

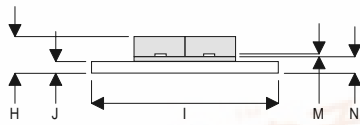
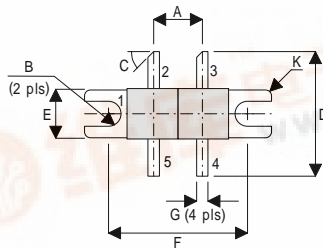
TetraFET

D1008UK

METAL GATE RF SILICON FET

MECHANICAL DATA

**GOLD METALLISED  
MULTI-PURPOSE SILICON  
DMOS RF FET  
80W – 28V – 500MHz  
PUSH-PULL**



DK

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

FEATURES

- SIMPLIFIED AMPLIFIER DESIGN
- SUITABLE FOR BROAD BAND APPLICATIONS
- LOW  $C_{rss}$
- SIMPLE BIAS CIRCUITS
- LOW NOISE
- HIGH GAIN – 13 dB MINIMUM

DIM	mm	Tol.	Inches	Tol.
A	6.45	0.13	0.254	0.005
B	1.65R	0.13	0.065R	0.005
C	45°	5°	45°	5°
D	16.51	0.76	0.650	0.03
E	6.47	0.13	0.255	0.005
F	18.41	0.13	0.725	0.005
G	1.52	0.13	0.060	0.005
H	4.82	0.25	0.190	0.010
I	24.76	0.13	0.975	0.005
J	1.52	0.13	0.060	0.005
K	0.81R	0.13	0.032R	0.005
M	0.13	0.02	0.005	0.001
N	2.16	0.13	0.085	0.005

APPLICATIONS

- HF/VHF/UHF COMMUNICATIONS  
from 1 MHz to 500 MHz

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

$P_D$	Power Dissipation	175W
$BV_{DSS}$	Drain – Source Breakdown Voltage *	70V
$BV_{GSS}$	Gate – Source Breakdown Voltage *	±20V
$I_{D(sat)}$	Drain Current *	10A
$T_{stg}$	Storage Temperature	-65 to 150°C
	Maximum Operating Junction Temperature	200°C



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

Parameter	Test Conditions	Min.	Typ.	Max.	Unit
<b>PER SIDE</b>					
BV <sub>DSS</sub> Drain–Source Breakdown Voltage	V <sub>GS</sub> = 0 I <sub>D</sub> = 100mA	70			V
I <sub>DSS</sub> Zero Gate Voltage Drain Current	V <sub>DS</sub> = 28V V <sub>GS</sub> = 0			2	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> = 2A	1.6			S
<b>TOTAL DEVICE</b>					
G <sub>PS</sub> Common Source Power Gain	P <sub>O</sub> = 80W	13			dB
η Drain Efficiency	V <sub>DS</sub> = 28V I <sub>DQ</sub> = 0.4A	50			%
VSWR Load Mismatch Tolerance	f = 400MHz	20:1			—
<b>PER SIDE</b>					
C <sub>iss</sub> Input Capacitance	V <sub>DS</sub> = 28V V <sub>GS</sub> = -5V f = 1MHz			120	pF
C <sub>oss</sub> Output Capacitance	V <sub>DS</sub> = 28V V <sub>GS</sub> = 0 f = 1MHz			60	pF
C <sub>rss</sub> Reverse Transfer Capacitance	V <sub>DS</sub> = 28V V <sub>GS</sub> = 0 f = 1MHz			5	pF

\* Pulse Test: Pulse Duration = 300 μs , Duty Cycle ≤ 2%

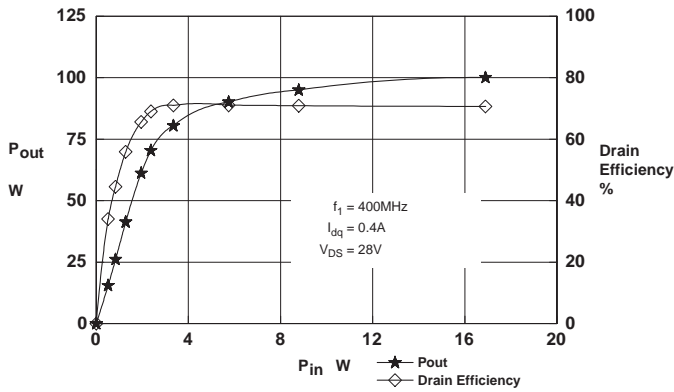
### HAZARDOUS MATERIAL WARNING

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.

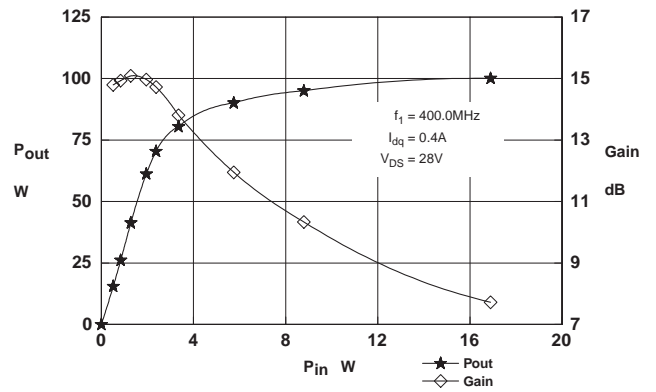
**THESE DEVICES MUST NEVER BE THROWN AWAY WITH GENERAL INDUSTRIAL OR DOMESTIC WASTE.**

### THERMAL DATA

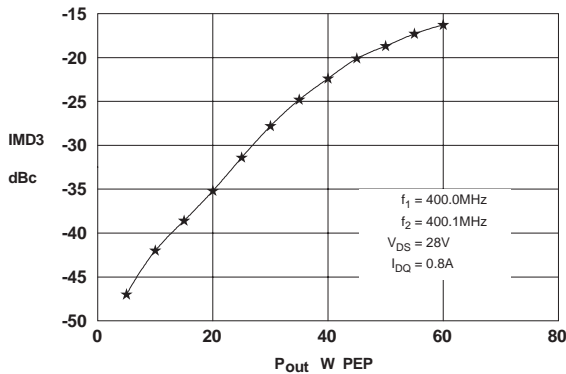
R <sub>THj-case</sub>	Thermal Resistance Junction – Case	Max. 1.0°C / W
-----------------------	------------------------------------	----------------



**Figure 1 – Power Output and Efficiency vs. Power Input.**



**Figure 2 – Power Output & Gain vs. Power Input.**



**Figure 3 – IMD vs. Output Power.**

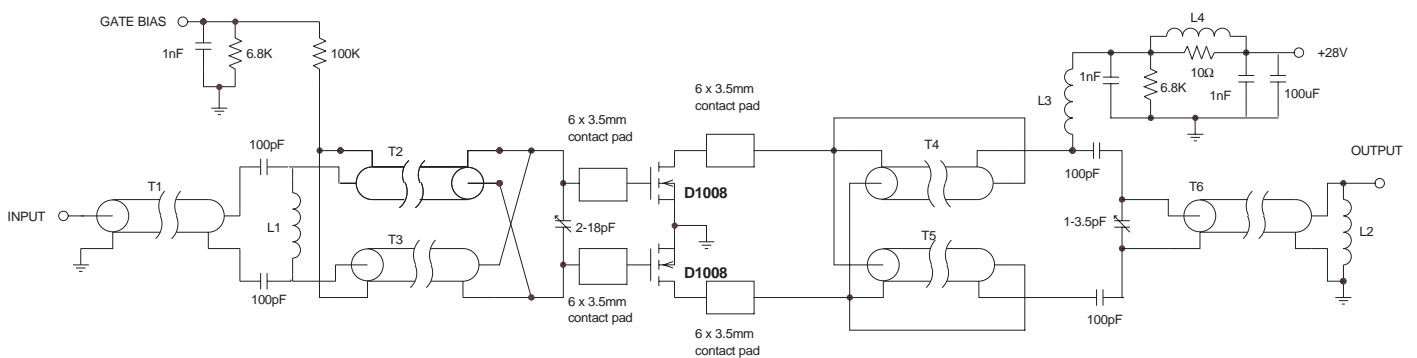
## D1008UK OPTIMUM SOURCE AND LOAD IMPEDANCE

Frequency MHz	$Z_S$ $\Omega$	$Z_L$ $\Omega$
400	$1.5 + j0.2$	$5.0 + j2.0$

## Typical S Parameters

! Vds=28V, Idq=1A  
# MHz S MA R 50

!Freq MHz	S11 mag ang	S21 mag ang	S12 mag ang	S22 mag ang
100	0.794 -158	14.622 69	0.0115 -7	0.61 -145
200	0.881 -167	5.821 42	0.0061 3	0.794 -156
300	0.923 -171	3.02 28	0.0068 60	0.871 -162
400	0.923 -176	1.82 18	0.117 77	0.902 -167
500	0.937 -179	1.439 15	0.0168 76	0.923 -169
600	0.952 177	1.057 13	0.0234 75	0.945 -171
700	0.966 174	0.676 10	0.0285 74	0.966 -174
800	0.966 171	0.543 5	0.0335 69	0.955 -177
900	0.977 167	0.447 1	0.0394 64	0.966 178
1000	0.966 165	0.359 1	0.0432 64	0.955 178



## D1008UK TEST FIXTURE

Substrate 1.6mm PTFE/glass,  $\epsilon_r=2.5$   
All microstrip lines  $W=4.4\text{mm}$

T1	70mm	50Ω UT34 SEMI RIGID COAX	L1	3.5 turns of 24swg ECW, 3mm ID
T2,T3	85mm	25Ω UT70-25 SEMI RIGID COAX	L2	5.5 turns of 24swg ECW, 4mm ID
T4,T5	100mm	15Ω UT85-15 SEMI RIGID COAX	L3	4 turns of 21swg ECW, 7mm ID
T6	70mm	50Ω UT85 SEMI RIGID COAX	L4	3 turns of 21swg ECW on Fair-Rite FT50-75 core