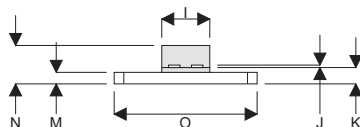
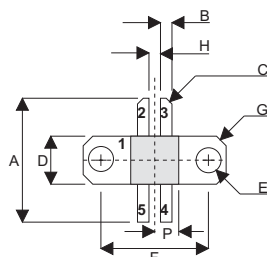


## MECHANICAL DATA



## DQ

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

| DIM | mm         | Tol. | Inches     | Tol.  |
|-----|------------|------|------------|-------|
| A   | 16.38      | 0.26 | 0.645      | 0.010 |
| B   | 1.52       | 0.13 | 0.060      | 0.005 |
| C   | 45°        | 5°   | 45°        | 5°    |
| D   | 6.35       | 0.13 | 0.250      | 0.005 |
| E   | 3.30       | 0.13 | 0.130      | 0.005 |
| F   | 14.22      | 0.13 | 0.560      | 0.005 |
| G   | 1.27 x 45° | 0.13 | 0.05 x 45° | 0.005 |
| H   | 1.52       | 0.13 | 0.060      | 0.005 |
| I   | 6.35       | 0.13 | 0.250      | 0.005 |
| J   | 0.13       | 0.02 | 0.005      | 0.001 |
| K   | 2.16       | 0.13 | 0.085      | 0.005 |
| M   | 1.52       | 0.13 | 0.060      | 0.005 |
| N   | 5.08       | MAX  | 0.200      | MAX   |
| O   | 18.90      | 0.13 | 0.744      | 0.005 |
| P   | 3.18       | 0.25 | 0.125      | 0.010 |

# GOLD METALLISED MULTI-PURPOSE SILICON DMOS RF FET 40W – 28V – 500MHz PUSH-PULL

## FEATURES

- SIMPLIFIED AMPLIFIER DESIGN
- SUITABLE FOR BROAD BAND APPLICATIONS
- VERY LOW  $C_{rss}$
- USEFUL  $P_O$  AT 1GHz
- LOW NOISE
- HIGH GAIN – 13 dB MINIMUM

## APPLICATIONS

- VHF/UHF COMMUNICATIONS  
from 1 MHz to 1 GHz

ABSOLUTE MAXIMUM RATINGS ( $T_{case} = 25^{\circ}C$  unless otherwise stated)

|              |                                        |                         |
|--------------|----------------------------------------|-------------------------|
| $P_D$        | Power Dissipation                      | 100W                    |
| $BV_{DSS}$   | Drain – Source Breakdown Voltage *     | 70V                     |
| $BV_{GSS}$   | Gate – Source Breakdown Voltage *      | $\pm 20V$               |
| $I_{D(sat)}$ | Drain Current *                        | 5A                      |
| $T_{stg}$    | Storage Temperature                    | $-65$ to $150^{\circ}C$ |
| $T_j$        | Maximum Operating Junction Temperature | $200^{\circ}C$          |

\* Per Side

Semelab Plc reserves the right to change test conditions, parameter limits and package dimensions without notice. Information furnished by Semelab is believed to be both accurate and reliable at the time of going to press. However Semelab assumes no responsibility for any errors or omissions discovered in its use. Semelab encourages customers to verify that datasheets are current before placing orders.

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

| Parameter           | Test Conditions                                                                    | Min. | Typ. | Max. | Unit |
|---------------------|------------------------------------------------------------------------------------|------|------|------|------|
| PER SIDE            |                                                                                    |      |      |      |      |
| 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       |      |      | 1    | 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> = 1A             | 0.8  |      |      | S    |
| TOTAL DEVICE        |                                                                                    |      |      |      |      |
| G <sub>PS</sub>     | Common Source Power Gain<br>P <sub>O</sub> = 40W                                   | 13   |      |      | dB   |
| η                   | Drain Efficiency<br>V <sub>DS</sub> = 28V I <sub>DQ</sub> = 0.4A                   | 50   |      |      | %    |
| V <sub>SWR</sub>    | Load Mismatch Tolerance<br>f = 400MHz                                              | 20:1 |      |      | —    |
| PER SIDE            |                                                                                    |      |      |      |      |
| C <sub>iss</sub>    | Input Capacitance<br>V <sub>DS</sub> = 28V V <sub>GS</sub> = –5V f = 1MHz          |      |      | 60   | pF   |
| C <sub>oss</sub>    | Output Capacitance<br>V <sub>DS</sub> = 28V V <sub>GS</sub> = 0 f = 1MHz           |      |      | 30   | pF   |
| C <sub>rss</sub>    | Reverse Transfer Capacitance<br>V <sub>DS</sub> = 28V V <sub>GS</sub> = 0 f = 1MHz |      |      | 2.5  | pF   |

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

## HAZARDOUS MATERIAL WARNING

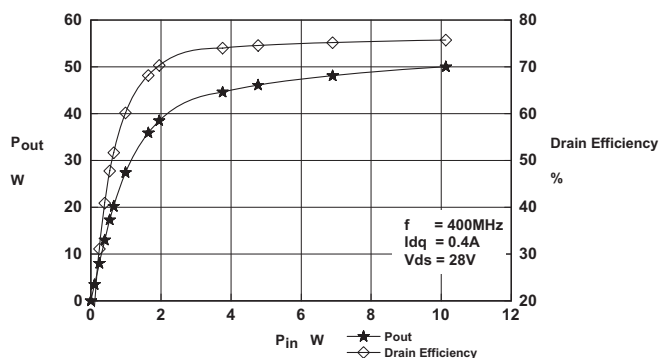
The ceramic portion of the device between leads and metal flange is beryllium oxide. Beryllium oxide dust is highly toxic and care must be taken during handling and mounting to avoid damage to this area.

**THESE DEVICES MUST NEVER BE THROWN AWAY WITH GENERAL INDUSTRIAL OR DOMESTIC WASTE.**

## THERMAL DATA

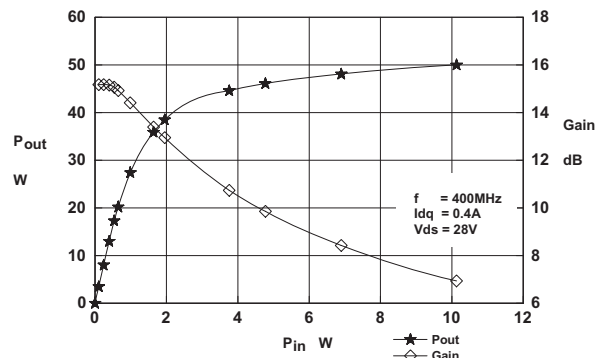
|                       |                                    |                 |
|-----------------------|------------------------------------|-----------------|
| R <sub>THj-case</sub> | Thermal Resistance Junction – Case | Max. 1.75°C / W |
|-----------------------|------------------------------------|-----------------|

Semelab Plc reserves the right to change test conditions, parameter limits and package dimensions without notice. Information furnished by Semelab is believed to be both accurate and reliable at the time of going to press. However Semelab assumes no responsibility for any errors or omissions discovered in its use. Semelab encourages customers to verify that datasheets are current before placing orders.



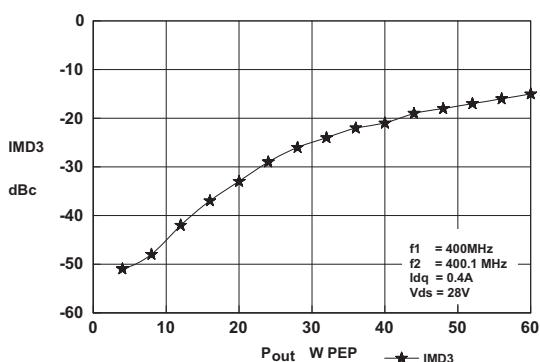
**Figure 1**

Power Output and efficiency vs. Power Input.



**Figure 2**

Power Output and Gain vs. Power Input.



**Figure 3**

IMD vs. Output Power.

## OPTIMUM SOURCE AND LOAD IMPEDANCE

| Frequency<br>MHz | $Z_S$<br>$\Omega$ | $Z_L$<br>$\Omega$ |
|------------------|-------------------|-------------------|
| 400MHZ           | 10.7 - j35.4      | 13.8 - j22.2      |

## Typical S Parameters

!  $V_{DS} = 28V$ ,  $I_{DQ} = 1A$   
# MHz S MA R 50

| !Freq<br>!MHz | S11<br>mag ang | S21<br>mag ang | S12<br>mag ang | S22<br>mag ang |
|---------------|----------------|----------------|----------------|----------------|
| 100           | 0.767 -135     | 22.646 88      | 0.0155 9       | 0.531 -103     |
| 200           | 0.813 -153     | 10.116 57      | 0.0099 4       | 0.692 -131     |
| 300           | 0.841 -161     | 5.623 39       | 0.0076 49      | 0.794 -143     |
| 400           | 0.861 -169     | 3.548 25       | 0.013 79       | 0.841 -151     |
| 500           | 0.882 -175     | 2.82 20        | 0.021 78       | 0.875 -156     |
| 600           | 0.902 180      | 2.093 14       | 0.0285 78      | 0.91 -161      |
| 700           | 0.923 174      | 1.365 9        | 0.0376 77      | 0.944 -166     |
| 800           | 0.912 170      | 1.096 2        | 0.0457 66      | 0.944 -170     |
| 900           | 0.923 164      | 0.902 -3       | 0.0484 66      | 0.933 -176     |
| 1000          | 0.923 161      | 0.724 -4       | 0.0596 64      | 0.944 -177     |

Semelab Plc reserves the right to change test conditions, parameter limits and package dimensions without notice. Information furnished by Semelab is believed to be both accurate and reliable at the time of going to press. However Semelab assumes no responsibility for any errors or omissions discovered in its use. Semelab encourages customers to verify that datasheets are current before placing orders.

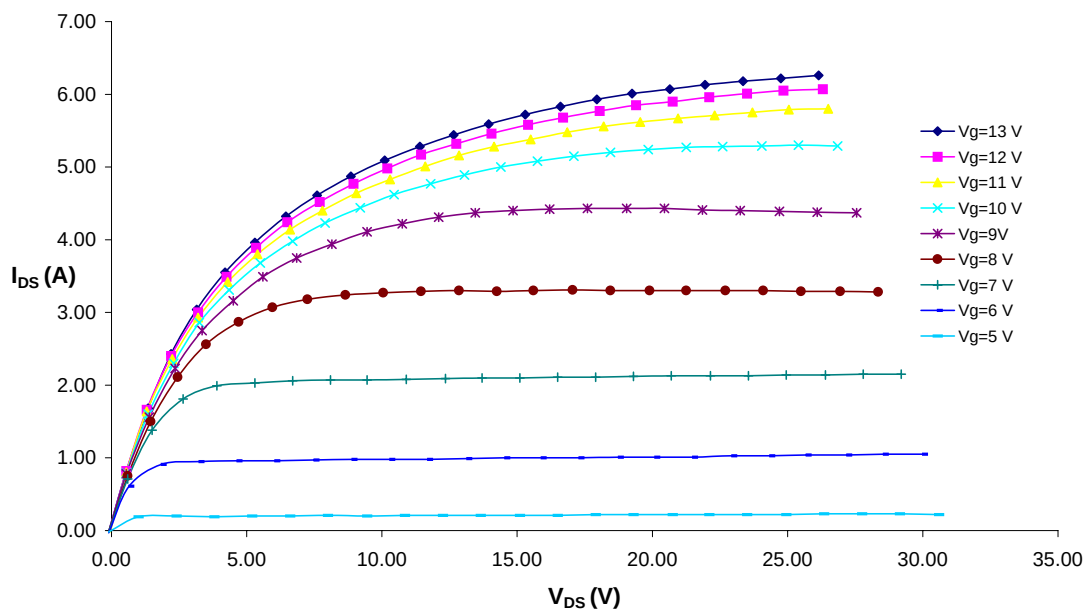


Figure 4 – Typical IV Characteristics.

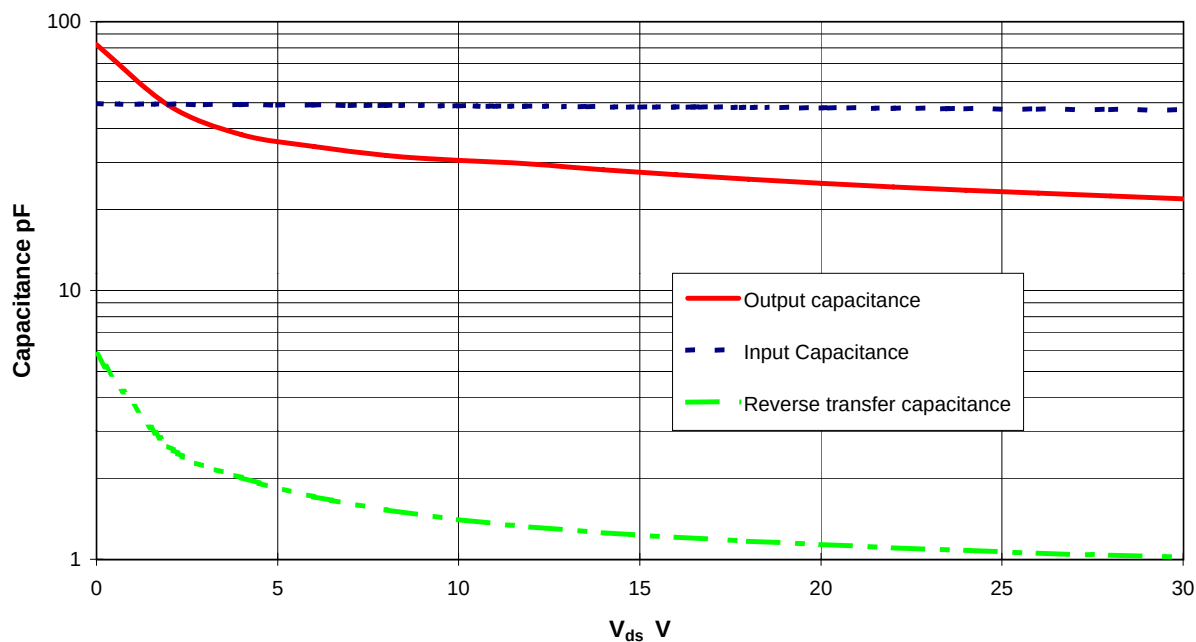
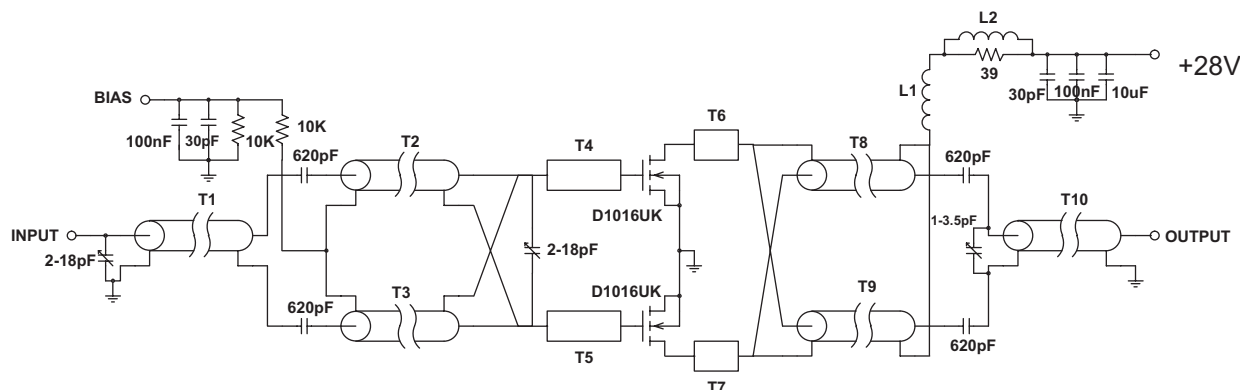


Figure 5 – Typical CV Characteristics.



## TEST FIXTURE

Substrate 1.6mm FR4

All microstrip lines  $W = 2.5\text{mm}$

|        |                                                                  |
|--------|------------------------------------------------------------------|
| T1     | 45mm 50 OHM UT34 semi-rigid coax                                 |
| T2, T3 | 55mm 50 OHM UT 34 semi-rigid coax                                |
| T4, T5 | 25mm microstrip line                                             |
| T6, T7 | 10mm microstrip line                                             |
| T8, T9 | 45mm 25 OHM UT 34-25 semi-rigid coax                             |
| T10    | 60mm 50OHM UT34 semi-rigid coax                                  |
| L1     | 4 turns 19swg enamelled copper wire, 7mm i.d.                    |
| L2     | 2.5 turns of 19swg enamelled copper wire on T50-6 ferrite toroid |