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$\mathbf{N0.} : \mathbf{\Pi} \mathbf{N1} \mathbf{D241} 00000$						
Applicant	:	SIEPER GMBH				
		Schlittenbacher Strasse 60, D-58511 Lüdenscheid, Germany				
Supplier / Manufacturer	:	SIEPER GMBH				
		Schlittenbacher Strasse 60, D-58511 Lüdenscheid, Germany				
Description of Sample(s)	:	Submitted sample(s) said to be				
- ····F ···· ·· ···F··(·)		Product: Massey Ferguson 9S with Bluetooth App-Control				
		Brand Name: N/A				
		Model No.: 10688500000				
		FCC ID: 2BCOX-6885				
Date Samples Received	:	2024-10-16				
Date Tested	:	2024-10-16 to 2024-10-23				
Investigation Requested	:	Perform ElectroMagnetic Interference measurement in accordance with FCC 47CFR [Codes of Federal Regulations] Part 15: 2017 and ANSI C63.10:2013 for FCC Certification.				
Conclusions	:	The submitted product <u>COMPLIED</u> with the requirements of Federal Communications Commission [FCC] Rules and Regulations Part 15. The tests were performed in accordance with the standards described above and on Section 2.2 in this Test Report.				
Remarks	:	Bluetooth DTS (GFSK)				
		For additional model(s) details, please see page 3				
Test by		Susu Brianch and the second se				
		Dr.CHAN Kwok Hung, Brian				

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Authorized Signatory



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<u>1.0</u> General Details

1.1 Test Laboratory

The Hong Kong Standards and Testing Centre Ltd.EMC Laboratory10 Dai Wang Street, Taipo Industrial Estate, New Territories, Hong KongTelephone:852 2666 1888Fax:852 2664 4353

1.2 Equipment Under Test [EUT] Description of Sample(s)

Product:	Massey Ferguson 9S with Bluetooth App-Control
Manufacturer:	SIEPER GMBH
Manufacturer.	Schlittenbacher Strasse 60, D-58511 Lüdenscheid, Germany
Brand Name:	N/A
Model Number:	10688500000
Rating:	4.5Vd.c.("AAA" battery *3)

1.2.1 Description of EUT Operation

The Equipment Under Test (EUT) is a Massey Ferguson 9S with Bluetooth App-Control. The transmission signal is digital modulated with channel frequency range 2402-2480MHz. The R.F. signal was modulated by IC; the type of modulation used was digital transmission Modulation.

1.3 Date of Order

2024-10-15

1.4 Submitted Sample(s):

1 Sample

1.5 Test Duration

2024-10-16 to 2024-10-23

1.6 Country of Origin

China

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1.7 **RF Module Details**

Module Model Number:	PTR9813
Module FCC ID:	N/A
Module Transmission Type:	Bluetooth 5.2 BLE
Modulation:	GFSK
Data Rates:	1Mbps/ 2Mbps
Frequency Range:	2400-2483.5MHz
Carrier Frequencies:	2402MHz - 2480MHz

Module Specification (specification provided by manufacturer)

1.8 Antenna Details

Antenna Type:	PCB antenna
Antenna Gain:	0.55dBi

1.9 Channel List

Channel	Frequency (MHz)	Channel	Frequency (MHz)
0	2402	20	2442
1	2404	21	2444
2	2406	22	2446
3	2408	23	2448
4	2410	24	2450
5	2412	25	2452
6	2414	26	2454
7	2416	27	2456
8	2418	28	2458
9	2420	29	2460
10	2422	30	2462
11	2424	31	2464
12	2426	32	2466
13	2428	33	2468
14	2430	34	2470
15	2432	35	2472
16	2434	36	2474
17	2436	37	2476
18	2438	38	2478
19	2440	39	2480

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<u>2.0</u> <u>Technical Details</u>

2.1 Investigations Requested

Perform Electromagnetic Interference measurements in accordance with FCC 47CFR [Codes of Federal Regulations] Part 15: 2017 Regulations and ANSI C63.10:2013for FCC Certification. The device was realized by test software, the power set is fixed value in software.

Direct Test Mode Tool	– 🗆 X
🔨 Menu	
Common Configuration COM Port Port Numb COM6 Refresh Mode () Transmitt () Receive	Transmit Radio Control Tx Pow 0 dBm Pavload M PRBS9 Pavload L 1 : Byte
N Single channel Multi ◀ ▶	Common Radio Control Run Time 1000 🗄 ms
Channel 0 ÷	PHY LE 1Mbps
	Receiver Radio Control Received Packet Erron &
Log IINFO	
16:38:39 INFO> Start Transmitt	ter Test
16:38:39 INFO> Port PHY	Length Power Channel
16:38:39 INFO> COM6 1	1 0 0
16:38:39 INFO> Start TX	
16:38:40 INFO> ####################################	
16:38:40 INFO> Completed trans	
16:38:40 INFO> ####################################	
Nordic Semiconductor	Start Close



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2.2 Test Standards and Results Summary Tables

EMISSION Results Summary								
Test Condition Test Requirement Test Method Class / Test Result								
			Severity	Pass	Failed	N/A		
Maximum Peak Output Power	FCC 47CFR 15.247(b)(3)	ANSI C63.10: 2013	N/A	\boxtimes				
Radiated Spurious	FCC 47CFR 15.209	ANSI C63.10: 2013	N/A	\boxtimes				
Emissions	FCC 47CFR 15.205							
AC Mains Conducted Emissions	FCC 47CFR 15.207	ANSI C63.10: 2013	N/A					
Conducted Spurious Emissions	FCC 47CFR 15.247(d)	ANSI C63.10: 2013	N/A	\boxtimes				
Power Spectral Density	FCC 47CFR 15.247(e)	ANSI C63.10: 2013	N/A	\boxtimes				
6dB Bandwidth	FCC 47CFR 15.247(a)(2)	ANSI C63.10: 2013	N/A	\boxtimes				
Band Edge Emissions	FCC 47CFR 15.247(d)	ANSI C63.10: 2013	N/A	\boxtimes				
(Radiated)								
Antenna requirement	FCC 47CFR 15.203	N/A	N/A	\boxtimes				

Note: N/A - Not Applicable

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3.0 Test Results

3.1 Emission

3.1.1 Maximum Peak Output Power

Test Requirement: Test Method:	FCC 47CFR 15.247(b)(3) ANSI C63.10: 2013	
Test Date:	2024-10-16	
Mode of Operation:	Bluetooth DTS Tx mode	
Ambient Temperature: 25°C	Relative Humidity: 51%	Atmospheric Pressure: 101 kPa

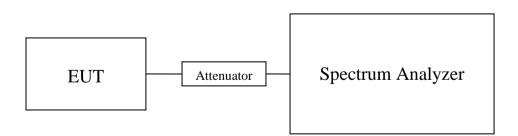
Test Method:

The RF output of the EUT was connected to the spectrum analyzer. All the attenuation or cable loss will be added to the measured maximum output power. The results are recorded in Watt.

Spectrum Analyzer Setting:

RBW = 3 MHz, VBW= 10MHz, Sweep = Auto, Span = 10MHz Detector = Peak, Trace = Max. hold

Test Setup:



Note: a temporary antenna connector was soldered to the RF output.



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Limits for Peak Output Power of Fundamental & Harmonics Emissions [FCC 47CFR 15.247]:

For Digital Transmission systems in 2400-2483.5 MHz Band: 1 Watt (30dBm)

Results of BT DTS Tx Mode (2402MHz to 2480MHz) : Pass (TX Unit) (GFSK 1Mbps)									
ChannelFrequency(MHz)Conducted power(dBm)Antenna Gain(dBi)E.I.R.P(dBm)E.I.R.P (Watt)									
0	2402	-4.96	0.55	-4.41	0.000362				
19	2440	-5.88	0.55	-5.33	0.000293				
39	2480	-6.77	0.55	-6.22	0.000239				

Results of BT DTS Tx Mode (2402MHz to 2480MHz) : Pass (TX Unit) (GFSK 2Mbps)

Channel	Frequency(MHz)	Conducted power(dBm)	Antenna Gain(dBi)	E.I.R.P(dBm)	E.I.R.P (Watt)
0	2402	-4.97	0.55	-4.42	0.000361
19	2440	-5.85	0.55	-5.30	0.000295
39	2480	-6.73	0.55	-6.18	0.000241

Calculated measurement uncertainty

: 30MHz to 1GHz 1.7dB 1GHz to 26GHz 1.7dB



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Test plot of Maximum Peak Conducted Output Power :

Bluetooth Communication mode (BT DTS-GFSK 1Mbps, 2402MHz)

Spectrum								
Ref Level e Att	14.00 dBm 30 dB		e RBV ms e VBV		Mode Auto	o Sweep		
●1Pk Max		~	12					
10 dBm						M1[1]	2.40	-4.96 dBm 21160 GHz
0 dBm					M1			
-10 dBm								
-20 dBm						-		
-30 dBm		-	_				 	1 may
-40 dBm							 	
-50 dBm		-						
-60 dBm								
-70 dBm								
-80 dBm								
CF 2.402 G	Ηz			69)1 pts	_L,	Span	10.0 MHz



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Bluetooth Communication mode (BT DTS-GFSK 1Mbps, 2440MHz)

Spectrum Ref Level Att	14.00 dBm 30 dB	SWT 1	e RBW		1ode Auto 9	Gweep			
●1Pk Max			-		<i>i</i>				
10 dBm				0	M:	1[1]	i	-5.88 di 2.4397540 G	
0 dBm				M1					
-10 dBm				X			<hr/>		
-20 dBm								~	
-30 dBm				_					- marker
-40 dBm								-	
-50 dBm									
-60 dBm				- io					
-70 dBm				- 19					
-80 dBm				2				4S	
CF 2.44 GHz				691	ntc			Snan	10.0 MHz



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Bluetooth Communication mode (BT DTS-GFSK 1Mbps, 2480MHz)

Spectrum Ref Level 14.00 dBr		3 MHz		
Att 30 d 1Pk Max	B SWT 1 ms 👄 VBW	10 MHz Mode	Auto Sweep	
10 dBm			M1[1]	-6.77 dBm 2.4796530 GHz
0 dBm		M1		
-10 dBm		X		_
-20 dBm				
~36 dBm				
-40 dBm				
-50 dBm				
-60 dBm				
-70 dBm				
-80 dBm				
CF 2.48 GHz		691 pts		Span 10.0 MHz



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Bluetooth Communication mode (BT DTS-GFSK 2Mbps, 2402MHz)

Spectrum		40 ⁻⁴ 4 1.000 (10)			
Ref Level 10.00 dBm Att 25 dB	● RBW SWT 1 ms ● VBW	3 MHz 10 MHz N	lode Auto Sw	/eep	
●1Pk Max					
			M1[1]	-4.97 dBn 2.4014650 GH;
0 dBm		M1			
-10 dBm					
-20 dBm					
-30 dBm					
-30 0811					
-40 dBm		2 0			
-50 dBm					
-60 dBm		2			
-70 dBm		-			
-80 dBm-					
CF 2.402 GHz		691	pts		 Span 10.0 MHz



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Bluetooth Communication mode (BT DTS-GFSK 2Mbps, 2440MHz)

Ref Level 10.00 c Att 25	dB SWT 1 ms 👄	RBW 3 MHz VBW 10 MHz Mo	de Auto Sweep	
●1Pk Max			1010000052994	1624 August - 9490.6
			M1[1]	-5.85 dBn 2.4394500 GH
0 dBm		M1		
-10 dBm				
-20 dBm				
430 dBm				
-40 dBm				
-50 dBm				
-60 dBm	_			
70.40				
-70 dBm				
-80 dBm	+ +			



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Bluetooth Communication mode (BT DTS-GFSK 2Mbps, 2480MHz)

RefLevel 10.00 dBm
● 1Pk Max
M1[1] -6.73 2.4794500
0 dBm
-10 dBm
-20 dBm
~30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
-80 dBm
CF 2.48 GHz 691 pts Span 10.0 M



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3.1.2 Radiated Emissions

Test Requirement:	FCC 47CFR 15.209
Test Method:	ANSI C63.10:2013
Test Date:	2024-10-17 to 2024-10-22
Mode of Operation:	Tx mode / Bluetooth Communication mode (GFSK)

Ambient Temperature: 25°C Relative Humidity: 50% Atmospheric Pressure: 101 kPa

Test Method:

For emission measurements at or below 1 GHz, the sample was placed 0.8m above the ground plane of semianechoic Chamber*. For emission measurements above 1 GHz, the sample was placed 1.5m above the ground plane of semi-anechoic Chamber*. Measurements in both horizontal and vertical polarities were performed. During the test, each emission was maximized by: having the EUT continuously working, investigated all operating modes, rotated about all 3 axis (X, Y & Z) and considered typical configuration to obtain worst position, manipulating interconnecting cables, rotating turntable, varying antenna height from 1m to 4m in both horizontal and vertical polarizations. The emissions worst-case are shown in Test Results of the following pages.

 * Semi-Anechoic chamber located on the G/F of The Hong Kong Standards and Testing Centre Ltd. with Registration Number: HK0001 Test Firm Registration Number: 367672

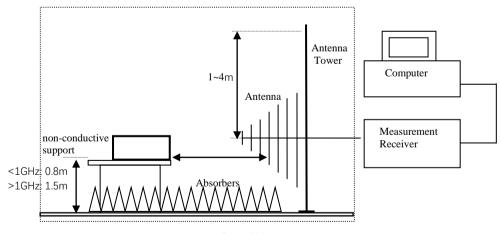


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Spectrum Analyzer Setting:

9KHz – 30MHz (Pk & Av)	RBW: VBW: Sweep: Span: Trace:	Auto Fully capture the emissions being measured
30MHz – 1GHz (QP)	RBW: VBW: Sweep: Span: Trace:	120kHz Auto Fully capture the emissions being measured
Above 1GHz (Pk)	RBW: VBW: Sweep: Span: Trace:	Auto Fully capture the emissions being measured
Above 1GHz (Av)	RBW: VBW: Sweep: Span: Trace:	Auto

Test Setup:



Ground Plane

- Absorbers placed on top of the ground plane are for measurements above 1000MHz only.

- Measurements between 30MHz to 1000MHz made with Bi-log antennas, above 1000MHz horn antennas are used.

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Limits for Radiated Emissions FCC 47 CFR 15.209]:

Frequency Range	Quasi-Peak Limits
[MHz]	[µV/m]
0.009-0.490	2400/F (kHz)
0.490-1.705	24000/F (kHz)
1.705-30	30
30-88	100
88-216	150
216-960	200
Above960	500

The emission limits shown in the above table are based on measurement employing a CISPR quasi-peak detector and above 1000MHz are based on measurements employing an average detector.

Remarks:

No additional spurious emissions found between lowest internal used/generated frequency and 30 MHz

Denotes restricted band of operation.

Measurements were made using a peak detector. Any emission less than 1000MHz and falling within the restricted bands of FCC Rules Part 15 Section 15.205 and the limits of FCC Rules Part 15 Section 15.209 were applied.

Correction Factor included Antenna Factor and Cable Attenuation.

Calculated measurement uncertainty

(30MHz -1GHz): 4.9dB (1GHz -6GHz): 4.02dB (6GHz -26.5GHz): 4.03dB

(9kHz-30MHz): 2.0dB

Emissions in the vertical and horizontal polarizations have been investigated and the worst-case test results are recorded in this report.



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Result of Tx mode (2402.0 MHz) (GFSK 1Mbps) (9kHz - 30MHz): Pass

Field Strength of Spurious Emissions								
Peak Value								
Frequency	Measured	Correction	Field	Field	Limit	E-Field		
	Level	Factor	Strength	Strength		Polarity		
MHz	dBuV	dB/m	dBuV/m	uV/m	uV/m			
	Emissions detected are more than 20 dB below the FCC Limits							

Result of Tx mode (2402.0 MHz) (GFSK 1Mbps) (Above 1GHz): Pass

Field Strength of Spurious Emissions Peak Value								
Frequency	Measured	Correction	Field	Limit	Margin	E-Field		
1 5	Level @3m	Factor	Strength	@3m	U	Polarity		
MHz	dBµV	dB/m	dBµV/m	dBµV/m	dB	-		
4804.0	56.8	0.82	57.6	74.0	16.4	Vertical		
4804.0	56.3	0.52	56.8	74.0	17.2	Horizontal		
7206.0	49.8	7	56.8	74.0	17.2	Vertical		
7206.0	49.7	6.5	56.2	74.0	17.8	Horizontal		
9608.0	46.7	8.5	55.2	74.0	18.8	Vertical		
9608.0	47.2	8.3	55.5	74.0	18.5	Horizontal		
12010.0	45.0	10.9	55.9	74.0	18.1	Vertical		
12010.0	45.3	10.8	56.1	74.0	17.9	Horizontal		

Field Strength of Spurious Emissions Average Value								
Frequency	Measured	Correction	Field	Limit	Margin	E-Field		
	Level @3m	Factor	Strength	@3m		Polarity		
MHz	dBµV	dB/m	dBµV/m	dBµV/m	dB			
4804.0	41.3	0.82	42.1	54.0	11.9	Vertical		
4804.0	41.2	0.52	41.7	54.0	12.3	Horizontal		
7206.0	35.0	7	42.0	54.0	12.0	Vertical		
7206.0	35.1	6.5	41.6	54.0	12.4	Horizontal		
9608.0	30.6	8.5	39.1	54.0	14.9	Vertical		
9608.0	31.5	8.3	39.8	54.0	14.2	Horizontal		
12010.0	30.4	10.9	41.3	54.0	12.7	Vertical		
12010.0	30.1	10.8	40.9	54.0	13.1	Horizontal		

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Result of Tx mode (2440.0 MHz) (GFSK 1Mbps) (9kHz - 30MHz): Pass

Field Strength of Spurious Emissions								
Peak Value								
Frequency	Measured	Correction	Field	Field	Limit	E-Field		
	Level	Factor	Strength	Strength		Polarity		
MHz	dBuV	dB/m	dBuV/m	uV/m	uV/m			
	Emissions detected are more than 20 dB below the FCC Limits							

Result of Tx mode (2440.0 MHz) (GFSK 1Mbps) (Above 1GHz): Pass

	Field Strength of Spurious Emissions Peak Value									
Frequency	Measured	Correction	Field	Limit	Margin	E-Field				
	Level @3m	Factor	Strength	@3m		Polarity				
MHz	dBµV	dB/m	dBµV/m	dBµV/m	dB					
4880.0	56.6	0.82	57.4	74.0	16.6	Vertical				
4880.0	56.0	0.52	56.5	74.0	17.5	Horizontal				
7320.0	49.5	7	56.5	74.0	17.5	Vertical				
7320.0	49.8	6.5	56.3	74.0	17.7	Horizontal				
9760.0	46.9	8.5	55.4	74.0	18.6	Vertical				
9760.0	47.3	8.3	55.6	74.0	18.4	Horizontal				
12200.0	45.2	10.9	56.1	74.0	17.9	Vertical				
12200.0	45.1	10.8	55.9	74.0	18.1	Horizontal				

	Field Strength of Spurious Emissions Average Value									
Frequency	Measured	Correction	Field	Limit	Margin	E-Field				
	Level @3m	Factor	Strength	@3m		Polarity				
MHz	dBµV	dB/m	dBµV/m	dBµV/m	dB					
4880.0	41.3	0.82	42.1	54.0	11.9	Vertical				
4880.0	41.2	0.52	41.7	54.0	12.3	Horizontal				
7320.0	35.0	7	42.0	54.0	12.0	Vertical				
7320.0	35.2	6.5	41.7	54.0	12.3	Horizontal				
9760.0	32.6	8.5	41.1	54.0	12.9	Vertical				
9760.0	32.7	8.3	41.0	54.0	13.0	Horizontal				
12200.0	30.5	10.9	41.4	54.0	12.6	Vertical				
12200.0	30.2	10.8	41.0	54.0	13.0	Horizontal				

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Result of Tx mode (2480.0 MHz) (GFSK 1Mbps) (9kHz - 30MHz): Pass

Field Strength of Spurious Emissions							
Peak Value							
Frequency	Measured	Correction	Field	Field	Limit	E-Field	
	Level	Factor	Strength	Strength		Polarity	
MHz	dBuV	dB/m	dBuV/m	uV/m	uV/m		
	Emissions detected are more than 20 dB below the FCC Limits						

Result of Tx mode (2480.0 MHz) (GFSK 1Mbps) (Above 1GHz): Pass

	Field Strength of Spurious Emissions Peak Value									
Frequency	Measured	Correction	Field	Limit	Margin	E-Field				
1 5	Level @3m	Factor	Strength	@3m	U	Polarity				
MHz	dBµV	dB/m	dBµV/m	dBµV/m	dB	-				
4960.0	56.0	0.82	56.8	74.0	17.2	Vertical				
4960.0	56.5	0.52	57.0	74.0	17.0	Horizontal				
7440.0	49.6	7	56.6	74.0	17.4	Vertical				
7440.0	50.2	6.5	56.7	74.0	17.3	Horizontal				
9920.0	47.1	8.5	55.6	74.0	18.4	Vertical				
9920.0	47.2	8.3	55.5	74.0	18.5	Horizontal				
12400.0	45.3	10.9	56.2	74.0	17.8	Vertical				
12400.0	45.5	10.8	56.3	74.0	17.8	Horizontal				

	Field Strength of Spurious Emissions Average Value									
Frequency	Measured	Correction	Field	Limit	Margin	E-Field				
	Level @3m	Factor	Strength	@3m		Polarity				
MHz	dBµV	dB/m	dBµV/m	dBµV/m	dB					
4960.0	41.2	0.82	42.0	54.0	12.0	Vertical				
4960.0	42.0	0.52	42.5	54.0	11.5	Horizontal				
7440.0	34.6	7	41.6	54.0	12.4	Vertical				
7440.0	35.3	6.5	41.8	54.0	12.2	Horizontal				
9920.0	32.5	8.5	41.0	54.0	13.0	Vertical				
9920.0	31.6	8.3	39.9	54.0	14.1	Horizontal				
12400.0	30.0	10.9	40.9	54.0	13.1	Vertical				
12400.0	30.3	10.8	41.1	54.0	12.9	Horizontal				

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Result of Tx mode (2402.0 MHz) (GFSK 2Mbps) (9kHz - 30MHz): Pass

	Field Strength of Spurious Emissions							
Peak Value								
Frequency	Measured	Correction	Field	Field	Limit	E-Field		
	Level	Factor	Strength	Strength		Polarity		
MHz	dBuV	dB/m	dBuV/m	uV/m	uV/m			
	Emissions	detected are 1	nore than 20	dB below the	FCC Limits			

Result of Tx mode (2402.0 MHz) (GFSK 2Mbps) (Above 1GHz): Pass

	Field Strength of Spurious Emissions Peak Value									
Frequency	Measured	Correction	Field	Limit	Margin	E-Field				
1	Level @3m	Factor	Strength	@3m		Polarity				
MHz	dBµV	dB/m	dBµV/m	dBµV/m	dB					
4804.0	56.0	0.82	56.8	74.0	17.2	Vertical				
4804.0	56.8	0.52	57.3	74.0	16.7	Horizontal				
7206.0	49.6	7	56.6	74.0	17.4	Vertical				
7206.0	50.0	6.5	56.5	74.0	17.5	Horizontal				
9608.0	57.5	8.5	66.0	74.0	8.0	Vertical				
9608.0	47.2	8.3	55.5	74.0	18.5	Horizontal				
12010.0	44.9	10.9	55.8	74.0	18.2	Vertical				
12010.0	45.3	10.8	56.1	74.0	17.9	Horizontal				

	Field Strength of Spurious Emissions Average Value									
Frequency	Measured	Correction	Field	Limit	Margin	E-Field				
	Level @3m	Factor	Strength	@3m		Polarity				
MHz	dBµV	dB/m	dBµV/m	dBµV/m	dB					
4804.0	41.0	0.82	41.8	54.0	12.2	Vertical				
4804.0	41.6	0.52	42.1	54.0	11.9	Horizontal				
7206.0	34.5	7	41.5	54.0	12.5	Vertical				
7206.0	35.2	6.5	41.7	54.0	12.3	Horizontal				
9608.0	30.9	8.5	39.4	54.0	14.6	Vertical				
9608.0	32.6	8.3	40.9	54.0	13.1	Horizontal				
12010.0	30.4	10.9	41.3	54.0	12.7	Vertical				
12010.0	30.2	10.8	41.0	54.0	13.0	Horizontal				

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Result of Tx mode (2440.0 MHz) (GFSK 2Mbps) (9kHz - 30MHz): Pass

Field Strength of Spurious Emissions							
Peak Value							
Frequency	Measured	Correction	Field	Field	Limit	E-Field	
	Level	Factor	Strength	Strength		Polarity	
MHz	dBuV	dB/m	dBuV/m	uV/m	uV/m		
	Emissions	detected are r	nore than 20	dB below the	FCC Limits		

Result of Tx mode (2440.0 MHz) (GFSK 2Mbps) (Above 1GHz): Pass

	Field Strength of Spurious Emissions Peak Value									
Frequency	Measured	Correction	Field	Limit	Margin	E-Field				
	Level @3m	Factor	Strength	@3m		Polarity				
MHz	dBµV	dB/m	$dB\mu V/m$	dBµV/m	dB					
4880.0	56.2	0.82	57.0	74.0	17.0	Vertical				
4880.0	56.3	0.52	56.8	74.0	17.2	Horizontal				
7320.0	49.5	7	56.5	74.0	17.5	Vertical				
7320.0	50.0	6.5	56.5	74.0	17.5	Horizontal				
9760.0	47.4	8.5	55.9	74.0	18.1	Vertical				
9760.0	47.2	8.3	55.5	74.0	18.5	Horizontal				
12200.0	45.4	10.9	56.3	74.0	17.7	Vertical				
12200.0	45.3	10.8	56.1	74.0	17.9	Horizontal				

	Field Strength of Spurious Emissions Average Value									
Frequency	Measured	Correction	Field	Limit	Margin	E-Field				
	Level @3m	Factor	Strength	@3m		Polarity				
MHz	dBµV	dB/m	dBµV/m	dBµV/m	dB					
4880.0	41.0	0.82	41.8	54.0	12.2	Vertical				
4880.0	41.8	0.52	42.3	54.0	11.7	Horizontal				
7320.0	34.9	7	41.9	54.0	12.1	Vertical				
7320.0	34.8	6.5	41.3	54.0	12.7	Horizontal				
9760.0	31.7	8.5	40.2	54.0	13.8	Vertical				
9760.0	32.7	8.3	41.0	54.0	13.0	Horizontal				
12200.0	30.2	10.9	41.1	54.0	12.9	Vertical				
12200.0	30.4	10.8	41.2	54.0	12.8	Horizontal				

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Result of Tx mode (2480.0 MHz) (GFSK 2Mbps) (9kHz - 30MHz): Pass

	Field Strength of Spurious Emissions							
Peak Value								
Frequency	Measured	Correction	Field	Field	Limit	E-Field		
	Level	Factor	Strength	Strength		Polarity		
MHz	dBuV	dB/m	dBuV/m	uV/m	uV/m			
	Emissions detected are more than 20 dB below the FCC Limits							

Result of Tx mode (2480.0 MHz) (GFSK 2Mbps) (Above 1GHz): Pass

	Field Strength of Spurious Emissions Peak Value							
Frequency	Measured	Correction	Field	Limit	Margin	E-Field		
	Level @3m	Factor	Strength	@3m	-	Polarity		
MHz	dBµV	dB/m	dBµV/m	dBµV/m	dB			
4960.0	56.1	0.82	56.9	74.0	17.1	Vertical		
4960.0	56.3	0.52	56.8	74.0	17.2	Horizontal		
7440.0	49.5	7	56.5	74.0	17.5	Vertical		
7440.0	49.5	6.5	56.0	74.0	18.0	Horizontal		
9920.0	47.4	8.5	55.9	74.0	18.1	Vertical		
9920.0	47.1	8.3	55.4	74.0	18.6	Horizontal		
12400.0	45.1	10.9	56.0	74.0	18.0	Vertical		
12400.0	45.3	10.8	56.1	74.0	17.9	Horizontal		

	Field Strength of Spurious Emissions Average Value							
Frequency	Measured	Ieasured Correction Field Limit Margin						
	Level @3m	Factor	Strength	@3m		Polarity		
MHz	dBµV	dB/m	dBµV/m	dBµV/m	dB			
4960.0	41.2	0.82	42.0	54.0	12.0	Vertical		
4960.0	41.3	0.52	41.8	54.0	12.2	Horizontal		
7440.0	34.2	7	41.2	54.0	12.8	Vertical		
7440.0	35.1	6.5	41.6	54.0	12.4	Horizontal		
9920.0	32.7	8.5	41.2	54.0	12.8	Vertical		
9920.0	31.7	8.3	40.0	54.0	14.0	Horizontal		
12400.0	30.3	10.9	41.2	54.0	12.8	Vertical		
12400.0	30.5	10.8	41.3	54.0	12.7	Horizontal		

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Radiated Emissions Measurement:

Limit :

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated 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 band 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 Section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.205(c)).

Result: RF Radiated Emissions (Lowest)-GFSK 1Mbps

Field Strength of Band-edge Compliance						
			Peak Value			
Frequency	Measured	Correction	Field	Limit	Margin	E-Field
	Level @3m Factor Strength @3m Polari					
MHz	dBµV	dB/m	dBµV/m	dBµV/m	dB	
2390.0	47.6	-4.8	42.8	74.0	31.2	Vertical
2390.0	48.0	-4.7	43.3	74.0	30.7	Horizontal

Field Strength of Band-edge Compliance							
Average Value							
Frequency	Measured	Correction	Field	Limit	Margin	E-Field	
	Level @3m	Factor	Strength	@3m		Polarity	
MHz	dBµV	dB/m	$dB\mu V/m$	dBµV/m	dB		
2390.0	42.0	-4.8	37.2	54.0	16.8	Vertical	
2390.0	2390.0 41.4 -4.7 36.7 54.0 17.3 Horizontal						

Result: RF Radiated Emissions (Highest) -GFSK 1Mbps

Field Strength of Band-edge Compliance						
			Peak Value			
Frequency	Measured	Correction	Field	Limit	Margin	E-Field
	Level @3m Factor Strength @3m Polari					
MHz	dBµV	dB/m	$dB\mu V/m$	$dB\mu V/m$	dB	
2483.5	58.5	-4.8	53.7	74.0	20.3	Vertical
2483.5	58.0	-4.7	53.3	74.0	20.7	Horizontal

Field Strength of Band-edge Compliance						
		A	verage Valu	e		
Frequency	Measured	Correction	Field	Limit	Margin	E-Field
	Level @3m	Factor	Strength	@3m		Polarity
MHz	dBµV	dB/m	dBµV/m	dBµV/m	dB	
2483.5	44.2	-4.8	39.4	54.0	14.6	Vertical
2483.5	44.3	-4.7	39.6	54.0	14.4	Horizontal

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Result: RF Radiated Emissions (Lowest)-GFSK 2Mbps

Field Strength of Band-edge Compliance							
			Peak Value				
Frequency	Measured	Correction	Field	Limit	Margin	E-Field	
	Level @3m	Factor	Strength	@3m		Polarity	
MHz	dBµV	dB/m	dBµV/m	dBµV/m	dB		
2390.0	48.5	-4.8	43.7	74.0	30.3	Vertical	
2390.0	49.0	-4.7	44.3	74.0	29.7	Horizontal	

Field Strength of Band-edge Compliance							
		Α	verage Valu	e			
Frequency	Measured	Correction	Field	Limit	Margin	E-Field	
	Level @3m	Level @3m Factor Strength @3m F					
MHz	dBµV	dB/m	$dB\mu V/m$	dBµV/m	dB		
2390.0	42.5	-4.8	37.7	54.0	16.3	Vertical	
2390.0	43.0	-4.7	38.3	54.0	15.7	Horizontal	

Result: RF Radiated Emissions (Highest) -GFSK 2Mbps

Field Strength of Band-edge Compliance						
	Peak Value					
Frequency	Measured	Correction	Field	Limit	Margin	E-Field
	Level @3m	Factor	Strength	@3m		Polarity
MHz	dBµV	dB/m	dBµV/m	dBµV/m	dB	
2483.5	58.5	-4.8	53.7	74.0	20.3	Vertical
2483.5	59.2	-4.7	54.5	74.0	19.5	Horizontal

Field Strength of Band-edge Compliance							
			A	verage Valu	e		
Freque	ency	Measured	Correction	Field	Limit	Margin	E-Field
		Level @3m	Factor	Strength	@3m		Polarity
MH	łz	dBµV	dB/m	dBµV/m	dBµV/m	dB	
248	3.5	45.0	-4.8	40.2	54.0	13.8	Vertical
248	33.5	44.6	-4.7	39.9	54.0	14.1	Horizontal

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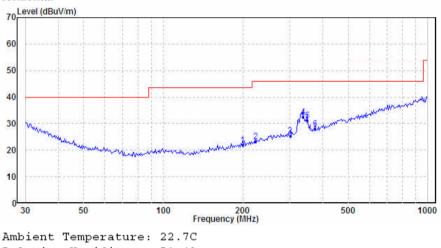
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Results of Bluetooth mode (2402.0 MHz) (30MHz – 1GHz): Pass

Please refer to the following table for result details(The data is the worst cases) Horizontal



Relative Humidity : 51.4% Air Pressure : 100.8kPa

Limit Over Freq Level Line Limit Remark Pol/Phase MHz dBuV/m dBuV/m dB 1 199.286 21.82 43.50 -21.68 QP Horizontal 2 222.950 23.14 46.00 -22.86 QP Horizontal 301.422 25.44 46.00 -20.56 QP Horizontal З 4 337.216 32.48 46.00 -13.52 QP Horizontal 5 349.250 31.28 46.00 -14.72 QP Horizontal 374.623 28.08 46.00 -17.92 OP Horizontal 6

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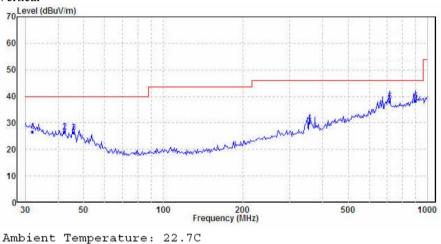
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Results of Bluetooth mode (2402.0 MHz) (30MHz – 1GHz): Pass

Please refer to the following table for result details(The data is the worst cases) Vertical



Ambient Temperature: 22.7C Relative Humidity : 51.4% Air Pressure : 100.8kPa

	Freq	Level	Limit Line	Over Limit	Remark	Pol/Phase
-	MHz	dBuV/m	dBuV/m	dB		
1	31.955	26.81	40.00	-13.19	QP	Vertical
2	42.302	26.75	40.00	-13.25	QP	Vertical
3	45.695	26.34	40.00	-13.66	QP	Vertical
4	356.676	30.14	46.00	-15.86	QP	Vertical
5	719.200	38.02	46.00	-7.98	QP	Vertical
6	900.147	38.19	46.00	-7.81	QP	Vertical

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3.1.3 AC Mains Conducted Emissions (0.15MHz to 30MHz)

Test Requirement:	FCC 47CFR 15.207
1	
Test Method:	ANSI C63.10:2013
Test Date:	N/A
Mode of Operation:	N/A
Test Voltage:	N/A

Ambient Temperature: 25°C

Relative Humidity: 51%

Atmospheric Pressure: 101 kPa

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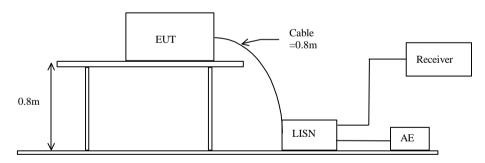
Test Method:

The test was performed in accordance with ANSI ANSI C63.10:2013, with the following: an initial measurement was performed in peak and average detection mode on the live line, any emissions recorded within 30dB of the relevant limit line were re-measured using quasi-peak and average detection on the live and neutral lines with the worst case recorded in the table of results.

Receiver Setting:

Bandw. = 9 kHz, Meas. Time= 10.0 ms, Step Width = 5.0kHz Detector = MaxPeak and CISPR AV

Test Setup:



Limits for Conducted Emissions (FCC 47 CFR 15.207):

Frequency Range	Quasi-Peak Limits	Average	
[MHz]	[dBµV]	[dBµV]	
0.15-0.5	66 to 56*	56 to 46*	
0.5-5.0	56	46	
5.0-30.0	60	50	

* Decreases with the logarithm of the frequency.

Remarks:

Calculated measurement uncertainty (0.15MHz - 30MHz): 3.25dB

-*- Test result: N/A

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3.1.4 Power Spectral Density

Test Requirement:	FCC 47CFR 15.247(e)
Test Method:	ANSI C63.10:2013
Test Date:	2024-10-18
Mode of Operation:	Tx mode

Ambient Temperature: 25°C Relative Humidity: 51%

Atmospheric Pressure: 101 kPa

Test Method:

The RF output of the EUT was connected to the spectrum analyzer. Set the fundamental frequency as the center frequency of the spectral analyzer. Use RBW=3kHz, VBW= 10KHz, Set the span to 1.5 times the DTS channel bandwidth. Detector = peak, Sweep time = auto couple, Trace mode = max hold. Measure the Power Spectral Density (PSD) and record the results in dBm.

Test Setup:

As Test Setup of clause 3.1.1 in this test report.

Test Limit:

The maximum power spectral density (PSD) shall not exceeded 8dBm in any 3kHz band.

Results of Tx Mode GFSK 1Mbps (Tx:2402MHz to 2480MHz) : Pass (Tx Unit) Maximum power spectral density

Transmitter Frequency (MHz)	Maximum Power spectral density level / 3kHz band (dBm)	Maximum Power spectral density / 3kHz band limit
2402.0	-20.44	8dBm
2440.0	-21.21	8dBm
2480.0	-22.08	8dBm

Results of Tx Mode GFSK 2Mbps (Tx:2402MHz to 2480MHz) : Pass (Tx Unit) Maximum power spectral density

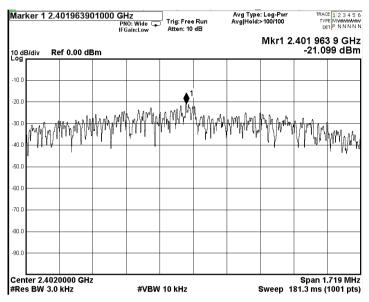
Transmitter Frequency (MHz)	Maximum Power spectral density level / 3kHz band (dBm)	Maximum Power spectral density / 3kHz band limit
2402.0	-21.099	8dBm
2440.0	-22.342	8dBm
2480.0	-23.216	8dBm

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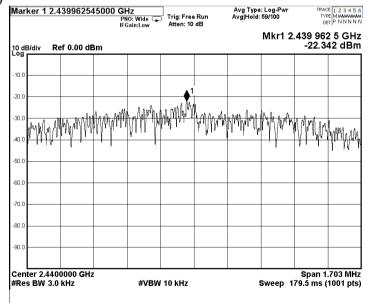


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Tx mode GFSK 1Mbps (Tx: 2402MHz to 2480MHz) CH 0 (2402.0 MHz)



CH 19 (2440.0 MHz)



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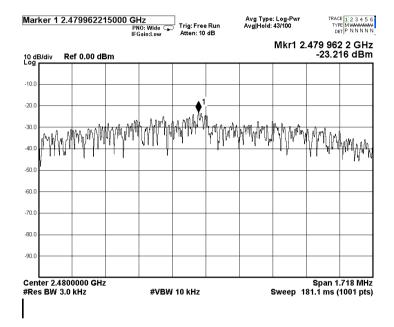
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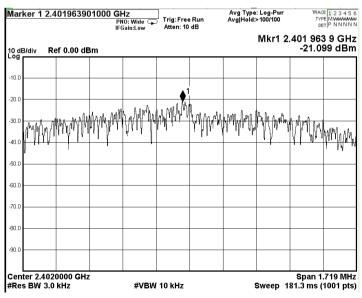
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CH 39 (2480.0 MHz)



Tx mode GFSK 2Mbps (Tx: 2402MHz to 2480MHz) CH 0 (2402.0 MHz)

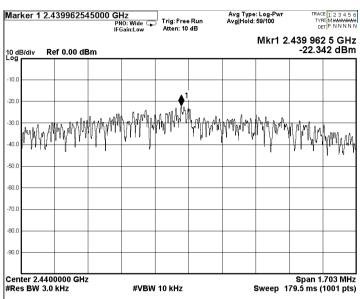




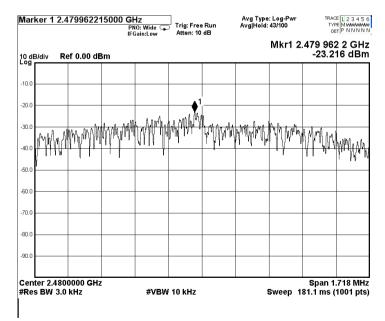
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CH 19 (2440.0 MHz)



CH 39 (2480.0 MHz)



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3.1.5 6dB Spectrum Bandwidth Measurement

Test Requirement:	FCC 47CFR 15.247(a)(2)
Test Method:	ANSI C63.10:2013
Test Date:	2024-10-21
Mode of Operation:	Tx mode

Ambient Temperature: 25°C Relative Humidity: 51%

Atmospheric Pressure: 101 kPa

Test Method:

The bandwidth is measured at an amplitude level reduced from the reference level by a specified ratio. The reference level is the level of the highest amplitude signal observed from the transmitter at the fundamental frequency. Once the reference level is established, the equipment is conditioned with typical modulating signal to produce the worst-case (i.e. the widest) bandwidth.

Test Setup:

As Test Setup of clause 3.1.1 in this test report.



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Limits for 6dB Spectrum Bandwidth Measurement:

Center Frequency	6dB Bandwidth	FCC Limits
[MHz]	[KHz]	[kHz]
2402.0	712.0	

Spectr		0.00 dBn	- DD	W 100 kHz			
Att	Vel 20	0.00 UBN 30 dE	the second s		de Auto FFT		
●1Pk Ma	x						
10 dBm- 0 dBm—				M	M1[1] ndB Bw Q factor		-5.25 dBn 2.40198260 GH 6.00 dl 712.000000000 kH 3373.
-10 dBm	_		Т	T		-	
-20 dBm							
-30 dBm	_					\wedge	
-40 dBm							
-50 dBm	+						
-60 dBm	+					_	
-70 dBm	+						
CF 2.40	2 GHz			691 pts			Span 3.0 MHz
larker Type	Ref	Trc	X-value	Y-value	Function	Eup	ction Result
M1	NGI	1	2.4019826 GHz	-5.25 dBm	ndB down	run	712.0 kHz
T1		1	2.4016266 GHz	-11.25 dBm	ndB		6.00 dB
T2		1	2.4023386 GHz	-11.26 dBm	Q factor		3373.5

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Limits for 6dB Spectrum Bandwidth Measurement:

Frequency Range	6dB Bandwidth	FCC Limits
[MHz]	[KHz]	[kHz]
2440.0	707.7	> 500

Spectrun	294					
Ref Leve	l 20.00 dBr	(4)	W 100 kHz			
Att	30 d	B SWT 19 µs 🖷 VE	W 300 kHz Mo	de Auto FFT		
1Pk Max						
				M1[1]		-6.30 dB
10 dBm						2.43997830 GH
10 0011				ndB		6.00 d
0 d8m				Bw		707.70000000 kH
o dom			M1	Q factor	ñ.,	3447.
-10 dBm		T		<u>~</u>		
10 0011			<i>v</i>	X		
-20 dBm					<u> </u>	
		X				
-30 dBm						
-40 dBm		\sim $-$				
_						
-58 dBm						
-60 dBm						
-70 dBm		-	<i></i>			
CF 2.44 GH	17		691 pts			Span 3.0 MHz
larker	14		091 pt3			opan o.o mn
Type Re	f Trc	X-value	Y-value	Function	Eur	ction Result
M1	1	2.4399783 GHz	-6.30 dBm	ndB down	1 41	707.7 kHz
T1	1	2.4396266 GHz	-12.30 dBm	ndB		6.00 dE
T2	1	2.4403343 GHz	-12.31 dBm	Q factor		3447.9

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Limits for 6dB Spectrum Bandwidth Measurement:

Frequency Range	6dB Bandwidth	FCC Limits
[MHz]	[KHz]	[kHz]
2480.0	707.7	> 500

Spect							
Ref L	evel :	20.00 dBm		SW 100 kHz			
Att		30 dB	SWT 19 µs 👄 VE	3W 300 kHz Mo	de Auto FFT		
∎1Pk M	ax		2 <u>30</u>				
					M1[1]		-7.15 dBi
10 dBm							2.47997830 GH
ro abiii					ndB		6.00 d
0 dBm-					Bw		707.70000000 kH
o abiii				M1	Q factor	7	3504.
-10 dBn			Т		<u></u>		
10 001	°		1	2	X		
-20 dBn						<u> </u>	
20 000						\mathbf{X}	
-30 dBn							
00 000	8		1				~
-40 dBn			~ _				
1200	-	~					
-50 dBn				-			
-60 dBn	i						
-70 dBn	<u>ا</u> لـــــ						
CF 2.4	B GHZ			691 pts			Span 3.0 MHz
Marker				001 pt	·		opan olo min
Type	Ref	Trc	X-value	Y-value	Function	Funr	ction Result
M1		1	2.4799783 GHz	-7.15 dBm	ndB down		707.7 kHz
Τ1		1	2.4796266 GHz	-13.12 dBm	ndB		6.00 dB
T2		1	2.4803343 GHz	-13.10 dBm	Q factor		3504.4

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Limits for 6dB Spectrum Bandwidth Measurement:

Center Frequency	6dB Bandwidth	FCC Limits
[MHz]	[MHz]	[kHz]
2402.0	1.146	> 500

ef Value	15.00 dBn		Ce	amental Emission on GFSK 2N Center Freq: 2.402000000 GHz Trig: Free Run Avg Hold:>10/1			Radio Std: None	
		#IF		ig: Free Run tten: 10 dB	Avginoid	>10/10	Radio De	vice: BTS
) d <u>B/div</u>	Ref 15.00	0 dBm						
.00								
00								
5.0				~~~~~~~	~			
5.0					~~	\mathbb{N}		
enter 2.4 Res BW				#VBW 30	0 kHz			oan 5 M⊦ eep 1 m
Occup	ied Band	width		Total	Power	3.62	2 dBm	
		2.07	763 MHz					
Transm	it Freq Err	or	-8.922 kHz	OBW	Power	99	9.00 %	
	ndwidth		1.146 MHz	x dB		-6	00 dB	

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Limits for 6dB Spectrum Bandwidth Measurement:

Frequency Range	6dB Bandwidth	FCC Limits
[MHz]	[MHz]	[kHz]
2440.0	1.135	> 500

6dB Bandwidth of Fundamental Emission on GFSK 2Mbps (2440MHz) Center Freq: 2.440000000 GHz Trig: Free Run Avg|Ho Radio Std: None x dB -6.00 dB Avg|Hold:>10/10 Ð #IFGain:Low Radio Device: BTS #Atten: 10 dB Ref 13.00 dBm 10 dB/div Loa 3.00 -7.00 -17.0 -27.0 -37.0 -47.0 -57.0 -67.0 -77 O Center 2.44 GHz Span 5 MHz #Res BW 100 kHz #VBW 300 kHz Sweep 1 ms **Total Power** 2.28 dBm **Occupied Bandwidth** 2.0743 MHz Transmit Freg Error -9.525 kHz **OBW Power** 99.00 % x dB Bandwidth 1.135 MHz x dB -6.00 dB

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Limits for 6dB Spectrum Bandwidth Measurement:

Frequency Range	6dB Bandwidth	FCC Limits
[MHz]	[MHz]	[kHz]
2480.0	1.145	> 500

6dB Bandwidth of Fundamental Emission on GFSK 2Mbps (2480MHz) Center Freq 2.48000000 GHz Center Freq: 2.48000000 GHz Radio Std: None

	-q 2.400000		IFGain:Low	Trig: Fre #Atten:		Avg Hold	:>10/10	Radio De	vice: BTS
0 dB/div	Ref 13.00 (dBm	_						
.og 3.00									
.00									
7.0				~~~		<u></u>			
7.0		1				<u> </u>	\wedge		
.0							- Maria		
7.0	\sim						λ.		
7.0									
7.0									
enter 2.4 Res BW				#V	BW 300 k	Hz			oan 5 MH eep 1 m
Occup	ied Bandw	idth			Total P	ower	1.4	0 dBm	
		2.0	778 MF	lz					
Transm	it Freq Error	r	-10.819 k	Hz	OBW P	ower	9	9.00 %	
x dB Ba	Indwidth		1.145 M	Hz	x dB		-6	.00 dB	

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3.1.6 Band Edges Measurement

Test Requirement:	FCC 47CFR 15.247
Test Method:	ANSI C63.10:2013
Test Date:	2024-10-21
Mode of Operation:	Tx mode

Ambient Temperature: 25°C Relative Humidity: 51%

Atmospheric Pressure: 101 kPa

Test Method:

The band edge is measured at an amplitude level reduced from the reference level by a specified ratio. The reference level is the level of the highest amplitude signal observed from the transmitter at the fundamental frequency. The RBW are set to 100kHz and VBW are set to 300kHz for this measurement.

Test Setup:

As Test Setup of clause 3.1.2 in this test report.



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Band-edge Compliance of RF Conducted Emissions Measurement:

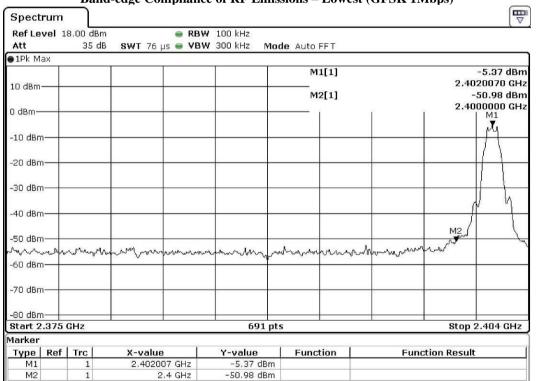
Limit :

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated 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 band 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 Section 15.209(a) is not required.

Remark: Emissions under the fixed frequency mode and hopping mode have been investigated, the worst-case measurement results were recorded in the test report

Band-edge Compliance of RF Conducted Emissions Measurement:

Frequency Range	Reference level	Limit	The highest conducted band edge emission	Result
[MHz]	[dBm]	[dBm]	[dBm]	
2400 – Lowest Fundamental (2402)	-5.37	-25.37	-50.98	PASS



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Band-edge Compliance of RF Emissions - Lowest (GFSK 1Mbps)



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Band-edge Compliance of RF Conducted Emissions Measurement:

Frequency Range	Reference level	Limit	The highest conducted band edge emission	Result	
[MHz]	[dBm]	[dBm]	[dBm]		
2483.5 - Highest Fundamental (2480)	-7.16	-27.16	-60.45	PASS	

Spect	rum		-edge Compl				ngnese		(10p 5)	
Ref Le	vel 7.	00 dBm		🔵 RBW 100 k	Hz					
Att		25 dB	SWT 56.9 µs	📄 VBW 300 k	Hz Mod	le Auto F	FT			
●1Pk M	ax									
						M1[1]			-7.16 dBm
0 dBm-						-			2.47	799590 GH:
	M1					M2[1]			-60.45 dBn
-10 dBn	n <u>M</u>								2.48	35000 GH:
	$I = \mathbb{N}$									
-20 dBn	6									
-30 dBh		<u></u>								
-40 8Bn	n	<u>v</u>								
10 101	·	1								
-50 dBn		٦,								
Ap upu		5	er anten i							
-60 dBn	~	4	N M2							
-00 UBI			"Vun	monor	wood at A		A	man anna	me as me	اس ورسید ا
					~~		- uni	1		1
-70 dBn	n									
-80 dBn	n			1				22		2
-90 dBn										
Start 2		GHz			691 pts				Sto	pp 2.5 GHz
Marker										
Туре	Ref	Trc	X-value	Y-va		Functio	on 📃	Fun	ction Result	t
M1		1	2.479959 @	and the second sec	16 dBm					
M2		1	2,4835 G	Hz -60.	45 dBm					

Band-edge Compliance of RF Emissions – Highest (GFSK 1Mbps)

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Band-edge Compliance of RF Conducted Emissions Measurement:

Frequency Range	Reference level	Limit	The highest conducted band edge emission	Result
[MHz]	[dBm]	[dBm]	[dBm]	
2400 – Lowest Fundamental (2402)	-5.26	-25.26	-37.27	PASS

Spectru	n				
	17.00 dBm		₩ 100 kHz		
Att	35 dB	SWT 76 µs 🖷 VB	W 300 kHz Mod	le Auto FFT	
●1Pk Max					
				M1[1]	-5.26 dBi
10 dBm			*		2.4019650 GH
				M2[1]	-37.27 dBi
0 dBm					2.400000 GH
-10 dBm—					- I I I
-20 dBm—					
-20 abm—					
-30 dBm					
-30 abin					<u> M2 / </u>
-40 dBm					
io dom					- / V V
-50 dBm					
- Month	henrowen	my unpromision	www.mm	manne	andrownownand
-60 dBm				2 25-19-0-19-0-00-00-00-00-00-00-00-00-00-00-00-00-	
-70 dBm—		-			
-80 dBm—					
Start 2.37	5 GHz		691 pts		Stop 2.404 GHz
Marker					
Type R	ef Trc	X-value	Y-value	Function	Function Result
M1	1	2.401965 GHz	-5.26 dBm		
M2	1	2.4 GHz	-37.27 dBm		

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Band-edge Compliance of RF Conducted Emissions Measurement:

Frequency Range	Reference level	Limit	The highest conducted band edge emission	Result	
[MHz]	[dBm]	[dBm]	[dBm]		
2483.5 - Highest Fundamental (2480)	-7.01	-27.01	-59.36	PASS	

Spectrun		-edge Compliand	ce of RF Emiss	ions – Highe	st (GFSK 21	Mbps)
Ref Level	6.00 dBm	👄 RE	W 100 kHz			
Att	25 dB	SWT 56.9 µs 👄 VE		ie Auto FFT		
●1Pk Max						
- a				M2[1]		-59.36 dBm
0 dBmM1						2.4835000 GHz
T				M1[1]		-7.01 dBm
-10 dBrand	m			, T	3	2.4799900 GHz
Į	1					
-20 dem	5			-		
-30/dBm						
1						
_40 dBm—	174					
N	V {					
-50 dBm		V				
co lo		m, M²				
-60 dBm		Ammun	mannon		in the section	the state of the state
70.10				a we showed		1000 mm Cript who
-70 dBm						
-80 dBm						
-ou ubiii						
-90 dBm						
Start 2.47	8 GHz		691 pts			Stop 2.5 GHz
Marker	- 1 - 1					
	f Trc	X-value	Y-value	Function	Fun	ction Result
M1 M2	1	2.47999 GHz 2.4835 GHz	-7.01 dBm -59.36 dBm			
IMZ	L	2,7035 GH2	39.30 UBIII			

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Compliance of RF Emissions Measurement:

Limit :

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated 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 band 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 Section 15.209(a) is not required.

Remark: Emissions under the fixed frequency mode and hopping mode have been investigated, the worst-case measurement results were recorded in the test report

Spectrun	n								
Ref Level	10.00 d	dBm	😑 R	BW 100 kHz					
🛢 Att	25	5 dB SWT 250) ms 👄 🖌	' BW 300 kHz	Mode Au	ito Sweep	2		
●1Pk Max									
					M	1[1]			-5.59 dBm
0 dBm									2.4020 GHz
U UBM M	3				M	2[1]			-57.62 dBm
10 40 -						ř.	ĩ	ř	7.2030 GHz
-10 dBm		5° %		2		1	2		
-20 dBm									
-20 UBIII									
-30 dBm									
-30 dbm								î.	
-40 dBm									
10 0011									
-50 dBm								_	
Contract of Contract of Contract		M2							
-60 dBm		mul rel will				iunt .	h		
-60 dBm-ff	Whendow	www.www.	when when the	ma water and	- mary market	and a com	and the man	manunan	and the way
-70 dBm				2					
-80 dBm		-				1			
Start 30.0	MHz			691	nts			Sto	p 25.0 GHz
Marker								010	
Type Re	f Trc	X-value	1	Y-value	Function Function Result		t 1		
M1	1		2 GHz	-5.59 dB					
M2	1	7.20	I3 GHz	-57.62 dB	m				

Compliance of RF Emissions – (GFSK 1Mbps 2402MHz) (the worst case)

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Co	mpliar	ice of RF Emis	sions – (GFS	K 2Mbps	2402N	(the w	orst case)	_
Spectrum								[₩
Ref Level 5.	00 dBm		RBW 100 kHz					
📄 Att	15 dB	SWT 250 ms 👄 🕯	VBW 300 kHz	Mode Auto	Sweep			
●1Pk Max		1						
0 dBm M1				M	1[1]			5.31 dBn 4020 GH:
T				M2[1]			-60.90 dBm	
-10 dBm		<u>n</u>						2060 GH
-20 dBm								
			12					
-30 dBm		<u></u>			-			
-40 dBm								
-50 dBm		5						
-60 dBm		M2	ie			_		
-70 dBml	Vijtigan ^{s and b} ijdelo ^s	- wallow						
neroward for	Villen and a start	w	ulupununuh	mounth	www	mantherport	In manuscriper	worderland
-80 dBm					5			
-90 dBm								
Start 30.0 MH	lz		691	pts		1	Stop :	25.0 GHz
Marker								
	Trc	X-value	Y-value	Func	tion	Fun	ction Result	
M1	1	2.402 GHz	-5.31 dB	The second s				
M2	1	7.206 GHz	-60,90 dB	m				

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3.1.7 Antenna Requirement

Ambient Temperature: 25°C

Relative Humidity: 51%

Atmospheric Pressure: 101 kPa

Test Requirements: § 15.203

Test Specification:

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. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

Test Results:

This is PCB antenna. There is no external antenna, the antenna gain = 0.55dBi. User is unable to remove or changed the Antenna.



-- - - -

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Appendix A

List of Measurement Equipment

Radiated Emission									
EQP NO.	DESCRIPTION	MANUFACTURER	MODEL NO.	SERIAL NO.	LAST CAL	DUE CAL			
EM215	MULTIDEVICE CONTROLLER	EMCO	2090	00024676	N/A	N/A			
EM217	ELECTRIC POWERED TURNTABLE	EMCO	2088	00029144	N/A	N/A			
EM218	ANECHOIC CHAMBER	ETS-LINDGREN	FACT-3		2024-04-18	2029-04-18			
EM356	ANTENNA POSITIONING TOWER	ETS-LINDGREN	2171B	00150346	N/A	N/A			
EM293	SPECTRUM ANALYZER	AGILENT TECHNOLOGIES	N9020A	MY50510152	2023-03-21	2025-03-21			
EM363	SIGNAL ANALYZER(10HZ- 40GHZ)	R & S	FSV40	101231	2024-01-17	2026-01-17			
EM299	BROADBAND HORN ANTENNA	ETS-LINDGREN	3115	00114120	2023-01-25	2025-01-25			
EM300	PYRAMIDAL STANDARD GAIN HORN ANTENNA	ETS-LINDGREN	3160-09	00130130	2023-01-16	2025-01-16			
EM301	PYRAMIDAL STANDARD GAIN HORN ANTENNA	ETS-LINDGREN	3160-10	00130988	2023-02-15	2025-02-15			
EM353	LOOP ANTENNA	ETS_LINDGREN	6502	00206533	2022-09-26	2025-09-26			
EM355	BICONILOG ANTENNA	ETS-LINDGREN	3143B	00094856	2022-08-26	2025-08-26			
EM200	DUAL CHANNEL POWER METER	R & S	NRVD	100592	2023-08-02	2025-08-02			

Remarks:-

CM CORRECTIVE MAINTENANCE

N/A NOT APPLICABLE TBD TO BE DETERMINED

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Appendix **B**

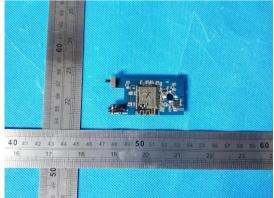
Photographs of EUT



View of battery

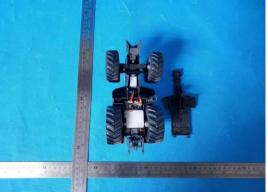


Inner circuit bottom view

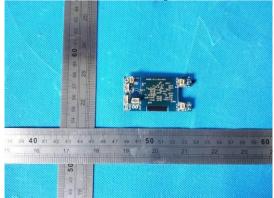




Inside View of the product



Inner circuit top view



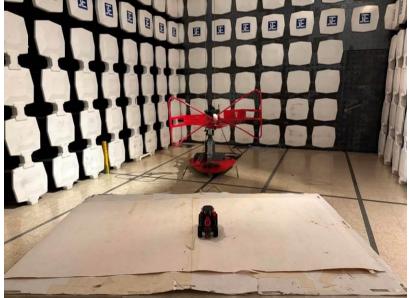


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Photographs of EUT

<image>

Measurement of Radiated Emission Test Set Up (30MHz to 1000MHz)



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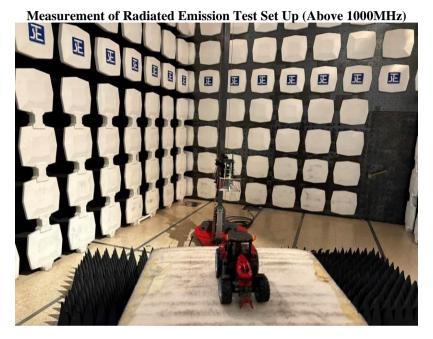
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Photographs of EUT



***** End of Test Report *****

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- 5. The results in Report apply only to the sample as received and do not apply to the bulk, unless the sampling has been carried out by the Company and is stated as such in the Report.
- 6. When a statement of conformity to a specification or standard is provided, the ILAC-G8 Guidance document (and/or IEC Guide 115 in the electrotechnical sector) will be adopted as a decision rule for the determination of conformity unless it is inherent in the requested specification or standard, or otherwise specified in the Report.
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- 10. Clients wishing to use the Report in court proceedings or arbitration shall inform the Company to that effect prior to submitting the sample for testing.
- 11. Subject to the variable length of retention time for test data and report stored hereinto as to otherwise specifically required by individual accreditation authorities, the Company will only keep the supporting test data and information of this test report for a period of three years. The data and information will be disposed of after the aforementioned retention period has elapsed. Under no circumstances shall we provide any data and information which has been disposed of after the retention period. Under no circumstances shall we be liable for damages of any kind, including (but not limited to) compensatory damages, lost profits, lost data, or any form of special, incidental, indirect, consequential or punitive damages of any kind, whether based on breach of contract of warranty, tort (including negligence), product liability or otherwise, even if we are informed in advance of the possibility of such damages.
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