



## Description

The HRU1L002SNTL 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

$V_{DS} = 60V$   $I_D = 0.115A$

$R_{DS(ON)} < 3\Omega @ V_{GS}=10V$

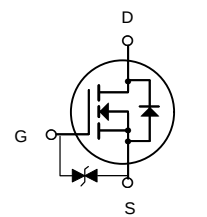
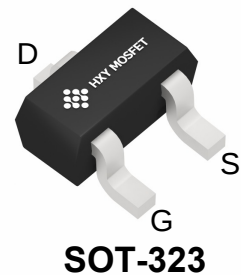
ESD Rating: HBM  $\geq 2000V$

## Application

Battery protection

Load switch

Uninterruptible power supply



N-Channel MOSFET

## Package Marking and Ordering Information

| Product ID   | Pack    | Marking | Qty(PCS) |
|--------------|---------|---------|----------|
| HRU1L002SNTL | SOT-323 | 72K     | 3000     |

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

| Symbol          | Parameter                                                   | Limit      | Unit          |
|-----------------|-------------------------------------------------------------|------------|---------------|
| $V_{DS}$        | Drain-Source Voltage                                        | 60         | V             |
| $V_{GS}$        | Gate-Source Voltage                                         | $\pm 20$   | V             |
| $I_D$           | Drain Current-Continuous                                    | 0.115      | A             |
| $P_D$           | Maximum Power Dissipation                                   | 0.2        | W             |
| $T_J, T_{STG}$  | Operating Junction and Storage Temperature Range            | -55 To 150 | $^{\circ}C$   |
| $R_{\theta JA}$ | Thermal Resistance, Junction-to-Ambient <sup>(Note 2)</sup> | 625        | $^{\circ}C/W$ |



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

| Parameter                       | Symbol               | Test conditions                                           | Min  | Typ | Max   | Unit |
|---------------------------------|----------------------|-----------------------------------------------------------|------|-----|-------|------|
| Drain-Source Breakdown Voltage  | V <sub>(BR)DSS</sub> | V <sub>GS</sub> =0 V, I <sub>D</sub> =250 μA              | 60   |     |       | V    |
| Gate-Threshold Voltage          | V <sub>(GS)th</sub>  | V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250 μA | 1    | 1.6 | 2.5   |      |
| Gate-body Leakage               | I <sub>GSS</sub>     | V <sub>DS</sub> =0 V, V <sub>GS</sub> =±20 V              |      |     | ±80   | nA   |
| Zero Gate Voltage Drain Current | I <sub>DSS</sub>     | V <sub>DS</sub> =60 V, V <sub>GS</sub> =0 V               |      |     | 80    | nA   |
| On-state Drain Current          | I <sub>D(on)</sub>   | V <sub>GS</sub> =10 V, V <sub>DS</sub> =7 V               | 500  |     |       | mA   |
| Drain-Source On-Resistance      | R <sub>DS(on)</sub>  | V <sub>GS</sub> =10 V, I <sub>D</sub> =115mA              |      | 1.3 | 3     | Ω    |
|                                 |                      | V <sub>GS</sub> =4.5V, I <sub>D</sub> =50mA               |      | 2   | 5     |      |
| Forward Trans conductance       | g <sub>fs</sub>      | V <sub>DS</sub> =10 V, I <sub>D</sub> =200mA              | 80   |     |       | ms   |
| Drain-source on-voltage         | V <sub>DS(on)</sub>  | V <sub>GS</sub> =10V, I <sub>D</sub> =500mA               |      |     | 3.75  | V    |
|                                 |                      | V <sub>GS</sub> =5V, I <sub>D</sub> =50mA                 |      |     | 0.375 | V    |
| Diode Forward Voltage           | V <sub>SD</sub>      | I <sub>S</sub> =115mA, V <sub>GS</sub> =0 V               | 0.55 |     | 1.2   | V    |
| Input Capacitance *             | C <sub>iss</sub>     | V <sub>DS</sub> =25V, V <sub>GS</sub> =0V, f=1MHz         |      |     | 50    | pF   |
| Output Capacitance *            | C <sub>oss</sub>     |                                                           |      |     | 25    |      |
| Reverse Transfer Capacitance *  | C <sub>rss</sub>     |                                                           |      |     | 5     |      |

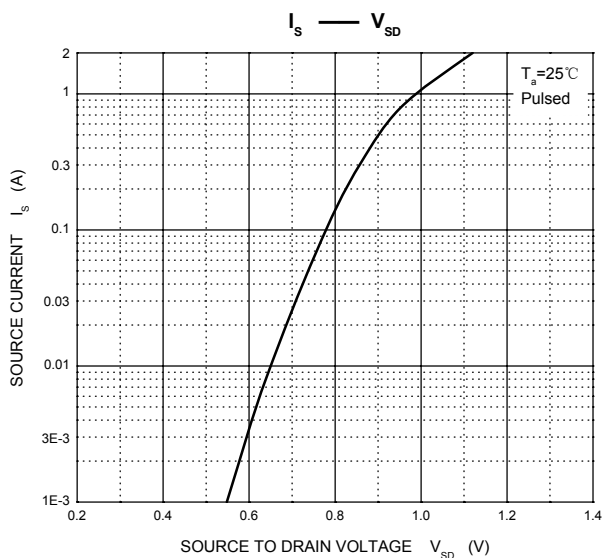
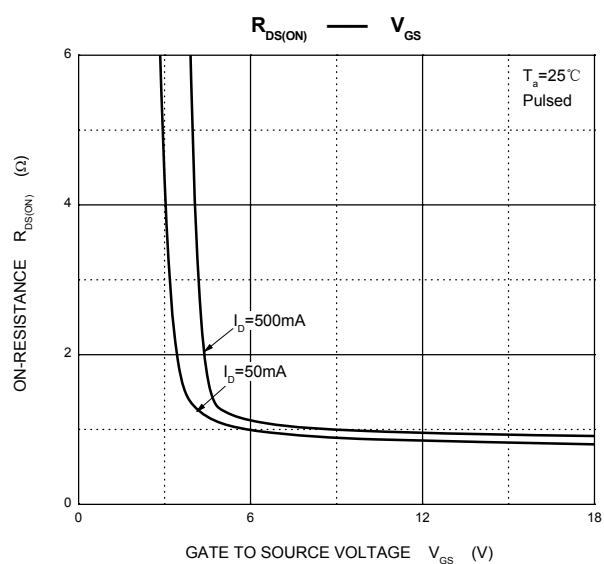
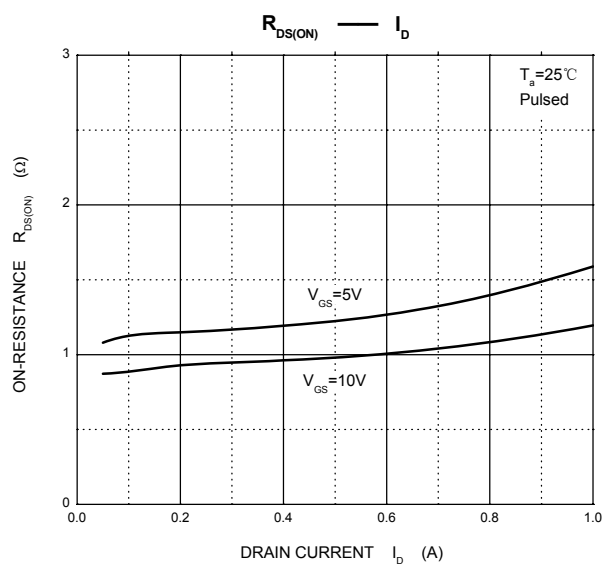
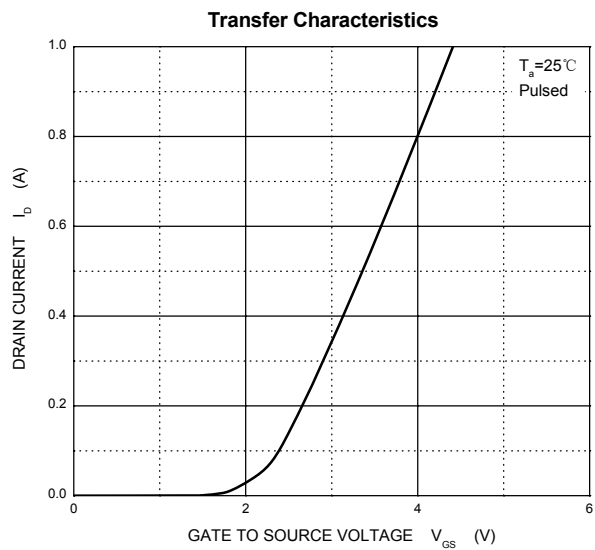
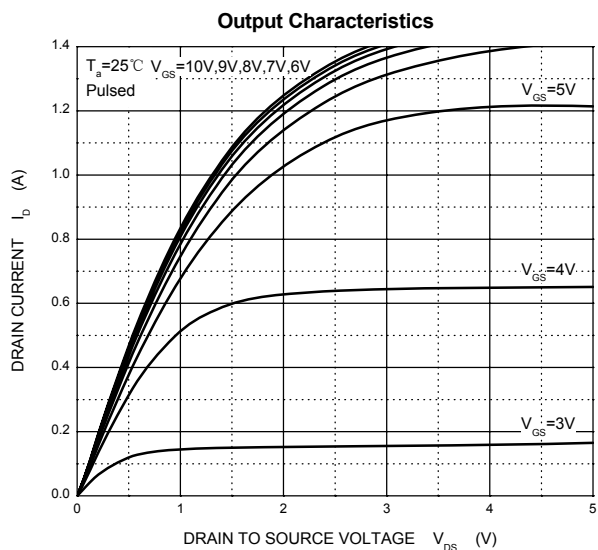
**Switching Time**

|                |                     |                                                                                                                     |  |  |    |    |
|----------------|---------------------|---------------------------------------------------------------------------------------------------------------------|--|--|----|----|
| Turn-on Time * | t <sub>d(on)</sub>  | V <sub>DD</sub> =25 V, R <sub>L</sub> =50Ω,<br>I <sub>D</sub> =500mA, V <sub>GEN</sub> =10 V<br>R <sub>G</sub> =25Ω |  |  | 20 | ns |
| Turn-off Time* | t <sub>d(off)</sub> |                                                                                                                     |  |  | 40 |    |

\*These parameters have no way to verify.

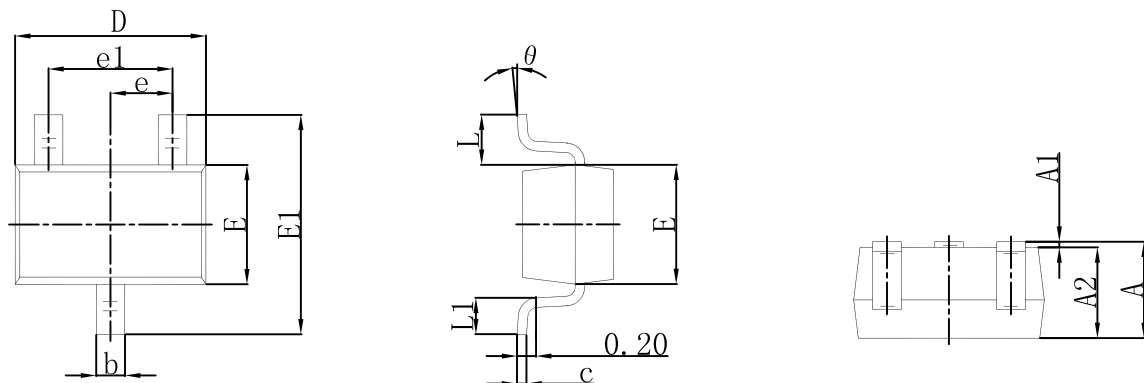


## Typical Characteristics





## SOT-323 Package Outline Dimensions



| Symbol | Dimensions In Millimeters |       | Dimensions In Inches |       |
|--------|---------------------------|-------|----------------------|-------|
|        | Min                       | Max   | Min                  | Max   |
| A      | 0.900                     | 1.100 | 0.035                | 0.043 |
| A1     | 0.000                     | 0.100 | 0.000                | 0.004 |
| A2     | 0.900                     | 1.000 | 0.035                | 0.039 |
| b      | 0.200                     | 0.400 | 0.008                | 0.016 |
| c      | 0.080                     | 0.150 | 0.003                | 0.006 |
| D      | 2.000                     | 2.200 | 0.079                | 0.087 |
| E      | 1.150                     | 1.350 | 0.045                | 0.053 |
| E1     | 2.150                     | 2.450 | 0.085                | 0.096 |
| e      | 0.650 TYP                 |       | 0.026 TYP            |       |
| e1     | 1.200                     | 1.400 | 0.047                | 0.055 |
| L      | 0.525 REF                 |       | 0.021 REF            |       |
| L1     | 0.260                     | 0.460 | 0.010                | 0.018 |
| K      | 0°                        | 8°    | 0°                   | 8°    |



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