

ELECTROMAGNETIC EMISSIONS COMPLIANCE REPORT

INTENTIONAL RADIATOR CERTIFICATION TO FCC PART 15 SUBPART C REQUIREMENT

	OF		
Product Name:	Rugged Handheld Computer		
Brand Name:	unitech		
Model No.:	PA720		
Model Difference:	N/A		
FCC ID:	HLEPA720BTNFL		
Report No.:	ER/2016/60092		
Issue Date:	Jul. 08, 2016		
FCC Rule Part:	§15.247, Cat: DTS		
Prepared for:	unitech electronics co., ltd. 5F, No. 136, Lane 235, Pao-Chiao Rd., Hsin-Tien Dist., New Taipei City, Taiwan SGS Taiwan Ltd.		
Prepared by:	Electronics & Communication Laboratory No.134, Wu Kung Road, New Taipei Industrial Park, Wuku District, New Taipei City, Taiwan 24803		
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VERIFICATION OF COMPLIANCE

Applicant:	unitech electronics co., ltd. 5F, No. 136, Lane 235, Pao-Chiao Rd., Hsin-Tien Dist., New Taipei City, Taiwan
Product Name:	Rugged Handheld Computer
Brand Name:	unitech
Model No.:	PA720
Model Difference:	N/A
FCC ID:	HLEPA720BTNFL
File Number:	ER/2016/60092
Date of Test:	Jun. 16, 2016 ~ Jul. 01, 2016
Date of EUT Received:	Jun. 16, 2016

We hereby certify that:

The above equipment was tested by SGS Taiwan Ltd. Electronics & Communication Laboratory The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI C63.10:2013 and the energy emitted by the sample EUT tested as described in this report is in compliance with conducted and radiated emission limits.

The test results of this report relate only to the tested sample identified in this report.

Test By:	Ton Lis	Date:	Jul. 08, 2016
Prepared By:	Tin Lin / Engineer Tiffany Kao	Date:	Jul. 08, 2016
Approved By:	Tiffany Kao / Clerk Jim Chang / Asst. Manager	Date:	Jul. 08, 2016

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Revision History

Report Number	Revision	Description	Issue Date
ER/2016/60092 Rev.00		Initial creation of document	Jul. 08, 2016

No.134,WuKungRoad,NewTaipeiIndustrialPark,WukuDistrict,NewTaipeiCity,Taiwan24803/新北市五股區新北產業園區五工路 134 號 SGS Taiwan Ltd.



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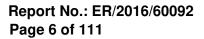
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GENERAL INFORMATION 1

1.1 Product description

General:

Product Name:	Rugged H	Handheld Computer	
Brand Name:	unitech		
Model No.:	PA720		
Model Difference:	N/A		
Product SW/HW version:	298 / R00)4	
Radio SW/HW version:	N/A / N/A		
Test SW Version:	N/A		
RF power setting in TEST SW:	N/A		
USB Charging cable:	Model No	o.: N/A, Supplier: N/A	
	3.6Vdc fr AC/DC A	om Rechargeable Li-polymer Battery or 5V from dapter	
Power Supply:	Battery:	Model No.: 1400-900035G, Supplier: WELLTECH TECHNOLOGY	
	Adapter :	Model No.: PSA10F-050Q, Supplier Phi Hong	

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WLAN 2.4GHz:

Wi-Fi	Frequency Range	Channels	Rated Power	Modulation Technology
11b/g	2412-2462	11	b: 18.95dBm g: 22.62dBm	DSSS, OFDM
11n	HT20 2412-2462	11	22.73dBm	OFDM
11n	HT40 2422-2452	7	23.81dBm	OFDM
Antenna Designation:		PIFA Ante	enna, Gain: -3.76dBi	
Modulati	on type:	CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM		
Transition Rate:		802.11 g: 802.11 n_	1/2/5.5/11 Mbps 6/9/12/18/24/36/48/54 Mbps 20MHz: 6.5 – 65Mbps 40MHz: 13.5 - 135Mbps	

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1.2 Product Feature of Equipment Under Test

The equipment under Test (Hereafter Called: EUT) is Rugged Handheld Computer, supporting GSM / WCDMA / LTE, Wi-Fi 802.11abgn, Bluetooth and NFC features, and below is details of information.

Product Feature		
Product Name:	Rugged Handheld Computer	
Brand Name:	unitech	
Model No.:	PA720	
Model Difference:	N/A	
FCC ID:	HLEPA720BTNFL	
GSM Operating Band(s)	GSM 850/1900MHz	
GPRS / EGPRS Multi Slot Class	GPRS Class 12	
WCDMA Operating Band(s)	FDD Band II / V	
WCDMA Rel. Version	Rel.9	
LTE Operating Band(s)	FCC Band 5: Part 22. / FCC Band 2: Part 24. FCC Band 7 / 38 / 41: Part 27	
LTE Rel. Version	Rel.9	
Bluetooth Version	V4.1 dual mode	
Wi-Fi- Specification	802.11a/b/g/n	
NFC Specification	NFC	

Note: The above EUT information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.

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1.3 Test Methodology of Applied Standards

FCC Part 15, Subpart C §15.247

FCC KDB 558074 D01 DTS Meas. Guidance

ANSI C63.10:2013

Note:

- 1. All test items have been performed and record as per the above standards.
- The composite system is compliance with FCC Subpart B is authorized under a 2. DoC procedure.

1.4 Test Facility

SGS Taiwan Ltd. Electronics & Communication Laboratory No.134, Wu Kung Road, New Taipei Industrial Park, Wuku District, New Taipei City, Taiwan 24803

(TAF code 0513)

FCC Registration Numbers are: 509634

1.5 Special Accessories

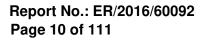
There are no special accessories used while test was conducted.

1.6 Equipment Modifications

There was no modification incorporated into the EUT.

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SYSTEM TEST CONFIGURATION 2

2.1 EUT Configuration

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner which intends to maximize its emission characteristics in a continuous normal application.

2.2 EUT Exercise

An engineering test mode (software/firmware) that applicant provided was utilized to manipulate the EUT into transmit, selection of the test channel, and modulation scheme.

2.3 Test Procedure

2.3.1 Conducted Emissions

The EUT is a placed on as turn table which is 0.8 m above ground plane. Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30MHz,. The CISPR Quasi-Peak and Average detector mode is employed according to §15.207. The two LISNs provide 50 ohm/ 50uH of coupling impedance for the measuring instrument. Both lines of the power mains connected to the EUT were checked for maximum conducted interference.

2.3.2 Radiated Emissions

The EUT is a placed on as turn table. For emissions testing at or below 1 GHz, the table height shall be 0.8 m above the reference ground plane. For emission measurements above 1 GHz, the table height shall be 1.5 m. The turn table shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3m away from the receiving antenna which varied from 1m to 4m to find out the highest emission. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical. In order to find out the max. emission, the relative positions of this hand-held transmitter (EUT) was rotated through three orthogonal axes and measurement procedures for electric field radiated emissions above 1 GHz the EUT measurement is to be made "while keeping the antenna in the 'cone of radiation' from that area and pointed at the area both in azimuth and elevation, with polarization oriented for maximum response." is still within the 3dB illumination BW of the measurement antenna.

2.4 Measurement Results Explanation Example

For all conducted test items:

The offset level is set in the spectrum analyzer to compensate the RF cable loss and attenuation factor between EUT conducted port and spectrum analyzer. With the offset compensation, the spectrum analyzer reading level is exactly EUT RF output level. Note:

The spectrum analyzer offset is derived from RF cable loss and attenuator factor. Following shows an offset computation example with cable loss 1.1dB and 10dB attenuator.

Offset:

= RF cable loss (dB)+ attenuation factor(dB) dB =11.1dB

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2.5 Configuration of Tested System



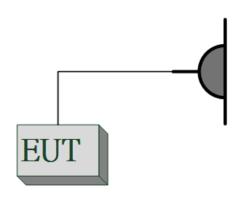
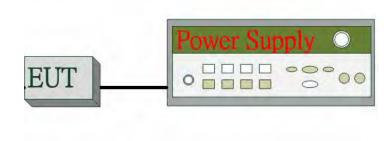


Fig. 2-2 Conducted Emission Configuration



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Fig. 2-3 AC Power Line Conducted Emission

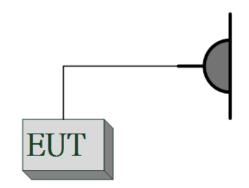


Table 2-1 Equipment Used in Tested System

Item	Equipment	Mfr/Brand	Model/Type No.	Series No.	Data Cable	Power Cord
1.	WLAN Test Software	N/A	N/A	N/A	N/A	N/A
2.	Notebook	Lenovo	L420	LR-7HXZA	N/A	Un-shielded
3.	DC Power Supply	HP	E3640A	KR93300208	N/A	Un-shielded

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SUMMARY OF TEST RESULTS 3

FCC Rules	Description Of Test	Result
§15.207(a)	AC Power Line Conducted Emission	Compliant
§15.247(b) (3)	Peak Output Power	Compliant
§15.247(a)(2)	6dB Emission Bandwidth	Compliant
§15.247(d)	Conducted Band Edge and Spurious Emission	Compliant
§15.247(d)	Radiated Band Edge and Spurious Emission	Compliant
§15.247(e)	Power Spectral Density	Compliant
§15.203 §15.247(b)	Antenna Requirement	Compliant

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DESCRIPTION OF TEST MODES 4

4.1 Operated in 2400 ~ 2483.5MHz Band

11 channels are provided for 802.11b, 802.11g and 802.11n_HT20

CHANNEL	FREQUENCY	CHANNEL	FREQUENCY
1	2412 MHz	7	2442 MHz
2	2417 MHz	8	2447 MHz
3	2422 MHz	9	2452 MHz
4	2427 MHz	10	2457 MHz
5	2432 MHz	11	2462 MHz
6	2437 MHz		

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4.2 The Worst Test Modes and Channel Details

- 1. The EUT has been tested under operating condition.
- 2. Test program used to control the EUT for staying in continuous transmitting and receiving mode is programmed.
- 3. Investigation has been done on all the possible configurations for searching the worst case.

RADIATED EMISSION TEST: RADIATED EMISSION TEST (BELOW 1 GHz) DATA **AVAILABLE** TESTED **ANTENNA** MODE MODULATION RATE CHANNEL CHANNEL PORT (Mbps) OFDM MAIN 1 to 11 1,6,11 6 802.11g **RADIATED EMISSION TEST (ABOVE 1 GHz)** DATA AVAILABLE **TESTED ANTENNA** MODULATION MODE RATE CHANNEL CHANNEL PORT (Mbps) 802.11b DSSS MAIN 1 to 11 1, 6, 11 1 MAIN 802.11a 1 to 11 1, 6, 11 OFDM 6 802.11n (HT20) 1 to 11 OFDM MCS 0 MAIN 1, 6, 11 802.11n (HT40) OFDM MCS 0 MAIN 3 to 9 3, 6, 9

Note:

The field strength of radiation emission was measured as EUT stand-up position (H mode) and lie down position (E1, E2 mode) for 802.11b/g/n WLAN Transmitter for channel Low, Mid and High, the worst case E1 position was reported; as for the wireless charging mode, the worst case E2 position was reported.

ANTENNA PORT CONDUCTED MEASUREMENT:

	CONDUCTED TEST							
MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION	DATA RATE (Mbps)	ANTENNA PORT			
802.11b	1 to 11	1, 6, 11	DSSS	1	MAIN			
802.11g	1 to 11	1, 6, 11	OFDM	6	MAIN			
802.11n (HT20)	1 to 11	1, 6, 11	OFDM	MCS 0	MAIN			
802.11n (HT40)	3 to 9	3, 6, 9	OFDM	MCS 0	MAIN			

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MEASUREMENT UNCERTAINTY 5

Test Items	Uncertainty
AC Power Line Conducted Emission	+/- 2.586 dB
Peak Output Power	+/- 0.84 dB
6dB Bandwidth	+/- 51.33 Hz
100 KHz Bandwidth Of Frequency Band Edges	+/- 0.84 dB
Peak Power Density	+/- 1.3 dB
Temperature	+/- 0.65 °C
Humidity	+/- 4.6 %
DC / AC Power Source	DC= +/- 0.13%, AC= +/- 0.2%

Radiated Spurious Emission:

	9kHz-30MHz: +/-2.87dB
	30MHz - 180MHz: +/- 3.37dB
Measurement uncertainty	180MHz -417MHz: +/- 3.19dB
(Polarization : Vertical)	0.417GHz-1GHz: +/- 3.19dB
	1GHz - 18GHz: +/- 4.04dB
	18GHz - 40GHz: +/- 4.04dB

	9kHz-30MHz: +/-2.87dB
	30MHz - 167MHz: +/- 4.22dB
Measurement uncertainty	167MHz -500MHz: +/- 3.44dB
(Polarization : Horizontal)	0.5GHz-1GHz: +/- 3.39dB
	1GHz - 18GHz: +/- 4.08dB
	18GHz - 40GHz: +/- 4.08dB

This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

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CONDUCTED EMISSION TEST 6

6.1 Standard Applicable

Frequency range within 150kHz to 30MHz shall not exceed the Limit table as below.

Frequency range	Limits dB(uV)			
MHz	Quasi-peak	Average		
0.15 to 0.50	66 to 56	56 to 46		
0.50 to 5	56	46		
5 to 30	60	50		
Note				

1. The lower limit shall apply at the transition frequencies

2. The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz.

6.2 Measurement Equipment Used

Conducted Emission Test Site									
EQUIPMENT	EQUIPMENT MFR		MODEL SERIAL		CAL DUE.				
ТҮРЕ		NUMBER	NUMBER	CAL.					
EMI Test Receiver	R&S	ESCI7	100760	05/10/2016	05/09/2017				
LISN	SCHWARZBECK	NSLK 8127	8127-649	05/16/2016	05/15/2017				
LISN	MESS TEC	FCC-LISN-50/250 -25-2-01	4034	05/16/2016	05/15/2017				
Coaxial Cables	N/A	WK CE Cable	N/A	11/26/2015	11/25/2016				

6.3 EUT Setup

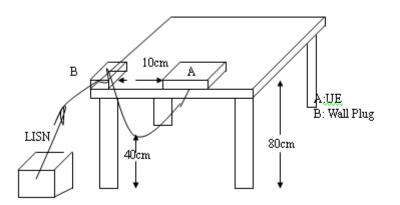
- 1. The conducted emission tests were performed in the test site, using the setup in accordance with the ANSI 63.10:2013.
- 2. The AC/DC Power adaptor of EUT was plug-in LISN. The EUT was placed flushed with the rear of the table.
- 3. The LISN was connected with 120Vac/60Hz power source.

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6.4 Test SET-UP (Block Diagram of Configuration)



6.5 Measurement Procedure

- 1. The EUT was placed on a table which is 0.8m above ground plane.
- 2. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
- 3. Repeat above procedures until all phases of power being supplied by given UE are completed

6.6 Measurement Result

Note: Refer to next page for measurement data and plots. Note2: The * reveals the worst-case results that closet to the limit

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AC POWER LINE CONDUCTED EMISSION TEST DATA

Operation Mode: Operation mode Temperature: 20

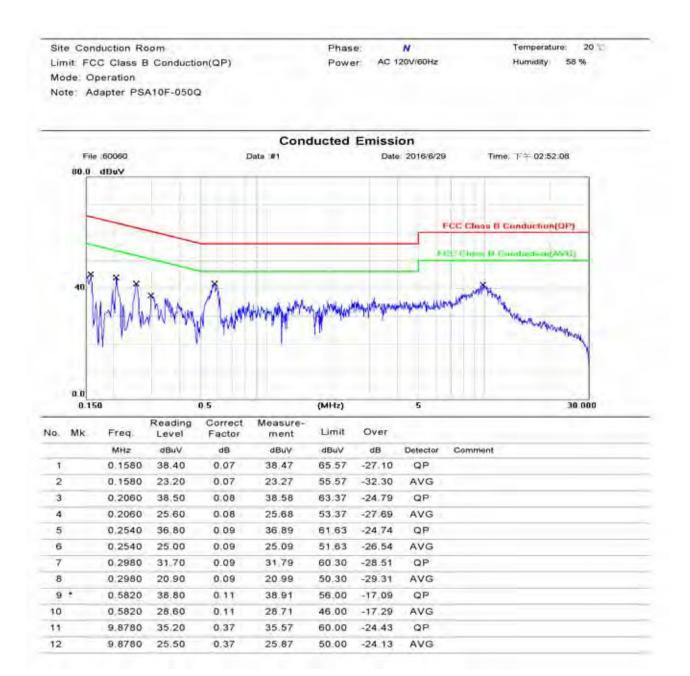
Test Date: Jun. 29, 2016

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DUTY CYCLE OF TEST SIGNAL 7

Pre-analysis Check: While conducting average power measurement, duty cycle of each mode shall be checked to ensure its duty cycle in order to compensate for the loss due to insufficient ratio of duty cycle.

All duty cycle is pre-scanned, and result as obtained below shows only the most representative ones where duty cycle is conducted as the given transmission with given virtual operation that expresses the percentage.

Formula:

Duty Cycle = Ton / (Ton+Toff)

Measurement Procedure:

- 1. Set span = Zero
- 2. RBW = 8MHz
- 3. VBW = 8MHz,
- 4. Detector = Peak

Duty Cycle:

	Duty Cycle (%)	Duty Factor (dB)
802.11b	99.99	0.00
802.11g	89.37	0.49
802.11n_20	88.21	0.54
802.11n_40	79.05	1.02

b = 99.9924%, g = 89.37%, n ht 20 = 88.21%, n ht40 = 79.05%

Duty Cycle Factor: $10 * \log(1/0.999924) = 0$ Duty Cycle Factor: $10 * \log(1/0.8937) = 0.49$ Duty Cycle Factor: $10 * \log(1/0.8821) = 0.54$ Duty Cycle Factor: $10 * \log(1/0.7905) = 1.02$

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7.1 DUTY CYCLE TEST SIGNAL Measurement Result

802.11 b

Center Freq 2.437000000	GHz PNO: Fast =+	Trig: Free Run	Avg	Type: Log-Per	D61111114M kg 17, 2016 TRACE TO CONTRACT TYPE DET PLANTON	Frequency
Ref Offset 11.1 dB	I Gaincow					Auto Tune
100 0.00 0.00						Center Freq 2.437000000 GHz
200 300						Start Freq 2.437000000 GHz
50 0 40 p 						Stop Freq 2.437000000 GHz
Center 2.437000000 GHz Res BW 8 MHz	#VBW	8.0 MHz	PUNCTION	Sweep 3	Span 0 Hz 1.013 ms (401 pts)	CF Step 8.000000 MHz Auto Man
1 2 3 4 4 5 5 7 8			101621001			Freq Offset 0 Hz
9						

802.11 g

	IFGain:Lov	Atten: 3		Avg Type: Log-Pwr	TYPE CET PTC HILFTON	Frequency
Ref Offset 11. Ref 20.00 d	dBm			۵	Mkr3 1.559 ms -0.54 dB	Auto Tun
-MR.	man halvaharan	Xa		JANE		Center Fre 2.437000000 GH
		and a			- m	Start Fre 2 437000000 GH
						Stop Fre 2.437000000 GH
IHZ		BW 8.0 MHz	-			CF Ste 8.000000 Mi Auto Ma
			dB	DN FUNEBUN WIDTH	FUNCTION WALLIE	- Internet
		(\Delta) -0.54	dB			Freq Offse
	7000000 G	7000000 GHz Hz #V 5 × 1 1.394 ms 1 1.213 ms 1 (Δ)	7000000 GHz Hz #VBW 8.0 MHz τ (Δ) 1.394 ms (Δ) -3.30 t (Δ) 1.469 ds -4.65 ds	Ref 20.00 dBm 7000000 GHz Hz #VBW 8.0 MHz 5 Y (Δ) 1.394 ms (Δ) 3.30 dB 1 1.213 ms 1.490 dBm 1.490 dBm	Ref 20.00 dBm 7000000 GHz Hz #VBW 8.0 MHz SS Y FUNCTION FUNCTION 1 1.394 ms 1 1.213 ms 1 14.80 dBm t (Δ) 1 1.569 ms (Δ) 0.54 dB	Ref 20.00 dBm -0.54 dB -0.54 dB -0.54 dB



802.11 n_20 MHz

enter F	req 2.43700	PND: Fast -+	Trig: Free Run #Atten: 30 dB	Avg	Type: Log-Pwr	INTERNAL TRACE TO THE TYPE WAVE DET PIN UTTEN	Frequency
0 delaiv	Ref Offset 11 Ref 20.00 d				۵	Mkr3 1.469 ms 0.01 dB	Auto Tune
09 (64)/40 (01) (10)	Xa.	An an - rinn an fraight fraigh	-g-b-friebist	m¥1∆2,3	δ4 α ταστολιτοί	havartaintis Bos	Center Freq 2.437000000 GHz
200 200 200	-9500.0			42-91			Start Freq 2 437000000 GHz
5010 5010 7010							Stop Freq 2.437000000 GHz
enter 2. tes BW 8	437000000 G MHz		8.0 MHz		Sweep :	Span 0 Hz 3.013 ms (401 pts)	CF Step 8.000000 MHz
1 A2	t (Δ)	× 1.296 ms (Δ)	V 0.60 dB	PUNCTION	FUNCTION WOTH	FUNETION WALLE	Auto: Man
		444.5 μs 1.459 ms (Δ) 444.5 μs	14.88 dBm 0.01 dB 14.88 dBm				Freq Offset 0 Hz
8 9 10							
DO I					STATUS		

802.11 n 40 MHz



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PEAK OUTPUT POWER MEASUREMENT 8

8.1 Standard Applicable

For systems using digital modulation in the 2400-2483.5 MHz bands, the limit for peak output power is 1Watt.

If the transmitting antenna of directional gain greater than 6dBi are used the peak output power form the intentional radiator shall be reduced below the above stated value by the amount in dB that the directional gain of the Antenna exceeds 6dBi.

In case of point-to-point operation, the limit has to be reduced by 1dB for every 3dB that the directional gain of Antenna exceeds 6dBi.

8.2 Measurement Equipment Used

	Conduc	ted Emission	Test Site		
EQUIPMENT	MFR	MODEL	SERIAL	LAST	CAL DUE.
ТҮРЕ		NUMBER	NUMBER	CAL.	
Power Meter	Anritsu	ML2495A	1005007	12/09/2015	12/08/2016
Power Sensor	Anritsu	MA2411B	917032	12/09/2015	12/08/2016
EXA Spectrum An-					
alyzer	Agilent	N9030A	MY53120760	02/26/2016	02/25/2017
DC Block	Mini-Circuits	BLK-18-S+	1	01/02/2016	01/01/2017
Coaxial Cable	HUBER+SUHNER	SUCOFLEX	23670/2	01/02/2016	01/01/2017
		102			
Attenuator	Mini-Circuit	BW-S10W2+	2	01/02/2016	01/01/2017
Splitter	Agilent	11636B	N/A	01/02/2016	01/01/2017
DC Power Supply	Agilent	E3640A	MY52410006	11/05/2015	11/04/2016
Temperature	TERCHY	MHG-120LF	911009	05/17/2016	05/16/2017
Chamber					

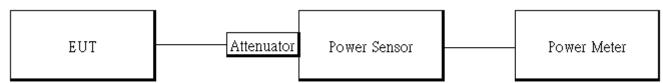
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8.3 Test Set-up

Power Meter:



8.4 Measurement Procedure

- 1. Place the EUT on the table and set it in transmitting mode.
- 2. The testing follows the Measurement Procedure of FCC KDB 558074 D01 DTS Meas. Guidance.
- 3. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the power meter.

Power Meter:

It is used as the auxiliary test equipment to conduct the output power measurement.

4. Record the max. Reading as observed from Spectrum or Power Meter.

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8.5 Measurement Result

802.11	1b Main							
сн	Frequency (MHz)	Data Rate	Peak Output Power (dBm)	Peak Output Power (mW)	Limit		RESULT	
1	2412	1	18.73	74.64	1 Watt =	30.00	dBm	PASS
6	2437	1	18.55	71.61	1 Watt =	30.00	dBm	PASS
11	2462	1	18.95	78.52	1 Watt =	30.00	dBm	PASS
802.11	1b Main							
сн	Frequency (MHz)	Data Rate	Avg. Output Power (dBm)	Avg. Output Power (mW)	Limit			RESULT
1	2412	1	15.72	37.33	1 Watt =	30.00	dBm	PASS
6	2437	1	15.67	36.90	1 Watt =	30.00	dBm	PASS
11	2462	1	15.93	39.17	1 Watt =	30.00	dBm	PASS

802.11g Main							
сн	Frequency (MHz)	Data Rate	Peak Output Power (dBm)	Peak Output Power (mW)	Limit		RESULT
1	2412	6	22.57	180.72	1 Watt = 30.00	dBm	PASS
6	2437	6	22.12	162.93	1 Watt = 30.00	dBm	PASS
11	2462	6	22.62	182.81	1 Watt = 30.00	dBm	PASS
802.11	1g Main						
сн	Frequency (MHz)	Data Rate	Avg. Output Power (dBm)	Avg. Output Power (mW)	Limit		RESULT
1	2412	6	12.87	19.36	1 Watt = 30.00	dBm	PASS
6	2437	6	12.79	19.01	1 Watt = 30.00	dBm	PASS
11	2462	6	12.72	18.71	1 Watt = 30.00	dBm	PASS

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802.11n_HT20M Main								
СН	Frequency (MHz)	Data Rate	Peak Output Power (dBm)	Peak Output Power (mW)	Limit		RESULT	
1	2412	MCS0	22.73	187.50	1 Watt =	30.00	dBm	PASS
6	2437	MCS0	22.18	165.20	1 Watt =	30.00	dBm	PASS
11	2462	MCS0	22.61	182.39	1 Watt =	30.00	dBm	PASS
802.1	1n_HT20M Main							
СН	Frequency (MHz)	Data Rate	Avg. Output Power (dBm)	Avg. Output Power (mW)	Limit		RESULT	
1	2412	MCS0	12.74	18.79	1 Watt =	30.00	dBm	PASS
6	2437	MCS0	12.63	18.32	1 Watt =	30.00	dBm	PASS
11	2462	MCS0	12.66	18.45	1 Watt =	30.00	dBm	PASS

802.1 ⁻	1n_HT40M Main							
СН	Frequency (MHz)	Data Rate	Peak Output Power (dBm)	Peak Output Power (mW)	Limit		RESULT	
3	2422	MCS0	23.54	225.94	1 Watt =	30.00	dBm	PASS
6	2437	MCS0	23.51	224.39	1 Watt =	30.00	dBm	PASS
9	2452	MCS0	23.81	240.44	1 Watt =	30.00	dBm	PASS
802.1 ⁻	1n_HT40M Main							
СН	Frequency (MHz)	Data Rate	Avg. Output Power (dBm)	Avg. Output Power (mW)	Limit		RESULT	
3	2422	MCS0	12.81	19.10	1 Watt =	30.00	dBm	PASS
6	2437	MCS0	12.63	18.32	1 Watt =	30.00	dBm	PASS
9	2452	MCS0	12.84	19.23	1 Watt =	30.00	dBm	PASS

* Note: The duty cycle factor is compensated to obtain the maximum value of measurement in average.

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6DB BANDWIDTH MEASUREMENT 9

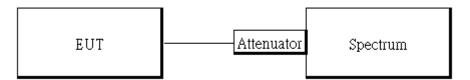
9.1 Standard Applicable

The minimum 6 dB bandwidth shall be at least 500 kHz.

9.2 Measurement Equipment Used

Conducted Emission Test Site							
EQUIPMENT	MFR	MODEL	SERIAL	LAST	CAL DUE.		
ТҮРЕ		NUMBER	NUMBER	CAL.			
EXA Spectrum							
Analyzer	Agilent	N9030A	MY53120760	02/26/2016	02/25/2017		
DC Block	Mini-Circuits	BLK-18-S+	1	01/02/2016	01/01/2017		
Attenuator	Mini-Circuit	BW-S10W2+	2	01/02/2016	01/01/2017		

9.3 Test Set-up



9.4 Measurement Procedure

- 1. Place the EUT on the table and set it in transmitting mode.
- 2. The testing follows the Measurement Procedure of FCC KDB 558074 D01 DTS Meas. Guidance.
- 3. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
- 4. For 6dB Bandwidth:

Set the spectrum analyzer as RBW = 100 kHz, VBW = 3*RBW, Span = 30M/50MHz, Detector=peak, Sweep=auto.

- 5. Mark the peak frequency and –6dB (upper and lower) frequency.
- 6. Repeat above procedures until all frequency of interest measured was complete.

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9.5 Measurement Result

6dB Bandwidth

802.11b Main

Frequency (MHz)	6dB Bandwidth (kHz)	Limit (kHz)	Result
2412	9078	> 500	PASS
2437	9592	> 500	PASS
2462	9093	> 500	PASS

802.11g Main

Frequency (MHz)	6dB Bandwidth (kHz)	Limit (kHz)	Result
2412	15430	> 500	PASS
2437	15730	> 500	PASS
2462	13900	> 500	PASS

802.11 n HT20 Main

Frequency (MHz)	6dB Bandwidth (kHz)	Limit (kHz)	Result
2412	15960	> 500	PASS
2437	16160	> 500	PASS
2462	15120	> 500	PASS

802.11 n HT40 Main

Frequency (MHz)	6dB Ban dwidth (kHz)	Limit (kHz)	Result
2422	32530	> 500	PASS
2437	35560	> 500	PASS
2452	35170	> 500	PASS

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802.11b (Main) 6dB Band Width Test Data CH-Low



6dB Band Width Test Data CH-Mid

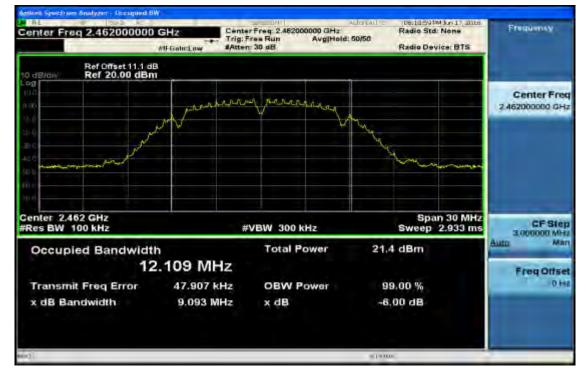


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6dB Band Width Test Data CH-High



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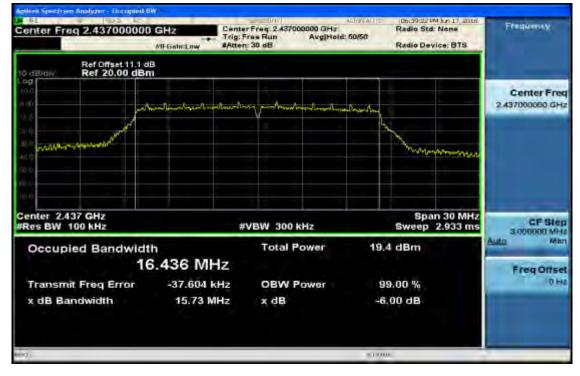
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802.11g (Main) 6dB Band Width Test Data CH-Low



6dB Band Width Test Data CH-Mid

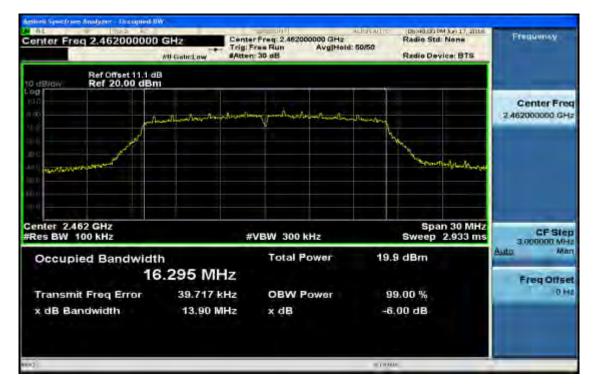


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6dB Band Width Test Data CH-High



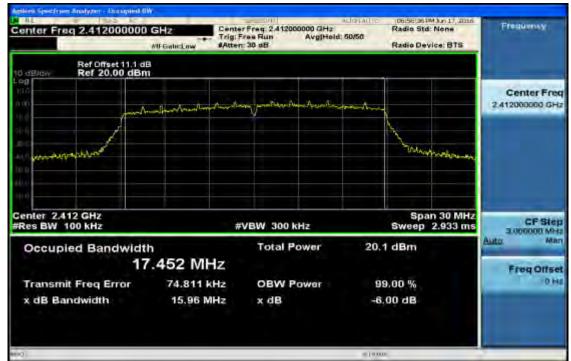
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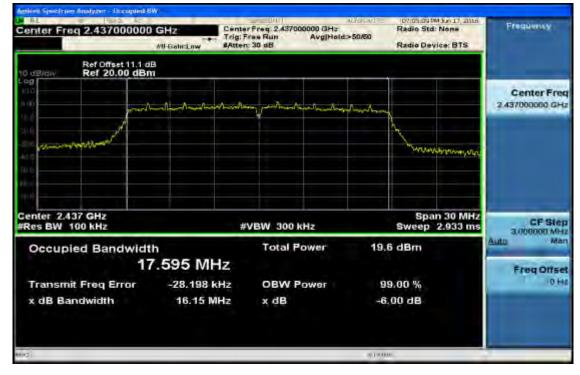
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802.11n 20M (Main) 6dB Band Width Test Data CH-Low



6dB Band Width Test Data CH-Mid

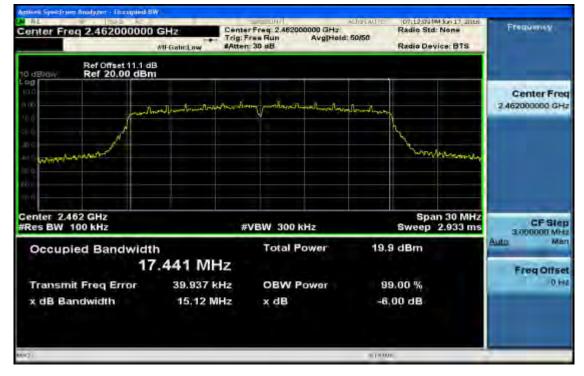


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6dB Band Width Test Data CH-High



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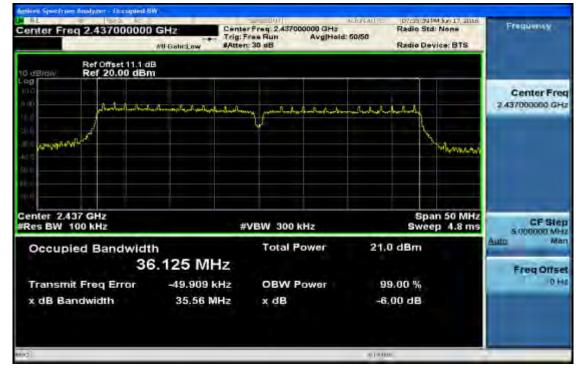
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802.11n_40M (Main) 6dB Band Width Test Data CH-Low



6dB Band Width Test Data CH-Mid



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6dB Band Width Test Data CH-High

Center Freq 2.452000000	GHZ WFGalicLow	Talat Edge Eld	2.45200000 GHz	ALTOPLACINE Id: 50/50	Radio Sta	wice: BTS	Frequency
10 dB/div Ref 20,00 dBm							_
	hann finghaphaph	r.	اسیا ہے۔ اس		iii a	Moneton	Center Fred 2.452000000 GH3
Center 2.452 GHz #Res BW 100 kHz		#VBW	300 kHz		Spa	an 50 MHz ap 4.8 ms	CF Step
Occupied Bandwidth 35	695 MF		otal Power	21.	0 dBm		Auto Mar
Transmit Freq Error x dB Bandwidth	150.33 k 35.16 M		BW Power dB		9.00 % .00 dB		OH
edi				=100	0	_	



10 CONDUCTED BAND EDGES AND SPURIOUS EMISSION MEASUREMENT

10.1 Standard Applicable

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.

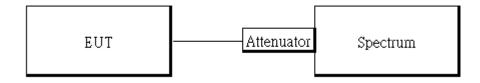
In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a) & RSS-Gen §8.10, must also comply with the radiated emission limits specified in §15.209(a) & RSS-Gen §8.8.

If the transmitter complies with the conducted power limits based on the use of root-mean-square averaging over a time interval, as permitted under Section 5.4(4), the attenuation required shall be 30 dB instead of 20 dB. Attenuation below the general field strength limits specified in RSS-Gen is not required.

10.2 Measurement Equipment Used

	Conduct	ed Emission	Test Site		
EQUIPMENT	MFR	MODEL	SERIAL	LAST	CAL DUE.
ТҮРЕ		NUMBER	NUMBER	CAL.	
EXA Spectrum					
Analyzer	Agilent	N9030A	MY53120760	02/26/2016	02/25/2017
DC Block	Mini-Circuits	BLK-18-S+	1	01/02/2016	01/01/2017
Attenuator	Mini-Circuit	BW-S10W2+	2	01/02/2016	01/01/2017

10.3 Test SET-UP



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10.4 Measurement Procedure

Conducted Band Edge:

- 1. To connect Antenna Port of EUT to Spectrum.
- 2. The testing follows the Measurement Procedure of FCC KDB 558074 D01 DTS Meas. Guidance.
- 3. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
- 4. Set start to edge frequency, and stop frequency of spectrum analyzer so as to encompass the spectrum to be examined.
- 5. Set the spectrum analyzer as RBW=100 kHz, VBW=300 kHz, Detector = Peak, Sweep = auto
- 6. Mark the highest reading of the emission as the reference level measurement.
- 7. Set DL as the limit = reading on marker 1 20dBm
- 8. Marker on frequency, 2.3999GHz and 2.4836GHz, and examine shall 100 kHz immediately outside the authorized (2400~2483.5) be attenuated by 20dB at least relative to the maximum emission of power.
- 9. Repeat above procedures until all default test channel (low, middle, and high) was complete.

Conducted Spurious Emission:

- To connect Antenna Port of EUT to Spectrum
- 2. The testing follows the Measurement Procedure of FCC KDB 558074 D01 DTS Meas. Guidance.
- 3. Set RBW = 100 kHz & VBW= 300 kHz, Detector = Peak, Sweep = Auto.
- 4. Allow trace to fully stabilize.
- 5. Use the peak marker function to determine the maximum power level in any 100 kHz band segment within the fundamental EBW.
- 6. Repeat above procedures until all default test channel measured were complete.

10.5 Measurement Result

Note: Refer to next page spectrum analyzer data chart and tabular data sheets.

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802.11b **Band Edges Test Data CH-Low**

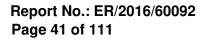


Band Edges Test Data CH-High



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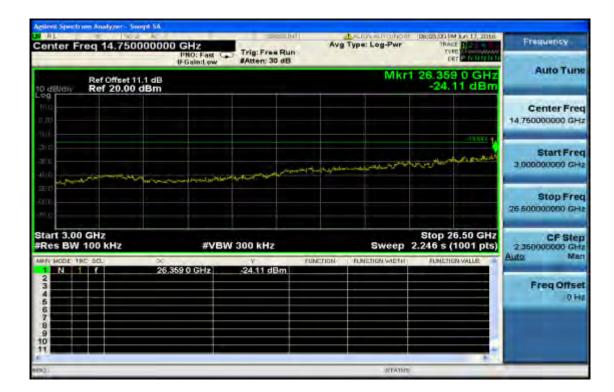
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802.11b **Spurious Emission Test Data CH-Low**

RL enter Freq 1.51	5000000 GHz PNO: Fast IFGain:Low	Trig: Free Run #Atten: 30 dB	Avg Type: Log-Pwr	DBIDAUSIA MAN 17, 2015 NAACE 112	Frequency
dBraiv Ref 20.	et 11.1 dB 00 dBm		MIK	1 2.411 9 GHz 4.31 dBm	Auto Tune
29 000 200				1	Center Free 1,51600000 GH:
				- Dis test open	
				ومحدورة متلالة فيالحو معروسان مناس	Start Free 30,000000 MH
	104 14 14 14 14 14 14 14 14 14 14 14 14 14		and a second		Stop Free 3 00000000 GH
art 30 MHz Res BW 100 kHz	#V	BW 300 kHz	Sweep 28	Stop 3.000 GHz 3.9 ms (1001 pts)	CF Stej 297.000000 MH
N MODE THE SEL	>> 2,411.9 GHz	7 4.31 dBm	INCTION FUNCTION WIDTH	FUNCTION WALLS	Auto: Ma
					Freq Offse
31			STATUS	-	

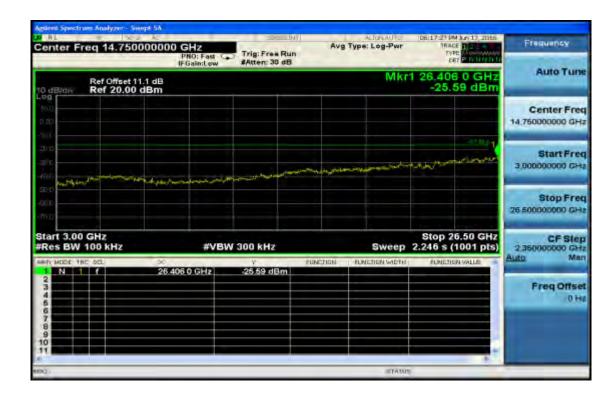


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Spurious Emission Test Data CH-Mid

enter Freq 1.5150	00000 GHz PN0: Fast IFGain:Low	Trig: Free Run	Avg Type: Log-Pwr	D61201244 km 17, 23th TRACE 112 54 TYPE D1000000 DET P TUTUTU	Frequency
Ref Offset 1 Ref 20.00	1.1 dB		M	kr1 2.435 7 GHz 2.72 dBm	
000				• ¹	Center Free 1,516000000 GH
ai				417 IB (18)	
řt.					Start Free 30,000000 MH
D D Serve de la glade de la COLO	المحيدة ومشيناتهم أطباطه إسانية المال بعرل				Stop Free 3 00000000 GH
tart 30 MHz Res BW 100 kHz	#VBW	300 kHz	Sweep 2	Stop 3.000 GHz 283.9 ms (1001 pts	297.000000 MH
NODE THE SEL	2.435 7 GHz	V //	NETION FUNCTION WADTED	FUNCTION WALLS	Auto Mar
23466678					Freq Offse
9					
a			TAT	*	



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Spurious Emission Test Data CH-High

Frequency	DESS 14 PM An 17, 2016 TRACE DO CONTRACTOR TYPE OF VARIANCE CET P DESTRUCTION	Type: Log-Pwr	Trig: Free Run #Atten: 30 dB	GH2 PNO: Fast C	1.515000000	RL enter Fred
Auto Tun	1 2,462 4 GHz 5,49 dBm	Miki			f Offset 11.1 dB f 20.00 dBm	devaiv R
Center Free 1.516000000 GH	*					
Start Free 30,000000 MH	i 14 52 den					Did Dit
Stop Free 3.00000000 GH			مه الله منيا «تونيه الله اله ها الم		٣٠٠ ١٠٠٠ م. المراجع الم المراجع الم	
CF Stej 297.000000 MH Auto Ma	Stop 3.000 GHz 3.9 ms (1001 pts)			#VBW		art 30 MH; Res BW 10
Freq Offse	FUNETION WALLE	RUNESSEN SODTH	7 Put 5.49 dBm	62.4 GHz		N MODE THE S
00						4
		STATUS				3)

	#Atten: 30 dB		DET P NUMPEU	-
		Mkr	1 26.359 0 GHz -24.76 dBm	Auto Tune
				Center Fred 14,750000000 GH;
	- Winter and Malagoration	- Andrew and the second		Start Free 3,000000000 GHa
				Stop Free 26 50000000 GH
#VBW			Stop 26.50 GHz 2.246 s (1001 pts)	CF Step 2.350000000 GH Auto Mar
59 0 GHz	-24.76 dBm			Freq Offse 0 H
		#VBW 300 kHz	#VBW 300 kHz Sweep	Stop 26.50 GHz #VBW 300 kHz Stop 26.50 GHz V FUNCTION

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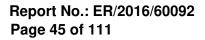
802.11g Band Edges Test Data CH-Low



Band Edges Test Data CH-High



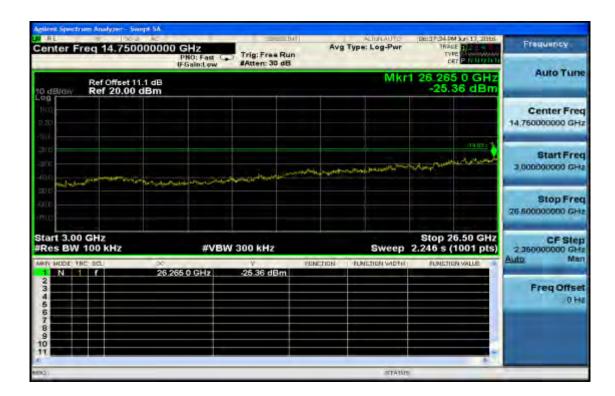
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802.11g **Spurious Emission Test Data CH-Low**

enter Freg 1.51500000	CH2 PND: Fast C Trig: Fr IFGain:Low #Atten:		Aug Type: Log-Pwr	Deidfordow k.e. 17, 2016 TRACE 112 - C TYPE Processory CAT P MULTIN	10000
Ref Offset 11.1 dB Ref 20.00 dBm			MK	r1 2.411 9 GHz 0.97 dBm	
99 00 101				1	Center Free 1,51600000 GH
0 0				-14 01 d24	Start Free
C	All which the product of the second	-	الجاما ومدوات فالمج جومد كرونه والمار		30,00000 MH
					Stop Free 3.800800000 GH
art 30 MHz tes BW 100 kHz	#VBW 300 kH	z	Sweep 2	Stop 3.000 GHz 83.9 ms (1001 pts)	297.000000 MH
N MODE THE SEL 00	411.9 GHz 0.97		TION FUNCTION WADTH	FUNETION WALLE	Auto Mar
					Freq Offse 0 H
			TAU		



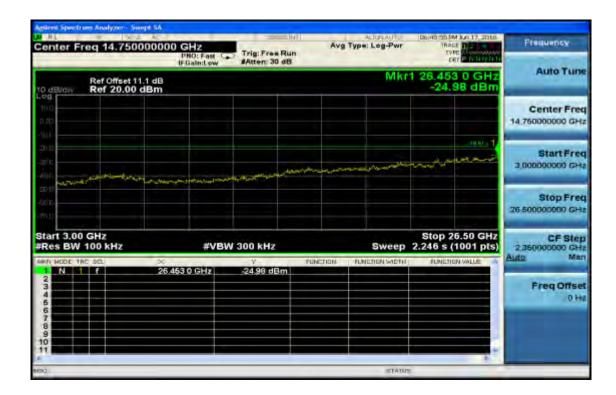
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Spurious Emission Test Data CH-Mid

iB m		MI	(r1 2.429 8 GHz	Auto Tune
			1.40 dBm	
			1	Center Free 1.51600000 GH
			anii fatanên	Start Free 30,000000 MH
	مريسر في المنابعة الم المريض بيا المنارك المراج			Stop Free 3.00000000 GH
				CF Step 297.000000 MH Auto Ma
2.429 8 GHz	1,40 dBm	NETION FUNCTION WADTH	PUNETION VALUE	Freq Offse
	#VBW	#VBW 300 kHz	C Y PUNCTION FUNCTION WADTH	لله منه محمد محمد بالمعلم من المعلم معلم



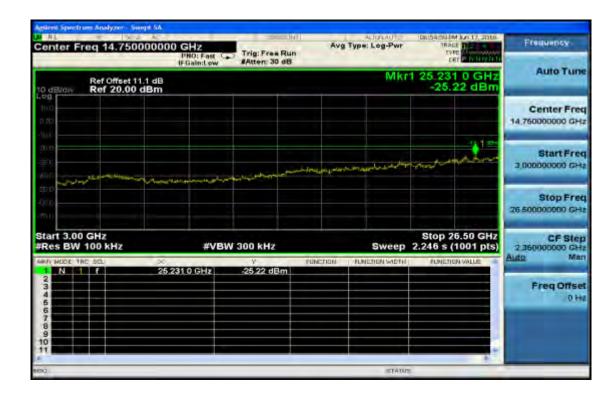
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Spurious Emission Test Data CH-High

D GH2		Del54363M km 17, 2016 TRACE 1,2 2 M TYPE H SHOWS	Frequency
	M	(r1 2 459 5 GHz 1.66 dBm	Auto Tuni
		2 1	Center Free 1 516000000 GH
			Start Free 30,000000 MH
nandeliki ya Miriya Miriya Nanangi kupa yi Kataliki a Mina yi Kataliki a Mina ya Kataliki Mira kataliki Mira ka			Stop Fre 3 B0000000 GH
#VBW 300 kHz			CF Ste 297.000000 MH Auto Ma
2,459 5 GHz 1,66 dBm			Freq Offse 0 H
	PN0: Fast IFGain:Low Trig: Free Ru #Atten: 30 dB Atten: 30 dB #VBW 300 kHz	PNO: Fast Trig: Free Run PNO: Fast Trig: Free Run #Atten: 30 dB MI Must be a set of the set of	PNO: Fast IFGain:Low Trig: Free Run #Atten: 30 oB Trig: Free Run #Atten: 30 oB Mkr1 2 459 5 GHz 1.66 dBm 4109 951 4109 951 4100 951 410



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802.11n HT20 **Band Edges Test Data CH-Low**



Band Edges Test Data CH-High



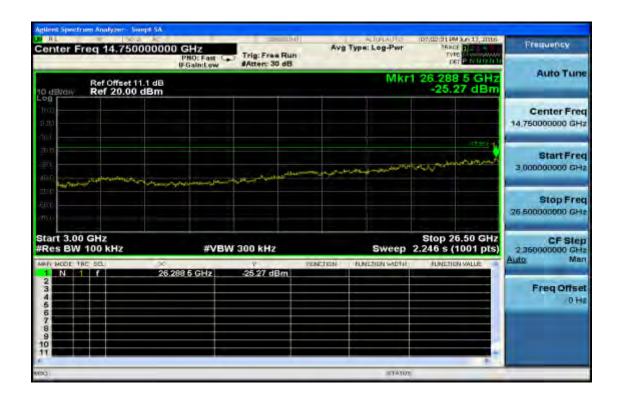
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802.11n HT20 **Spurious Emission Test Data CH-Low**

Center Freq 1.51500000	PNO: Fast Trig: Free Run FGaint.ow #Atten: 30 dB	Avg Type: Log-Pwr	IDM/IEE/DS PM Aux 17, 2016 TRACE 11 21 TYPE IN WARMANNY LEFT P. TOTAL CONTRACT	Frequency
Ref Offset 11.1 dB		Mkr	1 2.414 9 GHz 2.65 dBm	Auto Tuni
1000. 1010			1	Center Free 1.51600000 GH
100 200 201			(17.35 dişm	Start Free 30,000000 MH
40.0 50.0 60.0	en men gela en en el trans d'an el tra de la secto	Lange Constrainty Constrainty	a a a a a a a a a a a a a a a a a a a	Stop Free 3.00000000 GH
Start 30 MHz Res BW 100 kHz	#VBW 300 kHz		Stop 3.000 GHz 3.9 ms (1001 pts)	CF Ster 297.000000 MH Auto Ma
1 N 1 F	2.414.9 GHz 2.65 dBm	NETION FUNCTION WADTH	POWERCH WILLE	Freq Offse 0 H
6 7 8 9 10				



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Spurious Emission Test Data CH-Mid

0 GHz	Avg Type: Log-Pwr	1071101454M kes 17, 2016 TRACE 12 2 5 TVPE Providence CET P Transmission	Frequency
	Mk	-0.70 dBm	Auto Tuni
		<u>, 1</u>	Center Free 1.51600000 GH
			Start Free 30,000000 MH
			Stop Fre 3.00000000 GH
#VBW 300 kHz	Sweep 2		CF Ste 297.000000 MH Auto Ma
2.438 7 GHz -0.70 dBm	PUNCTION FUNCTION VAD THE	FUNCTION WALLE	Hance Inter
			Freq Offse 0 H
	#VBW 300 kHz	PND: Fast Trig: Free Run BAtten: 30 dB Mk #VBW 300 kHz Y FUNCTION FUNCTION SPEED	PRO: Fast Trig: Free Run #Atten: 30 dB

Center Freq 14.7500000	PNO: Fast Call	Trig: Free Run #Atten: 30 dB	Avg Type: Log-Pwr	ID7111.05 IM key 17, 2016 TRACE 12 2 1 TVTC I VERING AND DET P TO DESIGN	Frequency
Ref Offset 11.1 dB 0 dB/div Ref 20.00 dBm			Mkr	1 26.359 0 GHz -24.60 dBm	Auto Tun
og 1000 0.201					Center Fre 14,750000000 GH
100 200 200		مطروم المعالم معين مرار المادان	المعلم والمعادية المعادية المعاد ا	on the second	Start Free 3,000000000 GH
	and a second				Stop Fre 26 50000000 GH
				044 - 05 50 OU	
Res BW 100 kHz		300 kHz		Stop 26.50 GHz 2.246 s (1001 pts)	2.350000000 GH Auto: Ma
ttart 3.00 GHz Res BW 100 KHz MM MODE THE SEL 20 1 N 1 f 20 3 4 6 6 7			Sweep NETON INNEDUNGADIN		2,350000000 GH

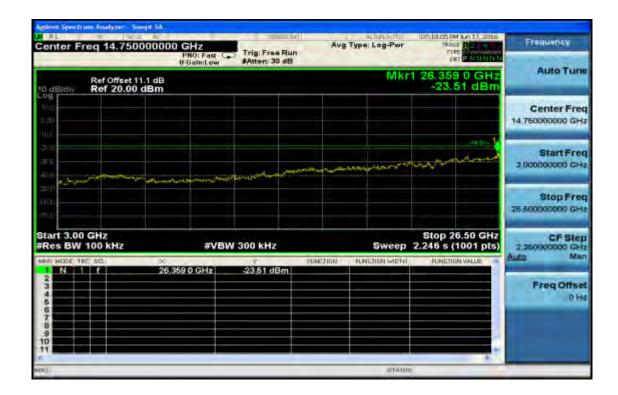
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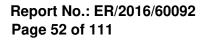
Spurious Emission Test Data CH-High

enter Freq 1.51500	00000 GHz PNO: Fast G IFGain:Low	Trig: Free Run #Atten: 30 dB	Avg Type: Log-Pwr	107:17:62 PM km 17, 2016 TRACE 112	Frequency
Ref Offset 11. dB/div Ref 20.00 d			Mk	r1 2.459 5 GHz 1.50 dBm	Auto Tuni
010) (215)				* ¹	Center Fre 1.516000000 GH
					Start Fre 30.000000 MH
ED ALL AND	gay dahati Atoo Ayaa aya dadaha		nga la Sharar Navi Pri af si Marabit Agris		Stop Fre 3.00000000 GH
tart 30 MHz Res BW 100 kHz		V 300 kHz		Stop 3.000 GHz 83.9 ms (1001 pts)	CF Ste 297.000000 Mi-
NA MODE THE SEL	2.459 5 GHz	1.50 dBm	INCTION FUNCTION WADTH	FUNCTION WALLIE	
					Freq Offse
23445677899					01



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802.11n HT40 **Band Edges Test Data CH-Low**



Band Edges Test Data CH-High



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802.11n HT40 **Spurious Emission Test Data CH-Low**

ter Freq 1.51500000	PNO: Fast C Trig: Free Run	Avg Type: Log-Pwr	THACE DE SAL	Frequency
	IFGain:Low #Atten: 30 dB		DET PLANNING	Auto Tu
Bydiv Ref 20.00 dBm		MIKET	2.414 9 GHz 0.77 dBm	
		1		Center Fr
				1.516000000 G
			111.23 (00)	2
				StartFr
	مور ما موجوع شار ما المتراجع ، والما موري ما الماري الم	and house and rear designed	الالتراسية استاله الاجتهار	30,000000 M
I Sanderman and a descent for the second sec	na " na mangangan sa sa kana sa panakan sa panakan sa panakan sa sa			Stop Fr
				3.00000000 G
nt 30 MHz			Stop 3.000 GHz	-
s BW 100 kHz	#VBW 300 kHz		9 ms (1001 pts)	297.000000 M
MODE THE SEL	2.414.9 GHz 0.77 dBm	UNITION FUNCTION VIDTH	FUNCTION WALLS	Auto M
				Freq Offs
				0
			-	
		STATUS		<u></u>
RL 8 502 Ac	-tanana tur	ALIONAUTO I	07(25)20 IM key 17, 2016	Frequency
RL 8 502 Ac	DOD GHZ PNO: Fast C Trig: Free Run		0/221291M Art 17, Titlen TRace Tra Tyte Cert P Mutantit	Frequency
nter Freq 14.7500000	PNO: Fast Trig: Free Run IFGain:Low #Atten: 30 dB	ALIXYAUTO II Avg Type: Log-Pwr	TRACE 12 TYPE OFT PROMOTION	Frequency Auto Tu
Ref Offset 11.1 dB	PHO: Fast FGain:Low Atten: 30 dB	ALIXYAUTO II Avg Type: Log-Pwr	TRACE 1.2	-
Ref Offset 11.1 dB Ref 20.00 dBm	PHO: Fast FGain:Low Atten: 30 dB	ALIXYAUTO II Avg Type: Log-Pwr	TRACE 12 TYPE OFT PROMOTION	1
Ref Offset 11.1 dB Ref 20.00 dBm	PHO: Fast FGain:Low Atten: 30 dB	ALIXYAUTO II Avg Type: Log-Pwr	TRACE 12 TYPE OFT PROMOTION	Auto Tu Center Fr
Ref Offset 11.1 dB Ref Offset 11.1 dB Ref 20.00 dBm	PHO: Fast FGain:Low Atten: 30 dB	ALIXYAUTO II Avg Type: Log-Pwr	TRACE 12 TYPE OFT PROMOTION	Auto Tu Center Fr 14,75000000 c
Ref Offset 11.1 dB	DOO GHZ PHO: Fost IFGain:Low #Atten: 30 dB	Aug Type: Log Pwr	26.359 0 GHz -25.41 dBm	Auto Tu
Ref Offset 11.1 dB	DOO GHZ PHO: Fost IFGain:Low #Atten: 30 dB	Avg Type: Log-Pwr	26.359 0 GHz -25.41 dBm	Auto Tu Center Fr 14.75000000 d Start Fr
Ref Offset 11.1 dB	100 GHz PRO: Fast Control Trig: Free Run #Atten: 30 dB	Aug Type: Log Pwr	26.359 0 GHz -25.41 dBm	Auto Tu Center Fr 14.75000000 0 Start Fr 3.000000000 0
Ref Offset 11.1 dB	100 GHz PRO: Fast Control Trig: Free Run #Atten: 30 dB	Aug Type: Log Pwr	26.359 0 GHz -25.41 dBm	Auto Tu Center Fr 14,75000000 0 Start Fr 3,00000000 0 Stop Fr
Ref Offset 11.1 dB	100 GHz PRO: Fast Control Trig: Free Run #Atten: 30 dB	Aug Type: Log Pwr	26.359 0 GHz -25.41 dBm	Auto Tu Center Fr 14,75000000 d Start Fr 3,00000000 d Stop Fr 26,60000000 d
Ref Offset 11.1 dB Ref 20.00 dBm	100 GHz PRO: Fast Control Trig: Free Run #Atten: 30 dB	Avg Type: Log Pwr	26.359 0 GHz -25.41 dBm	Auto Tu Center Fr 14.750000000 0 Start Fr 3.00000000 0 Stop Fr 26.50000000 0
Ref Offset 11.1 dB Ref 20.00 dBm	#VBW 300 kHz	Avg Type: Log Pwr	26.359 0 GHz -25.41 dBm	Auto Tu Center Fr 14.75000000 0 Start Fr 3.00000000 0 Stop Fr 26.50000000 0
Ref Offset 11.1 dB Ref 20.00 dBm	#VBW 300 kHz	Avg Type: Log Pwr	26.359 0 GHz -25.41 dBm	Auto Tu Center Fr 14.75000000 c Start Fr 3.00000000 c Stop Fr 25.50000000 c CF St 2.35000000 c Auto N
Ref 20.00 dBm And	#VBW 300 kHz	Avg Type: Log Pwr	26.359 0 GHz -25.41 dBm	Auto Tu Center Fr 14.75000000 c Start Fr 3.00000000 c Stop Fr 25.50000000 c
Ref Offset 11.1 dB Ref 20.00 dBm Ref 20.00 dBm art 3.00 GHz es BW 100 kHz	#VBW 300 kHz	Avg Type: Log Pwr	26.359 0 GHz -25.41 dBm	Auto Tu Center Fr 14.750000000 0 Start Fr 3.00000000 0 Stop Fr 26.50000000 0 Auto h Freq Off
Ref Offset 11.1 dB Ref 20.00 dBm Ref 20.00 dBm	#VBW 300 kHz	Avg Type: Log Pwr	26.359 0 GHz -25.41 dBm	Auto Tu Center Fri 14.750000000 0 Start Fri 3.000000000 0 Stop Fri 26.50000000 0 Auto h Freq Off
Ref Offset 11.1 dB Ref 20.00 dBm Ref 20.00 dBm	#VBW 300 kHz	Avg Type: Log Pwr	26.359 0 GHz -25.41 dBm	Auto Tu Center Fr 14.75000000 c Start Fr 3.00000000 c Stop Fr 26.50000000 c 2.35000000 c Auto N Freq Off

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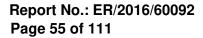
Spurious Emission Test Data CH-Mid

enter Freq 1.51500	00000 GHz PND: Fast (FGalin:Low	Trig: Free Run #Atten: 30 dB	Aug Type: Log-Pwr	107139128144 km 17, 2016 TRACE 112 5 TYPE Providence Det Provident	Frequency
Ref Offset 11 0 dEtraiv Ref 20.00			Mk	r1 2.420 9 GHz 1.11 dBm	Auto Tuni
1000,				t	Center Fre 1.515000000 GH
		a a sa mada ya afali ina ang pa			Start Fre 30.000000 MH
					Stop Fre 3.80000000 GH
tart 30 MHz Res BW 100 kHz	#VBI	W 300 kHz	Sweep 2	Stop 3.000 GHz 83.9 ms (1001 pts)	CF Ste 297.000000 Mi Auto Ma
1 NOT T	2.420 9 GHz	1.11 dBm		TONE JUNE VIELE	Freq Offse
2 3 4 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6					01

enter Freq 14.75000000	PHO: Fast C Trig: Free Run BrGain:Low Akten: 30 dB	Aug Type: Log-Pwr	ID7126140204 key 17, 2016 RADE 122 TVTE Disconstruct DET P Tellington	Frequency
Ref Offset 11.1 dB		Mkr	1 26 382 5 GHz -24.25 dBm	Auto Tuni
29 000 101				Center Fre 14,75000000 GH
	and the second	بيحسمهم وبمبط ومعارضهم	1000 c 7	Start Free 3,00000000 GH
				Stop Fre 26.50000000 GH
tart 3.00 GHz Res BW 100 kHz	#VBW 300 kHz		Stop 26.50 GHz 2.246 s (1001 pts)	CF Ste 2,35000000 GH Auto Ma
N NOL THE SE. 25. N 1 f 25. 3 4 5 6 7 7 8 8 9 0	382 5 GHz24 25 dBm	NCTON - FUNCTION - ADTH	FUNCTION WALLS	Freq Offse 0 H

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Spurious Emission Test Data CH-High

PNO: Fast C Trig: Free Run FGalint.ow #Atten: 30 dB	Avg Type: Log-Pwr TRac	E 1235
	Mkr1 2.462 1.3	2 4 GHz Auto Tune 39 dBm
	, ¹	Center Fre 1,516000000 GH
		40 8003 Start Fre 30,000000 MH
		Stop Fre 3.00000000 GH
#VBW 300 kHz	Sweep 283.9 ms (Autor Ma
.462 4 GHz 1.39 dBm		Freq Offse
	HIS PHO: Fast Trig: Free Run IFGain:Low Trig: Free Run Atten: 30 dB	Avg Type: Log-Pwr PRO: Fast Trig: Free Run #Atten: 30 dB Mkr1 2.463 1.3 Mkr1 2.463 1.3 1.3 1.3 1.3 1.3 1.3 1.3 1.

enter Freq 14.75000		7 Trig: Free Run #Atten: 30 dB	Avg Type: Log-Pwr	107/53 US PM 3.0-17, 2016 TRACE 112 TYPE PARTY DET P TAULTURE	Frequency
Ref Offset 11.1 0 dB/div Ref 20.00 dB			Mkr	1 26.335 5 GHz -24.73 dBm	Auto Tune
00 1000					Center Free 14,75000000 GH:
100 200 200 100	manimant	and the second second	المعادية والمعالية المسترجين والمعالية	- produced	Start Fred 3,00000000 GHa
					Stop Free 26 50000000 GH
itart 3.00 GHz Res BW 100 kHz	#VBW	/ 300 kHz	Sweep	Stop 26.50 GHz 2.246 s (1001 pts)	CF Step 2.350000000 GH Auto Mar
N 1 7	26.335 5 GHz	-24.73 dBm			Freq Offse 0 Hi
NJ .			STATUS		



11 RADIATED BANDEDGE AND SPURIOUS EMISSION MEASUREMENT

11.1 Standard Applicable

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. In addition, radiated emissions which fall in the restricted bands must also comply with the §15.209 & RSS-Gen §8.8, 8.9 limit as below.

And according to §15.33(a) (1) & RSS-Gen §6.13(a), for an intentional radiator operates below 10GHz, the frequency range of measurements: to the tenth harmonic of the highest fundamental frequency or to 40GHz, whichever is lower.

Frequency (MHz)	Field strength (microvolts/meter)	Distance (meters)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

Note:

- 1. The lower limit shall apply at the transition frequencies.
- 2. Emission level $(dB\mu V/m) = 20 \log Emission level (dB\mu V/m)$

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11.2 Measurement Equipment Used:

SGS SAC-III								
EQUIPMENT	MFR	MODEL	SERIAL	LAST	CAL DUE.			
TYPE		NUMBER	NUMBER	CAL.				
EMI Test Receiver	R&S	ESCI7	100760	05/11/2015	05/10/2016			
Spectrum Analyzer	Agilent	E4446A	MY51100003	01/28/2016	01/27/2017			
Loop Antenna	ETS.LINDGREN	6502	148045	09/07/2015	09/06/2016			
Bilog Antenna	SCHWAZBECK	VULB9168	378	12/14/2015	12/13/2016			
Horn Antenna	Schwarzbeck	BBHA9120D	1441	08/10/2015	08/09/2016			
Pre-Amplifier	Agilent	8447D	2944A07676	01/02/2016	01/01/2017			
Pre-Amplifier	EMC Instruments Corp.	EMC0126530	980038	01/02/2016	01/01/2017			
Turn Table	HD	DT420	N/A	N.C.R	N.C.R			
Antenna Tower	ChamPro	AM-BS-4500- B	060776-ABS	N.C.R	N.C.R			
Controller	ChamPro	EM1000	60776	N.C.R	N.C.R			
Low Loss Cable	Huber Suhner	966_RX	9	01/02/2016	01/01/2017			
3m Site NSA	SGS	966 chamber	N/A	07/02/2015	07/01/2016			
Low Loss Cable	Huber Suhner	966 TX	1	01/02/2016	01/01/2017			

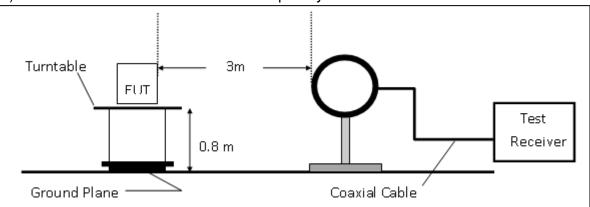
Note: N.C.R refers to Not Calibrated Required.

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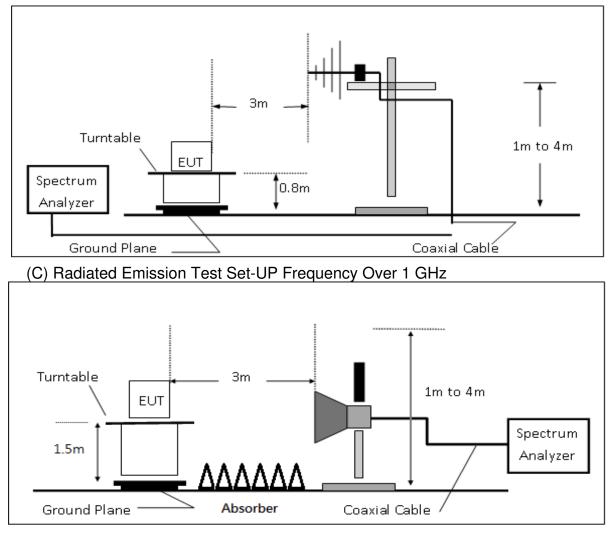


11.3 Test SET-UP





(B) Radiated Emission Test Set-Up, Frequency form 30MHz to 1000MHz



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11.4 Measurement Procedure

- 1. The testing follows the Measurement Procedure of FCC KDB 558074 D01 DTS Meas. Guidance.
- 2. The EUT was placed on a turn table with 0.8m for frequency< 1GHz and 1.5m for frequency> 1GHz above ground plane.
- 3. The turn table shall rotate 360 degrees to determine the position of maximum emission level.
- 4. EUT is set 3m away from the receiving antenna which varied from 1m to 4m to find out the highest emissions.
- 5. When measurement procedures for electric field radiated emissions above 1 GHz the EUT measurement is to be made "while keeping the antenna in the 'cone of radiation' from that area and pointed at the area both in azimuth and elevation, with polarization oriented for maximum response." is still within the 3dB illumination BW of the measurement antenna.
- 6. Set the spectrum analyzer as RBW=120 kHz and VBW=300 kHz for Peak Detector (PK) and Quasi-peak (QP) at frequency below 1 GHz.
- 7. Set the spectrum analyzer as RBW=1 MHz, VBW=3 MHz for Peak Detector at frequency above 1 GHz.
- 8. Set the spectrum analyzer as RBW=1 MHz, VBW=10 Hz (Duty cycle > 98%) or VBW \geq 1/T (Duty cycle < 98%) for Average Detector at frequency above 1 GHz.
- 9. The test-receiver system was set to quasi-peak detect function and specified bandwidth with maximum hold mode when the test frequency is below 1 GHz.
- 10. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
- 11. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical. On spectrum, change spectrum mode in linear display mode, and reduce VBW = 10Hz if average reading is measured.
- 12. Repeat above procedures until all default test channel measured were complete.

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11.5 Field Strength Calculation

The field strength is calculated by adding the Antenna Factor and Cable Factor and subtracting the Amplifier Gain and Duty Cycle Correction Factor (if any) from the measured reading. The basic equation with a sample calculation is as follows:

FS = RA + AF + CL - AG

Where	6	CL = Cable Attenuation Factor (Cable Loss)
	RA = Reading Amplitude	AG = Amplifier Gain
	AF = Antenna Factor	

Actual FS(dB μ V/m) = SPA. Reading level(dB μ V) + Factor(dB)

Factor(dB) = Antenna Factor(dB μ V/m) + Cable Loss(dB) – Pre Amplifier Gain(dB)

Note :

"F" : denotes Fundamental Frequency. ; "H" : denotes Harmonic Frequency.

"E" : denotes Band Edge Frequency. ; "S" : denotes Spurious Frequency.

11.6 Test Results of Radiated Spurious Emissions form 9 kHz to 30 MHz

The low frequency, which started from 9 kHz to 30MHz, was pre-scanned and the result which was 20dB lower than the limit per 15.31(o) was not reported.

11.7 Measurement Result

Note: Refer to next page spectrum analyzer data chart and tabular data sheets.

Note: WPC wireless charging functions are implemented in field strength of spurious radiation measurement.

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Radiated Band Edge Measurement Result (802.11b)

Operation Mode :802.11bFundamental Frequency :2412 MHzOperation Band :Bandedge CH LOWEUT Pol. :E2 Plane		Test Date : Temp. / Humi. : Test Engineer : Measurement Antenna Pol. :		06/27/2016 21 deg_C / 62 RH Kane VERTICAL			
Freq.	Note	Decetor	Actual	Spectrum	Factor	Limit	Margin
		Mode	Reading Lev	vel FS		@3m	
MHz	F/H/E/S	QP/AV/PK	dBµV/m	dBµV/m	dB	dBuV/m	dB
2390.00	Е	Average	37.31	39.05	-1.74	54.00	-16.69
2390.00	Е	Peak	50.10	51.84	-1.74	74.00	-23.90
Fundamen Operation	Operation Mode :802.11bFundamental Frequency :2412 MHzOperation Band :Bandedge CH LOWEUT Pol. :E2 Plane		Test Date : Temp. / Humi. : Test Engineer : Measurement Ante	nna Pol. :	06/27/2016 21 deg_C / 6 Kane HORIZONT/		
Freq.	Note	Decetor Mode	Actual Reading Lev	Spectrum /el FS	Factor	Limit @3m	Margin
MHz	F/H/E/S	QP/AV/PK	dBµV/m	dBµV/m	dB	dBuV/m	dB
2390.00	Е	Average	39.67	41.41	-1.74	54.00	-14.33
2390.00	E	Peak	50.80	52.54	-1.74	74.00	-23.20

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Freq.NoteDecetor ModeActual Reading LevelSpectrum FSFactorLimit @3mMargin @3mMHzF/H/E/SQP/AV/PKdBµV/mdBµV/mdBdBuV/mdB2483.50EAverage37.3238.94-1.6254.00-16.682483.50EPeak50.6252.24-1.6274.00-23.38Operation Mode :802.11bTest Date :06/27/2016Fundamental Frequency :2462 MHzTemp. / Humi. :21 deg_C / 62 RHOperation Band :Bande dge CH HIGH Test Engineer :KaneEUT Pol. :E2 PlaneMeasurement Antenna Pol. :HORIZONTALFreq.NoteDecetorActual ModeSpectrum FSFactorLimit Margin @3mMHzF/H/E/SQP/AV/PKdBµV/mdBµV/mdBdBuV/mdB2483.50EAverage39.2140.83-1.6254.00-14.79	Fundamental Frequency :2462 MHzOperation Band :Bandedge CH HIGH		Test Date : Temp. / Humi. : Test Engineer : Measurement Antenna Pol. :		06/27/2016 21 deg_C / 62 RH Kane VERTICAL			
MHzF/H/E/SQP/AV/PKdBµV/mdBµV/mdBdBuV/mdB2483.50EAverage37.3238.94-1.6254.00-16.682483.50EPeak50.6252.24-1.6274.00-23.38Operation Mode :802.11bTest Date :06/27/2016Fundamental Frequency :2462 MHzTemp. / Humi. :21 deg_C / 62 RHOperation Band :Bandedge CH HIGH Test Engineer :KaneEUT Pol. :E2 PlaneMeasurement Antenna Pol. :HORIZONTALFreq.NoteDecetorActualSpectrumFactorLimitMargin @3mMHzF/H/E/SQP/AV/PKdBµV/mdBµV/mdBdBuV/mdB	Freq.	Note	Decetor	Actual	Spectrum	Factor	Limit	Margin
2483.50EAverage37.3238.94-1.6254.00-16.682483.50EPeak50.6252.24-1.6274.00-23.38Operation Mode :802.11bTest Date :06/27/2016Fundamental Frequency :2462 MHzTemp. / Humi. :21 deg_C / 62 RHOperation Band :Bandedge CH HIGH Test Engineer :KaneEUT Pol. :E2 PlaneMeasurement Antenna Pol. :HORIZONTALFreq.NoteDecetorActualSpectrumFactorLimitModeReading LevelFS@3mMHzF/H/E/SQP/AV/PKdBµV/mdBµV/mdBdBuV/m			Mode	Reading Lev	/el FS		@3m	
2483.50 E Peak 50.62 52.24 -1.62 74.00 -23.38 Operation Mode : 802.11b Test Date : 06/27/2016 Fund amental Frequency : 2462 MHz Temp. / Humi. : 21 deg_C / 62 RH Operation Band : Bandedge CH HIGH Test Engineer : Kane EUT Pol. : E2 Plane Measurement Antenna Pol. : HORIZONTAL Freq. Note Decetor Actual Spectrum Factor Limit Margin Mde Reading Level FS @3m @3m MBµV/m dBµV/m dB µV/m dB µV/m dB µV/m dB	MHz	F/H/E/S	QP/AV/PK	dBµV/m	dBµV/m	dB	dBuV/m	dB
Operation Mode :802.11bTest Date :06/27/2016Fundamental Frequency :2462 MHzTemp. / Humi. :21 deg_C / 62 RHOperation Band :Bande dge CH HIGHTest Engineer :KaneEUT Pol. :E2 PlaneMeasurement Antenna Pol. :HORIZONTALFreq.NoteDecetorActualSpectrumFactorLimitMarginModeReading LevelFS@3mMHzF/H/E/SQP/AV/PKdBµV/mdBµV/mdBdBuV/mdB	2483.50	E	Average	37.32	38.94	-1.62	54.00	-16.68
Fundamental Frequency : 2462 MHz Temp. / Humi. : 21 deg_C / 62 RH Operation Band : Bandedge CH HIGH Test Engineer : Kane EUT Pol. : E2 Plane Measurement Antenna Pol. : HORIZONTAL Freq. Note Decetor Actual Spectrum Factor Limit Margin Mode Reading Level FS @3m MHz F/H/E/S QP/AV/PK dBµV/m dBµV/m dB dBuV/m dB	2483.50	Е	Peak	50.62	52.24	-1.62	74.00	-23.38
Freq. Note Decetor Actual Spectrum Factor Limit Margin Mode Reading Level FS @3m MHz F/H/E/S QP/AV/PK dBµV/m dBµV/m dB dBuV/m dB	Fundamen Operation	Fundamental Frequency: 2462 MHz		Temp. / Humi. : Test Engineer :		21 deg_C / 6 Kane		
Mode Reading Level FS @3m MHz F/H/E/S QP/AV/PK dBµV/m dBµV/m dB dBuV/m dB	EUT Pol. :		E2 Plan	e	Measurement Ant	enna Pol. :	HORIZONT	AL
MHz F/H/E/S QP/AV/PK dBµV/m dBµV/m dB dBuV/m dB	Freq.	Note	Decetor	Actual	Spectrum	Factor	Limit	Margin
			Mode	Reading Lev	vel FS		@3m	-
2483.50 E Average 39.21 40.83 -1.62 54.00 -14.79	MHz	F/H/E/S	QP/AV/PK	dBµV/m	dBµV/m	dB	dBuV/m	dB
0	2483.50	E	Average	39.21	40.83	-1.62	54.00	-14.79
2483.50 E Peak 50.24 51.86 -1.62 74.00 -23.76	2483.50	E	Peak	50.24	51.86	-1.62	74.00	-23.76

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Radiated Band Edge Measurement Result (802.11g)

Operation Mode :802.11gFundamental Frequency :2412 MHOperation Band :Bandedg	z e CH LOW	Test Date : Temp. / Humi. : Test Engineer :		06/27/2016 21 deg_C / 6 Kane	62 RH
EUT Pol. : E2 Plane		Measurement Anter	na Pol. :		
Freq. Note Decetor	Actual	Spectrum	Factor	Limit	Margin
Mode F	Reading Lev	el FS		@3m	
MHz F/H/E/S QP/AV/PK	dBµV/m	dBµV/m	dB	dBuV/m	dB
2390.00 E Average	37.52	39.26	-1.74	54.00	-16.48
2390.00 E Peak	49.30	51.05	-1.74	74.00	-24.70
Operation Mode : 802.11g Fundamental Frequency : 2412 MHz Operation Band : Bandedge CH LOW		Test Date: Temp. / Humi.: Test Engineer:		06/27/2016 21 deg_C / 6 Kane	
EUT Pol. : E2 Plane		Measurement Anter	na Pol. :	HORIZONT	AL.
Freq. Note Decetor	Actual	Spectrum	Factor	Limit	Margin
Mode F	Reading Lev	el FS		@3m	
MHz F/H/E/S QP/AV/PK	dBµV/m	dBµV/m	dB	dBuV/m	dB
2390.00 E Average	40.80	42.54	-1.74	54.00	-13.20
2390.00 E Peak	52.93	54.67	-1.74	74.00	-21.07

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Fundamental Frequency : 246 Operation Band : Bar		•	Hz Ige CH HIGH	Test Date : Temp. / Humi. : Test Engineer : Measurement Antenna Pol. :		06/27/2016 21 deg_C / 62 RH Kane VERTICAL	
Freq.	Note	Decetor	Actual	Spectrum	Factor	Limit	Margin
		Mode	Reading Lev	rel FS		@3m	
MHz	F/H/E/S	QP/AV/PK	dBµV/m	dBµV/m	dB	dBuV/m	dB
2483.50	E	Average	38.85	40.47	-1.62	54.00	-15.15
2483.50	Е	Peak	52.07	53.68	-1.62	74.00	-21.93
Operation Fundamer	Operation Mode : 80		-	Test Date: Temp. / Humi. :		06/27/2016 21 deg_C / 62 RH	
Operation		•		Test Engineer :		Kane	
EUT Pol. :		E2 Plan	•	Measurement Ant	enna Pol ·		ΔΙ
Freq.	Note	Decetor Mode	Actual Reading Lev	Spectrum	Factor	Limit @3m	Margin
MHz	F/H/E/S	QP/AV/PK	dBµV/m	dBµV/m	dB	dBuV/m	dB
2483.50	E	Average	43.06	44.68	-1.62	54.00	-10.94
2483.50	Е	Peak	57.67	59.29	-1.62	74.00	-16.33

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Radiated Band Edge Measurement Result (802.11_HT20)

Fundamental Frequency : 2412 Operation Band : Bande		•	Hz lge CH LOW	Test Date : Temp. / Humi. : Test Engineer : Measurement Antenna Pol. :		06/27/2016 21 deg_C / 62 RH Kane VERTICAL	
Freq.	Note	Decetor	Actual	Spectrum	Factor	Limit	Margin
		Mode	Reading Lev	<i>r</i> el FS		@3m	
MHz	F/H/E/S	QP/AV/PK	dBµV/m	dBµV/m	dB	dBuV/m	dB
2390.00	E	Average	37.76	39.50	-1.74	54.00	-16.24
2390.00	Е	Peak	51.30	53.04	-1.74	74.00	-22.70
Fundamen	Operation Mode : Fundamental Frequency Operation Band :		120 Hz Ige CH LOW Ie	Test Date : Temp. / Humi. : Test Engineer : Measurement Antenna Pol.		06/27/2016 21 deg_C / 62 RH Kane HORIZONTAL	
Free	Nata	Decetor	A stual	Chaothum	Factor	Limit	Marain
Freq.	Note	Decetor	Actual	Spectrum	Factor	Limit	Margin
		Mode	Reading Lev			@3m	
MHz	F/H/E/S	QP/AV/PK	dBµV/m	dBµV/m	dB	dBuV/m	dB
2390.00	E	Average	41.46	43.21	-1.74	54.00	-12.54
2390.00	E	Peak	58.00	59.74	-1.74	74.00	-16.00

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Operation Mode :802.11rFundamental Frequency :2462 MiOperation Band :BandedEUT Pol. :E2 Plan		Hz lge CH HIGH	Test Date : Temp. / Humi. : Test Engineer : Measurement Ante	enna Pol. :	06/27/2016 21 deg_C / 6 Kane VERTICAL	62 RH	
Freq.	Note	Decetor	Actual	Spectrum	Factor	Limit	Margin
		Mode	Reading Lev	rel FS		@3m	
MHz	F/H/E/S	QP/AV/PK	dBµV/m	dBµV/m	dB	dBuV/m	dB
2483.50	E	Average	40.32	41.94	-1.62	54.00	-13.68
2483.50	Е	Peak	55.16	56.78	-1.62	74.00	-18.84
Operation		802.11r		Test Date :		06/27/2016	
	ntal Frequer	•		Temp. / Humi. :		21 deg_C / 6	DZ RH
Operation			•	Test Engineer :		Kane	A 1
EUT Pol. :		E2 Plar	le	Measurement Ante	enna Pol. :	HURIZUNT	AL
Freq.	Note	Decetor	Actual	Spectrum	Factor	Limit	Margin
		Mode	Reading Lev	rel FS		@3m	
MHz	F/H/E/S	QP/AV/PK	dBµV/m	dBµV/m	dB	dBuV/m	dB
2483.50	E	Average	43.65	45.27	-1.62	54.00	-10.35
2483.50	E	Peak	60.67	62.29	-1.62	74.00	-13.33

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Radiated Band Edge Measurement Result (802.11_HT40)

Fundamental Frequency : 24 Operation Band : Ba		•	Hz lge CH LOW	Test Date : Temp. / Humi. : Test Engineer : Measurement Antenna Pol. :		06/27/2016 21 deg_C / 62 RH Kane VERTICAL		
	Freq.	Note	Decetor	Actual	Spectrum	Factor	Limit	Margin
			Mode	Reading Lev			@3m	
_	MHz	F/H/E/S	QP/AV/PK	dBµV/m	dBµV/m	dB	dBuV/m	dB
	2390.00	E	Average	40.81	42.55	-1.74	54.00	-13.19
	2390.00	E	Peak	57.47	59.21	-1.74	74.00	-16.53
	Operation Mode : Fundamental Frequenc Operation Band : EUT Pol. :		•		Test Date : Temp. / Humi. : Test Engineer : Measurement Antenna Pol.		06/27/2016 21 deg_C / 62 RH Kane : HORIZONTAL	
	_	N 1 .	. .	•				
	Freq.	Note	Decetor	Actual	Spectrum	Factor	Limit	Margin
			Mode	Reading Lev	el FS		@3m	
_	MHz	F/H/E/S	QP/AV/PK	dBµV/m	dBµV/m	dB	dBuV/m	dB
	2390.00	Е	Average	46.93	48.67	-1.74	54.00	-7.07
	2390.00	Е	Peak	65.05	66.79	-1.74	74.00	-8.95

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Operation Mode :802.11n40Fundamental Frequency :2422 MHzOperation Band :BandedgeEUT Pol. :E2 Plane		Hz lge CH HIGH	Test Date : Temp. / Humi. : Test Engineer : Measurement Ante	enna Pol. :	06/27/2016 21 deg_C / 6 Kane VERTICAL	62 RH	
Freq.	Note	Decetor	Actual	Spectrum	Factor	Limit	Margin
		Mode	Reading Lev	el FS		@3m	
MHz	F/H/E/S	QP/AV/PK	dBµV/m	dBµV/m	dB	dBuV/m	dB
2483.50	E	Average	42.33	43.95	-1.62	54.00	-11.67
2483.50	Е	Peak	55.76	57.37	-1.62	74.00	-18.24
Operation Fundamer	Operation Mode : 802.1			Test Date : Temp. / Humi. :		06/27/2016 21 deg_C / 6	32 PH
		•		•			02 NH
Operation			•	Test Engineer :		Kane	A 1
EUT Pol. :	Note	E2 Plar Decetor	Actual	Measurement Ante	Factor	Limit	
Freq.	note			•	Facior		Margin
		Mode	Reading Lev			@3m	
MHz	F/H/E/S	QP/AV/PK	dBµV/m	<u>dBµV/m</u>	dB	dBuV/m	dB
2483.50	E	Average	48.15	49.77	-1.62	54.00	-5.85
2483.50	E	Peak	61.92	63.54	-1.62	74.00	-12.08

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Below 1GHz Worst-Case Data: Radiated Spurious Emission Measurement Result (802.11 g)

Operation Mode : Fundamental Frequency :	802.11g 2412 MHz	Test Date: Temp. / Humi.:	06/27/2016 21 deg_C / 62 RH
Operation Band :	Tx CH LOW	Test Engineer :	Kane
EUT Pol. :	E2 Plane	Measurement Antenna Pol. :	VERTICAL
97			
80 -			
Level [d3uV]		R	C RSE-QP 3M
40			6
20 -K	2 ×	4 × ×	×
30 200		600 800 ency [MHz]	1000

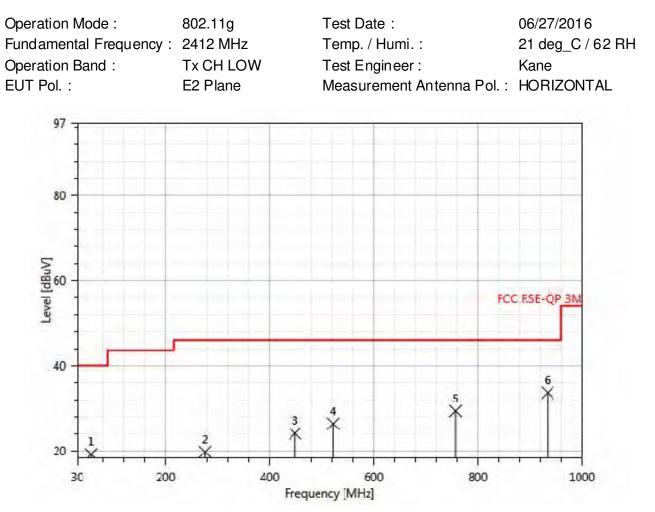
Freq.	Note	Decetor Mod e	Actual Reading Level	Spectrum FS	Factor	Limit @3m	Margin
MHz	F/H/E/S	QP/AV/PK	dBµV/m	dBµV/m	dB	dBuV/m	dB
30.97	S	Peak	21.69	30.84	-9.15	40.00	-18.31
269.59	S	Peak	19.05	25.98	-6.93	46.00	-26.95
450.01	S	Peak	23.69	26.61	-2.92	46.00	-22.31
556.71	S	Peak	26.05	27.40	-1.34	46.00	-19.95
750.71	S	Peak	29.73	26.98	2.76	46.00	-16.27
978.66	S	Peak	32.84	26.57	6.28	54.00	-21.16

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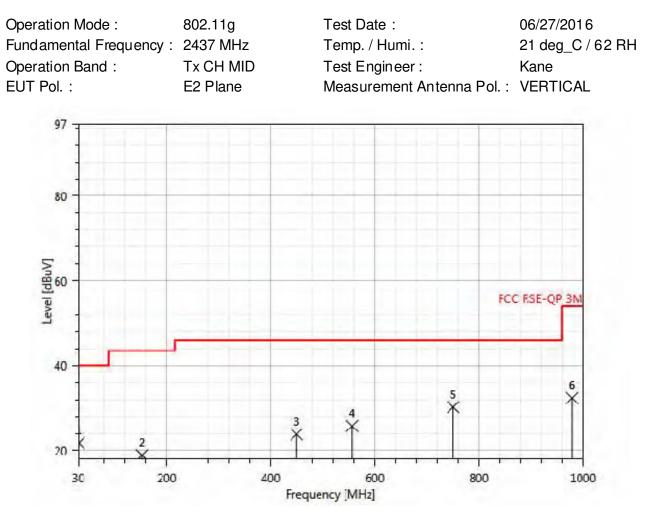




Freq.	Note	Decetor Mod e	Actual Reading Level	Spectrum FS	Factor	Limit @3m	Margin
MHz	F/H/E/S	QP/AV/PK	dBµV/m	dBµV/m	dB	dBuV/m	dB
57.16	S	Peak	19.19	27.16	-7.97	40.00	-20.81
275.41	S	Peak	19.73	26.35	-6.63	46.00	-26.27
449.04	S	Peak	24.07	27.04	-2.96	46.00	-21.93
521.79	S	Peak	26.34	27.94	-1.60	46.00	-19.66
757.50	S	Peak	29.31	26.30	3.01	46.00	-16.69
934.04	S	Peak	33.63	28.40	5.23	46.00	-12.37

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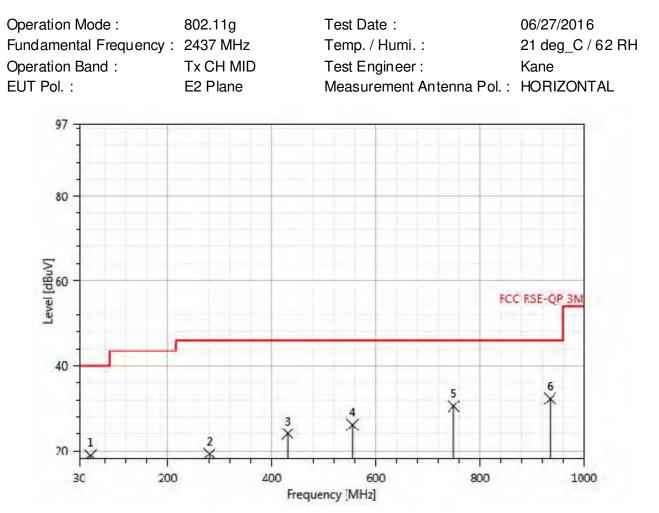




Freq.	Note	Decetor Mod e	Actual Reading Level	Spectrum FS	Factor	Limit @3m	Margin
MHz	F/H/E/S	QP/AV/PK	dBµV/m	dBµV/m	dB	dBuV/m	dB
30.97	S	Peak	21.74	30.89	-9.15	40.00	-18.26
153.19	S	Peak	18.88	26.58	-7.70	43.50	-24.62
450.01	S	Peak	23.82	26.73	-2.92	46.00	-22.18
556.71	S	Peak	25.79	27.13	-1.34	46.00	-20.21
750.71	S	Peak	30.20	27.44	2.76	46.00	-15.80
978.66	S	Peak	32.38	26.10	6.28	54.00	-21.62

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Freq.	Note	Decetor Mod e	Actual Reading Level	Spectrum FS	Factor	Limit @3m	Margin
MHz	F/H/E/S	QP/AV/PK	dBµV/m	dBµV/m	dB	dBuV/m	dB
52.31	S	Peak	18.95	26.71	-7.77	40.00	-21.05
280.26	S	Peak	19.26	25.61	-6.35	46.00	-26.74
430.61	S	Peak	24.02	27.35	-3.33	46.00	-21.98
555.74	S	Peak	26.13	27.42	-1.29	46.00	-19.87
749.74	S	Peak	30.47	27.75	2.72	46.00	-15.53
935.01	S	Peak	32.29	27.07	5.22	46.00	-13.71

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Operation Mode : 802.11g Test Date : 06/27/2016 Fundamental Frequency: 2462 MHz Temp. / Humi. : 21 deg C / 62 RH **Operation Band** : Tx CH HIGH Test Engineer : Kane EUT Pol. : E2 Plane Measurement Antenna Pol. : VERTICAL 97 80 Level [dBuV] FCC RSE-QP 3N 40 6 5 3 20 200 400 600 800 30 1000 Frequency [MHz]

	Freq.	Note	Decetor	Actual	Spectrum	Factor	Limit	Margin
			Mode	Reading Level	FS		@3m	
_	MHz	F/H/E/S	QP/AV/PK	dBµ V/m	dBµV/m	dB	dBuV/m	dB
	30.97	S	Peak	21.85	31.00	-9.15	40.00	-18.15
	159.01	S	Peak	19.08	26.46	-7.38	43.50	-24.42
	430.61	S	Peak	23.94	27.27	-3.33	46.00	-22.06
	519.85	S	Peak	26.48	28.10	-1.62	46.00	-19.52
	731.31	S	Peak	29.91	28.19	1.72	46.00	-16.09
	961.20	S	Peak	32.71	26.74	5.97	54.00	-21.29

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Operation Mode : 802.11g Test Date : 06/27/2016 Fundamental Frequency: 2462 MHz Temp. / Humi. : 21 deg C / 62 RH **Operation Band** : **Tx CH HIGH** Test Engineer : Kane EUT Pol. : E2 Plane Measurement Antenna Pol. : HORIZONTAL 97 80 Level [dBuV] FCC RSE-QP 3N 40 6 5 Ж ж 3 20 400 600 800 30 200 1000 Frequency [MHz] Spectrum Eroo Nloto Actual Eastar Limit Margin Decetor

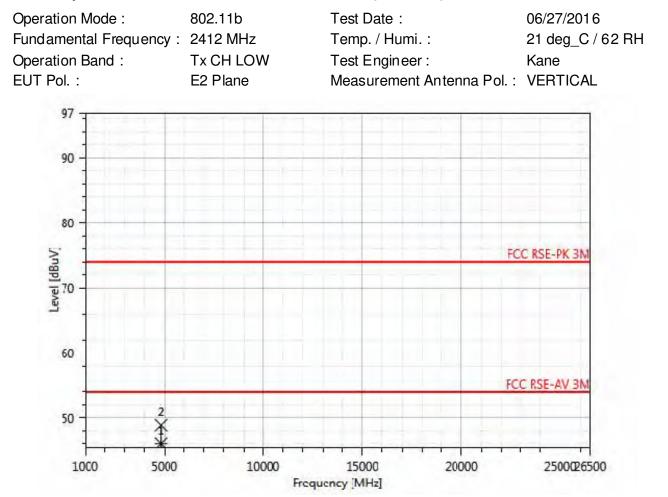
	⊢req.	INOTE	Decetor	Actual	Spectrum	Factor	Limit	Margin	
			Mode	Reading Level	FS		@3m		
_	MHz	F/H/E/S	QP/AV/PK	dBµ V/m	dBµV/m	dB	dBuV/m	dB	
	57.16	S	Peak	19.57	27.54	-7.97	40.00	-20.43	_
	280.26	S	Peak	19.90	26.25	-6.35	46.00	-26.10	
	450.01	S	Peak	25.12	28.04	-2.92	46.00	-20.88	
	515.00	S	Peak	26.15	28.09	-1.94	46.00	-19.85	
	759.44	S	Peak	30.47	27.46	3.01	46.00	-15.53	
	978.66	S	Peak	32.19	25.92	6.28	54.00	-21.81	

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Above 1GHz Data: Radiated Spurious Emission Measurement Result (802.11 b)

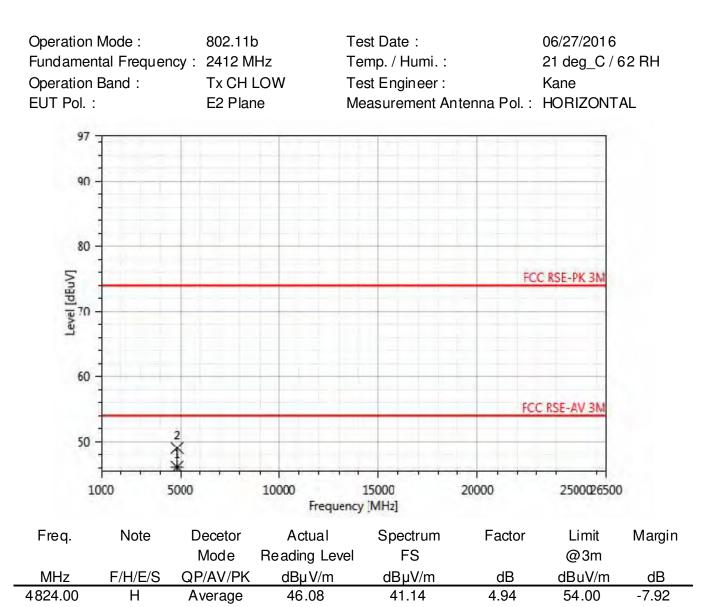


Freq.	Note	Decetor	Actual	Spectrum	Factor	Limit	Margin
		Mode	Reading Level	FS		@3m	
MHz	F/H/E/S	QP/AV/PK	dBµV/m	dBµV/m	dB	dBuV/m	dB
4824.00	Н	Average	46.03	41.09	4.94	54.00	-7.97
4824.00	Н	Peak	48.93	43.99	4.94	74.00	-25.07

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Н



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Peak

49.00

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44.06

4.94

74.00

-25.00



Н

Operation Mode : Test Date : 802.11b 06/27/2016 Fundamental Frequency: 2437 MHz Temp. / Humi. : 21 deg C / 62 RH **Operation Band :** Tx CH MID Test Engineer: Kane EUT Pol. : E2 Plane Measurement Antenna Pol. : VERTICAL 97 90 80 Level [dBuV] FCC RSE-PK 3N 60 FCC RSE-AV 3N 50 10000 15000 20000 2500@6500 1000 5000 Frequency [MHz] Freq. Decetor Actual Spectrum Limit Margin Note Factor Mode Reading Level FS @3m F/H/E/S QP/AV/PK dBuV/m MHz dBµV/m dBµV/m dB dB 4874.00 Η 49.31 44.18 5.13 -4.69 Average 54.00

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50.25

Peak

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45.11

5.13

74.00

-23.75



4874.00

Η

Н

Operation Mode : Test Date : 802.11b 06/27/2016 Fundamental Frequency: 2437 MHz Temp. / Humi. : 21 deg C / 62 RH **Operation Band :** Tx CH MID Test Engineer: Kane EUT Pol. : E2 Plane Measurement Antenna Pol. : HORIZONTAL 97 90 80 Level [dBuV] FCC RSE-PK 3N 60 FCC RSE-AV 3N 50 10000 15000 20000 2500@6500 1000 5000 Frequency [MHz] Freq. Decetor Actual Spectrum Factor Limit Margin Note Mode Reading Level FS @3m F/H/E/S QP/AV/PK MHz dBµV/m dBµV/m dB dBuV/m dB

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47.50

48.25

Average

Peak

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42.36

43.11

5.13

5.13

-6.50

-25.75

54.00

74.00



Operation Mode : Test Date : 802.11b 06/27/2016 Fundamental Frequency: 2462 MHz Temp. / Humi. : 21 deg C / 62 RH **Operation Band :** Test Engineer: **Tx CH HIGH** Kane EUT Pol. : E2 Plane Measurement Antenna Pol. : VERTICAL 97 90 80 Level [dBuV] FCC RSE-PK 3N 60 FCC KSE-AV 3N 7 0 10000 15000 20000 2500@6500 1000 5000 Frequency [MHz] Freq. Decetor Actual Spectrum Factor Limit Margin Note Mode Reading Level FS @3m F/H/E/S QP/AV/PK MHz dBµV/m dBµV/m dB dBuV/m dB 4924.00 Η 51.68 46.43 5.25 -2.32 Average 54.00 4924.00 Н 53.43 48.18 5.25 74.00 -20.57 Peak

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.



Н

Operation Mode : Test Date : 802.11b 06/27/2016 Fundamental Frequency: 2462 MHz Temp. / Humi. : 21 deg C / 62 RH **Operation Band :** Test Engineer: **Tx CH HIGH** Kane EUT Pol. : E2 Plane Measurement Antenna Pol. : HORIZONTAL 97 90 80 Level [dBuV] FCC RSE-PK 3M 60 2 FCC RSE-AV 3N 10000 15000 20000 2500@6500 1000 5000 Frequency [MHz] Freq. Decetor Actual Spectrum Factor Limit Margin Note Mode Reading Level FS @3m F/H/E/S QP/AV/PK MHz dBµV/m dBµV/m dB dBuV/m dB 4924.00 Η 51.90 46.65 5.25 -2.10 Average 54.00

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

53.78

Peak

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48.52

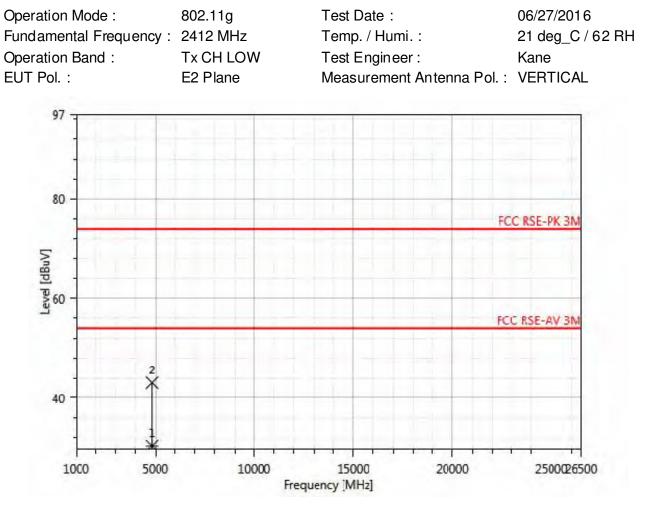
5.25

74.00

-20.22



Radiated Spurious Emission Measurement Result (802.11 g)



Freq.	Note	Decetor	Actual	Spectrum	Factor	Limit	Margin
		Mode	Reading Level	FS		@3m	
MHz	F/H/E/S	QP/AV/PK	dBµ V/m	dBµV/m	dB	dBuV/m	dB
4824.00	Н	Average	30.39	25.45	4.94	54.00	-23.61
4824.00	Н	Peak	43.10	38.15	4.94	74.00	-30.90

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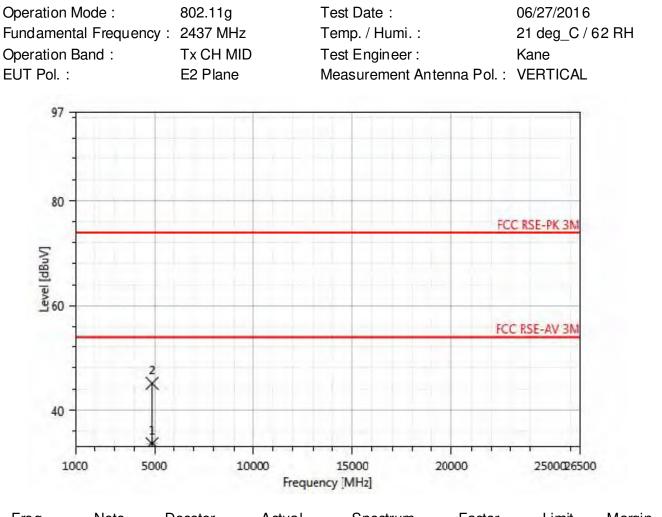


Operation Mode : 802.11g Test Date : 06/27/2016 Fundamental Frequency: 2412 MHz Temp. / Humi. : 21 deg C / 62 RH **Operation Band** : Tx CH LOW Test Engineer : Kane EUT Pol. : E2 Plane Measurement Antenna Pol.: HORIZONTAL 97 80 FCC RSE-PK 3N Level [dBuV] FCC RSE-AV 3N 2 40 10000 15000 20000 1000 5000 2500@6500 Frequency [MHz] Mata Deceter 1:00:00 N 4 -

	⊢req.	Note	Decetor	Actual	Spectrum	Factor	Limit	Margin	
			Mode	Reading Level	FS		@3m		
_	MHz	F/H/E/S	QP/AV/PK	dBµ V/m	dBµV/m	dB	dBuV/m	dB	
	4824.00	Н	Average	30.50	25.56	4.94	54.00	-23.50	
	4824.00	Н	Peak	42.51	37.57	4.94	74.00	-31.49	

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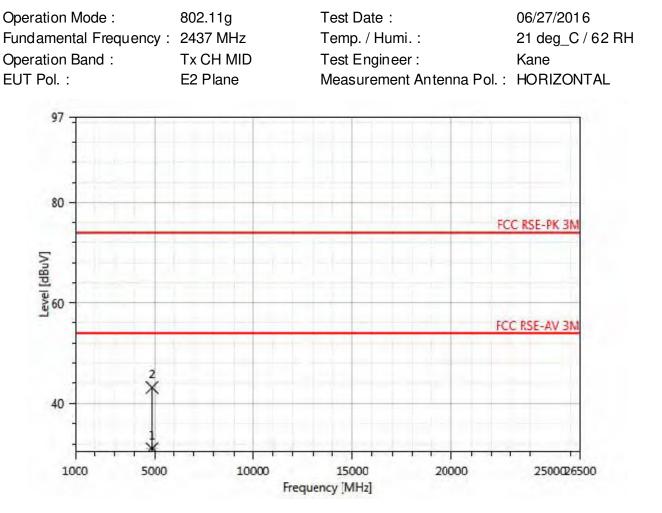




⊢req.	Note	Decetor	Actual	Spectrum	Factor	Limit	Margin	
		Mode	Reading Level	FS		@3m		
MHz	F/H/E/S	QP/AV/PK	dBµ V/m	dBµV/m	dB	dBuV/m	dB	
4874.00	Н	Average	33.65	28.52	5.13	54.00	-20.35	_
4874.00	Н	Peak	45.14	40.00	5.13	74.00	-28.86	

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.





Freq.	Note	Decetor	Actual	Spectrum	Factor	Limit	Margin	
		Mode	Reading Level	FS		@3m		
MHz	F/H/E/S	QP/AV/PK	dBµ V/m	dBµV/m	dB	dBuV/m	dB	
4874.00	Н	Average	31.09	25.96	5.13	54.00	-22.91	
4874.00	Н	Peak	43.20	38.07	5.13	74.00	-30.80	

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.



Operation Mode : Test Date : 802.11g 06/27/2016 Fundamental Frequency: 2462 MHz Temp. / Humi. : 21 deg C / 62 RH **Operation Band : Tx CH HIGH** Test Engineer : Kane EUT Pol. : E2 Plane Measurement Antenna Pol. : VERTICAL 97 80 FCC RSE-PK 3N Level [dBuV] FCC RSE-AV 3N 2 X 40 10000 15000 20000 1000 5000 2500@6500 Frequency [MHz] Decetor Actual Spectrum Limit Margin Freq. Note Factor Mode Reading Level FS @3m

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

QP/AV/PK

Average

Peak

dBµV/m

30.77

42.63

F/H/E/S

Η

Н

MHz

4924.00

4924.00

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dBµV/m

25.52

37.37

dBuV/m

54.00

74.00

dB

-23.23

-31.37

dB

5.25

5.25



Operation Mode : Test Date : 802.11g 06/27/2016 Fundamental Frequency: 2462 MHz Temp. / Humi. : 21 deg C / 62 RH **Operation Band : Tx CH HIGH** Test Engineer : Kane EUT Pol. : E2 Plane Measurement Antenna Pol.: HORIZONTAL 97 80 FCC RSE-PK 3N Level [dBuV] FCC RSE-AV 3N 2 Ж 40 1000 10000 15000 20000 5000 2500@6500 Frequency [MHz] Decetor Actual Spectrum Limit Margin Freq. Note Factor Mode Reading Level FS @3m

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

QP/AV/PK

Average

Peak

dBµV/m

30.70

43.45

F/H/E/S

Η

Н

MHz

4924.00

4924.00

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dBµV/m

25.45

38.20

dBuV/m

54.00

74.00

dB

-23.30

-30.55

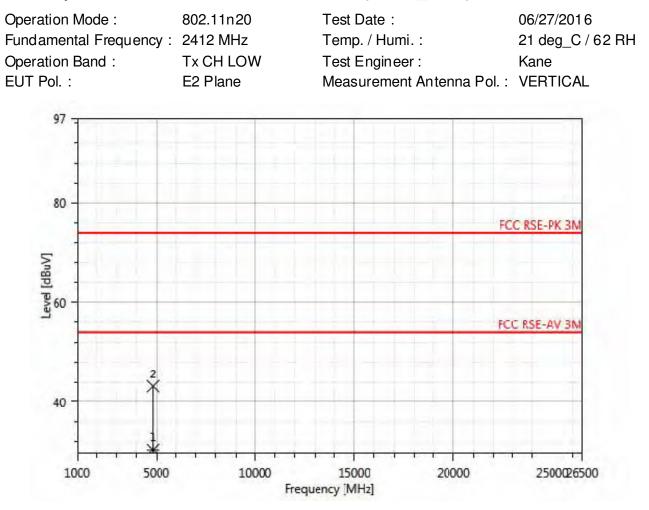
dB

5.25

5.25



Radiated Spurious Emission Measurement Result (802.11_HT20)



Freq.	Note	Decetor	Actual	Spectrum	Factor	Limit	Margin
		Mode	Reading Level	FS		@3m	
MHz	F/H/E/S	QP/AV/PK	dBµV/m	dBµV/m	dB	dBuV/m	dB
4824.00	Н	Average	30.37	25.43	4.94	54.00	-23.63
4824.00	Н	Peak	43.16	38.22	4.94	74.00	-30.84

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.



Operation Mode : Test Date : 06/27/2016 802.11n20 Fundamental Frequency: 2412 MHz Temp. / Humi. : 21 deg C / 62 RH **Operation Band** : Tx CH LOW Test Engineer : Kane EUT Pol. : E2 Plane Measurement Antenna Pol.: HORIZONTAL 97 80 FCC RSE-PK 3N Level [dBuV] FCC RSE-AV 3N 2 40 1000 10000 20000 5000 15000 2500@6500 Frequency [MHz] Actual Spectrum Factor Limit Margin Freq. Note Decetor

					• • • • • • • • • • •			
			Mode	Reading Level	FS		@3m	
_	MHz	F/H/E/S	QP/AV/PK	dBµ V/m	dBµV/m	dB	dBuV/m	dB
	4824.00	Н	Average	30.57	25.63	4.94	54.00	-23.43
	4824.00	Н	Peak	43.11	38.17	4.94	74.00	-30.89

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Operation Mode : Test Date : 802.11n20 06/27/2016 Fundamental Frequency: 2437 MHz Temp. / Humi. : 21 deg C / 62 RH **Operation Band** : Tx CH MID Test Engineer : Kane EUT Pol. : E2 Plane Measurement Antenna Pol. : VERTICAL 97 80 FCC RSE-PK 3N Level [dBuV] FCC RSE-AV 3N 2 Ж 40 1000 10000 15000 20000 5000 2500@6500 Frequency [MHz] Actual Spectrum Margin Freq. Note Decetor Factor Limit

		Mode	Reading Level	FS		@3m	
MHz	F/H/E/S	QP/AV/PK	dBµ V/m	dBµV/m	dB	dBuV/m	dB
4874.00	Н	Average	30.76	25.63	5.13	54.00	-23.24
4874.00	Н	Peak	44.16	39.03	5.13	74.00	-29.84

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.



Operation Mode : Test Date : 802.11n20 06/27/2016 Fundamental Frequency: 2437 MHz Temp. / Humi. : 21 deg C / 62 RH **Operation Band** : Tx CH MID Test Engineer : Kane EUT Pol. : E2 Plane Measurement Antenna Pol. : HORIZONTAL 97 80 FCC RSE-PK 3N Level [dBuV] FCC RSE-AV 3N 2 40 1000 10000 20000 5000 15000 2500@6500 Frequency [MHz] Actual Spectrum Margin Freq. Note Decetor Factor Limit

		Mode	Reading Level	FS		@3m	
MHz	F/H/E/S	QP/AV/PK	dBµ V/m	dBµV/m	dB	dBuV/m	dB
4874.00	Н	Average	30.16	25.03	5.13	54.00	-23.84
4874.00	Н	Peak	43.48	38.35	5.13	74.00	-30.52

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.



Operation Mode : Test Date : 802.11n20 06/27/2016 Fundamental Frequency: 2462 MHz Temp. / Humi. : 21 deg C / 62 RH **Operation Band : Tx CH HIGH** Test Engineer : Kane EUT Pol. : E2 Plane Measurement Antenna Pol. : VERTICAL 97 80 FCC RSE-PK 3N Level [dBuV] FCC RSE-AV 3N Ж 40 1000 10000 15000 20000 5000 2500@6500 Frequency [MHz] Decetor Actual Spectrum Limit Margin Freq. Note Factor Mode Reading Level FS @3m

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

QP/AV/PK

Average

Peak

dBµV/m

30.70

42.84

F/H/E/S

Η

Н

MHz

4924.00

4924.00

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dBµV/m

25.45

37.59

dBuV/m

54.00

74.00

dB

-23.30

-31.16

dB

5.25

5.25



Operation Mode : 802.11n20 Test Date : 06/27/2016 Fundamental Frequency: 2462 MHz Temp. / Humi. : 21 deg C / 62 RH **Operation Band**: **Tx CH HIGH** Test Engineer : Kane EUT Pol. : E2 Plane Measurement Antenna Pol. : HORIZONTAL 97 80 FCC RSE-PK 3M Level [dBuV] FCC RSE-AV 3N 2 40 10000 15000 20000 1000 5000 2500@6500 Frequency [MHz]

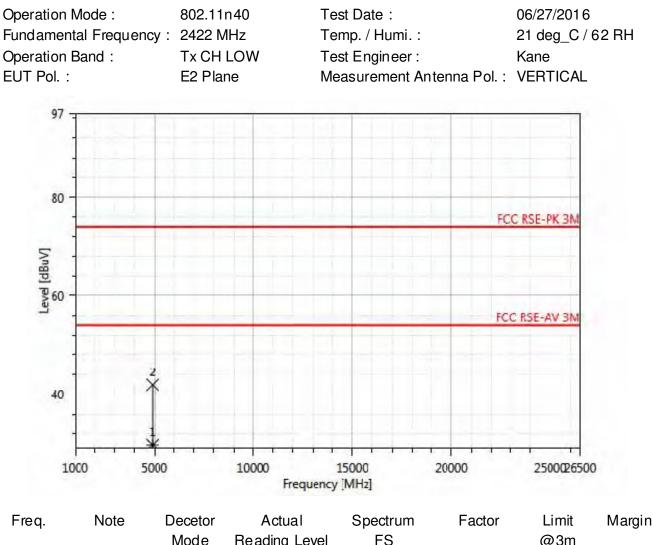
Note	Decetor	Actual	Spectrum	Factor	Limit	Margin	
	Mode	Reading Level	FS		@3m		
F/H/E/S	QP/AV/PK	dBµ V/m	dBµV/m	dB	dBuV/m	dB	
Н	Average	30.86	25.61	5.25	54.00	-23.14	-
Н	Peak	43.96	38.71	5.25	74.00	-30.04	
	F/H/E/S H	Mode F/H/E/S QP/AV/PK H Average	ModeReading LevelF/H/E/SQP/AV/PKdBµ V/mHAverage30.86	ModeReading LevelFSF/H/E/SQP/AV/PKdBµV/mdBµV/mHAverage30.8625.61	ModeReading LevelFSF/H/E/SQP/AV/PKdBµV/mdBµV/mHAverage30.8625.615.25	Mode Reading Level FS @3m F/H/E/S QP/AV/PK dBμV/m dBμV/m dB dBuV/m H Average 30.86 25.61 5.25 54.00	Mode Reading Level FS @3m F/H/E/S QP/AV/PK dBµV/m dB µV/m dB dBuV/m dB H Average 30.86 25.61 5.25 54.00 -23.14

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Radiated Spurious Emission Measurement Result (802.11_HT40)



		Mode	Reading Level	FS		@3m		
MHz	F/H/E/S	QP/AV/PK	dBµ V/m	dBµV/m	dB	dBuV/m	dB	
4904.00	Н	Average	29.76	24.53	5.23	54.00	-24.24	_
4904.00	Н	Peak	41.94	36.71	5.23	74.00	-32.06	

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Operation Mode : 802.11n40 Test Date : 06/27/2016 Fundamental Frequency: 2422 MHz Temp. / Humi. : 21 deg C / 62 RH **Operation Band**: Tx CH LOW Test Engineer : Kane EUT Pol. : E2 Plane Measurement Antenna Pol.: HORIZONTAL 97 80 FCC RSE-PK 3N Level [dBuV] FCC RSE-AV 3M 2 40 10000 15000 20000 1000 5000 2500@6500 Frequency [MHz] Frea. Note Decetor Actual Spectrum Factor Limit Margin

	· · • • •				• p • • •				
			Mode	Reading Level	FS		@3m		
_	MHz	F/H/E/S	QP/AV/PK	dBµ V/m	dBµV/m	dB	dBuV/m	dB	_
	4904.00	Н	Average	29.72	24.49	5.23	54.00	-24.28	
	4904.00	Н	Peak	42.53	37.30	5.23	74.00	-31.47	

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.



4874.00

Η

Н

Operation Mode : Test Date : 802.11n40 06/27/2016 Fundamental Frequency: 2437 MHz Temp. / Humi. : 21 deg C / 62 RH **Operation Band**: Tx CH MID Test Engineer : Kane EUT Pol. : E2 Plane Measurement Antenna Pol. : VERTICAL 97 80 FCC RSE-PK 3M Level [dBuV] FCC RSE-AV 3N 2 40 1000 10000 15000 20000 5000 2500@6500 Frequency [MHz] Decetor Actual Spectrum Limit Margin Freq. Note Factor Mode Reading Level FS @3m F/H/E/S QP/AV/PK dBµV/m dBuV/m MHz dBµV/m dB dB

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29.60

42.92

Average

Peak

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24.47

37.78

5.13

5.13

-24.40

-31.08

54.00

74.00



Operation Mode : Test Date : 802.11n40 06/27/2016 Fundamental Frequency: 2437 MHz Temp. / Humi. : 21 deg C / 62 RH **Operation Band**: Tx CH MID Test Engineer : Kane EUT Pol. : E2 Plane Measurement Antenna Pol.: HORIZONTAL 97 80 FCC RSE-PK 3N Level [dBuV] FCC RSE-AV 3M 2 40 1000 10000 15000 20000 5000 2500@6500 Frequency [MHz] Decetor Actual Spectrum Limit Margin Freq. Note Factor Mode Reading Level FS @3m

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

QP/AV/PK

Average

Peak

dBµV/m

29.75

41.21

F/H/E/S

Η

Н

MHz

4874.00

4874.00

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dBµV/m

24.62

36.08

dBuV/m

54.00

74.00

dB

-24.25

-32.79

dB

5.13

5.13



Operation Mode : Test Date : 802.11n40 06/27/2016 Fundamental Frequency: 2452 MHz Temp. / Humi. : 21 deg C / 62 RH **Operation Band**: **Tx CH HIGH** Test Engineer : Kane EUT Pol. : E2 Plane Measurement Antenna Pol. : VERTICAL 97 80 FCC RSE-PK 3N Level [dBuV] 8 FCC RSE-AV 3N 2 × 40 1000 10000 20000 5000 15000 2500@6500 Frequency [MHz] Actual Spectrum Margin Freq. Note Decetor Factor Limit

		Mode	Reading Level	FS		@3m	
MHz	F/H/E/S	QP/AV/PK	dBµV/m	dBµV/m	dB	dBuV/m	dB
4904.00	Н	Average	29.91	24.68	5.23	54.00	-24.09
4904.00	Н	Peak	42.23	36.99	5.23	74.00	-31.77

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.



Operation Mode : 802.11n40 Test Date : 06/27/2016 Fundamental Frequency: 2452 MHz Temp. / Humi. : 21 deg C / 62 RH **Operation Band** : **Tx CH HIGH** Test Engineer : Kane EUT Pol. : E2 Plane Measurement Antenna Pol.: HORIZONTAL 97 80 FCC RSE-PK 3N Level [dBuV] FCC RSE-AV 3N 2 40 10000 15000 20000 1000 5000 2500@6500 Frequency [MHz]

Freq.	Note	Decetor	Actual	Spectrum	Factor	Limit	Margin	
		Mode	Reading Level	FS		@3m		
MHz	F/H/E/S	QP/AV/PK	dBµ V/m	dBµV/m	dB	dBuV/m	dB	
4904.00	Н	Average	30.07	24.84	5.23	54.00	-23.93	_
4904.00	Н	Peak	41.76	36.53	5.23	74.00	-32.24	

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12 PEAK POWER SPECTRAL DENSITY

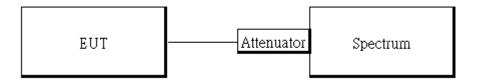
12.1 Standard Applicable

The power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8dBm in any 3 kHz band during any time interval of continuous transmission.

12.2 Measurement Equipment Used

Conducted Emission Test Site							
EQUIPMENT	MFR	MODEL	SERIAL	LAST	CAL DUE.		
ТҮРЕ		NUMBER	NUMBER	CAL.			
EXA Spectrum Ana-							
lyzer	Agilent	N9030A	MY53120760	02/26/2016	02/25/2017		
DC Block	Mini-Circuits	BLK-18-S+	1	01/02/2016	01/01/2017		
Attenuator	Mini-Circuit	BW-S10W2+	2	01/02/2016	01/01/2017		

12.3 Test Set-up



12.4 Measurement Procedure

- 1. Set analyzer center frequency to DTS channel center frequency.
- 2. The testing follows the Measurement Procedure of FCC KDB 558074 D01 DTS Meas. Guidance.
- 3. Set the span to 1.5 times the DTS channel bandwidth.
- 4. Set the RBW = 3 kHz.
- 5. Set the VBW = 10 kHz.
- 6. Detector = peak.
- 7. Sweep time = auto couple.
- 8. Trace mode = max hold.
- 9. Allow trace to fully stabilize.
- 10. Use the peak marker function to determine the maximum amplitude level.

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12.5 Measurement Result

POWER DENSITY 802.11b MODE						
Frequency (MHz)	RF Power Density (dBm)	Maximum Limit (dBm)	Result			
2412	-9.19	8.00	PASS			
2437	-9.92	8.00	PASS			
2462	-6.78	8.00	PASS			

POWER DENSITY 802.11n HT20 MODE					
Frequency (MHz)	RF Power Density (dBm)	Maximum Limit (dBm)	Result		
2412	-11.94	8.00	PASS		
2437	-13.02	8.00	PASS		
2462	-11.40	8.00	PASS		

POWER DENSITY 802.11g MODE					
Frequency (MHz)	RF Power Density (dBm)	Maximum Limit (dBm)	Result		
2412	-11.58	8.00	PASS		
2437	-12.39	8.00	PASS		
2462	-11.42	8.00	PASS		

POWER DENSITY 802.11n HT40 MODE					
Frequency (MHz)	RF Power Density (dBm)	Maximum Limit (dBm)	Result		
2422	-13.71	8.00	PASS		
2437	-14.97	8.00	PASS		
2452	-14.03	8.00	PASS		

Bandedge Limit 802.11b MODE					
Frequency (MHz)	RF Power Density (dBm)	Bandedge Limit (dBm)			
2412	3.32	-16.68			
2462	6.91	-13.09			

Bandedge Limit 802.11n20 MODE					
Frequency (MHz)	RF Power Density (dBm)	Maximum Limit (dBm)			
2412	3.22	-16.78			
2462	3.64	-16.36			

Banded	ge Limit 802	.11g MODE
Frequency (MHz)	RF Power Density (dBm)	Maximum Limit (dBm)
2412	3.71	-16.29
2462	3.33	-16.67

Bandedge Limit 802.11n40 MODE							
Frequency (MHz)	RF Power Density (dBm)	Maximum Limit (dBm)					
2422	2.16	-17.84					
2452	1.41	-18.59					

*Refer to next page for plots

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802.11b Power Spectral Density Test Plot (CH-Low)



Power Spectral Density Test Plot (CH-Mid)



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Power Spectral Density Test Plot (CH-High)



802.11g

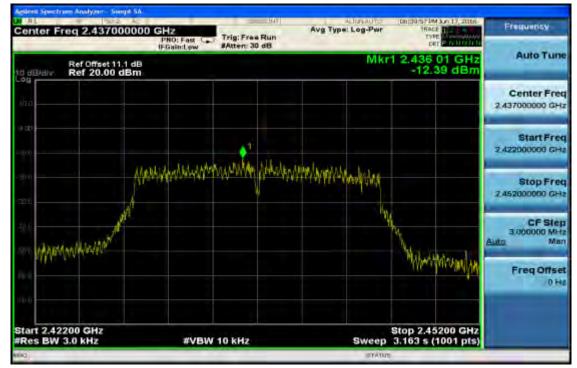




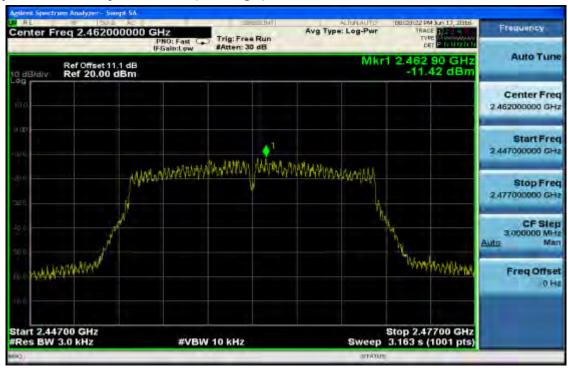
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Power Spectral Density Test Plot (CH-Mid)



Power Spectral Density Test Plot (CH-High)



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802.11n HT20 Power Spectral Density Test Plot (CH-Low)



Power Spectral Density Test Plot (CH-Mid)



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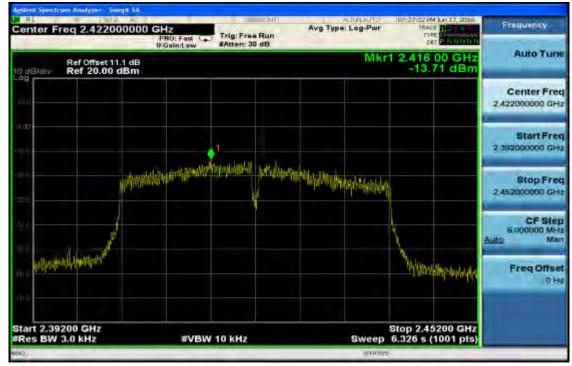


Power Spectral Density Test Plot (CH-High)

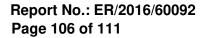


802.11n HT40

Power Spectral Density Test Plot (CH-Low)



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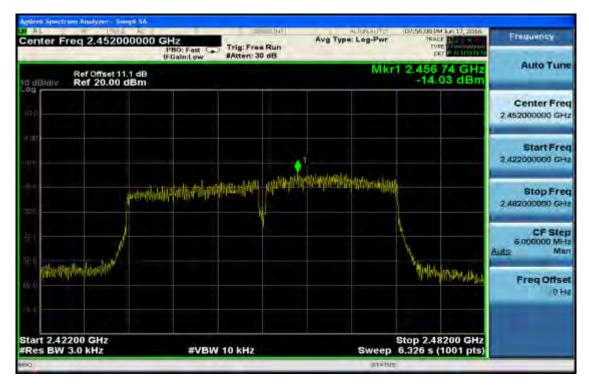




Power Spectral Density Test Plot (CH-Mid)



Power Spectral Density Test Plot (CH-High)



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802.11b PSD for Band edge Limit (CH-Low)

RL	um Analyzer - Swept SA	Sector Sector	-1000001047	declar ed o Norir	0601127 PM 3 m 17, 2016	
Center F	req 2.413005000	PHO: Wide	Trig: Free Run #Atten: 30 dB	Avg Type: Log-Pwr	TYPE EFT PARTY	Frequency
in abiaiv	Ref Offset 11.1 dB Ref 20.00 dBm			Mkr1 2.	413 000 2 GHz 5.31 dBm	Auto Tuni
0ja.a			•			Center Free 2.413005000 GH;
10-0.						Start Free 2,412865000 GH
ann						Stop Free 2,413165000 GH
40 0						CF Step 30.000 kH Auto Mar
io o						Freq Offse 0 H
	28550 GHz			Sto	op 2.4131550 GHz	
Res BW	100 KHZ	#VBW	300 kHz	#Sweep	100.0 s (1001 pts)	

802.11b PSD for Bandedge Limit(CH-High)



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802.11g PSD for Bandedge Limit(CH-Low)

Center Freq 2.413290000	CH2 PNO: While C Trig: Free Run IFGain:Low SAtten: 30 dB	Avg Type: Log-Pwr	DUI24.06 PM kg 17, 2016 TRACE T 20 4 TVTE DURANT	Frequency Auto Tum	
Ref Offset 11.1 dB Mkr1 2.413 264 2 GHz 3.09 dBm 3.09 dBm					
10.0	1			Center Free 2.413290000 GH	
9 00				Start Fre 2.413140000 GH	
800				Stop Fre 2.413440000 GH	
40.0				CF Ste 30.000 kH Auto Ma	
10.0				Freq Offse	
Start 2.4131400 GHz #Res BW 100 kHz	#VBW 300 kHz	St #Sweep	op 2.4134400 GHz 100.0 s (1001 pts)		

802.11g PSD for Bandedge Limit(CH-High)



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802.11n_HT20 PSD for Bandedge Limit(CH-Low)

Center Freq 2.413260000 (Philip Milder 171	ig: Free Run tten: 30 dB	Avg Type: Log-Pwr	100117:06144 km 17, 2016- TRACE 11.2 TYPE Vision Control (17) DET P. 19107111	Frequency Auto Tune
Ref Offset 11.1 dB Mkr1 2.413 265 1 GHz 10 dB/d/v Ref 20.00 dBm 2.86 dBm					
10.0		•1			Center Free 2.413260000 GH
9.00					Start Free 2,413110000 GH
-00					Stop Fre 2.413410000 GH
40.0					CF Stej 30.000 kH Auto Ma
10.0					Freq Offse
Start 2.4131100 GHz #Res BW 100 kHz	#VBW 300) kHz	Sto #Sweep	op 2.4134100 GHz 100.0 s (1001 pts)	

802.11n_HT20 PSD for Bandedge Limit(CH-High)

Center Freq 2.463260000 0	PHO: Wide Con Tri	g: Free Run ten: 30 dB	Avg Type: Log-Pwr	100007-57144 Jon 17, 2016- 16ACE 11, 2016 TVTC 1000000000000000000000000000000000000	Frequ	
Ref Offset 11.1 dB Mkr1 2.463 264 2 GHz 3.05 dBm 3.05 dBm						to Tun
10.0		At			Cen 2.463260	ter Fre
9 00					St 2.463110	art Fre
800					Şt 2.463411	op Fre
40.0						CF Ste 1000 kH Ma
ru e					Fre	q Offse 0 H
Start 2.4631100 GHz #Res BW 100 kHz	#VBW 300	I KHZ	Str. #Sweep	op 2.4634100 GHz 100.0 s (1001 pts)		

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802.11n_HT40 PSD for Bandedge Limit(CH-Low)

Center Freq 2.41948000	DO GHz PNO: Wide Co	Trig: Free Run #Atten: 30 dB	Aug Type: Log-Pwr	DV2242024M km 17, 2016 NRACE 1222 TVPE Commence DET P Tr United 11	Frequency Auto Tune
Ref Offset 11.1 dB Mkr1 2.419 497 4 GHz 10 dE/dlv Ref 20.00 dBm 2.16 dBm					
10.0					Center Free 2.419480000 GH
9 (D)					Start Free 2,419330000 GH
-311)					Stop Fre 2,419630000 GH
40.0					CF Ste 30.000 kH Auto Ma
10.0					Freq Offse 0 H
Start 2.4193300 GHz			St	op 2.4196300 GHz	
#Res BW 100 kHz	#VBW	300 kHz	#Sweep	100.0 s (1001 pts)	

802.11n HT40 PSD for Bandedge Limit(CH-High)

Center Freq 2.463280000	GHZ PNO: Wide Co IFGain:Low	Trig: Free Run #Atten: 30 dB	Avg Type: Log-Pwr	07(50)1614M key 17, 2016 TRACE 112 20 TVTE CONSTRUCTION DET PT- 00000000	Frequency Auto Tune	
Ref Offset 11.1 dB Ref 20.00 dBm	Ref Offset 11.1 dB Mkr1 2.463 265 6 GHz 0.78 dBm 0.78 dBm					
10.0		AT			Center Free 2.463280000 GH	
9 (0) +10 0					Start Free 2.463130000 GH	
-300)					Stop Fre 2.463430000 GH	
40.0					CF Ste 30.000 kH Auto Ma	
10.0					Freq Offse 0 H	
Start 2.4631300 GHz #Res BW 100 kHz	#VBW	300 kHz	St #Sweep	op 2.4634300 GHz 100.0 s (1001 pts)		

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13 ANTENNA REQUIREMENT

13.1 Standard Applicable

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

If the transmitting antenna is greater than 6dBi, the power shall be reduced by the same level in dB comparing to gain minus 6dBi.

13.2 Antenna Connected Construction

An embedded-in antenna design is used.

The antenna connector is designed with unique type RF connector and no consideration of replacement. Please see EUT photo and antenna spec. for details.

The antenna gain is less than 6dBi. Therefore, it is not necessary to reduce maximum output power limit.

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