### 1 CO-LOCATION

### 1.1 Transmitter Radiated Unwanted Emissions

#### 1.1.1 Transmitter Radiated Unwanted Emissions Limit

	Restricted Band Emissions Limit								
Frequency Range (MHz)	Field Strength (uV/m)	Field Strength (dBuV/m)	Measure Distance (m)						
0.009~0.490	2400/F(kHz)	48.5 - 13.8	300						
0.490~1.705	24000/F(kHz)	33.8 - 23	30						
1.705~30.0	30	29	30						
30~88	100	40	3						
88~216	150	43.5	3						
216~960	200	46	3						
Above 960	500	54	3						

- Note 1: Test distance for frequencies at or above 30 MHz, measurements may be performed at a distance other than the limit distance provided they are not performed in the near field and the emissions to be measured can be detected by the measurement equipment. When performing measurements at a distance other than that specified, the results shall be extrapolated to the specified distance using an extrapolation factor of 20 dB/decade (inverse of linear distance for field-strength measurements, inverse of linear distance-squared for power-density measurements).
- Note 2: Test distance for frequencies at below 30 MHz, measurements may be performed at a distance closer than the EUT limit distance; however, an attempt should be made to avoid making measurements in the near field. When performing measurements below 30 MHz at a closer distance than the limit distance, the results shall be extrapolated to the specified distance by either making measurements at a minimum of two or more distances on at least one radial to determine the proper extrapolation factor or by using the square of an inverse linear distance extrapolation factor (40 dB/decade). The test report shall specify the extrapolation method used to determine compliance of the EUT.

Un-restricted Band Emissions Limit							
RF output power procedure	Limit (dB)						
Peak output power procedure	20						
Average output power procedure	30						

- Note 1: If the peak output power procedure is used to measure the fundamental emission power to demonstrate compliance to requirements, then the peak conducted output power measured within any 100 kHz outside the authorized frequency band shall be attenuated by at least 20 dB relative to the maximum measured in-band peak PSD level.
- Note 2: If the average output power procedure is used to measure the fundamental emission power to demonstrate compliance to requirements, then the power in any 100 kHz outside of the authorized frequency band shall be attenuated by at least 30 dB relative to the maximum measured in-band average PSD level.

#### 1.1.2 Measuring Instruments

Refer a test equipment and calibration data table in this test report.

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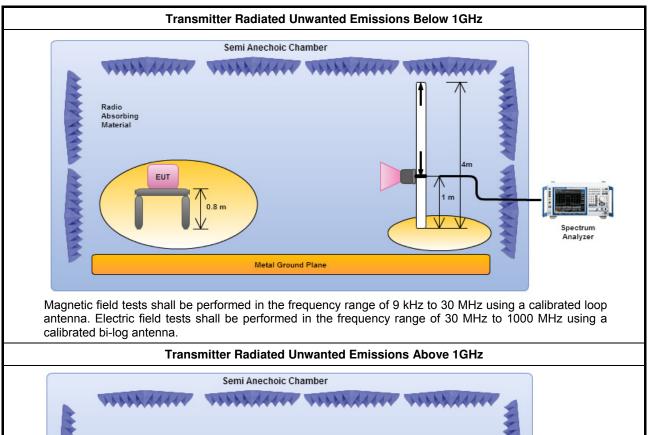
# 1.1.3 Test Procedures

		Test Method
	perfe equi extra dista	surements may be performed at a distance other than the limit distance provided they are not be ormed in the near field and the emissions to be measured can be detected by the measurement pment. When performing measurements at a distance other than that specified, the results shall be applied to the specified distance using an extrapolation factor of 20 dB/decade (inverse of linear ance for field-strength measurements, inverse of linear distance-squared for power-density surements).
		Measurements in the frequency range 10 GHz - 18GHz are typically made at a closer distance 1m, because the instrumentation noise floor is typically close to the radiated emission limit.
		Measurements in the frequency range above 18 GHz - 25GHz are typically made at a closer distance 0.5m, because the instrumentation noise floor is typically close to the radiated emission limit.
$\boxtimes$	The	average emission levels shall be measured in [duty cycle ≥ 98 or duty factor].
$\boxtimes$	For	the transmitter unwanted emissions shall be measured using following options below:
	$\boxtimes$	Refer as FCC KDB 558074, clause 10.1 for unwanted emissions into non-restricted bands.
	$\boxtimes$	Refer as FCC KDB 558074, clause 10.2 for unwanted emissions into restricted bands.
		Refer as FCC KDB 558074, clause 10.2.3.3 and 8.2.1 Option 1 (spectral trace averaging)
		Refer as FCC KDB 558074, clause 10.2.3.3 and 8.2.1 Option 2 (slow sweep speed).
		Refer as ANSI C63.10, clause 4.2.3.2.3 (Reduced VBW). VBW ≥ 1/T, where T is pulse time.
		Refer as ANSI C63.10, clause 4.2.3.2.4 average value of pulsed emissions.
		Refer as FCC KDB 558074, clause 10.2.3.2 and 8.1.1 measurement procedure peak limit.
		Refer as FCC KDB 558074, clause 10.2.3.1 measurement procedure Quasi-Peak limit.
	For	radiated measurement, refer as FCC KDB 558074, clause 10.2.1.
	$\boxtimes$	Refer as ANSI C63.10, clause 6.4 for radiated emissions below 30 MHz and test distance is 3m.
	$\boxtimes$	Refer as ANSI C63.10, clause 6.5 for radiated emissions 30 MHz to 1 GHz and test distance is 3m.
	$\boxtimes$	Refer as ANSI C63.10, clause 6.6 for radiated emissions above 1GHz. For 1 GHz to 5 GHz, test distance is 3m; For 5 GHz to 40 GHz, test distance is 1m.
	For	conducted and cabinet radiation measurement, refer as FCC KDB 558074, clause 10.2.2.
		For conducted unwanted emissions into non-restricted bands (relative emission limits). Devices with multiple transmit chains: Refer as FCC KDB 662911, when testing out-of-band and spurious emissions against relative emission limits, tests may be performed on each output individually without summing or adding 10 log(N) if the measurements are made relative to the in-band emissions on the individual outputs.
		For conducted unwanted emissions into restricted bands (absolute emission limits).  Devices with multiple transmit chains using options given below:  (1) Measure and sum the spectra across the outputs or  (2) Measure and add 10 log(N) dB

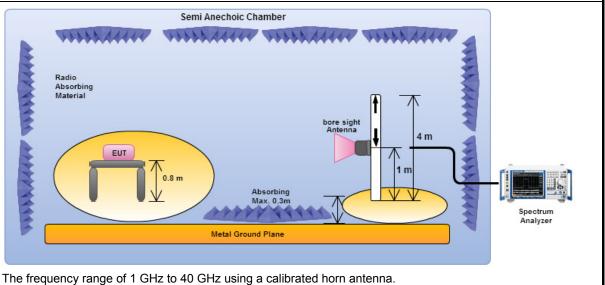
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### 1.1.4 Test Setup



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## 1.1.5 Transmitter Radiated Unwanted Emissions (Below 30MHz)

All amplitude of spurious emissions that are attenuated by more than 20 dB below the permissible value has no need to be reported.

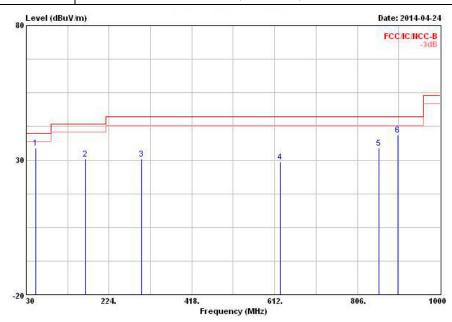
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# 1.1.6 Results of Radiated Emissions (30MHz~1GHz)

	Transmitter Radiated Unwanted Emissions		
Operating Mode	EUT with Adapter 1	Polarization	V
Operating Function	2.4GHz WiFi 3TX 11n20M (2437MHz) + 5G WiFi	3TX 11n20M (5	745MHz)



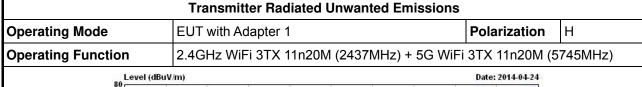
	Freq	Level	Over Limit			Antenna Factor	**************************************	Preamp Factor		Ant Pos	Table Pos
-	MHz	dBuV/m	dВ	dBuV/m	dBuV	dB/m	dB	dB	-	cm.	deg
1 @	52.310	34.52	-5.48	40.00	53.09	7.84	1.16	27.57	Peak		
2	169.150	30.30	-13.20	43.50	45.55	9.73	2.14	27.12	Peak		
3	299.660	30.48	-15.52	46.00	41.00	13.23	2.90	26.65	Peak		
4	625.580	29.45	-16.55	46.00	34.51	18.67	4.25	27.98	Peak	7.77	
5	856.200	34.38	-11.62	46.00	36.76	20.32	4.96	27.66	Peak	100000	
6 @	901.060	39.38	-6.62	46.00	41.21	20.53	5.19	27.55	Peak		

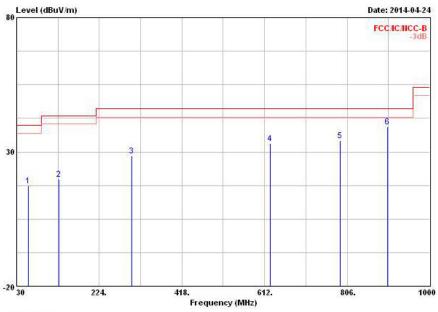
Note 1: ">20dB" means spurious emission levels that exceed the level of 20 dB below the applicable limit.

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

Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical)

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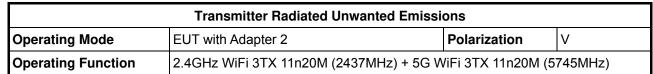
	31		Over	Limit	Readi	Antenna	Cable	Preamp		Ant	Table
	Freq	Level	Limit	Line	Level	Factor	Loss	Factor	Remark	Pos	Pos
-	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1	56.880	17.32	-22.68	40.00	36.73	6.93	1.21	27.55	Peak		-223
2	129.000	19.93	-23.57	43.50	33.40	11.93	1.87	27.27	Peak		
3	299.660	28.61	-17.39	46.00	39.13	13.23	2.90	26.65	Peak		
4	625.580	33.02	-12.98	46.00	38.08	18.67	4.25	27.98	Peak		
5	789.000	34.21	-11.79	46.00	37.45	19.71	4.86	27.81	Peak		
6 @	901.060	39.39	-6.61	46.00	41.22	20.53	5.19	27.55	Peak		

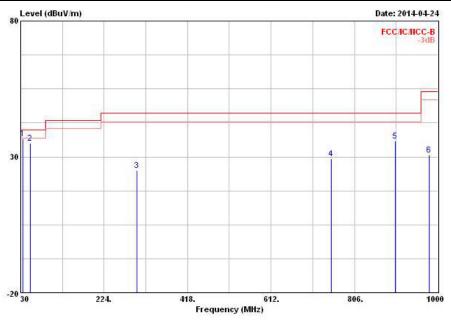
Note 1: ">20dB" means spurious emission levels that exceed the level of 20 dB below the applicable limit.

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

Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical)

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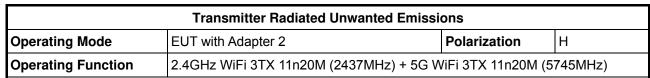
	Freq	Level	Over Limit			Antenna Factor				Ant Pos	Table Pos
9	MHz	dBuV/m	- dB	dBuV/m	dBuV	dB/m	dB	dB			deg
											- 5
1 0	35.820	36.76	-3.24	40.00	47.88	15.52	0.96	27.60	QP	97/00/00	
2 @	52.310	35.07	-4.93	40.00	53.64	7.84	1.16	27.57	Peak		
3	299.660	24.92	-21.08	46.00	35.44	13.23	2.90	26.65	Peak	200	
4	751.680	29.28	-16.72	46.00	32.94	19.54	4.67	27.87	Peak		
5	901.060	35.71	-10.29	46.00	37.54	20.53	5.19	27.55	Peak		
6	978.660	30.75	-23.25	54.00	31.46	21.19	5.43	27.33	Peak		

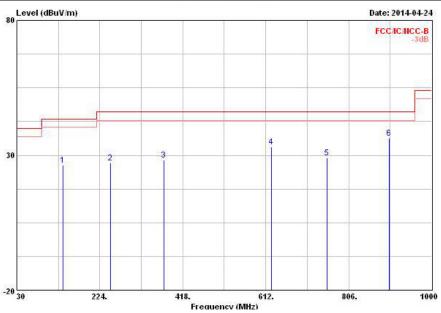
Note 1: ">20dB" means spurious emission levels that exceed the level of 20 dB below the applicable limit.

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

Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical)

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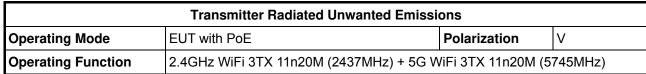
	Freg	Level	Over Limit	Limit Line		Antenna Factor			Pomark	Ant Pos	Table Pos
	rreu		111111	9000000	reser	ractor	1000	ractor	Kejikark	103	ros
*	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1	137.460	26.34	-17.16	43.50	40.12	11.53	1.93	27.24	Peak		1223
2	248.800	27.06	-18.94	46.00	38.65	12.64	2.60	26.83	Peak		
3	374.350	28.23	-17.77	46.00	37.36	14.80	3.23	27.16	Peak		
4	625.580	33.13	-12.87	46.00	38.19	18.67	4.25	27.98	Peak	0.00	No.
5	754.560	28.92	-17.08	46.00	32.54	19.55	4.69	27.86	Peak	1000	
6	901.060	36.28	-9.72	46.00	38.11	20.53	5.19	27.55	Peak		

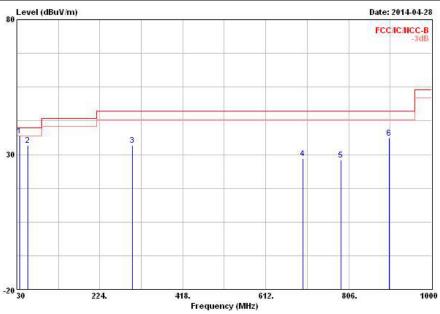
Note 1: ">20dB" means spurious emission levels that exceed the level of 20 dB below the applicable limit.

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

Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical)

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	Freq	Level	Over Limit	Limit Line		Antenna Factor		Preamp	Remark	Ant Pos	Table Pos
	*****	5000000	шис	0.0000000000000000000000000000000000000		Lactor	1000	ractor	MC MILK		100
1	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm.	deg
1 @	36.790	36.85	-3.15	40.00	48.56	14.91	0.98	27.60	Peak		2,000
2 @	55.320	33.46	-6.54	40.00	52.91	6.93	1.18	27.56	Peak		2000
3	299.660	33.35	-12.65	46.00	43.87	13.23	2.90	26.65	Peak	222	
4	699.300	28.63	-17.37	46.00	33.20	18.81	4.56	27.94	Peak		10000
1 5	788.220	28.07	-17.93	46.00	31.32	19.71	4.86	27.82	Peak		
6	901.060	36.14	-9.86	46.00	37.97	20.53	5.19	27.55	Peak		

Note 1: ">20dB" means spurious emission levels that exceed the level of 20 dB below the applicable limit.

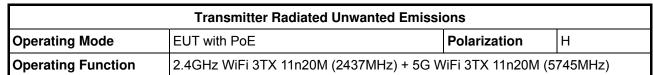
Note 2: "N/F" means Nothing Found spurious emissions (No spurious emissions were detected.)

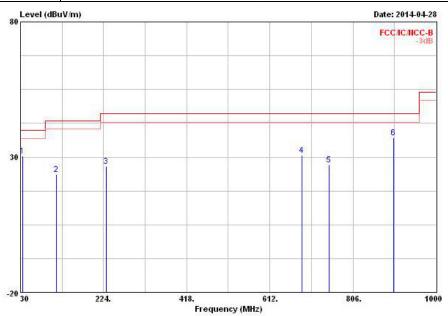
Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical)

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	Freq	Level	Over Limit			Antenna Factor		Preamp Factor		Ant Pos	Table Pos
÷	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		- Cm	deg
1	35.820	30.35	-9.65	40.00	41.47	15.52	0.96	27.60	Peak	2000	
2	114.200	23.61	-19.89	43.50	37.13	12.08	1.73	27.33	Peak		
3	230.790	26.60	-19.40	46.00	40.40	10.60	2.50	26.90	Peak		
4	687.420	30.68	-15.32	46.00	35.44	18.68	4.51	27.95	Peak	777	
5	749.740	27.10	-18.90	46.00	30.77	19.54	4.66	27.87	Peak		
6 @	901.060	37.05	-8.95	46.00	38.88	20.53	5.19	27.55	Peak		

Note 1: ">20dB" means spurious emission levels that exceed the level of 20 dB below the applicable limit.

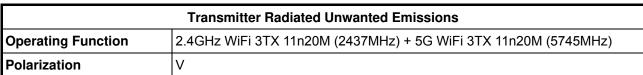
Note 2: "N/F" means Nothing Found spurious emissions (No spurious emissions were detected.)

Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical)

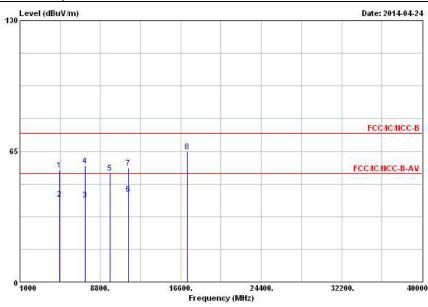
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1.1.7 Results for Radiated Emissions (1GHz~10<sup>th</sup> Harmonic)



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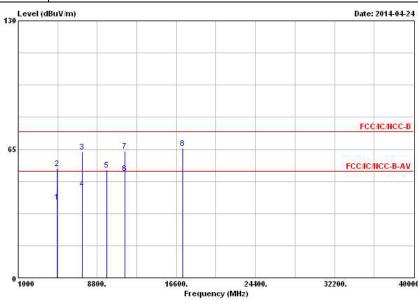


			0ver	Limit	Read	Antenna	Cable	Preamp		Ant	Table
	Freq	Level	Limit	Line	Level	Factor	Loss	Factor	Remark	Pos	Pos
	MKz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	9	cm	deg
1	4874.000	55.71	-18.29	74.00	49.23	33.18	5.72	32.42	Peak	232	222
2	4874.000	41.30	-12.70	54.00	34.82	33.18	5.72	32.42	Average		
3	7311.000	40.81	-13.19	54.00	30.15	36.04	7.28	32.66	Average		
4	7311.000	57.78	-16.22	74.00	47.12	36.04	7.28	32.66	Peak	200	10000
5	9748.000	54.33	-19.67	74.00	40.07	38.57	8.77	33.08	Peak		
6	11490.000	43.56	-10.44	54.00	26.78	39.08	10.04	32.34	Average		
7	11490.000	56.62	-17.38	74.00	39.84	39.08	10.04	32.34	Peak		
8	@17235.000	64.86	-9.14	74.00	42.48	42.17	11.59	31.38	Peak	Ser harrier	1000

- Note 1: ">20dB" means spurious emission levels that exceed the level of 20 dB below the applicable limit.
- Note 2: "N/F" means Nothing Found spurious emissions (No spurious emissions were detected.)
- Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical)
- Note 4: For restricted bands, the peak measurement is fully sufficient, as the max field strength as measured with the Peak-Detector meets the AV-Limit so that the AV level does not need to be reported in addition.
- Note 5: For un-restricted bands, unwanted emissions shall be attenuated by at least 20 dB relative to the maximum measured in-band level.

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	Transmitter Radiated Unwanted Emissions								
Operating Function	2.4GHz WiFi 3TX 11n20M (2437MHz) + 5G WiFi 3TX 11n20M (5745MHz)								
Polarization	Н								



				0ver	Limit	Read	Antenna	Cable	Preamp		Ant	Table
		Freq	Level Lim	Limit	t Line	Level	Factor	Loss	Factor	Remark	Pos	Pos
	-	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	- dB		czm	deg
1	4874	. 000	38.44	-15.56	54.00	31.96	33.18	5.72	32.42	Average	2.000	
2	4874	. 000	55.40	-18.60	74.00	48.92	33.18	5.72	32.42	Peak		
3	731:	L. 000	63.61	-10.39	74.00	52.95	36.04	7.28	32.66	Peak		
1	@ 731:	L. 000	45.07	-8.93	54.00	34.41	36.04	7.28	32.66	Average	5.00	10000
5	9748	3.000	54.48	-19.52	74.00	40.22	38.57	8.77	33.08	Peak		
6	@11490	0.000	52.89	-1.11	54.00	36.11	39.08	10.04	32.34	Average		
7	11490	0.000	64.07	-9.93	74.00	47.29	39.08	10.04	32.34	Peak		less:
8	@17235	. 000	65.48	-8.52	74.00	43.10	42.17	11.59	31.38	Peak	-	100000

Note 1: ">20dB" means spurious emission levels that exceed the level of 20 dB below the applicable limit.

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

Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical)

Note 4: For restricted bands, the peak measurement is fully sufficient, as the max field strength as measured with the Peak-Detector meets the AV-Limit so that the AV level does not need to be reported in addition.

Note 5: For un-restricted bands, unwanted emissions shall be attenuated by at least 20 dB relative to the maximum measured in-band level.

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# 2 TEST EQUIPMENT AND CALIBRATION DATA

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
3m Semi Anechoic Chamber	SIDT FRANKO NIA	SAC-3M	03C H03-HY	30MHz ~ 1GHz 3m	No v. 30, 2013	Ra d ia te d Em issio n
Amplifie r	HP	8447D	2944A08033	10kHz ~ 1.3G Hz	May 03, 2013	Ra d ia te d Em issio n
Amplifie r	Amp lifie r Ag ile nt		3008A02120	1G Hz ~ 26.5G Hz	Aug. 20, 2013	Ra d ia te d Em issio n
Spec trum	R&S	FSP40	100004	9kHz ~ 40G Hz	Mar. 27, 2014	Ra d ia te d Em issio n
Bilo g Ante nna	SC HAFFNER	CBL6112D	22237	30MHz ~ 1GHz	Se p. 21, 2013	Ra d ia te d Em issio n
Ho m Ante nna	EMCO	3115	6741	1G Hz ~ 18G Hz	May 31, 2013	Ra d ia te d Em issio n
Ho m Ante nna	SC HWARZBEC K	BBHA9170	BBHA9170154	15G Hz ~ 40G Hz	Jan. 10, 2014	Ra d ia te d Em issio n
RF C a b le -R03m	Jye Bao	RG 142	C B021	9kHz ~ 1G Hz	No v. 16, 2013	Ra d ia te d Em issio n
RFC a b le -hig h	SUHNER	SUC O FLEX 106	03C H03-HY	1G Hz ~ 40G Hz	Dec. 11, 2013	Ra d ia te d Em issio n
Tum Table	EM Ele c tro nic s	EM Ele c tro nic s	060615	0 ~ 360 degree	N/A	Ra d ia te d Em issio n
Antenna Mast	MF	MF-7802	MF780208179	1 ~ 4 m	N/A	Ra d ia te d Em issio n

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

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
Amp lifie r	EM	EM18G40G	060604	18G Hz ~ 40G Hz	Oct. 17.2013	Ra d ia te d Em issio n
Loop Antenna	TESEQ	HIA 6120	31244	9kHz ~ 30MHz	Dec. 02, 2012	Ra d ia te d Em issio n

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

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