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ELECTROMAGNETIC EMISSION COMPLIANCE REPORT

of

TRANSMITTER
MODEL: EX201TR
FCC ID: QUQSILEX201TR

March 3, 2003

This report concerns (check one): Original grant __x__ Class II change _____
Equipment type: TRANSMITTER

Deferred grant requested per 47 CF 0.457(d)(1)(ii)? yes _____ no __x__
If yes, defer until: _____ (date)
Company agrees to notify the Commission by _____ (date)
of the intended date of announcement of the product so that the grant can be issued on that date.

Transition Rules Request per 15.37? yes _____ no __x__
If no, assumed Part 15, Subpart B for unintentional radiators - the new 47 CFR [10-1-90 Edition] provision.

Report prepared for:	SILCON INNOPRODUCTS LTD.
Report prepared by:	Advanced Compliance Lab
Report number:	0048-030120-01

NVLAP®

The test result in this report IS supported and covered by the NVLAP accreditation

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1. GENERAL INFORMATION

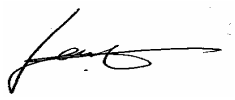
1.1 Verification of Compliance

EUT:	TRANSMITTER
Model:	EX201TR
Applicant:	SILCON INNOPRODUCTS LTD.
Test Type:	FCC Part 15C CERTIFICATION
Result:	PASS
Tested by:	ADVANCED COMPLIANCE LAB
Test Date:	March 3, 2003
Report Number:	0048-030120-01

The above equipment was tested by Advanced Technologies Lab. Compliance Laboratory for compliance with the requirement set forth in the FCC rules and regulations Part 15, subpart C. This said equipment in the configuration described in the report, shows the maximum emission levels emanating from equipment are within the compliance requirements.

The estimated uncertainty of the test result is given as following. The method of uncertainty calculation is provided in Advanced Compliance Lab. Doc. No. 0048-01-01.

	Prob. Dist.	Uncertainty(dB)	Uncertainty(dB)	Uncertainty(dB)
		30-1000MHz	1-6.5GHz	Conducted
Combined Std. Uncertainty u_c	norm.	±2.36	±2.99	±1.83



Wei Li
Lab Manager
Advanced Compliance Lab

Date: March 3, 2003

1.2 Equipment Modifications

N/A

1.3 Product Information

System Configuration

ITEM	DESCRIPTION	FCC ID	CABLE
Product	TRANSMITTER:EX201TR	QUQSILEX201TR(1)	
Housing	PLASTIC		
Power Supply	4.5V DC BATTERY		
Clock/OSC Freq.	433.9 MHz		
Device Type	Periodic Operation 15.231(e)		
Receiver	EX201RT	FCC DoC: EX201RT	

(1) EUT submitted for grant.

1.4 Test Methodology

Radiated tests were performed according to the procedures in ANSI C63.4-1992 at an antenna to EUT distance of 3 meters.

1.5 Test Facility

The open area test site and conducted measurement facility used to collect the radiated and conducted data are located at 50 Randolph Road, Somerset, New Jersey. This site has been accepted by FCC to perform measurements under Part 15 or 18 in a letter dated May 19, 1997 (Refer to: 31040/PRV 1300F2). The NVLAP Lab code for accreditation of FCC EMC Test Method is: 200101-0.

1.6 Test Equipment

Manufacture	Model	Serial No.	Description	Last Cal dd/mm/yy	Cal Due dd/mm/yy
Hewlett-Packard	HP8546A	3625A00341	EMI Receiver	23/10/02	23/10/03
EMCO	3115	4945	Double Ridge Guide Horn Antenna	28/06/02	28/06/03
EMCO	3104C	9307-4396	20-300MHz Biconical Antenna	19/09/02	19/09/03
EMCO	3146	9008-2860	200-1000MHz Log-Periodic Antenna	27/09/02	27/09/03
Fischer Custom	LISN-2	900-4-0008	Line Impedance Stabilization Networks	03/07/02	03/07/03
Fischer Custom	LISN-2	900-4-0009	Line Impedance Stabilization Networks	03/07/02	03/07/03

All Test Equipment Used are Calibrated Traceable to NIST Standards

1.7 Statement for the Document Use

This report shall not be reproduced except in full, without the written approval of the laboratory. And this report must not be used by the client to claim product endorsement by NVLAP or any agency of the U.S. Government.

2. PRODUCT LABELING

See attachment: fcclabel.doc

Fig 2.1 FCC ID Label

Fig. 2.2 Location of Label

3. SYSTEM TEST CONFIGURATION

3.1 Justification

The system was configured for testing in a typical fashion (as a customer would normally use it). And its antenna was permanently attached to the EUT (Made on the PCB). One LED is located on the front appearance.

This transmitter sends out a signal at minimum 30s interval and each transmission lasts less than one second.

3.2 Special Accessories

N/A

3.3 Configuration of Tested System

Figure 3.1 and Figure 3.3 illustrate this system, which is tested standing along.

See attachment: Setup.pdf

Figure 3.1 Radiated Test Setup, Position 1

Figure 3.2 Radiated Test Setup, Position 2

Figure 3.3 Radiated Test Setup, Position 3

4. SYSTEM SCHEMATICS

See attachment: schematic.pdf

Figure 4.1(a) (b) System Schematics

5. RADIATED EMISSION DATA

5.1 Field Strength Calculation

The corrected field strength is automatically calculated by EMI Receiver using following:

$$FS = RA + AF + CF + AG$$

where FS: Corrected Field Strength in dBμV/m
RA: Amplitude of EMI Receiver before correction in dBμV
AF: Antenna Factor in dB/m
CF: Cable Attenuation Factor in dB
AG: Built-in Preamplifier Gain in dB (Stored in receiver as part of the calibration data)

The transmitter sends out long and/or short pulse trains with less than 1s transmission duration each time. Silent period is no less than 30s.

Long pulse train, total length 87.1ms, contains one pulse with 4ms space, then 36 pulses with every 2ms space; Max. number of transmitting long pulse trains each time is 11 (i.e. total time for each transmission is less than one second).

Short pulse train, total length 50.1ms, contains one pulse with 4ms space, then 36 pulses with every 1ms space; Max. number of transmitting long pulse trains each time is 19 (i.e. total time for each transmission is less than one second).

Each pulse is 300us long. (see attachment for pulse train plot)

Considering the max. signal strength within 0.1s duration, two-consecutive-short-pulse-train transmitting period is selected for duty-cycle calculation:

Coeff. =(1x0.3+36x0.3)x2/100 = 0.22

The maximum average field strength should be 0.22 of the peak field strength measured. So we use peak value minus 13.2dB as calculated maximum average field strength.

5.2 Test Methods and Conditions

The EUT exercise program was loaded during the radiated emission test. The initial step in collecting radiated data is a EMI Receiver scan of the measurement range 30MHz - 5GHz using peak detector. IF bandwidth is 120kHz and video bandwidth is 300kHz for measuring 30MHz-1GHz. Both bandwidth are 1MHz for above 1GHz measurement.

5.3 Test Data

The following data lists the significant emission frequencies, polarity and position, peak reading of the EMI Receiver, calculated average reading, the FCC limit, and the difference between the peak reading and the limit. Explanation of the correction and calculation are given in section 5.1. Among 3 channels, channel 2 is the worst case for final data recording.

Test Personnel:

Typed/Printed Name: Edward Lee Date: March 3, 2003

Radiated Test Data

Frequency (MHz)	Polarity [H or V], Position (X,Y,Z)	Height (m)	Azimuth (Degree)	Peak Reading (dBμV/m)	Calculated Average Reading (dBμV/m)	FCC 3m Limit (dBμV/m)	Difference from limit (dB)
433.9	H,X(1)	1.4	30	79.5	66.3	72.8(3)	-6.5
867.8	H,X	1.2	30	63.7	50.5	52.8(4)	-2.3
1301.5	H,X	1.0	40	52.1	38.9	52.8(2)	-13.9
433.5	V,X	1.3	10	76.2	63	72.8	-9.8
867.8	V,X	1.2	10	61.5	48.3	52.8	-4.5
1301.5	V,X	1.1	20	50.2	37	52.8	-15.8
433.5	H,Y	1.1	0	75.2	62	72.8	-10.8
867.8	H,Y	1.1	30	62.0	48.8	52.8	-4
1301.5	H,Y	1.0	10	50.0	36.8	52.8	-16
433.5	V,Y	1.2	0	78.7	65.5	72.8	-7.3
867.8	V,Y	1.1	0	55.3	42.1	52.8	-10.7
1301.5	V,Y	1.0	20	49.8	36.6	52.8	-16.2
1735.5	V,Y	1.0	10	49.5	36.3	52.8	-16.5
433.5	H,Z	1.1	30	69.7	56.5	72.8	-16.3
867.8	H,Z	1.2	40	57.6	44.4	52.8	-8.4
1301.5	H,Z	1.0	30	48.2	35	52.8	-17.8
433.5	V,Z	1.3	40	84.7	71.5	72.8	-1.3
867.8	V,Z	1.2	20	59.9	46.7	52.8	-6.1
1301.5	V,Z	1.1	30	55.2	42	52.8	-10.8
1735.5	V,Z	1.1	20	56.0	42.8	52.8	-10

(1) See Figure 3.1, 3.2 and 3.3 for definition of position X-1, Y-2, Z-3.
(2) Restricted band per 15.205 with higher limit 54db.

(3) Fundamental limit is 1500-5000 microvolts/meter linear interpolations per 15.231(e).
(4) Spurious limit is 150-500 microvolts/meter linear interpolations per 15.231(e).

5.4 Occupied Bandwidth

The bandwidth of the emission shall be no wider than 0.25% of the center frequency, in this case, 1.085MHz(433.9x0.25%). Bandwidth is determined at the points 20dB down from the modulated carrier. Figure 5.1 shows the occupied bandwidth plot.

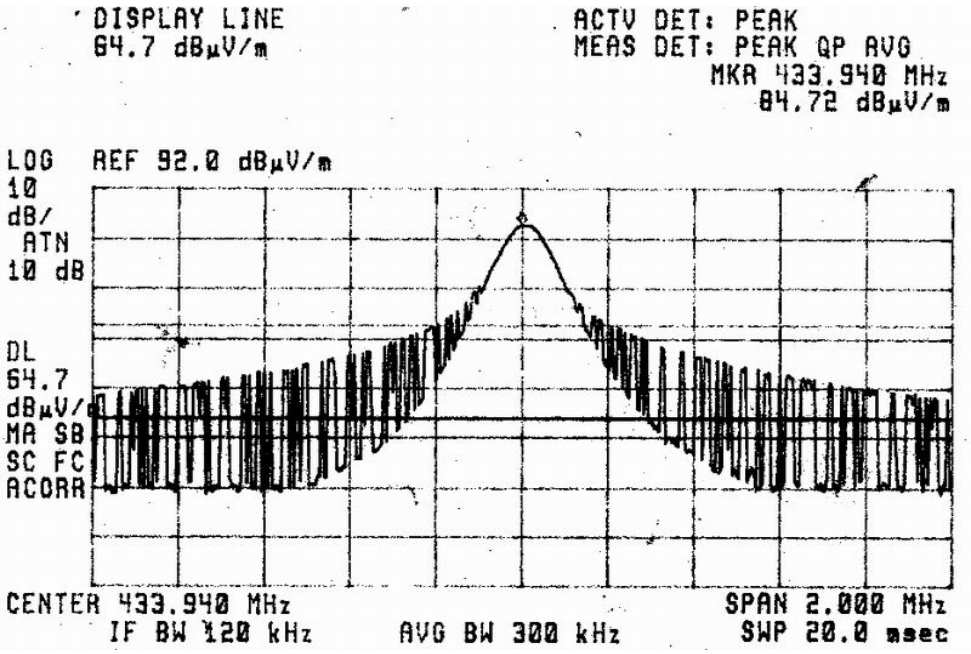


Figure 5.1 Occupied Bandwidth

6. PHOTOS OF TESTED EUT

The following photos show the inside details of the EUT.

See attachments:
EUT.pdf contains front.jpg, rear.jpg, inside.jpg, component.jpg, foil.jpg