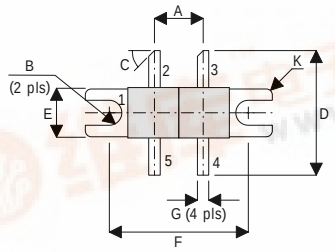
TetraFET

D2013UK

METAL GATE RF SILICON FET

MECHANICAL DATA



DK

PIN 1 SOURCE (COMMON) PIN 2 DRAIN 1

PIN 3 DRAIN 2 PIN 4 GATE 2

PIN 5 GATE 1

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

GOLD METALLISED MULTI-PURPOSE SILICON DMOS RF FET 20W – 28V – 1GHz PUSH–PULL

FEATURES

- **SIMPLIFIED AMPLIFIER DESIGN**
- **SUITABLE FOR BROAD BAND APPLICATIONS**
- **VERY LOW C_{rss}**
- **SIMPLE BIAS CIRCUITS**
- **LOW NOISE**
- **HIGH GAIN – 10 dB MINIMUM**

APPLICATIONS

- HF/VHF/UHF COMMUNICATIONS from 1MHz to 2 GHz

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

P_D	Power Dissipation	83W
BV_{DSS}	Drain – Source Breakdown Voltage *	65V
BV_{GSS}	Gate – Source Breakdown Voltage *	±20V
$I_{D(sat)}$	Drain Current *	4A
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 = 10mA		65			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	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 = 0.8A		0.72			S
		TOTAL DEVICE						
G_{PS}	Common Source Power Gain	P_O = 20W			10			dB
η	Drain Efficiency	V_{DS} = 28V	I_{DQ} = 0.8A		40			%
VSWR	Load Mismatch Tolerance	f = 1GHz			20:1			—
		PER SIDE						
C_{iss}	Input Capacitance	V_{DS} = 0	V_{GS} = –5V	f = 1MHz			48	pF
C_{oss}	Output Capacitance	V_{DS} = 28V	V_{GS} = 0	f = 1MHz			24	pF
C_{rss}	Reverse Transfer Capacitance	V_{DS} = 28V	V_{GS} = 0	f = 1MHz			2	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. 2.1°C / W

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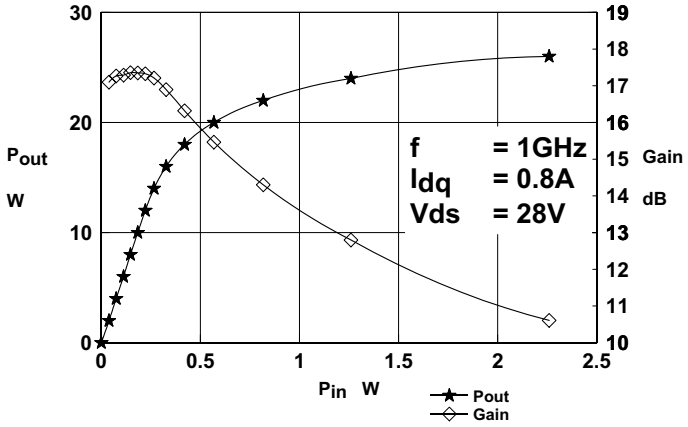

Figure 1

OutputPower and Gain vs. Input Power.

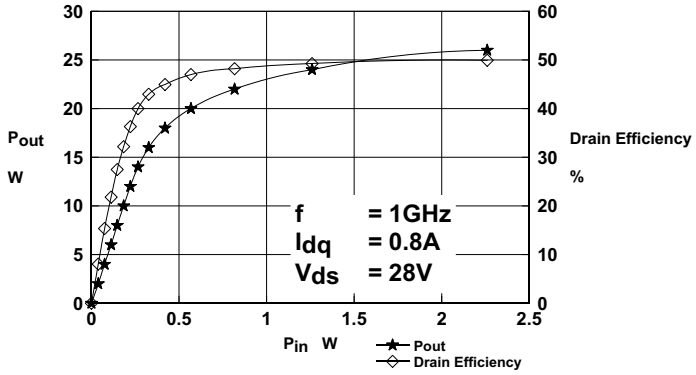

Figure 2

Output Power and efficiency vs. Input Power.

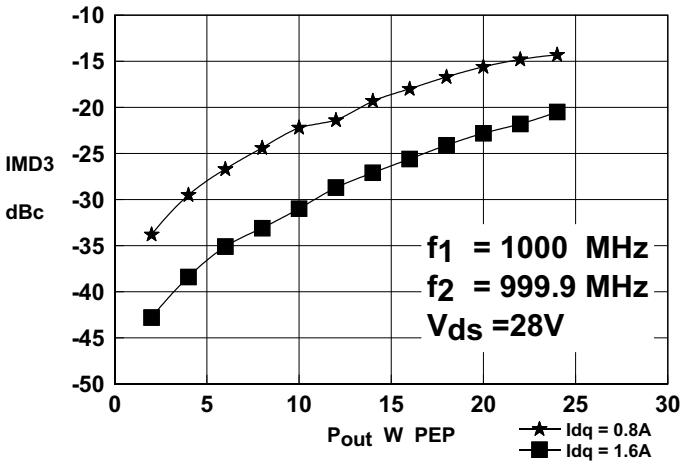

Figure 3

IMD Vs. Output Power.

OPTIMUM SOURCE AND LOAD IMPEDANCE

Frequency MHz	Z_S Ω	Z_L Ω
1000MHZ	1.3 - j4.6	2.5 - j2.6

Typical S Parameters

! Vds=28V, Idq=0.8A
MHz S MA R 50

!Freq	S11		S21		S12		S22	
!MHz	mag	ang	mag	ang	mag	ang	mag	ang
100	0.841	-122	24.547	98	0.01318	13	0.49	-94
200	0.871	-146	11.482	69	0.01	0	0.61	-125
300	0.891	-156	6.683	52	0.00653	10	0.708	-137
400	0.902	-163	4.365	40	0.00596	49	0.767	-146
500	0.923	-170	3.055	27	0.00891	71	0.813	-155
600	0.933	-174	2.113	22	0.01349	79	0.851	-165
700	0.955	-175	1.758	19	0.01862	85	0.881	-166
800	0.955	-177	1.413	12	0.02344	82	0.902	-170
900	0.966	179	1.161	5	0.02851	80	0.902	-177
1000	0.955	177	0.944	3	0.03236	80	0.902	-179

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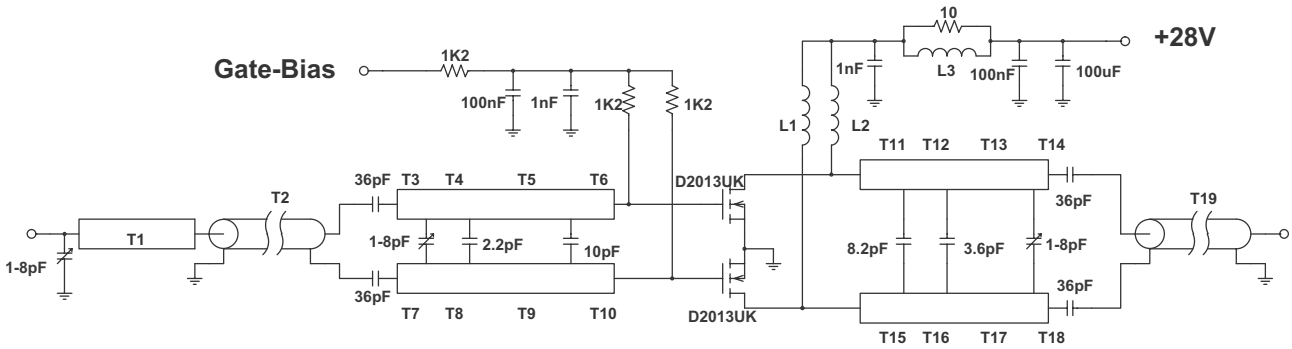

1000MHz Test Fixture

Substrate 0.8mm thick PTFE/glass

All microstrip lines W = 2.7mm

T1	23mm
T2, T19	50MM 50 Ohm UT34 semi-rigid coax
T3, T7	6mm
T4, T8	8mm
T5, T9	15mm
T6, T10	9mm
T11, T15	8mm
T12, T16	7mm
T13, T17	11mm
T14, T18	5mm

L1, L2 6 turns of 24swg enamelld copper wire, 3mm i,d.

L3 1.5 turn 24 swg enamelled copper wire on Siemens B62152-A7x 2 hole core