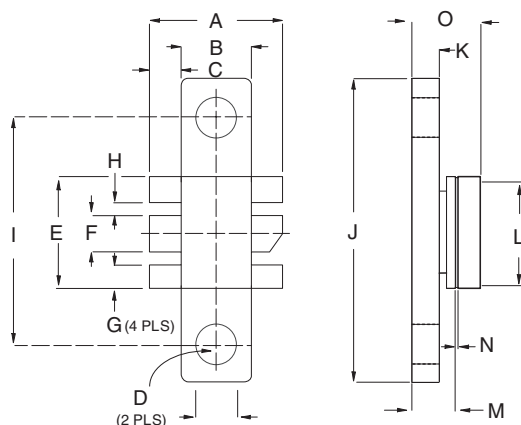


MECHANICAL DATA



SOT 171

PIN 1	SOURCE	PIN 2	SOURCE
PIN 3	GATE	PIN 4	DRAIN
PIN 5	SOURCE	PIN 6	SOURCE

DIM	mm	Tol.	Inches	Tol.
A	10.92	0.25	0.430	0.001
B	5.84	0.08	0.230	0.003
C	2.54	0.08	0.100	0.003
D	3.30 dia	0.13	0.130 dia	0.05
E	9.14	0.08	0.360	0.003
F	3.05	0.08	0.120	0.003
G	2.01	0.08	0.079	0.003
H	1.04	0.08	0.041	0.003
I	18.42	0.08	0.725	0.003
J	24.77	0.08	0.975	0.003
K	2.74	0.08	0.108	0.003
L	9.14	0.13	0.360	0.005
M	4.19	0.08	0.165	0.003
N	0.13	0.05	0.005	0.002
O	7.11	MAX	0.280	MAX

GOLD METALLISED MULTI-PURPOSE SILICON DMOS RF FET 10W – 28V – 500MHz SINGLE ENDED

FEATURES

- SIMPLIFIED AMPLIFIER DESIGN
- SUITABLE FOR BROAD BAND

APPLICATIONS

- VERY LOW C_{rss}
- SIMPLE BIAS CIRCUITS
- LOW NOISE
- HIGH GAIN – 13 dB MINIMUM

APPLICATIONS

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

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

P_D	Power Dissipation	42W
BV_{DSS}	Drain – Source Breakdown Voltage *	65V
BV_{GSS}	Gate – Source Breakdown Voltage *	$\pm 20V$
$I_{D(sat)}$	Drain Current *	4A
T_{stg}	Storage Temperature	-65 to $150^{\circ}C$
T_j	Maximum Operating Junction Temperature	$200^{\circ}C$

* Per Side

Semelab Plc reserves the right to change test conditions, parameter limits and package dimensions without notice. Information furnished by Semelab is believed to be both accurate and reliable at the time of going to press. However Semelab assumes no responsibility for any errors or omissions discovered in its use. Semelab encourages customers to verify that datasheets are current before placing orders.

ELECTRICAL CHARACTERISTICS ($T_{case} = 25^{\circ}\text{C}$ unless otherwise stated)

Parameter	Test Conditions	Min.	Typ.	Max.	Unit
BV_{DSS} Drain–Source Breakdown Voltage	$V_{GS} = 0$ $I_D = 10\text{mA}$	65			V
I_{DSS} Zero Gate Voltage Drain Current	$V_{DS} = 28\text{V}$ $V_{GS} = 0$			1	mA
I_{GSS} Gate Leakage Current	$V_{GS} = 20\text{V}$ $V_{DS} = 0$			4	μA
$V_{GS(th)}$ Gate Threshold Voltage *	$I_D = 10\text{mA}$ $V_{DS} = V_{GS}$	1		7	V
g_{fs} Forward Transconductance *	$V_{DS} = 10\text{V}$ $I_D = 0.8\text{A}$	0.72			S
G_{PS} Common Source Power Gain	$P_O = 10\text{W}$	13			dB
η Drain Efficiency	$V_{DS} = 28\text{V}$ $I_{DQ} = 0.4\text{A}$	40			%
VSWR Load Mismatch Tolerance	$f = 500\text{MHz}$	20:1			—
C_{iss} Input Capacitance	$V_{DS} = 0$ $V_{GS} = -5\text{V}$ $f = 1\text{MHz}$			48	pF
C_{oss} Output Capacitance	$V_{DS} = 28\text{V}$ $V_{GS} = 0$ $f = 1\text{MHz}$			24	pF
C_{rss} Reverse Transfer Capacitance	$V_{DS} = 28\text{V}$ $V_{GS} = 0$ $f = 1\text{MHz}$			2	pF

* Pulse Test: Pulse Duration = 300 μs , Duty Cycle $\leq 2\%$

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. 4.2°C / W
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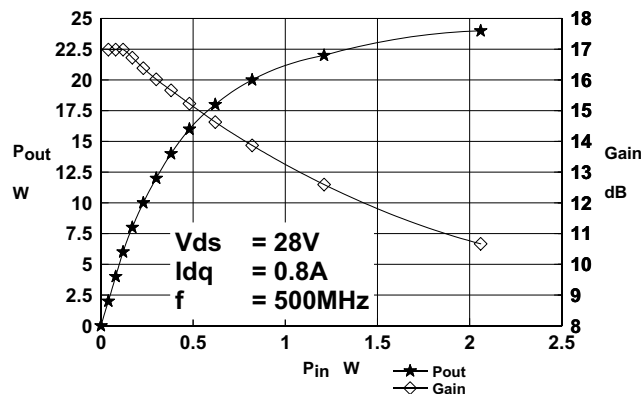


Figure 1 Output Power and Gain vs. Input Power

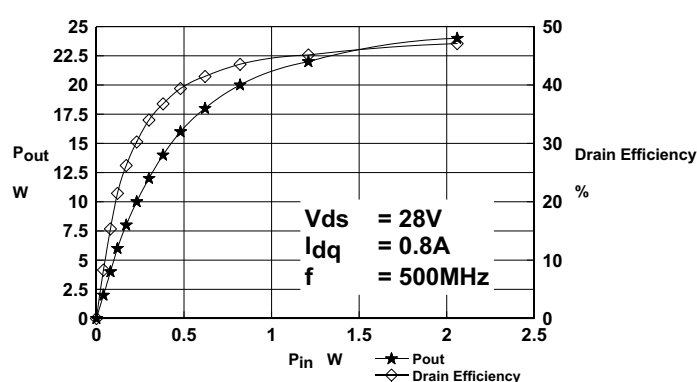


Figure 2 Output Power and Efficiency vs. Input Power

D1093UK 10W / 28V OPTIMUM SOURCE AND LOAD IMPEDANCE

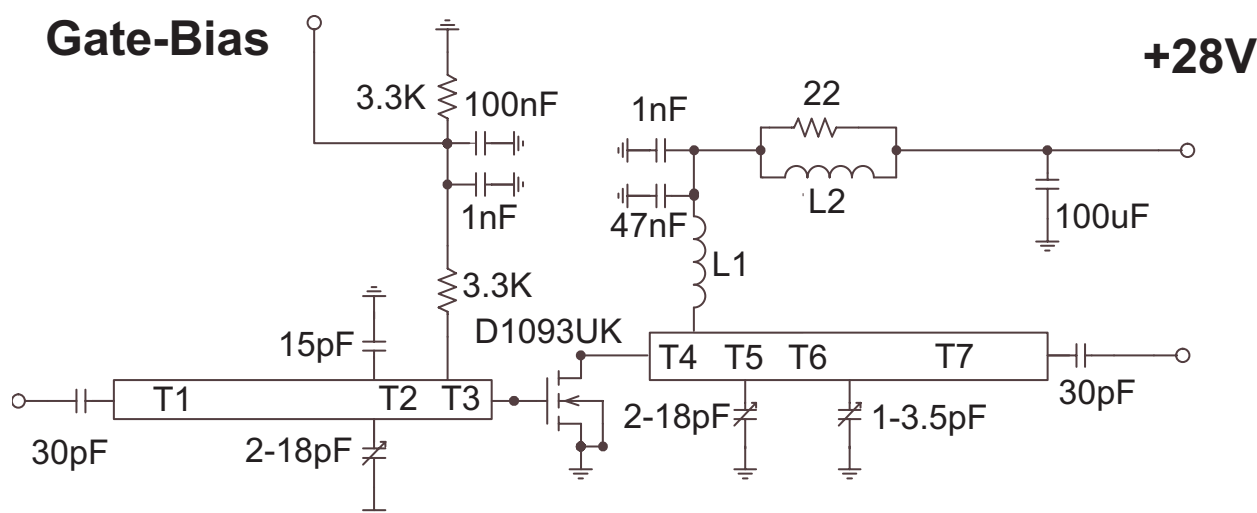
Frequency MHz	ZS Ω	ZL Ω
500MHz	1.9+j4.3	15.9+j1.0

Typical S Parameters

! Vds=28V Idq=0.4A
MHz S MA R 50

!Freq !MHz	S11 mag ang	S21 mag ang	S12 mag ang	S22 mag ang
100	0.82 -131.3	16.6 98	0.028 5.8	0.54 -102.6
150	0.81 -145.6	11.3 79.3	0.027 -7	0.55 -115.3
200	0.83 -153.1	8.12 68.2	0.025 -15.1	0.59 -123.5
250	0.84 -158.2	6.24 59	0.022 -22.4	0.63 -130.6
300	0.85 -161.4	5.05 52.4	0.021 -24.9	0.68 -135.8
350	0.87 -165.1	3.86 41.5	0.017 -31	0.72 -140.7
400	0.89 -167.6	3.26 39	0.015 -33.4	0.75 -145.2
450	0.9 -169.6	2.68 32.4	0.012 -34.1	0.79 -148.3
500	0.91 -171.9	2.36 30.1	0.011 -31.6	0.81 -151.9
550	0.92 -173.6	2.01 23.4	0.009 -28.8	0.84 -154.5
600	0.92 -175.1	1.8 17.5	0.007 -26.7	0.86 -157.3
650	0.93 -176.6	1.46 13.1	0.005 -14.6	0.88 -159.5
700	0.94 -178.1	1.3 8.8	0.005 5.5	0.89 -161.9
750	0.94 -179.8	1.06 5.5	0.005 33.2	0.91 -164.2
800	0.95 178.7	0.87 4	0.005 49.5	0.92 -166.5
850	0.96 177.3	0.78 7.1	0.007 60.5	0.92 -168.1
900	0.96 175.7	0.72 5.2	0.008 64.5	0.93 -169.6
950	0.96 175.1	0.66 5.4	0.01 69.5	0.93 -170.2
1000	0.96 174	0.61 3.4	0.011 71.3	0.94 -172

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500 MHz Test Fixture

Substrate 1.6mm thick G200

All microstrip lines $W = 2.8 \text{ mm}$

T1 46.3mm

T2 2.2mm

T3 T4 8mm

T5 4.3mm

T6 11.7mm

T7 32.3mm

L1 7 turns 24 swg enamelled copper wire, 3mm i.d.

L2 1.5 turns 24 swg enamelled copper wire on ferrite core.