



Report No.: TW2011170-02E File Reference No.: 2020-11-26

Applicant: Qingdao Hisense Intelligent Commercial System Co. Ltd

Product: Tablet POS

Model No.: HM626R, HM626

Trademark: N/A

Test Standards: FCC Part 15.247

Test Result:

It is herewith confirmed and found to comply with the

requirements set up by ANSI C63.10, FCC Part 15.247 for

the evaluation of electromagnetic compatibility

Approved By

Jack Chung

Manager

Dated: November 26, 2020

Results appearing herein relate only to the sample tested

The technical reports is issued errors and omissions exempt and is subject to withdrawal at

SHENZHEN TIMEWAY TESTING LABORATORIES

Zone C, 1st Floor, Block B, Jun Xiang Da Building, Zhongshan Park Road West, Tong Le Village, Nanshan District, Shenzhen, China

Tel (755) 83448688, Fax (755) 83442996, E-Mail:info@timeway-lab.com

Date: 2020-11-26



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Special Statement:

The testing quality ability of our laboratory meet with "Quality Law of People's Republic of China" Clause 19.

The testing quality system of our laboratory meet with ISO/IEC-17025 requirements, which is approved by CNAS. This approval result is accepted by MRA of APLAC.

Our test facility is recognized, certified, or accredited by the following organizations:

CNAS-LAB Code: L2292

The EMC Laboratory has been assessed and in compliance with CNAS-CL01 accreditation criteria for testing Laboratories (identical to ISO/IEC 17025:2005 General Requirements) for the Competence of testing Laboratories.

FCC-Registration No.: 744189

The EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications commission. The acceptance letter from the FCC is maintained in our files. Registration No.: 744189.

Industry Canada (IC) — Registration No.:5205A

The EMC Laboratory has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 5205A.

A2LA (Certification Number:5013.01)

The EMC Laboratory has been accredited by the American Association for Laboratory Accreditation (A2LA). Certification Number:5013.01

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Test Report Conclusion

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1.0 General Details

1.1 Test Lab Details

Name: SHENZHEN TIMEWAY TESTING LABORATORIES.

Address: Zone C, 1st Floor, Block B, Jun Xiang Da Building, Zhongshan Park Road West, Tong Le

Village, Nanshan District, Shenzhen, China

Telephone: (755) 83448688 Fax: (755) 83442996

Site Listed with Federal Communications commission (FCC)

Registration Number:744189 For 3m Anechoic Chamber

Site Listed with Industry Canada of Ottawa, Canada

Registration Number: IC: 5205A

For 3m Anechoic Chamber

1.2 Applicant Details

Applicant: Qingdao Hisense Intelligent Commercial System Co. Ltd

Address: 399 Songling Road, Laoshan, Qingdao, Shandong

Telephone: ---

1.3 Description of EUT

Product: Tablet POS

Manufacturer: Qingdao Hisense Intelligent Commercial System Co. Ltd

Address: 399 Songling Road, Laoshan, Qingdao, Shandong

Brand Name: N/A

Model Number: HM626R Additional Model Number: HM626 Hardware Version: WTR288C1 REV:1.2 Software Version: V1.01.KB09.HM626R

Type of Modulation GFSK, ∏/4D-QPSK, 8DPSK for Bluetooth

Frequency range 2402-2480MHz for Bluetooth

Channel Spacing 1MHz for Bluetooth

Frequency Selection By software

Channel Number 79 channels for Bluetooth

Antenna: Integral antenna used. The gain of the antennas is 2.0dBi (get from the antenna

specification provided the applicant)

Input Voltage: DC5V

Battey: DC3.8V, 11000mAh Li-ion battery

Power Supply: Model: PG241-12020001; Input: 100-240V~, 50/60Hz, 0.8A;

The report refers only to the sample tested and does not apply to the bulk.

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THE LAS

(for simple base) Output: 12.0V 2.0A,24W

Power Supply: Model: FSP090-AAAN3; Input: 100-240V~, 50-60Hz, 1.2A;

(for multi-functional Output: DC24.0V, 3.75A,90W

base)

1.4 Submitted Sample: 1 Samples

1.5 Test Duration

2020-11-12 to 2020-11-26

1.6 Test Uncertainty

Conducted Emissions Uncertainty =3.6dB

Radiated Emissions below 1GHz Uncertainty =4.7dB

Radiated Emissions above 1GHz Uncertainty =6.0dB

Conducted Power Uncertainty =6.0dB

Occupied Channel Bandwidth Uncertainty =5%

Note: The measurement uncertainty is for coverage factor of k=2 and a level of confidence of 95%.

1.7 Test Engineer

Terry Tang

The sample tested by

Print Name: Terry Tang

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2.0 Test Equipment					
Instrument Type	Manufacturer	Model	Serial No.	Date of Cal.	Due Date
ESPI Test Receiver	R&S	ESPI 3	100379	2020-06-23	2021-06-22
Impuls-Begrenzer	R&S	ESH3-Z2	100281	2020-06-23	2021-06-22
Loop Antenna	EMCO	6507	00078608	2018-06-25	2021-06-24
Spectrum	R&S	FSIQ26	100292	2020-06-23	2021-06-22
Horn Antenna	A-INFO	LB-180400-KF	J211060660	2019-06-21	2021-06-20
Horn Antenna	R&S	BBHA 9120D	9120D-631	2018-07-09	2021-07-08
Power meter	Anritsu	ML2487A	6K00003613	2020-06-23	2021-06-22
Power sensor	Anritsu	MA2491A	32263	2020-06-23	2021-06-22
Bilog Antenna	Schwarebeck	VULB9163	9163/340	2018-07-04	2021-07-03
9*6*6 Anechoic			N/A	2018-02-07	2021-02-06
EMI Test Receiver	RS	ESVB	826156/011	2020-06-23	2021-06-22
EMI Test Receiver	RS	ESH3	860904/006	2020-06-23	2021-06-22
Spectrum	HP/Agilent	ESA-L1500A	US37451154	2020-06-23	2021-06-22
Spectrum	HP/Agilent	E4407B	MY50441392	2020-06-23	2021-06-22
Spectrum	RS	FSP	1164.4391.38	2020-01-16	2021-01-15
RF Cable	Zhengdi	ZT26-NJ-NJ-8 M/FA		2020-06-23	2021-06-22
RF Cable	Zhengdi	7m		2020-06-23	2021-06-22
RF Switch	EM	EMSW18	060391	2020-06-23	2021-06-22
Pre-Amplifier	Schwarebeck	BBV9743	#218	2020-06-23	2021-06-22
Pre-Amplifier	HP/Agilent	8449B	3008A00160	2020-06-23	2021-06-22
LISN	SCHAFFNER	NNB42	00012	2020-01-06	2021-01-07

2.2 Automation Test Software

For Conducted Emission Test

Name	Version		
EZ-EMC	Ver.EMC-CON 3A1.1		

For Radiated Emissions

Name	Version
EMI Test Software BL410-EV18.91	V18.905
EMI Test Software BL410-EV18.806 High Frequency	V18.06

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3.0 **Technical Details**

3.1 **Summary of test results**

The EUT has been tested according to the following specifications:

Requirement	CFR 47 Section	Result	Notes
Antenna Requirement	15.203, 15.247(b)(4)	PASS	Complies
Maximum Peak Out Power	15.247 (b)(1), (4)	PASS	Complies
Carrier Frequency Separation	15.247(a)(1)	PASS	Complies
20dB Channel Bandwidth	15.247 (a)(1)	PASS	Complies
Number of Hopping Channels	15.247(a)(iii), 15.247(b)(1)	PASS	Complies
Time of Occupancy (Dwell Time)	15.247(a)(iii)	PASS	Complies
Spurious Emission, Band Edge, and Restricted bands	15.247(d),15.205(a), 15.209 (a),15.109	PASS	Complies
Conducted Emissions	15.207(a), 15.107	PASS	Complies
RF Exposure	15.247(i), 1.1307(b)(1)	PASS	Complies

Note: the multi-functional base and simple base were tested and only the worst case was reported. The multi-functional base was the worst case.

Test Standards 3.2

FCC Part 15 Subpart & Subpart C, Paragraph 15.247

4.0 **EUT Modification**

No modification by SHENZHEN TIMEWAY TESTING LABORATORIES.

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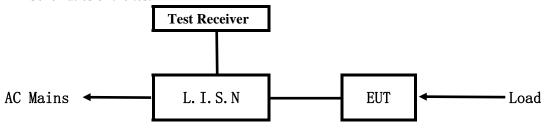
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5. Power Line Conducted Emission Test

5.1 Schematics of the test

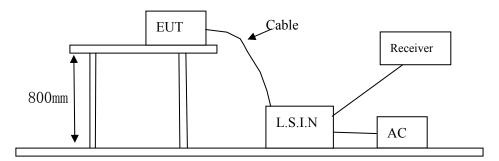


EUT: Equipment Under Test

5.2 Test Method and test Procedure

The EUT was tested according to ANSI C63.10-2013. The Frequency spectrum From 0.15MHz to 30MHz was investigated. The LISN used was 50ohm/50uH as specified by section 5.1 of ANSI C63.10-2013.

Test Voltage: 120V~60Hz Block diagram of Test setup



5.3 Configuration of The EUT

The EUT was configured according to ANSI C63.10-2013. All interface ports were connected to the appropriate peripherals. All peripherals and cables are listed below.

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A. EUT

Device	Manufacturer	Model	FCC ID
Tablet POS	Qingdao Hisense Intelligent Commercial	HM626R,	COV HM626
Tablet POS	System Co. Ltd	HM626	GQK-HM626

B. Internal Device

Device	Manufacturer	Model	Rating

C. Peripherals

Device	Manufacturer	Model	Rating

5.4 EUT Operating Condition

Operating condition is according to ANSI C63.10-2013.

- A Setup the EUT and simulators as shown on follow
- B Enable AF signal and confirm EUT active to normal condition

5.5 Power line conducted Emission Limit according to Paragraph 15.207

Frequency	Limits (dB μ V)				
(MHz)	Quasi-peak Level	Average Level			
$0.15 \sim 0.50$	66.0~56.0*	56.0~46.0*			
$0.50 \sim 5.00$	56.0	46.0			
5.00 ~ 30.00	60.0	50.0			

Notes:

- 1. *Decreasing linearly with logarithm of frequency.
- 2. The tighter limit shall apply at the transition frequencies

5.6 Test Results

The frequency spectrum from 0.15MHz to 30MHz was investigated. All reading are quasi-peak values with a resolution bandwidth of 9kHz.

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A: Conducted Emission on Live Terminal (150kHz to 30MHz)

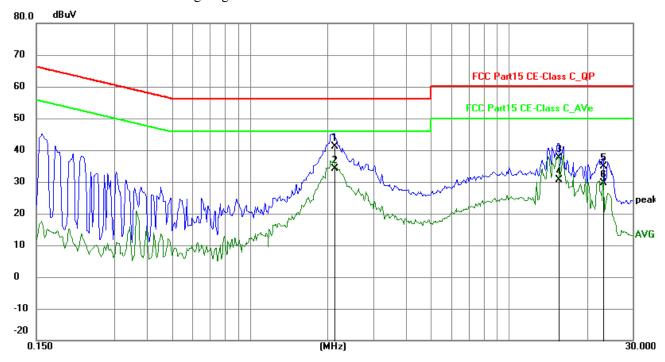
EUT Operating Environment

Temperature: 26°C Humidity: 65%RH Atmospheric Pressure: 101 KPa

EUT set Condition: Keep Bluetooth Transmitting

Results: Pass

Please refer to following diagram for individual



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F
1	2.1195	31.41	9.81	41.22	56.00	-14.78	QP	Р
2	2.1195	24.35	9.81	34.16	46.00	-11.84	AVG	Р
3	15.4701	27.28	10.41	37.69	60.00	-22.31	QP	Р
4	15.4701	20.21	10.41	30.62	50.00	-19.38	AVG	Р
5	23.1279	24.05	10.87	34.92	60.00	-25.08	QP	Р
6	23.1279	18.85	10.87	29.72	50.00	-20.28	AVG	Р

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B: Conducted Emission on Neutral Terminal (150kHz to 30MHz)

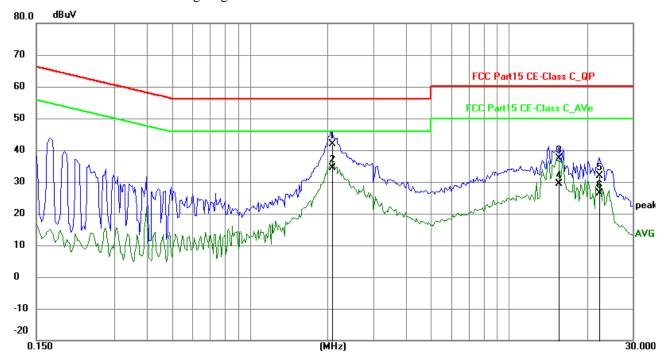
EUT Operating Environment

Temperature: 26°C Humidity: 65%RH Atmospheric Pressure: 101 KPa

EUT set Condition: Keep Bluetooth Transmitting

Results: Pass

Please refer to following diagram for individual



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F
1	2.0659	32.18	9.80	41.98	56.00	-14.02	QP	Р
2	2.0659	24.56	9.80	34.36	46.00	-11.64	AVG	Р
3	15.4701	27.03	10.41	37.44	60.00	-22.56	QP	Р
4	15.4701	18.93	10.41	29.34	50.00	-20.66	AVG	Р
5	22.2153	21.07	10.82	31.89	60.00	-28.11	QP	Р
6	22.2153	15.60	10.82	26.42	50.00	-23.58	AVG	Р

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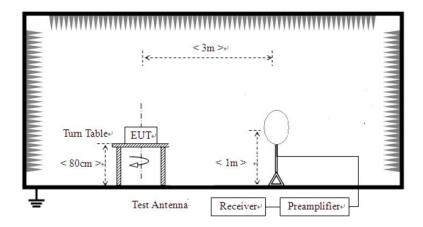


6 Radiated Emission Test

- 6.1 Test Method and test Procedure:
- (1) The EUT was tested according to ANSI C63.10-2013. The radiated test was performed at Timeway EMC Laboratory. This site is on file with the FCC laboratory division, Registration No. 744189
- (2) The EUT, peripherals were put on the turntable which table size is 1m x 1.5 m, table high 0.8 m. All set up is according to ANSI C63.10-2013.
- (3) The frequency spectrum from 30 MHz to 25GHz was investigated. All readings from 30 MHz to 1 GHz are quasi-peak values with a resolution bandwidth of 120 kHz. For measurement above 1GHz, peak values with RBW=VBW=1MHz and PK detector. AV value with RBW=1MHz, VBW=10Hz and PK detector. Measurements were made at 3 meters.
- (4) The antenna high is varied from 1 m to 4 m high to find the maximum emission for each frequency.
- (5) Maximizing procedure was performed on the six (6) highest emissions to ensure EUT compliance is with all installation combinations. All data was recorded in the peak detection mode. Quasi-peak readings was performed only when an emission was found to be marginal (within -4 dB of specification limit), and are distinguished with a "QP" in the data table.
- (6) The antenna polarization: Vertical polarization and Horizontal polarization.

Block diagram of Test setup

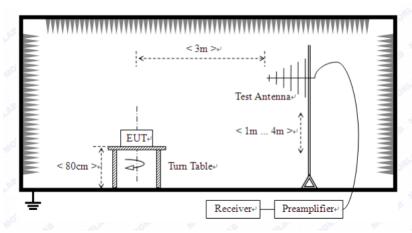
For radiated emissions from 9kHz to 30MHz



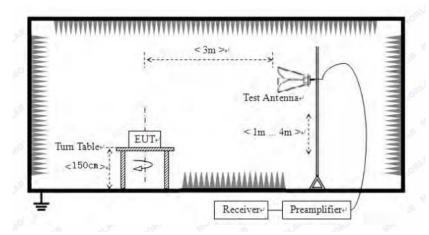
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For radiated emissions from 30MHz to1GHz



For radiated emissions above 1GHz



- 6.2 Configuration of The EUT
 Same as section 5.3 of this report
- 6.3 EUT Operating Condition
 Same as section 5.4 of this report.
- 6.4 Radiated Emission Limit

All emission from a digital device, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strength specified below:

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Frequencies in restricted band are complied to limit on Paragraph 15.209

Frequency Range (MHz)	Distance (m)	Field strength (dB μ V/m)
30-88	3	40.0
88-216	3	43.5
216-960	3	46.0
Above 960	3	54.0

Note:

- 1. RF Voltage (dBuV) = 20 log RF Voltage (uV)
- 2. In the Above Table, the higher limit applies at the band edges.
- 3. Distance refers to the distance in meters between the measuring instrument antenna and the EUT
- 4. 8DPSK was the worst case because it has highest output power
- 5. This is a handhold device. The radiated emissions should be tested under 3-axes position (Lying, Side, and Stand), After pre-test. It was found that the worse radiated emission was get at the lying position.

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Test result

General Radiated Emission Data and Harmonics Radiated Emission Data

Radiated Emission In Horizontal/Vertical (30MHz----1000MHz)

EUT set Condition: Keep Bluetooth Transmitting

Results: Pass

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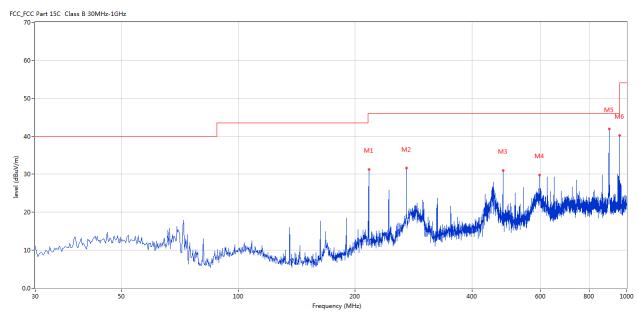
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Test Figure:

H



No.	Frequency	Results	Factor	Limit	Over	Detector	Table (o)	Height	ANT	Verdict
	(MHz)	(dBuV/m)	(dB)	(dBuV/m)	Limit (dB)			(cm)		
1	216.921	31.21	-13.51	46.0	-14.79	Peak	360.00	100	Horizontal	Pass
2	271.227	31.58	-11.72	46.0	-14.42	Peak	360.00	100	Horizontal	Pass
3	479.968	30.96	-7.40	46.0	-15.04	Peak	336.00	100	Horizontal	Pass
4	596.823	29.78	-5.11	46.0	-16.22	Peak	359.00	100	Horizontal	Pass
5	900.115	42.46	-1.86	46.0	-3.54	Peak	360.00	100	Horizontal	Pass
6	960.240	40.75	-1.63	54.0	-5.25	Peak	340.00	100	Horizontal	Pass

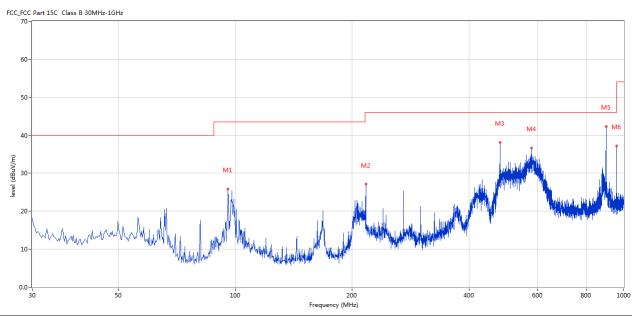
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Test Figure:

V



No.	Frequency	Results	Factor	Limit	Over Limit	Detector	Table (o)	Height	ANT	Verdict
	(MHz)	(dBuV/m)	(dB)	(dBuV/m)	(dB)			(cm)		
1	95.701	25.81	-14.19	43.5	-17.69	Peak	0.00	100	Vertical	Pass
2	216.921	27.10	-13.51	46.0	-18.90	Peak	0.00	100	Vertical	Pass
3	479.968	38.12	-7.40	46.0	-7.88	Peak	0.00	100	Vertical	Pass
4	580.095	36.70	-5.60	46.0	-9.30	Peak	3.00	100	Vertical	Pass
5	900.115	42.67	-1.86	46.0	-3.33	Peak	31.00	100	Vertical	N/A
6	959.998	37.18	-1.63	46.0	-8.82	Peak	15.00	100	Vertical	Pass

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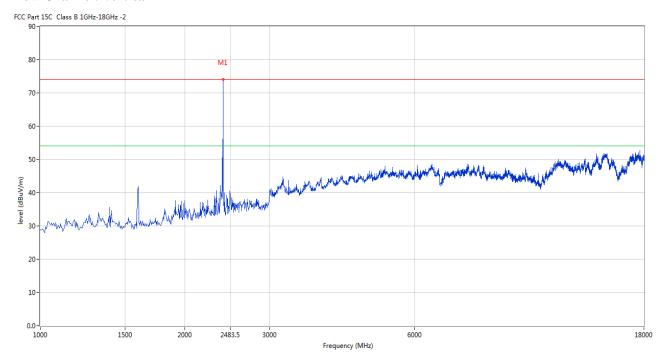
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Test Figures above 1GHz:

Please refer to the following test plots for details:

Low Channel: Vertical

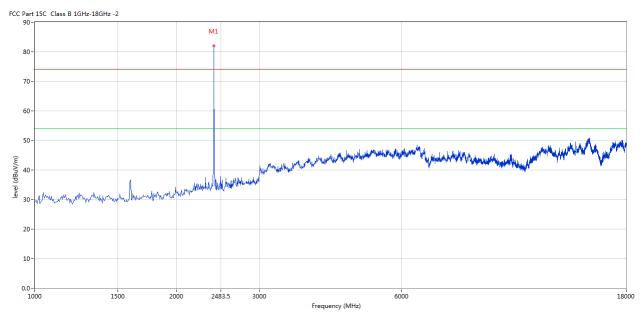


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Low Channel: Horizontal

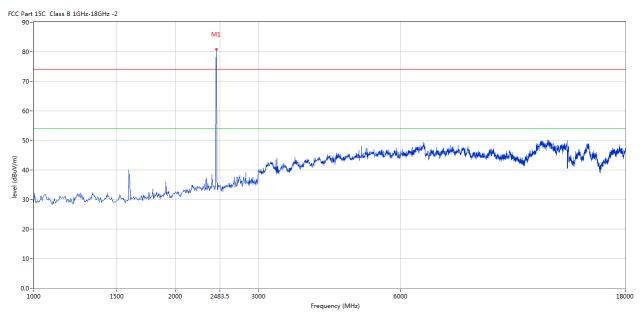


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Middle Channel: Horizontal



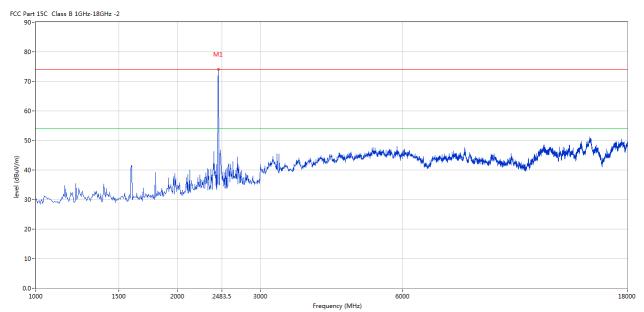
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Middle Channel: Vertical

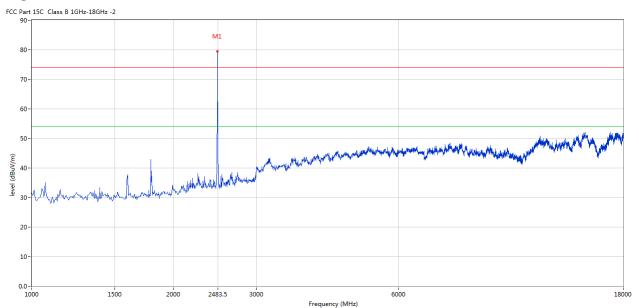


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High Channel: Horizontal

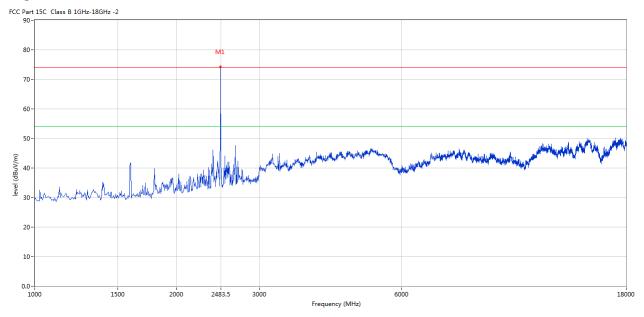


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High Channel: Vertical



Note: 1. Level = Reading + AF + Cable - Preamp

- 2. For the radiated emissions above 18G and Below 30MHz, it is the floor noise.
- 3. The measured PK value less than the AV limit, no necessary to take down the AV measurement result.

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7.0 20dB Bandwidth Measurement

7.1 Regulation

Intentional radiators operating under the alternative provisions to the general emission limits, as contained in §§ 15.217 through 15.257 and in Subpart E of this part, must be designed to ensure that the 20 dB bandwidth of the emission, or whatever bandwidth may otherwise be specified in the specific rule section under which the equipment operates, is contained within the frequency band designated in the rule section under which the equipment is operated.

7.2 Limits of 20dB Bandwidth Measurement

N/A

7.3 Test Procedure.

- 1. Check the calibration of the measuring instrument (spectrum analyzer) using either an internal calibrator or a known signal from an external generator.
- 2. Set the spectrum analyzer as follows: Span =3MHz, RBW =30 kHz, VBW=100 kHz, Sweep = auto Detector function = peak, Trace = max hold
- 3. Measure the highest amplitude appearing on spectral display and record the level to calculate results. 6. Repeat above procedures until all frequencies measured were complete.

7.4 Test Result

Type of Modulation: GFSK

-yF								
EUT		Tablet POS	Model	HM626R				
Mode	Ke	ep Transmitting	Input Voltage	DC3.8V				
Temperat	ure	24 deg. C,	Humidity	56% RH				
Channel	Channel Frequency (MHz)	20 dB Bandwidth (kHz)	Minimum Limit (kHz)	Pass/ Fail				
Low	2402	1040		Pass				
Middle	2441	1034		Pass				
High	2480	1034		Pass				

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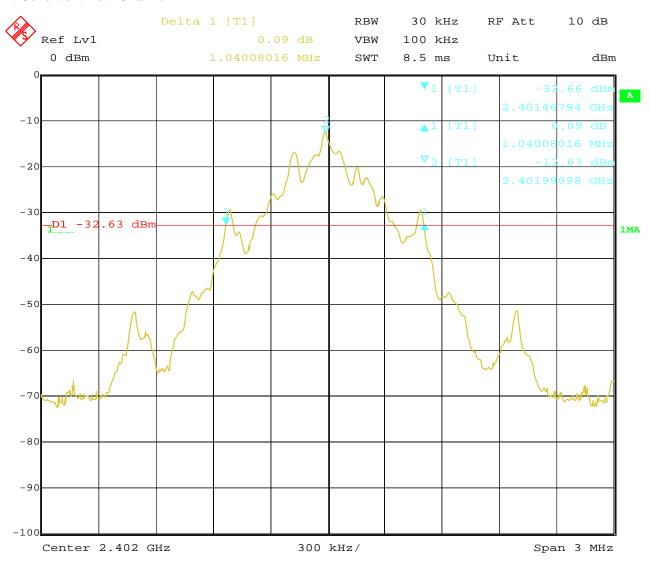
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Test Figure:

1. Condition: Low Channel



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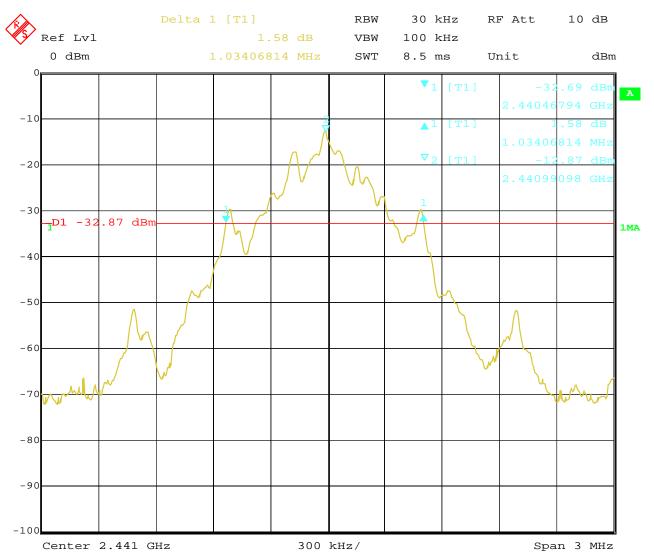
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2. Condition: Middle Channel



25.NOV.2020 14:31:53 Date:

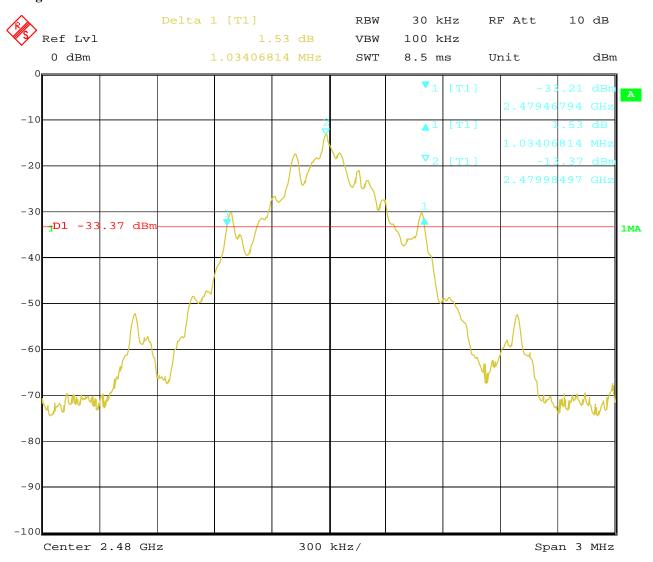
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3. High Channel



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Test Result

Type of Modulation: JI/4D-QPSK

EUT		Tablet POS	Model	HM626R	
Mode	Ko	eep Transmitting	Input Voltage	DC3.8V	
Temperat	ure	24 deg. C,	Humidity	56% RH	
Channel	Channel Frequency (MHz)	20 dB Bandwidth (kHz)	Maximum Limit (kHz)	Pass/ Fail	
Low	2402	1136		Pass	
Middle	2441	2441 1130		Pass	
High	2480	1130		Pass	

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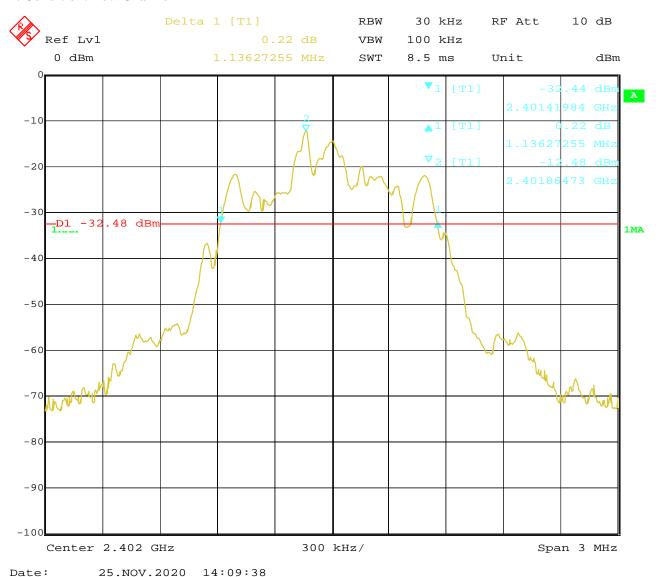
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Test Figure:

1. Condition: Low Channel



Date: 25.NOV.2020

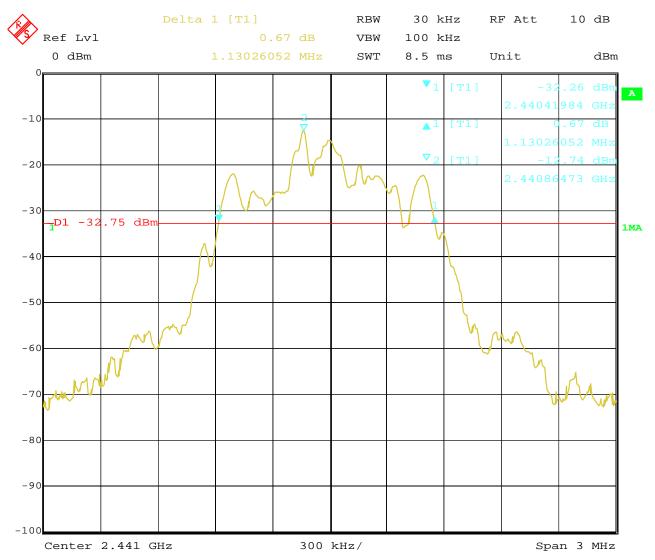
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2. Condition: Middle Channel



25.NOV.2020 Date: 14:10:55

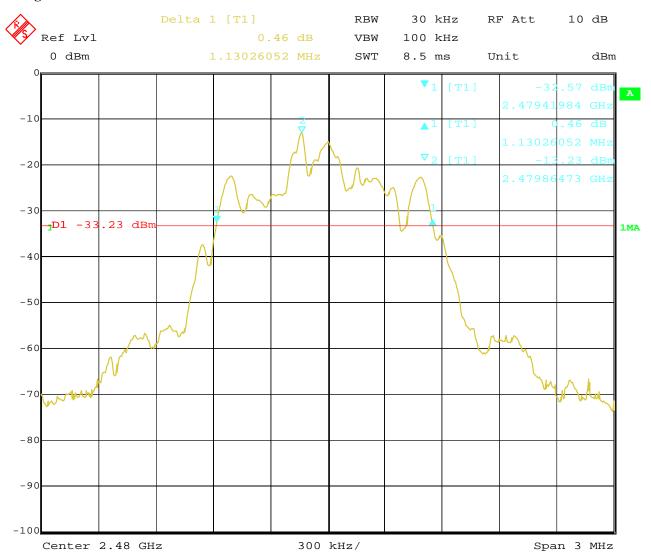
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3. High Channel



25.NOV.2020 14:13:04 Date:

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Test Result

Type of Modulation: 8DPSK

EUT		Tablet POS	Model	HM626R	
Mode	K	eep Transmitting	Input Voltage	DC3.8V	
Temperat	ure	24 deg. C,	Humidity	56% RH	
Channel	Channel Frequency (MHz)	20 dB Bandwidth (kHz)	Maximum Limit (kHz)	Pass/ Fail	
Low	2402	1257		Pass	
Middle	2441	2441 1257		Pass	
High	2480	1226		Pass	

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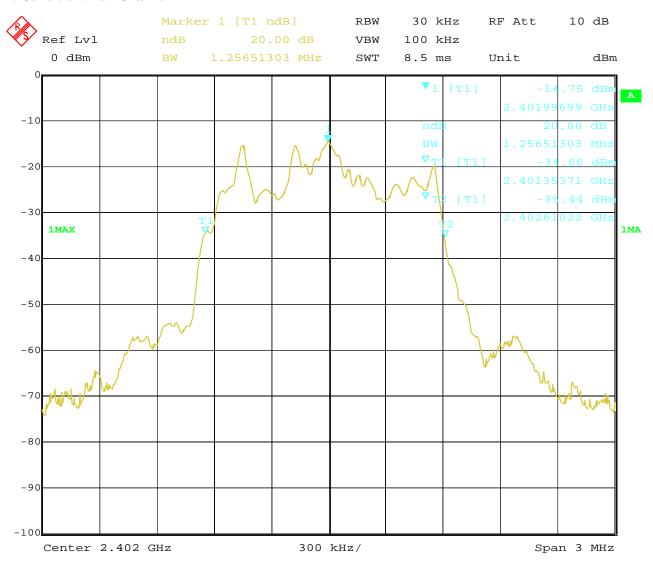
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Test Figure:

1. Condition: Low Channel



Date: 25.NOV.2020 14:19:36

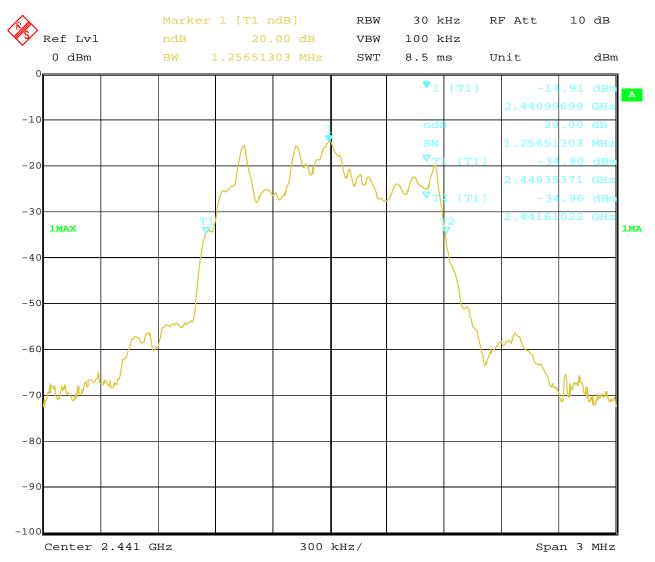
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2. Condition: Middle Channel

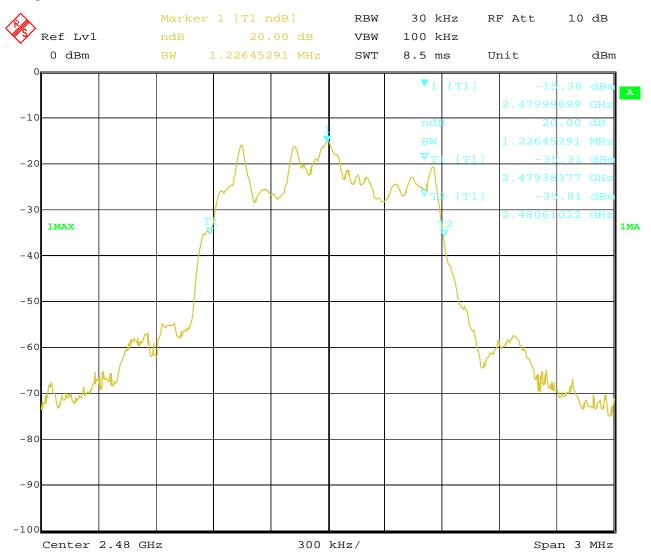


25.NOV.2020 Date: 14:17:46 Report No.: TW2011170-02E Page 35 of 74

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3. High Channel



25.NOV.2020 Date: 14:14:07

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8. Maximum Output Power

8.1 Regulation

According to §15.247(b)(1), for frequency hopping systems operating in the 2400-2483.5 MHz band employing at least 75 non-overlapping hopping channels, and all frequency hopping systems in the 5725-5850 MHz band: 1 watt. For all other frequency hopping systems in the 2400-2483.5MHz band:0.125 watts. According to §15.247(b)(4), the conducted output power limit specified in paragraph (b) of this section is based on the use of antennas with directional gains that do not exceed 6 dBi. Except as shown in paragraph (c) of this section, if transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1), (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.

8.2 Limits of Maximum Output Power

The Maximum Output Power Measurement is 30dBm.

8.3 Test Procedure

- 1. Check the calibration of the measuring instrument (spectrum analyzer) using either an internal calibrator or a known signal from an external generator.
- 2. Set the spectrum analyzer as follows: Span = approximately 5 times the 20 dB bandwidth, centered on a hopping channel; RBW > the 20 dB bandwidth of the emission being measured; VBW = 10MHz, RBW=3MHz; Sweep = 60s; Detector function = PK; Trace = max hold
- 3. Measure the highest amplitude appearing on spectral display and record the level to calculate results.
- 4. Repeat above procedures until all frequencies measured were complete.

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8.4Test Results

Type of Modulation: GFSK

EUT		Tablet POS			Tablet POS Mo		Model	HM626R
Mode	Ke	eep Transmitting	Input Voltage		ep Transmitting Input Voltage		DC3.8V	
Temperature	perature 24 deg. C, Hum		Humi	idity	56% RH			
Channel	Channel Frequency (MHz)	Max. Power Output (dBm) Peak		Peak Power Limit (dBm)	Pass/ Fail			
Low	2402	-11.99		30	Pass			
Middle	2441	-12.23		30	Pass			
High	2480	-12.70		30	Pass			

Note: 1. the result basic equation calculation as follow:

Max. Power Output = Power Reading + Cable loss + Attenuator

- 2. The worse case was recorded
- 3. The Peak power was measured

Type of Modulation: $\pi/4D$ -QPSK

EUT		Tablet POS		N	Model	HM626R
Mode		Ke	ep Transmitting	Input	Voltage	DC3.8V
Temperature	ture 24 deg. C, Hu		Humi	idity	56% RH	
Channel	Channel Frequency Max. Power Output (dBr)	Peak Power	Pass/ Fail	
	((MHz)	Peak		Limit (dBm)	
Low		2402	-10.20		30	Pass
Middle		2441	-10.51		30	Pass
High		2480	-10.98		30	Pass

Note: 1. the result basic equation calculation as follow:

Max. Power Output = Power Reading + Cable loss + Attenuator

- 2. The worse case was recorded
- 3. The Peak power was measured

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Type of Modulation: 8DPSK

EUT		Tablet POS		Model	HM626R
Mode	Ke	Keep Transmitting		ıt Voltage	DC3.8V
Temperature		24 deg. C,		umidity	56% RH
Channel	Channel Frequency (MHz)	Max. Power Output (dBm) Peak		Peak Power Limit (dBm)	Pass/ Fail
Low	2402	-10.20		30	Pass
Middle	2441	-10.51		30	Pass
High	2480	-10.98		30	Pass

Note: 1. the result basic equation calculation as follow:

Max. Power Output = Power Reading + Cable loss + Attenuator

- 2. The worse case was recorded
- 3. The Peak power was measured

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9. Carrier Frequency Separation

9.1 Regulation

According to §15.247(a)(1), frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater. Alternatively, frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than 125 mW.

9.2 Limits of Carrier Frequency Separation

The Maximum Power Spectral Density Measurement is 25kHz or two-thirds of the 20dB bandwidth of the hopping Channel which is great.

9.3 Test Procedure

- 1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
- 2. Set the spectrum analyzer as follows: Span = wide enough to capture the peaks of two adjacent channels: Resolution (or IF) Bandwidth (RBW) \geq 1% of the span; Video (or Average) Bandwidth (VBW) \geq RBW; Sweep = auto; Detector function = peak; Trace = max hold
- 3. Measure the separation between the peaks of the adjacent channels using the marker-delta function.
- 4. Repeat above procedures until all frequencies measured were complete.

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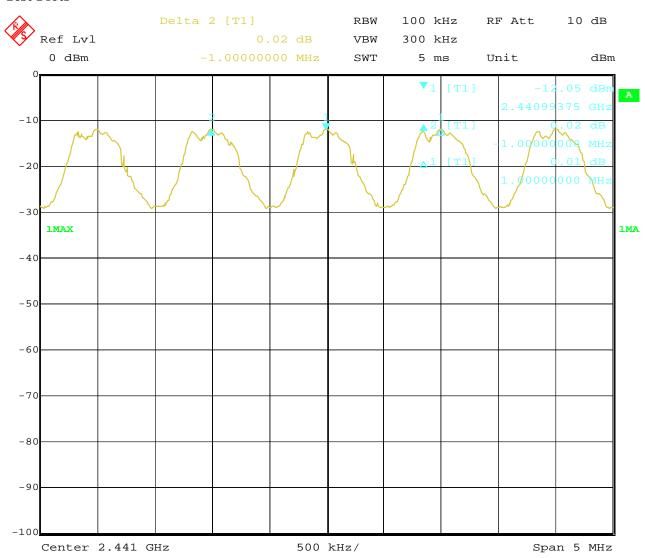


9.4Test Result

Type of Modulation: GFSK

EUT	Tablet POS	Model	-	HM626R	
Mode	Hopping O	Input Voltage		DC3.8V	
Temperature	24 deg. C,		Humidity		56% RH
Carrier I	Frequency Separation		Limit		Pass/ Fail
	1.000MHz	≥ 25 kHz or 2/3	of the 20 dB ban	dwidth	Pass

Test Plots



24.NOV.2020 10:58:19 Date:

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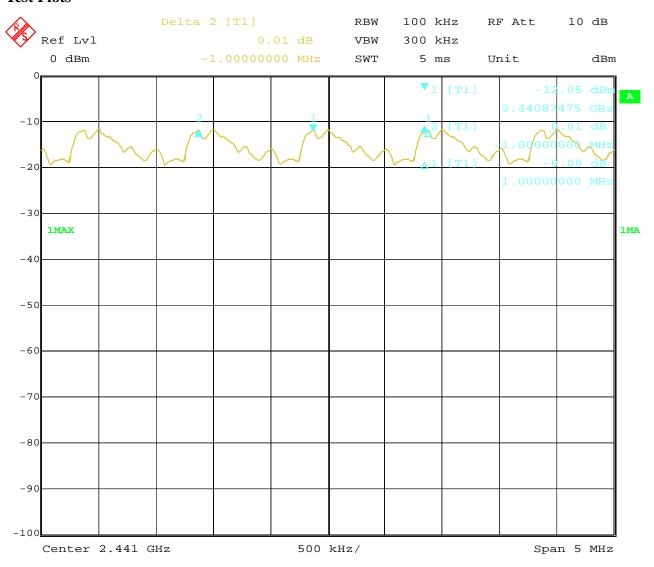
Date: 2020-11-26



Type of Modulation: Л/4D-QPSK

EUT	Tablet POS	Model		HM626R	
Mode	Hopping O	Input Voltage		DC3.8V	
Temperature	24 deg. C,		Humidity	56% RH	
Carrier F	Frequency Separation		Limit		Pass/ Fail
	1.000MHz	≥ 25 kHz or 2	2/3 of 20 dB bands	width	Pass

Test Plots



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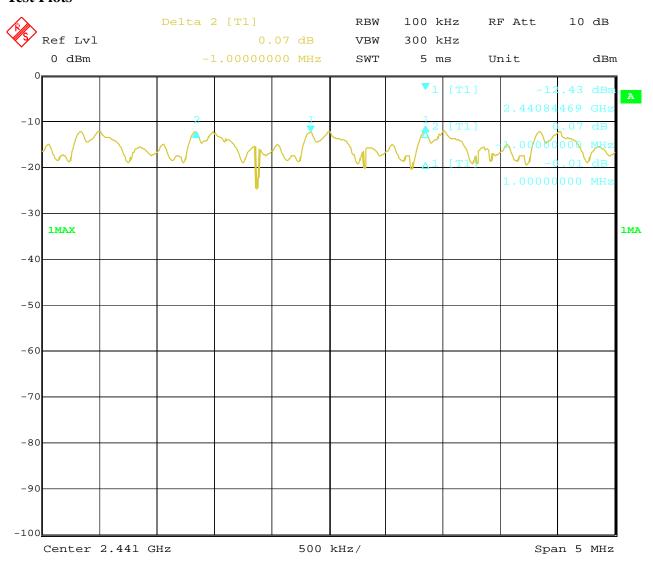
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Type of Modulation: 8DPSK

EUT	Tablet POS	Model		HM626R	
Mode	Hopping On Ir		Input Voltage	DC3.8V	
Temperature	24 deg. C,		Humidity	56% RH	
Carrier Frequency Separation			Limit		Pass/ Fail
	1.000MHz	≥ 25 kHz or 2	/3 of 20 dB bands	width	Pass

Test Plots



25.NOV.2020 11:10:58 Date:

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10. Number of Hopping Channels

10.1 Regulation

According to §15.247(a)(1)(iii), frequency hopping systems in the 2400-2483.5 MHz band shall use at least 15 channels. The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed. Frequency hopping systems may avoid or suppress transmissions on a particular hopping frequency provided that a minimum of 15 channels are used. According to §15.247(b)(1), for frequency hopping systems operating in the 2400-2483.5 MHz band employing at least 75 non-overlapping hopping channels, and all frequency hopping systems in the 5725-5850 MHz band: 1 watt. For all other frequency hopping systems in the 2400-2483.5 MHz band: 0.125 watts.

10.2 Limits of Number of Hopping Channels

The frequency hopping systems in the 2400-2483.5MHz band shall use at least 15 channels.

10.3 Test Procedure

- 1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
- 2. Set the spectrum analyzer as follows: Span = the frequency band of operation; RBW=100 kHz, VBW=300 kHz; Sweep = auto; Detector function = peak; Trace = max hold
- 3. Record the number of hopping channels.

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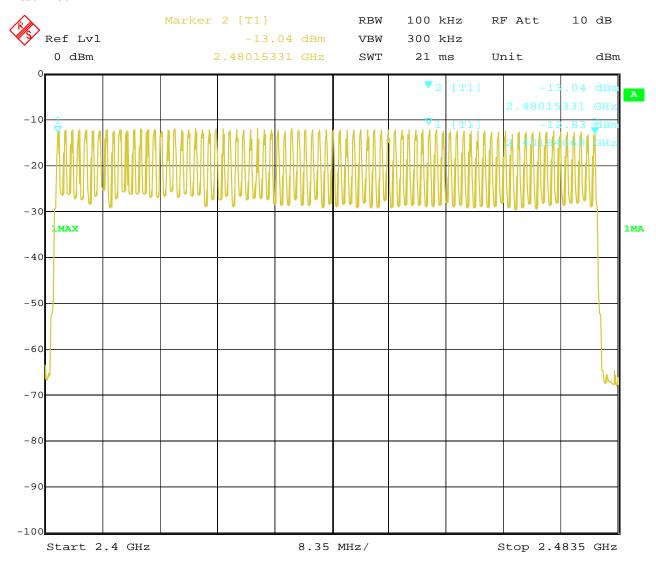


10.4Test Result

Type of Modulation: GFSK

EUT	Tablet POS		Model		HM626R	
Mode	Hopping On		Input Voltage	DC3.8V		
Temperature	2	24 deg. C,	Humidity	56% RH		
Operating Frequency		Number of hopp	oing channels	Limit	Pass/ Fail	
2402-2480MHz		79		≥ 15	Pass	

Test Plot



Date: 23.NOV.2020 17:18:54

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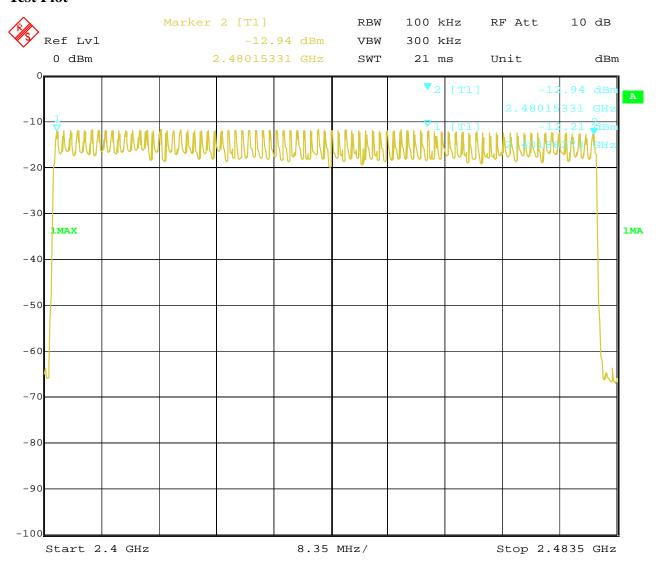
Date: 2020-11-26



Type of Modulation: $\pi/4D$ -QPSK

EUT	Tablet POS		Model	HM626R
Mode	Hopping On		Input Voltage	DC3.8V
Temperature	24 deg. C,		Humidity	56% RH
Operating Frequency		Number of hopping channels	Limit	Pass/ Fail
2402-2480MHz		79	≥ 15	Pass

Test Plot



Date: 24.NOV.2020 17:57:09

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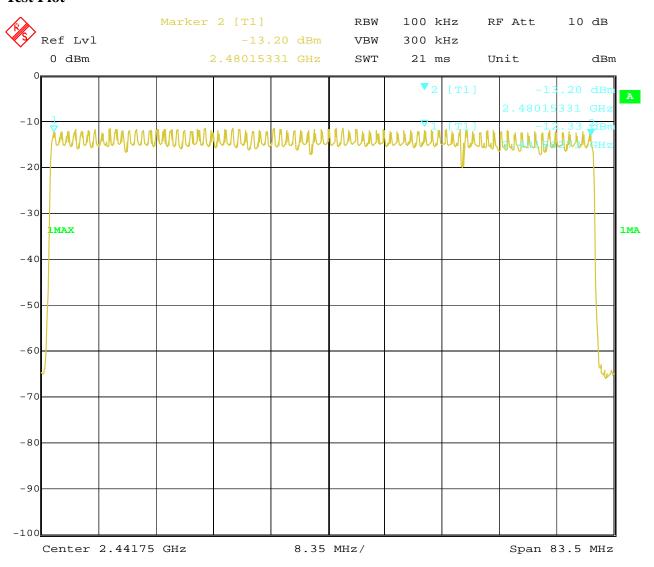
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Type of Modulation: 8DPSK

EUT	Tablet POS		M	odel		HM626R	
Mode	Hopping On		Input	Voltage		DC3.8V	
Temperature	24 deg. C,		Humi	dity		56% RH	
Operating Frequency		Number of hopping channels	ng	Liı	mit	Pass/ Fail	
2402-2480MHz		79		<u> </u>	15	Pass	

Test Plot



25.NOV.2020 09:26:56 Date:

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11. Time of Occupancy (Dwell Time)

11.1 Regulation

According to §15.247(a)(1)(iii), frequency hopping systems in the 2400-2483.5 MHz band shall use at least 15 channels. The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed. Frequency hopping systems may avoid or suppress transmissions on a particular hopping frequency provided that a minimum of 15 channels are used.

11.2 Limits of Carrier Frequency Separation

The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed

11.3 Test Procedure

- 1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
- 2. Set the spectrum analyzer as follows: Span = zero span, centered on a hopping channel; RBW = 1 MHz; VBW \geq RBW; Sweep = as necessary to capture the entire dwell time per hopping channel; Detector function = peak; Trace = max hold
- 3. Measure the dwell time using the marker-delta function.
- 4. Repeat above procedures until all frequencies measured were complete.
- 5. Repeat this test for different modes of operation (e.g., data rate, modulation format, etc.), if applicable.

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11.4 Test Result

Type of Modulation: GFSK

EUT	EUT Tablet POS		Model	H	IM626R	
Mode	Keep Tr	ansmitting	Input Voltage	DC3.8V		
Temperatur	e 24 c	leg. C,	Humidity	5	56% RH	
Channel	Reading	Hoping	g Rate	Actual	Limit	
	DH5					
Middle	2.926ms	266.66	7 hop/s	0.312s	0.4s	

Actual = Reading × (Hopping rate / Number of channels) × Test period, Test period = 0.4 [seconds / channel] × 79 [channel] = 31.6 [seconds] NOTE: The EUT makes worst case 1600 hops per second or 1 time slot has a length of $625\mu s$ with 79 channels.

A DH5 Packet needs 5 time slot for transmitting and 1 time slot for receiving. Then the EUT makes worst case 266.667 hops per second with 79 channels.

A DH3 Packet needs 3 time slot for transmitting and 1 time slot for receiving. Then the EUT makes worst case 400 hops per second with 79 channels.

A DH1 Packet needs 1 time slot for transmitting and 1 time slot for receiving. Then the EUT makes worst case 800 hops per second with 79 channels.

Note: DH5 was the worst case.

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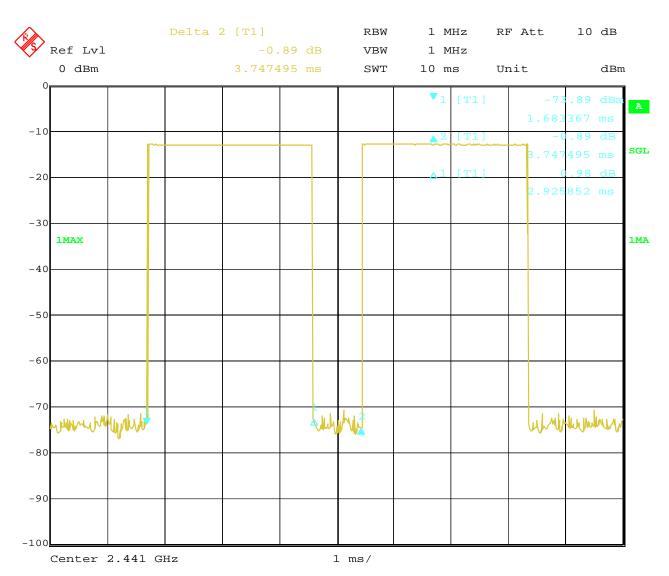
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Test Plots:

DH5



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Test Result

Type of Modulation: JI/4D-QPSK

			1			
EUT	Table	Tablet POS		H	IM626R	
Mode	Keep Tr	ansmitting	Input Voltage	t Voltage DC3.8V		
Temperatur	re 24 d	leg. C,	Humidity	56% RH		
Channel	Reading	Hoping	g Rate	Actual	Limit	
	2DH5					
Middle	2.946ms	266.667	7 hop/s	0.314s	0.4s	

Actual = Reading × (Hopping rate / Number of channels) × Test period, Test period = 0.4 [seconds / channel] × 79 [channel] = 31.6 [seconds] NOTE: The EUT makes worst case 1600 hops per second or 1 time slot has a length of $625\mu s$ with 79 channels.

A DH5 Packet needs 5 time slot for transmitting and 1 time slot for receiving. Then the EUT makes worst case 266.667 hops per second with 79 channels.

A DH3 Packet needs 3 time slot for transmitting and 1 time slot for receiving. Then the EUT makes worst case 400 hops per second with 79 channels.

A DH1 Packet needs 1 time slot for transmitting and 1 time slot for receiving. Then the EUT makes worst case 800 hops per second with 79 channels.

Note: 2DH5 was the worst case.

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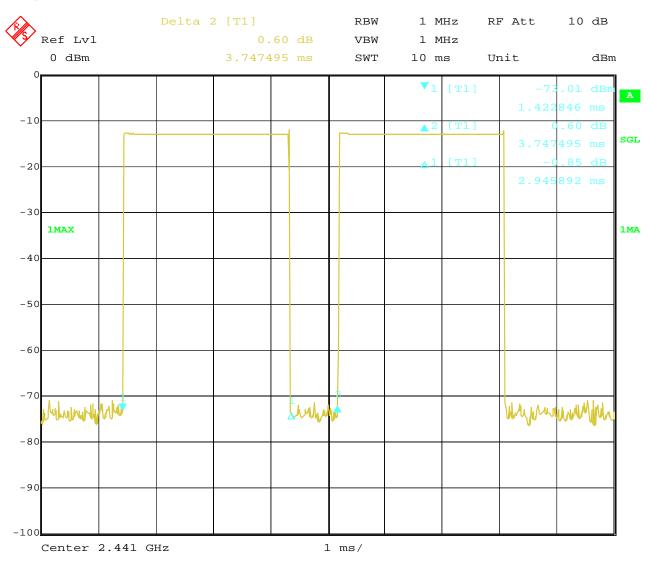
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Test Plots:

2DH5



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Type of Modulation: 8DPSK

EUT	Т	Tablet POS Model		Tablet POS Model HM626R		IM626R
Mode	Mode Keep Transmitting Input Voltage		DC3.8V			
Temperatur	re 2	4 deg. C,	Humidity	5	56% RH	
Channel	Reading	Hopin	g Rate	Actual	Limit	
			3DH5			
Middle	2.966ms	266.66	7 hop/s	0.316s	0.4s	

Actual = Reading \times (Hopping rate / Number of channels) \times Test period, Test period = 0.4 [seconds / channel] \times 79 [channel] = 31.6 [seconds] NOTE: The EUT makes worst case 1600 hops per second or 1 time slot has a length of 625 μ s with 79 channels.

A DH5 Packet needs 5 time slot for transmitting and 1 time slot for receiving. Then the EUT makes worst case 266.667 hops per second with 79 channels.

A DH3 Packet needs 3 time slot for transmitting and 1 time slot for receiving. Then the EUT makes worst case 400 hops per second with 79 channels.

A DH1 Packet needs 1 time slot for transmitting and 1 time slot for receiving. Then the EUT makes worst case 800 hops per second with 79 channels.

Note: 3DH5 was the worst case.

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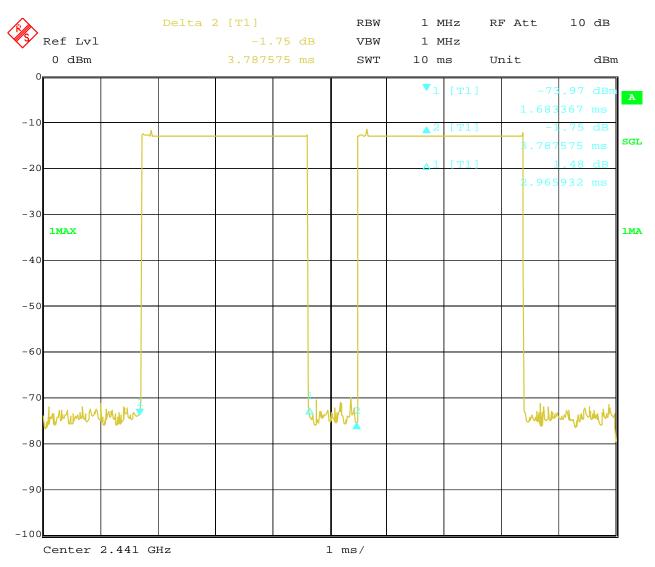
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Test Plots:

3DH5



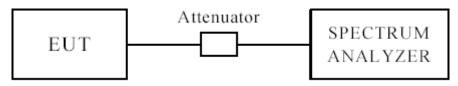
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12 Out of Band Measurement

12.1 Test Setup



The restricted band requirement based on radiated emission test; please see the clause 6 for the test setup

12.2 Limits of Out of Band Emissions Measurement

- 1. Below –20dB of the highest emission level of operating band (in 100kHz Resolution Bandwidth).
- 2. Fall in the restricted bands listed in section 15.205. The maximum permitted average field strength is listed in section 15.209.

12.3 Test Procedure

For signals in the restricted bands above and below the 2.4-2.483GHz allocated band a measurement was made of radiated emission test. Peak values with RBW=VBW=1MHz and PK detector.

For bandage test, the spectrum set as follows: RBW=100 kHz, VBW=300 kHz. A conducted measurement used

Note: 1. For band-edge measurement, the frequency from 30MHz-25GHz was tested. And It met the FCC rule. 2. This is a handhold device. The radiated emissions should be tested under 3-axes position (Lying, Side, and Stand), After pre-test. It was found that the worse radiated emission was get at the lying position.

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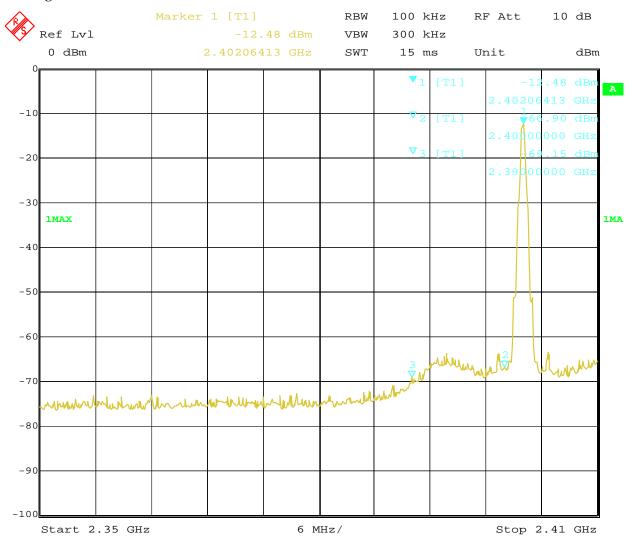


Type of Modulation: GFSK

Band Edge Test Result 12.4

Product:	Tablet POS	Test Mode:	Low Channel
Mode	Keeping Transmitting	Input Voltage	DC3.8V
Temperature	24 deg. C	Humidity	56% RH
Test Result:	Pass	Detector	PK

Test Figure:



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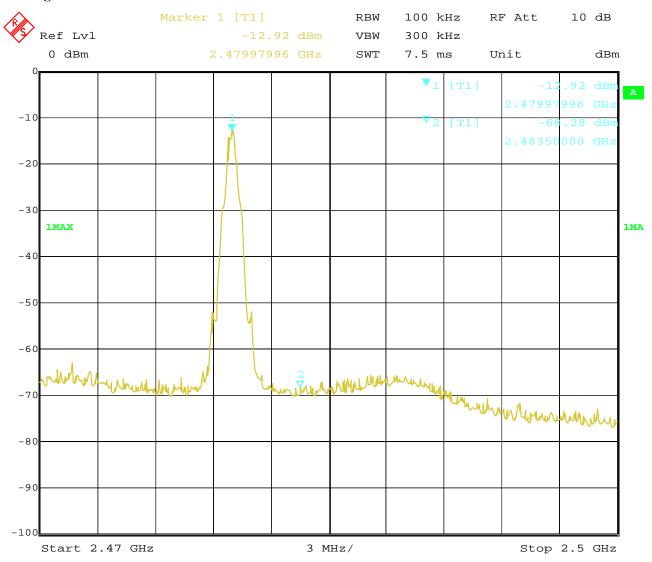


Type of Modulation: GFSK

Band Edge Test Result 12.4

Product:	Tablet POS	Test Mode:	High Channel
Mode	Keeping Transmitting	Input Voltage	DC3.8V
Temperature	24 deg. C,	Humidity	56% RH
Test Result:	Pass	Detector	PK

Test Figure:



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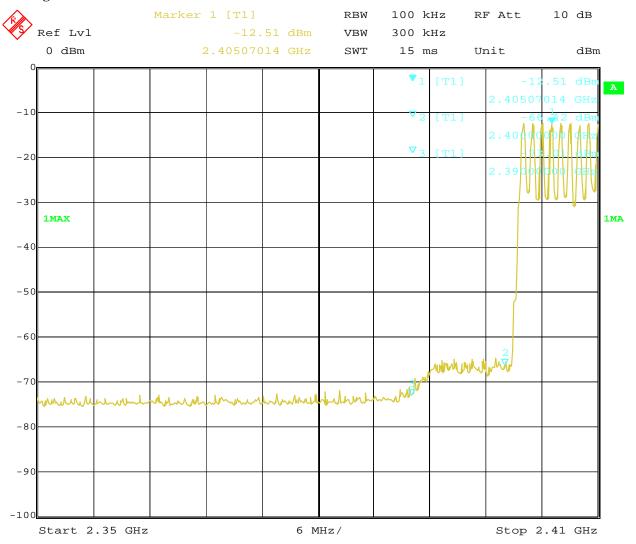


Type of Modulation: GFSK

Band Edge Test Result

Product:	Tablet POS	Test Mode:	Hopping mode
Mode	Hopping On	Input Voltage	DC3.8V
Temperature	24 deg. C,	Humidity	56% RH
Test Result:	Pass	Detector	PK

Test Figure:



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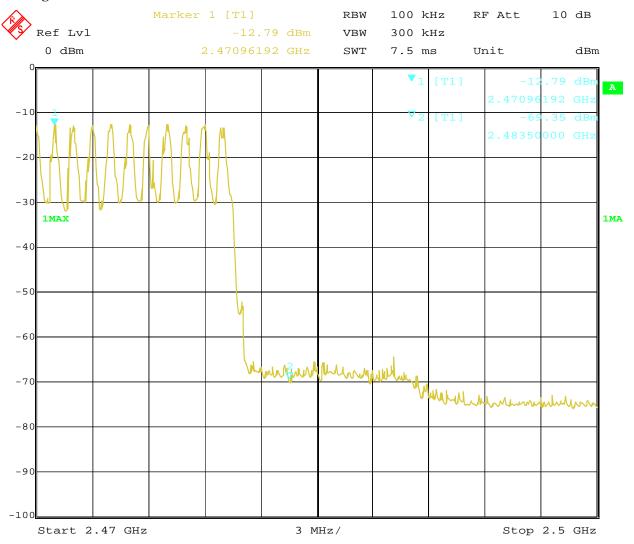


Type of Modulation: GFSK

Band Edge Test Result

Product:	Tablet POS	Test Mode:	Hopping mode
Mode	Hopping On	Input Voltage	DC3.8V
Temperature	24 deg. C,	Humidity	56% RH
Test Result:	Pass	Detector	PK

Test Figure:



Date: 25.NOV.2020 13:08:12

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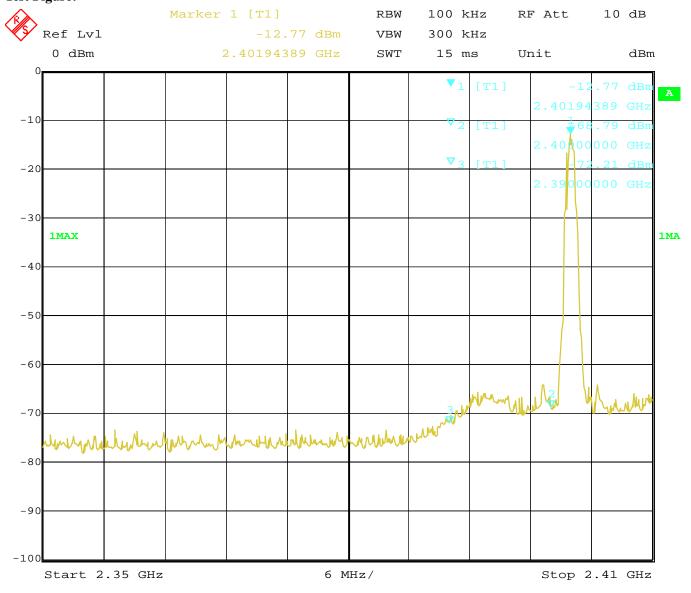


Type of Modulation: $\Pi/4D$ -QPSK

12.4 Out of Band Test Result

Product:	Tablet POS	Test Mode:	Low Channel
Mode	Keeping Transmitting	Input Voltage	DC3.8V
Temperature	24 deg. C	Humidity	56% RH
Test Result:	Pass	Detector	PK

Test Figure:



Date: 25.NOV.2020 13:40:12

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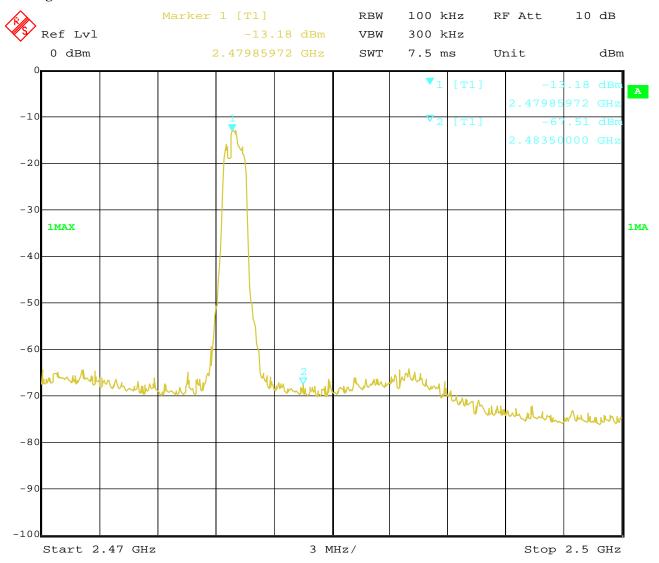


Type of Modulation: $\pi/4D$ -QPSK

12.4 Band Edge Test Result

Product:	Tablet POS	Test Mode:	High Channel
Mode	Keeping Transmitting	Input Voltage	DC3.8V
Temperature	24 deg. C,	Humidity	56% RH
Test Result:	Pass	Detector	PK

Test Figure:



Date: 25.NOV.2020 13:45:40

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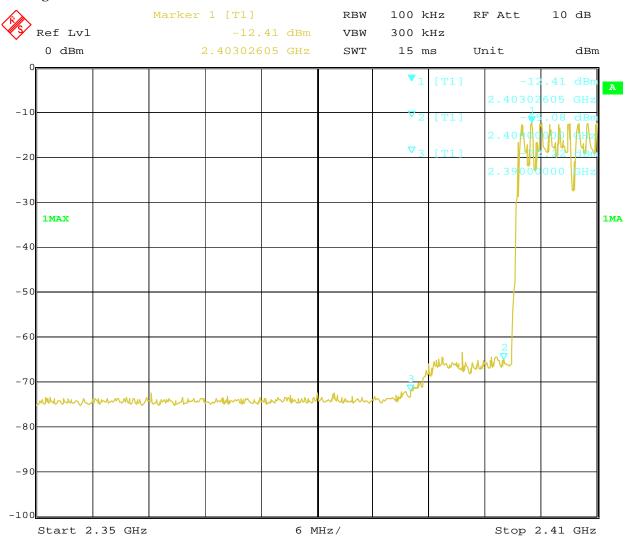


Type of Modulation: $\pi/4D$ -QPSK

Out of Band Test Result

Product:	Tablet POS	Test Mode:	Hopping mode
Mode	Hopping On	Input Voltage	DC3.8V
Temperature	24 deg. C,	Humidity	56% RH
Test Result:	Pass	Detector	PK

Test Figure:



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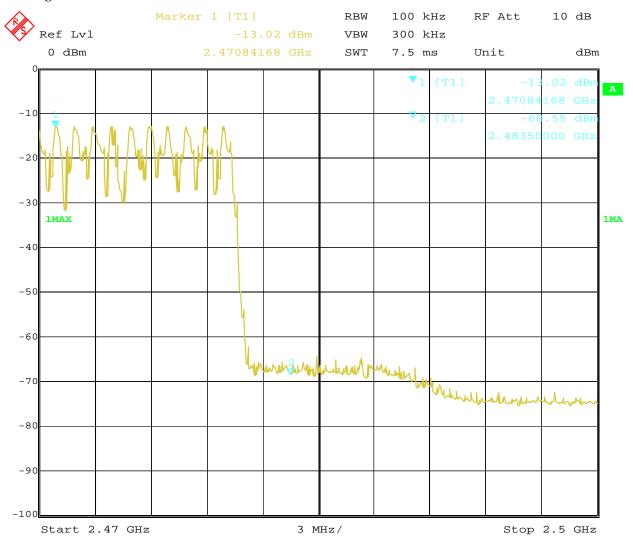


Type of Modulation: $\pi/4D$ -QPSK

Out of Band Test Result

Product:	Tablet POS	Test Mode:	Hopping mode
Mode	Hopping On	Input Voltage	DC3.8V
Temperature	24 deg. C,	Humidity	56% RH
Test Result:	Pass	Detector	PK

Test Figure:



Date: 25.NOV.2020 13:15:02

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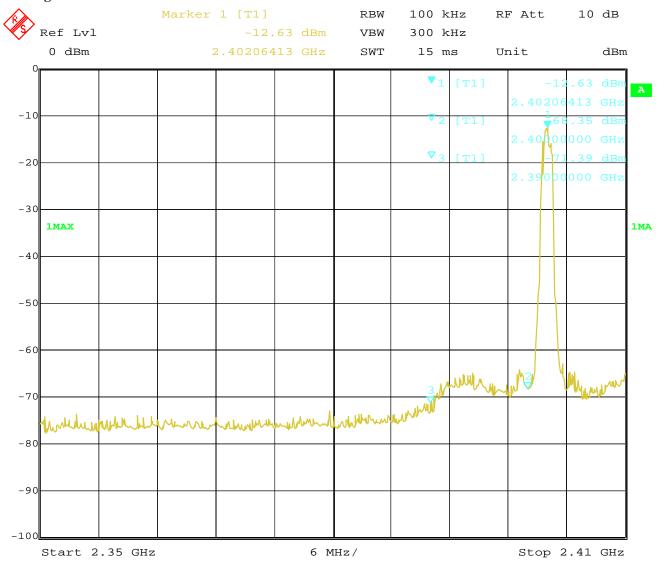


Type of Modulation: 8DPSK

12.4 Band Edge Test Result

Product:	Tablet POS	Test Mode:	Low Channel
Mode	Keeping Transmitting	Input Voltage	DC3.8V
Temperature	24 deg. C	Humidity	56% RH
Test Result:	Pass	Detector	PK

Test Figure:



25.NOV.2020 Date: 13:40:45

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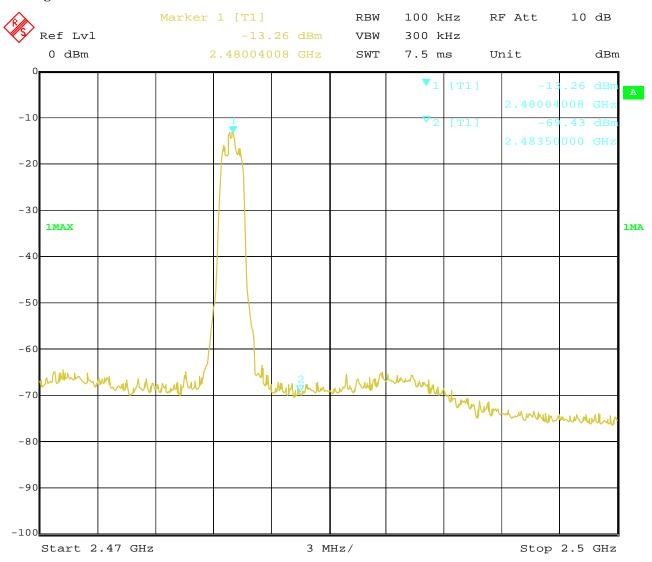


Type of Modulation: 8DPSK

Band Edge Test Result 12.4

Product:	Tablet POS	Test Mode:	High Channel
Mode	Keeping Transmitting	Input Voltage	DC3.8V
Temperature	24 deg. C,	Humidity	56% RH
Test Result:	Pass	Detector	PK

Test Figure:



25.NOV.2020 Date: 13:46:27

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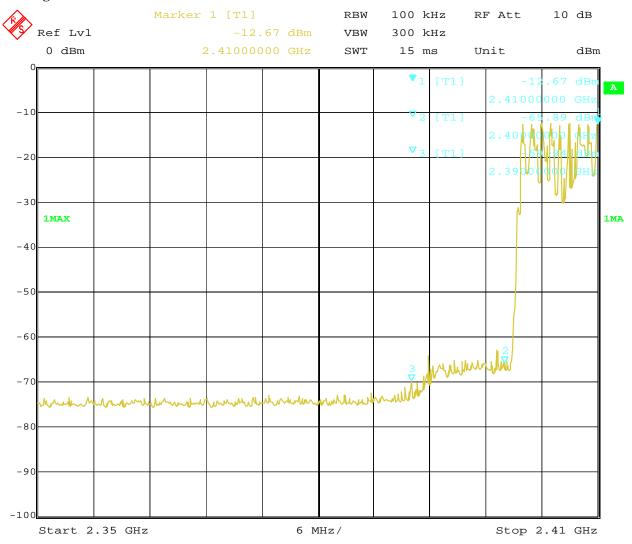


Type of Modulation: 8DPSK

Band Edge Test Result

Product:	Tablet POS	Test Mode:	Hopping mode
Mode	Hopping On	Input Voltage	DC3.8V
Temperature	24 deg. C,	Humidity	56% RH
Test Result:	Pass	Detector	PK

Test Figure:



Date: 25.NOV.2020 13:44:20

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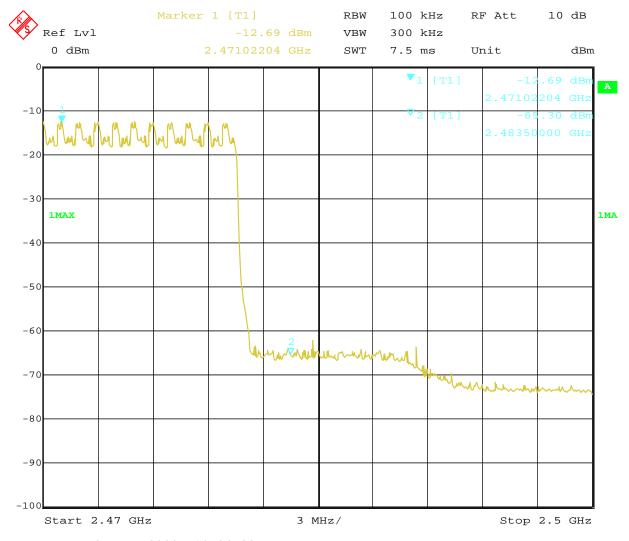


Type of Modulation: 8DPSK

Band Edge Test Result

Product:	Tablet POS	Test Mode:	Hopping mode
Mode	Hopping On	Input Voltage	DC3.8V
Temperature	24 deg. C,	Humidity	56% RH
Test Result:	Pass	Detector	PK

Test Figure:



Date: 25.NOV.2020 13:04:22

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12.4 Restrict Band Measurement

]	EUT		Tablet P	OS		Model			HM626F	2
N	Mode	K	eep Transı	mitting	I	nput Volta	ge		DC3.8V	
Tem	nperature		24 deg.	C,		Humidity	7		56% RH	
Test	t Result:		Pass		Me	odulation 7	Гуре		8DPSK	
Part 15C	Class B 1GHz-18GHz	-2								
70-									M1	
50-	ي الم	so alaketrokoda				ıl)	мз			
50 - 40 - 30 -	akanda Manada Labi	May market May to a state of the state of th	المساورة والمساورة والمساو	nesiten kaliki seranda pladen k	iskiki planesii polityin takei	الماميميغران يغليا	мз		22	Marilly and prophists
50 - 40 -	akindon (Manada Landa)	Mayber Market Carlos Construction of the Const	h.dh.eelde.ddedddidenheb.	nterior de la companya	iskulki plannosii kookiliy hiskoli		мз		22	mentisas pagline
50 - 40 - 30 - 20 -	akada Manakka A	Magazin Maria Mari	h. del. and de Libertia and a base i	nesiten katiki kerika laba, t	ukulik ediktrociil edekiy, bi bildi	h, ber egente from the each, of	мз	New Albandary	1/2	Marahlyan planpalasar
50- 40- 30-		Marie Ma	h. dejanle Ibb abbeile och dere	nesilead ladik karandar ladik d	Frequency (MHz)	h.lorl species, down the walk.	МЗ	Haraba Hatar	1/2	2410
50 - 40 - 30 - 20 -	Frequency	Results	Factor	Limit	Frequency (MHz)	Detector	Table (o)	Height	ANT	
50- 40- 30- 20- 10- 0.0- 2350	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	1	Detector	Table (o)	Height (cm)		2410

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12.4 Restrict Band Measurement

E	UT		Tablet	POS		Model		F	HM626R	
Me	ode	K	eep Tran	smitting	Inp	ut Voltage		I	DC3.8V	
Temp	erature		24 deg	g. C,	Н	Iumidity		5	66% RH	
Test I	Result:		Pas	SS	Modi	ulation Typ	oe e		8DPSK	
Part 15C Cla	lass B 1GHz-18GHz -	-2								
80-									M1	
70-									$/ \setminus$	
60-										
50-							Mª (I I I I I I I I I I I I I I I I I I		/	
	higgad ya bayyani ya kida	kananali akiliya dajalinga	ildishirkada (laka)	uligi (Magalar) Helyayar Adama Histo	hadiyilalinda	udaphojiph malkatsork m ^{al} d			/	
50-	higher ar mary at 17 materia	4886 M/M/A/A/A/A/A	older of the second of the sec	older freeholder freeh	hadaya kalandar	ularinish kathasyal ada			/	
40-	high a thaif goth a thaif		oliates proposada (padral)	allag Bagaini Hali _{ag} an Alaasa hiin	iden de la	ul _{art} hija fi nethaliye keelel			/	
50- 40- 30- 20-	hhippolyphaplyathya.hip	MANINANI JAKI VANDANI PININANI	halahirkada <mark>kkal</mark> ah	vlági ktopovářelovoví teje	hodrigh <mark>i</mark> kaljadeenkan	udapaterijak karakaturak arabit		M		
30 - 20 -	hhippy of shippy of the ship	MANIMANI/ANI/VANIMANIANI	ilduk/ibadal _{ele} elel	illagiidaphaisteighyaddaphaid	Frequency (MHz)	abayahiya Parabayya karibi				2410
30 - 20 - 10 - 2350	Frequency	Results	Factor	Limit	Frequency (MHz) Over	Detector	Table (o)	Height	ANT	2410 Verdict
30- 20- 10- 2350	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)		Detector	Table (o)		ANT	1

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12.4 Restrict Band Measurement

	EUT		Tablet	POS		Model			HM626	R
	Mode	K	eep Tran	smitting		Input Volta	age		DC3.8V	I
Ten	mperature		24 deg	g. C,		Humidit	у		56% RI	1
Tes	st Result:		Pas	S	N	Iodulation	Туре		8DPSK	
C Part 15	5C Class B 1GHz-18GHz	-2			1			•		
80-				····						
70-										
60-			/							
			/							
50-										
		/								
50- 40- 30-	hitamaka kapateri perdapan kapan	tropostopological proprior			A residence residence	isoloh danphadisikan dingdi.	alaborahad ayo da bada kili basaya	hts:hadaabii.dekkala		oll _{an} dad li _a d ada
40-	hitamakidapin padamakilah modili	mangazipida miliyakika miliya			and the second second	istophasistochesik	the shape of the state of the s	Mahadisələhdə	ud a blishman in lista	ala, kapla Nicharia
40-	hitamakidapari randambakilah modifi	rengashirabatikakina min			A residence in the second	isahahan di dan dingki	distributed and have been all the best of	Maritisalmetissalmiklaha	ud on the state of	all _{as} h _{as} dall _{la} h _a da
30- 20-	lykapudokapun parakennyilagi angalifi	transport of the distribution of the second			And the second	hostel dayle do a fare disease.	itidos hipoteris kaj dilikuseris	Mistribuladiralidah		ali _{ka} dalikata
30-	man e e e e e e e e e e e e e e e e e e e	transport of the desire desired to the second			2483.5 Frequency (MHz)		itidos hipotenies kaj deli kansen	denis de de la deservación dela deservación de la deservación de la deservación de la deservación de la deservación dela deservación de la		2500
30-	man e e e e e e e e e e e e e e e e e e e	Results	Factor	Limit	2483.5		Table (o)	Height	ANT	
20- 20- 20- 2470	n property	The state of the s	Factor (dB)	T	2483.5 Frequency (MHz)					2500

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12.4 Restrict Band Measurement

EUT		Tablet	ros		Model			HM626F	₹
Mode	K	eep Tran	smitting		Input Volta	ige		DC3.8V	T
Temperature		24 deg	g. C,		Humidity	У		56% RH	I
Test Result:		Pas	SS	M	odulation	Гуре		8DPSK	
C Part 15C Class B 1GHz-18G	lz -2								
80-									
70-			Married World Control of the Control						
60-									
50-									
	10 1 1 1 1 1 1 1 1 1								<u> </u>
					i kara pakkan palagaa		A polygonia la propieda de la companya de la compa		Marijap Naga
50- 40- 30-	Alfridge and long from the facility of the state of			"Laprophicopy white	il hara feriji ka apida feri	hisintipa denggan ilibera	hijdh dimbhliph an hair agus	Muhamphy hall glad	AAIIII AAAAAAAA
40-				water property to the second	p ^h ari <mark>bahka da kata</mark> n	historia di manganti di dimenji	hijdhainhidha an dadhaidh	American Market Market	ANIHAP NAHA
30-	Allan Maradhard Port (14 Ann Air				H ^{il} wyr y ^{r o} ffik wyfyddyfelu	htsbiftparladged, illihagi	highliginikhiga walada gad	i Apakanji kyhothyj hi	AAAAAAAAAA
30-					phorephylosphilapen	Halliften Hadiga de Bloda	hipelianikelphia debakalan	Human ya kata da kata d	ANTHAN MAIN
30-	Allay Made and head for the facility of the second		2	2483.5	H ^a wan <mark>wakka padalak</mark> a	htsbifteathabytetsbiftets	Aspella de contra de la contra d	i Alukuyi kyhikyyhi	2500
30-			2	2483.5 Frequency (MHz)	phopologic books de la constantina	ly silvépa de degrada librery	hipel distribution of the		2500
30-			2		H ^a wan <mark>wakka pidalaha</mark>	htsbiften tendeler (tilber)			2500
30-	Results	Factor	Limit		Detector	Table (o)	Height	ANT	2500 Verdict
30- 20- 10- 2470	Results (dBuV/m)	Factor (dB)		Frequency (MHz)	1	Table (o)	Height (cm)	ANT	T

Note: 1. For Restricted band test, All modulation mode was tested and only the worst case was reported. 8DPSK was the worst case.

2. The measured PK value less than the AV limit, no necessary to take down the AV measurement result.

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13.0 Antenna Requirement

13.1 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 transmitter antennas of directional gain greater than 6 dBi are used, the power shall be reduced by the mount in dB that the directional gain of the antenna exceeds 6 dBi.

13.2 Antenna Connected constructions

Integral antenna used. The gain of the antennas is 2.0dBi.

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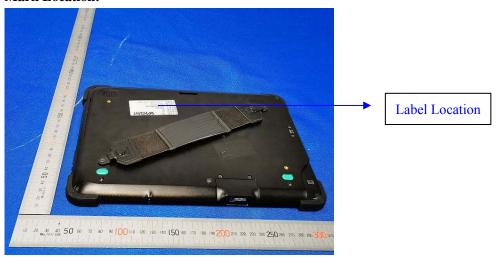
14.0 FCC ID Label

FCC ID: GQK-HM626

This device complies with part 15 of the FCC rules. Operation is subject to the following two conditions (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

The label must not be a stick-on paper label. The label on these products must be permanently affixed to the product and readily visible at the time of purchase and must last the expected lifetime of the equipment not be readily detachable.

Mark Location:



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15.0 Photo of testing

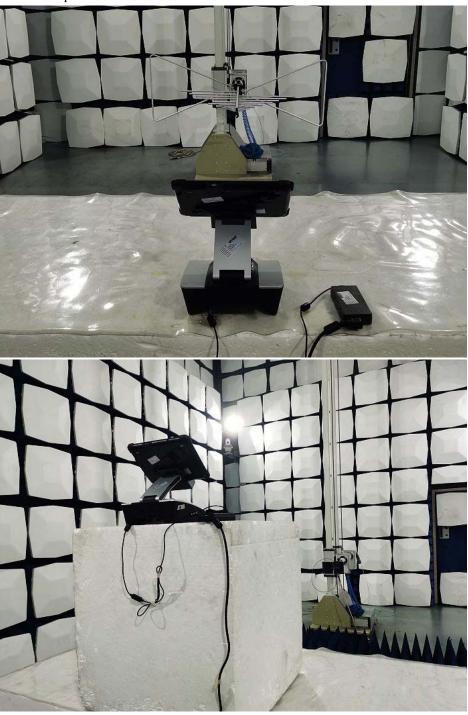
Conducted Emission Test Setup:



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Radiated Emission Test Setup:



Photographs - EUT

Please refer test report TW2011170-01E

-- End of Report--

The report refers only to the sample tested and does not apply to the bulk.

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