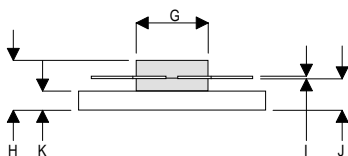
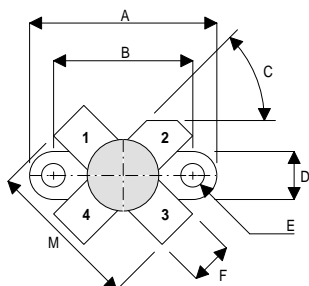


MECHANICAL DATA



DA

PIN 1 SOURCE PIN 2 DRAIN
 PIN 3 SOURCE PIN 4 GATE

| DIM | mm | Tol. | Inches | Tol. |
|-----|-------|------|-----------|-------|
| A | 24.76 | 0.13 | 0.975 | 0.005 |
| B | 18.42 | 0.13 | 0.725 | 0.005 |
| C | 45° | 5° | 45° | 5° |
| D | 6.35 | 0.13 | 0.25 | 0.005 |
| E | 3.17 | 0.13 | 0.125 DIA | 0.005 |
| F | 5.71 | 0.13 | 0.225 | 0.005 |
| G | 9.52 | 0.13 | 0.375 | 0.005 |
| H | 6.60 | REF | 0.260 | REF |
| I | 0.13 | 0.02 | 0.005 | 0.001 |
| J | 4.32 | 0.13 | 0.170 | 0.005 |
| K | 2.54 | 0.13 | 0.100 | 0.005 |
| M | 20.32 | 0.25 | 0.800 | 0.010 |

**GOLD METALLISED
 MULTI-PURPOSE SILICON
 DMOS RF FET
 40W – 28V – 175MHz
 SINGLE ENDED**

FEATURES

- SIMPLIFIED AMPLIFIER DESIGN
- SUITABLE FOR BROAD BAND APPLICATIONS
- LOW C_{rss}
- SIMPLE BIAS CIRCUITS
- LOW NOISE
- HIGH GAIN – 16 dB MINIMUM

APPLICATIONS

- HF/VHF/UHF COMMUNICATIONS
 from 1 MHz to 175 MHz

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

| | | |
|--------------|--|-------------------------|
| P_D | Power Dissipation | 87W |
| BV_{DSS} | Drain – Source Breakdown Voltage | 70V |
| BV_{GSS} | Gate – Source Breakdown Voltage | $\pm 20V$ |
| $I_{D(sat)}$ | Drain Current | 10A |
| T_{stg} | Storage Temperature | -65 to $150^{\circ}C$ |
| T_j | Maximum Operating Junction Temperature | $200^{\circ}C$ |

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_{case} = 25°C unless otherwise stated)

| Parameter | Test Conditions | Min. | Typ. | Max. | Unit |
|---|--|------|------|------|------|
| B _V DSS Drain–Source Breakdown Voltage | V _{GS} = 0 I _D = 100mA | 70 | | | V |
| I _D DSS Zero Gate Voltage Drain Current | V _{DS} = 28V V _{GS} = 0 | | | 2 | mA |
| I _G DSS Gate Leakage Current | V _{GS} = 20V V _{DS} = 0 | | | 1 | μA |
| V _{GS(th)} Gate Threshold Voltage* | I _D = 10mA V _{DS} = V _{GS} | 1 | | 7 | V |
| g _{fs} Forward Transconductance* | V _{DS} = 10V I _D = 2A | 1.6 | | | S |
| G _{PS} Common Source Power Gain | P _O = 40W | 16 | | | dB |
| η Drain Efficiency | V _{DS} = 28V I _{DQ} = 0.2A | 50 | | | % |
| VSWR Load Mismatch Tolerance | f = 175MHz | 20:1 | | | — |
| C _{iss} Input Capacitance | V _{DS} = 28V V _{GS} = -5V f = 1MHz | | | 120 | pF |
| C _{oss} Output Capacitance | V _{DS} = 28V V _{GS} = 0 f = 1MHz | | | 60 | pF |
| C _{rss} Reverse Transfer Capacitance | V _{DS} = 28V V _{GS} = 0 f = 1MHz | | | 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 _{THj-case} | Thermal Resistance Junction – Case | Max. 2.0°C / W |
|-----------------------|------------------------------------|----------------|

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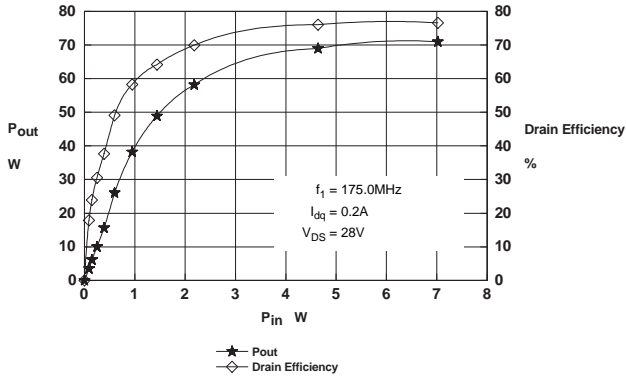


Figure 1 – Power Output and Efficiency vs. Power Input.

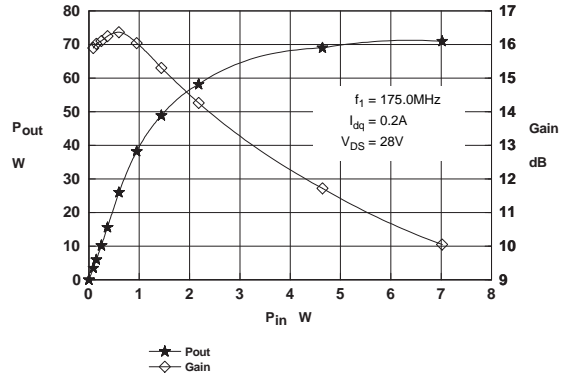


Figure 2 – Power Output & Gain vs. Power Input.

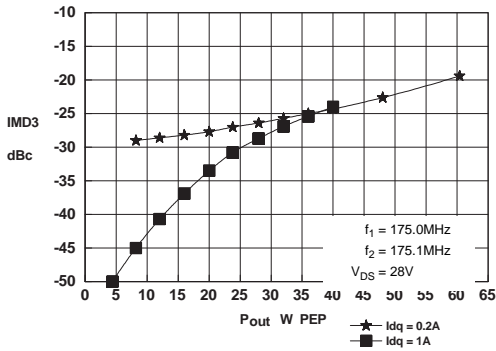


Figure 3 – IMD vs. Output Power.

D1002UK
OPTIMUM SOURCE AND LOAD IMPEDANCE

| Frequency MHz | Z _S Ω | Z _L Ω |
|------------------|---------------------|---------------------|
| 175MHz | 3.8 + j6.5 | 4.6 + j0.4 |

Typical S Parameters

! Vds=28V Idq=0.2A
MHZ S MA R 50

| !Freq MHz | S11 | | S21 | | S12 | | S22 | |
|--------------|------|------|------|-----|-------|-----|------|------|
| | mag | ang | mag | ang | mag | ang | mag | ang |
| 50 | 0.76 | -144 | 15.6 | 86 | 0.026 | 1 | 0.58 | -119 |
| 100 | 0.79 | -155 | 7.1 | 61 | 0.021 | -9 | 0.66 | -132 |
| 150 | 0.84 | -163 | 4.2 | 43 | 0.012 | -3 | 0.74 | -144 |
| 200 | 0.87 | -169 | 2.7 | 33 | 0.009 | 47 | 0.81 | -154 |
| 250 | 0.90 | -176 | 1.9 | 23 | 0.016 | 76 | 0.85 | -163 |
| 300 | 0.92 | 177 | 1.5 | 20 | 0.025 | 87 | 0.88 | -172 |
| 350 | 0.94 | 170 | 1.1 | 11 | 0.033 | 85 | 0.91 | -180 |
| 400 | 0.96 | 163 | 0.9 | 6 | 0.046 | 82 | 0.94 | 172 |
| 450 | 0.97 | 156 | 0.7 | -2 | 0.051 | 78 | 0.96 | 165 |
| 500 | 0.98 | 150 | 0.6 | -8 | 0.062 | 76 | 0.98 | 157 |
| 550 | 0.98 | 144 | 0.4 | -12 | 0.068 | 74 | 0.98 | 152 |
| 600 | 0.98 | 141 | 0.4 | -14 | 0.078 | 67 | 0.98 | 148 |

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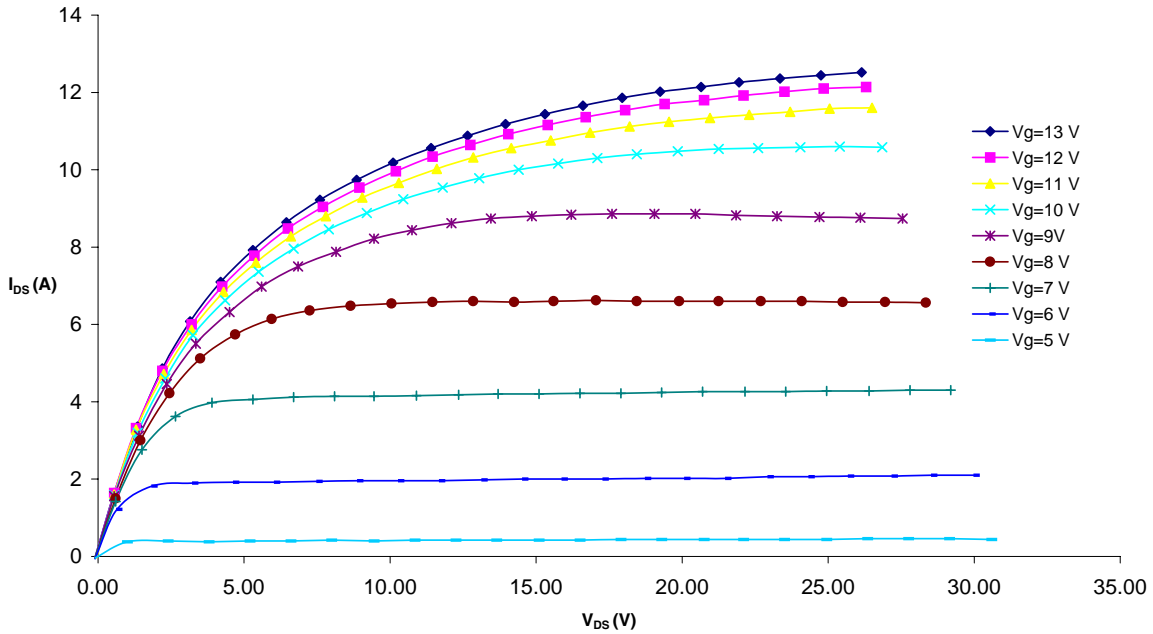


Figure 4 – Typical IV Characteristics.

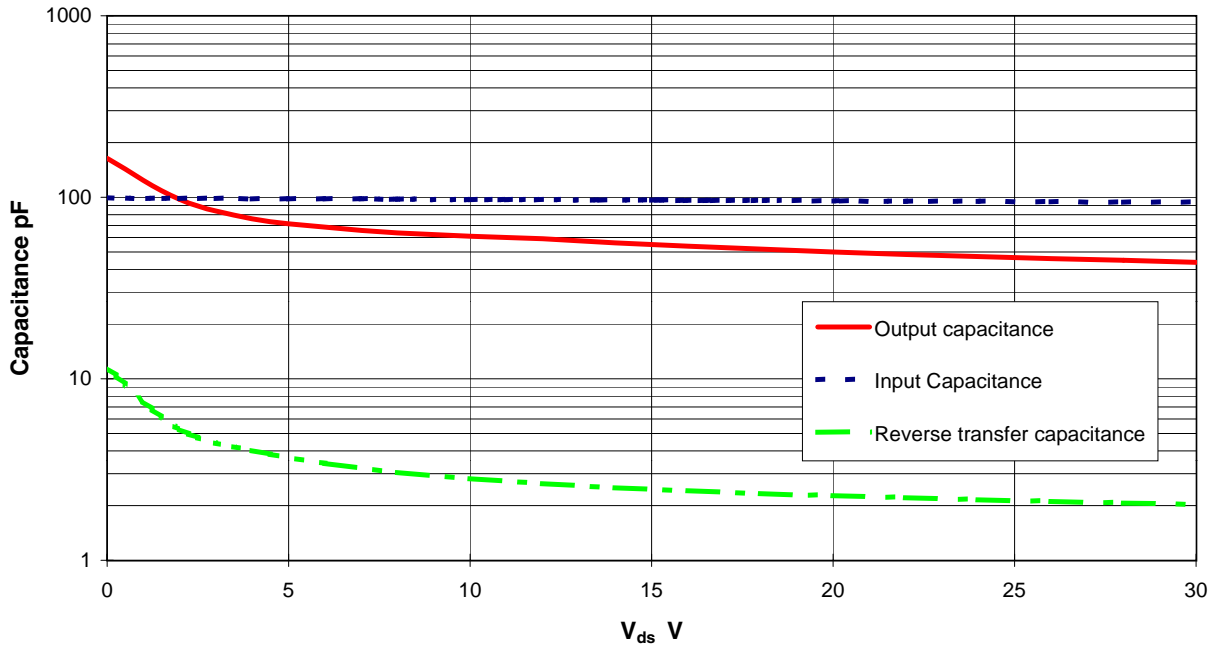
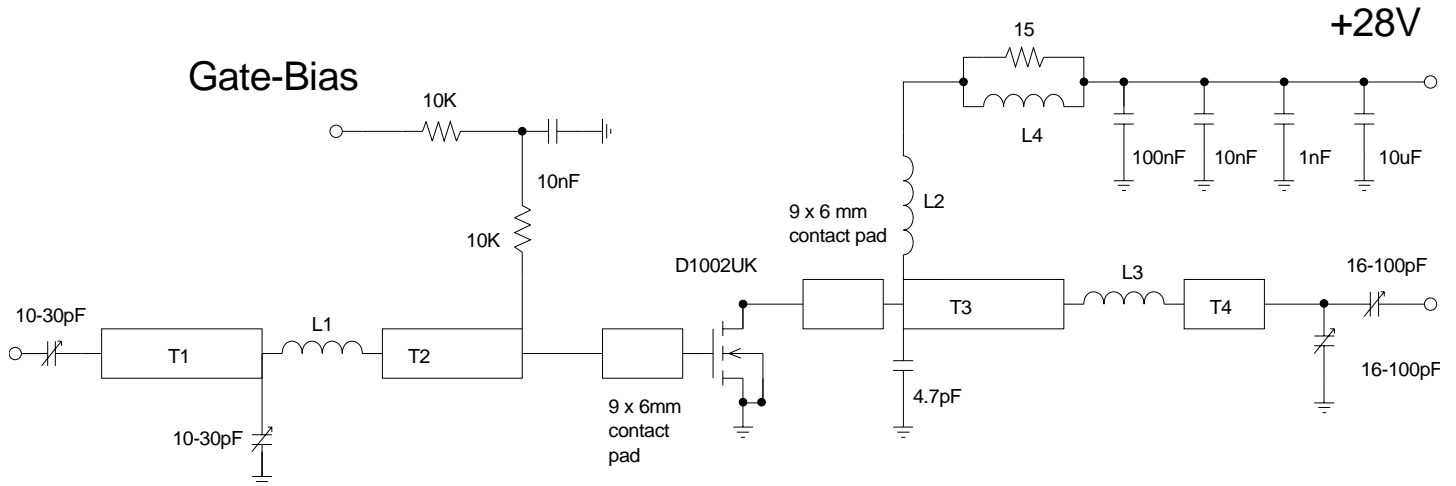


Figure 5 – Typical CV Characteristics.

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D1002UK 175MHz TEST FIXTURE

Substrate 1.6mm PTFE/glass, Er=2.5
All microstrip lines W=4.4mm

| | | | |
|----|------|----|---|
| T1 | 10mm | L1 | 1.5 turns 22swg enamelled copper wire, 6mm i.d. |
| T2 | 13mm | L2 | 10 turns 19swg enamelled copper wire, 6mm i.d. |
| T3 | 12mm | L3 | 1.5 turns 22swg enamelled copper wire, 6mm i.d. |
| T4 | 4mm | L4 | 13.5 turns 19swg enamelled copper wire on Siemens B64920A618X830 ferrite core |

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