

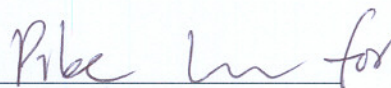
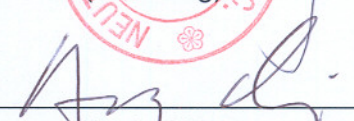
Measurement Report

FCC ID: RYK-POE220This report concerns (check one) : ☒ Original Grant ☐ Class II Change**Issued Date :** May 29, 2006**Project No. :** 0507126B**Equipment :** Power over Ethernet Injector**Model No. :** POE-220**Applicant :** SparkLAN Communications, Inc.3F, NO. 246, Sec. 1, Neihu Road, Neihu
Chiu Taipei, Taiwan, R.O.C. 114**Tested by:**

Neutron Engineering Inc. EMC Laboratory

Data of Test:

Jul. 26, 2005 ~ Dec. 28, 2005

Testing Engineer :
(Chief Chau)**Technical Manager :**
(Jeff Yang)**Authorized Signatory :**
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Declaration

Neutron represents to the client that testing is done in accordance with standard procedures as applicable and that test instruments used has been calibrated with the standards traceable to National Measurement Laboratory (NML) of R.O.C., or National Institute of Standards and Technology (NIST) of U.S.A.

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Limitation

For the use of the authority's logo is limited unless the Test Standard(s)/Scope(s)/Item(s) mentioned in this test report is (are) included in the conformity assessment authorities acceptance respective.

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1. General Information**1.1 Applicant**

Name : SparkLAN Communications, Inc.

Address : 3F, NO. 246, Sec. 1, Neihu Road, Neihu Chiu Taipei, Taiwan, R.O.C. 114

1.2 Manufacturer

Name : N/A

Address : N/A

1.3 Equipment Under Tested

Name : Power over Ethernet Injector

Trade Name : Sparklan

Model No. : POE-220

1.4 OEM Brand/Model (if applicable)

OEM Brand(s)/Model(s) except the basic model in sub-clause 1.3 is (are) the follows:

OEM Brand : N/A

Model No. : N/A

1.5 Model Difference (Series, Versions, if any)

Except the basic model no. (model designation of the sample tested in this test report), additional model no. covered is(are) :

N/A

1.6 Product Descriptions (Application/Features/Specification)

The EUT is a Power over Ethernet Injector.

Based on the application, features, or specification exhibited in User's Manual, the EUT is considered as an ITE/Computing Device. More details of EUT technical specification, please refer to the User's Manual

1.7 Connecting I/O Port(s)

Please refer to the User's Manual

1.8 Power Supplied

Power Source : AC Mains.

Power Cord : Detachable, shielded type.

Power Rating : I/P 48V,0.35A / O/P 5V, 2.4A

1.9 Products Covered (if applicable)

The sample tested including the following sub-system/module/accessory:

Sub-system/ Module/ Accessory	Model/Type No.	Int. Inst./ Ext. Cont.
N/A	N/A	N/A

1.10 Description of Test Mode(s)

To investigate the maximum EMI emission characteristics generates from EUT, the test system was pre-scanning tested base on the consideration of following EUT operation mode or test configuration mode which possible have effect on EMI emission level. Each of these EUT operation mode(s) or test configuration mode(s) mentioned above was evaluated respectively.

1.11 EUT Modifications (if applicable)

No any modification required for the EUT to comply with the standards.

1.12 Summary of Test Results

Test procedures according to the technical standards:

EMC Emission				
Standard	Test Item	Limit	Judgment	Remark
FCC Part15, Subpart B CISPR 22:1997+A1: 2000 ICES-003: 2004	Conducted Emission	Class B	PASS	
	Radiated Emission	Class B	PASS	

NOTE:

(1) "N/A" denotes test is not applicable in this Test Report

2. RFI Emissions Measurement

2.1 Test Facility

The test facilities used to collect the test data in this report is C01/OS02 at the location of No.132-1, Lane 329, Sec. 2, Palain Road, Shijr City, Taipei, Taiwan.

2.2 Standard Compliance

The test data contained in this report relate only to the item(s) listed below:

Limitation Class B

FCC Part15, Subpart B/CISPR 22:1997+A1: 2000

ICES-003: 2004

2.3 Test Methodology

Both conducted and radiated tests were performed during the max. EMI emission evaluation.

Antenna to EUT distance is 10 m.

Test procedures according to the technical standards:

FCC Part15, Subpart B / ANSI C63.4: 2003.

ICES-003: 2004

2.4 Deviations from Standard Test Method

N/A

2.5 Sample(s) Tested

The representative sample tested in this reports is(are): POE-220

Test results in this test report relate only to the sample(s) tested.

The EUT has been tested according to the following environmental condition:

Input Power	120Vac/60Hz
Environmental Conditions	Please refer to the measurement data.

2.6 Measurement Instruments

Valid measurement instruments used in this report refer to **Table-1** enclosed.

2.7 Measurement Uncertainty

The reported uncertainty of measurement $y \pm U$, where expanded uncertainty U is based on a standard uncertainty multiplied by a coverage factor of $k=2$, providing a level of confidence of approximately 95 %.

A. Conducted Measurement :5.05dB

B. Radiated Measurement :

Test Site	Method	Measurement Frequency Range	Ant. H / V	U , (dB)	NOTE
OS-01	ANSI	30MHz ~ 200MHz	H	4.59	
		30MHz ~ 200MHz	V	4.80	
		200MHz ~ 1,000MHz	H	4.47	
		200MHz ~ 1,000MHz	V	5.03	
OS-01	VCCI	30MHz ~ 200MHz	H	4.59	Only for VCCI Report
		30MHz ~ 200MHz	V	4.48	Only for VCCI Report
		200MHz ~ 1,000MHz	H	4.47	Only for VCCI Report
		200MHz ~ 1,000MHz	V	4.73	Only for VCCI Report
OS-02	ANSI	30MHz ~ 200MHz	H	4.34	
		30MHz ~ 200MHz	V	5.15	
		200MHz ~ 1,000MHz	H	5.28	
		200MHz ~ 1,000MHz	V	4.53	
OS-02	VCCI	30MHz ~ 200MHz	H	4.34	Only for VCCI Report
		30MHz ~ 200MHz	V	4.77	Only for VCCI Report
		200MHz ~ 1,000MHz	H	4.91	Only for VCCI Report
		200MHz ~ 1,000MHz	V	4.53	Only for VCCI Report

2.8 Tested System Set-Up/Configuration Details

The system was configured for testing in a typical fashion (as a user would normally use) or in accordance with the operating configuration specified in the user's manual. A Block Diagram (please refer to the Diagram - 1) and Photos (please refer to the attachment - A) showing the set-up/configuration of system tested. In addition, **Table-2** and **Table-3** provide a detail of all equipment items and cables information used in the system tested.

Table 1 Measurement Instruments List

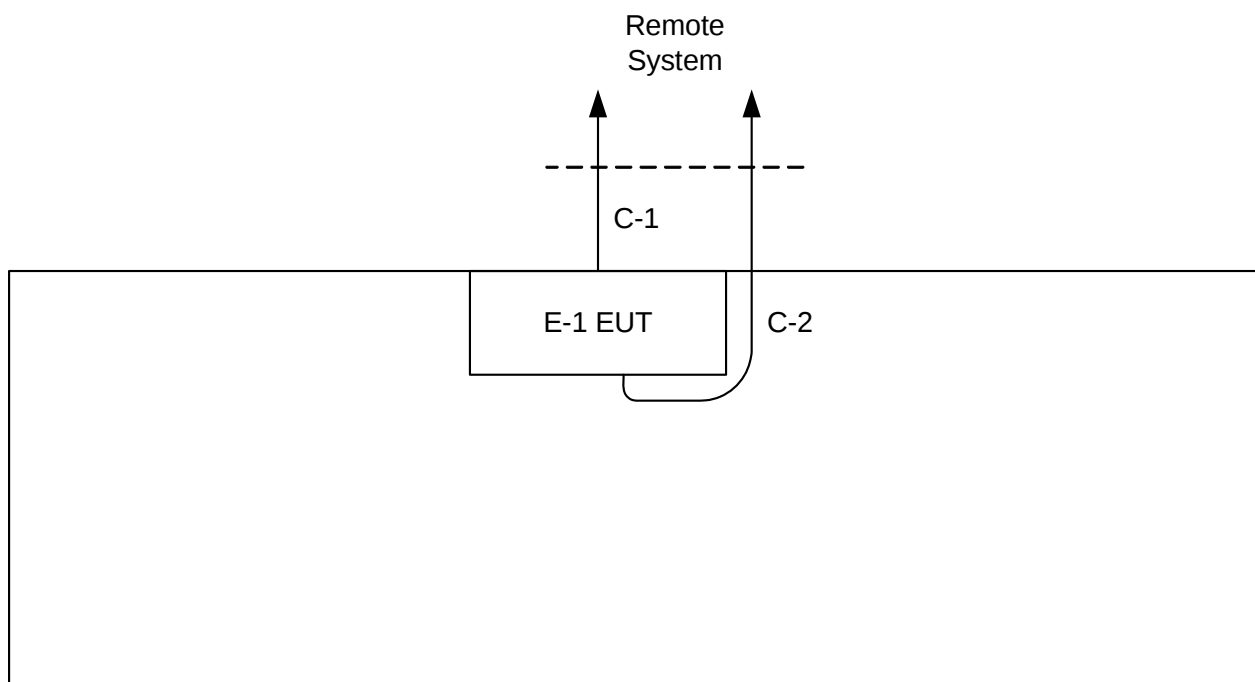
Item	Instruments	Mfr/Brand	Model/Type No.	Serial No.	Calibrated Date	Next Cali. Date	Note
1	LISN	EMCO	3825/2	9605-2539	2005-10-03	2006-10-02	
2	LISN	Rolf Heine	NNB-2/16Z	98083	2005-08-02	2006-08-01	
3	LISN	Rolf Heine	NNB-2/16Z	98053	2005-12-23	2006-12-22	✓
4	4L-V-LISN	Rolf Heine	NNB-4/63TL	02/10040	2005-04-08	2006-04-07	
5	LISN	EMCO	3816/2	00042991	2005-01-12	2006-01-11	
6	LISN	EMCO	3816/2	00042990	2005-01-12	2006-01-11	
7	LISN	EMCO	4825/2	00028234	2005-10-13	2006-10-12	
8	ISN	SCHAFFNER	ISN T400	16017	2005-04-01	2007-03-31	
9	Pulse Limiter	Electro-Metrics	EM-7600	112644	2005-11-30	2006-11-29	✓
10	50Ω Terminator	N/A	N/A	N/A	2005-05-12	2007-05-11	✓
11	Test Cable	N/A	C01	N/A	2005-11-30	2006-11-29	✓
12	Test Cable	N/A	CISPR 14	N/A	2005-10-03	2006-10-02	
13	Log-Bicon Antenna	MESS-ELEKTRONIK	VULB 9160	3058	2005-11-30	2006-11-29	✓
14	Log-Bicon Antenna	MESS-ELEKTRONIK	VULB 9160	3177	2005-02-07	2007-02-06	
15	Log-Bicon Antenna	MESS-ELEKTRONIK	VULB 9161	4022	2005-08-17	2006-08-16	
16	Test Cable	N/A	10M_OS01	N/A	2005-11-30	2006-11-29	
17	Test Cable	N/A	OS01-1/-2	N/A	2005-11-30	2006-11-29	
18	Test Cable	N/A	10M_OS02	N/A	2005-11-30	2006-11-29	✓
19	Test Cable	N/A	OS02-1/-2/-3	N/A	2005-11-30	2006-11-29	✓
20	RF Switch	Anritsu	MP59B	M65982	2005-11-30	2006-11-29	
21	Pre-Amplifier	Anritsu	MH648A	M09961	2005-11-30	2006-11-29	✓
22	Spectrum Analyzer	ADVAN TEST	R3261C	81720298	2005-09-15	2006-09-14	
23	Spectrum Analyzer	ADVAN TEST	R3132	81700025	2005-02-23	2006-02-22	
24	Spectrum Analyzer	HP	8591EM	3536A00681010	2005-06-30	2006-06-29	
25	EMI Test Receiver	R&S	ESCI	100082	2005-02-02	2007-02-01	✓
26	EMI Test Receiver	R&S	ESCI	100080	2005-01-10	2007-01-09	
27	Test Receiver	MEB	SMV41	130	2005-11-23	2006-11-22	
28	Test Receiver	PMM	PMM 9000	4310J01002	2005-02-25	2006-02-24	
29	Horn Antenna	EMCO	3115	9605-4803	2005-06-10	2006-06-09	
30	Absorbing Clamp	Schwarzbeck	MDS-21	03195	2005-06-17	2006-06-16	
31	Voltage Probe	R&S	ESH2-Z3	841.800/023	2005-09-13	2006-09-12	
32	Antenna Mast	Chance Most	CMTB-1.5	N/A	N/A	N/A	✓
33	Turn Table	Chance Most	CMTB-1.5	N/A	N/A	N/A	✓
34	Loop Ant	EMCO	6502	00042960	2005-01-14	2008-01-13	

Remark :

(1)" ✓" indicates the instrument used in Test Report.

(2)" N/A" denotes No Model No. / Serial No. and No Calibration specified.

Diagram - 1
Block diagram showing the configuration of system tested



C-1 RJ-45 Cable
C-2 RJ-45 Cable

Table 2 Equipments Used in Tested System

Item	Equipment	Mfr/Brand	Model/Type No.	FCC ID	Series No.	Note
E-1	Power over Ethernet Injector	Sparklan	POE-220	DOC	N/A	EUT

Note:

- (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 support equipment to the tested system.
- (3) The support equipment was authorized by Declaration of Confirmation.

Table 3 Information of Interface Cable

Item	Shielded Type	Ferrite Core	Length	Note
C-1	NO	NO	20M	
C-2	NO	NO	100M	

Note:

- (1) Unless otherwise marked as ※ in 『Remark』 column, Neutron consigns the support equipment to the tested system.
- (2) For detachable type I/O cable should be specified the length in cm in 『Length』 column.

2.9 EUT Operating Conditions

- (a) Both conducted and radiated testing were performed during the max. EMI emission evaluation.
- (b) The system was configured for testing in a typical fashion (as a customer would normally use it). The EUT was connected to support equipment-remote personal computer. Peripherals of remote system, such as monitor, keyboard, modem, and printer were contained in this system in order to comply with the CISPR22 Rules requirement. The remote system operated in the default 1024 X 768 VGA Graphic mode. This operating condition was tested and used to collect the included data.
- (c) The EUT exercise program used during radiated and/or conducted emission measurement was designed to exercise the various system components in a manner similar to a typical use. The EUT send/receiver data to/from remote system.

3. Justification

3.1 Limitations

3.1.1 Power Line Conducted Emission (Frequency Range 150KHz-30MHz)

Measurement Frequency Range (MHz)	Mains Terminal Class A Limits (dBuV)		Mains Terminals Class B Limits (dBuV)		Note CISPR FCC Std.
	QP Mode	AV Mode	QP Mode	AV Mode	
0.15 - 0.50	79.00	66.00	66 - 56 *	56 - 46 *	CISPR
0.50 - 5.00	73.00	60.00	56.00	46.00	CISPR
5.00 - 30.0	73.00	60.00	60.00	50.00	CISPR
0.15 - 0.50	79.00	66.00	66 - 56 *	56 - 46 *	FCC
0.50 - 5.00	73.00	60.00	56.00	46.00	FCC
5.00 - 30.0	73.00	60.00	60.00	50.00	FCC

Notes:

- (1). The tighter limit applies at the band edges.
- (2). The limit of " * " marked band means the limitation decreases linearly with the logarithm of the frequency in the range.

3.1.2 Radiated Emission Limits (Frequency Range 30MHz-1000MHz)

Measurement Frequency Range (MHz)	Quasi-Peak Mode Class A Limits (dBuV/m)		Quasi-Peak Mode Class B Limits (dBuV/m)		Note CISPR FCC Std.
	10m	30m	10m	3m	
30.00 -230.00	40.00	30.00	30.00	40.00	CISPR
230.0 -1000.0	47.00	37.00	37.00	47.00	CISPR
30.00 - 88.00	39.00	N/A	30.00	40.00	FCC
88.00 - 216.0	43.50	N/A	33.50	43.50	FCC
216.0 -960.0	46.00	N/A	36.00	46.00	FCC
above 960.0	49.50	N/A	46.00	54.00	FCC

Notes:

- (1). The tighter limit applies at the band edges.
- (2). Emission level (dBuV/m)=20log Emission level (uV/m).
- (3). A measuring distance Of 10m is a primary used. However, either 3m or 10m (instead of 10m) distance my be allowed. If the distance is 3m, add 10dB to the QP-limit above. If the distance is 10m, subtract 10dB from the QP-limit above.

3.2 Measurement Justification

3.2.1 Conducted Emission

The initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and these signals are then Quasi Peak detector mode and Average detector mode re-measured.

Data of **Table - 4.** lists the significant emission frequencies, measured levels, limits and safe margins. All readings are Peak Mode measured unless otherwise stated as QP or AV in column of " Remark ".

If the Peak Mode measured value lower than both QP Mode and AV Mode Limit, EUT shall be deemed to compliance with both QP & AV Limits and then no additional QP Mode or AV Mode measurement performed.

If additional QP or AV Mode measurement needed, and if the QP Mode measured value compliance with the QP Mode Limit and lower than AV Mode Limit, the EUT shall be deemed to meet both QP & AV Limits and then only QP Mode was measured, but AV Mode was not performed ◦

3.2.2 Radiated Emission

The initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured.

Data of **Table - 5.** lists the significant emission frequencies, measured levels, limits and safe margins. All readings are Peak Mode measured unless otherwise stated as QP in column of " Remark ".

If the Peak Mode measured value compliance with and lower than Quasi Peak Mode Limit, the EUT shall be deemed to meet QP Limits and then no additional QP Mode measurement performed.

3.3 Measurement Data

Table - 4. Conducted Emission Data

Table - 5. Radiated Emission Data

Table 4 Conducted Emission Data

EUT : Power over Ethernet Injector Model/Type No. : POE-220

Temperature : 25 °C Relative Humidity : 57 % Pressure : 1023 hPa

Special Notes : (EUT Operation Mode or Test Configuration Mode, if applicable)

Minimum passing margin is -10.18dB at 7.90MHz

Freq. (MHz)	Terminal L/N	Measured(dBuV)		Limits(dBuV)		Safe Margins	
		QP-Mode	AV-Mode	QP-Mode	AV-Mode	(dBuV)	Note
0.32	Line	49.09	38.76	59.69	49.69	-10.60	(QP)
0.45	Line	44.26	*	56.90	46.90	-12.64	(QP)
0.51	Line	42.92	*	56.00	46.00	-13.08	(QP)
0.64	Line	39.40	*	56.00	46.00	-16.60	(QP)
3.27	Line	38.42	*	56.00	46.00	-17.58	(QP)
8.70	Line	44.72	*	60.00	50.00	-15.28	(QP)
0.32	Neutral	48.22	36.37	59.67	49.67	-11.45	(QP)
0.45	Neutral	42.31	*	56.91	46.91	-14.60	(QP)
0.96	Neutral	39.67	*	56.00	46.00	-16.33	(QP)
1.35	Neutral	38.81	*	56.00	46.00	-17.19	(QP)
2.89	Neutral	38.44	*	56.00	46.00	-17.56	(QP)
7.90	Neutral	49.82	35.91	60.00	50.00	-10.18	(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 . Reading in which marked as AV means measurements by using are Average Mode with instrument setting in RBW=1MHz,VBW=10Hz, Swp. Time =0.3 sec./MHz .
- (2) All readings are QP Mode value unless otherwise stated AVG in column of 『Note』 . If the QP Mode Measured value compliance with the QP Limits and lower than AVG Limits, the EUT shall be deemed to meet both QP & AVG Limits and then only QP Mode was measured, but AVG Mode didn't perform . In this case, a “ * ” marked in AVG Mode column of Interference Voltage Measured .
- (3) Measuring frequency range from 150KHz to 30MHz .

Table 5 Radiated Emission Data

EUT : Power over Ethernet Injector Model/Type No. : POE-220

Temperature : 17.1 °C Relative Humidity : 88 % Pressure : 1023 hPa

Special Notes : (EUT Operation Mode or Test Configuration Mode, if applicable)

Minimum passing margin is -1.45dB at 80.06MHz

Freq. (MHz)	Ant. H/V	Reading(RA) (dBuV)	Corr.Factor(CF) (dB)	Measured(FS) (dBuV/m)	Limits(QP) (dBuV/m)	Safe Margins (dBuV/m)	Note
31.43	V	36.90	- 8.36	28.54	30.00	- 1.46	(QP)
32.28	H	35.01	- 8.20	26.81	30.00	- 3.19	(QP)
65.63	H	31.45	- 7.63	23.82	30.00	- 6.18	
80.06	V	38.50	- 9.95	28.55	30.00	- 1.45	(QP)
81.47	H	33.54	- 10.18	23.36	30.00	- 6.64	
163.96	V	34.10	- 5.58	28.52	30.00	- 1.48	(QP)
300.00	V	29.40	- 4.95	24.45	37.00	- 12.55	
343.20	V	30.04	- 3.95	26.09	37.00	- 10.91	
345.20	H	27.88	- 3.91	23.97	37.00	- 13.03	
359.40	H	28.36	- 3.62	24.74	37.00	- 12.26	
368.60	V	27.39	- 3.45	23.94	37.00	- 13.06	
373.40	H	27.49	- 3.36	24.13	37.00	- 12.87	

Remark :

- (1) Reading in which marked as QP or Peak means measurements by using are Quasi-Peak Mode or Peak Mode with Detector BW=120KHz ; SPA setting in RBW=120KHz, VBW=120KHz, Swp. Time = 0.3 sec./MHz ◦
- (2) All readings are Peak unless otherwise stated QP in column of 『Note』 . Peak denotes that the Peak reading compliance with the QP Limits and then QP Mode measurement didn't perform ◦
- (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 ◦