RADIO TEST REPORT

Test Report No. : 28DE0027-HO-01-A-R1

Applicant	:	**ALPINE ELECTRONICS, INC.**
Type of Equipment	:	**Bluetooth Module Board**
Model No.	:	**UGZZ4-301B**
FCC ID	:	**A269ZUA127**
Test standard	:	**FCC Part 15 Subpart C 2007 Section 15.247**
Test Result	:	**Complied**

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6. Original test report number of this report is 28DE0027-HO-01-A.

Date of test: November 19 to 30, 2007

Tested by: Norihisa Hashimoto, EMC Services; Shinya Watanabe, EMC Services

Approved by : Mitsuru Fujimura, EMC Services

NVLAP LAB CODE: 200572-0

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*As for the range of Accreditation in NVLAP, you may refer to the WEB address, http://uljapan.co.jp/emc/nvlap.htm

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SECTION 1: Customer information

Company Name	:	ALPINE ELECTRONICS, INC.
Address	:	20-1 Yoshima-kogyodanchi Iwaki Fukushima Japan
Telephone Number	:	+81-246-36-4111
Facsimile Number	:	+81-246-36-6090
Contact Person	:	Shinichi Asuke

SECTION 2: Equipment under test (E.U.T.)

2.1 Identification of E.U.T.

Type of Equipment	:	Bluetooth Module Board
Model No.	:	UGZZ4-301B
Serial No.	:	1
Country of Manufacture	:	Japan
Receipt Date of Sample	:	November 14, 2007
Condition of EUT	:	Production model
Modification of EUT	:	No modification by the test lab.

2.2 Product Description

Model No: UGZZ4-301B (referred to as the EUT in this report) is the Bluetooth Module Board .
The EUT is installed in the vehicular host (Car Audio) for testing purpose.

Clock frequency(ies) in the system	:	59.755MHz, 32.768MHz, 18.87MHz, 18.432MHz, 16.384MHz, 14.94MHz, 11.2896MHz, 7.465MHz, 3.072MHz, 2.822MHz, 2.048MHz
Equipment Type	:	Transceiver
Frequency of Operation	:	2402-2480MHz
Bandwidth & Channel spacing	:	79MHz & 1MHz / CH
Modulation	:	FHSS
Antenna Type	:	Inverted-F Antenna
Antenna Gain	:	1.5dBi max
Operating voltage	:	DC3.3V (to Module), DC5.0V, DC8.5V (to Board)

SECTION 3: Test specification, procedures & results

3.1 Test Specification

Test Specification	:	FCC Part15 Subpart C: 2007
Title	:	FCC 47CFR Part15 Radio Frequency Device Subpart C Intentional Radiators Section 15.247 Operation within the bands 902-928MHz, 2400-2483.5MHz, and 5725-5850MHz

FCC 15.31 (e)

*The EUT (Bluetooth Module Board) is provided with DC5.0V and DC8.5V, and the RF module of EUT is constantly provided with stable voltage (DC3.3V) through regulator (in Bluetooth Module Board).
Therefore, this EUT complies with the requirement.

FCC Part 15.203 Antenna requirement

It is impossible for end users to replace the antenna, because the antenna is mounted inside of the end-product (Car Audio) manufactured by ALPINE ELECTRONICS, INC.
Therefore, the equipment complies with the antenna requirement of Section 15.203.

3.2 Procedures and results

[FHSS]

No.	Item	Test Procedure	Specification	Remarks	Deviation	Worst Margin	Results
1	Conducted emission	**FCC:** ANSI C63.4:2003 7. AC powerline conducted emission measurements	**FCC:** Section 15.207	-	N/A *1)	N/A	N/A
		IC: RSS-Gen 7.2.2	**IC:** RSS-Gen 7.2.2				
2	Carrier Frequency Separation	**FCC:** FCC Public Notice DA 00-705	**FCC:** Section15.247(a)(1)	Conducted	N/A	See data.	Complied
		IC: -	**IC:** RSS-210 A8.1 (b)				
3	20dB Bandwidth	**FCC:** FCC Public Notice DA 00-705	**FCC:** Section15.247(a)(1)	Conducted	N/A		Complied
		IC: -	**IC:** RSS-210 A8.1 (a)				
4	Number of Hopping Frequency	**FCC:** FCC Public Notice DA 00-705	**FCC:** Section15.247(a)(1)(iii)	Conducted	N/A		Complied
		IC: -	**IC:** RSS-210 A8.1 (d)				
5	Dwell time	**FCC:** FCC Public Notice DA 00-705	**FCC:** Section15.247(a)(1)(iii)	Conducted	N/A		Complied
		IC: -	**IC:** RSS-210 A8.1 (d)				
6	Maximum Peak Output Power	**FCC:** FCC Public Notice DA 00-705	**FCC:** Section15.247(b)(1)	Conducted	N/A		Complied
		IC: RSS-Gen 4.8	**IC:** RSS-210 A8.4 (2)				
7	Band Edge Compliance	**FCC:** FCC Public Notice DA 00-705	**FCC:** Section15.247(d)	Conducted	N/A		Complied
		IC: -	**IC:** RSS-210 A8.5				
8	Spurious Emission	**FCC:** FCC Public Notice DA 00-705	**FCC:** Section15.247(d)	Conducted/ Radiated	N/A	[Tx] 1.4dB 298.760MHz, QP Horizontal [Rx] 4.0dB 4807.9MHz, AV Vertical	Complied
		IC: RSS-Gen 4.9 RSS-Gen 4.10	**IC:** RSS-210 A8.5 RSS-Gen 7.2.1 and 7.2.3				

Note: UL Japan, Inc.'s EMI Work Procedures No.QPM05 and QPM15.
*1) The test is not applicable since the EUT is for vehicular use.

*These tests were performed without any deviations from test procedure except for additions or exclusions.
*In case any questions arise about test procedure, ANSI C63.4: 2003 is also referred.

3.3 Addition to standards

No.	Item	Test Procedure	Specification	Remarks	Deviation	Worst margin	Results
1	99% Occupied Band Width	RSS-Gen 4.6.1	-	Conducted	N/A	N/A	N/A

3.4 Uncertainty

The following uncertainties have been calculated to provide a confidence level of 95% using a coverage factor k=2.

Test room	Conducted emission	Radiated emission (10m*)			Radiated emission (3m*)			Radiated emission (3m*)
	150kHz-30MHz	9kHz-30MHz	30MHz-300MHz	300MHz-1GHz	9kHz-30MHz	30MHz-300MHz	300MHz-1GHz	1GHz <
No.1 semi-anechoic chamber	±3.7dB	±3.1dB	±4.7dB	±4.4dB	±3.2dB	±3.7dB	±4.4dB	±5.9dB
No.2 semi-anechoic chamber	±3.7dB	-	-	-	±3.2dB	±4.3dB	±3.9dB	±5.9dB
No.3 semi-anechoic chamber	±3.7dB	-	-	-	±3.2dB	±4.2dB	±4.4dB	±5.9dB
No.4 semi-anechoic chamber	±3.7dB	-	-	-	±3.2dB	±4.2dB	±4.4dB	±5.9dB

*10m/3m = Measurement distance

Radiated emission test(3m)
The data listed in this report meets the limits unless the uncertainty is taken into consideration.

Other test except Conducted Emission and Spurious Emission (Radiated)
The measurement uncertainty for this test is ±3.0dB.

3.5 Test Location

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	FCC Registration Number	IC Registration Number	Width x Depth x Height (m)	Size of reference ground plane (m) / horizontal conducting plane	Other rooms
No.1 semi-anechoic chamber	313583	IC4247	19.2 x 11.2 x 7.7m	7.0 x 6.0m	No.1 Power source room
No.2 semi-anechoic chamber	655103	IC4247-2	7.5 x 5.8 x 5.2m	4.0 x 4.0m	-
No.3 semi-anechoic chamber	148738	IC4247-3	12.0 x 8.5 x 5.9m	6.8 x 5.75m	No.3 Preparation room
No.3 shielded room	-	-	4.0 x 6.0 x 2.7m	N/A	-
No.4 semi-anechoic chamber	134570	IC4247-4	12.0 x 8.5 x 5.9m	6.8 x 5.75m	No.4 Preparation room
No.4 shielded room	-	-	4.0 x 6.0 x 2.7m	N/A	-
No.5 semi-anechoic chamber	-	-	6.0 x 6.0 x 3.9m	6.0 x 6.0m	-
No.6 shielded room	-	-	4.0 x 4.5 x 2.7m	4.75 x 5.4 m	-
No.6 measurement room	-	-	4.75 x 5.4 x 3.0m	4.75 x 4.15 m	-
No.7 shielded room	-	-	4.7 x 7.5 x 2.7m	4.7 x 7.5m	-
No.8 measurement room	-	-	3.1 x 5.0 x 2.7m	N/A	-
No.9 measurement room	-	-	8.0 x 4.5 x 2.8m	N/A	-
No.10 measurement room	-	-	2.6 x 2.8 x 2.5m	2.4 x 2.4m	-
No.11 measurement room	-	-	3.1 x 3.4 x 3.0m	2.4 x 3.4m	-

* Size of vertical conducting plane (for Conducted Emission test) : 2.0 x 2.0m
for No.1, No.2, No.3, and No.4 semi-anechoic chambers and No.3 and No.4 shielded rooms.

3.6 Test set up, Test instruments and Data of EMI

Refer to APPENDIX 1 to 3.

SECTION 4: Operation of E.U.T. during testing

4.1 Operating Mode(s)

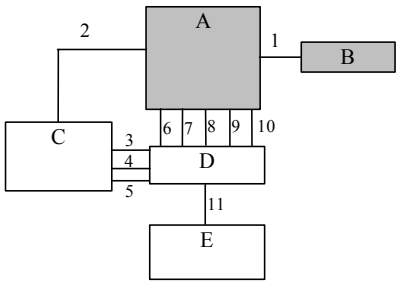
The mode used for test : Transmitting mode(Packet size DH5(Worst), Data packet: PRBS9)
- Low Channel : 2402MHz
- Mid Channel : 2441MHz
- High Channel : 2480MHz

Inquiry mode

Receiving mode
- Mid Channel : 2441MHz

As a result of preliminary test, the formal test was performed with the above modes, which had the maximum payload (except Dwell time test).
Remarks: Test was not performed at AFH mode, because the decrease of number of channel (min: 20ch) at AFH mode does not influence on the output power and bandwidth of the EUT.
However, the limit level 125mWof AFH mode was used for the test.

4.2 Configuration and peripherals



* Cabling and setup were taken into consideration and test data was taken under worse case conditions.

Description of EUT and Support equipment

No.	Item	Model number	Serial number	Manufacturer	Remarks
A	Bluetooth Module Board	UGZZ4-301B	1	ALPINE ELECTRONICS, INC.	EUT
B	Antenna *1)	-	1	ALPINE ELECTRONICS, INC.	EUT
C	Navigation Monitor	-	-	ALPINE ELECTRONICS, INC.	-
D	Navigation	-	-	ALPINE ELECTRONICS, INC.	-
E	Car Battery	40B19L	A030402	YUASA	-

*1) Used for Radiated emission test only.

List of cables used

No.	Name	Length (m)	Shield	
			Cable	Connector
1	Antenna Cable *1) *2)	0.6	Unshielded	Unshielded
2	Signal Cable	0.4	Unshielded	Unshielded
3	Audio Cable	0.3	Unshielded	Unshielded
4	Signal Cable	0.5	Unshielded	Unshielded
5	Signal Cable	0.5	Unshielded	Unshielded
6	Signal Cable	0.15	Unshielded	Unshielded
7	Signal Cable	0.15	Unshielded	Unshielded
8	Signal Cable	0.15	Unshielded	Unshielded
9	Signal Cable	0.15	Unshielded	Unshielded
10	Signal Cable	0.15	Unshielded	Unshielded
11	DC Cable	1.8	Unshielded	Unshielded

*1) Used for Radiated emission test only.
*2) There are two types of antenna cable. One is short cable (0.5m), and the other is long cable (3.0m).
The test was made with short cable since the carrier power of short cable was larger than the one of long cable.

SECTION 5: Spurious Emission

[Conducted]
Test Procedure
The Out of Band Emission was measured with a spectrum analyzer connected to the antenna port.
Test data : APPENDIX 2
Test result : Pass

[Radiated]
Test Procedure
EUT was placed on a urethane platform of nominal size, 0.5m by 0.5m, raised 80cm above the conducting ground plane.
The Radiated Electric Field Strength intensity has been measured in a Semi Anechoic Chamber with a ground plane and at a distance of 3m(Below 10GHz) and 1m(Upper 10GHz).
The height of the measuring varied between 1 and 4m and EUT was rotated a full revolution in order to obtain the maximum value of the electric field intensity.
The measurements were performed for both vertical and horizontal antenna polarization with the Test Receiver, or the Spectrum Analyzer (in linear mode).
The test was made with the detector (RBW/VBW) in the following table.
When using Spectrum analyzer, the test was made with adjusting span to zero by using peak hold.

In any 100kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator confirmed 20dB below that in the 100kHz bandwidth within the band that contains the highest level of the desired power, based on a radiated measurement.

20dBc was applied to the frequency over the limit of FCC 15.209 / Table 2 of RSS-210 2.7 (IC) and outside the restricted band of FCC15.205 / Table 1 of RSS-210 2.7 (IC).

Frequency	Below 1GHz	Above 1GHz
Instrument used	Test Receiver / Spectrum Analyzer	Spectrum Analyzer
Detector IF Bandwidth	QP: BW 120kHz(T/R) 20dBc : RBW: 100kHz VBW: 300kHz (S/A)	PK: RBW:1MHz/VBW: 1MHz AV: RBW:1MHz/VBW:10Hz 20dBc : RBW:100kHz/VBW:300kHz

- The carrier level and noise levels were confirmed at each position of X, Y and Z axes of EUT to see the position of maximum noise, and the test was made at the position that has the maximum noise. (for antenna)

- The test was made on EUT at the normal use position (X-axis). (for Bluetooth Module Board)

Test data : APPENDIX 2
Test result : Pass

SECTION 6: Bandwidth

Test Procedure

The bandwidth was measured with a spectrum analyzer connected to the antenna port.

Test data : **APPENDIX 2**
Test result : **Pass**

SECTION 7: Maximum Peak Output Power

Test Procedure

The Maximum Peak Output Power was measured with a power meter (tested bandwidth: 50MHz) connected to the antenna port.

Test data : **APPENDIX 2**
Test result : **Pass**

SECTION 8: Carrier Frequency Separation

Test Procedure

The carrier frequency separation was measured with a spectrum analyzer connected to the antenna port.

Test data : **APPENDIX 2**
Test result : **Pass**

SECTION 9: Number of Hopping Frequency

Test Procedure

The Number of Hopping Frequency was measured with a spectrum analyzer connected to the antenna port.

Test data : **APPENDIX 2**
Test result : **Pass**

SECTION 10: Dwell time

Test Procedure

The Dwell time was measured with a spectrum analyzer connected to the antenna port.

Test data : **APPENDIX 2**
Test result : **Pass**