



Report No.: TW 2008248-02E File Reference No.: 2020-09-08

Applicant: Shenzhen Jingwah Information Technology Co., Ltd.

Product: Tablet PC

Model No.: N7DW, ST7680

Trademark: SMARTAB

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: September 08, 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: 2020-09-08



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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: Shenzhen Jingwah Information Technology Co., Ltd.

Address: 6F, Bldg.4, Jinghua Square, No. 168, Zhenzhong Rd., Fuqiang Community, Huaqiangbei,

Futian District, Shenzhen

Telephone: 0755-84688843

Fax: --

1.3 Description of EUT

Product: Tablet PC

Manufacturer: Shenzhen Jingwah Information Technology Co., Ltd.

Address: 6F, Bldg.4, Jinghua Square, No. 168, Zhenzhong Rd., Fuqiang Community,

Huaqiangbei, Futian District, Shenzhen

Brand Name: SMARTAB
Model Number: N7DW
Additional Model Number: ST7680
Hardware Version: AK71-D8U5A

Software Version: Android 10

Type of Modulation GFSK, JI/4DQPSK, 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 0.5dBi (get from the antenna

specification provided the applicant)

Input Voltage: DC5.0V

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Battery:

DC3.7V === 3000mAh, 11.1Wh; Model: PL3370100P

Power Supply:

Model: TPA-95A050100UU; Input: 100-240V~, 50/60Hz, 0.15A; Output: DC5V, 1A

Submitted Sample: 3 Samples

1.5 Test Duration

2020-08-25 to 2020-09-08

Test Uncertainty 1.6

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	7hanadi	ZT26-NJ-NJ-8		2020-06-23	2021-06-22		
Kr Cable	Zhengdi	M/FA	-				
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	2021-01-07	2020-01-06		

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

2.3 Bluetooth Test Software:

ADB Command used

Power Setting: 7

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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

3.2 **Test Standards**

FCC Part 15 Subpart & Subpart C, Paragraph 15.247

4.0 **EUT Modification**

No modification by SHENZHEN TIMEWAY TESTING LABORATORIES.

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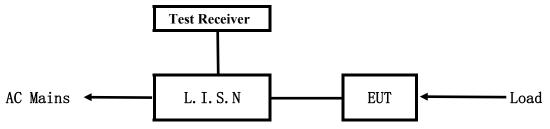
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5. Power Line Conducted Emission Test

5.1 Schematics of the test

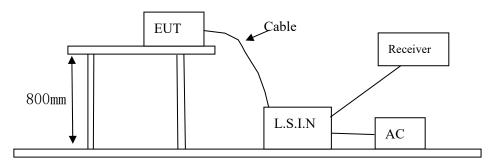


EUT: Equipment Under Test

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 PC	Shenzhen Jingwah Information	N7DW,	RBD-N7DW
Tablet PC	Technology Co., Ltd.	ST7680	RBD-N/DW

B. Internal Device

Device	Manufacturer	Model	Rating

C. Peripherals

Device	Manufacturer	Model	Rating
Power Supply	TIANYIN	TPA-95A050100UU	Input: 100-240V~, 50/60Hz, 0.15A;
			Output: DC5V, 1A

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

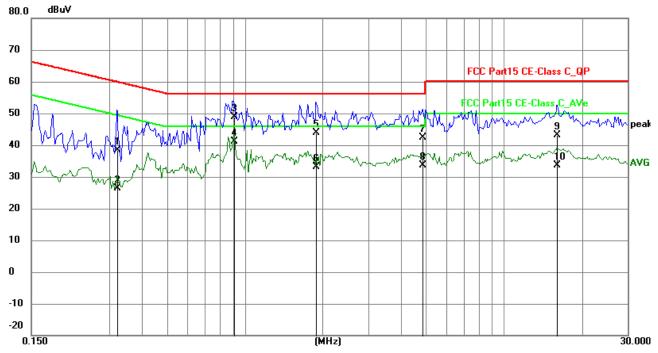
EUT Operating Environment

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

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	0.3215	28.60	9.76	38.36	59.67	-21.31	QP	Р
2	0.3215	16.52	9.76	26.28	49.67	-23.39	AVG	Р
3	0.9066	38.99	9.79	48.78	56.00	-7.22	QP	Р
4	0.9066	31.30	9.79	41.09	46.00	-4.91	AVG	Р
5	1.8855	34.02	9.80	43.82	56.00	-12.18	QP	Р
6	1.8855	23.25	9.80	33.05	46.00	-12.95	AVG	Р
7	4.8486	32.57	9.92	42.49	56.00	-13.51	QP	Р
8	4.8486	23.66	9.92	33.58	46.00	-12.42	AVG	Р
9	16.0494	32.71	10.44	43.15	60.00	-16.85	QP	Р
10	16.0494	23.21	10.44	33.65	50.00	-16.35	AVG	Р

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

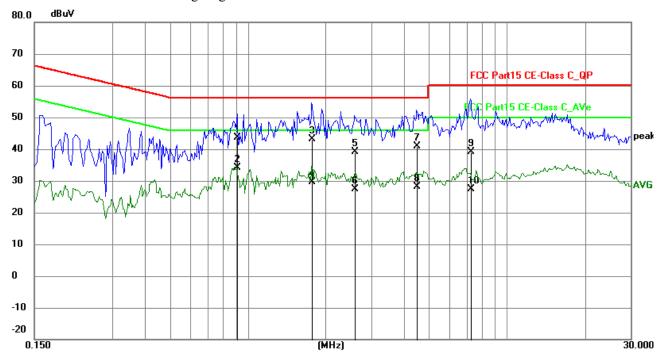
EUT Operating Environment

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

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	0.9105	33.93	9.79	43.72	56.00	-12.28	QP	Р
2	0.9105	24.39	9.79	34.18	46.00	-11.82	AVG	Р
3	1.7685	33.40	9.80	43.20	56.00	-12.80	QP	Р
4	1.7685	19.79	9.80	29.59	46.00	-16.41	AVG	Р
5	2.5836	29.30	9.83	39.13	56.00	-16.87	QP	Р
6	2.5836	17.44	9.83	27.27	46.00	-18.73	AVG	Р
7	4.4898	30.96	9.91	40.87	56.00	-15.13	QP	Р
8	4.4898	18.26	9.91	28.17	46.00	-17.83	AVG	Р
9	7.2354	29.12	10.02	39.14	60.00	-20.86	QP	Р
10	7.2354	17.39	10.02	27.41	50.00	-22.59	AVG	Р

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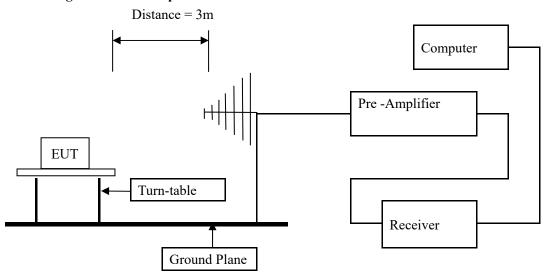


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6 Radiated Emission Test

- 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



- 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.

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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:

Frequencies in restricted band are complied to limit on Paragraph 15.209

	•	9 1
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. GFSK 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)

Keep Bluetooth Transmitting EUT set Condition:

Results: Pass Page 15 of 79

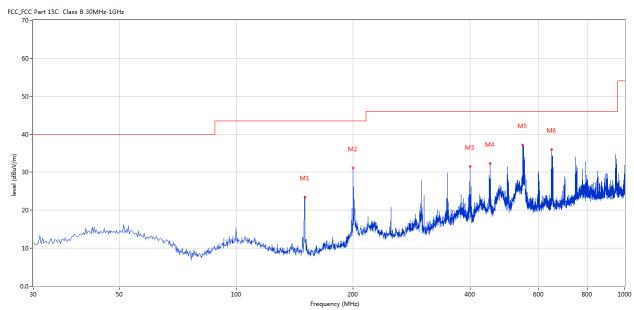
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Test Figure:

H



No.	Frequency	Results	Factor	Limit	Over Limit	Detector	Table (o)	Height	ANT	Verdict
	(MHz)	(dBuV/m)	(dB)	(dBuV/m)	(dB)			(cm)		
1	150.007	23.52	-17.03	43.5	-19.98	Peak	311.00	200	Horizontal	Pass
2	199.950	31.13	-13.45	43.5	-12.37	Peak	293.00	100	Horizontal	Pass
3	399.963	31.56	-8.57	46.0	-14.44	Peak	103.00	100	Horizontal	Pass
4	449.905	32.26	-8.01	46.0	-13.74	Peak	126.00	200	Horizontal	Pass
5	548.335	37.68	-6.31	46.0	-8.32	Peak	86.00	200	Horizontal	Pass
6	648.220	35.99	-4.60	46.0	-10.01	Peak	73.00	100	Horizontal	Pass

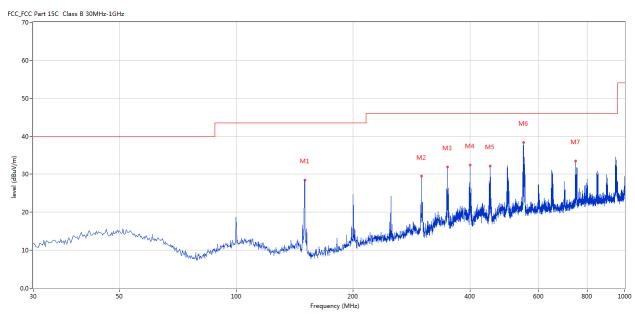
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Test Figure:

V



No.	Frequency	Results	Factor	Limit	Over Limit	Detector	Table (o)	Height	ANT	Verdict
	(MHz)	(dBuV/m)	(dB)	(dBuV/m)	(dB)			(cm)		
1	150.007	28.45	-17.03	43.5	-15.05	Peak	360.00	200	Vertical	Pass
2	299.835	29.47	-11.03	46.0	-16.53	Peak	28.00	200	Vertical	Pass
3	349.778	31.93	-9.35	46.0	-14.07	Peak	360.00	200	Vertical	Pass
4	399.963	32.44	-8.57	46.0	-13.56	Peak	360.00	200	Vertical	Pass
5	449.905	32.15	-8.01	46.0	-13.85	Peak	101.00	100	Vertical	Pass
6	550.032	38.41	-6.36	46.0	-7.59	Peak	267.00	200	Vertical	Pass
7	748.348	33.52	-3.38	46.0	-12.48	Peak	360.00	200	Vertical	Pass

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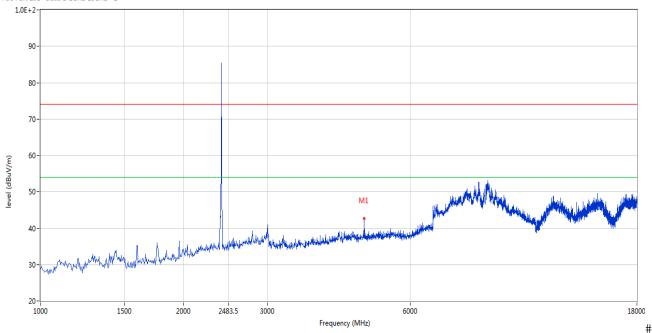
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Test Figures above 1GHz:

Please refer to the following test plots for details:

Low Channel: Vertical





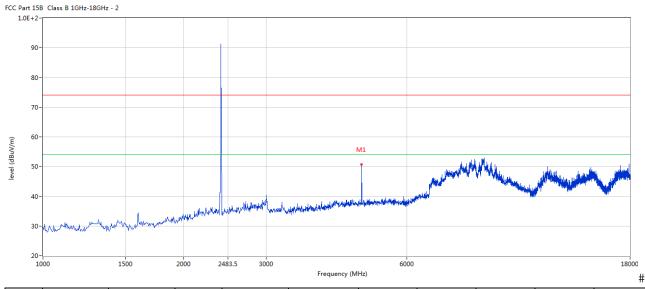
No.	Frequency	Results	Factor (dB)	Limit	Over Limit	Detector	Table	Height	ANT	Verdict
	(MHz)	(dBuV/m)		(dBuV/m)	(dB)		(o)	(cm)		
1	4802.799	42.69	3.12	54.0	-11.31	Peak	318.00	100	V	Pass

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Low Channel: Horizontal



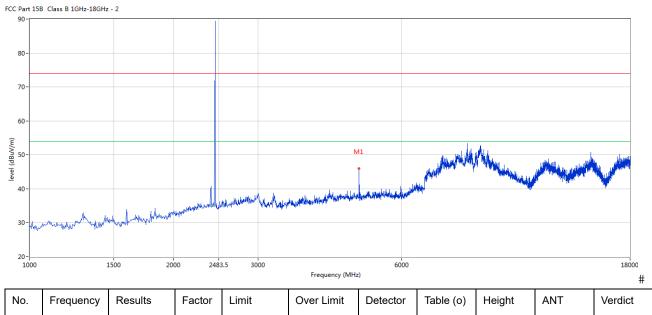
No.	Frequency	Results	Factor	Limit	Over Limit	Detector	Table (o)	Height	ANT	Verdict
	(MHz)	(dBuV/m)	(dB)	(dBuV/m)	(dB)			(cm)		
1	4802.799	50.76	3.12	54.0	-3.24	Peak	243.00	100	Н	Pass

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Middle Channel: Horizontal



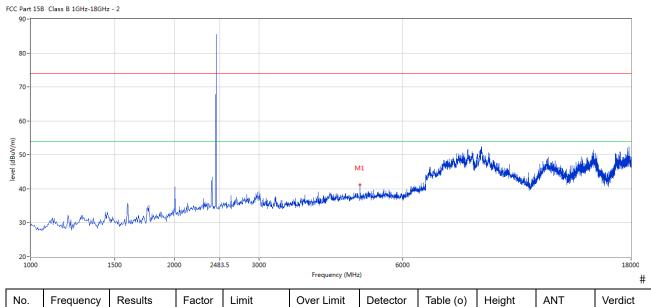
No.	Frequency	Results	Factor	Limit	Over Limit	Detector	Table (o)	Height	ANT	Verdict
	(MHz)	(dBuV/m)	(dB)	(dBuV/m)	(dB)			(cm)		
1	4879.280	45.93	3.20	4.0	-8.07	Peak	242.00	100	Н	Pass

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Middle Channel: Vertical



No.	Frequency	Results	Factor	Limit	Over Limit	Detector	Table (o)	Height	ANT	Verdict
	(MHz)	(dBuV/m)	(dB)	(dBuV/m)	(dB)			(cm)		
1	4879.280	41.15	3.20	54.0	-12.85	Peak	351.00	100	٧	Pass

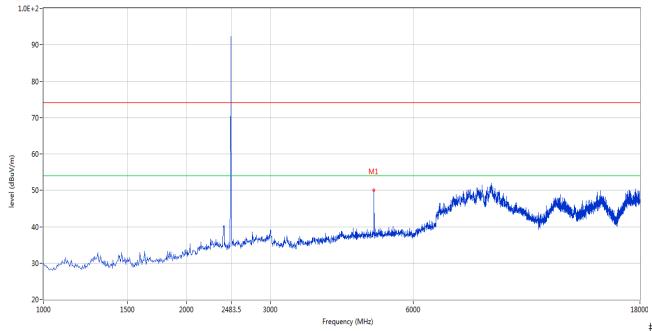
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High Channel: Horizontal





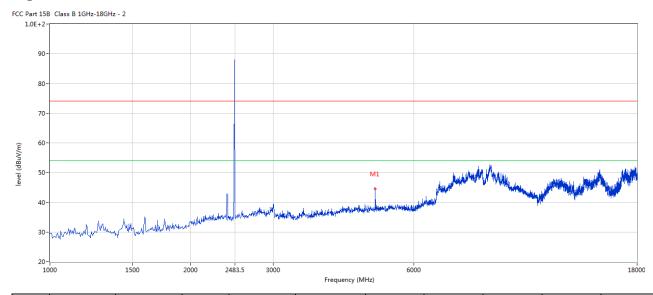
No.	Frequency	Results	Factor (dB)	Limit	Over Limit	Detector	Table	Height	ANT	Verdict
	(MHz)	(dBuV/m)		(dBuV/m)	(dB)		(o)	(cm)		
1	4960.010	50.01	3.36	54.0	-3.99	Peak	240.00	100	Н	Pass

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High Channel: Vertical



No.	Frequency	Results	Factor	Limit	Over Limit	Detector	Table (o)	Height	ANT	Verdict
	(MHz)	(dBuV/m)	(dB)	(dBuV/m)	(dB)			(cm)		
1	4960.010	44.48	3.36	54.0	-9.52	Peak	351.00	100	V	Pass

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

EUT		Tablet PC	Model	N7DW					
Mode	Ke	ep Transmitting	Input Voltage	DC3.7V					
Temperat	ure	24 deg. C,	Humidity	56% RH					
Channel	Channel Frequency (MHz)			Pass/ Fail					
Low	2402	884		Pass					
Middle	2441	890		Pass					
High 2480		884		Pass					

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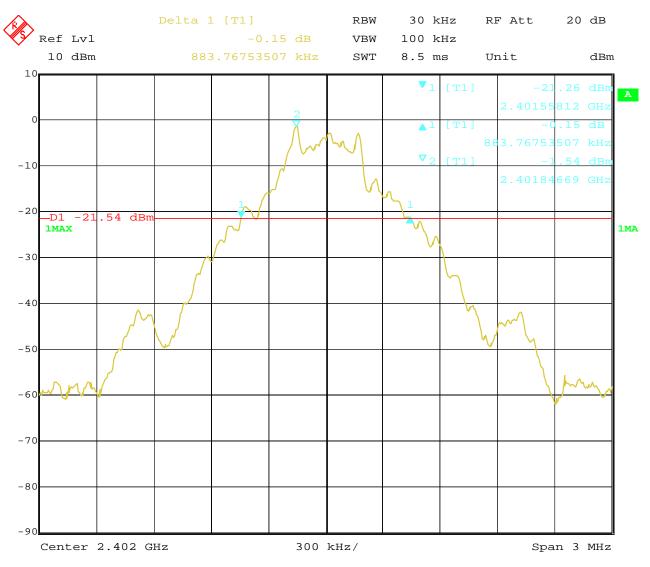
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Test Figure:

1. Condition: Low Channel



Date: 2.SEP.2020 15:49:25

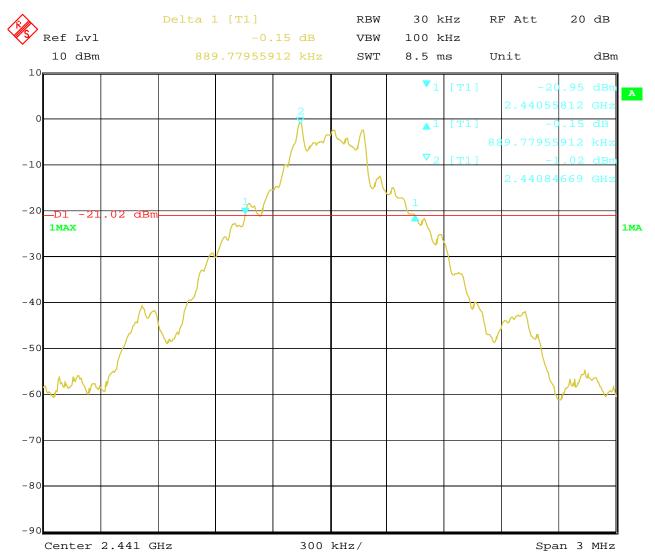
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2. Condition: Middle Channel



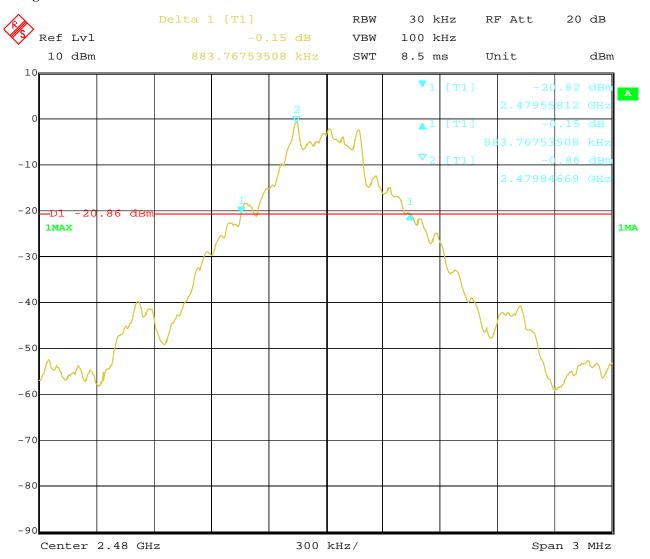
2.SEP.2020 Date: 15:50:44

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3. High Channel



2.SEP.2020 15:58:33 Date:

Date: 2020-09-08



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Test Result

Type of Modulation: $\sqrt{1/4}$ DQPSK

EUT		Tablet PC	Model	N7DW
Mode	K	eep Transmitting	Input Voltage	DC3.7V
Temperat	ure	24 deg. C,	deg. C, Humidity	
Channel	Channel Frequency (MHz)			Pass/ Fail
Low	2402	1142		Pass
Middle	2441	1142		Pass
High	2480	1142		Pass

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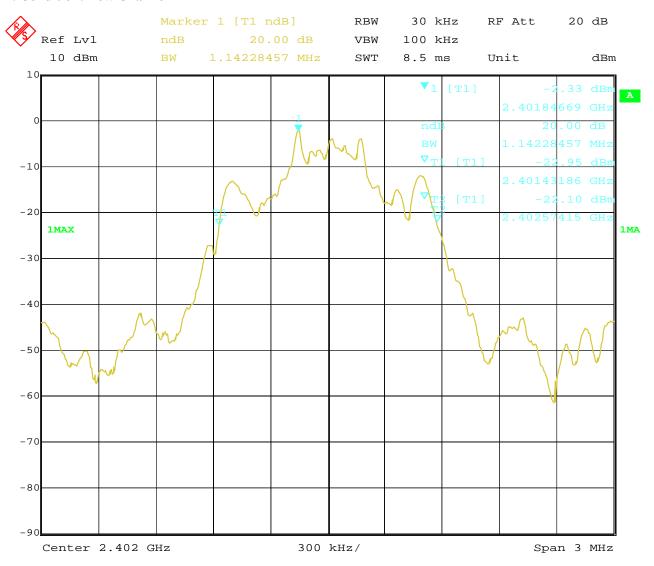
Report No.: TW2008248-02E

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Test Figure:

1. Condition: Low Channel

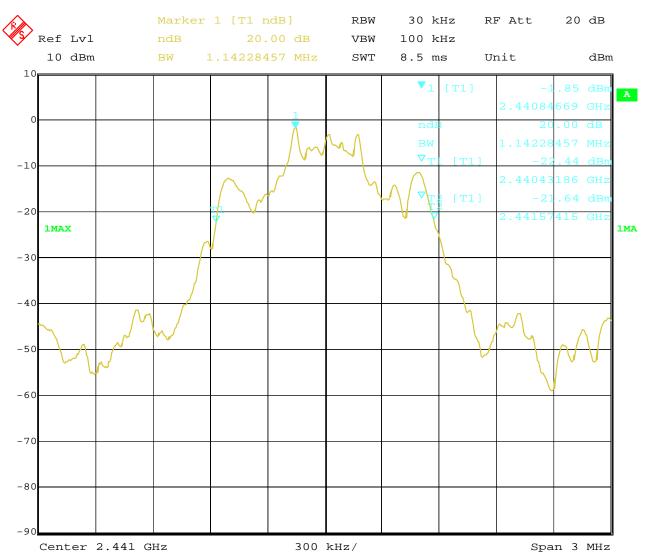


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2. Condition: Middle Channel



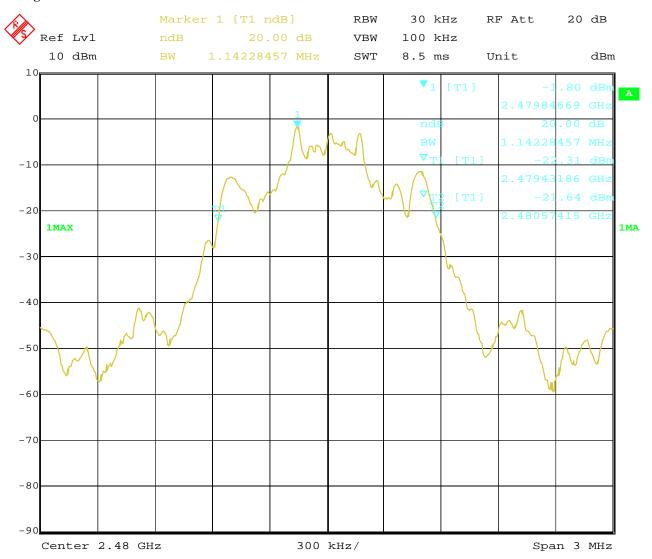
2.SEP.2020 Date: 16:01:42

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3. High Channel



2.SEP.2020 Date: 15:59:43

Date: 2020-09-08



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Test Result

Type of Modulation: 8DPSK

EUT		Tablet PC	Model	N7DW
Mode	K	eep Transmitting	Input Voltage	DC3.7V
Temperat	ure	24 deg. C,	Humidity	56% RH
Channel	Channel Frequency (MHz)	20 dB Bandwidth (kHz)	Maximum Limit (kHz)	Pass/ Fail
Low	2402	1160		Pass
Middle	2441	2441 1160		Pass
High	2480	1166		Pass

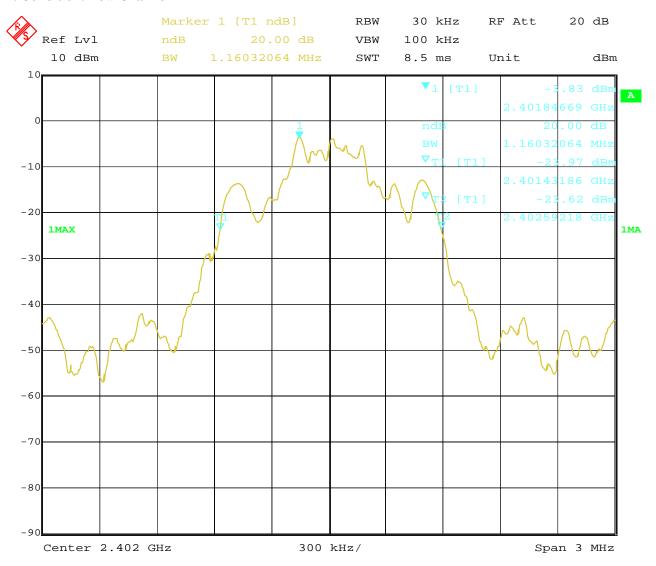
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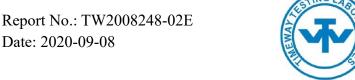


Test Figure:

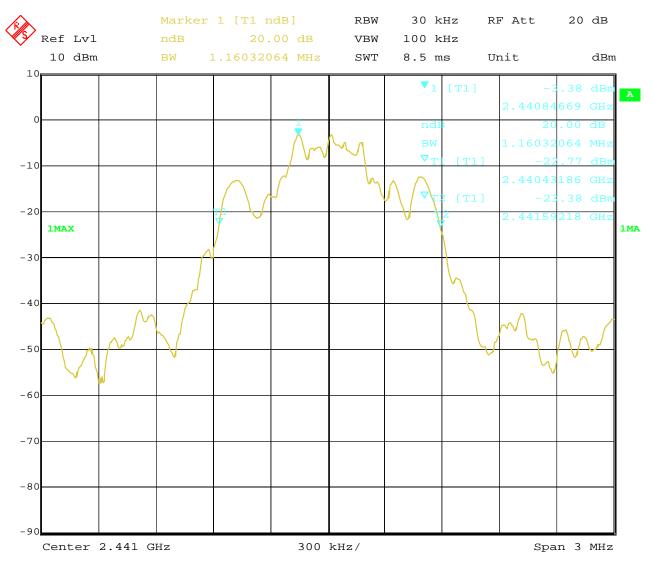
1. Condition: Low Channel



Date: 2.SEP.2020 16:03:08 Page 33 of 79



2. Condition: Middle Channel



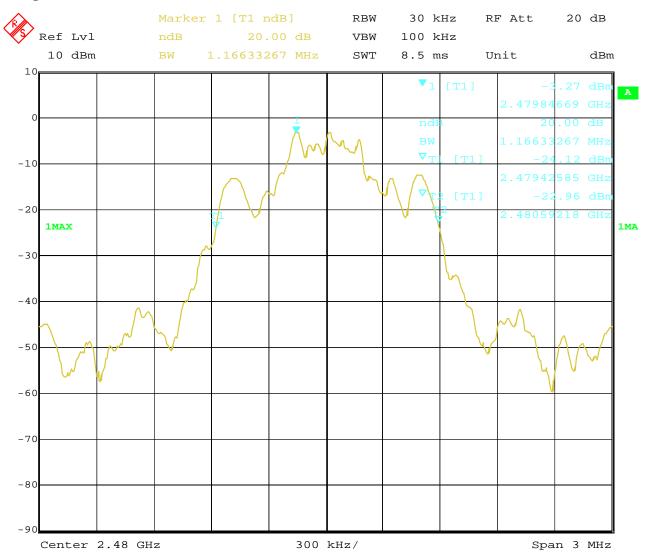
2.SEP.2020 Date: 16:04:16

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3. High Channel



2.SEP.2020 Date: 16:05:05

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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 = 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 PC	N	Model	N7DW
Mode	K	Keep Transmitting			DC3.7V
Temperature	e	24 deg. C,			56% RH
Channel	Channel Frequency (MHz)	Max. Power Output (dBm)	Peak Power Limit (dBm)	Pass/ Fail
Low	2402	1.46		30	Pass
Middle	2441 1.89			30	Pass
High 2480		2.01		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: Л/4DQPSK

EUT		Tablet PC		Model		N7DW
Mode		Keep Transmitting		Input Voltage		DC3.7V
Temperature		24 deg. C,		Humidity		56% RH
Channel	Cł	nannel Frequency (MHz)	Max. Power Output (dBm	out (dBm)		Pass/ Fail
			Peak		Limit (dBm)	
Low		2402	0.80		30	Pass
Middle	2441		1.32		30	Pass
High	High 2480		1.32		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 PC		Model	N7DW
Mode	Ke	ep Transmitting	Input Voltage		DC3.7V
Temperature	e	24 deg. C,		umidity	56% RH
Channel	Channel Frequency (MHz)	Max. Power Output (dBm) Peak		Peak Power Limit (dBm)	Pass/ Fail
Low	2402	0.80		30	Pass
Middle	2441	1.20		30	Pass
High	2480	1.32		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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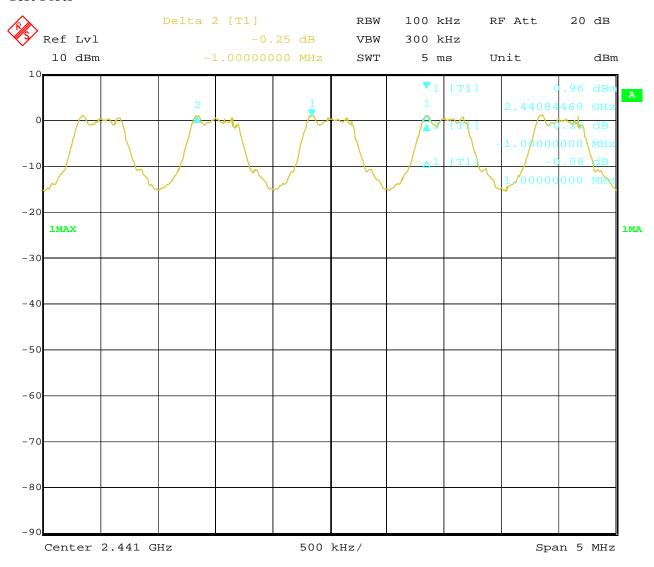


9.4Test Result

Type of Modulation: GFSK

EUT	Tablet PC		Model		N7DW
Mode	Hopping On I		Input Voltage	DC3.7V	
Temperature	24 deg. C,		Humidity	56% RH	
Carrier Frequency Separation		Limit			Pass/ Fail
1.000MHz		≥ 25 kHz or 2/3 of the 20 dB bandwidth		dwidth	Pass

Test Plots



2.SEP.2020 09:56:00 Date:

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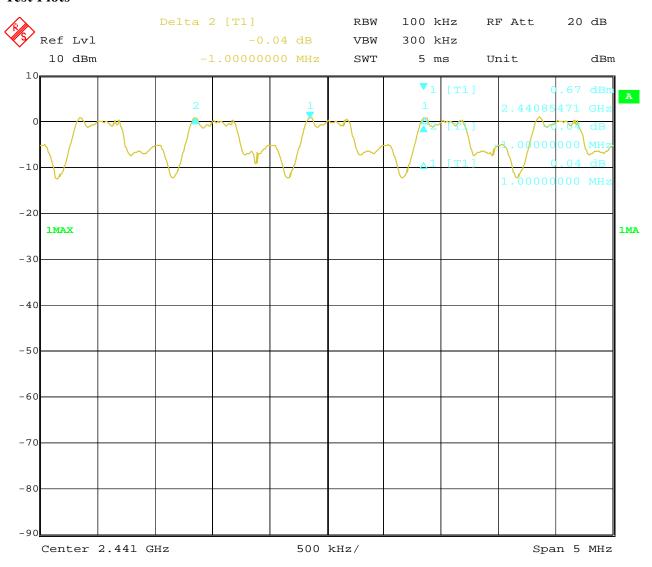
Date: 2020-09-08



Type of Modulation: √ //4DQPSK

EUT	Tablet PC		Model		N7DW
Mode	Hopping On II		Input Voltage		DC3.7V
Temperature	24 deg. C,		Humidity	56% RH	
Carrier Frequency Separation		Limit			Pass/ Fail
1.000MHz		≥ 25 kHz or 2/3 of 20 dB bandwidth		Pass	

Test Plots



2.SEP.2020 11:19:41 Date:

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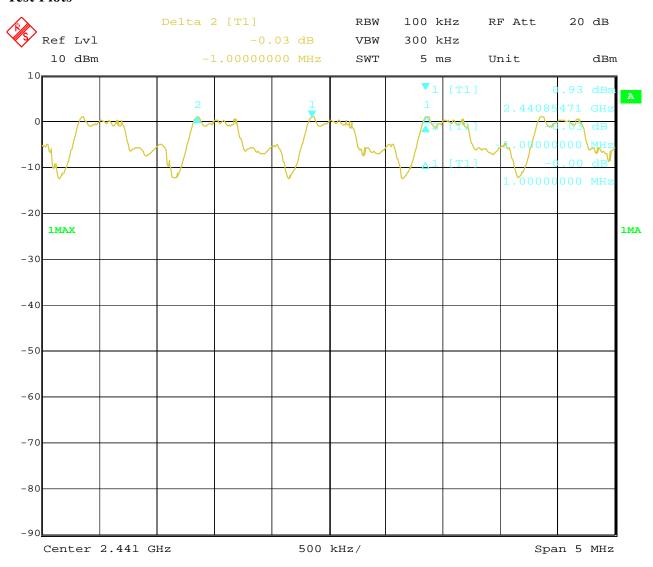
Date: 2020-09-08



Type of Modulation: 8DPSK

EUT	Tablet PC		Model		N7DW
Mode	Hopping On II		Input Voltage	DC3.7V	
Temperature	24 deg. C,		Humidity	56% RH	
Carrier Frequency Separation		Limit			Pass/ Fail
1.000MHz		≥ 25 kHz or 2/3 of 20 dB bandwidth		Pass	

Test Plots



2.SEP.2020 14:32:56 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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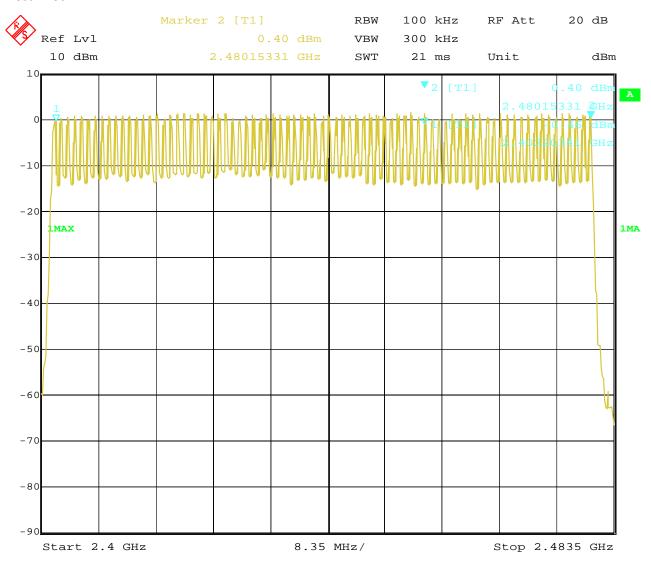


10.4Test Result

Type of Modulation: GFSK

EUT	Tablet PC		Model	N7DW	
Mode	Hopping On		Input Voltage	DC3.7V	
Temperature	2	24 deg. C,	Humidity	56% RH	
Operating Free	quency	Number of hopping channels		Limit	Pass/ Fail
2402-2480MHz		79		≥ 15	Pass

Test Plot



Date: 2.SEP.2020 10:14:55

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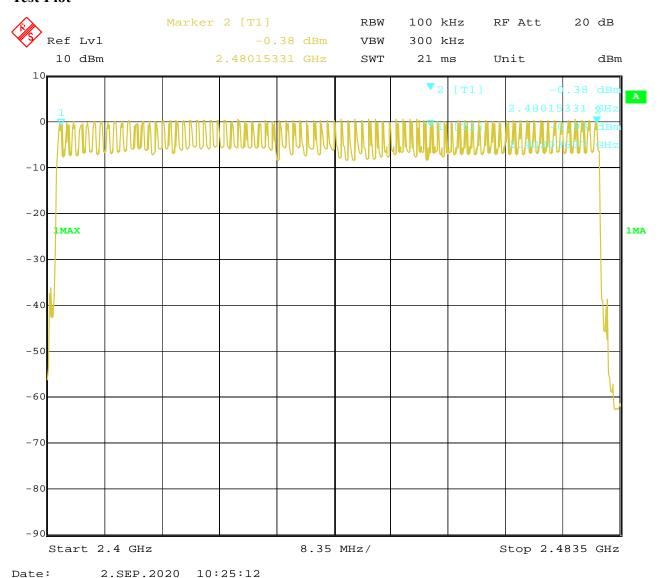
Date: 2020-09-08



Type of Modulation: √1/4DQPSK

EUT	Tablet PC		Model	N7DW
Mode	Hopping On		Input Voltage	DC3.7V
Temperature		24 deg. C,	Humidity	56% RH
Operating Frequency		Number of hopping channels	Limit	Pass/ Fail
2402-2480MHz		79	≥ 15	Pass

Test Plot



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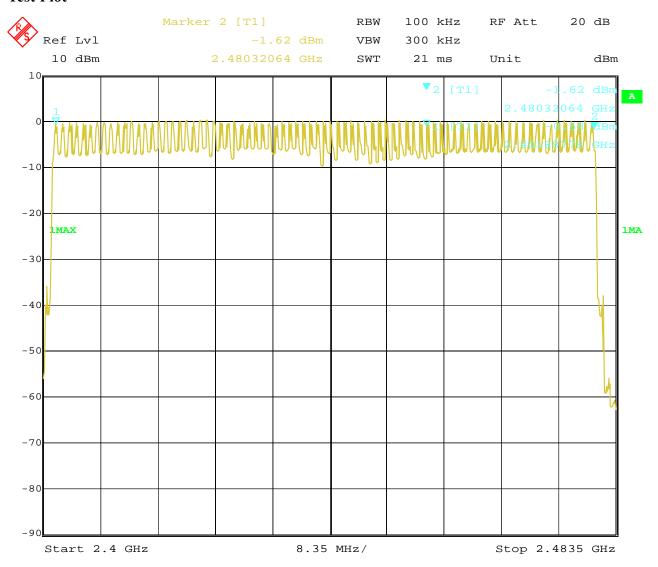
Date: 2020-09-08



Type of Modulation: 8DPSK

EUT	Tablet PC			odel		N7DW
Mode	Hopping On		Input	Voltage		DC3.7V
Temperature	24 deg. C,		Humi	dity	56% RH	
Operating Frequency		Number of hopping channels	ng	Liı	nit	Pass/ Fail
2402-2480MHz		79		≥	15	Pass

Test Plot



2.SEP.2020 15:32:44 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	Tab	Tablet PC		-	N7DW			
Mode	Keep Tra	ansmitting	Input Voltage	I	OC3.7V			
Temperatur	e 24 d	24 deg. C, Humidity		56% RH				
Channel	Reading	Hoping Rate		Actual	Limit			
	DH1							
Middle	0.20ms	800 1	nop/s	0.064s	0.4s			
	DH3							
Middle	0.22ms	400 l	nop/s	0.0352s	0.4s			
	DH5							
Middle	0.22ms	266.66	7 hop/s	0.0235s	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.

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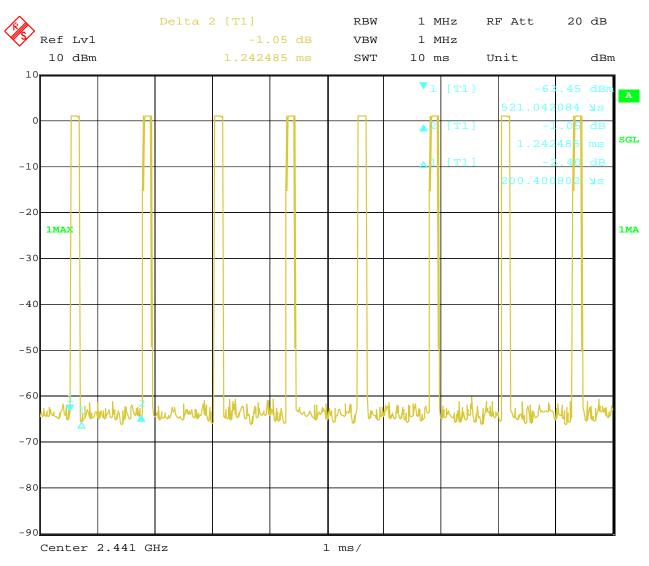
Date: 2020-09-08



Test Plots:

DH1

Date:



2.SEP.2020

16:26:39

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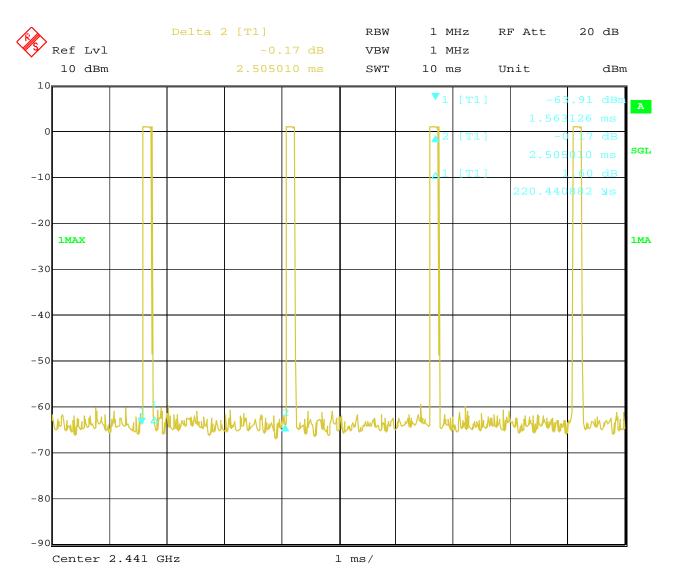
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Test Plots:

DH3



2.SEP.2020 16:27:27 Date:

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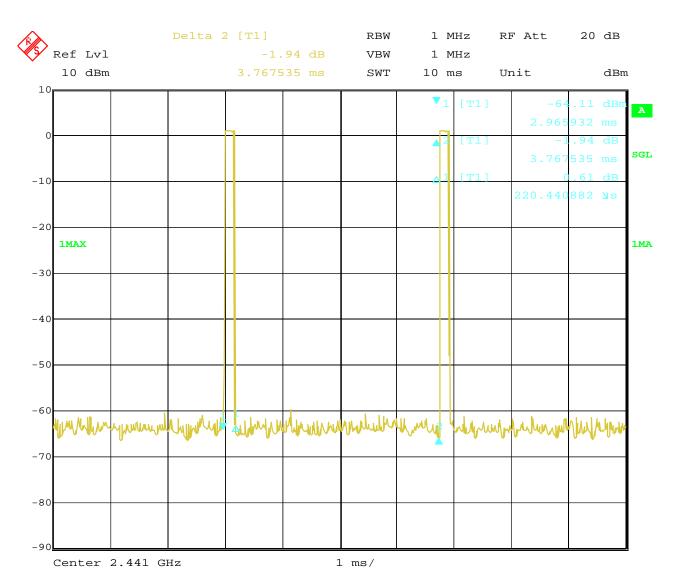
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Test Plots:

DH5



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Test Result

Type of Modulation: $\sqrt{1/4}$ DQPSK

EUT	Tab	Tablet PC			N7DW			
Mode	Keep Tr	ansmitting	Input Voltage	Ι	DC3.7V			
Temperatur	e 24 d	24 deg. C,		5	6% RH			
Channel	Reading	Hoping	g Rate	Actual	Limit			
	DH1							
Middle	0.22ms	800 1	nop/s	0.0704s	0.4s			
			DH3					
Middle	0.20ms	400 l	nop/s	0.0320s	0.4s			
	DH5							
Middle	0.22ms	266.66	7 hop/s	0.0235s	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.

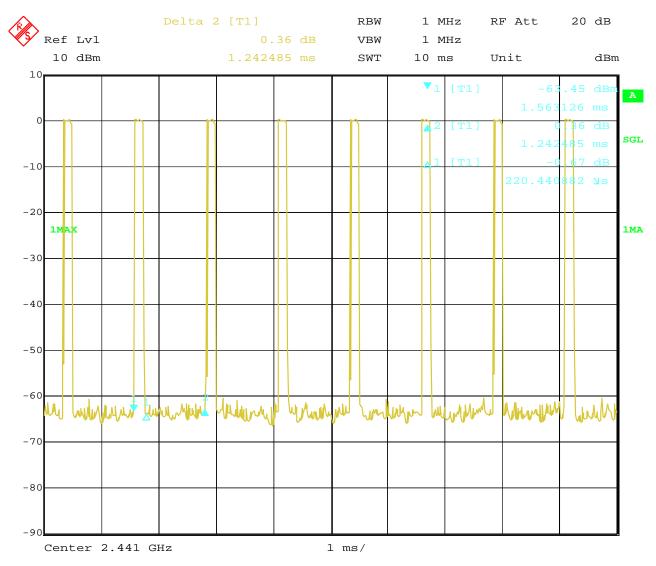
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Test Plots:

2DH1



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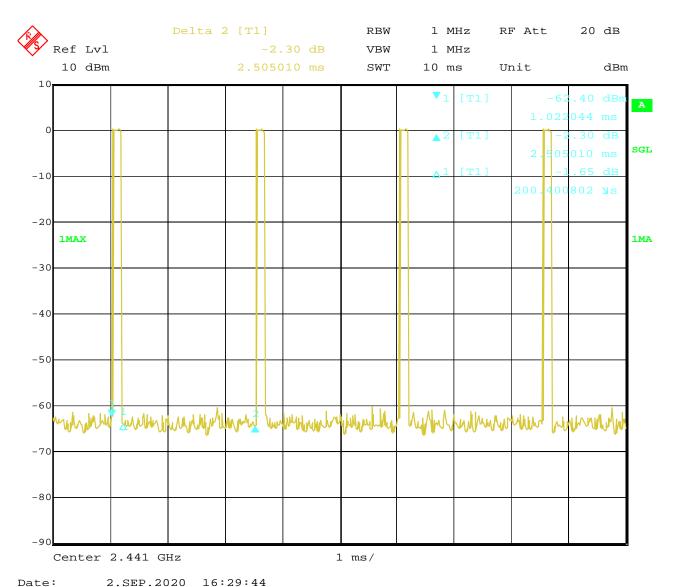
Report No.: TW2008248-02E

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Test Plots:

2DH3

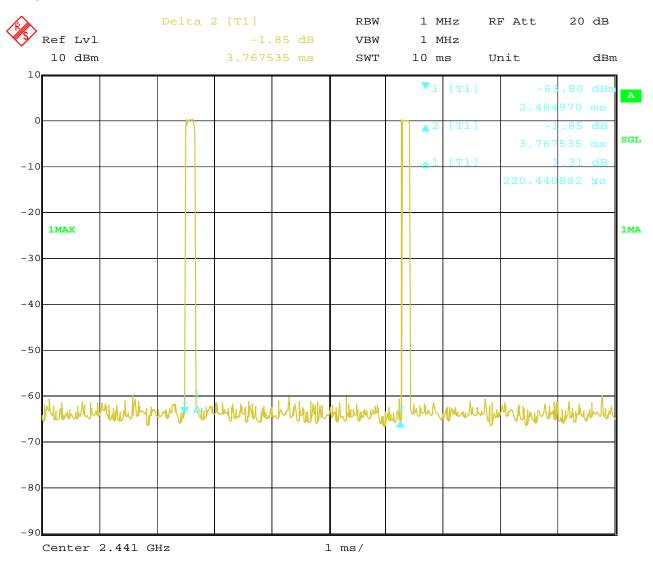


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Test Plots:

2DH5



2.SEP.2020

16:30:22

Date:

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Type of Modulation: 8DPSK

EUT	Tab	Tablet PC		N7DW				
Mode	Keep Ti	ransmitting	Input Voltage	Do	C3.7V			
Temperatur	e 24 o	24 deg. C, Humidity		56% RH				
Channel	Reading	Hoping	Hoping Rate		Limit			
	DH1							
Middle	0.20ms	800 1	nop/s	0.064s	0.4s			
			DH3					
Middle	0.20ms	400 hop/s		0.032s	0.4s			
DH5								
Middle	0.20ms	266.66	7 hop/s	0.0213s	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.

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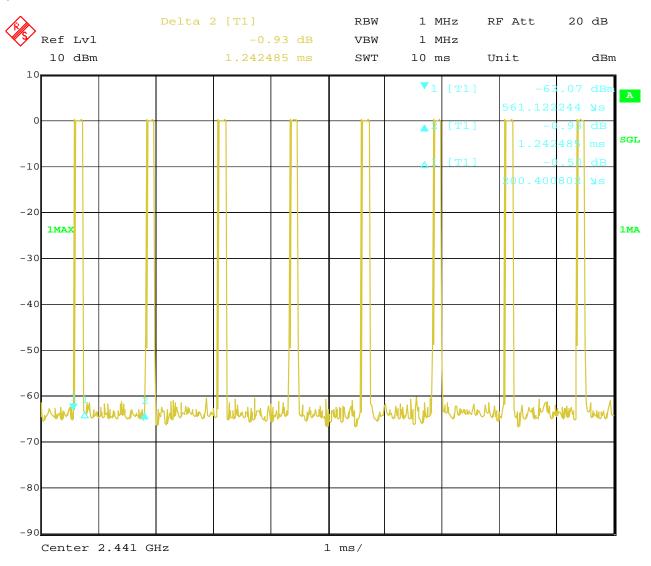


Test Plots:

Date: 2020-09-08

3DH1

Date:



2.SEP.2020

16:31:11

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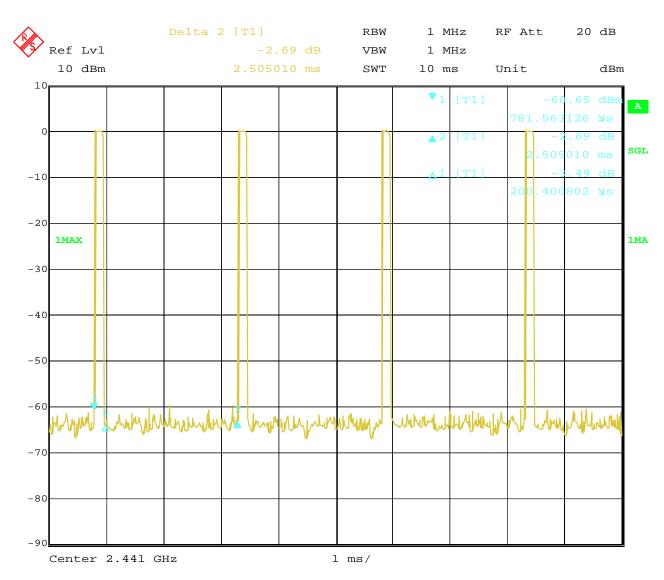
Report No.: TW2008248-02E

Date: 2020-09-08



Test Plots:

3DH3



2.SEP.2020 16:32:35 Date:

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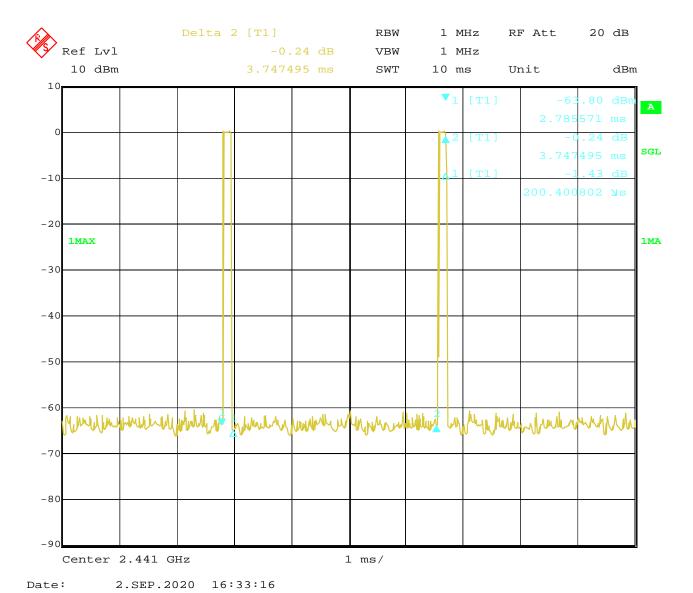
Report No.: TW2008248-02E

Date: 2020-09-08



Test Plots:

3DH5



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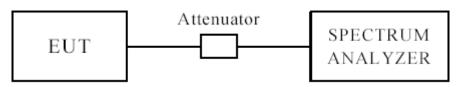
Date: 2020-09-08



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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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Date: 2020-09-08

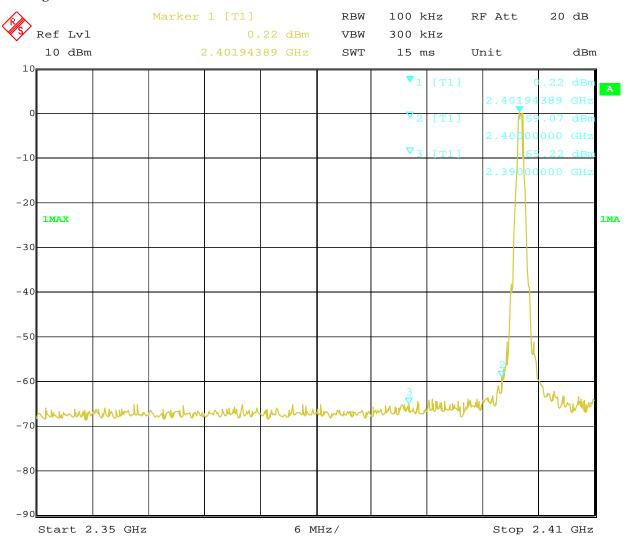


Type of Modulation: GFSK

Band Edge Test Result 12.4

Product:	Tablet PC	Test Mode:	Low Channel
Mode	Keeping Transmitting	Input Voltage	DC3.7V
Temperature	24 deg. C	Humidity	56% RH
Test Result:	Pass	Detector	PK

Test Figure:



Date: 2.SEP.2020 15:47:41

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Date: 2020-09-08

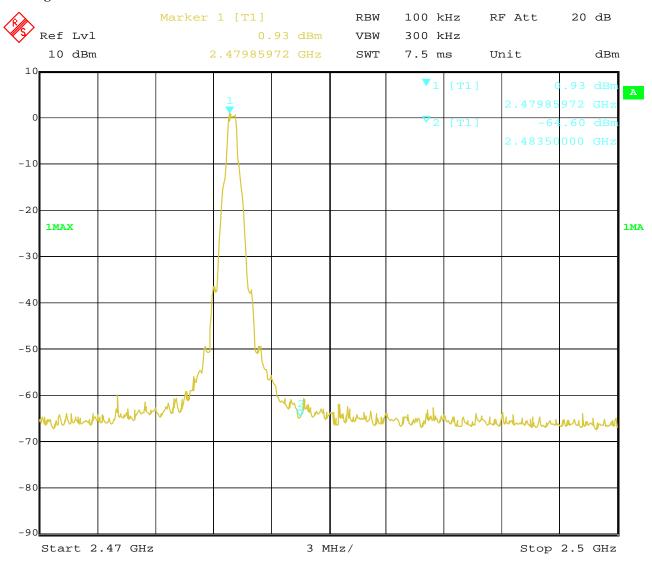


Type of Modulation: GFSK

Band Edge Test Result 12.4

Product:	Tablet PC	Test Mode:	High Channel
Mode	Keeping Transmitting	Input Voltage	DC3.7V
Temperature	24 deg. C,	Humidity	56% RH
Test Result:	Pass	Detector	PK

Test Figure:



Date: 2.SEP.2020 15:41:39

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Date: 2020-09-08

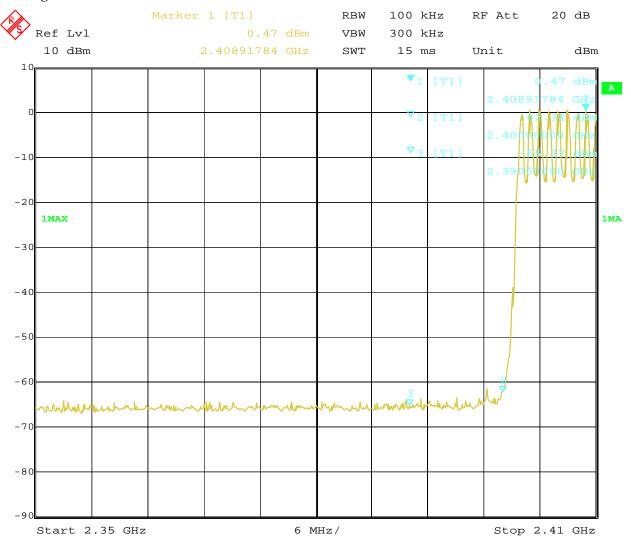


Type of Modulation: GFSK

Band Edge Test Result

Product:	Tablet PC	Test Mode:	Hopping mode
Mode	Hopping On	Input Voltage	DC3.7V
Temperature	24 deg. C,	Humidity	56% RH
Test Result:	Pass	Detector	PK

Test Figure:



Date: 2.SEP.2020 15:36:05

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Date: 2020-09-08

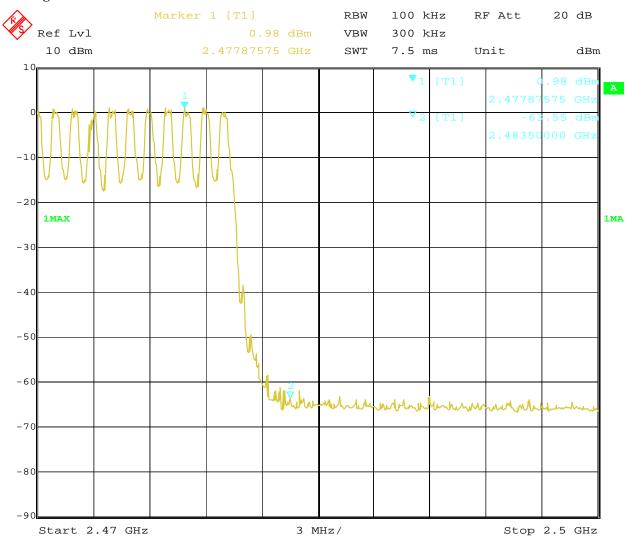


Type of Modulation: GFSK

Band Edge Test Result

Product:	Tablet PC	Test Mode:	Hopping mode
Mode	Hopping On	Input Voltage	DC3.7V
Temperature	24 deg. C,	Humidity	56% RH
Test Result:	Pass	Detector	PK

Test Figure:



Date: 2.SEP.2020 15:39:56

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Date: 2020-09-08

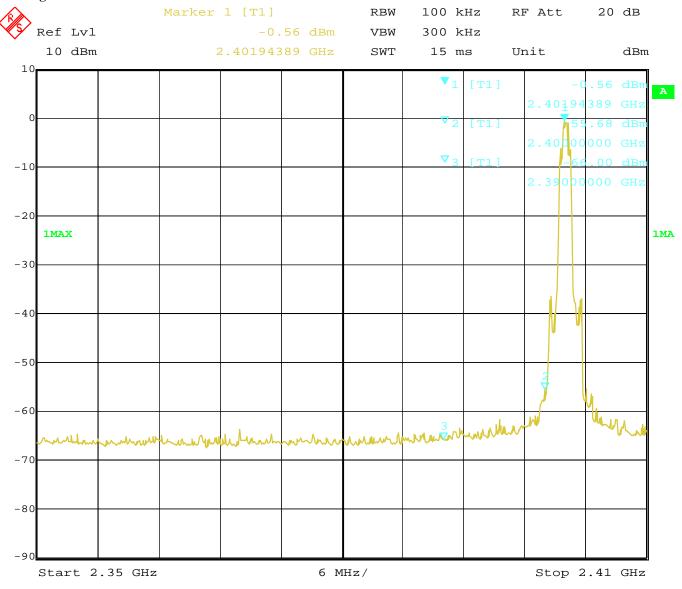


Type of Modulation: √√4DQPSK

12.4 Out of Band Test Result

Product:	Tablet PC	Test Mode:	Low Channel
Mode	Keeping Transmitting	Input Voltage	DC3.7V
Temperature	24 deg. C	Humidity	56% RH
Test Result:	Pass	Detector	PK

Test Figure:



Date: 2.SEP.2020 15:47:09

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Date: 2020-09-08

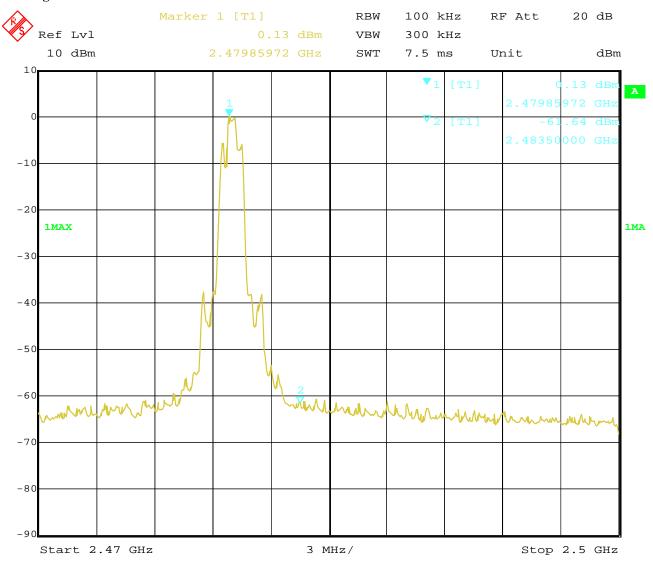


Type of Modulation: √ //4DQPSK

Band Edge Test Result 12.4

Product:	Tablet PC	Test Mode:	High Channel
Mode	Keeping Transmitting	Input Voltage	DC3.7V
Temperature	24 deg. C,	Humidity	56% RH
Test Result:	Pass	Detector	PK

Test Figure:



Date: 2.SEP.2020 15:43:49

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Date: 2020-09-08

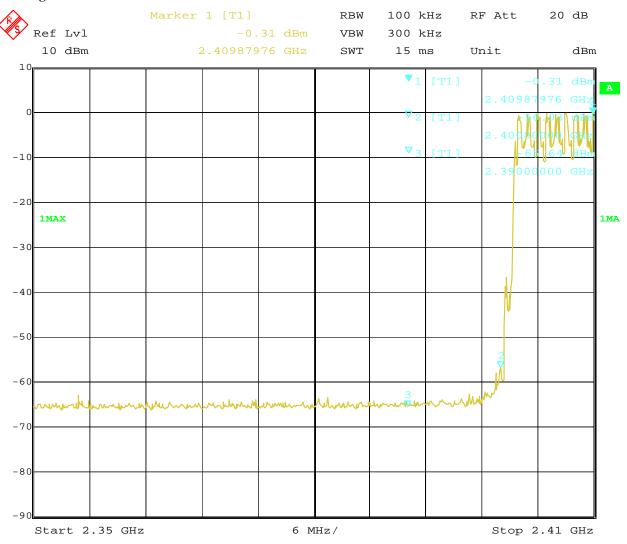


Type of Modulation: √ //4DQPSK

Out of Band Test Result

Product:	Tablet PC	Test Mode:	Hopping mode
Mode	Hopping On	Input Voltage	DC3.7V
Temperature	24 deg. C,	Humidity	56% RH
Test Result:	Pass	Detector	PK

Test Figure:



Date: 2.SEP.2020 15:17:33

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Date: 2020-09-08

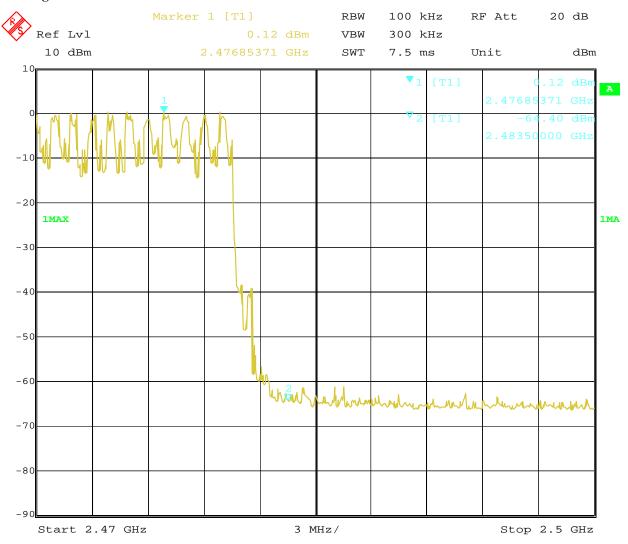


Type of Modulation: √ //4DQPSK

Out of Band Test Result

Product:	Tablet PC	Test Mode:	Hopping mode
Mode	Hopping On	Input Voltage	DC3.7V
Temperature	24 deg. C,	Humidity	56% RH
Test Result:	Pass	Detector	PK

Test Figure:



Date: 2.SEP.2020 15:23:22

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Date: 2020-09-08

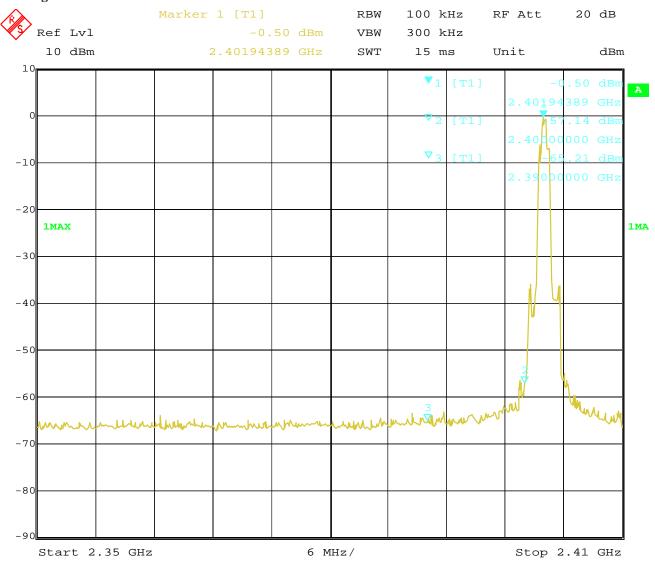


Type of Modulation: 8DPSK

12.4 Band Edge Test Result

Product:	Tablet PC	Test Mode:	Low Channel
Mode	Keeping Transmitting	Input Voltage	DC3.7V
Temperature	24 deg. C	Humidity	56% RH
Test Result:	Pass	Detector	PK

Test Figure:



Date: 2.SEP.2020 15:45:58

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Date: 2020-09-08

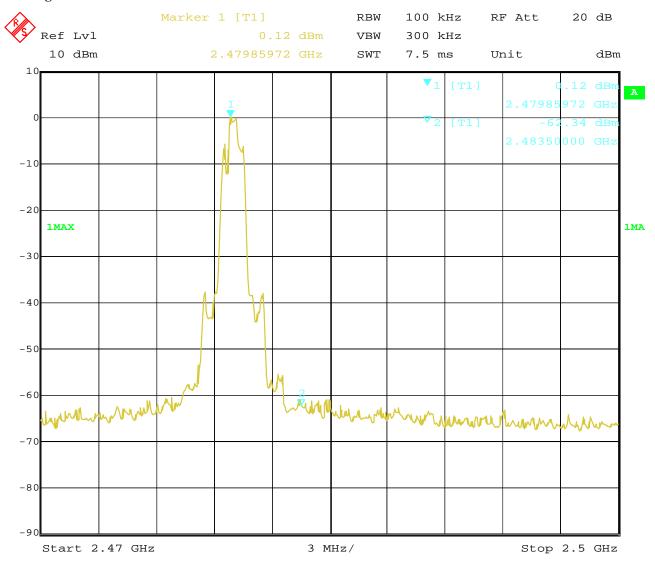


Type of Modulation: 8DPSK

Band Edge Test Result 12.4

Product:	Tablet PC	Test Mode:	High Channel
Mode	Keeping Transmitting	Input Voltage	DC3.7V
Temperature	24 deg. C,	Humidity	56% RH
Test Result:	Pass	Detector	PK

Test Figure:



Date: 2.SEP.2020 15:44:30

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Date: 2020-09-08

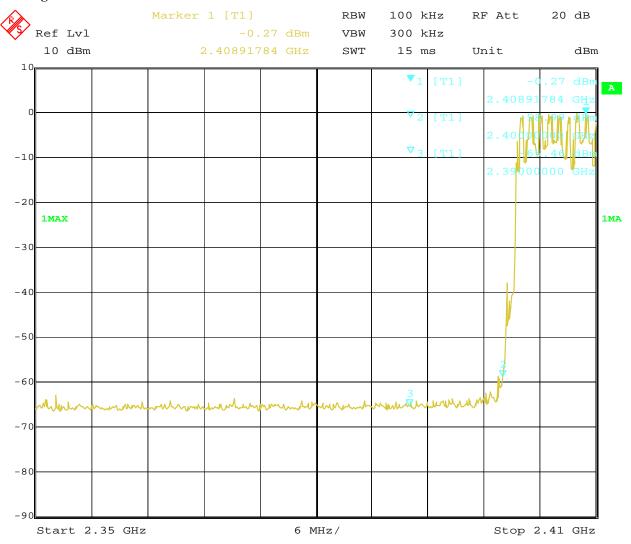


Type of Modulation: 8DPSK

Band Edge Test Result

Product:	Tablet PC	Test Mode:	Hopping mode
Mode	Mode Hopping On		DC3.7V
Temperature	24 deg. C,	Humidity	56% RH
Test Result:	Pass	Detector	PK

Test Figure:



Date: 2.SEP.2020 15:08:08

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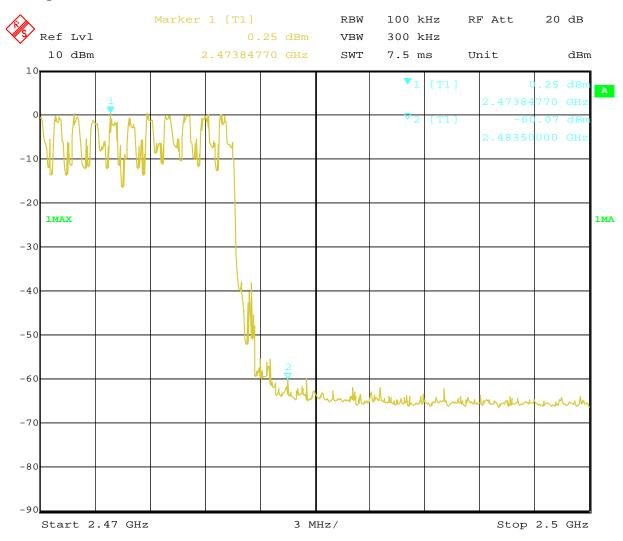


Type of Modulation: 8DPSK

Band Edge Test Result

Product:	Tablet PC	Test Mode:	Hopping mode	
Mode	Hopping On	Input Voltage DC3.7		
Temperature	24 deg. C,	Humidity	56% RH	
Test Result:	Pass	Detector	PK	

Test Figure:



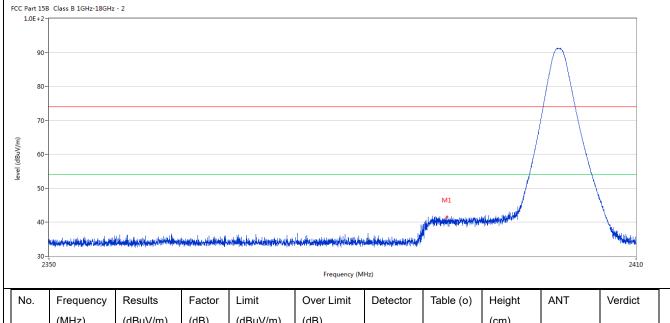
Date: 2.SEP.2020 15:02:58 Report No.: TW2008248-02E Page 72 of 79

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12.4 Restrict Band Measurement

T :44:		
eep Transmitting	Input Voltage	DC3.7V
24 deg. C,	Humidity	56% RH
Pass	Modulation Type	8DPSK
	24 deg. C,	24 deg. C, Humidity



No.	Frequency	Results	Factor	Limit	Over Limit	Detector	Table (o)	Height	ANT	Verdict
	(MHz)	(dBuV/m)	(dB)	(dBuV/m)	(dB)			(cm)		
1	2390.520	41.54	-3.53	54.0	-12.46	Peak	211.00	100	Н	Pass

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12.4 Restrict Band Measurement

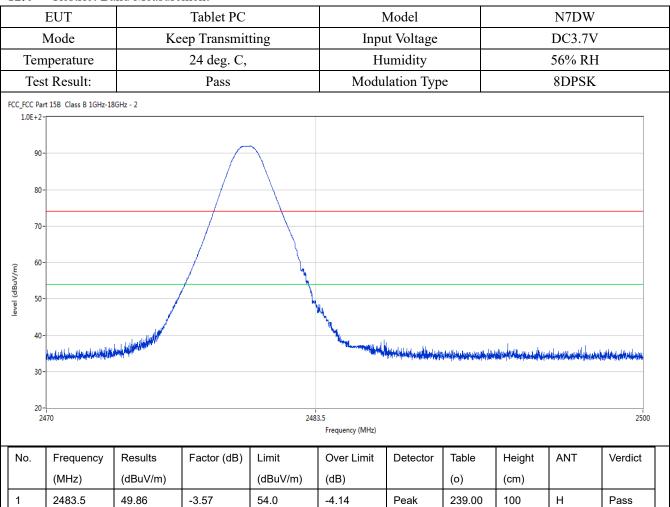
EUT Mode		EUT	Tablet PC Keep Transmitting 24 deg. C,				Model Input Voltage Humidity			N7DW DC3.7V 56% RH			
		Mode				Inp							
-	Temperature Test Result:					I							
			Pass		Mod	Modulation Type		8DPSK					
	art 15B .0E+2-	Class B 1GHz-18GHz	- 2										
	90-									\wedge			
	80-												
Œ	70-												
level (dBuV/m)	60-												
<u>ù</u>	50-							M1					
		H 1111 H	ariation (_{accid} os polonies y professor producted de prop	ent half and a laboration	e positivi ile mente producti dell'incidente	nades plates of the light before the plates of the section and	ild and geometric collection debt	philipadia ipaka iliki kidaali.			Application of the Party of the		
	30-¦ 23!	50				Frequency (M	Hz)				2410		
No	٥.	Frequency	Results	Factor	Limit	Over Limit	Detector	Table (o)	Height	ANT	Verdict		
		(MHz)	(dBuV/m)	(dB)	(dBuV/m)	(dB)			(cm)				
1		2390.145	43.81	-3.53	54.0	-10.19	Peak	170.00	100	V	Pass		

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12.4 **Restrict Band Measurement**



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12.4 Restrict Band Measurement

	EUT	Tablet PC				Model			N7DW			
Mode		Ke	eep Tran	smitting		Input Voltage			DC3.7V			
Tem	nperature		24 deg	g. C,		Humidity			56% RH			
Tes	t Result: Pass			S	Modulation Type			8DPSK				
C Part 15B	3 Class B 1GHz-18GHz	- 2										
90 -	00-											
70-												
60-												
<u>&</u> 50−	O											
						and the standard the standard and the continues of the standard of the standar						
30- 24	170				2483.5 Frequency (N	MHz)				2500 #		
No.	Frequency	Results	Factor	Limit	Over Limit	Detector	Table (o)	Height	ANT	Verdict		
	(MHz)	(dBuV/m)	(dB)	(dBuV/m)	(dB)			(cm)				
1	2483.5	50.50	-3.57	54.0	-3.50	Peak	356.00	100	V	Pass		

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 0.5dBi.

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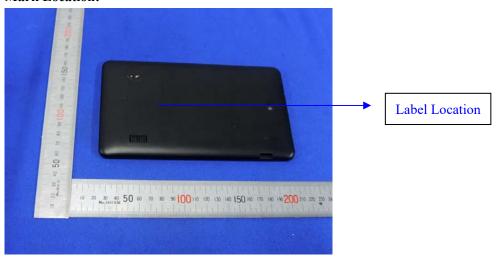
14.0 FCC ID Label

FCC ID: RBD-N7DW

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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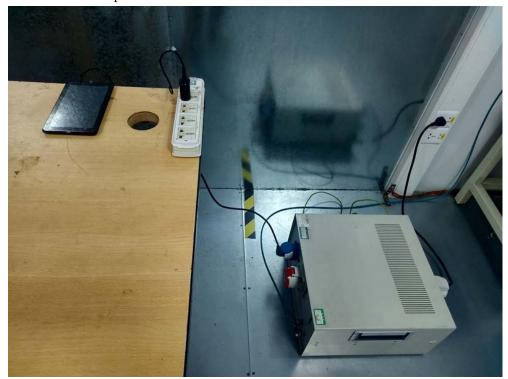
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15.0 **Photo of testing**

Conducted Emission Test Setup:



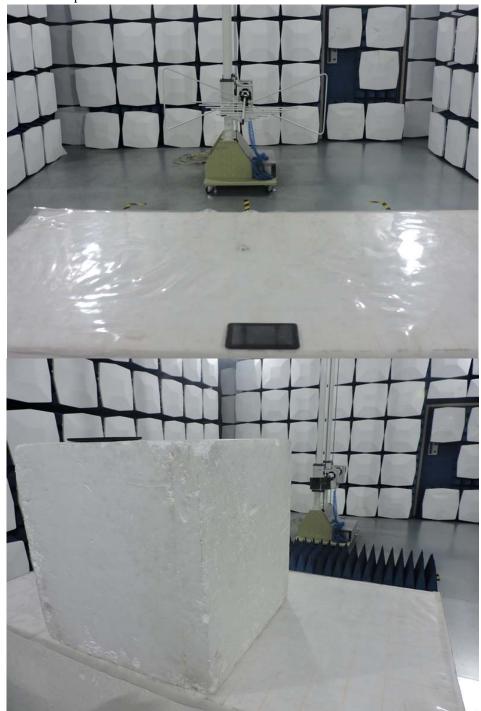
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Radiated Emission Test Setup:



Photographs - EUT

Please refer test report TW2008248-01E

-- End of Report--

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

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