



Features:

- 12 dB Small Gain at 18 GHz
- +22.0 dBm Output Power at 18 GHz
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- 0.25 Micron Refractory Metal/Gold Gate
- 300 Micron Gate Width
- Choice of Chip and Three Package Types

Chip Dimensions 415 x 260 microns
Chip Thickness: 100 microns

Description:

The MwT-3F is a GaAs MESFET device whose nominal quarter-micron gate length and 300 micron gate width make it ideally suited to applications requiring high-gain and linearity in the 500 MHz to 26 GHz frequency range with power outputs ranging from +18 to +22 dBm. The straight geometry of the MwT-3F makes it equally effective for either wideband (e.g. 6 to 18 GHz) or narrow-band applications. All chips are passivated with SiN (Silicon Nitride).

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

PARAMETERS & CONDITIONS	SYMBOL	FREQ	UNITS	MIN	TYP
Output Power at 1dB Compression $V_{ds}=7.0\text{V}$ $I_{ds}=0.6 \times I_{DSS}$	P1dB	12 GHz	dBm		22.0
Output Third Order Intercept Point $V_{ds}=7.0\text{V}$ $I_{ds}=0.6 \times I_{DSS}$	OIP3	12 GHz	dBm		32
Small Signal Gain $V_{ds}=6.0\text{V}$ $I_{ds}=0.6 \times I_{DSS}$	SSG	12 GHz	dB	11.0	12.0
Power Added Efficiency $V_{ds}=7.0\text{V}$ $I_{ds}=0.6 \times I_{DSS}$	PAE	12 GHz	%		35

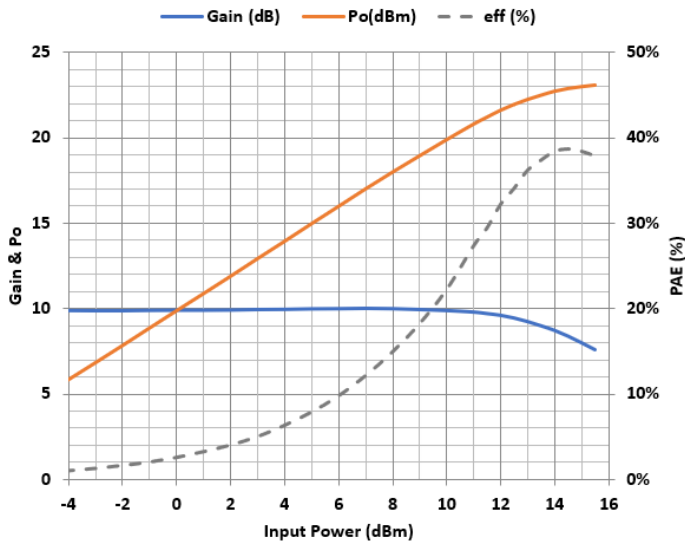
DC Specifications: • at $T_a = 25^\circ\text{C}$

PARAMETERS & CONDITIONS	SYMBOL	UNITS	MIN	TYP	MAX
Saturated Drain Current $V_{ds}=4.0\text{V}$ $V_{gs}=0.0\text{V}$	I_{DSS}	mA	90		110
Transconductance $V_{ds}=4.0\text{V}$ $V_{gs}=0.0\text{V}$	G_m	mS		48	
Pinch-off Voltage $V_{ds}=3.0\text{V}$ $I_{ds}=2.0\text{mA}$	V_p	V		-2.0	
Gate-to-Source Breakdown Voltage $I_{gs}=-0.2\text{mA}$	BVGSO	V	-14	-17	
Gate-to-Drain Breakdown Voltage $I_{gd}=-0.2\text{mA}$	BVGDO	V	-14	-16	
Thermal Resistance <i>MwT-3F chip & 71 pkg 70 pkg & 73 pkg</i>	R_{th}	$^{\circ}\text{C/W}$			120 290*

*Overall R_{th} depends on case mounting

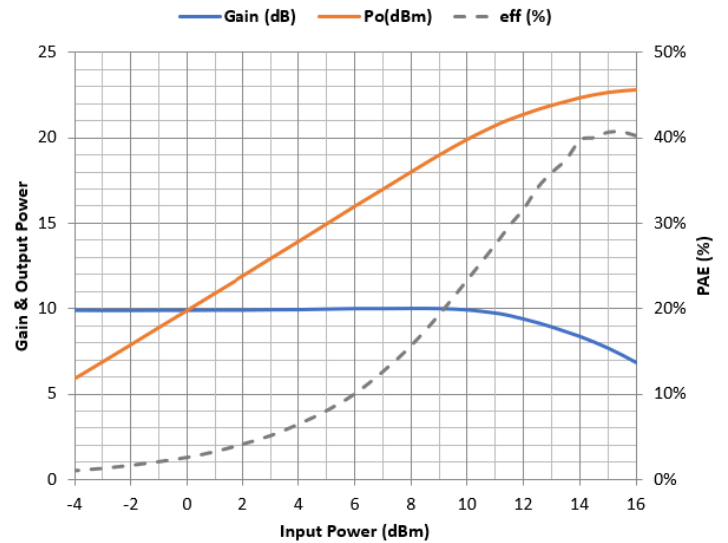
MwT-3F. Power, 12GHz

Vds=7V; Idq= 0.6xIDSS

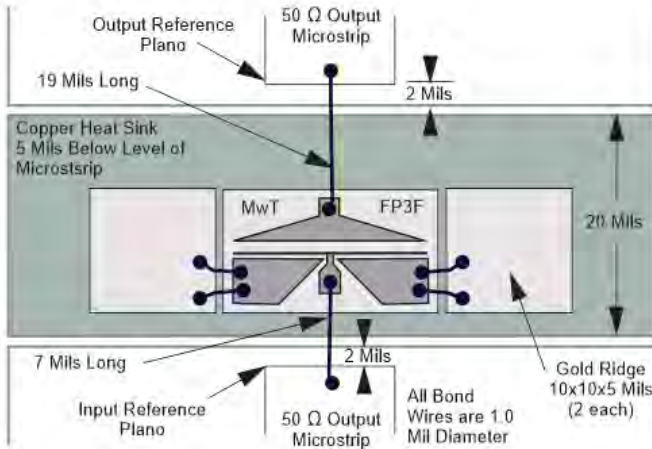


MwT-3F, Typical Power at 18GHz

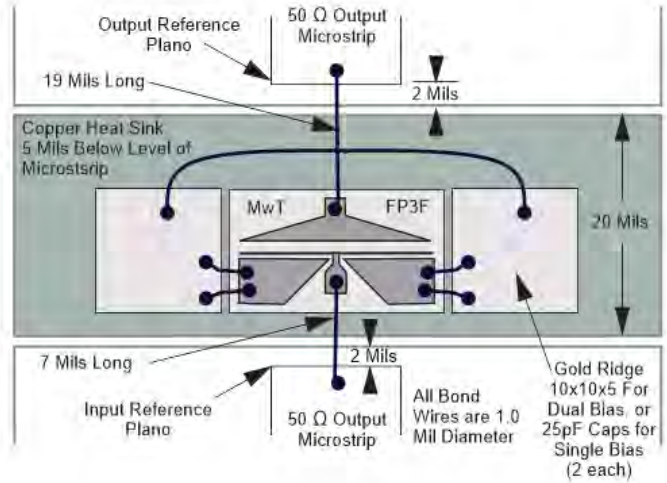
Vds=7.0V Ids= 0.6xIDSS



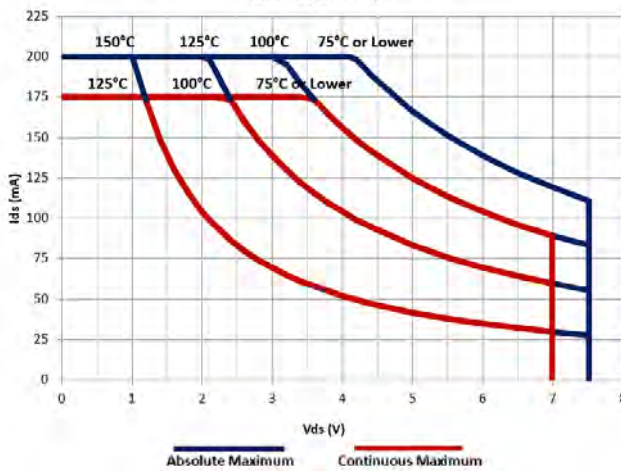
MwT-3F DUAL BIAS



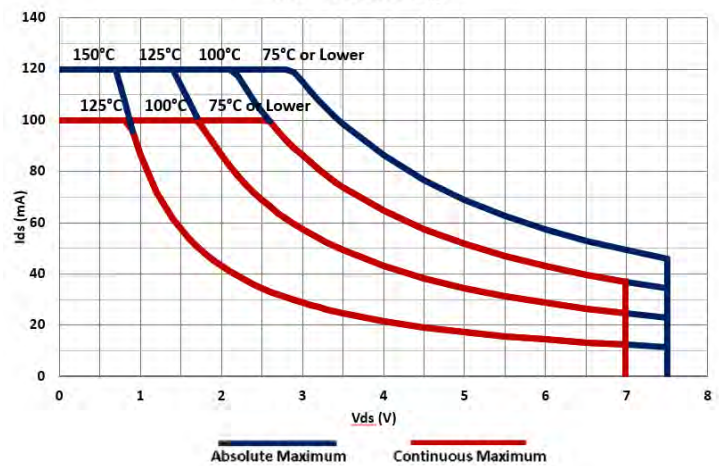
MwT-3F OPTIONAL BONDING



Thermal Safe Operating Limits vs Backside Temperature
MwT-3F chip & 71 Pkg



Thermal Safe Operating Limits vs Backside Temperature
MwT-3F 70 & 73 Pkg



MAXIMUM RATINGS AT Ta = 25 °C

Symbol	Parameter	Units	Cont Max1	Absolute Max2
VDS	Drain to Source Volt.	V	See Safe Operating Limits	
Tch	Channel Temperature	°C	+150	+175
Tst	Storage Temperature	°C	-65 to +150	+175
Pin	RF Input Power	mW	120	180

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-PARAMETER Vds=6V, Ids= 0.7 x Idss

Freq.	S11		S21		S12		S22		K	GMAX
GHz	dB	Ang (°)	dB	Ang (°)	dB	Ang (°)	dB	Ang (°)		dB
1	-0.602	-13.928	11.366	169.128	-39.249	82.727	-2.574	-5.014	0.727	25.307
2	-0.688	-27.258	11.182	158.656	-33.447	75.536	-2.683	-10.036	0.459	22.314
3	-0.833	-40.013	10.956	148.891	-30.324	68.493	-2.790	-14.648	0.415	20.640
4	-0.986	-51.736	10.607	139.722	-28.069	62.245	-2.905	-18.587	0.411	19.338
5	-1.251	-63.399	10.116	130.212	-26.663	56.288	-3.090	-23.701	0.464	18.390
6	-1.519	-73.152	9.575	122.381	-25.734	52.157	-3.310	-26.293	0.544	17.654
7	-1.631	-84.485	9.115	114.483	-24.971	47.312	-3.542	-29.006	0.572	17.043
8	-1.977	-93.223	8.669	106.889	-24.516	42.248	-3.611	-33.418	0.668	16.592
9	-1.863	-102.153	8.350	98.824	-23.776	39.691	-3.670	-39.033	0.583	16.063
10	-2.293	-110.812	7.743	92.565	-23.635	36.251	-3.834	-41.152	0.737	15.689
11	-2.209	-118.362	7.332	86.637	-23.429	31.995	-4.164	-44.531	0.767	15.380
12	-2.427	-126.390	6.909	80.269	-23.288	29.751	-4.021	-47.000	0.817	15.099
13	-2.441	-133.543	6.514	74.276	-23.277	28.431	-4.176	-50.544	0.852	14.895
14	-2.460	-140.387	6.090	67.962	-23.178	26.575	-4.150	-54.204	0.868	14.634
15	-2.474	-146.864	5.785	62.796	-23.164	24.828	-4.260	-58.545	0.891	14.475
16	-2.648	-152.935	5.214	57.648	-23.347	23.570	-4.267	-61.278	1.020	13.412
17	-2.696	-158.192	4.717	52.401	-23.370	23.301	-4.360	-64.671	1.101	12.110
18	-2.619	-164.197	4.422	46.141	-23.516	23.330	-4.206	-67.802	1.083	12.213
19	-2.649	-168.933	4.081	41.509	-23.646	23.921	-4.286	-72.195	1.147	11.539
20	-2.600	-173.399	3.617	37.093	-23.785	24.763	-4.303	-77.061	1.189	11.074
21	-2.549	-177.772	3.400	32.332	-23.611	24.902	-4.358	-80.820	1.166	11.037
22	-2.452	-177.403	3.034	27.296	-23.835	25.893	-4.329	-84.891	1.184	10.841
23	-2.364	-173.404	2.681	21.701	-23.801	28.157	-4.130	-90.219	1.113	11.193
24	-2.249	-170.253	2.377	17.442	-23.825	31.198	-3.921	-93.693	1.028	12.079
25	-2.187	-165.935	2.010	13.249	-23.425	33.691	-3.986	-99.489	0.978	12.718
26	-2.050	-162.897	1.611	8.645	-23.098	35.733	-3.748	-103.514	0.837	12.354

ORDERING INFORMATION:

When placing order or inquiring, please specify wafer number, if known. All dice are Visual Level 3 (military grade visual screening). MwT cannot guarantee dice will fall at the lower or upper end of the Idss Range. For details of Safe Handling Procedure please see supplementary information in available PDF on our website www.mwtinc.com.

Available Packaging:

- 70 Package - MwT-3F70
- 71 Package - MwT-3F71
- 73 Package - MwT-3F73