

Test Report

August 7, 2009

No. **29LE0069-SH-D**

Subject : **Measurement Job based on FCC Part15B and FCC part90, for radio communication equipments in vehicle.(SC-780, FCC90)**

We report the test result based by Job No. **29LE0069-SH**.

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The results in this report apply only to the sample tested.

Customer : **SMART COMMUNICATIONS LIMITED.**

Result	☒ EMI test datacheet	Page : 2 ~ 1 0
	☐ EMS test datacheet	Page : ~
	☒ Test instruments	Page : 1 2 ~ 1 2
	☒ Photographs of test setup	Page : 1 1 ~ 1 1
	☐ Others()	Page : ~
		Total Page : 1 2

Tested by:

Kenichi Adachi

Approved by:

Tetsuya Hashimoto

- | | |
|---|---|
| ☐ YOKOWA EMC LAB. | 108, Yokowa-cho, Ise-shi, Mie 516-1106 JAPAN TEL +81-596-39-1485 FAX +81-596-39-0232 |
| ☐ YAMAKITA EMC LAB. | 907, Kawanishi, Yamakita-machi, Ashigarakami-gun, Kanagawa 258-0124 JAPAN TEL +81-465-77-1011 FAX +81-465-77-2112 |
| ☐ HEAD OFFICE EMC LAB. | 4383-326, Asama-cho, Ise-shi, Mie 516-0021 JAPAN TEL +81-596-24-8116 FAX +81-596-24-8124 |
| ☒ SHONAN EMC LAB. | 1-22-3 Megumigaoka, Hiratsuka-shi, Kanagawa-ken, 259-1220 JAPAN TEL +81-463-50-6400 FAX +81-463-50-6401 |

DATA OF RADIATED EMISSION TEST

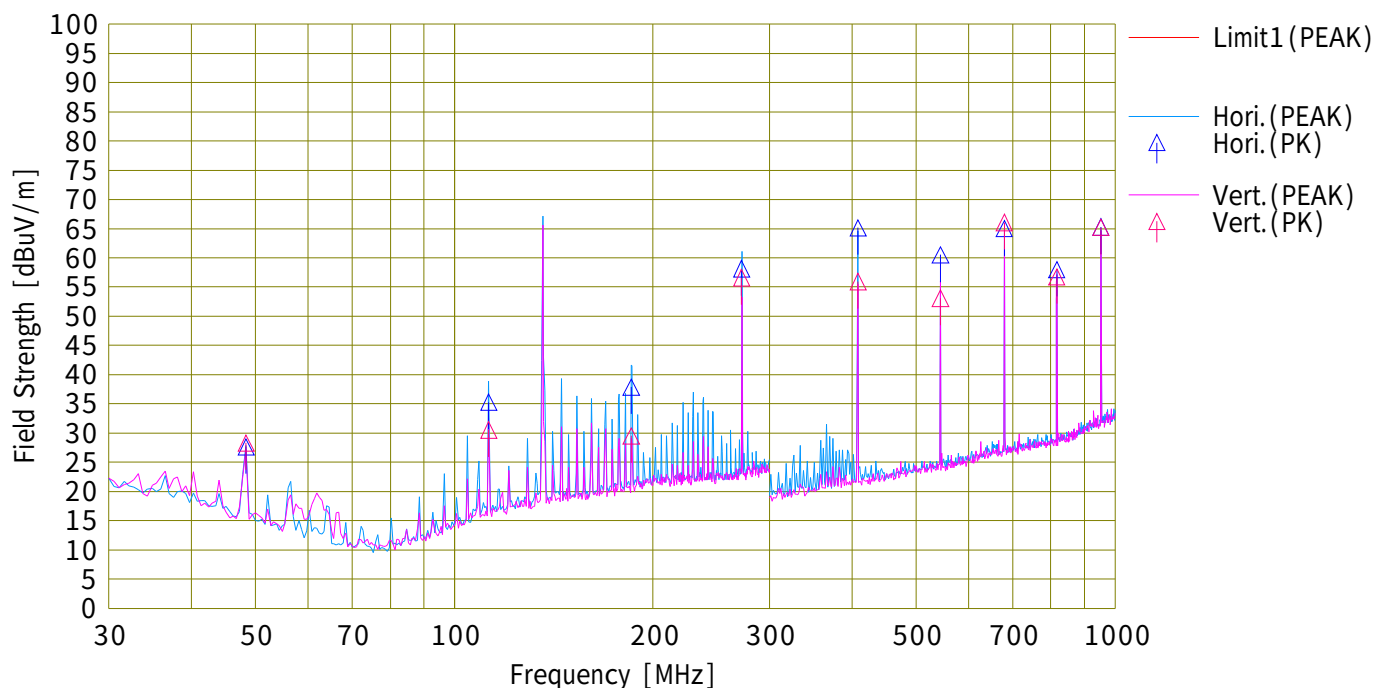
UL Japan, Inc. Shonan EMC Lab. No.3 Semi Anechoic Chamber
Date : 2009/07/29

Company : CSR,Inc.
Kind of EUT : VHF MOBILE TRANSCEIVER
Model No. : SC - 780
Serial No. : No.3

Mode : Transmitting (136.1MHz)
Report No. : 29LE0069-SH
Power : DC 13.6V
Temp./Humi. : 24deg.C. / 69%

Remarks : (below 1GHz: S/A RBW 10kHz, VBW 300kHz, above 1GHz: RBW 1MHz, VBW 3MHz)

Engineer : Kenichi Adachi



No.	Freq.	Reading <PEAK>	Ant.Fac	Loss	Gain	Result <PEAK>	Limit <PEAK>	Margin <PEAK>	Pola.	Height	Angle	Ant. Type	Comment
	[MHz]	[dBuV]	[dB/m]	[dB]	[dB]	[dBuV/m]	[dBuV/m]	[dB]	[H/V]	[cm]	[deg]		
1	48.397	40.8	12.2	6.7	32.1	27.6	---	---	Hori.	300	297	BC	
2	112.786	48.2	12.0	7.2	32.1	35.3	---	---	Hori.	300	347	BC	
3	185.291	46.0	16.2	7.7	32.0	37.9	---	---	Hori.	150	65	BC	
4	272.200	64.0	17.9	8.1	31.9	58.1	---	---	Hori.	120	269	BC	
5	408.300	72.2	16.2	8.7	31.9	65.2	---	---	Hori.	100	266	LP	
6	544.400	65.1	18.1	9.2	31.9	60.5	---	---	Hori.	217	78	LP	
7	680.500	67.2	20.0	9.7	31.9	65.0	---	---	Hori.	143	61	LP	
8	816.600	58.8	20.9	10.0	31.7	58.0	---	---	Hori.	132	124	LP	
9	952.700	63.1	22.4	10.4	30.6	65.3	---	---	Hori.	180	44	LP	
10	48.397	41.5	12.2	6.7	32.1	28.3	---	---	Vert.	183	358	BC	
11	112.786	43.4	12.0	7.2	32.1	30.5	---	---	Vert.	264	359	BC	
12	185.291	37.6	16.2	7.7	32.0	29.5	---	---	Vert.	219	359	BC	
13	272.200	62.5	17.9	8.1	31.9	56.6	---	---	Vert.	100	211	BC	
14	408.300	62.9	16.2	8.7	31.9	55.9	---	---	Vert.	100	359	LP	
15	544.400	57.7	18.1	9.2	31.9	53.1	---	---	Vert.	217	103	LP	
16	680.500	68.3	20.0	9.7	31.9	66.1	---	---	Vert.	100	46	LP	
17	816.600	57.6	20.9	10.0	31.7	56.8	---	---	Vert.	100	12	LP	
18	952.700	63.0	22.4	10.4	30.6	65.2	---	---	Vert.	175	2	LP	

Calculation: Result [dBuV/m] = Reading [dBuV] + Ant.Fac [dB/m] + Loss (Cable) [dB] + Gain (AMP) [dB]
Ant.Type=BC:Biconical Antenna, LP:Logperiodic Antenna, SHA03:Horn Antenna

DATA OF RADIATED EMISSION TEST

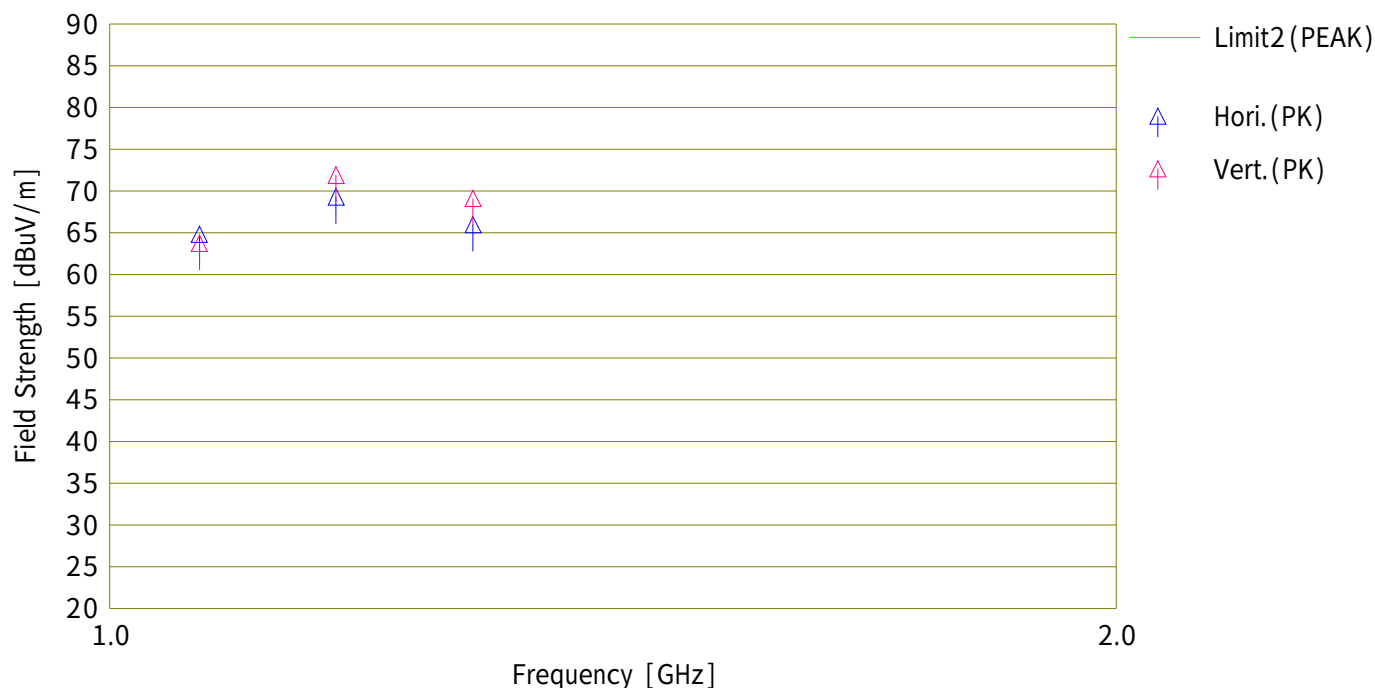
UL Japan, Inc. Shonan EMC Lab. No.3 Semi Anechoic Chamber
Date : 2009/07/30

Company : CSR,Inc.
Kind of EUT : VHF MOBILE TRANSCEIVER
Model No. : SC - 780
Serial No. : No.3

Mode : Transmitting (136.1MHz)
Report No. : 29LE0069-SH
Power : DC 13.6V
Temp./Humi. : 24deg.C. / 69%

Remarks : (below 1GHz: S/A RBW 10kHz, VBW 300kHz, above 1GHz: RBW 1MHz, VBW 3MHz)

Engineer : Kenichi Adachi



No.	Freq.	Reading <PEAK>	Ant.Fac	Loss	Gain	Result <PEAK>	Limit <PEAK>	Margin <PEAK>	Pola.	Height	Angle	Ant. Type	Comment
	[MHz]	[dBuV]	[dB/m]	[dB]	[dB]	[dBuV/m]	[dBuV/m]	[dB]	[H/V]	[cm]	[deg]		
1	1088.800	77.6	24.5	2.4	39.7	64.8	---	---	Hori.	167	115	SHA03	
2	1224.900	81.6	24.9	2.5	39.7	69.3	---	---	Hori.	157	5	SHA03	
3	1361.000	77.8	25.2	2.6	39.6	66.0	---	---	Hori.	127	0	SHA03	
4	1088.800	76.6	24.5	2.4	39.7	63.8	---	---	Vert.	240	359	SHA03	
5	1224.900	84.2	24.9	2.5	39.7	71.9	---	---	Vert.	180	359	SHA03	
6	1361.000	80.9	25.2	2.6	39.6	69.1	---	---	Vert.	147	0	SHA03	

DATA OF RADIATED EMISSION TEST

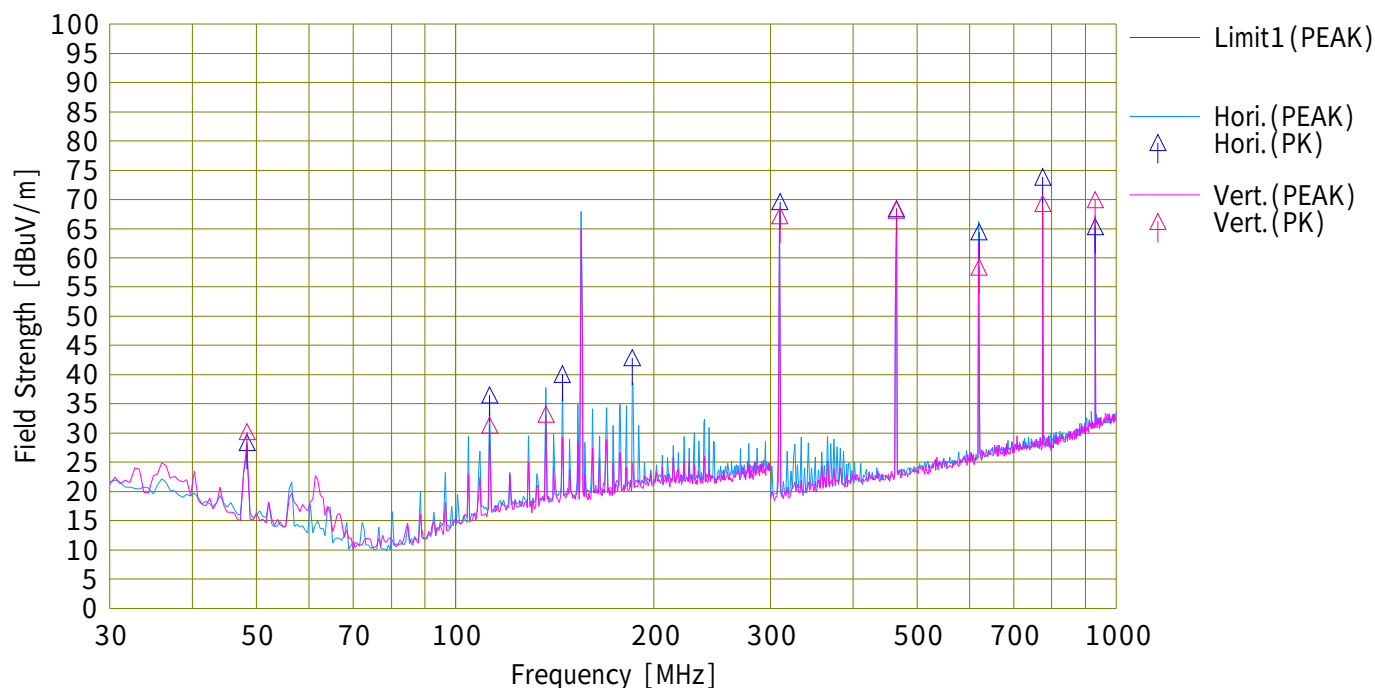
UL Japan, Inc. Shonan EMC Lab. No.3 Semi Anechoic Chamber
Date : 2009/07/29

Company : CSR,Inc.
Kind of EUT : VHF MOBILE TRANSCEIVER
Model No. : SC - 780
Serial No. : No.3

Mode : Transmitting (155.1MHz)
Report No. : 29LE0069-SH
Power : DC 13.6V
Temp./Humi. : 24deg.C. / 69%

Remarks : (below 1GHz: S/A RBW 10kHz, VBW 300kHz, above 1GHz: RBW 1MHz, VBW 3MHz)

Engineer : Kenichi Adachi



No.	Freq.	Reading <PEAK>	Ant.Fac	Loss	Gain	Result <PEAK>	Limit <PEAK>	Margin <PEAK>	Pola.	Height	Angle	Ant. Type	Comment
	[MHz]	[dBuV]	[dB/m]	[dB]	[dB]	[dBuV/m]	[dBuV/m]	[dB]	[H/V]	[cm]	[deg]		
1	48.397	41.6	12.2	6.7	32.1	28.4	---	---	Hori.	300	278	BC	used SDA - 06 (dipole antenna)
2	112.786	49.4	12.0	7.2	32.1	36.5	---	---	Hori.	300	182	BC	
3	145.251	50.2	14.5	7.4	32.0	40.1	---	---	Hori.	228	56	BC	
4	185.291	51.0	16.2	7.7	32.0	42.9	---	---	Hori.	172	87	BC	
5	310.200	74.9	18.3	8.3	31.9	69.6	---	---	Hori.	240	286	DP	
6	465.300	74.5	16.9	8.9	31.9	68.4	---	---	Hori.	100	174	LP	
7	620.400	67.6	19.2	9.5	31.9	64.4	---	---	Hori.	300	206	LP	used SDA - 06 (dipole antenna)
8	775.500	75.0	20.6	9.9	31.7	73.8	---	---	Hori.	250	55	LP	
9	930.600	63.6	22.2	10.4	30.8	65.4	---	---	Hori.	100	36	LP	
10	48.397	43.4	12.2	6.7	32.1	30.2	---	---	Vert.	285	357	BC	
11	112.786	44.3	12.0	7.2	32.1	31.4	---	---	Vert.	222	10	BC	
12	137.134	43.6	14.2	7.4	32.0	33.2	---	---	Vert.	100	0	BC	
13	310.200	72.5	18.3	8.3	31.9	67.2	---	---	Vert.	220	281	DP	
14	465.300	74.4	16.9	8.9	31.9	68.3	---	---	Vert.	100	175	LP	
15	620.400	61.6	19.2	9.5	31.9	58.4	---	---	Vert.	260	300	LP	
16	775.500	70.4	20.6	9.9	31.7	69.2	---	---	Vert.	100	161	LP	
17	930.600	68.2	22.2	10.4	30.8	70.0	---	---	Vert.	100	0	LP	

Calculation: Result [dBuV/m] = Reading [dBuV] + Ant.Fac [dB/m] + Loss (Cable) [dB] + Gain (AMP) [dB]
Ant.Type = BC: Biconical Antenna, LP: Logperiodic Antenna, SHA03: Horn Antenna

DATA OF RADIATED EMISSION TEST

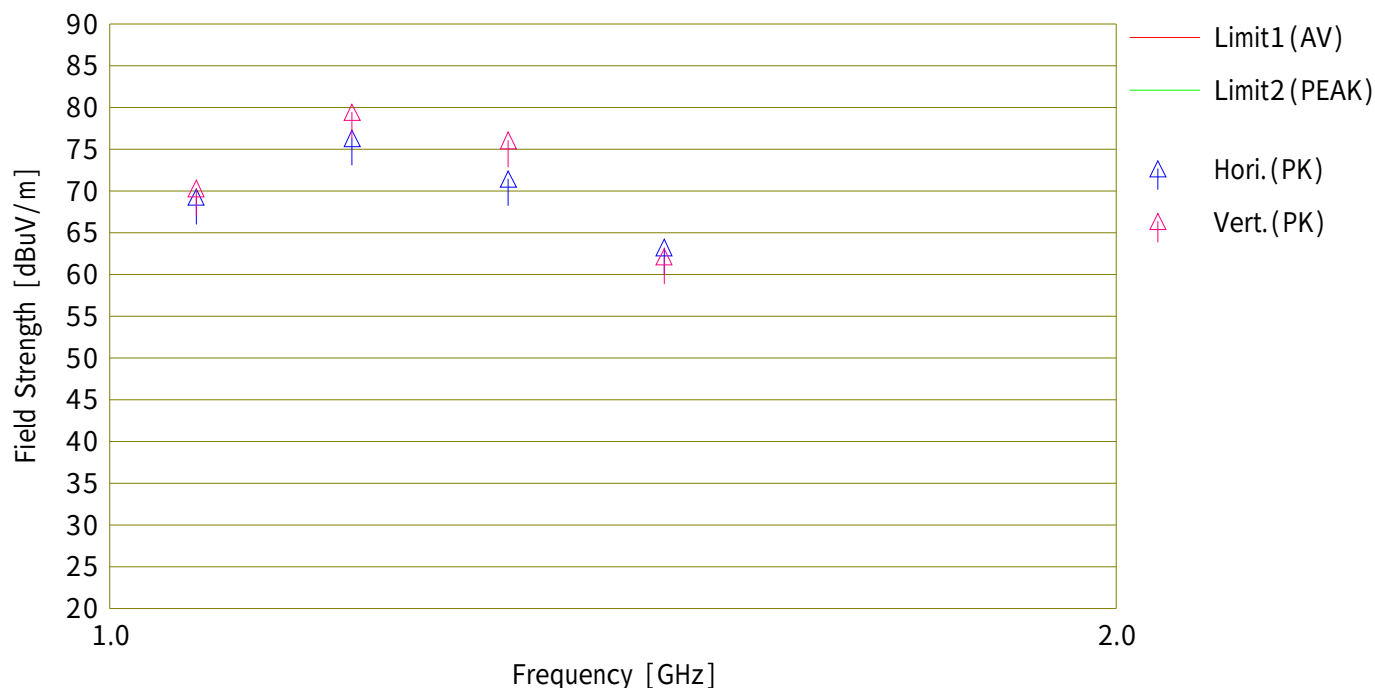
UL Japan, Inc. Shonan EMC Lab. No.3 Semi Anechoic Chamber
Date : 2009/07/30

Company : CSR,Inc.
Kind of EUT : VHF MOBILE TRANSCEIVER
Model No. : SC - 780
Serial No. : No.3

Mode : Transmitting (155.1MHz)
Report No. : 29LE0069-SH
Power : DC 13.6V
Temp./Humi. : 24deg.C. / 69%

Remarks : (below 1GHz: S/A RBW 10kHz, VBW 300kHz, above 1GHz: RBW 1MHz, VBW 3MHz)

Engineer : Kenichi Adachi



No.	Freq.	Reading	Ant.Fac	Loss	Gain	Result	Limit		Margin		Pola.	Height	Angle	Ant. Type	Comment
		<PEAK>				<PEAK>	<AV>	<PEAK>	<AV>	<PEAK>					
	[MHz]	[dBuV]	[dB/m]	[dB]	[dB]	[dBuV/m]	[dBuV/m]	[dBuV/m]	[dB]	[dB]	[H/V]	[cm]	[deg]		
1	1085.700	82.1	24.5	2.4	39.7	69.3	---	---	---	---	Hori.	188	116	SHA03	
2	1240.800	88.6	24.9	2.5	39.7	76.3	---	---	---	---	Hori.	152	3	SHA03	
3	1395.900	83.0	25.3	2.7	39.6	71.4	---	---	---	---	Hori.	127	326	SHA03	
4	1551.000	74.3	25.7	2.8	39.6	63.2	---	---	---	---	Hori.	116	115	SHA03	
5	1085.700	83.1	24.5	2.4	39.7	70.3	---	---	---	---	Vert.	133	194	SHA03	
6	1240.800	91.8	24.9	2.5	39.7	79.5	---	---	---	---	Vert.	172	2	SHA03	
7	1395.900	87.7	25.3	2.7	39.6	76.1	---	---	---	---	Vert.	139	164	SHA03	
8	1551.000	73.2	25.7	2.8	39.6	62.1	---	---	---	---	Vert.	100	76	SHA03	

Calculation: Result [dBuV/m] = Reading [dBuV] + Ant.Fac [dB/m] + Loss (Cable+ATT) [dB] + Gain (AMP) [dB]
Ant.Type=BC:Biconical Antenna, LP:Logperiodic Antenna

UL Japan, Inc.	Shonan EMC Lab.
Semi Anechoic Chamber :	No3
REPORT NO	29LE0069-SH
REGULATION	FCC (FCC 2.1053)
TEST DISTANCE	3m (below26.5GHz)/ 1m (above26.5GHz)
DATE	July 29, 2009 August 1, 2009
TEMPERATURE	24 deg.C. 25deg.C.
HUMIDITY	69 % 49 %
ENGINEER	Kenichi Adachi Kenichi Adachi

TIA-603-C, section 2.2.12[illegible]

DATA OF RADIATED EMISSION TEST

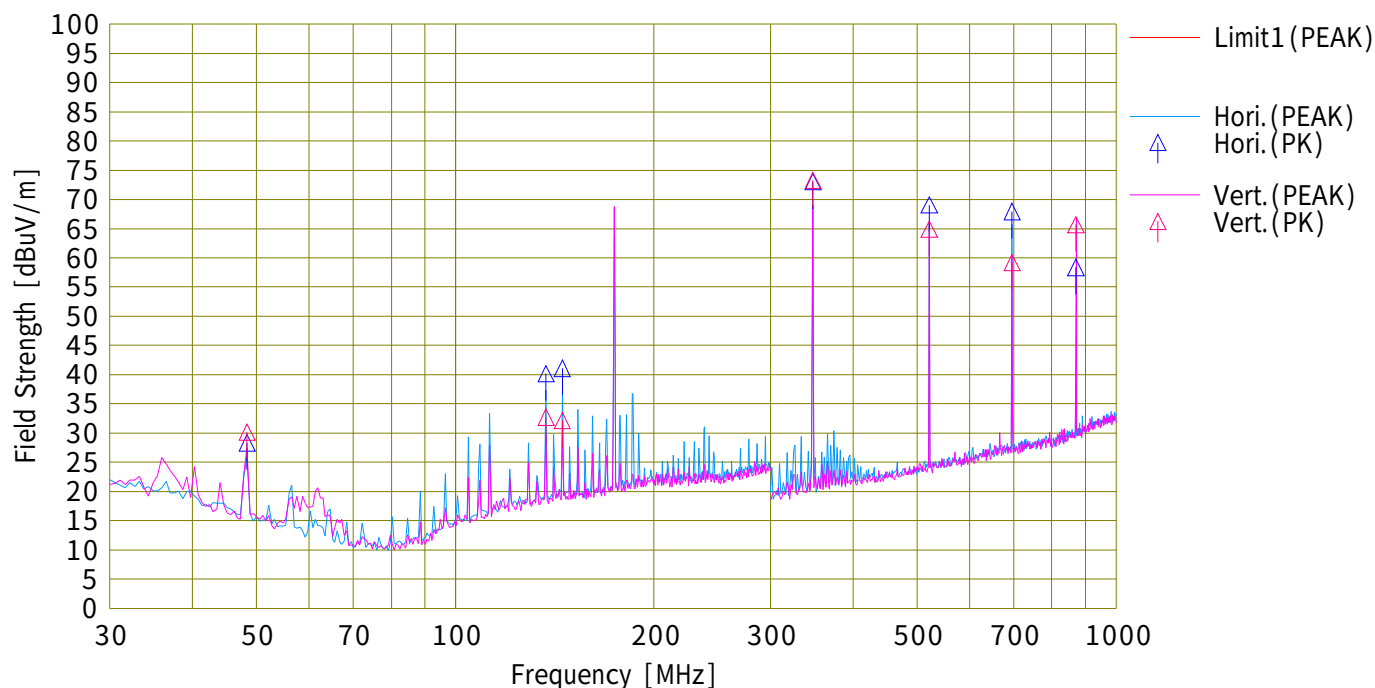
UL Japan, Inc. Shonan EMC Lab. No.3 Semi Anechoic Chamber
Date : 2009/07/29

Company : CSR,Inc.
Kind of EUT : VHF MOBILE TRANSCEIVER
Model No. : SC - 780
Serial No. : No.3

Mode : Transmitting (173.99MHz)
Report No. : 29LE0069-SH
Power : DC 13.6V
Temp./Humi. : 24deg.C. / 69%

Remarks : (below 1GHz: S/A RBW 10kHz, VBW 300kHz, above 1GHz: RBW 1MHz, VBW 3MHz)

Engineer : Kenichi Adachi



No.	Freq.	Reading <PEAK>	Ant.Fac	Loss	Gain	Result <PEAK>	Limit <PEAK>	Margin <PEAK>	Pola.	Height	Angle	Ant. Type	Comment
	[MHz]	[dBuV]	[dB/m]	[dB]	[dB]	[dBuV/m]	[dBuV/m]	[dB]	[H/V]	[cm]	[deg]		
1	48.397	41.5	12.2	6.7	32.1	28.3	---	---	Hori.	300	277	BC	used SDA - 06 (dipole antenna)
2	137.134	50.6	14.2	7.4	32.0	40.2	---	---	Hori.	235	32	BC	
3	145.251	51.2	14.5	7.4	32.0	41.1	---	---	Hori.	242	45	BC	
4	347.980	77.3	19.1	8.5	31.9	73.0	---	---	Hori.	353	268	DP	
5	521.970	74.2	17.7	9.1	31.9	69.1	---	---	Hori.	228	78	LP	
6	695.960	69.8	20.2	9.7	31.8	67.9	---	---	Hori.	150	57	LP	
7	869.950	57.9	21.5	10.2	31.2	58.4	---	---	Hori.	206	115	BC	
8	48.397	43.3	12.2	6.7	32.1	30.1	---	---	Vert.	238	359	LP	used SDA - 06 (dipole antenna)
9	137.134	43.1	14.2	7.4	32.0	32.7	---	---	Vert.	100	290	BC	
10	145.251	42.2	14.5	7.4	32.0	32.1	---	---	Vert.	100	291	BC	
11	347.980	77.6	19.1	8.5	31.9	73.3	---	---	Vert.	100	73	DP	
12	521.970	70.0	17.7	9.1	31.9	64.9	---	---	Vert.	100	193	LP	
13	695.960	61.1	20.2	9.7	31.8	59.2	---	---	Vert.	100	331	LP	
14	869.950	65.2	21.5	10.2	31.2	65.7	---	---	Vert.	100	0	LP	

Calculation: Result [dBuV/m] = Reading [dBuV] + Ant.Fac [dB/m] + Loss (Cable+ATT) [dB] + Gain (AMP) [dB]
Ant.Type=BC:Biconical Antenna, LP:Logperiodic Antenna

DATA OF RADIATED EMISSION TEST

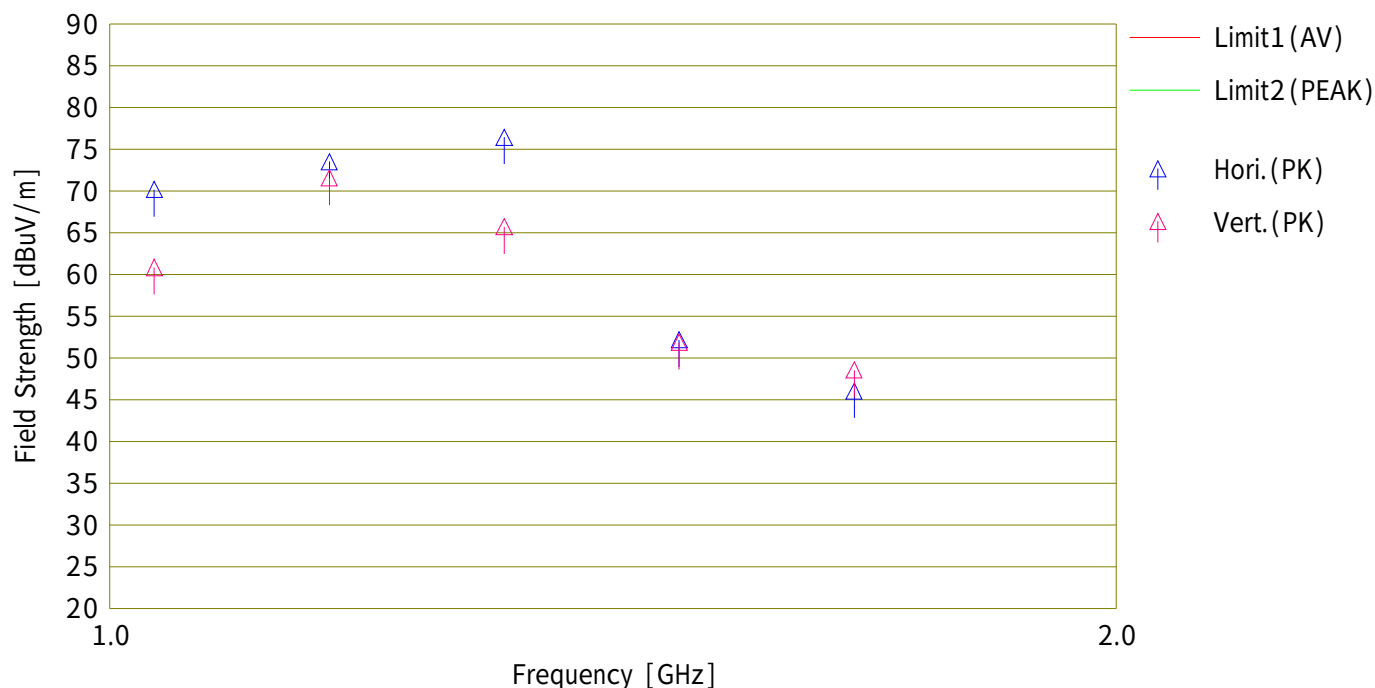
UL Japan, Inc. Shonan EMC Lab. No.3 Semi Anechoic Chamber
Date : 2009/07/30

Company : CSR,Inc.
Kind of EUT : VHF MOBILE TRANSCEIVER
Model No. : SC - 780
Serial No. : No.3

Mode : Transmitting (173.99MHz)
Report No. : 29LE0069-SH
Power : DC 13.6V
Temp./Humi. : 24deg.C. / 69%

Remarks : (below 1GHz: S/A RBW 10kHz, VBW 300kHz, above 1GHz: RBW 1MHz, VBW 3MHz)

Engineer : Kenichi Adachi



No.	Freq.	Reading	Ant.Fac	Loss	Gain	Result	Limit		Margin		Pola.	Height	Angle	Ant. Type	Comment
		<PEAK>				<PEAK>	<AV>	<PEAK>	<AV>	<PEAK>					
	[MHz]	[dBuV]	[dB/m]	[dB]	[dB]	[dBuV/m]	[dBuV/m]	[dBuV/m]	[dB]	[dB]	[H/V]	[cm]	[deg]		
1	1043.940	83.2	24.4	2.3	39.7	70.2	---	---	---	---	Hori.	100	27	SHA03	
2	1217.930	85.8	24.9	2.5	39.7	73.5	---	---	---	---	Hori.	148	285	SHA03	
3	1391.920	88.2	25.3	2.6	39.6	76.5	---	---	---	---	Hori.	125	340	SHA03	
4	1565.910	63.3	25.7	2.8	39.6	52.2	---	---	---	---	Hori.	121	115	SHA03	
5	1739.900	56.9	26.0	2.9	39.7	46.1	---	---	---	---	Hori.	100	194	SHA03	
6	1043.940	73.8	24.4	2.3	39.7	60.8	---	---	---	---	Vert.	180	85	SHA03	
7	1217.930	83.9	24.9	2.5	39.7	71.6	---	---	---	---	Vert.	258	357	SHA03	
8	1391.920	77.4	25.3	2.6	39.6	65.7	---	---	---	---	Vert.	282	359	SHA03	
9	1565.910	63.0	25.7	2.8	39.6	51.9	---	---	---	---	Vert.	100	217	SHA03	
10	1739.900	59.4	26.0	2.9	39.7	48.6	---	---	---	---	Vert.	173	6	SHA03	

Calculation: Result [dBuV/m] = Reading [dBuV] + Ant.Fac [dB/m] + Loss (Cable+ATT) [dB] + Gain (AMP) [dB]
Ant.Type=BC:Biconical Antenna, LP:Logperiodic Antenna

UL Japan, Inc.	Shonan EMC Lab.
Semi Anechoic Chamber :	No3
REPORT NO	29LE0069-SH
REGULATION	FCC (FCC 2.1053)
TEST DISTANCE	3m (below26.5GHz)/ 1m (above26.5GHz)
DATE	July 29, 2009 August 1, 2009
TEMPERATURE	24 deg.C. 25deg.C.
HUMIDITY	69 % 49 %
ENGINEER	Kenichi Adachi Kenichi Adachi

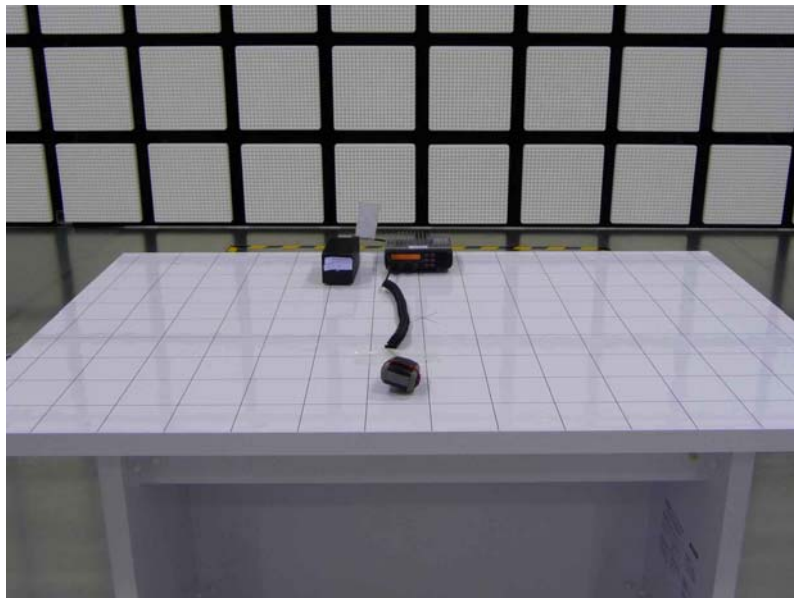
TIA-603-C, section 2.2.12[illegible]

Facsimile : +81- (0) 463-50-6401

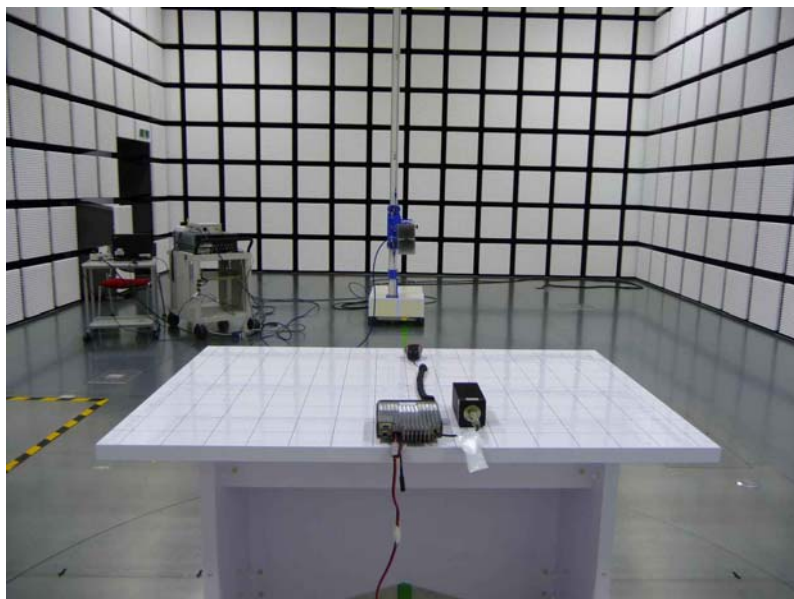
Photographs of test setup

Radiated emission

Front



Rear



UL Japan, Inc.
Shonan EMC Lab.

1-22-3 Megumigaoka, Hiratsuka-shi, Kanagawa-ken 259-1220 JAPAN

Telephone : +81-(0)463-50-6400
Facsimile : +81-(0)463-50-6401

Test instruments

EMI test equipment

Control No.	Instrument	Manufacturer	Model No	Serial No	Test Item	Calibration Date * Interval(month)
SAEC-03(NSA)	Anechoic Chamber	TDK	SAEC-03(NSA)	3	RE	2009/03/19 * 12
SBA-03	Biconical Antenna	Schwarzbeck	BBA9106	91032666	RE	2009/03/20 * 12
SLA-03	Logperiodic Antenna	Schwarzbeck	UHALP9108A	UHALP 9108-A 0901	RE	2009/03/20 * 12
SDA-06	Dipole Antenna	Schwarzbeck	UHA9105	91052453	RE	2009/03/20 * 12
SAT6-05	Attenuator	JFW	50HF-006N	-	RE	2009/02/13 * 12
SAF-03	Pre Amplifier	SONOMA	310N	290213	RE	2009/02/13 * 12
SCC-C1/C2/C3/C4/C5/C10/SRSE-03	Coaxial Cable&RF Selector	Fujikura/Fujikura/Suhner/Suhner/Suhner/TOYO	8D2W/12DSFA/141PE/141PE/141PE/NS4906	-/0901-271(RF Selector)	RE	2009/04/06 * 12
STR-03	Test Receiver	Rohde & Schwarz	ES140	100054/040	RE	2009/04/08 * 12
SJM-03	Measure	KOMELON	KMC-36	-	RE	-
SOS-03	Humidity Indicator	A&D	AD-5681	4063325	RE	2009/02/04 * 12
COTS-SEMI-1	EMI Software	TSJ	TEPTO-DV	1	RE	-
SAF-06	Pre Amplifier	TOYO Corporation	TPA0118-36	1440491	RE	2009/03/26 * 12
SHA-03	Horn Antenna	Schwarzbeck	BBHA9120D	9120D-739	RE	2009/03/14 * 12
SCC-G03	Coaxial Cable	Suhner	SUCOFLEX 104A	46499/4A	RE	2009/04/10 * 12
SCC-G23	Coaxial Cable	Suhner	SUCOFLEX 104	297342/4	RE	2009/05/27 * 12
SHA-01	Horn Antenna	Schwarzbeck	BBHA9120D	9120D-725	RE	2009/03/14 * 12
SCC-G01	Coaxial Cable	Suhner	SUCOFLEX 104A	46497/4A	RE	2009/04/10 * 12
SCC-G21	Coaxial Cable	Suhner	SUCOFLEX 104	296169/4	RE	2009/05/27 * 12
SSG-02	Signal Generator	Agilent	E8257D-540	MY48051404	RE	2009/02/12 * 12
SCC-07	Coaxial Cable	Fujikura	5D2W	-	RE	2009/06/12 * 12

The expiration date of the calibration is the end of the expired month.

All equipment is calibrated with traceable calibrations. Each calibration is traceable to the national or international standards.

As for some calibrations performed after the tested dates, those test equipment have been controlled by means of an unbroken chains of calibrations.

Test Item:

RE: Radiated emission

UL Japan, Inc.

Shonan EMC Lab.

1-22-3 Megumigaoka, Hiratsuka-shi, Kanagawa-ken 259-1220 JAPAN

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