EMI TEST REPORT

Test report No. : **EMC- FCC- 0058**

Type of equipment : **CAR DVD-PLAYER**

Model No. : **DA-100**

FCC ID. : **QV3DA100TFDS**

Applicant : **DAESUNG ELTEC CO., LTD.**

Test standards : **FCC part 15 subpart B, Class B**
FCC part 15 subpart C, Class B

Test result : **Complied**

The above equipment was tested by EMC compliance Testing Laboratory for compliance with the requirements of FCC Rules and Regulations.
The results of testing in this report apply to the product/system which was tested only. Other similar equipment will not necessarily produce the same results due to production tolerance and measurement uncertainties.

Date of test: 2003.2.26~2.27 Issued date: 2003 . 3. 3

Tested by : **Kim, Jung-Soo**

Approved by: **Chung, Min-Seok**

82-1, JEIL-RI, YANGJI-MYUN, YONGIN-CITY, KYUNGGI-DO, KOREA
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Contents

1. Client information

Applicant:	DAESUNG ELTEC CO., LTD.
Address:	371-6, Kasan-Dong, Kumchon-Gu, Seoul, 153-023, Korea
Telephone number:	82-2-866-4131
Facsimile number:	82-2-838-9051
President:	Yoon, Jong-Kyung

Manufacture:	DAESUNG ELTEC CO., LTD.
Address:	371-6, Kasan-Dong, Kumchon-Gu, Seoul, 153-023, Korea
Telephone number:	82-2-866-4131
Facsimile number:	82-2-838-9051

2. Laboratory information

Address

EMC compliance Ltd.

82-1, JEIL-RI, YANGJI-MYUN, YOUNGIN-CITY, KYUNGGI-DO, KOREA

Telephone Number : 82 31 336 9919

Facsimile Number : 82 31 336 4767

FCC Filing No. : 793334

SITE MAP

3. TEST SYSTEM CONFIGURATION

3.1 Operation Environment

	Temperature	Humidity	Pressure
OATS :	5°C	36 %	1011 hPa

Test site

These testing were performed following locations;

OATS (3m) : Radiated emission

3.2 Measurement Uncertainty

All measurements involve certain levels of uncertainties, especially in field of EMI. The factors contributing to uncertainties are test receiver, Cable Loss, antenna factor calibration, Antenna directivity, antenna factor Variation with height, antenna phase center variation, antenna Frequency interpolation, measurement distance variation, Site imperfection, mismatching, and system repeatability.

Based on NIS 80, 81, the measurement uncertainty level with a 95% confidence level was applied.

3.3 Sample calculation

Radiated emission

The field strength is calculated adding the antenna Factor, cable loss and, Antenna pad adding, subtracting the amplifier gain from the measured reading.
The sample calculation is as follows :

FS = MR + AF + CL + AT –AG
MR = Meter Reading
AF = Antenna Factor
CL = Cable Loss
AP = Antenna Pad
AG=Amplifier Gain

If MR is 30dB, AF 12dB, CL 5dB, AP 10dB, AG 35dB
The result (MR) is
30 + 12 + 5 + 10 –35 = 22dBuV/m

4. Description of EUT

4.1 Product Description

Manufactured by:	**DAESUNG ELTEC CO., LTD.**
Address:	371-6 , Kasan-Dong, Kumchon-Gu, Seoul, 153-023, Korea
Type of equipment:	CAR DVD-PLAYER
Model:	DA-100
Serial number:	N/A
Power source:	DC 11 V~16 V, 30W(Max.)

4.2 Peripherals

Description	Model / Part #	Serial Number	Manufacture
DC Power Supply	6032A	US38322201	HP

4.3 Used cables

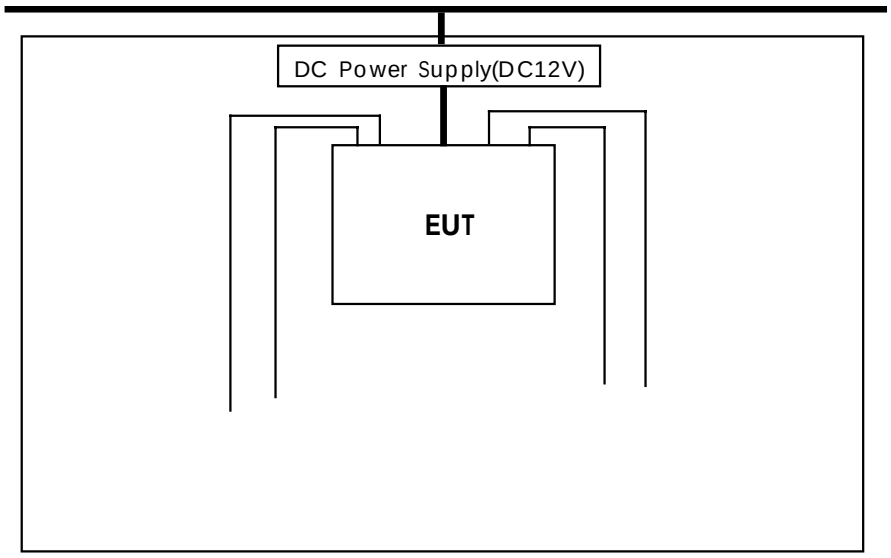
EUT Port	Type	Shield (Y/N)	Length (m)	Connection point 1	Connection point 2
Audio(L/R) Input	-	N	1.0	EUT	Open cable
Video input	-	N	1.0		75Ω terminator
Audio(L/R) Output (1),(2)	-	N	1.2		Open cable
Video Output(1),(2)	-	N	1.2		75Ω terminator
Digital out	-	N	1.2		Open cable
Door S/W	-	N	0.8		Open cable
Power Select	-	N	0.8		Open cable
LAMP(+)(EIL GND)	-	N	0.8		DC Power Supply

4.4 Operating conditions

Operating : 1. DVD play mode
2. FM transmitter mode

- The system was configured in typical fashion (as a customer would normally use it) for testing.
- This EUT was tested transmitter operating and DVD play mode.

4.5 EUT test configuration



5. Summary of test results

5.1 Modification to the E.U.T.

None

5.2 Standards & results

FCC Part 15 Subpart B (Class B)
FCC Part 15 Subpart C (Class B)
- ANSI C63.4 – 1992

Test items	Test methods	Result
Radiated Electric Field emission	ANSI C63.4-1992	Pass
Intentional radiator 200kHz bandwidth	ANSI C63.4-1992	Pass
Intentional radiator field strength of radiation	ANSI C63.4-1992	Pass
Intentional radiator field strength of spurious	ANSI C63.4-1992	Pass

* Conducted emission test was waived because the EUT used in vehicle.

6. Test results

6.1 Radiated Electric Field Emission

6.1.1 Measurement procedure

The test was done at a 3m open area test site with a quasi-peak detector.
EUT was placed on a non-metallic table height of 0.8m above the reference ground plane.
They were folded back and forth forming a bundle 0.3m to 0.4m long and were hanged at a 0.4m height to the ground plane.
Cables connected to EUT were fixed to cause maximum emission.
Test was made with the antenna positioned in both the horizontal and vertical planes of polarization. The measurement antenna was varied in height above the conducting ground plane to obtain the maximum signal strength.

6.1.2 Used equipments

Equipment	Model no.	Serial no.	Makers	Next Cal. date	Used
Test receiver	ESVS10	827864/006	R&S	03.05.08	●
Spectrum	SA-9270A	01080005	LG	03.05.10	●
Biconnical antenna	SAS-540	560	A.H.System	03.04.04	●
Log-Periodic antenna	SAS-510-2	1035	A.H.System	03.04.04	●
Antenna Mast	A109	N/A	DEAIL	.	●
Turn Table	TS14	N/A	DEAIL	.	●
3m OATS	-	-	EMC Compliance	-	●

6.1.3 Measurement uncertainty

Radiated Emission measurement : (K=2)
30-300 MHz ; 3 m: ±3.67, 10 m: ±4.4
300-1000 MHz ; 3 m:+4.6/-2.92, 10 m:+2.94/-2.88

6.1.4 Test data

[DVD play & transmitter mode]

Frequency	Reading	Pol.	Height	angle	Correction Factor		Limits	Result	Margin
[MHz]	[dBuV/m]		[m]		Antenna	Cable	[dBuV/m]	[dBuV/m]	[dB]
110.00	19.3	H	2.9	297	10.20	1.45	43.5	30.95	12.55
202.54	24.0	H	1.6	240	14.30	2.12	43.5	40.42	3.08
216.00	25.0	H	1.4	217	14.70	2.26	46.0	41.96	4.04
216.00	20.8	V	1.0	132	14.70	2.26	46.0	37.76	8.24
270.00	21.0	H	1.2	249	17.20	3.02	46.0	41.22	4.78
347.17	24.6	H	1.0	76	14.86	3.41	46.0	42.87	3.13
405.02	22.7	V	1.7	292	16.22	3.62	46.0	42.54	3.46
464.10	20.6	H	1.4	224	17.57	3.88	46.0	42.05	3.95
548.97	19.2	V	1.0	264	18.43	4.29	46.0	41.92	4.08
664.90	15.5	V	1.0	302	20.57	4.60	46.0	40.67	5.33
994.94	11.8	H	1.6	244	23.09	5.66	54.0	40.55	13.45

* Receiving Antenna Mode : *Horizontal, Vertical*

* <5 : mean less than 5dB

* IF Bandwidth : 120kHz

* Note : Reading = Test Receiver meter,

* P= Polarization → POL H = Horizontal, POL V = Vertical

* Result = Field Strength (Antenna factor + Cable factor + Reading)

6.1.5 Result

Complied

6.2 Intentional radiator 200kHz Bandwidth

6.2.1 Measurement procedure

The test was done at a 3m open area test site with a quasi-peak detector.
EUT was placed on a non-metallic table height of 0.8m above the reference ground plane.
They were folded back and forth forming a bundle 0.3m to 0.4m long and were hanged at a 0.4m height to the ground plane.
Cables connected to EUT were fixed to cause maximum emission.
Test was made with the antenna positioned in both the horizontal and vertical planes of polarization. The measurement antenna was varied in height above the conducting ground plane to obtain the maximum signal strength.

6.2.2 Used equipments

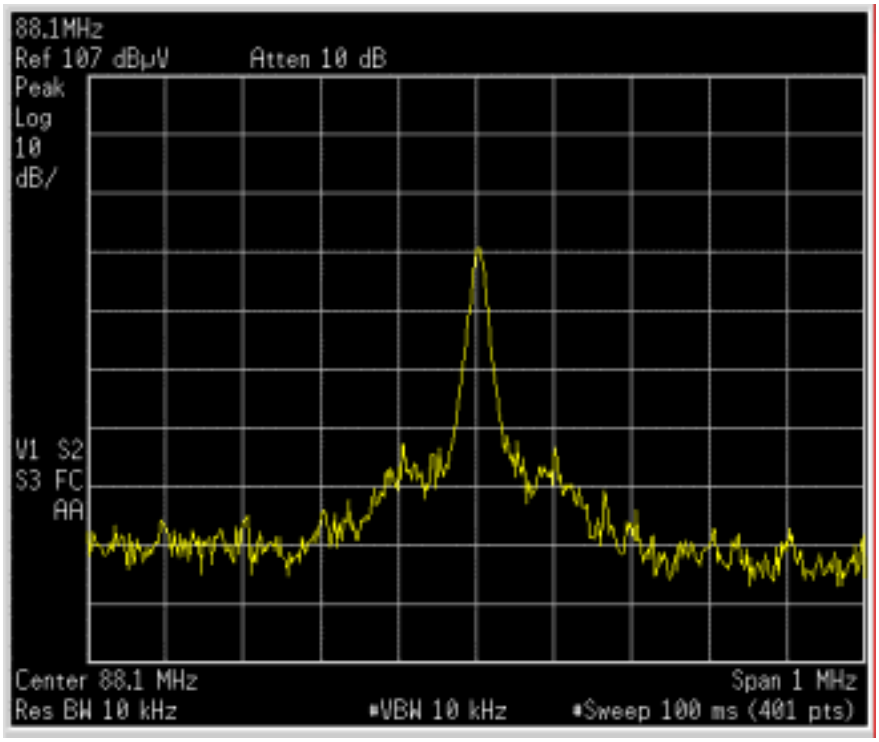
Equipment	Model no.	Serial no.	Makers	Next Cal. date	Used
Test receiver	ESVS10	827864/006	R&S	03.05.08	●
Spectrum	SA-9270A	01080005	LG	03.05.10	●
Biconnical antenna	SAS-540	560	A.H.System	03.04.04	●
Log-Periodic antenna	SAS-510-2	1035	A.H.System	03.04.04	●
Antenna Mast	A109	N/A	DEAIL	.	●
Turn Table	TS14	N/A	DEAIL	.	●
3m OATS	-	-	EMC Compliance	-	●

6.2.3 Instrument Settings

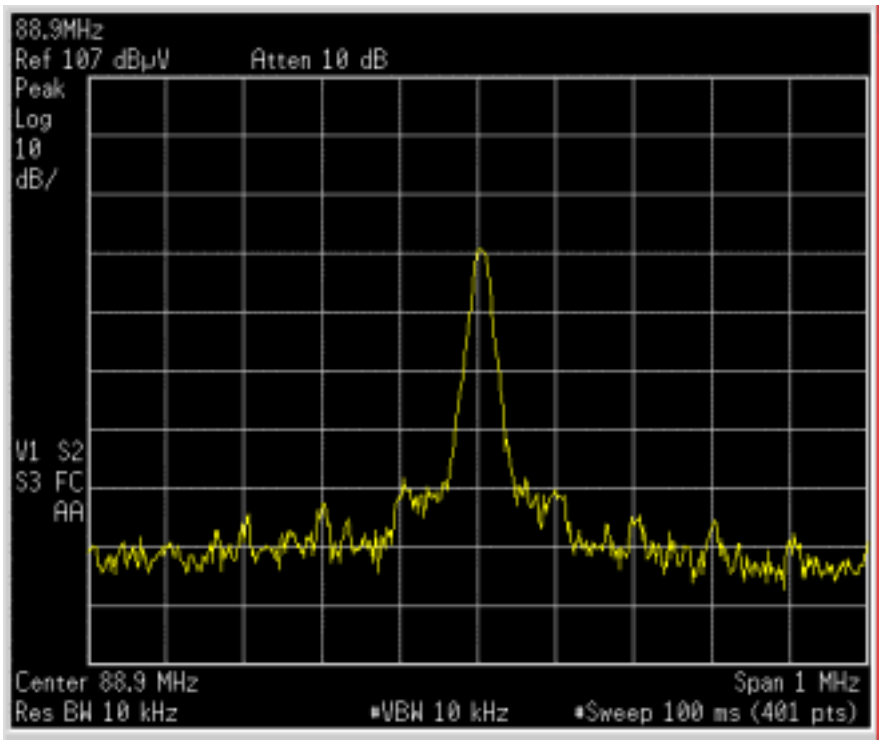
RES BW : 10 kHz
VBW : 10 kHz

6.2.4 Test data

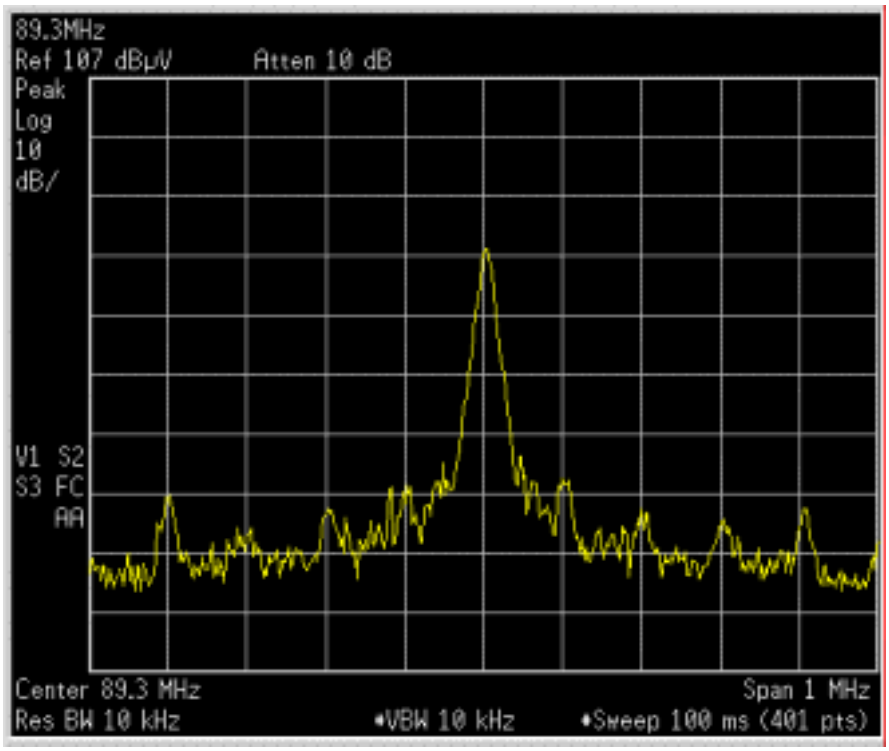
[88.1MHz]



[88.9MHz]



[89.3MHz]



6.2.5 Result

Complied

6.3 Intentional radiator Field Strength of Radiation

6.3.1 Measurement procedure

The test was done at a 3m open area test site with a quasi-peak detector.
EUT was placed on a non-metallic table height of 0.8m above the reference ground plane.
They were folded back and forth forming a bundle 0.3m to 0.4m long and were hanged at a 0.4m height to the ground plane.
Cables connected to EUT were fixed to cause maximum emission.
Test was made with the antenna positioned in both the horizontal and vertical planes of polarization. The measurement antenna was varied in height above the conducting ground plane to obtain the maximum signal strength.

6.3.2 Used equipments

Equipment	Model no.	Serial no.	Makers	Next Cal. date	Used
Test receiver	ESVS10	827864/006	R&S	03.05.08	●
Spectrum	SA-9270A	01080005	LG	03.05.10	●
Biconnical antenna	SAS-540	560	A.H.System	03.04.04	●
Log-Periodic antenna	SAS-510-2	1035	A.H.System	03.04.04	●
Antenna Mast	A109	N/A	DEAIL	.	●
Turn Table	TS14	N/A	DEAIL	.	●
3m OATS	-	-	EMC Compliance	-	●

6.3.3 Measurement uncertainty

Radiated Emission measurement : (K=2)
30-300 MHz ; 3 m: ±3.67, 10 m: ±4.4
300-1000 MHz ; 3 m:+4.6/-2.92, 10 m:+2.94/-2.88

6.3.4 Test data

Frequency	Reading	Pol.	Height	angle	Correction Factor		Limits	Result	Margin
[MHz]	[dBuV/m]		[m]		Antenna	Cable	[dBuV/m]	[dBuV/m]	[dB]
88.10	35.8	H	1.8	232	9.04	1.28	48.0	46.12	1.88
88.90	35.6	H	1.5	225	9.04	1.28	48.0	45.92	2.08
89.30	35.6	H	1.8	230	9.02	1.24	48.0	45.86	2.14

* Receiving Antenna Mode : *Horizontal, Vertical*

* <5 : mean less than 5dB

* IF Bandwidth : 120kHz

* Note : Reading = Test Receiver meter,

* P= Polarization → POL H = Horizontal, POL V = Vertical

* Result = Field Strength (Antenna factor + Cable factor + Reading)

6.3.5 Result

Complied

6.4 Intentional radiator Field Strength of Spurious

6.4.1 Measurement procedure

The test was done at a 3m open area test site with a quasi-peak detector.
EUT was placed on a non-metallic table height of 0.8m above the reference ground plane.
They were folded back and forth forming a bundle 0.3m to 0.4m long and were hanged at a 0.4m height to the ground plane.
Cables connected to EUT were fixed to cause maximum emission.
Test was made with the antenna positioned in both the horizontal and vertical planes of polarization. The measurement antenna was varied in height above the conducting ground plane to obtain the maximum signal strength.

6.4.2 Used equipments

Equipment	Model no.	Serial no.	Makers	Next Cal. date	Used
Test receiver	ESVS10	827864/006	R&S	03.05.08	●
Spectrum	SA-9270A	01080005	LG	03.05.10	●
Biconnical antenna	SAS-540	560	A.H.System	03.04.04	●
Log-Periodic antenna	SAS-510-2	1035	A.H.System	03.04.04	●
Antenna Mast	A109	N/A	DEAIL	.	●
Turn Table	TS14	N/A	DEAIL	.	●
3m OATS	-	-	EMC Compliance	-	●

6.4.3 Measurement uncertainty

Radiated Emission measurement : (K=2)
30-300 MHz ; 3 m: ±3.67, 10 m: ±4.4
300-1000 MHz ; 3 m:+4.6/-2.92, 10 m:+2.94/-2.88

6.4.4 Test data

[88.1MHz]

Frequency	Reading	Pol.	Height	angle	Correction Factor		Limits	Result	Margin
[MHz]	[dBuV/m]		[m]		Antenna	Cable	[dBuV/m]	[dBuV/m]	[dB]
176.20	13.7	H	1.6	259	13.12	2.02	43.5	28.84	14.66
352.41	9.3	H	1.5	293	14.99	3.41	46.0	27.70	18.30
440.50	6.4	H	1.6	84	17.28	3.76	46.0	27.44	18.56

[88.9MHz]

Frequency	Reading	Pol.	Height	angle	Correction Factor		Limits	Result	Margin
[MHz]	[dBuV/m]		[m]		Antenna	Cable	[dBuV/m]	[dBuV/m]	[dB]
177.80	12.5	H	1.9	241	13.19	2.04	43.5	27.73	15.77
355.61	9.6	H	1.4	208	15.12	3.42	46.0	28.14	17.86
533.40	7.2	H	2.1	305	18.67	4.23	46.0	30.10	15.90

[89.3MHz]

Frequency	Reading	Pol.	Height	angle	Correction Factor		Limits	Result	Margin
[MHz]	[dBuV/m]		[m]		Antenna	Cable	[dBuV/m]	[dBuV/m]	[dB]
178.60	11.7	H	2.3	221	13.26	2.06	43.5	27.02	16.48
357.19	6.2	H	1.4	240	15.21	3.43	46.0	24.84	21.16

* Receiving Antenna Mode : *Horizontal, Vertical*

* <5 : mean less than 5dB

* IF Bandwidth : 120kHz

* Note : Reading = Test Receiver meter,

* P= Polarization → POL H = Horizontal, POL V = Vertical

* Result = Field Strength (Antenna factor + Cable factor + Reading)

6.4.5 Result

Complied

7. Test photographs

Radiated Electric Field Emission