

Avg Type: Log-Pw Center Freq 9.015 Trig: Free Run Auto Tu Ref Offset 12.83 dB Ref 10.00 dBm Center Fre Start Fr Stop Fr 30 MHz BW 1.0 MH Stop 18.000 Sweep 30.0 ms (1001 CF St #VBW 3.0 MH 43 39 c 50 35 c 47 45 c 11.000 16.500 Freq Offs 0+

cisco

Conducted Spurs Peak, 5500 MHz, HT-20 STBC, M0 to M7

Antenna A

Antenna B

Conducted Spurs Peak, 5510 MHz, Non HT-40, 6 to 54 Mbps

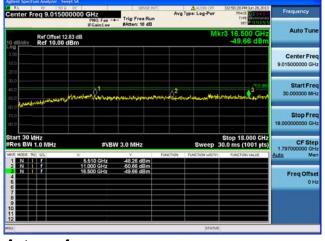
RL RF 50 G DC		SENSE:INT			47:33 PM Jun 29,2013	Frequency
enter Freq 9.01500000	PNO: Fast -+ IFGain:Low	- Trig: Free Run #Atten: 18 dB	Avg Type: Lo	og-Pwr	TRACE DESCRIPTION	
Ref Offset 12.83 dE	3				16.500 GHz 49.47 dBm	Auto Tun
000						Center Fre 9.015000000 GH
0.0 0.0 0.0	han Striker	الافتلازان معاومهم وزام	www.	e broke realizability	Westman gruphwith	Start Free 30.000000 MH
800						Stop Fre 18.000000000 GF
tart 30 MHz Res BW 1.0 MHz		V 3.0 MHz		weep 30.0	p 18.000 GHz ms (1001 pts)	CF Ste 1.797000000 GH
KR MODE THE SEL X	5.510 GHz	-47.80 dBm	UNCTION FUNCTI	ON WIDTH	PUNCTION VALUE	Auto Ma
2 N 1 1	11,000 GHz	-51.99 dBm				
2 N 1 7 N 1 7	11.000 GHz 16.500 GHz	49.47 dBm				Freq Offse 0 H
2 N 1 7 3 N 1 7 4						

Antenna A

Page No: 61 of 99

Conducted Spurs Peak, 5510 MHz, Non HT-40, 6 to 54 Mbps

ninin cisco



Avg Type: Log-Pw Auto Tu Ref Offset 12.83 dB Ref 10.00 dBm Center Fre 9.01500000 GH Start Fre Stop Fre Start 30 MHz Res BW 1.0 Stop 18.000 GHz Sweep 30.0 ms (1001 pts) CF Ste #VBW 3.0 MH 1,7970 5.510 GHz 11.000 GHz 16.500 GHz 48.89 cB 49.56 cB 49.28 cB Freq Offse

Antenna A



Conducted Spurs Peak, 5510 MHz, HT-40, M0 to M7



Antenna A

Page No: 62 of 99

Conducted Spurs Peak, 5510 MHz, HT-40, M0 to M7





cisco

Antenna B

Conducted Spurs Peak, 5510 MHz, HT-40, M8 to M15



Antenna A

ter Freq 9.015000000	04:22:53 PM Xn 28, 2013 TRACE D 24 CM
Ref Offset 12.83 dB Bidiv Ref 10.00 dBm	kr3 16,500 GHz Auto Tu -48.10 dBm
	Center Fr 9.01500000 G
	Start Fr 30.000000 M
	\$top Fr 18.00000000 G
rt 30 MHz s BW 1.0 MHz	Stop 18.000 GHz 30.0 ms (1001 pts) CF Sto 1.797000000 G
MORE THE SOL X N 1 F N 1 F N 1 F 1 T	Fireq Offs

Antenna B

Page No: 63 of 99





Conducted Spurs Peak, 5510 MHz, HT-40 STBC, M0 to M7

Antenna A

Antenna B

Conducted Spurs Peak, 5550 MHz, Non HT-40, 6 to 54 Mbps

RL RF 50 0 DC		SENSE:INT	ALISN OFF	04:49:04 PM Jun 28,2013	Frequency
enter Freq 9.0150000	PNO: Fast -+ IFGain:Low	- Trig: Free Run #Atten: 18 dB	Avg Type: Log-Pwr	TYPE DET PLANNER	
Ref Offset 12.76 e Ref 10.00 dBn	iB n		M	kr3 16.620 GHz -48.73 dBm	Auto Tun
20					Center Fre 9.015000000 GH
20.0 20.0	un former	hitogenter managementer	wand many that have not	monument	Start Fre 30.000000 MH
00					Stop Fre 18.000000000 GF
tart 30 MHz Res BW 1.0 MHz	#VBV	/ 3.0 MHz	Sweep	Stop 18.000 GHz 30.0 ms (1001 pts)	CF Ste 1.797000000 GH
IN HOLE THE SEL	5.550 GHz 11.080 GHz	45.07 dBm	UNCTION FUNCTION WIDTH	FUNCTION VALUE	Auto Ma
3 N 1 F 4 6 6 6 7	16.620 GHz	48.73 dBm			Freq Offse 0 F
96			STATU		

Antenna A

Page No: 64 of 99

Conducted Spurs Peak, 5550 MHz, Non HT-40, 6 to 54 Mbps

ninin cisco



RL # 501 DC GHz enter Freq 9.015000000 GHz PN0: Fast -----IFGaint.ew #Atten: % dB Avg Type: Log-Pw Auto Tu Ref Offset 12.76 dB Ref 10.00 dBm Center Fre 9.01500000 GH Start Fre Stop Fre Start 30 MHz Res BW 1.0 Stop 18.000 GHz Sweep 30.0 ms (1001 pts #VBW 3.0 MH CF Ste 1,7970 5.550 GHz 11.080 GHz 16.620 GHz 45.86 cB -50.94 cB -46.06 cB Freq Offse

Antenna A



Conducted Spurs Peak, 5550 MHz, HT-40, M0 to M7

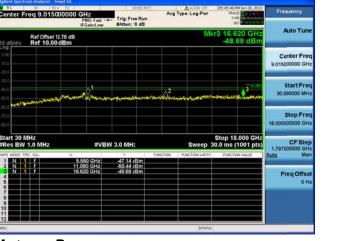


Antenna A

Page No: 65 of 99

Conducted Spurs Peak, 5550 MHz, HT-40, M0 to M7





cisco

Antenna B

Conducted Spurs Peak, 5550 MHz, HT-40, M8 to M15



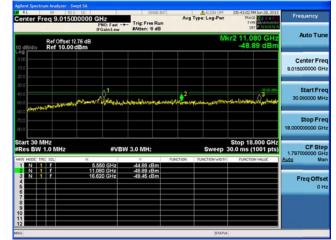
Antenna A



Antenna B

Page No: 66 of 99





Conducted Spurs Peak, 5550 MHz, HT-40 STBC, M0 to M7

Antenna A

Antenna B

Conducted Spurs Peak, 5700 MHz, Non HT-20, 6 to 54 Mbps

RL RF 50 G DC		SENSE: INT	ALISN OFF	06:20:56 PM Jun 28,2013	Frequency
enter Freq 9.01500000	PNO: Fast	Trig: Free Run #Atten: 18 dB	Avg Type: Log-Pwr	TYPE WEREAU	Frequency
Ref Offset 11.88 dB	in Gamileon		M	49.65 dBm	Auto Tun
					Center Fre 9.015000000 GH
	anijomenan	بالتلاطية وستهوم	-	allivelyhtertenesseem	Start Fre 30.000000 MH
0 0 0					Stop Fre 18.000000000 GF
art 30 MHz les BW 1.0 MHz R MODE Thic stul	#VBW		Sweep	Stop 18.000 GHz 30.0 ms (1001 pts) FUNCTION VALUE	CF Ste 1.797000000 GF Auto Ma
	5.700 GHz 11.400 GHz 17.100 GHz	34.20 dBm -50,37 dBm -49.65 dBm			Freq Offse 0 F
	11.400 GHz	-50.37 dBm			

Antenna A

Page No: 67 of 99

Conducted Spurs Peak, 5700 MHz, Non HT-20, 6 to 54 Mbps

ninin cisco



enn Seetres neuron Rissi et al 1901 pc PhO: Fast et al 1905 Fa Avg Type: Log-Pw Auto Tu Ref Offset 11.88 dB Ref 10.00 dBm Center Fre 9.01500000 GH Start Fre Stop Fre Start 30 MHz Res BW 1.0 Stop 18.000 GHz Sweep 30.0 ms (1001 pts CF Ste #VBW 3.0 MH 1,7970 5.700 GHz 11.400 GHz 17.100 GHz -38.53 cB -51.23 cB -49.10 cB Freq Offse

Antenna A

Antenna B

Conducted Spurs Peak, 5700 MHz, HT-20, M0 to M7



Antenna A

Page No: 68 of 99

Conducted Spurs Peak, 5700 MHz, HT-20, M0 to M7

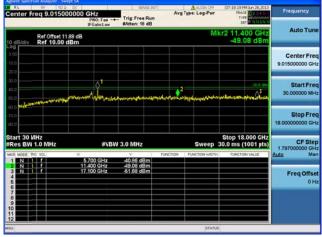




cisco

Antenna B

Conducted Spurs Peak, 5700 MHz, HT-20, M8 to M15



Antenna A

enter Freq 9.0150	PNO: Fast =	Trig: Free Run	Avg	Type: Log-Pwr	07:20:42 PM Jan 28, 2013 TRACE 1 2 4 4 TYPE	Frequency
Ref Offset 11 0 dB/div Ref 10.00	IFGain:Low .88 dB dBm	#Atten: 18 dB		M	r2 11.400 GHz -50.49 dBm	Auto Tune
						Center Free 9.0150)0000 GH:
10.0 40.0 50.0	en sussel and any	-educeron income	and a star	10-00 - 10-00 - 10-00-00-00-00-00-00-00-00-00-00-00-00-0	strilensegnen gener	Start Freq 30.000000 MHs
60.0 00.0						Stop Freq 18.00000000 GHz
tart 30 MHz Res BW 1.0 MHz	#VB	N 3.0 MHz		Sweep 3	Stop 18.000 GHz 30.0 ms (1001 pts)	CF Step 1.797000000 GHz
KR HODE TRC SOL	× 5,700 GHz 11,400 GHz		PUNCTION	FUNCTION WIDTH	FUNCTION VALUE	Auto Mar
	11.400 GHz 17.100 GHz	-50.49 cBm -50.53 cBm				Freq Offset 0 Hz
8 9 10 11 12				STATUS		

Antenna B

Page No: 69 of 99



Conducted Spurs Peak, 5700 MHz, HT-20 STBC, M0 to M7



rindu cisco

Antenna A

Antenna B

Conducted Bandedge

15.407: For transmitters operating in the 5.25-5.35 and 5.47-5.725 GHz band: all emissions outside of the 5.25-5.35 and 5.47-5.725 GHz bands shall not exceed an EIRP of -27dBm/MHz.

Connect the antenna port(s) to the spectrum analyzer input. Place the radio in continuous transmit mode. Configure the spectrum analyzer as shown below (be sure to enter all losses between the transmitter output and the spectrum analyzer).

Span:	30 MHz-40 GHz
Reference Level:	20 dBm
Attenuation:	10 dB
Sweep Time:	10 s
Resolution Bandwidth:	1 MHz
Video Bandwidth:	3 MHz
Detector:	Peak
Trace:	Single
Marker:	Peak

Record the marker waveform peak to spur difference

Page No: 70 of 99

Frequency (MHz)	Mode	Tx Paths	Correlated Antenna Gain (dBi)	Tx 1 Bandedge Level (dBm)	Tx 2 Bandedge Level (dBm)	Total Tx Bandedge Level (dBm)	Limit (dBm)	Margin (dB)
	Non HT-20, 6 to 54 Mbps	1	5	-36.4		-31.4	-27	4.4
	Non HT-20, 6 to 54 Mbps	2	5	-47.5	-41.2	-35.3	-27	8.3
5500	HT-20, M0 to M7	1	5	-35.7		-30.7	-27	3.7
55	HT-20, M0 to M7	2	5	-46.5	-40.0	-34.1	-27	7.1
	HT-20, M8 to M15	2	5	-43.9	-38.9	-32.7	-27	5.7
	HT-20 STBC, M0 to M7	2	5	-43.9	-38.9	-32.7	-27	5.7
	Non HT-40, 6 to 54 Mbps	1	5	-32.8		-27.8	-27	0.8
	Non HT-40, 6 to 54 Mbps	2	5	-34.7	-37.2	-27.8	-27	0.8
10	HT-40, M0 to M7	1	5	-36.1		-31.1	-27	4.1
5510	HT-40, M0 to M7	2	5	-36.1	-36.1	-28.1	-27	1.1
	HT-40, M8 to M15	2	5	-36.1	-36.1	-28.1	-27	1.1
	HT-40 STBC, M0 to M7	2	5	-36.1	-36.1	-28.1	-27	1.1
	Non HT-20, 6 to 54 Mbps	1	5	-32.3		-27.3	-27	0.3
	Non HT-20, 6 to 54 Mbps	2	5	-41.1	-39.4	-32.2	-27	5.2
8	HT-20, M0 to M7	1	5	-32.6		-27.6	-27	0.6
5700	HT-20, M0 to M7	2	5	-41.1	-36.3	-30.1	-27	3.1
	HT-20, M8 to M15	2	5	-38.8	-34.1	-27.8	-27	0.8
	HT-20 STBC, M0 to M7	2	5	-38.8	-34.1	-27.8	-27	0.8

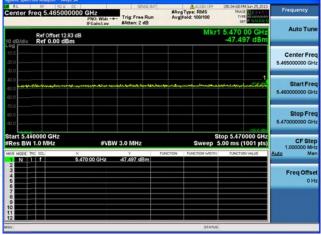
Page No: 71 of 99

Center Freq 5.465000000 GHz #AvgType: RMS AvgHold: 100/100 Trig: Free Run Auto Tu Ref Offset 12.83 dB Ref 0.00 dBm 68 97 G Center Fr Start Fr Stop Fre Stop 5.470000 GH 5.00 ms (1001 pt Start 5.460000 GH Res BW 1.0 MHz CF Ste #VBW 3.0 MHz 5.470 00 GHz 38.773 dBm 5.468 97 GHz -36.391 dBm Freq Offs OH

Conducted Bandedge Peak, 5500 MHz, Non HT-20, 6 to 54 Mbps

Antenna A

Conducted Bandedge Peak, 5500 MHz, Non HT-20, 6 to 54 Mbps



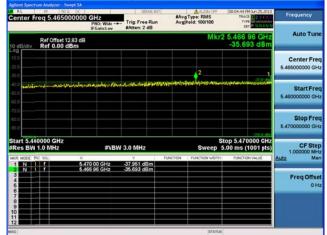
Center Freq 5.465000000 GHz #Avg Type: RMS AvgiHeid: 100/100 Frequer Trig: Free Run Auto Tu Ref Offset 12.83 dB Ref 0.00 cBm 470 00 Center Fre 00 G Start Fr Stop Fr Start 5.460000 GHz #Res BW 1.0 MHz Stop 5.470000 GHz ep 5.00 ms (1001 pts CF St VBW 3.0 N Freq Offse

cisco

Antenna A



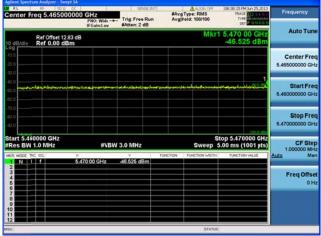
Page No: 72 of 99



Conducted Bandedge Peak, 5500 MHz, HT-20, M0 to M7

Antenna A

Conducted Bandedge Peak, 5500 MHz, HT-20, M0 to M7



#Avg Type: RMS Avg[Hold: 100/100 Center Freq 5.465000000 GHz Trig: Free Run Auto Tu 40.046 Ref Offset 12.83 dB Ref 0.00 cBm Center Fre 00 G Start Fr Stop Fr Start 5.460000 GHz #Res BW 1.0 MHz Stop 5.470000 GHz ep 5.00 ms (1001 pts CF St VBW 3.0 Freq Offse

որոր cisco

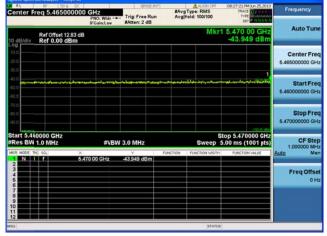
Frequency



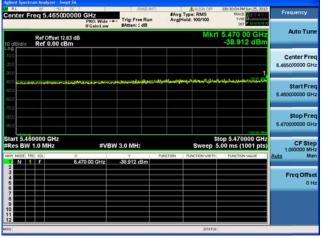
Antenna B

Page No: 73 of 99

rilinini cisco



Conducted Bandedge Peak, 5500 MHz, HT-20, M8 to M15



Antenna A

Antenna B

Conducted Bandedge Peak, 5500 MHz, HT-20 STBC, M0 to M7

RL Center F		50 0 0C	PNO: Wide ~	Trig: Free Run #Atten: 2 dB	#Avg Tr	ALICH OFF pe: RMS Id: 100/100	08:27:21 FM X/n 25,2013 TRACE 1 1 1 TYPE 1 1	Frequency
I0 dB/div		set 12.83 dB 00 dBm	IFGain:Low	BAtten: 2 db		Mkr1	5.470 00 GHz -43.949 dBm	Auto Tun
10.0								Center Fre 5.465000000 GH
10.0	*****	nonnainne	ية 14 مع ما مع	an a baiga sa Malay Manag		مسجدوجتما	1 	Start Fre 5.460000000 GF
70.0							150	Stop Fre 5.470000000 GH
Start 5.40 Res BW	1.0 MH		#\B	N 3.0 MHz	PUNCTION	Sweep 5	top 5.470000 GHz .00 ms (1001 pts)	CF Ste 1.000000 MH Auto Mi
1 N			70 00 GHz	-43.949 dBm	FUNCTION	roscilos worn	FUNCTION VALUE	Auto mi
3 4 6 6 7								Freq Offs 01
8 9 10 11								
12						STATUS		

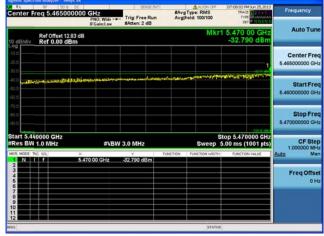
Of No.
M
Op
Content Freq 5.46500000 GHz
Proceeding = 1 (1000000 GHz)
Proceeding = 1 (10000000 GHz)
Content Freq 5.465000000 GHz
Content Freq 5.465000000 GHz
State 1 (100000 GHz)
State 1 (1000000 GHz)
State 1 (100000 GHz)
State 1 (1000000 GHz)
State 1 (10000000 GHz)
St

Antenna A



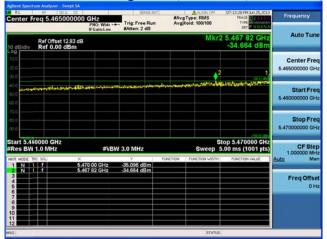
Page No: 74 of 99

Conducted Bandedge Peak, 5510 MHz, Non HT-40, 6 to 54 Mbps

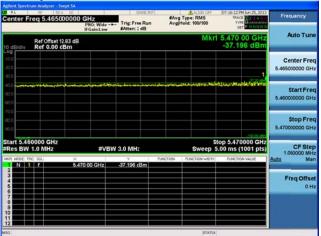


Antenna A

Conducted Bandedge Peak, 5510 MHz, Non HT-40, 6 to 54 Mbps



Antenna A

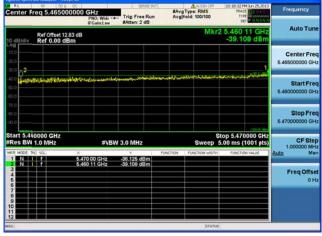


Antenna B

Page No: 75 of 99

riluilu cisco

Conducted Bandedge Peak, 5510 MHz, HT-40, M0 to M7



Antenna A

Conducted Bandedge Peak, 5510 MHz, HT-40, M0 to M7

RL RF 50 G CC	58565.357		10:18:32 PM Jun 25,2013	in a statistic to a s
enter Freq 5.465000000	PNO: Wide Trig: Free Run IF Gain:Low #Atten: 2 dB	#AvgType: RMS AvgHold: 100/100	TRACE DE LA	Frequency
Ref Offset 12.83 dB dB/div Ref 0.00 dBm		Mkr	2 5.460 11 GHz -39.108 dBm	Auto Tune
20 00 00 00 00 00			1	Center Free 5.465000000 GH
0.0 0.0 0.0	talling analytic later and the second se	ngrught fluintillen tribilien av		Start Fre 5.46000000 GH
20 			-150 - 255	Stop Fre 5.470000000 GH
art 5.460000 GHz Res BW 1.0 MHz	#VBW 3.0 MHz		top 5.470000 GHz 5.00 ms (1001 pts)	CF Ste 1.000000 MH
IN MODEL THE SEL X 1 N f 5.47 2 N f 5.46	70 00 GHz 36.125 dBm 60 11 GHz 39.108 dBm	FUNCTION FUNCTION WIDTH	FUNCTION VALUE	<u>Auto</u> Mar
				Freq Offse 0 H

Antenna A

	eq 5.4650	00000 GHz PNO: Wide IEGain Lev		#Avg	Type: RMS Hold: 100/100	10:21:17 PM Ain 25, 2013 TRACE 12:34 Trife Off 2:34	Frequency
dB/div	Ref Offset 1 Ref 0.00 d	2.83 dB	Private 2 40		Mkr	5.470 00 GHz -36.091 dBm	Auto Tune
						1	Center Fre 5.465000000 GH
	alli on and	L'Anna maigne an ga bandan	an an de sector de la Contra de Martine		saraadka shirad		Start Fre 5.460000000 GH
						19300.00	Stop Free 5.47000000 GH
art 5,46 tes BW	0000 GHz 1.0 MHz	#V	BW 3.0 MHz			top 5.470000 GHz 5.00 ms (1001 pts)	CF Ste 1.000000 MH
N 1		× 5.470 00 GHz	√ -36.091 ¢Bm	PUNCTION	FUNCTION WIDTH	FUNCTION VALUE	Auto Mar
							Freq Offse 0 H

Antenna B

Page No: 76 of 99

rilinini cisco

Auto Tu

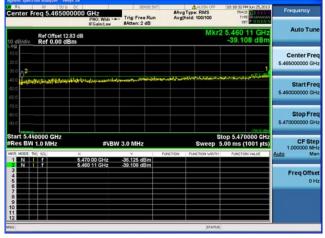
Center Fre

Stop Fre

CF St

Freq Offse

\$top 5.470000 GHz ep 5.00 ms (1001 pts



Conducted Bandedge Peak, 5510 MHz, HT-40, M8 to M15



Antenna B

Res BW 1.0

Rt Freq 5.465000000 GHz Ph0: Wide ---- Trig: Free Run ficality w

#VBW 3.0 MH

Ref Offset 12.83 dB Ref 0.00 cBm #Avg Type: RMS Avg[Held: 100/100

Conducted Bandedge Peak, 5510 MHz, HT-40 STBC, M0 to M7

enter F	req 5.46	5000000 GHz PNO IF Ga	: Wide -+ in:Low	#Atten: 2 dB	n Avg	gType: RMS [Hold: 100/100	TYPE TYPE DET DIN SUN N	
0 dB/div	Ref Offse Ref 0.0	et 12.83 dB 0 dBm				Mkr2	5.460 11 GHz -39.108 dBm	Auto Tun
							1	Center Fre 5.465000000 GP
	tersonal Phil	henselebelteten dare	enteritetete	anna an thaird	danar-waldhur	and an early and a star of a st	an a	Start Fre 5.46000000 G
0.0 0.0 0.0							1500.000	Stop Fr 5.47000000 G
	0000 GH	z	#\BV	V 3.0 MHz		Sweep 5	op 5.470000 GHz .00 ms (1001 pts)	CF Sto 1.000000 M
	nc scl.	× 5.470 00 5.460 11	GHz	-36.125 dBm -39.108 dBm	PUNCTION	FUNCTION WIDTH	FUNCTION VALUE	Auto M
345677899001122		0.001						Freq Offs 0

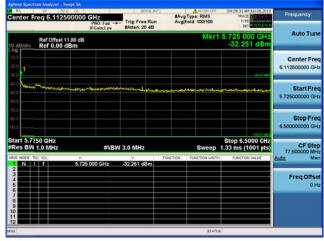


nter Freq 5.46500000		Trig: Free Run	#Avg Typ Avg Hold		10:21:17 PM Ain 25, 2013 TRACE 1 2 3 4 TYPE DET 2 NUMBER	Frequency
Ref Offset 12.83 dB dB/div Ref 0.00 cBm				Mkri	5.470 00 GHz -36.091 dBm	Auto Tune
0					1	Center Free 5.465000000 GH
and a state of the second second		and the second second	and a provider	and a start of	all and a second second	-
0						Start Free 5.460000000 GH
0						\$top Fre 5.47000000 GH
art 5.460000 GHz es BW 1.0 MHz	#VBW	3.0 MHz		Şi Sween 5	op 5.470000 GHz .00 ms (1001 pts)	CF Ste
MODE THE SEL	70 00 GHz		UNCTION PI	INCTION WIDTH	FUNCTION VALUE	1.000000 MH Auto Ma
						Freq Offse 0 H



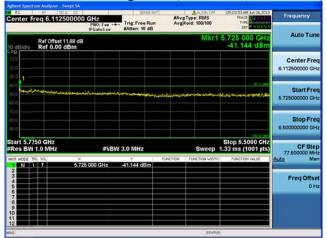
Page No: 77 of 99

Conducted Bandedge Peak, 5700 MHz, Non HT-20, 6 to 54 Mbps



Antenna A

Conducted Bandedge Peak, 5700 MHz, Non HT-20, 6 to 54 Mbps



Antenna A

nter Freq 6.112500	000 GHz PN0: Fast - IFGain:Low	Trig: Free Run #Atten: 16 dB	#Avg	Type: RMS Hold: 100/100	05:06:47 AM Xin 26, 201 TRACE D 20 4 TYPE D 2010 17	Frequency
Ref Offset 11.8 Bidly Ref 0.00 cBr	8 dB M			Mkr1	Auto Tune	
						Center Fred 6.112500000 GH:
					100.01 (20	
	angen and an and the	aturtha ay the grade and	and a state	man#majoranam#saattana	andras alam Mataan	Start Free 5.725000000 GHz
						\$top Free
						6.50000000 GH:
rt 5.7250 GHz es BW 1.0 MHz	#VB	W 3.0 MHz		Sweep	Stop 6.5000 GHz .33 ms (1001 pts	CF Step 77.500000 MH
MODE TRIC SOL	× 5.725 000 GHz	ү 39.410 сВт	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE	Auto Mar
						Freq Offse 0 H
				STATUS	-	

Antenna B

Page No: 78 of 99



Conducted Bandedge Peak, 5700 MHz, HT-20, M0 to M7



Conducted Bandedge Peak, 5700 MHz, HT-20, M0 to M7

Center F	req 6.1	12500000	PNO: Fast -	Trig: Free Ru #Atten: 14 dB	#Avg	Type: RMS Hold: 100/100	06:43:02 AM Ain 26,2013 TRACE 1 2 4 4 Type Det Protection	Frequency
0 dB/div	Ref Of Ref 0	set 11.88 dB .00 dBm				Mkr1	5.725 000 GHz -41.119 dBm	Auto Tune
10.0 20.0								Center Fre 6.112500000 GH
40.0		elisistajayan	hoffertek augentek	Mehreulenseon	uplinese,	ay the state of the		Start Fre 5.725000000 GH
70.0 80.0 90.0							.150 (1 49%)	Stop Fre 6.500000000 GH
Start 5.7	1.0 MH	z	#VB	W 3.0 MHz		Sweep	Stop 6.5000 GHz 1.33 ms (1001 pts)	CF Ste 77.500000 MH
1 N	NC SCL	× 5.7:	25 000 GHz	41.119 dBm	PUNCTION	FUNCTION WIDTH	FUNCTION VALUE	Auto Ma
34667								Freq Offse 0 H
8 9 10 11 12								
\$6						STATU	5	

Antenna A

enter Freq 6.112500000	CH2 PNO: Fast Trig: Free Ru #Atten: 16 dB	#Avg Type: RMS Avg[Hold: 100/100	06:45:56 AM Jun 26, 2013 TRACE 1 2 4 4 TYPE DET 2 44 4 4	Frequency
Ref Offset 11.88 dB dB/div Ref 0.00 cBm	" Ounces	Mkr1	5.725 000 GHz -36.294 dBm	Auto Tune
20 20 20				Center Free 6.112500000 GH
10 Malainternenis-sentereparate 10	-land samples and a group	na a palacepart menter	and and a second se	Start Fre 5.725000000 GH
10 10 00			.19.00 (5-	\$top Fre 6,50000000 GH
art 5.7250 GHz Res BW 1.0 MHz	#VBW 3.0 MHz	Sweep	Stop 6.5000 GHz 1.33 ms (1001 pts)	CF Ste 77.500000 MH
N 1 F 5.72	5 000 GHz -36 294 cBm	PUNCTION PUNCTION WIDTH	FUNCTION VALUE	Auto Ma
				Freq Offse 0 H

rindu cisco

Antenna B

Page No: 79 of 99

riluilu cisco

nter Freq 6.112500000 GHz #AvgType: RM: Avg[Hold: 100/1 Fast ---- Trig: Free Run Auto Tur Ref Offset 11.88 dB Ref 0.00 dBm Center Fre 6.11250 00 GI Start Fre 5.725000000 GH Stop Fre t 5.7250 GHz s BW 1.0 MH Stop 6.5000 GHz 1.33 ms (1001 pts CF Ste #VBW 3.0 MH 77.50 Freq Offs



Antenna A

Antenna B

Conducted Bandedge Peak, 5700 MHz, HT-20 STBC, M0 to M7

Rt RF 508 00 Center Freq 6.112500000	PNO: Fast Trig: Free Run	Aug Type: RMS TRACE REAL Avg Hold: 100/100 Type	Frequency
Ref Offset 11.88 dB	IFGain:Low #Atten: 16 dB	Mkr1 5.725 000 GH: -38.800 dBm	Auto Tun
20.0			Center Fre 6.112500000 GH
30.0 40.0 50.0 60.0	an a	-56.01 dbs Repf. in New York (1994) (1994) (1994) Repf. in New York (1994)	Start Fre 5.725000000 GF
70.0 80.0 90.0			Stop Fre 6.50000000 GH
Start 5.7250 GHz Res BW 1.0 MHz	#VBW 3.0 MHz	Stop 6.5000 GH2 Sweep 1.33 ms (1001 pts ction runction width) function value	
2 3 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4			Freq Offs 0 F
10 11 12 13		STATUS	

All the second wave average ave

Antenna A



Page No: 80 of 99

This document is uncontrolled. Please refer to the electronic copy within EDCS for the most up to date version. Cisco Systems, Inc. Company Confidential

Conducted Bandedge Peak, 5700 MHz, HT-20, M8 to M15



20dB Bandwidth

Connect the antenna port(s) to the spectrum analyzer input. Using the spectrum analyzer Channel Bandwidth mode, configure the spectrum analyzer as shown below (enter all losses between the transmitter output and the spectrum analyzer).

Center Frequency:	Frequency from table be.low
Span:	2 x Nominal Bandwidth (e.g. 40MHz for a 20MHz channel)
Reference Level:	20 dBm
Attenuation:	10 dB
Sweep Time:	5 s
Resolution Bandwidth:	1%-3% of 20 dB Bandwidth
Video Bandwidth:	≥Resolution Bandwidth
X dB Bandwidth:	20 dB
Detector:	Peak
Trace:	Single

Place the radio in continuous transmit mode. View the transmitter waveform on the spectrum analyzer, and record the pertinent measurements:

Page No: 81 of 99

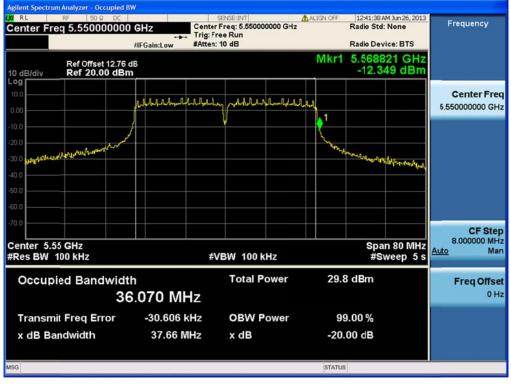
Frequency (MHz)	Mode	Data Rate (Mbps)	20dB BW (MHz)	Limit (kHz)	Margin (MHz)
5550	Non HT-40, 6 to 54 Mbps	6	5569	5600	31
5550	HT-40, M0 to M23	m0	5569	5600	31
5560	Non HT-20, 6 to 54 Mbps	6	5569	5600	31
5500	HT-20, M0 to M23	m0	5569	5600	31
F 6 8 0	Non HT-20, 6 to 54 Mbps	6	5671	5650	21
5680	HT-20, M0 to M23	m0	5670	5650	20

Page No: 82 of 99

lyzer - Occupied BW 11:24:51 PM Jun 25, 2013 RL SENSE:INT Center Freq: 5.550000000 GHz Trig: Free Run ALIGN OFF Frequency Radio Std: None Center Freg 5.550000000 GHz #Atten: 10 dB Radio Device: BTS #IFGain:Low 5.569114 GHz -17.357 dBm Mkr1 Ref Offset 12.76 dB Ref 20.00 dBm 0 dB/div _00 **Center Freq** John May بالملها لعالمها 1 have فبالعلمانها 5.550000000 GHz Junt Tran-**CF** Step 8.000000 MHz Center 5.55 GHz #Res BW 100 kHz Span 80 MHz #Sweep 5 s Auto Man #VBW 100 kHz **Total Power** 27.2 dBm **Occupied Bandwidth** Freq Offset 36.135 MHz 0 Hz -33.615 kHz **OBW Power** 99.00 % **Transmit Freq Error** x dB Bandwidth 37.60 MHz x dB -20.00 dB STATUS

20dB BW, 5550 MHz, Non HT-40, 6 to 54 Mbps

20dB BW, 5550 MHz, HT-40, M0 to M23



Page No: 83 of 99

lyzer - Occupied BW 08:07:34 AM Jul 09, 2013 RL SENSE:INT Center Freq: 5.560000000 GHz Trig: Free Run ALIGN OFF Frequency Radio Std: None Center Freg 5.560000000 GHz #Atten: 10 dB Radio Device: BTS #IFGain:Low 5.569146 GHz Mkr1 Ref Offset 12.57 dB Ref 20.00 dBm -12.278 dBm 0 dB/div _00 **Center Freq** holesto alula handmontered howburk 5.56000000 GHz NW Antow Mry **CF** Step 4 000000 MHz Center 5.56 GHz #Res BW 100 kHz Span 40 MHz #Sweep 5 s Auto Man #VBW 100 kHz **Total Power** 28.6 dBm **Occupied Bandwidth** Freq Offset 16.424 MHz 0 Hz -6.124 kHz **OBW Power** 99.00 % **Transmit Freq Error** x dB Bandwidth 17.60 MHz x dB -20.00 dB STATUS

20dB BW, 5560 MHz, Non HT-20, 6 to 54 Mbps

20dB BW, 5560 MHz, HT-20, M0 to M23

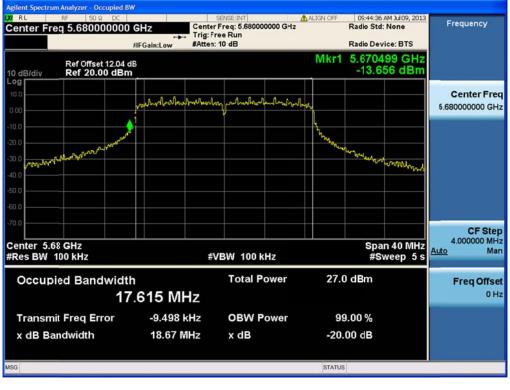


Page No: 84 of 99



20dB BW, 5680 MHz, Non HT-20, 6 to 54 Mbps

20dB BW, 5680 MHz, HT-20, M0 to M23



Page No: 85 of 99



uluilu cisco

Page No: 86 of 99

Appendix B: Emission Test Results

Testing Laboratory: Cisco Systems, Inc., 170 West Tasman Drive, San Jose, CA 95134, USA

Radiated Spurious Emissions

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)).

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:	1 MHz for peak, 10 Hz for average
Detector:	Peak

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

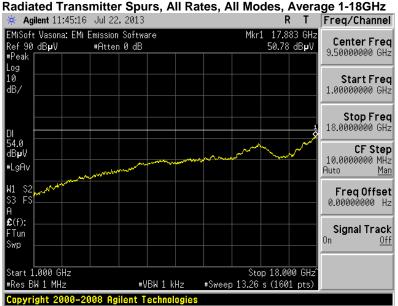
Save 2 plots: 1) Average Plot (Vertical and Horizontal), Limit= 54dBuV @3m 2) Peak plot (Vertical and Horizontal), Limit = 74dBuV @3m

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.

Page No: 87 of 99

Transmitter Radiated Spurious Emissions



Radiated Transmitter Spurs, All Rates, All Modes, Peak 1-18GHz Agilent 11:46:47 Jul 22, 2013 RT Freq/Channel EMiSoft Vasona: EMi Emission Software 17.809 GHz Mkr1 **Center Freq** Ref 90 dB**µ**V #Peak #Atten 0 dB 59.11 dB**µ**V 9.50000000 GHz Log 10 Start Freq dB/ 1.00000000 GHz Stop Freq 18.0000000 GHz DI 74.0 dB**µ**V wall And which was not the board 10.61 CF Step 10.0000000 MHz #LgAv Luui: Auto Man W1 S2 S3 FS Freq Offset 0.00000000 Hz A £(f): Signal Track FTun 0n <u>0ff</u> Swp Start 1.000 GHz Stop 18.000 GHz **#VBW** 1 MHz #Sweep 56.85 ms (1601 pts) #Res BW 1 MHz 2000-2008 Agilent Technologie Copyright

Page No: 88 of 99

This document is uncontrolled. Please refer to the electronic copy within EDCS for the most up to date version. Cisco Systems, Inc. Company Confidential

միսիս

tart Freq 18.000000000	PNO: Fast Tr	ig: Free Run tten: 4 dB	Aug Type: Voltage		Frequency
0 dB/div Ref 80.00 dBµV	n gannen	iten, 4 ab		Mkr1 26.420 GHz 29.88 dBµV	Auto Tune
70.0					Center Free 22249999500 GH
50 0 				54.00 dbu/	Start Fre 18.000000000 GH
80.0					Stop Fre 26.499999000 GH
0.0					CF Ste 10.000000 MH Auto <u>Ma</u>
0.00					Freq Offse 0 H
tart 18.000 GHz Res BW (CISPR) 1 MHz	#VBW 1.0			Stop 26.500 GHz	

Radiated Transmitter Spurs, All Rates, All Modes, Average 18-26.5 GHz

Radiated Transmitter Spurs, All Rates, All Modes, Peak 18-26.5 GHz

Agilent Speci	trum Analyzer - EMiSoft Vas	ona: EMI Emission Sc	ftware SENSE:INT		UGNAUTO	00.50.10	AM Jul 18, 2013	
Start Fre	eq 18.000000000	GHz		Avg Type:		TRAC	E 12 84 8	Frequency
		PNO: Fast	Trig: Free Run #Atten: 4 dB			D	PPPPPP	
					M	kr1 26.4	84 GHz	Auto Tune
10 dB/div	Ref 80.00 dBµV					38.8	1 dBµV	
-08							74.00 dBpN	Center Fred
70.0								22.249999500 GH
60.0								Start Fred
50.0								18.00000000 GH
							1	-
40.0				الت من ال			م م الم	Stop Free
30.0	for the state of the second	ALL OP MAIL SAU	and the state of the state of the state	a management	Him were	Winish that	All	26,499999000 GH
and Mulli	Med has live at	a shart a dharan						
20.0								CF Ster 10.000000 MH
								Auto Mar
10.0								
0.00								Freq Offse
								0 H:
-10.0								
Start 18.		-					.500 GHz	
#Res BW	(CISPR) 1 MHz	#VBW	1.0 MHz		Sweep		1601 pts)	
50					314100			

Page No: 89 of 99



Radiated Transmitter Spurs, All Rates, All Modes, Average 26.5-40 GHz

Radiated Transmitter Spurs, All Rates, All Modes, Peak 18-26.5 GHz

	R DC	1	SENSE:INT		ALIGNAUTO	09:06:34 AM Jul 18, 2013	Peak Search
arker 1 28.29718	PNO	East T	rig: Free Run Atten: 4 dB	Avg Type	e: Voltage	TRACE 1 2 3 4 5 0 TYPE WARMANN DET P P P P P P	
dB/div Ref 80.00	dBμV				M	kr1 28.297 GHz 51.40 dBµV	Next Pea
						74.00 dBuV	Next Pk Rigi
							Next Pk Le
	The self of the self of	lind in the state of the state	densetudypendenteri	ndeddigwydd	a water and	estalatigationalised	Marker Del
0.0							Mkr→C
							Mkr→RefL
tart 26.500 GHz Res BW (CISPR) 1	MH7	#VBW 1.0	0 MHz		Sween	Stop 40.000 GHz 31.0 ms (1601 pts)	Moi 1 of

Page No: 90 of 99

Receiver Radiated Spurious Emissions



Radiated Receiver Spurs, All Rates, All Modes, Average

Radiated Receiver Spurs, All Rates, All Modes, Peak



Page No: 91 of 99

uluulu cisco

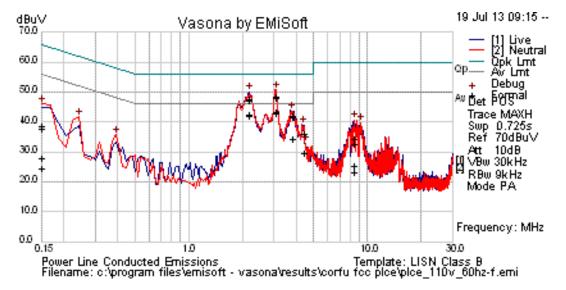


Radiated Test Setup 1–18GHz



Radiated Test Setup 18–40GHz

Page No: 92 of 99



Conducted Emissions

No	Frequency MHz	Raw dBuV		Factors dB	Level dBuV	Measurement Type	Line	Limit dBuV	Margin dB	Pass /Fail
1	3.079	23.2	20.0	.0	43.2	Average	Neutral	46.0	-2.8	Pass
2	3.079	23.1	20.0	.0	43.1	Average	Live	46.0	-2.9	Pass
3	2.183	22.3	20.0	.0	42.3	Average	Neutral	46.0	-3.7	Pass
4	2.184	22.2	20.0	.0	42.2	Average	Live	46.0	-3.8	Pass
5	3.079	28.3	20.0	.0	48.3	Quasi Peak	Neutral	56.0	-7.7	Pass
6	3.079	28.2	20.0	.0	48.2	Quasi Peak	Live	56.0	-7.8	Pass
7	2.183	27.4	20.0	.0	47.5	Quasi Peak	Neutral	56.0	-8.6	Pass
8	2.184	27.3	20.0	.0	47.3	Quasi Peak	Live	56.0	-8.7	Pass
9	3.819	14.3	20.0	.1	34.3	Average	Neutral	46.0	-11.7	Pass
10	3.819	14.3	20.0	.1	34.3	Average	Live	46.0	-11.7	Pass
11	3.819	22.0	20.0	.1	42.0	Quasi Peak	Neutral	56.0	-14.0	Pass
12	3.819	21.6	20.0	.1	41.6	Quasi Peak	Live	56.0	-14.4	Pass
13	4.420	9.5	20.0	.1	29.5	Average	Neutral	46.0	-16.5	Pass
14	4.420	9.4	20.0	.1	29.5	Average	Live	46.0	-16.5	Pass
15	4.420	16.1	20.0	.1	36.2	Quasi Peak	Live	56.0	-19.8	Pass
16	4.420	16.0	20.0	.1	36.1	Quasi Peak	Neutral	56.0	-19.9	Pass
17	8.469	5.0	20.1	.1	25.2	Average	Neutral	50.0	-24.8	Pass
18	8.469	14.3	20.1	.1	34.5	Quasi Peak	Neutral	60.0	-25.5	Pass
19	8.469	2.8	20.1	.1	23.0	Average	Live	50.0	-27.0	Pass
20	.150	17.3	21.4	.1	38.8	Quasi Peak	Neutral	66.0	-27.2	Pass

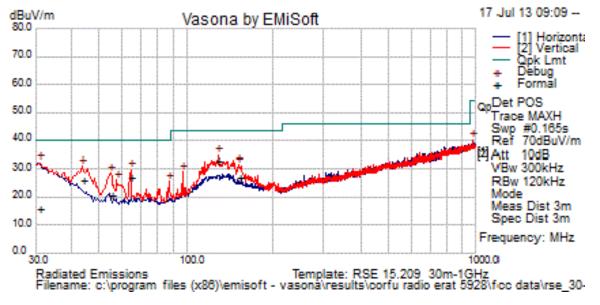
Page No: 93 of 99

21	8.469	12.6	20.1	.1	32.8	Quasi Peak	Live	60.0	-27.2	Pass
22	.150	6.3	21.4	.1	27.8	Average	Neutral	56.0	-28.2	Pass
23	.150	16.2	21.4	.1	37.7	Quasi Peak	Live	66.0	-28.3	Pass
24	.150	2.9	21.4	.1	24.4	Average	Live	56.0	-31.6	Pass



Conducted Emissions Test Setup

Page No: 94 of 99



Radiated emissions

Test Results Table

Page No: 95 of 99



Page No: 96 of 99

Maximum Permissible Exposure (MPE) Calculations

15.407: U-NII devices are subject to the radio frequency radiation exposure requirements specified in Sec. 1.1307(b), Sec. 2.1091 and Sec. 2.1093 of this chapter, as appropriate. All equipment shall be considered to operate in a ``general population/uncontrolled" environment. Applications for equipment authorization of devices operating under this section must contain a statement confirming compliance with these requirements for both fundamental emissions and unwanted emissions. Technical information showing the basis for this statement must be submitted to the Commission upon request.

Given

 $E=\sqrt{(30^{*}P^{*}G)/d}$ and S=E^2/3770

where

E=Field Strength in Volts/meter P=Power in Watts G=Numeric Antenna Gain d=Distance in meters S=Power Density in mW/cm²

Combine equations and rearrange the terms to express the distance as a function of the remaining variables:

```
d=√((30*P*G)/(3770*S))
```

Changing to units of power in mW and distance in cm, using:

P(mW)=P(W)/1000 d(cm)=100*d(m)

vields

d=100*√((30*(P/1000)*G)/(3770*S)) d=0.282*√(P*G/S)

where

d=Distance in cm P=Power in mW G=Numerica Antenna Gain S=Power Density in mW/cm²

Substituting the logarithmic form of power and gain using: $P(mW)=10^{(P(dBm)/10)}$ G(numeric)=10^{(G(dBi)/10)}

vields

and

d=0.282*10^((P+G)/20)/√S Equation (1) s=((0.282*10^((P+G)/20))/d)^2

where

d=MPE distance in cm P=Power in dBm G=Antenna Gain in dBi S=Power Density in mW/cm²

Equation (2)

Page No: 97 of 99

This document is uncontrolled. Please refer to the electronic copy within EDCS for the most up to date version. Cisco Systems, Inc. Company Confidential

Equation (1) and the measured peak power are used to calculate the MPE distance. Note that for mobile or fixed location transmitters such as an access point, the minimum separation distance is 20 cm even if the calculations indicate that the MPE distance may be less.

S=1mW/cm² maximum. The highest supported antenna gain is 5 dBi. Using the peak power levels recorded in the test report along with Equation 1 above, the MPE distances are calculated as follows.

Frequency (MHz)	Power Density (mW/cm^2)	Power	Antenna Gain (dBi)	MPE Distance (cm)	Limit (cm)	Margin (cm)
5500	1	22.0	5	6.31	20	13.69
5700	1	21.0	5	5.63	20	14.37

MPE Calculations

To maintain compliance, installations will assure a separation distance of at least 20cm.

Using Equation 2, the MPE levels (s) at 20 cm are calculated as follows:

		Peak				
	MPE	Transmit	Antenna	Power		
Frequency	Distance	Power	Gain	Density	Limit	Margin
(MHz)	(cm)	(dBm)	(dBi)	(mW/cm^2)	(mW/cm^2)	(mW/cm^2)
5500	20	22.0	5	0.10	1	0.90
5700	20	21	5	0.08	1	0.92

Page No: 98 of 99



Equip #	Manufacturer	Model	Description	Last Cal	Next Due
44940	Rohde & Schwarz	ESU	Spectrum Analyzer	15May13	15May14
40514	Agilent	E4440A	Spectrum Analyzer	12-NOV-12	12-NOV-13
47299	Agilent	PXA	Signal Analyzer	04Sept12	04Sept13
3003	HP	8373B	Signal Generator	26Mar13	26Mar14
30654	Sunol Sciences	JB1	Combination Antenna	16Oct12	16Oct13
4882	EMCO	3115	Horn Antenna	28Jun13	28Jun14
41935	Newport	iBTHP-5-DB9	Temperature Probe	25MAR13	25MAR14
5691	Miteq	NSP1800-25-S1	1GHz to 18GHz Pre-Amplifier	01Feb13	01Feb14
41979	Cisco	1840	18-40GHz EMI Test Head	09Jul13	09Jul14
25658	Micro-Coax	UFB311A-1-0840-504504	RF Cable	13Feb13	13Feb14
21117	Micro-Coax	UFB311A-0-2484-520520	RF Cable	24Aug12	24Aug13
48720	Huber Suhner	Sucoflex 106PA	RF Cable	20Aug12	20Aug13
47300	Agilent	MXE	EMI Receiver	13Nov12	13Nov13
8195	TTE	H613-150K-50-21378	Filter	04Jan13	04Jan14
8496	Fischer Custom	FCC-450B-2.4-N	Pulse limiter	20May13	20May14
39110	Coleman	RG-223	RF Cable, 25 ft., N	29Nov12	29Nov13
29957	Fischer	FCC-LISN-50/250-50-2-01	LISN	02Aug12	02Aug13
29959	Fischer	FCC-LISN-PA-NENA-5-15	LISN Adapter	02Aug12	02Aug13
44023	Fischer	M2	CDN	16Nov12	16Nov13
31919	Midwest Microwave	TRM-2048-MC-BNC-10	50Ohm Terminator	30Aug12	30Aug13
39162	Coleman	RG-223	RF Cable, 2 ft. BNC	09Oct12	09Oct13
25001	Micro-Coax	UFB197C-1-0240-504504	RF Cable, 2 ft.	24Mar13	24Mar14

Appendix C: Test Equipment/Software Used to perform the test

Page No: 99 of 99