

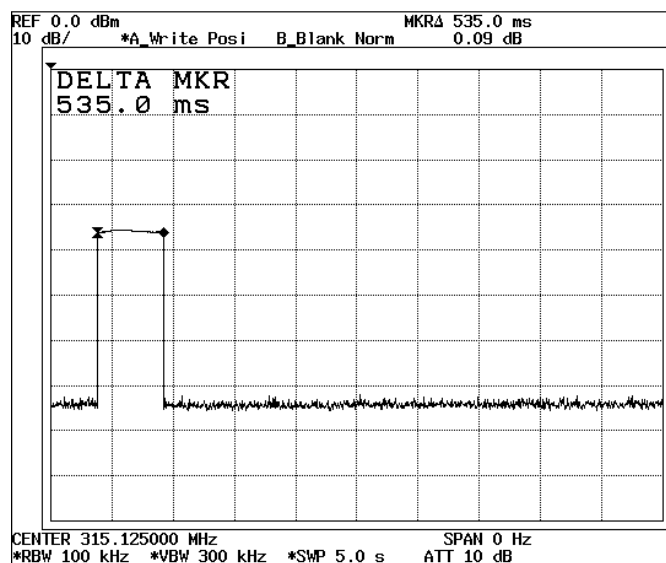
APPENDIX 2: Data of EMI test

Automatically deactivate

UL Japan, Inc.
Head Office EMC Lab. No.4 Semi Anechoic Chamber

COMPANY	: DENSO CORPORATION	REPORT NO	: 28DE0074-HO
EQUIPMENT	: Electronic Key	REGULATION	: FCC15.231(a)(1)
MODEL	: 14AAM	TEST DISTANCE	: -
S/N	: 001	DATE	: 11/22/2007
POWER	: DC 3.0V	TEMPERATURE	: 22 deg.C.
Mode	: Normal use mode	HUMIDITY	: 45%
Axis	: -	ENGINEER	: Shinya Watanabe

Time of Transmitting [sec]	Limit [sec]	Result
0.535	5.00	Pass



UL Japan, Inc.
Head Office EMC Lab.
4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN
Telephone : +81 596 24 8116
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Radiated Emission (Electric Field Strength of Fundamental and Spurious Emission)

UL Japan, Inc.
Head Office EMC Lab. No.4 Semi Anechoic Chamber

COMPANY : DENSO CORPORATION
EQUIPMENT : Electronic Key
MODEL : 14AAM
S/N : 001
POWER : DC 3.0V
Mode : Transmitting mode
Axis : Hor.: X-axis, Ver.: Y-axis

REPORT NO : 28DE0074-HO
REGULATION : FCC Part15 Subpart C 15.231(b) / 15.205 / 15.209
TEST DISTANCE : 3m
DATE : 11/22/2007
TEMPERATURE : 22 deg.C.
HUMIDITY : 45%
ENGINEER : Shinya Watanabe

QP DETECT (BW 120kHz)							(Outside Restricted bands)					
No.	FREQ	T/R READING		ANT	AMP	LOSS	Duty	RESULT		Limit	MARGIN	
	[MHz]	HOR	VER	Factor	GAIN		Factor	HOR	VER	[dBuV/m]	HOR	VER
		[dBuV]		[dB/m]	[dB]	[dB]	[dB]	[dBuV/m]			[dB]	[dB]
1	315.13	73.9	66.5	16.3	31.9	9.9	-	68.2	60.8	75.6	7.4	14.8
2	630.25	33.3	37.4	20.3	32.1	11.8	-	33.3	37.4	55.6	22.3	18.2
3	945.38	37.7	37.7	25.1	31.0	13.3	-	45.1	45.1	55.6	10.5	10.5

PK DETECT (RBW: 1MHz , VBW: 1MHz)							(Inside Restricted bands)					
No.	FREQ	S/A READING		ANT Factor [dB/m]	AMP GAIN [dB]	LOSS [dB]	Duty Factor [dB]	RESULT		Limit [dBuV/m]	MARGIN	
	[MHz]	HOR [dBuV]	VER					HOR [dBuV/m]	VER		HOR [dB]	VER [dB]
5	1575.63	45.6	44.7	25.6	33.1	2.0	-	40.1	39.2	73.9	33.8	34.7
7	2205.88	44.0	42.7	26.5	32.2	2.4	-	40.7	39.4	73.9	33.2	34.5
9	2836.13	48.2	43.6	27.8	32.0	2.9	-	46.9	42.3	73.9	27.0	31.6

Peak with Duty factor (RBW: 1MHz, VBW: 1MHz)										(Inside Restricted bands)			
No.	FREQ [MHz]	S/A READING HOR VER [dBuV]		ANT Factor [dB/m]	AMP GAIN [dB]	LOSS [dB]	Duty Factor [dB]	RESULT HOR VER [dBuV/m]		Limit [dBuV/m]	MARGIN HOR VER [dB]		
5	1575.63	45.6	44.7	25.6	33.1	2.0	-6.1	34.0	33.1	53.9	19.9	20.8	
7	2205.88	44.0	42.7	26.5	32.2	2.4	-6.1	34.6	33.3	53.9	19.3	20.6	
9	2836.13	48.2	43.6	27.8	32.0	2.9	-6.1	40.8	36.2	53.9	13.1	17.7	

PK DETECT (RBW: 1MHz , VBW: 1MHz)							(Outside Restricted bands)					
No.	FREQ [MHz]	S/A READING HOR VER [dBuV]		ANT Factor [dB/m]	AMP GAIN [dB]	LOSS [dB]	Duty Factor [dB]	RESULT HOR VER [dBuV/m]		Limit [dBuV/m]	MARGIN HOR VER [dB]	
4	1260.50	44.4	44.3	25.1	33.9	1.8	-	37.4	37.3	75.6	38.2	38.3
6	1890.75	55.1	50.3	25.9	32.4	2.2	-	50.8	46.0	75.6	24.8	29.6
8	2521.00	51.4	48.1	27.3	32.1	2.6	-	49.2	45.9	75.6	26.4	29.7
10	3151.25	42.3	41.8	28.2	31.8	3.0	-	41.7	41.2	75.6	33.9	34.4

Peak with Duty factor (RBW: 1MHz, VBW: 1MHz)							(Outside Restricted bands)					
No.	FREQ [MHz]	S/A READING HOR VER [dBuV]		ANT Factor [dB/m]	AMP GAIN [dB]	LOSS [dB]	Duty Factor [dB]	RESULT HOR VER [dBuV/m]		Limit [dBuV/m]	MARGIN HOR VER [dB]	
4	1260.05	44.4	44.3	25.1	33.9	1.8	-6.1	31.3	31.2	55.6	24.3	24.4
6	1890.75	55.1	50.3	25.9	32.4	2.2	-6.1	44.7	39.9	55.6	10.9	15.7
8	2521.00	51.4	48.1	27.3	32.1	2.6	-6.1	43.1	39.8	55.6	12.5	15.8
10	3151.25	42.3	41.8	28.2	31.8	3.0	-6.1	35.6	35.1	55.6	20.0	20.5

REMARKS ANTENNA TYPE:30-300MHz Biconical / 300-1000MHz Logperiodic / 1-3.2GHz Horn
CALCULATION RESULT=Reading + ANT Factor - Amp Gain + LOSS (Cable+ ATTEN.)+Duty factor

Duty cycle Factor Measurement : -6.1 dB

- * All the measured noise was pulse emissions.
 - * 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

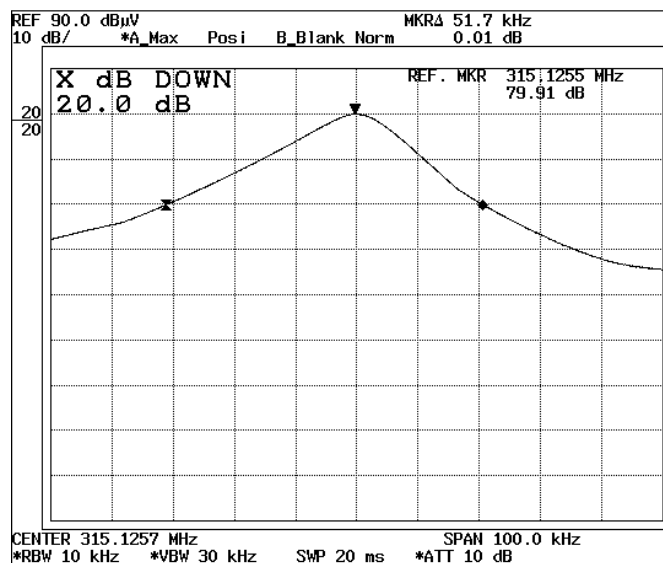
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Head Office EMC Lab. No.4 Semi Anechoic Chamber

COMPANY : DENSO CORPORATION
EQUIPMENT : Electronic Key
MODEL : 14AAM
S/N : 001
POWER : DC 3.0V
Mode : Transmitting mode
Axis : Hor.: X-axis

REPORT NO : 28DE0074-HO
REGULATION : FCC15.231(c)
TEST DISTANCE : 3m
DATE : 11/22/2007
TEMPERATURE : 22 deg.C.
HUMIDITY : 45%
ENGINEER : Shinya Watanabe

Bandwidth Limit : Fundamental Frequency 315.12 MHz X 0.25% = 787.80 kHz

-20dB Bandwidth	Bandwidth Limit	Result
[kHz]	[kHz]	
51.70	787.80	Pass



99% Occupied Bandwidth

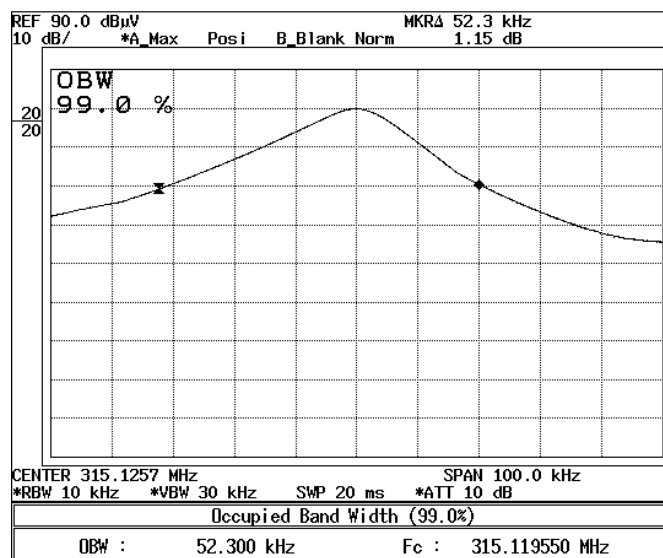
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COMPANY : DENSO CORPORATION
EQUIPMENT : Electronic Key
MODEL : 14AAM
S/N : 001
POWER : DC 3.0V
Mode : Transmitting mode
Axis : Hor.: X-axis

REPORT NO : 28DE0074-HO
REGULATION : RSS-210 A1.1.3
TEST DISTANCE : 3m
DATE : 11/22/2007
TEMPERATURE : 22 deg.C.
HUMIDITY : 45%
ENGINEER : Shinya Watanabe

Bandwidth Limit : Fundamental Frequency 315.12 MHz X 0.25% = 787.8 kHz

99% Occupied Bandwidth	Bandwidth Limit	Result
[kHz]	[kHz]	
52.30	787.80	Pass



Duty Cycle

UL Japan, Inc.
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COMPANY : DENSO CORPORATION
EQUIPMENT : Electronic Key
MODEL : 14AAM
S/N : 001
POWER : DC 3.0V
Mode : Transmitting mode
Axis : -

REPORT NO : 28DE0074-HO
REGULATION : FCC 15.231(b) / 15.35(c)
TEST DISTANCE : -
DATE : 11/22/2007
TEMPERATURE : 22 deg.C
HUMIDITY : 45%
ENGINEER : Shinya Watanabe

Type	Times	ON time(One pulse) [ms]	ON time(in 100ms) [ms]
A	39	0.700	27.3
B	16	1.405	22.48

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

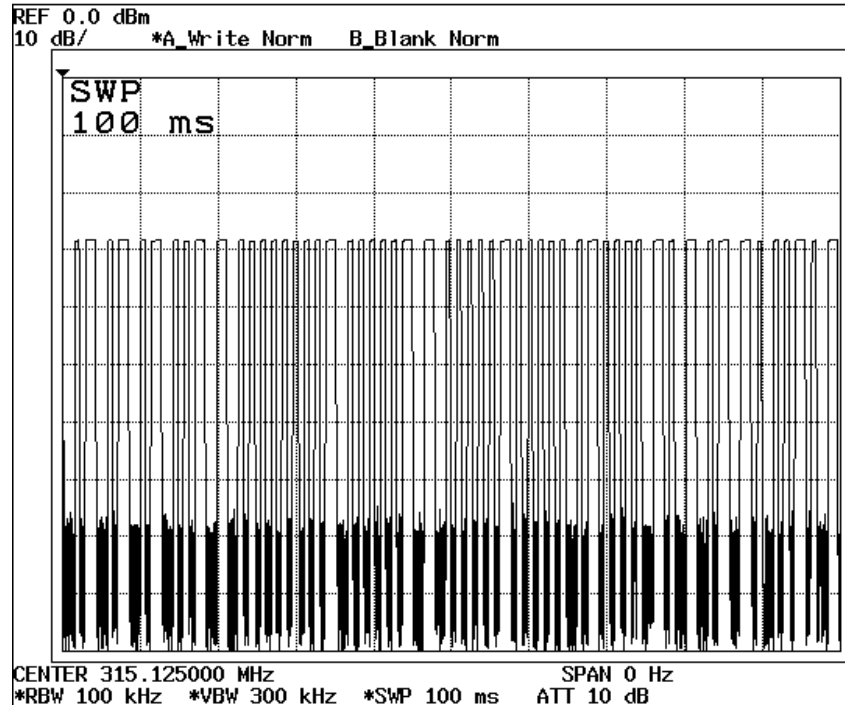
*2)The train of pulses was exceeding 100msec, and that sampled 100msec was the worst case against the pulse train.

(Total)

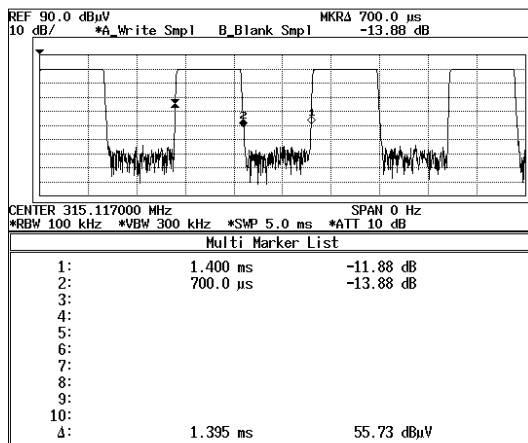
ON time [ms]	Cycle [ms]	Duty (On time/Cycle)	Duty [dB]
49.78	100.00	0.50	-6.1

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

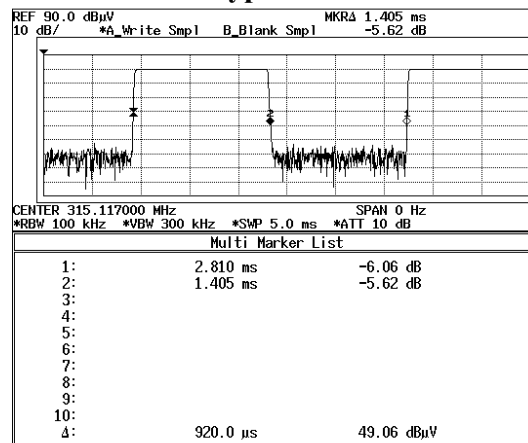
Duty Cycle



<Type A>



<Type B>



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Head Office EMC Lab.

4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8116

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APPENDIX 3:Test Instruments

EMI test equipment

Control No.	Instrument	Manufacturer	Model No	Test Item	Calibration Date * Interval(month)
MAEC-04	Anechoic Chamber	TDK	Semi Anechoic Chamber 3m	RE	2007/03/03 * 12
MBA-05	Biconical Antenna	Schwarzbeck	BBA9106	RE	2007/01/19 * 12
MLA-08	Logperiodic Antenna	Schwarzbeck	UKLP9140-A	RE	2007/01/19 * 12
MAT-31	Attenuator(6dB)	TME	UFA-01	RE	2007/03/05 * 12
MCC-50	Coaxial cable	UL Japan	-	RE	2007/03/06 * 12
MPA-14	Pre Amplifier	SONOMA INSTRUMENT	310	RE	2007/03/12 * 12
MTR-07	Test Receiver	Rohde & Schwarz	ESCI	RE	2007/09/14 * 12
MSA-05	Spectrum Analyzer	Advantest	R3273	RE	2007/06/01 * 12
MHA-21	Horn Antenna 1-18GHz	Schwarzbeck	BBHA9120D	RE	2007/08/16 * 12
MCC-57	Microwave Cable 1G-26.5GHz	Suhner	SUCOFLEX104	RE	2007/03/30 * 12
MPA-12	MicroWave System Amplifier	Agilent	83017A	RE	2007/03/12 * 12
MSTW-14	EMI measurement program	TSJ	TEPTO-DV	RE	-
MOS-15	Thermo-Hygrometer	Custom	CTH-180	RE	2006/01/19 * 24
MJM-07	Measure	PROMART	SEN1955	RE	-

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

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