APPENDIX 2:Test Instruments

EMI test equipment

Control No.	Instrument	Manufacturer	Model No	Test Item	Calibration Date * Interval(month)
MAEC-02	Anechoic Chamber	TDK	Semi Anechoic Chamber 3m	RE	2006/04/10 * 12
MRENT-31	Spectrum Analyzer	Advantest	R3273	RE	2006/04/24 * 12
MCC-12	Coaxial Cable	Fujikura/Agilent	-	RE	2006/02/23 * 12
MPA-09	Pre Amplifier	Agilent	8447D	RE	2005/09/07 * 12
MAT-07	Attenuator(6dB)	Weinschel Corp	2	RE	2005/12/16 * 12
MBA-02	Biconical Antenna	Schwarzbeck	BBA9106	RE	2005/10/10 * 12
MLA-02	Logperiodic Antenna	Schwarzbeck	USLP9143	RE	2005/10/14 * 12
MCC-16	Microwave Cable 1G-26.5GHz	Suhner	SUCOFLEX 104	RE	2006/02/02 * 12
MCC-47	Microwave Cable 1G-26.5GHz	Suhner	SUCOFLEX104	RE	2005/08/30 * 12
MPA-10	Pre Amplifier	Agilent	8449B	RE	2005/09/07 * 12
MHA-06	Horn Antenna	Schwarzbeck	BBHA9120D	RE	2006/01/09 * 12
MOS-02	Digital Humidity Indicator	N.T	NT-1800	RE	2004/11/25 * 24
MSTW-14	EMI measurement program	TSJ	TEPTO-DV	RE	-

All equipment is calibrated with traceable calibrations. Each calibration is traceable to the national or international standards.
Test Item:
RE: Radiated emission

APPENDIX 3: Data of EMI test

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

UL Apex Co., Ltd.
Head Office EMC Lab. No.2 Semi Anechoic Chamber

COMPANY	: BRIDGESTONE Co., Ltd.	REPORT NO	: 26IE0253-HO
EQUIPMENT	: SENSOR	REGULATION	: Fcc Part15 Subpart C 231(e) / 205
MODEL	: B421	TEST DISTANCE	: 3m
S/N	: 0020DB	DATE	: 05/22/2006
POWER	: DC3.0V	TEMPERATURE	: 26℃
Mode	: Continuous Transmitting	HUMIDITY	: 50%
Axis	: Hor.: Y-axis , Ver.: Z-axis	ENGINEER	: Yasuyuki Fukui

(Fundamental)

No.	FREQ	T/R READING		ANT	AMP	LOSS	Duty	RESULT		Limit	MARGIN		DETECTOR
		HOR	VER	Factor	GAIN		Factor	HOR	VER		HOR	VER	
	[MHz]	[dBuV/m]		[dB]	[dB]	[dB]	[dB]	[dBuV/m]		[dBuV/m]	[dB]	[dB]	
1	314.94	76.3	74.3	14.7	27.2	8.6	-6.1	66.3	64.3	67.6	1.3	3.3	AV

(below 1GHz)

No.	FREQ	T/R READING		ANT	AMP	LOSS	Duty	RESULT		Limit	MARGIN		DETECTOR
		HOR	VER	Factor	GAIN		Factor	HOR	VER		HOR	VER	
	[MHz]	[dBuV/m]		[dB]	[dB]	[dB]	[dB]	[dBuV/m]		[dBuV/m]	[dB]	[dB]	
2	629.88	24.4	27.3	19.6	28.7	9.5	0.0	24.8	27.7	47.6	22.8	19.9	QP
3	944.82	26.0	27.1	22.2	27.7	10.5	0.0	31.0	32.1	47.6	16.6	15.5	QP

(above 1GHz)

No.	FREQ	T/R READING		ANT	AMP	LOSS	Duty	RESULT		Limit	MARGIN		DETECTOR
		HOR	VER	Factor	GAIN		Factor	HOR	VER		HOR	VER	
	[MHz]	[dBuV/m]		[dB]	[dB]	[dB]	[dB]	[dBuV/m]		[dBuV/m]	[dB]	[dB]	
4	1259.76	46.2	52.1	23.5	33.4	2.6	0.0	38.9	44.8	74.0	35.1	29.2	PK
5	1574.70	50.8	55.8	25.3	32.9	2.8	0.0	46.0	51.0	74.0	28.0	23.0	PK
6	1889.63	46.7	46.2	29.9	32.4	3.0	0.0	47.2	46.7	74.0	26.8	27.3	PK
7	2204.57	43.8	42.5	30.9	32.4	3.2	0.0	45.5	44.2	74.0	28.5	29.8	PK
8	2519.51	52.9	53.9	30.5	32.4	3.5	0.0	54.5	55.5	74.0	19.5	18.5	PK
9	2834.45	46.8	49.5	31.4	32.2	3.6	0.0	49.6	52.3	74.0	24.4	21.7	PK
10	3149.39	48.2	47.3	31.7	32.1	3.8	0.0	51.6	50.7	74.0	22.4	23.3	PK

No.	FREQ	T/R READING		ANT	AMP	LOSS	Duty	RESULT		Limit	MARGIN		DETECTOR
		HOR	VER	Factor	GAIN		Factor	HOR	VER		HOR	VER	
	[MHz]	[dBuV/m]		[dB]	[dB]	[dB]	[dB]	[dBuV/m]		[dBuV/m]	[dB]	[dB]	
4	1259.76	46.2	52.1	23.5	33.4	2.6	-6.1	32.8	38.7	54.0	21.2	15.3	AV
5	1574.70	50.8	55.8	25.3	32.9	2.8	-6.1	39.9	44.9	54.0	14.1	9.1	AV
6	1889.63	46.7	46.2	29.9	32.4	3.0	-6.1	41.1	40.6	54.0	12.9	13.4	AV
7	2204.57	43.8	42.5	30.9	32.4	3.2	-6.1	39.4	38.1	54.0	14.6	15.9	AV
8	2519.51	52.9	53.9	30.5	32.4	3.5	-6.1	48.4	49.4	54.0	5.6	4.6	AV
9	2834.45	46.8	49.5	31.4	32.2	3.6	-6.1	43.5	46.2	54.0	10.5	7.8	AV
10	3149.39	48.2	47.3	31.7	32.1	3.8	-6.1	45.5	44.6	54.0	8.5	9.4	AV

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
*Except for the above table : All other spurious emissions were less than 20dB for the limit.

Duty factor calculation

Duty Factor Calculation:

Duty Factor is 20log{(48+100+49)／397}=-6.1dB

The measured duty factor is the above -6.1dB. The duty factor (-6.1dB) was used for Radiated Emission.
The EUT continuously transmitted the train of pulse 1 to 3 (in Chart 2 to 4) as 1 cycle (397.0us, in Chart 1).

Chart 1 (1 cycle)

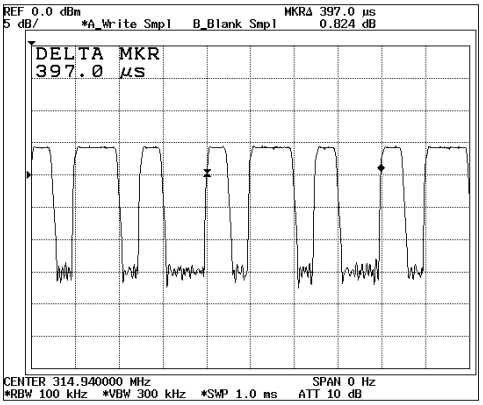


Chart 2 (pulse 1)

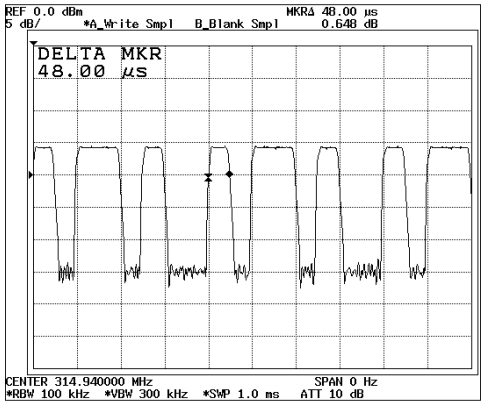


Chart 3 (pulse 2)

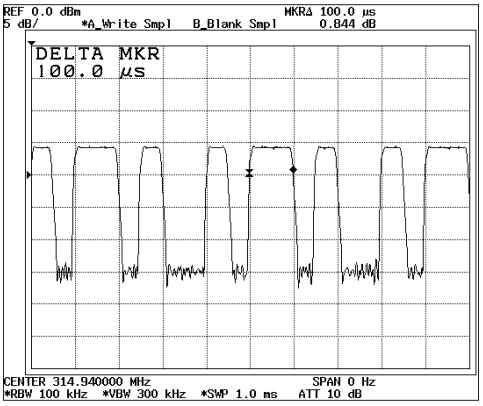
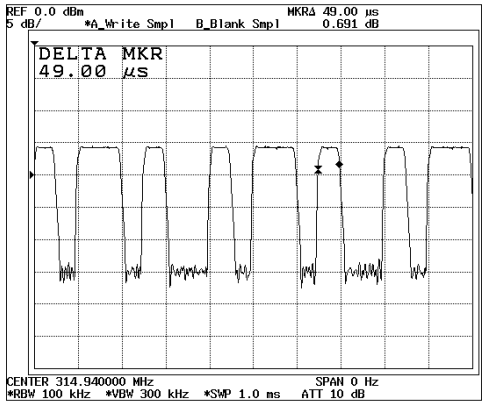


Chart 4 (pulse 3)

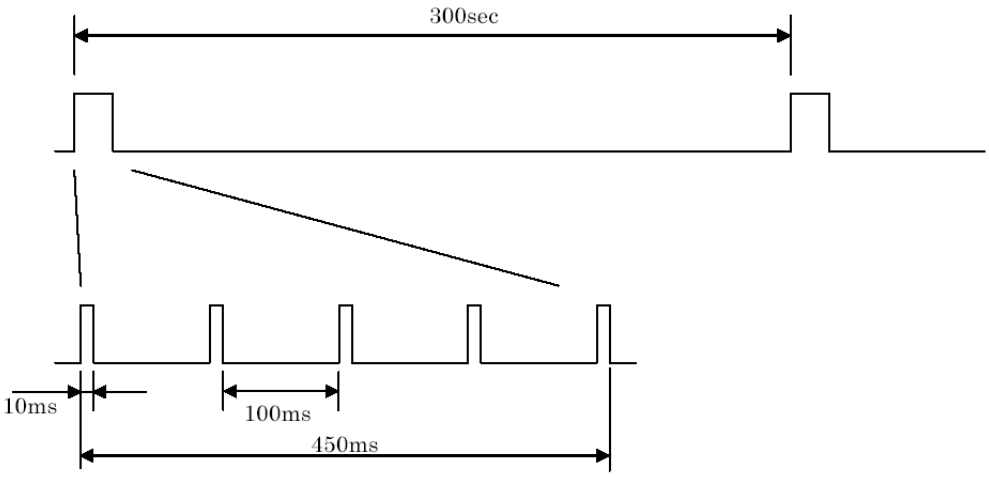


Transmitting and interval

1. Normal Mode

   Interval of the transmission : 300sec

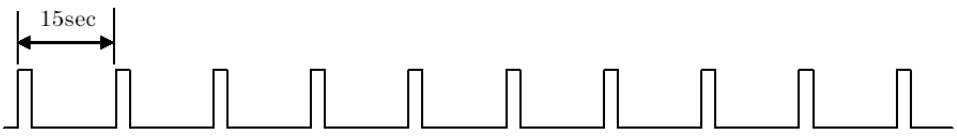
   Duration of the transmission : 450ms



2. Alarm Mode

   Interval of the transmission : 15sec (Silent period: 14.55sec > 450ms×30=13.5sec)

   Duration of the transmission : 450ms



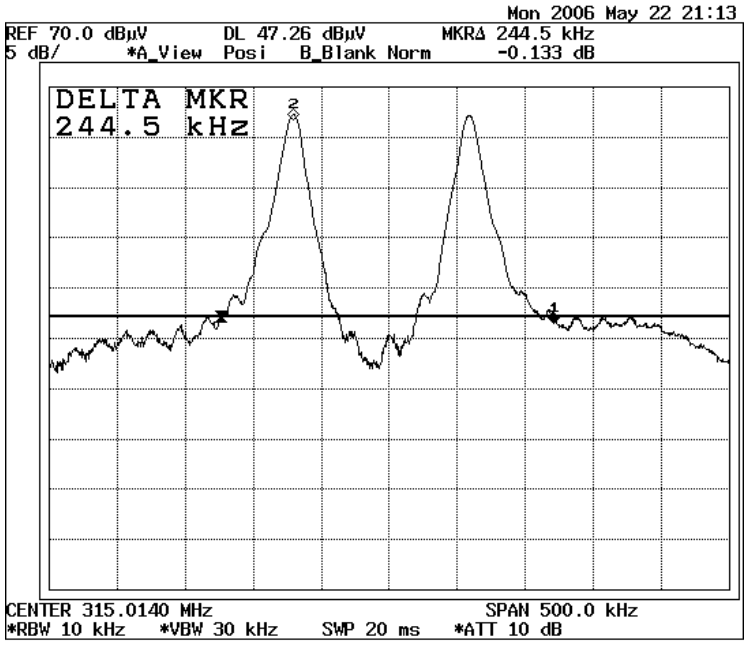
-20dB Bandwidth

UL-Apex
Head Office EMC Lab. No.2 Semi Anechoic Chamber

Company	: BRIDGESTONE Co., Ltd.	Regulation	: Fcc Part15 Subpart C 15.231(c)
Equipment	: SENSOR	Test Distance	: 3m
Model	: B421	Date	: 05/22/2006
S/N	: 0020DB	Temperature	: 26 deg.C.
Power	: DC3.0V	Humidity	: 50 %
Mode	: Continuous Transmitting	Engineer	: Yasuyuki Fukui

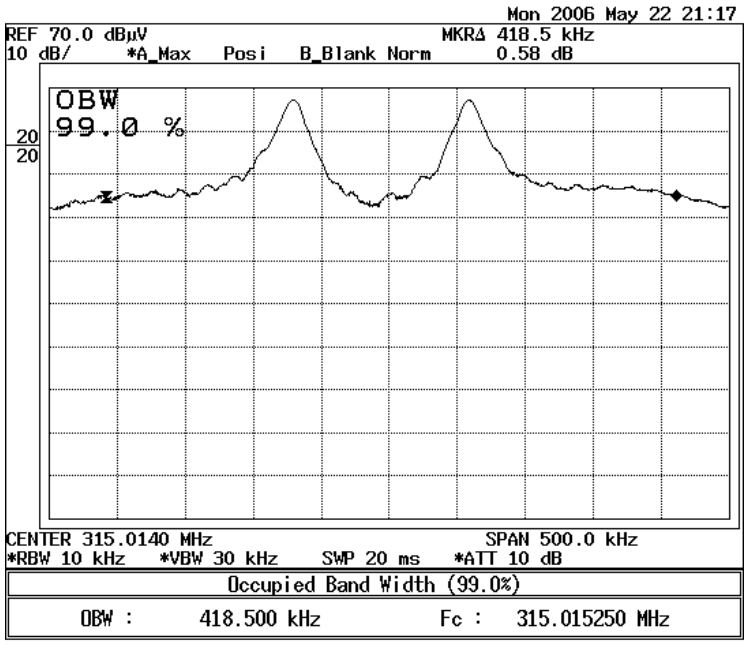
Bandwidth Limit : Fundamental Frequency 315.01 MHz X 0.25% = 787.525 kHz

-20dB Bandwidth [kHz]	Bandwidth Limit [kHz]	Result
244.50	787.53	Pass



99% Occupied Bandwidth

UL-Apex
Head Office EMC Lab. No.2 Semi Anechoic Chamber

Company	: BRIDGESTONE Co., Ltd.	Regulation	: RSS-210 A1.1.3
Equipment	: SENSOR	Test Distance	: 3m
Model	: B421	Date	: 05/22/2006
S/N	: 0020DB	Temperature	: 26 deg.C.
Power	: DC3.0V	Humidity	: 50 %
Mode	: Continuous Transmitting	Engineer	: Yasuyuki Fukui

99% Occupied Bandwidth Result: 418.5kHz