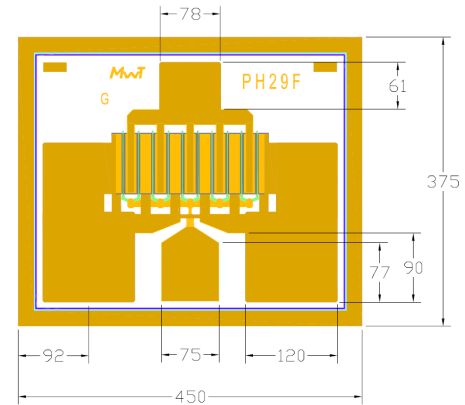


Features:

- 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 $T_a = 25^\circ\text{C}$

PARAMETERS & CONDITIONS	SYMBOL	FREQ	UNITS	MIN	TYP
Output Power at 1dB Compression $V_{ds}=8.0\text{V}$ $I_{ds}=0.7 \times I_{DSS}$	P1dB	12 GHz	dBm		27.5
Saturated Power $V_{ds}=8.0\text{V}$ $I_{ds}=0.7 \times I_{DSS}$	Psat	12 GHz	dBm		28.5
Output Third Order Intercept Point $V_{ds}=8.0\text{V}$ $I_{ds}=0.7 \times I_{DSS}$	OIP3	12 GHz	dBm		35.0
Small Signal Gain $V_{ds}=8.0\text{V}$ $I_{ds}=0.7 \times I_{DSS}$	SSG	12 GHz	dB		13.0
Power Added Efficiency at P1dB $V_{ds}=8.0\text{V}$ $I_{ds}=0.7 \times I_{DSS}$	PAE	12 GHz	%		48

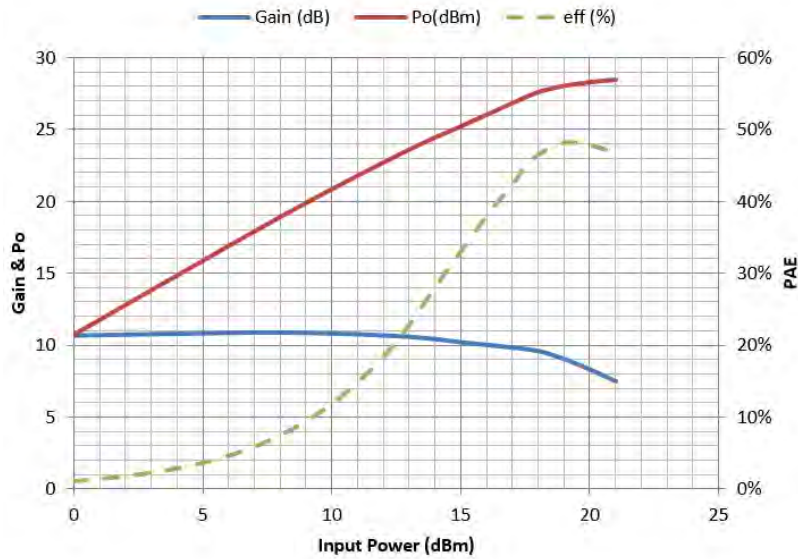
Note: I_{ds} should be between 40% and 80% of I_{DSS} . Currently, our data shows I_{ds} at 70% of I_{DSS} . Low I_{ds} will improve efficiency, but high I_{ds} will make Psat and IP3 better.

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

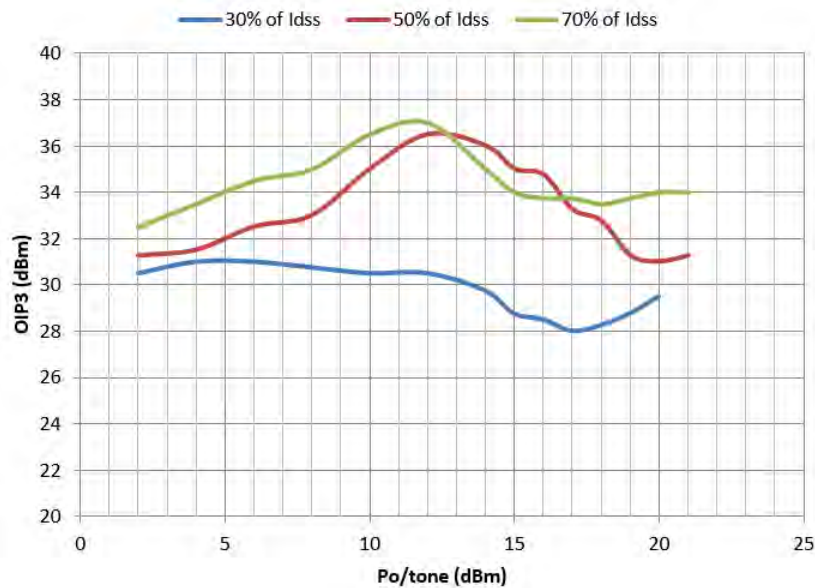
PARAMETERS & CONDITIONS	SYMBOL	UNITS	MIN	TYP	MAX
Saturated Drain Current $V_{ds}=3.0\text{V}$ $V_{gs}=0.0\text{V}$	I_{DSS}	mA	160		200
Transconductance $V_{ds}=2.5\text{V}$ $V_{gs}=0.0\text{V}$	G_m	mS		250	
Pinch-off Voltage $V_{ds}=3.0\text{V}$ $I_{ds}=1.0\text{mA}$	V_p	V		-0.8	-1.0
Gate-to-Source Breakdown Voltage $I_{gs}=-0.3\text{mA}$	BVGSO	V		-16.0	
Gate-to-Drain Breakdown Voltage $I_{gd}=-0.3\text{mA}$	BVGDO	V		-18.0	
Chip Thermal Resistance	R_{th}	C/W		50 170*	

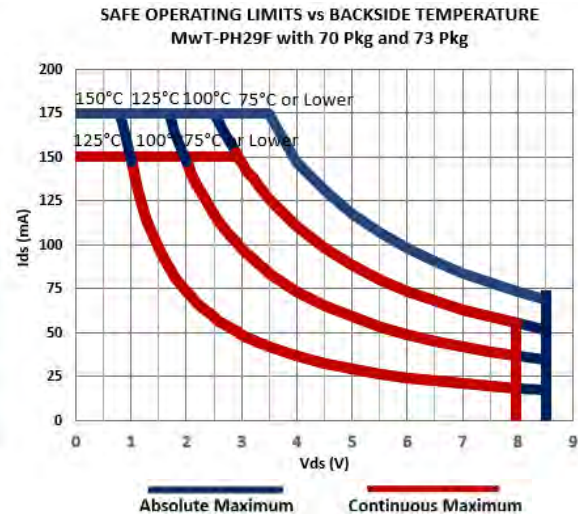
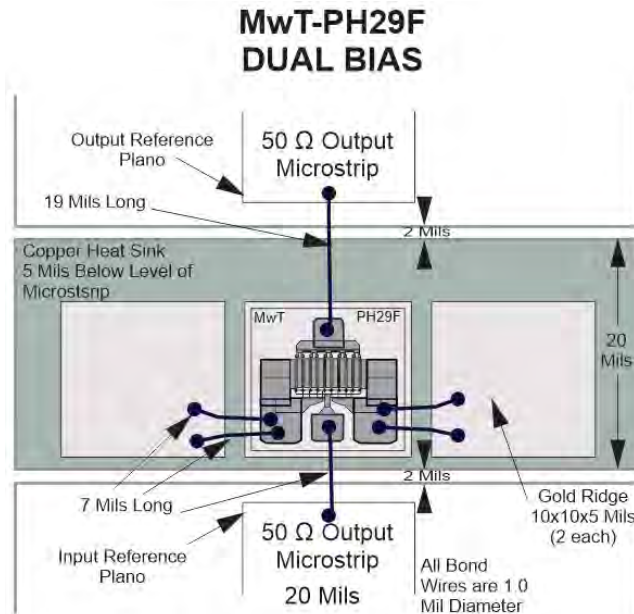
* Overall R_{th} depends on case mounting

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



OIP3 at 12GHz with different Idq vs Po/tone





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. GHz	S11		S21		S12		S22		K	GMAX dB
	dB	Ang (°)	dB	Ang (°)	dB	Ang (°)	dB	Ang (°)		
1	-0.712	-67.337	23.023	139.525	-32.599	57.496	-5.155	-23.436	0.169	27.811
2	-1.353	-108.137	20.085	115.840	-29.767	41.079	-6.895	-34.175	0.300	24.926
3	-1.665	-131.813	17.484	100.794	-28.622	34.042	-7.978	-40.417	0.423	23.053
4	-1.763	-146.856	15.400	89.895	-28.156	31.334	-8.553	-45.057	0.530	21.778
5	-1.885	-157.678	13.551	81.830	-28.171	31.322	-9.010	-50.315	0.699	20.861
6	-1.916	-165.644	12.211	74.642	-27.788	33.022	-9.071	-53.629	0.786	20.000
7	-1.895	-173.359	10.986	67.218	-27.597	34.315	-9.208	-58.792	0.877	19.291
8	-1.799	-178.234	9.805	61.180	-27.386	35.942	-9.089	-66.587	0.920	18.596
9	-1.812	176.799	8.648	54.437	-27.206	39.784	-9.273	-73.885	1.057	16.466
10	-1.777	171.859	7.816	48.903	-26.686	40.303	-8.856	-79.598	1.045	15.947
11	-1.680	166.906	7.074	42.841	-26.328	44.397	-8.779	-86.121	1.033	15.586
12	-1.603	163.630	6.265	37.485	-25.918	47.483	-8.540	-93.146	1.026	15.103
13	-1.640	160.115	5.521	31.985	-25.233	49.370	-8.271	-100.349	1.050	14.016
14	-1.615	157.560	4.698	27.199	-24.623	52.216	-7.926	-107.380	1.050	13.287
15	-1.533	152.951	4.147	22.340	-24.021	54.193	-7.658	-113.008	0.987	14.084
16	-1.353	150.924	3.478	16.561	-22.985	54.691	-7.219	-121.113	0.798	13.231
17	-1.425	148.177	2.835	11.779	-22.403	55.650	-6.777	-127.836	0.839	12.619
18	-1.311	146.809	2.236	7.466	-21.459	56.044	-6.257	-135.260	0.706	11.848
19	-1.286	145.148	1.551	3.522	-20.735	55.550	-6.003	-140.108	0.675	11.143
20	-1.136	140.448	1.032	-1.969	-20.112	54.770	-5.697	-145.992	0.573	10.572
21	-1.230	137.630	0.160	-7.121	-19.229	55.449	-5.186	-151.442	0.604	9.695
22	-1.163	135.653	-0.361	-11.359	-18.769	54.385	-4.748	-156.476	0.539	9.204
23	-1.003	134.207	-0.870	-15.331	-18.253	51.773	-4.515	-162.925	0.435	8.691
24	-1.066	131.414	-1.646	-19.291	-17.634	50.708	-4.317	-168.685	0.490	7.994
25	-1.027	129.270	-2.280	-24.007	-17.122	48.641	-3.752	-174.041	0.420	7.421
26	-0.915	127.789	-2.841	-27.153	-16.387	45.878	-3.430	-178.848	0.320	6.773
27	-0.862	125.477	-3.472	-30.993	-15.709	44.780	-3.126	176.329	0.280	6.119
28	-0.863	124.404	-4.116	-33.323	-15.403	42.689	-2.958	171.827	0.287	5.643
29	-0.850	121.049	-4.841	-36.377	-14.913	40.266	-2.709	167.484	0.284	5.036
30	-0.883	119.313	-5.459	-38.681	-14.322	37.936	-2.480	163.570	0.282	4.431

ORDERING INFORMATION:

When placing order or inquiring, please specify wafer number, if known. For details of Safe Handling Procedure please see supplementary information in available PDF on our website www.mwtinc.com. For package information, please see supplementary application note in PDF format by clicking located on our website.

Available Packaging:

70 Package - MwT-PH29F70
71 Package - MwT-PH29F71
73 Package - MwT-PH29F73