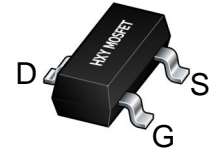




Description

The SI1013X-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.



SOT-523

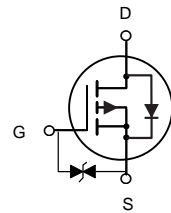
General Features

$V_{DS} = -20V$ $I_D = -0.66A$

$R_{DS(ON)} < 560\text{ m}\Omega @ V_{GS} = -4.5V$

$R_{DS(ON)} < 780\text{ m}\Omega @ V_{GS} = -2.5V$

ESD Rating: 1500V HBM



P-Channel MOSFET

Application

Battery protection

Load switch

Uninterruptible power supply

Package Marking and Ordering Information

| Product ID | Pack | Brand | Qty(PCS) |
|----------------|---------|------------|----------|
| SI1013X-T1-GE3 | SOT-523 | 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 | ± 12 | V |
| I_D | Drain Current-Continuous | -0.66 | A |
| P_D | Maximum Power Dissipation | 150 | mW |
| T_J, T_{STG} | Operating Junction and Storage Temperature Range | -55 To 150 | $^\circ\text{C}$ |
| $R_{\theta JA}$ | Thermal Resistance, Junction-to-Ambient ^(Note 2) | 833 | $^\circ\text{C/W}$ |



Electrical Characteristics (T_J=25°C, unless otherwise noted)

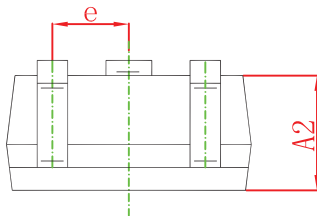
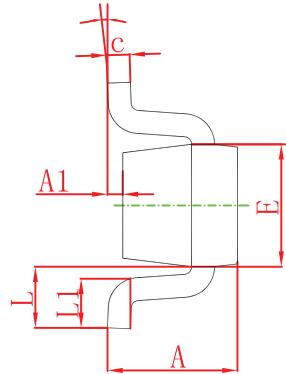
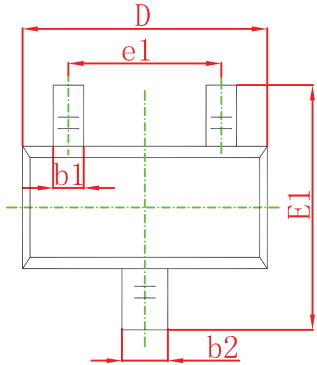
| Parameter | Symbol | Test conditions | Min | Typ | Max | Unit |
|--|----------------------|---|------|------|------|------|
| STATIC CHARACTERISTICE | | | | | | |
| Drain-source breakdown voltage | V _{(BR)DSS} | V _{GS} = 0V, I _D = -250μA | -20 | | | V |
| Zero gate voltage drain current | I _{DSS} | V _{DS} = -20V, V _{GS} = 0V | | | -1 | μA |
| Gate-body leakage current | I _{GSS} | V _{GS} = ±10V, V _{DS} = 0V | | | ±10 | μA |
| Gate threshold voltage (note2) | V _{GS(th)} | V _{DS} = V _{GS} , I _D = -250μA | -0.4 | -0.7 | -1.0 | V |
| Drain-source on-resistance (note2) | R _{DS(on)} | V _{GS} = -4.5V, I _D = -0.5A | | | 0.56 | Ω |
| | | V _{GS} = -2.5V, I _D = -0.2A | | | 0.78 | Ω |
| Maximum Continuous Drain to Source Diode Forward Current | I _S | -- | | | -0.6 | A |
| Maximum Pulsed Drain to Source Diode Forward Current | I _{SM} | -- | | | -1.2 | A |
| Diode forward voltage | V _{SD} | I _S = -0.5A, V _{GS} = 0V | | | -1.2 | V |
| DYNAMIC CHARACTERISTICS (note4) | | | | | | |
| Input capacitance | C _{iss} | V _{DS} = -16V, V _{GS} = 0V, f = 1MHz | | 115 | | pF |
| Output capacitance | C _{oss} | | | 15 | | pF |
| Reverse transfer capacitance | C _{rss} | | | 9 | | pF |
| SWITCHING CHARACTERISTICS (note4) | | | | | | |
| Turn-on delay time (note3) | t _{d(on)} | V _{GS} = -4.5V, V _{DS} = -10V, I _D = -200mA, R _{GEN} = 10Ω | | 9 | | nS |
| Turn-on rise time (note3) | t _r | | | 6 | | nS |
| Turn-off delay time (note3) | t _{d(off)} | | | 33 | | nS |
| Turn-off fall time (note3) | t _f | | | 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.

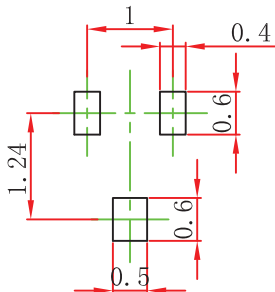


SOT-523 Package Information



| 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 Suggested Pad Layout



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



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