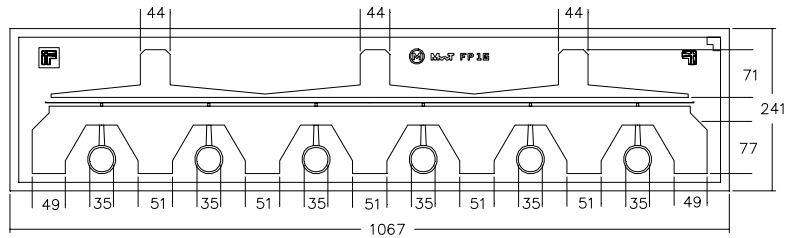


## Features:

- +30.0 dBm Output Power at 12 GHz
- 11.5 dB Small Signal Gain at 12 GHz
- 60% PAE at 12 GHz
- 0.3 x 900 Micron Refractory Metal/Gold Gate
- Excellent for High Power, Gain, and High Power Added Efficiency
- Ideal for Commercial, Military, Hi-Rel Space Applications



**Chip Dimensions: 1,067 x 241 microns**  
**Chip Thickness: 100 microns**

## Description:

The MwT-PH16 is a AlGaAs/InGaAs PHEMT (Pseudomorphic-High-Electron-Mobility-Transistor) device whose nominal 0.3 micron gate length and 900 micron gate width make it ideally suited for applications requiring high-gain and power up to 28 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  $T_a = 25\text{ }^\circ\text{C}$

SYMBOL	PARAMETERS & CONDITIONS	FREQ	UNITS	MIN	TYP
P1dB	Output Power at 1dB Compression Vds=7.0 V Ids=0.75xIDSS=195 mA	12 GHz	dBm	28.5	30.0
SSG	Small Signal Gain VDS=7.0 V Ids=0.75xIDSS=195 mA	12 GHz	dB	10.0	11.5
PAE	Power Added Efficiency at P1dB VDS=7.0 V Ids=0.75xIDSS=195 mA	12 GHz	%		60
IDSS	Recommended IDSS Range for Optimum P1dB		mA		180-315

## DC Specifications:

• at  $T_a = 25\text{ }^\circ\text{C}$

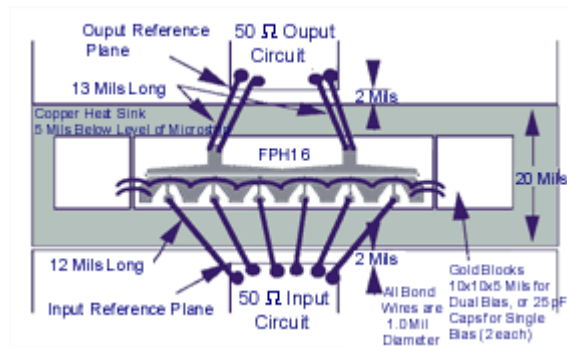
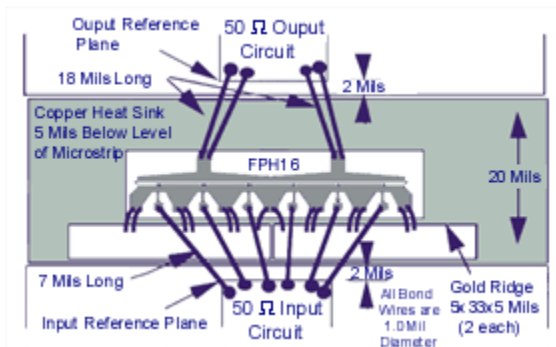
SYMBOL	PARAMETERS & CONDITIONS	UNITS	MIN	TYP	MAX
IDSS	Saturated Drain Current Vds=4.0 V Vgs=0.0 V	mA	150		360
Gm	Transconductance Vds=2.5 V Vgs=0.0 V	mS	180	280	
Vp	Pinch-off Voltage Vds=3.0 V Ids=3.0 mA	V		-1.2	-2.5
BVGSO	Gate-to-Source Breakdown Voltage Igs= -1.0 mA	V	-6.0	-12.0	
BVGDO	Gate-to-Drain Breakdown Voltage Igd= -1.0 mA	V	-10.0	-13.0	
Rth	Chip Thermal Resistance	C/W		45*	

\* Overall Rth depends on case mounting

DEVICE EQUIVALENT CIRCUIT	PARAMETER	VALUE	
	Source Resistance	$R_s$	0.60 ohm
	Source Inductance	$L_s$	0.04 nH
	Drain-Source Resistance	$R_{ds}$	140 ohm
	Drain-Source Capacitance	$C_{ds}$	0.10 pF
	Drain Resistance	$R_d$	1.00 ohm
	Drain Pad Capacitance	$C_{pd}$	0.20 pF
	Drain Inductance	$L_d$	0.09 nH
	Gate Bond Wire Inductance	$L_g$	0.05 nH
	Gate Pad Capacitance	$C_{pg}$	0.50 pF
	Gate Resistance	$R_g$	0.30 ohm
	Gate-Source Capacitance	$C_{gs}$	1.60 pF
	Channel Resistance	$R_i$	3.60 ohm
	Gate-Drain Capacitance	$C_{gd}$	0.10 pF
	Transconductance	$g_m$	260 mS
Transit Time	$\tau$	1.90 psec	

MwT-PH16  
DUAL BIAS

MwT-PH16  
SELF BIAS



### MAXIMUM RATINGS AT $T_a = 25^\circ\text{C}$

Symbol	Parameter	Units	Cont Max1	Absolute Max2
VDS	Drain to Source Volt.	V	7.5	8.0
Tch	Channel Temperature	$^\circ\text{C}$	+150	+175
Tst	Storage Temperature	$^\circ\text{C}$	-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.
2. Exceeding any one of these limits may cause permanent damage.



**MwT-PH16**  
**28 GHz Medium Power AlGaAs/InGaAs PHEMT**  
**May 2011**