

MEASUREMENT/TECHNICAL REPORT

APPLICANT: Sunpark Electronics (Taiwan) Corporation

MODEL NO.: SL26;SL26T;SL27;SL27T

FCC ID: N96-SL2x

This report concerns (check one) :

Original Grant

Class II Change

Equipment type: ELECTRONIC BALLAST

Deferred grant requested per 47CFR 0.457(d)(1)(ii)?

Yes No If yes, defer until: _____ (date)

We, the undersigned, agree 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.

Transiyion Rules Request per 15.37?

Yes No

If no, assumed Part 18, Consumer equipment of RF lighting device for new 47 CFR (10-1-90 Edition) provision.

Report Prepared

by Testing House : Neutron Engineering Inc.

for Company Name: Sunpark Electronics (Taiwan) Corporation

Address: No. 1, Lane 392, Futeh 1st Road, Hsichih, Taipei County, Taiwan, R.O.C.

Applicant Signature :



Jim C.F. Chao / President

CERTIFICATION

We hereby certify that:

The test data , data evaluation , test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI C63.4 (1992) and the energy emitted by the sample EUT tested as described in this report is in compliance with conducted and radiated emission limits of FCC Rules Part 18, Subpart C. Consumer Class.

Prepared by : Lydia Chiang**Reviewed by :** Andy Chiu**Approved by :** George Yao**Issued Date :** Aug. 08, 2002**Report No. :** NEI-FCCB-02166**Company Stamp :****NEUTRON ENGINEERING INC.****No. 132-1, Lane 329, Sec. 2, Palain Rd.,****Shijr Jen, Taipei, Taiwan****TEL : (02) 2646-5426 FAX : (02) 2646-6815**

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1. GENERAL INFORMATION

1-1. Product Description

The Sunpark Electronics (Taiwan) Corporation Model: SL26;SL26T;SL27;SL27T (referred to as the EUT in this report) is a electronic ballasts are suitable for residential lighting fixtures. It performs rapid start to optimize lamp life.

Operating frequency : 60KHz.

1-2. Related Submittal(s) / Grant (s)

1-2-1. Models Covered

Models covering in this test report is : SL26;SL27

1-2-2. Models Difference

Model : SL2x series is identical to Model SL2xT series and the models with " T" ended, they are potted for outdoor use. The detail list please refer to the following:

Model	Lamp	Lamp	Lamp	Line	Input	Line	Power	Min Start	Case
Number	Qty	Type/Wattage	Wattage	Voltage	Watts	Amps	Factor	Temp.F	Type
SL26	2	FC12T9 32W+FC16T9 40W Circline Lamps	32W+40W	120	65	0.95	>0.5	-10	#6
SL27	2	CFQ18W, Quad	18W	120	36	0.60	>0.5	-10	#6
	2	F17 T8	17W	120	34	0.57	>0.5	-10	#6
	2	CFQ13W, Quad	13W	120	26	0.43	>0.5	-10	#6

Model	Lamp	Lamp	Lamp	Line	Input	Line	Power	Min Start	Case
Number	Qty	Type/Wattage	Wattage	Voltage	Watts	Amps	Factor	Temp.F	Type
SL26T	2	FC12T9 32W+FC16T9 40W Circline Lamps	32W+40W	120	65	0.95	>0.5	-10	#6
SL27T	2	CFQ18W, Quad	18W	120	36	0.60	>0.5	-10	#6
	2	F17 T8	17W	120	34	0.57	>0.5	-10	#6
	2	CFQ13W, Quad	13W	120	26	0.43	>0.5	-10	#6

The EUT has four different operating modes:

Mode 1:SL26 (32W+40W)

Mode 2:SL27 (18W)

Mode 3:SL27 (17W)

Mode 4:SL27 (13W)

All the above nodes were tested, and the mode 1 & mode 2 were found to be the worst case during the pre-scanning test, Those modes of the worst case were used for final testing and collecting test data included on this report.

Engineering BOM for 2 lamps Parallel LCEB

Model: SL-26, -27

Part No	Description	Designation	Q'ty	SL26	SL27
	Res, CF, 470K, 1/4W, J	R1,2	2	v	v
	Res, MOF, 2.2, 1/2W, J, mini	R3,4	2	v	v
	Res, MOF, 0.22, 1/2W, J, mini	R6,7	2	v	v
	Res, CF, 47K, 1/4W, J	R8,14	2	v	v
	Res, CF, 6.8K, 1/4W, J	R11	1	v	v
	Res, CF, 220K, 1W, J	R13	1	v	v
	CAP, MD, 0.1uF/400V, J, 10mm	C1,7	2	v	v
	Cap, Elec, 22uF/200V, M, Chemicon/KMG	C2A, C2B	2		v
	Cap, Elec, 47uF/200V, M, Chemicon/KMG	C2A, C2B	2	v	
	Cap, Cer, 3.3nF/3KV, M, 10mm	C3	1	v	v
	CAP, PDS, 3.3nF/800V, J, 15mm	C4,5,8	3	v	v
	CAP, L, 0.047uF/50V, J, 5mm	C6,10,11	3	v	v
	Cap, Elec, 10uF/50V, M	C13	1	v	v
	Cap, Cer, 1nF/100V, M, 5mm	C16	1	v	v
	Cap, Cer, 22pF/2KV, K	C17,18	2	v	v
	Dio, RL207	D1,2,3,4	4	v	v
	Dio, 1N4937	D5,6,7,11	4	v	v
	Dio, DIAC, 28-36V, DB3	D8	1	v	v
	Dio, FR107	D9,12	2	v	v
	Dio, Zener, 1/2W, 6.8V	Z2	1	v	v
24-0255A	Choke, EE25, 1.00mH, 120T	L1A,B	2	v	
24-0242A	Choke, EE25, 2.1mH	L1A,B	2		v
24-2K165	Choke, 9X12, P=5mm, 100uH	L2	1	v	v
24-2K166	Common mode, ET24, 10mH	L3	1	v	v
24-0227A	Driver, MZ4, T954 N=1:5:1:9	T1	1	v	v
	Transistor, 8A/400V, PHE13007	Q1,2	2	v	v
	SCR, 0.85A/400V, BT169D	TH1	1	v	v
	Fuse, 3A/125V	F1	1	v	v
10-001	X'TR Clip, CMM-100		2	v	v
SL-15P V02-C	CEM-1, 94V-0, 120*39mm	PCB	1	v	v
	LEAD WIRE, AWG#18,1015, BLK, 140mm	BLK	1	v	v
	LEAD WIRE, AWG#18,1015, WHT, 150mm	WHT	1	v	v
	LEAD WIRE, AWG#18,1015, GRN, 260mm w/ terminal	GRN	1	v	v
	LEAD WIRE, AWG#18,1015, BLU, 275mm	BLU1, BLU2	2		v
	LEAD WIRE, AWG#18,1015, BLU, 1055mm	BLU3	1		v
	LEAD WIRE, AWG#18,1015, RED, 275mm	RED1, RED2	2		v
	LEAD WIRE, AWG#18,1015, RED, 1055mm	RED3	1		v
	LEAD WIRE, AWG#18,1015, YEL, 1055mm	RED4	1		v
	LEAD WIRE, Circline Plug	RED1-4, BLU1-4	2	v	
08-001	Insulation Paper, CMP-090		1	v	v
08-002	Insulation Paper, CMP-092		2	v	v
80-007	Insulation Paper, CMP-096		2	v	v
10-012	Retainer, 1015-2H		2	v	v

Engineering BOM for 2 lamps Parallel LCEB

Model: SL-26, -27

Part No	Description	Designation	Q'ty	SL26	SL27
10-014	Retainer, 1015-3H		2	v	v
01-002	SL-15 EB Chassis		1	v	v
01-001	SL-15 EB Cover		1	v	v
	Label, SL-26		1	v	
	Label, SL-27		1		v

1-3. Tested System Details

The FCC IDs for all equipment, plus descriptions of all cables used in the tested system (including inserted cards, which have grants) are:

Model No.	FCC ID	Equipment	Cable
SL26;SL27	N96-SL2x	ELECTRONIC BALLAST	Un-Shielded Data Cable AC Power Cable.

Notes:

- (1) EUT submitted for grant.
- (2) The support equipment was authorized by Declaration of Conformity.

1-4. Test Methodology

Both conducted and radiated testing were performed according to the procedures in ANSI C63.4 (1992) / MP-5 (1986). Radiated testing was performed at an antenna to EUT distance **3 meter (30MHz-1000MHz)** and **1 meter (0.009MHz-30MHz)**.

1-5. Test Facility

The open area test site and conducted measurement facility used to collect the radiated data is located on the address of No. 132-1, Lane 329, Sec. 2, Palain Road, Shijr 221, Taipei, Taiwan, R.O.C. of NEUTRON ENGINEERING INC. This site has been fully described in report dated Jun. 25, 1999 Submitted to your office, and accepted in a letter dated Sep. 02, 1999 (Reg. No. 95335).

3. System Test Configuration

3-1. EUT Configuration

The EUT was placed on a turn table which is 0.8m above round plane. The turn table shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3m away from the receiving antenna which varied from 1m to 4m to find out the highest emissions. And also. Each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.

3-2. EUT Exercise

The EUT (Transmitter) was operated continuously in its normal operating mode for the purpose of the measurements.

3-3. Test Procedure

3-3-1 Conducted Emissions

Conducted emissions from the EUT measured in the Frequency range between 0.45MHz and 30MHz were made with a Spectrum Analyzer, HP Model 8568B, using CISPR Quasi-Peak detector mode and appropriate broadband linearly polarized antenna.

3-3-2. Radiated Emissions

Radiated emissions from the EUT measured in the **frequency range between 25MHz and 1000MHz** were made with a **Spectrum Analyzer, HP Model 8568B, using CISPR Quasi-Peak detector mode** and appropriate broadband linearly polarized antenna.

Radiated emissions measurement for **frequency above 1000MHz** were made with a **Test Receiver, R&S model ESMI**, plus a **Pre-amplifier R&S model ESMI-Z7**, and a **Horn Antenna, EMCO model 3115** to measure its **Peak detector Mode** level and **Average Detector Mode** level.

3-3. Special Accessories

Not available for this EUT intended for grant.

3-4. Equipment Modifications

Not available for this EUT intended for grant.

Applicant Signature :



Date:

Aug. 08, 2002

Type/Printed Name:

Jim C.F. Chao

Position:

President

3.5 Configuration of Tested System

The configuration of tested system is described as the block diagram shown in next page Figure 3.1 and details information of I/O cable and power cord connection are tabulated as Table A and B. The monitor is powered from a floor mounted receptacle (referred to as the wall outlet in the previous described) was tested.

TABLE A - Test Equipment

Item	Equipment	Mfr/Brand	Model/Type No.	Port Connected	FCC ID	Series No.	Note
E-1	ELECTRONIC BALLAST	Sunpark	SL26;SL27		N96-SL2x	N/A	EUT
E-2	Lamp	Philips	N/A		N/A	N/A	

Remark:

- (1) Unless otherwise denoted as EUT in "Remark" column, device(s) used in tested system is a support equipment.
- (2) Unless otherwise marked as "in "Remark" column, Neutron consigns the supporting equipment(s) to the tested system.
- (3) The support equipment was authorized by Declaration of Conformity.

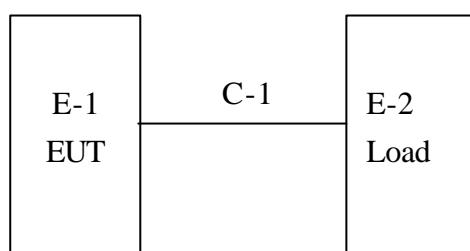
Table B. - Informations Cable Information

Item	I/O Cable	Device Connected	Shielded Type	Ferrite Core	Detachable/Permanently	Length	Note
C-1	Power line	EUT-Load	N/A	N/A	Permanently	10cm	

Note:

(1) Unless otherwise marked as in (Remark) column, Neutron consigns the supporting equipment(s) to the tested system.

Figure 3.1 Configuration of Tested System



3-2 Test Equipment

Item	Instruments	Mfr/Brand	Model/Type No.	Serial No.	Calibrated Date	Next Cali. Date	Note
1	LISN	EMCO	3825/2	9605-2539	2002-05-20	2003-05-19	
2	LISN	Rolf Heine	NNB-2/16Z	98083	2001-10-20	2002-10-19	✓
3	LISN	Rolf Heine	NNB-2/16Z	98053	2001-11-22	2002-11-21	
4	Pulse Limiter	Electro-Metrics	EM-7600	112644	2001-12-10	2002-12-19	✓
5	50 Terminator	N/A	N/A	N/A	2002-05-10	2003-05-09	
6	Test Cable	N/A	C01	N/A	2001-12-08	2002-12-07	✓
7	Log-Bicon Antenna	MESS-ELEKTRONIK	VULB 9160	3058	2001-10-27	2002-10-26	✓
8	Log-Bicon Antenna	MESS-ELEKTRONIK	VULB 9160	3060	2001-10-20	2002-10-19	
9	Log-Bicon Antenna	MESS-ELEKTRONIK	VULB 9161	4022	2001-07-04	2002-07-03	
10	Test Cable	N/A	10M_OS01	N/A	2001-12-08	2002-12-07	✓
11	Test Cable	N/A	OS01-1/-2	N/A	2001-12-08	2002-12-07	✓
12	Test Cable	N/A	10M_OS02	N/A	2001-12-08	2002-12-07	
13	Test Cable	N/A	OS02-1/-2/-3	N/A	2001-12-08	2002-12-07	
14	RF Switch	Anritsu	MP59B	M65982	2001-12-10	2002-12-09	
15	Quasi-Peak Adapter	HP	85650A	2521A00844	2002-04-08	2002-10-07	
16	RF Pre-Selector	HP	85685A	2648A00417	2002-04-08	2002-10-07	
17	Spectrum Analyzer	HP	85680B	2634A03025	2002-04-08	2002-10-07	
18	Spectrum Monitor	HP	85662B	2648A13616	2002-04-08	2002-10-07	
19	Pre-Amplifier	Anritsu	MH648A	M09961	2001-12-10	2002-12-09	✓
20	Spectrum Analyzer	ADVAN TEST	R3261C	81720298	2001-08-17	2002-08-16	✓
21	Test Receiver	R&S	ESH3	860156/018	2001-10-23	2002-10-22	
22	Test Receiver	R&S	ESVP	860687/009	2001-10-23	2002-10-22	
23	Test Receiver	MEB	SMV41	130	2001-12-05	2002-12-04	✓
24	Test Receiver	PMM	PMM 9000	4310J01002	2001-12-31	2002-12-30	
25	Horn Antenna	EMCO	3115	9605-4803	2001-05-09	2002-05-08	
26	Test Receiver	R&S	ESMI	843977/005	2001-11-14	2002-11-05	
27	Pre-Amplifier	R&S	ESMI-Z7	1045.5020	2001-05-21	2002-05-20	
28	Absorbing Clamp	R&S	MDS-21	841077/011	2001-08-18	2002-08-17	
29	Voltage Probe	R&S	ESH2-Z3	841.800/023	2001-08-20	2002-08-19	
30	Signal Generator	HP	8648A	3426A01034	2000-02-10	2003-09-23	
31	Antenna Mast	Chance Most	CMTB-1.5	N/A	N/A	N/A	✓
32	Turn Table	Chance Most	CMTB-1.5	N/A	N/A	N/A	✓

Remark :

- (1) ✓ indicates the instrument used in Test Report.
- (2) N/A denotes No Model No. / Serial No. and No Calibration specified.

4. Block Diagram(s)

Figure 4.1 Block diagram of system, Page 13.A

6. Conducted Emission Datas

6.1 Standard Applicable

According to 18.307(C) , Consumer equipment for conduction limits.

6.2 The initial step in collecting conducted data is a spectrum analyzer peak scan of the measurement range. significant peaks are then marked as shown on the following data page, and these signals are then quasi-peaked.

Judgement: Passed by **-5.05 dB** in mode of **Neutral** terminal **9.53 MHz**
Test Mode : SL26

Freq. (MHz)	Terminal L/N	Measured(dBuV)		Safe Margins	
		QP-Mode	QP-Mode	(dBuV)	Note
0.49	Line	39.10	48.00	-8.90	(QP)
0.99	Line	39.01	48.00	-8.99	(QP)
2.03	Line	36.65	48.00	-11.35	(QP)
8.09	Line	41.97	48.00	-6.03	(QP)
9.53	Line	42.75	48.00	-5.25	(QP)
18.90	Line	38.50	48.00	-9.50	(QP)
0.51	Neutral	41.61	48.00	-6.39	(QP)
0.75	Neutral	38.41	48.00	-9.59	(QP)
1.06	Neutral	37.40	48.00	-10.60	(QP)
1.47	Neutral	36.93	48.00	-11.07	(QP)
9.53	Neutral	42.95	48.00	-5.05	(QP)
24.42	Neutral	40.00	48.00	-8.00	(QP)

Remark :

- (1) Reading in which marked as QP means measurements by using are Quasi-Peak Mode with Detector BW=9KHz ; SPA setting in RBW=10KHz,VBW =10KHz, Swp. Time = 0.3 sec./MHz.
- (2) Measuring frequency range from 450KHz to 30MHz.

Review:

Andy Liu

Test Engr.:

James

Test Date :

Aug. 06, 2002

6. Conducted Emission Datas

6.1 Standard Applicable

According to 18.307(C) , Consumer equipment for conduction limits.

6.2 The initial step in collecting conducted data is a spectrum analyzer peak scan of the measurement range. significant peaks are then marked as shown on the following data page, and these signals are then quasi-peaked.

Judgement: Passed by **-5.76 dB** in mode of **Line** terminal **9.86 MHz**
Test Mode : SL27

Freq. (MHz)	Terminal L/N	Measured(dBuV)		Limits(dBuV)		Safe Margins	
		QP-Mode	QP-Mode	QP-Mode	(dBuV)	Note	
0.46	Line	36.61		48.00	-11.39	(QP)	
0.76	Line	32.41		48.00	-15.59	(QP)	
3.41	Line	40.10		48.00	-7.90	(QP)	
9.86	Line	42.24		48.00	-5.76	(QP)	
13.12	Line	41.30		48.00	-6.70	(QP)	
22.27	Line	39.78		48.00	-8.22	(QP)	
0.46	Neutral	34.81		48.00	-13.19	(QP)	
0.77	Neutral	32.21		48.00	-15.79	(QP)	
1.24	Neutral	28.57		48.00	-19.43	(QP)	
9.82	Neutral	40.00		48.00	-8.00	(QP)	
12.06	Neutral	40.67		48.00	-7.33	(QP)	
21.89	Neutral	41.16		48.00	-6.84	(QP)	

Remark :

- (1) Reading in which marked as QP means measurements by using are Quasi-Peak Mode with Detector BW=9KHz ; SPA setting in RBW=10KHz, VBW =10KHz, Swp. Time = 0.3 sec./MHz.
- (2) Measuring frequency range from 450KHz to 30MHz.

Review:

Andy Liu

Test Engr.:

James

Test Date : Aug. 06, 2002

7. Radiated Emission Data

7.1 Standard Applicable

According to 18.305(c). Consumer equipment for Field Strength limits.

7.2 The following data lists the significant emission frequencies, measured levels, correction factor (includes cable and antenna corrections), the corrected reading, as well as the limit. Explanation of the Correction Factor is given in paragraph 7.3.

Judgement: Passed by **-4.90 dB** in polarity of **Vertical 32.44 MHz**
Test Mode : SL26

Freq. (MHz)	Ant. H/V	Reading(RA) (dBuV)	Corr.Factor(CF) (dB)	Measured(FS) (dBuV/m)	Limits(OP) (dBuV/m)	Safe Margins (dBuV/m)	Note
32.44	V	47.80	- 12.70	35.10	40.00	- 4.90	
34.93	V	46.60	- 12.38	34.22	40.00	- 5.78	
38.29	H	40.90	- 12.10	28.80	43.50	- 14.70	
48.44	H	37.80	- 12.09	25.71	43.50	- 17.79	
52.27	V	36.80	- 12.16	24.64	40.00	- 15.36	
65.51	H	37.90	- 13.64	24.26	46.00	- 21.74	
203.69	H	44.30	- 13.45	30.85	40.00	- 9.15	
224.21	V	36.00	- 13.01	22.99	40.00	- 17.01	
225.02	H	35.50	- 12.96	22.54	46.00	- 23.46	
226.64	H	34.30	- 12.88	21.42	46.00	- 24.58	
244.01	V	36.60	- 12.23	24.37	40.00	- 15.63	
299.09	V	35.40	- 10.12	25.28	46.00	- 20.72	

Remark :

- (1) Test Spectrum Analyzer measurement condition setting are RBW=100KHz, Video BW =100KHz , Sweep. Time = 0.2 sec; Receiver setting. RBW, VBW=120KHz.Sweep time=0.2 sec.
- (2) All readings are Peak unless otherwise stated QP in column of **『Note』**
- (3) Measuring frequency range from 30MHz to 1000MHz.
- (4) If the peak scan value lower limit more than 20dB, then this signal data does not show in table.
- (5) If the peak scan value lower limit less than 20dB, then this signal data will be listed. But if these signal data more than 10 frequencies, then only the Top 10 be listed.

Review:

Andy Chiu

Test Engr.:

James

Test Date :

Aug. 06, 2002

7. Radiated Emission Data

7.1 Standard Applicable

According to 18.305(c). Consumer equipment for Field Strength limits.

7.2 The following data lists the significant emission frequencies, measured levels, correction factor (includes cable and antenna corrections), the corrected reading, as well as the limit. Explanation of the Correction Factor is given in paragraph 7.3.

Judgement: Passed by **-9.92 dB** in polarity of **Vertical 433.97 MHz**
Test Mode : SL27

Freq. (MHz)	Ant. H/V	Reading(RA) (dBuV)	Corr.Factor(CF) (dB)	Measured(FS) (dBuV/m)	Limits(OP) (dBuV/m)	Safe Margins (dBuV/m)	Note
32.60	H	37.50	- 12.67	24.83	40.00	- 15.17	
36.00	H	35.70	- 7.08	28.62	46.00	- 17.38	
48.94	V	39.20	- 12.07	27.13	43.50	- 16.37	
52.62	V	42.20	- 12.17	30.03	40.00	- 9.97	
56.28	H	38.80	- 12.42	26.38	40.00	- 13.62	
64.20	H	39.60	- 13.41	26.19	46.00	- 19.81	
65.21	V	36.20	- 13.61	22.59	43.50	- 20.91	
205.22	H	36.80	- 13.49	23.31	40.00	- 16.69	
244.25	V	38.30	- 12.23	26.07	40.00	- 13.93	
249.40	H	35.20	- 12.12	23.08	46.00	- 22.92	
431.36	V	34.70	- 7.23	27.47	46.00	- 18.53	
433.97	V	37.30	- 7.22	30.08	40.00	- 9.92	

Remark :

- (1) Test Spectrum Analyzer measurement condition setting are RBW=100KHz, Video BW =100KHz, Sweep. Time = 0.2 sec; Receiver setting. RBW, VBW=120KHz. Sweep time=0.2 sec.
- (2) All readings are Peak unless otherwise stated QP in column of **『Note』**
- (3) Measuring frequency range from 30MHz to 1000MHz.
- (4) If the peak scan value lower limit more than 20dB, then this signal data does not show in table.
- (5) If the peak scan value lower limit less than 20dB, then this signal data will be listed. But if these signal data more than 10 frequencies, then only the Top 10 be listed.

Review:

Andy Chee

Test Engr.:

James

Test Date :

Aug. 06, 2002

7. Radiated Emission Data

7.1 Standard Applicable

According to 18.309. Consumer equipment for Field Strength limits.

7.2 The following data lists the significant emission frequencies, measured levels, plus the limit. Explanation of field strength limit calculation is given in paragraph 7-3.2.

Condition : Test Distance : 1 meter Test Mode : SL26

Type of Antenna: Loop Antenna

Freq. (KHz)	Receiver* Reading in dBuV/m	Factor (dB) Cable Loss	Field Strength (uV/m)	Required Measurement Distance(m)	Limitation Converted 1 m dist. (dBuV/m)	Over Limit
51.2	88.78	0.1	46.88	300	132.50	-43.62
102.4	53.43	0.1	23.44	300	126.48	-72.95
153.6	68.95	0.1	15.63	300	122.96	-53.91
204.8	30.91	0.1	11.72	300	120.46	-89.45
256.0	52.08	0.2	9.38	300	118.52	-66.24
307.2	26.99	0.2	7.81	300	116.94	-89.75
358.4	49.85	0.2	6.70	300	115.60	-65.55
409.6	*	0.3	5.86	300	114.44	*
460.8	38.96	0.3	5.21	300	113.42	-74.16
512.0	31.46	0.3	46.88	30	92.50	-60.74

* All receiver readings (the measured field strength levels) are measured from loop antenna directly.

* The emission limits shown in the above table are base on measurements employing a quasi-peak doctro except for the frequency bands 9-90 KHz, 110-490 KHz and above 1000MHz. Radiated emission limits in these three bands are based on measurements employing an average doctro.

* The tighter limit applies at the band edges.

* **Remark:** “**” means that the noise emission is too low to detect by Field Strength Meter.

Review :

Andy Chiu

Test Personnel. :

James

Date:

Aug. 13, 2002

7. Radiated Emission Data

7.1 Standard Applicable

According to 18.309. Consumer equipment for Field Strength limits.

7.2 The following data lists the significant emission frequencies, measured levels, plus the limit. Explanation of field strength limit calculation is given in paragraph 7-3.2.

Condition : Test Distance : 1 meter Test Mode : SL27

Type of Antenna: Loop Antenna

Freq. (KHz)	Receiver* Reading in dBuV/m	Factor (dB) Cable Loss	Field Strength (uV/m)	Required Measurement Distance(m)	Limitation Converted 1 m dist. (dBuV/m)	Over Limit
72.85	74.86	0.1	32.94	300	129.44	-54.48
145.70	39.56	0.1	16.47	300	123.42	-83.76
218.55	57.92	0.1	10.98	300	119.90	-61.88
291.40	37.51	0.1	8.24	300	117.40	-79.79
364.25	41.24	0.2	6.59	300	115.46	-74.02
437.10	38.24	0.2	5.49	300	113.88	-75.44
509.95	38.40	0.2	47.06	300	92.54	-53.94
582.80	38.32	0.3	41.18	300	91.38	-52.76
655.65	35.96	0.3	36.60	300	90.36	-54.10
728.50	33.62	0.3	32.94	30	89.44	-55.52

- * All receiver readings (the measured field strength levels) are measured from loop antenna directly.
- * The emission limits shown in the above table are base on measurements employing a quasi-peak doctro except for the frequency bands 9-90 KHz, 110-490 KHz and above 1000MHz. Radiated emission limits in these three bands are based on measurements employing an average doctro.
- * The tighter limit applies at the band edges.
- * **Remark:** “**” means that the noise emission is too low to detect by Field Strength Meter.

Review :

Andy Chiu

Test Personnel :

James

Date:

Aug. 13, 2002

7-2. Field Strength Calculation

The field strength is calculated by adding the Antenna Factor and Cable Factor and subtracting the Amplifier Gain (if any) from the measured reading. The basic equation with a sample calculation is as follows:

$$FS = RA + AF + CL - AG$$

Where **FS** = Field Strength

RA = Receiver Amplitude

AF = Antenna Factor (1)

CL = Cable Attenuation Factor (1)

AG = Amplifier Gain (1) (2)

Remark :

(1) The Correction Factor = AF + CL - AG, as shown in the data tables' Correction Factor column.

(2) AG is not available for Neutron's Open Site Facility

Example of Calculation:

Assume a Receiver Reading of 23.7 dBuV is obtained with an Antenna Factor of 7.2 dB and a Cable Factor of 1.1 dB. Then:

1. The Correction Factor will be calculated by

$$\text{Correction Factor} = AF + CL - AG = 7.2 + 1.1 - 0 = 8.3 \text{ (dB)}$$

as shown in the data tables' Correction Factor column.

2. The Field Strength will be calculated by

$$FS = RA + \text{Correction Factor} = 23.7 + 8.3 = 32 \text{ (dBuV/m).}$$

FS is the value shown in the data tables' Corrected Reading column and RA is the value shown in the data tables' Receiver Reading column. The 32 dBuV/m value was mathematically converted to its corresponding level in uV/m as:

$$\text{Log}^{-1}\{(32.0 \text{dBuV/m})/20\} = 39.8 \text{ (uV/m)}$$

8. Photos of Tested EUT:

- 1. Photo # 1 Front View**
- 2. Photo # 2 Rear View**
- 3. Photo # 3-4 Unit Partially Disassembled**
- 4. Photo # 5 Front View**
- 5. Photo # 6 Rear View**
- 6. Photo # 7-8 Unit Partially Disassembled**