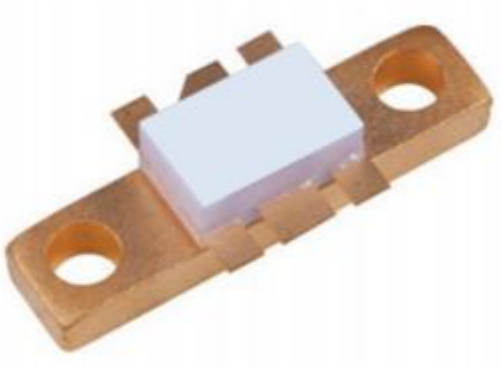
RF Silicon Mosfet

20W 500MHz 28V Single-Ended

D1094UK



Features:

- Simplified Amplifier Design
- Suitable for Broad Band Applications
- Low C_{rss}
- Simple Bias Circuits
- Low Noise
- High Gain – 11dB Minimum
- RoHS Compliant

Description:

Single-Ended RF Silicon Mosfet. 20W at 500MHz, 28V

Absolute Maximum Ratings (T_A = 25°C unless otherwise noted)

P_D	Power Dissipation	50W
BV_{DSS}	Drain – Source Breakdown Voltage	65V
BV_{GSS}	Gate – Source Breakdown Voltage	±20V
$I_{D\ (sat)}$	Drain Current	6A
T_{stg}	Storage Temperature	-65 to +150°C
T_j	Maximum Operating Junction Temperature	200°C

Thermal Properties

SYMBOL	PARAMETER	MAX	UNITS
$R_{\theta JC}$	Thermal Resistance, Junction to Case	3.5	°C/W

TT Electronics | Semelab Limited
Coventry Road, Lutterworth, Leicestershire, LE17 4JB, UK | Ph: +44 (0) 1455 556565
www.ttelectronics.com | Lutterworth.sales@ttelectronics.com

Electrical Specifications

Electrical Characteristics (T_A = 25° C unless otherwise noted)

SYMBOL	PARAMETER	TEST CONDITIONS	MIN	TYP	MAX	UNITS
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS} = 0V, I_D = 10mA	65			V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS} = 28V, V_{GS} = 0V			6	mA
I_{GSS}	Gate leakage Current	V_{GS} = 20V, V_{DS} = 0V			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 = 1.2A	1.08			S
G_{PS}	Common Source Power Gain	P_O = 20W V_{DS} = 28V, I_{DQ} = 0.6A f = 500MHz	11			dB
η	Drain Efficiency		40			%
VSWR(1)	Load Mismatch Tolerance		20:1			-
C_{iss}(1)	Input Capacitance	V_{DS} = 28V, V_{GS} = -5V f = 1MHz			72	pF
C_{oss}(1)	Output Capacitance	V_{DS} = 28V, V_{GS} = 0V f = 1MHz			36	pF
C_{rss}(1)	Reverse Transfer Capacitance	V_{DS} = 28V, V_{GS} = 0V f = 1MHz			3	pF

Notes:

(1) By design only, not a production test

HAZARDOUS MATERIAL WARNING

The ceramic portion of the device between leads and metal flange is beryllium oxide. Beryllium oxide dust us 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

Performance

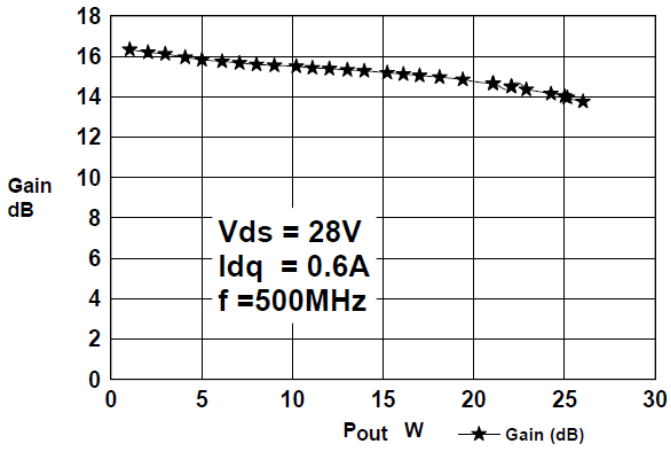


Figure 1- Gain vs. Power Output

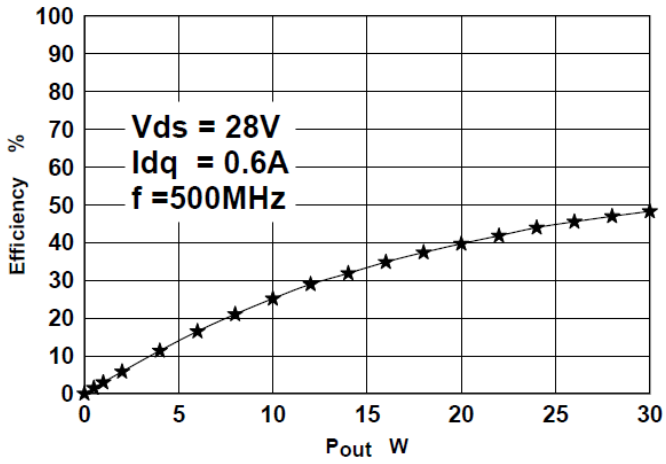


Figure 2 - Efficiency vs Power Output

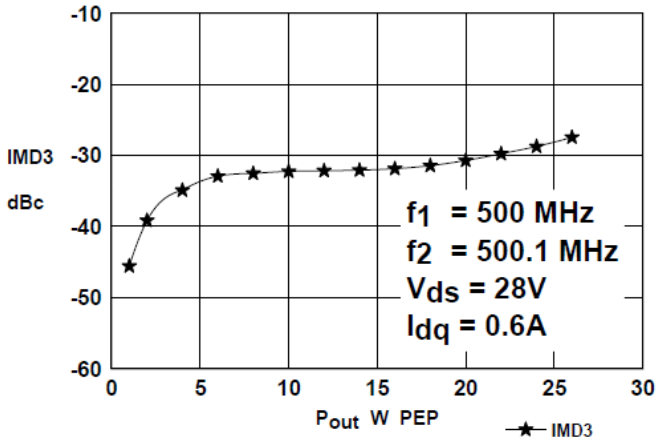


Figure 3 - IMD vs Power Output

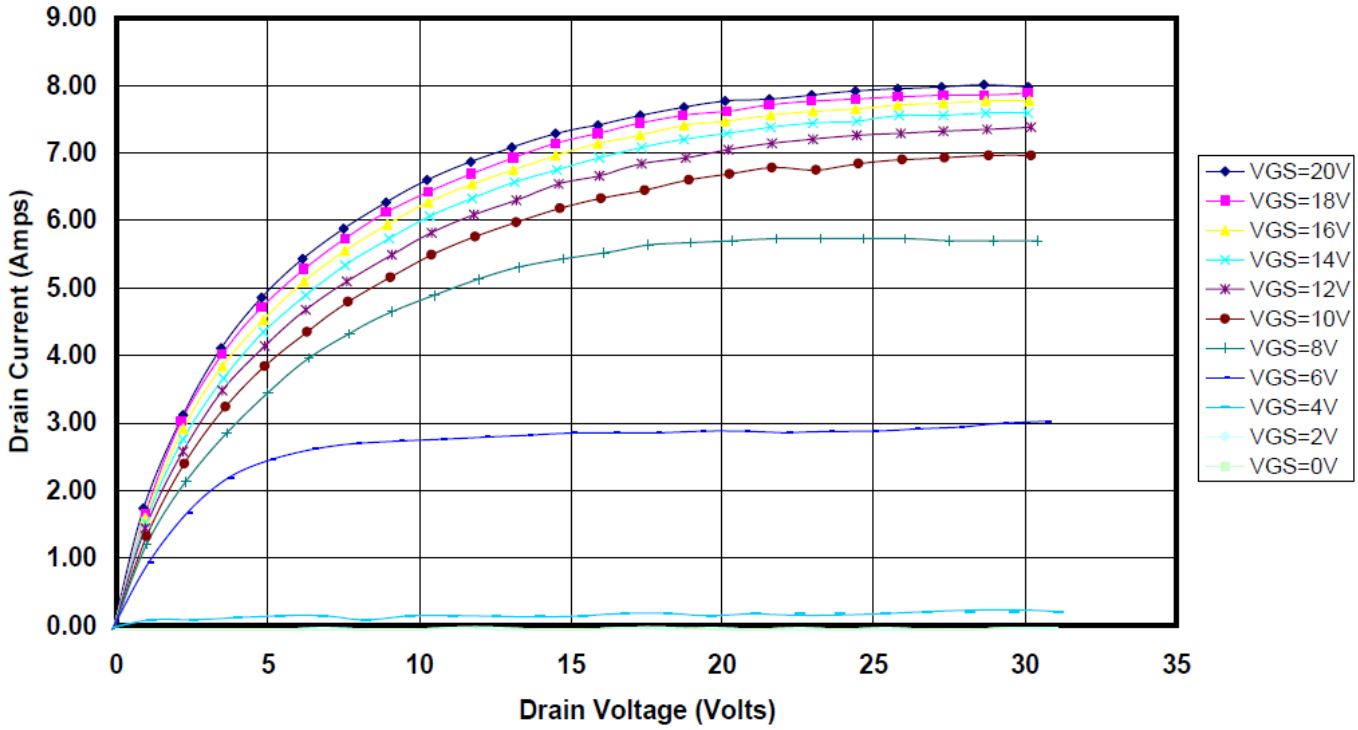


Figure 4 – Typical IV Characteristics

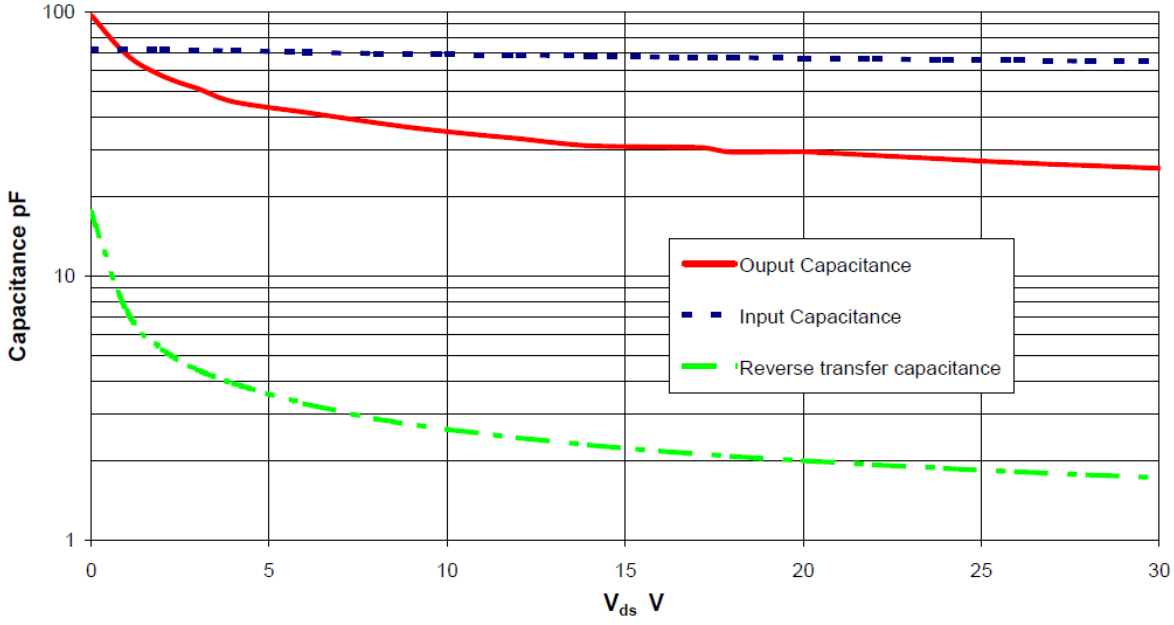
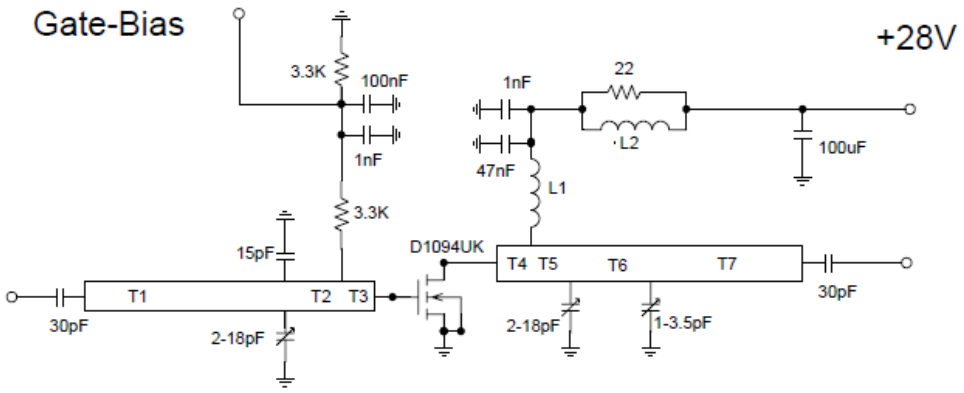


Figure 5 – Typical CV Characteristics

500MHz RF Test Fixture



Substrate 1.6mm thick G200

All microstrip lines W=2.8mm

T1 46.3mm

T2 2.2mm

T3, T4 8mm

T5 4.3mm

T6 11.7mm

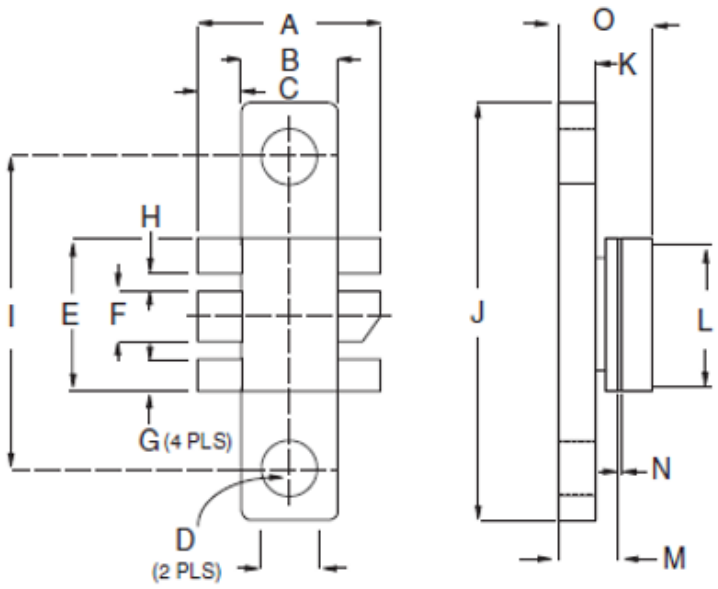
T7 32.3mm

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

L2 1.5 turns 24swg enamelled copper wire on ferrite core

Packaging

Mechanical Data



SOT171

Top View

Pin 1 - Source	Pad 2 – Source
Pin 3 – Gate	Pin 4 – Drain
Pin 5 – Source	Pin 6 – Source

DIM	mm	Tol.	Inches	Tol.
A	10.92	0.38	0.430	0.015
B	5.84	0.13	0.230	0.005
C	2.54	0.13	0.100	0.005
D	3.30 dia	1.27	0.130 dia	0.050
E	9.14	0.13	0.360	0.005
F	3.05	0.13	0.120	0.005
G	2.01	0.13	0.079	0.005
H	1.07	0.13	0.042	0.005
I	18.42	0.13	0.725	0.005
J	24.77	0.13	0.975	0.005
K	2.79	0.13	0.110	0.005
L	9.14	0.13	0.360	0.005
M	4.22	0.25	0.166	0.010
N	0.13	0.05	0.005	0.002
O	7.37	MAX	0.290	MAX

Revision Control

ISSUE	CHANGE DESCRIPTION	APPROVAL	DATE
1	First issue	J.Walker	03-05-2001
2	Replaced package drawing to improve quality	J.Walker	11-07-2001
3	Corrections to package drawing	J.Walker	04-09-2001
4	Corrected gfs test conditions from 0.6A to 1.2A	J.Walker	11-12-2001
5	Addition of I-V and C-V data	J.Walker	21-03-2006
6	Corrected dimension tolerances	P.Smith	25-06-2020