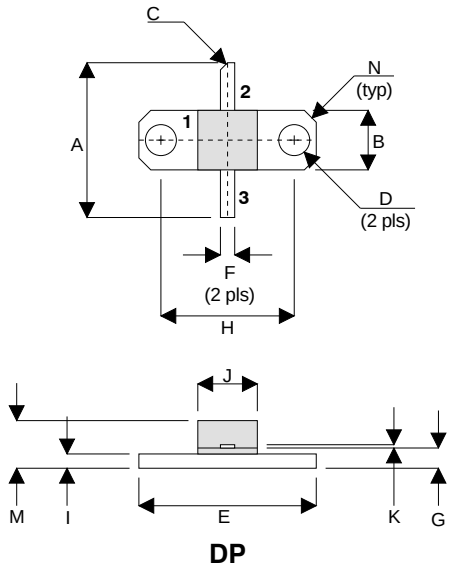
D5013UK

METAL GATE RF SILICON FET

MECHANICAL DATA



DP

PIN 1 SOURCE PIN 2 DRAIN

PIN 3 GATE

DIM	mm	Tol.	Inches	Tol.
A	16.51	0.25	0.650	0.010
B	6.35	0.13	0.250	0.005
C	45°	5°	45°	5°
D	3.30	0.13	0.130	0.005
E	18.92	0.08	0.745	0.003
F	1.52	0.13	0.060	0.005
G	2.16	0.13	0.085	0.005
H	14.22	0.08	0.560	0.003
I	1.52	0.13	0.060	0.005
J	6.35	0.13	0.250	0.005
K	0.13	0.03	0.005	0.001
M	5.08	0.51	0.200	0.020
N	1.27 x 45°	0.13	0.050 x 45°	0.005

GOLD METALLISED MULTI-PURPOSE SILICON DMOS RF FET 20W – 50V – 500MHz SINGLE ENDED

FEATURES

- **SIMPLIFIED AMPLIFIER DESIGN**
- **SUITABLE FOR BROAD BAND APPLICATIONS**
- **LOW C_{rss}**
- **USEFUL P_O AT 1GHz**
- **LOW NOISE**
- **HIGH GAIN – 13 dB MINIMUM**

APPLICATIONS

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

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25°C unless otherwise stated)

P_D	Power Dissipation	50W
BV_{DSS}	Drain – Source Breakdown Voltage	125V
BV_{GSS}	Gate – Source Breakdown Voltage	±20V
$I_{D(sat)}$	Drain Current	3A
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	125			V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS} = 50V	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 = 0.5A	0.8			S
G_{PS}	Common Source Power Gain	P_O = 20W		13			dB
η	Drain Efficiency	V_{DS} = 50V	I_{DQ} = 0.1A	50			%
VSWR	Load Mismatch Tolerance	f = 500MHz		20:1			—
C_{iss}	Input Capacitance	V_{DS} = 50V	V_{GS} = –5V f = 1MHz			60	pF
C_{oss}	Output Capacitance	V_{DS} = 50V	V_{GS} = 0 f = 1MHz			25	pF
C_{rss}	Reverse Transfer Capacitance	V_{DS} = 50V	V_{GS} = 0 f = 1MHz			1.5	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. 3.5°C / W

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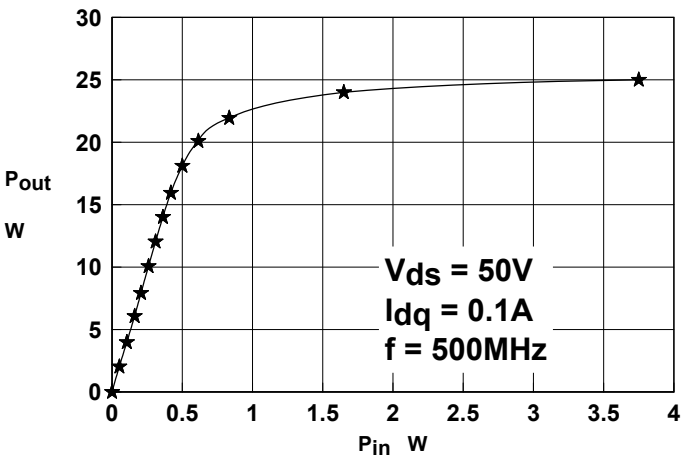

Figure 1. Output Power vs Input Power

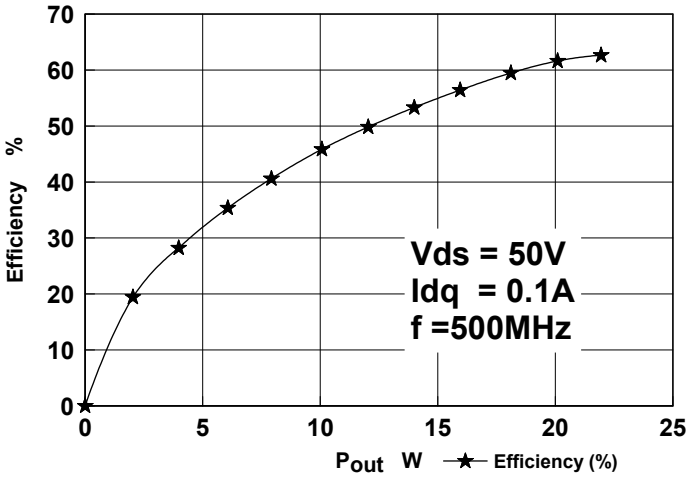

Figure 2. Efficiency vs. Output Power

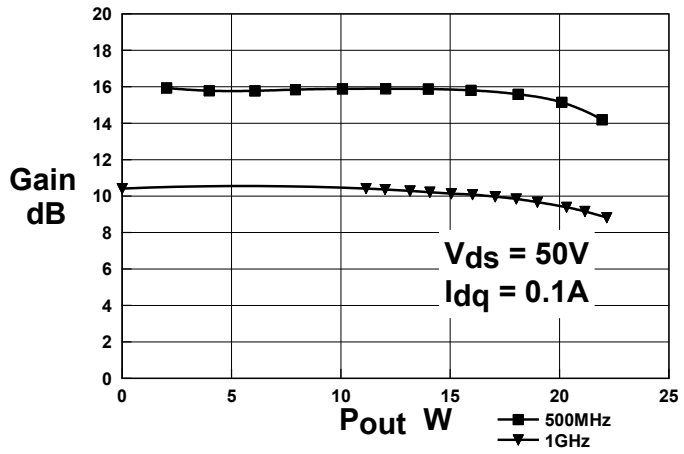

Figure 3. Gain vs Output Power

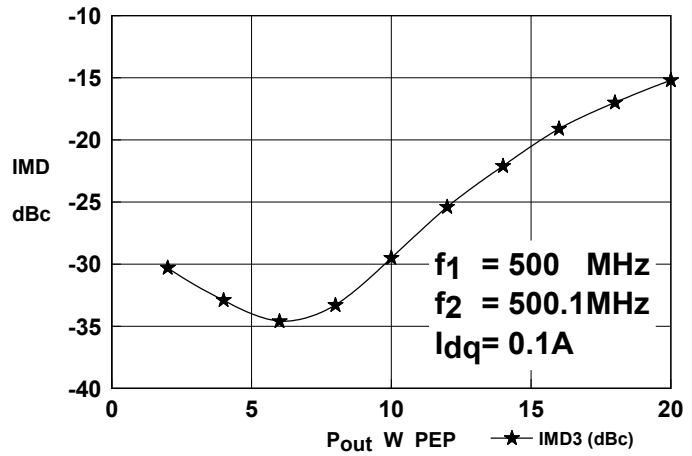

Figure 3. IMD 3 vs Output Power

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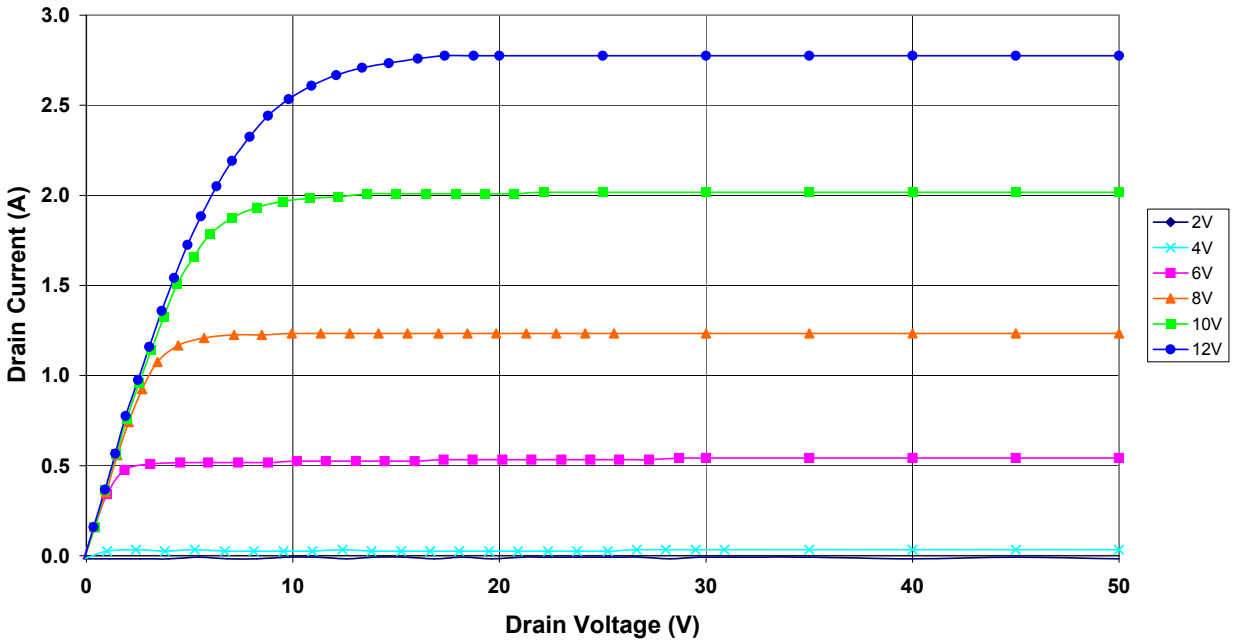

Figure 5 – Typical IV Characteristics.

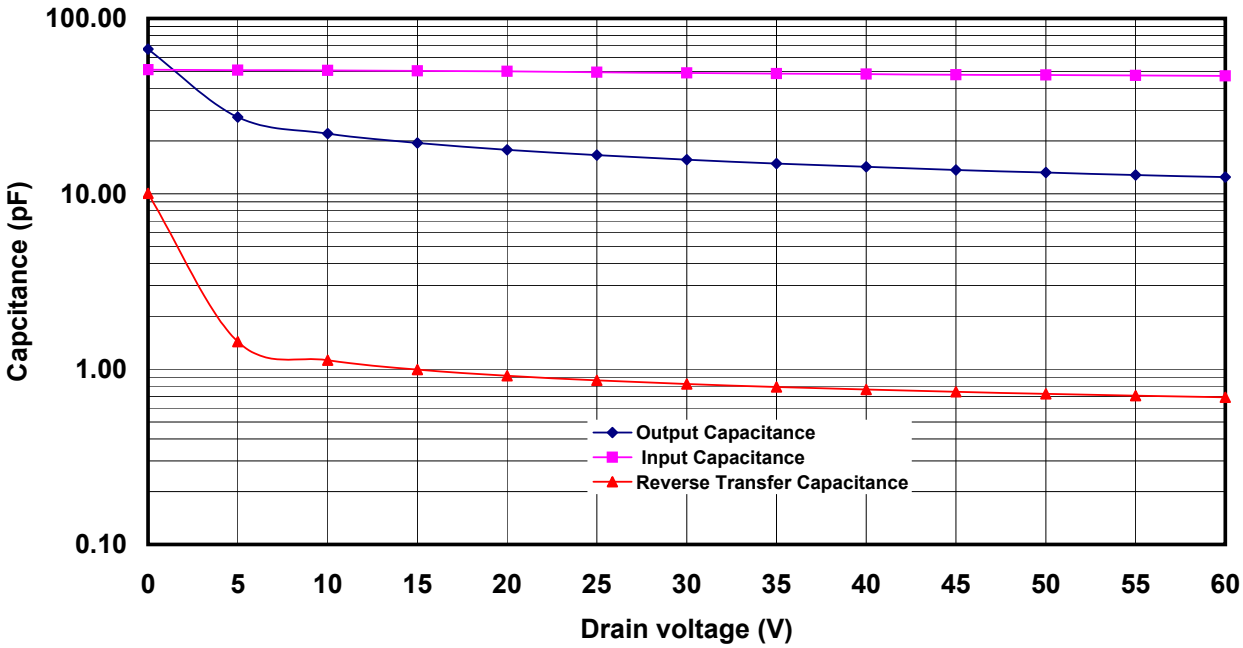

Figure 6 – Typical CV Characteristics.

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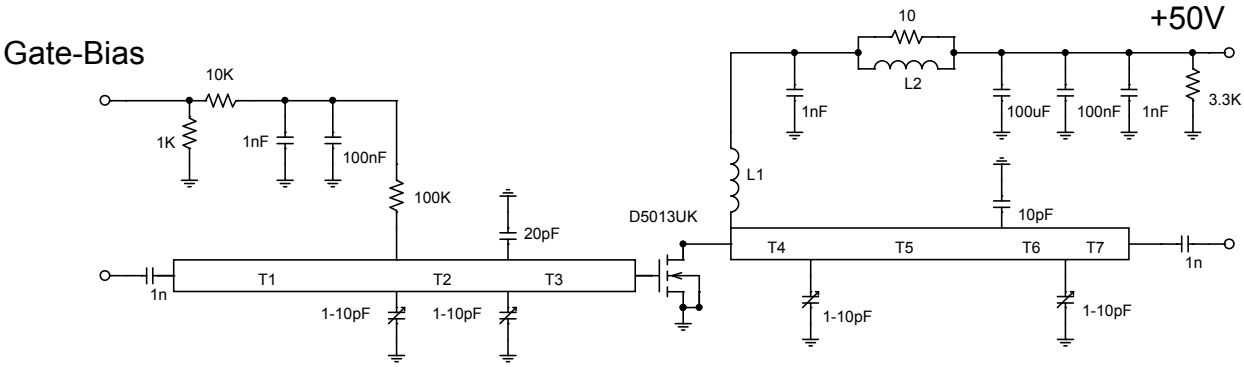

D5013UK 500MHz TEST FIXTURE

Substrate 0.8mm FR4, Er=2.2

All microstrip lines W=2.2mm

T1 37.5mm
T2 14.2mm
T3 10mm
T4 12.5mm
T5 30mm
T6 6mm
T7 12.5mm

L1 5.5 turns 20swg enamelled copper wire, 7mm i.d.

L2 1.5 turns 24swg enamelled copper wire on Siemens B62152A7X 2 hole core

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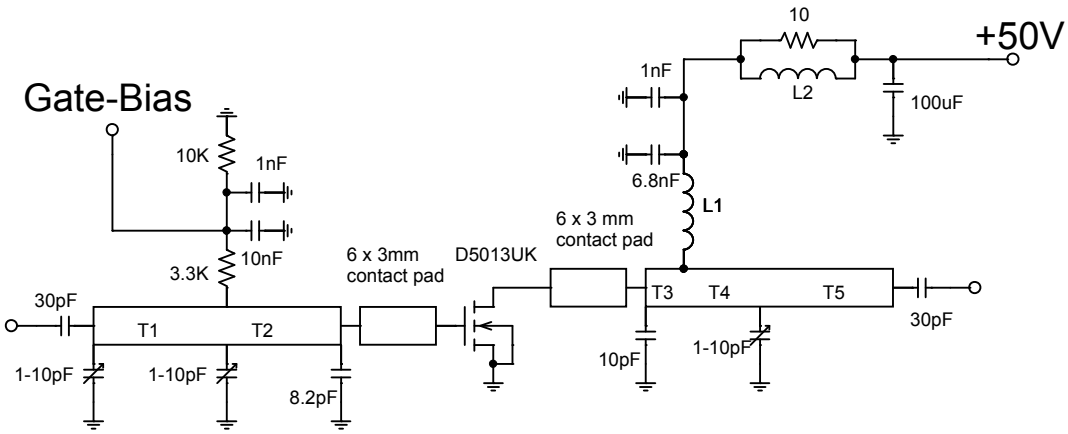

D5013UK 1GHz TEST FIXTURE

Substrate 0.8mm PTFE/glass, Er=2.5

All microstrip lines W=2.2mm

T1 35mm

T2 15mm

T3 4mm

T4 14 mm

T5 32mm

L1 7.5 turns 24swg enamelled copper wire, 3mm i.d.

L2 1.5 turns 24swg enamelled copper wire on ferrite core

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