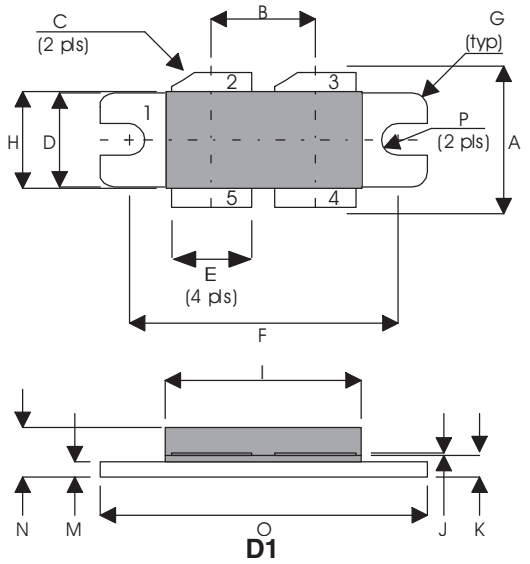
TetraFET

DMD1020
DMD1020-A

METAL GATE RF SILICON FET

MECHANICAL DATA



D1

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	15.24	0.50	0.600	0.020
B	10.80	0.13	0.425	0.005
C	45°	5°	45°	5°
D	9.78	0.13	0.385	0.005
E	8.38	0.13	0.330	0.005
F	27.94	0.13	1.100	0.005
G	1.52R	0.13	0.060R	0.005
H	10.16	0.15	0.400	0.006
I	21.84	0.23	0.860	0.009
J	0.10	0.02	0.004	0.001
K	1.96	0.13	0.077	0.005
M	1.02	0.13	0.040	0.005
N	4.45	0.38	0.175	0.015
O	34.04	0.13	1.340	0.005
P	1.63R	0.13	0.064R	0.005

GOLD METALLISED MULTI-PURPOSE SILICON DMOS RF FET 150W – 28V – 400MHz PUSH–PULL

FEATURES

- **SUITABLE FOR BROAD BAND APPLICATIONS**
- **SIMPLE BIAS CIRCUITS**
- **ULTRA-LOW THERMAL RESISTANCE**
- **BeO FREE**
- **LOW Crss**
- **HIGH GAIN – 13 dB MINIMUM**

APPLICATIONS

- VHF/UHF COMMUNICATIONS from 1 MHz to 500 MHz

P_D	Power Dissipation	760W (389W -A Version)
BV_{DSS}	Drain – Source Breakdown Voltage *	70V
BV_{GSS}	Gate – Source Breakdown Voltage*	±20V
$I_{D(sat)}$	Drain Current*	25A
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			5	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 = 5A	4			mhos
$V_{GS(th)match}$	Gate Threshold Voltage Matching Between Sides	I_D = 10mA	V_{DS} = V_{GS}			0.1	V
TOTAL DEVICE							
G_{PS}	Common Source Power Gain	P_O = 150W		13			dB
η	Drain Efficiency	V_{DS} = 28V	I_{DQ} = 2A	50			%
VSWR	Load Mismatch Tolerance	f = 400MHz		20:1			—
PER SIDE							
C_{iss}	Input Capacitance	V_{DS} = 28V	V_{GS} = –5V f = 1MHz			300	pF
C_{oss}	Output Capacitance	V_{DS} = 28V	V_{GS} = 0 f = 1MHz			150	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%

THERMAL DATA

$R_{THj–case}$	Thermal Resistance Junction – Case	Max. 0.23°C / W 0.45 °C / W -A Version

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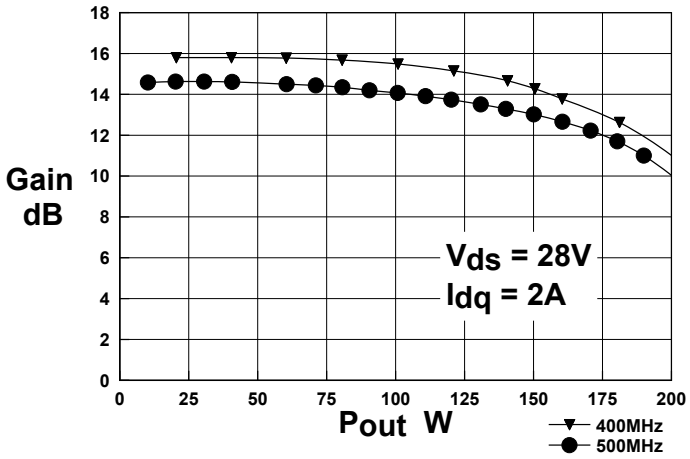

Figure 1- Gain vs. Power Output

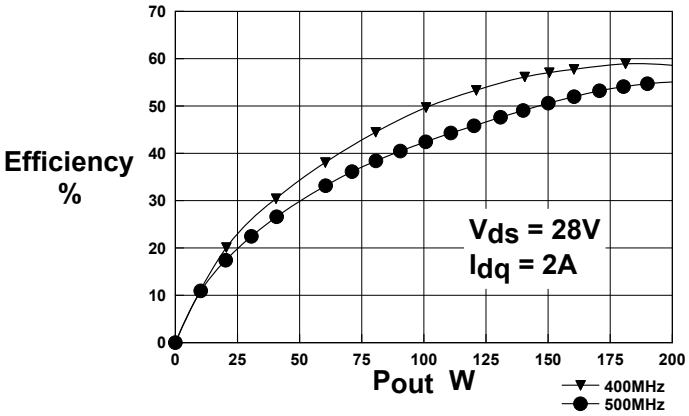

Figure 2 - Efficiency vs Power Output

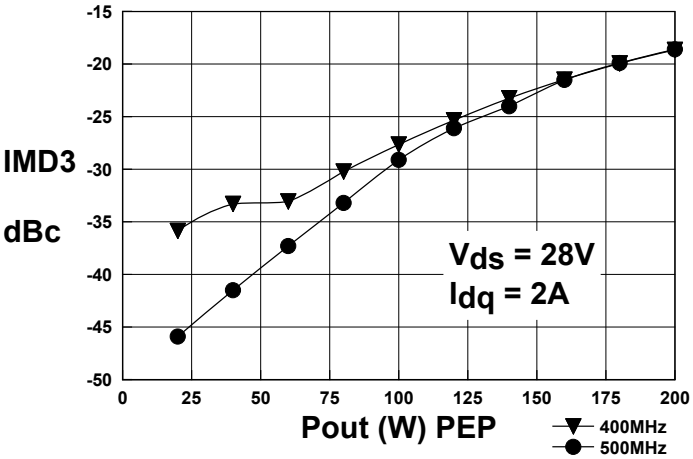

Figure 3 - IMD vs Power Output

Typical S Parameters

!DMD1020UK.s2p
!Vds=28V,Idq=2A
 # MHZ S MA R 50

Freq	S11		S21		S12		S22	
MHz	Mag	Ang	Mag	Ang	Mag	Ang	Mag	Ang
100	0.926	-167.4	3.56	26.4	0.002	81.3	0.963	-173.6
200	0.981	-176.2	0.88	11.9	0.009	91.7	0.990	-177.8
300	0.990	180.0	0.43	7.9	0.014	89.8	0.995	-179.5
400	0.995	176.7	0.24	7.0	0.020	87.6	0.997	179.0
500	0.996	174.4	0.16	8.6	0.025	86.1	0.998	178.0
600	0.997	171.9	0.11	13.1	0.031	84.3	0.998	177.0
700	0.997	169.9	0.09	18.8	0.035	83.0	0.998	176.2
800	0.998	168.0	0.08	25.7	0.040	81.6	0.998	175.4
900	0.998	165.8	0.07	34.3	0.046	80.1	0.998	174.5
1000	0.998	164.0	0.07	40.9	0.051	78.8	0.998	173.7

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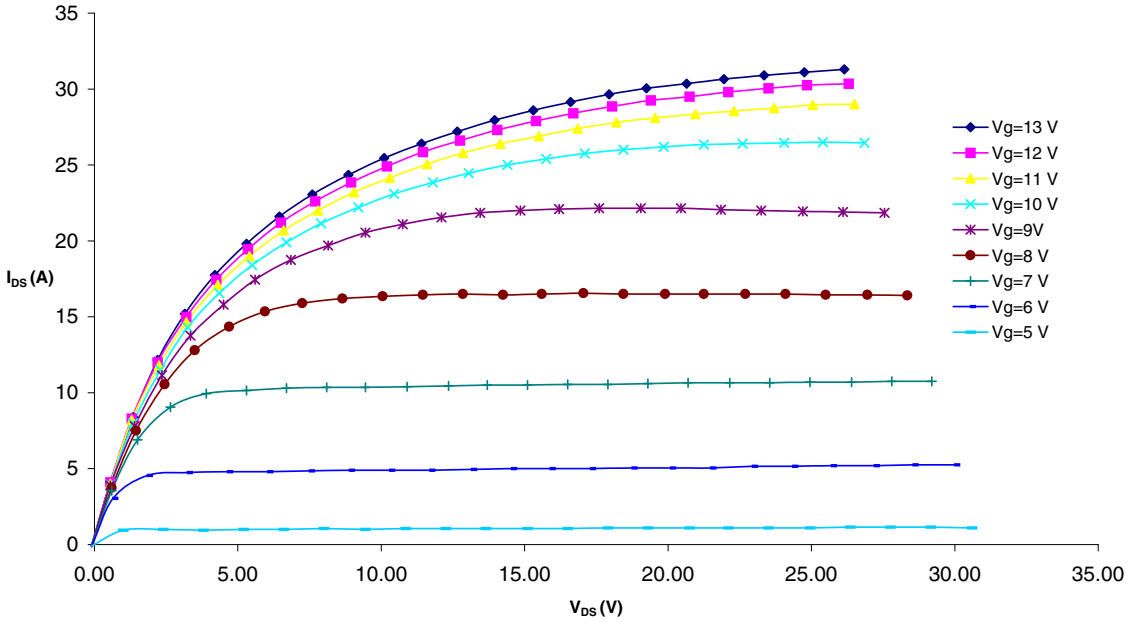

Figure 4 – Typical IV Characteristics.

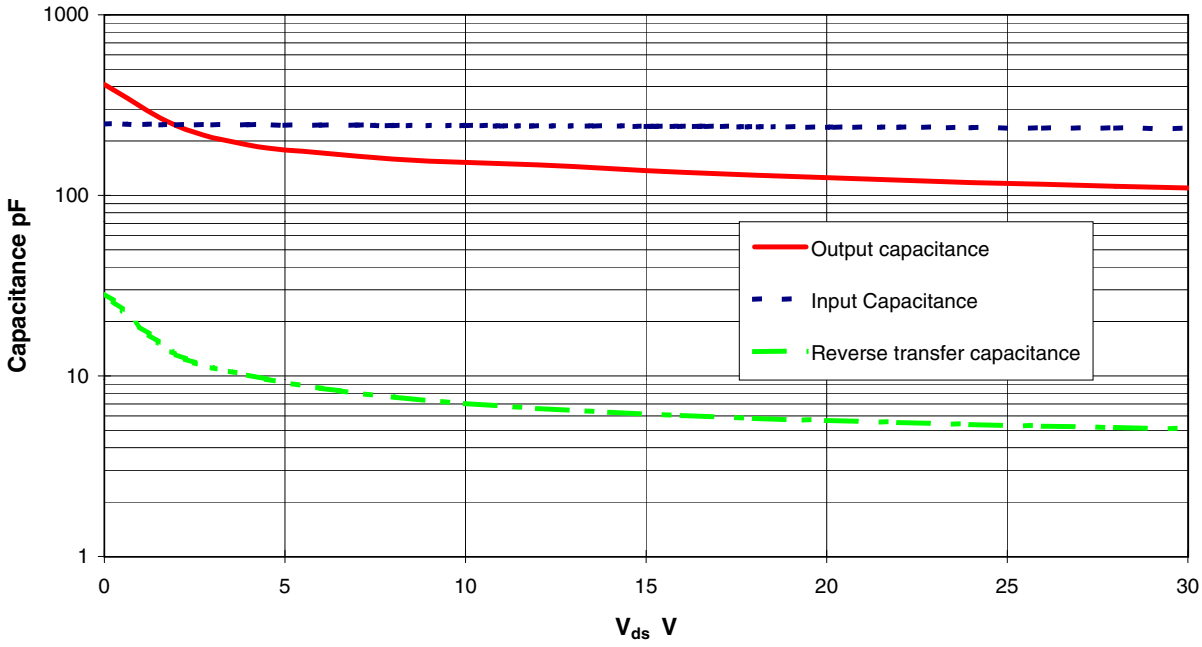

Figure 5 – Typical CV Characteristics.

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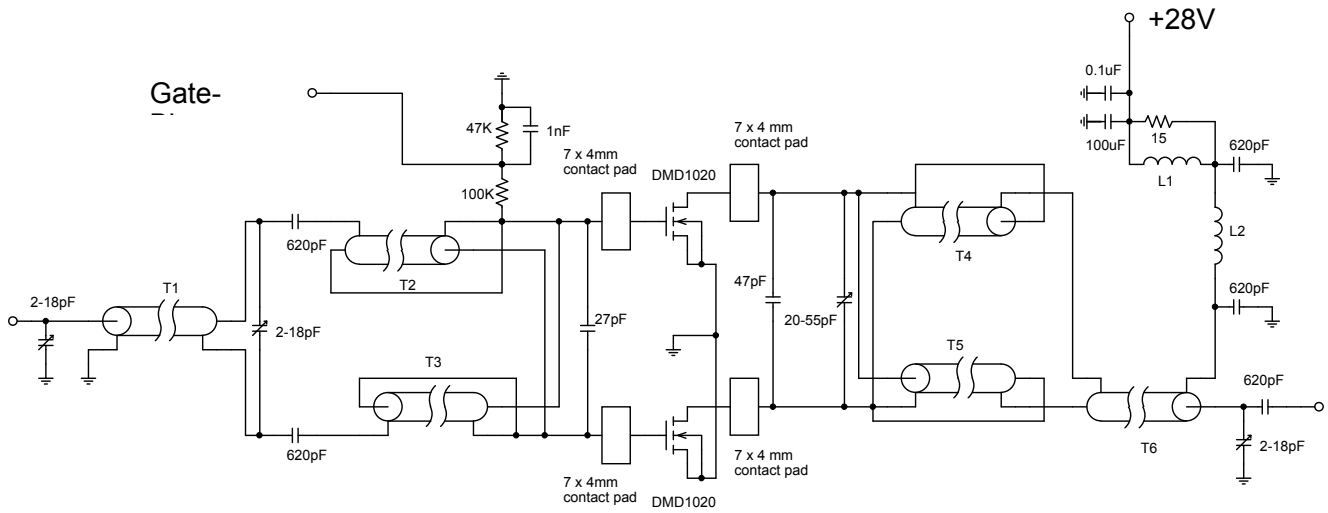

400MHz TEST FIXTURE

T1	11cm 50 Ohm UT47 semi-rigid coax
T2,3,4,5	8.9cm 18 Ohm UT62-18 semi-rigid coax
T6	9.4cm 50 Ohm UT85 semi-rigid coax
L1	5.5 turns 18swg enamelled copper wire on Fair-Rite FT50B-43 ferrite core
L2	6 turns 18swg enamelled copper wire, 3.5mm internal diameter

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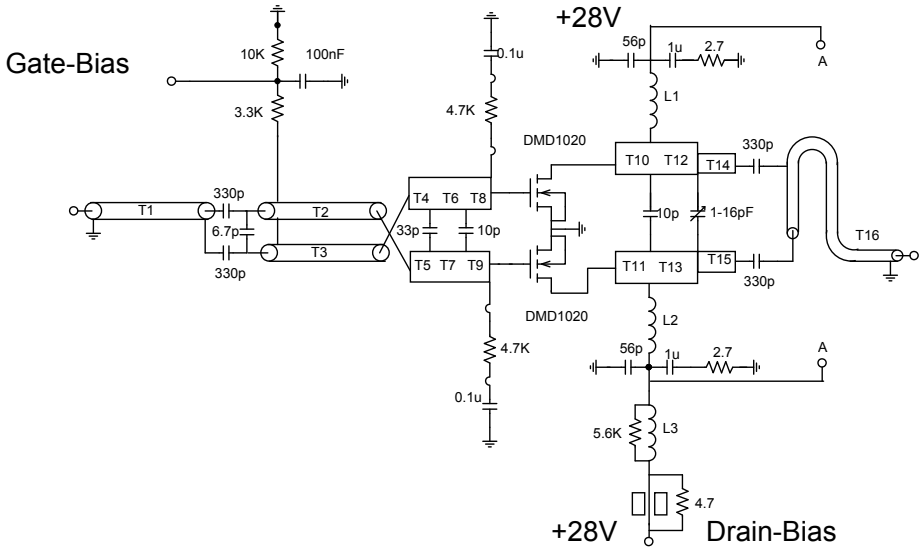

500MHz TEST FIXTURE

Substrate 0.78mm, Er=3.3

All microstrip lines W=10mm unless otherwise stated

T1 70mm 50 Ohm Coaxial cable

T2,T3 50mm 25 Ohm Coaxial cable

T4, T5 L=3.8mm

T6, T7 L=10.6mm

T8, T9 L=5.6mm

T10, T11, T12,13 L=14mm

T14 7mm wide 6mm long

T15 7mm wide 6mm long

T16 80mm 50 Ohm Coaxial Cable

L1 = L2 3 turns 1mm diameter enamelled copper wire, 5mm i.d.

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