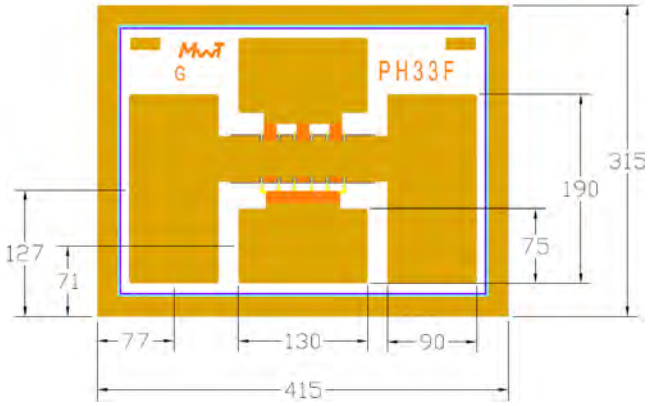
MwT-PH33F 26 GHz Medium Power AlGaAs/InGaAs pHEMT

Features:

- **24 dBm of Power at 18 GHz**
- **14 dB Small Signal Gain at 18 GHz**
- **45% typical PAE at 18 GHz**
- **0.25 x 300 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: 415 x 315 microns
Chip Thickness: 100 microns

Description:

The MwT-PH33F is a AlGaAs/InGaAs pHEMT (Pseudomorphic-High-Electron-Mobility-Transistor) device whose nominal 0.25 micron gate length and 300 micron gate width make it ideally suited for applications requiring high-gain and medium power up to 26 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	18 GHz	dBm		21.0
Saturated Power Vds=8.0V Ids=0.7xIDSS	Psat	18 GHz	dBm		24.0
Output Third Order Intercept Point Vds=8.0V Ids=0.7xIDSS	OIP3	18 GHz	dBm		29.0
Small Signal Gain Vds=8.0V Ids=0.7xIDSS	SSG	18 GHz	dB		14.0
Power Added Efficiency at P1dB Vds=8.0V Ids=0.7xIDSS	PAE	18 GHz	%		45

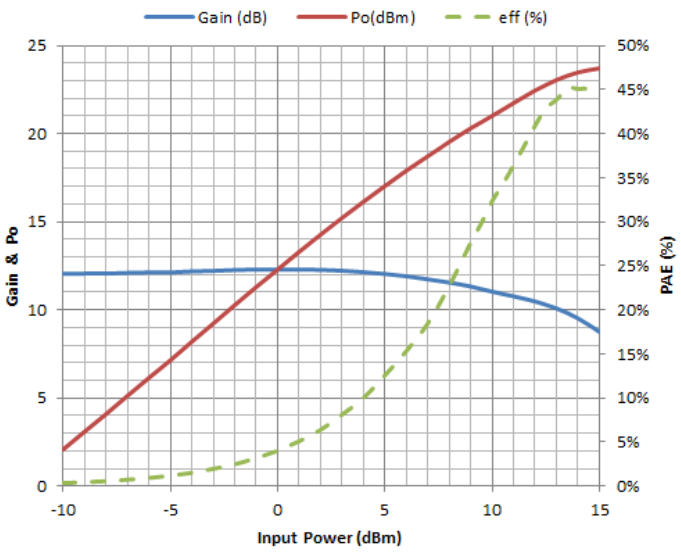
Note: Ids should be between 40% and 80% of Idss. Currently, our data shows Ids at 70% of IDSS. Low Ids will improve efficiency, but high Ids will make Psat and IP3 better.

DC Specifications: *at Ta= 25 °C*

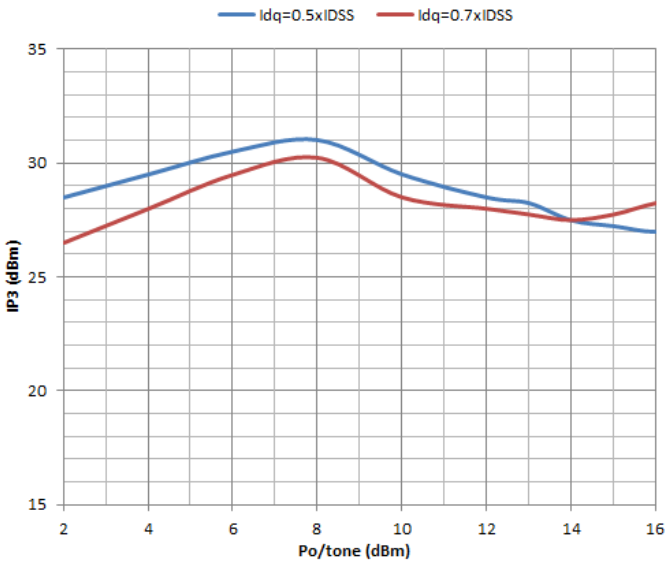
PARAMETERS & CONDITIONS		SYMBOL	UNITS	MIN	TYP	MAX
Saturated Drain Current Vds= 3.0 V Vgs= 0.0 V		IDSS	mA	70		90
Transconductance Vds= 2.5 V Vgs= 0.0 V		Gm	mS		100	
Pinch-off Voltage Vds= 3.0 V Ids= 1.0 mA		Vp	V		-0.8	-1.0
Gate-to-Source Breakdown Voltage Igs= -0.3 mA		BVGSO	V		-18.0	
Gate-to-Drain Breakdown Voltage Igd= -0.3 mA		BVGDO	V		-18.0	
Chip Thermal Resistance	Chip & 71 pkg 70 & 73 pkg	Rth	C/W		120 290*	

* Overall Rth depends on case mounting

MwT-PH33F, Po, Gain & PAE vs Pin at 18GHz
Vds=8V; Idq=0.7xIDSS



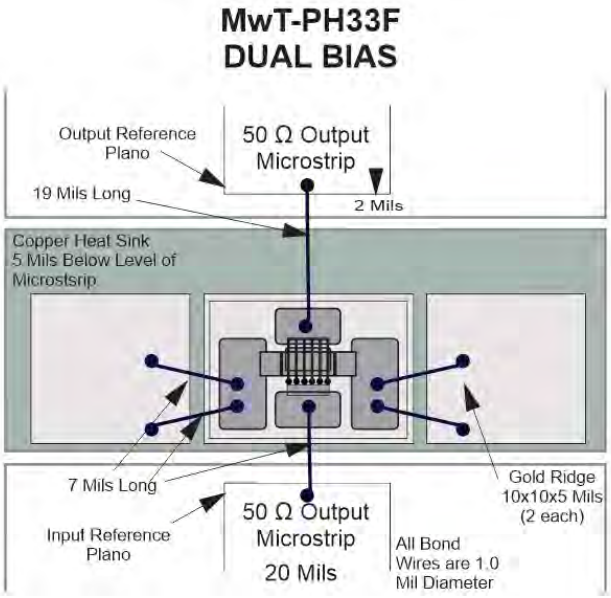
MwT-PH33F, OIP3 vs Po/tone
with different Idq

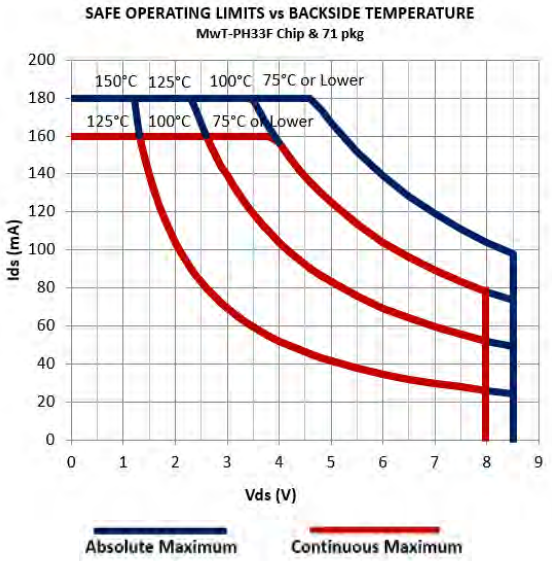


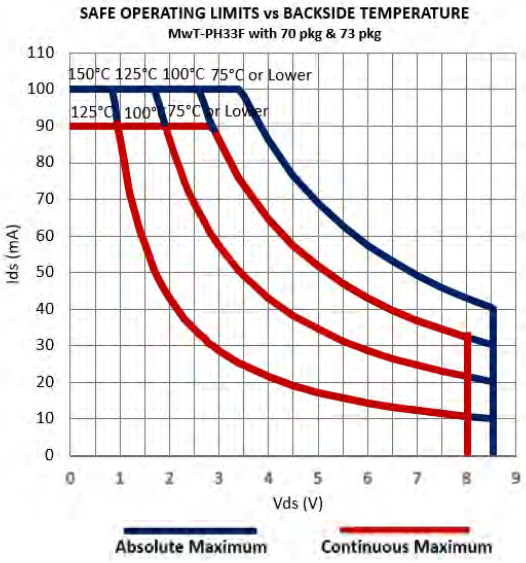
MwT-PH33F, Load Pull Data, Vdq=8V; Idq=0.7xIdss

Freq (GHz)	Zs		ZL		Psat
	Mag	phase	mag	phase	dBm
2	0.78	39.00	0.30	10.49	24.7
4	0.74	71.00	0.32	22.73	24.4
6	0.67	103.00	0.30	24.48	24.6
8	0.72	111.00	0.32	37.18	24.5
10	0.83	126.00	0.36	45.10	24.4
12	0.83	134.00	0.40	53.96	24.2
14	0.78	142.00	0.40	59.61	24.3
16	0.82	147.00	0.43	66.47	24.1
18	0.80	153.00	0.43	72.15	24.1

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	100	150

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=8V, Ids= 0.7 x Idss

Freq.	S11		S21		S12		S22		K	GMAX
GHz	dB	Ang (°)	dB	Ang (°)	dB	Ang (°)	dB	Ang (°)		dB
1	-0.183	-25.327	17.604	162.275	-37.987	76.340	-1.596	-6.660	0.106	27.795
2	-0.539	-48.599	16.930	146.469	-32.388	65.878	-1.893	-12.246	0.165	24.659
3	-1.016	-69.359	16.047	132.480	-29.751	55.469	-2.193	-17.309	0.248	22.899
4	-1.394	-87.173	15.102	120.450	-28.324	49.112	-2.464	-21.063	0.295	21.713
5	-1.868	-101.895	13.924	110.509	-27.659	43.211	-2.944	-24.615	0.419	20.792
6	-2.211	-113.757	12.993	102.137	-27.167	40.493	-3.081	-27.206	0.488	20.080
7	-2.539	-125.936	12.063	94.018	-26.779	37.723	-3.291	-29.596	0.580	19.421
8	-2.549	-135.590	11.348	86.930	-26.655	34.777	-3.340	-33.721	0.598	19.001
9	-2.671	-145.720	10.256	79.616	-26.645	34.484	-3.780	-35.765	0.751	18.451
10	-2.676	-153.374	9.705	73.468	-26.404	33.187	-3.609	-39.827	0.719	18.054
11	-2.595	-161.377	9.078	66.705	-26.506	33.582	-3.827	-41.951	0.783	17.792
12	-2.599	-167.847	8.369	61.321	-26.484	35.048	-3.853	-45.874	0.822	17.427
13	-2.603	-173.696	7.723	55.622	-26.483	35.639	-3.957	-49.609	0.896	17.103
14	-2.558	-179.318	6.999	50.263	-26.530	37.922	-3.985	-53.365	0.954	16.764
15	-2.490	175.476	6.548	45.300	-26.380	40.518	-4.064	-57.151	0.955	16.464
16	-2.494	170.999	6.070	40.875	-26.200	43.885	-3.976	-61.013	0.949	16.135
17	-2.511	166.967	5.476	35.956	-25.851	46.720	-3.930	-65.756	0.961	15.664
18	-2.303	162.920	4.897	31.857	-25.542	49.944	-3.865	-70.002	0.870	15.220
19	-2.272	161.235	4.450	27.655	-24.949	53.361	-3.844	-73.382	0.823	14.700
20	-2.248	155.053	4.057	23.089	-24.414	55.553	-3.993	-78.093	0.826	14.236
21	-2.178	152.324	3.543	16.206	-23.660	56.804	-3.783	-82.573	0.709	13.601
22	-2.200	149.391	3.061	12.687	-23.036	59.864	-3.727	-87.325	0.695	13.048
23	-1.910	147.069	2.643	8.442	-22.244	62.581	-3.685	-92.843	0.522	12.444
24	-1.938	143.894	2.178	3.482	-21.417	63.031	-3.730	-98.397	0.519	11.798
25	-1.982	140.780	1.659	-0.696	-20.838	61.265	-3.566	-103.955	0.505	11.249
26	-1.878	138.412	1.207	-4.718	-20.129	61.166	-3.462	-109.217	0.428	10.668
27	-1.711	135.244	0.747	-8.956	-19.558	60.255	-3.344	-114.074	0.337	10.153
28	-1.586	134.542	0.368	-12.927	-18.714	59.563	-3.233	-119.935	0.237	9.541
29	-1.635	130.710	-0.166	-17.261	-17.896	58.376	-3.120	-125.497	0.237	8.865
30	-2.277	205.120	-1.877	-33.900	-18.812	57.331	-4.035	-122.051	0.654	8.468

Available Packaging:

70 Package - MwT-PH33F70
71 Package - MwT-PH33F71
73 Package - MwT-PH33F73

Contact Information

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