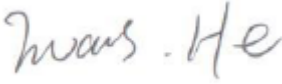
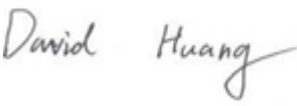



EMC TEST REPORT



Report No.: Q190509S003-FCC-E

Supersede Report No: N/A

Applicant	TiVo Solutions Inc. d/b/a TiVo Inc	
Product Name	REMOTE CONTROL UNIT	
Model No.	S6BL	
Serial No.	N/A	
Test Standard	FCC Part 15 Subpart B Class B, ANSI C63.4: 2014	
Test Date	June 11 to July 31, 2019	
Issue Date	August 06, 2019	
Test Result	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail	
Equipment complied with the specification <input checked="" type="checkbox"/>		
Equipment did not comply with the specification <input type="checkbox"/>		
		
Evans He Test Engineer	David Huang Checked By	
This test report may be reproduced in full only Test result presented in this test report is applicable to the tested sample only		

Issued by:

SIEMIC (SHENZHEN-CHINA) LABORATORIES

Zone A, Floor 1, Building 2 Wan Ye Long Technology Park

South Side of Zhoushi Road, Bao'an District, Shenzhen, Guangdong China 518108

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Laboratories Introduction

SIEMIC, headquartered in the heart of Silicon Valley, with superior facilities in US and Asia, is one of the leading independent testing and certification facilities providing customers with one-stop shop services for Compliance Testing and Global Certifications.



In addition to testing and certification, SIEMIC provides initial design reviews and compliance management throughout a project. Our extensive experience with China, Asia Pacific, North America, European, and International compliance requirements, assures the fastest, most cost effective way to attain regulatory compliance for the global markets.

Accreditations for Conformity Assessment

Country/Region	Scope
USA	EMC, RF/Wireless, SAR, Telecom
Canada	EMC, RF/Wireless, SAR, Telecom
Taiwan	EMC, RF, Telecom, SAR, Safety
Hong Kong	RF/Wireless, SAR, Telecom
Australia	EMC, RF, Telecom, SAR, Safety
Korea	EMI, EMS, RF, SAR, Telecom, Safety
Japan	EMI, RF/Wireless, SAR, Telecom
Singapore	EMC, RF, SAR, Telecom
Europe	EMC, RF, SAR, Telecom, Safety

Test Report	Q190509S003-FCC-E
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1. Report Revision History

Report No.	Report Version	Description	Issue Date
Q190509S003-FCC-E	NONE	Original	August 06, 2019

2. Customer information

Applicant Name	TiVo Solutions Inc. d/b/a TiVo Inc
Applicant Add	2160 Gold Street San Jose California United States
Manufacturer	Remote Solution
Manufacturer Add	92, Chogok-ri, Nammyun, Gimchun city, Kyungsangbukdo, Korea

3. Test site information

Lab performing tests	SIEMIC (Shenzhen-China) LABORATORIES
Lab Address	Zone A, Floor 1, Building 2 Wan Ye Long Technology Park South Side of Zhoushi Road, Bao'an District, Shenzhen, Guangdong China 518108
FCC Test Site No.	535293
IC Test Site No.	4842E-1
Test Software of Radiated Emission	Radiated Emission Program-To Shenzhen v2.0
Test Software of Conducted Emission	EZ-EMC(ver.lcp-03A1)

4. Equipment under Test (EUT) Information

Description of EUT:	REMOTE CONTROL UNIT
Main Model:	S6BL
Serial Model:	N/A
Antenna Gain:	0dBi
Antenna Type:	Chip Antenna
Equipment Category :	JAB
Type of Modulation:	GFSK
RF Operating Frequency (ies):	2402-2480 MHz
Number of Channels:	40CH
Input Power:	Battery: Spec: DC 3V
Port:	Please refer to the user's manual
Trade Name :	N/A
FCC ID:	TGN-CRB97C
Date EUT received:	May 30, 2019
Test Date(s):	June 11 to July 31, 2019

5. Test Summary

The product was tested in accordance with the following specifications.

All testing has been performed according to below product classification:

FCC Rules	Description of Test	Result
§15.107; ANSI C63.4: 2014	AC Power Line Conducted Emissions	N/A
§15.109; ANSI C63.4: 2014	Radiated Emissions	Compliance

Measurement Uncertainty


Parameter	Uncertainty
AC Power Line Conducted Emissions (150kHz~30MHz)	±2.70dB
Radiated Emission(30MHz~1GHz)	±3.74dB
Radiated Emission(1GHz~6GHz)	±4.66dB

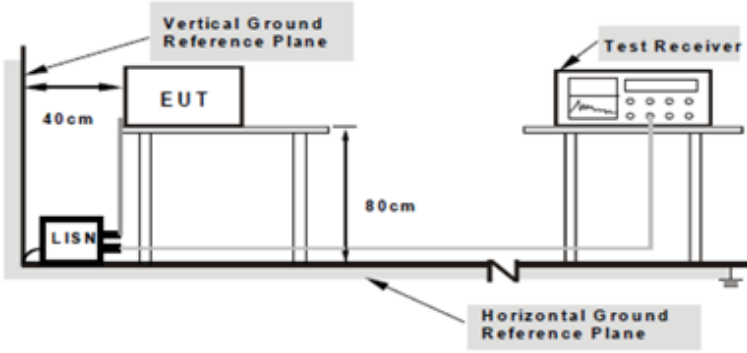
6. Measurements, Examination And Derived Results

6.1 AC Power Line Conducted Emissions

Temperature	--
Relative Humidity	--
Atmospheric Pressure	--
Test date :	--
Tested By :	--

Requirement(s):

Spec	Item	Requirement	Applicable														
47CFR§15.107	a)	For Low-power radio-frequency devices that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies, within the band 150 kHz to 30 MHz, shall not exceed the limits in the following table, as measured using a 50 [mu] H/50 ohms line impedance stabilization network (LISN). The lower limit applies at the boundary between the frequencies ranges.															
		<table><tr><th rowspan="2">Frequency ranges (MHz)</th><th colspan="2">Limit (dBµV)</th></tr><tr><th>QP</th><th>Average</th></tr><tr><td>0.15 ~ 0.5</td><td>66 – 56</td><td>56 – 46</td></tr><tr><td>0.5 ~ 5</td><td>56</td><td>46</td></tr><tr><td>5 ~ 30</td><td>60</td><td>50</td></tr></table>	Frequency ranges (MHz)	Limit (dBµV)		QP	Average	0.15 ~ 0.5	66 – 56	56 – 46	0.5 ~ 5	56	46	5 ~ 30	60	50	
Frequency ranges (MHz)	Limit (dBµV)																
	QP	Average															
0.15 ~ 0.5	66 – 56	56 – 46															
0.5 ~ 5	56	46															
5 ~ 30	60	50															

Test Setup	 <p>Note: 1.Support units were connected to second LISN. 2.Both of LISNs (AMN) are 80cm from EUT and at least 80cm from other units and other metal planes support units.</p>
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Procedure	<ol style="list-style-type: none"> The EUT and supporting equipment were set up in accordance with the requirements of the standard on top of a 1.5m x 1m x 0.8m high, non-metallic table. The power supply for the EUT was fed through a 50Ω /50mH EUT LISN, connected to filtered mains.
-----------	--

	<p>3. The RF OUT of the EUT LISN was connected to the EMI test receiver via a low-loss coaxial cable.</p> <p>4. All other supporting equipment were powered separately from another main supply.</p> <p>5. The EUT was switched on and allowed to warm up to its normal operating condition.</p> <p>6. A scan was made on the NEUTRAL line (for AC mains) or Earth line (for DC power) over the required frequency range using an EMI test receiver.</p> <p>7. High peaks, relative to the limit line, The EMI test receiver was then tuned to the selected frequencies and the necessary measurements made with a receiver bandwidth setting of 10 kHz.</p> <p>8. Step 7 was then repeated for the LIVE line (for AC mains) or DC line (for DC power).</p>
Remark	The EUT was powered by battery.
Result	<input type="checkbox"/> Pass <input type="checkbox"/> Fail <input checked="" type="checkbox"/> N/A

Test Data ☐ Yes ☒ N/A

Test Plot ☐ Yes (See below) ☒ N/A

6.2 Radiated Emissions

Temperature	25°C
Relative Humidity	57%
Atmospheric Pressure	1014mbar
Test date :	Jane 20, 2019
Tested By :	Evans He

Requirement(s):

Spec	Item	Requirement	Applicable	
47CFR§15.109(d)	a)	Except higher limit as specified elsewhere in other section, the emissions from the low-power radio-frequency devices shall not exceed the field strength levels specified in the following table and the level of any unwanted emissions shall not exceed the level of the fundamental emission. The tighter limit applies at the band edges	<div><input checked="" type="checkbox"/></div>	
		Frequency range (MHz)		Field Strength (µV/m)
		30 – 88		100
		88 – 216		150
		216 - 960		200
		Above 960		500

Test Setup	
------------	--

Procedure	<ol style="list-style-type: none"> The EUT was switched on and allowed to warm up to its normal operating condition. The test was carried out at the selected frequency points obtained from the EUT characterization. Maximization of the emissions, was carried out by rotating the EUT, changing the antenna polarization, and adjusting the antenna height in the following manner: <ol style="list-style-type: none"> Vertical or horizontal polarization (whichever gave the higher emission level
-----------	--

	<p>over a full rotation of the EUT) was chosen.</p> <p>b. The EUT was then rotated to the direction that gave the maximum emission.</p> <p>c. Finally, the antenna height was adjusted to the height that gave the maximum emission.</p> <p>3. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120 kHz for Quasiy Peak detection at frequency below 1GHz.</p> <p>4. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 3MHz with Peak detection for Peak measurement at frequency above 1GHz.</p> <p>The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth with Peak detection for Average Measurement as below at frequency above 1GHz.</p> <p>■ 1 kHz (Duty cycle < 98%) □ 10 Hz (Duty cycle > 98%)</p> <p>5. Steps 2 and 3 were repeated for the next frequency point, until all selected frequency points were measured.</p>
Remark	We tested the infrared function with a frequency less than 108MHz
Result	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail

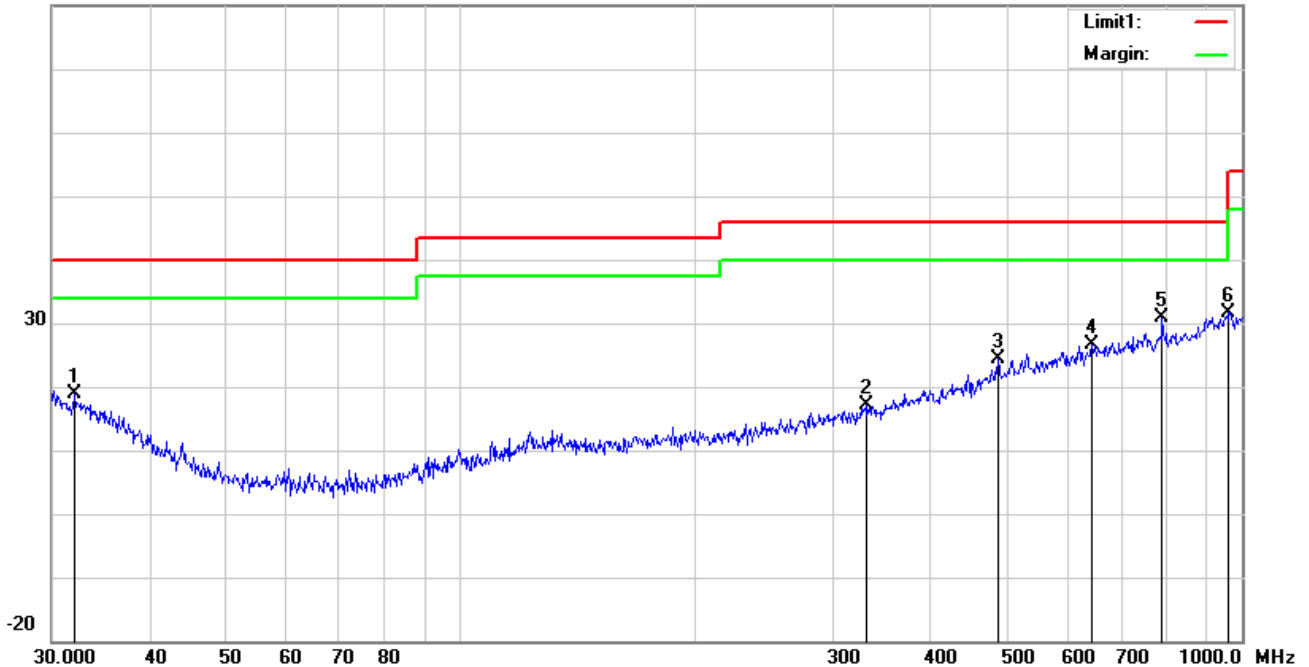
Test Data ☒ Yes ☐ N/A

Test Plot ☒ Yes (See below) ☐ N/A

Test Mode : Normal Working Mode

Below 1GHz

80.0 dBuV/m

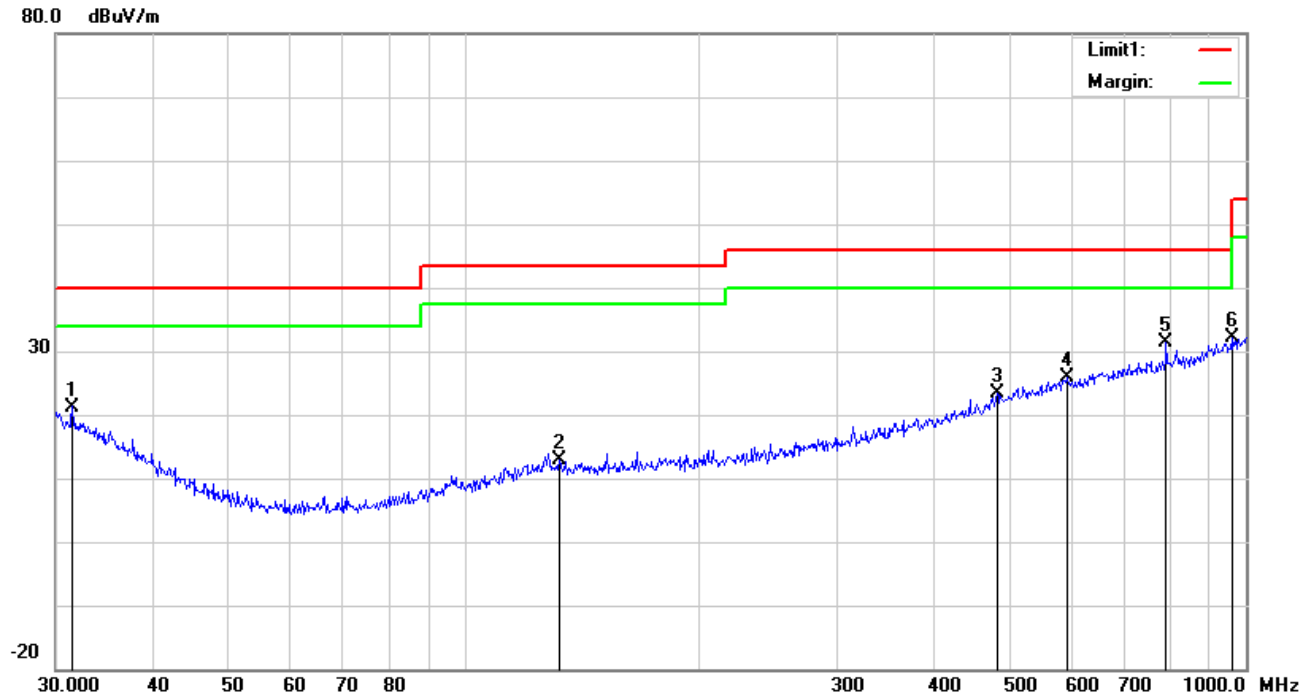


Test Data

Horizontal Polarity Plot @3m

No.	P/L	Frequency	Reading	Ant_F	PA_G	Cab_L	Result	Limit	Margin	Height	Degree
		(MHz)	(dBuV/m)	(dB/m)	(dB)	(dB)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(°)
1	H	32.0668	22.33	18.78	22.27	0.14	18.98	40.00	-21.02	242	292
2	H	330.1949	23.20	14.30	22.21	1.80	17.09	46.00	-28.91	229	175
3	H	487.3151	25.51	18.55	21.84	2.10	24.32	46.00	-21.68	227	77
4	H	642.8613	25.01	20.66	21.49	2.35	26.53	46.00	-19.47	378	319
5	H	790.6188	27.29	22.11	21.17	2.54	30.77	46.00	-15.23	382	42
6	H	962.1623	25.99	23.70	20.76	2.71	31.64	54.00	-22.36	359	141

Below 1GHz



Test Data

Vertical Polarity Plot @3m

No.	P/L	Frequency	Reading	Ant_F	PA_G	Cab_L	Result	Limit	Margin	Height	Degree
		(MHz)	(dBuV/m)	(dB/m)	(dB)	(dB)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(°)
1	V	31.5095	24.25	19.13	22.27	0.14	21.25	40.00	-18.75	244	253
2	V	132.2206	22.59	11.47	22.39	1.11	12.78	43.50	-30.72	326	87
3	V	480.5276	24.60	18.47	21.85	2.08	23.30	46.00	-22.70	394	285
4	V	590.9737	24.97	20.23	21.60	2.30	25.90	46.00	-20.10	165	355
5	V	790.6188	28.01	22.11	21.17	2.54	31.49	46.00	-14.51	246	317
6	V	958.7943	26.47	23.70	20.77	2.71	32.11	46.00	-13.89	239	121

Above 1GHz

Polarity(H/V)	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	DETECTO R(PK/AV)	LIMIT (dBuV/ m)	MARGIN (dB)	ANTENN A HEIGHT (MM)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
H	1046.3	40.95	PK	74	-33.05	100	180	59.43	-18.48
H	1046.3	26.16	AV	54	-27.84	100	99	44.64	-18.48
H	1157.2	41.67	PK	74	-32.33	100	191	58.64	-16.97
H	1157.2	28.35	AV	54	-25.65	100	291	45.32	-16.97
H	1269.8	42.77	PK	74	-31.23	100	188	60.52	-17.75
H	1269.8	28.65	AV	54	-25.35	200	36	46.4	-17.75
V	1054.2	40.05	PK	74	-33.95	100	34	57.31	-17.26
V	1054.2	26.59	AV	54	-27.41	100	145	43.85	-17.26
V	1244.8	41.25	PK	74	-32.75	100	180	58.22	-16.97
V	1244.8	27.66	AV	54	-26.34	100	201	44.63	-16.97
V	1992.3	42.99	PK	74	-31.01	100	135	56.74	-13.75
V	1992.3	28.43	AV	54	-25.57	200	226	42.18	-13.75

Note1: The highest frequency of the EUT is 2480 MHz, so the testing has been conformed to $5 \times 2480 \text{ MHz} = 12,400 \text{ MHz}$.

Note2: The frequency that above 3GHz is mainly from the environment noise.

Note3: The AV measurement performed, more than 20dB below limit so AV test data was not presented.

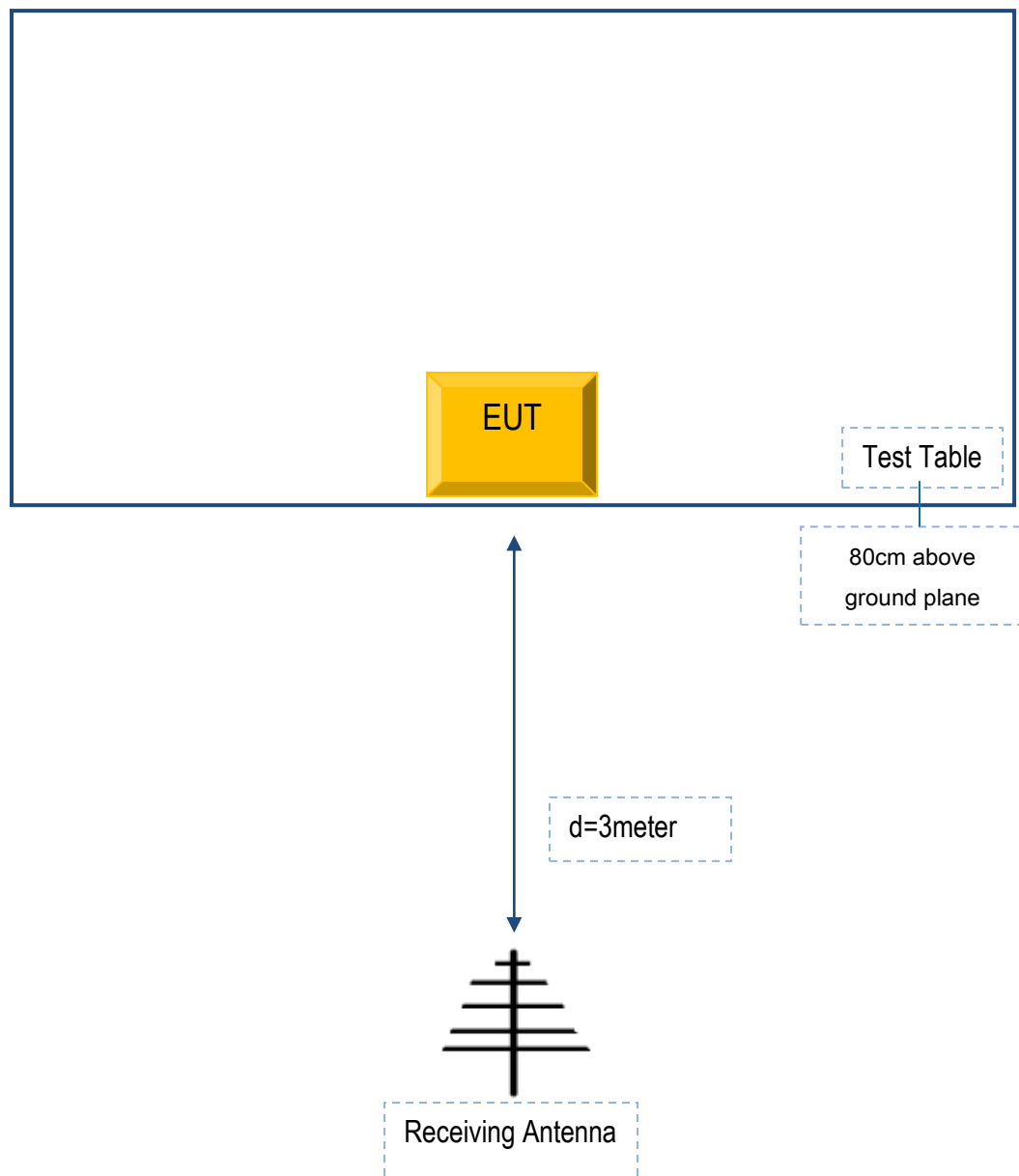
Annex A. TEST INSTRUMENT

Instrument	Model	Serial #	Cal Date	Cal Due
AC Line Conducted Emissions				
EMI test receiver	ESCS30	8471241027	01/04/2019	01/03/2020
Artificial Mains Network	8127	8127713	01/04/2019	01/03/2020
ISN	ISN T800	34373	01/04/2019	01/03/2020
Radiated Emissions				
EMI test receiver	ESL6	1300.5001K06-100262-eQ	01/04/2019	01/03/2020
Active Antenna	AL-130	121031	02/07/2019	02/06/2020
3m Semi-anechoic Chamber	9m*6m*6m	N/A	10/18/2018	10/17/2019
Signal Amplifier	8447E	443008	01/24/2019	01/23/2020
MXA signal analyzer	N9020A	MY49100060	01/04/2019	01/03/2020
Horn Antenna	HAH-118	71259	01/25/2019	01/24/2020
Horn Antenna	HAH-118	71283	02/01/2019	01/31/2020
AMPLIFIER	EM01G26G	60613	01/24/2019	01/23/2020
AMPLIFIER	Emc012645	980077	01/04/2019	01/03/2020
Bilog Antenna (30MHz~6GHz)	JB6	A110712	02/07/2019	02/06/2020

Annex B. TEST SETUP AND SUPPORTING EQUIPMENT

Annex B.i. TEST SET UP BLOCK

Block Configuration Diagram for Radiated Emissions



Annex C. ii. SUPPORTING EQUIPMENT DESCRIPTION

The following is a description of supporting equipment and details of cables used with the EUT.

Supporting Equipment:

Manufacturer	Equipment Description	Model	Serial No
-	-	-	-

Supporting Cable:

Cable type	Shield Type	Ferrite Core	Length	Serial No
-	-	-	-	-

Annex C. User Manual / Block Diagram / Schematics / Partlist

Please see the attachment

Annex D. DECLARATION OF SIMILARITY

Please see attachment