

### Product Summary

| $V_{(BR)DSS}$ | $R_{DS(on)MAX}$ | $I_D$ |
|---------------|-----------------|-------|
| 100V          | 4.2mΩ@10V       | 160A  |

### Feature

- Advanced trench technology
- Low gate charge and excellent  $R_{DS(ON)}$

### Application

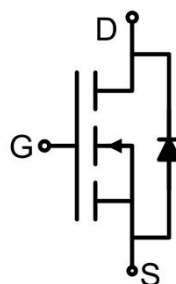
- Battery protection
- Load switch
- Uninterruptible power supply

### Package

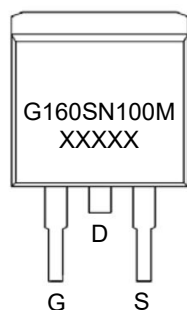


TO-263AB

### Circuit diagram



### Marking



### Absolute Maximum Ratings (T<sub>c</sub>=25°C unless otherwise noted)

| Parameter                                                                            | Symbol                  | Value      | Unit |
|--------------------------------------------------------------------------------------|-------------------------|------------|------|
| Drain-Source Voltage                                                                 | V <sub>DS</sub>         | 100        | V    |
| Gate-Source Voltage                                                                  | V <sub>GS</sub>         | ±20        | V    |
| Continuous Drain Current <sup>1)</sup> (V <sub>GS</sub> =10V)                        | I <sub>D</sub>          | 160        | A    |
| Continuous Drain Current <sup>1)</sup> (V <sub>GS</sub> =10V, T <sub>C</sub> =100°C) | I <sub>D</sub> ( 100°C) | 105        | A    |
| Pulsed Drain Current <sup>2)</sup>                                                   | I <sub>DM</sub>         | 600        | A    |
| Single Pulse Avalanche Energy <sup>3)</sup>                                          | E <sub>AS</sub>         | 540        | mJ   |
| Power Dissipation <sup>4)</sup>                                                      | P <sub>D</sub>          | 225        | W    |
| Thermal Resistance Junction to Case                                                  | R <sub>θJC</sub>        | 0.55       | °C/W |
| Operating Junction Temperature                                                       | T <sub>J</sub>          | -55 ~ +150 | °C   |
| Storage Temperature                                                                  | T <sub>STG</sub>        | -55 ~ +150 | °C   |

### Electrical characteristics (T<sub>J</sub>=25°C unless otherwise noted)

| Parameter                             | Symbol               | Test Condition                                                                        | Min. | Typ. | Max. | Unit |
|---------------------------------------|----------------------|---------------------------------------------------------------------------------------|------|------|------|------|
| Static Characteristics                |                      |                                                                                       |      |      |      |      |
| Drain-source breakdown voltage        | V <sub>(BR)DSS</sub> | V <sub>GS</sub> =0V, I <sub>D</sub> =250μA                                            | 100  |      |      | V    |
| Zero gate voltage drain current       | I <sub>DSS</sub>     | V <sub>DS</sub> =100V, V <sub>GS</sub> =0V                                            |      |      | 1    | μA   |
| Gate-body leakage current             | I <sub>GSS</sub>     | V <sub>DS</sub> =0V, V <sub>GS</sub> =±20V                                            |      |      | ±100 | nA   |
| Gate threshold voltage                | V <sub>GS(th)</sub>  | V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250μA                              | 2.5  | 3.0  | 4.2  | V    |
| Drain-source on-resistance            | R <sub>DS(on)</sub>  | V <sub>GS</sub> =10V, I <sub>D</sub> =80A                                             |      | 3.7  | 4.2  | mΩ   |
| Dynamic characteristics <sup>5)</sup> |                      |                                                                                       |      |      |      |      |
| Input Capacitance                     | C <sub>iss</sub>     | V <sub>DS</sub> =50V, V <sub>GS</sub> =0V, f =1MHz                                    |      | 3950 |      | pF   |
| Output Capacitance                    | C <sub>oss</sub>     |                                                                                       |      | 1200 |      |      |
| Reverse Transfer Capacitance          | C <sub>rss</sub>     |                                                                                       |      | 45   |      |      |
| Total Gate Charge                     | Q <sub>g</sub>       | V <sub>DS</sub> =50V, V <sub>GS</sub> =10V, I <sub>D</sub> =80A                       |      | 78   |      | nC   |
| Gate-Source Charge                    | Q <sub>gs</sub>      |                                                                                       |      | 32   |      |      |
| Gate-Drain Charge                     | Q <sub>gd</sub>      |                                                                                       |      | 17   |      |      |
| Turn-on delay time                    | t <sub>d(on)</sub>   | V <sub>DS</sub> =50V, V <sub>GS</sub> =10V, I <sub>D</sub> =80A<br>R <sub>G</sub> =5Ω |      | 27   |      | nS   |
| Turn-on rise time                     | t <sub>r</sub>       |                                                                                       |      | 52   |      |      |
| Turn-off delay time                   | t <sub>d(off)</sub>  |                                                                                       |      | 58   |      |      |
| Turn-off fall time                    | t <sub>f</sub>       |                                                                                       |      | 23   |      |      |
| Source-Drain Diode characteristics    |                      |                                                                                       |      |      |      |      |
| Diode Forward Current                 | I <sub>S</sub>       |                                                                                       |      |      | 160  | A    |
| Diode Forward voltage                 | V <sub>SD</sub>      | V <sub>GS</sub> =0V, I <sub>S</sub> =50A                                              |      |      | 1.2  | V    |
| Reverse Recovery Time                 | T <sub>rr</sub>      | I <sub>F</sub> =20A, di/dt =-500A/μs                                                  |      | 82   |      | nS   |
| Reverse Recovery Charge               | Q <sub>rr</sub>      |                                                                                       |      | 180  |      | nC   |

Notes:

- 1) The data tested by surface mounted on a 1 inch<sup>2</sup> FR-4 board with 20Z copper.
- 2) The data tested by pulsed , pulse width ≤ 300us , duty cycle ≤ 2%.
- 3) The EAS data shows Max. rating . The test condition is V<sub>GS</sub> =10V, L=0.1mH, I<sub>AS</sub> = 53.8A, V<sub>DD</sub> = 82V.
- 4) The power dissipation is limited by 150°C junction temperature.
- 5) Guaranteed by design, not subject to production testing.

### Typical Characteristics

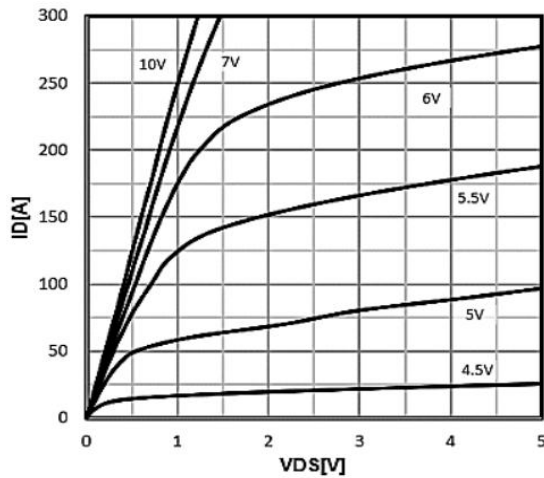


Figure 1. Type. Output Characteristics ( $T_j=25\text{ }^{\circ}\text{C}$ )

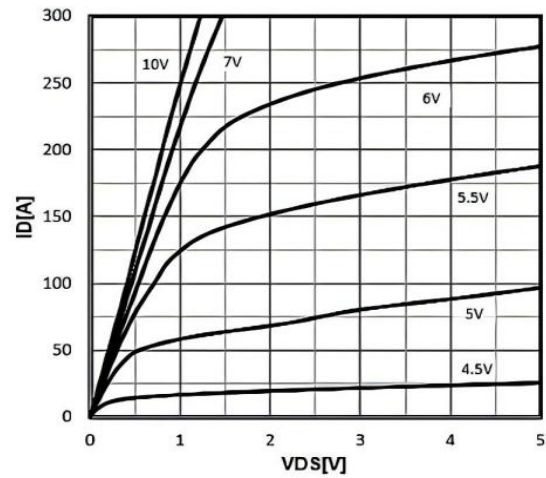


Figure 2. Type. drain-source on resistance

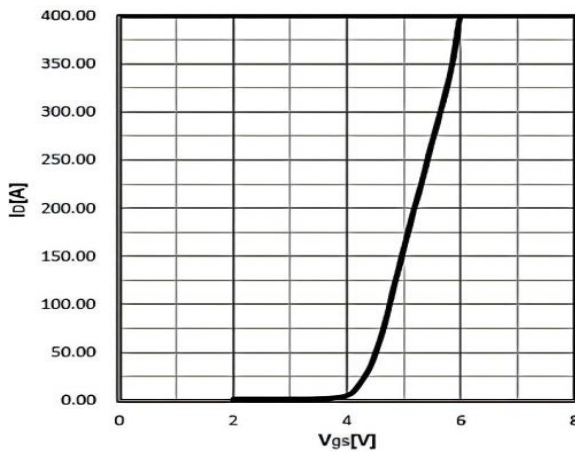


Figure 3. Type. transfer characteristics

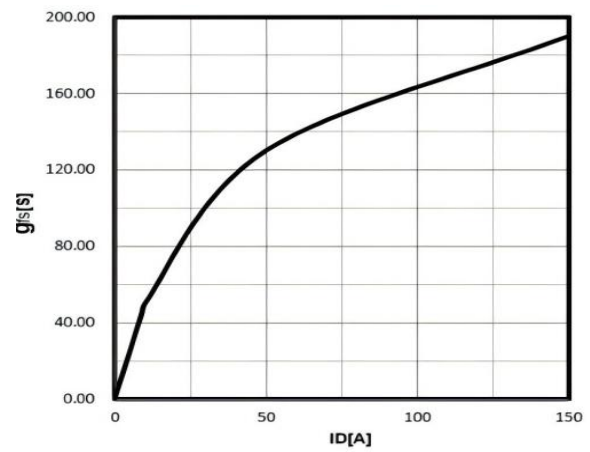


Figure 4. Type. forward transconductance

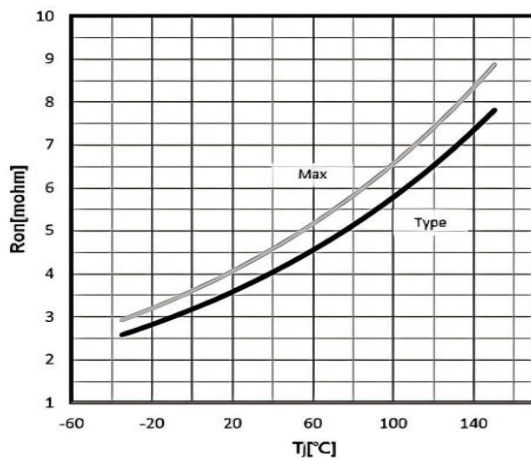


Figure 5. Drain-source on-state resistance  
 $R_{DS(on)} = f(T_j)$ ;  $I_D = 80\text{ A}$ ;  $V_{GS} = 10\text{ V}$

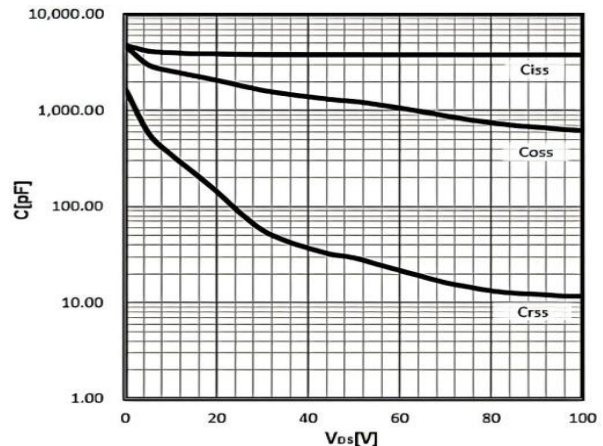
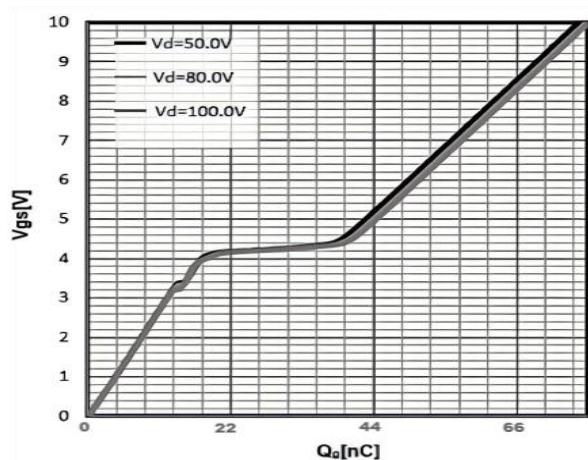
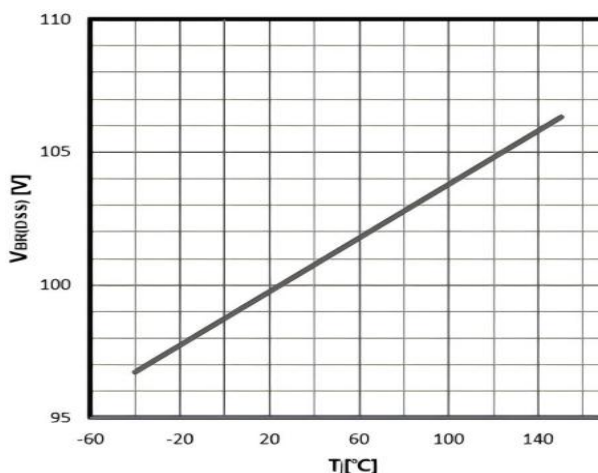


Figure 6. Body-Diode Characteristics  
 $C = f(V_{DS})$ ;  $V_{GS} = 0\text{ V}$ ;  $f = 1\text{ MHz}$

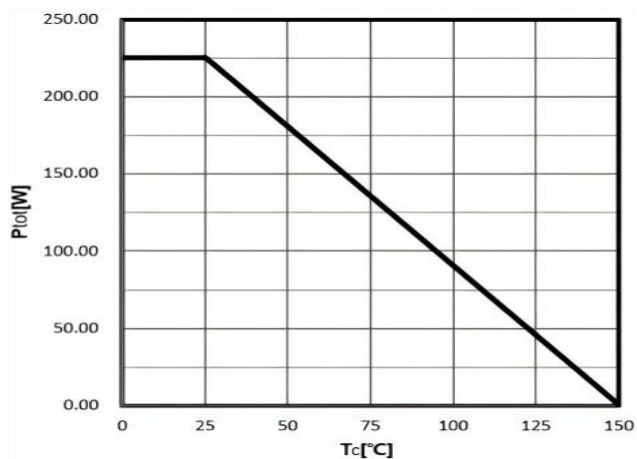
### Typical Characteristics



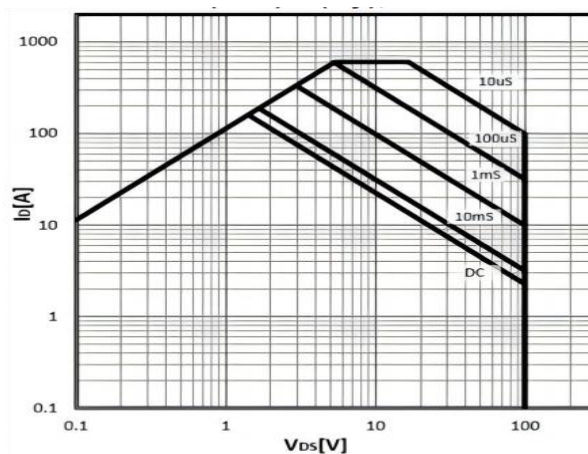
**Figure 7. Typ. gate charge**  
 $V_{GS} = f(Q_{gate})$ ;  $I_D = 20A$



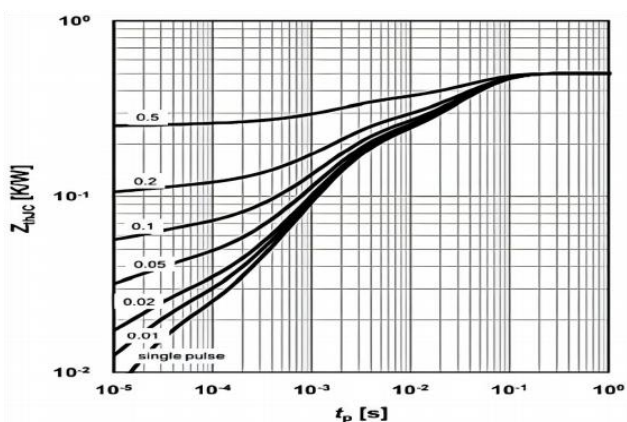
**Figure 8. Drain Current Derating**  
 $V_{BR(DSS)} = f(T_j)$ ;  $I_D = 250\mu A$



**Figure9 . Power Dissipation**



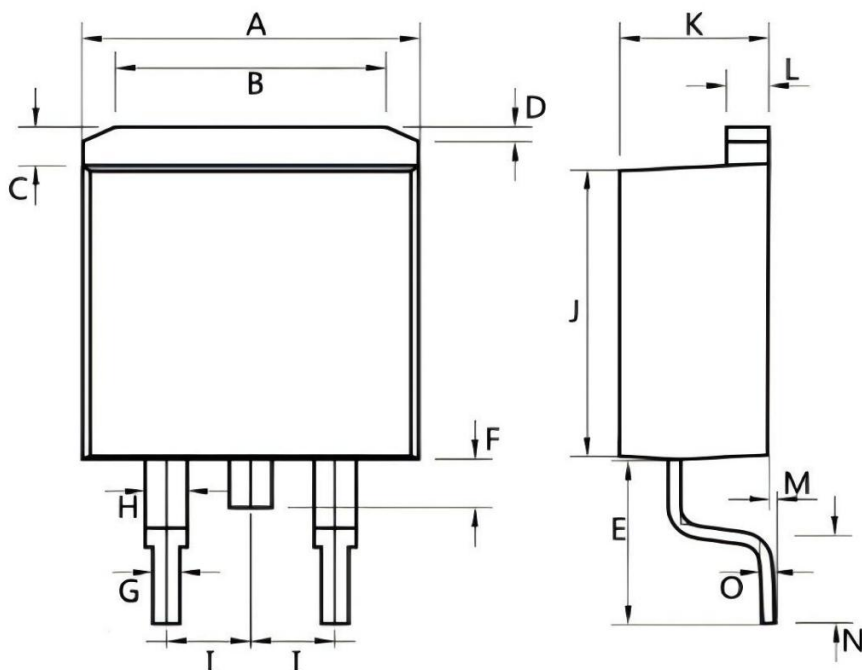
**Figure10. Safe operating area**



**Figure11. Max. transient thermal impedance**

$$Z_{thJC} = f(t_p)$$

### TO-263AB Package Information



| Symbol | Dimensions In Millimeters |        | Dimensions In Inches |       |
|--------|---------------------------|--------|----------------------|-------|
|        | Min.                      | Max.   | Min.                 | Max.  |
| A      | 10.000                    | 10.500 | 0.394                | 0.413 |
| B      | 7.250                     | 7.750  | 0.285                | 0.305 |
| C      | 1.300                     | 1.500  | 0.051                | 0.059 |
| D      | 0.550                     | 0.750  | 0.022                | 0.030 |
| E      | 5.000                     | 6.000  | 0.197                | 0.236 |
| F      | 1.400                     | 1.600  | 0.055                | 0.063 |
| G      | 0.750                     | 0.950  | 0.030                | 0.037 |
| H      | 1.150                     | 1.350  | 0.045                | 0.053 |
| I      | 2.540 TYP.                |        | 0.100 TYP.           |       |
| J      | 8.400                     | 8.600  | 0.331                | 0.339 |
| K      | 4.400                     | 4.600  | 0.173                | 0.181 |
| L      | 1.250                     | 1.450  | 0.049                | 0.057 |
| M      | 0.020                     | 0.100  | 0.001                | 0.004 |
| N      | 2.400                     | 2.800  | 0.094                | 0.110 |
| O      | 0.350                     | 0.450  | 0.014                | 0.018 |