EMC
TEST REPORT

Report No.: **TS10030155-EME**
Model No.: **TR5830, 15-332, 1500332**
Issued Date: **May 12, 2010**

Applicant: **TRANS ELECTRIC CO., LTD.**
No.765, Sec. 2, Zhongshan Rd., Huatan Township, Changhua County 503, Taiwan

Test Method/ Standard: **47 CFR FCC Part 15.249 & ANSI C63.4 2003**

Test By: **Intertek Testing Services Taiwan Ltd.**
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The test report was reviewed by: Rex Liao

Name Rex Liao
Title Engineer

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Summary of Tests

Test	Reference	Results
Radiated Emission test	15.249(c), 15.209	Pass
Conducted Emission of AC Power	15.207	Pass

1. General information

1.1 Identification of the EUT

Product:	5.8GHz WIRELESS A/V SIGNAL SENDER
Model No.:	TR5830
FCC ID.:	BY4TR5830
Frequency Range:	5790 MHz ~ 5866 MHz
Channel Number:	4 channels: 5790 MHz, 5828 MHz, 5847 MHz, 5866 MHz
Rated Power:	DC 12 V from adapter model: CP130D0120V0250U, I/P Voltage: 120 Vac 60 Hz
Power Cord:	N/A
Sample Received:	Mar. 29, 2010
Test Date(s):	Mar. 31, 2010 ~ May 11, 2010
Note 1:	This report is for the exclusive use of Intertek's Client and is provided pursuant to the agreement between Intertek and its Client. Intertek's responsibility and liability are limited to the terms and conditions of the agreement. Intertek assumes no liability to any party, other than to the Client in accordance with the agreement, for any loss, expense or damage occasioned by the use of this report. Only the Client is authorized to permit copying or distribution of this report and then only in its entirety. Any use of the Intertek name or one of its marks for the sale or advertisement of the tested material, product or service must first be approved in writing by Intertek. The observations and test results in this report are relevant only to the sample tested. This report by itself does not imply that the material, product, or service is or has ever been under an Intertek certification program.
Note 2:	When determining the test conclusion, the Measurement Uncertainty of test has been considered.

1.2 Additional information about the EUT

The main function of TR5830 is to send the video and audio signals to receiver unit by 5 GHz RF signal and do the FM modulation, then put the video and audio signals to TV, or other AV device.

The customer confirmed the models listed below are identical to model TR5830 (EUT). Different brand serves as marking strategy.

Trade Name	Model No.	Differences
TRANS ELECTRIC CO., LTD	TR5830	5 GHz Tx, 433 MHz Rx
Radio Shack	15-332	Same as TR5830, designed for marketing strategy.
Radio Shack	1500332	Same as TR5830, designed for marketing strategy.

For more detail features, please refer to User's manual as file name "Installation guide.pdf"

1.3 Antenna description

The EUT uses a permanently connected antenna.

Antenna for 5.8 GHz

Antenna Gain: 8 dBi
Antenna Type: PCB printed antenna
Connector Type: N/A

Antenna for 433 MHz

Antenna Gain: -2 dBi
Antenna Type: Dipole antenna
Connector Type: N/A

1.4 Peripherals equipment

Peripherals	Brand	Model No.	Serial No.	Description of Data Cable
DVD Player	VITO	CU03	N/A	RCA unshielded cable 1.5 meter × 3

2. Test specifications

2.1 Test standard

The EUT was performed according to the procedures in FCC Part 15 Subpart C Paragraph 15.249 for non-spread spectrum devices.

The test of radiated measurements according to FCC Part15 Section 15.33(a) had been conducted and the field strength of this frequency band were all meet limit requirement, thus we evaluate the EUT pass the specified test.

2.2 Operation mode

A video and audio signal was generated from DVD Player and was transmitted from the EUT to receiver through radiated emission.

The EUT was continuously transmitting during the test. Low, middle and high channels were verified and defined as below.

Frequency of Low Channel:	5790 MHz
Frequency of Middle Channel:	5828 MHz
Frequency of High Channel:	5866 MHz

2.4 Test equipment

Equipment	Brand	Frequency range	Model No.
EMI Test Receiver	Rohde & Schwarz	9kHz~2.75GHz	ESCS 30
EMI Test Receiver	Rohde & Schwarz	20Hz~26.5GHz	ESMI
Spectrum Analyzer	Rohde & Schwarz	9kHz~30GHz	FSP 30
Spectrum Analyzer	Rohde & Schwarz	20Hz~40GHz	FSEK 30
Horn Antenna	EMCO	1GHz~18GHz	3115
Bilog Antenna	SCHWARZBECK	25MHz~1.7GHz	VULB 9160
Turn Table	HDGmbH	N/A	DS 420S
Antenna Tower	HDGmbH	N/A	MA 240
Pre-Amplifier	MITER	100MHz~26.5GHz	919981
LISN	Rohde & Schwarz	9KHz~30MHz	ESH3-Z5

Note: The above equipments are within the valid calibration period.

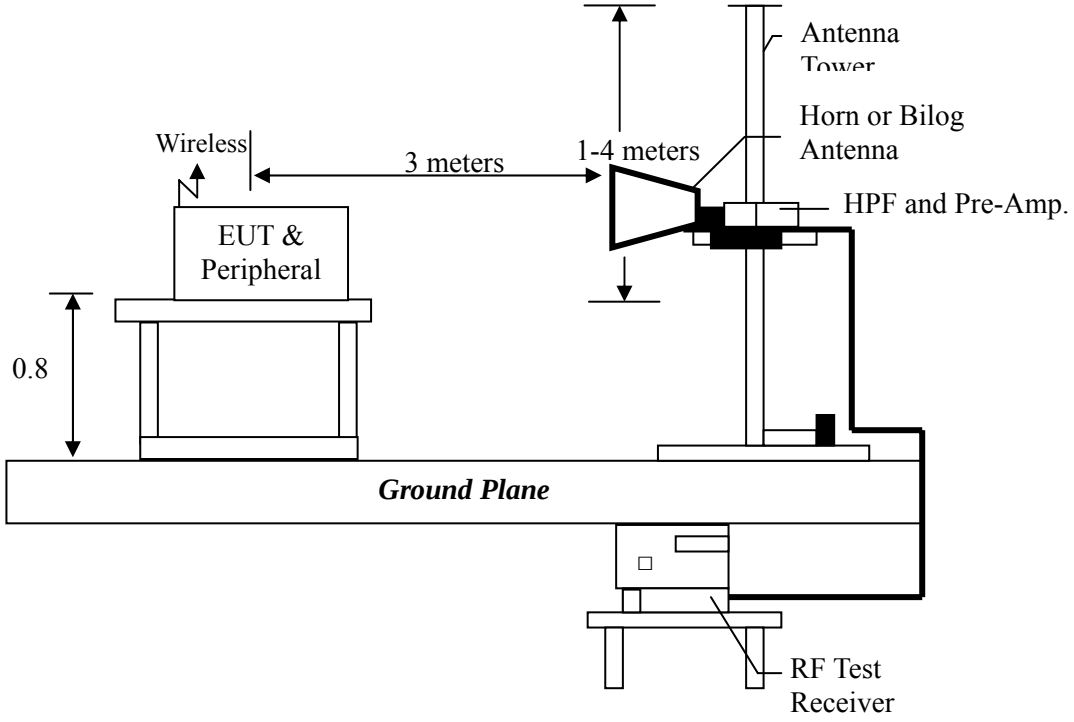
3. Radiated emission test FCC 15.249 (C)

3.1 Operating environment

Temperature:	22	℃
Relative Humidity:	56	%
Atmospheric Pressure	1023	hPa

3.2 Test setup & procedure

The Diagram below shows the test setup, which is utilized to make these measurements.



Radiated emissions were invested cover the frequency range from 30MHz to 1000MHz using a receiver RBW of 120kHz record QP reading, and the frequency over 1GHz using a spectrum analyzer RBW of 1MHz and 10Hz VBW record Average reading. (15.209 paragraph), the Peak reading (1MHz RBW/VBW) recorded also on the report.
The EUT for testing is arranged on a wooden turntable. If some peripherals apply to the EUT, the peripherals will be connected to EUT and the whole system. During the test, all cables were arranged to produce worst-case emissions. The signal is maximized through rotation. The height of antenna and polarization is changing constantly for exploring for maximum signal level. The height of antenna can be up to 4 meters and down to 1 meter.

The measurement for radiated emission will be done at the distance of three meters unless the signal level is too low to measure at that distance. In the case of the reading under noise floor, a pre-amplifier is used and/or the test is conducted at a closer distance. And then all readings are extrapolated back to the equivalent three meter reading using inverse scaling with distance.

The EUT configuration please refer to the "Spurious set-up photo.pdf".

3.3 Emission limit

3.3.1 Fundamental and harmonics emission limits

Frequency (MHz)	Field Strength of Fundamental		Field Strength of Harmonics	
	(mV/m@3m)	(dBuV/m@3m)	(uV/m@3m)	(dBuV/m@3m)
5725 - 5875	50	94	500	54

3.3.2 General radiated emission limits

Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50dB below the level of the fundamental or to the general radiated emission limits in paragraph 15.209, whichever is the lesser attenuation.

Frequency MHz	15.209 Limits (dB μ V/m@3m)
30-88	40
88-216	43.5
216-960	46
Above 960	54

Remark:
1. In the above table, the tighter limit applies at the band edges.
2. Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system

Measurement uncertainty was calculated in accordance with TR 100 028-1.

Parameter	Uncertainty
Radiated Emission	± 5.10 dB
Conducted Emission	± 2.786 dB

This uncertainty represents an expanded uncertainty expressed at approximately the 95 % confidence level using a coverage factor of k=2.

3.4 Radiated spurious emission test data

3.4.1 Measurement results: frequencies equal to or less than 1 GHz

The test was performed on EUT under continuously transmitting mode. Low, middle and high channels were verified. The worst case occurred Tx at low channel.

EUT : TR5830
Test Condition : Tx at low channel

Polarization (circle)	Frequency (MHz)	Detector	Corr. Factor (dB/m)	Reading (dBuV)	Calculated dBuV/m	Limit (dBuV/m)	Margin (dB)
Vertical	93.05	QP	7.38	17.90	25.27	43.50	-18.23
Vertical	159.98	QP	15.83	17.95	33.78	43.50	-9.72
Vertical	168.71	QP	15.70	17.34	33.04	43.50	-10.46
Vertical	177.44	QP	14.96	12.49	27.44	43.50	-16.06
Vertical	236.61	QP	12.18	13.20	25.38	46.00	-20.62
Vertical	438.37	QP	17.64	12.23	29.87	46.00	-16.13
Horizontal	93.05	QP	7.93	17.44	25.36	43.50	-18.14
Horizontal	143.49	QP	13.24	10.47	23.70	43.50	-19.80
Horizontal	159.98	QP	13.60	14.90	28.50	43.50	-15.00
Horizontal	168.71	QP	13.84	13.52	27.35	43.50	-16.15
Horizontal	418.97	QP	16.81	14.19	31.00	46.00	-15.00
Horizontal	439.34	QP	18.12	12.85	30.97	46.00	-15.03

Remark:
1. Corr. Factor = Antenna Factor + Cable Loss
2. Corrected Level = Reading + Corr. Factor

EUT : TR5830
Test Condition : Tx at middle channel

Polarization (circle)	Frequency (MHz)	Detector	Corr. Factor (dB/m)	Reading (dBuV)	Calculated dBuV/m	Limit (dBuV/m)	Margin (dB)
Vertical	50.37	QP	12.90	14.91	27.80	40.00	-12.20
Vertical	108.57	QP	7.64	20.55	28.19	43.50	-15.31
Vertical	159.01	QP	15.83	11.82	27.65	43.50	-15.85
Vertical	167.74	QP	15.70	17.16	32.86	43.50	-10.64
Vertical	176.47	QP	14.96	13.89	28.84	43.50	-14.66
Vertical	439.34	QP	17.64	13.72	31.36	46.00	-14.64
Horizontal	109.54	QP	9.03	22.18	31.20	43.50	-12.30
Horizontal	159.98	QP	13.60	16.87	30.47	43.50	-13.03
Horizontal	168.71	QP	13.84	18.60	32.43	43.50	-11.07
Horizontal	176.47	QP	13.48	13.12	26.59	43.50	-16.91
Horizontal	421.88	QP	16.81	12.60	29.41	46.00	-16.59
Horizontal	443.22	QP	18.12	11.97	30.09	46.00	-15.91

Remark:
1. Corr. Factor = Antenna Factor + Cable Loss
2. Corrected Level = Reading + Corr. Factor

EUT : TR5830
Test Condition : Tx at high channel

Polarization (circle)	Frequency (MHz)	Detector	Corr. Factor (dB/m)	Reading (dBuV)	Calculated dBuV/m	Limit (dBuV/m)	Margin (dB)
Vertical	50.37	QP	12.90	15.19	28.08	40.00	-11.92
Vertical	109.54	QP	7.64	19.57	27.21	43.50	-16.29
Vertical	159.98	QP	15.83	13.93	29.76	43.50	-13.74
Vertical	168.71	QP	15.70	17.17	32.87	43.50	-10.63
Vertical	177.44	QP	14.96	11.93	26.88	43.50	-16.62
Vertical	437.40	QP	17.64	13.59	31.23	46.00	-14.77
Horizontal	109.54	QP	9.03	21.46	30.48	43.50	-13.02
Horizontal	159.98	QP	13.60	16.07	29.67	43.50	-13.83
Horizontal	168.71	QP	13.84	18.33	32.16	43.50	-11.34
Horizontal	177.44	QP	13.48	12.12	25.59	43.50	-17.91
Horizontal	419.94	QP	16.81	11.55	28.36	46.00	-17.64
Horizontal	438.37	QP	18.12	12.48	30.60	46.00	-15.40

Remark:
1. Corr. Factor = Antenna Factor + Cable Loss
2. Corrected Level = Reading + Corr. Factor

3.4.2 Measurement results: frequency above 1GHz

EUT : TR5830
Test Condition : Tx at low channel

Frequency (MHz)	Spectrum Analyzer Detector	Ant. Pol. (H/V)	Preamp. Gain (dB)	Correction Factor (dB/m)	Reading (dBuV)	Corrected Reading (dBuV/m)	Limit @ 3 m (dBuV/m)	Margin (dB)
11580.00	PK	V	30.3	51.84	37.09	58.63	74	-15.37
11580.00	AV	V	30.3	51.84	24.32	45.86	54	-8.14
11580.00	PK	H	30.3	51.84	35.16	56.7	74	-17.30
11580.00	AV	H	30.3	51.84	21.72	43.26	54	-10.74

Remark:
1. Correction Factor = Antenna Factor + Cable Loss
2. Corrected Level = Reading + Correction Factor – Preamp. Gain
3. The frequency measured ranges from 1 GHz to 25 GHz. The data value listed above which is higher than the system noise floor.

EUT : TR5830
Test Condition : Tx at middle channel

Frequency (MHz)	Spectrum Analyzer Detector	Ant. Pol. (H/V)	Preamp. Gain (dB)	Correction Factor (dB/m)	Reading (dBuV)	Corrected Reading (dBuV/m)	Limit @ 3 m (dBuV/m)	Margin (dB)
11656.00	PK	V	30.3	51.84	35.78	57.32	74	-16.68
11656.00	AV	V	30.3	51.84	23.74	45.28	54	-8.72
11656.00	PK	H	30.3	51.84	36.13	57.67	74	-16.33
11656.00	AV	H	30.3	51.84	23.21	44.75	54	-9.25

Remark:
1. Correction Factor = Antenna Factor + Cable Loss
2. Corrected Level = Reading + Correction Factor – Preamp. Gain
3. The frequency measured ranges from 1 GHz to 25 GHz. The data value listed above which is higher than the system noise floor.

EUT : TR5830
Test Condition : Tx at high channel

Frequency (MHz)	Spectrum Analyzer Detector	Ant. Pol. (H/V)	Preamp. Gain (dB)	Correction Factor (dB/m)	Reading (dBuV)	Corrected Reading (dBuV/m)	Limit @ 3 m (dBuV/m)	Margin (dB)
11732.00	PK	V	30.3	51.84	35.18	56.72	74	-17.28
11732.00	AV	V	30.3	51.84	20.82	42.36	54	-11.64
11732.00	PK	H	30.3	51.84	34.09	55.63	74	-18.37
11732.00	AV	H	30.3	51.84	19.7	41.24	54	-12.76

Remark:

1. Correction Factor = Antenna Factor + Cable Loss
2. Corrected Level = Reading + Correction Factor – Preamp. Gain
3. The frequency measured ranges from 1 GHz to 25 GHz. The data value listed above which is higher than the system noise floor.

3.4.3 Measurement results: Fundamental and harmonics emission

EUT : TR5830
Test Condition : Tx at low channel

Frequency (MHz)	Spectrum Analyzer Detector	Ant. Pol. (H/V)	Preamp. Gain (dB)	Correction Factor (dB/m)	Reading (dBuV)	Corrected Reading (dBuV/m)	Limit @ 3 m (dBuV/m)	Margin (dB)
5790.00	PK	H	35.3	40.58	98.58	103.86	114	-10.14
5790.00	AV	H	35.3	40.58	85.61	90.89	94	-3.11

Remark:
1. Correction Factor = Antenna Factor + Cable Loss
2. Corrected Level = Reading + Correction Factor – Preamp. Gain

EUT : TR5830
Test Condition : Tx at middle channel

Frequency (MHz)	Spectrum Analyzer Detector	Ant. Pol. (H/V)	Preamp. Gain (dB)	Correction Factor (dB/m)	Reading (dBuV)	Corrected Reading (dBuV/m)	Limit @ 3 m (dBuV/m)	Margin (dB)
5828.00	PK	H	35.3	40.58	98.42	103.70	114	-10.30
5828.00	AV	H	35.3	40.58	85.04	90.32	94	-3.68

Remark:
1. Correction Factor = Antenna Factor + Cable Loss
2. Corrected Level = Reading + Correction Factor – Preamp. Gain

EUT : TR5830
Test Condition : Tx at high channel

Frequency (MHz)	Spectrum Analyzer Detector	Ant. Pol. (H/V)	Preamp. Gain (dB)	Correction Factor (dB/m)	Reading (dBuV)	Corrected Reading (dBuV/m)	Limit @ 3 m (dBuV/m)	Margin (dB)
5866.00	PK	H	35.3	40.58	97.9	103.18	114	-10.82
5866.00	AV	H	35.3	40.58	85.17	90.45	94	-3.55

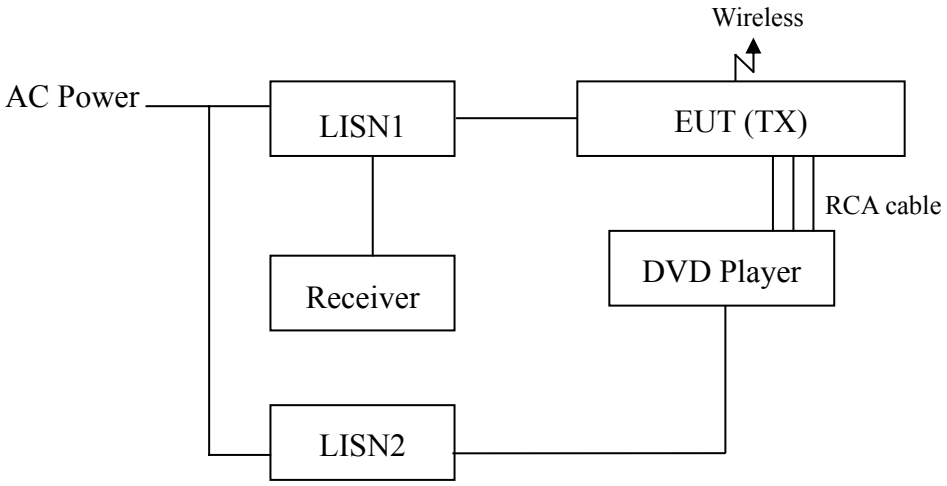
Remark:
1. Correction Factor = Antenna Factor + Cable Loss
2. Corrected Level = Reading + Correction Factor – Preamp. Gain

4. Conducted emission test FCC 15.207

4.1 Operating environment

Temperature:	23	℃
Relative Humidity:	61	%
Atmospheric Pressure	1023	hPa

4.2 Test setup & procedure



The EUT are connected to the main power through a line impedance stabilization network (LISN). This provides a 50 ohm/50uH coupling impedance for the measuring equipment. The peripheral devices are also connected to the main power through a LISN that provides a 50ohm/50uH coupling impedance with 50ohm termination.
Both sides (Line and Neutral) of AC line are checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.4/1992 on conducted measurement.
The bandwidth of the field strength meter (R & S Test Receiver ESCS 30) is set at 9kHz.

The EUT configuration please refer to the "Conducted set-up photo.pdf".

4.3 Emission limit

Freq. (MHz)	Conducted Limit (dBuV)	
	Q.P.	Ave.
0.15~0.50	66 – 56*	56 – 46*
0.50~5.00	56	46
5.00~30.0	60	50

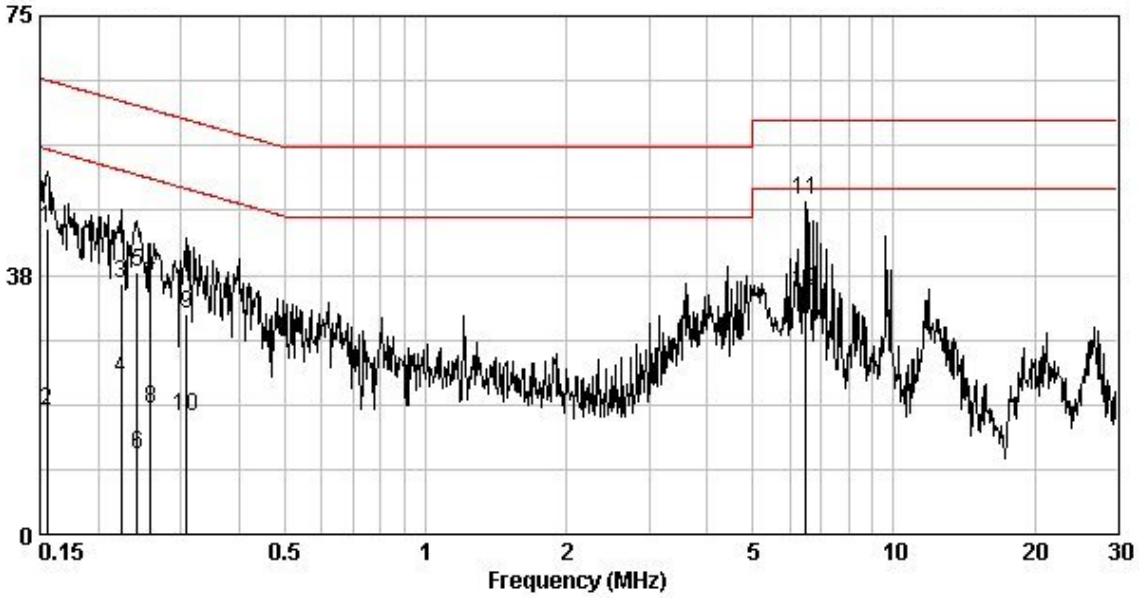
*Decreases with the logarithm of the frequency.

4.4 Conducted emission data FCC 15.207

Phase: Line
Model No.: TR5830
Operating mode: Tx operating mode

Frequency (MHz)	Corr. Factor (dB)	Level Qp (dBuV)	Limit Qp (dBuV)	Level AV (dBuV)	Limit Av (dBuV)	Margin (dB) Qp	Av
0.16	0.81	44.34	65.69	17.86	55.69	-21.36	-37.84
0.22	0.69	36.37	62.70	22.44	52.70	-26.33	-30.26
0.24	0.61	37.82	62.04	11.59	52.04	-24.22	-40.45
0.26	0.55	35.86	61.47	18.11	51.47	-25.61	-33.36
0.31	0.37	31.91	60.02	16.99	50.02	-28.10	-33.02
6.50	0.37	48.35	60.00	35.27	50.00	-11.65	-14.73

Remark:
1. Corr. Factor (dB)= LISN Factor (dB) + Cable Loss (dB)
2. Margin (dB) = Level (dBuV) – Limit (dBuV)



Phase: Neutral
Model No.: TR5830
Operating mode: Tx operating mode

Frequency (MHz)	Corr. Factor (dB)	Level Qp (dBuV)	Limit Qp (dBuV)	Level AV (dBuV)	Limit Av (dBuV)	Margin (dB) Qp	Av
0.15	0.11	43.76	65.78	14.91	55.78	-22.02	-40.87
0.19	0.11	34.65	64.02	13.53	54.02	-29.37	-40.49
0.22	0.11	37.13	62.83	20.74	52.83	-25.70	-32.09
0.24	0.11	39.51	62.00	11.09	52.00	-22.49	-40.91
6.00	0.31	39.90	60.00	30.59	50.00	-20.10	-19.41
6.50	0.32	46.41	60.00	35.81	50.00	-13.59	-14.19

Remark:
1. Corr. Factor (dB)= LISN Factor (dB) + Cable Loss (dB)
2. Margin (dB) = Level (dBuV) – Limit (dBuV)