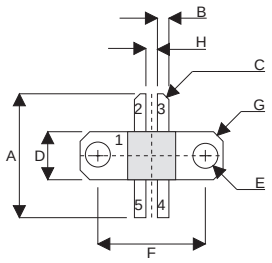
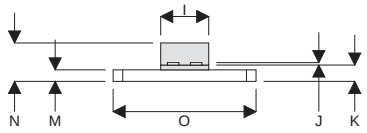
D2203UK

METAL GATE RF SILICON FET

MECHANICAL DATA

GOLD METALLISED MULTI-PURPOSE SILICON DMOS RF FET 5W – 12.5V – 1GHz PUSH–PULL





DQ

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

DIM	mm	Tol.	Inches	Tol.
A	16.38	0.26	0.645	0.010
B	1.52	0.13	0.060	0.005
C	45°	5°	45°	5°
D	6.35	0.13	0.250	0.005
E	3.30	0.13	0.130	0.005
F	14.22	0.13	0.560	0.005
G	1.27 x 45°	0.13	0.05 x 45°	0.005
H	1.52	0.13	0.060	0.005
I	6.35	0.13	0.250	0.005
J	0.13	0.02	0.005	0.001
K	2.16	0.13	0.085	0.005
M	1.52	0.13	0.060	0.005
N	5.08	MAX	0.200	MAX
O	18.90	0.13	0.744	0.005

FEATURES

- **SIMPLIFIED AMPLIFIER DESIGN**
- **SUITABLE FOR BROAD BAND APPLICATIONS**
- **VERY LOW C_{rss}**
- **SIMPLE BIAS CIRCUITS**
- **LOW NOISE**
- **HIGH GAIN – 10 dB MINIMUM**

APPLICATIONS

- VHF/UHF COMMUNICATIONS from 1MHz to 1 GHz

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

P_D	Power Dissipation	35W
BV_{DSS}	Drain – Source Breakdown Voltage *	40V
BV_{GSS}	Gate – Source Breakdown Voltage *	±20V
$I_{D(sat)}$	Drain Current *	2A
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 = 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}	1		7	V
g_{fs}	Forward Transconductance*	V_{DS} = 10V	I_D = 0.2A	0.18			S
TOTAL DEVICE							
G_{PS}	Common Source Power Gain	P_O = 5W		10			dB
η	Drain Efficiency	V_{DS} = 12.5V	I_{DQ} = 0.2A	40			%
VSWR	Load Mismatch Tolerance	f = 1GHz		20:1			—
PER SIDE							
C_{iss}	Input Capacitance	V_{DS} = 0V	V_{GS} = –5V f = 1MHz			12	pF
C_{oss}	Output Capacitance	V_{DS} = 12.5V	V_{GS} = 0 f = 1MHz			10	pF
C_{rss}	Reverse Transfer Capacitance	V_{DS} = 12.5V	V_{GS} = 0 f = 1MHz			1	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. 5.0°C / W

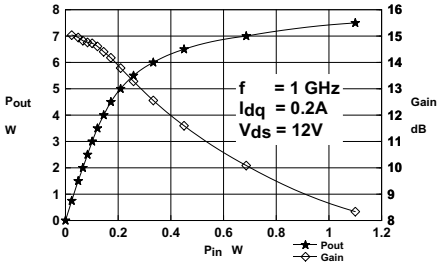


Figure 1 Output Power and Gain vs. Input power

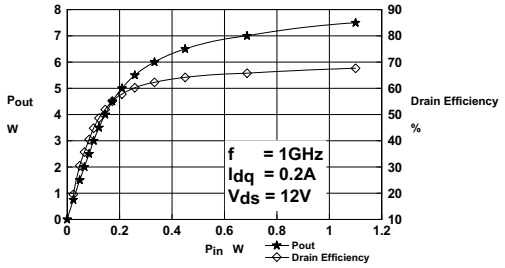


Figure 2 Output Power and Efficiency vs. Input Power

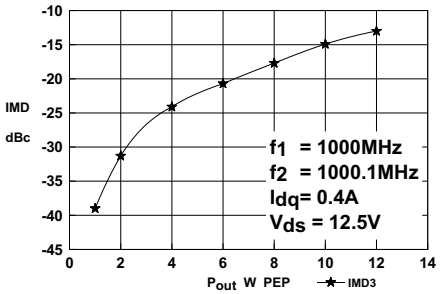


Figure 3 IMD Vs. Output Power.

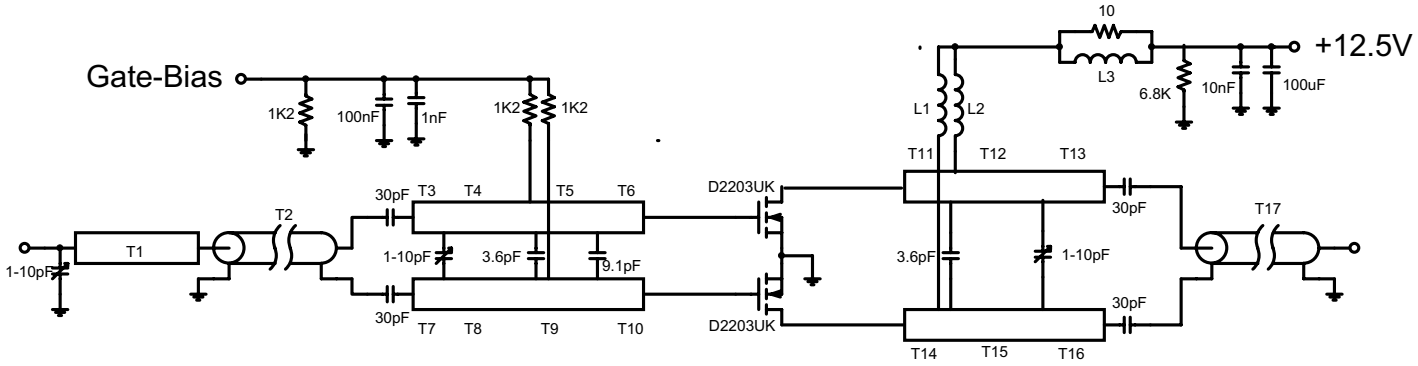
OPTIMUM SOURCE AND LOAD IMPEDANCE

Frequency MHz	Z_S Ω	Z_L Ω
1000MHZ	6.0 + j8.3	7.0 + j9.3

Typical S Parameters

! Vds=12.5V, Idq=0.2A
MHZ S MA R 50

!Freq	S11		S21		S12		S22	
!MHz	mag	ang	mag	ang	mag	ang	mag	ang
100	0.88	-59	13.48	137	0.039	48	0.82	-51
150	0.79	-77	11.02	119	0.047	34	0.75	-65
200	0.74	-88	8.78	105	0.049	24	0.71	-76
250	0.71	-98	7.33	97	0.049	17	0.69	-84
300	0.70	-105	6.36	91	0.048	16	0.68	-91
350	0.69	-111	5.56	81	0.047	9	0.67	-97
400	0.69	-118	4.87	78	0.044	10	0.67	-103
450	0.70	-125	4.30	71	0.040	7	0.67	-110
500	0.71	-131	3.94	68	0.038	10	0.68	-116
550	0.72	-138	3.62	62	0.034	11	0.69	-124
600	0.73	-145	3.43	58	0.033	16	0.70	-130
650	0.75	-151	3.05	51	0.029	21	0.72	-137
700	0.75	-156	2.91	47	0.028	28	0.72	-142
750	0.76	-160	2.59	41	0.027	40	0.72	-147
800	0.76	-162	2.26	36	0.028	49	0.72	-150
850	0.76	-164	2.03	36	0.030	63	0.72	-153
900	0.77	-166	1.93	35	0.034	71	0.72	-156
950	0.77	-168	1.88	34	0.042	79	0.72	-159
1000	0.78	-170	1.81	30	0.050	81	0.72	-162



D2203UK 1000MHz TEST FIXTURE

Substrate 0.8mm thick PTFE/glass

All microstrip lines W=2.7mm

T1 15.7mm
T2, T17 45mm 50 Ohm UT34 semi-rigid coax
T3, T7 7mm
T4, T8 15mm
T5, T9 7.6mm
T6, T10 8mm
T11, T14 8mm
T12, T15 11.2mm
T13, T16 7mm

L1, L2 6 turns of 24swg enamelled copper wire, 3mm i.d.

L3 1.5 turn 24swg enamelled copper wire on Siemens B62152-A7X 2 hole core