Chapter 1 Introduction

Description of EUT:

This device is a receiver of car alarm system that install in the car . The system contains a receiver and a remote controller .

Connection of EUT:

(1)Two wires connect the EUT to a 12V battery .
(2)Four wires connect the EUT to a shock sensor.
(3)Two wires connect the EUT to a siren.
(4)Two wires connect the EUT to a LED & Reset.
(5)The alarm panel connects with cables unterminated .

Test method:

Plug the battery and make sure the EUT is in "receiving" mode. There is a near field probe probe placed approximately to the EUT to radiate an unmodulated continous wave (CW) signal to EUT at its operating frequency in order to "cohere" from such a receiver. The signal level may need to be increased for this to occur pursuant to FCC ANSI C63.4 Section 12.1.1.1' The amplitude and frequency of the signal was varied to yield the maximum emission.

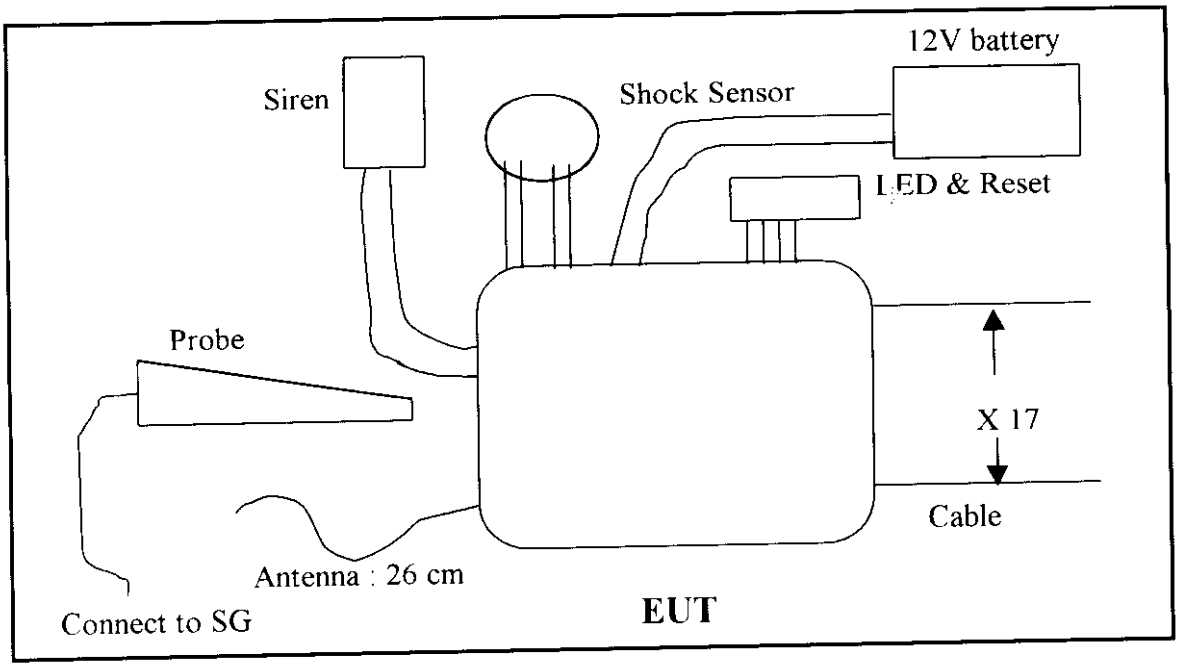
If the emission is less than 20 dB, no data can be recorded or the number of test data recorded is less than six.

Statement of transition provision for compliance with the rules

The EUT receives the signal which only send from the remote controller. The EUT won't be influenced by the transition provision , it will be continuous comply with the regulations of the FCC Part 15 . (The relative remote controller FCC ID : LEZCA750T).

The testing configuration of test setup is showing in the next page.

Configuration of test setup:



EUT:

* Between EUT and shock sensor --- four wires 82 cm long, 22 AWG, Non-shielded, no ferrite core.
* Between EUT and LED & Reset--- four wires 105 cm long, 22 AWG, Non-shielded, no ferrite core.
* Between EUT and siren --- two wires 250 cm & 270 cm long for 20 AWG, Non-shielded, no ferrite core.
* Other cable (17 wire) is unterminated, 135 cm long for 16 wire (15 wire/22 AWG, 1 wire/20 AWG), one wire is 244 cm long , 22 AWG, non-shielded, no ferrite core.

List of support equipment

Field Probe : HP Field Probe 30MHz~1GHz

Model No. : HP11940A

Serial No. : 2650A03038

Signal Generator : HP 9KHz~4000MHz

Model No. : 8648D

Serial No. : 3613A00117

Power type : 110vac 60Hz

Power cord : Non - Shielded

Chapter 3 Radiated emission test

Test condition and setup:

Pretest : Prior to the final test (OATS test) ,the EUT is placed in a shielded enclosure, and scan from 30MHz to 20GHz. This is done to ensure the radiation exactly emits form the EUT.

Final test: Final radiation measurements is made on a **3 - meter,** open-field test site. The EUT is placed on a nonconductive table which is 0.8 m height, the top surface is 1.0 x 1.5 meter. All the placement is according to ANSI C63.4 - 1992.

The spectrum is examined from 30 MHz to 20 GHz measured by HP spectrum.

The field strength below 1 GHz was measured by EMCO Bi-Log Periodic Antenna (model 3142) at 3 meter, and the EMCO Double Ridged Guide Antenna (model 3115) was used in frequencies 1 ~ 20 GHz at a distance of 1 meter. All test results were extrapolated tl equivalent signal at 3 meters utilizing an inverse linear distance extrapolated factor (20dB/decade).

Measure more than six top marked frequencies generated form pretest by computer step by step at each frequency. The EUT is rotated 360 degrees, and antenna is raised and lowered from 1 to 4 meters to find the maximum emission levels. The antenna is used with both horizontal and vertical polarization.

Appropriated preamplifier which is made by TRC is used for improving sensitivity and precautions is taken to avoid overloading. The frequency below or equal to 1000MHz apply a quasi-peak detector and the frequency above 1000MHz is measured both peak and average detector. If the peak value of EUT complies with limits then the average reading is not required.

If the emission is close to the frequency band of ambient, the data will be rechecked by the tester and the corrected data will be written in the test data sheet. If the emission is just within the ambient, the data from shield room will be taken as the final data.

List of test Instrument:

Instrument Name	Model No.	Brand	Serial No.	Calibration Date Last	Next
Spectrum analyzer	8568B	H P	3004A18617	05/15/98	05/15/99
Quasi-peak Adapter	85650A	H P	2521A00984	05/15/98	05/15/99
RF Pre-selector	85685A	H P	2947A01011	05/15/98	05/15/99
Spectrum analyzer	8564E	H P	US36433002	08/13/98	08/13/99
Antenna(1G-18 GHz)	3115	EMCO	5178	08/13/98	08/13/99
Antenna (30M-2 GHz)	3142	EMCO	1296	06/10/98	06/10/99
Open test side (Antenna, Amplify, cable calibrated together)				05/15/98	05/15/99

The level of confidence of 95%, the uncertainty of measurement of radiated emission is ± 4.96 dB.

Test Result: Pass (Appendix B)

Appendix A

Radiated Emission Test Result: (Horizontal)

Test Conditions:

Testing room : Temperature : 31 ° C Humidity : 72% RH

Testing site : Temperature : 34 ° C Humidity : 81% RH

Frequency	Reading Amplitude	Ant. Height	Table	Correction Factors	Corrected Amplitude	Class B limit	Margin
MHz	dBuV	m	degree	dB/m	dBuV/m	dBuV/m	dB
30.000	32.97	3.02	221	-15.33	17.64	40.00	-22.36
56.700	39.38	3.02	194	-23.92	15.46	40.00	-24.54
72.980	38.59	3.02	138	-24.40	14.19	40.00	-25.81
120.42	35.01	3.02	295	-23.32	11.69	43.50	-31.81
300.62	37.28	3.02	168	-14.84	22.44	46.00	-23.56
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Note:

1.Margin = Amplitude - limit, *if margin is minus means under limit.*

2.Corrected Amplitude = Reading Amplitude + Correction Factors

3.Correction factor = Antenna factor + (Cable Loss - Amplitude gain)

(For example : 30MHz correction factor = 15.5 + (-15.26) = 0.24 dB/m)

The emissions of EUT are not find at frequency range 1GHz to 20 GHz.

Radiated Emission Test Result: (Vertical)

Frequency	Reading Amplitude	Ant. Height	Table	Correction Factors	Corrected Amplitude	Class B limit	Margin
MHz	dBuV	m	degree	dB/m	dBuV/m	dBuV/m	dB
30.000	37.66	1.00	338	-15.33	22.33	40.00	-17.67
56.700	37.20	1.00	226	-23.92	13.28	40.00	-26.72
72.980	49.00	1.00	200	-24.40	24.60	40.00	-15.40
120.42	46.67	1.00	57	-23.32	23.35	43.50	-20.15
300.62	42.65	3.02	115	-14.84	22.44	46.00	-18.19
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The emissions of EUT are not find at frequency range 1GHz to 20 GHz.

Final statement:
This test report, measurements made by TRC are traceable to the NIST.