6. Band Edge

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6.1. Test Equipment

RF Conducted Measurement

The following test equipments are used during the band edge tests:

	Equipment	Manufacturer	Model No./Serial No.	Last Cal.
	Spectrum Analyzer	R&S	FSP40 / 100170	Jun, 2011
	Spectrum Analyzer	Agilent	E4407B / US39440758	Jun, 2011
Х	Spectrum Analyzer	Agilent	N9010A / MY48030495	Apr., 2011

Note:

- 1. All equipments are calibrated with traceable calibrations. Each calibration is traceable to the national or international standards.
- 2. The test instruments marked with "X" are used to measure the final test results.

RF Radiated Measurement:

The following test equipments are used during the band edge tests:

Test Site		Equipment	Manufacturer	Model No./Serial No.	Last Cal.
Site # 3		Bilog Antenna	Schaffner Chase	CBL6112B/2673	Sep., 2011
	Х	Horn Antenna	Schwarzbeck	BBHA9120D/D305	Sep., 2011
		Horn Antenna	Schwarzbeck	BBHA9170/208	Jul., 2011
		Pre-Amplifier	QTK	QTK-AMP-03 / 0003	May, 2011
	Х	Pre-Amplifier	QTK	AP-180C / CHM_0906076	Sep., 2011
	Pre-Amplifier		MITEQ	AMF-4D-180400-45-6P/ 925975	Mar, 2011
	Х	Spectrum Analyzer	Agilent	E4407B / US39440758	May, 2011
		Test Receiver	R & S	ESCS 30/ 825442/018	Sep., 2011
	Х	Coaxial Cable	QuieTek	QTK-CABLE/ CAB5	Feb., 2011
	Х	Controller	QuieTek	QTK-CONTROLLER/ CTRL3	N/A
	Х	Coaxial Switch	Anritsu	MP59B/6200265729	N/A

Note:

1. All instruments are calibrated every one year.

2. The test instruments marked by "X" are used to measure the final test results.

6.2. Test Setup

RF Conducted Measurement



RF Radiated Measurement:



6.3. Limits

Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 20dB below the level of the fundamental or to the general radiated emission limits in paragraph 15.209, whichever is the lesser attenuation.

6.4. Test Procedure

The EUT was setup according to ANSI C63.4, 2009 and tested according to DTS test procedure of Mar. 2005 KDB558074 for compliance to FCC 47CFR 15.247 requirements.

The EUT is placed on a turn table which is 0.8 meter above ground. The turn table is rotated 360 degrees to determine the position of the maximum emission level. The EUT was positioned such that the distance from antenna to the EUT was 3 meters.

The antenna is scanned from 1 meter to 4 meters to find out the maximum emission level. This is repeated for both horizontal and vertical polarization of the antenna. In order to find the maximum emission, all of the interface cables were manipulated according to ANSI C63.4:2009 on radiated measurement.

6.5. Uncertainty

- ± 3.9 dB above 1GHz
- ± 3.8 dB below 1GHz

6.6. Test Result of Band Edge

Product	:	WHDI Tx Stick
Test Item	:	Band Edge
Test Site	:	No.3 OATS
Test Mode	:	Mode 1: Transmit - 20BW

Chain A

Test Frequency	Measurement Level	Limit	Result
(MHz)	Δ (dB)	Δ (dB)	
5745	46.93	>20	PASS

Agile	nt Spe	ectrur	n An	alyzer - Sw	ept SA										
LXI F	L		RF	50 Ω	AC			SEN	ISE:INT	A		ALIGN AUTO	03:24:03 F	MDec 15, 2011	Frequency
Cei	nter	Fre	þ	5.7250	00000 G	HZ		ia: Free	Run	Avg I	ype	: Log-Pwr	TY	PE MWWWWW	
					IFC	Sain:Low	At	ten: 30	dB				D	ET P N N N N N	
					282-344							Mk	r2 5 72	5 0 GH7	Auto Tune
40.	mark.		Def		d D ma								-52	49 dBm	
Log	Bian	V	Rei	20.00	ып				_	1	-		- VL.		
10.0			_				_								Center Fred
0.00											\wedge 1				Center Freq
0.00									-	which et also	X	Man ashikuma Lau			5.725000000 GHZ
-10.0										- Wallach	t i i	11 Minel lak			
-20.0			_				-		-		-			-25 56 dBm	
-30.0			8			2				1				20.00 0.011	Start Freq
40.0										1					5.675000000 GHz
-40.0									2	1	1		h. 1		
-50.0		a vor en en		and the second	a seconda			a how	A BUILDING				and they are	Munkel	
-60.0	L'artes	ntransfi	row	Marshandlevian	thread the spleres	Maraile Stevenson	hand	ender.		-	-			(TUN) AND	Stop Freq
-70.0															5.775000000 GHz
0.50															
Cer	nter	5.72	250	0 GHz						10	0		Span 1	00.0 MHz	
#Re	s B	W 1	00	kHz		#VE	3W 1.0	MHz			1	#Sweep	500 ms (1001 pts)	CF Step
			Lagi	1						OTION			-		10.000000 MHz
MRE 1	MUDE	1	f		57/3	1 CH7		1 5 56 de	FUI	ICTION	FUR	ICTION WIDTH	FUNCTI	JN VALUE	<u>Auto</u> Man
2	N	1	f		5.725	0 GHz	-5	2.49 dE	3m						
3															Fred Offset
4	_										_				i i cq olisci
5															UHZ
7															
8			_	-											
10	_		-						-		-				
11											0				
12															
MSG												STATUS	3		

Chain B

Test Frequency	Measurement Level	Limit	Result
(MHz)	Δ (dB)	Δ (dB)	
5745	48.68	>20	PASS

Agilent Spectrum	Analyzer - Swept SA				
Center Fre	RF 50 Ω AC q 5.725000000 GHz	SENSE:INT	ALIGNAUTO Avg Type: Log-Pwr	03:52:46 PMDec 15, 2011 TRACE 1 2 3 4 5 6	Frequency
10 dB/div	PNO: IFGair Ref 20.00 dBm	Fast (High rice Ruin n:Low Atten: 30 dB	Mł	tr2 5.725 0 GHz -56.86 dBm	Auto Tune
10.0 0.00 -10.0					Center Freq 5.725000000 GHz
-20.0 -30.0 -40.0				-28.19 dBm	Start Freq 5.675000000 GHz
-50.0 -60.0 -70.0	กสไขน/ใกรู้และเหมือการ รูกประกะห์ แปะสมุทร์เหม่นไของ	esterned all and a second and a second and a second at		hand an har man a high part	Stop Freq 5.775000000 GHz
Center 5.72 #Res BW 10 MKR MODE TRO	500 GHz 00 kHz 50	#VBW 1.0 MHz	#Sweep	Span 100.0 MHz 500 ms (1001 pts) FUNCTION VALUE	CF Step 10.000000 MHz <u>Auto</u> Man
2 N 1 3 4 5 5 6	f 5.725 0 0	GHz -56.86 dBm			Freq Offset 0 Hz
7 8 9 10 11 12					
MSG			STATU	5 5	1

Product	:	WHDI Tx Stick
Test Item	:	Band Edge
Test Site	:	No.3 OATS
Test Mode	:	Mode 1: Transmit - 20BW

Chain A

Test Frequency	Measurement Level	Limit	Result
(MHz)	Δ (dB)	Δ (dB)	
5825	49.49	>20	PASS

Agilent Spectrum Analyz	zer - Swept SA						
Center Freq 5.	50 Ω AC 850000000 GHz	SENSE:II	Avg Type	ALIGNAUTO : Log-Pwr	03:43:23 PM Dec : TRACE 1 2 TYPE MW	15,2011 3 4 5 6	Frequency
10 dB/div Ref 2	PNU: Fast IFGain:Lov 0.00 dBm	Atten: 30 dB		Mk	DET P N r2 5.850 0 (-55.18 c	GHz Bm	Auto Tune
10.0							Center Freq 5.85000000 GHz
-20.0					-25	5.69 dBm	Start Freq 5.800000000 GHz
-50.0		White has been and the second se	gy-lansag-rysigneget	/s/~/29%=Podyayd/ir	Antoniae training the providence of the second s	4	Stop Freq 5.90000000 GHz
Center 5.85000 (#Res BW 100 kH	GHz Iz #V	/BW 1.0 MHz	FUNCTION	#Sweep	Span 100.0 500 ms (1001	MHz pts)	CF Step 10.000000 MHz
1 N 1 f 2 N 1 f 3 4 5 6 7 7	5.821 1 GHz 5.850 0 GHz	-5.69 dBm -55.18 dBm					Freq Offset
8 9 10 11 12					1		

Chain B

Test Frequency	Me	Lin	nit	Result		
(MHz)		Δ (dB)		Δ (d	B)	
5825		48.75		>2	0	PASS
Agilent Spectrum Analyzer - Swe	ot SA					
Center Freq 5.85000	AC 0000 GHz		ALIG Avg Type: Log	NAUTO 04:11:14 g-Pwr TRA	PMDec 15, 2011 CE 1 2 3 4 5 6	Frequency
	PNO: Fast 🕞 IFGain:Low	Atten: 30 dB		Ē	DET P N N N N N	Auto Turo
10 dB/div Ref 20.00 d	Bm			Mkr2 5.85 -56.	0 0 GHz 81 dBm	Auto Tune
Log 10.0 0.00	() ¹					Center Freq 5.85000000 GHz
-10.0					-28.06 dBm	Start Freq 5.80000000 GHz
-50.0 -60.0 -70.0	ha	Laboration to make a second	na-mura anna stra an Alarmui	w.lennyahet-philipianetrahikitewana	Allman Allenary	Stop Freq 5.90000000 GHz
Center 5.85000 GHz #Res BW 100 kHz	#VBV	V 1.0 MHz	#Sv	Span ′ veep 500 ms	100.0 MHz (1001 pts)	CF Step 10.000000 MHz
MKR MODE TRC SCL	× 5.831 0 GHz	-8.06 dBm	FUNCTION FUNCTIO	N WIDTH FUNCT	ION VALUE	<u>Auto</u> Man
2 N 1 f 3	5.850 0 GHz	-56.81 dBm				Freq Offset 0 Hz
7 8 9						
MSG				STATUS		

Product	:	WHDI Tx Stick
Test Item	:	Band Edge
Test Site	:	No.3 OATS
Test Mode	:	Mode 2: Transmit - 40BW

Chain A

Test Frequency	Measurement Level	Limit	Result
(MHz)	Δ (dB)	Δ (dB)	
5755	40.56	>20	PASS

Agilent Spe	ctrum An	alyzer - Swe	ept SA								
Center	RF Freq	50 Ω 5.7250	AC 00000 GI	Hz	SEN		Avg Typ	ALIGNAUTO De: Log-Pwr	05:06:13 P TRAC	MDec 15, 2011 E 1 2 3 4 5 6	Frequency
10 dB/div	PN0: Fast Ing. recttal Der P NNNN IFGain:Low Atten: 30 dB Mkr2 5.725 00 GHz 0 dB/div Ref 20.00 dBm -49.80 dBm								Auto Tune		
10.0 0.00 -10.0						10		11 Miles - Statistics	010lm		Center Freq 5.725000000 GHz
-20.0 -30.0 -40.0						2				-29.24 dBm	Start Freq 5.65000000 GHz
-50.0 -60.0		erelleyson for the	agenerste Algebrunge	trouver they are	and the state of t	and a second			- Amp	- antim descende	Stop Freq 5.800000000 GHz
Center #Res Bl	5.7250 N 100	0 GHz kHz	X 5 7 42 0	#VBV	V 1.0 MHz	FUN	ICTION	#Sweep	Span 1 500 ms (50.0 MHz 1001 pts) IN VALUE	CF Step 15.000000 MHz Auto Man
2 N 3 4 5 6	1 f		5.725 0	0 GHz	-49.80 dE	3m				_	Freq Offset 0 Hz
7 8 9 10 11											
MSG		1						STATUS			

Chain B

Test Frequency	Measurement Level						Lim	it	Result
(MHz)		Δ (dB)				L	۵ (dE	B)	
5755		44.86					>20		PASS
Agilent Spectrum Analyzer - Swe	ot SA								
	AC 0000 GHz	SENSE:I	NT	Avg Typ	ALIGNA e: Log-F	UTO 05 Pwr	:25:06 Pf TRAC	4Dec 15, 2011 1 2 3 4 5 6	Frequency
	PNO: Fast IFGain:Low	Trig: Free Rui Atten: 30 dB	n				TYP	E M WAWAAA T P N N N N N	
In Internet Def 20.00 d	D				N	1kr2 5.	725	00 GHz	Auto Tune
Log	Bm						-00		
10.0									Center Freq
-10.0						1			5.725000000 GHz
-20.0			rihi'r	humber	alle have	for the party of t			
-30.0					1			-31.56.dBm	Start Freq
-40.0									5.05000000 GHZ
-50.0	مراحيها الراحيين المحصومية الربط ومعاور	auguneen mineme	ma				marchan	housed	Oton From
-60.0									5.80000000 GHz
-70.0									
Center 5.72500 GHz #Res BW 100 kHz	#\/F	NW 10 MHz			#Swe	en 500	ban 1: ms (*	50.0 MHz 1001 nts)	CF Step
MKB MIDELTER SCI		Y	FUN	TION I FI				NVALLE	15.000000 MHz Auto Man
1 N 1 f	5.769 55 GHz	-11.56 dBm							
	5.725 00 GHZ	-00.42 UBIII				-			Freq Offset
5									0 Hz
7									
9									
MSG					S	TATUS			

Product	:	WHDI Tx Stick
Test Item	:	Band Edge
Test Site	:	No.3 OATS
Test Mode	:	Mode 2: Transmit - 40BW

Chain A

Test Frequency	M	Limit	Result		
(MHz)		Δ (dB)		Δ (dB)	
5795		47.53	>20	PASS	
Agilent Spectrum Analyzer - Swe	pt SA				
Center Freq 5.85000	AC 00000 GHz	SENSE:INT	ALIGN	AUTO 05:15:12 PMDec -Pwr TRACE 1 2 DOE 101	15,2011 3 4 5 6 Frequency
	PNO: Fast IFGain:Low	Atten: 30 dB		DET P N	INNNN
10 dB/div Ref 20.00 d	Bm		I	00 Mkr2 5.850 -56.57-	GHz Auto Tune dBm
					Contor From
0.00	<u>_1</u>				5.85000000 GHz
-10.0	(Maryan I				
-20.0				-2	29.04 dBm Start Freq
-40.0					5.775000000 GHz
-50.0	March Marchanta	2	and the state of the second	and the second state of the second	
-60.0					5.925000000 GHz
#Res BW 100 kHz	#VE	SW 1.0 MHz	#Sw	eep 500 ms (100	1 pts) CF Step
MKR MODE TRC SCL	X	Y	FUNCTION FUNCTION	WIDTH FUNCTION VAL	Auto Man
1 N 1 f 2 N 1 f	5.807 55 GHz 5.850 00 GHz	-9.04 dBm -56.57 dBm	0		
4			-		Freq Offset
6	22 27				0 Hz
8					
<u>9</u> 10					
11 12					
MSG				STATUS	

Chain B

Test Frequency	Measurement Level				it	Result
(MHz)		Δ (dB)		Δ (dI	3)	
5795		45.12	>20)	PASS	
Agilent Spectrum Analyzer - Swe	ot SA					
RL RF 50 Ω Center Freq 5.85000	AC 0000 GHz		ALIGN Avg Type: Log	IAUTO 05:34:39 P I -Pwr TRAC	MDec 15, 2011 E 1 2 3 4 5 6	Frequency
	PNO: Fast (IFGain:Low	Atten: 30 dB		DE		Auto Turo
10 dB/div Ref 20.00 d	Bm			Mkr2 5.850 -56.0	00 GHz 06 dBm	Auto I une
Log 10.0						Center Fred
0.00						5.85000000 GHz
-10.0	hh-Jhm-h					
-20.0					-30.94 dBm	Start Freq
-40.0						5.775000000 GHz
-50.0	hannes i de	²				
-60.0			Manuf and address from and address	antific anti-antipo dis-angla paragen	an film and and and and and	Stop Freq
-70.0						3.92000000 G112
Center 5.85000 GHz #Res BW 100 kHz	#VB	W/10MHz	#Sw	Span 1 (een 500 ms (50.0 MHz 1001 pts)	CF Step
MKR MODE TRC SCL	× • •	Y F	UNCTION FUNCTION	WIDTH FUNCTION	IN VALUE	15.000000 MHz Auto Man
1 N 1 f	5.799 75 GHz	-10.94 dBm				
3	0.000 00 0112					Freq Offset
5						0 Hz
7						
9						
MSG				STATUS		1

QuieTer

7. Occupied Bandwidth

7.1. Test Equipment

	Equipment	Manufacturer	Model No./Serial No.	Last Cal.
	Spectrum Analyzer	R&S	FSP40 / 100170	Jun, 2011
	Spectrum Analyzer	Agilent	E4407B / US39440758	Jun, 2011
Х	Spectrum Analyzer	Agilent	N9010A / MY48030495	Apr., 2011

Note:

- 1. All equipments are calibrated with traceable calibrations. Each calibration is traceable to the national or international standards.
- 2. The test instruments marked with "X" are used to measure the final test results.

7.2. Test Setup



7.3. Limits

The minimum bandwidth shall be at least 500 kHz.

7.4. Test Procedure

The EUT was setup according to ANSI C63.4, 2009; tested according to DTS test procedure of Mar. 2005 KDB558074 for compliance to FCC 47CFR 15.247 requirements. Set RBW = 100 kHz, Span greater than RBW.

7.5. Uncertainty

 \pm 150Hz

7.6. Test Result of Occupied Bandwidth

Product	:	WHDI Tx Stick
Test Item	:	Occupied Bandwidth Data
Test Site	:	No.3 OATS
Test Mode	:	Mode 1: Transmit - 20BW (5745MHz)

Channel No.	Frequency (MHz)	Measurement Level (kHz)	Required Limit (kHz)	Result
149	5745.00	18050	>500	Pass

Agilen	it Spec	ctrun	n Ana	alyzer - Swe	pt SA									
Cen	L Iter	Fre	RF q	50 Ω 5.7450	AC 00000 GI	Hz	S Tria: Era		Avg T	ALIGN A ype: Log-l	AUTO Pwr	03:29:26 P TRAC	MDec 15, 2011 E 1 2 3 4 5 6	Frequency
	IFGain:Low Atten: 30 dB DETPNNNNN Mkr2 5.735 90 GHz								Auto Tune					
10 di	B/div	j	Ref	20.00 c	Bm						6.6.00000000000	-14.	55 dBm	
10.00														Center Freq
-10.0			+					FITT MA	THIN THE	∂ ³			12.45 dBm	
-20.0 -30.0														Start Freq
-40.0						/				V				5.720000000 GHz
-50.0	and and	-	r di Ma	ed the start of the	hologonally					- Antonio	and spech	in the second	Mahalumen	
-60.0													- toth treat	Stop Freq 5.770000000 GHz
-70.0			5.0											
Cen #Re	s BV	5.74 N 1	50 00	U GHZ kHz		#VB	W 100 kH:	2		#Swe	eep (Span 5 500 ms (0.00 MHZ 1001 pts)	CF Step 5.000000 MHz
MKR	MODE	TRC	SCL		×		Y C. 45		FUNCTION	FUNCTION \	WIDTH	FUNCTIO	DN VALUE	<u>Auto</u> Man
2	N N	1	f f		5.735 9 5.753 9	0 GHz 0 GHz 5 GHz	-14.55 c -13.38 c	IBm IBm						Freg Offset
4														0 Hz
7	_	_	_	8 9		0								
9 10														
11 12						1								
MSG										s	STATUS			

Figure Channel 149: (Chain A)

Channel No.	Frequency (MHz)	Measurement Level (kHz)	Required Limit (kHz)	Result
149	5745.00	18050	>500	Pass

Figure Channel 149: (Chain B)

Agilent Spectrum Analyzer - Swept SA	٨						
Center Freq 5.7450000	00 GHz	SENSE:INT	Avg Type	ALIGN AUTO : Log-Pwr	03:58:10 PM TRACI	1 2 3 4 5 6	Frequency
10 dB/div Ref 20.00 dBn	IFGain:Low	Atten: 30 dB		Mkr	₀ 2 5.735 -17.9	90 GHz 91 dBm	Auto Tune
10.0	2 mar 1000					45 45 dDm	Center Freq 5.745000000 GHz
-20.0		×TWUYIIIII)					Start Freq 5.720000000 GHz
-50.0 -60.0 -70.0	werservint			the water	where where the state of the st	mandhir dan 1	Stop Freq 5.770000000 GHz
Center 5.74500 GHz #Res BW 100 kHz MKR MODE TRC SCL	#VBW	100 kHz	FUNCTION FUN	#Sweep	Span 50 500 ms (1 FUNCIIO	0.00 MHz 1001 pts)	CF Step 5.000000 MHz <u>Auto</u> Man
1 N 1 f 9 2 N 1 f 9 3 N 1 f 9 4 - - - - 6 - - - -	5.741 65 GHz 5.735 90 GHz 5.753 95 GHz	-9.15 dBm -17.91 dBm -17.22 dBm					Freq Offset 0 Hz
7 8 9 10 11 12							
MSG				STATUS			

:	WHDI Tx Stick
:	Occupied Bandwidth Data
:	No.3 OATS
:	Mode 1: Transmit - 20BW (5785MHz)
	:

Channel No.	Frequency	Measurement Level	t Level Required Limit			
	(MHz)	(kHz)	(kHz)			
157	5785.00	18050	>500	Pass		

Agilen	nt Spe	ctrum	Апа	alyzer - Sv	wept S	A												
	tor	Fro	RF	50 9			-U-7		SE	ENSE:IN	Т	Ava T	Туре		03:38:16 TR	PMDec 15, 2011	Fre	equency
Cen	lei	FIE	q	5.7650	1000	<u>100 G</u>	NO: Fas	st 🖵	Trig: Fre	e Run		0.9.	1.314.0	. Lvg i m	1		+	35 65
<u> </u>						IF	Gain:Lo	w	Atten: 30) dB				B d Look			1	Auto Tune
10 di	B/div		Ref	20.00	dBr	n								MKr	2 5.77	5 90 GHz 5.54 dBm		Auto i uno
Log 10.0																		ontor From
0.00								<u>_1</u>									6 705	enter Freq
10.00							A2,	-	Mander Maria	Ame	HARIN ALL	mh anam	∕\3			10.70.10	5.785	3000000 GHZ
-10.0			-		_			TU T	A MARIA	141	, भाग भू म	NUTY	14			-12.70 abm		
-20.0										4							1	Start Fred
-30.0			-				1						-			_	5 760	000000 GHz
-40.0	⊢		_		-		-						\rightarrow		-	-	0.700	000000 0112
-50.0				- holeshole	APRIL 1	appropriation	1]	Hunderstrand	-			
-60.0	ann	with	11.11.4	and the second sec		La Contra de la								- Development	A LOT MANAGE OF LOAD	and the state of t		Stop Freq
70.0																	5 810	0000000 GHz
-70.0																		/////////
Cen	ter :	5.78	50	0 GHz						-			_		Span	50.00 MHz		
#Re	s Bl	N 10	00 1	kHz			#\	VBW	100 kHz				2	#Sweep	500 ms	(1001 pts)		CF Step
I WKBI	MODE	Terl	en l			v			~		EUN	NUM	L EUR	UCTION WIDTH			D.	.000000 MHz Man
1	N	1	f			5.778 0)5 GHz	z	-6.70 d	Bm	Ponte	SHOR) iter			HON WALKE	Auto	Width
2	N	1	f			5.775 9	0 GHz	2	-15.54 d	Bm								
3	<u>N</u>	1	f			5.793 9)5 GHz	2	-13.68 d	Bm							F F	Freq Offset
5																		0 Hz
6								-		\rightarrow								
8																		
9	_																	
11	-	-	-	-				-		\pm			-					
12																		
MSG														STATUS	3			

Figure Channel 157: (Chain A)

Channel No.	Frequency (MHz)	Measurement Level (kHz)	Required Limit (kHz)	Result
157	5785.00	18000	>500	Pass

Figure Channel 157: (Chain B)

Agilent Spe	ctrum An	alyzer - Swe	pt SA								
Center	Freq	50 Ω 5.78500	AC 00000 GH	z		SE:INT	Avg Typ	e: Log-Pwr	04:07:36 P TRAC	MDec 15, 2011 E 1 2 3 4 5 6	Frequency
10 dB/div	/ Re	f 20.00 d	Bm): Fast (iin:Low	Atten: 30	dB		Mkr	2 5.775 -17.	90 GHz 83 dBm	Auto Tune
10.0				2		*111141 1033051		3		17.00 - 17-	Center Freq 5.785000000 GHz
-20.0 -30.0 -40.0						A A (Mai A.				-15.03 dBm	Start Freq 5.760000000 GHz
-50.0 -60.0	mun	<u>لارم</u> امة.محمداني[ارانفسان	mout					hadrennes	ewpertorite provide	the hypergene and the program of the second s	Stop Freq 5.810000000 GHz
Center #Res Bi	5.7850 W 100	0 GHz kHz	× 5 779 30	#VBW	100 kHz -9 03 dB	FUN	ICTION F	#Sweep	Span 5 500 ms (0.00 MHz 1001 pts) NVALUE	CF Step 5.000000 MHz <u>Auto</u> Man
2 N 3 N 4 5 6	1 f		5.775 90 5.793 95	GHz GHz	-17.83 dB -16.26 dB	m					Freq Offset 0 Hz
7 8 9 10 11 12											
MSG								STATUS	5		

Product	:	WHDI Tx Stick
Test Item	:	Occupied Bandwidth Data
Test Site	:	No.3 OATS
Test Mode	:	Mode 1: Transmit - 20BW (5825MHz)

Channel No.	Frequency (MHz)	Measurement Level (kHz)	Required Limit (kHz)	Result
165	5825.00	18050	>500	Pass

Figure Channel 165: (Chain A)

Agilent Spe	ctrum An	alyzer - Swe	ept SA								
Center	RF Freq	50 Ω 5.8250	AC 00000 GI	Hz	SE	NSE:INT	Avg Tyj	ALIGNAUTO e: Log-Pwr	03:48:46 F TRAC TY	MDec 15, 2011 E 1 2 3 4 5 6	Frequency
10 dB/div	Re	f 20.00 c	IFG IBm	10: Fast G Gain:Low	Atten: 30	dB		Mkr	□ 2 5.815 -15.	90 GHz 58 dBm	Auto Tune
10.0 0.00 -10.0								3		-1 3.03 dDm	Center Freq 5.825000000 GHz
-20.0			in and								Start Freq 5.80000000 GHz
-50.0 -60.0 -70.0	www.white	n frank frank							(Information))#1	Magdersholesawaren	Stop Freq 5.85000000 GHz
Center 4 #Res BN MKE MODE 1 N	5.8250 N/100	0 GHz kHz	× 5.825 70	#VBV	V 100 kHz Y -7.03 d	FU Bm	NCTION F	#Sweep	Span 5 500 ms (0.00 MHz 1001 pts) IN VALUE	CF Step 5.000000 MHz <u>Auto</u> Man
2 N 3 N 4 5 6	1 f		5.815 9 5.833 9	0 GHz 5 GHz	-15.58 d -13.73 d	Bm Bm					Freq Offset 0 Hz
10 11 12											
MSG								STATUS	5		

Channel No.	Frequency (MHz)	Measurement Level (kHz)	Required Limit (kHz)	Result
165	5825.00	18050	>500	Pass

Figure Channel 165: (Chain B)

Agilent Spect	rum Analyzer - Swej	pt SA					
Center F	RF 50 Ω req 5.82500	AC 00000 GHz	SENSE:IN	T ALIGN ALIGN ALIGN ALIGN ALIGN A	AUTO 04:16:39 PM Pwr TRACE	Dec 15, 2011 1 2 3 4 5 6	Frequency
10 dB/div	Ref 20.00 d	PNO: Fast G	Atten: 30 dB	Ν	Vikr2 5.815 9 -18.0	90 GHz 2 dBm	Auto Tune
10.0 0.00 -10.0		2	אריייזין איז			-14.89 dBm	Center Freq 5.825000000 GHz
-20.0			4. (10) - (1) - (1)				Start Freq 5.80000000 GHz
-50.0 -60.0	ang	man way N			here and here and here and	pl.e-alwy-dipanasi	Stop Freq 5.85000000 GHz
Center 5. #Res BW	82500 GHz 100 kHz	#VBV	V 100 kHz	#Swe	Span 50 eep 500 ms (1 width Function	0.00 MHz 001 pts)	CF Step 5.000000 MHz <u>Auto</u> Man
1 N 2 N 3 N 4 5 6 7 2	1 f 1 f 1 f	5.823 05 GHz 5.815 90 GHz 5.833 95 GHz	-8.89 dBm -18.02 dBm -15.86 dBm				Freq Offset 0 Hz
8 9 10 11 12 MSG				s	STATUS		

Product	:	WHDI Tx Stick
Test Item	:	Occupied Bandwidth Data
Test Site	:	No.3 OATS
Test Mode	:	Mode 2: Transmit - 40BW (5755MHz)

Channel No.	Frequency (MHz)	Measurement Level (kHz)	Required Limit (kHz)	Result
151	5755.00	38000	>500	Pass

Figure Channel 151: (Chain A)

Agilent Spect	rum Analyzer - S	Swept SA								
Center F	RF 50 req 5.755	000000 GHz	SENSE	Avg Type	ALIGNAUTO : Log-Pwr	05:11:39 P TRAC	MDec 15, 2011 E 1 2 3 4 5 6	Frequency		
10 dB/div	PN0: Fast Ing: Free Run IFGain:Low Atten: 30 dB Mkr2 5.735 95 GHz -17.16 dBm									
10.0 0.00	2		radata - Janu Patrikan, an Is	he Musich Inc. Land Public Association	a the stall as so it.			Center Freq 5.755000000 GHz		
-20.0 -30.0 -40.0		x Maller fra taliha e e la		than a that the second s	(MCCCCC,A)		-15.74 dbm	Start Freq 5.730000000 GHz		
-50.0 								Stop Freq 5.78000000 GHz		
Center 5. #Res BW	.75500 GHz 100 kHz	#V	3W 100 kHz -9.74 dBm	FUNCTION FU	#Sweep	Span 5 500 ms (500000	0.00 MHz 1001 pts) N VALUE	CF Step 5.000000 MHz <u>Auto</u> Man		
2 N 3 N 4 5 6	1 f 1 f	5.735 95 GHz 5.773 95 GHz	-17.16 dBm -17.97 dBm					Freq Offset 0 Hz		
7 8 9 10 11 12										
MSG					STATUS					

Channel No.	Frequency (MHz)	Measurement Level (kHz)	Required Limit (kHz)	Result
151	5755.00	38000	>500	Pass

Figure Channel 151: (Chain B)

								ept SA	nalyzer - Swe	t Spectrum A	Agilen
Frequency	MDec 15, 2011 E 1 2 3 4 5 6	05:30:33 P TRAC	ALIGNAUTO : Log-Pwr	Avg Typ			Hz	AC 00000 GI	F 50 Ω 5.7550	ter Freq	Cen
Auto Tune	PN0: Fast IFGain:Low Atten: 30 dB dB/div Ref 20.00 dBm -19.25 dBm										10 di
Center Freq 5.755000000 GHz								^1			10.0 0.00
Start Freq 5.730000000 GHz	-17.93 dBm	WYMDAC) ³	Marrin A	ymon holiny	กราชบุษุกรรมพัฒนา 	harring		Marrinny			-20.0 -30.0 -40.0
Stop Freq 5.780000000 GHz	Water married									priamical	-50.0 -60.0 -70.0
CF Step 5.000000 MHz <u>Auto</u> Man	0.00 MHz 1001 pts) NVALUE	Span 5 500 ms (#Sweep	CTION F	FUN	100 kHz	#VBW	×	00 GHz kHz	ter 5.755 s BW 100	Cen #Re MKE
Freq Offset 0 Hz					3m 3m 3m	-19.25 dl -22.14 dl	5 GHz 5 GHz	5.735 9		N 1 f	2 3 4 5 6
											7 8 9 10 11 12
1			STATUS	-							MSG

:	WHDI Tx Stick
:	Occupied Bandwidth Data
:	No.3 OATS
:	Mode 2: Transmit - 40BW (5795MHz)
	::

Channel No.	Frequency (MHz)	Measurement Level (kHz)	Required Limit (kHz)	Result
159	5795.00	37950	>500	Pass

Figure Channel 159:	(Chain A)
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Agilent Spectrum Analyzer - Swept SA				
UXI RL RF 50Ω AC	SENSE:INT	ALIGN AUTO	05:20:38 PMDec 15, 2011	Frequency
Center Freq 5.795000000 GHZ PNO: Fast	Trig: Free Run	Avg Type. Log-Fwr	TYPE MWWWW	
IFGain:Low	Atten: 30 dB		DET P NNNN	Auto Tuno
		Mkr	2 5.775 95 GHz	Auto Tune
10 dB/div Ref 20.00 dBm			-15.80 dBm	
				Conton Enor
0.00				Center Freq
10.0			_∖3	5.795000000 GHz
-10.0 ALARYAN TALAN WALLAND	Marrison Harrison	Mar and a state of the second	-15.41 dBm	
-20.0				Start Fred
-30.0				5.770000000 GHz
-40.0				
-50.0			apple hoursh	
-60.0				Stop Freq
-70.0				5.820000000 GHz
Center 5.79500 GHz		372	Span 50.00 MHz	CE Sten
#Res BW 100 kHz #VBV	V 100 KHZ	#Sweep	500 ms (1001 pts)	5.000000 MHz
MKR MODE TRC SCL X	Y F	UNCTION FUNCTION WIDTH	FUNCTION VALUE	<u>Auto</u> Man
1 N 1 f 5.783 65 GHz	-9.41 dBm			
3 N 1 f 5.813 90 GHz	-15.61 dBm			Fred Offset
4				
6				0112
8				
9				
10				
MSG		STATUS	;	11

Channel No. Frequency (MHz)		Measurement Level (kHz)	Required Limit (kHz)	Result
159	5795.00	38000	>500	Pass

Figure Channel 159: (Chain B)

Agilent Spectrum Analyzer - Swept SA		- 52			-				
RL RF 50 Ω AC Center Freq 5.79500000	0 GHz	SENSE:IN	T Avg Type	ALIGNAUTO : Log-Pwr	05:40:05 PI TRAC	MDec 15, 2011 E 1 2 3 4 5 6	Frequency		
10 dB/div Ref 20.00 dBm	PN0: Fast Trig: Free Run Trig: Free Run <thtrig: free="" ru<="" td=""></thtrig:>								
10.0 0.00 -10.0	1 1770440/00/01/10/10/10/10/10/10/10/10/10/10/10		ድርጉሥብ ስትድርሞቸው የሚሳሌል	የለለዲፈንግ አስግ አስ	HTHMAN)3	-15.84 dBm	Center Freq 5.795000000 GHz		
-20.0 -30.0 -40.0	<u>1. (6. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1.</u>	W.		··· • • • • • • • •		the tradition would be	Start Freq 5.770000000 GHz		
-60.0							Stop Freq 5.820000000 GHz		
Center 5.79500 GHz #Res BW 100 kHz	#VBW	100 kHz	FUNCTION	#Sweep	Span 5 500 ms (' FUNCIO	0.00 MHz 1001 pts) NVALUE	CF Step 5.000000 MHz <u>Auto</u> Man		
1 N 1 1 3. 2 N 1 f 5. 3 N 1 f 5. 4 - - - - 5 - - - - 6 - - - - 7 - - - - 9 - - - -	775 95 GHz 813 95 GHz	-9.64 dBm -18.19 dBm -18.44 dBm					Freq Offset 0 Hz		
10 11 12 MSG				STATUS					

8. **Power Density**

8.1. Test Equipment

	Equipment	Manufacturer	Model No./Serial No.	Last Cal.
	Spectrum Analyzer	R&S	FSP40 / 100170	Jun, 2011
	Spectrum Analyzer	Agilent	E4407B / US39440758	Jun, 2011
Х	Spectrum Analyzer	Agilent	N9010A / MY48030495	Apr., 2011

Note:

- 1. All equipments are calibrated with traceable calibrations. Each calibration is traceable to the national or international standards.
- 2. The test instruments marked with "X" are used to measure the final test results.

8.2. Test Setup



8.3. Limits

The transmitted power density averaged over any 1 second interval shall not be greater +8dBm in any 3kHz bandwidth.

8.4. Test Procedure

The EUT was setup according to ANSI C63.4, 2009; tested according to DTS test procedure of Mar. 2005 KDB558074 for compliance to FCC 47CFR 15.247 requirements. Set RBW= 3 kHz, VBW=10KHz, Sweep time=(SPAN/3KHz), detector=Peak detector

8.5. Uncertainty

 \pm 1.27 dB

8.6. Test Result of Power Density

Product	:	WHDI Tx Stick
Test Item	:	Power Density Data
Test Site	:	No.3 OATS
Test Mode	:	Mode 1: Transmit - 20BW (5745MHz)

Channel No.	Frequency (MHz)	Chain A Power (dBm)	Chain B Power (dBm)	Chain A+B Power (dBm)	Limit (dBm)	Result
149	5745.00	-22.540	-26.170	-20.976	< 8dBm	Pass

Note: Power Density Value (dBm) = 10*LOG (Chain A (mW)+ Chain B (mW))

Agilent Spectrum	Analyzer - Swe	≥pt SA			45			30		
W RL	RF 50 Ω		U-7	SE	NSE:INT	Ανα Τικρε	ALIGNAUTO	03:28:44 P	MDec 15, 2011	Frequency
	ef 20.00 c	93000 G	⊓∠ NO: Far ♀ Sain:Low	Trig: Free Atten: 30	e Run ⊧dB		Mkr1 5.	זיי ספ 745 733 -22.:	7 9 GHz 54 dBm	Auto Tune
10.0										Center Freq 5.745695000 GHz
-10.0						24				Start Freq 5.745545000 GHz
-20.0	~~~~~	m	Ser. M	\sim	m	nh	m	2000	r~~~v	Stop Freq 5.745845000 GHz
-40.0										CF Step 30.000 kHz <u>Auto</u> Mar
-60.0										Freq Offset 0 Hz
-70.0 Center 5.745 #Res BW 3.0	56950 GHz) kHz	Z	#VBW	10 kHz			#Sweep	Span 3 100 s (300.0 kHz 1001 pts)	
MSG							STATUS			

Figure Channel 149: (Chain A)

Agilen	t Spect	rum Analyzei	r - Swep	ot SA									
LXI RI		RF	50 Ω	AC C			NSE:INT	A	ALIGN AUTO	03:57:28 F	MDec 15, 2011	Frequency	
Cen	ter F	req 5.7	4164	5000 G	HZ NO:Ear (Trig: Fre	e Run	Avg typ	e. Log-Fwr	TY	PE MWWWWW		_
				JE	Gain:Low	Atten: 30) dB			D	et P N N N N N		
									Mkr1 5.	741 63	7 8 GHz	Auto Tur	ne
10 dE	3/div	Ref 20.	.00 di	Bm						-26.	17 dBm		_
Log													
10.0												Center Fre	þę
10.0												5.741645000 GH	٦z
0.00													_
0.00												Start Fre	ea
-10.0												5.741495000 GH	Hz
10.0													
-20.0													-
20.0						•	ſ					Stop Fre	eq
-30.0						m	non	n n	a Am			5.741795000 GH	Ηz
	a surer	mon	mont	m.	www.			Nry -	and an	man	nom		_
-40.0	Y		0.000	89 · · · ·							V V V	CF Ste	p
												30.000 kH	Ηz
-50.0						_						<u>Auto</u> Ma	an
0.000													_
-60.0												Freq Offs	et
												0 H	Ηz
-70.0						_		-					_
10505													
Cen	ter 5.	7416450	GHz		41 /D1	W 40 LUL			#0	Span :	300.0 kHz		
#ĸe	SBW	3.0 KHZ			#vB	W TU KHZ			#Swee	J 100 S (Tour prs)		
MSG									STATUS				_

Figure Channel 149: (Chain B)

Product	:	WHDI Tx Stick
Test Item	:	Power Density Data
Test Site	:	No.3OATS
Test Mode	:	Mode 1: Transmit - 20BW (5785MHz)

Channel No.	Frequency (MHz)	Chain A Power (dBm)	Chain B Power (dBm)	Chain A+B Power (dBm)	Limit (dBm)	Result
157	5785.00	-23.680	-25.740	-21.579	< 8dBm	Pass

Note: Power Density Value (dBm) = 10*LOG (Chain A (mW)+ Chain B (mW))

Figure Channel 157: (Chain A)

Agilent Spectru	ım Analyzer - Swe	ept SA								
Center Fr	RF 50 Ω req 5.7842	AC 85000 GH PNC	Z D: Far 😱	S⊟] Trig: Free	NSE:INT	Avg Type	ALIGNAUTO E: Log-Pwr	03:37:34 PI TRAC TYP	MDec 15, 2011 E 1 2 3 4 5 6 E MWWWWW	Frequency
10 dB/div	Ref 20.00 c	IFGa J Bm	in:Low	Atten: 30	dB		Mkr1 5.	784 354 -23.6	6 GHz 58 dBm	Auto Tune
10.0										Center Freq 5.784285000 GHz
-10.0										Start Freq 5.784135000 GHz
-20.0		m	h	m	nm	wh	n h	$\sim \sim$	m	Stop Freq 5.784435000 GHz
-40.0										CF Step 30.000 kHz <u>Auto</u> Man
-60.0										Freq Offset 0 Hz
Center 5.7 #Res BW	842850 GHz 3.0 kHz	Z	#VBW	10 kHz			#Swee	Span 3 5 100 s ('	00.0 kHz 1001 pts)	
MSG							STATUS			



Agilent Spectrum Analyzer - Swe	ept SA				
02 RL RF 50 Ω Center Freq 5.7897	AC 60000 GHz PN0: Far	SENSE:INT	ALIGN AUTO	04:06:54 PMDec 15, 2011 TRACE 1 2 3 4 5 6 TYPE MWWWWWW DET P NNNN	Frequency
10 dB/div Ref 20.00 d	IFGain:Low	Atten: 30 dB	Mkr1 (5.789 778 3 GHz -25.74 dBm	Auto Tune
10.0					Center Freq 5.789760000 GHz
-10.0					Start Freq 5.789610000 GHz
-20.0			martin		Stop Freq 5.789910000 GHz
-40.0					CF Step 30.000 kHz <u>Auto</u> Man
-60.0					Freq Offset 0 Hz
Center 5.7897600 GHz	2			Span 300.0 kHz	
#Res BW 3.0 kHz	#VBW	10 kHz	#Swe state	ep 100 s (1001 pts) ^{JS}	

Figure Channel 157: (Chain B)

Product	:	WHDI Tx Stick
Test Item	:	Power Density Data
Test Site	:	No.3 OATS
Test Mode	:	Mode 1: Transmit - 20BW (5825MHz)

Channel No.	Frequency (MHz)	Chain A Power (dBm)	Chain B Power (dBm)	Chain A+B Power (dBm)	Limit (dBm)	Result
165	5825.00	-23.710	-26.211	-21.773	< 8dBm	Pass

Note: Power Density Value (dBm) = 10*LOG (Chain A (mW)+ Chain B (mW))

Figure Channel 165: (Chain A)

Agilen	it Spectru	ım Analyzer - Sw	rept SA								
Cen	ıter Fr	RF 50 ຊ eq 5.8260	AC 50000 C	GHz	SE		Avg Type	ALIGNAUTO : Log-Pwr	03:48:04 P TRAC	MDec 15, 2011	Frequency
10 dE	B/div	Ref 20.00	" dBm	PNO: Far G	Atten: 30	dB		Mkr1 5.	826 072 -23.	2 5 GHz 71 dBm	Auto Tune
10.0											Center Freq 5.826050000 GHz
0.00 -10.0											Start Freq 5.825900000 GHz
-20.0 -30.0	bry	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	محمصم	m	m	n 1	har	nor a		n	Stop Freq 5.826200000 GHz
-40.0 -50.0											CF Step 30.000 kHz <u>Auto</u> Man
-60.0											Freq Offset 0 Hz
-70.0 Cen #Re:	ter 5.8 s BW 3	260500 GH 3.0 kHz	z	#VBW	10 kHz			#Sweer	Span 3 0 100 s (00.0 kHz	
MSG								STATUS		F/	



Figure Channel 165: (Chain B)



Product	:	WHDI Tx Stick
Test Item	:	Power Density Data
Test Site	:	No.3 OATS
Test Mode	:	Mode 2: Transmit - 40BW (5755MHz)

Channel No.	Frequency (MHz)	Chain A Power (dBm)	Chain B Power (dBm)	Chain A+B Power (dBm)	Limit (dBm)	Result
151	5755.00	-24.940	-26.310	-22.561	< 8dBm	Pass

Note: Power Density Value (dBm) = 10*LOG (Chain A (mW)+ Chain B (mW))

Figure Channel 151: (Chain A)





RL RF 50Ω AC		SENSE:INT	ALIGN AUTO	05:29:48 PM Dec 15, 2011	Erequency
nter Freq 5.7524050	100 GHz PNO: Far 😱 IFGain:Low	Trig: Free Run Atten: 30 dB	Avg Type: Log-Pwr	TRACE 123456 TYPE MWWWWW DET PNNNNN	Frequency
B/div Ref 20.00 dBm	1		Mkr1 5	752 299 4 GHz -26.31 dBm	Auto Tur
					Center Fr
					5.752405000 G
					Start Fr
·					5.752255000 G
J		·			Stop Fr
1 mon marked	man	wood the		ma som	5.752555000 0
					CF St
,					30.000 <u>Auto</u>
					Freg Off
					(
Lnter 5.7524050 GHz			<u> </u>	Span 300.0 kHz	

Figure Channel 151: (Chain B)

Product	:	WHDI Tx Stick
Test Item	:	Power Density Data
Test Site	:	No.3OATS
Test Mode	:	Mode 2: Transmit - 40BW (5795MHz)

Channel No.	Frequency (MHz)	Chain A Power (dBm)	Chain B Power (dBm)	Chain A+B Power (dBm)	Limit (dBm)	Result
159	5795.00	-25.070	-27.870	-23.238	< 8dBm	Pass

Note: Power Density Value (dBm) = 10*LOG (Chain A (mW)+ Chain B (mW))

Figure Channel 159: (Chain A)

Agilent Sp	ectrum A	nalyzer - Sw	ept SA			12						
LXI RL	R	F 50 Ω	AC		SE	NSE:INT		ALIGN AUTO	05:49:36 P	MDec 15, 2011	Frequ	INDOV
Center	⁻ Freq	5.8035	85000	GHZ PNO: Far IFGain:Low	Trig: Free Atten: 10	e Run dB	Avg Type	e: Log-Pwr	TRAC TYF DE	E 1 2 3 4 5 6 E MWWWWW T P N N N N N		lency
10 dB/di	v Re	f 0.00 dl	Bm	ann genn acon i annagennar				Mkr1 5.	803 643 -25.0	32 GHz 07 dBm	Aı	uto Tune
-10.0											Cer	nter Freq
20.0											5.80358	5000 GHZ
-20.0		~~~~	mm	m	~~~^	MA	mon	hom	m	non	5 80343	tart Freq
-30.0	O	<u> </u>				~~~						
-40.0			2								S 5.80373	top Freq
-50.0												
-60.0											3 Auto	CF Step 0.000 kHz Man
-70.0												Man
-80.0											Fre	e q Offset 0 Hz
-90.0 —												
Center #Res B	5.803 W 3.0	5850 GH: kHz	z	#VBW	10 kHz			#Sweep	Span 3 100 s (00.0 kHz 1001 pts)		
MSG								STATUS				

Agilent Spectrum Analyzer - Swept SA											
Cer	nter Fr	req 5.799	Ω AC 765000 G	Hz	SE		Avg Typ	ALIGNAUTO e: Log-Pwr	05:52:42 P TRAC	MDec 15, 2011 E 1 2 3 4 5 6	Frequency
10 d	B/div	Ref 20.00	⊦ IFi dBm	'NO: Far Le	Atten: 30	dB		Mkr1 5.	™ 799 754 -27.	4 8 GHz 87 dBm	Auto Tune
10.0											Center Freq 5.799765000 GHz
0.00 -10.0											Start Freq 5.799615000 GHz
-20.0 -30.0	n n h c		here		mar and a market	~~^~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~					Stop Freq 5.799915000 GHz
-40.0 -50.0			1						m	Do Marine	CF Step 30.000 kHz <u>Auto</u> Man
-60.0											Freq Offset 0 Hz
-70.0 Cer #Re	nter 5.7 es BW	997650 GH 3.0 kHz	łz	#VBW	10 kHz			#Sweep	Span 3 5 100 s (300.0 kHz 1001 pts)	
MSG	Align	ment Comple	ted					STATUS			

Figure Channel 159: (Chain B)

9. EMI Reduction Method During Compliance Testing

No modification was made during testing.

Attachment 1: EUT Test Photographs

Attachment 2: EUT Detailed Photographs