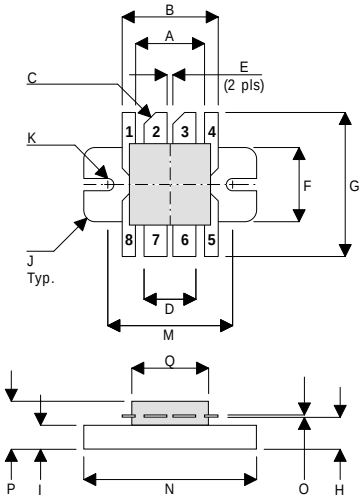
TetraFET

D1018UK

ROHS COMPLIANT METAL GATE RF SILICON FET

MECHANICAL DATA



DD

PIN 1	SOURCE (COMMON)	PIN 2	DRAIN 1
PIN 3	DRAIN 2	PIN 4	SOURCE (COMMON)
PIN 5	SOURCE (COMMON)	PIN 6	GATE 2
PIN 7	GATE 1	PIN 8	SOURCE (COMMON)

DIM	mm	Tol.	Inches	Tol.
A	9.14	0.13	0.360	0.005
B	12.70	0.13	0.500	0.005
C	45°	5°	45°	5°
D	6.86	0.13	0.270	0.005
E	0.76	0.13	0.030	0.005
F	9.78	0.13	0.385	0.005
G	19.05	0.25	0.750	0.010
H	4.19	0.13	0.165	0.005
I	3.17	0.13	0.125	0.005
J	1.52R	0.13	0.060R	0.005
K	1.65R	0.13	0.065R	0.005
M	16.51	0.13	0.650	0.005
N	22.86	0.13	0.900	0.005
O	0.13	0.02	0.005	0.001
P	6.35	0.64	0.250	0.025
Q	10.77	0.13	0.424	0.005

GOLD METALLISED MULTI-PURPOSE SILICON DMOS RF FET 100W – 28V – 500MHz PUSH–PULL

FEATURES

- **SIMPLIFIED AMPLIFIER DESIGN**
- **SUITABLE FOR BROAD BAND APPLICATIONS**
- **LOW C_{rss}**
- **SIMPLE BIAS CIRCUITS**
- **LOW NOISE**
- **HIGH GAIN – 10 dB MINIMUM**

APPLICATIONS

- HF/VHF/UHF COMMUNICATIONS from 1 MHz to 500 MHz

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

P_D	Power Dissipation	250W
BV_{DSS}	Drain – Source Breakdown Voltage *	70V
BV_{GSS}	Gate – Source Breakdown Voltage *	±20V
$I_{D(sat)}$	Drain Current *	15A
T_{stg}	Storage Temperature	–65 to 150°C
T_j	Maximum Operating Junction Temperature	200°C

* Per Side

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ELECTRICAL CHARACTERISTICS (T_{case} = 25°C unless otherwise stated)

Parameter		Test Conditions		Min.	Typ.	Max.	Unit
PER SIDE							
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			3	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
TOTAL DEVICE							
G_{PS}	Common Source Power Gain	P_O = 100W		10			dB
η	Drain Efficiency	V_{DS} = 28V	I_{DQ} = 1.2A	50			%
VSWR	Load Mismatch Tolerance	f = 500MHz		20:1			—
PER SIDE							
C_{iss}	Input Capacitance	V_{DS} = 28V	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. 0.7°C / W

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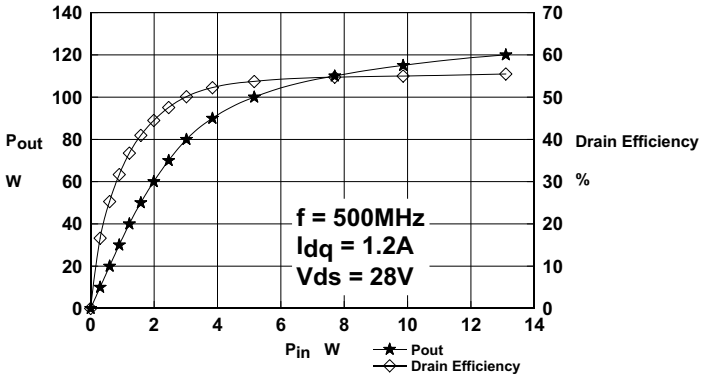

Figure 1
Power Output and Efficiency vs Input Power

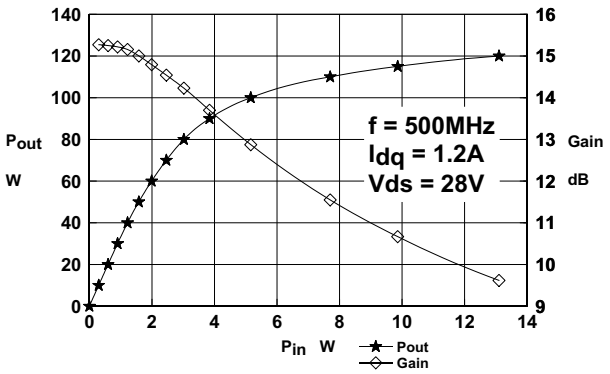

Figure 2
Power Output and Gain vs Input Power

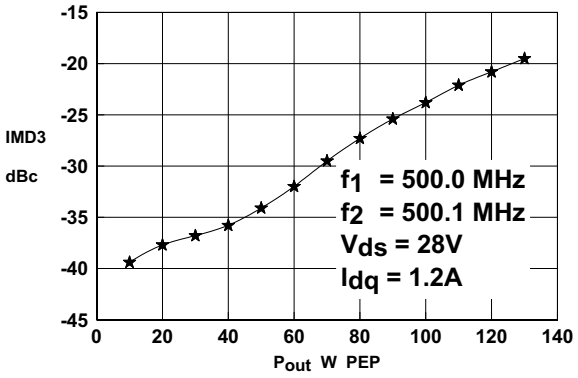

Figure 3
IMD vs. Output Power

OPTIMUM SOURCE AND LOAD IMPEDANCE

Frequency MHz	Z_S Ω	Z_L Ω
500	2.0 - j2.2	2.6 - j0.6

N.B. Impedances measured terminal to terminal

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Typical S Parameters

! Vds=28V, Idq=0.3A
MHZ S MA R 50

!Freq	S11		S21		S12		S22	
!MHz	mag	ang	mag	ang	mag	ang	mag	ang
100	0.86	-157.3	5.98	55.7	0.01	20.3	0.73	-139.7
150	0.9	-163.2	3.22	43.1	0.01	78	0.82	-149.7
200	0.93	-167.9	1.98	36.9	0.02	98.2	0.88	-156.3
250	0.95	-170.4	1.39	31	0.03	101	0.91	-160.2
300	0.95	-172.7	1.1	29.6	0.05	103.7	0.93	-163.6
350	0.96	-174.5	0.82	23.9	0.06	99.9	0.94	-166.1
400	0.96	-176.2	0.69	23.9	0.08	100.2	0.95	-168.1
450	0.97	-177.5	0.55	22.1	0.09	98.3	0.96	-170.1
500	0.97	-179.4	0.51	21	0.11	95.6	0.97	-171.6
550	0.97	179.8	0.43	19.1	0.13	90.8	0.97	-173.3
600	0.96	178.8	0.4	15.1	0.15	82	0.97	-174.5
650	0.98	177.5	0.35	15.8	0.17	83.5	0.98	-175.7
700	0.99	175.4	0.31	11	0.19	76.8	1	-178.4
750	0.99	173	0.27	14.2	0.21	75.1	1.01	178.8
800	1	170.5	0.24	16.6	0.22	71.5	1	176.1
850	0.99	168.1	0.24	22.7	0.25	72.6	0.99	173.3
900	1	166.1	0.24	23.7	0.3	68.8	0.99	170.6
950	1	163.9	0.25	23.2	0.34	62.7	0.97	167.7
1000	0.99	161.6	0.25	21.7	0.37	56.4	0.96	166.1

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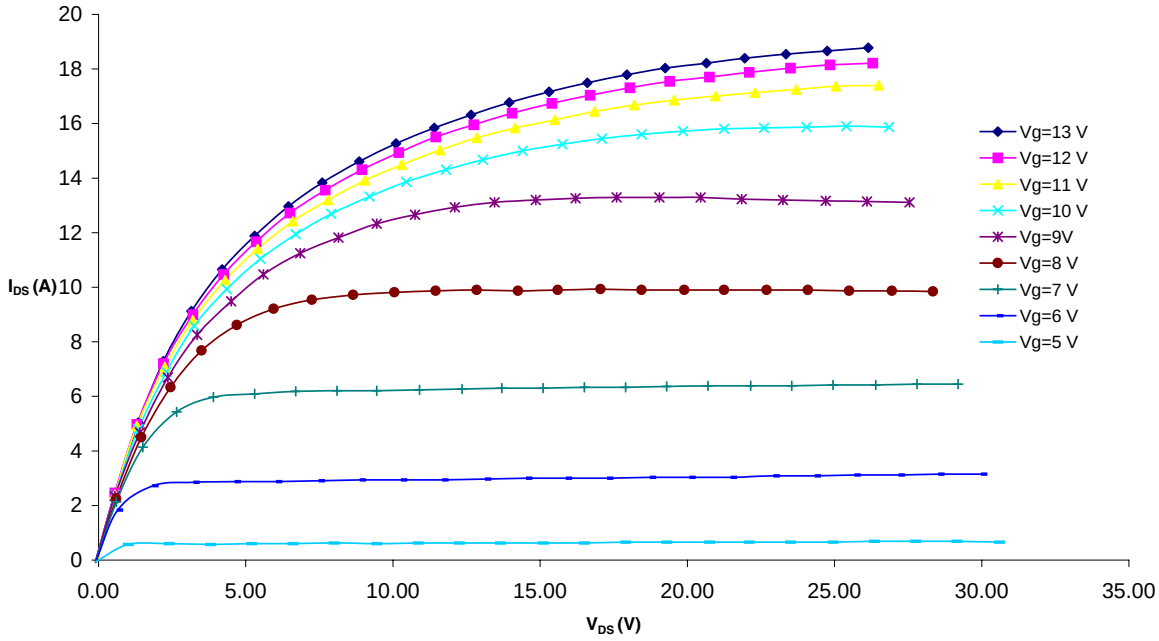

Figure 4 – Typical IV Characteristics.

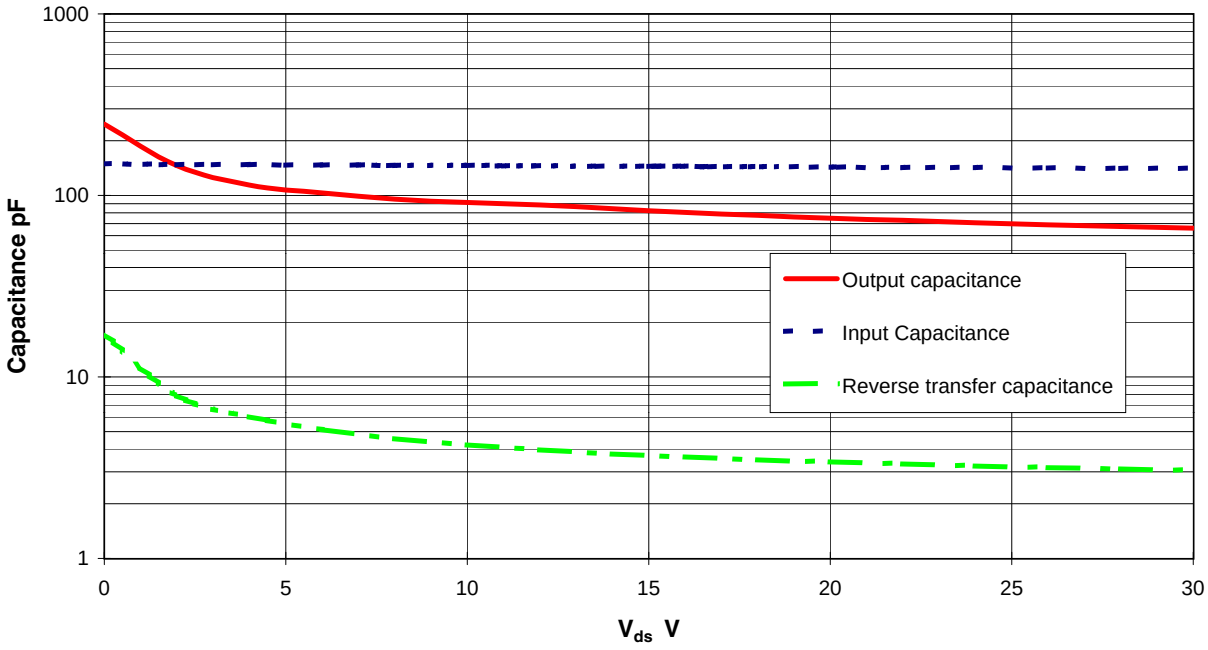

Figure 5 – Typical CV Characteristics.

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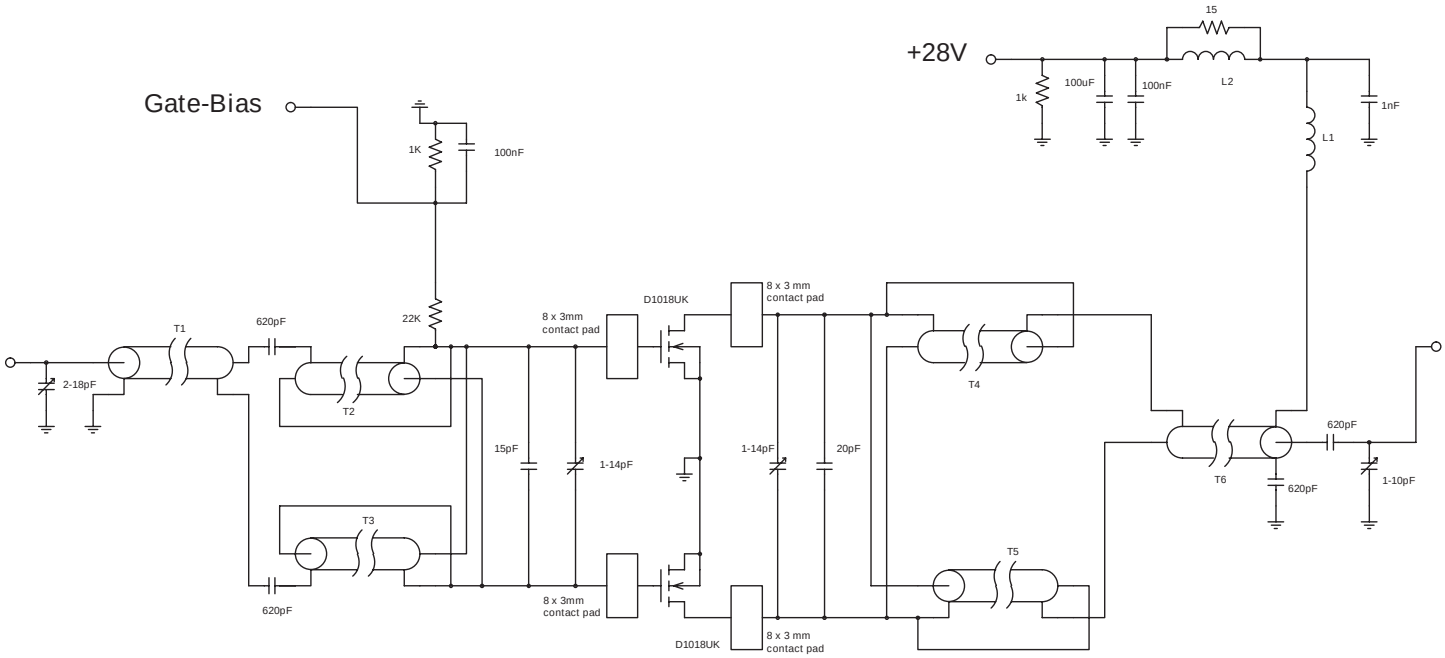

500MHz TEST FIXTURE

T1,6	**65mm 50ohm UT85 semi-rigid coax**
T2,3,4,5	**75mm 15 ohm UT85-15 semi-rigid coax**
L1	**6 turns 21 swg enamelled copper wire, 3mm id.**
L2	**8.5 turns 19swg enamelled copper wire on Fair-Rite FT82-43 core**
T6	**Placed through Ferronics 12-360-K ferrite bead**

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