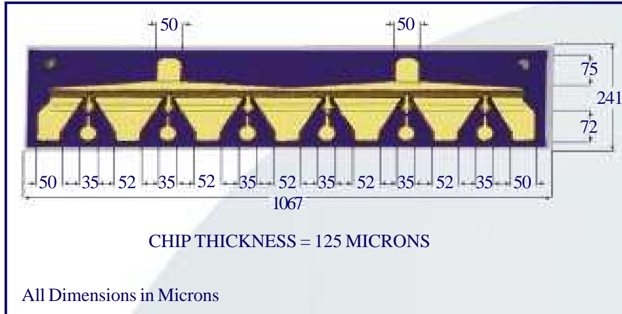
# MwT-16

## 26 GHz High Power GaAs FET

DOWNLOAD ADDITIONAL DATA WWW.MWTINC.COM




CHIP THICKNESS = 125 MICRONS

All Dimensions in Microns

## FEATURES

- 0.5 WATT POWER OUTPUT AT 12 GHz
- +39 dBm THIRD ORDER INTERCEPT
- HIGH ASSOCIATED GAIN
- 0.3 MICRON REFRACTORY METAL/GOLD GATE
- 900 MICRON GATE WIDTH
- DIAMOND-LIKE CARBON PASSIVATION

## DESCRIPTION

The MwT-16 is a GaAs MESFET device whose nominal quarter micron gate length and 900 micron gate width make it ideally suited to applications requiring high-power output in the 2 GHz to 18 GHz frequency range. The straight gate geometry of the MwT-16 makes it equally effective for either wideband (e.g. 6-18 GHz) or narrow-band applications. The chip is produced using MwT's reliable metal system and all devices are screened to insure reliability. All chips are passivated using MwT's patented "Diamond-Like Carbon" process for increased durability. Designers can use MwT's unique BIN selection feature to choose devices from narrow Idss ranges, insuring consistent circuit operation.

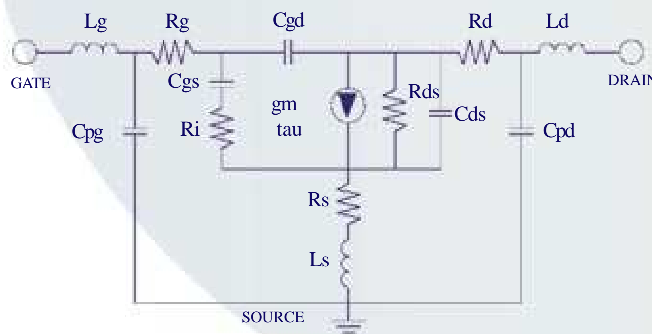
## DC SPECIFICATIONS AT Ta = 25°C

| SYMBOL | PARAM. & CONDITIONS | UNITS | MIN | TYP | MAX |
|---|---|---|---|---|---|
| IDSS | Saturated Drain Current<br>Vds= 4.0 V VGS= 0.0 V | mA | 90 | | 360 |
| Gm | Transconductance<br>Vds= 2.0 V VGS= 0.0 V | mS | 108 | 130 | |
| Vp | Pinch-off Voltage<br>Vds= 3.0 V IDS= 6.0 mA | V | | -2.0 | -5.0 |
| BVGSO | Gate-to-Source Breakdown Volt.<br>Igs= -0.6 mA | V | -6.0 | -12.0 | |
| BVGDO | Gate-to-Drain Breakdown Volt.<br>Igd= -0.6 mA | V | -8.0 | -12.0 | |
| Rth | Thermal Resistance MwT-16 Chip | °C/W | | 55 | |

## RF SPECIFICATIONS AT Ta = 25°C

| SYMBOL | PARAMETERS AND CONDITIONS | FREQ | UNITS | MIN | TYP |
|---|---|---|---|---|---|
| P1dB | Output Power at 1 dB Compression<br>VDS= 6.0 V IDS=150mA | 12 GHz | dBm | 26.0 | 27.0 |
| SSG | Small Signal Gain<br>VDS= 6.0 V IDS=150mA | 12 GHz | dB | 7.5 | 8.5 |
| PAE | Power Added Efficiency<br>VDS= 6.0V IDS=150mA | 12 GHz | % | 25 | 35 |
| Idss | Recommended IDSS Range for Optimum P1dB | | mA | | 240-330 |

DEVICE EQUIVALENT CIRCUIT MODEL




| PARAMETER | | VALUE | |
|---|---|---|---|
| Source Resistance | Rs | 0.60 | Ω |
| Source Inductance | Ls | 0.04 | nH |
| Drain-Source Resistance | Rds | 150.0 | Ω |
| Drain-Source Capacitance | Cds | 0.01 | pF |
| Drain Resistance | Rd | 1.0 | Ω |
| Drain Pad Capacitance | Cpd | 0.20 | pF |
| Drain Inductance | Ld | 0.09 | nH |
| Gate Bond Wire Inductance | Lg | 0.05 | nH |
| Gate Pad Capacitance | Cpg | 0.50 | pF |
| Gate Resistance | Rg | 0.30 | Ω |
| Gate-Source Capacitance | Cgs | .85 | pF |
| Channel Resistance | Ri | 1.0 | Ω |
| Gate-Drain Capacitance | Cgd | 0.06 | pF |
| Transconductance | gm | 140.0 | mS |
| Transit Time | tau | 1.9 | psec |

## ORDERING INFORMATION

Chip MwT-16

***When placing order or inquiring, please specify BIN range, wafer no., if known, and screening level required.***

**4268 Solar Way Fremont California 94538 Phone: (510) 651-6700 Fax: (510) 651-2208**

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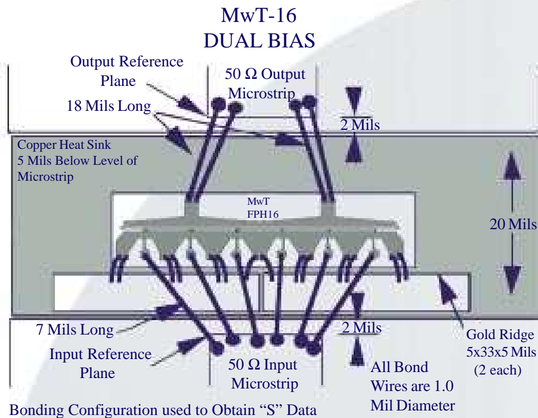


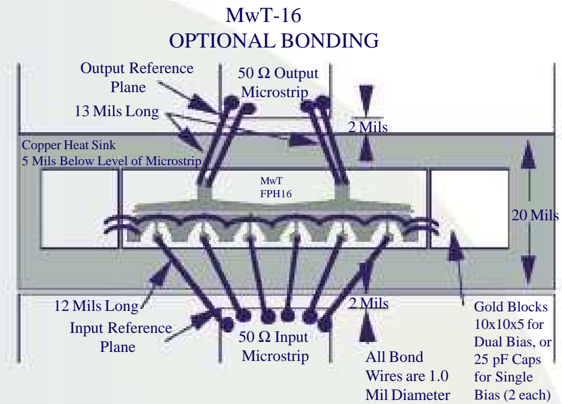


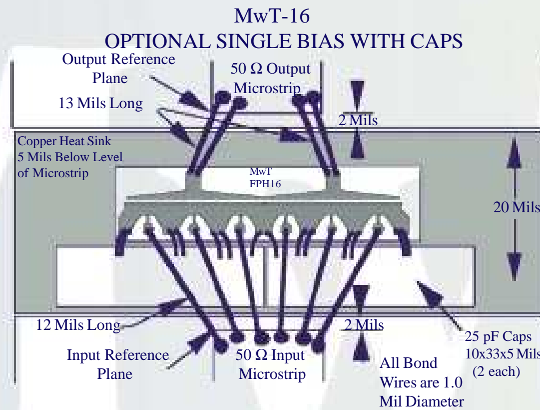


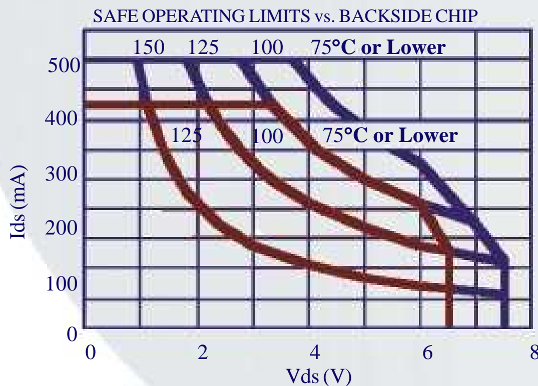


Absolute Maximum Continuous Maximum

## MAXIMUM RATINGS AT Ta = 25°C

| SYMBOL | PARAMETER | UNITS | CONT MAX[1] | ABSOLUTE MAX[2] |
|---|---|---|---|---|
| VDS | Drain to Source Voltage | V | See Safe Operating Limits | |
| Tch | Channel Temperature | °C | +150 | +175 |
| Tst | Storage Temperature | °C | -65 to +150 | +175 |
| Pin | RF Input Power | mW | 280 | 430 |

NOTES: 1. Exceeding any one of these limits in continuous operation may reduce the mean-time-to-failure below the design goals.
2. Exceeding any one of these limits may cause permanent damage.

BIN SELECTION

| BIN# | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| IDSS (mA) | 90-105 | 105-120 | 120-135 | 135-150 | 150-165 | 165-180 | 180-195 | 195-210 | 210-225 | 225-240 | 240-255 | 255-270 | 270-285 | 285-300 | 300-315 | 315-330 | 330-345 | 345-360 |

BIN ACCURACY STATEMENT

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