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FCC ID: NF30C-AKSE

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TEST EQUIPMENT LIST

1. Spectrum Analyzer: HP 8566B-Opt 462, S/N 3138A07786, w/
preselector HP 85685A, S/N 3221A01400, Quasi-Peak Adapter
HP 85650A, S/N 3303A01690 & Preamplifier HP 8449B-OPT H02,
S/N 3008A00372 Cal. 8/31/01 Due 8/31/02
2. Biconnical Antenna: Eaton Model 94455-1, S/N 1057,
Cal. 10/1/01 Due 10/1/02
3. Biconnical Antenna: Electro-Metrics Model BIA-25, S/N 1171
Cal. 4/26/01 Due 4/26/03
4. Log-Periodic Antenna: Electro-Metrics Model EM-6950, S/N 632
Char. 3/15/00 Due 3/15/01
5. Log-Periodic Antenna: Electro-Metrics Model LPA-30, S/N 409
Char. 3/15/00 Due 3/15/01
6. Double-Ridged Horn Antenna: Electro-Metrics Model RGA-180,
1-18 GHz, S/N 2319 Cal. 4/27/99 Due 4/27/00
7. 18-26.3GHz Systron Donner Standard Gain Horn #DBE-520-20
No Cal Required
8. Horn 40-60GHz: ATM Part #19-443-6R No Cal Required
9. Line Impedance Stabilization Network: Electro-Metrics Model
EM-7820, w/NEMA Adapter S/N 2682 Cal. 3/16/01 Due 3/16/02
10. Temperature Chamber: Tenney Engineering Model TTRC, S/N 11717-7
Char. 1/27/01 Due 1/27/02
11. Frequency Counter: HP Model 5385A, S/N 3242A07460
Char. 11/20/00 Due 11/20/01
12. Peak Power Meter: HP Model 8900C, S/N 2131A00545
Char. 1/26/01 Due 1/26/02
13. Open Area Test Site #1-3meters Cal. 12/22/99
14. Signal Generator: HP 8640B, S/N 2308A21464
Cal. 11/15/01 Due 11/15/02
15. Passive Loop Antenna: EMCO Model 6512, 9KHz to 30MHz, S/N
9706-1211 Char. 6/10/00 Due 6/10/01
16. Dipole Antenna Kit: Electro-Metrics Model TDA-30/1-4, S/N 153
Char. 11/24/00 Due 11/24/01
17. AC Voltmeter: HP Model 400FL, S/N 2213A14499
Cal. 10/9/01 Due 10/09/02
18. Digital Multimeter: Fluke Model 77, S/N 43850817
Cal. 11/16/00 Due 11/16/01
19. Oscilloscope: Tektronix Model 2230, S/N 300572
Char. 2/1/01 Due 2/1/02

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TEST PROCEDURES

GENERAL: This report shall NOT be reproduced except in full without the written approval of TIMCO ENGINEERING, INC.

RADIATION INTERFERENCE: The test procedure used was ANSI STANDARD C63.4-1992 using a HEWLETT PACKARD spectrum analyzer with a preselector. In the frequency range 10KHz to 30MHz the RBW was 10KHz and from 30-1000MHz the RBW 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 82°F with a humidity of 70%.

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

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FCC ID: NF30C-AKSE
NAME OF TEST: RADIATION INTERFERENCE

RULES PART NO.15.109(a) and 15.209

REQUIREMENTS: CARRIER FREQUENCY WILL NOT EXCEED 2400/F(KHz) AT 300 METERS.

OUT-OF-BAND EMISSIONS SHALL NOT EXCEED THE LEVEL OF THE FUNDAMENTAL.

9 to 490 KHz: 2400/F(KHz) uV/m @ 300 METERS
490 to 1705 KHz: 24000/F(KHz) uV/m @ 30 METERS
1705 to 30 MHz: 29.54 dBuV/M @ 30 METERS
30 to 88 MHz: 40.00 dBuV/M @ 3 METERS
88 to 216 MHz: 43.50 dBuV/M
216 to 960 MHz: 46.02 dBuV/M
ABOVE 960 MHz: 54.00 dBuV/M

TEST

CONFIGURATION: The INTENTIONAL RADIATOR was connected to an ignition switch and a harness simulator cable box.

TEST DATA:

Emission Frequency MHz	Meter Reading dBuv	Coax Loss dB	Correction Factor dB	Field Strength dBuv/m	Limit	Margin dB	Ant. Polarity
0.123	34.40	1.00	25.94	61.34	65.81	4.47	V
0.125	35.20	1.00	25.93	62.13	65.67	3.54	V
0.129	35.20	1.00	25.93	62.13	65.39	3.26	V
0.131	35.00	1.00	25.93	61.93	65.26	3.33	V
0.133	35.30	1.00	25.93	62.23	65.13	2.90	V
0.384	13.60	1.00	25.80	40.40	55.92	15.52	V
0.512	10.00	1.00	25.73	36.73	53.42	16.69	V
0.640	11.00	1.00	25.66	37.66	51.48	13.82	V
0.768	10.30	1.00	25.60	36.90	49.90	13.00	V
0.891	5.50	1.00	25.55	32.05	48.61	16.56	V

THE MEASUREMENTS WERE MADE AT 3.0Meters and the test data was extrapolated per section 15.31 "measurement standards". The spectrum was scanned from 10KHz to 1000MHz.

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NAME OF TEST: RADIATION INTERFERENCE

TEST PROCEDURE: ANSI C63.4-1992 Section 8.2.1. The EUT was placed on a non-conducting table 80CM above the ground plane with the EUT located in the center of the table. With the antenna vertical a preliminary scan was done at 1 meters distance, the EUT was moved to a 3.0 meter distance and the antenna height varied and also placed in a horizontal position. The frequency was scanned from 9.0KHz to 1.0GHz. When an emission was found, the table was rotated to produce the maximum signal strength. The EUT was measured in three(3) orthogonal planes. The unit was measured at TIMCO ENGINEERING, INC. located at 849 N.W. State Road 45 Newberry, Florida 32669.

TEST RESULTS: THE UNIT DOES MEET THE FCC REQUIREMENTS.

PERFORMED BY: JOSEPH SCOGLIO

DATE: 10/17/01

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FCC ID: NF30C-AKSE
NAME OF TEST: Occupied Bandwidth
RULES PART NO.: 15.209
REQUIREMENTS: The field strength of any emissions appearing between the band edges and up to 10 kHz above and below the band edges shall be attenuated at least 26 dB below the level of the unmodulated carrier or to the general limits of 15.209, whichever permits the higher emission levels.

THE GRAPH ON THE FOLLOWING PAGE REPRESENTS THE EMISSIONS TAKEN FOR THE DEVICE.

METHOD OF MEASUREMENT: A small sample of the transmitter output was fed into the spectrum analyzer and the above photo was taken. The vertical scale is set to -10 dBm per division. The horizontal scale is set to 5 kHz per division.

TEST RESULTS: The unit DOES meet the FCC requirements.

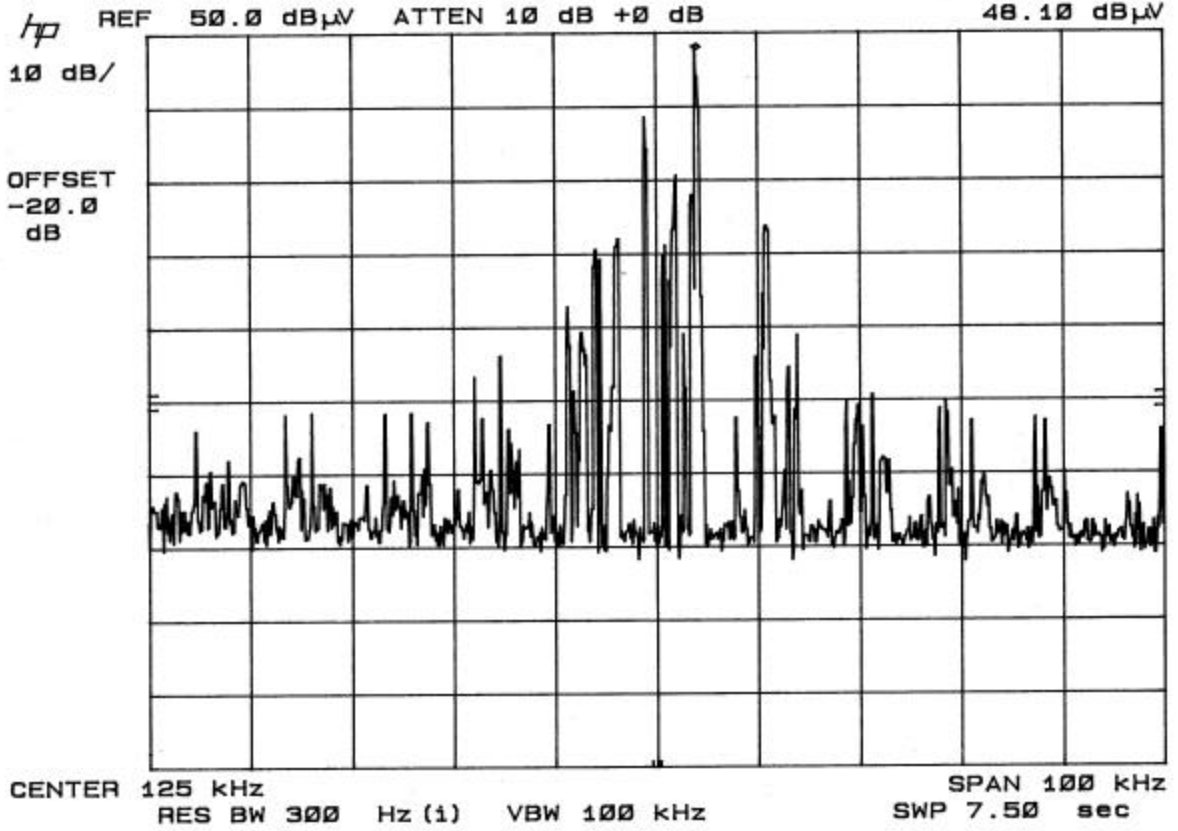
PERFORMED BY: JOSEPH SCOGLIO

10/17/01

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APPLICANT: ROBERT BOSCH GMBH
FCC ID: NF30C-AKSE

MKR 129.2 kHz
48.10 dB μ V



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