

# FCC RADIO TEST REPORT FCC ID: 2AA5C-FAR001

Product: Blue Docker

**Trade Name:** ALLsor

Model Name: FAR001

Serial Model: FAR001-XXXXXX((where X can be 0~9,A~Z or

blank)

**Report No.**: NTEK-2013NT0911985F

# **Prepared for**

CviLux Corporation

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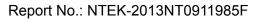
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# **TEST RESULT CERTIFICATION**

Report No.: NTEK-2013NT0911985F

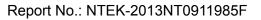
Applicant's name	Cvil uv El	octronics/Dor	ngguan)Co. I td
			ience Industry Foundation, 1278-173
Address	Ponam-D	ong Gangnet	ing-Si Gangwon-Do Korea
Manufacture's Name			
Address			velopmeng Zone Huaizhuli Village gguang city ,Guangdong province China
Product description			
Product name		ker	
Model and/or type reference	FAR001		
Serial Model :	FAR001->	XXXXX((whe	ere X can be 0~9,A~Z or blank)
Standards	FCC Part	15.247	
Test procedure	. ANSI C63	3.4-2003	
	s in compli	ance with the	EK, and the test results show that the FCC requirements. And it is applicable only
·	revised by	•	nout the written approval of NTEK, this nal only, and shall be noted in the revision of
Date (s) of performance of tes	sts	11 Sep. 2013	3 ~29 Sep. 2013
Date of Issue			
Test Result		· ·	
Testing Eng	ineer	:	Apple Huong
			(Apple Huang)
Technical M	lanager	:	Brown Ln
			(Brown Lu)
Authorized	Signatory	:	Barry Young
			(Bovey Yang)





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# 1. SUMMARY OF TEST RESULTS

Test procedures according to the technical standards:

FCC Part15 (15.247) , Subpart C				
Standard Section	Test Item	Judgment	Remark	
15.207	Conducted Emission	PASS		
15.247(a)(1)	Hopping Channel Separation	PASS		
15.247(b)(1)	Peak Output Power	PASS		
15.247(c)	Radiated Spurious Emission	PASS		
15.247(a)(iii)	Number of Hopping Frequency	PASS		
15.247(a)(iii)	Dwell Time	PASS		
15.247(a)(1)	Bandwidth	PASS		
15.205	Band Edge Emission	PASS		
15.203	Antenna Requirement	PASS		

NOTE:

(1)" N/A" denotes test is not applicable in this Test Report



1.1 TEST FACILITY

NTEK Testing Technology Co., Ltd

Add.: 1/F, Building E, Fenda Science Park, Sanwei Community, Xixiang Street, Bao'an District, Shenzhen P.R. China.

Report No.: NTEK-2013NT0911985F

FCC Registration No.:238937; IC Registration No.:9270A-1

CNAS Registration No.:L5516

# 1.2 MEASUREMENT UNCERTAINTY

The reported uncertainty of measurement  $\mathbf{y} \pm \mathbf{U}$ , where expended uncertainty  $\mathbf{U}$  is based on a standard uncertainty multiplied by a coverage factor of  $\mathbf{k=2}$ , providing a level of confidence of approximately 95 %  $^{\circ}$ 

No.	Item	Uncertainty
1	Conducted Emission Test	±1.38dB
2	RF power,conducted	±0.16dB
3	Spurious emissions,conducted	±0.21dB
4	All emissions,radiated(<1G)	±4.68dB
5	All emissions,radiated(>1G)	±4.89dB
6	Temperature	±0.5°C
7	Humidity	±2%



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# 2. GENERAL INFORMATION

# 2.1 GENERAL DESCRIPTION OF EUT

Equipment	Blue Docker			
Trade Name	ALLsor			
Model Name	FAR001			
Serial Model	FAR001-XXXXXX((whole) blank)	nere X can be 0~9,A~Z or		
Model Difference	except the model nam			
	The EUT is a Blue Dock			
	Operation Frequency:	2402~2480 MHz		
	Modulation Type:	BT(1Mbps): GFSK		
		BT EDR(2Mbps):∏/4-DQPSK		
		BT EDR(3Mbps): 8-DPSK		
	Bit Rate of Transmitter   1Mbps/2Mbps/3Mbps			
	Number Of Channel 79 CH			
Product Description	Antenna Designation: Please see Note 3.			
·	Output	BT(1Mbps): -2.760dBm		
	Power(Conducted):	BT EDR(2Mbps): -3.956dBm		
		BT EDR(3Mbps): -3.739dBm		
	Based on the application, features, or specification exhibited in User's Manual, the EUT is considered as an ITE/Computing Device. More details of EUT technical specification, please refer to the User's Manual.			
Channel List	Please refer to the Note 2.			
Adapter	N/A			
Battery	N/A			

#### Note:

1. For a more detailed features description, please refer to the manufacturer's specifications or the User's Manual.



2

		Chann	el List		
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
00	2402	27	2429	54	2456
01	2403	28	2430	55	2457
02	2404	29	2431	56	2458
03	2405	30	2432	57	2459
04	2406	31	2433	58	2460
05	2407	32	2434	59	2461
06	2408	33	2435	60	2462
07	2409	34	2436	61	2463
08	2410	35	2437	62	2464
09	2411	36	2438	63	2465
10	2412	37	2439	64	2466
11	2413	38	2440	65	2467
12	2414	39	2441	66	2468
13	2415	40	2442	67	2469
14	2416	41	2443	68	2470
15	2417	42	2444	69	2471
16	2418	43	2445	70	2472
17	2419	44	2446	71	2473
18	2420	45	2447	72	2474
19	2421	46	2448	73	2475
20	2422	47	2449	74	2476
21	2423	48	2450	75	2477
22	2424	49	2451	76	2478
23	2425	50	2452	77	2479
24	2426	51	2453	78	2480
25	2427	52	2454		
26	2428	53	2455		

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# 3. Table for Filed Antenna

Ant	Brand	Model Name	Antenna Type	Connector	Gain (dBi)	NOTE
1	N/A	N/A	PCB Antenna	N/A	1.0	BT Antenna



2.2 DESCRIPTION OF TEST MODES

To investigate the maximum EMI emission characteristics generates from EUT, the test system was pre-scanning tested base on the consideration of following EUT operation mode or test configuration mode which possible have effect on EMI emission level. Each of these EUT

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# operation mode(s) or test configuration mode(s) mentioned above was evaluated respectively.

Pretest Mode	Description
Mode 1	CH00
Mode 2	CH39
Mode 3	CH78
Mode 4	Link Mode

For Conducted Emission		
Final Test Mode	Description	
Mode 4	Link Mode	

For Radiated Emission		
Final Test Mode	Description	
Mode 1	CH00	
Mode 2	CH39	
Mode 3	CH78	

#### Note:

- (1) The measurements are performed at the highest, middle, lowest available channels.
- (2) The EUT use new battery.
- (3)The data rate was set in 1Mbps for radiated emission due to the highest RF output power.

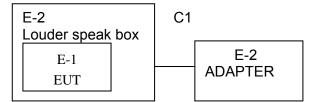
#### 2.3 TABLE OF PARAMETERS OF TEXT SOFTWARE SETTING

During testing channel & power controlling software provided by the customer was used to control the operating channel as well as the output power level. The RF output power selection is for the setting of RF output power expected by the customer and is going to be fixed on the firmware of the final end product power parameters of FHSS

Test software Version	Test program: Broadcom				
Frequency	2402 MHz	2441 MHz	2480 MHz		
Parameters(1/2/3Mbps)	DEF	DEF	DEF		



# 2.4 BLOCK DIGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED





## 2.5 DESCRIPTION OF SUPPORT UNITS(CONDUCTED MODE)

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

Item	Equipment	Brand	Model/Type No.	Series No.	Note
E-1	Blue Docker	N/A	FAR001	N/A	EUT

Item	Shielded Type	Ferrite Core	Length	Note

#### Note:

- (1) The support equipment was authorized by Declaration of Confirmation.
- (2) For detachable type I/O cable should be specified the length in cm in <code>"Length\_"</code> column.
- (3) "YES" is means "shielded" "with core"; "NO" is means "unshielded" "without core".



2.6 EQUIPMENTS LIST FOR ALL TEST ITEMS

Radiation Test equipment

radio	ation rest equip	official and a second					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until	Calibratio n period
1	Spectrum Analyzer	Agilent	E4407B	MY4510804 0	2013.07.06	2014.07.05	1 year
2	Test Receiver	R&S	ESPI	101318	2013.06.07	2014.06.06	1 year
3	Bilog Antenna	TESEQ	CBL6111D	31216	2013.07.06	2014.07.05	1 year
4	50Ω Coaxial Switch	Anritsu	MP59B	620026441 6	2013.06.07	2014.06.06	1 year
5	Spectrum Analyzer	ADVANTEST	R3132	150900201	2013.06.07	2014.06.06	1 year
6	Horn Antenna	EM	EM-AH-101 80	2011071402	2013.07.06	2014.07.05	1 year
7	Horn Ant	Schwarzbeck	BBHA 9170	9170-181	2013.07.06	2014.07.05	1 year
8	Amplifier	EM	EM-30180	060538	2012.12.22	2013.12.21	1 year
9	Loop Antenna	ARA	PLA-1030/B	1029	2013.06.08	2014.06.07	1 year
10	Power Meter	R&S	NRVS	100696	2013.07.06	2014.07.05	1 year
11	Power Sensor	R&S	URV5-Z4	0395.1619. 05	2013.07.06	2014.07.05	1 year

Conduction Test equipment

Item	Kind of Equipment	Manufactu rer	Type No.	Serial No.	Last calibration	Calibrated until	Calibratio n period
1	Test Receiver	R&S	ESCI	101160	2013.06.06	2014.06.05	1 year
2	LISN	R&S	ENV216	101313	2013.08.24	2014.08.23	1 year
3	LISN	EMCO	3816/2	00042990	2013.08.24	2014.08.23	1 year
4	50Ω Coaxial Switch	Anritsu	MP59B	620026441 7	2013.06.07	2014.06.06	1 year
5	Passive Voltage Probe	R&S	ESH2-Z3	100196	2013.06.07	2014.06.06	1 year
6	Absorbing clamp	R&S	MOS-21	100423	2013.06.08	2014.06.07	1 year

1	Attenuation	MCE	24-10-34	BN9258	2013.06.08	2014.06.07	1 year
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# 3. EMC EMISSION TEST

#### 3.1 CONDUCTED EMISSION MEASUREMENT

# 3.1.1 POWER LINE CONDUCTED EMISSION Limits (Frequency Range 150KHz-30MHz)

FREQUENCY (MHz)	Class A (dBuV)		Class B	Standard	
PREQUENCT (MITZ)	Quasi-peak	Average	Quasi-peak	Average	Stariuaru
0.15 -0.5	79.00	66.00	66 - 56 *	56 - 46 *	CISPR
0.50 -5.0	73.00	60.00	56.00	46.00	CISPR
5.0 -30.0	73.00	60.00	60.00	50.00	CISPR

0.15 -0.5	79.00	66.00	66 - 56 *	56 - 46 *	FCC
0.50 -5.0	73.00	60.00	56.00	46.00	FCC
5.0 -30.0	73.00	60.00	60.00	50.00	FCC

#### Note:

- (1) The tighter limit applies at the band edges.
- (2) The limit of " \* " marked band means the limitation decreases linearly with the logarithm of the frequency in the range.

The following table is the setting of the receiver

Receiver Parameters	Setting
Attenuation	10 dB
Start Frequency	0.15 MHz
Stop Frequency	30 MHz
IF Bandwidth	9 kHz



#### 3.1.2 TEST PROCEDURE

- a. The EUT was placed 0.8 meters from the horizontal ground plane with EUT being connected to the power mains through a line impedance stabilization network (LISN). All other support equipments powered from additional LISN(s). The LISN provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.
- b. Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.
- c. I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.
- d. LISN at least 80 cm from nearest part of EUT chassis.
- e. For the actual test configuration, please refer to the related Item –EUT Test Photos.

#### 3.1.3 DEVIATION FROM TEST STANDARD

No deviation

#### 3.1.4 TEST SETUP



Note: 1.Support units were connected to second LISN.

2.Both of LISNs (AMN) are 80 cm from EUT and at least 80 from other units and other metal planes

### 3.1.5 EUT OPERATING CONDITIONS

The EUT was configured for testing in a typical fashion (as a customer would normally use it). The EUT has been programmed to continuously transmit during test. This operating condition was tested and used to collect the included data.



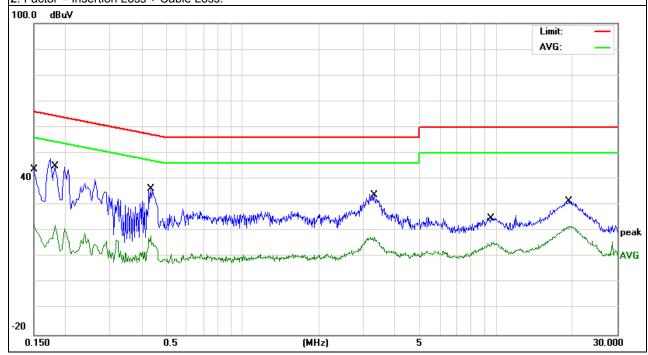
# 3.1.6 TEST RESULTS

EUT:	Blue Docker	Model Name :	FAR001
Temperature :	<b>26</b> ℃	Relative Humidity:	54%
Pressure :	1010hPa	Phase :	L
Test Voltage :	DC 3.3V	Test Mode:	Mode 4

Frequency	Reading Level	Correct Factor	Measure-ment	Limits	Margin	Detector Type
(MHz)	(dBµV)	(dB)	(dBµV)	(dBµV)	(dB)	Detector Type
0.1499	32.08	11.63	43.71	66.00	-22.29	QP
0.1499	10.77	11.63	22.40	56.00	-33.60	AVG
0.1819	33.64	11.28	44.92	64.39	-19.47	QP
0.1819	10.91	11.28	22.19	54.39	-32.20	AVG
0.4339	25.55	10.66	36.21	57.18	-20.97	QP
0.4339	7.72	10.66	18.38	47.18	-28.80	AVG
3.3060	23.40	10.56	33.96	56.00	-22.04	QP
3.3060	7.03	10.56	17.59	46.00	-28.41	AVG
9.5699	13.61	10.82	24.43	60.00	-35.57	QP
9.5699	4.73	10.82	15.55	50.00	-34.45	AVG
19.5379	20.42	11.09	31.51	60.00	-28.49	QP
19.5379	10.82	11.09	21.91	50.00	-28.09	AVG

#### Remark:

- All readings are Quasi-Peak and Average values.
   Factor = Insertion Loss + Cable Loss.



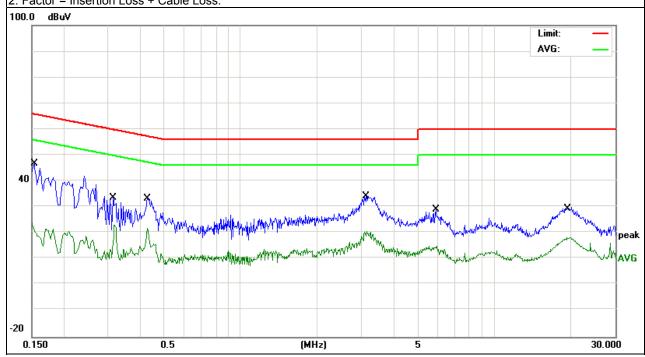


EUT:	Blue Docker	Model Name :	FAR001
Temperature :	<b>26</b> ℃	Relative Humidity:	54%
Pressure :	1010hPa	Phase :	N
Test Voltage :	DC 3.3V	Test Mode:	Mode 4

Frequency	Reading Level	Correct Factor	Measure-ment	Limits	Margin	Dotostor Typo
(MHz)	(dBµV)	(dB)	(dBµV)	(dBµV)	(dB)	Detector Type
0.1499	32.05	11.63	43.68	66.00	-22.32	QP
0.1499	12.28	11.63	23.91	56.00	-32.09	AVG
0.3180	19.63	10.84	30.47	59.76	-29.29	QP
0.3180	12.16	10.84	23.00	49.76	-26.76	AVG
0.4299	22.56	10.66	33.22	57.25	-24.03	QP
0.4299	11.20	10.66	21.86	47.25	-25.39	AVG
3.1499	23.25	10.56	33.81	56.00	-22.19	QP
3.1499	10.16	10.56	20.72	46.00	-25.28	AVG
5.9298	15.62	10.67	26.29	60.00	-33.71	QP
5.9298	4.26	10.67	14.93	50.00	-35.07	AVG
19.4257	18.11	11.09	29.20	60.00	-30.80	QP
19.4257	7.28	11.09	18.37	50.00	-31.63	AVG

#### Remark:

- All readings are Quasi-Peak and Average values.
   Factor = Insertion Loss + Cable Loss.





#### 3.2 RADIATED EMISSION MEASUREMENT

#### 3.2.1 RADIATED EMISSION LIMITS (Frequency Range 9kHz-1000MHz)

20dBc in any 100 kHz bandwidth outside the operating frequency band. In case the emission fall within the restricted band specified on 15.205(a), then the 15.209(a) limit in the table below has to be followed.

Frequencies	Field Strength	Measurement Distance
(MHz)	(micorvolts/meter)	(meters)
0.009~0.490	2400/F(KHz)	300
0.490~1.705	24000/F(KHz)	30
1.705~30.0	30	30
30~88	100	3
88~216	150	3
216~960	200	3
Above 960	500	3

#### LIMITS OF RADIATED EMISSION MEASUREMENT (Above 1000MHz)

FREQUENCY (MHz)	Class A (dBu	ıV/m) (at 3M)	Class B (dBuV/m) (at 3M)		
PREQUENCT (WITZ)	PEAK AVERAGE		PEAK	AVERAGE	
Above 1000	80	60	74	54	

#### Notes:

- (1) The limit for radiated test was performed according to FCC PART 15C.
- (2) The tighter limit applies at the band edges.
- (3) Emission level (dBuV/m)=20log Emission level (uV/m).

#### FREQUENCY RANGE OF RADIATED MEASUREMENT (For unintentional radiators)

Highest frequency generated or Upper frequency of measurement used in the device or on which the device operates or tunes (MHz)	Range (MHz)
Below 1.705	30
1.705 – 108	1000
108 – 500	2000
500 – 1000	5000
Above 1000	5 <sup>th</sup> harmonic of the highest frequency or 40 GHz, whichever is lower



Spectrum Parameter	Setting
Attenuation	Auto
Start Frequency	1000 MHz
Stop Frequency	10th carrier harmonic
RB / VB (emission in restricted	1 MHz / 1 MHz for Dook, 1 MHz / 10Hz for Average
band)	1 MHz / 1 MHz for Peak, 1 MHz / 10Hz for Average

Receiver Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	9kHz~150kHz / RB 200Hz for QP
Start ~ Stop Frequency	150kHz~30MHz / RB 9kHz for QP
Start ~ Stop Frequency	30MHz~1000MHz / RB 120kHz for QP

#### 3.2.2 TEST PROCEDURE

- a. The measuring distance of at 3 m shall be used for measurements at frequency up to 1GHz. For frequencies above 1GHz, any suitable measuring distance may be used.
- b. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter open area test site. The table was rotated 360 degrees to determine the position of the highest radiation.
- c. The height of the equipment or of the substitution antenna shall be 0.8 m; the height of the test antenna shall vary between 1 m to 4 m. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- d. The initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured.
- e. If the Peak Mode measured value compliance with and lower than Quasi Peak Mode Limit, the EUT shall be deemed to meet QP Limits and then no additional QP Mode measurement performed.
- f. For the actual test configuration, please refer to the related Item –EUT Test Photos. Note:

Both horizontal and vertical antenna polarities were tested and performed pretest to three orthogonal axis. The worst case emissions were reported

#### 3.2.3 DEVIATION FROM TEST STANDARD

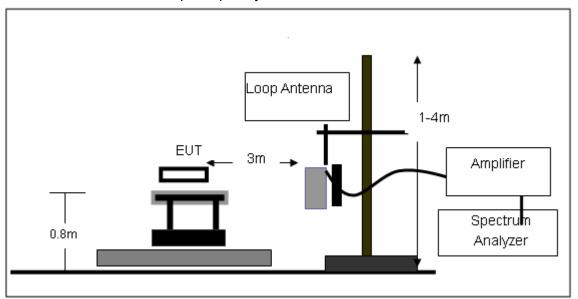
No deviation



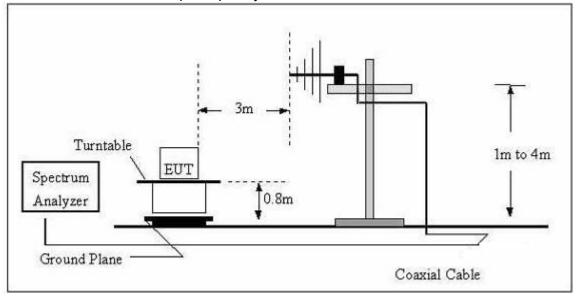


# 3.2.4 TEST SETUP

(A) Radiated Emission Test-Up Frequency Below 30MHz

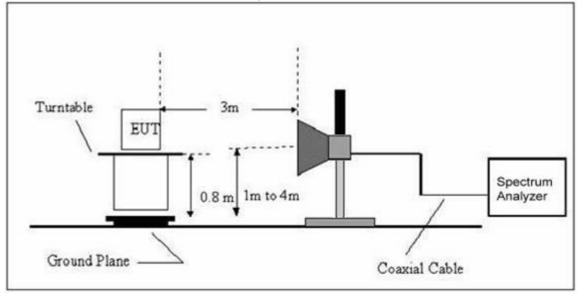


(B) Radiated Emission Test-Up Frequency 30MHz~1GHz





# (C) Radiated Emission Test-Up Frequency Above 1GHz



#### 3.2.5 EUT OPERATING CONDITIONS

The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.



# 3.2.6 TEST RESULTS (BELOW 30 MHZ)

EUT:	Blue Docker	Model Name :	FAR001
Temperature :	<b>20</b> ℃	Relative Humidity:	48%
Pressure:	1010 hPa	Test Voltage :	DC 3.3V
Test Mode :	TX	Polarization :	

Freq.	Reading	Limit	Margin	State
(MHz)	(dBuV/m)	(dBuV/m)	(dB)	P/F
				PASS
				PASS

#### NOTE:

The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.

Distance extrapolation factor =20 log (specific distance/test distance)(dB); Limit line = specific limits(dBuv) + distance extrapolation factor.



3.2.7 TEST RESULTS (BETWEEN 30M - 1000 MHZ)

EUT:	Blue Docker	Model Name :	FAR001
Temperature:	<b>26</b> ℃	Relative Humidity:	54%
Pressure :	1010hPa	Phase :	Horizontal
Test Voltage :	DC3.3V	Test Mode:	TX

Report No.: NTEK-2013NT0911985F

Frequency	Reading Level	Correct Factor	Measure-ment	Limits	Margin	Dotostor Typo
(MHz)	(dBµV)	(dB)	(dBµV)	(dBµV)	(dB)	Detector Type
111.738	26.34	11.74	38.08	43.5	-5.42	QP
189.0743	25.96	9.14	35.1	43.5	-8.4	QP
254.7284	28.84	14.22	43.06	46	-2.94	QP
283.9791	28.76	14.14	42.9	46	-3.1	QP
379.9141	25.65	17.14	42.79	46	-3.21	QP
475.4991	13.88	19.89	33.77	46	-12.23	QP

#### Remark:

All readings are Quasi-Peak and Average values.
 Factor = Insertion Loss + Cable Loss.



EUT: Blue Docker Model Name: FAR001

Temperature: 26 °C Relative Humidity: 54%

Pressure: 1010hPa Phase: Vertical

Test Voltage: DC3.3V Test Mode: TX

Report No.: NTEK-2013NT0911985F

Frequency	Reading Level	Correct Factor	Measure-ment	Limits	Margin	Dotostor Typo
(MHz)	(dBµV)	(dB)	(dBµV)	(dBµV)	(dB)	Detector Type
112.1305	30.13	11.77	41.9	43.5	-1.60	QP
143.8294	24.58	12.06	36.64	43.5	-6.86	QP
185.1379	29.79	9.67	39.46	43.5	-4.04	QP
252.9482	26.94	13.94	40.88	46	-5.12	QP
400.4319	17.46	18.26	35.72	46	-10.28	QP
492.4685	12.48	20.49	32.97	46	-13.03	QP

#### Remark:

1. All readings are Quasi-Peak and Average values.

2. Factor = Insertion Loss + Cable Loss.



3.2.8 TEST RESULTS (ABOVE 1000 MHZ)

EUT:	Blue Docker	Model Name :	FAR001
Temperature :	20 ℃	Relative Humidity:	48%
Pressure :	1010 hPa	Test Voltage :	DC3.3V
Test Mode :	TX 2402MHz - CH 00(1Mhns)		

Report No.: NTEK-2013NT0911985F

Polar	Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector
(H/V)	(MHz)	(dBuV)	(dB)	(dBuV/m)	(dBuV/m)	(dB)	Туре
V	4804.000	63.33	-3.64	59.69	74	-14.31	Pk
V	4804.000	46.32	-3.64	42.68	54	-11.32	AV
V	7206.000	54.17	-0.95	53.22	74	-20.78	Pk
V	7206.000	45.57	-0.95	44.62	54	-9.38	AV
Н	4804.000	67.63	-3.64	63.99	74	-10.01	Pk
Н	4804.000	53.46	-3.64	49.82	54	-4.18	AV
Н	7206.000	56.77	-0.96	55.81	74	-18.19	Pk
Н	7206.000	47.58	-0.96	46.62	54	-7.38	AV

# Remark:

Absolute Level= ReadingLevel+ Factor, Margin= Absolute Level - Limit



EUT: Blue Docker Model Name: FAR001

Temperature: 20 °C Relative Humidity: 48%

Pressure: 1010 hPa Test Voltage: DC 3.3V

Test Mode: TX 2441MHz – CH 39(1Mbps)

Report No.: NTEK-2013NT0911985F

Polar	Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector
(H/V)	(MHz)	(dBuV)	(dB)	(dBuV/m)	(dBuV/m)	(dB)	Туре
V	4882.000	67.12	-3.67	63.45	74	-10.55	Pk
V	4882.000	48.35	-3.67	44.68	54	-9.32	AV
V	7323.000	55.74	-0.82	54.92	74	-19.08	Pk
V	7323.000	46.58	-0.82	45.76	54	-8.24	AV
Н	4882.000	63.38	-3.67	59.71	74	-14.29	Pk
Н	4882.000	47.76	-3.67	44.09	54	-9.91	AV
Н	7323.000	56.78	-0.82	55.96	74	-18.04	Pk
Н	7323.000	48.36	-0.82	47.54	54	-6.46	AV

#### Remark:

Absolute Level= ReadingLevel+ Factor, Margin= Absolute Level - Limit



EUT: Blue Docker Model Name: FAR001

Temperature: 20 °C Relative Humidity: 48%

Pressure: 1010 hPa Test Voltage: DC 3.3V

Test Mode: TX 2480MHz – CH 78(1Mbps)

Report No.: NTEK-2013NT0911985F

Polar	Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector
(H/V)	(MHz)	(dBuV)	(dB)	(dBuV/m)	(dBuV/m)	(dB)	Туре
V	4960.000	55.14	-3.59	51.55	74	-22.45	Pk
V	4960.000	46.37	-3.59	42.78	54	-11.22	AV
V	7440.000	54.48	-0.68	53.80	74	-20.20	Pk
Н	7440.000	46.34	-0.68	45.66	54	-8.34	AV
Н	4960.000	64.42	-3.59	60.83	74	-13.17	Pk
Н	4960.000	44.53	-3.59	40.94	54	-13.06	AV
Н	7440.000	57.63	-0.68	56.95	74	-17.05	Pk

# Remark:

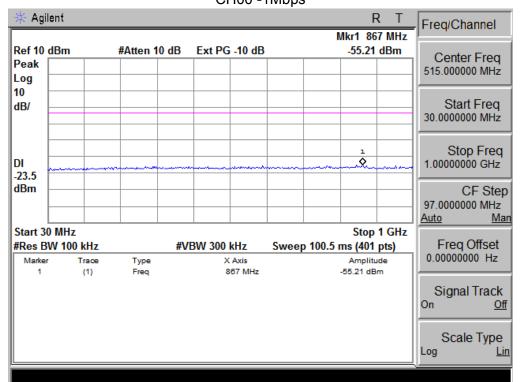
Absolute Level= ReadingLevel+ Factor, Margin= Absolute Level - Limit

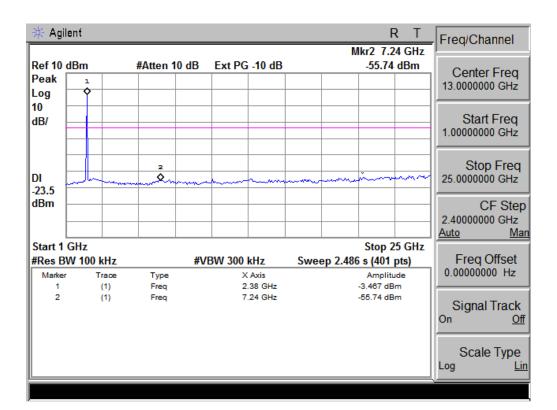
Note: Mode 1Mbps is the worst mode.

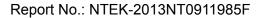


# Conducted Spurious Emissions at Antenna Port: CH00 -1Mbps

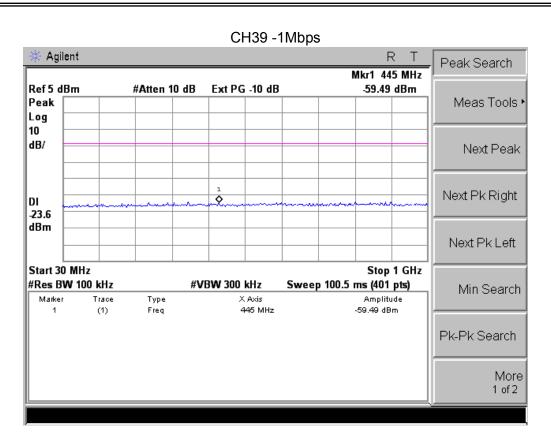
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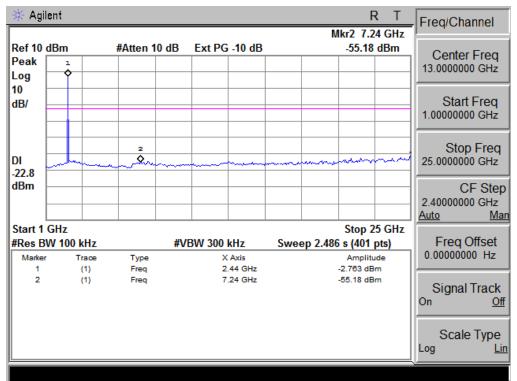


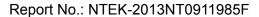




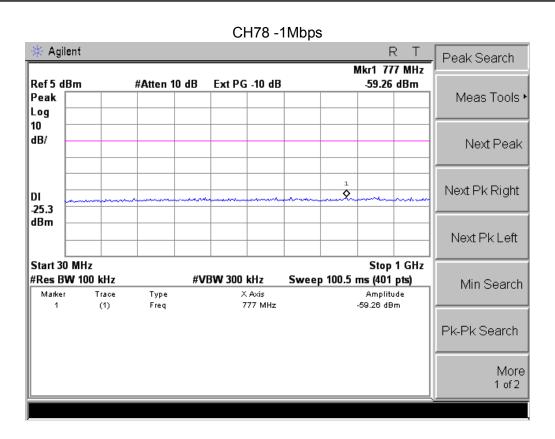


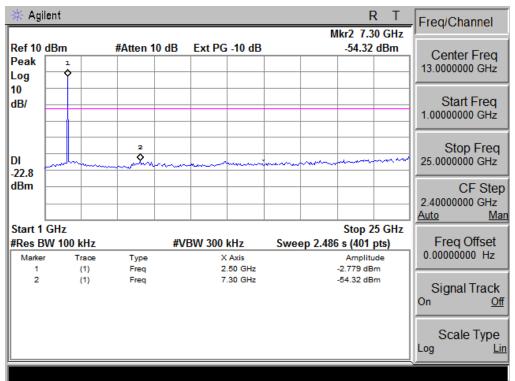


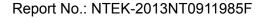




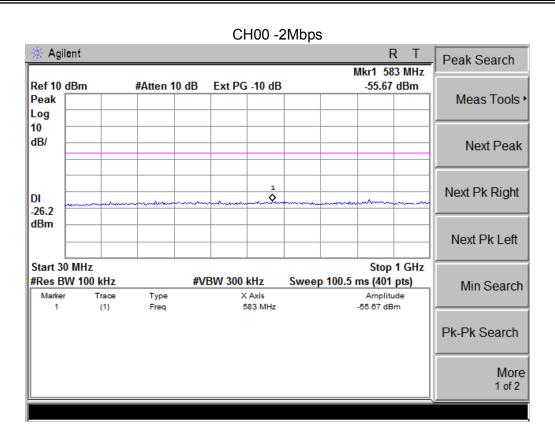


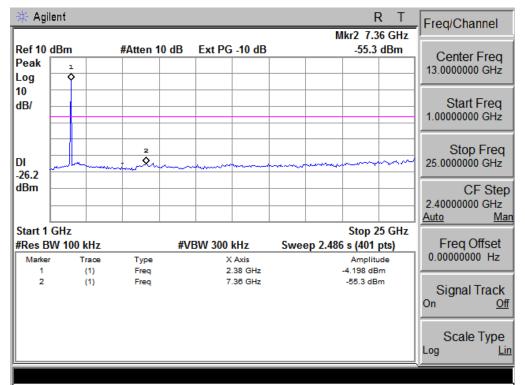


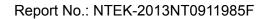




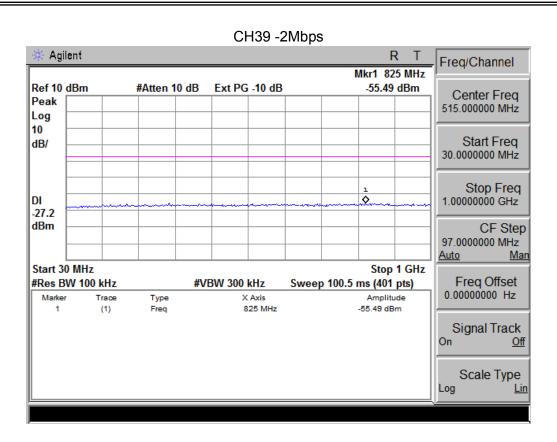


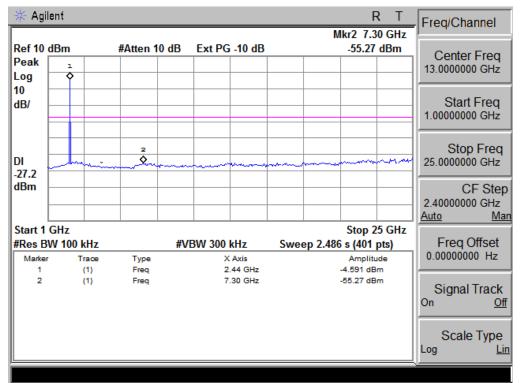


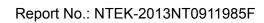




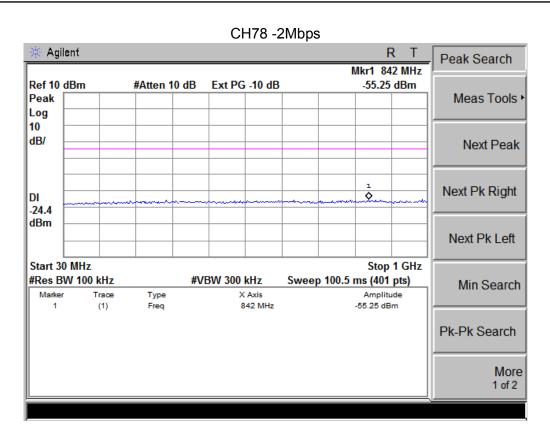


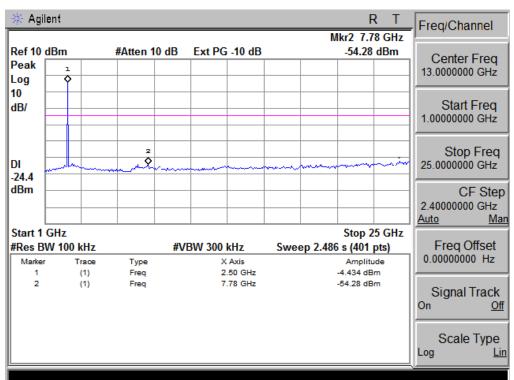




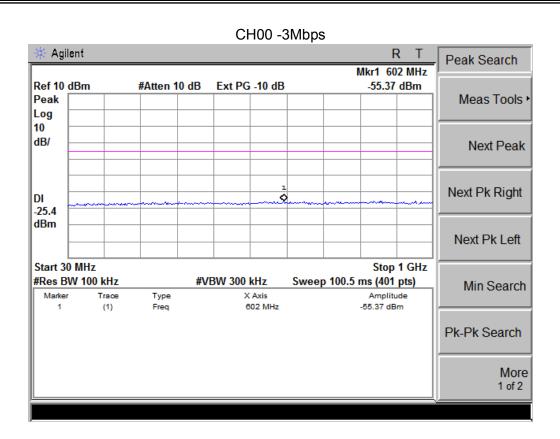


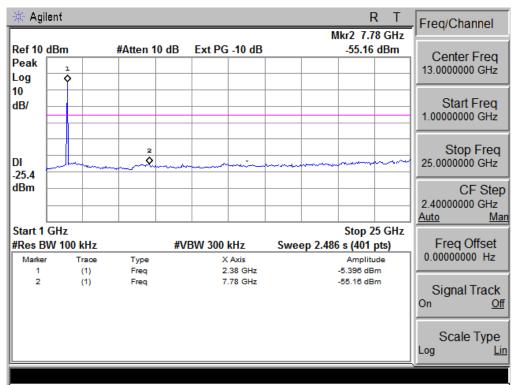




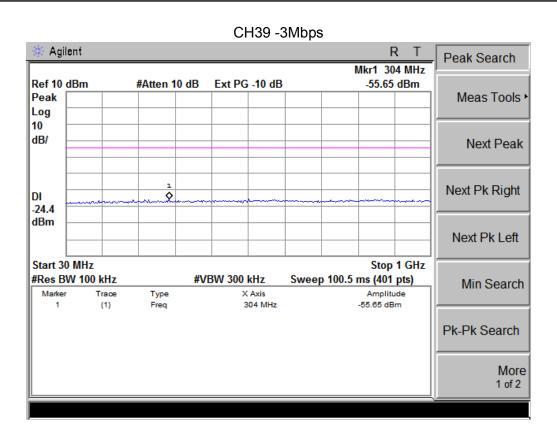


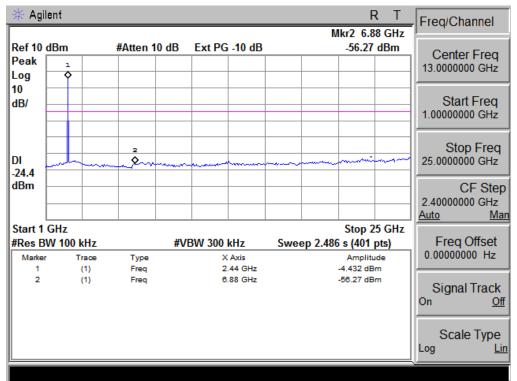


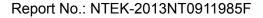




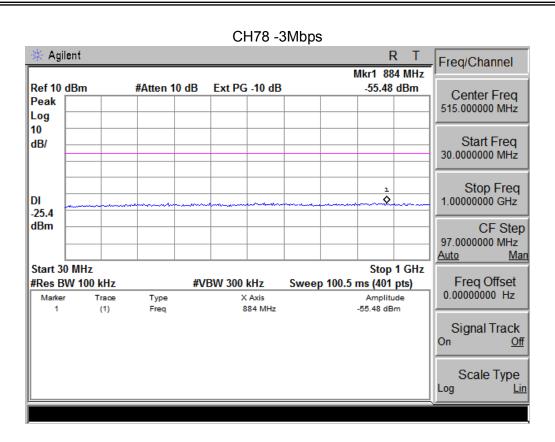


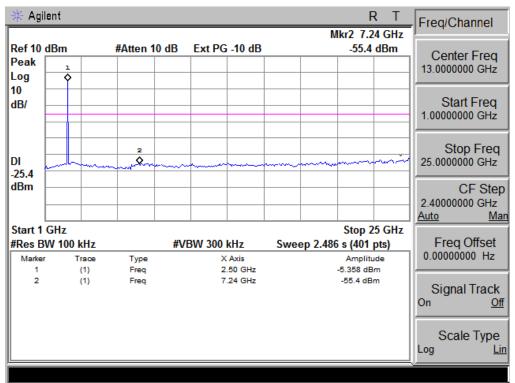














#### 4. NUMBER OF HOPPING CHANNEL

#### 4.1 APPLIED PROCEDURES / LIMIT

FCC Part15 (15.247) , Subpart C				
Section	Test Item	Limit	Frequency Range (MHz)	Result
15.247 (a)(1)(iii)	Number of Hopping Channel	≥15	2400-2483.5	PASS

Spectrum Parameters	Setting		
Attenuation	Auto		
Span Frequency	= the frequency band of operation		
RB	RBW ≥ 1% of the span		
VB	VBW ≥ RBW		
Detector	Peak		
Trace	Max Hold		
Sweep Time	Auto		

#### 4.1.1 TEST PROCEDURE

- a. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below,
- b. Spectrum Setting: RBW= 1MHz, VBW=3MHz, Sweep time = Auto.

#### 4.1.2 DEVIATION FROM STANDARD

No deviation.

#### 4.1.3 TEST SETUP



#### **4.1.4 EUT OPERATION CONDITIONS**

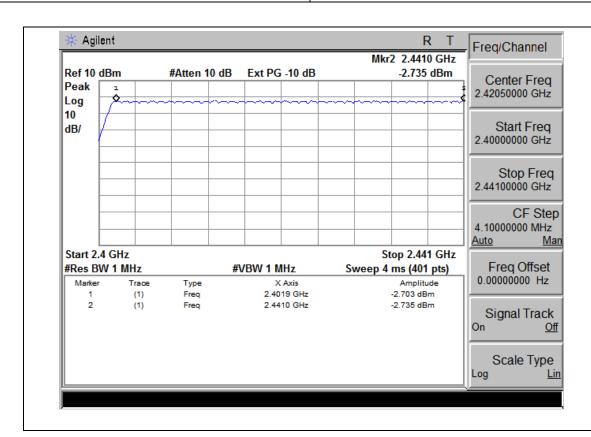
The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.

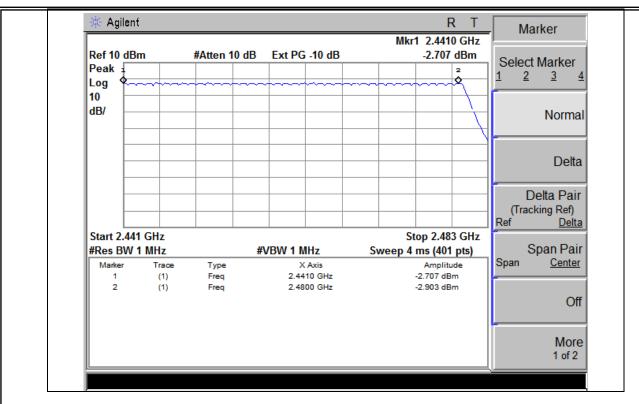


## 4.1.5 TEST RESULTS

EUT:	Blue Docker	Model Name :	FAR001
Temperature :	25 ℃	Relative Humidity:	60%
Pressure:	1015 hPa	Test Voltage :	DC 3.3V
Test Mode :	Hopping Mode		









#### 5. AVERAGE TIME OF OCCUPANCY

#### 5.1 APPLIED PROCEDURES / LIMIT

	FCC Part15 (15.247) , Subpart C				
Section	Test Item	Limit	Frequency Range (MHz)	Result	
15.247 (a)(1)(iii)	Average Time of Occupancy	0.4sec	2400-2483.5	PASS	

#### **5.1.1 TEST PROCEDURE**

- a. The transmitter output (antenna port) was connected to the spectrum analyzer
- b. Set RBW of spectrum analyzer to 1MHz and VBW to 1MHz.
- c. Use a video trigger with the trigger level set to enable triggering only on full pulses.
- d. Sweep Time is more than once pulse time.
- e. Set the center frequency on any frequency would be measure and set the frequency span to zero span.
- f. Measure the maximum time duration of one single pulse.
- g. Set the EUT for DH5, DH3 and DH1 packet transmitting.
- h. Measure the maximum time duration of one single pulse.
- i. A Period Time = (channel number)\*0.4

  - DH1 Time Slot: Reading \* (1600/2)\*31.6/(channel number)
    DH3 Time Slot: Reading \* (1600/4)\*31.6/(channel number)
    DH5 Time Slot: Reading \* (1600/6)\*31.6/(channel number)

#### **5.1.2 DEVIATION FROM STANDARD**

No deviation.



## 5.1.3 TEST SETUP



# **5.1.4 EUT OPERATION CONDITIONS**

The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.

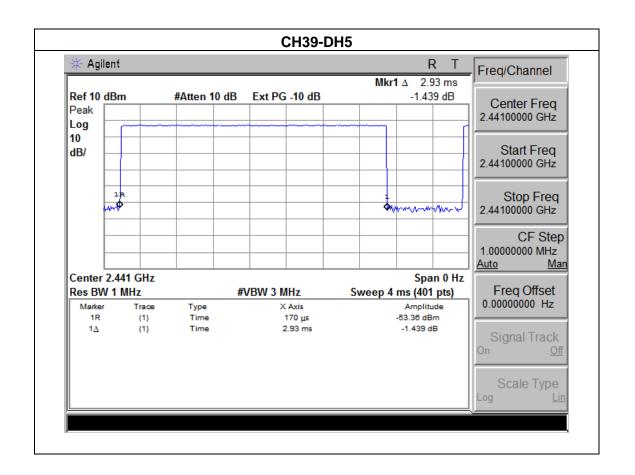


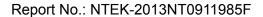
## **5.1.5 TEST RESULTS**

EUT:	Blue Docker	Model Name :	FAR001
Temperature :	25 ℃	Relative Humidity:	60%
Pressure :	1012 hPa	Test Voltage :	DC 3.3V
Test Mode :	CH39-DH5,2DH5,3DH5		

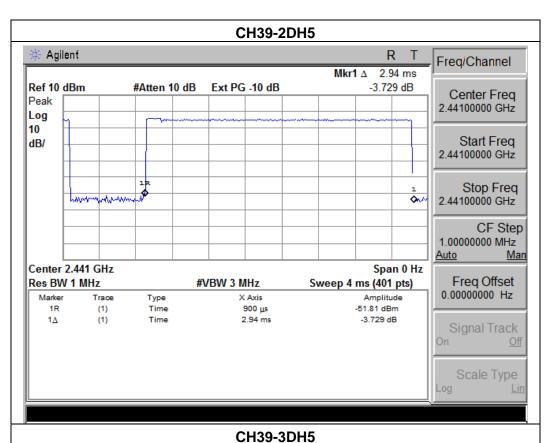
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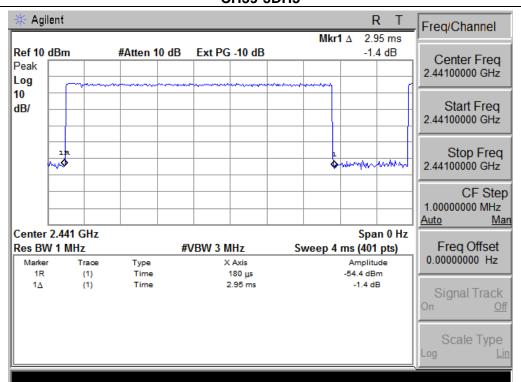
Data Packet	Frequency	Pulse Duration (ms)	Dwell Time (s)	Limits (s)
DH5	2441 MHz	2.93	0.31	0.4
2DH5	2441 MHz	2.94	0.31	0.4
3DH5	2441 MHz	2.95	0.31	0.4













EUT: Blue Docker Model Name: FAR001

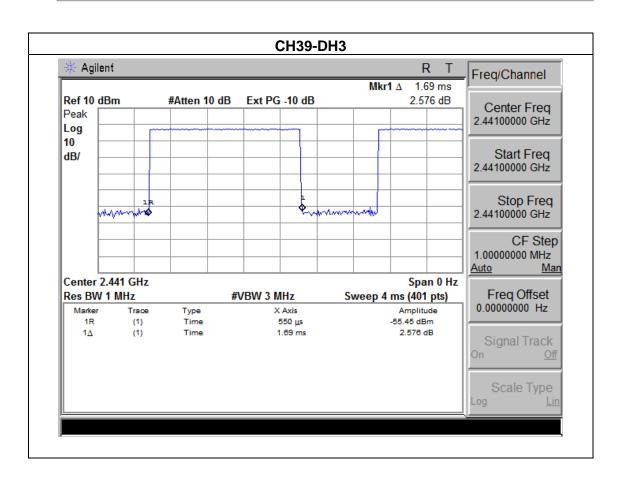
Temperature: 25 °C Relative Humidity: 60%

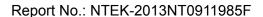
Pressure: 1012 hPa Test Voltage: DC 3.3V

Test Mode: CH39-DH3,2DH3,3DH3

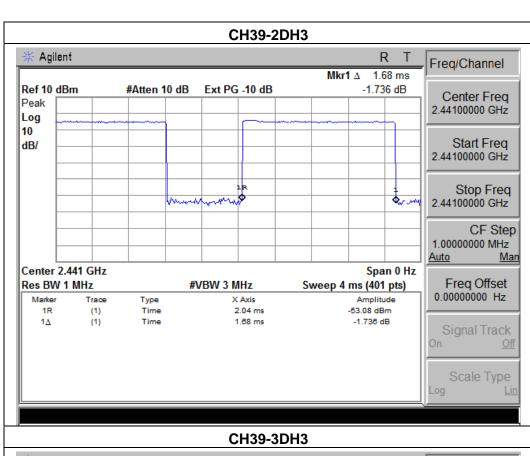
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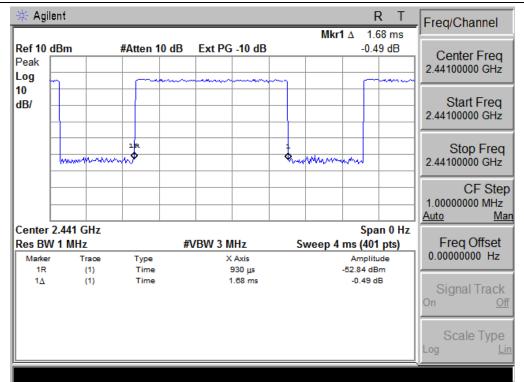
Data Packet	Frequency	Pulse Duration (ms)	Dwell Time (s)	Limits (s)
DH3	2441 MHz	1.69	0.27	0.4
2DH3	2441 MHz	1.68	0.27	0.4
3DH3	2441 MHz	1.68	0.27	0.4













Temperature:

EUT:

Blue Docker Model Name : FAR001

Relative Humidity: 60%

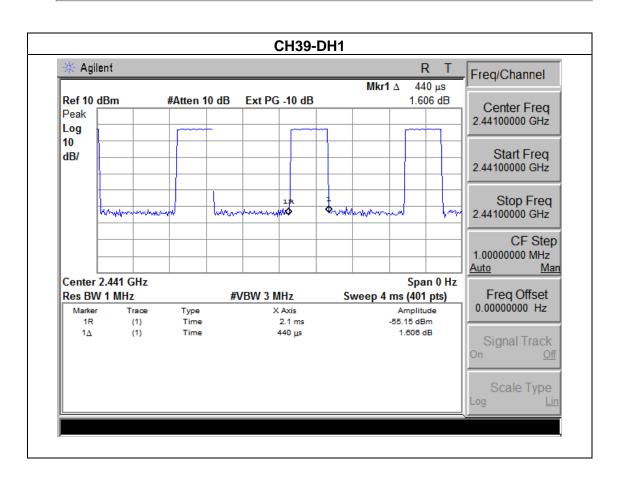
Pressure: 1012 hPa Test Voltage : DC 3.3V

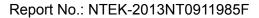
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Test Mode : CH39-DH1,2DH1,3DH1

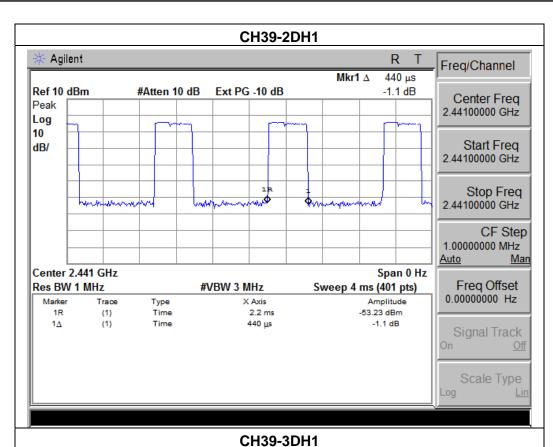
**25** ℃

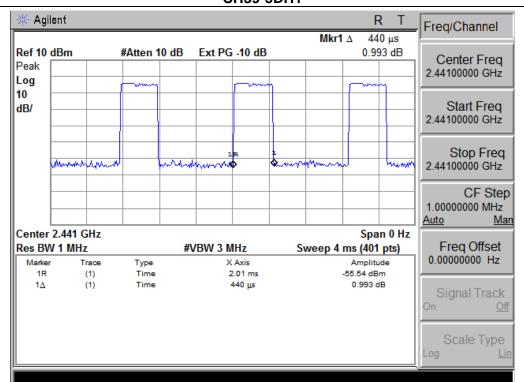
Data Packet	Frequency	Pulse Duration (ms)	Dwell Time (s)	Limits (s)
DH1	2441 MHz	( /	0.14	0.4
2DH1	2441 MHz	0.44	0.14	0.4
3DH1	2441 MHz	0.44	0.14	0.4













#### 6. HOPPING CHANNEL SEPARATION MEASUREMENT

#### **6.1 APPLIED PROCEDURES / LIMIT**

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.

Spectrum Parameter	Setting
Attenuation	Auto
Span Frequency	> Measurement Bandwidth or Channel Separation
RB	30 kHz
VB	100 kHz
Detector	Peak
Trace	Max Hold
Sweep Time	Auto

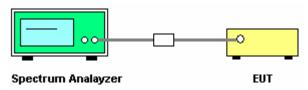
### **6.1.1 TEST PROCEDURE**

- a. The transmitter output (antenna port) was connected to the spectrum analyser in peak hold mode.
- b. The resolution bandwidth of 30 kHz and the video bandwidth of 100 kHz were utilised for channel separation measurement.

### **6.1.2 DEVIATION FROM STANDARD**

No deviation.

### 6.1.3 TEST SETUP



## **6.1.4 EUT OPERATION CONDITIONS**

The EUT was programmed to be in continuously transmitting mode.

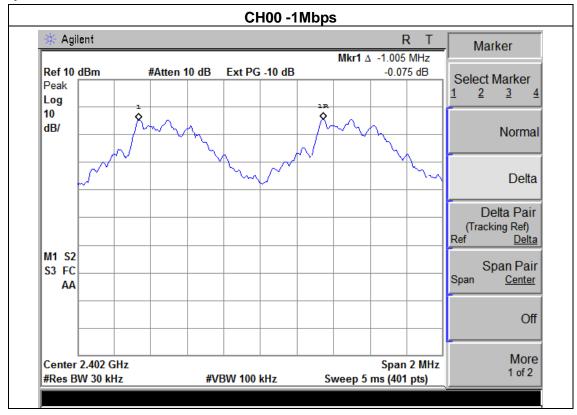


## **6.1.5 TEST RESULTS**

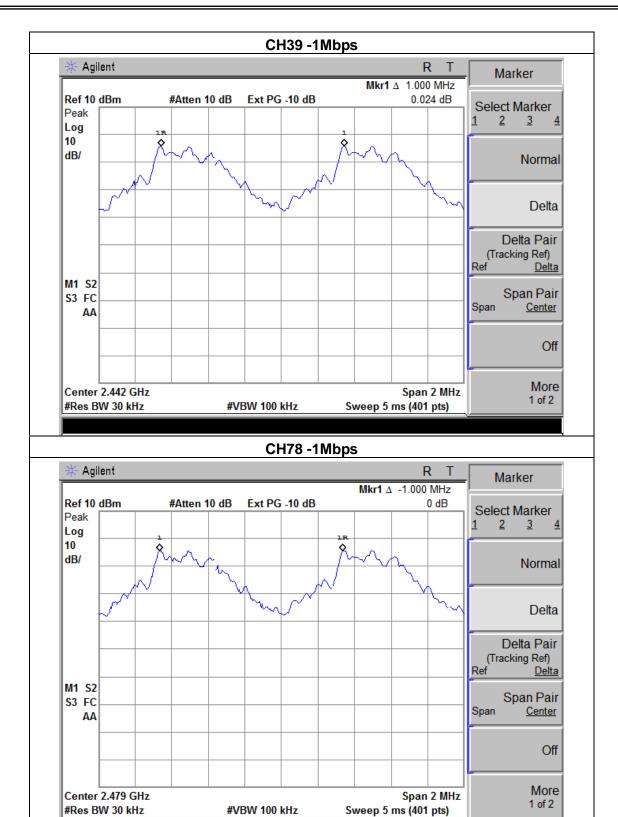
EUT:	Blue Docker	Model Name :	FAR001	
Temperature :	25 ℃	Relative Humidity:	60%	
Pressure:	1012 hPa	Test Voltage :	DC 3.3V	
Test Mode :	CH00 / CH39 /CH78 (1Mbps Mode)			

Frequency	Ch. Separation (MHz)	Result
2402 MHz	1.005	Complies
2441 MHz	1.000	Complies
2480 MHz	1.000	Complies

# Ch. Separation Limits: >20dB bandwidth









EUT: Blue Docker Model Name: FAR001

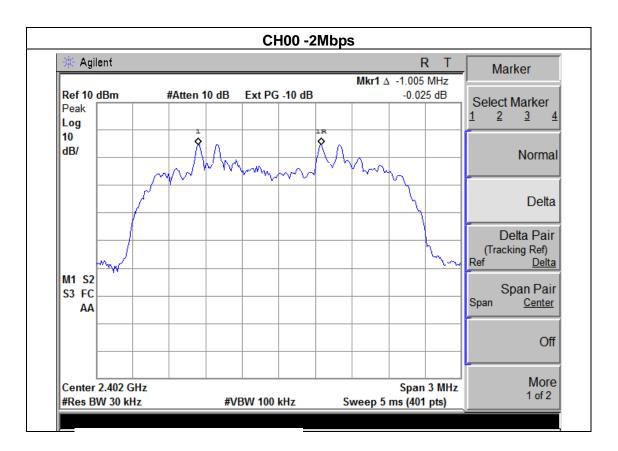
Temperature: 25 °C Relative Humidity: 60%

Pressure: 1012 hPa Test Voltage: DC 3.3V

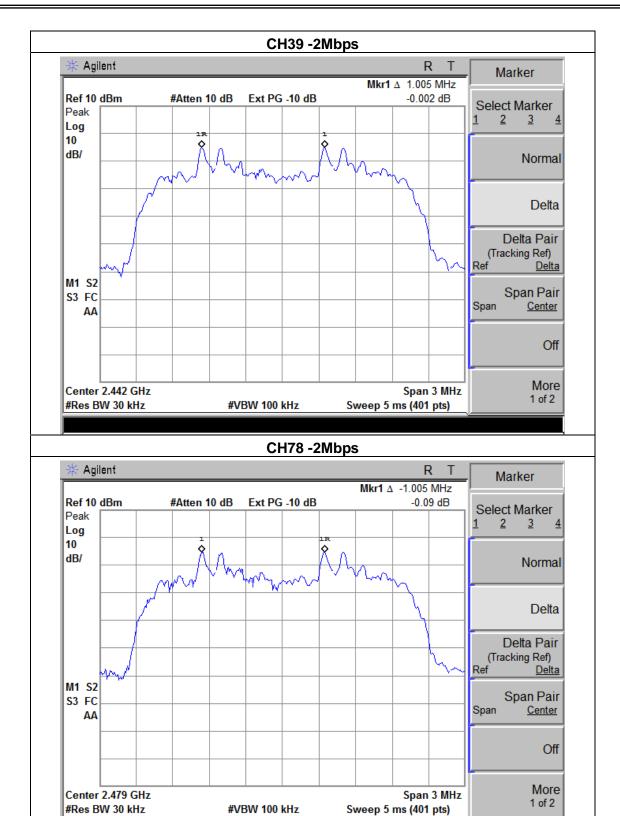
Test Mode: CH00 / CH39 /CH78 (2Mbps Mode)

Frequency	Ch. Separation (MHz)	Result
2402 MHz	1.005	Complies
2441 MHz	1.005	Complies
2480 MHz	1.005	Complies

## Ch. Separation Limits: >2/3 of 20dB bandwidth









EUT: Blue Docker Model Name: FAR001

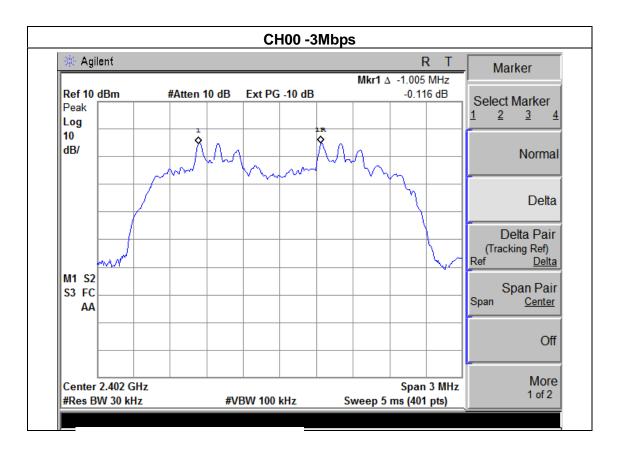
Temperature: 25 °C Relative Humidity: 60%

Pressure: 1012 hPa Test Voltage: DC 3.3V

Test Mode: CH00 / CH39 /CH78 (3Mbps Mode)

Frequency	Ch. Separation (MHz)	Result
2402 MHz	1.005	Complies
2441 MHz	1.005	Complies
2480 MHz	1.005	Complies

## Ch. Separation Limits: >2/3 of 20dB bandwidth

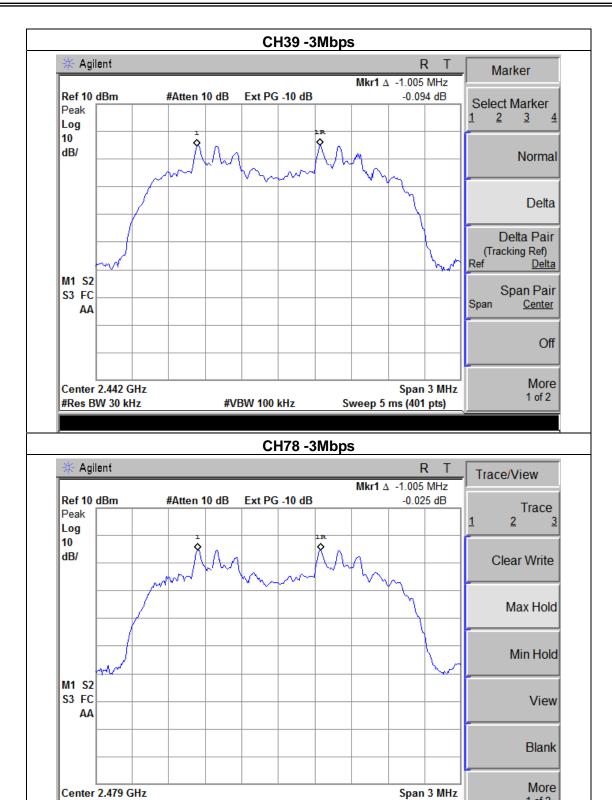




#Res BW 30 kHz

Report No.: NTEK-2013NT0911985F

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**#VBW 100 kHz** 

Sweep 5 ms (401 pts)



#### 7. BANDWIDTH TEST

#### 7.1 APPLIED PROCEDURES / LIMIT

FCC Part15 (15.247) , Subpart C				
Section	Test Item	Limit	Frequency Range (MHz)	Result
15.247 (a)(1)	Bandwidth	(20dB bandwidth)	2400-2483.5	PASS

Spectrum Parameter	Setting
Attenuation	Auto
Span Frequency	> Measurement Bandwidth or Channel Separation
RB	30 kHz
VB	100 kHz
Detector	Peak
Trace	Max Hold
Sweep Time	Auto

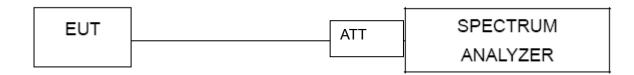
#### 7.1.1 TEST PROCEDURE

- a. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below,
- b. Spectrum Setting: RBW= 30KHz, VBW=100KHz, Sweep time = Auto.

### 7.1.2 DEVIATION FROM STANDARD

No deviation.

### **7.1.3 TEST SETUP**



#### 7.1.4 EUT OPERATION CONDITIONS

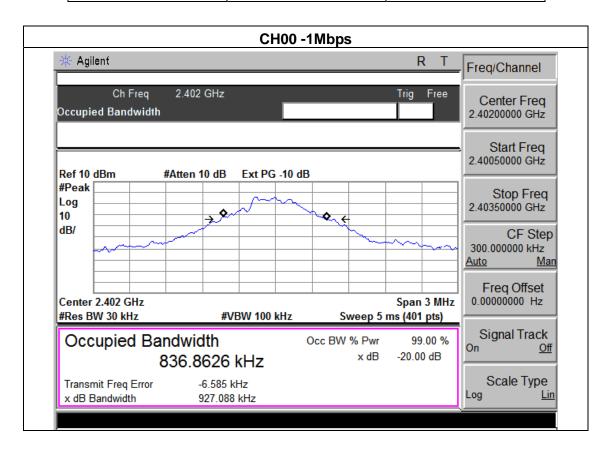
The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.

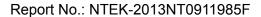


## 7.1.5 TEST RESULTS

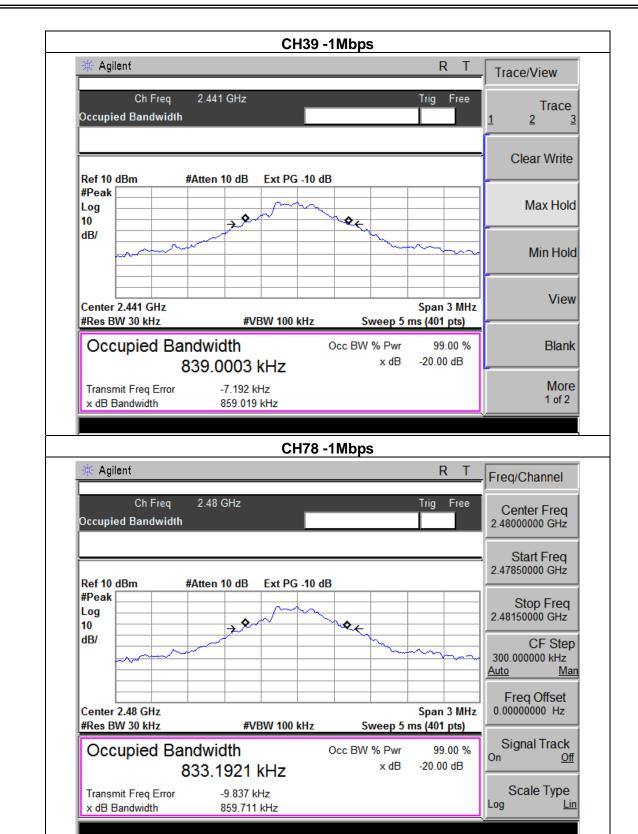
EUT:	Blue Docker	Model Name :	FAR001
Temperature :	25 ℃	Relative Humidity:	60%
Pressure :	1012 hPa	Test Voltage :	DC 3.3V
Test Mode :	CH00 / CH39 /C78(1Mbps)		

Frequency	20dB Bandwidth (kHz)	Result
2402 MHz	927.088	PASS
2441 MHz	859.019	PASS
2480 MHz	859.711	PASS











EUT: Blue Docker Model Name: FAR001

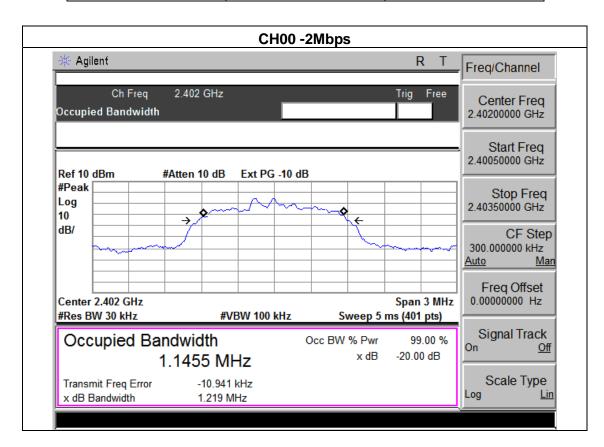
Temperature: 25 °C Relative Humidity: 60%

Pressure: 1012 hPa Test Voltage: DC 3.3V

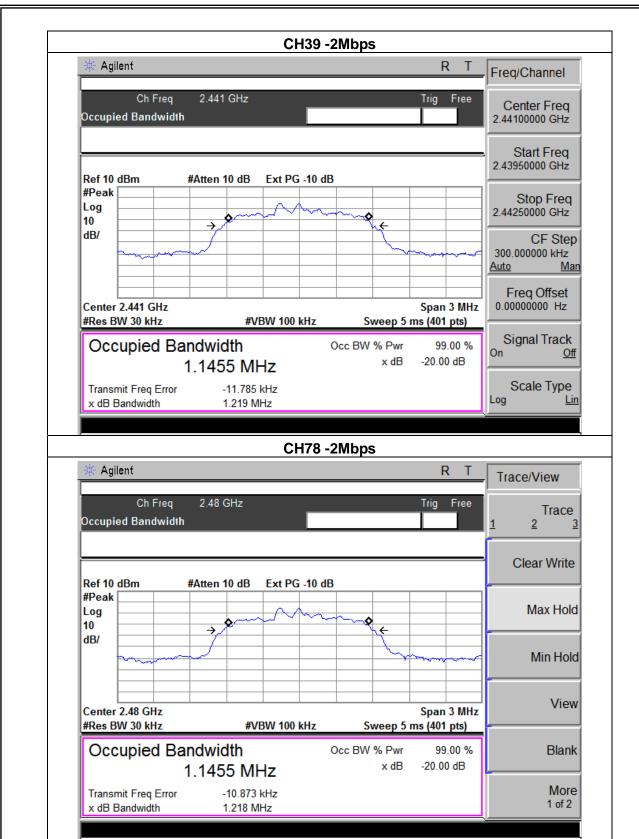
Test Mode: CH00 / CH39 /C78(2Mbps)

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Frequency	20dB Bandwidth (MHz)	Result
2402 MHz	1.219	PASS
2441 MHz	1.219	PASS
2480 MHz	1.218	PASS





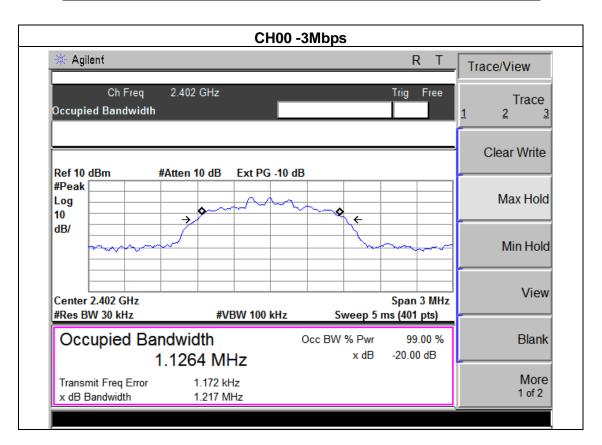


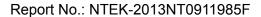


EUT:	Blue Docker	Model Name :	FAR001
Temperature :	<b>25</b> ℃	Relative Humidity:	60%
Pressure:	1012 hPa	Test Voltage :	DC 3.3V
Test Mode :	CH00 / CH39 /C78 <b>(3Mbps)</b>		

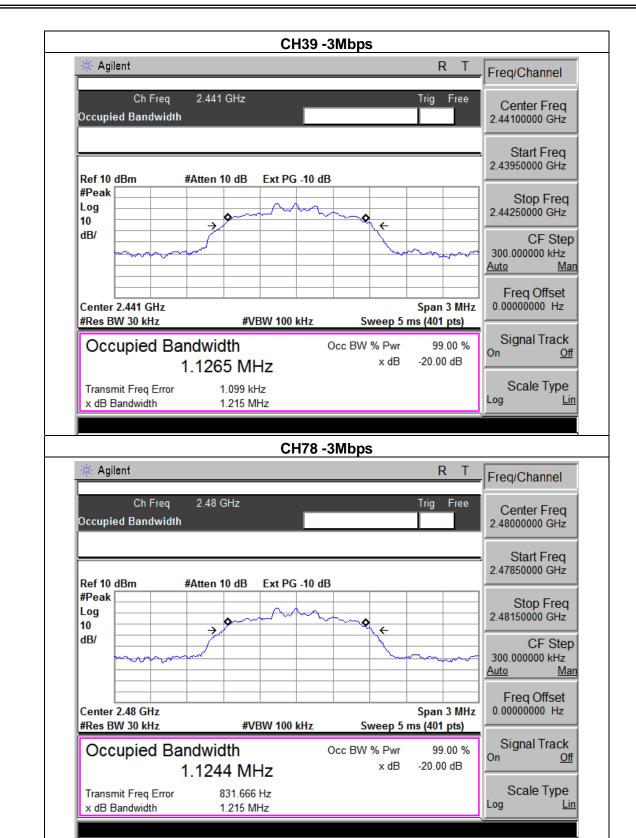
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Frequency	20dB Bandwidth (MHz)	Result
2402 MHz	1.217	PASS
2441 MHz	1.215	PASS
2480 MHz	1.215	PASS











## 8. PEAK OUTPUT POWER TEST

#### 8.1 APPLIED PROCEDURES / LIMIT

FCC Part15 (15.247) , Subpart C					
Section Test Item Limit Frequency Range (MHz) Result					
15.247 (b)(i)	1 125 W or 1W   2400-2483 5   PAS				

### 8.1.1 TEST PROCEDURE

- a. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below,
- b. Spectrum Setting: RBW > the 20 dB bandwidth of the emission being measured

Span = approximately 5 times the 20 dB bandwidth, centered on a hopping channel

 $VBW \geq RBW$ 

Sweep = auto

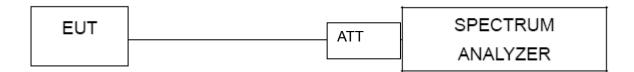
Detector function = peak

Trace = max hold

#### 8.1.2 DEVIATION FROM STANDARD

No deviation.

### 8.1.3 TEST SETUP



### **8.1.4 EUT OPERATION CONDITIONS**

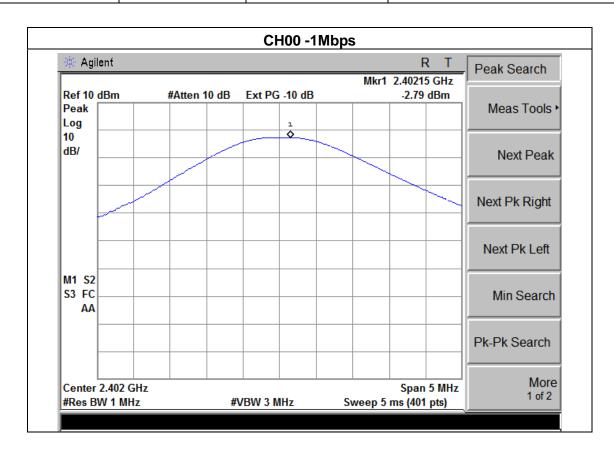
The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.



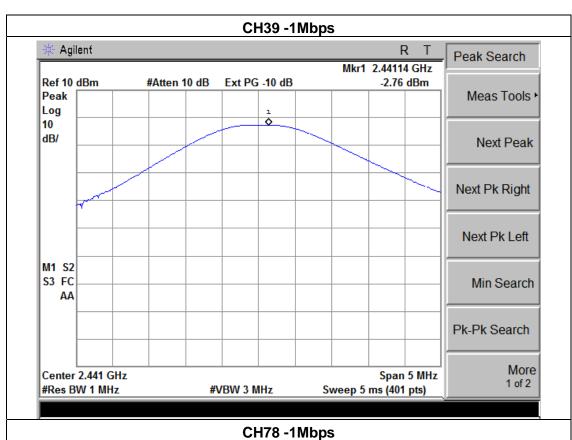
## 8.1.5 TEST RESULTS

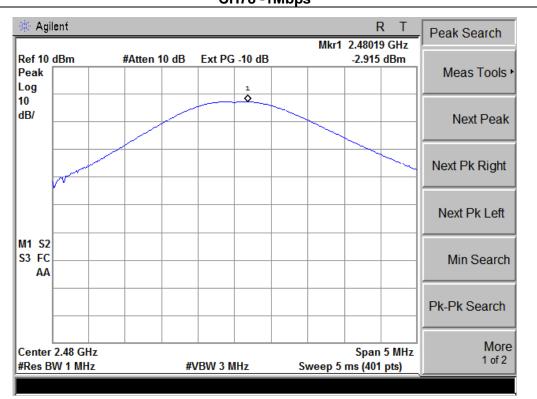
EUT:	Blue Docker	Model Name :	FAR001	
Temperature :	<b>25</b> ℃	Relative Humidity:	60%	
Pressure :	1012 hPa	Test Voltage :	DC 3.3V	
Test Mode :	le : CH00/ CH39 /CH78 (1M/2M/3Mbps Mode)			

	1Mbps				
Test Channel	Frequency (MHz)	Peak Output Power (dBm)	LIMIT (dBm)		
CH00	2402	-2.790	30		
CH39	2441	-2.760	30		
CH78	2480	-2.915	30		
		2Mbps			
CH00	2402	-3.956	20.96		
CH39	2441	-3.995	20.96		
CH78	2480	-4.146	20.96		
		3Mbps			
CH00	2402	-3.824	20.96		
CH39	2441	-3.739	20.96		
CH78	2480	-3.944	20.96		

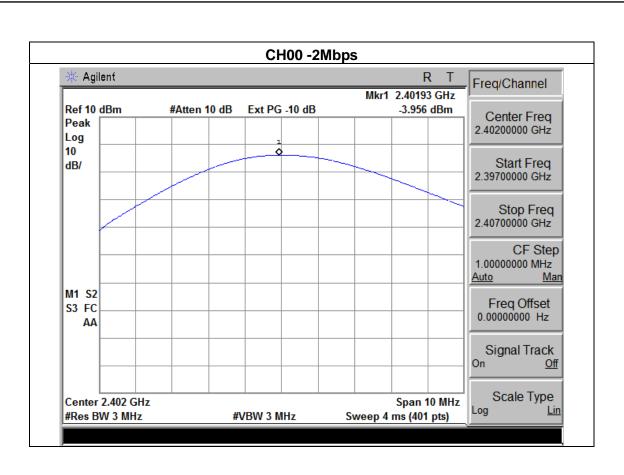


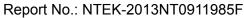












Signal Track

Scale Type

<u>Lin</u>

Span 10 MHz

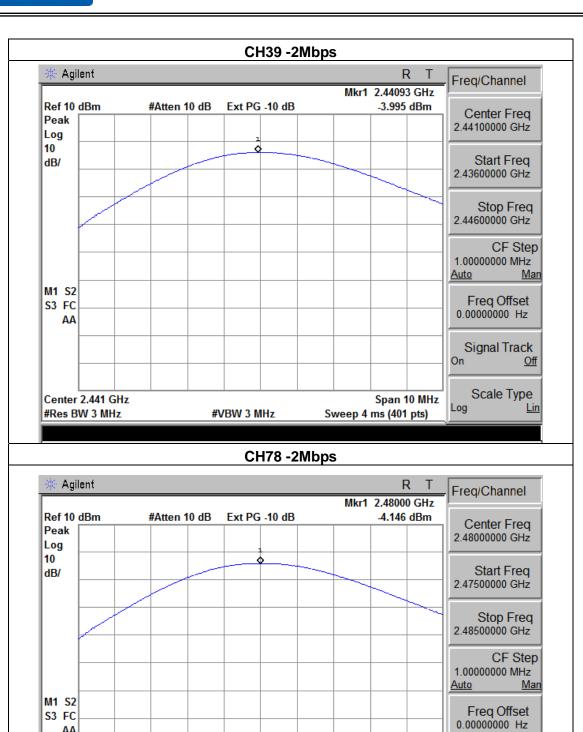
Sweep 4 ms (401 pts)



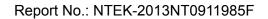
S3 FC AΑ

Center 2.48 GHz

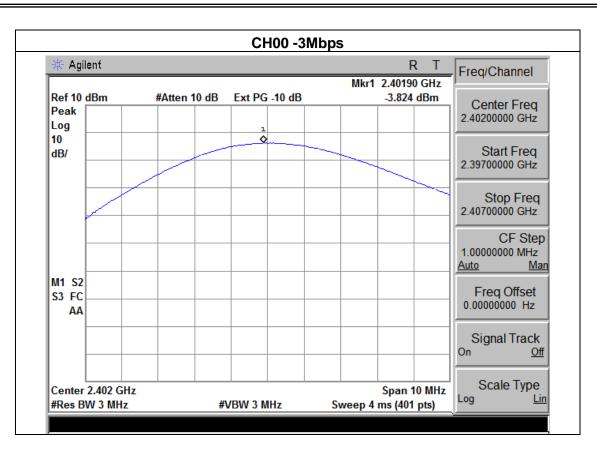
#Res BW 3 MHz



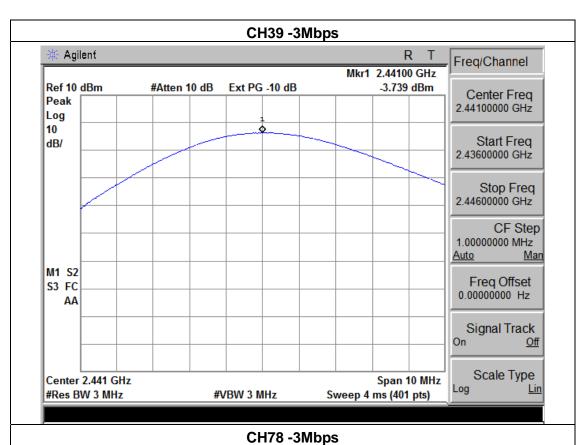
#VBW 3 MHz

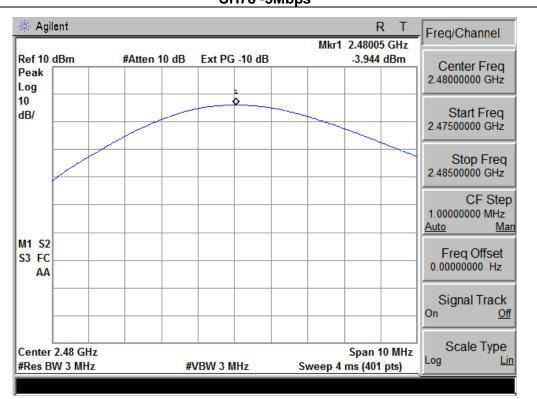














9. 100 KHZ BANDWIDTH OF FREQUENCY BAND EDGE APPLICABLE STANDARD

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).

#### **TEST PROCEDURE**

- a) Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
- b) Position the EUT without connection to measurement instrument. Turn on the EUT and connect its antenna terminal to measurement instrument via a low loss cable. Then set it to any one measured frequency within its operating range, and make sure the instrument is operated in its linear range.
- c) Set RBW to 100 kHz and VBW of spectrum analyzer to 300 kHz with a convenient frequency span including 100 kHz bandwidth from band edge.
- d) Measure the highest amplitude appearing on spectral display and set it as a reference level. Plot the graph with marking the highest point and edge frequency.
- e) Repeat above procedures until all measured frequencies were complete.

#### 9.1 DEVIATION FROM STANDARD

No deviation.

#### 9.2 TEST SETUP



#### 9.3 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.



# 9.4 TEST RESULTS

EUT:	Blue Docker	Model Name :	FAR001
Temperature :	<b>25</b> ℃	Relative Humidity:	60%
Pressure:	1012 hPa	Test Voltage :	DC 3.3V

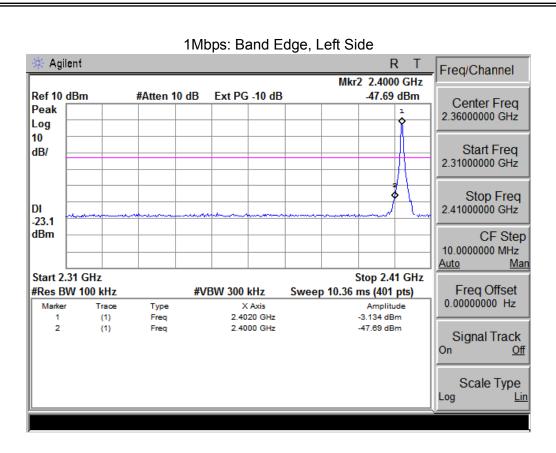
Frequency Band	Delta Peak to band emission (dBc)	>Limit (dBc)	Result
	1Mbps Non-hopp	ing	
Left-band	44.56	20	Pass
Right-band	44.23	20	Pass
	1Mbps Hopping	g	
Left-band	54.60	20	Pass
Right-band	55.53	20	Pass
	2Mbps Non-hoppi	ng	
Left-band	47.59	20	Pass
Right-band	48.55	20	Pass
	2Mbps Hopping	g	
Left-band	53.99	20	Pass
Right-band	53.53	20	Pass
	3Mbps Non-hoppi	ng	
Left-band	48.71	20	Pass
Right-band	50.84	20	Pass
	3Mbps Hopping	g 	
Left-band	55.71	20	Pass
Right-band	54.83	20	Pass

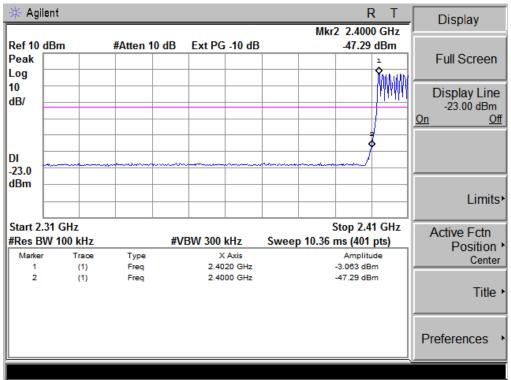


Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector	Commont
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBµV/m)	(dB)	Туре	Comment
	1Mbps Non-hopping						
2390	65.78	-13.06	52.72	74	-21.28	peak	Vertical
2390	63.39	-13.06	50.33	74	-23.67	peak	Horizontal
2483.5	63.11	-12.78	50.33	74	-23.67	peak	Vertical
2483.5	61.24	-12.78	48.46	74	-25.54	peak	Horizontal
			1Mbps hoppin	g			
2390	64.12	-13.06	51.06	74	-22.94	peak	Vertical
2390	62.38	-13.06	49.32	74	-24.68	peak	Horizontal
2483.5	60.12	-12.78	47.34	74	-26.66	peak	Vertical
2483.5	58.22	-12.78	45.44	74	-28.56	peak	Horizontal
		21	Mbps Non-hopp	ing			
2390	63.43	-13.06	50.37	74	-23.63	peak	Vertical
2390	61.28	-13.06	48.22	74	-25.78	peak	Horizontal
2483.5	63.25	-12.78	50.47	74	-23.53	peak	Vertical
2483.5	56.67	-12.78	43.89	74	-30.11	peak	Horizontal
			2Mbps hopping	9			
2390	61.26	-13.06	48.20	74	-25.8	peak	Vertical
2390	62.21	-13.06	49.15	74	-24.85	peak	Horizontal
2483.5	62.45	-12.78	49.67	74	-24.33	peak	Vertical
2483.5	56.12	-12.78	43.34	74	-30.66	peak	Horizontal
		31	Mbps Non-hopp	ing			
2390	61.43	-13.06	48.37	74	-25.63	peak	Vertical
2390	59.93	-13.06	46.87	74	-27.13	peak	Horizontal
2483.5	64.31	-12.78	51.53	74	-22.47	peak	Vertical
2483.5	65.63	-12.78	52.85	74	-21.15	peak	Horizontal
			3Mbps hopping	g			
2390	60.21	-13.06	47.15	74	-26.85	peak	Vertical
2390	58.61	-13.06	45.55	74	-28.45	peak	Horizontal
2483.5	63.42	-12.78	50.64	74	-23.36	peak	Vertical
2483.5	64.61	-12.78	51.83	74	-22.17	peak	Horizontal

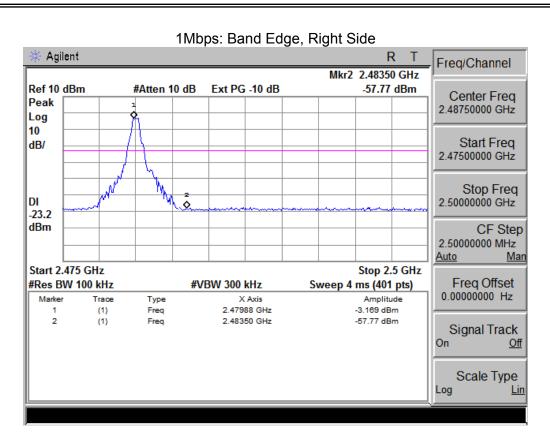
Note: Test method to see chapter 3.2 . PK value below the AV value limit, no record AV value.

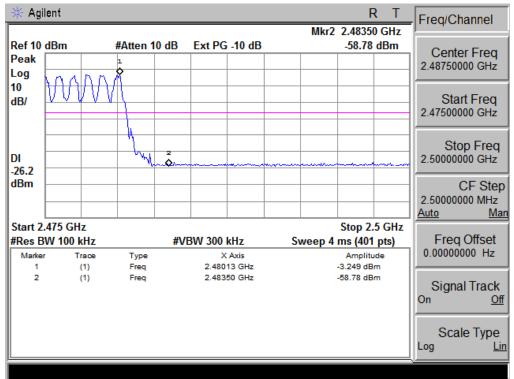




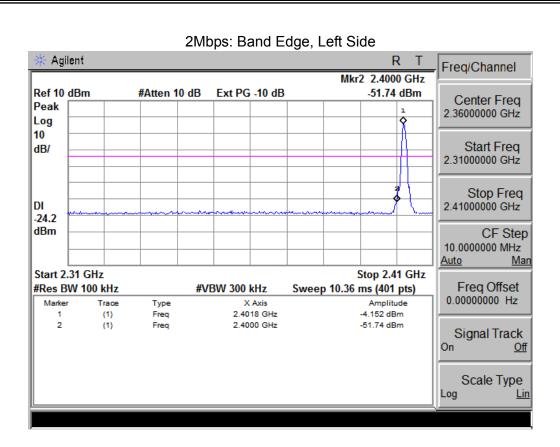


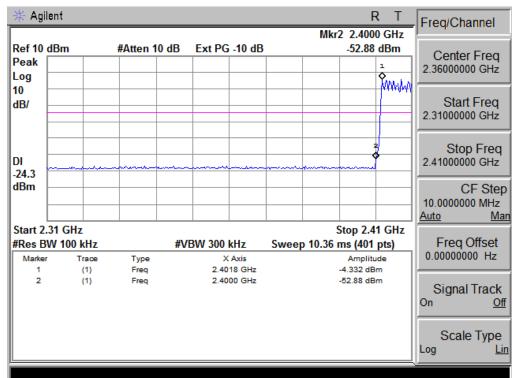




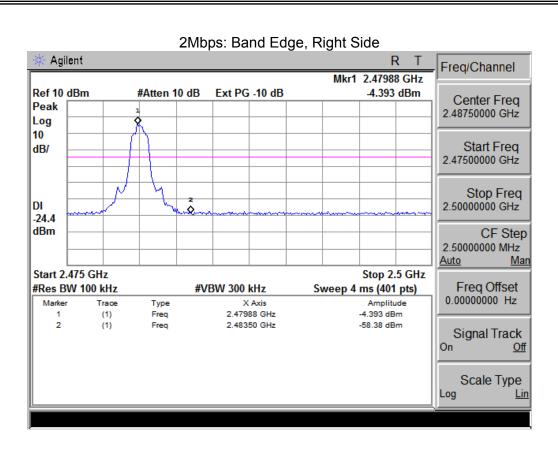


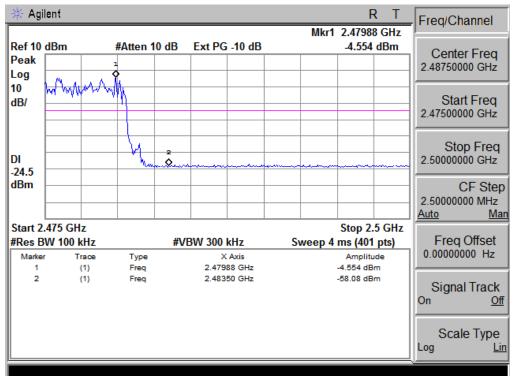




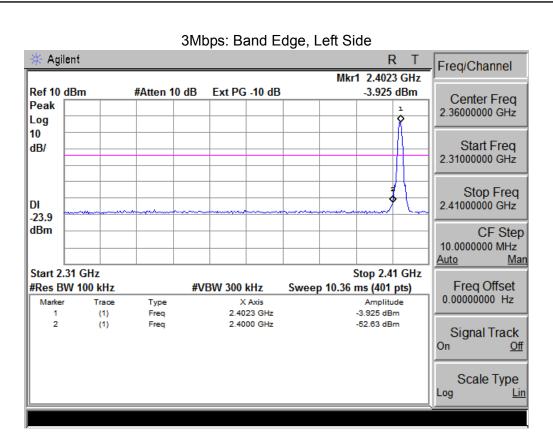


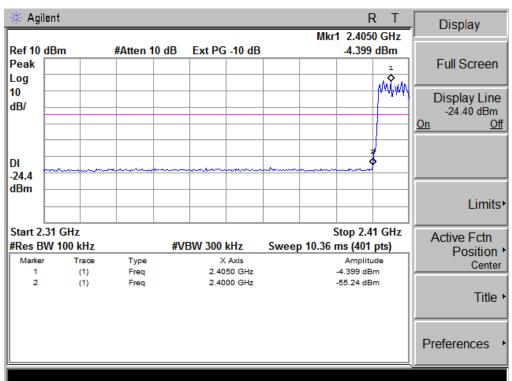


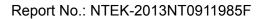




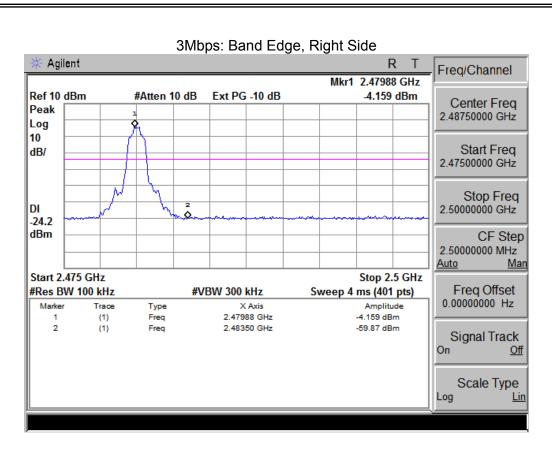


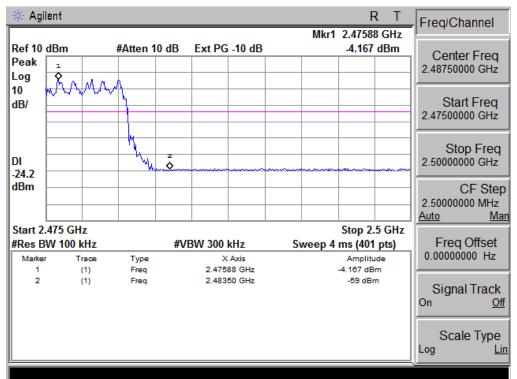














## **10. ANTENNA REQUIREMENT**

## **10.1 STANDARD REQUIREMENT**

15.203 requirement: For intentional device, according to 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.

### **10.2 EUT ANTENNA**

The EUT antenna is Integrated(PCB) antenna. I	It comply with the standard requirement	
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# 11. EUT TEST PHOTO



