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FCC TEST REPORT

for

Switching Power Supply

MODEL: SGAS60xyzzzzz (x = B, U, E, SA, BS, AR, KR, CH, I (denotes AC plug type); y = 05, 07, 09, 12A, 12, 15, 18, 24, 28 or 48; z = 0 to 9, A to Z, hyphen or blank); SGA60xyzzzzz (x = B, U, E, SA, BS, AR, KR, CH (denotes AC plug type); y = 05, 07, 09, 12A, 12, 15, 18, 24, 28 or 48; z = 0 to 9, A to Z, hyphen or blank); SGA40xyzzzzz (x = B, U, E, SA, BS, AR, KR, CH, I (denotes AC plug type); y = 05, 07, 09, 12A, 12, 15, 18, 24, 28 or 48; z = 0 to 9, A to Z, hyphen or blank)

Issued to:

Mean Well Enterprises Co, Ltd**No. 28, Wuquan 3rd Rd., Wugu Dist.,
New Taipei City 248 Taiwan**

Issued by:

Compliance Certification Services Inc.**Xindian Lab.****No.163-1, Jhongsheng Rd., Xindian Dist.,
New Taipei City, 23151 Taiwan.****TEL: 886-2-22170894****FAX: 886-2-22171029****Issued Date: June 26, 2019**

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Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

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Revision History

Rev.	Issue Date	Revisions	Effect Page	Revised By
00	October 12, 2018	Initial Issue	ALL	Eva Fan
01	May 30, 2019	Update model	ALL	Eva Fan
02	June 26, 2019	Copy report	ALL	Eva Fan



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1 TEST RESULT CERTIFICATION

Product: Switching Power Supply

Model: SGAS60xyzzzzz (x = B, U, E, SA, BS, AR, KR, CH, I (denotes AC plug type); y = 05, 07, 09, 12A, 12, 15, 18, 24, 28 or 48; z = 0 to 9, A to Z, hyphen or blank); SGA60xyzzzzz (x = B, U, E, SA, BS, AR, KR, CH (denotes AC plug type); y = 05, 07, 09, 12A, 12, 15, 18, 24, 28 or 48; z = 0 to 9, A to Z, hyphen or blank); SGA40xyzzzzz (x = B, U, E, SA, BS, AR, KR, CH, I (denotes AC plug type); y = 05, 07, 09, 12A, 12, 15, 18, 24, 28 or 48; z = 0 to 9, A to Z, hyphen or blank)

Brand: Mean Well Enterprises Co, Ltd

Applicant: Mean Well Enterprises Co, Ltd
No. 28, Wuquan 3rd Rd., Wugu Dist.,
New Taipei City 248 Taiwan

Manufacturer: ELJINTEK INC
6F-1, No.286-3, Shin Ya Road, Chien Chen Dist.,
Kaohsiung 806 Taiwan

Mean Well Enterprises Co, Ltd
No. 28, Wuquan 3rd Rd., Wugu Dist.,
New Taipei City 248 Taiwan

Mitra Power Solution Co., Ltd
First Industrial district, Cunwei Village, HengLi Town DongGuan GuangDong PRC.

YOUNGYEAR ELECTRONICS CO LTD
Jin Zhu Industries Area Qing Xi Town Dongguan, Guangdong 523646 China

Dongguan Shengfone Electronics Technology Co., Ltd.
Shengfeng Electronic Factory, Dongfeng RD., Qingxi Town, Dongguan city,
Guangdong Province, China

Tested: May 23, 2018 ~ June 15, 2018

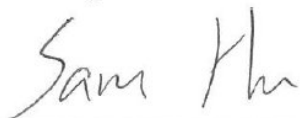
EMISSION			
Standard	Item	Result	Remarks
FCC 47 CFR Part 15 Subpart B, ICES-003 Issue 6-2016 ANSI C63.4-2014	Conducted (Power Port)	PASS	Meet Class B limit
	Radiated	PASS	Meet Class B limit

Statements of Conformity

Determination of compliance is based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.

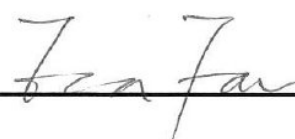
The above equipment has been tested by Compliance Certification Services Inc., and found compliance with the requirements set forth in the technical standards mentioned above. The results of testing in this report apply only to the product/system, which was tested. Other similar equipment will not necessarily produce the same results due to production tolerance and measurement uncertainties.

Approved by:



Sam Hu
Assistant Manager

Reviewed by:



Eva Fan
Supervisor of report document dept.



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2 EUT DESCRIPTION

Product	Switching Power Supply
Brand Name	Mean Well Enterprises Co, Ltd
Model	SGAS60xyzzzzz (x = B, U, E, SA, BS, AR, KR, CH, I (denotes AC plug type); y = 05, 07, 09, 12A, 12, 15, 18, 24, 28 or 48; z = 0 to 9, A to Z, hyphen or blank); SGA60xyzzzzz (x = B, U, E, SA, BS, AR, KR, CH (denotes AC plug type); y = 05, 07, 09, 12A, 12, 15, 18, 24, 28 or 48; z = 0 to 9, A to Z, hyphen or blank); SGA40xyzzzzz (x = B, U, E, SA, BS, AR, KR, CH, I (denotes AC plug type); y = 05, 07, 09, 12A, 12, 15, 18, 24, 28 or 48; z = 0 to 9, A to Z, hyphen or blank)
Applicant	Mean Well Enterprises Co, Ltd
Housing material	Plastic
Identify Number	T180518D09
Received Date	May 18, 2018
EUT Power Rating	IP: 100~240VAC, 50-60Hz, 1.5A OP: Please see the model differences
AC Power During Test	120VAC / 60Hz & 230VAC / 60Hz
DC Power Cable Type	Desktop type: Unshielded, 1.2m (Non-detachable) Wall Mount type: Unshielded, 1.2m (Non-detachable)

I/O PORT

I/O PORT TYPES	Q'TY	TESTED WITH

Note: None.

Model Differences

Model Name	Difference				Tested (Check)
	Output Voltage (Vdc)	Output Current (A)	Max. Output Power (W)	Measured at the output of	
SGAS60X05	5-6	6.00-5.00	30	5V/6A	<input type="checkbox"/>
SGAS60I07	6~8	6.00~5.63	45.04	7.5V / 6A	<input checked="" type="checkbox"/>
SGAS60B07					<input checked="" type="checkbox"/>
SGAS60X09	8~11	5.63~5.00	55	9V/5.5A	<input type="checkbox"/>
SGAS60I12A	11~13	5.0~4.5	60	12V / 5A	<input checked="" type="checkbox"/>
SGAS60B12A					<input checked="" type="checkbox"/>
SGAS60X15	13~16	4.62~3.75	60	15V/4A	<input type="checkbox"/>
SGAS60U18	16~21	3.75~2.86	60.06	18V / 3.33A	<input checked="" type="checkbox"/>
SGAS60B18					<input checked="" type="checkbox"/>
SGAS60X24	21~27	2.86~2.23	60.21	24V/2.5A	<input type="checkbox"/>
SGAS60U28	27~33	2.23~1.82	60.06	28V / 2.14A	<input checked="" type="checkbox"/>
SGAS60B28					<input checked="" type="checkbox"/>
SGAS60U48	33~58	1.82~1.04	60.32	48V / 1.25A	<input checked="" type="checkbox"/>
SGA60U48					<input checked="" type="checkbox"/>
SGA60B48					<input checked="" type="checkbox"/>
SGA40X05	5~6	5.00~4.16A	25	5V/5A	<input type="checkbox"/>
SGA40I07	6~8	5.00~3.75	30	7.5V / 4A	<input checked="" type="checkbox"/>
SGA40B07					<input checked="" type="checkbox"/>
SGA40X09	8~11	5.00~3.27	40.04	9V/4.44A	<input type="checkbox"/>
SGA40I12	11~13	3.64~3.07	40.04	12V / 3.33A	<input checked="" type="checkbox"/>
SGA40B12					<input checked="" type="checkbox"/>
SGA40X15	13~16	3.07~2.05	40.04	15V/2.66A	<input type="checkbox"/>
SGA40U18	16~21	2.5~1.9	40	18V / 2.22A	<input checked="" type="checkbox"/>
SGA40B18					<input checked="" type="checkbox"/>
SGA40X24	21~27	1.9~1.48	40.23	24V/1.66A	<input type="checkbox"/>
SGA40U28	27~33	1.48~1.21	40.26	28V / 1.43A	<input checked="" type="checkbox"/>
SGA40B28					<input checked="" type="checkbox"/>
SGA40X48	33~58	1.21~0.68	40.6	48V / 0.84A	<input checked="" type="checkbox"/>
SGA40B48					<input checked="" type="checkbox"/>
Model Name	Difference				Tested (Check)
SGAS60xyzzzzz; SGA40xyzzzzz	1. x = B, U, E, SA, BS, AR, KR, CH, I (denotes AC plug type) y = 05, 07, 09, 12A, 12, 15, 18, 24, 28 or 48 z = 0 to 9, A to Z, hyphen or blank "B" denotes IEC 60320 C8 inlet type "U" or "I" denotes for American type or Interchangeable American type; "E" or "I" denotes for Europe type or Interchangeable Europe type; "SA" or "I" denotes for 2 Pin Australia type or 2 Pin Interchangeable Australia type; "BS" or "I" denotes for UK type or Interchangeable UK type; "AR" or "I" denotes for Argentina type or Interchangeable Argentina type; "KR" or "I" denotes for Korea type or Interchangeable Korea type; "CH" or "I" denotes for china type or Interchangeable china type 2. For marketing purpose only				<input type="checkbox"/>
SGA60xyzzzzz	1. x = B, U, E, SA, BS, AR, KR, CH (denotes AC plug type) y = 05, 07, 09, 12A, 12, 15, 18, 24, 28 or 48 z = 0 to 9, A to Z, hyphen or blank "B" denotes IEC 60320 C8 inlet type "U" denotes for American type; "E" denotes for Europe type; "SA" denotes for 2 Pin Australia type; "BS" denotes for UK type; "AR" denotes for Argentina type; "KR" denotes for Korea type; "CH" denotes for china type 2. For marketing purpose only				<input type="checkbox"/>

3 TEST METHODOLOGY

3.1. DECISION OF FINAL TEST MODE

The EUT was tested together with the below additional components, and a configuration, which produced the worst emission levels, was selected and recorded in this report.

The test configuration/ modes are as the following:

Conduction Modes:

1	SGAS60I07	Wall Mount Type	Full Rated Load Mode	120VAC, 60Hz
2	SGAS60I12A			120VAC, 60Hz
3	SGAS60U18			230VAC, 60Hz
4	SGAS60U28			120VAC, 60Hz
5				230VAC, 60Hz
6				120VAC, 60Hz
7	SGA60U48			120VAC, 60Hz
8	SGAS60B07	120VAC, 60Hz		
9	SGAS60B12A	Desktop Type		120VAC, 60Hz
10				230VAC, 60Hz
11				
12				
13				
14	SGA40I07	Wall Mount Type		120VAC, 60Hz
15	SGA40I12			
16	SGA40U18			
17	SGA40U28			
18	SGA40X48			
19	SGA40B07	Desktop Type		
20	SGA40B12			
21	SGA40B18			
22	SGA40B28			
23	SGA40B48			

Radiation Modes:

1	SGAS60I07	Wall Mount Type	Full Rated Load Mode	120VAC, 60Hz
2	SGAS60I12A			
3	SGAS60U18			
4	SGAS60U28			
5	SGAS60U48			
6				
7				
8	SGA60U48	Desktop Type		120VAC, 60Hz
9				
10				
11				
12				
13				
14	SGA60B48			120VAC, 60Hz
15				
16				
17	SGA40I07	Wall Mount Type		120VAC, 60Hz
18				
19				
20	SGA40I12			
21				
22				
23	SGA40U18			
24				
25				
26	SGA40U28			
27				
28				
29	SGA40X48			
30				
31				
32	SGA40B07	Desktop Type		
33				
34				
35	SGA40B12			
36				
37				
38	SGA40B18			
39				
40				
41	SGA40B28			
42				
43				
44	SGA40B48			
45				
46				

Worst:

Conduction: Mode 4, 10

Radiation: Mode 6, 13

3.2. EUT SYSTEM OPERATION

1. To adjust variable resistor to test full rated load mode.

Note: Test program is self-repeating throughout the test.

4 SETUP OF EQUIPMENT UNDER TEST

4.1. DESCRIPTION OF SUPPORT UNITS

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

Peripherals Devices:

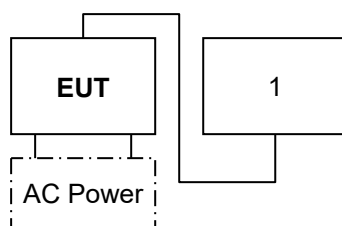
No.	Equipment	Model No.	Serial No.	FCC ID / BSMI ID	Trade Name	Data Cable	Power Cord
1	Variable Resistor	N/A	N/A	N/A	N/A	N/A	Unshielded, 1.2m

Note:

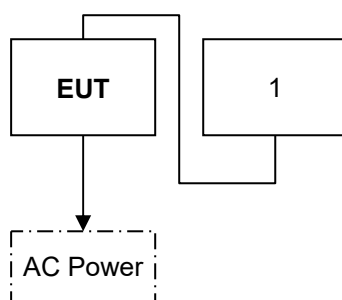
- 1) All the equipment/cables were placed in the worst-case configuration to maximize the emission during the test.
- 2) Grounding was established in accordance with the manufacturer's requirements and conditions for the intended use.

4.2. CONFIGURATION OF SYSTEM UNDER TEST

Wall Mount Type



Desktop Type



5 FACILITIES AND ACCREDITATIONS

5.1. FACILITIES

All measurement facilities used to collect the measurement data are located at CCSrf Taiwan Xindian Lab. at No.163-1, Jhongsheng Rd., Xindian Dist., New Taipei City, 23151 Taiwan.

The sites are constructed in conformance with the requirements of ANSI C63.4 and CISPR Publication 22. All receiving equipment conforms to CISPR 16-1-1, CISPR 16-1-2, CISPR 16-1-3, CISPR 16-1-4 and CISPR 16-1-5.

5.2. ACCREDITATIONS

Our laboratories are accredited and approved by the following accreditation body according to ISO/IEC 17025.

Taiwan	TAF
USA	A2LA

The measuring facility of laboratories has been authorized or registered by the following approval agencies.

Canada	Industry Canada
Japan	VCCI
Taiwan	BSMI
USA	FCC

Copies of granted accreditation certificates are available for downloading from our web site, <http://www.ccsrf.com>

5.3. MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2:

Measurement	Frequency	Uncertainty
Conducted emissions	0.15MHz ~ 30MHz	± 1.06
Radiated emissions	30MHz ~ 1000MHz	± 4.86

This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

Consistent with industry standard (e.g. CISPR 22: 2005, clause 11, Measurement Uncertainty) determining compliance with the limits shall be based on the results of the compliance measurement. Consequently the measured emissions being less than the maximum allowed emission result in this being a compliant test or passing test.

The acceptable measurement uncertainty value without requiring revision of the compliance statement is based on conducted and radiated emissions being less than U_{CISPR} which is 3.6dB and 5.2dB respectively. CCS values (called U_{Lab} in CISPR 16-4-2) is less than U_{CISPR} as shown in the table above. Therefore, MU need not be considered for compliance.

6 CONDUCTED EMISSION MEASUREMENT

6.1. LIMITS OF CONDUCTED EMISSION MEASUREMENT

FREQUENCY (MHz)	Class A (dBuV)		Class B (dBuV)	
	Quasi-peak	Average	Quasi-peak	Average
0.15 - 0.5	79	66	66 - 56	56 - 46
0.50 - 5.0	73	60	56	46
5.0 - 30.0	73	60	60	50

NOTE:

- (1) The lower limit shall apply at the transition frequencies.
- (2) The limit decreases in line with the logarithm of the frequency in the range 0.15 to 0.50 MHz.
- (3) All emanations from a class A/B digital device or system, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strengths specified above.

6.2. TEST INSTRUMENTS

Conducted Emission room # B				
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
BNC Cable	EMCI	CFD300-NL	BNC#B4	01/07/2019
EMI Test Receiver	R&S	ESCI	100234	05/15/2019
LISN	Schwarzbeck	NSLK 8127	8127382	05/14/2019
LISN(EUT)	Schwarzbeck	NSLK 8127	8127691	05/14/2019
Pulse Limiter	R&S	ESH3-Z2	100374	01/07/2019
Thermo-Hygro Meter	Wisewind	201A	No. 05	10/01/2018
Test S/W	EZ-EMC			

- NOTE:** 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. N.C.R = No Calibration Request.

6.3. TEST PROCEDURES (please refer to measurement standard or CCS SOP PA-031)

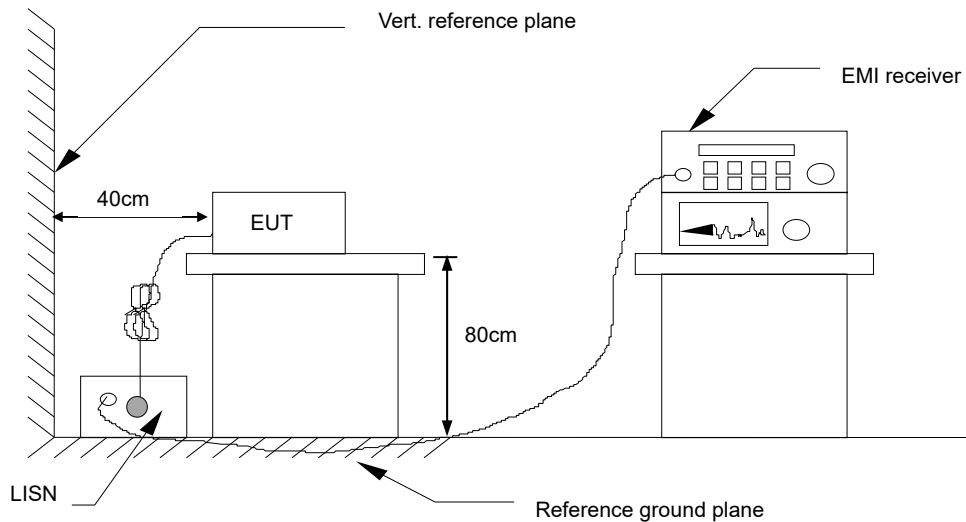
Procedure of Preliminary Test

- The EUT and support equipment, if needed, were 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 table with a height of 0.8 meters is used and is placed on the ground plane as per ANSI C63.4 (see Test Facility for the dimensions of the ground plane used). When the EUT is a floor standing equipment, it is placed on the ground plane, which has a 12 mm non-conductive covering to insulate the EUT from the ground plane.
- All I/O cables were positioned to simulate typical actual usage as per ANSI C63.4.
- The test equipment EUT installed by AC 120VAC/60Hz main power, through a Line Impedance Stabilization Network (LISN), which was supplied power source and was grounded to the ground plane.
- All support equipment power by from a second LISN.
- The test program of the EUT was started. Emissions were measured on each current carrying line of the EUT using an EMI Test Receiver connected to the LISN powering the EUT.
- The Receiver scanned from 150kHz to 30MHz for emissions in each of the test modes.
- During the above scans, the emissions were maximized by cable manipulation.
- The test mode(s) described in Item 3.1 were scanned during the preliminary test.
- After the preliminary scan, we found the test mode described in Item 3.1 producing the highest emission level.
- 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 test bench as per the configuration with highest emission level in the preliminary test.
- A scan was taken on both power lines, Line 1 and Line 2, recording at least the six highest emissions. Emission frequency and amplitude were recorded into a computer in which correction factors were used to calculate the emission level and compare reading to the applicable limit.
- The test data of the worst-case condition(s) was recorded.

6.4. TEST SETUP



- For the actual test configuration, please refer to the related item – Photographs of the Test Configuration.

6.5. DATA SAMPLE

Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Detector (P/Q/A)	Line (L1/L2)
x.xx	42.95	0.55	43.50	56	-12.50	Q	L1

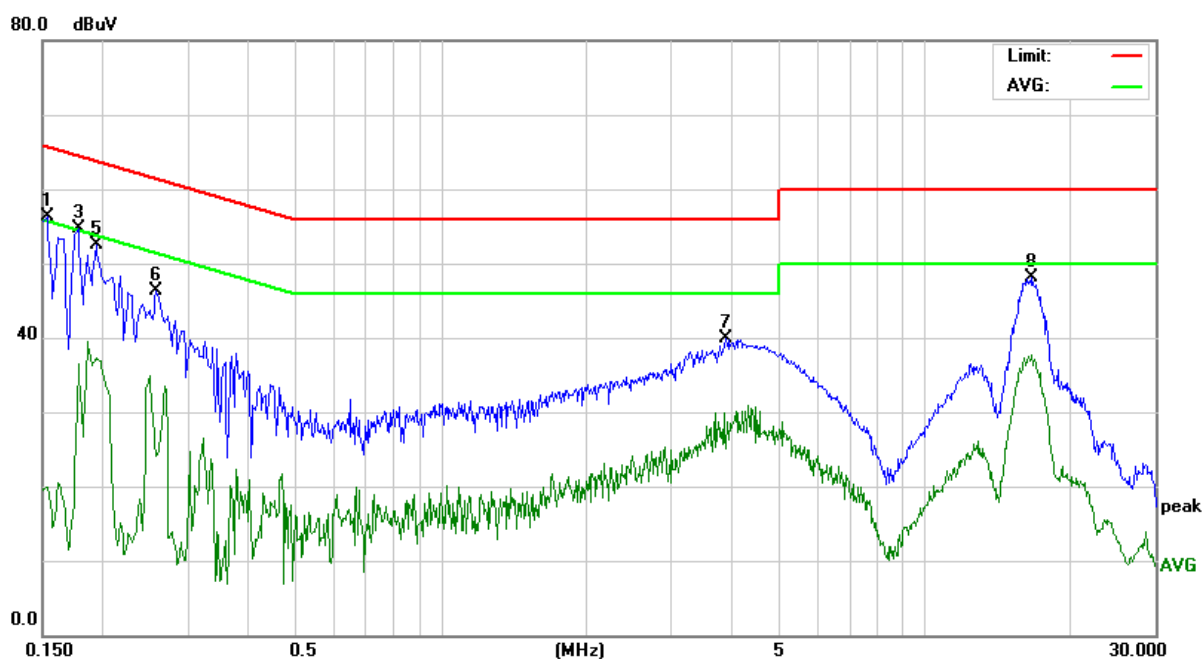
Freq. = Emission frequency in MHz
 Reading = Uncorrected Analyzer/Receiver reading
 Factor = Insertion loss of LISN + Cable Loss + Pulse Limit
 Result = Reading + Factor
 Limit = Limit stated in standard
 Margin = Reading in reference to limit
 P = Peak Reading
 Q = Quasi-peak Reading
 A = Average Reading
 L1 = Hot side
 L2 = Neutral side

Calculation Formula

Margin (dB) = Result (dBuV) – Limit (dBuV)

6.6. TEST RESULTS

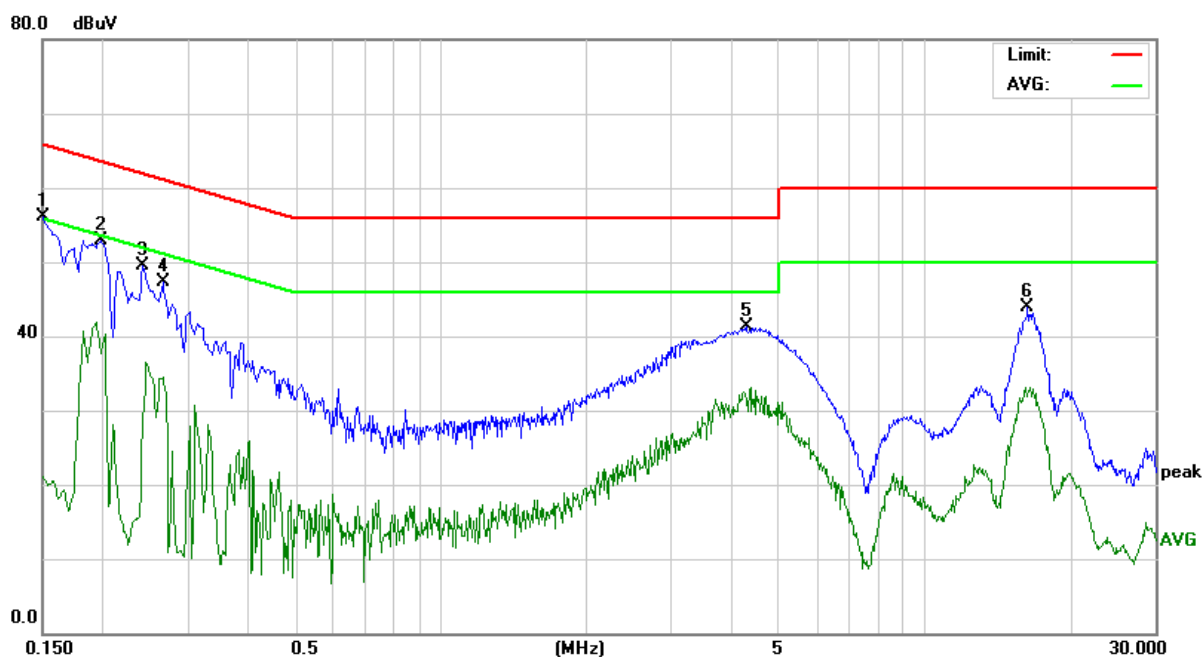
Model No.	SGAS60U28	6dB Bandwidth	9 kHz
Environmental Conditions	23°C, 62% RH	Test Mode	Mode 4
Tested by	Pipo Hou	Phase	L1
Standard	FCC CLASS B		



Conducted Emission Readings							
Frequency Range Investigated				150 kHz to 30 MHz			
Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Detector (P/Q/A)	Line (L1/L2)
0.1539	46.37	9.99	56.36	65.78	-9.42	P	L1
0.1539	9.99	9.99	19.98	55.78	-35.80	A	L1
0.1780	44.78	9.97	54.75	64.57	-9.82	P	L1
0.1780	26.48	9.97	36.45	54.57	-18.12	A	L1
0.1940	42.48	9.95	52.43	63.86	-11.43	P	L1
0.2580	36.36	9.94	46.30	61.49	-15.19	P	L1
3.8940	29.64	10.19	39.83	56.00	-16.17	P	L1
16.6620	37.60	10.55	48.15	60.00	-11.85	P	L1

Note: 1. L1 = Line One (Live Line) / L2 = Line Two (Neutral Line).

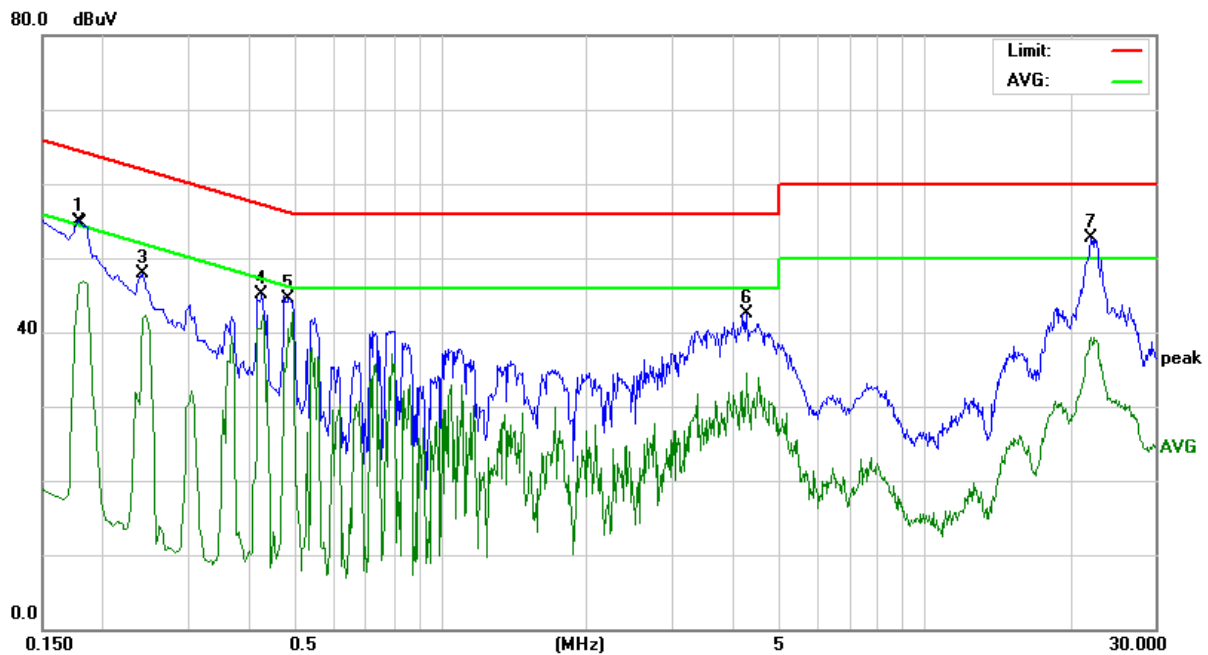
Model No.	SGAS60U28	6dB Bandwidth	9 kHz
Environmental Conditions	23°C, 62% RH	Test Mode	Mode 4
Tested by	Pipo Hou	Phase	L2
Standard	FCC CLASS B		



Conducted Emission Readings							
Frequency Range Investigated				150 kHz to 30 MHz			
Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Detector (P/Q/A)	Line (L1/L2)
0.1500	46.09	9.98	56.07	65.99	-9.92	P	L2
0.1980	42.99	9.92	52.91	63.69	-10.78	P	L2
0.2420	39.56	9.92	49.48	62.02	-12.54	P	L2
0.2660	37.29	9.92	47.21	61.24	-14.03	P	L2
4.2780	31.06	10.18	41.24	56.00	-14.76	P	L2
16.3180	33.33	10.52	43.85	60.00	-16.15	P	L2

Note: 1. L1 = Line One (Live Line) / L2 = Line Two (Neutral Line).

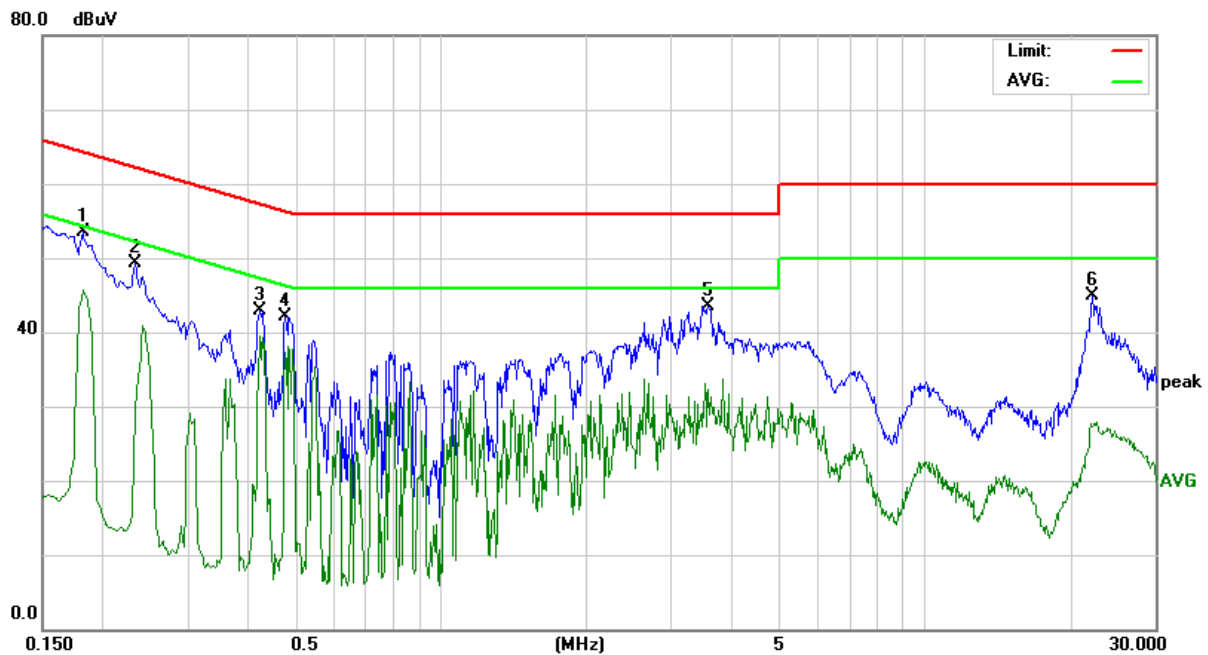
Model No.	SGAS60B12A	6dB Bandwidth	9 kHz
Environmental Conditions	23°C, 62% RH	Test Mode	Mode 10
Tested by	Pipo Hou	Phase	L1
Standard	FCC CLASS B		



Conducted Emission Readings							
Frequency Range Investigated				150 kHz to 30 MHz			
Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Detector (P/Q/A)	Line (L1/L2)
0.1787	44.85	9.97	54.82	64.54	-9.72	P	L1
0.1819	36.96	9.97	46.93	54.39	-7.46	A	L1
0.2420	37.90	9.94	47.84	62.02	-14.18	P	L1
0.4260	35.06	9.96	45.02	57.33	-12.31	P	L1
0.4863	34.46	9.96	44.42	56.23	-11.81	P	L1
4.2700	32.36	10.20	42.56	56.00	-13.44	P	L1
22.1140	41.95	10.67	52.62	60.00	-7.38	P	L1
22.1140	28.71	10.67	39.38	50.00	-10.62	A	L1

Note: 1. L1 = Line One (Live Line) / L2 = Line Two (Neutral Line).

Model No.	SGAS60B12A	6dB Bandwidth	9 kHz
Environmental Conditions	23°C, 62% RH	Test Mode	Mode 10
Tested by	Pipo Hou	Phase	L2
Standard	FCC CLASS B		



Conducted Emission Readings							
Frequency Range Investigated				150 kHz to 30 MHz			
Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Detector (P/Q/A)	Line (L1/L2)
0.1819	43.52	9.95	53.47	64.39	-10.92	P	L2
0.2340	39.36	9.92	49.28	62.30	-13.02	P	L2
0.4220	32.88	9.94	42.82	57.41	-14.59	P	L2
0.4780	32.21	9.94	42.15	56.37	-14.22	P	L2
3.5780	33.39	10.16	43.55	56.00	-12.45	P	L2
22.2380	34.26	10.64	44.90	60.00	-15.10	P	L2

Note: 1. L1 = Line One (Live Line) / L2 = Line Two (Neutral Line).

7 RADIATED EMISSION MEASUREMENT

7.1. LIMITS OF RADIATED EMISSION MEASUREMENT

Below 1GHz (for digital device)

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 L_2 corresponding to the close-in distance d_2 by applying the following relation: $L_2 = L_1 (d_1/d_2)$, where L_1 is the specified limit in microvolts per metre (uV/m) at the distance d_1 (10m), L_2 is the new limit for distance d_2 (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 1.705	30
1.705-108	1000
108-500	2000
500-1000	5000
Above 1000	5 th harmonic of the highest frequency or 40GHz, whichever is lower

7.2. TEST INSTRUMENTS

Open Area Test Site # H				
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
Bilog Antenna	Teseq	CBL 6112D	36995	06/27/2018
Cable	EMEC	CFD400NL-LW	N-Type#H11	08/17/2018
EMI Test Receiver	R&S	ESCI	101340	03/26/2019
Pre-Amplifier	HP	8447D	1937A01554	09/28/2018
Thermo-Hygro Meter	Wisewind	201A	No. 03	05/27/2019
Test S/W	EZ-EMC			

NOTE: 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. N.C.R = No Calibration Request.

7.3. TEST PROCEDURES (please refer to measurement standard or CCS SOP PA-031)

Procedure of Preliminary Test

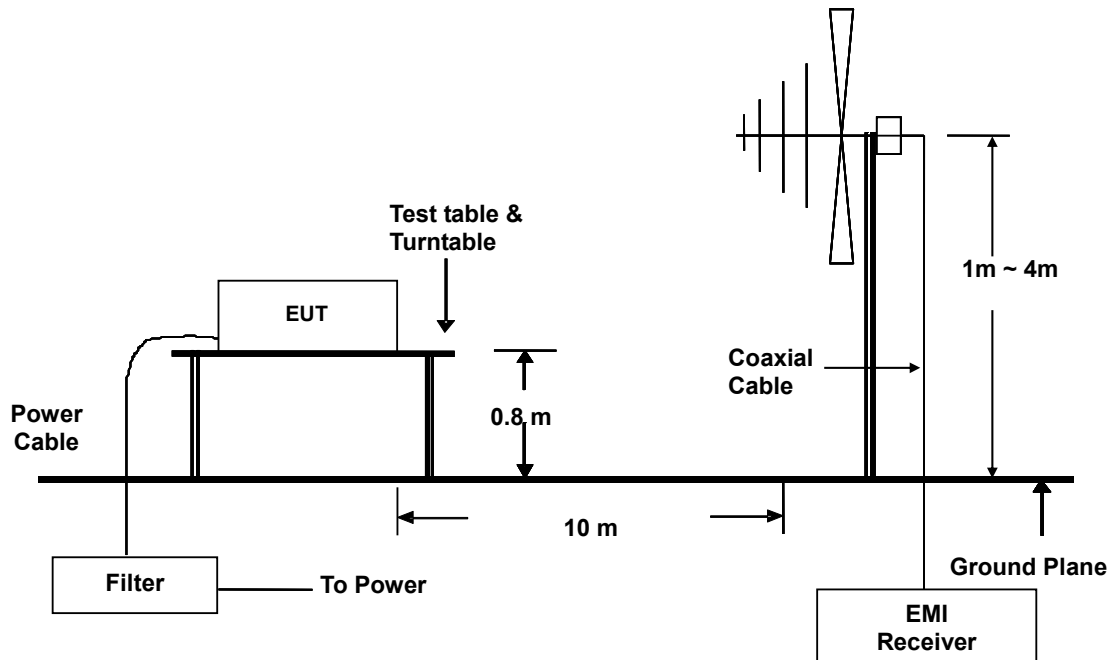
- The equipment was set up as per the test configuration to simulate typical usage per the user's manual. When the EUT is a tabletop system, a wooden turntable with a height of 0.8 meters is used which is placed on the ground plane. When the EUT is a floor standing equipment, it is placed on the ground plane which has a 12 mm 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.
- The test mode(s) described in Item 3.1 were scanned during the preliminary test:
- After the preliminary scan, we found the test mode described in Item 3.1 producing the highest emission level.
- 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

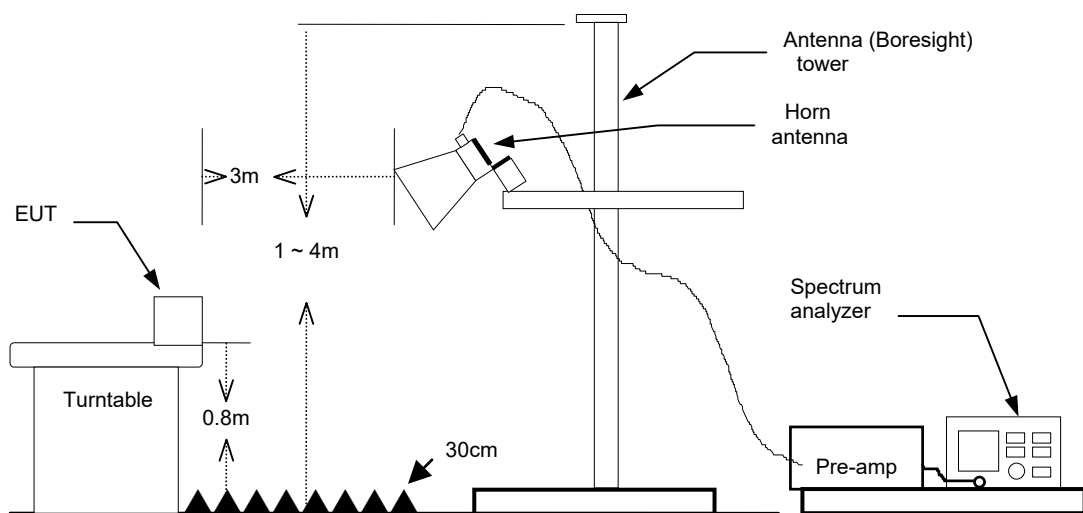
- EUT and support equipment were set up on the turntable as per the configuration with highest emission level in the preliminary test.
- The Analyzer / Receiver scanned from 30MHz to 40GHz. Emissions were scanned and measured rotating the EUT to 360 degrees, varying cable placement and positioning the 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 Q.P. reading and above 1GHz the Peak and Average reading are presented.
- The test data of the worst-case condition(s) was recorded.

7.4. TEST SETUP

Below 1GHz



Above 1GHz



- For the actual test configuration, please refer to the related item – Photographs of the Test Configuration.

7.5. DATA SAMPLE

Below 1GHz

Freq. (MHz)	Reading (dBuV)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector (P/Q)	Pol. (H/V)
x.xx	14.0	12.2	26.2	30	-3.8	Q	H

Above 1GHz

Freq. (MHz)	Reading (dBuV)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector (P/A)	Pol. (H/V)
x.xx	42.95	0.55	43.50	54	-10.50	A	H

Freq. = Emission frequency in MHz
 Reading = Uncorrected Analyzer/Receiver reading
 Factor = Antenna Factor + Cable Loss - Amplifier Gain
 Result = Reading + Factor
 Limit = Limit stated in standard
 Margin = Reading in reference to limit
 P = Peak Reading
 Q = Quasi-peak Reading
 A = Average Reading
 H = Antenna Polarization: Horizontal
 V = Antenna Polarization: Vertical

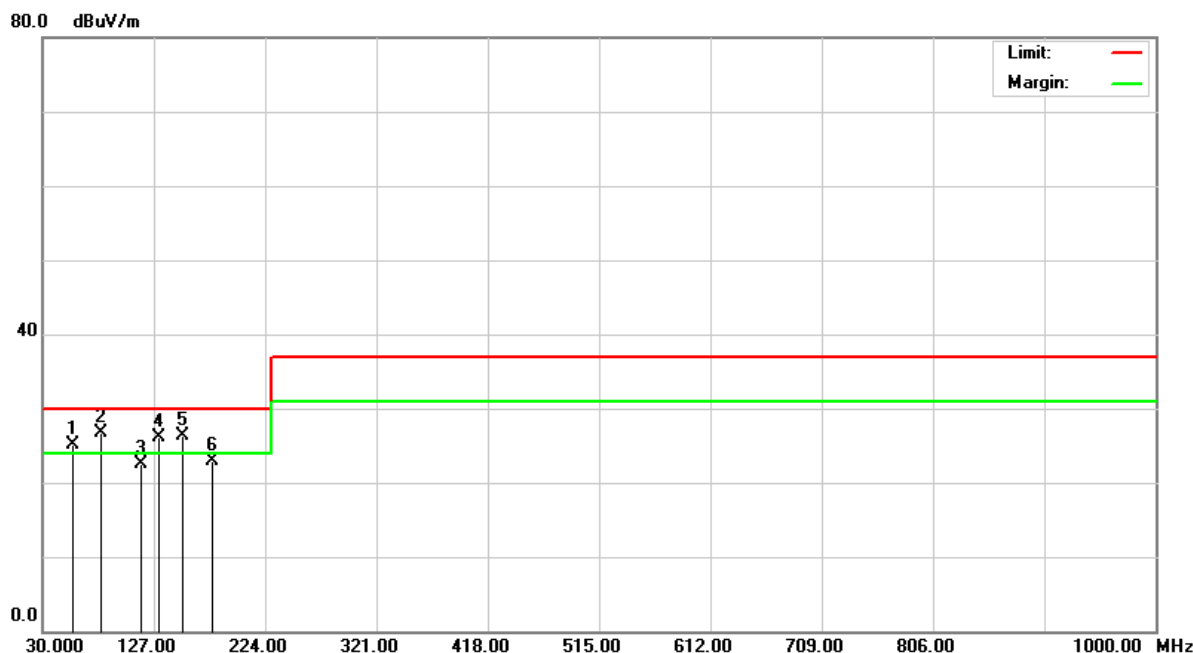
Calculation Formula

Margin (dB) = Result (dBuV/m) – Limit (dBuV/m)

7.6. TEST RESULTS

Below 1GHz

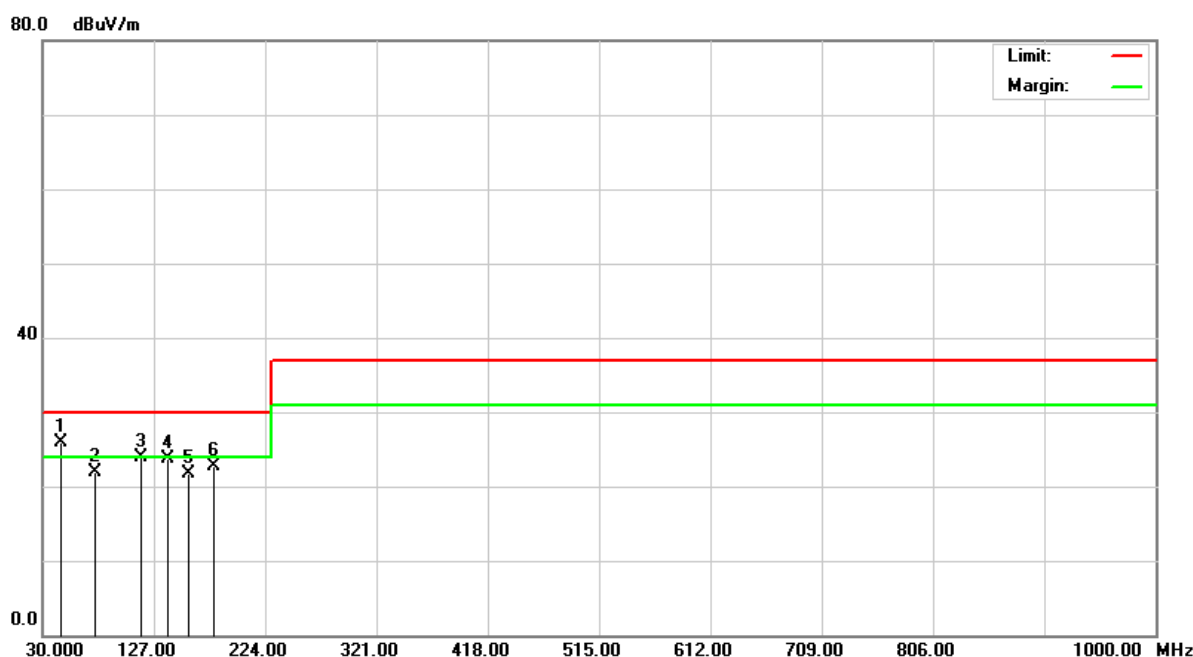
Model No.	SGAS60U48	Test Mode	Mode 6
Environmental Conditions	27°C, 62% RH	6dB Bandwidth	120 kHz
Antenna Pole	Vertical	Antenna Distance	10m
Detector Function	Quasi-peak.	Tested by	David Cheng
Standard	FCC CLASS B W/ CISPR 22 CLASS B LIMIT		



Radiated Emission Readings									
Frequency Range Investigated					30 MHz to 1000 MHz at 10m				
Freq. (MHz)	Reading (dBuV)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (°)	Detector (P/Q)	Pol. (H/V)
56.3900	38.50	-13.38	25.12	30.00	-4.88	100	136	Q	V
81.2300	40.10	-13.40	26.70	30.00	-3.30	100	82	Q	V
115.6900	30.50	-8.07	22.43	30.00	-7.57	100	120	Q	V
131.2890	34.20	-8.13	26.07	30.00	-3.93	100	339	Q	V
152.3600	35.90	-9.65	26.25	30.00	-3.75	100	157	Q	V
178.6100	33.80	-10.97	22.83	30.00	-7.17	100	151	Q	V

Note: 1. 30MHz to 1000MHz test is Applicable CISPR 22 standard.
2. P= Peak Reading; Q= Quasi-peak Reading.

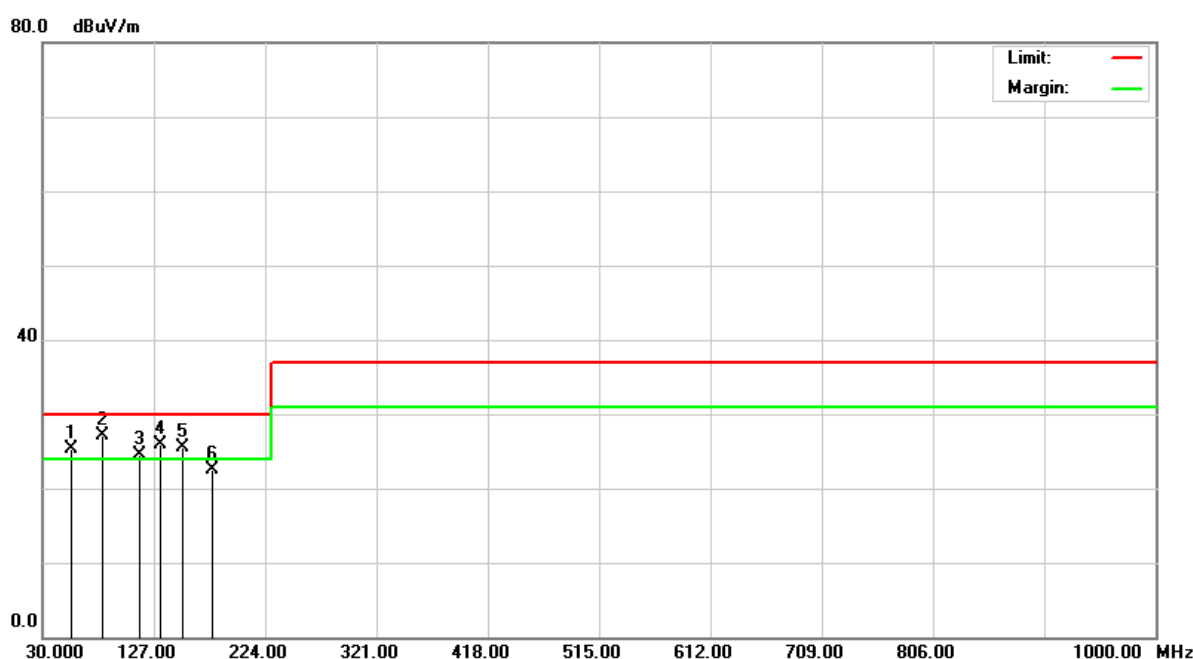
Model No.	SGAS60U48	Test Mode	Mode 6
Environmental Conditions	27°C, 62% RH	6dB Bandwidth	120 kHz
Antenna Pole	Horizontal	Antenna Distance	10m
Detector Function	Quasi-peak.	Tested by	David Cheng
Standard	FCC CLASS B W/ CISPR 22 CLASS B LIMIT		



Radiated Emission Readings									
Frequency Range Investigated					30 MHz to 1000 MHz at 10m				
Freq. (MHz)	Reading (dBuV)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (°)	Detector (P/Q)	Pol. (H/V)
46.3900	36.50	-10.52	25.98	30.00	-4.02	400	198	Q	H
75.6100	35.80	-13.98	21.82	30.00	-8.18	400	66	Q	H
115.5800	31.90	-8.08	23.82	30.00	-6.18	400	327	Q	H
139.3100	32.30	-8.54	23.76	30.00	-6.24	400	115	Q	H
157.1400	31.60	-9.86	21.74	30.00	-8.26	400	103	Q	H
179.6600	33.70	-11.03	22.67	30.00	-7.33	400	121	Q	H

Note: 1. 30MHz to 1000MHz test is Applicable CISPR 22 standard.
 2. P= Peak Reading; Q= Quasi-peak Reading.

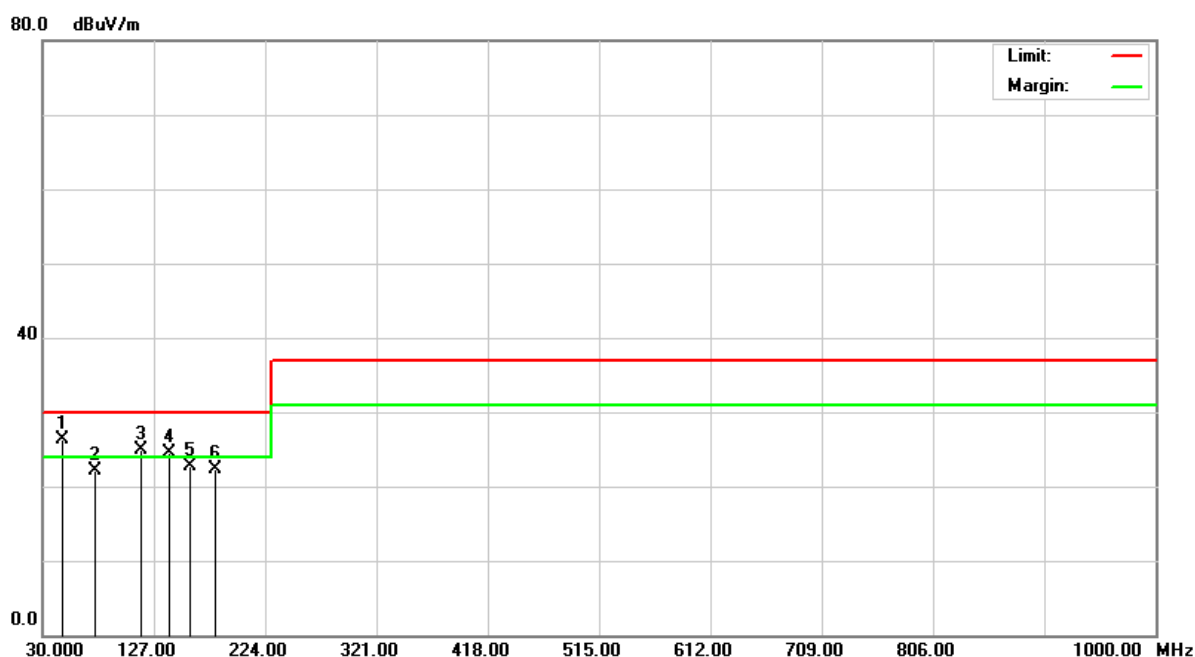
Model No.	SGA60B48	Test Mode	Mode 13
Environmental Conditions	27°C, 62% RH	6dB Bandwidth	120 kHz
Antenna Pole	Vertical	Antenna Distance	10m
Detector Function	Quasi-peak.	Tested by	David Cheng
Standard	FCC CLASS B W/ CISPR 22 CLASS B LIMIT		



Radiated Emission Readings									
Frequency Range Investigated					30 MHz to 1000 MHz at 10m				
Freq. (MHz)	Reading (dBuV)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (°)	Detector (P/Q)	Pol. (H/V)
55.3200	38.51	-13.18	25.33	30.00	-4.67	100	162	Q	V
82.5100	40.16	-13.15	27.01	30.00	-2.99	100	341	Q	V
115.3400	32.60	-8.10	24.50	30.00	-5.50	100	110	Q	V
132.6600	34.12	-8.19	25.93	30.00	-4.07	100	152	Q	V
152.3400	35.20	-9.65	25.55	30.00	-4.45	100	300	Q	V
178.2500	33.45	-10.95	22.50	30.00	-7.50	100	0	Q	V

Note: 1. 30MHz to 1000MHz test is Applicable CISPR 22 standard.
2. P= Peak Reading; Q= Quasi-peak Reading.

Model No.	SGA60B48	Test Mode	Mode 13
Environmental Conditions	27°C, 62% RH	6dB Bandwidth	120 kHz
Antenna Pole	Horizontal	Antenna Distance	10m
Detector Function	Quasi-peak.	Tested by	David Cheng
Standard	FCC CLASS B W/ CISPR 22 CLASS B LIMIT		



Radiated Emission Readings									
Frequency Range Investigated					30 MHz to 1000 MHz at 10m				
Freq. (MHz)	Reading (dBuV)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (°)	Detector (P/Q)	Pol. (H/V)
47.1600	37.25	-10.86	26.39	30.00	-3.61	400	222	Q	H
75.9900	36.12	-13.95	22.17	30.00	-7.83	400	163	Q	H
116.2400	32.99	-8.04	24.95	30.00	-5.05	400	352	Q	H
140.2600	33.10	-8.60	24.50	30.00	-5.50	400	241	Q	H
158.3700	32.56	-9.93	22.63	30.00	-7.37	400	100	Q	H
180.3000	33.44	-11.05	22.39	30.00	-7.61	400	153	Q	H

Note: 1. 30MHz to 1000MHz test is Applicable CISPR 22 standard.
 2. P= Peak Reading; Q= Quasi-peak Reading.



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Above 1GHz

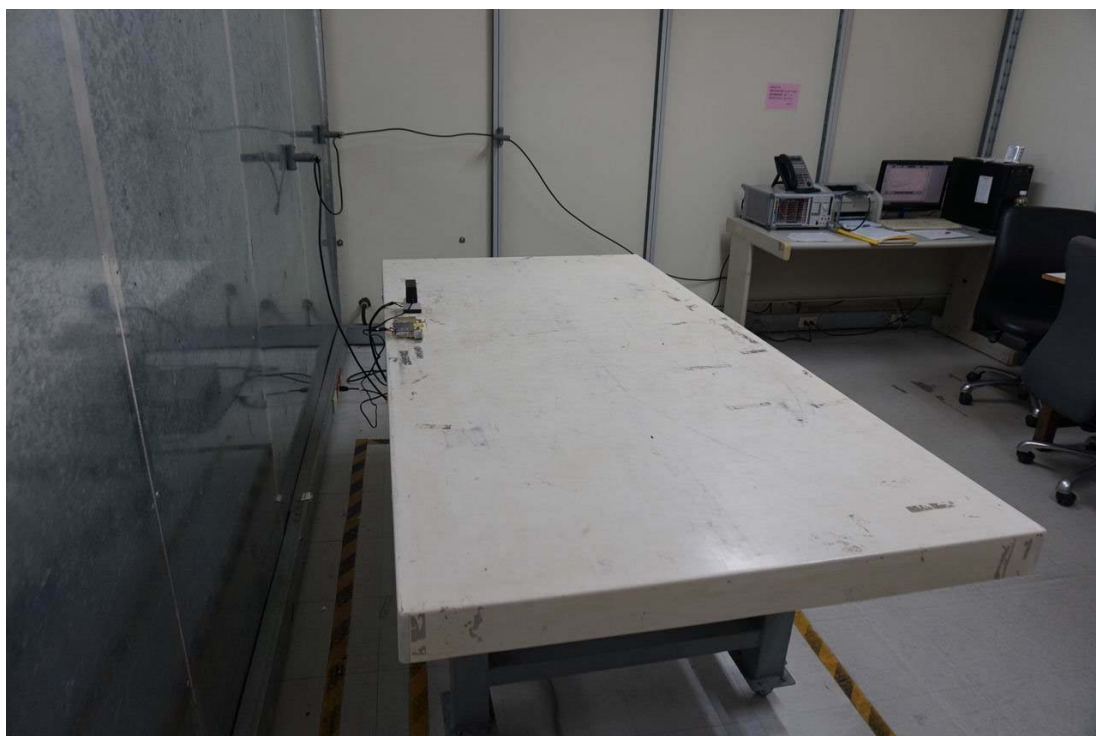
Model No.	SGA60B48	Test Mode	N/A
Environmental Conditions	N/A	6dB Bandwidth	N/A
Antenna Pole	N/A	Antenna Distance	N/A
Highest frequency generated or used	65KHz	Upper frequency	See note
Detector Function	N/A	Tested by	N/A

Note: No applicable, when the highest frequency of the internal sources of the EUT is less than 108MHz, the measurement shall only be made up to 1 GHz.

8 PHOTOGRAPHS OF THE TEST CONFIGURATION

CONDUCTED EMISSION TEST

Wall Mount Type

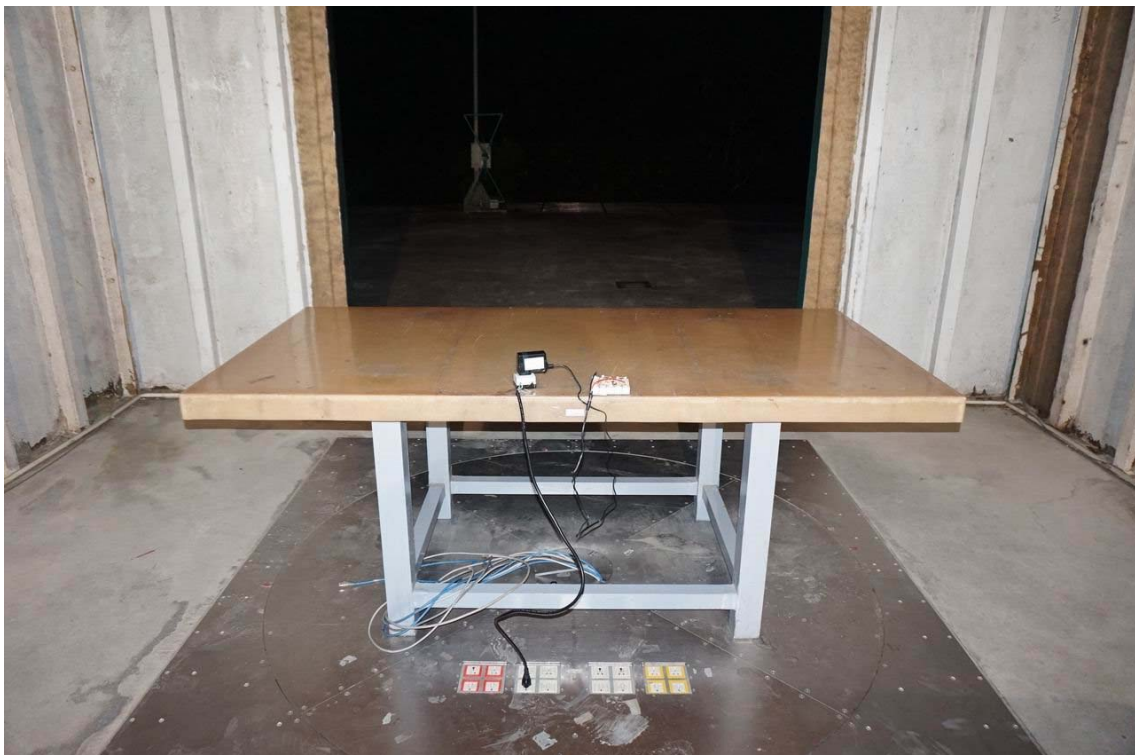


Desktop Type



RADIATED EMISSION TEST

Wall Mount Type



Desktop Type

