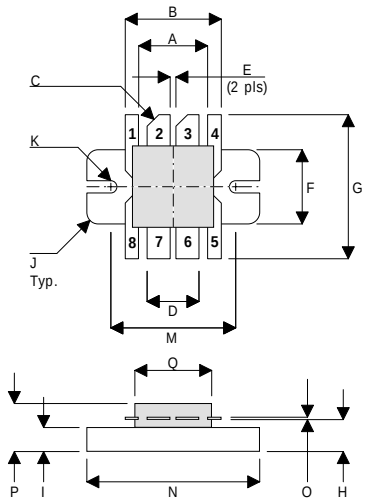
D1217UK

ROHS COMPLIANT METAL GATE RF SILICON FET

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°C unless otherwise stated)

P_D	Power Dissipation	175W
BV_{DSS}	Drain – Source Breakdown Voltage*	40V
BV_{GSS}	Gate – Source Breakdown Voltage*	±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

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

Parameter		Test Conditions		Min.	Typ.	Max.	Unit
PER SIDE							
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			2	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 = 2A	1.6			S
TOTAL DEVICE							
G_{PS}	Common Source Power Gain	P_O = 40W		10			dB
η	Drain Efficiency	V_{DS} = 12.5V	I_{DQ} = 1.6A	50			%
VSWR	Load Mismatch Tolerance	f = 400MHz		20:1			—
PER SIDE							
C_{iss}	Input Capacitance	V_{DS} = 0V	V_{GS} = –5V f = 1MHz			120	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. 1.0°C / W

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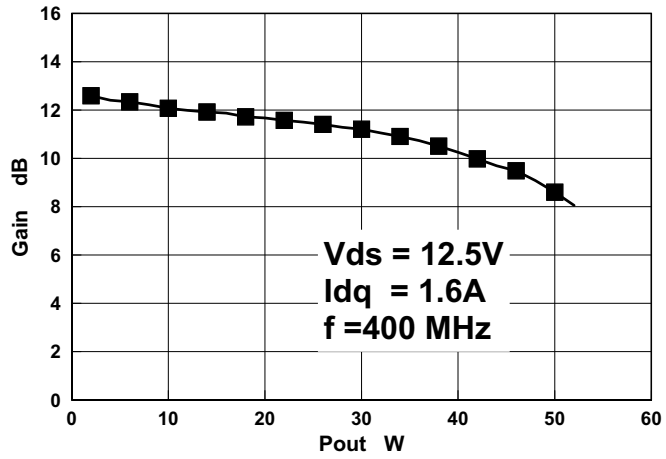

Figure 1- Gain vs. Power Output

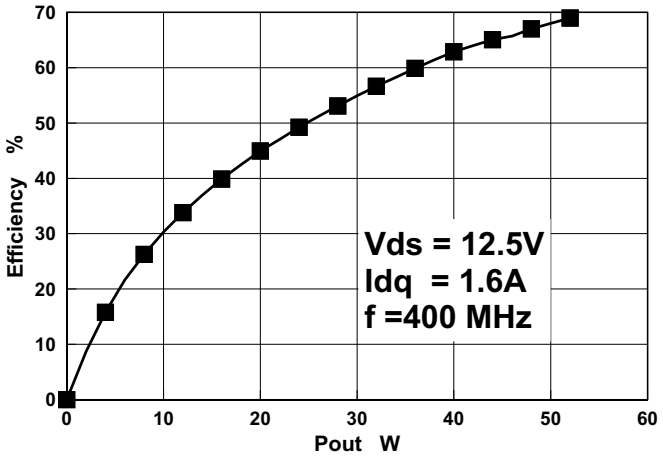

Figure 2 - Efficiency vs Power Output

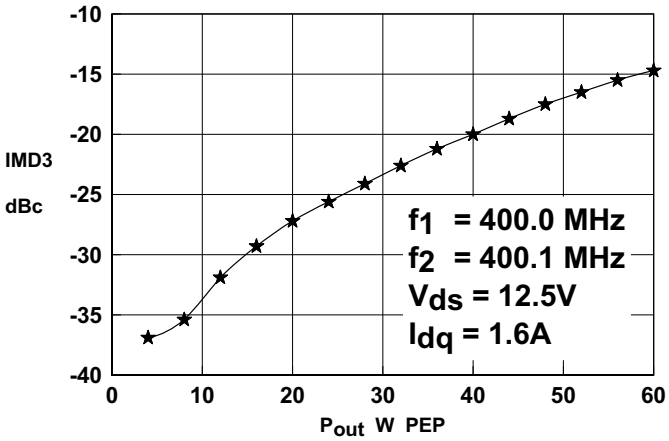

Figure 3 - IMD vs Power Output

OPTIMUM SOURCE AND LOAD IMPEDANCE

Frequency MHz	Z_S Ω	Z_L Ω
400	1.5 + j1.2	1.9 - j1.1

Typical S Parameters

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

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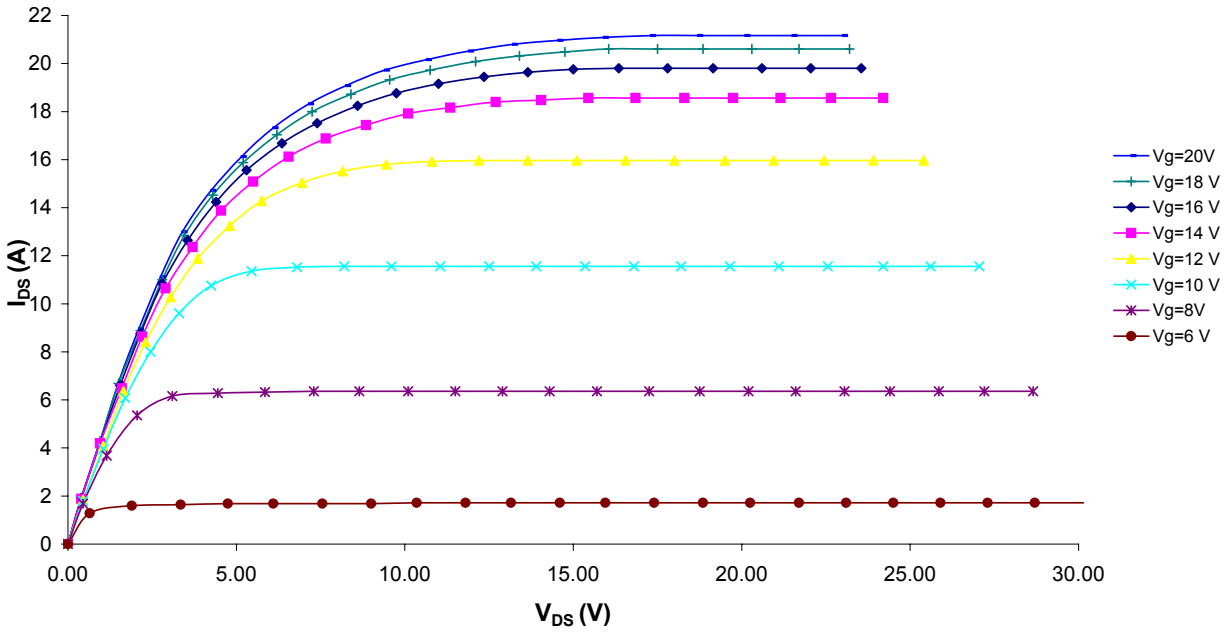

Figure 4 – Typical IV Characteristics.

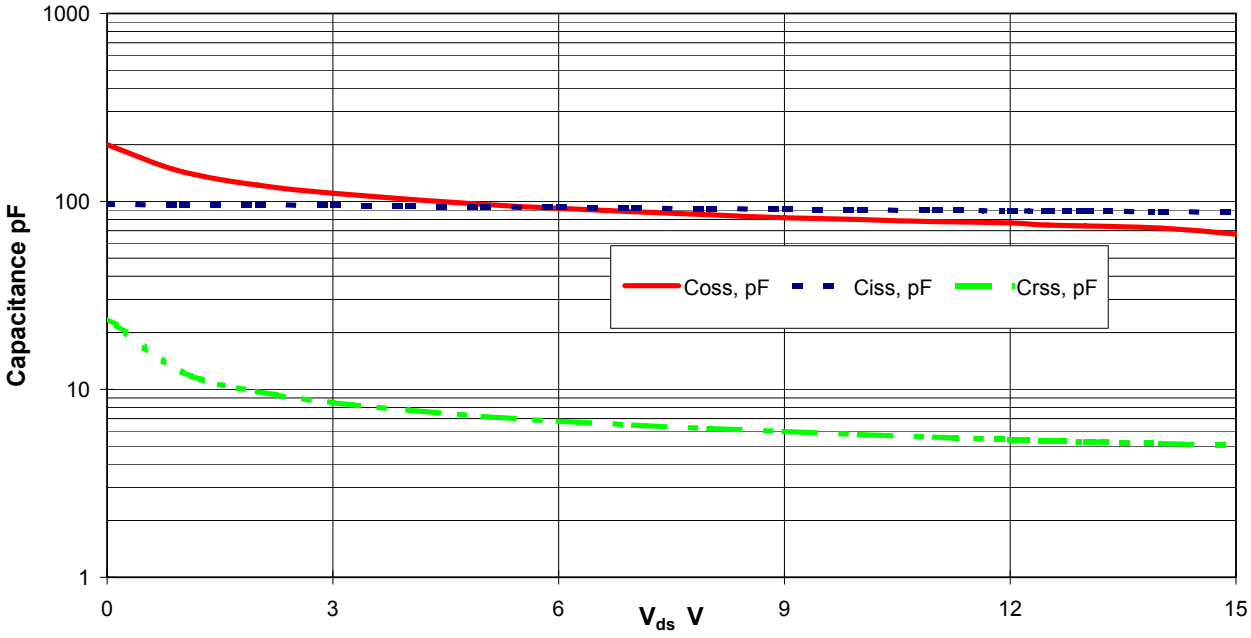

Figure 5 – Typical CV Characteristics.

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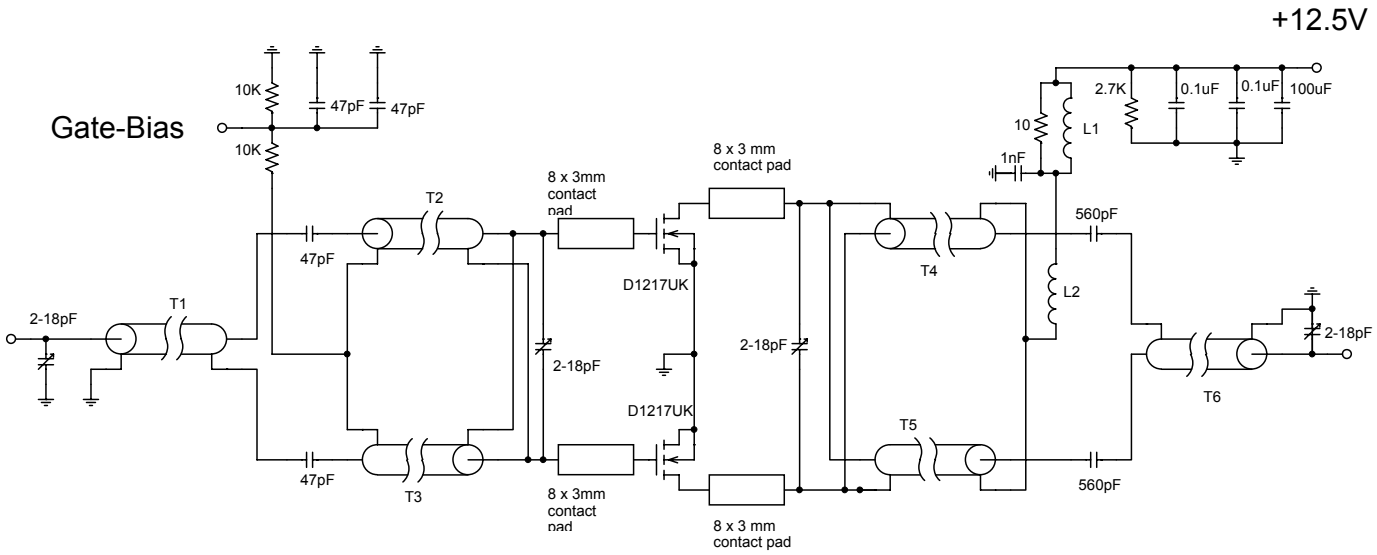

D1217UK TEST FIXTURE

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

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