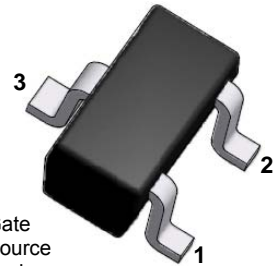


150mW SOT-523 SURFACE MOUNT
Plastic Package
N-Channel 1.8-V (G-S) MOSFET

Green Product



SOT-523

Absolute Maximum Ratings $T_A = 25^\circ\text{C}$ unless otherwise noted

| Symbol | Parameter | 5 secs | Steady State | Units | |
|------------|--|------------------------|--------------|------------------|----|
| V_{DS} | Drain-Source Voltage | | 20 | V | |
| V_{GS} | Gate-Source Voltage | | $\pm 6V$ | V | |
| I_D | Continuous Drain Current ^e | $T_A=25^\circ\text{C}$ | 600 | 500 | mA |
| | | $T_A=85^\circ\text{C}$ | 400 | 350 | |
| I_{DM} | Pulsed Drain Current ^d | | 1000 | mA | |
| I_S | Continuous Source Current ^e | 275 | 250 | mA | |
| P_D | Power Dissipation ^e | $T_A=25^\circ\text{C}$ | 175 | 150 | mW |
| | | $T_A=85^\circ\text{C}$ | 90 | 80 | |
| T_{STG} | Storage Temperature Range | -55 to +150 | | $^\circ\text{C}$ | |
| T_J | Operating Junction Temperature | +150 | | $^\circ\text{C}$ | |
| ESD | Gate-source ESD Rating (HBM, Method 3015) | 2000 | | V | |

These ratings are limiting values above which the serviceability of the device may be impaired.

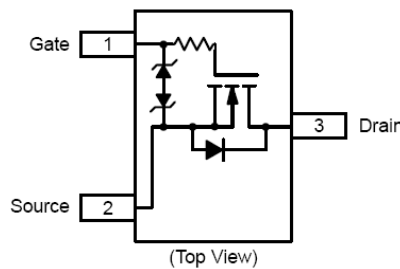
Notes:

- d. Pulse width limited by maximum junction temperature.
- e. Surface mounted on FR4 board.

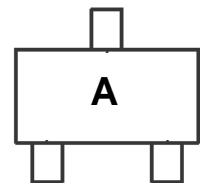
FEATURES

- TrenchFET[®] Power MOSFET: 1.8-V Rated
- Gate-Source ESD Protected: 2000V
- High-side Switching
- Low On-Resistance: 0.7 Ω
- Low Threshold: 0.8V (Typ.)
- Fast Switching Speed: 10ns
- S-Prefix for Automotive and Other Applications Requiring Unique Site and Control Change Requirements
- RoHS Compliant
- Green EMC
- Matte Tin(Sn) Lead Finish
- Weight: approx. 0.002g

Electrical Symbol:



Device Marking Code:



BENEFITS

- Ease in Driving Switches
- Low Offset(Error) Voltage
- Low-Voltage operation
- High-Speed Circuits
- Low Battery Voltage Operation

APPLICATIONS

- Drivers: Relays, Solenoids, Lamps, Hammers, displays, Memories
- Battery Operated Systems
- Power Supply Converter Circuits
- Load/Power Switching Cell Phones, agers

Electrical Characteristics ($T_A = 25^\circ\text{C}$ unless otherwise noted)

Static

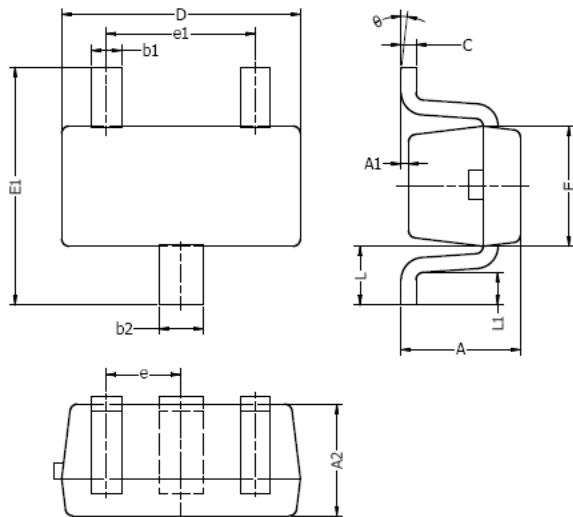
| Symbol | Parameter | Test Condition | Limits | | | Unit |
|--------------|---|--|--------|-----------|-----------|---------------|
| | | | Min | Typ | Max | |
| $V_{th(GS)}$ | Gate-Threshold Voltage | $V_{DS}=V_{GS}, I_D=250\mu\text{A}$ | 0.45 | | 0.9 | Volts |
| I_{GSS} | Gate-Body Leakage | $V_{DS}=0\text{V}, V_{GS}=\pm 4.5\text{V}$ | | ± 0.5 | ± 1.0 | μA |
| I_{DSS} | Zero Gate Voltage Drain Current | $V_{DS}=20\text{V}, V_{GS}=0\text{V}$ | | 0.3 | 100 | nA |
| $I_{D(ON)}$ | On-state Drain Current ^a | $V_{DS}=5\text{V}, V_{GS}=4.5\text{V}$ | 700 | | | mA |
| $R_{DS(on)}$ | Drain-Source On-Resistance ^a | $V_{GS}=4.5\text{V}, I_D=600\text{mA}$ | | 0.41 | 0.70 | Ω |
| | | $V_{GS}=2.5\text{V}, I_D=500\text{mA}$ | | 0.53 | 0.85 | |
| | | $V_{GS}=1.8\text{V}, I_D=350\text{mA}$ | | 0.70 | 1.25 | |
| g_{fs} | Forward Trans Conductance ^a | $V_{DS}=10\text{V}, I_D=400\text{mA}$ | | 1 | | ms |
| V_{SD} | Diode Forward Voltage ^a | $I_S=150\text{mA}, V_{GS}=0\text{V}$ | | 0.8 | 1.2 | V |

Dynamic ^b

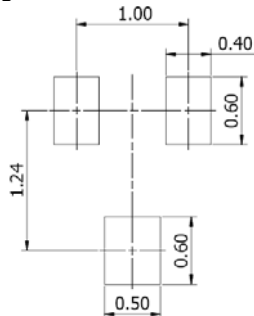
| Symbol | Parameter | Test Condition | Limits | | | Unit |
|--------------|---------------------|--|--------|-----|-----|------|
| | | | Min | Typ | Max | |
| Q_g | Total Gate Charge | $V_{DS}=10\text{V}, V_{GS}=4.5\text{V}, I_D=250\text{mA}$ | -- | 750 | -- | pC |
| Q_{gs} | Gate-Source Charge | | -- | 75 | -- | |
| Q_{gd} | Gate-Drain Charge | | -- | 225 | -- | |
| $T_{d(on)}$ | Turn-On Delay Time | $V_{DD}=10\text{V}, R_L=47\Omega, I_D=200\text{mA}, V_{GEN}=4.5\text{V}, R_G=10\Omega$ | -- | 5 | -- | ns |
| t_r | Rise Time | | -- | 5 | -- | |
| $t_{d(off)}$ | Turn-Off Delay Time | | -- | 25 | -- | |
| t_f | Fall Time | | -- | 11 | -- | |

Notes:

- Pulse test: pulse width $\leq 300\mu\text{s}$, duty cycle $\leq 2\%$.
- Guaranteed by design, not subject to production testing.

SOT-523 Package Outline


| DIM | MILLIMETERS | | INCHES | |
|-----|-------------|------|------------|-------|
| | MIN | MAX | MIN | MAX |
| A | 0.70 | 0.90 | 0.028 | 0.035 |
| A1 | 0.00 | 0.10 | 0.000 | 0.004 |
| A2 | 0.70 | 0.80 | 0.028 | 0.031 |
| b1 | 0.15 | 0.25 | 0.006 | 0.010 |
| b2 | 0.25 | 0.35 | 0.010 | 0.014 |
| c | 0.10 | 0.20 | 0.004 | 0.008 |
| D | 1.50 | 1.70 | 0.059 | 0.067 |
| E | 0.70 | 0.90 | 0.028 | 0.035 |
| E1 | 1.45 | 1.75 | 0.057 | 0.069 |
| e | 0.50 TYP. | | 0.020 TYP. | |
| e1 | 0.90 | 1.10 | 0.035 | 0.043 |
| L | 0.40 REF. | | 0.016 REF. | |
| L1 | 0.10 | 0.30 | 0.004 | 0.012 |
| θ | 0° | 8° | 0° | 8° |

Typical Soldering Pattern:

NOTES:

1. Above package outline conforms to JEITA EAIJ ED-7500A SC-75A.
2. Dimensions are exclusive of Burrs, Mold Flash & Tie Bar extrusions.

NOTICE

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The product listed herein is designed to be used with ordinary electronic equipment or devices, and not designed to be used with equipment or devices which require high level of reliability and the malfunction of which would directly endanger human life (such as medical instruments, transportation equipment, aerospace machinery, nuclear-reactor controllers, fuel controllers and other safety devices), Tak Cheong Semiconductor Co., Ltd., or anyone on its behalf, assumes no responsibility or liability for any damages resulting from such improper use of sale.

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