



## Description

The HXY70N07D can be used in various power switching circuit for system miniaturization and higher efficiency. The package form is TO-252-2L, which accords with the RoHS standard.

## General Features

$V_{DS} = 70V$   $I_D = 70A$

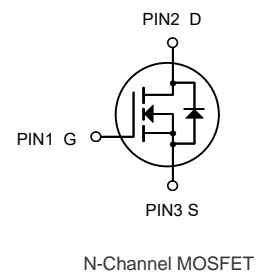
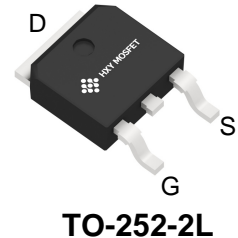
$R_{DS(ON)} < 8.6m\Omega$  @  $V_{GS}=10V$

## Application

Battery protection

Load switch

Uninterruptible power supply



## Package Marking and Ordering Information

| Product ID | Pack      | Brand      | Qty(PCS) |
|------------|-----------|------------|----------|
| HXY70N07D  | TO-252-2L | HXY MOSFET | 2500     |

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

| Symbol                 | Parameter                                | Rating     | Units         |
|------------------------|--|------------|---------------|
| $V_{DS}$               | Drain-Source Voltage                     | 60         | V             |
| $V_{GS}$               | Gate-Source Voltage                      | $\pm 20$   | V             |
| $I_D@T_c=25^{\circ}C$  | Continuous Drain Current, $V_{GS}$ @ 10V | 70         | A             |
| $I_D@T_c=100^{\circ}C$ | Continuous Drain Current, $V_{GS}$ @ 10V | 52         | A             |
| $I_{DM}$               | Pulsed Drain Current                     | 320        | A             |
| EAS                    | Single Pulse Avalanche Energy            | 121        | mJ            |
| $I_{AS}$               | Avalanche Current                        | 70         | A             |
| $P_D@T_c=25^{\circ}C$  | Total Power Dissipation                  | 116        | 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      | 62         | $^{\circ}C/W$ |
| $R_{\theta JC}$        | Thermal Resistance Junction-Case         | 0.85       | $^{\circ}C/W$ |



**Electrical Characteristics ( $T_J=25^{\circ}\text{C}$ , unless otherwise noted)**

| Symbol       | Parameter  | Conditions                                    | Min | Typ  | Max       | Units      |
|--------------|--|---|-----|------|-----------|------------|
| $BV_{DSS}$   | Drain-Source Breakdown Voltage                       | $V_{GS}=0V, I_D=250\mu A$                     | 70  | ---  | ---       | V          |
| $I_{DSS}$    | Zero Gate Voltage Drain Current                      | $V_{DS}=68V, V_{GS}=0V$                       | --- | ---  | 1         | $\mu A$    |
| $I_{GSS}$    | Gate-Source Leakage Current                          | $V_{GS}=\pm 20V, V_{DS}=0A$                   | --- | ---  | $\pm 100$ | nA         |
| $V_{GS(th)}$ | GATE-Source Threshold Voltage                        | $V_{GS}=V_{DS}, I_D=250\mu A$                 | 2   | ---  | 4         | V          |
| $R_{DS(ON)}$ | Drain-Source On Resistance <sup>2</sup>              | $V_{GS}=10V, I_D=30A$                         | --- | 6.6  | 8.6       | m $\Omega$ |
| $C_{iss}$    | Input Capacitance                                    | $V_{DS}=25V, V_{GS}=0V, f=1MHz$               | --- | 4000 | ---       | pF         |
| $C_{oss}$    | Output Capacitance                                   |   | --- | 258  | ---       |            |
| $C_{rss}$    | Reverse Transfer Capacitance                         |   | --- | 225  | ---       |            |
| $t_{d(on)}$  | Turn-On Delay Time                                   | $V_{DD}=30V, V_{GS}=10V, RG=6\Omega, I_D=20A$ | --- | 13   | ---       | ns         |
| $t_r$        | Rise Time  |   | --- | 90   | ---       | ns         |
| $t_{d(off)}$ | Turn-Off Delay Time                                  |   | --- | 43   | ---       | ns         |
| $t_f$        | Fall Time  |   | --- | 30   | ---       | ns         |
| $Q_g$        | Total Gate Charge                                    | $V_{GS}=10V, V_{DS}=30V, I_D=20A$             | --- | 33   | ---       | nC         |
| $Q_{gs}$     | Gate-Source Charge                                   |   | --- | 8    | ---       | nC         |
| $Q_{gd}$     | Gate-Drain "Miller" Charge                           |   | --- | 7    | ---       | nC         |
| $I_S$        | Continuous Source Current                            | -   | --- | ---  | 70        | A          |
| $I_{SM}$     | Maximum Pulsed Drain to Source Diode Forward Current | -   | --- | ---  | 320       | A          |
| $V_{SD}$     | Diode Forward Voltage <sup>2</sup>                   | $V_{GS}=0V, I_S=80A$                          | --- | ---  | 1.2       | V          |
| $T_{rr}$     | Reverse Recovery Time                                | $I_F=20A, dI/dt=100A/\mu s, T_J=25^{\circ}C$  | --- | 78   | ---       | ns         |
| $Q_{rr}$     | Reverse Recovery Charge                              |   | --- | 51   | ---       | nC         |

**Notes:**

- 1.Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature
- 2.EAS condition :  $T_J=25^{\circ}C, V_{DD}=35V, V_G=10V, L=0.5mH, R_g=25\Omega, I_{AS}=22A$
- 3.Pulse Test: Pulse Width $\leq 300\mu s$ , Duty Cycle $\leq 0.5\%$



## Typical Characteristics

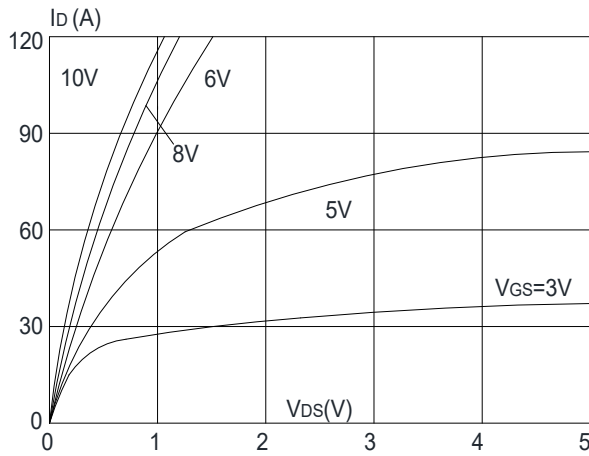


Figure1: Output Characteristics

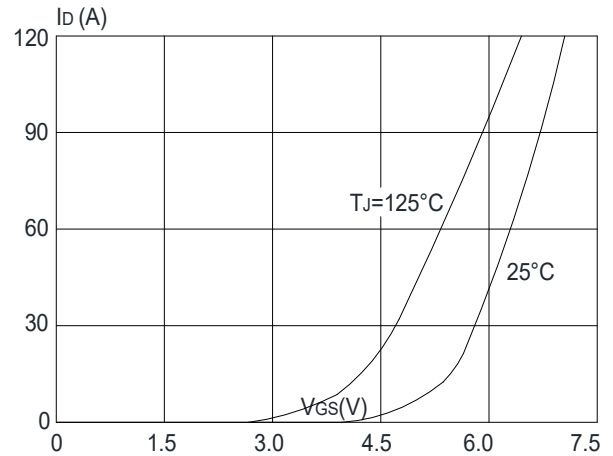


Figure 2: Typical Transfer Characteristics

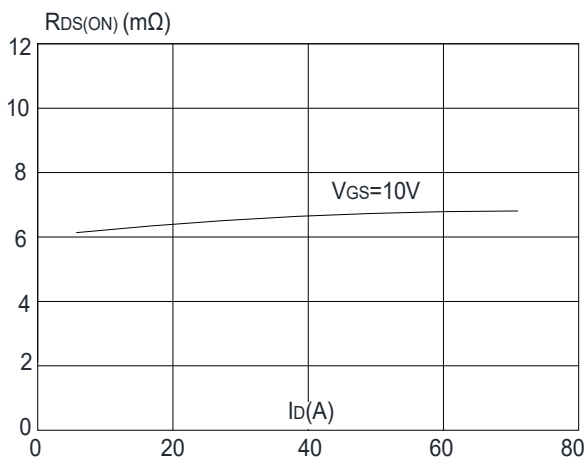


Figure 3: On-resistance vs. Drain Current

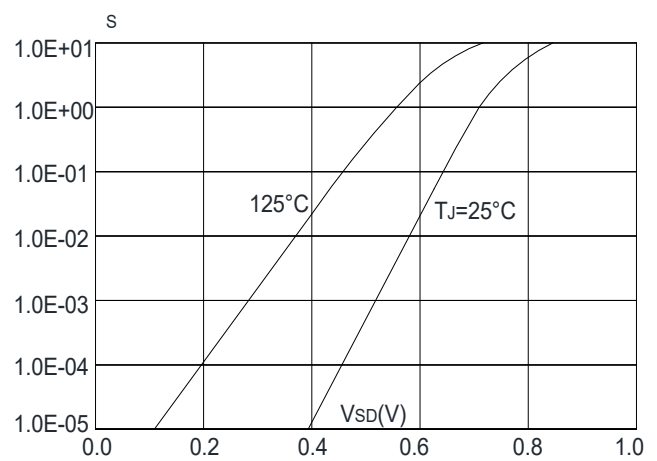


Figure 4: Body Diode Characteristics

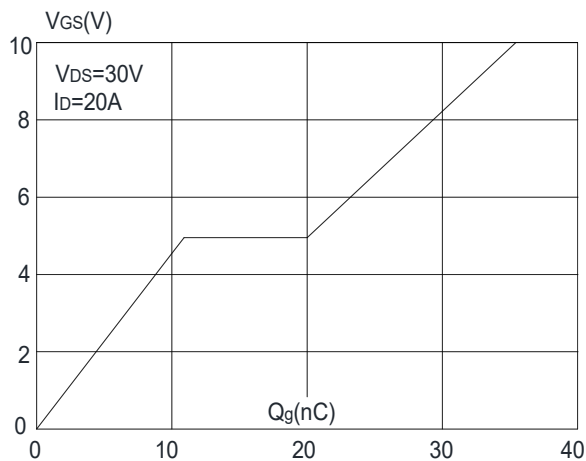


Figure 5: Gate Charge Characteristics

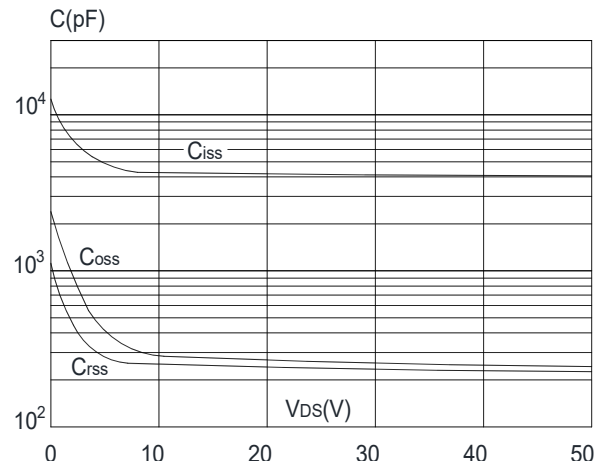
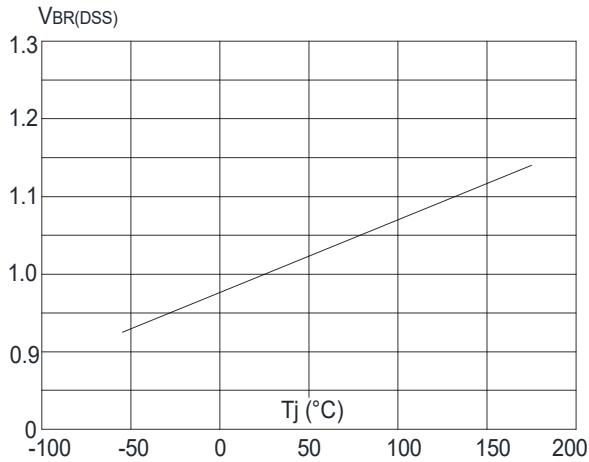
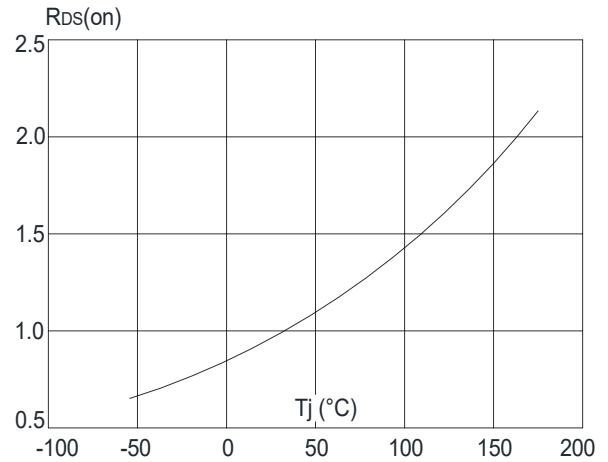


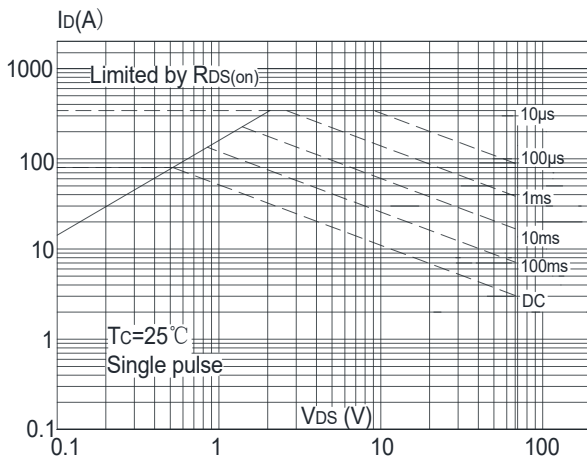
Figure 6: Capacitance Characteristics



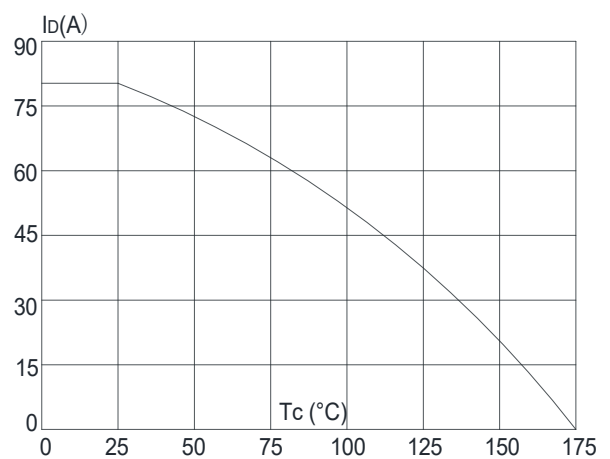
**Figure 7:** Normalized Breakdown Voltage vs. Junction Temperature



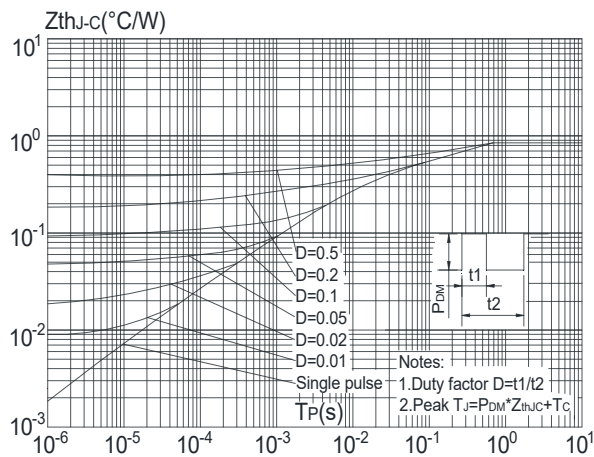
**Figure 8:** Normalized on Resistance vs. Junction Temperature



**Figure 9:** Maximum Safe Operating Area

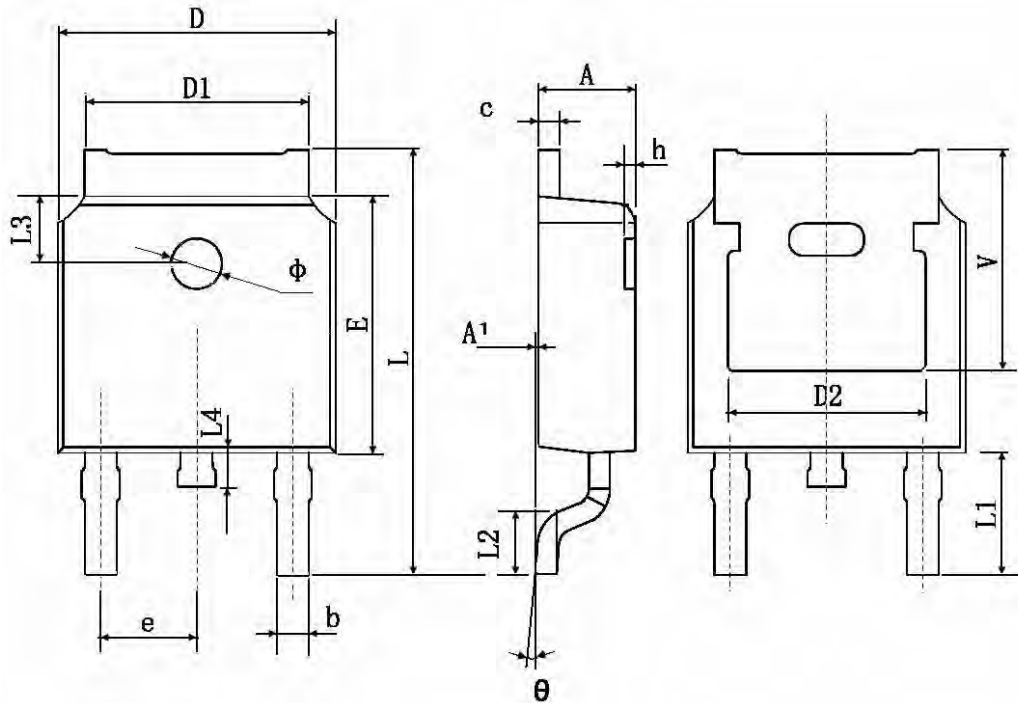


**Figure 10:** Maximum Continuous Drain Current vs. Case Temperature



**Figure.11:** Maximum Effective Transient Thermal Impedance, Junction-to-Case

## TO-252-2L Package Information



| Symbol | Dimensions In Millimeters |        | Dimensions In Inches |       |
|--------|---------------------------|--------|----------------------|-------|
|        | Min.                      | Max.   | Min.                 | Max.  |
| A      | 2.200                     | 2.400  | 0.087                | 0.094 |
| A1     | 0.000                     | 0.127  | 0.000                | 0.005 |
| b      | 0.660                     | 0.860  | 0.026                | 0.034 |
| c      | 0.460                     | 0.580  | 0.018                | 0.023 |
| D      | 6.500                     | 6.700  | 0.256                | 0.264 |
| D1     | 5.100                     | 5.460  | 0.201                | 0.215 |
| D2     | 0.483 TYP.                |        | 0.190 TYP.           |       |
| E      | 6.000                     | 6.200  | 0.236                | 0.244 |
| e      | 2.186                     | 2.386  | 0.086                | 0.094 |
| L      | 9.800                     | 10.400 | 0.386                | 0.409 |
| L1     | 2.900 TYP.                |        | 0.114 TYP.           |       |
| L2     | 1.400                     | 1.700  | 0.055                | 0.067 |
| L3     | 1.600 TYP.                |        | 0.063 TYP.           |       |
| L4     | 0.600                     | 1.000  | 0.024                | 0.039 |
| Φ      | 1.100                     | 1.300  | 0.043                | 0.051 |
| θ      | 0°                        | 8°     | 0°                   | 8°    |
| h      | 0.000                     | 0.300  | 0.000                | 0.012 |
| V      | 5.350 TYP.                |        | 0.211 TYP.           |       |



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