



Description

The NTD18N06L 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

$V_{DS} = 60V$ $I_D = 20A$

$R_{DS(ON)} < 32m\Omega$ @ $V_{GS} = 10V$

Application

Battery protection

Load switch

Uninterruptible power supply



Package Marking and Ordering Information

| Product ID | Pack | Brand | Qty(PCS) |
|------------|-----------|------------|----------|
| NTD18N06L | 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, $V_{GS} @ 10V^1$ | 20 | A |
| $I_D @ T_C = 100^\circ C$ | Continuous Drain Current, $V_{GS} @ 10V^1$ | 10 | A |
| I_{DM} | Pulsed Drain Current ² | 80 | A |
| EAS | Single Pulse Avalanche Energy ³ | 38 | mJ |
| $P_D @ T_C = 25^\circ C$ | Total Power Dissipation ⁴ | 34.7 | W |
| T_{STG} | Storage Temperature Range | -55 to 150 | $^\circ C$ |
| T_J | Operating Junction Temperature Range | -55 to 150 | $^\circ C$ |



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

| Parameter | Symbol | Test Conditions | Min. | Typ. | Max. | Unit |
|--|--|--|------|------|------|------|
| Static Characteristics | | | | | | |
| Drain-Source Breakdown Voltage | V _{(BR)DSS} | V _{GS} = 0V, I _D = 250μA | 60 | - | - | V |
| Gate-Body Leakage Current | I _{GSS} | V _{DS} = 0V, V _{GS} = ±20V | - | - | ±100 | nA |
| Zero Gate Voltage Drain Current | T _J =25°C | V _{DS} = 60V, V _{GS} = 0V | - | - | 1 | μA |
| | T _J =100°C | | - | - | 100 | |
| Gate-Threshold Voltage | V _{GS(th)} | V _{DS} = V _{GS} , I _D = 250μA | 1.2 | 1.7 | 2.5 | V |
| Drain-Source on-Resistance ⁴ | R _{DS(on)} | V _{GS} = 10V, I _D = 10A | - | 25 | 32 | mΩ |
| | | V _{GS} = 4.5V, I _D = 5A | - | 31.5 | 40 | |
| Forward Transconductance ⁴ | g _{fs} | V _{DS} = 5V, I _D = 10A | - | 15.5 | - | S |
| Dynamic Characteristics⁵ | | | | | | |
| Input Capacitance | C _{iss} | V _{DS} = 30V, V _{GS} = 0V, f = 1MHz | - | 1355 | - | pF |
| Output Capacitance | C _{oss} | | - | 60 | - | |
| Reverse Transfer Capacitance | C _{rss} | | - | 49 | - | |
| Gate Resistance | R _G | f = 1MHz | - | 1.2 | - | Ω |
| Switching Characteristics⁵ | | | | | | |
| Total Gate Charge | Q _g | V _{GS} = 10V, V _{DD} = 30V, I _D = 10A | - | 22 | - | nC |
| Gate-Source Charge | Q _{gs} | | - | 4.2 | - | |
| Gate-Drain Charge | Q _{gd} | | - | 6.9 | - | |
| Turn-on Delay Time | t _{d(on)} | V _{GS} = 10V, V _{DD} = 30V, R _G = 3Ω, I _D = 10A | - | 6.4 | - | ns |
| Rise Time | t _r | | - | 15.3 | - | |
| Turn-off Delay Time | t _{d(off)} | | - | 25 | - | |
| Fall Time | t _f | | - | 7.6 | - | |
| Body Diode Reverse Recovery Time | t _{rr} | I _F = 10A, dI _F /dt = 100A/μs | - | 26 | - | ns |
| Body Diode Reverse Recovery Charge | Q _{rr} | | - | 45 | - | nC |
| Drain-Source Body Diode Characteristics | | | | | | |
| Diode Forward Voltage ⁴ | V _{SD} | I _S = 10A, V _{GS} = 0V | - | - | 1.2 | V |
| Continuous Source Current | T _C =25°C I _S | - | - | - | 20 | A |

Notes:

1. Repetitive rating, pulse width limited by junction temperature T_{J(MAX)} = 150°C
2. The EAS data shows Max. rating . The test condition is V_{DD} = 25V, V_{GS} = 10V, L = 0.4mH, I_{AS} = 14A
3. The data tested by surface mounted on a 1 inch² FR-4 board with 2OZ copper, The value in any given application depends on the user's specific board design.
4. The data tested by pulsed , pulse width ≤ 300us , duty cycle ≤ 2%.
5. This value is guaranteed by design hence it is not included in the production test.



Typical Characteristics

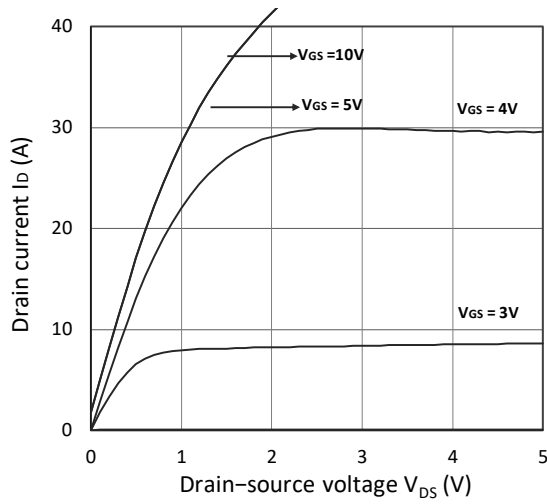


Figure 1. Output Characteristics

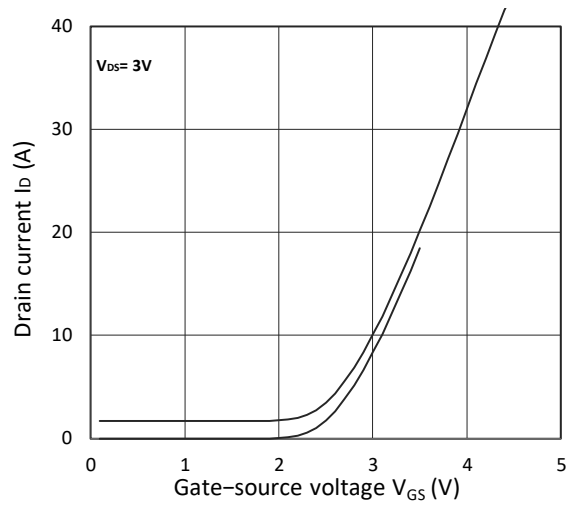


Figure 2. Transfer Characteristics

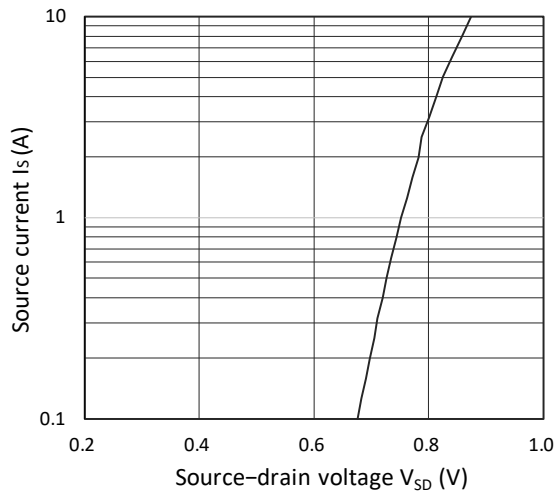


Figure 3. Forward Characteristics of Reverse

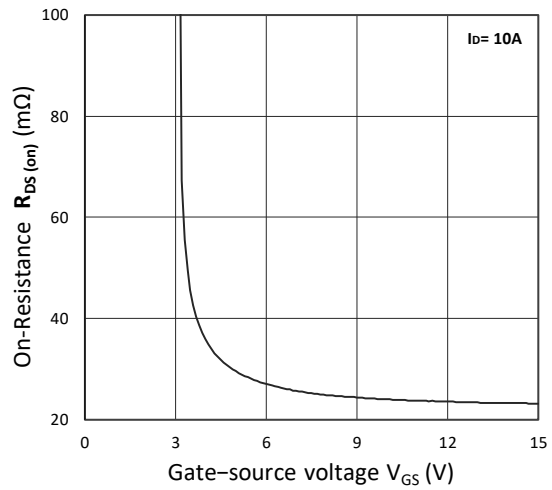


Figure 4. $R_{DS(ON)}$ vs. V_{GS}



Figure 5. $R_{DS(ON)}$ vs. I_D



Figure 6. Normalized $R_{DS(ON)}$ vs. Temperature



Figure 7. Capacitance Characteristics



Figure 8. Gate Charge Characteristics

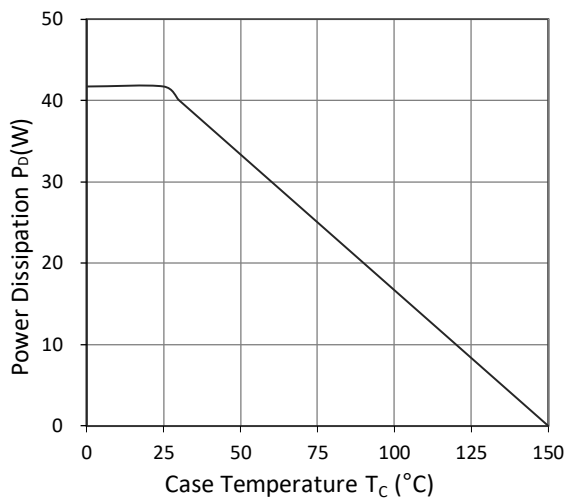


Figure 9. Power Dissipation



Figure 10. Safe Operating Area

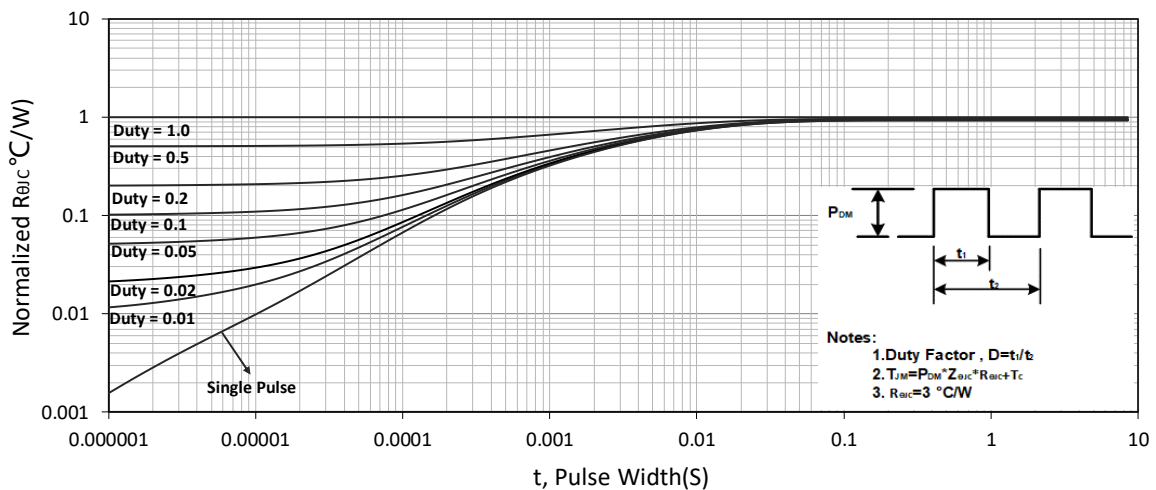
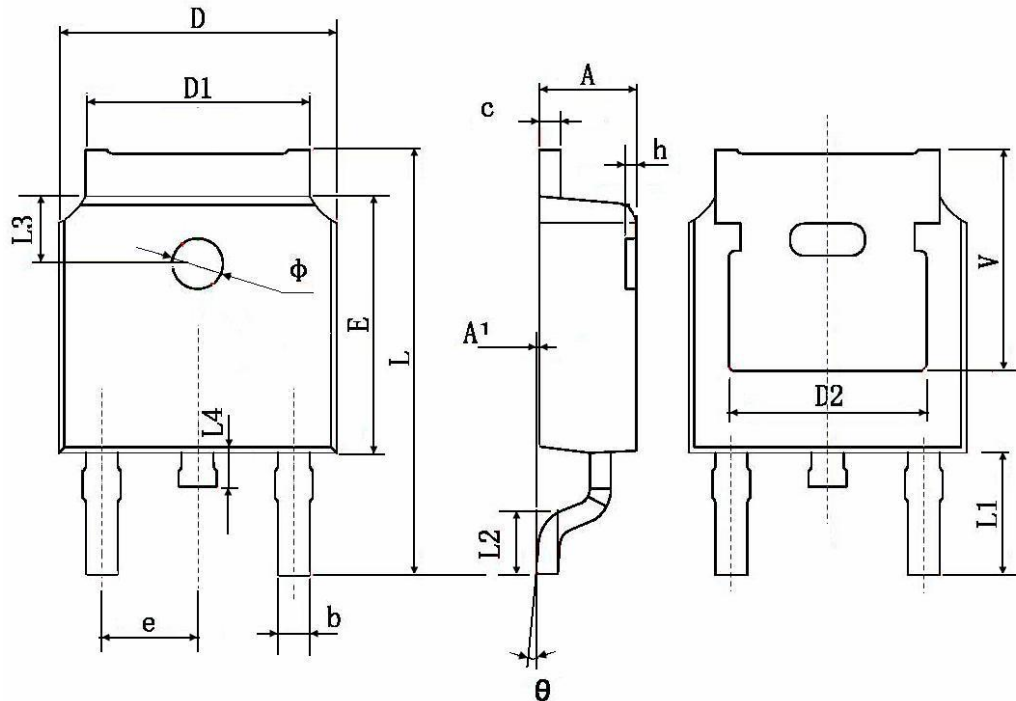


Figure 11. Normalized Maximum Transient Thermal Impedance



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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