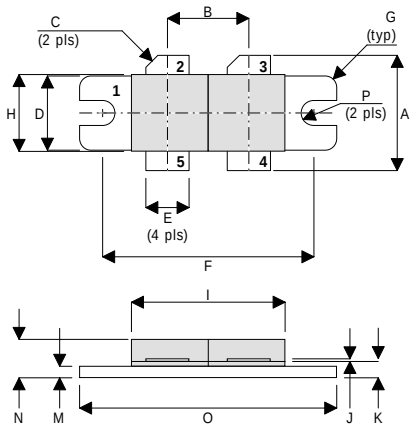
D5030UK

ROHS COMPLIANT METAL GATE RF SILICON FET

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 400W – 50V – 175MHz PUSH–PULL

FEATURES

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

APPLICATIONS

- VHF/UHF COMMUNICATIONS from 1 MHz to 250 MHz

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

P_D	Power Dissipation	583W
BV_{DSS}	Drain – Source Breakdown Voltage*	125V
BV_{GSS}	Gate – Source Breakdown Voltage*	±20V
$I_{D(sat)}$	Drain Current*	24A
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 = 100mA	125			V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS} = 50V	V_{GS} = 0			8	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 = 8A	6.4			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 = 400W		16			dB
η	Drain Efficiency	V_{DS} = 50V	I_{DQ} = 2A	50			%
VSWR	Load Mismatch Tolerance	f = 175MHz		20:1			—
PER SIDE							
C_{iss}	Input Capacitance	V_{DS} = 50V	V_{GS} = –5V f = 1MHz			480	pF
C_{oss}	Output Capacitance	V_{DS} = 50V	V_{GS} = 0 f = 1MHz			200	pF
C_{rss}	Reverse Transfer Capacitance	V_{DS} = 50V	V_{GS} = 0 f = 1MHz			12	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. 0.3°C / W

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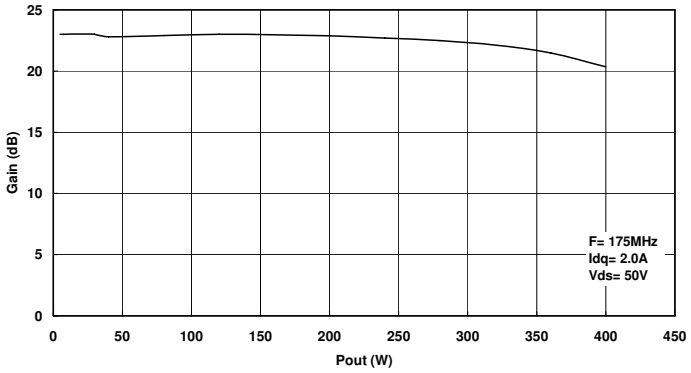

Figure 1

Gain vs. Output Power.

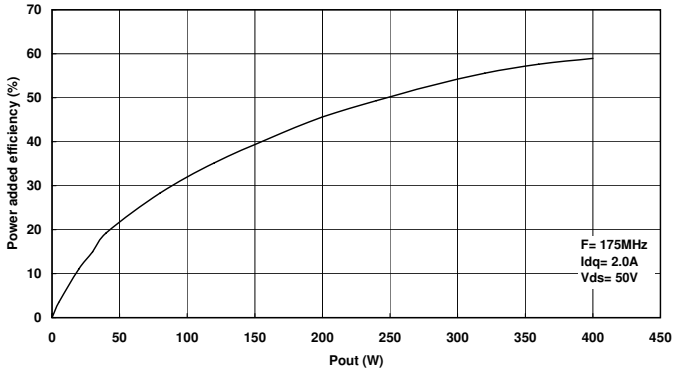

Figure 2

Power added efficiency vs.Output Power

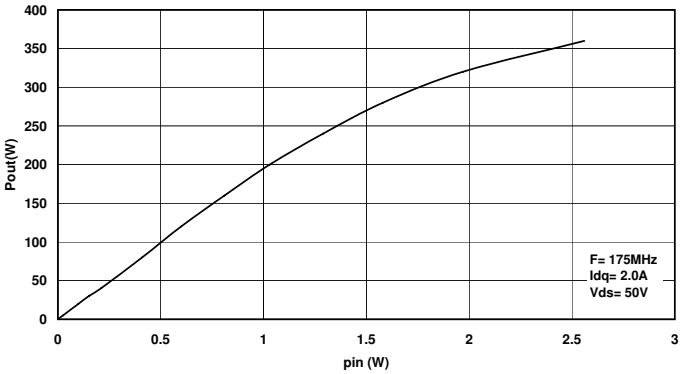

Figure 3

Output Power vs. Input Power.

Typical S Parameters

! V_{DS}50V, I_{DQ} = 1.4A

MHz S MA R 50

!Freq !MHz	S11 mag	ang	S21 mag	ang	S12 mag	ang	S22 mag	ang
50	0.83	-165.3	20.29	69.4	0.007	-9.2	0.63	-150.7
100	0.89	-170	8.28	48.6	0.004	-6	0.78	-156.6
150	0.93	-173.2	4.42	35.6	0.003	50	0.86	-162
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	1.3	17	0.011	90	0.95	-171.9
350	0.98	178.7	0.97	13.8	0.014	89.6	0.97	-174
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	0.02	87.9	0.98	-177.3
500	0.99	174.7	0.5	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

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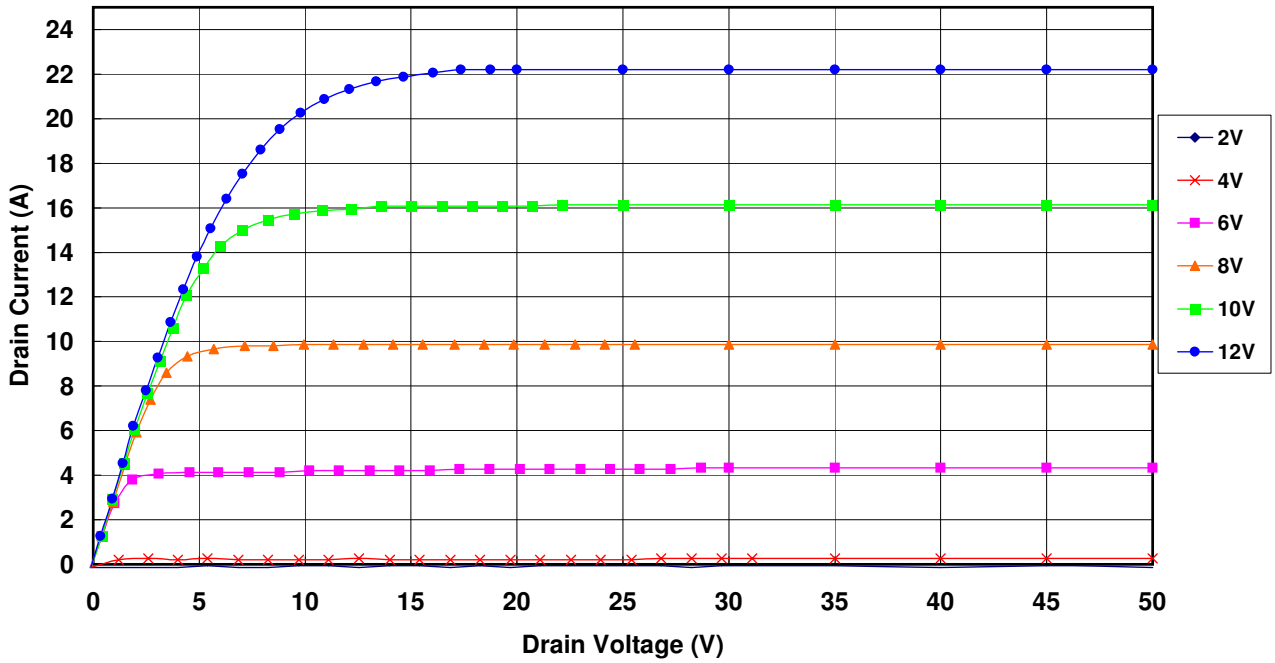

Figure 5 – Typical IV Characteristics.

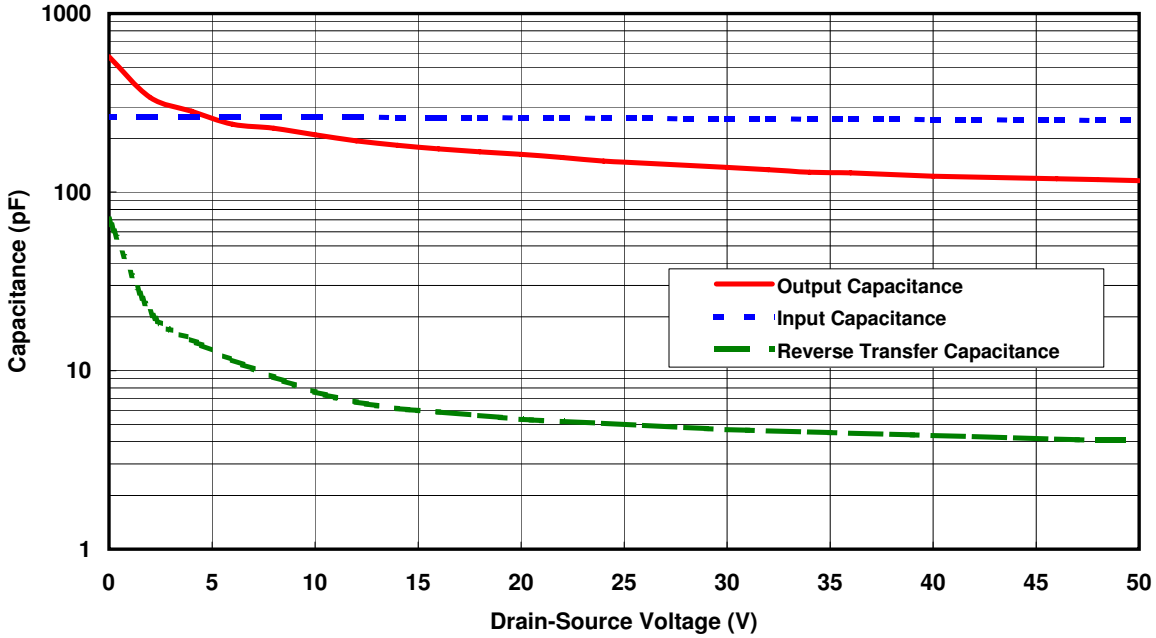

Figure 6 – Typical CV Characteristics.

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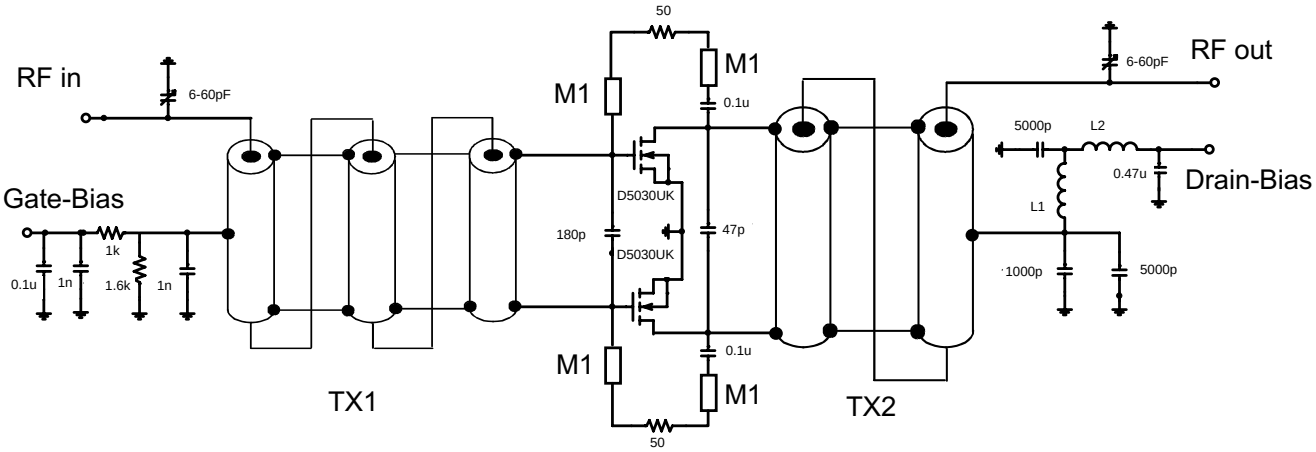

TX1 9:1 transformer. 3 turns of 062-25 semi-rigid coax around 75-26 powdered iron core

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

D5030UK 175MHz TEST FIXTURE

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