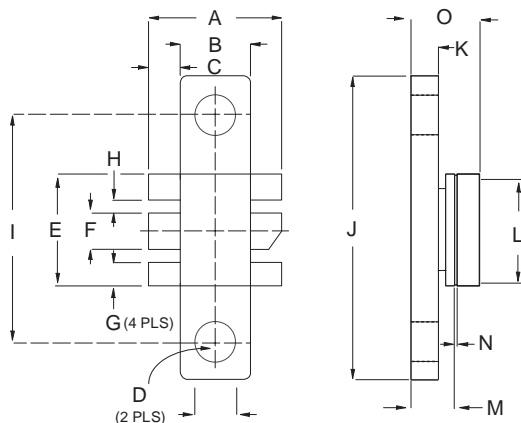


MECHANICAL DATA



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 *	±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

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°C unless otherwise stated)

Parameter	Test Conditions	Min.	Typ.	Max.	Unit
BV _{DSS} Drain-Source Breakdown Voltage	V _{GS} = 0 I _D = 10mA	65			V
I _{DSS} Zero Gate Voltage Drain Current	V _{DS} = 28V V _{GS} = 0			1	mA
I _{GSS} Gate Leakage Current	V _{GS} = 20V V _{DS} = 0			4	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 = 0.8A	0.72			S
G _{PS} Common Source Power Gain	P _O = 10W	13			dB
η Drain Efficiency	V _{DS} = 28V I _{DQ} = 0.4A	40			%
VSWR Load Mismatch Tolerance	f = 500MHz	20:1			—
C _{iss} Input Capacitance	V _{DS} = 0 V _{GS} = -5V f = 1MHz			48	pF
C _{oss} Output Capacitance	V _{DS} = 28V V _{GS} = 0 f = 1MHz			24	pF
C _{rss} Reverse Transfer Capacitance	V _{DS} = 28V V _{GS} = 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 _{THj-case}	Thermal Resistance Junction – Case	Max. 4.2°C / W
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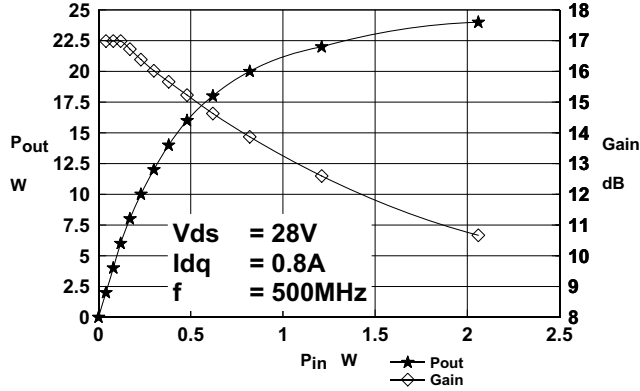


Figure 1 Output Power and Gain vs. Input Power

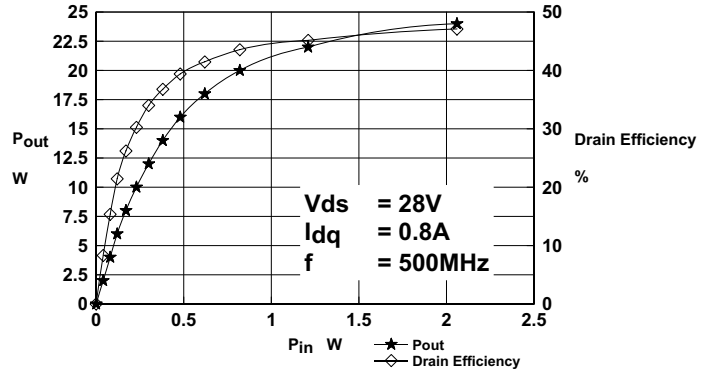


Figure 2 Output Power and Efficiency vs. Input Power

**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		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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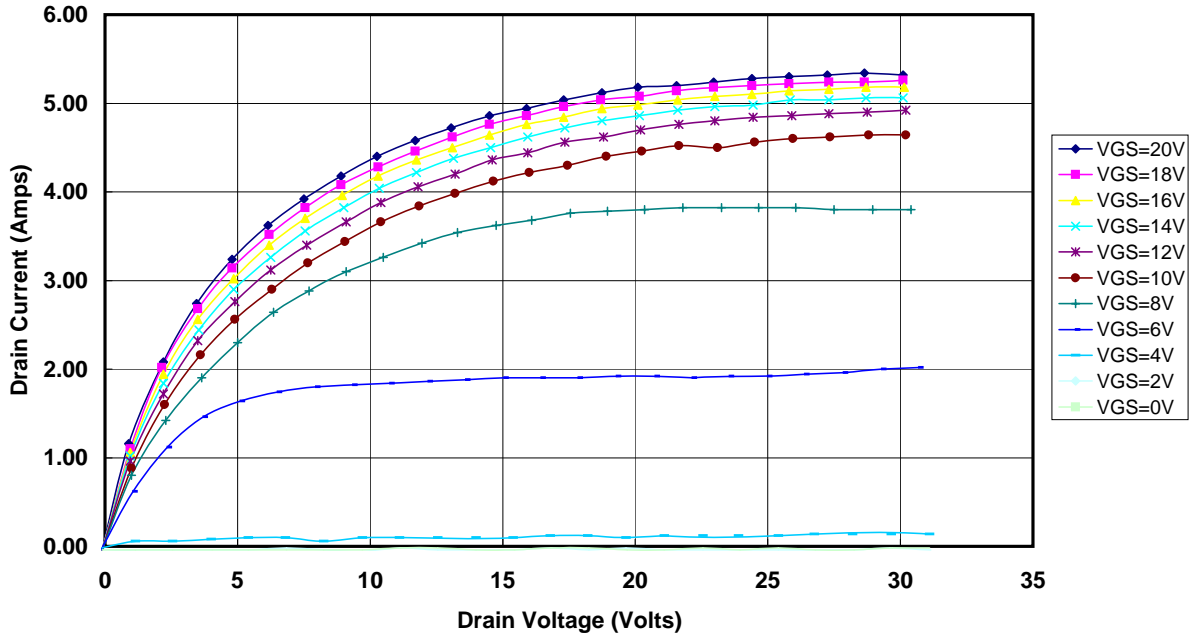


Figure 4 – Typical IV Characteristics.

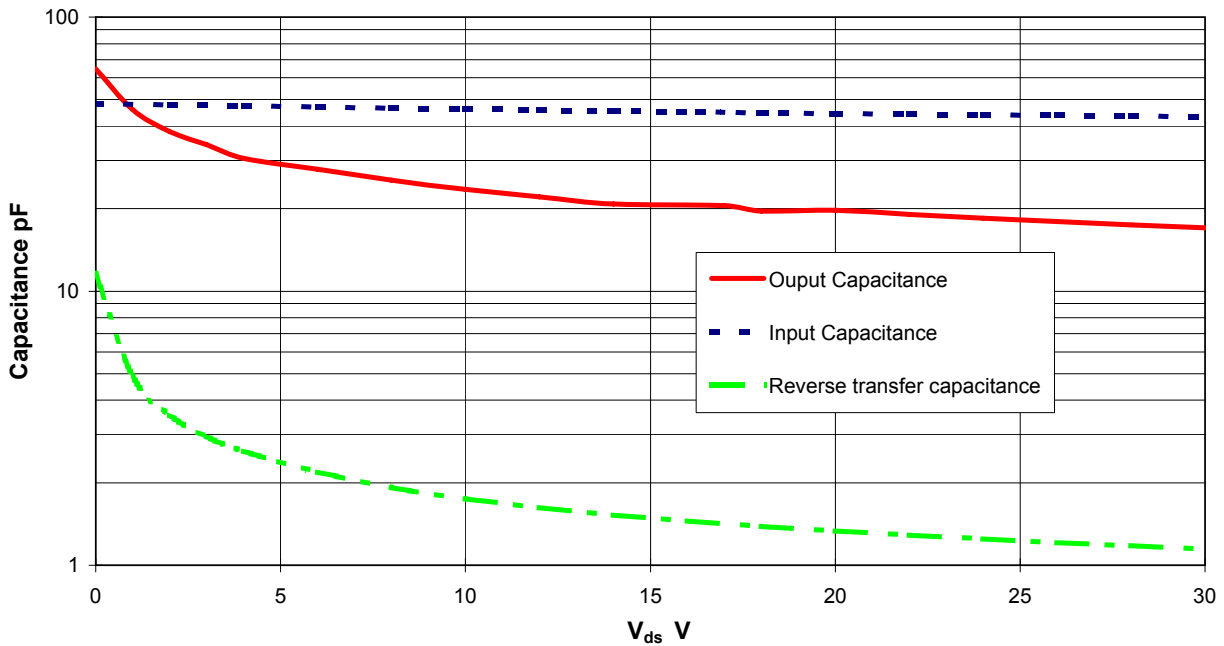
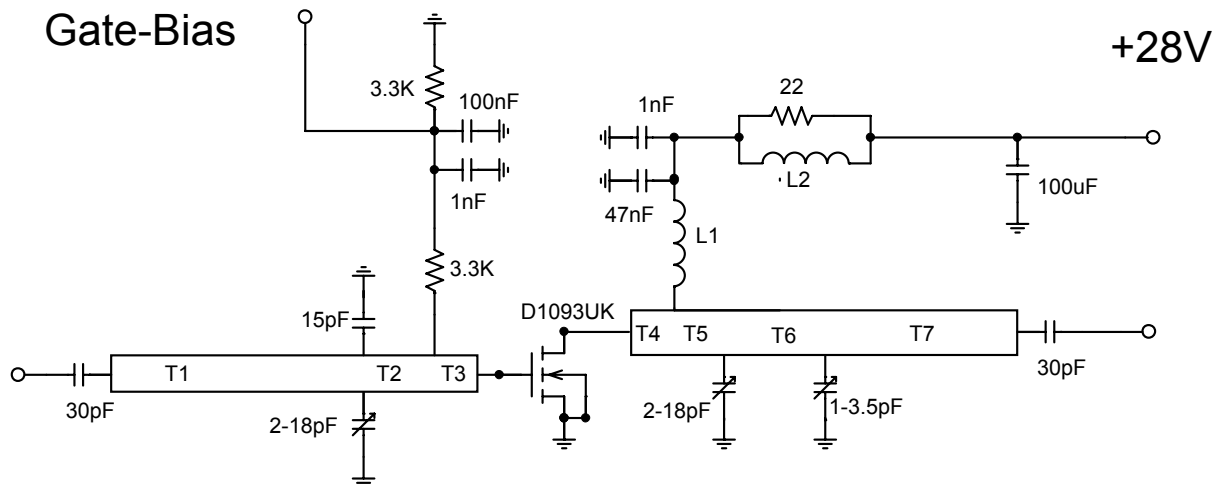


Figure 5 – Typical CV Characteristics.

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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.