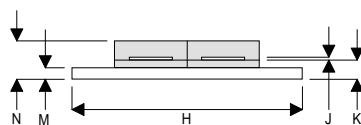
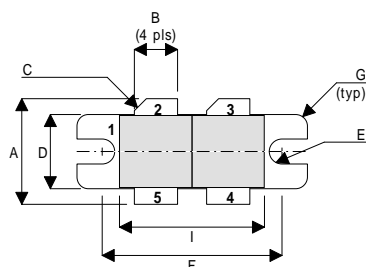


MECHANICAL DATA



DH

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   | 13.97 | 0.26 | 0.550  | 0.010 |
| B   | 5.72  | 0.13 | 0.225  | 0.005 |
| C   | 45°   | 5°   | 45°    | 5°    |
| D   | 9.78  | 0.13 | 0.385  | 0.005 |
| E   | 1.65R | 0.13 | 0.065R | 0.005 |
| F   | 23.75 | 0.13 | 0.935  | 0.005 |
| G   | 1.52R | 0.13 | 0.060R | 0.005 |
| H   | 30.48 | 0.13 | 1.200  | 0.005 |
| I   | 19.17 | 0.26 | 0.755  | 0.010 |
| J   | 0.13  | 0.02 | 0.005  | 0.001 |
| K   | 2.54  | 0.13 | 0.100  | 0.005 |
| M   | 1.52  | 0.13 | 0.060  | 0.005 |
| N   | 5.08  | 0.50 | 0.200  | 0.020 |

**GOLD METALLISED  
 MULTI-PURPOSE SILICON  
 DMOS RF FET  
 100W – 28V – 500MHz  
 PUSH-PULL**

FEATURES

- SIMPLIFIED AMPLIFIER DESIGN
- SUITABLE FOR BROAD BAND APPLICATIONS
- LOW  $C_{rss}$
- SIMPLE BIAS CIRCUITS
- LOW NOISE
- HIGH GAIN – 10 dB MINIMUM

APPLICATIONS

- HF/VHF/UHF COMMUNICATIONS  
 from 1 MHz to 500 MHz

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

|              |  |                         |
|--------------|--|-------------------------|
| $P_D$        | Power Dissipation                      | 290W                    |
| $BV_{DSS}$   | Drain – Source Breakdown Voltage *     | 70V                     |
| $BV_{GSS}$   | Gate – Source Breakdown Voltage *      | $\pm 20V$               |
| $I_{D(sat)}$ | Drain Current *                        | 15A                     |
| $T_{stg}$    | Storage Temperature                    | $-65$ to $150^{\circ}C$ |
| $T_j$        | Maximum Operating Junction Temperature | $200^{\circ}C$          |

\* 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  | V <sub>GS</sub> = 0   | I <sub>D</sub> = 100mA            | 70   | V      |
| I <sub>D</sub> DSS  | Zero Gate Voltage Drain Current | V <sub>DS</sub> = 28V | V <sub>GS</sub> = 0               |      | 3 mA   |
| I <sub>G</sub> DSS  | 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> = 3A               | 2.4  | S      |
| <b>TOTAL DEVICE</b> |                                 |                       |                                   |      |        |
| G <sub>PS</sub>     | Common Source Power Gain        | P <sub>O</sub> = 100W |                                   | 10   | dB     |
| η                   | Drain Efficiency                | V <sub>DS</sub> = 28V | I <sub>DQ</sub> = 1.2A            | 50   | %      |
| VSWR                | Load Mismatch Tolerance         | f = 500MHz            |                                   | 20:1 | —      |
| <b>PER SIDE</b>     |                                 |                       |                                   |      |        |
| C <sub>i</sub> SS   | Input Capacitance               | V <sub>DS</sub> = 28V | V <sub>GS</sub> = -5V f = 1MHz    |      | 180 pF |
| C <sub>o</sub> SS   | Output Capacitance              | V <sub>DS</sub> = 28V | V <sub>GS</sub> = 0 f = 1MHz      |      | 90 pF  |
| C <sub>r</sub> SS   | Reverse Transfer Capacitance    | V <sub>DS</sub> = 28V | V <sub>GS</sub> = 0 f = 1MHz      |      | 7.5 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. 0.6°C / W |
|-----------------------|------------------------------------|----------------|

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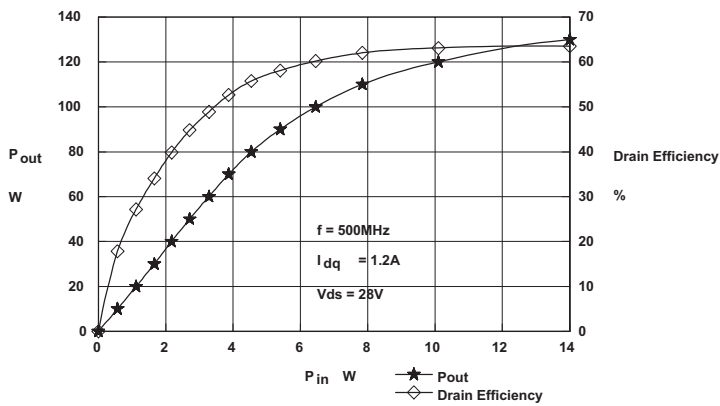


Figure 1 - Power Output and Efficiency vs. Power Input.

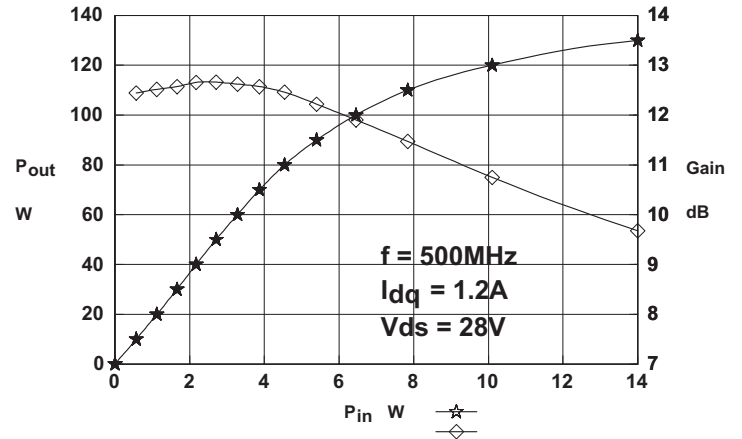


Figure 2 - Power Output & Gain vs. Power Input.

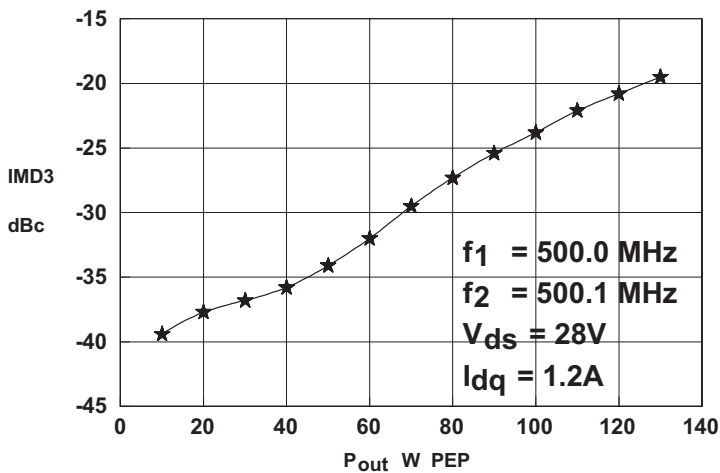


Figure 3 - IMD vs. Output Power.

## D1012UK OPTIMUM SOURCE AND LOAD IMPEDANCE

| Frequency<br>MHz | Z <sub>S</sub><br>Ω | Z <sub>L</sub><br>Ω |
|------------------|---------------------|---------------------|
| 500              | 2.0 - j2.2          | 2.6 - j0.6          |

N.B. Impedances measured terminal to terminal

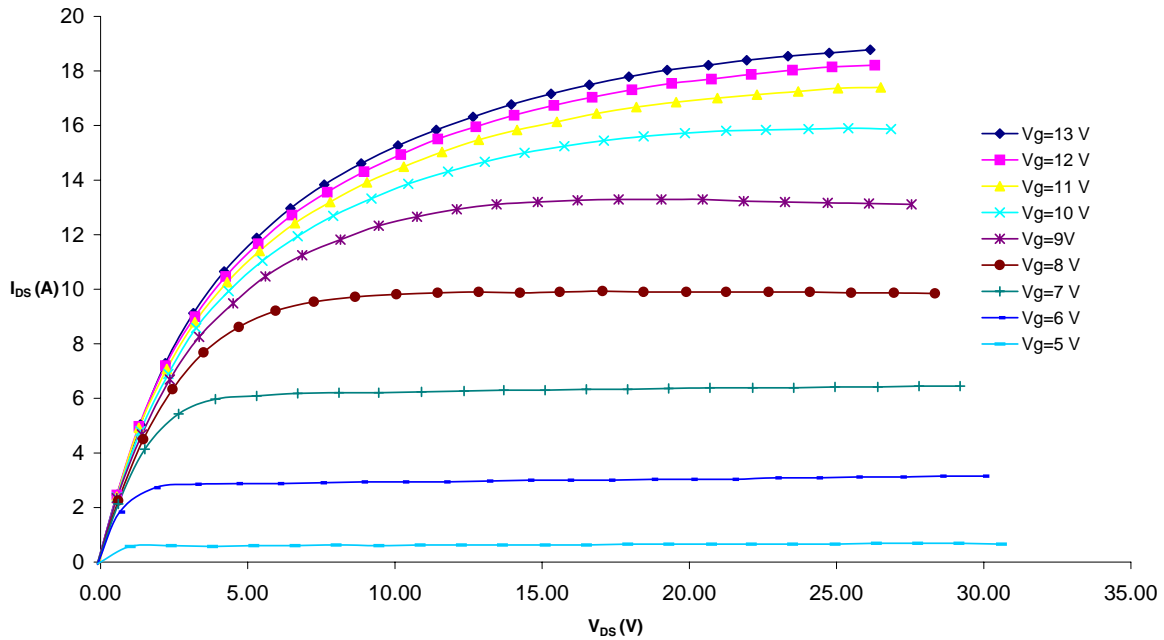


Figure 4 – Typical IV Characteristics.

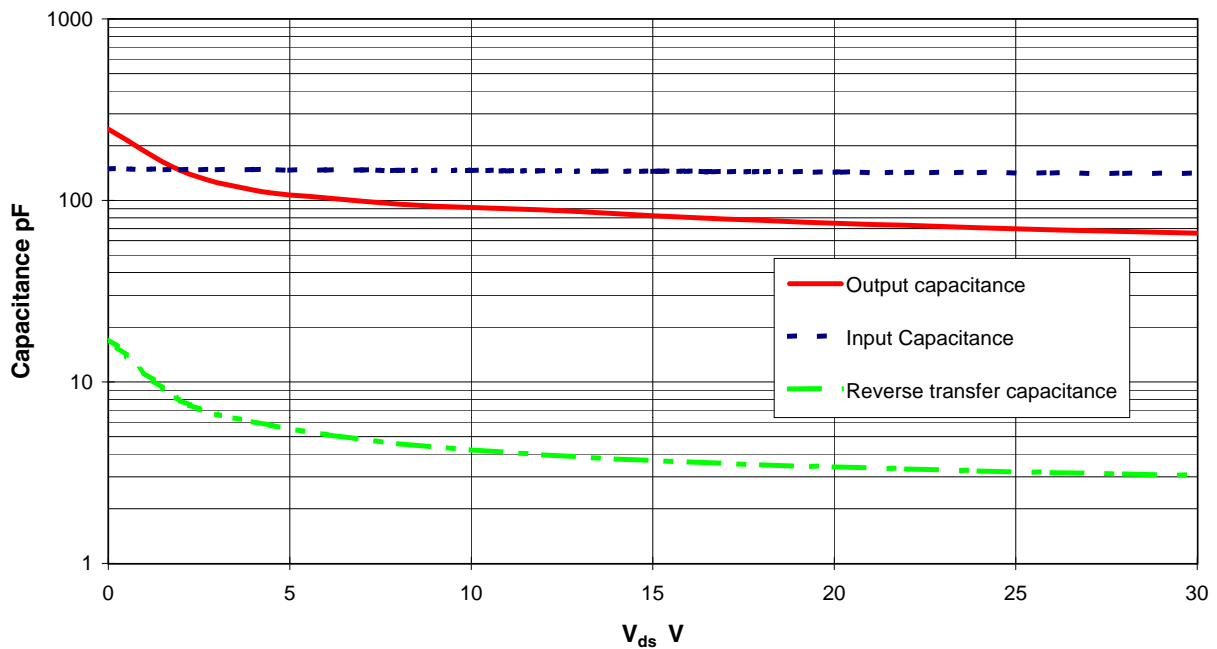
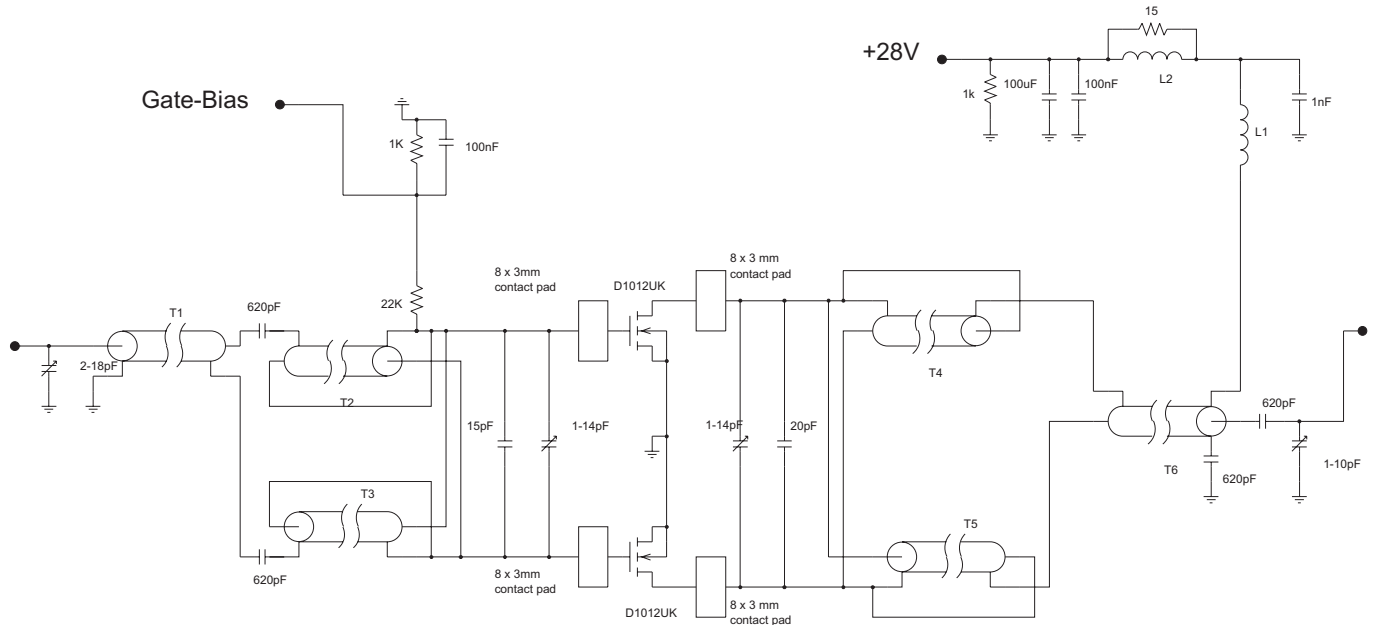


Figure 5 – Typical CV Characteristics.

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## D1012UK 500MHz TEST FIXTURE

|          |           |  |
|----------|-----------|--|
| T1,6     | 65mm      | 50 Ohm UT85 semi-rigid coax                            |
| T2,3,4,5 | 75mm      | 15 Ohm UT85-15 semi-rigid coax                         |
| L1       | 6 turns   | 21 swg enamelled copper wire, 3mm i.d.                 |
| L2       | 8.5 turns | 19 swg enamelled copper wire on Fair-Rite FT82-43 core |

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