

FCC Test Report

FCC ID : ZQ6-AP6234A

Equipment : Wifi Dual Band + BT combo module

Model No. : AP6234A

Brand Name : Ampak

Applicant : Ampak Technology Inc

Address : No.1 Jen Al Road, Hsinchu Industrial Park,

Hukou, Hsinchu, Taiwan, 30352

Standard : 47 CFR FCC Part 15.247

Received Date : Apr. 01, 2014

Tested Date : Apr. 22 ~ May 07, 2014

We, International Certification Corp., would like to declare that the tested sample has been evaluated and in compliance with the requirement of the above standards. The test results contained in this report refer exclusively to the product. It may be duplicated completely for legal use with the approval of the applicant. It shall not be reproduced except in full without the written approval of our laboratory.

Approved & Reviewed by:

Gary Chang / Manager

Iac-MRA

Testing Laboratory

Page: 1 of 50

Report No.: FR440102AI



Table of Contents

1	GENERAL DESCRIPTION	5
1.1	Information	5
1.2	Local Support Equipment List	7
1.3	Test Setup Chart	7
1.4	The Equipment List	8
1.5	Test Standards	9
1.6	Measurement Uncertainty	g
2	TEST CONFIGURATION	10
2.1	Testing Condition	10
2.2	The Worst Test Modes and Channel Details	10
3	TRANSMITTER TEST RESULTS	11
3.1	Conducted Emissions	11
3.2	6dB and Occupied Bandwidth	14
3.3	RF Output Power	17
3.4	Power Spectral Density	19
3.5	Unwanted Emissions into Restricted Frequency Bands	21
3.6	Unwanted Emissions into Non-Restricted Frequency Bands	41
4	TEST LABORATORY INFORMATION	50



Release Record

Report No.	Version	Description	Issued Date
FR440102AI	Rev. 01	Initial issue	May 15, 2014

Report No.: FR440102AI Page: 3 of 50



Summary of Test Results

FCC Rules	Test Items	Measured	Result
15.207	Conducted Emissions	[dBuV]: 0.152MHz 47.27 (Margin -8.60dB) - AV	Pass
15.247(d) 15.209	Radiated Emissions	[dBuV/m at 3m]:3856.00MHz 51.49 (Margin -2.51dB) - AV	Pass
15.247(b)(3)	Fundamental Emission Output Power	Power [dBm]: 11a: 22.13 HT20: 22.24 HT40: 22.37	Pass
15.247(a)(2)	6dB Bandwidth	Meet the requirement of limit	Pass
15.247(e)	Power Spectral Density	Meet the requirement of limit	Pass
15.203	Antenna Requirement	Meet the requirement of limit	Pass

Report No.: FR440102AI Page: 4 of 50



1 General Description

1.1 Information

1.1.1 Specification of the Equipment under Test (EUT)

RF General Information								
Frequency Range (MHz)	IEEE Std. 802.11	Ch. Freq. (MHz)	Channel Number	Transmit Chains (N _{TX})	Data Rate / MCS			
5725-5850	а	5745-5825	149-165 [5]	1	6-54 Mbps			
5725-5850	n (HT20)	5745-5825	149-165 [5]	1	MCS 0-7			
5725-5850	n (HT40)	5755-5795	151-159 [2]	1	MCS 0-7			

Note 1: RF output power specifies that Maximum Peak Conducted Output Power..

Note 2: 802.11a/n uses a combination of OFDM-BPSK, QPSK, 16QAM, 64QAM modulation.

1.1.2 Antenna Details

Ant No	Typo	C	Connector				
Ant. No.	Туре	2400~2483.5	5150~5250	5250~5350	5470~5725	5725~5850	Connector
1	Dipole	2	3	3	3	3	UFL

1.1.3 Power Supply Type of Equipment under Test (EUT)

Power Supply Type	3.3Vdc from host.
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1.1.4 Accessories

N/A

Report No.: FR440102AI Page: 5 of 50



1.1.5 Channel List

Frequenc	y band (MHz)	5725	~5850
802.1	1 a / HT20	802.11	n HT40
Channel	Channel Frequency(MHz)		Frequency(MHz)
149	5745	151	5755
153	5765	159	5795
157	5785		
161	5805		
165	5825		

1.1.6 Test Tool and Duty Cycle

Test Tool	MP tool, V2.0.1.1				
	Mode	Duty cycle (%)	Duty factor (dB)		
Duty Cycle and Duty Footor	11a	99.51%	0.02		
Duty Cycle and Duty Factor	HT20	99.26%	0.03		
	HT40	98.21%	0.08		

Report No.: FR440102AI Page: 6 of 50



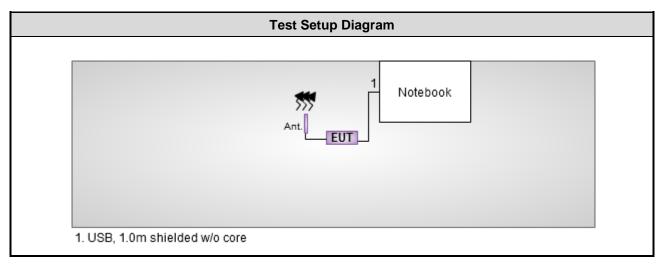
1.1.7 Power Setting

Modulation Mode	Test Frequency (MHz)	Power Set
11a	5745	92
11a	5785	92
11a	5825	92
HT20	5745	92
HT20	5785	92
HT20	5825	92
HT40	5755	92
HT40	5795	92

1.2 Local Support Equipment List

	Support Equipment List							
No.	Equipment	Brand	Model	S/N	FCC ID	Signal cable / Length (m)		
1	Notebook	DELL	E6430		DoC	USB 1.0m shielded cable w/o core.		

1.3 Test Setup Chart



Report No.: FR440102AI Page: 7 of 50



1.4 The Equipment List

Test Item	Conducted Emission								
Test Site	Conduction room 1 / (CO01-WS)								
Instrument	Manufacturer	Manufacturer Model No. Serial No. Calibration Date Calibration Until							
EMC Receiver	R&S	ESCS 30	100169	Oct. 15, 2013	Oct. 14, 2014				
LISN	SCHWARZBECK	Schwarzbeck 8127	8127-667	Nov. 23, 2013	Nov. 22, 2014				
LISN (Support Unit)	SCHWARZBECK	Schwarzbeck 8127	8127-666	Dec. 04, 2013	Dec. 03, 2014				
RF Cable-CON	Woken	CFD200-NL	CFD200-NL-001	Apr. 23, 2014	Apr. 22, 2015				
50 ohm terminal (Support Unit)	NA	50	04	Apr. 18, 2014	Apr. 17, 2015				
$\frac{1}{2}$									

Test Item	Radiated Emission	Radiated Emission						
Test Site	966 chamber1 / (03C	H01-WS)						
Instrument	Manufacturer	Manufacturer Model No. Serial No. Calibration Date Calibration Until						
Spectrum Analyzer	R&S	FSV40	101498	Jan. 25, 2014	Jan. 24, 2015			
Receiver	R&S	ESR3	101658	Jan. 10, 2014	Jan. 09, 2015			
Bilog Antenna	SCHWARZBECK	VULB9168	VULB9168-522	Jan. 02, 2014	Jan. 01, 2015			
Horn Antenna 1G-18G	SCHWARZBECK	BBHA 9120 D	BBHA 9120 D 1096	Feb. 13, 2014	Feb. 12, 2015			
Horn Antenna 18G-40G	SCHWARZBECK	BBHA 9170	BBHA 9170517	Dec. 27, 2013	Dec. 26, 2014			
Preamplifier	Burgeon	BPA-530	SN:100219	Nov. 28, 2013	Nov. 27, 2014			
Preamplifier	Agilent	83017A	MY39501308	Dec. 16, 2013	Dec. 15, 2014			
Preamplifier	EM	EM18G40G	060572	Jun. 20, 2013	Jun. 19, 2014			
RF Cable	HUBER+SUHNER	SUCOFLEX104	MY16014/4	Dec. 16, 2013	Dec. 15, 2014			
RF Cable	HUBER+SUHNER	SUCOFLEX104	MY16019/4	Dec. 16, 2013	Dec. 15, 2014			
RF Cable	HUBER+SUHNER	SUCOFLEX104	MY16139/4	Dec. 16, 2013	Dec. 15, 2014			
LF cable 3M	Woken	CFD400NL-LW	CFD400NL-001	Dec. 16, 2013	Dec. 15, 2014			
LF cable 10M	Woken	CFD400NL-LW	CFD400NL-002	Dec. 16, 2013	Dec. 15, 2014			
Note: Calibration Inter	val of instruments liste	d above is one year.						

Instrument	Manufacturer	Manufacturer Model No.		Calibration Date	Calibration Until				
Loop Antenna	R&S	HFH2-Z2 100330		Nov. 15, 2012	Nov. 14, 2014				
Note: Calibration Interval of instruments listed above is two year.									

Test Item	RF Conducted							
Test Site	(TH01-WS)							
Instrument	Manufacturer	Model No.	Serial No.	Calibration Date	Calibration Until			
Spectrum Analyzer	R&S	FSV40	101063	Feb. 17, 2014	Feb. 16, 2015			
Power Meter	Anritsu	ML2495A	1241002	Oct. 24, 2013	Oct. 23, 2014			
Power Sensor	Anritsu	MA2411B	1207366	Oct. 24, 2013	Oct. 23, 2014			
Note: Calibration Interval of instruments listed above is one year.								

Report No.: FR440102AI Page: 8 of 50



1.5 Test Standards

According to the specification of EUT, the EUT must comply with following standards and KDB documents.

47 CFR FCC Part 15.247

ANSI C63.10-2009

FCC KDB 558074 D01 DTS Meas Guidance v03r01

Note: The EUT has been tested and complied with FCC part 15B requirement. FCC Part 15B test results are issued to another report.

1.6 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						
Parameters	Uncertainty					
Bandwidth	±34.134 Hz					
Conducted power	±0.808 dB					
Frequency error	±34.134 Hz					
Power density	±0.463 dB					
Conducted emission	±2.670 dB					
AC conducted emission	±2.92 dB					
Radiated emission < 1GHz	±3.26 dB					
Radiated emission > 1GHz	±4.94 dB					
Time	±0.1%					

Report No.: FR440102AI Page: 9 of 50



2 Test Configuration

2.1 Testing Condition

Test Item	Test Site	Ambient Condition	Tested By
AC Conduction	CO01-WS	22°C / 68%	Skys Huang
Radiated Emissions	03CH01-WS	23-24°C / 63-65%	Haru Yang Brad Wu
RF Conducted	TH01-WS	24°C / 62%	Mark Liao

FCC site registration No.: 657002IC site registration No.: 10807A-1

2.2 The Worst Test Modes and Channel Details

Test item	Modulation Mode	Test Frequency (MHz)	Data Rate (Mbps) / MCS	Test Configuration
Conducted Emissions	HT40	5755	MCS 0	
Radiated Emissions ≤1GHz	HT40	5755	MCS 0	
Radiated Emissions >1GHz RF Output Power 6dB bandwidth Power spectral density	11a HT20 HT40	5745 / 5785 / 5825 5745 / 5785 / 5825 5755 / 5795	6 Mbps MCS 0 MCS 0	

NOTE:

Report No.: FR440102AI Page: 10 of 50

^{1.} The EUT was pretested with 3 orientations placed on the table for the radiated emission measurement – X, Y, and Z-plane. The **Y-plane** results were found as the worst case and were shown in this report.



3 Transmitter Test Results

3.1 Conducted Emissions

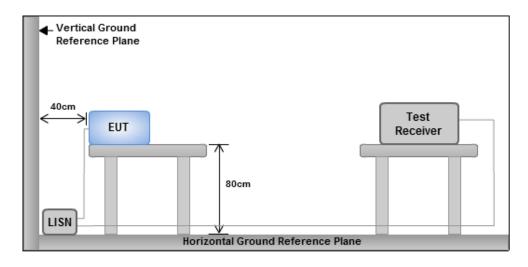
3.1.1 Limit of Conducted Emissions

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.							

3.1.2 Test Procedures

- 1. The device is placed on a test table, raised 80 cm above the reference ground plane. The vertical conducting plane is located 40 cm to the rear of the device.
- 2. The device is connected to line impedance stabilization network (LISN) and other accessories are connected to other LISN. Measured levels of AC power line conducted emission are across the 50 Ω LISN port.
- 3. AC conducted emission measurements is made over frequency range from 150 kHz to 30 MHz.
- 4. This measurement was performed with AC 120V / 60Hz.

3.1.3 Test Setup



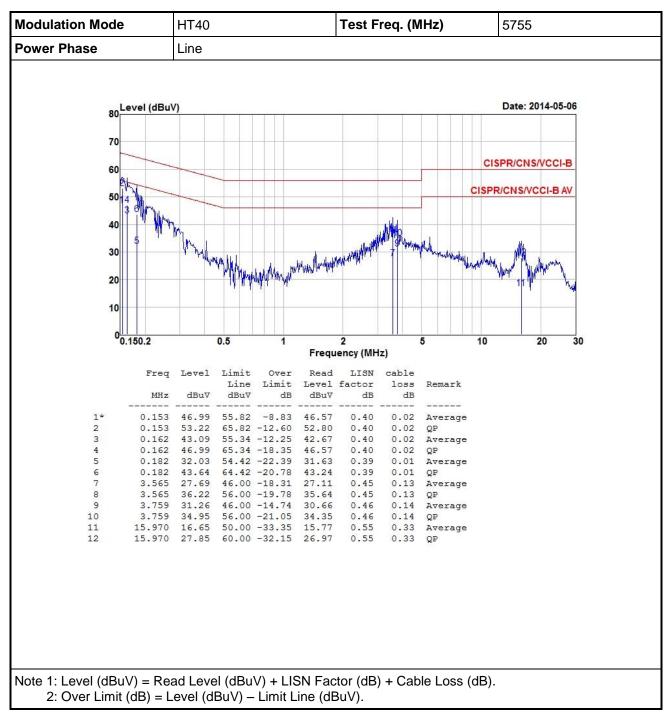
Note: 1. Support units were connected to second LISN.

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

Report No.: FR440102AI Page: 11 of 50

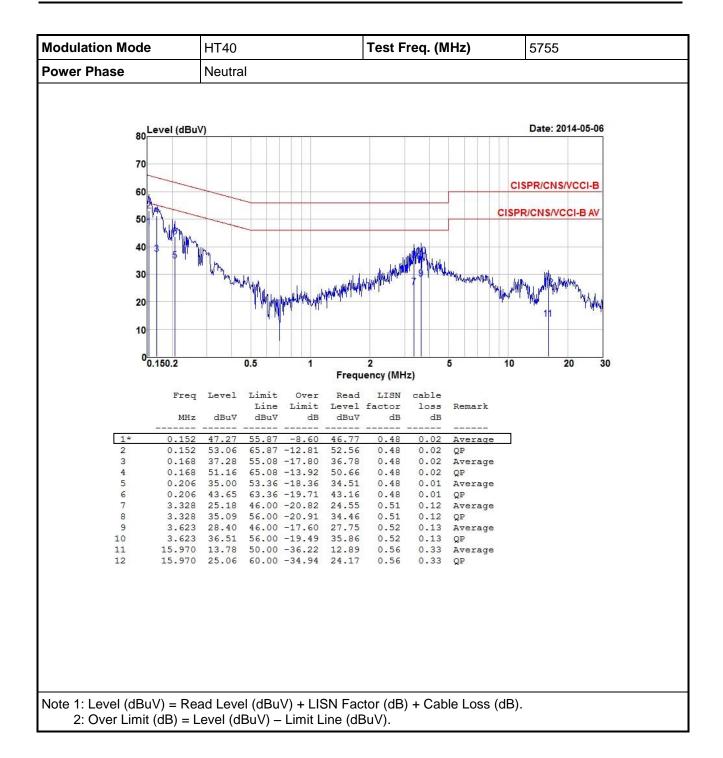


3.1.4 Test Result of Conducted Emissions



Report No.: FR440102AI Page: 12 of 50





Report No.: FR440102AI Page: 13 of 50



3.2 6dB and Occupied Bandwidth

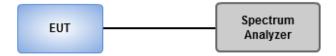
3.2.1 Limit of 6dB Bandwidth

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

3.2.2 Test Procedures

- 1. Set resolution bandwidth (RBW) = 100 kHz, Video bandwidth = 300 kHz.
- 2. Detector = Peak, Trace mode = max hold.
- 3. Sweep = auto couple, Allow the trace to stabilize.
- 4. Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower) that are attenuated by 6dB relative to the maximum level measured in the fundamental emission.

3.2.3 Test Setup

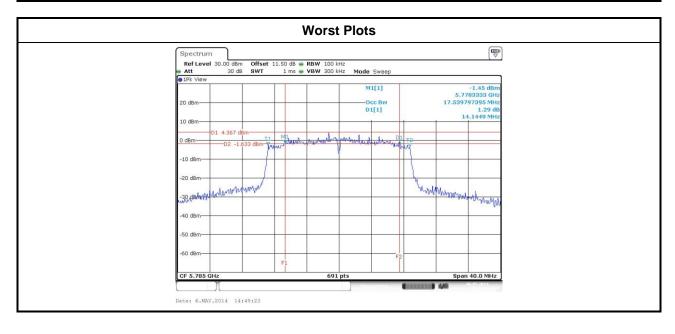


Report No.: FR440102AI Page: 14 of 50



3.2.4 Test Result of 6dB and Occupied Bandwidth

Modulation	N	Eros (MUz)		Limit (kUz)			
Mode	N _{TX}	Freq. (MHz)	Chain 0	Chain 1	Chain 2	Chain 3	Limit (kHz)
11a	1	5745	14.38				500
11a	1	5785	14.72				500
11a	1	5825	15.59				500
HT20	1	5745	15.07				500
HT20	1	5785	14.14				500
HT20	1	5825	15.07				500
HT40	1	5755	35.13				500
HT40	1	5795	35.25				500



Report No.: FR440102Al Page: 15 of 50



Modulation	N	Erog (MUz)		99% Occupied E	Bandwidth (MHz)	
Mode	N _{TX}	Freq. (MHz)	Chain 0	Chain 0 Chain 1		Chain 3
11a	1	5745	16.68			
11a	1	5785	16.61			
11a	1	5825	16.61			
HT20	1	5745	17.58			
HT20	1	5785	17.55			
HT20	1	5825	17.58			
HT40	1	5755	36.40			
HT40	1	5795	36.53			



Report No.: FR440102Al Page: 16 of 50



3.3 RF Output Power

3.3.1 Limit of RF Output Power

Conducted power shall not exceed 1Watt.

Antenna gain <= 6dBi, no any corresponding reduction is in output power limit.

Antenna gain > 6dBi

Non Fixed, point to point operations.
The conducted output power from the intentional radiator shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dB

Fixed, point to point operations
Systems operating in the 2400–2483.5 MHz band that are used exclusively for fixed, point-to-point Operations, maximum peak output power of the intentional radiator is reduced by 1 dB for every 3 dB that the directional gain of the antenna exceeds 6 dBi.

Systems operating in the 5725–5850 MHz band that are used exclusively for fixed, point-to-point operations, no any corresponding reduction is in transmitter peak output power

3.3.2 Test Procedures

Maximum Peak Conducted Output Power

- 1. Set RBW = 1MHz, VBW = 3MHz, Detector = Peak.
- 2. Sweep time = auto, Trace mode = max hold, Allow trace to fully stabilize.
- 3. Use the spectrum analyzer channel power measurement function with the band limits set equal to the DTS bandwidth edges.

Nower meter

- A broadband Peak RF power meter is used for output power measurement. The video bandwidth of power meter is greater than DTS bandwidth of EUT. If duty cycle of test signal is not 100 %, trigger and gating function of power meter will be enabled to capture transmission burst for measuring output power.
- Maximum Conducted Output Power (For reference only)

Nower meter

 A broadband Average RF power meter is used for output power measurement. The video bandwidth of power meter is greater than DTS bandwidth of EUT. If duty cycle of test signal is not 100 %, trigger and gating function of power meter will be enabled to capture transmission burst for measuring output power.

3.3.3 Test Setup



Report No.: FR440102AI Page: 17 of 50



3.3.4 Test Result of Maximum Output Power

Modulation Mode	N _{TX}	Freq.	Peak conducted output power (dBm)		Total Power					
Wode		(IVITIZ)	Chain 0	Chain 1	Chain 2	Chain 3	(mW)	(dBm)	(dBm)	
11a	1	5745	22.13				163.305	22.13	30.00	
11a	1	5785	22.05				160.325	22.05	30.00	
11a	1	5825	21.71				148.252	21.71	30.00	
HT20	1	5745	22.24				167.494	22.24	30.00	
HT20	1	5785	22.08				161.436	22.08	30.00	
HT20	1	5825	21.67				146.893	21.67	30.00	
HT40	1	5755	22.37				172.584	22.37	30.00	
HT40	1	5795	22.26				168.267	22.26	30.00	

Modulation Mode	N _{TX}	Freq.	Conducted (average) output power (dBm)			Total Power	Total Power	Limit	
Wode		(MHz)	Chain 0	Chain 1	Chain 2	Chain 3	(mW)	(dBm)	(dBm)
11a	1	5745	15.26				33.574	15.26	30.00
11a	1	5785	15.04				31.915	15.04	30.00
11a	1	5825	14.76				29.923	14.76	30.00
HT20	1	5745	15.21				33.189	15.21	30.00
HT20	1	5785	14.94				31.189	14.94	30.00
HT20	1	5825	14.63				29.040	14.63	30.00
HT40	1	5755	15.34				34.198	15.34	30.00
HT40	1	5795	15.18				32.961	15.18	30.00

Note: Conducted average output power is for reference only.

Report No.: FR440102AI Page: 18 of 50



3.4 Power Spectral Density

3.4.1 Limit of Power Spectral Density

Power spectral density shall not be greater than 8 dBm in any 3 kHz band.

3.4.2 Test Procedures

- Maximum peak conducted output power was used to demonstrate compliance to the fundamental output power limit.
 - Set the RBW = 3kHz, VBW = 10kHz.
 - Detector = Peak, Sweep time = auto couple.
 - 3. Trace mode = max hold, allow trace to fully stabilize.
 - 4. Use the peak marker function to determine the maximum amplitude level.
- Maximum (average) conducted output power was used to demonstrate compliance to the fundamental output power limit.
 - Set the RBW = 100kHz, VBW = 300 kHz.
 - 2. Detector = RMS, Sweep time = auto couple.
 - 3. Set the sweep time to: ≥ 10 x (number of measurement points in sweep) x (maximum data rate per stream).
 - 4. Perform the measurement over a single sweep.
 - 5. Use the peak marker function to determine the maximum amplitude level.\

3.4.3 Test Setup

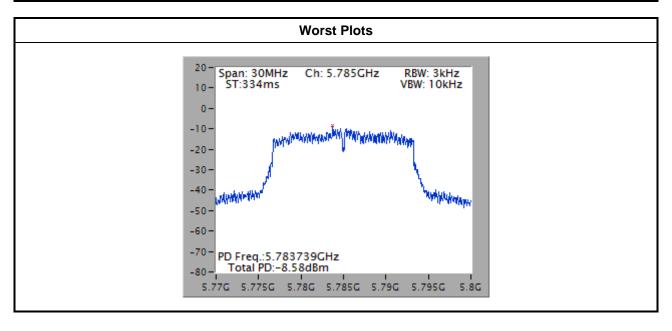


Report No.: FR440102AI Page: 19 of 50



3.4.4 Test Result of Power Spectral Density

Modulation Mode	N _{TX}	Freq. (MHz)	Total Power Spectral Density (dBm/3kHz)	Limit (dBm/3kHz)
11a	1	5745	-8.71	8
11a	1	5785	-8.58	8
11a	1	5825	-10.48	8
HT20	1	5745	-8.90	8
HT20	1	5785	-9.30	8
HT20	1	5825	-10.12	8
HT40	1	5755	-10.34	8
HT40	1	5795	-12.26	8



Report No.: FR440102Al Page: 20 of 50



3.5 Unwanted Emissions into Restricted Frequency Bands

3.5.1 Limit of Unwanted Emissions into Restricted Frequency Bands

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:

Qusai-Peak value is measured for frequency below 1GHz except for 9–90 kHz, 110–490 kHz frequency band. Peak and average value are measured for frequency above 1GHz. The limit on average radio frequency emission is as above table. The limit on peak radio frequency emissions is 20 dB above the maximum permitted average emission limit **Note 2:**

Measurements may be performed at a distance other than what is specified provided. When performing measurements at a distance other than that specified, the results shall be extrapolated to the specified distance using an extrapolation factor as below, Frequency at or above 30 MHz: 20 dB/decade Frequency below 30 MHz: 40 dB/decade.

3.5.2 Test Procedures

- Measurement is made at a semi-anechoic chamber that incorporates a turntable allowing a EUT rotation of 360°. A continuously-rotating, remotely-controlled turntable is installed at the test site to support the EUT and facilitate determination of the direction of maximum radiation for each EUT emission frequency. The EUT is placed at a height of 0.8 m test table above the ground plane.
- 2. Measurement is made with the antenna positioned in both the horizontal and vertical planes of polarization. The measurement antenna is varied in height (1m ~ 4m) above the reference ground plane to obtain the maximum signal strength. Distance between EUT and antenna is 3 m.
- 3. This investigation is performed with the EUT rotated 360°, the antenna height scanned between 1 m and 4 m, and the antenna rotated to repeat the measurements for both the horizontal and vertical antenna polarizations.

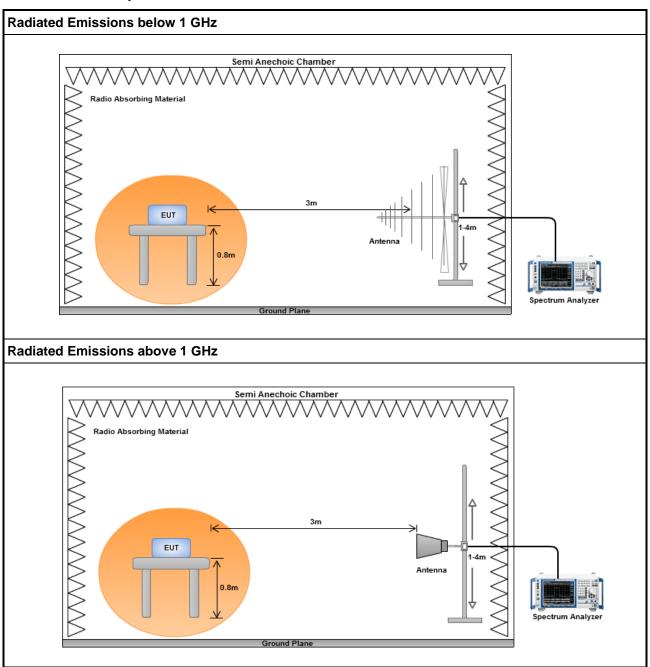
Note:

- 1. 120kHz measurement bandwidth of test receiver and Quasi-peak detector is for radiated emission below 1GHz.
- 2. RBW=1MHz, VBW=3MHz and Peak detector is for peak measured value of radiated emission above 1GHz.
- 3. RBW=1MHz, VBW=1/T and Peak detector is for average measured value of radiated emission above 1GHz.

Report No.: FR440102AI Page: 21 of 50



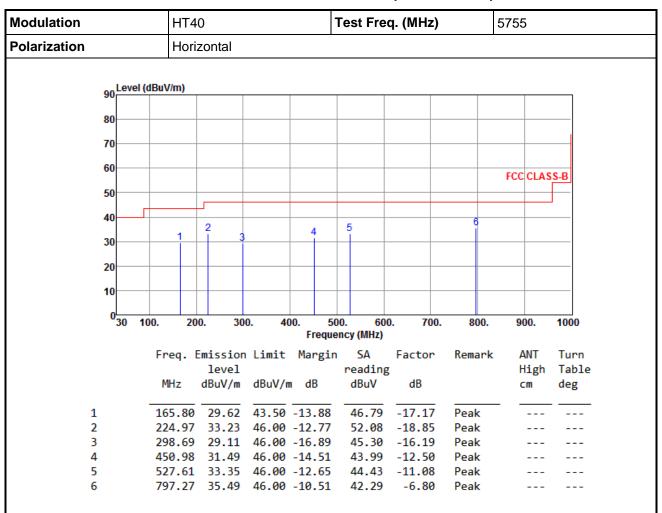
3.5.3 Test Setup



Report No.: FR440102AI Page: 22 of 50



3.5.4 Transmitter Radiated Unwanted Emissions (Below 1GHz)



Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB)

*Factor includes antenna factor, cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Note 3: All spurious emissions below 30MHz are more than 20 dB below the limit.

Report No.: FR440102Al Page: 23 of 50



Modulation			HT4	0		7	Γest Fre	q. (MHz)		5755						
Polarization			Vertical													
	90Le	vel (dBu	ıV/m)													
	80															
	70															
	60															
										FCC CLAS	S-B					
	50															
	40			_					-3-	5	_6					
	20								2							
	30															
	20															
	10															
	030	100.	200	0. 30	0. 40	00. 50 Freque	0. 600 ncy (MHz)	0. 700.	800.	900.	1000					
		E	rea F	mission	limit	Margin		Factor	Remark	ANT	Turn					
			req. E	level	LIMIL	riai 6±ii	reading		Kellidi K	High	Table					
			MHz	dBuV/m	dBuV/r	n dB	dBuV	dB		cm	deg					
1			98.51	28.36	46.00	-17.64	39.94	-11.58	Peak							
2			54.59	34.05		-11.95	41.24	-7.19	Peak							
3			74.96	37.09		-8.91	44.09	-7.00	Peak							
4			97.27				48.74	-6.80	Peak							
5 6			41.89 73.81	40.40 38.19	46.00	-5.60 -15.81	46.65 42.74	-6.25 -4.55	Peak Peak							

*Factor includes antenna factor, cable loss and amplifier gain

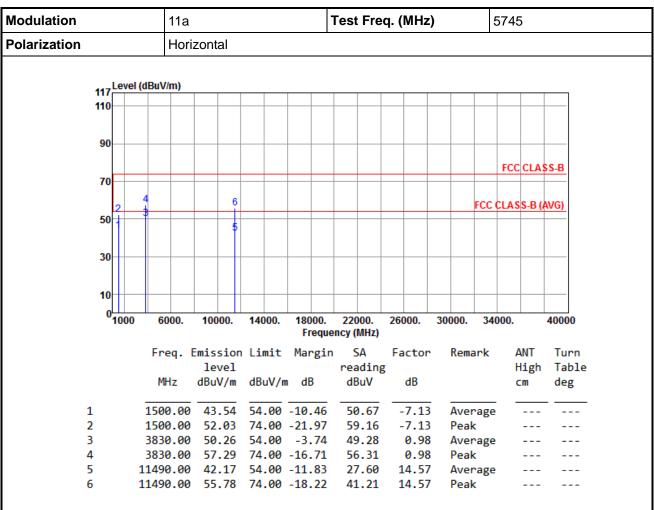
Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Note 3: All spurious emissions below 30MHz are more than 20 dB below the limit.

Report No.: FR440102AI Page: 24 of 50



3.5.5 Transmitter Radiated Unwanted Emissions (Above 1GHz) for 11a



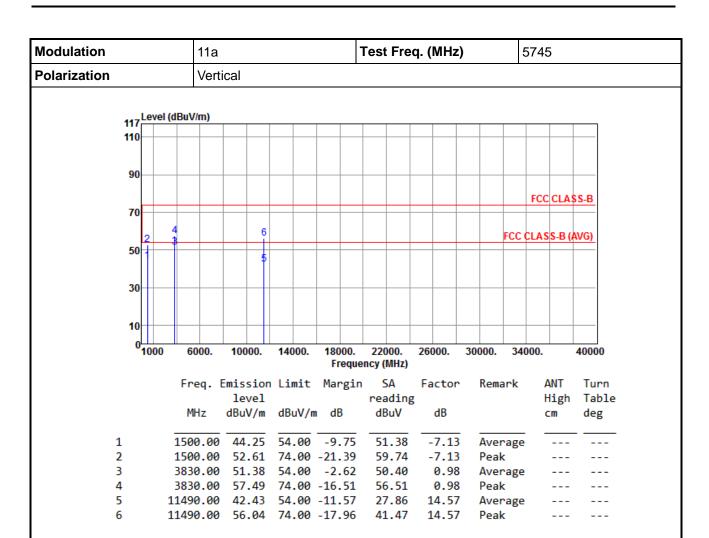
Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB)

*Factor includes antenna factor, cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Report No.: FR440102AI Page: 25 of 50



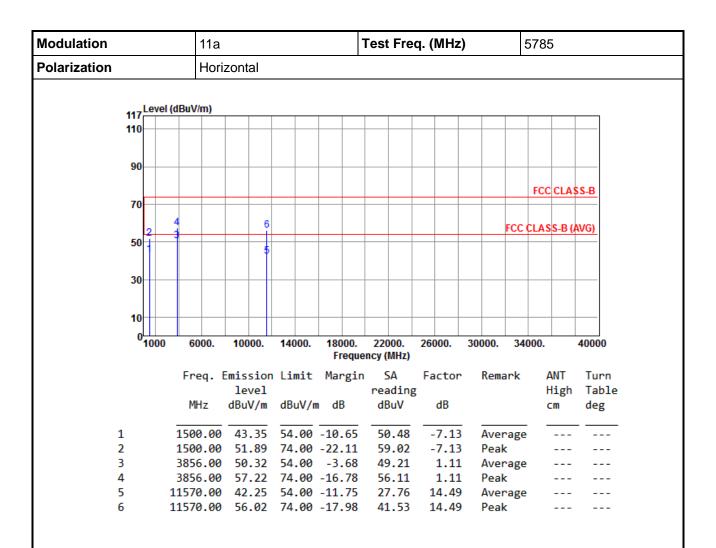


*Factor includes antenna factor, cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Report No.: FR440102AI Page: 26 of 50



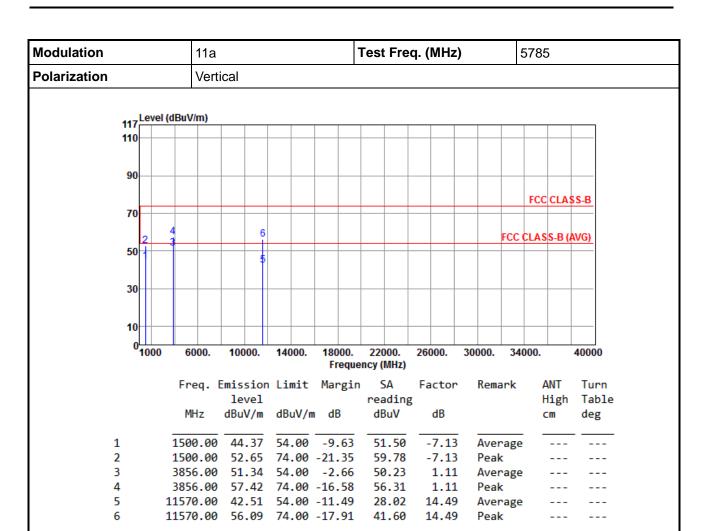


*Factor includes antenna factor, cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Report No.: FR440102AI Page: 27 of 50



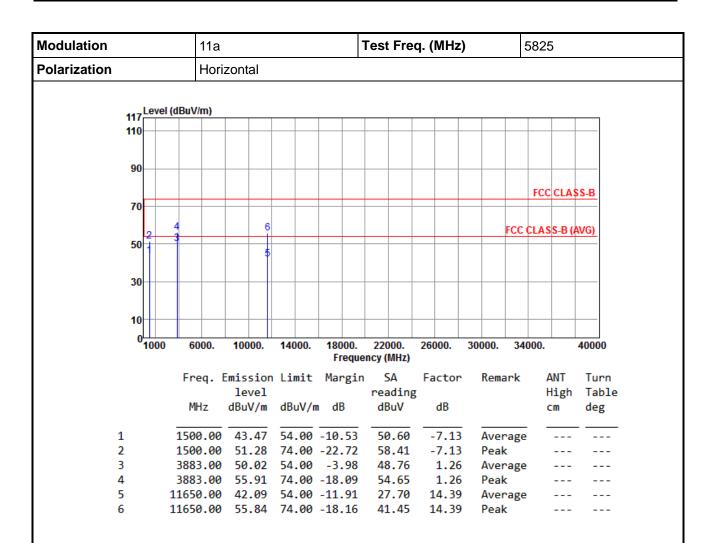


*Factor includes antenna factor, cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Report No.: FR440102AI Page: 28 of 50



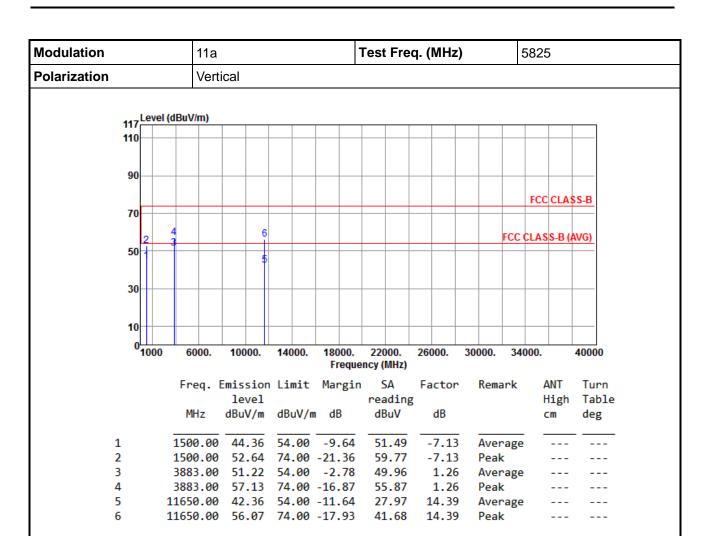


*Factor includes antenna factor, cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Report No.: FR440102Al Page: 29 of 50





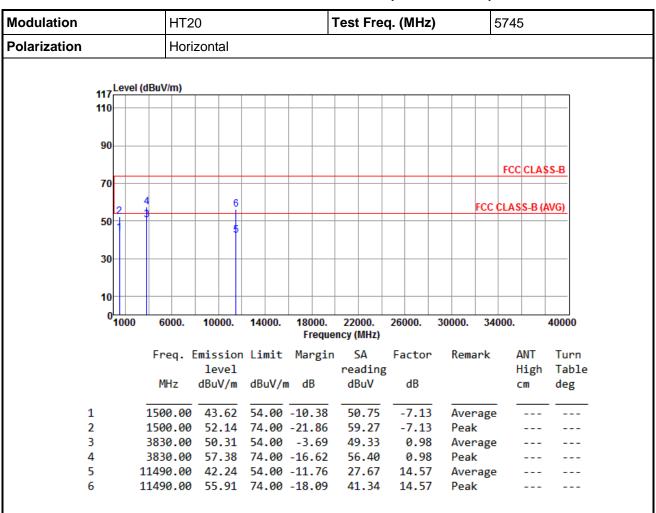
*Factor includes antenna factor, cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Report No.: FR440102AI Page: 30 of 50



3.5.6 Transmitter Radiated Unwanted Emissions (Above 1GHz) for HT20



Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB)

*Factor includes antenna factor, cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBuV/m) - Limit (dBuV/m).

Report No.: FR440102AI Page: 31 of 50

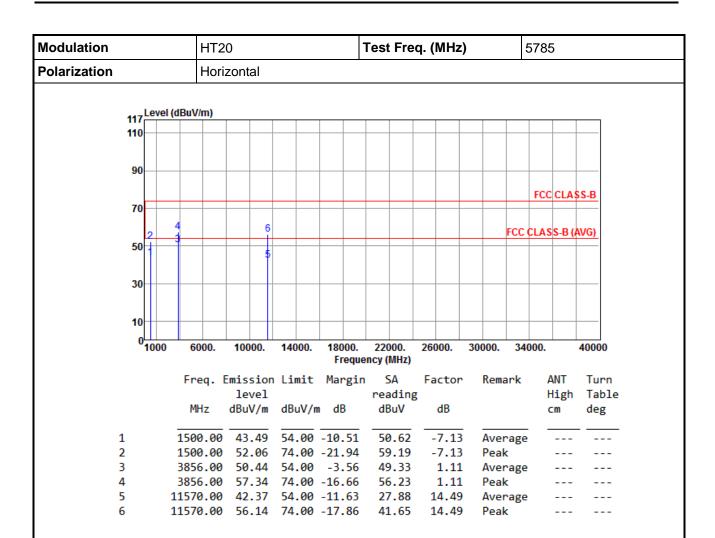


Modulation		HT2	:0				-	Test	Fre	5745	5745							
Polarization				Vertical														
				•														
	117	Lev	el (dBu	IV/m)														
	110																	
	90																	
	70															FCC	CLA	88-B
			4			6												
		2	i_			ů									FCC	CLAS	S-B (AVG)
	50	1				5												
	30	††																
	10	++																
	0	100	0	6000.	100	000.	1400	0. 1	18000.	220	000.	260	000.	30000	34	000.		40000
									Freque	ency (MHz)							
			F	req.			l Limi	t M	Margin				actor	Rer	nark		ANT	Turn
						vel			ID.		ding		ID.				High	
				MHz	dBu	V/m	dBu\	//m	dВ	dE	₿uV		dB			(cm	deg
	1		15	00.00	44	.31	54.6	00 -	9.69	51	.44	_	7.13	Ave	erage			
	2			00.00		.69			21.31		.82		-7.13					
	3			30.00					-2.54		.48		0.98		erage	•		
	4			30.00							.64		0.98					
	5			90.00					11.44		.99		14.57		erage	2		
•	6		114	90.00	56	.13	/4.6	- DI	1/.8/	41	.56	1	L4.57	Pe	aK .			

*Factor includes antenna factor , cable loss and amplifier gain Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Report No.: FR440102AI Page: 32 of 50



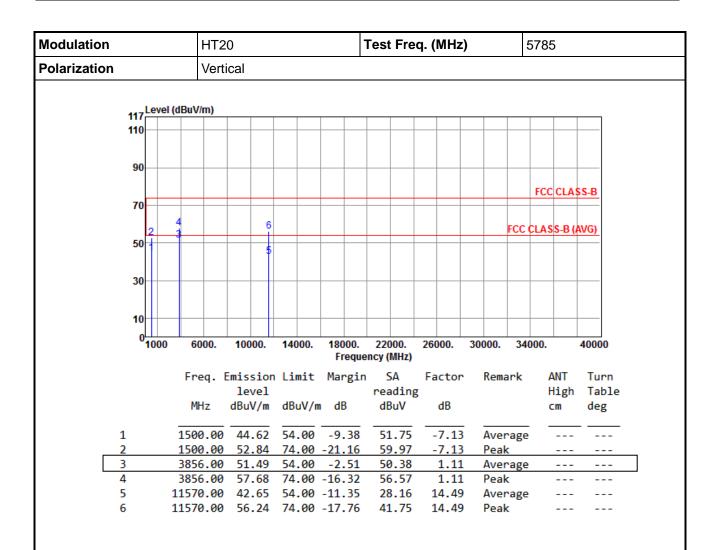


*Factor includes antenna factor, cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Report No.: FR440102AI Page: 33 of 50



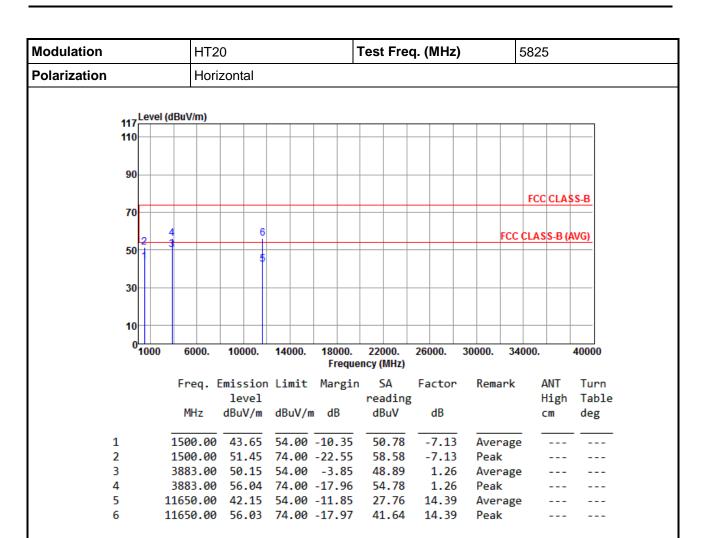


*Factor includes antenna factor, cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Report No.: FR440102AI Page: 34 of 50





*Factor includes antenna factor, cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Report No.: FR440102AI Page: 35 of 50



Modulation		HT2	0				-	Test Freq. (MHz) 5								5825			
Polarization				Vertical															
		Low	ol /dDu	M(m)															
		Leve	el (dBu	IV/III)															
	110							\dashv											
	90																		
	30																		
	70																FCC	CLAS	SS-B
	70																		
		2	- 1			6										FCC (CLAS	S-B (/	AVG)
	50	1				5													
	30																		
	10																		
	0																		
		100	U	6000.	100	00.	1400	0.	18000. Freque	220 ncy (260	000.	3000	00.	340	000.		40000
			F	rea. I	Emis	sion	Limi	it	Margin	9	Α	Fa	ctor	R	lema	rk	Δ	ANT	Turn
						vel					ding	3					Н	ligh	Tabl
				MHz	dBu'	V/m	dBu\	//m	dB	dE	uV		dB				C	m	deg
1			15	00.00	44	.53	54.6	 90	-9.47	51	.66	_	7.13		ver	age	-		
2				00.00		.77			21.23		.90		7.13		eak	_			
3	}		38	83.00	51	.34	54.6	90	-2.66	56	.08		1.26	Δ	ver	age			
4	ļ		38	83.00	57	.24	74.6	90 -	16.76	55	.98		1.26	P	eak				
5									11.46		.15		4.39			age			
6	•		116	50.00	56	.18	74.6	90 -	17.82	41	.79	1	4.39	P	eak'				

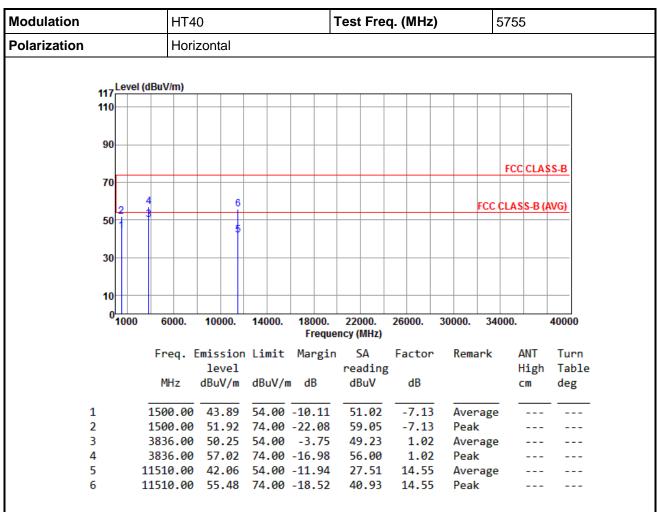
Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB)

*Factor includes antenna factor , cable loss and amplifier gain Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Report No.: FR440102AI Page: 36 of 50



3.5.7 Transmitter Radiated Unwanted Emissions (Above 1GHz) for HT40



Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB)

*Factor includes antenna factor, cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBuV/m) - Limit (dBuV/m).

Report No.: FR440102AI Page: 37 of 50



Modulation		HT	40				Test Fre	q. (MHz)	5755					
Polarization		Vertical												
117	117 Level (dBuV/m)													
110														
90														
										FCC	CLASS	<u>-B</u>		
70		4		6					ECC	CLAS	S-B (AV	G)		
50	1	3		5						CLAS	3-D (AV	<u> </u>		
30														
10														
0		6000.	100	00.	14000.	18000.	22000.	26000.	30000. 34	4000.	4	0000		
							iency (MHz)							
		Freq.		sion vel	Limit	Margi	n SA reading	Factor	Remark	_		Turn Table		
		MHz			dBuV/	m dB	dBuV	dВ			_	deg		
1		1500.00	44	.38	54.00	-9.62	51.51	-7.13	Average	– – e				
2		1500.00		.01		-21.99			Peak					
		2026 06	L L L	0.4	E4 00	2 16	40 93	1 02	Average	_				
3 4		3836.00 3836.00							Peak	e				

14.55

Peak

Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB)

11510.00 55.76 74.00 -18.24 41.21

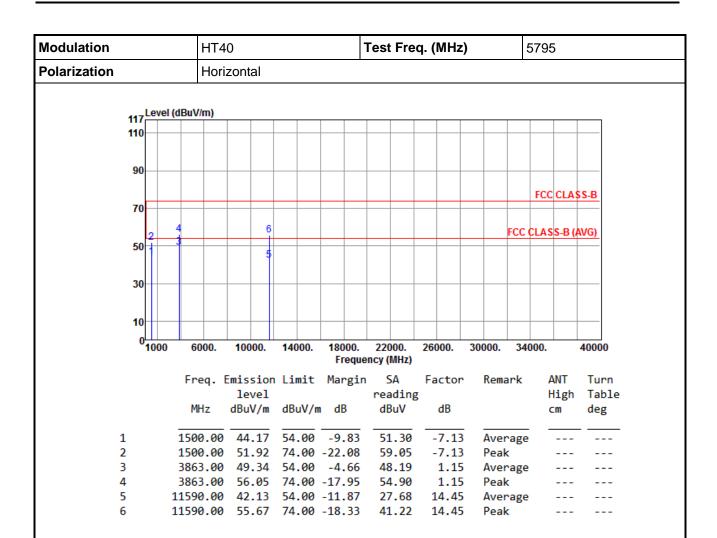
*Factor includes antenna factor , cable loss and amplifier gain Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Report No.: FR440102AI Page: 38 of 50

Report Version: Rev. 01

6





Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB)

*Factor includes antenna factor, cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Report No.: FR440102AI Page: 39 of 50



Modulation		HT4	HT40						Test Freq. (MHz) 5						5795			
Polarization			Vertical															
117	7 ^{Le}	evel (d	BuV/m)															
110																		
90	0																	
														FCC	CLA	SS-B		
70	0																	
	١,	4			6								FCC	CLAS	S-B (AVG)		
50	0 1				- 5													
	Ш				Ĭ													
30	0							+-										
	Ш																	
10	0																	
(0 1(000	6000.	100	00.	14000			000.		000.	30000.	34	000.		40000		
			_						(MHz)							_		
			Freq.		sion vel	l Limit	Margi		SA ading		ictor	Rem	ark		ANT High	Turn Table		
			MHz			dBuV/	m dB		BuV		dB				:#8::	deg		
		_			_			_		_								
1			1500.00		.51		9.49		1.64		7.13		rage	!				
2			1500.00 3863.00		.18) -21.82) -3.35		9.31 9.50		7.13		k rage					
4			3863.00						6.13		1.15	Pea		i				
5			1590.00				-11.64		7.91		4.45		rage					
6		11	1500 00	55	2/	7/ 00	-18.16		1.39	4	4.45	Pea	le.					

Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB)

*Factor includes antenna factor , cable loss and amplifier gain Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Report No.: FR440102AI Page: 40 of 50



3.6 Unwanted Emissions into Non-Restricted Frequency Bands

3.6.1 Limit of Unwanted Emissions into Non-Restricted Frequency Bands

The peak output power measured in any 100 kHz bandwidth outside of the authorized frequency band shall be attenuated by at least 20 dB relative to the maximum in-band peak PSD level in 100 kHz.

3.6.2 Test Procedures

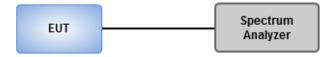
Reference Level Measurement

- 1. Set the RBW = 100 kHz, VBW = 300 kHz, Detector = peak.
- 2. Set Sweep time = auto couple, Trace mode = max hold.
- 3. Allow trace to fully stabilize.
- 4. Use the peak marker function to determine the maximum amplitude level.

Unwanted Emissions Level Measurement

- Set RBW = 100 kHz, VBW = 300 kHz, Detector = peak.
- 2. Trace Mode = max hold, Sweep = auto couple.
- 3. Allow the trace to stabilize.
- 4. Use peak marker function to determine maximum amplitude of all unwanted emissions within any 100 kHz bandwidth.

3.6.3 Test Setup

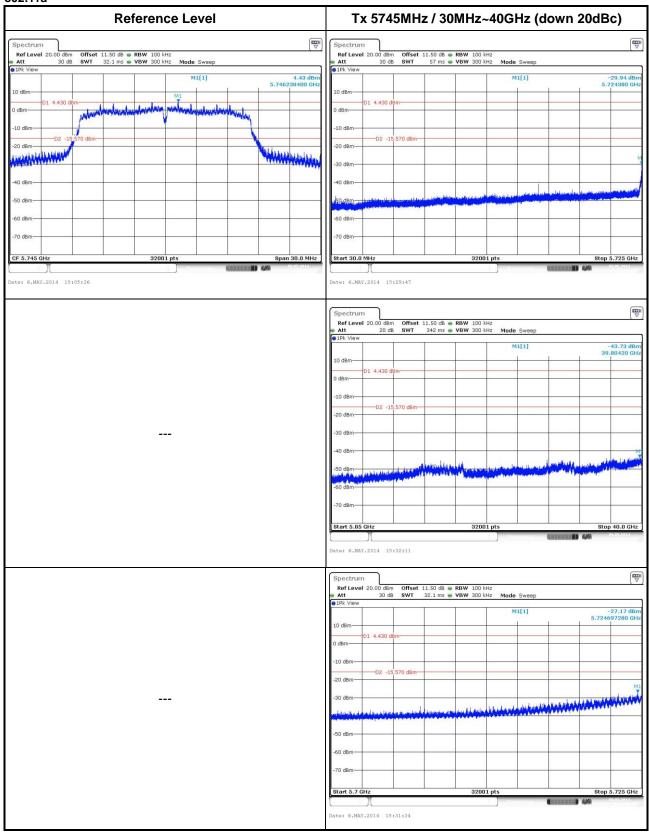


Report No.: FR440102AI Page: 41 of 50



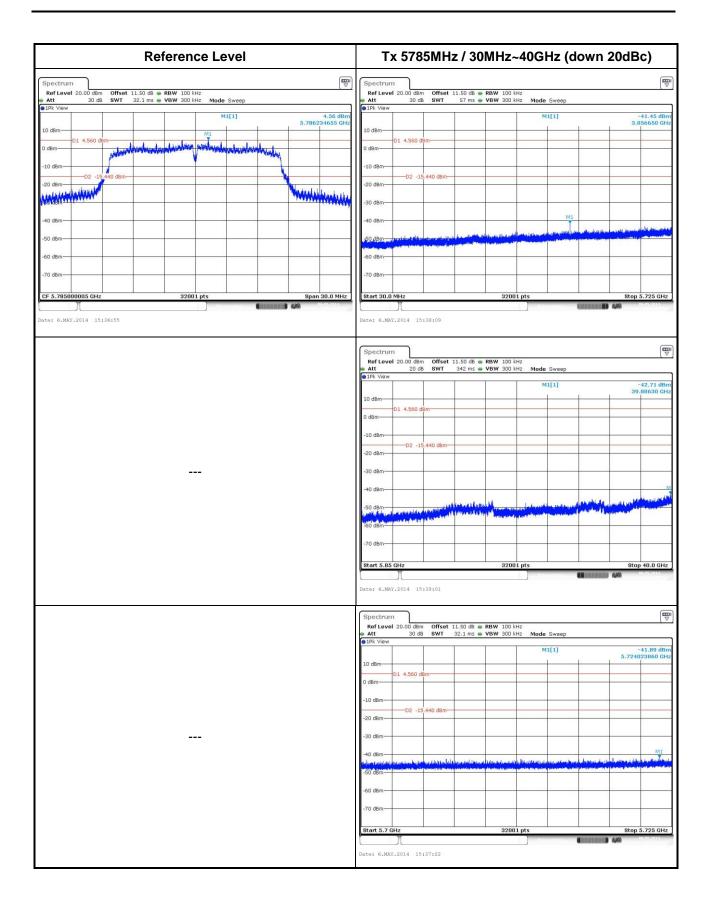
3.6.4 Unwanted Emissions into Non-Restricted Frequency Bands

802.11a



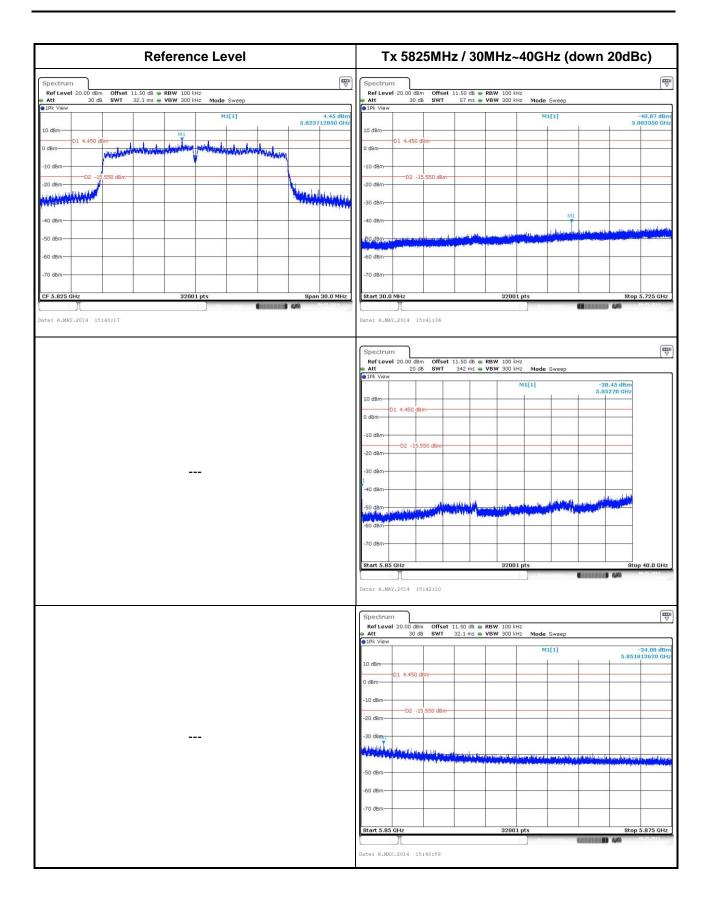
Report No.: FR440102Al Report Version: Rev. 01





Report No.: FR440102AI Page: 43 of 50

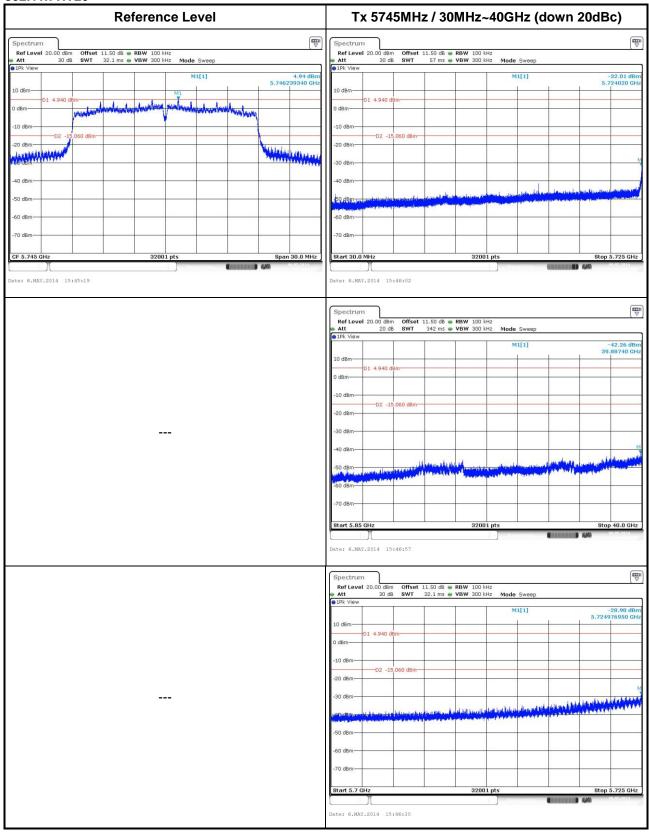




Report No.: FR440102AI Page: 44 of 50

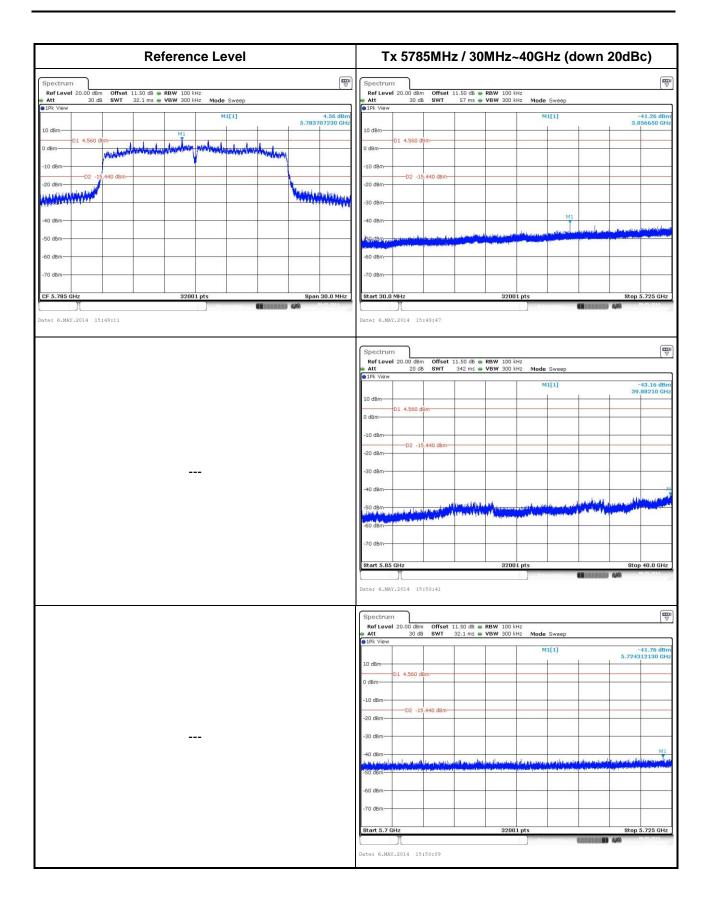


802.11n HT20



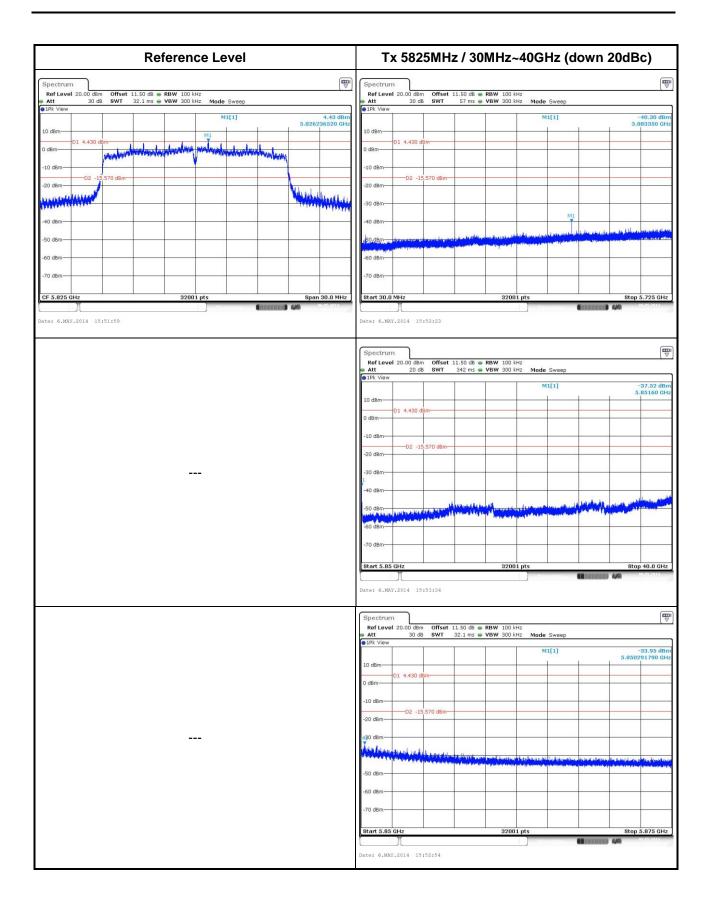
Report No.: FR440102AI Page: 45 of 50





Report No.: FR440102AI Page: 46 of 50

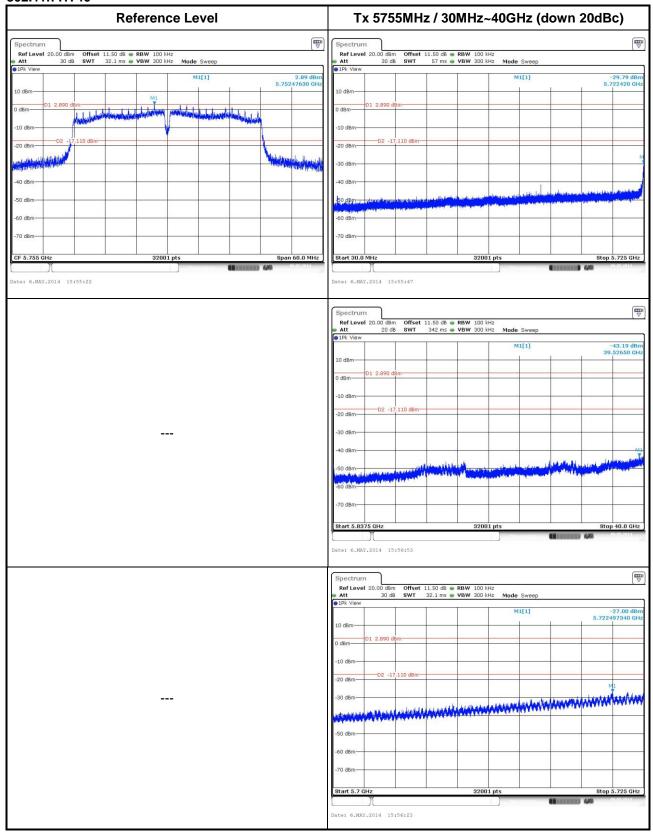




Report No.: FR440102AI Page: 47 of 50

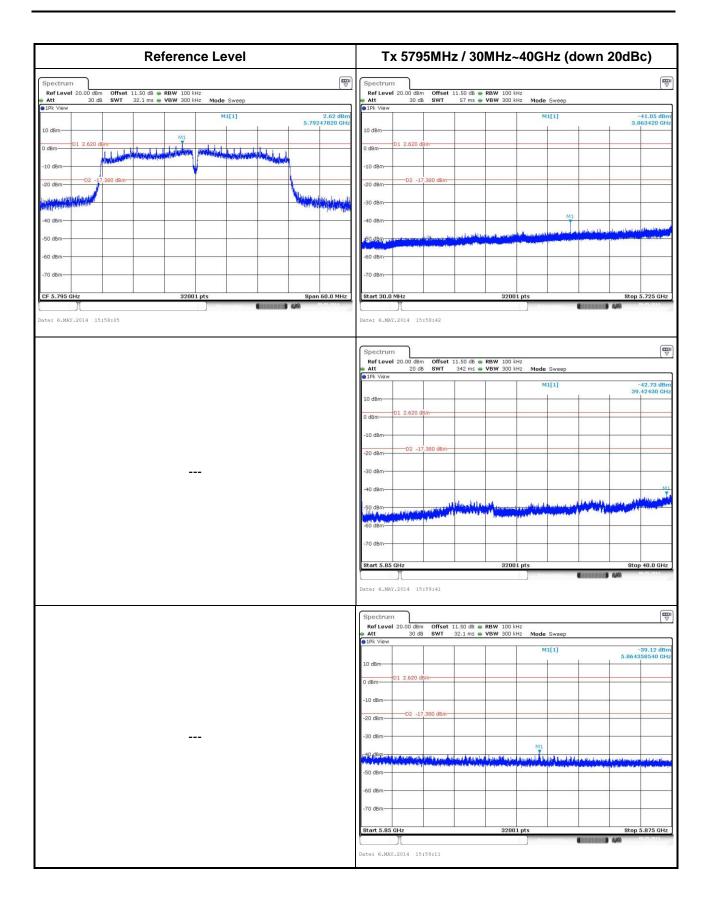


802.11n HT40



Report No.: FR440102AI Page: 48 of 50





Report No.: FR440102AI Page: 49 of 50



4 Test laboratory information

Established in 2012, ICC provides foremost EMC & RF Testing and advisory consultation services by our skilled engineers and technicians. Our services employ a wide variety of advanced edge test equipment and one of the widest certification extents in the business.

International Certification Corp, it is our definitive objective is to institute long term, trust-based associations with our clients. The expectation we set up with our clients is based on outstanding service, practical expertise and devotion to a certified value structure. Our passion is to grant our clients with best EMC / RF services by oriented knowledgeable and accommodating staff.

Our Test sites are located at Linkou District and Kwei Shan Hsiang. Location map can be found on our website http://www.icertifi.com.tw.

Linkou Kwei Shan

Tel: 886-2-2601-1640 Tel: 886-3-271-8666

No. 30-2, Ding Fwu Tsuen, Lin Kou District, New Taipei
City, Taiwan, R.O.C.

No. 3-1, Lane 6, Wen San 3rd St., Kwei Shan
Hsiang, Tao Yuan Hsien 333, Taiwan, R.O.C.

If you have any suggestion, please feel free to contact us as below information

Tel: 886-3-271-8666 Fax: 886-3-318-0155

Email: ICC_Service@icertifi.com.tw

==END==

Report No.: FR440102AI Page: 50 of 50