

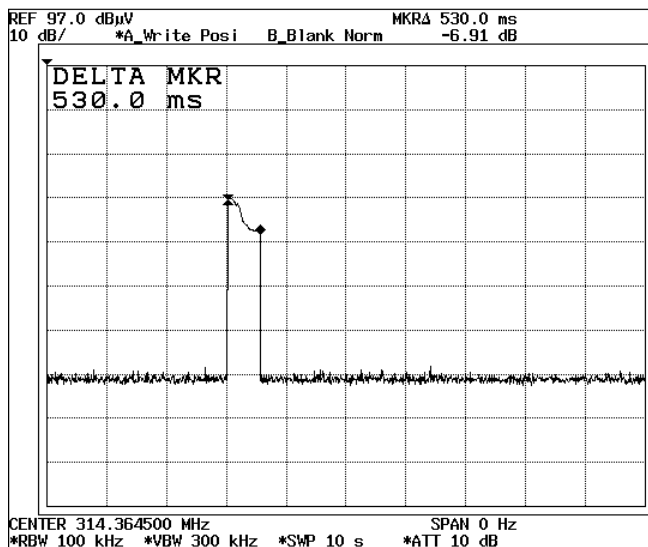
APPENDIX 2: Data of EMI test

Automatically deactivate

UL Japan, Inc.
Head Office EMC Lab. No.3 Semi Anechoic Chamber

COMPANY : DENSO CORPORATION	REPORT NO : 27LE0342-HO
EQUIPMENT : Remote Keyless Entry System (Transmitter)	REGULATION : Fcc Part15 Subpart C 15.231(a)(1)
MODEL : 12BDC	TEST DISTANCE : -
S/N : No.1	DATE : 07/31/2007
POWER : DC 3.0V	TEMPERATURE : 23 deg.C.
Mode : Normal use mode	HUMIDITY : 61%
Axis : -	ENGINEER : Takahiro Hatakeda

Time of Transmitting [sec]	Limit [sec]	Result
0.53	5.00	Pass



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Radiated Emission (Electric Field Strength of Fundamental and Spurious Emission)

UL Japan, Inc.
Head Office EMC Lab. No.3 Semi Anechoic Chamber

COMPANY : DENSO CORPORATION	REPORT NO : 27LE0342-HO
EQUIPMENT : Remote Keyless Entry System (Transmitter)	REGULATION : Fcc Part15 Subpart C 15.231(b) / 15.205 / 15.209
MODEL : I2BDC	TEST DISTANCE : 3m
S/N : No.1	DATE : 07/31/2007
POWER : DC 3.0V	TEMPERATURE : 23 deg.C.
Mode : Transmitting mode	HUMIDITY : 61%
Axis : Hor.: X-axis , Ver.: Y-axis	ENGINEER : Takahiro Hatakedo

QP DETECT

No.	FREQ [MHz]	T/R READING		ANT Factor [dB/m]	AMP GAIN [dB]	LOSS [dB]	Duty Factor [dB]	RESULT		Limit [dBuV/m]	MARGIN	
		HOR	VER					HOR	VER		HOR	VER
1	314.35	81.7	76.9	14.6	32.0	10.0	-	74.3	69.5	75.5	1.2	6.0
2	628.70	28.5	30.9	19.3	32.1	11.9	-	27.6	30.0	55.5	27.9	25.5
3	943.05	25.4	26.7	22.4	30.8	13.3	-	30.3	31.6	55.5	25.2	23.9

PK DETECT (RBW: 1MHz, VBW: 1MHz)

(Inside Restricted bands)

No.	FREQ [MHz]	S/A READING		ANT Factor [dB/m]	AMP GAIN [dB]	LOSS [dB]	Duty Factor [dB]	RESULT		Limit [dBuV/m]	MARGIN	
		HOR	VER					HOR	VER		HOR	VER
5	1571.75	46.0	47.6	25.9	32.6	2.3	-	41.6	43.2	73.9	32.3	30.7
7	2200.45	43.5	43.5	27.0	31.6	2.8	-	41.7	41.7	73.9	32.2	32.2
9	2829.15	57.9	43.1	28.0	31.4	3.3	-	57.8	43.0	73.9	16.1	30.9

Peak with Duty factor Result = Reading (RBW: 1MHz, VBW: 1MHz) + Duty Factor (Inside Restricted bands)

No.	FREQ [MHz]	S/A READING		ANT Factor [dB/m]	AMP GAIN [dB]	LOSS [dB]	Duty Factor [dB]	RESULT		Limit [dBuV/m]	MARGIN	
		HOR	VER					HOR	VER		HOR	VER
5	1571.75	46.0	47.6	25.9	32.6	2.3	-6.4	35.2	36.8	53.9	18.7	17.1
7	2200.45	43.5	43.5	27.0	31.6	2.8	-6.4	35.3	35.3	53.9	18.6	18.6
9	2829.15	57.9	43.1	28.0	31.4	3.3	-6.4	51.4	36.6	53.9	2.5	17.3

PK DETECT Result = Reading (RBW: 1MHz, VBW: 1MHz)

(Outside Restricted bands)

No.	FREQ [MHz]	S/A READING		ANT Factor [dB/m]	AMP GAIN [dB]	LOSS [dB]	Duty Factor [dB]	RESULT		Limit [dBuV/m]	MARGIN	
		HOR	VER					HOR	VER		HOR	VER
4	1257.47	45.3	48.2	25.3	33.4	1.8	-	39.0	41.9	75.5	36.5	33.6
6	1886.10	43.9	43.6	26.5	31.9	2.5	-	41.0	40.7	75.5	34.5	34.8
8	2514.80	55.3	46.3	27.5	31.5	3.1	-	54.4	45.4	75.5	21.1	30.1
10	3143.50	50.0	35.9	28.5	31.3	3.4	-	50.6	36.5	75.5	24.9	39.0

Peak with Duty factor Result = Reading (RBW: 1MHz, VBW: 1MHz) + Duty Factor (Outside Restricted bands)

No.	FREQ [MHz]	S/A READING		ANT Factor [dB/m]	AMP GAIN [dB]	LOSS [dB]	Duty Factor [dB]	RESULT		Limit [dBuV/m]	MARGIN	
		HOR	VER					HOR	VER		HOR	VER
4	1257.47	45.3	48.2	25.3	33.4	1.8	-6.4	32.6	35.5	55.5	22.9	20.0
6	1886.10	43.9	43.6	26.5	31.9	2.5	-6.4	34.6	34.3	55.5	20.9	21.2
8	2514.80	55.3	46.3	27.5	31.5	3.1	-6.4	48.0	39.0	55.5	7.5	16.5
10	3143.50	50.0	35.9	28.5	31.3	3.4	-6.4	44.2	30.1	55.5	11.3	25.4

REMARKS ANTENNA TYPE:30-300MHz Biconical / 300-1000MHz Logperidic / 1-4.4GHz Horn

CALCULATION RESULT=Reading + ANT Factor - Amp Gain + LOSS (Cable+ ATTEN.)+Duty factor

Duty cycle Factor Measurement : -6.4 dB

- * All the measured noise was pulse emission.
- * The test above 1GHz was performed with PK DETECT. Average emission measurements were calculated with PK DETECT and Duty cycle factor.
- * Duty Factor was calculated with the assumption of the worst condition in 100msec.
- * The result is rounded off to the second decimal place, so some differences might be observed.
- *The limit was converted from V to dBuV, and it is rounded off to the second decimal place.
- *Except for the above table : All other spurious emissions were less than 20dB for the limit.

The carrier level (or, noise levels) was (or were) measured at each position of all three axes X, Y and Z, and the position that has the maximum noise was determined. With the position, the noise levels of all the frequencies was measured.

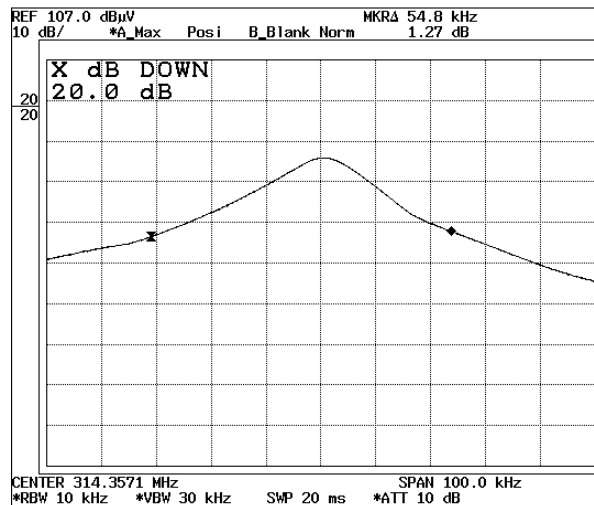
-20dB Bandwidth

UL Japan, Inc.
 Head Office EMC Lab. No.3 Semi Anechoic Chamber

COMPANY : DENSO CORPORATION	REPORT NO : 27LE0342-HO
EQUIPMENT : Remote Keyless Entry System (Transmitter)	REGULATION : Fcc Part15 Subpart C 15.231(c)
MODEL : 12BDC	TEST DISTANCE : 3m
S/N : No.1	DATE : 07/31/2007
POWER : DC 3.0V	TEMPERATURE : 23 deg.C.
Mode : Transmitting mode	HUMIDITY : 61%
Axis : Ver.: Y-axis	ENGINEER : Takahiro Hatakeda

Bandwidth Limit : Fundamental Frequency 314.35 MHz X 0.25% = 785.88 kHz

-20dB Bandwidth	Bandwidth Limit	Result
[kHz]	[kHz]	
54.80	785.88	Pass



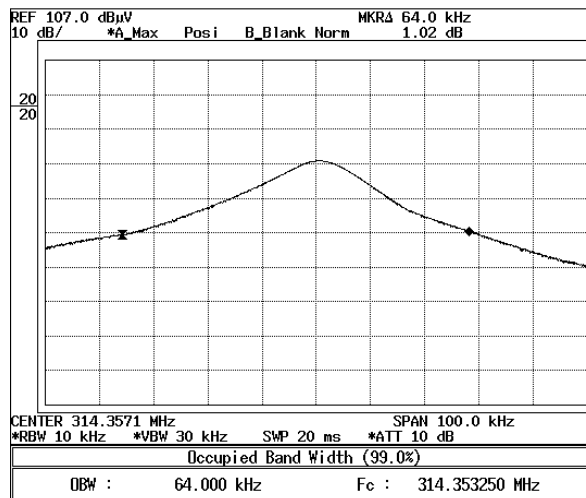
99% Occupied Bandwidth

UL Japan, Inc.
Head Office EMC Lab. No.3 Semi Anechoic Chamber

COMPANY : DENSO CORPORATION	REPORT NO : 27LE0342-HO
EQUIPMENT : Remote Keyless Entry System (Transmitter)	REGULATION : RSS-210 A1.1.3
MODEL : 12BDC	TEST DISTANCE : 3m
S/N : No.1	DATE : 07/31/2007
POWER : DC 3.0V	TEMPERATURE : 23 deg.C.
Mode : Transmitting mode	HUMIDITY : 61%
Axis : Ver.: Y-axis	ENGINEER : Takahiro Hatakeda

Bandwidth Limit : Fundamental Frequency 314.35 MHz X 0.25% = 785.88 kHz

99% Occupied Bandwidth	Bandwidth Limit	Result
[kHz]	[kHz]	
64.00	785.88	Pass



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Duty Cycle(Fundamental)

UL Japan, Inc.
Head Office EMC Lab. No.2 Semi Anechoic Chamber

COMPANY	: DENSO CORPORATION	REPORT NO	: 27LE0342-HO
EQUIPMENT	: Remote Keyless Entry System (Transmitter)	REGULATION	: Fcc Part15 Subpart C 15.231(b) / 15.35(c)
MODEL	: 12BDC	TEST DISTANCE	: -
S/N	: No.1	DATE	: 09/07/2007
POWER	: DC 3.0V	TEMPERATURE	: 27 deg.C
Mode	: Transmitting mode	HUMIDITY	: 58%
Axis	: -	ENGINEER	: Takahiro Hatakeda

Type	Times	ON time(One pulse) [ms]	ON time(in 100ms) [ms]
A	39	0.727	28.353
B	16	1.403	22.448

*1)ON time(in 100ms) = Times * ON time(One pulse)

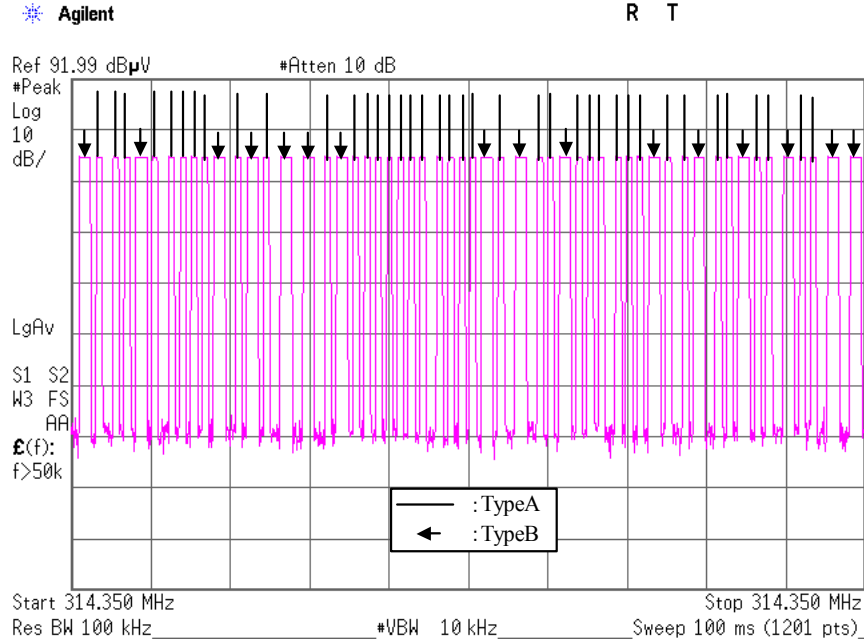
*2)The train of pulses was exceeding 100msec, and that sampled 100msec was the worst case against the pulse train.

(Total)

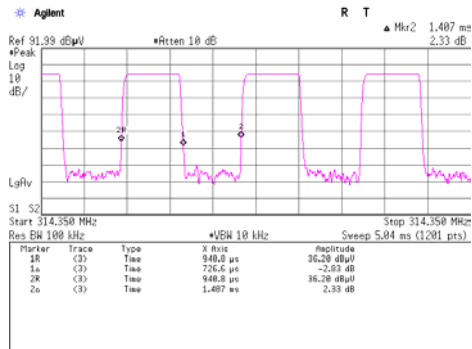
ON time [ms]	Cycle [ms]	Duty (On time/Cycle)	Duty [dB]
50.80	100.00	0.51	-5.9

*3)Duty = $20\log_{10}(\text{ON time/Cycle})$

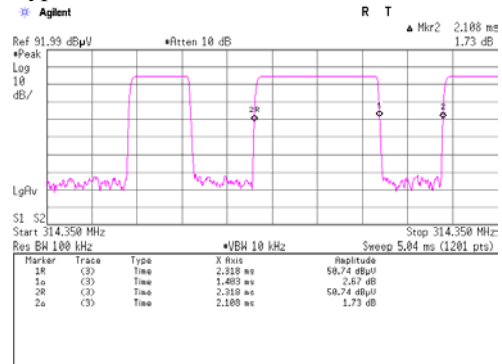
Duty Cycle(Fundamental)



TypeA



TypeB



Duty Cycle(Spurious Emission)

UL Japan, Inc.
 Head Office EMC Lab. No.2 Semi Anechoic Chamber

COMPANY : DENSO CORPORATION	REPORT NO : 27LE0342-HO
EQUIPMENT : Remote Keyless Entry System (Transmitter)	REGULATION : Fcc Part15 Subpart C 15.231(b) / 15.35(C)
MODEL : 12BDC	TEST DISTANCE : -
S/N : No.1	DATE : 09/07/2007
POWER : DC 3.0V	TEMPERATURE : 27 deg.C
Mode : Transmitting mode	HUMIDITY : 58%
Axis : -	ENGINEER : Takahiro Hatakeda

Type	Times	ON time(One pulse) [ms]	ON time(in 100ms) [ms]
A	37	0.663	24.531
B	17	1.373	23.341

*1)ON time(in 100ms) = Times * ON time(One pulse)

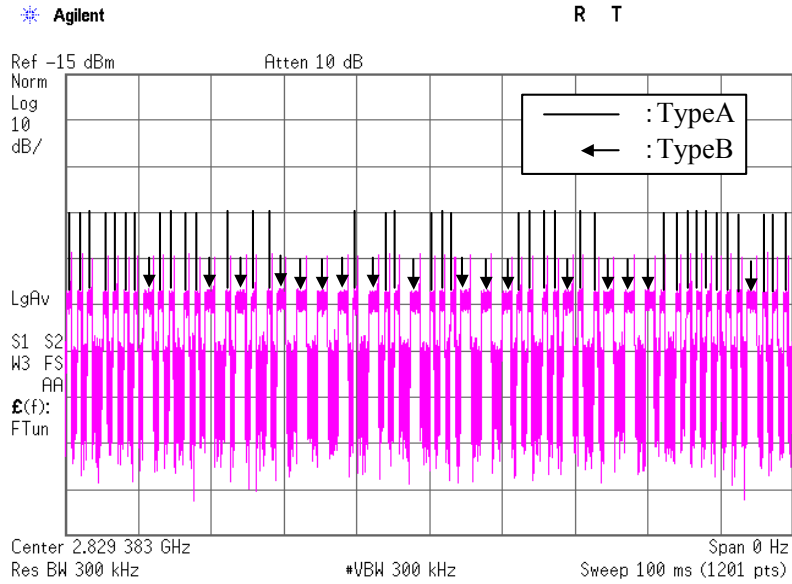
*2)The train of pulses was exceeding 100msec, and that sampled 100msec was the worst case against the pulse train.

(Total)

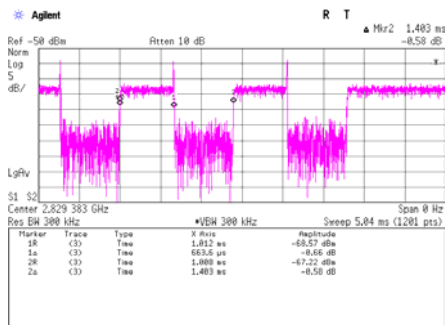
ON time [ms]	Cycle [ms]	Duty (On time/Cycle)	Duty [dB]
47.87	100.00	0.48	-6.4

*3)Duty = $20\log_{10}(\text{ON time}/\text{Cycle})$

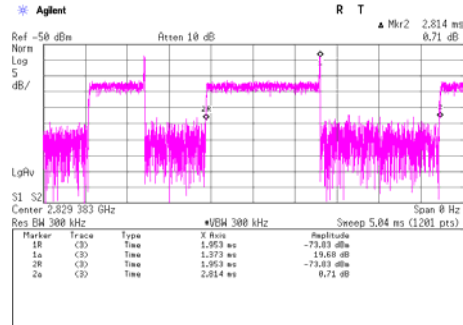
Duty Cycle(Spurious Emission)



TypeA



TypeB



APPENDIX 3: Test Instruments

EMI test equipment

Control No.	Instrument	Manufacturer	Model No	Test Item	Calibration Date * Interval(month)
MAEC-03	Anechoic Chamber	TDK	Semi Anechoic Chamber 3m	RE	2007/03/05 * 12
MOS-12	Thermo-Hygrometer	Custom	CTH-180	RE	2006/01/19 * 24
MBM-03	Barometer	Sunoh	SBR121	RE	2006/02/13 * 36
MJM-06	Measure	PROMART	SEN1955	RE	-
MSTW-14	EMI measurement program	TSJ	TEPTO-DV	RE	-
MBM-03	Barometer	Sunoh	SBR121	RE	2006/02/13 * 36
MLA-03	Logperiodic Antenna	Schwarzbeck	USLP9143	RE	2007/01/19 * 12
MAT-30	Attenuator(6dB)	TME	UFA-01	RE	2007/03/05 * 12
MCC-51	Coaxial cable	UL Japan	-	RE	2007/07/26 * 12
MPA-13	Pre Amplifier	SONOMA INSTRUMENT	310	RE	2007/03/16 * 12
MSA-09	Spectrum Analyzer	Advantest	R3273	RE	2006/12/08 * 12
MTR-02	Test Receiver	Rohde & Schwarz	ESCS30	RE	2007/02/03 * 12
MHA-20	Horn Antenna 1-18GHz	Schwarzbeck	BBHA9120D	RE	2007/04/14 * 12
MCC-56	Microwave Cable 1G-26.5GHz	Suhner	SUCOFLEX104	RE	2007/03/29 * 12
MPA-11	MicroWave System Amplifier	Agilent	83017A	RE	2007/03/02 * 12
MAEC-02	Anechoic Chamber	TDK	Semi Anechoic Chamber 3m	RE	2007/04/02 * 12
MOS-02	Digital Humidity Indicator	N.T	NT-1800	RE	2006/11/27 * 12
MJM-05	Measure	PROMART	SEN1955	RE	-
MHA-06	Horn Antenna	Schwarzbeck	BBHA9120D	RE	2007/01/30 * 12
MCC-47	Microwave Cable 1G-26.5GHz	Suhner	SUCOFLEX104	RE	2007/08/28 * 12
MCC-16	Microwave Cable 1G-26.5GHz	Suhner	SUCOFLEX 104	RE	2007/02/22 * 12
MPA-10	Pre Amplifier	Agilent	8449B	RE	2006/09/11 * 12
MSA-04	Spectrum Analyzer	Agilent	E4448A	RE	2007/06/20 * 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.

Test Item:

RE: Radiated Emission

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