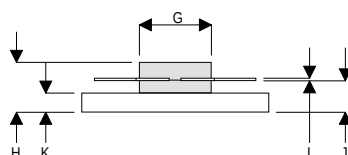
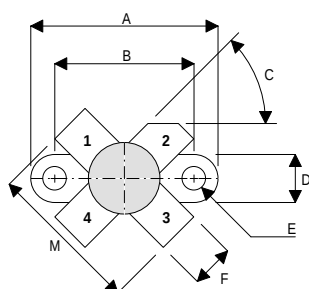


MECHANICAL DATA



DA

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

DIM	mm	Tol.	Inches	Tol.
A	24.76	0.13	0.975	0.005
B	18.42	0.13	0.725	0.005
C	45°	5°	45°	5°
D	6.35	0.13	0.25	0.005
E	3.17	0.13	0.125 DIA	0.005
F	5.71	0.13	0.225	0.005
G	9.52	0.13	0.375	0.005
H	6.60	REF	0.260	REF
I	0.13	0.02	0.005	0.001
J	4.32	0.13	0.170	0.005
K	2.54	0.13	0.100	0.005
M	20.32	0.25	0.800	0.010

GOLD METALLISED MULTI-PURPOSE SILICON DMOS RF FET 40W – 50V – 175MHz SINGLE ENDED

FEATURES

- SIMPLIFIED AMPLIFIER DESIGN
- SUITABLE FOR BROAD BAND APPLICATIONS
- LOW C_{rss}
- SIMPLE BIAS CIRCUITS
- LOW NOISE
- HIGH GAIN – 16 dB MINIMUM

APPLICATIONS

- HF/VHF/ COMMUNICATIONS
from 1 MHz to 175 MHz

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

P_D	Power Dissipation	87W
BV_{DSS}	Drain – Source Breakdown Voltage	125V
BV_{GSS}	Gate – Source Breakdown Voltage	$\pm 20V$
$I_{D(sat)}$	Drain Current	6A
T_{stg}	Storage Temperature	-65 to $150^{\circ}C$
T_j	Maximum Operating Junction Temperature	$200^{\circ}C$

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

Parameter	Test Conditions	Min.	Typ.	Max.	Unit
BV_{DSS} Drain–Source Breakdown Voltage	$V_{GS} = 0$ $I_D = 100\text{mA}$	125			V
I_{DSS} Zero Gate Voltage Drain Current	$V_{DS} = 50\text{V}$ $V_{GS} = 0$			2	mA
I_{GSS} Gate Leakage Current	$V_{GS} = 20\text{V}$ $V_{DS} = 0$			1	μA
$V_{GS(th)}$ Gate Threshold Voltage*	$I_D = 10\text{mA}$ $V_{DS} = V_{GS}$	1		7	V
g_{fs} Forward Transconductance*	$V_{DS} = 10\text{V}$ $I_D = 1\text{A}$	1.6			S
G_{PS} Common Source Power Gain	$P_O = 40\text{W}$	16			dB
η Drain Efficiency	$V_{DS} = 50\text{V}$ $I_{DQ} = 0.2\text{A}$	50			%
VSWR Load Mismatch Tolerance	$f = 175\text{MHz}$	20:1			—
C_{iss} Input Capacitance	$V_{DS} = 50\text{V}$ $V_{GS} = -5\text{V}$ $f = 1\text{MHz}$			120	pF
C_{oss} Output Capacitance	$V_{DS} = 50\text{V}$ $V_{GS} = 0$ $f = 1\text{MHz}$			50	pF
C_{rss} Reverse Transfer Capacitance	$V_{DS} = 50\text{V}$ $V_{GS} = 0$ $f = 1\text{MHz}$			3	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. 2.0 $^{\circ}\text{C} / \text{W}$
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Document Number 3141
Issue 1

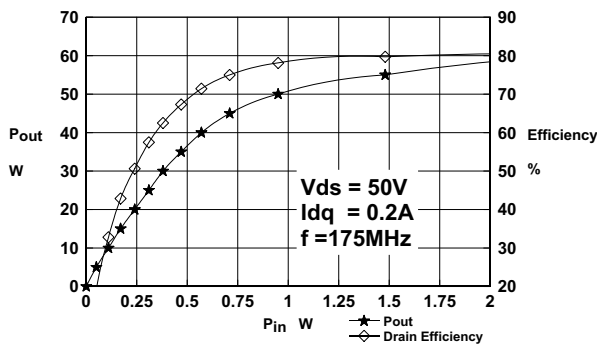


Figure 1

Power Output and Efficiency vs. Power input

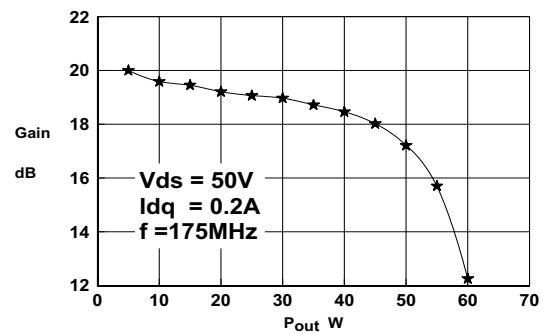


Figure 2

Power Output and Gain vs Power Input

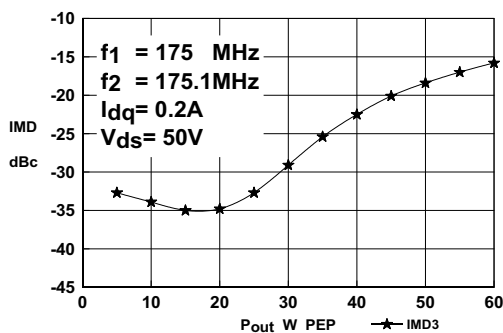


Figure 3

IMD3 vs Power Output

OPTIMUM SOURCE AND LOAD IMPEDANCE

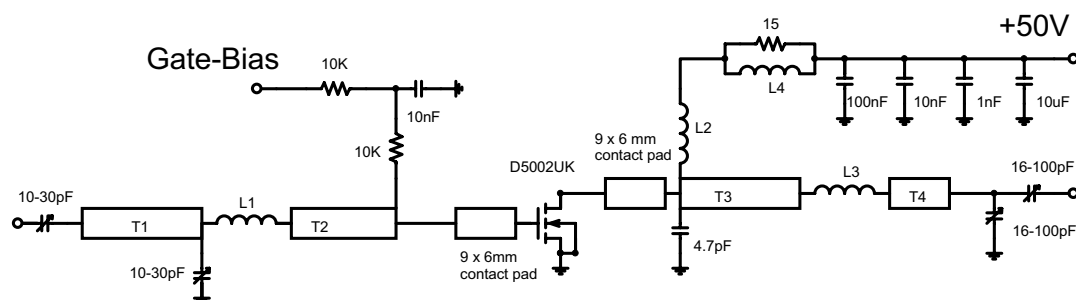
Frequency MHz	Z_S Ω	Z_L Ω
175	$3.3 + j7.1$	$10.9 + j10.5$

Typical S Parameters

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

!Freq !Mhz	S11 mag ang	S21 mag ang	S12 mag ang	S22 mag ang
30	0.869 -127.8	10.81 166.3	0.01 79.5	0.565 -96.1
40	0.868 -131.2	10.45 153.6	0.012 70.2	0.569 -99.8
50	0.86 -138.6	9.931 142.9	0.014 63.2	0.578 -102.1
60	0.858 -140.1	9.241 133.3	0.015 57.4	0.582 -105.5
70	0.855 -141.9	8.544 126	0.015 54.8	0.587 -107.1
80	0.85 -143.5	7.896 118.7	0.016 52.2	0.598 -109.2
90	0.847 -146	7.336 112.5	0.016 50.8	0.606 -111.8
100	0.851 -148.8	6.819 106.8	0.016 50.9	0.622 -114.8
110	0.847 -151.1	6.402 101.4	0.016 51.3	0.626 -115.8
120	0.845 -153.2	5.988 96.2	0.016 53.2	0.63 -116.8
130	0.844 -155.1	5.563 91.1	0.015 55.9	0.637 -118.5
140	0.846 -157.1	5.198 87.3	0.015 59.5	0.645 -119.7
150	0.846 -160	4.696 80.8	0.016 65.6	0.655 -123.4
160	0.848 -161.3	4.37 76.3	0.016 69.6	0.67 -124.1
170	0.851 -162.5	4.069 72.4	0.016 74.9	0.676 -126.4
180	0.849 -164.8	3.786 69.2	0.017 79.5	0.683 -128.6
190	0.859 -166.1	3.537 66.8	0.019 84.6	0.697 -130.1
200	0.858 -166.8	3.289 64.2	0.02 88.6	0.708 -132.2
210	0.865 -168.8	3.103 62.7	0.022 93.2	0.716 -134.3
220	0.867 -170.1	2.991 60.3	0.024 94.6	0.725 -135.7
230	0.873 -171.2	2.837 58.3	0.026 96	0.737 -137.4
240	0.877 -172.4	2.699 55.3	0.028 96.5	0.749 -139.3
250	0.877 -173.7	2.555 52.6	0.03 97.2	0.75 -140.6
260	0.884 -174.5	2.419 49.5	0.032 97.5	0.766 -142.2
270	0.889 -175.4	2.296 47.4	0.034 99.1	0.778 -144
280	0.882 -176.9	2.182 44.8	0.037 99.6	0.786 -145.3
290	0.891 -177.4	2.081 44.6	0.04 101	0.794 -147.2
300	0.892 -178.3	2.001 42.8	0.043 100.9	0.805 -148.4
310	0.896 -179.5	1.928 40.9	0.046 100	0.809 -150
320	0.905 179.3	1.854 38.5	0.049 98.8	0.82 -151.1
330	0.902 179.2	1.761 35.6	0.051 97.2	0.825 -153.4
340	0.908 178	1.661 32.9	0.052 96.1	0.832 -154.1
350	0.908 176.3	1.556 31.4	0.054 95.7	0.837 -156
360	0.913 175.7	1.461 29.6	0.055 95.7	0.845 -156.4
370	0.917 174.8	1.379 29.1	0.058 96.6	0.849 -158.1
380	0.914 174.4	1.321 28.7	0.062 96.8	0.847 -159.6
390	0.919 173.2	1.259 28.5	0.067 96.6	0.858 -161.7
400	0.92 172.9	1.226 27.1	0.07 95.3	0.872 -162.3
410	0.923 171.8	1.183 26	0.073 93.3	0.874 -163.6
420	0.921 171.1	1.143 24.1	0.075 91.7	0.88 -165.1
430	0.929 170	1.092 21.5	0.075 89.7	0.883 -165.7
440	0.93 169.7	1.036 20	0.076 89.4	0.891 -167.2
450	0.928 168.8	0.985 19.2	0.077 89.3	0.894 -167.8
460	0.928 168.1	0.936 18.1	0.079 89.4	0.896 -169.5
470	0.928 167.3	0.898 18.5	0.081 90.1	0.899 -169.7
480	0.937 167.2	0.868 18.3	0.084 90	0.904 -170.8
490	0.937 166.7	0.841 18.5	0.087 90.4	0.905 -172
500	0.932 166	0.818 18.5	0.09 90.2	0.909 -172.8

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Substrate 1.6mm PTFE/glass, $\epsilon_r=2.5$

All microstrip lines $W=4.4\text{mm}$

T1 10mm

T2 13mm

T3 12mm

T4 4mm

L1 1.5 turns 22swg enamelled copper wire, 6mm i.d.

L2 10 turns 19swg enamelled copper wire, 6mm i.d.

L3 1.5 turns 22swg enamelled copper wire, 6mm i.d.

L4 13.5 turns 19swg enamelled copper wire on Siemens B64920A618X830 ferrite core

D5002UK 175MHz TEST FIXTURE