



588 West Jindu Road, Songjiang District, Shanghai, China

Telephone: +86 (0) 21 6191 5666
Fax: +86 (0) 21 6191 5655
ee.shanghai@sgs.com

Report No.: SHEM130200023201
Page: 1 of 40

TEST REPORT

Application No. : SHEM1302000232RF
Applicant: Checkpoint System Inc.
Manufacturer: Sidep Electronics (Shanghai) Co.,Ltd.
FCC ID: DO4NGL
IC: 3356B-NGL
Fundamental Frequency :
Equipment Under Test (EUT):
Product Name: Electronic Article Surveillance Detection System
Brand Name: 
Model No.: Classic Style
Standards: FCC PART 15 SUBPART C, Section 15.223
RSS-210 (Issue 8): 2012
RSS-Gen (Issue 3): 2010
Date of Receipt: Nov. 15, 2012
Date of Test: Nov. 15, 2012 to Jan. 31, 2013
Date of Issue: Mar. 01, 2013
Test Result : **PASS ***

* In the configuration tested, the EUT complied with the standards specified above.



Tony Wu
E&E Section Manager
SGS-CSTC (Shanghai) Co., Ltd.

The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report. If the product in this report is used in any configuration other than that detailed in the report, the manufacturer must ensure the new system complies with all relevant standards.


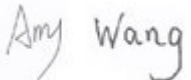
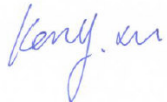
The report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the federal government. All test results in this report can be traceable to National or International Standards.

"This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at www.sgs.com/terms_and_conditions.htm and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at www.sgs.com/terms_e-document.htm. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. 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."



2 Version

Revision Record				
Version	Chapter	Date	Modifier	Remark
00	/	Mar. 01, 2013	/	Original

Authorized for issue by:			
Engineer	Jim Xu		Date (Jan. 31, 2013)
	Print Name		
Clerk	Amy Wang		Date(Mar. 01, 2013)
	Print Name		
Reviewer	Keny Xu		Date(Mar. 01, 2013)
	Print Name		



3 Test Summary

TEST ITEM	FCC REFERANCE	IC REFERANCE	RESULT
Radiated emission	15.223 &15.209	RSS-210 Issue 8 Annex A2.3	Pass
Assigned bandwidth (6dB bandwidth)	15.223(a)	RSS-Gen Issue 3 Clause 4.6.1	Complete
AC power line conducted emission	15.207	RSS-Gen Issue 3 Clause 7.2.4	Pass

Note 1: “-”means not require in the rules.


Note 2: NA = Not Applicable



4 Contents

	Page
1 COVER PAGE	1
2 VERSION	2
3 TEST SUMMARY	3
4 CONTENTS	4
5 GENERAL INFORMATION.....	5
5.1 CLIENT INFORMATION	5
5.2 DETAILS OF E.U.T.	5
5.3 OPERATION IN RESTRICTED BANDS.....	6
5.4 DESCRIPTION OF SUPPORT UNITS	7
5.5 TEST LOCATION	7
5.6 OTHER INFORMATION REQUESTED BY THE CUSTOMER.....	7
5.7 TEST FACILITY	8
5.8 TEST INSTRUMENTS.....	9
5.9 E.U.T. OPERATION	10
5.10 TEST PROCEDURE & MEASUREMENT DATA	11
5.10.1 <i>6dB Assigned Bandwidth</i>	11
5.10.2 <i>Field Strength of Fundamental and Radiated Spurious Emission</i>	14
5.10.3 <i>Duty Cycle</i>	31
5.10.4 <i>Conducted Emission Test</i>	35



5 General Information							
5.1 Client Information							
Applicant :	Checkpoint Systems Inc.						
Applicant Address:	101 Wolf Drive, Thorofare, New Jersey, USA 08086						
Manufacturer:	Sidep Electronics (Shanghai) Co.,Ltd.						
Manufacturer Address:	No. 1695 Xin TanWa RD PuDong district 201321 Shanghai China						
5.2 Details of E.U.T.							
Product Name	Electronic Article Surveillance Detection System						
Brand Name	<i>Checkpoint</i> 						
Model No.	Classic Style						
Antenna Type	Near Field Antenna						
Frequency	7.2MHz~10MHz						
Equipment classification:	<input checked="" type="checkbox"/> equipment for fixed use <input type="checkbox"/> equipment for portable use <input type="checkbox"/> equipment for vehicular use						
Antenna Type:	Loop Antenna						
Antenna Gain:	-45 dBi						
Production Function and Intended Use:	<p>The Classic Style is an Electronic Article Surveillance System (EAS). The system detects target tags attached to merchandise. The targets resonate in the HF region of 8.2MHz,7.2MHz,9.2MHz,9.5MHz,etc... When an article of merchandise is purchased, the targets is deactivated which causes it no longer resonate, The Classic Style system monitors an area of 3-feet on either side of antenna in the 7.2 to 10MHz range, and triggers an alarm when a non-deactivated target is detected.</p>						
Channel List:							
Frequency Table For Pharma/Razor Keeper 7.2/8.2							
8.325 E+06	8.325 E+06	8.325 E+06	8.325 E+06	8.075 E+06	8.075 E+06	8.075 E+06	8.075 E+06
7.600 E+06	7.600 E+06	7.600 E+06	7.600 E+06	7.200 E+06	7.200 E+06	7.200 E+06	7.200 E+06
Frequency Table For Library 9.5							
9.800 E+06	9.800 E+06	9.800 E+06	9.800 E+06	9.600 E+06	9.600 E+06	9.600 E+06	9.600 E+06
9.400 E+06	9.400 E+06	9.400 E+06	9.400 E+06	9.200 E+06	9.200 E+06	9.200 E+06	9.200 E+06



Power Supply:

Rated Input:	24VDC/2.1A Max		
Adapter:	Manufacturer:	GlobTek	
	Model No.:	GT-2S5024D-R-ES	
	Rated Input:	100V-240VAC, 1.5A MAX, 50-60Hz, 60-70VA	
	Rated Output:	24VDC, 2.1A	

EUT Hardware:

Description	Manufacturer	Model No.	Serial No.
Electronics Main Board	Checkpoint	TR4215	N/A
Coupler Board	Checkpoint	A1096	N/A
DC Line Filter Board	Checkpoint	A1057	N/A

5.3 Operation in Restricted Bands

The EUT is a digital swept frequency hopping transmitter. The EUT hops on discrete frequencies. The discrete frequencies that can be transmitted by the EUT are as above channel list:

The restricted frequency bands (per FCC Part 15 Clause 15.205 and RSS Gen 7.2.2 Table 3) in the operating frequency band of the EUT are as follows:

8.291 – 8.294 MHz

8.362 – 8.366 MHz

8.37625 – 8.38675 MHz

8.41425 – 8.41475 MHz

The transmitter is not capable of hopping into, or operating, in the restricted frequency bands and therefore complies with the restriction.



5.4 Description of Support Units

Support equipments / Associated Equipments:

- The EUT has been tested independently. and or
 The EUT has been tested with support equipments as below.

Description	Manufacturer	Model No.	Serial No.	Supplied by Client or SGS?
N/A	N/A	N/A	N/A	N/A

Cable List:

START		END		Cable Spec.		
Description	I/O Port	Description	I/O Port	Length (m)	Shield (Y/N)	Ferrite (Y/N)
Adapter	AC IN	AC Source	AC OUT	1.5	N	N
Transmission	Main Board	Transmission	Coupler Board	15	Y	Y

5.5 Test Location

Test Laboratory 1: SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd.

No.588 West Jindu Road, Songjiang District, Shanghai, China. 201612.

Tel: +86 21 6191 5666 Fax: +86 21 6191 5655

Test Laboratory 2 (Subcontractor): Shanghai Institute of Measurement and Testing Technology

No.716, Yi Shan Road, Shanghai 200233, P.R.China.

5.6 Other Information Requested by the Customer

None.



5.7 Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd.

- **CNAS (No. CNAS L0599)**

CNAS has accredited SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. to ISO/IEC 17025:2005 General Requirements for the Competence of Testing and Calibration Laboratories (CNAS-CL01 Accreditation Criteria for the Competence of Testing and Calibration Laboratories) for the competence in the field of testing. Date of expiry: 2014-07-26.

- **FCC – Registration No.: 402683**

SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. has been registered and fully described in a report filed with the Federal Communications Commission (FCC). The acceptance letter from the FCC is maintained in our files. Registration No.: 402683, Expiry Date: 2015-02-22.

- **Industry Canada (IC) – IC Assigned Code: 8617A**

The 3m Semi-anechoic chamber of SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 8617A. Expiry Date: 2014-09-20.

SIMT EMC Laboratory (Shanghai Institute of Measurement and Testing Technology)

- **FCC registration No.: 142171; IC site No.:6625A**



5.8 Test Instruments

SGS Test Equipment:

Item	Test Equipment	Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due date
1	EMI test receiver	Rohde & Schwarz	ESU40	100109	2012-6-4	2013-6-3
2	Horn Antenna	SCHWARZBECK	BBHA9120D	9120D-679	2012-6-4	2013-6-3
3	Horn Antenna	Rohde & Schwarz	HF906	100284	2012-3-12	2013-3-10
4	ANTENNA	SCHWARZBECK	VULB9168	9168-313	2012-6-4	2013-6-3
5	Ultra broadband antenna	Rohde & Schwarz	HL562	100227	2012-10-8	2013-10-7
6	Atmosphere pressure meter	Shanghai ZhongXuan	BY-2009P	--	2012-10-14	2013-10-15
7	CLAMP METER	FLUKE	316	86080010	2012-4-22	2013-4-20
8	Thermo-Hygrometer	ZHICHEN	ZC1-2	01050033	2012-10-14	2013-10-15
9	High-low temperature cabinet	Shanghai YuanZhen	GW2050	--	2012-09-05	2013-09-03
11	Tunable Notch Filter	Wainwright instruments Gmbh	WRCT1800.0/ 2000.0-0.2/40-5SSK	11	2012-6-16	2013-6-15
12	Tunable Notch Filter	Wainwright instruments Gmbh	WRCT800.0/880.0- 0.2/40-5SSK	9	2012-5-7	2013-5-6
13	High pass Filter	FSCW	HP 12/2800-5AA2	19A45-02	2012-5-5	2013-5-4
14	Low noise amplifier	TESEQ	LNA6900	70133	2012-6-4	2013-6-3
15	EMI test receiver	Rohde & Schwarz	ESCS30	100086	2012-4-8	2013-4-7

SIMT Test Equipment:

No.	Equipment	Model	Serial No.	Cal. Due date
1	EMI test receiver	ESI 26	Rong-001-01	2012/12/21
2	Loop Field Strength Measuring System	FMZB 1516	Rong-001-07	2013/6/15



5.9 E.U.T. Operation

Input voltage:	120V/60Hz supply for the adapter
Operating Environment:	
Temperature:	22-25.0 °C
Humidity:	50-58% RH
Atmospheric Pressure:	1001 mbar
EUT Operation:	Test Mode A: Kept transmitting at 7.2MHz; Test Mode B: Kept transmitting at 9.5MHz.



5.10 Test Procedure & Measurement Data

5.10.1 6dB Assigned Bandwidth

Test Requirement: FCC Part 15 Section 15.223(a) & RSS-210 A2.3
Test Method: ANSI C63.10:2009 Clause 6.9.1, RSS-Gen Issue 3 Clause 4.6.2
Test date: Jan. 31, 2013
Test Status: Test in fixing operating frequency at 7.2MHz and 9.5MHz.

Test Procedure:

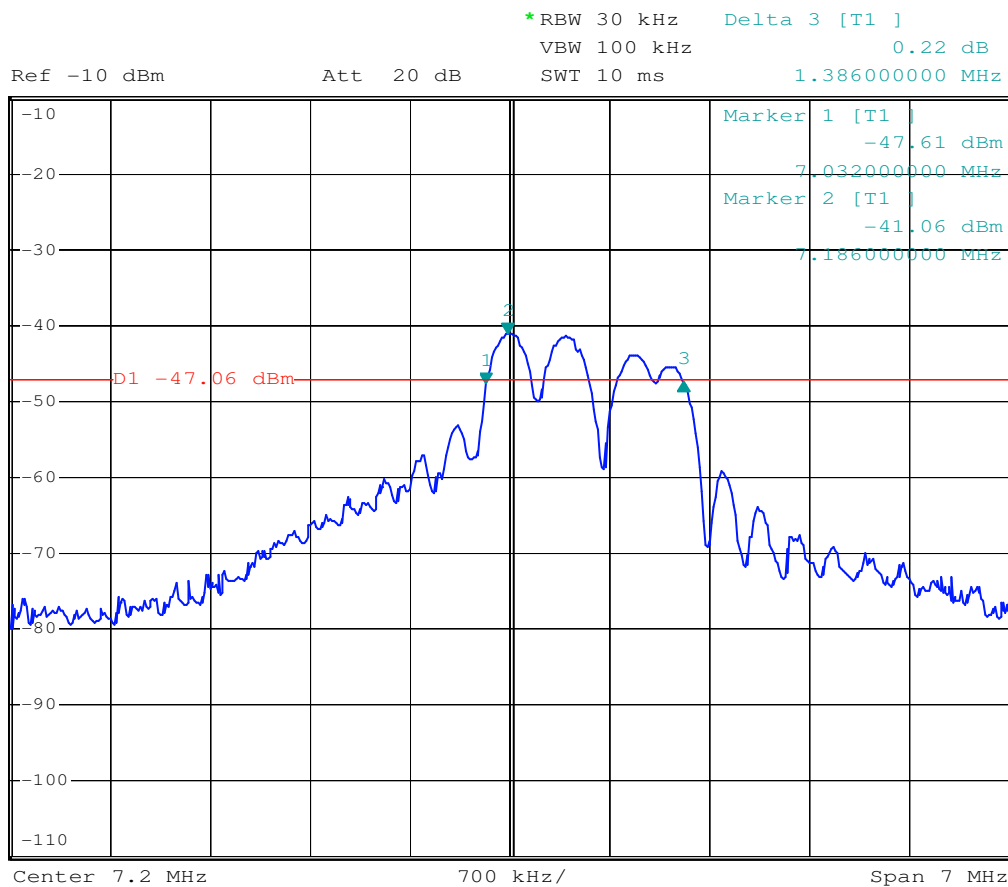
1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum;
2. Set the spectrum analyzer: Span = approximately 2 to 5 times the 6dB bandwidth, centered on the hopping channel;
3. Set the spectrum analyzer: RBW = 1% to 5% of the 6dB bandwidth (set 30kHz). VBW \geq 3RBW (set 100kHz). Sweep = auto; Detector Function = Peak. Trace = Max Hold.
4. Mark the peak frequency and -6dB points.



Emission Bandwidth Measurement Result:

Test Mode A: Working at 7.2MHz

Nom. Frequency	6dB Bandwidth
7.2MHz	1.386 MHz



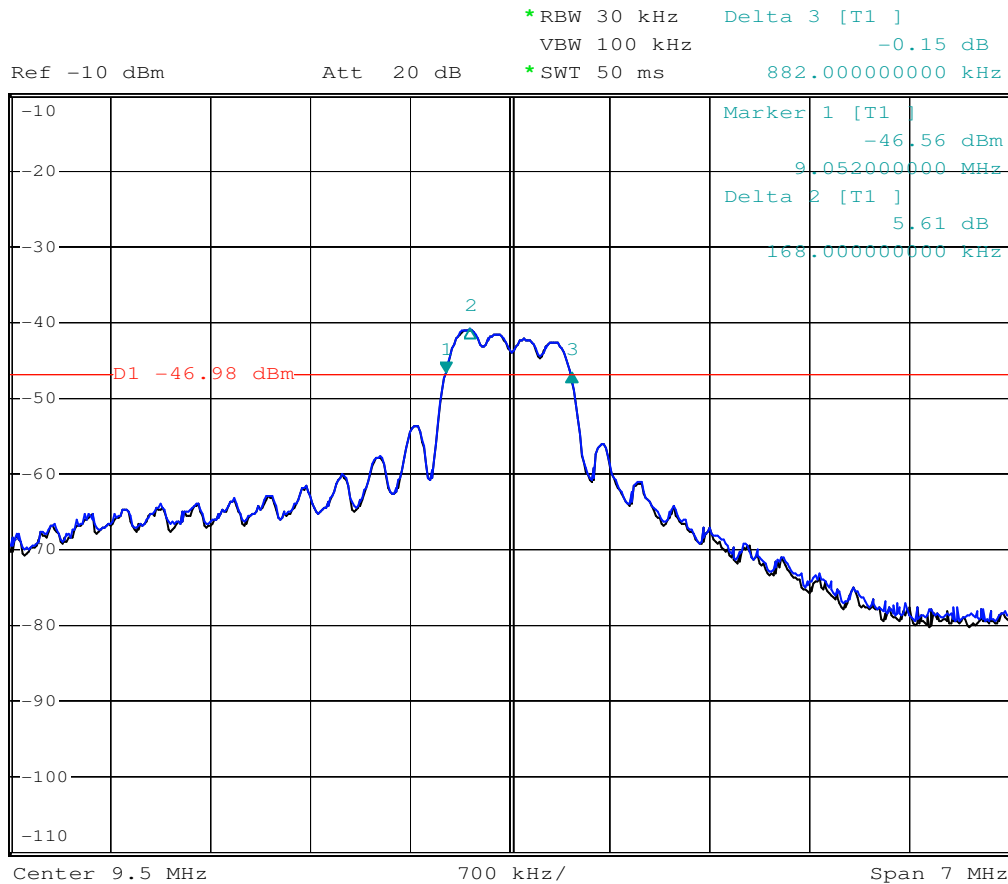
Date: 31.JAN.2013 11:01:02

This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at www.sgs.com/terms_and_conditions.htm and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at www.sgs.com/terms_e-document.htm. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. 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



Test Mode B: Working at 9.5MHz

Nom. Frequency	6dB Bandwidth
9.5MHz	0.882 MHz



Date: 31.JAN.2013 11:12:20



5.10.2 Field Strength of Fundamental and Radiated Spurious Emission

Test Requirement:	FCC Part 15 Section 15.223 & RSS-210 A2.3
Test date:	Dec. 07, 2012 to Jan. 24, 2013
Standard Applicable	ANSI C63.10:2009

Test Procedures:

1. Test Procedures for emission from 9 kHz to 30 MHz

- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground and the antenna was placed on the ground plane above 10mm at a 10 meter anechoic chamber test site. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. Then antenna is fixed at one meter above the ground to determine the maximum value of the field strength. Both X,Y,Z polarization of the antenna are set to make the measurement.
- c. For each suspected emission, the EUT was arranged to its worst case and then the table was turned from 0 degrees to 360 degrees to find the maximum reading.
- d. The test-receiver system was set to Peak and Quasi-Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

2. Test Procedures for emission from 30 MHz to 1000 MHz

- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter anechoic chamber test site. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. During performing radiated emission below 1 GHz, the EUT was set 3 meters away from the interference receiving antenna, which was mounted on the top of a variable-height antenna tower. During performing radiated emission above 1 GHz, the EUT was set 1 meter away from the interference-receiving antenna.
- c. The antenna is a broadband antenna, and its height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- f. If the emission level of the EUT in peak mode was 10 dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10 dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.



Measurement Result:

5.10.2.1 Fundamental Frequency Field Strength

Test Requirements and Standards

According to 15.223 (a): The field strength of any emission within the band 1.705-10.0 MHz shall not exceed 100 microvolts/meter at a distance of 30 meters. However, if the bandwidth of the emission is less than 10% of the center frequency, the field strength shall not exceed 15 microvolts/meter or (the bandwidth of the device in kHz) divided by (the center frequency of the device in MHz) microvolts/meter at a distance of 30 meters, whichever is the higher level. For the purposes of this Section, bandwidth is determined at the points 6 dB down from the modulated carrier. The emission limits in this paragraph are based on measurement instrumentation employing an average detector. The provisions in Section 15.35(b) for limiting peak emissions apply.

Limits:

For 7.2MHz, since 6dB bandwidth (1.382MHz) is more than 10% of the center frequency (7.2MHz * 10% =0.72MHz), so the field strength limit should be 100 microvolts/meter at 30 meters. For the details, please refer to the below table.

For 9.5MHz, since 6dB bandwidth (0.882MHz) is less than 10% of the center frequency (9.5MHz * 10% =0.95MHz), so the field strength shall not exceed 15 microvolts/meter or (the bandwidth of the device in kHz) divided by (the center frequency of the device in MHz) microvolts/meter at a distance of 30 meters, whichever is the higher level. Field strength = 882 (6dB bandwidth in kHz) / 9.5 (center frequency in MHz) = 92.84 microvolts/meter. For the details, please refer to the below table.

Table: 30m published limit

Freq.	AV limit	PK limit	Measurement Distance
7.2MHz	100 microvolts/meter (40dBuV/m)	60dBuV/m	30 m
9.5MHz	92.84 microvolts/meter (39.4dBuV/m)	59.4dBuV/m	30 m

Calculation for Extrapolation Factor:

§ 15.31 (f)(2): Measurement Standards.

(2) At frequencies below 30 MHz, measurements may be performed at a distance closer than that specified in the regulations; however, an attempt should be made to avoid making measurements in the near field. Pending the development of an appropriate measurement procedure for measurements performed below 30 MHz, when performing measurements at a closer distance than specified, the results shall be extrapolated to the specified distance by either making measurements at a minimum of two 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).

In order to extrapolate the correction factor, three peak measurements were taken at 3m, 7m and 10m.

The frequency of 7.2MHz was used during preliminary measurement.

Measurement Distance	Reading Level
3m	107.57
10m	76.31

Calculate 3m – 10 m:

$$\text{Extrapolation Factor } X1 * \log(3/10) = 76.31 - 107.57$$



**SGS-CSTC Standards
Technical Services
(Shanghai) Co., Ltd.**

FCC ID: DO4LIB24TZ
IC :3356B-LIB24TZ

Report No.: SHEM130200023201
Page: 16 of 40

Extrapolation Factor $X1^* \log(0.3) = -31.26$
 Extrapolation Factor $X1^* (-0.523) = -31.26$
Extrapolation Factor X1 = 59.78 (dB/decade)

Measurement Distance	Reading Level
7m	85.46
10m	76.31

Calculate 7m – 10 m:

Extrapolation Factor $X2^* \log(7/10) = 76.31 - 85.46$
 Extrapolation Factor $X2^* \log(0.7) = -9.15$
 Extrapolation Factor $X2^* (-0.155) = -9.15$
Extrapolation Factor X2 = 59.07 (dB/decade)

Correction used to extrapolate from 30m published limit:
 $59 \log(D1/D2)$

Deviations:

Measurement of the fundamental, 7.2 to 9.5 MHz, was performed by setting a spectrum analyzer to “max-hold”, peak detector, a 300 kHz bandwidth, and a span from 7 to 10 MHz. Increasing the resolution bandwidth above 300 kHz did not increase fundamental signal level.

Test Receiver Setup:

Measurement Freq. (MHz)	Detector Type	RBW
7 – 10	Peak (PK)	300kHz



**Test Data for Fundamental Emission:
Test Mode A: working at 7.2MHz**

Peak Value:

Freq. (MHz)	PK Result @10m (dBμv)	Distance extrapolation factor(10m to 30m)	PK Result @30m (dBμv)	PK Limit @30m (dBμv/m)	Margin (dB)	Antenna Polarization (Axis)
7.571142	75.05	28.15	46.90	60	-13.10	X
8.304609	80.90	28.15	52.75	60	-7.25	X
7.559118	79.22	28.15	51.07	60	-8.93	Y
8.310621	85.73	28.15	57.58	60	-2.42	Y
7.162325	58.63	28.15	30.48	60	-29.52	Z
8.376754	58.42	28.15	30.27	60	-29.73	Z

Remark: PK result @10m = Receiving reading + Antenna Factor + Cable Loss

PK result @30m = PK result @10m - Distance extrapolation factor(10m to 30m)

Margin = PK Result @30m - PK Limit @30m

Test Antenna Polarization: X – along measurement axis, Y – vertical axis, Z – horizontal axis.

Average Value:

Freq. (MHz)	Duty Cycle Correction Factor (dB)	PK Value @30m (dBμv)	AV Result @30m (dBμv/m)	AV Limit @30m (dBμv/m)	Margin (dB)	Antenna Polarization (Axis)
7.571142	-30.31	46.90	16.59	40	-23.41	X
8.304609	-30.31	52.75	22.44	40	-17.56	X
7.559118	-30.31	51.07	20.76	40	-19.24	Y
8.310621	-30.31	57.58	27.27	40	-12.73	Y
7.162325	-30.31	30.48	0.17	40	-39.83	Z
8.376754	-30.31	30.27	-0.04	40	-40.04	Z

Remark: AV result @30m = PK Value @30m + Duty Cycle Correction Factor (7.2MHz is -30.31dB)

Margin = AV Result @30m - AV Limit @30m



Test Mode B: working at 9.5MHz

Peak Value:

Freq. (MHz)	PK Result @10m (dBµv)	Distance extrapolation factor(10m to 30m)	PK Result @30m (dBµv)	PK Limit @30m (dBµv/m)	Margin (dB)	Antenna Polarization (Axis)
9.176353	70.71	28.15	42.56	59.4	-16.84	X
9.777555	70.67	28.15	42.52	59.4	-16.88	X
9.158317	75.00	28.15	46.85	59.4	-12.55	Y
9.428858	70.38	28.15	42.23	59.4	-17.17	Y
9.182365	59.35	28.15	31.20	59.4	-28.2	Z
9.603206	57.69	28.15	29.54	59.4	-29.86	Z

Remark: PK result @10m = Receiving reading + Antenna Factor + Cable Loss

PK result @30m = PK result @10m - Distance extrapolation factor(10m to 30m)

Margin = PK Result @30m - PK Limit @30m

Test Antenna Polarization: X – along measurement axis, Y – vertical axis, Z – horizontal axis.

Average Value:

Freq. (MHz)	Duty Cycle Correction Factor (dB)	PK Value @30m (dBµv)	AV Result @30m (dBµv/m)	AV Limit @30m (dBµv/m)	Margin (dB)	Antenna Polarization (Axis)
9.176353	-30.14	42.56	12.42	39.4	-26.98	X
9.777555	-30.14	42.52	12.38	39.4	-27.02	X
9.158317	-30.14	46.85	16.71	39.4	-22.69	Y
9.428858	-30.14	42.23	12.09	39.4	-27.31	Y
9.182365	-30.14	31.20	1.06	39.4	-38.34	Z
9.603206	-30.14	29.54	-0.6	39.4	-40.00	Z

Remark: AV result @30m = PK Value @30m + Duty Cycle Correction Factor (9.5MHz is -30.14dB)

Margin = AV Result @30m - AV Limit @30m



5.10.2.2 9kHz~30MHz Spurious Emissions (Except that Fundamental Frequency)

Limits: Based on 15.209

Frequency (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meters)
0.009 - 0.490	2400/F(kHz)	300
0.490 - 1.705	24000/F(kHz)	30
1.705 - 30.0	30	30

Measurement Distance: 10 meter

For 10m measurement the limit was adjusted = $40\log(300/10) = 59.08\text{dB}$ under 0.009 – 0.490MHz.

For 10m measurement the limit was adjusted = $40\log(30/10) = 19.08\text{dB}$ under 0.490 – 30MHz.

So the final limit at 10 meter measurement is as below:

Frequency (MHz)	Field Strength (dBuV/m)	Measurement Distance
0.009 – 0.490	107.6 to 72.9	10 m
0.490 – 1.705	52.9 to 42.0	10 m
1.705 - 30	48.6	10 m

Test Antenna Polarization:

X – along measurement axis,

Y – vertical axis,

Z – horizontal axis.

Test Receiver Setup:

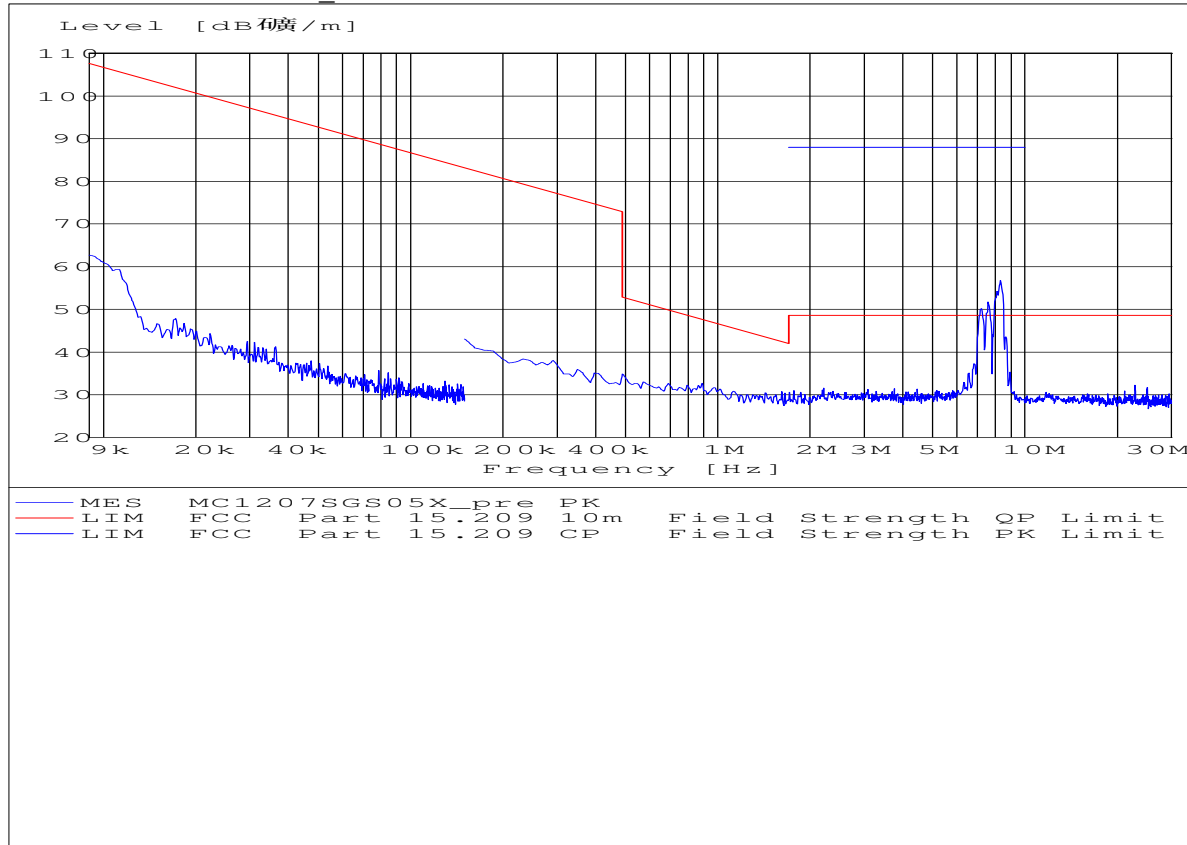
Measurement Freq. (MHz)	Detector Type	RBW
0.009 to 0.15	Quasi-Peak (QP)	200Hz
0.15 to 30	Quasi-Peak (QP)	9kHz

Test Result: Pass



Test Plot:

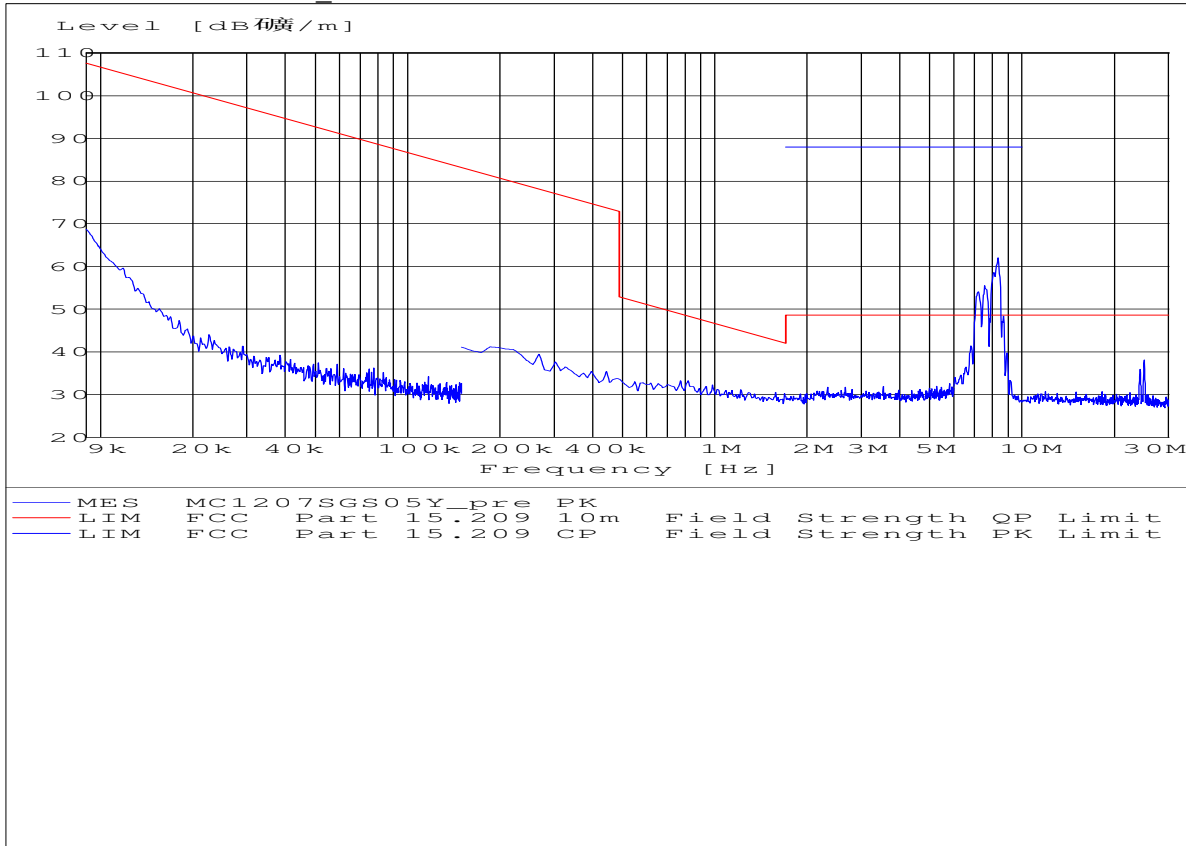
Test Mode A: working at 7.2MHz
Test Antenna Polarization_X axis



Remark: All Radiated Spurious Emissions is below the limit at least 6dB.



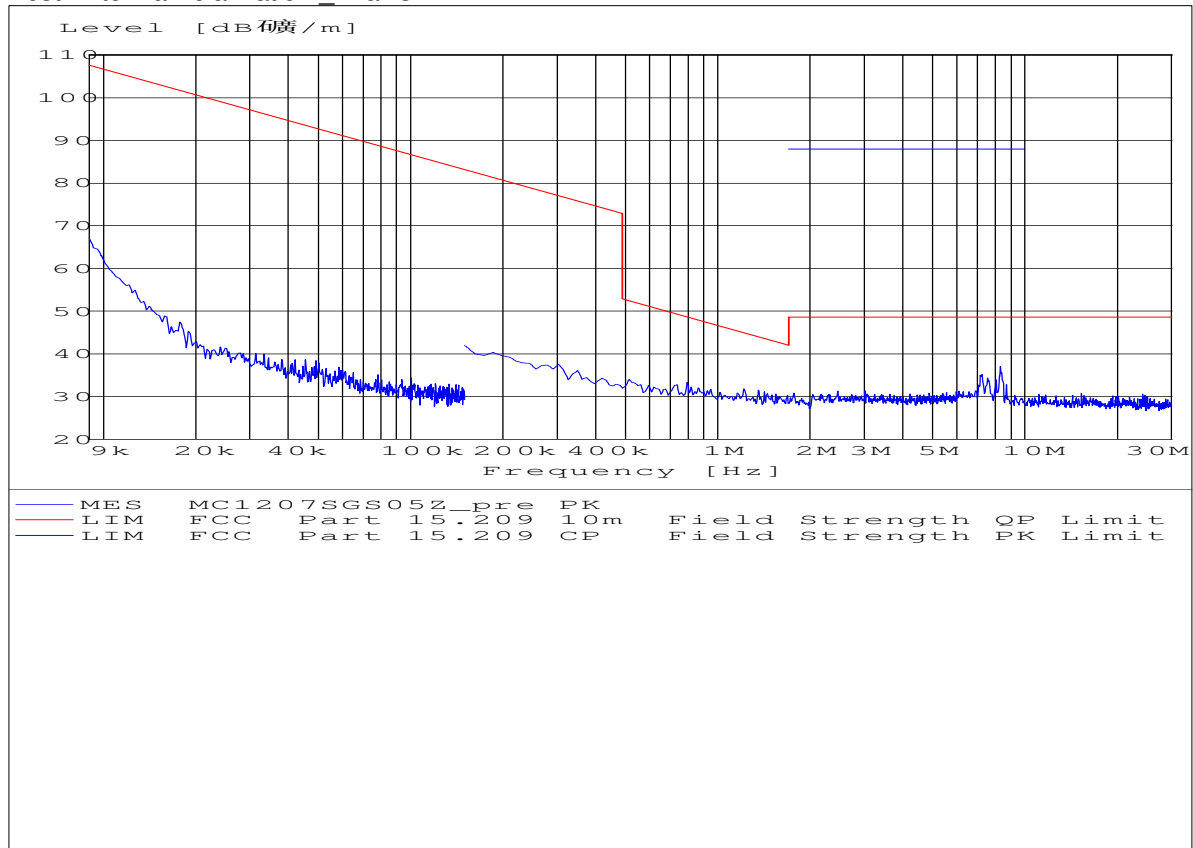
Test Mode A: working at 7.2MHz
Test Antenna Polarization _ Y axis



Remark: All Radiated Spurious Emissions is below the limit at least 6dB.



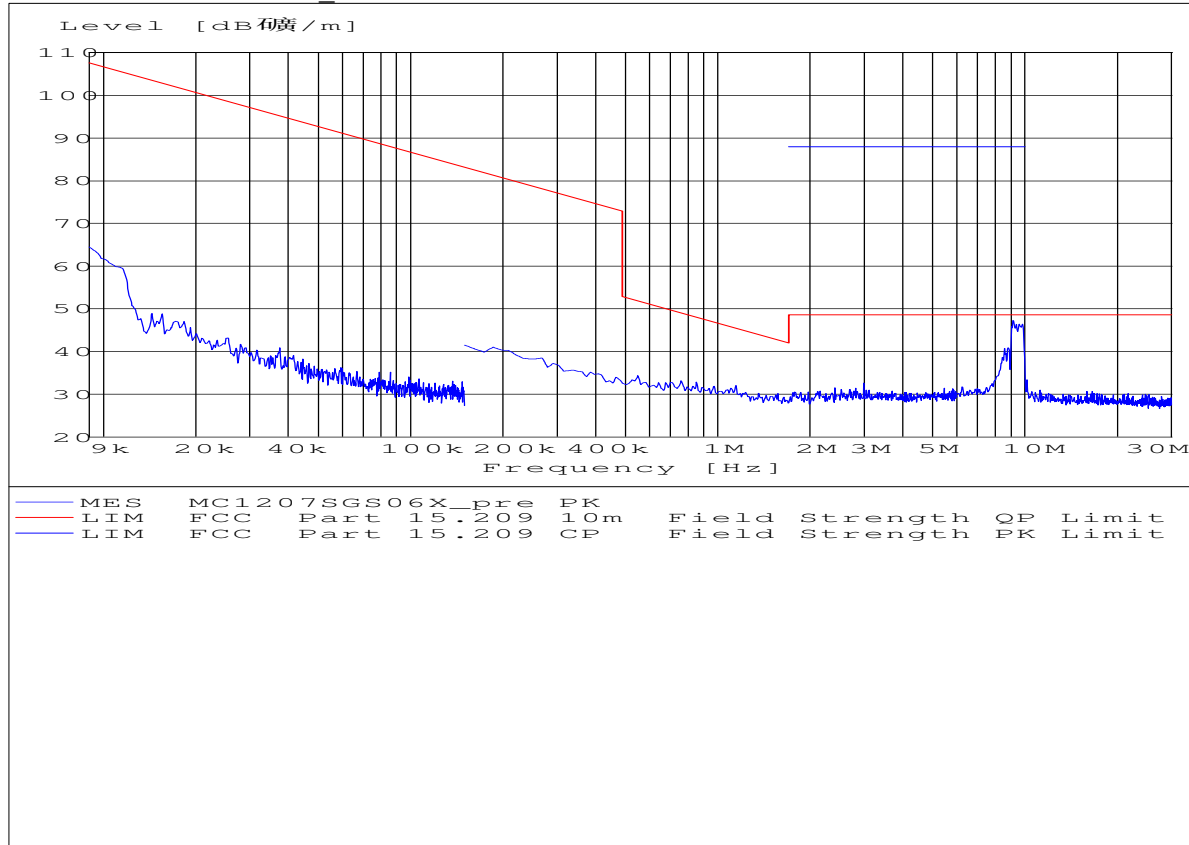
Test Mode A: working at 7.2MHz
Test Antenna Polarization _ Z axis



Remark: All Radiated Spurious Emissions is below the limit at least 6dB.



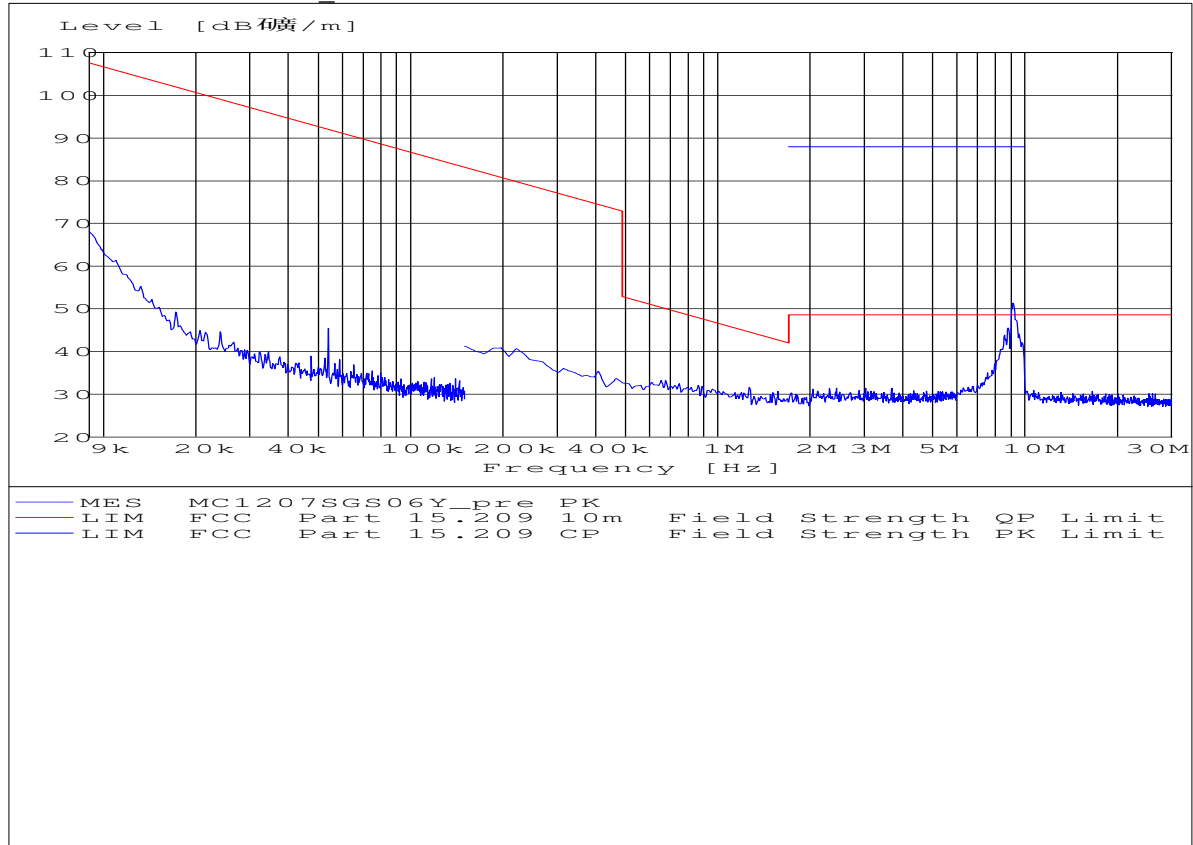
Test Mode B: working at 9.5MHz
Test Antenna Polarization _ X axis



Remark: All Radiated Spurious Emissions is below the limit at least 6dB.



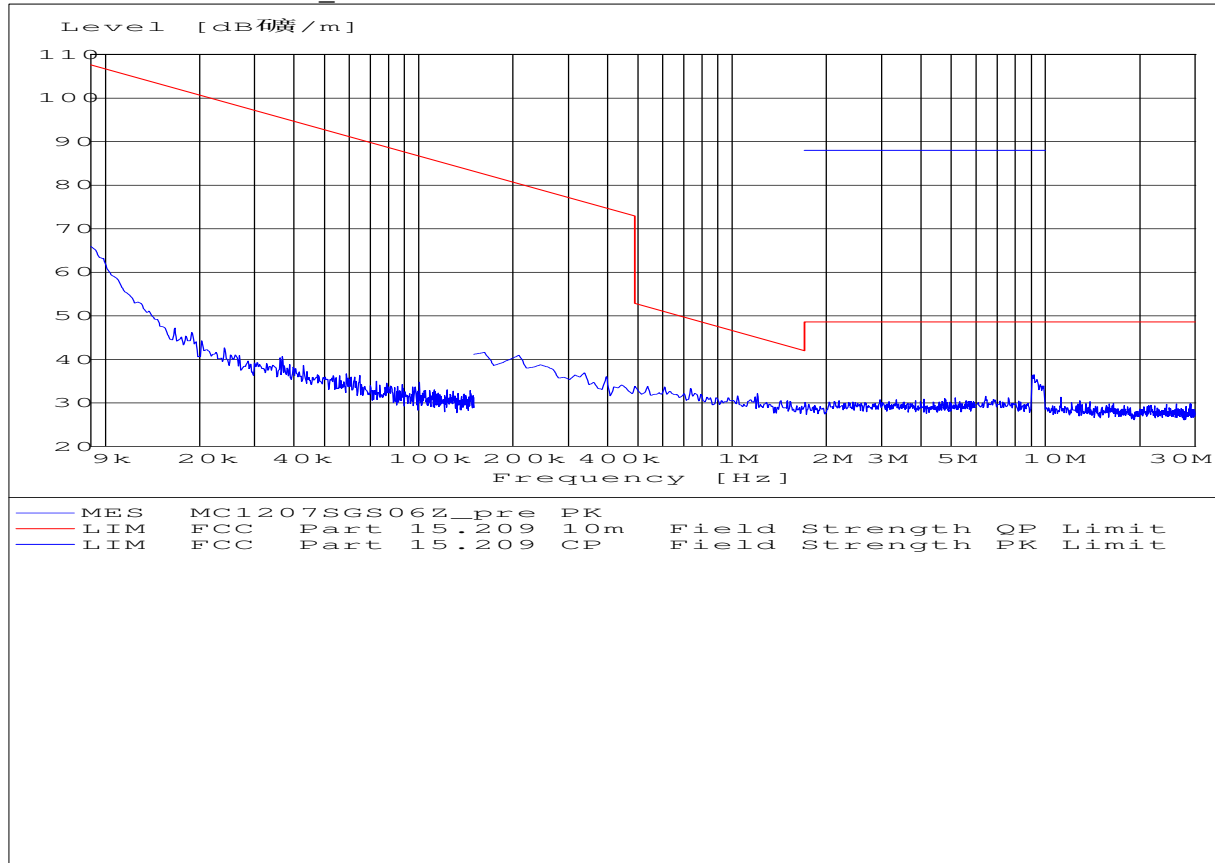
Test Mode B: working at 9.5MHz
Test Antenna Polarization _Y axis



Remark: All Radiated Spurious Emissions is below the limit at least 6dB.



Test Mode B: working at 9.5MHz
Test Antenna Polarization _ Z axis



Remark: All Radiated Spurious Emissions is below the limit at least 6dB.



5.10.2.3 30MHz~1GHz Spurious Emission

Limits: Based on 15.209

Frequency (MHz)	Field Strength (dBuV/m)	Measurement Distance
30-88	40.0	3 m
88-216	43.5	3 m
216-960	46.0	3 m
Above 960	54.0	3 m

Test Antenna Polarization:

H – Horizontal,
V –Vertical.

Test Receiver Setup:

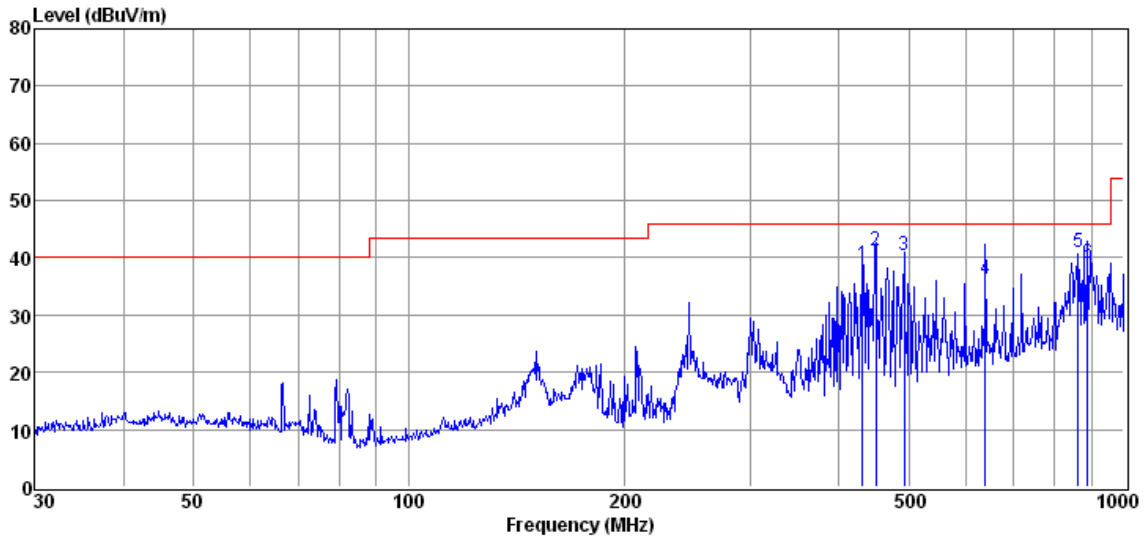
Measurement Freq. (MHz)	Detector Type	RBW
30 – 1000	Quasi-Peak (QP)	120kHz

Test Result: Pass



Test Mode A: Kept transmitting at 7.2MHz

Antenna Horizontal:

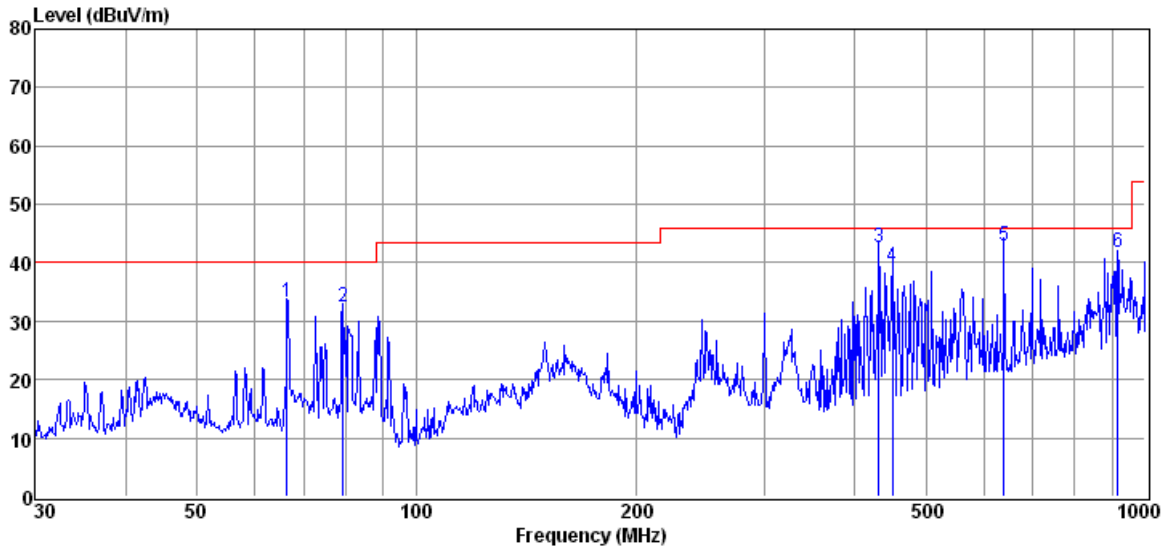


Item	Freq.	Read	Antenna	Preamp	Cable	Result	Limit	Over	Detector
(Mark)	(MHz)	Level	Factor	Factor	Loss	Level	Line	Limit	
		(dBμV)	(dB/m)	(dB)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
1	431.03	45.30	15.59	24.40	2.39	38.88	46.00	-7.12	QP
2	449.56	47.09	16.19	24.40	2.44	41.32	46.00	-4.68	QP
3	492.47	45.60	16.44	24.33	2.59	40.30	46.00	-5.70	QP
4	640.61	37.51	19.82	24.17	3.00	36.16	46.00	-9.84	QP
5	862.43	38.52	22.65	23.90	3.58	40.85	46.00	-5.15	QP
6	890.73	36.34	22.83	23.84	3.63	38.96	46.00	-7.04	QP

Note: 1. Result Level = Read Level + Antenna Factor + Cable loss - Preamp Factor
2. If Peak Result comply with QP limit, QP Result is deemed to comply with QP limit



Antenna Vertical:



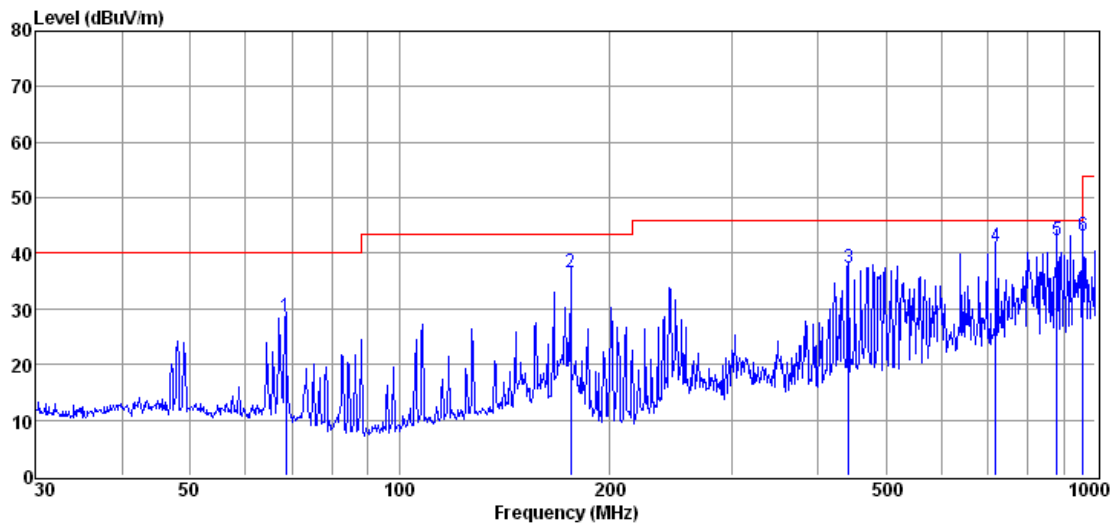
Item	Freq.	Read Level	Antenna Factor	Preamp Factor	Cable Loss	Result Level	Limit Line	Over Limit	Detector
(Mark)	(MHz)	(dBμV)	(dB/m)	(dB)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
1	66.50	45.80	11.29	24.70	0.78	33.17	40.00	-6.83	QP
2	79.24	47.41	8.95	24.70	0.86	32.52	40.00	-7.48	QP
3	431.03	48.90	15.59	24.40	2.39	42.48	46.00	-3.52	QP
4	449.56	45.19	16.19	24.40	2.44	39.42	46.00	-6.58	QP
5	640.61	44.31	19.82	24.17	3.00	42.96	46.00	-3.04	QP
6	916.07	38.71	23.22	23.80	3.69	41.82	46.00	-4.18	QP

Note: 1. Result Level = Read Level + Antenna Factor + Cable loss - Preamp Factor
2. If Peak Result comply with QP limit, QP Result is deemed to comply with QP limit



Test Mode B: Kept transmitting at 9.5MHz

Antenna Horizontal:

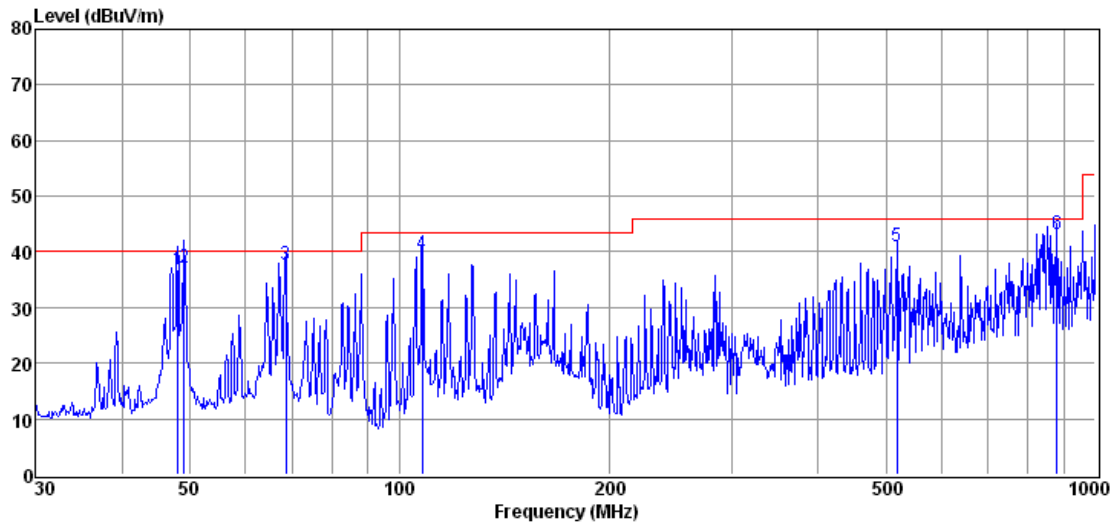


Item (Mark)	Freq. (MHz)	Read Level (dBμV)	Antenna Factor (dB/m)	Preamp Factor (dB)	Cable Loss (dB)	Result Level (dBμV/m)	Limit Line (dBμV/m)	Over Limit (dB)	Detector	Polarization
1	68.63	41.43	10.99	24.70	0.79	28.51	40.00	-11.49	QP	HORIZONTAL
2	176.27	48.26	11.55	24.60	1.39	36.60	43.50	-6.90	QP	HORIZONTAL
3	441.74	43.46	15.94	24.40	2.42	37.42	46.00	-8.58	QP	HORIZONTAL
4	719.20	41.09	20.94	24.10	3.22	41.15	46.00	-4.85	QP	HORIZONTAL
5	881.41	39.88	22.75	23.87	3.61	42.37	46.00	-3.63	QP	HORIZONTAL
6	958.79	39.17	23.97	23.76	3.82	43.20	46.00	-2.80	QP	HORIZONTAL

Note: 1. Result Level = Read Level + Antenna Factor + Cable loss - Preamp Factor
2. If Peak Result comply with QP limit, QP Result is deemed to comply with QP limit



Antenna Vertical:



Item (Mark)	Freq. (MHz)	Read Level (dBμV)	Antenna Factor (dB/m)	Preamp Factor (dB)	Cable Loss (dB)	Result Level (dBμV/m)	Limit Line (dBμV/m)	Over Limit (dB)	Detector	Polarization
1	47.99	48.02	12.92	24.70	0.63	36.87	40.00	-3.13	QP	VERTICAL
2	49.01	48.40	12.86	24.70	0.64	37.20	40.00	-2.80	QP	VERTICAL
3	68.63	50.66	10.99	24.70	0.79	37.74	40.00	-2.26	QP	VERTICAL
4	107.89	53.38	9.91	24.70	1.08	39.67	43.50	-3.83	QP	VERTICAL
5	519.07	45.65	16.96	24.30	2.67	40.98	46.00	-5.02	QP	VERTICAL
6	881.41	40.65	22.75	23.87	3.61	43.14	46.00	-2.86	QP	VERTICAL

Note: 1. Result Level = Read Level + Antenna Factor + Cable loss - Preamp Factor
2. If Peak Result comply with QP limit, QP Result is deemed to comply with QP limit



5.10.3 Duty Cycle

The duty cycle factor, expressed in dB, is arrived by taking the following formula:

$$KE = 20 \log [(tiB \cdot p) / Tw]$$

KE: pulse operation correction factor (dB);

tiw: pulse duration for one complete pulse track (msec);

tiB: pulse duration for one pulse (μsec);

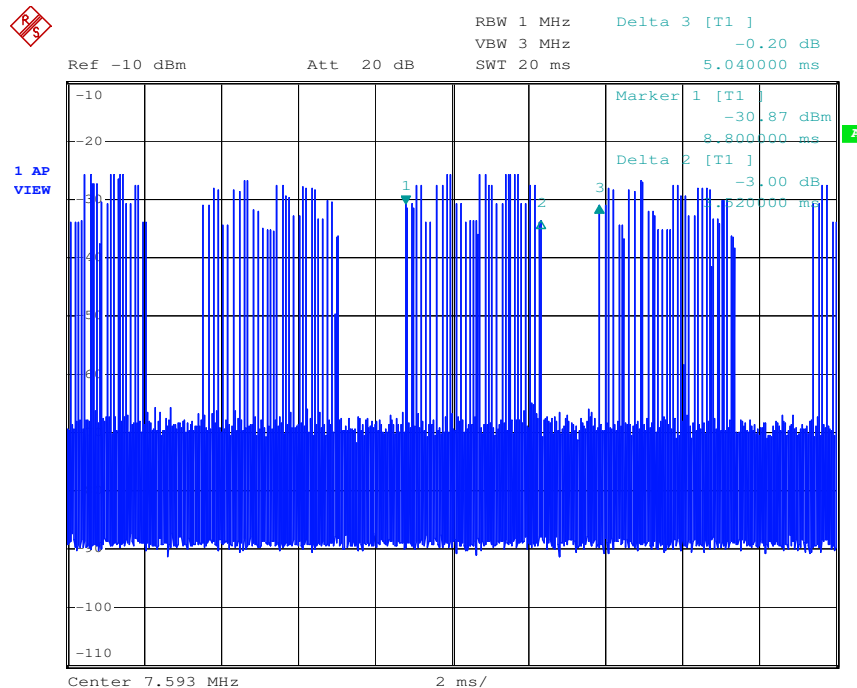
Tw: a period of the pulse track (msec);

p: number of pulses in one train.

Working at 7.2MHz Duty cycle measurement result

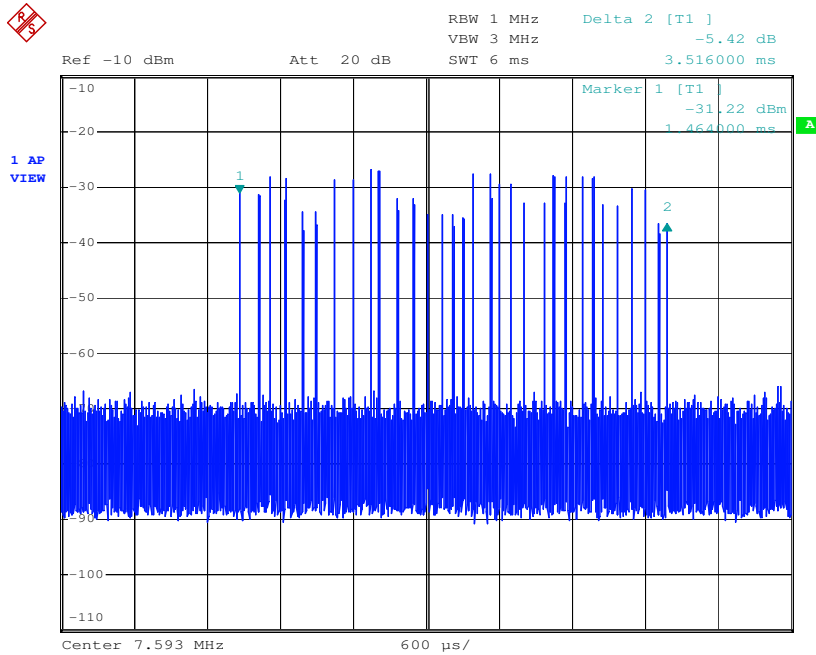
tiw (msec)	Tw (msec)	tiB (μsec)	p	KE (%)	KE (dB)
3.516	5.04	4.8	32	3.05	-30.31

The following figures were those measured by spectrum analyzer.



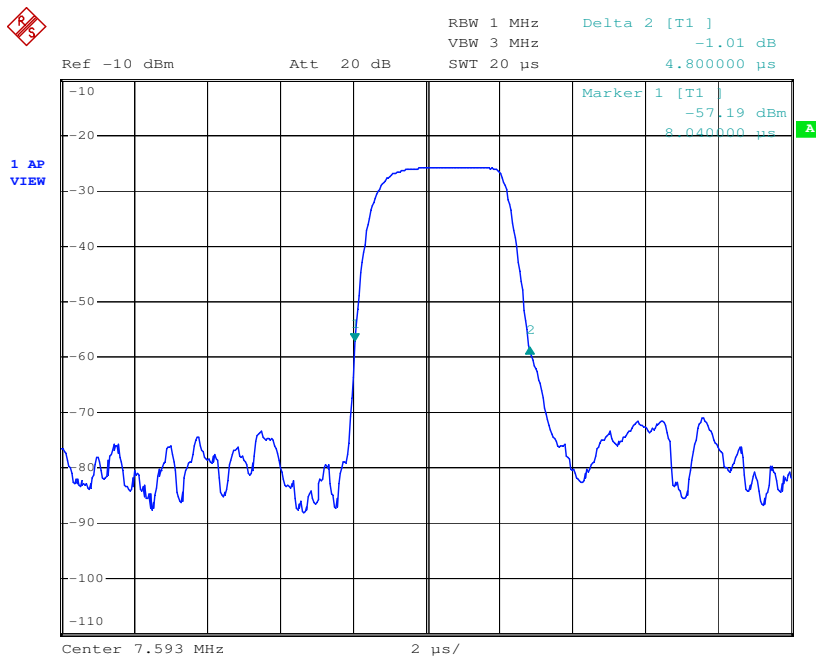
Date: 31.JAN.2013 10:43:09

Tw = 5.04ms



Date: 31.JAN.2013 10:44:51

tiw = 3.516ms



Date: 31.JAN.2013 10:46:49

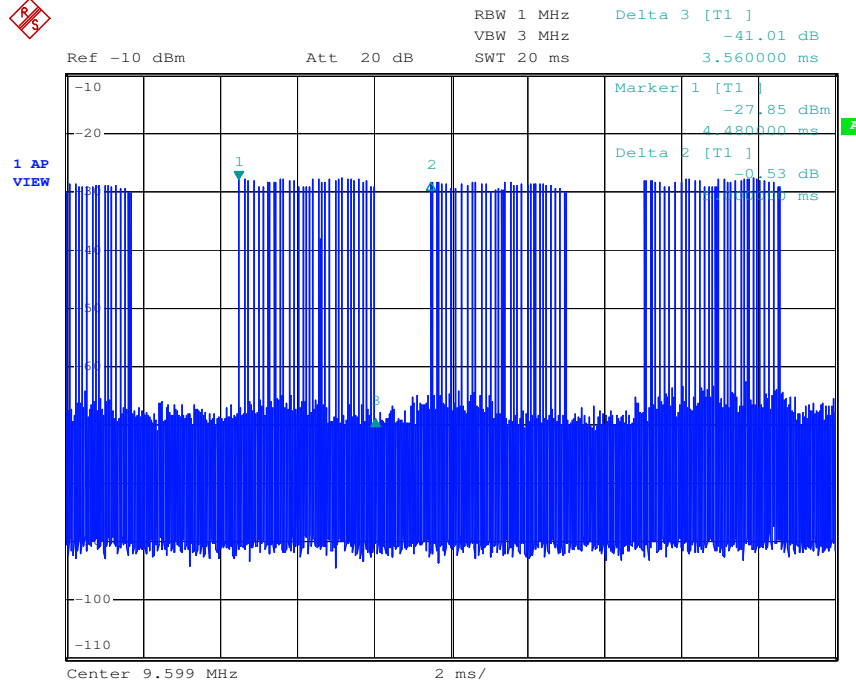
tib = 4.8 us



Working at 9.5MHz Duty cycle measurement result

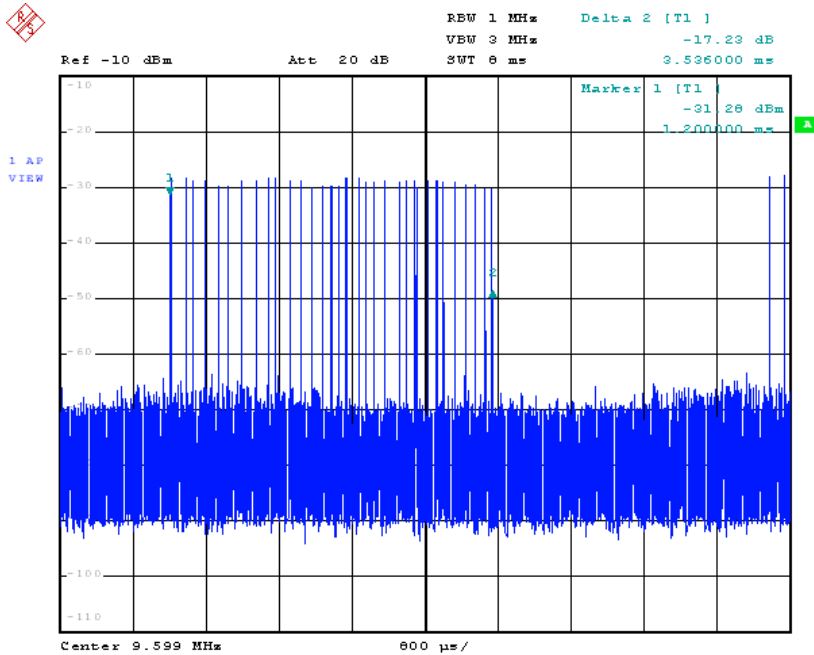
tiw (msec)	Tw (msec)	tiB (μsec)	p	KE (%)	KE (dB)
3.536	5.00	4.86	32	3.11	-30.14

The following figures were those measured by spectrum analyzer.



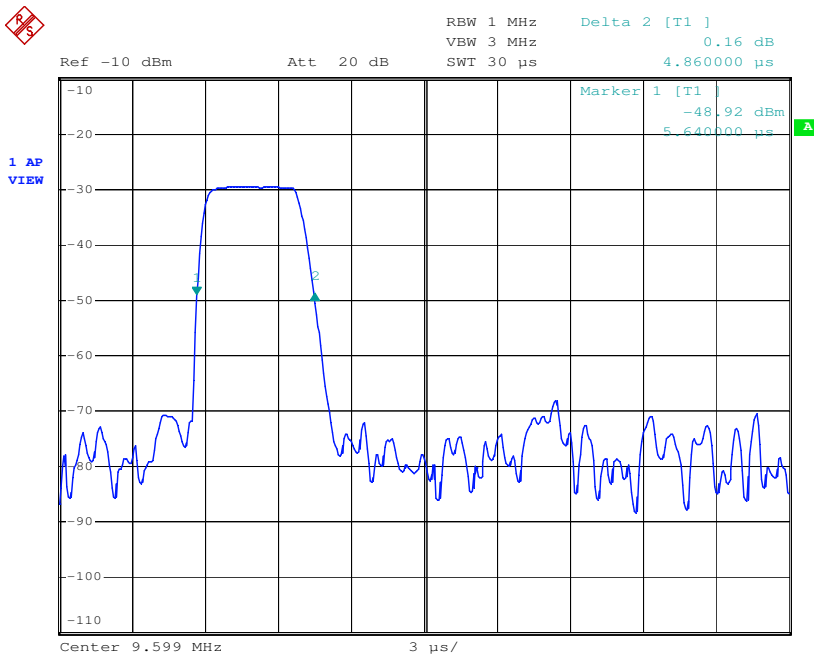
Date: 31.JAN.2013 11:17:27

Tw = 5.00 ms



Date: 31.JAN.2013 11:19:08

tiw = 3.536ms



Date: 31.JAN.2013 11:21:28

tib = 4.86 us

This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at www.sgs.com/terms_and_conditions.htm and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at www.sgs.com/terms_e-document.htm. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. 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



5.10.4 Conducted Emission Test

Test Requirement: FCC Part 15 Section 15.207 & RSS-GEN 7.2.2
Test date: Jan. 30, 2013
Standard Applicable According to section 15.207, frequency 150KHz to 30MHz shall not exceed the limit table as blew.

Frequency of Emission (MHz)	Conducted Limit (dBuV)	
	Quasi-peak	Average
0.15-0.5	66 to 56 [*]	56 to 46 [†]
0.5-5	56	46
5-30	60	50

EUT Setup

- 1.The conducted emission tests were performed in the test site,using the setup in accordance with the ANSI C63.10-2009.
- 2.EUT is connect with AC Power adaptor was plug-in LISN.The rear of the EUT and peripherals were placed flushed with the rear of the tabletop.
- 3.The LISN was connected with 120V AC/60Hz power source.

Measurement Result Operation mode: Working mode at operating frequency 7.2MHz or 9.5MHz.

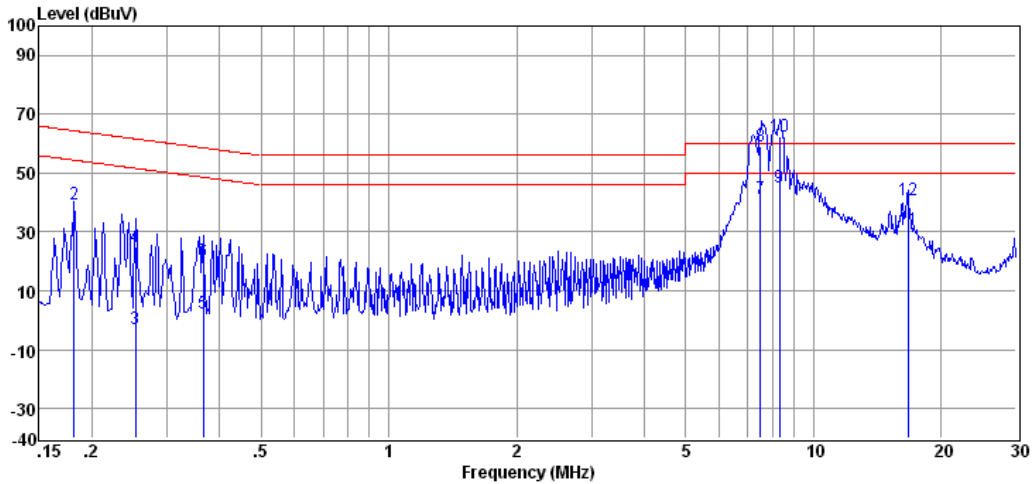
Note: All test modes have been tested.



Test Data:

Test Mode A: working at 7.2MHz

L line:



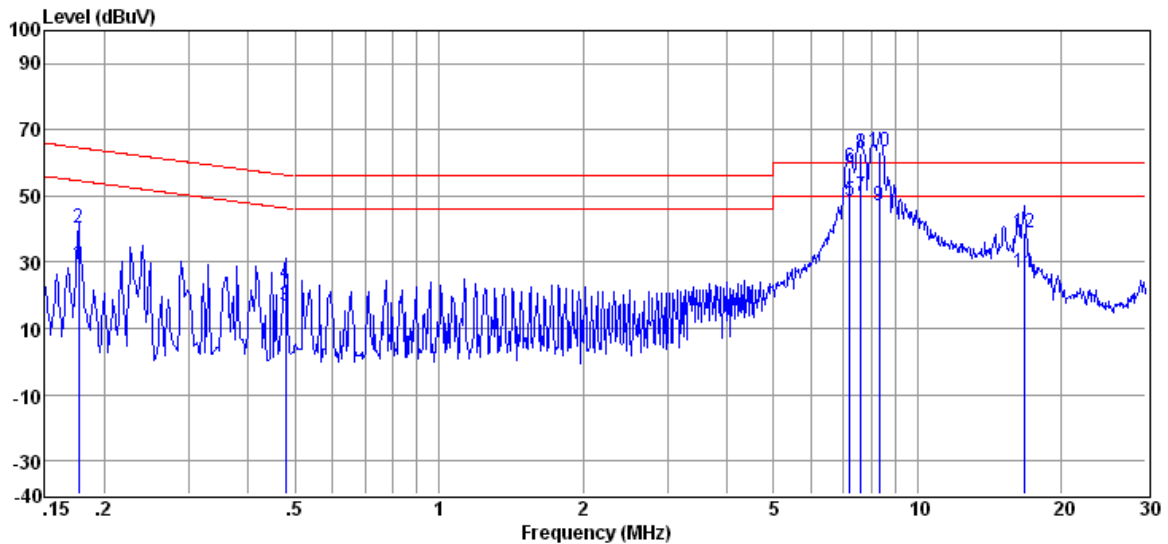
Item (Mark)	Freq (MHz)	Read Level (dBμV)	LISN Factor (dB)	Cable Loss dB	Level (dBμV)	Limit Line (dBμV)	Over Limit (dB)	Detector	Phase
1	0.182	23.98	0.14	0.10	24.22	54.42	-30.20	Average	LINE
2	0.182	39.25	0.14	0.10	39.49	64.42	-24.93	QP	LINE
3	0.253	-3.41	0.12	0.10	-3.19	51.64	-54.83	Average	LINE
4	0.253	24.62	0.12	0.10	24.84	61.64	-36.80	QP	LINE
5	0.365	1.98	0.16	0.10	2.24	48.61	-46.37	Average	LINE
6	0.365	19.88	0.16	0.10	20.14	58.61	-38.47	QP	LINE
7	7.486	40.94	0.35	0.18	41.47	50.00	-8.53	Average	LINE
8	7.486	58.75	0.35	0.18	59.28	60.00	-0.72	QP	LINE
9	8.323	44.54	0.43	0.16	45.13	50.00	-4.87	Average	LINE
10	8.323	58.99	0.43	0.16	59.58	60.00	-0.42	QP	LINE
11	16.661	29.80	0.60	0.13	30.53	50.00	-19.47	Average	LINE
12	16.661	40.20	0.60	0.13	40.93	60.00	-19.07	QP	LINE

Remark: The above mark 7 to mark 10 are the EUT operating frequencies, it is the exclusion band.



Test Mode A: working at 7.2MHz

N line:



Item (Mark)	Freq (MHz)	Read Level (dBμV)	LISN Factor (dB)	Cable Loss dB	Level (dBμV)	Limit Line (dBμV)	Over Limit (dB)	Detector	Phase
1	0.177	28.91	0.15	0.10	29.16	54.64	-25.48	Average	NEUTRAL
2	0.177	40.18	0.15	0.10	40.43	64.64	-24.21	QP	NEUTRAL
3	0.479	16.29	0.19	0.10	16.58	46.36	-29.78	Average	NEUTRAL
4	0.479	23.45	0.19	0.10	23.74	56.36	-32.62	QP	NEUTRAL
5	7.213	47.87	0.32	0.19	48.38	50.00	-1.62	Average	NEUTRAL
6	7.213	57.93	0.32	0.19	58.44	60.00	-1.56	QP	NEUTRAL
7	7.606	49.40	0.36	0.18	49.94	50.00	-0.06	Average	NEUTRAL
8	7.606	58.49	0.36	0.18	59.03	60.00	-0.97	QP	NEUTRAL
9	8.323	46.71	0.43	0.16	47.30	50.00	-2.70	Average	NEUTRAL
10	8.323	58.61	0.43	0.16	59.20	60.00	-0.80	QP	NEUTRAL
11	16.750	25.94	0.60	0.13	26.67	50.00	-23.33	Average	NEUTRAL
12	16.750	38.37	0.60	0.13	39.10	60.00	-20.90	QP	NEUTRAL

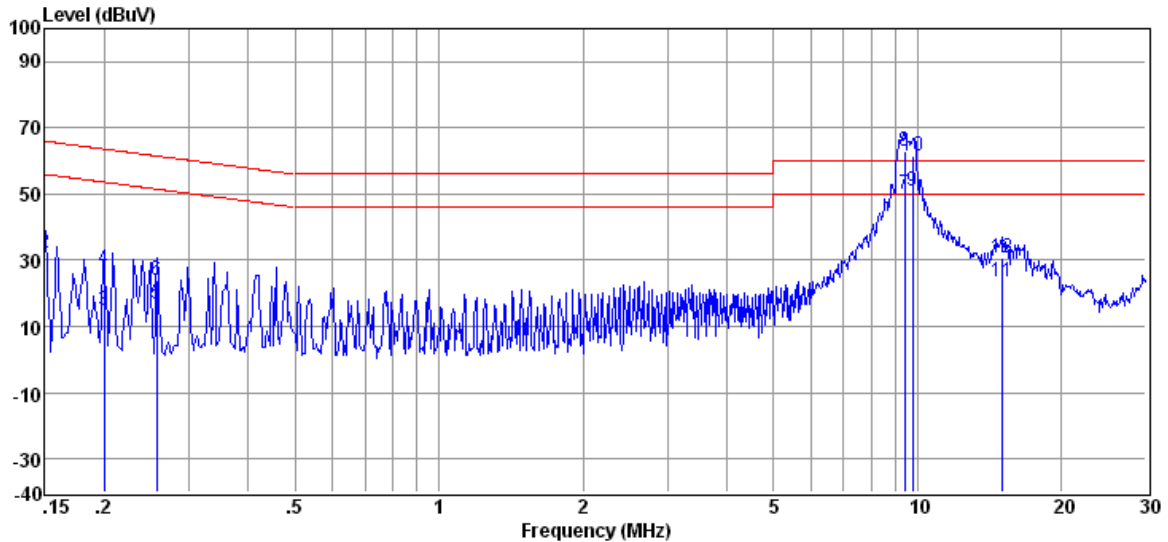
Remark: The above mark 5 to mark 10 are the EUT operating frequencies, it is the exclusion band.

This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at www.sgs.com/terms_and_conditions.htm and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at www.sgs.com/terms_e-document.htm. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. 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.



Test Mode B: working at 9.5MHz

L line:



Item (Mark)	Freq (MHz)	Read Level (dBμV)	LISN Factor (dB)	Cable Loss dB	Level (dBμV)	Limit Line (dBμV)	Over Limit (dB)	Detector	Phase
1	0.150	15.62	0.20	0.10	15.92	56.00	-40.08	Average	LINE
2	0.150	31.77	0.20	0.10	32.07	66.00	-33.93	QP	LINE
3	0.200	14.43	0.10	0.10	14.63	53.62	-38.99	Average	LINE
4	0.200	27.11	0.10	0.10	27.31	63.62	-36.31	QP	LINE
5	0.258	16.50	0.12	0.10	16.72	51.51	-34.79	Average	LINE
6	0.258	23.80	0.12	0.10	24.02	61.51	-37.49	QP	LINE
7	9.401	48.41	0.54	0.12	49.07	50.00	-0.93	Average	LINE
8	9.401	58.31	0.54	0.12	58.97	60.00	-1.03	QP	LINE
9	9.757	48.24	0.58	0.11	48.93	50.00	-1.07	Average	LINE
10	9.757	58.66	0.58	0.11	59.35	60.00	-0.65	QP	LINE
11	14.986	23.02	0.60	0.10	23.72	50.00	-26.28	Average	LINE
12	14.986	30.03	0.60	0.10	30.73	60.00	-29.27	QP	LINE

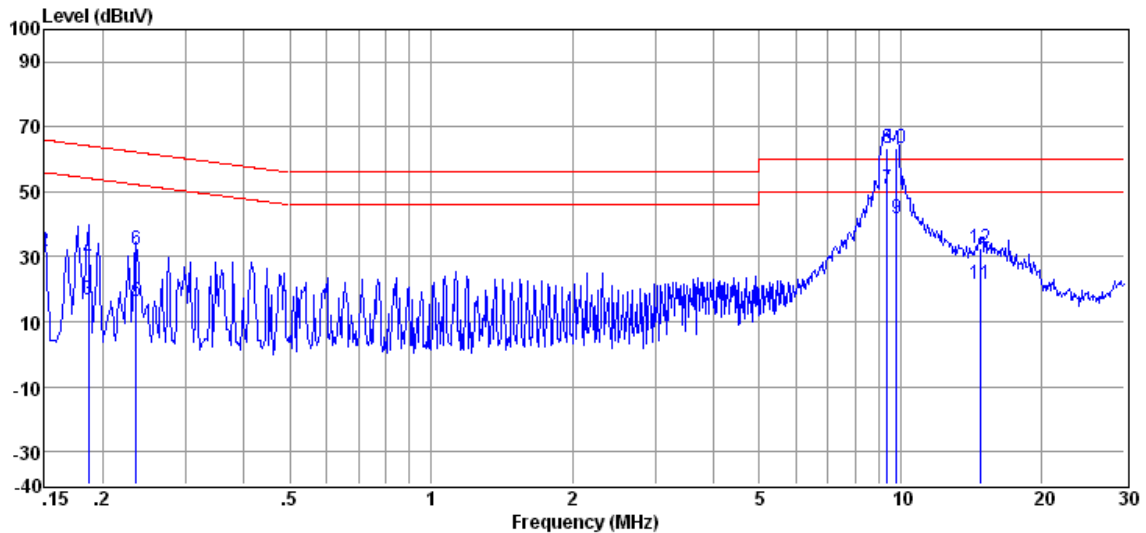
Remark: The above mark 7 to mark 10 are the EUT operating frequencies, it is the exclusion band.

This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at www.sgs.com/terms_and_conditions.htm and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at www.sgs.com/terms_e-document.htm. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. 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.



Test Mode B: working at 9.5MHz

N line:



Item (Mark)	Freq (MHz)	Read Level (dBμV)	LISN Factor (dB)	Cable Loss dB	Level (dBμV)	Limit Line (dBμV)	Over Limit (dB)	Detector	Phase
1	0.150	8.52	0.20	0.10	8.82	56.00	-47.18	Average	NEUTRAL
2	0.150	31.50	0.20	0.10	31.80	66.00	-34.20	QP	NEUTRAL
3	0.186	16.76	0.13	0.10	16.99	54.20	-37.21	Average	NEUTRAL
4	0.186	29.03	0.13	0.10	29.26	64.20	-34.94	QP	NEUTRAL
5	0.235	15.93	0.11	0.10	16.14	52.26	-36.12	Average	NEUTRAL
6	0.235	32.03	0.11	0.10	32.24	62.26	-30.02	QP	NEUTRAL
7	9.352	48.31	0.54	0.12	48.97	50.00	-1.03	Average	NEUTRAL
8	9.352	58.79	0.54	0.12	59.45	60.00	-0.65	QP	NEUTRAL
9	9.809	41.08	0.58	0.11	41.77	50.00	-8.23	Average	NEUTRAL
10	9.809	58.97	0.58	0.11	59.66	60.00	-0.34	QP	NEUTRAL
11	14.750	20.72	0.60	0.10	21.42	50.00	-28.58	Average	NEUTRAL
12	14.750	31.81	0.60	0.10	32.51	60.00	-27.49	QP	NEUTRAL

Remark: The above mark 7 to mark 10 are the EUT operating frequencies, it is the exclusion band.

- THE END -