SD4933

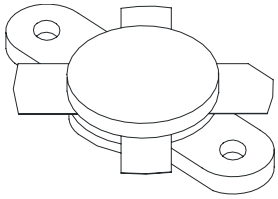
RF power transistor HF/VHF/UHF N-channel MOSFET

Features

- Improved ruggedness $V_{(BR)DSS}$ > 200 V
- Excellent thermal stability
- 20:1 all phases load mismatch capability
- P_{OUT} = 300 W min. with 24 dB gain @ 30 MHz
- In compliance with the 2002/95/EEC european directive

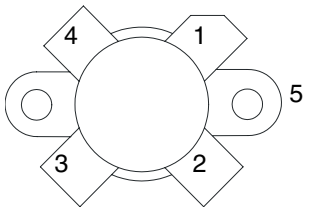
Description

The SD4933 is a N-channel MOS field-effect RF power transistor. It is intended for use in 50 V ISM applications up to 100 MHz.



M177
Epoxy sealed

Figure 1. Pin connection



1. Drain
2. Source
3. Gate
4. Source
5. Source

Table 1. Device summary

Order code	Marking	Package	Packaging
SD4933	SD4933	M177	Plastic tray

1 Electrical data

1.1 Maximum ratings

Table 2. Absolute maximum ratings (T_{CASE} = 25 °C)

Symbol	Parameter	Value	Unit
$V_{(BR)DSS}$	Drain source voltage	200	V
V_{DGR}	Drain-gate voltage (R_{GS} = 1 MΩ)	200	V
V_{GS}	Gate-source voltage	±20	V
I_D	Drain current	40	A
P_{DISS}	Power dissipation	648	W
T_J	Max. operating junction temperature	200	°C
T_{STG}	Storage temperature	-65 to +150	°C

1.2 Thermal data

Table 3. Thermal data

Symbol	Parameter	Value	Unit
R_{thJC}	Junction - case thermal resistance	0.27	°C/W

2 Electrical characteristics

T_{CASE} = +25 °C

2.1 Static

Table 4. Static

Symbol	Test conditions			Min	Typ	Max	Unit
$V_{(BR)DSS}$	V_{GS} = 0 V	I_{DS} = 100 mA		200	240		V
I_{DSS}	V_{GS} = 0 V	V_{DS} = 100 V				2	mA
I_{GSS}	V_{GS} = 20 V	V_{DS} = 0 V				500	nA
V_{TH}	I_D = 250 mA			1.5	2.5	4.0	V
$V_{DS(ON)}$	V_{GS} = 10 V	I_D = 20 A			3.5	4.0	V
G_{FS}	V_{DS} = 10 V	I_D = 5 A		5	8		S
C_{ISS}	V_{GS} = 0 V	V_{DS} = 50 V	f = 1 MHz		1000		pF
C_{OSS}	V_{GS} = 0 V	V_{DS} = 50 V	f = 1 MHz		400		pF
C_{RSS}	V_{GS} = 0 V	V_{DS} = 50 V	f = 1 MHz		16		pF

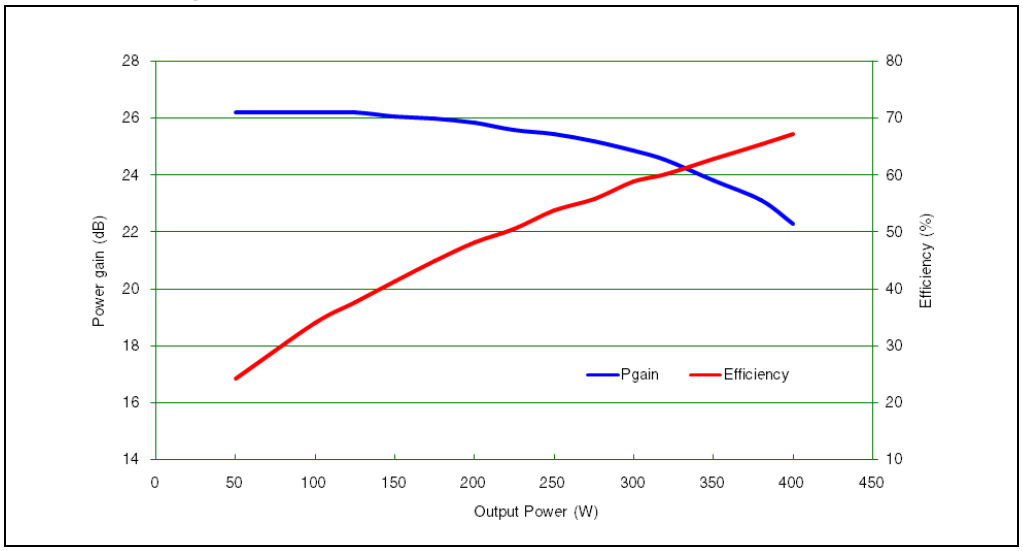
2.2 Dynamic

Table 5. Dynamic

Symbol	Test conditions				Min	Typ	Max	Unit
P_{OUT}	V_{DD} = 50 V	I_{DQ} = 250 mA		f = 30 MHz	300		-	W
G_{PS}	V_{DD} = 50 V	I_{DQ} = 250 mA	P_{OUT} = 300 W	f = 30 MHz	20	24	-	dB
h_D	V_{DD} = 50 V	I_{DQ} = 250 mA	P_{OUT} = 300 W	f = 30 MHz	50	58	-	%
Load mismatch	V_{DD} = 50 V All phase angles	I_{DQ} = 250 mA	P_{OUT} = 300 W	f = 30 MHz	10:1	20:1	-	VSWR

3 Typical performance

Figure 2. Gain and efficiency vs output power_Vdd = 50 V, Idq = 250 mA, freq = 30 MHz



4 VGS/GFS sorts

Table 6. VGS/GFS sorts

Marking	Vgs(min)	Vgs(max)	Gfs(min)	Gfs(max)
A1	1.50	1.75	5	6
A2	1.50	1.75	6	7
A3	1.50	1.75	7	8
A4	1.50	1.75	8	9
A5	1.50	1.75	9	10
A6	1.50	1.75	10	11
A7	1.50	1.75	11	12
A8	1.50	1.75	12	13
A9	1.50	1.75	13	14
B1	1.75	2.00	5	6
B2	1.75	2.00	6	7
B3	1.75	2.00	7	8
B4	1.75	2.00	8	9
B5	1.75	2.00	9	10
B6	1.75	2.00	10	11
B7	1.75	2.00	11	12
B8	1.75	2.00	12	13
B9	1.75	2.00	13	14
C1	2.00	2.25	5	6
C2	2.00	2.25	6	7
C3	2.00	2.25	7	8
C4	2.00	2.25	8	9
C5	2.00	2.25	9	10
C6	2.00	2.25	10	11
C7	2.00	2.25	11	12
C8	2.00	2.25	12	13
C9	2.00	2.25	13	14
D1	2.25	2.50	5	6
D2	2.25	2.50	6	7
D3	2.25	2.50	7	8
D4	2.25	2.50	8	9
D5	2.25	2.50	9	10

Table 6. VGS/GFS sorts (continued)

Marking	Vgs(min)	Vgs(max)	Gfs(min)	Gfs(max)
D6	2.25	2.50	10	11
D7	2.25	2.50	11	12
D8	2.25	2.50	12	13
D9	2.25	2.50	13	14
E1	2.50	2.75	5	6
E2	2.50	2.75	6	7
E3	2.50	2.75	7	8
E4	2.50	2.75	8	9
E5	2.50	2.75	9	10
E6	2.50	2.75	10	11
E7	2.50	2.75	11	12
E8	2.50	2.75	12	13
E9	2.50	2.75	13	14
F1	2.75	3.00	5	6
F2	2.75	3.00	6	7
F3	2.75	3.00	7	8
F4	2.75	3.00	8	9
F5	2.75	3.00	9	10
F6	2.75	3.00	10	11
F7	2.75	3.00	11	12
F8	2.75	3.00	12	13
F9	2.75	3.00	13	14
G1	3.00	3.25	5	6
G2	3.00	3.25	6	7
G3	3.00	3.25	7	8
G4	3.00	3.25	8	9
G5	3.00	3.25	9	10
G6	3.00	3.25	10	11
G7	3.00	3.25	11	12
G8	3.00	3.25	12	13
G9	3.00	3.25	13	14
H1	3.25	3.50	5	6
H2	3.25	3.50	6	7
H3	3.25	3.50	7	8
H4	3.25	3.50	8	9

Table 6. VGS/GFS sorts (continued)

Marking	Vgs(min)	Vgs(max)	Gfs(min)	Gfs(max)
H5	3.25	3.50	9	10
H6	3.25	3.50	10	11
H7	3.25	3.50	11	12
H8	3.25	3.50	12	13
H9	3.25	3.50	13	14
I1	3.50	3.75	5	6
I2	3.50	3.75	6	7
I3	3.50	3.75	7	8
I4	3.50	3.75	8	9
I5	3.50	3.75	9	10
I6	3.50	3.75	10	11
I7	3.50	3.75	11	12
I8	3.50	3.75	12	13
I9	3.50	3.75	13	14
J1	3.75	4.00	5	6
J2	3.75	4.00	6	7
J3	3.75	4.00	7	8
J4	3.75	4.00	8	9
J5	3.75	4.00	9	10
J6	3.75	4.00	10	11
J7	3.75	4.00	11	12
J8	3.75	4.00	12	13
J9	3.75	4.00	13	14

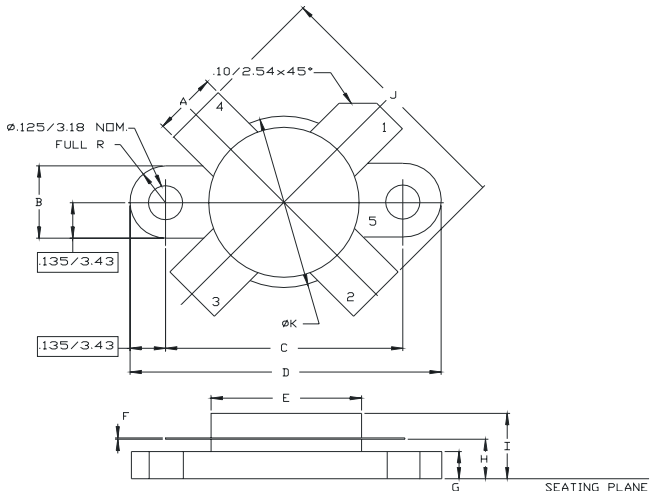
5 Package mechanical data

In order to meet environmental requirements, ST offers these devices in different grades of ECOPACK® packages, depending on their level of environmental compliance. ECOPACK® specifications, grade definitions and product status are available at: www.st.com. ECOPACK is an ST trademark.

Table 7. M177 (.550 DIA 4/L N/HERM W/FLG) mechanical data

Dim.	mm.			Inch		
	Min	Typ	Max	Min	Typ	Max
A	5.72		5.97	0.225		0.235
B	6.73		6.96	0.265		0.275
C	21.84		22.10	0.860		0.870
D	28.70		28.96	1.130		1.140
E	13.84		14.10	0.545		0.555
F	0.08		0.18	0.003		0.007
G	2.49		2.74	0.098		0.108
H	3.81		4.32	0.150		0.170
I			7.11			0.280
J	27.43		28.45	1.080		1.120
K	15.88		16.13	0.625		0.635

Figure 3. Package dimensions



6 Revision history

Table 8. Document revision history

Date	Revision	Changes
11-Mar-2009	1	Initial release
24-Feb-2010	2	Updated *Table 6: VGS/GFS sorts on page 5*.
29-Sep-2010	3	Document status promoted from preliminary to datasheet.

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