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3. 802.11b at 11Mbps of CH11



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4. 802.11b at 1Mbps of CH1



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5. 802.11b at 1Mbps of CH6



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6. 802.11b at 1Mbps of CH11



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7. 802.11g at 6Mbps of CH1



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8. 802.11g at 6Mbps of CH6



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9. 802.11g at 6Mbps of CH11



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10. 802.11n at HT20 of CH01



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11. 802.11n at HT20 of CH06



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12. 802.11n at HT20 of CH11



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13. 802.11n at HT40 of CH01



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14. 802.11n at HT40 of CH04



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15. 802.11n at HT40 of CH07



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10 Out of Band Measurement 10.1 Test Setup for band edge



The restricted band requirement based on radiated emission test; please see the clause 6 for the test setup

10.2 Limits of Out of Band Emissions Measurement

- 1. Below –20dB of the highest emission level of operating band (in 100kHz Resolution Bandwidth).
- 2. Fall in the restricted bands listed in section 15.205. The maximum permitted average field strength is listed in section 15.209.

10.3 Test Procedure

For signals in the restricted bands above and below the 2.4-2.483GHz allocated band a measurement was made of radiated emission test.(Peak values with RBW=VBW=1MHz and PK detector. AV value with RBW=1MHz, VBW=3MHz and RMS detector ,test at MIMO mode)

For bandage test, the spectrum set as follows: RBW=100, VBW=300 kHz. A conducted measurement used

10.4 Test Result

Please see next pages

Note: 1. for band-edge measurement, the frequency from 30MHz-25GHz was tested. And It met the FCC rule. 2. Two antennas were tested and only the worst cased was recorded in the test report. Ant 1 was the worst case.

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For 802.11b mode

CH01 at 1Mbps

10.4 Band-edge Measurement

EUT	Developer Board	Model	DB8
Mode	Keeping Transmitting	Input Voltage	120V~
Temperature	24 deg. C,	Humidity	56% RH
Test Result:	Pass	Detector	РК
Test Figure:			
R	Marker 1 [T1]	RBW 100	kHz RF Att 20 dB
Ref Lvl	3.21 dBm	VBW 300	kHz
10 dBm	2.41108216 GHz	SWT 20 1	ms Unit dBm
10 0 -10 -20 1MAX -30 -40 -50 -60 -60 -70 -80			[T1] 3.21 dBm 2.41108216 GHz 2.4000000 GHz 2.4000000 GHz [T1] 2.3900000 GHz 1MA
-90	35 GHz 8 MH	Hz/	Stop 2.43 GHz
Date: 25	.MAR.2019 15:32:32		

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CH11 at 1Mbps

10.4 Band-edge Measurement



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For 802.11b mode

CH01 at 11Mbps

10.4 Band-edge Measurement

EUT		Develo	oper Board	l	Mo	odel	DB8			
Mode		Keeping	Transmitti	ng	Input '	Voltage		120	V~	
Temperature		24	deg. C,		Hun	nidity		56%	RH	
Test Result:			Pass		Det	ector		PK	2	
Test Figure:										
k k		Marker	1 [T1]		RBW	100 k	Hz R	F Att	20 dI	3
Ref Lvl			3.	96 dBm	VBW	300 k	Hz			
10 dBm		2	2.411242	248 GHz	SWT	20 m	ns U:	nit	dI	3m
10						▼1	[11]1		3 96 de	300
						-		2.4112	4248 GH	
0						₹2	T1]	√ <u>-3</u>	7.57 de	3m
								2.4000	0000 GH	[z
-10						⊽₿	[T1]	+5	9.15 dE	3m
								2.3900	0000 GH	z
										
-20										1 МА
-30										
						2				
-40						A				
					المر ا	v			V V	
FO										مر
-50					1					
				A.LA.A	N					
-60 human	And and a	La Ma a March	when	A Martine						
-70										
-80										
-90	35 GH7		I		Hz/		1	Stop	2.43 CH	
D 1		010 1-		0 11	,			200P		

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CH11 at 11Mbps

10.4 Band-edge Measurement

Mode	Keeping Transmitting			Input V	/oltage	120V~					
Temperature		24	deg. C,		Hum	idity			56% F	RH	
Test Result:	Pass			Dete	ector			PK			
st Figure:											
		Marker	1 [T1]		RBW	100	kHz	RF	Att	20	dB
Y Ref Lvl			3.	56 dBm	VBW	300	kHz				10
10 dBm		2	2.462925	85 GHZ	SWI	12.5	ms	Uni	.t	-	dBm
10		1				▼ 1	[T1]			.56	dBm
	m	munin	N					2	.46292	585	GHz
0	م م					▼ 2	2 [T1]		-57	.10	dBm
<i>.</i>			کر					2	.48350	000	GHz
-10			<u> </u>								
				\mathbf{h}							
-20											
IMAX											
-30											
-40											
				· ·	"he						
-50					M.						
						2					
- 6 0						min	ymen	men	<u> </u>		
									·~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	Mun	hould
-70											
-80							-				
-90											

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For 802.11g mode

CH01 at 6Mbps

10.4 Band-edge Measurement

EUT	Developer Board	Model	DB8
Mode	Keeping Transmitting	Input Voltage	120V~
Temperature	24 deg. C,	Humidity	56% RH
Test Result:	Pass	Detector	РК
Test Figure:			
(K)	Marker 1 [T1]	RBW 100	kHz RF Att 20 dB
Ref Lvl	-0.43 dBm	VBW 300 1	kHz
10 dBm	2.41701403 GHz	SWT 20 1	ms Unit dBm
		▼1	[T1] -0.43 dBm
		_	2. <u>4</u> 1701403 GHz
0		ſ	1111 111137.12 dBm
			2.4000000 GHz
-10		3	2 20000000 CU-
			2.39000000 GH2
-20			
IMAX		ſ	IMA
-30			
		A	
-40			
5.0			
-50		menter	
	had a manufamentament		
-00200000000			
-70			
-80			
-90			
Start 2.3	35 GHz 8 MH	Hz/	Stop 2.43 GHz
Date: 25	.MAR.2019 15:33:36		

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CH11 at 6Mbps

10.4 Band-edge Measurement

EUT	Developer Board Model			DB	8			
Mode	Keeping Transmit	Keeping Transmitting		/oltage	120V~ 56% RH			
Temperature	24 deg. C,		Hum	idity				
Test Result:	Pass		Dete	ector		PK		
Test Figure:								
6 a	Marker 1 [T1]	RBW	100	kHz I	RF Att	20 dB	
Ref Lvl	-	0.61 dBm	VBW	300	kHz			
10 dBm	2.4557	1142 GHz	SWT	12.5	ms t	Jnit	dB	m
10				▼ 1	[11]	- (61 dB	
1						2.45571	142 GH	A Z
0		1		₹2	2 [T1]	-55	.17 dB	m
	harden alle have here	Nh				2.48350	000 GH	z
-10	V							
-20								1112
20		\mathbf{h}						
-30		۲ بر						
-40								
			My Mar					
-50			~ % /4	MM 2				
				vel	Hunner	handramh	and a he	
-60								~
-70								
-80								
-90								
Start 2.45	GHz	5 M	Hz/			Stop	2.5 GH	Z

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For 802.11n (HT20) mode

CH01 at mcs0

10.4 Band-edge Measurement

EUT	Developer Board	Model	DB8
Mode	Keeping Transmitting	Input Voltage	120V~
Temperature	24 deg. C,	Humidity	56% RH
Test Result:	Pass	Detector	РК

Test Figure:



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CH11 at mcs0

10.4 Band-edge Measurement

EUT	Develo	oper Board	Mo	odel		DB8	3	
Mode	Keeping	Transmitting	Input V	Voltage		120V	~	
Temperature	24	deg. C,	Hum	nidity	56% RH			
Test Result:		Pass	Dete	ector	РК			
Test Figure:								
Ref Lvl	Marker	1 [T1] -0.68 dBm 2.45571142 GHz	RBW VBW SWT	100 300 12.5	kHz Ri kHz ms Ui	F Att nit	20 dB	ı
10								7
0				▼1 	[T1]	-0 2.45571 -55	.68 dBm 142 GHz	A
-10 -10	which have a first of the	M				2.48350	000 GHz	
-20								
1MXX								1MA
-30								
-40		Ť.	L.					
-50			- www	Untrial.	mm	human	Will when	
-60								
-70								
- 8 0								
-90	45 GHz .MAR.2019 15	5 M	Hz/			Stop	2.5 GHz	ļ

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For 802.11n (HT40) mode

CH03 at msc0

10.4 Band-edge and Restricted band Measurement

EUT	Developer Board	Model	DB8
Mode	Keeping Transmitting	Input Voltage	120V~
Temperature	24 deg. C,	Humidity	56% RH
Test Result:	Pass	Detector	РК

Test Figure:





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CH09 at msc0

10.4 Band-edge and Restricted band Measurement





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10.5 Restricted band Measurement

Test mode: MIMO

EUT	Deve	loper Board	Model	DB8					
Mode	Keeping	g Transmitting	Input Voltage	120V~					
Temperature	24	l deg. C,	Humidity	56% RH					
Test Result:		Pass	Detector	РК					
802.11b mode, Low Channel, Horizontal									
2390	PK (dBµV/m)	44.69	Limit	74(dBµV/m)					
	AV ($dB\mu V/m$)		Limit	54(dBµV/m)					
	· · ·	802.11b mode, Low	Channel, Vertical						
2390	PK (dBµV/m)	46.83	Limit	74(dBµV/m)					
	AV ($dB\mu V/m$)		LIMI	54(dBµV/m)					

EUT	Deve	loper Board	Model	DB8					
Mode	Keeping	g Transmitting	Input Voltage	120V~					
Temperature	24	l deg. C,	Humidity	56% RH					
Test Result:		Pass	Detector	РК					
802.11b mode, High Channel, Horizontal									
2483.5	PK (dBµV/m)	48.33	T :	74(dBµV/m)					
	AV ($dB\mu V/m$)		Limit	54(dBµV/m)					
		802.11b mode, High	Channel, Vertical						
2483.5	PK (dBµV/m)	44.29	T in it	74(dBµV/m)					
	AV ($dB\mu V/m$)		Limit	54(dBµV/m)					

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EUT	Deve	loper Board	Model	DB8						
Mode	Keeping	g Transmitting	Input Voltage	120V~						
Temperature	24	deg. C,	Humidity	56% RH						
Test Result:		Pass	Detector	РК						
802.11g mode, Low Channel, Horizontal										
2390	PK (dBµV/m)	47.30	Limit	74(dBµV/m)						
	AV (dBµV/m)			54(dBµV/m)						
	802.11g mode, Low Channel, Vertical									
2390	PK (dBµV/m)	50.28	Limit	74(dBµV/m)						
	AV ($dB\mu V/m$)			54(dBµV/m)						

Test Plots



No.	Frequency	Results	Factor	Limit	Over	Detector	Table (o)	Height	ANT	Verdict
	(MHz)	(dBuV/m	(dB)	(dBuV/m	Limit			(cm)		
))	(dB)					
1	2390.000	50.28	-3.53	74.0	-23.72	Peak	194.00	100	V	Pass

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No.	Frequency	Results	Factor (dB)	Limit	Over Limit	Detector	Table	Height	ANT	Verdict
	(MHz)	(dBuV/m)		(dBuV/m)	(dB)		(o)	(cm)		
1	2390.000	47.30	-3.53	74.0	-26.70	Peak	314.00	100	Н	Pass

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EUT	Deve	loper Board	Model	DB8				
Mode	Keeping	g Transmitting	Input Voltage	120V~				
Temperature	24	ł deg. C,	Humidity	56% RH				
Test Result:		Pass	Detector	РК				
	802.11g mode, High Channel, Horizontal							
2483.5	PK (dBµV/m)	51.16	Tiuit	74(dBµV/m)				
	AV ($dB\mu V/m$)		Limit	54(dBµV/m)				
802.11g mode, High Channel, Vertical								
2483.5	PK (dBµV/m)	47.16	T :	74(dBµV/m)				
	AV ($dB\mu V/m$)		Limit	54(dBµV/m)				



No.	Frequen	Results	Factor	Limit	Over	Detector	Table (o)	Height	ANT	Verdict
	cy (MHz)	(dBuV/m	(dB)	(dBuV/m	Limit			(cm)		
))	(dB)					
1	2483.5	51.16	-3.57	74.0	-22.84	Peak	76.00	100	н	Pass

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No.	Frequen	Results	Factor	Limit	Over	Detector	Table (o)	Height	ANT	Verdict
	cy (MHz)	(dBuV/m	(dB)	(dBuV/m	Limit			(cm)		
))	(dB)					
1	2483.5	47.16	-3.57	74.0	-26.84	Peak	342.00	100	V	Pass

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EUT	Deve	loper Board	Model	DB8				
Mode	Keeping	g Transmitting	Input Voltage	120V~				
Temperature	24	l deg. C,	Humidity	56% RH				
Test Result:		Pass	Detector	РК				
802.11n HT20 mode, Low Channel, Horizontal								
2390	PK (dBµV/m)	47.11	Limit	74(dBµV/m)				
	AV ($dB\mu V/m$)			54(dBµV/m)				
802.11n HT20 mode, Low Channel, Vertical								
2390	PK (dBµV/m)	49.75	Limit	74(dBµV/m)				
	AV ($dB\mu V/m$)			54(dBµV/m)				

EUT	Deve	loper Board	Model	DB8				
Mode	Keeping	g Transmitting	Input Voltage	120V~				
Temperature	24	l deg. C,	Humidity	56% RH				
Test Result:		Pass	Detector	РК				
802.11n HT20 mode, High Channel, Horizontal								
2483.5	PK (dBµV/m)	(dBµV/m) 50.38		74(dBµV/m)				
	AV ($dB\mu V/m$)		Limit	54(dBµV/m)				
802.11n HT20 mode, High Channel, Vertical								
2483.5	PK (dBµV/m)	46.52	Limit	74(dBµV/m)				
	AV ($dB\mu V/m$)		Limit	54(dBµV/m)				

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EUT	Deve	loper Board	Model	DB8				
Mode	Keeping	g Transmitting	Input Voltage	120V~				
Temperature	24	4 deg. C,	Humidity	56% RH				
Test Result:		Pass	Detector	РК				
802.11n HT40 mode, Low Channel, Horizontal								
2390	PK (dBµV/m)	45.79	Limit	74(dBµV/m)				
	AV ($dB\mu V/m$)			54(dBµV/m)				
802.11n HT20 mode, Low Channel, Vertical								
2390	PK (dBµV/m)	48.86	Limit	74(dBµV/m)				
	AV ($dB\mu V/m$)			54(dBµV/m)				

EUT	Deve	loper Board	Model	DB8				
Mode	Keeping	g Transmitting	Input Voltage	120V~				
Temperature	24	ł deg. C,	Humidity	56% RH				
Test Result:		Pass	Detector	РК				
802.11n HT40 mode, High Channel, Horizontal								
2483.5	PK (dBµV/m) 48.53		T	74(dBµV/m)				
	AV ($dB\mu V/m$)		Limit	54(dBµV/m)				
802.11n HT20 mode, High Channel, Vertical								
2483.5	PK (dBµV/m)	K (dBμV/m) 44.71		74(dBµV/m)				
	AV ($dB\mu V/m$)		Limit	54(dBµV/m)				

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11.0 Antenna Requirement

11.1 Standard Applicable

For intentional device, according to FCC 47 CFR Section 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. And according to FCC 47 CFR Section 15.247 (b), if transmitter antennas of directional gain greater than 6 dBi are used, the power shall be reduced by the mount in dB that the directional gain of the antenna exceeds 6 dBi.

11.2 Antenna Connected construction

2 pcs External antenna with reversed polarity non standard unique antenna port. Antenna gain : 2.0dBi Directional gain =2+10log2=5.01dBi

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12.0 FCC ID Label

FCC ID: ZJU-D19EC5

This device complies with part 15 of the FCC rules. Operation is subject to the following two conditions (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

The label must not be a stick-on paper label. The label on these products must be permanently affixed to the product and readily visible at the time of purchase and must last the expected lifetime of the equipment not be readily detachable.

Mark Location:



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13.0 Photo of testing

Conducted Emission Test Setup:



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Radiated Emission Test Setup:



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Photographs – EUT

Power Supply





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Power Supply



Outside View



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Outside View



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Inside view





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Inside view





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Inside view





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Inside view



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Inside view



End of the report

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