

# FCC ID TEST REPORT

According to

## FCC Part 15 Subpart C, Intentional Radiators

EUT Type **Wireless Keyboard**

Transmitter (TX) **1) Model No.: RF-525, RF-530, RF-540**

**2) FCC ID: P4PRF-525**

**3) Power Supply: DC 3V, battery Type AAA, 1.5Vdc x 2**

Receiver (RX) **1) Model No.: RF-525**

**2) FCC ID: N/A, (under DoC)**

**3) Power Supply: DC 3V from PS/2 connector of PC**

Applicant Name: **ZIPPY TECHNOLOGY CORP.**

Address See the General Information for details.

Test Date : 2001-09-29 Issued Date : DEC. 05, 2001

Test Engineer : STEVEN CHEN NVLAP Signature : Peter Kao  
Peter Kao / Director

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- The report must not be used by the client to claim product endorsement by NVLAP or any agency of the United States government.
- This report is applicable only for EUT Model which described in page 4 .
- The testing result in this report are traceable to national or international standard .

### **PEP TESTING LABORATORY**

12-3Fl, No. 27-1, Lane 169, Kang-Ning St., Hsi-Chih.  
Taipei Hsien, Taiwan, R. O. C.  
Tel : 8862-26922097 Fax : 8862-26956236

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FCC ID: P4PRF-525

REPORT NO. :E900666

## 1. General Information

Measurement of electromagnetic emissions (EME) of radio frequency devices including intentional and/or unintentional radiators for compliance with the technical rules and regulations of the Federal Communications Commission under FCC Part 2 and 15.

**a) EUT Transmitter (TX):**

**Model No.: RF-525, RF-530, RF-540**

**FCC ID: P4PRF-525**

**b) EUT Receiver (RX):**

**Model No.: RF-525**

**FCC ID: N/A, (under DoC)**

**c) Applicant Name/Address: ZIPPY TECHNOLOGY CORP.**

**10F, NO. 50 MIN CHYUAN RD., SHIN TIEN CITY,  
TAIPEI HSIEN, TAIWAN, R. O. C.**

**Contact Person: LAURENCE TSAI**

**Phone No.: 886-2-29188512      Fax No.: 886-2-29123671**

**d) Manufacturer Name/Address: ZIPPY TECHNOLOGY CORP.**

**10F, NO. 50 MIN CHYUAN RD., SHIN TIEN CITY,  
TAIPEI HSIEN, TAIWAN, R. O. C.**

❖ Regulation: FCC Parts 2 and 15

❖ Limitation: Part 15, Section 15.227, 15.207 and 15.209, Class B

❖ Test Procedure: ANSI C63.4-1992

❖ Place of Test: PEP Testing Laboratory

12-3F1, No. 27-1, Lane 169, Kang-Ning St., Hsi-Chih.  
Taipei Hsien, Taiwan, R. O. C.  
TEL : 8862-26922097 FAX : 8862-26956236

**Measurement Uncertainty :**

The uncertainty of the testing result is given as below . The method of uncertainty Calculation is based on NIST Technical Note 1297 .

Frequency ( MHz )	0.15 ~ 30	30 ~ 1000
Combined Uncertainty $\mu_c$	1.77 (dB)	2.08 (dB)

## 2. Product Information

a. **EUT Type: Wireless Keyboard**

b. **Transmitter Model: RF-525** **Receiver Model: RF-525**

c. **TX FCC ID: P4PRF-525** **RX FCC ID: N/A, (under DoC)**

d. **TX Channel No. : Two** **RX Channel No. : Two**

e. **TX Working Freq. : 27.045 / 27.145MHz** **RX Working Freq.: N/A**

f. **TX Modulation : FSK** **RX Modulation : N/A**

g. **TX Crystal / Osc. : 455KHz,13.5225MHz** **RX Crystal / Osc. : 6MHz, 26.69MHz, 26.59MHz**

h. **TX Port(s) : N/A** **RX Port(s) : USB**

i. **TX Transmitting Power :**

j. **TX Power Supply : DC 3V (1.5V × 2)** **RX Power Supply : DC 5V from USB**

j. **TX Case :** **ABS** **TX Case :** **ABS**

k. **EUT Condition :**  **Prototype**  **Engineering**  **Production**

l. **EUT Received Date :** **Aug. 10, 2001**

### **3. EUT Description and Test Methods**

(A) The EUT is Wireless Keypad, FCC ID: P4PRF-525, Model RF-525, RF-530 and RF-540.

These models have identical electrical design and mechanical construction except minor appearances are different for marketing purpose. We took model RF-525 as worst-case EUT for the test after these models had been pre-scanned. The EUT consists of one wireless transmitter supplied from DC 3V (Battery size AAA 1.5V ×2) and one receiver connected to USB port rated DC 5V from PC. The transmitting frequency is operating either 27.145MHz or 27.045MHz, which is controlled by select switch at the side of transmitter unit and bottom of receiver unit; we tested both of two frequencies and attached the worst-case test result in this report. The effective transmitting distance of EUT system is approximate 1 meter. We located both transmitter and receiver on turntable under test. For more detail information about the EUT, please refer to the user's manual.

(B) Test Method: EUT system including Transmitter and Receiver link with PC system were setup as a complete test system on turntable. The receiver of EUT connected to USB port of PC system, the PC operating system was setup to detect and drive every peripheral devices including EUT. Then, we pressed "H" key on the transmitter to enable RF keyboard under Control panel of WIN98 for Tx-On Mode, and ran "EMITEST" for Tx-Off Mode, and the worst-case test data as ANSI C63.4 requirement was recorded and provided in this report.

(C) Test Mode: (1) For Conducted EMI---"Tx-Off" Mode

(2) For Radiated EMI---"Tx-On" and "Tx-Off" Mode

(D) At the frequencies where the peak values of the emission exceeded the quasi-peak limit, the emissions were also measured with the quasi-peak detectors. The average detector also measured the emission either (A) quasi-peak values were under quasi-peak limit but exceeded average limit, or (B) peak values were under quasi-peak limit but exceeded average limit.

(E) Due to EUT system is Desktop type not Handheld type, only one orthogonal plane is tested for detecting the required EMI testing data.

## **4. Modification(s):**

N/A

## **5. Test Software Used**

(A) EMITEST.EXE program that continuously generates a complete line of repeating “H” letter was the software used during test.

## 6. Support Equipment Used

### 1. Personal Computer (PC1)

**CPU** : Intel P III 733 MHz

**FCC ID** : Declaration of Conformity(DoC)

**Manufacturer** : ASUS INC.

**Model Number** : P2-99

**Power Supply** : Switching

**Power Cord** : Non-Shielded, Detachable, 1.8m

**Data Cable** : N/A

### 2. Monitor (MON1 15")

**FCC ID** : Declaration of Conformity(DoC)

**Manufacturer** : SAMSUNG

**Model Number** : 550S

**Power Supply** : Switching

**Power Cord** : Non-Shielded, Detachable, 1.8m

**Data Cable** : 1 > Shielded , Non-detachable,1.2m

2 > Back Shell : Metal

### 3. Printer (PRN1)

**FCC ID** : B94C2642X

**Manufacturer** : Hewlett-Packard

**Model Number** : C2642E

**Power Supply** : Linear, 30Vdc O/P

**Power Cable** : Non-Shielded , Detachable,1.8m

**Data Cable** : 1 > Shielded , Detachable,1.2m

2 > Back Shell : Metal

### 4. Modem (MOD1) x 2

**FCC ID** : IFAXDM1414

**Manufacturer** : ACEEX

**Model Number** : 1414

**Power Supply** : Linear, 9Vac O/P

**Power Cable** : Non-Shielded , Detachable,1.7m

**Data Cable** : 1 > Shielded , Detachable,1m

2 > Back Shell : Metal

**5. Mouse (MOUS/1 PS/2)**

**FCC ID :** DZL211106

**Manufacturer :** LOGITECH

**Model Number :** M-S43

**Power Supply :** +5Vdc from PS2 of PC

**Power Cord :** N/A

**Data Cable :** 1 > Shielded , Non-detachable, 1.8m

2 > Back Shell : Metal

## 7. Description of Conducted Emissions Test

### 7.1 Conducted Emissions Limits

Frequency	Maximum RF Voltage in dB(uV)				
	FCC Part 15, Subpart C		Frequency	CISPR 22	
MHz	QUASI-PEAK	AVERAGE	MHz	QUASI-PEAK	AVERAGE
0.45 – 30	48	--	0.15 – 0.5	66-56	56-46
--	--	--	0.5 – 5	56	46
--	--	--	5-30	60	50

Remarks : In the above table, the tighter limit applies at the band edges.

## 8. Description of Radiated Emissions Test

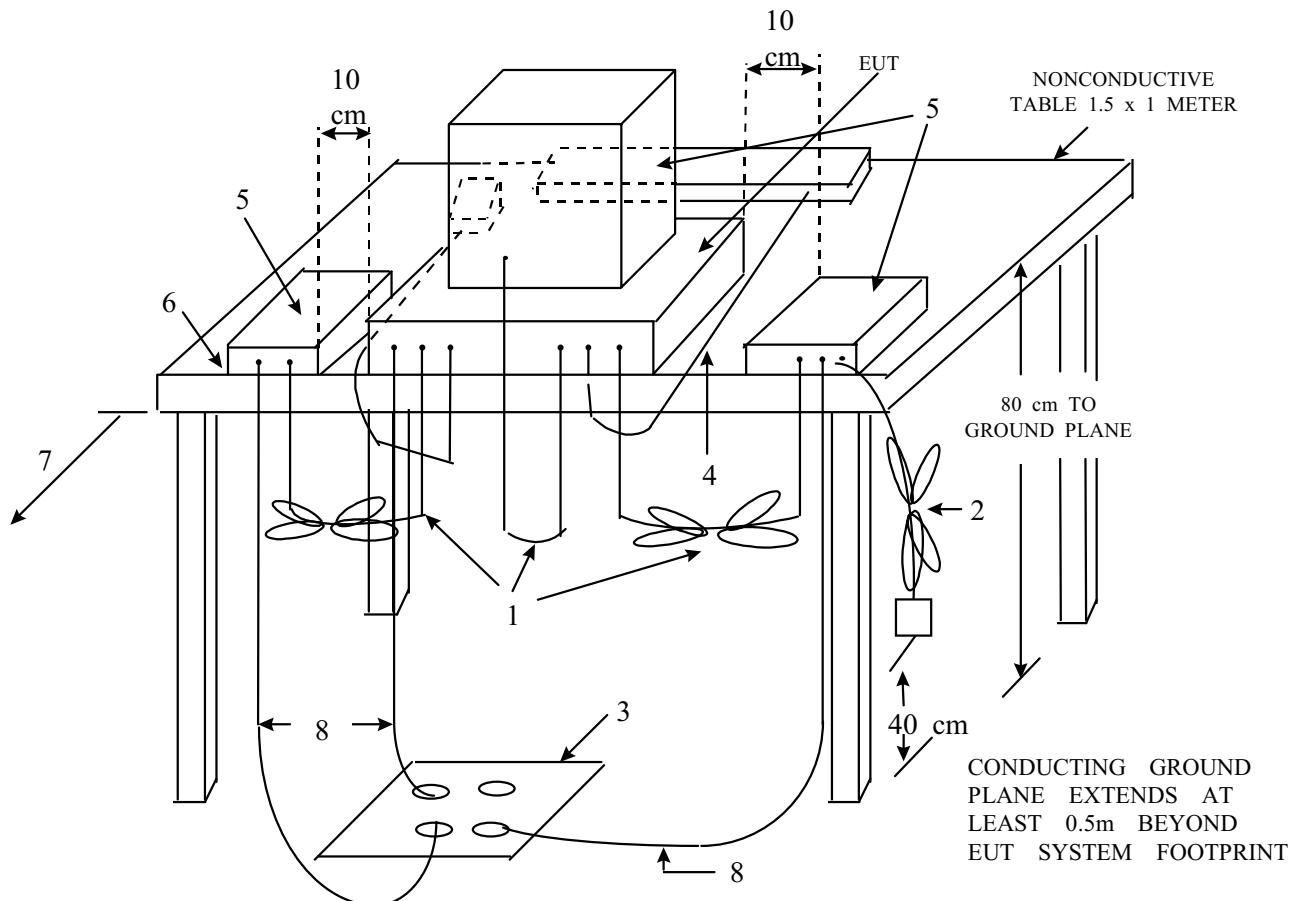
### **8.1 Radiated Emissions**

Preliminary measurements were made indoors chamber at 3 meter using broadband antennas, broadband amplifier, and spectrum analyzer to determine the frequency producing the maximum EME. Appropriate precaution was taken to ensure that all EME from the EUT were maximized and investigated. The system configuration, clock speed, mode of operation or video resolution, turntable azimuth with respect to the antenna were noted for each frequency found. The spectrum was scanned from 30 to 1000 MHz using logbicon antenna. Above 1GHz, linearly polarized double ridge horn antenna was used.

Final measurements were made outdoors at 3-meter test range using logbicon antenna and horn antenna. The test equipment was placed on a wooden bench situated on a 1.5x1 meter area adjacent to the measurement area. Sufficient time for the EUT, support equipment, and test equipment was allowed in order for them to warm up to their normal operating condition. Each frequency found during pre-scan measurements was re-examined and investigated using Quasi-Peak Adapter. The detector function was set to CISPR quasi-peak mode and the bandwidth of the receiver was set to 120kHz.

The turntable containing the system was rotated; the antenna height was varied 1 to 4 meters and stopped at the azimuth or height producing the maximum emission. Each emission was maximized by: varying mode of operation or resolution; clock or data exchange speed; scrolling H pattern to the EUT and/or support equipment, and powering the monitor from the floor mounted outlet box and the computer aux AC outlet , if applicable; and changing the polarity of the antenna, whichever determined the worst-case emission. Photographs of the worst-case emission can be seen in radiated emission test photo.

## 8.2 Test Configuration



### LEGEND

1. Interconnecting cables which hang closer than 40 cm to the ground plane shall be folded back and forth forming a bundle 30 to 40 cm long, hanging approximately in the middle between ground plane and table.
2. I/O cables which are connected to a peripheral shall be bundled in center. The end of the cable may be terminated if required using correct terminating impedance. The total length shall not exceed 1 m.
3. If LISN are kept in the test setup for radiated emissions, it is preferred that they be installed under the ground if required receptacle flush with the ground plane.
4. Cables of hand-operated devices, such as keyboards, KEYPADs, etc., have to be placed as close as possible to the controller.
5. Non-EUT components of EUT system being tested.
6. The rear of all components of the system under test shall be located flush with the rear of the table.
7. No vertical conducting wall used.
8. Power cords drape to the floor and are routed over to receptacle.

### **8.3 Radiated Emission Limits**

Limits for radiated disturbance of  
Class B ITE or Intentional Radiator  
At a measuring distance of 3 m

Frequency MHz	Field Strength dB( $\mu$ V/m) or uV/m	
30 to 88	40	100
88 to 216	43.5	150
216 to 960	46	200
Above 960	56	500

#### NOTES

- 1 The lower limit shall apply at the transition frequency.
- 2 Additional provisions may be required for cases where interference occurs.

## 9. Conducted Emissions Test Setup Photo.

< Front View >



<Rear View >



## 10. Conducted Emissions Test Data

**EUT Models** : RF-525  
**Frequency range** : 450KHz to 30MHz  
**Detector** : Quasi-peak Value  
**Temperature** : 26 °C  
**Relative Humidity** : 55 %  
**Memo** : CH1

**Test Data :** # 381 < LINE >  
# 379 <NEUTRAL>

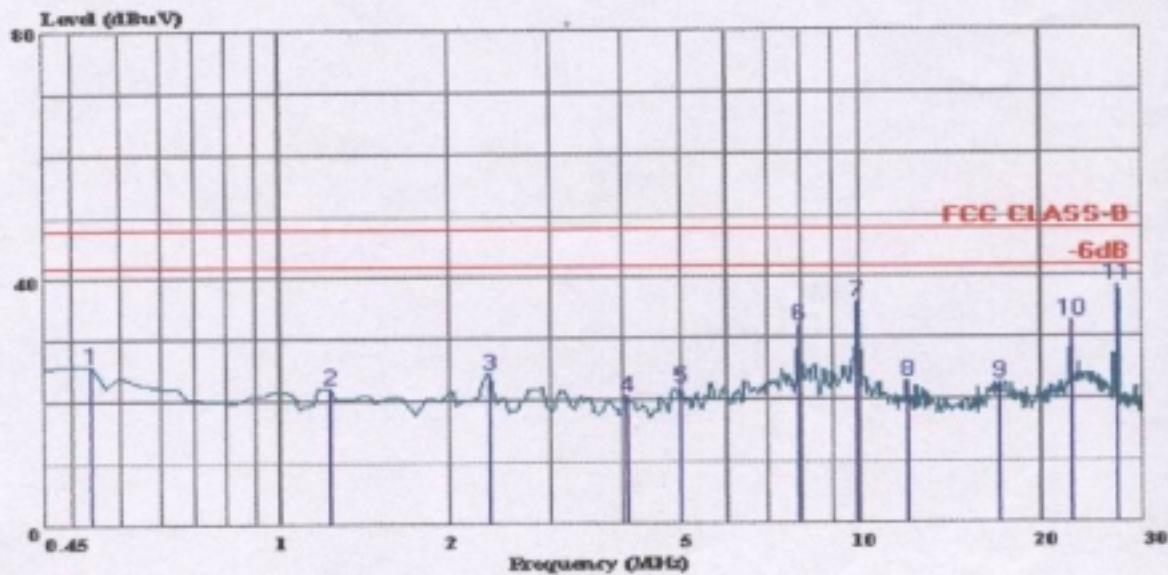
**※ Note** 1. Level = Read Level + Cable Loss + Probe (LISN)  
2. Over Limit = Level – Limit = Margin



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PEP Testing Laboratory

Data#: 381 File#: Fccb.emi

Date: 2001-09-29 Time: 11:11:25



Trace: 380

Site : Conduction NO.1(NICK)  
Condition: FCC CLASS-B LISN.L(16A) LINE  
eut : 900666  
power : AC 145V 60Hz  
memo : Peak Value  
: Final Test  
: CH1

Page: 1

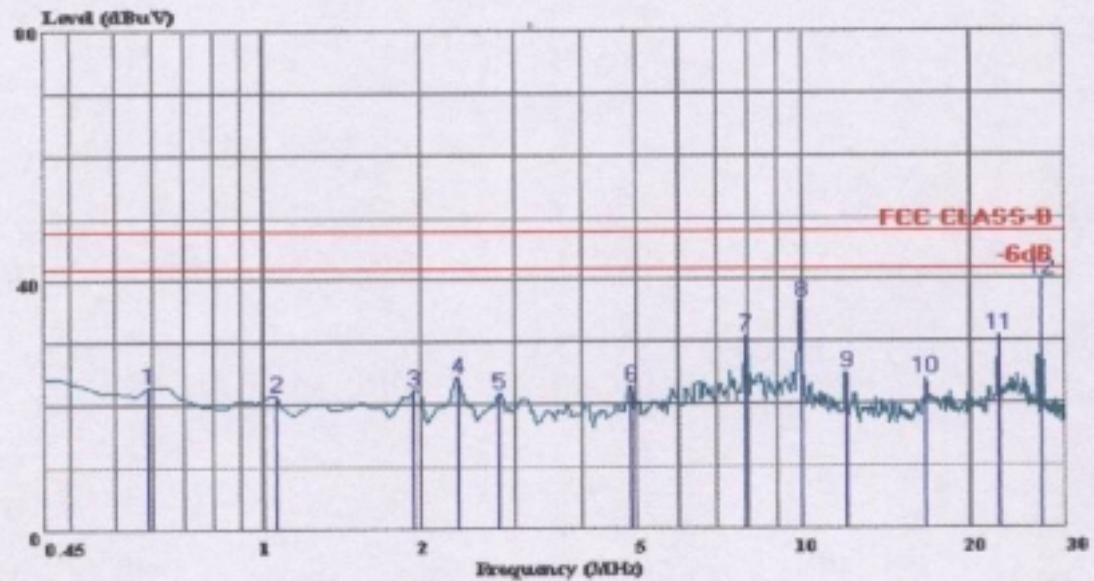
Freq	Level	Over	Limit	Read	Probe	Cable	Remark
		Limit	Line	Level	Factor	Loss	
MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.539	25.80	-22.20	48.00	25.60	0.10	0.10
2	1.337	22.04	-25.96	48.00	21.80	0.10	0.14
3	2.459	24.48	-23.52	48.00	24.20	0.13	0.15
4	4.144	20.51	-27.49	48.00	20.20	0.21	0.10
5	5.119	21.95	-26.05	48.00	21.60	0.25	0.10
6	8.015	32.05	-15.95	48.00	31.60	0.35	0.10
7	10.024	35.80	-12.20	48.00	35.20	0.40	0.20
8	12.093	22.90	-25.10	48.00	22.21	0.49	0.20
9	17.205	22.75	-25.25	48.00	21.80	0.65	0.30
10	22.642	32.73	-15.27	48.00	31.60	0.81	0.32
11	27.193	38.36	-9.64	48.00	37.20	0.85	0.31



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Data#: 379 File#: Fccb.emi

Date: 2001-09-29 Time: 11:09:50



Trace: 378

Site : Conduction NO.1(NICK)  
Condition: FCC CLASS-B LISN.N(16A) NEUTRAL  
eut : 900666  
power : AC 145V 60Hz  
memo : Peak Value  
: Final Test  
: CH1

Page: 1

Freq MHz	Level dBuV	Over Limit dB	Limit Line dBuV	Read Level dBuV	Probe Factor	Cable Loss		Remark
						Line	dB	
1	0.686	22.80	-25.20	48.00	22.60	0.10	0.10	
2	1.159	21.42	-26.58	48.00	21.20	0.10	0.12	
3	2.046	22.50	-25.50	48.00	22.21	0.10	0.19	
4	2.459	24.45	-23.55	48.00	24.20	0.10	0.15	
5	2.903	21.81	-26.19	48.00	21.60	0.10	0.11	
6	5.001	22.85	-25.15	48.00	22.60	0.15	0.10	
7	8.044	30.95	-17.05	48.00	30.60	0.25	0.10	
8	10.083	36.30	-11.70	48.00	35.80	0.30	0.20	
9	12.093	24.95	-23.05	48.00	24.40	0.35	0.20	
10	16.021	24.14	-23.86	48.00	23.40	0.44	0.30	
11	22.642	31.07	-16.93	48.00	30.19	0.56	0.32	
12	27.193	39.86	-8.14	48.00	39.00	0.55	0.31	

**EUT Models** : RF-525  
**Frequency range** : 450KHz to 30MHz  
**Detector** : Quasi-peak Value  
**Temperature** : 26 °C  
**Relative Humidity** : 55 %  
**Memo** : CH2

**Test Data :** # 374 < LINE >  
# 377 <NEUTRAL>

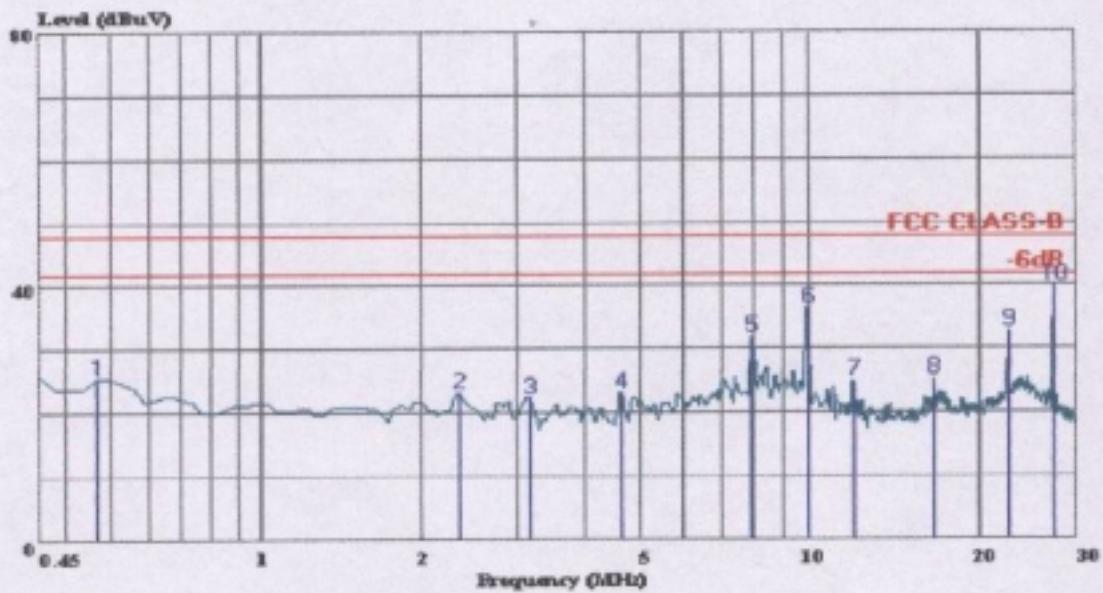
※ Note 1. Level = Read Level + Cable Loss + Probe (LISN)  
2. Over Limit = Level – Limit = Margin



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Data#: 374 File#: Fccb.emi

Date: 2001-09-29 Time: 11:01:01



Trace: 373

Site : Conduction NO.1(NICK)  
Condition: FCC CLASS-B LISN.L(16A) LINE  
eut : 900666  
power : AC 145V 60Hz  
memo : Peak Value  
: Final Test  
: CH2

Page: 1

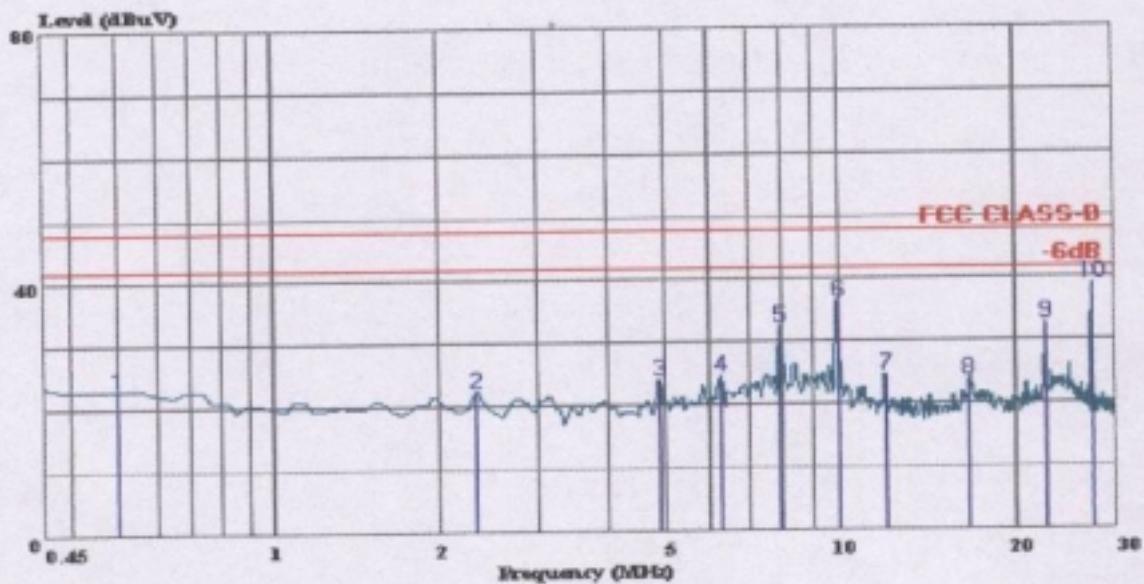
Freq	Level	Over	Limit	Read	Probe	Cable	Remark
		MHz	dBuV	dB	dBuV	dBuV	
1	0.568	25.40	-22.60	48.00	25.20	0.10	0.10
2	2.459	23.28	-24.72	48.00	23.00	0.13	0.15
3	3.287	22.47	-25.53	48.00	22.20	0.17	0.10
4	4.735	23.14	-24.86	48.00	22.80	0.24	0.10
5	8.044	31.85	-16.15	48.00	31.40	0.35	0.10
6	10.083	36.40	-11.60	48.00	35.80	0.40	0.20
7	12.093	24.90	-23.10	48.00	24.21	0.49	0.20
8	16.791	25.14	-22.86	48.00	24.20	0.64	0.30
9	22.642	32.73	-15.27	48.00	31.60	0.81	0.32
10	27.341	39.96	-8.04	48.00	38.80	0.85	0.31



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PEP Testing Laboratory

Data#: 377 File#: Fccb.emi

Date: 2001-09-29 Time: 11:06:28



Trace: 376

Site : Conduction NO.1(NICK)  
Condition: FCC CLASS-B LISN.N(16A) NEUTRAL  
eut : 900666  
power : AC 145V 60Hz  
memo : Peak Value  
: Final Test  
: CH2

Page: 1

Freq MHz	Level dBuV	Over Limit	Limit Line	Read dBuV	Probe Factor	Cable Loss	Remark
		dB	dBuV	dB	dB	dB	
1	0.598	23.00	-25.00	48.00	22.80	0.10	0.10
2	2.430	22.45	-25.55	48.00	22.20	0.10	0.15
3	5.001	24.05	-23.95	48.00	23.80	0.15	0.10
4	6.390	24.70	-23.30	48.00	24.40	0.20	0.10
5	8.044	32.35	-15.65	48.00	32.00	0.25	0.10
6	10.083	36.30	-11.70	48.00	35.80	0.30	0.20
7	12.093	24.55	-23.45	48.00	24.00	0.35	0.20
8	16.821	23.94	-24.06	48.00	23.20	0.44	0.30
9	22.642	32.67	-15.33	48.00	31.79	0.56	0.32
10	27.341	39.06	-8.94	48.00	38.20	0.55	0.31

## 11. Radiated Emissions Test Setup Photo.

**TX ON (27.045MHz)**

**< FRONT VIEW >**



**< REAR VIEW >**



**TX OFF (27.045MHz)**

**< FRONT VIEW >**



**< REAR VIEW >**



**TX ON (27.145MHz)**  
**< FRONT VIEW >**



**< REAR VIEW >**



**TX OFF (27.145MHz)**

**< FRONT VIEW >**



**< REAR VIEW >**

