

Application for FCC Certification
On behalf of

Hisense Broadband Multimedia Technologies Co., Ltd

Product Name: GPON SFU

Model No.: 7281G

Brand Name: Hisense, iPHOTONIX, Ligent

FCC ID: R66001

Prepared For :Hisense Broadband Multimedia Technologies Co., Ltd
11 Jiangxi Road, Qingdao Shandong 266071 PR China

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Report No. : ACI-F12198A1
Date of Test : Jan 22 - 23, 2013
Date of Report : Jan 23, 2013

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TEST REPORT FOR FCC CERTIFICATE

Applicant : Hisense Broadband Multimedia Technologies Co., Ltd
Manufacturer : Hisense Broadband Multimedia Technologies Co., Ltd
EUT Description : GPON SFU
(A) Model No. : 7281G
(B) Brand Name : Hisense, iPHOTONIX, Ligent
(C) Test Voltage : AC 120V/60Hz

Test Procedure Used:

*FCC RULES AND REGULATIONS PART 15 SUBPART C OCTOBER 2012
AND ANSI C63.4-2003*

The device described above is tested by Audix Technology (Shanghai) Co., Ltd. to determine the maximum emission levels emanating from the device. The maximum emission levels are compared to the FCC Part 15 Subpart C limits.

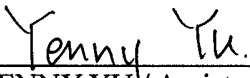
The test results are contained in this test report and Audix Technology (Shanghai) Co., Ltd. is assumed full responsibility for the accuracy and completeness of these measurements. This report also shows that the EUT (M/N: Refer to Sec2.1), which was tested on Jan 22 - 23, 2013 is technically compliance with the FCC limits.

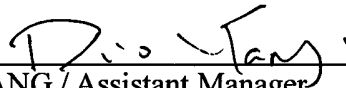
This report applies to above tested sample only. This report shall not be reproduced in part without written approval of Audix Technology (Shanghai) Co., Ltd.

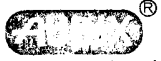
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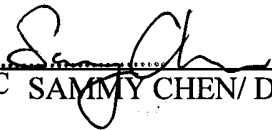
The test results for EUT's other function are contained in No. EM-F1010986, a Declaration of Conformity report.

Date of Test : Jan 22 - 23, 2013 Date of Report : Jan 23, 2013

Producer : 
YENNY YU / Assistant

Review : 
DIO YANG / Assistant Manager

 For and on behalf of
Audix Technology (Shanghai) Co., Ltd.

Signatory : 
Authorized Signature EMC SAMMY CHEN / Deputy Manager

1 SUMMARY OF STANDARDS AND RESULTS

1.1 Description of Standards and Results

The EUT have been tested according to the applicable standards as referenced below:

Description / Test Item	Test Standard	Results	Meets Limit
EMISSION			
Radiated Emission	FCC RULES AND REGULATIONS PART 15 SUBPART C October 2012 AND ANSI C63.4:2003 AND KDB558074	Pass	15.209(a) 15.205(a)(c)
Maximum Peak Output Power Measurement	FCC RULES AND REGULATIONS PART 15 SUBPART C October 2012 AND ANSI C63.4:2003 AND KDB558074	Pass	15.247(b)(3)
Note - The essential test items above were performed and recorded in the report.			

2 GENERAL INFORMATION

2.1 Description of Equipment Under Test

Description : GPON SFU

Type of EUT ☐ Production ☒ Pre-product ☐ Pro-type

Model Number : 7281G

Brand Name : Hisense, iPHOTONIX, Ligent

Note #1 :

Report No.	Model No.	Rev. Summary	Edition No.	Data of Rev.
ACI-F12198	7259G, 7258G	Original Report.	0	Jan 21, 2013
ACI-F12198A1	7259G, 7258G, 7281G	To add a new model.	Rev. A1	Jan 23, 2013

Note #2 : The different list between these models are as follows:

M/N: 7259G	2POTS+4GE+RF+RF Return+WiFi
M/N: 7258G	2POTS+4GE+RF +WiFi
M/N: 7281G	2POTS+4GE+WiFi

The model 7281G was tested with essential test items and recorded in the report.

Radio Tech : IEEE 802.11b/g/n (2.4GHz)

Freq. Band : 2412MHz ~ 2462MHz (Ch1-Ch11) for 802.11b/g
2412MHz ~ 2462MHz (Ch1-Ch11) for
802.11n 20MHz Band
2422MHz ~ 2452MHz (Ch3-Ch9) for
802.11n 40MHz Band

Tested Freq. : for 802.11b/g/n HT20
2412MHz (Ch1), 2437MHz (Ch6), 2462MHz (Ch11)
for 802.11n HT40
2422MHz (Ch3), 2437MHz (Ch6), 2452MHz (Ch9)

Modulation : DSSS for 802.11b
OFDM for 802.11g/n

Transmit data rate	:	802.11b: 1, 2, 5.5, 11 Mbps 802.11g: 6, 9, 12, 18, 24, 36, 48, 54 Mbps 802.11n HT20: (MCS0-MCS7) 6.5, 13, 19.5, 26, 39, 52, 58.5, 65Mbps 802.11n HT40: (MCS0-MCS7) 13.5, 27, 40.5, 54, 81, 108, 121.5, 135 Mbps After testing, the highest peak output power of the EUT was at 11 Mbps in 802.11b mode, 36 Mbps in 802.11g mode, 58.5 Mbps in 802.11n HT20 mode and 13.5 Mbps in 802.11n HT40 mode. So data rate mentioned above were representative selected to test in this report.
Antenna Gain	:	3.12 dBi (for both ANT1 & ANT2)
AC Adapter	:	Manufacturer : MOSO Model Number : MSP-C2000IC 12.0-24W-US Input : 100-240V~, 50/60Hz 0.8A Output : 12V  2.0A Output Cable : Unshielded, Undetachable, 1.8m
Applicant	:	Hisense Broadband Multimedia Technologies Co., Ltd. 11 Jiangxi Road, Qingdao Shandong 266071 PR China
Manufacturer	:	Hisense Broadband Multimedia Technologies Co., Ltd. 11 Jiangxi Road, Qingdao Shandong 266071 PR China

2.2 Description of Test Facility

Site Description (Semi-Anechoic Chamber)	:	Sept. 17, 1998 file on Mar 16, 2012 Renewed Federal Communications Commission FCC Engineering Laboratory 7435 Oakland Mills Road Columbia, MD 21046, USA
Name of Firm	:	Audix Technology (Shanghai) Co., Ltd.
Site Location	:	3F 34 Bldg 680 Guiping Rd., Caohejing Hi-Tech Park, Shanghai 200233, China
FCC registration Number	:	91789
Accredited by NVLAP, Lab Code	:	200371-0

2.3 Measurement Uncertainty

Radiated Emission Expanded Uncertainty (30-200MHz):

U = 4.14dB (Horizontal)

U = 4.28dB (Vertical)

Radiated Emission Expanded Uncertainty (200M-1GHz):

U = 4.18dB (Horizontal)

U = 4.26dB (Vertical)

Radiated Emission Expanded Uncertainty (Above 1GHz):

U= 4.50 dB (Horizontal)

U= 4.16 dB (Vertical)

Maximum Peak Output Power Expanded Uncertainty: U = 0.30 dBm

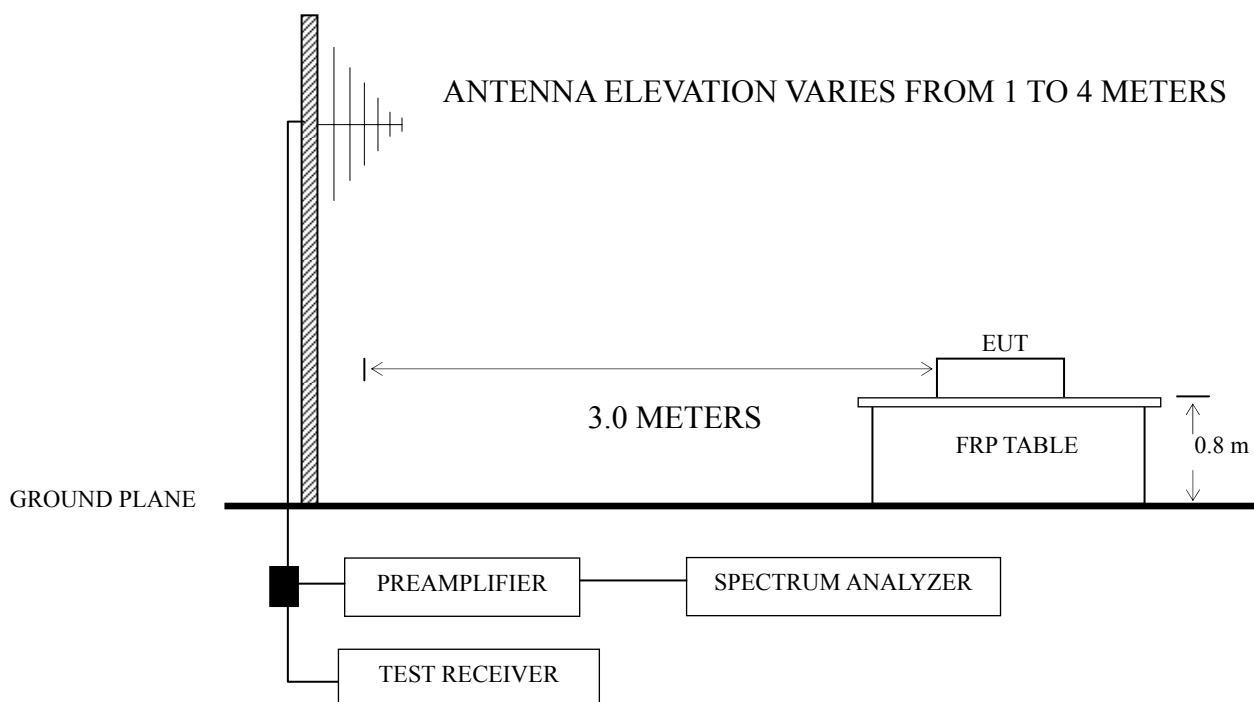
3 RADIATED EMISSION TEST

3.1 Test Equipment

The following test equipment are used during the radiated emission test in a semi-anechoic chamber:

Item	Type	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
1.	Preamplifier	Agilent	8447D	2944A10548	Sep 18, 2012	Mar 18, 2013
2.	Preamplifier	HP	8449B	3008A00864	Apr 29, 2012	Apr 29, 2013
3.	Spectrum Analyzer	Agilent	E7405A	MY45106600	Dec 17, 2012	Dec 17, 2013
4.	Test Receiver	R&S	ESCI	101302	Sep 11, 2012	Sep 11, 2013
5.	Bi-log Antenna	TESEQ	CBL6112D	23193	May 03, 2012	May 03, 2013
6.	Horn Antenna	EMCO	3115	9607-4878	May 03, 2012	May 03, 2013
7.	Horn Antenna	EMCO	3116	00062643	Jul 21, 2012	Jul 21, 2013
8.	50 Ω Coaxial Switch	Anritsu	MP59B	6200426390	Sep 18, 2012	Mar 18, 2013
9.	Software	Audix	E3	SET00200 9912M295-2	-	-

3.2 Block Diagram of Test Setup



■ : 50 ohm Coaxial Switch

3.3 Radiated Emission Limit [FCC Part 15 Subpart C 15.209]

Frequency (MHz)	Distance (m)	Field strength limits (μV/m)	
		(μV/m)	dB(μV/m)
30 ~ 88	3	100	40.0
88 ~ 216	3	150	43.5
216 ~ 960	3	200	46.0
Above 960	3	500	54.0
NOTE 1 - Emission Level dB (μV/m) = 20 log Emission Level (μV/m) NOTE 2 - The tighter limit applies at the band edges. NOTE 3 - Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system. NOTE 4 - The limits shown are based on Quasi-peak value detector below or equal to 1GHz and Average value detector above 1GHz. NOTE 5 - Above 1 GHz, the limit on peak emission is 20 dB above the maximum permitted average emission limit applicable to the EUT			

3.4 Test Configuration

The EUT (listed in Sec.2.1) and the simulators (listed in Sec.2.2) were installed as shown on Sec.3.2 to meet FCC requirements and operating in a manner that tends to maximize its emission level in a normal application.

3.5 Operating Condition of EUT

3.5.1 Setup the EUT as shown in Sec. 3.2.

3.5.2 Turn on the power of all equipment.

3.5.3 Turn the EUT on the test mode, and then test.

3.6 Test Procedures

Radiated emission test applies to harmonics/spurs that fall in the restricted bands listed in Section 15.205. The maximum permitted average field strength is listed in Section 15.209. A pre-amp is necessary for this measurement. For measurement above 1 GHz, set RBW = 1MHz, VBW = 10 Hz, Sweep: Auto. If the emission is pulsed, modify the unit for continuous operation; use the settings shown above, then correct the reading by subtracting the peak-average correction factor, derived from the appropriate duty cycle calculation.

The EUT was placed on a turntable that is 0.8 meter above ground. The turntable rotated 360 degrees to determine the position of the maximum emission level. The EUT was set 3 meters away from the receiving antenna, which was mounted on an antenna tower. The antenna moved up and down between 1 meter and 4 meters to find out the maximum emission level. Broadband antenna (Calibrated Bilog Antenna) or Horn antenna was used as receiving antenna. Both horizontal and vertical polarizations of the antenna were set on measurement. In order to find the maximum emission, all of the interference cables were manipulated according to ANSI C63.4:2003 requirements during radiated emission test.

The bandwidth of Test Receiver R&S ESCI was set at 120 kHz from 30MHz to 1000MHz.

The bandwidth of the VBW was set at 1MHz and RBW was set at 1MHz for peak emission measurement above 1GHz and 1MHz RBW, 10Hz VBW for average emission above 1GHz for Spectrum Agilent E7405A.

The frequency range from 30 MHz to 25 GHz (Up to 10th harmonics from fundamental frequency) was checked.

The EUT was tested under the following test modes:

Mode	Operation	Channel
1.	Transmitting	Low
2.		High
3.	Receiving	--
4.	Transmitting	Low
5.	Band-Edge	High

All the test results are listed in Sec.4.7.

3.7 Test Results

<PASS>

The frequency and amplitude of the highest radiated emission relative the limit is reported. All the emissions not reported below are too low against the FCC limit.

No.	Operation	Modulation	Channel	Frequency	Data Page
1.	Transmitting	802.11b	01	2412 MHz	P12
2.			11	2462 MHz	P13
3.		802.11g	01	2412 MHz	P14
4.			11	2462 MHz	P15
5.		802.11n HT20	01	2412 MHz	P16
6.			11	2462 MHz	P17
7.		802.11n HT40	03	2422 MHz	P18
8.			09	2452 MHz	P19
9.		Cabinet Emission			Band Edge P20

NOTE 1 – Level = Read Level + Antenna Factor + Cable Loss (<1GHz)

NOTE 2 – Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor (>1GHz)

NOTE 3 – All reading are Quasi-Peak values below or equal to 1GHz, Peak and Average values above 1GHz.

For above 1GHz test, if the peak measured value complies with the average limit, it is unnecessary to perform an average measurement.

EUT : GPON SFU Temperature : 18℃

Model No. : 7281G Humidity : 47%RH

Test Mode : 802.11b Transmitting Ch01 Date of Test : Jan 22 - 23, 2013

Polarization	Frequency (MHz)	Meter Reading dB (μV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Emission Level dB (μV/m)	Limits dB (μV/m)	Margin (dB)	Remark
Horizontal	65.89	15.39	9.55	1.32	--	26.26	40.00	13.74	QP
	143.49	21.13	10.54	2.19	--	33.86	43.50	9.64	
	197.81	25.20	9.82	2.42	--	37.44	43.50	6.06	
	347.19	16.90	15.04	2.88	--	34.82	46.00	11.18	
	396.66	17.35	16.24	2.98	--	36.57	46.00	9.43	
	872.93	15.42	20.37	4.60	--	40.39	46.00	5.61	
	1760.00	45.87	27.23	4.58	35.86	41.82	74.00	32.18	PK
	2445.00	40.89	29.40	5.39	35.48	40.20	74.00	33.80	
	4010.00	37.60	33.30	7.52	35.10	43.32	74.00	30.68	
	4770.00	35.72	35.50	8.01	35.02	44.21	74.00	29.79	
Vertical	143.49	14.74	10.54	2.19	--	27.47	43.50	16.03	QP
	197.81	18.86	9.82	2.42	--	31.10	43.50	12.40	
	247.28	19.94	11.85	2.60	--	34.39	46.00	11.61	
	347.19	22.25	15.04	2.88	--	40.17	46.00	5.83	
	396.66	20.29	16.24	2.98	--	39.51	46.00	6.49	
	495.60	9.01	17.56	3.25	--	29.82	46.00	16.18	
	1315.00	47.23	26.39	4.53	36.75	41.40	74.00	32.60	PK
	2850.00	41.95	31.29	5.86	35.34	43.76	74.00	30.24	
	3160.00	42.17	31.97	6.30	35.25	45.19	74.00	28.81	
	5990.00	39.94	34.26	7.93	35.04	47.09	74.00	26.91	

TEST ENGINEER: RAVEN JIN

EUT : GPON SFU Temperature : 18℃

Model No. : 7281G Humidity : 47%RH

Test Mode : 802.11b Transmitting Ch11 Date of Test : Jan 22 - 23, 2013

Polarization	Frequency (MHz)	Meter Reading dB (μV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Emission Level dB (μV/m)	Limits dB (μV/m)	Margin (dB)	Remark
Horizontal	143.49	14.40	10.54	2.19	--	27.13	43.50	16.37	QP
	210.42	21.38	10.22	2.46	--	34.06	43.50	9.44	
	247.28	19.25	11.85	2.60	--	33.70	46.00	12.30	
	347.19	23.00	15.04	2.88	--	40.92	46.00	5.08	
	396.66	22.25	16.24	2.98	--	41.47	46.00	4.53	
	741.98	14.86	19.98	3.78	--	38.62	46.00	7.38	
	1120.00	50.08	25.42	4.50	37.17	42.83	74.00	31.17	PK
	2060.00	46.98	27.66	4.90	35.58	43.96	74.00	30.04	
	3175.00	43.93	31.97	6.30	35.24	46.96	74.00	27.04	
	5860.00	42.88	33.21	7.47	35.11	48.45	74.00	25.55	
Vertical	49.40	18.23	8.69	0.91	--	27.83	40.00	12.17	QP
	65.89	18.18	9.55	1.32	--	29.05	40.00	10.95	
	143.49	21.81	10.54	2.19	--	34.54	43.50	8.96	
	197.81	26.13	9.82	2.42	--	38.37	43.50	5.13	
	380.17	16.42	15.90	2.95	--	35.27	46.00	10.73	
	446.13	16.37	16.92	3.11	--	36.40	46.00	9.60	
	1765.00	50.40	27.23	4.58	35.86	46.35	74.00	27.65	PK
	2445.00	48.24	29.40	5.39	35.48	47.55	74.00	26.45	
	3640.00	45.01	32.45	7.14	35.15	49.45	74.00	24.55	
	6090.00	43.88	31.94	6.21	35.27	46.76	74.00	27.24	

TEST ENGINEER: RAVEN JIN

EUT : GPON SFU Temperature : 18°C

Model No. : 7281G Humidity : 47%RH

Test Mode : 802.11g Transmitting Ch01 Date of Test : Jan 22 - 23, 2013

Polarization	Frequency (MHz)	Meter Reading dB (μV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Emission Level dB (μV/m)	Limits dB (μV/m)	Margin (dB)	Remark
Horizontal	45.52	18.14	10.09	0.89	--	29.12	40.00	10.88	QP
	60.07	18.16	9.14	1.19	--	28.49	40.00	11.51	
	87.23	19.06	10.88	1.70	--	31.64	40.00	8.36	
	143.49	19.17	10.54	2.19	--	31.90	43.50	11.60	
	207.51	26.78	10.11	2.45	--	39.34	43.50	4.16	
	360.77	18.94	15.41	2.91	--	37.26	46.00	8.74	PK
	1595.00	51.87	27.08	4.56	36.11	47.40	74.00	26.60	
	3145.00	42.84	31.96	6.30	35.25	45.85	74.00	28.15	
	4800.00	41.37	32.67	7.19	35.14	46.09	74.00	27.91	
	5195.00	37.55	36.62	8.33	34.97	47.53	74.00	26.47	
	4824.00	40.23	30.03	9.07	35.05	44.28	54.00	9.72	AV
	7236.00	39.73	35.05	10.63	34.53	50.88	54.00	3.12	
Vertical	90.14	9.96	11.00	1.73	--	22.69	43.50	20.81	QP
	143.49	13.24	10.54	2.19	--	25.97	43.50	17.53	
	180.35	17.58	9.99	2.36	--	29.93	43.50	13.57	
	211.39	19.44	10.26	2.47	--	32.17	43.50	11.33	
	268.62	21.53	12.74	2.66	--	36.93	46.00	9.07	
	360.77	18.99	15.41	2.91	--	37.31	46.00	8.69	PK
	1365.00	49.21	26.59	4.54	36.62	43.72	74.00	30.28	
	3540.00	42.31	32.20	7.05	35.17	46.39	74.00	27.61	
	4155.00	42.08	33.46	7.61	35.08	48.07	74.00	25.93	
	5055.00	39.16	36.68	8.19	34.98	49.05	74.00	24.95	

TEST ENGINEER: RAVEN JIN

EUT : GPON SFU Temperature : 18℃

Model No. : 7281G Humidity : 47%RH

Test Mode : 802.11g Transmitting Ch11 Date of Test : Jan 22 - 23, 2013

Polarization	Frequency (MHz)	Meter Reading dB (μV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Emission Level dB (μV/m)	Limits dB (μV/m)	Margin (dB)	Remark
Horizontal	71.71	7.78	9.99	1.45	--	19.22	40.00	20.78	QP
	143.49	17.12	10.54	2.19	--	29.85	43.50	13.65	
	210.42	22.43	10.22	2.46	--	35.11	43.50	8.39	
	378.23	23.09	15.83	2.95	--	41.87	46.00	4.13	
	396.66	18.46	16.24	2.98	--	37.68	46.00	8.32	
	540.22	12.74	17.84	3.34	--	33.92	46.00	12.08	
	2145.00	42.82	28.05	5.00	35.56	40.31	74.00	33.69	PK
	2615.00	38.26	30.15	5.60	35.42	38.59	74.00	35.41	
	3405.00	37.08	32.07	6.80	35.19	40.76	74.00	33.24	
	5165.00	35.41	33.47	7.61	35.08	41.41	74.00	32.59	
Vertical	65.89	17.18	9.55	1.32	--	28.05	40.00	11.95	QP
	107.60	18.94	11.22	1.92	--	32.08	43.50	11.42	
	143.49	21.80	10.54	2.19	--	34.53	43.50	8.97	
	209.45	26.13	10.18	2.46	--	38.77	43.50	4.73	
	378.23	21.16	15.83	2.95	--	39.94	46.00	6.06	
	540.22	18.19	17.84	3.34	--	39.37	46.00	6.63	
	1365.00	44.51	26.59	4.54	36.62	39.02	74.00	34.98	PK
	2440.00	38.15	29.40	5.39	35.48	37.46	74.00	36.54	
	3660.00	34.69	32.50	7.14	35.15	39.18	74.00	34.82	
	4770.00	32.09	35.50	8.01	35.02	40.58	74.00	33.42	

TEST ENGINEER: RAVEN JIN

EUT : GPON SFU Temperature : 18°C

Model No. : 7281G Humidity : 47%RH

Test Mode : 802.11n HT20
Transmitting Ch01 Date of Test : Jan 22 - 23, 2013

Polarization	Frequency (MHz)	Meter Reading dB (μV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Emission Level dB (μV/m)	Limits dB (μV/m)	Margin (dB)	Remark
Horizontal	32.91	8.62	16.79	0.82	--	26.23	40.00	13.77	QP
	65.89	17.39	9.55	1.32	--	28.26	40.00	11.74	
	74.62	17.21	10.21	1.51	--	28.93	40.00	11.07	
	146.40	19.73	10.49	2.20	--	32.42	43.50	11.08	
	209.45	24.91	10.18	2.46	--	37.55	43.50	5.95	
	376.29	18.66	15.79	2.93	--	37.38	46.00	8.62	
	2165.00	40.47	28.14	5.04	35.56	38.09	74.00	35.91	PK
	2875.00	38.02	31.40	5.90	35.33	39.99	74.00	34.01	
	4105.00	36.27	33.41	7.56	35.09	42.15	74.00	31.85	
	5335.00	33.25	36.57	8.47	34.95	43.34	74.00	30.66	
Vertical	74.62	9.84	10.21	1.51	--	21.56	40.00	18.44	QP
	147.37	15.59	10.46	2.22	--	28.27	43.50	15.23	
	224.97	18.64	10.84	2.52	--	32.00	46.00	14.00	
	301.60	15.70	13.77	2.76	--	32.23	46.00	13.77	
	369.50	12.49	15.64	2.92	--	31.05	46.00	14.95	
	483.96	7.46	17.42	3.23	--	28.11	46.00	17.89	
	1595.00	42.87	27.08	4.56	36.11	38.40	74.00	35.60	PK
	2810.00	36.71	31.11	5.82	35.36	38.28	74.00	35.72	
	3770.00	36.44	32.78	7.23	35.13	41.32	74.00	32.68	
	4585.00	34.64	34.34	7.93	35.04	41.87	74.00	32.13	

TEST ENGINEER: RAVEN JIN

EUT : GPON SFU Temperature : 18°C

Model No. : 7281G Humidity : 47%RH

Test Mode : 802.11n HT20
Transmitting Ch11 Date of Test : Jan 22 - 23, 2013

Polarization	Frequency (MHz)	Meter Reading dB (μV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Emission Level dB (μV/m)	Limits dB (μV/m)	Margin (dB)	Remark
Horizontal	30.00	4.41	18.30	0.80	--	23.51	40.00	16.49	QP
	61.04	10.05	9.21	1.21	--	20.47	40.00	19.53	
	85.29	9.39	10.80	1.66	--	21.85	40.00	18.15	
	150.28	22.48	10.41	2.23	--	35.12	43.50	8.38	
	196.84	27.94	9.83	2.42	--	40.19	43.50	3.31	
	281.23	18.94	13.17	2.70	--	34.81	46.00	11.19	
	1342.00	52.01	25.15	5.47	37.37	45.26	74.00	28.74	PK
	1765.00	50.90	28.75	6.11	36.40	49.36	74.00	24.64	
	4816.00	45.68	30.36	9.07	35.05	50.06	74.00	23.94	
	6004.00	41.10	32.60	9.04	34.60	48.14	74.00	25.86	
Vertical	36.79	15.34	14.57	0.85	--	30.76	40.00	9.24	QP
	61.04	22.60	9.21	1.21	--	33.02	40.00	6.98	
	114.39	11.56	11.10	1.97	--	24.63	43.50	18.87	
	223.03	28.96	10.76	2.51	--	42.23	46.00	3.77	
	298.69	16.84	13.67	2.75	--	33.26	46.00	12.74	
	446.13	15.52	16.92	3.11	--	35.55	46.00	10.45	
	1175.00	47.81	25.69	4.51	37.06	40.95	74.00	33.05	PK
	2445.00	43.24	29.40	5.39	35.48	42.55	74.00	31.45	
	3640.00	40.01	32.45	7.14	35.15	44.45	74.00	29.55	
	4830.00	36.87	35.81	8.06	35.01	45.73	74.00	28.27	

TEST ENGINEER: RAVEN JIN

EUT : GPON SFU Temperature : 18°C

Model No. : 7281G Humidity : 47%RH

Test Mode : 802.11n HT40
Transmitting Ch03 Date of Test : Jan 22 - 23, 2013

Polarization	Frequency (MHz)	Meter Reading dB (μV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Emission Level dB (μV/m)	Limits dB (μV/m)	Margin (dB)	Remark
Horizontal	36.79	14.61	14.57	0.85	--	30.03	40.00	9.97	QP
	61.04	20.98	9.21	1.21	--	31.40	40.00	8.60	
	206.54	19.32	10.04	2.45	--	31.81	43.50	11.69	
	281.23	17.19	13.17	2.70	--	33.06	46.00	12.94	
	395.69	13.68	16.20	2.98	--	32.86	46.00	13.14	
	494.63	13.21	17.53	3.25	--	33.99	46.00	12.01	
	1475.00	44.00	26.93	4.55	36.35	39.13	74.00	34.87	PK
	2415.00	38.96	29.30	5.39	35.49	38.16	74.00	35.84	
	3175.00	37.93	31.97	6.30	35.24	40.96	74.00	33.04	
	3765.00	36.73	32.78	7.23	35.13	41.61	74.00	32.39	
Vertical	30.00	1.54	18.30	0.80	--	20.64	40.00	19.36	QP
	61.04	9.49	9.21	1.21	--	19.91	40.00	20.09	
	94.99	6.71	11.18	1.80	--	19.69	43.50	23.81	
	201.69	14.57	9.87	2.43	--	26.87	43.50	16.63	
	281.23	19.14	13.17	2.70	--	35.01	46.00	10.99	
	395.69	11.10	16.20	2.98	--	30.28	46.00	15.72	
	1815.00	46.41	27.27	4.61	35.79	42.50	74.00	31.50	PK
	2615.00	36.26	30.15	5.60	35.42	36.59	74.00	37.41	
	3405.00	35.08	32.07	6.80	35.19	38.76	74.00	35.24	
	3980.00	34.04	33.25	7.47	35.10	39.66	74.00	34.34	

TEST ENGINEER: RAVEN JIN

EUT : GPON SFU Temperature : 18℃

Model No. : 7281G Humidity : 47%RH

Test Mode : 802.11n HT40
Transmitting Ch09 Date of Test : Jan 22 - 23, 2013

Polarization	Frequency (MHz)	Meter Reading dB (μV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Emission Level dB (μV/m)	Limits dB (μV/m)	Margin (dB)	Remark
Horizontal	30.00	10.79	18.30	0.80	--	29.89	40.00	10.11	QP
	38.73	14.05	13.40	0.86	--	28.31	40.00	11.69	
	65.89	23.83	9.55	1.32	--	34.70	40.00	5.30	
	221.09	19.11	10.68	2.51	--	32.30	46.00	13.70	
	281.23	18.84	13.17	2.70	--	34.71	46.00	11.29	
	431.58	16.88	16.72	3.08	--	36.68	46.00	9.32	
	2260.00	47.52	28.63	5.18	35.53	45.80	74.00	28.20	PK
	3090.00	44.88	31.94	6.21	35.27	47.76	74.00	26.24	
	3640.00	46.01	32.45	7.14	35.15	50.45	74.00	23.55	
	4105.00	44.79	33.41	7.56	35.09	50.67	74.00	23.33	
Vertical	33.88	4.15	16.26	0.83	--	21.24	40.00	18.76	QP
	65.89	16.57	9.55	1.32	--	27.44	40.00	12.56	
	109.54	13.17	11.19	1.93	--	26.29	43.50	17.21	
	169.68	18.35	10.11	2.32	--	30.78	43.50	12.72	
	201.69	16.25	9.87	2.43	--	28.55	43.50	14.95	
	281.23	19.30	13.17	2.70	--	35.17	46.00	10.83	
	1815.00	48.69	27.27	4.61	35.79	44.78	74.00	29.22	PK
	3660.00	34.69	32.50	7.14	35.15	39.18	74.00	34.82	
	4770.00	32.09	35.50	8.01	35.02	40.58	74.00	33.42	
	5935.00	31.47	36.41	9.04	34.90	42.02	74.00	31.98	

TEST ENGINEER: RAVEN JIN

Band edge using conducted measurement:

Note – The additional radiated test was performed to prove that the cabinet emissions (transmit antenna be replaced with a termination) also meets the requirement which according to 10.2.2.3 Radiated Spurious Emissions Measurement.

Cabinet Emission (Radiated with antenna terminated):

Polarization	Frequency (MHz)	Meter Reading dB (μV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Emission Level dB (μV/m)	Limits dB (μV/m)	Margin (dB)	Remark
Horizontal	2390.00	50.40	27.23	4.58	35.86	46.35	74.00	27.65	PK
	2483.50	48.24	29.40	5.39	35.48	47.55	74.00	26.45	
	2390.00	38.40	27.23	4.58	35.86	34.35	54.00	19.65	AV
	2483.50	37.24	29.40	5.39	35.48	36.55	54.00	17.45	
Vertical	2390.00	47.59	29.00	5.27	35.51	46.35	74.00	27.65	PK
	2483.50	46.02	31.40	5.90	35.33	47.99	74.00	26.01	
	2390.00	34.59	29.00	5.27	35.51	33.35	54.00	20.65	AV
	2483.50	35.02	31.40	5.90	35.33	36.99	54.00	17.01	

4 MAXIMUM PEAK OUTPUT POWER MEASUREMENT

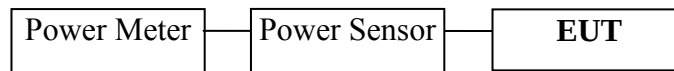
4.1 Test Equipment

The following test equipment was used during the maximum peak output power measurement:

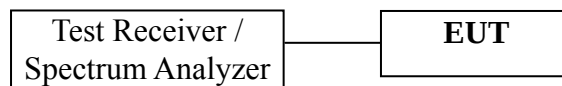
Item	Type	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
1.	Power Meter	Anritsu	ML2487A	6K00003245	Mar 22, 2012	Mar 22, 2013
2.	Power Sensor	Anritsu	MA2491A	32489	Mar 22, 2012	Mar 22, 2013
3.	Test Receiver	R&S	ESCI	101303	Sep 11, 2012	Sep 11, 2013

4.2 Block Diagram of Test Setup

For 802.11b/g/n HT20



For 802.11n HT40



4.3 Specification Limits ((§15.247(b)(3))

The Limits of maximum Peak Output Power for digital modulation in 2400-2483.5 MHz is: 1 Watt. (30 dBm)

4.4 Operating Condition of EUT

The test program “MP_TEST” was used to enable the EUT to transmit data at different channel frequency individually.

4.5 Test Procedure

This is an RF conducted test.

For 802.11b/g/n HT20:

Use a direct connection between the antenna port of the transmitter and the power meter, through suitable attenuation. We use Power Output Option 1 (which defined in KDB558074) to measure the power output. Power Output Option 1 is a peak measurement. The transmitter output was connected to the power meter that was designed to detect peak value automatically.

Note: The bandwidth of the power meter is 20MHz.

For 802.11n HT40:

The transmitter output was connected to the Test Receiver. The Test Receiver was set as RBW = 10MHz (maximum available), VBW = 10MHz (maximum available setting (must be $\geq$ RBW)), span to fully encompass the DTS bandwidth. Use the Test Receiver’s band power measurement function with the band limits set equal to the DTS bandwidth edges.

The test procedure is defined in KDB558074 v02:2012 (the 8.1.2 Measurement Procedure “Option 2 (channel integration method)” was used).

4.6 Test Results

PASSED. All the test results are listed below.

(Test Date: Jan. 23, 2013 Temperature: 21℃ Humidity: 55 %)

ANT1

Modulation	Channel	Frequency	Peak Output Power	Limit
802.11b	01	2412 MHz	20.01 dBm	30 dBm
	06	2437 MHz	21.03 dBm	30 dBm
	11	2462 MHz	21.33 dBm	30 dBm
802.11g	01	2412 MHz	21.54 dBm	30 dBm
	06	2437 MHz	21.87 dBm	30 dBm
	11	2462 MHz	21.56 dBm	30 dBm

ANT2

Modulation	Channel	Frequency	Peak Output Power	Limit
802.11b	01	2412 MHz	18.01 dBm	30 dBm
	06	2437 MHz	17.93 dBm	30 dBm
	11	2462 MHz	18.24 dBm	30 dBm
802.11g	01	2412 MHz	19.77 dBm	30 dBm
	06	2437 MHz	19.32 dBm	30 dBm
	11	2462 MHz	19.76 dBm	30 dBm

802.11n

Modulation	Channel	Frequency	Peak Output Power ANT1	Peak Output Power ANT2	Total Peak Output Power	Limit
802.11n HT20	01	2412 MHz	21.54 dBm	18.89 dBm	23.42 dBm	30 dBm
	06	2437 MHz	21.78 dBm	18.94 dBm	23.60 dBm	30 dBm
	11	2462 MHz	21.33 dBm	19.55 dBm	23.54 dBm	30 dBm
802.11n HT40	03	2422 MHz	20.87 dBm	18.56 dBm	22.88 dBm	30 dBm
	06	2437 MHz	21.94 dBm	17.23 dBm	23.20 dBm	30 dBm
	09	2452 MHz	22.21 dBm	17.19 dBm	23.40 dBm	30 dBm

5 DEVIATION TO TEST SPECIFICATIONS

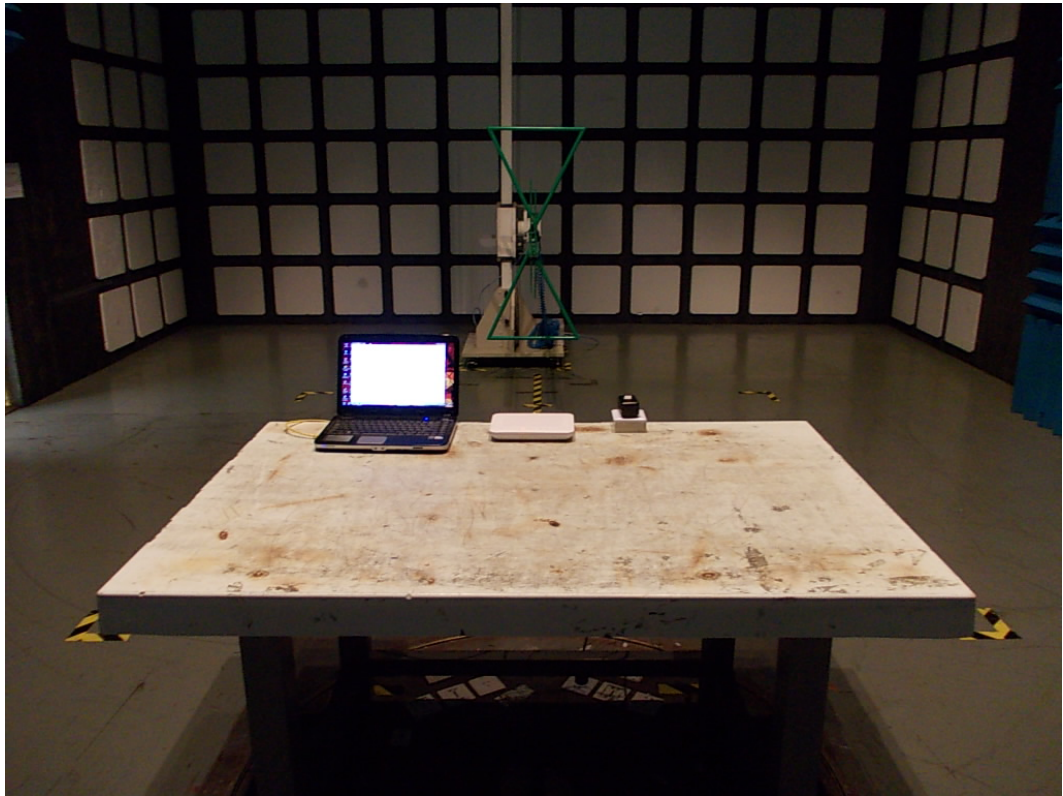
None.

APPENDIX I

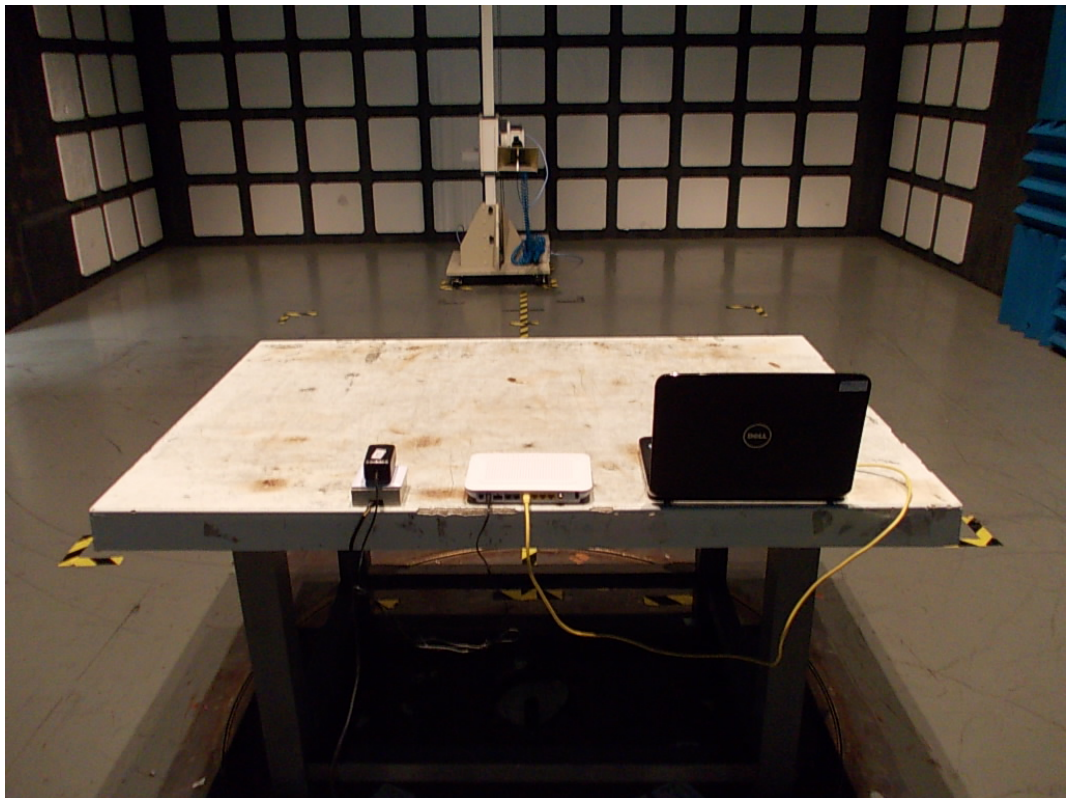
PHOTOGRAPHS OF TEST

Test Set-Up Photos

1. Radiated Electromagnetic Emission Test



*FRONT VIEW OF RADIATED EMISSION TEST
(BELOW 1GHz)*



*BACK VIEW OF RADIATED EMISSION TEST
(ABOVE 1GHz)*

2. RF Test



APPENDIX II

PHOTOGRAPHS OF EUT

FIGURE 1
GPON SFU (M/N: 7281G)
GENERAL APPEARANCE (FRONT VIEW)

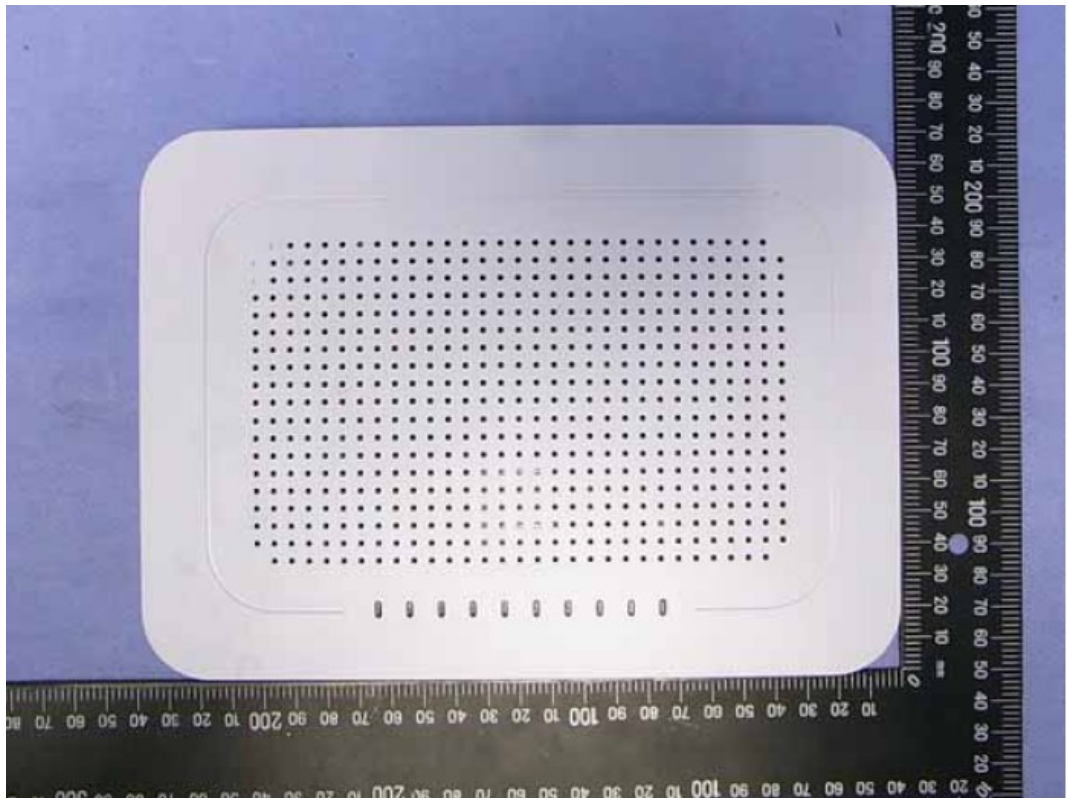


FIGURE 2
GPON SFU (M/N: 7281G)
GENERAL APPEARANCE (BACK VIEW)



FIGURE 3
GPON SFU (M/N: 7281G)
PORTS



FIGURE 4
GPON SFU (M/N: 7281G)
COVER REMOVED



FIGURE 5
GPON SFU (M/N: 7281G)
MAIN BOARD (COMPONENT SIDE)

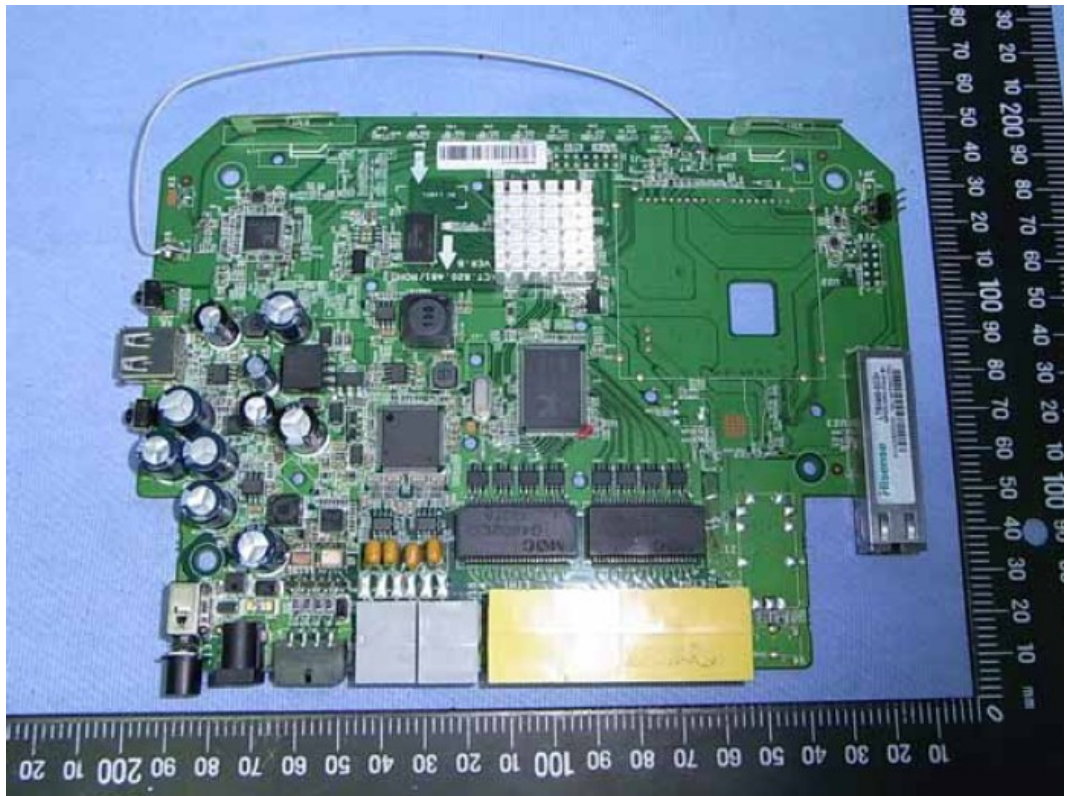


FIGURE 6
GPON SFU (M/N: 7281G)
MAIN BOARD (SOLDERED SIDE)



FIGURE 7
GPON SFU (M/N: 7281G)
CHIPS AND CRYSTAL ON MAIN BOARD

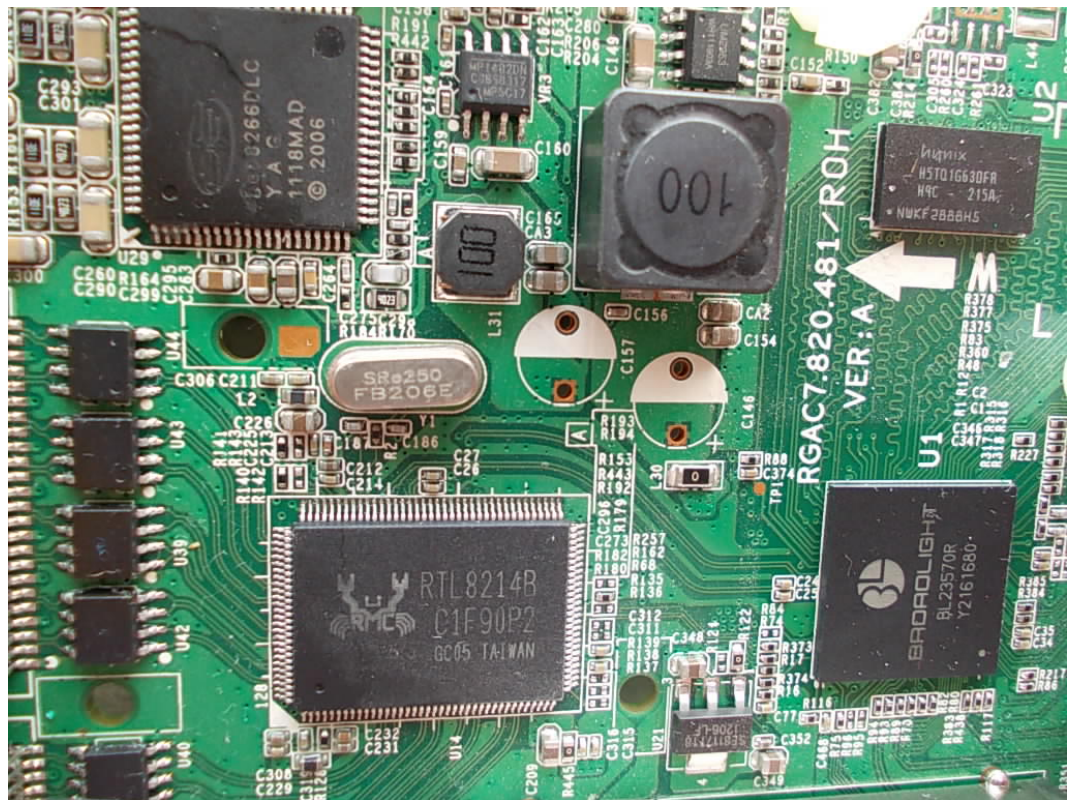


FIGURE 8
GPON SFU (M/N: 7281G)
RF PART

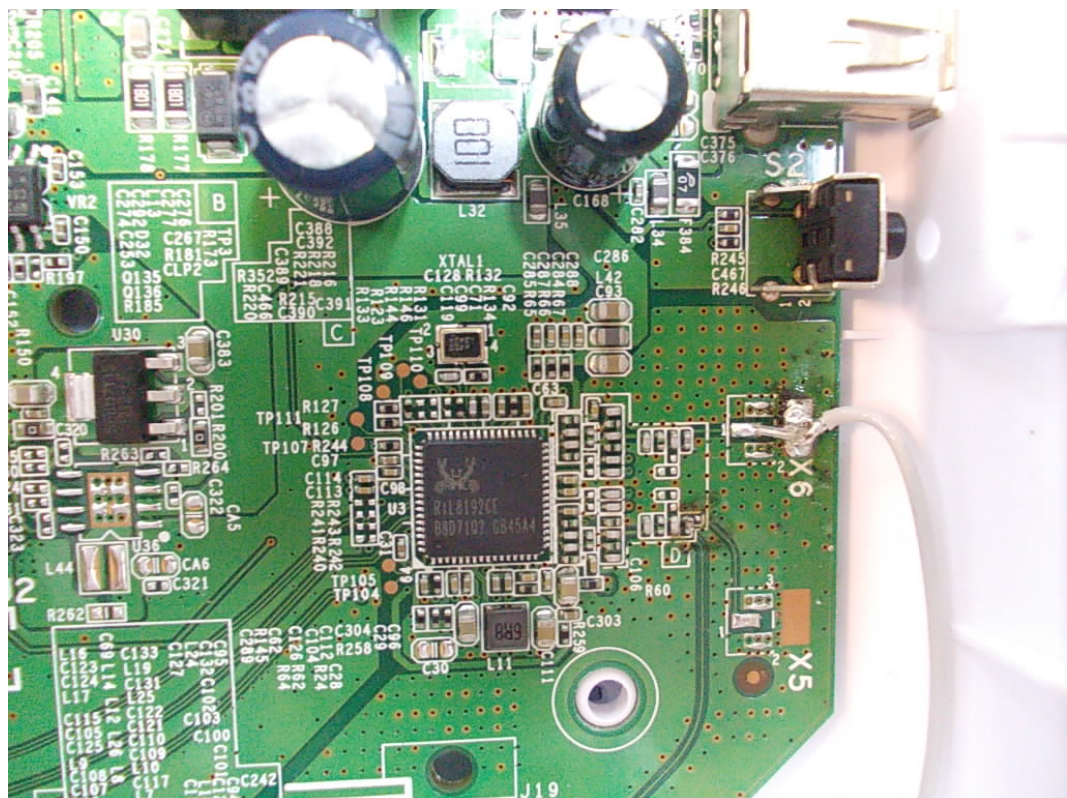


FIGURE 9
GPON SFU (M/N: 7281G)
ANT1

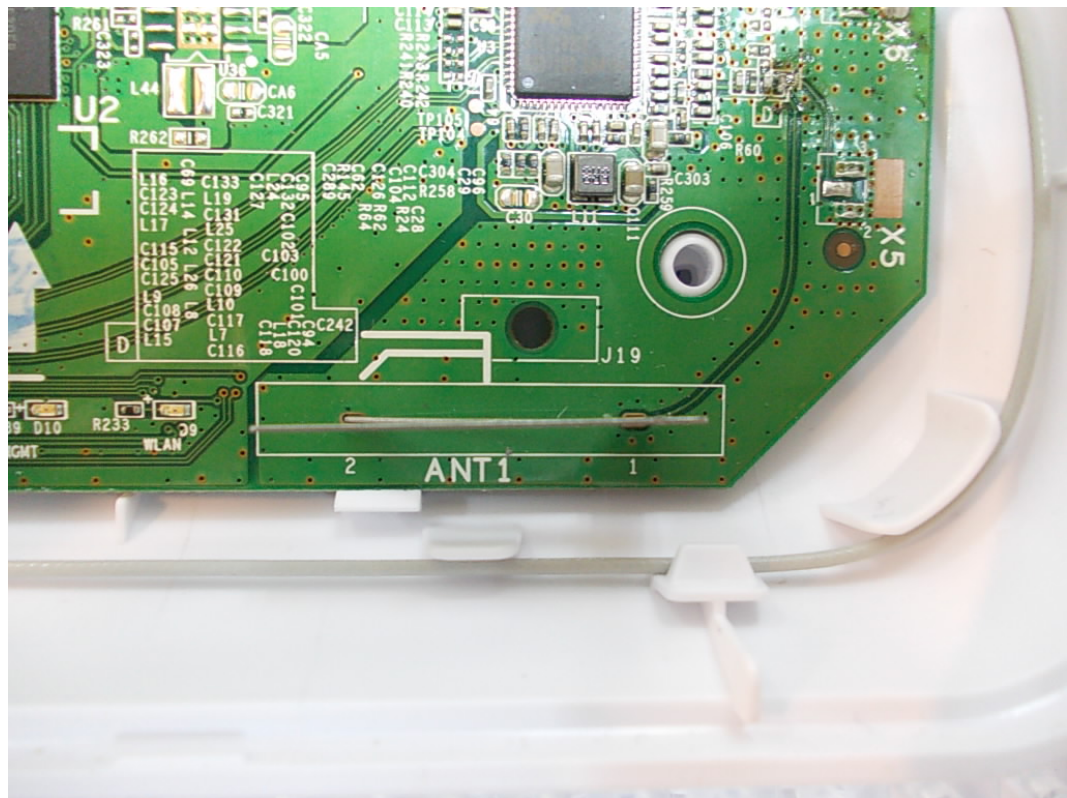


FIGURE 10
GPON SFU (M/N: 7281G)
ANT2

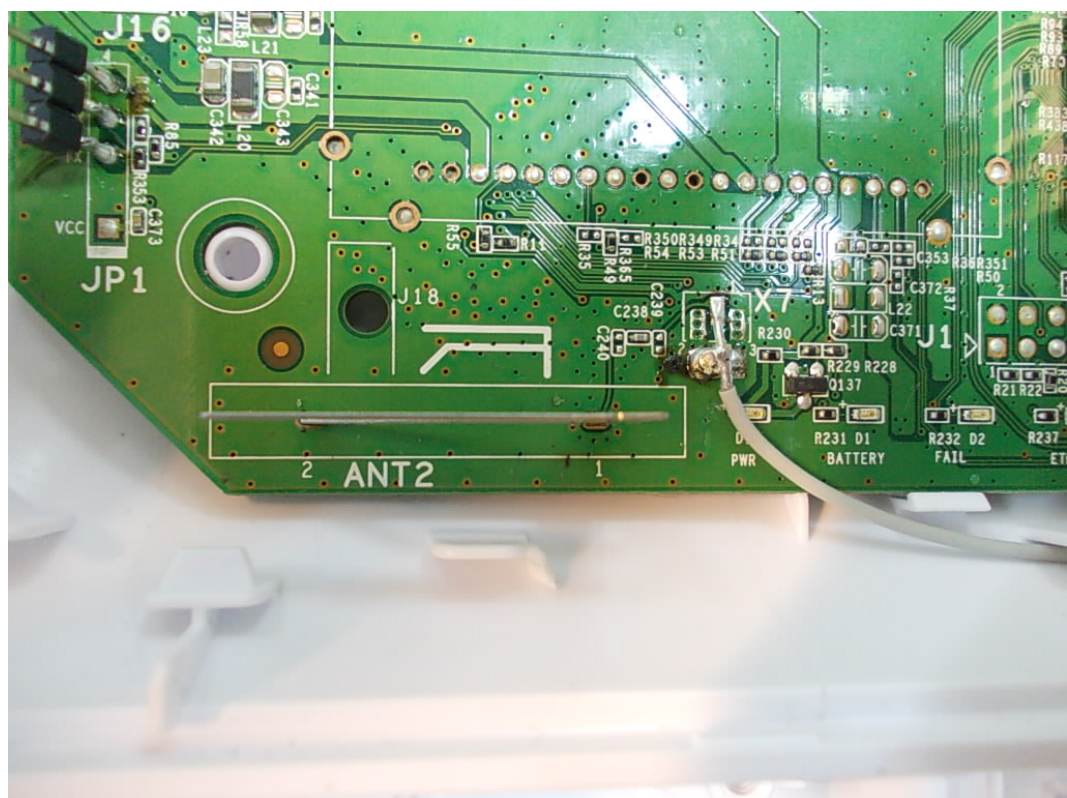


FIGURE 11
GPON SFU (M/N: 7281G)
ADAPTER (FRONT VIEW)



FIGURE 12
GPON SFU (M/N: 7281G)
ADAPTER (BACK VIEW)



FIGURE 13
GPON SFU (M/N: 7281G)
ADAPTER (LABEL)

