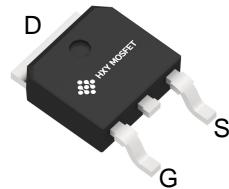




General Description

The NVD6824NLT4G-VF01 use advanced SGT MOSFET technology to provide low RDS(ON), low gate charge, fast switching and excellent avalanche characteristics.

This device is specially designed to get better ruggedness.



TO-252-2L

General Features

$V_{DS} = 100V$ $I_D = 40 A$

$R_{DS(ON)} < 23m\Omega$ @ $V_{GS}=10 V$

Applications

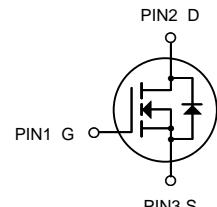
Consumer electronic power supply

Motor control

Synchronous-rectification

Isolated DC

Synchronous-rectification applications



N-SGT MOSFET

Package Marking and Ordering Information

| Product ID | Pack | Brand | Qty(PCS) |
|-------------------|-----------|------------|----------|
| NVD6824NLT4G-VF01 | TO-252-2L | HXY MOSFET | 2500 |

Absolute Maximum Ratings at $T_j=25^\circ C$ unless otherwise noted

| Symbol | Parameter | Value | Unit |
|-----------------------|---|------------|------|
| V_{DS} | Drain source voltage | 100 | V |
| V_{GS} | Gate source voltage | ± 20 | V |
| I_D | Continuous drain current ¹⁾ , $T_c=25^\circ C$ | 40 | A |
| $I_{D, \text{pulse}}$ | Pulsed drain current ²⁾ , $T_c=25^\circ C$ | 100 | A |
| P_D | Power dissipation ³⁾ , $T_c=25^\circ C$ | 27 | W |
| EAS | Single pulsed avalanche energy ⁵⁾ | 16 | mJ |
| T_{stg}, T_j | Operation and storage temperature | -55 to 150 | °C |
| $R_{\theta JC}$ | Thermal resistance, junction-case | 4.65 | °C/W |
| $R_{\theta JA}$ | Thermal resistance, junction-ambient ⁴⁾ | 62 | °C/W |



Electrical Characteristics at $T_j=25^\circ\text{C}$ unless otherwise specified

| Symbol | Parameter | Test Condition | Min. | Typ. | Max. | Units |
|----------------------------------|-----------------------------------|---|------|------|-----------|------------------|
| Off Characteristics | | | | | | |
| BV_{DSS} | Drain-Source Breakdown Voltage | $\text{V}_{\text{GS}} = 0\text{V}$, $\text{I}_D = 250\mu\text{A}$ | 100 | - | - | V |
| I_{DSS} | Drain-Source Leakage Current | $\text{V}_{\text{DS}} = 80\text{V}$, $\text{V}_{\text{GS}} = 0\text{V}$ | - | - | 1 | μA |
| I_{GSS} | Gate to Body Leakage Current | $\text{V}_{\text{DS}} = 0\text{V}$, $\text{V}_{\text{GS}} = \pm 20\text{V}$ | - | - | ± 100 | nA |
| On Characteristics | | | | | | |
| $\text{V}_{\text{GS(th)}}$ | Gate Threshold Voltage | $\text{V}_{\text{DS}} = \text{V}_{\text{GS}}$, $\text{I}_D = 250\mu\text{A}$ | 1.2 | 1.8 | 2.6 | V |
| $\text{R}_{\text{DS(on)}}$ | Static Drain-Source On-Resistance | $\text{V}_{\text{GS}} = 10\text{V}$, $\text{I}_D = 15\text{A}$ | - | 20 | 23 | $\text{m}\Omega$ |
| | | $\text{V}_{\text{GS}} = 4.5\text{V}$, $\text{I}_D = 10\text{A}$ | - | - | 33 | $\text{m}\Omega$ |
| g_{fs} | Forward Threshold Voltage | $\text{V}_{\text{DS}} = 10\text{V}$, $\text{I}_D = 20\text{A}$ | - | 22 | - | S |
| R_g | Gate Resistance | $\text{V}_{\text{DS}} = \text{V}_{\text{GS}} = 0\text{V}$, $f = 1.0\text{MHz}$ | - | 1.62 | - | Ω |
| Dynamic Characteristics | | | | | | |
| C_{iss} | Input Capacitance | $\text{V}_{\text{DS}} = 50\text{V}$, $\text{V}_{\text{GS}} = 0\text{V}$, $f = 1.0\text{MHz}$ | - | 822 | - | pF |
| C_{oss} | Output Capacitance | | - | 310 | - | pF |
| C_{rss} | Reverse Transfer Capacitance | | - | 23.5 | - | pF |
| Switching Characteristics | | | | | | |
| Q_g | Total Gate Charge | $\text{V}_{\text{DS}} = 50\text{V}$, $\text{I}_D = 20\text{A}$, $\text{V}_{\text{GS}} = 10\text{V}$ | - | 22.7 | - | nC |
| Q_{gs} | Gate-Source Charge | | - | 6.2 | - | |
| Q_{gd} | Gate-Drain("Miller") Charge | | - | 5.3 | - | |
| $\text{t}_{\text{d(on)}}$ | Turn-On Delay Time | $\text{V}_{\text{DS}} = 50\text{V}$, $\text{I}_D = 20\text{A}$, $\text{R}_g = 3\Omega$, $\text{V}_{\text{GS}} = 10\text{V}$ | - | 15 | - | ns |
| t_r | Turn-On Rise Time | | - | 3.2 | - | |
| $\text{t}_{\text{d(off)}}$ | Turn-Off Delay Time | | - | 30 | - | |
| t_f | Turn-Off Fall Time | | - | 7.6 | - | |
| Diode Characteristics | | | | | | |
| I_s | Continuous Source Current | | - | - | 40 | A |
| V_{SD} | Diode Forward Voltage | $\text{I}_s = 20\text{A}$, $\text{V}_{\text{GS}} = 0\text{V}$ | - | 0.88 | 1.0 | V |
| t_{rr} | Reverse Recovery Time | $\text{I}_{\text{SD}} = 20\text{A}$, $d\text{I}_{\text{SD}}/dt = 100\text{A}/\mu\text{s}$ | - | 45 | - | ns |
| Q_{rr} | Reverse Recovery Charge | | - | 59 | - | nC |

Notes:

1. The value of $\text{R}_{\text{θJC}}$ is measured in a still air environment with $\text{TA} = 25^\circ\text{C}$ and the maximum allowed junction temperature of 150°C . The value in any given application depends on the user's specific board design.
2. The power dissipation P_D is based on $\text{T}_{\text{J(MAX)}} = 150^\circ\text{C}$, using junction-to-case thermal resistance, and is more useful in setting the upper dissipation limit for cases where additional heatsinking is used.
3. Single pulse width limited by junction temperature $\text{T}_{\text{J(MAX)}} = 150^\circ\text{C}$.
4. The $\text{R}_{\text{θJA}}$ is the sum of the thermal impedance from junction to case $\text{R}_{\text{θJC}}$ and case to ambient.
5. The maximum current rating is package limited.
6. The EAS data shows Max. rating. The test condition is $\text{V}_{\text{DS}} = 50\text{V}$, $\text{V}_{\text{GS}} = 10\text{V}$, $L = 0.5\text{mH}$



Electrical Characteristics Diagrams

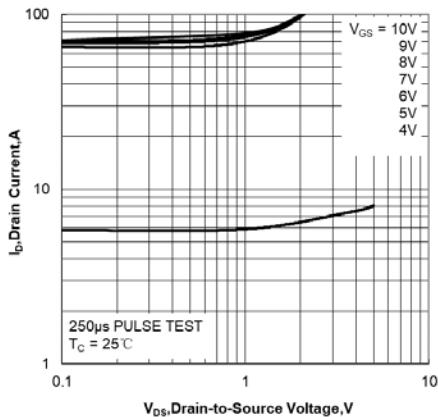


Figure 1. Output Characteristics

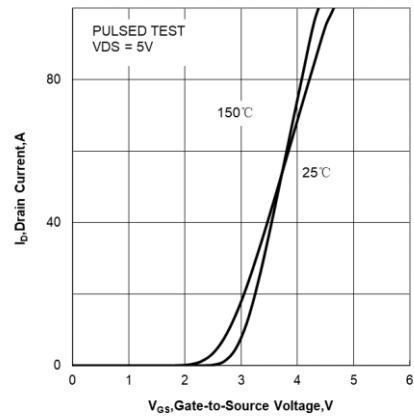


Figure 2. Transfer Characteristics

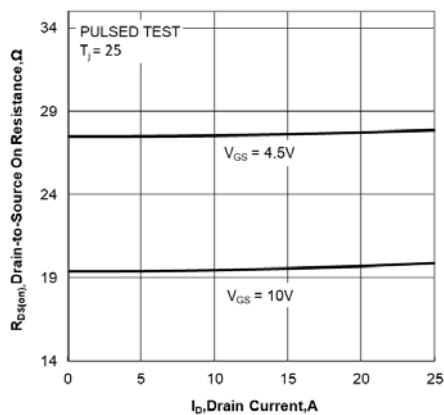


Figure 3. Drain-to-Source On Resistance
vs Drain Current

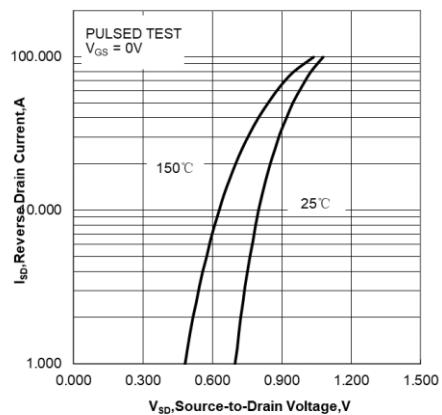


Figure 4. Body Diode Forward Voltage
vs Source Current and Temperature

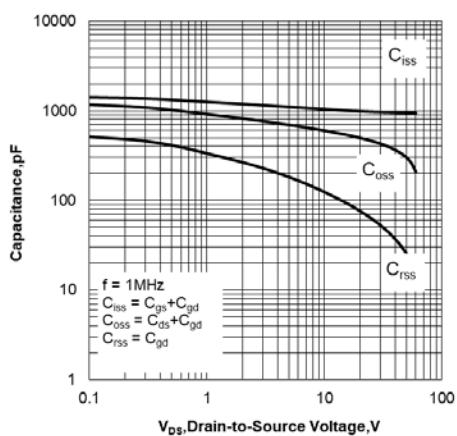


Figure 5. Capacitance Characteristics

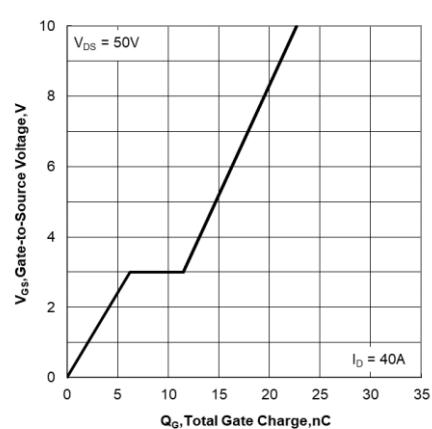


Figure 6. Gate Charge Characteristics

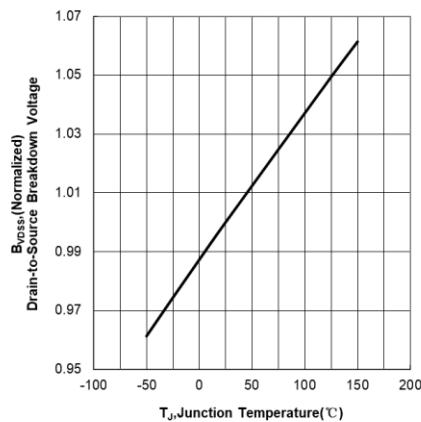


Figure 7. Normalized Breakdown Voltage
vs Junction Temperature

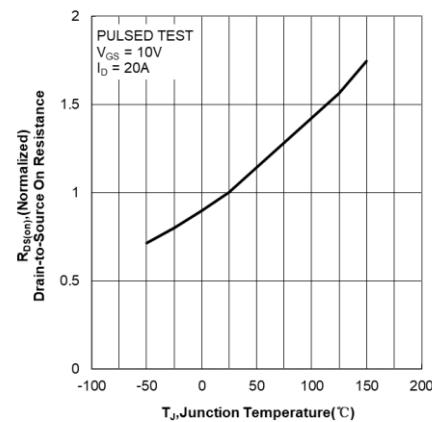


Figure 8. Normalized On Resistance vs
Junction Temperature

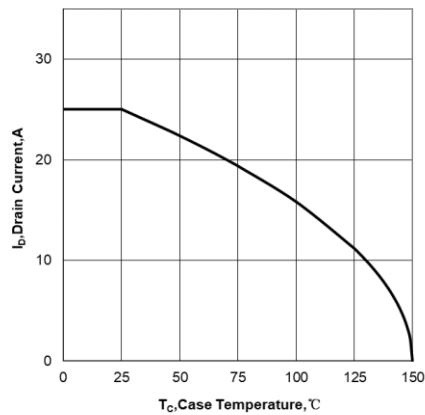


Figure 9. Maximum Continuous Drain Current
vs Case Temperature

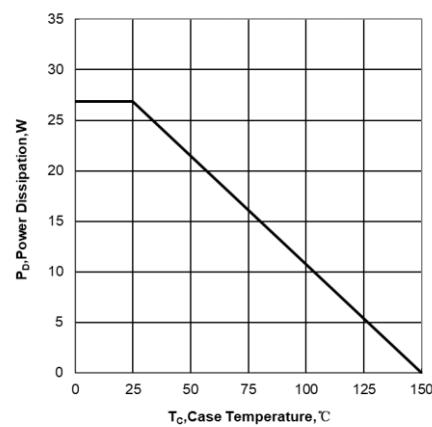


Figure 10. Maximum Power Dissipation
vs Case Temperature

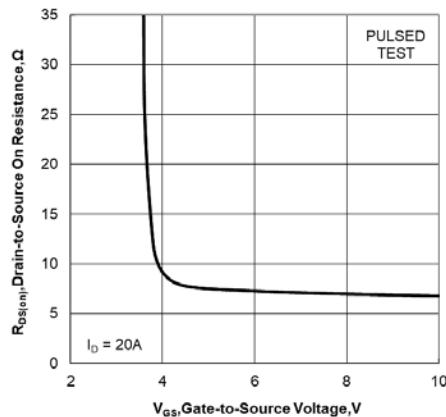


Figure 11. Drain-to-Source On Resistance vs Gate

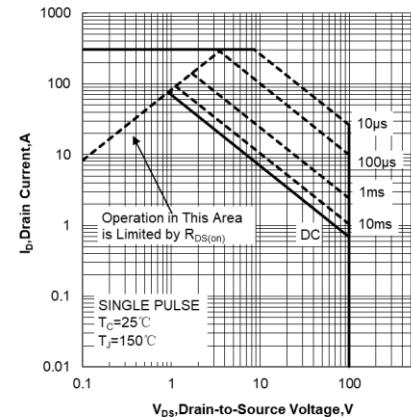


Figure 12. Maximum Safe Operating Area

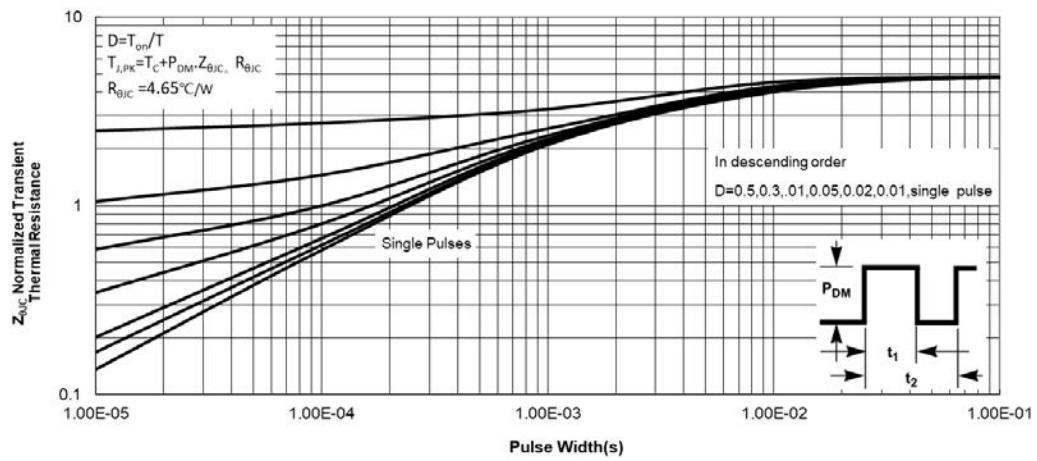
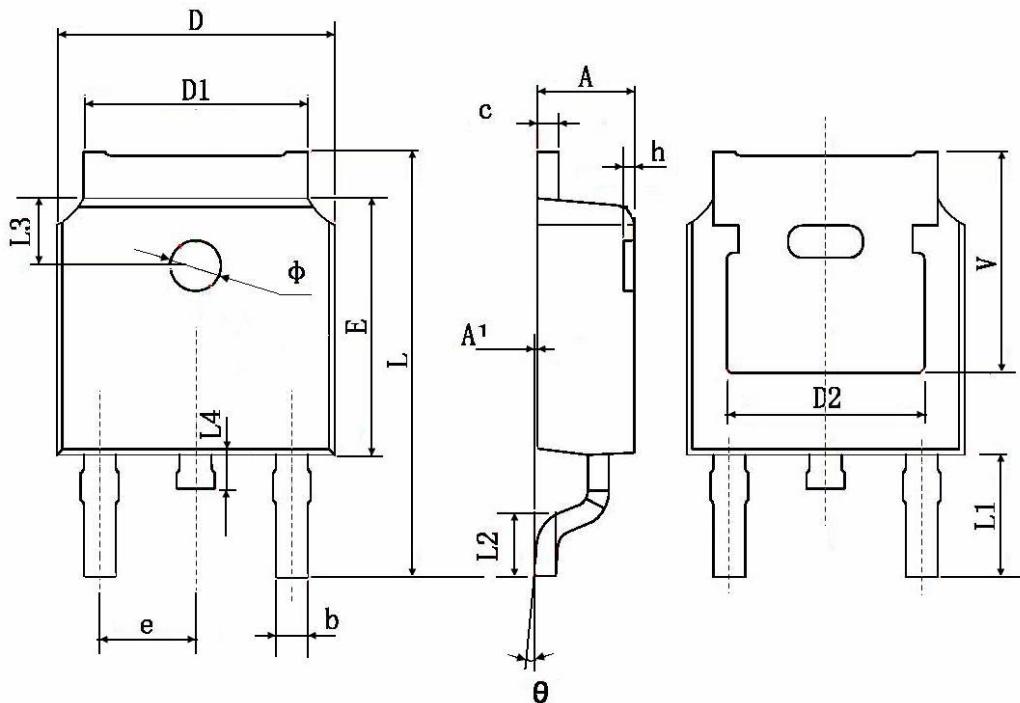


Figure 13. Maximum Effective Transient Thermal Impedance, Junction-to-Case



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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