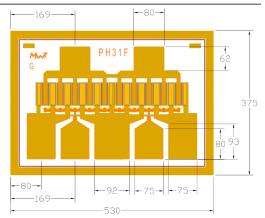


### **Features:**

- 30 dBm of Power at 12 GHz
- 13 dB Small Signal Gain at 12 GHz
- 44% PAE at 12 GHz
- 0.25 x 1200 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: 530 x 375 microns Chip Thickness: 100 microns

# **Description:**

The MwT-PH31F 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 Ta= 25 °C

PARAMETERS & CONDITIONS	SYMBOL	FREQ	UNITS	MIN	TYP
PARAMETERS & CONDITIONS	STWDUL	FREQ	UNITS	IVIIIN	116
Output Power at 1dB Compression Vds=8.0V lds=0.7xlDSS	P1dB	12 GHz	dBm		28.5
Saturated Power Vds=8.0V lds=0.7xIDSS	Psat	12 GHz	dBm		30.0
Output Third Order Intercept Point Vds=8.0V Ids=0.7xIDSS	OIP3	12 GHz	dBm		37.0
Small Signal Gain Vds=8.0V lds=0.7xlDSS	SSG	12 GHz	dB		13.0
Power Added Efficiency at P1dB Vds=8.0V lds=0.7xlDSS	PAE	12 GHz	%		44

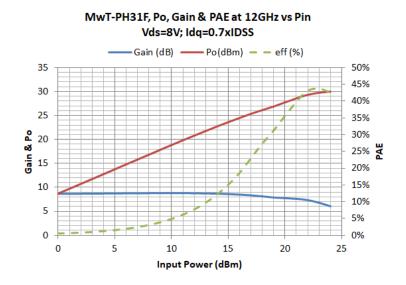
Note: Ids should be between 40% and 80% of Idss. Currently, our data shows Ids at 70% of IDSS. Low Ids will improve efficiency, but high Ids will make Psat and IP3 better.

## DC Specifications: at Ta= 25 °C

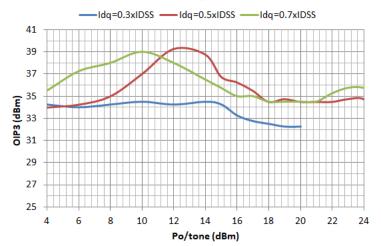
PARAMETERS & CON	IDITIONS	SYMBOL	UNITS	MIN	TYP	MAX
Saturated Drain Current Vds= 2.0 V Vgs= 0.0 V		IDSS	mA	240		280
Transconductance Vds= 2.0 V Vgs= 0.0 V		Gm	mS		260	
Pinch-off Voltage Vds= 2.0 V lds= 1.0 mA		Vp	V		-0.8	-1.0
Gate-to-Source Breakdown Volta Igs= -0.3 mA	age	BVGSO	V		-17.0	
Gate-to-Drain Breakdown Voltag Igd= -0.3 mA	BVGDO	V		-18.0		
Chip Thermal Resistance	Chip & 71 pkg	Rth	C/W		40	

\* Overall Rth depends on case mounting

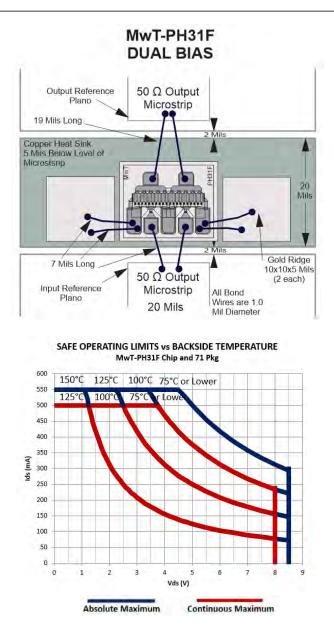




MwT-PH31F, OIP3 with different ldq vs Po/Tone at 12GHz Vds=8V; ldq=0.7xIDSS







### **Absolute Maximum Rating**

Symbol	Parameter	Units	Cont Max1	Absolute Max2	
VDS	/DS Drain to Source Volt.		8.0	8.5	
Tch	Channel Temperature	°C	+150	+175	
Tst	Tst Storage Temperature		-65 to +150	+175	
Pin	RF Input Power	mW	400	500	

#### 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.



# **MwT-PH31F** 18 GHz Medium Power AlGaAs/InGaAs pHEMT

MicroWave Technology

## **S-Parameters**

$\begin{array}{c c c c c c c c c c c c c c c c c c c $	S-PARAMETER Vds=8.0V, lds= 0.7 x ldss										
1 -0.856 -98.858 23.713 124.210 -31.068 41.642 -9.306 -52.923 0.169 27.391   2 -1.126 -136.801 19.396 101.730 -29.580 26.348 -11.989 -73.608 0.295 24.488   3 -1.124 -164.88 13.962 73.149 -28.877 18.339 -12.763 -93.478 0.533 21.4263   5 -1.177 -172.272 11.967 71.631 -28.908 18.831 -12.111 -104.555 0.767 19.685   6 -1.191 -178.371 10.560 64.738 -28.809 18.831 -12.111 -104.555 0.767 19.685   7 -1.183 175.952 9.311 57.617 -28.624 20.736 -11.570 110.970 0.855 18.24   10 -1.208 166.366 6.750 28.498 24.040 -10.001 123.657 1.120 15.041 15.277   11 -1.028 166.371<	Freq.	S	11	S	21	S	12	S22		K	GMAX
1 -0.856 -98.858 23.713 124.210 -31.068 41.642 -9.306 -52.923 0.169 27.391   2 -1.126 -136.801 19.396 101.730 -29.580 26.348 -11.989 -73.608 0.295 24.488   3 -1.124 -164.88 13.962 73.149 -28.877 18.339 -12.763 -93.478 0.533 21.4263   5 -1.177 -172.272 11.967 71.631 -28.908 18.831 -12.111 -104.555 0.767 19.685   6 -1.191 -178.371 10.560 64.738 -28.809 18.831 -12.111 -104.555 0.767 19.685   7 -1.183 175.952 9.311 57.617 -28.624 20.736 -11.570 110.970 0.855 18.24   10 -1.208 166.366 6.750 28.498 24.040 -10.001 123.657 1.120 15.041 15.277   11 -1.028 166.371<	GHz	dB	Ang (°)	dB	Ang (°)	dB	Ang (°)	dB	Ang (°)		dB
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	1	-0.856		23.713	124.210	-31.068		-9.306	-52.923	0.169	27.391
4 -1.214 -164.889 13.962 79.149 -28.877 18.339 -12.763 -93.478 0.533 21.420   5 -1.177 -172.272 11.967 71.631 -28.908 18.260 -12.459 -100.301 0.651 20.438   6 -1.191 -178.371 10.560 64.738 -28.809 18.831 -12.111 -104.555 0.767 19.685   7 -1.183 175.952 9.311 57.617 -28.624 20.736 -11.070 0.855 18.968   8 -1.130 172.611 8.041 51.098 -28.498 24.004 -10.001 -123.659 1.124 15.433   10 -1.129 164.711 5.828 38.604 -28.378 25.482 -9.257 -127.312 1.120 15.000   11 -1.005 160.316 5.000 32.535 -28.492 29.080 -8.672 -132.778 1.060 15.127   12 -0.987 157.617 4.128 <td>2</td> <td>-1.126</td> <td>-136.801</td> <td>19.396</td> <td>101.730</td> <td>-29.580</td> <td>26.348</td> <td>-11.989</td> <td>-73.608</td> <td>0.295</td> <td>24.488</td>	2	-1.126	-136.801	19.396	101.730	-29.580	26.348	-11.989	-73.608	0.295	24.488
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	3	-1.187	-154.298	16.288	88.779	-29.104	20.883	-12.849	-85.132	0.415	22.696
6-1.191-178.37110.560 $64.738$ -28.80918.831-12.111-104.5550.76719.6857-1.183175.9529.31157.617-28.62420.736-11.570-110.9700.85518.9688-1.130172.6118.04151.098-28.51321.777-10.606-116.8670.90418.2779-1.208168.6966.75444.756-28.49824.004-10.001-123.6591.12415.48310-1.129164.7115.82838.604-28.37825.482-9.257-127.3121.10015.00011-1.005160.3165.00032.535-28.25229.080-8.672-132.7781.06015.12712-0.987157.6174.12826.933-27.55031.077-8.064-137.2851.07014.36813-1.051154.4423.28721.238-27.54733.862-7.550-142.3881.20612.67714-1.074152.0882.39516.364-27.12137.341-7.020-147.0051.28111.57215-0.941147.7931.77011.277-26.52840.086-6.592-150.6631.09912.23316-0.883146.1291.0205.313-25.74541.127-6.071-156.2560.97413.38317-0.892143.7940.3410.584-25.14141.622-5.669-160.7280	4	-1.214	-164.889	13.962	79.149	-28.877	18.339	-12.763	-93.478	0.533	21.420
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	5	-1.177	-172.272	11.967	71.631	-28.908	18.260	-12.459	-100.301	0.651	20.438
8 -1.130 172.611 8.041 51.098 -28.513 21.777 -10.606 -116.867 0.904 18.277   9 -1.208 168.696 6.754 44.756 -28.498 24.004 -10.001 -123.659 1.124 15.483   10 -1.129 164.711 5.828 38.604 -28.378 25.482 -9.257 -127.312 1.120 15.000   11 -1.005 160.316 5.000 32.535 -28.252 29.080 -8.672 -132.778 1.060 15.127   12 -0.987 157.617 4.128 26.933 -27.850 31.077 -8.064 -137.285 1.070 14.368   13 -1.051 154.442 3.287 21.238 -27.121 37.341 -7.020 -147.005 1.281 11.572   14 -1.074 152.088 2.395 16.364 -27.121 37.341 -7.020 -147.005 1.281 11.572   15 -0.941 147.793	6	-1.191	-178.371	10.560	64.738	-28.809	18.831	-12.111	-104.555	0.767	19.685
9 -1.208 168.696 6.754 44.756 -28.498 24.004 -10.001 -123.659 1.124 15.483   10 -1.129 164.711 5.828 38.604 -28.378 25.482 -9.257 -127.312 1.120 15.000   11 -1.005 160.316 5.000 32.535 -28.252 29.080 -8.672 -132.778 1.060 15.127   12 -0.987 157.617 4.128 26.933 -27.850 31.077 -8.064 -137.285 1.070 14.368   13 -1.051 154.442 3.287 21.238 -27.547 33.862 -7.550 -142.388 1.206 12.677   14 -1.074 152.088 2.395 16.364 -27.121 37.341 -7.020 -147.005 1.281 11.572   15 -0.941 147.793 1.770 11.277 -26.528 40.086 -6.592 -150.663 1.099 12.231   16 -0.883 146.129	7	-1.183	175.952	9.311	57.617	-28.624	20.736	-11.570	-110.970	0.855	18.968
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	8	-1.130	172.611	8.041	51.098	-28.513	21.777	-10.606	-116.867	0.904	18.277
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	9	-1.208	168.696	6.754	44.756	-28.498	24.004	-10.001	-123.659	1.124	15.483
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	10	-1.129	164.711	5.828	38.604	-28.378	25.482	-9.257	-127.312	1.120	15.000
13-1.051154.4423.28721.238-27.54733.862-7.550-142.3881.20612.67714-1.074152.0882.39516.364-27.12137.341-7.020-147.0051.28111.57215-0.941147.7931.77011.277-26.52840.086-6.592-150.6631.09912.23316-0.883146.1291.0205.313-25.74541.127-6.071-156.2560.97413.38317-0.892143.7940.3410.584-25.14141.622-5.569-160.7280.95112.74118-0.909142.175-0.308-3.798-24.47541.227-5.101-165.8050.91812.08419-0.861139.912-1.092-8.147-23.86642.063-4.882-169.0540.86911.38720-0.710136.819-1.615-13.293-23.31142.288-4.600-172.3270.66310.84821-0.788133.976-2.529-17.902-22.38241.615-4.175-175.8730.6989.92622-0.804132.169-3.096-21.768-22.03141.256-3.786-179.7740.6869.46823-0.701130.823-3.691-25.639-21.62338.278-3.718175.4070.5778.96624-0.784128.186-4.479-29.154-21.09039.326-3.552171.496 <td< td=""><td>11</td><td>-1.005</td><td>160.316</td><td>5.000</td><td>32.535</td><td>-28.252</td><td>29.080</td><td>-8.672</td><td>-132.778</td><td>1.060</td><td>15.127</td></td<>	11	-1.005	160.316	5.000	32.535	-28.252	29.080	-8.672	-132.778	1.060	15.127
14-1.074152.0882.39516.364-27.12137.341-7.020-147.0051.28111.57215-0.941147.7931.77011.277-26.52840.086-6.592-150.6631.09912.23316-0.883146.1291.0205.313-25.74541.127-6.071-156.2560.97413.38317-0.892143.7940.3410.584-25.14141.622-5.569-160.7280.95112.74118-0.909142.175-0.308-3.798-24.47541.227-5.101-165.8050.91812.08419-0.861139.912-1.092-8.147-23.86642.063-4.882-169.0540.86911.38720-0.710136.819-1.615-13.293-23.31142.288-4.600-172.3270.66310.84821-0.788133.976-2.529-17.902-22.38241.615-4.175-175.8730.6989.92622-0.804132.169-3.096-21.768-22.03141.256-3.786-179.7740.6869.46823-0.701130.823-3.691-25.639-21.62338.278-3.718175.4070.5778.96624-0.784128.186-4.479-29.154-21.09039.326-3.552171.4960.7008.30525-0.767126.414-5.039-33.686-20.37537.433-3.123167.605 <td< td=""><td>12</td><td>-0.987</td><td>157.617</td><td>4.128</td><td>26.933</td><td>-27.850</td><td>31.077</td><td>-8.064</td><td>-137.285</td><td>1.070</td><td>14.368</td></td<>	12	-0.987	157.617	4.128	26.933	-27.850	31.077	-8.064	-137.285	1.070	14.368
15-0.941147.7931.77011.277-26.52840.086-6.592-150.6631.09912.23316-0.883146.1291.0205.313-25.74541.127-6.071-156.2560.97413.38317-0.892143.7940.3410.584-25.14141.622-5.569-160.7280.95112.74118-0.909142.175-0.308-3.798-24.47541.227-5.101-165.8050.91812.08419-0.861139.912-1.092-8.147-23.86642.063-4.882-169.0540.86911.38720-0.710136.819-1.615-13.293-23.31142.288-4.600-172.3270.66310.84821-0.788133.976-2.529-17.902-22.38241.615-4.175-175.8730.6989.92622-0.804132.169-3.096-21.768-22.03141.256-3.786-179.7740.6869.46823-0.701130.823-3.691-25.639-21.62338.278-3.718175.4070.5778.96624-0.784128.186-4.479-29.154-21.09039.326-3.552171.4960.7008.30525-0.767126.414-5.039-33.686-20.37537.433-3.123167.6050.5797.66826-0.686124.598-5.652-37.271-19.68234.897-2.871163.404 <td< td=""><td>13</td><td>-1.051</td><td>154.442</td><td>3.287</td><td>21.238</td><td>-27.547</td><td>33.862</td><td>-7.550</td><td>-142.388</td><td>1.206</td><td>12.677</td></td<>	13	-1.051	154.442	3.287	21.238	-27.547	33.862	-7.550	-142.388	1.206	12.677
16-0.883146.1291.0205.313-25.74541.127-6.071-156.2560.97413.38317-0.892143.7940.3410.584-25.14141.622-5.569-160.7280.95112.74118-0.909142.175-0.308-3.798-24.47541.227-5.101-165.8050.91812.08419-0.861139.912-1.092-8.147-23.86642.063-4.882-169.0540.86911.38720-0.710136.819-1.615-13.293-23.31142.288-4.600-172.3270.66310.84821-0.788133.976-2.529-17.902-22.38241.615-4.175-175.8730.6989.92622-0.804132.169-3.096-21.768-22.03141.256-3.786-179.7740.6869.46823-0.701130.823-3.691-25.639-21.62338.278-3.718175.4070.5778.96624-0.784128.186-4.479-29.154-21.09039.326-3.552171.4960.7008.30525-0.767126.414-5.039-33.686-20.37537.433-3.123167.6050.5797.66826-0.686124.598-5.652-37.271-19.68234.897-2.871163.4040.4497.01527-0.650122.569-6.125-41.252-19.20332.833-2.605160.210 <td< td=""><td>14</td><td>-1.074</td><td>152.088</td><td>2.395</td><td>16.364</td><td>-27.121</td><td>37.341</td><td>-7.020</td><td>-147.005</td><td>1.281</td><td>11.572</td></td<>	14	-1.074	152.088	2.395	16.364	-27.121	37.341	-7.020	-147.005	1.281	11.572
17-0.892143.7940.3410.584-25.14141.622-5.569-160.7280.95112.74118-0.909142.175-0.308-3.798-24.47541.227-5.101-165.8050.91812.08419-0.861139.912-1.092-8.147-23.86642.063-4.882-169.0540.86911.38720-0.710136.819-1.615-13.293-23.31142.288-4.600-172.3270.66310.84821-0.788133.976-2.529-17.902-22.38241.615-4.175-175.8730.6989.92622-0.804132.169-3.096-21.768-22.03141.256-3.786-179.7740.6869.46823-0.701130.823-3.691-25.639-21.62338.278-3.718175.4070.5778.96624-0.784128.186-4.479-29.154-21.09039.326-3.552171.4960.7008.30525-0.767126.414-5.039-33.686-20.37537.433-3.123167.6050.5797.66826-0.686124.598-5.652-37.271-19.68234.897-2.871163.4040.4497.01527-0.650122.569-6.125-41.252-19.20332.833-2.605160.2100.3586.53928-0.592121.413-6.853-43.261-18.74231.782-2.617156.689 <t< td=""><td>15</td><td>-0.941</td><td>147.793</td><td>1.770</td><td>11.277</td><td>-26.528</td><td>40.086</td><td>-6.592</td><td>-150.663</td><td>1.099</td><td>12.233</td></t<>	15	-0.941	147.793	1.770	11.277	-26.528	40.086	-6.592	-150.663	1.099	12.233
18 -0.909 142.175 -0.308 -3.798 -24.475 41.227 -5.101 -165.805 0.918 12.084   19 -0.861 139.912 -1.092 -8.147 -23.866 42.063 -4.882 -169.054 0.869 11.387   20 -0.710 136.819 -1.615 -13.293 -23.311 42.288 -4.600 -172.327 0.663 10.848   21 -0.788 133.976 -2.529 -17.902 -22.382 41.615 -4.175 -175.873 0.698 9.926   22 -0.804 132.169 -3.096 -21.768 -22.031 41.256 -3.786 -179.774 0.686 9.468   23 -0.701 130.823 -3.691 -25.639 -21.623 38.278 -3.718 175.407 0.577 8.966   24 -0.784 128.186 -4.479 -29.154 -21.090 39.326 -3.522 171.496 0.700 8.305   25 -0.767 126.41	16	-0.883	146.129	1.020	5.313	-25.745	41.127	-6.071	-156.256	0.974	13.383
19 -0.861 139.912 -1.092 -8.147 -23.866 42.063 -4.882 -169.054 0.869 11.387   20 -0.710 136.819 -1.615 -13.293 -23.311 42.288 -4.600 -172.327 0.663 10.848   21 -0.788 133.976 -2.529 -17.902 -22.382 41.615 -4.175 -175.873 0.698 9.926   22 -0.804 132.169 -3.096 -21.768 -22.031 41.256 -3.786 -179.774 0.686 9.468   23 -0.701 130.823 -3.691 -25.639 -21.623 38.278 -3.718 175.407 0.577 8.966   24 -0.784 128.186 -4.479 -29.154 -21.090 39.326 -3.552 171.496 0.700 8.305   25 -0.767 126.414 -5.039 -3.686 -20.375 37.433 -3.123 167.605 0.579 7.668   26 -0.686 124.598<	17	-0.892	143.794	0.341	0.584	-25.141	41.622	-5.569	-160.728	0.951	12.741
20 -0.710 136.819 -1.615 -13.293 -23.311 42.288 -4.600 -172.327 0.663 10.848   21 -0.788 133.976 -2.529 -17.902 -22.382 41.615 -4.175 -175.873 0.698 9.926   22 -0.804 132.169 -3.096 -21.768 -22.031 41.256 -3.786 -179.774 0.686 9.468   23 -0.701 130.823 -3.691 -25.639 -21.623 38.278 -3.718 175.407 0.577 8.966   24 -0.784 128.186 -4.479 -29.154 -21.090 39.326 -3.552 171.496 0.700 8.305   25 -0.767 126.414 -5.039 -33.686 -20.375 37.433 -3.123 167.605 0.579 7.668   26 -0.686 124.598 -5.652 -37.271 -19.682 34.897 -2.871 163.404 0.449 7.015   27 -0.650 122.569<	18	-0.909	142.175	-0.308	-3.798	-24.475	41.227	-5.101	-165.805	0.918	12.084
21-0.788133.976-2.529-17.902-22.38241.615-4.175-175.8730.6989.92622-0.804132.169-3.096-21.768-22.03141.256-3.786-179.7740.6869.46823-0.701130.823-3.691-25.639-21.62338.278-3.718175.4070.5778.96624-0.784128.186-4.479-29.154-21.09039.326-3.552171.4960.7008.30525-0.767126.414-5.039-33.686-20.37537.433-3.123167.6050.5797.66826-0.686124.598-5.652-37.271-19.68234.897-2.871163.4040.4497.01527-0.650122.569-6.125-41.252-19.20332.833-2.605160.2100.3586.53928-0.592121.413-6.853-43.261-18.74231.782-2.617156.6890.3445.94529-0.620118.473-7.512-46.279-18.19830.189-2.440153.2100.3635.343	19	-0.861	139.912	-1.092	-8.147	-23.866	42.063	-4.882	-169.054	0.869	11.387
22 -0.804 132.169 -3.096 -21.768 -22.031 41.256 -3.786 -179.774 0.686 9.468   23 -0.701 130.823 -3.691 -25.639 -21.623 38.278 -3.718 175.407 0.577 8.966   24 -0.784 128.186 -4.479 -29.154 -21.090 39.326 -3.552 171.496 0.700 8.305   25 -0.767 126.414 -5.039 -33.686 -20.375 37.433 -3.123 167.605 0.579 7.668   26 -0.686 124.598 -5.652 -37.271 -19.682 34.897 -2.871 163.404 0.449 7.015   27 -0.650 122.569 -6.125 -41.252 -19.203 32.833 -2.605 160.210 0.358 6.539   28 -0.592 121.413 -6.853 -43.261 -18.742 31.782 -2.617 156.689 0.344 5.945   29 -0.620 118.473 <td>20</td> <td>-0.710</td> <td>136.819</td> <td>-1.615</td> <td>-13.293</td> <td>-23.311</td> <td>42.288</td> <td>-4.600</td> <td>-172.327</td> <td>0.663</td> <td>10.848</td>	20	-0.710	136.819	-1.615	-13.293	-23.311	42.288	-4.600	-172.327	0.663	10.848
23 -0.701 130.823 -3.691 -25.639 -21.623 38.278 -3.718 175.407 0.577 8.966   24 -0.784 128.186 -4.479 -29.154 -21.090 39.326 -3.552 171.496 0.700 8.305   25 -0.767 126.414 -5.039 -33.686 -20.375 37.433 -3.123 167.605 0.579 7.668   26 -0.686 124.598 -5.652 -37.271 -19.682 34.897 -2.871 163.404 0.449 7.015   27 -0.650 122.569 -6.125 -41.252 -19.203 32.833 -2.605 160.210 0.358 6.539   28 -0.592 121.413 -6.853 -43.261 -18.742 31.782 -2.617 156.689 0.344 5.945   29 -0.620 118.473 -7.512 -46.279 -18.198 30.189 -2.440 153.210 0.363 5.343	21	-0.788	133.976	-2.529	-17.902	-22.382	41.615	-4.175	-175.873	0.698	9.926
24 -0.784 128.186 -4.479 -29.154 -21.090 39.326 -3.552 171.496 0.700 8.305   25 -0.767 126.414 -5.039 -33.686 -20.375 37.433 -3.123 167.605 0.579 7.668   26 -0.686 124.598 -5.652 -37.271 -19.682 34.897 -2.871 163.404 0.449 7.015   27 -0.650 122.569 -6.125 -41.252 -19.203 32.833 -2.605 160.210 0.358 6.539   28 -0.592 121.413 -6.853 -43.261 -18.742 31.782 -2.617 156.689 0.344 5.945   29 -0.620 118.473 -7.512 -46.279 -18.198 30.189 -2.440 153.210 0.363 5.343	22	-0.804	132.169	-3.096	-21.768	-22.031	41.256	-3.786	-179.774	0.686	9.468
25 -0.767 126.414 -5.039 -33.686 -20.375 37.433 -3.123 167.605 0.579 7.668   26 -0.686 124.598 -5.652 -37.271 -19.682 34.897 -2.871 163.404 0.449 7.015   27 -0.650 122.569 -6.125 -41.252 -19.203 32.833 -2.605 160.210 0.358 6.539   28 -0.592 121.413 -6.853 -43.261 -18.742 31.782 -2.617 156.689 0.344 5.945   29 -0.620 118.473 -7.512 -46.279 -18.198 30.189 -2.440 153.210 0.363 5.343	23	-0.701	130.823	-3.691	-25.639	-21.623	38.278	-3.718	175.407	0.577	8.966
26 -0.686 124.598 -5.652 -37.271 -19.682 34.897 -2.871 163.404 0.449 7.015   27 -0.650 122.569 -6.125 -41.252 -19.203 32.833 -2.605 160.210 0.358 6.539   28 -0.592 121.413 -6.853 -43.261 -18.742 31.782 -2.617 156.689 0.344 5.945   29 -0.620 118.473 -7.512 -46.279 -18.198 30.189 -2.440 153.210 0.363 5.343	24	-0.784	128.186	-4.479	-29.154	-21.090	39.326	-3.552	171.496	0.700	8.305
27 -0.650 122.569 -6.125 -41.252 -19.203 32.833 -2.605 160.210 0.358 6.539   28 -0.592 121.413 -6.853 -43.261 -18.742 31.782 -2.617 156.689 0.344 5.945   29 -0.620 118.473 -7.512 -46.279 -18.198 30.189 -2.440 153.210 0.363 5.343	25	-0.767	126.414	-5.039	-33.686	-20.375	37.433	-3.123	167.605	0.579	7.668
28 -0.592 121.413 -6.853 -43.261 -18.742 31.782 -2.617 156.689 0.344 5.945   29 -0.620 118.473 -7.512 -46.279 -18.198 30.189 -2.440 153.210 0.363 5.343	26	-0.686	124.598	-5.652	-37.271	-19.682	34.897	-2.871	163.404	0.449	7.015
29 -0.620 118.473 -7.512 -46.279 -18.198 30.189 -2.440 153.210 0.363 5.343	27	-0.650	122.569	-6.125	-41.252	-19.203	32.833	-2.605	160.210	0.358	6.539
	28	-0.592	121.413	-6.853	-43.261	-18.742	31.782	-2.617	156.689	0.344	5.945
30 -0.654 117.126 -8.080 -48.940 -17.676 28.161 -2.275 149.717 0.363 4.798	29	-0.620	118.473	-7.512	-46.279	-18.198	30.189	-2.440	153.210	0.363	5.343
	30	-0.654	117.126	-8.080	-48.940	-17.676	28.161	-2.275	149.717	0.363	4.798

### **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-PH31F71