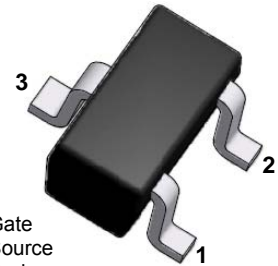


## 150mW SOT-523 SURFACE MOUNT

### 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 <sup>b</sup>	$T_A=25^\circ\text{C}$	600	500	mA
		$T_A=85^\circ\text{C}$	400	350	
$I_{DM}$	Pulsed Drain Current <sup>a</sup>		1000	mA	
$I_S$	Continuous Source Current <sup>b</sup>	275	250	mA	
$P_D$	Power Dissipation <sup>b</sup>	$T_A=25^\circ\text{C}$	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		$^\circ\text{C}$	
<b>ESD</b>	Gate-source ESD Rating (HBM, Method 3015)	2000		V	

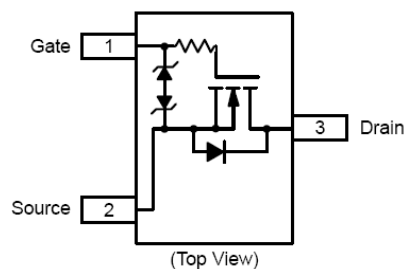
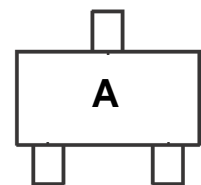
These ratings are limiting values above which the serviceability of the device may be impaired.

Notes:

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

**FEATURES**

- TrenchFET<sup>®</sup> Power MOSFET: 1.8-V Rated
- Gate-Source ESD Protected: 2000V
- High-side Switching
- Low On-Resistance:  $0.7\Omega$
- 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**

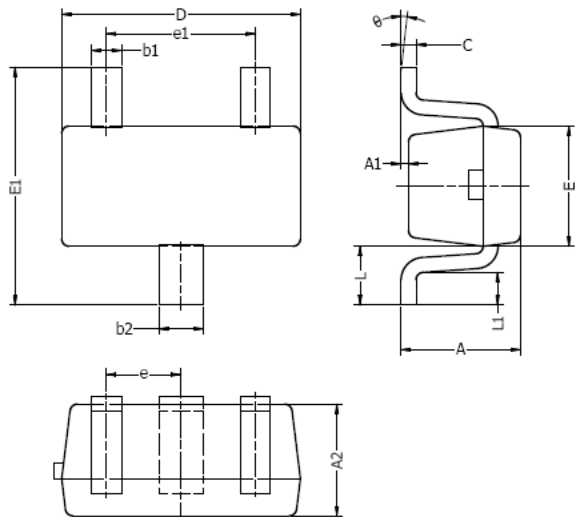
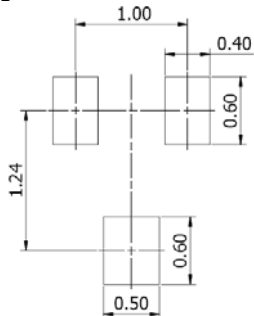
Symbol	Parameter	Test Condition	Limits			Unit
			Min	Typ	Max	
$V_{th(GS)}$	Gate-Threshold Voltage	$V_{DS}=V_{GS}, I_D=250\mu\text{A}$	0.45		0.9	Volts
$I_{GSS}$	Gate-Body Leakage	$V_{DS}=0\text{V}, V_{GS}=\pm 4.5\text{V}$		$\pm 0.5$	$\pm 1.0$	$\mu\text{A}$
$I_{DSS}$	Zero Gate Voltage Drain Current	$V_{DS}=20\text{V},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

**Dynamic <sup>b</sup>**

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**

**Typical Soldering Pattern:**


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°

**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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