



FCC TEST REPORT

According to

**47 CFR, Part 2, Part 15, CISPR PUB. 22
ICES 003 Issue 6**

Applicant : Suzhou Switek Electronics&Technology Co, Ltd.
Address : No.86, South WuSong Road, Luzhi Town, Wuzhong
District, Suzhou City.
Equipment : KVM SWITCH
Model No. : KS-3104(KT-150),KS-3104(KT-250)
KS-3108(KT-150),KS-3108(KT-250)
KS-3116(KT-150),KS-3116(KT-250)
FCC ID : ZQXKS-3116

I HEREBY CERTIFY THAT :

The sample was received on Sep 07, 2018 and the testing was carried out on Sep 17, 2018 at Cerpass Technology Corp. The test result refers exclusively to the test presented test model / sample. Without written approval of Cerpass Technology Corp., the test report shall not be reproduced except in full.

Approved by

Kero Kuo / EMC & RF Manager



FCC TEST REPORT

Issued by:

CerpPASS Technology Co.,Ltd

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The test record, data evaluation & Equipment. Under Test configurations represented herein are true and accurate accounts of the measurements of the samples EMC characteristics under the conditions specified in this report.

Laboratory Accreditation:

☒ CerpPASS Technology Corporation Test Laboratory

TAF LAB Code:

1439



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History of this test report

■ ORIGINAL.

☐ Additional attachment as following record:

Report No	Version	Date	Description
TEFD1809102	Rev 01	Sep 20, 2018	Initial Issue



1. Summary of Test Procedure and Test Result

1.1. Applicable Standards

The measurements shown in this test report were made in accordance with the procedures given in ANSI C63.4 – 2014 and the energy emitted by this equipment was passed Part 2, Part 15, CISPR PUB. 22.

The energy emitted by this equipment was passed both Radiated and Conducted Emissions Class A limits.

Test Item	Normative References	Test Result	Remarks
Conducted Emission	ANSI C63.4-2014 FCC Part 15 Subpart B ICES 003 Issue 6	PASS	Meets Class A Limit Minimum passing margin(QP) is -33.39 dB at 0.1500 MHz
Radiated Emission	ANSI C63.4-2014 FCC Part 15 Subpart B ICES 003 Issue 6	PASS	Meets Class A Limit Minimum passing margin(peak) is -7.08 dB at 207.5099 MHz



2. Test Configuration of Equipment under Test

2.1. Feature of Equipment under Test

Product Name:	KVM SWITCH	
Model Name:	KS-3104(KT-150),KS-3104(KT-250) KS-3108(KT-150),KS-3108(KT-250) KS-3116(KT-150),KS-3116(KT-250)	
Adapter	Model:	FJ-SW1260901000DU
	Input:	100-240V~ 50/60Hz 0.4A Max
	Output:	9V, 1000mA

Note: Please refer to user manual.

Model Different:

Type		4 Port	8 Port	16 Port
Model		KS-3104(KT-150) KS-3104(KT-250)	KS-3108(KT-150) KS-3108(KT-250)	KS-3116(KT-150) KS-3116(KT-250)
Computer Connection	Direct Connects	4	8	16
Operating Environment	Operating temperature	-10-50°C		
	Storage temperature	-20-60°C		
	Humidity	0-80%RH, No Condensation		
Physical Properties	Housing	Metal		
	Dimension	432 x 155 x 44 mm		
	Weight	0.8kg	0.8kg	0.8kg



2.2. Test Manner

- a. During testing, the interface cables and equipment positions were varied according to ANSI C63.4.
- b. Turn on the power of all equipment.
- c. The complete test system included PC, PS/2 Keyboard, USB Keyboard, USB Mouse, PS/2 Mouse, Monitor, LAN to VGA + USB Docking and EUT for EMI test.
- d. The test mode as follow:

Mode 1: Full system for KS-3116(KT-150)

Mode 2: Full system for KS-3116(KT-250)

Mode 3: Full system for KS-3104(KT-150)

Mode 4: Full system for KS-3104(KT-250)

Mode 5: Full system for KS-3108(KT-150)

Mode 6: Full system for KS-3108(KT-250)

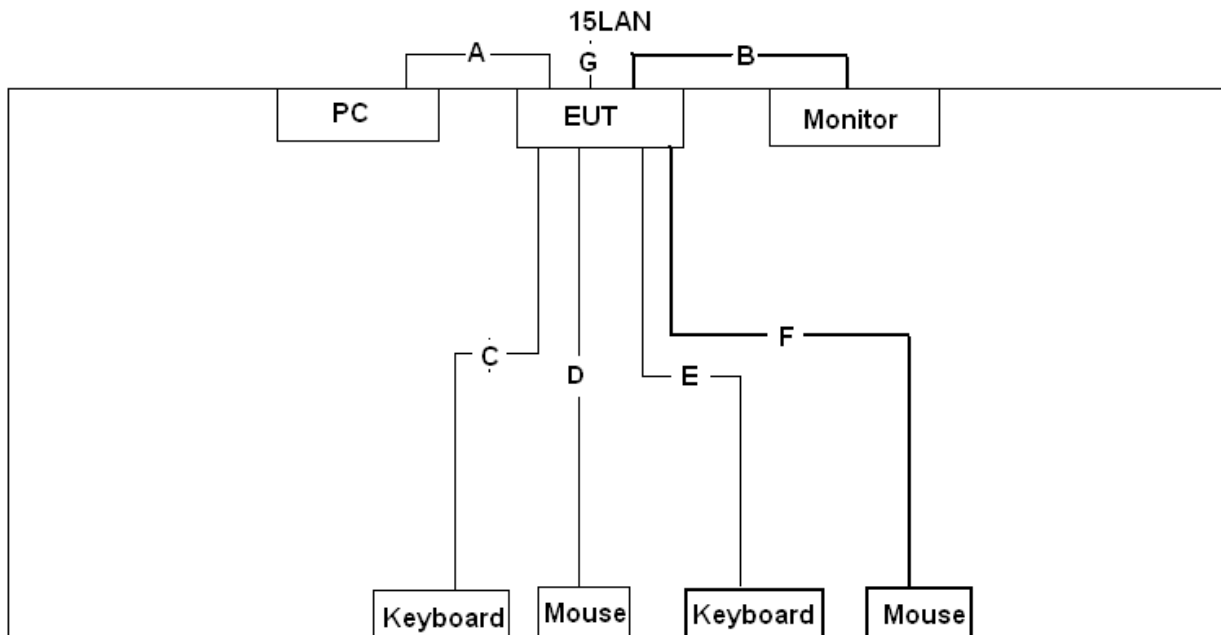
The "Test Mode 1 were reported as final data.

**2.3. Description of Test System**

No.	Device	Manufacturer	Model No.	Description
1	PC	HP	HP Compaq Elite 8200 MTPC	Non-Shielded ,1.8m
2	PS/2 Keyboard	ASUS	PK1100	N/A
3	USB Keyboard	DELL	SK-8115	N/A
4	USB Mouse	DELL	G0K02XYK	N/A
5	PS/2 Mouse	FOXQUEEN	HM518	N/A
6	Monitor	Lenovo	L2364wA	R33B65
7	LAN to VGA + USB Docking	OTECH	DT-5002A	N/A



2.4. Connection Diagram of Test System



No.	Cable	Quantity	Description
A	LAN to VGA + USB Cable	1	Non-Shielded, 0.5m
B	VGA Cable	1	Non-Shielded, 1.8m,with two ferrite core bonded
C	USB Cable	1	Non-Shielded, 1.8m, with one ferrite core bonded
D	USB Cable	1	Non-Shielded, 1.5m
E	PS/2 Cable	1	Non-Shielded, 1.5m, with one ferrite core
F	PS/2 Cable	1	Non-Shielded, 1.5m
G	LAN Cable	15	Non-Shielded, 1.5m

**2.5. General Information of Test**

Test Site :	Cerpass Technology Corporation Test Laboratory Address: No.10, Ln. 2, Lianfu St., Luzhu Dist., Taoyuan City 33848, Taiwan (R.O.C.) Tel:+886-3-3226-888 Fax:+886-3-3226-881 Address: No.68-1, Shihbachongsi, Shihding Township, New Taipei City 223, Taiwan, R.O.C. Tel: +886-2-2663-8582
FCC Registration Number :	TW1079, TW1061
IC Registration Number :	4934E-1, 4934E-2
VCCI	T-2205 for Telecommunication Test C-4663 for Conducted emission test R-4218 for Radiated emission test G-10812 for radiated disturbance above 1GHz
Frequency Range Investigated :	Conducted Emission Test: from 150 kHz to 30 MHz Radiated Emission Test: from 30 MHz to 18,000 MHz
Test Distance :	The test distance of radiated emission below 1GHz from antenna to EUT is 10 M. The test distance of radiated emission above 1GHz from antenna to EUT is 3 M.

2.6. Measurement Uncertainty

Measurement Item	Measurement Frequency	Polarization	Uncertainty
Conducted Emission	9 kHz ~ 30 MHz	LINE / NEUTRAL	3.25 dB
Radiated Emission	30 MHz ~ 1,000 MHz	Vertical / Horizontal	3.93 dB
	1,000 MHz ~ 18,000 MHz	Vertical / Horizontal	5.18 dB



3. Test of Conducted Emission

3.1. Test Limit

Conducted Emissions were measured from 150 kHz to 30 MHz with a bandwidth of 9 KHz on the 120 VAC power and return leads of the EUT according to the methods defined in ANSI C63.4-2014 Section 3.1. The EUT was placed on a nonmetallic stand in a shielded room 0.8 meters above the ground plane as shown in section 2.2. The interface cables and equipment positioning were varied within limits of reasonable applications to determine the position produced maximum conducted emissions.

Conducted Emission Limits:

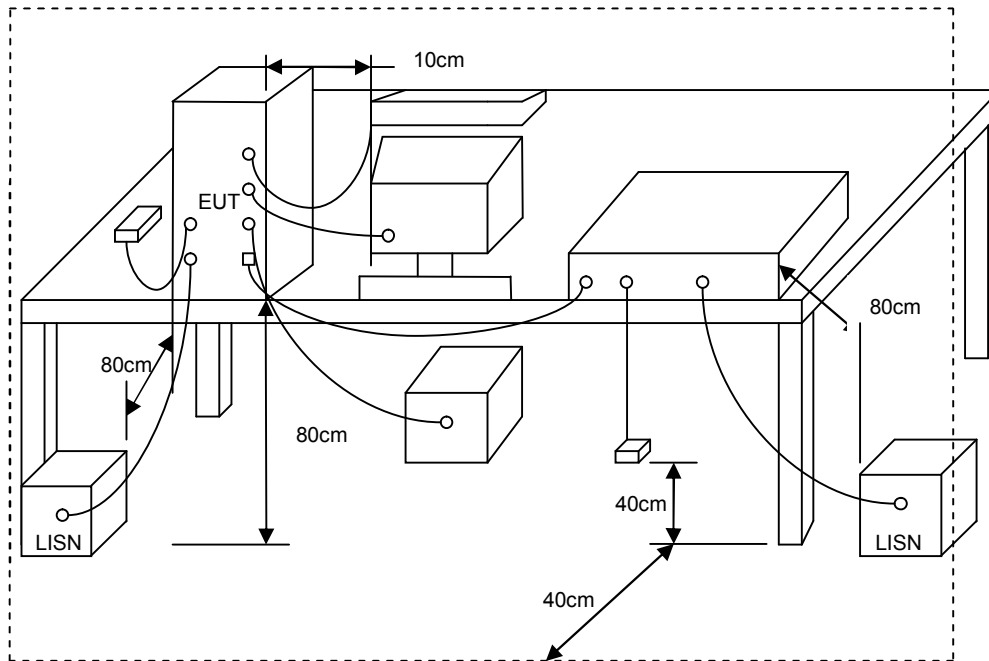
Frequency range (MHz)	Class A Equipment		Class B Equipment	
	Quasi Peak	Average	Quasi Peak	Average
0.15 to 0.50	79	66	66 to 56*	56 to 46*
0.50 to 5	73	60	56	46
5. to 30.	73	60	60	50
*The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.5MHz.				

3.2. Test Procedures

- The EUT was placed 0.4 meter from the conducting wall of the shielding room was kept at least 80 centimeters from any other grounded conducting surface.
- Connect EUT to the power mains through a line impedance stabilization network (LISN).
- All the support units are connecting to the other LISN.
- The LISN provides 50 ohm coupling impedance for the measuring instrument.
- The FCC states that a 50 ohm, 50 micro-Henry LISN should be used.
- Both sides of AC line were checked for maximum conducted interference.
- The frequency range from 150 kHz to 30 MHz was searched.
- Set the test-receiver system to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.



3.3. Typical test Setup



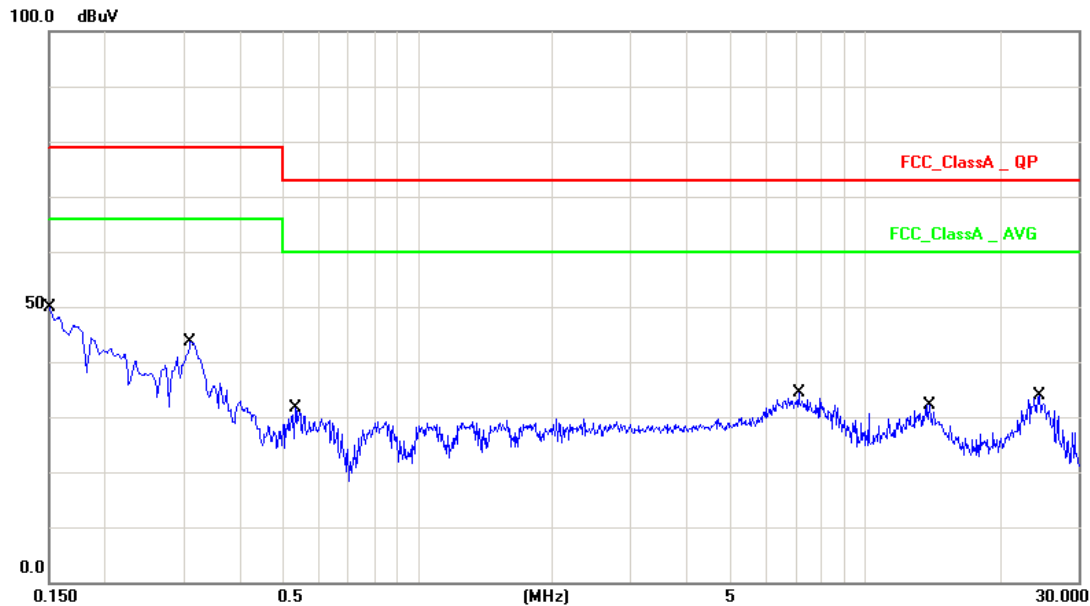
3.4. Measurement Equipment

Instrument	Manufacturer	Model No.	Serial No.	Calibration Date	Valid Date
EMI Receiver	R&S	ESCI3	100821	2018/9/8	2019/9/7
Line Impedance Stabilization Network	Schwarzbeck	NSLK 8127	8127-516	2018/9/12	2019/9/11
Line Impedance Stabilization Network	Schwarzbeck	NSLK 8127	8127-568	2018/2/26	2019/2/25
Pulse Limiter	R&S	ESH3-Z2	101934	2018/2/22	2019/2/21
Software	Farad	Ez-EMC	ver.ct3a1	N/A	N/A



3.5. Test Result and Data

Test Mode :	Mode 1: Full system for KS-3116(KT-150)		
AC Power :	AC 120V/60Hz	Phase :	LINE
Temperature :	24°C	Humidity :	53%
Pressure(mbar) :	1002	Date:	2018/09/16

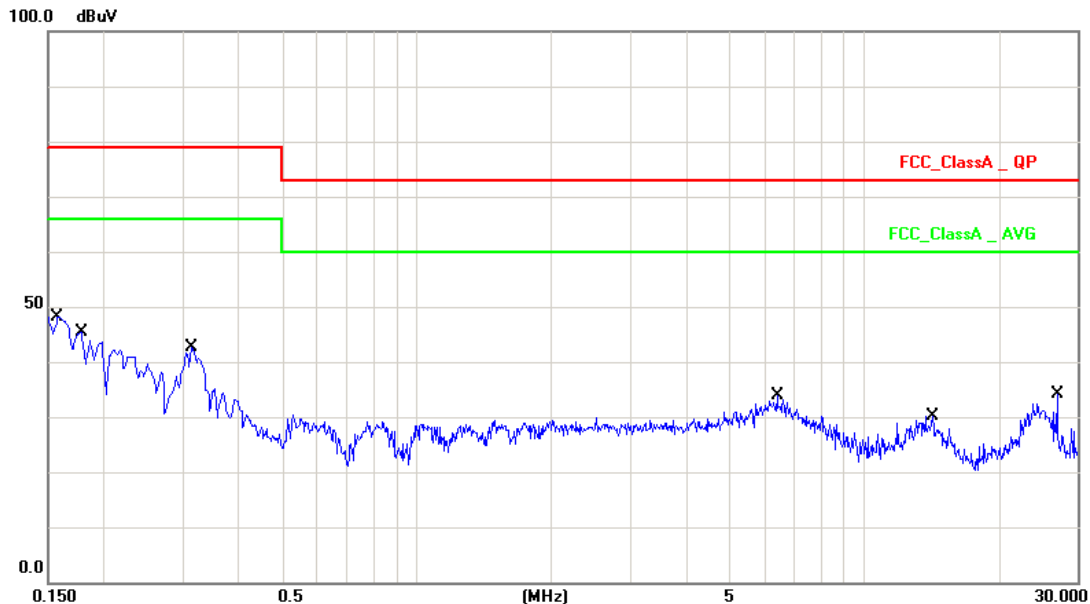


No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1	0.1500	9.97	35.64	45.61	79.00	-33.39	QP
2	0.1500	9.97	18.46	28.43	66.00	-37.57	AVG
3	0.3100	9.97	29.64	39.61	79.00	-39.39	QP
4	0.3100	9.97	22.14	32.11	66.00	-33.89	AVG
5	0.5340	9.98	16.06	26.04	73.00	-46.96	QP
6	0.5340	9.98	9.63	19.61	60.00	-40.39	AVG
7	7.1220	10.20	18.37	28.57	73.00	-44.43	QP
8	7.1220	10.20	11.06	21.26	60.00	-38.74	AVG
9	13.9300	10.38	18.97	29.35	73.00	-43.65	QP
10	13.9300	10.38	13.78	24.16	60.00	-35.84	AVG
11	24.5820	10.60	20.84	31.44	73.00	-41.56	QP
12	24.5820	10.60	14.23	24.83	60.00	-35.17	AVG

Note: Measurement Level = Reading Level + Correct Factor



Test Mode :	Mode 1: Full system for KS-3116(KT-150)		
AC Power :	AC 120V/60Hz	Phase :	NEUTRAL
Temperature :	24°C	Humidity :	53%
Pressure(mbar) :	1002	Date:	2018/09/16



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1	0.1580	9.97	35.15	45.12	79.00	-33.88	QP
2	0.1580	9.97	18.84	28.81	66.00	-37.19	AVG
3	0.1780	9.97	32.73	42.70	79.00	-36.30	QP
4	0.1780	9.97	15.63	25.60	66.00	-40.40	AVG
5	0.3140	9.97	28.77	38.74	79.00	-40.26	QP
6	0.3140	9.97	21.81	31.78	66.00	-34.22	AVG
7	6.4020	10.18	16.19	26.37	73.00	-46.63	QP
8	6.4020	10.18	8.76	18.94	60.00	-41.06	AVG
9	14.2340	10.39	13.79	24.18	73.00	-48.82	QP
10	14.2340	10.39	7.04	17.43	60.00	-42.57	AVG
11	27.0900	10.66	20.30	30.96	73.00	-42.04	QP
12	27.0900	10.66	14.01	24.67	60.00	-35.33	AVG

Note: Measurement Level = Reading Level + Correct Factor

Test engineer: Magina



4. Test of Radiated Emission

4.1. Test Limit

Below 1GHz (for digital device)

For unintentional device, according to CISPR PUB.22, for Class B digital devices, the general requirement of field strength of radiated emissions from intentional radiators at a distance of 10 meters shall not exceed the below table.

FREQUENCY (MHz)	dBuV/m (At 10m)	
	Class A	Class B
30 ~ 230	40	30
230 ~ 1000	47	37

Limit tables for non-digital device:

Class A Radiated Emission limit at 10m (for others)

Frequency (MHz)	Field Strength Limit (uV/m)Q.P.	Field Strength Limit (dBuV/m)Q.P.
30 - 88	90	39
88 - 216	150	43.5
216 – 960	210	46.4
Above 960	300	49.5

Class B Radiated Emission limit at 3m (for others)

Frequency (MHz)	Field Strength Limit (uV/m)Q.P.	Field Strength Limit (dBuV/m)Q.P.
30 - 88	100	40
88 - 216	150	43.5
216 – 960	200	46
Above 960	500	54

Above 1GHz(for all device)

Frequency (MHz)	Class A (dBuV/m) (At 10m)		Class B (dBuV/m) (At 3m)	
	Average	Peak	Average	Peak
Above 1000	49.5	69.5	54	74

NOTE: (1) The lower limit shall apply at the transition frequencies.
 (2) Emission level (dBuV/m) = 20 log Emission level (uV/m).
 (3) The measurement above 1GHz is at close-in distances 3m, and determine the limit L2 corresponding to the close-in distance d2 by applying the following relation: $L2 = L1 (d1/d2)$, where L1 is the specified limit in microvolts per metre (uV/m) at the distance d1 (10m), L2 is the new limit for distance d2 (3m).
 So the new Class A limit above 1GHz at 3m is as following table:



Frequency (MHZ)	Class A (dBuV/m) (At 3m)	
	Average	Peak
Above 1000	60	80

According to FCC Part 15.33 (b), for an unintentional radiator, including a digital device, the spectrum shall be investigated from the lowest radio frequency signal generated or used in the device, without going below the lowest frequency for which a radiated emission limit is specified, up to the frequency shown in the following table:

Highest frequency generated or used in the device or on which the device operates or tunes (MHz)	Upper frequency of measurement range (MHz)
Below 1.75	30
1.75-108	1000
108-500	2000
500-1000	5000
Above 1000	5 th harmonic of the highest frequency or 40GHz, whichever is lower

4.2. Test Procedures

Procedure of Preliminary Test

- The equipment was set up as per the test configuration to simulate typical usage per the user's manual. When the EUT is a tabletop system, a wooden turntable with a height of 0.8 meters is used which is placed on the ground plane. When the EUT is a floor standing equipment, it is placed on the ground plane which has a 15 cm non-conductive covering to insulate the EUT from the ground plane.
- Support equipment, if needed, was placed as per ANSI C63.4.
- All I/O cables were positioned to simulate typical usage as per ANSI C63.4.
- The EUT received AC 120VAC/60Hz power source from the outlet socket under the turntable. All support equipment power received from another socket under the turntable.
- The antenna was placed at 3 or 10 meter away from the EUT as stated in ANSI C63.4. The antenna connected to the Spectrum Analyzer via a cable and at times a pre-amplifier would be used.
- The Analyzer / Receiver quickly scanned from 30MHz to 40GHz. The EUT test program was started. Emissions were scanned and measured rotating the EUT to 360 degrees and positioning the antenna 1 to 4 meters above the ground plane, in both the vertical and the horizontal polarization, to maximize the emission reading level.



- Set the spectrum analyzer/ Receiver in the following setting as:
Below 1GHz:
RBW=120KHz / VBW=300KHz / Sweep=AUTO
Above 1GHz:
Peak: RBW=1MHz, VBW=3MHz / Sweep=AUTO
Average: RBW=1MHz / VBW=1.6Hz / Sweep=AUTO
- The worst configuration of EUT and cable of the above highest emission level were recorded for reference of the final test.

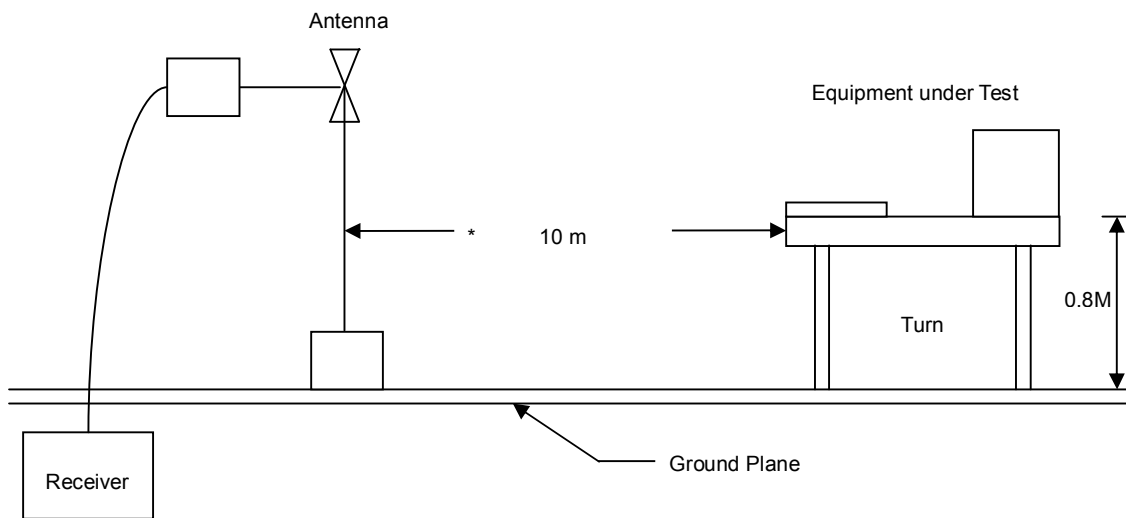
Procedure of Final Test

- EUT and support equipment were set up on the turntable as per the configuration with highest emission level in the preliminary test.
- The Analyzer / Receiver scanned from 30MHz to 40GHz. Emissions were scanned and measured rotating the EUT to 360 degrees, varying cable placement and positioning the antenna 1 or 1 to 4 meters above the ground plane, in both the vertical and the horizontal polarization, to maximize the emission reading level.
- Recording at least the six highest emissions. Emission frequency, amplitude, antenna position, polarization and turntable position were recorded into a computer in which correction factors were used to calculate the emission level and compare reading to the applicable limit. Below 1GHz the QP. reading and above 1GHz the Peak and Average reading are presented.
- The test data of the worst-case condition(s) was recorded.

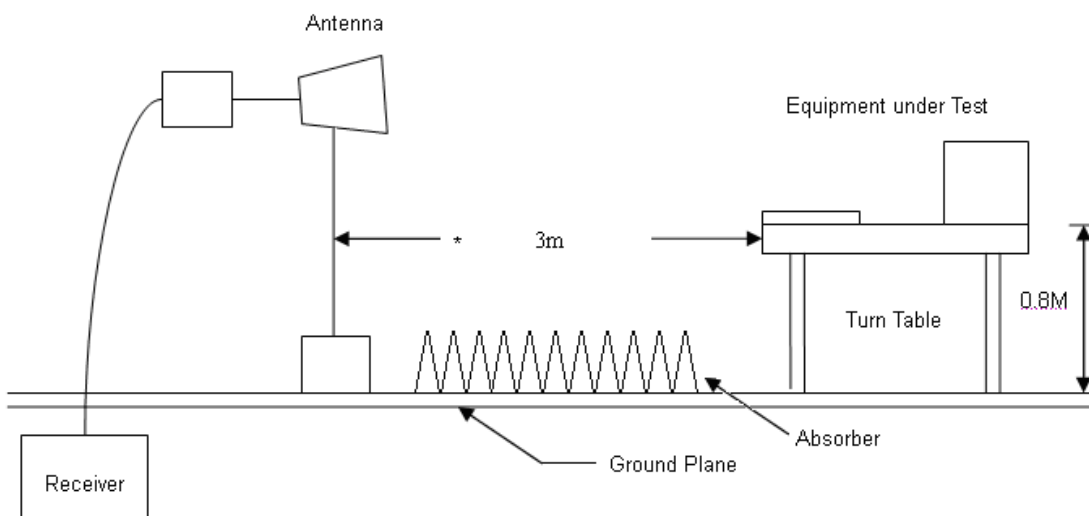


4.3. Typical test Setup

Below 1GHz Test Setup



Above 1GHz Test Setup





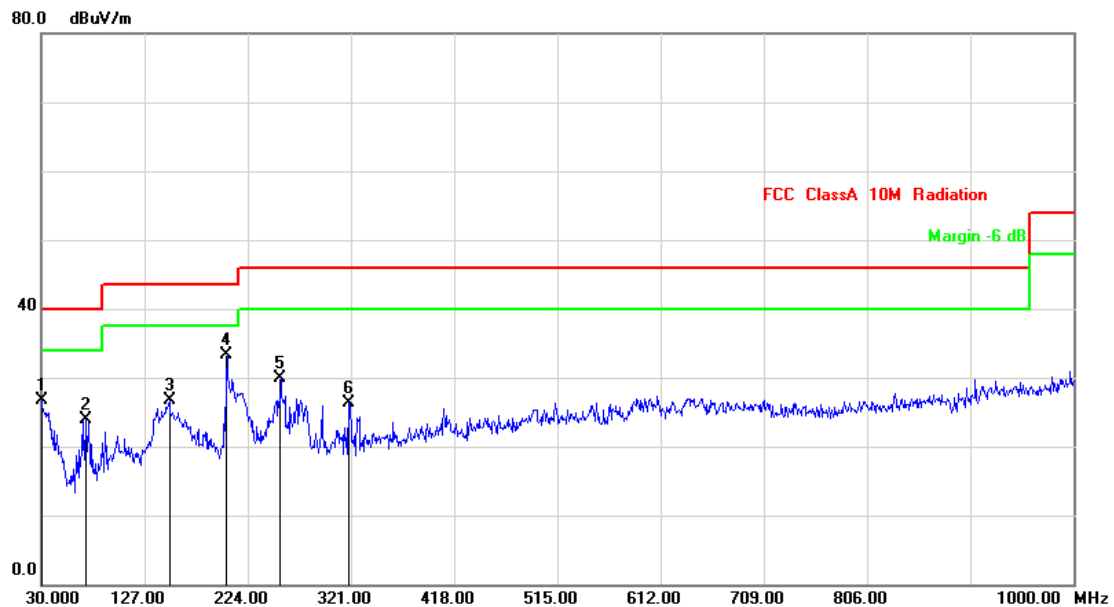
4.4. Measurement Equipment

Instrument	Manufacturer	Model No.	Serial No.	Calibration Date	Valid Date
Bilog Antenna	Sunol	JB1	A020514-1	2018/2/23	2019/2/22
Bilog Antenna	Sunol	JB1	A020514-2	2018/3/20	2019/3/19
EMI Receiver	R&S	ESCI3	101402	2018/2/23	2019/2/22
EMI Receiver	R&S	ESCI7	100963	2018/3/15	2019/3/14
Preamplifier	EM Electronics corp.	EM330	60610	2018/3/8	2019/3/7
Preamplifier	EM Electronics corp.	EM330	60611	2018/2/26	2019/2/25
Horn Antenna	Schwarzbeck	BBHA 9120 D	9120D-1785	2017/9/27	2018/9/26
Spectrum Analyzer	R&S	FSP40	100047	2018/3/20	2019/3/19
Preamplifier	EM Electronics corp.	EM01G18G	60700	2018/09/01	2019/08/31
Software	E3	AUDIX	Version: 8.14.806b	N/A	N/A



4.5. Test Result and Data (30MHz~1GHz)

Test Mode :	Mode 1: Full system for KS-3116(KT-150)		
AC Power :	AC 120V/60Hz	Ant. Polarization:	Horizontal
Temp :	25°C	Humidity :	52%
Pressure(mbar) :	1002	Date:	2018/09/17

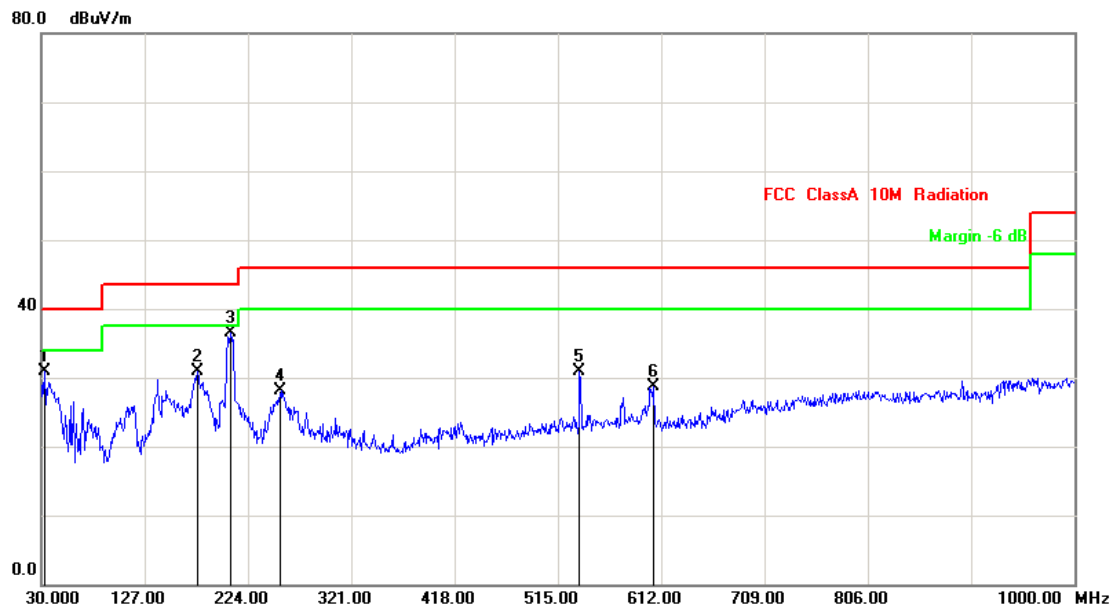


No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.	Height (cm)	Azimuth (deg)
1	30.0000	-6.50	33.27	26.77	40.00	-13.23	peak	100	184
2	71.7099	-17.25	41.25	24.00	40.00	-16.00	peak	100	52
3	150.2800	-11.83	38.48	26.65	43.50	-16.85	peak	400	226
4	204.5999	-13.13	46.50	33.37	43.50	-10.13	peak	400	36
5	255.0399	-11.64	41.50	29.86	46.00	-16.14	peak	200	118
6	319.0600	-8.99	35.36	26.37	46.00	-19.63	peak	200	78

Note: Measurement Level = Reading Level + Correct Factor



Test Mode :	Mode 1: Full system for KS-3116(KT-150)		
AC Power :	AC 120V/60Hz	Ant. Polarization:	Vertical
Temp :	25°C	Humidity :	52%
Pressure(mbar) :	1002	Date:	2018/09/17



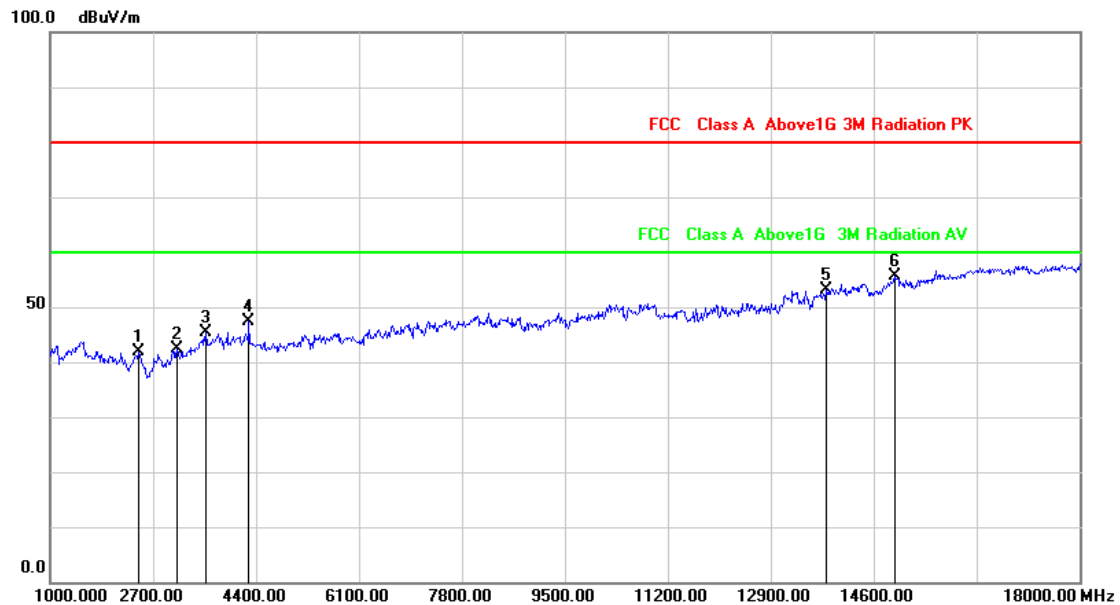
No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.	Height (cm)	Azimuth (deg)
1	32.9099	-8.07	38.92	30.85	40.00	-9.15	peak	100	61
2	176.4698	-12.71	43.71	31.00	43.50	-12.50	peak	100	151
3	207.5099	-13.05	49.47	36.42	43.50	-7.08	peak	400	128
4	255.0399	-11.64	39.69	28.05	46.00	-17.95	peak	200	223
5	535.3700	-3.26	34.09	30.83	46.00	-15.17	peak	200	25
6	604.2400	-1.78	30.50	28.72	46.00	-17.28	peak	400	117

Note: Measurement Level = Reading Level + Correct Factor



4.6. Test Result and Data (1GHz ~18GHz)

Test Mode :	Mode 1: Full system for KS-3116(KT-150)		
AC Power :	AC 120V/60Hz	Ant. Polarization:	Horizontal
Temp :	25°C	Humidity :	52%
Pressure(mbar) :	1002	Date:	2018/09/17

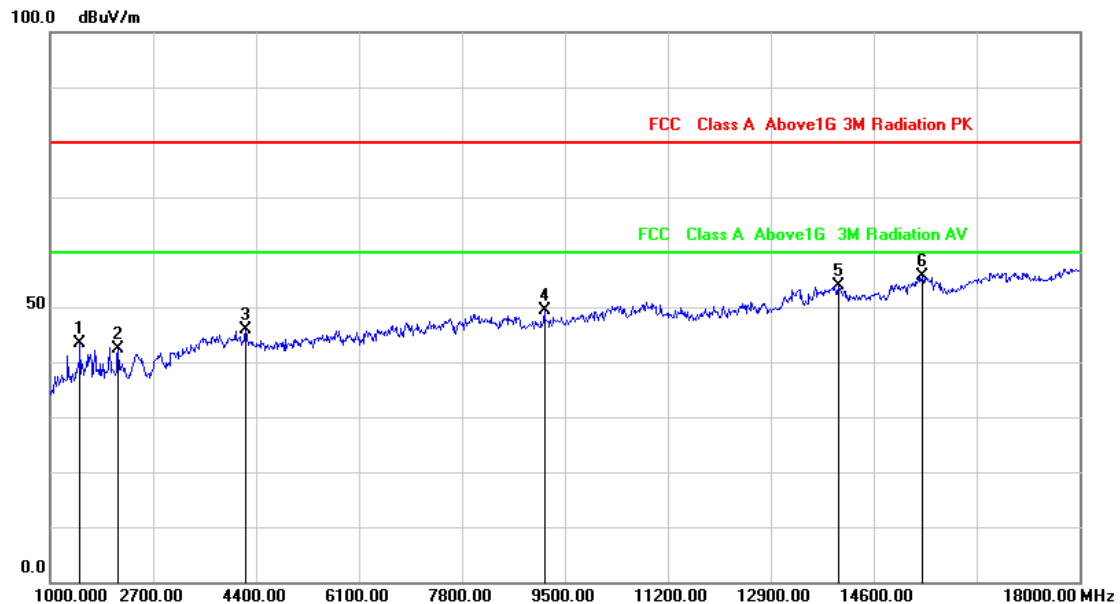


No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.	Height (cm)	Azimuth (deg)
1	2462.000	-1.97	43.93	41.96	80.00	-38.04	peak	200	185
2	3091.000	-0.72	42.98	42.26	80.00	-37.74	peak	100	227
3	3567.000	1.81	43.45	45.26	80.00	-34.74	peak	200	204
4	4281.000	3.02	44.36	47.38	80.00	-32.62	peak	100	78
5	13818.000	20.82	32.41	53.23	80.00	-26.77	peak	100	300
6	14940.000	22.14	33.40	55.54	80.00	-24.46	peak	189	360

Note: Measurement Level = Reading Level + Correct Factor



Test Mode :	Mode 1: Full system for KS-3116(KT-150)		
AC Power :	AC 120V/60Hz	Ant. Polarization:	Vertical
Temp :	25°C	Humidity :	52%
Pressure(mbar) :	1002	Date:	2018/09/17



No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.	Height (cm)	Azimuth (deg)
1	1493.000	-5.83	49.21	43.38	80.00	-36.62	peak	169	360
2	2122.000	-3.24	45.65	42.41	80.00	-37.59	peak	200	328
3	4230.000	3.10	42.87	45.97	80.00	-34.03	peak	200	2
4	9160.000	9.12	40.30	49.42	80.00	-30.58	peak	200	141
5	14022.000	21.72	32.11	53.83	80.00	-26.17	peak	100	191
6	15399.000	22.23	33.29	55.52	80.00	-24.48	peak	100	274

Note: Measurement Level = Reading Level + Correct Factor

Test engineer: Magina