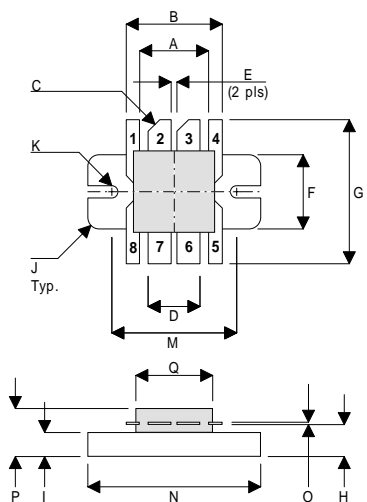


MECHANICAL DATA



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  
40W – 12.5V – 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 ( $T_{case} = 25^{\circ}C$  unless otherwise stated)

$P_D$	Power Dissipation	175W
$BV_{DSS}$	Drain – Source Breakdown Voltage*	40V
$BV_{GSS}$	Gate – Source Breakdown Voltage*	$\pm 20V$
$I_{D(sat)}$	Drain Current*	20A
$T_{stg}$	Storage Temperature	-65 to 150°C
$T_j$	Maximum Operating Junction Temperature	200°C

\* Per side

Semelab Plc reserves the right to change test conditions, parameter limits and package dimensions without notice. Information furnished by Semelab is believed to be both accurate and reliable at the time of going to press. However Semelab assumes no responsibility for any errors or omissions discovered in its use. Semelab encourages customers to verify that datasheets are current before placing orders.

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

Parameter	Test Conditions	Min.	Typ.	Max.	Unit
<b>PER SIDE</b>					
B <sub>V</sub> DSS	Drain–Source Breakdown Voltage	V <sub>GS</sub> = 0      I <sub>D</sub> = 100mA	40		V
I <sub>D</sub> DSS	Zero Gate Voltage Drain Current	V <sub>DS</sub> = 12.5V      V <sub>GS</sub> = 0		2	mA
I <sub>G</sub> DSS	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> = 2A	1.6		S
<b>TOTAL DEVICE</b>					
G <sub>PS</sub>	Common Source Power Gain	P <sub>O</sub> = 40W	10		dB
η	Drain Efficiency	V <sub>DS</sub> = 12.5V      I <sub>DQ</sub> = 1.6A	50		%
VSWR	Load Mismatch Tolerance	f = 400MHz	20:1		—
<b>PER SIDE</b>					
C <sub>iss</sub>	Input Capacitance	V <sub>DS</sub> = 0V      V <sub>GS</sub> = -5V      f = 1MHz		120	pF
C <sub>oss</sub>	Output Capacitance	V <sub>DS</sub> = 12.5V      V <sub>GS</sub> = 0      f = 1MHz		80	pF
C <sub>rss</sub>	Reverse Transfer Capacitance	V <sub>DS</sub> = 12.5V      V <sub>GS</sub> = 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 <sub>THj-case</sub>	Thermal Resistance Junction – Case	Max. 1.0°C / W
-----------------------	------------------------------------	----------------

Semelab Plc reserves the right to change test conditions, parameter limits and package dimensions without notice. Information furnished by Semelab is believed to be both accurate and reliable at the time of going to press. However Semelab assumes no responsibility for any errors or omissions discovered in its use. Semelab encourages customers to verify that datasheets are current before placing orders.

**Semelab plc.** Telephone +44(0)1455 556565. Fax +44(0)1455 552612.

E-mail: [sales@semelab.co.uk](mailto:sales@semelab.co.uk) Website: <http://www.semelab.co.uk>

Document Number 3174

Issue 2

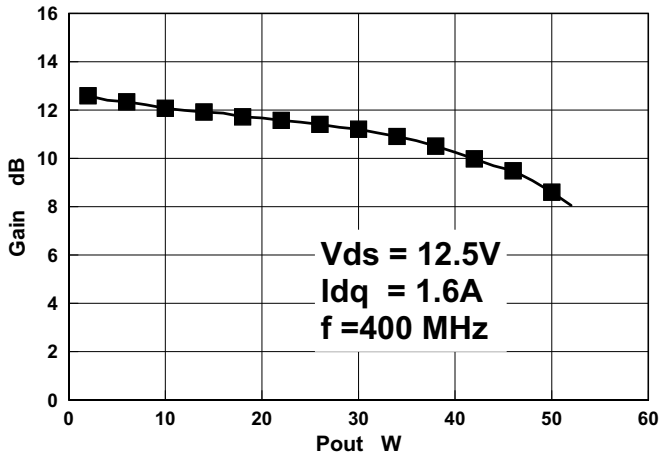


Figure 1- Gain vs. Power Output

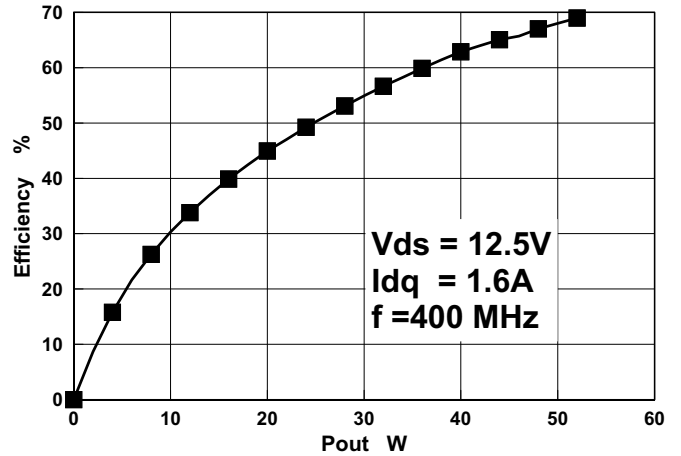


Figure 2 - Efficiency vs. Power Output

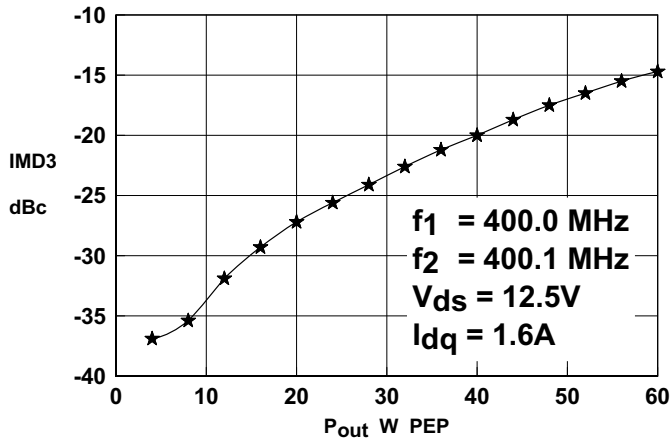


Figure 3 - IMD vs. Power Output

OPTIMUM SOURCE AND LOAD IMPEDANCE

Frequency MHz	Z <sub>S</sub> Ω	Z <sub>L</sub> Ω
400	1.5 + j1.2	1.9 - j1.1

Typical S Parameters

! V<sub>DS</sub> = 12.5V, I<sub>DQ</sub> = 0.4A  
# MHZ S MA R 50

!Freq !MHz	S11 mag	ang	S21 mag	ang	S12 mag	ang	S22 mag	ang
70	0.71	-151.2	9.5	73.1	0.019	-9.1	0.77	-163.9
100	0.75	-156.2	6.1	62.2	0.016	-13.2	0.79	-166.0
150	0.81	-162.7	3.7	50.4	0.012	-12.8	0.83	-169.7
200	0.85	-167.4	2.4	44.0	0.009	0.4	0.86	-172.8
250	0.88	-171.0	1.7	36.6	0.008	20.8	0.88	-175.3
300	0.90	-173.9	1.3	34.5	0.009	49.0	0.89	-176.6
350	0.91	-175.1	1.0	26.0	0.010	60.6	0.90	-178.7
400	0.92	-177.9	0.8	23.4	0.014	70.2	0.91	-180.0
450	0.93	-179.7	0.7	17.6	0.017	75.0	0.92	-178.6
500	0.93	-178.1	0.6	13.3	0.021	77.9	0.93	-176.8
550	0.94	-175.9	0.5	8.2	0.023	78.5	0.93	-175.4
600	0.95	-174.2	0.4	2.5	0.028	77.1	0.94	-174.4
650	0.95	-172.2	0.3	8.9	0.029	80.6	0.95	-172.9
700	0.96	-170.9	0.2	19.2	0.034	76.8	0.95	-171.8

Semelab Plc reserves the right to change test conditions, parameter limits and package dimensions without notice. Information furnished by Semelab is believed to be both accurate and reliable at the time of going to press. However Semelab assumes no responsibility for any errors or omissions discovered in its use. Semelab encourages customers to verify that datasheets are current before placing orders.

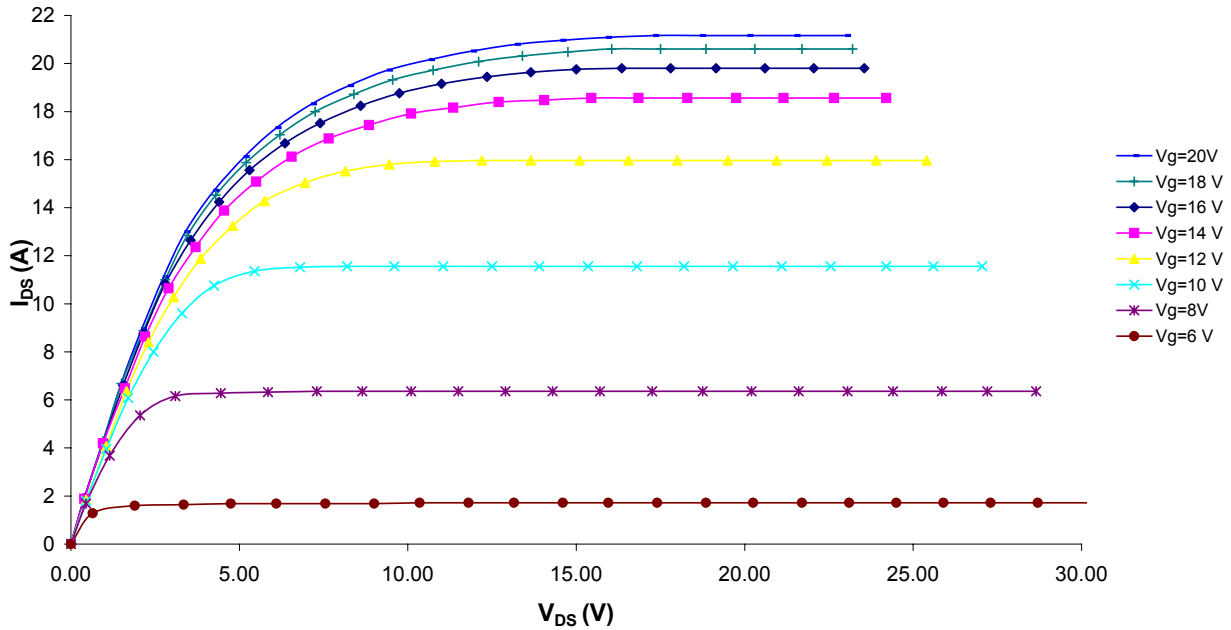


Figure 4 – Typical IV Characteristics.

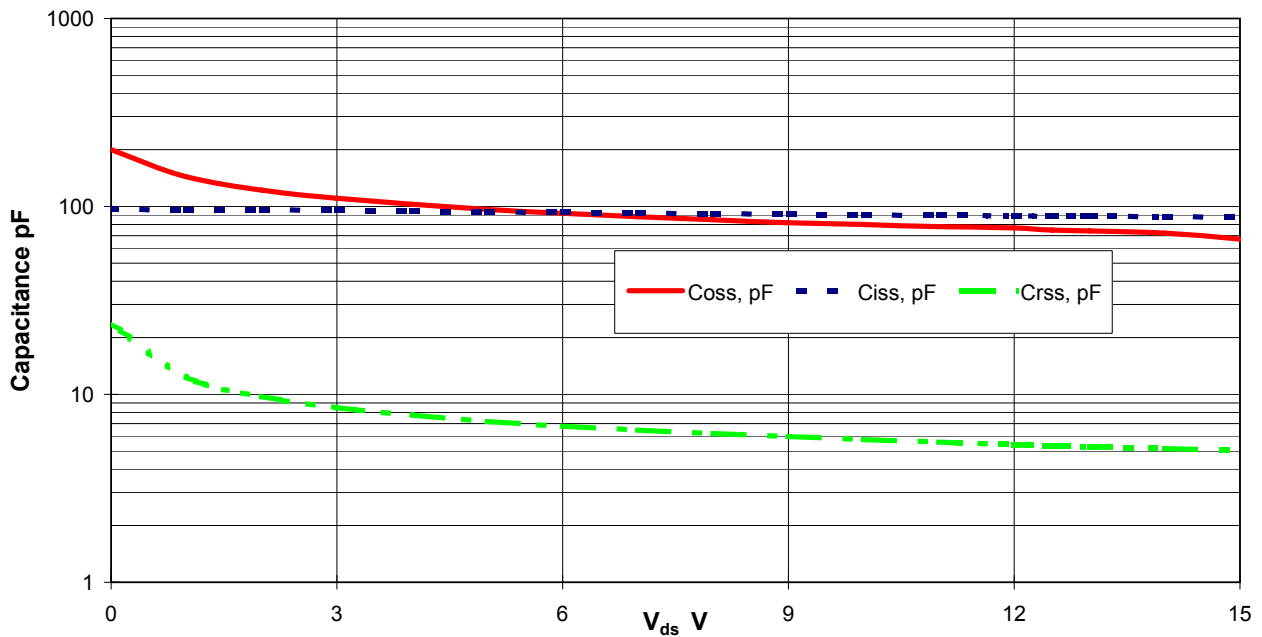
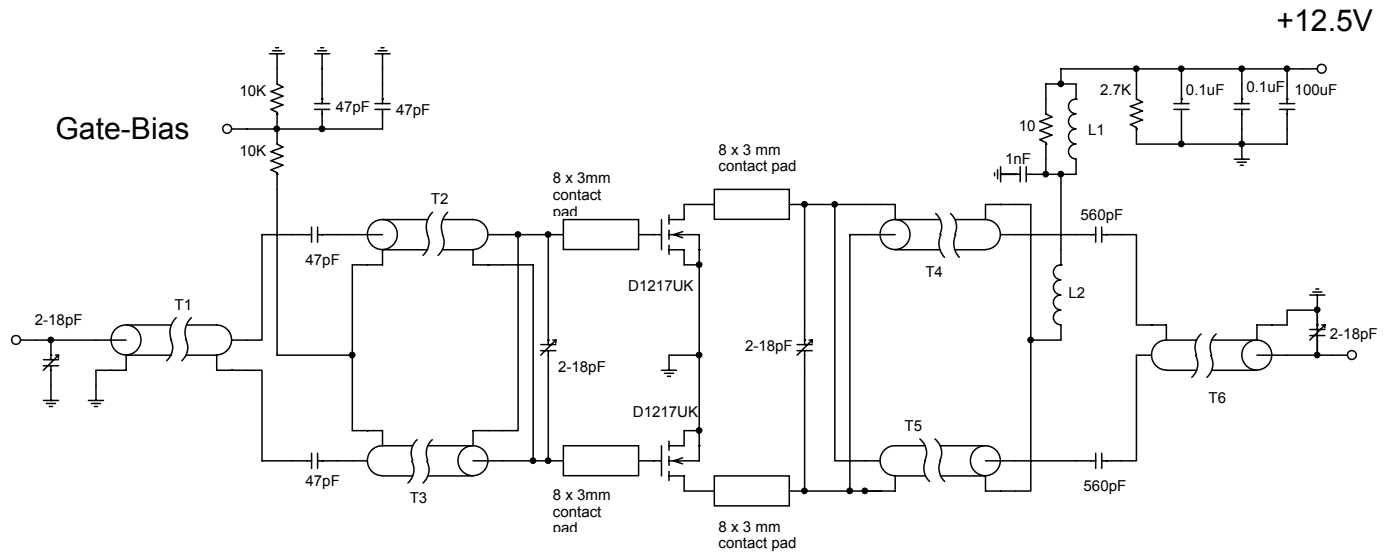


Figure 5 – Typical CV Characteristics.

Semelab Plc reserves the right to change test conditions, parameter limits and package dimensions without notice. Information furnished by Semelab is believed to be both accurate and reliable at the time of going to press. However Semelab assumes no responsibility for any errors or omissions discovered in its use. Semelab encourages customers to verify that datasheets are current before placing orders.



## D1217UK TEST FIXTURE

- T1 50 Ohm semi-rigid coax 0.034" dia, 7cm long
- T2,3 25 Ohm semi-rigid coax 0.070" dia, 10cm long on Siemens B62152A1X1 ferrite core
- T4,5 25 Ohm semi-rigid coax 0.070" dia, 10cm long
- T6 50 Ohm semi-rigid coax 0.034" dia, 7cm long
- L1 2.5 turns 1mm dia enamelled copper wire on Siemens B62152A1X1 ferrite core
- L2 6 turns 2 mm dia enamelled copper wire, 3.5mm internal diameter