

SD2933

HF/VHF/UHF RF power N-channel MOSFETs

Features

- Gold metallization
- Excellent thermal stability
- Common source configuration
- $P_{OUT} = 300 \text{ W min. with } 20 \text{ dB gain @ } 30 \text{ MHz}$
- Thermally enhanced packaging for lower junction temperatures

Description

The SD2933 is a gold metallized N-channel MOS field-effect RF power transistor, intended for use in 50 V dc large signal applications up to 150 MHz. Its special low thermal resistance package makes it ideal for ISM applications, where reliability and ruggedness are critical factors.

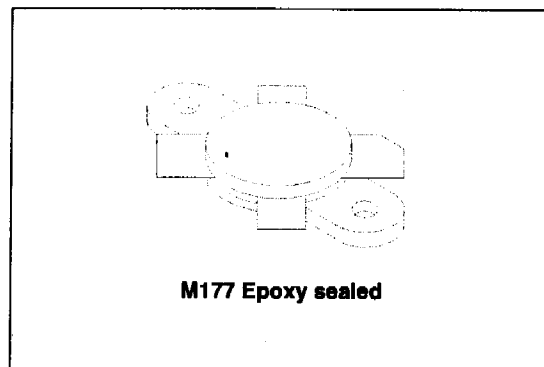
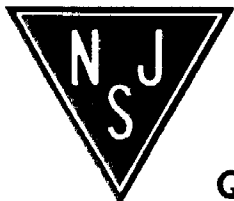
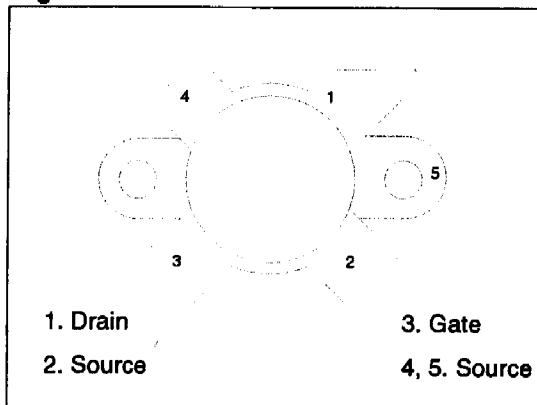


Figure 1. Pin connection



NJ Semi-Conductors reserves the right to change test conditions, parameter limits and package dimensions without notice. Information furnished by NJ Semi-Conductors is believed to be both accurate and reliable at the time of going to press. However, NJ Semi-Conductors assumes no responsibility for any errors or omissions discovered in its use. NJ Semi-Conductors encourages customers to verify that datasheets are current before placing orders.

1 Electrical data

1.1 Maximum rating

$T_{CASE} = 25^{\circ}C$

Table 2. Absolute maximum rating

| Symbol | Parameter | Value | Unit |
|---------------|---|-------------|-------------|
| $V_{(BR)DSS}$ | Drain source voltage | 125 | V |
| V_{DGR} | Drain-gate voltage ($R_{GS} = 1M\Omega$) | 125 | V |
| V_{GS} | Gate-source voltage | ± 20 | V |
| I_D | Drain current | 40 | A |
| P_{DISS} | Power dissipation | 648 | W |
| E_{AS} | Avalanche energy, single pulse ($I_D = 53 A, 800 \mu H$ coil) | 1100 | mJ |
| T_J | Max. operating junction temperature | 200 | $^{\circ}C$ |
| T_{STG} | Storage temperature | -65 to +150 | $^{\circ}C$ |

1.2 Thermal data

Table 3. Thermal data

| Symbol | Parameter | Value | Unit |
|-------------|-------------------------------------|-------|---------------|
| R_{thJ-C} | Junction to case thermal resistance | 0.27 | $^{\circ}C/W$ |

Electrical characteristics

$T_{CASE} = 25^{\circ}C$

Table 4. Static

| Symbol | Test conditions | | | Min. | Typ. | Max. | Unit |
|-------------------|-----------------|-------------------|-------------|----------------------------|------|------|---------|
| $V_{(BR)DSS}$ | $V_{GS} = 0 V$ | $I_{DS} = 200 mA$ | | 125 | | | V |
| I_{DSS} | $V_{GS} = 0 V$ | $V_{DS} = 50 V$ | | | | 100 | μA |
| I_{GSS} | $V_{GS} = 20 V$ | $V_{DS} = 0 V$ | | | | 500 | nA |
| $V_{GS(Q)}^{(1)}$ | $V_{DS} = 10 V$ | $I_D = 250 mA$ | | 1.5 | | 4 | V |
| $V_{DS(ON)}$ | $V_{GS} = 10 V$ | $I_D = 20 A$ | | | | 3.0 | V |
| $G_{FS}^{(1)}$ | $V_{DS} = 10 V$ | $I_D = 10 A$ | | see Table 5: G_{FS} sort | | | mho |
| C_{ISS} | $V_{GS} = 0 V$ | $V_{DS} = 50 V$ | $f = 1 MHz$ | | 1000 | | pF |
| C_{OSS} | $V_{GS} = 0 V$ | $V_{DS} = 50 V$ | $f = 1 MHz$ | | 372 | | pF |
| C_{RSS} | $V_{GS} = 0 V$ | $V_{DS} = 50 V$ | $f = 1 MHz$ | | 29 | | pF |

1. $V_{GS(Q)}$ and G_{FS} sorted with alpha/numeric code marked on unit.

Table 5. G_{FS} sort

| G_{FS} sort | Value |
|---------------|------------|
| A | 10 - 10.99 |
| B | 11 - 11.99 |
| C | 12 - 12.99 |
| D | 13 - 13.99 |
| E | 14 - 14.99 |
| F | 15 - 15.99 |
| G | 16 - 16.99 |
| H | 17 - 18 |

Table 6. Dynamic

| Symbol | Test Conditions | | | Min. | Typ. | Max. | Unit |
|---------------|-----------------|-------------------|-------------------|------|------|------|------|
| P_{OUT} | $V_{DD} = 50 V$ | $I_{DQ} = 250 mA$ | $f = 30 MHz$ | 300 | 400 | | W |
| G_{PS} | $V_{DD} = 50 V$ | $I_{DQ} = 250 mA$ | $P_{OUT} = 300 W$ | 20 | 23.5 | | dB |
| η_D | $V_{DD} = 50 V$ | $I_{DQ} = 250 mA$ | $P_{OUT} = 150 W$ | 50 | 65 | | % |
| Load Mismatch | $V_{DD} = 50 V$ | $I_{DQ} = 250 mA$ | $P_{OUT} = 300 W$ | 3:1 | | | VSWR |