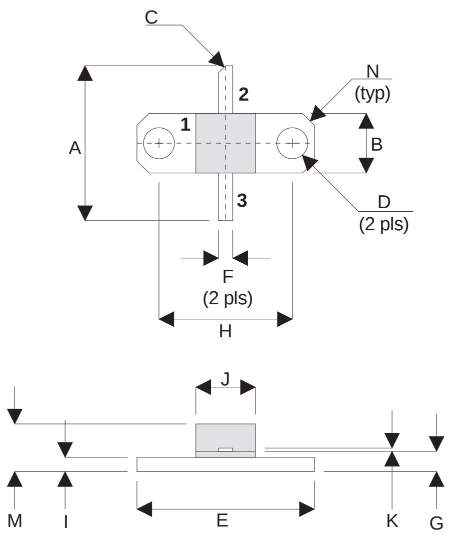
TetraFET

D2201UK

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 2.5W – 12.5V – 1GHz 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 1 MHz to 1 GHz

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

P_D	Power Dissipation	17.5W
BV_{DSS}	Drain – Source Breakdown Voltage	40V
BV_{GSS}	Gate – Source Breakdown Voltage	±20V
$I_{D(sat)}$	Drain Current	2A
T_{stg}	Storage Temperature	–65 to 150°C
T_j	Maximum Operating Junction Temperature	200°C

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Document Number 4346
Issue 2

D2201UK

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 = 10mA		40			V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS} = 12.5V	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 = 0.2A		0.18			S
G_{PS}	Common Source Power Gain	P_O = 2.5W			10			dB
η	Drain Efficiency	V_{DS} = 12.5V	I_{DQ} = 0.1A		40			%
VSWR	Load Mismatch Tolerance	f = 1GHz			20:1			—
C_{iss}	Input Capacitance	V_{DS} = 0	V_{GS} = –5V	f = 1MHz			12	pF
C_{oss}	Output Capacitance	V_{DS} = 12.5V	V_{GS} = 0	f = 1MHz			10	pF
C_{rss}	Reverse Transfer Capacitance	V_{DS} = 12.5V	V_{GS} = 0	f = 1MHz			1	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. 10°C / W

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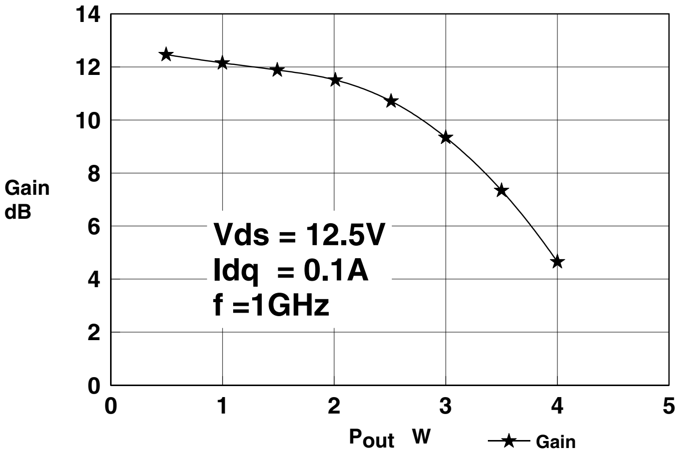

Figure 1- Gain vs. Power Output

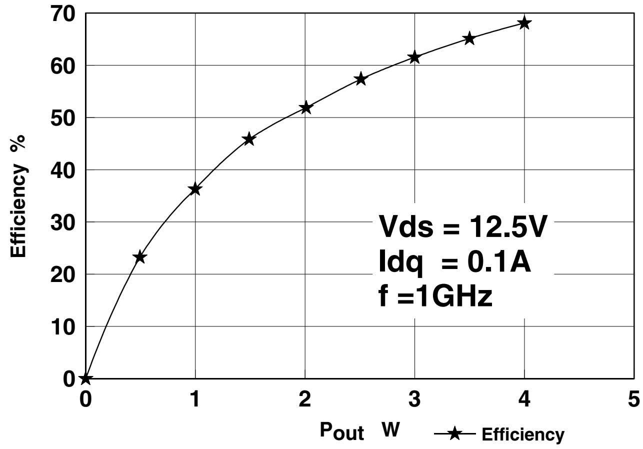

Figure 2 - Efficiency vs Power Output

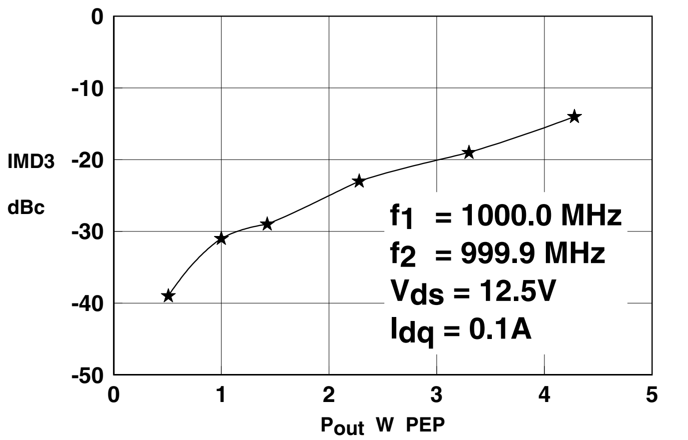

Figure 3 - IMD vs Power Output

OPTIMUM SOURCE AND LOAD IMPEDANCE

Frequency MHz	Z_S Ω	Z_L Ω
1000MHz	2.8 + j3.0	8.0 – j2.0

Typical S Parameters

! V_{DS} = 12.5V, I_{DQ} = 0.2A

MHZ S MA R 50

Freq	S11		S21		S12		S22	
MHz	mag	ang	mag	ang	mag	ang	mag	ang
50	0.95	-38.2	16.3	160.6	0.015	67.2	0.90	-34.4
100	0.89	-55.9	14.0	139.3	0.026	49.3	0.86	-55.4
150	0.84	-75.2	11.8	122.1	0.032	33.6	0.80	-74.8
200	0.80	-90.6	9.5	107.5	0.034	23.1	0.77	-89.6
250	0.78	-99.5	8.2	97.1	0.035	13.1	0.76	-97.9
300	0.76	-109.8	6.9	92.1	0.035	11.0	0.75	-106.7
350	0.76	-115.0	6.2	80.9	0.035	2.4	0.76	-113.0
400	0.76	-121.6	5.2	74.0	0.031	-2.8	0.76	-119.5
450	0.76	-126.4	4.7	74.9	0.030	0.1	0.77	-123.3
500	0.76	-131.1	4.1	67.7	0.028	-4.6	0.78	-127.5
550	0.77	-135.4	3.8	65.3	0.026	-3.1	0.79	-131.5
600	0.77	-139.6	3.6	60.1	0.024	-4.1	0.79	-135.0
650	0.77	-142.8	3.2	53.9	0.021	-4.9	0.80	-137.9
700	0.74	-148.1	2.6	52.5	0.017	0.4	0.75	-140.6
750	0.76	-148.4	3.0	52.2	0.018	8.5	0.81	-141.2
800	0.77	-153.1	2.8	46.2	0.017	14.5	0.81	-144.1
850	0.77	-155.8	2.6	40.0	0.016	22.0	0.82	-146.2
900	0.77	-159.4	2.4	35.4	0.016	31.0	0.82	-148.5
950	0.77	-163.8	2.3	32.3	0.017	40.7	0.83	-150.7
1000	0.76	-167.7	2.2	29.7	0.017	51.3	0.82	-153.1
1050	0.76	-170.9	2.2	24.6	0.020	58.8	0.83	-155.6

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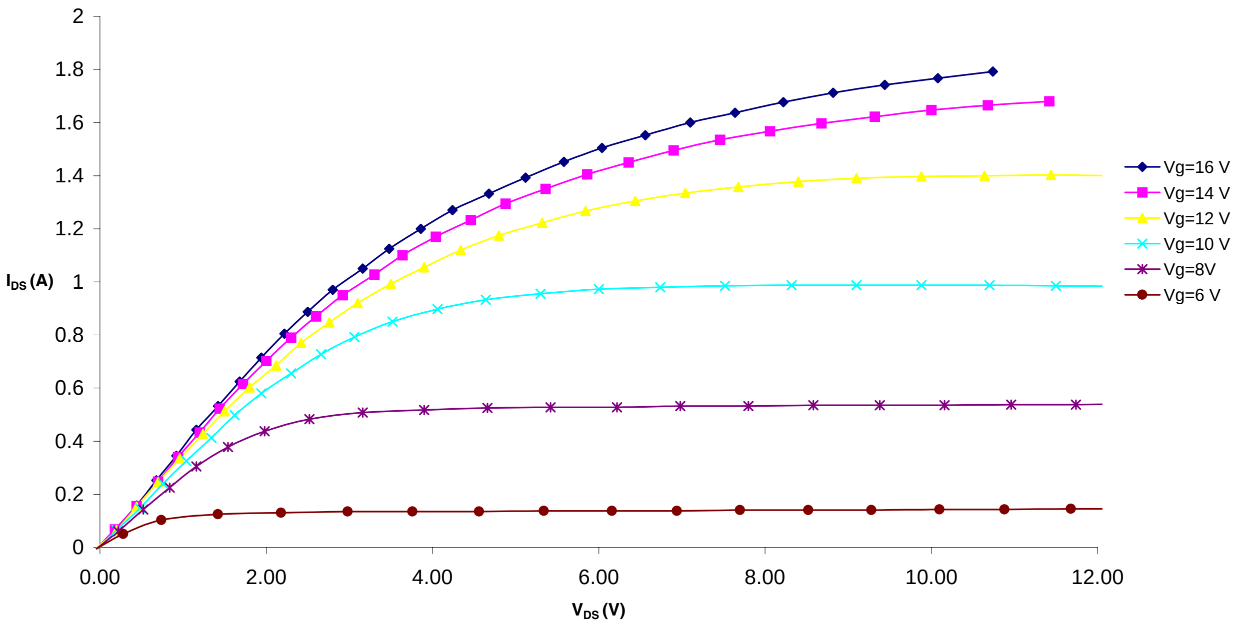

Figure 4 – Typical IV Characteristics.

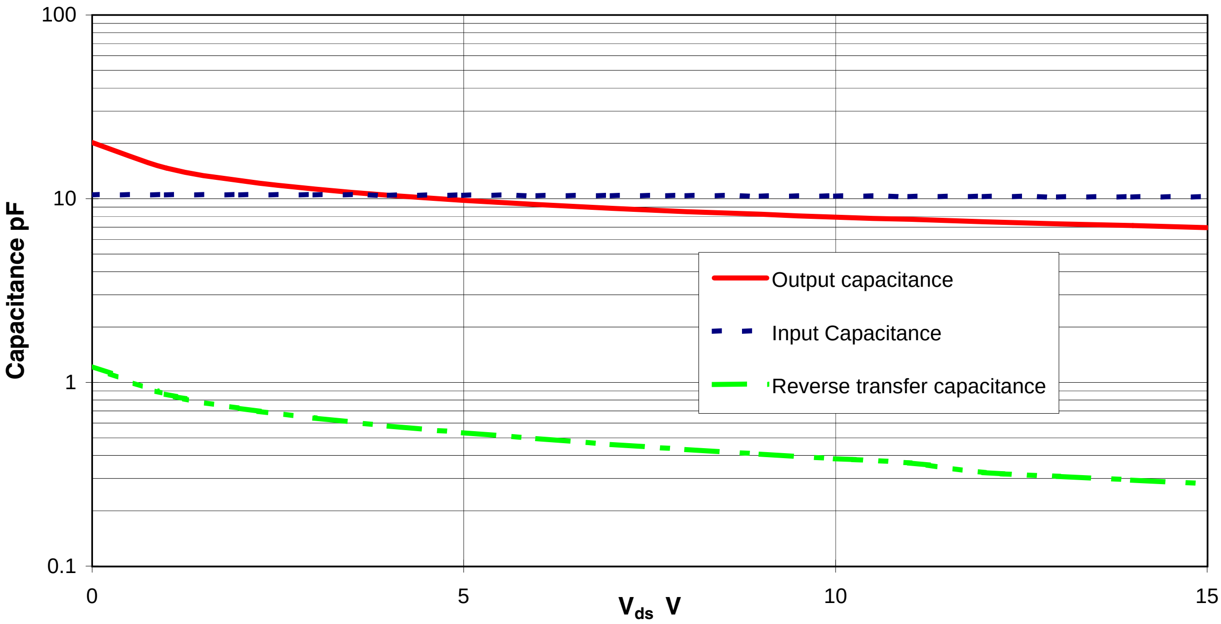

Figure 5 – Typical CV Characteristics.

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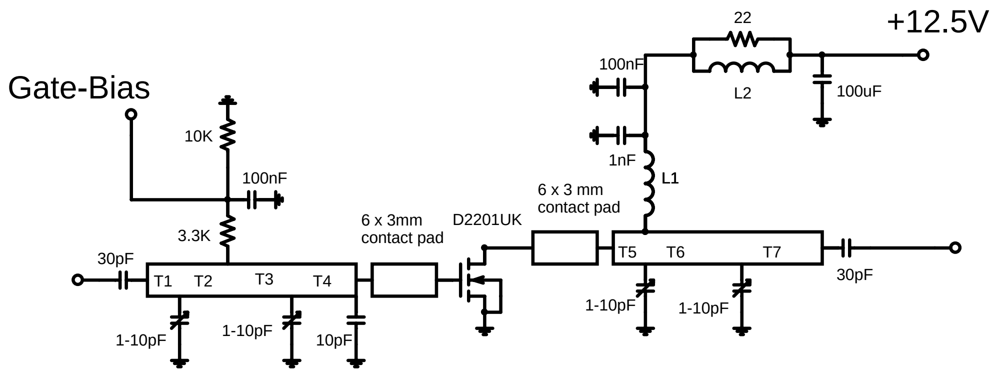

Substrate 0.8mm PTFE/glass, Er=2.5
All microstrip lines W=2.2mm

T1 3mm

T2 28mm

T3 12mm

T4 9mm

T5 5mm

T6 23 mm

T7 17mm

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

L2 1.5 turns 24swg enamelled copper wire on ferrite core

D2201UK 1000MHz Test Fixture

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