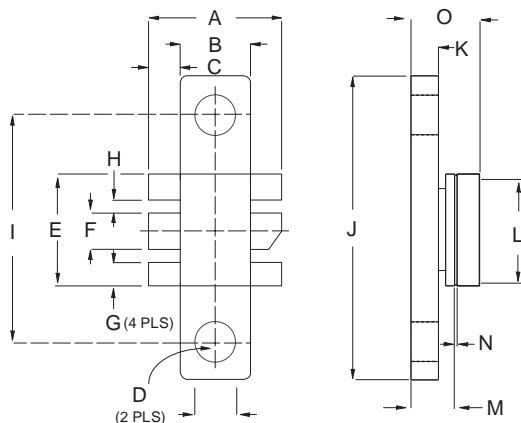


MECHANICAL DATA



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°C
$T_j$	Maximum Operating Junction Temperature	200°C

\* Per Side

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## ELECTRICAL CHARACTERISTICS (T<sub>case</sub> = 25°C unless otherwise stated)

Parameter	Test Conditions	Min.	Typ.	Max.	Unit
B <sub>V</sub> DSS Drain–Source Breakdown Voltage	V <sub>GS</sub> = 0      I <sub>D</sub> = 10mA	65			V
I <sub>D</sub> DSS Zero Gate Voltage Drain Current	V <sub>DS</sub> = 28V      V <sub>GS</sub> = 0			1	mA
I <sub>G</sub> DSS Gate Leakage Current	V <sub>GS</sub> = 20V      V <sub>DS</sub> = 0			4	μA
V <sub>GS(th)</sub> Gate Threshold Voltage *	I <sub>D</sub> = 10mA      V <sub>DS</sub> = V <sub>GS</sub>	1		7	V
g <sub>fs</sub> Forward Transconductance *	V <sub>DS</sub> = 10V      I <sub>D</sub> = 0.8A	0.72			S
G <sub>PS</sub> Common Source Power Gain	P <sub>O</sub> = 10W	13			dB
η Drain Efficiency	V <sub>DS</sub> = 28V      I <sub>DQ</sub> = 0.4A	40			%
VSWR Load Mismatch Tolerance	f = 500MHz	20:1			—
C <sub>iss</sub> Input Capacitance	V <sub>DS</sub> = 0      V <sub>GS</sub> = -5V      f = 1MHz			48	pF
C <sub>oss</sub> Output Capacitance	V <sub>DS</sub> = 28V      V <sub>GS</sub> = 0      f = 1MHz			24	pF
C <sub>rss</sub> Reverse Transfer Capacitance	V <sub>DS</sub> = 28V      V <sub>GS</sub> = 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 <sub>THj-case</sub>	Thermal Resistance Junction – Case	Max. 4.2°C / W
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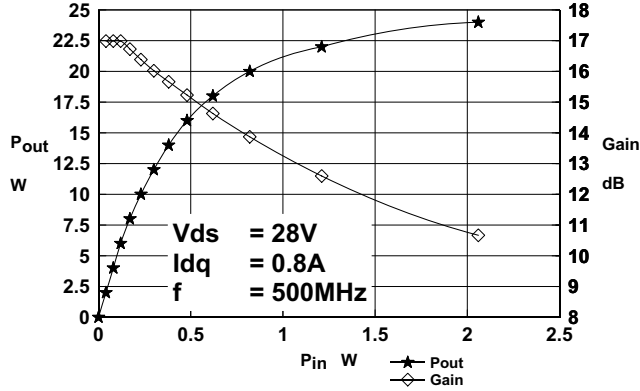


Figure 1 Output Power and Gain vs. Input Power

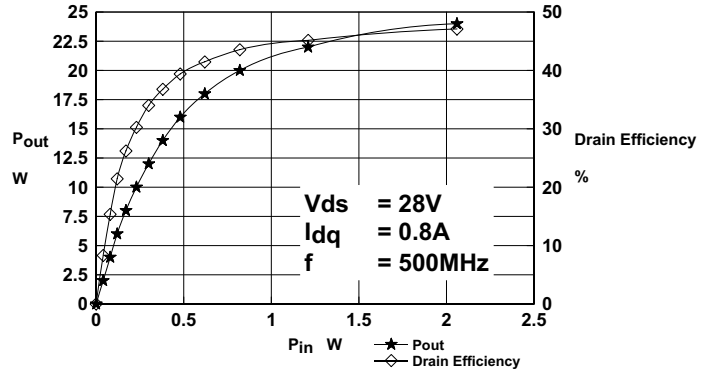


Figure 2 Output Power and Efficiency vs. Input Power

**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		S21		S12		S22	
	mag	ang	mag	ang	mag	ang	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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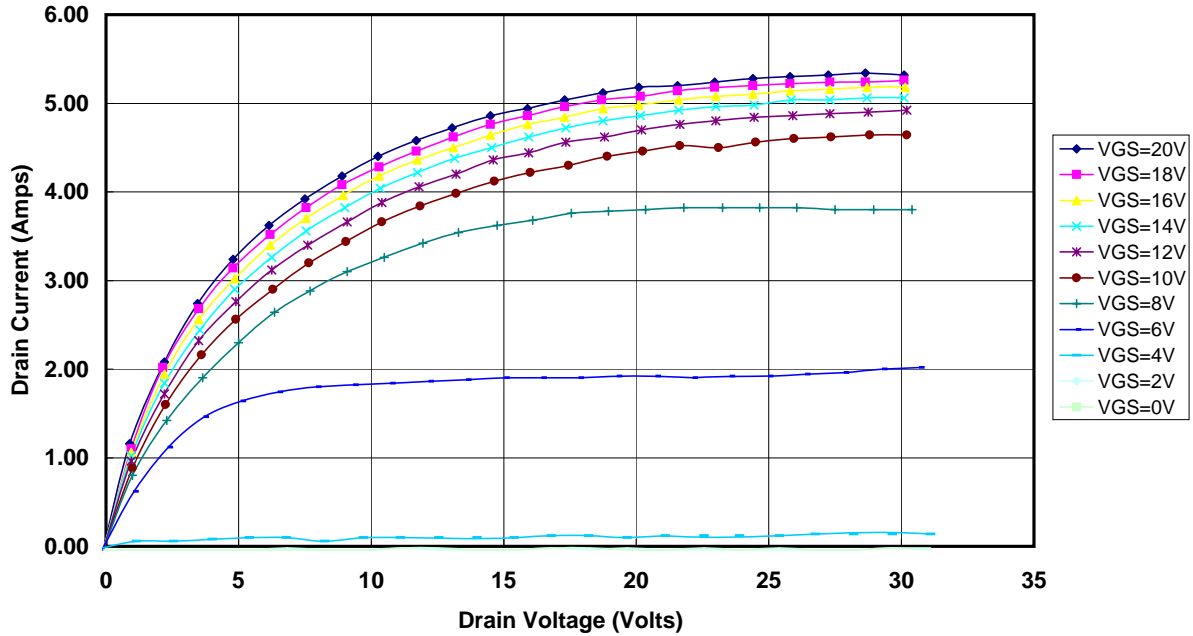


Figure 4 – Typical IV Characteristics.

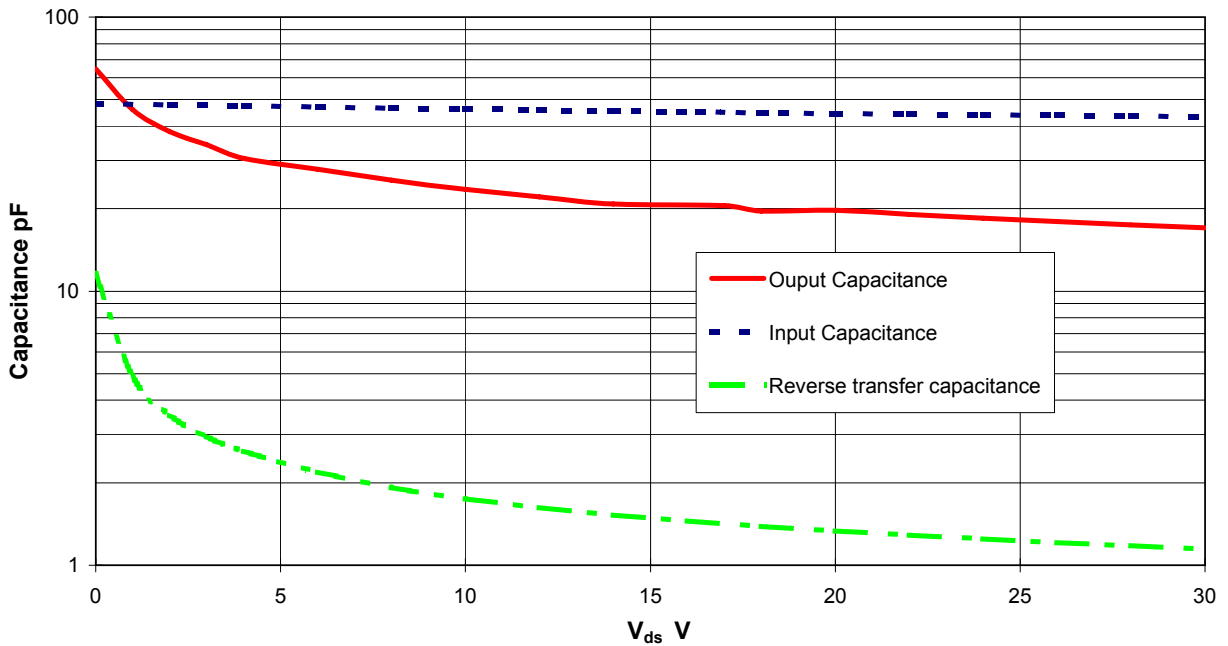
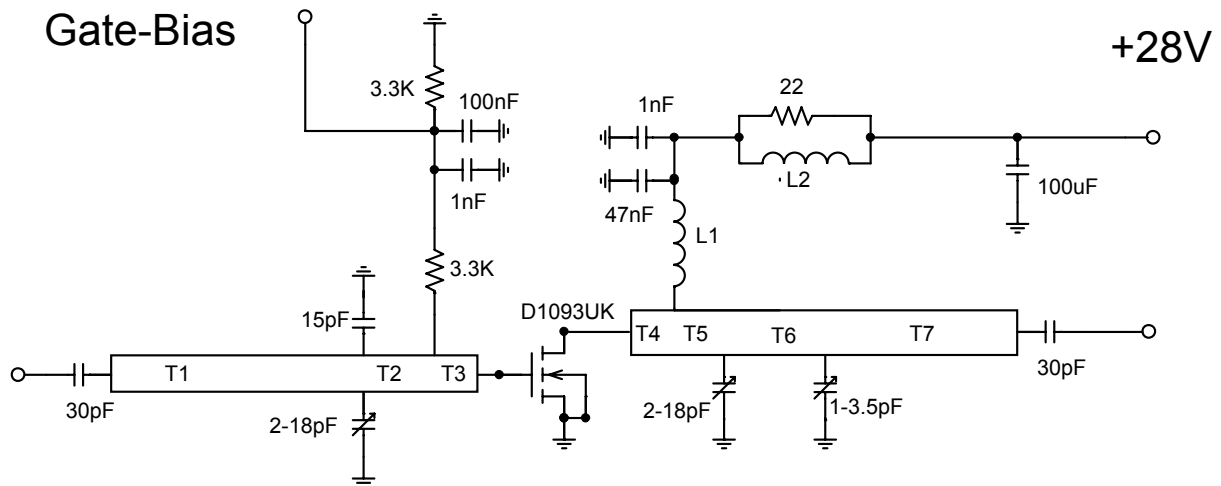


Figure 5 – Typical CV Characteristics.

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## 500 MHz Test Fixture

Substrate 1.6mm thick G200

All microstrip lines  $W = 2.8$  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.