

Date: 2000-06-13

TEST REPORT

Page 1 of 8

No.: HM102298

APPLICANT: (CODE : RIS001)

RISING SUN INDUSTRIAL COMPANY.

5/F., Koon Wah Mirror Fty. (3rd) Building, 5-9 Ka Hing Road, Kwai Chung, N.T., Hong Kong

DATE OF SAMPLES RECEIVED:

2000-03-08

TEST DURATION

2000-06-10

DESCRIPTION OF SAMPLE(S):

A sample of product said to be:

Product: 300MHz TRANSMITTER® 12 VOLTS
Manufacturer: RISING SUN INDUSTRIAL COMPANY
Model Number: TX21
Brand Name: N/A
Rating: 12Vd.c.
Origin: CHINA

INVESTIGATIONS REQUESTED:

Measurement to the relevant clauses of F.C.C. Rules and Regulations Part 15 Subpart C - Intentional Radiator.

RESULT/ REMARK:

Please see attached sheet(s).

CONCLUSION:

From the measurement data obtained, the tested sample was considered to have COMPLIED with the clause 15.231 for the Transmitter Section of Federal Communications Commission Rules. Clause 15.231 (1),(2) & (3).

TEST EQUIPMENT AUDIT:

Please see Appendix A

Law Man Kit
Testing Engineer

Kitty Choy
Verify by

Patrick Wong
Patrick Wong
for Managing Director

Date: 2000-06-13

TEST REPORT

Page 2 of 8

No.: HM102298

TEST SUMMARY

- (1) Measurement of Emission of RF energy on the carrier frequencySatisfactory
- (2) Measurement of the out-of band emission including harmonicsSatisfactory
- (3) Measurement of Emission Within Band Edges.....Satisfactory
- (4) Measurement of Radiated EmissionsSatisfactory
- (5) Measurement of Line-Conducted Voltage onto AC Power Line.....Not applicable
- (6) FCC rule clause 15.231 (1),(2) and (3) subpart C-Intentional-radiatorSatisfactory

TEST DATA

Please refer to the attached result sheets.

Date: 2000-06-13

TEST REPORT

Page 3 of 8

No.: HM102298

*** INTENTIONAL RADIATOR ***

(1) Measurement of Radiated Interference

TEST REFERENCE : FCC Rules Part 15 Subpart Section 15.231(299.130MHz)

TEST CONDITION : Normal

TEST DATE : 2000-06-10

Emission of RF energy on the carrier frequency -- 299.130 MHz (PEAK VALUE)

Emission Frequency	Meter Reading	Polarization	Antenna Factor	Field Strength (at 3m)		FCC Limit
MHz	dB(μV)	H-V	dB	dB(μV/m)	μV/m	μV/m
299.1	66.2	H	+ 20.6	86.8	21877.6	53804.3

Emission of RF energy on the carrier frequency -- 299.130 MHz (AVERAGE VALUE)

Emission Frequency	Meter Reading	Polarization	Antenna Factor	Field Strength (at 3m)		FCC Limit
MHz	dB(μV)	H-V	dB	dB(μV/m)	μV/m	μV/m
299.1	43.3	H	+ 20.6	63.9	1566.8	5380.4

... to be continued

Date: 2000-06-13

TEST REPORT

Page 4 of 8

No.: HM102298

*** INTENTIONAL RADIATOR ***

(1) Measurement of Radiated Interference ... Continued ..

TEST REFERENCE : FCC Rules Part 15 Subpart Section 15.231(299.130MHz)

TEST CONDITION : Normal

TEST DATE : 2000-06-10

Field strength of spurious emissions (PEAK VALUE)

Emission Frequency		Meter Reading	Polarization	Antenna Factor		Field Strength (at 3m)			FCC Limit
MHz		dB(μV)	H-V	dB		dB(μV/m)	μV/m		μV/m
598.3		29.6	H	+	26.4	56.0	631.0		5895.4
897.4		25.4	H	+	33.2	58.6	851.1		5895.4
*	1196.5	< 1.0		+	28.3	< 29.3	< 29.2		5000.0
*	1495.7	< 1.0		+	32.1	< 33.1	< 45.2		5000.0
1794.8		< 1.0		+	26.2	< 27.2	< 22.9		5895.4
2093.9		< 1.0		+	28.0	< 29.0	< 28.2		5895.4
2393.0		< 1.0		+	28.5	< 29.5	< 29.9		5895.4
*	2692.2	< 1.0		+	30.6	< 31.6	< 38.0		5000.0
2991.3		< 1.0		+	32.0	< 33.0	< 44.7		5895.4
3290.4		< 1.0		+	33.0	< 34.0	< 50.1		5895.4

Remark : * - Denotes restricted band of operation.

Measurement were made using a peak detector. Any emission less than 1000 MHz and falling within the restricted bands of FCC Rules Part 15 Section 15.205 were not adjusted for averaging and the limit of FCC Rules Part 15 Section 15.209 were applied

=====SUMMARY=====

data is within limits

Broad-band Antennas were used and both polarizations of emissions were measured.
polarizations at highest reading indicated as:
H -- Horizontal V -- Vertical

Date: 2000-06-13

TEST REPORT

Page 5 of 8

No.: HM102298

*** INTENTIONAL RADIATOR ***

(1) Measurement of Radiated Interference .. Continued ..

TEST REFERENCE : FCC Rules Part 15 Subpart Section 15.231(299.130MHz)

TEST CONDITION : Normal

TEST DATE : 2000-06-10

Field strength of spurious emissions (AVERAGE VALUE)

Emission Frequency		Meter Reading	Polarization	Antenna Factor		Field Strength (at 3m)			FCC Limit
MHz		dB(μV)	H-V	dB		dB(μV/m)	μV/m		μV/m
598.3		14.7	H	+	26.4	41.1	113.5		589.5
897.4		11.5	H	+	33.2	44.7	171.8		589.5
*	1196.5	< 1.0		+	32.8	< 33.8	< 49.0		500.0
*	1495.7	< 1.0		+	28.3	< 29.3	< 29.2		500.0
1794.8		< 1.0		+	32.1	< 33.1	< 45.2		589.5
2093.9		< 1.0		+	26.2	< 27.2	< 22.9		589.5
2393.0		< 1.0		+	28.0	< 29.0	< 28.2		589.5
*	2692.2	< 1.0		+	28.5	< 29.5	< 29.9		500.0
2991.3		< 1.0		+	30.6	< 31.6	< 38.0		589.5
3290.4		< 1.0		+	31.6	< 32.6	< 42.7		589.5

Remark : * - Denotes restricted band of operation.

Measurement were made using a peak detector. Any emission less than 1000 MHz and falling within the restricted bands of FCC Rules Part 15 Section 15.205 were not adjusted for averaging and the limit of FCC Rules Part 15 Section 15.209 were applied

=====SUMMARY=====

data is within limits

Broad-band Antennas were used and both polarizations of emissions were measured.
polarizations at highest reading indicated as:
H -- Horizontal V -- Vertical

Date: 2000-06-13

TEST REPORT

Page 6 of 8

No.: HM102298

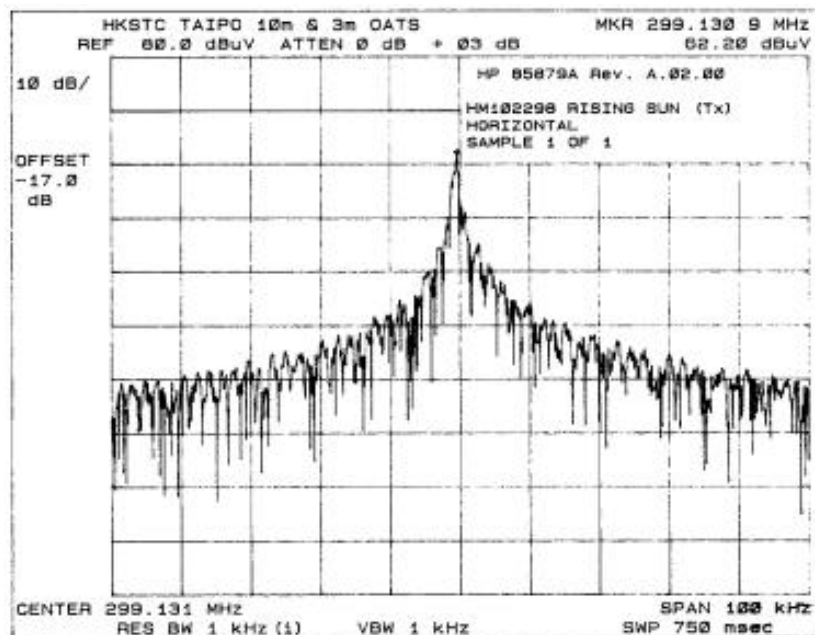
*** INTENTIONAL RADIATOR ***

(2) Measurement of Emissions Within Band Edges.

TEST REFERENCE : FCC Rules Part 15 Subpart Section 15.231(299.130MHz)

TEST CONDITION : Normal

TEST DATE : 2000-06-10



RESULTS AND NOTES

The bandwidth of the emission shall be no wider than 0.25% of the center frequency for devices operating above 70 MHz and below 900 MHz . The bandwidth is determined at the points 20dB down from the modulated carrier.

@ 299.130 MHz

$$299.130 \text{ MHz} * 0.0025 = 0.748 \text{ MHz}$$

$$0.748 \text{ MHz} / 2 = 373.913 \text{ KHz}$$

The bandwidth at 20dB down is 18kHz which is within the allowable limit of 373.913KHz at 299.130MHz.

SPECTRUM ANALYZER SETTINGS

Resolution bandwidth : 8.8KHz

Frequency span : 10.0KHz/div

No. of dB/div : 44.5dB/div

=====SUMMARY=====

All data is within limits

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NOTES FOR THE RADIATION MEASUREMENT

- (1) Test site facility:
Open field test site located at Taipo (Hong Kong) with a metal ground plane on filed with the FCC pursuant to section 2.948 of the FCC rules.
- (2) Distance between the EUT and measuring antenna:
3 meters.
- (3) Measuring instrumentations:
CISPR Quasi-peak type field strength meter (25 MHz - 1000 MHz and 1GHz-18GHz). 6 dB bandwidth set at 120KHz. Also, peak level of the fundamental emissions was measured in order to determine compliance with the 20dB peak to average limit specified in Section 15.231 of the FCC new Rules.
- (4) Measuring antenna:
Broad band antenna for the frequency range 25-1000 MHz, connected with 10 meters coaxial cable. Horn antenna for the frequency range 1-18 GHz, connected with high frequency coaxial cable. Cable loss of the coaxial cable. included in the Antenna Factor for measurement data. The antenna are capable of measuring both horizontal and vertical polarizations.
- (5) Frequency range scanned:
The frequency range from 25 MHz to 1000 MHz and 1GHz to 18GHz had been searched. Readings of the highest emissions relating to the limit were reported as above.
- (6) Arrangement of EUT:
During the test, the sample was operated at rated supply voltage and arranged for maximum emissions.
- (7) Measuring Procedure:
In accordance with the relevant clauses of the FCC Rules Part 15 section 15.231. For superregenerative receivers, an independent signal generator had been used to radiated an unmodulated wave (cw) signal to the receiver at its operating frequency in order to “cohere” or resolve the individual components of the characteristic broadband emission from such a receiver. The level of such signal may need to be adjusted in order to accomplish this.
- (8) Measuring Uncertainty:
The calculated uncertainty for measurement performed at 3M test distance are:-
30MHz to 300MHz = $\pm 3.7\text{dB}$, 300MHz to 1000MHz = $\pm 3.0\text{dB}/-2.7\text{dB}$.
1GHz to 18GHz = $\pm 3.3\text{dB}/-3.4\text{dB}$.

Remark: Purpose of this test is to provide the Applicant with the necessary test data of their device for the submission to FCC with application for Equipment Authorization under FCC's Equipment Authorization Program. This test itself is not an Approval Test.

End of Document

Date: 2000-06-13

TEST REPORT

Page 8 of 8

No.: HM102298

TEST EQUIPMENT AUDIT

Radiated Emission

EQP NO.	DESCRIPTION	MANUFACTURER	MODEL NO.	SERIAL NO.	LAST CAL.
EM007	SPECTRUM ANALYZER	HEWLETT PACKARD	HP85660B	3144A21192	11/06/99
EM008	SPECTRUM ANALYZER DISPLAY	HEWLETT PACKARD	HP85662A	3144A20514	11/06/99
EM009	QUASI PEAK ADAPTOR	HEWLETT PACKARD	HP85650A	3303A01702	11/06/99
EM010	RF PRESELECTOR	HEWLETT PACKARD	HP85685A	3221A01410	11/06/99
EM011	ATTENUATOR/SWITCH	HEWLETT PACKARD	HP11713A	2508A10595	11/06/99
EM012	PRE-AMPLIFIER	HEWLETT PACKARD	HP8449B	3008A00262	11/06/99
EM013	CONTROLLER (COMPUTER), COLOR MONITOR, KEYBOARD & MOUSE FLOPPY DRIVE	HEWLETT PACKARD HEWLETT PACKARD HEWLETT PACKARD	HP9000 HP A1097C HP9133L	6226A60314 3151J39517 2623A02468	CM
EM017	ANTENNA	ARA INC.	LPB-2513/A	1069	17/02/00
EM020	HORN ANTENNA	EMCO	3115	4032	30/06/97
EM072	SIGNAL GENERATOR	HEWLETT PACKARD	8640B	1948A11892	30/03/98
EM083	HKSTC OPEN AREA TEST SITE	HKSTC	N/A	N/A	15/01/00
EM145	EMI TEST RECEIVER	R & S	ESCS 30	830245/021	10/05/99

Remarks:-

CM Corrective Maintenance
N/A Not Applicable or Not Available
TBD To Be Determined