reysight spectrum Analyzer - swept SA (Prototype - Limited Sale Allowed)	
X RF 50.0 DC CORREC SENSE:INT Avg Type: Log-Pwr TRACE 2.3.4.5.6 Free Center Freq 2.4060000000 GHz Avg Type: Log-Pwr TRACE 2.3.4.5.6 Trig: Free Run Trig: Free	equency
Ref Offset 0.5 dB Mkr2 2.398 608 GHz 10 dB/div Ref 10.00 dBm	Auto Tun
Cog 0 00 -10.0 -20.0	enter Fre 3000000 GH
-30.0 -40.0 -50.0	Start Fre
	Stop Fre 2000000 GH
Start 2,39000 GHz Stop 2.42200 GHz #Res BW 100 kHz #VBW 300 kHz Sweep 1.000 ms (1001 pts) MkR MODELTRCI SCLI X Y Function Function with the second secon	CF Stej .200000 MH Ma
1 N 1 f 2.400 000 GHz -44.50 dBm 2 N 1 f 2.398 608 GHz -40.74 dBm 3 Δ2 1 f (Δ) 7.136 MHz (Δ) 43.53 dB 4 6 6 8 8 8 8 8	Freq Offse 0 H
	Scale Type
MSG STATUS	

Conducted Bandedge Delta, 2422 MHz, HT/VHT40, M0 to M15

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cisco

Title: Physical Test Arrangement Photograph

This is a dual band 2.4GHz / 5GHz device. All ports in this test set up photo are connected as all testing is automated. Section 2.6 of this test report given an overview of the different Tx antenna combinations used by this device.

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Testing Laboratory: Cisco Systems, Inc., 125 West Tasman Drive, San Jose, CA 95134, USA

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Radiated Emission Setup Diagram-Below 1G



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B.1 Radiated Spurious Emissions

15.205 / RSS-Gen / LP0002:3.10.1(5)/2.8 Radiated emissions which fall in the restricted bands, as defined in Section 15.205(a) and RSS-Gen 8.10, must also comply with the radiated emission limits specified in Section 15.209(a) (see Section 15.205(c)) and RSS-Gen 8.9.

Ref. ANSI C63.10: 2013 section 4.1.4.2.2, 4.1.4.2.3, 6.6.4 & 11.12.2

Using Vasona, configure the spectrum analyzer as shown below (be sure to enter all losses between the transmitter output and the spectrum analyzer). Place the radio in continuous transmit mode.

Span:	1GHz – 18 GHz
Reference Level:	80 dBuV
Attenuation:	10 dB
Sweep Time:	Coupled
Resolution Bandwidth:	1MHz
Video Bandwidth:	3 MHz for peak, 1 KHz for average
Detector:	Peak

Terminate the access Point RF ports with 50 ohm loads.

Maximize Turntable (find worst case table angle), Maximize Antenna (find worst case height)

Save 2 plots: 1) Average plot, Limit= 54dBuV/m @3m 2) Peak plot, Limit = 74dBuV/m @3m

Place a marker at the end of the restricted band closest to the transmit frequency to show compliance. Also measure any emissions in the restricted bands.

This report represents the worst case data for all supported operating modes and antennas. There are no measurable emissions above 18 GHz.

System Number	Description	Samples	System under test	Support equipment
0	EUT	S03	\checkmark	
2	Support	S04		\checkmark

Tested By :	Date of testing:
Jose Aguirre	25-April-16 - 08-Aug-16
Test Result : PASS	

See Appendix C for list of test equipment

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			Spurious Emission		
Frequency		Data Rate	Level	Limit	Margin
(MHz)	Mode	(Mbps)	(dBuV/m)	(dBuV/m)	(MHz)
2412	Non HT20, 6 to 54 Mbps	1	50.4	54.0	3.6
2412	Non HT20, 6 to 54 Mbps	6	50.1	54.0	3.9
2412	HT/VHT20, M0 to M23	m0	49.9	54.0	4.1
2422	Non HT40, 6 to 54 Mbps	6	50.4	54.0	3.6
2422	HT/VHT40, M0 to M23	m0	50.4	54.0	3.6
2437	Non HT20, 6 to 54 Mbps	1	50.4	54.0	3.6
2437	Non HT20, 6 to 54 Mbps	6	50.2	54.0	3.8
2437	HT/VHT20, M0 to M23	m0	50.0	54.0	4.0
2442	Non HT40, 6 to 54 Mbps	6	50.4	54.0	3.6
2442	HT/VHT40, M0 to M23	m0	50.3	54.0	3.7
2452	Non HT40, 6 to 54 Mbps	6	50.1	54.0	3.9
2452	HT/VHT40, M0 to M23	m0	50.3	54.0	3.7
2462	Non HT20, 6 to 54 Mbps	1	50.5	54.0	3.5
2462	Non HT20, 6 to 54 Mbps	6	50.1	54.0	3.9
2462	HT/VHT20, M0 to M23	m0	50.6	54.0	3.4

B.1.A Transmitter Radiated Spurious Emissions-Average Worst Case

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Average Radiated Transmitter Spurs, 2412 MHz, CCK, 1 to 11 Mbps

Average Radiated Transmitter Spurs, 2412 MHz, Non HT20, 6 to 54 Mbps



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Average Radiated Transmitter Spurs, 2412 MHz, HT/VHT20, M0 to M23

Average Radiated Transmitter Spurs, 2422 MHz, Non HT40, 6 to 54 Mbps



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Average Radiated Transmitter Spurs, 2422 MHz, HT/VHT40, M0 to M23

Average Radiated Transmitter Spurs, 2437 MHz, CCK, 1 to 11 Mbps



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Average Radiated Transmitter Spurs, 2437 MHz, Non HT20, 6 to 54 Mbps

Average Radiated Transmitter Spurs, 2437 MHz, HT/VHT20, M0 to M23



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Average Radiated Transmitter Spurs, 2442 MHz, Non HT40, 6 to 54 Mbps

Average Radiated Transmitter Spurs, 2442 MHz, HT/VHT40, M0 to M23



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Average Radiated Transmitter Spurs, 2452 MHz, Non HT40, 6 to 54 Mbps

Average Radiated Transmitter Spurs, 2452 MHz, HT/VHT40, M0 to M23



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Average Radiated Transmitter Spurs, 2462 MHz, CCK, 1 to 11 Mbps





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	CORREC SEN	SE:INT ALIGNA	UTO 02:20:18 PM Apr 26, 2016	Marker
Marker 4 16.520656250000	PNO: Fast Trig: Free IFGain:Low #Atten: 6	eRun dB	TYPE MMMMMM DET P P P P P	Select Marker
10 dB/div Ref 102.99 dBµV			Mkr4 16.521 GHz 50.10 dBµV	4
93.0 83.0 73.0				Normal
⁷³⁰ ⁶³⁰ ⁵³⁰ ⁴³⁰ ∧ ³ ∧ ²			4	Delta
33.0 23.0 13.0				Fixed⊳
Start 1.000 GHz #Res BW 1.0 MHz	#VBW 1.0 kHz	SINCTION SINCTION	Stop 18.000 GHz weep 13.3 s (1601 pts)	Off
MAR MODE (1HL SL) X 1 N 1 f 22 2 N 1 f 44 3 N 1 f 33 4 N 1 f 16 6	466 GHz 69.22 dB) 917 GHz 34.25 dB) 883 GHz 36.91 dB) 521 GHz 50.10 dB)		VIDTH FUNCTION VALUE	Properties►
7 8 9 10 11 12				More 1 of 2

Average Radiated Transmitter Spurs, 2462 MHz, HT/VHT20, M0 to M23

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Rof Lul	Marker 1	33.3	2 dBull	RBM	1 MHz 1 kH=	RF Att	10 dB
80/dBµV ∞	21.	764528	62 GHz	SWT	21.5 s	Unit	dBµV
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0L		Vasona	Emissio	Softman	e : ENIXot	t	

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Average Radiated Transmitter Spurs, All modes, All rates, 18-26GHz

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			Spurious Emission		
Frequency		Data Rate	Level	Limit	Margin
(MHz)	Mode	(Mbps)	(dBuV/m)	(dBuV/m)	(MHz)
2412	Non HT20, 6 to 54 Mbps	1	62.2	74.0	11.8
2412	Non HT20, 6 to 54 Mbps	6	63.3	74.0	10.7
2412	HT/VHT20, M0 to M23	m0	63.3	74.0	10.7
2422	Non HT40, 6 to 54 Mbps	6	62.5	74.0	11.5
2422	HT/VHT40, M0 to M23	m0	62.3	74.0	11.7
2437	Non HT20, 6 to 54 Mbps	1	63.1	74.0	10.9
2437	Non HT20, 6 to 54 Mbps	6	61.6	74.0	12.4
2437	HT/VHT20, M0 to M23	m0	62.6	74.0	11.4
2442	Non HT40, 6 to 54 Mbps	6	63.3	74.0	10.7
2442	HT/VHT40, M0 to M23	m0	62.3	74.0	11.7
2452	Non HT40, 6 to 54 Mbps	6	62.8	74.0	11.2
2452	HT/VHT40, M0 to M23	m0	63.2	74.0	10.8
2462	Non HT20, 6 to 54 Mbps	1	63.0	74.0	11.0
2462	Non HT20, 6 to 54 Mbps	6	62.1	74.0	11.9
2462	HT/VHT20, M0 to M23	m0	62.3	74.0	11.7

B.1.P Transmitter Radiated Spurious Emissions-Peak Worst Case

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				Software	a: EMI Emission	MISOIT Vason	alyzer - El	ctrum An	nt Spec	Agne
Marker	TRACE 123456	Type: Log-Pwr	Avg	SENSE:IN		0000000	512500	4 16.5	ker	Ia
Select Marker			1	Trig: Free Run #Atten: 6 dB	PNO: Fast G					
4	62.62 dBµV	IVI				dBµV	f 80.00	Re	B/div	10 d
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Fixed⊳										
										-10.0
Off	Stop 18.000 GHz 2.6 ms (1601 pts)	Sweep 4		V 3.0 MHz	#VBV		lz ∀IHz	000 GH V 1.0 P	nt 1.0 sBV	Sta #Re
	FUNCTION VALUE	FUNCTION WIDTH	FUNCTION	Y		×		TRC SCL	MODE	MKR
				75.57 dBµV 45.91 dBuV	411 GHz 824 GHz	<u>2</u> . 4.		1 f 1 f	N	1
Properties				49.14 dBµV	321 GHz	7.		1 f	N	3
Troperaces						10.		<u> </u>		5
										7
More										9
1 of 2										10
										12
		STATUS								MSG

Peak Radiated Transmitter Spurs, 2412 MHz, CCK, 1 to 11 Mbps





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LXI	L		RF	50 \$	2 AC CO	RREC	SE	VSE:INT		ALIGNAUTO	11:11:45	AM Apr 22, 2016	
Mar	ker	41	6.5	12500	000000	GHz	Tria: Free	Dun	Avg	Type: Log-Pwr	TRA		Marker
		_	_		P IF	NO: Fast G Gain:Low	#Atten: 6	dB			C	ETPPPPP	Select Marker
										M	kr4 16.	513 GHz	4
10 d Loa	B/div	t.	Ref	80.00	dBµV						63.2	авнл	
70.0	ТП											4	
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40.0		-	يتحا	with any in the	- Andrewson								
30.0													Delta
20.0													
10.0													
0.00													Fixedb
-10.0													Fixed
10.0													
Sta	rt 1.	000	GH	Z						1220	Stop 18	3.000 GHz	
#Re	S B)	W 1	.0 N	IHZ		#VB\	₩ 3.0 MHz			Sweep	42.6 ms	(1601 pts)	Off
MKR	MODE	TRC	SCL		×	4 011-	Y ZO OC JID	FL	INCTION	FUNCTION WIDTH	FUNCTI	ON VALUE	
2	N	1	f		4.82	4 GHz	45.90 dB	μν μV					
3	N	1	f		7.32	3 GHz	48.56 dB 63 25 dB	uV uV					Properties >
5													
7													
8											-		More
10													1 of 2
11													
MSG	_									STATU	s		

Peak Radiated Transmitter Spurs, 2412 MHz, HT/VHT20, M0 to M23

Peak Radiated Transmitter Spurs, 2422 MHz, Non HT40, 6 to 54 Mbps



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Peak Radiated Transmitter Spurs, 2422 MHz, HT/VHT40, M0 to M23

Peak Radiated Transmitter Spurs, 2437 MHz, CCK, 1 to 11 Mbps



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Marker	02:09:47 PM Apr 22, 2016 TRACE 12 3 4 5 6	ALIGNAUTO Type: Log-Pwr	Avg	SENSE:IN	GHZ	2 AC CO	.470000	4 16	L rker
Select Marker	r4 16.470 GHz 62.57 dBuV	Mk		#Atten: 6 dB	PNO: Fast G	dBuV	ef 90 00		B/div
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Delta		ing the product of the second	لى الله اليوم الم الم الم	and the second secon		2 	a de compresente de la compresente de l	المعطم	
Fixed⊳									
Off	Stop 18.000 GHz 2.6 ms (1601 pts)	Sweep 4		3.0 MHz		Hz MHz	000 (N 1.(rt 1.0 Is Bl	
	FUNCTION VALUE	FUNCTION WIDTH	FUNCTION	Y 80.64 dBuV	34 GHz	× 24		TRC S	MODE
Properties►				44.63 dBµV 49.38 dBµV 62.57 dBµV	89 GHz 11 GHz 70 GHz	4.7 7.3 16.4		1 2	N N N
More 1 of 2									
		STATUS						_	

Peak Radiated Transmitter Spurs, 2437 MHz, Non HT20, 6 to 54 Mbps

Peak Radiated Transmitter Spurs, 2437 MHz, HT/VHT20, M0 to M23



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Marker	MApr 22, 2016 E 1 2 3 4 5 6	02:39:10 TRA	ALIGNAUTO Type: Log-Pwr	Avg	SENSE:IN	GHz	000000	581250	16.20	er 4 '	ke
Select Marker	PPPPP	Th E			Trig: Free Run #Atten: 6 dB	PNO: Fast G					
4	68 GHz 8 dBµV	r4 16.2	MI				lBμV	90.00 c	Ref	div	B/e
Norma	4							6	\$¹ ∎ ⊓	ΠL	
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Fixed											
or	.000 GHz 1601 pts)	Stop 11 2.6 ms	Sweep		3.0 MHz	#VBW		2 Hz) GHz 1.0 M	1.000 BW 1	t
	N VALUE	FUNCTI	FUNCTION WIDTH	FUNCTION	Y		×		SCL	DE TRC	мо
Properties					77.94 dBµV 48.61 dBµV 48.11 dBµV 62.28 dBµV	445 GHz 331 GHz 298 GHz 268 GHz	2.4 1.8 7.2 16.2		f f f		NNN
More											
1 of 2											

Peak Radiated Transmitter Spurs, 2442 MHz, Non HT40, 6 to 54 Mbps

Peak Radiated Transmitter Spurs, 2442 MHz, HT/VHT40, M0 to M23



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Broportion	PM Apr 22, 2016	02:47:10	ALIGNAUTO	1	SENSE: IN	CORREC	AC I	50 9	RF		L
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Select Marker	42 GHz	kr4 16.8	MI		#Atten: 6 dB	IFGain:Low	dDu)/	00.00	Dof	2.11.2	
	o abuv	00.1					αΒμν	90.00	Rer	div	ľ
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	.000 GHz	Stop 18						z	0 GH	1.00	H
Lines	1601 pts)	42.6 ms (Sweep 4		3.0 MHz	#VBV		IHz	1.0 N	BW	es
On <u>Of</u>	IN VALUE	FUNCTIO	FUNCTION WIDTH	FUNCTION	Y	L.	×	1	C SCL	ODE TR	М
					79.28 dBµV	466 GHz	2.		f	N 1	
					47.92 dBuV 48.59 dBuV	386 GHz	7		f	N 2 N 1	
					63.18 dBµV	842 GHz	16.		f	N 2	
		12	STATUS								Ē

Peak Radiated Transmitter Spurs, 2452 MHz, Non HT40, 6 to 54 Mbps

Peak Radiated Transmitter Spurs, 2452 MHz, HT/VHT40, M0 to M23



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rker 4	RF 16.7	50 S	Ω AC C	GHZ	SENS	E:INT A	ALIGNAUTO	02:12:50 TRA	PM Apr 22, 2016 CE 1 2 3 4 5 6	Marker
Dialiu	Pof	00.00	dRuV	PNO: Fast FGain:Low	#Atten: 6 d	B	M	kr4 16.7	25 GHz	Select Marker 4
		90.00							4	Norma
		Aladiapi a fi	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~			and the second	and the second second second second			Delt
										Fixed
rt 1.00 es BW	00 GH 1.0 N	z 1Hz	~	#VB	W 3.0 MHz	FUNCTION	Sweep	Stop 18 42.6 ms (.000 GHz 1601 pts)	o
N	f		2.4	66 GHz	80.29 dBµ	V	FUNCTION WIDTH	PUNCTIC	IN VALUE	
N N N	1 f 1 f 2 f		4.9 7.3 16.7	24 GHz 886 GHz 25 GHz	44.99 dBµ 49.34 dBµ 63.00 dBµ	V V				Properties
										Mor 1 of

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Peak Radiated Transmitter Spurs, 2462 MHz, CCK, 1 to 11 Mbps





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Arker 4 16.427500000000 GHz Avg Type: Log-Pwr Trace processor Base of the second s		M Apr 22, 2016	02:14:45 F	ALIGNAUTO	T	ENSE:IN	SE	RREC	AC CC	50 Ω	RF	pecara	L
Belect Marke Belect Marke Be	Marker	E 123456	TRAC	Type: Log-Pwr	Avg	ee Run	Trig: Fre	GHz	000000	75000	6.42	er 4 1	ırk
Image: State of the s	Select Marker		DE			6 dB	#Atten: 6	Gain:Low	IF				_
Image: Step 18.000 GHz Image: Step 18.000 GHz<	4	8 dBµV	62.0	IVI					iBμV	0.00 d	Ref 9	div	dB/
Norm Q											<u> </u>		u .0
Image: Note: Trcl Scl. X Y Function Function width Function value Function value Properties N 1 f 4.924 GHz 62.08 dBuV 62.08 dBuV Model 1 <t< td=""><td>Norma</td><td>↓⁴ — – –</td><td></td><td></td><td></td><td>П</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></t<>	Norma	↓ ⁴ — – –				П							
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x x	Delta						and the second		man	-	العيديدة يو	- John	
MODE TRC SEL X Y FUNCTION FUNCTION width FUNCTION value N 1 f 2.96 GHz 43.92 dBµV N N F 7.386 GHz 47.65 dBµV N N F 7.986 GHz 47.65 dBµV N N MODE TRC SCU N MODE TRC SCU N N T F 7.386 GHz 47.65 dBµV N N N 1 F 7.386 GHz 47.65 dBµV N N MODE N 1 T 7.386 GHz 47.65 dBµV N N N N 1 T<													
Image: Stop 18.000 GHz Stop 18.000 GHz Fixed s BW 1.0 MHz #VBW 3.0 MHz Sweep 42.6 ms (1601 pts) C MODE TRC SCL X Y FUNCTION FUNCTION WIDTH FUNCTION VALUE N 1 f 2.466 GHz 83.24 dBµV FUNCTION FUNCTION WIDTH FUNCTION VALUE Properties N 1 f 7.396 GHz 43.92 dBµV N F FUNCTION WIDTH FUNCTION VALUE Properties N 2 f 16.428 GHz 62.08 dBµV N Model Model Model													
Image: Set of the set	Fixed												╘
N 1 f 2.96 GHz 43.92 dBy/ FUNCTION FUNCTION viol H FUNCT													ľ
MODE TRC Scl. X Y FUNCTION FUNCTION WIDTH FUNCTION VALUE N 1 f 2.466 GHz 83.24 dBµV FUNCTION WIDTH FUNCTION VALUE N 1 f 4.924 GHz 43.92 dBµV FUNCTION WIDTH FUNCTION VALUE N 1 f 7.386 GHz 47.66 dBµV FUNCTION VALUE FUNCTION VALUE N 2 f 16.428 GHz 62.08 dBµV FUNCTION VALUE FUNCTION VALUE N 2 f 16.428 GHz 62.08 dBµV FUNCTION VALUE FUNCTION VALUE	Of	.000 GHz 1601 pts)	Stop 18 2.6 ms (Sweep 4		z	3.0 MHz	#VBW		z	GHz	1.000 BW 1	rt es
N 1 f 2.466 GHz 83.24 dBuV N 1 f 4.924 GHz 43.92 dBuV Properties N 1 f 7.386 GHz 43.92 dBuV Properties N 2 f 16.428 GHz 62.08 dBuV Mo Image: State		IN VALUE	FUNCTIO	FUNCTION WIDTH	FUNCTION		Y		×		SCL	DE TRC	NC
N 1 f 4.3-24 GHz 43-22 dBµV Properties N 1 f 7.386 GHz 47.66 dBµV Properties N 2 f 16.428 GHz 62.08 dBµV Mo N 2 f 16.428 GHz 62.08 dBµV Mo						BuV	83.24 dE	6 GHz	2.4		f	1	1
N 2 f 16.428 GHz 62.08 dBµV Properties N 2 6 62.08 dBµV 60.08 dBµV <td></td> <td></td> <td></td> <td></td> <td></td> <td>ΒμΥ</td> <td>47.65 dE</td> <td>6 GHz</td> <td>7.3</td> <td></td> <td>f</td> <td>1</td> <td>T</td>						ΒμΥ	47.65 dE	6 GHz	7.3		f	1	T
Ma 1 o	Properties					BμV	62.08 dE	8 GHz	16.42		f	2	1
	More												
	1 of 2												
			_										

Peak Radiated Transmitter Spurs, 2462 MHz, HT/VHT20, M0 to M23

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Marker 1 []	[1]	RBW	1 M	Hz RF Att	10 dB
21.781	15.86 dBµV 156268 GHz	SML	3 M 86 m	HZ 5 Unit	dBµV
	- I				Ĥ
8 GHz					
	1				
and Applicate	unstration Resisters	and the ford	the state of the	the man and an	all light with
Petroph Andrew					- B- 10
	_				
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	8 GHz	8 GHz	Harker I [1] NBW 45.86 dBµU UBW 21.78156268 GHz SWT 8 GHz 1	Harker I LILL Now I III 45.86 dBµU UBW 3 Mi 21.78156268 GHz SWT 86 mi 8 GHz Image: Swt	8 GHz

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Peak Radiated Transmitter Spurs, All modes, All rates, 18-26GHz

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B.2 Receiver Spurious Emissions

RSS-Gen Receivers are required to comply with the limits of spurious emissions as set out in this section. Receiver emission measurements are to be performed as per the normative test method referenced in Section 3.

Radiated emissions which fall in the restricted bands, as defined in RSS-Gen section 8.10, must also comply with the radiated emission limits specified in RSS-Gen section 8.9.

For emissions at frequencies below 1 GHz, measurements shall be performed using a CISPR quasi-peak detector and the related measurement bandwidth. At frequencies above 1 GHz, measurements shall be performed using a linear average detector with a minimum resolution bandwidth of 1 MHz.

Ref. RSS-Gen section 8.9 & 8.10 ANSI C63.10: 2013 section 4.1.4.2.2, 4.1.4.2.3, 6.6.4 & 11.12.2

Using Vasona, configure the spectrum analyzer as shown below (be sure to enter all losses between the transmitter output and the spectrum analyzer). Place the radio in continuous transmit mode.

1GHz – 18 GHz
80 dBuV
10 dB
Coupled
1MHz
3MHz for Peak, 1 kHz for average
Peak

Radiated emission measurements shall be performed with the receiver antenna connected to the receiver antenna terminals.

Maximize Turntable (find worst case table angle), Maximize Antenna (find worst case height)

Save plot: 1) Average Plot (Vertical and Horizontal), Limit= 54dBuV/m @3m 2) Peak Plot (Vertical and Horizontal), Limit= 74dBuV/m @3m

This report represents the worst case data for all supported operating modes and antennas. There are no measurable emissions above 18 GHz.

System Number	Description	Samples	System under test	Support equipment
0	EUT	S03	\checkmark	
2	Support	S04		V

Tested By :	Date of testing:
Jose Aguirre	25-April-16 - 08-Aug-16

Test Result : PASS

See Appendix C for list of test equipment

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B.2.A Receiver Radiated Spurious Emissions (Average Measurements)



Average Radiated Receiver Spurs, All modes, All rates, 1-18GHz

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B.2.A Receiver Radiated Spurious Emissions (Peak Measurements)



Peak Radiated Receiver Spurs, All modes, All rates, 1-18GHz

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B.3 Radiated Emissions 30MHz to 1GHz

15.205 / 15.209 / RSS-Gen / LP0002:3.10.1(5)/2.8 Radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a) (see Section 15.205(c)) and RSS-Gen section 8.9.

Ref. ANSI C63.10: 2013 section 6.5

Using Vasona, configure the spectrum analyzer as shown below (be sure to enter all losses between the transmitter output and the spectrum analyzer). Place the radio in continuous transmit mode.

30MHz – 1GHz
80 dBuV
10 dB
Coupled
100kHz
300kHz
Peak for Pre-scan, Quasi-Peak
Compliance shall be determined using CISPR quasi-peak detection; however, peak detection is permitted as an alternative to quasi-peak detection.

Terminate the access Point RF ports with 50 ohm loads.

Maximize Turntable (find worst case table angle), Maximize Antenna (find worst case height)

This report represents the worst case data for all supported operating modes and antennas.

System Number	Description	Samples	System under test	Support equipment
	EUT	S03	\checkmark	
2	Support	S04		\checkmark

Tested By :	Date of testing:
Jose Aguirre	25-April-16 - 08-Aug-16
Test Result : PASS	

See Appendix C for list of test equipment

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Test Results Table

Frequency (MHz)	Raw (dBuV)	Cable Loss	AF (dB)	Level (dBuV/m)	Measurement Type	Pol	Hgt (cm)	Azt (Deg)	Limit (dBuV/m)	Margin (dB)	Pass/ Fail	Comments
34.24375	14.29	0.69	17.95	32.93	Quasi Max	Н	105	12	40.50	-7.57	Pass	
47.58125	24.03	0.80	8.83	33.66	Quasi Max	Н	113	36	40.50	-6.84	Pass	
212.48125	14.97	1.77	10.50	27.24	Quasi Max	V	117	182	40.50	-13.26	Pass	
100.325	14.43	1.20	10.39	26.02	Quasi Max	Н	233	244	40.50	-14.48	Pass	
66.98125	25.03	1.00	8.26	34.29	Quasi Max	Н	113	292	40.50	-6.21	Pass	
76.68125	22.45	1.06	8.19	31.70	Quasi Max	Н	128	344	40.50	-8.80	Pass	

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B.4 AC Conducted Emissions

FCC 15.207 (a) & RSS-Gen 8.8 / LP0002:2.3 Except when the requirements applicable to a given device state otherwise, for any radio apparatus equipped to operate from the public utility AC power supply, either directly or indirectly (such as with a battery charger), the radio frequency voltage of emissions conducted back onto the AC power lines in the frequency range of 0.15 MHz to 30 MHz shall not exceed the limits shown in the table in these sections. The more stringent limit applies at the frequency range boundaries.

Measurement Procedure Accordance with ANSI C63.10:2013 section 6.2

Using Vasona, configure the spectrum analyzer as shown below (be sure to enter all losses between the transmitter output and the spectrum analyzer). Place the radio in continuous transmit mode.

150 KHz – 30 MHz
10 dB
Coupled
9 KHz
30 KHz
Quasi-Peak / Average

System Number	Description	Samples	System under test	Support equipment
2	EUT	S03	\checkmark	
	Support	S04		\checkmark

Tested By :	Date of testing:
Jose Aguirre	25-April-16 - 08-Aug-16
Test Result : PASS	

See separate EMC test report for test data.

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Test Results Table

Frequency (MHz)	Raw (dBuV)	Cable Loss	Factors (dB)	Level (dBuV/m)	Measurement Type	Line	Limit (dBuV/m)	Margin (dB)	Pass/ Fail	Comments
.318	22.63	20.28	0.04	42.96	Quasi Peak	Live	59.76	-16.80	Pass	
3.446	14.92	19.99	0.05	34.95	Quasi Peak	Live	56.00	-21.05	Pass	
3.135	11.83	19.98	0.06	31.86	Quasi Peak	Live	56.00	-24.14	Pass	
.195	27.83	20.78	0.05	48.66	Quasi Peak	Live	63.82	-15.16	Pass	
17.358	14.25	20.33	0.19	34.77	Quasi Peak	Live	60.00	-25.23	Pass	
3.350	15.24	19.98	0.05	35.27	Quasi Peak	Live	56.00	-20.73	Pass	
.261	21.84	20.48	0.04	42.36	Quasi Peak	Live	61.40	-19.04	Pass	
3.446	11.71	19.99	0.05	31.75	Quasi Peak	Neutral	56.00	-24.25	Pass	
.195	25.78	20.78	0.05	46.61	Quasi Peak	Neutral	63.82	-17.21	Pass	
3.350	11.97	19.98	0.05	32.01	Quasi Peak	Neutral	56.00	-23.99	Pass	
3.135	8.12	19.98	0.06	28.16	Quasi Peak	Neutral	56.00	-27.84	Pass	
.261	20.21	20.48	0.04	40.73	Quasi Peak	Neutral	61.40	-20.67	Pass	
17.358	4.23	20.33	0.19	24.75	Quasi Peak	Neutral	60.00	-35.25	Pass	
.318	20.63	20.28	0.04	40.95	Quasi Peak	Neutral	59.76	-18.81	Pass	
.318	11.54	20.28	0.04	31.87	Average	Live	49.76	-17.89	Pass	
3.446	1.77	19.99	0.05	21.81	Average	Live	46.00	-24.19	Pass	
3.135	1.82	19.98	0.06	21.86	Average	Live	46.00	-24.14	Pass	
.195	17.05	20.78	0.05	37.87	Average	Live	53.82	-15.95	Pass	
17.358	11.08	20.33	0.19	31.59	Average	Live	50.00	-18.41	Pass	
3.350	2.45	19.98	0.05	22.49	Average	Live	46.00	-23.51	Pass	
.261	10.69	20.48	0.04	31.21	Average	Live	51.40	-20.19	Pass	
3.446	-0.15	19.99	0.05	19.89	Average	Neutral	46.00	-26.11	Pass	
.195	14.85	20.78	0.05	35.68	Average	Neutral	53.82	-18.14	Pass	
3.350	0.12	19.98	0.05	20.16	Average	Neutral	46.00	-25.84	Pass	
3.135	-1.39	19.98	0.06	18.64	Average	Neutral	46.00	-27.36	Pass	
.261	8.30	20.48	0.04	28.82	Average	Neutral	51.40	-22.58	Pass	

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Frequency (MHz)	Raw (dBuV)	Cable Loss	Factors (dB)	Level (dBuV/m)	Measurement Type	Line	Limit (dBuV/m)	Margin (dB)	Pass/ Fail	Comments
17.358	-0.50	20.33	0.19	20.02	Average	Neutral	50.00	-29.98	Pass	
.318	9.08	20.28	0.04	29.41	Average	Neutral	49.76	-20.35	Pass	

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Appendix C: List of Test Equipment Used to perform the test

	Test Equipment used for Radiated Emissions						
Equip#	Manufacturer/ Model	Description	Last Cal	Next Cal	Test Item		
CIS051796	TTA1800-30-HG	SMA 18 GHz Pre-Amplifier	29-Sep-15	29-Sep-16	B.1, B.2		
	Miteq						
CIS035285	3117	Double Ridged Waveguide Horn	30-Sep-15	30-Sep-16	B.1, B.2		
	ETS-Lindgren	Antenna					
CIS008447	NSA 10m Chamber	NSA 10m Chamber	14-Oct-15	14-Oct-16	B.3		
	Cisco						
CIS045096	TH0118	Mast Mount Preamplifier Array,	4-Nov-15	4-Nov-16	B.1, B.2		
	Cisco	1-18GHz					
CIS030652	JB1	Combination Antenna,	4-Dec-15	4-Dec-16	B.3		
	Sunol Sciences	30MHz-2GHz					
CIS041929	iBTHP-5-DB9	5 inch Temp/RH/Press Sensor w/20ft	22-Dec-15	22-Dec-16	B.1, B.2, B.3		
	Newport	cable					
CIS043124	Above 1GHz Site Cal	Above 1GHz Cispr Site Verification	14-Jan-16	14-Jan-17	B.1, B.2		
	Cisco						
CIS047300	N9038A	MXE EMI Receiver	28-Jan-16	28-Jan-17	B.1, B.2, B.3		
	Agilent Technologies	20Hz to 26.5 Ghz					
CIS051642	Sucoflex 106PA	RF N Type Cable 8.5m	11-Feb-16	11-Feb-17	B.1, B.2, B.3		
	Huber+Suhner						
CIS030559	UFB311A-1-0950-504504	RF Coaxial Cable, to 18GHz, 95 in	15-Feb-16	15-Feb-17	B.1, B.2, B.3		
	Micro-Coax						
CIS020975	UFB311A-0-1344-520520	RF Coaxial Cable, to 18GHz, 134.4 in	17-Feb-16	17-Feb-17	B.1, B.2, B.3		
	Micro-Coax						
CIS051708	UFB293C-2-0840-300504	RF Coaxial SMA-N Type Cable	28-Jun-16	28-Jun-17	B.1, B.2, B.3		
	Micro-Coax						
CIS044940	ESU40	EMI Test Receiver,	2-Nov-15	2-Nov-16	B.1, B.2		
	Rohde & Schwarz	20Hz-40GHz					
CIS034075	RSG 2000	Reference Spectrum Generator,	Cal Not Req	uired			
	Schaffner	1-18GHz		1			
CIS041979	1840	18-40GHz EMI Test Head/	02-Sep-16	02-Sep-17	B.1, B.2		
	Cisco	Verification Fixture					
CIS044940	ESU40	EMI Test Receiver,	2-Nov-15	2-Nov-16	B.1, B.2,		
	Rohde & Schwarz	20Hz-40GHz					
CIS030652	JB1	Combination Antenna,	4-Dec-15	4-Dec-16	B.3		
	Sunol Sciences	30MHz-2GHz					
CIS003003	83731B	Synthesized Signal Generator	29-Jan-16	29-Jan-17	B.1, B.2		
	HP						
CIS037236	50CB-015	GPIB Control Box			B.1, B.2		
	JFW						

	Test Equipment used for AC Mains Conducted Emissions						
Equip#	Manufacturer/ Model	Description	Last Cal	Next Cal	Test Item		
8510	Fischer Custom Communications FCC-450B-2.4-N	Instrumentation Limiter	5/16/16	5/16/17	B.4		
23802	Fischer Custom Communications FCC-801-M2-50A	CDN, 2-LINE 50A	1/12/16	1/12/17	B.4		
45995	Fischer Custom Communications F-090527-1009-2	Lisn Adapter	6/17/16	6/17/17	B.4		
49468	Coleman RG223	BNC 25 ft Cable	3/9/16	3/9/17	B.4		
31918	Midwest Microwave TRM-2048-MC-BNC-10	50 Ohm, 5W Terminator, Type BNC	11/9/15	11/9/16	B.4		
49531	TTE H785-150K-50-21378	High Pass Filter	5/3/16	5/3/17	B.4		
45994	Fischer Custom Communications F-090527-1009-1	Line Impedance Stabilization Network	6/17/16	6/17/17	B.4		
18963	York CNE V	Comparison Noise Emitter, 30 - 1000MHz	Cal Not Required	Cal Not Required	B.4		
45050	Rohde & Schwarz ESCI	EMI Test Receiver	11/3/15	11/3/16	B.4		
51721	Teseq CDN ST08A	Coupling Decoupling Network	6/7/16	6/7/17	B.4		
54231	Newport iBTHP-5-DB9	5 inch Temp/RH/Press Sensor w/20ft cable	2/10/16	2/10/17	B.4		

Test Equipment used for RF Conducted Tests						
Equip#	Manufacturer/ Model	Description	Last Cal	Next Cal	Test Item	
CIS054666	RA08-S1S1-18	SMA 18" Cable	25-Sep-15	25-Sep-16	A1 thru A7	
	MegaPhase					
CIS054667	RA08-S1S1-18	SMA 18" Cable	25-Sep-15	25-Sep-16	A1 thru A7	
	MegaPhase					
CIS054668	RA08-S1S1-18	SMA 18" Cable	25-Sep-15	25-Sep-16	A1 thru A7	
	MegaPhase					
CIS054669	RA08-S1S1-18	SMA 18" Cable	25-Sep-15	25-Sep-16	A1 thru A7	
	MegaPhase					
CIS054686	NI PXI-2796	Plug-in switch module	6-Oct-15	6-Oct-16	A1 thru A7	
	National Instruments					
CIS055166	RFLT4WDC40GK	4 Way Power Divider 40GHz	23-Nov-15	23-Nov-16	A1 thru A7	
	RF Lambda					
CIS054662	RFLT4WDC40GK	SMA 36" cable	24-Sep-15	24-Sep-16	A1 thru A7	
	RF Lambda					
CIS054656	BRC50705-02	Band Reject Filter	24-Sep-15	24-Sep-16	A1 thru A7	
	Micro-Tronics					
CIS054655	BRC50704-02	Notch Filter,	24-Sep-15	24-Sep-16	A1 thru A7	
	Micro-Tronics	SB:5.470-5.725GHz, to 12GHz				

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CIS054654	BRC50703-02	Notch Filter,	24-Sep-15	24-Sep-16	A1 thru A7
CI2054652	DDM50702.02	SB.5.150-5.550GHZ, to TTGHZ	24 Son 15	24 Son 16	
013004000	Micro-Tronics	SB:2.400-2.500GHz. to 18GHz	24-Sep-15	24-Sep-16	AT UTU A7
CIS054678	RA08-S1S1-12	SMA 12" Cable	25-Sep-15	25-Sep-16	A1 thru A7
	MegaPhase		20 000 10	20 000 10	
CIS054677	RA08-S1S1-12	SMA 12" Cable	25-Sep-15	25-Sep-16	A1 thru A7
	MegaPhase				
CIS054676	RA08-S1S1-12	SMA 12" Cable	25-Sep-15	25-Sep-16	A1 thru A7
	MegaPhase				
CIS054675	RA08-S1S1-12	SMA 12" Cable	25-Sep-15	25-Sep-16	A1 thru A7
	MegaPhase				
CIS054674	RA08-S1S1-12	SMA 12" Cable	25-Sep-15	25-Sep-16	A1 thru A7
	MegaPhase				
CIS054673	RA08-S1S1-12	SMA 12" Cable	25-Sep-15	25-Sep-16	A1 thru A7
	MegaPhase				
CIS054672	RA08-S1S1-12	SMA 12" Cable	25-Sep-15	25-Sep-16	A1 thru A7
	MegaPhase				
CIS054671	RA08-S1S1-12	SMA 12" Cable	25-Sep-15	25-Sep-16	A1 thru A7
	MegaPhase				
CIS054670	RA08-S1S1-12	SMA 12" Cable	25-Sep-15	25-Sep-16	A1 thru A7
	MegaPhase				
CIS054664	GC12-8181-16	SMA 16" Cable	25-Sep-15	25-Sep-16	A1 thru A7
	MegaPhase				
CIS054663	F120-S1S1-48	SMA 48" Cable	25-Sep-15	25-Sep-16	A1 thru A7
	MegaPhase				
CIS054686	NI PXI-2796	Plug-in switch module	6-Oct-15	6-Oct-16	A1 thru A7
	National Instruments			-	
CIS042005	BWS30W2+	SMA 30dB Attenuator	16-Oct-15	16-Oct-16	A1 thru A7
	Mini-Circuits				
CIS041995	BW-S6W2	6dB Attenuator	16-Oct-15	16-Oct-16	A1 thru A7
	Mini-Circuits				
CIS054695	D3C2060	Circulator	20-Oct-15	20-Oct-16	A1 thru A7
	Ditom				
CIS055146	RA08-S1S1-12	12" SMA Cable	17-Nov-15	17-Nov-16	A1 thru A7
	Megaphase				
CIS050721	N9030A	PXA Signal Analyzer	30-Mar-16	30-Mar-17	A1 thru A7
	Keysight				
CIS054303	N5182B Keysight	MXG X-Series RF Vector Signal	6-Apr-16	6-Apr-17	A1 thru A7
	7550.2.100	Generator			
CIS055358	Mini-Circuits	Splitter	11-Apr-16	11-Apr-17	A1 thru A7
CIS055099	SMART2200RM2U	Power Supply	Cal Not Reg	uired	A1 thru A7
	Tripp-Lite	·			
CIS055094	PXI-1042 National Instruments	Chassis	Cal Not Requ	uired	A1 thru A7

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Appendix E: Abbreviation Key and Definitions

The following table defines abbreviations used within this test report.

Abbreviation	Description	Abbreviation	Description
EMC	Electro Magnetic Compatibility	°F	Degrees Fahrenheit
EMI	Electro Magnetic Interference	°C	Degrees Celsius
EUT	Equipment Under Test	Temp	Temperature
ITE	Information Technology Equipment	S/N	Serial Number
TAP	Test Assessment Schedule	Qty	Quantity
ESD	Electro Static Discharge	emf	Electromotive force
EFT	Electric Fast Transient	RMS	Root mean square
EDCS	Engineering Document Control System	Qp	Quasi Peak
Config	Configuration	Av	Average
CIS#	Cisco Number (unique identification	Pk	Peak
	number for Cisco test equipment)		
Cal	Calibration	kHz	Kilohertz (1x10 ³)
EN	European Norm	MHz	MegaHertz (1x10 ⁶)
IEC	International Electro technical	GHz	Gigahertz (1x10 ⁹)
	Commission		
CISPR	International Special Committee on	н	Horizontal
	Radio Interference		
CDN	Coupling/Decoupling Network	V	Vertical
LISN	Line Impedance Stabilization	dB	decibel
	Network		
PE	Protective Earth	V	Volt
GND	Ground	kV	Kilovolt (1x10 ³)
L1	Line 1	μV	Microvolt (1x10 ⁻⁶)
L2	Line2	А	Amp
L3	Line 3	μА	Micro Amp (1x10 ⁻⁶)
DC	Direct Current	mS	Milli Second (1x10 ⁻³)
RAW	Uncorrected measurement value,	μS	Micro Second (1x10 ⁻⁶)
	as indicated by the measuring		
	device		
RF	Radio Frequency	μS	Micro Second (1x10 ⁻⁶)
SLCE	Signal Line Conducted Emissions	m	Meter
Meas dist	Measurement distance	Spec dist	Specification distance
N/A or NA	Not Applicable	SL	Signal Line (or Telecom Line)
Р	Power Line	L	Live Line
Ν	Neutral Line	R	Return
S	Supply	AC	Alternating Current

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