

Test Report

August 7, 2009

No. **29LE0069-SH-F**

Subject : **Measurement Job based on FCC Part15B and FCC part90, for radio communication equipments in vehicle.(SC-980, 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.**

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	☐ Others()	Page : ~
		Total Page : 1 2

Tested by:

Kenichi Adachi

Approved by:

Tetsuya Hashimoto

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DATA OF RADIATED EMISSION TEST

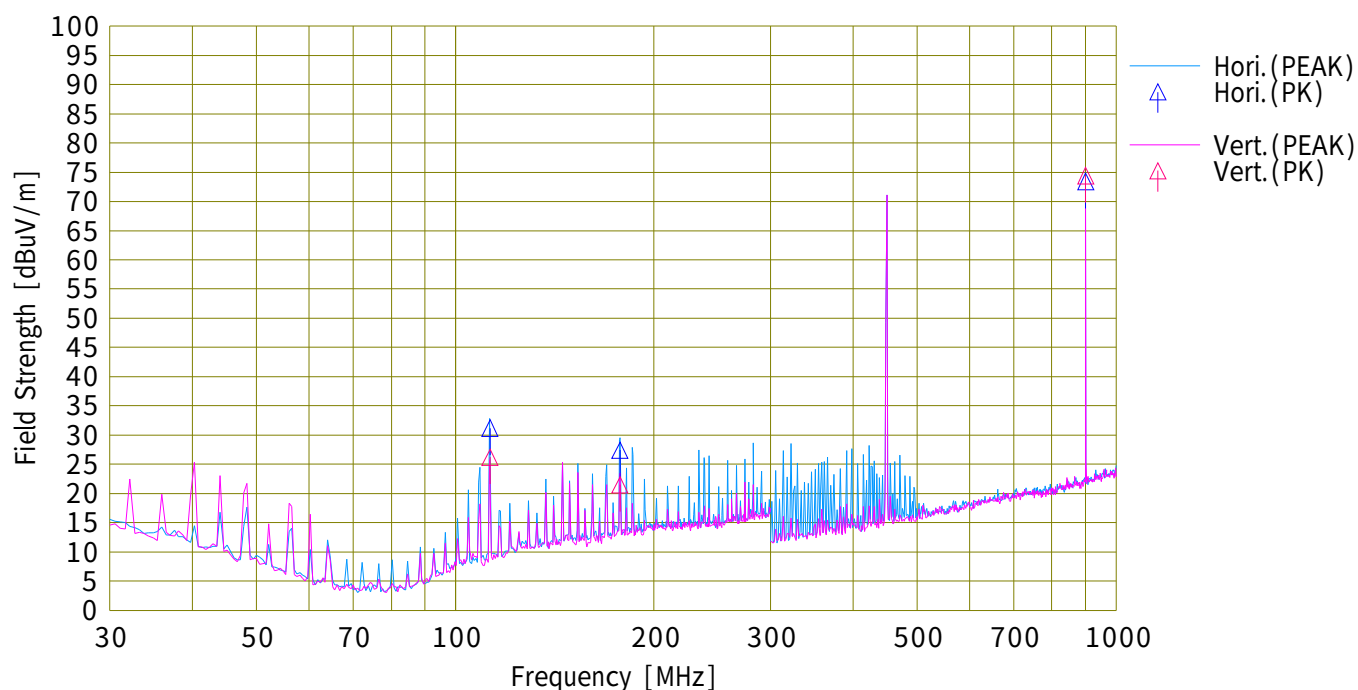
UL Japan, Inc. Shonan EMC Lab. No.3 Semi Anechoic Chamber
Date : 2009/08/03

Company : CSR,Inc.
Kind of EUT : UHF MOBILE TRANSCEIVER
Model No. : SC - 980
Serial No. : No.7

Mode : Transmitting (450.1MHz)
Report No. : 29LE0069-SH
Power : DC 13.6V
Temp./Humi. : 23deg.C. / 60%

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

Engineer : Kenichi Adachi



No.	Freq.	Reading <PEAK>	Ant.Fac	Loss	Gain	Result <PEAK>	Pola.	Height	Angle	Ant. Type	Comment
	[MHz]	[dBuV]				[dBuV/m]					
1	112.899	44.0	12.1	7.2	32.1	31.2	Hori.	166	151	BC	
2	177.412	36.0	15.8	7.6	32.0	27.4	Hori.	184	261	BC	
3	900.200	72.3	21.8	10.3	31.0	73.4	Hori.	126	300	LP	
4	112.899	39.0	12.1	7.2	32.1	26.2	Vert.	256	7	BC	
5	177.412	30.1	15.8	7.6	32.0	21.5	Vert.	100	255	BC	
6	900.200	73.3	21.8	10.3	31.0	74.4	Vert.	100	330	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

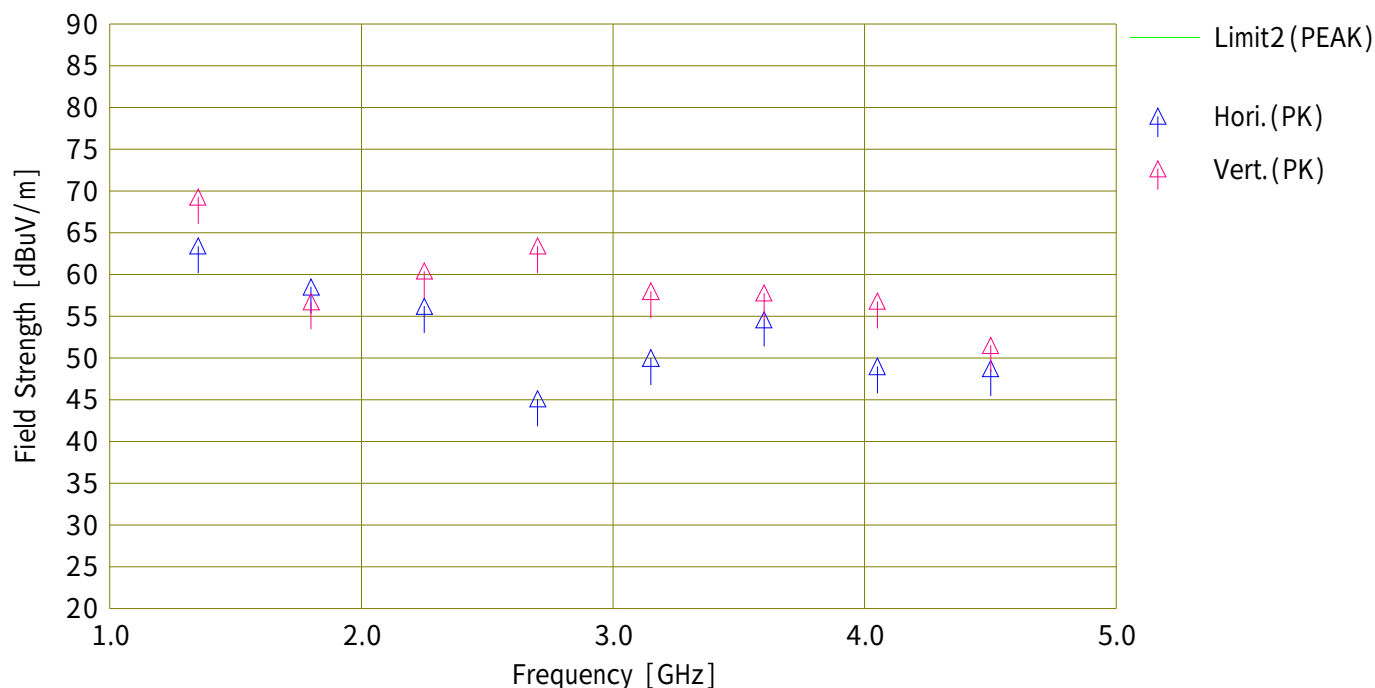
UL Japan, Inc. Shonan EMC Lab. No.3 Semi Anechoic Chamber
Date : 2009/08/04

Company : CSR,Inc.
Kind of EUT : UHF MOBILE TRANSCEIVER
Model No. : SC-980
Serial No. : No.7

Mode : Transmitting (450.1MHz)
Report No. : 29LE0069-SH
Power : DC 13.6V
Temp./Humi. : 25deg.C. / 60%

Remarks : (below 1GHz: 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	1350.300	75.2	25.2	2.6	39.6	63.4	---	---	Hori.	117	4	SHA03	
2	1800.400	69.2	26.1	3.0	39.8	58.5	---	---	Hori.	100	14	SHA03	
3	2250.500	65.7	27.1	3.3	39.9	56.2	---	---	Hori.	116	23	SHA03	
4	2700.600	53.3	28.0	3.7	39.9	45.1	---	---	Hori.	100	306	SHA03	
5	3150.700	57.4	28.8	4.0	40.2	50.0	---	---	Hori.	140	124	SHA03	
6	3600.800	61.2	29.4	4.4	40.4	54.6	---	---	Hori.	106	153	SHA03	
7	4050.900	54.5	30.1	4.7	40.3	49.0	---	---	Hori.	100	270	SHA03	
8	4501.000	52.7	31.0	4.8	39.8	48.7	---	---	Hori.	100	89	SHA03	
9	1350.300	81.1	25.2	2.6	39.6	69.3	---	---	Vert.	100	172	SHA03	
10	1800.400	67.4	26.1	3.0	39.8	56.7	---	---	Vert.	116	147	SHA03	
11	2250.500	69.9	27.1	3.3	39.9	60.4	---	---	Vert.	127	213	SHA03	
12	2700.600	71.6	28.0	3.7	39.9	63.4	---	---	Vert.	100	269	SHA03	
13	3150.700	65.4	28.8	4.0	40.2	58.0	---	---	Vert.	107	275	SHA03	
14	3600.800	64.4	29.4	4.4	40.4	57.8	---	---	Vert.	100	210	SHA03	
15	4050.900	62.3	30.1	4.7	40.3	56.8	---	---	Vert.	100	184	SHA03	
16	4501.000	55.5	31.0	4.8	39.8	51.5	---	---	Vert.	162	194	SHA03	

UL Japan, Inc.	Shonan EMC Lab.
Semi Anechoic Chamber :	No3
REPORT NO	29LE0069-SH
REGULATION	FCC (FCC 2.1053)
TEST DISTANCE	3m (below 26.5GHz)/ 1m (above 26.5GHz)
DATE	August 3, 2009
TEMPERATURE	23 deg.C.
HUMIDITY	60 %
ENGINEER	Kenichi Adachi

TIA-603-C, section 2.2.12

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

DATA OF RADIATED EMISSION TEST

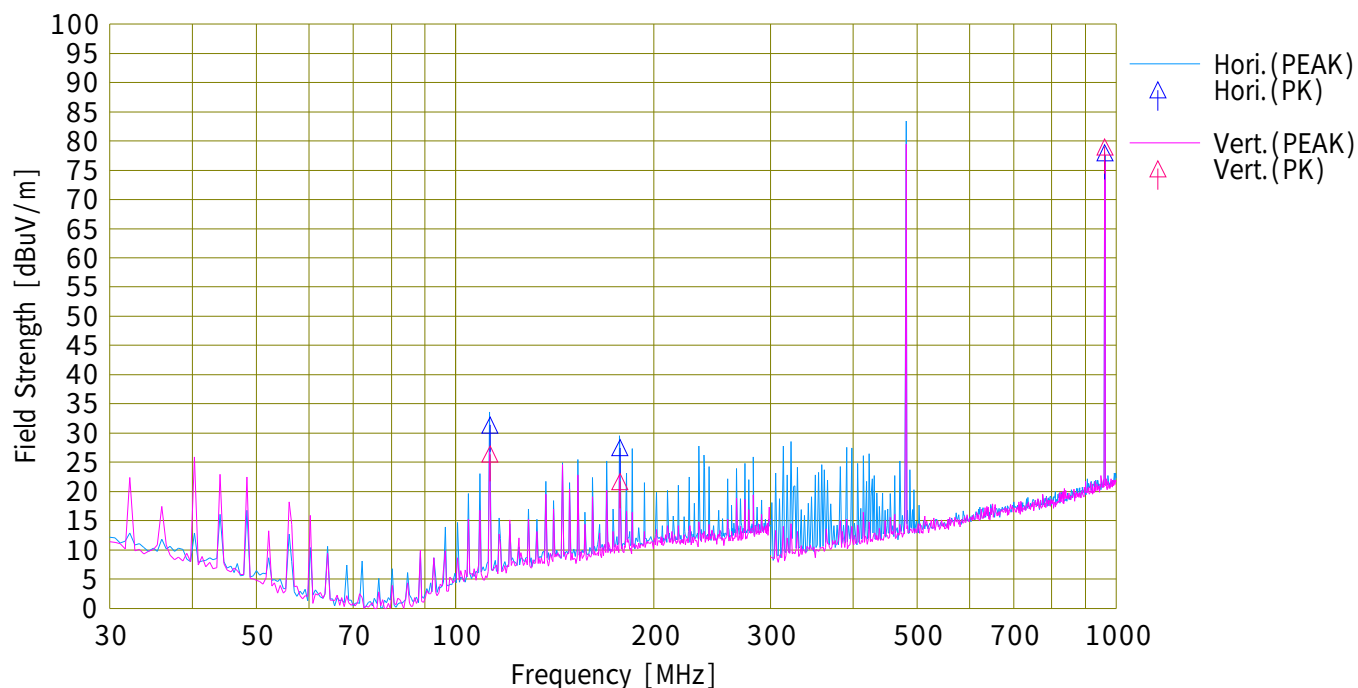
UL Japan, Inc. Shonan EMC Lab. No.3 Semi Anechoic Chamber
Date : 2009/08/03

Company : CSR,Inc.
Kind of EUT : UHF MOBILE TRANSCEIVER
Model No. : SC - 980
Serial No. : No.7

Mode : Transmitting (481.1MHz)
Report No. : 29LE0069-SH
Power : DC 13.6V
Temp./Humi. : 23deg.C. / 60%

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

Engineer : Kenichi Adachi



No.	Freq.	Reading <PEAK>	Ant.Fac	Loss	Gain	Result <PEAK>	Pola.	Height	Angle	Ant. Type	Comment
	[MHz]	[dBuV]				[dBuV/m]					
1	112.899	44.2	12.1	7.2	32.1	31.4	Hori.	172	163	BC	
2	177.412	36.1	15.8	7.6	32.0	27.5	Hori.	186	259	BC	
3	962.200	75.5	22.5	10.5	30.5	78.0	Hori.	100	359	LP	
4	112.899	39.2	12.1	7.2	32.1	26.4	Vert.	253	4	BC	
5	177.412	30.3	15.8	7.6	32.0	21.7	Vert.	100	251	BC	
6	962.200	76.5	22.5	10.5	30.5	79.0	Vert.	191	349	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

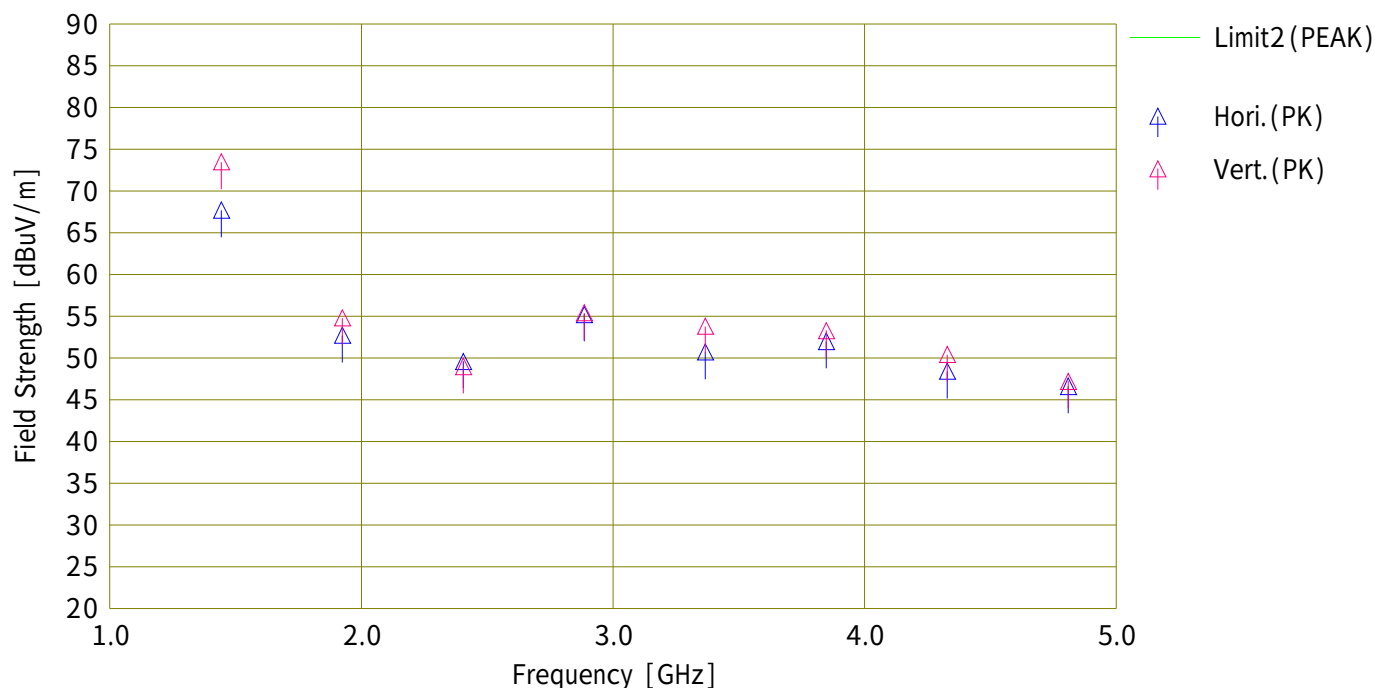
UL Japan, Inc. Shonan EMC Lab. No.3 Semi Anechoic Chamber
Date : 2009/08/04

Company : CSR,Inc.
Kind of EUT : UHF MOBILE TRANSCEIVER
Model No. : SC-980
Serial No. : No.7

Mode : Transmitting (481.1MHz)
Report No. : 29LE0069-SH
Power : DC 13.6V
Temp./Humi. : 25deg.C. / 60%

Remarks : (below 1GHz: 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	1443.300	79.2	25.4	2.7	39.6	67.7	---	---	Hori.	112	46	SHA03	
2	1924.400	63.1	26.4	3.1	39.9	52.7	---	---	Hori.	126	346	SHA03	
3	2405.500	58.4	27.4	3.6	39.8	49.6	---	---	Hori.	100	12	SHA03	
4	2886.600	63.1	28.4	3.8	40.1	55.2	---	---	Hori.	105	124	SHA03	
5	3367.700	57.7	29.1	4.2	40.3	50.7	---	---	Hori.	114	117	SHA03	
6	3848.800	58.0	29.8	4.6	40.4	52.0	---	---	Hori.	111	143	SHA03	
7	4329.900	53.0	30.7	4.7	40.0	48.4	---	---	Hori.	113	150	SHA03	
8	4811.000	49.5	31.6	5.0	39.5	46.6	---	---	Hori.	120	48	SHA03	
9	1443.300	85.0	25.4	2.7	39.6	73.5	---	---	Vert.	100	156	SHA03	
10	1924.400	65.2	26.4	3.1	39.9	54.8	---	---	Vert.	111	173	SHA03	
11	2405.500	57.8	27.4	3.6	39.8	49.0	---	---	Vert.	196	172	SHA03	
12	2886.600	63.3	28.4	3.8	40.1	55.4	---	---	Vert.	141	180	SHA03	
13	3367.700	60.8	29.1	4.2	40.3	53.8	---	---	Vert.	100	76	SHA03	
14	3848.800	59.3	29.8	4.6	40.4	53.3	---	---	Vert.	185	64	SHA03	
15	4329.900	55.0	30.7	4.7	40.0	50.4	---	---	Vert.	116	198	SHA03	
16	4811.000	50.1	31.6	5.0	39.5	47.2	---	---	Vert.	100	229	SHA03	

ENGINEER Kenichi Adachi

DATA OF RADIATED EMISSION TEST

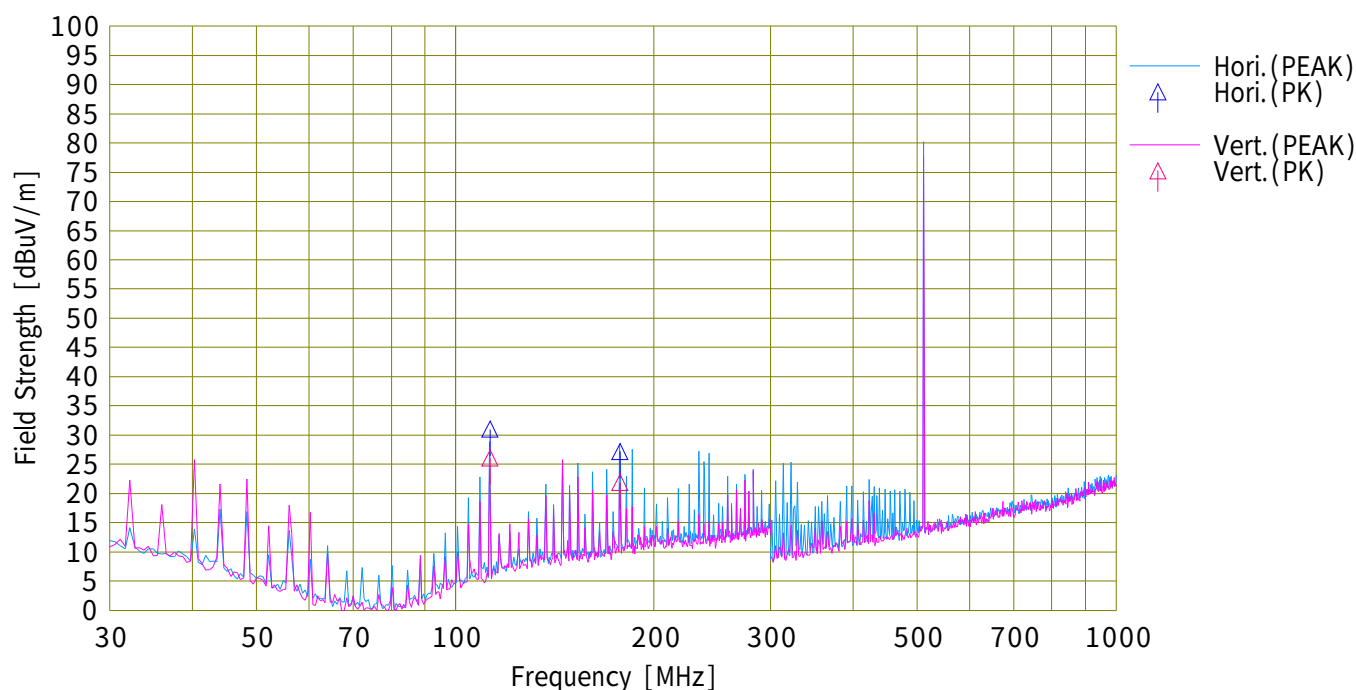
UL Japan, Inc. Shonan EMC Lab. No.3 Semi Anechoic Chamber
Date : 2009/08/03

Company : CSR,Inc.
Kind of EUT : UHF MOBILE TRANSCEIVER
Model No. : SC - 980
Serial No. : No.7

Mode : Transmitting (511.9875MHz)
Report No. : 29LE0069-SH
Power : DC 13.6V
Temp./Humi. : 23deg.C. / 60%

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

Engineer : Kenichi Adachi



No.	Freq.	Reading <PEAK>	Ant.Fac	Loss	Gain	Result <PEAK>	Pola.	Height	Angle	Ant. Type	Comment
	[MHz]	[dBuV]				[dBuV/m]					
1	112.899	43.8	12.1	7.2	32.1	31.0	Hori.	172	159	BC	
2	177.412	35.8	15.8	7.6	32.0	27.2	Hori.	182	253	BC	
3	112.899	38.9	12.1	7.2	32.1	26.1	Vert.	257	11	BC	
4	177.412	30.5	15.8	7.6	32.0	21.9	Vert.	100	248	BC	

DATA OF RADIATED EMISSION TEST

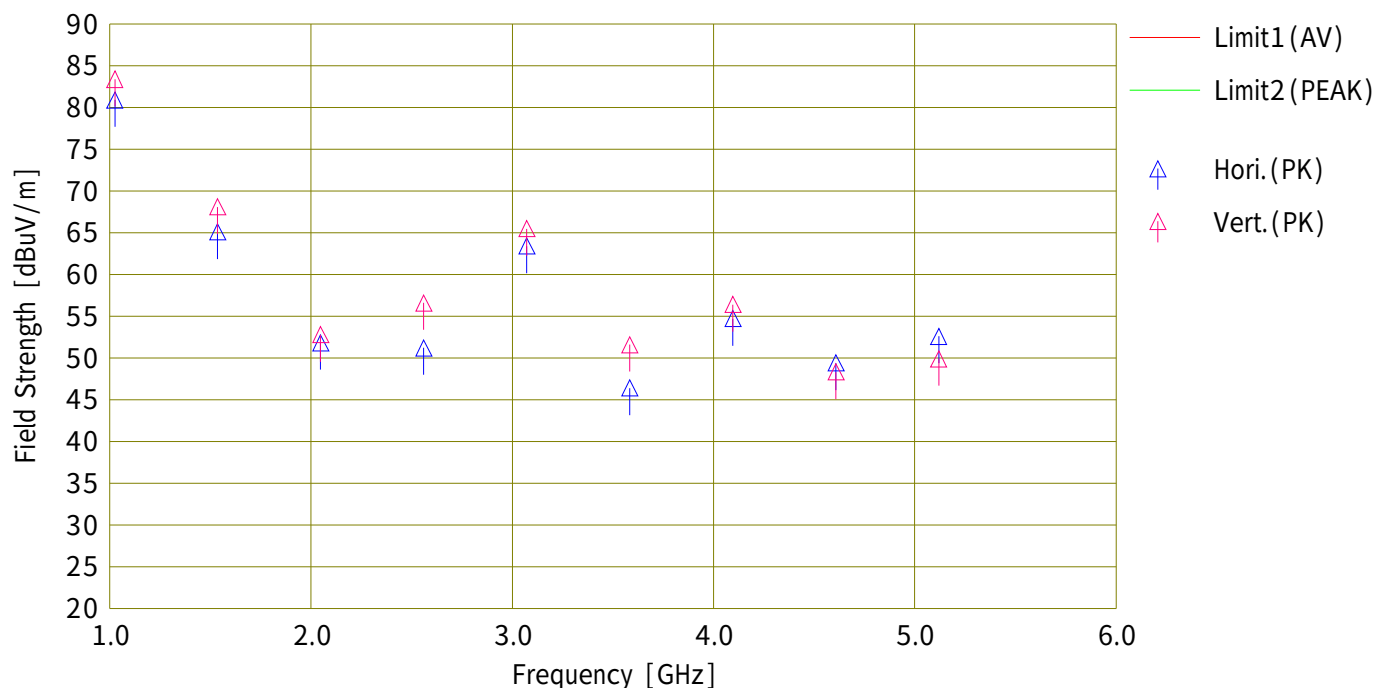
UL Japan, Inc. Shonan EMC Lab. No.3 Semi Anechoic Chamber
Date : 2009/08/04

Company : CSR,Inc.
Kind of EUT : UHF MOBILE TRANSCEIVER
Model No. : SC-980
Serial No. : No.7

Mode : Transmitting (511.9875MHz)
Report No. : 29LE0069-SH
Power : DC 13.6V
Temp./Humi. : 25deg.C. / 60%

Remarks : (below 1GHz: 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
	[MHz]	[dBuV]				[dBuV/m]	<AV>	<PEAK>	<AV>	<PEAK>					
1	1023.976	94.0	24.3	2.3	39.7	80.9	---	---	---	---	Hori.	100	264	SHA03	
2	1535.963	76.2	25.7	2.8	39.6	65.1	---	---	---	---	Hori.	116	55	SHA03	
3	2047.950	61.9	26.6	3.2	39.9	51.8	---	---	---	---	Hori.	119	25	SHA03	
4	2559.938	59.6	27.7	3.7	39.8	51.2	---	---	---	---	Hori.	137	117	SHA03	
5	3071.925	71.0	28.7	3.9	40.2	63.4	---	---	---	---	Hori.	145	80	SHA03	
6	3583.913	53.0	29.4	4.4	40.4	46.4	---	---	---	---	Hori.	115	147	SHA03	
7	4095.900	60.1	30.2	4.7	40.3	54.7	---	---	---	---	Hori.	111	235	SHA03	
8	4607.888	53.0	31.2	4.9	39.7	49.4	---	---	---	---	Hori.	100	215	SHA03	
9	5119.875	54.4	32.0	5.4	39.2	52.6	---	---	---	---	Hori.	100	137	SHA03	
10	1023.976	96.5	24.3	2.3	39.7	83.4	---	---	---	---	Vert.	145	186	SHA03	
11	1535.963	79.2	25.7	2.8	39.6	68.1	---	---	---	---	Vert.	100	170	SHA03	
12	2047.950	62.9	26.6	3.2	39.9	52.8	---	---	---	---	Vert.	161	43	SHA03	
13	2559.938	65.0	27.7	3.7	39.8	56.6	---	---	---	---	Vert.	111	188	SHA03	
14	3071.925	73.1	28.7	3.9	40.2	65.5	---	---	---	---	Vert.	110	189	SHA03	
15	3583.913	58.2	29.4	4.4	40.4	51.6	---	---	---	---	Vert.	100	95	SHA03	
16	4095.900	61.8	30.2	4.7	40.3	56.4	---	---	---	---	Vert.	100	201	SHA03	
17	4607.888	51.9	31.2	4.9	39.7	48.3	---	---	---	---	Vert.	157	53	SHA03	
18	5119.875	51.7	32.0	5.4	39.2	49.9	---	---	---	---	Vert.	100	219	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 (below 26.5GHz)/ 1m (above 26.5GHz)
DATE	August 3, 2009
TEMPERATURE	23 deg.C.
HUMIDITY	60 %
ENGINEER	Kenichi Adachi

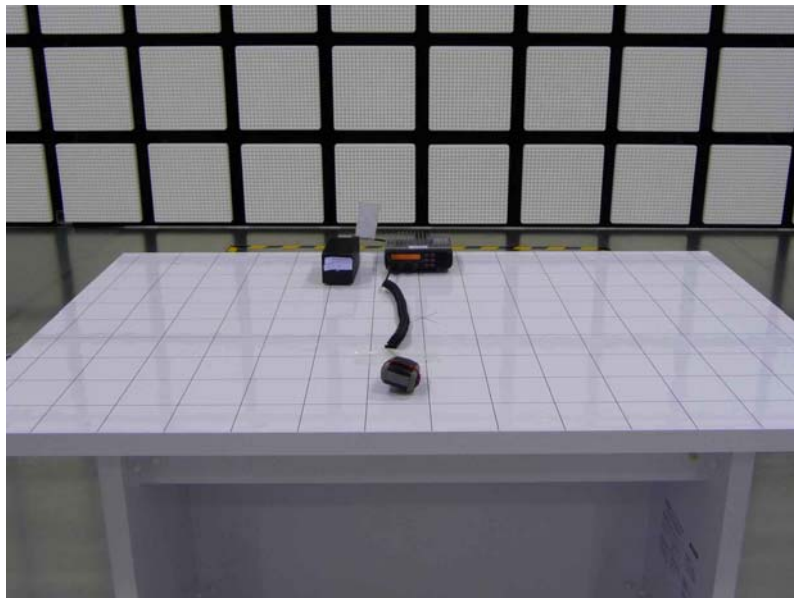
TIA-603-C, section 2.2.12[illegible]

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

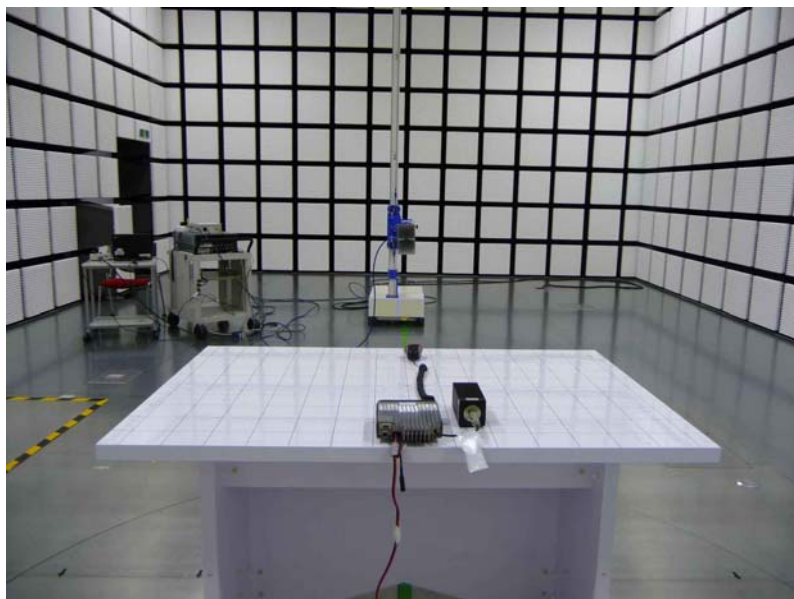
Photographs of test setup

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