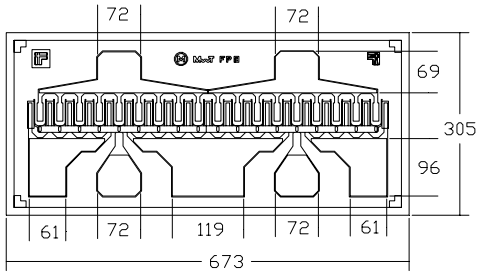
MwT-PH8

20 GHz Medium Power AlGaAs/InGaAs PHEMT
May 2011

Features:

- **+30.0 dBm typical Output Power at 12 GHz**
- **10.0 dB typical Small Signal Gain at 12 GHz**
- **55% typical PAE at 12 GHz**
- **0.3 x 1200 Micron Refractory Metal/Gold Gate**
- **Sorted into 20 mA Idss Bin Ranges**
- **Excellent for High Power, Gain, and High Power Added Efficiency**
- **Ideal for Commercial, Military, Hi-Rel Space Applications**



Chip Dimensions: 673 x 305 microns
Chip Thickness: 100 microns

Description:

The MwT-PH8 is a AlGaAs/InGaAs PHEMT (Pseudomorphic-High-Electron-Mobility-Transistor) device whose nominal 0.3 micron gate length and 1200 micron gate width make it ideally suited for applications requiring high-gain and power up to 20 GHz frequency range with power outputs ranging from 800 to 1000 milli-watts. The device is equally effective for either wideband (e.g. 6 to 18 GHz) or narrow-band applications. The chip is produced using MwT's reliable metal systems and all devices from each wafer are screened to insure reliability. All chips are passivated using MwT's patented "Diamond-Like Carbon" process for increased durability.

Electrical Specifications:

- ***at Ta= 25 ℃***

SYMBOL	PARAMETERS & CONDITIONS	FREQ	UNITS	MIN	TYP
P1dB	Output Power at 1dB Compression Vds=7.0 V Ids=0.6xIDSS=240 mA	12 GHz	dBm	29.0	30.0
SSG	Small Signal Gain VDS=7.0 V Ids=0.6xIDSS=240 mA	12 GHz	dB	9.0	10.0
PAE	Power Added Efficiency at P1dB VDS=7.0 V Ids=0.6xIDSS=240 mA	12 GHz	%		55
IDSS	Recommended IDSS Range for Optimum P1dB		mA		280-460

DC Specifications:

- ***at Ta= 25 ℃***

SYMBOL	PARAMETERS & CONDITIONS	UNITS	MIN	TYP	MAX
IDSS	Saturated Drain Current Vds=4.0 V Vgs=0.0 V	mA	240		600
Gm	Transconductance Vds=2.5 V Vgs=0.0 V	mS	240	320	
Vp	Pinch-off Voltage Vds=3.0 V Ids=8.0 mA	V		-1.2	-2.5
BVGSO	Gate-to-Source Breakdown Voltage Igs= -1.4 mA	V	-6.0	-12.0	
BVGDO	Gate-to-Drain Breakdown Voltage Igd= -1.4 mA	V	-10.0	-13.0	
Rth	Chip Thermal Resistance	C/W		40*	

MicroWave Technology, Inc. an IXYS Company, 4268 Solar Way, Fremont, CA 94538
510-651-6700 FAX 510-651-2208 WEB www.mwtinc.com

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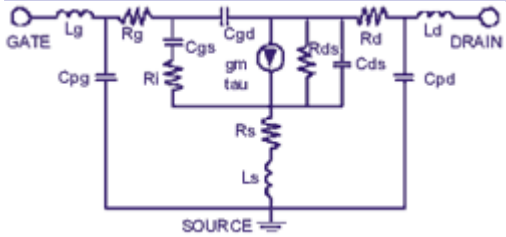
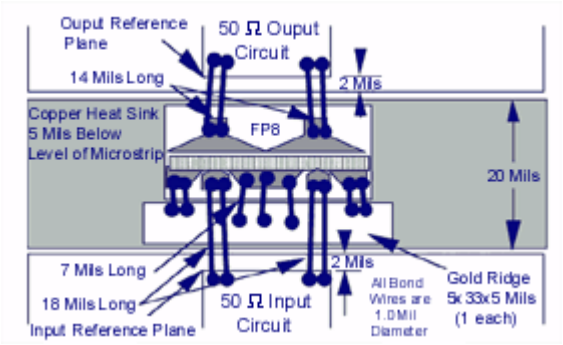
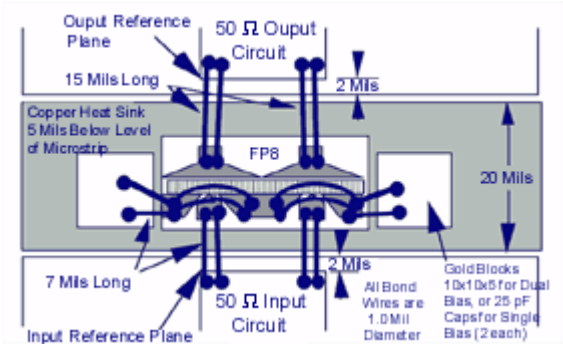
* Overall Rth depends on case mounting

DEVICE EQUIVALENT CIRCUIT	PARAMETER		VALUE	
	Source Resistance	Rs	0.30	ohm
	Source Inductance	Ls	0.055	nH
	Drain-Source Resistance	Rds	200	ohm
	Drain-Source Capacitance	Cds	0.15	pF
	Drain Resistance	Rd	0.3	ohm
	Drain Pad Capacitance	Cpd	0.20	pF
	Drain Inductance	Ld	0.1	nH
	Gate Bond Wire Inductance	Lg	0.12	nH
	Gate Pad Capacitance	Cpg	0.25	pF
	Gate Resistance	Rg	0.20	ohm
	Gate-Source Capacitance	Cgs	2.50	pF
	Channel Resistance	Ri	4.00	ohm
	Gate-Drain Capacitance	Cgd	0.13	pF
	Transconductance	gm	280	mS
	Transit Time	tau	1.0	psec

MwT-PH8 DUAL BIAS



MwT-PH8 SELF BIAS



MAXIMUM RATINGS AT Ta = 25 °C

Symbol	Parameter	Units	Cont Max1	Absolute Max2
VDS	Drain to Source Volt.	V	7.5	8.0
Tch	Channel Temperature	°C	+150	+175
Tst	Storage Temperature	°C	-65 to+150	+175
Pin	RF Input Power	mW	240	360
Pt	Total Power Dissipation	mW	2700	3300

Notes:
1. Exceeding any one of these limits in continuous operation may reduce the mean-time- to-failure below the design goal.

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2. Exceeding any one of these limits may cause permanent damage.