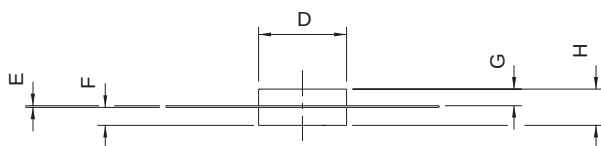
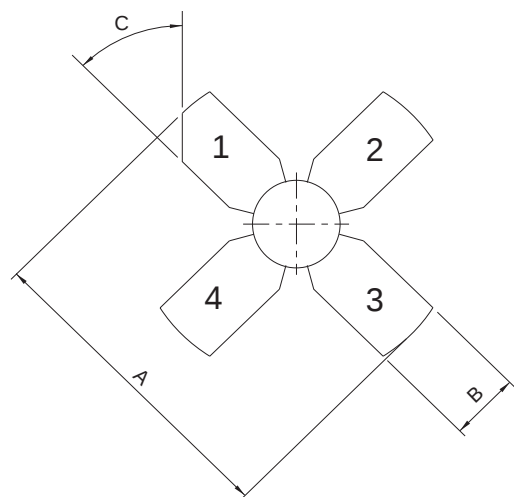


MECHANICAL DATA



DW

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

DIM	mm	Tol.	Inches	Tol.
A	26.16	0.38	1.030	0.015
B	5.72	0.13	0.225	0.005
C	45°	5°	45°	5°
D	7.11	0.13	0.280	0.005
E	0.13	0.03	0.005	0.001
F	1.52	0.13	0.055	0.005
G	0.43	0.20	0.060	0.008
H	7.67	REF	0.120	REF

GOLD METALLISED MULTI-PURPOSE SILICON DMOS RF FET 20W – 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	50W
BV_{DSS}	Drain – Source Breakdown Voltage	70V
BV_{GSS}	Gate – Source Breakdown Voltage	$\pm 20V$
$I_{D(sat)}$	Drain Current	5A
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 = 1A	0.8			S
G _{PS} Common Source Power Gain	P _O = 20W	16			dB
η Drain Efficiency	V _{DS} = 28V I _{DQ} = 0.1A	50			%
VSWR Load Mismatch Tolerance	f = 175MHz	20:1			—
C _{iss} Input Capacitance	V _{DS} = 28V V _{GS} = –5V f = 1MHz			60	pF
C _{oss} Output Capacitance	V _{DS} = 28V V _{GS} = 0 f = 1MHz			30	pF
C _{rss} Reverse Transfer Capacitance	V _{DS} = 28V V _{GS} = 0 f = 1MHz			2.5	pF
R _{dson} Saturation Resistance	V _{GS} = 20V I _{DS} = 2.5A		1		Ω

* 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. 3.5°C / W
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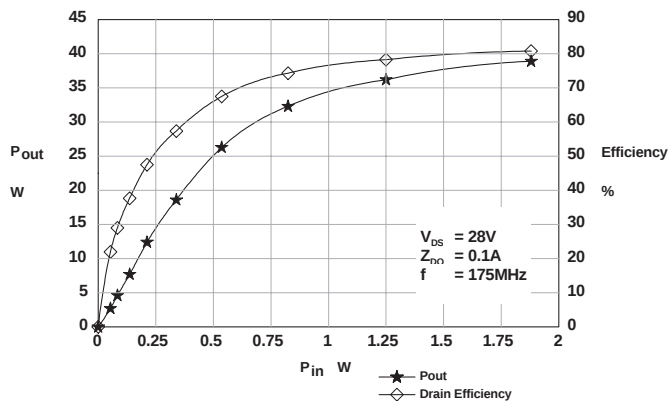


Figure 1 – Power Output and Efficiency vs. Power Input.

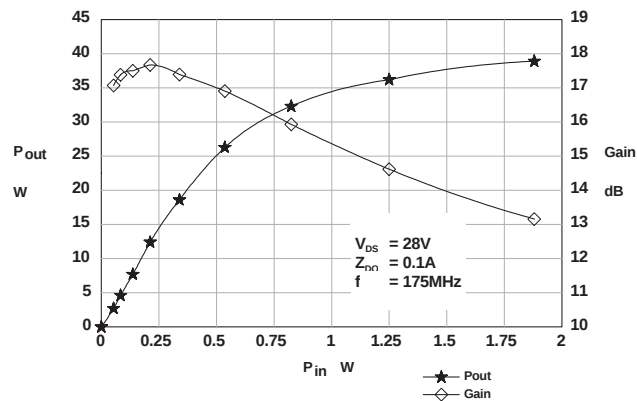


Figure 2 – Power Output & Gain vs. Power Input.

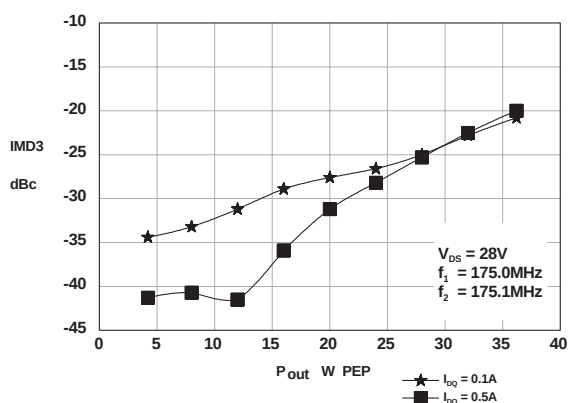


Figure 3 – IMD vs. Output Power.

D1019UK OPTIMUM SOURCE AND LOAD IMPEDANCE

Frequency MHz	Z_S Ω	Z_L Ω
175MHz	$5 + j14$	$12 - j14$

Typical S Parameters

! $V_{DS} = 28V$, $I_{DQ} = 0.1A$
MHz S MA R 50

!Freq MHz	S11 mag ang	S21 mag ang	S12 mag ang	S22 mag ang
50	0.780 -116	18 112	0.034 25	0.642 -85
100	0.775 -135	9.312 85	0.030 11	0.577 -103
150	0.795 -149	6.077 68	0.022 14	0.613 -116
200	0.826 -159	4.193 53	0.017 44	0.669 -128
250	0.853 -169	3.216 43	0.023 74	0.715 -139
300	0.878 -179	2.566 35	0.039 89	0.759 -150
350	0.903 171	1.991 23	0.052 86	0.801 -161
400	0.923 161	1.655 18	0.070 84	0.839 -173
450	0.944 151	1.322 9	0.080 80	0.878 177
500	0.963 142	1.121 4	0.098 76	0.914 167
550	0.978 136	0.899 -2	0.108 72	0.945 159
600	0.985 131	0.762 -7	0.119 66	0.966 153

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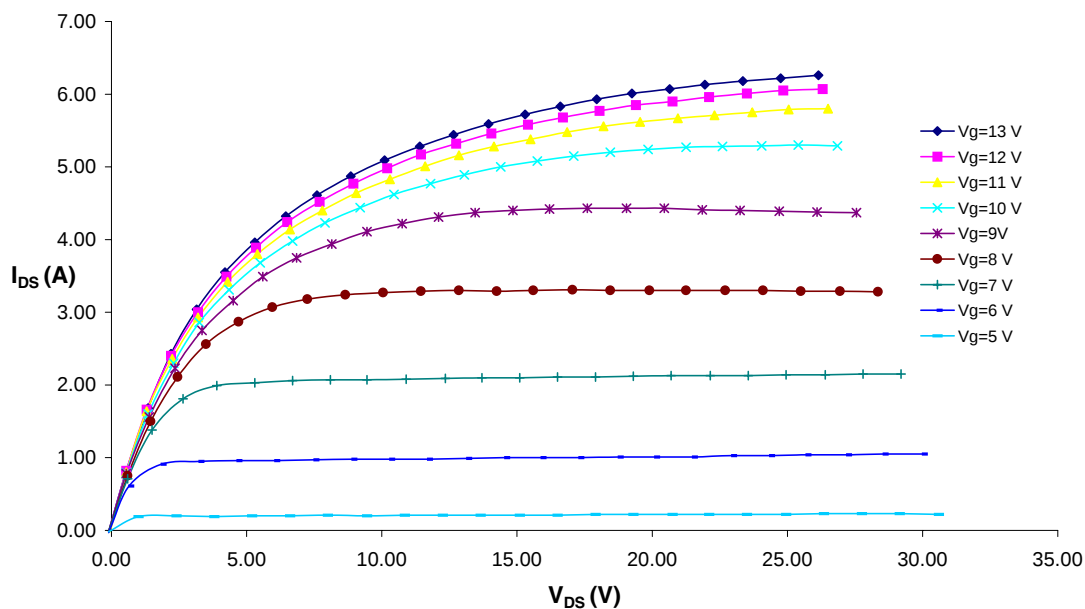


Figure 4 – Typical IV Characteristics.

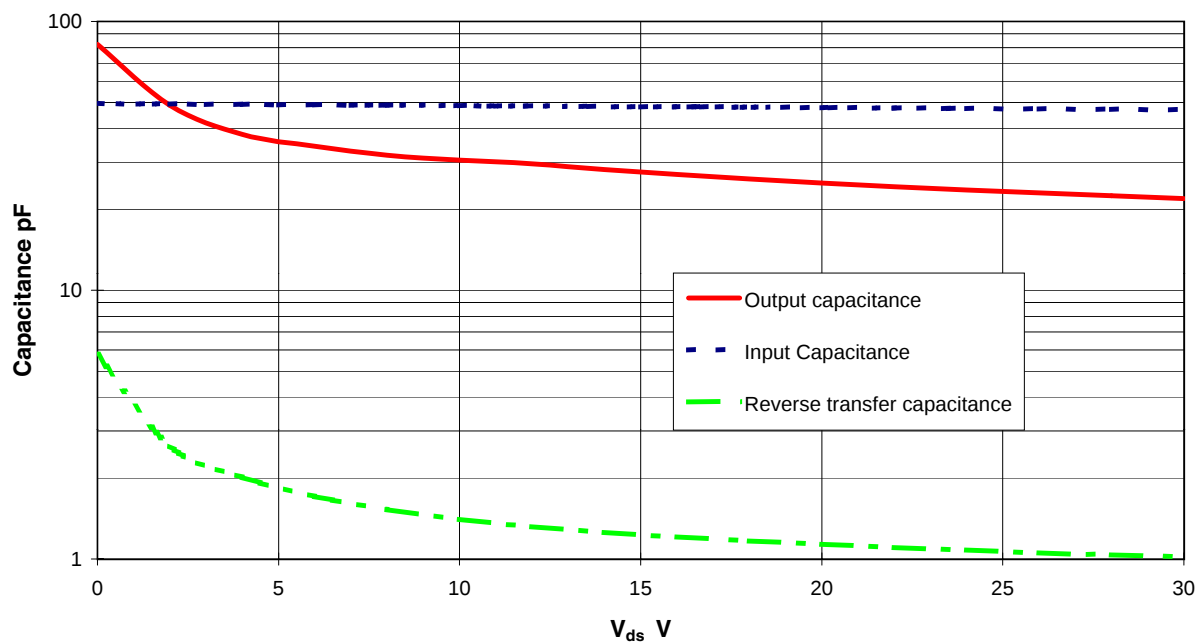
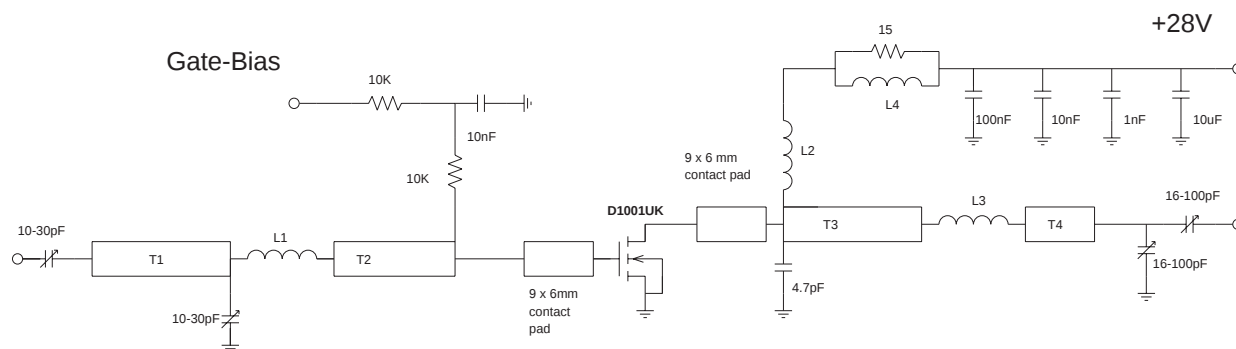


Figure 5 – Typical CV Characteristics.



D1019UK 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