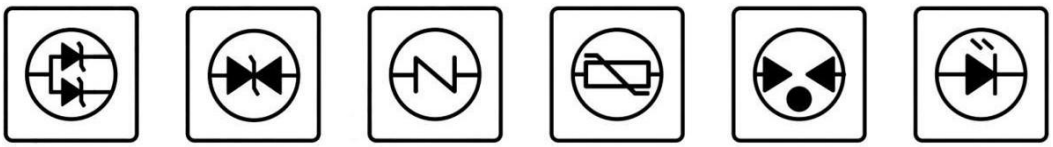
MSKSEMI 美森科
SEMICONDUCTOR




# NTZD3154NT1G-MS

**Product specification**

## General Description

These dual N Channel enhancement mode power field effect transistors are using trench DMOS technology. This advanced technology has been especially tailored to minimize on-state resistance, provide superior switching performance, and withstand high energy pulse in the avalanche and commutation mode. These devices are well suited for high efficiency fast switching applications.

| BVDSS | RDSON | ID |
|---|---|---|
| 20V | 400mΩ | 0.55A |

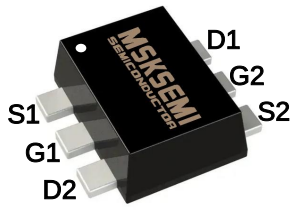
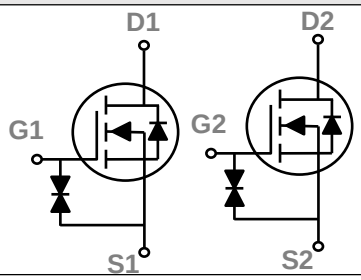
## Features

- Fast switching
- Green Device Available

## Application

- Notebook
- Load Switch
- Networking
- Hand-held Instruments

## Reference News

| SOT-563 | Pin Configuration | MARKING |
|---|---|---|
|  |  | TV* |





## Absolute Maximum Ratings $T_C$=25℃ unless otherwise noted

| Symbol | Parameter | Rating | Units |
|---|---|---|---|
| $V_{DS}$ | Drain-Source Voltage | 20 | V |
| $V_{GS}$ | Gate-Source Voltage | ±10 | V |
| $I_D$ | Drain Current - Continuous ($T_A$=25℃) | 550 | mA |
| | Drain Current - Continuous ($T_A$=85℃) | 410 | mA |
| $I_{DM}$ | Drain Current - Pulsed[1] | 1.5 | A |
| $P_D$ | Power Dissipation ($T_A$=25℃) | 280 | mW |
| | Power Dissipation - Derate above 25℃ | 2.5 | mW/℃ |
| $T_{STG}$ | Storage Temperature Range | -55 to 150 | ℃ |
| $T_J$ | Operating Junction Temperature Range | -55 to 150 | ℃ |

## Thermal Characteristics

| Symbol | Parameter | Typ. | Max. | Unit |
|---|---|---|---|---|
| $R_{\theta JA}$ | Thermal Resistance Junction to ambient | --- | 400 | ℃/W |

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## Electrical Characteristics ($T_J$=25 ℃, unless otherwise noted)

### Off Characteristics

| Symbol | Parameter | Conditions | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|
| $BV_{DSS}$ | Drain-Source Breakdown Voltage | $V_{GS}$=0V , $I_D$=250uA | 20 | --- | --- | V |
| $\triangle BV_{DSS}/\triangle T_J$ | $BV_{DSS}$ Temperature Coefficient | Reference to 25℃ , $I_D$=1mA | --- | -0.01 | --- | V/℃ |
| $I_{DSS}$ | Drain-Source Leakage Current | $V_{DS}$=20V , $V_{GS}$=0V , $T_J$=25℃ | --- | --- | 1 | uA |
| | | $V_{DS}$=16V , $V_{GS}$=0V , $T_J$=125℃ | --- | --- | 10 | uA |
| $I_{GSS}$ | Gate-Source Leakage Current | $V_{GS}$= ±10V , $V_{DS}$=0V | --- | --- | ±10 | uA |

### On Characteristics

| | | | | | | |
|---|---|---|---|---|---|---|
| $R_{DS(ON)}$ | Static Drain-Source On-Resistance | $V_{GS}$=4.5V , $I_D$=0.55A | --- | 400 | 500 | mΩ |
| | | $V_{GS}$=2.5V , $I_D$=0.4A | --- | 500 | 700 | |
| | | $V_{GS}$=1.8V , $I_D$=0.2A | --- | 700 | 900 | |
| $V_{GS(th)}$ | Gate Threshold Voltage | $V_{GS}$=$V_{DS}$ , $I_D$ =250uA | 0.4 | 0.65 | 1.0 | V |
| $\triangle V_{GS(th)}$ | $V_{GS(th)}$ Temperature Coefficient | | --- | 3 | --- | mV/℃ |

### Dynamic and switching Characteristics

| | | | | | | |
|---|---|---|---|---|---|---|
| $Q_g$ | Total Gate Charge[2,3] | $V_{DS}$=10V , $V_{GS}$=4.5V , $I_D$=0.5A | --- | 1 | --- | nC |
| $Q_{gs}$ | Gate-Source Charge[2,3] | | --- | 0.26 | --- | |
| $Q_{gd}$ | Gate-Drain Charge[2,3] | | --- | 0.2 | --- | |
| $T_{d(on)}$ | Turn-On Delay Time[2,3] | $V_{DD}$=10V , $V_{GS}$=4.5V , $R_G$=10Ω $I_D$=0.5A | --- | 5 | --- | ns |
| $T_r$ | Rise Time[2,3] | | --- | 3.5 | --- | |
| $T_{d(off)}$ | Turn-Off Delay Time[2,3] | | --- | 14 | --- | |
| $T_f$ | Fall Time[2,3] | | --- | 6 | --- | |
| $C_{iss}$ | Input Capacitance | $V_{DS}$=10V , $V_{GS}$=0V , F=1MHz | --- | 38.2 | --- | pF |
| $C_{oss}$ | Output Capacitance | | --- | 14.4 | --- | |
| $C_{rss}$ | Reverse Transfer Capacitance | | --- | 6 | --- | |

### Drain-Source Diode Characteristics and Maximum Ratings

| Symbol | Parameter | Conditions | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|
| $I_S$ | Continuous Source Current | $V_G$=$V_D$=0V , Force Current | --- | --- | 0.55 | A |
| $I_{SM}$ | Pulsed Source Current | | --- | --- | 1.1 | A |
| $V_{SD}$ | Diode Forward Voltage | $V_{GS}$=0V , $I_S$=0.3A , $T_J$=25℃ | --- | --- | 1.2 | V |

Note :

1. Repetitive Rating : Pulsed width limited by maximum junction temperature.
2. The data tested by pulsed , pulse width ≦ 300us , duty cycle ≦ 2%.
3. Essentially independent of operating temperature.

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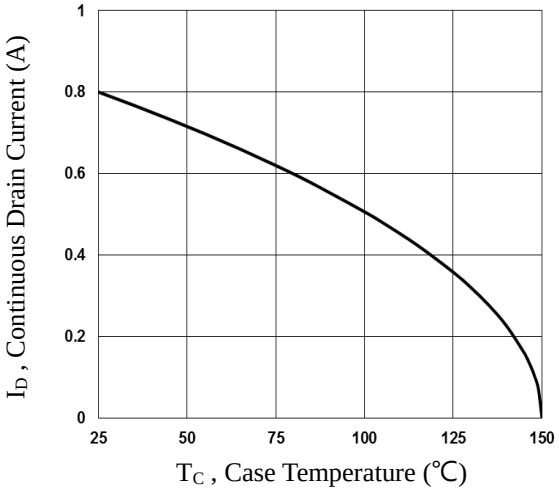



**Fig.1 Continuous Drain Current vs. $T_C$**

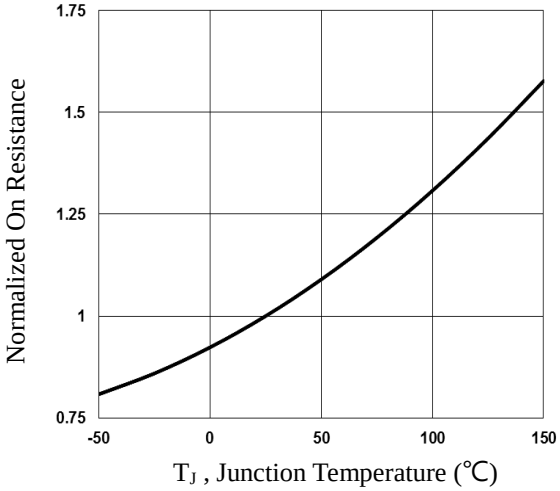



**Fig.2 Normalized RDSON vs. $T_J$**

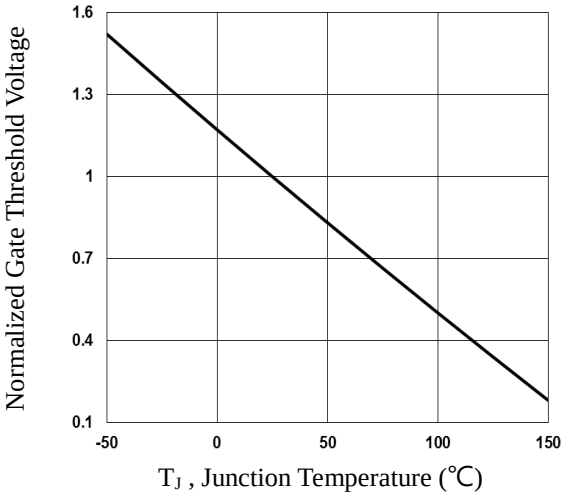



**Fig.3 Normalized $V_{th}$ vs. $T_J$**

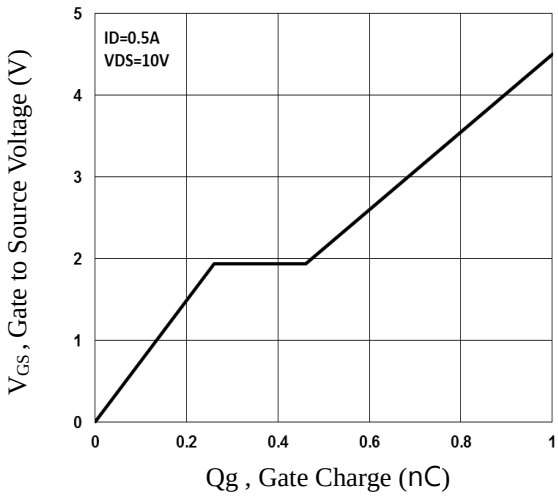



**Fig.4 Gate Charge Waveform**

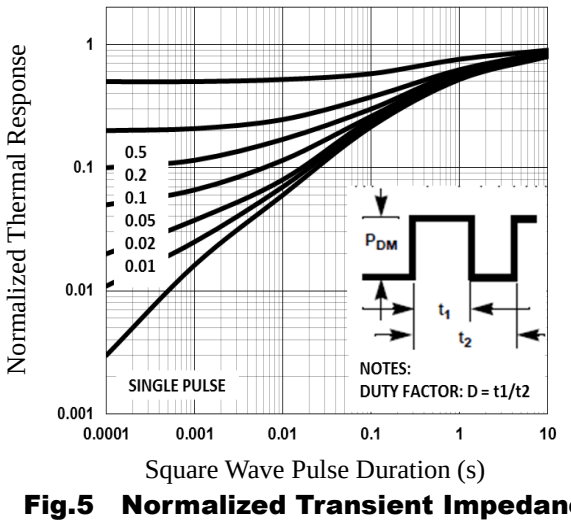



**Fig.5 Normalized Transient Impedance**

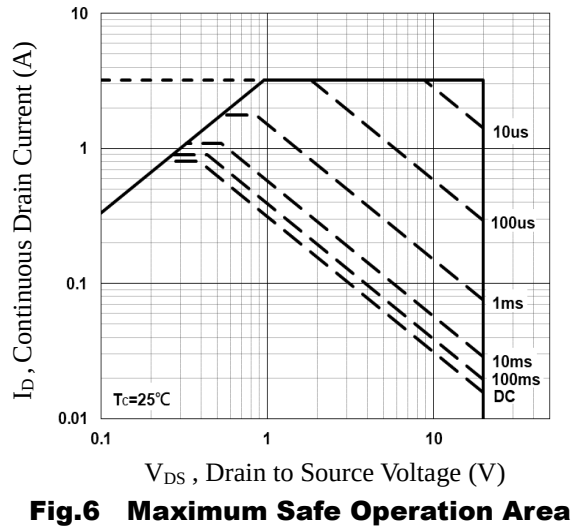
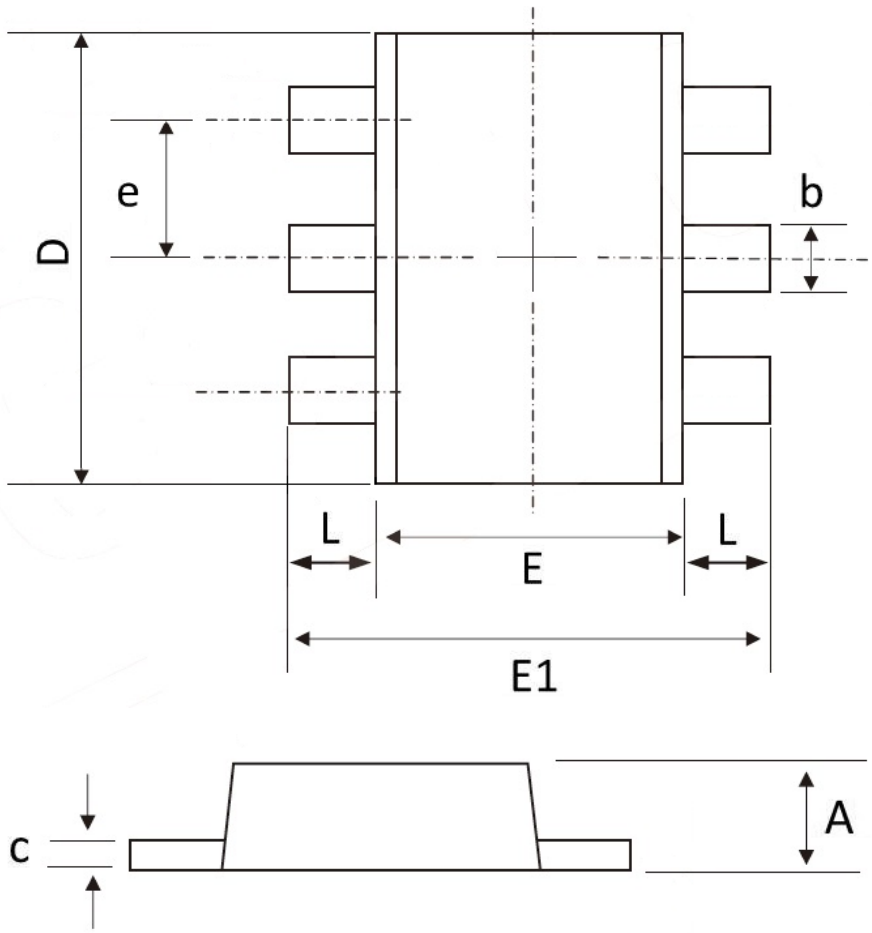



**Fig.6 Maximum Safe Operation Area**

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## SOT-563 Dual PACKAGE INFORMATION




| Symbol | Dimensions In Millimeters | | Dimensions In Inches | |
|---|---|---|---|---|
| | MAX | MIN | MAX | MIN |
| A | 0.600 | 0.500 | 0.024 | 0.020 |
| b | 0.300 | 0.150 | 0.012 | 0.006 |
| c | 0.180 | 0.100 | 0.007 | 0.004 |
| D | 1.700 | 1.500 | 0.067 | 0.059 |
| E | 1.250 | 1.100 | 0.049 | 0.043 |
| E1 | 1.700 | 1.550 | 0.067 | 0.061 |
| e | 0.5BSC | | 0.02BSC | |
| L | 0.300 | 0.100 | 0.012 | 0.004 |

## REEL SPECIFICATION

| P/N | PKG | QTY |
|---|---|---|
| NTZD3154NT1G-MS | SOT-563 | 3000 |

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