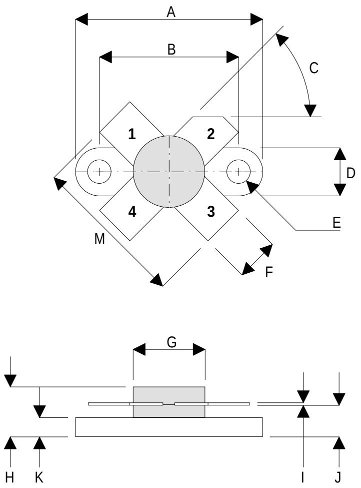
TetraFET

D1210UK

ROHS COMPLIANT **METAL GATE RF SILICON FET**

MECHANICAL DATA



DA

PIN 1	SOURCE	PIN 2	DRAIN
PIN 3	SOURCE	PIN 4	GATE

DIM	mm	Tol.	Inches	Tol.
A	24.76	0.13	0.975	0.005
B	18.42	0.13	0.725	0.005
C	45°	5°	45°	5°
D	6.35	0.13	0.25	0.005
E	3.17	0.13	0.125 DIA	0.005
F	5.71	0.13	0.225	0.005
G	9.52	0.13	0.375	0.005
H	6.60	REF	0.260	REF
I	0.13	0.02	0.005	0.001
J	4.32	0.13	0.170	0.005
K	2.54	0.13	0.100	0.005
M	20.32	0.25	0.800	0.010

GOLD METALLISED MULTI-PURPOSE SILICON DMOS RF FET 10W – 12.5V – 175MHz 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

- HF/VHF/UHF COMMUNICATIONS
  from 1 MHz to 175 MHz

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

P_D	Power Dissipation	50W
BV_{DSS}	Drain – Source Breakdown Voltage	40V
BV_{GSS}	Gate – Source Breakdown Voltage	±20V
$I_{D(sat)}$	Drain Current	10A
T_{stg}	Storage Temperature	–65 to 150°C
T_j	Maximum Operating Junction Temperature	200°C

Semelab plc. Telephone +44(0)1455 556565. Fax +44(0)1455 552612.
E-mail: sales@semelab.co.uk Website: http://www.semelab.co.uk

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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	$V_{GS} = 0$	$I_D = 100mA$		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*	$V_{DS} = 10V$	$I_D = 1A$		0.8			S
G_{PS}	Common Source Power Gain	$P_O = 10W$			10			dB
η	Drain Efficiency	$V_{DS} = 12.5V$	$I_{DQ} = 0.4A$		50			%
VSWR	Load Mismatch Tolerance	f = 175MHz			20:1			—
C_{iss}	Input Capacitance	$V_{DS} = 0$	$V_{GS} = –5V$	f = 1MHz			60	pF
C_{oss}	Output Capacitance	$V_{DS} = 12.5V$	$V_{GS} = 0$	f = 1MHz			40	pF
C_{rss}	Reverse Transfer Capacitance	$V_{DS} = 12.5V$	$V_{GS} = 0$	f = 1MHz			4	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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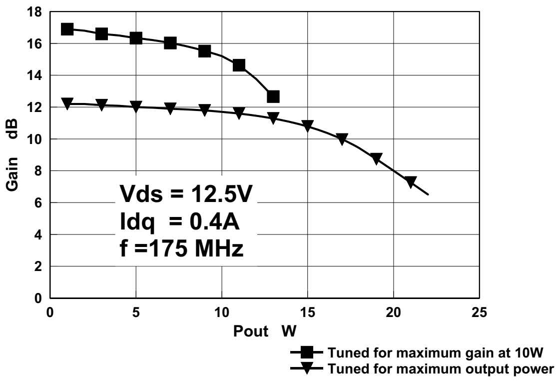

Figure 1 – Gain vs. Power Output.

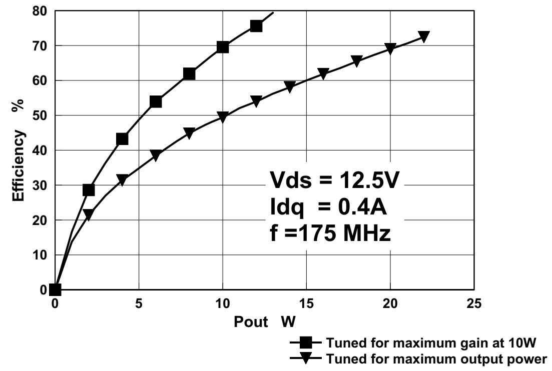

Figure 2 – Efficiency vs. Power Output.

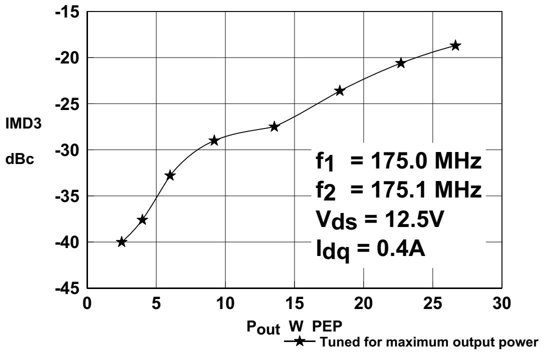

Figure 3 – IMD vs. Power Output.

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OPTIMUM SOURCE AND LOAD IMPEDANCE

Frequency MHz	Z_S Ω	Z_L Ω
175MHz	7.2 + j15	4.1 - j2.5

! V_{DS} = 12.5V, I_{DQ} = 0.4A

MHZ S MA R 50

Typical S Parameters

! V_{DS} = 12.5V, I_{DQ} = 0.4A

MHZ S MA R 50

!Freq	S11		S21		S12		S22	
MHz	mag	ang	mag	ang	mag	ang	mag	ang
50	0.7	-116.5	14.93	97.9	0.036	15.7	0.64	-108.4
100	0.7	-140	7.42	73.6	0.03	2.7	0.65	-132
150	0.75	-150.2	4.56	58.1	0.02	11	0.71	-143.1
200	0.81	-157.2	3.1	46.5	0.016	52.3	0.78	-151.2
250	0.85	-163.1	2.23	37.4	0.026	82.6	0.83	-157.9
300	0.88	-168.1	1.67	30.3	0.04	90.1	0.86	-163.7
350	0.9	-172.6	1.3	24.7	0.055	90.8	0.89	-168.8
400	0.92	-176.6	1.04	20.3	0.071	89.2	0.91	-173.4
450	0.93	179.7	0.85	17.1	0.086	86.8	0.92	-177.5
500	0.94	176.3	0.71	14.9	0.101	84.2	0.93	178.7
550	0.95	173.1	0.6	13.5	0.115	81.5	0.94	175.2
600	0.95	170.1	0.52	13	0.13	78.8	0.95	171.9

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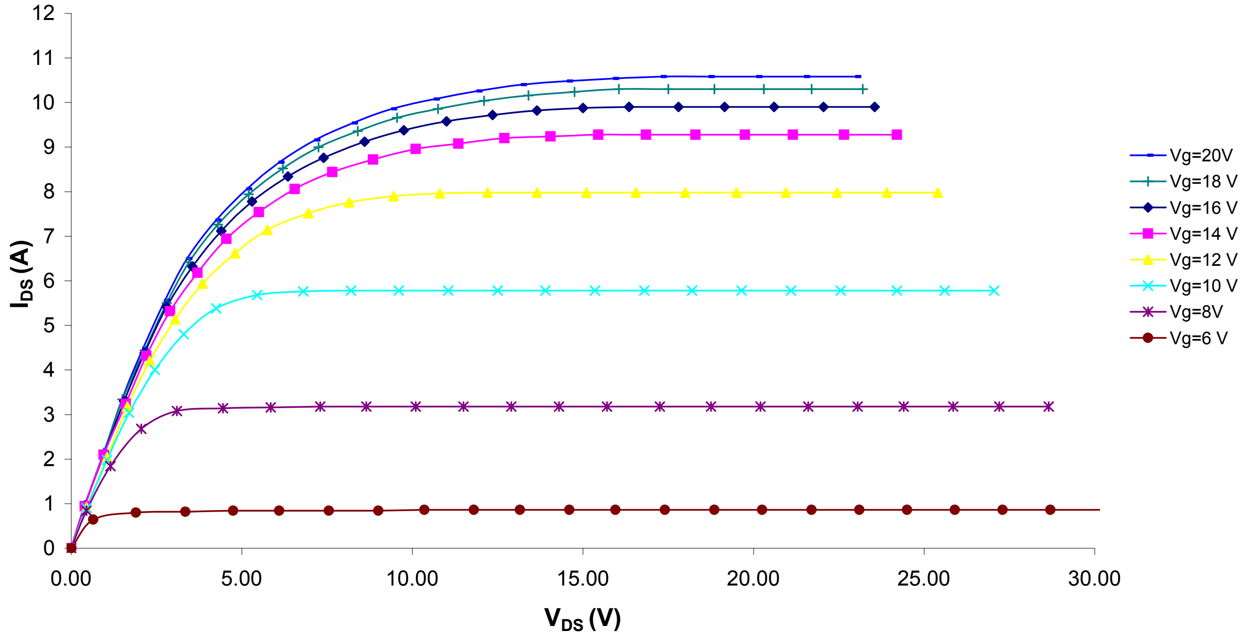

Figure 4 – Typical IV Characteristics.

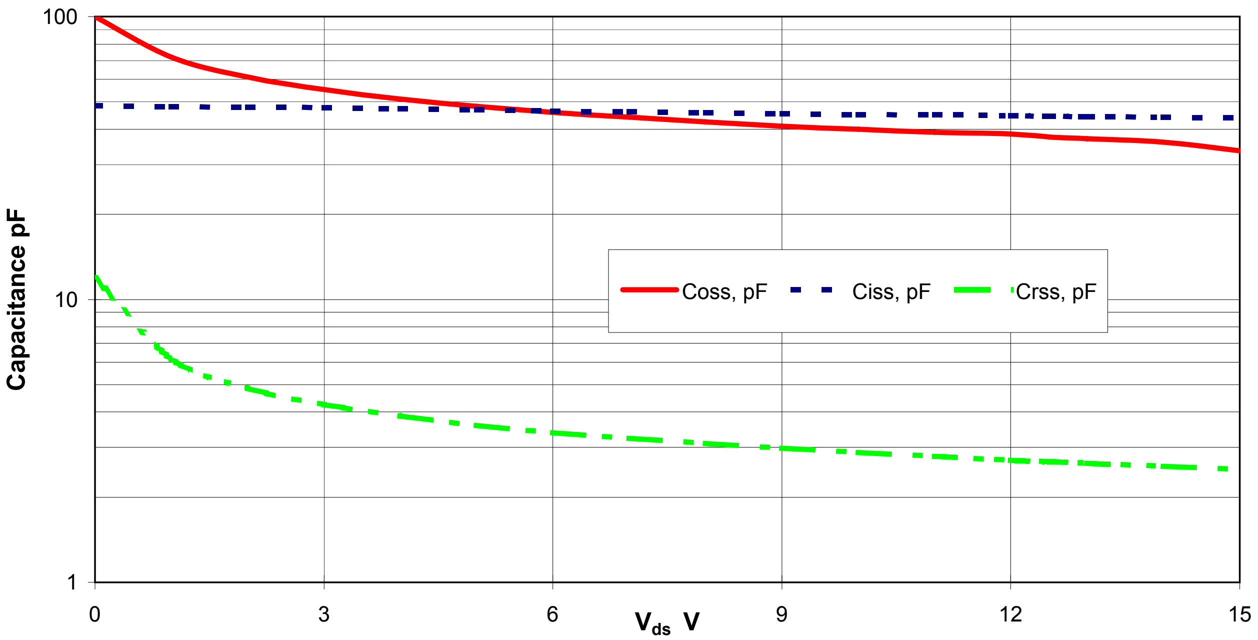

Figure 5 – Typical CV Characteristics.

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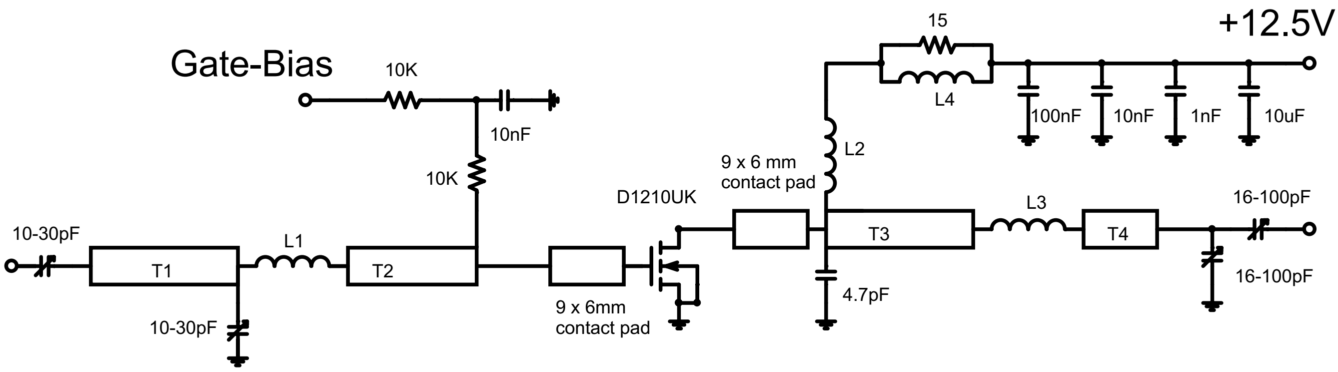

Substrate 1.6mm PTFE/glass, Er=2.5

All microstrip lines W=4.4mm

T1 10mm

T2 13mm

T3 12mm

T4 4mm

L1 1.5 turns 22swg enamelled copper wire, 6mm i.d.

L2 10 turns 19swg enamelled copper wire, 6mm i.d.

L3 1.5 turns 22swg enamelled copper wire, 6mm i.d.

L4 13.5 turns 19swg enamelled copper wire on Siemens B64920A618X830 ferrite core

D1210UK 175MHz TEST FIXTURE

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