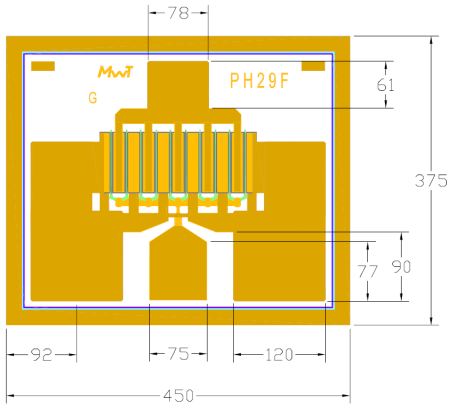
MwT-PH29F

18 GHz Medium Power AlGaAs/InGaAs pHEMT

Features:

- **28.5 dBm of Power at 12 GHz**
- **13 dB Small Signal Gain at 12 GHz**
- **48% PAE at 12 GHz**
- **0.25 x 800 Micron Refractory Metal/Gold Gate**
- **Excellent for Medium Power, Gain, and High Power Added Efficiency**
- **Ideal for Commercial, Military, Hi-Rel Space Applications**



Chip Dimensions: 450 x 375 microns
Chip Thickness: 100 microns

Description:

The MwT-PH29F is a AlGaAs/InGaAs pHEMT (Pseudomorphic-High-Electron-Mobility-Transistor) device whose nominal 0.25 micron gate length and 800 micron gate width make it ideally suited for applications requiring high-gain and medium power up to 18 GHz frequency range. The device is equally effective for either wideband (e.g. 6 to 18 GHz) or narrow-band applications. The chip is produced using reliable metal systems and passivated to insure excellent reliability.

Electrical Specifications: *at Ta= 25 °C*

PARAMETERS & CONDITIONS	SYMBOL	FREQ	UNITS	MIN	TYP
Output Power at 1dB Compression Vds=8.0V Ids=0.7xIDSS	P1dB	12 GHz	dBm		27.5
Saturated Power Vds=8.0V Ids=0.7xIDSS	Psat	12 GHz	dBm		28.5
Output Third Order Intercept Point Vds=8.0V Ids=0.7xIDSS	OIP3	12 GHz	dBm		35.0
Small Signal Gain Vds=8.0V Ids=0.7xIDSS	SSG	12 GHz	dB		13.0
Power Added Efficiency at P1dB Vds=8.0V Ids=0.7xIDSS	PAE	12 GHz	%		48

Note: Ids should be between 40% and 80% of Idss. Currently, our data shows Ids at 70% of IDSS. Low Ids will improve efficiency, but high Ids will make Psat and IP3 better.

DC Specifications: *at Ta= 25 °C*

PARAMETERS & CONDITIONS		SYMBOL	UNITS	MIN	TYP	MAX
Saturated Drain Current Vds= 3.0 V Vgs= 0.0 V		IDSS	mA	160		200
Transconductance Vds= 2.5 V Vgs= 0.0 V		Gm	mS		250	
Pinch-off Voltage Vds= 3.0 V Ids= 1.0 mA		Vp	V		-0.8	-1.0
Gate-to-Source Breakdown Voltage Igs= -0.3 mA		BVGSO	V		-16.0	
Gate-to-Drain Breakdown Voltage Igd= -0.3 mA		BVGDO	V		-18.0	
Chip Thermal Resistance	Chip & 71 pkg 70 & 73 pkg	Rth	C/W		50 170*	

* Overall Rth depends on case mounting

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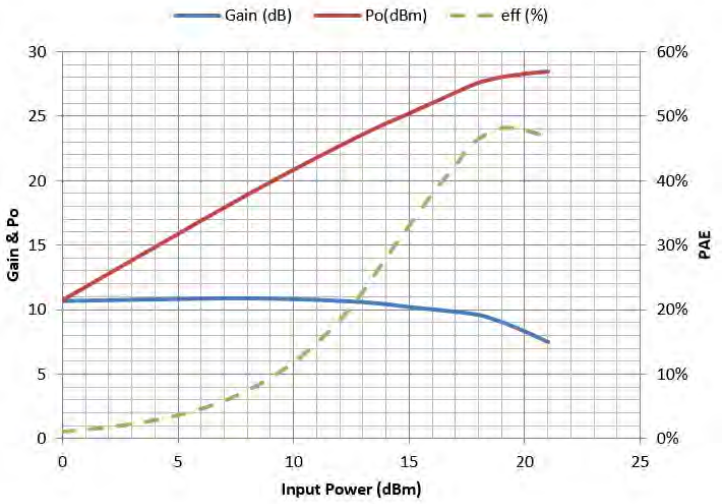
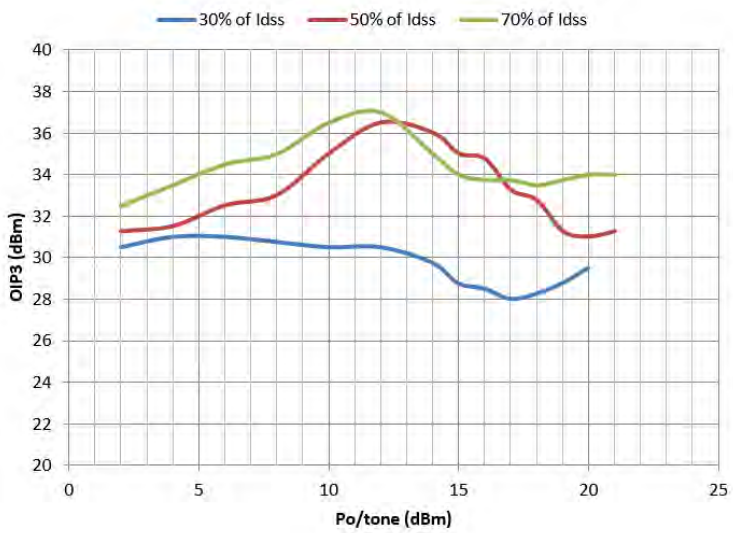
MwT-PH29F, Po, Gain & PAE at 12GHz vs Pin
Vds=8V; Idq=0.7xIDSS



OIP3 at 12GHz with different Idq vs Po/tone



MwT-PH29F, Load Pull data, Vds=8V, Idq=0.7xIdss

Freq	ZS		ZL		Psat
GHz	Mag	phase	mag	phase	dBm
2	0.89	91.00	0.20	151.70	28.57
4	0.87	133.00	0.25	149.30	28.52
6	0.85	150.00	0.32	133.90	28.42
8	0.88	158.00	0.31	143.00	28.50
10	0.88	163.00	0.36	138.00	28.47
12	0.89	175.00	0.38	144.50	28.65

The load pull data is based on nonlinear model provided by the foundry that processes the device.

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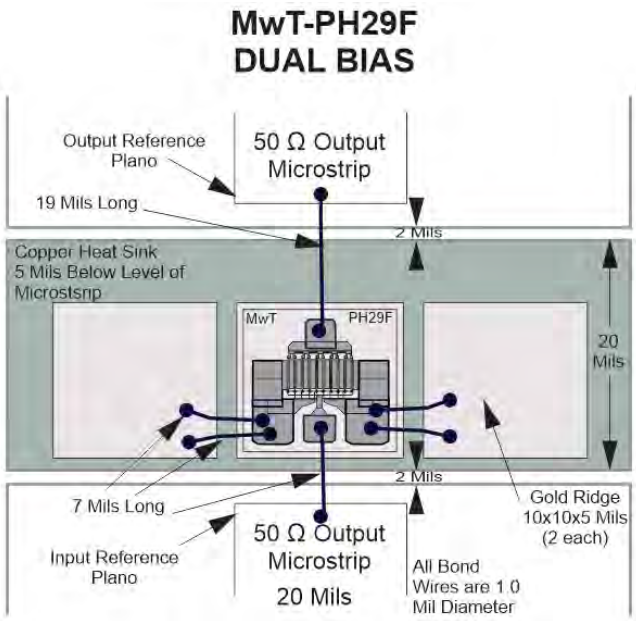

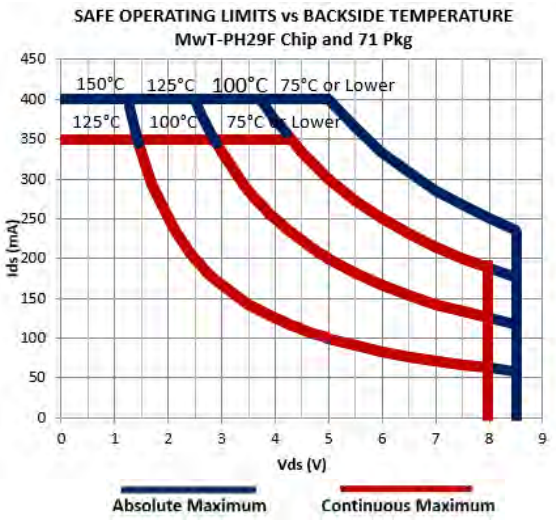

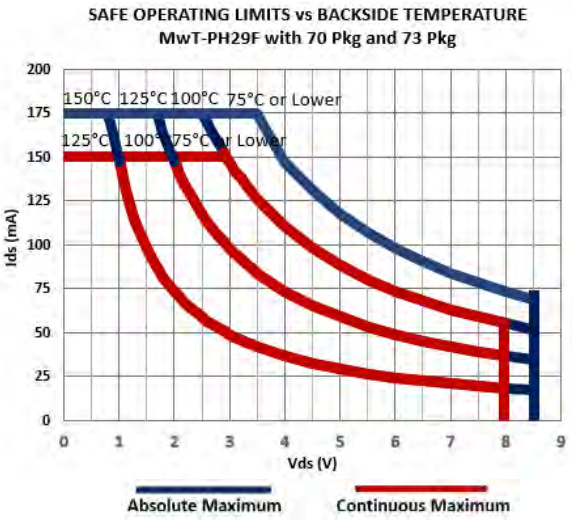

Absolute Maximum Rating

Symbol	Parameter	Units	Cont Max1	Absolute Max2
VDS	Drain to Source Volt.	V	8.0	8.5
Tch	Channel Temperature	°C	+150	+175
Tst	Storage Temperature	°C	-65 to +150	+175
Pin	RF Input Power	mW	300	400

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.

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