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Revision	**0.1**
Test Engineer	**Gui-fang Tang**
Product Leader	**Robin.Xu**

Project Code: NC024
H/W Revision: V23
S/W Revision: NA
Solution Description: Marvell 88W8787 11b/g/n+BT+FM

802.11b/g/n +BT 3.0/HS+FM 3-in-1 SiP Module

Electronic Design Verification Test Report

Reviewers

Prepared by	Reviewed by	Approved by
Benson Liu	Dave Wang	Aaron Yu

Modification History

Rev	Date	Originator	Comment
0.0	2010.03.09	Gui-fang	Initial Release
0.1	2010.06.01	Gui-fang	Update over temp. and voltage test data

Table of Contents

1. Introduction

The Marvell 8787 module is integrated 802.11b/g/n and Bluetooth 3.0+HS function. The objective of this test plan is to verify the functionality of the module RF/Digital electronic design against the design specifications.
This revision includes results taken at various temperatures (-20℃,25℃,+70 ℃) and voltages (3.15V/1.71V,3.3V/1.8V,3.45V/1.89V).Included are statements of test purpose, test methodologies, test modes and parameters, environmental conditions, applicable specifications, and typical reference design performance.

The major specifications and documents are listed below and upon to update in the following new revisions.

802.11b: IEEE Std 802.11b/D8.0-Sept 2001 Part 11 Paragraph 18.4.7.3
802.11g: IEEE Std 802.11g/D8.2-Apr 2003 Part 11 Paragraph 19.5.4
802.11n: IEEE P802.11n/D2.07-Mar 2006 Paragraph 20.3.20.1

2. Block Diagram

The general HW architecture for the module is shown in Figure 1. The module integrates Marvell® 88W8787, PA,SP3T RF switch and all required passive elements into a miniature 8.3mm x 8.6mm x 1.2mm(max.) size package.

WiFi 11bgn / BT3.0+HS / FM(TX/RX)

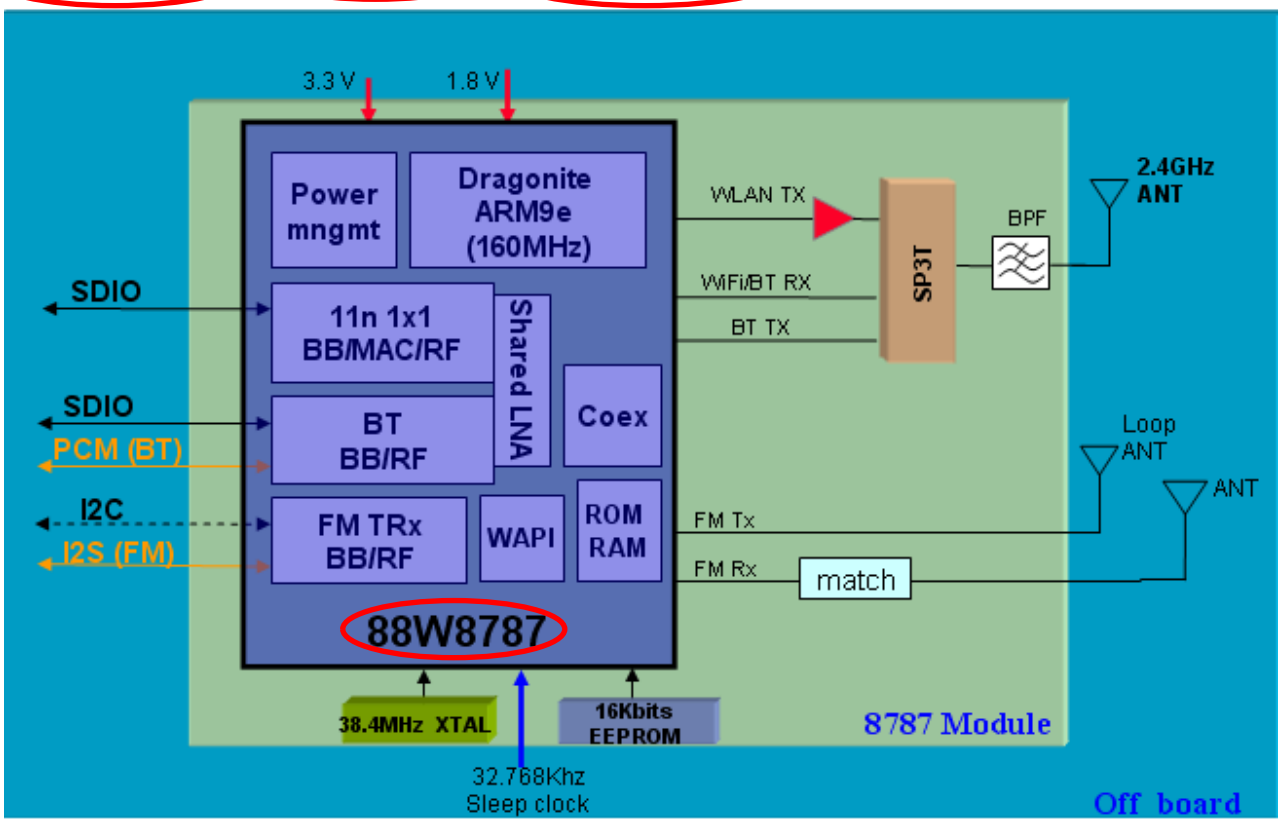


Figure1 8787 SiP Module Block Diagram

The Module is powered in the application from two regulated supply (3.3V and 1.8V). Host digital interfacing is compatible with G-SPI/SDIO interface for WLAN, PCM/I2S interfaces for Bluetooth and I2C/I2S interfaces for FM RX/TX. Host analog audio interfaces are available for both FM RX and FM TX.

3. RF Test Setup and Equipment Required

3.1 Block Diagram of Test setup

The following diagram is the setup of the RF EDVT; the equipments required are list in the table below. According to the block diagram of the test setup, the connection of the RF cables would be changed alone with the requirement of the various test items. The end of the connectors which is not in used during the test will be terminated with a 50 ohm load. The test setup could be variable regarding to the request of DUT.

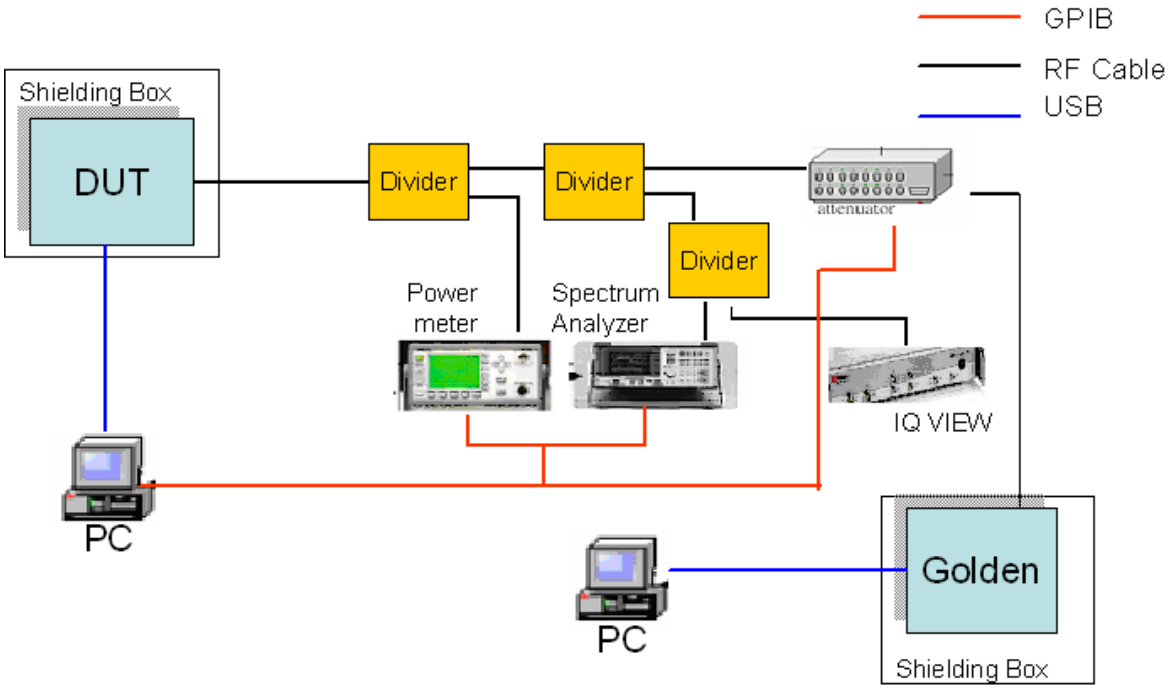


Fig2. Test Setup of NC024 RF EDVT

3.2 Equipment List

The equipment list below is to indicate the equipment of the RF EDVT test setup. The equipment can be modified upon the request of the design. The list below is a typical setup for general design use.

Description	Manufacturer	Model	Qty	Remark
Personal Computer	Local	WinXP system	2	
Spectrum Analyzer	Local	E4404B Series	1	
Power Meter	Agilent	E4416A	1	
Power Sensor	Agilent	E9323A	1	
Vector Signal Analyzer	LitePoint	IQVIEW	1	
RF Divider			3	
RF Cable			8	
GPIB Controller	National	GPIB-USB-B	1	
GPIB Cable	National		3	
Attenuator	Agilent	8494H & 8496H	2	
Attenuator Controller	Agilent	11703A	1	
Power supply	Agilent	E3631A		
Golden Unit	Local		1	
Shielding Box	Local		2	
USB Cable	Local		2	
Test Fixture	Local		1	

3.3 Test program

Marvell Mfg tool: MFG-8787-WIFI-SD-BT-SD-WIN-X86-1.0.5.18_2-14.0.1.P63

4. RF EDVT Test Case and Procedure

Below is the detailed description for each test item of NC024 RF EDVT.
For the test items cannot be executed by the automatic test utility, the test engineer should finish them manually by using achievable tools.

4.1 Tx Power Levels

The test spec and the test criteria should be updated according to customer requested or regulatory result.

4.2 Spectrum Mask And OBW/SBW

The transmitted spectrum shall have a 0 dBr bandwidth not exceeding 17.5 MHz(99% OBW),and spreading must be larger than 9MHz(90% SBW), –20dBr at 11MHz frequency offset, –28 dBr at 20 MHz frequency offset and –40 dBr at 30 MHz frequency offset and above. The transmitted spectral density of the transmitted signal shall fall within the spectral mask as shown in Fig.4. The measurements shall be made using a 100 kHz resolution bandwidth and a 30 kHz video bandwidth. It will be measured over the operating voltage range for specified channels in accordance with the below procedures:

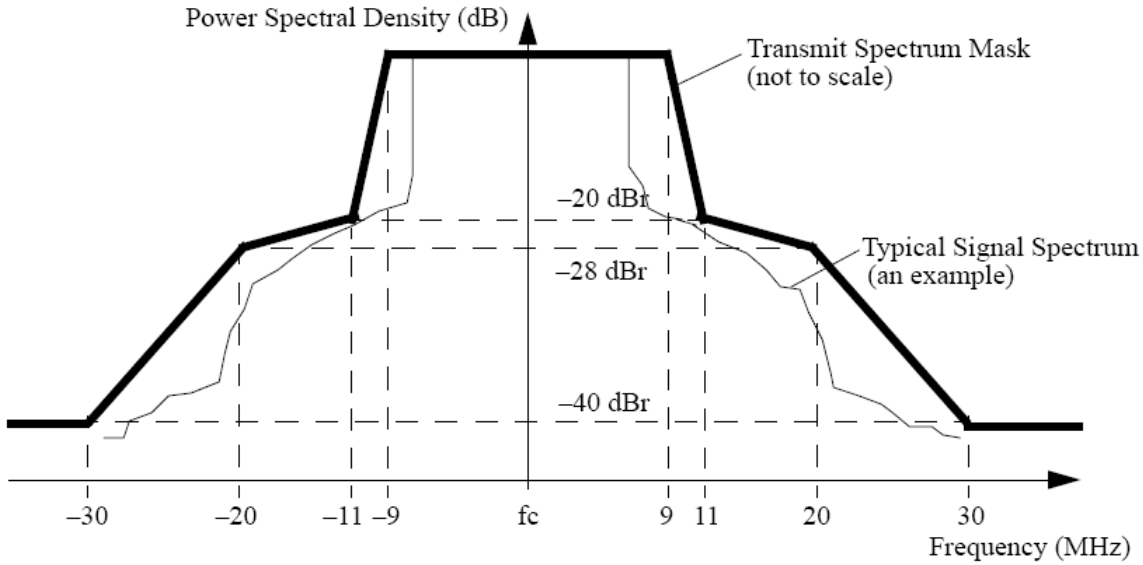


Fig.4 802.11g Transmit Spectrum Mask

The transmitted spectral products shall be less than -30 dBr for f_c - 22 MHz < f < f_c - 11 MHz, f_c +11 MHz < f < f_c + 22 MHz, - 50 dBr for f < f_c - 22 MHz, and f > f_c + 22 MHz, where f_c is the channel center frequency. The transmit spectral mask is shown in Fig.5. The measurements shall be made using 100 kHz resolution bandwidth and a 100 kHz video bandwidth. It will be measured over the operating voltage range for specified channels in accordance with the below procedure:

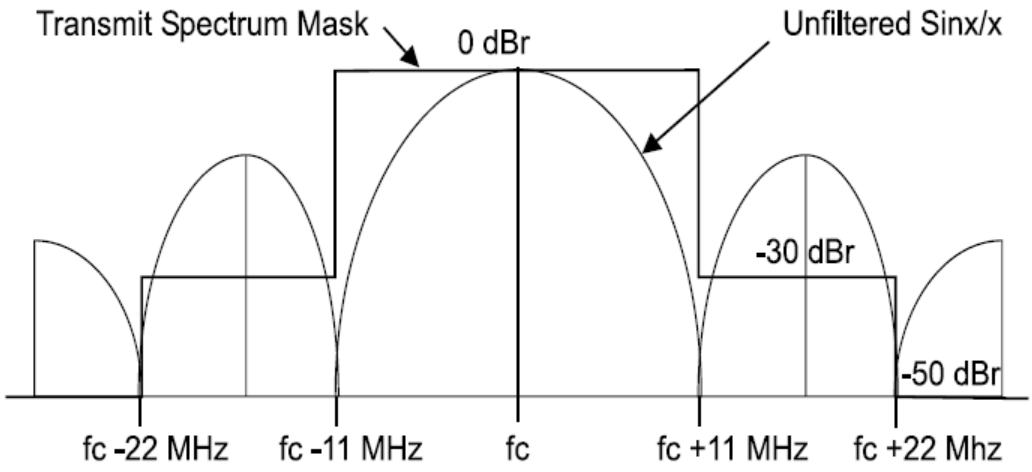


Fig.5 802.11b Transmit Spectrum Mask

In the absence of other regulatory restrictions, when transmitting in a 20 MHz channel, the transmitted spectrum shall have a 0 dBr (dB relative to the maximum spectral density of the signal) bandwidth not exceeding 18 MHz, –20 dBr at 11 MHz frequency offset, –28 dBr at 20 MHz frequency offset and –45 dBr at 30 MHz frequency offset and above. The transmitted spectral density of the transmitted signal shall fall within the spectral mask, as shown in Fig.6 (Transmit spectral mask for 20 MHz transmission). The measurements shall be made using a 100 kHz resolution bandwidth and a 30 kHz video bandwidth.

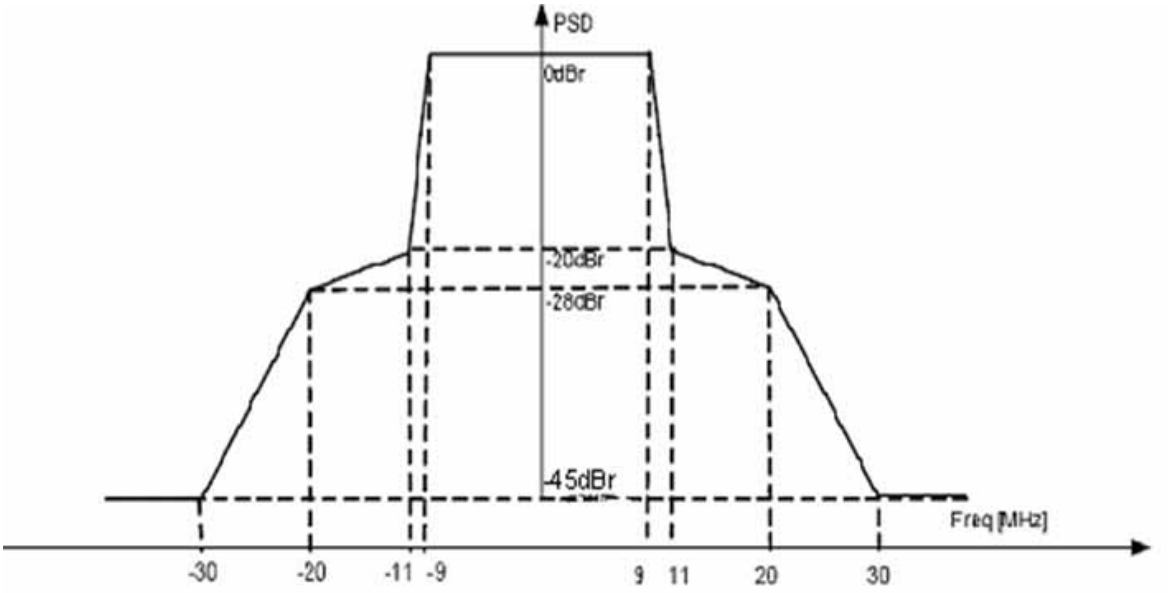


Fig.6 802.11n HT20 Transmit Spectrum Mask

In the absence of other regulatory restrictions, when transmitting in a 40 MHz channel, the transmitted spectrum shall have a 0 dBr bandwidth not exceeding 38 MHz, –20 dBr at 21 MHz frequency offset, -28 dBr at 40 MHz offset and –45 dBr at 60 MHz frequency offset and above. The transmitted spectral density of the transmitted signal shall fall within the spectral mask, as shown in Fig.7 (Transmit spectral mask for a 40 MHz channel).

The transmit spectral mask for 20 MHz transmission in upper or lower 20 MHz channels

of a 40 MHz is the same mask as that used for the 40 MHz channel.

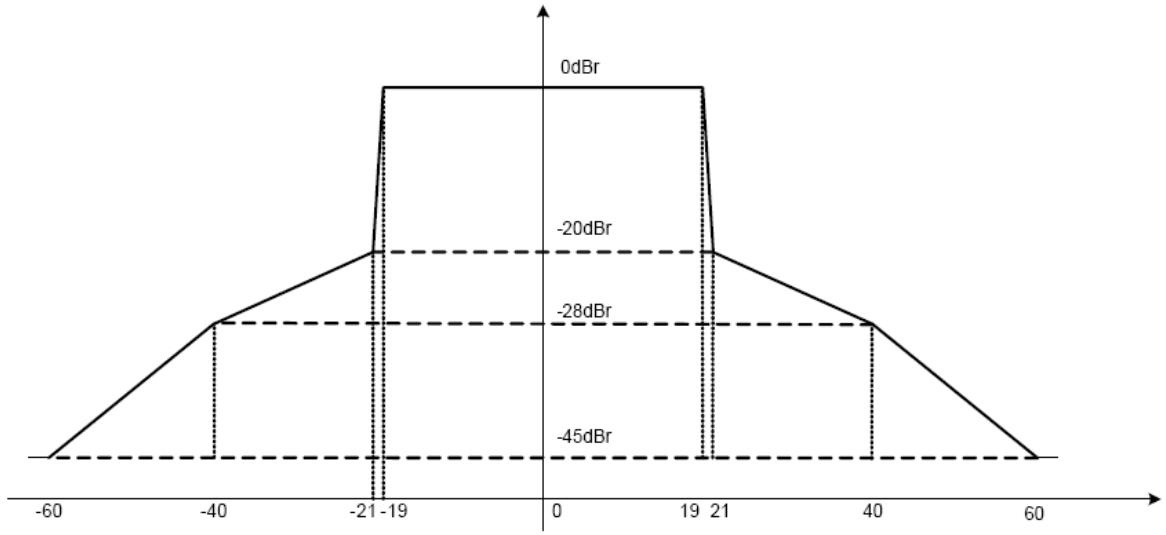


Fig.7 802.11n HT40 Transmit Spectrum Mask

Mode of Operation 802.11g	**IEEE Specifications**
802.11 g at ± 9 MHz Offset	0 dBr
802.11 g at ± 11 MHz Offset	-20 dBr
802.11 g at ± 20 MHz Offset	-28 dBr
802.11 g at ± 30 MHz Offset	-40 dBr
Mode of Operation 802.11b	**IEEE Specifications**
802.11b at +/-11MHz~+/-22MHz Offset	-30 dBr
802.11b at >+22MHz,<-22MHz Offset	-50 dBr
Mode of Operation 802.11n-HT20	**IEEE Specifications**
802.11n at ±9 MHz offset	0 dBr
802.11n at ±11 MHz offset	-20 dBr
802.11n at ±20 MHz offset	-28 dBr
802.11n at ±30 MHz offset	-45 dBr
Mode of Operation 802.11n-HT40	**IEEE Specifications**
802.11n at ±19 MHz offset	-0 dBr
802.11n at ±21 MHz offset	-20 dBr
802.11n at ±40 MHz offset	-28 dBr
802.11n at ±60 MHz offset	-45 dBr

OPERATION OUTPUT POWER

802.11 g

(-20 ℃/3.15V/1.71)

Rate (Mbps)	Spec. (dBm)	Frequency (MHz)												
		2412	2417	2422	2427	2432	2437	2442	2447	2452	2457	2462	2467	2472
6	15+/-1.5	13.82	13.99	13.96	14.36	14.71	14.18	14.11	14	13.89	14.61	14.21	14.1	14.01
36	15+/-1.5	13.71	13.88	14.16	14.28	14.28	14.1	14.03	13.93	13.79	14.2	14.14	14.04	13.95
48	15+/-1.5	13.8	13.96	13.93	14.35	14.35	14.18	14.11	13.96	13.85	14.27	14.21	14.1	14.01
54	15+/-1.5	13.79	13.94	13.91	14.35	14.34	14.16	14.09	13.93	13.83	14.25	14.18	14.09	13.99

OBW (99% Bandwidth)

Rate (Mbps)	Spec. (MHz)	Frequency (MHz)												
		2412	2417	2422	2427	2432	2437	2442	2447	2452	2457	2462	2467	2472
54	17.5	16.5	16.5	16.5	16.5	16.5	16.5	16.5	16.5	16.5	16.4	16.4	16.4	16.4

SPECTRUM MASK

802.11g

RBW: 100KHZ VBW: 30KHZ SPAN: 60MHZ MAX HOLD

Offset Frequency	Spec. (dBr)	Data Rate (Mbps)	Frequency (MHz)		
			2412	**2442**	**2472**
+/-11MHz offset	-20	54	-35.5	-38	-37.3
+/-20MHz offset	-28	54	-42.6	-43.2	-43.4
+/-30MHz offset	-40	54	-49.9	-50.2	-51.1

OPERATION OUTPUT POWER

802.11 b

(-20 ℃/3.15V/1.71)

Rate (Mbps)	Spec. (dBm)	Frequency (MHz)													
		2412	2417	2422	2427	2432	2437	2442	2447	2452	2457	2462	2467	2472	2484
1	18+/-1.5	16.75	16.87	17.36	17.29	17.29	17.59	17.52	17.42	17.29	17.75	17.71	17.59	14.52	17.59
2	18+/-1.5	16.77	16.94	17.43	17.36	17.37	17.66	17.59	17.44	17.34	17.77	17.77	17.57	17.58	17.61
5.5	18+/-1.5	16.79	17.02	17.12	17.27	17.37	17.49	17.62	17.37	17.09	17.51	17.56	17.46	17.48	17.66
11	18+/-1.5	16.62	16.77	17.06	17.11	16.99	17.33	17.23	17.32	17.11	17.42	17.43	17.44	17.25	17.69

OBW (99% Occupied Bandwidth,90% Spreading Bandwidth)

Rate (Mbps)	Spec. (MHz)	Frequency (MHz)												
		2412	2417	2422	2427	2432	2437	2442	2447	2452	2457	2562	2467	2472
11	<17.5	14.3	14.3	14.4	14.4	14.5	14.6	14.6	14.5	14.5	14.5	14.4	14.4	14.4
11	>9.0	10.2	10.2	10.3	10.2	10.3	10.4	10.4	10.3	10.3	10.2	10.2	10.2	10.2

SPECTRUM MASK

802.11b

RBW: 100KHZ VBW: 100KHZ SPAN: 110MHZ MAX HOLD

Offset Frequency	Spec. (dBr)	Data Rate (Mbps)	Frequency (MHz)		
			2412	**2442**	**2472**
+/-11MHz~+/-22MHz offset	-30	11	-48.3	-47.2	-48.3
>+22MHz,<-22MHz offset	-50	11	-54.1	-56.1	-55.1

OPERATION OUTPUT POWER

802.11n HT20
(-20 ℃/3.15V/1.71)

Rate (Mbps)	Spec. (dBm)	Frequency (MHz)													
		2412	2417	2422	2427	2432	2437	2442	2447	2452	2457	2462	2467	2472	2484
MCS0	13+/-1.5	12.12	12.28	12.26	12.85	12.85	12.65	12.58	12.48	12.31	12.67	12.49	12.38	12.29	
MCS1	13+/-1.5	12.12	12.29	12.29	12.88	12.86	12.67	12.6	12.44	12.33	12.53	12.52	12.41	12.32	
MCS2	13+/-1.5	12.14	12.31	12.29	12.85	12.87	12.69	12.62	12.45	12.34	12.56	12.53	12.43	12.34	
MCS3	13+/-1.5	12.15	12.32	12.27	12.85	12.89	12.71	12.6	12.47	12.36	12.57	12.55	12.44	12.35	
MCS4	13+/-1.5	12.17	12.3	12.27	12.86	12.9	12.68	12.61	12.49	12.38	12.58	12.52	12.41	12.32	
MCS5	13+/-1.5	12.18	12.29	12.29	12.87	12.87	12.69	12.62	12.5	12.34	12.59	12.53	12.43	12.33	
MCS6	13+/-1.5	12.18	12.3	12.29	12.87	12.89	12.69	12.63	12.46	12.35	12.6	12.55	12.44	12.34	
MCS7	13+/-1.5	12.18	12.31	12.3	12.89	12.89	12.71	12.64	12.47	12.36	12.61	12.55	12.44	12.35	

SPECTRUM MASK

802.11n
RBW: 100KHZ VBW: 30KHZ SPAN: 110MHZ MAX HOLD

Offset Frequency	Spec. (dBr)	Data Rate (Mbps)	Frequency (MHz)		
			2412	**2442**	**2472**
+/-11MHz offset	-20	MCS7	-36.7	-37.6	-39
+/-20MHz offset	-28	MCS7	-44.4	-44.3	-46.4
+/-30MHz offset	-45	MCS7	-47.5	-47.2	-47.7

OPERATION OUTPUT POWER

802.11n HT40
(-20 ℃/3.15V/1.71)

Rate (Mbps)	Spec. (dBm)	Frequency (MHz)								
		2422	2427	2432	2437	2442	2447	2452	2457	2462
MCS0	13+/-1.5	12	12.61	12.64	12.48	12.43	12.27	12.17	12.37	12.34
MCS1	13+/-1.5	12.02	12.62	12.66	12.5	12.45	12.3	12.19	12.38	12.35
MCS2	13+/-1.5	12.02	12.59	12.67	12.52	12.42	12.3	12.19	12.37	12.35
MCS3	13+/-1.5	11.99	12.6	12.68	12.48	12.43	12.31	12.19	12.39	12.36
MCS4	13+/-1.5	12	12.61	12.65	12.49	12.42	12.31	12.2	12.39	12.36
MCS5	13+/-1.5	12	12.62	12.65	12.47	12.43	12.31	12.2	12.39	12.36
MCS6	13+/-1.5	12.01	12.62	12.64	12.48	12.44	12.31	12.2	12.4	12.36
MCS7	13+/-1.5	12.01	12.62	12.64	12.49	12.43	12.32	12.21	12.4	12.33

SPECTRUM MASK

802.11n
RBW: 100KHZ VBW: 30KHZ SPAN: 120MHZ MAX HOLD

Offset Frequency	Spec. (dBr)	Data Rate (Mbps)	Frequency (MHz)		
			2422	2437	2452
+/-21MHz offset	-20	MCS7	-32.4	-33.2	-33.7
+/-40MHz offset	-28	MCS7	-38.6	-40	-38.7
+/-60MHz offset	-45	MCS7	-47.9	-50.1	-50

OPERATION OUTPUT POWER

802.11 g

(-20℃ / 3.3V/1.8V)

Rate (Mbps)	Spec. (dBm)	Frequency (MHz)												
		2412	2417	2422	2427	2432	2437	2442	2447	2452	2457	2462	2467	2472
6	15+/-1.5	14.64	14.79	14.77	15.17	15.17	14.99	14.91	14.81	14.71	15.05	15.01	14.91	14.82
36	15+/-1.5	14.56	14.74	14.71	15.11	15.11	14.93	14.88	14.76	14.63	15.02	14.96	14.86	14.79
48	15+/-1.5	14.67	14.82	14.61	15.19	15.2	14.84	14.7	14.73	14.71	15.09	14.8	14.6	14.89
54	15+/-1.5	14.48	14.43	14.72	14.92	15.19	14.67	14.94	14.52	14.53	14.9	14.79	14.92	14.49

OBW (99% Bandwidth)

Rate (Mbps)	Spec. (MHz)	Frequency (MHz)												
		2412	2417	2422	2427	2432	2437	2442	2447	2452	2457	2462	2467	2472
54	17.5	16.5	16.5	16.5	16.5	16.5	16.5	16.5	16.5	16.5	16.5	16.4	16.4	16.4

SPECTRUM MASK

802.11g

RBW: 100KHZ VBW: 30KHZ SPAN: 60MHZ MAX HOLD

Offset Frequency	Spec. (dBr)	Data Rate (Mbps)	Frequency (MHz)		
			2412	**2442**	**2472**
+/-11MHz offset	-20	54	-36.7	-38.5	-38.2
+/-20MHz offset	-28	54	-43.2	-44	-43.9
+/-30MHz offset	-40	54	-50.2	-51.1	-51.5

OPERATION OUTPUT POWER

802.11 b

(-20℃ / 3.3V/1.8V)

Rate (Mbps)	Spec. (dBm)	Frequency (MHz)													
		2412	2417	2422	2427	2432	2437	2442	2447	2452	2457	2462	2467	2472	2484
1	18+/-1.5	17.15	17.27	17.77	17.69	17.66	17.96	17.91	17.78	17.63	18.1	18.06	17.96	17.85	18.14
2	18+/-1.5	17.12	17.29	17.79	17.72	17.72	18.02	17.96	17.8	17.71	18.13	18.14	18.03	17.95	18.14
5.5	18+/-1.5	17.22	17.39	17.91	17.85	17.84	18.15	18.09	17.94	17.86	18.28	18.25	18.15	18.06	18.2
11	18+/-1.5	17.29	17.45	17.97	17.91	17.91	18.2	18.11	18.01	17.91	18.33	18.36	18.26	18.18	18.2

OBW (99% Occupied Bandwidth,/90% Spreading Bandwidth)

Rate (Mbps)	Spec. (MHz)	Frequency (MHz)												
		2412	2417	2422	2427	2432	2437	2442	2447	2452	2457	2462	2467	2472
11	<17.5	14.3	14.3	14.4	14.4	14.5	14.6	14.7	14.6	14.6	14.5	14.5	14.5	14.5
11	>9.0	10.2	10.3	10.3	10.3	10.3	10.4	10.4	10.3	10.2	10.3	10.3	10.3	10.2

SPECTRUM MASK

802.11b

RBW: 100KHZ VBW: 100KHZ SPAN: 110MHZ MAX HOLD

Offset Frequency	Spec. (dBr)	Data Rate (Mbps)	Frequency (MHz)		
			2412	**2442**	**2472**
+/-11MHz~+/-22MHz offset	-30	11	-49.1	-48.5	-48.9
>+22MHz,<-22MHz offset	-50	11	-56.9	-56.8	-57.7

OPERATION OUTPUT POWER

802.11n HT20
(-20℃ / 3.3V/1.8V)

Rate (Mbps)	Spec. (dBm)	Frequency (MHz)													
		2412	2417	2422	2427	2432	2437	2442	2447	2452	2457	2462	2467	2472	2484
MCS0	13+/-1.5	13.14	13.31	13.3	13.41	13.54	13.33	13.27	13.1	12.99	13.53	13.47	13.37	13.27	
MCS1	13+/-1.5	13.16	13.33	13.07	13.56	13.55	13.37	13.18	13.01	12.97	13.31	13.53	13.07	12.97	
MCS2	13+/-1.5	12.94	12.98	13.09	13.37	13.4	13.2	13.2	13.16	12.88	13.23	13.32	13.43	13.12	
MCS3	13+/-1.5	13.2	12.73	12.95	13.37	13.47	13.11	13.06	12.87	13.01	12.97	13.32	12.85	12.76	
MCS4	13+/-1.5	12.97	12.7	12.68	13.27	13.43	13.21	13.08	12.96	13.03	13.35	12.94	12.82	12.74	
MCS5	13+/-1.5	12.58	13.1	12.68	13.46	13.52	13.1	13.03	12.9	12.75	13.01	13.31	12.84	13.1	
MCS6	13+/-1.5	13.1	12.98	12.69	13.28	13.29	13.23	13.03	12.87	12.77	13.13	12.95	12.97	12.88	
MCS7	13+/-1.5	12.85	12.71	12.7	13.3	13.3	13.12	13.04	12.99	12.77	13.27	13.33	13.1	12.89	

SPECTRUM MASK

802.11n
RBW: 100KHZ VBW: 30KHZ SPAN: 110MHZ MAX HOLD

Offset Frequency	Spec. (dBr)	Data Rate (Mbps)	Frequency (MHz)		
			2412	**2442**	**2472**
+/-11MHz offset	-20	MCS7	-37.2	-38.5	-39.7
+/-20MHz offset	-28	MCS7	-45.1	-45.5	-47.2
+/-30MHz offset	-45	MCS7	-48.5	-48.2	-48.9

OPERATION OUTPUT POWER

802.11n HT40
(-20℃ / 3.3V/1.8V)

Rate (Mbps)	Spec. (dBm)	Frequency (MHz)								
		2422	2427	2432	2437	2442	2447	2452	2457	2462
MCS0	13+/-1.5	12.79	13.01	13.04	13.19	13.02	12.87	12.76	12.89	12.98
MCS1	13+/-1.5	12.8	13.09	13.37	12.9	12.92	12.89	12.58	13.26	13.24
MCS2	13+/-1.5	12.42	13.13	13.31	12.93	13.13	12.71	12.79	13.37	13.23
MCS3	13+/-1.5	12.66	13.01	13.21	12.89	12.96	12.72	12.72	12.8	12.77
MCS4	13+/-1.5	12.54	13.27	13.12	12.9	13.01	12.72	12.6	12.93	12.9
MCS5	13+/-1.5	12.41	13.03	13.07	12.89	12.96	12.72	12.61	13.06	12.8
MCS6	13+/-1.5	12.68	13.03	13.06	13.02	12.84	12.73	12.61	13.06	12.79
MCS7	13+/-1.5	12.7	13.23	13.06	13.03	12.86	12.73	12.61	13.18	13

SPECTRUM MASK

802.11n
RBW: 100KHZ VBW: 30KHZ SPAN: 120MHZ MAX HOLD

Offset Frequency	Spec. (dBr)	Data Rate (Mbps)	Frequency (MHz)		
			2422	2437	2452
+/-21MHz offset	-20	MCS7	-33.1	-33.9	-34.2
+/-40MHz offset	-28	MCS7	-39.5	-40.5	-39.1
+/-60MHz offset	-45	MCS7	-48.2	-51.2	-50.9

OPERATION OUTPUT POWER

802.11 g
(-20℃ /3.45V/1.89V)

Rate (Mbps)	Spec. (dBm)	Frequency (MHz)												
		2412	2417	2422	2427	2432	2437	2442	2447	2452	2457	2462	2467	2472
6	15+/-1.5	15.01	15.17	15.16	15.55	15.54	15.36	15.29	15.18	15.09	15.44	15.38	15.27	15.19
36	15+/-1.5	14.91	15.08	15.08	15.47	15.21	15.3	15.24	15.13	15	15.37	15.32	15.04	15.12
48	15+/-1.5	15.02	15.17	14.96	15.54	15.56	15.38	15.32	14.87	15.05	15.45	15.4	15.21	15.12
54	15+/-1.5	14.81	14.87	14.83	15.26	15.36	15.08	15.3	15.04	14.87	15.44	15.04	14.85	14.92

OBW (99% Bandwidth)

Rate (Mbps)	Spec. (MHz)	Frequency (MHz)												
		2412	2417	2422	2427	2432	2437	2442	2447	2452	2457	2462	2467	2472
54	17.5	16.4	16.4	16.4	16.5	16.5	16.4	16.5	16.5	16.5	16.5	16.5	16.5	16.5

SPECTRUM MASK

802.11g
RBW: 100KHZ VBW: 30KHZ SPAN: 60MHZ MAX HOLD

Offset Frequency	Spec. (dBr)	Data Rate (Mbps)	Frequency (MHz)		
			2412	**2442**	**2472**
+/-11MHz offset	-20	54	-35.9	-38.6	-38.1
+/-20MHz offset	-28	54	-43.1	-43.9	-44.1
+/-30MHz offset	-40	54	-50.2	-50.5	-51.7

OPERATION OUTPUT POWER

802.11 b
(-20℃ /3.45V/1.89V)

Rate (Mbps)	Spec. (dBm)	Frequency (MHz)													
		2412	2417	2422	2427	2432	2437	2442	2447	2452	2457	2462	2467	2472	2484
1	18+/-1.5	17.58	17.67	18.18	18.11	18.09	18.39	18.32	18.21	18.08	18.55	18.51	18.38	18.29	18.56
2	18+/-1.5	17.53	17.7	18.22	18.16	18.14	18.46	18.39	18.24	18.15	18.58	18.59	18.47	18.38	18.53
5.5	18+/-1.5	17.67	17.82	18.35	18.29	18.28	18.61	18.54	18.4	18.32	18.73	18.7	18.59	18.5	18.62
11	18+/-1.5	17.71	12.87	18.41	18.34	18.33	18.65	18.56	18.45	18.34	18.76	18.77	18.67	18.58	18.64

OBW (99% Occupied Bandwidth,/90% Spreading Bandwidth)

Rate (Mbps)	Spec. (MHz)	Frequency (MHz)												
		2412	2417	2422	2427	2432	2437	2442	2447	2452	2457	2462	2467	2472
11	<17.5	14.3	14.3	14.4	14.4	14.4	14.5	14.6	14.5	14.5	14.4	14.4	14.4	14.4
11	>9.0	10.2	10.2	10.3	10.2	10.3	10.3	10.4	10.3	10.3	10.2	10.2	10.2	10.2

SPECTRUM MASK

802.11b

RBW: 100KHZ VBW: 100KHZ SPAN: 110MHZ MAX HOLD

Offset Frequency	Spec. (dBr)	Data Rate (Mbps)	Frequency (MHz)		
			2412	**2442**	**2472**
+/-11MHz~+/-22MHz offset	-30	11	-50.1	-48.5	-49.4
>+22MHz,<-22MHz offset	-50	11	-57.8	-57.8	-58.5

OPERATION OUTPUT POWER

802.11n HT20
(-20℃ /3.45V/1.89V)

Rate (Mbps)	Spec. (dBm)	Frequency (MHz)													
		2412	2417	2422	2427	2432	2437	2442	2447	2452	2457	2462	2467	2472	2484
MCS0	13+/-1.5	13.2	13.61	13.59	13.83	13.83	13.64	13.57	13.35	13.3	13.85	13.78	13.67	13.35	
MCS1	13+/-1.5	13.45	13.38	13.63	13.75	13.68	13.61	13.61	13.45	13.17	13.84	13.59	13.71	13.39	
MCS2	13+/-1.5	13.49	13.65	13.39	13.61	13.76	13.69	13.33	13.46	13.23	13.86	13.74	13.5	13.64	
MCS3	13+/-1.5	12.85	13.67	13.61	13.61	13.71	13.6	13.48	13.24	13.31	13.53	13.51	13.63	13.3	
MCS4	13+/-1.5	13.4	13.26	13.25	13.56	13.66	13.56	13.43	13.31	13.2	13.29	13.35	13.72	13.39	
MCS5	13+/-1.5	13.27	12.99	12.98	13.81	13.57	13.39	13.62	13.2	13.17	13.3	13.25	13.72	13.29	
MCS6	13+/-1.5	12.87	13.4	12.98	13.76	13.77	13.58	13.33	13.17	13.24	13.44	13.25	13.73	13.05	
MCS7	13+/-1.5	13.14	13.14	13.26	13.58	13.65	13.59	13.58	13.17	13.06	13.56	13.62	13.39	13.64	

SPECTRUM MASK

802.11n
RBW: 100KHZ VBW: 30KHZ SPAN: 110MHZ MAX HOLD

Offset Frequency	Spec. (dBr)	Data Rate (Mbps)	Frequency (MHz)		
			2412	**2442**	**2472**
+/-11MHz offset	-20	MCS7	-37.6	-38.4	-39.8
+/-20MHz offset	-28	MCS7	-45.1	-45.3	-46.9
+/-30MHz offset	-45	MCS7	-48.1	-47.9	-48.1

OPERATION OUTPUT POWER

802.11n HT40
(-20℃ /3.45V/1.89V)

Rate (Mbps)	Spec. (dBm)	Frequency (MHz)								
		2422	2427	2432	2437	2442	2447	2452	2457	2462
MCS0	13+/-1.5	13.08	13.6	13.64	13.36	13.43	13.27	13.16	13.42	13.61
MCS1	13+/-1.5	13.32	13.49	13.53	13.5	13.46	13.29	13.18	13.67	13.64
MCS2	13+/-1.5	13.34	13.58	13.55	13.33	13.43	13.3	13.14	13.66	13.64
MCS3	13+/-1.5	13.31	13.59	13.67	13.47	13.43	13.25	13.19	13.66	13.3
MCS4	13+/-1.5	13.32	13.36	13.64	13.36	13.35	13.3	13.13	13.67	13.64
MCS5	13+/-1.5	13.33	13.62	13.46	13.47	13.42	13.31	13.07	13.68	13.65
MCS6	13+/-1.5	13.34	13.5	13.63	13.48	13.26	13.2	13.21	13.11	13.65
MCS7	13+/-1.5	13.1	13.63	13.53	13.38	13.44	13.01	12.9	13.46	13.4

SPECTRUM MASK

802.11n
RBW: 100KHZ VBW: 30KHZ SPAN: 120MHZ MAX HOLD

Offset Frequency	Spec. (dBr)	Data Rate (Mbps)	Frequency (MHz)		
			2422	2437	2452
+/-21MHz offset	-20	MCS7	-32.8	-33.9	-34.2
+/-40MHz offset	-28	MCS7	-39.4	-40.5	-39.4
+/-60MHz offset	-45	MCS7	-48.1	-50.9	-50.5

OPERATION OUTPUT POWER

802.11 g
(25℃ / 3.15V/1.71V)

Rate (Mbps)	Spec. (dBm)	Frequency (MHz)												
		2412	2417	2422	2427	2432	2437	2442	2447	2452	2457	2462	2467	2472
6	15+/-1.5	14.91	15	14.97	15.41	15.37	15.18	15.1	14.98	14.86	15.25	15.17	15.04	14.97
36	15+/-1.5	14.79	14.93	14.89	15.32	15.32	15.13	15.06	14.92	14.76	15.16	15.09	14.97	14.91
48	15+/-1.5	14.87	14.99	14.95	15.41	15.39	15.22	15.13	14.97	14.82	15.25	15.15	15.04	14.96
54	15+/-1.5	14.84	14.96	14.95	15.4	15.37	15.2	15.09	14.92	14.81	15.22	15.15	15.03	14.96

OBW (99% Bandwidth)

Rate (Mbps)	Spec. (MHz)	Frequency (MHz)												
		2412	2417	2422	2427	2432	2437	2442	2447	2452	2457	2462	2467	2472
54	17.5	16.3	16.3	16.3	16.3	16.4	16.4	16.4	16.4	16.4	16.4	16.4	16.4	16.4

SPECTRUM MASK

802.11g
RBW: 100KHZ VBW: 30KHZ SPAN: 60MHZ MAX HOLD

Offset Frequency	Spec. (dBr)	Data Rate (Mbps)	Frequency (MHz)		
			2412	**2442**	**2472**
+/-11MHz offset	-20	54	-33.1	-36.4	-36.1
+/-20MHz offset	-28	54	-41.6	-44.5	-42.1
+/-30MHz offset	-40	54	-53.1	-54.9	-54.1

OPERATION OUTPUT POWER

802.11 b
(25℃ / 3.15V/1.71V)

Rate (Mbps)	Spec. (dBm)	Frequency (MHz)													
		2412	2417	2422	2427	2432	2437	2442	2447	2452	2457	2462	2467	2472	2484
1	18+/-1.5	17.72	17.8	18.13	18.02	18	18.3	18.22	18.09	17.95	18.2	18.13	18.05	17.94	17.98
2	18+/-1.5	17.67	17.82	18.14	18.06	18.04	18.34	18.26	18.09	18	18.22	18.21	18.12	18.01	18
5.5	18+/-1.5	17.78	17.91	18.26	18.18	18.15	18.48	18.4	18.24	18.14	18.38	18.32	18.23	18.11	18.07
11	18+/-1.5	17.8	17.94	18.28	18.2	18.17	18.49	18.39	18.27	18.13	18.37	18.36	18.24	18.17	18.09

OBW (99% Occupied Bandwidth,/90% Spreading Bandwidth)

Rate (Mbps)	Spec. (MHz)	Frequency (MHz)												
		2412	2417	2422	2427	2432	2437	2442	2447	2452	2457	2462	2467	2472
11	<17.5	13.6	13.6	13.6	13.6	13.7	13.7	13.7	13.7	13.6	13.6	13.6	13.6	13.6
11	>9.0	9.5	9.5	9.6	9.5	9.5	9.6	9.6	9.5	9.6	9.5	9.5	9.5	9.5

SPECTRUM MASK

802.11b

RBW: 100KHZ VBW: 100KHZ SPAN: 110MHZ MAX HOLD

Offset Frequency	Spec. (dBr)	Data Rate (Mbps)	Frequency (MHz)		
			2412	**2442**	**2472**
+/-11MHz~+/-22MHz offset	-30	11	-45.7	-46.9	-48.6
>+22MHz,<-22MHz offset	-50	11	-53.9	-54.1	-53.2

OPERATION OUTPUT POWER

802.11n HT20 (25℃ / 3.15V/1.71V)															
Rate (Mbps)	Spec. (dBm)	Frequency (MHz)													
		2412	2417	2422	2427	2432	2437	2442	2447	2452	2457	2462	2467	2472	2484
MCS0	13+/-1.5	13.38	13.51	13.47	13.84	13.81	13.69	13.59	13.4	13.26	13.49	13.41	13.26	13.18	
MCS1	13+/-1.5	13.39	13.53	13.5	13.86	13.83	13.73	13.64	13.43	13.3	13.5	13.44	13.31	13.22	
MCS2	13+/-1.5	13.43	13.56	13.52	13.84	13.85	13.75	13.65	13.46	13.32	13.52	13.46	13.32	13.24	
MCS3	13+/-1.5	13.44	13.57	13.5	13.84	13.87	13.77	13.63	13.48	13.33	13.53	13.48	13.33	13.26	
MCS4	13+/-1.5	13.46	13.55	13.51	13.86	13.88	13.74	13.64	13.49	13.35	13.54	13.35	13.31	13.23	
MCS5	13+/-1.5	13.47	13.55	13.51	13.87	13.86	13.75	13.65	13.5	13.31	13.56	13.46	13.31	13.24	
MCS6	13+/-1.5	13.47	13.56	13.53	13.89	13.87	13.76	13.67	13.47	13.33	13.55	13.46	13.32	13.25	
MCS7	13+/-1.5	13.47	13.56	13.53	13.9	13.87	13.77	13.67	13.48	13.33	13.57	13.48	13.33	13.24	

SPECTRUM MASK

802.11n

RBW: 100KHZ VBW: 30KHZ SPAN: 110MHZ MAX HOLD

Offset Frequency	Spec. (dBr)	Data Rate (Mbps)	Frequency (MHz)		
			2412	**2442**	**2472**
+/-11MHz offset	-20	MCS7	-34.2	-36.1	-35.9
+/-20MHz offset	-28	MCS7	-41.2	-41.9	-41.3
+/-30MHz offset	-45	MCS7	-51.4	-51.9	-51.1

OPERATION OUTPUT POWER

802.11n HT40 (25℃ / 3.15V/1.71V)										
Rate (Mbps)	Spec. (dBm)	Frequency (MHz)								
		2422	2427	2432	2437	2442	2447	2452	2457	2462
MCS0	13+/-1.5	13.24	13.71	13.71	13.54	13.46	13.27	13.13	13.34	13.27
MCS1	13+/-1.5	13.24	13.72	13.73	13.55	13.48	13.29	13.15	13.37	13.29
MCS2	13+/-1.5	13.25	13.68	13.74	13.57	13.45	13.31	13.16	13.35	13.29
MCS3	13+/-1.5	13.23	13.69	13.76	13.54	13.46	13.31	13.15	13.36	13.29
MCS4	13+/-1.5	13.23	13.71	13.72	13.54	13.45	13.3	13.17	13.36	13.3
MCS5	13+/-1.5	13.24	13.72	13.73	13.54	13.46	13.31	13.17	13.37	13.31
MCS6	13+/-1.5	13.24	13.92	13.72	13.54	13.46	13.32	13.17	13.37	13.31
MCS7	13+/-1.5	13.26	13.73	13.73	13.54	13.46	13.32	13.17	13.37	13.27

SPECTRUM MASK

802.11n

RBW: 100KHZ VBW: 30KHZ SPAN: 120MHZ MAX HOLD

Offset Frequency	Spec. (dBr)	Data Rate (Mbps)	Frequency (MHz)		
			2422	2437	2452
+/-21MHz offset	-20	MCS7	-35.5	-35.4	-34.8
+/-40MHz offset	-28	MCS7	-39.8	-40.5	-40.9
+/-60MHz offset	-45	MCS7	-50.7	-50.5	-50.1

OPERATION OUTPUT POWER

802.11 g
(25℃ / 3.3V/1.8V)

Rate (Mbps)	Spec. (dBm)	Frequency (MHz)												
		2412	2417	2422	2427	2432	2437	2442	2447	2452	2457	2462	2467	2472
6	15+/-1.5	15.28	15.36	15.32	15.78	15.78	15.57	15.49	15.35	15.24	15.61	15.59	15.45	15.34
36	15+/-1.5	15.16	15.3	15.27	15.72	15.73	15.52	15.45	15.32	15.17	15.57	15.48	15.41	15.28
48	15+/-1.5	15.25	15.39	15.35	15.82	15.8	15.6	15.53	15.36	15.23	15.64	15.58	15.5	15.39
54	15+/-1.5	15.24	15.37	15.36	15.81	15.78	15.6	15.52	15.35	15.23	15.63	15.56	15.48	15.38

OBW (99% Bandwidth)

Rate (Mbps)	Spec. (MHz)	Frequency (MHz)												
		2412	2417	2422	2427	2432	2437	2442	2447	2452	2457	2462	2467	2472
54	<17.5	16.4	16.4	16.4	16.4	16.4	16.4	16.4	16.4	16.4	16.4	16.4	16.4	16.4

SPECTRUM MASK

802.11g
RBW: 100KHZ VBW: 30KHZ SPAN: 60MHZ MAX HOLD

Offset Frequency	Spec. (dBr)	Data Rate (Mbps)	Frequency (MHz)		
			2412	**2442**	**2472**
+/-11MHz offset	-20	54	-32.9	-37.9	-35.9
+/-20MHz offset	-28	54	-41.9	-44.2	-41.9
+/-30MHz offset	-40	54	-53.9	-55.3	-54.9

OPERATION OUTPUT POWER

802.11 b
(25℃ / 3.3V/1.8V)

Rate (Mbps)	Spec. (dBm)	Frequency (MHz)													
		2412	2417	2422	2427	2432	2437	2442	2447	2452	2457	2462	2467	2472	2484
1	18+/-1.5	18.01	18.1	18.43	18.34	18.32	18.65	18.56	18.44	18.27	18.6	18.53	18.39	18.27	18.34
2	18+/-1.5	18.01	18.15	18.5	18.41	18.4	18.74	18.66	18.48	18.36	18.6	18.62	18.49	18.37	18.32
5.5	18+/-1.5	18.13	18.26	18.64	18.56	18.53	18.88	18.8	18.64	18.53	18.77	18.75	18.61	18.48	18.42
11	18+/-1.5	18.19	18.32	18.69	18.6	18.58	18.93	18.81	18.69	18.56	18.8	18.83	18.7	18.58	18.44

OBW (99% Occupied Bandwidth,/90% Spreading Bandwidth)

Rate (Mbps)	Spec. (MHz)	Frequency (MHz)												
		2412	2417	2422	2427	2432	2437	2442	2447	2452	2457	2462	2467	2472
11	<17.5	13.6	13.6	13.6	13.6	16.6	13.7	13.7	13.7	13.7	13.7	13.6	13.6	13.6
11	>9.0	9.5	9.5	9.5	9.6	9.6	9.5	9.6	9.6	9.6	9.5	9.5	9.5	9.5

SPECTRUM MASK

802.11b

RBW: 100KHZ VBW: 100KHZ SPAN: 110MHZ MAX HOLD

Offset Frequency	Spec. (dBr)	Data Rate (Mbps)	Frequency (MHz)		
			2412	**2442**	**2472**
+/-11MHz~+/-22MHz offset	-30	11	-46.8	-47.9	-49.6
>+22MHz,<-22MHz offset	-50	11	-54.5	-54.2	-53.5

OPERATION OUTPUT POWER

802.11n HT20
(25℃ / 3.3V/1.8V)

Rate (Mbps)	Spec. (dBm)	Frequency (MHz)													
		2412	2417	2422	2427	2432	2437	2442	2447	2452	2457	2462	2467	2472	2484
MCS0	13+/-1.5	13.89	14.02	13.97	14.09	14.1	14.19	13.94	13.88	13.73	13.92	13.8	13.75	13.63	
MCS1	13+/-1.5	13.9	14.03	13.96	14.13	14.15	13.99	13.98	13.92	13.75	13.86	13.74	13.7	13.57	
MCS2	13+/-1.5	13.83	13.82	13.78	14.15	14.12	14	13.89	13.73	13.77	13.78	13.76	13.62	13.59	
MCS3	13+/-1.5	13.76	13.84	13.79	14.16	14.13	13.99	13.8	13.74	13.69	13.79	13.78	13.62	13.6	
MCS4	13+/-1.5	13.77	13.85	13.8	14.17	14.13	13.98	13.92	13.75	13.7	13.8	13.79	13.64	13.51	
MCS5	13+/-1.5	13.78	13.86	13.82	14.19	14.14	13.93	13.92	13.75	13.6	13.8	13.75	13.6	13.58	
MCS6	13+/-1.5	13.78	13.86	13.82	14.17	14.15	13.93	13.88	13.75	13.56	13.81	13.76	13.61	13.66	
MCS7	13+/-1.5	13.75	13.87	13.82	14.18	14.15	13.94	13.82	13.72	13.57	13.78	13.78	13.63	13.5	

SPECTRUM MASK

802.11n
RBW: 100KHZ VBW: 30KHZ SPAN: 110MHZ MAX HOLD

Offset Frequency	Spec. (dBr)	Data Rate (Mbps)	Frequency (MHz)		
			2412	**2442**	**2472**
+/-11MHz offset	-20	MCS7	-33.2	-35.5	-35.1
+/-20MHz offset	-28	MCS7	-40.7	-41.5	-41.2
+/-30MHz offset	-45	MCS7	-52.5	-52.1	-51.5

OPERATION OUTPUT POWER

802.11n HT40
(25℃ / 3.3V/1.8V)

Rate (Mbps)	Spec. (dBm)	Frequency (MHz)								
		2422	2427	2432	2437	2442	2447	2452	2457	2462
MCS0	13+/-1.5	13.54	13.91	13.91	13.82	13.73	13.54	13.4	13.66	13.57
MCS1	13+/-1.5	13.5	13.88	13.9	13.82	13.73	13.54	13.4	13.75	13.59
MCS2	13+/-1.5	13.52	13.9	13.91	13.83	13.75	13.56	13.41	13.67	13.6
MCS3	13+/-1.5	13.54	13.92	13.93	13.84	13.75	13.56	13.42	13.64	13.62
MCS4	13+/-1.5	13.55	13.93	13.94	13.87	13.78	13.58	13.43	13.65	13.63
MCS5	13+/-1.5	13.56	13.9	13.95	13.86	13.74	13.59	13.44	13.64	13.62
MCS6	13+/-1.5	13.53	13.91	13.96	13.83	13.73	13.59	13.43	13.65	13.63
MCS7	13+/-1.5	13.54	13.92	13.93	13.84	13.73	13.59	13.45	13.66	13.64

SPECTRUM MASK

802.11n
RBW: 100KHZ VBW: 30KHZ SPAN: 120MHZ MAX HOLD

Offset Frequency	Spec. (dBr)	Data Rate (Mbps)	Frequency (MHz)		
			2422	2437	2452
+/-21MHz offset	-20	MCS7	-35.1	-34.9	-34.6
+/-40MHz offset	-28	MCS7	-40.2	-41.3	-40.5
+/-60MHz offset	-45	MCS7	-51.4	-51.9	-50.8

OPERATION OUTPUT POWER

802.11 g

(25℃ /3.45V/1.89V)

Rate (Mbps)	Spec. (dBm)	Frequency (MHz)												
		2412	2417	2422	2427	2432	2437	2442	2447	2452	2457	2462	2467	2472
6	15+/-1.5	15.71	15.82	15.75	16.21	16.18	15.98	15.9	15.77	15.66	16.04	15.98	15.83	15.76
36	15+/-1.5	15.57	15.71	15.68	16.13	16.12	15.94	15.85	15.72	15.57	15.98	15.9	15.76	15.7
48	15+/-1.5	15.67	15.8	15.77	16.21	16.2	15.99	15.92	15.76	15.61	16.06	15.98	15.85	15.75
54	15+/-1.5	15.64	15.76	15.75	16.18	16.18	15.98	15.9	15.71	15.6	16.03	15.95	15.8	15.74

OBW (99% Bandwidth)

Rate (Mbps)	Spec. (MHz)	Frequency (MHz)												
		2412	2417	2422	2427	2432	2437	2442	2447	2452	2457	2462	2467	2472
54	17.5	16.3	16.4	16.5	16.4	16.5	16.4	16.4	16.4	16.5	16.4	16.5	16.4	16.3

SPECTRUM MASK

802.11g

RBW: 100KHZ VBW: 30KHZ SPAN: 60MHZ MAX HOLD

Offset Frequency	Spec. (dBr)	Data Rate (Mbps)	Frequency (MHz)		
			2412	**2442**	**2472**
+/-11MHz offset	-20	54	-32.5	-35.4	-36.1
+/-20MHz offset	-28	54	-41.2	-42.1	-40.5
+/-30MHz offset	-40	54	-53.1	-54.2	-54.1

OPERATION OUTPUT POWER

802.11 b

(25℃ /3.45V/1.89V)

Rate (Mbps)	Spec. (dBm)	Frequency (MHz)													
		2412	2417	2422	2427	2432	2437	2442	2447	2452	2457	2462	2467	2472	2484
1	18+/-1.5	18.53	18.6	18.91	18.81	18.77	19.1	19.02	18.88	18.75	19.01	18.94	18.86	18.77	18.9
2	18+/-1.5	18.48	18.61	18.96	18.87	18.85	19.17	19.11	18.94	18.83	19.07	19.06	18.94	18.87	18.83
5.5	18+/-1.5	18.62	18.75	19.1	19.03	19.01	19.34	19.27	19.1	18.99	19.24	19.18	19.05	18.96	18.93
11	18+/-1.5	18.65	18.77	19.14	19.04	19.02	19.35	19.25	19.13	19	19.24	19.24	19.11	19.03	18.94

OBW (99% Occupied Bandwidth,/90% Spreading Bandwidth)

Rate (Mbps)	Spec. (MHz)	Frequency (MHz)												
		2412	2417	2422	2427	2432	2437	2442	2447	2452	2457	2462	2467	2472
11	<17.5	13.5	13.5	13.5	13.6	13.6	13.6	13.7	13.7	13.7	13.7	13.6	13.6	13.6
11	>9.0	9.5	9.5	9.5	9.4	9.4	9.5	9.5	9.6	9.6	9.5	9.5	9.5	9.5

SPECTRUM MASK

802.11b

RBW: 100KHZ VBW: 100KHZ SPAN: 110MHZ MAX HOLD

Offset Frequency	Spec. (dBr)	Data Rate (Mbps)	Frequency (MHz)		
			2412	**2442**	**2472**
+/-11MHz~+/-22MHz offset	-30	11	-45.9	-46.8	-48.1
>+22MHz,<-22MHz offset	-50	11	-53.6	-53.2	-52.5

OPERATION OUTPUT POWER

802.11n HT20
(25℃ /3.45V/1.89V)

Rate (Mbps)	Spec. (dBm)	Frequency (MHz)													
		2412	2417	2422	2427	2432	2437	2442	2447	2452	2457	2462	2467	2472	2484
MCS0	13+/-1.5	13.9	13.81	13.76	13.98	13.99	13.87	13.83	13.67	13.52	13.87	13.81	13.7	13.58	
MCS1	13+/-1.5	13.68	13.99	13.71	13.99	14.1	13.84	13.84	13.68	13.52	13.89	13.82	13.72	13.59	
MCS2	13+/-1.5	13.68	13.77	13.95	14.08	14.06	13.84	13.83	13.68	13.53	13.99	13.93	13.72	13.73	
MCS3	13+/-1.5	13.68	13.75	13.72	13.09	14.17	14.04	14.05	13.66	13.52	13.88	13.82	13.85	13.58	
MCS4	13+/-1.5	13.91	13.75	13.71	14.31	14.03	14.15	13.82	13.88	13.73	14.01	13.8	13.9	13.71	
MCS5	13+/-1.5	13.66	13.74	13.93	14.18	14.24	14.25	13.71	13.85	13.7	14.13	13.96	13.92	13.75	
MCS6	13+/-1.5	13.89	14.19	14.13	14.38	14.35	14.33	14.23	13.84	13.76	14.1	14.01	13.9	13.78	
MCS7	13+/-1.5	13.82	14.17	14.11	14.46	14.44	14.32	14.21	14	13.85	14.03	14.01	13.91	13.78	

SPECTRUM MASK

802.11n
RBW: 100KHZ VBW: 30KHZ SPAN: 110MHZ MAX HOLD

Offset Frequency	Spec. (dBr)	Data Rate (Mbps)	Frequency (MHz)		
			2412	**2442**	**2472**
+/-11MHz offset	-20	MCS7	-33.1	-35.1	-34.6
+/-20MHz offset	-28	MCS7	-40.1	-40.5	-40.9
+/-30MHz offset	-45	MCS7	-51.4	-51.9	-52.1

OPERATION OUTPUT POWER

802.11n HT40
(25℃ /3.45V/1.89V)

Rate (Mbps)	Spec. (dBm)	Frequency (MHz)								
		2422	2427	2432	2437	2442	2447	2452	2457	2462
MCS0	13+/-1.5	13.81	14.28	14.28	14.08	14	13.8	13.67	13.92	13.79
MCS1	13+/-1.5	13.76	14.25	14.26	14.07	13.99	13.8	13.65	13.91	13.85
MCS2	13+/-1.5	13.76	14.26	14.26	14.08	13.99	13.81	13.66	13.92	13.85
MCS3	13+/-1.5	13.77	14.26	14.27	14.09	14	13.81	13.66	13.87	13.86
MCS4	13+/-1.5	13.78	14.27	14.27	14.1	14.01	13.82	13.67	13.88	13.87
MCS5	13+/-1.5	13.79	14.23	14.28	14.1	13.97	13.82	13.66	13.87	13.84
MCS6	13+/-1.5	13.74	14.23	14.28	14.05	13.97	13.81	13.65	13.87	13.85
MCS7	13+/-1.5	13.76	14.23	14.24	14.06	13.96	13.81	13.66	13.88	13.85

SPECTRUM MASK

802.11n
RBW: 100KHZ VBW: 30KHZ SPAN: 120MHZ MAX HOLD

Offset Frequency	Spec. (dBr)	Data Rate (Mbps)	Frequency (MHz)		
			2422	2437	2452
+/-21MHz offset	-20	MCS7	-35.5	-35.3	-34.6
+/-40MHz offset	-28	MCS7	-39.5	-40.2	-41.1
+/-60MHz offset	-45	MCS7	-50.2	-50.9	-50.1

OPERATION OUTPUT POWER

802.11 g

(70 ℃/3.15V/1.71)

Rate (Mbps)	Spec. (dBm)	Frequency (MHz)												
		2412	2417	2422	2427	2432	2437	2442	2447	2452	2457	2462	2467	2472
6	15+/-1.5	13.98	14.01	14.35	14.3	14.71	14.51	14.43	13.85	14.23	14.09	14.45	14.29	14.13
36	15+/-1.5	13.97	14.18	13.92	14.25	14.23	14.27	13.96	13.81	13.61	14.03	13.89	13.72	13.57
48	15+/-1.5	13.82	14.02	13.98	14.31	14.31	14.35	14.05	13.84	13.68	14.09	13.98	13.79	13.65
54	15+/-1.5	13.78	13.99	13.98	14.3	14.29	14.11	14.01	13.8	13.66	14.09	13.95	13.79	13.83

OBW (99% Bandwidth)

Rate (Mbps)	Spec. (MHz)	Frequency (MHz)												
		2412	2417	2422	2427	2432	2437	2442	2447	2452	2457	2462	2467	2472
54	<17.5	16.3	16.3	16.3	16.3	16.4	16.4	16.4	16.4	16.4	16.4	16.4	16.4	16.4

SPECTRUM MASK

802.11g

RBW: 100KHZ VBW: 30KHZ SPAN: 60MHZ MAX HOLD

Offset Frequency	Spec. (dBr)	Data Rate (Mbps)	Frequency (MHz)		
			2412	**2442**	**2472**
+/-11MHz offset	-20	54	-33.1	-35.6	-35.6
+/-20MHz offset	-28	54	-39.3	-45.7	-44.6
+/-30MHz offset	-40	54	-50.4	-52.5	-52.4

OPERATION OUTPUT POWER

802.11 b

(70 ℃/3.15V/1.71)

Rate (Mbps)	Spec. (dBm)	Frequency (MHz)													
		2412	2417	2422	2427	2432	2437	2442	2447	2452	2457	2462	2467	2472	2484
1	18+/-1.5	16.84	17.08	17.31	17.24	17.24	17.52	17.43	17.29	17.1	17.45	17.36	17.18	17.04	17.04
2	18+/-1.5	16.93	17.11	17.35	17.29	17.29	17.58	17.49	17.29	17.16	17.48	17.42	17.26	17.1	17.02
5.5	18+/-1.5	16.8	17.21	17.46	17.3	17.39	17.61	17.53	17.23	17.19	17.54	17.44	17.36	17.21	17.08
11	18+/-1.5	16.73	16.93	17.35	17.39	17.22	17.35	17.33	17.29	17.01	17.47	17.32	17.15	16.89	17.11

OBW (99% Occupied Bandwidth,/90% Spreading Bandwidth)

Rate (Mbps)	Spec. (MHz)	Frequency (MHz)												
		2412	2417	2422	2427	2432	2437	2442	2447	2452	2457	2462	2467	2472
11	<17.5	13.4	13.4	13.5	13.5	13.5	13.5	13.4	13.4	13.4	13.5	13.5	13.4	13.4
11	>9.0	9.5	9.4	9.4	9.4	9.4	9.5	9.4	9.4	9.5	9.4	9.4	9.4	9.4

SPECTRUM MASK

802.11b

RBW: 100KHZ VBW: 100KHZ SPAN: 110MHZ MAX HOLD

Offset Frequency	Spec. (dBr)	Data Rate (Mbps)	Frequency (MHz)		
			2412	**2442**	**2472**
+/-11MHz~+/-22MHz offset	-30	11	-44.9	-47.6	-47.9
>+22MHz,<-22MHz offset	-50	11	-52.8	-52.7	-52.3

OPERATION OUTPUT POWER

802.11n HT20 (70 ℃/3.15V/1.71)															
Rate (Mbps)	Spec. (dBm)	Frequency (MHz)													
		2412	2417	2422	2427	2432	2437	2442	2447	2452	2457	2462	2467	2472	2484
MCS0	13+/-1.5	12.39	12.35	12.44	12.78	13.08	12.58	12.77	12.29	12.49	12.57	12.35	12.61	12.18	
MCS1	13+/-1.5	12.5	12.5	12.37	12.93	12.91	12.62	12.71	12.32	12.16	12.44	12.37	12.2	12.14	
MCS2	13+/-1.5	12.39	12.41	12.39	12.91	12.83	12.63	12.54	12.53	12.18	12.5	12.4	12.21	12.05	
MCS3	13+/-1.5	12.24	12.43	12.37	12.8	12.84	12.65	12.52	12.35	12.39	12.5	12.42	12.23	12.07	
MCS4	13+/-1.5	12.25	12.62	12.37	12.82	12.87	12.61	12.54	12.37	12.31	12.71	12.39	12.21	12.06	
MCS5	13+/-1.5	12.48	12.4	12.38	12.84	12.84	12.65	12.55	12.38	12.19	12.54	12.41	12.22	12.06	
MCS6	13+/-1.5	12.27	12.42	12.4	12.85	12.85	12.65	12.56	12.35	12.19	12.54	12.41	12.23	12.06	
MCS7	13+/-1.5	12.28	12.44	12.41	12.86	12.86	12.66	12.56	12.35	12.2	12.56	12.42	12.23	12.07	

SPECTRUM MASK

802.11n

RBW: 100KHZ VBW: 30KHZ SPAN: 110MHZ MAX HOLD

Offset Frequency	Spec. (dBr)	Data Rate (Mbps)	Frequency (MHz)		
			2412	**2442**	**2472**
+/-11MHz offset	-20	MCS7	-34.1	-35.6	-34.6
+/-20MHz offset	-28	MCS7	-41.9	-41.7	-40.2
+/-30MHz offset	-45	MCS7	-49.2	-50.5	-50.2

OPERATION OUTPUT POWER

802.11n HT40 (70 ℃/3.15V/1.71)										
Rate (Mbps)	Spec. (dBm)	Frequency (MHz)								
		2422	2427	2432	2437	2442	2447	2452	2457	2462
MCS0	13+/-1.5	12.16	12.62	12.93	12.66	12.49	12.4	12.07	12.37	12.26
MCS1	13+/-1.5	12.18	12.64	12.86	12.5	12.42	12.23	12.09	12.37	12.27
MCS2	13+/-1.5	12.19	12.61	12.69	12.51	12.39	12.23	12.08	12.38	12.27
MCS3	13+/-1.5	12.16	12.72	12.69	12.48	12.39	12.25	12.26	12.38	12.49
MCS4	13+/-1.5	12.17	12.63	12.66	12.49	12.4	12.24	12.08	12.39	12.3
MCS5	13+/-1.5	12.18	12.64	12.67	12.58	12.5	12.25	12.3	12.41	12.3
MCS6	13+/-1.5	12.19	12.65	12.66	12.49	12.42	12.27	12.11	12.41	12.31
MCS7	13+/-1.5	12.19	12.66	12.66	12.49	12.41	12.25	12.09	12.4	12.27

SPECTRUM MASK

802.11n

RBW: 100KHZ VBW: 30KHZ SPAN: 120MHZ MAX HOLD

Offset Frequency	Spec. (dBr)	Data Rate (Mbps)	Frequency (MHz)		
			2422	2437	2452
+/-21MHz offset	-20	MCS7	-36.5	-35.5	-34.6
+/-40MHz offset	-28	MCS7	-39.5	-40.3	-39.6
+/-60MHz offset	-45	MCS7	-49.6	-49.8	-48.5

OPERATION OUTPUT POWER

802.11 g
(70 ℃/3.3V/1.8)

Rate (Mbps)	Spec. (dBm)	Frequency (MHz)												
		2412	2417	2422	2427	2432	2437	2442	2447	2452	2457	2462	2467	2472
6	15+/-1.5	14.22	14.4	14.37	15.2	14.68	14.6	14.82	14.66	14.63	14.97	14.76	14.29	14.01
36	15+/-1.5	14.14	14.33	14.31	14.63	14.65	14.44	14.37	14.2	14.01	14.41	14.3	14.11	13.97
48	15+/-1.5	14.21	14.41	14.39	14.7	14.71	14.52	14.44	14.24	14.06	14.5	14.39	14.2	14.04
54	15+/-1.5	14.21	14.41	14.39	14.71	14.7	14.53	14.38	14.19	14.04	14.48	14.34	14.18	14.01

OBW (99% Bandwidth)

Rate (Mbps)	Spec. (MHz)	Frequency (MHz)												
		2412	2417	2422	2427	2432	2437	2442	2447	2452	2457	2462	2467	2472
54	17.5	16.4	16.4	16.4	16.4	16.4	16.4	16.4	16.3	16.3	16.4	16.4	16.4	16.4

SPECTRUM MASK

802.11g
RBW: 100KHZ VBW: 30KHZ SPAN: 60MHZ MAX HOLD

Offset Frequency	Spec. (dBr)	Data Rate (Mbps)	Frequency (MHz)		
			2412	**2442**	**2472**
+/-11MHz offset	-20	54	-32.3	-37.1	-33.8
+/-20MHz offset	-28	54	-40.7	-43.2	-41.2
+/-30MHz offset	-40	54	-53.2	-53.8	-54

OPERATION OUTPUT POWER

802.11 b
(70 ℃/3.3V/1.8)

Rate (Mbps)	Spec. (dBm)	Frequency (MHz)													
		2412	2417	2422	2427	2432	2437	2442	2447	2452	2457	2462	2467	2472	2484
1	18+/-1.5	16.85	17.32	17.66	17.67	17.66	17.95	17.85	17.71	17.49	17.86	17.73	17.57	17.4	17.27
2	18+/-1.5	17.33	17.49	17.71	17.65	17.65	17.95	17.87	17.66	17.52	17.86	17.8	17.62	17.47	17.24
5.5	18+/-1.5	17.41	17.61	17.87	17.81	17.8	18.12	17.94	17.85	17.72	17.77	17.96	17.69	17.54	17.3
11	18+/-1.5	17.39	17.35	17.73	17.67	17.72	17.8	17.67	17.62	17.22	17.63	17.57	17.78	17.33	17.3

OBW (99% Occupied Bandwidth,/90% Spreading Bandwidth)

Rate (Mbps)	Spec. (MHz)	Frequency (MHz)												
		2412	2417	2422	2427	2432	2437	2442	2447	2452	2457	2462	2467	2472
11	<17.5	13.4	13.4	13.4	13.5	13.5	13.4	13.4	13.4	13.4	13.5	13.5	13.4	13.4
11	>9.0	9.4	9.4	9.3	9.3	9.3	9.4	9.4	9.4	9.4	9.3	9.3	9.4	9.4

SPECTRUM MASK

802.11b

RBW: 100KHZ VBW: 100KHZ SPAN: 110MHZ MAX HOLD

Offset Frequency	Spec. (dBr)	Data Rate (Mbps)	Frequency (MHz)		
			2412	**2442**	**2472**
+/-11MHz~+/-22MHz offset	-30	11	-45.7	-46.8	-48.5
>+22MHz,<-22MHz offset	-50	11	-52.7	-53.4	-52.6

OPERATION OUTPUT POWER

802.11n HT20 (70 ℃/3.3V/1.8)															
Rate (Mbps)	Spec. (dBm)	Frequency (MHz)													
		2412	2417	2422	2427	2432	2437	2442	2447	2452	2457	2462	2467	2472	2484
MCS0	13+/-1.5	12.53	12.71	12.69	13.14	13.14	12.93	12.83	12.92	12.94	12.93	12.88	12.51	12.34	
MCS1	13+/-1.5	12.77	12.74	12.84	13.19	13.17	12.97	12.89	12.87	12.51	12.83	12.93	12.55	12.49	
MCS2	13+/-1.5	12.58	12.78	12.97	13.27	13.19	13	12.91	12.7	12.54	12.86	12.77	12.57	12.41	
MCS3	13+/-1.5	12.81	12.79	12.74	13.17	13.41	13.02	12.87	12.71	12.55	12.87	12.79	12.6	12.43	
MCS4	13+/-1.5	12.62	12.77	12.74	13.19	13.23	12.99	12.9	12.73	12.56	13.08	12.76	12.57	12.4	
MCS5	13+/-1.5	12.64	12.77	12.75	13.21	13.19	13.01	12.92	12.74	12.54	12.9	12.77	12.58	12.42	
MCS6	13+/-1.5	12.63	12.78	12.76	13.21	13.41	13.01	12.92	12.71	12.54	12.91	12.78	12.59	12.42	
MCS7	13+/-1.5	12.64	12.79	12.77	13.22	13.22	13.03	12.93	12.72	12.55	12.92	12.79	12.6	12.43	

SPECTRUM MASK

802.11n

RBW: 100KHZ VBW: 30KHZ SPAN: 110MHZ MAX HOLD

Offset Frequency	Spec. (dBr)	Data Rate (Mbps)	Frequency (MHz)		
			2412	**2442**	**2472**
+/-11MHz offset	-20	MCS7	-33.6	-34.6	-35.1
+/-20MHz offset	-28	MCS7	-39.6	-40.4	-40.3
+/-30MHz offset	-45	MCS7	-51.8	-50.8	-50.6

OPERATION OUTPUT POWER

802.11n HT40 (70 ℃/3.3V/1.8)										
Rate (Mbps)	Spec. (dBm)	Frequency (MHz)								
		2422	2427	2432	2437	2442	2447	2452	2457	2462
MCS0	13+/-1.5	12.63	12.99	13.11	13.03	12.75	12.56	12.4	12.9	12.61
MCS1	13+/-1.5	12.53	13	13.03	12.86	12.97	12.58	12.42	12.93	12.63
MCS2	13+/-1.5	12.55	12.98	13.05	12.88	12.76	12.6	12.43	12.74	12.64
MCS3	13+/-1.5	12.52	13	13.06	13.04	12.76	12.61	12.43	12.75	12.65
MCS4	13+/-1.5	12.54	13.01	13.03	12.85	12.76	12.6	12.44	12.76	12.66
MCS5	13+/-1.5	12.54	13.01	13.03	12.84	12.76	12.61	12.45	12.76	12.66
MCS6	13+/-1.5	12.55	13.02	13.03	12.85	12.78	12.62	12.45	12.77	12.67
MCS7	13+/-1.5	12.56	13.03	13.03	12.86	12.78	12.62	12.45	12.77	12.91

SPECTRUM MASK

802.11n

RBW: 100KHZ VBW: 30KHZ SPAN: 120MHZ MAX HOLD

Offset Frequency	Spec. (dBr)	Data Rate (Mbps)	Frequency (MHz)		
			2422	2437	2452
+/-21MHz offset	-20	MCS7	-35.3	-33.9	-34.6
+/-40MHz offset	-28	MCS7	-40.5	-40.2	-40.1
+/-60MHz offset	-45	MCS7	-50.3	-51.2	-50.5

OPERATION OUTPUT POWER

802.11 g

(70 ℃/3.45V/1.89)

Rate (Mbps)	Spec. (dBm)	Frequency (MHz)												
		2412	2417	2422	2427	2432	2437	2442	2447	2452	2457	2462	2467	2472
6	15+/-1.5	14.87	15.04	15.01	15.47	15.47	15.28	15.2	15.03	14.88	15.25	15.1	14.95	14.68
36	15+/-1.5	14.78	14.75	14.95	15.11	14.9	15.24	14.94	15	14.81	15.17	15.07	14.7	14.22
48	15+/-1.5	14.72	14.83	14.64	15.4	15.3	15.09	15.02	14.72	14.43	14.96	14.94	14.77	14.61
54	15+/-1.5	14.46	14.65	14.62	14.97	14.96	14.75	14.88	14.78	14.3	15.13	14.72	14.65	14.37

OBW (99% Bandwidth)

Rate (Mbps)	Spec. (MHz)	Frequency (MHz)												
		2412	2417	2422	2427	2432	2437	2442	2447	2452	2457	2462	2467	2472
54	17.5	16.4	16.4	16.4	16.4	16.4	16.4	16.4	16.4	16.4	16.4	16.4	16.4	16.4

SPECTRUM MASK

802.11g

RBW: 100KHZ VBW: 30KHZ SPAN: 60MHZ MAX HOLD

Offset Frequency	Spec. (dBr)	Data Rate (Mbps)	Frequency (MHz)		
			2412	**2442**	**2472**
+/-11MHz offset	-20	54	-34.1	-34.3	-35.2
+/-20MHz offset	-28	54	-40.8	-41.1	-40.9
+/-30MHz offset	-40	54	-53.1	-52.3	-53.3

OPERATION OUTPUT POWER

802.11 b

(70 ℃/3.45V/1.89)

Rate (Mbps)	Spec. (dBm)	Frequency (MHz)													
		2412	2417	2422	2427	2432	2437	2442	2447	2452	2457	2462	2467	2472	2484
1	18+/-1.5	17.64	17.76	17.99	17.9	17.89	18.19	18.06	17.91	17.69	18.07	17.93	17.75	17.59	17.55
2	18+/-1.5	17.56	17.71	17.93	17.88	17.87	18.21	18.12	17.93	17.8	18.14	18.09	17.93	17.81	17.49
5.5	18+/-1.5	17.76	17.97	18.24	18.17	18.18	18.31	18.21	17.89	18.07	18.41	18.29	18.11	17.93	17.58
11	18+/-1.5	17.8	18	18.25	18.17	18.17	18.49	18.16	18.23	18.05	18.4	18.34	18.17	18.01	17.55

OBW (99% Occupied Bandwidth,/90% Spreading Bandwidth)

Rate (Mbps)	Spec. (MHz)	Frequency (MHz)												
		2412	2417	2422	2427	2432	2437	2442	2447	2452	2457	2462	2467	2472
11	<17.5	13.3	13.3	13.3	13.3	13.3	13.4	13.4	13.4	13.4	13.4	13.4	13.4	13.4
11	>9.0	9.2	9.2	9.2	9.2	9.3	9.3	9.3	9.3	9.2	9.3	9.3	9.3	9.3

SPECTRUM MASK

802.11b

RBW: 100KHZ VBW: 100KHZ SPAN: 110MHZ MAX HOLD

Offset Frequency	Spec. (dBr)	Data Rate (Mbps)	Frequency (MHz)		
			2412	**2442**	**2472**
+/-11MHz~+/-22MHz offset	-30	11	-45.6	-46.1	-48.2
>+22MHz,<-22MHz offset	-50	11	-53.1	-52.9	-51.7

OPERATION OUTPUT POWER

802.11n HT20
(70 ℃/3.45V/1.89)

Rate (Mbps)	Spec. (dBm)	Frequency (MHz)													
		2412	2417	2422	2427	2432	2437	2442	2447	2452	2457	2462	2467	2472	2484
MCS0	13+/-1.5	13.1	13.27	13.03	13.85	13.86	13.64	13.55	13.33	13.18	13.52	13.4	13.21	13.04	
MCS1	13+/-1.5	13.21	13.3	13.28	13.62	13.89	13.51	13.6	13.39	12.94	13.06	13.26	13.26	12.82	
MCS2	13+/-1.5	13.14	13.02	13.31	13.61	13.83	13.44	13.53	13.41	13.16	13.38	13.2	13.28	13.03	
MCS3	13+/-1.5	12.84	13.45	13.29	13.71	13.55	13.75	13.42	13.25	13.09	13.31	13.22	13.12	12.87	
MCS4	13+/-1.5	13.28	13.12	13.29	13.53	13.77	13.53	13.34	13.26	12.9	13.5	12.99	12.81	12.64	
MCS5	13+/-1.5	13.2	13.12	13.1	13.45	13.45	13.25	13.45	13.28	13.08	13.34	13.01	12.82	13.2	
MCS6	13+/-1.5	12.88	13.24	13	13.46	13.75	13.36	13.16	12.96	13.28	13.35	13.22	12.83	12.66	
MCS7	13+/-1.5	13.1	13.03	13.12	13.76	13.66	13.36	13.17	13.06	12.8	13.16	13.23	12.84	12.86	

SPECTRUM MASK

802.11n
RBW: 100KHZ VBW: 30KHZ SPAN: 110MHZ MAX HOLD

Offset Frequency	Spec. (dBr)	Data Rate (Mbps)	Frequency (MHz)		
			2412	**2442**	**2472**
+/-11MHz offset	-20	MCS7	-32.2	-33.9	-33.3
+/-20MHz offset	-28	MCS7	-39.1	-39.5	-39.8
+/-30MHz offset	-45	MCS7	-50.5	-51.1	-52.2

OPERATION OUTPUT POWER

802.11n HT40
(70 ℃/3.45V/1.89)

Rate (Mbps)	Spec. (dBm)	Frequency (MHz)								
		2422	2427	2432	2437	2442	2447	2452	2457	2462
MCS0	13+/-1.5	12.87	13.52	13.44	13.46	13.29	13.28	13.12	13.42	13.31
MCS1	13+/-1.5	13.28	13.35	13.27	13.58	13.12	13.31	12.77	13.44	13.34
MCS2	13+/-1.5	13.01	13.42	13.77	13.51	13.47	13.14	12.88	13.08	13.17
MCS3	13+/-1.5	13.17	13.63	13.78	13.29	13.2	13.04	13.06	13.09	13.09
MCS4	13+/-1.5	13.09	13.25	13.75	13.1	13.1	12.84	12.69	13.11	13.37
MCS5	13+/-1.5	12.79	13.75	13.48	13.38	13.22	13.15	12.79	13.29	13.2
MCS6	13+/-1.5	12.8	13.47	13.76	13.4	13.5	13.06	13.18	13.48	13.19
MCS7	13+/-1.5	13.31	13.28	13.28	13.59	13.22	13.16	13.18	13.48	12.89

SPECTRUM MASK

802.11n
RBW: 100KHZ VBW: 30KHZ SPAN: 120MHZ MAX HOLD

Offset Frequency	Spec. (dBr)	Data Rate (Mbps)	Frequency (MHz)		
			2422	2437	2452
+/-21MHz offset	-20	MCS7	-34.7	-35.5	-34.4
+/-40MHz offset	-28	MCS7	-38.2	-40.5	-41.2
+/-60MHz offset	-45	MCS7	-48.7	-49.8	-50.3

4.3 Output Center And Symbol Clock Frequency Tolerance

The transmitted center frequency tolerance shall be +/-25ppm maximum for 2.4GHz.

The transmit center frequency and the symbol clock frequency shall be derived from the same reference oscillator. It will be measured for below procedures:

(1) Set DUT at 11 g channels and set the data rate as 54Mbps for 11g. This process is to unify the setting of the test.

(2) Test program in continuous carrier Tx mode.

(3) Set the spectrum analyzer as below:

Center frequency = the center frequency of test channel
Span = 50 KHz
RBW = 1 KHz
VBW = 100 Hz

(4) Read the frequency deviation on the spectrum analyzer.

CENTER FREQUENCY TOLERANCE(-20 ℃/3.3V/1.8V) RBW: 1KHZ VBW: 100HZ SPAN: 100KHZ			
802.11G -----2442MHZ			
Test Item	Spec. (ppm)	Test result	Remark
Transmit Center Frequency Tolerance	+/-25	5.84 ppm	
Symbol Clock Frequency Tolerance	+/-25	5.9ppm	

CENTER FREQUENCY TOLERANCE(25℃ / 3.3V/1.8V) RBW: 1KHZ VBW: 100HZ SPAN: 100KHZ			
802.11G -----2442MHZ			
Test Item	Spec. (ppm)	Test result	Remark
Transmit Center Frequency Tolerance	+/-25	-0.09 ppm	
Symbol Clock Frequency Tolerance	+/-25	0.11 ppm	

CENTER FREQUENCY TOLERANCE(70 ℃/3.3V/1.8) RBW: 1KHZ VBW: 100HZ SPAN: 100KHZ			
802.11G -----2442MHZ			
Test Item	Standard Spec. (ppm)	Test result	Remark
Transmit Center Frequency Tolerance	+/-25	-0.20 ppm	
Symbol Clock Frequency Tolerance	+/-25	-0.30 ppm	

4.4 Rx Minimum Input Level Sensitivity

4.4.1 Purpose of Test:

This test measures the minimum RF input signal level at which the receiver Packet Error Rate (PER) is less than 10% at the 11g and less than 8% at the 11b.

4.4.2 Test Methodology:

With the DUT placed inside a shielded enclosure, its antenna ports are connected through a set of 50 ohm coaxial cables, and in-line variable attenuators to the antenna ports of Golden. During the test, data is transmitted at a fixed output power level from the "golden" transmitter to the DUT receiver. The variable attenuators is adjusted at each rate and channel until the DUT's received packet error rate is 10% at the 11g and less than 8% at the 11b, at which point the input signal level (dBm) is recorded. The test is performed across a set of user-defined channels and data rates.

4.4.3 IEEE Specification

802.11b: IEEE Std 802.11b/R2003-June 2003 Paragraph 18.4.8.1

802.11g: IEEE Std 802.11g/R2003-June 2003 Paragraph 19.5.1

802.11n: IEEE P802.11n/D2.07-Mar 2006 Paragraph 20.3.20.1

Data Rate (Mbps)	Minimum 11g Sensitivity (dBm)	Data Rate (Mbps)	Minimum 11b Sensitivity (dBm)
6	-82	1	NA
9	-81	2	-80
12	-79	5.5	NA
18	-77	11	-76
24	-74		
36	-70		
48	-66		
54	-65		

802.11n: IEEE P802.11n/D2.07-September 2007 Paragraph 20.3.21.1

Modulation Coding	Data Rate (R)	Minimum Sensitivity (dBm) (20MHz channel spacing)	Minimum Sensitivity (dBm) (40MHz channel spacing)
BPSK	1/2	-82	-79
QPSK	1/2	-79	-76
QPSK	3/4	-77	-74
16-QAM	1/2	-74	-70
16-QAM	3/4	-70	-67
64-QAM	2/3	-66	-63
64-QAM	3/4	-65	-62
64-QAM	5/6	-64	-61

4.4.4 Test result:

11b/g Mode RECEIVER SENSITIVITY (-20 ℃/3.15V/1.71)								
Rate (Mbps)	802.11 g @FER<10%				Rate (Mbps)	802.11 b @FER<8%			
	Spec. (dBm)	Frequency				Spec. (dBm)	Frequency		
		2412MHz	2442MHz	2472MHz			2412MHz	2442MHz	2472MHz
6	-85	-89.5	-89	-89	1	-90	-97.5	-97	-97
9	-83	-89	-89	-88.5					
12	-81	-87.5	-87	-87	2	-85	-94.5	-94	-94
18	-79	-85.5	-85	-85					
24	-76	-82	-82	-81.5	5.5	-83	-92.5	-92	-92
36	-73	-78.5	-78.5	-78					
48	-70	-75	-75	-74.5	11	-80	-87.5	-87.5	-87
54	-68	-73.5	-73.5	-73					

HT20 Mode-2G RECEIVER SENSITIVITY (-20 ℃/3.15V/1.71)				
Rate (Mbps)	@FER<10%			
	Spec. (dBm)	Frequency		
		2412MHz	2442MHz	2472MHz
MCS0	-82	-89	-88.5	-88
MCS1	-79	-86	-85.5	-85
MCS2	-77	-83.5	-83	-83
MCS3	-74	-80.5	-80.5	-80
MCS4	-70	-77	-77	-76.5
MCS5	-66	-73	-72.5	-72.5
MCS6	-65	-72	-72	-71.5
MCS7	-64	-70	-70	-69.5

HT40 Mode-2G RECEIVER SENSITIVITY (-20 ℃/3.15V/1.71)				
Rate (Mbps)	@FER<10%			
	Spec. (dBm)	Frequency		
		2422MHz	2437MHz	2452MHz
MCS0	-79	-85.5	-85.5	-85
MCS1	-76	-82	-82	-82
MCS2	-74	-80.5	-80	-80
MCS3	-70	-78	-78	-78
MCS4	-67	-74	-74	-74
MCS5	-63	-70	-70	-70
MCS6	-62	-68	-68	-68
MCS7	-61	-66.5	-66.5	-66

11b/g Mode RECEIVER SENSITIVITY (-20℃ / 3.3V/1.8V)

Rate (Mbps)	802.11 g @FER<10% Spec. (dBm)	Frequency 2412MHz	2442MHz	2472MHz	Rate (Mbps)	802.11 b @FER<8% Spec. (dBm)	Frequency 2412MHz	2442MHz	2472MHz
6	-85	-89.5	-89	-89	1	-90	-97.5	-97	-97
9	-83	-89	-89	-88.5					
12	-81	-87.5	-87	-87	2	-85	-94.5	-94	-94
18	-79	-85.5	-85	-85					
24	-76	-82	-82	-81.5	5.5	-83	-92.5	-92	-92
36	-73	-78.5	-78.5	-78					
48	-70	-75	-75	-74.5	11	-80	-87.5	-87.5	-87
54	-68	-73.5	-73.5	-73					

HT20 Mode-2G RECEIVER SENSITIVITY (-20℃ / 3.3V/1.8V)

Rate (Mbps)	@FER<10% Spec. (dBm)	Frequency 2412MHz	2442MHz	2472MHz
MCS0	-82	-89	-88.5	-88
MCS1	-79	-86	-85.5	-85
MCS2	-77	-83.5	-83	-83
MCS3	-74	-80.5	-80.5	-80
MCS4	-70	-77	-77	-76.5
MCS5	-66	-73	-72.5	-72.5
MCS6	-65	-72	-72	-71.5
MCS7	-64	-70	-70	-69.5

HT40 Mode-2G RECEIVER SENSITIVITY (-20℃ / 3.3V/1.8V)

Rate (Mbps)	@FER<10% Spec. (dBm)	Frequency 2422MHz	2437MHz	2452MHz
MCS0	-79	-85.5	-85.5	-85
MCS1	-76	-82	-82	-82
MCS2	-74	-80.5	-80	-80
MCS3	-70	-78	-78	-78
MCS4	-67	-74	-74	-74
MCS5	-63	-70	-70	-70
MCS6	-62	-68	-68	-68
MCS7	-61	-66.5	-66.5	-66

11b/g Mode RECEIVER SENSITIVITY (-20℃ / 3.45V/1.89)

Rate	802.11 g @FER<10%		802.11 b @FER<8%

Rate (Mbps)	Spec. (dBm)	Frequency			Rate (Mbps)	Spec. (dBm)	Frequency		
		2412MHz	2442MHz	2472MHz			2412MHz	2442MHz	2472MHz
6	-85	-89.5	-89	-89	1	-90	-97.5	-97	-97
9	-83	-89	-89	-88.5					
12	-81	-87.5	-87	-87	2	-85	-94.5	-94	-94
18	-79	-85.5	-85	-85					
24	-76	-82	-82	-81.5	5.5	-83	-92.5	-92	-92
36	-73	-78.5	-78.5	-78					
48	-70	-75	-75	-74.5	11	-80	-87.5	-87.5	-87
54	-68	-73.5	-73.5	-73					

HT20 Mode-2G RECEIVER SENSITIVITY (-20℃ / 3.45V/1.89)

Rate (Mbps)	Spec. (dBm)	@FER<10% Frequency		
		2412MHz	2442MHz	2472MHz
MCS0	-82	-89	-88.5	-88
MCS1	-79	-86	-85.5	-85
MCS2	-77	-83.5	-83	-83
MCS3	-74	-80.5	-80.5	-80
MCS4	-70	-77	-77	-76.5
MCS5	-66	-73	-72.5	-72.5
MCS6	-65	-72	-72	-71.5
MCS7	-64	-70	-70	-69.5

HT40 Mode-2G RECEIVER SENSITIVITY (-20℃ / 3.45V/1.89)

Rate (Mbps)	Spec. (dBm)	@FER<10% Frequency		
		2422MHz	2437MHz	2452MHz
MCS0	-79	-85.5	-85.5	-85
MCS1	-76	-82	-82	-82
MCS2	-74	-80.5	-80	-80
MCS3	-70	-78	-78	-78
MCS4	-67	-74	-74	-74
MCS5	-63	-70	-70	-70
MCS6	-62	-68	-68	-68
MCS7	-61	-66.5	-66.5	-66

11b/g Mode RECEIVER SENSITIVITY (25℃ / 3.15V/1.71)

Rate (Mbps)	802.11 g @FER<10%		Rate (Mbps)	802.11 b @FER<8%	
	Spec. (dBm)	Frequency		Spec. (dBm)	Frequency

		2412MHz	2442MHz	2472MHz			2412MHz	2442MHz	2472MHz
6	-85	-88.5	-88	-88	1	-90	-96.5	-96	-96
9	-83	-88	-88	-87.5					
12	-81	-86.5	-86	-86	2	-85	-93.5	-93	-93
18	-79	-84.5	-84	-84					
24	-76	-81	-81	-80.5	5.5	-83	-91.5	-91	-91
36	-73	-77.5	-77.5	-77					
48	-70	-74	-74	-73.5	11	-80	-86.5	-86.5	-86
54	-68	-72.5	-72.5	-72					

HT20 Mode-2G RECEIVER SENSITIVITY (25℃ / 3.15V/1.71)

Rate (Mbps)	Spec. (dBm)	@FER<10% Frequency		
		2412MHz	2442MHz	2472MHz
MCS0	-82	-88	-87.5	-87
MCS1	-79	-85	-84.5	-84
MCS2	-77	-82.5	-82	-82
MCS3	-74	-79.5	-79.5	-79
MCS4	-70	-76	-76	-75.5
MCS5	-66	-72	-71.5	-71.5
MCS6	-65	-71	-71	-70.5
MCS7	-64	-69	-69	-68.5

HT40 Mode-2G RECEIVER SENSITIVITY (25℃ / 3.15V/1.71)

Rate (Mbps)	Spec. (dBm)	@FER<10% Frequency		
		2422MHz	2437MHz	2452MHz
MCS0	-79	-84.5	-84.5	-84
MCS1	-76	-81	-81	-81
MCS2	-74	-79.5	-79	-79
MCS3	-70	-77	-77	-77
MCS4	-67	-73	-73	-73
MCS5	-63	-69	-69	-69
MCS6	-62	-67	-67	-67
MCS7	-61	-65.5	-65.5	-65

11b/g Mode RECEIVER SENSITIVITY (25℃ / 3.3V/1.8V)

Rate (Mbps)	Spec. (dBm)	802.11 g @FER<10% Frequency			Rate (Mbps)	Spec. (dBm)	802.11 b @FER<8% Frequency		
		2412MHz	2442MHz	2472MHz			2412MHz	2442MHz	2472MHz

6	-85	-88.5	-88	-88	1	-90	-96.5	-96	-96
9	-83	-88	-88	-87.5					
12	-81	-86.5	-86	-86	2	-85	-93.5	-93	-93
18	-79	-84.5	-84	-84					
24	-76	-81	-81	-80.5	5.5	-83	-91.5	-91	-91
36	-73	-77.5	-77.5	-77					
48	-70	-74	-74	-73.5	11	-80	-86.5	-86.5	-86
54	-68	-72.5	-72.5	-72					

HT20 Mode-2G RECEIVER SENSITIVITY (25℃ / 3.3V/1.8V)

Rate (Mbps)	Spec. (dBm) @FER<10%	Frequency		
		2412MHz	2442MHz	2472MHz
MCS0	-82	-88	-87.5	-87
MCS1	-79	-85	-84.5	-84
MCS2	-77	-82.5	-82	-82
MCS3	-74	-79.5	-79.5	-79
MCS4	-70	-76	-76	-75.5
MCS5	-66	-72	-71.5	-71.5
MCS6	-65	-71	-71	-70.5
MCS7	-64	-69	-69	-68.5

HT40 Mode-2G RECEIVER SENSITIVITY (25℃ / 3.3V/1.8V)

Rate (Mbps)	Spec. (dBm) @FER<10%	Frequency		
		2422MHz	2437MHz	2452MHz
MCS0	-79	-84.5	-84.5	-84
MCS1	-76	-81	-81	-81
MCS2	-74	-79.5	-79	-79
MCS3	-70	-77	-77	-77
MCS4	-67	-73	-73	-73
MCS5	-63	-69	-69	-69
MCS6	-62	-67	-67	-67
MCS7	-61	-65.5	-65.5	-65

11b/g Mode RECEIVER SENSITIVITY (25℃ /3.45V/1.89V)

Rate (Mbps)	802.11 g @FER<10%				Rate (Mbps)	802.11 b @FER<8%			
	Spec. (dBm)	Frequency				Spec. (dBm)	Frequency		
		2412MHz	2442MHz	2472MHz			2412MHz	2442MHz	2472MHz
6	-85	-88.5	-88	-88	1	-90	-96.5	-96	-96

9	-83	-88	-88	-87.5					
12	-81	-86.5	-86	-86	2	-85	-93.5	-93	-93
18	-79	-84.5	-84	-84					
24	-76	-81	-81	-80.5	5.5	-83	-91.5	-91	-91
36	-73	-77.5	-77.5	-77					
48	-70	-74	-74	-73.5	11	-80	-86.5	-86.5	-86
54	-68	-72.5	-72.5	-72					

HT20 Mode-2G RECEIVER SENSITIVITY (25℃ /3.45V/1.89V)

Rate (Mbps)	Spec. (dBm)	@FER<10% Frequency 2412MHz	2442MHz	2472MHz
MCS0	-82	-88	-87.5	-87
MCS1	-79	-85	-84.5	-84
MCS2	-77	-82.5	-82	-82
MCS3	-74	-79.5	-79.5	-79
MCS4	-70	-76	-76	-75.5
MCS5	-66	-72	-71.5	-71.5
MCS6	-65	-71	-71	-70.5
MCS7	-64	-69	-69	-68.5

HT40 Mode-2G RECEIVER SENSITIVITY (25℃ /3.45V/1.89V)

Rate (Mbps)	Spec. (dBm)	@FER<10% Frequency 2422MHz	2437MHz	2452MHz
MCS0	-79	-84.5	-84.5	-84
MCS1	-76	-81	-81	-81
MCS2	-74	-79.5	-79	-79
MCS3	-70	-77	-77	-77
MCS4	-67	-73	-73	-73
MCS5	-63	-69	-69	-69
MCS6	-62	-67	-67	-67
MCS7	-61	-65.5	-65.5	-65

11b/g Mode RECEIVER SENSITIVITY (70℃ / 3.15V/1.71V)

Rate (Mbps)	Spec. (dBm)	802.11 g @FER<10% Frequency 2412MHz	2442MHz	2472MHz	Rate (Mbps)	Spec. (dBm)	802.11 b @FER<8% Frequency 2412MHz	2442MHz	2472MHz
6	-85	-86.5	-86	-86	1	-90	-94.5	-94	-94
9	-83	-86	-86	-85.5					

12	-81	-84.5	-84	-84	2	-85	-91.5	-91	-91
18	-79	-82.5	-82	-82					
24	-76	-79	-79	-78.5	5.5	-83	-89.5	-89	-89
36	-73	-75.5	-75.5	-75					
48	-70	-72	-72	-71.5	11	-80	-84.5	-84.5	-84
54	-68	-70.5	-70.5	-70					

HT20 Mode-2G RECEIVER SENSITIVITY (70℃ / 3.15V/1.71V)

Rate (Mbps)	Spec. (dBm)	@FER<10% Frequency 2412MHz	2442MHz	2472MHz
MCS0	-82	-86	-85.5	-85
MCS1	-79	-83	-82.5	-82
MCS2	-77	-80.5	-80	-80
MCS3	-74	-77.5	-77.5	-77
MCS4	-70	-74	-74	-73.5
MCS5	-66	-70	-69.5	-69.5
MCS6	-65	-69	-69	-68.5
MCS7	-64	-67	-67	-66.5

HT40 Mode-2G RECEIVER SENSITIVITY (70℃ / 3.15V/1.71V)

Rate (Mbps)	Spec. (dBm)	@FER<10% Frequency 2422MHz	2437MHz	2452MHz
MCS0	-79	-82.5	-82.5	-82
MCS1	-76	-79	-79	-79
MCS2	-74	-77.5	-77	-77
MCS3	-70	-75	-75	-75
MCS4	-67	-71	-71	-71
MCS5	-63	-67	-67	-67
MCS6	-62	-65	-65	-65
MCS7	-61	-63.5	-63.5	-63

11b/g Mode RECEIVER SENSITIVITY (70℃ / 3.3V/1.8V)

Rate (Mbps)	802.11 g @FER<10% Spec. (dBm)	Frequency 2412MHz	2442MHz	2472MHz	Rate (Mbps)	802.11 b @FER<8% Spec. (dBm)	Frequency 2412MHz	2442MHz	2472MHz
6	-85	-86.5	-86	-86	1	-90	-94.5	-94	-94
9	-83	-86	-86	-85.5					
12	-81	-84.5	-84	-84	2	-85	-91.5	-91	-91

18	-79	-82.5	-82	-82					
24	-76	-79	-79	-78.5	5.5	-83	-89.5	-89	-89
36	-73	-75.5	-75.5	-75					
48	-70	-72	-72	-71.5	11	-80	-84.5	-84.5	-84
54	-68	-70.5	-70.5	-70					

HT20 Mode-2G RECEIVER SENSITIVITY (70℃ / 3.3V/1.8V)

Rate (Mbps)	Spec. (dBm)	@FER<10% Frequency 2412MHz	2442MHz	2472MHz
MCS0	-82	-86	-85.5	-85
MCS1	-79	-83	-82.5	-82
MCS2	-77	-80.5	-80	-80
MCS3	-74	-77.5	-77.5	-77
MCS4	-70	-74	-74	-73.5
MCS5	-66	-70	-69.5	-69.5
MCS6	-65	-69	-69	-68.5
MCS7	-64	-67	-67	-66.5

HT40 Mode-2G RECEIVER SENSITIVITY (70℃ / 3.3V/1.8V)

Rate (Mbps)	Spec. (dBm)	@FER<10% Frequency 2422MHz	2437MHz	2452MHz
MCS0	-79	-82.5	-82.5	-82
MCS1	-76	-79	-79	-79
MCS2	-74	-77.5	-77	-77
MCS3	-70	-75	-75	-75
MCS4	-67	-71	-71	-71
MCS5	-63	-67	-67	-67
MCS6	-62	-65	-65	-65
MCS7	-61	-63.5	-63.5	-63

11b/g Mode RECEIVER SENSITIVITY (70℃ /3.45V/1.89V)

Rate (Mbps)	802.11 g @FER<10% Spec. (dBm)	Frequency 2412MHz	2442MHz	2472MHz	Rate (Mbps)	802.11 b @FER<8% Spec. (dBm)	Frequency 2412MHz	2442MHz	2472MHz
6	-85	-86.5	-86	-86	1	-90	-94.5	-94	-94
9	-83	-86	-86	-85.5					
12	-81	-84.5	-84	-84	2	-85	-91.5	-91	-91
18	-79	-82.5	-82	-82					

24	-76	-79	-79	-78.5	5.5	-83	-89.5	-89	-89
36	-73	-75.5	-75.5	-75					
48	-70	-72	-72	-71.5	11	-80	-84.5	-84.5	-84
54	-68	-70.5	-70.5	-70					

HT20 Mode-2G RECEIVER SENSITIVITY (70℃ /3.45V/1.89V)

Rate (Mbps)	Spec. (dBm)	@FER<10% Frequency		
		2412MHz	2442MHz	2472MHz
MCS0	-82	-86	-85.5	-85
MCS1	-79	-83	-82.5	-82
MCS2	-77	-80.5	-80	-80
MCS3	-74	-77.5	-77.5	-77
MCS4	-70	-74	-74	-73.5
MCS5	-66	-70	-69.5	-69.5
MCS6	-65	-69	-69	-68.5
MCS7	-64	-67	-67	-66.5

HT40 Mode-2G RECEIVER SENSITIVITY (70℃ /3.45V/1.89V)

Rate (Mbps)	Spec. (dBm)	@FER<10% Frequency		
		2422MHz	2437MHz	2452MHz
MCS0	-79	-82.5	-82.5	-82
MCS1	-76	-79	-79	-79
MCS2	-74	-77.5	-77	-77
MCS3	-70	-75	-75	-75
MCS4	-67	-71	-71	-71
MCS5	-63	-67	-67	-67
MCS6	-62	-65	-65	-65
MCS7	-61	-63.5	-63.5	-63

4.5 Rx Maximum Input Level Sensitivity

The packet error rate (PER) shall be less than 10% for 11g/n and 8% for 11b at a PSDU length of 1000 bytes for rate-dependent input levels. The Maximum input receiver sensitivity uses the same test setup and increase the input source signal to measure the maximum input power which DUT can tolerate and within desired PER 10% for 11g/n, and 8% for 11b. It will be measured over golden unit in accordance with the below procedures:

(1) Set DUT at 11b/g/n channels.

(2) The attenuation of the test will be reduced 1 dB step continuously from -30dBm in signal strength and increasing the input power until PER > 10% for 11g/n; 8% for 11b.

RECEIVER SENSITIVITY (-20 ℃/3.15V/1.71)														
Rate (Mbps)	802.11n @FER<10%				Rate (Mbps)	802.11g @FER<10%				Rate (Mbps)	802.11b @FER<8%			
		Frequency					Frequency					Frequency		
	Spec. (dBm)	2422 MHz	2437 MHz	2452 MHz		Spec. (dBm)	2412 MHz	2442 MHz	2472 MHz		Spec. (dBm)	2412 MHz	2442 MHz	2472 MHz
HT-20	>-20	-9.5	-9.5	-9.5	6	>-20	10	10	10	1	>-10	10	10	10
HT-40	>-20	-9	-9	-9	54	>-20	-10	-10	-10	11	>-10	10	10	10

RECEIVER SENSITIVITY (-20℃ / 3.3V/1.8V)														
Rate (Mbps)	802.11n @FER<10%				Rate (Mbps)	802.11g @FER<10%				Rate (Mbps)	802.11b @FER<8%			
		Frequency					Frequency					Frequency		
	Spec. (dBm)	2422 MHz	2437 MHz	2452 MHz		Spec. (dBm)	2412 MHz	2442 MHz	2472 MHz		Spec. (dBm)	2412 MHz	2442 MHz	2472 MHz
HT-20	>-20	-9.5	-9.5	-9.5	6	>-20	10	10	10	1	>-10	10	10	10
HT-40	>-20	-9	-9	-9	54	>-20	-10	-10	-10	11	>-10	10	10	10

RECEIVER SENSITIVITY (-20℃ / 3.45V/1.89)														
Rate (Mbps)	802.11n @FER<10%				Rate (Mbps)	802.11g @FER<10%				Rate (Mbps)	802.11b @FER<8%			
		Frequency					Frequency					Frequency		
	Spec. (dBm)	2422 MHz	2437 MHz	2452 MHz		Spec. (dBm)	2412 MHz	2442 MHz	2472 MHz		Spec. (dBm)	2412 MHz	2442 MHz	2472 MHz
HT-20	>-20	-9.5	-9.5	-9.5	6	>-20	10	10	10	1	>-10	10	10	10
HT-40	>-20	-9	-9	-9	54	>-20	-10	-10	-10	11	>-10	10	10	10

RECEIVER SENSITIVITY (25℃ / 3.15V/1.71V)													
Rate (Mbps)	802.11n @FER<10%				Rate (Mbps)	802.11g @FER<10%				Rate (Mbps)	802.11b @FER<8%			
		Frequency					Frequency					Frequency		
	Spec. (dBm)	2422 MHz	2437 MHz	2452 MHz		Spec. (dBm)	2412 MHz	2442 MHz	2472 MHz		Spec. (dBm)	2412 MHz	2442 MHz	2472 MHz
HT-20	>-20	-8.5	-8.5	-8.5	6	>-20	10	10	10	1	>-10	10	10	10
HT-40	>-20	-8	-8	-8	54	>-20	-9	-9	-9	11	>-10	10	10	10

RECEIVER SENSITIVITY (25℃ / 3.3V/1.8V)													
Rate (Mbps)	802.11n @FER<10%				Rate (Mbps)	802.11g @FER<10%				Rate (Mbps)	802.11b @FER<8%			
		Frequency					Frequency					Frequency		
	Spec. (dBm)	2422 MHz	2437 MHz	2452 MHz		Spec. (dBm)	2412 MHz	2442 MHz	2472 MHz		Spec. (dBm)	2412 MHz	2442 MHz	2472 MHz
HT-20	>-20	-8.5	-8.5	-8.5	6	>-20	10	10	10	1	>-10	10	10	10
HT-40	>-20	-8	-8	-8	54	>-20	-9	-9	-9	11	>-10	10	10	10

RECEIVER SENSITIVITY (25℃ /3.45V/1.89V)													
Rate (Mbps)	802.11n @FER<10%				Rate (Mbps)	802.11g @FER<10%				Rate (Mbps)	802.11b @FER<8%			
		Frequency					Frequency					Frequency		
	Spec. (dBm)	2422 MHz	2437 MHz	2452 MHz		Spec. (dBm)	2412 MHz	2442 MHz	2472 MHz		Spec. (dBm)	2412 MHz	2442 MHz	2472 MHz
HT-20	>-20	-8.5	-8.5	-8.5	6	>-20	10	10	10	1	>-10	10	10	10
HT-40	>-20	-8	-8	-8	54	>-20	-9	-9	-9	11	>-10	10	10	10

RECEIVER SENSITIVITY (70℃ / 3.15V/1.71V)													
Rate (Mbps)	802.11n @FER<10%				Rate (Mbps)	802.11g @FER<10%				Rate (Mbps)	802.11b @FER<8%			
		Frequency					Frequency					Frequency		
	Spec. (dBm)	2422 MHz	2437 MHz	2452 MHz		Spec. (dBm)	2412 MHz	2442 MHz	2472 MHz		Spec. (dBm)	2412 MHz	2442 MHz	2472 MHz
HT-20	>-20	-6.5	-6.5	-6.5	6	>-20	10	10	10	1	>-10	10	10	10
HT-40	>-20	-6	-6	-6	54	>-20	-7	-7	-7	11	>-10	10	10	10

RECEIVER SENSITIVITY (70℃ / 3.3V/1.8V)													
Rate	802.11n				Rate	802.11g				Rate	802.11b			

(Mbps)	@FER<10%				(Mbps)	@FER<10%				(Mbps)	@FER<8%			
		Frequency					Frequency					Frequency		
	Spec. (dBm)	**2422 MHz**	**2437 MHz**	**2452 MHz**		Spec. (dBm)	**2412 MHz**	**2442 MHz**	**2472 MHz**		Spec. (dBm)	**2412 MHz**	**2442 MHz**	**2472 MHz**
HT-20	>-20	-6.5	-6.5	-6.5	6	>-20	10	10	10	1	>-10	10	10	10
HT-40	>-20	-6	-6	-6	54	>-20	-7	-7	-7	11	>-10	10	10	10

RECEIVER SENSITIVITY (70℃ /3.45V/1.89V)

Rate (Mbps)	**802.11n** @FER<10%				Rate (Mbps)	**802.11g** @FER<10%				Rate (Mbps)	**802.11b** @FER<8%			
		Frequency					Frequency					Frequency		
	Spec. (dBm)	**2422 MHz**	**2437 MHz**	**2452 MHz**		Spec. (dBm)	**2412 MHz**	**2442 MHz**	**2472 MHz**		Spec. (dBm)	**2412 MHz**	**2442 MHz**	**2472 MHz**
HT-20	>-20	-6.5	-6.5	-6.5	6	>-20	10	10	10	1	>-10	10	10	10
HT-40	>-20	-6	-6	-6	54	>-20	-7	-7	-7	11	>-10	10	10	10

4.6 Adjacent Channel Rejection

-11n

The adjacent channel rejection shall follow 17.3.10.2 in the 5 GHz band or 19.5.2 in the 2.4 GHz band for all transmissions in a 20 MHz channel width with the exception that 10% PER is required for 4096 octet packets rather than 10% PER for 1000 octet packets. For all transmissions in a 40 MHz channel width, the adjacent channel rejection shall be measured by setting the desired signal's strength 3 dB above the rate dependent sensitivity specified in IEEE standard (Receiver minimum input level sensitivity) and raising the power of the interfering signal until 10% PER is caused for a PSDU length of 4096 octets. The power difference between the interfering and the desired channel is the corresponding adjacent channel rejection. The adjacent channel center frequencies shall be separated by 40 MHz. The interfering signal in the adjacent channel shall be a conformant OFDM signal, unsynchronized with the signal in the channel under test. For a conformed OFDM PHY, the corresponding rejection shall be no less than specified in IEEE standard (Receiver minimum input level sensitivity). The interference signal shall have a minimum duty cycle of 50%.

Table n75—Receiver minimum input level sensitivity

Modulation	Rate (R)	Adjacent channel rejection (dB)	Non-adjacent channel rejection (dB)	Minimum sensitivity (dBm) (20 MHz channel spacing)	Minimum sensitivity (dBm) (40 MHz channel spacing)
BPSK	1/2	16	32	-82	-79
QPSK	1/2	13	29	-79	-76
QPSK	3/4	11	27	-77	-74
16-QAM	1/2	8	24	-74	-71
16-QAM	3/4	4	20	-70	-67
64-QAM	2/3	0	16	-66	-63
64-QAM	3/4	–1	15	-65	-62
64-QAM	5/6	–2	14	-64	-61

-11g

Adjacent channels at 2.4 GHz are defined to be at +/ -25 MHz spacing. The adjacent channel rejection shall be measured by setting the desired signal's strength 3 dB above the rate-dependent sensitivity and raising the power of the interfering signal until 10% PER is caused for a PSDU length of 1000 bytes. The power difference between the interfering and the desired channel is the corresponding adjacent channel rejection. The interfering signal in the adjacent channel shall be a conformant OFDM signal, unsynchronized with the signal in the channel under test. For a conformant OFDM PHY the corresponding rejection shall be no less than IEEE specified .

Table 91—Receiver performance requirements

Data rate (Mbits/s)	Minimum sensitivity (dBm)	Adjacent channel rejection (dB)	Alternate adjacent channel rejection (dB)
6	–82	16	32
9	–81	15	31
12	–79	13	29
18	–77	11	27
24	–74	8	24
36	–70	4	20
48	–66	0	16
54	–65	–1	15

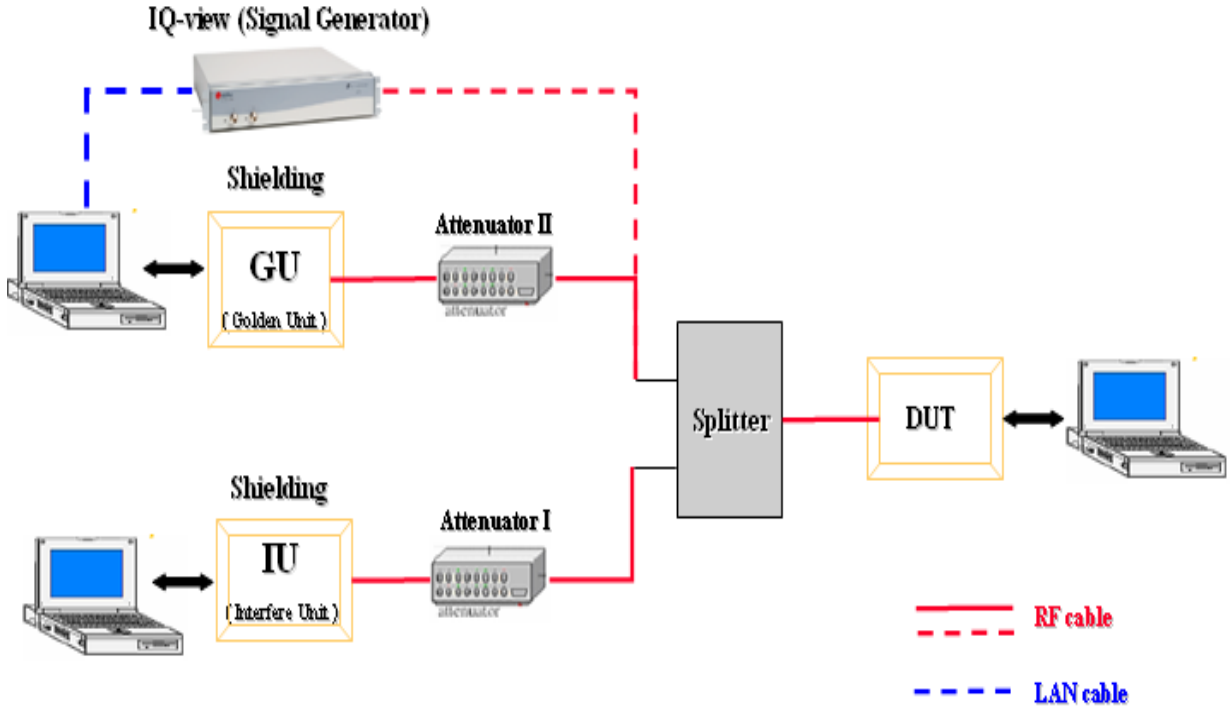
– 11b

Adjacent channel rejection is defined between any two channels with equal to or larger than 25 MHz separation. The adjacent channel rejection shall be equal to or better than 35 dB with an FER of 8% using 11 Mbit/s CCK modulation and a PSDU length of 1024 octets. The adjacent channel rejection shall be measured using the following method:
Input an 11 Mbit/s CCK modulated signal at a level -70 dBm. In an adjacent channel (25 MHz separation), input a signal modulated in a similar fashion that adheres to the transmit mask specified a level –35 dBm. The adjacent channel signal shall be derived from a separate signal source. It cannot be a frequency shifted version of the reference channel. Under these conditions, the FER shall be no worse than 8%.

It will be measured over in accordance with the below procedures:

(1) Set DUT at channel 2412 MHz (Start).
(2) VCC is 3.3V;Temperature :25℃.
(3) Wake up the 802.11b IU and set it 11 Mbits/s Tx rate at channel 2437 MHz.
(4) Enable IU(Interfere Unit) in duty cycle Tx mode.
(5) Wake up the 802.11b GU(Golden Unit) and set it 11 Mbits/s Tx rate at channel 2412 MHz via the conductive.
(6) Adjust the “attenuator I” in the path between IU to DUT such that IU’s signal level at the antenna connector equal to –35 dBm.
(7) Enable DUT in continuous Rx mode.
(8) Enable GU to transmit packets.
(9) Adjust the “attenuator II” in the path between GU and DUT such that the Rx signal level at the antenna connector equal to -70 dBm.

The test setup is as below：



ADJACENT CHANNEL REJECTION(+/-25MHZ)					
Rate (Mbps)	**802.11G**@FER<10% **(3.3V / 25℃)**				
	Spec. (dB)	Frequency			
		2412 MHz	2442 MHz		2472 MHz
			REJECTION CHANNEL: 2	REJECTION CHANNEL: 12	
9	15	40	41	41	42
18	11	37	37	38	39
36	4	30	31	30	32
54	-1	24	25	25	26

ADJACENT CHANNEL REJECTION(+/-25MHZ)															
Rate (Mbps)	**802.11B**@FER<8% **(3.3V / 25℃)**														
	Spec. (dB)	Frequency (MHz)													
		2412 MHz	2417 MHz	2422 MHz	2427 MHz	2432 MHz	2437 MHz	2442 MHz	2447 MHz	2452 MHz	2457 MHz	2462 MHz	2467 MHz	2472 MHz	
11	35	43	43	43	42	42	42	42	42	42	43	43	43	43	

ADJACENT CHANNEL REJECTION(+/-20MHZ)	
Rate	**802.11N HT20**@FER<10% **(3.3V /25℃)**

(Mbps)	Spec. (dB)	Frequency			
		2412 MHz	2442MHz		2472 MHz
			REJECTION CHANNEL: 3	REJECTION CHANNEL: 11	
MCS0	16	31	32	33	33
MCS1	13	29	29	31	31
MCS2	11	27	27	29	29
MCS3	8	24	25	26	26
MCS4	4	20	21	22	22
MCS5	0	17	18	19	19
MCS6	-1	16	16	18	18
MCS7	-2	15	16	17	17

ADJACENT CHANNEL REJECTION(+/-40MHZ)			
Rate (Mbps)	**802.11N HT40**@FER<10% **(3.3V /25℃)**		
	Spec. (dB)	Frequency	
		2422MHz (interfering channel=2462MHz)	2462 MHz (interfering channel=2422MHz)
MCS0	16	36	37
MCS1	13	33	36
MCS2	11	31	32
MCS3	8	28	28
MCS4	4	24	26
MCS5	0	20	21
MCS6	-1	18	20
MCS7	-2	16	19

4.7 In/Out of Band Emissions in Restricted Bands and Emission for Regulation

For 2.4GHz band, the emission of Tx harmonics will measure at the 3.3V voltage according to the below procedures:

(1) VCC is 3.3V;Temperature is room temperature.
(2) Set DUT at measured channel.
(3) Set DUT at 11Mbps Tx rate for 11b and 6Mbps for 11g.
(4) Enable DUT in continuous Tx mode
(5) Set the spectrum analyzer as below for peak measurement:
RBW = 1 MHz
VBW = 30 Hz
Detector: Peak
Max Hold: Yes
Averaging: No
(6) Set the "Span" in sequence and check the emission from the spectrum analyzer.
(7) Disable DUT from the continuous Tx mode

LIMIT OF THE BANDEGE TEST(25℃,3.3V)									
Frequency Range (MHz)	Spec. (dBm)	**802.11B** 18dBm @11MBPS		**802.11G** 15dBm @54MBPS		**802.11N HT20** 13dBm @MCS7		**802.11N HT40** 13dBm @MCS7	
		CH1 2412MHz	**CH11 2462MHz**	**CH1 2412MHz**	**CH11 2462MHz**	**CH1 2412MHz**	**CH11 2462MHz**	**CH3 2422MHz**	**CH9 2452MHz**
<2390	<-41.3	-47.6	-45.7	-48.3	-48.3	-45.1	-60.5	-44.2	-48.5
>2483.5	<-41.3	-47.7	-45.5	-48.5	-48.1	-60.5	-45.1	-48.4	-44.3

OUTPUT SPURIOUS OF HARMONIC(25 ℃, 3.3V)								
Frequency Range (MHz)	Spec. (dBm)	MODE	**CH1 2412MHz**		**CH7 2442MHz**		**CH13 2472MHz**	
			2nd	**3rd**	**2nd**	**3rd**	**2nd**	**3rd**
>2483.5	<-41.3	**802.11B** 18 dBm @11MBPS	-85.1	-69.8	-85.0	-67.5	-85.2	-67.7
>2483.5	<-41.3	**802.11G** 15 dBm @54MBPS	-85.1	-75.7	-85.0	-75.2	-85.2	-74.1
>2483.5	<-41.3	**802.11N HT20** 13 dBm @MCS7	-85.1	-78.6	-85.0	-78.4	-85.2	-77.6

OUTPUT SPURIOUS OF HARMONIC(25 ℃, 3.3V)								
Frequency Range (MHz)	Spec. (dBm)	MODE	**CH3 2412MHz**		**CH6 2442MHz**		**CH9 2472MHz**	
			2nd	**3rd**	**2nd**	**3rd**	**2nd**	**3rd**
>2483.5	<-41.3	**802.11N HT40** 13 dBm @MCS7	-85.1	-80.2	-85.0	-79.8	-85.2	-79.8

4.8 Transmitter Modulation Accuracy Test

This test will determine the T77H145 transmitter modulation accuracy.

IEEE802.11 b/g: IEEE Std 802.11b and 11g Follow 802.11a specifications,

Data Rate (Mbps)	Relative constellation error (dB) 11g	Data Rate (Mbps)	Relative constellation error (%) 11b
6	-5	1	35
9	-8	2	35
12	-10	5.5	35
18	-13	11	35
24	-16		
36	-19		
48	-22		
54	-25		

IEEE802.11n: IEEE P802.11n/D2.07-September 2007 Paragraph 20.3.20.7.4

Modulation Coding	Data Rate(R)	Relative constellation error (dB)
BPSK	1/2	-5
QPSK	1/2	-10
QPSK	3/4	-13
16-QAM	1/2	-16
16-QAM	3/4	-19
64-QAM	2/3	-22
64-QAM	3/4	-25
64-QAM	5/6	-28

Perform the following test procedure:

- Configure the test setup.
- Put the radio in duty cycle transmit mode. All channels are recommended to test.
- Set the real time vector signal analyzer as follows:
- Digital demod mode
- Wideband input mode
- DQPSK or OFDM demodulation
- Turn on the analyzer sampling
- Record the Tx EVM (error vector magnitude)
- Tx PER measurement
  (Set the power level -50dBm at antenna port of golden unit)

EVM TEST (-20℃/3.15V/1.71V)	
	11b with 18dBm output power

	2412MHz		2442MHz		2472MHz	
1	-33.86	2.0%	-34.4	1.8%	-34.66	1.6%
2	-33.56	2.1%	-33.96	1.9%	-34.45	1.7%
5.5	-33.41	2.2%	-34.02	1.9%	-34.49	1.7%
11	-33.33	2.2%	-33.74	2.0%	-34.43	1.8%

EVM TEST (-20℃/3.15V/1.71V)			
Rate (Mbps)	11g with 15dBm output power		
	2412MHz	2442MHz	2472MHz
6	-31.62	-31.59	-30.99
36	-31.92	-31.59	-31.42
48	-31.81	-32.13	-31.49
54	-31.53	-31.99	-31.29

EVM TEST (-20℃/3.15V/1.71V)			
HT20 Mode	11n with 13dBm output power		
	2412MHz	2442MHz	2472MHz
MCS0	-33.26	-33.28	-33.12
MCS1	-32.71	-33.39	-33.26
MCS2	-32.58	-33.46	-32.35
MCS3	-32.88	-33.47	-33.44
MCS4	-33.4	-33.7	-33.49
MCS5	-32.78	-33.89	-32.72
MCS6	-32.48	-33.33	-33.03
MCS7	-32.57	-33.82	-32.56

EVM TEST (-20℃/3.15V/1.71V)			
HT40 Mode	11n with 13dBm output power		
	2422MHz	2437MHz	2452MHz
MCS0	-33.48	-32.37	-33.52
MCS1	-33.15	-33.54	-32.39
MCS2	-33.41	-33.05	-33.21
MCS3	-33.4	-32.28	-32.39
MCS4	-32.56	-32.5	-32.72
MCS5	-33.2	-32.68	-32.64
MCS6	-33.21	-33.1	-32.79
5MCS7	-33.14	-32.79	-32.28

EVM TEST (-20℃/3.3 V/1.8V)						
Rate (Mbps)	11b with 18dBm output power					
	2412MHz		2442MHz		2472MHz	
1	-33.41	2.1%	-34.18	1.9%	-32.19	2.5%

2	-33.52	2.1%	-34.04	1.9%	-31.77	2.6%
5.5	-33.32	2.1%	-34.01	1.9%	-31.85	2.6%
11	-33.04	2.2%	-33.9	2.0%	-31.85	2.6%

EVM TEST (-20℃/3.3 V/1.8V)			
Rate (Mbps)	11g with 15dBm output power		
	2412MHz	2442MHz	2472MHz
6	-32.38	-31.43	-32.81
36	-32.14	-31.59	-32.43
48	-32.48	-32.92	-33.02
54	-33.17	-31.74	-33.52

EVM TEST (-20℃/3.3 V/1.8V)			
HT20 Mode	11n with 13dBm output power		
	2412MHz	2442MHz	2472MHz
MCS0	-33.96	-33.88	-34.36
MCS1	-33.73	-34.63	-34.42
MCS2	-34.09	-33.91	-34
MCS3	-34.5	-34.92	-34.25
MCS4	-34.04	-34.55	-34.77
MCS5	-34.18	-34.75	-34.08
MCS6	-33.73	-33.82	-34.15
MCS7	-34.04	-34.25	-33.45

EVM TEST (-20℃/3.3 V/1.8V)			
HT40 Mode	11n with 13dBm output power		
	2422MHz	2437MHz	2452MHz
MCS0	-34.3	-34.63	-34.63
MCS1	-34.17	-34.22	-34.09
MCS2	-34.32	-34.5	-34.31
MCS3	-34.03	-33.95	-33.68
MCS4	-34.03	-34.00	-34.02
MCS5	-33.83	-33.28	-33.5
MCS6	-33.56	-33.92	-33.76
MCS7	-34.24	-33.83	-34.34

EVM TEST (-20℃/3.45 V/1.89V)						
Rate (Mbps)	11b with 18dBm output power					
	2412MHz		2442MHz		2472MHz	
1	-33.5	2.1%	-34.21	1.8%	-31.86	2.5%
2	-33.05	2.2%	-33.99	1.9%	-31.68	2.6%

5.5	-33.1	2.2%	-33.96	1.9%	-31.96	2.5%
11	-32.93	2.2%	-33.61	2.0%	-31.84	2.5%

EVM TEST (-20℃/3.45 V/1.89V)			
Rate (Mbps)	11g with 15dBm output power		
	2412MHz	2442MHz	2472MHz
6	-32.2	-31.63	-33.36
36	-32.28	-32.11	-32.89
48	-33.15	-33.02	-33.4
54	-33.08	-33.08	-33.79

EVM TEST (-20℃/3.45 V/1.89V)			
HT20 Mode	11n with 13dBm output power		
	2412MHz	2442MHz	2472MHz
MCS0	-33.45	-33.55	-33.86
MCS1	-33.52	-33.9	-34
MCS2	-33.41	-34.4	-34.28
MCS3	-33.71	-34.56	-34.24
MCS4	-34.2	-34.11	-34.19
MCS5	-33.58	-34.35	-34.01
MCS6	-33.07	-33.78	-33.43
MCS7	-33.66	-33.86	-33.58

EVM TEST (-20℃/3.45 V/1.89V)			
HT40 Mode	11n with 13dBm output power		
	2422MHz	2437MHz	2452MHz
MCS0	-33.61	-34.29	-34.15
MCS1	-34.15	-34.2	-33.75
MCS2	-34.31	-34.05	-33.85
MCS3	-33.32	-33.21	-33.01
MCS4	-33.61	-33.96	-33.93
MCS5	-33.27	-33.33	-33.53
MCS6	-33.78	-33.93	-33.64
MCS7	-34.06	-34.05	-33.91

EVM TEST (25℃/3.15V/1.71V)						
Rate (Mbps)	11b with 18dBm output power					
	2412MHz		2442MHz		2472MHz	
1	-33.37	2.1%	-34.41	2.1%	-34.59	1.9%
2	-33.02	2.2%	-34.07	2.2%	-34.21	1.9%

5.5	-33.18	2.2%	-33.89	2.2%	-34.01	2.0%
11	-33.02	2.2%	-33.63	2.3%	-33.99	2.0%

EVM TEST (25℃/3.15V/1.71V)			
Rate (Mbps)	11g with 15dBm output power		
	2412MHz	2442MHz	2472MHz
6	-28.32	-27.5	-28.82
36	-28.05	-27.68	-28.35
48	-28.5	-27.96	-29.08
54	-28.06	-27.76	-29

EVM TEST (25℃/3.15V/1.71V)			
HT20 Mode	11n with 13dBm output power		
	2412MHz	2442MHz	2472MHz
MCS0	-31.48	-31.71	-30.03
MCS1	-30.94	-31.32	-31.84
MCS2	-31.15	-30.89	-30.83
MCS3	-30.75	-31.49	-31.38
MCS4	-30.98	-31.05	-31.68
MCS5	-30.92	-31.43	-31.46
MCS6	-30.13	-31.21	-31.06
MCS7	-31.42	-31.58	-31.37

EVM TEST (25℃/3.15V/1.71V)			
HT40 Mode	11n with 13dBm output power		
	2422MHz	2437MHz	2452MHz
MCS0	-31.37	-30.35	-31.53
MCS1	-31.57	-31.74	-30.87
MCS2	-31.19	-30.99	-31.62
MCS3	-30.71	-29.63	-30.24
MCS4	-30.81	-29.71	-30.78
MCS5	-30.17	-29.72	-29.66
MCS6	-30.6	-30.02	-30.15
MCS7	-31.43	-31.08	-30.29

EVM TEST (25℃/3.3 V/1.8V)						
Rate (Mbps)	11b with 18dBm output power					
	2412MHz		2442MHz		2472MHz	
1	-33.86	2.0%	-34.4	1.9%	-34.66	1.8%
2	-33.56	2.1%	-33.96	2.0%	-34.45	1.9%
5.5	-33.41	2.1%	-34.02	2.0%	-34.49	1.9%
11	-33.33	2.1%	-33.74	2.1%	-34.43	1.9%

EVM TEST (25℃/3.3 V/1.8V)			
Rate (Mbps)	11g with 15dBm output power		
	2412MHz	2442MHz	2472MHz
6	-29.51	-28.77	-29.75
36	-29.05	-28.52	-29.75
48	-29.46	-29.24	-30.32
54	-29.28	-28.97	-29.97

EVM TEST (25℃/3.3 V/1.8V)			
HT20 Mode	11n with 13dBm output power		
	2412MHz	2442MHz	2472MHz
MCS0	-33.38	-33.84	-32.73
MCS1	-33.37	-33.24	-32.63
MCS2	-32.72	-33.14	-32.88
MCS3	-33.12	-33.35	-33.29
MCS4	-33.1	-33.23	-32.66
MCS5	-33.39	-33.71	-32.54
MCS6	-32.55	-32.85	-32.23
MCS7	-32.66	-33.31	-32.27

EVM TEST (25℃/3.3 V/1.8V)			
HT40 Mode	11n with 13dBm output power		
	2422MHz	2437MHz	2452MHz
MCS0	-32.89	-33.26	-33.49
MCS1	-33.00	-33.04	-33.77
MCS2	-33.42	-33.15	-33.31
MCS3	-31.95	-31.75	-31.91
MCS4	-31.89	-32.35	-32.37
MCS5	-31.97	-31.53	-32.51
MCS6	-33.03	-32.52	-32.6
MCS7	-32.70	-32.59	-32.93

EVM TEST (25℃/3.45 V/1.89V)						
Rate (Mbps)	11b with 18dBm output power					
	2412MHz		2442MHz		2472MHz	
1	-33.6	2.1%	-34.64	1.8%	-34.69	1.8%
2	-33.29	2.2%	-34.09	1.9%	-34.63	1.8%
5.5	-33.28	2.2%	-33.82	2.0%	-34.13	1.9%
11	-32.92	2.2%	-34.06	2.0%	-34.21	1.9%

EVM TEST (25℃/3.45 V/1.89V)			
Rate (Mbps)	11g with 15dBm output power		
	2412MHz	2442MHz	2472MHz
6	-29.19	-28.97	-29.88
36	-28.77	-28.44	-29.47
48	-29.45	-29.27	-30.07
54	-29.06	-28.91	-29.66

EVM TEST (25℃/3.45 V/1.89V)			
HT20 Mode	11n with 13dBm output power		
	2412MHz	2442MHz	2472MHz
MCS0	-33.29	-33.61	-33.37
MCS1	-33.34	-33.88	-33.57
MCS2	-33.27	-32.89	-32.69
MCS3	-33.73	-33.84	-33.99
MCS4	-33.54	-33.44	-33.04
MCS5	-33.5	-33.96	-33.34
MCS6	-32.71	-32.13	-32
MCS7	-33.02	-33.52	-32.53

EVM TEST (25℃/3.45 V/1.89V)			
HT40 Mode	11n with 13dBm output power		
	2422MHz	2437MHz	2452MHz
MCS0	-33.18	-33.26	-33.33
MCS1	-33.14	-33.53	-32.77
MCS2	-33.09	-32.85	-32.77
MCS3	-32.69	-31.57	-31.83
MCS4	-32.75	-32.24	-32.76
MCS5	-32.21	-31.98	-32.06
MCS6	-32.71	-32.6	-32.74
MCS7	-33.82	-32.48	-33.04

EVM TEST (70℃/3.15V/1.71V)						
Rate (Mbps)	11b with 18dBm output power					
	2412MHz		2442MHz		2472MHz	
1	-32.43	2.4%	-33.16	2.2%	-33.4	2.2%
2	-31.72	2.6%	-32.92	2.3%	-33.4	2.2%
5.5	-31.83	2.5%	-32.98	2.3%	-33.54	2.2%
11	-31.53	2.6%	-32.68	2.4%	-33.04	2.3%

EVM TEST (70℃/3.15V/1.71V)			
Rate (Mbps)	11g with 15dBm output power		
	2412MHz	2442MHz	2472MHz
6	-28.86	-28.37	-28.29
36	-28.28	-29.33	-29.65
48	-29.6	-29.67	-29.89
54	-28.98	-29.43	-29.19

EVM TEST (70℃/3.15V/1.71V)			
HT20 Mode	11n with 13dBm output power		
	2412MHz	2442MHz	2472MHz
MCS0	-30.37	-30.26	-29.65
MCS1	-30.14	-30.22	-29.92
MCS2	-29.42	-29.51	-29.99
MCS3	-30.37	-29.92	-29.73
MCS4	-29.81	-30.75	-30.05
MCS5	-29.96	-30	-30.53
MCS6	-30.06	-29.02	-29.69
MCS7	-30.5	-28.85	-29.87

EVM TEST (70℃/3.15V/1.71V)			
HT40 Mode	11n with 13dBm output power		
	2422MHz	2437MHz	2452MHz
MCS0	-29.55	-28.31	-29.66
MCS1	-29.3	-29.21	-28.98
MCS2	-30.06	-29.34	-28.27
MCS3	-29.72	-28.97	-28.27
MCS4	-29.07	-29.12	-28.65
MCS5	-29.16	-28.64	-29.22
MCS6	-28.65	-28.4	-28.57
MCS7	-28.57	-28.63	-29.1

EVM TEST (70℃/3.3V/1.8V)						
Rate (Mbps)	11b with 18dBm output power					
	2412MHz		2442MHz		2472MHz	
1	-31.62	2.6%	-33.64	2.2%	-33.5	2.2%
2	-31.91	2.6%	-32.82	2.4%	-33.03	2.3%
5.5	-31.96	2.6%	-33.11	2.3%	-33.23	2.2%
11	-31.69	2.6%	-32.28	2.4%	-33.53	2.2%

EVM TEST (70℃/3.3V/1.8V)			
Rate (Mbps)	11g with 15dBm output power		
	2412MHz	2442MHz	2472MHz

6	-30.48	-29.87	-31.7
36	-30.59	-30.78	-31.63
48	-30.48	-31.41	-32.01
54	-30.46	-30.77	-31.72

EVM TEST (70℃/3.3V/1.8V)			
HT20 Mode	11n with 13dBm output power		
	2412MHz	2442MHz	2472MHz
MCS0	-32.26	-33.47	-32.98
MCS1	-32.48	-33.34	-32.57
MCS2	-32.54	-33.06	-33.09
MCS3	-31.89	-32.82	-33.34
MCS4	-32.74	-33.3	-33.46
MCS5	-32.65	-33.51	-32.93
MCS6	-31.35	-32.14	-32.22
MCS7	-32.22	-32.72	-32.95

EVM TEST (70℃/3.3V/1.8V)			
HT40 Mode	11n with 13dBm output power		
	2422MHz	2437MHz	2452MHz
MCS0	-31.99	-32.59	-32.7
MCS1	-32.57	-32.55	-32.62
MCS2	-32.56	-31.85	-32.16
MCS3	-31.73	-31.04	-31.82
MCS4	-31.97	-32.05	-32.43
MCS5	-31.58	-32.02	-31.6
MCS6	-31.95	-32.36	-32.16
MCS7	-31.38	-32.28	-32.46

EVM TEST (70℃/3.45V/1.89V)						
Rate (Mbps)	11b with 18dBm output power					
	2412MHz		2442MHz		2472MHz	
1	-32.01	2.5%	-33.39	2.2%	-33.22	2.2%
2	-31.69	2.6%	-32.94	2.2%	-33.28	2.2%
5.5	-31.94	2.5%	-32.96	2.2%	-33.35	2.2%
11	-31.94	2.5%	-32.66	2.3%	-32.79	2.3%

EVM TEST (70℃/3.45V/1.89V)			
Rate (Mbps)	11g with 15dBm output power		
	2412MHz	2442MHz	2472MHz
6	-29.66	-29.89	-30.42

36	-29.24	-30.18	-31.81
48	-30.37	-30.89	-31.23
54	-30.85	-31.01	-31.63

EVM TEST(70℃/3.45V/1.89V)			
HT20 Mode	11n with 13dBm output power		
	2412MHz	2442MHz	2472MHz
MCS0	-32.38	-33.1	-33.14
MCS1	-32.4	-32.6	-32.88
MCS2	-32.23	-32.95	-33.02
MCS3	-32.22	-33.23	-33.35
MCS4	-32.5	-33.26	-33.13
MCS5	-32.47	-33.42	-33.08
MCS6	-32.13	-32.45	-32.6
MCS7	-32.87	-33.11	-32.7

EVM TEST(70℃/3.45V/1.89V)			
HT40 Mode	11n with 13dBm output power		
	2422MHz	2437MHz	2452MHz
MCS0	-32.52	-32.26	-32.9
MCS1	-32.41	-32.96	-33.42
MCS2	-32.72	-32.49	-32.52
MCS3	-31.62	-31.87	-31.62
MCS4	-32.11	-32.57	-32.67
MCS5	-31.87	-31.84	-32.08
MCS6	-32.41	-31.6	-32.12
MCS7	-32.49	-32.36	-32.87

4.9 Transmit power-on and power-down ramp

The transmit power-on ramp for 10% to 90% of maximum power shall be no greater than 2us.The
transmit power-on ramp is shown in Fig.8

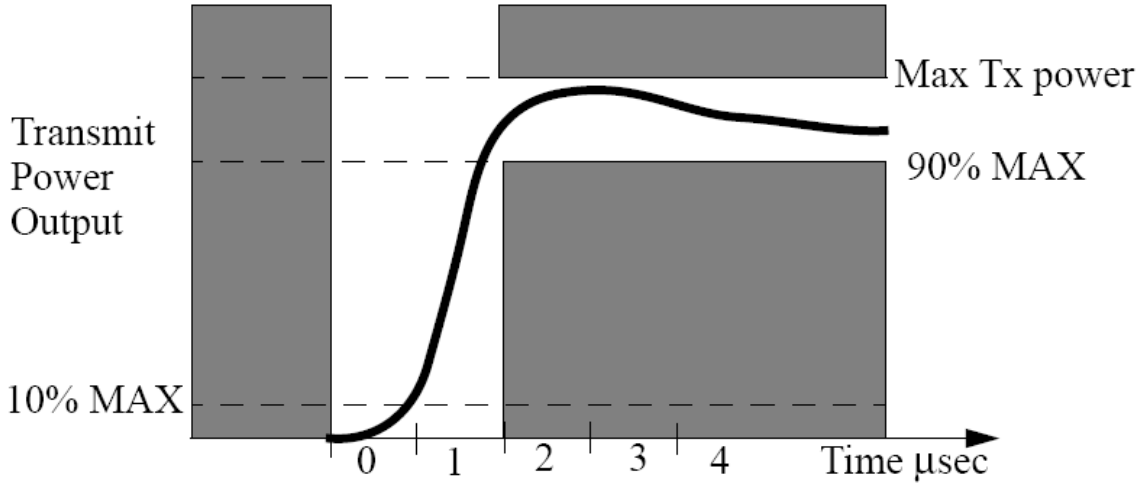


Fig.8 – Transmit Power-On Ramp

The transmit power-down ramp for 90% to 10% of maximum power shall be no greater than 2us.The Transmit power-down ramp is shown in Fig.9

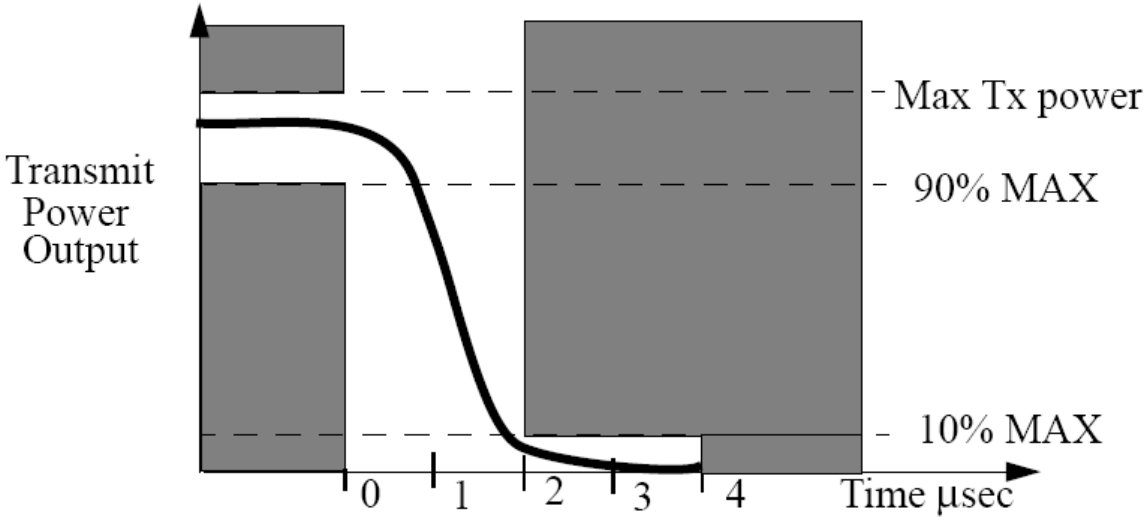


Fig.9 – Transmit Power-Down Ramp

POWER-ON AND DOWN RAMP （TBD）															
Test Item	802.11B @3.15,3.3,3.45V/-20,25,70 ℃ Rate (11Mbps)														
	Spec.(us)	Frequency (MHz)													
		2412	2417	2422	2427	2432	2437	2442	2447	2452	2457	2462	2467	2472	2484
Power-on	<2														
Power-down	<2														

5 BT EDVT Test Case and Procedure

5.1 Block Diagram of Test setup

Figure 6 is the setup for the BT function EDVT test , the equipment required are list in the table below. According to the block diagram of the test setup, the connection of the RF cables would be changed alone with the requirement of the various test items. The end of the connectors which is not in used during the test will be terminated with a 50 ohm load. The test setup could be variable regarding to the request of DUT.

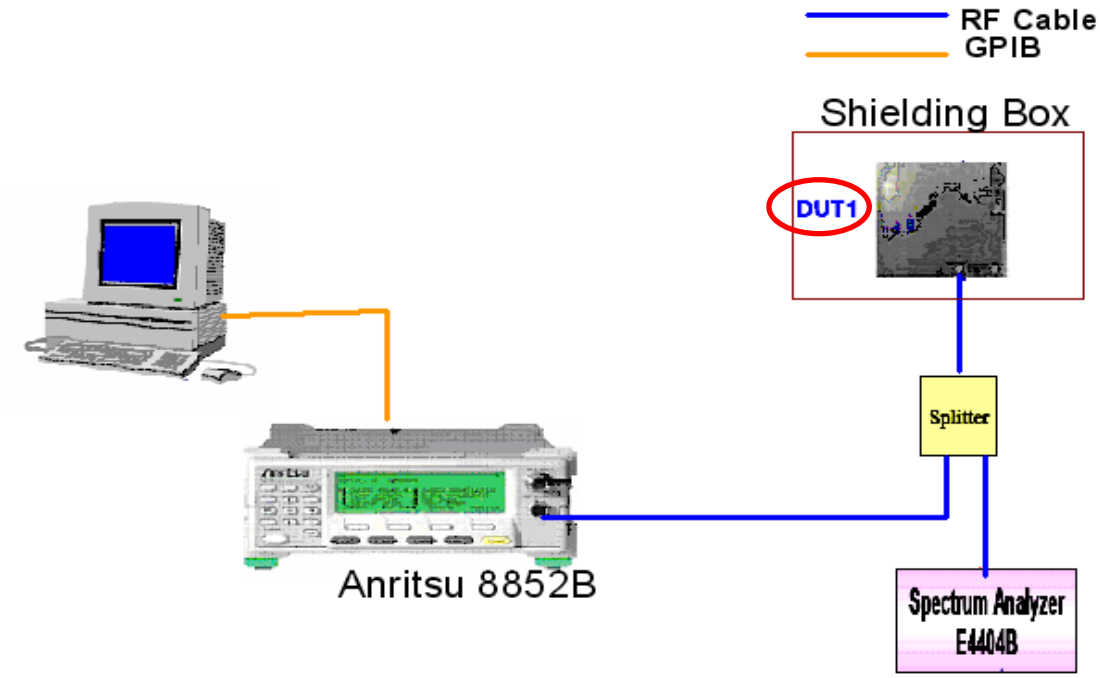


Figure 6. Test setup of BT EDVT

5.2 Equipment List

The equipment list below is to indicate the equipment of the RF EDVT test setup. The equipment can be modified upon the request of the design. The list below is a typical setup for general design use.

Description	Manufacturer	Model	Qty	Remark
Personal Computer	Local	WinXP system	1	
Spectrum Analyzer	Local	E4404B Series	1	
RF Splitter			1	
RF Cable			3	
GPIB Controller	National	GPIB-USB-B	1	
GPIB Cable	National		1	
Anritsu 8852B	Anritsu		1	
Shielding Box	Local		1	

5.3 Output Power

The test item to verify maximum peak and average RF output power. In the testing, we can control DUT transmitting in low/mid/high channel with hopping on mode . The output power measurement will be taken at Anritsu 8852B. It will be measured as below procedures .

1) DUT via 50ohm connector connect tester .
2) DUT in test mode
3) DUT in hopping on mode
4) Tester transmits PRBS9 payload to DUT

5) Run the Anritsu 8852B, and the result will show in the log file

OPERATION OUTPUT POWER (-20 ℃/3.3V/1.8V)							
	Specification		Test Result (dBm)				Summary
	Min	Max		CH0	CH39	CH78	
Output Power	4dBm	10dBm	Average Power	6.67	7.19	7.30	dBm
			Maximum Power	6.67	7.19	7.31	
			Minimum Power	6.66	7.18	7.30	

OPERATION OUTPUT POWER (25 ℃/3.3V1.8V)							
	Specification		Test Result (dBm)				Summary
	Min	Max		CH0	CH39	CH78	
Output Power	4dBm	10dBm	Average Power	7.8	7.8	7.7	dBm
			Maximum Power	7.8	7.8	7.7	
			Minimum Power	7.8	7.8	7.7	

OPERATION OUTPUT POWER (70 ℃/3.3V/1.8V)（TBD）							
	Specification		Test Result (dBm)				Summary
	Min	Max		CH0	CH39	CH78	
Output Power	4dBm	10dBm	Average Power				dBm
			Maximum Power				
			Minimum Power				

5.4 Power control

It is for verification TX power control (if the DUT doesn't support it ,this test is not needed),during the test,we can control DUT in hopping off mode . The test result will show at the 8852B , The test procedures as below :

1) DUT via 50ohm connector connect tester .
2) DUT in test mode
3) DUT in hopping off mode
4) DUT transmits at maximum power back to the tester
5) Run the Anritsu 8852B, and the result will show in the log file

POWER CONTROL (-20 ℃/3.3V/1.8V)			
Power Control	Specification	Test Result (dBm)	Summary

	Min step	Max step		CH0	CH39	CH78	
	2dB	8dB	Min Power	-21.8	-21.6	-22.0	dB
			Max Power	8.0	8.5	8.3	
			Mini Power step	2.3	3.2	3.5	
			Max Power step	4.9	4.4	4.1	

POWER CONTROL (25 ℃/3.3V1.8V)							
	Specification		Test Result (dBm)				Summary
	Min step	Max step		CH0	CH39	CH78	
Power Control	2dB	8dB	Min Power	-21.1	-21.2	-21.3	dB
			Max Power	8.7	8.7	8.4	
			Mini Power step	2.1	3.1	2.9	
			Max Power step	4.5	4.3	4.5	

POWER CONTROL (70 ℃/3.3V/1.8V)（TBD）							
	Specification		Test Result (dBm)				Summary
	Min step	Max step		CH0	CH39	CH78	
Power Control	2dB	8dB	Min Power				dB
			Max Power				
			Mini Power step				
			Max Power step				

5.5 Initial carrier and carrier drift

The initial carrier is to verify the transmitter carrier frequency accuracy ,In the testing ,we need control DUT transmits DH1 packets with PRBS9 payload to the tester in low, middle, how channel ,the test result is not exceed +/-75KHz. The carrier drift is to verify the transmitter carrier frequency drift within a packet, the center frequency is not allowed drift the limits ,for DH1 ,not exceed +/-25KHz ,for DH3 DH5 ,not exceed +/-40KHz.The maximum drift rate is 20KHz /50uS. the test procedure as below Item.

1) DUT via 50ohm connector connect tester .
2) DUT in test mode
3) DUT in hopping on mode
4) The tester measures at the low /mid /high frequency
5) Run the Anristsu 8852B, the test result will show in log file

Carrier drift (-20 ℃/3.3V/1.8V)								
CH0	Specification			Test Result				Summary
		Min	Max		DH1	DH3	DH5	

	DH1	-25KHz	25kHz	Drift Rate/50us	-3.03	3.48	-3.53	KHz
				Maximum Drift	5	5	6	
	DH3	-40KHz	40KHz	Average Drift	3	1	3	
				Packets Test	10	10	10	
	DH5	-40KHz	40KHz	Packets Failed	0	0	0	
CH39	DH1	-25KHz	25kHz	Drift Rate/50us	3.43	-3.11	-4.23	KHz
				Maximum Drift	4	-3	-4	
	DH3	-40KHz	40KHz	Average Drift	0	0	0	
				Packets Test	10	10	10	
	DH5	-40KHz	40KHz	Packets Failed	0	0	0	
CH78	DH1	-25KHz	25kHz	Drift Rate/50us	-2.97	-3.07	-3.28	KHz
				Maximum Drift	4	-5	-4	
	DH3	-40KHz	40KHz	Average Drift	1	0	0	
				Packets Test	10	10	10	
	DH5	-40KHz	40KHz	Packets Failed	0	0	0	

Carrier drift (25 ℃/3.3V1.8V)							
CH0	Specification			Test Result			Summary
		Min	Max		DH1	DH3	DH5	
	DH1	-25KHz	25kHz	Drift Rate/50us	2.66	3.39	3.15	
				Maximum	-5	-6	-5	

	DH3	-40KHz	40KHz	Drift				KHz
				Average Drift	-2	-4	-4	
				Packets Test	10	10	10	
	DH5	-40KHz	40KHz	Packets Failed	0	0	0	
CH39	DH1	-25KHz	25kHz	Drift Rate/50us	3.35	-3.15	3.93	KHz
				Maximum Drift	-5	-7	-6	
	DH3	-40KHz	40KHz	Average Drift	-4	-6	-5	
				Packets Test	10	10	10	
	DH5	-40KHz	40KHz	Packets Failed	0	0	0	
CH78	DH1	-25KHz	25kHz	Drift Rate/50us	-2.77	-3.47	-3.43	KHz
				Maximum Drift	-5	-6	-7	
	DH3	-40KHz	40KHz	Average Drift	-4	-4	-4	
				Packets Test	10	10	10	
	DH5	-40KHz	40KHz	Packets Failed	0	0	0	

Carrier drift (70 ℃/3.3V/1.8V) （TBD）								
CH0	Specification			Test Result				Summary
		Min	Max		DH1	DH3	DH5	
	DH1	-25KHz	25kHz	Drift Rate/50us				KHz
				Maximum Drift				
	DH3	-40KHz	40KHz	Average Drift				

				Packets Test				
	DH5	-40KHz	40KHz	Packets Failed				
CH39	DH1	-25KHz	25kHz	Drift Rate/50us				KHz
				Maximum Drift				
	DH3	-40KHz	40KHz	Average Drift				
				Packets Test				
	DH5	-40KHz	40KHz	Packets Failed				
CH78	DH1	-25KHz	25kHz	Drift Rate/50us				KHz
				Maximum Drift				
	DH3	-40KHz	40KHz	Average Drift				
				Packets Test				
	DH5	-40KHz	40KHz	Packets Failed				

5.6 TX output spectrum -20dB bandwidth

It is for verification the emissions inside the operating frequency range within the limits , .it must fulfill Δf =|f(h)-f(l)|<=1.0MHz in low ,mid and high frequency. In the testing , we must control the DUT in hoping off mode ,

-20dB bandwidth (-20 ℃/3.3V/1.8V) （TBD）		
Specification		Test result
Δf =|f(h)-f(l)|<=1.0MHz	CH0	
	CH39	
	CH78	

-20dB bandwidth (25 ℃/3.3V1.8V) （TBD）		
Specification		Test result
Δf =|f(h)-f(l)|<=1.0MHz	CH0	
	CH39	
	CH78	
-20dB bandwidth (70 ℃/3.3V/1.8V) （TBD）		
Specification		Test result
Δf =|f(h)-f(l)|<=1.0MHz	CH0	
	CH39	
	CH78	

5.7 Modulation characteristic

This test item is for verification of the modulation index .In the test , we need control the DUT in hopping off mode and transmits in low ,middle and high frequency .When the tester transmit the 1111000…..bit pattern as payload , the average of deviation frequency with bit period is recorded to $\Delta f1_{avg}$,when the

test transmits 10101010…bit pattern as payload , ,the Max deviation frequency is recorded to $\Delta f2_{max}$,the average deviation is recoded to $\Delta f2_{avg,}$, The test result must fulfill the average of all frequency deviations within 140KHz and 175KHz , at least99.9% of all frequency deviations shall be greater than 175KHz..the test procedure as below item

1) DUT connect to the tester via 50ohm connector and in test mode
2) DUT in hopping off mode
3) DUT transmits frequency at low/mid/high
4) Run the Anristsu 8852B, the test result will show in log file

Modulation characteristic (-20 ℃/3.3V/1.8V)							
Specification			Test Result				Summary
	Min	Max		CH0	CH39	CH78	
$\Delta f1_{avg}$	140kHz	175kHz	F1 Average	171.4	171.5	171.8	•
			F1 maximum	173.8	173.4	173.4	KHz
$\Delta f2_{max}$	115kHz		F1 Packets Failed	0	0	0	
			F2 Average	145.9	146.4	145.4	
			F2 Maximum	140.3	140.6	138.2	
$\Delta f2_{avg}/\Delta f1_{avg}$	0.8		F2 pass rate	100%	100%	100%	
			F1/F2 ratio	0.85	0.85	0.84	
			Total Packets tested	20	20	20	

Modulation characteristic (25 ℃/3.3V1.8V)							
Specification			Test Result				Summary
	Min	Max		CH0	CH39	CH78	
$\Delta f1_{avg}$	140kHz	175kHz	F1 Average	171.8	171.9	171.7	
			F1 maximum	174.8	174.8	174.9	
$\Delta f2_{max}$	115kHz		F1 Packets Failed	0	0	0	KHz
			F2 Average	149.2	150.7	151	
			F2 Maximum	140.2	141.5	141.6	
$\Delta f2_{avg}/\Delta f1_{avg}$	0.8		F2 pass rate	100%	100%	100%	
			F1/F2 ratio	0.86	0.87	0.87	
			Total Packets tested	20	20	20	

Modulation characteristic (70 ℃/3.3V/1.8V) （TBD）							
Specification			Test Result				Summary
	Min	Max		CH0	CH39	CH78	
$\Delta f1_{avg}$	140kHz	175kHz	F1 Average				
			F1 maximum				
$\Delta f2_{max}$	115kHz		F1 Packets Failed				KHz
			F2 Average				

$\Delta f2_{avg}/\Delta f1_{avg}$	0.8		F2 Maximum				
			F2 pass rate				
			F1/F2 ratio				
			Total Packets tested				

5.8 Single sensitivity

The sensitivity is tested using a non-ideal transmitter (one-slot packet). This test case defines the signal sent to the DUT in detail. The DUT must meet the required sensitivity for this non-ideal signal .In the test , we need control the DUT in hopping off mode . the tester continuously send DH1 packets with PBRS9 payload to DUT ,and the transmit power is -70dBm,the DUT receive packets must fulfill BER≦ 0.1 %(The minimum numbers of samples , 1600000returned payload bits) the test procedure as below items:

1) DUT is connected to the tester via 50ohm connector and in test mode
2) DUT is in loop back .
3) DUT is in hopping off mode
4) The tester transmit power is chosen such that the input power to DUT receiver is –70dBm
5) The tester continuously sends DH1 packets to DUT. The payload is PRBS9.
6) Run the Anristsu 8852B, the test result will show in log file

Single sensitivity (power level @-70dBm (-20 ℃/3.3V/1.8V)		
Channel	Spec.	Result
2402(MHz)	BER≦0.1 %	-87 dBm
2441(MHz)	BER≦0.1 %	-87 dBm
2480(MHz)	BER≦0.1 %	-87 dBm

Single sensitivity (power level @-70dBm (25 ℃/3.3V1.8V)		
Channel	Spec.	Result
2402(MHz)	BER≦0.1 %	-86 dBm
2441(MHz)	BER≦0.1 %	-86 dBm
2480(MHz)	BER≦0.1 %	-86 dBm

Single sensitivity (power level @-70dBm (70 ℃/3.3V/1.8V) （TBD）		
Channel	Spec.	Result
2402(MHz)	BER≦0.1 %	
2441(MHz)	BER≦0.1 %	
2480(MHz)	BER≦0.1 %	

5.9 Multi slot sensitivity

Multi-slot packets are sent to the DUT at the sensitivity level. The DUT must meet the required sensitivity for this non-ideal signal .the tester transmit power to the DUT receiver is no more than-70dBm ,and the BER<=0.1%., we also need control the DUT in low/mid/high frequency.The test procedure as below :

1. DUT is connected to the tester via 50ohm connector and in test mode
2. DUT is in loop back
3. DUT is in hopping off mode
4. The tester continuously sends DH5 packets with the PRBS 9 payload to the DUT.
5. The returned packets are received must fulfill the BER≦0.1%
6. Run the Anristsu 8852B, the test result will show in log file

Multi slot sensitivity (-20 ℃/3.3V/1.8V)		
Channel	Spec (BER≦0.1%)	Result
2402(MHz)	-70dBm	-87 dBm
2441(MHz)	-70dBm	-87 dBm
2480(MHz)	-70dBm	-87 dBm

Multi slot sensitivity (25 ℃/3.3V1.8V)		
Channel	Spec (BER≦0.1%)	Result
2402(MHz)	-70dBm	-86 dBm
2441(MHz)	-70dBm	-86 dBm
2480(MHz)	-70dBm	-86 dBm

Multi slot sensitivity (70 ℃/3.3V/1.8V) （TBD）		
Channel	Spec (BER≦0.1%)	Result
2402(MHz)	-70dBm	
2441(MHz)	-70dBm	
2480(MHz)	-70dBm	

5.10 Max input level

The maximum input level is verification of the receiver performance ,interoperability ,System performance ,the tester send DH1 packets with a nominal bluetooth signal continuously at –20dBm power at the receiver input of the DUT., and the BER≦0.1% with minimum number of samples 1600000 returned payload bits .

Test procedure as below:

1. DUT is connected to the tester via 50ohm connector and in test mode
2. DUT in loop back
3. DUT is in hopping of mode
4. The tester continuously sends DH5 packets with the PRBS 9 payload to the DUT.
5. Run the Annritsu 8852B, the test result will show in log file .

Single sensitivity max input level (-20 ℃/3.3V/1.8V)		
Channel	Spec (BER≦0.1%)	Result
2402(MHz)	-20dBm	Pass

2441(MHz)	-20dBm	Pass
2480(MHz)	-20dBm	pass

Single sensitivity max input level (25 °C/3.3V1.8V)		
Channel	Spec (BER≦0.1%)	Result
2402(MHz)	-20dBm	Pass
2441(MHz)	-20dBm	Pass
2480(MHz)	-20dBm	pass

Single sensitivity max input level (70 °C/3.3V/1.8V) （TBD）		
Channel	Spec (BER≦0.1%)	Result
2402(MHz)	-20dBm	
2441(MHz)	-20dBm	
2480(MHz)	-20dBm	

5.11 EDR modulation characteristic and frequency tolerance

This test item verifies the transmitter carrier frequency stability and modulation accuracy . During the test ,the DUT transmits the π/4-DQPSK and 8DPSK packets with PRBS9 payload in low /mid/high frequency ,the tester calculates the carrier frequency ,RMS DEVM, peak DEVM and 99%DEVM value , and the test result must fulfill RMS DEVM <=0.2 for all π/4-DQPSK RMS DEVM <=0.3 for all 8DPSK
Peak DEVM<=0.35 for all π/4-DQPSK Peak DEVM<=0.13 for all 8DPSK
99%DEVM<=0.3 for 99% of π/4-DQPSK 99%DEVM<=0.3 for 99% of 8DPSK
Initial center frequency accuracy , -75kHz<ω < 75 kHz,
EDR center frequency accuracy, -10kHz<ω< 10 kHz
The test procedure as below :

1) DUT is connected to the tester via 50ohm connector and in test mode
2) DUT in loop back or TX
3) DUT in hopping off mode
4) DUT transmits the longest supported π/4-DQPSK and 8DPSK packet type.
5) Run the Annritsu 8852B, the test result will show in log file .

EDR Modulation characteristic (-20 °C/3.3V/1.8V)						
Specification			Test Result			Summary
			CH1	CH39	CH78	
2Mbits/sec	RMS DEVM	<=0.2	0.056	0.048	0.055	
	Peak DEVM	<=0.35	0.131	0.106	0.129	
	99%DEVM	<=0.3	100%	100%	100%	

	Initial center Frequency accuracy	-75kHz<ω < 75 kHz	13.4	13.5	13.7	KHz
	EDR center frequency accuracy	-10kHz<ω< 10 kHz	-0.8	0.9	0.9	
3Mbits/sec	RMS DEVM	<=0.2	0.067	0.054	0.056	
	Peak DEVM	<=0.35	0.209	0.161	0.172	
	99%DEVM	<=0.3	100%	100%	100%	
	Initial center Frequency accuracy	-75kHz<ω < 75 kHz	13.3	13.4	13.5	KHz
	EDR center frequency accuracy	-10kHz<ω< 10 kHz	1.1	1.1	0.9	

EDR Modulation characteristic (25 ℃/3.3V1.8V)						
Specification			Test Result			Summary
			CH1	CH39	CH78	
2Mbits/sec	RMS DEVM	<=0.2	0.052	0.048	0.045	
	Peak DEVM	<=0.35	0.110	0.118	0.118	
	99%DEVM	<=0.3	100%	100%	100%	
	Initial center Frequency accuracy	-75kHz<ω < 75 kHz	-4.4	-4.4	-4.8	KHz
	EDR center frequency accuracy	-10kHz<ω< 10 kHz	1	0.8	0.9	
	RMS DEVM	<=0.2	0.049	0.040	0.044	
	Peak DEVM	<=0.35	0.119	0.117	0.107	

3Mbits/sec						
	99%DEVM	<=0.3	100%	100%	100%	
	Initial center Frequency accuracy	-75kHz<ω < 75 kHz	-4.3	-4.7	-4.6	KHz
	EDR center frequency accuracy	-10kHz<ω< 10 kHz	-1	0.9	-0.9	

EDR Modulation characteristic (70 ℃/3.3V/1.8V) (TBD)						
Specification			Test Result			Summary
			CH1	CH39	CH78	
2Mbits/sec	RMS DEVM	<=0.2				
	Peak DEVM	<=0.35				
	99%DEVM	<=0.3				
	Initial center Frequency accuracy	-75kHz<ω < 75 kHz				KHz
	EDR center frequency accuracy	-10kHz<ω< 10 kHz				
3Mbits/sec	RMS DEVM	<=0.2				
	Peak DEVM	<=0.35				

	99%DEVM	<=0.3				
	Initial center Frequency accuracy	-75kHz<ω < 75 kHz				KHz
	EDR center frequency accuracy	-10kHz<ω< 10 kHz				

5.12 EDR relative transmit power

EDR relative transmit power verify the difference in average transmit power during frequency modulated[GFSK] and phase modulated [DPSK] portions of a packet within an acceptable range.

During the test ,we need control DUT transmit the longest supported π/4-DQPSK and 8DPSK packet type with the maximum length payload containing PRBS9. he tester calculates average power P[GFSK] over at least 80% of the GFSK portion of the packet .and calculates the average power P[DPSK] over at least 80% of the DPSK portion of the packet .the test result must fulfill the spec of P[GFSK]-4dB<P[DPSK]< P[GFSK]+1dB, the test as below steps

1) DUT is connected to the tester via 50ohm connector and in test mode
2) DUT in loop back or TX mode
3) DUT in hopping off
4) DUT transmits the longest supported π/4-DQPSK and 8DPSK packet type in low /mid/high frequency
5) Run the Annritsu 8852B, the test result will show in log file .

EDR relative transmit power (-20 °C/3.3V/1.8V)							
EUT Max	Specification		2Mbits/sec Test Result				Summary
	Min	Max		CH0	CH39	CH78	
	-4dB	1dB	Max difference	-0.17	-0.16	-0.13	dB
			Min difference	-0.14	-0.14	-0.10	
			Avg difference	-0.16	-0.15	-0.12	
EUT Min	Specification		2Mbits/sec Test Result				Summary
	Min	Max		CH0	CH39	CH78	
	-4dB	1dB	Max difference	-0.20	-0.20	-0.20	dB
			Min difference	-0.17	-0.16	-0.16	
			Avg difference	-0.18	-0.17	-0.18	
EUT Max	Specification		3Mbits/sec Test Result				Summary
	Min	Max		CH0	CH39	CH78	
	-4dB	1dB	Max difference	-0.17	-0.17	-0.14	dB
			Min difference	-0.15	-0.14	-0.12	
			Avg difference	-0.16	-0.15	-0.13	
EUT Min	Specification		3Mbits/sec Test Result				Summary
	Min	Max		CH0	CH39	CH78	

	-4dB	1dB	Max difference	-0.21	-0.21	-0.21	dB
			Min difference	-0.19	-0.18	-0.17	
			Avg difference	-0.20	-0.19	-0.19	

EDR relative transmit power (25 ℃/3.3V1.8V)							
EUT Max	Specification		2Mbits/sec Test Result				Summary
	Min	Max		CH0	CH39	CH78	
	-4dB	1dB	Max difference	-0.15	-0.13	-0.13	dB
			Min difference	-0.13	-0.11	-0.10	
			Avg difference	-0.14	-0.12	-0.12	
EUT Min	Specification		2Mbits/sec Test Result				Summary
	Min	Max		CH0	CH39	CH78	
	-4dB	1dB	Max difference	-0.19	-0.18	-0.19	dB
			Min difference	-0.16	-0.16	-0.17	
			Avg difference	-0.18	-0.17	-0.18	
EUT Max	Specification		3Mbits/sec Test Result				Summary
	Min	Max		CH0	CH39	CH78	
	-4dB	1dB	Max difference	-0.15	-0.14	-0.13	dB
			Min difference	-0.13	-0.11	-0.11	
			Avg difference	-0.14	-0.13	-0.12	
EUT Min	Specification		3Mbits/sec Test Result				Summary
	Min	Max		CH0	CH39	CH78	
	-4dB	1dB	Max difference	-0.21	-0.19	-0.19	dB
			Min difference	-0.19	-0.17	-0.17	

			Avg difference	-0.19	-0.18	-0.18	

EDR relative transmit power (70 ℃/3.3V/1.8V) （TBD）							
EUT Max	Specification		2Mbits/sec Test Result				Summary
	Min	Max		CH0	CH39	CH78	
	-4dB	1dB	Max difference				dB
			Min difference				
			Avg difference				
EUT Min	Specification		2Mbits/sec Test Result				Summary
	Min	Max		CH0	CH39	CH78	
	-4dB	1dB	Max difference				dB
			Min difference				
			Avg difference				
EUT Max	Specification		3Mbits/sec Test Result				Summary
	Min	Max		CH0	CH39	CH78	
	-4dB	1dB	Max difference				dB
			Min difference				
			Avg difference				
EUT Min	Specification		3Mbits/sec Test Result				Summary
	Min	Max		CH0	CH39	CH78	
	-4dB	1dB	Max difference				dB
			Min difference				

			Avg difference				

5.13 EDR maximum input power

The EDR maximum input level is for verify the maximum performance at the maximum input signal level ,the tester continuously sends π/4DQPSK or 8DPSK with the longest supported packet type and the maximum length payload containing PRBS9 .The tester transmit at the –20dBm power level in low/mid/high frequency ,.the DUT receive the packets and the measure BER must fulfill BER<=$10^{-3,}$ The minimum number of samples shall be 1600000 returned payload bits .The test steps as below :

1) DUT is connected to the tester via 50ohm connector and in test mode
2) DUT in loop back mode
3) DUT in hopping off
4) DUT transmits at maximum power to the tester
5) Run the Annritsu 8852B, the test result will show in log file .

EDR maximum input level (-20 ℃/3.3V/1.8V)					
Receiver (Power Level =-20dBm)	Specification	TEST RESULT (Measurement REF. SENSITIVITY=-20dBm)			Summary
			CH0	CH39	CH78
2Mbps Packet Length: 2-DH1	≦0.1%	Overall BER	0	0	0
		Bits in Error	0	0	0
		Packets sent	295	295	295
		Packets in Error	0	0	0
Receiver (Power Level =-20dBm)	Specification	TEST RESULT (Measurement REF. SENSITIVITY=-20dBm)			Summary
			CH0	CH39	CH78
3Mbps Packet Length: 3-DH1	≦0.1%	Overall BER	3.87E-005	5.37E-005	5.56E-005
		Bits in Error	62	86	89
		Packets sent	196	196	196
		Packets in Error	32	53	54

EDR maximum input level (25 ℃/3.3V1.8V)						
Receiver (Power Level =-20dBm)	Specification	TEST RESULT (Measurement REF. SENSITIVITY=-20dBm)				Summary
			CH0	CH39	CH78	
2Mbps Packet Length: 2-DH1	≦0.1%	Overall BER	0	0	0	
		Bits in Error	0	0	0	
		Packets sent	295	295	295	
		Packets in Error	0	0	0	
Receiver (Power Level =-20dBm)	Specification	TEST RESULT (Measurement REF. SENSITIVITY=-20dBm)				Summary
			CH0	CH39	CH78	
3Mbps Packet Length: 3-DH1	≦0.1%	Overall BER	0	0	0	
		Bits in Error	0	0	0	
		Packets sent	196	196	196	
		Packets in Error	0	0	0	

EDR maximum input level (70 ℃/3.3V/1.8V) （TBD）						
Receiver (Power Level =-20dBm)	Specification	TEST RESULT (Measurement REF. SENSITIVITY=-20dBm)				Summary
			CH0	CH39	CH78	
2Mbps Packet Length: 2-DH1	≦0.1%	Overall BER				
		Bits in Error				
		Packets sent				
		Packets in Error				
Receiver (Power Level =-20dBm)	Specification	TEST RESULT (Measurement REF. SENSITIVITY=-20dBm)				Summary
			CH0	CH39	CH78	
3Mbps Packet Length: 3-DH1	≦0.1%	Overall BER				
		Bits in Error				
		Packets sent				
		Packets in Error				

5.14 EDR sensitivity

The EDR sensitivity is for verification the receiver sensitivity for the 10^{-4} bit error rate using non-ideal

transmitter ,the tester continuously sends π/4DQPSKor8DPSK packets and at the –70dBm power level the DUT receives the packets at low/mid/high channel ,The returned packets with the minimum number of 16000000 bits ,the test result must fulfill BER≦$10^{-4.}$

1) DUT is connected to the tester via 50ohm connector and in test mode
2) DUT in loop back mode
3) DUT in hopping off
4) DUT transmits at maximum power to the tester
5) Run the Annritsu 8852B, the test result will show in log file .

EDR receiver sensitivity(2Mbps) Power level:-70dBm (-20 ℃/3.3V/1.8V)		
Channel	Spec.	Result
2402(MHz)	BER≦0.1 %	-87 dBm
2441(MHz)	BER≦0.1 %	-87 dBm
2480(MHz)	BER≦0.1 %	-87 dBm
EDR receiver sensitivity (3Mbps) Power level:-70dBm (-20 ℃/3.3V/1.8V)		
Channel	Spec.	Result
2402(MHz)	BER≦0.1 %	-82 dBm
2441(MHz)	BER≦0.1 %	-82 dBm
2480(MHz)	BER≦0.1 %	-82 dBm

EDR receiver sensitivity(2Mbps) Power level:-70dBm (25 ℃/3.3V1.8V)		
Channel	Spec.	Result
2402(MHz)	BER≦0.1 %	-86 dBm
2441(MHz)	BER≦0.1 %	-86 dBm
2480(MHz)	BER≦0.1 %	-86 dBm
EDR receiver sensitivity (3Mbps) Power level:-70dBm (25 ℃/3.3V1.8V)		
Channel	Spec.	Result
2402(MHz)	BER≦0.1 %	-81 dBm
2441(MHz)	BER≦0.1 %	-81 dBm
2480(MHz)	BER≦0.1 %	-81 dBm

EDR receiver sensitivity(2Mbps) Power level:-70dBm (70 ℃/3.3V/1.8V) （TBD）		
Channel	Spec.	Result
2402(MHz)	BER≦0.1 %	
2441(MHz)	BER≦0.1 %	
2480(MHz)	BER≦0.1 %	
EDR receiver sensitivity (3Mbps) Power level:-70dBm (70 ℃/3.3V/1.8V) （TBD）		
Channel	Spec.	Result
2402(MHz)	BER≦0.1 %	
2441(MHz)	BER≦0.1 %	
2480(MHz)	BER≦0.1 %	

5.15 EDR BER floor sensitivity

The EDR BER floor sensitivity is for verification the receiver performance for the 10^{-5} bit error rate, the tester transmit power is set at –60dBm ,the DUT receives at low/mid/high channel

And the tester measures the returned packets BER rate , the test result must fulfill the below Spec:

<$7x10^{-6}$ after 8000000bits/ <$1x10^{-5}$after 160000000bits

1) DUT is connected to the tester via 50ohm connector and in test mode
2) DUT in loop back mode
3) DUT in hopping off
4) DUT transmits at maximum power to the tester
5) Run the Annritsu 8852B, the test result will show in log file

EDR BER floor sensitivity (-20 ℃/3.3V/1.8V)

Receiver (Power Level =-60dBm)	Specification	TEST RESULT (Measurement REF. SENSITIVITY=-60dBm)				Summary
			CH0	CH39	CH78	
2Mbps Packet Length: 2-DH1	≦7.00E-006 ≦1.00E-005	Overall BER	0	0	0	
		Bits in Error	0	0	0	
		Packets sent	1500	1500	1500	
		Packets in Error	0	0	0	
Receiver (PowerLevel =-60Bm)	Specification	TEST RESULT (Measurement REF. SENSITIVITY=-60dBm)				Summary
			CH0	CH39	CH78	
3Mbps Packet Length: 3-DH1	≦7.00E-006 ≦1.00E-005	Overall BER	0	0	0	
		Bits in Error	0	0	0	
		Packets sent	990	990	990	
		Packets in Error	0	0	0	

EDR BER floor sensitivity (25 ℃/3.3V1.8V)						
Receiver (Power Level =-60dBm)	Specification	TEST RESULT (Measurement REF. SENSITIVITY=-60dBm)				Summary
			CH0	CH39	CH78	
2Mbps Packet Length: 2-DH1	≦7.00E-006 ≦1.00E-005	Overall BER	0	0	0	
		Bits in Error	0	0	0	
		Packets sent	1500	1500	1500	
		Packets in Error	0	0	0	
Receiver (PowerLevel =-60Bm)	Specification	TEST RESULT (Measurement REF. SENSITIVITY=-60dBm)				Summary
			CH0	CH39	CH78	
3Mbps Packet Length: 3-DH1	≦7.00E-006 ≦1.00E-005	Overall BER	0	0	0	
		Bits in Error	0	0	0	
		Packets sent	990	990	990	

		Packets in Error	0	0	0	

EDR BER floor sensitivity (70 ℃/3.3V/1.8V) （TBD）						
Receiver (Power Level =-60dBm)	Specification	TEST RESULT (Measurement REF. SENSITIVITY=-60dBm)				Summary
			CH0	CH39	CH78	
2Mbps Packet Length: 2-DH1	≦7.00E-006 ≦1.00E-005	Overall BER				
		Bits in Error				
		Packets sent				
		Packets in Error				
Receiver (PowerLevel =-60Bm)	Specification	TEST RESULT (Measurement REF. SENSITIVITY=-60dBm)				Summary
			CH0	CH39	CH78	
3Mbps Packet Length: 3-DH1	≦7.00E-006 ≦1.00E-005	Overall BER				
		Bits in Error				
		Packets sent				
		Packets in Error				

6.Throughput test (TBC)

Below test data is just for your reference. (Android phone with 8787 module)

Topology: Iperf PC ----> AP ----> Phone
Iperf command for single TCP stream: iperf -c IP -t 30s
Iperf command for bi-direction TCP stream: iperf -c IP -d -t 40s
Iperf command for single UDP stream: iperf -c IP -u -l 100 -t 40s

Unit: Mbps

Data Transfer	AP -> Phone (TCP)	Phone -> AP (TCP)	AP <-> Phone (TCP Bi-direction) (TX/RX)	AP -> Phone (UDP Transaction)
Atheros AP AR5002AP-2x (v0.0.9.97)				
802.11b Open	5.2	5.2	2.19/2.90	1.1
802.11b with BT A2DP	0.8	3.3	0.72/0.43	1.1
802.11g Open	19.6	19.3	10.7/9.92	1.1
802.11g with BT A2DP	1.5	8.0	3.75/1.08	1.1
802.11g WEP 64bit	20.8	20.7	9.26/11.4	1.1
802.11g WPA-PSK TKIP	20.4	18.7	8.08/10.7	1.1
802.11g WPA2-PSK AES	19.9	20.9	11.3/9.32	1.1

Unit: Mbps

Atheros AP AR5KPB-042WFA (LSDK 6.1.1.93) with 20/40 Mhz				
802.11n Open	25.4	35.6	23.2/11.3	1.1
802.11n with BT A2DP	2.7	7.1	2.35/1.75	1.1
802.11n WPA2-PSK AES	31.3	28.1	6.83/13.4	1.1
802.11n Indoor 15M	14.4	23.3		
802.11n Indoor 25M	N/A	N/A		

Unit: Mbps

AP Ralink RT2800 PD2 (v1.1.3.0) with 20/40 Mhz				
802.11b Open	5.2	5.5	1.89/3.43	1.1
802.11b with BT A2DP	2.6	4.0	2.78/0.62	1.1
802.11g Open	20.9	20.4	10.1/11.1	1.1
802.11g with BT A2DP	8.1	11.7	7.56/2.45	1.1
802.11g WEP 64bit	21.8	21.6	10.9/9.88	1.1
802.11g WPA-PSK TKIP	21.5	19.0	9.56/8.58	1.1
802.11g WPA2-PSK AES	21.4	21.7	9.38/8.81	1.1
802.11n Open	36.3	39.5	8.67/14.1	1.1
802.11n with BT A2DP	13.8	27.8	4.36/4.78	1.1
802.11n WEP 64bit	34.7	37.6	27.4/23.0	1.1
802.11n WPA2-PSK AES	32.4	21.1	12.4/21.5	1.1

7. FM DVT test(TBD)

8. Power consumption

The DUT TX/Rx steady state current will be manually measured in accordance with the following procedure:

- Configure the Tx/Rx steady state current test setup as Fig.12
- Terminated the RF antenna port with 50 Ohm load.
- Using Marvell labtool to set the power level of DUT to target power, Radio Channels and Data rate
- Continuous TX mode is selected in the test utility.
- Read the Tx steady state current displayed on the multi-meter.
- Set the channel frequency on the DUT to the next higher channel and measure the Tx/Rx steady state current. (Repeat for all remaining channel frequency).
- Perform this test for all required voltages, temperatures & frequencies listed in Table as below.

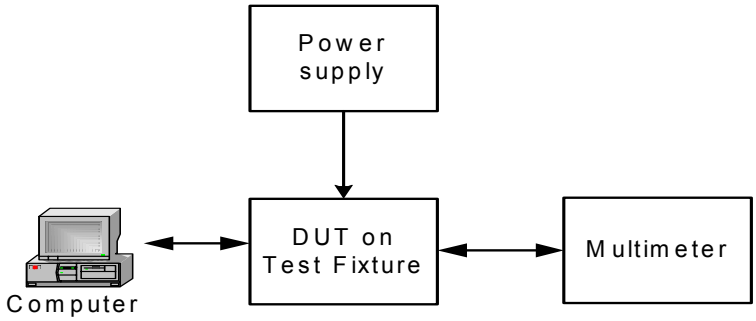


Fig.12 Tx steady state Current Test Setup

Test result:

The power consumption values under 25ºC for several rates is shown in below table

Power Consumption Test							
Mode	Freq	Rate	Power	Function	Current (mA)		Power (W)
					3.3V	1.8V	
11b	2.437 GHz	1Mbps	18.1	Tx	158	123	0.74
				Rx active	0	125	0.225
11g	2.437 GHz	54Mbps	16.3	Tx	133	128	0.67
				Rx active	0	125	0.225
11g HT20	2.437 GHz	MCS 7	15.5	Tx	127	128	0.649
				Rx active	0	125	0.225
11g HT40	2.437 GHz	MCS 7	15.0	Tx	129	134	0.667
				Rx active	0.	130	0.234