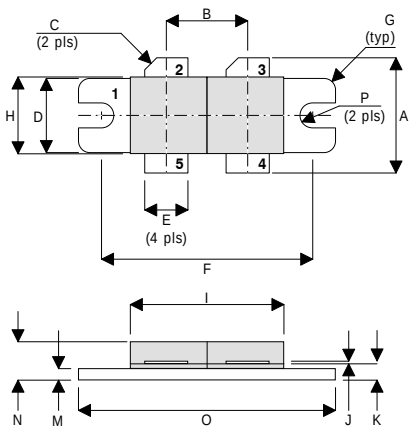
D1040UK

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 – 108MHz 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 FM COMMUNICATIONS

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

P_D	Power Dissipation	438W
BV_{DSS}	Drain – Source Breakdown Voltage *	70V
BV_{GSS}	Gate – Source Breakdown Voltage *	±20V
$I_{D(sat)}$	Drain Current *	35A
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	70			V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS} = 28V	V_{GS} = 0			7	mA
I_{GSS}	Gate Leakage Current	V_{GS} = 20V	V_{DS} = 0			7	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 = 7A	5.6			S
TOTAL DEVICE							
G_{PS}	Common Source Power Gain	P_O = 400W		16			dB
η	Drain Efficiency	V_{DS} = 28V	I_{DQ} = 2A	65			%
VSWR	Load Mismatch Tolerance	f = 108MHz		20:1			—
PER SIDE							
C_{iss}	Input Capacitance	V_{DS} = 28V	V_{GS} = –5V f = 1MHz			380	pF
C_{oss}	Output Capacitance	V_{DS} = 28V	V_{GS} = 0 f = 1MHz			180	pF
C_{rss}	Reverse Transfer Capacitance	V_{DS} = 28V	V_{GS} = 0 f = 1MHz			10	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. 0.4°C / W

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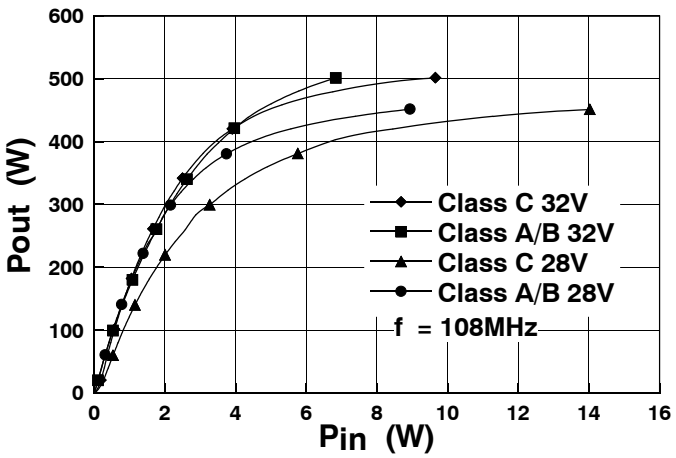

Figure 1
Output Power vs. Input Power

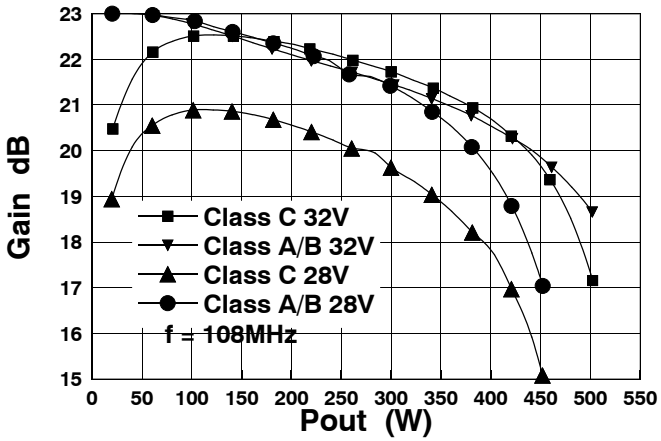

Figure 2
Gain vs. Output Power

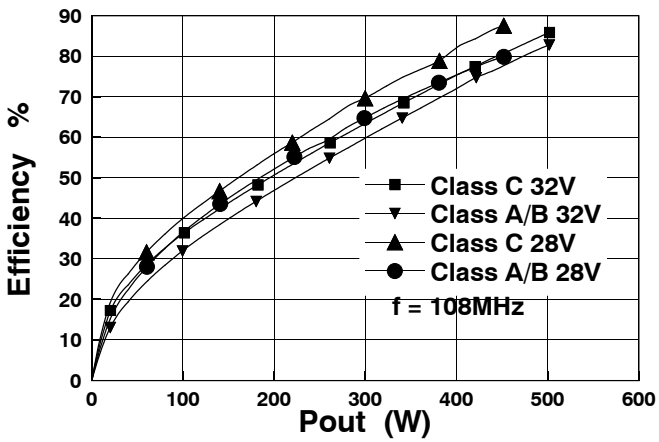

Figure 3
Efficiency vs. Output Power

OPTIMUM SOURCE AND LOAD IMPEDANCE

Frequency MHz	Z_S Ω	Z_L Ω
108	1.5 + j3.5	1.5 - j0.4

APPLICATION NOTE

In applications where a constant output power is required irrespective of variations in temperature or supply voltage etc. then a feedback loop must be incorporated whereby the drain voltage is adjusted to maintain constant output power.

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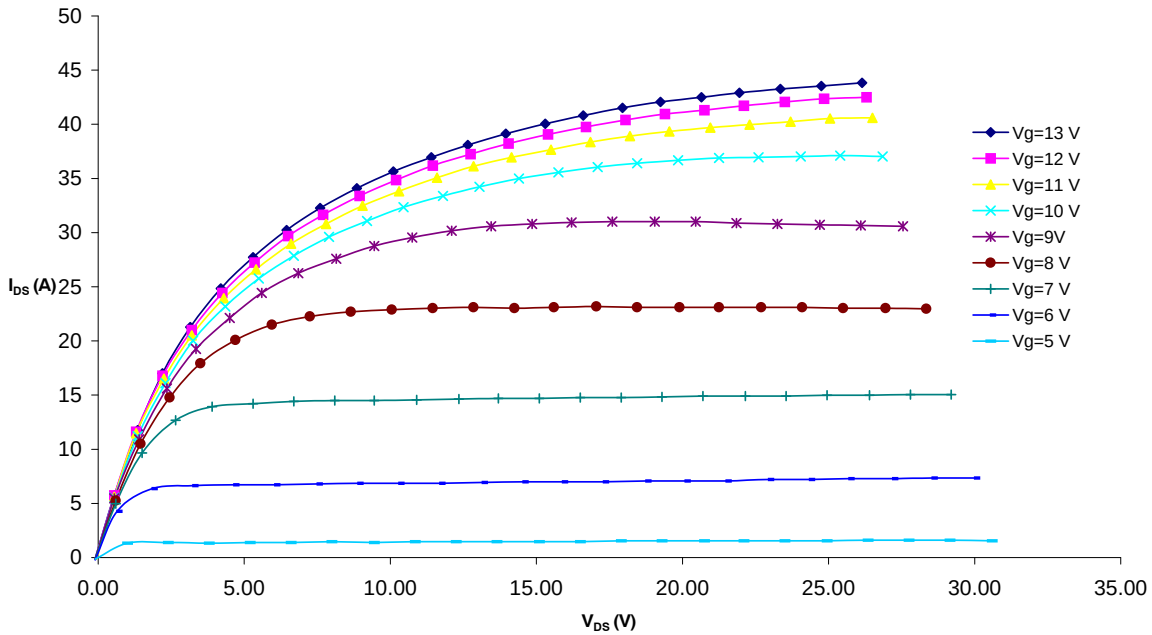

Figure 4 – Typical IV Characteristics.

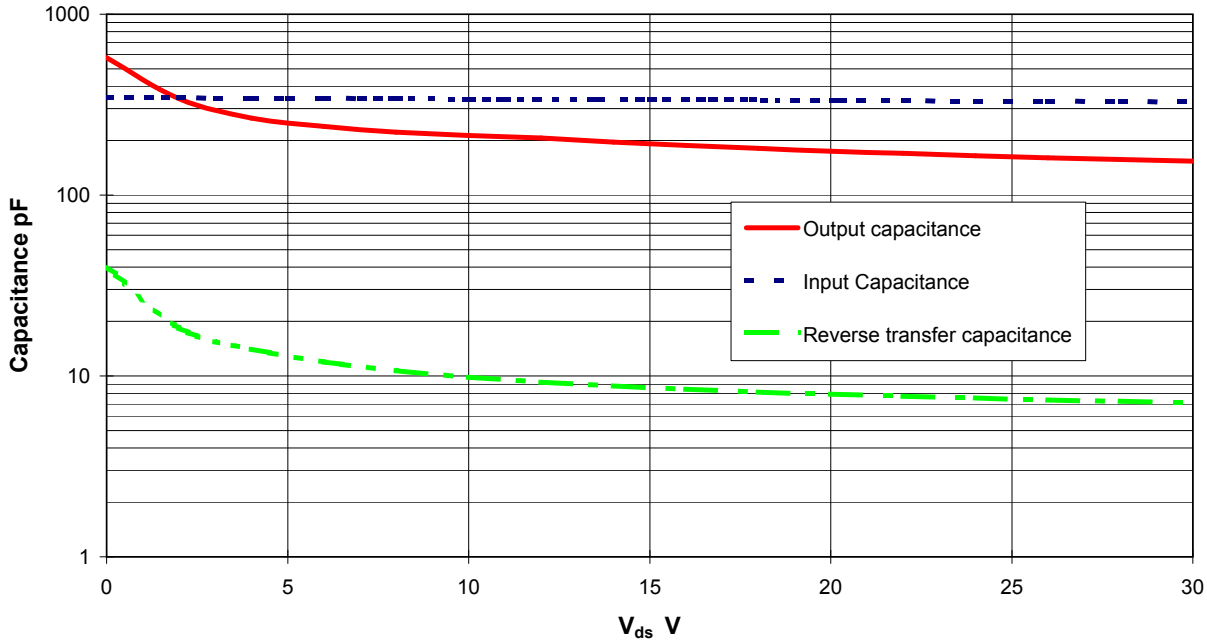

Figure 5 – Typical CV Characteristics.

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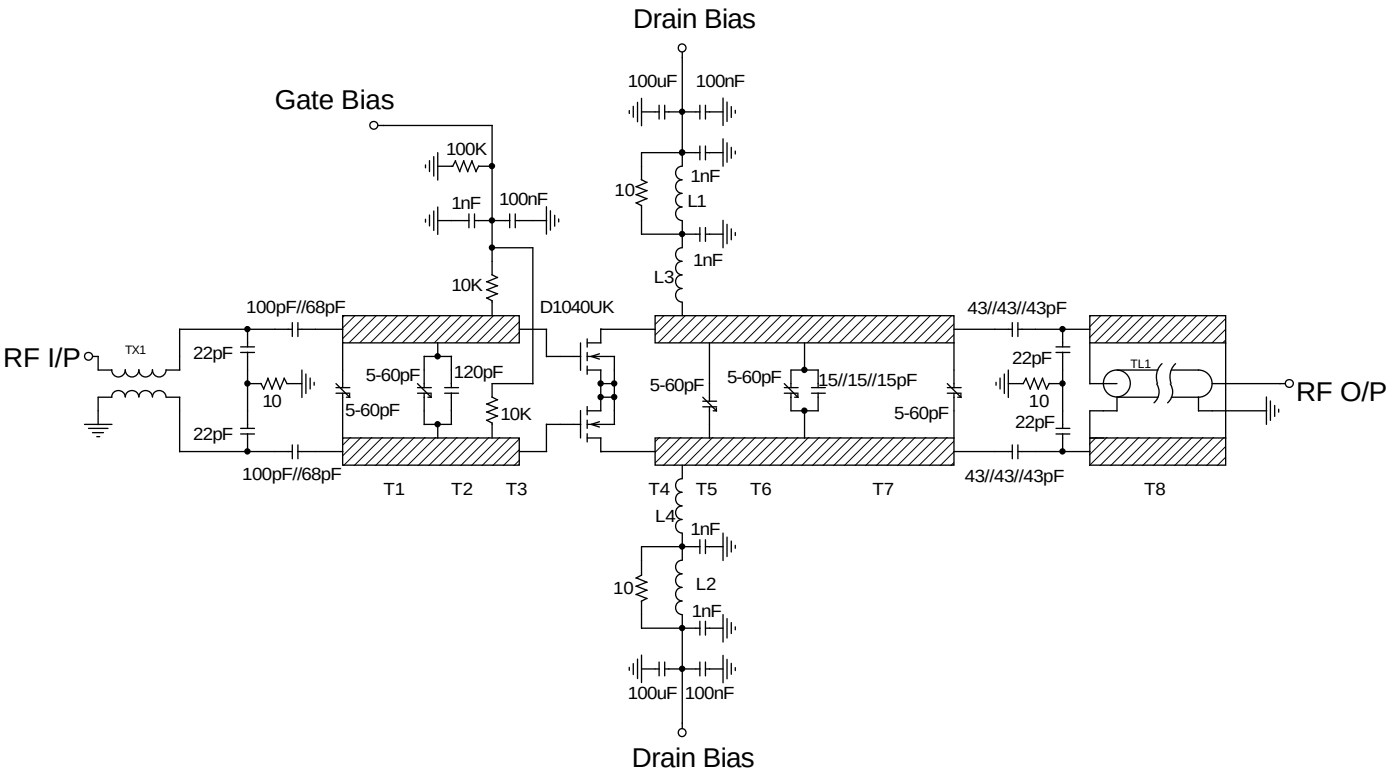

D1040UK 108MHz Test Fixture

Substrate 1.6mm PTFE/glass ε_r=2.2

TX1	4 turns 50Ω coaxial cable wound around toroid
TL1	160mm UT85 semi-rigid coax
L1, L2	1 turn 1.2mm dia wire on Siemens B62152A1X1 2 hole core
L3, L4	4 turns 1.2mm dia wire, 10mm internal dia

T8 4.8mm wide, all other lines 6mm wide

T1	50mm
T2	40mm
T3	10mm
T4	14mm
T5	8mm
T6	40mm
T7	66mm
T8	160mm

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