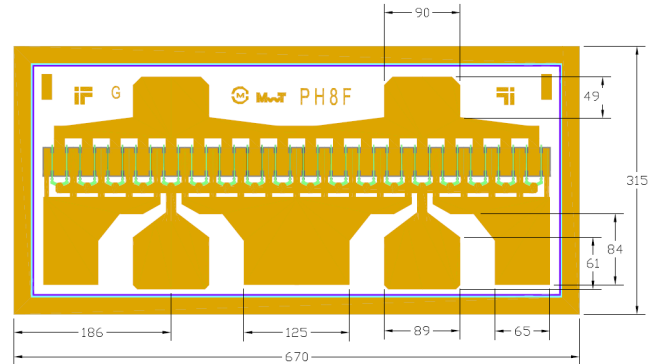


Features:

- 30 dBm of Power at 12 GHz
- 11 dB Small Signal Gain at 12 GHz
- 42% PAE at 12 GHz
- 0.25 x 1200 Micron Refractory Metal/Gold Gate
- Excellent for Power, Gain, and High Power Added Efficiency
- Ideal for Commercial, Military, Hi-Rel Space Applications



Chip Dimensions: 670 x 315 microns
Chip Thickness: 100 microns

Description:

The MwT-PH8F is a AlGaAs/InGaAs pHEMT (Pseudomorphic-High-Electron-Mobility-Transistor) device whose nominal 0.25 micron gate length and 1200 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 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		30.0
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		11.0
Power Added Efficiency at P1dB $V_{ds}=8.0\text{V}$ $I_{ds}=0.7 \times I_{DSS}$	PAE	12 GHz	%		42

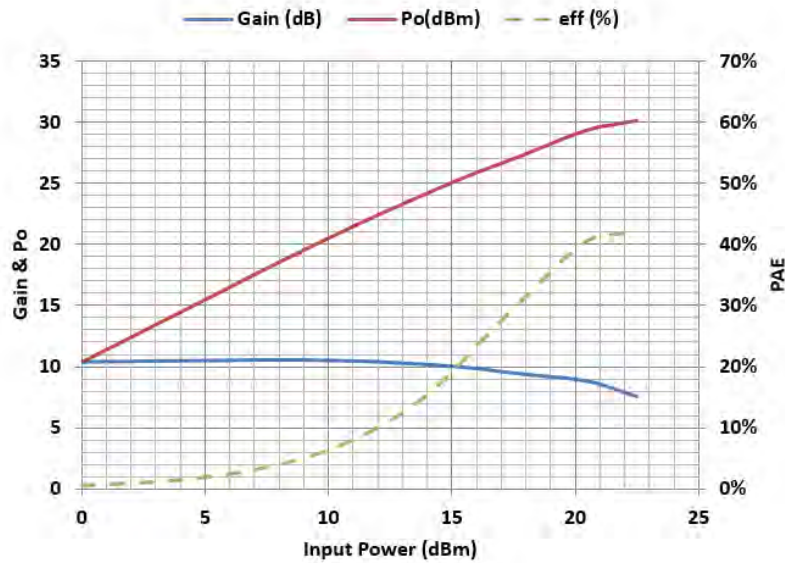
Note: I_{ds} should be between 40% and 80% of I_{DSS} . Currently, our data shows I_{ds} at 70% of I_{DSS} . Low I_{ds} will improve efficiency, but high I_{ds} will make Psat and IP3 better.

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

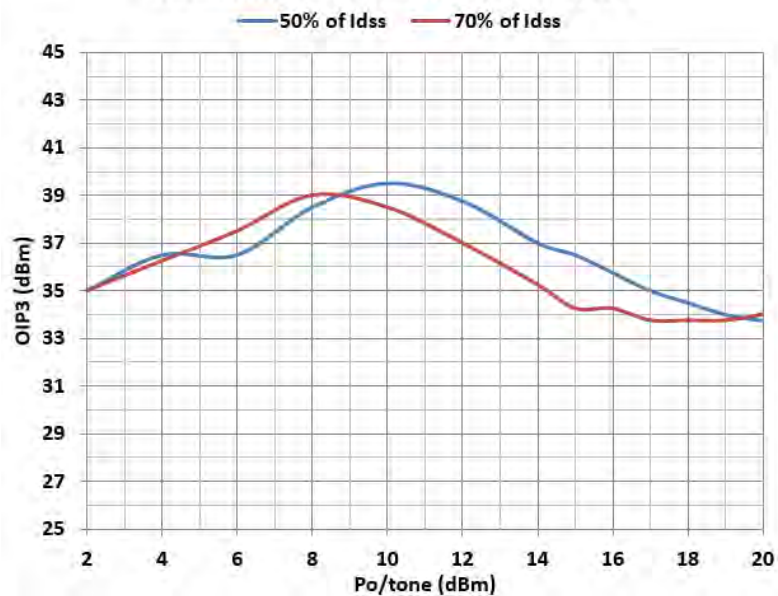
PARAMETERS & CONDITIONS	SYMBOL	UNITS	MIN	TYP	MAX
Saturated Drain Current $V_{ds}= 3.0\text{ V}$ $V_{gs}= 0.0\text{ V}$	I_{DSS}	mA	250		300
Transconductance $V_{ds}= 2.5\text{ V}$ $V_{gs}= 0.0\text{ V}$	Gm	mS		400	
Pinch-off Voltage $V_{ds}= 3.0\text{ V}$ $I_{ds}= 1.0\text{ mA}$	V_p	V		-0.8	-1.0
Gate-to-Source Breakdown Voltage $I_{gs}= -0.3\text{ mA}$	BVGSO	V		-17.0	
Gate-to-Drain Breakdown Voltage $I_{gd}= -0.3\text{ mA}$	BVGDO	V		-18.0	
Chip Thermal Resistance	Chip & 71 pkg	Rth	C/W	40	

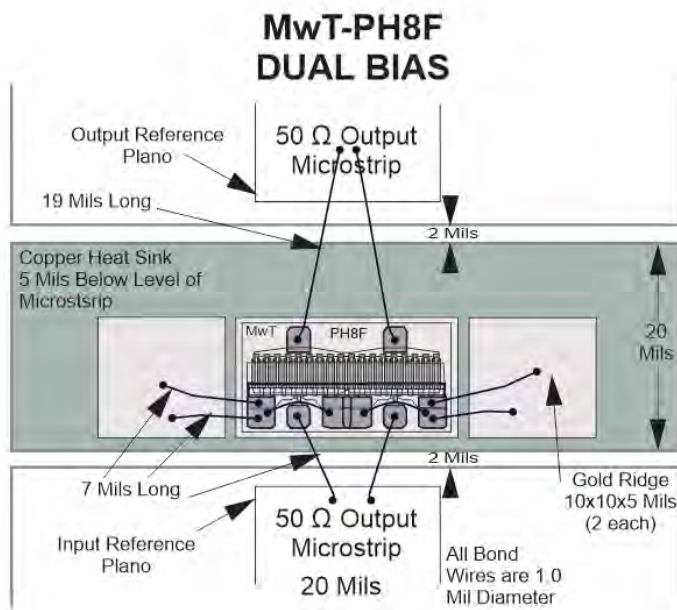
* Overall Rth depends on case mounting

MwT-PH8F, Gain, Po & PAE vs Pin at 12GHz
Vds=8V; Idq=0.7xIDSS

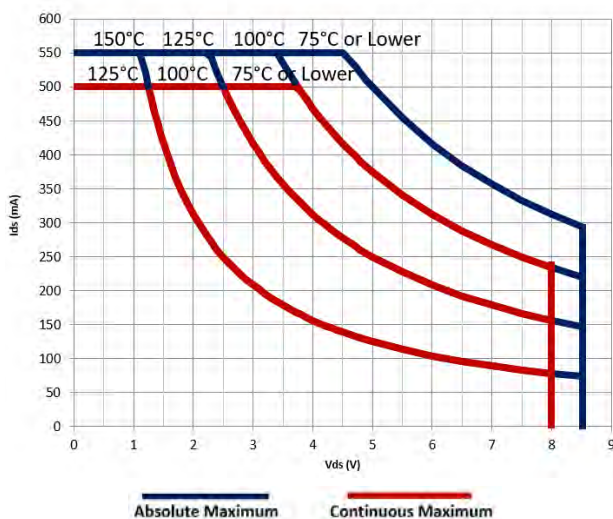


MwT-PH8F, OIP3 at different Idq vs Po/tone





SAFE OPERATING LIMITS vs BACKSIDE TEMPERATURE
MwT-PH8F Chip and 71 Pkg



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	240	360

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 $V_{ds}=7V$, $I_{ds}=0.7 \times I_{dss}$										
Freq.	S11		S21		S12		S22		K	GVAX
GHz	dB	Ang(°)	dB	Ang(°)	dB	Ang(°)	dB	Ang(°)		dB
1	-0.797	-105.764	23.698	120.928	-30.475	36.428	-9.913	-66.285	0.142	27.086
2	-1.013	-142.316	19.168	98.781	-29.182	21.607	-12.065	-91.703	0.246	24.175
3	-1.074	-158.417	15.918	86.533	-28.890	14.949	-12.426	-103.823	0.361	22.404
4	-1.066	-168.735	13.455	76.864	-28.912	12.818	-12.109	-111.656	0.474	21.184
5	-1.135	-175.599	11.713	69.433	-28.982	11.368	-11.534	-115.912	0.622	20.347
6	-1.075	178.059	10.277	62.338	-28.608	11.162	-11.291	-117.393	0.663	19.443
7	-1.060	172.527	8.897	54.790	-28.664	11.342	-10.580	-121.871	0.761	18.781
8	-0.908	168.363	7.649	48.712	-28.888	12.493	-9.686	-127.227	0.737	18.268
9	-0.929	163.974	6.443	41.824	-29.157	13.847	-8.853	-133.165	0.887	17.800
10	-0.886	159.729	5.405	35.820	-29.187	15.047	-8.264	-137.075	0.952	17.296
11	-1.021	155.950	4.434	28.977	-29.154	18.775	-7.715	-141.092	1.220	13.962
12	-0.905	152.770	3.551	23.436	-29.122	20.573	-7.112	-144.743	1.144	14.033
13	-0.890	149.662	2.669	17.844	-28.938	24.087	-6.508	-148.828	1.184	13.208
14	-0.841	147.238	1.840	12.607	-28.562	27.535	-5.987	-153.195	1.135	12.972
15	-0.894	144.635	1.199	7.394	-28.365	29.575	-5.594	-156.596	1.247	11.787
16	-0.856	140.767	0.125	1.689	-27.839	32.064	-5.162	-160.689	1.237	11.049
17	-0.771	138.480	-0.600	-3.283	-27.337	33.623	-4.824	-164.458	1.089	11.553
18	-0.612	135.783	-1.326	-9.305	-26.534	35.571	-4.296	-168.525	0.748	12.604
19	-0.631	133.950	-1.999	-12.797	-26.039	36.300	-4.007	-171.216	0.761	12.020
20	-0.668	130.846	-2.771	-17.623	-25.622	37.231	-3.771	-174.525	0.836	11.426
21	-0.728	130.194	-3.354	-20.861	-24.776	35.806	-3.332	-177.864	0.786	10.711
22	-0.743	127.846	-4.125	-24.898	-24.335	38.120	-3.117	-179.188	0.827	10.105
23	-0.641	125.806	-4.776	-29.541	-23.912	35.358	-3.003	-175.194	0.669	9.568
24	-0.643	123.589	-5.319	-33.051	-23.417	35.689	-2.775	-172.108	0.642	9.049
25	-0.662	121.452	-6.156	-36.456	-22.474	34.629	-2.492	-169.560	0.582	8.159
26	-0.666	119.436	-6.822	-39.518	-22.043	33.914	-2.303	-166.785	0.566	7.611
27	-0.688	117.606	-7.493	-42.911	-21.454	32.623	-1.999	-163.882	0.503	6.981
28	-0.543	116.052	-8.099	-45.599	-21.207	30.986	-1.970	-161.331	0.362	6.554
29	-0.616	113.503	-8.716	-48.616	-20.636	29.121	-1.895	-159.018	0.422	5.960
30	-0.588	112.267	-9.324	-51.172	-20.334	27.951	-1.814	-155.833	0.398	5.505

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:

71 Package - MwT-PH8F71