



Description

The HSQD25N0622L 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.



TO-252-2L

General Features

$V_{DS} = 60V$ $I_D = 30A$

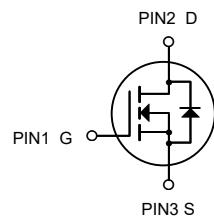
$R_{DS(ON)} < 26m\Omega$ @ $V_{GS}=10V$

Application

Battery protection

Load switch

Uninterruptible power supply



N-Channel MOSFET

Package Marking and Ordering Information

| Product ID | Pack | Brand | Qty(PCS) |
|--------------|-----------|------------|----------|
| HSQD25N0622L | 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 | ± 20 | V |
| $I_D @ T_c=25^\circ C$ | Continuous Drain Current, $V_{GS} @ 10V^1$ | 30 | A |
| $I_D @ T_c=100^\circ C$ | Continuous Drain Current, $V_{GS} @ 10V^1$ | 15 | A |
| I_{DM} | Pulsed Drain Current ² | 46 | A |
| EAS | Single Pulse Avalanche Energy ³ | 25.5 | mJ |
| I_{AS} | Avalanche Current | 22.6 | A |
| $P_D @ T_c=25^\circ C$ | Total Power Dissipation ⁴ | 34.7 | W |
| $P_D @ T_a=25^\circ C$ | Total Power Dissipation ⁴ | 2 | W |
| T_{STG} | Storage Temperature Range | -55 to 150 | °C |
| T_J | Operating Junction Temperature Range | -55 to 150 | °C |
| $R_{\theta JA}$ | Thermal Resistance Junction-Ambient ¹ | 62 | °C/W |
| $R_{\theta JC}$ | Thermal Resistance Junction-Case ¹ | 3.6 | °C/W |



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

| Symbol | Parameter | Conditions | Min. | Typ. | Max. | Unit |
|-------------------------------------|--|--|------|-------|------|-------|
| BV _{DSS} | Drain-Source Breakdown Voltage | V _{GS} =0V, I _D =250uA | 60 | --- | --- | V |
| △BV _{DSS} /△T _J | BV _{DSS} Temperature Coefficient | Reference to 25°C, I _D =1mA | --- | 0.063 | --- | V/°C |
| R _{Ds(ON)} | Static Drain-Source On-Resistance ² | V _{GS} =10V, I _D =15A | --- | 22 | 26 | mΩ |
| | | V _{GS} =4.5V, I _D =10A | --- | 30 | 38 | |
| V _{GS(th)} | Gate Threshold Voltage | V _{GS} =V _{DS} , I _D =250uA | 1.2 | --- | 2.5 | V |
| △V _{GS(th)} | V _{GS(th)} Temperature Coefficient | | --- | -5.24 | --- | mV/°C |
| I _{DSS} | Drain-Source Leakage Current | V _{DS} =48V, V _{GS} =0V, T _J =25°C | --- | --- | 1 | uA |
| | | V _{DS} =48V, V _{GS} =0V, T _J =55°C | --- | --- | 5 | |
| I _{GSS} | Gate-Source Leakage Current | V _{GS} =±20V, V _{DS} =0V | --- | --- | ±100 | nA |
| g _{fs} | Forward Transconductance | V _{DS} =5V, I _D =15A | --- | 17 | --- | S |
| R _g | Gate Resistance | V _{DS} =0V, V _{GS} =0V, f=1MHz | --- | 3.2 | --- | Ω |
| Q _g | Total Gate Charge (4.5V) | V _{DS} =48V, V _{GS} =4.5V, I _D =12A | --- | 12.6 | --- | nC |
| Q _{gs} | Gate-Source Charge | | --- | 3.2 | --- | |
| Q _{gd} | Gate-Drain Charge | | --- | 6.3 | --- | |
| T _{d(on)} | Turn-On Delay Time | V _{DD} =30V, V _{GS} =10V, R _G =3.3, I _D =10A | --- | 8 | --- | ns |
| T _r | Rise Time | | --- | 14.2 | --- | |
| T _{d(off)} | Turn-Off Delay Time | | --- | 24.4 | --- | |
| T _f | Fall Time | | --- | 4.6 | --- | |
| C _{iss} | Input Capacitance | V _{DS} =15V, V _{GS} =0V, f=1MHz | --- | 1378 | --- | pF |
| C _{oss} | Output Capacitance | | --- | 86 | --- | |
| C _{rss} | Reverse Transfer Capacitance | | --- | 64 | --- | |
| I _s | Continuous Source Current ^{1,5} | V _G =V _D =0V, Force Current | --- | --- | 23 | A |
| I _{SM} | Pulsed Source Current ^{2,5} | | --- | --- | 46 | A |
| V _{SD} | Diode Forward Voltage ² | V _{GS} =0V, I _s =1A, T _J =25°C | --- | --- | 1.2 | V |

Note :

- 1.The data tested by surface mounted on a 1 inch² FR-4 board with 2OZ copper.
- 2.The data tested by pulsed, pulse width \leq 300us, duty cycle \leq 2%
- 3.The EAS data shows Max. rating. The test condition is VDD=25V, VGS=10V, L=0.1mH, IAS=22.6A
- 4.The power dissipation is limited by 150°C junction temperature
- 5.The data is theoretically the same as ID and IDM, in real applications, should be limited by total power dissipation.



Typical Characteristics

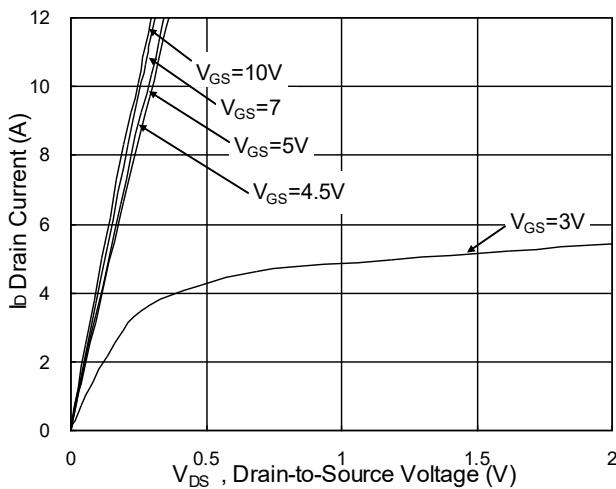


Fig.1 Typical Output Characteristics

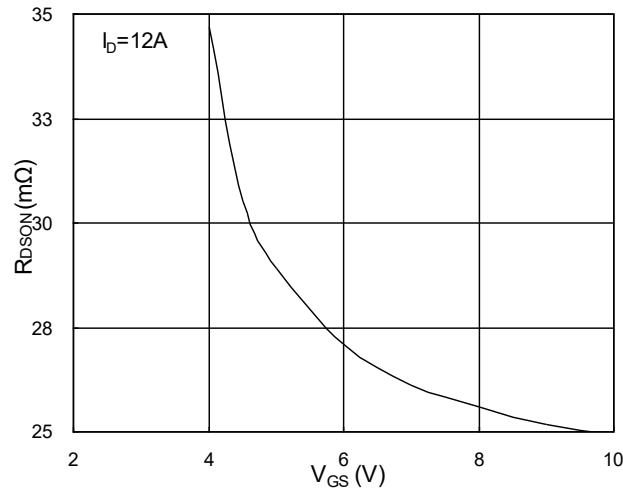


Fig.2 On-Resistance v.s Gate-Source

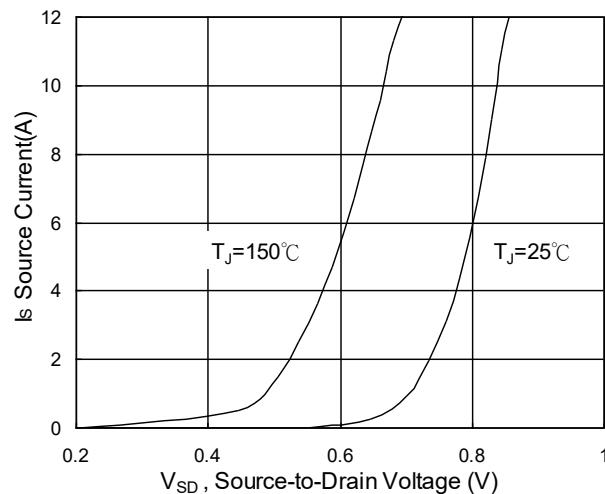


Fig.3 Forward Characteristics of Reverse

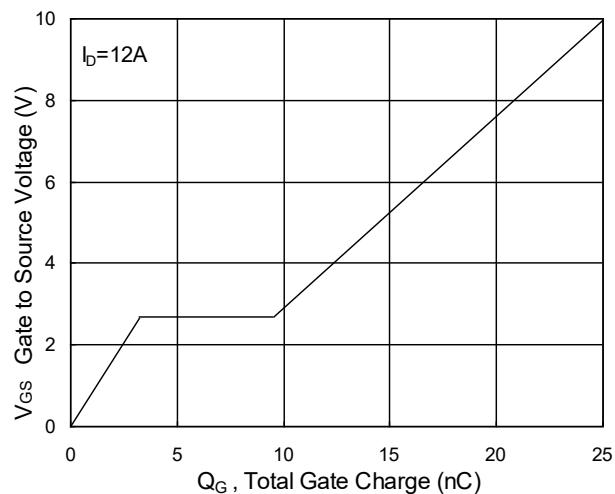


Fig.4 Gate-Charge Characteristics

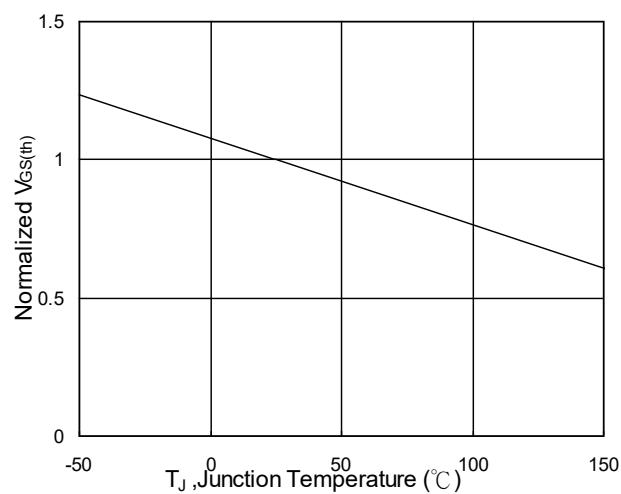


Fig.5 Normalized V_{GS(th)} v.s T_J

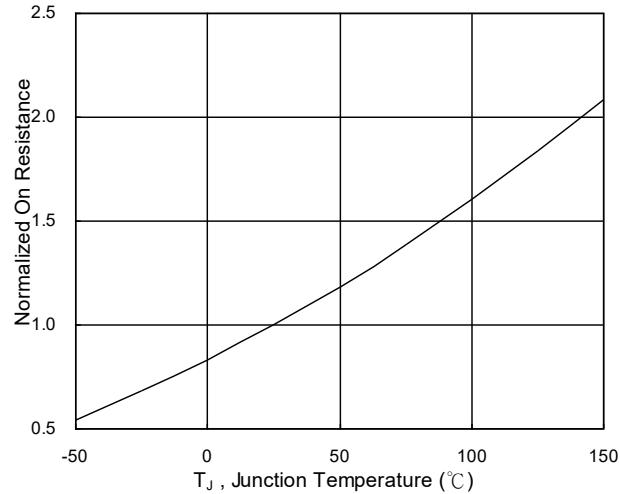


Fig.6 Normalized R_{DS(on)} v.s T_J

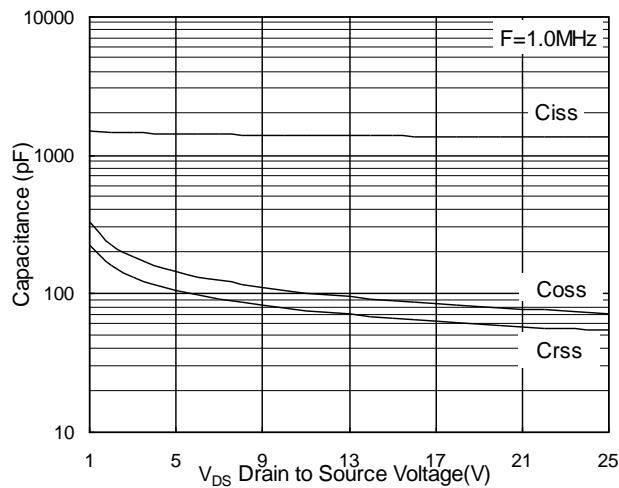


Fig.7 Capacitance

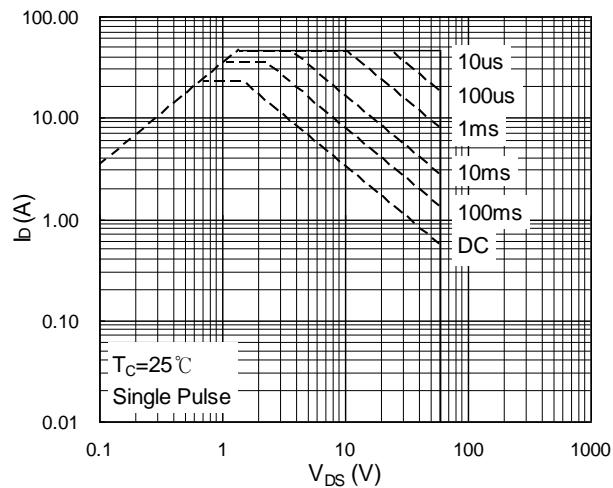


Fig.8 Safe Operating Area

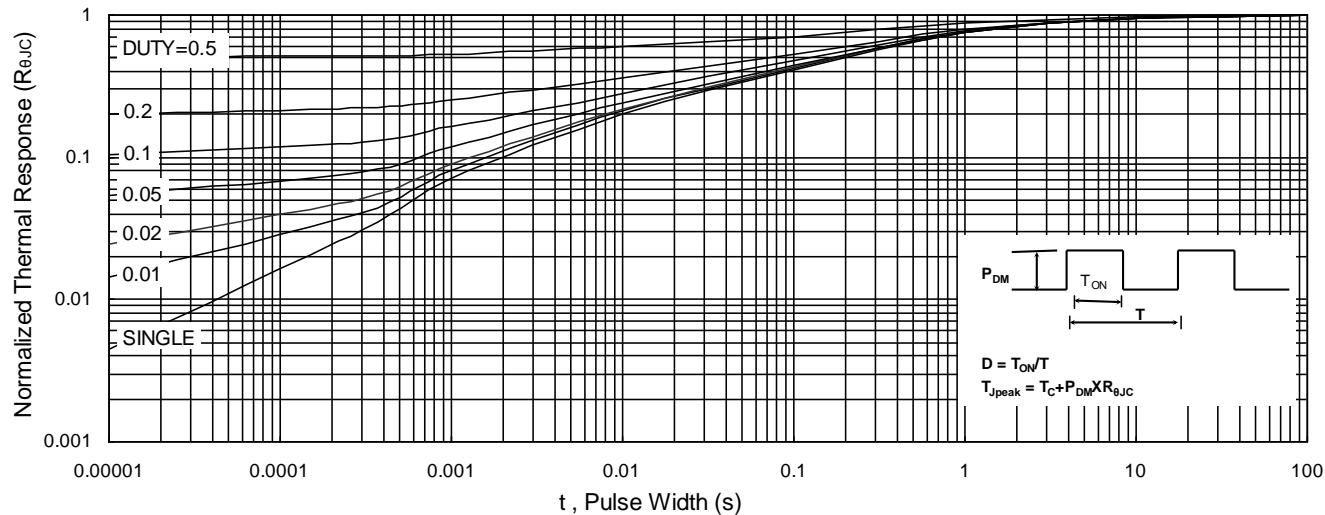


Fig.9 Normalized Maximum Transient Thermal Impedance

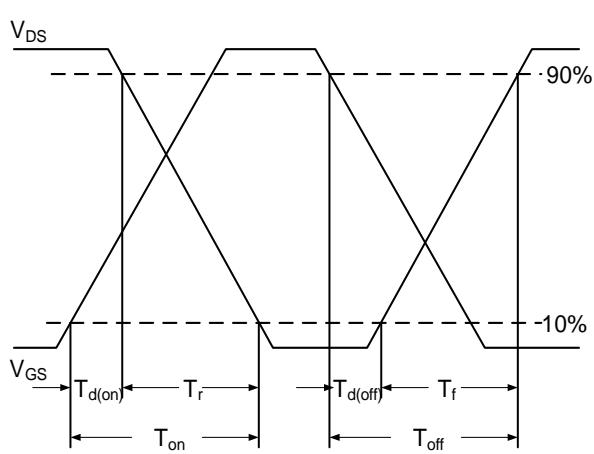


Fig.10 Switching Time Waveform

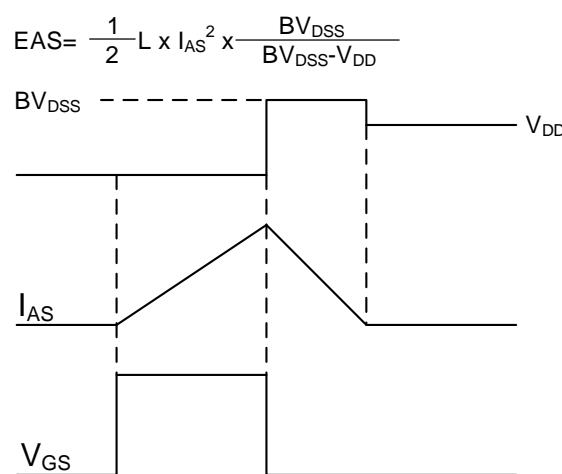
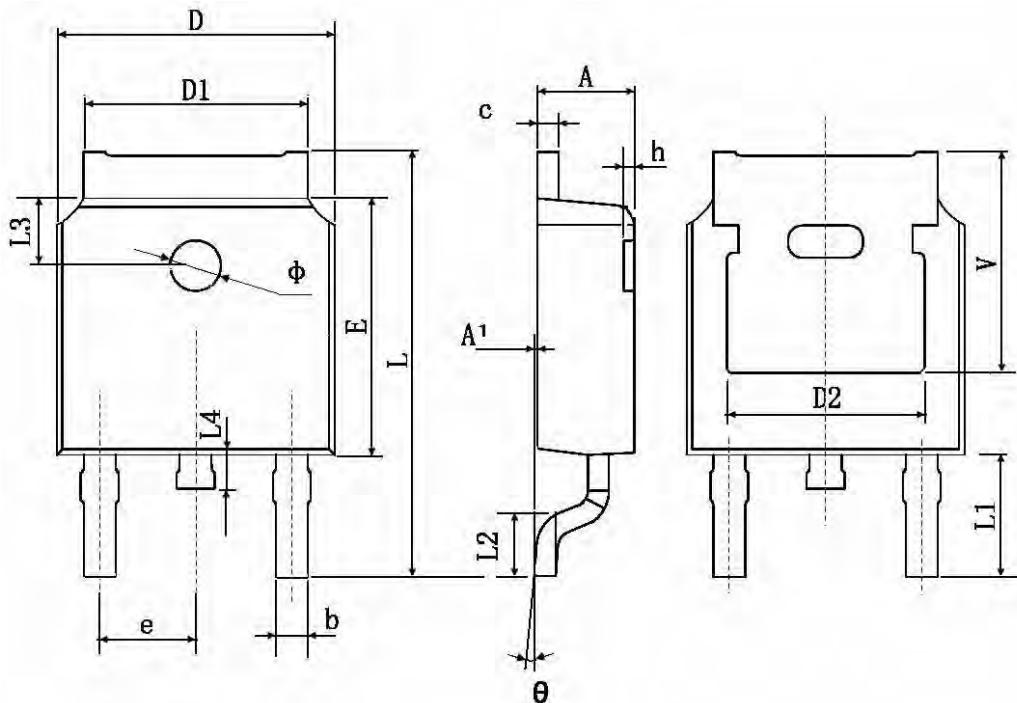


Fig.11 Unclamped Inductive Waveform



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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