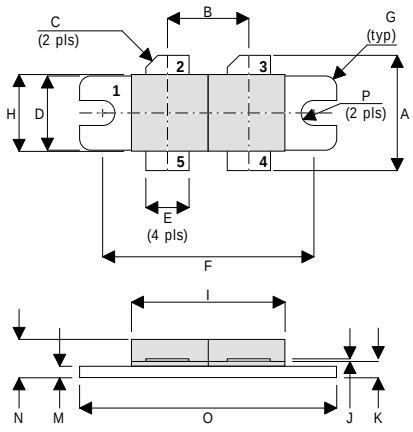
D1030UK

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 – 28V – 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℃ unless otherwise stated)

P_D	Power Dissipation	500W
BV_{DSS}	Drain – Source Breakdown Voltage	70V
BV_{GSS}	Gate – Source Breakdown Voltage	±20V
$I_{D(sat)}$	Drain Current	40A
T_{stg}	Storage Temperature	–65 to 150℃
T_j	Maximum Operating Junction Temperature	200℃

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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	70			V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS} = 28V	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		13			dB
η	Drain Efficiency	V_{DS} = 28V	I_{DQ} = 2A	50			%
VSWR	Load Mismatch Tolerance	f = 175MHz		20:1			—
PER SIDE							
C_{iss}	Input Capacitance	V_{DS} = 28V	V_{GS} = –5V f = 1MHz			480	pF
C_{oss}	Output Capacitance	V_{DS} = 28V	V_{GS} = 0 f = 1MHz			240	pF
C_{rss}	Reverse Transfer Capacitance	V_{DS} = 28V	V_{GS} = 0 f = 1MHz			20	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. 0.35°C / W

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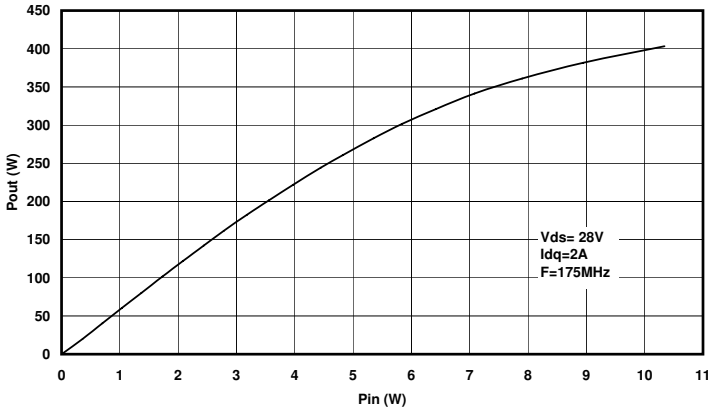

Figure 1. Output Power Vs Input Power

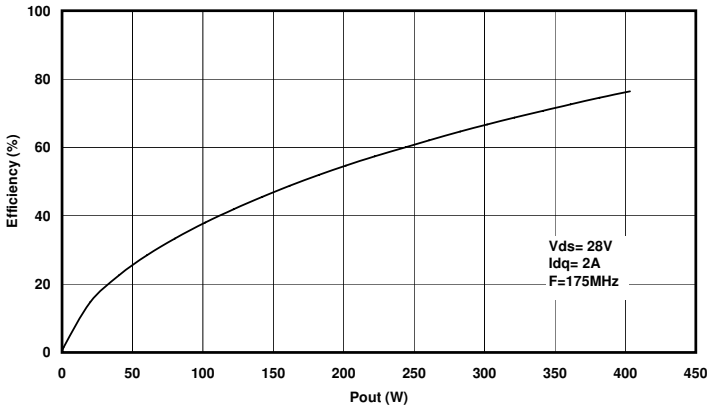

Figure 2. Efficiency Vs. Output Power

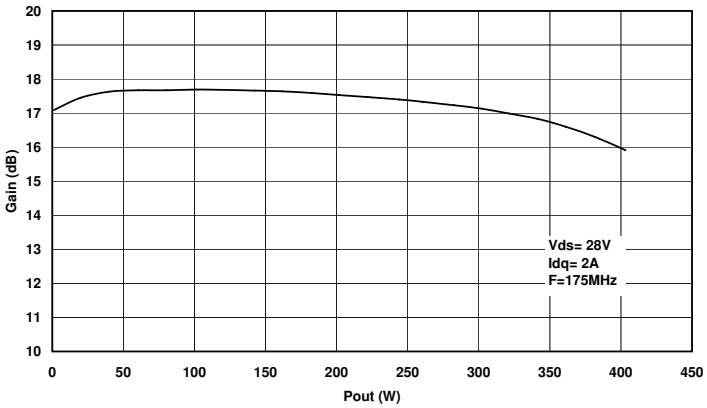

Figure 3. Gain Vs Output Power

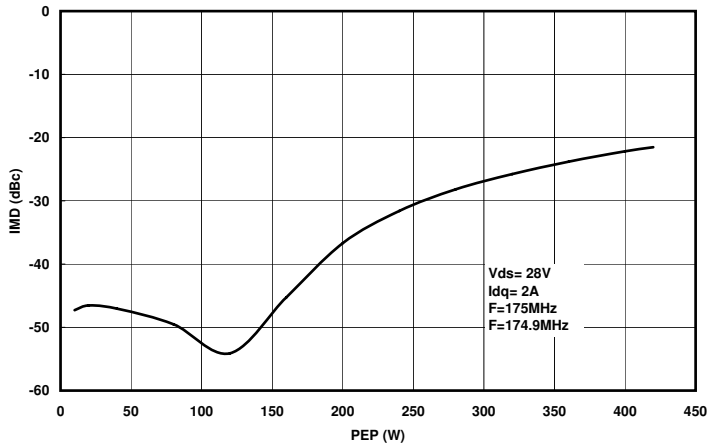

Figure 3.IMD 3 Vs PEP

Typical S Parameters

!D1030UK.s2p !Vds=28V,Idq=2A
MHZ S MA R 50!Vds=28V,Idq=2A
MHZ S MA R 50

!Freq	S11		S21		S12		S22	
!MHz	mag	ang	mag	ang	mag	ang	mag	ang
100	0.934	-173.64	3.319	31.63	0.003	73.63	0.949	-175.09
200	0.981	-178.98	0.858	14.57	0.009	88.83	0.985	-179.24
300	0.990	178.16	0.428	9.41	0.014	87.58	0.992	178.52
400	0.994	175.42	0.236	7.52	0.020	85.54	0.995	176.37
500	0.995	173.39	0.162	8.51	0.025	83.86	0.997	174.78
600	0.996	171.08	0.114	12.37	0.031	81.88	0.997	172.98
700	0.997	169.22	0.093	17.49	0.036	80.25	0.998	171.52
800	0.997	167.00	0.078	25.09	0.043	78.30	0.998	169.79
900	0.997	165.14	0.073	31.70	0.049	76.66	0.998	168.35
1000	0.997	163.27	0.071	37.73	0.055	75.01	0.997	166.90

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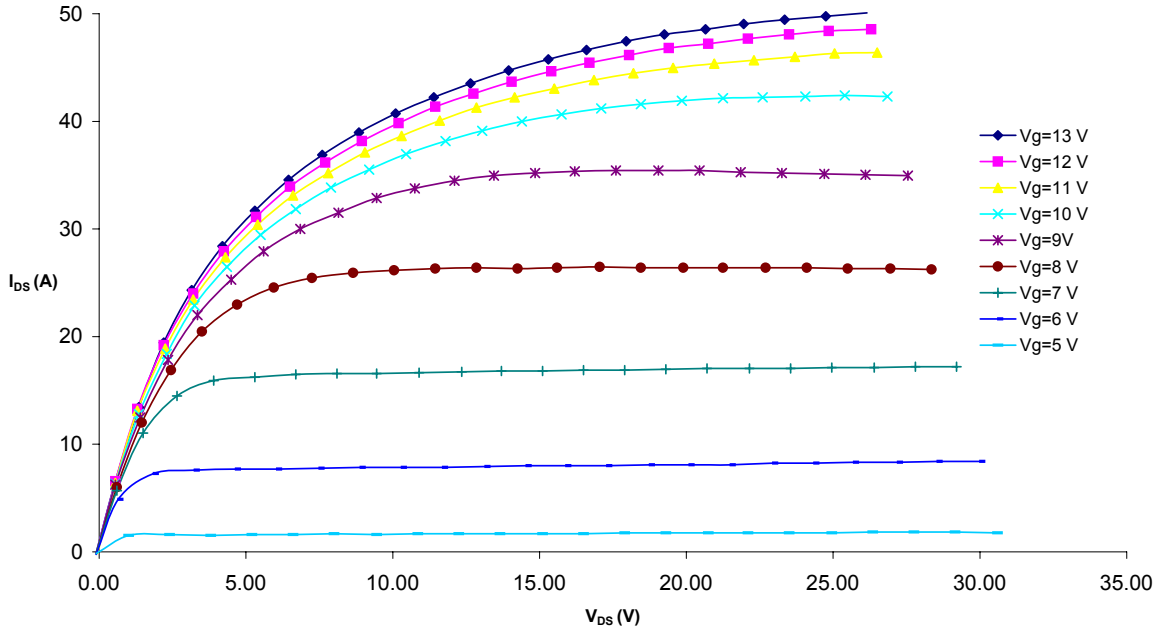

Figure 4 – Typical IV Characteristics.

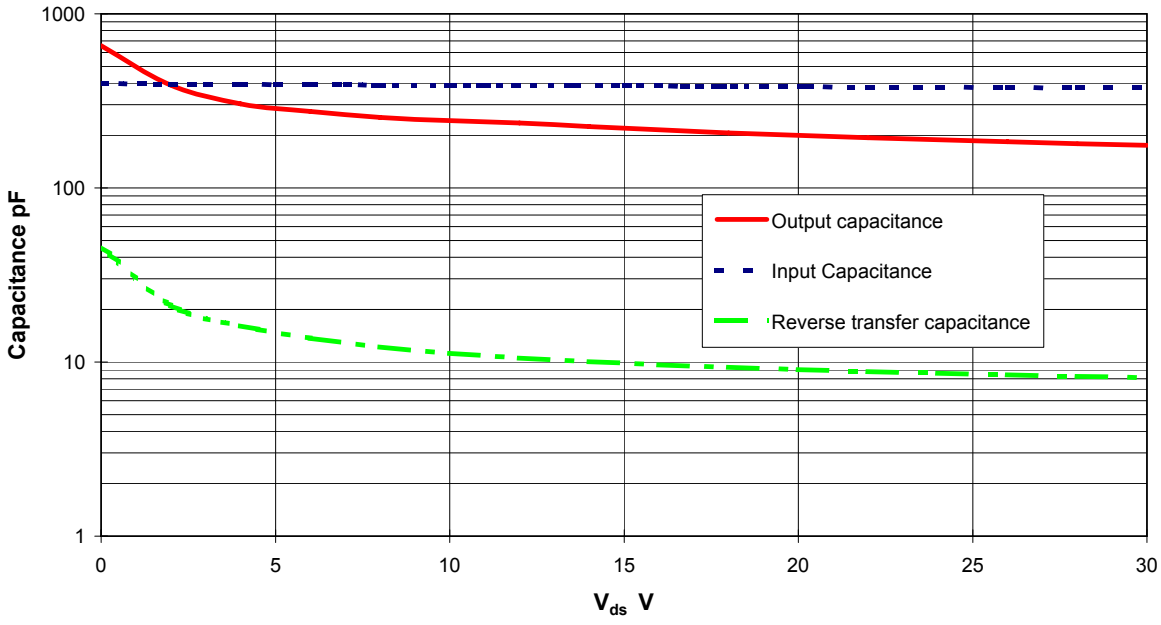

Figure 5 – Typical CV Characteristics.

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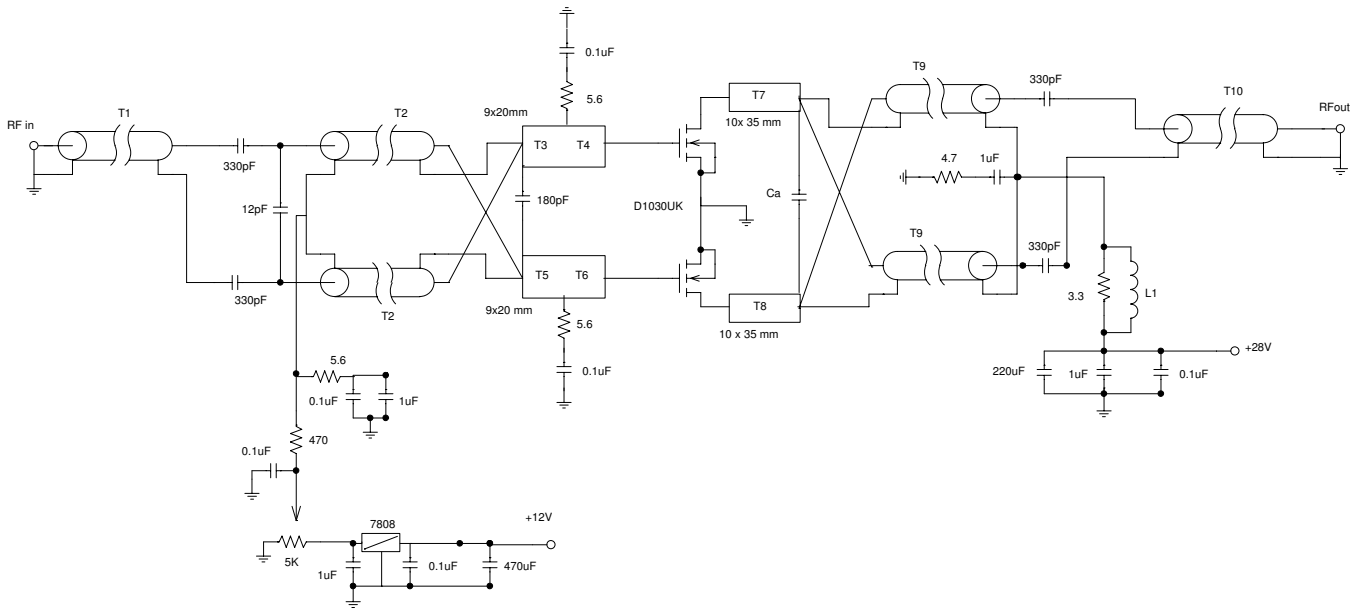

D1030UK TEST FIXTURE

substrate Er=3.3
substrate thickness= 0.78mm
T1 50 Ohm coaxial cable UT 47, length=100mm
T2 25 Ohm coaxial cable UT-034-25, length=70mm
T3 10mm T5 10mm T7 35mm
T4 10mm T6 10mm T8 35mm
T9 25 Ohm semi rigid coaxial cable, length=120mm
T10 50 Ohm coaxial cable UT-085, length=120mm
L1 5 turns 1mm diameter enamelled copper wire on a ferrite core
Ca 3x39pF

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