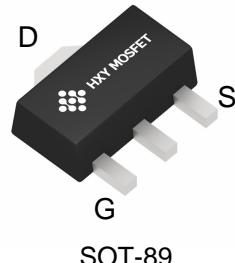




## Description

The HXY8N10SI uses advanced trench technology to provide excellent  $R_{DS(ON)}$ , low gate charge and operation with gate voltages as low as 4.5V. This device is suitable for use as a Battery protection or in other Switching application.



SOT-89

## General Features

$V_{DS} = 100V$   $I_D = 8A$

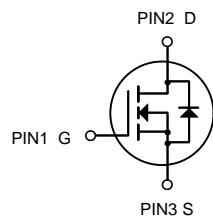
$R_{DS(ON)} < 125m\Omega$  @  $V_{GS}=10V$

## Application

Battery protection

Load switch

Uninterruptible power supply



N-Channel MOSFET

## Package Marking and Ordering Information

| Product ID | Pack   | Marking | Qty(PCS) |
|------------|--------|---------|----------|
| HXY8N10SI  | SOT-89 | 8N10    | 1000     |

## Absolute Maximum Ratings ( $T_C=25^\circ C$ unless otherwise specified )

| Symbol                 | Parameter   | Rating     | Units        |
|------------------------|---|------------|--------------|
| $V_{DS}$               | Drain-Source Voltage  | 100        | V            |
| $V_{GS}$               | Gate-Source Voltage   | $\pm 20$   | V            |
| $I_D @ T_A=25^\circ C$ | Continuous Drain Current, $V_{GS} @ 10V^1$                      | 8          | A            |
| $I_D @ T_A=70^\circ C$ | Continuous Drain Current, $V_{GS} @ 10V^1$                      | 5          | A            |
| $I_{DM}$               | Pulsed Drain Current <sup>2</sup>                               | 20         | A            |
| $P_D @ T_A=25^\circ C$ | Total Power Dissipation <sup>4</sup>                            | 9.3        | W            |
| $T_{STG}$              | Storage Temperature Range                                       | -55 to 150 | $^\circ C$   |
| $T_J$                  | Operating Junction Temperature Range                            | -55 to 150 | $^\circ C$   |
| $R_{\theta JA}$        | Thermal Resistance Junction-ambient (Steady State) <sup>1</sup> | 13.5       | $^\circ C/W$ |



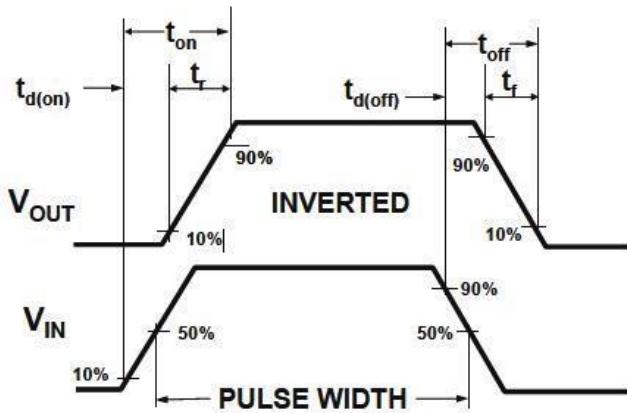
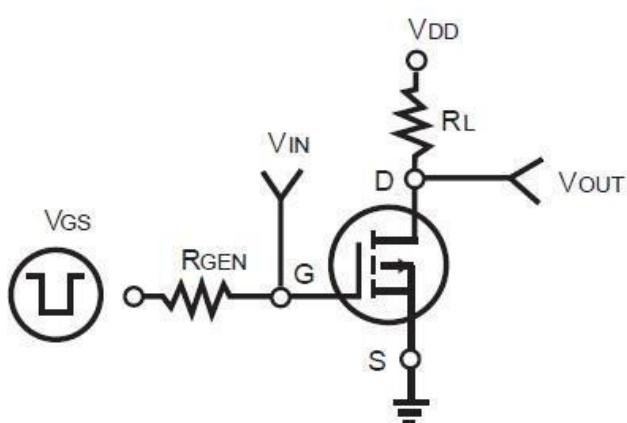
**Electrical Characteristics (T<sub>A</sub>=25°C unless otherwise noted)**

| Symbol                                    | Parameter                          | Conditions  | Min | Typ  | Max  | Unit |
|---|------------------------------------|---|-----|------|------|------|
| <b>On/Off States</b>                      |                                    |   |     |      |      |      |
| BV <sub>DSS</sub>                         | Drain-Source Breakdown Voltage     | V <sub>GS</sub> =0V I <sub>D</sub> =250μA   | 100 |      |      | V    |
| I <sub>DSS</sub>                          | Zero Gate Voltage Drain Current    | V <sub>DS</sub> =100V, V <sub>GS</sub> =0V  |     |      | 100  | μA   |
| I <sub>GSS</sub>                          | Gate-Body Leakage Current          | V <sub>GS</sub> =±20V, V <sub>DS</sub> =0V  |     |      | ±100 | nA   |
| V <sub>GS(th)</sub>                       | Gate Threshold Voltage             | V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250μA  | 1   | 1.5  | 3    | V    |
| R <sub>DSON</sub>                         | Drain-Source On-State Resistance   | V <sub>GS</sub> =10V, I <sub>D</sub> = 5A   |     | 114  | 125  | mΩ   |
|   |                                    | V <sub>GS</sub> =4.5V, I <sub>D</sub> =-5A  |     | 120  | 135  | mΩ   |
| <b>Dynamic Characteristics</b>            |                                    |   |     |      |      |      |
| C <sub>iss</sub>                          | Input Capacitance                  | V <sub>DS</sub> =25V, V <sub>GS</sub> =0V, f=1.0MHz   |     | 690  |      | pF   |
| C <sub>oss</sub>                          | Output Capacitance                 |   |     | 120  |      | pF   |
| C <sub>rss</sub>                          | Reverse Transfer Capacitance       |   |     | 90   |      | pF   |
| <b>Switching Times</b>                    |                                    |   |     |      |      |      |
| t <sub>d(on)</sub>                        | Turn-on Delay Time                 | V <sub>DD</sub> =15V, I <sub>D</sub> =1A, R <sub>L</sub> =15<br>V <sub>GS</sub> =10V, R <sub>G</sub> =2.5 |     | 11   |      | ns   |
| t <sub>r</sub>                            | Turn-on Rise Time                  |   |     | 7.4  |      | ns   |
| t <sub>d(off)</sub>                       | Turn-Off Delay Time                |   |     | 35   |      | ns   |
| t <sub>f</sub>                            | Turn-Off Fall Time                 |   |     | 9.1  |      | ns   |
| Q <sub>g</sub>                            | Total Gate Charge                  | V <sub>DS</sub> =15V, I <sub>D</sub> =10A V <sub>GS</sub> =10V  |     | 15.5 |      | nC   |
| Q <sub>gs</sub>                           | Gate-Source Charge                 |   |     | 3.2  |      | nC   |
| Q <sub>gd</sub>                           | Gate-Drain Charge                  |   |     | 4.7  |      | nC   |
| <b>Source-Drain Diode Characteristics</b> |                                    |   |     |      |      |      |
| I <sub>SD</sub>                           | Source-Drain Current(Body Diode)   |   |     |      | 20   | A    |
| V <sub>SD</sub>                           | Forward on Voltage <b>(Note 1)</b> | V <sub>GS</sub> =0V, I <sub>S</sub> =2A   |     |      | 0.8  | V    |

Notes 1. Repetitive Rating: Pulse width limited by maximum junction temperature.



### Switch Time Test Circuit and Switching Waveforms:



### Typical Electrical And Thermal Characteristics (Curves)

Figure1. Output Characteristics

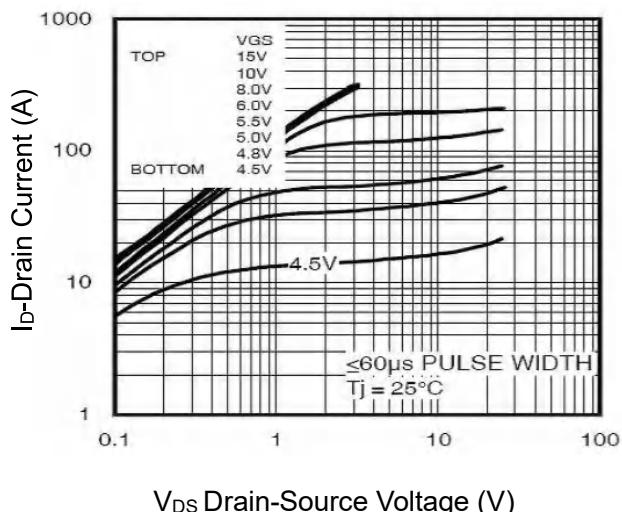


Figure2. Transfer Characteristics

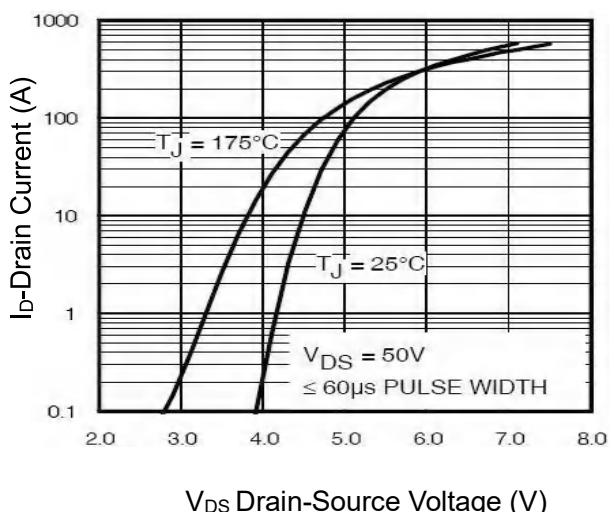


Figure3. BVDSS vs Junction Temperature

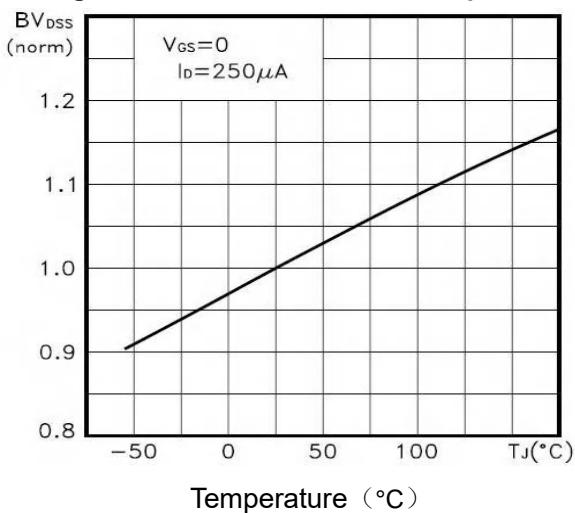


Figure4. ID vs Junction Temperature

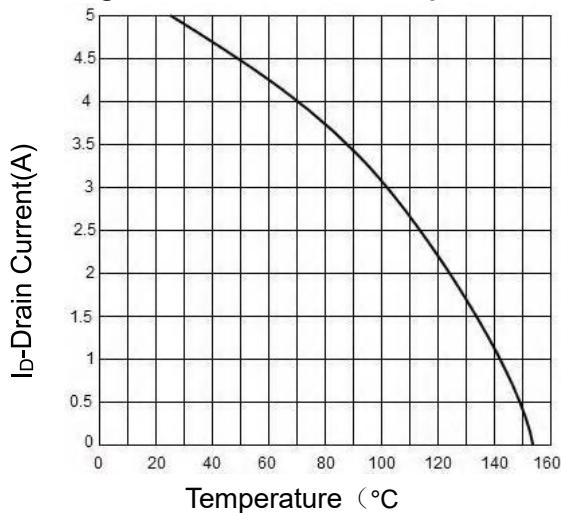




Figure5. VGS(th) vs Junction Temperature

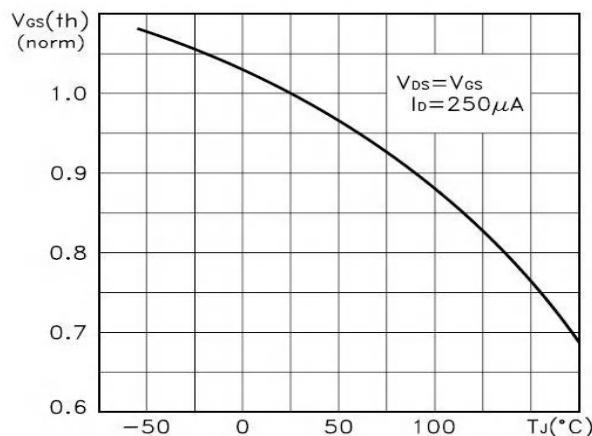


Figure6. Rdson Vs Junction Temperature

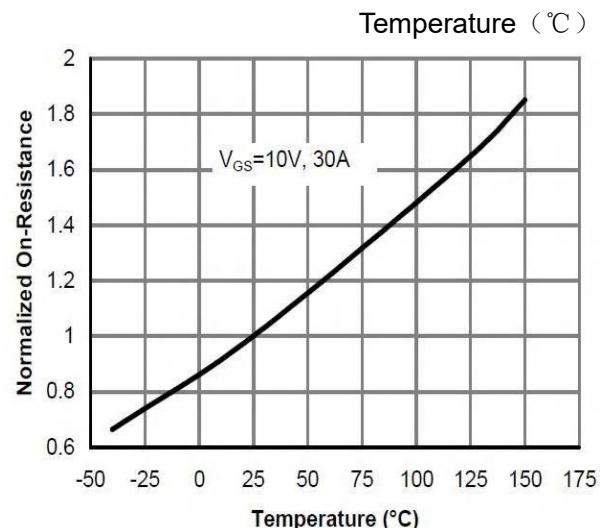


Figure7. Gate Charge

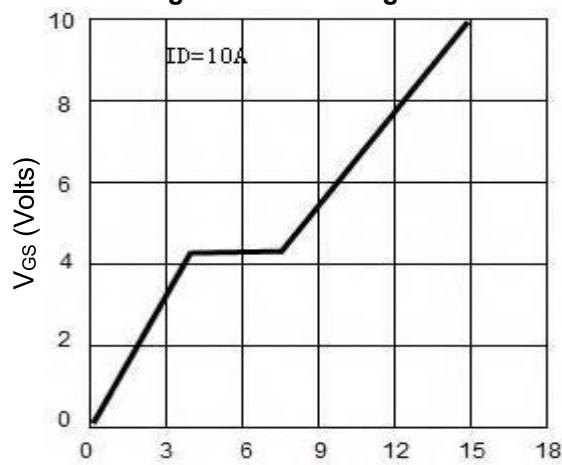
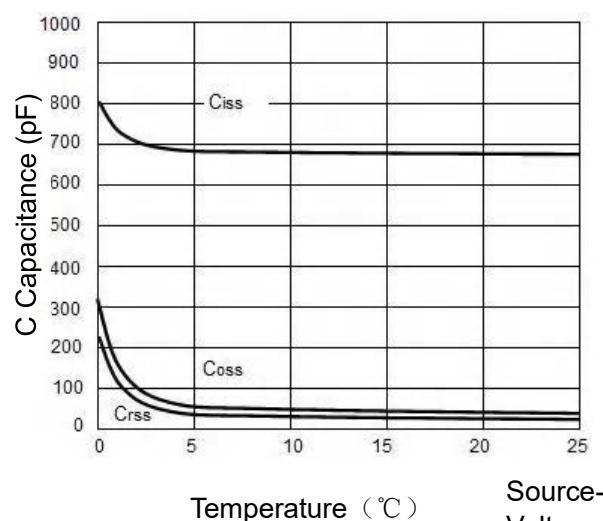
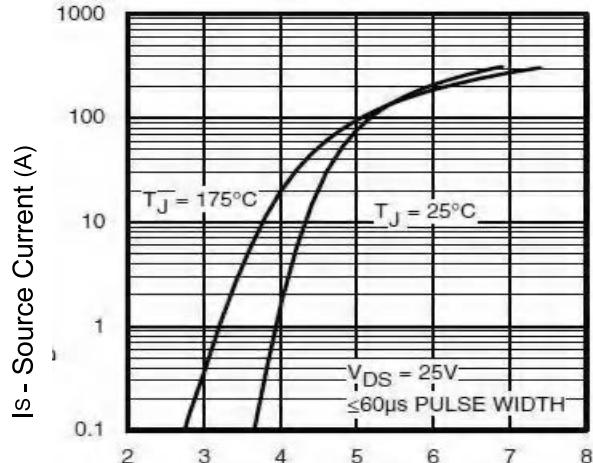


Figure8. Capacitance vs Vds



V<sub>SD</sub>  
Drain  
(V) V<sub>DS</sub> V<sub>DS</sub> Drain-Source Voltage (V)  
Source

Figure9. Source- Drain Diode Forward



Source-  
Voltage  
Drain-

Temperature (°C)

V<sub>DS</sub>

Figure10. Safe Operation Area

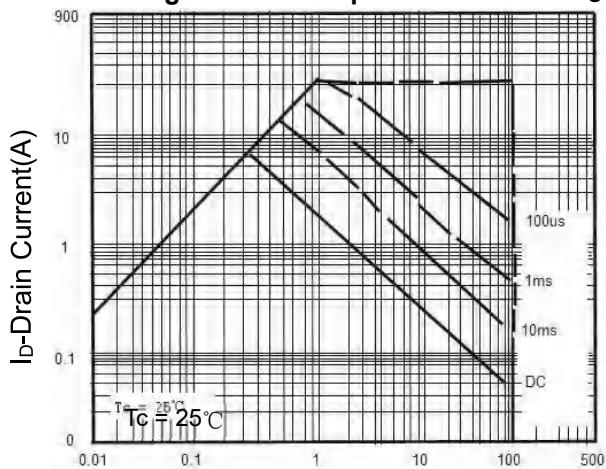
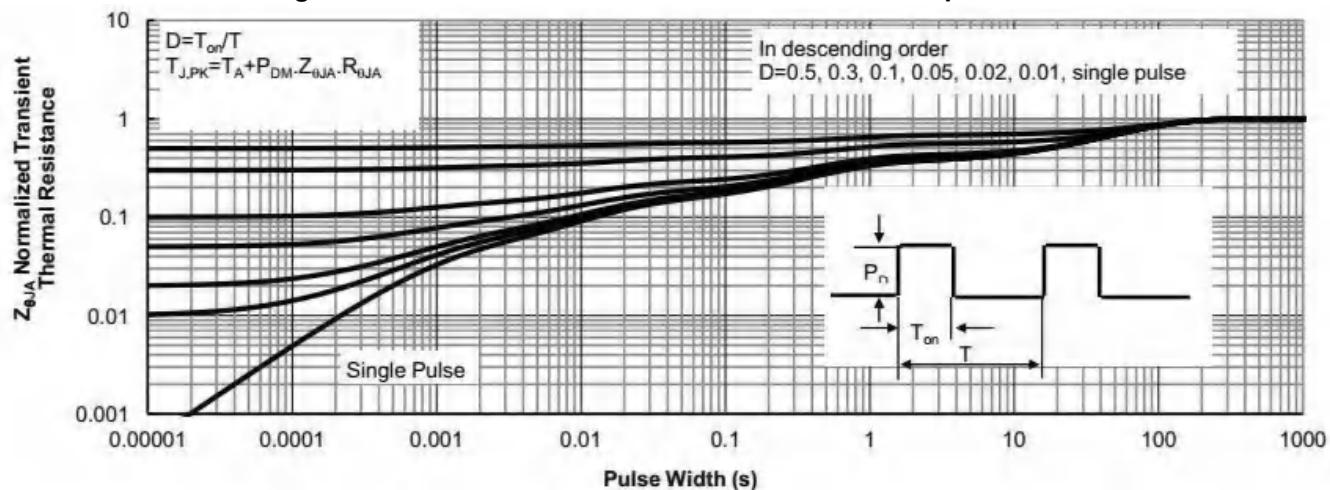


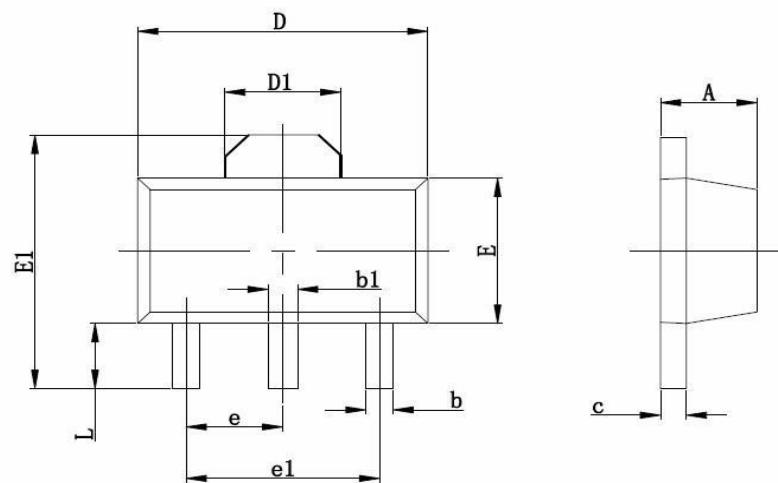


Figure11. Normalized Maximum Transient Thermal Impedance





### SOT-89 Package Outline Dimensions



| Symbol | Dimensions In Millimeters |       | Dimensions In Inches |       |
|--------|---------------------------|-------|----------------------|-------|
|        | Min                       | Max   | Min                  | Max   |
| A      | 1.400                     | 1.600 | 0.055                | 0.063 |
| b      | 0.350                     | 0.520 | 0.013                | 0.197 |
| b1     | 0.400                     | 0.580 | 0.016                | 0.023 |
| c      | 0.350                     | 0.440 | 0.014                | 0.017 |
| D      | 4.400                     | 4.600 | 0.173                | 0.181 |
| D1     | 1.550 REF                 |       | 0.061 REF            |       |
| E      | 2.350                     | 2.550 | 0.091                | 0.102 |
| E1     | 3.940                     | 4.250 | 0.155                | 0.167 |
| e      | 1.500 TYP                 |       | 0.060 TYP            |       |
| e1     | 3.000 TYP                 |       | 0.118 TYP            |       |
| L      | 0.900                     | 1.100 | 0.035                | 0.047 |



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