



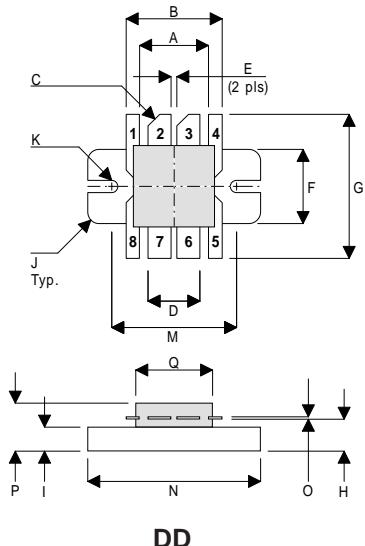
**SEME  
LAB**

TetraFET

**D1024UK**

METAL GATE RF SILICON FET

**MECHANICAL DATA**



PIN 1 SOURCE (COMMON) PIN 2 DRAIN 1  
PIN 3 DRAIN 2 PIN 4 SOURCE (COMMON)  
PIN 5 SOURCE (COMMON) PIN 6 GATE 2  
PIN 7 GATE 1 PIN 8 SOURCE (COMMON)

DIM	mm	Tol.	Inches	Tol.
A	9.14	0.13	0.360	0.005
B	12.70	0.13	0.500	0.005
C	45°	5°	45°	5°
D	6.86	0.13	0.270	0.005
E	0.76	0.13	0.030	0.005
F	9.78	0.13	0.385	0.005
G	19.05	0.25	0.750	0.010
H	4.19	0.13	0.165	0.005
I	3.17	0.13	0.125	0.005
J	1.52R	0.13	0.060R	0.005
K	1.65R	0.13	0.065R	0.005
M	16.51	0.13	0.650	0.005
N	22.86	0.13	0.900	0.005
O	0.13	0.02	0.005	0.001
P	6.35	0.64	0.250	0.025
Q	10.77	0.13	0.424	0.005

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

$P_D$	Power Dissipation	100W
$BV_{DSS}$	Drain – Source Breakdown Voltage *	70V
$BV_{GSS}$	Gate – Source Breakdown Voltage *	$\pm 20\text{V}$
$I_{D(sat)}$	Drain Current *	5A
$T_{stg}$	Storage Temperature	–65 to $150^\circ\text{C}$
$T_j$	Maximum Operating Junction Temperature	200°C

\* Per Side

Semelab Plc reserves the right to change test conditions, parameter limits and package dimensions without notice. Information furnished by Semelab is believed to be both accurate and reliable at the time of going to press. However Semelab assumes no responsibility for any errors or omissions discovered in its use. Semelab encourages customers to verify that datasheets are current before placing orders.

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Issue 1

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

Parameter	Test Conditions	Min.	Typ.	Max.	Unit
<b>PER SIDE</b>					
$BV_{DSS}$	Drain-Source Breakdown Voltage $V_{GS} = 0$ $I_D = 100mA$	70			V
$I_{DSS}$	Zero Gate Voltage Drain Current $V_{DS} = 28V$ $V_{GS} = 0$			1	mA
$I_{GSS}$	Gate Leakage Current $V_{GS} = 20V$ $V_{DS} = 0$			1	$\mu A$
$V_{GS(th)}$	Gate Threshold Voltage *	$I_D = 10mA$	$V_{DS} = V_{GS}$	1	V
$g_{fs}$	Forward Transconductance *	$V_{DS} = 10V$	$I_D = 1A$	0.8	S
<b>TOTAL DEVICE</b>					
$G_{PS}$	Common Source Power Gain $P_O = 40W$	13			dB
$\eta$	Drain Efficiency $V_{DS} = 28V$ $I_{DQ} = 0.4A$	50			%
VSWR	Load Mismatch Tolerance $f = 400MHz$	20:1			—
<b>PER SIDE</b>					
$C_{iss}$	Input Capacitance $V_{DS} = 28V$ $V_{GS} = -5V$ $f = 1MHz$			60	pF
$C_{oss}$	Output Capacitance $V_{DS} = 28V$ $V_{GS} = 0$ $f = 1MHz$			30	pF
$C_{rss}$	Reverse Transfer Capacitance $V_{DS} = 28V$ $V_{GS} = 0$ $f = 1MHz$			2.5	pF

\* Pulse Test: Pulse Duration = 300  $\mu s$  , Duty Cycle  $\leq 2\%$

**HAZARDOUS MATERIAL WARNING**

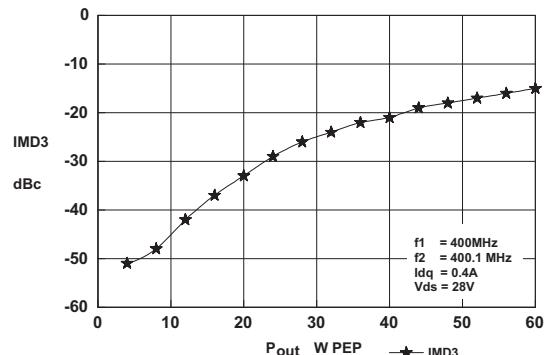
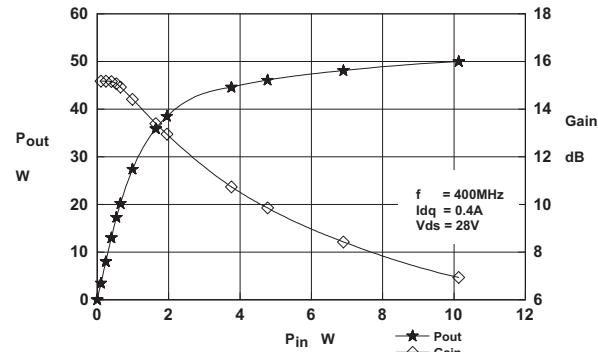
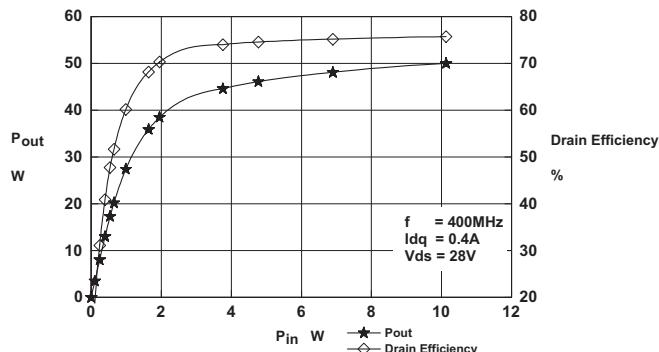
The ceramic portion of the device between leads and metal flange is beryllium oxide. Beryllium oxide dust is highly toxic and care must be taken during handling and mounting to avoid damage to this area.

**THESE DEVICES MUST NEVER BE THROWN AWAY WITH GENERAL INDUSTRIAL OR DOMESTIC WASTE.**

**THERMAL DATA**

$R_{THj-case}$	Thermal Resistance Junction – Case	Max. 1.75°C / W
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#### OPTIMUM SOURCE AND LOAD IMPEDANCE

Frequency MHz	$Z_S$ $\Omega$	$Z_L$ $\Omega$
400MHz	10.7 - j35.4	13.8 - j22.2

#### Typical S Parameters

!  $V_{DS} = 28V$ ,  $I_{DQ} = 1A$

# MHZ S MA R 50

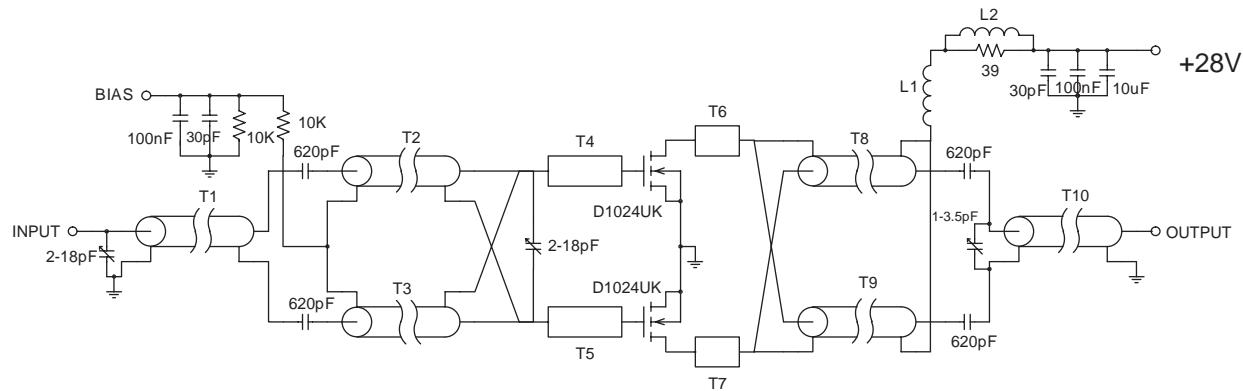
!Freq !MHz	S11 mag	S11 ang	S21 mag	S21 ang	S12 mag	S12 ang	S22 mag	S22 ang
100	0.767	-135	22.646	88	0.0155	9	0.531	-103
200	0.813	-153	10.116	57	0.0099	4	0.692	-131
300	0.841	-161	5.623	39	0.0076	49	0.794	-143
400	0.861	-169	3.548	25	0.0130	79	0.841	-151
500	0.882	-175	2.820	20	0.0210	78	0.875	-156
600	0.902	180	2.093	14	0.0285	78	0.910	-161
700	0.923	174	1.365	9	0.0376	77	0.944	-166
800	0.912	170	1.096	2	0.0457	66	0.944	-170
900	0.923	164	0.902	-3	0.0484	66	0.933	-176
1000	0.923	161	0.724	-4	0.0596	64	0.944	-177

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## D1024UK TEST FIXTURE

Substrate 1.6mm FR4  
All microstrip lines W = 2.5mm

T1	45mm 50 OHM UT34 semi-rigid coax
T2, T3	55mm 50 OHM UT 34 semi-rigid coax
T4, T5	25mm microstrip line
T6, T7	10mm microstrip line
T8, T9	45mm 25 OHM UT 34-25 semi-rigid coax
T10	60mm 50OHM UT34 semi-rigid coax
L1	4 turns 19swg enamelled copper wire, 7mm i.d.
L2	2.5 turns of 19swg enamelled copper wire on T50-6 ferrite toroid