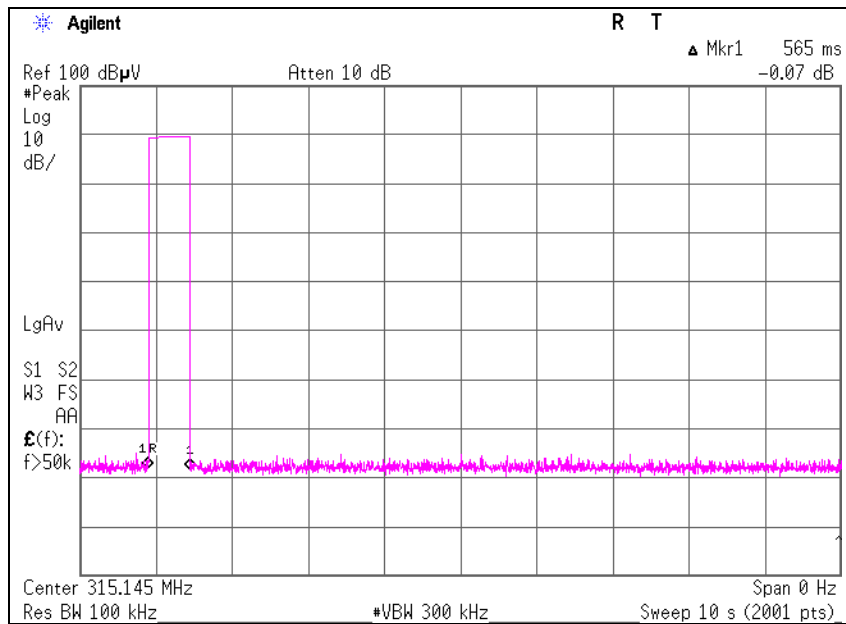


**APPENDIX 2: Data of EMI test**

**Automatically deactivate**

Test place Head Office EMC Lab. No.2 Semi Anechoic Chamber  
Report No. 31FE0146-HO-01  
Date 02/03/2011  
Temperature/ Humidity 25 deg. C./ 25%  
Engineer Hironobu Ohnishi  
Mode Normal use mode

Time of Transmitting [sec]	Limit [sec]	Result
0.565	5.00	Pass



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

Test place	Head Office EMC Lab. No.2 Semi Anechoic Chamber
Report No.	31FE0146-HO-01
Date	02/03/2011
Temperature/ Humidity	25 deg. C./ 25%
Engineer	Hironobu Ohnishi
Mode	Transmitting mode

**PK**

Frequency [MHz]	Detector	Reading [dBuV]		Ant Factor [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]		Limit dBuV/m	Margin [dB]		Remark Inside or Outside of Restricted Bands
		Hor	Ver					Hor	Ver		Hor	Ver	
315.145	PK	79.5	75.9	15.4	8.8	27.8	-	75.9	72.3	95.6	19.7	23.3	Carrier
630.290	PK	34.2	34.1	19.7	10.2	28.6	-	35.5	35.4	75.6	40.1	40.2	Outside
945.435	PK	31.6	31.2	22.6	11.3	27.8	-	37.7	37.3	75.6	37.9	38.3	Outside
1260.579	PK	46.8	48.1	24.7	2.0	33.4	-	40.1	41.4	75.6	35.5	34.2	Outside
1575.723	PK	46.9	49.2	25.7	2.2	33.0	-	41.8	44.1	73.9	32.1	29.8	Inside
1890.868	PK	45.2	46.4	26.5	2.4	32.6	-	41.5	42.7	75.6	34.1	32.9	Outside
2206.012	PK	49.4	47.5	27.1	2.7	32.5	-	46.7	44.8	73.9	27.2	29.1	Inside
2521.157	PK	55.2	53.9	27.6	2.9	32.4	-	53.3	52.0	75.6	22.3	23.6	Outside
2836.302	PK	57.2	56.2	28.1	3.1	32.4	-	56.0	55.0	73.9	17.9	18.9	Inside
3151.446	PK	51.7	53.0	28.6	3.3	32.2	-	51.4	52.7	75.6	24.2	22.9	Outside

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter) - Gain(Amplifier)

**PK with Duty factor**

Frequency [MHz]	Detector	Reading [dBuV]		Ant Factor [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]		Limit dBuV/m	Margin [dB]		Remark
		Hor	Ver					Hor	Ver		Hor	Ver	
315.145	PK	79.5	75.9	15.4	8.8	27.8	-5.9	70.0	66.4	75.6	5.6	9.2	Carrier
630.290	PK	34.2	34.1	19.7	10.2	28.6	-5.9	29.6	29.5	55.6	26.0	26.1	Outside
945.435	PK	31.6	31.2	22.6	11.3	27.8	-5.9	31.8	31.4	55.6	23.8	24.2	Outside
1260.579	PK	46.8	48.1	24.7	2.0	33.4	-5.9	34.2	35.5	55.6	21.4	20.1	Outside
1575.723	PK	46.9	49.2	25.7	2.2	33.0	-5.9	35.9	38.2	53.9	18.0	15.7	Inside
1890.868	PK	45.2	46.4	26.5	2.4	32.6	-5.9	35.6	36.8	55.6	20.0	18.8	Outside
2206.012	PK	49.4	47.5	27.1	2.7	32.5	-5.9	40.8	38.9	53.9	13.1	15.0	Inside
2521.157	PK	55.2	53.9	27.6	2.9	32.4	-5.9	47.4	46.1	55.6	8.2	9.5	Outside
2836.302	PK	57.2	56.2	28.1	3.1	32.4	-5.9	50.1	49.1	53.9	3.8	4.8	Inside
3151.446	PK	51.7	53.0	28.6	3.3	32.2	-5.9	45.5	46.8	55.6	10.1	8.8	Outside

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter) - Gain(Amplifier) + Duty factor (Refer to Duty factor data sheet)

\*Other frequency noises omitted in this report were not seen or had enough margin (more than 20dB).

- \* 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 noise measured with PK detect was pulse emission.

**-20dB and 99% Occupied Bandwidth**

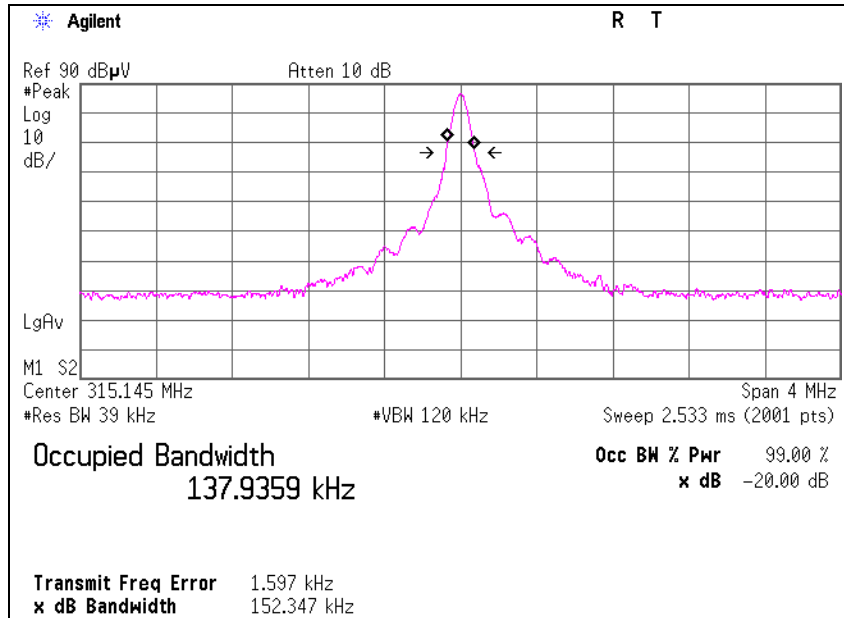
Test place Head Office EMC Lab. No.2 Semi Anechoic Chamber  
 Report No. 31FE0146-HO-01  
 Date 02/03/2011  
 Temperature/ Humidity 25 deg. C./ 25%  
 Engineer Hironobu Ohnishi  
 Mode Normal use mode

Bandwidth Limit : Fundamental Frequency  $315.12 \text{ MHz} \times 0.25\% = 787.80 \text{ kHz}$

\* The above limit was calculated from more stringent nominal frequency.

-20dB Bandwidth [kHz]	Bandwidth Limit [kHz]	Result
152.35	787.80	Pass

99% Occupied Bandwidth [kHz]	Bandwidth Limit [kHz]	Result
137.94	787.80	Pass



### Duty Cycle

Test place Head Office EMC Lab. No.2 Semi Anechoic Chamber  
Report No. 31FE0146-HO-01  
Date 02/03/2011  
Temperature/ Humidity 25 deg. C./ 25%  
Engineer Hironobu Ohnishi  
Mode Normal use mode

Type	Times	ON time(One pulse) [ms]	ON time(in 100ms) [ms]
A	35	0.721	25.225
B	18	1.424	25.632

\*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]
50.857	100.00	0.51	-5.87

\*3)ON time = Type A's ON time (in 100ms) + Type B's ON time (in 100ms)

\*4)Duty =  $20\log_{10}(\text{ON time/Cycle})$

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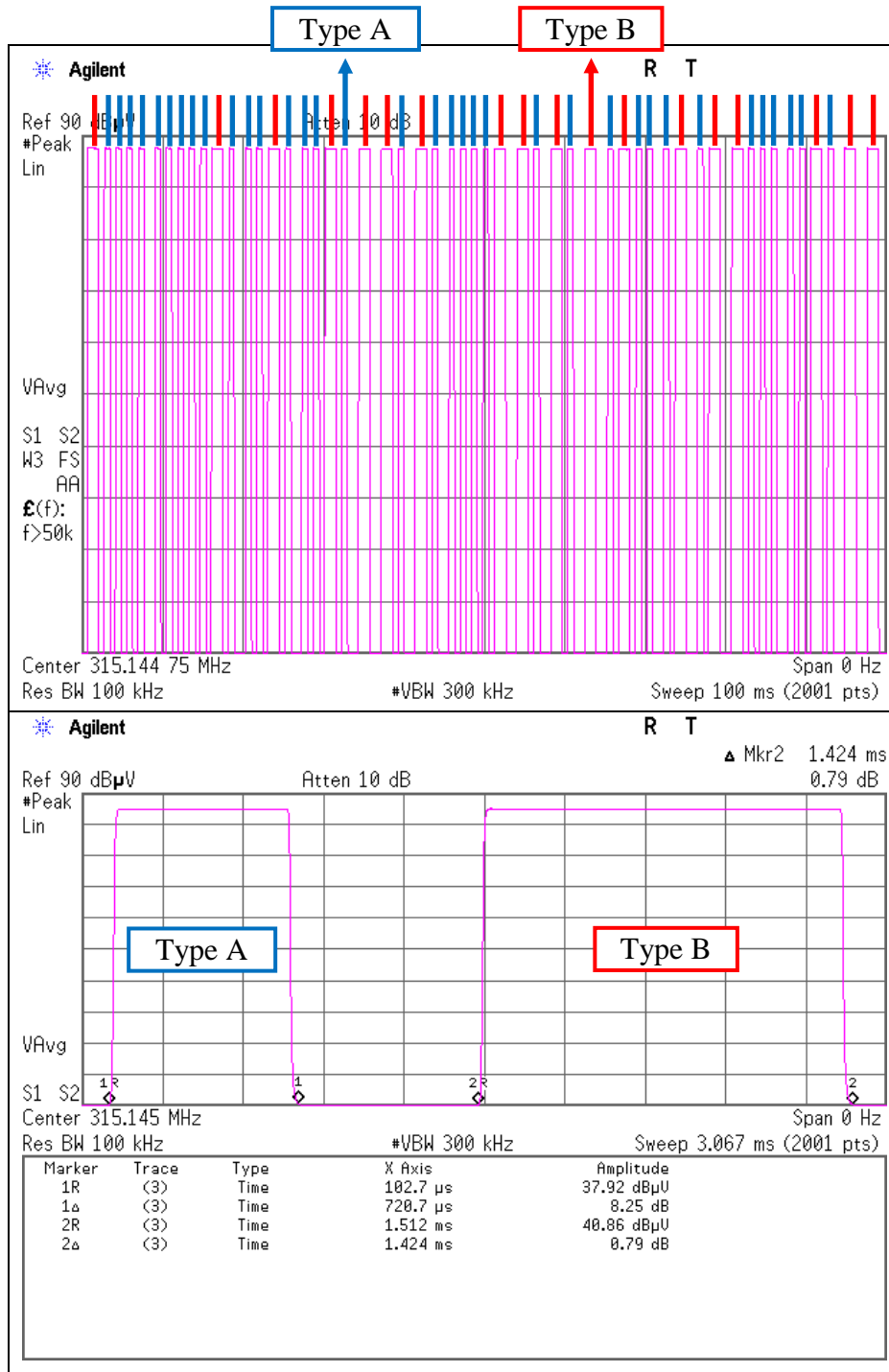
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### Duty Cycle



### **APPENDIX 3:Test Instruments**

#### **EMI test equipment**

<b>Control No.</b>	<b>Instrument</b>	<b>Manufacturer</b>	<b>Model No</b>	<b>Serial No</b>	<b>Test Item</b>	<b>Calibration Date * Interval(month)</b>
MAEC-02	Semi Anechoic Chamber(NSA)	TDK	Semi Anechoic Chamber 3m	DA-06902	RE	2010/09/01 * 12
MOS-22	Thermo-Hygrometer	Custom	CTH-201	0003	RE	2010/02/09 * 12
MJM-05	Measure	PROMART	SEN1955	-	RE	-
COTS-MEMI	EMI measurement program	TSJ	TEPTO-DV	-	RE	-
MSA-03	Spectrum Analyzer	Agilent	E4448A	MY44020357	RE	2010/11/30 * 12
MTR-03	Test Receiver	Rohde & Schwarz	ESCI	100300	RE	2010/04/19 * 12
MBA-02	Biconical Antenna	Schwarzbeck	BBA9106	VHA9103200 8	RE	2010/10/11 * 12
MLA-02	Logperiodic Antenna	Schwarzbeck	USLP9143	201	RE	2010/10/11 * 12
MCC-12	Coaxial Cable	Fujikura/Agilent	-	-	RE	2010/02/22 * 12
MAT-07	Attenuator(6dB)	Weinschel Corp	2	BK7970	RE	2010/11/05 * 12
MPA-09	Pre Amplifier	Agilent	8447D	2944A10845	RE	2010/09/09 * 12
MHA-06	Horn Antenna 1-18GHz	Schwarzbeck	BBHA9120D	254	RE	2011/01/16 * 12
MCC-56	Microwave Cable	Suhner	SUCOFLEX104	174410(1m) / 284655(5m)	RE	2011/01/18 * 12
MPA-10	Pre Amplifier	Agilent	8449B	3008A02142	RE	2010/09/30 * 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, 99% Occupied Bandwidth, -20dB bandwidth , Automatically deactivate and Duty cycle tests**

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