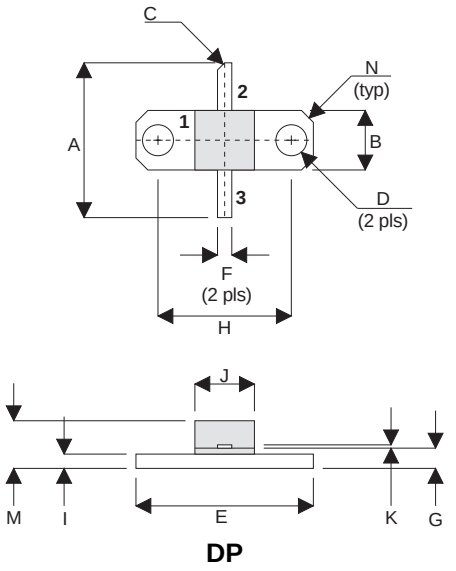
TetraFET

D1013UK

ROHS COMPLIANT 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 – 28V – 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	70V
BV_{GSS}	Gate – Source Breakdown Voltage	±20V
$I_{D(sat)}$	Drain Current	5A
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				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			13			dB
η	Drain Efficiency	V_{DS} = 28V	I_{DQ} = 0.2A		50			%
VSWR	Load Mismatch Tolerance	f = 500MHz			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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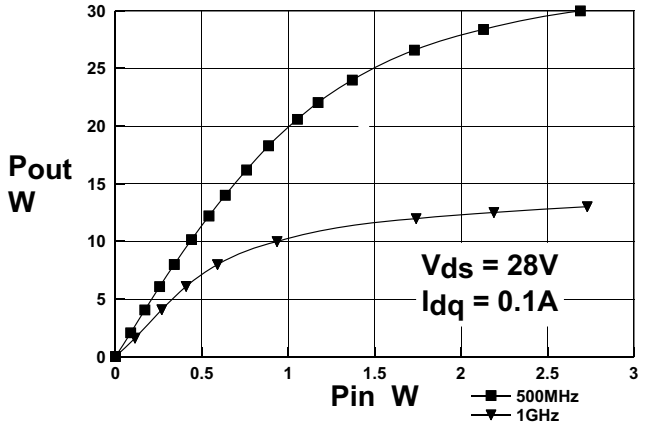

Figure 1
Power Output vs. Input Power

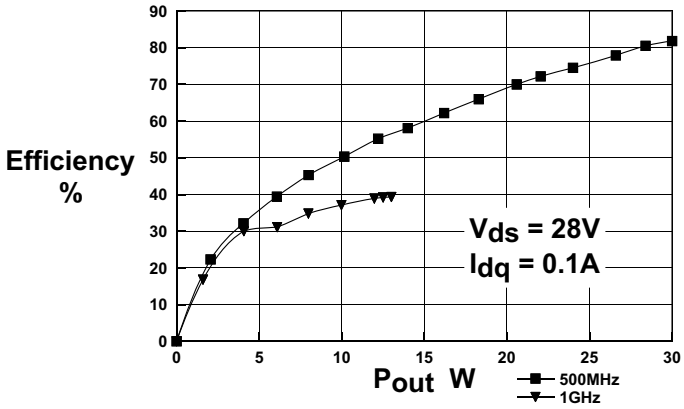

Figure 2
Efficiency vs. Output Power

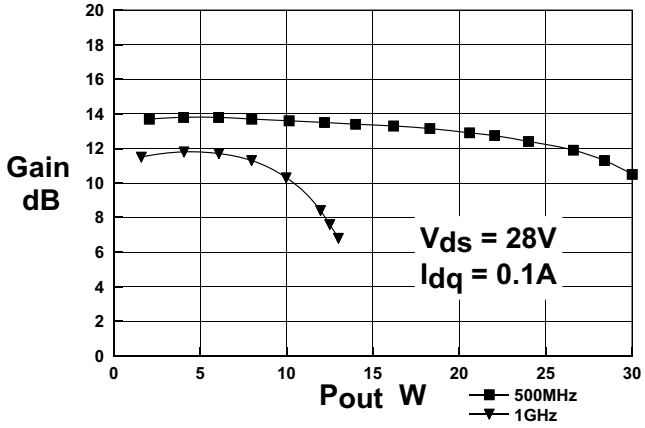

Figure 3
Gain vs. Output Power

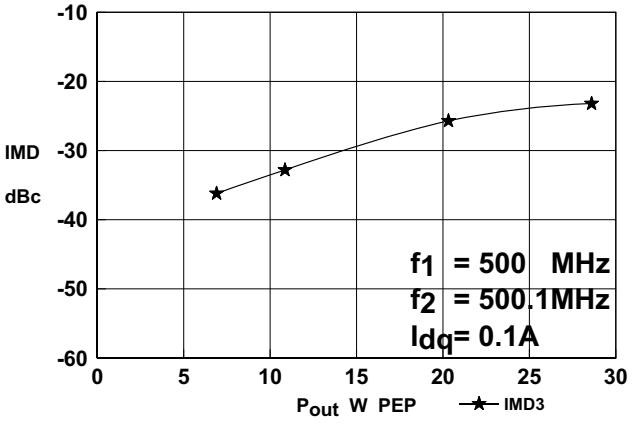

Figure 4
IMD vs. Output Power

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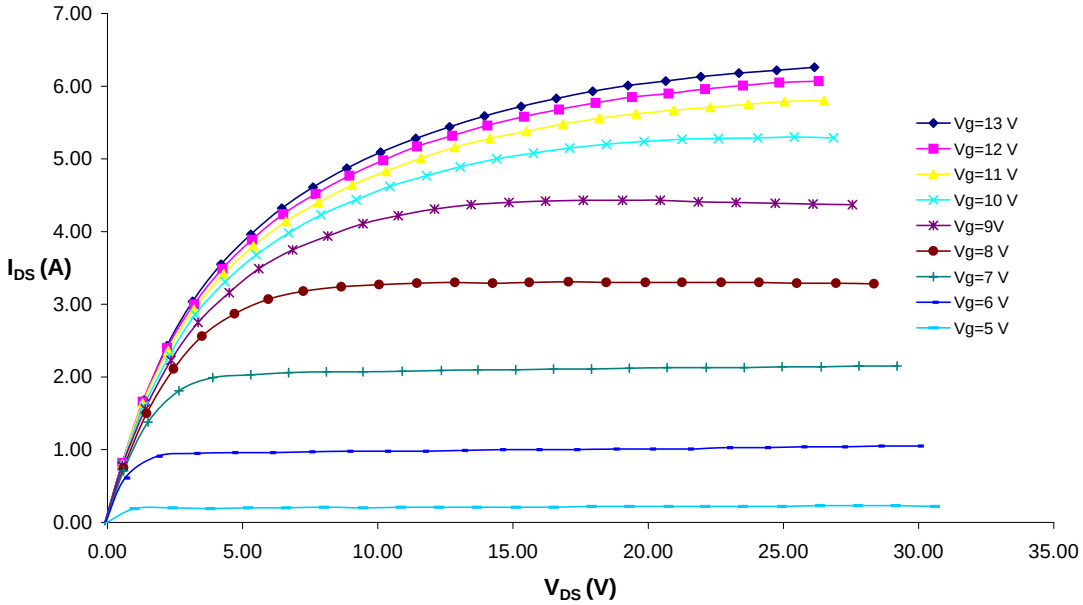

Figure 5 – Typical IV Characteristics.

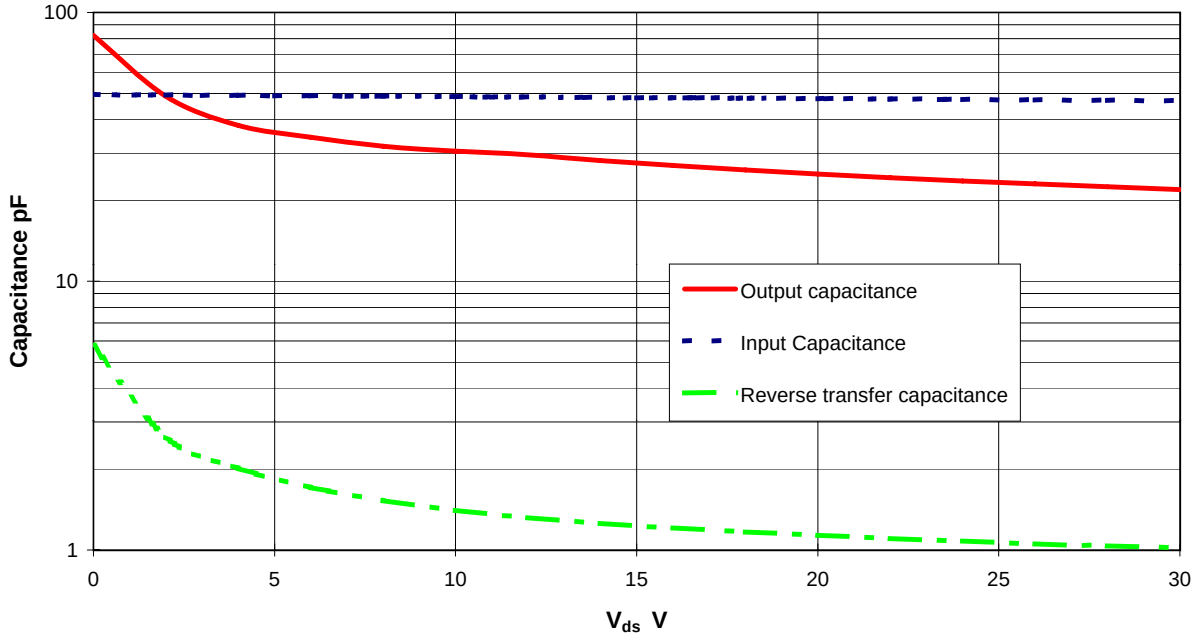

Figure 6 – Typical CV Characteristics.

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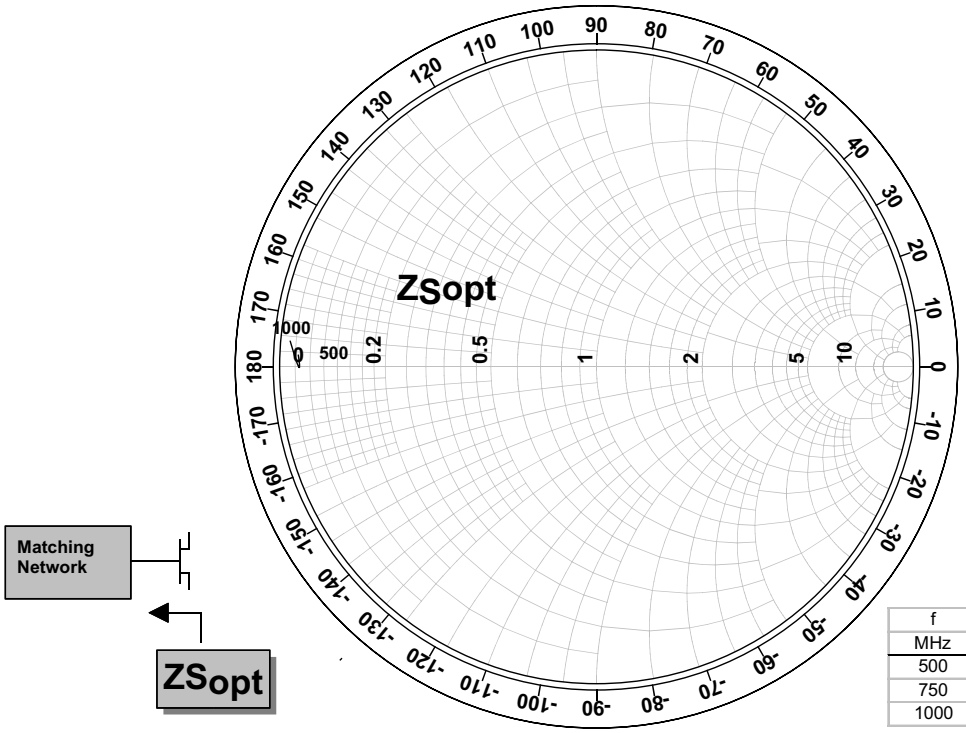
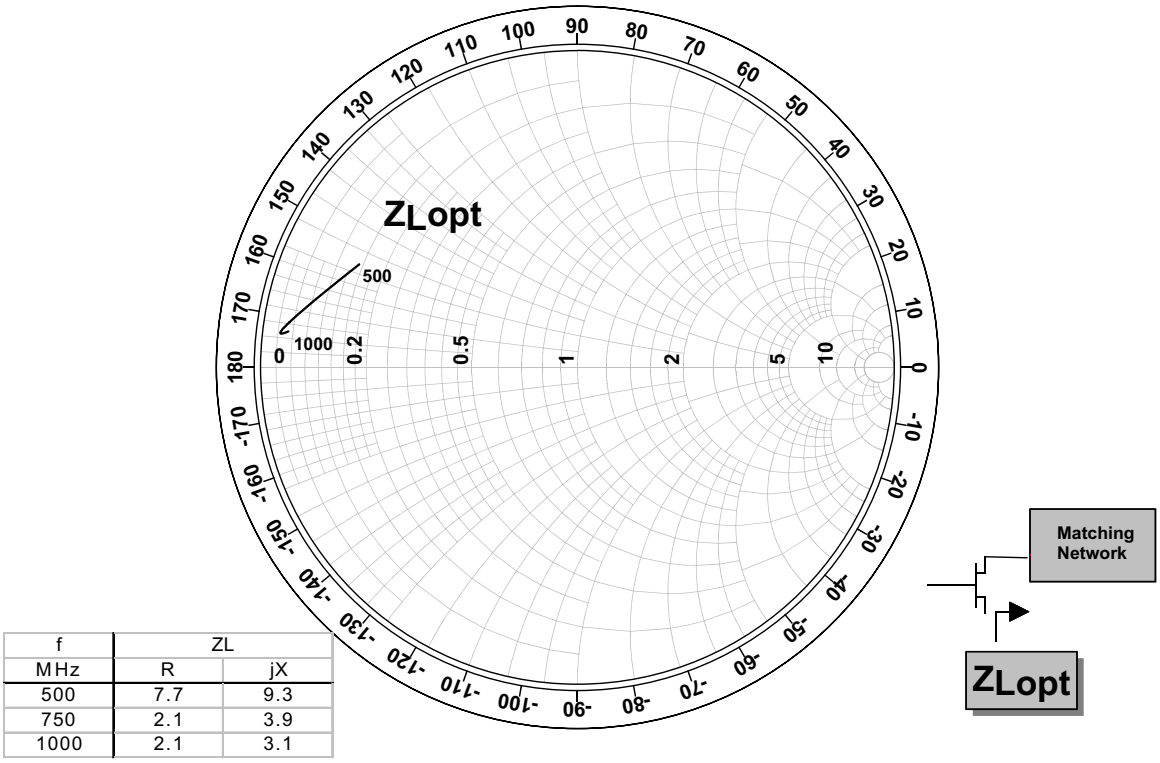


f	ZS	
MHz	R	jX
500	1.5	1
750	1.55	0
1000	0.76	2.1



f	ZL	
MHz	R	jX
500	7.7	9.3
750	2.1	3.9
1000	2.1	3.1

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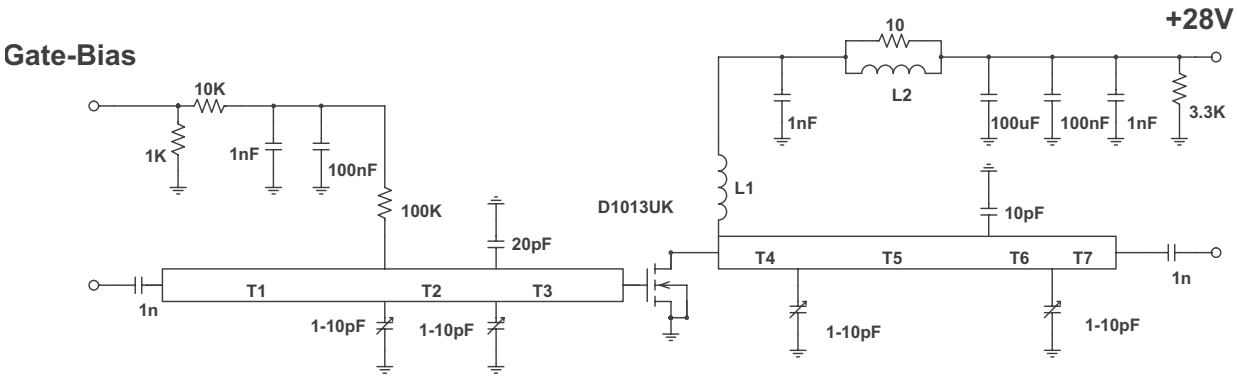

500MHz Test Fixture

Substrate 0.8 mm FR4, Er = 2.2
All microstrip lines W = 2.2mm

T1	
T2	
T3	10mm
T4	
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

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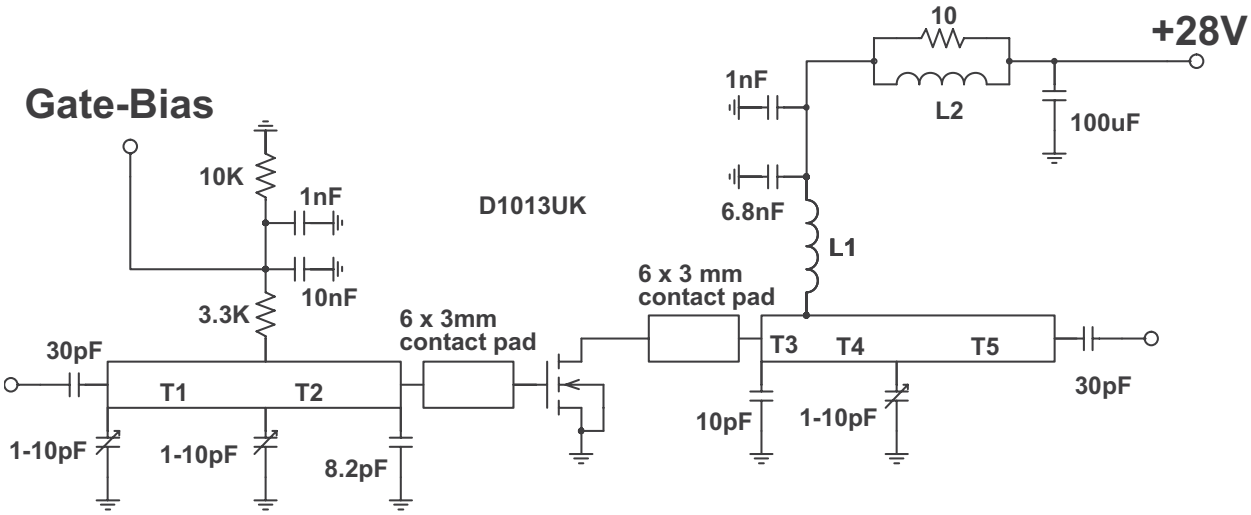

1GHz Test Fixture

Substrate 0.8mm PTFE/glass, Er = 2.5
All microstrip lines W = 2.2mm

T1	35mm
T2	15mm
T3	4mm
T4	14mm
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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