



## Description

The SI1012X-T1-GE3 uses advanced trench technology to provide excellent  $R_{DS(ON)}$ , low gate charge and operation with gate voltages as low as 2.5V. This device is suitable for use as a Battery protection or in other Switching application.

## General Features

$V_{DS} = 20V$   $I_D = 0.8A$

$R_{DS(ON)} < 250\text{ m}\Omega @ V_{GS}=4.5V$

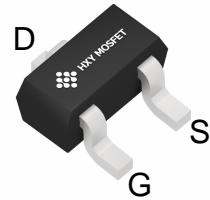
$R_{DS(ON)} < 360\text{ m}\Omega @ V_{GS}=2.5V$

## Application

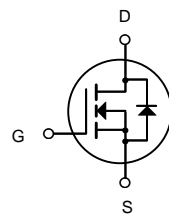
Battery protection

Load switch

Uninterruptible power supply



SOT-523  
(SC-89)



N-Channel MOSFET

## Ordering Information

Product ID	Pack	Brand	Qty(PCS)
SI1012X-T1-GE3	SOT-523(SC-89)	HXY MOSFET	3000

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

Symbol	Parameter	Limit	Unit
$V_{DS}$	Drain-Source Voltage	20	V
$V_{GS}$	Gate-Source Voltage	$\pm 8$	V
$I_D$	Drain Current-Continuous	0.8	A
$P_D$	Maximum Power Dissipation	0.15	W
$T_J, T_{STG}$	Operating Junction and Storage Temperature Range	-55 To 150	$^\circ\text{C}$
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient <sup>(Note 2)</sup>	850	$^\circ\text{C/W}$



**Electrical Characteristics (T<sub>J</sub>=25 °C, unless otherwise noted)**

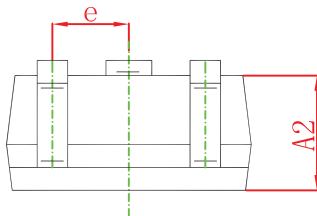
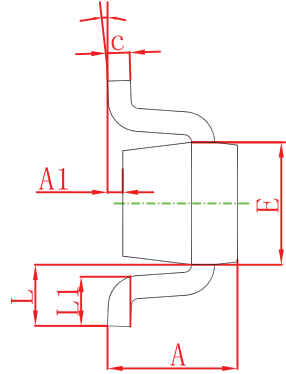
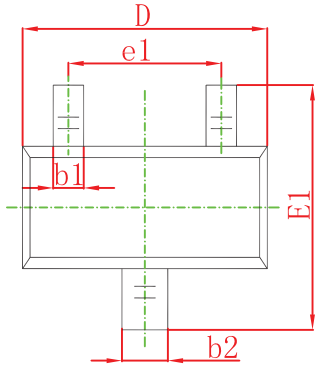
Parameter	Symbol	Test conditions	Min	Typ	Max	Unit	
<b>STATIC CHARACTERISTIC</b>							
Drain-source breakdown voltage	V <sub>(BR)DSS</sub>	V <sub>GS</sub> = 0V, I <sub>D</sub> =250μA	20			V	
Zero gate voltage drain current	I <sub>DSS</sub>	V <sub>DS</sub> =20V, V <sub>GS</sub> = 0V			1	μA	
Gate-body leakage current	I <sub>GSS</sub>	V <sub>GS</sub> =±8V, V <sub>DS</sub> = 0V			±10	μA	
Gate threshold voltage (note2)	V <sub>GS(th)</sub>	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250μA	0.5	0.7	1.0	V	
Drain-source on-resistance (note2)	R <sub>DS(on)</sub>	V <sub>GS</sub> =4.5V, I <sub>D</sub> =0.5A		0.18	0.25	Ω	
		V <sub>GS</sub> =2.5V, I <sub>D</sub> =0.5A		0.27	0.36	Ω	
Maximum Continuous Drain to Source Diode Forward Current	I <sub>S</sub>	--			0.8	A	
Maximum Pulsed Drain to Source Diode Forward Current	I <sub>SM</sub>	--			1.2	A	
Diode forward voltage	V <sub>SD</sub>	I <sub>S</sub> =0.5A, V <sub>GS</sub> =0V			1.2	V	
<b>DYNAMIC CHARACTERISTICS (note4)</b>							
Input capacitance	C <sub>iss</sub>	V <sub>DS</sub> =16V, V <sub>GS</sub> =0V, f =1MHz		50		pF	
Output capacitance	C <sub>oss</sub>				7		pF
Reverse transfer capacitance	C <sub>rss</sub>				4.5		pF
<b>SWITCHING CHARACTERISTICS (note4)</b>							
Turn-on delay time (note3)	t <sub>d(on)</sub>	V <sub>GS</sub> =4.5V, V <sub>DS</sub> =10V, R <sub>L</sub> =10Ω		2		nS	
Turn-on rise time (note3)	t <sub>r</sub>				32		nS
Turn-off delay time (note3)	t <sub>d(off)</sub>				47		nS
Turn-off fall time (note3)	t <sub>f</sub>				22		nS

Notes:

1. Surface mounted on FR4 board using the minimum recommended pad size.
2. Pulse Test : Pulse Width=300μs, Duty Cycle=2%.
3. Switching characteristics are independent of operating junction temperatures.
4. Guaranteed by design, not subject to producing.

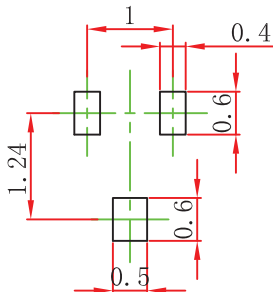


### SOT-523(SC-89) Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.700	0.900	0.028	0.035
A1	0.000	0.100	0.000	0.004
A2	0.700	0.800	0.028	0.031
b1	0.150	0.250	0.006	0.010
b2	0.250	0.350	0.010	0.014
c	0.100	0.200	0.004	0.008
D	1.500	1.700	0.059	0.067
E	0.700	0.900	0.028	0.035
E1	1.450	1.750	0.057	0.069
e	0.500 TYP.		0.020 TYP.	
e1	0.900	1.100	0.035	0.043
L	0.400 REF.		0.016 REF.	
L1	0.260	0.460	0.010	0.018
θ	0°	8°	0°	8°

### SOT-523(SC-89) Suggested Pad Layout



- Note:
1. Controlling dimension: in millimeters.
  2. General tolerance:  $\pm 0.05$ mm.
  3. The pad layout is for reference purposes only.



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