## Product Summary

| $V_{(BR)DSS}$ | $R_{DS(on)TYP}$ | $I_D$ |
|---|---|---|
| 650V | 0.8Ω@10V | 10A |

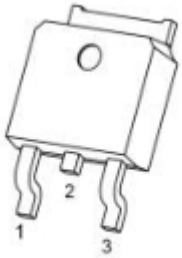
## Feature

- Fast Switching
- Low Gate Charge and Rdson
- 100% Single Pulse avalanche energy Test

## Applications

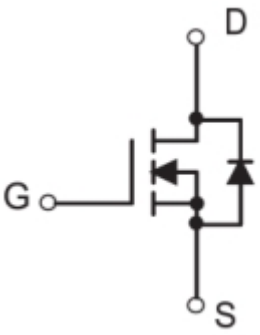
- DC Motor Control and Class D Amplifier
- Uninterruptible Power Supply (UPS)

## Package

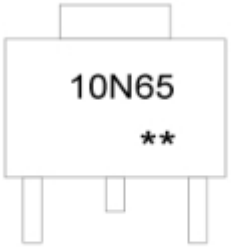



**TO-252-2L(G:1 D:2 S:3)**

## Circuit diagram



## Marking




10N65 : Product code
** : Week code.

## Absolute maximum ratings

($T_a$=25℃ unless otherwise noted)

| Parameter | Symbol | Value | Unit |
|---|---|---|---|
| Drain-Source Voltage | $V_{DS}$ | 650 | V |
| Gate-Source Voltage | $V_{GS}$ | ±30 | V |
| Continuous Drain Current ($T_C$ = 25℃) | $I_D$ | 10 | W |
| Pulsed Drain Current | $I_{DM}$ | 40 | A |
| Single Pulse Avalanche Energy | $E_{AS}$ | 500 | mJ |
| Power Dissipation ($T_C$ = 25℃) | $P_D$ | 40 | W |
| Thermal Resistance Junction- Case | $R_{\theta JC}$ | 3.13 | ℃/ W |
| Operating and Storage Temperature Range | $T_J$, $T_{STG}$ | -55~ +150 | ℃ |

## Electrical characteristics

($T_A$=25℃, unless otherwise noted)

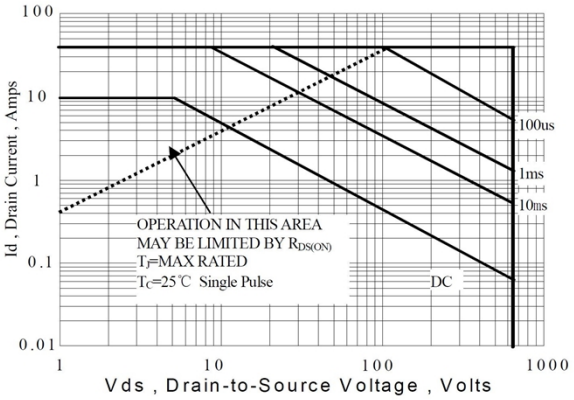
| Parameter | Symbol | Test Condition | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|
| **Static Characteristics** | | | | | | |
| Drain-source breakdown voltage | $BV_{DSS}$ | $V_{GS}$ = 0V, $I_D$ =250μA | 650 | | | V |
| Zero gate voltage drain current | $I_{DSS}$ | $V_{DS}$ =650V,$V_{GS}$ = 0V , $T_J$=25℃ | | | 1 | uA |
| Gate-body leakage current | $I_{GSS}$ | $V_{GS}$ =±30V , $V_{DS}$=0V | | | ±100 | uA |
| Gate threshold voltage | $V_{GS(th)}$ | $V_{DS}$ =$V_{GS}$, $I_D$ =250μA | 2 | | 4 | V |
| Static Drain-Source On-Resistance | $R_{DS(on)}$ | $V_{GS}$ =10V, $I_D$ =5A | | 0.8 | 1 | Ω |
| **Dynamic characteristics**[4] | | | | | | |
| Input Capacitance | $C_{iss}$ | $V_{DS}$=25V,$V_{GS}$=0V, f=1MHz | | 1442 | | pF |
| Output Capacitance | $C_{oss}$ | | | 130 | | |
| Reverse Transfer Capacitance | $C_{rss}$ | | | 7 | | |
| Total Gate Charge(4.5V) | $Q_g$ | $V_{DS}$=520V, $V_{GS}$=10V, $I_D$=18A | | 32 | | nC |
| Gate-Source Charge | $Q_{gs}$ | | | 8 | | |
| Gate-Drain Charge | $Q_{gd}$ | | | 12.3 | | |
| **Switching Characteristics** | | | | | | |
| Turn-On Delay Time | $T_{d(on)}$ | $V_{DS}$=15V, $I_D$=60A, $R_{GEN}$=1.8Ω, $V_{GS}$=4.5V | | 11 | | nS |
| Rise Time | $T_r$ | | | 120 | | |
| Turn-Off Delay Time | $T_{d(off)}$ | | | 25 | | |
| Fall Time | $T_f$ | | | 60 | | |
| **Drain-Source Diode Characteristics and Maximum Ratings** | | | | | | |
| Maximum Continuous Drain to Source Diode Forward Current | $I_S$ | | | | 130 | A |
| Maximum Pulsed Drain to Source Diode Forward Current | $I_{SM}$ | | | | 360 | A |
| Drain to Source Diode Forward Voltage | $V_{SD}$ | $V_{GS}$ = 0V, $I_S$=20A | | | 1.2 | V |
| Body Diode Reverse Recovery Time | $t_{rr}$ | $I_F$=60A,dI/dt=100A/μs | | 56 | | ns |
| Body Diode Reverse Recovery Time Charge | $Q_{rr}$ | | | 110 | | nC |

**Note :**

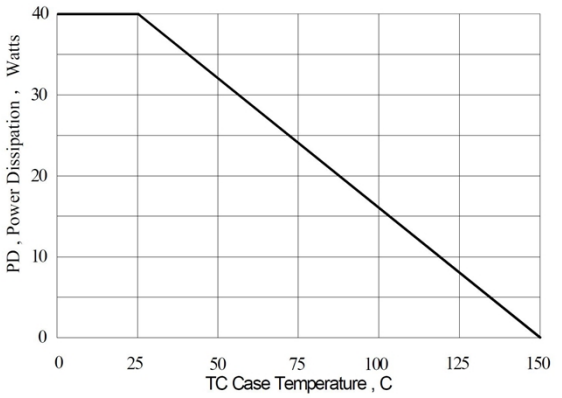
1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature

2. EAS condition: $T_j$=25℃, $V_G$=10V,L=30mH,Rg=25Ω,$V_{DD}$=100V

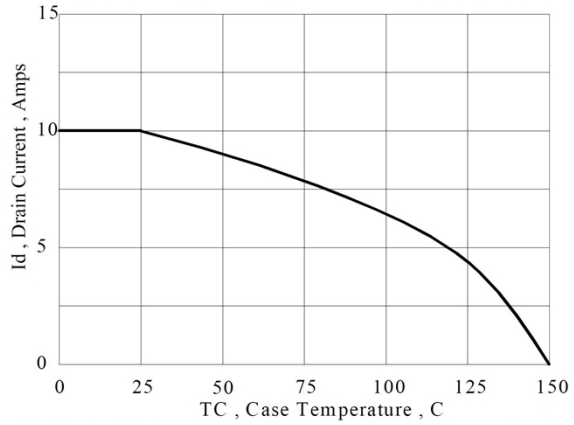
## Typical Characteristics



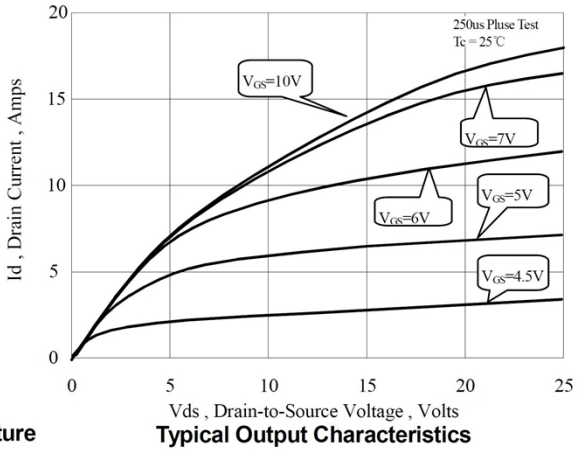

**Maximum Forward Bias Safe Operating Area**



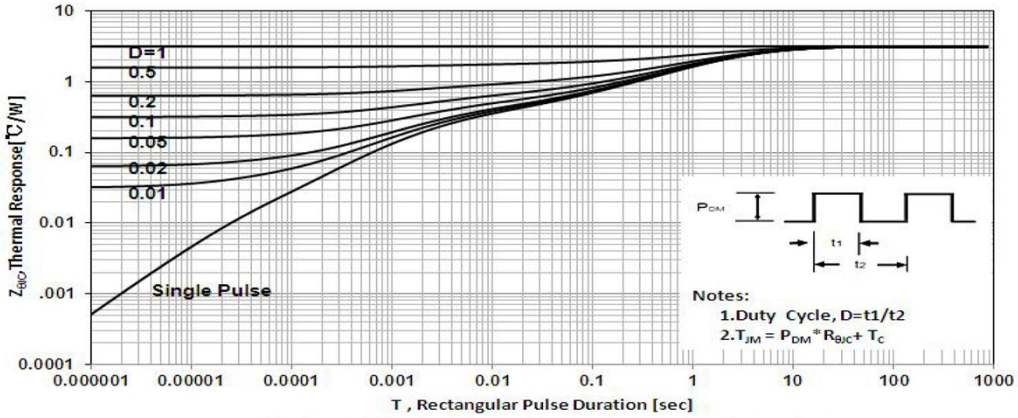

**Maximum Power Dissipation vs Case Temperature**



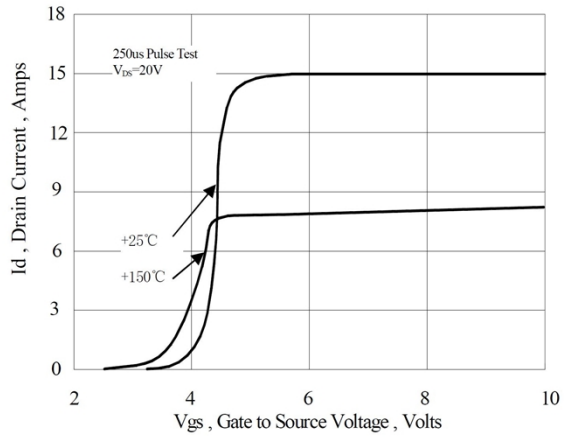

**Maximum Continuous Drain Current vs Case Temperature**



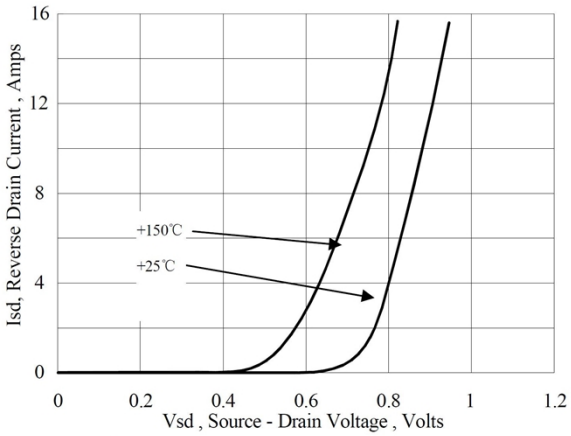

**Typical Output Characteristics**



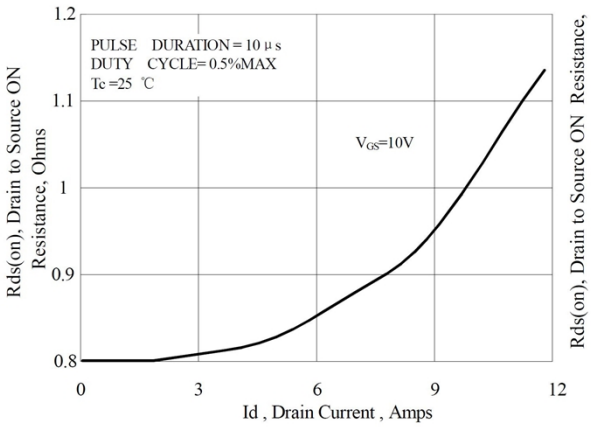

Maximum Effective Thermal Impendance , Junction to Case



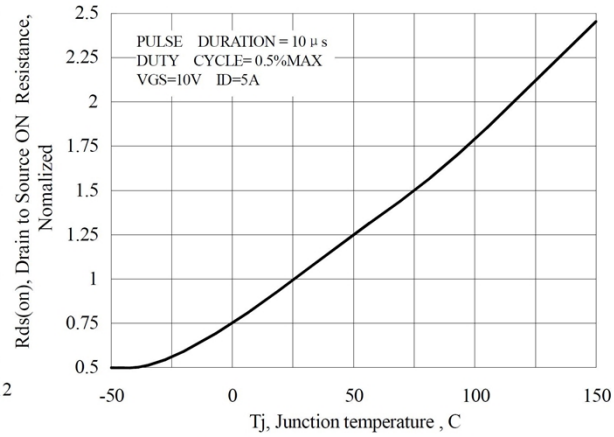

**Typical Transfer Characteristics**




**Typical Body Diode Transfer Characteristics**

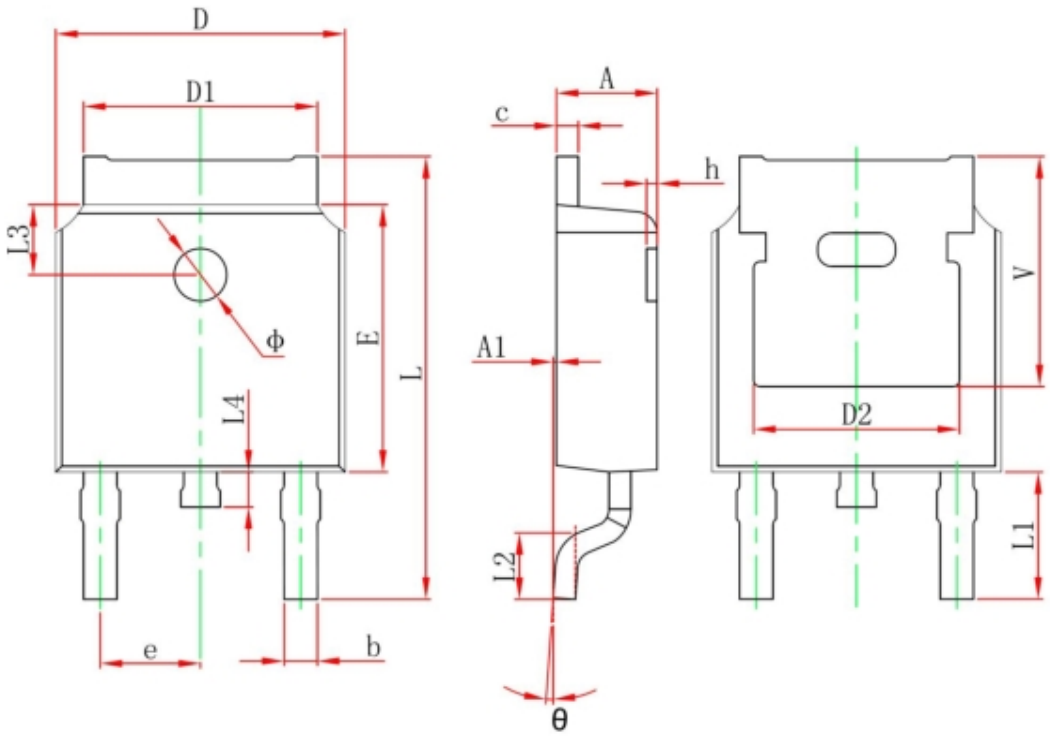



**Typical Drain to Source ON Resistance vs Drain Current**




**Typical Drian to Source on Resistance vs Junction Temperature**

## TO-252 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 | 4.830 REF. | | 0.190 REF. | |
| 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 REF. | | 0.114 REF. | |
| L2 | 1.400 | 1.700 | 0.055 | 0.067 |
| L3 | 1.600 REF. | | 0.063 REF. | |
| 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 REF. | | 0.211 REF. | |