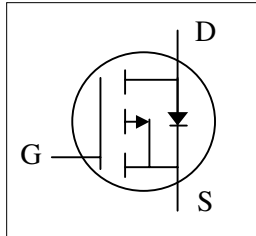




- ▼ Simple Drive Requirement
- ▼ 2.5V Gate Drive Capability
- ▼ Fast Switching Characteristic

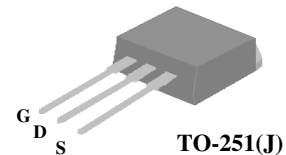
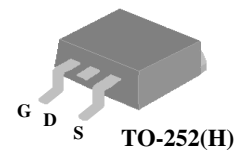


| | |
|--------------|---------------|
| BV_{DSS} | -20V |
| $R_{DS(ON)}$ | 150m Ω |
| I_D | -10A |

Description

Advanced Power MOSFETs from APEC provide the designer with the best combination of fast switching, low on-resistance and cost-effectiveness.

This device is suited for low voltage and battery power applications.



Absolute Maximum Ratings

| Symbol | Parameter | Rating | Units |
|-----------------------|---|------------|---------------|
| V_{DS} | Drain-Source Voltage | - 20 | V |
| V_{GS} | Gate-Source Voltage | ± 12 | V |
| $I_D@T_C=25^\circ C$ | Continuous Drain Current, V_{GS} @ 4.5V | -10 | A |
| $I_D@T_C=100^\circ C$ | Continuous Drain Current, V_{GS} @ 4.5V | -6.2 | A |
| I_{DM} | Pulsed Drain Current ¹ | -24 | A |
| $P_D@T_C=25^\circ C$ | Total Power Dissipation | 25 | W |
| | Linear Derating Factor | 0.01 | W/ $^\circ C$ |
| T_{STG} | Storage Temperature Range | -55 to 150 | $^\circ C$ |
| T_J | Operating Junction Temperature Range | -55 to 150 | $^\circ C$ |

Thermal Data

| Symbol | Parameter | Value | Units |
|--------|---|-------|--------------|
| Rthj-c | Maximum Thermal Resistance, Junction-case | 5.0 | $^\circ C/W$ |
| Rthj-a | Maximum Thermal Resistance, Junction-ambient (PCB mount) ³ | 62.5 | $^\circ C/W$ |
| Rthj-a | Maximum Thermal Resistance, Junction-ambient | 110 | $^\circ C/W$ |



AP3310GH/J

Electrical Characteristics@T_j=25°C(unless otherwise specified)

| Symbol | Parameter | Test Conditions | Min. | Typ. | Max. | Units |
|-------------------------------------|--|---|------|------|------|-------|
| BV _{DSS} | Drain-Source Breakdown Voltage | V _{GS} =0V, I _D =-250uA | -20 | - | - | V |
| ΔBV _{DSS} /ΔT _j | Breakdown Voltage Temperature Coefficient | Reference to 25°C, I _D =-1mA | - | -0.1 | - | V/°C |
| R _{DS(ON)} | Static Drain-Source On-Resistance ² | V _{GS} =-4.5V, I _D =-2.8A | - | - | 150 | mΩ |
| | | V _{GS} =-2.5V, I _D =-2.0A | - | - | 250 | mΩ |
| V _{GS(th)} | Gate Threshold Voltage | V _{DS} =V _{GS} , I _D =-250uA | -0.5 | - | - | V |
| g _{fs} | Forward Transconductance | V _{DS} =-5V, I _D =-2.8A | - | 4.4 | - | S |
| I _{DSS} | Drain-Source Leakage Current | V _{DS} =-20V, V _{GS} =0V | - | - | -1 | uA |
| | Drain-Source Leakage Current (T _j =125°C) | V _{DS} =-16V, V _{GS} =0V | - | - | -250 | uA |
| I _{GSS} | Gate-Source Leakage | V _{GS} =±12V, V _{DS} =0V | - | - | ±100 | nA |
| Q _g | Total Gate Charge ² | I _D =-2.8A | - | 6 | - | nC |
| Q _{gs} | Gate-Source Charge | V _{DS} =-6V | - | 1.5 | - | nC |
| Q _{gd} | Gate-Drain ("Miller") Charge | V _{GS} =-5V | - | 0.6 | - | nC |
| t _{d(on)} | Turn-on Delay Time ² | V _{DS} =-6V | - | 25 | - | ns |
| t _r | Rise Time | I _D =-1A | - | 60 | - | ns |
| t _{d(off)} | Turn-off Delay Time | R _G =6Ω, V _{GS} =-5V | - | 70 | - | ns |
| t _f | Fall Time | R _D =6Ω | - | 60 | - | ns |
| C _{iss} | Input Capacitance | V _{GS} =0V | - | 300 | - | pF |
| C _{oss} | Output Capacitance | V _{DS} =-6V | - | 180 | - | pF |
| C _{rss} | Reverse Transfer Capacitance | f=1.0MHz | - | 60 | - | pF |

Source-Drain Diode

| Symbol | Parameter | Test Conditions | Min. | Typ. | Max. | Units |
|-----------------|---|---|------|------|------|-------|
| I _S | Continuous Source Current (Body Diode) | V _D =V _G =0V , V _S =-1.2V | - | - | -10 | A |
| I _{SM} | Pulsed Source Current (Body Diode) ¹ | | - | - | -24 | A |
| V _{SD} | Forward On Voltage ² | T _j =25°C, I _S =-10A, V _{GS} =0V | - | - | -1.2 | V |

Notes:

- 1.Pulse width limited by Max. junction temperature.
- 2.Pulse test
- 3.Surface mounted on 1 in² copper pad of FR4 board

THIS PRODUCT IS SENSITIVE TO ELECTROSTATIC DISCHARGE, PLEASE HANDLE WITH CAUTION.

USE OF THIS PRODUCT AS A CRITICAL COMPONENT IN LIFE SUPPORT OR OTHER SIMILAR SYSTEMS IS NOT AUTHORIZED.

APEC DOES NOT ASSUME ANY LIABILITY ARISING OUT OF THE APPLICATION OR USE OF ANY PRODUCT OR CIRCUIT DESCRIBED HEREIN; NEITHER DOES IT CONVEY ANY LICENSE UNDER ITS PATENT RIGHTS, NOR THE RIGHTS OF OTHERS.

APEC RESERVES THE RIGHT TO MAKE CHANGES WITHOUT FURTHER NOTICE TO ANY PRODUCTS HEREIN TO IMPROVE RELIABILITY, FUNCTION OR DESIGN.

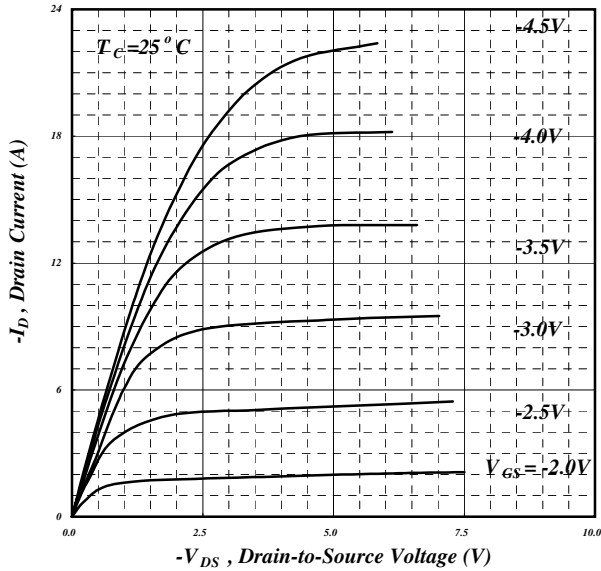


Fig 1. Typical Output Characteristics

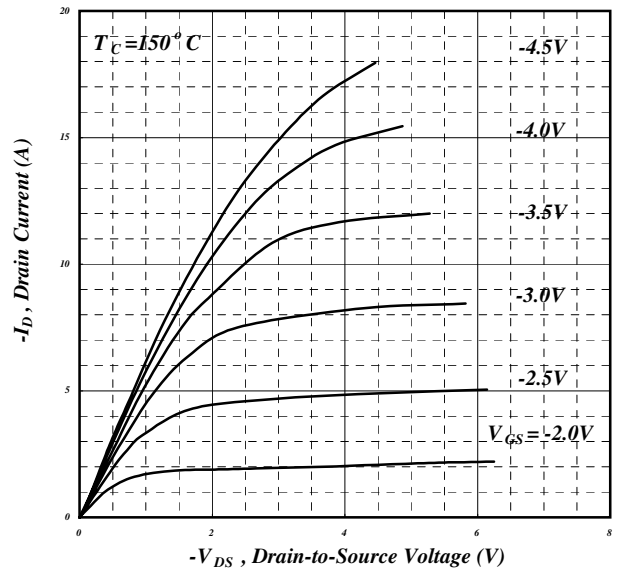


Fig 2. Typical Output Characteristics

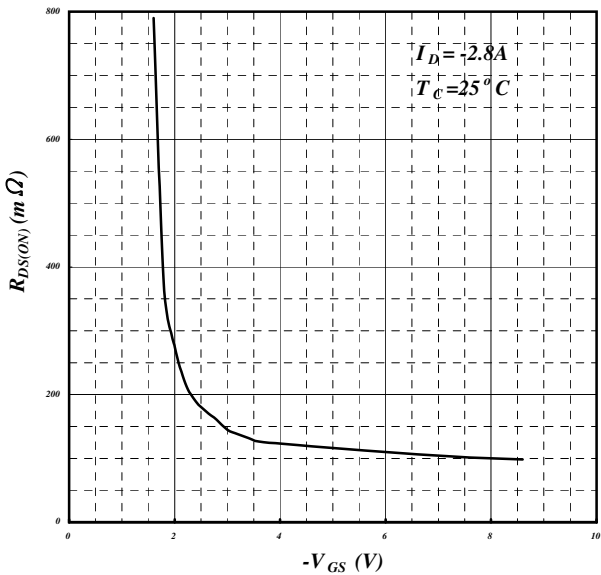


Fig 3. On-Resistance v.s. Gate Voltage

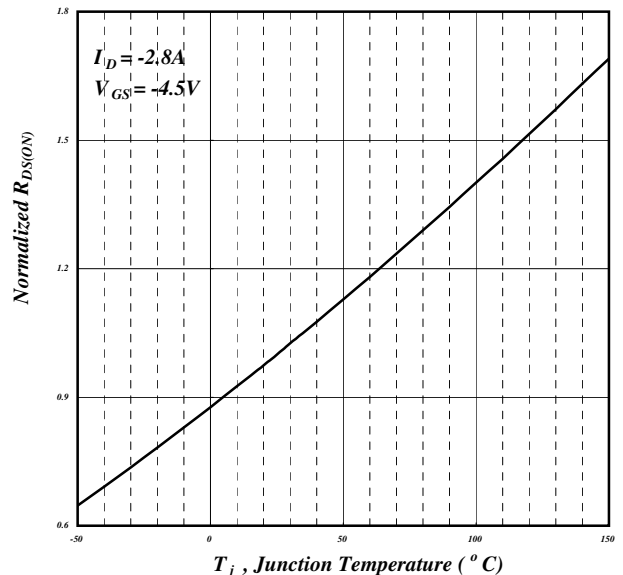


Fig 4. Normalized On-Resistance v.s. Junction Temperature

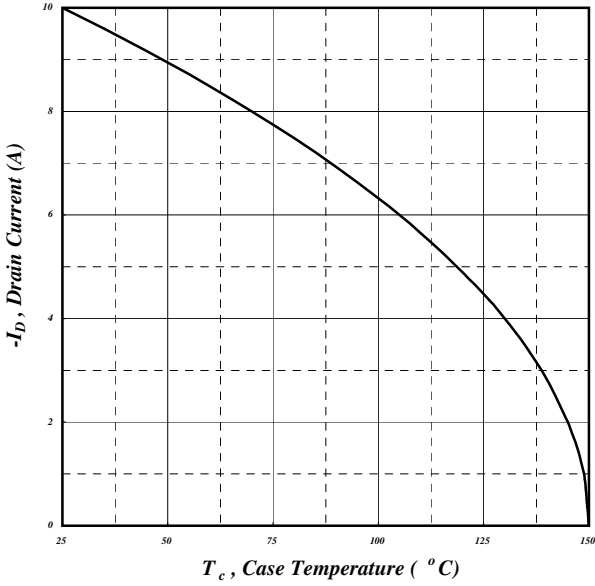


Fig 5. Maximum Drain Current v.s. Case Temperature

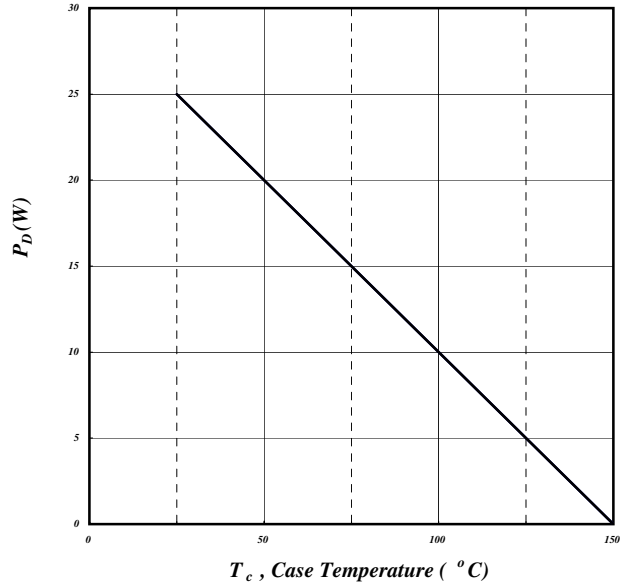


Fig 6. Typical Power Dissipation

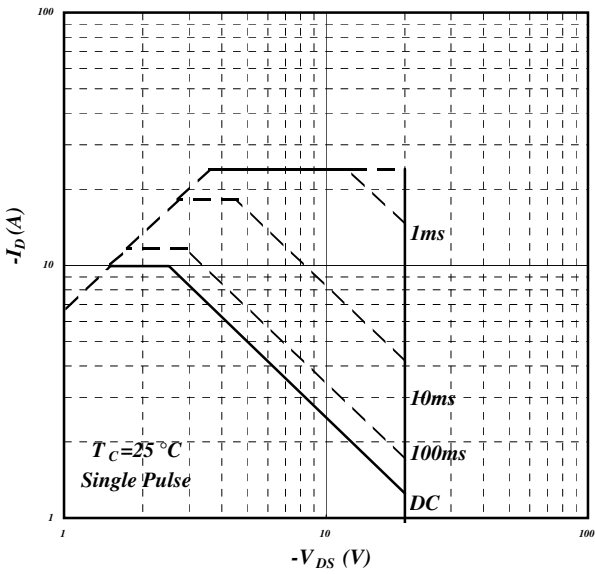


Fig 7. Maximum Safe Operating Area

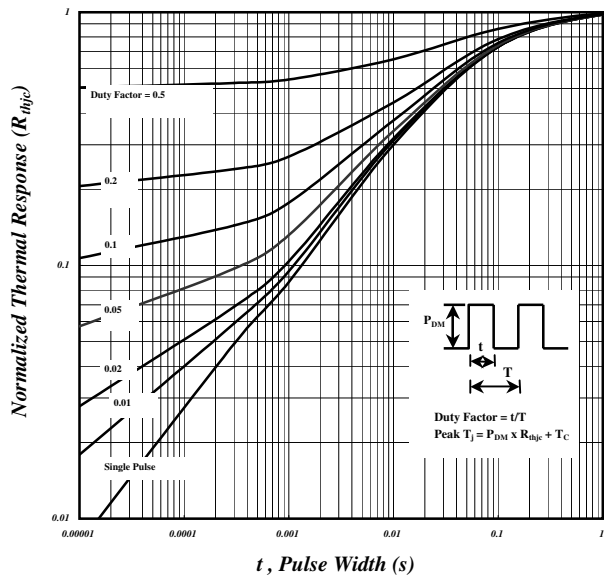


Fig 8. Effective Transient Thermal Impedance

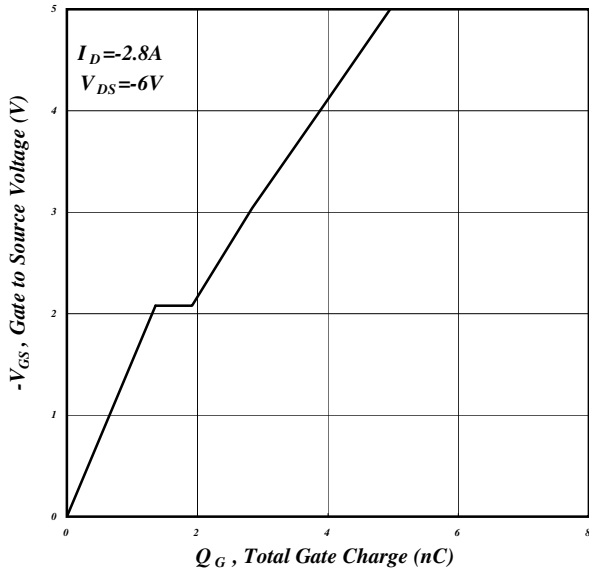


Fig 9. Gate Charge Characteristics

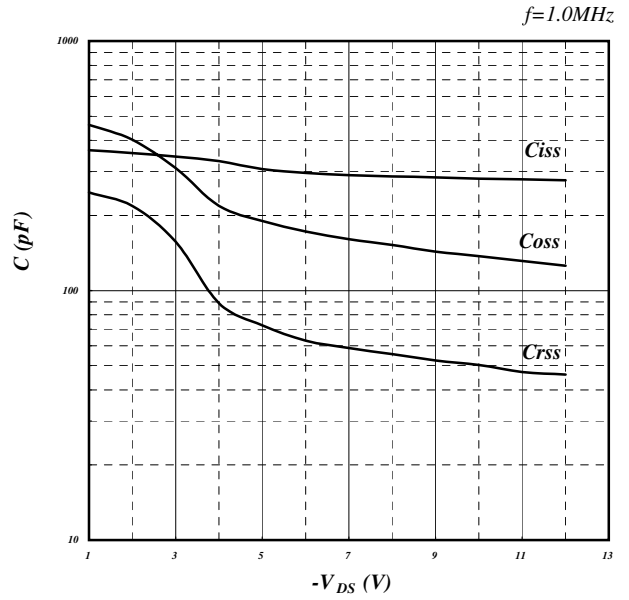


Fig 10. Typical Capacitance Characteristics

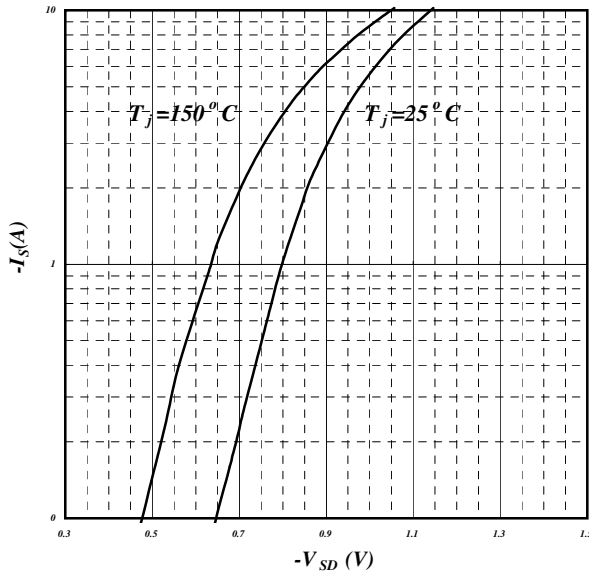


Fig 11. Forward Characteristic of Reverse Diode

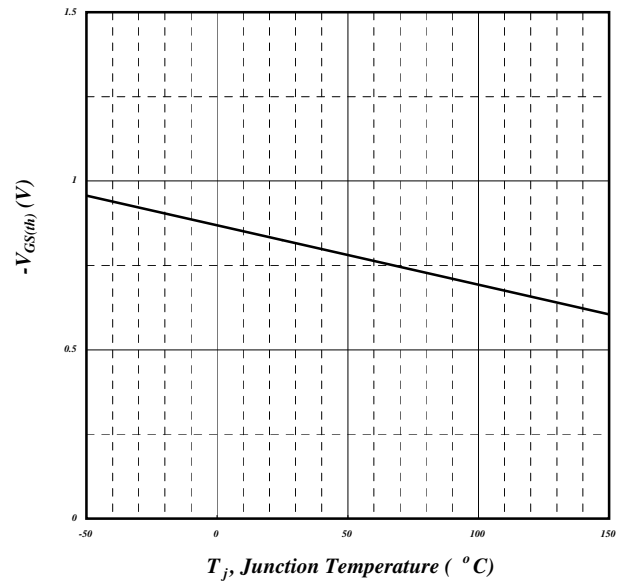


Fig 12. Gate Threshold Voltage v.s. Junction Temperature

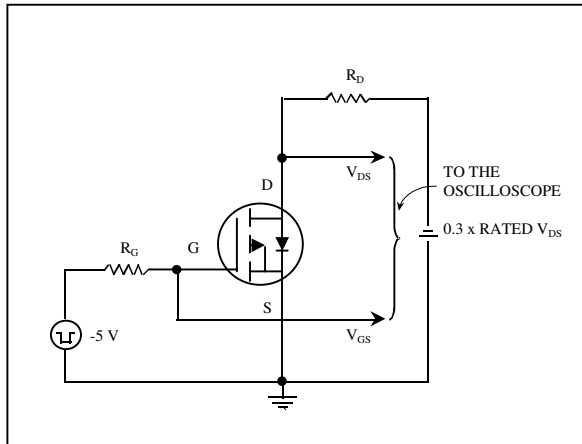


Fig 13. Switching Time Circuit

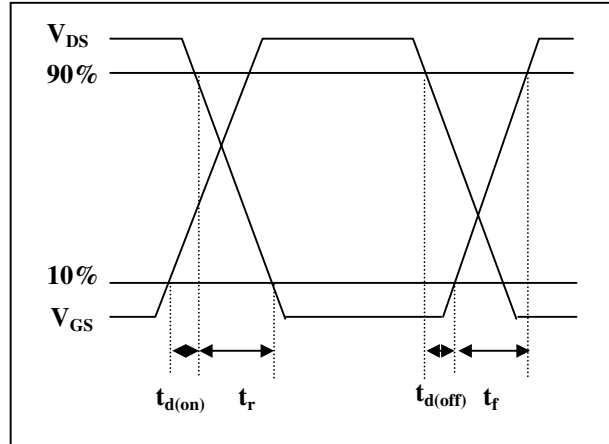


Fig 14. Switching Time Waveform

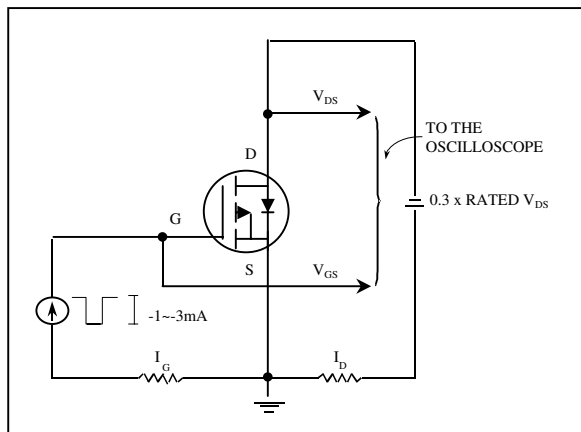


Fig 15. Gate Charge Circuit

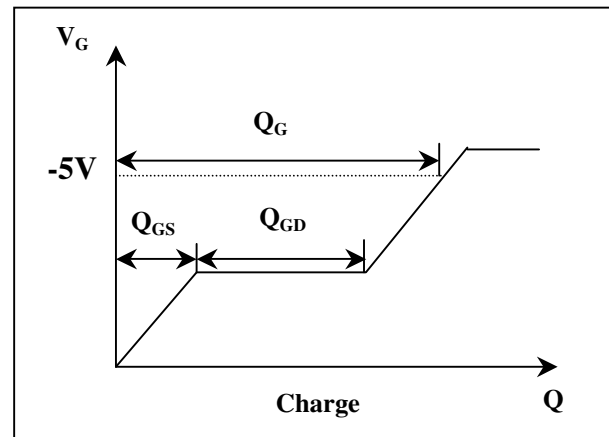


Fig 16. Gate Charge Waveform