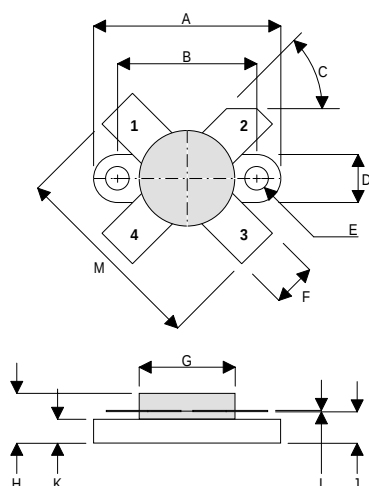


MECHANICAL DATA

GOLD METALLISED MULTI-PURPOSE SILICON DMOS RF FET 60W – 28V – 175MHz SINGLE ENDED



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

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	117W
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	$200^{\circ}C$

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
BV _{DSS} 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			1	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 = 3A	2.4			S
G _{PS} Common Source Power Gain	P _O = 60W	16			dB
η Drain Efficiency	V _{DS} = 28V I _{DQ} = 0.3A	50			%
VSWR Load Mismatch Tolerance	f = 175MHz	20:1			—
C _{iss} Input Capacitance	V _{DS} = 0 V _{GS} = –5V f = 1MHz			180	pF
C _{oss} Output Capacitance	V _{DS} = 28V V _{GS} = 0 f = 1MHz			90	pF
C _{rss} Reverse Transfer Capacitance	V _{DS} = 28V V _{GS} = 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 _{THj-case}	Thermal Resistance Junction – Case	Max. 1.5°C / W
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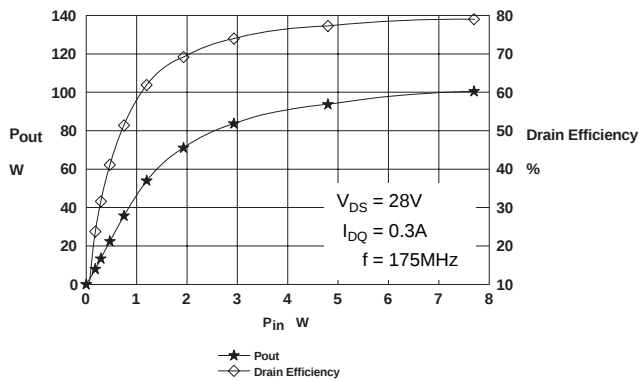


Figure 1 – Power Output and Efficiency vs. Power Input.

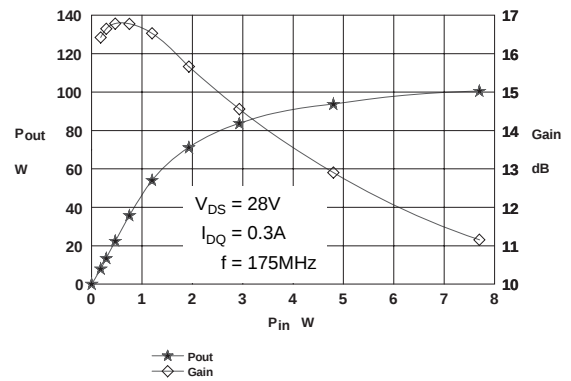


Figure 2 – Power Output & Gain vs. Power Input.

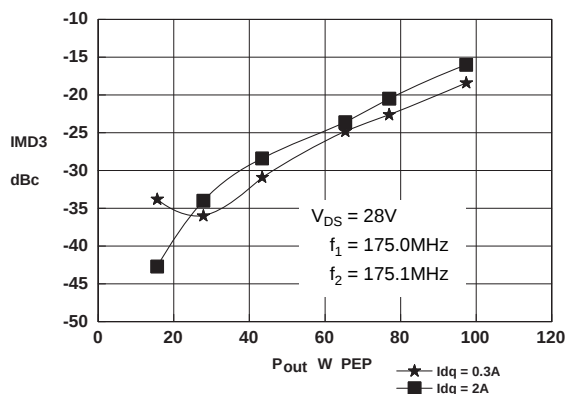


Figure 3 – IMD vs. Output Power.

D1003UK OPTIMUM SOURCE AND LOAD IMPEDANCE

Frequency MHz	Z_S Ω	Z_L Ω
175MHz	$2.0 - j4.3$	$3.7 - j4.5$

Typical S Parameters

! $V_{DS} = 28V$, $I_{DQ} = 0.3A$

MHz S MA R 50

!Freq MHz	S11 mag ang	S21 mag ang	S12 mag ang	S22 mag ang
70	0.83 -156.8	6.9 59.9	0.018 -16.7	0.65 -137.0
100	0.87 -163.3	4.3 46.9	0.012 -15.5	0.75 -147.2
150	0.91 -171.0	2.3 31.5	0.007 37.1	0.84 -159.7
200	0.93 -177.6	1.4 22.6	0.013 81.0	0.90 -168.8
250	0.95 177.6	0.9 14.3	0.022 86.6	0.93 -175.0
300	0.97 173.6	0.7 10.5	0.032 86.9	0.95 179.5
350	0.96 168.6	0.5 4.0	0.039 80.0	0.96 175.3
400	0.98 165.0	0.4 3.9	0.048 80.0	0.98 172.0
450	0.98 161.9	0.3 2.9	0.053 77.5	0.98 169.8
500	0.97 159.3	0.3 2.1	0.064 74.8	0.97 166.5

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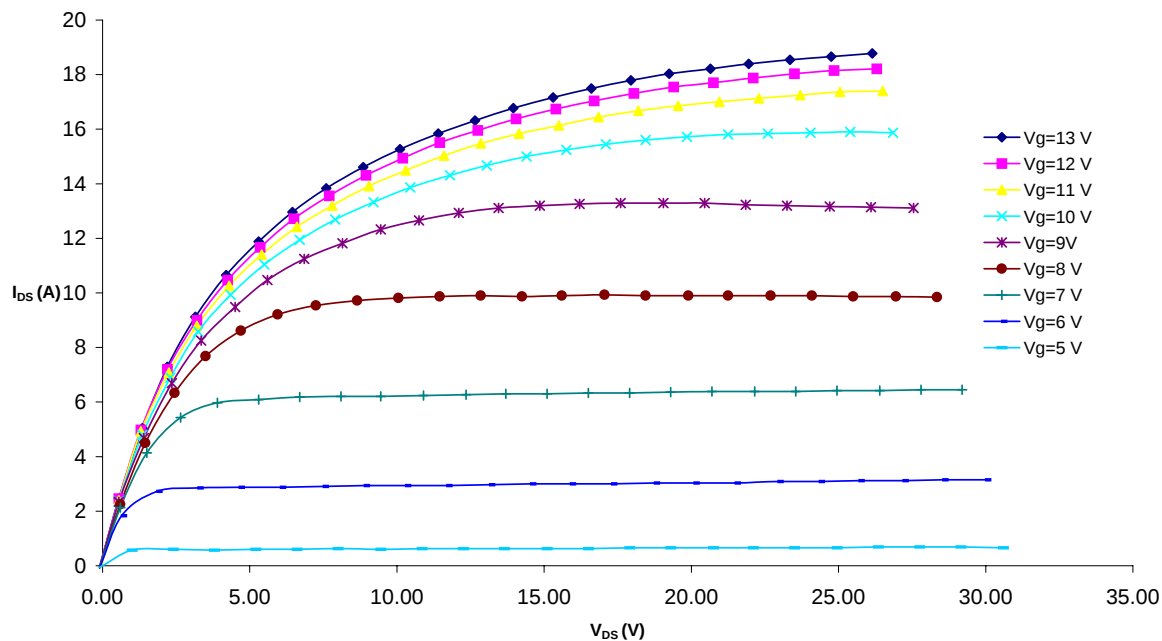


Figure 4 – Typical IV Characteristics.

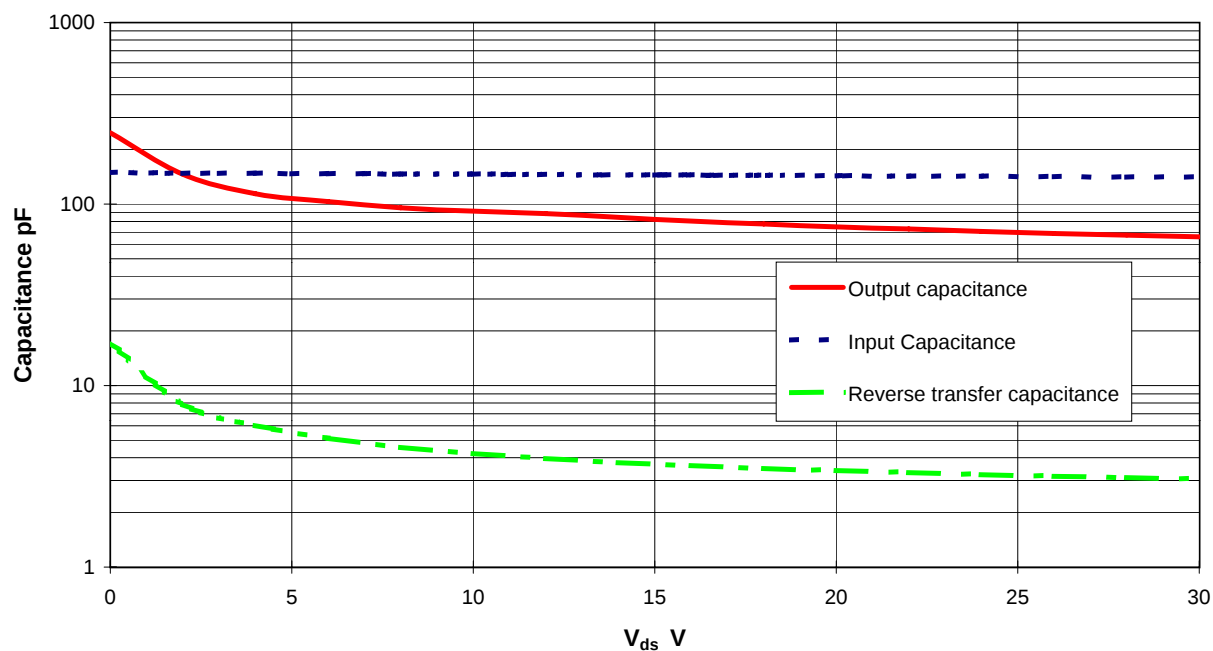
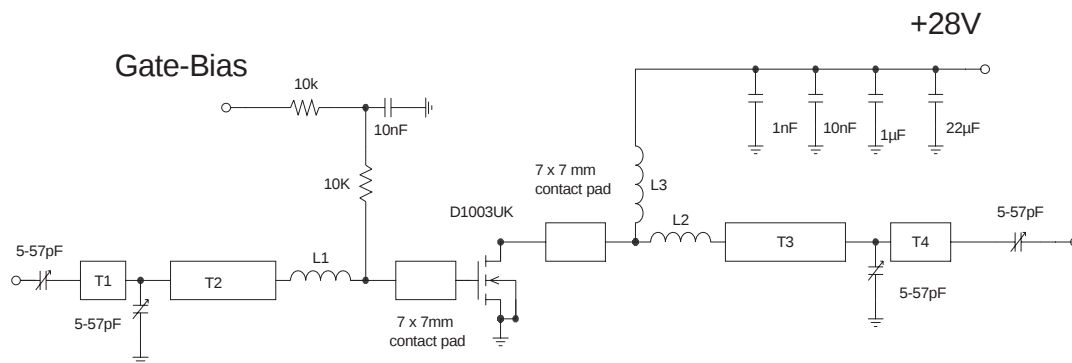


Figure 5 – Typical CV Characteristics.



D1003UK 175MHz TEST FIXTURE

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

T1 8mm
T2 22mm
T3 18mm
T4 4.5mm

L1 Hairpin loop 16swg 15.5mm dia.
L2 Hairpin loop 16swg 10mm dia.
L3 11 turns 18swg enamelled copper wire, 10mm i. d.