

### Product Summary

| $V_{(BR)DSS}$ | $R_{DS(on)TYP}$ | $I_D$ |
|---------------|-----------------|-------|
| 100V          | 3.9mΩ@10V       | 130A  |

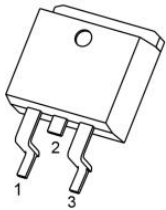
### Feature

- Fast Switching
- Low Gate Charge and R<sub>ds(on)</sub>
- Low Reverse transfer capacitances
- 100% Single Pulse avalanche energy Test

### Applications

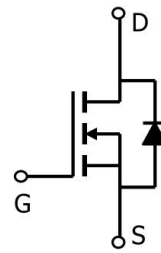
- Power switching application
- DC-DC Converter
- Power Management

### Package

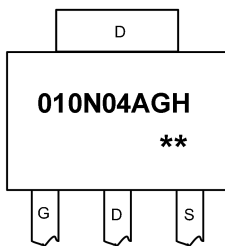


TO-263(1:G 2:D 3:S)

### Circuit diagram



### Marking



**010N04AGH** : Product code  
**\*\*** : Week code

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

| Parameter                         | Symbol          | Rating     | Unit |
|-----------------------------------|-----------------|------------|------|
| Drain source voltage              | $V_{DS}$        | 100        | V    |
| Gate source voltage               | $V_{GS}$        | $\pm 20$   | V    |
| Continuous drain current(Tc=25°C) | $I_D$           | 130        | A    |
| Pulsed drain current              | $I_{DM}$        | 520        | A    |
| Power dissipation(Tc=25°C)        | $P_D$           | 210        | W    |
| Single pulsed avalanche energy1)  | $E_{AS}$        | 180        | mJ   |
| Thermal resistance, junction-case | $R_{\theta JC}$ | 0.59       | °C/W |
| Operation and storage temperature | $T_{stg}, T_j$  | -55 to 150 | °C   |

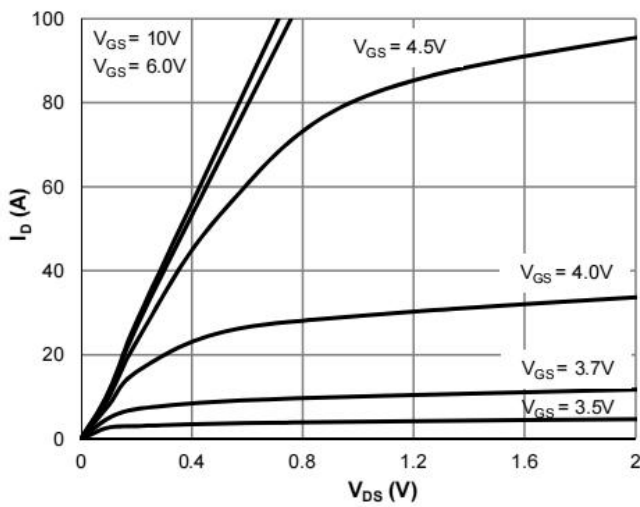
**Electrical characteristics (Ta=25°C, unless otherwise noted)**

| Characteristics                                | Symbol       | Test Condition   | Min | Typ  | Max       | Unit       |
|--|--------------|--|-----|------|-----------|------------|
| <b>Static Characteristics</b>                  |              |  |     |      |           |            |
| Drain-Source Breakdown Voltage                 | $BV_{DSS}$   | $I_D = 250\mu A, V_{GS} = 0V$                            | 100 | -    | -         | V          |
| Drain Cut-Off Current                          | $I_{DSS}$    | $V_{DS} = 80V, V_{GS} = 0V$                              | -   | -    | 1         | $\mu A$    |
| Gate Leakage Current                           | $I_{GSS}$    | $V_{GS} = \pm 20V, V_{DS} = 0V$                          | -   | -    | $\pm 0.1$ |            |
| Gate Threshold Voltage                         | $V_{GS(th)}$ | $V_{DS} = V_{GS}, I_D = 250\mu A$                        | 2.0 | 3.0  | 4.0       | V          |
| Drain-Source ON Resistance                     | $R_{DS(ON)}$ | $V_{GS} = 10V, I_D = 20A$                                | -   | 3.9  | 5.2       | m $\Omega$ |
| <b>Dynamic Characteristics</b>                 |              |  |     |      |           |            |
| Input Capacitance                              | $C_{iss}$    | $V_{DS} = 50V, V_{GS} = 0V, f = 1.0MHz$                  | -   | 6750 | -         | pF         |
| Output Capacitance                             | $C_{oss}$    |  | -   | 650  | -         |            |
| Reverse Transfer Capacitance                   | $C_{rss}$    |  | -   | 46   | -         |            |
| <b>Switching Characteristics</b>               |              |  |     |      |           |            |
| Total Gate Charge                              | $Q_g$        | $V_{DS}=50V, V_{GS}=10V, I_D=50A$                        | -   | 100  | -         | nC         |
| Gate-Source Charge                             | $Q_{gs}$     |  | -   | 43   | -         |            |
| Gate-Drain Charge                              | $Q_{gd}$     |  | -   | 19   | -         |            |
| Turn-On Delay Time                             | $t_{d(on)}$  | $V_{GS} = 10V, V_{DS} = 50V, I_D = 50A, R_G = 3.0\Omega$ | -   | 20   | -         | ns         |
| Rise Time                                      | $t_r$        |  | -   | 70   | -         |            |
| Turn-Off Delay Time                            | $t_{d(off)}$ |  | -   | 50   | -         |            |
| Fall Time                                      | $t_f$        |  | -   | 16   | -         |            |
| <b>Drain-Source Body Diode Characteristics</b> |              |  |     |      |           |            |
| Source-Drain Diode Forward Voltage             | $V_{SD}$     | $I_S = 1A, V_{GS} = 0V$                                  | -   | -    | 1.2       | V          |

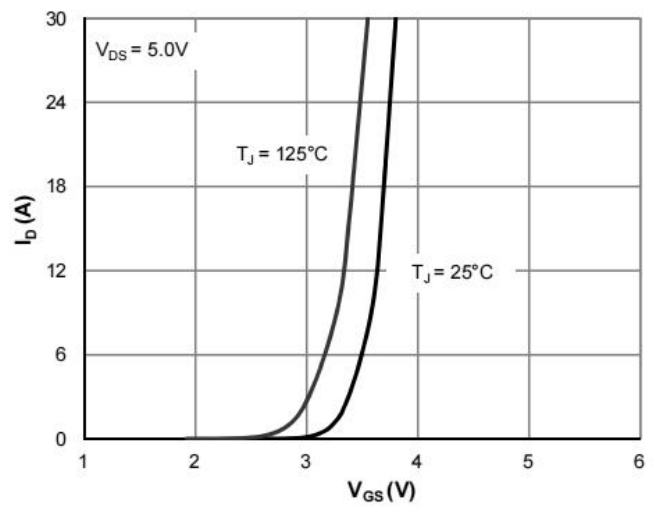
Note:

- $E_{AS}$  is tested at starting  $T_j = 25^\circ C, V_{DD}=50V, V_{GS} = 10V, L = 0.1mH, R_g=25\Omega, I_{AS} = 65A;$

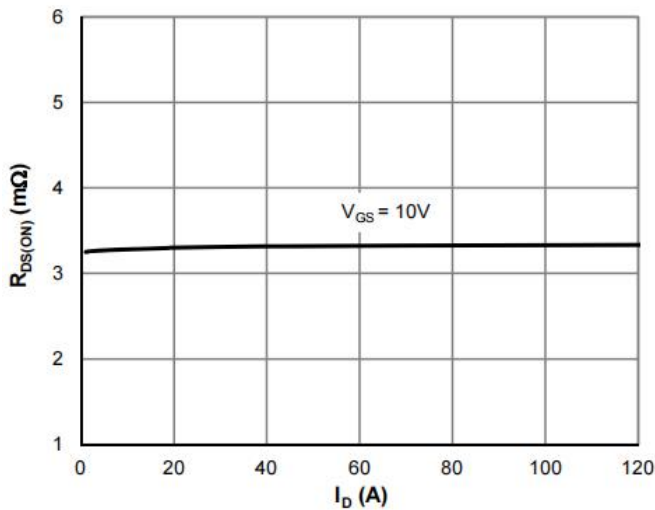
**Typical Characteristics**



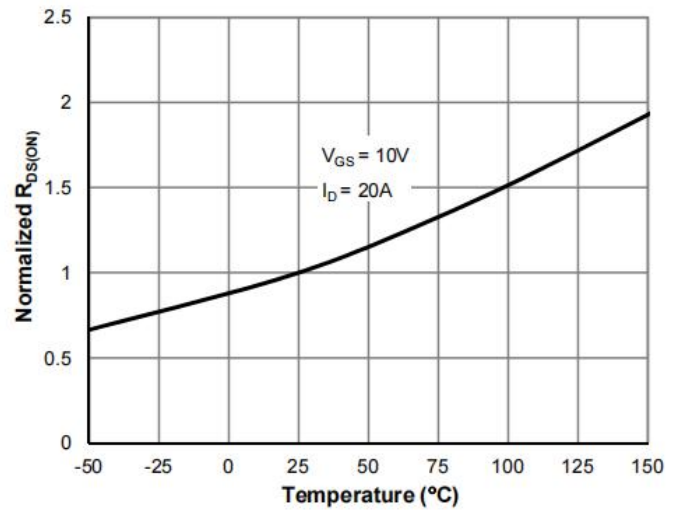
**Typical Output Characteristics**



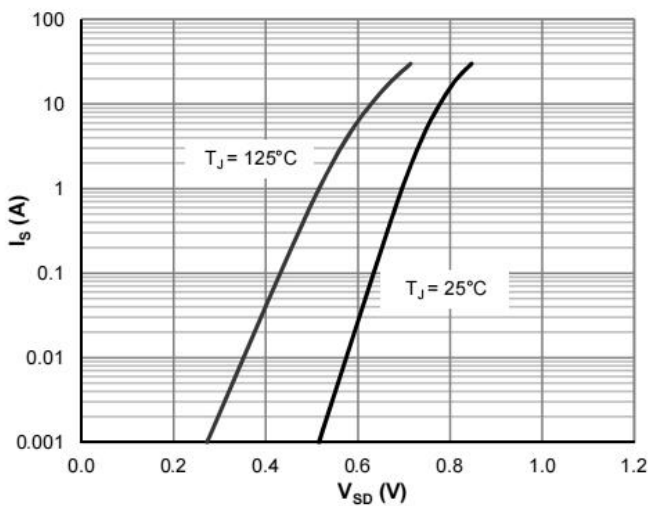
**Transfer Characteristics**



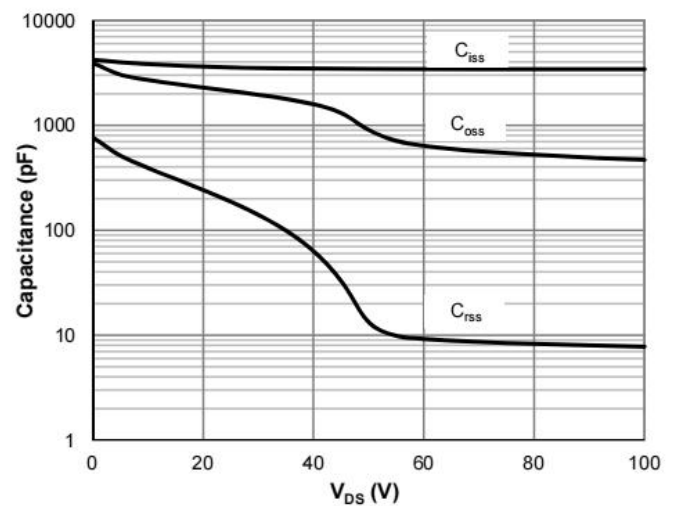
**On-Resistance vs. Drain Current**



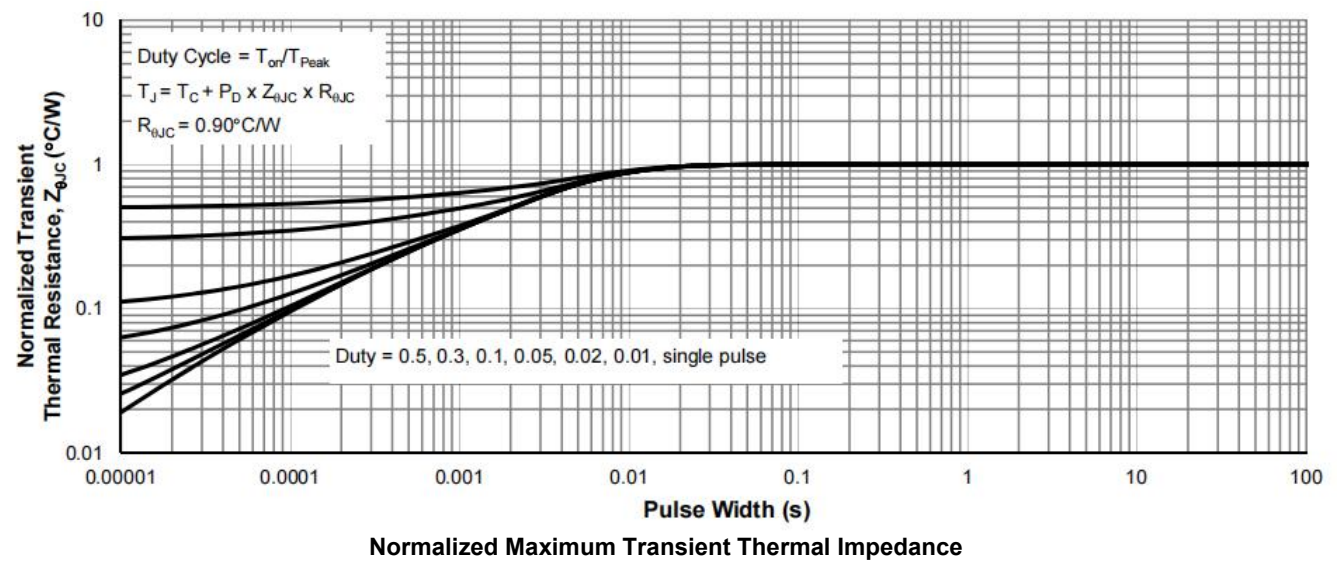
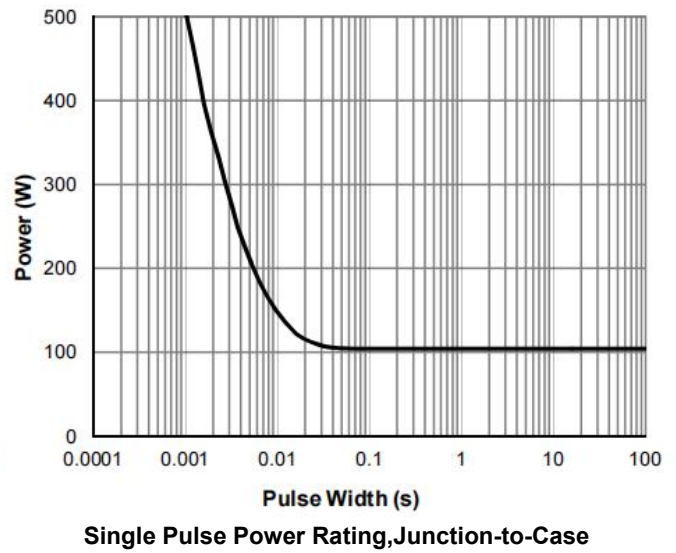
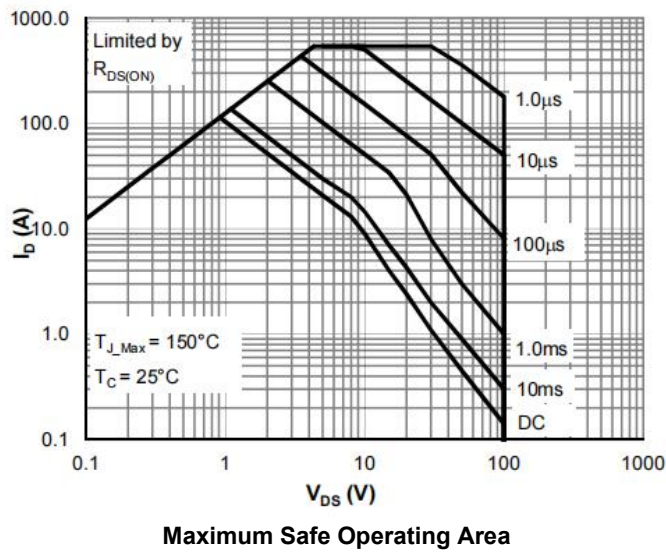
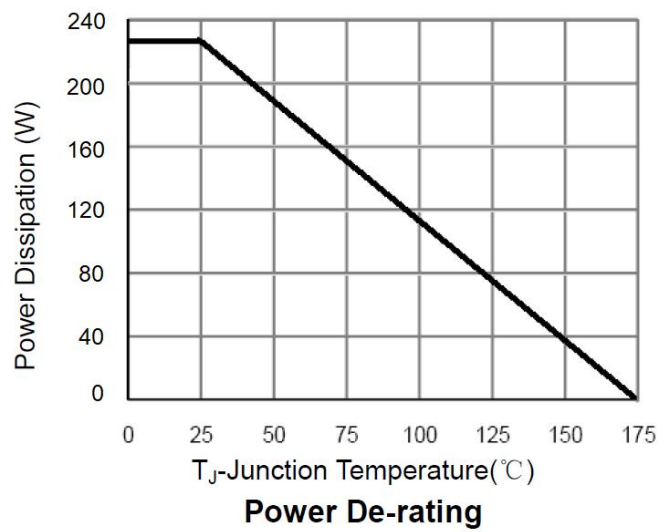
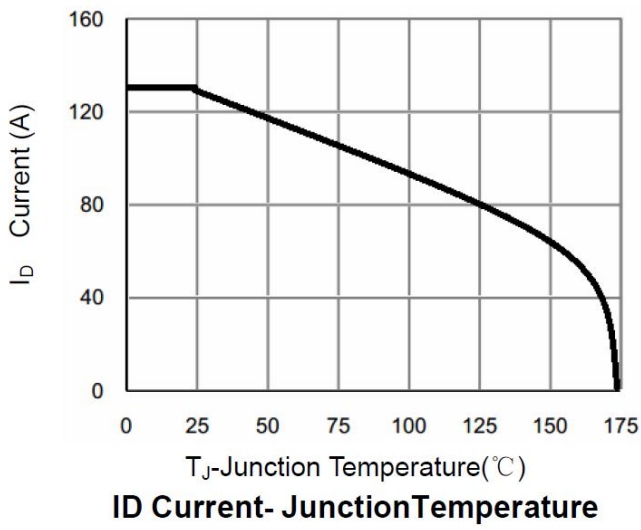
**On-Resistance vs. Junction Temperature**



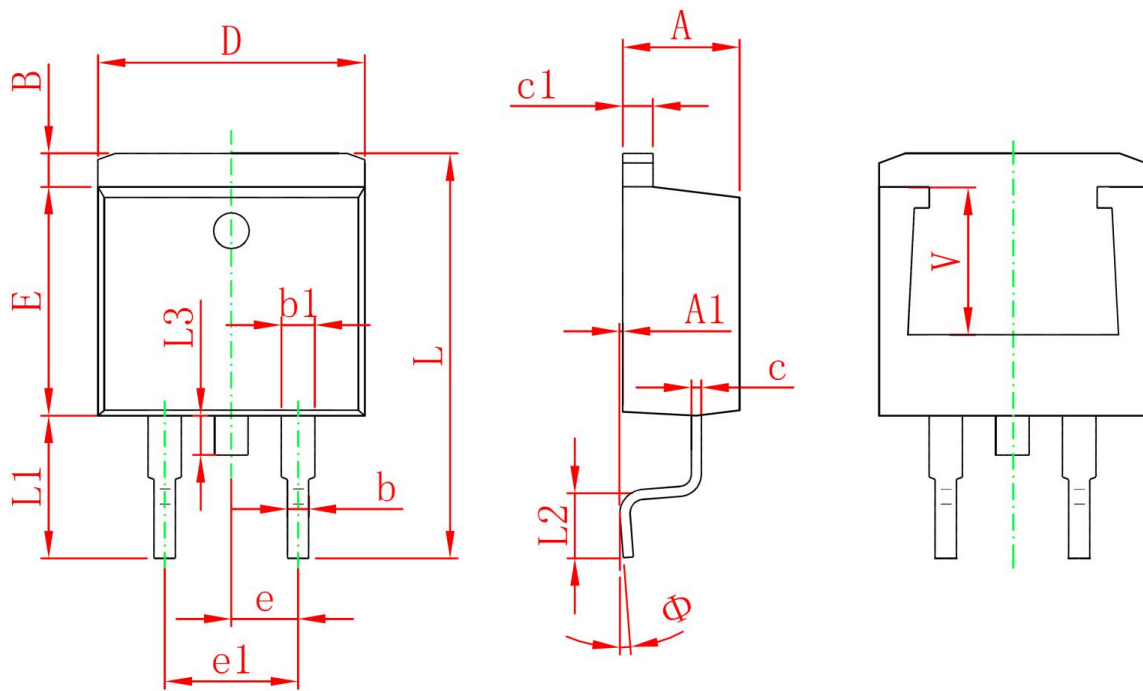
**Body-Diode Characteristics**



**Capacitance Characteristics**



**TO-263 Package Outline Dimensions**



| Symbol | Dimensions In Millimeters |        | Dimensions In Inches |       |
|--------|---------------------------|--------|----------------------|-------|
|        | Min.                      | Max.   | Min.                 | Max.  |
| A      | 4.470                     | 4.670  | 0.176                | 0.184 |
| A1     | 0.000                     | 0.150  | 0.000                | 0.006 |
| B      | 1.120                     | 1.420  | 0.044                | 0.056 |
| b      | 0.710                     | 0.910  | 0.028                | 0.036 |
| b1     | 1.170                     | 1.370  | 0.046                | 0.054 |
| c      | 0.310                     | 0.530  | 0.012                | 0.021 |
| c1     | 1.170                     | 1.370  | 0.046                | 0.054 |
| D      | 10.010                    | 10.310 | 0.394                | 0.406 |
| E      | 8.500                     | 8.900  | 0.335                | 0.350 |
| e      | 2.540 TYP.                |        | 0.100 TYP.           |       |
| e1     | 4.980                     | 5.180  | 0.196                | 0.204 |
| L      | 14.940                    | 15.500 | 0.588                | 0.610 |
| L1     | 4.950                     | 5.450  | 0.195                | 0.215 |
| L2     | 2.340                     | 2.740  | 0.092                | 0.108 |
| L3     | 1.300                     | 1.700  | 0.051                | 0.067 |
| $\Phi$ | 0°                        | 8°     | 0°                   | 8°    |
| V      | 5.600 REF.                |        | 0.220 REF.           |       |

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