LISTINGS

The test facilities used to perform radiated and conducted emissions tests are accredited by Taiwan Accreditation Foundation for the specific scope of accreditation under Lab Code: 1109 to perform Electromagnetic Interference tests according to FCC PART 15 AND CISPR 22 requirements. No part of this report may be used to claim or imply product endorsement by TAF or any agency of the Government. In addition, the test facilities are listed with Federal Communications Commission (registration no: TW1109).



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5.4 TABLE OF ACCREDITATIONS AND LISTINGS

Our laboratories are accredited and approved by the following accreditation body according to ISO/IEC 17025.

Taiwan TAF

The measuring facility of laboratories has been authorized or registered by the following approval agencies.

Canada	Industry Canada
Germany	TUV NORD
Taiwan	BSMI
USA	FCC

Copies of granted accreditation certificates are available for downloading from our web site, <u>http://www.ccsrf.com</u>



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5.5 MEASUREMENT EQUIPMENT USED

For §8.6

Chamber 966 Room (Radiated Test)						
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due	
Active Loop Antenna	ETS-LINDREN	6502	8905-2356	09/06/2021	09/05/2023	
Bilog Antenna with 5dB Attenator	TESEQ & EMCI	CBL 6112D & N-6-05	35404 & ATN0563	09/15/2021	09/14/2022	
Cable	Suhner	SUCOFLEX104PE A	20520/4PEA&O6	01/29/2021	01/28/2022	
Double Ridged Guide Horn Antenna	ETS-LINDGREN	3116	00078900	03/30/2021	03/29/2022	
EMI Test Receiver	R&S	ESCI	100960	02/05/2021	02/04/2022	
Horn Antenna	Com-Power	AH-118	071032	05/04/2021	05/03/2022	
MXA Signal Analyzer	KEYSIGHT	N9020A	MY56060171	08/23/2021	08/22/2022	
Pre-Amplifier	EMCI	EMC012645	980098	01/29/2021	01/28/2022	
Pre-Amplifier	HP	8447F	2443A01683	01/19/2021	01/18/2022	
Pre-Amplifier	Com-Power	PAM-840A	461378	07/05/2021	07/04/2022	
Type N coaxial cable	Suhner	CHA9513	6	01/19/2021	01/18/2022	
Notch Filter	MICRO-TRONICS	BRM50702-01	018	N.C.R	N.C.R	
Software	Software Excel(ccs-o6-2020 v1.1) , e3(v6.101222)					

For §8.1~8.5

Chamber 966 Room (Conducted Test)						
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due	
EXA Spectrum Analyzer	KEYSIGHT	N9020A	MY56060171	08/23/2021	08/22/2022	
Power Meter	Anritsu	ML2487A	6K00003888	05/18/2021	05/17/2023	
Power Sensor	Anritsu	MA2491A	033265	05/18/2021	05/17/2023	
SMA Cable + 10dB Attenuator	CCS	SMA+10dB ATT	SMA/10dB	01/29/2021	01/28/2022	
Software	Excel(ccs-o6-2020 v1.1)					

For §8.7

Conducted Emission room #1					
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
Test S/W			-		



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6. CALIBRATION AND UNCERTAINTY

6.1 MEASURING INSTRUMENT CALIBRATION

The measuring equipment utilized to perform the tests documented in this report has been calibrated in accordance with the manufacturer's recommendations, and is traceable to recognized national standards.

6.2 MEASUREMENT UNCERTAINTY

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

Parameter	Uncertainty
Radiated Emission, 30 to 200 MHz Test Site : CB966	±3.1dB
Radiated Emission, 200 to 1000 MHz Test Site : CB966	±2.7dB
Radiated Emission, 1 to 6 GHz	±2.7dB
Radiated Emission, 6 to 18 GHz	±2.7dB
Radiated Emission, 18 to 26.5 GHz	±2.7dB
Radiated Emission, 26 to 40 GHz	±3.7dB
Power Line Conducted Emission	±2.0dB

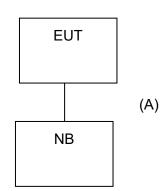
This measurement uncertainty is confidence of approximately 95%, k=2



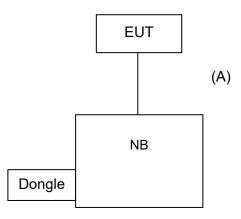
7. SETUP OF EQUIPMENT UNDER TEST

7.1 SETUP CONFIGURATION OF EUT

[RF]



[EMC]



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7.2 SUPPORT EQUIPMENT

[RF]

No.	Product	Manufacturer	Model No.	Certify No.	Signal cable
1	Note Book	Acer	Z5WE1		DC: Unshd, 1.4m with 1 core. AC: Unshd, 1.0m with.
No.	Signal cat	ole description			

[EMC]

No.	Product	Manufacture	er Model No.	Certify No.	Signal cable	
1	Note Book	MSI	MS-1452	Doc	N/A	
No.	No. Signal cable description					
А	A DC Power Cable Unshielded, 1.0m, 1pcs.					

Note:

1) All the equipment/cables were placed in the worst-case configuration to maximize the emission during the test.

2) Grounding was established in accordance with the manufacturer's requirements and conditions for the intended use.

3) shd. = shielded; unshd. = unshielded



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Report No.: TMTN2109000342NR 7.3 EUT OPERATING CONDITION

RF Setup

1. Make sure mouse power off

2. Press Left, Right, and Scroll Wheel buttons with BT(BT Mode) or RF(RF Mode) power on, continue for 3 seconds and release. (Red LED light keep on)

3. Press Scroll Wheel button into as below function. (Red LED off)

(1). Press Right button into Carrier Mode 2402MHz emission, one more time into Carrier Mode 2440MHz emission, one more time into Carrier Mode 2480MHz emission, going cycle.
(2). Press Left button into Modulation Mode 2402MHz emission, one more time into Modulation Mode 2440MHz emission, one more time into Modulation Mode 2480MHz emission, going cycle.



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8. APPLICABLE LIMITS AND TEST RESULTS

8.1 6dB BANDWIDTH

<u>LIMIT</u>

§ 15.207(a) (2) For direct sequence systems, the minimum 6dB bandwidth shall be at least 500kHz

TEST SETUP



TEST PROCEDURE

- a) Set RBW = 100 kHz.
- b) Set the video bandwidth (VBW) \geq 3 RBW.
- c) Detector = Peak.
- d) Trace mode = max hold.
- e) Sweep = auto couple.
- f) Allow the trace to stabilize.

g) Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.



TEST RESULTS

No non-compliance noted.

Model Name	JF-81	Test By	Ted Huang
Temp & Humidity	25.6°C, 55%	Test Date	2021/10/04

GFSK(BT) mode

Channel	Channel Frequency (MHz)	6dB Bandwidth (kHz)	Minimum Limit (kHz)	Pass / Fail
Low	2402	658	500	PASS
Middle	2442	666	500	PASS
High	2480	658	500	PASS

GFSK(RF) mode

Channel	Channel Frequency (MHz)	6dB Bandwidth (kHz)	Minimum Limit (kHz)	Pass / Fail
Low	2402	669	500	PASS
Middle	2442	665	500	PASS
High	2480	672	500	PASS

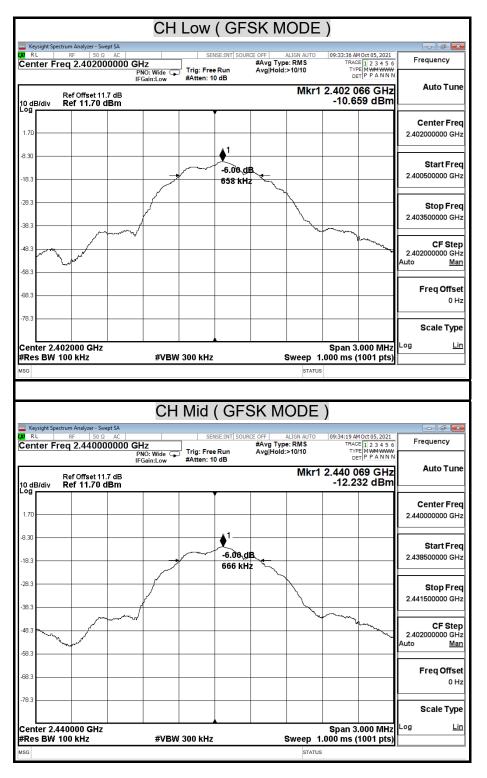
NOTE : 1. At finial test to get the worst-case emission at1Mbps long.
 2. The cable assembly insertion loss of 11.1dB (including 10 dB pad and 1.1 dB cable) was entered as an offset in the spectrum analyzer to allow for direct reading of power.

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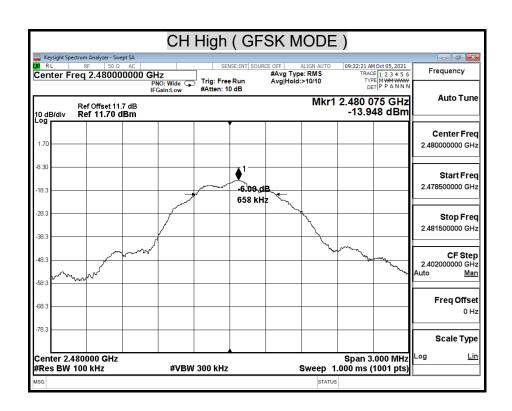
6dB BANDWIDTH (GFSK(BT) MODE)





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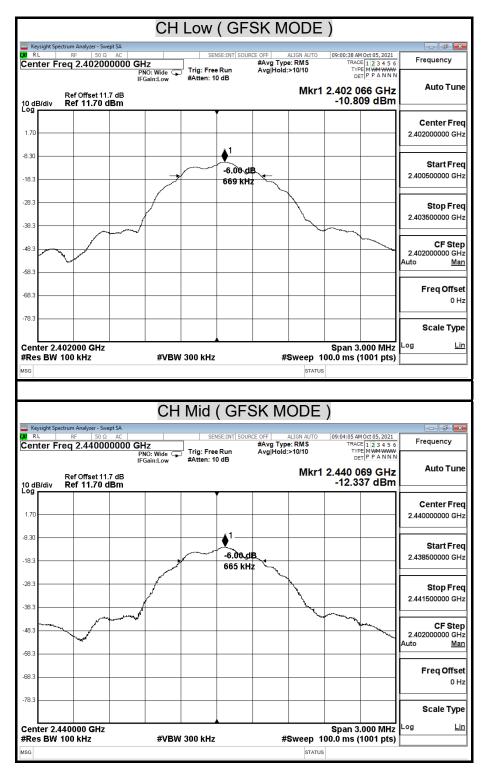
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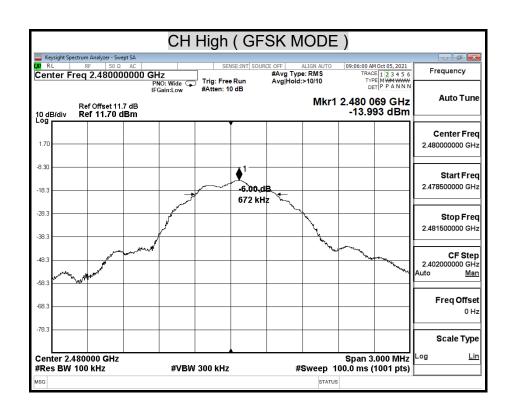
6dB BANDWIDTH (GFSK(RF) MODE)





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8.2 MAXIMUM PEAK OUTPUT POWER

<u>LIMIT</u>

§ 15.247(b) The maximum peak output power of the intentional radiator shall not exceed the following :

§ 15.247(b) (3) For systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands : 1 watt.

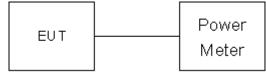
§ 15.247(b) (4) Except as shown in paragraphs (c) of this section , if transmitting antennas of directional gain greater than 6 dBi are used the peak output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1) or (b)(2), and (b)(3) of this section , as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

TEST SETUP

For Peak Power



For Average Power





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TEST PROCEDURE

The tests were performed in accordance with KDB 558074 D01 v05r02 and ANSI C63.10-2013, 11.9.1.1.

9.1.1 Measurement Procedure PK2:

- a) Set the RBW \geq DTS bandwidth.
- b) Set VBW \geq 3 RBW.
- c) Set span ≥ 3 x RBW
- d) Sweep time = auto couple.
- e) Detector = peak.
- f) Trace mode = max hold.
- g) Allow trace to fully stabilize.
- h) Use peak marker function to determine the peak amplitude level.

Average Power

The tests were performed in accordance with ANSI C63.10-2013, 11.9.2.3.1.

Connect the EUT to power meter, set the center frequency of the power meter to the channel center frequency.



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TEST RESULTS

No non-compliance noted.

Model Name	JF-81	Test By	Ted Huang
Temp & Humidity	25.6°C, 55%	Test Date	2021/10/04

GFSK(BT) mode

Channel	Channel Frequency (MHz)	Peak Power (dBm)	Peak Power Limit (dBm)	Pass / Fail
Low	2402	-10.54	30.00	PASS
Middle	2442	-12.06	30.00	PASS
High	2480	-13.75	30.00	PASS

GFSK(RF) mode

Channel	Channel Frequency (MHz)	Peak Power (dBm)	Peak Power Limit (dBm)	Pass / Fail
Low	2402	-10.60	30.00	PASS
Middle	2442	-12.09	30.00	PASS
High	2480	-13.91	30.00	PASS

NOTE : 1. At finial test to get the worst-case emission at 1Mbps long.

2. The cable assembly insertion loss of 11.1dB (including 10 dB pad and 1.1 dB cable) was entered as an offset in the power meter to allow for direct reading of power.



Average Power Data

Model Name	JF-81	Test By	Ted Huang
Temp & Humidity	25.6°C, 55%	Test Date	2021/10/04

GFSK(BT) mode

Channel	Channel Frequency (MHz)	Average Power (dBm)
Low	2402	-10.93
Middle	2442	-12.51
High	2480	-14.18

GFSK(RF) mode

Channel	Channel Frequency (MHz)	Average Power (dBm)
Low	2402	-12.62
Middle	2442	-14.11
High	2480	-15.69



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MAXIMUM PEAK OUTPUT POWER (GFSK(BT) MODE)

			СН	L011				/		
Keysight Spectrum	Analyzer - Swept S	5A								- 7 -
X/RL RF	50 Ω /	AC		SEN	NSE:INT SOU		ALIGN AUTO	09:38:29 /	M Oct 05, 2021	Frequency
Center Freq	2.4020000	JUU GH	Z IO: Fast 😱	Trig: Free		#Avg Typ Avg∣Hold	e: RMS :>10/10		CE 1 2 3 4 5 6 PE MWMWWW	
		IFG	Sain:Low	#Atten: 1					ET P P A N N N	A
Ref	Offset 11.7 c	B					Mkr1		780 GHz	Auto Tune
10 dB/div Rei	f 11.70 dBi							-10.5	38 dBm	
Log					ſ					
1.70										Center Free
1.70										2.40200000 GH:
				1						
-8.30										Start Free
										2.399500000 GH;
-18.3		-								2.033000000 011
-28.3	~									Stop Free
										2.404500000 GH
-38.3										
										05.01
-48.3						-				CF Step 2.402000000 GH
										Auto <u>Mar</u>
-58.3										
										Eron Office
-68.3									-	Freq Offse 0 Hi
										U 0 H
-78.3										
										Scale Type
								<u> </u>	5.000 MHz	Log <u>Lir</u>
Center 2.4020										
	1.11.1		#\/D\\				Oween 1	000 mc	(1001 ptc)	
	MHz		#VBW	5.0 MHz				.000 ms	(1001 pts)	
	MHz						STATUS	.000 ms	(1001 pts)	
#Res BW 1.5 ^{IISG}	MHz					SK M	STATUS	.000 ms	(1001 pts)	
ISG	Analyzer - Swept S			Mid	(GF	SK M	STATUS	.000 ms	(1001 pts)	
IISG Keysight Spectrum X RL RF	Analyzer - Swept S	AC	СН	Mid		SK M	STATUS ODE ALIGN AUTO)	(1001 pts)	
IISG Keysight Spectrum X RL RF	Analyzer - Swept S	AC 000 GH	CH		(GF	SK M	STATUS ODE ALIGN AUTO e: RMS	09:35:14 /	(1001 pts)	
ISG Keysight Spectrum X RL RF	Analyzer - Swept S	AC 000 GH PN	СН	Mid	(GF	SK M	STATUS ODE ALIGN AUTO e: RMS :>10/10	000 ms	M Oct 05, 2021 CE 1 2 3 4 5 6 PE MWWWW ET P P A N N N	Frequency
Keysight Spectrum RL RF Center Freq	Analyzer - Swept S	AC 000 GH PN IFG	CH z IO: Fast		(GF	SK M	STATUS ODE ALIGN AUTO e: RMS :>10/10) 09:35:14 <i>A</i> TRA TY 2.439 1	(1001 pts) (1001 pts) (1021 2345 6 (12345 6 (12356 6 (123	
keysight Spectrum. R RL RF Center Freq Ref 10 dB/div Ref	Analyzer - Swept S = 50 Ω A 2.4400000	AC DOO GH PN IFG	CH z IO: Fast		(GF	SK M	STATUS ODE ALIGN AUTO e: RMS :>10/10) 09:35:14 <i>A</i> TRA TY 2.439 1	M Oct 05, 2021 CE 1 2 3 4 5 6 PE MWWWW ET P P A N N N	Frequency
Keysight Spectrum RL RF Center Freq Ref	Analyzer - Swept S 50 Ω A 2.4400000	AC DOO GH PN IFG	CH z IO: Fast		(GF	SK M	STATUS ODE ALIGN AUTO e: RMS :>10/10) 09:35:14 <i>A</i> TRA TY 2.439 1	(1001 pts) (1001 pts) (1021 2345 6 (12345 6 (12356 6 (123	Frequency
Keysight Spectrum RL RF Center Freq	Analyzer - Swept S 50 Ω A 2.4400000	AC DOO GH PN IFG	CH z IO: Fast		(GF	SK M	STATUS ODE ALIGN AUTO e: RMS :>10/10) 09:35:14 <i>A</i> TRA TY 2.439 1	(1001 pts) (1001 pts) (1021 2345 6 (12345 6 (12356 6 (123	Frequency Auto Tune
Keysight Spectrum. Reysight Spectrum. Ref Center Freq Ref 0 dB/div Ref	Analyzer - Swept S 50 Ω A 2.4400000	AC DOO GH PN IFG	CH z IO: Fast		(GF	SK M	STATUS ODE ALIGN AUTO e: RMS :>10/10) 09:35:14 <i>A</i> TRA TY 2.439 1	(1001 pts) (1001 pts) (1021 2345 6 (12345 6 (12356 6 (123	Frequency
Keysight Spectrum RL RF Center Freq 0 dB/div Ref 1.70	Analyzer - Swept S 50 Ω A 2.4400000	AC DOO GH PN IFG	CH z IO: Fast	Mid SEP Trig: Free #Atten: 1	(GF	SK M	STATUS ODE ALIGN AUTO e: RMS :>10/10) 09:35:14 <i>A</i> TRA TY 2.439 1	(1001 pts) (1001 pts) (1021 2345 6 (12345 6 (12356 6 (123	Frequency Auto Tune
Keysight Spectrum RL RF Center Freq 0 dB/div Ref 1.70	Analyzer - Swept S 50 Ω A 2.4400000	AC DOO GH PN IFG	CH z IO: Fast		(GF	SK M	STATUS ODE ALIGN AUTO e: RMS :>10/10) 09:35:14 <i>A</i> TRA TY 2.439 1	(1001 pts) (1001 pts) (1021 2345 6 (12345 6 (12356 6 (123	Frequency Auto Tune Center Freq 2.44000000 GH
ISG Keysight Spectrum R RL RE Center Freq 1.70 8.30	Analyzer - Swept S 50 Ω A 2.4400000	AC DOO GH PN IFG	CH z IO: Fast	Mid SEP Trig: Free #Atten: 1	(GF	SK M	STATUS ODE ALIGN AUTO e: RMS :>10/10) 09:35:14 <i>A</i> TRA TY 2.439 1	(1001 pts) (1001 pts) (1021 2345 6 (12345 6 (1236 6 (Frequency Auto Tune
Keysight Spectrum R RL FR Center Freq 10 dB/div Re 1.70	Analyzer - Swept S 50 Ω A 2.4400000	AC DOO GH PN IFG	CH z IO: Fast	Mid SEP Trig: Free #Atten: 1	(GF	SK M	STATUS ODE ALIGN AUTO e: RMS :>10/10) 09:35:14 <i>A</i> TRA TY 2.439 1	(1001 pts) (1001 pts) (1021 2345 6 (12345 6 (1236 6 (Frequency Auto Tune 2.44000000 GH3
Keysight Spectrum R L RF Center Freq 1.70 1.	Analyzer - Swept S 50 Ω A 2.4400000	AC DOO GH PN IFG	CH z IO: Fast	Mid SEP Trig: Free #Atten: 1	(GF	SK M	STATUS ODE ALIGN AUTO e: RMS :>10/10) 09:35:14 <i>A</i> TRA TY 2.439 1	(1001 pts) (1001 pts) (1021 2345 6 (12345 6 (1236 6 (Frequency Auto Tune 2.44000000 GH3
Keysight Spectrum RL RC Center Freq 10 dB/div Re 1.70 -8.30	Analyzer - Swept S 50 Ω A 2.4400000	AC DOO GH PN IFG	CH z IO: Fast	Mid SEP Trig: Free #Atten: 1	(GF	SK M	STATUS ODE ALIGN AUTO e: RMS :>10/10) 09:35:14/1 TRA TRA TRA TRA TRA TRA TRA TRA	(1001 pts) (1001 pts) (1021 2345 6 (12345 6 (1236 6 (Frequency Auto Tune Center Freq 2.44000000 GH: Catalogue
Keysight Spectrum RL RF Center Freq 1.70 8.30 18.3 28.3	Analyzer - Swept S 50 Ω A 2.4400000	AC DOO GH PN IFG	CH z IO: Fast	Mid SEP Trig: Free #Atten: 1	(GF	SK M	STATUS ODE ALIGN AUTO e: RMS :>10/10) 09:35:14/1 TRA TRA TRA TRA TRA TRA TRA TRA	(1001 pts) (1001 pts) (1021 2345 6 (12345 6 (1236 6 (Center Frequency Center Freq 2.44000000 GH: Catalogue
ISG Keysight Spectrum R RL RF Center Freq 1.70 8.30 -18.3	Analyzer - Swept S 50 Ω A 2.4400000	AC DOO GH PN IFG	CH z IO: Fast	Mid SEP Trig: Free #Atten: 1	(GF	SK M	STATUS ODE ALIGN AUTO e: RMS :>10/10) 09:35:14/1 TRA TRA TRA TRA TRA TRA TRA TRA	(1001 pts) (1001 pts) (1021 2345 6 (12345 6 (1236 6 (Frequency Auto Tune Center Freq 2.44000000 GH: Catalogue
Keysight Spectrum RL BF Center Freq 1.70	Analyzer - Swept S 50 Ω A 2.4400000	AC DOO GH PN IFG	CH z IO: Fast	Mid SEP Trig: Free #Atten: 1	(GF	SK M	STATUS ODE ALIGN AUTO e: RMS :>10/10) 09:35:14/1 TRA TRA TRA TRA TRA TRA TRA TRA	(1001 pts) (1001 pts) (1021 2345 6 (12345 6 (1236 6 (Frequency Auto Tune Center Freq 2.44000000 GH2 Start Freq 2.437500000 GH2 Stop Freq 2.442500000 GH2
Keysight Spectrum RL RF Center Freq 1.70 8.30 18.3 28.3	Analyzer - Swept S 50 Ω A 2.4400000	AC DOO GH PN IFG	CH z IO: Fast	Mid SEP Trig: Free #Atten: 1	(GF	SK M	STATUS ODE ALIGN AUTO e: RMS :>10/10) 09:35:14/1 TRA TRA TRA TRA TRA TRA TRA TRA	(1001 pts) (1001 pts) (1021 2345 6 (12345 6 (1236 6 (Frequency Auto Tune Center Freq 2.44000000 GH: Catalogue
Keysight Spectrum RL BF Center Freq 1.70	Analyzer - Swept S 50 Ω A 2.4400000	AC DOO GH PN IFG	CH z IO: Fast	Mid SEP Trig: Free #Atten: 1	(GF	SK M	STATUS ODE ALIGN AUTO e: RMS :>10/10) 09:35:14/1 TRA TRA TRA TRA TRA TRA TRA TRA	(1001 pts) (1001 pts) (1021 2345 6 (12345 6 (1236 6 (Center Frequency Auto Tune Center Freq 2.44000000 GH; C43750000 GH; C44250000 GH; CF Step
Keysight Spectrum RL RF Center Freq 1.70 -09 -09 -03 -09 -04 -09 -04 -09 -05 -09 -04 -09 -04 -09 -05 -09 -04	Analyzer - Swept S 50 Ω A 2.4400000	AC DOO GH PN IFG	CH z IO: Fast	Mid SEP Trig: Free #Atten: 1	(GF	SK M	STATUS ODE ALIGN AUTO e: RMS :>10/10) 09:35:14/1 TRA TRA TRA TRA TRA TRA TRA TRA	(1001 pts) (1001 pts) (1021 2345 6 (12345 6 (1236 6 (Center Frequency Auto Tune Center Freq 2.44000000 GH: 3tart Freq 2.43750000 GH: CF Steg 2.40200000 GH: 2.40200000 GH: CF Steg 2.4020000 GH: CF Steg 2.40200000 GH: CF Steg 2.4020000 GH: CF S
Keysight Spectrum R L FF Center Freq Ref 10 dB/div Ref -0 g	Analyzer - Swept S 50 Ω A 2.4400000	AC DOO GH PN IFG	CH z IO: Fast	Mid SEP Trig: Free #Atten: 1	(GF	SK M	STATUS ODE ALIGN AUTO e: RMS :>10/10) 09:35:14/1 TRA TRA TRA TRA TRA TRA TRA TRA	(1001 pts) (1001 pts) (1021 2345 6 (12345 6 (1236 6 (Center Frequency Auto Tune Center Freq 2.44000000 GH: 3tart Freq 2.43750000 GH: CF Step 2.40200000 GH: Auto Mar
Keysight Spectrum RL RF Center Freq 1.70 -09 -09 -03 -09 -04 -09 -04 -09 -05 -09 -04 -09 -04 -09 -05 -09 -04	Analyzer - Swept S 50 Ω A 2.4400000	AC DOO GH PN IFG	CH z IO: Fast	Mid SEP Trig: Free #Atten: 1	(GF	SK M	STATUS ODE ALIGN AUTO e: RMS :>10/10) 09:35:14/1 TRA TRA TRA TRA TRA TRA TRA TRA	(1001 pts) (1001 pts) (1021 2345 6 (12345 6 (1236 6 (Frequency Auto Tune Center Free 2.44000000 GH: Start Free 2.437500000 GH: Stop Free 2.402000000 GH: CF Step 2.402000000 GH: Auto Mar
Keysight Spectrum R L RF Center Freq Ref 1.70 8.30 18.3 9 38.3 9 46.3 68.3	Analyzer - Swept S 50 Ω A 2.4400000	AC DOO GH PN IFG	CH z IO: Fast	Mid SEP Trig: Free #Atten: 1	(GF	SK M	STATUS ODE ALIGN AUTO e: RMS :>10/10) 09:35:14/1 TRA TRA TRA TRA TRA TRA TRA TRA	(1001 pts) (1001 pts) (1021 2345 6 (12345 6 (1236 6 (Center Frequency Auto Tune Center Freq 2.44000000 GH: Start Freq 2.43750000 GH: CF Step 2.40200000 GH: Auto Mar
Keysight Spectrum R R RF Center Freq Ref 1.70 Ref 28.30 Ref -8.30	Analyzer - Swept S 50 Ω A 2.4400000	AC DOO GH PN IFG	CH z IO: Fast	Mid SEP Trig: Free #Atten: 1	(GF	SK M	STATUS ODE ALIGN AUTO e: RMS :>10/10) 09:35:14/1 TRA TRA TRA TRA TRA TRA TRA TRA	(1001 pts) (1001 pts) (1021 2345 6 (12345 6 (1236 6 (Center Frequency Auto Tune Center Freq 2.44000000 GH: 3tart Freq 2.43750000 GH: 2.432500000 GH: 2.40200000 GH: CF Step 2.40200000 GH: CF Step 0 H:
Keysight Spectrum RL RF Center Freq Ref 10 dB/div Ref -09	Analyzer - Swept S 50 Ω A 2.4400000	AC DOO GH PN IFG	CH z IO: Fast	Mid SEP Trig: Free #Atten: 1	(GF	SK M	STATUS ODE ALIGN AUTO e: RMS :>10/10) 09:35:14/1 TRA TRA TRA TRA TRA TRA TRA TRA	(1001 pts) (1001 pts) (1021 2345 6 (12345 6 (1236 6 (Frequency Auto Tune Center Free 2.44000000 GH: Start Free 2.437500000 GH: Stop Free 2.402000000 GH: CF Step 2.402000000 GH: Auto Mar
Keysight Spectrum Ref RL Rf Center Freq Ref 1.70 Ref 0 dB/div Ref 38.3 Ref 48.3 Ref 68.3 Ref 78.3 Ref	Analyzer - Swept S S 1 50 2 / 2.4400000 7 Offset 11.7 c f 11.70 dBi	AC DOO GH PN IFG	CH z IO: Fast	Mid SEP Trig: Free #Atten: 1	(GF	SK M	STATUS ODE ALIGN AUTO e: RMS :>10/10) 009:35:14/4 TRA TRA TRA TRA TRA TRA TRA TRA	Moct 65, 2021 CE [1 2 3 4 5 6 FE M WWWW 3555 GHz 162 dBm	Center Frequency Auto Tune Center Freq 2.44000000 GH; Start Freq 2.43750000 GH; CF Steg 2.40200000 GH; Auto Mar Freq Offse 0 H; Scale Type
Keysight Spectrum RL RF Center Freq Ref 1.70	Analyzer - Swept 3 50 Q / A 2.4400000 Offset 11.7 c f 11.70 dB 0 0 0 0 0 0 0 0 0 0 0 0 0	AC DOO GH PN IFG	CH z ain:Low	Mid	(GF	SK M #Avg Typ AvglHold	STATUS) (09:35:14/ TRA TRA TRA TRA TRA TRA TRA TRA	(1001 pts)	Center Frequency Auto Tune Center Freq 2.44000000 GH; Start Freq 2.43750000 GH; CF Steg 2.40200000 GH; Auto Mar Freq Offse 0 H; Scale Type
Keysight Spectrum Ref RL Rf Center Freq Ref 1.70 Ref 0 dB/div Ref 38.3 Ref 48.3 Ref 68.3 Ref 78.3 Ref	Analyzer - Swept 3 50 Q / A 2.4400000 Offset 11.7 c f 11.70 dB 0 0 0 0 0 0 0 0 0 0 0 0 0	AC DOO GH PN IFG	CH z ain:Low	Mid SEP Trig: Free #Atten: 1	(GF	SK M #Avg Typ AvglHold	STATUS) (09:35:14/ TRA TRA TRA TRA TRA TRA TRA TRA	Moct 65, 2021 CE [1 2 3 4 5 6 FE M WWWW 3555 GHz 162 dBm	Center Frequency Auto Tune Center Freq 2.44000000 GH; Start Freq 2.43750000 GH; CF Steg 2.40200000 GH; Auto Mar Freq Offse 0 H; Scale Type



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Report No.: TMTN2109000342NR

			ALIGN AUTO /pe: RMS Id:>10/10	09:37:55 AM O	ct 05, 2021 L 2 3 4 5 6	Frequency
Ref Offsei 0 dB/div Ref 11.7	IFGa t 11.7 dB	in:Low #Atten: 10		2.479 83 -13.754	0 GHz	Auto Tune
1.70						Center Fre 2.480000000 GH
18.3		1-				Start Fre 2.477500000 GH
28.3						Stop Fre 2.482500000 GH
48.3						CF Ste 2.402000000 GH
58.3					Au	ito <u>Ma</u>
68.3						Freq Offse 0 H
78.3						Scale Typ



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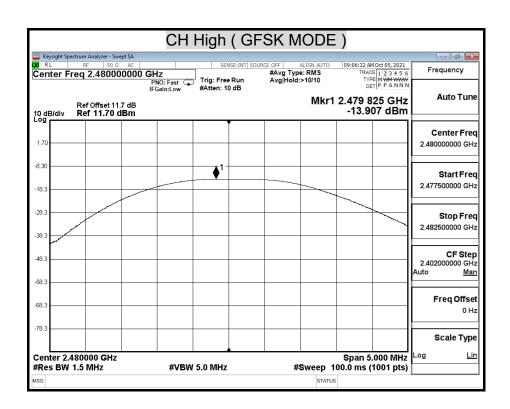
MAXIMUM PEAK OUTPUT POWER (GFSK(RF) MODE)

	CH L	<u> </u>		/			
Keysight Spectrum Analyzer - Swept SA R L RF 50 Ω AC		SENSE:INT SC	DURCE OFF ALIGN			Oct 05, 2021	Frequency
enter Freq 2.40200000	PNO: Fast 😱	rig: Free Run Atten: 10 dB	#Avg Type: RI Avg Hold:>10/		TRAC TYP DE	E 1 2 3 4 5 6 MWMWWW T P P A N N N	
Ref Offset 11.7 dB 0 dB/div Ref 11.70 dBm	IFGain:Low #		I	Mkr1 2	.401 7	60 GHz 01 dBm	A
		Ĭ					Center Fre
1.70							2.402000000 GH
3.30		∮ 1					Start Fre
18.3					_		2.399500000 GH
28.3							Stop Fre 2.404500000 GH
							CF Ste
18.3							2.402000000 GH Auto <u>Ma</u>
							FreqOffse
68.3							0 H
78.3							Scale Typ
enter 2.402000 GHz					0		
enter 2.402000 GHz							
	#VBW 5.() MHz	Swe	eep 1.00	span 5. 00 ms ('	000 MHz 1001 pts)	
				STATUS	span 5. 00 ms (000 MHz 1001 pts)	
56			swe SK MOI	STATUS	span 5. 00 ms (000 MHz 1001 pts)	
sg Keysight Spectrum Analyzer - Swept SA RL RF S0 Ω AC		Aid (GF	SK MO	DE)	00 ms (1001 pts)	Frequency
ig , Keysight Spectrum Analyzer - Swept SA RL RF [50 Ω Δ ΔC		/lid(GF	SK MOI	DE)	09:10:13 AM TRAC TYP DE	1001 pts)	Frequency
Center Freq 2.440000000 Ref Offset 11.7 dB 0 dB/div Ref 11.70 dBm	CH N D GHZ PNO: Fast T	Iid (GF	SK MOI	DE)	09:10:13 AM TRAC TYP DE .439 8	1001 pts)	Frequency
sa Keysight Spectrum Analyzer - Swept SA RL RF 50 Ω AC Center Freq 2.440000000 Ref Offset 11.7 dB 0 dB/div Ref 11.70 dBm 9	CH N D GHZ PNO: Fast T	Iid (GF	SK MOI	DE)	09:10:13 AM TRAC TYP DE .439 8	1001 pts)	Frequency Auto Tun Center Fre
sa Keysight Spectrum Analyzer - Swept SA RL RF 50 Ω AC Center Freq 2.440000000 Ref Offset 11.7 dB 0 dB/div Ref 11.70 dBm 9	CH N D GHZ PNO: Fast T	Iid (GF	SK MOI	DE)	09:10:13 AM TRAC TYP DE .439 8	1001 pts)	Frequency Auto Tun Center Fre
sc Keysight Spectrum Analyzer - Swept SA RL RF 50 Ω AC center Freq 2.440000000 Ref Offset 11.7 dB o dB/div Ref 11.70 dBm	CH N D GHZ PNO: Fast T	Iid (GF	SK MOI	DE)	09:10:13 AM TRAC TYP DE .439 8	1001 pts)	Frequency Auto Tun Center Fre 2.44000000 GH
Sector Reysight Spectrum Analyzer - Swept SA RL RE 50 2 AC Center Freq 2.440000000 Ref Offset 11.7 dB Ref 11.70 dBm 0 dB/div Ref 11.70 dBm Ref 30 2 AC 1.70	CH N D GHZ PNO: Fast T	Aid (GF sense:int] sc rig: Free Run Atten: 10 dB	SK MOI	DE)	09:10:13 AM TRAC TYP DE .439 8	1001 pts)	Frequency Auto Tun Center Fre 2.44000000 GH
Keysight Spectrum Analyzer - Swept SA RL RF 50 Ω AC center Freq 2.440000000 Ref Offset 11.7 dB Ref 11.70 dBm 0 dB/div Ref 11.70 dBm Ref 11.70 dBm 0	CH N D GHZ PNO: Fast T	Aid (GF sense:int] sc rig: Free Run Atten: 10 dB	SK MOI	DE)	09:10:13 AM TRAC TYP DE .439 8	1001 pts)	Frequency Auto Tun Center Fre 2.44000000 GH
Keysight Spectrum Analyzer - Swept SA RL RF 50 Ω AC center Freq 2.440000000 Ref Offset 11.7 dB 0 dB/div Ref 11.70 dBm 3.30	CH N D GHZ PNO: Fast T	Aid (GF sense:int] sc rig: Free Run Atten: 10 dB	SK MOI	DE)	09:10:13 AM TRAC TYP DE .439 8	1001 pts)	Center Fre 2.44000000 GH Start Fre 2.437500000 GH
Keysight Spectrum Analyzer - Swept SA RL RE 50 2 AC Center Freq 2.440000000 Set Offset 11.7 dB 0 dB/div Ref Offset 11.7 dBm 3.30 Set Offset 11.7 dBm 3.30 Set Offset 11.7 dBm	CH N D GHZ PNO: Fast T	Aid (GF sense:int] sc rig: Free Run Atten: 10 dB	SK MOI	DE)	09:10:13 AM TRAC TYP DE .439 8	1001 pts)	Frequency Auto Tun Center Fre 2.44000000 GH Start Fre 2.43750000 GH Stop Fre 2.44250000 GH
Keysight Spectrum Analyzer - Swept SA RL RF 50 Ω AC center Freq 2.440000000 Ref Offset 11.7 dB Ref 11.70 dBm 0 dB/div Ref 11.70 dBm Ref 11.70 dBm 1.70	CH N D GHZ PNO: Fast T	Aid (GF sense:int] sc rig: Free Run Atten: 10 dB	SK MOI	DE)	09:10:13 AM TRAC TYP DE .439 8	1001 pts)	Frequency
SG Keysight Spectrum Analyzer - Swept SA RL RF 50 Ω AC Center Freq 2.440000000 Ref Offset 11.7 dB 0 0 dB/div Ref 0ffset 11.7 dB 0 1.70	CH N D GHZ PNO: Fast T	Aid (GF sense:int] sc rig: Free Run Atten: 10 dB	SK MOI	DE)	09:10:13 AM TRAC TYP DE .439 8	1001 pts)	Center Fre 2.44000000 GH Start Fre 2.44250000 GH Stop Fre 2.44250000 GH
SG Reysight Spectrum Analyzer - Swept SA RL RF 50 Ω AC center Freq 2.440000000 Ref Offset 11.7 dB Ref 11.70 dBm 0 dB/div Ref 11.70 dBm Ref 11.70 dBm 0 8.3 8.3 8.3	CH N D GHZ PNO: Fast T	Aid (GF sense:int] sc rig: Free Run Atten: 10 dB	SK MOI	DE)	09:10:13 AM TRAC TYP DE .439 8	1001 pts)	Center Fre 2.440000000 GH Start Fre 2.437500000 GH Stop Fre 2.442500000 GH CF Ste 2.402000000 GH
SG Keysight Spectrum Analyzer - Swept SA RL RF 50 Ω AC center Freq 2.440000000 Ref Offset 11.7 dB 0 OdB/div Ref 11.70 dBm 0 0 30	CH N D GHZ PNO: Fast T	Aid (GF sense:int] sc rig: Free Run Atten: 10 dB	SK MOI	DE)	09:10:13 AM TRAC TYP DE .439 8	1001 pts)	Center Fre 2.440000000 GH Start Fre 2.437500000 GH Stop Fre 2.442500000 GH CF Step 2.402000000 GH Freq Offse
In the sector of the se	CH N D GHZ PNO: Fast T	Aid (GF sense:int] sc rig: Free Run Atten: 10 dB	SK MOI	DE)	00 ms (09:10:13 AM TRAC TYP 20:439 8 -12:03	1001 pts)	Center Fre 2.440000000 GH Start Fre 2.437500000 GH Stop Fre 2.442500000 GH 2.442500000 GH 2.402000000 GH Auto Tun Stop Fre 2.442500000 GH Preq Offse 0 H Scale Typ



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8.3 DUTY CYCLE

<u>LIMIT</u>

Nil (No dedicated limit specified in the Rules)

TEST SETUP



TEST PROCEDURE

- 1. Place the EUT on the table and set it in transmitting mode.
- 2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
- 3. The zero-span mode on a spectrum analyzer or EMI receiver if the response time and spacing between bins on the sweep are sufficient to permit accurate measurements of the on and off times of the transmitted signal. Set the center frequency of the instrument to the center frequency of the transmission. Set RBW ≥ OBW if possible; otherwise, set RBW to the largest available value. Set VBW ≥ RBW. Set detector = peak or average. The zero-span measurement method shall not be used unless both RBW and VBW are > 50/T and the number of sweep points across duration T exceeds 100. (For example, if VBW and/or RBW are limited to 3 MHz, then the zero-span measuring duty cycle shall not be used if T ≤ 16.7 microseconds.)

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TEST RESULTS

No non-compliance noted.

Model Name	JF-81	Test By	Ted Huang
Temp & Humidity	25.6°C, 55%	Test Date	2021/10/04

GFSK(BT) Mode

	us	Times	Ton	Total Ton time(ms)
Ton1	432.000	1	432	
Ton2		0	0	
Ton3			0	0.432
Тр				0.624

Ton	0.432
Tp(Ton+Toff)	0.624
Duty Cycle	0.692
Duty Factor	1.597

GFSK(RF) Mode

	us	Times	Ton	Total Ton time(ms)
Ton1	432.000	1	432	
Ton2		0	0	
Ton3			0	0.432
Тр				0.624

Ton	0.432
Tp(Ton+Toff)	0.624
Duty Cycle	0.692
Duty Factor	1.597



TEST PLOT

Duty Cycle

GFSK(BT) Mode

	CH Low (G	FSK MODE)
Keysight Spectrum Analyzer - Swep	ot SA	
	AC SENSE:INT :	SOURCE OFF ALIGN AUTO 09:29:45 AM Oct 05, 2021 #Avg Type: RMS TRACE 12 3 4 5 6 TYPE WWWWWWW
Ref Offset 11. 10 dB/div Ref 11.70 d	IFGain:Low #Atten: 10 dB	ΔMkr1 432.0 μs 13.62 dB
-18.3	1Δ2	2.40200000 GH:
-28.3 -38.3 -48.3	¥2\$	∆4 Start Free 2.40200000 GH:
-58.3 -68.3 -78.3	hourbell leapyu	With With Stop Free 2.402000000 GH; 2.402000000 GH; 2.402000000 GH;
Center 2.402000000 G Res BW 1.0 MHz MKR MODE TRO SCL	#VBW 3.0 MHz	Span 0 Hz CF Step Sweep 3.000 ms (1001 pts) 2.402000000 GH: FUNCTION VALUE Auto
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	432.0 μs (Δ) 13.62 dB 993.0 μs -25.14 dBm 624.0 μs (Δ) -5.79 dB 993.0 μs -25.14 dBm	Freq Offse
7 8 9		Scale Type
10 11 · · · · · · · · · · · · · · · · ·	m	Log Lir
Keysight Spectrum Analyzer - Swep RL RF 50Ω Center Freq 2.440000	AC SENSE:INT SEN	FSK MODE)
Ref Offset 11. 10 dB/div Ref 11.70 d	PNO: Fast Free Run IFGain:Low 7 dB	ΔMkr1 432.0 μs 6.98 dB
-18.30	1Δ2	Center Free 2.44000000 GH2
-28.3		Start Free 2.44000000 GHz
-58.3 -68.3 -78.3	Nurvit ymradu	С
Center 2.440000000 G Res BW 1.0 MHz MKR MODE TRC SCL	#VBW 3.0 MHz	Span 0 Hz Sweep 3.000 ms (1001 pts) FUNCTION FUNCTION VALUE Auto Mar
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	432.0 μs (Δ) 6.98 dB 966.0 μs -20.70 dBm 624.0 μs (Δ) -2.42 dB 966.0 μs -20.70 dBm	Freq Offse
6		Scale Type
<		STATUS



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RL RF		#Avg Type: R		Frequency
		Free Run h: 10 dB	ΔMkr1 432.0 μs 15.96 dB	Auto Tur
		1Δ2		Center Fre 2.480000000 G⊦
48.3	2	3∆4		Start Fre 2.480000000 G⊦
58.3 WINN 58.3 78.3	undud n	um kond		Stop Fre 2.480000000 GH
Lenter 2.48000000 Les BW 1.0 MHz	#VBW 3.0 M	FUNCTION FUNCTIO	Span 0 Hz eep 3.000 ms (1001 pts) N WIDTH FUNCTION VALUE	CF Ste 2.402000000 GH Auto <u>Ma</u>
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	933.0 μs -30.13 624.0 μs (Δ) -7	96 dB 3 dBm 21 dB 3 dBm		Freq Offs 0 F
6				Scale Typ



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GFSK(RF) Mode

	CH Low (G	FSK MODE)	
Keysight Spectrum Analyzer - Swept SA XI RF 50 Ω AC		SOURCE OFF ALIGN AUTO 09:27:39 AM Oct 05	5,2021 Frequency
Center Freq 2.40200000	PNO: Fast +++ IFGain:Low #Atten: 10 dB	#Avg Type: RMS TRACE 1 2 : TYPE WWM DET P P	
Ref Offset 11.7 dB 10 dB/div Ref 11.70 dBm		ΔMkr1 432.0 12.99) μs Auto Tune
10 dB/div Ref 11.70 dBm			Center Freq
-8.30	1Δ2		2.402000000 GHz
-18.3	X2(3Δ4	Start Ereg
-38.3			2.402000000 GHz
-48.3 -58.3		ուսերի ինչերի է հետևելին է հետևելի	Stop Erog
-68.3	. Mheada. hatada.	Иญ4 ₁₉₄ ™ Ка™มป	Stop Freq 2.402000000 GHz
Center 2.402000000 GHz		Span	0 Hz CF Step
	#VBW 3.0 MHz	Sweep 3.000 ms (1001	pts) 2.402000000 GHz
1 Δ2 1 t (Δ) 2 F 1 t	432.0 μs (Δ) 12.99 dB 1.035 ms -24.38 dBm		
3 Δ4 1 t (Δ) 4 F 1 t 5	624.0 μs (Δ) -5.35 dB 1.035 ms -24.38 dBm		Freq Offset
6 7 8			Scale Type
9 10 11			Log <u>Lin</u>
MSG	III	STATUS	•
		FSK MODE)	
Keysight Spectrum Analyzer - Swept SA			
M RL RF 50 Ω AC Center Freq 2.440000000) GHz	SOURCE OFF ALIGN AUTO 09:28:22 AM Oct 05 #Avg Type: RMS TRACE 1 2 : TYPE WWW	3 4 5 6
	PNO: Fast +++ Trig: Free Run IFGain:Low #Atten: 10 dB	DET P P	ANNN Auto Tuno
Ref Offset 11.7 dB 10 dB/div Ref 11.70 dBm Log		ΔMkr1 432.0 20.74	dB
1.70	1Δ2		Center Freq
-8.30			2.440000000 GHz
-28.3		3Δ4	Start Freq
-48.3			2.440000000 GHz
-58.3	yining and any	hanger hand hand hand hand hand hand hand hand	Stop Freq
-78.3			2.440000000 GHz
Center 2.440000000 GHz Res BW 1.0 MHz	#VBW 3.0 MHz	Span Sweep 3.000 ms (1001	
-		FUNCTION FUNCTION WIDTH FUNCTION VALU	Auto Man
MKR MODE TRC SCL X	432.0 up (A) 20.74 dB		
1 Δ2 1 t (Δ) 2 F 1 t	432.0 μs (Δ) 20.74 dB 1.014 ms -32.91 dBm 624.0 μs (Δ) -8.34 dB 4.014 ms -32.91 dBm		Freq Offset
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	1.014 ms -32.91 dBm		Freq Offset
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	1.014 ms -32.91 dBm 624.0 μs (Δ) -8.34 dB		
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	1.014 ms -32.91 dBm 624.0 us (A) -8.34 dB 1.014 ms -32.91 dBm		E O Hz Scale Type Log Lin
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	1.014 ms -32.91 dBm 624.0 μs (Δ) -8.34 dB	STATUS	© Hz



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enter Freq 2.4	lyzer - Swept SA 50 Ω AC 480000000 G	Hz PNO: Fast +++ Trig: F	ree Run		50 AM Oct 05, 2021 TRACE 1 2 3 4 5 6 TYPE WWWWWW DET P P A N N N	Frequency
0 dB/div Ref 1	ffset 11.7 dB 1.70 dBm	FGain:Low #Atten	: 10 dB	ΔMkr	1 432.0 µs 11.50 dB	Auto Tur
og 1.70 3.30			1Δ2			Center Fre 2.48000000 GH
28.3		** 2	3Δ4			Start Fre 2.48000000 GF
58.3 58.3 78.3	*****		Miriya	un iv		Stop Fre 2.48000000 GH
enter 2.480000 es BW 1.0 MH:		#VBW 3.0 MI		Sweep 3.000 m		CF Ste 2.402000000 GF uto <u>M</u> a
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	<u>) 4</u> 1. () 6	203 ms -26.33	50 dB dBm 39 dB			Freq Offs 0 H
						Scale Typ



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Report No.: TMTN2109000342NR

8.4 POWER SPECTRAL DENSITY

<u>LIMIT</u>

§ 15.247(e) For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

TEST SETUP



TEST PROCEDURE

The tests were performed in accordance with KDB 558074 D01 v05r02.

10.2 Method PKPSD (peak PSD):

- 1. Set analyzer center frequency to DTS channel center frequency.
- 2. Set the span to 1.5 times the DTS bandwidth.
- 3. Set the RBW to: $3 \text{ kHz} \le \text{RBW} \le 100 \text{ kHz}$.
- 4. Set the VBW \geq 3 RBW.
- 5. Detector = peak.
- 6. Sweep time = auto couple.
- 7. Trace mode = max hold.
- 8. Allow trace to fully stabilize.
- 9. Use the peak marker function to determine the maximum amplitude level within the RBW.
- 10. If measured value exceeds limit, reduce RBW (no less than 3 kHz) and repeat.



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Report No.: TMTN2109000342NR TEST RESULTS

No non-compliance noted.

Model Name	JF-81	Test By	Ted Huang
Temp & Humidity	25.6°C, 55%	Test Date	2021/10/04

GFSK(BT) mode

Channel	Frequency (MHz)	PPSD/3kHz (dBm)	Limit (dBm)	Margin (dB)	Result
Low	2402	-17.03	8.00	-25.03	PASS
Middle	2442	-18.65	8.00	-26.65	PASS
High	2480	-20.39	8.00	-28.39	PASS

GFSK(RF) mode

Channel	Frequency (MHz)	PPSD/3kHz (dBm)	Limit (dBm)	Margin (dB)	Result
Low	2402	-17.19	8.00	-25.19	PASS
Middle	2442	-18.73	8.00	-26.73	PASS
High	2480	-20.46	8.00	-28.46	PASS

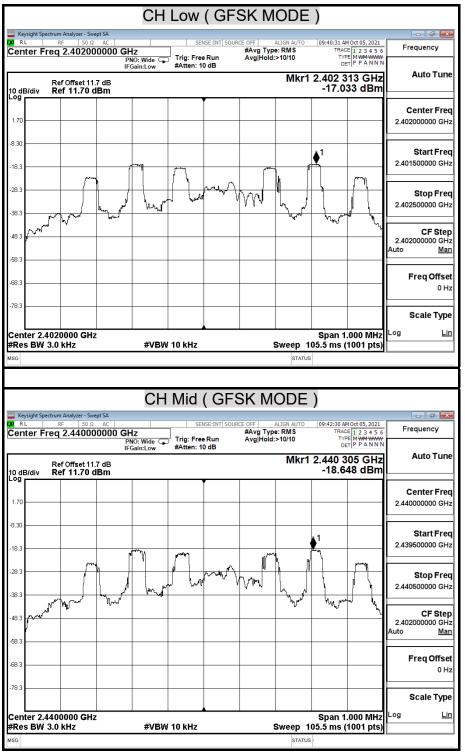
NOTE: 1. At finial test to get the worst-case emission at 1Mbps long.

2. The cable assembly insertion loss of 11.1dB (including 10 dB pad and 1.1 dB cable) was Entered as an offset in the spectrum analyzer to allow for direct reading of power.



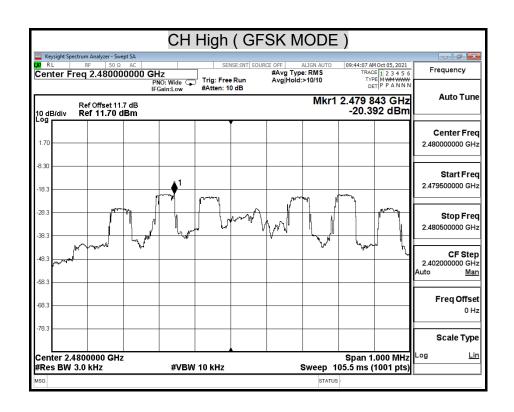
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POWER SPECTRAL DENSITY (GFSK(BT) MODE)





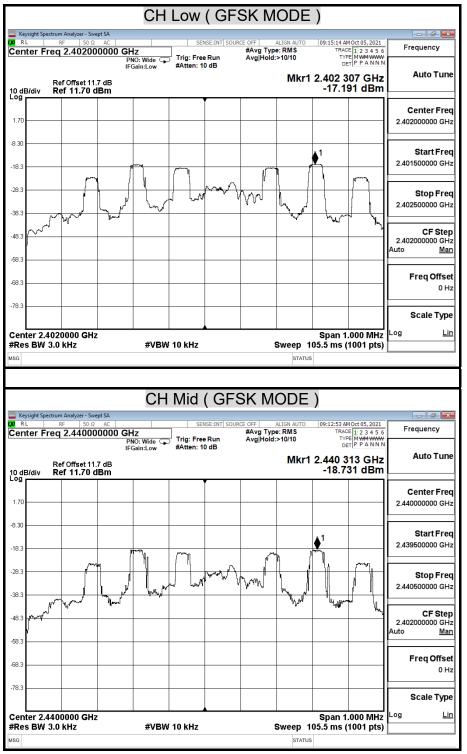
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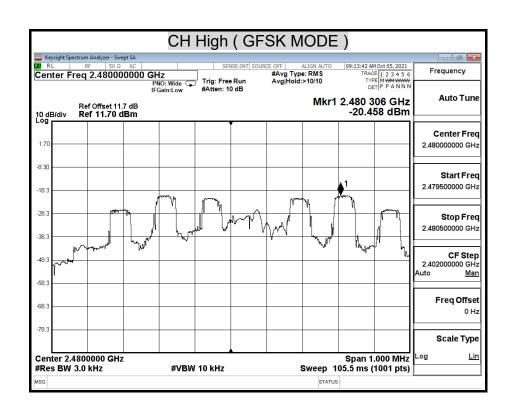
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POWER SPECTRAL DENSITY (GFSK(RF) MODE)





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Report No.: TMTN2109000342NR

8.6 CONDUCTED SPURIOUS EMISSION

LIMITS

§ 15.247(d) In any 100 kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the and that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement. Attenuation below the general limits specified in § 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in § 15.205(a), must also comply with the radiated emission limits specified in § 15.209(a) (see § 15.205(c)).

TEST SETUP



TEST PROCEDURE

The transmitter output is connected to a spectrum analyzer. The resolution bandwidth is set to 100 kHz. The video bandwidth is set to 300 kHz.

The spectrum from 30 MHz to 26 GHz is investigated with the transmitter set to the lowest, middle, and highest channels in the 2.4 GHz band.

TEST RESULTS

No non-compliance noted.



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TEST DATA

Model Name	JF-81	Test By	Ted Huang
Temp & Humidity	25.6°C, 55%	Test Date	2021/10/04

OUT-OF-BAND SPURIOUS EMISSIONS-CONDUCTED MEASUREMENT

		GFSK(B	I) Mode		
	CF	I Low(G	FSK MODE)	
Keysight Spectrum Analyzer - Sw					
Center Freq 2.40200		SENSE:INT S	#Avg Type: RMS	09:33:36 AM Oct 05, 2021 TRACE 1 2 3 4 5 6	Frequency
· · · · ·	PNO: Wide (IFGain:Low	Trig: Free Run #Atten: 10 dB	Avg Hold:>10/10	DET P P A N N N	
Ref Offset 11 10 dB/div Ref 11.70 d	.7 dB		Mkr1	2.402 066 GHz -10.659 dBm	Auto Tune
Log		Ţ			Contor From
1.70					Center Freq 2.402000000 GHz
-8.30		∮ 1			
		-6.0	L dB		Start Freq 2.400500000 GHz
-18.3		658	KHZ -		2.400500000 GHz
-28.3	/				
10.0	1				Stop Freq 2.403500000 GHz
-38.3	-				2.403300000 GH2
					CF Step
-48.3		+ +			2.402000000 GHz
-58.3					Auto <u>Man</u>
					Ener Offert
-68.3					Freq Offset 0 Hz
-78.3					Scale Type
Center 2.402000 GHz #Res BW 100 kHz	#\/B	W 300 kHz	Sween	Span 3.000 MHz 1.000 ms (1001 pts)	Log <u>Lin</u>
MSG	#40	W 300 KH2	STATU		
Keysight Spectrum Analyzer - Sw				-	- 5 -
<mark>(X</mark> RL RF 50 Ω	AC	SENSE:INT S	OURCE OFF ALIGN AUTO	09:50:26 AM Oct 05, 2021	-
Start Freq 2.310000	000 GHz PNO: Fast	Trig: Free Run	#Avg Type: RMS Avg Hold:>10/10	TRACE 1 2 3 4 5 6 TYPE M WHWWW DET P P A N N N	
	IFGain:Low	#Atten: 10 dB			Auto Tune
Ref Offset 11			MKr1 2	402 070 0 GHz. -10.280 dBm	
10 dB/div Ref 11.70	авт	Ţ		-10.200 dBm	
1.70				<u> </u>	Center Freq
-8.30		+ +		X I	2.36000000 GHz
-18.3				30.66 dBm	
-28.3					Start Freq
-48.3				6	2.310000000 GHz
-58.3				3	
-68.3 444444444444444444444444444444444444	And the design of the second second	we provide the second second second	and have a second and the second s		Stop Freq
-78.3					2.410000000 GHz
Start 2.31000 GHz				Stop 2.41000 GHz	OF Other
#Res BW 100 kHz	#VB	W 300 kHz	Sweep 10	560p 2.41000 GHz).67 ms (40001 pts)	CF Step 2.40200000 GHz
MKR MODE TRC SCL	Х	Y	FUNCTION FUNCTION WIDTH		Auto <u>Man</u>
1 N 1 f	2.402 070 0 GHz 2.400 GHz	-10.280 dBm -56.078 dBm			
2 N 1 f 3 N 1 f 4	2.484 GHz	dBm			Freq Offset
5				E	0 Hz
6					Roals Tor
8 9 10					Scale Type
10					Log <u>Lin</u>
11					
		III	•	•	
			STATU		

GFSK(BT) Mode



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Frequency	AM Oct 05, 2021 RACE 1 2 3 4 5 6 TYPE MWWWW DET P P A N N N	TR		#Avg Typ Avg Hold			NO: Fast G	PI	.00000	eq 30	-	RI tar
Auto Tur	02 4 GHz .335 dBm		Mk			WAtten. N	Sam:Low	7 dB	Offset 1		3/div) dF
Center Fre												og .70
13.265000000 GH	_									•		.30
	30.66 dBm											8.3 8.3
Start Fre 30.000000 MH	00.00 0.01											8.3
	to a set of									- <u> </u> 2		8.3
Stop Fre					الابينينال	أستقاد والمراجع	the second statements	endeliter estator.			at deat	8.3 8.3
26.50000000 GH	_						. Builder eine de san		- Andrew			8.3
CF Ste	26.50 GHz (40001 pts)		Sween *			/ 300 kHz	#\/B))3 GHz V 100		
Auto <u>Ma</u>	CTION VALUE		ICTION WIDTH	CTION FU	FUN	Y 300 KHZ	<i>#</i> 0	X		TRC SCL		_
Freq Offs					3m	-11.335 dE -58.789 dE -69.152 dE	4 GHz 0 GHz 4 GHz			1 f 1 f 1 f	N N N	3 4
Scale Typ	E											5 6 7 8
Log <u>L</u>												9 0 1
	· · ·			-	- 1						- 1	1

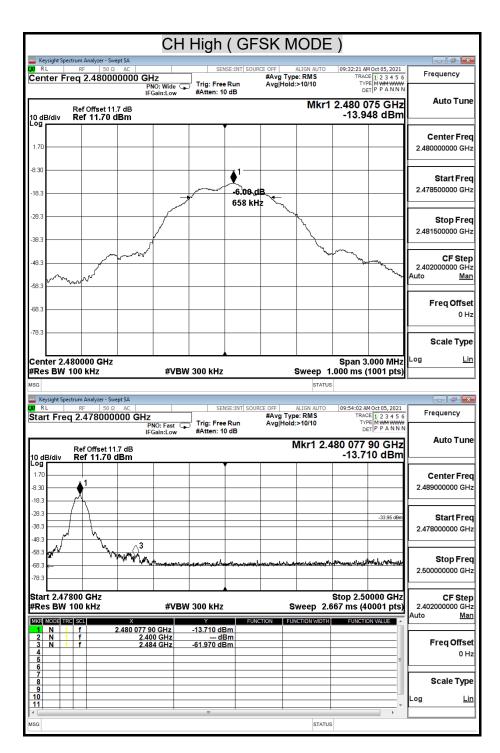


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Keysight Spect	trum Analyzer - Sw	ept SA		l Mid (/		
X RL	RF 50 Ω	AC	7	SENS	SE:INT SOURC	E OFF	ALIGN AUTO	TRA	AM Oct 05, 2021	Frequency
		PN	⊂ O: Wide ⊂ ain:Low	Trig: Free #Atten: 10		Avg Hold	1:>10/10	T" I	PPE MWMWWW DET PPANNN	
	Ref Offset 11 Ref 11.70 (.7 dB					Mkr1		069 GHz 232 dBm	Auto Tu
-og										Contor F
1.70										2.440000000 0
-8.30					♦ 1					Otort F
-18.3					-6.00,dl	В				Start Fi 2.438500000 0
-10.3			مسم		666 kHz					
-28.3							\setminus			Stop Fi
20.2			¢ l							2.441500000
-38.3	~	mand						~~~~	1	
48.3									Marrow Marrow	CF St 2.402000000 0
20	marrow									Auto <u>N</u>
-58.3										
-68.3		-								Freq Off
-78.3		1								Scale Ty
										,
								-		1.07
	40000 GHz 00 kHz		#VBV	V 300 kHz			Sweep 1		3.000 MHz (1001 pts)	Log
Center 2.44 #Res BW 1			#VBV	V 300 kHz			Sweep 1	.000 ms	3.000 MHz (1001 pts)	Log
#Res BW 1	00 kHz	ept SA	#VBV	¥ 300 kHz				.000 ms		
#Res BW 1	00 kHz trum Analyzer - Sw RF 50 Ω	AC	#VBV		SE:INT SOURC		STATU: ALIGN AUTO	09:51:25	(1001 pts)	Log Frequency
#Res BW 1	00 kHz	AC OMHZ PN	IO: Fast G	SENS	Run	ce OFF #Avg Tyj Avg Hold	ALIGN AUTO	09:51:25	(1001 pts)	Frequency
#Res BW 1	00 kHz trum Analyzer - Sw RF 50 Ω 30.00000	AC OMHz IFG		SENS	Run	#Avg Typ	ALIGN AUTO pe: RMS d:>10/10	09:51:25 TRJ	(1001 pts)	Frequency
Keysight Spect	00 kHz trum Analyzer - Sw RF 50 Ω	AC OMHZ PN IFG I.7 dB	IO: Fast G	SENS	Run	#Avg Typ	ALIGN AUTO pe: RMS d:>10/10	09:51:25 TRJ TRJ	(1001 pts)	Frequency
#Res BW 1	00 kHz rrum Analyzer - Sw ℝF 50 Ω 30.00000 Ref Offset 11 Ref 11.70	AC OMHZ PN IFG I.7 dB	IO: Fast G	SENS	Run	#Avg Typ	ALIGN AUTO pe: RMS d:>10/10	09:51:25 TRJ TRJ	(1001 pts)	Frequency Auto Tu
Keysight Spect	00 kHz rum Analyzer - Sw RF 50 Ω 30.00000 Ref Offset 11	AC OMHZ PN IFG I.7 dB	IO: Fast G	SENS	Run	#Avg Typ	ALIGN AUTO pe: RMS d:>10/10	09:51:25 TRJ TRJ	(1001 pts)	Frequency
#Res BW 1 Isg	00 kHz rrum Analyzer - Sw ℝF 50 Ω 30.00000 Ref Offset 11 Ref 11.70	AC OMHZ PN IFG I.7 dB	IO: Fast G	SENS	Run	#Avg Typ	ALIGN AUTO pe: RMS d:>10/10	09:51:25 TRJ TRJ	(1001 pts)	Frequency Auto TL
Keysight Spect X RL Start Freq 10 dB/div Log 1.70 -8.30 -18.3 -28.3	00 kHz rrum Analyzer - Sw ℝF 50 Ω 30.00000 Ref Offset 11 Ref 11.70	AC OMHZ PN IFG I.7 dB	IO: Fast G	SENS	Run	#Avg Typ	ALIGN AUTO pe: RMS d:>10/10	09:51:25 TRJ TRJ	(1001 pts)	Frequency Auto TL
#Res BW 1 Asa Keysight Spect X RL Start Freq 10 dB/div	00 kHz rrum Analyzer - Sw ℝF 50 Ω 30.00000 Ref Offset 11 Ref 11.70	AC OMHZ PN IFG I.7 dB	IO: Fast G	SENS	Run	#Avg Typ	ALIGN AUTO pe: RMS d:>10/10	09:51:25 TRJ TRJ	(1001 pts)	Auto Tu Center Fr 13.26500000 0
#Res BW 1 Asa Keysight Spect X RL Start Freq 10 dB/div	00 kHz rrum Analyzer - Sw ℝF 50 Ω 30.00000 Ref Offset 11 Ref 11.70	AC OMHZ PN IFG I.7 dB	IO: Fast G	SENS	Run	#Avg Typ	ALIGN AUTO pe: RMS d:>10/10	09:51:25 TRJ TRJ	(1001 pts)	Frequency Auto TL Center Fr 13.26500000 C
#Res BW 1 Asa Keysight Spect X RL Start Freq 10 dB/div	00 kHz rrum Analyzer - Sw ℝF 50 Ω 30.00000 Ref Offset 11 Ref 11.70	AC OMHZ PN IFG I.7 dB	IO: Fast G	SENS	Run	#Avg Typ	ALIGN AUTO pe: RMS d:>10/10	09:51:25 TRJ TRJ	(1001 pts)	Frequency Auto TL Center Fr 13.26500000 0 Start Fr 30.00000 N Stop Fr
#Res BW 1 Asa Keysight Spect X RL Start Freq 1.70	00 kHz rrum Analyzer - Sw ℝF 50 Ω 30.00000 Ref Offset 11 Ref 11.70	AC OMHZ PN IFG I.7 dB	IO: Fast G	SENS	Run	#Avg Typ	ALIGN AUTO pe: RMS d:>10/10	09:51:25 TRJ TRJ	(1001 pts)	Frequency Auto Tu Center Fr 13.26500000 C Start Fr 30.00000 N
#Res BW 1 48a Image: Constraint Spectra Image: Constraint Spectra Image: Constraint Spectra 170 Image: C	00 kHz	AC OMHZ PN IFG I.7 dB	IO: Fast G	SENS	Run	#Avg Typ	ALIGN AUTO DE: RMS i>10/10 MI	1.000 ms	(1001 pts)	Frequency Frequency Auto TL Center Fit 13.265000000 C Start Fit 30.000000 N Stop Fit 26.50000000 C
#Res BW 1 sca Keysight Spect B RL Start Freq 10 dB/div	00 kHz	AC 0 MHz PN IFG IFG IFG IFG IFG IFG IFG IFG	O: Fast Gain:Low	Trig: Free #Atten: 10	Run dB	#Avg Tyj Avg Hold	STATU ALIGN AUTO De: RMS I:>10/10 MI	1.000 ms s 09:51:25 TRU 1 (r1 2.44 -12.4 -12.4 -12.4 -12.4 -12.4 -12.4 -12.4 -12.4 -12.4 -12.4 -12.4 -12.4 -12.4 -12.5 -10.6 -1	(1001 pts)	Frequency Frequency Auto TL Center Fit 13.265000000 C Start Fit 30.000000 N Stop Fit 26.50000000 C
#Res BW 1 sca Keysight Spect Iteration Spect Iteration Spect 170	00 kHz	AC OMHz PN PN IFG IFG IFG A A A A A A A A A A A A A A A A A	0: Fast G ain:Low #VBV	V 300 kHz	Run dB	#Avg Tyj Avg Hold	ALIGN AUTO DE: RMS i>10/10 MI	1.000 ms s 09:51:25 TRU 1 (r1 2.44 -12.4 -12.4 -12.4 -12.4 -12.4 -12.4 -12.4 -12.4 -12.4 -12.4 -12.4 -12.4 -12.4 -12.5 -10.6 -1	(1001 pts)	Frequency Auto Tu Center Fr 13.265000000 0 Start Fr 30.000000 N Stop Fr 26.50000000 0 CF St 2.402000000 0
#Res BW 1 Isca Keysight Spect X Ruit Start Freq 170	00 kHz	X 2.440 1 2.400	O: Fast Gain:Low	SENS Trig: Free #Atten: 10	Run dB	#Avg Tyj Avg Hold	STATU ALIGN AUTO De: RMS I:>10/10 MI	1.000 ms s 09:51:25 TRU 1 (r1 2.44 -12.4 -12.4 -12.4 -12.4 -12.4 -12.4 -12.4 -12.4 -12.4 -12.4 -12.4 -12.4 -12.4 -12.5 -10.6 -1	(1001 pts)	Center Fr 13.26500000 0 Start Fr 30.00000 N Stop Fr 26.5000000 0 CF SI 2.402000000 0 Auto M Freq Off
#Res BW 1 Isca Keysight Spect X Ruit Start Freq Income 1.70	00 kHz	X 2.440 1 2.400	O: Fast Gain:Low #VBV	V 300 kHz	Run dB	#Avg Tyj Avg Hold	STATU ALIGN AUTO De: RMS I:>10/10 MI	1.000 ms s 09:51:25 TRU 1 (r1 2.44 -12.4 -12.4 -12.4 -12.4 -12.4 -12.4 -12.4 -12.4 -12.4 -12.4 -12.4 -12.4 -12.4 -12.5 -10.6 -1	(1001 pts)	Center Fr 13.26500000 0 Start Fr 30.00000 N Stop Fr 26.5000000 0 CF Si 2.4020000000
#Res BW 1 Issa Issa Keysight Spect Issa Start Freq Issa 170 Issa 183 Issa 184 Issa 184 Issa 183 Issa 184 <t< td=""><td>00 kHz</td><td>X 2.440 1 2.400</td><td>O: Fast Gain:Low #VBV</td><td>V 300 kHz</td><td>Run dB</td><td>#Avg Tyj Avg Hold</td><td>STATU ALIGN AUTO De: RMS I:>10/10 MI</td><td>1.000 ms s 09:51:25 TRU 1 (r1 2.44 -12.4 -12.4 -12.4 -12.4 -12.4 -12.4 -12.4 -12.4 -12.4 -12.4 -12.4 -12.4 -12.4 -12.5 -10.6 -1</td><td>(1001 pts)</td><td>Center Fr 13.26500000 0 Start Fr 30.00000 N Stop Fr 26.5000000 0 CF SI 2.402000000 0 Auto M Freq Off 0</td></t<>	00 kHz	X 2.440 1 2.400	O: Fast Gain:Low #VBV	V 300 kHz	Run dB	#Avg Tyj Avg Hold	STATU ALIGN AUTO De: RMS I:>10/10 MI	1.000 ms s 09:51:25 TRU 1 (r1 2.44 -12.4 -12.4 -12.4 -12.4 -12.4 -12.4 -12.4 -12.4 -12.4 -12.4 -12.4 -12.4 -12.4 -12.5 -10.6 -1	(1001 pts)	Center Fr 13.26500000 0 Start Fr 30.00000 N Stop Fr 26.5000000 0 CF SI 2.402000000 0 Auto M Freq Off 0
#Res BW 1 sca Keysight Spect B RL Start Freq 10 dB/div	00 kHz	X 2.440 1 2.400	O: Fast Gain:Low #VBV	V 300 kHz	Run dB	#Avg Tyj Avg Hold	STATU ALIGN AUTO De: RMS I:>10/10 MI	1.000 ms s 09:51:25 TRU 1 (r1 2.44 -12.4 -12.4 -12.4 -12.4 -12.4 -12.4 -12.4 -12.4 -12.4 -12.4 -12.4 -12.4 -12.4 -12.5 -10.6 -1	(1001 pts)	Center Fr 13.26500000 0 Start Fr 30.00000 N Stop Fr 26.5000000 0 CF SI 2.402000000 0 Auto M Freq Off



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Frequency	09:53:15 AM Oct 05, 2021 TRACE 1 2 3 4 5 6		SOURCE OFF	SENSE:			RF 50	
	TYPE MWWWW DET P P A N N N		Avg Hold	Trig: Free Ru #Atten: 10 dB	NO: Fast C Gain:Low	PI	30.0000	Fred
Auto Tu	1 2.479 8 GHz -13.850 dBm	Mkr					Ref Offset 1 Ref 11.70	div
Center Fro								
13.265000000 G							≜ ¹	
							1	
Start Fr	-33.95 dBm							
30.000000 M								
							3	1
Stop Fre				and the second	لير الم	يوليه جوهوني م	M.	
Stop Fr 26.50000000 G					in the second second		Jenne -	
26.50000000 G	Stop 26 50 GHz							0.03
26.50000000 G CF Ste 2.40200000 G	Stop 26.50 GHz 531 s (40001 pts)	Sweep 2.5		300 kHz	#VB		GHz 00 kHz	0.03 BW
26.50000000 G		Sweep 2.4		Y		×	00 kHz	BW
26.50000000 G CF Ste 2.402000000 G Auto <u>M</u>	531 s (40001 pts)	-		Y -13.850 dBm -69.196 dBm	8 GHz 0 GHz	<u>2.479</u> 2.40	00 kHz SCL f	
26.50000000 G CF Ste 2.40200000 G	531 s (40001 pts)	-	FUNCTION FL	Y -13.850 dBm	8 GHz	<u>2.479</u> 2.40	00 kHz	
26.50000000 G CF Ste 2.402000000 G Auto <u>M</u> Freq Offs	531 s (40001 pts)	-	FUNCTION	Y -13.850 dBm -69.196 dBm	8 GHz 0 GHz	<u>2.479</u> 2.40	00 kHz SCL f	
26.50000000 G CF Ste 2.402000000 G Auto <u>M</u> Freq Offs	531 s (40001 pts)	-	FUNCTION FU	Y -13.850 dBm -69.196 dBm	8 GHz 0 GHz	<u>2.479</u> 2.40	00 kHz SCL f	
26.50000000 GI CF Ste 2.402000000 GI Auto M Freq Offs 0 I	531 s (40001 pts)	-	FUNCTION FL	Y -13.850 dBm -69.196 dBm	8 GHz 0 GHz	<u>2.479</u> 2.40	00 kHz SCL f	



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OUT-OF-BAND SPURIOUS EMISSIONS-CONDUCTED MEASUREMENT

	GFSK(RF) Mode	
	CH Low (GF	SK MODE)	
Keysight Spectrum Analyzer - Swept SA			
KL RF 50 Ω AC Center Freq 2.402000000 GH PN	O: Wide 😱 Trig: Free Run	ALIGN AUTO 09: #Avg Type: RMS Avg Hold:>10/10	10:38 AM Oct 05, 2021 TRACE 1 2 3 4 5 6 TYPE MWWW DET P P A N N N
Ref Offset 11.7 dB	ain:Low #Atten: 10 dB		02 066 GHz 10.809 dBm
10 dB/div Ref 11.70 dBm			
1.70			2.402000000 GHz
-8.30	-6.00 d		Start Freq 2.400500000 GHz
-18.3	669 kH		
-28.3			2.403500000 GHz
-48.3			CF Step 2.40200000 GHz Auto <u>Man</u>
-68.3			Freq Offset 0 Hz
-78.3			Scale Type
Center 2.402000 GHz			an 3.000 MHz Log Lin
#Res BW 100 kHz	#VBW 300 kHz	#Sweep 100.0	ms (1001 pts)
MSG		STATUS	
Keysight Spectrum Analyzer - Swept SA			
	CENCE INT. COUR		
X RL RF 50 Ω AC Start Freq 2.310000000 GHz Photocol Photocol Photocol	IO: Fast	ACE OFF ALIGN AUTO 09: #Avg Type: RMS Avg Hold:>10/10	18:51 AM Oct 05, 2021 TRACE 1 2 3 4 5 6 TYPE M WM WWW
Start Freq 2.310000000 GHz PR IFC Ref Offset 11.7 dB	Trim Free Dure	#Avg Type: RMS Avg Hold:>10/10 Mkr1 2.402	18:51 AM Oct 05, 2021 TRACE 1 2 3 4 5 6 Frequency
Start Freq 2.310000000 GHz	IO: Fast 😱 Trig: Free Run	#Avg Type: RMS Avg Hold:>10/10 Mkr1 2.402	IB:51 AMOct 05, 2021 Frequency TRACE [1 2 3 4 5 6 Frequency TYPE [Mwwww DET [P P A N N N Auto Tune 072 5 GHz Auto Tune
Start Freq 2.310000000 GHz PP Ref Offset 11.7 dB 10 dB/div Ref 11.70 dBm	IO: Fast 😱 Trig: Free Run	#Avg Type: RMS Avg Hold:>10/10 Mkr1 2.402	1851 AMOR:05.2021 Frequency TRACE [1: 23 4 5 6 Frequency DFT P P A NNN Auto Tune 072 5 GHz Auto Tune 0.408 dBm Center Freq 1 2.36000000 GHz
Start Freq 2.31000000 GHz PP It of dB/div Ref Offset 11.7 dB It of dB/div Ref 11.70 dBm It of dB/div Ref 11.70 dBm	IO: Fast 😱 Trig: Free Run	#Avg Type: RMS Avg Hold:>10/10 Mkr1 2.402	1851 AMOR 05, 2021 Frequency TRADE [1, 2, 3, 4, 5, 6] Frequency DFT P P A NNN Auto Tune 0.725 GHz Auto Tune 0.408 dBm Center Freq
Start Freq 2.310000000 GHz Prive Ref Offset 11.7 dB 1.70	IO: Fast 😱 Trig: Free Run	#Avg Type: RMS Avg Hold:>10/10 Mkr1 2.402	1851 AMORT 05, 2021 Frequency TRADE [1, 2, 3, 4, 5, 6] Frequency DFT P P A N N N Auto Tune 0.408 dBm Center Freq 1 Center Freq 2.36000000 GHz Start Freq
Start Freq 2.310000000 GHz Price Ref Offset 11.7 dB Log Colspan="2">Colspan="2" Colspan="2"Cols	AD: Fast Trig: Free Run #Atten: 10 dB	#Avg Type: RMS Avg Hold:>10/10 Mkr1 2.402	1 Frequency 1 Center Freq 0.408 dBm Center Freq 1 2.36000000 GHz 2.31000000 GHz Start Freq 2.31000000 GHz Stop Freq 2.41000 GHz CF Step 2.41000 GHz 2.402000000 GHz 2.41000 GHz CF Step 2.402000000 GHz CF Step
Start Freq 2.310000000 GHz Price Ref Offset 11.7 dB 1.70 O dB/div Ref Offset 11.7 dB O dB/div Ref Offset 11.7 dB O dB/div Ref Offset 11.7 dB O dB/div A div A div A div A div Start 2.31000 GHz X div	Image: Construction of the second s	#Avg Type: RMS Avg Hold:>10/10 Mkr1 2.402	Iss1 AMORT05.2021 Frequency TRACE [1.2.3 4.5 6 Frequency DPE NWWWWW Auto Tune 0.408 dBm Auto Tune 1 Center Freq 2.36000000 GHz 2.36000000 GHz 2 Stop Freq 2 Stop Freq 2 Stop Freq 2.41000 GHz CF Step 2.40200000 GHz 2.40200000 GHz
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Frequency		CE 1 2 3 4 5 PE MWHWWW FT P P A N N	TY		#Avg Typ Avg Hold			IO: Fast 🕞	0 MHz	.00000	eq 30	ι τFr	
Auto Tun		2 4 GHz 95 dBm		Mk			#Atten: 1	Gain:Low	.7 dB	Offset 11		B/div) 4F
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13.265000000 GH	13.:												.30
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26.50000000 GH	26.							National Association					8.3 8.3
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Scale Typ												-	9

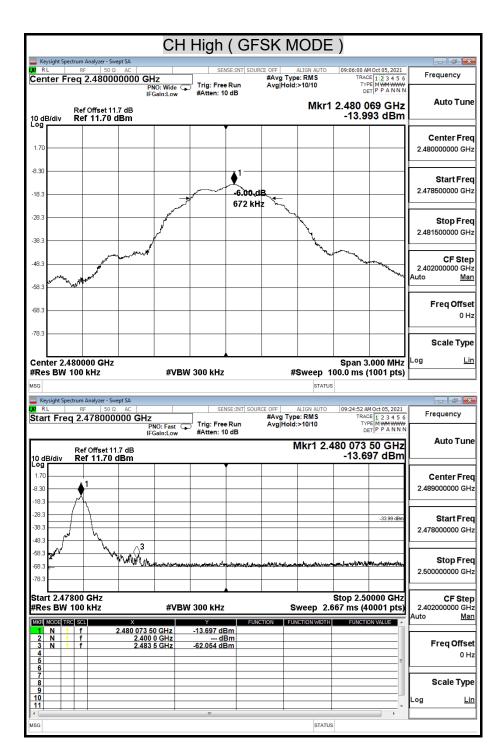


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			(GFSK N	NODE)		
Keysight Spectrum Analyz	ter - Swept SA 50 Ω AC	SE	NSE:INT SOURCE OFF		09:04:05 AM Oct 05, 2021	Eroguanav
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-8.30			 ♠ ¹			Start Fred
-18.3			-6.00.dB			2.438500000 GH
			665 kHz	<u> </u>		
-28.3						Stop Free
-38.3		1				2.441500000 GH
	John Martin					
-48.3	/				And a start of the	CF Step 2.402000000 GHz
-58.3						Auto <u>Mar</u>
-30.3						
-68.3						Freq Offset
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		#VBW 300 kHz	!	#Sweep 100	Span 3.000 MHz).0 ms (1001 pts)	Log <u>Lir</u>
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Res BW 100 kHz Asc Keysight Spectrum Analyz RL RF Start Freq 30.00 Red Bl/div Ref 0ffs 1.70 8.30 -8.3 -8.3 -8.3 -8.3 -8.3 -8.3	er - Swept SA 50 Ω AC 0000 MHz F Set 11.7 dB	NO: Fast D	NSE:INT SOURCE OFF #Avg 1 e Run Avg Ho	#Sweep 10(STATUS ALIGN AUTO Type: RM S old:>10/10	0.0 ms (1001 pts) 09:20:55 AM Oct 05, 2021 TRACE [1 2 3 4 5 G TYPE M WM DET P P A NNN 1 2.440 1 GHz -12.292 dBm	Auto Tune Center Free 30.000000 MH2 Stop Free
Res BW 100 kHz Asc 85 Keysight Spectrum Analyz 87 RL 87 Start Freq 30.00 86 10 dB/div Ref 0ffs 1.70 1 1.83 1 1.83 1 1.83 38.3 48.3 9 68.3 9 78.3 9	er - Swept SA 50 Ω AC 0000 MHz F Set 11.7 dB	NO: Fast D	NSE:INT SOURCE OFF #Avg 1 e Run Avg Ho	#Sweep 10(STATUS ALIGN AUTO Type: RM S old:>10/10	0.0 ms (1001 pts) 09:20:55 AM Oct 05, 2021 TRACE [1 2 3 4 5 6 TYPE M WM WN DET P P A NNN 1 2.440 1 GHz -12.292 dBm -32.34 dBm	Auto Tune Center Free 13.26500000 GH2 Start Free 30.000000 MH2 Center Free 26.5000000 GH2
Res BW 100 kHz Asc RL RF Start Freq 30.00 Red Bloin Ref Offs 10 dB/div Ref 11 0 dB/div Ref 0ffs 1.70 8.30 18.3 28.3 38.3 48.3 48.3 48.3 48.3 48.3 48.3	er - Swept SA 50 Ω AC 00000 MHz P IF set 11.7 dB .70 dBm	NO: Fast D	NSE:INT SOURCE OFF #Avg 1 #Avg 1 0 dB	#Sweep 100	0.0 ms (1001 pts) 09:20:55 AM Oct 05, 2021 TRACE [1 2 3 4 5 G TYPE M WM DET P P A NNN 1 2.440 1 GHz -12.292 dBm	Center Frequency Auto Tune Center Frec 13.265000000 GHz Start Frec 30.000000 GHz 2.402000000 GHz
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Frequency	14 AM Oct 05, 2021		ALIGN AUTO	T SOURCE OFF	SENSE		Ω AC		iL
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Center Fre					l T				,
13.265000000 GH								^1) —
								<u>[</u>	
Start Fre	-33.99 dBm								
30.000000 MH									
	a constant of						1	12	,
						hand		Jen _) Junio
26.500000000 GF CF Ste	26.50 GHz							B GHz	rt 0.0
26.50000000 GF CF Ste 2.40200000 GF	(40001 pts)	2.531 s (Sweep		/ 300 kHz	#VBV		100 kHz	rt 0.0 es B\
26.50000000 GF CF Ste 2.40200000 GF		2.531 s (FUNCTION	Y -14.288 dBn	8 GHz	× 2.479	100 kHz	rt 0.0 es B\
26.50000000 GF CF Ste 2.402000000 GF uto <u>Ma</u>	(40001 pts)	2.531 s (Sweep	FUNCTION	Y	8 GHz 0 GHz		100 kHz	rt 0.0 es B\
26.50000000 Gł CF Ste 2.40200000 Gł uto <u>M</u> Freq Offs	(40001 pts)	2.531 s (Sweep	EUNCTION F	Y -14.288 dBn -69.324 dBn	8 GHz 0 GHz	<u>2.479</u> 2.400	100 kHz RC SCL f f	rt 0.(es B)
CF Ste 24.02000000 GH 2.402000000 GH uto Mi Freq Offs 0 H	(40001 pts)	2.531 s (Sweep	FUNCTION	Y -14.288 dBn -69.324 dBn	8 GHz 0 GHz	<u>2.479</u> 2.400	100 kHz RC SCL f f	rt 0.(es B)
26.50000000 GH CF Ste 2.402000000 GH uto Ma Freq Offs 0 H	(40001 pts)	2.531 s (Sweep	FUNCTION F	Y -14.288 dBn -69.324 dBn	8 GHz 0 GHz	<u>2.479</u> 2.400	100 kHz RC SCL f f	rt 0.(es B)
Stop Fre 26.50000000 GF 2.40200000 GF 2.40200000 GF uto Freq Offs 0 F Scale Typ: og	(40001 pts)	2.531 s (Sweep	FUNCTION	Y -14.288 dBn -69.324 dBn	8 GHz 0 GHz	<u>2.479</u> 2.400	100 kHz RC SCL f f	rt 0.(es B)



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Report No.: TMTN2109000342NR

8.7 RADIATED EMISSIONS

8.7.1 TRANSMITTER RADIATED SUPURIOUS EMSSIONS LIMITS

§ 15.205 (a) Except as shown in paragraph (d) of this section, only spurious emissions are permitted in any of the frequency bands listed below:

MHz	MHz	MHz	GHz
0.090 - 0.110	16.42 - 16.423	399.9 - 410	4.5 - 5.15
¹ 0.495 - 0.505	16.69475 - 16.69525	608 - 614	5.35 - 5.46
2.1735 - 2.1905	16.80425 - 16.80475	960 - 1240	7.25 - 7.75
4.125 - 4.128	25.5 - 25.67	1300 - 1427	8.025 - 8.5
4.17725 - 4.17775	37.5 - 38.25	1435 - 1626.5	9.0 - 9.2
4.20725 - 4.20775	73 - 74.6	1645.5 - 1646.5	9.3 - 9.5
6.215 - 6.218	74.8 - 75.2	1660 -1710	10.6 -12.7
6.26775 - 6.26825	108 -121.94	1718.8 - 1722.2	13.25 -13.4
6.31175 - 6.31225	123 - 138	2200 - 2300	14.47 – 14.5
8.291 - 8.294	149.9 - 150.05	2310 - 2390	15.35 -16.2
8.362 - 8.366	156.52475 - 156.52525	2483.5 - 2500	17.7 - 21.4
8.37625 - 8.38675	156.7 - 156.9	2655 - 2900	22.01 - 23.12
8.41425 - 8.41475	162.0125 - 167.17	3260 - 3267	23.6 - 24.0
12.29 - 12.293	167.72 - 173.2	3332 - 3339	31.2 - 31.8
12.51975 - 12.52025	240 - 285	3345.8 - 3338	36.43 - 36.5
12.57675 - 12.57725	322 -335.4	3600 - 4400	(2)
13.36 - 13.41			

¹ Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz.

² Above 38.6

§ 15.205 (b) Except as provided in paragraphs (d) and (e), the field strength of emissions appearing within these frequency bands shall not exceed the limits shown is Section 15.209. At frequencies equal to or less than 1000 MHz, compliance with the limits in Section 15.209 shall be demonstrated using measurement instrumentation employing a CISPR quasi-peak detector. Above 1000 MHz, compliance with the emission limits in Section 15.209 shall be demonstrated based on the average value of the measured emissions. The provisions in Section 15.35 apply to these measurements.



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Report No.: TMTN2109000342NR Rev.: 00 § 15.209 (a) Except as provided elsewhere in this Subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table :

Frequency (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meters)
30 - 88	100 **	3
88 - 216	150 **	3
216 - 960	200 **	3
Above 960	500	3

** Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this Section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz, However, operation within these frequency bands is permitted under other sections of this Part, e-g, Sections 15.231 and 15.241.

§ 15.209 (b) In the emission table above, the tighter limit applies at the band edges.

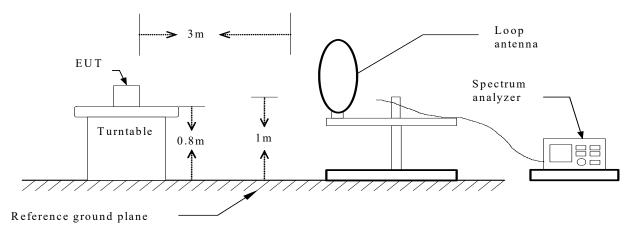


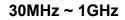
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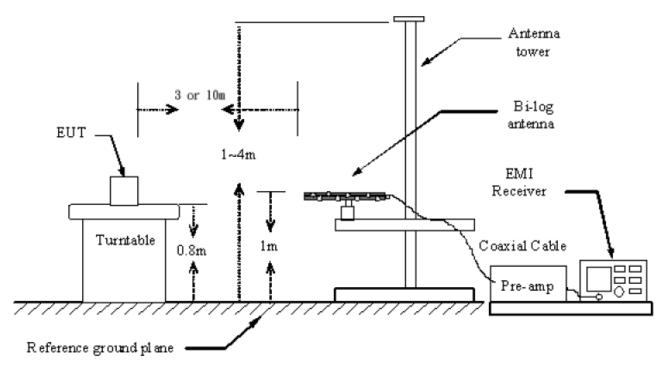
TEST SETUP

The diagram below shows the test setup that is utilized to make the measurements for emission from below 1GHz.

9kHz ~ 30MHz



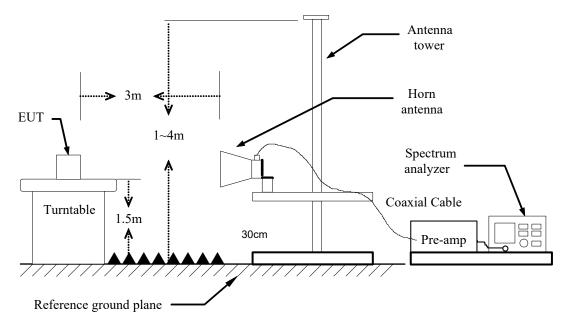






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The diagram below shows the test setup that is utilized to make the measurements for emission above 1GHz.



TEST PROCEDURE

- a. The EUT was placed on the top of a rotating table 0.8/1.5 meters above the ground at a 10 meter open area test site. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. White measuring the radiated emission below 1GHz, the EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower. White measuring the radiated emission above 1GHz, the EUT was set 3 meters away from the interference-receiving antenna
- c. The antenna is a broadband antenna, and its height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarization of the antenna are set to make the measurement.
- d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- f. If the emission level of the EUT in peak mode was 10 dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10 dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.
- g. The tests were performed in accordance with KDB 558074 D01 15.247 Meas Guidance v05



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NOTE:

- 1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120 KHz for Peak detection (PK) and Quasi-peak detection (QP) at frequency below 1GHz.
- 2. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 1 MHz for Peak detection and frequency above 1GHz.
- 3. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 10 Hz for Average detection (AV) at frequency above 1GHz.
- 4. No emission is found between lowest internal used/generated frequency to 30MHz (9kHz~30MHz)

TEST RESULTS

No non-compliance noted.

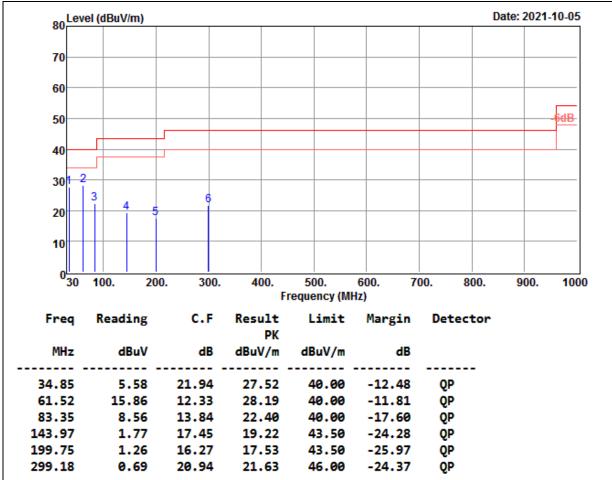


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Report No.: TMTN2109000342NR 8.7.2 WORST-CASE RADIATED EMISSION BELOW 1 GHz

Product Name	Cherry Wireless Mouse	Test Date	2021/10/05
Model Name	JF-81	Test By	Ted Huang
Test Mode	ТХ	Temp & Humidity	26.4°C, 58%

Vertical



Remark:

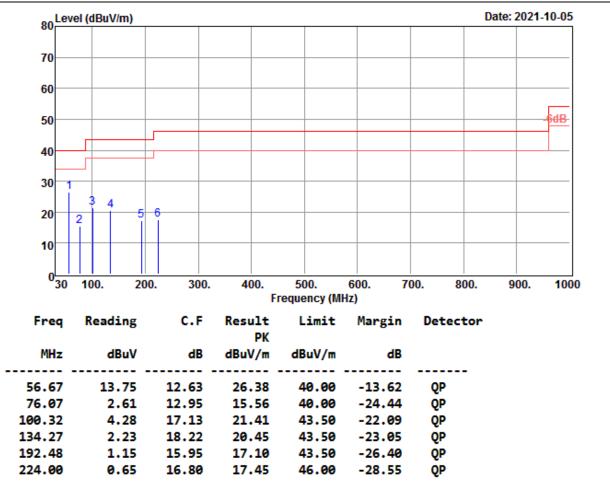
- 1. No emission found between lowest internal used/generated frequency to 30MHz (9kHz~30MHz).
- 2. Radiated emissions measured were made with an instrument using peak/quasi-peak detector mode.
- 3. Quasi-peak test would be performed if the peak result were greater than the quasi-peak limit or as required by the applicant.
- 4. Margin (dB) = Remark result (dBuV/m) Quasi-peak limit (dBuV/m).



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Product Name	Cherry Wireless Mouse	Test Date	2021/10/05
Model Name	JF-81	Test By	Ted Huang
Test Mode	ТХ	Temp & Humidity	26.4°C, 58%

Horizontal



Remark:

- No emission found between lowest internal used/generated frequency to 30MHz (9kHz~30MHz).
- 2. Radiated emissions measured were made with an instrument using peak/quasi-peak detector mode.
- 3. Quasi-peak test would be performed if the peak result were greater than the quasi-peak limit or as required by the applicant.
- 4. Margin (dB) = Remark result (dBuV/m) Quasi-peak limit (dBuV/m).



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Report No.: TMTN2109000342NR 8.7.3 TRANSMITTER RADIATED EMISSION ABOVE 1 GHz

Product Name	Cherry Wireless Mouse	Test Date	2021/10/04
Model	JF-81	Test By	Ted Huang
Test Mode	GFSK(BT) TX (CH Low)	TEMP& Humidity	25.6°C, 55%

Horizontal

	тх	/ GFSK m	ode / CH	Low	Meas	urement	t Distance	at 3m H	orizontal	polarity
	Freq.	Reading	AF	Cable Loss	Pre-amp	Filter	Level	Limit	Margin	Mark
	(MHz)	(dBµV)	(dB/m)	(dB)	(dB)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	(P/Q/A)
*	1536.42	57.19	26.89	3.21	44.68	0.50	43.11	74.00	-30.89	Р
*	1536.42	48.49	26.89	3.21	44.68	0.50	34.41	54.00	-19.59	А
*	4804.08	58.88	33.07	5.46	42.61	0.22	55.02	74.00	-18.98	Р
*	4804.08	50.85	33.07	5.46	42.61	0.22	46.99	54.00	-7.01	А
	7205.96	56.64	38.68	6.57	42.44	0.27	59.72	74.00	-14.28	Р
	7205.96	45.52	38.68	6.57	42.44	0.27	48.60	54.00	-5.40	А

Product Name	Cherry Wireless Mouse	Cherry Wireless Mouse Test Date			
Model	JF-81	Test By	Ted Huang		
Test Mode	GFSK(BT) TX (CH Low)	TEMP& Humidity	25.6°C, 55%		

Vertical

	ТХ	/ GFSK m	ode / CH	Low	Measurement Distance at 3m Vertical polarity					olarity
	Freq.	Reading	AF	Cable Loss	Pre-amp	Filter	Level	Limit	Margin	Mark
	(MHz)	(dBµV)	(dB/m)	(dB)	(dB)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	(P/Q/A)
*	1551.36	59.33	27.01	3.23	44.66	0.51	45.43	74.00	-28.57	Р
*	1551.36	49.29	27.01	3.23	44.66	0.51	35.38	54.00	-18.62	А
*	4804.07	58.15	33.07	5.46	42.61	0.22	54.29	74.00	-19.71	Р
*	4804.07	49.58	33.07	5.46	42.61	0.22	45.72	54.00	-8.28	А
	7205.60	56.86	38.68	6.57	42.44	0.27	59.94	74.00	-14.06	Р
	7205.60	45.87	38.68	6.57	42.44	0.27	48.94	54.00	-5.06	А

REMARK:

1. AF: Antenna Factor, Cable: Cable Loss, Pre-Amp: Preamplifier gain, Filter: 2.4GHz~2.5GHz Filter Insertion Loss

Spectrum analyzer setting P(Peak): RBW=1MHz, VBW=1MHz, A(Average): RBW=1MHz, VBW=10Hz

2. 3. The result basic equation calculation is as follow:

Level = Reading + AF + Cable - Preamp + Filter - Dist, Margin = Level-Limit

4. The other emission levels were 20dB below the limit

5. The test limit distance is 3M limit.



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Report No.: TMTN2109000342NR

Product Name	Cherry Wireless Mouse	2021/10/04	
Model	Model JF-81		Ted Huang
Test Mode	GFSK(BT) TX (CH Middle)	TEMP& Humidity	25.6°C, 55%

Horizontal

	ТХ /	GFSK mo	de / CH N	liddle	Meas	uremen	t Distance	at 3m H	orizontal	polarity
	Freq.	Reading	AF	Cable Loss	Pre-amp	Filter	Level	Limit	Margin	Mark
	(MHz)	(dBµV)	(dB/m)	(dB)	(dB)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	(P/Q/A)
*	1536.56	57.26	26.89	3.22	44.68	0.50	43.18	74.00	-30.82	Р
*	1536.56	48.65	26.89	3.22	44.68	0.50	34.57	54.00	-19.43	А
*	4880.12	60.07	33.32	5.51	42.60	0.23	56.52	74.00	-17.48	Р
*	4880.12	52.98	33.32	5.51	42.60	0.23	49.43	54.00	-4.57	А
*	7319.90	56.27	39.12	6.59	42.29	0.27	59.96	74.00	-14.04	Р
*	7319.90	45.30	39.12	6.59	42.29	0.27	48.98	54.00	-5.02	А

Product Name	Cherry Wireless Mouse	Test Date	2021/10/04
Model	JF-81	Test By	Ted Huang
Test Mode	GFSK(BT) TX (CH Middle)	TEMP& Humidity	25.6°C, 55%

Vertical

	ТХ /	GFSK mo	de / CH I	Viddle	Mea	sureme	ent Distanc	e at 3m	Vertical po	olarity
	Freq.	Reading	AF	Cable Loss	Pre-amp	Filter	Level	Limit	Margin	Mark
	(MHz)	(dBµV)	(dB/m)	(dB)	(dB)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	(P/Q/A)
*	1551.42	59.25	27.01	3.23	44.66	0.51	45.34	74.00	-28.66	Р
*	1551.42	49.18	27.01	3.23	44.66	0.51	35.27	54.00	-18.73	А
*	4879.99	59.58	33.32	5.51	42.60	0.23	56.04	74.00	-17.96	Р
*	4879.99	51.93	33.32	5.51	42.60	0.23	48.38	54.00	-5.62	А
*	7320.28	56.35	39.12	6.59	42.29	0.27	60.04	74.00	-13.96	Р
*	7320.28	45.88	39.12	6.59	42.29	0.27	49.57	54.00	-4.43	А

REMARK:

AF: Antenna Factor, Cable: Cable Loss, Pre-Amp: Preamplifier gain, Filter: 2.4GHz~2.5GHz Filter Insertion Loss Spectrum analyzer setting P(Peak): RBW=1MHz, VBW=1MHz, A(Average): RBW=1MHz, VBW=10Hz 1. 2.

3. The result basic equation calculation is as follow:

Level = Reading + AF + Cable – Preamp + Filter – Dist, Margin = Level-Limit The other emission levels were 20dB below the limit

4.

5. The test limit distance is 3M limit.



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Report No.: TMTN2109000342NR

Product Name	Cherry Wireless Mouse	2021/10/04	
Model	JF-81	Test By	Ted Huang
Test Mode	GFSK(BT) TX (CH High)	TEMP& Humidity	25.6°C, 55%

Horizontal

	ТХ	/ GFSK m	ode / CH	High	Measurement Distance at 3m				Horizontal polarity	
	Freq.	Reading	AF	Cable Loss	Pre-amp	Filter	Level	Limit	Margin	Mark
	(MHz)	(dBµV)	(dB/m)	(dB)	(dB)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	(P/Q/A)
*	1536.37	57.42	26.89	3.21	44.68	0.50	43.34	74.00	-30.66	Р
*	1536.37	48.65	26.89	3.21	44.68	0.50	34.57	54.00	-19.43	А
*	4960.11	61.24	33.57	5.57	42.59	0.24	58.03	74.00	-15.97	Р
*	4960.11	54.88	33.57	5.57	42.59	0.24	51.67	54.00	-2.33	А
*	7440.08	56.89	39.57	6.62	42.13	0.27	61.21	74.00	-12.79	Р
*	7440.08	46.90	39.57	6.62	42.13	0.27	51.22	54.00	-2.78	А

Product Name	Cherry Wireless Mouse	Wireless Mouse Test Date			
Model	JF-81	Test By	Ted Huang		
Test Mode	GFSK(BT) TX (CH High)	TEMP& Humidity	25.6°C, 55%		

Vertical

	тх	/ GFSK m	ode / CH	High	Measurement Distance at 3m Vertical polarity					
	Freq.	Reading	AF	Cable Loss	Pre-amp	Filter	Level	Limit	Margin	Mark
	(MHz)	(dBµV)	(dB/m)	(dB)	(dB)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	(P/Q/A)
*	1551.46	59.45	27.01	3.23	44.66	0.51	45.54	74.00	-28.46	Р
*	1551.46	49.38	27.01	3.23	44.66	0.51	35.47	54.00	-18.53	А
*	4960.04	60.44	33.57	5.57	42.59	0.24	57.23	74.00	-16.77	Р
*	4960.04	53.19	33.57	5.57	42.59	0.24	49.97	54.00	-4.03	А
*	7440.18	57.05	39.57	6.62	42.13	0.27	61.37	74.00	-12.63	Р
*	7440.18	47.30	39.57	6.62	42.13	0.27	51.63	54.00	-2.37	А

REMARK:

AF: Antenna Factor, Cable: Cable Loss, Pre-Amp: Preamplifier gain, Filter: 2.4GHz~2.5GHz Filter Insertion Loss Spectrum analyzer setting P(Peak): RBW=1MHz, VBW=1MHz, A(Average): RBW=1MHz, VBW=10Hz 1.

2.

3. The result basic equation calculation is as follow:

Level = Reading + AF + Cable – Preamp + Filter – Dist, Margin = Level-Limit The other emission levels were 20dB below the limit

4. 5.

The test limit distance is 3M limit.



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Report No.: TMTN2109000342NR

Product Name	Cherry Wireless Mouse	Test Date	2021/10/04
Model	JF-81	Test By	Ted Huang
Test Mode	GFSK(RF) TX (CH Low)	TEMP& Humidity	25.6°C, 55%

Horizontal

	тх	TX / GFSK mode / CH Low				Measurement Distance at 3m Horizontal polarity					
	Freq.	Reading	AF	Cable Loss	Pre-amp	Filter	Level	Limit	Margin	Mark	
	(MHz)	(dBµV)	(dB/m)	(dB)	(dB)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	(P/Q/A)	
*	1536.30	57.58	26.89	3.21	44.68	0.50	43.50	74.00	-30.50	Р	
*	1536.30	48.75	26.89	3.21	44.68	0.50	34.67	54.00	-19.33	А	
*	4804.00	58.88	33.07	5.45	42.61	0.22	55.02	74.00	-18.98	Р	
*	4804.00	50.38	33.07	5.45	42.61	0.22	46.52	54.00	-7.48	А	
	7205.81	57.23	38.68	6.57	42.44	0.27	60.31	74.00	-13.69	Р	
	7205.81	46.56	38.68	6.57	42.44	0.27	49.64	54.00	-4.36	А	

Product Name	Cherry Wireless Mouse	Test Date	2021/10/04
Model	JF-81	Test By	Ted Huang
Test Mode	GFSK(RF) TX (CH Low)	TEMP& Humidity	25.6°C, 55%

Vertical

	ТХ	/ GFSK m	ode / CH	Low	Measurement Distance at 3m Vertical polarity					
	Freq.	Reading	AF	Cable Loss	Pre-amp	Filter	Level	Limit	Margin	Mark
	(MHz)	(dBµV)	(dB/m)	(dB)	(dB)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	(P/Q/A)
*	1551.48	59.58	27.01	3.23	44.66	0.51	45.67	74.00	-28.33	Р
*	1551.48	49.25	27.01	3.23	44.66	0.51	35.34	54.00	-18.66	А
*	4804.00	58.22	33.07	5.45	42.61	0.22	54.35	74.00	-19.65	Р
*	4804.00	49.24	33.07	5.45	42.61	0.22	45.38	54.00	-8.62	А
	7205.52	57.37	38.68	6.57	42.44	0.27	60.44	74.00	-13.56	Р
	7205.52	46.55	38.68	6.57	42.44	0.27	49.63	54.00	-4.37	А

REMARK:

AF: Antenna Factor, Cable: Cable Loss, Pre-Amp: Preamplifier gain, Filter: 2.4GHz~2.5GHz Filter Insertion Loss Spectrum analyzer setting P(Peak): RBW=1MHz, VBW=1MHz, A(Average): RBW=1MHz, VBW=10Hz 1.

2.

3. The result basic equation calculation is as follow:

Level = Reading + AF + Cable – Preamp + Filter – Dist, Margin = Level-Limit The other emission levels were 20dB below the limit

4.

5. The test limit distance is 3M limit.



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Report No.: TMTN2109000342NR

Product Name	Cherry Wireless Mouse	Test Date	2021/10/04
Model	JF-81	Test By	Ted Huang
Test Mode	GFSK(RF) TX (CH Middle)	TEMP& Humidity	25.6°C, 55%

Horizontal

	ТХ /	GFSK mo	de / CH N	liddle	Meas	Measurement Distance at 3m Horizontal polarity					
	Freq.	Reading	AF	Cable Loss	Pre-amp	Filter	Level	Limit	Margin	Mark	
	(MHz)	(dBµV)	(dB/m)	(dB)	(dB)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	(P/Q/A)	
*	1536.39	57.27	26.89	3.21	44.68	0.50	43.19	74.00	-30.81	Р	
*	1536.39	48.59	26.89	3.21	44.68	0.50	34.51	54.00	-19.49	А	
*	4880.11	59.69	33.32	5.51	42.60	0.23	56.14	74.00	-17.86	Р	
*	4880.11	51.55	33.32	5.51	42.60	0.23	48.00	54.00	-6.00	А	
*	7320.15	56.22	39.12	6.59	42.29	0.27	59.90	74.00	-14.10	Р	
*	7320.15	45.61	39.12	6.59	42.29	0.27	49.29	54.00	-4.71	А	

Product Name	Cherry Wireless Mouse	Test Date	2021/10/04
Model	JF-81	Test By	Ted Huang
Test Mode	GFSK(RF) TX (CH Middle)	TEMP& Humidity	25.6°C, 55%

Vertical

	ТХ /	GFSK mo	de / CH I	Viddle	Measurement Distance at 3m Vertical polarity					
	Freq.	Reading	AF	Cable Loss	Pre-amp	Filter	Level	Limit	Margin	Mark
	(MHz)	(dBµV)	(dB/m)	(dB)	(dB)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	(P/Q/A)
*	1551.65	59.48	27.01	3.23	44.66	0.51	45.58	74.00	-28.42	Р
*	1551.65	49.52	27.01	3.23	44.66	0.51	35.62	54.00	-18.38	А
*	4880.08	59.36	33.32	5.51	42.60	0.23	55.82	74.00	-18.18	Р
*	4880.08	49.97	33.32	5.51	42.60	0.23	46.43	54.00	-7.57	А
*	7320.13	56.83	39.12	6.59	42.29	0.27	60.51	74.00	-13.49	Р
*	7320.13	46.08	39.12	6.59	42.29	0.27	49.77	54.00	-4.23	А

REMARK:

AF: Antenna Factor, Cable: Cable Loss, Pre-Amp: Preamplifier gain, Filter: 2.4GHz~2.5GHz Filter Insertion Loss Spectrum analyzer setting P(Peak): RBW=1MHz, VBW=1MHz, A(Average): RBW=1MHz, VBW=10Hz 1. 2.

3. The result basic equation calculation is as follow:

Level = Reading + AF + Cable – Preamp + Filter – Dist, Margin = Level-Limit The other emission levels were 20dB below the limit

4.

5. The test limit distance is 3M limit.



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Report No.: TMTN2109000342NR

Product Name	Cherry Wireless Mouse	Test Date	2021/10/04
Model	JF-81	Test By	Ted Huang
Test Mode	GFSK(RF) TX (CH High)	TEMP& Humidity	25.6°C, 55%

Horizontal

	ТХ	/ GFSK m	ode / CH	High	Measurement Distance at 3m				Horizontal polarity	
	Freq.	Reading	AF	Cable Loss	Pre-amp	Filter	Level	Limit	Margin	Mark
	(MHz)	(dBµV)	(dB/m)	(dB)	(dB)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	(P/Q/A)
*	1536.62	57.44	26.89	3.22	44.68	0.50	43.36	74.00	-30.64	Р
*	1536.62	48.82	26.89	3.22	44.68	0.50	34.74	54.00	-19.26	А
*	4960.16	61.35	33.57	5.57	42.59	0.24	58.13	74.00	-15.87	Р
*	4960.16	54.04	33.57	5.57	42.59	0.24	50.82	54.00	-3.18	А
*	7440.06	57.64	39.57	6.62	42.13	0.27	61.96	74.00	-12.04	Р
*	7440.06	47.24	39.57	6.62	42.13	0.27	51.57	54.00	-2.43	А

Product Name	Cherry Wireless Mouse	Test Date	2021/10/04
Model	JF-81	Test By	Ted Huang
Test Mode	GFSK(RF) TX (CH High)	TEMP& Humidity	25.6°C, 55%

Vertical

	тх	/ GFSK m	ode / CH	High	Measurement Distance at 3m Vertical polarity								
	Freq.	Reading AF		Cable Loss	Pre-amp	Filter	Level	Limit	Margin	Mark			
	(MHz)	(dBµV)	(dB/m)	(dB)	(dB)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	(P/Q/A)			
*	1551.46	59.56	27.01	3.23	44.66	0.51	45.65	74.00	-28.35	Р			
*	1551.46	49.36	27.01	3.23	44.66	0.51	35.45	54.00	-18.55	А			
*	4960.24	59.28	33.57	5.57	42.59	0.24	56.07	74.00	-17.93	Р			
*	4960.24	51.93	33.57	5.57	42.59	0.24	48.72	54.00	-5.28	А			
*	7440.17	57.52	39.57	6.62	42.13	0.27	61.85	74.00	-12.15	Р			
*	7440.17	47.81	39.57	6.62	42.13	0.27	52.14	54.00	-1.86	А			

REMARK:

AF: Antenna Factor, Cable: Cable Loss, Pre-Amp: Preamplifier gain, Filter: 2.4GHz~2.5GHz Filter Insertion Loss Spectrum analyzer setting P(Peak): RBW=1MHz, VBW=1MHz, A(Average): RBW=1MHz, VBW=10Hz 1.

2.

3. The result basic equation calculation is as follow:

Level = Reading + AF + Cable – Preamp + Filter – Dist, Margin = Level-Limit The other emission levels were 20dB below the limit

4. 5.

The test limit distance is 3M limit.



Report No.: TMTN2109000342NR 8.7.4 RESTRICTED BAND EDGES

et	ect	or mo	ode :		_					/ : HO	rizontal
				CH	Low	(GF	SK M	ODE			
uni Keys XI RL		rum Analyzer - S RF 50	wept SA Ω AC		SEI	NSE:INT SOUR	CE OFE	ALIGN AUTO	03:52:58 A	4 Sep 30, 2021	
			0000 GH	Z PNO: Fast 🕞	Trig: Free #Atten: 1	Run	#Avg Typ Avg Hold	e: RMS	TRAC	E 1 2 3 4 5 6 MWWWWW T P P N N N N	Frequency
10 dB		Ref Offset 5 Ref 112.1	.2 dB	Gameow				М	(r1 2.39) 59.22	0 0 GHz 0 dBµV	Auto Tun
102 -											Center Fre 2.360000000 GH
92.2 - 82.2 -										A	Start Fre 2.310000000 GH
72.2							<u> </u>		1	74.00 dBµV	Stop Fre 2.410000000 GH
5 2.2	(แม <i>น</i> (ไข)) เมือง	adayi ka wali wa ya ji	na thurbhrother	14-14-14-14-14-14-14-14-14-14-14-14-14-1	radiuser and an	45.h.19.s.f.est.s	Lic-Malitanovi	kantan ketaketaketaketaketaketaketaketaketaketa	สม ารางสมสมุขางสมุขไ	' Kinlah	CF Ste 10.000000 MH <u>Auto</u> Ma
42.2 - 32.2 -											Freq Offse 0 H
22.2											Scale Typ
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🚾 Keysight S 🕅 R L	pectrum Analyzer - S				•	SK M				- 5 -
	RF 50 eq 2.31000				NSE:INT SOU	#Avg Type Avg Hold:		TF	AM Sep 30, 2021 ACE 1 2 3 4 5 6	Trace/Detector
		I	PNO: Fast 🕞 FGain:Low	#Atten: 1		Avginoid.			90 0 GHz	Select Trace
10 dB/div Log	Ref Offset 6 Ref 112.1			,	-		IVIT		47 dBµV	2
102										Clear Write
92.2										
82.2									Λ	Trace Average
72.2										Max Hold
62.2										
52.2		*****				a hanna an		1	54.00 dBµV	Min Hold
42.2										
32.2										View Blank Blank
22.2										
	1000 GHz								41000 GHz	More 1 of 3
#Res BV	1.0 MHz		#VBW	/ 2.4 kHz		5	Sweep 3	1	s (1001 pts)	



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ete	ect	or r	noc	ie : I	Peak						rity :	Vertical
					CH	H Low	(GFS	SK M	ODE	Ξ)		
		ctrum Anal										- 6
X/RL Star		RF 1 2.31	50 Ω 00000	AC	7		NSE:INT SOUR	#Avg Typ		TRAC	HSep 30, 2021 E 1 2 3 4 5 6	Frequency
					PNO: Fast FGain:Low	Trig: Fre #Atten: 1		Avg Hold	:>10/10			
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-°g												Center Fre
102												2.360000000 G
92.2												Start Fre
82.2											A	2.310000000 G
72.2											14.00 dBµV	0 4 F
										1		Stop Fre 2.410000000 G
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52.2												CF Ste 10.000000 M
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		000 GH			#VP	W 3.0 MHz	•	#	Sween	Stop 2.41 100.0 ms (1000 GHz	Log <u>L</u>
ISG			-		<i></i>			"	STAT			

Polarity : Vertical Detector mode : Average CH Low (GFSK MODE)

 Image: Sectrum Analyzer - Swept SA
 SENSE::INT

 Image: Start Freq 2.310000000 GHz
 Fast

 PNO: Fast
 Frig: Free Run

 IFGain:Low
 #Atten: 10 dB

 SENSE:INT SOURCE OFF ALIGN AU #Avg Type: RMS g: Free Run Avg|Hold:>10/10 04:00:39 AM Sep 30, 2021 TRACE 1 2 3 4 5 6 TYPE M WWWW DET P P N N N N Frequency Mkr1 2.390 0 GHz 50.454 dBµV Auto Tune Ref Offset 5.2 dB Ref 112.19 dBµV 10 dB/div Center Freq 103 2.360000000 GHz 92. Start Freq 2.31000000 GHz 82. 72. Stop Freq 2.410000000 GHz 62. 54,00 dB) CF Step 10.000000 MHz 52. Auto Man 42. Freq Offset 32. 0 Hz 22. Scale Type Stop 2.41000 GHz Sweep 32.53 ms (1001 pts) Lin Log Start 2.31000 GHz #Res BW 1.0 MHz #VBW 2.4 kHz ISG STATUS



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)et	ect	or	mo	de :	Peak				Ρ	olarit	у : Но	rizontal
					СН	High	(GF	SK N	10DE	Ξ)		
M Key		trum Ana RF	lyzer - Swe 50 Ω	pt SA AC		CE.	NSE:INT SOUR		ALIGN AUTO	02:44:05 0	M Sep 30, 2021	- 7 2
				000 GHz				#Avg Typ Avg Hold	be:RMS	TRA	CE 1 2 3 4 5 6	Frequency
					PNO: Fast G Gain:Low	#Atten: 1		Avginoid		D	ETPPNNNN	Auto Tur
10 dE Log r	3/div		ffset 5.2 12.19						Mkr	1 2.483 5 59.07	500 GHz 76 dBµV	Auto Tur
												Center Fre
102		-										2.488000000 GH
92.2		-										Start Fre
82.2			\frown									2.476000000 GH
				\							74.00 dBµV	
72.2		1		λ,	.1							Stop Fre 2.50000000 GH
62.2		كلبهد		Yww	John Hannes	والإرز بالإيهدام والأحة	and the second	لمويلطا مرياباته	Lad Hippy Harakia	. How many how the	-	
52.2												CF Ste 2.400000 MH
42.2												Auto Ma
												Freq Offs
32.2												0H
22.2		+										Scale Typ
	t 2.476									Stop 2.5	0000 GHz	Log <u>L</u>
#Res	5 BW 1	1.0 MH	lz		#VBV	V 3.0 MHz		#	Sweep	100.0 ms	(1001 pts)	
ISG									STAT	SL		

Detector mode : Average **Polarity : Horizontal** CH High (GFSK MODE)

 Image: Sectrum Analyzer - Swept SA
 SENSE::INT

 Image: RL
 RF
 50 Ω
 AC
 SENSE::INT

 Start Freq 2.476000000 GHz
 PNO: Fast
 Trig: Free Run
 IFGain:Low
 #Atten: 10 dB

 SENSE:INT SOURCE OFF ALIGN AU #Avg Type: RMS g: Free Run Avg|Hold:>10/10 03:44:55 AM Sep 30, 2021 TRACE 1 2 3 4 5 6 TYPE M WWWW DET P P N N N N Frequency Mkr1 2.483 500 GHz 50.816 dBµV Auto Tune Ref Offset 5.2 dB Ref 112.19 dBµV 10 dB/div Center Freq 103 2.488000000 GHz 92. Start Freq 2.476000000 GHz 82. 72. Stop Freq 2.500000000 GHz 62. 54.00 dBj. CF Step 2.400000 MHz 52. Auto Man 42. Freq Offset 32. 0 Hz 22. Scale Type Stop 2.50000 GHz Sweep 7.800 ms (1001 pts) Lin Log Start 2.47600 GHz #Res BW 1.0 MHz #VBW 2.4 kHz ISG STATUS



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)et	ect	or mo	ode : I	Peak					Pola	rity :	Vertical
				СН	High	(GF	SK N	IODE	Ξ)		
M Key		rum Analyzer - ! RF 50							100 00 0C 1		- 7
			Ω AC 0000 GHz			NSE:INT SOU	#Avg Typ		TRA	M Sep 30, 2021 DE 1 2 3 4 5 6 PE M WWWW	Frequency
				PNO: Fast 🕞 Gain:Low	Trig: Fre #Atten: 1		Avg Hold	:>10/10		ET P P N N N N	
10 dE		Ref Offset (Ref 112.1						Mkr	1 2.483 5 58.31	500 GHz ∣2 dBµV	Auto Tur
LUg						ľ					Center Fre
102											2.488000000 GH
92.2											Start Fre
82.2			•								2.476000000 G
72.2			λ							74.00 dBµV	~ -
62.2			N.	.1							Stop Fre 2.50000000 GF
62.2	NHAMM	-1 ²⁰⁷	Yme	P. CHARMENT	Landon and the second	hillingendered	rights and an apply	alternet also	yrsylfrytheredelanno	ile alteration appression	
52.2											2.400000 Mi
42.2											<u>Auto</u> Ma
32.2											Freq Offs
											01
22.2											Scale Typ
		00 GHz .0 MHz		#VBM	/ 3.0 MHz		#	Sween	Stop 2.5 100.0 ms	0000 GHz	Log <u>L</u>
HRC:				#1000	5.0 IVINZ		#	SWEEP		(1001 pts)	

Polarity : Vertical Detector mode : Average CH High (GFSK MODE)

 Image: Sectrum Analyzer - Swept SA
 SENSE::INT

 Image: RL
 RF
 50 Ω
 AC
 SENSE::INT

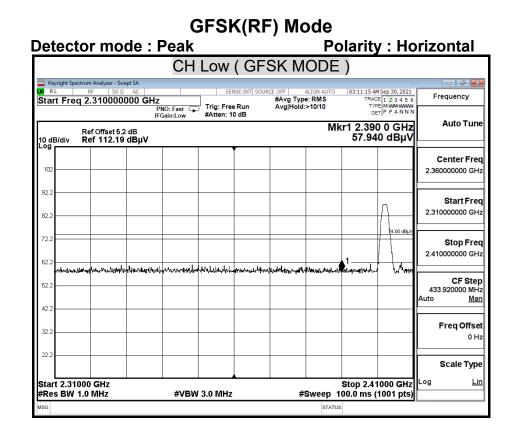
 Start Freq 2.476000000 GHz
 PNO: Fast
 Trig: Free Run
 IFGain:Low
 #Atten: 10 dB

 SENSE:INT SOURCE OFF ALIGN AU #Avg Type: RMS g: Free Run Avg|Hold:>10/10 03:38:59 AM Sep 30, 2021 TRACE 1 2 3 4 5 6 TYPE M WWWW DET P P N N N N Frequency Mkr1 2.483 500 GHz 50.244 dBµV Auto Tune Ref Offset 5.2 dB Ref 112.19 dBµV 10 dB/div Center Freq 103 2.488000000 GHz 92. Start Freq 2.476000000 GHz 82. 72. Stop Freq 2.50000000 GHz 62. 54.00 dBj. CF Step 2.400000 MHz 52. Auto Man 42. Freq Offset 32. 0 Hz 22. Scale Type Stop 2.50000 GHz Sweep 7.800 ms (1001 pts) Lin Log Start 2.47600 GHz #Res BW 1.0 MHz #VBW 2.4 kHz ISG STATUS



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			CH Lo	w (Gl	FSK MO	DE)		
🔤 Keysight S	ectrum Analyzer - Sw	ept SA				,		
N RL Start Ere	RF 50 Ω			SENSE:INT SO	OURCE OFF ALIGN #Avg Type: R!		41 AM Sep 30, 2021 TRACE 1 2 3 4 5 6	Frequency
	q 2.5 10000	PNO:		g: Free Run tten: 10 dB	Avg Hold:>10/		DET P P A N N N	
10 dB/div	Ref Offset 5.2 Ref 112.19						390 0 GHz 340 dBµV	Auto Tun
102								Center Fre 2.360000000 GH
92.2							^	Start Fre
82.2							\square	2.310000000 GH
62.2								Stop Fre 2.410000000 GH
52.2						1	54,00 dBµV	CF Ste 433.920000 MH
42.2								Auto <u>Ma</u>
32.2								Freq Offso 0 ⊦
22.2								Scale Typ
	1000 GHz 1.0 MHz	<u> </u>	#VBW 2.4	kHz	Swe	Stop 2 ep 32.53 m	2.41000 GHz is (1001 pts)	Log <u>Li</u>

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or mod	<u>e : Pea</u>	K			Pola	rity :	vertical
	С	H Low (GFSK	MODE	E)		
							- 6
		SENS					Frequency
4 2.0 100000	PNO: Fast	φ. · · ·		Hold: 10/10	TYF DE		• • • •
				М			Auto Tur
							Center Fre
							2.36000000 G
							Start Fre
						Λ	2.310000000 G
						4.00 dBµV	
							Stop Fr
				_	1		2.410000000 G
water and the second second	๙๛๚๚๛๛๛๛๚๛๚๛๚๚๚๛๚๚๚ ๛๛๚๚๛๛๛๛๚๛๚๛๚๚๚๚๚๚๚๚	างสารสารที่สารประเทศ	uningto the terms of the	errally/tubbly-abused-war	www.mannowlinkyw	heyelity	CF Ste
							433.920000 M
		_					Auto <u>M</u>
							Freq Offs
							0
							Scale Ty
000 GHz					Stop 2.4	1000 GHz	Log <u>L</u>
1.0 MHz	#V	'BW 3.0 MHz		#Sweep	100.0 ms (1001 pts)	
	etrum Analyzer - Sweg RF 50 Ω q 2.31000000 Ref Offset 5.2 Ref 112.19 (ctrum Analyzer - Swept SA RF 50.0 AC PRO: Fast IF Fain:Low Ref Offset 5.2 dB Ref 112.19 dBµV	Ref 0ffset 5.2 dB Trig: Free IFGain:Low Ref 112.19 dBμV Image: Comparison of the second of	CH Low (GFSK	CH Low (GFSK MODE	CH Low (GFSK MODE) etrum Analyzer - Swept SA RF 50.9 AC PNO: Fast PNO: Fast PNO: Fast Ref Offset 5.2 dB Ref 112.19 dBµV	CH Low (GFSK MODE)

Polarity : Vertical Detector mode : Average CH Low (GFSK MODE)

 Image: Sectrum Analyzer - Swept SA
 SENSE::INT

 Image: Start Freq 2.310000000 GHz
 Fast

 PNO: Fast
 Frig: Free Run

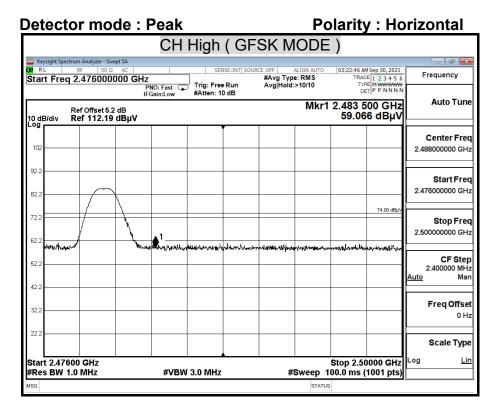
 IFGain:Low
 #Atten: 10 dB

 SENSE:INT SOURCE OFF ALIGN AU #Avg Type: RMS g: Free Run Avg|Hold:>10/10 03:06:15 AM Sep 30, 2021 TRACE 1 2 3 4 5 6 TYPE M WWW DET P P A N N N Frequency Mkr1 2.390 0 GHz 50.481 dBµV Auto Tune Ref Offset 5.2 dB Ref 112.19 dBµV 10 dB/div Center Freq 103 2.360000000 GHz 92. Start Freq 2.31000000 GHz 82. 72. Stop Freq 2.410000000 GHz 62. 54,00 dBj CF Step 433.920000 MHz 52. Auto Man 42. Freq Offset 32. 0 Hz 22. Scale Type Stop 2.41000 GHz Sweep 32.53 ms (1001 pts) Lin Log Start 2.31000 GHz #Res BW 1.0 MHz #VBW 2.4 kHz ISG STATUS



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Polarity : Horizontal Detector mode : Average CH High (GFSK MODE)

 Keysight Spectrum Analyzer - Swept SA
 SENSE::NT

 RL
 RF
 50 Ω
 AC
 SENSE::NT

 Start Freq 2.476000000 GHz
 PNO: Fast
 Trig: Free Run
 Free Run

 IFGain:Low
 #Atten: 10 dB

 SENSE:INT SOURCE OFF ALIGN AU #Avg Type: RMS g: Free Run Avg|Hold:>10/10 03:23:55 AM Sep 30, 2021 TRACE 1 2 3 4 5 6 TYPE M WWWW DET P P N N N N Frequency Mkr1 2.483 500 GHz 50.723 dBµV Auto Tune Ref Offset 5.2 dB Ref 112.19 dBµV 10 dB/div Center Freq 10 2.488000000 GHz 92. Start Freq 2.476000000 GHz 82. 72. Stop Freq 2.500000000 GHz 62. 54.00 dBj. CF Step 2.400000 MHz 52. Auto Man 42. Freq Offset 32. 0 Hz 22 Scale Type Stop 2.50000 GHz Sweep 7.800 ms (1001 pts) Lin Log Start 2,47600 GHz #Res BW 1.0 MHz #VBW 2.4 kHz ISG STATUS



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)ete	ecte	or mo	ode :	Peak					Pola	<u>rity :</u>	Vertical
				CH	High	(GF	SK №	10DE	Ξ)		
XI RL			Ω AC		SE	NSE:INT SO		ALIGN AUTO		M Sep 30, 2021	Frequency
Start I	Freq	2.47600		Z PNO:Fast ⊂ FGain:Low	Trig: Fre #Atten: 1		#Avg Typ Avg Hold		TY	CE 1 2 3 4 5 6 PE M WWWW ET P P N N N N	. ,
10 dB/d		Ref Offset! Ref 112.1						Mkr		500 GHz 59 dBµV	Auto Tur
						Ĭ					Center Fre
102 —											2.488000000 GH
92.2											Start Fro
82.2		6								74.00 dBuV	2.476000000 Gi
72.2		\top	\mathbf{h}							74.00 00014	Stop Fre 2.50000000 G
62.2 	nonnyakka	**	N.m.t	net the second	erona hina naka kata	and the states	Www.web.log.org/kaparity	in the second	******	anna an tarachta an tarba	2.50000000 6
52.2		_									CF Ste 2.400000 MI
42.2											<u>Auto</u> M
32.2		_									Freq Offs
22.2			_								
											Scale Typ
		00 GHz .0 MHz		#VB	N 3.0 MHz		#	Sweep	Stop 2.5 100.0 ms	0000 GHz (1001 pts)	Log <u>L</u>
ISG								STAT	JS		

Polarity : Vertical Detector mode : Average CH High (GFSK MODE)

 Image: Sectrum Analyzer - Swept SA
 SENSE::INT

 Image: RL
 RF
 50 Ω
 AC
 SENSE::INT

 Start Freq 2.476000000 GHz
 PNO: Fast
 Trig: Free Run
 IFGain:Low
 #Atten: 10 dB

 SENSE:INT SOURCE OFF ALIGN AU #Avg Type: RMS g: Free Run Avg|Hold:>10/10 03:29:19 AM Sep 30, 2021 TRACE 1 2 3 4 5 6 TYPE M WWWW DET P P N N N N Frequency Mkr1 2.483 500 GHz 50.523 dBµV Auto Tune Ref Offset 5.2 dB Ref 112.19 dBµV 10 dB/div Center Freq 103 2.488000000 GHz 92. Start Freq 2.476000000 GHz 82. 72. Stop Freq 2.50000000 GHz 62. 54.00 dBj. CF Step 2.400000 MHz 52. Auto Man 42. Freq Offset 32. 0 Hz 22. Scale Type Stop 2.50000 GHz Sweep 7.800 ms (1001 pts) Lin Log Start 2.47600 GHz #Res BW 1.0 MHz #VBW 2.4 kHz ISG STATUS



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8.8 POWERLINE CONDUCTED EMISSIONS

LIMITS

§ 15.207 (a) Except as shown in paragraph (b) and (c) this section, for an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed the limits in the following table, as measured using a 50 μ H/50 ohms line impedance stabilization network (LISN). Compliance with the provisions of this paragraph shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminal.

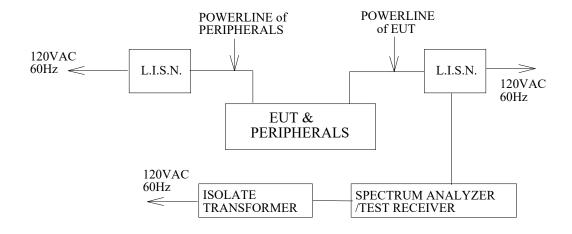
The lower limit applies at the boundary between the frequency ranges.

Frequency of Emission (MHz)	Conducted	limit (dBµv)
	Quasi-peak	Average
0.15 - 0.5	66 to 56	56 to 46
0.5 - 5	56	46
5 - 30	60	50



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TEST SETUP



TEST PROCEDURE

The EUT is placed on a non-conducting table 40 cm from the vertical ground plane and 80cm above the horizontal ground plane. The EUT IS CONFIGURED IN ACCORDANCE WITH ANSI C63.10.

The resolution bandwidth is set to 9 kHz for both quasi-peak detection and average detection measurements.

Line conducted data is recorded for both NEUTRAL and LINE.

TEST RESULTS

No non-compliance noted.

※ This EUT is not connected to AC Source directly. Not applicable for this test.



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9. ANTENNA REQUIREMENT

9.1 STANDARD APPLICABLE

For intentional device, according to FCC 47 CFR Section 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

And according to FCC 47 CFR Section 15.247 (b), if transmitting antennas of directional gain greater than 6dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

9.2 ANTENNA CONNECTED CONSTRUCTION

Manufacturer: Sunrex Type: PCB Model: JD-85M Gain: 0.37 dBi

===End of Test Report===