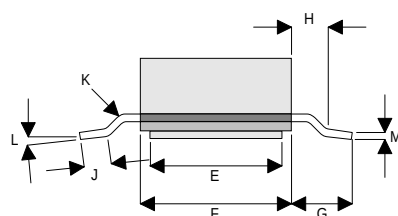
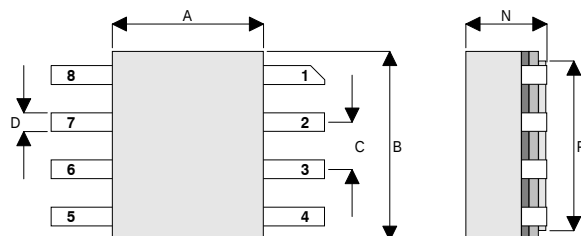


## MECHANICAL DATA



## SO8 PACKAGE

PIN 1 – SOURCE  
PIN 2 – DRAIN  
PIN 3 – DRAIN  
PIN 4 – SOURCE  
PIN 5 – SOURCE  
PIN 6 – GATE  
PIN 7 – GATE  
PIN 8 – SOURCE

| Dim. | mm   | Tol.           | Inches | Tol.             |
|------|------|----------------|--------|------------------|
| A    | 4.06 | ±0.08          | 0.160  | ±0.003           |
| B    | 5.08 | ±0.08          | 0.200  | ±0.003           |
| C    | 1.27 | ±0.08          | 0.050  | ±0.003           |
| D    | 0.51 | ±0.08          | 0.020  | ±0.003           |
| E    | 3.56 | ±0.08          | 0.140  | ±0.003           |
| F    | 4.06 | ±0.08          | 0.160  | ±0.003           |
| G    | 1.65 | ±0.08          | 0.065  | ±0.003           |
| H    | 0.76 | +0.25<br>-0.00 | 0.030  | +0.010<br>-0.000 |
| J    | 0.51 | Min.           | 0.020  | Min.             |
|      | 1.02 | Max.           | 0.040  | Max.             |
| K    | 45°  | Max.           | 45°    | Max.             |
| L    | 0°   | Min.           | 0°     | Min.             |
|      | 7°   | Max.           | 7°     | Max.             |
| M    | 0.20 | ±0.08          | 0.008  | ±0.003           |
| N    | 2.18 | Max.           | 0.086  | Max.             |
| P    | 4.57 | ±0.08          | 0.180  | ±0.003           |

# GOLD METALLISED MULTI-PURPOSE SILICON DMOS RF FET 10W – 50V – 500MHz SINGLE ENDED

## FEATURES

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

## APPLICATIONS

- HF/VHF/UHF COMMUNICATIONS  
from 1 MHz to 1 GHz

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

|              |                                        |              |
|--------------|----------------------------------------|--------------|
| $P_D$        | Power Dissipation                      | 30W          |
| $BV_{DSS}$   | Drain – Source Breakdown Voltage       | 125V         |
| $BV_{GSS}$   | Gate – Source Breakdown Voltage        | ±20V         |
| $I_{D(sat)}$ | Drain Current                          | 3A           |
| $T_{stg}$    | Storage Temperature                    | –65 to 150°C |
| $T_j$        | Maximum Operating Junction Temperature | 200°C        |

Semelab Ltd 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 |
|--------------------------------------------------|---------------------------------------------------------|------|------|------|------|
| BV <sub>DSS</sub> Drain–Source Breakdown Voltage | V <sub>GS</sub> = 0 I <sub>D</sub> = 100mA              | 125  |      |      | V    |
| I <sub>DSS</sub> Zero Gate Voltage Drain Current | V <sub>DS</sub> = 50V V <sub>GS</sub> = 0               |      |      | 1    | mA   |
| I <sub>GSS</sub> Gate Leakage Current            | V <sub>GS</sub> = 20V V <sub>DS</sub> = 0               |      |      | 1    | μA   |
| V <sub>GS(th)</sub> Gate Threshold Voltage*      | I <sub>D</sub> = 10mA V <sub>DS</sub> = V <sub>GS</sub> | 1    |      | 7    | V    |
| g <sub>fs</sub> Forward Transconductance*        | V <sub>DS</sub> = 10V I <sub>D</sub> = 0.5A             | 0.8  |      |      | S    |
| G <sub>PS</sub> Common Source Power Gain         | P <sub>O</sub> = 10W                                    | 13   |      |      | dB   |
| η Drain Efficiency                               | V <sub>DS</sub> = 50V I <sub>DQ</sub> = 0.1A            | 50   |      |      | %    |
| VSWR Load Mismatch Tolerance                     | f = 500MHz                                              | 20:1 |      |      | —    |
| C <sub>iss</sub> Input Capacitance               | V <sub>DS</sub> = 50V V <sub>GS</sub> = –5V f = 1MHz    |      |      | 60   | pF   |
| C <sub>oss</sub> Output Capacitance              | V <sub>DS</sub> = 50V V <sub>GS</sub> = 0 f = 1MHz      |      |      | 25   | pF   |
| C <sub>rss</sub> Reverse Transfer Capacitance    | V <sub>DS</sub> = 50V V <sub>GS</sub> = 0 f = 1MHz      |      |      | 1.5  | pF   |

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

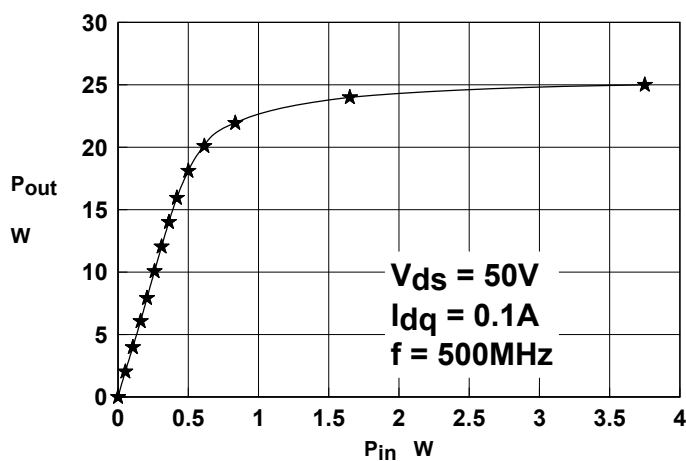
HAZARDOUS MATERIAL WARNING

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.

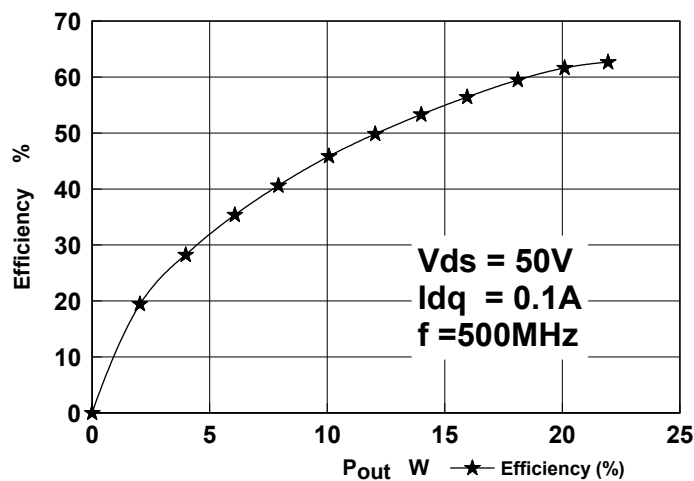
THESE DEVICES MUST NEVER BE THROWN AWAY WITH GENERAL INDUSTRIAL OR DOMESTIC WASTE.

THERMAL DATA

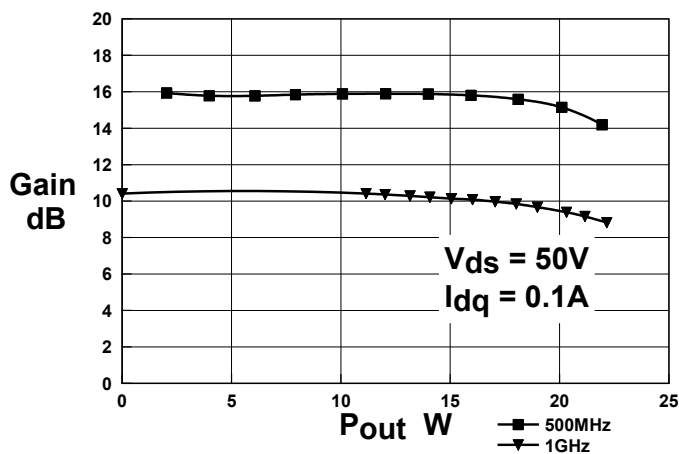
|                       |                                    |              |
|-----------------------|------------------------------------|--------------|
| R <sub>THj-case</sub> | Thermal Resistance Junction – Case | Max. 6°C / W |
|-----------------------|------------------------------------|--------------|



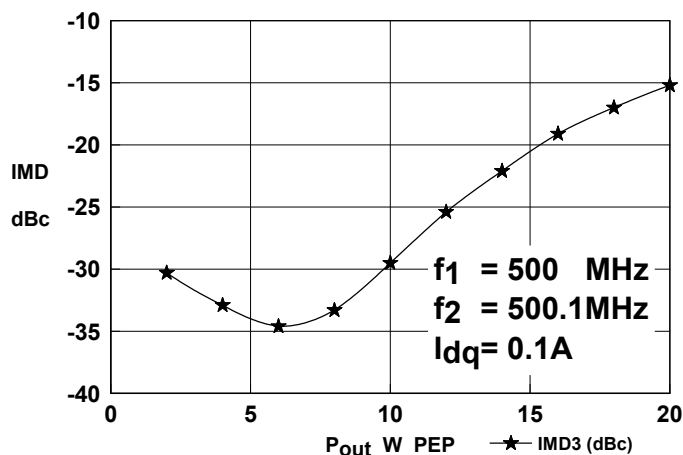
**Figure 1.** Output Power vs Input Power



**Figure 2.** Efficiency vs. Output Power



**Figure 3.** Gain vs Output Power



**Figure 3.** IMD 3 vs Output Power

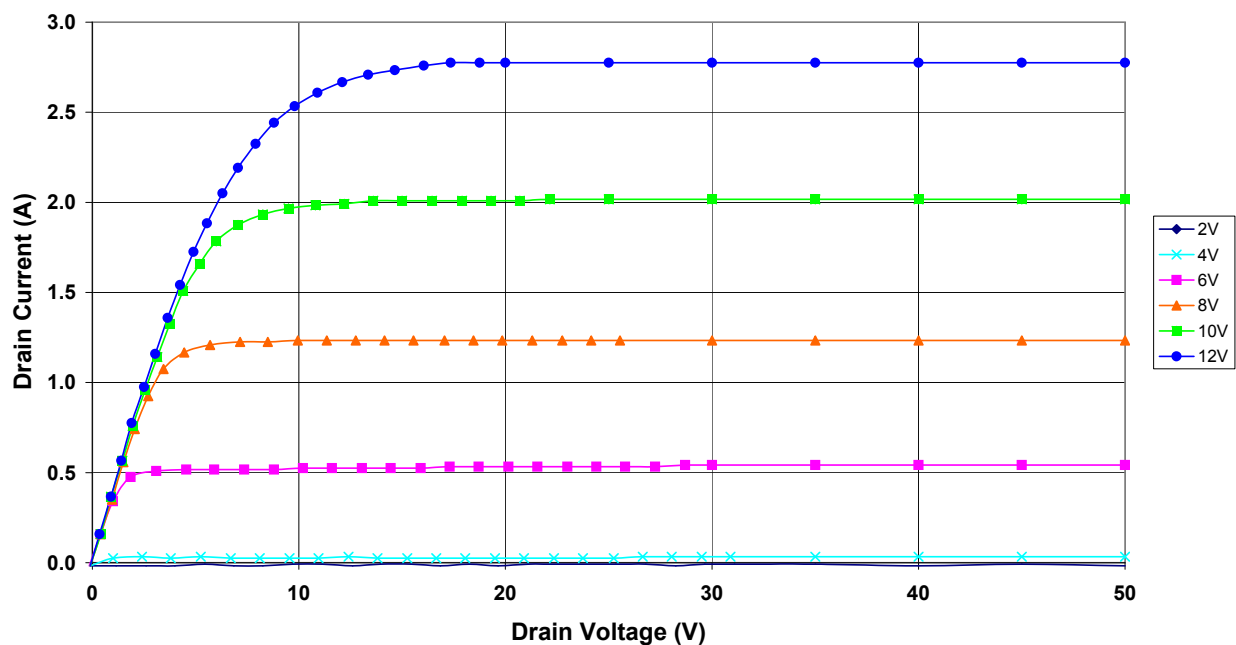


Figure 5 – Typical IV Characteristics.

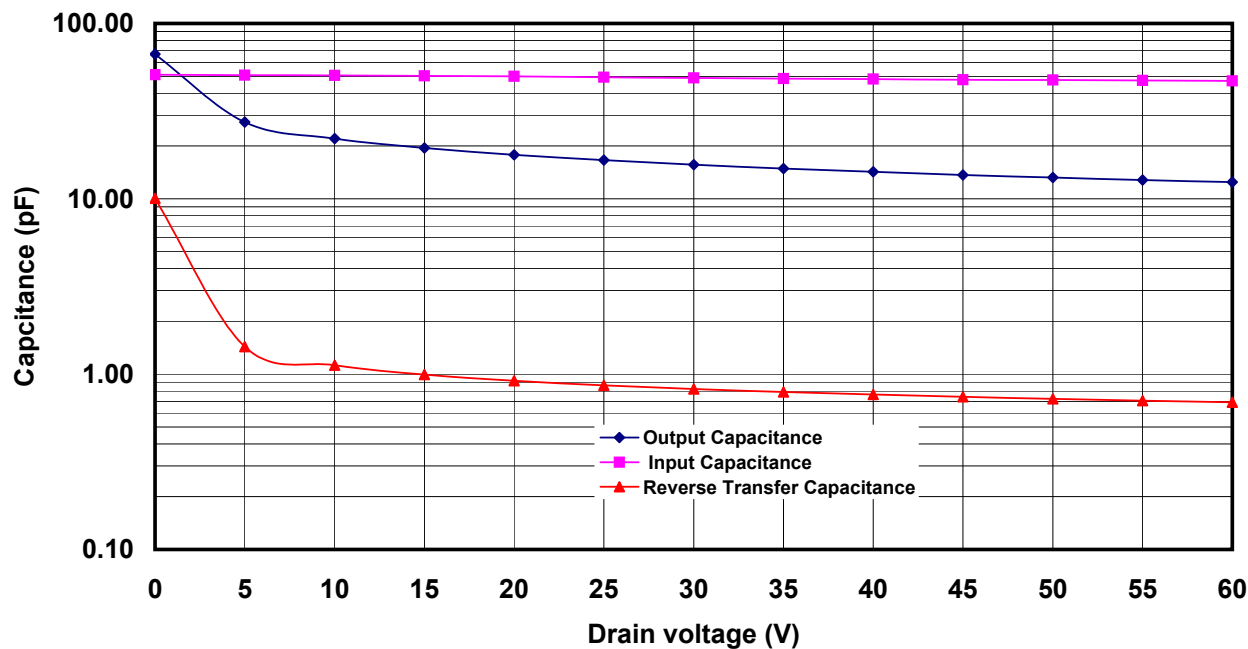
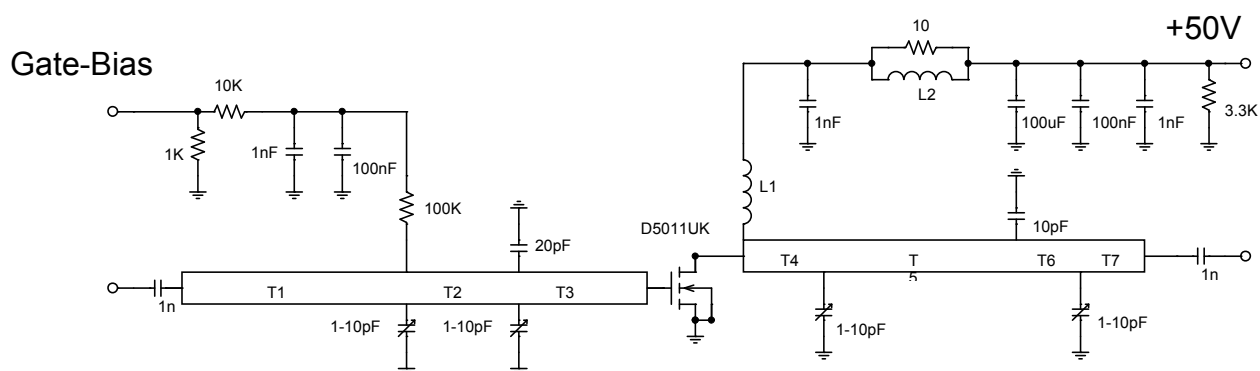


Figure 6 – Typical CV Characteristics.



## D5011UK 500MHz TEST FIXTURE

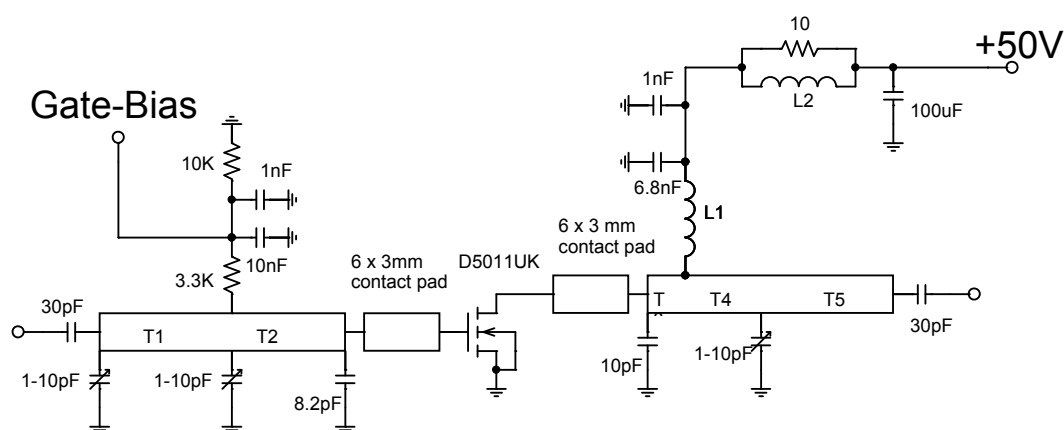
Substrate 0.8mm FR4,  $\epsilon_r=2.2$

All microstrip lines  $W=2.2\text{mm}$

T1 37.5mm  
T2 14.2mm  
T3 10mm  
T4 12.5mm  
T5 30mm  
T6 6mm  
T7 12.5mm

L1 5.5 turns 20swg enamelled copper wire, 7mm i.d.

L2 1.5 turns 24swg enamelled copper wire on Siemens B62152A7X 2 hole core



## D5011UK 1GHz TEST FIXTURE

Substrate 0.8mm PTFE/glass,  $\epsilon_r=2.5$

All microstrip lines  $W=2.2\text{mm}$

T1 35mm

T2 15mm

T3 4mm

T4 14 mm

T5 32mm

L1 7.5 turns 24swg enamelled copper wire, 3mm i.d.

L2 1.5 turns 24swg enamelled copper wire on ferrite core