SGS-CSTC Standards Technical Services Ltd.

No. 1 Workshop, M-10, Middle Section, Science & Technology
Park, District Shenzhen, China 518057
Telephone: +86 (0) 755 2601 2053
Fax: +86 (0) 755 2671 0594
Email: sgs_internet_operations@sgs.com
FEDERAL COMMUNICATIONS COMMISSION
Registration number: 556682

TEST REPORT

Application No. :	SZEMO090704097ET (SGS SZ No.: SZTYR090702501/EL)
Applicant:	KATUMFEL INDUSTRY LIMITED(HK)
Applicant Address:	FuCheng Industrial Town, Hong Tian, ShaJing, ShenZhen
FCC ID:	XNZ27M-TX
Fundamental Frequency :	27.145MHz
Equipment Under Test (EUT):	
Name:	27MHz Transmitter
Model No.:	90100, 90200,90300,90500,90600♣
♣	Please refer to section 2 of this report which indicates which item was actually tested and which were electrically identical.
Standards:	FCC PART 15, SUBPART C : 2008 Section 15.227
Date of Receipt:	21 July 2009
Date of Test:	21 July to 25 August 2009
Date of Issue:	25 August 2009

Test Result :	**PASS ***

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

Authorized Signature:

Robinson Lo
Laboratory Manager

2 Test Summary

Test	Test Requirement	Standard Paragraph	Result
Radiated Emission (25MHz to 1000MHz)	FCC PART 15 :2008	Section 15.227	PASS*
Occupied Bandwidth	FCC PART 15 :2008	Section 15.215	PASS

.Remark:

Tx: In this whole report Tx (or tx) means Transmitter.

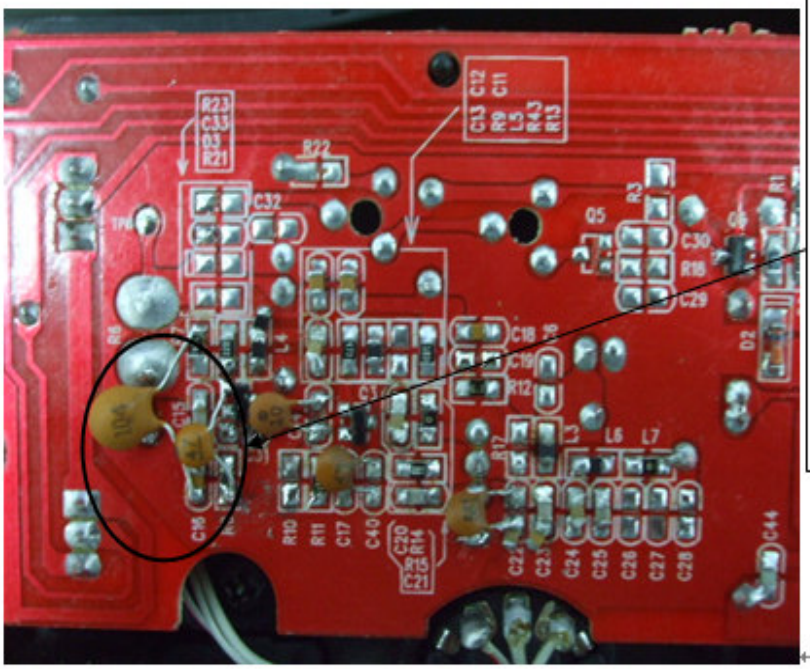
Rx: In this whole report Rx (or rx) means Receiver.

Remark:

Item No.: 90100, 90200,90300,90500,90600

Only the Item 90100 was tested, since the electrical circuit design, layout, components used and internal wiring were identical for the above items, with only different of the appearance.

The EUT passed the RE test after modification as below:



Add c16 0.1UF capacitance and Ca 47pF capacitance to these positions; after modify:
L4=2.2uH, C13=100pF, C40=470pF, C22=560pF, C20=100pF, C23=100pF, C24=100pF

3 Contents

4 General Information

4.1 Details of E.U.T.

Name:	27MHz Transmitter
Model No.:	90100, 90200,90300,90500,90600
Power Supply:	DC12V (8*1.5V ”AA” Size Batteries)
Power Cord:	N/A-

4.2 Description of Support Units

The EUT was tested as an independent unit: a 27MHz radio transmitter.

4.3 Test Location

All tests were performed at:

No. 1 Workshop, M-10, Middle Section, Science & Technology Park, District Shenzhen, China 518057

Telephone: +86 (0) 755 2601 2053 Fax: +86 (0) 755 2671 0594

No tests were sub-contracted.

4.4 Other Information Requested by the Customer

None.

4.5 Test Facility

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

- **CNAS (No. CNAS L2929)**
  CNAS has accredited SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch EMC Lab 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.
- **VCCI**
  The 3m Semi-anechoic chamber and Shielded Room (7.5m x 4.0m x 3.0m) of SGS-CSTC Standards Technical Services Co., Ltd. have been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: R-2197 and C-2383 respectively.
  Date of Registration: September 29, 2008. Valid until September 28, 2011.
- **FCC – Registration No.: 556682**
  SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Registration 556682, June 27, 2008.
- **Industry Canada (IC)**
  The 3m Semi-anechoic chamber of SGS-CSTC Standards Technical Services Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 4620C-1.

5 Test Results

Test Instruments

RE in Chamber						
Item	**Test Equipment**	**Manufacturer**	**Model No.**	**Inventory No.**	**Cal.Date (dd-mm-yy)**	**Cal.Due date (dd-mm-yy)**
1	3m Semi-Anechoic Chamber	ETS-LINDGREN	N/A	SEL0017	16-06-2009	15-06-2010
2	EMI Test Receiver	Rohde & Schwarz	ESIB26	SEL0023	12-12-2008	11-12-2009
3	EMI Test software	AUDIX	E3	SEL0050	N/A	N/A
4	Coaxial cable	SGS	N/A	SEL0028	18-06-2009	17-06-2010
5	BiConiLog Antenna (26-3000MHz)	ETS-LINDGREN	3142C	SEL0014	12-08-2008	11-08-2009
6	Pre-amplifier (0.1-1300MHz)	Agilent Technologies	8447D	SEL0053	18-06-2009	17-06-2010
7	Double-ridged horn (1-18GHz)	ETS-LINDGREN	3117	SEL0005	12-08-2008	11-08-2009
8	Horn Antenna (18-26GHz)	ETS-LINDGREN	3160	SEL0076	12-08-2008	11-08-2009
9	Pre-amplifier (1-18GHz)	Rohde & Schwarz	AFS42-00101 800-25-S-42	SEL0081	18-06-2009	17-06-2010
10	Pre-amplifier (18-26GHz)	Rohde & Schwarz	AFS33-18002 650-30-8P-44	SEL0080	18-06-2009	17-06-2010
11	Band filter	Amindeon	82346	SEL0094	18-06-2009	17-06-2010
12	Active Loop Antenna	Beijing Daze	ZN30900A	SEL0097	15-06-2009	14-06-2010

5.1 E.U.T. Operation

Operating Environment:

Temperature:	24.0 °C
Humidity:	52 % RH
Atmospheric Pressure:	1012 mbar
EUT Operation:	Test the EUT in transmitting mode.

5.2 Test Procedure & Measurement Data

5.2.1 Radiated Emissions

Test Requirement:	FCC Part15 C Section 15.227
Test Method:	ANSI C63.4: 2003
Measurement Distance:	3m (Semi-Anechoic Chamber)
Requirements:	Carrier Power will not exceed 80dBuV/m at 3m (Average). Out of band emissions shall not exceed: 40.0 dBμV/m between 30MHz & 88MHz 43.5 dBμV/m between 88MHz & 216MHz 46.0 dBμV/m between 216MHz & 960MHz 54.0 dBμV/m above 960MHz
Detector:	9KHz to 30MHz RBW=9KHz VBW=30KHz 30MHz to 1000MHz RBW=100KHz VBW=300KHz Above 1000MHz RBW=1MHz VBW=3MHz
Test Procedure:	1. The EUT is placed on a turntable, which is 0.8m above ground plane. 2. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level. 3. EUT is set 3m away from the receiving antenna, which is moved from 1m to 4m to find out the maximum emissions. 4. Maximum procedure was performed on the six highest emissions to ensure EUT compliance. 5. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical. 6. Repeat above procedures until the measurements for all frequencies are complete. 7. The radiation measurements are performed in X, Y, Z axis positioning. Only the worst case is shown in the report.

27.145MHz Mode

Test Procedure: For testing performed with the loop antenna, testing was performed in accordance to ANSI C63.4 section 8.2.1. The center of the loop was positioned 1 m above the ground and positioned with its plane vertical at the specified distance from the EUT. During testing the loop was rotated about its vertical axis for maximum response at each azimuth and also investigated with the loop positioned in the horizontal plane.

Intentional emission

Test Frequency (MHz)	Peak (dBμV/m)		Limits (dBμV/m)	Margin (dB)	
	Vertical	Horizontal		Vertical	Horizontal
27.145	72.06	61.40	100.00	36.33	46.66

Test Frequency (MHz)	Average (dBμV/m)		Limits (dBμV/m)	Margin (dB)	
	Vertical	Horizontal		Vertical	Horizontal
27.145	68.20	57.25	80.00	11.80	22.75

Other emissions

Vertical

Frequency (MHz)	Cable Loss (dB)	Antenna Factor (dB/m)	Preamp Factor (dB)	Read Level (dBuV)	Quasi-peak Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)
51.325	0.80	7.89	28.10	51.59	32.18	40.00	-7.82
78.625	1.06	7.61	28.00	51.54	32.21	40.00	-7.79
105.925	1.22	8.81	27.82	56.71	38.92	43.50	-4.58
160.525	1.34	9.59	27.38	52.13	35.68	43.50	-7.82
187.825	1.38	10.06	27.22	55.65	39.87	43.50	-3.63

Horizontal

Frequency (MHz)	Cable Loss (dB)	Antenna Factor (dB/m)	Preamp Factor (dB)	Read Level (dBuV)	Quasi-peak Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)
105.925	1.22	8.81	27.82	41.22	23.43	43.50	-20.07
160.525	1.34	9.59	27.38	45.00	28.55	43.50	-14.95
187.825	1.38	10.06	27.22	42.68	26.90	43.50	-16.60
405.250	2.22	16.32	27.43	38.32	29.43	46.00	-16.57
648.025	2.80	20.59	27.45	36.10	32.04	46.00	-13.96

Remark:
According to 15.35 (b) When average radiated emission measurements are specified in the regulations, including emission measurements below 1000 MHz, there is also a limit on the radio frequency emissions, as measured using instrumentation with a peak detector function, corresponding to 20 dB above the maximum permitted average limit for the frequency being investigated unless a different peak emission limit is otherwise specified in the rules, e.g., see Section 15.255.

Test Results: The unit does meet the FCC Part 15 C Section 15.227 requirements.

5.2.2 Occupied Bandwidth

Test Requirement: FCC Part 15 C Section 15.215 (C)

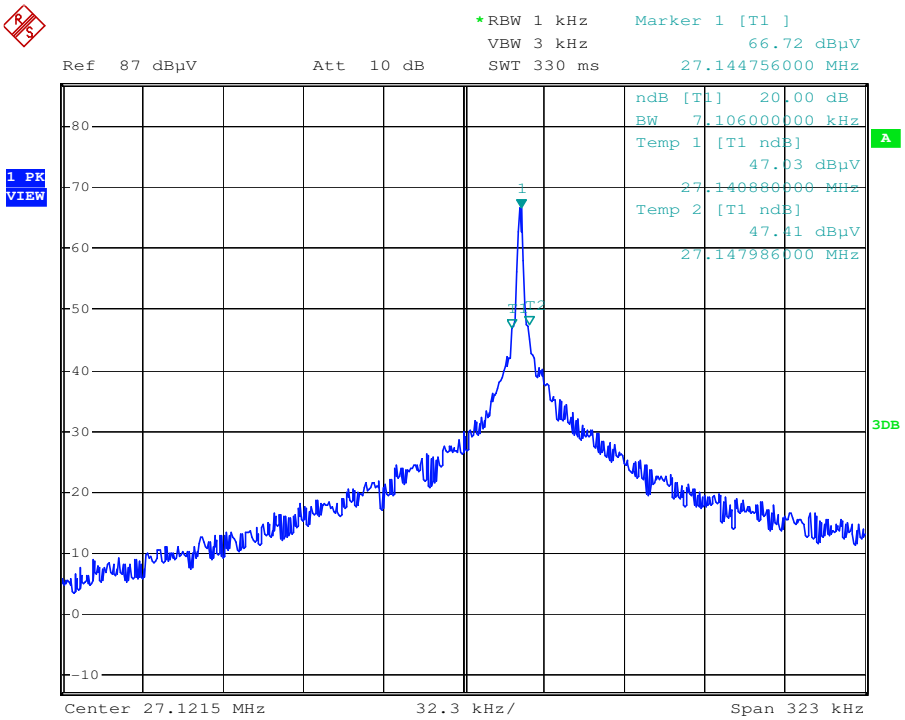
Test Method: ANSI C63.4: 2003

Operation within the band 26.960 – 27.280 MHz

Requirements: Intentional radiators operating under the alternative provisions to the general emission limits, as contained in §§ 15.217 through 15.257 and in subpart E of this part, must be designed to ensure that the 20 dB bandwidth of the emission is contained within the frequency band designated in the rule section under which the equipment is operated. The requirement to contain the 20 dB bandwidth of the emission within the specified frequency band includes the effects from frequency sweeping, frequency hopping and other modulation techniques that may be employed as well as the frequency stability of the transmitter over expected variations in temperature and supply voltage. If frequency stability is not specified in the regulations, it is recommended that the fundamental emission be kept within at least the central 80% of the permitted band in order to minimize the possibility of out-of-band operation.

Method of measurement: The useful radiated emission from the EUT was detected by the spectrum analyser with peak detector. The vertical Scale is set to 10dB per division. The horizontal scale is set to 34KHz per division.

The graph as below: represents the emissions take for this device.



The results: The unit does meet the FCC Part 15 C Section 15.215 requirements.