Certificate No.: CB10204115

FCC Radio Test Report

EQUIPMEN	:	Speed Radar
BRAND NAME	:	IZZO GOLF
MODEL NO.	:	A75001
FCC ID	:	RO63159860000
STANDARD	:	47 CFR FCC Part 15.245
APPLICANT	:	IZZO GOLF 1635 Commons Pkwy Macedon, NY 14502-9191
MANUFACTURER	:	Tri-Great International LTD No. 4 San Lian Road, Ping Shan District, Tang Xia Town, Dong Guan City, Guang Dong Province, China

The product sample received on Mar. 22, 2013 and completely tested on Apr. 09, 2013. We, SPORTON, would like to declare that the tested sample has been evaluated in accordance with the procedures given in ANSI C63.10-2009 and shown compliance with the applicable technical standards.

The test results in this report apply exclusively to the tested model / sample. Without written approval of SPORTON INTERNATIONAL INC., the test report shall not be reproduced except in full.

Reviewed by: Sam Chen

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SUMMARY OF TEST RESULT

FCC Standard Requirements and Conformance Test Specifications				
Report Clause	**Ref. Std. Clause**	**Description**	**Result**	**Remark**
-	15.207	AC Power Conducted Emissions	-	-
3.1	15.215(c)	Occupied Bandwidth	Complied	-
3.2	15.245(b)	Field Strength of Fundamental	Complied	-
3.3	15.245(b)	Transmitter Spurious Emissions	Complied	-
3.4	15.203	Antenna Requirements	Complied	-

Note: The EUT is a DC-powered (AA Battery) equipment; it's not necessary to apply for AC Power Line Conducted Emissions test.

REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FR332924-01	Rev. 01	Initial issue of report	Apr. 26, 2013

1 General Description

1.1 Information

1.1.1 Operating Frequency Range(s)

Operating Frequency Range(s)	
Range 1:	☐ 902 – 928 MHz
Range 2:	☐ 2435 – 2465 MHz
Range 3:	☐ 5785 – 5815 MHz
Range 4:	☒ 10.5 – 10.55 GHz
Range 5:	☐ 24.075 – 24.175 GHz

1.1.2 The Channel Plan(s)

The Channel Plan(s)	
Channel Plan 1:	10.5 – 10.55 GHz Band
Nominal Channel Bandwidth 1:	5 MHz, 10.525 GHz
Channel Plan 2:	N/A
Nominal Channel Bandwidth 2:	N/A

1.1.3 Transmit Operating Modes

The Different Transmit Operating Modes
☒ Operating mode 1: Single Antenna Equipment
☐ Operating mode 2: Smart Antenna Systems - without beam forming
☐ Operating mode 3: Smart Antenna Systems - with beam forming

1.1.4 Smart Antenna Systems

In Case of Smart Antenna Systems		
Smart Antenna Systems:	N/A	
The number of Receive chains:	N/A	
The number of Transmit chains:	N/A	
Equal power distribution among the transmit chains:	☐ Yes ☒ No	
☐ In case of beam forming, the maximum beam forming gain:		dB

1.1.5 Antenna Information

Antenna Information	
☐ Equipment placed on the market without antennas	
☒ Integral antenna (Antenna permanently attached)	
Integral antenna gain:	5 dBi
	☐ Temporary RF connector provided
	☒ No temporary RF connector provided
☐ External antenna (dedicated antennas)	
	☐ Single power level with corresponding antenna(s)
	☐ Multiple power settings and corresponding antenna(s)
	☐ Professional Install
	☐ Unique antenna connector
	☐ BIOS lock.
NOTE: EUT antenna complied with FCC 15.203, antenna requirements.	

1.1.6 Type of Equipment

Type of Equipment
☒ Stand-alone
☐ Combined Equipment (The radio part is fully integrated within another type of equipment)
☐ Plug-in radio device (Equipment intended for a variety of host systems)
☐ Other:

1.1.7 Transmit Power Control (TPC)

Worst Power Levels for TPC Range 1 (Integrated Antenna)								
Applicable power levels:	☐ Conducted ☐ EIRP ☒ Field Strength at 3m							
Integral antenna gain:	5 dBi							
Channel Plan:	1							
Nominal Channel Bandwidth:	1							
Operating Mode # & Frequency (GHz)		Highest setting (P_{high}): (dBuV/m)						
		Power Setting	Modulation	Data Rate (Mb/s)	Average Level	Peak Level	Average Level Limit	Peak Level Limit
#1	10.525	N/A	CW	N/A	112.89	113.05	128	148

1.2 Additional Information Provided by the Submitter

1.2.1 Modulation

Modulation		
ITU Class of emission - Mode 1	CW	
Can the transmitter operate un-modulated:	☒ Yes	☐ No

1.2.2 Duty Cycle

Duty Cycle		
The transmitter is intended for:	☒ Continuous Duty	100 %
	☐ Intermittent Duty:	%
	☐ Continuous operation possible for testing purposes	

1.2.3 About the EUT

About the EUT	
☒	The equipment submitted are representative production models.
☐	If not, the equipment submitted are pre-production models
☐	If pre-production equipment is submitted, the final production equipment will be identical in all respects with the equipment tested.
☐	If not, supply full details:

1.3 Ancillary and/or Support Equipment

N/A

1.4 EUT Setups

For the purposes of this test report, EUT's ancillary equipment (AE) or testing support equipment (SE) is defined as equipment which is used in conjunction with the EUT to provide operational and control features to the EUT. It is necessary to configure the system in a typical fashion, as a customer would normally use it. But nevertheless EUT's ancillary equipment (AE) or testing support equipment (SE) could possible influence the test results. EUT setups describe the combination of EUT's and EUT's ancillary equipment (AE) or testing support equipment (SE) used for testing.

Description
Transmitter Spurious Emissions

1.5 Testing Applied Standards

According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standards:

- 47 CFR FCC Part 15.245
- ANSI C63.10-2009

1.6 Testing Location

Testing Location					
☐	HWA YA	ADD : No. 52, Hwa Ya 1st Rd., Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C. TEL : 886-3-327-3456 FAX : 886-3-318-0055			
☒	JHUBEI	ADD : No.8, Lane 724, Bo-ai St., Jhubei City, HsinChu County 302, Taiwan, R.O.C. TEL : 886-3-656-9065 FAX : 886-3-656-9085			
Test Condition		**Test Site No.**	**Test Engineer**	**Test Environment**	**Test Date**
Radiated Emission		03CH01-CB	Serway Li	22°C / 63%	23-Mar-13 ~ 09-Apr-13

2 Test Configuration of Equipment under Test

2.1 Test Channel Frequencies

Nominal Channel Bandwidth 1				
Frequency Band (see note 1)	**Channel Plan** (see note 2)	**Low Channel**	**Middle Channel**	**High Channel**
10.5 – 10.55 GHz	1	N/A	10.525 GHz	N/A
NOTE 1: see test report clause 1.1.1. NOTE 2: see test report clause 1.1.2.				

2.2 Conformance Tests and Related Test Frequencies

Test	**Test Frequencies (GHz)**
	Channel Plan 1 (10.5 GHz to 10.55 GHz)
AC Power Conducted Emissions	10.525
Emission Bandwidth	10.525
Field Strength of Fundamental	10.525
Transmitter Spurious Emissions	10.525
Note1: The centre frequency of the lowest declared channel for every declared nominal bandwidth within this band. Note2: The centre frequency of the middle declared channel for every declared nominal bandwidth within this band. Note3: The centre frequency of the highest declared channel for every declared nominal bandwidth within this band.	

3 Transmitter Test Result

3.1 Occupied Bandwidth

3.1.1 Limit of Occupied Bandwidth

20dB Bandwidth (see Note 1)	None
99% Occupied Bandwidth (see Note 2)	None
NOTE 1: Refer as FCC 15.215(c). Ensure that the 20 dB occupied bandwidth shall be fall in the specified operating frequency range. NOTE 2: The 99% occupied bandwidth is the frequency bandwidth of the signal power at the 99% channel power of occupied bandwidth when resolution bandwidth should be approximately 1 % to 5 % of the occupied bandwidth (OBW). These measurements shall also be performed at normal test conditions.	

3.1.2 Measuring Instruments

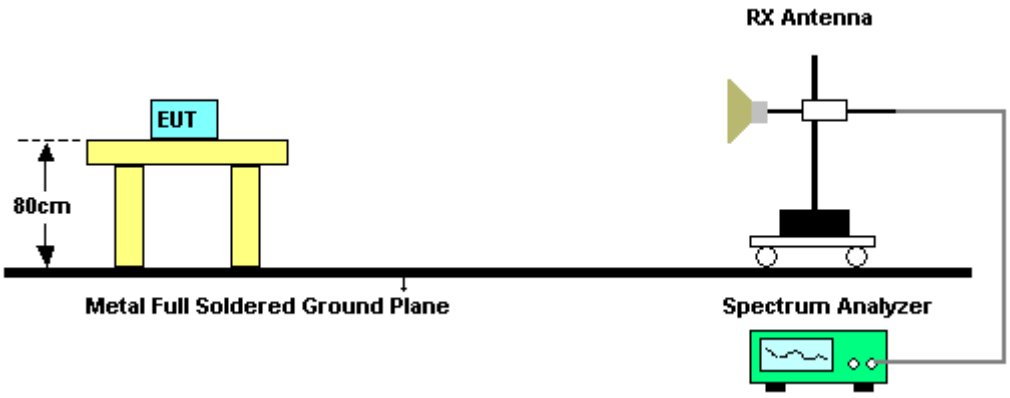
Refer a measuring instruments list in this test report.

3.1.3 Test Procedures

Method of measurement: Refer as ANSI C63.10-2009, clauses 6.6 and 6.9.1.

3.1.4 Test Setup

Occupied Bandwidth



3.1.5 Test Result of Occupied Bandwidth

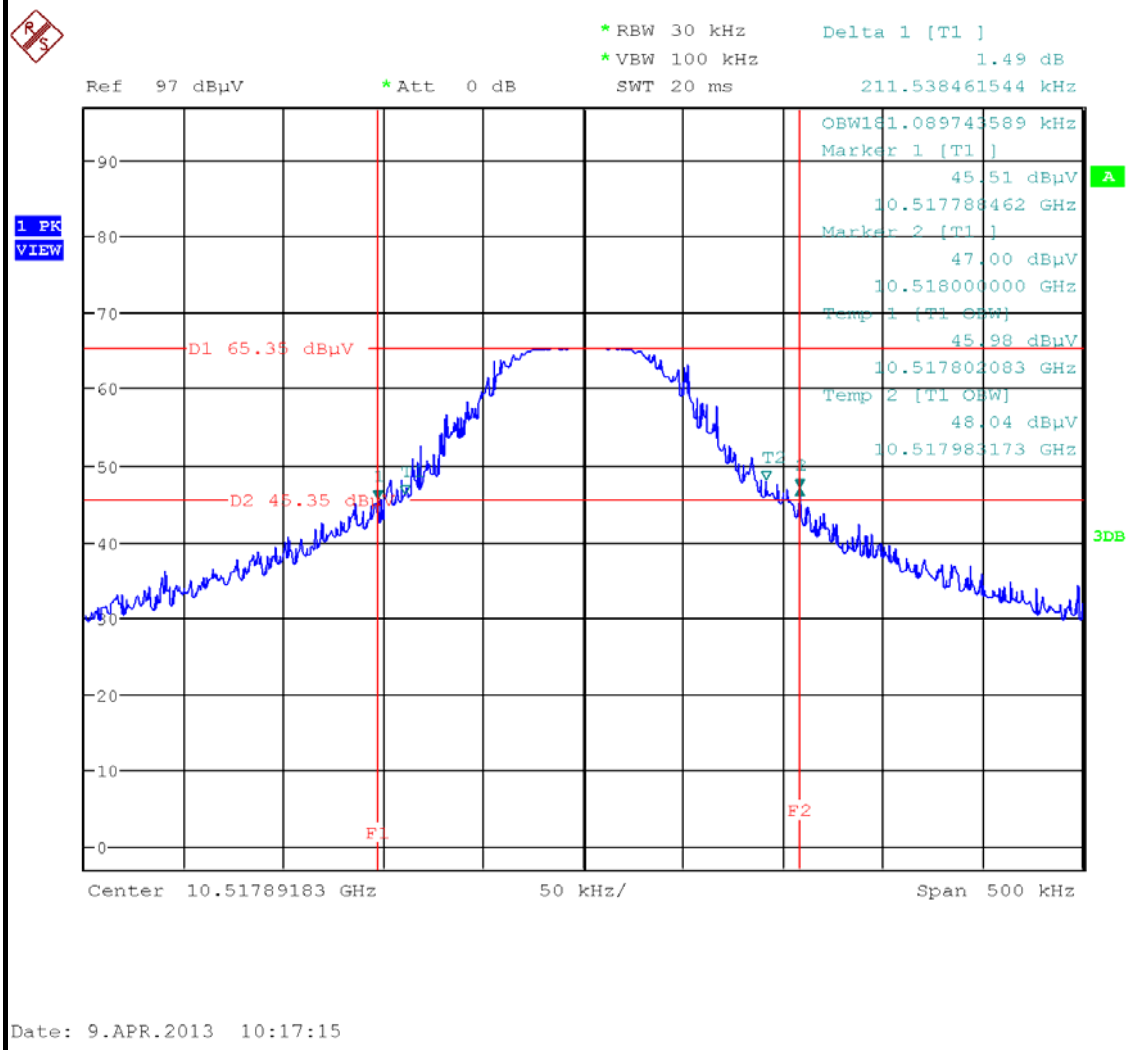
Test Conditions:	see ANSI C63.10, clause 5.11		
Test Setup:	see ANSI C63.10, clause 6.6		
Frequency Band:	10.5 – 10.55 GHz Band		
TPC Range:	1 (see test report clause 1.1.7)		
Operating Mode #:	1	**Nominal Channel Bandwidth #:**	1
NOTE: If equipment having different transmit operating modes (see test report clause 1.1.3), the measurements are uninfluenced by different transmit operating modes, may not need to be repeated for all the operating modes. Similar, if the equipment supports different modulations and/or data rates, the measurements described in ANSI C63.10, clause 5.12 may not need to be repeated for all these modulations and data rates. Simple comparison of engineering test across all operating modes, modulations and data rates may need to be performed to define the worse case combination to be used for the conformance testing. Refer as ANSI C63.10, clause 6.9.1, observe and record with plotted graphs or photographs the worst-case (i.e., widest) occupied bandwidth produced by these different modulation sources.			

Operating Mode #:	1 (see test report clause 1.1.3)
Worse case modulation for this operating mode:	CW
Worse case data rate for this operating mode:	N/A
Number of transmit chains present:	1
Number of active transmit chains in this mode:	1

10.5 – 10.55 GHz Band					
Test Conditions:	see ANSI C63.10, clause 5.12		**Operating Mode #:**	1	
Test Engineer:	Serway Li		**Nominal Channel Bandwidth #:**	1	
Duty Cycle:	100 %	**Test Results**			
Rel. Humidity:	22 %	**20dB Bandwidth (KHz)**	**99% Bandwidth (KHz)**	**Frequency range (GHz) f_L＞10.5 GHz**	**Frequency range (GHz) f_H＜10.55 GHz**
Ambient Temp.:	63 °C				
Test Frequency: (GHz)					
10.525		211.538	181.09	10.525648	10.52592
Measurement uncertainty:		±8.5×10^{-8} Hz			

3.1.5.1 Occupied Bandwidth Plots

Occupied Bandwidth



3.2 Field Strength of Fundamental

3.2.1 Limit of Field Strength of Fundamental

Frequencies (MHz)	Field Strength (mV/meter)	Field Strength (dB£gV/m) at 3m
902~928 MHz	500 at 3m	114 (Average)
902~928 MHz	5000 at 3m	134 (Peak)
2435~2465MHz	500 at 3m	114 (Average)
2435~2465MHz	5000 at 3m	134 (Peak)
5785~5815 MHz	500 at 3m	114 (Average)
5785~5815 MHz	5000 at 3m	134 (Peak)
10.5~10.55 GHz	2500 at 3m	128 (Average)
10.5~10.55 GHz	25000 at 3m	148 (Peak)
24.075~24.175 GHz	2500 at 3m	128 (Average)
24.075~24.175 GHz	25000 at 3m	148 (Peak)
NOTE: For the applicable limit, see FCC 15.245(b)		

3.2.2 Measuring Instruments

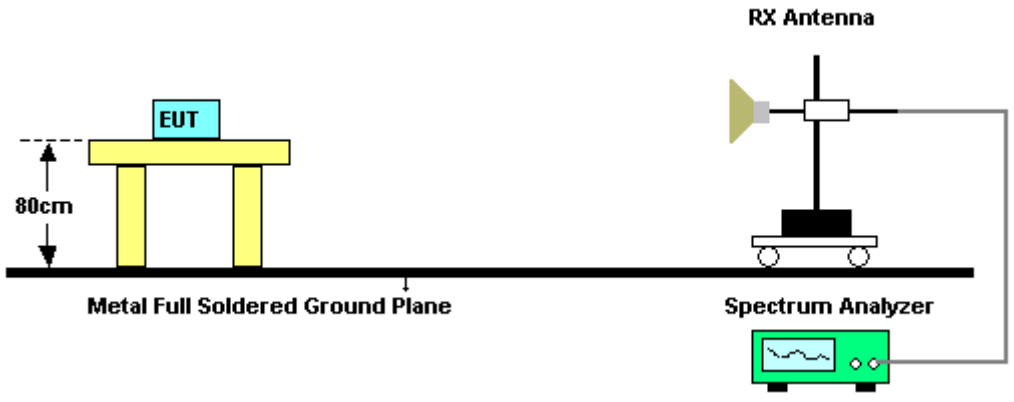
Refer a measuring instruments list in this test report.

3.2.3 Test Procedures

Method of measurement: Refer as ANSI C63.10-2009, clause 6.6.

3.2.4 Test Setup

Field Strength of Fundamental



3.2.5 Test Result of Field Strength of Fundamental

Test Conditions:	see ANSI C63.10, clause 5.11		
Test Setup:	see ANSI C63.10, clause 6.6		
Frequency Band:	10.5 – 10.55 GHz Band		
TPC Range:	1 (see test report clause 1.1.7)		
Operating Mode #:	1	**Nominal Channel Bandwidth #:**	1
NOTE: If the equipment supports different modulations and/or data rates, the measurements described in ANSI C63.10, clause 5.12 may not need to be repeated for all these modulations and data rates. Simple comparison of engineering test across all operating modes, modulations and data rates may need to be performed to define the worse case combination to be used for the conformance testing.			

3.2.5.1 TPC Range 1

TPC range:	1 (see test report clause 1.1.7)
NOTE: Conformance tests have to be performed over the frequency range(s) that has been declared with this TPC range (see test report clause 1.1.7) and using the antenna gain of the antenna with the highest gain among those that have been declared with this TPC range. For smart antenna systems, the antenna beam forming gain may have to be taken into account as well.	

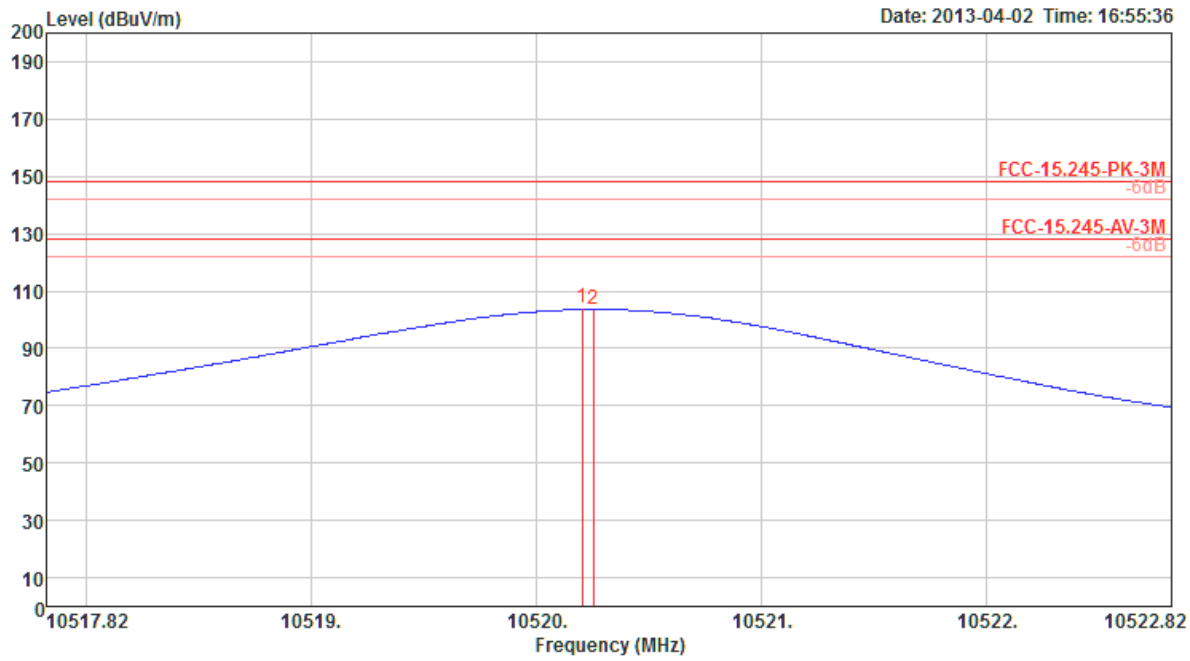
3.2.5.1.1 Operating Mode 1

Operating Mode #:	1 (see test report clause 1.1.3)
Worse case modulation for this operating mode:	CW
Worse case data rate for this operating mode:	N/A
Number of transmit chains present:	1
Number of active transmit chains in this mode:	1

3.2.5.1.1.1 Test Result of Field Strength of Fundamental

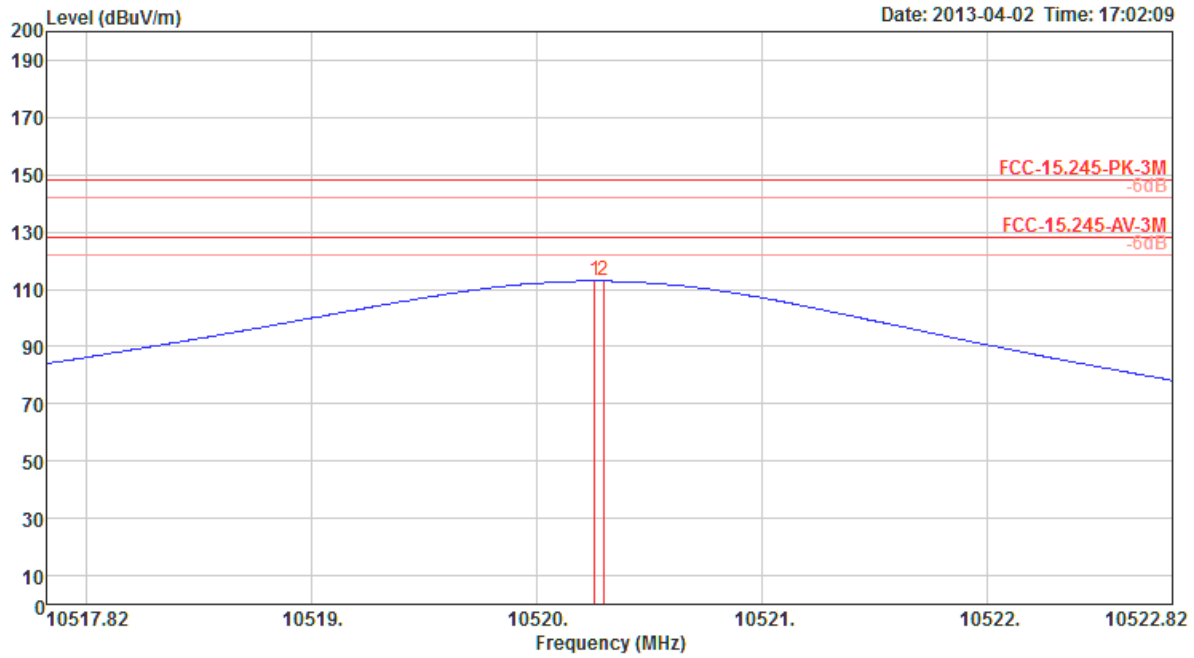
10.5 – 10.55 GHz Band							
Maximum Antenna Gain: 5 dBi							
TPC Range: 1				**Operating Mode #:** 1			
Test Engineer: Serway Li				**Nominal Channel Bandwidth #:** 1			
Duty Cycle: 100 %		**Test Results**					
Duty Factor: 0 dB		**Field Strength (dBuV/m)** (note 1)		**Field Strength Limit (dBm)**		**Margin (dB)**	
Rel. Humidity: 63 %							
Test Distance: 3 m							
Test Frequency: (GHz)		AV	Peak	AV	Peak	AV	Peak
10.525		112.89	113.05	128	148	-15.11	-34.95
Measurement uncertainty: ±2.7 DB							
NOTE 1: If EUT is the pulsed transmitters, the average value shall be considered the peak value plus the duty cycle factor using as following as equation: Average = Peak + 20 log (Duty Cycle).							
NOTE 2: For the applicable limit, see FCC 15.255(b)							
NOTE 3: AV is average EIRP power.							

TPC range:	1			**Operating Mode #:**	1
Test Engineer:	Serway Li			**Nominal Channel Bandwidth #:**	1
Duty Cycle:	100	%	**Field Strength of Fundamental Plots**		
Rel. Humidity:	63	%	**Polarization:**	Vertical	
Ambient Temp.:	22	°C	**Test Distance:**	3 m	
Test Frequency:	10.525	GHz			



	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Antenna Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m		deg	cm	
1 p	10520.20	104.04	148.00	-43.96	58.91	6.63	0.00	38.50	Peak	277	161	VERTICAL
2 a	10520.25	103.58	128.00	-24.42	58.45	6.63	0.00	38.50	Average	277	161	VERTICAL

TPC range:	1			**Operating Mode #:**	1
Test Engineer:	Serway Li			**Nominal Channel Bandwidth #:**	1
Duty Cycle:	100	%	**Field Strength of Fundamental Plots**		
Rel. Humidity:	63	%	**Polarization:**	Horizontal	
Ambient Temp.:	22	°C	**Test Distance:**	3 m	
Test Frequency: ,	10.525	GHz			



	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Antenna Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m		deg	cm	
1 a	10520.25	112.89	128.00	-15.11	67.76	6.63	0.00	38.50	Average	319	141	HORIZONTAL
2 p	10520.29	113.05	148.00	-34.95	67.92	6.63	0.00	38.50	Peak	319	141	HORIZONTAL

3.3 Transmitter Spurious Emissions

3.3.1 Limit of Transmitter Spurious Emissions

Transmitter Spurious Emissions	
1.	902 - 928MHz, Field disturbance sensors
♦	Harmonic emissions in the restricted bands: FCC 15.209 limit
♦	Harmonic emissions in the non-restricted bands: 1.6mV/m
♦	Except harmonic emissions, spurious emissions: FCC 15.209 limit or 50 dB below the fundamental, whichever is the lesser attenuation.
2.	2435 - 2465MHz, 5785 - 5815MHz, Field disturbance sensors
♦	Harmonic emissions in the restricted bands at and below 17.7 GHz: FCC 15.209 limit
♦	Harmonic emissions in the restricted bands at and above 17.7 GHz: 7.5mV/m
♦	Harmonic emissions in the non-restricted bands: 1.6mV/m
♦	Except harmonic emissions, spurious emissions: FCC 15.209 limit or 50 dB below the fundamental, whichever is the lesser attenuation.
3.	10500 – 10550MHz, Field disturbance sensors
♦	Harmonic emissions in the restricted bands at and above 17.7 GHz: 7.5mV/m
♦	Harmonic emissions in the non-restricted bands: 25mV/m
♦	Except harmonic emissions, spurious emissions: FCC 15.209 limit or 50 dB below the fundamental, whichever is the lesser attenuation.
4.	24075-24175 MHz, Field disturbance sensors
♦	Second and third harmonics: 25 mV/m
♦	Except harmonic emissions, spurious emissions: FCC 15.209 limit or 50 dB below the fundamental, whichever is the lesser attenuation.

3.3.2 Measuring Instruments

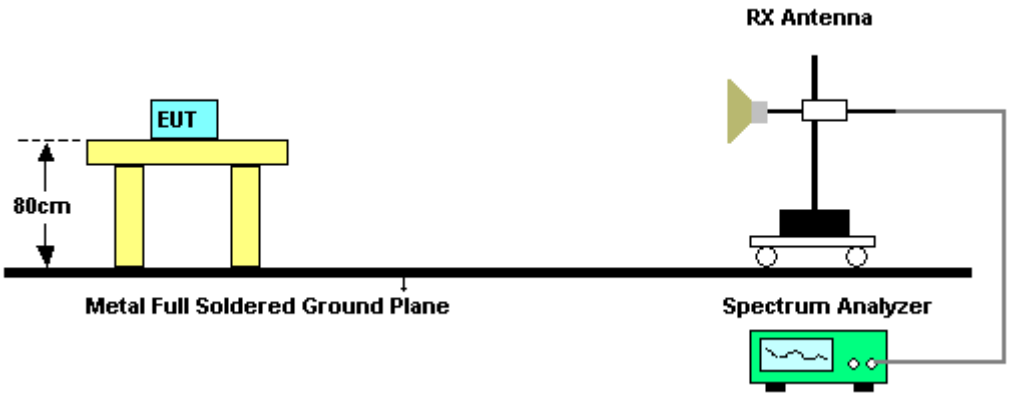
Refer a measuring instruments list in this test report.

3.3.3 Test Procedures

Method of measurement: Refer as ANSI C63.10-2009, clauses 6.3, 6.4, 6.5, 6.6 and 7.8.6.

3.3.4 Test Setup

Transmitter Spurious Emissions



A measuring distance of at 3 m shall be used for measurements at frequencies up to 15 GHz. For frequencies above 15 GHz, any suitable measuring distance may be used. The measurement distance is chosen up to far field distance, depending on the test system noise floor for detecting spurious emission signals. Then above 15 GHz shall be extrapolated to the specified distance using an extrapolation factor of 20 dB/decade from spec. distance (3 m) to measurement distance. Distance extrapolation factor = 20 log (spec. distance [3 m] / measurement distance [N m]) (dB) .The measurements described in ANSI C63.10, clause 7.8.6. If the emission cannot be detected at 3m, reduce the RBW to increase system sensitivity. Note the value. If the emission still cannot be detected, move the horn closer to the EUT, noting the distance at which a measurement is made.

3.3.5 Test Result of Transmitter Spurious Emissions

Test Conditions:	see ANSI C63.10, clause 5.11		
Test Setup:	see ANSI C63.10, clauses 6.3, 6.4, 6.5, 6.6 and 7.8.6		
Frequency Band:	10.5 – 10.55 GHz Band		
TPC Range:	1 (see test report clause 1.1.7)		
Operating Mode #:	1	**Nominal Channel Bandwidth #:**	1
NOTE: If equipment having different channel plan and nominal channel bandwidth modes (see test report clause 1.1.2), the measurements are uninfluenced by different channel plan and nominal channel bandwidth modes, may not need to be repeated for all modes.			

3.3.5.1 TPC Range 1

TPC Range:	1 (see test report clause 1.1.7)
NOTE: Conformance tests have to be performed over the frequency range(s) that has been declared with this TPC range (see test report clause 1.1.7) and using the antenna gain of the antenna with the highest gain among those that have been declared with this TPC range. For smart antenna systems, the antenna beam forming gain may have to be taken into account as well.	

3.3.5.1.1 Operating Mode 1

Operating Mode #:	1 (see test report clause 1.1.3)
Worse case modulation for this operating mode:	CW
Worse case data rate for this operating mode:	N/A
Number of transmit chains present:	1
Number of active transmit chains in this mode:	1

3.3.5.1.2 10.5 – 10.55 GHz Band, Test Frequency FX, Radiated Testing

TPC Range:	1			**Operating Mode #:**	1	
Test Engineer:	Serway Li			**Nominal Channel Bandwidth #:**	1	
Duty Cycle:	100	%	**Test Range:**	9 kHz – 30 MHz		
Rel. Humidity:	63	%	**Test Results**			
Ambient Temp.:	22	°C				
Test Frequency:	10.525	GHz				

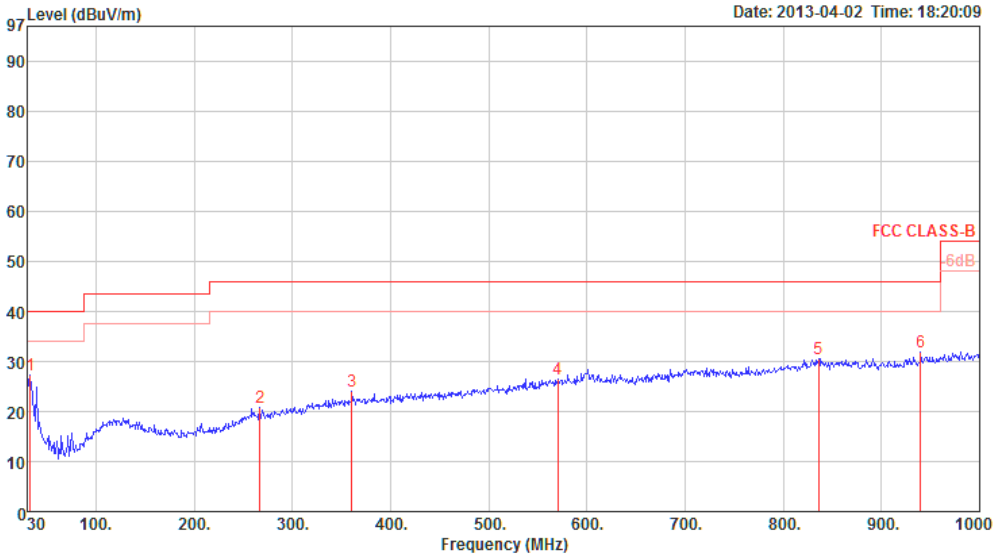
Test Range	Emission Frequency (MHz)	Emission Observed (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
9 kHz - 30 MHz	N/F	N/F	-	-	Peak

Measurement uncertainty: ±2.7 dB

NOTE 1: “>20dB” means the tables in this clause should only list values of spurious emissions that exceed the level of 20 dB below the applicable limit, see ANSI C63.4, clause 10.1.8.2.

NOTE 2: “N/F” means Nothing Found (No spurious emissions were detected.)

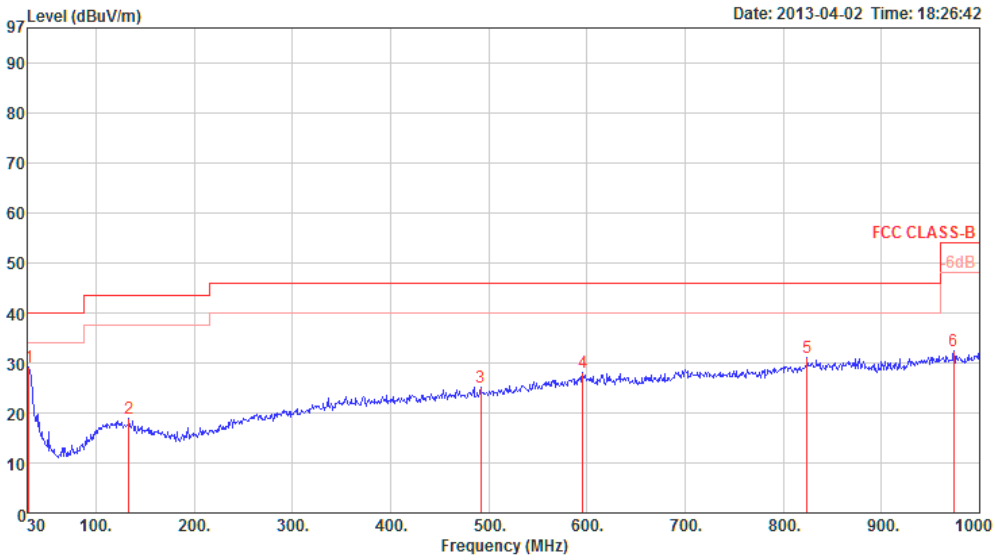
TPC range:	1			**Operating Mode #:**	1
Test Engineer:	Serway Li			**Nominal Channel Bandwidth #:**	1
Duty Cycle:	100	%	**Test Range:**	30 MHz – 1000 MHz	
Rel. Humidity:	63	%	**Polarization:**	Vertical	
Ambient Temp.:	22	°C	**Test Distance:**	3m	
Test Frequency:	10.525	GHz	**Test Results**		



	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Antenna Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m		deg	cm	
1 p	32.91	27.32	40.00	-12.68	36.33	0.88	27.99	18.10	Peak	0	400	VERTICAL
2	266.68	20.81	46.00	-25.19	31.79	2.47	26.91	13.46	Peak	0	400	VERTICAL
3	360.77	23.96	46.00	-22.04	32.71	2.84	27.15	15.56	Peak	0	400	VERTICAL
4	570.29	26.51	46.00	-19.49	31.66	3.62	27.77	19.00	Peak	0	400	VERTICAL
5	836.07	30.61	46.00	-15.39	32.01	4.41	26.90	21.09	Peak	0	400	VERTICAL
6	939.86	31.82	46.00	-14.18	31.77	4.80	26.57	21.82	Peak	0	400	VERTICAL

Measurement uncertainty: ±2.7 dB

TPC range:	1			**Operating Mode #:**	1
Test Engineer:	Serway Li			**Nominal Channel Bandwidth #:**	1
Duty Cycle:	100	%	**Test Range:**	30 MHz – 1000 MHz	
Rel. Humidity:	63	%	**Polarization:**	Horizontal	
Ambient Temp.:	22	°C	**Test Distance:**	3m	
Test Frequency:	10.525	GHz	**Test Results**		



	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Antenna Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m		deg	cm	
1 p	31.94	29.22	40.00	-10.78	37.63	0.87	27.98	18.70	Peak	0	100	HORIZONTAL
2	133.79	18.96	43.50	-24.54	32.35	1.69	27.60	12.52	Peak	0	100	HORIZONTAL
3	491.72	25.19	46.00	-20.81	32.09	3.36	27.92	17.66	Peak	0	100	HORIZONTAL
4	595.51	28.02	46.00	-17.98	32.69	3.71	27.63	19.25	Peak	0	100	HORIZONTAL
5	824.43	30.97	46.00	-15.03	32.47	4.39	26.89	21.00	Peak	0	100	HORIZONTAL
6	973.81	32.50	54.00	-21.50	31.98	4.85	26.37	22.04	Peak	0	100	HORIZONTAL

Measurement uncertainty: ±2.7 dB

TPC Range:	1			**Operating Mode #:**		1
Test Engineer:	Serway Li			**Nominal Channel Bandwidth #:**		1
Duty Cycle:	100	%	**Test Range:**	1 GHz – 40GHz		
Rel. Humidity:	63	%	**Test Distance:**	1 GHz – 18GHz: 3m / 18 GHz – 40GHz: 1.5m		
Ambient Temp.:	22	°C	**Test Results**			
Test Frequency:	10.525	GHz				
Test Range	**Frequency (MHz)**		**Peak Level (dBuV/m)**	**Peak Limit (dBuV/m)**	**Margin (dB)**	**Remark**
1 GHz – 40 GHz	1807.9		46.03	74	-27.97	Peak
	Frequency (MHz)		**Average Level (dBuV/m)**	**Average Limit (dBuV/m)**	**Margin (dB)**	**Remark**
	1807.9		33.49	54	-20.51	Average
	Frequency (MHz)		**Peak Level (dBuV/m)**	**Peak Limit (dBuV/m)**	**Margin (dB)**	**Remark**
	21038.9		75.28	103.5	-28.22	Peak
	Frequency (MHz)		**Average Level (dBuV/m)**	**Average Limit (dBuV/m)**	**Margin (dB)**	**Remark**
	21038.9		74.48	83.5	-9.02	Average
	Frequency (MHz)		**Peak Level (dBuV/m)**	**Peak Limit (dBuV/m)**	**Margin (dB)**	**Remark**
	31557.2		81.52	103.5	-21.98	Peak
	Frequency (MHz)		**Average Level (dBuV/m)**	**Average Limit (dBuV/m)**	**Margin (dB)**	**Remark**
	31557.2		80.77	83.5	-2.73	Average
Measurement uncertainty:		±2.7	dB			

Note 1: “>20dB” means the tables in this clause should only list values of spurious emissions that exceed the level of 20 dB below the applicable limit, see ANSI C63.4, clause 10.1.8.2.

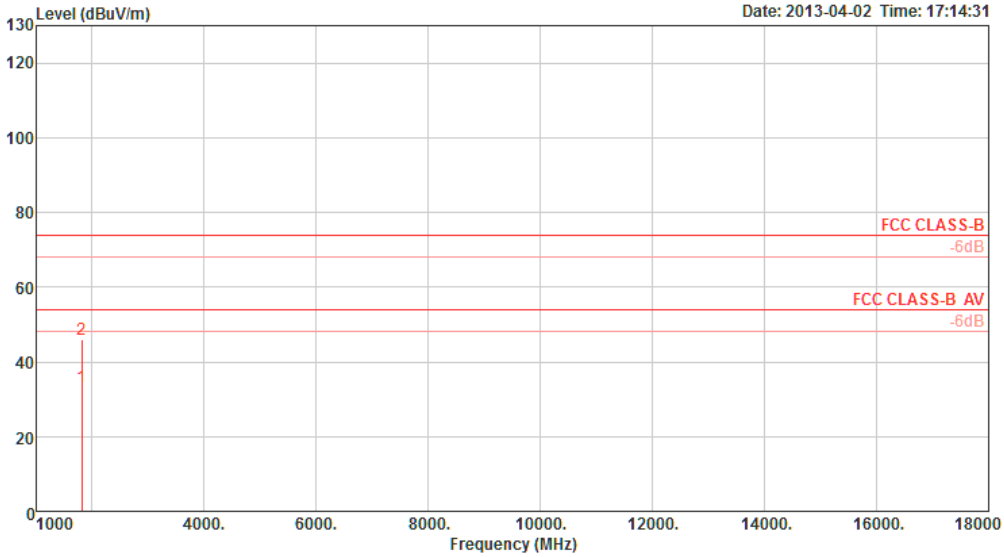
Note 2: “N/F” means Nothing Found (No spurious emissions were detected.)

Test Distance : 1.5m ; Limit = 7.5mV +Distance factor 20log(3/1.5)

AV=77.5dBuV/m + 6.02dB =83.5dBuV/m

PK=83.5dBuV/m + 20dB = 103.5dBuV/m

TPC range:	1			**Operating Mode #:**	1
Test Engineer:	Serway Li			**Nominal Channel Bandwidth #:**	1
Duty Cycle:	100	%	**Test Range:**	1 GHz – 18 GHz	
Rel. Humidity:	63	%	**Polarization:**	Vertical	
Ambient Temp.:	22	°C	**Test Distance:**	3m	
Test Frequency:	10.525	GHz	**Test Results**		



	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Antenna Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m		deg	cm	
1 a	1807.81	33.49	54.00	-20.51	38.48	2.52	34.87	27.36	Average	162	100	VERTICAL
2 p	1807.83	46.03	74.00	-27.97	51.02	2.52	34.87	27.36	Peak	162	100	VERTICAL

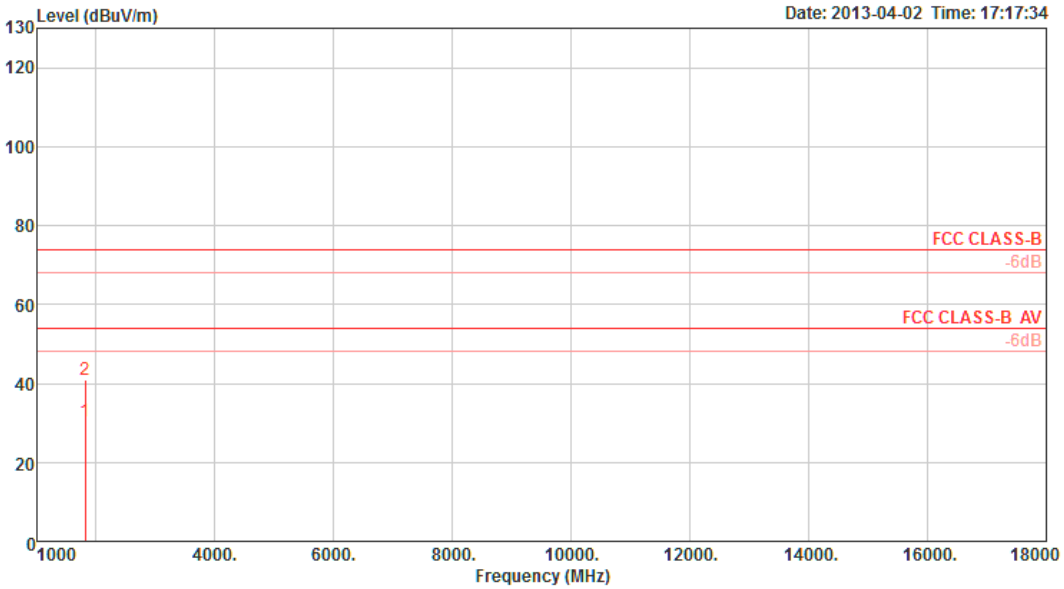
Measurement uncertainty:	±2.7	dB

Harmonic emissions in the restricted bands at and above 17.7 GHz: 7.5mV/m

Harmonic emissions in the non-restricted bands: 25mV/m

Except harmonic emissions, spurious emissions: FCC 15.209 limit or 50 dB below the fundamental, whichever is the lesser attenuation.

TPC range:	1			**Operating Mode #:**	1
Test Engineer:	Serway Li			**Nominal Channel Bandwidth #:**	1
Duty Cycle:	100	%	**Test Range:**	1 GHz – 18 GHz	
Rel. Humidity:	63	%	**Polarization:**	Horizontal	
Ambient Temp.:	22	°C	**Test Distance:**	3m	
Test Frequency:	10.525	GHz	**Test Results**		



	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Antenna Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m		deg	cm	
1 a	1807.83	30.53	54.00	-23.47	35.52	2.52	34.87	27.36	Average	263	105	HORIZONTAL
2 p	1807.90	41.02	74.00	-32.98	46.01	2.52	34.87	27.36	Peak	263	105	HORIZONTAL

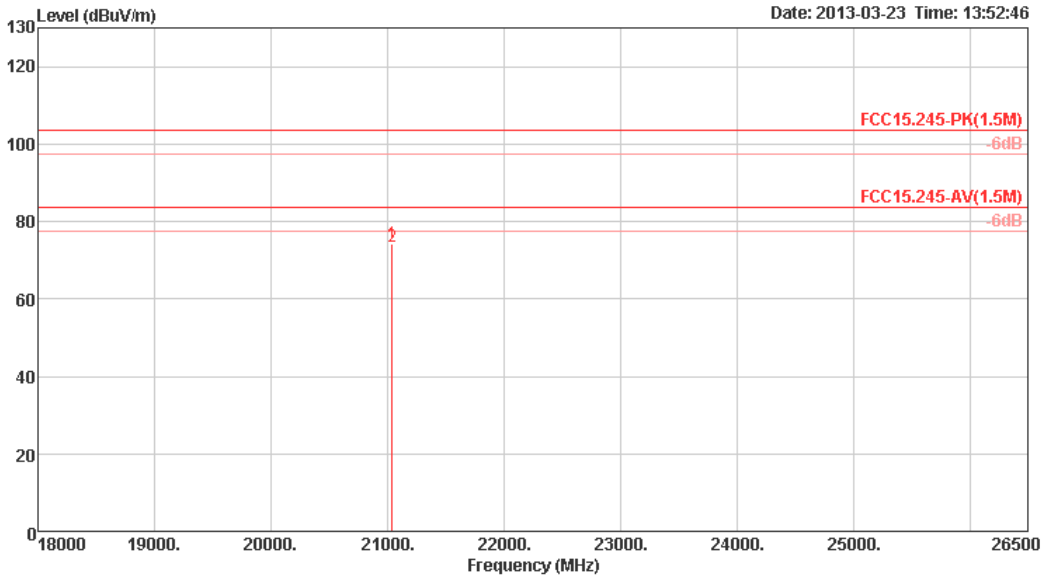
Measurement uncertainty:	±2.7	dB

Harmonic emissions in the restricted bands at and above 17.7 GHz: 7.5mV/m

Harmonic emissions in the non-restricted bands: 25mV/m

Except harmonic emissions, spurious emissions: FCC 15.209 limit or 50 dB below the fundamental, whichever is the lesser attenuation.

TPC range:	1			**Operating Mode #:**	1
Test Engineer:	Serway Li			**Nominal Channel Bandwidth #:**	1
Duty Cycle:	100	%	**Test Range:**	18 GHz – 26.5 GHz	
Rel. Humidity:	63	%	**Polarization:**	Horizontal	
Ambient Temp.:	22	°C	**Test Distance:**	1.5m	
Test Frequency: F2,	10.525	GHz	**Test Results**		



	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	21038.55	74.32	83.50	-9.18	62.76	9.35	37.92	35.71	Average	100	15	HORIZONTAL
2	21038.56	73.54	103.50	-29.96	61.98	9.35	37.92	35.71	Peak	100	15	HORIZONTAL

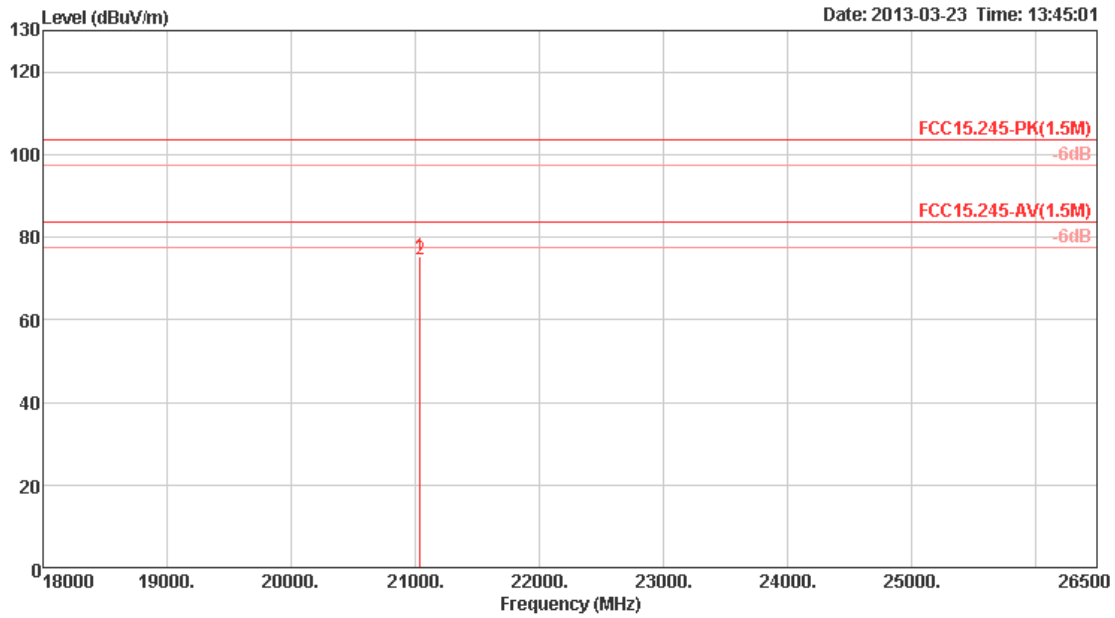
Measurement uncertainty:	±2.7	dB

Test Distance : 1.5m ; Limit = 7.5mV +Distance factor 20log(3/1.5)

AV=77.5dBuV/m + 6.02dB =83.5dBuV/m

PK=83.5dBuV/m + 20dB = 103.5dBuV/m

TPC range:	1			**Operating Mode #:**	1
Test Engineer:	Serway Li			**Nominal Channel Bandwidth #:**	1
Duty Cycle:	100	%	**Test Range:**	18 GHz – 26.5 GHz	
Rel. Humidity:	63	%	**Polarization:**	Vertical	
Ambient Temp.:	22	°C	**Test Distance:**	1.5m	
Test Frequency: F2,	10.525	GHz	**Test Results**		



	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	21038.90	75.28	103.50	-28.22	63.72	9.35	37.92	35.71	Peak	100	340	VERTICAL
2	21038.91	74.48	83.50	-9.02	62.92	9.35	37.92	35.71	Average	100	340	VERTICAL

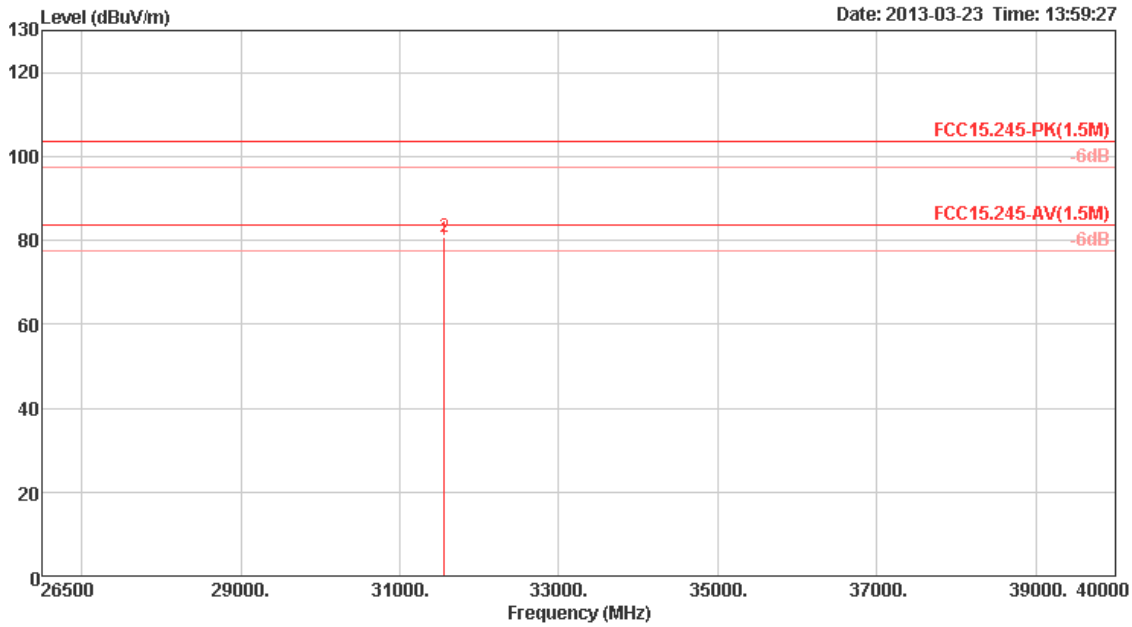
Measurement uncertainty:	±2.7	dB

Test Distance : 1.5m ; Limit = 7.5mV +Distance factor 20log(3/1.5)

AV=77.5dBuV/m + 6.02dB =83.5dBuV/m

PK=83.5dBuV/m + 20dB = 103.5dBuV/m

TPC range:	1			**Operating Mode #:**	1
Test Engineer:	Serway Li			**Nominal Channel Bandwidth #:**	1
Duty Cycle:	100	%	**Test Range:**	26.5 GHz – 40 GHz	
Rel. Humidity:	63	%	**Polarization:**	Horizontal	
Ambient Temp.:	22	°C	**Test Distance:**	1.5m	
Test Frequency: F2,	10.525	GHz	**Test Results**		



	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	31557.04	80.13	83.50	-3.37	68.62	11.73	40.95	41.17	Average	101	358	HORIZONTAL
2	31557.13	80.87	103.50	-22.63	69.36	11.73	40.95	41.17	Peak	101	358	HORIZONTAL

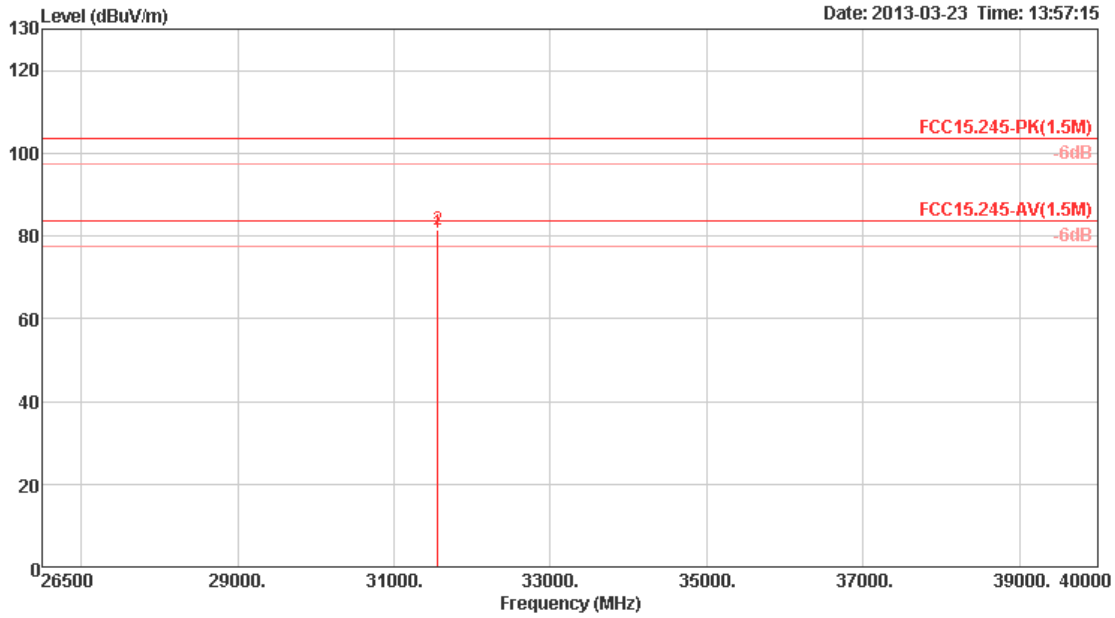
Measurement uncertainty:	±2.7	dB

Test Distance : 1.5m ; Limit = 7.5mV +Distance factor 20log(3/1.5)

AV=77.5dBuV/m + 6.02dB =83.5dBuV/m

PK=83.5dBuV/m + 20dB = 103.5dBuV/m

TPC range:	1			**Operating Mode #:**	1
Test Engineer:	Serway Li			**Nominal Channel Bandwidth #:**	1
Duty Cycle:	100	%	**Test Range:**	26.5 GHz – 40 GHz	
Rel. Humidity:	63	%	**Polarization:**	Vertical	
Ambient Temp.:	22	°C	**Test Distance:**	1.5m	
Test Frequency: F2,	10.525	GHz	**Test Results**		



	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	31557.18	80.77	83.50	-2.73	69.26	11.73	40.95	41.17	Average	100	27	VERTICAL
2	31557.20	81.52	103.50	-21.98	70.01	11.73	40.95	41.17	Peak	100	27	VERTICAL

Measurement uncertainty:	±2.7	dB

Test Distance : 1.5m ; Limit = 7.5mV +Distance factor 20log(3/1.5)

AV=77.5dBuV/m + 6.02dB =83.5dBuV/m

PK=83.5dBuV/m + 20dB = 103.5dBuV/m

TPC Range:	1			**Operating Mode #:**		1
Test Engineer:	Serway Li			**Nominal Channel Bandwidth #:**		1
Duty Cycle:	100	%	**Test Range:**	40GHz ~ 60GHz		
Rel. Humidity:	22	%	**Test Distance:**	1m		
Ambient Temp.:	63	°C	**Test Results**			
Test Frequency:	10.525	GHz				
Test Range	**Frequency (MHz)**		**Peak Level (dBuV/m)**	**Peak Limit (dBuV/m)**	**Margin (dB)**	**Remark**
40GHz ~ 60GHz	53.28		41.26	107.04	-65.78	Peak
	Frequency (MHz)		**Average Level (dBuV/m)**	**Average Limit (dBuV/m)**	**Margin (dB)**	**Remark**
	53.28		30.24	87.04	-56.8	Average
Measurement uncertainty:	±2.7	dB				

Note 1: “>20dB” means the tables in this clause should only list values of spurious emissions that exceed the level of 20 dB below the applicable limit, see ANSI C63.4, clause 10.1.8.2.

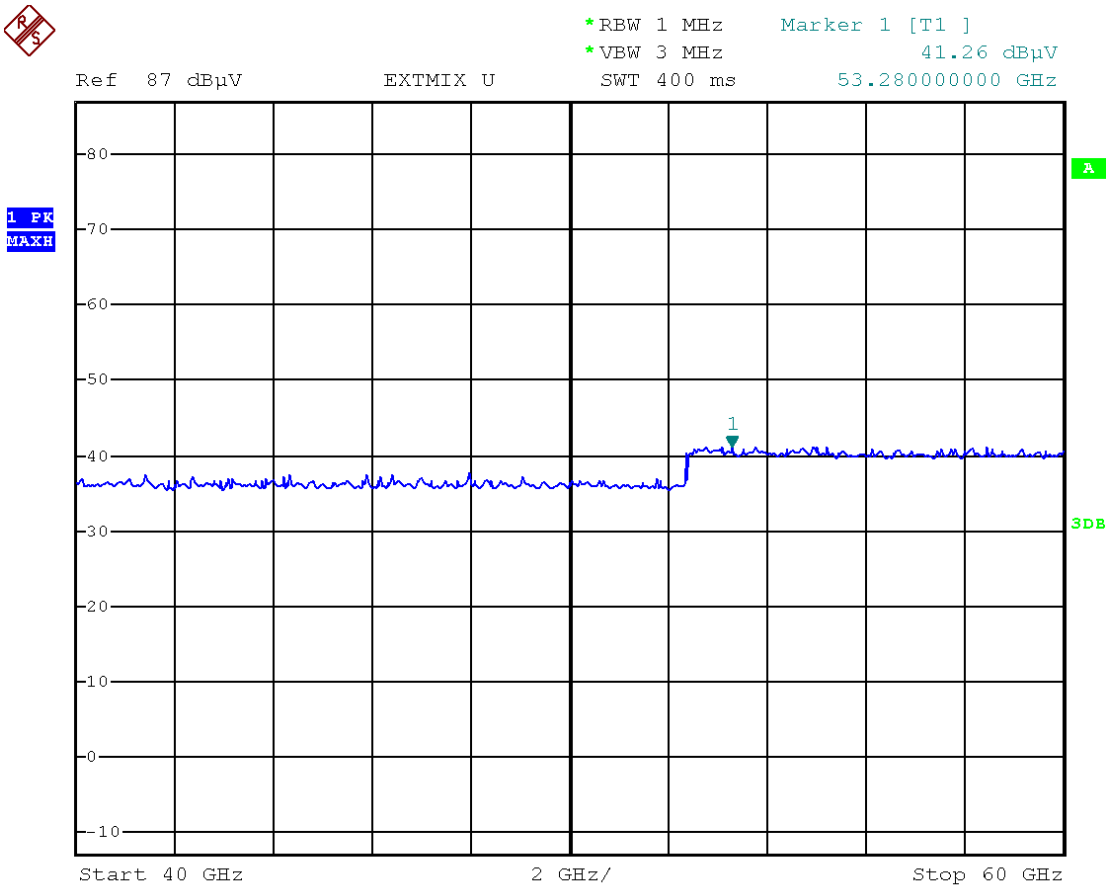
Note 2: “N/F” means Nothing Found (No spurious emissions were detected.)

Test Distance : 1m ; Limit = 7.5mV +Distance factor 20log(3/1)

AV=77.5dBuV/m + 9.54dB = 87.04dBuV/m

PK=87.04dBuV/m +20dB = 107.04dBuV/m

TPC range:	1			**Operating Mode #:**	1
Test Engineer:	Serway Li			**Nominal Channel Bandwidth #:**	1
Duty Cycle:	100	%	**Test Range:**	40GHz ~ 60GHz	
Rel. Humidity:	63	%	**Test Distance:**	1m	
Ambient Temp.:	22	°C			
Test Frequency: F2,	10.525	GHz	**Test Results**		



Date: 9.APR.2013 03:27:34

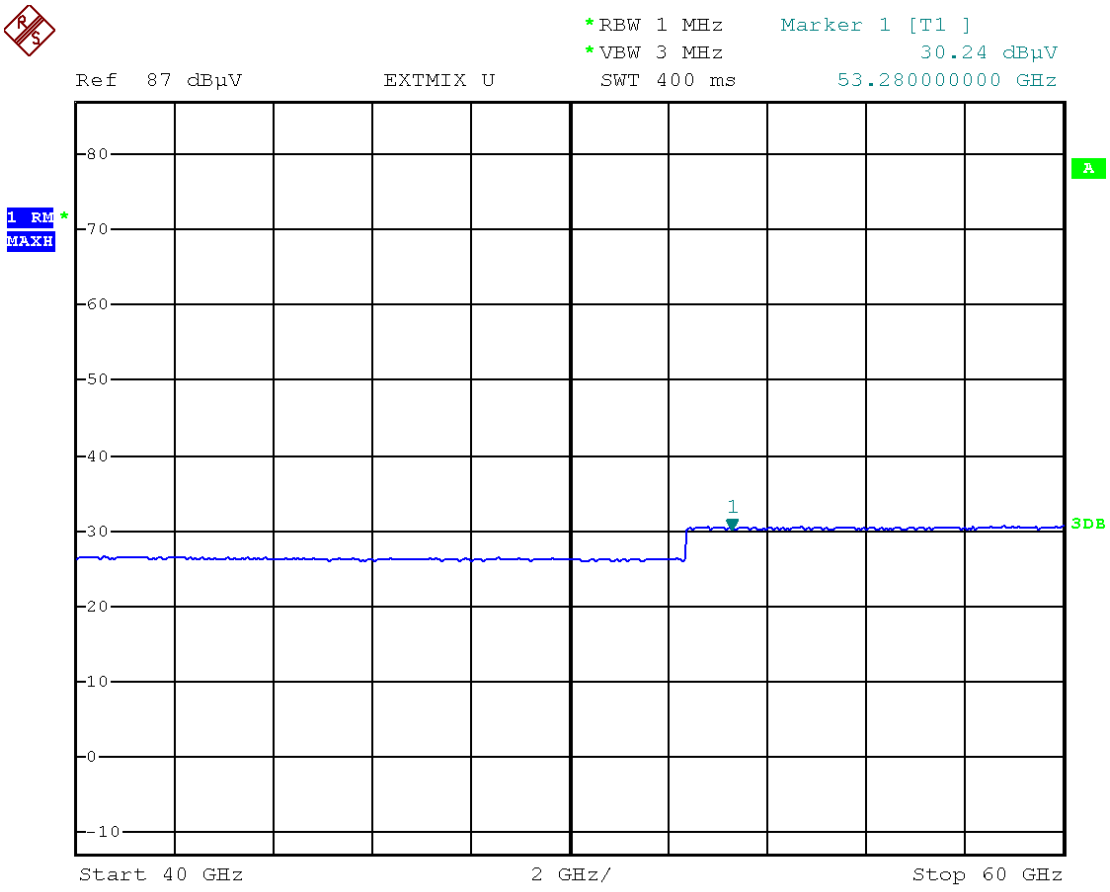
Measurement uncertainty:	±2.7	dB

Test Distance : 1m ; Limit = 7.5mV +Distance factor 20log(3/1)

AV=77.5dBuV/m + 9.54dB = 87.04dBuV/m

PK=87.04dBuV/m +20dB = 107.04dBuV/m

TPC range:	1			**Operating Mode #:**	1
Test Engineer:	Serway Li			**Nominal Channel Bandwidth #:**	1
Duty Cycle:	100	%	**Test Range:**	40GHz ~ 60GHz	
Rel. Humidity:	63	%	**Test Distance:**	1m	
Ambient Temp.:	22	°C			
Test Frequency:	10.525	GHz	**Test Results**		



Date: 9.APR.2013 03:30:58

Measurement uncertainty:	±2.7	dB

3.4 Antenna Requirements

3.4.1 Limit of Antenna Requirements

Limits for Antenna Requirements
The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited
NOTE 1: For the applicable limit, see FCC 15.203

3.4.2 EUT Antenna

See test report clause 1.1.5, EUT antenna complied with antenna requirements.

4 List of Measuring Equipments

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
BILOG ANTENNA	Schaffner	CBL6112D	22021	20MHz ~ 2GHz	Nov. 27, 2012	Radiation (03CH01-CB)
Loop Antenna	Teseq	HLA 6120	24155	9 kHz - 30 MHz	Nov. 05, 2012*	Radiation (03CH01-CB)
Horn Antenna	EMCO	3115	00075790	750MHz~18GHz	Nov. 27, 2012	Radiation (03CH01-CB)
Horn Antenna	SCHWARZBEAK	BBHA 9170	BBHA9170252	15GHz ~ 40GHz	Nov. 23, 2012	Radiation (03CH01-CB)
Pre-Amplifier	Agilent	8447D	2944A10991	0.1MHz ~ 1.3GHz	Nov. 27, 2012	Radiation (03CH01-CB)
Pre-Amplifier	Agilent	8449B	3008A02310	1GHz ~ 26.5GHz	Nov. 23, 2012	Radiation (03CH01-CB)
Pre-Amplifier	WM	TF-130N-R1	923365	26.5GHz ~ 40GHz	Jul. 31, 2012	Radiation (03CH01-CB)
Spectrum analyzer	R&S	FSP40	100056	9KHz~40GHz	Nov. 16, 2012	Radiation (03CH01-CB)
EMI Test Receiver	R&S	ESCS 30	100355	9KHz ~ 2.75GHz	Mar. 20, 2013	Radiation (03CH01-CB)
Turn Table	INN CO	CO 2000	N/A	0 ~ 360 degree	N.C.R	Radiation (03CH01-CB)
Antenna Mast	INN CO	CO2000	N/A	1 m - 4 m	N.C.R	Radiation (03CH01-CB)
RF Cable-low	Woken	Low Cable-1	N/A	30 MHz - 1 GHz	Nov. 18, 2012	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-1	N/A	1 GHz – 26.5 GHz	Nov. 18, 2012	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-2	N/A	1 GHz – 26.5 GHz	Nov. 18, 2012	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-3	N/A	1 GHz - 40 GHz	Nov. 18, 2012	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-4	N/A	1 GHz - 40 GHz	Nov. 18, 2012	Radiation (03CH01-CB)
Mixer	OML	M19HW/A	U91113-1	40 ~ 60 GHz	Dec. 01, 2012	Radiation (03CH01-CB)
Mixer	OML	M15HW/A	V91113-1	50 ~ 75 GHz	Dec. 01, 2012	Radiation (03CH01-CB)
Mixer	OML	M12HW/A	E91113-1	60 ~ 90 GHz	Dec. 01, 2012	Radiation (03CH01-CB)

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
Mixer	OML	M08HW/A	F91113-1	90 ~ 140 GHz	Dec. 01, 2012	Radiation (03CH01-CB)
Mixer	OML	M05HW/A	G91113-1	140 ~ 220 GHz	Dec. 01, 2012	Radiation (03CH01-CB)
Standard Horn Antenna	Custom Microwave	HO19R	U91113-A	40 ~ 60 GHz	N.C.R	Radiation (03CH01-CB)
Standard Horn Antenna	Custom Microwave	HO15R	V91113-A	50 ~ 75 GHz	N.C.R	Radiation (03CH01-CB)
Standard Horn Antenna	Custom Microwave	HO12R	E91113-A	60 ~ 90 GHz	N.C.R	Radiation (03CH01-CB)
Standard Horn Antenna	Custom Microwave	HO08R	F91113-A	90 ~ 140 GHz	N.C.R	Radiation (03CH01-CB)
Standard Horn Antenna	Custom Microwave	HO05R	G91113-A	140 ~ 220 GHz	N.C.R	Radiation (03CH01-CB)

Note: Calibration Interval of instruments listed above is one year.

N.C.R. means Non-Calibration required.