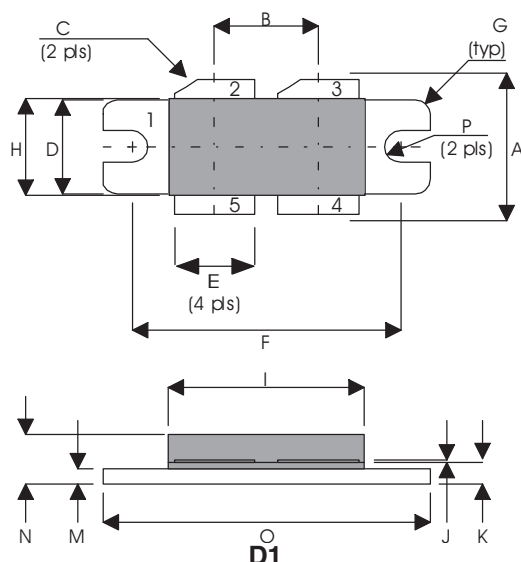


DMD1020

DMD1020-A

METAL GATE RF SILICON FET

MECHANICAL DATA



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 C_{rss}
- 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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Document Number 6984
Issue 1

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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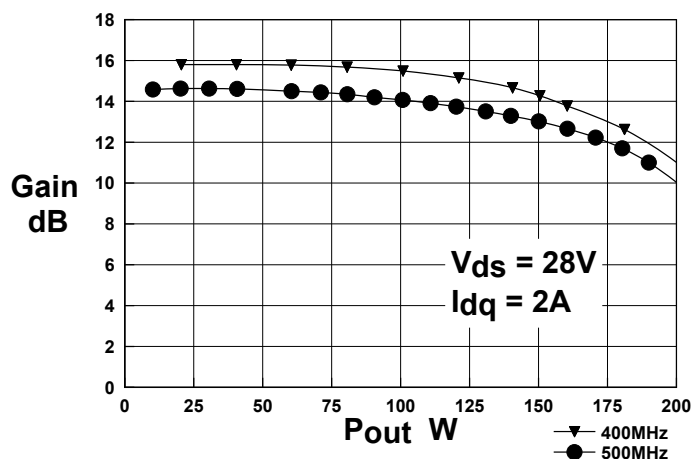


Figure 1- Gain vs. Power Output

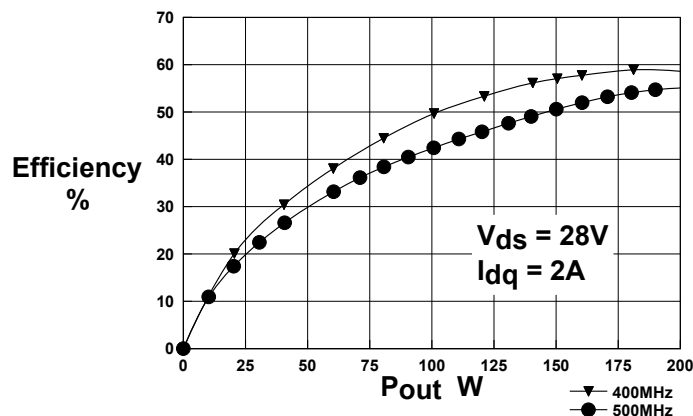


Figure 2 - Efficiency vs. Power Output

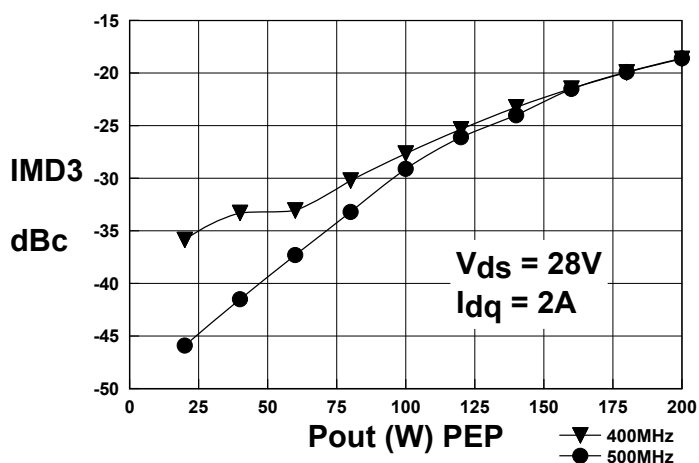


Figure 3 - IMD vs. Power Output

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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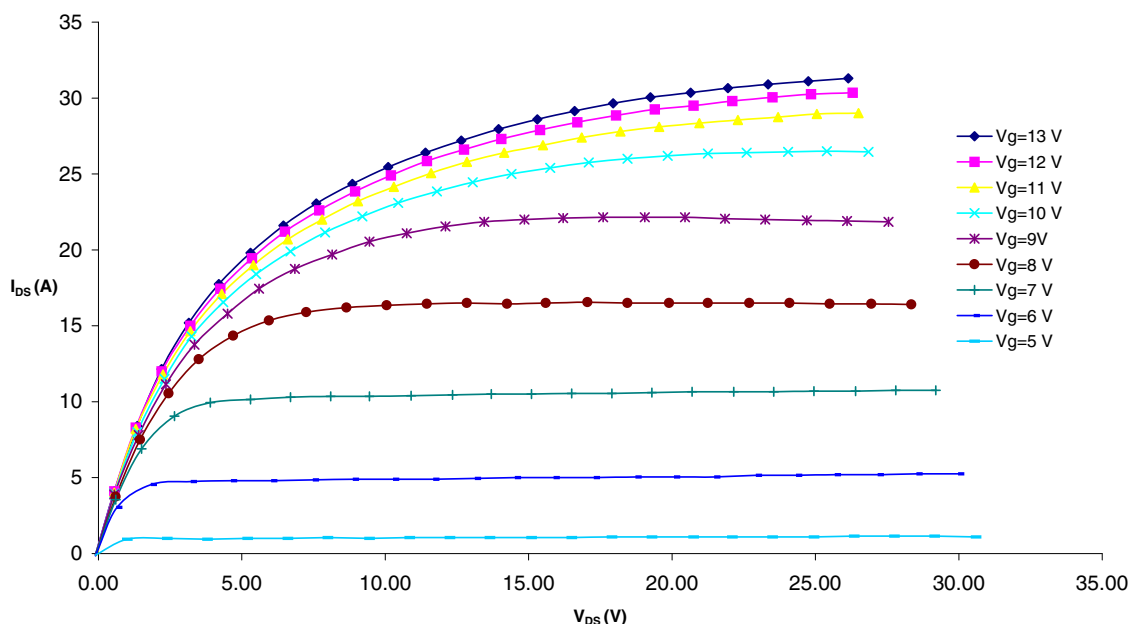


Figure 4 – Typical IV Characteristics.

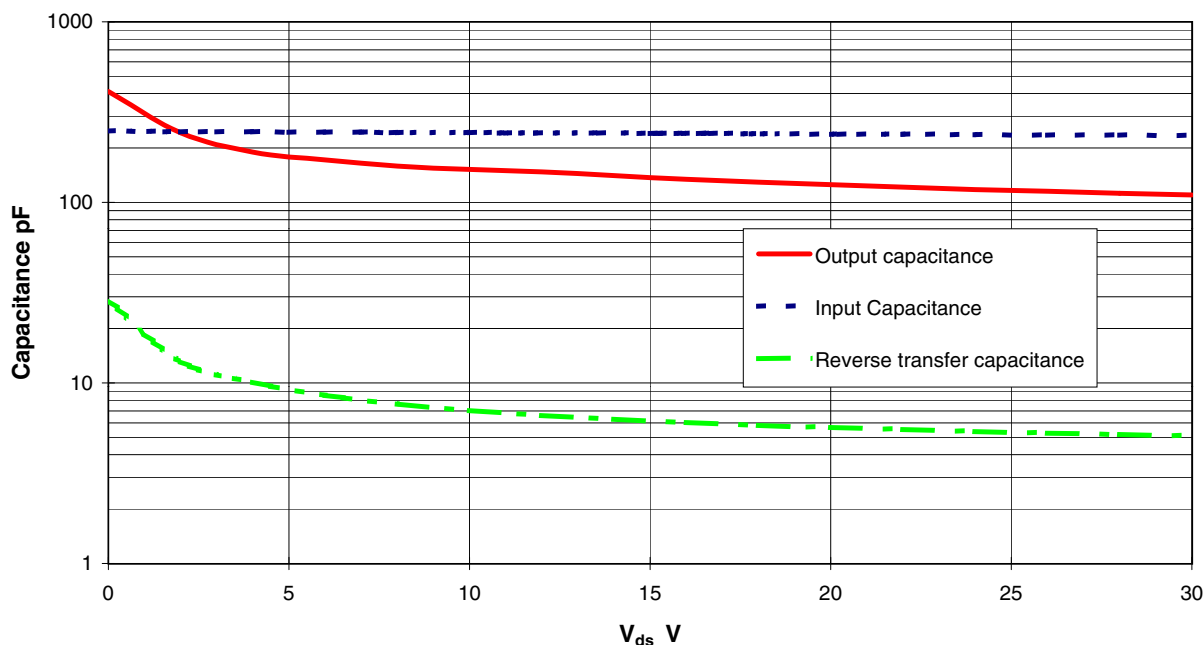
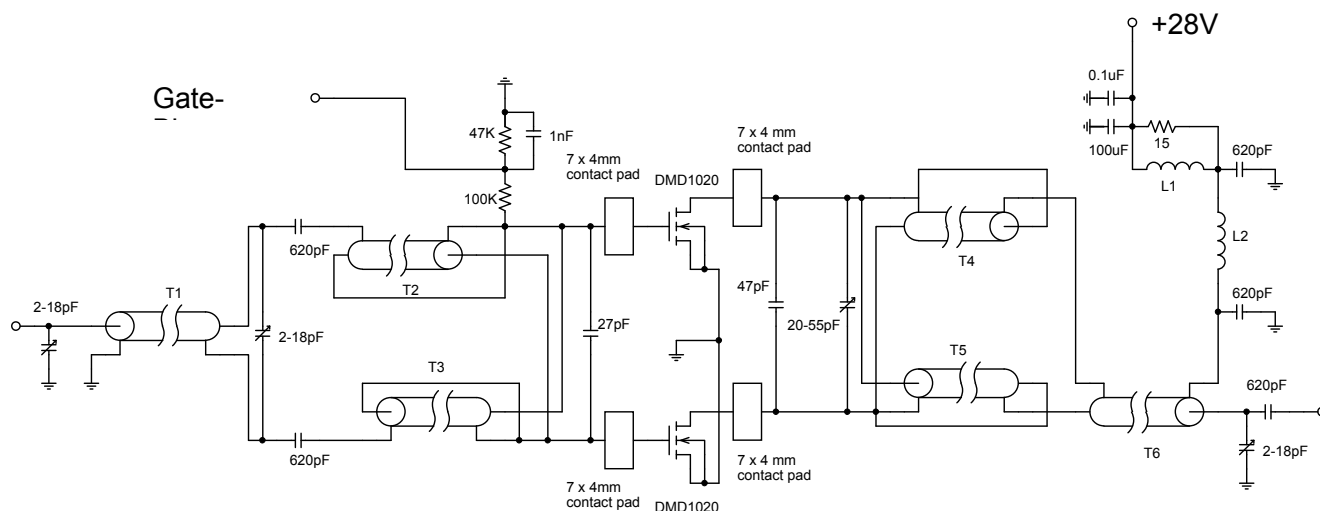


Figure 5 – Typical CV Characteristics.

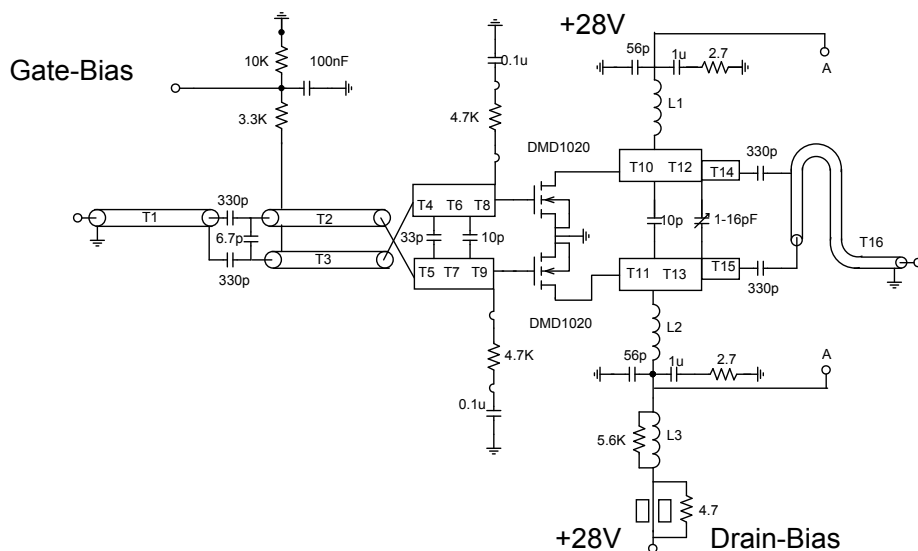
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400MHz TEST FIXTURE

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	T14 7mm wide 6mm long
T2,T3 50mm 25 Ohm Coaxial cable	T15 7mm wide 6mm long
T4, T5 L=3.8mm	T16 80mm 50 Ohm Coaxial Cable
T6, T7 L=10.6mm	
T8, T9 L=5.6mm	
T10, T11, T12,13 L=14mm	
L1 = L2 3 turns 1mm diameter enamelled copper wire, 5mm i.d.	

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