

N-Channel 1.8-V (G-S) MOSFET

VC1012F SOT-523 150mW N-Channel MOSFET

Green Product

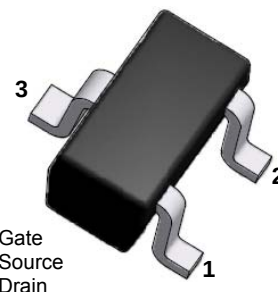
Absolute Maximum Ratings $T_A = 25^\circ\text{C}$ unless otherwise noted

Symbol	Parameter	5 secs	Steady State	Units
V_{DS}	Drain-Source Voltage		20	V
V_{GS}	Gate-Source Voltage		$\pm 6\text{V}$	V
I_D	Continuous Drain Current ^e $T_A=25^\circ\text{C}$ $T_A=85^\circ\text{C}$	600 400	500 350	mA
I_{DM}	Pulsed Drain Current ^d		1000	mA
I_S	Continuous Source Current ^e	275	250	mA
P_D	Power Dissipation ^e $T_A=25^\circ\text{C}$ $T_A=85^\circ\text{C}$	175 90	150 80	mW
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.

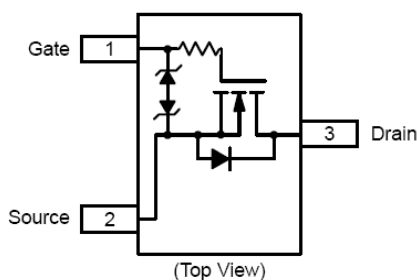


SOT-523

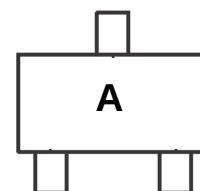
FEATURES

- TrenchFET[®] Power MOSFET: 1.8-V Rated
- Gate-Source ESD Protected: 2000V
- High-side Switching
- Low On-Resistance: 0.7Ω
- 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

N-Channel 1.8-V (G-S) MOSFET

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	--	

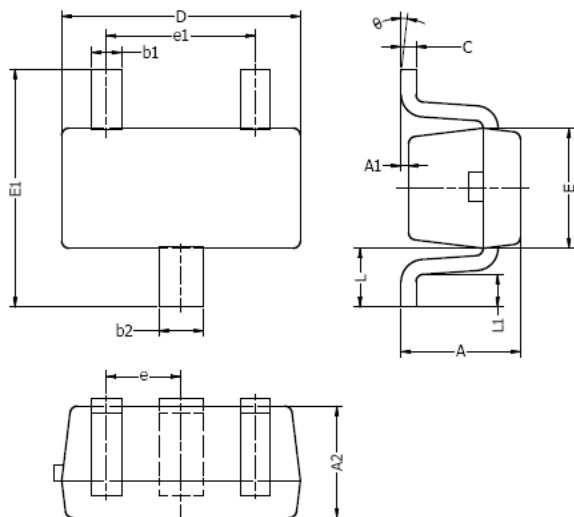
Notes:

a. Pulse test: pulse width $\leq 300\mu\text{s}$, duty cycle $\leq 2\%$.

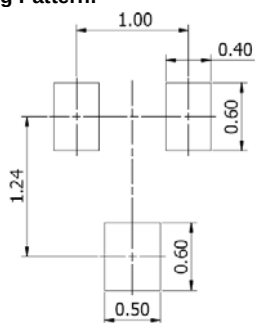
b. Guaranteed by design, not subject to production testing.

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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	0.15	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.



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