

**Product Summary**

|               |                 |       |
|---------------|-----------------|-------|
| $V_{(BR)DSS}$ | $R_{DS(on)TYP}$ | $I_D$ |
| 100V          | 8.5mΩ@10V       | 65A   |
|               | 11mΩ@4.5V       |       |



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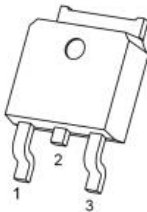
**Feature**

- Fast Switching
- Low Gate Charge and Rds on
- Advanced Split Gate Trench Technology
- 100% Single Pulse avalanche energy Test

**Applications**

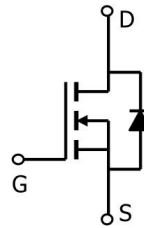
- Power switching application
- PWM Application
- DC-DC Converter

**Package**

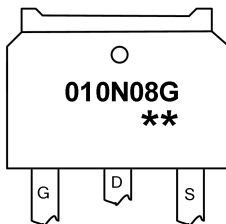


TO-252(1:G 2:D 3:S)

**Circuit diagram**



**Marking**



010N08G =Device Code  
\*\* =Week Code

**Order Information**

| Device      | Package | Unite/Tape |
|-------------|---------|------------|
| SP010N08GTH | TO-252  | 2500       |

### Absolute maximum ratings (Ta=25°C unless otherwise noted)

| Parameter                                      | Symbol           | Rating     | Units |
|--|------------------|------------|-------|
| Drain-Source Voltage                           | V <sub>DS</sub>  | 100        | V     |
| Gate-Source Voltage                            | V <sub>GS</sub>  | ±20        | V     |
| Continuous Drain Current (Tc=25°C)             | I <sub>D</sub>   | 65         | A     |
| Pulsed Drain Current <sup>2</sup>              | I <sub>DM</sub>  | 260        | A     |
| Single Pulse Avalanche Energy <sup>3</sup>     | E <sub>AS</sub>  | 156        | mJ    |
| Total Power Dissipation <sup>4</sup> (Tc=25°C) | P <sub>D</sub>   | 90         | W     |
| Thermal Resistance Junction-Case <sup>1</sup>  | R <sub>θJC</sub> | 1.38       | °C/W  |
| Storage Temperature Range                      | T <sub>STG</sub> | -55 to 150 | °C    |
| Operating Junction Temperature Range           | T <sub>J</sub>   | -55 to 150 | °C    |

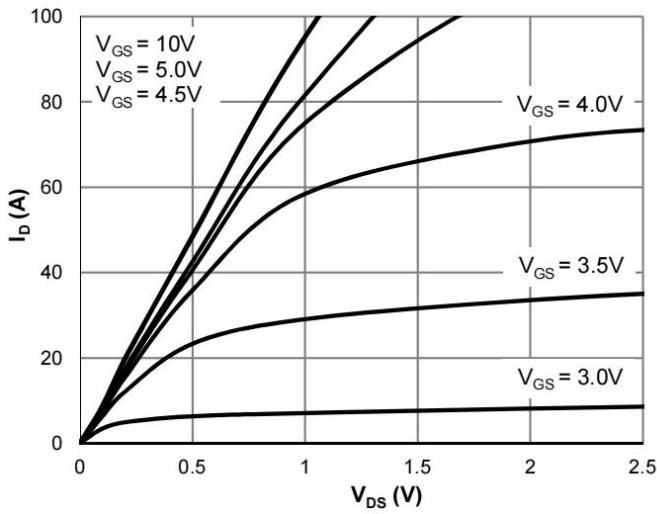
### Electrical characteristics (Ta=25°C, unless otherwise noted)

| Parameter                                      | Symbol              | Conditions                       | Min. | Typ. | Max. | Unit |
|--|---------------------|----------------------------------|------|------|------|------|
| <b>Static Characteristics</b>                  |                     |                                  |      |      |      |      |
| Drain-Source Breakdown Voltage                 | BV <sub>DSS</sub>   | VGS=0V, ID=250uA                 | 100  | ---  | ---  | V    |
| Drain-Source Leakage Current                   | I <sub>DSS</sub>    | VDS=80V, VGS=0V, TJ=25°C         | ---  | ---  | 1    | uA   |
| Gate-Source Leakage Current                    | I <sub>GSS</sub>    | VGS=±20V, VDS=0V                 | ---  | ---  | ±100 | nA   |
| Gate Threshold Voltage                         | V <sub>GS(th)</sub> | VGS=VDS, ID=250uA                | 1.2  | 1.9  | 2.5  | V    |
| Static Drain-Source On-Resistance <sup>2</sup> | R <sub>DS(ON)</sub> | VGS=10V, ID=20A                  | ---  | 8.5  | 12   | mΩ   |
|  |                     | VGS=4.5V, ID=15A                 | ---  | 11   | 15   |      |
| <b>Dynamic Characteristics</b>                 |                     |                                  |      |      |      |      |
| Input Capacitance                              | C <sub>iss</sub>    | VDS=50V, VGS=0V, f=1MHz          | ---  | 1635 | ---  | pF   |
| Output Capacitance                             | C <sub>oss</sub>    |                                  | ---  | 339  | ---  |      |
| Reverse Transfer Capacitance                   | C <sub>rss</sub>    |                                  | ---  | 22   | ---  |      |
| <b>Switching Characteristics</b>               |                     |                                  |      |      |      |      |
| Total Gate Charge (4.5V)                       | Q <sub>g</sub>      | VDS=50V, VGS=10V, ID=20A         | ---  | 14   | ---  | nC   |
| Gate-Source Charge                             | Q <sub>gs</sub>     |                                  | ---  | 5    | ---  |      |
| Gate-Drain Charge                              | Q <sub>gd</sub>     |                                  | ---  | 7    | ---  |      |
| Turn-On Delay Time                             | T <sub>d(on)</sub>  | VDD=50V, VGS=10V, RL=2.5Ω, RG=6Ω | ---  | 8    | ---  | ns   |
| Rise Time                                      | T <sub>r</sub>      |                                  | ---  | 16   | ---  |      |
| Turn-Off Delay Time                            | T <sub>d(off)</sub> |                                  | ---  | 31   | ---  |      |
| Fall Time                                      | T <sub>f</sub>      |                                  | ---  | 27   | ---  |      |
| <b>Source-Drain Diode Characteristics</b>      |                     |                                  |      |      |      |      |
| Diode Forward Voltage <sup>2</sup>             | V <sub>SD</sub>     | VGS=0V, IS=1A, TJ=25°C           | ---  | ---  | 1.2  | V    |

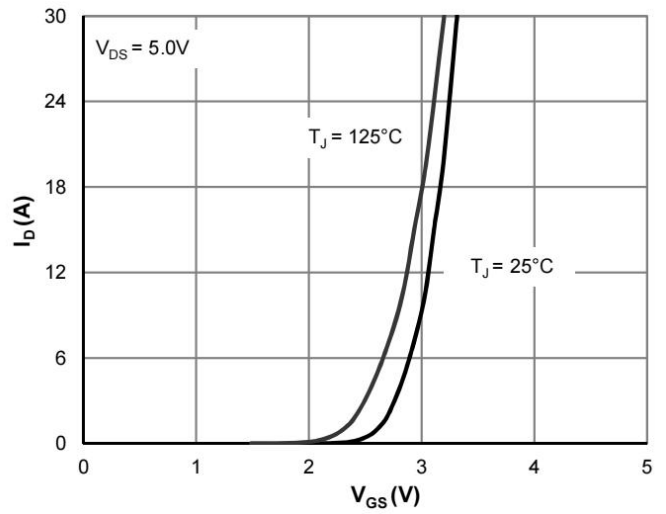
Note :

- The data tested by surface mounted on a 1 inch<sup>2</sup> FR-4 board with 2OZ copper.
- The data tested by pulsed, pulse width ≤ 300us, duty cycle ≤ 2%
- The EAS data shows Max. rating. The test condition is VDD=50V, VGS=10V, L=0.5mH, Rg=25Ω
- The power dissipation is limited by 150°C junction temperature

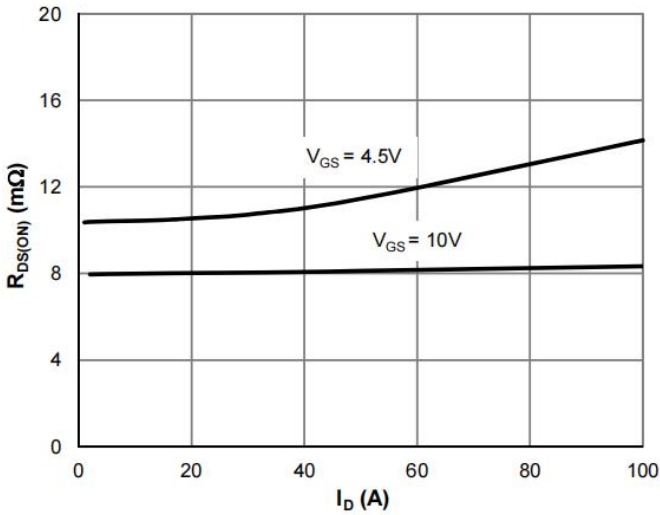
**Typical Characteristics**



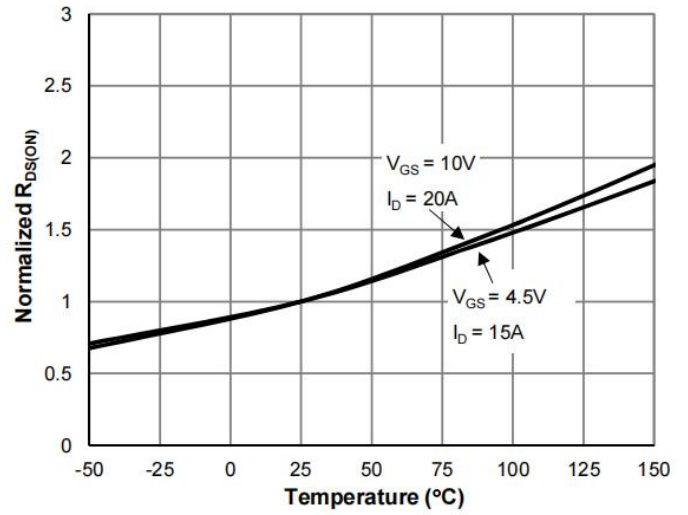
Typical Output Characteristics



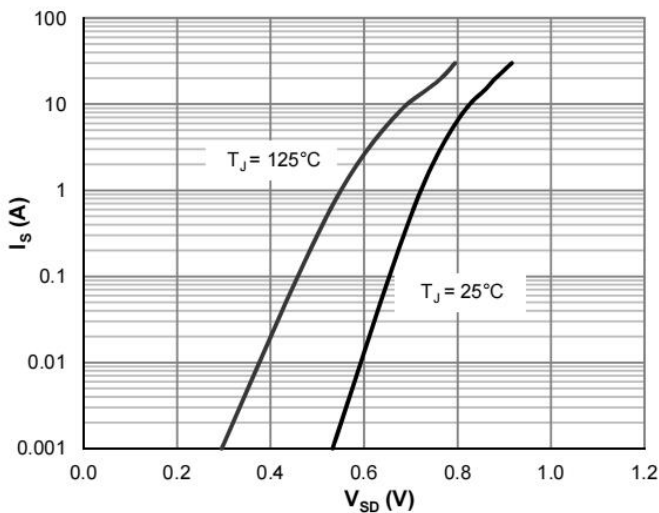
Transfer Characteristics



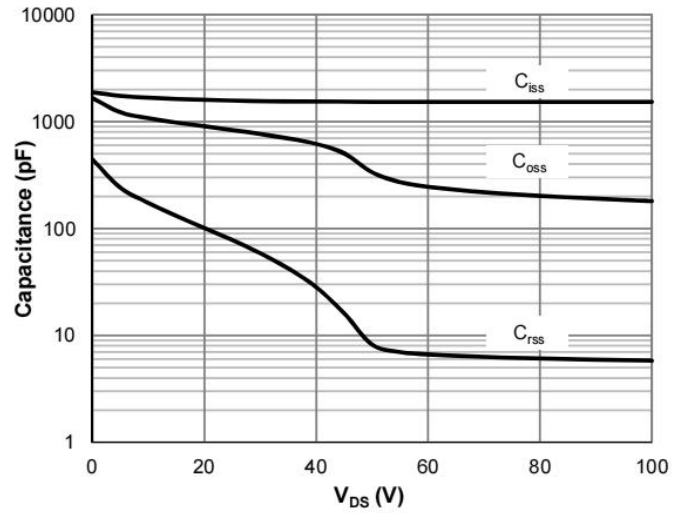
On-Resistance vs. Drain Current



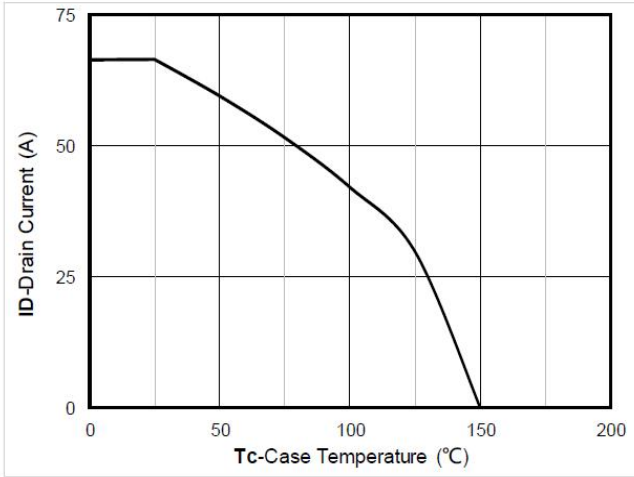
On-Resistance vs. Junction Temperature



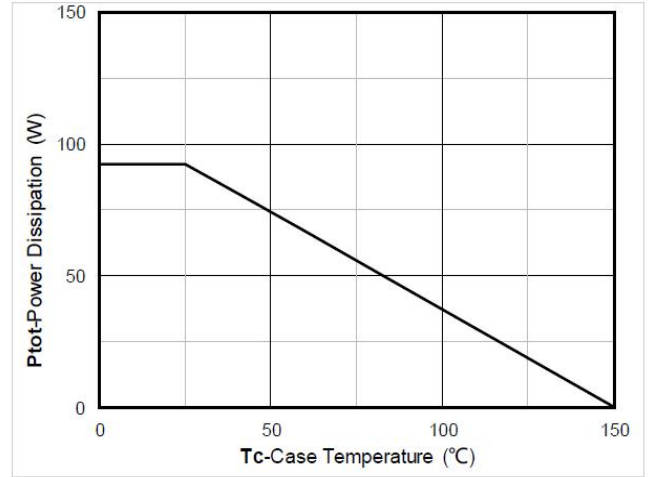
Body-Diode Characteristics



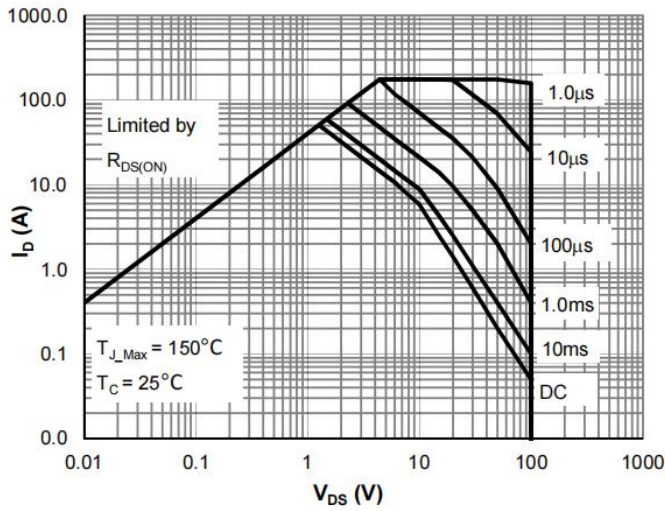
Capacitance Characteristics



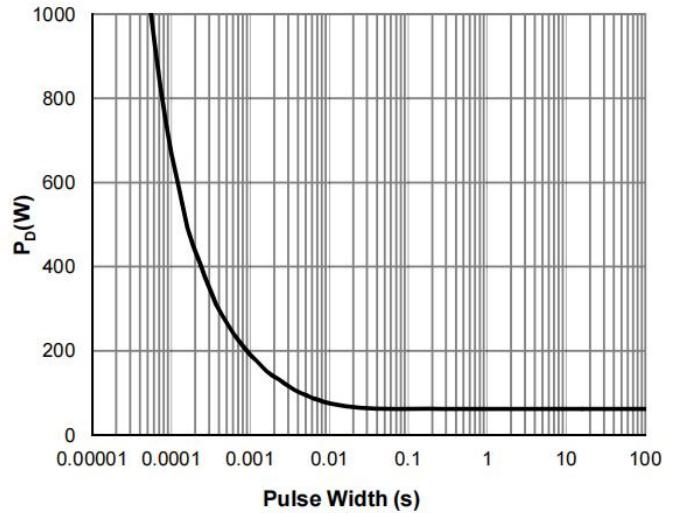
**Current De-rating**



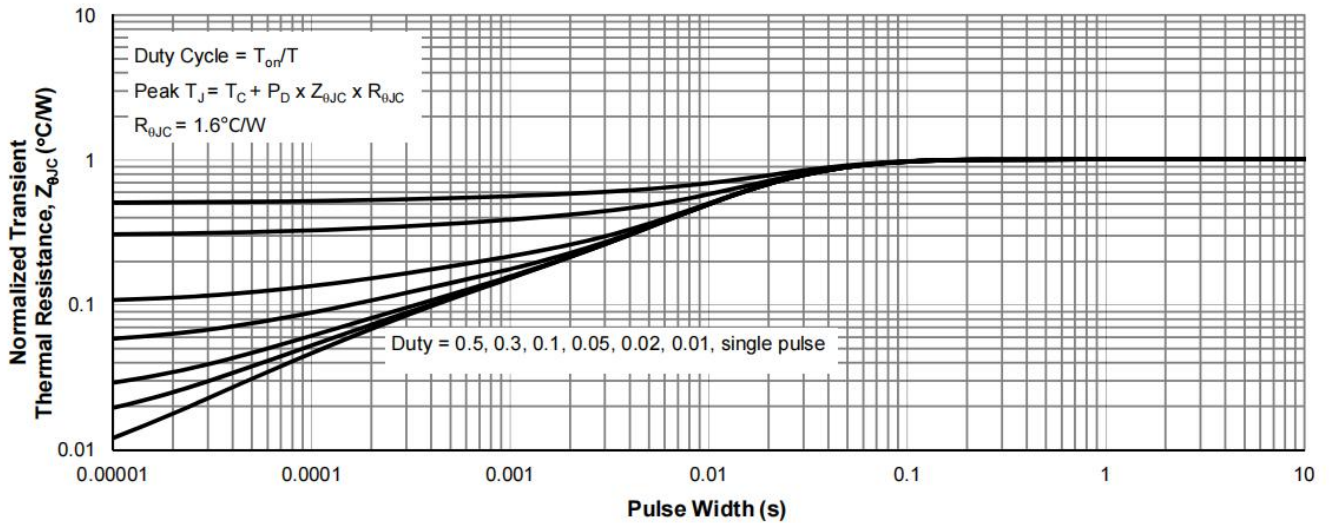
**Power De-rating**



**Maximum Safe Operating Area**

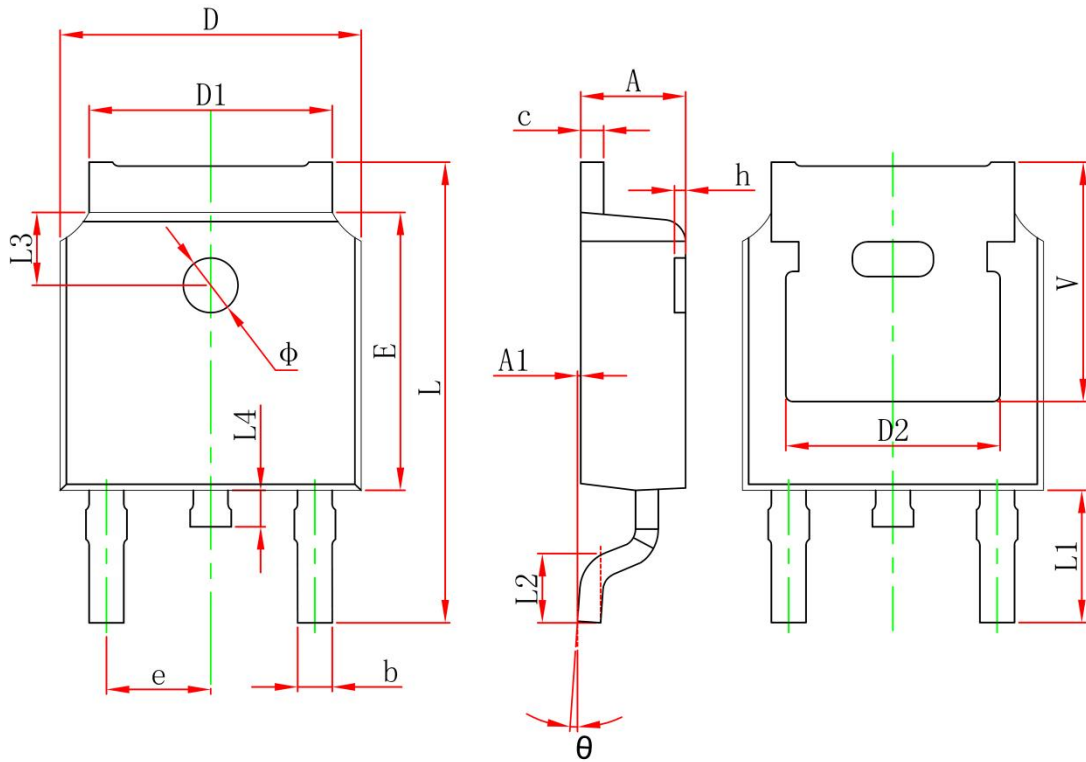


**Single Pulse Power Rating, Junction-to-Case**



**Normalized Maximum Transient Thermal Impedance**

**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.           |       |

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