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APPLICANT: VERTEX STANDARD CO., LTD.

FCC ID: K6620223X20

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TEST EQUIPMENT LIST

Device	Manufacturer	Model	Serial Number	Cal/Char Date	Due Date or Status
3-Meter OATS	TEI	N/A	N/A	Listed 1/13/03	1/12/06
3/10-Meter OATS	TEI	N/A	N/A	Listed 3/27/04	3/26/07
Tan Tower Spectrum Analyzer	HP	8566B Opt 462	3138A07786 3144A20661	CAL 9/23/03	9/23/05
Tan Tower RF Preselector	HP	85685A	3221A01400	CAL 9/23/03	9/23/05
Tan Tower Quasi-Peak Adapter	HP	85650A	3303A01690	CAL 9/23/03	9/23/05
Tan Tower Preamplifier	HP	8449B-H02	3008A00372	CAL 9/23/03	9/23/05
Blue Tower Spectrum Analyzer	HP	8568B	2928A04729 2848A18049	CAL 4/15/03	4/15/05
Blue Tower RF Preselector	HP	85685A	2620A00294	CAL 4/27/04	4/27/06
Blue Tower Quasi-Peak Adapter	HP	85650A	2811A01279	CAL 4/15/03	4/15/05
Silver Tower Spectrum Analyzer	HP	8566B Opt 462	3552A22064 3638A08608	CAL 3/22/04	3/22/06
Silver Tower RF Preselector	HP	85685A	2926A00983	CAL 3/22/04	3/22/06
Silver Tower Quasi-Peak Adapter	HP	85650A	3303A01844	CAL 3/22/04	3/22/06
Silver Tower Preamplifier	HP	8449B	3008A01075	CAL 3/22/04	3/22/06
Biconnical Antenna	Electro-Metrics	BIA-25	1171	CAL 4/26/01	4/26/03
Biconnical Antenna	Eaton	94455-1	1096	CAL 8/17/04	8/17/06
Biconnical Antenna	Eaton	94455-1	1057	CAL 3/18/03	3/18/05
BiconiLog Antenna	EMCO	3143	9409-1043	No Cal Required	
Log-Periodic	Electro-	LPA-25	1122	CAL	8/26/06

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Device	Manufacturer	Model	Serial Number	Cal/Char Date	Due Date or Status
Antenna	Metrics			8/26/04	
Log-Periodic Antenna	Electro-Metrics	LPA-30	409	CAL 3/4/03	3/4/05
Log-Periodic Antenna	Eaton	96005	1243	CAL 5/8/03	5/8/05
Dipole Antenna Kit	Electro-Metrics	TDA-30/1-4	152	CAL 3/21/01	3/21/04
Dipole Antenna Kit	Electro-Metrics	TDA-30/1-4	153	CAL 9/26/02	9/26/05
Double-Ridged Horn Antenna	Electro-Metrics	RGA-180	2319	CAL 2/17/03	2/17/05
Horn Antenna *(at 3 meters)	Electro-Metrics	EM-6961	6246	CAL 3/31/03	3/31/05
Horn Antenna *(at 10 meters)	Electro-Metrics	EM-6961	6246	CAL 6/4/03	6/4/05
Passive Loop Antenna	EMC Test Systems	EMCO 6512	9706-1211	CHAR 7/10/01	7/10/03
Harmonic Mixer with Horn Antenna	Oleson Microwave Labs	M08HW/A	F30425-1	CHAR 4/25/03	4/25/05
Harmonic Mixer with Horn Antenna	Oleson Microwave Labs	M12HW/A	E30425-1	CHAR 4/25/03	4/25/05
LISN	Electro-Metrics	ANS-25/2	2604	CAL 8/27/04	8/27/06
LISN	Electro-Metrics	EM-7820	2682	CAL 3/12/03	3/12/05
Termaline Wattmeter	Bird Electronic Corporation	611	16405	CAL 7/16/04	7/16/06
Termaline Wattmeter	Bird Electronic Corporation	6104	1926	CAL 7/16/04	7/16/06
Oscilloscope	Tektronix	2230	300572	CAL 7/3/03	7/3/05
System One	Audio Precision	System One	SYS1-45868	CHAR 4/25/02	4/25/04
Temperature Chamber	Tenney Engineering	TTRC	11717-7	CHAR 1/22/02	1/22/04
AC Voltmeter	HP	400FL	2213A14499	CAL 7/19/04	7/19/06
AC Voltmeter	HP	400FL	2213A14261	CHAR 10/15/01	10/15/03
AC Voltmeter	HP	400FL	2213A14728	CHAR 10/15/01	10/15/03
Digital Multimeter	Fluke	77	35053830	CHAR 1/8/02	1/8/04
Digital Multimeter	Fluke	77	43850817	CHAR	1/8/04

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Device	Manufacturer	Model	Serial Number	Cal/Char Date	Due Date or Status
				1/8/02	
Digital Multimeter	HP	E2377A	2927J05849	CHAR 1/8/02	1/8/04
Multimeter	Fluke	FLUKE-77-3	79510405	CHAR 9/26/01	9/26/03
Peak Power Meter	HP	8900C	2131A00545	CAL 7/2/03	7/2/05
Power Sensor	Agilent Technologies	84811A	2551A02705	CAL 7/2/03	7/2/05
Power Meter	HP	432A	1141A07655	CAL 4/15/03	4/15/05
Power Sensor	HP	478A	72129	CAL 4/15/03	4/15/05
Power Meter And Sensor	Bird	4421-107 & 4022	0166 & 0218	CAL 4/16/03	4/16/05
Digital Thermometer	Fluke	2166A	42032	CAL 7/19/04	7/19/06
Thermometer	Traulsen	SK-128		CHAR 1/22/02	1/22/04
Thermometer	Extech	4028	14871-2	CAL 3/7/03	3/7/05
Hygro-Thermometer	Extech	445703	0602	CAL 10/4/02	10/4/04
Frequency Counter	HP	5352B	2632A00165	CAL 8/3/04	8/3/06
Frequency Counter	HP	5385A	2730A03025	CAL 3/7/03	3/7/05
Service Monitor	IFR	FM/AM 500A	5182	CAL 11/22/00	Out of Service
Comm. Serv. Monitor	IFR	FM/AM 1200S	6593	CAL 5/12/02	5/12/04
Signal Generator	HP	8640B	2308A21464	CAL 8/26/04	8/26/06
Sweep Generator	Wiltron	6648	101009	CAL 4/15/03	4/15/05
Sweep Generator	Wiltron	6669M	007005	CAL 3/3/03	3/3/05
Modulation Analyzer	HP	8901A	3435A06868	CAL 9/5/01	9/5/03
Modulation Meter	Boonton	8220	10901AB	CAL 4/15/03	4/15/05
Near Field Probe	HP	HP11940A	2650A02748	CHAR 2/1/01	Out of Service
BandReject Filter	Lorch Microwave	5BR4- 2400/60-N	Z1	CHAR 4/17/03	4/17/05
BandReject Filter	Lorch	6BR6-	Z1	CHAR	4/17/05

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Device	Manufacturer	Model	Serial Number	Cal/Char Date	Due Date or Status
	Microwave	2442/300-N		4/17/03	
BandReject Filter	Lorch Microwave	5BR4-10525/900-S	Z1	CHAR 4/12/03	4/12/05
Notch Filter	Lorch Microwave	5BRX-850/X100-N	AD-1	CHAR 4/17/03	4/17/05
High Pass Filter	Unk	3768(5)-400	041	CHAR 12/17/02	12/17/04
High Pass Filter	Microlab	HA-10N		CHAR 11/17/02	11/17/04
High Pass Filter	Microlab	HA-20N		CHAR 12/17/02	12/17/04
Audio Oscillator	HP	653A	832-00260	CHAR 12/1/02	12/1/04
Audio Generator	B&K Precision	3010	8739686	CHAR 12/1/02	12/1/04
Frequency Counter	HP	5382A	1620A03535	CHAR 3/2/01	Out of Service
Frequency Counter	HP	5385A	3242A07460	CAL 3/7/03	3/7/05
Amplifier	HP	11975A	2738A01969	No Cal Required	
Egg Timer	Unk			CHAR 2/1/02	2/1/04
Measuring Tape-20M	Kraftixx	0631-20		CHAR 2/1/02	2/1/04
Measuring Tape-7.5M	Kraftixx	7.5M PROFI		CHAR 2/1/02	2/1/04
Coaxial Cable #51	Insulated Wire Inc.	NPS 2251-2880	Timco #51	CHAR 1/23/02	1/23/04
Coaxial Cable #64	Semflex Inc.	60637	Timco #64	CHAR 1/24/02	1/24/04
Coaxial Cable #65	General Cable Co.	E9917 RG233/U	Timco #65	CHAR 1/23/02	1/23/04
Coaxial Cable #106	Unknown	Unknown	Timco #106	CHAR 1/23/02	1/23/04
Injection Probe	Fischer Custom Communications	F-120-9A	270	CAL 6/1/01	6/1/03
Power Line Coupling/Decoupling Network	Fischer Custom Communications	FCC-801-M2-16A	01048	CAL 8/29/01	8/29/03
Power Line Coupling/Decoupling Network	Fischer Custom Communications	FCC-801-M3-16A	01060	CAL 8/29/01	8/29/03
VHF/UHF Current Probe	Fischer Custom Communications	F-52	130	CAL 8/30/01	8/30/03
Passive Impedance	Fischer Custom	FCC-801-150-	01117 & 01118	CAL	8/29/03

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Device	Manufacturer	Model	Serial Number	Cal/Char Date	Due Date or Status
Adapter	Communications	50-CDN		8/29/01	
Radiating Field Coil	Fischer Custom Communications	F-1000-4-8/9/10-L-1M	9859	CAL 10/15/98	10/15/00
EMC Immunity Test System	Keytek	CEMASTER	9810210	CAL 2/1/02	2/1/04
Compliance Test System - AC Power Source	California Instruments	1251RP	L05865	CAL 2/25/04	2/25/06
Compliance Test System - PACS-1 Module	California Instruments	PACS-1	X71484	CAL 2/25/04	2/25/06
Isotropic Field Probe	Amplifier Research	FP5000	22839		
Isotropic Field Probe	Amplifier Research	FP5000	300103		
Capacitor Clamp	Keytek	CM-CCL	9811359	No Cal Required	
Amplifier	Amplifier Research	10W1000B	23117	No Cal Required	
Field Monitor	Amplifier Research	FM5004	22288	No Cal Required	
ELF Meter	F. W. Bell	4060	Not Serialized		Out of Service
Standard Gain Horn 1.0-2.4 GHz	Polarad	CA-L	235	No Cal Required	
Standard Gain Horn 2.14-4.34 GHz	Polarad	CA-S	203	No Cal Required	
Standard Gain Horn 3.95-5.85 GHz	Scientific-Atlanta Inc.	11A-3.9	8448CG	No Cal Required	
Standard Gain Horn 8.2-12.5 GHz	Systron Donner	DBG-520-20	Not Serialized	No Cal Required	
Standard Gain Horn 18.0-26.3 GHz	Systron Donner	DBE-520-20	Not Serialized	No Cal Required	
Standard Gain Horn 26.5-40.2 GHz	Systron Donner	DBD-520-20	Not Serialized	No Cal Required	
Standard Gain Horn 40.0-60.0 GHz	ATM	19-443-6R	Not Serialized	No Cal Required	
Double-Ridged Horn Antenna	EMCO	3116	9011-2145		Out of Service
Standard Gain Horn 12.4-18.0 GHz	ATM	62-442-6	D262108-01	No Cal Required	
Standard Gain Horn 5.85-8.2 GHz	ATM	137-442-2	D261908-01	No Cal Required	
AC Voltmeter	HP	400F	0950A05433	CAL 8/13/03	8/13/05
RF Power Amplifier	Ophir RF	5150F	1041 'X1'	No Cal	

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Device	Manufacturer	Model	Serial Number	Cal/Char Date	Due Date or Status
				Required	
Electric Field Sensor	Amplifier Research	FP6001	302504		
Electric Field Sensor	Amplifier Research	FP6001	302510	CAL 6/1/04	6/1/06
Surge Generator	Com-Power Corporation	SG-168	25802	CAL 2/27/04	2/27/06
RF Power Amplifier	Ophir RF, Inc.	5150F	1041	CHAR 10/31/03	10/31/05
3-Meter Anechoic Chamber	Panashield	N/A	N/A	Listed 5/12/04	5/11/07
Digital Multimeter	Fluke	77III	79510408	CAL 7/19/04	7/19/06
Open-Frame Tower Spectrum Analyzer	HP	8566B/85662A	2627A03154/2648A14276	CAL 7/9/04	7/9/06
Open-Frame Tower RF Preselector	HP	85685A	3107A01282	CAL 7/9/04	7/9/06
Open-Frame Tower Quasi-Peak Adapter	HP	85650A	2046A00305	CAL 7/9/04	7/9/06
Signal Generator	HP	8648C	3847A04696	CAL 9/27/04	9/27/06

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TEST PROCEDURE

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RADIATION INTERFERENCE: The test procedure used was ANSI STANDARD C63.4-2003 using a HEWLETT PACKARD spectrum analyzer with a preselector. The bandwidth of the spectrum analyzer was 100 kHz with an appropriate sweep speed. The analyzer was calibrated in dB above a microvolt at the output of the antenna. The resolution bandwidth was 100KHz and the video bandwidth was 300KHz. The ambient temperature of the UUT was 80oC with a humidity of 76%.

FORMULA OF CONVERSION FACTORS: The Field Strength at 3m was established by adding the meter reading of the spectrum analyzer (which is set to read in units of dBuV) to the antenna correction factor supplied by the antenna manufacturer. The antenna correction factors are stated in terms of dB. The gain of the Preselector was accounted for in the Spectrum Analyzer Meter Reading.

Example:

Freq (MHz) METER READING + ACF = FS
33 20 dBuV + 10.36 dB = 30.36 dBuV/m @ 3m

ANSI STANDARD C63.4-1992 10.1.7 MEASUREMENT PROCEDURES: The unit under test was placed on a table 80 cm high and with dimensions of 1m by 1.5m. The table used for radiated measurements is capable of continuous rotation.

When an emission was found, the table was rotated to produce the maximum signal strength. At this point, the antenna was raised and lowered from 1m to 4m. The antenna was placed in both the horizontal and vertical planes.

The situation was similar for the conducted measurement except that the table did not rotate. The EUT was setup as described in ANSIC63.4-2003 with the EUT 40 cm from the vertical ground wall.

APPLICANT: VERTEX STANDARD CO., LTD.

FCC ID: K6620223X20

NAME OF TEST: RADIATION INTERFERENCE

RULES PART NUMBER: 15.109

REQUIREMENTS: 30 to 80 MHz: 40.0 dBuV/M @ 3 METERS
88 to 216 MHz: 43.5 dBuV/M
216 to 960 MHz: 46.0 dBuV/M
ABOVE 960 MHz: 54.0 dBuV/M

TEST RESULTS: A search was made of the spectrum from 30 to 1000 MHz and the measurements indicate that the unit DOES meet the FCC requirements.

TEST DATA:

Table with 8 columns: Tuned Frequency MHz, Emission Frequency MHz, Meter Reading dBuV, Ant. Polarity, Coax Loss dB, Correction Factor dB, Field Strength dBuV/m, Margin dB. It contains 6 rows of test data.

The device was also tested at 137 MHz and 154 MHz but no emissions were found. The only emissions found are listed in the table above.

SAMPLE CALCULATION: FSdBuV/m = MR (dBuV) + ACFdB.

TEST PROCEDURE: ANSI STANDARD C63.4-2003 using a Hewlett Packard Model 8566B spectrum analyzer, a Hewlett Packard Model 85685A Preselector, a Hewlett Packard Model 85650A Quasi-Peak adapter, an Electro-Metric Dipole Kit, and an Eaton Model 94455-1 Biconical Antenna. The bandwidth of spectrum analyzer was 100 kHz with an appropriate sweep speed. When an emission was found, the table was rotated to produce the maximum signal strength. The antenna was placed in both the horizontal and vertical planes and the worse case emissions were reported. The receiver was put into the coherent mode by placing an antenna driven by a signal generator off site. The UUT was tested in 3 orthogonal planes.

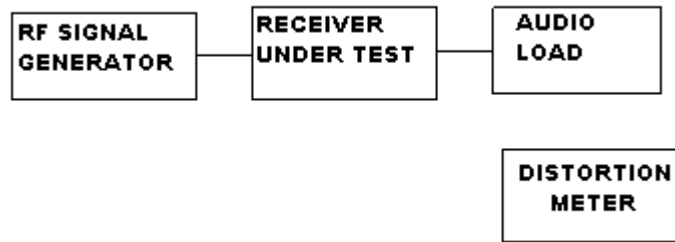
PERFORMED BY: JOSEPH SCOGLIO

DATE: 3/18/2005

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APPLICANT: VERTEX STANDARD CO., LTD.
FCC ID: K6620223X20
NAME OF TEST: 38dB REJECTION RATIO
RULES PART NUMBER: 15.121(b)
REQUIREMENTS: 38dB REJECTION RATIO TO SENSITIVITY OF THE RECEIVER.

TEST SET-UP



TEST PROCEDURE: The reference sensitivity was measured in accordance with TIA/EIA-603;

- a. Equipment connected as illustrated
- b. A standard signal was applied to the receiver input terminals.
- c. Receiver output audio output was adjusted for rated output.
- d. The RF Signal generator was adjusted to the lowest level to produce a 12dB SINAD without the audio output dropping more than 3dB. Make note of sensitivity level.
- e. This was done across the different bands to establish a reference level. The reference taken was the worse case sensitivity.
- f. The output of the signal generator was then adjusted to a level of 60dB above the reference level at a frequency of 824.5MHz.
- g. With the level set 60dB above the level measured in step e.
- h. Set squelch on receiver to threshold, the signal level required to open the squelch must be lower than the level measured in step d.
- i. Cause the receiver to scan or step-it through its complete range of frequencies.
- j. If receiver stops or unsquelches on any frequency, record the frequency and then adjust the level until a 12dB SINAD is produced. This level must be greater than 38dB above the level in step e.
- k. Repeat steps f through j for frequencies 836.0, 848.5, 869.1, 881.0, & 893.5MHz.

TEST RESULTS: The UUT meets the 38dB REJECTION RATIO.

PERFORMED BY: JOSEPH SCOGLIO

DATE: 3/18/2005

APPLICANT: VERTEX STANDARD CO., LTD.
FCC ID: K6620223X20
NAME OF TEST: POWER LINE CONDUCTED INTERFERENCE
RULES PART NO.: 15.107

REQUIREMENTS:	QUASI-PEAK	AVERAGE
.15 - 0.5 MHz	66-56 dBuV	56-46 dBuV
0.5 - 5.0	56	46
5.0 - 30.	60	50

TEST PROCEDURE: ANSI STANDARD C63.4-1992. The spectrum was scanned from .15 to 30 MHz.

THE ATTACHED GRAPHS REPRESENT THE EMISSIONS READ FOR POWERLINE CONDUCTED FOR THIS DEVICE.

TEST RESULTS: Both lines were observed. The measurements indicate that the unit DOES appear to meet the FCC requirements for this class of equipment.

PERFORMED BY: JOSEPH SCOGLIO

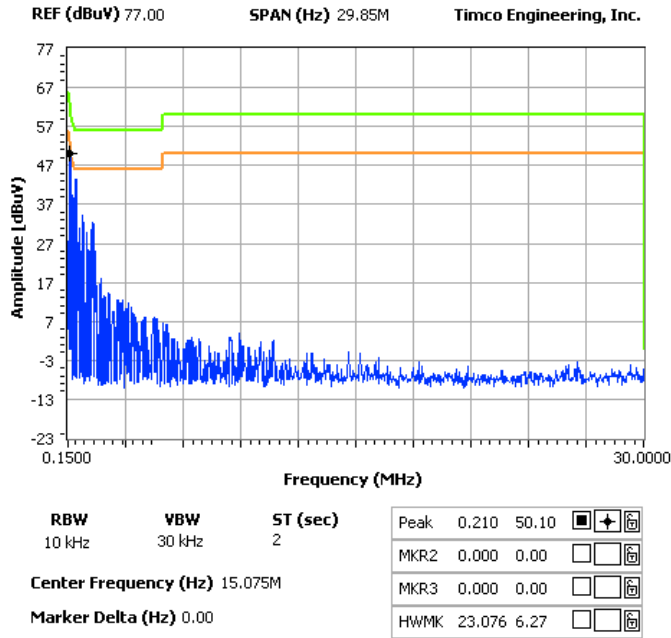
DATE: 3/18/05

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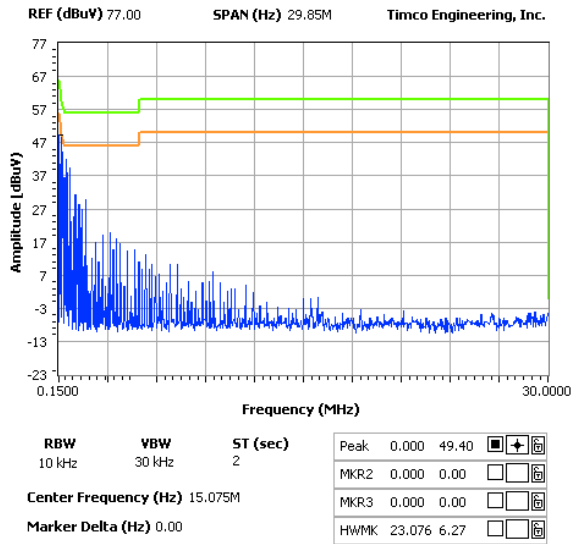
NOTES:
537aut5 ac line conducted line 1

FCC 15.107 Mask Class B



NOTES:
537aut5 ac line conducted line 2

FCC 15.107 Mask Class B



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