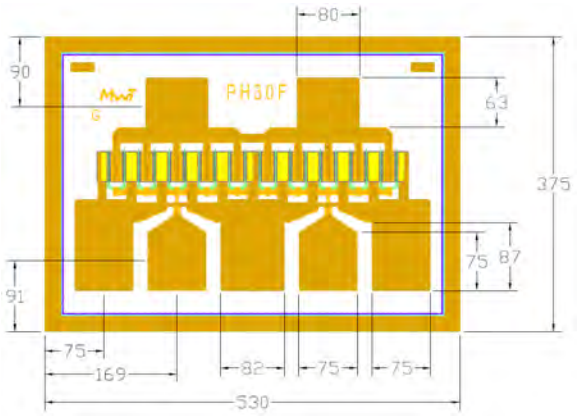
MwT-PH30F 18 GHz Medium Power AlGaAs/InGaAs pHEMT

Features:

- **28 dBm of Power at 12 GHz**
- **14 dB Small Signal Gain at 12 GHz**
- **45% 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: 530 x 375 microns
Chip Thickness: 100 microns

Description:

The MwT-PH30F 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*

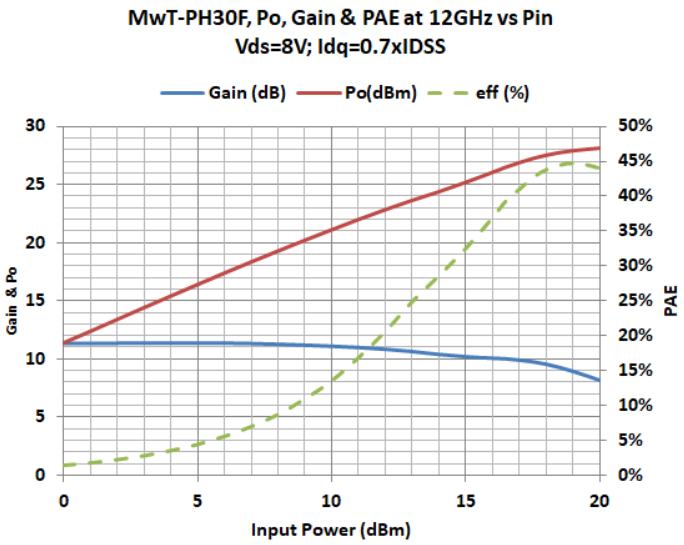
PARAMETERS & CONDITIONS	SYMBOL	FREQ	UNITS	MIN	TYP
Output Power at 1dB Compression Vds=8.0V Ids=0.7xIDSS	P1dB	12 GHz	dBm		25.0
Saturated Power Vds=8.0V Ids=0.7xIDSS	Psat	12 GHz	dBm		28.0
Output Third Order Intercept Point Vds=8.0V Ids=0.7xIDSS	OIP3	12 GHz	dBm		34.0
Small Signal Gain Vds=8.0V Ids=0.7xIDSS	SSG	12 GHz	dB		14.0
Power Added Efficiency at P1dB Vds=8.0V Ids=0.7xIDSS	PAE	12 GHz	%		45

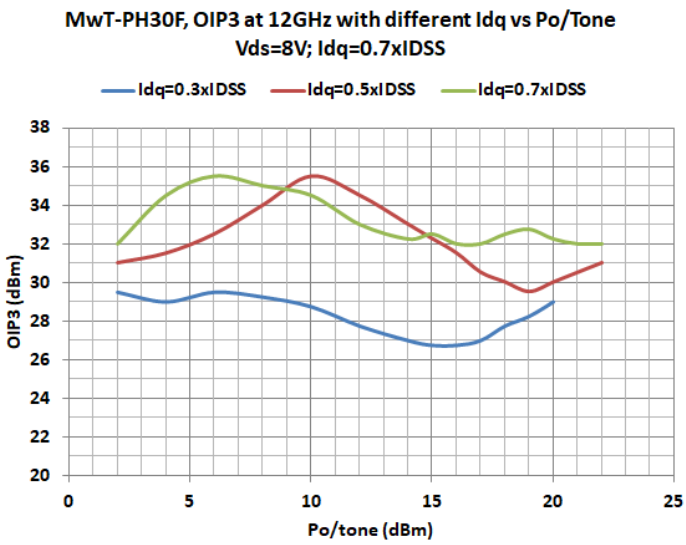
Note: Ids should be between 40% and 80% of Idss. Currently, our data shows Ids at 70% of IDSS. Low Ids will improve efficiency, but high Ids will make Psat and IP3 better.

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	160		200
Transconductance Vds= 2.5 V Vgs= 0.0 V		Gm	mS		200	
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		-18.0	
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

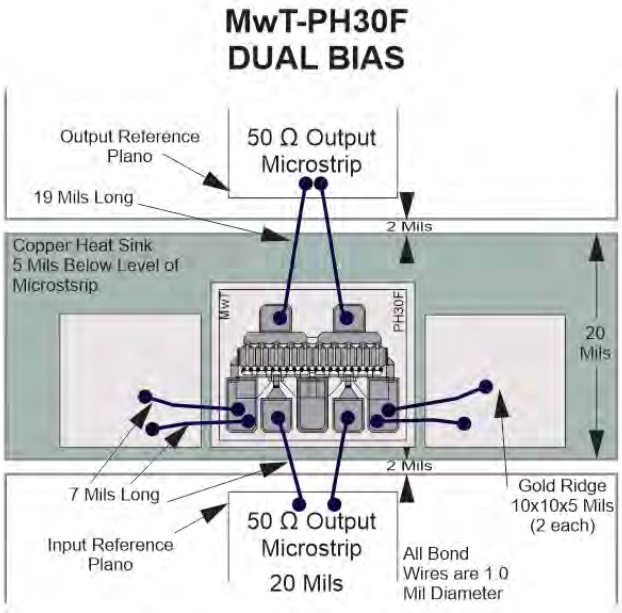


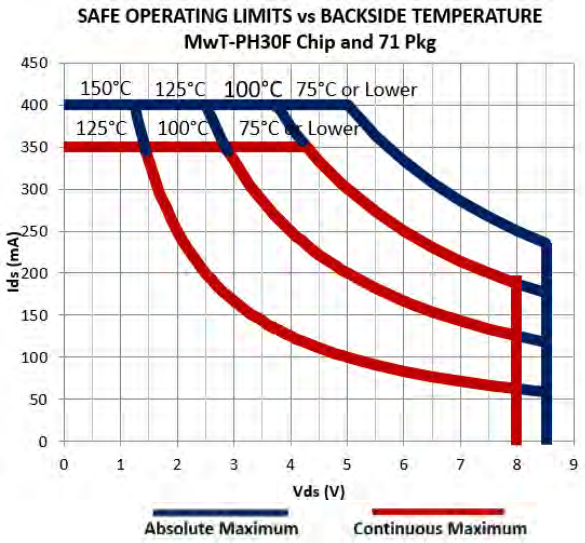


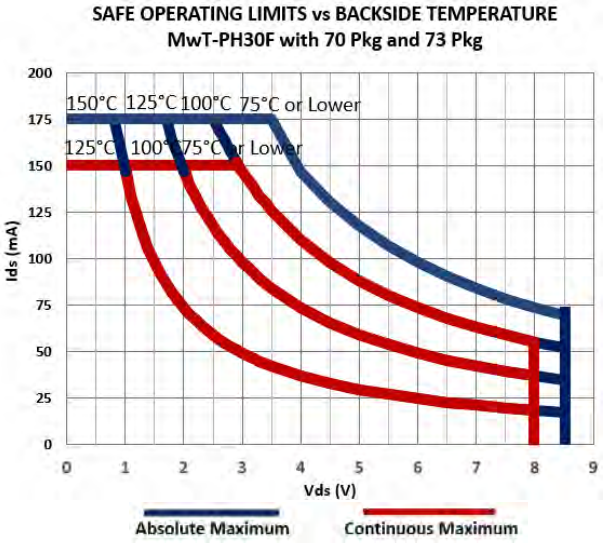
MwT-PH30F, Load Pull Data, Vds=8V, Idq=0.7xIdss

Freq	ZS		ZL		Psat
GHz	Mag	phase	mag	phase	dBm
2	0.86	101.00	0.22	126.40	28.07
4	0.92	147.50	0.31	121.50	27.51
6	0.93	149.00	0.42	125.80	27.55
8	0.91	160.00	0.48	131.60	27.53
10	0.94	163.00	0.52	135.60	27.51
12	0.91	167.00	0.57	139.00	27.43

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







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.

S-Parameters

S-PARAMETER Vds=8.0V, Ids= 0.7 x Idss

Freq.	S11		S21		S12		S22		K	GMAX
GHz	dB	Ang (°)	dB	Ang (°)	dB	Ang (°)	dB	Ang (°)		dB
1	-0.652	-74.597	22.941	136.307	-30.869	51.647	-5.689	-31.679	0.130	26.905
2	-1.092	-116.007	19.701	112.057	-28.123	33.014	-7.922	-46.483	0.219	23.912
3	-1.274	-138.647	16.987	97.045	-27.387	23.524	-9.233	-54.738	0.315	22.187
4	-1.364	-152.728	14.808	86.259	-27.081	18.767	-9.825	-61.819	0.408	20.945
5	-1.391	-162.796	12.905	78.067	-27.049	15.831	-10.157	-67.798	0.513	19.977
6	-1.391	-170.373	11.537	70.657	-26.862	14.934	-10.196	-71.799	0.586	19.199
7	-1.393	-177.875	10.322	63.209	-26.930	13.278	-10.219	-77.723	0.682	18.626
8	-1.353	177.875	9.131	56.537	-27.087	13.092	-9.734	-85.242	0.752	18.109
9	-1.390	172.838	7.875	49.967	-27.330	14.774	-9.751	-92.406	0.936	17.603
10	-1.322	168.152	7.007	43.722	-27.145	14.405	-9.080	-97.975	0.923	17.076
11	-1.176	163.081	6.163	37.399	-27.227	15.738	-8.944	-104.071	0.903	16.695
12	-1.164	159.795	5.339	32.004	-27.309	17.415	-8.477	-110.028	0.976	16.324
13	-1.215	156.044	4.521	26.163	-27.258	18.948	-8.087	-116.083	1.108	13.893
14	-1.219	152.982	3.677	21.150	-27.027	21.685	-7.695	-122.260	1.177	12.802
15	-1.006	148.974	3.044	15.549	-26.817	24.672	-7.381	-127.424	0.976	14.931
16	-1.084	146.844	2.439	9.983	-26.485	27.458	-6.842	-133.042	1.059	12.973
17	-1.058	144.249	1.784	5.267	-26.262	28.980	-6.416	-138.430	1.055	12.590
18	-1.102	141.709	1.103	1.217	-25.612	31.156	-5.899	-143.788	1.060	11.857
19	-0.965	139.573	0.412	-3.994	-25.184	32.602	-5.712	-148.353	0.923	12.798
20	-0.921	136.584	-0.080	-8.757	-24.430	33.808	-5.372	-153.173	0.808	12.175
21	-0.874	133.891	-0.907	-14.602	-24.112	35.757	-5.108	-156.664	0.790	11.603
22	-0.940	132.014	-1.464	-18.447	-23.318	34.754	-4.677	-162.025	0.780	10.927
23	-0.776	130.364	-2.040	-22.707	-23.003	35.322	-4.421	-167.422	0.605	10.481
24	-0.796	127.534	-2.730	-27.372	-22.459	33.696	-4.252	-171.560	0.620	9.865
25	-0.956	126.012	-3.240	-31.472	-21.724	33.969	-3.915	-176.356	0.723	9.242
26	-0.876	124.144	-3.847	-35.248	-21.176	32.737	-3.653	178.880	0.609	8.664
27	-0.881	121.628	-4.355	-38.783	-20.646	32.450	-3.360	175.534	0.569	8.146
28	-0.738	120.460	-5.004	-42.709	-20.050	30.665	-3.227	171.107	0.410	7.523
29	-0.776	117.928	-5.651	-46.070	-19.645	28.542	-3.022	167.951	0.427	6.997
30	-0.764	116.436	-6.160	-49.587	-19.117	27.239	-2.825	163.526	0.382	6.478

Available Packaging:

70 Package - MwT-PH30F70
71 Package - MwT-PH30F71
73 Package - MwT-PH30F73

Contact Information

For additional information please visit www.cmlmicro.com or contact a sales office.

Europe	America	Asia
• Maldon, UK • Tel +44 (0) 1621 875500 • sales@cmlmicro.com	• Winston-Salem, NC • Tel +1 336 744 5050 • us.sales@cmlmicro.com	• Singapore • Tel +65 6288129 • sg.sales@cmlmicro.com