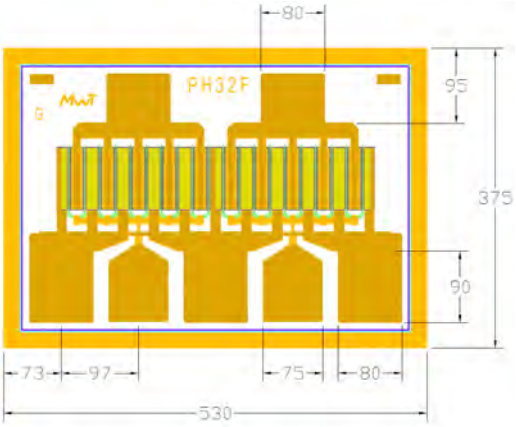
MwT-PH32F 12 GHz High Power AlGaAs/InGaAs pHEMT

Features:

- **30.5 dBm of Power at 12 GHz**
- **13 dB Small Signal Gain at 12 GHz**
- **43% PAE at 12 GHz**
- **0.25 x 1600 Micron Refractory Metal/Gold Gate**
- **Excellent for High 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-PH32F is a AlGaAs/InGaAs pHEMT (Pseudomorphic-High-Electron-Mobility-Transistor) device whose nominal 0.25 micron gate length and 1600 micron gate width make it ideally suited for applications requiring high power and high power added efficiency up to 12.0 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*

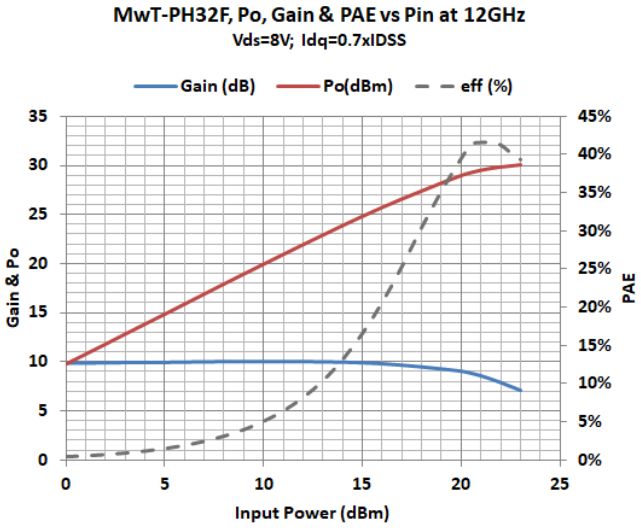
PARAMETERS & CONDITIONS	SYMBOL	FREQ	UNITS	MIN	TYP
Output Power at 1dB Compression Vds=8.0V Ids=0.7xIDSS	P1dB	12 GHz	dBm		29.5
Saturated Power Vds=8.0V Ids=0.7xIDSS	Psat	12 GHz	dBm		30.5
Output Third Order Intercept Point Vds=8.0V Ids=0.7xIDSS	OIP3	12 GHz	dBm		37.0
Small Signal Gain Vds=8.0V Ids=0.7xIDSS	SSG	12 GHz	dB		13.0
Power Added Efficiency at P1dB Vds=8.0V Ids=0.7xIDSS	PAE	12 GHz	%		43

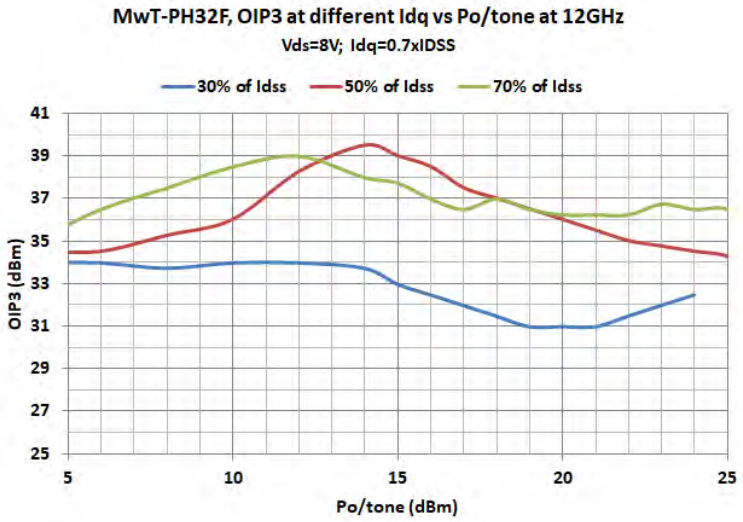
Note: Ids should be between 40% and 80% of Idss. Currently, our data shows Ids at 70% of IDSS. Low Ids will improve efficiency, but high Ids will make Psat and IP3 better.

DC Specifications: *at Ta= 25 °C*

PARAMETERS & CONDITIONS		SYMBOL	UNITS	MIN	TYP	MAX
Saturated Drain Current Vds= 2.0 V Vgs= 0.0 V		IDSS	mA	310		360
Transconductance Vds= 2.0 V Vgs= 0.0 V		Gm	mS		500	
Pinch-off Voltage Vds= 2.0 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	Rth	C/W		35	

* Overall Rth depends on case mounting

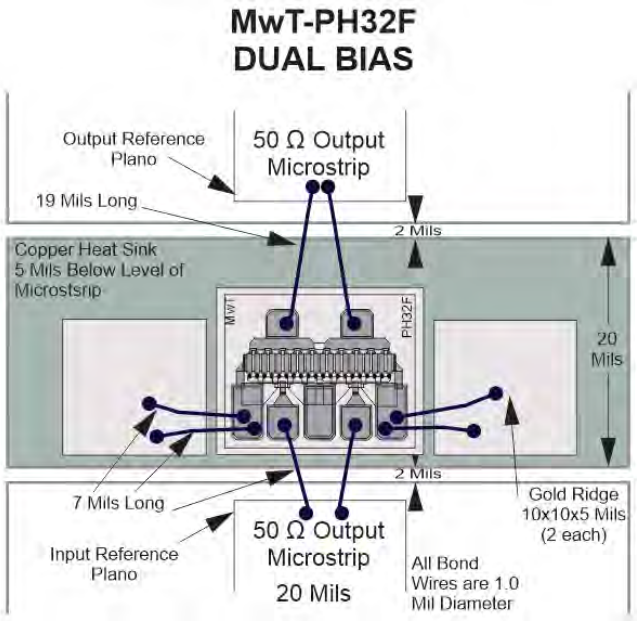


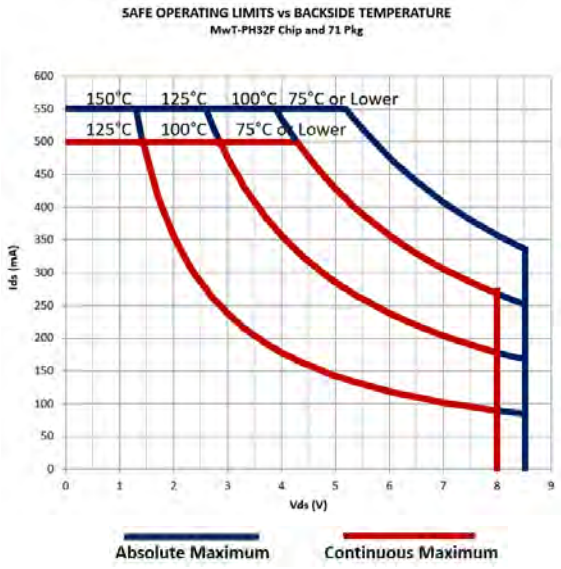


MwT-PH32F, Load Pull Power Data, Vds=8V, Idq=0.7xIdss

Freq	Zs		ZL		Psat
GHz	Mag	phase	mag	phase	dBm
2	0.75	130.00	0.43	169.60	31.68
4	0.83	154.00	0.52	162.40	31.37
6	0.92	162.00	0.53	164.60	31.33
8	0.89	168.00	0.58	160.80	31.31
10	0.94	175.00	0.57	164.60	31.35
12	0.94	175.00	0.64	161.40	31.27

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	500	600

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	-0.901	-113.868	23.723	116.890	-31.670	35.749	-11.804	-79.522	0.194	27.697
2	-1.038	-147.063	18.885	96.578	-30.376	23.056	-13.369	-105.494	0.328	24.631
3	-1.076	-161.209	15.614	85.161	-30.170	20.193	-13.262	-116.481	0.476	22.892
4	-1.066	-169.750	13.195	76.045	-30.039	20.447	-12.502	-121.983	0.601	21.617
5	-1.063	-176.049	11.232	69.465	-30.031	21.336	-11.842	-126.258	0.751	20.631
6	-1.034	178.942	9.770	62.508	-29.633	24.115	-11.322	-128.733	0.823	19.701
7	-1.002	173.811	8.456	55.234	-29.538	25.475	-10.597	-133.267	0.908	18.997
8	-0.961	171.069	7.130	49.333	-29.295	28.311	-9.528	-135.733	0.950	18.212
9	-0.987	168.218	5.870	43.056	-29.146	31.673	-8.918	-141.169	1.111	15.482
10	-0.977	164.295	4.962	37.197	-28.836	34.988	-8.147	-142.878	1.143	14.605
11	-0.879	160.740	4.171	31.054	-28.316	37.670	-7.596	-147.506	1.037	15.067
12	-0.833	158.197	3.240	25.487	-27.736	40.317	-7.014	-150.806	0.991	15.488
13	-0.918	155.533	2.378	19.918	-27.328	41.825	-6.461	-154.552	1.123	12.722
14	-0.904	153.405	1.471	15.121	-26.770	45.311	-5.952	-158.777	1.131	11.923
15	-0.833	150.121	0.908	10.090	-25.842	46.535	-5.512	-161.883	0.958	13.375
16	-0.760	147.650	0.038	4.627	-25.261	47.142	-5.102	-165.888	0.866	12.649
17	-0.788	145.645	-0.667	0.193	-24.626	46.962	-4.691	-169.713	0.863	11.980
18	-0.712	144.152	-1.373	-4.698	-23.877	47.045	-4.294	-173.707	0.722	11.252
19	-0.743	142.562	-2.132	-8.286	-23.190	47.541	-4.109	-176.932	0.753	10.529
20	-0.605	138.939	-2.756	-13.188	-22.591	46.786	-3.785	-179.984	0.568	9.918
21	-0.750	136.851	-3.605	-17.194	-21.869	45.923	-3.485	176.182	0.697	9.132
22	-0.756	134.609	-4.199	-20.926	-21.305	44.821	-3.133	172.520	0.654	8.553
23	-0.603	133.762	-4.791	-24.814	-20.889	42.712	-3.081	168.982	0.492	8.049
24	-0.679	131.312	-5.581	-28.384	-20.461	41.694	-2.973	165.880	0.587	7.440
25	-0.712	129.088	-6.238	-32.310	-19.864	39.934	-2.657	161.409	0.572	6.813
26	-0.629	127.333	-6.846	-35.594	-19.443	38.205	-2.433	157.322	0.474	6.299
27	-0.533	125.264	-7.506	-38.622	-18.943	36.975	-2.260	154.298	0.375	5.719
28	-0.565	124.853	-8.133	-40.149	-18.372	34.103	-2.131	151.304	0.369	5.120
29	-0.573	121.535	-8.844	-42.976	-17.976	32.590	-2.050	148.433	0.400	4.566
30	-0.610	120.229	-9.421	-44.915	-17.442	31.191	-1.862	145.226	0.406	4.010

Available Packaging:

70 Package - MwT-PH32F70
71 Package - MwT-PH32F71
73 Package - MwT-PH32F73

Contact Information

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