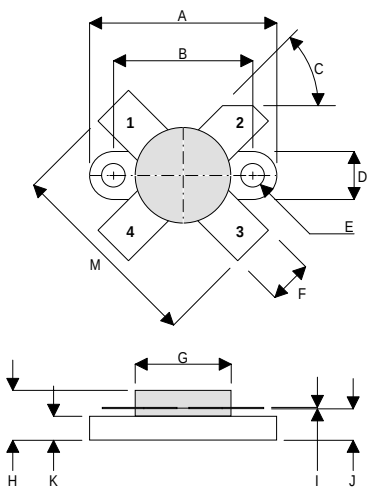
D1005UK

ROHS COMPLIANT METAL GATE RF SILICON FET

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°C unless otherwise stated)

P_D	Power Dissipation	146W
BV_{DSS}	Drain – Source Breakdown Voltage	70V
BV_{GSS}	Gate – Source Breakdown Voltage	±20V
$I_{D(sat)}$	Drain Current	20A
T_{stg}	Storage Temperature	–65 to 150°C
T_j	Maximum Operating Junction Temperature	200°C

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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			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

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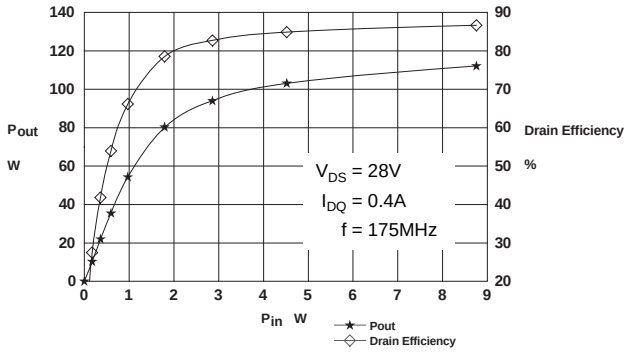

Figure 1 – Power Output and Efficiency vs. Power Input.

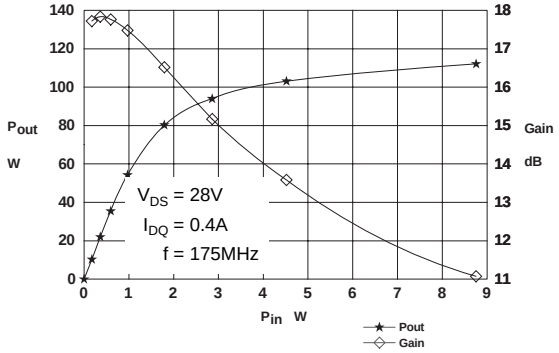

Figure 2 – Power Output & Gain vs. Power Input.

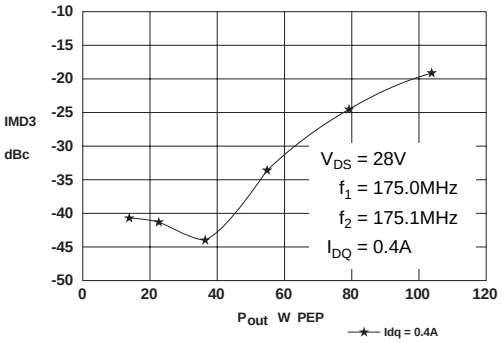

Figure 3 – IMD vs. Output Power.

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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 MA 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

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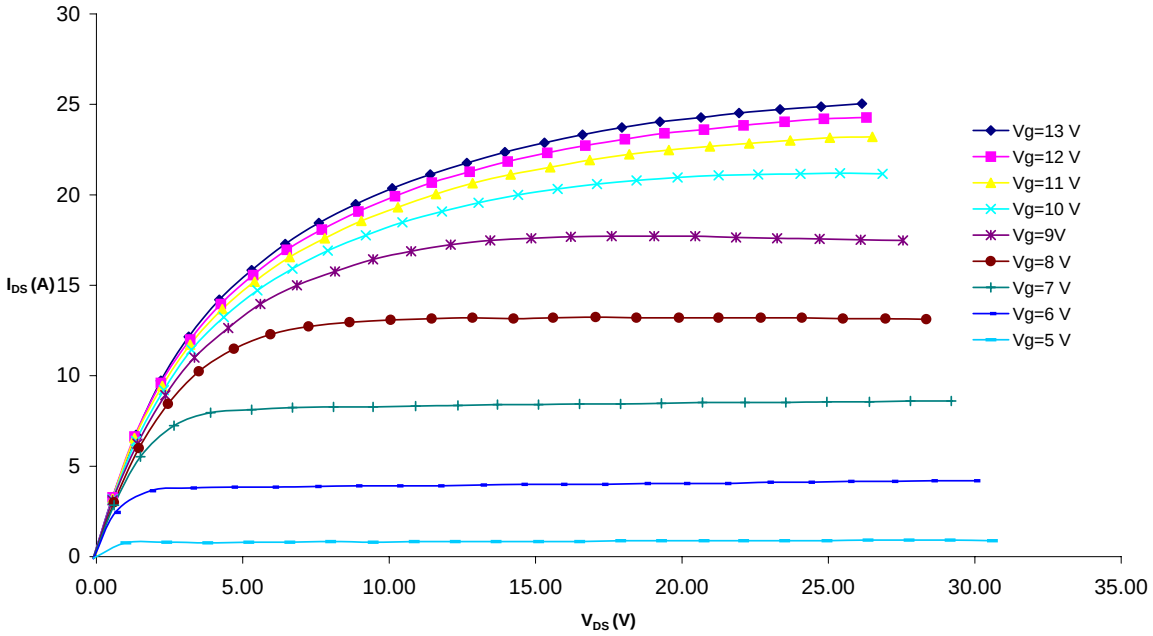

Figure 4 – Typical IV Characteristics.

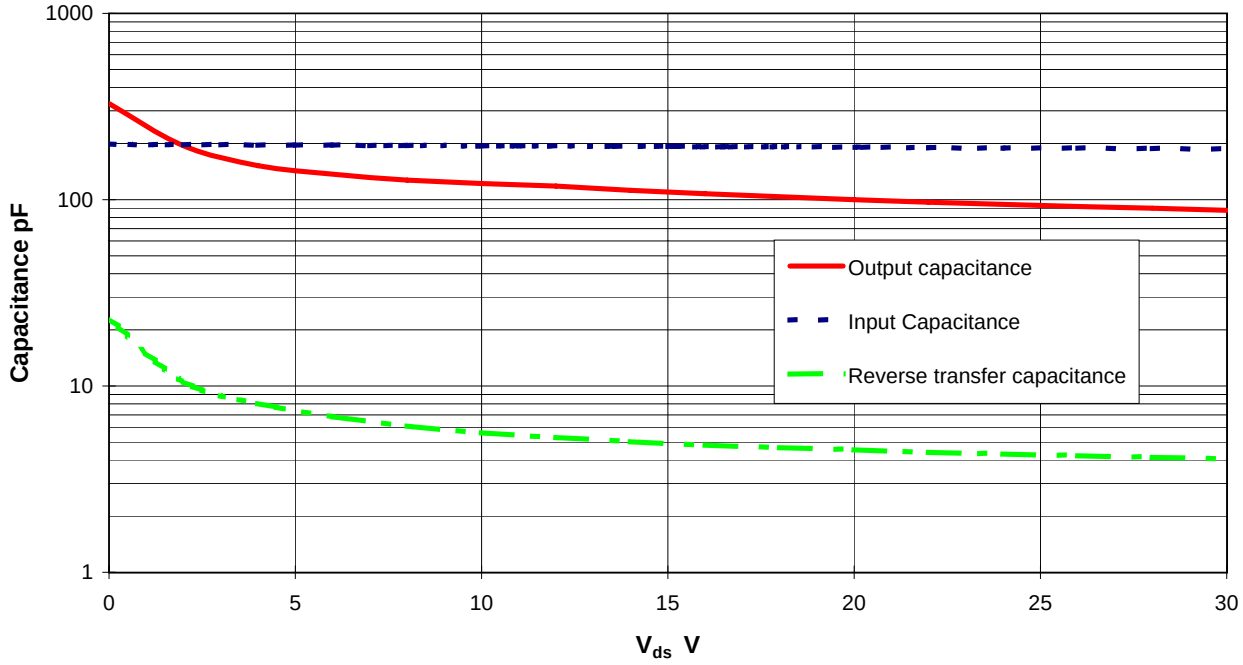

Figure 5 – Typical CV Characteristics.

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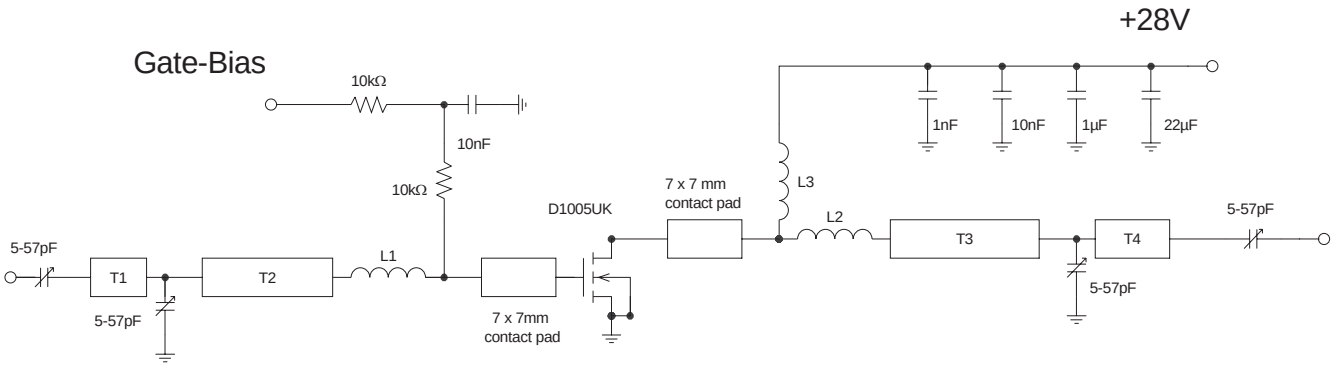

D1005UK 175MHz TEST FIXTURE

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.

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