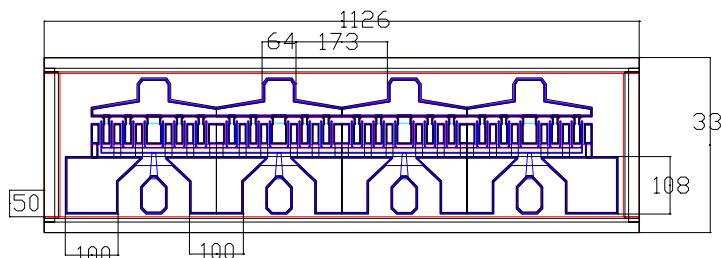


## Features:

- +31.0 dBm Output Power at 12 GHz
- 11 dB Small Signal Gain at 12 GHz
- 50% PAE at 12 GHz
- 0.25 x 1600 Micron Refractory Metal/Gold Gate
- Sorted into 50 mA Idss Bin Ranges
- Excellent for High Power, Gain, and High Power-Added-Efficiency Applications
- Ideal for Commercial, Military, and Space Applications



**Chip Dimensions: 1126 x 330 microns**  
**Chip Thickness: 100 microns**  
**All dimensions in microns**

## Description:

The MwT-PH16A is a AlGaAs/InGaAs pHEMT device whose nominal 0.25 micron gate length and 1600 micron gate width make it ideally suited for applications requiring high-gain and high power up to 20 GHz . The device is equally effective for either wideband (e.g. 6 to 18 GHz) or narrow-band applications in EW, Radar, Instrumentation and Communications equipment .

## Electrical Specifications:

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

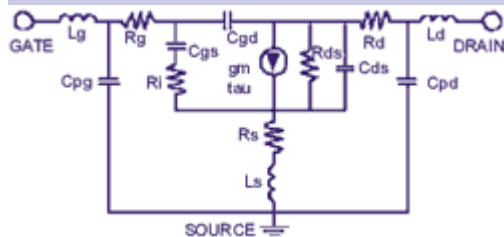
SYMBOL	PARAMETERS & CONDITIONS	FREQ	UNITS	MIN	TYP
<b>P1dB</b>	Output Power at 1dB Compression $V_{ds}=8.0\text{ V}$ $I_{ds}=0.6 \times I_{DSS}$	F=12 GHz	dBm	29.0	31.0
		F=18 GHz			31.0
<b>SSG</b>	Small Signal Gain $V_{ds}=8.0\text{ V}$ $I_{ds}=0.6 \times I_{DSS}$	F=12 GHz	dB	9.5	11.0
		F=18 GHz			9.0
<b>PAE</b>	Power Added Efficiency at P1dB $V_{dS}=8.0\text{ V}$ $I_{ds}=0.6 \times I_{DSS}$	12 GHz	%		50

**DC Specifications:** • at  $T_a = 25^\circ\text{C}$

SYMBOL	PARAMETERS & CONDITIONS	UNITS	MIN	TYP	MAX
<b>IDSS</b>	Saturated Drain Current $V_{ds}=2.0\text{ V}$ $V_{gs}=0.0\text{ V}$	mA	300		600
<b>Gm</b>	Transconductance $V_{ds}=2.0\text{ V}$ $V_{gs}=0.0\text{ V}$	mS	300	400	
<b>Vp</b>	Pinch-off Voltage $V_{ds}=3.0\text{ V}$ $I_{ds}=2.0\text{ mA}$	V		-1.2	-2.5
<b>BVGSO</b>	Gate-to-Source Breakdown Voltage $I_{gs} = -2.0\text{ mA}$	V	-6.0	-8.0	
<b>BVGDO</b>	Gate-to-Drain Breakdown Voltage $I_{gd} = -2.0\text{ mA}$	V	-10.0	-13.0	
<b>Rth</b>	Thermal Resistance	$^\circ\text{C/W}$		30	

\* Overall Rth depends on case mounting

**DEVICE EQUIVALENT CIRCUIT**



**PARAMETER**

**VALUE**

Source Resistance	$R_s$	0.13	ohm
Source Inductance	$L_s$	0.025	nH
Drain-Source Resistance	$R_{ds}$	40	ohm
Drain-Source Capacitance	$C_{ds}$	0.25	pF
Drain Resistance	$R_d$	0.3	ohm
Drain Pad Capacitance	$C_{pd}$	0.027	pF
Drain Inductance	$L_d$	0.1	nH
Gate Bond Wire Inductance	$L_g$	0.1	nH
Gate Pad Capacitance	$C_{pg}$	0.050	pF
Gate Resistance	$R_g$	0.20	ohm
Gate-Source Capacitance	$C_{gs}$	2.50	pF
Channel Resistance	$R_i$	0.30	ohm
Gate-Drain Capacitance	$C_{gd}$	0.10	pF
Transconductance	$g_m$	400.0	mS
Transit Time	$\tau$	3.0	psec

## MAXIMUM RATINGS AT Ta = 25 °C

Symbol	Parameter	Units	Cont Max1	Absolute Max2
VDS	Drain to Source Voltage	V	8.5	9.0
Tch	Channel Temperature	°C	+150	+175
Tst	Storage Temperature	°C	-65 to +150	+175
Pin	RF Input Power	mW	800	1000
Pt	Total Power Dissipation	mW	2000	2400

### 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.

## BIN SELECTION

BIN#	1	2	3	4	5	6
IDSS (mA)	300-350	350-400	400-450	450-500	500-550	550-600

**BIN ACCURACY STATEMENT:** Due to the effects of temperature, dc loading and probe tip varnishing, the IDSS from the "on wafer" probing of any MwT device may differ. After it has been attached to a proper heat sink and tested in an RF or DC circuit. Because of the aforementioned effects, the IDSS distribution may deviate as much as +/- 1 bin within the range identified on the label of Each die shipping container, and +/- 2 bins within the selected range.

## ORDERING INFORMATION:

### CHIP – Model Number MwT-PH16A

When placing order or inquiring, please specify BIN range, wafer number, if known, and visual screening level required. For details of BIN Selection and Safe Handling Procedure please see supplementary information in available PDF on our website [www.mwtinc.com](http://www.mwtinc.com). Contact factory for availability of packages.