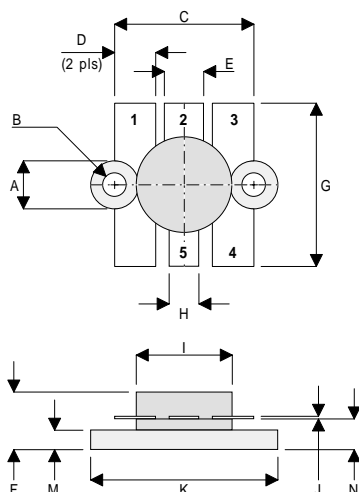


MECHANICAL DATA

**GOLD METALLISED  
MULTI-PURPOSE SILICON  
DMOS RF FET  
30W – 12.5V – 175MHz  
SINGLE ENDED**



DT

- PIN 1 SOURCE (COMMON)    PIN 2 GATE
- PIN 3 SOURCE (COMMON)    PIN 4 SOURCE (COMMON)
- PIN 5 DRAIN

FEATURES

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

DIM	mm	Tol.	Inches	Tol.
A	6.35 DIA	0.13	0.250 DIA	0.005
B	3.17 DIA	0.13	0.125 DIA	0.005
C	18.41	0.25	0.725	0.010
D	5.46	0.13	0.215	0.005
E	5.21	0.13	0.205	0.005
F	7.62	MAX	0.300	MAX
G	21.59	0.38	0.850	0.015
H	3.94	0.13	0.155	0.005
I	12.70	0.13	0.500	0.005
J	0.13	0.03	0.005	0.001
K	24.76	0.13	0.975	0.005
M	2.59	0.13	0.102	0.005
N	4.06	0.25	0.160	0.010

APPLICATIONS

- HF/VHF/UHF COMMUNICATIONS  
from 1 MHz to 200 MHz

ABSOLUTE MAXIMUM RATINGS ( $T_{case} = 25^{\circ}C$  unless otherwise stated)

$P_D$	Power Dissipation	117W
$BV_{DSS}$	Drain – Source Breakdown Voltage	40V
$BV_{GSS}$	Gate – Source Breakdown Voltage	$\pm 20V$
$I_{D(sat)}$	Drain Current	30A
$T_{stg}$	Storage Temperature	$-65$ to $150^{\circ}C$
$T_j$	Maximum Operating Junction Temperature	$200^{\circ}C$

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## ELECTRICAL CHARACTERISTICS (T<sub>case</sub> = 25°C unless otherwise stated)

Parameter	Test Conditions	Min.	Typ.	Max.	Unit
B <sub>V</sub> DSS Drain-Source Breakdown Voltage	V <sub>GS</sub> = 0      I <sub>D</sub> = 100mA	40			V
I <sub>DSS</sub> Zero Gate Voltage Drain Current	V <sub>DS</sub> = 12.5V      V <sub>GS</sub> = 0			1	mA
I <sub>GSS</sub> Gate Leakage Current	V <sub>GS</sub> = 20V      V <sub>DS</sub> = 0			1	μA
V <sub>GS(th)</sub> Gate Threshold Voltage*	I <sub>D</sub> = 10mA      V <sub>DS</sub> = V <sub>GS</sub>	1		7	V
g <sub>fs</sub> Forward Transconductance*	V <sub>DS</sub> = 10V      I <sub>D</sub> = 3A	2.4			S
G <sub>PS</sub> Common Source Power Gain	P <sub>O</sub> = 30W	10			dB
η Drain Efficiency	V <sub>DS</sub> = 12.5V      I <sub>DQ</sub> = 0.6A	50			%
VSWR Load Mismatch Tolerance	f = 175MHz	20:1			—
C <sub>iss</sub> Input Capacitance	V <sub>DS</sub> = 0      V <sub>GS</sub> = -5V      f = 1MHz			180	pF
C <sub>oss</sub> Output Capacitance	V <sub>DS</sub> = 12.5V      V <sub>GS</sub> = 0      f = 1MHz			120	pF
C <sub>rss</sub> Reverse Transfer Capacitance	V <sub>DS</sub> = 12.5V      V <sub>GS</sub> = 0      f = 1MHz			12	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 <sub>THj-case</sub>	Thermal Resistance Junction – Case	Max. 1.5°C / W
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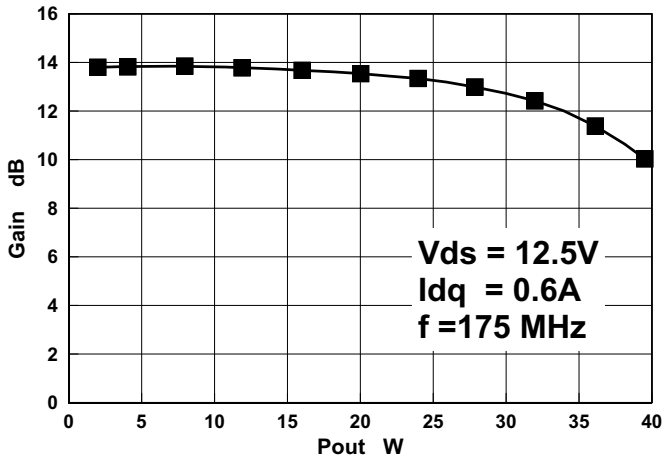


Figure 1- Gain vs. Power Output

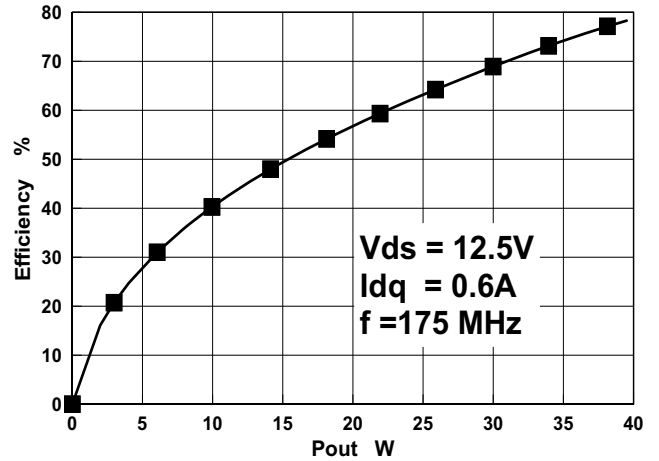


Figure 2 - Efficiency vs. Power Output

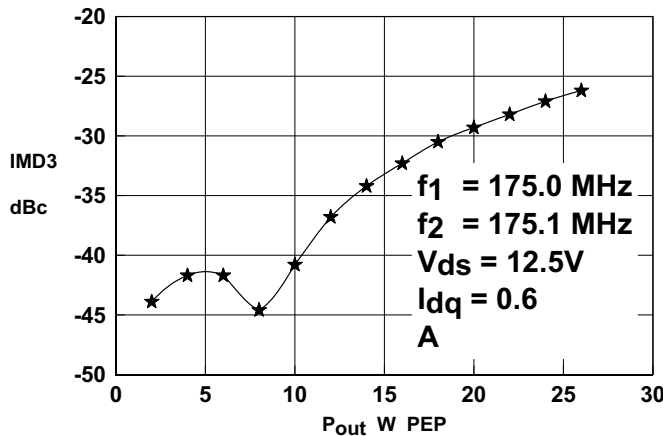


Figure 3 - IMD vs. Power Output

### OPTIMUM SOURCE AND LOAD IMPEDANCE

Frequency MHz	$Z_S$ $\Omega$	$Z_L$ $\Omega$
175	$2.2 + j3.8$	$1.4 - j1.8$

### Typical S Parameters

!  $V_{DS} = 12.5V$ ,  $I_{DQ} = 0.6A$   
# MHz S M A R 50

Freq MHz	S11		S21		S12		S22	
	mag	ang	mag	ang	mag	ang	mag	ang
50	0.78	-167.2	17.2	76.0	0.011	0.0	0.72	-164.2
100	0.82	-171.7	7.7	57.9	0.008	3.9	0.78	-167.6
150	0.87	-174.9	4.5	44.5	0.006	31.6	0.84	-170.3
200	0.90	-178.2	2.9	34.2	0.008	63.1	0.88	-173.3
250	0.93	178.6	2.0	26.2	0.012	75.9	0.91	-176.2
300	0.94	175.4	1.5	19.9	0.016	79.6	0.93	-178.9
350	0.96	172.5	1.1	14.8	0.020	80.1	0.95	178.5
400	0.96	169.6	0.9	10.5	0.025	79.2	0.96	176.1
450	0.97	166.9	0.7	7.1	0.029	77.7	0.97	173.8
500	0.97	164.3	0.6	4.2	0.033	76.0	0.97	171.7

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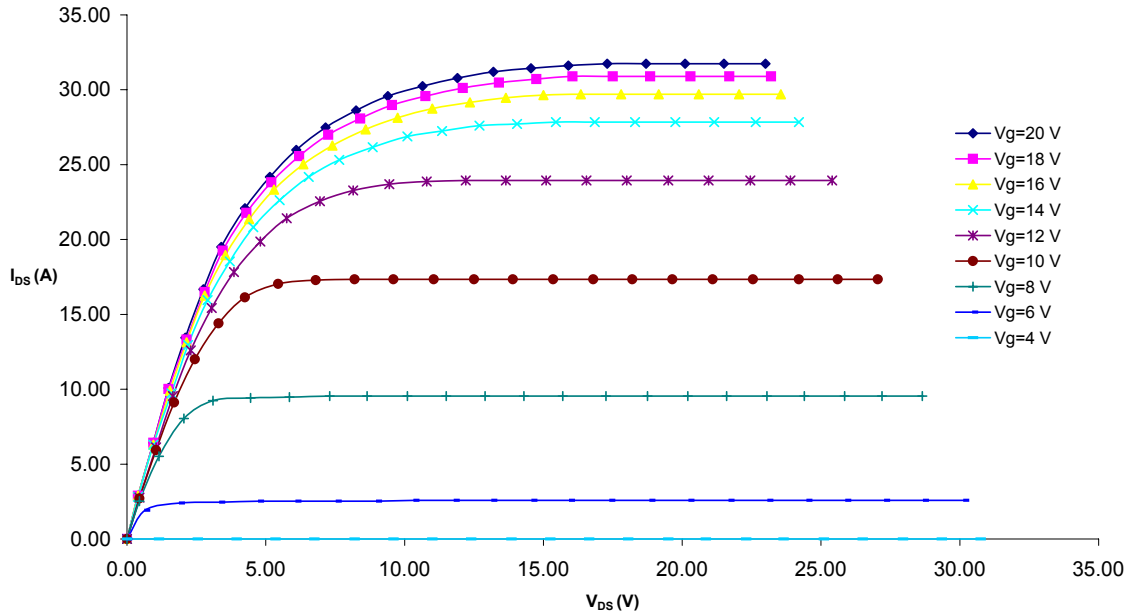


Figure 4 – Typical IV Characteristics.

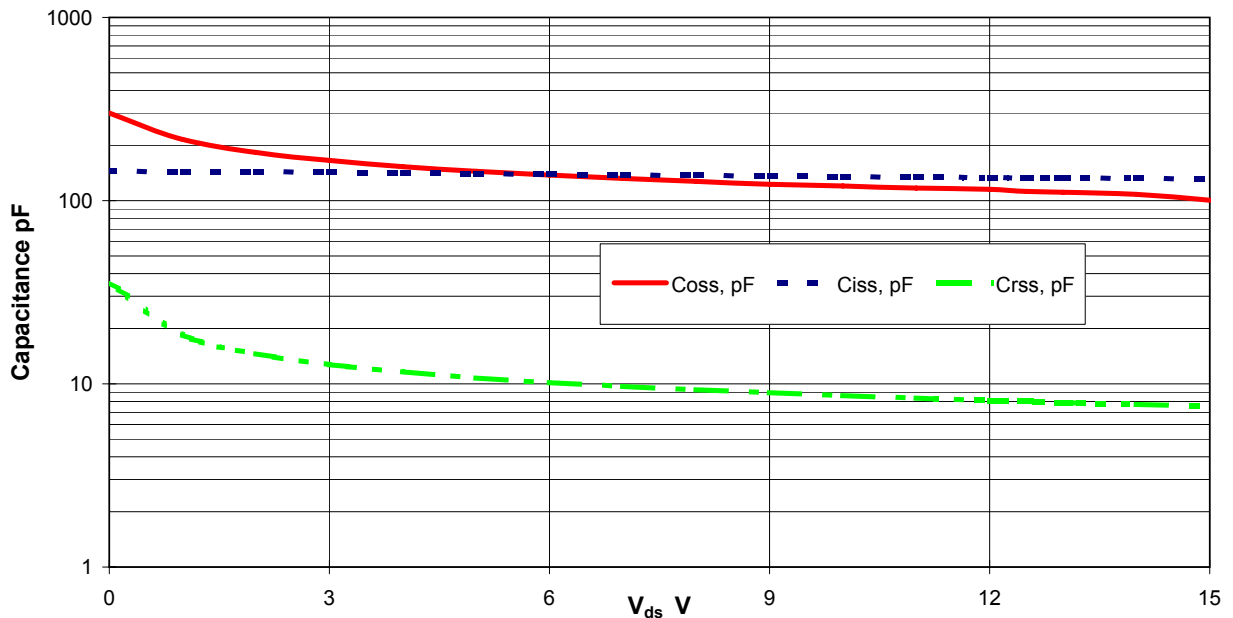
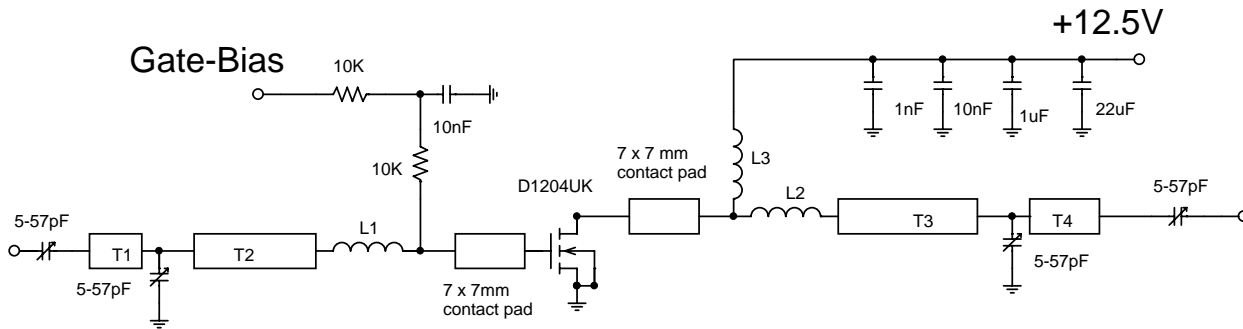


Figure 5 – Typical CV Characteristics.

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# D1204UK 175MHz TEST FIXTURE

Substrate 1.6mm PTFE/glass, Er=2.5

All microstrip lines W=4.4mm

T1 8mm

T2 22mm

T3 18mm

T4 4.5mm

L1 Hairpin loop 16swg 15.5mm dia

L2 Hairpin loop 16swg 10mm dia

L3 11 turns 18swg enamelled copper wire, 10mm i.d.