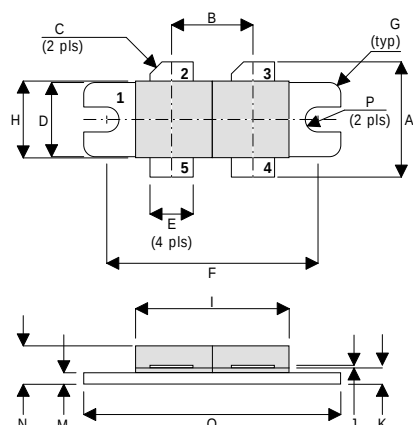


MECHANICAL DATA



DR

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

DIM	Millimetres	Tol.	Inches	Tol.
A	19.05	0.50	0.75	0.020
B	10.77	0.13	0.424	0.005
C	45°	5°	45°	5°
D	9.78	0.13	0.385	0.005
E	5.71	0.13	0.225	0.005
F	27.94	0.13	1.100	0.005
G	1.52R	0.13	0.060R	0.005
H	10.16	0.13	0.400	0.005
I	22.22	MAX	0.875	MAX
J	0.13	0.02	0.005	0.001
K	2.72	0.13	0.107	0.005
M	1.70	0.13	0.067	0.005
N	5.08	0.50	0.200	0.020
O	34.03	0.13	1.340	0.005
P	1.61R	0.08	0.064R	0.003

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

P_D	Power Dissipation	438W
BV_{DSS}	Drain – Source Breakdown Voltage*	125V
BV_{GSS}	Gate – Source Breakdown Voltage*	$\pm 20V$
$I_{D(sat)}$	Drain Current*	18A
T_{stg}	Storage Temperature	-65 to $150^{\circ}C$
T_j	Maximum Operating Junction Temperature	$200^{\circ}C$

* Per Side

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Document Number 3140
Issue 1

GOLD METALLISED MULTI-PURPOSE SILICON DMOS RF FET 300W – 50V – 175MHz PUSH-PULL

FEATURES

- SIMPLIFIED AMPLIFIER DESIGN
- SUITABLE FOR BROAD BAND APPLICATIONS
- LOW C_{rss}
- SIMPLE BIAS CIRCUITS
- LOW NOISE
- HIGH GAIN – 13 dB MINIMUM

APPLICATIONS

- VHF/UHF COMMUNICATIONS
from 1 MHz to 200 MHz

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

Parameter	Test Conditions	Min.	Typ.	Max.	Unit
PER SIDE					
BV_{DSS} Drain–Source Breakdown Voltage	$V_{GS} = 0$ $I_D = 100mA$	125			V
I_{DSS} Zero Gate Voltage Drain Current	$V_{DS} = 50V$ $V_{GS} = 0$			6	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*	$V_{DS} = 10V$ $I_D = 3A$	4.8			mhos
$V_{GS(th)match}$ Gate Threshold Voltage Matching Between Sides	$I_D = 10mA$ $V_{DS} = V_{GS}$			0.1	V
TOTAL DEVICE					
G_{PS} Common Source Power Gain	$P_O = 300W$	13			dB
η Drain Efficiency	$V_{DS} = 50V$ $I_{DQ} = 1.2A$	60			%
VSWR Load Mismatch Tolerance	$f = 175MHz$	20:1			—
PER SIDE					
C_{iss} Input Capacitance	$V_{DS} = 50V$ $V_{GS} = -5V$ $f = 1MHz$			360	pF
C_{oss} Output Capacitance	$V_{DS} = 50V$ $V_{GS} = 0$ $f = 1MHz$			150	pF
C_{rss} Reverse Transfer Capacitance	$V_{DS} = 50V$ $V_{GS} = 0$ $f = 1MHz$			9	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. 0.4°C / W
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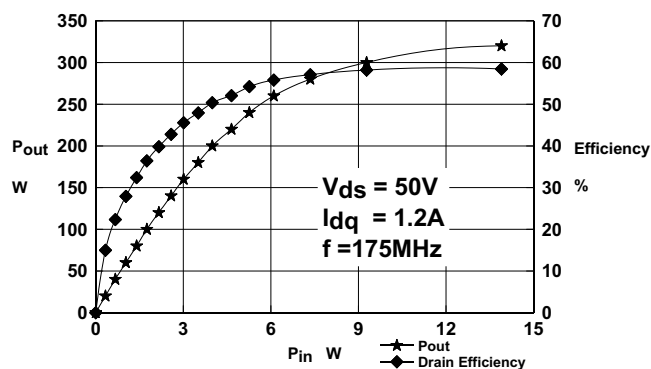


Figure 1 – Power Output and Efficiency vs. Power Input.

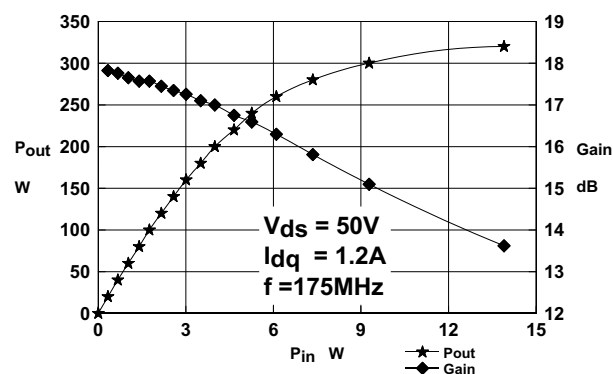


Figure 2 – Power Output & Gain vs. Power Input.

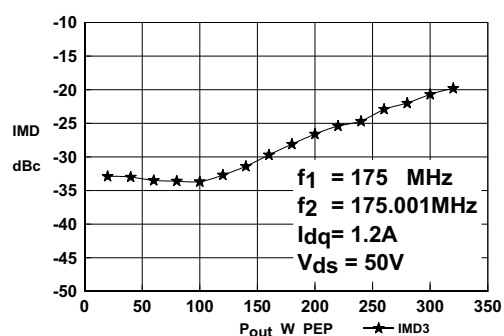


Figure 3 – IMD vs. Output Power.

D5028UK OPTIMUM SOURCE AND LOAD IMPEDANCE @ 300W / 50V

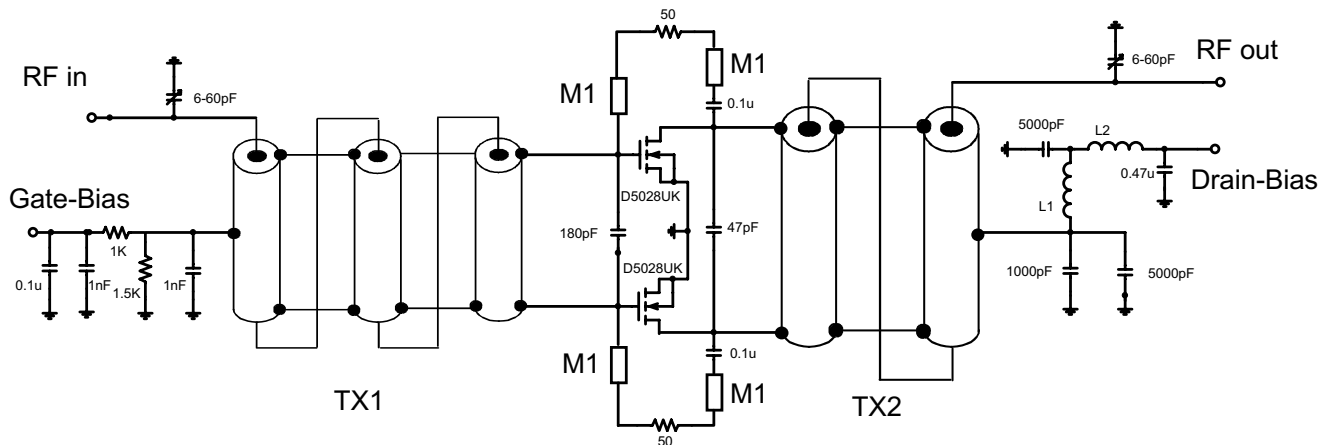
Frequency MHz	Z_S Ω	Z_L Ω
175	$6.1 + j1$	$6.7 + j2.9$

Typical S Parameters

! Vds=50V Idq=0.6A
MHZ S MA R 50

!Freq !Mhz	S11 mag ang	S21 mag ang	S12 mag ang	S22 mag ang
30	0.909 -146.2	14.21 101.4	0.015 14.9	0.497 -129.4
40	0.92 -153	10.87 92.2	0.015 7.4	0.515 -133.8
50	0.923 -157.9	8.804 85.8	0.015 2.6	0.545 -136
60	0.926 -160.9	7.352 79.3	0.015 -2.5	0.573 -138.4
70	0.936 -163.2	6.258 73.6	0.014 -6.5	0.613 -139.8
80	0.94 -165.1	5.381 67.8	0.013 -10.3	0.639 -141.6
90	0.941 -166.8	4.653 63.2	0.013 -13	0.669 -143.1
100	0.944 -167.9	4.022 58.8	0.011 -14.9	0.698 -144.2
110	0.946 -168.9	3.519 55.1	0.011 -15.2	0.726 -146.2
120	0.95 -169.1	3.099 51.4	0.01 -15.6	0.749 -147.5
130	0.955 -170.1	2.763 49.5	0.009 -14.2	0.773 -148.2
140	0.962 -171.1	2.501 47.3	0.009 -13.2	0.783 -149.7
150	0.961 -171.3	2.278 44.9	0.008 -11.9	0.806 -151.3
160	0.964 -173.2	2.092 41.5	0.007 -11.7	0.821 -152.3
170	0.963 -172.4	1.904 38	0.007 -10	0.839 -153.4
180	0.962 -173.1	1.706 34.6	0.006 -5.7	0.846 -154.7
190	0.97 -173.7	1.529 33.2	0.006 0.2	0.857 -156
200	0.974 -173.7	1.396 33	0.005 7.7	0.872 -156.2
210	0.974 -174.6	1.292 32.4	0.005 15.6	0.884 -157.3
220	0.974 -174.6	1.2 30.9	0.005 22.4	0.889 -158.5
230	0.974 -175.2	1.118 29	0.005 29	0.902 -159.4
240	0.98 -175.2	1.046 27.3	0.005 36.1	0.906 -159.9
250	0.977 -175.6	0.981 25.7	0.005 42.9	0.911 -159.9
260	0.978 -176	0.93 25.2	0.005 49.7	0.918 -161.2
270	0.983 -176.2	0.875 23.4	0.006 55.1	0.925 -161.3
280	0.984 -175.9	0.817 21.7	0.006 59.8	0.928 -162.5
290	0.984 -176.7	0.753 19.1	0.007 61.9	0.933 -162.6
300	0.983 -177	0.692 18.6	0.007 64.6	0.938 -163.5
310	0.986 -177	0.648 18.5	0.008 67.8	0.941 -163.6
320	0.985 -177.4	0.622 19.7	0.008 71.5	0.947 -164.5
330	0.985 -177.5	0.61 19.4	0.009 73.8	0.948 -164.3
340	0.987 -177.9	0.593 17.1	0.01 73.5	0.949 -164.9
350	0.988 -178.2	0.558 14.2	0.01 72.2	0.954 -165.6
360	0.986 -178.2	0.51 11.7	0.01 72	0.954 -165.6
370	0.988 -178.7	0.468 11.3	0.01 73.1	0.956 -166.2
380	0.987 -178.6	0.438 12.1	0.01 76.3	0.957 -166.6
390	0.99 -178.8	0.412 13.1	0.011 78.9	0.96 -166.9
400	0.99 -179.3	0.399 17.8	0.012 83.7	0.963 -167
410	0.988 -178.9	0.42 16.5	0.013 84.4	0.963 -167
420	0.988 -179.8	0.409 12.3	0.014 81.5	0.964 -168
430	0.988 -179.9	0.385 8.8	0.014 78.9	0.966 -167.8
440	0.986 -179.5	0.355 7.9	0.014 79.8	0.971 -168
450	0.992 179.9	0.333 8.6	0.015 81	0.973 -167.8
460	0.99 -179.8	0.317 9.6	0.015 82.6	0.969 -168.7
470	0.991 179.9	0.307 10.5	0.016 83.7	0.972 -168.6
480	0.99 179.2	0.299 10.8	0.017 83.8	0.972 -169.3
490	0.99 179.1	0.293 10.4	0.018 83.2	0.977 -168.7
500	0.988 178.9	0.286 9.2	0.018 82.1	0.973 -169.2

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TX1 9:1 transformer. 3 turns of 062-25 semi-rigid coax around 75-26 powdered iron core

TX2 4:1 transformer. 2 turns of 090-25 semi-rigid coax around 100-8 powdered iron core

L1 10 turns 16 awg enamelled wire, 5mm internal diameter

L2 0.5 turns 16 awg enamelled wire on A1 x 1 2-hole core

M1 microstrip line, 20mm long, 1mm wide on 0.062in thick G10 substrate

D5028UK 175MHz TEST FIXTURE