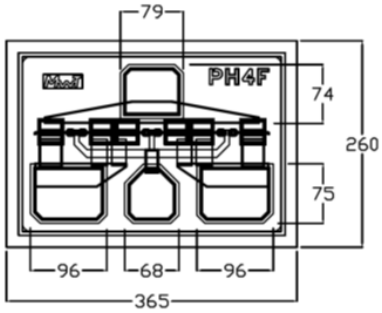
MwT-PH4F

28 GHz Medium Power AlGaAs/InGaAs PHEMT

Features:

- **+22.0 dBm typical Output Power at 12 GHz**
- **16.0 dB typical Small Signal Gain at 12 GHz**
- **60% typical PAE at 12 GHz**
- **0.25 x 180 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: 365 x 260 microns
Chip Thickness: 100 microns

Description:

The MwT-PH4F is a AlGaAs/InGaAs PHEMT (Pseudomorphic-High-Electron-Mobility-Transistor) device whose nominal 0.25 micron Gate length and 180 micron gate width make it ideally suited for applications requiring high-gain and medium power up to 28 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=50% of Idss	P1dB	12 GHz	dBm		22.0
Small Signal Gain Vds=8.0V Ids=50% of Idss	SSG	12 GHz 18 GHz	dB	14.0 12.0	16.0 13.0
Power Added Efficiency at P1dB Vds=8.0V Ids=50% of Idss	PAE	12 GHz	%		60

Note: Ids should be between 40% and 60% 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	60		84
Transconductance Vds= 2.5 V Vgs= 0.0 V	Gm	mS	60	65	
Pinch-off Voltage Vds= 3.0 V Ids= 1.0 mA	Vp	V		-1.2	-2.0
Gate-to-Source Breakdown Voltage Igs= -0.3 mA	BVGSO	V	-13.0	-15.0	
Gate-to-Drain Breakdown Voltage Igd= -0.3 mA	BVGDO	V	-16.0	-18.0	
Chip Thermal Resistance	Rth	C/W		200 410*	

* Overall Rth depends on case mounting

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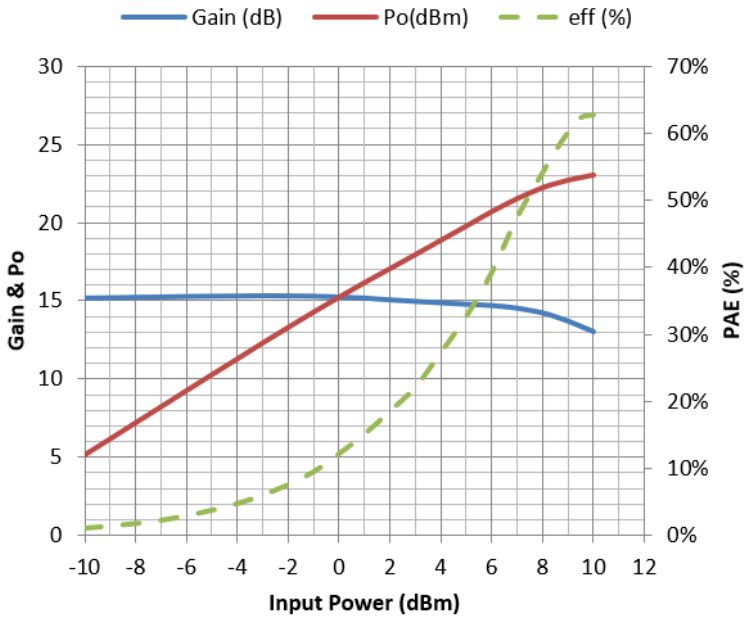
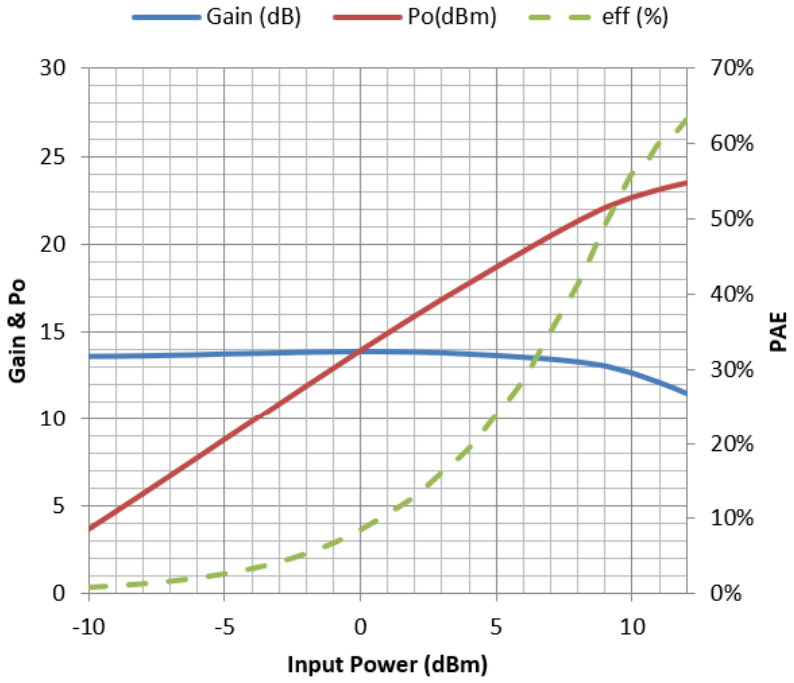
Power, Gain & PAE at 12GHz

Vds=8V; Ids= 50% of Idss



Power, Gain & PAE at 18GHz

Vds=8V; Ids= 50% of Idss



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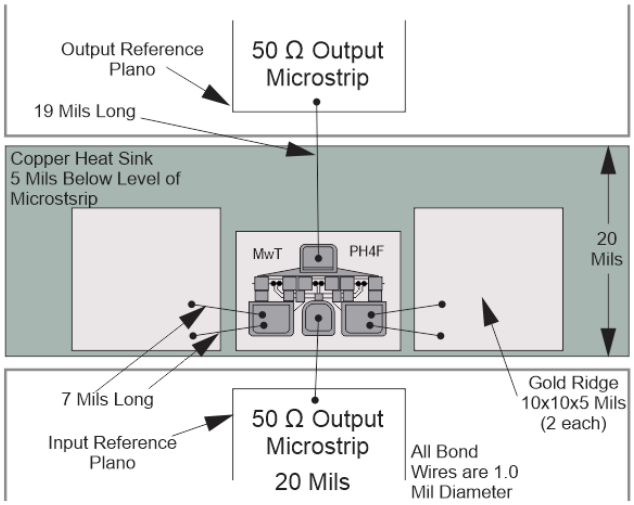
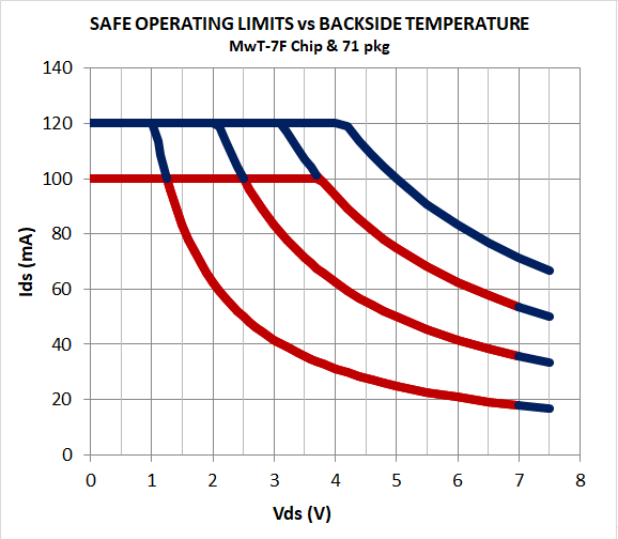
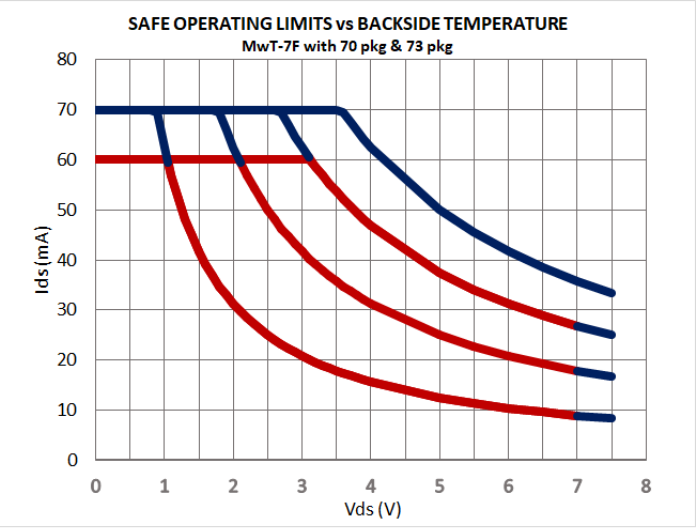
MwT-PH4F DUAL BIAS







Absolute Maximum Rating

Symbol	Parameter	Units	Cont Max1	Absolute Max2
VDS	Drain to Source Volt.	V	7.0	7.5
Tch	Channel Temperature	°C	+150	+175
Tst	Storage Temperature	°C	-65 to +150	+175
Pin	RF Input Power	mW	50	80

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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S-Parameters

S-PARAMETER Vds=7V, Ids= 0.7 x Idss

Freq.	S11		S21		S12		S22		K	GMAX
GHz	dB	Ang (°)	dB	Ang (°)	dB	Ang (°)	dB	Ang (°)		dB
1	-0.354	-12.905	15.125	169.947	-39.905	82.659	-1.736	-4.763	0.249	27.515
2	-0.433	-25.493	14.984	160.636	-33.665	76.340	-1.795	-9.466	0.170	24.325
3	-0.565	-37.791	14.763	151.391	-30.474	68.737	-1.990	-14.179	0.191	22.619
4	-0.839	-49.988	14.407	142.549	-28.388	62.465	-2.187	-18.143	0.235	21.398
5	-1.032	-59.974	14.027	134.422	-26.810	56.425	-2.406	-22.161	0.276	20.418
6	-1.375	-69.313	13.535	127.073	-25.799	51.363	-2.575	-24.578	0.345	19.667
7	-1.489	-79.644	13.120	119.349	-24.883	46.240	-2.999	-28.297	0.373	19.002
8	-1.872	-90.958	12.740	112.110	-24.244	40.271	-3.290	-31.429	0.437	18.492
9	-2.090	-99.836	12.306	105.521	-23.574	36.402	-3.089	-34.443	0.433	17.940
10	-2.333	-109.913	11.898	98.211	-23.336	31.802	-3.588	-37.984	0.500	17.617
11	-2.381	-118.361	11.480	91.574	-23.056	27.749	-3.933	-40.753	0.538	17.268
12	-2.551	-127.949	11.039	85.934	-22.867	24.559	-4.176	-42.388	0.577	16.953
13	-2.617	-136.012	10.644	79.581	-22.678	20.824	-4.376	-45.600	0.606	16.661
14	-2.865	-143.258	10.116	73.366	-22.591	18.516	-4.624	-48.151	0.687	16.354
15	-2.878	-149.423	9.741	68.866	-22.620	15.929	-4.866	-51.131	0.724	16.180
16	-2.994	-158.065	9.307	62.968	-22.753	12.766	-5.022	-53.595	0.790	16.030
17	-2.995	-163.886	8.812	57.673	-22.828	10.109	-5.226	-57.786	0.846	15.820
18	-2.858	-170.420	8.504	52.578	-23.031	8.712	-5.332	-59.693	0.860	15.767
19	-2.954	-175.527	8.099	48.189	-23.092	6.594	-5.397	-62.772	0.925	15.596
20	-2.951	179.671	7.670	42.915	-23.296	6.827	-5.447	-67.150	0.974	15.483
21	-2.971	175.397	7.307	39.436	-23.313	4.583	-5.564	-69.707	1.031	14.226
22	-2.940	170.802	6.945	34.620	-23.613	3.985	-5.639	-73.214	1.100	13.355
23	-2.674	166.921	6.739	29.932	-23.704	5.151	-5.563	-77.139	1.017	14.413
24	-2.693	163.388	6.445	25.725	-24.247	6.678	-5.509	-80.947	1.104	13.382
25	-2.734	160.029	6.049	21.606	-24.026	4.707	-5.440	-85.259	1.126	12.878
26	-2.667	156.201	5.618	17.283	-24.076	6.978	-5.520	-90.298	1.151	12.491
27	-2.712	151.365	5.242	12.248	-24.299	4.442	-5.475	-94.611	1.250	11.760
28	-2.481	149.343	5.056	8.194	-24.113	6.627	-5.420	-99.394	1.118	12.494
29	-2.390	146.649	4.778	4.188	-24.210	9.252	-5.195	-103.287	1.074	12.830
30	-2.352	143.610	4.520	0.102	-24.282	7.917	-5.064	-108.846	1.071	12.771

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.

Chip	MwT-PH4F
Package 70	MwT-PH470F
Package 73	MwT-PH473F

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