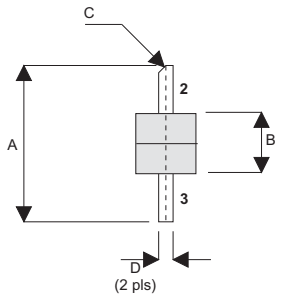
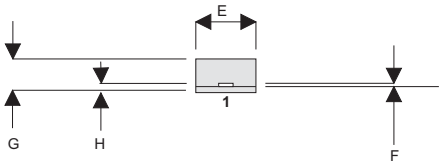
TetraFET

D2218UK

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	1.52	0.13	0.060	0.005
E	6.35	0.13	0.250	0.005
F	0.13	0.03	0.005	0.001
G	3.56	0.51	0.140	0.020
H	0.64	0.13	0.024	0.005

GOLD METALLISED MULTI-PURPOSE SILICON DMOS RF FET 20W – 12.5V – 500MHz SINGLE ENDED

FEATURES

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

APPLICATIONS

- VHF/UHF COMMUNICATIONS from DC to 1 GHz

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

P_D	Power Dissipation	70W
BV_{DSS}	Drain – Source Breakdown Voltage	40V
BV_{GSS}	Gate – Source Breakdown Voltage	±20V
$I_{D(sat)}$	Drain Current	16A
T_{stg}	Storage Temperature	–65 to 150℃
T_j	Maximum Operating Junction Temperature	200℃

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

Parameter		Test Conditions		Min.	Typ.	Max.	Unit
BV_{DSS}	Drain–Source Breakdown Voltage	V_{GS} = 0	I_D = 10mA	40			V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS} = 12.5V	V_{GS} = 0			8	mA
I_{GSS}	Gate Leakage Current	V_{GS} = 20V	V_{DS} = 0			8	µA
$V_{GS(th)}$	Gate Threshold Voltage*	I_D = 10mA	V_{DS} = V_{GS}	0.5		7	V
g_{fs}	Forward Transconductance*	V_{DS} = 10V	I_D = 1.6A	1.44			S
G_{PS}	Common Source Power Gain	P_O = 20W		10			dB
η	Drain Efficiency	V_{DS} = 12.5V	I_{DQ} = 1.6A	40			%
VSWR	Load Mismatch Tolerance	f = 500MHz		20:1			—
C_{iss}	Input Capacitance	V_{DS} = 12.5V	V_{GS} = –5V f = 1MHz			96	pF
C_{oss}	Output Capacitance	V_{DS} = 12.5V	V_{GS} = 0 f = 1MHz			80	pF
C_{rss}	Reverse Transfer Capacitance	V_{DS} = 12.5V	V_{GS} = 0 f = 1MHz			8	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. 2.5℃ / W

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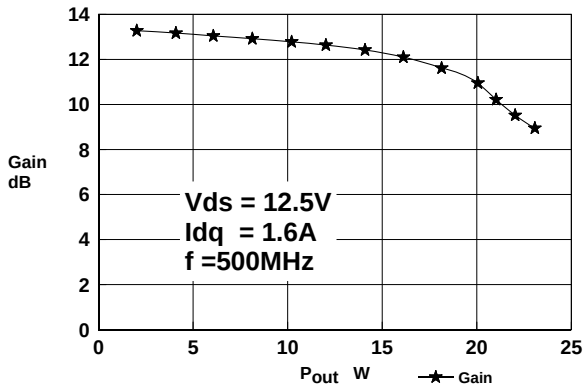

Figure 1 – Gain vs. Power Output.

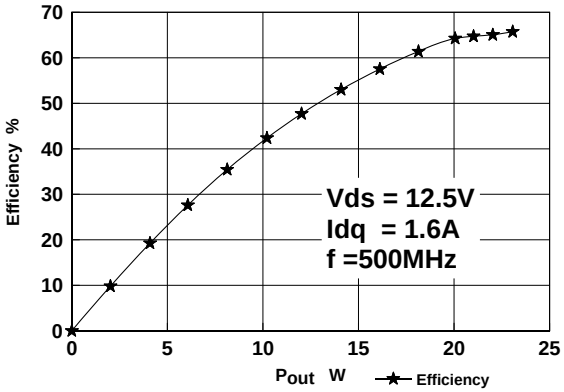

Figure 2 – Efficiency vs. Power Output.

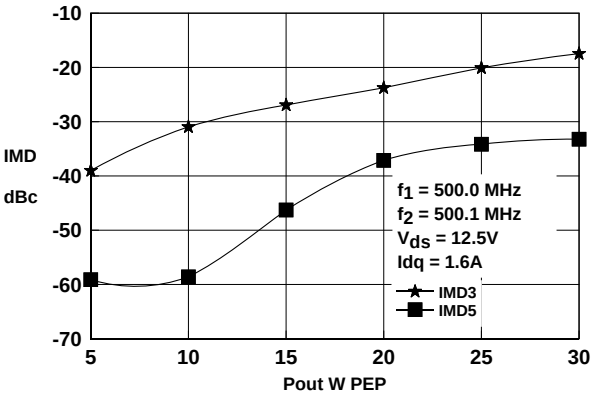

Figure 3 – IMD vs. Power Output.

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OPTIMUM SOURCE AND LOAD IMPEDANCE

Frequency MHz	Z_S Ω	Z_L Ω
500MHz	1.4 + j1.1	2.4 – j0.4

Typical S Parameters

! V_{DS} = 12.5V, I_{DQ} = 0.8A

MHZ S MA R 50

!Freq MHz	S11 mag	S11 ang	S21 mag	S21 ang	S12 mag	S12 ang	S22 mag	S22 ang
100	0.82	-160	9.92	72	0.018	-12	0.7	-155
200	0.88	-169	3.92	50	0.011	-16	0.81	-162
300	0.91	-175	2.29	40	0.006	11	0.87	-169
400	0.93	-179	1.43	30	0.008	57	0.91	-175
500	0.95	178	1.03	23	0.013	77	0.93	-179
600	0.95	173	0.76	14	0.019	78	0.95	176
700	0.95	170	0.56	7	0.023	75	0.96	173
800	0.96	166	0.39	5	0.025	76	0.97	169
900	0.97	163	0.33	9	0.032	84	0.97	166
1000	0.98	158	0.3	7	0.041	78	0.97	162

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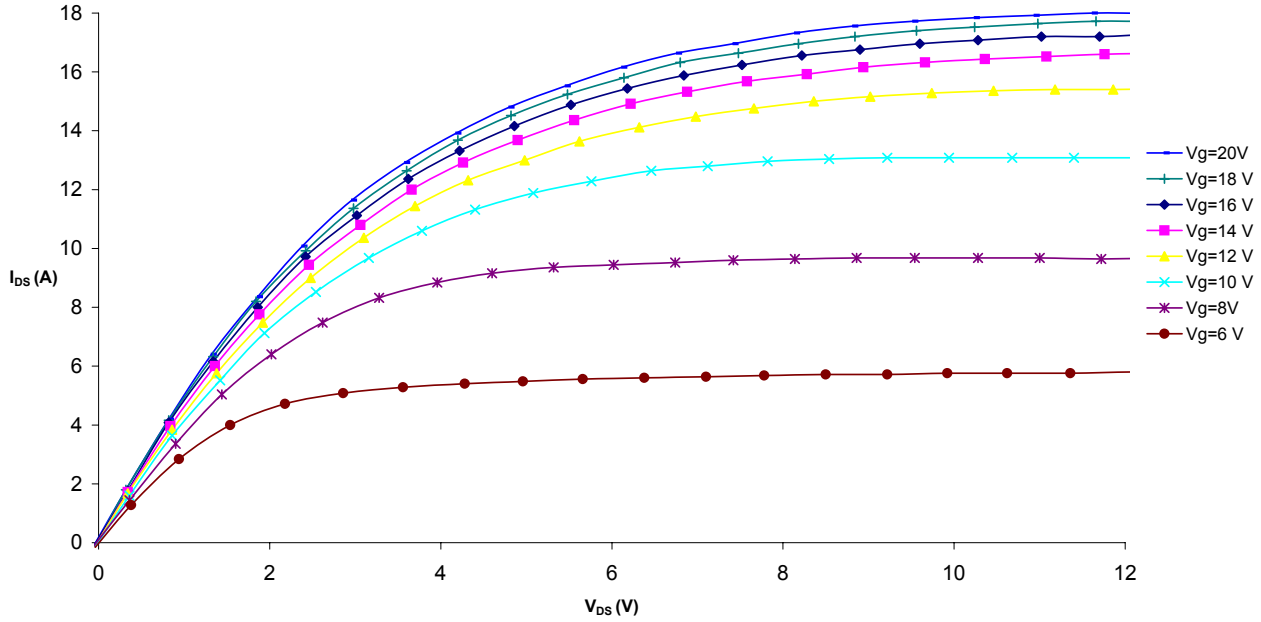

Figure 4 – Typical IV Characteristics.

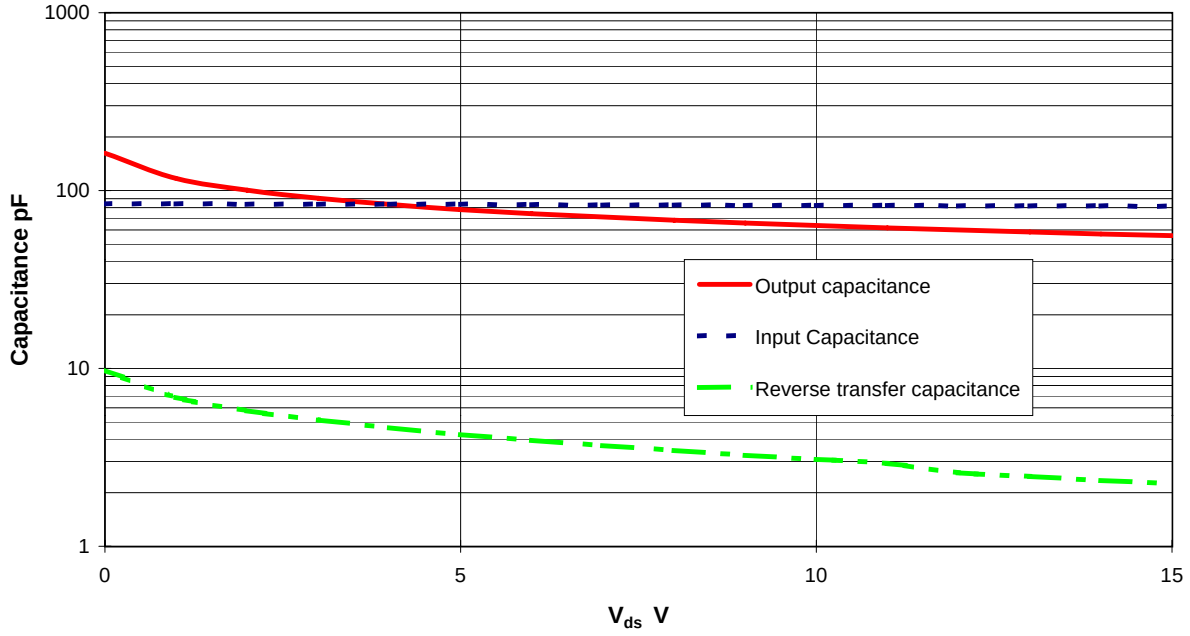

Figure 5 – Typical CV Characteristics.

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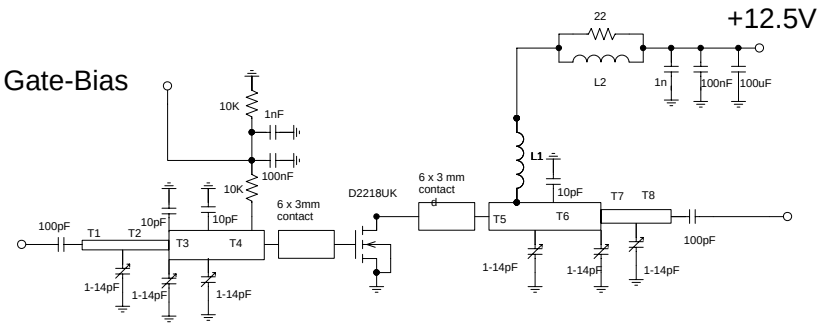

D2218UK 500MHz TEST FIXTURE

Substrate Taconic RF35 0.8mm, Er=3.5

T1 1.68mm wide, 21mm long
T2 1.68mm wide, 104mm long
T3 8.92mm wide, 17mm long
T4 8.92mm wide, 13.5mm long
T5 6.34mm wide, 11.5mm long
T6 6.34mm wide, 9mm long
T7 1.68mm wide, 13mm long
T8 1.68mm wide, 28mm long

L1 10 turns 0.5mm dia enamelled copper wire, 3mm i.d.

L2 1.5 turns 0.5mm dia enamelled copper wire on Siemens B62152-A7X ferrite core

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