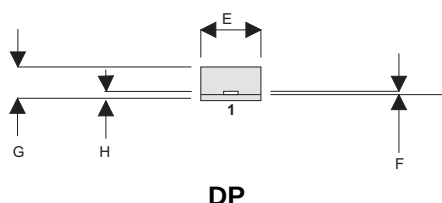
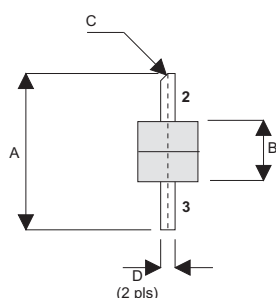


MECHANICAL DATA

GOLD METALLISED MULTI-PURPOSE SILICON DMOS RF FET 10W – 12.5V – 1GHz SINGLE ENDED



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	1.52	0.13	0.060	0.005
E	6.35	0.13	0.250	0.005
F	0.13	0.03	0.005	0.001
G	3.56	0.51	0.140	0.020
H	0.64	0.13	0.024	0.005

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 DC to 1 GHz

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

P_D	Power Dissipation	42W
BV_{DSS}	Drain – Source Breakdown Voltage	40V
BV_{GSS}	Gate – Source Breakdown Voltage	$\pm 20V$
$I_{D(sat)}$	Drain Current	8A
T_{stg}	Storage Temperature	-65 to $150^{\circ}C$
T_j	Maximum Operating Junction Temperature	$200^{\circ}C$

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 ($T_{case} = 25^{\circ}C$ 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*	$I_D = 10mA$ $V_{DS} = V_{GS}$	0.5		7	V
g_{fs} Forward Transconductance*	$V_{DS} = 10V$ $I_D = 0.8A$	0.72			S
G_{PS} Common Source Power Gain	$P_O = 10W$	10			dB
η Drain Efficiency	$V_{DS} = 12.5V$ $I_{DQ} = 0.4A$	40			%
VSWR Load Mismatch Tolerance	$f = 1GHz$	20:1			—
C_{iss} Input Capacitance	$V_{DS} = 0$ $V_{GS} = -5V$ $f = 1MHz$			48	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 $\leq 2\%$

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. 4.2°C / W
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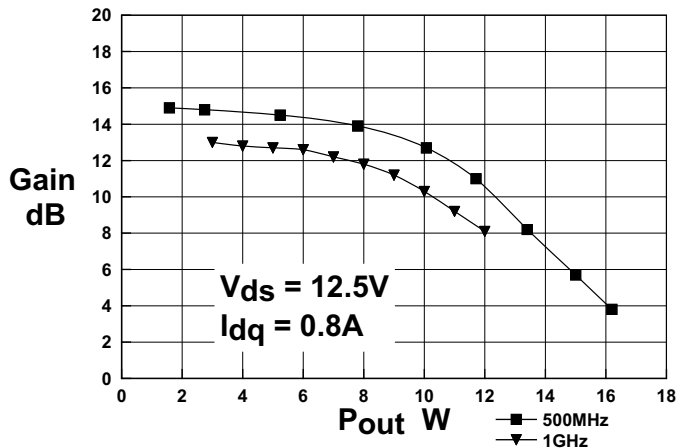


Figure 1- Gain vs. Power Output

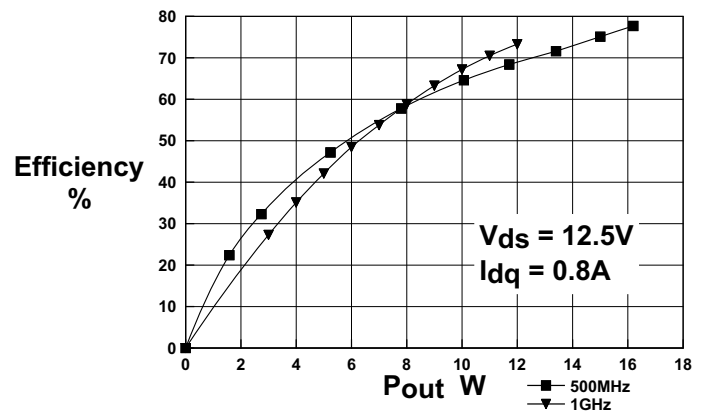


Figure 2 - Efficiency vs Output Power

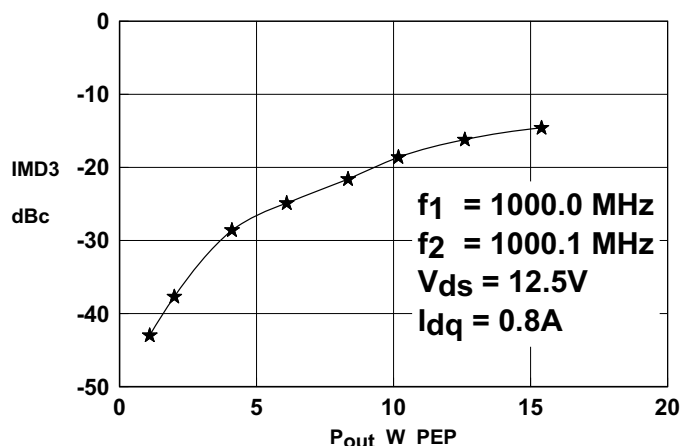


Figure 3 - IMD vs Power Output

D2214UK OPTIMUM SOURCE AND LOAD IMPEDANCE

Frequency MHz	Z_S Ω	Z_L Ω
1000MHz	$0.9 - j4.9$	$1.9 - j7.3$

Typical S Parameters

! $V_{DS} = 12.5V$, $I_{DQ} = 0.8A$

MHz S MA R 50

!Freq !MHz	S11 mag	ang	S21 mag	ang	S12 mag	ang	S22 mag	ang
70	0.77	-124.6	19.6	100.6	0.020	10.0	0.58	-120.3
100	0.75	-136.7	14.7	89.0	0.020	2.0	0.60	-130.3
150	0.77	-148	9.3	72.2	0.017	-7.6	0.65	-140.3
200	0.80	-154.9	6.4	61.7	0.015	-10.3	0.71	-146.8
250	0.83	-160.2	4.7	52.8	0.012	-10.4	0.76	-151.4
300	0.85	-164.1	3.8	49.3	0.010	-4.1	0.79	-155.5
350	0.87	-167.8	3.0	39.7	0.007	8.7	0.82	-159.6
400	0.88	-170.9	2.5	39.0	0.006	29.4	0.85	-162.6
450	0.90	-174.5	2.0	33.8	0.007	56.1	0.87	-165.9
500	0.90	-177.5	1.8	31.5	0.009	73.1	0.87	-168.5
550	0.92	-179.2	1.5	25.5	0.012	80.5	0.90	-171.7
600	0.92	-176.5	1.4	20.4	0.016	81.4	0.90	-174.4
650	0.93	-174.6	1.2	17.5	0.018	84.5	0.91	-176.5
700	0.94	-172.2	1.1	11.7	0.021	81.5	0.92	-178.7
750	0.94	-169.7	0.9	10.0	0.022	83.0	0.93	-179.1
800	0.95	-167.6	0.7	7.7	0.024	82.7	0.94	-177.2
850	0.95	-165.5	0.6	11.4	0.027	88.1	0.94	-174.4
900	0.96	-164.1	0.6	11.4	0.031	89.0	0.95	-172.6
950	0.96	-161.3	0.6	12.3	0.036	89.5	0.95	-170.6
1000	0.96	-158.6	0.5	8.7	0.040	86.0	0.95	-169

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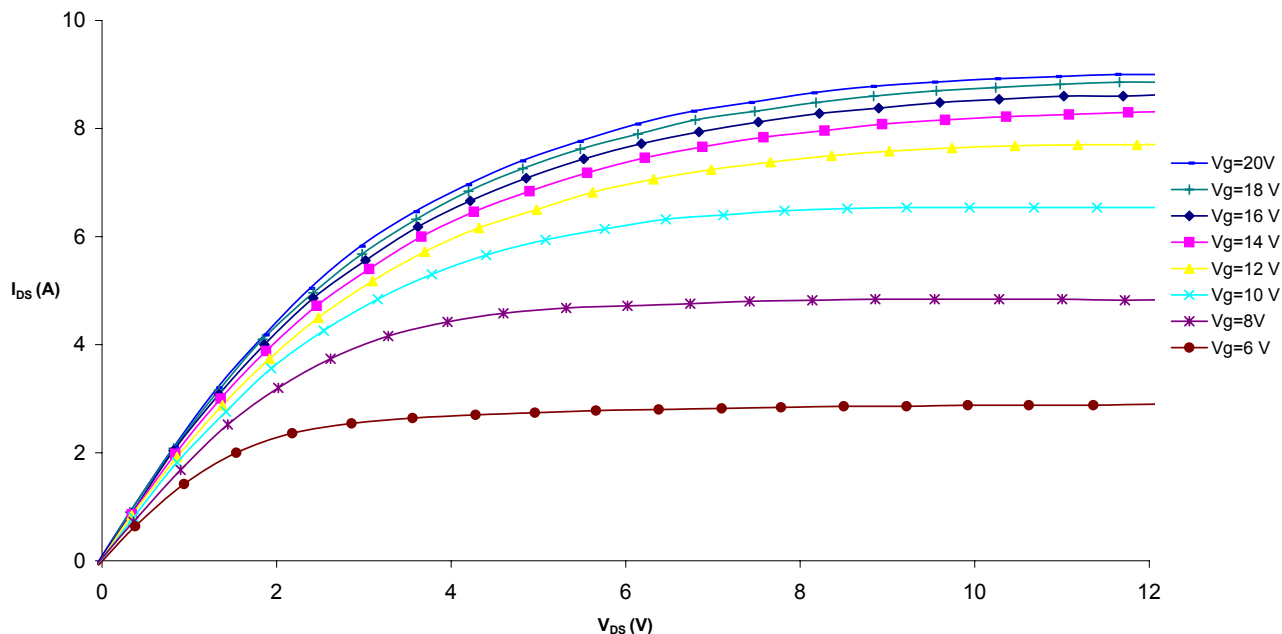


Figure 4 – Typical IV Characteristics.

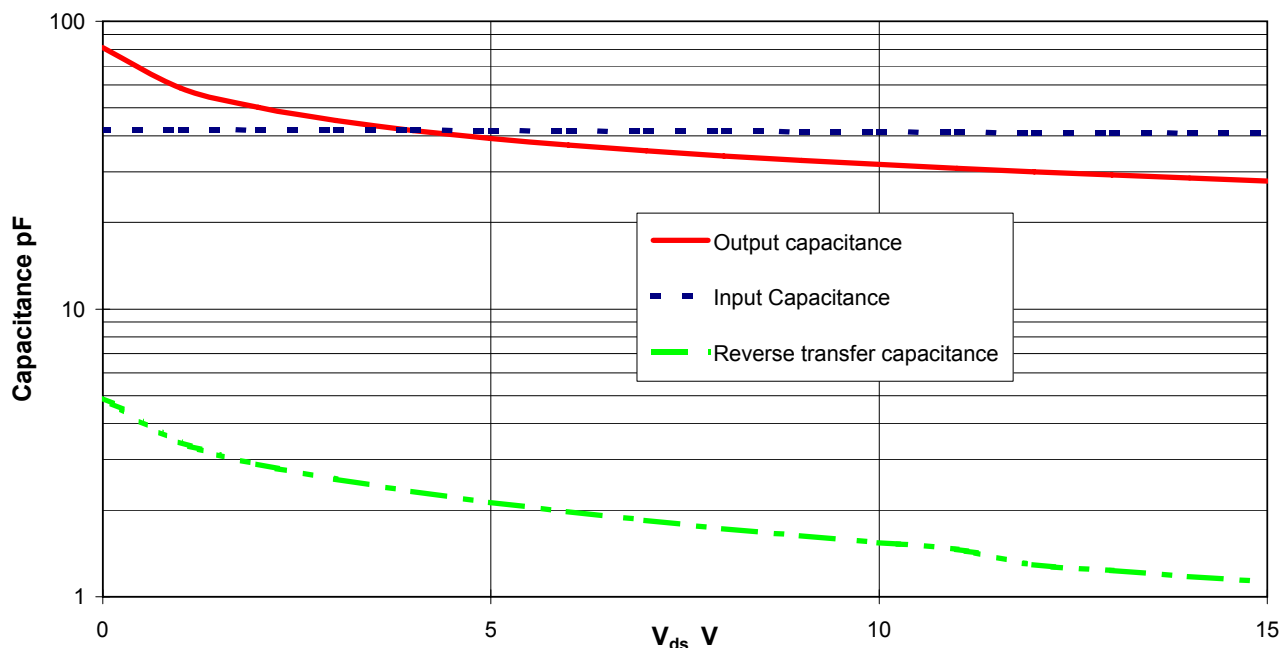
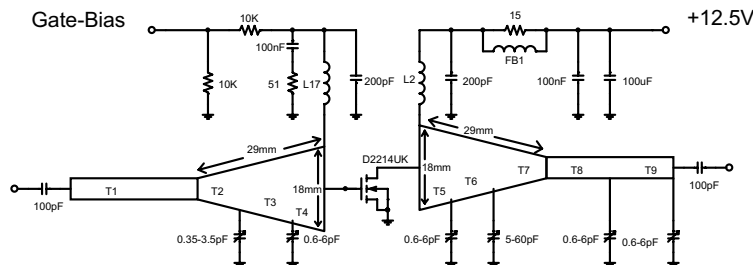


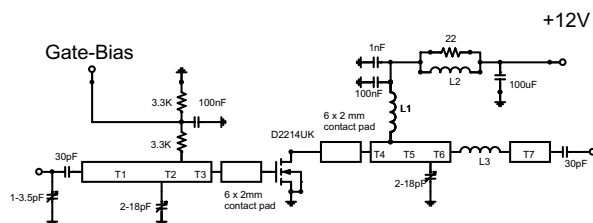
Figure 5 – Typical CV Characteristics.



Substrate 0.8mm PTFE/glass

T1 28mm 50 Ohms	T6 14mm
T2 11mm	T7 10mm
T3 11mm	T8 11mm 50 Ohms
T4 7mm	T9 17mm 50 Ohms
T5 5mm	
FB1 Murata BL02RN1-R62	
L1,L2 10 turns 22swg enamelled copper wire, 6mm i.d.	

Figure 6 - 1GHz Test Fixture



Substrate 0.8mm PTFE/glass, Er=2.5

All microstrip lines W=2.2mm

T1 32mm
T2 4mm
T3 5mm
T4 3mm
T5 9mm
T6 7.5mm
T7 13mm
L1 6 turns 0.5mm dia enamelled copper wire, 3mm i.d.
L2 1.5 turns 0.5mm enamelled copper wire on Siemens B62152A7 2 hole ferrite core
L3 1/16" dia wire hairpin loop 15mm long

Figure 7 - 500MHz Test Fixture