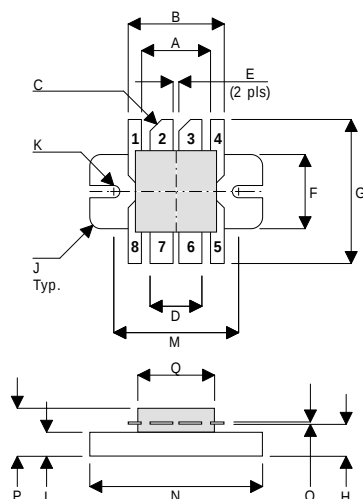


MECHANICAL DATA



DD

PIN 1	SOURCE (COMMON)	PIN 2	DRAIN 1
PIN 3	DRAIN 2	PIN 4	SOURCE (COMMON)
PIN 5	SOURCE (COMMON)	PIN 6	GATE 2
PIN 7	GATE 1	PIN 8	SOURCE (COMMON)

DIM	mm	Tol.	Inches	Tol.
A	9.14	0.13	0.360	0.005
B	12.70	0.13	0.500	0.005
C	45°	5°	45°	5°
D	6.86	0.13	0.270	0.005
E	0.76	0.13	0.030	0.005
F	9.78	0.13	0.385	0.005
G	19.05	0.25	0.750	0.010
H	4.19	0.13	0.165	0.005
I	3.17	0.13	0.125	0.005
J	1.52R	0.13	0.060R	0.005
K	1.65R	0.13	0.065R	0.005
M	16.51	0.13	0.650	0.005
N	22.86	0.13	0.900	0.005
O	0.13	0.02	0.005	0.001
P	6.35	0.64	0.250	0.025
Q	10.77	0.13	0.424	0.005

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

P_D	Power Dissipation	250W
BV_{DSS}	Drain – Source Breakdown Voltage *	70V
BV_{GSS}	Gate – Source Breakdown Voltage *	$\pm 20V$
$I_{D(sat)}$	Drain Current *	15A
T_{stg}	Storage Temperature	-65 to $150^{\circ}C$
T_j	Maximum Operating Junction Temperature	$200^{\circ}C$

* Per Side

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Document Number 3198

Issue 2

GOLD METALLISED MULTI-PURPOSE SILICON DMOS RF FET 100W – 28V – 500MHz PUSH-PULL

FEATURES

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

APPLICATIONS

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

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

Parameter	Test Conditions	Min.	Typ.	Max.	Unit
PER SIDE					
B _V DSS Drain–Source Breakdown Voltage	V _{GS} = 0 I _D = 100mA	70			V
I _D SS Zero Gate Voltage Drain Current	V _{DS} = 28V V _{GS} = 0			3	mA
I _G SS 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 = 3A	2.4			S
TOTAL DEVICE					
G _{PS} Common Source Power Gain	P _O = 100W	10			dB
η Drain Efficiency	V _{DS} = 28V I _{DQ} = 1.2A	50			%
VSWR Load Mismatch Tolerance	f = 500MHz	20:1			—
PER SIDE					
C _{iss} Input Capacitance	V _{DS} = 28V V _{GS} = –5V f = 1MHz			180	pF
C _{oss} Output Capacitance	V _{DS} = 28V V _{GS} = 0 f = 1MHz			90	pF
C _{rss} Reverse Transfer Capacitance	V _{DS} = 28V V _{GS} = 0 f = 1MHz			7.5	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 _{THj-case}	Thermal Resistance Junction – Case	Max. 0.7°C / W
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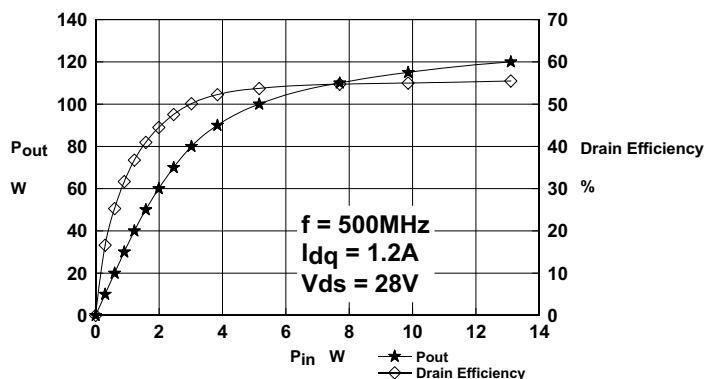


Figure 1

Power Output and Efficiency vs Input Power

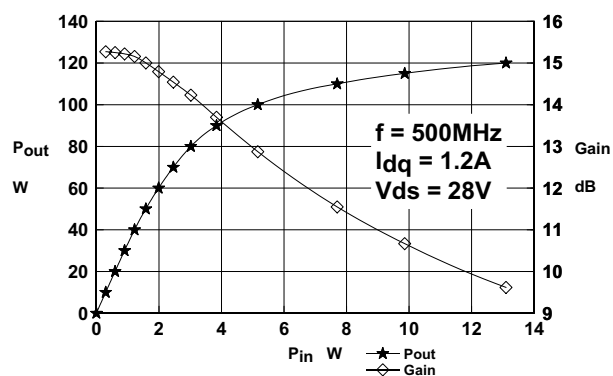


Figure 2

Power Output and Gain vs Input Power

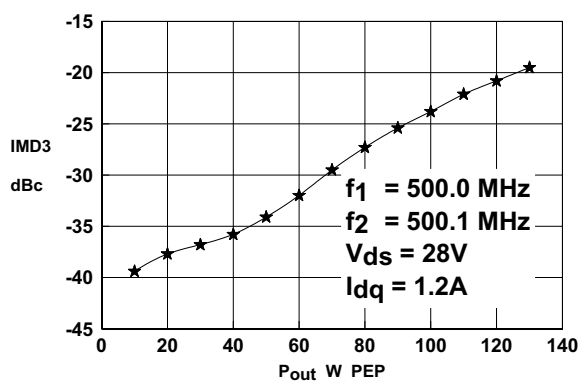


Figure 3

IMD vs. Output Power

OPTIMUM SOURCE AND LOAD IMPEDANCE

Frequency MHz	Z_S Ω	Z_L Ω
500	$2.0 - j2.2$	$2.6 - j0.6$

N.B. Impedances measured terminal to terminal

Typical S Parameters

! Vds=28V, Idq=0.3A
MHZ S MA R 50

!Freq	S11		S21		S12		S22	
!MHz	mag	ang	mag	ang	mag	ang	mag	ang
100	0.86	-157.3	5.98	55.7	0.01	20.3	0.73	-139.7
150	0.9	-163.2	3.22	43.1	0.01	78	0.82	-149.7
200	0.93	-167.9	1.98	36.9	0.02	98.2	0.88	-156.3
250	0.95	-170.4	1.39	31	0.03	101	0.91	-160.2
300	0.95	-172.7	1.1	29.6	0.05	103.7	0.93	-163.6
350	0.96	-174.5	0.82	23.9	0.06	99.9	0.94	-166.1
400	0.96	-176.2	0.69	23.9	0.08	100.2	0.95	-168.1
450	0.97	-177.5	0.55	22.1	0.09	98.3	0.96	-170.1
500	0.97	-179.4	0.51	21	0.11	95.6	0.97	-171.6
550	0.97	179.8	0.43	19.1	0.13	90.8	0.97	-173.3
600	0.96	178.8	0.4	15.1	0.15	82	0.97	-174.5
650	0.98	177.5	0.35	15.8	0.17	83.5	0.98	-175.7
700	0.99	175.4	0.31	11	0.19	76.8	1	-178.4
750	0.99	173	0.27	14.2	0.21	75.1	1.01	178.8
800	1	170.5	0.24	16.6	0.22	71.5	1	176.1
850	0.99	168.1	0.24	22.7	0.25	72.6	0.99	173.3
900	1	166.1	0.24	23.7	0.3	68.8	0.99	170.6
950	1	163.9	0.25	23.2	0.34	62.7	0.97	167.7
1000	0.99	161.6	0.25	21.7	0.37	56.4	0.96	166.1

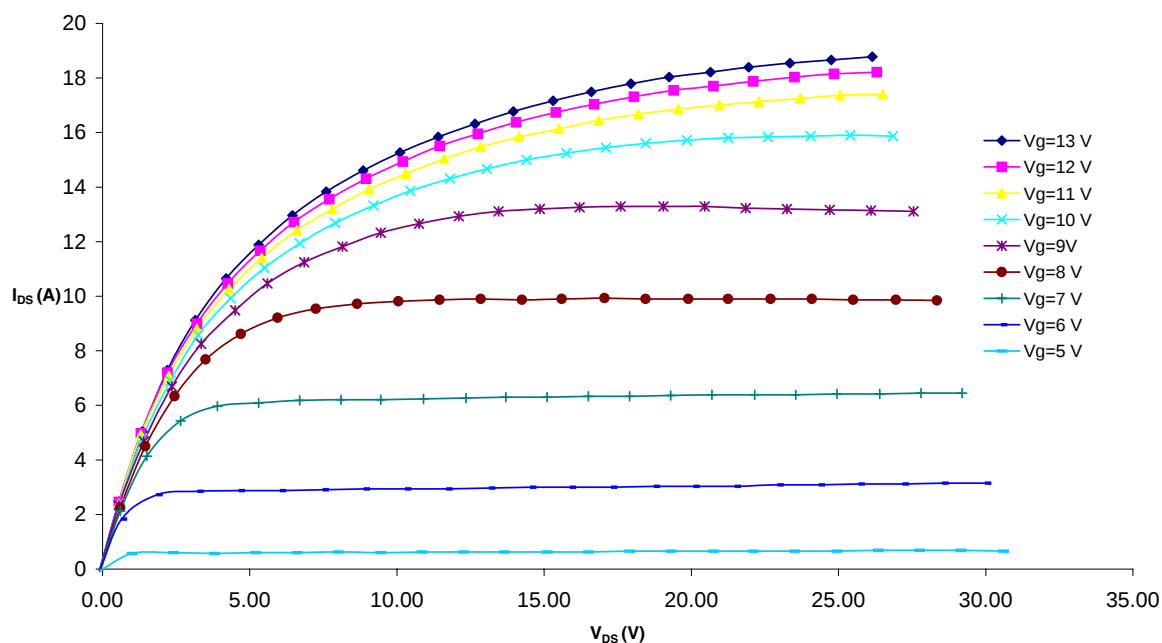


Figure 4 – Typical IV Characteristics.

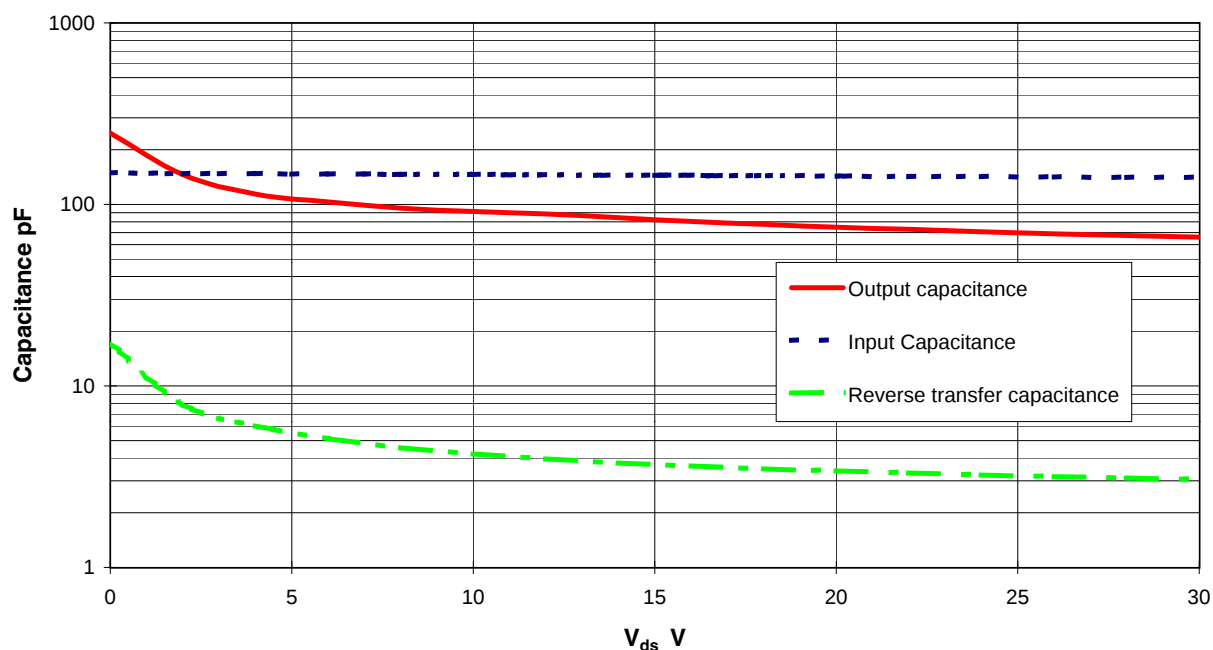
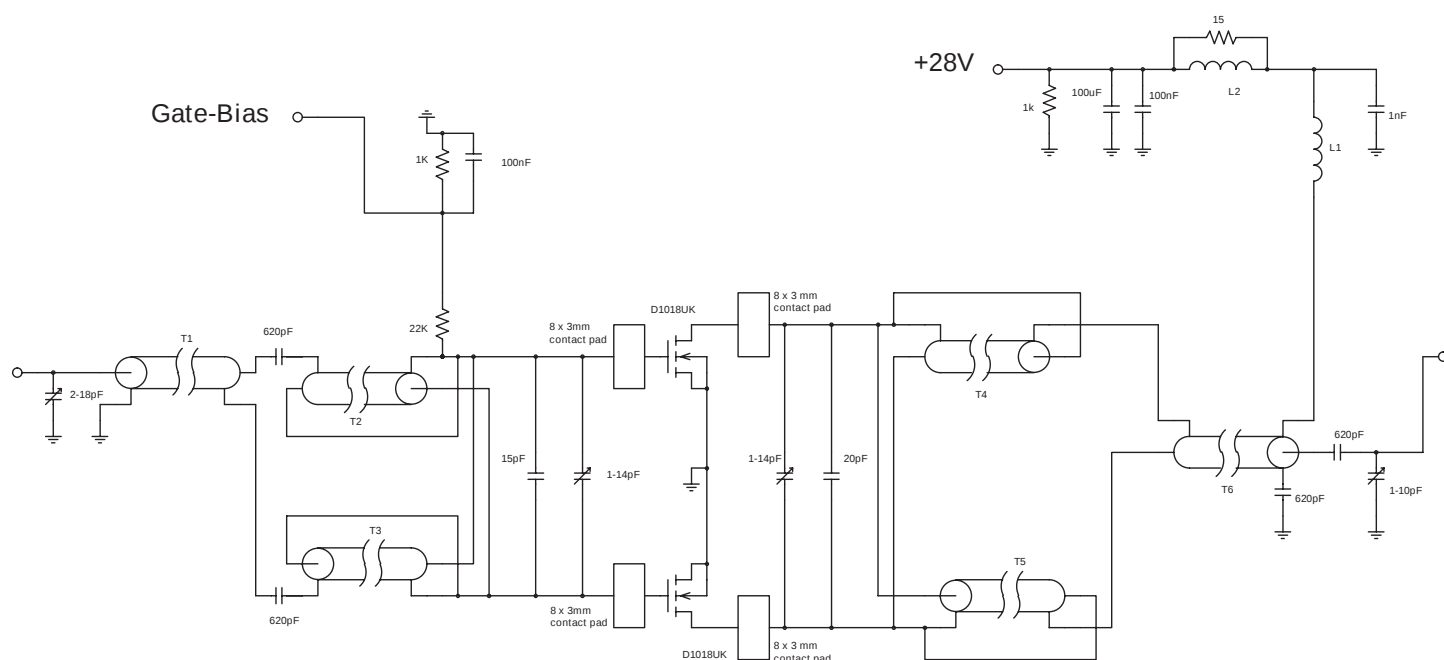


Figure 5 – Typical CV Characteristics.

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500MHz TEST FIXTURE

T1,6 65mm 50ohm UT85 semi-rigid coax

T2,3,4,5 75mm 15 ohm UT85-15 semi-rigid coax

L1 6 turns 21 swg enamelled copper wire, 3mm id.

L2 8.5 turns 19swg enamelled copper wire on Fair-Rite FT82-43 core

T6 Placed through Ferronics 12-360-K ferrite bead