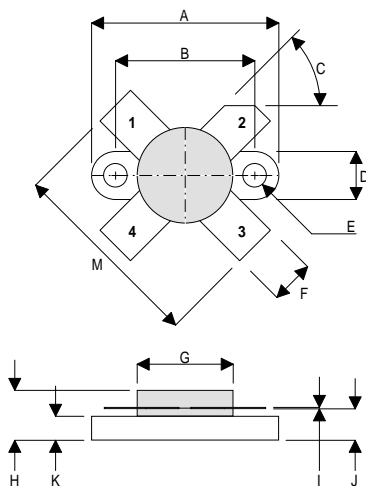


MECHANICAL DATA



DM

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 Dia. | 0.13 | 0.125 Dia. | 0.005 |
| F | 5.71 | 0.13 | 0.225 | 0.005 |
| G | 12.7 Dia. | 0.13 | 0.500 Dia. | 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 | 3.17 | 0.13 | 0.125 | 0.005 |
| M | 26.16 | 0.25 | 1.03 | 0.010 |

**GOLD METALLISED
 MULTI-PURPOSE SILICON
 DMOS RF FET
 80W – 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 COMMUNICATIONS
 from 1 MHz to 175 MHz

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

| | | |
|--------------|--|-------------------------|
| P_D | Power Dissipation | 146W |
| BV_{DSS} | Drain – Source Breakdown Voltage | 70V |
| BV_{GSS} | Gate – Source Breakdown Voltage | $\pm 20V$ |
| $I_{D(sat)}$ | Drain Current | 20A |
| 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 D _{SS} Drain-Source Breakdown Voltage | V _{GS} = 0 I _D = 100mA | 70 | | | V |
| I _{DSS} Zero Gate Voltage Drain Current | V _{DS} = 28V V _{GS} = 0 | | | 2 | mA |
| I _{GSS} 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 = 4A | 3.2 | | | S |
| G _{PS} Common Source Power Gain | P _O = 80W | 16 | | | dB |
| η Drain Efficiency | V _{DS} = 28V I _{DQ} = 0.4A | 50 | | | % |
| VSWR Load Mismatch Tolerance | f = 175MHz | 20:1 | | | — |
| C _{iSS} Input Capacitance | V _{DS} = 0 V _{GS} = -5V f = 1MHz | | | 240 | pF |
| C _{oSS} Output Capacitance | V _{DS} = 28V V _{GS} = 0 f = 1MHz | | | 100 | pF |
| C _{rSS} Reverse Transfer Capacitance | V _{DS} = 28V V _{GS} = 0 f = 1MHz | | | 10 | 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. 1.2°C / W |
|-----------------------|------------------------------------|----------------|

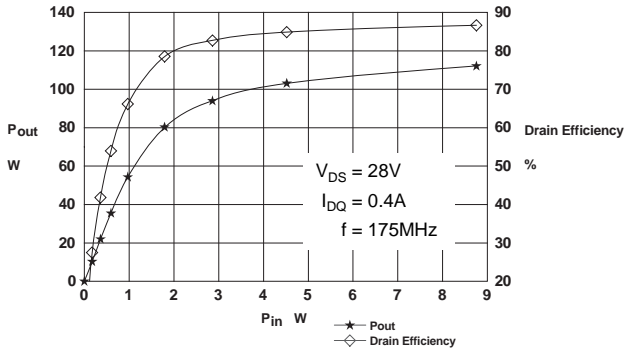


Figure 1 – Power Output and Efficiency vs. Power Input.

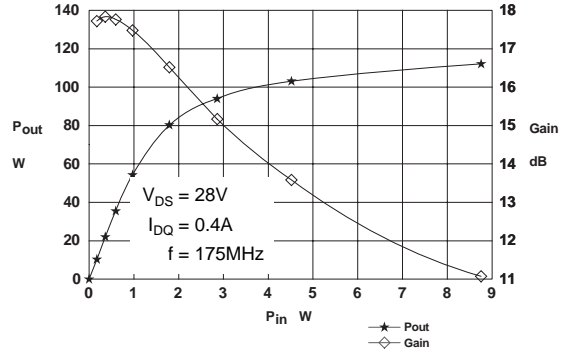


Figure 2 – Power Output & Gain vs. Power Input.

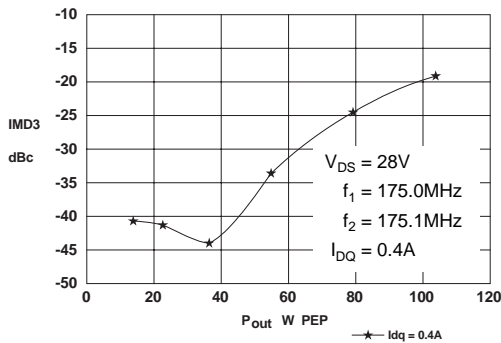


Figure 3 – IMD vs. Output Power.

D1005UK
OPTIMUM SOURCE AND LOAD IMPEDANCE

| Frequency MHz | Z_S Ω | Z_L Ω |
|------------------|-------------------|-------------------|
| 175MHz | $3 + j1$ | $3 - j2.5$ |

Typical S Parameters

! $V_{DS} = 28V$, $I_{DQ} = 0.3A$
MHz S M A R 50

| !Freq MHz | S11 mag ang | S21 mag ang | S12 mag ang | S22 mag ang |
|--------------|----------------|----------------|----------------|----------------|
| 50 | 0.95 -58 | 4.29 94 | 0.006 34 | 0.66 -162 |
| 100 | 0.94 -79 | 3.32 81 | 0.006 57 | 0.75 -164 |
| 150 | 0.94 -104 | 2.26 65 | 0.01 98 | 0.84 -169 |
| 200 | 0.93 -124 | 1.59 53 | 0.019 107 | 0.88 -175 |
| 250 | 0.94 -140 | 1.2 41 | 0.031 103 | 0.92 -180 |
| 300 | 0.95 -152 | 0.94 34 | 0.042 102 | 0.93 176 |
| 350 | 0.96 -161 | 0.72 22 | 0.052 92 | 0.96 170 |
| 400 | 0.96 -169 | 0.59 19 | 0.064 91 | 0.98 164 |
| 450 | 0.97 -177 | 0.46 11 | 0.073 84 | 1.00 159 |
| 500 | 0.98 177 | 0.35 -2 | 0.091 82 | 1.00 154 |

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.

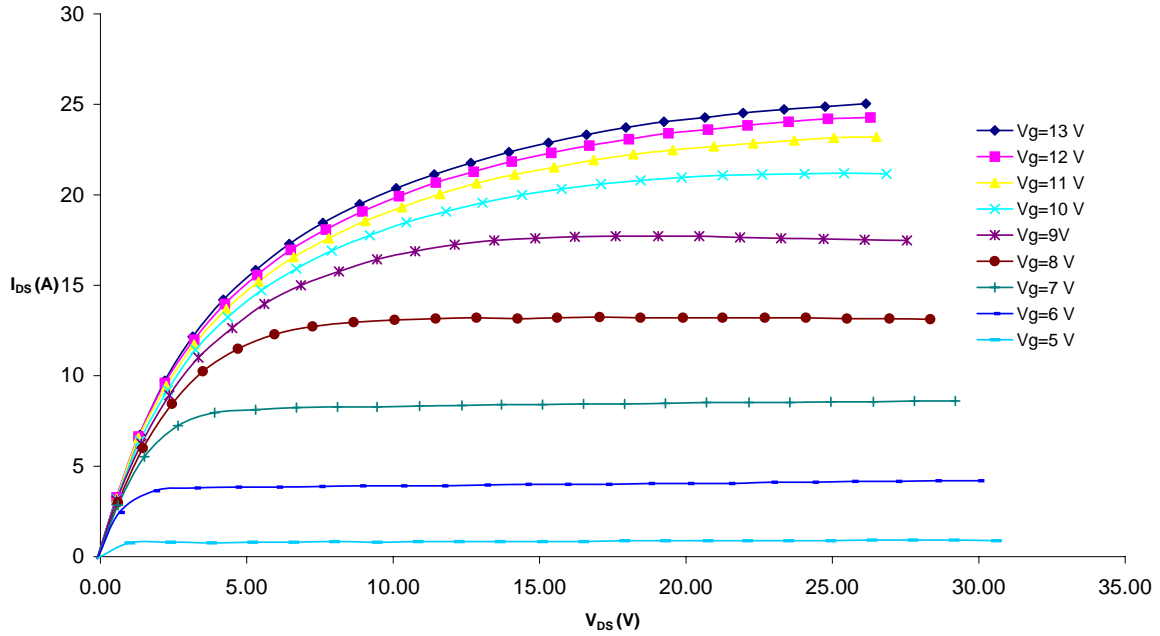


Figure 4 – Typical IV Characteristics.

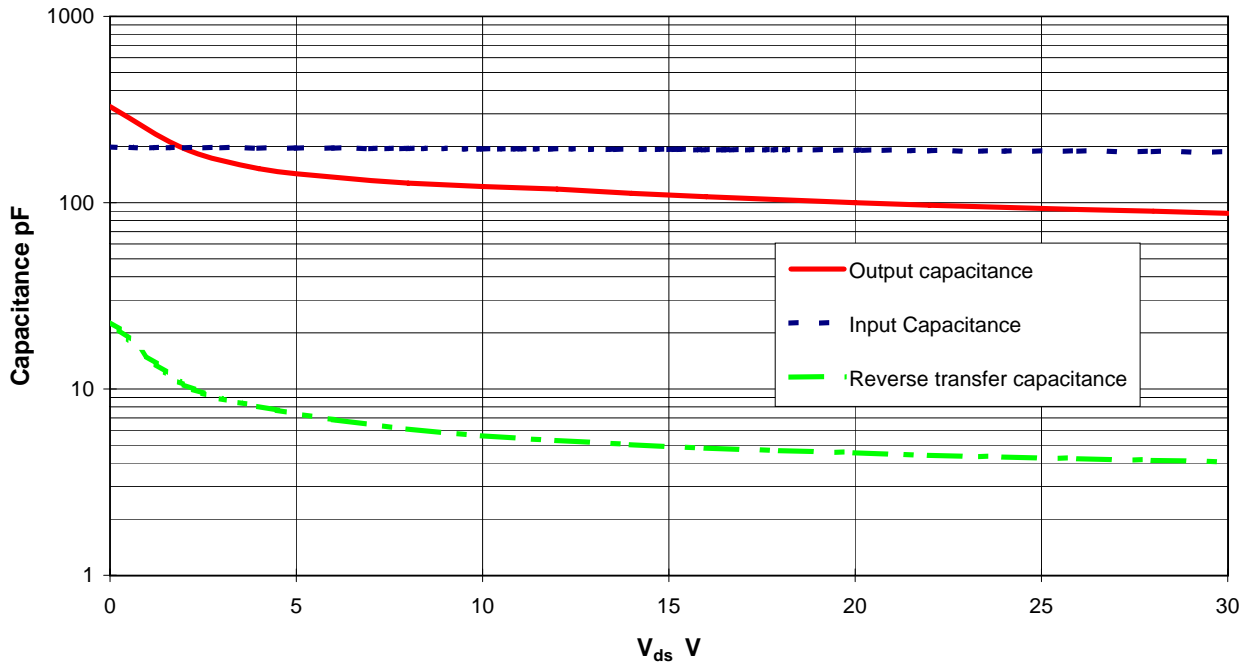
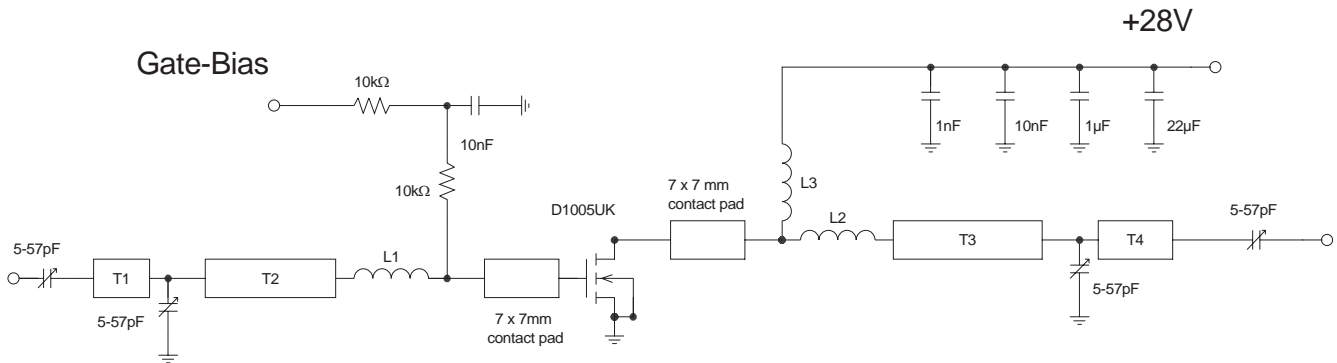


Figure 5 – Typical CV Characteristics.

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.



D1005UK 175MHz TEST FIXTURE

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

| | | | |
|----|-------|----|---|
| T1 | 8mm | L1 | Hairpin loop 16swg 15.5mm dia |
| T2 | 22mm | L2 | Hairpin loop 16swg 10mm dia |
| T3 | 18mm | L3 | 11 turns 18swg enamelled copper wire, 10mm i.d. |
| T4 | 4.5mm | | |

Mouser Electronics

Authorized Distributor

Click to View Pricing, Inventory, Delivery & Lifecycle Information:

[TT Electronics:](#)

[D1005UK](#)