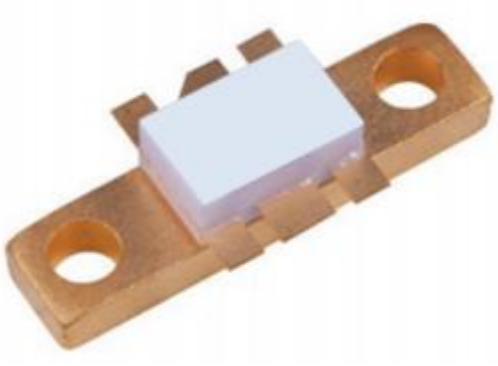
RF Silicon Mosfet

15W 500MHz 12V Single-Ended

D2294UK



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. 15W at 500MHz, 12.5V

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

P_D	Power Dissipation	50W
BV_{DSS}	Drain – Source Breakdown Voltage	40V
BV_{GSS}	Gate – Source Breakdown Voltage	±20V
$I_{D\ (sat)}$	Drain Current	12A
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

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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	40			V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS} = 12.5V, 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 = 15W V_{DS} = 12.5V, I_{DQ} = 0.6A f = 500MHz	11			dB
η	Drain Efficiency		50			%
VSWR(1)	Load Mismatch Tolerance		20:1			-
C_{iss}(1)	Input Capacitance	V_{DS} = 12.5V, V_{GS} = -5V f = 1MHz			72	pF
C_{oss}(1)	Output Capacitance	V_{DS} = 12.5V, V_{GS} = 0V f = 1MHz			60	pF
C_{rss}(1)	Reverse Transfer Capacitance	V_{DS} = 12.5V, V_{GS} = 0V f = 1MHz			6	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

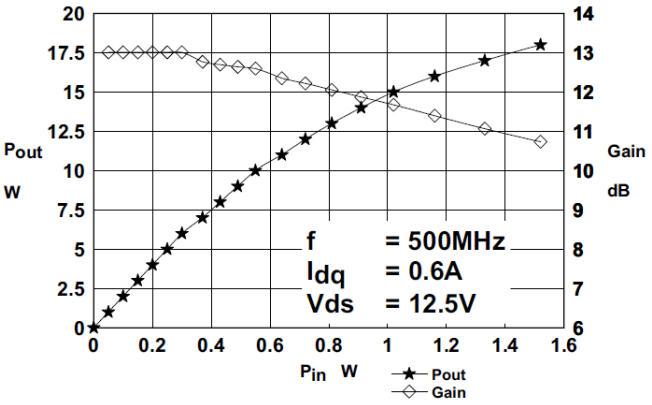


Figure 1
Output power and Gain vs. Input Power

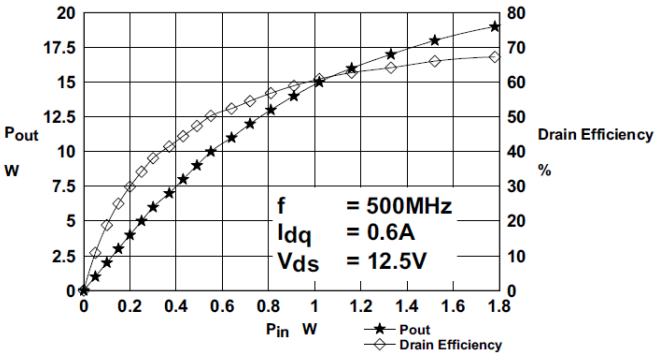


Figure 2
Output power and Efficiency vs. Input Power

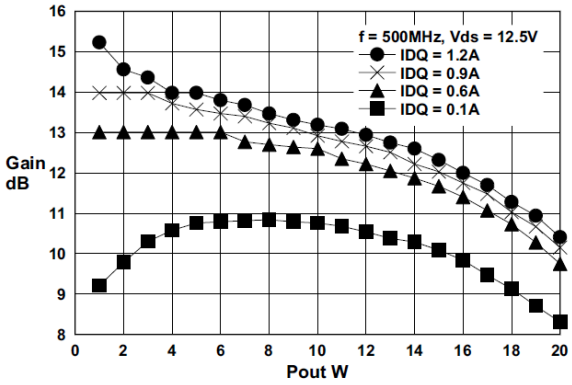


Figure 3
Gain vs Output Power

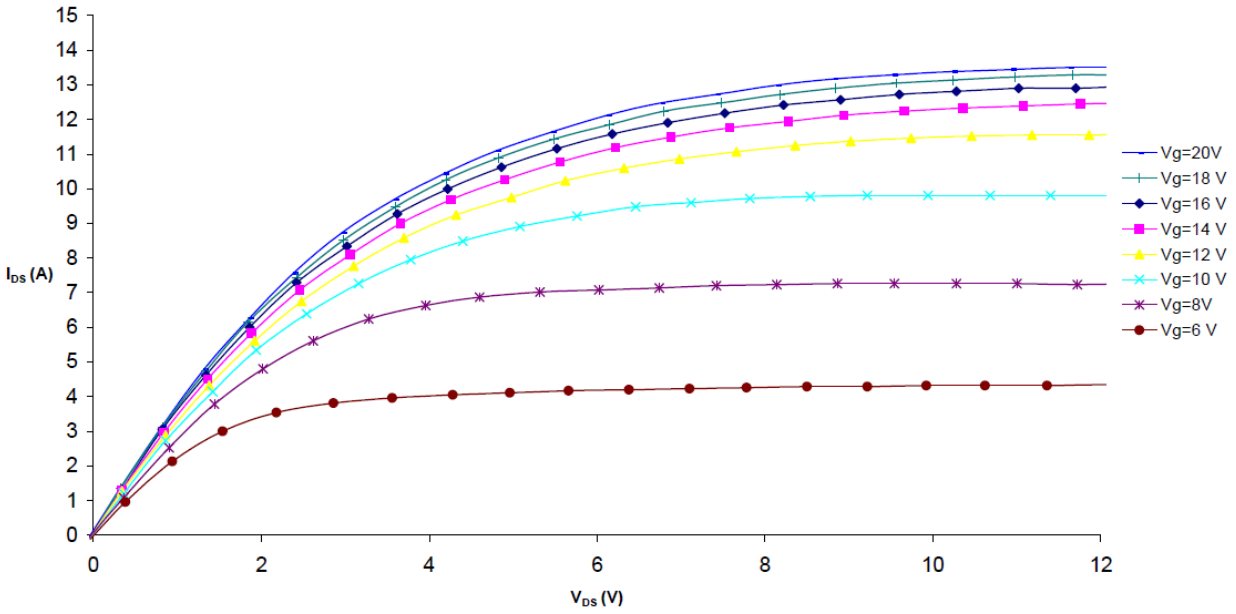


Figure 4 – Typical IV Characteristics

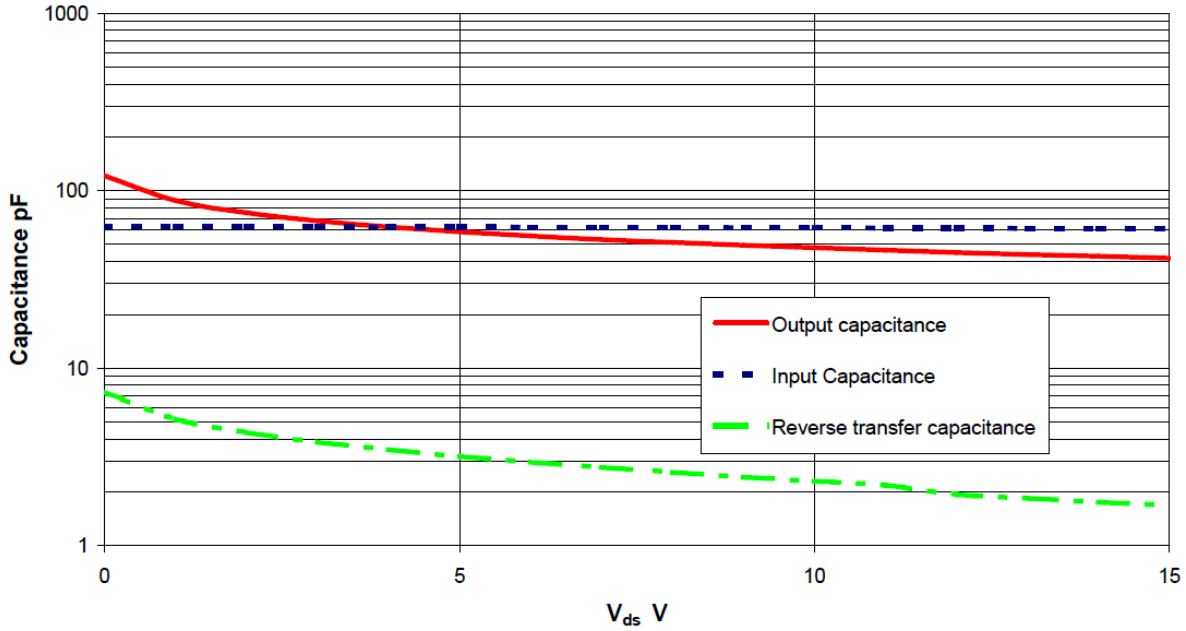
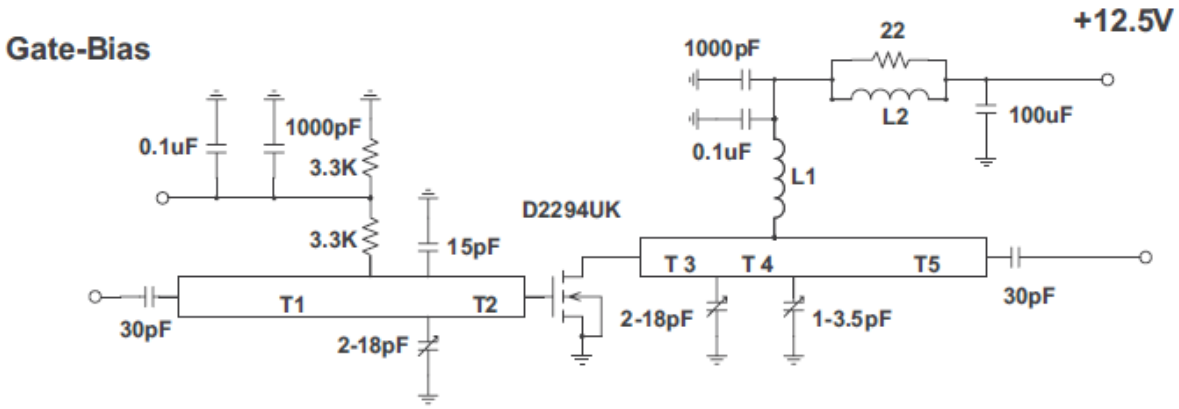


Figure 5 – Typical CV Characteristics

500MHz RF Test Fixture



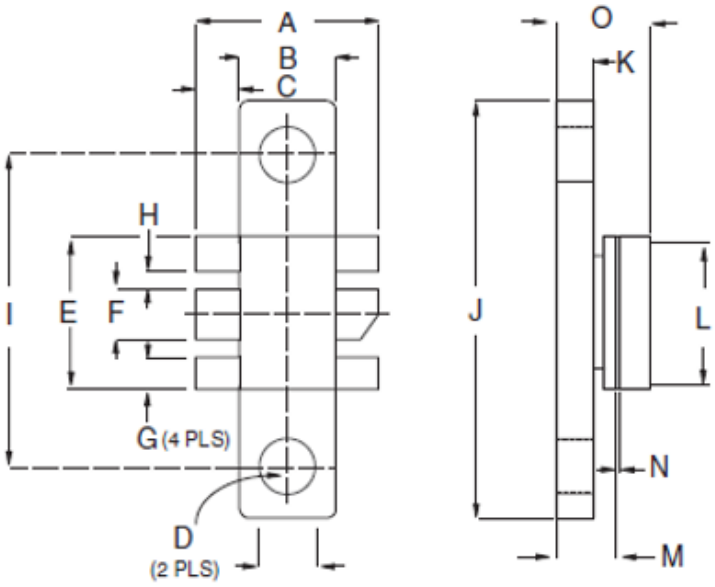
Substrate 1.6mm FR4
All microstrip lines W = 2.75mm

T1	47mm
T2	9mm
T3	9mm
T4	13mm
T5	32mm

L1	7 turns 24swg enamelled copper wire, 2mm i.d.
L2	1.5 turns 24swg enamelled copper wire on ferrite core

Packaging

Mechanical Data



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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	09-07-2001
2	Addition of I-V and C-V data	P.Smith	02-11-2006
3	Corrected gfs test conditions from 0.6A to 1.2A	P.Smith	22-02-2018
4	Corrected dimension tolerances	P.Smith	25-06-2020