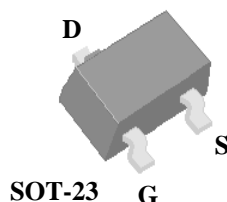




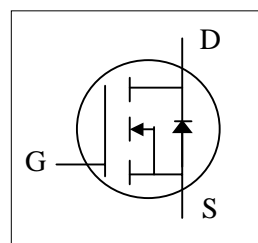
- ▼ Capable of 2.5V gate drive
- ▼ Small package outline
- ▼ Surface mount package
- ▼ RoHS Compliant



|              |              |
|--------------|--------------|
| $BV_{DSS}$   | 20V          |
| $R_{DS(ON)}$ | 85m $\Omega$ |
| $I_D$        | 3.2A         |

## Description

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



## Absolute Maximum Ratings

| Symbol                     | Parameter   | Rating     | Units               |
|----------------------------|---|------------|---------------------|
| $V_{DS}$                   | Drain-Source Voltage                                    | 20         | V                   |
| $V_{GS}$                   | Gate-Source Voltage                                     | $\pm 12$   | V                   |
| $I_D@T_A=25^\circ\text{C}$ | Continuous Drain Current <sup>3</sup> , $V_{GS}$ @ 4.5V | 3.2        | A                   |
| $I_D@T_A=70^\circ\text{C}$ | Continuous Drain Current <sup>3</sup> , $V_{GS}$ @ 4.5V | 2.6        | A                   |
| $I_{DM}$                   | Pulsed Drain Current <sup>1</sup>                       | 10         | A                   |
| $P_D@T_A=25^\circ\text{C}$ | Total Power Dissipation                                 | 1.38       | W                   |
|                            | Linear Derating Factor                                  | 0.01       | W/ $^\circ\text{C}$ |
| $T_{STG}$                  | Storage Temperature Range                               | -55 to 150 | $^\circ\text{C}$    |
| $T_J$                      | Operating Junction Temperature Range                    | -55 to 150 | $^\circ\text{C}$    |

## Thermal Data

| Symbol      | Parameter   | Value | Unit                      |
|-------------|---|-------|---------------------------|
| $R_{thj-a}$ | Maximum Thermal Resistance, Junction-ambient <sup>3</sup> | 90    | $^\circ\text{C}/\text{W}$ |



**Electrical Characteristics @T<sub>j</sub>=25°C(unless otherwise specified)**

| Symbol                              | Parameter   | Test Conditions  | Min. | Typ. | Max. | Units |
|-------------------------------------|---|--|------|------|------|-------|
| BV <sub>DSS</sub>                   | Drain-Source Breakdown Voltage                      | V <sub>GS</sub> =0V, I <sub>D</sub> =250uA               | 20   | -    | -    | V     |
| ΔBV <sub>DSS</sub> /ΔT <sub>j</sub> | Breakdown Voltage Temperature Coefficient           | Reference to 25°C, I <sub>D</sub> =1mA                   | -    | 0.1  | -    | V/°C  |
| R <sub>DS(ON)</sub>                 | Static Drain-Source On-Resistance <sup>2</sup>      | V <sub>GS</sub> =4.5V, I <sub>D</sub> =3.6A              | -    | -    | 85   | mΩ    |
|                                     |   | V <sub>GS</sub> =2.5V, I <sub>D</sub> =3.1A              | -    | -    | 115  | mΩ    |
| V <sub>GS(th)</sub>                 | Gate Threshold Voltage                              | V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250uA | 0.5  | -    | 1.2  | V     |
| g <sub>fs</sub>                     | Forward Transconductance                            | V <sub>DS</sub> =5V, I <sub>D</sub> =3.6A                | -    | 6    | -    | S     |
| I <sub>DSS</sub>                    | Drain-Source Leakage Current                        | V <sub>DS</sub> =20V, V <sub>GS</sub> =0V                | -    | -    | 1    | uA    |
|                                     | Drain-Source Leakage Current (T <sub>j</sub> =70°C) | V <sub>DS</sub> =20V, V <sub>GS</sub> =0V                | -    | -    | 10   | uA    |
| I <sub>GSS</sub>                    | Gate-Source Leakage                                 | V <sub>GS</sub> =±12V, V <sub>DS</sub> =0V               | -    | -    | ±100 | nA    |
| Q <sub>g</sub>                      | Total Gate Charge <sup>2</sup>                      | I <sub>D</sub> =3.6A                                     | -    | 4.4  | -    | nC    |
| Q <sub>gs</sub>                     | Gate-Source Charge                                  | V <sub>DS</sub> =10V                                     | -    | 0.6  | -    | nC    |
| Q <sub>gd</sub>                     | Gate-Drain ("Miller") Charge                        | V <sub>GS</sub> =4.5V                                    | -    | 1.9  | -    | nC    |
| t <sub>d(on)</sub>                  | Turn-on Delay Time <sup>2</sup>                     | V <sub>DS</sub> =10V                                     | -    | 5.2  | -    | ns    |
| t <sub>r</sub>                      | Rise Time   | I <sub>D</sub> =3.6A                                     | -    | 37   | -    | ns    |
| t <sub>d(off)</sub>                 | Turn-off Delay Time                                 | R <sub>G</sub> =6Ω, V <sub>GS</sub> =5V                  | -    | 15   | -    | ns    |
| t <sub>f</sub>                      | Fall Time   | R <sub>D</sub> =2.8Ω                                     | -    | 5.7  | -    | ns    |
| C <sub>iss</sub>                    | Input Capacitance                                   | V <sub>GS</sub> =0V                                      | -    | 145  | -    | pF    |
| C <sub>oss</sub>                    | Output Capacitance                                  | V <sub>DS</sub> =10V                                     | -    | 100  | -    | pF    |
| C <sub>rss</sub>                    | Reverse Transfer Capacitance                        | f=1.0MHz   | -    | 50   | -    | pF    |
| R <sub>g</sub>                      | Gate Resistance                                     | f=1.0MHz   | -    | 5.3  | 8    | Ω     |

**Source-Drain Diode**

| Symbol          | Parameter   | Test Conditions  | Min. | Typ. | Max. | Units |
|-----------------|---|--|------|------|------|-------|
| I <sub>S</sub>  | Continuous Source Current ( Body Diode )          | V <sub>D</sub> =V <sub>G</sub> =0V, V <sub>S</sub> =1.2V | -    | -    | 1    | A     |
| I <sub>SM</sub> | Pulsed Source Current ( Body Diode ) <sup>1</sup> |  | -    | -    | 10   | A     |
| V <sub>SD</sub> | Forward On Voltage <sup>2</sup>                   | I <sub>S</sub> =1.6A, V <sub>GS</sub> =0V                | -    | -    | 1.2  | V     |

**Notes:**

- 1.Pulse width limited by Max. junction temperature.
- 2.Pulse test
- 3.Surface mounted on 1 in<sup>2</sup> copper pad of FR4 board ; 270°C/W when mounted on min. copper pad.

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.

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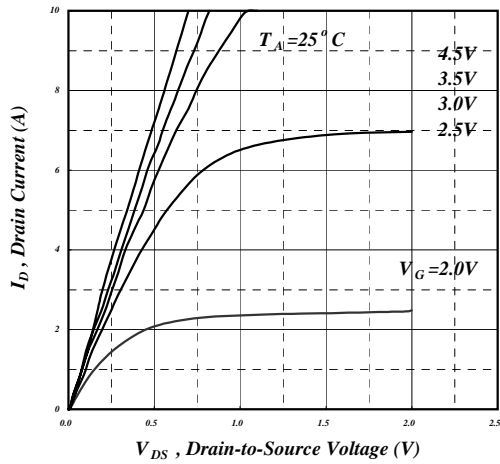


Fig 1. Typical Output Characteristics

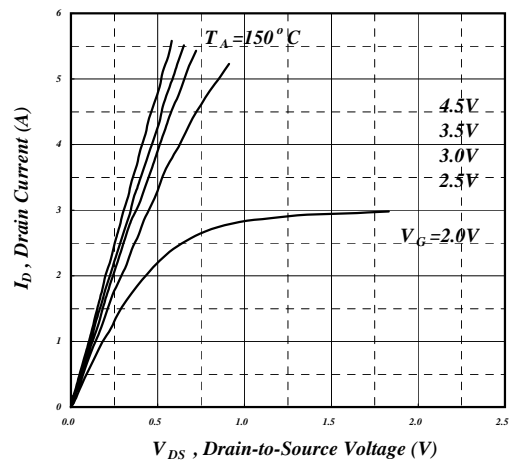


Fig 2. Typical Output Characteristics

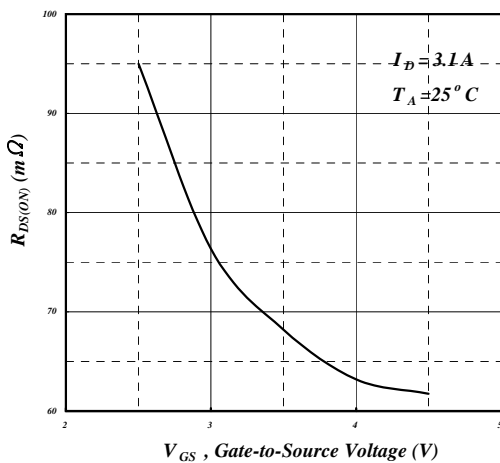


Fig 3. On-Resistance v.s. Gate Voltage

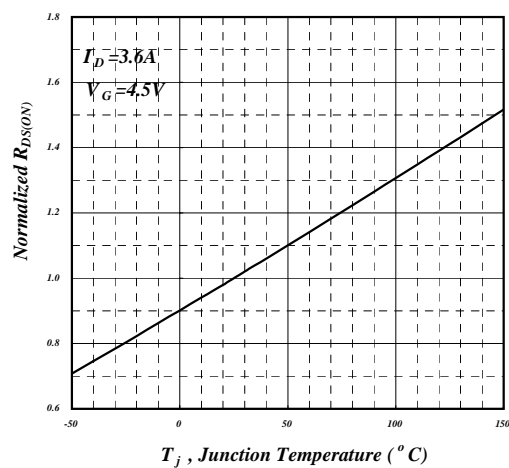


Fig 4. Normalized On-Resistance

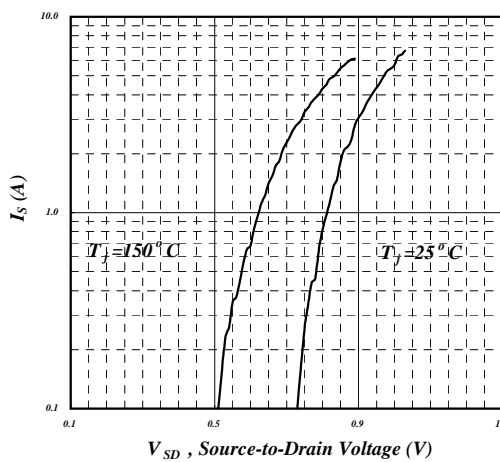


Fig 5. Forward Characteristic of Reverse Diode

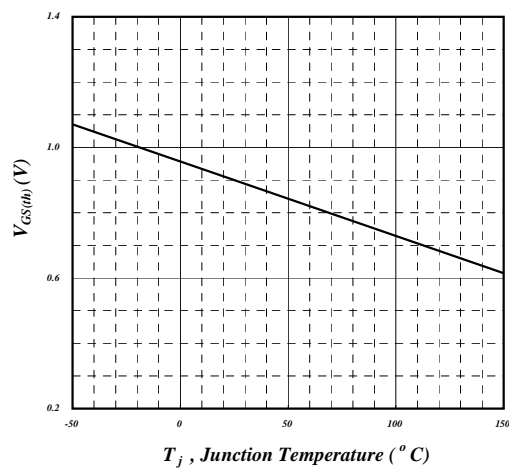


Fig 6. Gate Threshold Voltage v.s. Junction Temperature

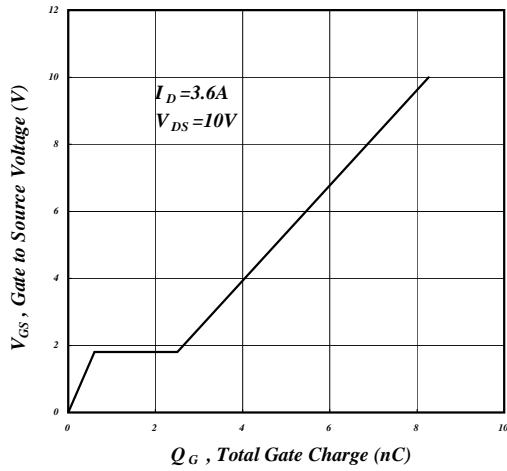


Fig 7. Gate Charge Characteristics

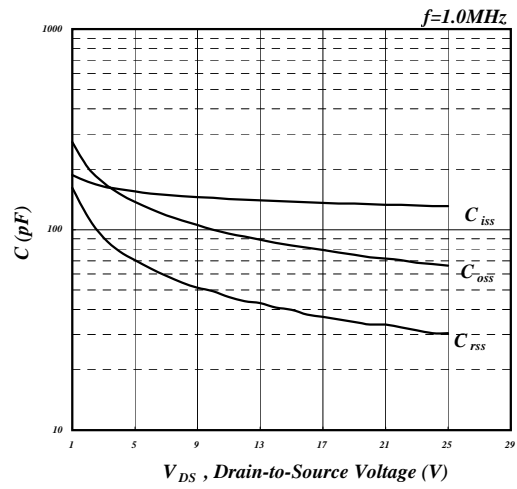


Fig 8. Typical Capacitance Characteristics

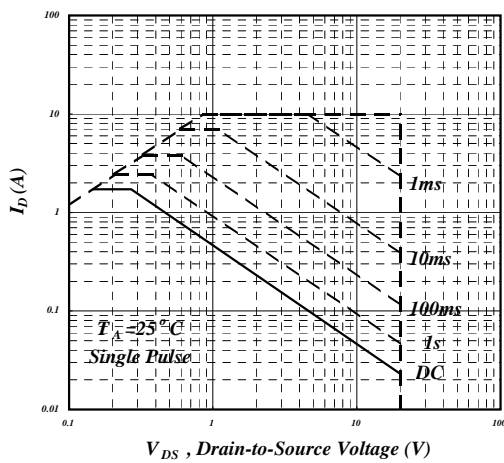


Fig 9. Maximum Safe Operating Area

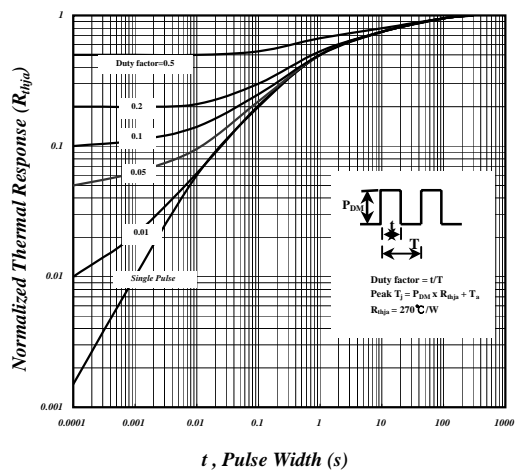


Fig 10. Effective Transient Thermal Impedance

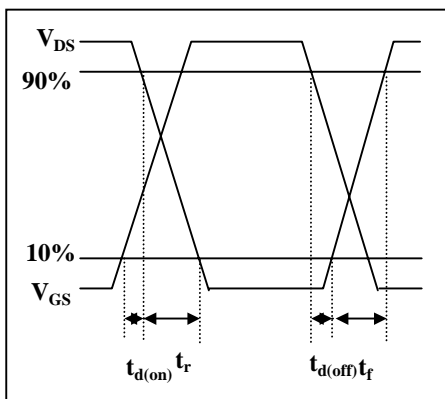


Fig 11. Switching Time Waveform

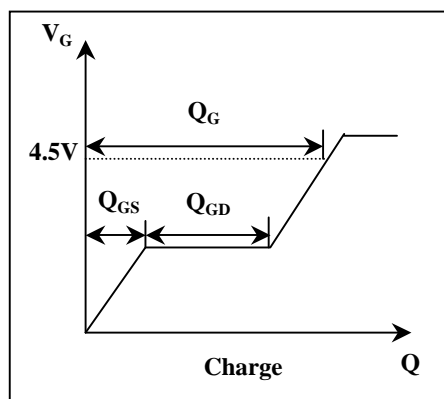


Fig 12. Gate Charge Waveform