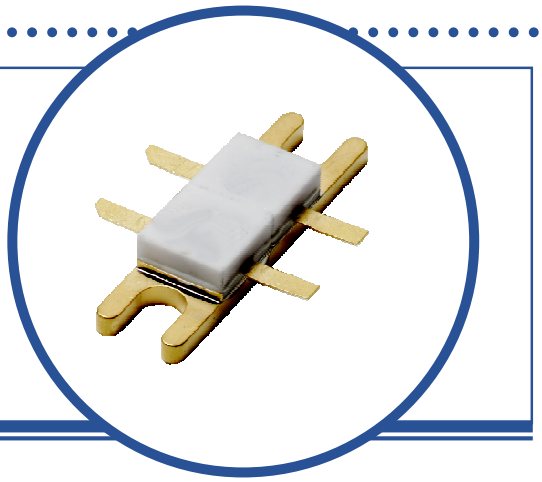
TETRA FET
ROHS COMPLIANT METAL GATE RF SILICON FET

D1008UK

GOLD METALLISED MULTI-PURPOSE SILICON DMOS RF FET 80W—28V—500MHZ PUSH-PULL



FEATURES:

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

APPLICATIONS

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

ABSOLUTE MAXIMUM RATINGS (T_{CASE} = 25°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 (Per Side)	10A
T_{stg}	Storage Temperature Range	-65 to +150°C
T_J	Maximum Operating Junction Temperature	200°C

Semelab Limited Coventry Road, Lutterworth, Leicestershire, LE17 4JB
Telephone +44 (0) 1455 556565 Fax +44 (0) 1455 552612 Email: sales@semelab-tt.com Website: http://www.semelab-tt.com

ELECTRICAL CHARACTERISTICS (T_{CASE} = 25°C unless otherwise stated)

Symbols	Parameters	Test Conditions	Min.	Typ.	Max.	Units
		PER SIDE				
BV_{DSS}	Drain – Source Breakdown Voltage	V_{GS} = 0V I_D = 100mA	70			V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS} = 28V V_{GS} = 0V			2	mA
I_{GSS}	Gate Leakage Current	V_{GS} = 20V V_{DS} = 0V			1	µA
$V_{GS(th)}$	Gate Threashold Voltage *	I_D = 10mA V_{DS} = V_{GS}	1		7	V
g_{fs}	Forward Transconducatnce*	V_{DS} = 10V I_D = 2A	1.6			S

* Pulse Width ≤ 380us, δ ≤ 2%

DYNAMIC CHARACTERISTICS

Symbols	Parameters	Test Conditions	Min.	Typ.	Max.	Units
		Per Side				
C_{iss}	Input Capacitance	V_{DS} = 28V V_{GS} = -5V f = 1.0MHz			120	pF
C_{oss}	Output Capacitance	V_{DS} = 28V V_{GS} = 0V f = 1.0MHz			60	
C_{rss}	Reverse Transfer Capacitance	V_{DS} = 28V V_{GS} = 0V f = 1.0MHz			5	
		Total Device				
G_{PS}	Common Source Power Gain	P_o = 80W V_{DS} = 28 I_{DQ} = 0.4A f = 400MHz	13			dB
η	Drain Efficiency		50			%
VSWR	Load Mismatch Tolerance		20:1			

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 Properties

Symbols	Parameters	Max.	Units
$R_{THj\text{-}case}$	Thermal Resistance, Junction To Case	1.0	°C/W

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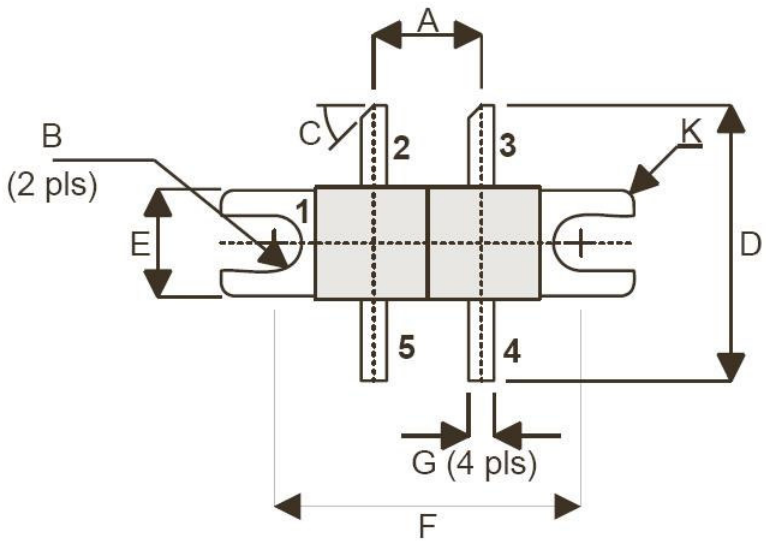
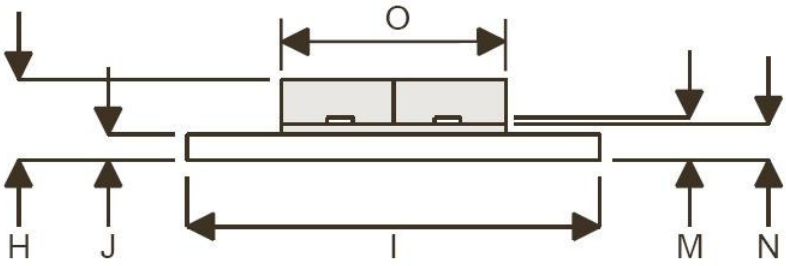
MECHANICAL DATA





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

DK METAL PACKAGE

Pin 1 – Source (Common) Pin 2 – Drain1 Pin 3 – Drain2 Pin 4 – Gate 2 Pin 5 – Gate 1

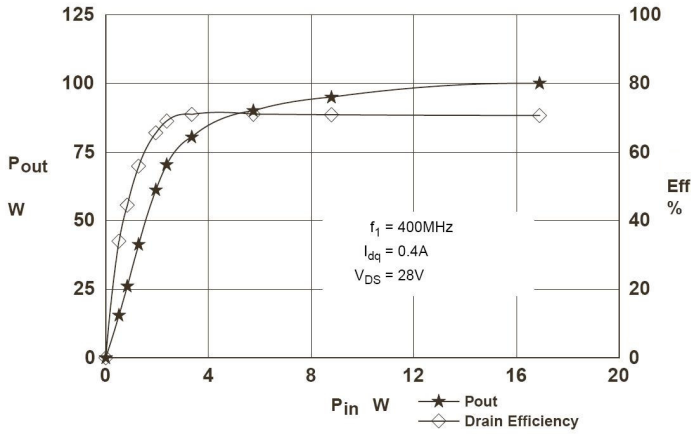


Figure 01— Power Output and Efficiency vs. Power Input.

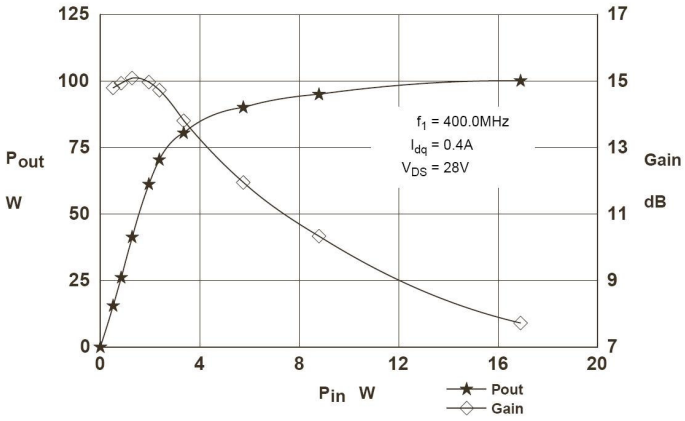


Figure 02— Power Output and Gain vs. Power Input.

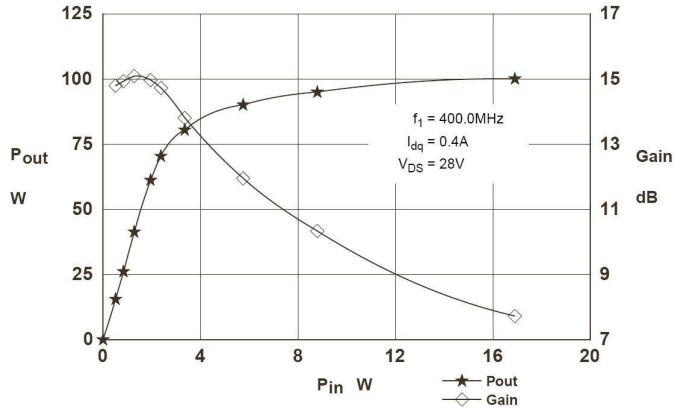


Figure 03— IMD vs. Output Power.

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OPTIMUM SOURCE AND LOAD IMPEDANCE

FREQUENCY MHZ	Z_S Ω	Z_L Ω
400	1.5 + j0.2	5.0+ j2.0

Typical S Parameters

Vds = 28V, Id=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

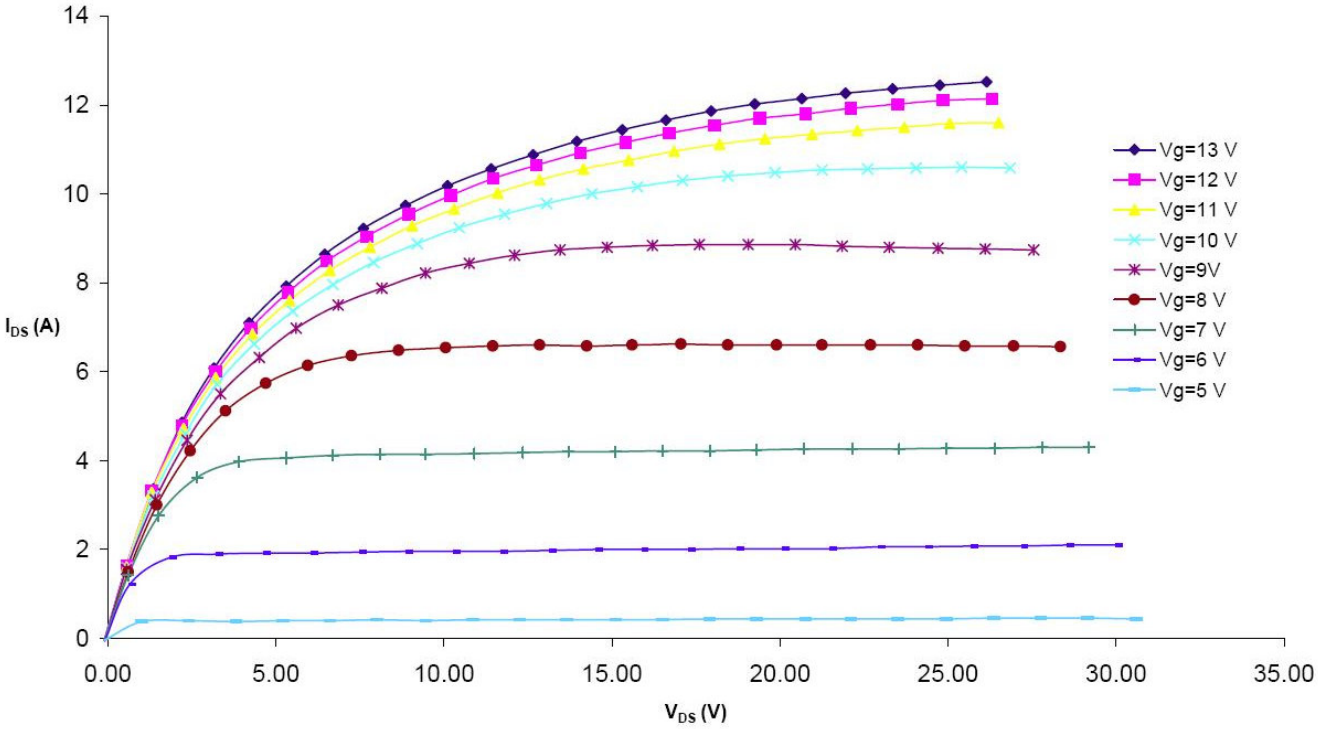


Figure 4—Typical IV Characteristics

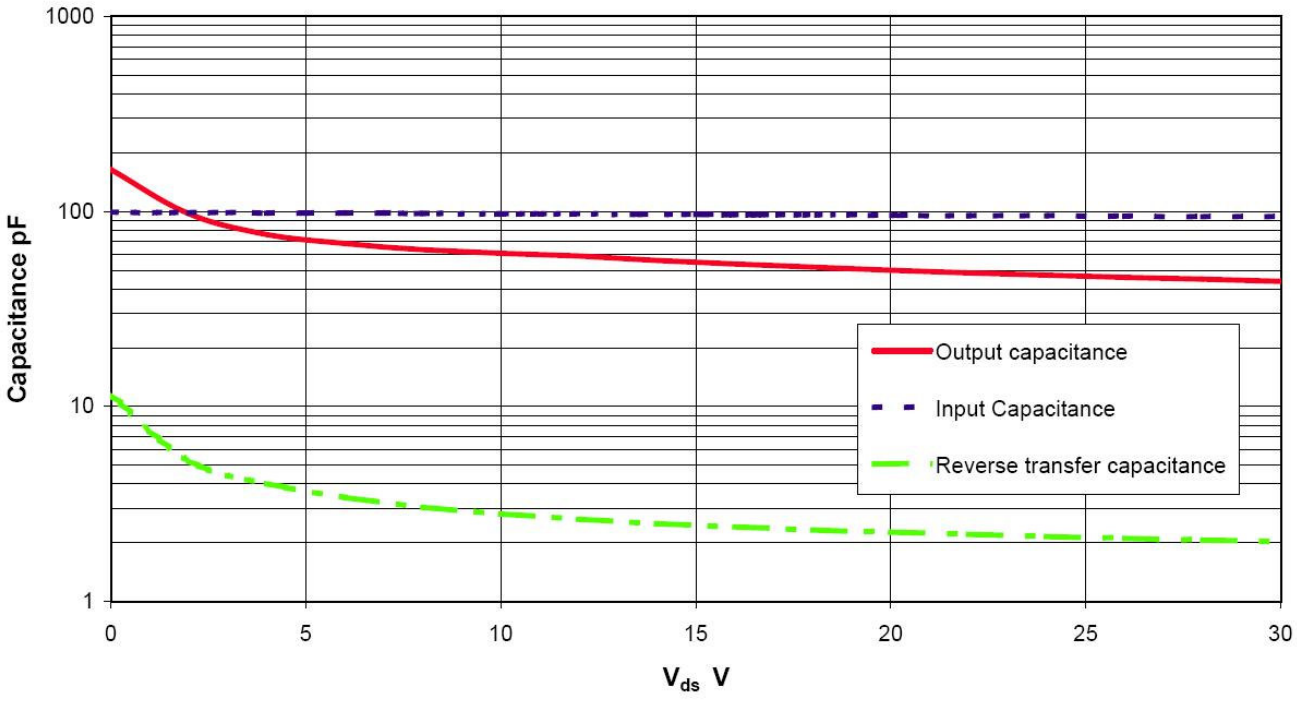
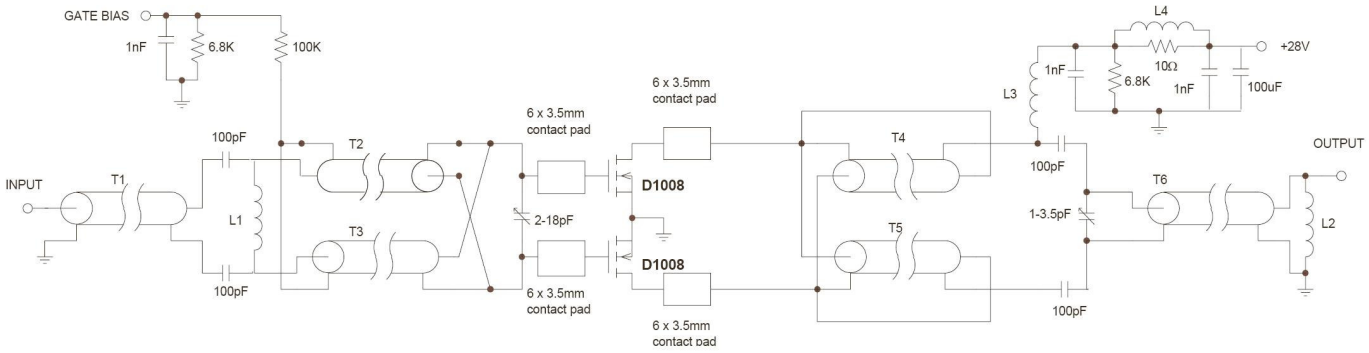


Figure 5—Typical CV Characteristics



D1008UK TEST FIXTURE

Substrate 1.6mm PTFE/glass, Er = 2.5
All microstrip lines W = 4.4mm

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