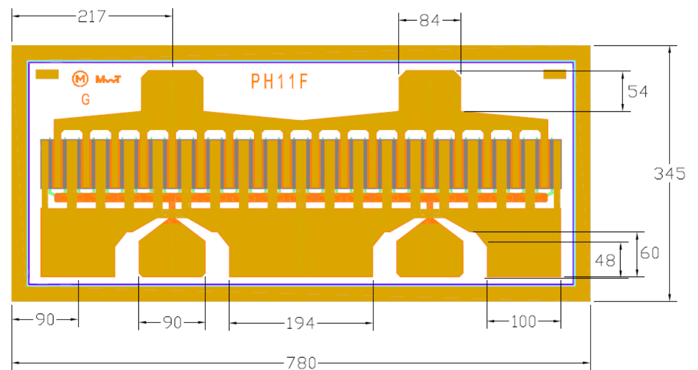
MwT MicroWave Technology

MwT-PH11F/MwT-PH11FV

12 GHz High Power AlGaAs/InGaAs pHEMT

Features:

- 33 dBm of Power at 12 GHz
- 12 dB Small Signal Gain at 12 GHz
- 45% PAE at 12 GHz
- 0.25 x 2400 Micron Refractory Metal/Gold Gate
- Excellent for High Power, and High Power Added Efficiency
- Ideal for Commercial, Military, Hi-Rel Space Applications
- Available with or without via holes



Chip Dimensions: 780 x 345 microns
Chip Thickness: 100 microns

Description:

The MwT-PH11F is a AlGaAs/InGaAs pHEMT (Pseudomorphic-High-Electron-Mobility-Transistor) device whose nominal 0.25 micron gate length and 2400 micron gate width make it ideally suited for applications requiring high power and high power added efficiency up to 12 GHz frequency range. The device is equally effective for either wideband 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		32.0
Saturated Power Vds=8.0V Ids=0.7xIDSS	Psat	12 GHz	dBm		33.0
Output Third Order Intercept Point Vds=8.0V Ids=0.7xIDSS	OIP3	12 GHz	dBm		40.0
Small Signal Gain Vds=8.0V Ids=0.7xIDSS	SSG	12 GHz	dB		12.0
Power Added Efficiency at P1dB Vds=8.0V Ids=0.7xIDSS	PAE	12 GHz	%		45

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	480		520
Transconductance Vds= 2.5 V Vgs= 0.0 V		Gm	mS		700	
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		-17.0	
Gate-to-Drain Breakdown Voltage Igd= -0.3 mA		BVGDO	V		-18.0	
Chip Thermal Resistance	Chip & 71 pkg	Rth	C/W		25	

* Overall Rth depends on case mounting

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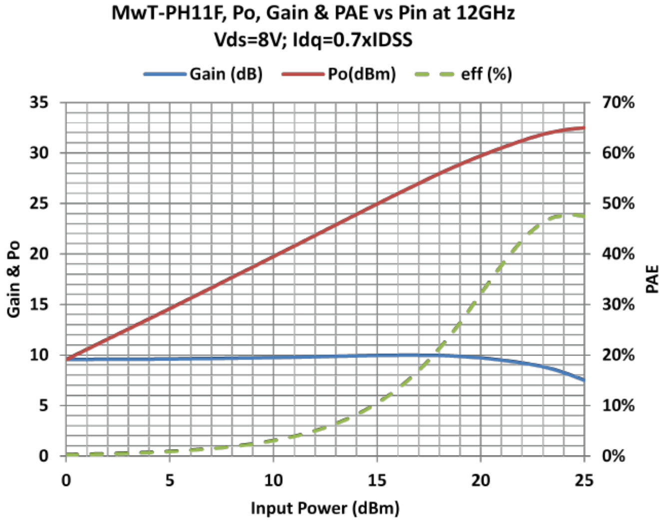

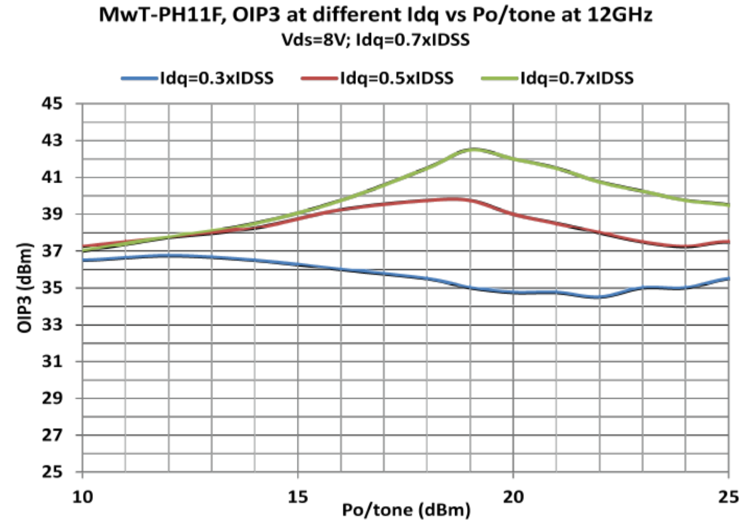

MwT-PH11F, Load Pull data, Vds=8V, Idq=0.7xIdss

	Z_S		Z_L		Psat
Freq (GHz)	Mag	phase	mag	phase	dBm
2	0.75	145.0	0.57	170.3	33.0
4	0.90	162.0	0.63	170.3	32.6
6	0.95	172.0	0.65	169.8	32.7
8	0.95	177.0	0.68	170.9	32.6
10	0.94	179.0	0.72	171.0	32.1
12	0.93	-177.0	0.72	171.0	32.3

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

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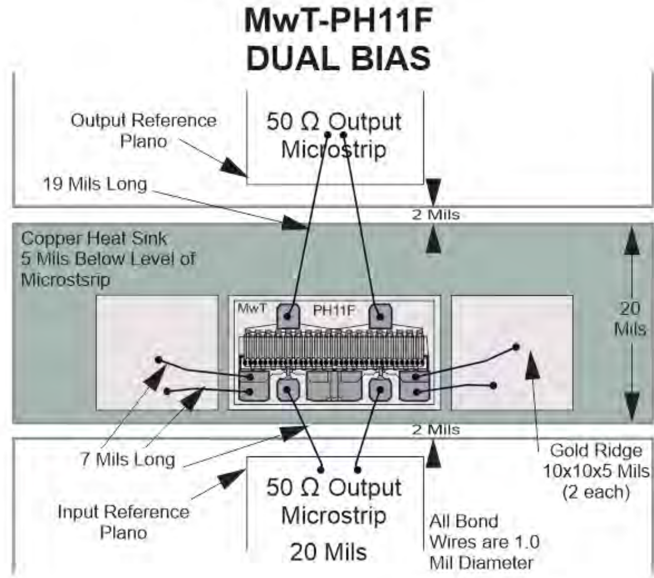

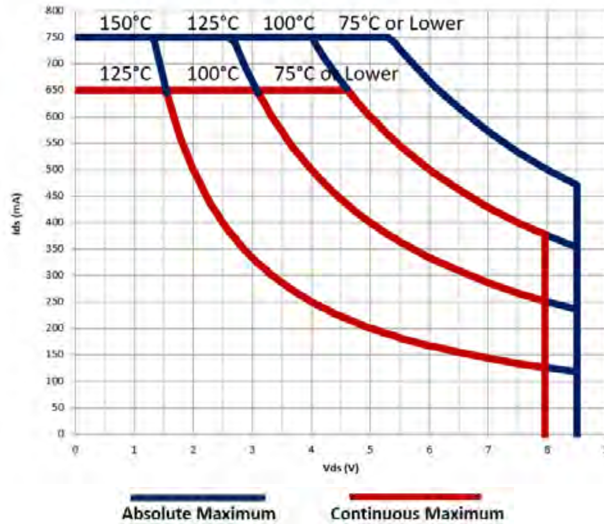

Absolute Maximum Rating

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	500	700

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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