

### Product Summary

| $V_{(BR)DSS}$ | $R_{DS(on)MAX}$ | $I_D$ |
|---------------|-----------------|-------|
| 85V           | 1.8mΩ@10V       | 340A  |

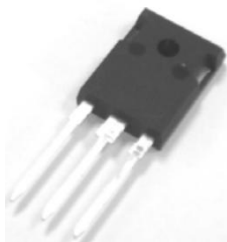
### Feature

- Advanced SGT technology
- Excellent  $R_{DS(on)}$
- Low gate charge

### Application

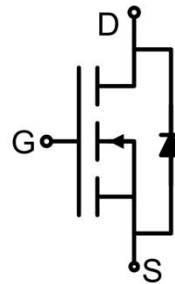
- DC/DC Converter
- LED Backlighting
- Power management switches

### Package



TO-247AB

### 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>        | 85         | V    |
| Gate-Source Voltage                                                    | V <sub>GS</sub>        | ±20        | V    |
| Continuous Drain Current (V <sub>GS</sub> =10V)                        | I <sub>D</sub>         | 340        | A    |
| Continuous Drain Current (V <sub>GS</sub> =10V, T <sub>c</sub> =100°C) | I <sub>D</sub> (100°C) | 220        | A    |
| Pulsed Drain Current <sup>1)</sup>                                     | I <sub>DM</sub>        | 960        | A    |
| Single Pulse Avalanche Energy <sup>2)</sup>                            | E <sub>AS</sub>        | 2025       | mJ   |
| Power Dissipation <sup>3)</sup>                                        | P <sub>D</sub>         | 313        | W    |
| Thermal Resistance, Junction-to-Case                                   | R <sub>θJC</sub>       | 0.54       | °C/W |
| Operating Junction Temperature                                         | T <sub>J</sub>         | -55 ~ +175 | °C   |
| Storage Temperature                                                    | T <sub>STG</sub>       | -55 ~ +175 | °C   |

### Electrical characteristics (T<sub>c</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                                            | 85   |       |      | V    |
| Zero gate voltage drain current       | I <sub>DSS</sub>     | V <sub>DS</sub> =85V, V <sub>GS</sub> =0V, T <sub>J</sub> =25℃                        |      |       | 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    | 3     | 4    | V    |
| Drain-source on-resistance            | R <sub>DS(on)</sub>  | V <sub>GS</sub> =10V, I <sub>D</sub> =50A                                             |      | 1.5   | 1.8  | mΩ   |
| Dynamic characteristics <sup>4)</sup> |                      |                                                                                       |      |       |      |      |
| Input Capacitance                     | C <sub>iss</sub>     | V <sub>DS</sub> =50V, V <sub>GS</sub> =0V, f =1MHz                                    |      | 13590 |      | pF   |
| Output Capacitance                    | C <sub>oss</sub>     |                                                                                       |      | 2000  |      |      |
| Reverse Transfer Capacitance          | C <sub>rss</sub>     |                                                                                       |      | 586.2 |      |      |
| Total Gate Charge                     | Q <sub>g</sub>       | V <sub>DS</sub> =50V, V <sub>GS</sub> =10V, I <sub>D</sub> =20A                       |      | 205   |      | nC   |
| Gate-Source Charge                    | Q <sub>gs</sub>      |                                                                                       |      | 54    |      |      |
| Gate-Drain Charge                     | Q <sub>gd</sub>      |                                                                                       |      | 46    |      |      |
| Turn-on delay time                    | t <sub>d(on)</sub>   | V <sub>DS</sub> =40V, V <sub>GS</sub> =10V, I <sub>D</sub> =20A<br>R <sub>G</sub> =3Ω |      | 38    |      | nS   |
| Turn-on rise time                     | t <sub>r</sub>       |                                                                                       |      | 132   |      |      |
| Turn-off delay time                   | t <sub>d(off)</sub>  |                                                                                       |      | 126   |      |      |
| Turn-off fall time                    | t <sub>f</sub>       |                                                                                       |      | 153   |      |      |
| Source-Drain Diode characteristics    |                      |                                                                                       |      |       |      |      |
| Diode Forward Current                 | I <sub>S</sub>       |                                                                                       |      |       | 340  | 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> =30A, di/dt =500A/μs                                                   |      | 112   |      | nS   |
| Reverse Recovery Charge               | Q <sub>rr</sub>      |                                                                                       |      | 213   |      | nC   |

Notes:

- 1) The data tested by pulsed , pulse width ≤ 300us , duty cycle ≤ 2%.
- 2) The EAS data shows Max. rating .The test condition is V<sub>DS</sub>=50V, V<sub>GS</sub>=10V, L=0.5mH, I<sub>AS</sub>=50A.
- 3) The power dissipation is limited by 150°C junction temperature.
- 4) Guaranteed by design, not subject to production testing.

## Typical Characteristics

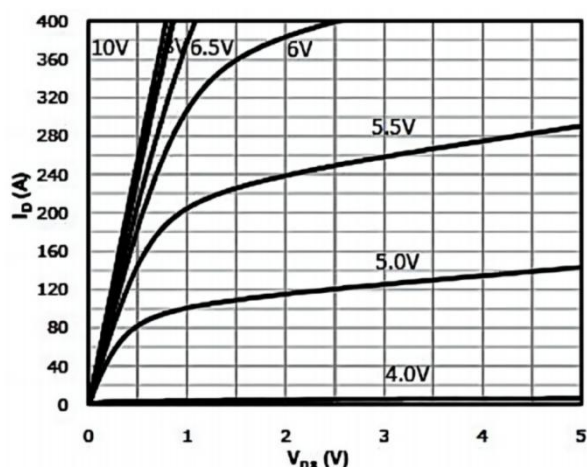


Figure 1. Output Characteristics

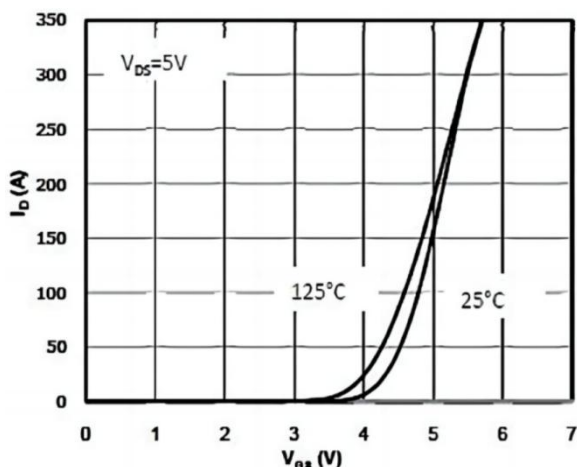


Figure 2. Transfer Characteristics

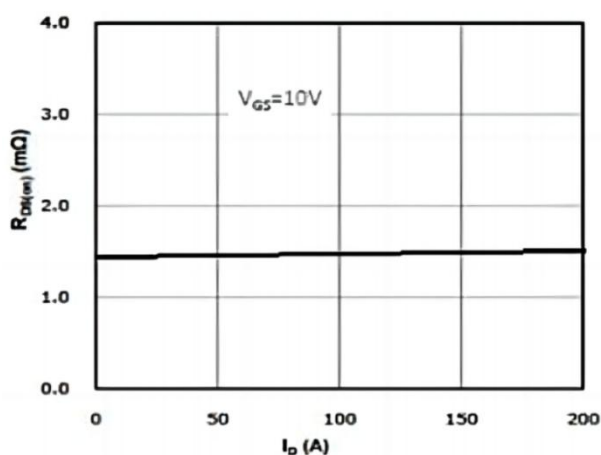


Figure 3. RDS (ON) VS Drain Current and Vgs

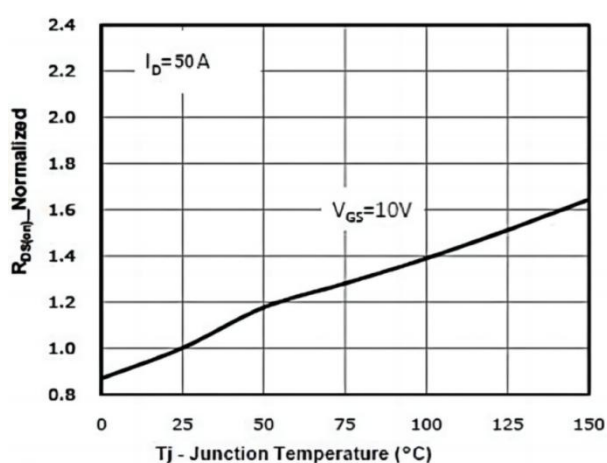


Figure 4. RDS(ON) vs. VGS

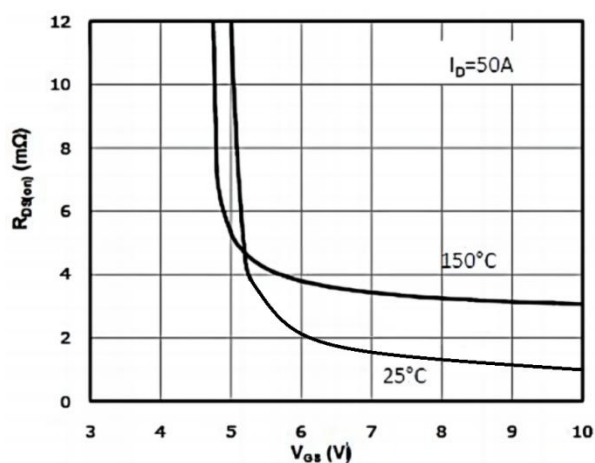


Figure 5. RDS(ON) vs. Temperature

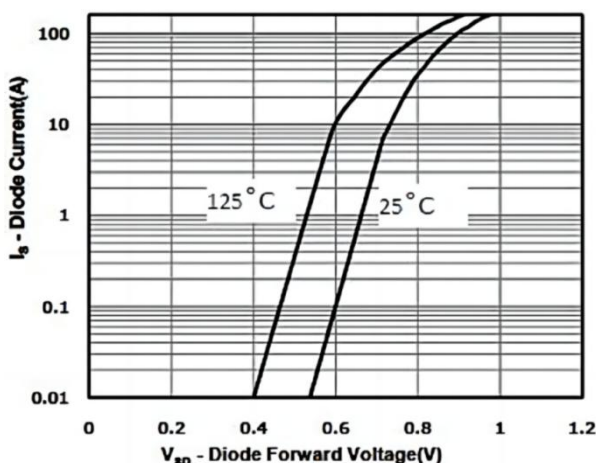


Figure 6. Capacitance Characteristics

## Typical Characteristics

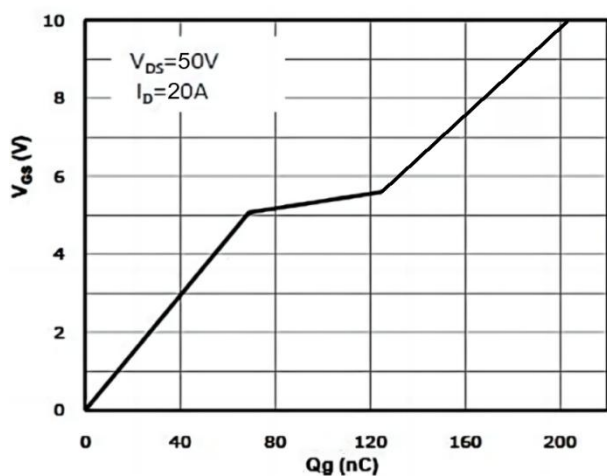


Figure 7. Gate Charge Characteristics

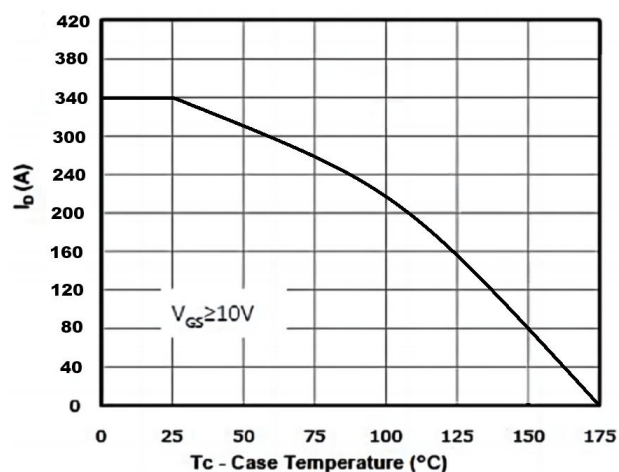


Figure 8. Body-Diode Forward Characteristics

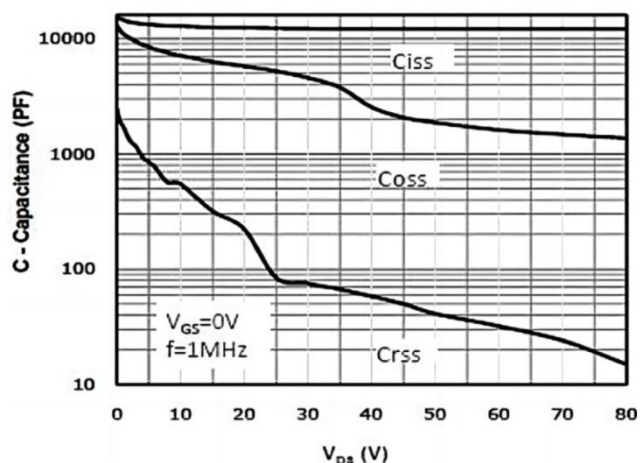


Figure 9. Capacitance Characteristics

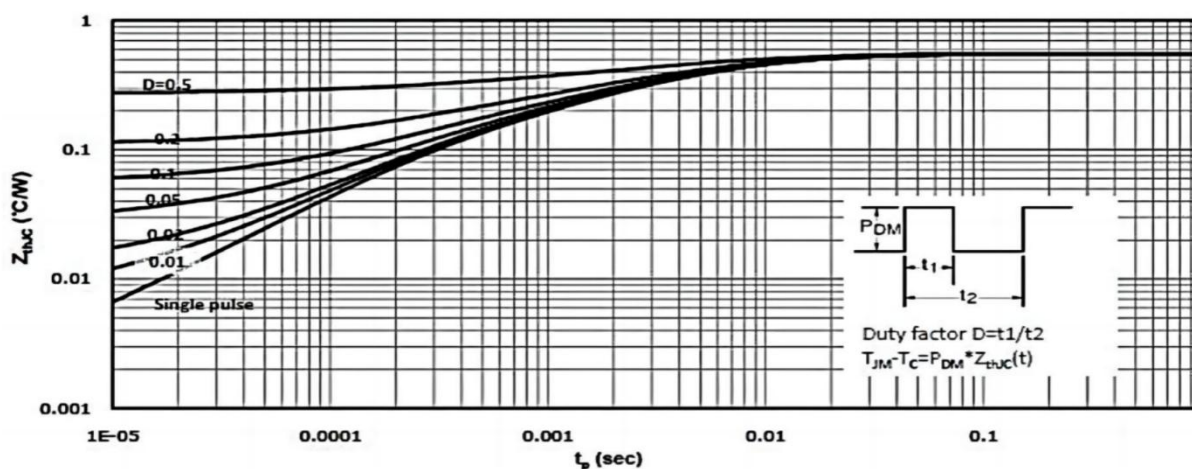
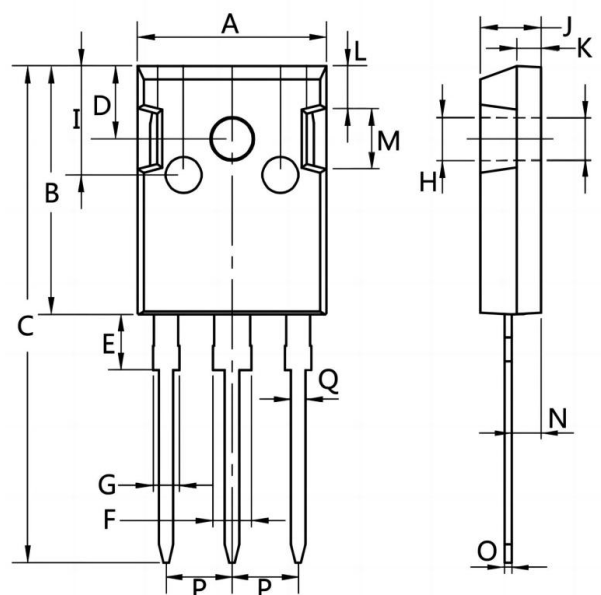


Figure 10. Normalized Maximum Transient Thermal Impedance

## TO-247AB Package Information



| Symbol | Dimensions In Millimeters |        | Dimensions In Inches |       |
|--------|---------------------------|--------|----------------------|-------|
|        | Min.                      | Max.   | Min.                 | Max.  |
| A      | 15.000                    | 16.000 | 0.591                | 0.630 |
| B      | 20.000                    | 21.000 | 0.787                | 0.827 |
| C      | 41.000                    | 42.000 | 1.614                | 1.654 |
| D      | 5.000                     | 6.000  | 0.197                | 0.236 |
| E      | 4.000                     | 5.000  | 0.157                | 0.197 |
| F      | 2.500                     | 3.500  | 0.098                | 0.138 |
| G      | 1.750                     | 2.500  | 0.069                | 0.098 |
| H      | 3.000                     | 3.500  | 0.118                | 0.138 |
| I      | 8.000                     | 10.000 | 0.315                | 0.394 |
| J      | 4.900                     | 5.100  | 0.193                | 0.201 |
| K      | 1.900                     | 2.100  | 0.075                | 0.083 |
| L      | 3.500                     | 4.000  | 0.138                | 0.157 |
| M      | 4.750                     | 5.250  | 0.187                | 0.207 |
| N      | 2.000                     | 3.000  | 0.079                | 0.118 |
| O      | 0.550                     | 0.750  | 0.022                | 0.030 |
| P      | 5.080 BSC.                |        | 0.200 BSC.           |       |
| Q      | 1.200                     | 1.300  | 0.047                | 0.051 |