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APPLICANT: BELCO INTERNATIONAL CO., LTD.
FCC ID: NYC-S4200

TEST REPORT:

EXHIBITS:

APPLICANT: BELCO INTERNATIONAL CO., LTD.
FCC ID: NYC-S4200

15.214(d) THIS DEVICE COMPLIES WITH THE SECURITY CODE REQUIREMENTS OF 15.214(d)(1)(2) AND (3) BY MEANS OF THE FOLLOWING:

THIS DEVICE HAS 24 MILLION POSSIBLE SECURITY CODES. ONE SECURITY CODE OUT OF 24 MILLION IS PRE-PROGRAMMED WHEN MANUFACTURED AT THE FACTORY. THE CPU CONTROLS THE RF FREQUENCY CHANNEL. AND THE ASIC CONTROLS ADPCM CODEC AND AUDIO SIGNAL SWITCHING ALSO SET UP THE SPREADING CODE. BEFORE THE COMMUNICATION LINK IS ESTABLISHED, THE DEVICE SEARCHES FOR A VACANT RF CHANNEL AND THEN TRANSMITS RF SIGNAL ON THE VACANT CHANNEL.

EMC Equipment List

	DEVICE	MFGR	MODEL	SERNO	CAL/CHAR DATE	DUE DATE or STATUS
X	3-Meter OATS	TEI	N/A	N/A	Listed 12/22/99	12/22/02
	3/10-Meter OATS	TEI	N/A	N/A	Listed 3/26/01	3/26/04
	Receiver, Beige Tower					
	Spectrum Analyzer (Tan)	HP	8566B Opt 462	3138A07786 3144A20661	CAL 8/31/01	8/31/03
	RF Preselector (Tan)	HP	85685A	3221A01400	CAL 8/31/01	8/31/03
	Quasi-Peak Adapter (Tan)	HP	85650A	3303A01690	CAL 8/31/01	8/31/03
X	Receiver, Blue Tower					
X	Spectrum Analyzer (Blue)	HP	8568B	2928A04729 2848A18049	CHAR 10/22/01	10/22/03
X	RF Preselector (Blue)	HP	85685A	2926A00983	CHAR 10/22/01	10/22/03
X	Quasi-Peak Adapter (Blue)	HP	85650A	2811A01279	CHAR 10/22/01	10/22/03
X	Biconnical Antenna	Electro-Metrics	BIA-25	1171	CAL 4/26/01	4/26/03
	Biconnical Antenna	Eaton	94455-1	1096	CAL 10/1/01	10/1/03
	Biconnical Antenna	Eaton	94455-1	1057	CHAR 3/15/00	3/15/02
	BiconiLog Antenna	EMCO	3143	9409-1043		
X	Log-Periodic Antenna	Electro-Metrics	LPA-25	1122	CAL 10/2/01	10/2/03
	Log-Periodic Antenna	Electro-Metrics	EM-6950	632	CHAR 10/15/01	10/15/03
	Log-Periodic Antenna	Electro-Metrics	LPA-30	409	CHAR 10/16/01	10/16/03
	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	CHAR 11/24/00	11/24/03
	Double-Ridged Horn Antenna	Electro-Metrics	RGA-180	2319	CAL 12/19/01	12/19/03
X	Horn Antenna	Electro-Metrics	EM-6961	6246	CAL 3/21/01	3/21/03
	Horn Antenna	ATM	19-443-6R	None	No Cal Required	

	DEVICE	MFGR	MODEL	SERNO	CAL/CHAR DATE	DUE DATE or STATUS
	Passive Loop Antenna	EMC Test Systems	EMCO 6512	9706-1211	CHAR 7/10/01	7/10/03
	Line Impedance Stabilization . . .	Electro-Metrics	ANS-25/2	2604	CAL 10/9/01	10/9/03
	Line Impedance Stabilization . . .	Electro-Metrics	EM-7820	2682	CAL 3/16/01	3/16/03
	Termaline Wattmeter	Bird Electronic Corporation	611	16405	CAL 5/25/99	5/25/01
	Termaline Wattmeter	Bird Electronic Corporation	6104	1926	CAL 12/12/01	12/12/03
	Oscilloscope	Tektronix	2230	300572	CHAR 2/1/01	2/1/03
	Temperature Chamber	Tenney Engineering	TTRC	11717-7	CHAR 1/22/02	1/22/04
	AC Voltmeter	HP	400FL	2213A14499	CAL 10/9/01	10/9/03
	AC Voltmeter	HP	400FL	2213A14261	CHAR 10/15/01	10/15/03
	AC Voltmeter	HP	400FL	2213A14728	CHAR 10/15/01	10/15/03
X	Digital Multimeter	Fluke	77	35053830	CHAR 1/8/02	1/8/04
	Digital Multimeter	Fluke	77	43850817	CHAR 1/8/02	1/8/04
	Digital Multimeter	HP	E2377A	2927J05849	CHAR 1/8/02	1/8/04
	Multimeter	Fluke	FLUKE-77-3	79510405	CAL 9/26/01	9/26/03
	Peak Power Meter	HP	8900C	2131A00545	CHAR 1/26/01	1/26/03
	Digital Thermometer	Fluke	2166A	42032	CAL 1/16/02	1/16/04
	Thermometer	Traulsen	SK-128		CHAR 1/22/02	1/22/04
X	Temp/Humidity gauge	EXTech	44577F	E000901	CHAR 1/22/02	1/22/04
	Frequency Counter	HP	5352B	2632A00165	CAL 11/28/01	11/28/03
	Power Sensor	Agilent Technologies	84811A	2551A02705	CAL 1/26/01	1/26/03
	Service Monitor	IFR	FM/AM 500A	5182	CAL 11/22/00	11/22/02
	Comm. Serv. Monitor	IFR	FM/AM 1200S	6593	CAL 5/12/02	5/12/04
	Signal Generator	HP	8640B	2308A21464	CAL 11/15/01	11/15/03
	Modulation Analyzer	HP	8901A	3435A06868	CAL 9/5/01	9/5/03

	DEVICE	MFGR	MODEL	SERNO	CAL/CHAR DATE	DUE DATE or STATUS
	Near Field Probe	HP	HP11940A	2650A02748	CHAR 2/1/01	2/1/03
	BandReject Filter	Lorch Microwave	5BR4-2400/ 60-N	Z1	CHAR 3/2/01	3/2/03
	BandReject Filter	Lorch Microwave	6BR6-2442/ 300-N	Z1	CHAR 3/2/01	3/2/03
	BandReject Filter	Lorch Microwave	5BR4-10525/ 900-S	Z1	CHAR 3/2/01	3/2/03
	High Pas Filter	Microlab	HA-10N		CHAR 10/4/01	10/4/03
	Audio Oscillator	HP	653A	832-00260	CHAR 3/1/01	3/1/03
	Frequency Counter	HP	5382A	1620A03535	CHAR 3/2/01	3/2/03
	Frequency Counter	HP	5385A	3242A07460	CHAR 12/11/01	12/11/03
	Preamplifier	HP	8449B-H02	3008A00372	CHAR 3/4/01	3/4/03
	Amplifier	HP	11975A	2738A01969	CHAR 3/1/01	3/1/03
	Egg Timer	Unk			CHAR 8/31/01	8/31/03
	Measuring Tape, 20M	Kraftixx	0631-20		CHAR 2/1/02	2/1/04
	Measuring Tape, 7.5M	Kraftixx	7.5M PROFI		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

TEST PROCEDURE

GENERAL: This report shall NOT be reproduced except in full without the written approval of TIMCO ENGINEERING, INC. Shielded interface cables were used in all cases except for cables connecting to the telephone line and the power cords. A test program was run which simulated a normal data transmission on a network.

POWER LINE CONDUCTED INTERFERENCE: The procedure used was ANSI STANDARD C63.4-1992 using a 50uH LISN. Both lines were observed. The bandwidth of the spectrum analyzer was 10 kHz with an appropriate sweep speed. The ambient temperature of the UUT was 74°F with a humidity of 44%.

BANDWIDTH 6.0dB: The measurements were made with the spectrum analyzer's resolution bandwidth(RBW)=100 kHz and the video bandwidth(VBW) =300 kHz and the span set as shown on plot.

POWER OUTPUT: Both base and handset have built-in/integral antennas. The RF power output was measured as Effective Radiated Power (ERP).

ANTENNA CONDUCTED EMISSIONS: The RBW=100 kHz, VBW > or = RBW and the spectrum was scanned from 30 MHz to the 10th Harmonic of the fundamental.

RADIATION INTERFERENCE: The test procedure used was ANSI STANDARD C63.4-1992 using a HEWLETT PACKARD spectrum analyzer with a preselector. The bandwidth(RBW) of the spectrum analyzer was 100 kHz up to 1 GHz and 1.0MHz above 1 GHz with an appropriate sweep speed. The VBW above 1.0 GHz was = 1.0 MHz. The analyzer was calibrated in dB above a microvolt at the output of the antenna. The ambient temperature of the UUT was 90°F with a humidity of 36%.

15.247(d) POWER SPECTRAL DENSITY. The peak within the pass band was located with a RBW set to 30 kHz and a span of 5 MHz, slightly greater than the 6 dB bandwidth, then the emission was centered on the display and the span and RBW reduced. A 1.5 MHz span, 3 kHz RBW, and a sweep time to sweep time set to 500 seconds. Since spectral line spacing could not be resolved, the noise power density method was used. The response was then plotted, a correction factor of measured using the noise power density and adding the correction of 35 dB and any attenuation used was added.

15.247(e): PROCESSING GAIN, This gain is supplied by the manufacturer of the UUT. (no longer a requirement)

2.1033(b)(4: ANTENNA AND GROUND SYSTEM, This unit uses a short, inductively loaded, antenna element for the base unit and the handset. The antenna is permanently attached to the unit and no provision is made for connection to an external antenna.

No ground connection is provided. The only ground in use is the ground plane on the printed circuit board.

APPLICANT: BELCO INTERNATIONAL CO., LTD.

FCC ID: NYC-S4200

NAME OF TEST: POWER LINE CONDUCTED INTERFERENCE

RULES PART NUMBER: 15.207

MINIMUM REQUIREMENTS:	FREQUENCY MHz	LEVEL dBuV
	0.450-30	48 dBuV or 250 uV

TEST PROCEDURE: ANSI STANDARD C63.4-1992

THE HIGHEST EMISSION READ FOR LINE 1 ON HOOK WAS 32.0 uV @ 28.85 MHz.

THE HIGHEST EMISSION READ FOR LINE 2 ON HOOK WAS 46.2 uV @ 28.85 MHz.

THE HIGHEST EMISSION READ FOR LINE 1 OFF HOOK WAS 46.8 uV @ 28.85 MHz.

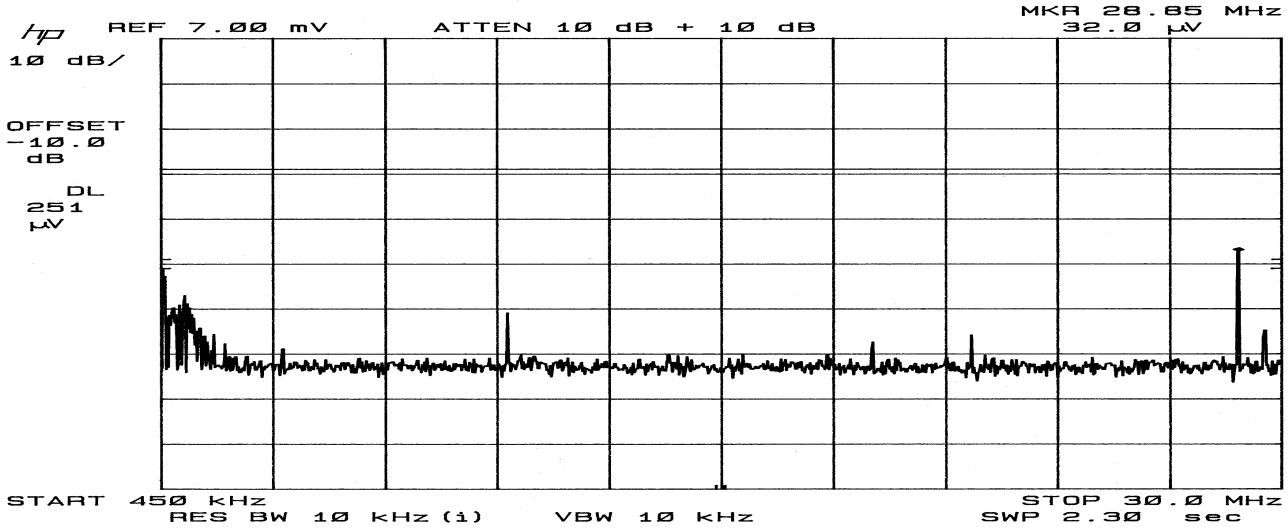
THE HIGHEST EMISSION READ FOR LINE 2 OFF HOOK WAS 63.8 uV @ 28.88 MHz.

THE GRAPHS ON THE FOLLOWING PAGES REPRESENT THE EMISSIONS TAKEN FOR THIS DEVICE.

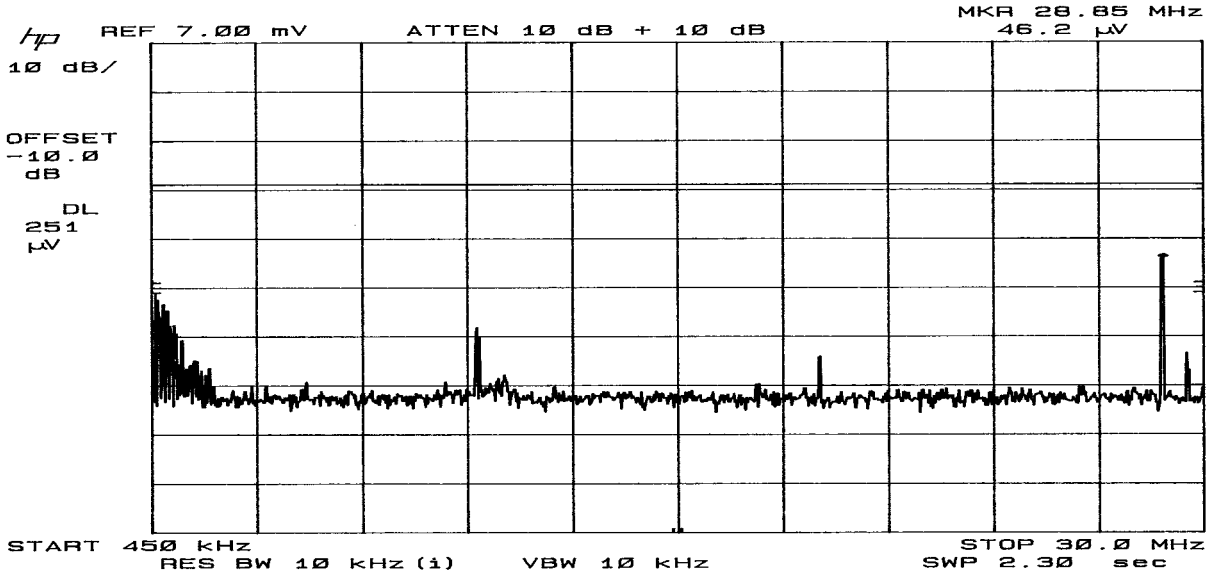
TEST RESULTS: Both lines were observed with the UUT transmitting. The measurements indicate that the unit DOES appear to meet the FCC requirements for this class of equipment.

PERFORMED BY: JOE SCOGLIO DATE: 9/5/02

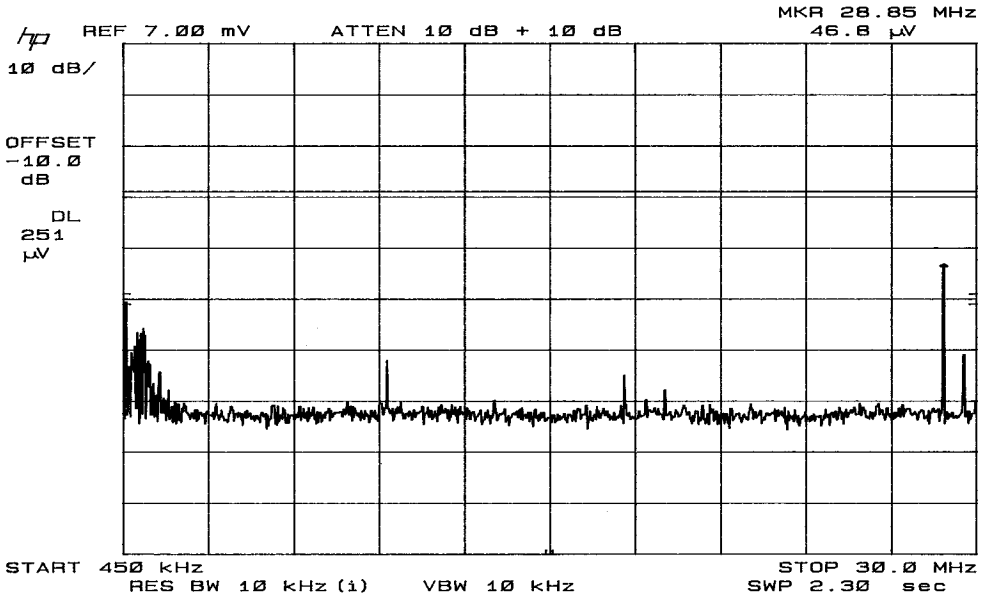
Power Line Conducted Plot On Hook – Line 1



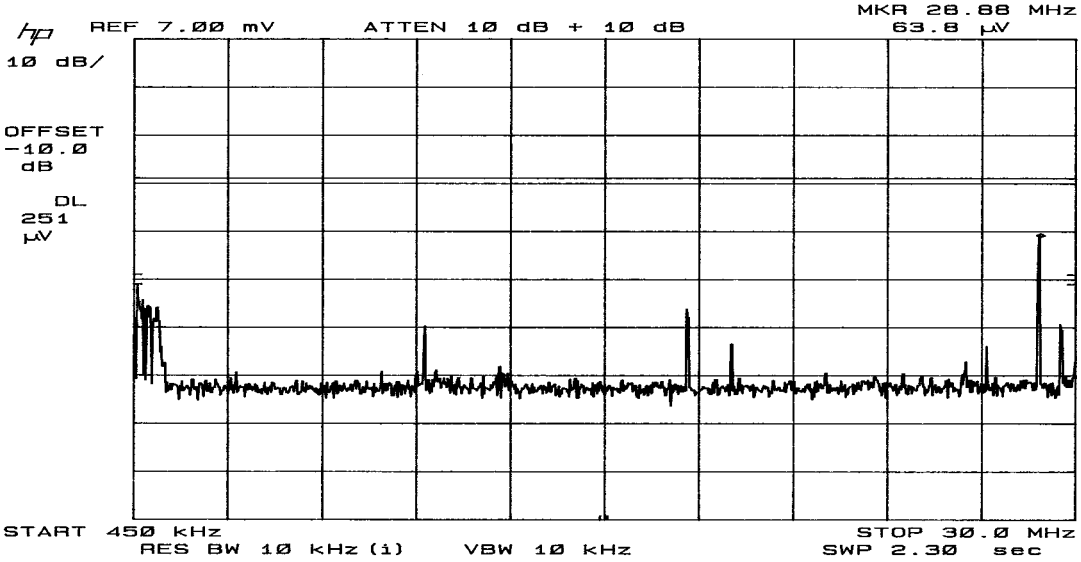
Power Line Conducted Plot On Hook – Line 2



Power Line Conducted Plot Off Hook – Line 1



Power Line Conducted Plot Off Hook – Line 2



APPLICANT: BELCO INTERNATIONAL CO., LTD.

FCC ID: NYC-S4200

NAME OF TEST: OCCUPIED BANDWIDTH

RULES PART NUMBER: 15.247

15.247(a)(2)

6dB bandwidth shall be at least 500 kHz. As shown in the accompanying plots. The bandwidth was measured at three places in the band and the narrowest is reported below.

Base 6dB Bandwidth = 1.520 MHz

Handset 6 dB Bandwidth = 1.515 MHz

15.247(B) PEAK POWER OUTPUT

The maximum peak output power shall not exceed 1 watt (30 dBm). If directional transmitting antennas with a gain of more than 6 dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

POWER OUTPUT - LIMIT +30 dBm

BASE PEAK POWER OUTPUT = 6.3 mWatts ERP
HANDSET PEAK POWER OUTPUT = 15.7 mWatts ERP

power in ERP

$dBuV := 109.34$

$efs := 10^{\frac{dBuV}{20}}$ $efs = 2.931 \times 10^{5}$

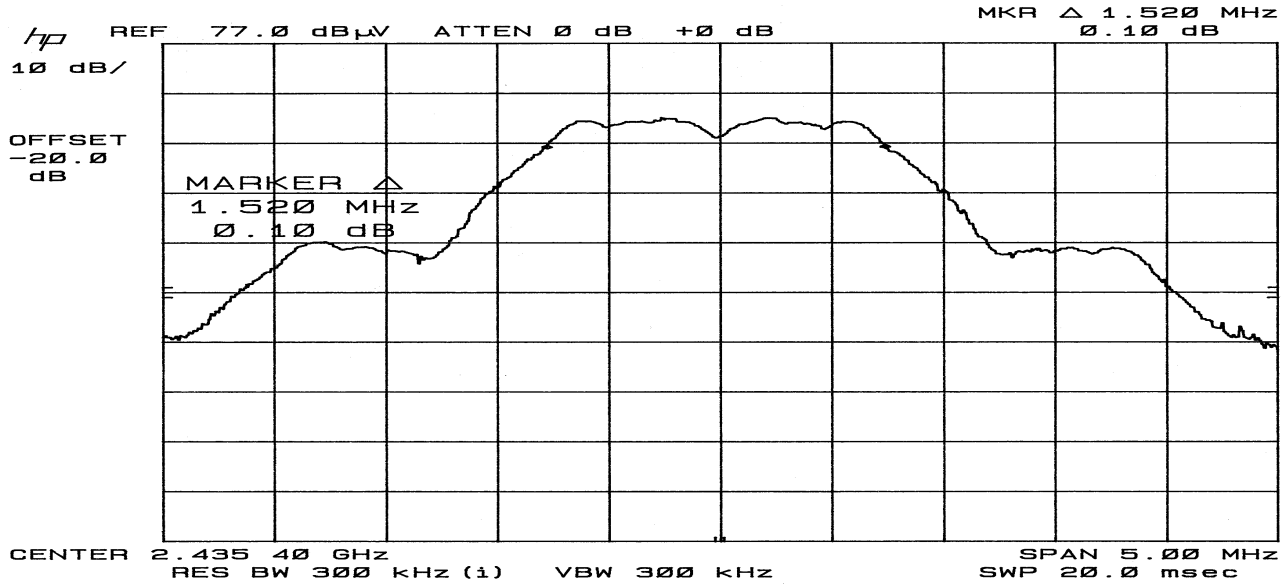
$efsmV := efs \cdot .001$ $efsmV = 293.089$ $Po := \frac{(3 \cdot efsmV)^2}{49.2}$

$Po = 1.571 \times 10^{4}$ $PoW := Po \cdot .000001$ $PoW = 0.016$ Watts

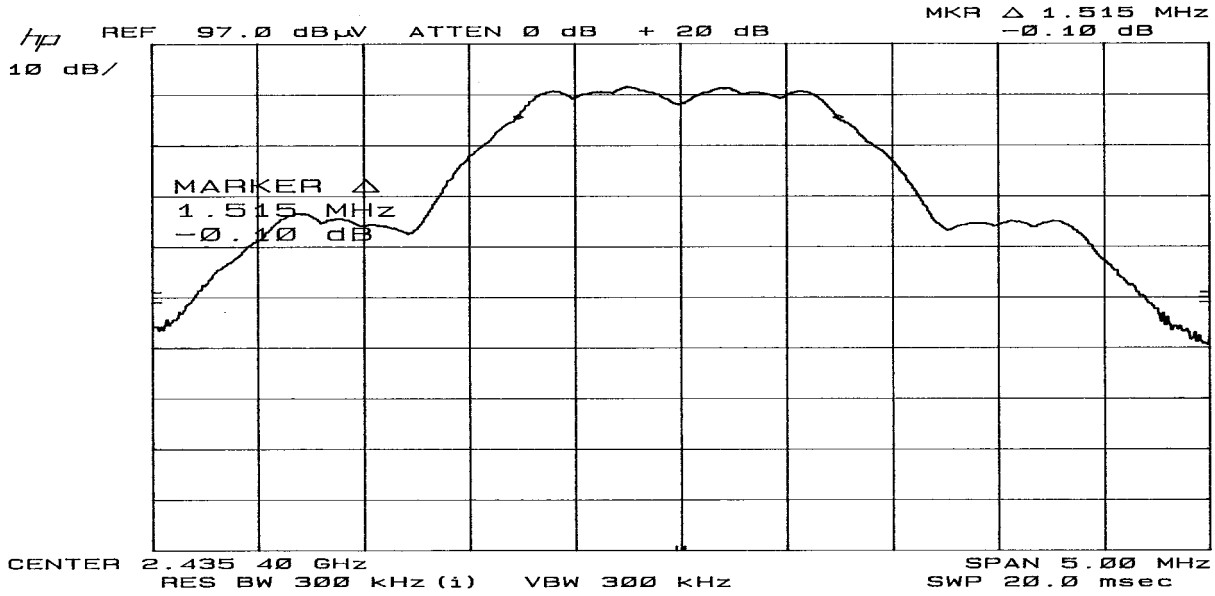
$PomW := Po \cdot .001$ $PomW = 15.714$ mWatts

dBuV taken from Field Strength of Fundamental

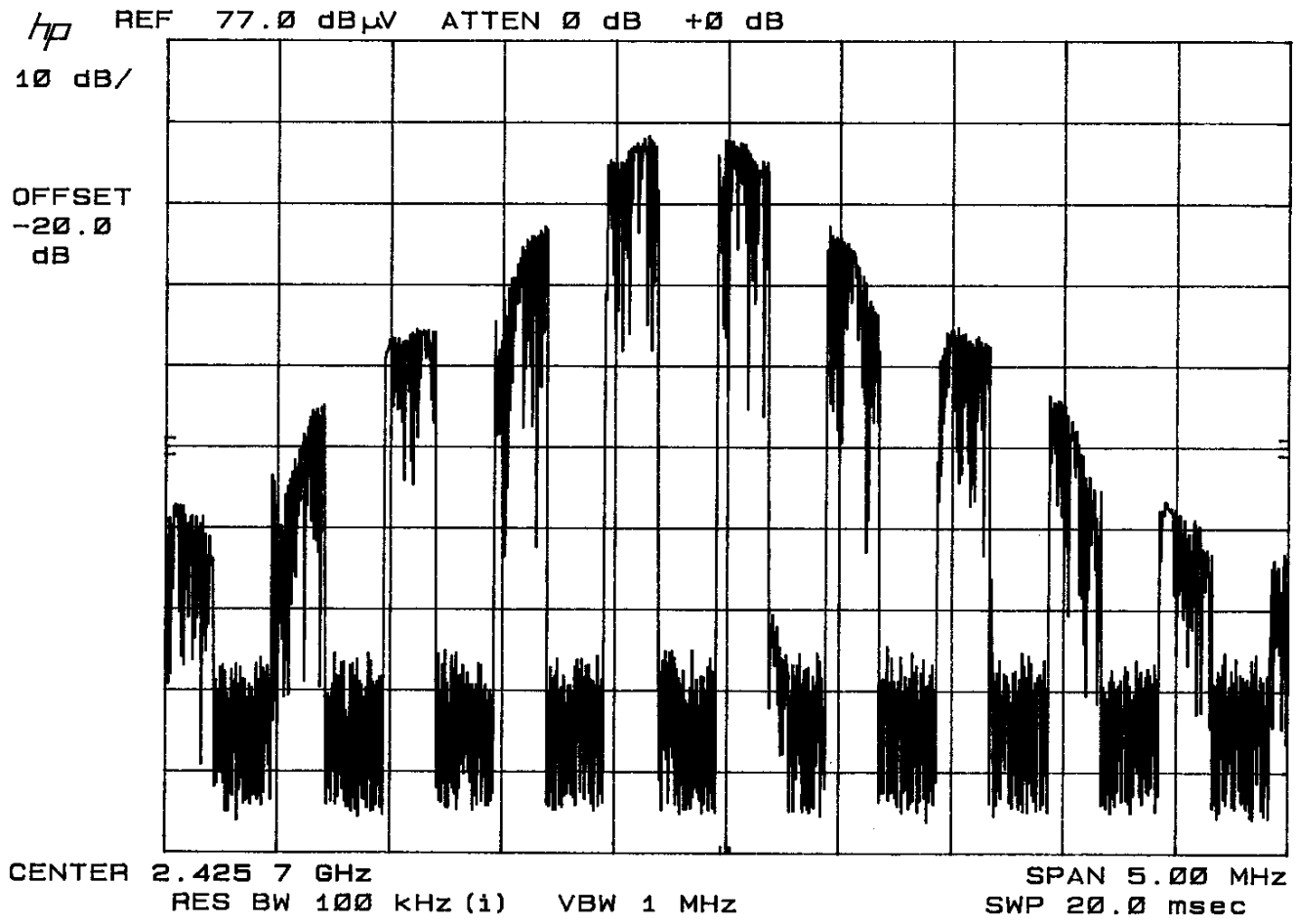
6dB Bandwidth Plot - Base



6dB Bandwidth Plot - Handset



DUTY CYCLE PLOT



The duty cycle is 50% which is equal to a 6.02 dB correction factor.

APPLICANT: BELCO INTERNATIONAL CO., LTD.

FCC ID: NYC-S4200

NAME OF TEST: RADIATED SPURIOUS EMISSIONS - HANDSET

RULES PART NUMBER: 15.247(c)

REQUIREMENTS: Emissions that fall in the restricted bands (15.205). These emissions must be less than or equal to 500 uV/m (54 dBuV/m). Spurious not in a restricted band must be 20 dBc.

TEST DATA:

Tuned Frequency MHz	Emission Frequency MHz	Meter Reading dBuV	Ant. Polarity	Coax Loss dB	Correction Factor dB	Pulsed CFactor dB	Field Strength dBuV/m	Margin dB
2,471.4	2,471.40	75.2	V	3.38	28.96	0.00	107.54	19.84
2,471.4	2,471.40	77.0	H	3.38	28.96	0.00	109.34	18.04
2,471.4	4,942.80R	18.8	V	6.12	33.93	-6.02	52.83	1.17
2,471.4	4,942.80R	19.8	H	6.12	33.93	-6.02	53.83	0.17
2,471.4	7,414.20R	13.5	H	7.27	36.40	-6.02	51.15	2.85
2,471.4	7,414.20R	10.2	V	7.27	36.40	-6.02	47.85	6.15
2,471.4	9,885.60	6.8	H	8.91	38.26	-6.02	47.95	41.39

APPLICANT: BELCO INTERNATIONAL CO., LTD.

FCC ID: NYC-S4200

NAME OF TEST: RADIATED SPURIOUS EMISSIONS - BASE

TEST DATA CONTD.:

Tuned Frequency MHz	Emission Frequency MHz	Meter Reading dBuV	Ant. Polarity	Coax Loss dB	Correction Factor dB	Pulsed CF dB	Field Strength dBuV/m	Margin dB
2,471.5	2,471.40	65.0	H	3.38	28.96	0.00	97.34	30.04
2,471.5	2,471.40	73.0	V	3.38	28.96	0.00	105.34	22.04
2,471.5	4,942.80R	19.7	H	6.12	33.93	-6.02	53.73	0.27
2,471.5	4,942.80R	14	V	6.12	33.93	-6.02	48.03	5.97
2,471.5	7,414.20R	15.9	V	7.27	36.40	-6.02	53.55	0.45
2,471.5	7,414.20R	11.1	H	7.27	36.40	-6.02	48.75	5.25
2,471.5	9,885.60	6.4	H	8.91	38.26	-6.02	47.55	37.79
2,471.5	9,885.60	8.2	V	8.91	38.26	-6.02	49.35	35.99

**** Emissions were taken at three places in the band. The worst-case scenario is presented.**

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

METHOD OF MEASUREMENT: The procedure used was ANSI STANDARD C63.4-1992. 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 spectrum was scanned from 30 MHz to 10^{th} harmonic using a Hewlett Packard Model 8566B Spectrum Analyzer, Hewlett Packard Model 85685A Preselector, Hewlett Packard Model 85650A Quasi-Peak Adaptor, and an appropriate antenna. Low loss coax was used above 1 GHz. Measurements were made at Timco Engineering, Inc. 849 NW State Road 45 Newberry, Fl.

TEST RESULTS: The unit DOES meet the FCC requirements.

PERFORMED BY: Joseph Scoglio DATE: 9/5/02

APPLICANT: BELCO INTERNATIONAL CO., LTD.

FCC ID: NYC-S4200

NAME OF TEST: RADIATED SPURIOUS EMISSIONS INTO ADJACENT RESTRICTED BAND

REQUIREMENTS: Emissions that fall in the restricted bands (15.205). These emissions must be less than or equal to 500 uV/m (54 dBuV/m).

TEST PROCEDURE: An in band field strength measurement of the fundamental Emission using the RBW and detector function required by C63.4-2000 and FCC Rules. The procedure was repeated with an average detector and a plot made. The calculated field strength in the adjacent restricted band is presented below.

BANDEDGE CALCULATION BASE

Channel 1 Frequency 2404 MHz		**Channel 34 Frequency 2475 MHz**	
Frequency 2389 MHz		Frequency 2483.5 MHz	
-6.20 dBuV	Peak	15.40 dBuV	Peak
28.88 dB	ACF	28.95 dB	ACF
20.00 dB	ATTN	0.00 dB	ATTN
3.31 dB	Coax Loss	3.38 dB	Coax Loss
45.99 dBuV		48.83 dBuV	

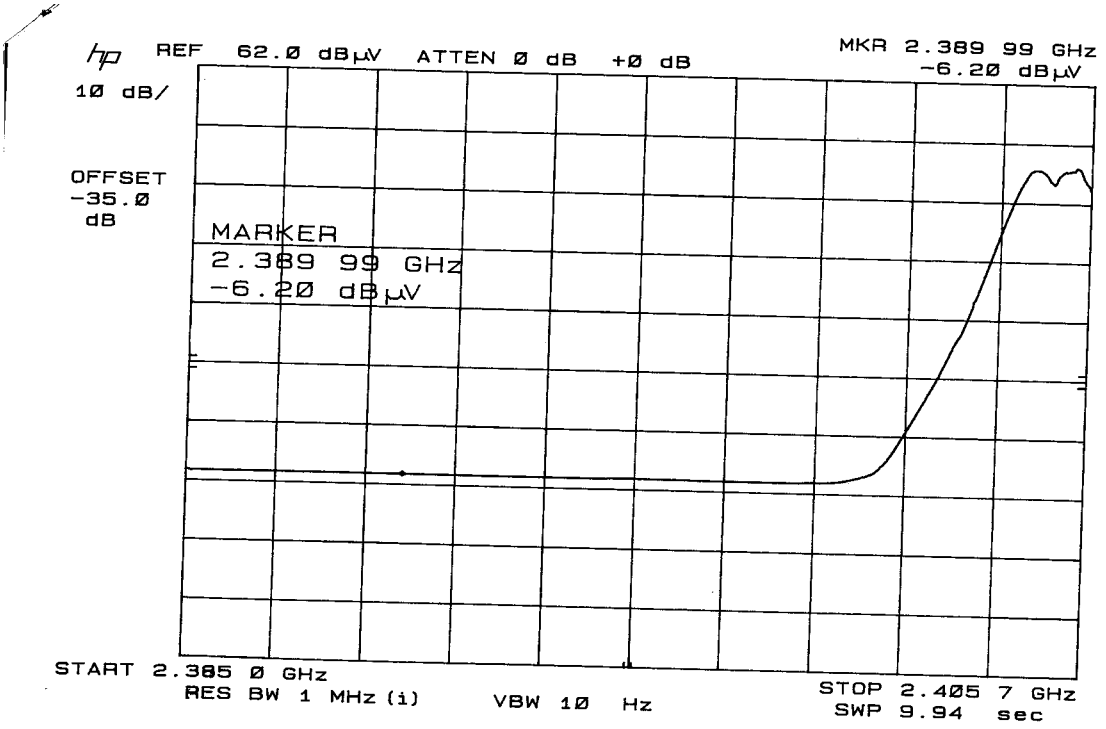
RESULTS: The limit is 54 dBuV.
This device appears to be passing.

BANDEDGE CALCULATION HANDSET

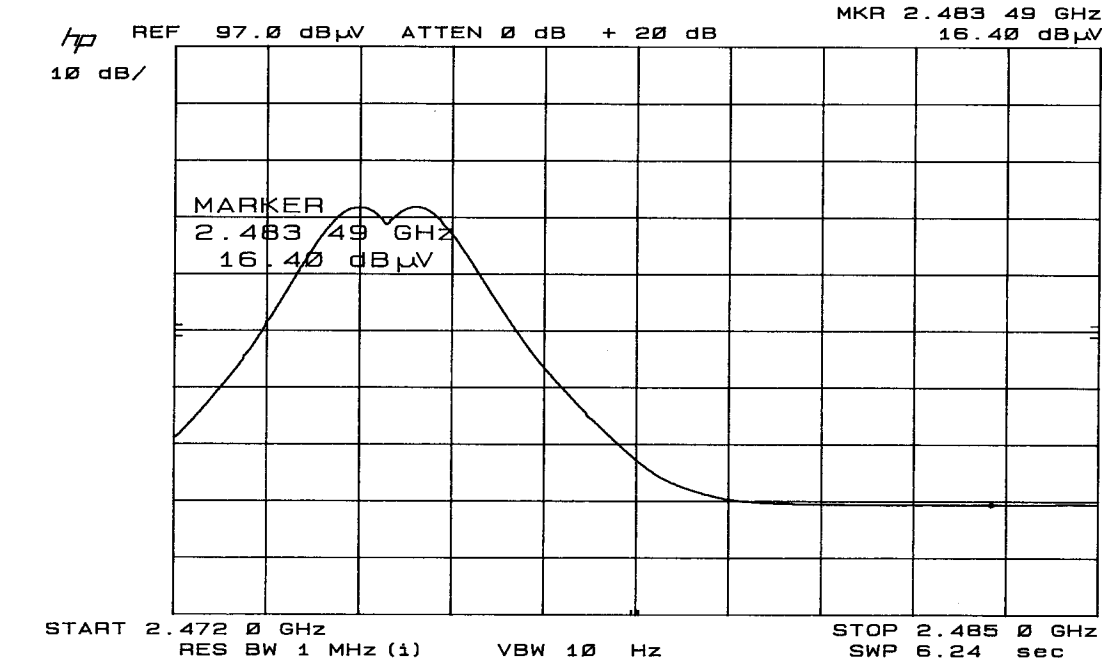
Channel 1 Frequency 2404 MHz		**Channel 34 Frequency 2475 MHz**	
Frequency 2389 MHz		Frequency 2483.5 MHz	
-6.30 dBuV	Peak	16.50 dBuV	Peak
28.88 dB	ACF	28.95 dB	ACF
10.00 dB	ATTN	0.00 dB	ATTN
3.31 dB	Coax Loss	3.38 dB	Coax Loss
35.89 dBuV		48.83 dBuV	

RESULTS: The limit is 54 dBuV.
This device appears to be passing.

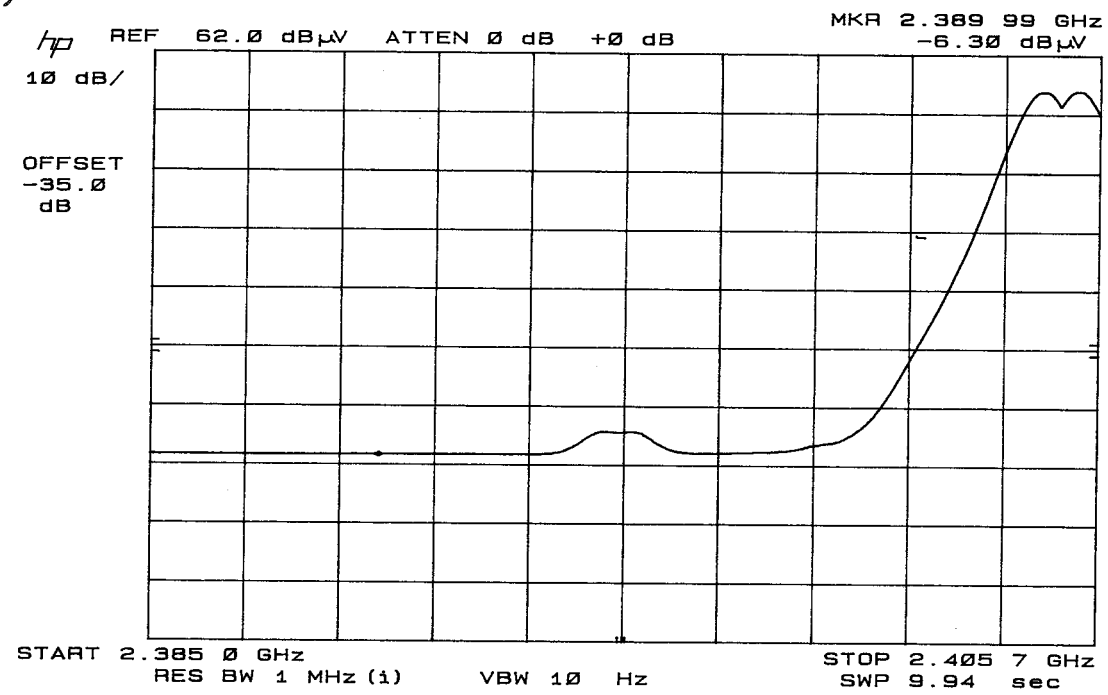
Bandedge Plot – Base



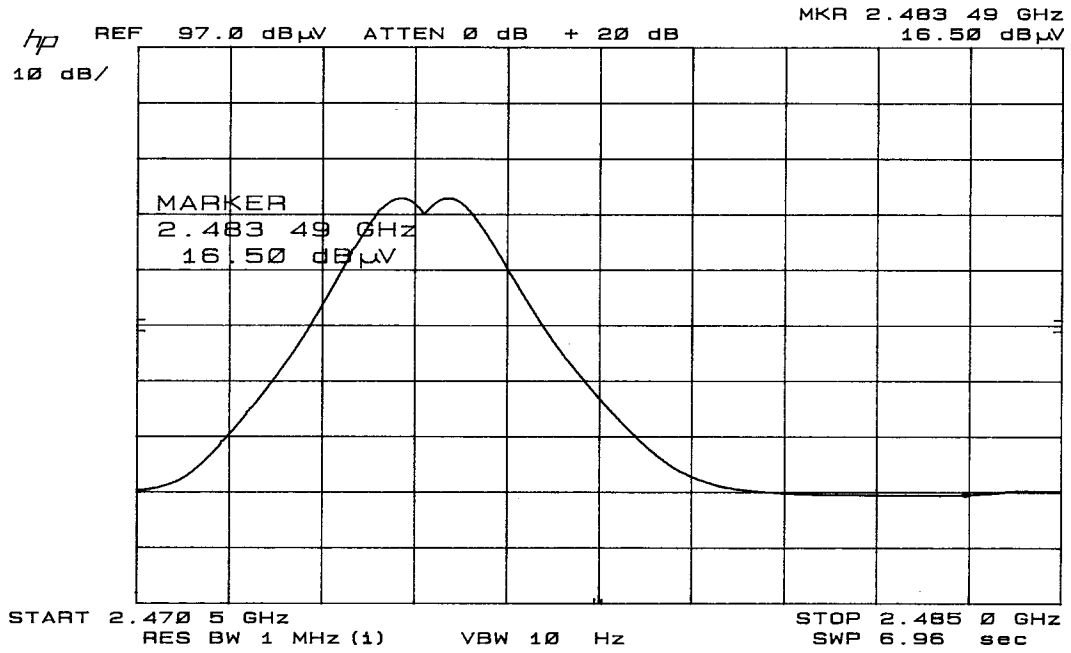
Bandedge Plot – Base



Bandedge Plot – Handset



Bandedge Plot – Handset



APPLICANT: BELCO INTERNATIONAL CO., LTD.

FCC ID: NYC-S4200

NAME OF TEST: POWER SPECTRAL DENSITY

RULES PART NUMBER: 15.247(d)

REQUIREMENTS: The power spectral density averaged over any 1 second interval shall not be greater than 8 dBm in any 3 kHz bandwidth within these bands.

TEST DATA:

The spectrum line spacing could not be resolved so the noise power density was measured;

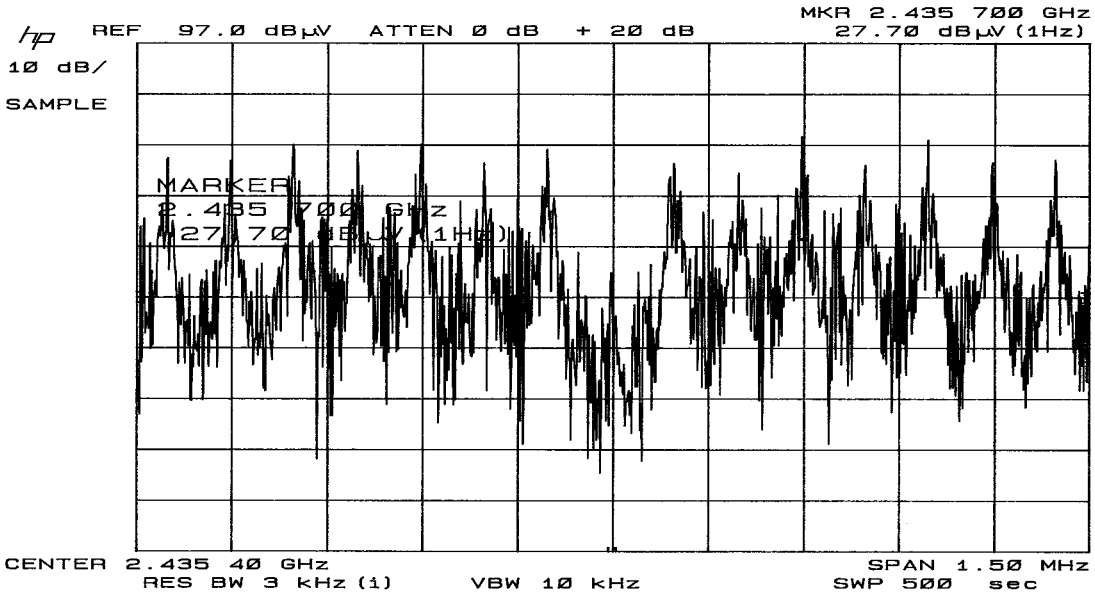
Measurement Method:

Starting from the settings that were used for the 6 dB bandwidth the peak signal was located and the span was reduced and the sweep time increased in a manner to maintain calibration and to keep the peak emission in the display, then the sweep time was increased to 500seconds at 1.5MHz span and a RBW changed to 3 kHz. The spectrum analyzer was put into the noise power mode and the plots made.

BASE	HANDSET
27.70 dBuV	34.10 dBuV
20 dB ATTN	20 dB ATTN
29 dB CF	29 dB CF
76.7 dBuV	83.1 dBuV

76.7 dBuV-107=-30.3 dBm 83.1 dBuV-107=-23.9 dBm

Power Spectral Density Plot - Base



Power Spectral Density Plot - Handset