

N-CHANNEL MOSFET
FOR SWITCHING

DESCRIPTION

The 2SK1588 is an N-channel vertical type MOSFET which can be driven by 2.5 V power supply.

As the MOSFET is driven by low voltage and does not require consideration of driving current, it is suitable for appliances including VCR cameras and headphone stereos which need power saving.

FEATURES

- Directly driven by ICs having a 3 V power supply.
- Low on-state resistance
 $R_{DS(on)1} = 0.5 \Omega \text{ MAX. (} V_{GS} = 2.5 \text{ V, } I_D = 1.0 \text{ A)}$
 $R_{DS(on)2} = 0.3 \Omega \text{ MAX. (} V_{GS} = 4.0 \text{ V, } I_D = 1.5 \text{ A)}$

ORDERING INFORMATION

| PART NUMBER | PACKAGE |
|-------------|-------------------------|
| 2SK1588 | SC-62 (Power Mini Mold) |

Marking: NG

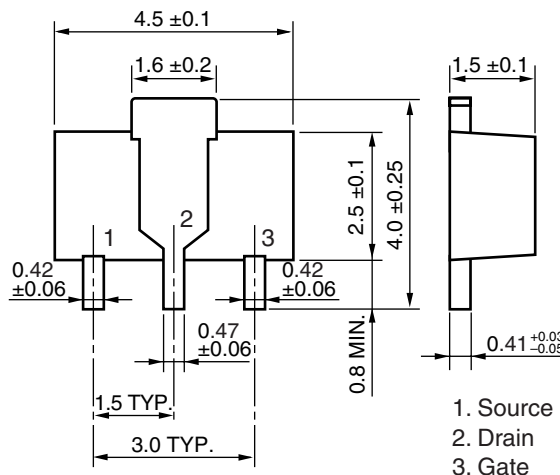
ABSOLUTE MAXIMUM RATINGS ($T_A = 25^\circ\text{C}$)

| | | | |
|--|----------------|-------------|------------------|
| Drain to Source Voltage ($V_{GS} = 0 \text{ V}$) | V_{DSS} | 16 | V |
| Gate to Source Voltage ($V_{DS} = 0 \text{ V}$) | V_{GSS} | ± 16 | V |
| Drain Current (DC) | $I_{D(DC)}$ | ± 3.0 | A |
| Drain Current (pulse) ^{Note1} | $I_{D(pulse)}$ | ± 6.0 | A |
| Total Power Dissipation ^{Note2} | P_T | 2.0 | W |
| Channel Temperature | T_{ch} | 150 | $^\circ\text{C}$ |
| Storage Temperature | T_{stg} | -55 to +150 | $^\circ\text{C}$ |

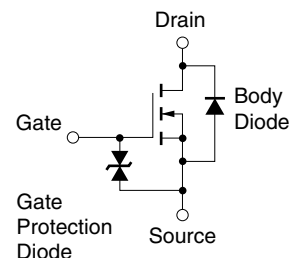
- Notes 1. $PW \leq 10 \text{ ms}$, Duty Cycle $\leq 50\%$
 2. Mounted on ceramic substrate of $16 \text{ cm}^2 \times 0.7 \text{ mm}$

Remark The diode connected between the gate and source of the transistor serves as a protector against ESD. When this device actually used, an additional protection circuit is externally required if a voltage exceeding the rated voltage may be applied to this device.

PACKAGE DRAWING (Unit: mm)



EQUIVALENT CIRCUIT



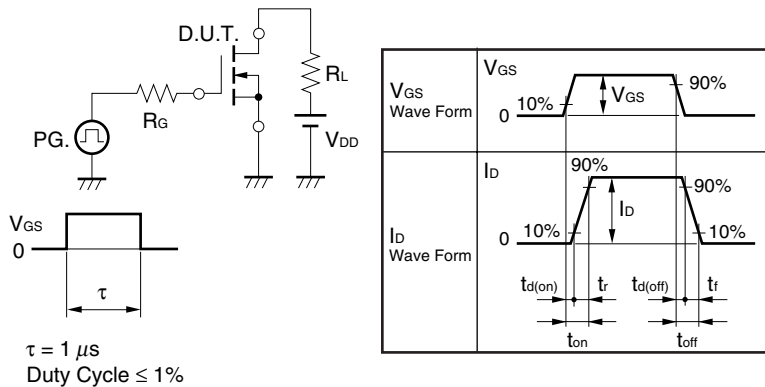
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ELECTRICAL CHARACTERISTICS (T_A = 25°C)

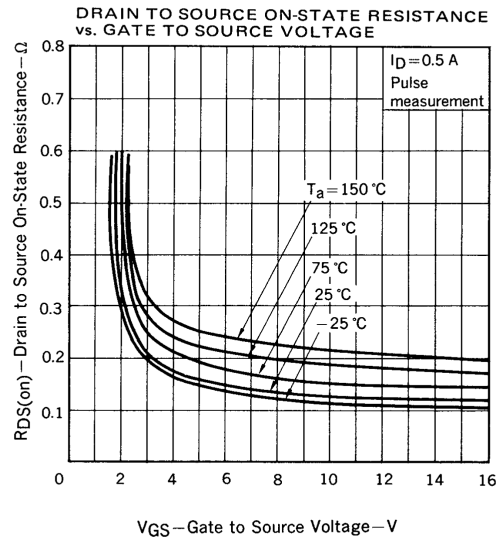
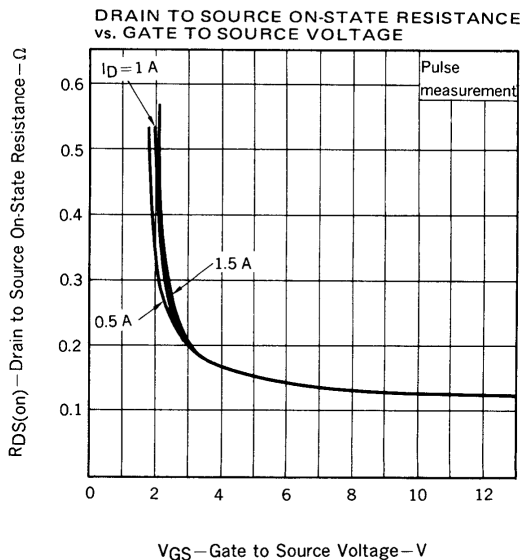
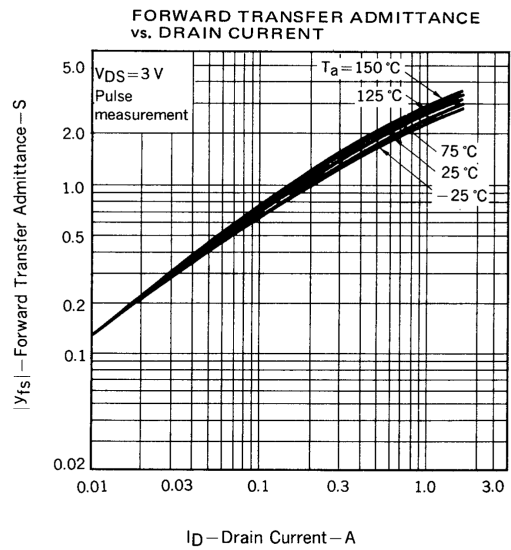
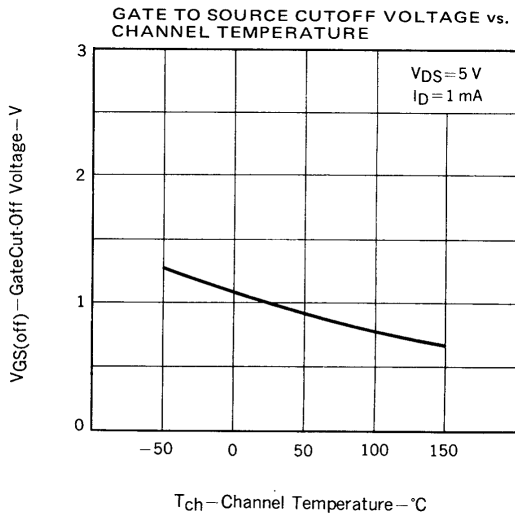
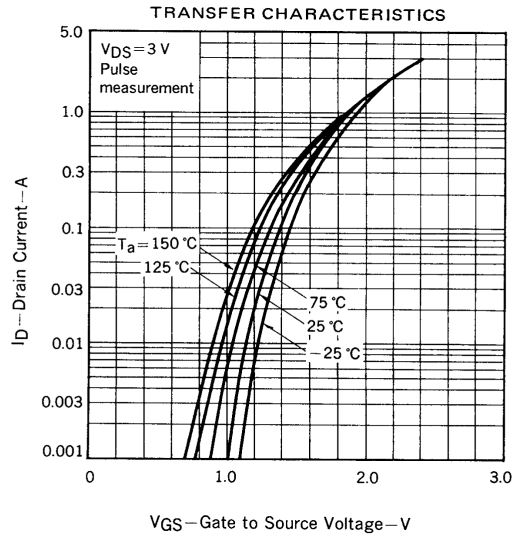
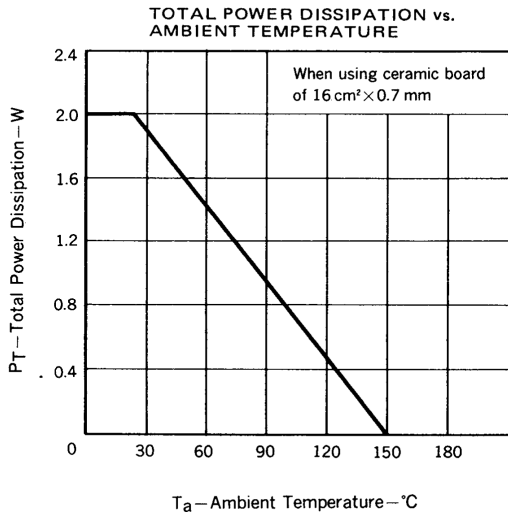
| CHARACTERISTICS | SYMBOL | TEST CONDITIONS | MIN. | TYP. | MAX. | UNIT |
|---|----------------------|--|------|------|------|------|
| Zero Gate Voltage Drain Current | I _{DSS} | V _{DS} = 16 V, V _{GS} = 0 V | | | 1.0 | μA |
| Gate Leakage Current | I _{GSS} | V _{GS} = ±16 V, V _{DS} = 0 V | | | ±5.0 | μA |
| Gate Cut-off Voltage | V _{GS(off)} | V _{DS} = 5.0 V, I _D = 1.0 mA | 0.8 | 1.0 | 1.6 | V |
| Forward Transfer Admittance Note | y _{fs} | V _{DS} = 3.0 V, I _D = 1.0 A | 0.4 | 3.0 | | S |
| Drain to Source On-state Resistance Note | R _{DS(on)1} | V _{GS} = 2.5 V, I _D = 1.0 A | | 0.25 | 0.5 | Ω |
| | R _{DS(on)2} | V _{GS} = 4.0 V, I _D = 1.5 A | | 0.17 | 0.3 | Ω |
| Input Capacitance | C _{iss} | V _{DS} = 3.0 V | | 240 | | pF |
| Output Capacitance | C _{oss} | V _{GS} = 0 V | | 250 | | pF |
| Reverse Transfer Capacitance | C _{rss} | f = 1 MHz | | 60 | | pF |
| Turn-on Delay Time | t _{d(on)} | V _{DD} = 3.0 V, I _D = 1.5 A | | 140 | | ns |
| Rise Time | t _r | V _{GS} = 3 V | | 650 | | ns |
| Turn-off Delay Time | t _{d(off)} | R _G = 10 Ω | | 120 | | ns |
| Fall Time | t _f | | | 160 | | ns |

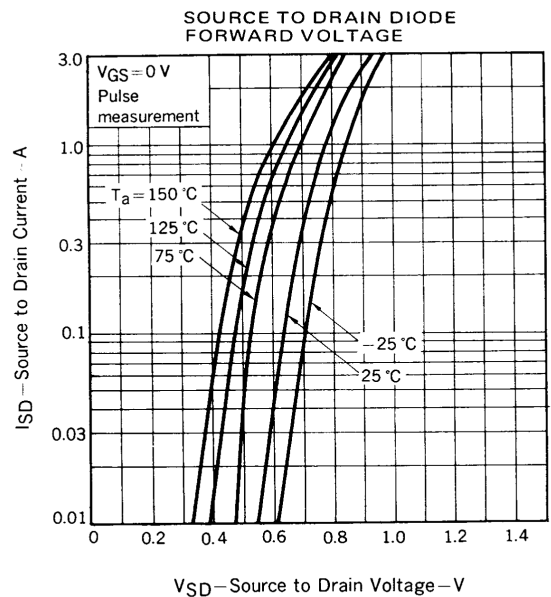
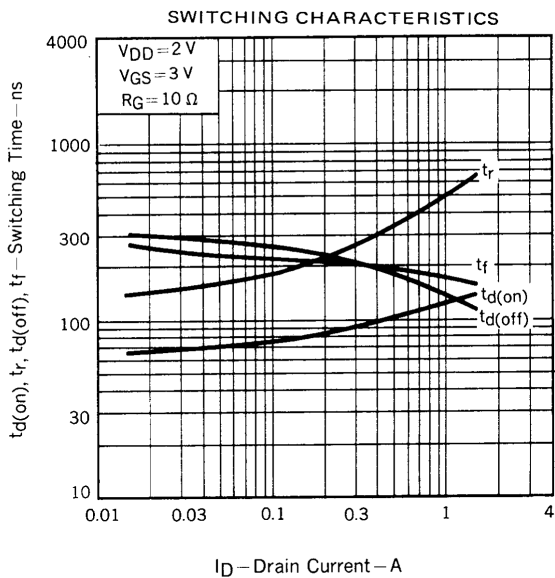
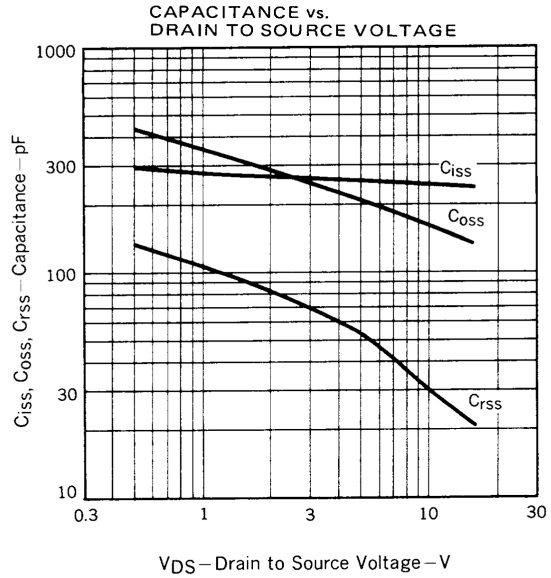
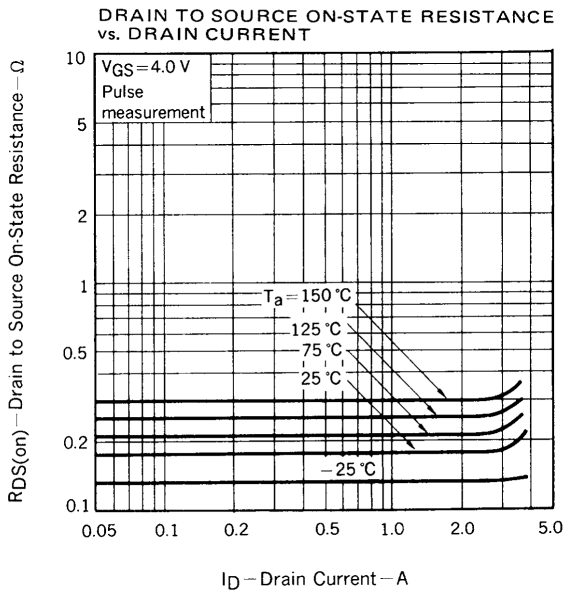
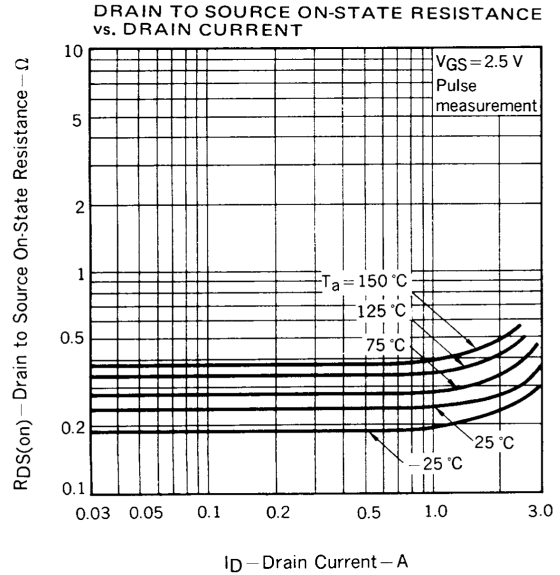
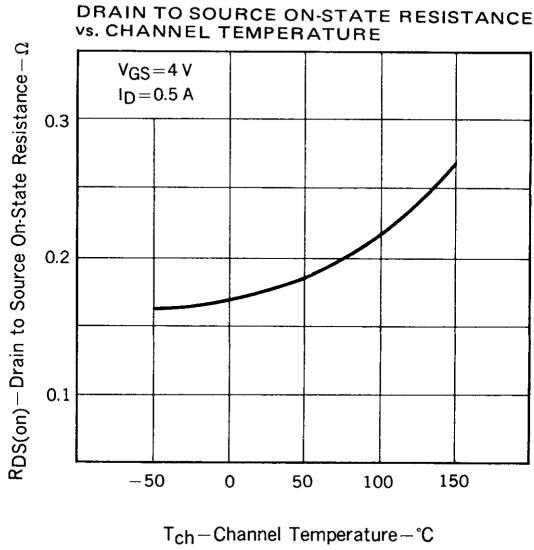
Note Pulsed

TEST CIRCUIT SWITCHING TIME



TYPICAL CHARACTERISTICS (T_A = 25°C)





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