

EMC Test Report
Project No.: 1411055AEquipment: PoE ExtenderModel Name: GV-POEX0100Applicant: GeoVision INC.Address: 9F, No. 246, Sec. 1, Neihu Rd. Neihu District, Taipei City 114, Taiwan
Date of Receipt : Nov. 07, 2014 Date of Test : Nov. 07, 2014 ~ Dec. 03, 2014 Issued Date : Feb. 11, 2015 Tested by : BTL Inc.
Technical Manager : <u>Hence</u> (Kener Wu) Technical Manager :
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Declaration

BTL 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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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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REPORT ISSUED HISTORY

Issued No.	Description	Issued Date
BTL-EMC-1-1411055	Original Report.	Dec. 04, 2014
BTL-EMC-1-1411055A	Compared with previous report (BTL-EMC-1-1411055), applicant, brand name, model name and appearance are changed, the rest are the same.	Feb. 11, 2015
	are the same.	



1. CERTIFICATION

Equipment	:	PoE Extender
Brand Name	:	GeoVision INC.
Model Name	:	GV-POEX0100
Applicant	:	GeoVision INC.
Date of Test	:	Nov. 07, 2014 ~ Dec. 03, 2014
Standard(s)	:	EN 55022: 2010+AC:2011 Class B
		AS/NZS CISPR 22: 2009 +A1: 2010 Class B
		CISPR 22: 2008 Class B
		EN 55024: 2010
		IEC 61000-4-2:2008
		IEC 61000-4-3:2006+A1:2007+A2:2010
		IEC 61000-4-4: 2012
		IEC 61000-4-6: 2013
		IEC 61000-4-8: 2009

The above equipment has been tested and found compliance with the requirement of the relative standards by BTL Inc.

The test data, data evaluation, and equipment configuration contained in our test report (Ref No. BTL-EMC-1-1411055A) were obtained utilizing the test procedures, test instruments, test sites that has been accredited by the Authority of TAF according to the ISO-17025 quality assessment standard and technical standard(s).

2. SUMMARY OF TEST RESULTS

Test procedures according to the technical standards:

Emission					
Standard	Test Item	Limit	Judgment	Remark	
EN 55022 [,] 2010	Conducted emission	Class B	N/A		
+AC :2011 AS/NZS CISPR 22:	Conducted emission at telecommunication ports	Class B	PASS		
2009 +A1: 2010	Radiated emission Below 1 GHz	Class B	PASS		
CISPR 22: 2008	Radiated emission Above 1 GHz	Class B	N/A	NOTE (2)	
Standard	Test Item	Limit	Judgment	Remark	
EN 61000-3-2: 2006 +A1: 2009 +A2: 2009	Harmonic current emissions	Class A or D	N/A	NOTE (3)	
EN 61000-3-3: 2013	Voltage changes, voltage fluctuations and flicker		N/A		

Immunity EN 55024: 2010

EN 55024: 2010				
Section	Test Item	Performance Criterion	Judgment	Remark
IEC 61000-4-2: 2008	Electrostatic discharge immunity	В	PASS	
IEC 61000-4-3: 2006 +A1: 2007 +A2: 2010	Radiated, radio-frequency, electromagnetic field immunity	А	PASS	
IEC 61000-4-4: 2012	Electrical fast transient/burst immunity	В	PASS	
IEC 61000-4-5: 2014	Surge immunity	B/C	N/A	NOTE (4)
IEC 61000-4-6: 2013	Immunity to conducted disturbances, induced by radio-frequency fields	А	PASS	
IEC 61000-4-8: 2009	Power frequency magnetic field immunity	А	PASS	
IEC 61000-4-11: 2004	Voltage dips, short interruptions and voltage variations immunity	B/C/C	N/A	NOTE(5)

NOTE:

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

- (2) If the EUT's max operating frequency does not exceed 108 MHz, the test will not be performed.
- (3) If the EUT's category is Class D and power consumptionis less than 75W, there is no limit applied.
- (4) Performance Criterion **C** for signal ports and telecommunication ports. Performance Criterion **B** for input d.c. power port and a.c. power ports.
- (5) Voltage Dips: >95% reduction Performance Criterion B
 Voltage Dips: 30% reduction Performance Criterion C
 Voltage Interruptions: >95% reduction Performance Criterion C



2.1TEST FACILITY

The test facilities used to collect the test data in this report:

Conducted emission at telecommunication ports Test:

C03: (VCCI RN: C-4461)

B1, No. 37, Lane 365, YangGuang St., NeiHu District 114, Taipei, Taiwan.

Radiated emission Test (Below 1 GHz):

OS02: (VCCI RN: R-2669; FCC RN: 95335; FCC DN: TW1010)

No.132-1, Ln. 329, Sec. 2, Balian Rd., Xizhi Dist., New Taipei City 221, Taiwan (R.O.C.)

The immunity test facilities are located at:

B1, No. 37, Lane 365, YangGuang St., NeiHu District 114, Taipei, Taiwan.

2.2 MEASUREMENT UNCERTAINTY

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

The measurement instrumentation uncertainty considerations contained in CISPR 16-4-2.

A. Conducted emission at telecommunication ports Test:

Test Site	MeasurementFrequencyRange	U , (dB)	NOTE
C03	150 kHz ~ 30 MHz	1.94	

B. Radiated emission test:

Test Site	MeasurementFrequencyRange	Ant. H / V	U,(dB)	NOTE
	30 MHz ~ 200 MHz	V	2.48	
0502	30 MHz ~ 200 MHz	Н	2.16	
0302	200 MHz ~ 1, 000 MHz	V	2.50	
	200 MHz ~ 1, 000 MHz	Н	2.66	

C. Immunity tests:

Item	Expanded l	Jncertainty	NOTE	
Electrostatic Discharge Immunity	Voltage	1.6 %		
Electrostatic Discharge Infinditity	Timing	2.8 %		
Radiated, Radio-frequency,	2.66	dB	80MHz - 2 5GHz k=2	
Electromagnetic Field Immunity	2.00 0D		8010112 - 2:30112, R-2	
Power Frequency Magnetic Field	1	0/_		
Immunity	1 %			

Our calculated Measurement Instrumentation Uncertainty is shown in the tables above. These are our U_{lab} values in CISPR 16-4-2 terminology.

Since Table 1 of CISPR 16-4-2 has values of measurement instrumentation uncertainty, called U_{CISPR} , as follows:

Conducted Disturbance (mains port) - 150 kHz - 30 MHz : 3.6 dB

Radiated Disturbance (electric field strength on an open area test site or alternative test site) – 30 MHz – 1000 MHz : 5.2 dB

It can be seen that our U_{lab} values are smaller than U_{CISPR} .

3. GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT

Equipment	PoE Extender
Brand Name	GeoVision INC.
Model Name	GV-POEX0100
Model Difference	N/A
PowerSource	Supplied from PoE
Power Rating	I/P DC 48~56V O/P DC 48~56V

Note:

1. For a more detailed features description, please refer to the manufacturer's specifications or the User's Manual.

2. The maximum operating frequency is 25MHz.

3.2DESCRIPTION OF TEST MODES

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.

Pretest Test Mode	Description
Mode 1	FULL SYSTEM

For ISN Test							
Final Test Mode Description							
Mode 1	FULL SYSTEM (ETHERNET 100M-100M (POE IN))						
Mode 1	FULL SYSTEM (ETHERNET 10M-10M (POE IN))						
Mode 1	FULL SYSTEM (ETHERNET 100M-100M (POE OUT))						
Mode 1	FULL SYSTEM (ETHERNET 10M-10M (POE OUT))						

Radiated emission test						
Final Test Mode	Description					
Mode 1	FULL SYSTEM					

Immunitytests						
Final Test Mode	Description					
Mode 1	FULL SYSTEM					





3.4DESCRIPTION OF SUPPORT UNITS

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

Item	Equipment	Mfr/Brand	Model/Type No.	FCC ID	Series No.	Note
А	AC Adapter	FAIRWAY	VAN90C-480B	DOC	10120700973-0F	
В	PoE	N/A	PS-201GV	N/A	N/A	
С	PC	DELL	OptiPlex 790 MT	DOC	64NJVBX	
D	IP Camera	GeoVision	GV-BX1200	DOC	00-13-E2-FF-00-9B	

Item	Shielded Type	Ferrite Core	Length	Note
1	NO	NO	10m	RJ-45 Cable
2	NO	NO	1m	RJ-45 Cable
3	YES	YES	1.8m	Power Cable
4	NO	NO	10m	RJ-45 Cable

Note:

(1) The support equipment was authorized by Declaration of Conformity (DOC).

4.EMC EMISSION TEST

4.1 CONDUCTED EMISSION AT TELECOMMUNICATION PORTS TEST

4.1.1 LIMITS

Voltage Limit:

	Class A	(dBuV)	Class B (dBuV)		
	Quasi-peak	Average	Quasi-peak	Average	
0.15 -0.5	97-87*	84-74*	84-74*	74-64*	
0.5 -30.0	87	74	74	64	

Current Limit:

	Class A	(dBuA)	Class B (dBuA)		
FREQUENCI (IVIIIZ)	Quasi-peak	Average	Quasi-peak	Average	
0.15 -0.5	53-43*	40-30*	40-30*	30-20*	
0.5 -30.0	43	30	30	20	

NOTE:

- (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) The test result calculated as following: Measurement Value = Reading Level + Correct Factor Correct Factor = Insertion Loss + Cable Loss + Attenuator Factor(if use) Margin Level = Measurement Value – Limit Value

4.1.2 MEASUREMENT INSTRUMENTS LIST

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	I RF Current Probe FCC		F-33-4	77	Apr. 15, 2015
2	ISN	TESEQ	ISN T800	30841	Jul. 29, 2015

Remark: "N/A" denotes No Model Name, No Serial No. or No Calibration specified.



4.1.3 TEST PROCEDURE

- a. The EUT was placed 0.4 meters from the horizontal ground plane with EUT being connected to the power mains through a line impedance stabilization network (LISN). All other support equipments powered from additional LISN(s). The LISN provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.
- b. Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.
- c. I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.
- d. ISN at least 80 cm from nearest part of EUT chassis.
- e. The communication function of EUT was executed and ISN was connected between EUT and associated equipment and the ISN was connected directly to reference ground plane.
- f. For the actual test configuration, please refer to the related Item –EUT Test Photos.

NOTE:

- a. Reading in which marked as Peak, QP or AVG means measurements by using are Quasi-Peak or Average Mode with Detector BW=9 kHz (6 dB Bandwidth).
- b. All readings are Peak Mode value unless otherwise stated QP or AVG in column of Note. If the Peak or 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 Peak or QP Mode was measured, but AVG Mode didn't perform.

4.1.4 DEVIATION FROM TEST STANDARD

No deviation

4.1.5 TEST SETUP



4.1.6 EUT OPERATING CONDITIONS

The EUT used during radiated and/or conducted emission measurement was designed to exercise in a manner similar to a typical use.

Remote system sends/receives data to remote IP Camera via EUT.



4.1.7 TEST RESULTS

EUT		PoE Fxte	ender		M	odel Nar	me	GV-PO	EX0100		
Tempera	ture	24°C	24°C			alative Humidity 48%					
Test Volt	ade	DC 48V					lannaity	1070			
Test Mod	de	FULL SY	ULL SYSTEM (ETHERNET 100M-100M (POE IN))								
56.0	dBuA						<u>(</u>	/			
									Limit: —		
									AVG:		
-											
	and manufacture	mound	and the	nd de X		la janu ra	Martin	. Malurika	Moural appendix		
e			a na nadi ta ta ta ta ta	an that we be	hour man	a she was a she w	فأطل بنيا يعد ب	1999 (M) 999 (M)	Miller and the associat		
ь											
-											
-											
-44											
0.1	50		0.5		(MHz)		5		30.000		
		Reading	Correct	Measure							
No. Mk	. Freq.	Level	Factor	ment	Limit	Over					
	MHz	dBuA	dB	dBuA	dBuA	dB	Detector	Comment			
1	0.4811	-42.60	34.24	-8.36	30.32	-38.68	QP				
2	0.4811	-46.90	34.24	-12.66	20.32	-32.98	AVG				
3	0.7700	-42.90	34.23	-8.67	30.00	-38.67	QP				
4	0.7700	-47.00	34.23	-12.77	20.00	-32.77	AVG				
5	1.3730	-43.20	34.23	-8.97	30.00	-38.97	QP				
6	1.3730	-47.30	34.23	-13.07	20.00	-33.07	AVG				
7	2.3270	-43.70	34.25	-9.45	30.00	-39.45	QP				
8	2.3270	-48.60	34.25	-14.35	20.00	-34.35	AVG				
9	5.3500	-43.80	34.38	-9.42	30.00	-39.42	QP				
10	5.3500	-48.50	34.38	-14.12	20.00	-34.12	AVG				
11	13.0500	-42.70	34.48	-8.22	30.00	-38.22	QP				
12 *	13.0500	-47.10	34.48	-12.62	20.00	-32.62	AVG				



Т		PoE Exte	PoE Extender			del Nam	ne	GV-POEX0100	
mperat	ure	24 ° C	24°C		Re	lative Hu	umidity	48%	
st Volta	ge	DC 48V							
st Mod	Э	FULL SY	STEM (E	THERNET	Г 10М-1	OM (PC	E IN))		
58.0	dBuA								
[Limit: —
									AV6: —
			•						
	North & M.		. ×-				taura 🕷	× min	and an an in the or belief
8	e i transferenci	an a	and the March of the second	hteldby survive	N. WARNER W	Anna Ann	anan-dahirthi M	alabhannan han tanain. Na	And and Address of Add
42									
-42 [50		0.5		(MHz)		5		30.000
		Reading	Correct	Measure-					
No. Mk	. Free	a. Level	Factor	ment	Limit	Over			
	MH2	dBuA	dB	dBuA	dBuA	dB	Detector	Comment	
1	0.438	4 -42.80	34.23	-8.57	31.09	-39.66	QP		
2	0.438	4 -46.90	34.23	-12.67	21.09	-33.76	AVG		
3	0.734	0 -42.90	34.23	-8.67	30.00	-38.67	QP		

1.2920

1.2920

3.3620

3.3620

6.2000

6.2000

8.8500

8.8500

5

6

7

8

9

10

11

12 *

-42.50

-46.60

-43.70

-48.60

-43.60

-48.40

-41.50

-45.90

34.23

34.23

34.30

34.30

34.38

34.38

34.40

34.40

-8.27

-12.37

-9.40

-14.30

-9.22

-14.02

-7.10

-11.50

30.00

20.00

30.00

20.00

30.00

20.00

30.00

20.00

-38.27

-32.37

-39.40

-34.30

-39.22

-34.02

-37.10

-31.50

QP

AVG

QP

AVG

AVG

QP

AVG

QP



JT		PoE Extender Model Name				ne	GV-POEX0100		
mperat	ture	24 ° C			Re	lative Hu	umidity	48%	
est Volta	age	DC 48V							
est Mod	е	FULL SYS	STEM (E	THERNE	T 100M-	-100M (F	POE OU	T))	
58.0) dBuA								
									Limit: —
									AVG:
		_							
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8	altanua Mar	CONCEPTS FOR MANY	and have	ng wagge one of	ar ver gegene	erbilles sealered	and the second of	wa Mdalimia . wa kie	110 CT 11 CT
-42 0.1	150		0.5		(MHz)		5		30.00
		Reading	Correct	Measure	-		_		
No. Mk	k. Freq	. Level	Factor	ment	Limit	Over			
	MHz	dBuA	dB	dBuA	dBuA	dB	Detector	Comment	
1	0.463	6 -26.70	34.24	7.54	30.63	-23.09	QP		
2	0.463	6 -26.50	34.24	7.74	20.63	-12.89	AVG		
3	0.707	0 -25.50	34.23	8.73	30.00	-21.27	QP		
4	0.707	0 -25.70	34.23	8.53	20.00	-11.47	AVG		
5	1.886	0 -23.40	34.24	10.84	30.00	-19.16	QP		
6	1.886	0 -24.10	34.24	10.14	20.00	-9.86	AVG		
7	2.822	0 -19.00	34.27	15.27	30.00	-14.73	QP		
8	2.822	0 -20.50	34.27	13.77	20.00	-6.23	AVG		
9	23.150	0 -23.00	34.60	11.60	30.00	-18.40	QP		
10	23.150	0 -25.45	34.60	9.15	20.00	-10.85	AVG		
11	26.500	0 -15.30	34.60	19.30	30.00	-10.70	QP		
	20 500	10.40	24.60	15 20	20.00	4 90	AVG		



EUT	PoE Extender	Model Name	GV-POEX0100					
Temperature	24°C	Relative Humidity	48%					
Test Voltage	DC 48V							
Test Mode	FULL SYSTEM (ETHERNET 10M-10M (POE OUT))							



	0.15	0	0	1.5		(MHz)		5		30.000
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over			
		MHz	dBuA	dB	dBuA	dBuA	dB	Detector	Comment	
1		0.7066	-25.40	34.23	8.83	30.00	-21.17	QP		
2		0.7066	-26.10	34.23	8.13	20.00	-11.87	AVG		
3		1.6429	-23.58	34.24	10.66	30.00	-19.34	QP		
4		1.6429	-24.60	34.24	9.64	20.00	-10.36	AVG		
5		2.8218	-24.10	34.27	10.17	30.00	-19.83	QP		
6		2.8218	-25.30	34.27	8.97	20.00	-11.03	AVG		
7		10.0998	-21.42	34.42	13.00	30.00	-17.00	QP		
8		10.0998	-22.42	34.42	12.00	20.00	-8.00	AVG		
9		23.1494	-23.50	34.60	11.10	30.00	-18.90	QP		
10		23.1494	-24.70	34.60	9.90	20.00	-10.10	AVG		
11		26.5000	-15.58	34.60	19.02	30.00	-10.98	QP		
12	*	26.5000	-18.33	34.60	16.27	20.00	-3.73	AVG		

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4.2RADIATED EMISSION TEST

4.2.1 LIMITS

Below 1 GHz

FREQUENCY	Class A (at 10m)	Class B (at 10m)
(MHz)	dBuV/m	dBuV/m
30 - 230	40	30
230 - 1000	47	37

NOTE:

- (1) The limit for radiated test was performed according to as following: EN 55022.
- (2) The tighter limit applies at the band edges.
- (3) Emission level (dBuV/m)=20log Emission level (uV/m).
- (4) The test result calculated as following: Measurement Value = Reading Level + Correct Factor Correct Factor = Antenna Factor + Cable Loss - Amplifier Gain(if use) Margin Level = Measurement Value - Limit Value

4.2.2 MEASUREMENT INSTRUMENTS LIST

Below 1 GHz:

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Log-Bicon Antenna	Schwarzbeck	VULB 9160	3173	Nov. 27, 2015
2	Pre-Amplifier	Anritsu	MH648A	M98457	May. 28, 2015
3	Test Cable	TIMES	LMR-400	10M-OS01	May. 28, 2015
4	Test Cable	TIMES	LMR-400	OS02	May. 28, 2015
5	EMI Test Receiver	R&S	ESCI	100082	Apr. 13, 2015
6	System Controller (OS02)	СТ	SC100	N/A	N/A
7	Turn Table	Chance Most	CMTB-1.5	N/A	N/A
8	Measurement Software	EZ	EZ_EMC (Version NB-03A)	N/A	N/A

Remark: "N/A" denotes No Model Name, No Serial No. or No Calibration specified.



4.2.3 TEST PROCEDURE

- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3m or 10 meter open area test site. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The height of the equipment or of the substitution antenna shall be 0.8 m; the height of the test antenna shall vary between 1 m to 4 m. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- c. The initial step in collecting radiated emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then QuasiPeak detector mode re-measured.
- d. 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.
- e. For the actual test configuration, please refer to the related Item -EUT Test Photos.

NOTE: (Below 1 GHz)

- a. Reading in which marked as QP or Peak means measurements by using are Quasi-Peak Mode with Detector BW=120 kHz.
- b. 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.

4.2.4 DEVIATION FROM TEST STANDARD

No deviation

4.2.5 TESTSETUP

Below 1 GHz



4.2.6EUT OPERATING CONDITIONS

The EUT tested system was configured as the statements of **4.1.6**Unless otherwise a special operating condition is specified in the follows during the testing.



4.2.7TEST RESULTS-BELOW 1 GHZ

.U.T		PoE Exte	nder		M	odel Na	me	GV-	POEX0	100	
empera	ture	21°C			Re	elative F	lumidit	y 78%	, D		
est Volta	age	DC 48V									
est Mod	le	FULL SYS	STEM								
ŧ	30.0 dBu∀/n	•		Polariz	ation:	Vertica	al				٦
	40 2 193 XX	4 5 × × 6 ×									
ı	30.000 12	7 00 224 (00 321.00	0 418.00	515.0	0 612	200 7	09.00 8	06.00	1000.00	
No. M	k. Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	,	Antenna Height	Table Degree		
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment	
1	56.4480	26.80	-5.94	20.86	30.00	-9.14	QP	100	175		
2 *	61.9200	30.40	-6.43	23.97	30.00	-6.03	QP	100	100		
3	66.0240	27.80	-6.99	20.81	30.00	-9.19	QP	100	190		
4	145.6000	25.10	-4.77	20.33	30.00	-9.67	QP	100	80		
5	171.0760	24.70	-4.83	19.87	30.00	-10.13	QP	100	251		
6	189.9900	23.20	-7.21	15.99	30.00	-14.01	QP	100	150		



U.T			F	νоЕ	Exte	ender				Μ	odel N	ame	G١	/-POEX	0100			
emperat	ure		2	21°C	,					R	elative	Humid	ity 78	%				
est Volta	ge		٦)C 4	18V													
est Mod	Э		F	UL	LSY	STE	Л											
F	пп	dBuð	//m		Polarization: Horizontal													
·	 	aba													ĺ	7		
									_							-		
																1		
	40																	
									-							-		
	\vdash								_							-		
		1	2	4 -X		6 X												
		×	x	X	5											1		
					Ŷ													
L L	.0 30.00	0	127	.00	224.	.00	321.00	0 41	8.00	515.0	00 61	2.00	709.00	806.00	1000.00	MHz		
				Re	ading	Cor	rect	Measu	ıre-				Antenna	Table				
No. M	۲.	Fre	q.	Ŀ	evel	Fa	ctor	mer	t	Limit	Over		Height	Degree				
		MH	z	4	BuV	d	B	dBuV/	m	dBuV/m	dB	Detecto	r cm	degree	Comment			
1	66	.93	60	2	5.40	-7	12	18.2	5	30.00	-11.72	QP	400	110				
	114	.33	40		5.30	-6.	93	18.3	<u> </u>	30.00	-11.63	QP	400	64				
3	147	.91	60	2	2.80	-4	./1	18.0		30.00	-11.91	QP	400	257				
4 ^	154	.86	40	20	5.50	-4	61	21.8		30.00	-8.11	QP	400	184				
5	208	.51	80	- 2	2.50	-1	5/	14.9	5	30.00	-15.07	QP	400	192				

5. EMC IMMUNITY TEST

5.1 STANDARD COMPLIANCE/SERVRITY LEVEL/CRITERIA

Tests	TEST SPECIFICATION	Test Mode	Criterion
Standard No.	Level	Test Ports	Chienon
	8kV air discharge	Direct Mode	B
Electrostatic discharge immunity	4kV contact discharge		В
IEC/EN 61000-4-2	4kV HCP discharge	Indirect Mode	B
	4kV VCP discharge		В
Radiated, radio-frequency,	80 MHz to 1000 MHz		
electromagnetic field immunity	3V/m(rms), 1 kHz, 80%,	Enclosure	A
IEC/EN 61000-4-3	AM modulated		
	1.0kV(peak)	Power Supply	
Electrical fast transient/burst	5/50ns Tr/Th	Port	В
immunity	5 kHz Repetition Freq.	TOIL	
	0.5 kV(peak)	CTL/Signal	
120/211 01000-4-4	5/50ns Tr/Th	Data Line	В
	5 kHz Repetition Freq.	Port	
	0.5, 1 kV(5P/5N)	AC PowerPort	D
	1.2/50(8/20) Tr/Th µs	L-N	D
	2 kV(5P/5N)	AC PowerPort	Р
Surge immunity	1.2/50(8/20) Tr/Th µs	L-PE/N-PE	D
IEC/EN 61000-4-5	0.5 kV(5P/5N)		D
	1.2/50(8/20) Tr/Th µs	DC PowerPort	В
	1 kV(5P/5N)	Signal/Telecommuni-	0
	10/700 or 1.2/50 Tr/Th µs	cation Ports	C
	0.15 MHz to 80 MHz		
	3V(rms), 1 kHz 80%,	CTL/Signal Port	۸
	AM Modulated		A
	150 Ω source impedance		
Immunity to conducted	0.15 MHz to 80 MHz		
disturbances, induced by	3V(rms), 1 kHz 80%,	AC DowerDort	۸
radio-frequency fields	AM Modulated	AC PowerPort	A
IEC/EN 61000-4-6	150 Ω source impedance		
	0.15 MHz to 80 MHz		
	3V(rms), 1 kHz 80%,		۸
	AM Modulated	DC PowerPort	A
	150 Ω source impedance		
Power frequency magnetic field	•		
immunity	50/60 Hz, 1A/m	Enclosure	А
IEC/EN 61000-4-8			
Voltage dips, short interruptions	Voltage Dips>95%		В
and voltage variations immunity	Voltage Dips 30%	AC PowerPort	Č
IEC/EN 61000-4-11	Voltage Interruptions>95%		Ċ



5.2 GENERAL PERFORMANCE CRITERIA

According to EN55024 standard, the general performance criteria as following:

Criterion	 A The equipment shall continue to operate as intended without operator intervention. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer when the equipment is used as intended. The performance level may be replaced by a permissible loss of performance. If the minimum performance level or the permissible performance loss is not specified by the manufacturer, then either of these may be derived from the product description and documentation, and by what the user product description and documentation, and by what the user may reasonably expect from the equipment if used as intended.
Criterion	 After the test, the equipment shall continue to operate as intended without operator Intervention. No degradation of performance or loss of function is allowed, after the application of the phenomenon below a performance level specified by the manufacturer, when the equipment is used as intended. The performance level may be replaced by a permissible loss of performance. During the test, degradation of performance is allowed. However, no change of operating state if stored data allowed to persist after the test. If the minimum performance level (or the permissible performance loss) is not specified by the manufacturer, then either of these may be derived from the product description and documentation, and by what the user may reasonably expect from the equipment if used as intended.
Criterion	 C Loss of function is allowed, provided the function is self-recoverable, or can be restored by the operation of the controls by the user in accordance with the manufacturer's instructions. Functions, and/or information stored in non-volatile memory, or protected by a battery backup, shall not be lost.

5.3 GENERAL PERFORMANCE CRITERIA TEST SETUP

The EUT tested system was configured as the statements of **4.1.6**Unless otherwise a special operating condition is specified in the follows during the testing.

5.4ELECTROSTATIC DISCHARGE IMMUNITY TEST (ESD)

5.4.1 TEST SPECIFICATION

Basic Standard	IEC/EN 61000-4-2
Dasic otandard	120/21101000-4-2
Discharge Impedance	330 ohm / 150 pF
Required Performance	В
Discharge Voltage	Air Discharge: N/A
	Contact Discharge: 2kV, 4kV (Direct/Indirect)
Polarity	Positive & Negative
Number of Discharge	Air Discharge: N/A
	Contact Discharge: min. 200 times in total
Discharge Mode	Single Discharge
Discharge Period	1 second minimum

5.4.2 MEASUREMENT INSTRUMENTS

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	ESD Simulator	TESEQ	NSG 437	429	Apr. 27, 2015

Remark: "N/A" denotes No Model Name, No Serial No. or No Calibration specified.

5.4.3 TEST PROCEDURE

The test generator necessary to perform direct and indirect application of discharges to the EUT in the following manner:

a. Contact discharge was applied to conductive surfaces (Direct) and coupling planes (Indirect) of the EUT.

During the test, it was performed with single discharges. For the single discharge timebetween successive single discharges was at least 1 second. The EUT shall be exposed to at least 200 discharges, 100 each at negative and positive polarity, at a minimum of four test points. One of the test points shall be subjected to at least 50 indirect discharges to the center of the front edge of the horizontal coupling plane. The remaining three test points shall each receive at least 50 direct contact discharges.

If no direct contact test points are available, then at least 200 indirect discharges shall be applied in the indirect mode. Test shall be performed at a maximum repetition rate of one discharge per second.

Vertical Coupling Plane (VCP):

The coupling plane, of dimensions 0.5m x 0.5m, is placed parallel to, and positioned at a distance 0.1m from, the EUT, with the Discharge Electrode touching the coupling plane. The four faces of the EUT will be performed with electrostatic discharge. Horizontal Coupling Plane (HCP):

The coupling plane is placed under to the EUT. The generator shall be positioned vertically at a distance of 0.1m from the EUT, with the Discharge Electrode touching the coupling plane. The four faces of the EUT will be performed with electrostatic discharge.

b. Air discharges at insulation surfaces of the EUT.

It was at least ten single discharges with positive and negative at the same selected point.



5.4.4 DEVIATION FROM TEST STANDARD

No deviation

5.4.5 TEST SETUP



Note:

TABLE-TOP EQUIPMENT

The configuration consisted of a wooden table 0.8 meters high standing on the Ground Reference Plane. The GRP consisted of a sheet of aluminum at least 0.25mm thick, and 2.5 meters square connected to the protective grounding system. A Horizontal Coupling Plane (1.6m x 0.8m) was placed on the table and attached to the GRP by means of a cable with 940k total impedance. The equipment under test was installed in a representative system as described inEN 61000-4-2/ IEC 61000-4-2, and its cables were placed on the HCP and isolated by an insulating support of 0.5mm thickness. A distance of1-meter minimum was provided between the EUT and the walls of the laboratory and any other metallic structure.

FLOOR-STANDING EQUIPMENT

The equipment under test was installed in a representative system as described in EN 61000-4-2/IEC 61000-4-2, and its cables were isolated from the Ground Reference Plane by an insulating support of0.1-meter thickness. The GRP consisted of a sheet of aluminum that is at least 0.25mm thick, and 2.5meters square connected to the protective grounding system and extended at least 0.5 meters from the EUT on all sides.

5.4.6 TEST RESULTS

EUT	PoE Extender	Model Name	GV-POEX0100
Temperature	26°C	Relative Humidity	53%
Pressure	1003 hPa	Test Voltage	DC 48V
Test Mode	FULL SYSTEM		

Mode			A	Air D	ischa	irge					Cor	ntact	Disc	harge	9	
	-k	ίV	-k	٢V	-kV		-k	٢V	21	2kV		٢V	-kV		-ŀ	٨٧
Location	P N P N			Ν	Р	Ν	Р	Ν	Р	Ν	Р	Ν	Р	Ν	Р	Ν
1	-	-	-	-	-	-	-	-	А	Α	В	В	-	-	-	-
2	-	-	-	-	-	-	-	-	А	Α	В	В	-	-	-	-
3	-	-	-	-	-	-	-	-	А	Α	В	В	-	-	-	-
4	-	-	-	-	-	-	-	-	А	Α	В	В	-	-	-	-
5	-	-	-	-	-	-	-	-	А	Α	В	В	-	-	-	-
6	-	-	-	-	-	-	-	-	А	А	В	В	-	-	-	-
7	-	-	-	-	-	-	-	-	А	Α	В	В	-	-	-	-
8	-	-	-	-	-	-	-	-	А	Α	В	В	-	-	-	-
Criterion	-							-		E	3		-		-	
Result	-							-		E	3		-		-	
Judgment	-							-		PA	SS				-	

Mode			H	CP I	Disch	arge			VCP Discharge							
	21	٨٧	4	٨٧	- kV		- kV		2kV		4kV		- kV		- kV	
Location	Ρ	Ν	Ρ	Ν	Ρ	Ν	Ρ	Ν	Ρ	Ν	Ρ	Ν	Р	Ν	Ρ	Ν
1	Α	Α	Α	Α	-	-	-	-	Α	Α	Α	Α	-	-	-	-
2	A A A A		-	-	-	-	Α	Α	Α	Α	-	-	-	-		
3	Α	Α	Α	Α	-	-	-	-	Α	Α	Α	Α	-	-	-	-
4	Α	Α	Α	Α	-	-	-	-	Α	Α	Α	Α	-	-	-	-
Criterion	B							В			-			-		
Result		-	4		-			-		A	1			-		-
Judgment		PA	SS					PASS				-		-		

Note:

1) P/N denotes the Positive/Negative polarity of the output voltage.

2) Test condition:

- Direct/Indirect(HCP/VCP) discharges: Minimum 25 times (Positive/Negative) at eachpoint. Air discharges: Minimum 10 times (Positive/Negative) at each point.
- 3) Test location(s) in which discharge (Air and contact discharge) to be applied illustrated by photos shown in next page(s)
- 4) The Indirect (HCP/VCP) discharges description of test point as following: 1.left side; 2.right side; 3.front side; 4.rear side.
- 5) N/A denotes test is not applicable in this test report
- 6) Criterion A: No observation of any performance degradation.
- 7) Criterion B: Some degradation of performance is observed but the equipment continues to operate as intended.

8) Criterion C: Loss of functionality, but self-recoverable by user, without loss of information or settings.





5.5RADIATED, RADIO-FREQUENCY, ELECTROMAGNETIC FIELD IMMUNITY TEST (RS)

5.5.1 TEST SPECIFICATION

Basic Standard	IEC/EN 61000-4-3
Required Performance	A
Frequency Range	80 MHz - 1000 MHz
Field Strength	3 V/m
Modulation	1 kHz Sine Wave, 80%, AM Modulation
Frequency Step	1% of fundamental
Polarity of Antenna	Horizontal and Vertical
Test Distance	3 m
Antenna Height	1.5 m
Dwell Time	at least 3 seconds

5.5.2 MEASUREMENT INSTRUMENTS

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Signal Generator	R&S	SMT06	832080/007	Jun. 19, 2015
2	Log-Periodic Antenna	AR	AT1080	320290	N/A
3	Power Amplifier	AR	150W1000M1	320946	N/A
4	Laser Power Field Prode	AR	FL7004	0320284/03132 98	Apr. 14, 2015
5	RF Power Meter	BOONTON	4232A	10179	Jun. 15, 2015
6	Power Sensor	BOONTON	51011-EMC	34150	Jun. 15, 2015
7	Measurement Software	AR	SW1006 (Version 1.22)	321779	N/A

Remark: "N/A" denotes No Model Name, No Serial No. or No Calibration specified.

5.5.3 TEST PROCEDURE

The EUT and support equipment, which are placed on a table that is 0.8 meter above ground and the testing was performed in a fully-anechoic chamber.

The testing distance from antenna to the EUT was 3 meters.

The other condition as following manner:

- a. The field strength level was 3V/m.
- b. The frequency range is swept from 80 MHz to 1000 MHz, with the signal 80% amplitude modulated with a 1 kHz sine wave. The rate of sweep did not exceed 1.5x 10-3 decade/s. Where the frequency range is swept incrementally, the step size was 1% of fundamental.
- c. Sweep Frequency 900 MHz, with the Duty Cycle:1/8 and Modulation: Pulse 217 Hz(if applicable)
- d. The dwell time at each frequency shall be not less than the time necessary for theEUT to be able to respond.
- e. The test was performed with the EUT exposed to both vertically and horizontallypolarized fields on each of the four sides.

5.5.4 DEVIATION FROM TEST STANDARD

No deviation





Note:

TABLE-TOP EQUIPMENT

The EUT installed in a representative system as described in EN 61000-4-3/IEC 61000-4-3 was placed on a non-conductive table 0.8 meters in height. The system under test was connected to the power and signal wire according to relevant installation instructions.

FLOOR-STANDING EQUIPMENT

The EUT installed in a representative system as described inEN 61000-4-3/IEC 61000-4-3 was placed on a non-conductive wood support 0.1 meters in height. The system under test was connected to the power and signal wire according to relevant installation instructions.



5.5.6 TEST RESULTS

EUT	PoE Extender	Model Name	GV-POEX0100
Temperature	26°C	Relative Humidity	53%
Test Voltage	AC 230V/50Hz		
Test Mode	FULL SYSTEM		

Frequency Range (MHz)	RF Field Position	R.F. Field Strength	Azimuth	Criterion	Result	Judgment
			0			
80 1000	80 - 1000 H / V AM Modulated	3 V/m (ms)	90	•	•	DACC
80 - 1000			180	A	A	PASS
	Т КПZ, 80%		270			

Note:

 P/N denotes the Positive/Negative polarity of the output voltage.
 N/A - denotes test is not applicable in this test report.
 Criterion A: No observation of any performance degradation.
 Criterion B: Some degradation of performance is observed but the equipment continues to operate as intended.

5) Criterion C: Loss of functionality, but self-recoverable by user, without loss of information or settings.

5.6 ELECTRICAL FAST TRANSIENT/BURST IMMUNITY TEST (EFT/BURST)

5.6.1 TEST SPECIFICATION

Basic Standard	IEC/EN 61000-4-4
Required Performance	В
Test Voltage	Power Line: 1 kV
	Signal/Control Line: 0.5 kV
Polarity	Positive & Negative
Impulse Frequency	5 kHz: except for xDSL equipment
	100 kHz: only for single lines of xDSL equipment.
Impulse Wave shape	5/50 ns
Burst Duration	15 ms
Burst Period	300 ms
Test Duration	Not less than 1 min.

5.6.2 MEASUREMENT INSTRUMENTS

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	EMC Immunity Test System	TESEQ	NSG 3060	1558	Jan 15,2015
2	EMC Immunity Test System	TESEQ	CDN 3061	1452	Jan 15,2015
3	Single motor driven variable transformer	TESEQ	VAR 3005-S16	844	Jan 15,2015
4	Measurement Software	TESEQ	WIN 3000 (Version 1.2)	N/A	N/A
5	Capacitive Clamp	Thermo	CCL	0502218	N/A

Remark: "N/A" denotes No Model Name, No Serial No. or No Calibration specified.

5.6.3 TEST PROCEDURE

The EUT and support equipment(s) are placed on a table that is 0.8 meter high above a metal ground plane and should be located 0.1 m+/- 0.01 m high above the Ground Reference Plane (1m*1m min. and 0.65mm thick min).

The other condition as following manner:

- a. The length of power cord between the coupling device and the EUT should not exceed 1 meter.
- b. Both positive and negative polarity discharges were applied.
- c. The duration time of each test sequential was 1 minute

5.6.4 DEVIATION FROM TEST STANDARD

No deviation





Note:

TABLE-TOP EQUIPMENT

The configuration consisted of a wooden table (0.8m high) standing on the Ground Reference Plane and should be located 0.1 m+/- 0.01m above the Ground Reference Plane. The GRP consisted of a sheet of aluminum (at least 0.25mm thick and 2.5m square) connected to the protective grounding system. A minimum distance of 0.5m was provided between the EUT and the walls of the laboratory or any other metallic structure.

FLOOR-STANDING EQUIPMENT

The EUT installed in a representative system as described in EN 61000-4-4/IEC 61000-4-4 and its cables were isolated from the Ground Reference Plane by an insulating support that is 0.1-meter thick. The GRP consisted of a sheet of aluminum (at least 0.25mm thick and 2.5m square) connected to the protective grounding system.



5.6.6 TEST RESULTS

EUT	PoE Extender	Model Name	GV-POEX0100
Temperature	26°C	Relative Humidity	53%
Test Voltage	AC 230V/50Hz		
Test Mode	FULL SYSTEM		

EUT Ports Tested		Delerity	Repetition	Test Level	Critorian	Decult	ludamont
		Polarity	Frequency	0.5 kV	Criterion	Result	Juagment
Signal/Data/	RJ-45	+	5 kHz	В	В	Р	DASS
Control Port	(Shleided Cable)	-	5 kHz	В	D	D	FA33

Note:

 N/A - denotes test is not applicable in this test report
 Criterion A: No observation of any performance degradation.
 Criterion B: Some degradation of performance is observed but the equipment continues to operate as intended.

4) Criterion C: Loss of functionality, but self-recoverable by user, without loss of information or settings.



5.7 IMMUNITY TO CONDUCTED DISTURBANCES, INDUCED BY RADIO-FREQUENCY FIELDS TEST (CS)

5.7.1 TEST SPECIFICATION

Basic Standard	IEC/EN 61000-4-6
Required Performance	A
Frequency Range	0.15 MHz - 80 MHz
Field Strength	3 Vr.m.s.
Modulation	1 kHz Sine Wave, 80%, AM Modulation
Frequency Step	1% of fundamental
Dwell Time	at least 3 seconds

5.7.2 MEASUREMENT INSTRUMENTS

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Signal Generator	IFR	2023A	202301/368	Apr. 15, 2015
2	Power Amplifier	AR	75A250AM1	0320709	N/A
3	CDN	FCC	FCC-801-T8-SRJ45	100265	Jul. 20, 2015
6	Measurement Software	AR	SW1006 (Version 1.13)	321778	N/A

Remark: "N/A" denotes No Model Name, No Serial No. or No Calibration specified.

5.7.3 TEST PROCEDURE

The EUT and support equipment, are placed on a table that is 0.8 meter above a metal ground plane measured 1m*1m min. and 0.65mm thick min.

The other condition as following manner:

- a. The field strength level was 3 Vr.m.s..
- b. The frequency range is swept from 150 kHz to 80 MHz, with the signal 80% amplitude modulated with a 1 kHz sine wave. The rate of sweep did not exceed 1.5x 10-3 decade/s. Where the frequency range is swept incrementally, the step size was 1% of fundamental.
- c. The dwell time at each frequency shall be not less than the time necessary for the EUT to be able to respond.

5.7.4 DEVIATION FROM TEST STANDARD

No deviation



5.7.5 TEST SETUP



NOTE:

FLOOR-STANDING EQUIPMENT

The equipment to be tested is placed on an insulating support of 0.1 meters height above a ground reference plane. All relevant cables shall be provided with the appropriate coupling and decoupling devices at a distance between 0.1 meters and 0.3 meters from the projected geometry of the EUT on the ground reference plane.



5.7.6 TEST RESULTS

EUT	PoE Extender		Model Name GV-POE>		0100	
Temperature	26°C		Relative Humidi	ty 53%		
Test Voltage	AC 230V/50Hz					
Test Mode	FULL SYSTEM					
	1					
Test Ports (Mode)	Freq. Range (MHz)	Field Strength	Criterion	Result	Judgment	
Signal Line (RJ-45) (Shielded Cable)	0.15 - 80	3 Vr.m.s. AM Modulated 1 kHz, 80%	А	Α	PASS	

Note:

 N/A - denotes test is not applicable in this Test Report.
 Criterion A: No observation of any performance degradation.
 Criterion B: Some degradation of performance is observed but the equipment continues to operate as intended.

4) Criterion C: Loss of functionality, but self-recoverable by user, without loss of information or settings.

5.8POWER FREQUENCY MAGNETIC FIELD IMMUNITY TEST (PFMF)

5.8.1 TEST SPECIFICATION

Basic Standard	IEC/EN 61000-4-8
Required Performance	A
Frequency Range	50/60 Hz
Field Strength	1 A/m
Observation Time	1 minute
Inductance Coil	Rectangular type, 1mx1m

5.8.2 MEASUREMENT INSTRUMENTS

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Triaxial ELF Magnetic Fiedl Meter	F.W. BELL	4190	0845014	May. 14,2015
2	Magnetic Field Test Generator	FCC	F-1000-4-8-G-1 25A	04029	May. 14,2015
3	Magnetic Field Immunity Loop	FCC	F-1000-4-8/9/10-L -1M	04018	May. 14,2015

Remark: "N/A" denotes No Model Name, No Serial No. or No Calibration specified.

5.8.3 TEST PROCEDURE

The EUT and support equipment, are placed on a table that is 0.8 meter above a metal ground plane measured 1m*1m min. and 0.65mm thick min. The other condition as following manner:

- a. The equipment cabinets shall be connected to the safety earth directly on the GRP via the earth terminal of the EUT.
- b. The cables supplied or recommended by the equipment manufacturer shall be used. 1 meter of all cables used shall be exposed to the magnetic field.

5.8.4 DEVIATION FROM TEST STANDARD

No deviation



5.8.5 TEST SETUP



Note:

TABLE-TOP EQUIPMENT

The equipment shall be subjected to the test magnetic field by using the induction coil of standard dimension (1 m x 1 m). The induction coil shall then be rotated by 90 degrees in order to expose the EUT to the test field with different orientations.

FLOOR-STANDING EQUIPMENT

The equipment shall be subjected to the test magnetic field by using induction coils of suitable dimensions. The test shall be repeated by moving and shifting the induction coils, in order to test the whole volume of the EUT for each orthogonal direction. The test shall be repeated with the coil shifted to different positions along the side of the EUT, in steps corresponding to 50 percent of the shortest side of the coil. The induction coil shall then be rotated by 90 degrees in order to expose the EUT to the test field with different orientations.



5.8.6 TEST RESULTS

EUT	PoE Extender	Model Name	GV-POEX0100
Temperature	26°C	Relative Humidity	53%
Test Voltage	AC 230V/50Hz		
Test Mode	FULL SYSTEM		

Test Mode	Test Level	Antenna aspect	Duration (s)	Criterion	Result	Judgment
Enclosure	1 A/m 50/60 Hz	х	60	Α	Α	PASS
Enclosure	1 A/m 50/60 Hz	Y	60	Α	Α	PASS
Enclosure	1 A/m 50/60 Hz	Z	60	Α	Α	PASS

Note:

- N/A denotes test is not applicable in this test report
 Criterion A: No observation of any performance degradation.
- 3) Criterion B: Some degradation of performance is observed but the equipment continues to operate as intended.
- 4) Criterion C: Loss of functionality, but self-recoverable by user, without loss of information or settings.



6. EUT TEST PHOTO

Conducted emission at telecommunication ports test photos

FULL SYSTEM







Radiated emission below 1 GHz test photos

FULL SYSTEM



