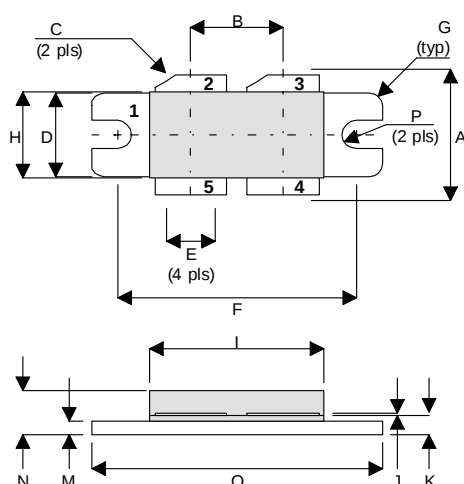


**MECHANICAL DATA**

**D1**

|       |                 |       |         |
|-------|-----------------|-------|---------|
| PIN 1 | SOURCE (COMMON) | PIN 2 | DRAIN 1 |
| PIN 3 | DRAIN 2         | PIN 4 | GATE 2  |
| PIN 5 | GATE 1          |       |         |

| DIM | Millimetres | Tol. | Inches | Tol.  |
|-----|-------------|------|--------|-------|
| A   | 15.24       | 0.50 | 0.600  | 0.020 |
| B   | 10.80       | 0.13 | 0.425  | 0.005 |
| C   | 45°         | 5°   | 45°    | 5°    |
| D   | 9.78        | 0.13 | 0.385  | 0.005 |
| E   | 8.38        | 0.13 | 0.330  | 0.005 |
| F   | 27.94       | 0.13 | 1.100  | 0.005 |
| G   | 1.52R       | 0.13 | 0.060R | 0.005 |
| H   | 10.16       | 0.15 | 0.400  | 0.006 |
| I   | 21.84       | 0.23 | 0.860  | 0.009 |
| J   | 0.10        | 0.02 | 0.004  | 0.001 |
| K   | 1.96        | 0.13 | 0.077  | 0.005 |
| M   | 1.02        | 0.13 | 0.040  | 0.005 |
| N   | 4.45        | 0.38 | 0.175  | 0.015 |
| O   | 34.04       | 0.13 | 1.340  | 0.005 |
| P   | 1.63R       | 0.13 | 0.064R | 0.005 |

# **GOLD METALLISED** **MULTI-PURPOSE SILICON** **DMOS RF FET** **125W – 28V – 500MHz** **PUSH-PULL**

**FEATURES**

- SUITABLE FOR BROAD BAND APPLICATIONS
- SIMPLE BIAS CIRCUITS
- ULTRA-LOW THERMAL RESISTANCE
- BeO FREE
- LOW Crss
- HIGH GAIN – 13 dB MINIMUM

**APPLICATIONS**

- VHF/UHF COMMUNICATIONS  
from 1 MHz to 500 MHz

|              |                                        |                        |
|--------------|----------------------------------------|------------------------|
| $P_D$        | Power Dissipation                      | 648W (389W -A Version) |
| $BV_{DSS}$   | Drain – Source Breakdown Voltage *     | 70V                    |
| $BV_{GSS}$   | Gate – Source Breakdown Voltage*       | ±20V                   |
| $I_{D(sat)}$ | Drain Current*                         | 20A                    |
| $T_{stg}$    | Storage Temperature                    | –65 to 150°C           |
| $T_j$        | Maximum Operating Junction Temperature | 200°C                  |

\* Per Side

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### ELECTRICAL CHARACTERISTICS (T<sub>case</sub> = 25°C unless otherwise stated)

| Parameter                | Test Conditions                                                                                        | Min. | Typ. | Max. | Unit |
|--------------------------|--------------------------------------------------------------------------------------------------------|------|------|------|------|
| <b>PER SIDE</b>          |                                                                                                        |      |      |      |      |
| B <sub>V</sub> DSS       | Drain–Source Breakdown Voltage<br>V <sub>GS</sub> = 0 I <sub>D</sub> = 100mA                           | 70   |      |      | V    |
| I <sub>D</sub> DSS       | Zero Gate Voltage Drain Current<br>V <sub>DS</sub> = 28V V <sub>GS</sub> = 0                           |      |      | 4    | mA   |
| I <sub>G</sub> DSS       | Gate Leakage Current<br>V <sub>GS</sub> = 20V V <sub>DS</sub> = 0                                      |      |      | 1    | μA   |
| V <sub>GS(th)</sub>      | Gate Threshold Voltage*<br>I <sub>D</sub> = 10mA V <sub>DS</sub> = V <sub>GS</sub>                     | 1    |      | 7    | V    |
| g <sub>fs</sub>          | Forward Transconductance*<br>V <sub>DS</sub> = 10V I <sub>D</sub> = 4A                                 | 3.2  |      |      | mhos |
| V <sub>GS(th)match</sub> | Gate Threshold Voltage Matching Between Sides<br>I <sub>D</sub> = 1A V <sub>DS</sub> = V <sub>GS</sub> |      |      | 0.1  | V    |
| <b>TOTAL DEVICE</b>      |                                                                                                        |      |      |      |      |
| G <sub>PS</sub>          | Common Source Power Gain<br>P <sub>O</sub> = 125W                                                      | 13   |      |      | dB   |
| η                        | Drain Efficiency<br>V <sub>DS</sub> = 28V I <sub>DQ</sub> = 2A                                         | 50   |      |      | %    |
| VSWR                     | Load Mismatch Tolerance<br>f = 400MHz                                                                  | 20:1 |      |      | —    |
| <b>PER SIDE</b>          |                                                                                                        |      |      |      |      |
| C <sub>iss</sub>         | Input Capacitance<br>V <sub>DS</sub> = 28V V <sub>GS</sub> = –5V f = 1MHz                              |      |      | 240  | pF   |
| C <sub>oss</sub>         | Output Capacitance<br>V <sub>DS</sub> = 28V V <sub>GS</sub> = 0 f = 1MHz                               |      |      | 100  | pF   |
| C <sub>rss</sub>         | Reverse Transfer Capacitance<br>V <sub>DS</sub> = 28V V <sub>GS</sub> = 0 f = 1MHz                     |      |      | 10   | pF   |

\* Pulse Test: Pulse Duration = 300 μs , Duty Cycle ≤ 2%

### THERMAL DATA

|                       |                                    |                                           |
|-----------------------|------------------------------------|-------------------------------------------|
| R <sub>THj-case</sub> | Thermal Resistance Junction – Case | Max. 0.27°C / W<br>0.45 °C / W -A Version |
|-----------------------|------------------------------------|-------------------------------------------|

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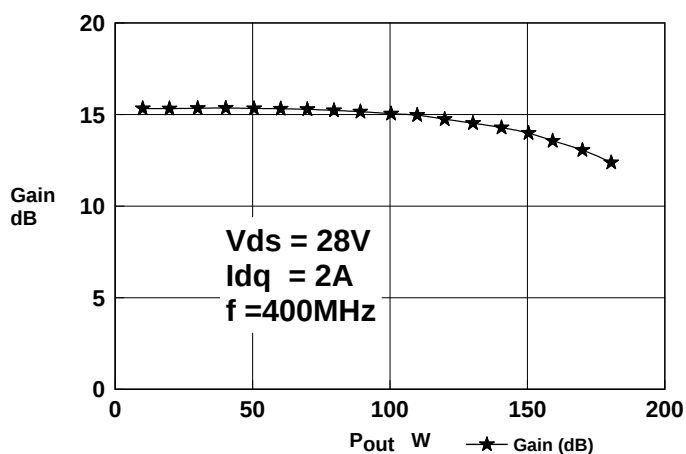


Figure 1 – Gain vs. Power Output.

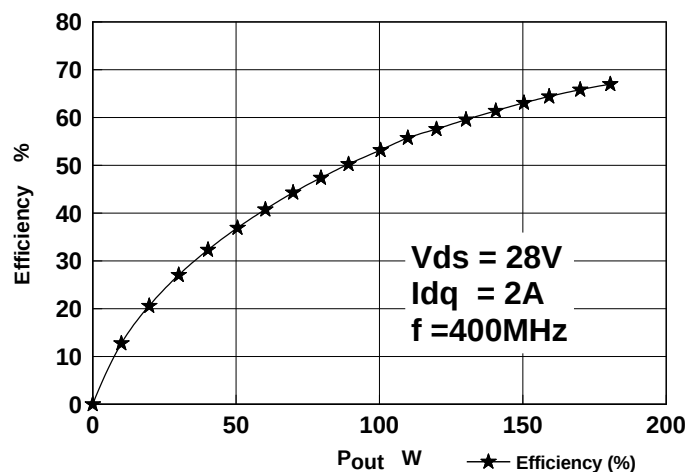


Figure 2 – Efficiency vs. Power Output.

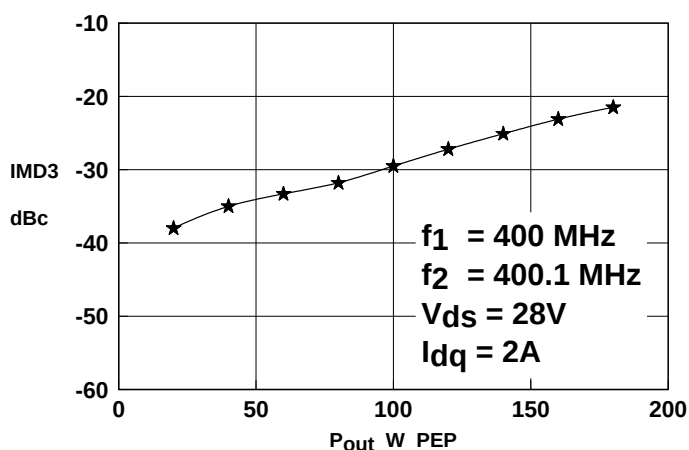


Figure 3 – IMD vs. Power Output

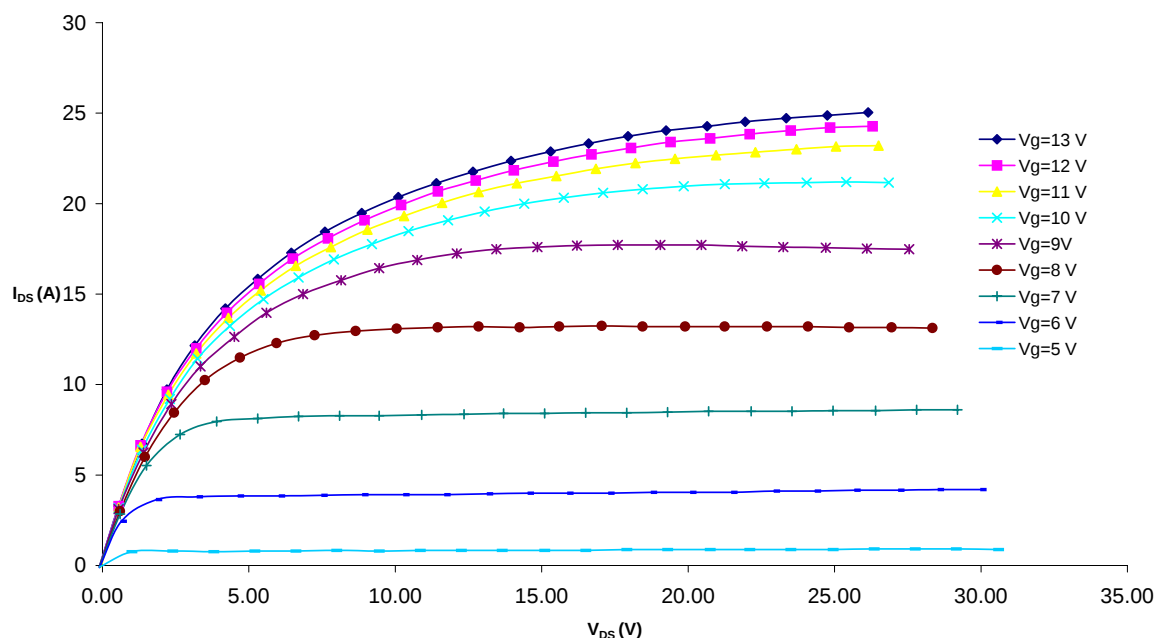


Figure 4 – Typical IV Characteristics.

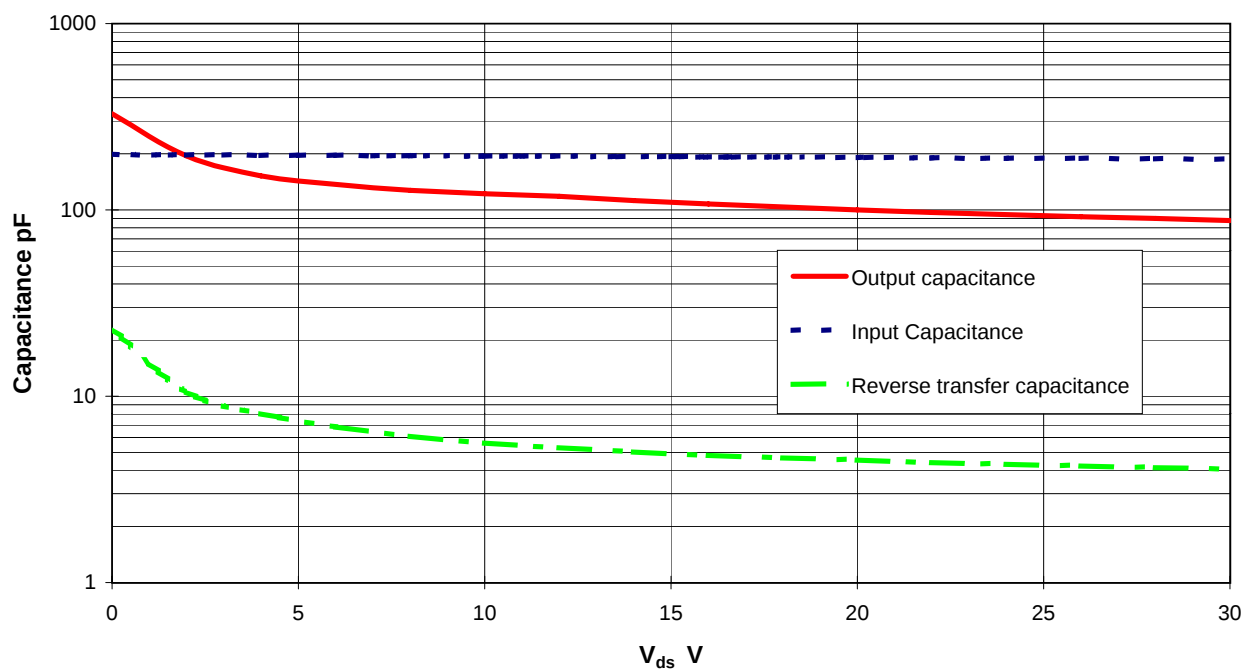
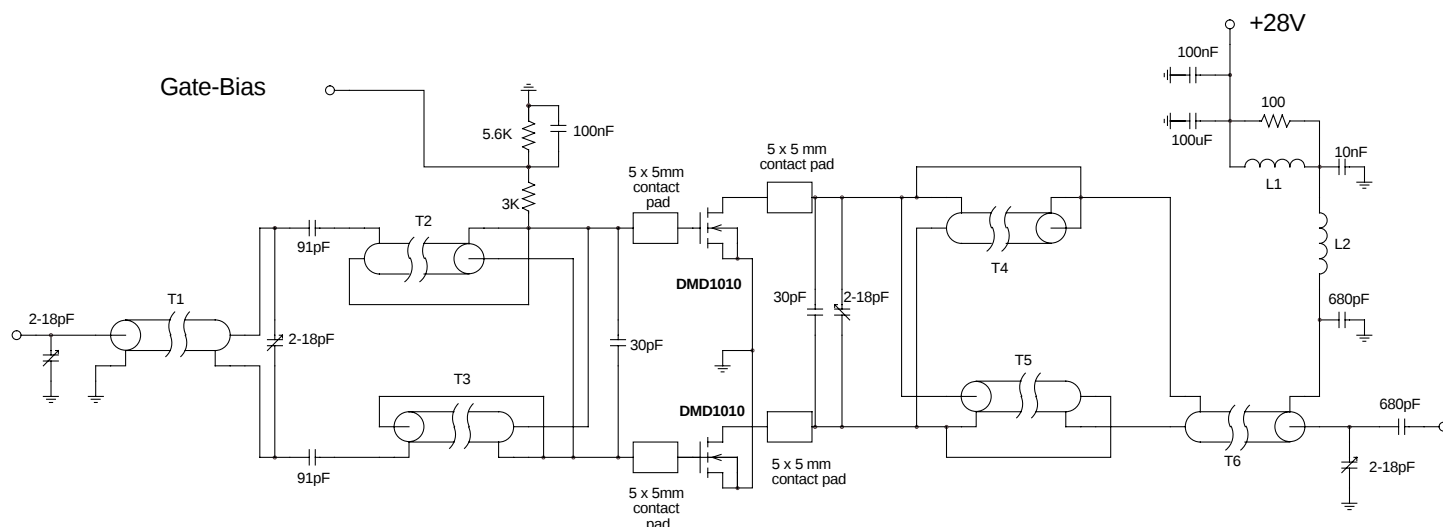


Figure 5 – Typical CV Characteristics.

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## DMD1010 TEST FIXTURE

Substrate 1.6mm PTFE/ glass,  $\epsilon_r = 2.5$   
All microstrip lines  $W = 4.4\text{mm}$

|      |           |                                                        |
|------|-----------|--------------------------------------------------------|
| T1   | 12cm      | 50 $\Omega$ UT85 semi-rigid coax on ferrite core       |
| T2,3 | 7.5cm     | 15 $\Omega$ UT85-15 semi-rigid coax                    |
| T4,5 | 7cm       | 15 $\Omega$ UT85-15 semi-rigid coax                    |
| T6   | 11cm      | 50 $\Omega$ UT85 semi-rigid coax on ferrite core       |
| L1   | 6.5 turns | 25swg enamelled copper wire on Fair-Rite FT50B-43 core |
| L2   | 6.5 turns | 25swg enamelled copper wire, 4mm internal diameter     |

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