

TIMCO ENGINEERING INC.

849 NW State Road 45

Newberry, Florida 32669

<http://www.timcoengr.com>

888.472.2424 F 352.472.2030 email: tei@timcoengr.com

Test Report

Product Name: HANDHELD MARINE TRANSCEIVER

FCC ID: PDHTX150M

Applicant:

TTI TECH CO., LTD.

TTI HOUSE, 163-4, POI-DONG

KANGNAM-KU, SEOUL, KOREA 135-260

Date Receipt: 9/18/2006

Date Tested: 9/21/2006

APPLICANT: TTI TECH CO., LTD.

FCC ID: PDHTX150M

REPORT #:V:\T\TTI_PDH\2645AUT6\Extra2645AUT6\2645AUT6TestReport.doc

COVER SHEET

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TABLE OF CONTENTS LIST

APPLICANT: TTI TECH CO., LTD.

FCC ID: PDHTX150M

TEST REPORT:

PAGE 1.....	GENERAL INFORMATION & TECHNICAL DESCRIPTION
PAGE 2.....	TECHNICAL DESCRIPTION CONTINUED
	RF POWER OUTPUT
PAGE 3.....	TECHNICAL DATA
PAGE 4.....	VOICE MODULATION CHARACTERISITICS
	AUDIO FREQUENCY RESPONSE
	AUDIO LOW PASS FILTER
PAGE 5.....	OCCUPIED BANDWIDTH
PAGE 6.....	OCCUPIED BANDWIDTH PLOT
PAGE 7.....	SPURIOUS EMISSIONS AT ANTENNA TERMINALS
PAGE 8.....	METHOD OF MEASURING CONDUCTED SPURIOUS EMISS
PAGE 9.....	FIELD STRENGTH OF SPURIOUS EMISSIONS
PAGE 10.....	METHOD OF MEASURING RADIATED SPURIOUS EMISSIONS
PAGE 11.....	FREQUENCY STABILITY
PAGE 12.....	LIST OF TEST EQUIPMENT

EXHIBITS INCLUDING:

CONFIDENTIALITY REQUEST LETTER
BLOCK DIAGRAM
SCHEMATIC
PARTS LIST
USERS MANUAL
LABEL SAMPLE
LABEL LOCATION
EXTERNAL PHOTOGRAPHS
INTERNAL PHOTOGRAPHS
OPERATIONAL DESCRIPTION
TUNING PROCEDURE
TEST SET UP PHOTOGRAPHS

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GENERAL INFORMATION

2.1033(c) TTI TECH CO., LTD. will sell the FCC ID:
PDHTX150M VHF Marine transmitter in quantity,
for use under FCC RULES PART 80.

2.1033(c) TECHNICAL DESCRIPTION

(4) Type of Emission: 16K0F3E

$$B_n = 2M + 2DK$$

$$M = 3000$$

$$D = 5.0 \text{ (Peak Deviation)}$$

$$K = 1$$

$$B_n = 2(3.0K) + 2(5.0K)(1) = 6.0K + 10.0 = 16.0K$$

80.205 (a) ALLOWED AUTHORIZED BANDWIDTH = 20.00 kHz.

2.1033(c)(6) Frequency Range: 156.025 - 157.425 MHz

2.1033(c)(7) Power Range and Controls: There is a user Power
switch for High/Low Power. Maximum Output Power
Rating: High 5.5 Watts, Low 1.1 Watt into a 50 ohm
resistive load.

2.1033(c)(8) DC Voltages and Current into Final Amplifier:

POWER INPUT

FINAL AMPLIFIER ONLY

High

$$V_{ce} = 7.4 \text{ Volts}$$

$$I_{ce} = 1.4 \text{ A}$$

$$P_{in} = 10.4 \text{ Watts}$$

Low

$$V_{ce} = 7.4 \text{ VDC}$$

$$I_{ce} = 0.7 \text{ A}$$

$$P_{in} = 5.18 \text{ Watts}$$

Function of each electron tube or semiconductor
device or other active circuit device is included
as an exhibit.

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- 2.1033(c)(9) Complete Circuit Diagrams: The circuit diagrams and block diagrams are included.
- 2.1033(c)(10) Instruction book. The instruction manual is included.
- 2.1033(c)(11) Tune-up procedure. The tune-up procedure is included.

Description of all circuitry and devices provided for determining and stabilizing frequency is included in the circuit description

- 2.1033(c)(11) Digital modulation. This unit does NOT use digital modulation.

The data required by 2.1046 through 2.1055 is submitted below.

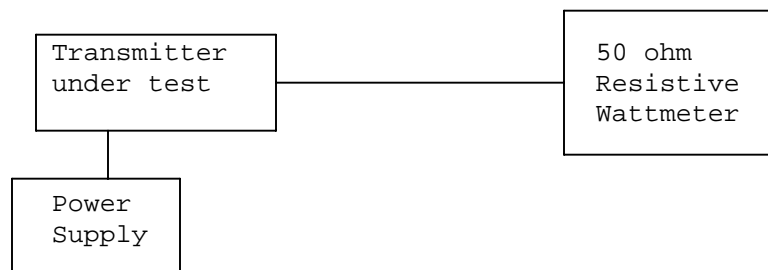
- 2.1046(a)
80.215 (e)(1)

RF power output.

RF power is measured by connecting a 50 ohm, resistive wattmeter to the RF output connector. With a nominal battery voltage, and the transmitter properly adjusted the RF output measures:

OUTPUT POWER: HIGH: 5.5 W CONDUCTED
LOW: 1.1 W CONDUCTED

METHOD OF MEASURING RF POWER OUTPUT



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TECHNICAL DATA:

80.203 (b)

External Controls: The transmitter is capable of changing frequency between 156.025 – 157.425 MHz by external control. The available channels are shown in the User Manual description Channel List. These channels are preprogrammed by the manufacturer and change of frequency is inaccessible to the station operator.

APPLICANT: TTI TECH CO., LTD.

FCC ID: PDHTX150M

REPORT #:V:\T\TTI_PDH\2645AUT6\Extra2645AUT6\2645AUT6TestReport.doc

Page 3 of 12

TIMCO ENGINEERING INC.

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2.1047(a) Voice Modulation_characteristics:

REFER TO 2645AUT6 TESTREPORT2

2.1047(a) AUDIO_LOW_PASS_FILTER

REFER TO 2645AUT6 TESTREPORT2

2.1047(b) Audio_input_versus_modulation
80.213 (d) A plot of the audio input versus deviation is
shown in the following plot.

REFER TO 2645AUT6 TESTREPORT2

APPLICANT: TTI TECH CO., LTD.

FCC ID: PDHTX150M

REPORT #:V:\T\TTI_PDH\2645AUT6\Extra2645AUT6\2645AUT6TestReport.doc

Page 4 of 12

TIMCO ENGINEERING INC.

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2.1049(c)

Occupied bandwidth:

80.213 (b)

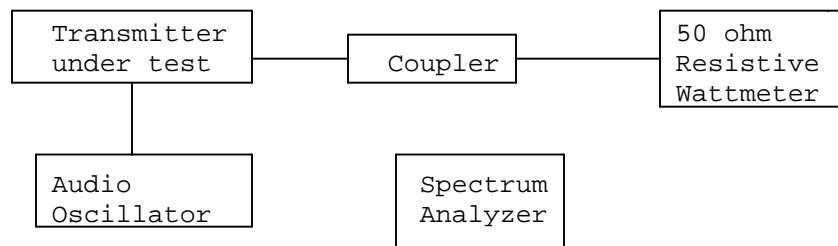
Data in the plots shows that on any frequency removed from the assigned frequency by more than 50%, but not more than 100%: At least 25dB. On any frequency removed from the assigned frequency by more than 100%, but not more than 250%: At least 35dB. On any frequency removed from the assigned frequency by more than 250%, of the authorized bandwidth:
At least $43 + \log(P)$ dB.

Radiotelephone transmitter with modulation limiter.

Test procedure: TIA/EIA-603 para 2.2.11, with the exception that various tones were used.

Test procedure diagram

OCCUPIED BANDWIDTH MEASUREMENT



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FCC ID: PDHTX150M

REPORT #:V:\T\TTI_PDH\2645AUT6\Extra2645AUT6\2645AUT6TestReport.doc

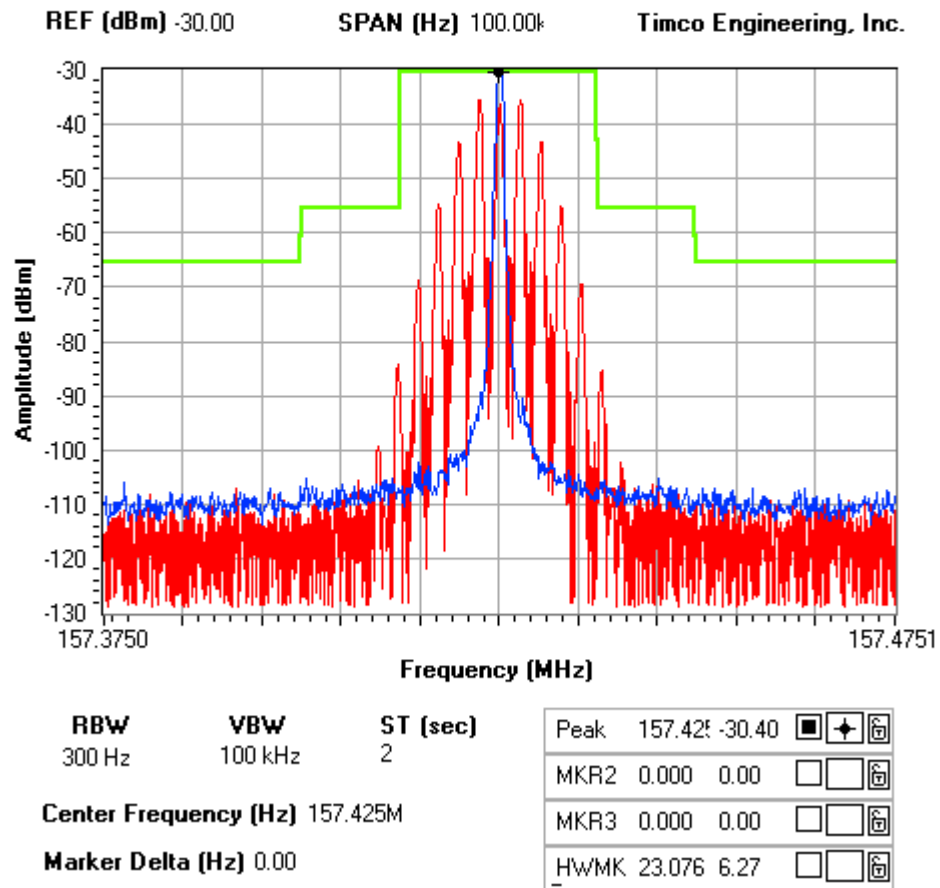
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OCCUPIED BANDWIDTH PLOT

NOTES:

TTI TECH CO., LTD. - FCC ID: PDHTX-150M
OCCUPIED BANDWIDTH PLOT



APPLICANT: TTI TECH CO., LTD.

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REPORT #: V:\T\TTI_PDH\2645AUT6\Extra2645AUT6\2645AUT6TestReport.doc

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2.1051
80.211

Spurious emissions at antenna terminals(conducted):

The data on below shows the level of conducted spurious responses. The carrier was modulated 100% using a 2500Hz tone. The spectrum was scanned from 0.4 to at least the 10th harmonic of the fundamental. The measurements were made in accordance with standard TIA/EIA-603.

REQUIREMENTS: Emissions must be $43 + 10\log(P_o)$ dB below the mean power output of the transmitter.

$$43 + 10\log(5.5) = 50.4$$

$$43 + 10\log(1.1) = 43.4$$

TF HIGH POWER	EF	dB below carrier		TF LOW POWER	EF	dB below carrier
156.8	156.80			157.45	157.45	
	313.60	75.2			314.90	81.6
	470.40	99			472.35	100.1
	627.20	96.8			629.80	100.3
	784.00	87			787.25	92.5
	940.80	84			944.70	91.3
	1097.60	80.1			1102.15	84.8
	1254.40	82.9			1259.60	89.2
	1411.20	92.6			1417.05	90.5
	1568.00	91.1			1574.50	89.6

TF LOW POWER	EF	dB below carrier
156.42	156.42	
	312.84	81.1
	469.26	99.7
	625.68	100.5
	782.10	92.8
	938.52	92.1
	1094.94	84.9
	1251.36	88.9
	1407.78	90.9
	1564.20	119.4

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FCC ID: PDHTX150M

REPORT #:V:\T\TTI_PDH\2645AUT6\Extra2645AUT6\2645AUT6TestReport.doc

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Method of Measuring Conducted Spurious Emissions



METHOD OF MEASUREMENT: The procedure used was TIA/EIA-603 STANDARD without any exceptions. The measurements were made using the shielded room located at TIMCO ENGINEERING INC. 849 STATE ROAD 45, NEWBERRY FLORIDA 32669.

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FCC ID: PDHTX150M

REPORT #:V:\T\TTI_PDH\2645AUT6\Extra2645AUT6\2645AUT6TestReport.doc

Page 8 of 12

TIMCO ENGINEERING INC.

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2.1053(a) Field strength of spurious emissions:

NAME OF TEST: RADIATED SPURIOUS EMISSIONS

REQUIREMENTS: Emissions must be $43 + 10\log(P_o)$ dB below the mean power output of the transmitter.

TEST DATA:

$$43 + 10\log(5.5) = 50.4$$

$$43 + 10\log(1.1) = 43.4$$

Emission Frequency MHz	Ant. Polarity	dB Below Carrier (dBc)
156.80		0
313.60	V	85.55
470.40	H	79.54
627.20	V	84.63
784.00	V	89.64
940.80	V	84.88
1097.60	V	87.16
1254.40	H	84.66
1411.20	H	89.26
1568.00	H	86.02

Emission Frequency MHz	Ant. Polarity	dB Below Carrier (dBc)
156.40		0
312.80	H	85.55
469.20	H	76.92
625.60	H	93.36
782.00	H	90.23
938.40	H	86.19
1094.80	H	75.5
1251.20	V	85.01
1407.60	V	76.71
1564.00	V	79.32

$$43 + 10\log(1.1) = 43.4$$

Emission Frequency MHz	Ant. Polarity	dB Below Carrier (dBc)
157.43		0
314.85	V	86.05
472.28	H	74.64
629.70	H	93.03
787.13	V	89.94
944.55	V	82.78
1101.98	H	78.56
1259.40	H	79.06
1416.83	H	83.36
1574.25	H	79.42

APPLICANT: TTI TECH CO., LTD.

FCC ID: PDHTX150M

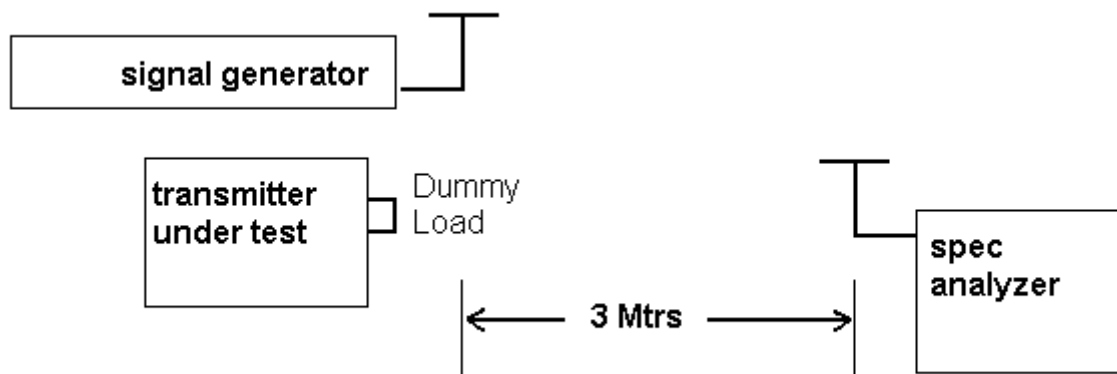
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2.1053(a) Continued Field_strength_of_spurious_emissions:

Method of Measuring Radiated Spurious Emissions



METHOD OF MEASUREMENT: The tabulated data shows the results of the radiated field strength emissions test. The spectrum was scanned from 30 to at least the tenth harmonic of the fundamental. This test was conducted per TIA/EIA standard 603 using the substitution method. Measurements were made at the open field test site of TIMCO ENGINEERING, INC. located at 849 N.W. State Road 45, Newberry, FL 32669.

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FCC ID: PDHTX150M

REPORT #:V:\T\TTI_PDH\2645AUT6\Extra2645AUT6\2645AUT6TestReport.doc

Page 10 of 12

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Frequency stability:

REFER TO 2645AUT6 TESTREPORT2

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FCC ID: PDHTX150M

REPORT #:V:\T\TTI_PDH\2645AUT6\Extra2645AUT6\2645AUT6TestReport.doc

Page 11 of 12

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EMC Equipment List

Device	Manufacturer	Model	Serial Number	Cal/Char Date	Due Date
3/10-Meter OATS	TEI	N/A	N/A	Listed 3/27/04	3/26/07
3-Meter OATS	TEI	N/A	N/A	Listed 1/11/06	1/10/09
Antenna: Biconnical	Eaton	94455-1	1057	CAL 12/12/05	12/12/07
Antenna: Biconnical	Electro-Metrics	BIA-25	1171	CAL 4/29/05	4/29/07
Analyzer Blue Tower Quasi- Peak Adapter	HP	85650A	2811A01279	CAL 4/13/05	4/13/07
Analyzer Blue Tower RF Preselector	HP	85685A	2926A00983	CAL 9/5/05	9/5/07
Analyzer Blue Tower Spectrum Analyzer	HP	8568B	2928A04729 2848A18049	CAL 4/13/05	4/13/07
LISN	Electro-Metrics	ANS-25/2	2604	CAL 10/5/06	10/5/08
LISN	Electro-Metrics	EM-7820	2682	CAL 4/28/05	4/28/07
Antenna: Log- Periodic	Eaton	96005	1243	CAL 12/14/05	12/14/07

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Page 12 of 12