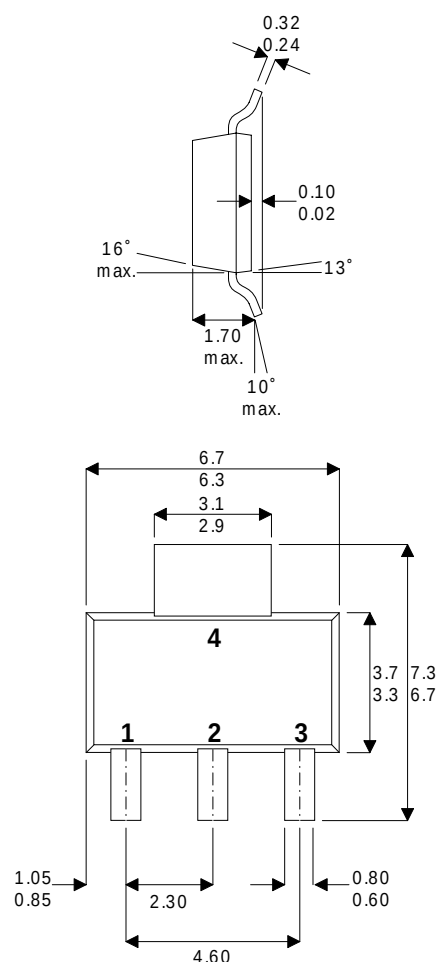


MECHANICAL DATA

Dimensions in mm.



SOT-223

PIN 1 GATE
PIN 3 SOURCE
PIN 2 DRAIN
PIN 4 DRAIN

GOLD METALLISED MULTI-PURPOSE SILICON DMOS RF FET 750mW – 12V – 1GHz SINGLE ENDED

FEATURES

- SIMPLIFIED AMPLIFIER DESIGN
- SUITABLE FOR BROAD BAND APPLICATIONS
- LOW C_{rss}
- SIMPLE BIAS CIRCUITS
- LOW NOISE (Typical < 2dB NF)
- HIGH GAIN – 11dB MINIMUM
- SURFACE MOUNT

APPLICATIONS

- VHF/UHF COMMUNICATIONS
from DC to 2.5 GHz

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

P_D	Power Dissipation	2W
BV_{DSS}	Drain – Source Breakdown Voltage	65V
BV_{GSS}	Gate – Source Breakdown Voltage	$\pm 20V$
$I_{D(sat)}$	Drain Current	200mA
T_{stg}	Storage Temperature	-65 to $125^{\circ}C$
T_j	Maximum Operating Junction Temperature	$150^{\circ}C$

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ELECTRICAL CHARACTERISTICS ($T_{\text{case}} = 25^{\circ}\text{C}$ unless otherwise stated)

Parameter	Test Conditions	Min.	Typ.	Max.	Unit
BV_{DSS} Drain–Source Breakdown Voltage	$V_{\text{GS}} = 0$ $I_{\text{D}} = 10\text{mA}$	65			V
I_{DSS} Zero Gate Voltage Drain Current	$V_{\text{DS}} = 28\text{V}$ $V_{\text{GS}} = 0$			1	mA
I_{GSS} Gate Leakage Current	$V_{\text{GS}} = 20\text{V}$ $V_{\text{DS}} = 0$			1	μA
$V_{\text{GS(th)}}$ Gate Threshold Voltage*	$I_{\text{D}} = 10\text{mA}$ $V_{\text{DS}} = V_{\text{GS}}$	1		7	V
g_{fs} Forward Transconductance*	$V_{\text{DS}} = 10\text{V}$ $I_{\text{D}} = 0.2\text{A}$	0.18			mhos
G_{PS} Common Source Power Gain	$P_{\text{O}} = 750\text{mW}$	11			dB
η Drain Efficiency	$V_{\text{DS}} = 12\text{V}$ $I_{\text{DQ}} = 75\text{mA}$	40			%
VSWR Load Mismatch Tolerance	$f = 1\text{GHz}$	10:1			—
C_{iss} Input Capacitance	$V_{\text{DS}} = 0\text{V}$ $V_{\text{GS}} = -5\text{V}$ $f = 1\text{MHz}$			12	pF
C_{oss} Output Capacitance	$V_{\text{DS}} = 28\text{V}$ $V_{\text{GS}} = 0$ $f = 1\text{MHz}$			6	
C_{rss} Reverse Transfer Capacitance	$V_{\text{DS}} = 28\text{V}$ $V_{\text{GS}} = 0$ $f = 1\text{MHz}$			0.5	

* Pulse Test: Pulse Duration = 300 μs , Duty Cycle $\leq 2\%$

THERMAL DATA

$R_{\text{THj-case}}$	Thermal Resistance Junction – Case	Max. 70°C / W
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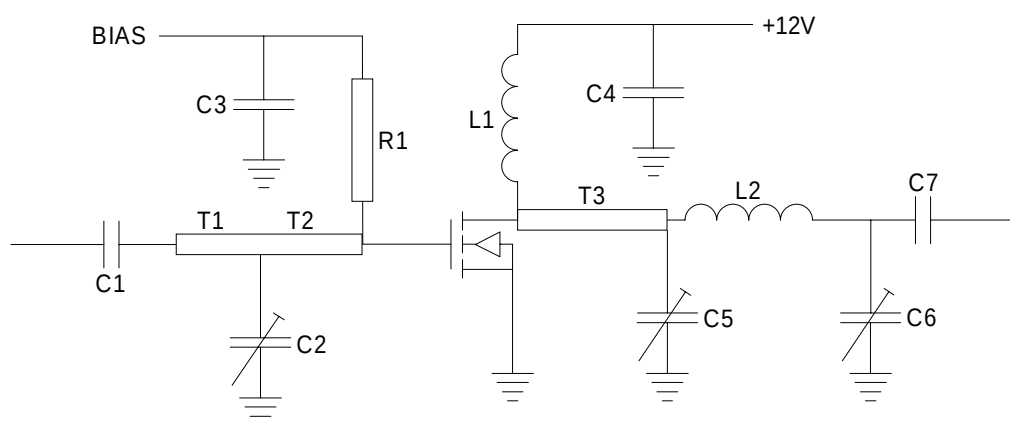
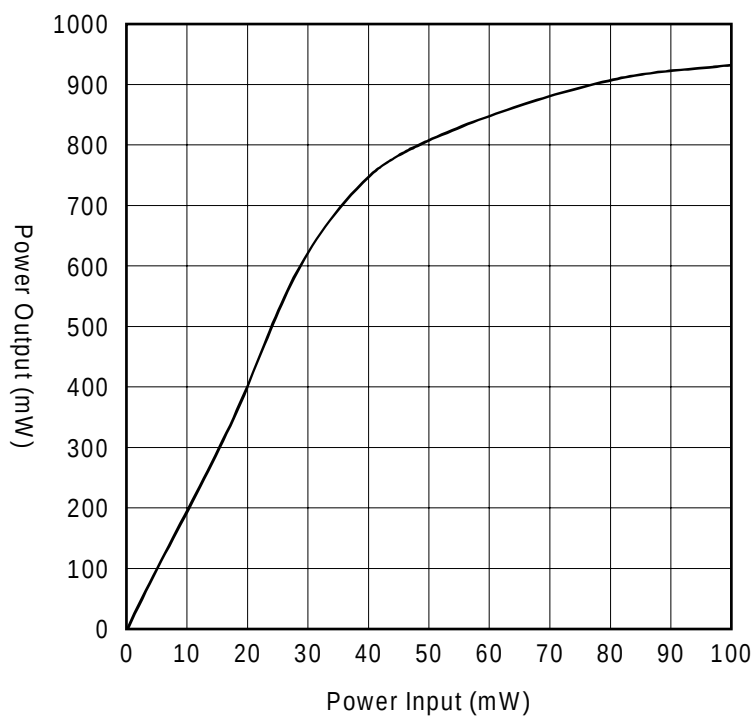
S Parameters at $V_{\text{d}} = 12\text{V}$, $I_{\text{d}} = 75\text{mA}$

Freq MHz	S11		S12		S21		S22	
	mag	ang	mag	ang	mag	ang	mag	ang
300	0.47	-95	0.04	50	5.20	90	0.32	-90
400	0.46	-120	0.05	80	4.40	76	0.35	-91
500	0.47	-131	0.07	100	3.50	68	0.38	-94
600	0.49	-146	0.10	110	3.00	59	0.43	-98
700	0.51	-156	0.15	110	2.60	51	0.48	-103
800	0.53	-163	0.20	104	2.30	45	0.54	-108
900	0.54	-180	0.25	100	2.10	40	0.58	-112
1000	0.55	178	0.29	96	1.80	36	0.60	-116
1100	0.56	175	0.34	91	1.60	33	0.63	-120
1200	0.57	163	0.40	85	1.40	28	0.65	-126
1300	0.58	150	0.45	80	1.30	26	0.66	-129
1400	0.60	144	0.48	75	1.20	24	0.66	-133
1500	0.60	140	0.52	70	1.10	22	0.66	-135
1600	0.59	130	0.55	66	1.00	21	0.65	-138
1700	0.58	123	0.58	63	0.95	20	0.65	-140
1800	0.56	115	0.60	58	0.90	19	0.64	-142
1900	0.54	110	0.62	54	0.90	20	0.64	-144
2000	0.51	108	0.62	50	0.90	20	0.63	-145

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TYPICAL PERFORMANCE D2081UK at 1GHz

Bias Conditions $V_d = 12V$, $I_{dq} = 75mA$



D2081UK 1GHz Test Circuit

C1, C7 33pF ATC100B

C2, C5, C6 1–8pF

C3, C4 1000pF NPO

L1 0.1μH

L2 10mm of 1.6mm tcw (half turn)

T1 50Ω microstrip, 11mm long

T2 50Ω microstrip, 15mm long

T3 50Ω microstrip, 5mm long

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