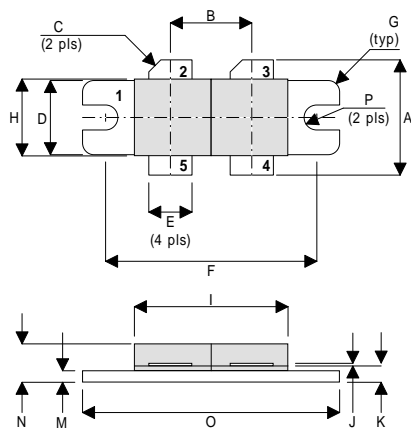


MECHANICAL DATA



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

**GOLD METALLISED  
MULTI-PURPOSE SILICON  
DMOS RF FET  
350W – 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

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*	±20V
$I_{D(sat)}$	Drain Current*	21A
$T_{stg}$	Storage Temperature	-65 to 150°C
$T_j$	Maximum Operating Junction Temperature	200°C

\* Per Side

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## ELECTRICAL CHARACTERISTICS (T<sub>case</sub> = 25°C unless otherwise stated)

Parameter	Test Conditions	Min.	Typ.	Max.	Unit	
<b>PER SIDE</b>						
B <sub>V</sub> DSS	Drain–Source Breakdown Voltage	V <sub>GS</sub> = 0	I <sub>D</sub> = 100mA	125	V	
I <sub>DSS</sub>	Zero Gate Voltage Drain Current	V <sub>DS</sub> = 50V	V <sub>GS</sub> = 0	7	mA	
I <sub>GSS</sub>	Gate Leakage Current	V <sub>GS</sub> = 20V	V <sub>DS</sub> = 0	1	μA	
V <sub>GS(th)</sub>	Gate Threshold Voltage*	I <sub>D</sub> = 10mA	V <sub>DS</sub> = V <sub>GS</sub>	1	7	V
g <sub>fs</sub>	Forward Transconductance*	V <sub>DS</sub> = 10V	I <sub>D</sub> = 3.5A	5.6	mhos	
V <sub>GS(th)match</sub>	Gate Threshold Voltage Matching Between Sides	I <sub>D</sub> = 10mA	V <sub>DS</sub> = V <sub>GS</sub>	0.1	V	
<b>TOTAL DEVICE</b>						
G <sub>PS</sub>	Common Source Power Gain	P <sub>O</sub> = 350W		13	dB	
η	Drain Efficiency	V <sub>DS</sub> = 50V	I <sub>DQ</sub> = 1.4A	50	%	
VSWR	Load Mismatch Tolerance	f = 175MHz		20:1	—	
<b>PER SIDE</b>						
C <sub>iss</sub>	Input Capacitance	V <sub>DS</sub> = 50V	V <sub>GS</sub> = -5V f = 1MHz		420	pF
C <sub>oss</sub>	Output Capacitance	V <sub>DS</sub> = 50V	V <sub>GS</sub> = 0 f = 1MHz		175	pF
C <sub>rss</sub>	Reverse Transfer Capacitance	V <sub>DS</sub> = 50V	V <sub>GS</sub> = 0 f = 1MHz		10.5	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 <sub>THj-case</sub>	Thermal Resistance Junction – Case	Max. 0.4°C / W
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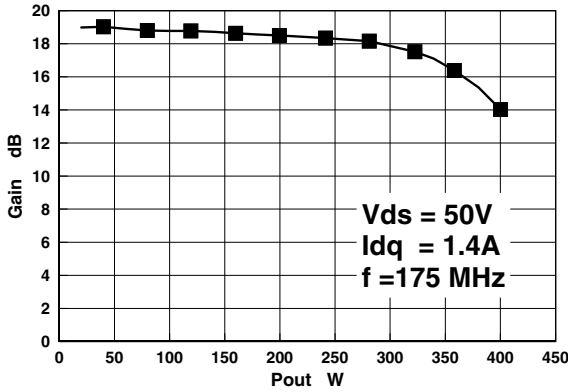


Figure 1 – Gain vs. Output Power.

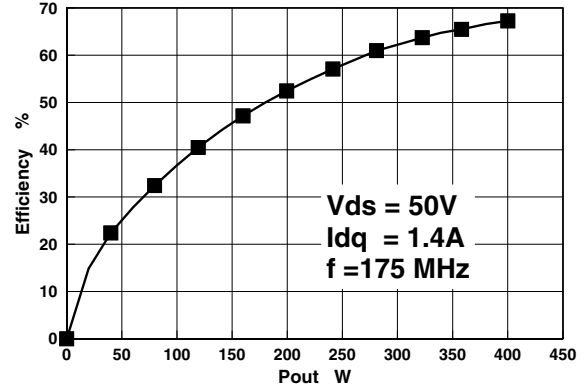


Figure 2 – Efficiency vs. Output Power.

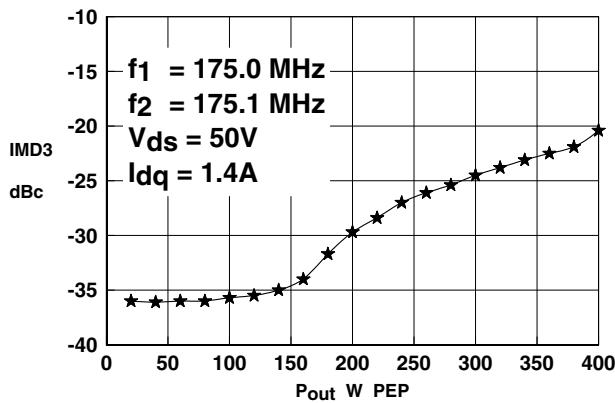


Figure 3 – IMD vs. Output Power.

### D5029UK OPTIMUM SOURCE AND LOAD IMPEDANCE @ 350W / 50V

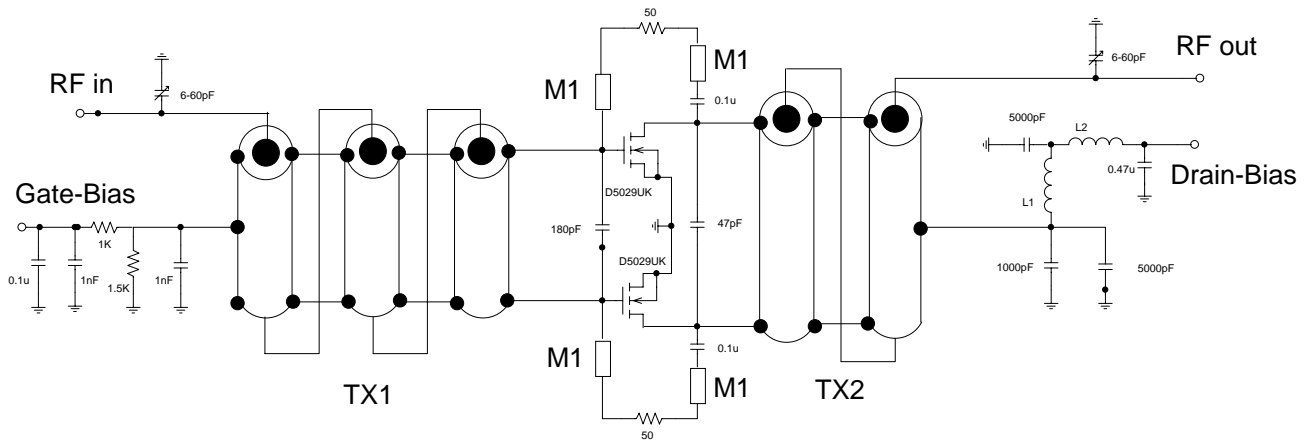
Frequency MHz	Z <sub>S</sub> Ω	Z <sub>L</sub> Ω
175	1.0 + j1.2	2.6 + j1.3

### Typical S Parameters

! V<sub>DS</sub> = 50V, I<sub>DQ</sub> = 1.4A  
# MHz S MA R 50

Freq MHz	S11		S21		S12		S22	
	mag	ang	mag	ang	mag	ang	mag	ang
50	0.83	-165.3	20.29	69.4	0.007	-9.2	0.63	-150.7
100	0.89	-170.0	8.28	48.6	0.004	-6.0	0.78	-156.6
150	0.93	-173.2	4.42	35.6	0.003	50.0	0.86	-162.0
200	0.95	-175.7	2.71	27.2	0.005	82.4	0.91	-166.2
250	0.97	-177.8	1.82	21.3	0.008	88.8	0.94	-169.4
300	0.98	-179.7	1.30	17.0	0.011	90.0	0.95	-171.9
350	0.98	-178.7	0.97	13.8	0.014	89.6	0.97	-174.0
400	0.98	177.3	0.76	11.4	0.017	88.9	0.97	-175.7
450	0.99	175.9	0.61	9.5	0.020	87.9	0.98	-177.3
500	0.99	174.7	0.50	8.1	0.023	86.9	0.98	-178.6
550	0.99	173.5	0.42	7.1	0.026	85.9	0.98	-179.8
600	0.99	172.3	0.35	6.5	0.028	84.9	0.99	179.0

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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

## D5029UK 175MHz TEST FIXTURE