F C C -

TEST REPORT

REPORT NO.: 46359

FCC listed testlab
acc. to Section 2.948 of the FCC - Rules

in compliance with the requirements of
ANSI C63.4 - 2003

Product	**:**	Radio Controller
Product Class	**:**	Low Power Communication Device Transmitter
Brand Name	**:**	--
Model	**:**	8238-27
Applicant	**:**	HITARI LIMITED

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LABORATORY - REPORT

APPLICANT:	HITARI LIMITED
ADDRESS:	Random House, 14 Hall Drive Bramhope, Leeds LS16 9JE, United Kingdom
DATE OF SAMPLE RECEIVED:	2006-09-15
DATE OF TESTING:	2006-06-21 to 2006-09-25

DESCRIPTION OF SAMPLE:

Product:	Radio Controller
Product class:	Low Power Communication Device - Transmitter
Model number:	8238-27
Rating:	DC 9V ('6F22' Size Battery x 1)

INVESTIGATIONS REQUESTED:	Measurements to the relevant clauses of F.C.C. Rules and Regulations Part 15 Subpart C - Intentional Radiators
RESULTS:	See the attached sheets
CONCLUSIONS:	From the measurement data obtained, the tested sample was considered to have COMPLIED with the requirements for the relevant clauses of Federal Communications Commission Rules as specified above.

INTERNATIONAL ELECTRICAL CERTIFICATION CENTRE LTD. IECC 國際電器認證中心有限公司

Authorized Signature

Test Location

International Electrical Certification Centre Ltd.
Unit 602-605, 31 Lok Yip Road, On Lok Tsuen, Fanling, N.T., Hong Kong

Summary of Test Results

Radiated Emission:

Test result: O.K.
Test data: See attached data sheet

Conducted Emission:

Test result: N.A.
Test data: N.A.

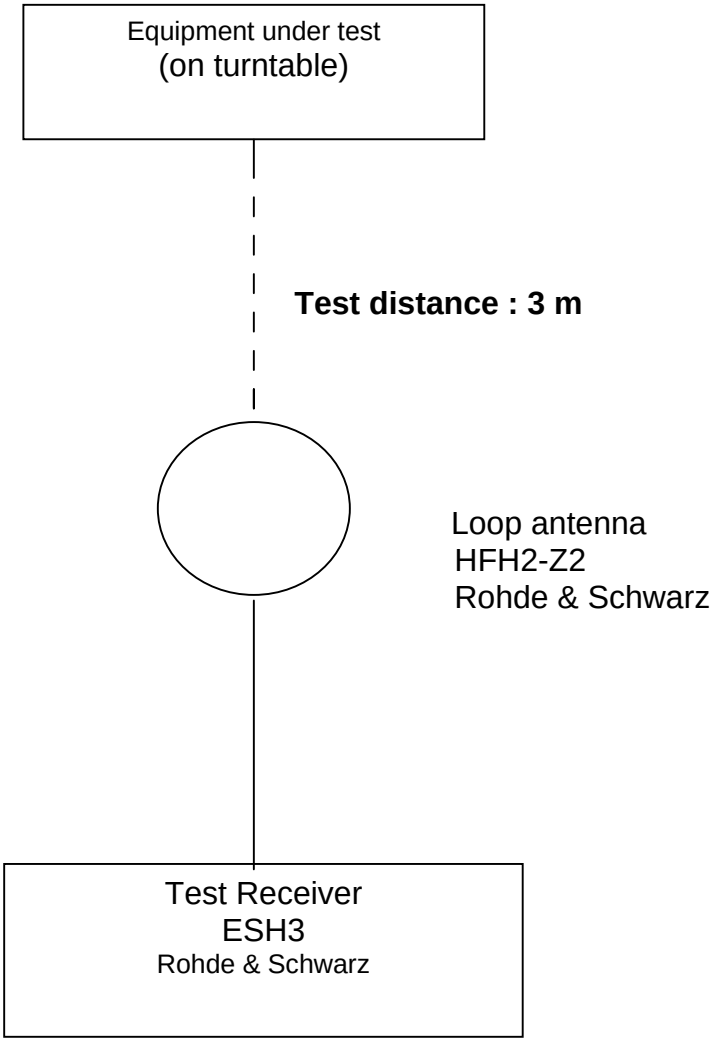
Measurement of Emissions within Band Edges

Test result: O.K.
Test data: See attached data sheet

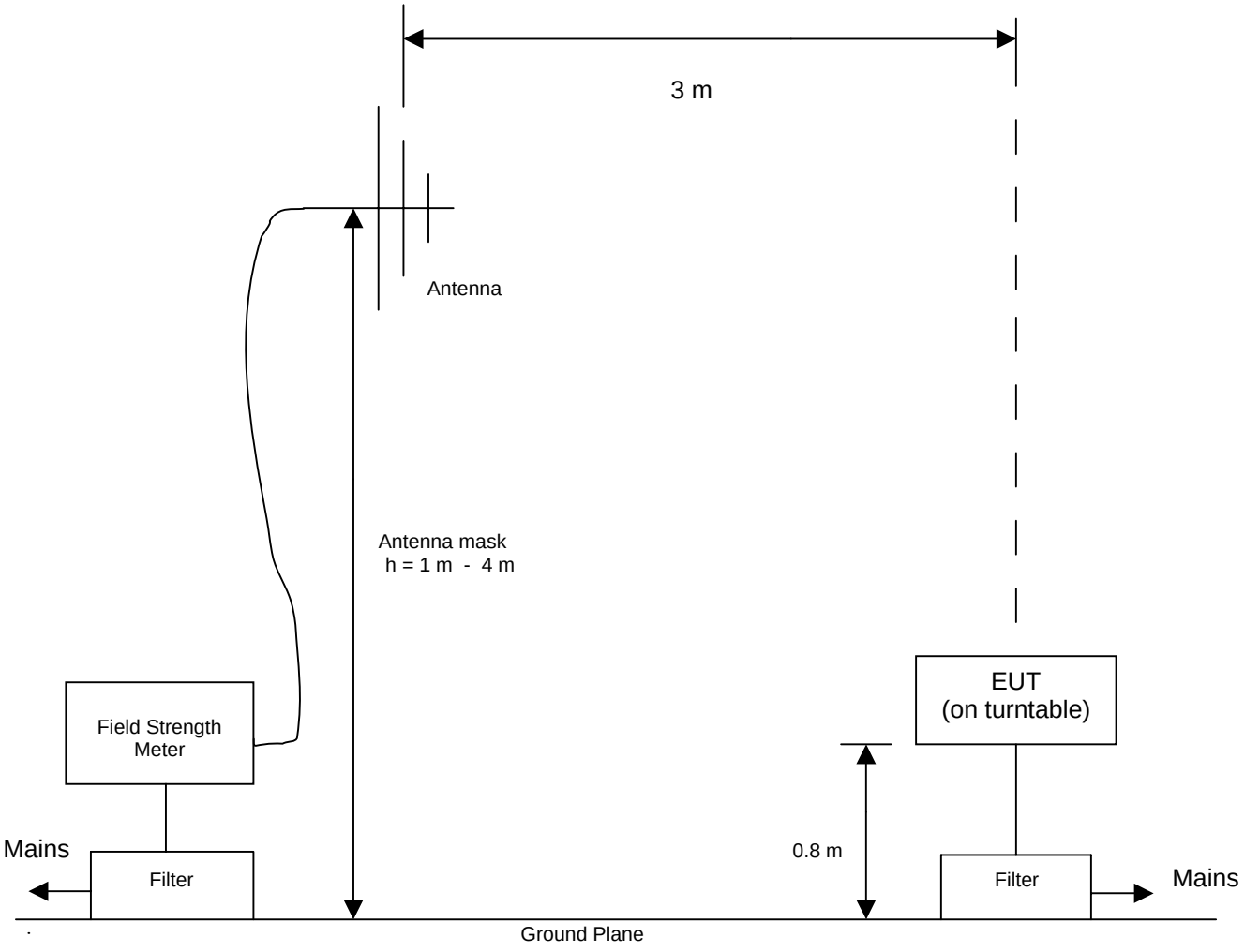
TEST EQUIPMENT LIST

Equipment	Manufacturer	Model	Serial No.	Last Calibration Date	Next Calibration Date
Test Receiver	Rohde & Schwarz	ESVP	860688/022	14/11/2005	13/11/2006
Test Receiver	Rohde & Schwarz	ESH 3	863497/015	14/11/2005	13/11/2006
Antenna	Schaffner	CBL6111C	2791	25/05/2005	24/05/2008
Antenna	Schwarzbeck	BBA 9106 / UHALP 9107	--	29/03/2005	28/03/2008
Antenna Mast System	Schwarzbeck	AM9104	--	--	--
Loop Antenna	Rohde & Schwarz	HFH2-Z2	871336/48	03/12/2003	02/12/2006
Turntable with Controller	Drehtisch	DT312	--	--	--
Spectrum Analyzer with Q. Peak	Advantest	R3132	140101852	16/11/2005	15/11/2006

Radiated Emission Test Setup (9kHz – 30MHz)



Radiated Emission Test Setup (3 m diatance) (> 30MHz)



Radiated Emission Test

Test Procedure :

The EUT was tested according to ANSI 63.4-2003 for the requirements of FCC Part 15 Subpart C Section 15.227 & 15.209.

1. Measurement Frequencies below 30MHz :

During the test, the sample was placed on a turn table and operated under various modes with supply from new battery. The table is 0.8 meter above ground and can rotate 360 degrees to determine the position of the maximum emission level. A loop antenna for the frequency range 9kHz - 30MHz, connected with 10 meters coaxial cable to the test receiver was used for measurement. The center of the loop 1 m above the floor, positioned with its plane vertical at the specified distance and rotated about its vertical axis and placed horizontal for maximum response at each azimuth about the EUT.

An initial pre-scan was performed to find out the maximum emission level of the sample placed at 3 orthogonal planes. Final measurement was then performed to record the data for fundamental emission within the operation band and spurious emissions outside the band under worst-case condition for combination of the antenna orientation and turn table position.

Note : Fundamental emission for this pulse modulated device was measured with the peak detector function of the test receiver and was properly adjusted for the duty cycle correction factor as pulse desensitization to calculate the average emission value.

2. Measurement Frequencies 30MHz – 1000 MHz :

During the test, the sample was also placed on a turn table and operated under various modes with supply from new battery. The table is 0.8 meter above the reference ground plane on the Open Aera Test Site and can rotate 360 degrees to determine the position of the maximum emission level. A broad-band antenna for the frequency range 30 - 1000 MHz, connected with 10 meters coaxial cable to the test receiver was used for measurement. The antenna is capable of measuring both horizontal and vertical polarizations. The antenna was raised from 1 to 4 meters to find out the maximum emission level from the EUT.

An initial pre-scan was performed to find out the maximum emission level of the sample placed at 3 orthogonal planes. Final measurement (30 MHz –1000 MHz) was then performed to record the data for the spurious emissions under worst-case condition for combination of the antenna orientation / height and turn table position.

Note : The Open Aera Test Site located at IECC was placed on file with the FCC Pursuant to Section 2.948 of the FCC Rules (FCC Registration No. : 97774).

Test Results :

Test Requirement:	FCC Part 15 Subpart C Section 15.227, 15.209
Test Method:	ANSI C63.4 : 2003
Frequency Range:	9kHz – 1000MHz
Measurement Distance:	3 m
Detector:	Peak (Measurement within the operation band) Quasi-Peak (Measurement outside the operation band)
Result:	Refer to page 11- 15 for emission measurement Refer to page 16 for band edge plot

Radiated Emission

Measurement of Radiated Emissions
FCC Part 15 Subpart C (15.227)

IECC Ref:	46359
Model:	8238-27
Applicant:	HITARI LIMITED
Sample No.:	1
Set under test:	Radio Controler
Connected sets:	-
Operating mode:	Operate

Test Equipment
Receiver: ESVP Rohde & Schwarz
Antenna: HFH2-Z2 Rohde & Schwarz

Radiation Measurement (3 m) below 30MHz

a. Fundamental Frequency

Frequency (MHz)	Maximum Test Result (dB(µV/m))		FCC Limit (dB(µV/m))	
	Peak	Average *	Peak	Average
27.145	54.0	33.3	100	80

Note : (1) The above peak value is the maximum value of the measurement in 3 orthogonal planes

(2) * Calculation for radiation (average) :

Formula :
Duty cycle = (N1L1 + N2L2 + … + Nn-1Ln-1 + NnLn) / 100 or T

where N1 is number of type 1 pluse, L1 is length of type 1 pulse, etc.
T is the period of the pulse train (if less than 100 ms)

According to the time domain plots shown in page 11 & 12 :
Duty cycle of the EUT = (3x0.36 + 1x0.66 + 7x0.12 + 12x0.264) / 62.48 = 0.092

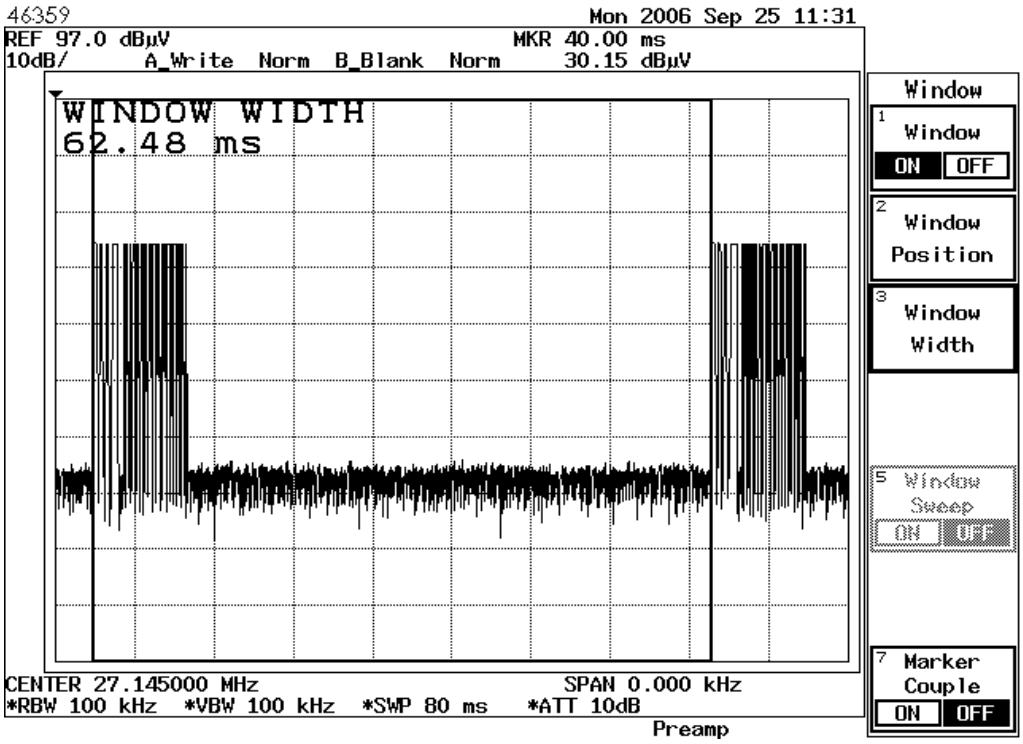
Av correction factor = 20 x log(0.092) dB
= - 20.72 dB

Radiation (average) = Radiation (peak) + Av correction factor

Radiation (average) of the EUT = 54.0 - 20.72 dB(µV/m)
= 33.3 dB(µV/m)

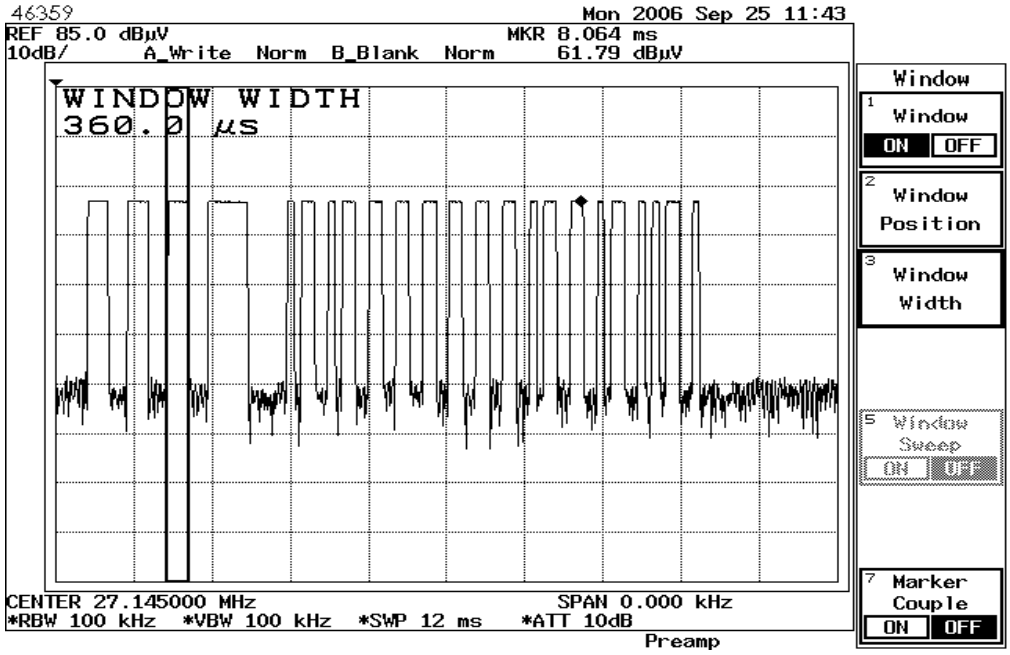
b. The measured radiation outside the operation band were negligible

Transmitter Emission - Time Domain Plots

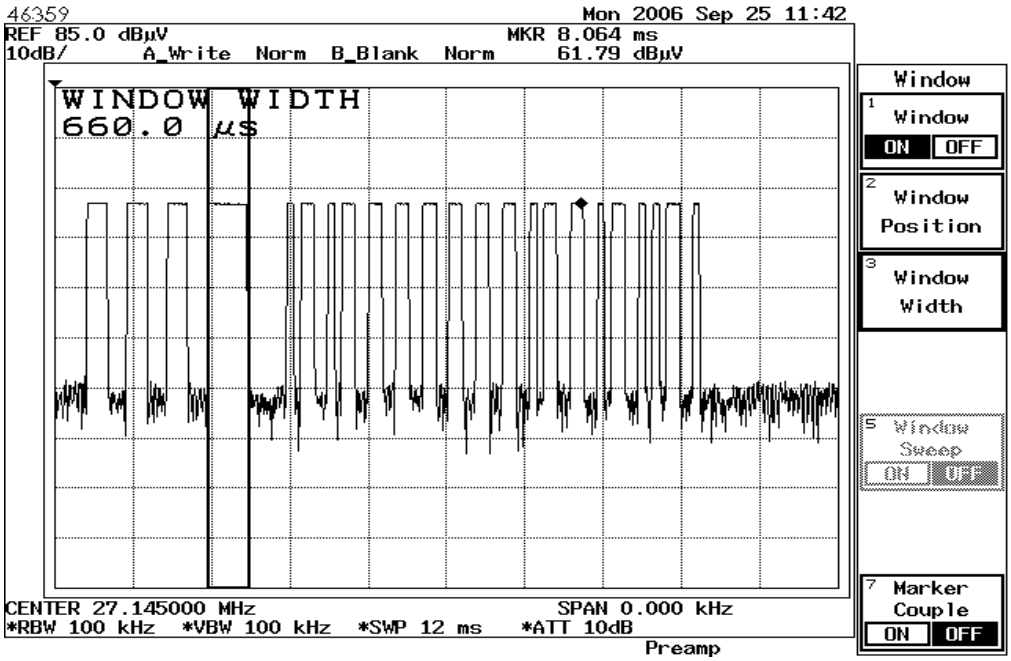


Pulse cycle period = 62.48 ms

Transmitter Emission - Time Domain Plots

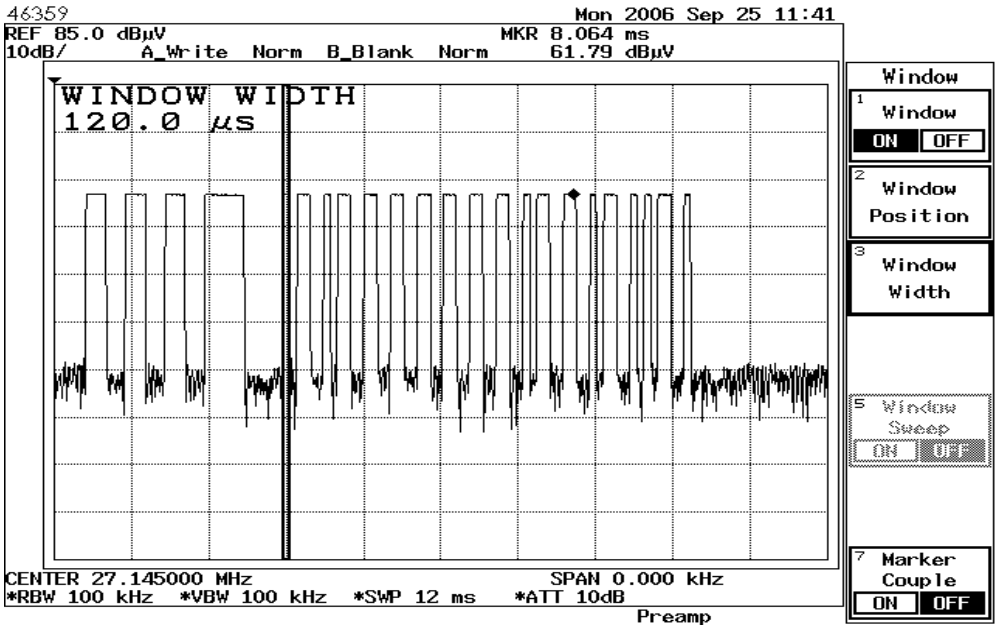


Pulse width = 0.36 ms (total number of pulse : 3)

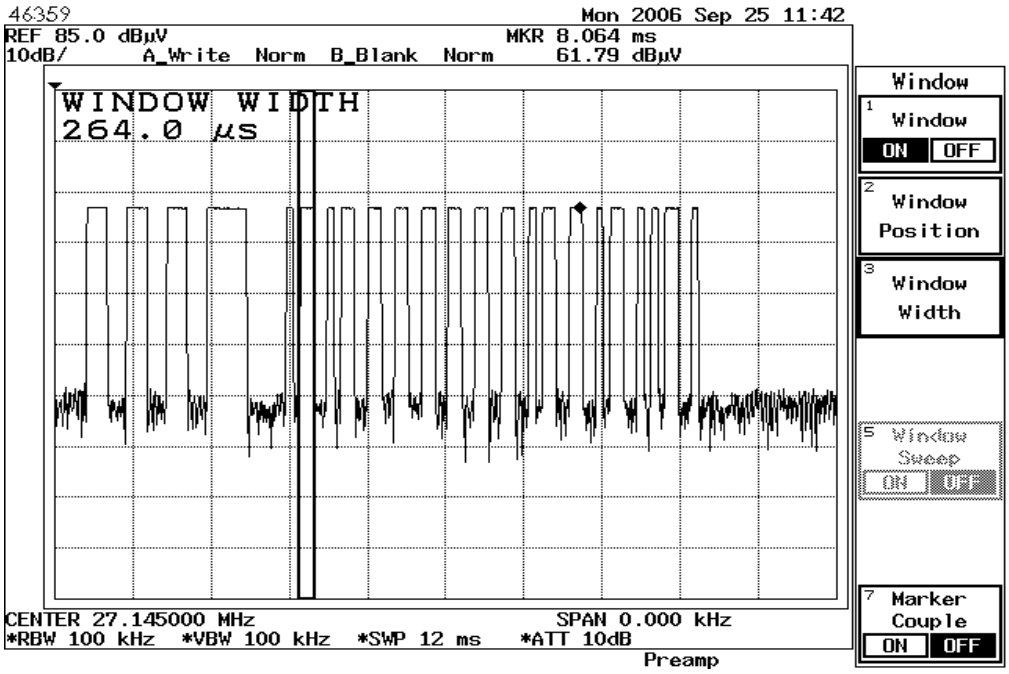


Pulse width = 0.66 ms (total number of pulse : 1)

Transmitter Emission - Time Domain Plots



Pulse width = 0.12 ms (total number of pulse : 7)



Pulse width = 0.264 ms (total number of pulse : 12)

Radiated Emission

Measurement of Radiated Emissions
FCC Part 15 Subpart C (15.209)

Date : 2006-09-29

IECC Ref: 46359
Model: 8238-27
Applicant: HITARI LTD.
LIMITED
Sample No. : 1

Set under test: Radio Controler
Connected sets: -
Operating mode: Operate

Test Equipment
Receiver: ESVP Rohde & Schwarz
Antenna: BBA 9106 / UHALP 9107
Schwarzbeck

Fundamental Frequency : 27.145 MHz

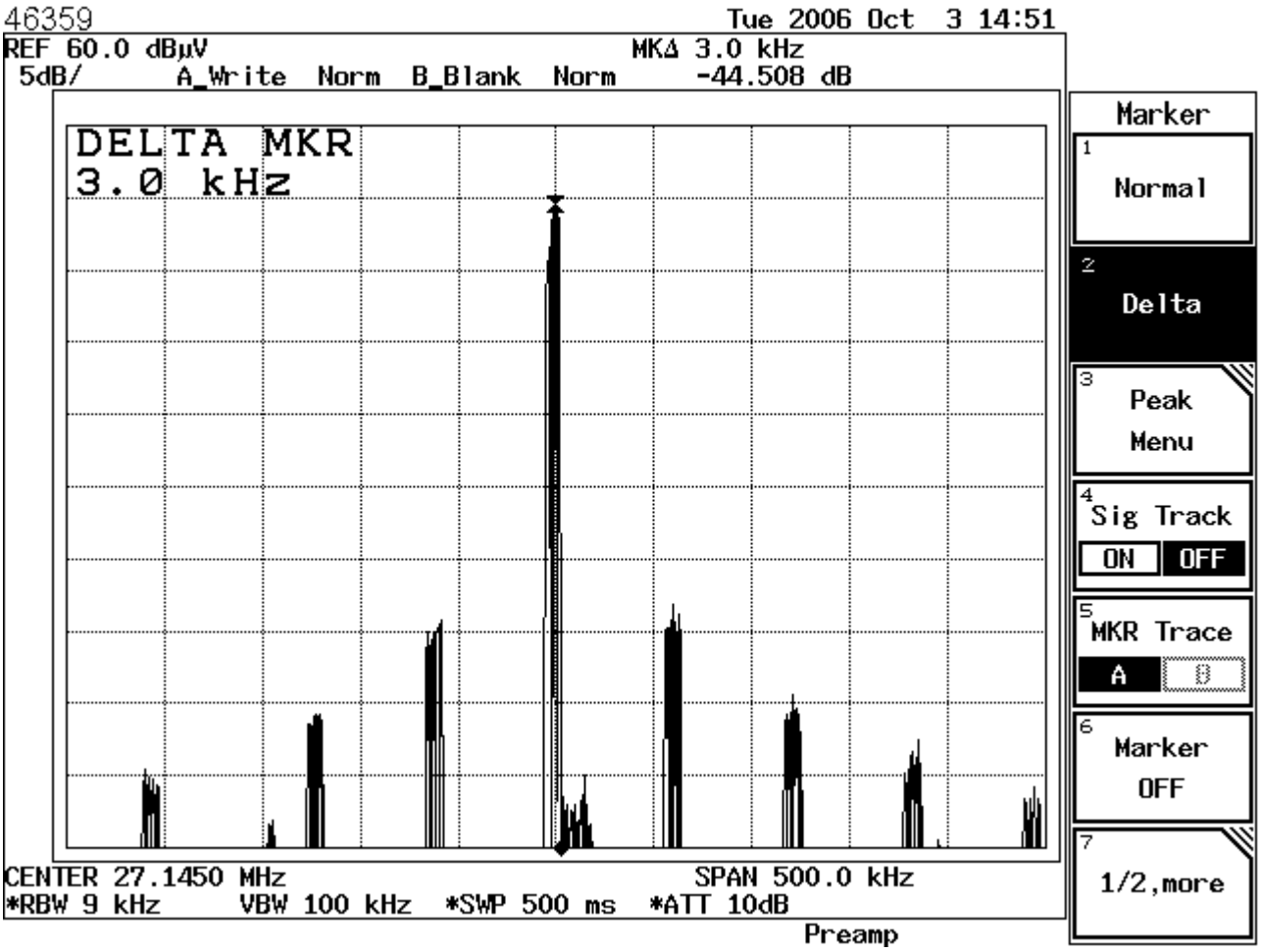
Radiation Measurement over 30MHz

	Frequency (MHz)	Horz. Reading dB(µV)	Vert. Reading dB(µV)	Corr. Factor (dB)	Horiz. Test Result dB(µV/m)	Vert. Test Result dB(µV/m)	Limit dB(µV/m)
Harm. 2	54.29	22	29	6.3	28.3	35.3	40.0
Harm. 3	81.44	< 16	< 16	7.4	< 23.4	< 23.4	40.0
Harm. 4	108.58	< 16	< 16	10.6	< 26.6	< 26.6	43.5
Harm. 5	135.73	< 16	< 16	11.5	< 27.5	< 27.5	43.5
Harm. 6	162.87	< 16	< 16	9.9	< 25.9	< 25.9	43.5
Harm. 7	190.02	< 16	< 16	8.6	< 24.6	< 24.6	43.5
Harm. 8	217.16	< 16	< 16	8.7	< 24.7	< 24.7	46.0
Harm. 9	244.31	< 16	< 16	11.9	< 27.9	< 27.9	46.0
Harm. 10	271.45	< 16	< 16	13.4	< 29.4	< 29.4	46.0
Harm. 11	298.60	< 16	< 16	13.8	< 29.8	< 29.8	46.0
Harm. 12	325.74	< 16	< 16	14.6	< 30.6	< 30.6	46.0
Harm. 13	352.89	< 16	< 16	15.4	< 31.4	< 31.4	46.0
Harm. 14	380.03	< 16	< 16	16.3	< 32.3	< 32.3	46.0
Harm. 15	407.18	< 16	< 16	17	< 33.0	< 33.0	46.0
Harm. 16	434.32	< 16	< 16	17.8	< 33.8	< 33.8	46.0
Harm. 17	461.47	< 16	< 16	18.4	< 34.4	< 34.4	46.0
Harm. 18	488.61	< 16	< 16	18.9	< 34.9	< 34.9	46.0
Harm. 19	515.76	< 16	< 16	19.4	< 35.4	< 35.4	46.0
Harm. 20	542.90	< 16	< 16	20.5	< 36.5	< 36.5	46.0
Harm. 21	570.05	< 16	< 16	21.1	< 37.1	< 37.1	46.0
Harm. 22	597.19	< 16	< 16	20.7	< 36.7	< 36.7	46.0
Harm. 23	624.34	< 16	< 16	21.9	< 37.9	< 37.9	46.0
Harm. 24	651.48	< 16	< 16	21.6	< 37.6	< 37.6	46.0
Harm. 25	678.63	< 16	< 16	22	< 38.0	< 38.0	46.0
Harm. 26	705.77	< 16	< 16	22.7	< 38.7	< 38.7	46.0
Harm. 27	732.92	< 16	< 16	23.9	< 39.9	< 39.9	46.0
Harm. 28	760.06	< 16	< 16	24.1	< 40.1	< 40.1	46.0
Harm. 29	787.21	< 16	< 16	24	< 40.0	< 40.0	46.0
Harm. 30	814.35	< 16	< 16	24.2	< 40.2	< 40.2	46.0
Harm. 31	841.50	< 16	< 16	25.3	< 41.3	< 41.3	46.0
Harm. 32	868.64	< 16	< 16	25.4	< 41.4	< 41.4	46.0
Harm. 33	895.79	< 16	< 16	25.3	< 41.3	< 41.3	46.0
Harm. 34	922.93	< 16	< 16	26.3	< 42.3	< 42.3	46.0
Harm. 35	950.08	< 16	< 16	27.6	< 43.6	< 43.6	46.0
Harm. 36	977.22	< 16	< 16	27	< 43.0	< 43.0	54.0

Remark: All frequencies in the required range have been scanned and only those significant and representative readings are reported above.
All emissions not reported above are all well below the limit.

Note: Unless otherwise indicated, the recorded readings are in quasi-peak values.

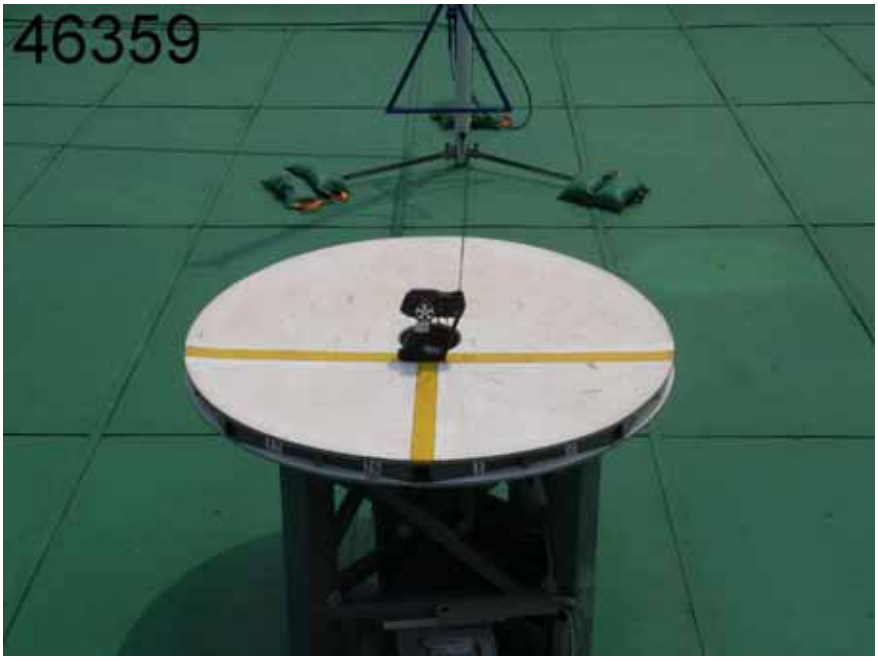
Measurement Data of Emissions within Band Edges

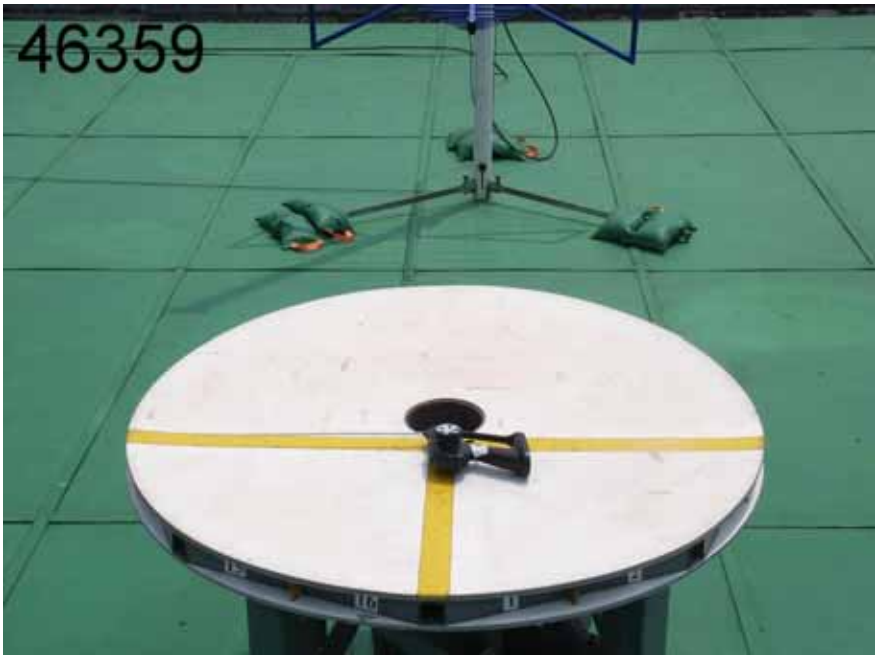


Result : The field strength of any emission within the operation band did not exceed 80 dB(µV/m) for average value or 100 dB(µV/m) for peak value. Refer to page 11 for the recorded value for the emission at the fundamental frequency.

Photographs

Radiated Emission Test setup





Sample Construction Details

Sample Construction Details