

FCC Test Report

Equipment	:	Wireless AC1000 Dual Band Cloud Router
Brand Name	:	D-Link
Model No.	:	DIR-820L
FCC ID	:	KA2IR820LB1
Standard	:	47 CFR FCC Part 15.247
Operating Band	:	2400 MHz – 2483.5 MHz
FCC Classification	:	DTS
Applicant	:	D-Link Corporation 17595 Mt. Herrmann, Fountain Valley, CA 92708 U.S.A.

The product sample received on Mar. 10, 2014 and completely tested on Mar. 28, 2014. We, SPORTON, would like to declare that the tested sample has been evaluated in accordance with the procedures given in ANSI C63.10-2009 and shown compliance with the applicable technical standards.

The test results in this report apply exclusively to the tested model / sample. Without written approval of SPORTON INTERNATIONAL INC., the test report shall not be reproduced except in full.

Reviewed by:

James Fan / Assistant Manager





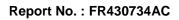
Table of Contents

1	GENERAL DESCRIPTION	5
1.1	Information	5
1.2	Accessories and Support Equipment	7
1.3	Testing Applied Standards	7
1.4	Testing Location Information	7
1.5	Measurement Uncertainty	8
2	TEST CONFIGURATION OF EUT	9
2.1	The Worst Case Modulation Configuration	9
2.2	Test Channel Frequencies Configuration	9
2.3	The Worst Case Power Setting Parameter	9
2.4	The Worst Case Measurement Configuration	10
2.5	Test Setup Diagram	11
3	TRANSMITTER TEST RESULT	12
3.1	AC Power-line Conducted Emissions	12
3.2	6dB Bandwidth	15
3.3	RF Output Power	17
3.4	Power Spectral Density	21
3.5	Emissions in non-restricted frequency bands	24
3.6	Transmitter Radiated Unwanted Emissions	
4	TEST EQUIPMENT AND CALIBRATION DATA	66
APPE	ENDIX A. TEST PHOTOS	A1-A3



Summary of Test Result

	Conformance Test Specifications							
Report Clause	Ref. Std. Clause	Description	Measured	Limit	Result			
1.1.2	15.203	Antenna Requirement	Antenna connector mechanism complied	FCC 15.203	Complied			
3.1	15.207	AC Power-line Conducted Emissions	[dBuV]:28.686MHz 47.89 (Margin 12.11dB) – QP 44.53 (Margin 5.47dB) - AV	FCC 15.207	Complied			
3.2	15.247(a)	6dB Bandwidth	6dB Bandwidth [MHz] 20M:17.62 / 40M:35.83	≥500kHz	Complied			
3.3	15.247(b)	RF Output Power (Maximum Conducted (Average) Output Power)	Power [dBm]:23.34	Power [dBm]:30	Complied			
3.4	15.247(e)	Power Spectral Density	PSD [dBm/10kHz]:1.38	PSD [dBm/3kHz]:5.99	Complied			
3.5	15.247(d)	Emissions in non-restricted frequency bands	Out-of -band emissions are 30dB below the highest power	Non-Restricted Bands: > 30 dBc Restricted Bands: FCC 15.209	Complied			
3.6	15.247(d)	Transmitter Radiated Unwanted Emissions	Restricted Bands [dBuV/m at 3m]:2483.50MHz 53.00 (Margin 1.00dB) - AV	Non-Restricted Bands: > 30 dBc Restricted Bands: FCC 15.209	Complied			





Revision History

Report No.	Version	Description	Issued Date
FR430734AC	Rev. 01	Initial issue of report	Apr. 14, 2014



1 General Description

1.1 Information

1.1.1 RF General Information

RF General Information						
Frequency Range (MHz)	IEEE Std. 802.11	Ch. Freq. (MHz)	Channel Number	Transmit Chains (Ν _{τx})	RF Output Power (dBm)	Co-location
2400-2483.5	b	2412-2462	1-11 [11]	2	23.34	Yes
2400-2483.5	g	2412-2462	1-11 [11]	2	21.84	Yes
2400-2483.5	HT20	2412-2462	1-11 [11]	2	22.03	Yes
2400-2483.5	HT40	2422-2452	3-9 [7]	2	18.12	Yes

Note 1: RF output power specifies that Maximum Conducted (Average) Output Power.

Note 2: 802.11b uses a combination of DSSS-DBPSK, DQPSK, CCK modulation.

Note 3: 802.11g/n uses a combination of OFDM-BPSK, QPSK, 16QAM, 64QAM modulation.

Note 4: Co-location, Co-location is generally defined as simultaneously transmitting (co-transmitting)

antennas within 20 cm of each other. (i.e., EUT has simultaneously co-transmitting that operating 2.4GHz and 5GHz.)

1.1.2 Antenna Information

	Antenna Category						
	Equ	Equipment placed on the market without antennas					
\square	Inte	gral antenna (antenna permanently attached)					
	\boxtimes	Temporary RF connector provided					
		No temporary RF connector provided Transmit chains bypass antenna and soldered temporary RF connector provided for connected measurement. In case of conducted measurements the transmitter shall be connected to the measuring equipment via a suitable attenuator and correct for all losses in the RF path.					
	Exte	ernal antenna (dedicated antennas)					
		Single power level with corresponding antenna(s).					
		Multiple power level and corresponding antenna(s).					
	RF connector provided						
	Unique antenna connector. (e.g., MMCX, U.FL, IPX, and RP-SMA, RP-N type)						
		Standard antenna connector. (e.g., SMA, N, BNC, and TNC type)					



	Antenna General Information						
No.	No. Ant. Cat. Ant. Type Connector Gain (dBi)						
1	Integral	PCB	I-PEX	0			
2	Integral	PCB	I-PEX	0			

1.1.3 Type of EUT

	Identify EUT				
EUT	F Serial Number	N/A			
Pre	sentation of Equipment	Production ; Pre-Production ; Prototype			
		Type of EUT			
\boxtimes	Stand-alone				
	Combined (EUT where the radio part is fully integrated within another device)				
	Combined Equipment - Brand Name / Model No.:				
	Plug-in radio (EUT intended for a variety of host systems)				
	Host System - Brand Name / Model No.:				
	Other:				

1.1.4 Test Signal Duty Cycle

Operated Mode for Worst Duty Cycle					
Operated normally mode for worst duty cycle	Operated normally mode for worst duty cycle				
Operated test mode for worst duty cycle					
Test Signal Duty Cycle (x)Power Duty Factor[dB] - (10 log 1/x)					
99.16% - IEEE 802.11b	0.04				
90.71% - IEEE 802.11g	0.42				
⊠ 91.60% - IEEE 802.11n (HT20)	0.38				
⊠ 78.31% - IEEE 802.11n (HT40)	1.06				

1.1.5 EUT Operational Condition

Supply Voltage	AC mains	DC	
Type of DC Source	Internal DC supply	External DC adapter	Battery



1.2 Accessories and Support Equipment

	Accessories							
No.	Equipment	Brand Name	Model Name	Spec.				
1	Adapter 1	D-Link	AMS9-1201000FU2	I/P: 100-240Vac, 50-60Hz, 0.5A, O/P: 12Vdc, 1.0A 1.22m non-shielded without core.				
2	Adapter 2	D-Link	F12W-120100SPAU	I/P: 100-240Vac, 50-60Hz, 0.3A, O/P: 12Vdc, 1.0A 1.22m non-shielded without core.				
3	Adapter 3	D-Link	F12W3-120100SPAU	I/P: 100-240Vac, 50-60Hz, 0.3A, O/P: 12Vdc, 1.0A 1.20m non-shielded without core.				

	Support Equipment						
No.	o. Equipment Brand Name Model Name FCC ID						
1	Notebook	DELL	E6430	DoC			
2	Notebook	DELL	E6410	DoC			
3	USB Dongle	Transcend	4G				

1.3 Testing Applied Standards

According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standards:

- 47 CFR FCC Part 15
- ANSI C63.10-2009
- FCC KDB 558074 v03r01
- FCC KDB 662911 v02r01
- FCC KDB 412172 v01

1.4 Testing Location Information

	Testing Location									
\boxtimes	HWA YA	ADE	ADD : No. 52, Hwa Ya 1 st Rd., Hwa Ya Technology Park, Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C.							
		TEL	EL : 886-3-327-3456 FAX : 886-3-327-0973							
Test Condition Test Site No. Test Engineer Test Environment						Test Date				
R	F Conducte	d		TH01-HY	Mark Liao	21°C / 64%	Mar. 28, 2014			
AC Conduction		n		CO04-HY	Skys Huang	20°C / 67%	Mar. 27, 2014			
Radiated Emission 03CH08-				3CH08-HY	Jack Li	18-20°C / 66-68%	Mar. 10 ~ Mar. 24, 2014			
	Test site registered number [636805] with FCC Test site registered number [4086B-2] with IC									



1.5 Measurement Uncertainty

ISO/IEC 17025 requires that an estimate of the measurement uncertainties associated with the emissions test results be included in the report. The measurement uncertainties given below are based on a 95% confidence level (based on a coverage factor (k=2)

Measurement Uncertainty						
Test Item	Uncertainty	Limit				
AC power-line conducted emissions	±2.26 dB	N/A				
Emission bandwidth, 6dB bandwidth		±1.42 %	N/A			
RF output power, conducted		±0.63 dB	N/A			
Power density, conducted		±0.81 dB	N/A			
Unwanted emissions, conducted	30 – 1000 MHz	±0.51 dB	N/A			
	1 – 18 GHz	±0.67 dB	N/A			
	18 – 40 GHz	±0.83 dB	N/A			
	40 – 200 GHz	N/A	N/A			
All emissions, radiated	30 – 1000 MHz	±2.56 dB	N/A			
	1 – 18 GHz	±3.59 dB	N/A			
	18 – 40 GHz	±3.82 dB	N/A			
	40 – 200 GHz	N/A	N/A			
Temperature		±0.8 °C	N/A			
Humidity	±3 %	N/A				
DC and low frequency voltages	±3 %	N/A				
Time	±1.42 %	N/A				
Duty Cycle		±1.42 %	N/A			



2 Test Configuration of EUT

2.1 The Worst Case Modulation Configuration

	Worst Modulation Used for Conformance Testing								
Modulation Mode	Transmit Chains (N _{TX})	Data Rate / MCS	Worst Data Rate / MCS						
11b,1-11Mbps	2	1-11 Mbps	1 Mbps						
11g,6-54Mbps	2	6-54 Mbps	6 Mbps						
HT20,M0-15	2	MCS 0-15	MCS 0						
HT40,M0-15	2	MCS 0-15	MCS 0						

2.2 Test Channel Frequencies Configuration

Test Channel Frequencies Configuration					
IEEE Std. 802.11 Test Channel Frequencies (MHz)					
b, g, n (HT-20)	2412-(F1), 2437-(F2), 2462-(F3)				
n (HT-40)	2422-(F4), 2437-(F5), 2452-(F6)				

2.3 The Worst Case Power Setting Parameter

The Worst Case Power Setting Parameter (2400-2483.5MHz band)								
Test Software	MToo	ol						
Test Software Version	RTL	319x 2.3						
				Test Frequ	ency (MHz)			
Modulation Mode	N _{TX}	NCB: 20MHz			NCB: 40MHz			
		2412	2437	2462	2422	2437	2452	
11b,1-11Mbps	2	47/49	50/52	50/52				
11g,6-54Mbps	2	42/44	51/53	40/41				
HT20,M0-15	2	40/42	51/53	38/39				
HT40,M0-15	2				36/38	44/46	35/36	



2.4 The Worst Case Measurement Configuration

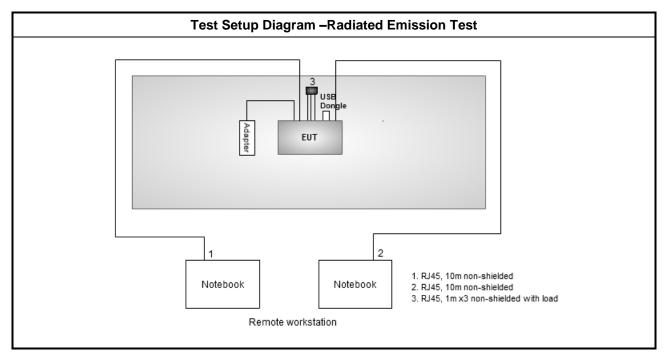
The Worst Case Mode for Following Conformance Tests						
Tests Item AC power-line conducted emissions						
Condition	AC power-line conducted measurement for line and neutral Test Voltage: 120Vac / 60Hz					
Operating Mode	Operating Mode Description					
1 AC Power & Radio link (WLAN), Adapter 1						
Note: Adapter 1, Adapter 2, and Adapter 3 had been pretested and found that the Adapter 1 was the worst case and was selected for final test.						

The Worst Case Mode for Following Conformance Tests					
Tests Item RF Output Power,6dB bandwidth, Power Spectral Density					
Test Condition Conducted measurement at transmit chains					
Modulation Mode 11b,11g, HT20, HT40					
Operating Mode	Operating Mode Description				
1	AC Power & Radio link (WLAN), Adapter 1				

Th	The Worst Case Mode for Following Conformance Tests						
Tests Item	Transmitter Radiated Unwanted Emissions Transmitter Radiated Bandedge Emissions						
Test Condition	Radiated measurement If EUT consist of multiple antenna assembly (multiple antenna are used in EUT regardless of spatial multiplexing MIMO configuration), the radiated test should be performed with highest antenna gain of each antenna type.						
	EUT will be placed in	fixed position.					
User Position	EUT will be placed in mobile position and operating multiple position shall be performed two orthogonal planes. The worst planes is X.						
	EUT will be a hand-held or body-worn battery-powered devices and operating multiple positions. EUT shall be performed two or three orthogonal planes. The worst planes is X.						
Operating Mode	🛛 1. AC Power & Radi	o link (WLAN), Adapter 1					
Modulation Mode	11b, 11g, HT20, HT40						
	X Plane	Y Plane	Z Plane				
Orthogonal Planes of EUT							
Note: Adapter 1, Adapter 2, and Adapter 3 had been pretested and found that the Adapter 1 was the worst case and was selected for final test.							



2.5 Test Setup Diagram





Transmitter Test Result 3

3.1 **AC Power-line Conducted Emissions**

3.1.1 **AC Power-line Conducted Emissions Limit**

AC Power-line Conducted Emissions Limit						
Frequency Emission (MHz) Quasi-Peak Average						
0.15-0.5	66 — 56 *	56 – 46 *				
0.5-5	56	46				
5-30 60 50						
Note 1: * Decreases with the logarithm of the frequency.						

ecreases with the logarithm of the frequency

3.1.2 Measuring Instruments

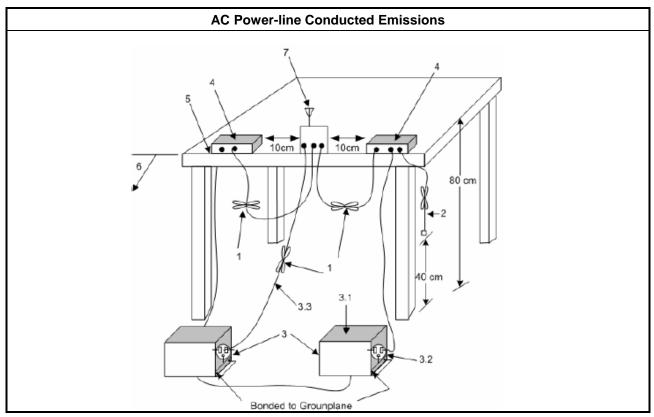
Refer a test equipment and calibration data table in this test report.

3.1.3 **Test Procedures**

Test Method

Refer as ANSI C63.10-2009, clause 6.2 for AC power-line conducted emissions.

3.1.4 Test Setup

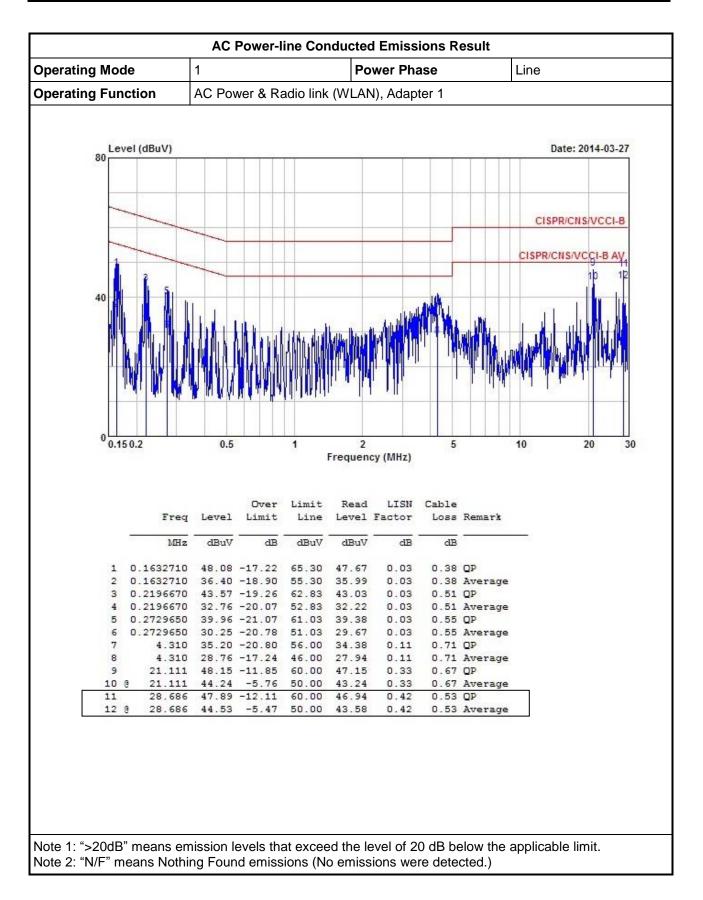




AC Power-line Conducted Emissions Result **Operating Mode** 1 **Power Phase** Neutral **Operating Function** AC Power & Radio link (WLAN), Adapter 1 Level (dBuV) Date: 2014-03-27 80 CISPR/CNS/VCCI-B CISPR/CNS/VCCI-B AV 0.150.2 0.5 2 5 10 20 1 30 Frequency (MHz) Over Limit Read LISN Cable Freq Level Limit Line Level Factor Loss Remark MHz dBuV dB dBuV dBuV dB dB 1 0.1650100 49.25 -15.96 65.21 48.84 0.02 0.39 QP 2 0.1650100 35.74 -19.47 55.21 35.33 0.02 0.39 Average 3 0.2220070 43.97 -18.77 62.74 43.43 0.02 0.52 QP 4 0.2220070 30.67 -22.07 52.74 30.13 0.02 0.52 Average 0.02 0.55 QP 5 0.2771290 39.91 -20.99 60.90 39.34 6 0.2771290 28.32 -22.58 50.90 27.75 0.02 0.55 Average 4.010 30.90 -25.10 56.00 30.11 0.09 0.70 QP 4.010 22.80 -23.20 46.00 22.01 0.09 0.70 Average 7 8 9 21.051 47.54 -12.46 60.00 46.52 0.34 0.68 QP 21.051 42.02 -7.98 50.00 41.00 28.685 46.09 -13.91 60.00 45.13 0.34 0.68 Av 0.43 0.53 QP 10 0.68 Average 11 28.685 41.83 -8.17 50.00 40.87 0.43 0.53 Average 12 Note 1: ">20dB" means emission levels that exceed the level of 20 dB below the applicable limit. Note 2: "N/F" means Nothing Found emissions (No emissions were detected.)

3.1.5 Test Result of AC Power-line Conducted Emissions







3.2 6dB Bandwidth

3.2.1 6dB Bandwidth Limit

6dB Bandwidth Limit

Systems using digital modulation techniques:

 \bigcirc 6 dB bandwidth ≥ 500 kHz.

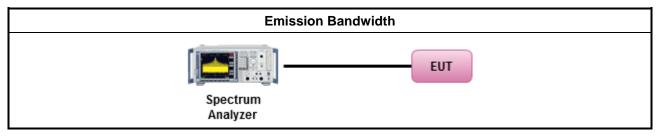
3.2.2 Measuring Instruments

Refer a test equipment and calibration data table in this test report.

3.2.3 Test Procedures

	Test Method								
\square	For	r the emission bandwidth shall be measured using one of the options below:							
	\square	Refe	er as FCC KDB 558074 v03r01, clause 8.1 Option 1 for 6 dB bandwidth measurement.						
		Refe	er as FCC KDB 558074 v03r01, clause 8.2 Option 2 for 6 dB bandwidth measurement.						
		Refe	er as ANSI C63.10, clause 6.9.1 for occupied bandwidth testing.						
\boxtimes	For	cond	ucted measurement.						
		The	EUT supports single transmit chain and measurements performed on this transmit chain.						
		The EUT supports diversity transmitting and the results on transmit chain port 1 is the worst case.							
	\boxtimes	The	EUT supports multiple transmit chains using options given below:						
		Option 1: Multiple transmit chains measurements need to be performed on one of the active transmit chains (antenna outputs). All measurement had be performed on transmit chains 1.							
			Option 2: Multiple transmit chains measurements need to be performed on each transmit chains individually (antenna outputs). All measurement had be performed on all transmit chains.						

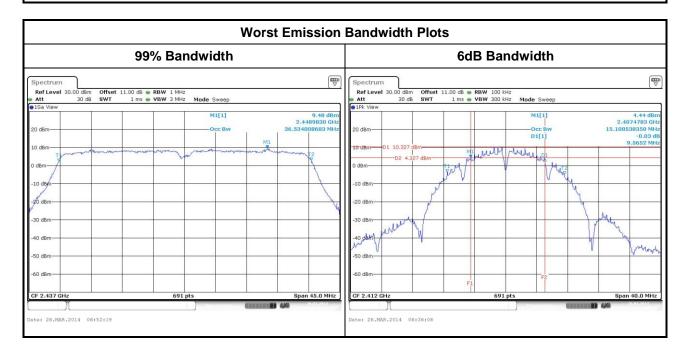
3.2.4 Test Setup





3.2.5 Test Result of Emission Bandwidth

	Emission Bandwidth Result										
Condi	tion		Emission Bandwidth (MHz)								
Medulation		F ree	99% Bandwidth					6dB Bandwidth			
Modulation Mode	N _{TX}	Freq. (MHz)	Chain- Port 1	Chain- Port 2	Chain- Port 3	Chain- Port 4	Chain- Port 1	Chain- Port 2	Chain- Port 3	Chain- Port 4	
11b	2	2412	15.01	15.12			9.57	9.57			
11b	2	2437	15.16	15.23			10.03	9.62			
11b	2	2462	15.16	15.16			10.03	10.09			
11g	2	2412	17.00	16.90			16.35	16.35			
11g	2	2437	17.04	16.93			16.35	16.35			
11g	2	2462	17.00	16.86			16.35	16.35			
HT-20	2	2412	18.09	18.05			17.62	17.57			
HT-20	2	2437	18.20	18.16			17.62	17.57			
HT-20	2	2462	18.09	18.09			17.62	17.62			
HT-40	2	2412	36.27	36.40			35.71	35.59			
HT-40	2	2437	36.34	36.53			35.59	35.59			
HT-40	2	2462	36.27	36.47			35.83	35.59			
Limit			N/A ≥500 kHz								
Resi	Complied										
Note 1: N _{TX} = Nur	Note 1: N_{TX} = Number of Transmit Chains										





3.3 **RF Output Power**

3.3.1 RF Output Power Limit

		RF Output Power Limit
Max	cimu	m Peak Conducted Output Power or Maximum Conducted Output Power Limit
\square	240	0-2483.5 MHz Band:
	\square	If $G_{TX} \le 6 \text{ dBi}$, then $P_{Out} \le 30 \text{ dBm} (1 \text{ W})$
	\square	Point-to-multipoint systems (P2M): If $G_{TX} > 6$ dBi, then $P_{Out} = 30 - (G_{TX} - 6)$ dBm
		Point-to-point systems (P2P): If $G_{TX} > 6 \text{ dBi}$, then $P_{Out} = 30 - (G_{TX} - 6)/3 \text{ dBm}$
		Smart antenna system (SAS):
		Single beam: If $G_{TX} > 6 \text{ dBi}$, then $P_{Out} = 30 - (G_{TX} - 6)/3 \text{ dBm}$
		Overlap beam: If $G_{TX} > 6$ dBi, then $P_{Out} = 30 - (G_{TX} - 6)/3$ dBm
		Aggregate power on all beams: If $G_{TX} > 6 \text{ dBi}$, then $P_{Out} = 30 - (G_{TX} - 6)/3 + 8 \text{dBm}$
e.i.r	.p. P	ower Limit:
\boxtimes	240	0-2483.5 MHz Band
	\square	Point-to-multipoint systems (P2M): $P_{eirp} \le 36 \text{ dBm} (4 \text{ W})$
		Point-to-point systems (P2P): $P_{eirp} \leq MAX(36, [P_{Out} + G_{TX}]) dBm$
		Smart antenna system (SAS)
		Single beam: $P_{eirp} \le MAX(36, P_{Out} + G_{TX}) dBm$
		□ Overlap beam: $P_{eirp} \le MAX(36, P_{Out} + G_{TX}) dBm$
		Aggregate power on all beams: $P_{eirp} \le MAX(36, [P_{Out} + G_{TX} + 8]) dBm$
G _{TX}	= the	aximum peak conducted output power or maximum conducted output power in dBm, e maximum transmitting antenna directional gain in dBi. i.r.p. Power in dBm.

3.3.2 Measuring Instruments

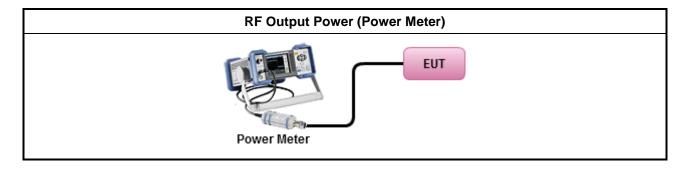
Refer a test equipment and calibration data table in this test report.



3.3.3 Test Procedures

		Test Method						
	Maximum Peak Conducted Output Power							
	□ Refer as FCC KDB 558074 v03r01, clause 9.1.1 (RBW ≥ DTS BW).							
	Refer as FCC KDB 558074 v03r01, clause 9.1.2 (Integrated band power method).							
	\boxtimes	Refer as FCC KDB 558074 v03r01, clause 9.1.3 (Peak power meter)						
\square	Мах	ximum Conducted Output Power						
		Refer as FCC KDB 558074 v03r01, clause 9.2.1.2 Method AVGSA-1 (spectral trace averaging).						
		Refer as FCC KDB 558074 v03r01, clause 9.2.1.3 Method AVGSA-1 Alt. (slow sweep speed)						
		Refer as FCC KDB 558074 v03r01, clause 9.2.1.4 Method AVGSA-2 (spectral trace averaging).						
		Refer as FCC KDB 558074 v03r01, clause 9.2.1.5 Method AVGSA-2 Alt. (slow sweep speed)						
	RF power meter and average over on/off periods with duty factor or gated trigger							
		Refer as FCC KDB 558074 v03r01, clause 9.2.3 Method AVGPM-G (using a gated RF average power meter)						
\boxtimes	For	conducted measurement.						
		The EUT supports single transmit chain and measurements performed on this transmit chain.						
		The EUT supports diversity transmitting and the results on transmit chain port 1 is the worst case.						
		The EUT supports multiple transmit chains using options given below: Refer as FCC KDB 662911, In-band power measurements. Using the measure-and-sum approach, measured all transmit ports individually. Sum the power (in linear power units e.g., mW) of all ports for each individual sample and save them.						
		If multiple transmit chains, EIRP calculation could be following as methods: $P_{total} = P_1 + P_2 + + P_n$ (calculated in linear unit [mW] and transfer to log unit [dBm]) EIRP _{total} = P _{total} + DG						

3.3.4 Test Setup





3.3.5 Directional Gain for Power Measurement

Directional Gain (DG) Result						
Transmit Chains No.		1	2	-	-	
Maximum G _{ANT} (dBi)		0	0	-	-	
Modulation Mode	DG (dBi)	Ν _{τχ}	N _{ss}	STBC	Array Gain (dB)	
11b,1-11Mbps	0	2	1	-	-	
11g,6-54Mbps	0	2	1	-	-	
HT-20,M0-M15	0	2	1	-	-	
HT-40,M0-M15	0	2	1	-	-	
Note 1: For CDD transmissions, directional gain is calculated as power measurements: Directional Gain (DG) = G _{ANT} + Array Gain, where Array Gain is as follows: Array Gain = 0 dB (i.e., no array gain) for N _{TX} ≤ 4; Array Gain = 0 dB (i.e., no array gain) for channel widths ≥ 40 MHz for any N _{TX} ;						



Maximum Conducted (Average) Output Power											
Condi	Condition				RF Output Power (dBm)						
Modulation Mode	Ντχ	Freq. (MHz)	Chain Port 1	Chain Port 2	Chain Port 3	Chain Port 4	Sum Chain	Power Limit	DG (dBi)	EIRP Power	EIRP Limit
11b	2	2412	19.71	19.12	-	-	22.44	30.00	0	22.44	36.00
11b	2	2437	20.31	20.34	-	-	23.34	30.00	0	23.34	36.00
11b	2	2462	20.13	20.47	-	-	23.31	30.00	0	23.31	36.00
11g	2	2412	14.85	14.89	-	-	17.88	30.00	0	17.88	36.00
11g	2	2437	18.74	18.91	-	-	21.84	30.00	0	21.84	36.00
11g	2	2462	13.63	13.71	-	-	16.68	30.00	0	16.68	36.00
HT-20	2	2412	13.92	13.94	-	-	16.94	30.00	0	16.94	36.00
HT-20	2	2437	19.01	19.03	-	-	22.03	30.00	0	22.03	36.00
HT-20	2	2462	12.81	12.88	-	-	15.86	30.00	0	15.86	36.00
HT-40	2	2422	10.84	10.93	-	-	13.90	30.00	0	13.90	36.00
HT-40	2	2437	14.99	15.23	-	-	18.12	30.00	0	18.12	36.00
HT-40	2	2452	10.15	10.22	-	-	13.20	30.00	0	13.20	36.00
Res	Result					C	Complie	d			

3.3.6 Test Result of Maximum Conducted Output Power



3.4 **Power Spectral Density**

3.4.1 Power Spectral Density Limit

Power Spectral	Density Limit
----------------	----------------------

Power Spectral Density (PSD) \leq 8 dBm/3kHz

3.4.2 Measuring Instruments

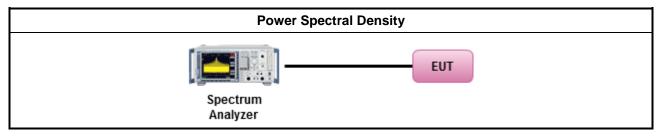
Refer a test equipment and calibration data table in this test report.

3.4.3 Test Procedures

			Test Method						
	\square	er as FCC KDB 558074 v03r01, clause 10.2 Method PKPSD (RBW=30kHz; detector=peak)							
	er as FCC KDB 558074 v03r01, clause 10.3 Method AVGPSD-1 (spectral trace averaging).								
		er as FCC KDB 558074 v03r01, clause 10.4 Method AVGPSD-1 Alt. (slow sweep speed)							
		Ref	er as FCC KDB 558074 v03r01, clause 10.5 Method AVGPSD-2 (spectral trace averaging).						
		Ref	er as FCC KDB 558074 v03r01, clause 10.6 Method AVGPSD-2 Alt. (slow sweep speed)						
\square	For	cond	ucted measurement.						
The EUT supports single transmit chain and measurements performed on this transm									
		The	EUT supports diversity transmitting and the results on transmit chain port 1 is the worst case.						
	\square	The	EUT supports multiple transmit chains using options given below:						
			Option 1: Measure and sum the spectra across the outputs. Refer as FCC KDB 662911, In-band power spectral density (PSD). Sample all transmit ports simultaneously using a spectrum analyzer for each transmit port. Where the trace bin-by-bin of each transmit port summing can be performed. (i.e., in the first spectral bin of output 1 is summed with that in the first spectral bin of output 2 and that from the first spectral bin of output 3, and so on up to the N _{TX} output to obtain the value for the first frequency bin of the summed spectrum.). Add up the amplitude (power) values for the different transmit chains and use this as the new data trace.						
			Option 2: Measure and add 10 $\log(N)$ dB, where N is the number of transmit chains. Refer as FCC KDB 662911, In-band power spectral density (PSD). Performed at each transmit chains and each transmit chains shall be compared with the limit have been reduced with 10 $\log(N)$. Or each transmit chains shall be add 10 $\log(N)$ to compared with the limit.						



3.4.4 Test Setup

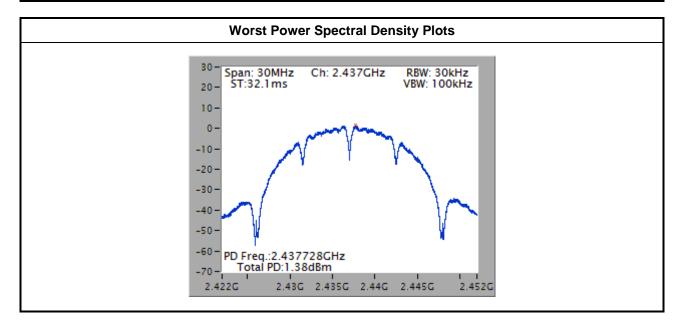


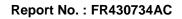


Power Spectral Density Result								
Cond	ition		Power Spectral Density (dBm/30kHz)					
Modulation Mode	Ντχ	Freq. (MHz)	Sum Chain	Power Limit				
11b	2	2412	-0.02	8				
11b	2	2437	1.38	8				
11b	2	2462	1.08	8				
11g	2	2412	-6.87	8				
11g	2	2437	-2.57	8				
11g	2	2462	-7.94	8				
HT-20	2	2412	-7.90	8				
HT-20	2	2437	-3.06	8				
HT-20	2	2462	-9.32	8				
HT-40	2	2422	-12.66	8				
HT-40 2 2		2437	-8.58	8				
HT-40	2	2452	-13.74	8				
Res	ult	•	Compl	ied				

3.4.5 Test Result of Power Spectral Density

Note 1: PSD = sum each transmit chains by bin-to-bin PSD







3.5 Emissions in non-restricted frequency bands

3.5.1 Emissions in non-restricted frequency bands limit

Peak power in any 100 kHz bandwidth outside of the authorized frequency band shall be attenuated by at least 30 dB relative to the maximum in-band peak PSD level in 100 kHz

3.5.2 Measuring Instruments

Refer a test equipment and calibration data table in this test report.

3.5.3 Test Procedures

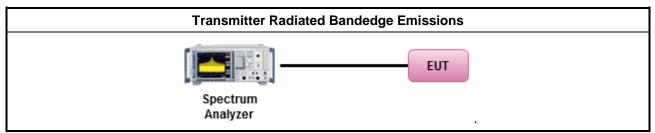
Reference level measurement

- 1. Set RBW=100kHz, VBW = 300kHz , Detector = Peak, Sweep time = Auto
- 2. Trace = max hold , Allow Trace to fully stabilize
- 3. Use the peak marker function to determine the maximum PSD level

Emission level measurement

- 1. Set RBW=100kHz, VBW = 300kHz , Detector = Peak, Sweep time = Auto
- 2. Trace = max hold , Allow Trace to fully stabilize
- 3. Scan Frequency range is up to 25GHz
- 4. Use the peak marker function to determine the maximum amplitude level

3.5.4 Test Setup

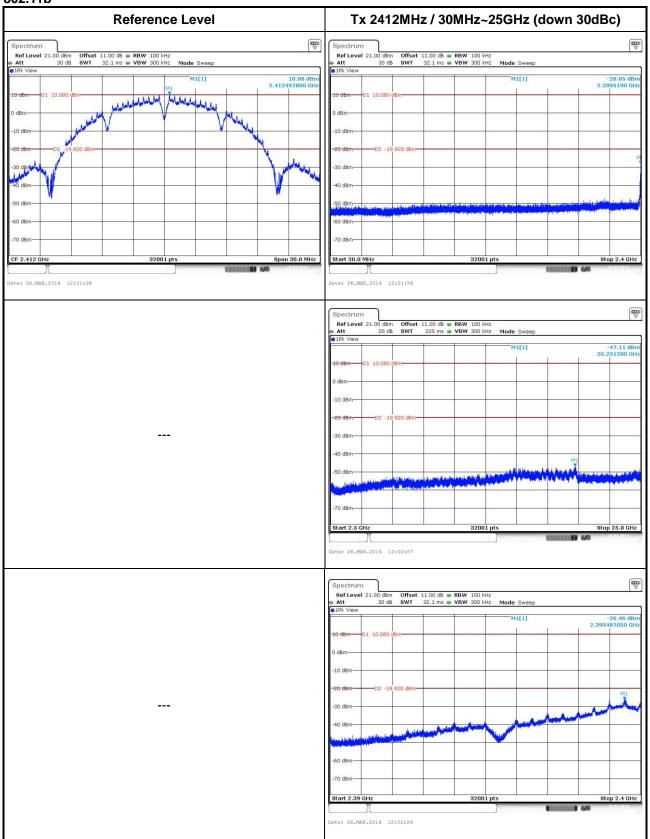


3.5.5 Test Result of Emissions in non-restricted frequency bands

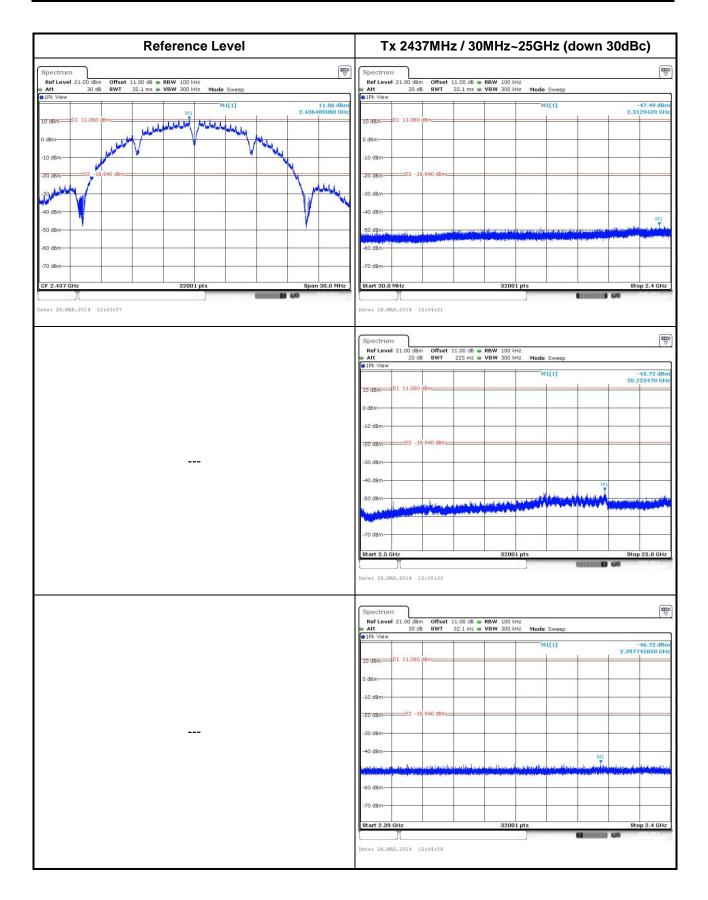
This test item is performed on each TX output individually without summing or adding 10 $\log(N_{ANT})$ since measurements are made relative to the in-band emissions on the individual outputs. Only worst test result of each operating mode is presented.



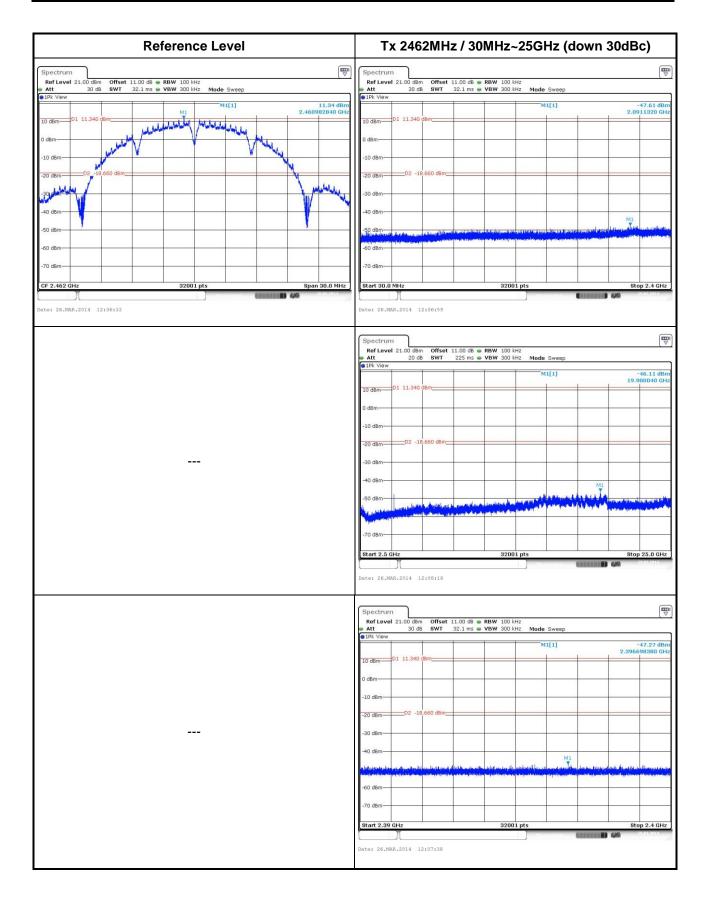
802.11b







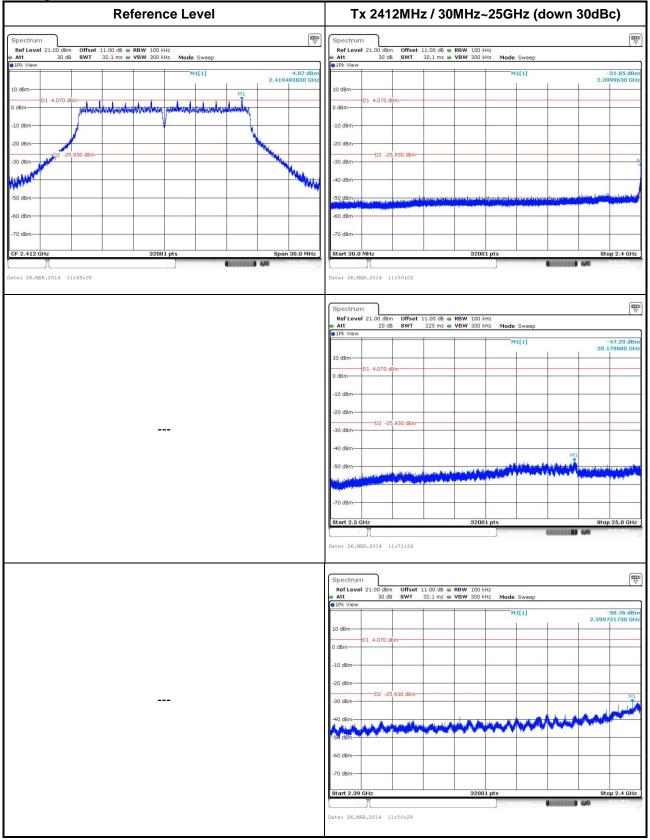






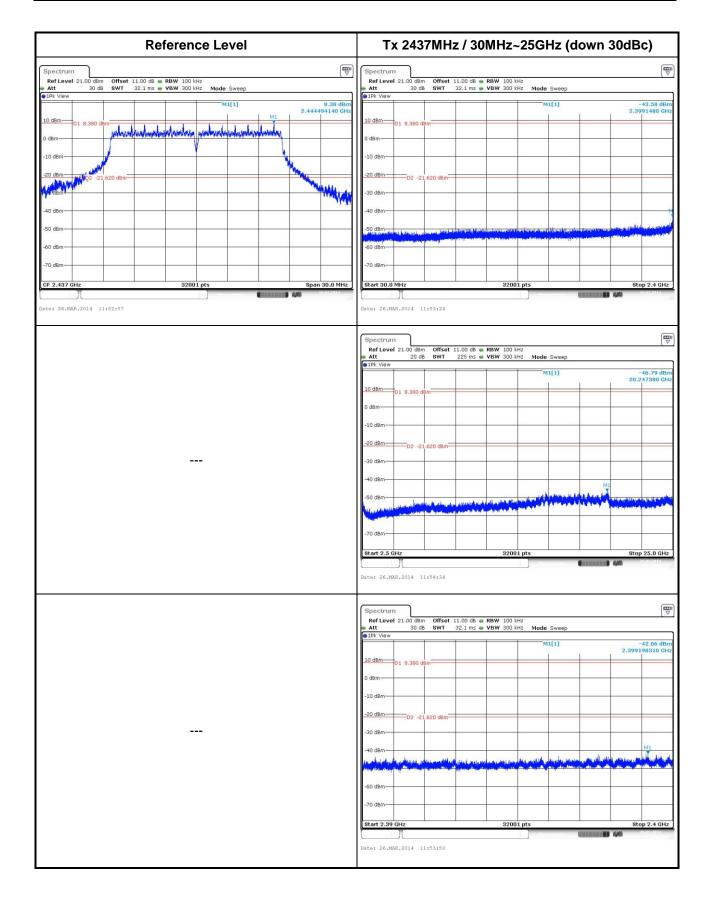
Report No. : FR430734AC

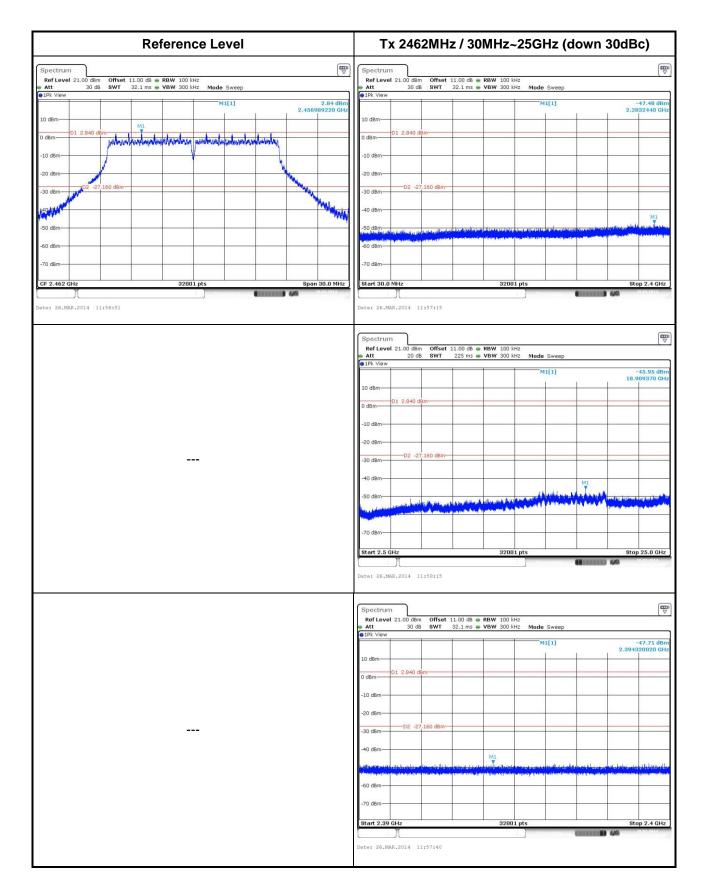
802.11g







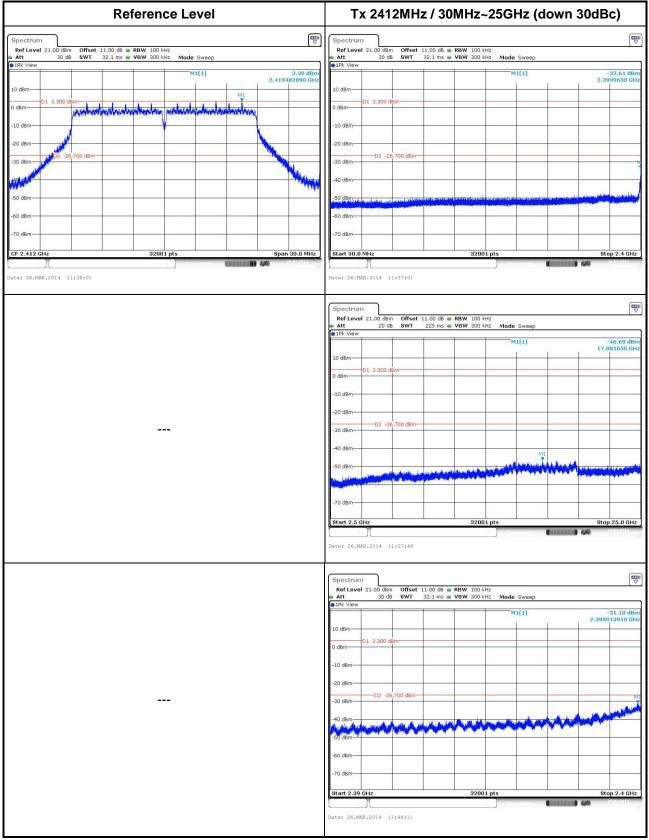






Report No. : FR430734AC

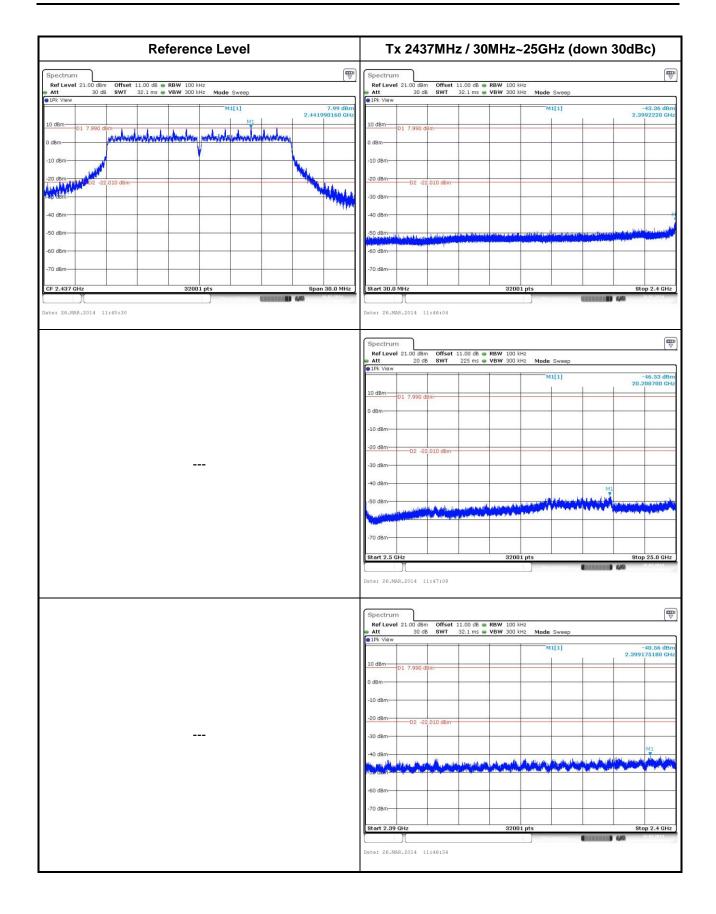
802.11n HT20



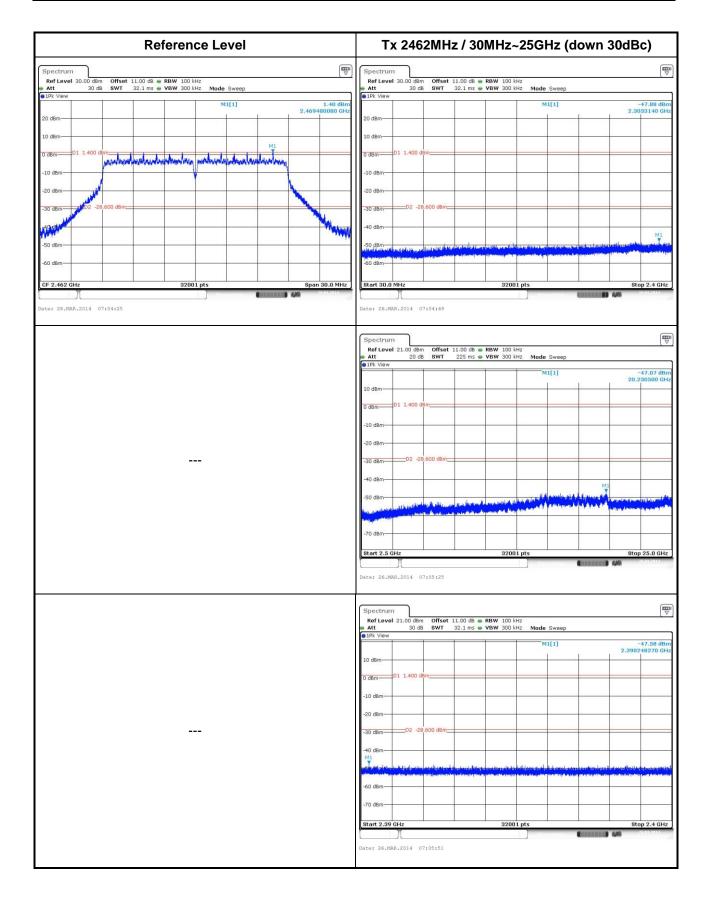
FCC Test Report

SPORTON LAB.





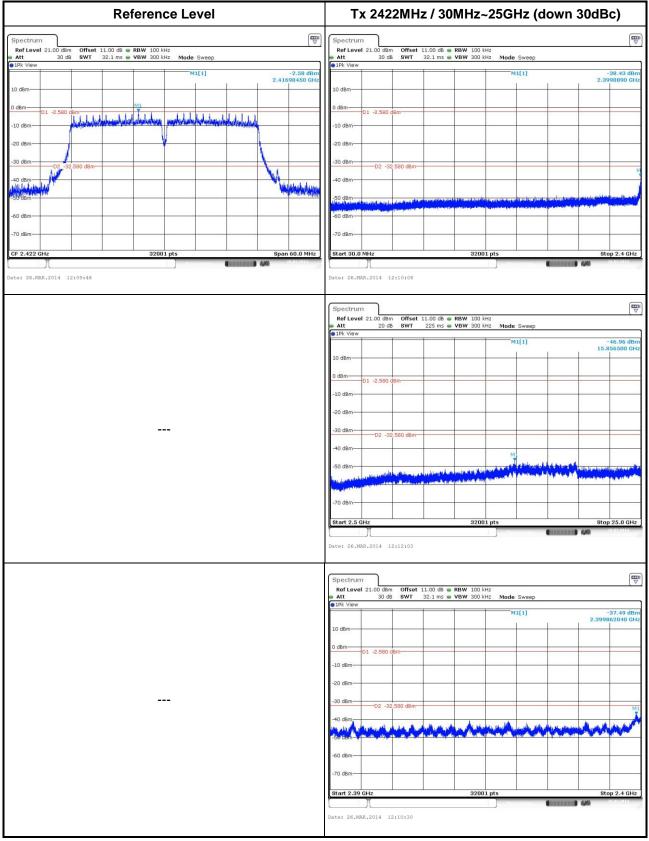




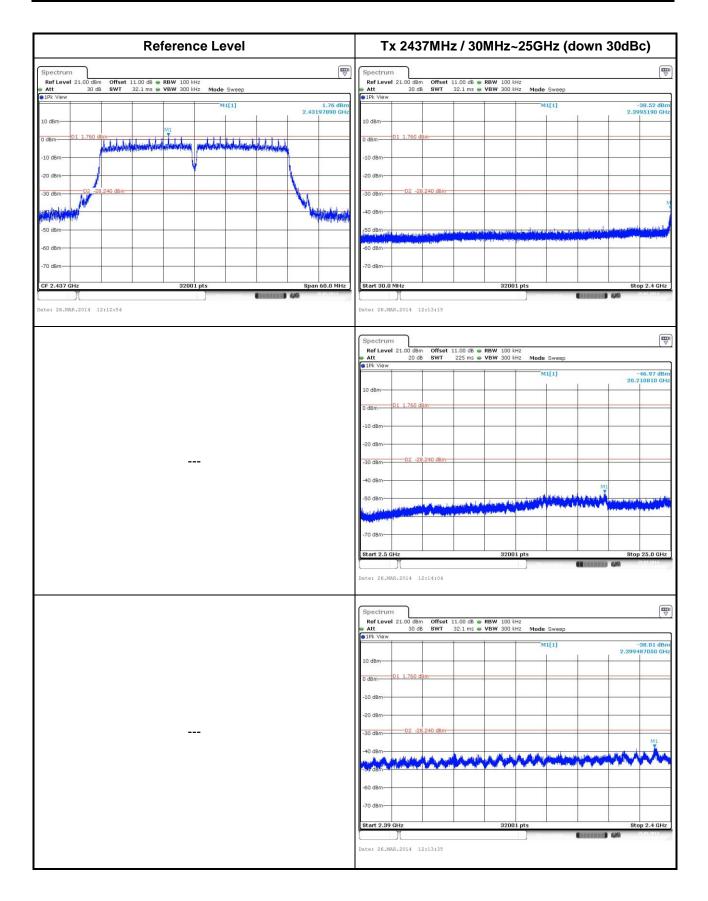


Report No. : FR430734AC

802.11n HT40

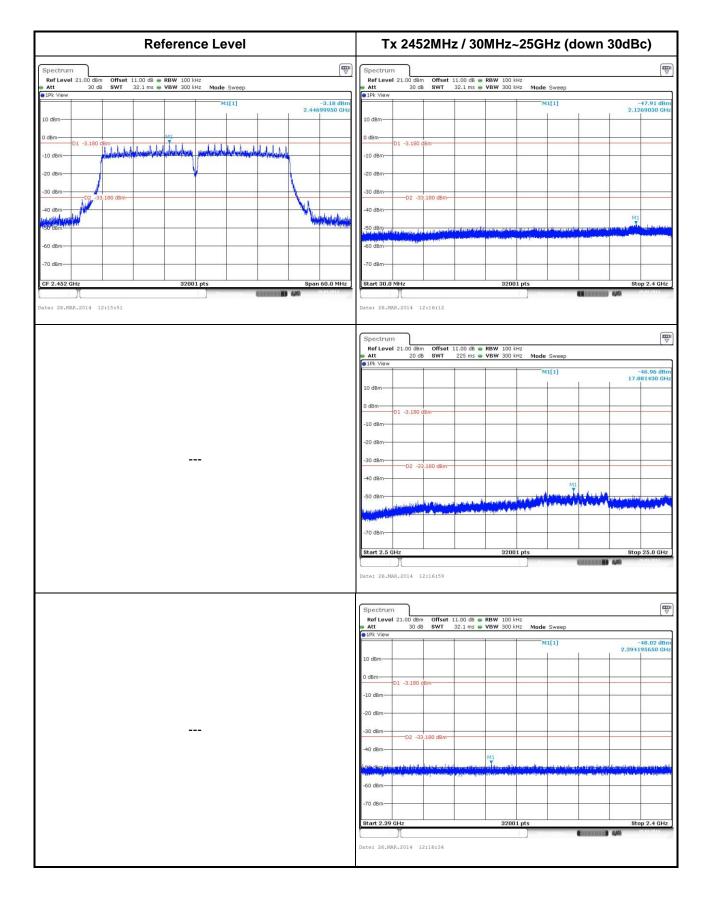














3.6 Transmitter Radiated Unwanted Emissions

3.6.1 Transmitter Radiated Unwanted Emissions Limit

	Restricted Band	Emissions Limit	
Frequency Range (MHz)	Field Strength (uV/m)	Field Strength (dBuV/m)	Measure Distance (m)
0.009~0.490	2400/F(kHz)	48.5 - 13.8	300
0.490~1.705	24000/F(kHz)	33.8 - 23	30
1.705~30.0	30	29	30
30~88	100	40	3
88~216	150	43.5	3
216~960	200	46	3
Above 960	500	54	3

Note 1: Test distance for frequencies at or above 30 MHz, measurements may be performed at a distance other than the limit distance provided they are not performed in the near field and the emissions to be measured can be detected by the measurement equipment. When performing measurements at a distance other than that specified, the results shall be extrapolated to the specified distance using an extrapolation factor of 20 dB/decade (inverse of linear distance for field-strength measurements, inverse of linear distance-squared for power-density measurements).

Note 2: Test distance for frequencies at below 30 MHz, measurements may be performed at a distance closer than the EUT limit distance; however, an attempt should be made to avoid making measurements in the near field. When performing measurements below 30 MHz at a closer distance than the limit distance, the results shall be extrapolated to the specified distance by either making measurements at a minimum of two or more distances on at least one radial to determine the proper extrapolation factor or by using the square of an inverse linear distance extrapolation factor (40 dB/decade). The test report shall specify the extrapolation method used to determine compliance of the EUT.

Un-restricted Ban	d Emissions Limit
RF output power procedure	Limit (dB)
Peak output power procedure	20
Average output power procedure	30
	n the peak conducted output power measured within band shall be attenuated by at least 20 dB relative to vel.

Note 2: If the average output power procedure is used to measure the fundamental emission power to demonstrate compliance to requirements, then the power in any 100 kHz outside of the authorized frequency band shall be attenuated by at least 30 dB relative to the maximum measured in-band average PSD level.

3.6.2 Measuring Instruments

Refer a test equipment and calibration data table in this test report.



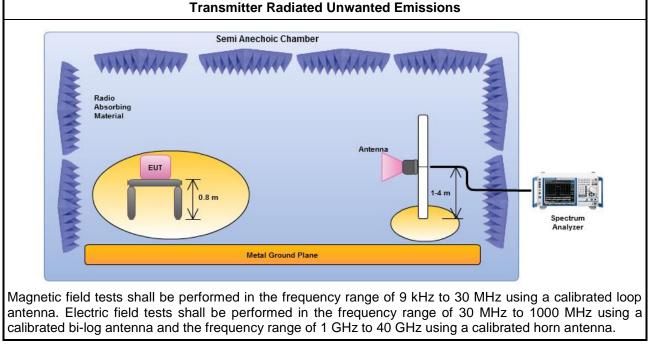
3.6.3 Test Procedures

			Test Method
	perfe equi extra dista	orme ipmei apola ance	ments may be performed at a distance other than the limit distance provided they are not d in the near field and the emissions to be measured can be detected by the measurement nt. When performing measurements at a distance other than that specified, the results shall be ted to the specified distance using an extrapolation factor of 20 dB/decade (inverse of linear for field-strength measurements, inverse of linear distance-squared for power-density ments).
\square	For	the tr	ansmitter unwanted emissions shall be measured using following options below:
	\square	Refe	er as FCC KDB 558074 v03r01, clause 11 for unwanted emissions into non-restricted bands.
	\square	Refe	er as FCC KDB 558074 v03r01, clause 12 for unwanted emissions into restricted bands.
			Refer as FCC KDB 558074 v03r01, clause 12.2.5.1 Option 1 (trace averaging for duty cycle ≥98%)
			Refer as FCC KDB 558074 v03r01, clause 12.2.5.2 Option 2 (trace averaging + duty factor).
		\boxtimes	Refer as FCC KDB 558074 v03r01, clause 12.2.5.3 Option 3 (Reduced VBW≥1/T).
			Refer as ANSI C63.10, clause 4.2.3.2.3 (Reduced VBW). VBW ≥ 1/T, where T is pulse time
			Refer as ANSI C63.10, clause 4.2.3.2.4 average value of pulsed emissions.
		\boxtimes	Refer as FCC KDB 558074 v03r01, clause 11.3 and 12.2.4 measurement procedure peak limit.
		\square	Refer as FCC KDB 558074 v03r01, clause 12.2.3 measurement procedure Quasi-Peak limit.
\boxtimes	For	radia	ted measurement, refer as FCC KDB 558074 v03r01, clause 12.2.7
	\square	Refe	er as ANSI C63.10, clause 6.4 for radiated emissions from below 30 MHz.
	\boxtimes	Refe	er as ANSI C63.10, clause 6.5 for radiated emissions from 30 MHz to 1000 MHz.
	\bowtie	Ref	er as ANSI C63.10, clause 6.6 for radiated emissions from above 1 GHz.

	Test Method
For	conducted and cabinet radiation measurement, refer as FCC KDB 558074 v03r01, clause 10.2.2
	For conducted unwanted emissions into non-restricted bands (relative emission limits). Devices with multiple transmit chains: Refer as FCC KDB 662911, when testing out-of-band and spurious emissions against relative emission limits, tests may be performed on each output individually without summing or adding 10 log(N) if the measurements are made relative to the in-band emissions on the individual outputs.
	For conducted unwanted emissions into restricted bands (absolute emission limits). Devices with multiple transmit chains using options given below: (1) Measure and sum the spectra across the outputs or (2) Measure and add 10 log(N) dB



3.6.4 Test Setup



Note: Test distance is 3m.

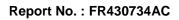
3.6.5 Transmitter Radiated Unwanted Emissions (Below 30MHz)

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



Modulation Mode		11b			Test	t Freq. (I	MHz)		2437		
Polarization		Н									
97 Level (o	lBuV/m)									Date: 20	14-03-11
87.3											
77.6											
67.9											
58.2										FCC C	LASS-B
48.5											
38.8	1				ĭ						
29.1							4	5 (5		
19.4											
9.7											
030 1	00.	200.	300.	400.	500.	600.	7/	00.	800.	900.	1000
50 1	00.	200.	500.		Frequenc			<i>.</i>	000.	900.	1000
			0ver		Read	Antenna	Cable	Preamp	A/Pos	T/Pos	
	Freq	Level	Limit	Line	Level	Factor	Loss	Factor			Remark
	 MLI	dD: 1/ /m		dD: 1/ /m		dD /m					
1	MHz 125.0	dBuV/m	dB 8 87	dBuV/m 43.50	авиv 53.30	dB/m 12.26	dB Ø 73	dB 31.66	Cm	deg	
2		9 42.90		46.00	60.87			31.51			Peak
3		5 42.83		46.00	54.52			31.41	148	185	QP
4		8 29.24			38.54			31.42			Peak
5		1 30.59			37.99			31.39			Peak
6	780.7	8 30.55	-15.45	46.00	37.51	22.47	1.94	31.37			Peak

3.6.6 Transmitter Radiated Unwanted Emissions (Below 1GHz)





Modulation Mode		11b			Tes	Freq. (MHz)		2437		
Polarization		V			•						
										D-4 204	
97 Level (dBuV/m)							1		Date: 20	14-03-11
87.3									_		
77.6											
67.9											
58.2									_	FCC C	LASS-B
48.5	_										
38.8	123	4									
29.1	_						6				
19.4	_										
9.7											
0 <mark></mark>	100.	200.	300.	400.	500.	600.	. 7	D 0.	800.	900.	1000
					Frequenc						
	-		0ver			Antenna				T/Pos	
	Freq	Level	Limit	Line		Factor		Factor			Remark
	MHz	dBuV/m	dB	dBuV/m			dB	dB	cm	deg	
1		8 36.90						31.80	100		QP
2	101.7	8 38.13	-5.37	43.50	59.49	9.67	0.66	31.69			Peak
3		6 36.05				12.26		31.66			Peak
4		9 36.49		46.00	54.46			31.51			Peak
5		5 42.91 8 26.26				18.21		31.41 31.42			Peak
0	025.5	0 20.20	-19.74	40.00	55.50	20.40	1.72	51.42			Peak
Note 1: ">20dB" me	ans spi	irious em	ission le	evels that	t excee	d the lev	vel of 2	0 dB be	low the	applic	able lin
Note 2: "N/F" means											
Note 3: Measureme											



Modulatio	n Mo	de		11	b				Test	Freq	. (N	/Hz)		2412				
N _{TX}				2					Pola	rizati	on			Н				
	L	evel	(dBuV/m))											Date:	2014	-03-25	
	72.0														FC	C CLA	SS-B	
	64.0		_															
	56.0		4	6										FCC	CLA	SS-B	(AVG)	
	48.0			Ĵ														
	40.0																	
	32.0																	
	24.0																	
	16.0																	
	8.0																	
	~1	000	400	0.	6000.	8000.	10	000.	12000. Frequency	14000. / (MHz)		6000. 1	8000.	20000. 2	22000		25000	
						0ver	L	imit	Read	Anter	nna	Cable	Pream	A/Pos	T/P	os		
			Free	9	Level	Limi			Level								Remark	
																		-
			MHz		dBuV/m	dB			dBuV	dB/n		dB	dB	cm		eg		
	1				43.60				46.49 55.90	27.1			34.64 34.64				Average Peak	2
	2				52.13			4.00 4.00		27.2			34.63				verage	
	4								62.40				34.63				Peak	-
	5								46.30				33.17			- 4	Average	2
	6		4824.0	90	53.94	-20.0	6 74	4.00	48.85	31.5	52	6.74	33.17			- F	Peak	
											-							
lote 1: ">2			•														ble lim	it.
lote 2: "N/														vere de	tecte	ed.)		
lote 3: Me														field at	0.00	<u>ام</u>		
ote 4: Fo																		sure
	n the dition		ak-Dete	ecto	n meet	s me A	۹۸-۲I	init S	so that th	e AV	iev		s not ne	eed to b	e re	port	ea in	
adi		•																
lote 5: Fo	r 1 1 m	~~+~	intod h	on	to unit	nntad	omin	- ni - r		o otte	<u></u>	atad h	v at las	Not 20 4	D ro	lativ /	o to th	<u> </u>

3.6.7 Transmitter Radiated Unwanted Emissions (Above 1GHz) for 11b



Modulation I	lode		11b				Tes	t Freq. (MHz)		2412		
N _{TX}			2				Pola	arization	1		V		
	Lava	(dDu)((m)										Date: 201	14 03 25
8		(dBuV/m)											LASS-B
72	.0												
64	.0	4											
56	.0		-6								FCC	CLASS-	B (AVG)
48	.0	7	-										
40	.0	1							_		_		
32	.0		_						_		_		
24	.0		_										
16	.0		_										
	.0												
-													
	⁰ 1000	400	0. 60	00.	8000.	10000.	12000. Frequenc	14000. 1 v (MHz)	6000. 1	8000. 2	20000. 2	22000.	25000
					0ver	Limit		Antenna	Cable	Preamo	A/Pos	T/Pos	
		Freq	Lev	vel				Factor				17105	Remark
		MHz	dBu	V/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
	1							27.17		34.64			Average
	2							27.17		34.64			
	3							27.20		34.63			Average
	4							27.20		34.63			
	5 6							31.52 31.52		33.17 33.17			
	0	4024.0	0 51	.09	-22.51	74.00	40.00	51.52	0.74	55.17			Peak
Note 1: ">20c	lB" me	eans spi	urious	emi	ssion le	evels that	at excee	d the lev	el of 20	0 dB be	olow the	e applic	able limi
Note 2: "N/F"													
Note 3: Meas													,
Note 4: For re											field str	ength	as meas
								ne AV lev					
additi	UII.												
additi Note 5: For u		ricted ba	ands.	unw	anted e	missior	is shall I	be atteni	uated b	v at lea	st 30 d	B relati	ive to the



Modulation M	ode		11b				Tes	t Freq. (MHz)		2437		
N _{TX}			2				Pola	arization			Н		
80	Level	(dBuV/m)										Date: 201	
72.0												FLU	LASS-B
64.0					_								
56.0		2	4		6 5						FCC	CLASS-	B (AVG)
48.0					I								
40.0													
32.0													
24.0													
16.0													
8.0													
(1000	400	D. 60	00.	8000.	10000.			6000. 1	8000. 2	20000.	22000.	25000
							Frequenc	y (MHz)					
					0ver			Antenna				T/Pos	
		Freq	Lev	/el	Limit	Line	Level	Factor	Loss	Factor	•		Remark
		MHz	dBuV		dB		dBuV	dB/m	dB	dB		deg	
1								27.21		34.63			Average
4						74.00 54.00				34.63 33.15			
-						74.00				33.15			[•]
						54.00				34.52			
-								36.28		34.52			Peak
Note 1: ">20dE	3" me	ans sp	irious	emis	ssion le	evels the	at excee	d the lev	el of 2	0 dB be	low the	e applic	able lim
Note 2: "N/F" r													
Note 3: Measu													,
Note 4: For res											field stu	renath :	as meas
								ne AV lev					
additio				6613			o nat li			SHOULE		le leho	
Note 5: For un		rictad by	ande i	IDW	antad a	mission	e chall	na attor	iatad h	v at loo	et 20 4	R relati	ive to the
		neasure				1112210[IS SIIdli		שמופט מ	y at lea	isi 30 û	reiali	



N _{TX}	80 72.0 64.0 56.0 48.0	evel	(dBuV/m	2				Del						
	72.0 64.0 56.0	evel	(dBuV/m)				Pola	arization	1		V		
	72.0 64.0 56.0	evel	(dBuV/m)									Data: 204	4 03 25
	64.0 56.0												Date: 201	4-03-25 A\$S-B
	56.0													A33-D
						6								
	48.0	:	2	4		\$						FCC	CLASS-	B (AVG)
				3		I								
	40.0													
	32.0													
	24.0													
	16.0													
	8.0													
	0	000	400)0.	6000.	8000.	10000.			6000. 1	8000. 2	20000. 2	2000.	25000
								Frequenc	y (MHz)					
						0ver			Antenna				T/Pos	
			Free	9	Level	Limit	Line	Level	Factor	Loss	Factor			Remark
	4		MHz		BuV/m	dB	dBuV/m		dB/m	dB	dB	cm	deg	A
	1						54.00 74.00				34.63 34.63			Average Peak
	3						54.00				33.15			Average
	4						74.00				33.15			Peak
	5						54.00				34.52			
	6								36.28		34.52			Peak
Note 1: "	>20dB'	' me	ans sp	urio	ous emi	ission le	evels that	at excee	ed the lev	el of 2) dB be	low the	applic	able limi
Note 2: "														
Note 3: N												5.5 40		,
Note 4: F												field str	enath :	as meas
									ne AV lev					
	ddition					c 11071							5 1500	
Note 5: F			icted h	and	ls unw	anted e	mission	s shall	he atteni	lated h	v at lea	st 30 d	R relati	ve to the
					n-band		10300	o onail			y at lea	51 50 u	l'isiali	



Modulation M	ode		11b				Tes	t Freq. (I	MHz)		2462		
N _{TX}			2				Pola	arization			Н		
	Lovol	(dDu\//m)										Date: 201	4-03-24
80	Lever	(dBuV/m)											ASS-B
72.0													
64.0		2			6								
56.0			4		š						FCC	CLASS-	B (AVG)
48.0													
40.0											_		
32.0					_						_		
24.0													
16.0													
8.0													
	1000	400	0. 60	00.	8000.	10000.	12000. Frequenc		6000. 1	8000. 2	0000.	22000.	25000
					_					_			
		-			0ver			Antenna				T/Pos	
		Freq	Lev	/e1	Limit	Line		Factor		Factor			Remark
		MHz	dBu\	//m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1							54.58			34.59		-	Average
2							64.74			34.59			Peak
3							46.09			33.13			Average
4	Ļ	4924.0	0 54.	38	-19.62	74.00	49.10	31.68		33.13			Peak
5		7386.0	0 51.	03	-2.97	54.00	40.19	36.45	9.01	34.62			Average
6		7386.0	0 57.	62	-16.38	74.00	46.78	36.45	9.01	34.62			Peak
)" mo		riouo		ooion la	wala th	ot over	d the lev	ial of D		low the	onnlia	ahla lim
Note 1: ">20dE													
Note 2: "N/F" r											ere de	ieciea.)
Note 3: Measu											field of	onath .	20 0000
Note 4: For res								ne AV lev					
additio				eets	s the AV		รูง และ เ	IE AV IEV		s not ne		e ieho	neu In
Note 5: For un	rootr	ictad h	anda	1014/	anted a	mission	he chall	ha attani	inted h	v at loa	ct 20 4	B rolati	vo to th



Modulation	Mode		11b				Tes	t Freq. (MHz)		2462		
N _{TX}			2				Pola	arization)		V		
	Lauc	(dDu)//m)										Date: 201	14.03.24
	80	(dBuV/m)											LASS-B
7	2.0												
64	4.0	2		6					_		_		
5	6. 0	Ĩ.	4	š							FCC	CLASS-	B (AVG)
4	B.O	_	3										
4	0.0								_				
3	2.0	-			_								
2	4.0								_				
	6.0				_				_				
	B.0	_											
	0 <mark>1000</mark>	400	0. 600	J. {	3000.	10000.	12000. Frequenc		6000. 1	8000. 2	0000.	22000.	25000
				C)ver	Limit	Read	Antenna	Cable	Preamp	A/Pos	T/Pos	
		Freq	Leve	el L	.imit			Factor					Remark
		MHz	dBuV,		dB	-	dBuV		dB	dB		deg	
	1 2							27.46 27.46		34.59			Average Peak
	2							31.68		33.13			
	4							31.68		33.13			Ŭ
	5							36.45		34.62			Average
	6							36.45					Peak
Note 1: ">20	dB" me	eans spi	urious e	miss	sion le	evels that	at excee	ed the lev	el of 2	0 dB be	low the	e applic	able limi
Note 2: "N/F'													
Note 3: Meas													-
											field str	rength	as meas
								he AV lev					
Note 4: For r	the Pe	ak-Dete	сюг тте										
Note 4: For r		ak-Dete	CIOT ME										
Note 4: For r with	ion.												



Modulation	M	ode		1	1g			Tes	t Freq. (MHz)		2412		
N _{TX}				2	-				arization			н		
												1		
	447	Level	(dBuV/r	n)									Date: 20	14-03-10
	05.3													
	93.6													
	93.0 81.9													
	70.2		4										FCC C	LASS-B
		2			6							FCC		D (AVC)
	58.5	Ĩ	3		5							FCC	CLASS	-B (AVG)
	46.8													
	35.1													
	23.4													
	11.7			+								_		
	0	1000	40	000.	6000.	8000.	10000.	12000.	14000. 1	6000. 1	8000. 2	20000. 2	22000.	25000
								Frequenc						
						0ver	Limit	Read	Antenna	Cable	Preamp	A/Pos	T/Pos	
			Fre	₽q	Level	Limit			Factor					Remark
			MH:		dBuV/m			dBuV		dB	dB		deg	·
	1					-12.96					35.72			Average
	2					-19.34					35.72			Peak
	3				52.82 68.73	-1.18	54.00 74.00	55.64 71.55			34.63 34.63			Average Peak
	5				48.03				31.52		33.17			Average
	6								31.52		33.17			Peak
			1021		02.07		/	57110	51152					- Cuit
Note 1: ">20)dB	" me	ans s	pur	ious em	ission le	evels that	at excee	d the lev	el of 2	0 dB be	low the	e applie	cable limit
Note 2: "N/F														
Note 3: Mea														,
Note 4: For												field str	ength	as measu
									ne AV lev					
add						-							- 1	
		root	ا مدما	مر م		مامى مە				المعلمية				the second second
Note 5: For	un-	resu	icted	par	nas, unv	vanted e	emissior	is snaii i	be attent	Jated D	y at lea	st 30 a	B relat	live to the

3.6.8 Transmitter Radiated Unwanted Emissions (Above 1GHz) for 11g





Modulation	Mode		11g				Tes	t Freq. (MHz)		2412		
Ν _{τχ}			2				Pola	rization	1		V		
	Level	l (dBuV/m)										Date: 201	14-03-10
		(abavini)	,										
10	5.3												
9	3.6											_	
8	.9											FCC C	LA\$S-B
7).2	4											
5	3.5 2	3	6						_		FCC	CLASS-	B (AVG)
4	i.8		-5						_				
3	5.1												
2	3.4												
1	.7												
	0 <mark>1000</mark>	400	0 0	000.	8000.	10000.	12000.	14000. 1	6000. 1	8000. 2	20000. 2	2000	25000
	1000	400	0. 0	000.	8000.	10000.	Frequenc		0000. 1	10000. 2		2000.	23000
					0ver	limit	Read	Antenna	Cable	Preamp	A/Pos	T/Pos	
		Free	a Le	vel		Line		Factor			-	.,	Remark
		MHz	dBu	V/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
	1					54.00				35.72			Average
	2					74.00				35.72			Peak
	3					54.00				34.63			Average
	4 5					74.00 54.00		27.21 31.52		34.63			
	6							31.52		33.17 33.17			Average Peak
	•	4024.0			10.24	/4.00	50.07	51.52	0.74	55.17			I Cuk
								1.1.1					
Note 1: ">20													
Note 2: "N/F'											ere de	ected.)
Note 3: Meas											field - t	-الاسمام	
Note 4: For r													
		ak-Dete	ector r	neet	s the Al	/-∟imit s	o that th	ne AV lev	vei does	s not ne	ed to b	e repo	rted in
addit	-	rioto d L	ondo		optod -	mincian			unted b	v ot los	ot 20 -	Drolat	ivo to th
Note 5: For u		ricted b				mission	is shall l	be attent	uated D	y at lea	51 30 C	o relat	
			-u III-l										



N _{TX}						t Freq. (,		2437		
		2			Pola	arization	1		Н		
)ato: 204	4-03-10
117	l (dBuV/m)									Jale. 20	14-03-10
105.3											
93.6										_	
81.9							_			ECC CI	LASS-B
70.2	2	6	8							ruu u	LA33-D
58.5	Ĩ	ĭ –	-i						FCC	CLASS-	
46.8	1	5							100	CLA33-	
35.1											
23.4											
11.7								_			
0 <mark>1000</mark>) 4000	6000.	8000.		12000.		6000. 1	8000. 2	20000. 2	2000.	25000
					Frequenc					T (D	
	Freq	l eve]	Over limit	Limit Line		Antenna Factor				T/Pos	Remark
	MHz	dBuV/m	dB	dBuV/m		dB/m	dB	dB	cm	deg	
1		50.23						34.63			
2		65.04	-8.96					34.63			Peak
3		48.77						34.59			Average
4		64.41		74.00	66.80			34.59			Peak
5		50.16		54.00	44.98			33.15			Average
6		63.68				31.60		33.15			Peak
7		50.24				36.28		34.52			Average
8	/311.00	63.78	-10.22	74.00	53.04	36.28	8.98	34.52			Peak
Note 1: ">20dB" m	eans sou	rious em	ission le	evels the	at excee	ed the lev	vel of 2) dB be	ow the	applic	able limi
Note 2: "N/F" mear											
Note 3: Measurem										COLEU.	,
Note 4: For restrict									field etr	onath ·	as meas
with the Pe											
addition.	ak-Dele(ior meet	s ine Al	/-LIIIII S	o mai ti	IE AV IE/		SHOULDE	รอน เบ ม	e ieho	neu III
	triated be	nde um	iontad -	micolor	م مهمال	ha attar:	untad h	v ot loo	NOT 20 -	2 rolo4	wa ta tha
Note 5: For un-res maximum				mission	s shall	be allent	ualeu D	y at lea	151 30 01	Sielat	



Modulation Mode		11g			Tes	t Freq. (MHz)		2437		
N _{TX}		2			Pola	arization	1		V		
1)ato: 204	4-03-10
117	l (dBuV/m)								`	ale. 20	4-03-10
105.3											
93.6											
81.9									_	FCC C	ASS-B
70.2	2		8								
58.5		6	* +						FCC	CLASS-	B (AVG)
46.8		-5									
35.1											
23.4											
11.7											
⁰ 1000	4000	. 6000.	8000.	10000.	12000. Frequenc	14000. 1 v (MHz)	6000. 1	8000. 2	20000. 2	2000.	25000
			0ver	limi+		Antenna	Cable	Preamn	A/Pos		
	Freq	Level		Line		Factor				1/103	Remark
	MHz	dBuV/m		dBuV/m		dB/m	dB	dB	CM	deg	
1		0 51.59						34.63			
2		0 64.55 0 52.23				27.21 27.46		34.63 34.59			
4		67.77		74.00				34.59			Average Peak
5		0 43.00				31.60		33.15			Average
6		57.29				31.60		33.15			Peak
7		48.16				36.28		34.52			Average
8		60.85						34.52			Peak
Note 1: ">20dB" m											
Note 2: "N/F" mear Note 3: Measurem Note 4: For restrict	ent recei ed bands	ve anten s, the pea	na polar ak meas	ization: uremen	H (Hori t is fully	zontal), \ sufficier	V (Vertient, as th	cal) ie max i	field str	ength	as meas
with the Pe addition.	ak-Dete	ctor meet	s the A	/-Limit s	o that th	ne AV lev	vel does	s not ne	ed to b	e repo	rted in



Modulation I	Node		11g				Tes	t Freq. (MHz)		2462			
Ν _{τχ}			2				Pola	arization	1		Н			
1	7	(dBuV/m)									I	Date: 201	14-03-10	
105														
93														
81														
70		2										FUUU	LA\$S-B	
58			4		6						FCC	CLASS-	B (AVG)	
46			3		5							CLASS-	D (AVO)	
35														
23														
11	.7													
	0 <mark>1000</mark>	4000	. 600)0.	8000.	10000.	12000.	14000. 1	6000. 1	8000. 2	20000. 2	2000.	25000	0
							Frequenc							
					0ver	Limit	Read	Antenna	Cable	Preamp	A/Pos	T/Pos		
		Freq	Lev	el	Limit			Factor				-	Remark	¢
		MHz	dBuV	•		dBuV/m		dB/m	dB	dB	cm	deg		
	1							27.46		34.59			-	ge
	2					74.00		27.46		34.59				
	3							31.68		33.13				ge
	4							31.68		33.13				
	5					54.00		36.45		34.62				ge
	6	/386.0	0 61.	/5 -	-12.25	74.00	50.91	36.45	9.01	34.62			Peak	
	ID "							1.1.1						••
Note 1: ">200														nıt.
Note 2: "N/F"											ere de	ected.)	
Note 3: Meas														
Note 4: For re														ISU
		ak-Dete	ctor m	eets	the AV	/-Limit s	o that th	ne AV lev	el does	s not ne	ed to b	e repo	rted in	
additi														
Note 5: For u						missior	is shall	be attenu	lated b	y at lea	st 30 d	B relat	ive to th	ne
	num n	neasure	d in_ha	and	امريما									



Modulation M	ode		11g				Tes	t Freq. (MHz)		2462		
N _{TX}			2				Pola	arization			V		
												Data: 204	4 02 40
117	Level	(dBuV/m)										Date: 201	14-03-10
105.3													
93.6													
81.9												ECC C	LASS-B
70.2		2										ruu u	LA33-D
58.5		1	4		6						FCC	CLASS-	B (AVG)
46.8		1			5								0 (11 0)
40.0													
23.4													
11.7													
(1000	4000). 600	0.	8000.	10000.	12000.	14000. 1	6000. 1	8000. 2	20000. 2	22000.	25000
							Frequenc	y (MHz)					
					0ver	Limit	Read	Antenna	Cable	Preamp	A/Pos	T/Pos	
		Freq	Lev	el	Limit			Factor					Remark
		MHz	dBuV		dB	dBuV/m		dB/m	dB	dB	cm	deg	
1						54.00							
2								27.46					
3						54.00		31.68		33.13			0
4								31.68		33.13			
5						54.00		36.45					
6		/200.0	0 59.	4Z -	-14.00	74.00	40.00	36.45	9.01	54.62			Peak
											. I.a		able l'est
Note 1: ">20dE													
Note 2: "N/F" n											vere de	lected.)
Note 3: Measu											C		
Note 4: For res													
		ak-Dete	ctor m	eets	s the AV	/-Limit s	o that th	ne AV lev	el doe	s not ne	ed to b	pe repo	orted in
additio										~			
Note 5: For un						mission	s shall	be atteni	lated b	y at lea	st 30 d	B relat	ive to the
mavim	um m	neasure	d in-ba	and	level								



3.6.9	Transmitter Radiated Unwanted Emissions	(Above 1GHz) for HT20
-------	--	-----------------------

Modulation M	ode		HT2	0				Test	Freq. (I	MHz)		2412		
N _{TX}			2					Pola	rization			Н		
117	Leve	l (dBuV/m))										Date: 201	14-03-10
105.3				_										
93.6														
81.9													FCC C	LASS-B
70.2	2	4	6	-										
58.5	2	3	-Ī-	_								FCC	CLASS-	B (AVG)
46.8			- 5											
35.1													_	
23.4				_										
11.7	,													
	1000	400	0. 6	000.	8000.	10000			14000. 1 (MHz)	6000. 1	8000. 2	20000. 2	22000.	25000
					0ver	Limi	it R	ead	Antenna	Cable	Preamp	A/Pos	T/Pos	
		Free	a Le	evel	Limit				Factor					Remark
		MHz		uV/m	dB	dBuV/			dB/m	dB	dB	cm	deg	
1					-12.16				25.80		35.72			
2					-18.87			1.60			35.72			Peak
3		2390.0							27.21 27.21		34.63 34.63			Average Peak
5		4824.0							31.52		33.17			Average
6									31.52		33.17			Peak
)"						hata		ما الم م	ial of O			onnlin	able limi
Note 1: ">20dE														
Note 2: "N/F" r												ere de	lected.)
Note 3: Measu												field of	onath	20 m.c.c.
Note 4: For res									e AV lev					
additio		ak-Dete	SCIOLI	neet	s the A		1 SO T	natin	IE AV IEV		S NOT NE		e iepo	nieu In
additio Note 5: For un		rictad b	anda	11014	antad a	micci	000 0		o ottopi	untod b		ot 20 d	D relat	ivo to the



Modulation M	lode		HT2	0			Tes	t Freq. (MHz)		2412		
N _{TX}			2				Pola	arization	1		V		
	Leve	l (dBuV/m)									Date: 201	14-03-10
		(ubutini	,										
105.									_			_	
93.									_		_	_	
81.												FCC C	LA\$S-B
70.		4	_						_			_	
58.		3	6	-							FCC	CLASS-	B (AVG)
46.			5						_				
35.												_	
23.													
11.	7												
	0 <mark>1000</mark>	400	0. 6	000.	8000.	10000.	12000. Frequenc	14000. 1 v (MHz)	6000. 1	8000. 2	20000. 2	22000.	25000
					0ver	limi+		Antenna	Cabla	Decomp	A /Pos	T/Doc	
		Free	n 14	evel		Line		Factor			-	1/P05	Remark
		MHz	dBu	uV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
	1	1500.0	00 38	8.74	-15.26	54.00	45.21	25.80	3.45	35.72			Average
	2						57.89			35.72			
	3						53.77			34.63			
	4 5					74.00 54.00	66.69	27.21 31.52		34.63			
	6							31.52					Peak
					10.07	/	50121	51152					- cuit
Note 1: ">20d	B" m	eans sn	urious	s em	ission la	avels the	at excee	d the lev	vel of 2	0 dB be	low the	annlic	ahle limi
Note 2: "N/F"													
Note 3: Meas													/
Note 4: For re											field st	enath	as meas
								ne AV lev					
WITH T													
additio	on.												
		ricted b	ands,	unw	anted e	missior	s shall	be atten	uated b	y at lea	st 30 d	B relat	ive to the



Modulation Mode		HT20			Tes	t Freq. (MHz)		2437		
N _{TX}		2			Pola	rization	1		Н		
117	(dBuV/m)									Date: 20	14-03-11
105.3											
93.6											
81.9										-	
70.2	7									FCCC	LASS-B
58.5	Ĩ.		8						500	CLASS-	
	₿	5	7						ru	CLASS-	D (AVO)
46.8											
35.1											
23.4											
11.7								_	_		
⁰ 1000	4000	. 6000.	8000.		12000. Frequenc	14000. 1 v (MHz)	6000. 1	8000. 2	20000. 2	22000.	25000
			0				Cable	Deserve	A /D = =	T (D	
	Freq	Loval	Over	Limit		Antenna Factor				T/Pos	Remark
	глеч	Level		LTHE	Level	Factor	LUSS	Factor			Nelliar K
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1		0 50.45		-	53.27	-		34.63			Average
2		0 65.43						34.63			Peak
3	2483.5	0 50.23	-3.77	54.00	52.62	27.46	4.74	34.59			Average
4	2483.5	0 66.70	-7.30	74.00	69.09	27.46	4.74	34.59			Peak
5	4874.0	0 49.40	-4.60	54.00	44.22	31.60	6.73	33.15			Average
6	4874.0	0 63.30	-10.70	74.00	58.12	31.60		33.15			Peak
7		a 48.23				36.28		34.52			
8	7311.0	62.21	-11.79	74.00	51.47	36.28	8.98	34.52			Peak
Note 1: ">20dB" m Note 2: "N/F" mear Note 3: Measurem Note 4: For restrict with the Pe	is Nothir ent recei ed band	ig Found ve anteni s, the pea	spuriou na polar ak meas	s emissi ization: uremen	ions (No H (Hori t is fully	o spuriou zontal), \ sufficier	us emis V (Vertient, as th	sions w cal) ie max i	rere de field str	tected.) as measu
addition. Note 5: For un-rest maximum r				mission	s shall	be atten	uated b	y at lea	st 30 d	B relat	ive to the



Modulation Mode		HT20			Tes	t Freq. (MHz)		2437		
N _{TX}		2			Pola	arizatior	1		V		
117	(dBuV/m)									Date: 201	14-03-11
105.3											
93.6											
81.9											
70.2	4									FCC CI	LASS-B
	1	6	8						FCC	CLASS	
58.5	8								FCC	CLASS	D (AVO)
46.8											
35.1											
23.4											
11.7							_	_	_		
0	4000	. 6000.	8000.		12000. Frequenc	14000. 1	6000. 1	8000. 2	20000. 2	2000.	25000
			0ver		-	Antenna	Cabla	Pnoomn	A /Pos		
	Freq	Level	Limit			Factor				1/FUS	Remark
	MHz	dBuV/m		dBuV/m		dB/m	dB	dB	cm	deg	
1	2390.00				55.01			34.63			Average
2		65.66						34.63			Peak
3		52.63				27.46		34.59			Average
4		69.05						34.59			Peak
6		42.1156.75			36.93	31.60 31.60		33.15 33.15			Average Peak
7		47.05				36.28		34.52			
8		59.48						34.52			Peak
Note 1: ">20dB" me	ans spu	rious em	ission le	evels that	at excee	d the lev	vel of 2	0 dB be	low the	applic	able limi
Note 2: "N/F" mean											
Note 3: Measureme											,
Note 4: For restricte									field str	engtha	as meası
with the Pe											
addition.											
Note 5: For un-rest	ricted ba	nds, unv	vanted e	mission	s shall	be atten	uated b	y at lea	st 30 d	B relati	ive to the
maximum n								-			



Modulation Mode	e	HT20			Tes	t Freq. (MHz)		2462		
N _{TX}		2			Pola	arization			Н		
117	el (dBuV/m)									Date: 20	14-03-11
105.3											
93.6										_	
81.9											
70.2	2									FCC C	LASS-B
		4	6						FCC	CLASS	D (AVC)
58.5		3	5						FCC	CLASS	B (AVG)
46.8											
35.1											
23.4										_	
11.7			_								
0	0 400). 6000.	8000.	10000.	12000.	14000. 1	6000. 1	8000. 2	20000. 2	2000.	25000
100					Frequenc						20000
			0ver	Limi+	Read	Antenna	Cable	Pream	A/Pos	T/Pos	
	Freq	Leve]	Limit			Factor				.,. 05	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1	2483.5	0 53.00	-1.00	54.00	55.39	27.46	4.74	34.59			Average
2	2483.5	0 69.08	-4.92	74.00	71.47	27.46	4.74	34.59			Peak
3		0 47.24			41.96			33.13			Average
4		0 61.05						33.13			
5		0 47.23				36.45		34.62			
6	7386.0	0 60.55	-13.45	74.00	49.71	36.45	9.01	34.62			Peak
						10.1			L. (L.)	P	
Note 1: ">20dB" n											
Note 2: "N/F" mea									ere det	ected.)
Note 3: Measuren											
Note 4: For restric											
with the P	eak-Dete	ctor meet	s the AV	/-Limit s	so that th	ne AV lev	el doe	s not ne	ed to b	e repo	orted in
addition.											
	. با او مخمانید		م امید مر		المحامية		المعدمات		-+	D	·
Note 5: For un-res maximum				missior	is shall	be attent	lated b	y at lea	st 30 a	B relat	ive to the



Modulation Mod	е	HT20			Tes	t Freq. (MHz)		2462		
N _{TX}		2			Pola	arization)		V		
117	vel (dBuV/m)									Date: 20	14-03-11
105.3										_	
93.6											
81.9										FCCC	LASS-B
70.2	2									1000	LAJJ-D
58.5		4	6						FCC	CLASS-	B (AVG)
46.8			5								
35.1											
23.4											
11.7											
0 ^L 10	00 400	0. 6000.	8000.	10000.	12000. Frequenc	14000. 1 y (MHz)	6000. 1	8000. 2	20000. 2	22000.	25000
			0ver	Limit		Antenna	Cable	Preamp	A/Pos	T/Pos	
	Free	Level	Limit			Factor					Remark
	MHz	dBuV/m	dB	dBuV/m		dB/m	dB	dB	 cm	deg	
1		60 49.82		-		-		34.59			Average
2		64.20						34.59			
3	4924.0	0 40.18	-13.82	54.00	34.90	31.68		33.13			Average
4	4924.0	0 54.43	-19.57	74.00	49.15	31.68	6.73	33.13			Peak
5		0 45.44						34.62			
6	7386.0	0 58.27	-15.73	74.00	47.43	36.45	9.01	34.62			Peak
Note 1: ">20dB" I	means sp	urious em	hission le	evels that	at excee	ed the lev	el of 2	0 dB be	low the	applic	able limi
Note 2: "N/F" me	ans Nothi	ng Found	spuriou	s emiss	ions (N	o spuriou	is emis	sions w	vere de	tected.)
Note 3: Measure											
Note 4: For restri											
with the F	Peak-Dete	ector mee	ts the A\	/-Limit s	o that th	ne AV lev	el doe	s not ne	ed to b	e repo	orted in
addition.										_	
Note 5: For un-re				missior	is shall	be atteni	lated b	y at lea	st 30 d	B relat	ive to the
	n measure										



Aodulation Mo	ode		HT40)			Tes	t Freq. (MHz)		2422		
I _{TX}			2				Pol	arizatior	า		Н		
117	Level	(dBuV/m)									Da	ate: 2014	4-03-11
105.3													
93.6													
81.9												FCC CL	ASS-B
70.2	_	4	6										
58.5	2	3	-								FCC C	LASS-B	(AVG)
46.8													
35.1													
23.4 11.7													
	1000				0000	40000	42000	44000		0000 0		000	25000
	1000	400	U. 6U	00.	8000.	10000.	12000. Frequenc		6000. 1	8000. 2	20000. 22	000.	25000
					0ver						A/Pos 1	[/Pos	
		Freq	Le	vel	Limit	Line	Level	Factor	Loss	Factor			Remark
		MHz	dBu	 V/m	dB	dBuV/	n dBuV	dB/m	dB	dB	cm	deg	
1				-		-	a 47.81	-		35.72			Average
2					-19.28					35.72			Peak
3					-1.57					34.63			Average
4		2390.0					0 67.53 0 40.38			34.63 33.16			Peak Average
6							0 54.90			33.16			Peak
lote 1: ">20dB	" me	ans sp	urious	emi	ssion le	evels th	nat exce	ed the le	vel of 2	0 dB be	low the a	applica	able limit.
lote 2: "N/F" m	ean	s Nothi	ng Foi	und s	spuriou	s emis	sions (N	o spurio	us emis	sions w	vere dete	cted.)	
lote 3: Measu													
ote 4: For res													
		ak-Dete	ctor n	neets	s the Al	/-∟imit	so that t	ne av le	vei does	s not ne	ed to be	repor	tea in
additior ote 5: For un-		ictad h	ande	unw	anted o	mieeio	ne chall	ha attan	uated h	v at loo	et 30 4P	relativ	a to the
ole J. FUI ull-	ເວລແ	ICLEU D	anus,	unwa	anieu e	1113310	nio oliali	טב מוופוו	ບລເປັນ ມ	v ai ita	่งเ งบ uD		



MHz dBuV/m dB dBuV/m dBuV dB/m dB dB cm deg 1 1500.00 38.25 -15.75 54.00 44.72 25.80 3.45 35.72 2 1500.00 50.96 -23.04 74.00 57.43 25.80 3.45 35.72 3 2390.00 50.87 -3.13 54.00 53.69 27.21 4.60 34.63 4 2390.00 63.75 -10.25 74.00 66.57 27.21 4.60 34.63 5 4844.00 38.57 -15.43 54.00 33.44 31.55 6.74 33.16	
105.3 33.6 94.0 94.0	
105.3 33.6 94.0 94.0	4-03-11
93.6 81.9 70.2 4 86.8 97.2 56.5 2 2 4 8 46.8 1.7 9 100 4000. 6000. 8000. 10000. 12000. 14000. 16000. 18000. 20000. 22000. Frequency (MHz) Ver Limit Read Antenna Cable Preamp A/Pos T/Pos Freq Level Limit Line Level Factor Loss Factor MHz dBuV/m dB dBuV/m dBvV dB/m dB dB cm deg 1 1500.00 50.96 -23.04 74.00 57.43 25.80 3.45 35.72 2 1500.00 50.96 -23.04 74.00 57.43 25.80 3.45 35.72 3 2390.00 50.87 -3.13 54.00 53.69 27.21 4.60 34.63 5 4844.00 38.57 -15.43 54.00 33.44 31.55 6.74 33.16 6 4844.00 53.08 -20.92 74.00 47.95 31.55 6.74 33.16 5 4844.00 53.08 -20.92 74.00 47.95 31.55 6.74 33.16	
81.9	
70.2 4 6 FCC CLASS-B 46.8 5 6 FCC CLASS-B 35.1 1 1 1 70.0 4000. 6000. 8000. 10000. 12000. 14000. 18000. 20000. 11.7 1000 4000. 6000. 8000. 10000. 12000. 14000. 18000. 20000. 22000. Freq Level Limit Line Level Factor Loss Factor MHz dBuV/m dB dBuV/m dBv/d Bd/m dB vB cm deg 1 1500.00 38.25 -15.75 54.00 44.72 25.80 3.45 35.72	
58.5 2 6 PCC C ASS B 46.8 35.1 35.1 1 1 23.4 1.7 1.0 1.000 6000. 8000. 10000. 12000. 16000. 18000. 20000. 22000. Frequency (MHz) Over Limit Read Antenna Cable Preamp A/Pos T/Pos Freq Level Limit Line Level Factor Loss Factor MHz dBuV/m dB dBuV/m dBuV dB/m dB dB cm deg 1 1500.00 38.25 -15.75 54.00 44.72 25.80 3.45 35.72 2 1500.00 50.96 -23.04 74.00 57.43 25.80 3.45 35.72 2 1500.00 50.96 -23.04 74.00 57.43 25.80 3.45 35.72 3 2390.00 63.75 -10.25 74.00 66.57 2.71 4.60 34.63 4 2390.00 63.75 -10.25 74.00 66.57 2.71 4.60 34.63 5 4844.00 53.08 -20.92 74.00 47.95 31.55 6.74 33.16 5 4844.00 53.08 -20.92 74.00 47.95 31.55 6.74 33.16 6 4844.00 53.08 -20.92 74.00 47.95 31.55 6.74 33.16	ASS-B
46.8 35.1 3.4 3.5.1 3.5	
35.1 3 4 3 3 3 4 3 3 4 3 4 3 4 3 4 3 4	(AVG)
23.4 11.7 1000 4000. 6000. 8000. 10000. 12000. 14000. 16000. 18000. 20000. 22000. Frequency (MHz) Over Limit Read Antenna Cable Preamp A/Pos T/Pos Freq Level Limit Line Level Factor Loss Factor MHz dBuV/m dB dBuV/m dBuV dB/m dB dB cm deg 1 1500.00 38.25 -15.75 54.00 44.72 25.80 3.45 35.72 2 1500.00 50.96 -23.04 74.00 57.43 25.80 3.45 35.72 3 2390.00 50.87 -3.13 54.00 53.69 27.21 4.60 34.63 5 4844.00 38.57 -15.43 54.00 33.44 31.55 6.74 33.16 6 4844.00 53.08 -20.92 74.00 47.95 31.55 6.74 33.16 6 4844.00 53.08 -20.92 74.00 47.95 31.55 6.74 33.16	
111.7 0 4000. 6000. 8000. 10000. 12000. 16000. 18000. 20000. 22000. Freq Level Limit Line Level Factor Loss Factor MHz MHz Over Limit Read Antenna Cable Preamp A/Pos T/Pos MHz MHz Over Limit Line Level Factor Loss Factor MHz MHz Over Almit Line Level Factor Loss Factor MHz MHz MHz Over Almit Line Level Factor Loss Factor MHz Over Almit Line Level Factor Loss Factor MHz MHz Over Almit Line Level Factor Loss Factor 1500.00 38.25 -15.75 54.00 44.72 25.80 3.45 35.72 2 390.00 63.75 -10.25 74.00 65.70 27.21 4.60 34.63 5 4844.00 53.08 -	
O 4000. 6000. 8000. 10000. 12000. 14000. 16000. 18000. 20000. 22000. Freq Level Limit Read Antenna Cable Preamp A/Pos T/Pos MHz dBuV/m dB dW dB dB	
Frequency (MHz) Over Limit Read Antenna Cable Preamp A/Pos T/Pos Freq Level Limit Line Level Factor Loss Factor MHz dBuV/m dB dBuV/m dBuV/m dBuV/m dBuV dB dB cm deg 1 1500.00 38.25 -15.75 54.00 44.72 25.80 3.45 35.72 2 1500.00 50.96 -23.04 74.00 57.43 25.80 3.45 35.72 3 2390.00 63.75 -10.25 74.00 57.21 4.60 34.63 4 2390.00 63.75 -15.43 54.00 34.4 31.55 6.74 33.16 6 4844.00 53.08 -20.92 74.00 47.95 31.55 6.74 33.16	
Freq Level Limit Line Level Factor Loss Factor MHz dBuV/m dB dBuV/m dBuV dB/m dB dB cm deg 1 1500.00 38.25 -15.75 54.00 44.72 25.80 3.45 35.72 2 1500.00 50.86 -3.13 54.00 57.43 25.80 3.45 35.72 3 2390.00 50.87 -3.13 54.00 53.69 27.21 4.60 34.63 4 2390.00 63.75 -10.25 74.00 66.57 27.21 4.60 34.63 5 4844.00 38.57 -15.43 54.00 33.44 31.55 6.74 33.16 6 4844.00 53.08 -20.92 74.00 47.95 31.55 6.74 33.16 <td>25000</td>	25000
Freq Level Limit Line Level Factor Loss Factor MHz dBuV/m dB dBuV/m dBuV dBuV dB/m dB dB cm deg 1 1500.00 38.25 -15.75 54.00 44.72 25.80 3.45 35.72 2 1500.00 50.87 -3.13 54.00 57.43 25.80 3.45 35.72 3 2390.00 50.87 -3.13 54.00 53.69 27.21 4.60 34.63 5 4844.00 38.57 -15.43 54.00 33.44 31.55 6.74 33.16 6 4844.00 53.08 -20.92 74.00 47.95 31.55 6.74 33.16 6 VB MA 0 53.08 -20.92 74.00 47.95 31.55 6.74	
MHz dBuV/m dB dBuV/m dB/m dB dB cm deg 1 1500.00 38.25 -15.75 54.00 44.72 25.80 3.45 35.72 2 1500.00 50.96 -23.04 74.00 57.43 25.80 3.45 35.72 3 2390.00 50.87 -3.13 54.00 53.69 27.21 4.60 34.63 4 2390.00 63.75 -10.25 74.00 66.57 27.21 4.60 34.63 5 4844.00 38.57 -15.43 54.00 33.44 31.55 6.74 33.16 6 4844.00 53.08 -20.92 74.00 47.95 31.55 6.74 33.16 6 4844.00 53.08 -20.92 74.00 47.95 31.55 6.74 33.16 9 20/dB <td>Remark</td>	Remark
1 1500.00 38.25 -15.75 54.00 44.72 25.80 3.45 35.72 2 1500.00 50.96 -23.04 74.00 57.43 25.80 3.45 35.72 3 2390.00 50.87 -3.13 54.00 53.69 27.21 4.60 34.63 4 2390.00 63.75 -10.25 74.00 66.57 27.21 4.60 34.63 5 4844.00 38.57 -15.43 54.00 33.44 31.55 6.74 33.16 6 4844.00 53.08 -20.92 74.00 47.95 31.55 6.74 33.16 7 4844.00 53.08 -20.92 74.00 47.95 31.55 6.74 33.16 9 74.00 47.95 31.55 6.74 33.16 9 74.00 47.95 31.55 6.74 33.16	
2 1500.00 50.96 -23.04 74.00 57.43 25.80 3.45 35.72 3 2390.00 50.87 -3.13 54.00 53.69 27.21 4.60 34.63 4 2390.00 63.75 -10.25 74.00 66.57 27.21 4.60 34.63 5 4844.00 38.57 -15.43 54.00 33.44 31.55 6.74 33.16 6 4844.00 53.08 -20.92 74.00 47.95 31.55 6.74 33.16 7	-
3 2390.00 50.87 -3.13 54.00 53.69 27.21 4.60 34.63 4 2390.00 63.75 -10.25 74.00 66.57 27.21 4.60 34.63 5 4844.00 38.57 -15.43 54.00 33.44 31.55 6.74 33.16 6 4844.00 53.08 -20.92 74.00 47.95 31.55 6.74 33.16	Average
4 2390.00 63.75 -10.25 74.00 66.57 27.21 4.60 34.63 5 4844.00 38.57 -15.43 54.00 33.44 31.55 6.74 33.16 6 4844.00 53.08 -20.92 74.00 47.95 31.55 6.74 33.16	Peak Average
5 4844.00 38.57 -15.43 54.00 33.44 31.55 6.74 33.16 6 4844.00 53.08 -20.92 74.00 47.95 31.55 6.74 33.16	Average Peak
6 4844.00 53.08 -20.92 74.00 47.95 31.55 6.74 33.16 Note 1: ">20dB" means spurious emission levels that exceed the level of 20 dB below the applica	Average
	Peak
Note 2: "N/F" means Nothing Found spurious emissions (No spurious emissions were detected)	able limit
Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical)	
Note 4: For restricted bands, the peak measurement is fully sufficient, as the max field strength a	
with the Peak-Detector meets the AV-Limit so that the AV level does not need to be repor	ted in
addition.	
Note 5: For un-restricted bands, unwanted emissions shall be attenuated by at least 30 dB relativ maximum measured in-band level.	e to the



Modulation Mo	ode		HT40				Tes	t Freq. (MHz)		2437			
N _{TX}			2				Pola	arization	Ì		Н			
	Level	(dBuV/m)									1	Date: 20 [.]	14-03-11	
105.3														
93.6														
81.9		4										FCC C	LA\$S-B	
70.2 58.5		2	6								FCC	CLASS-		
46.8		8	5								FCC	CLASS-	D (AVO)	
35.1														
23.4														
11.7														
U	1000	4000). 6000). 8	000.	10000.	12000. Frequenc	14000. 1 (MHz)	6000. 1	8000. 2	0000. 2	2000.	25000	
				0	ver	Limit		Antenna	Cable	Preamp	A/Pos	T/Pos		
		Freq	Leve					Factor				.,	Remark	
		MHz	dBuV/			-	dBuV	-		dB		deg		
1								27.21		34.63			Average	
2			0 65.0 0 52.2				67.83	27.21 27.46		34.63 34.59				
4			0 65.7				68.17			34.59				
5								31.60		33.15				
6								31.60		33.15			Peak	
Note 1: ">20dB	" me	ans spi	irious e	missi	ion le	evels th	at excee	ed the lev	vel of 2	0 dB be	low the	applic	able lim	
Note 2: "N/F" m														
Note 3: Measu	reme	nt recei	ve ante	nna	polar	ization:	H (Hori	zontal), \	V (Verti	cal)				
Note 4: For res	tricte	d band	s, the p	eak r	neas	uremer	nt is fully	sufficier	nt, as th	e max				
		ak-Dete	ctor me	ets th	ne A\	/-Limit s	so that t	he AV lev	el doe	s not ne	ed to b	e repo	rted in	
additio												_		
Note 5: For un- maxim						emissior	ns shall	be atteni	uated b	y at lea	st 30 d	B relat	ive to th	
	ITTI M													



Modulation Mode		HT40			Tes	t Freq. (I	MHz)		2437			
N _{TX}		2				Polarization				V		
Leve	el (dBuV/m)									Date: 201	14-03-11	
105.3												
93.6												
81.9	_									FCC C	LASS-B	
70.2	2											
58.5									FCC	CLASS-	B (AVG)	
46.8		5										
35.1												
23.4												
11.7												
0 <mark>0</mark>) 400	0. 6000.	8000.	10000.	12000. Frequenc	14000. 10 v (MHz)	6000. 1	8000. 2	0000. 2	2000.	25000	
			0ver	limit		Antenna	Cable	Preamp	A/Pos	T/Pos		
	Freq	Level	Limit			Factor			-	1/103	Remark	
	MHz	dBuV/m			dBuV		dB	dB	cm	deg		
1		0 50.70						34.63			Average	
2		0 65.07			67.89			34.63				
3		0 49.90 0 64.23				27.46 27.46		34.59 34.59			Average Peak	
5		0 40.05						33.15			Average	
6		0 54.48						33.15			Peak	
Note 1: ">20dB" m	eans spi	urious em	ission le	evels that	at excee	d the lev	el of 2	0 dB be	low the	applic	able limi	
Note 2: "N/F" mea									ere det	ected.)	
Note 3: Measurem												
Note 4: For restrict												
with the Pe	eak-Dete	ctor meet	ts the A	/-Limit s	o that th	ne AV lev	el does	s not ne	ed to b	e repo	rted in	
addition. Note 5: For un-res	4	l	ماء مندم			44	ا مدمد		at 00 -l	Dunlet		



Modulation Mode)	HT40			Tes	t Freq. (MHz)		2452		
N _{TX}		2			Pola	arization	1		Н		
117	el (dBuV/m)									Date: 20	14-03-11
105.3											
93.6											
81.9										ECC C	LASS-B
70.2	2						_			ruu u	LA33-D
58.5		4	6						FCC	CLASS	B (AVG)
46.8		3	5								
35.1											
23.4											
11.7											
0 ¹ 100	0 400	0. 6000.	8000.	10000.	12000. Frequenc	14000. 1 v (MHz)	6000. 1	8000. 2	20000.	22000.	25000
			0ver	Limit	-	Antenna	Cable	Preamp	A/Pos	T/Pos	
	Freq	Level	Limit			Factor					Remark
	MHz	dBuV/m		dBuV/m		dB/m	dB	dB	cm	deg	
1		0 52.85			55.24			34.59			Average
2		0 65.63 0 45.15				27.46 31.65		34.59			Peak
3		0 45.15 0 59.57						33.14 33.14			
4		0 45.12				36.38		34.58			-
6		0 58.42						34.58			-
Note 1: ">20dB" m	neans sp	urious em	ission le	evels that	at excee	ed the lev	vel of 20) dB be	low the	e applio	cable limi
Note 2: "N/F" mea											
Note 3: Measurem											,
Note 4: For restric			•		•		•	,	field str	ength	as measi
with the P											
addition.		-		-		-	_	-	-		
Note 5: For un-res	stricted ba	ands, unv	/anted e	emission	is shall I	be atteni	uated b	y at lea	st 30 d	B relat	ive to the



Modulation Mode	•	HT40			Tes	t Freq. (I	MHz)		2452		
N _{TX}		2			Pola	arization			V		
117	el (dBuV/m)									Date: 20	14-03-11
105.3								_	_		
93.6											
81.9										ECC C	LASS-B
70.2	0								_	ruu u	LA33-D
58.5	2	_	6					_	FCC	CLASS-	B (AVG)
46.8	1	4									
35.1		3									
23.4											
11.7								_			
0 <mark>1000</mark>	4000	. 6000.	8000.	10000.		14000. 1	6000. 1	8000. 2	20000. 2	2000.	25000
					Frequenc	y (MHz)					
			0ver	Limit	Read	Antenna	Cable	Preamp	A/Pos	T/Pos	
	Freq	Level	Limit	Line	Level	Factor	Loss	Factor			Remark
	MHz	dBuV/m	dB	dBuV/m		dB/m	dB	dB	cm	deg	
1		49.67						34.59			Average
2		62.22						34.59			
3		38.20						33.14			Average
4		52.2843.38						33.14 34.58			
6		56.13						34.58			
0	/550.00	, ,0.15	-17.07	/4.00	40.00	50.50	5.00	54.50			ICAN
Note 1: ">20dB" m	eans spu	rious em	ission le	evels that	at excee	ed the lev	el of 2) dB be	low the	applic	cable limit
Note 2: "N/F" mea											
Note 3: Measurem									510 00		/
Note 4: For restrict									field str	enath	as measu
with the Pe											
addition.				, Linit 3	o mai li					ie iepu	
Note 5: For un-res	tricted bo	nde unv	anted o	miccion	e chall	na attani	isted h	v at loo	ct 20 4	R rolat	ive to the



4 Test Equipment and Calibration Data

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
EMC Receiver	R&S	ESCS 30	100132	9kHz ~ 2.75GHz	Nov. 14, 2013	Conduction (CO04-HY)
LISN	SCHWARZBECK MESS-ELEKTRO NIK	NSLK 8127	8127-477	9kHz ~ 30MHz	Jan. 21, 2014	Conduction (CO04-HY)
LISN (Support Unit)	EMCO	3810/2NM	9703-1839	9kHz ~ 30MHz	Apr. 18, 2013	Conduction (CO04-HY)
RF Cable-CON	HUBER+SUHNE R	RG213/U	07611832010001	9kHz ~ 30MHz	Oct. 30, 2013	Conduction (CO04-HY)
50 ohm terminal	N/A	N/A	CON-01-04	N/A	Feb. 25, 2014	Conduction (CO04-HY)

Note: Calibration Interval of instruments listed above is one year.

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
Spectrum Analyzer	R&S	FSV40	101499	9Kz – 40GHz	Feb. 08, 2014	Radiation (03CH08-HY)
Receiver	R&S	ESR3	101657	9KHz – 3GHz	Jan. 18, 2014	Radiation (03CH08-HY)
Amplifier	Burgeon	BPA-530	100218	30MHz ~ 1000MHz	Dec. 09, 2013	Radiation (03CH08-HY)
Amplifier	Agilent	8449B	3008A02665	1GHz – 26.5 GHz	Sep. 04, 2013	Radiation (03CH08-HY)
Horn Antenna	ETS-LINDGREN	3117	66584	1GHz~18GHz	Aug. 07, 2013	Radiation (03CH08-HY)
SHF-EHF Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA 9170517	15GHz~40GHz	Dec. 27, 2013	Radiation (03CH08-HY)
Bilog Antenna	Teseq GmbH	CBL6112D	35379	30 MHz - 1 GHz	Oct. 10, 2013	Radiation (03CH08-HY)

Note: Calibration Interval of instruments listed above is one year.

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
Amplifier	EM	EM18G40G	060572	26.5GHz ~ 40GHz	Jun. 20, 2013	Radiation (03CH08-HY)
Loop Antenna	R&S	HFH2-Z2	860004/0001	9 kHz - 30 MHz	Jul. 03, 2012	Radiation (03CH08-HY)

Note: Calibration Interval of instruments listed above is two year.



Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
Spectrum Analyzer	R&S	FSV 40	101063	9KHz~40GHz	Feb. 17, 2014	Conducted (TH01-HY)
Spectrum Analyzer	Agilent	N9010A	MY53400091	9KHz~44GHz	Oct. 07, 2013	Conducted (TH01-HY)
Temp. and Humidity Chamber	Giant Force	GTH-225-20-SP- SD	MAA1112-007	-20 ~ 100℃	Nov. 21, 2013	Conducted (TH01-HY)
Signal Generator	R&S	SMB100A	175727	10MHz ~ 40GHz	Jan. 07, 2014	Conducted (TH01-HY)
Power Sensor	Anritsu	MA2411B	1207366	300MHz ~ 40GHz	Oct. 24, 2013	Conducted (TH01-HY)
Power Meter	Anritsu	ML2495A	1241002	300MHz ~ 40GHz	Oct. 24, 2013	Conducted (TH01-HY)
DC Power Source	G.W.	GPC-6030D	C671845	DC 1V ~ 60V	Jun. 21, 2013	Conducted (TH01-HY)
AC Power Source	G.W	APS-9102	EL920581	AC 0V ~ 300V	Jul. 16, 2013	Conducted (TH01-HY)

Note: Calibration Interval of instruments listed above is one year.