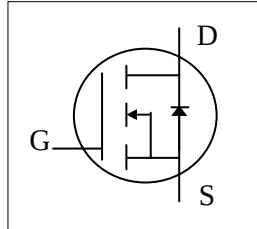




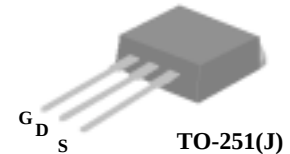
- ▼ Low on-resistance
- ▼ Capable of 2.5V gate drive
- ▼ Low drive current
- ▼ Single Drive Requirement



|              |              |
|--------------|--------------|
| $BV_{DSS}$   | 18V          |
| $R_{DS(ON)}$ | 25m $\Omega$ |
| $I_D$        | 35A          |

## Description

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



## Absolute Maximum Ratings

| Symbol                      | Parameter                                 | Rating     | Units               |
|-----------------------------|-------------------------------------------|------------|---------------------|
| $V_{DS}$                    | Drain-Source Voltage                      | 18         | V                   |
| $V_{GS}$                    | Gate-Source Voltage                       | $\pm 12$   | V                   |
| $I_D@T_C=25^\circ\text{C}$  | Continuous Drain Current, $V_{GS}$ @ 4.5V | 35         | A                   |
| $I_D@T_C=125^\circ\text{C}$ | Continuous Drain Current, $V_{GS}$ @ 4.5V | 16         | A                   |
| $I_{DM}$                    | Pulsed Drain Current <sup>1</sup>         | 90         | A                   |
| $P_D@T_C=25^\circ\text{C}$  | Total Power Dissipation                   | 50         | W                   |
|                             | Linear Derating Factor                    | 0.4        | 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                      |
|--------|------------------------------------------|-------|---------------------------|
| Rthj-c | Thermal Resistance Junction-case Max.    | 2.5   | $^\circ\text{C}/\text{W}$ |
| Rthj-a | Thermal Resistance Junction-ambient Max. | 110   | $^\circ\text{C}/\text{W}$ |

**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               | 18   | -    | -    | V     |
| ΔBV <sub>DSS</sub> /ΔT <sub>j</sub> | Breakdown Voltage Temperature Coefficient            | Reference to 25°C, I <sub>D</sub> =1mA                   | -    | 0.03 | -    | V/°C  |
| R <sub>DS(ON)</sub>                 | Static Drain-Source On-Resistance                    | V <sub>GS</sub> =4.5V, I <sub>D</sub> =6A                | -    | -    | 25   | mΩ    |
|                                     |                                                      | V <sub>GS</sub> =2.5V, I <sub>D</sub> =5.2A              | -    | -    | 40   | 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    | V     |
| g <sub>fs</sub>                     | Forward Transconductance                             | V <sub>DS</sub> =10V, I <sub>D</sub> =6A                 | -    | 18   | -    | S     |
| I <sub>DSS</sub>                    | Drain-Source Leakage Current (T <sub>j</sub> =25°C)  | V <sub>DS</sub> =18V, V <sub>GS</sub> =0V                | -    | -    | 1    | uA    |
|                                     | Drain-Source Leakage Current (T <sub>j</sub> =125°C) | V <sub>DS</sub> =18V, V <sub>GS</sub> =0V                | -    | -    | 25   | uA    |
| I <sub>GSS</sub>                    | Gate-Source Leakage                                  | V <sub>GS</sub> = ± 12V                                  | -    | -    | ±100 | nA    |
| Q <sub>g</sub>                      | Total Gate Charge <sup>2</sup>                       | I <sub>D</sub> =18A                                      | -    | 17.5 | -    | nC    |
| Q <sub>gs</sub>                     | Gate-Source Charge                                   | V <sub>DS</sub> =18V                                     | -    | 1.2  | -    | nC    |
| Q <sub>gd</sub>                     | Gate-Drain ("Miller") Charge                         | V <sub>GS</sub> =5V                                      | -    | 7.9  | -    | nC    |
| t <sub>d(on)</sub>                  | Turn-on Delay Time <sup>2</sup>                      | V <sub>DS</sub> =10V                                     | -    | 7.3  | -    | ns    |
| t <sub>r</sub>                      | Rise Time                                            | I <sub>D</sub> =18A                                      | -    | 98   | -    | ns    |
| t <sub>d(off)</sub>                 | Turn-off Delay Time                                  | R <sub>G</sub> =3.3Ω, V <sub>GS</sub> =5V                | -    | 25.6 | -    | ns    |
| t <sub>f</sub>                      | Fall Time                                            | R <sub>D</sub> =0.56Ω                                    | -    | 98   | -    | ns    |
| C <sub>iss</sub>                    | Input Capacitance                                    | V <sub>GS</sub> =0V                                      | -    | 527  | -    | pF    |
| C <sub>oss</sub>                    | Output Capacitance                                   | V <sub>DS</sub> =18V                                     | -    | 258  | -    | pF    |
| C <sub>rss</sub>                    | Reverse Transfer Capacitance                         | f=1.0MHz                                                 | -    | 112  | -    | pF    |

**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> =1.3V       | -    | -    | 35   | A     |
| I <sub>SM</sub> | Pulsed Source Current ( Body Diode ) <sup>1</sup> |                                                                | -    | -    | 90   | A     |
| V <sub>SD</sub> | Forward On Voltage <sup>2</sup>                   | T <sub>j</sub> =25°C, I <sub>S</sub> =35A, V <sub>GS</sub> =0V | -    | -    | 1.3  | V     |

**Notes:**

1.Pulse width limited by safe operating area.

2.Pulse width ≤300us, duty cycle ≤2%.

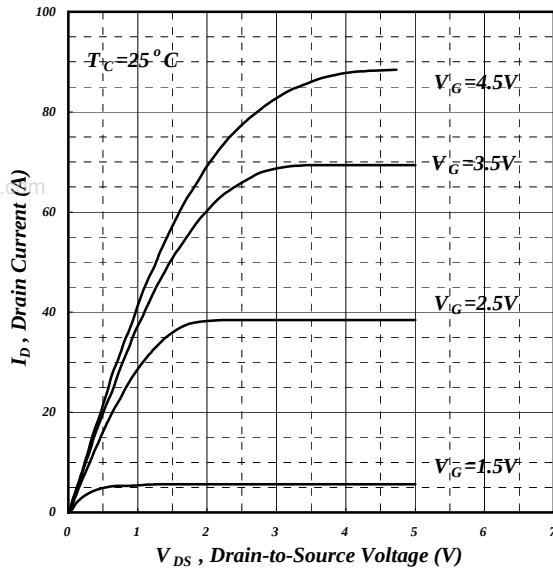


Fig 1. Typical Output Characteristics

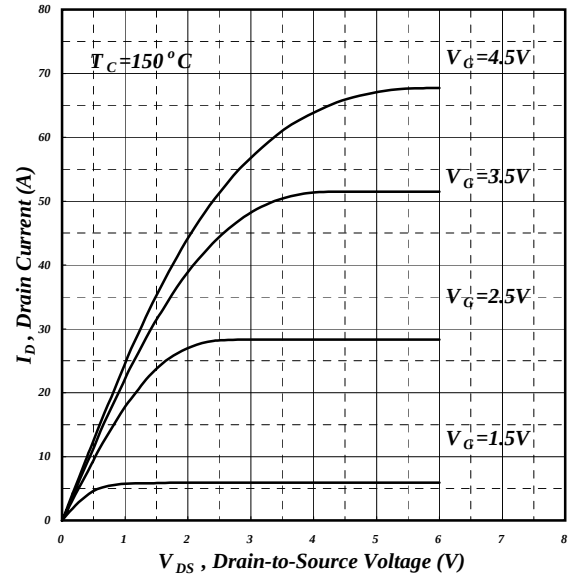


Fig 2. Typical Output Characteristics

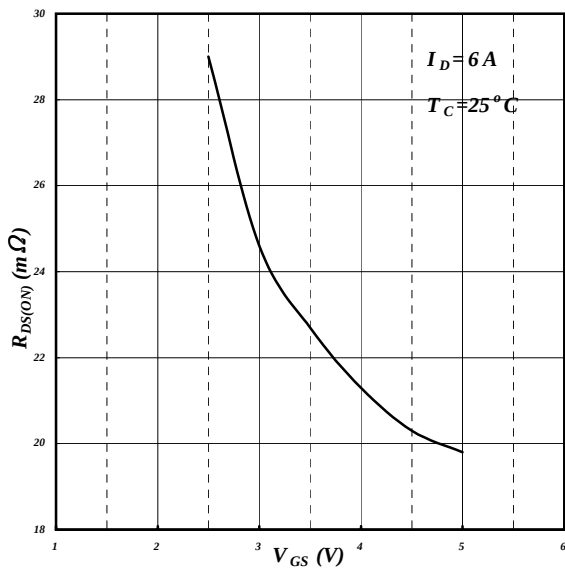


Fig 3. On-Resistance v.s. Gate Voltage

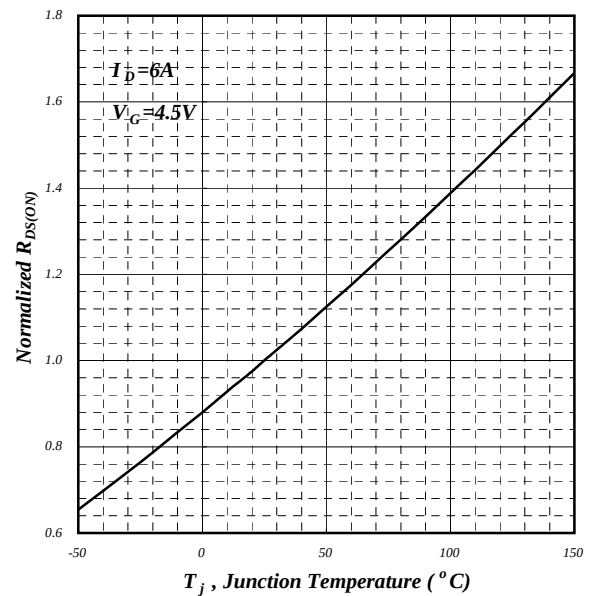
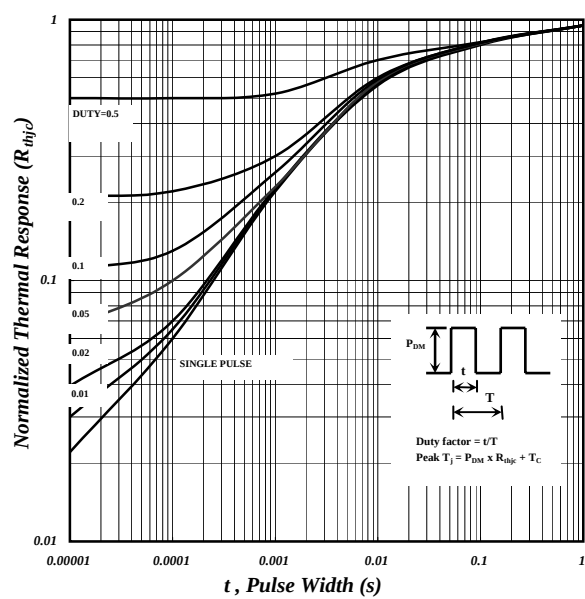
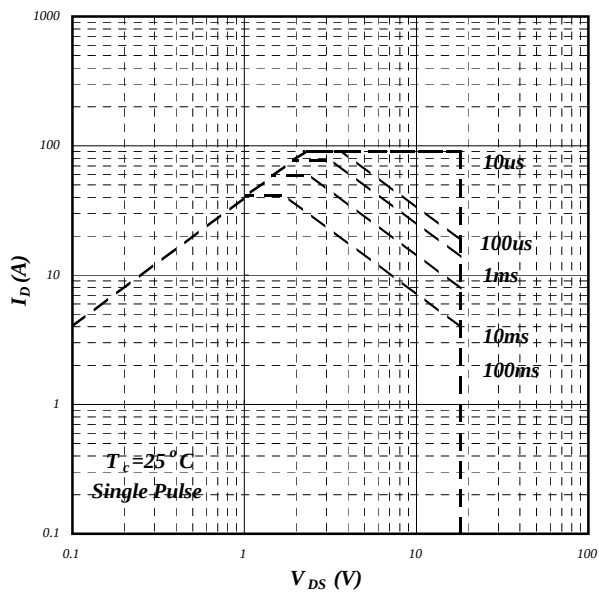
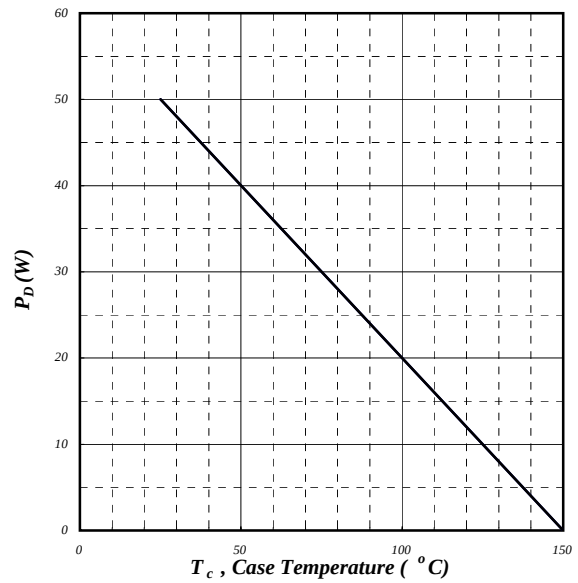
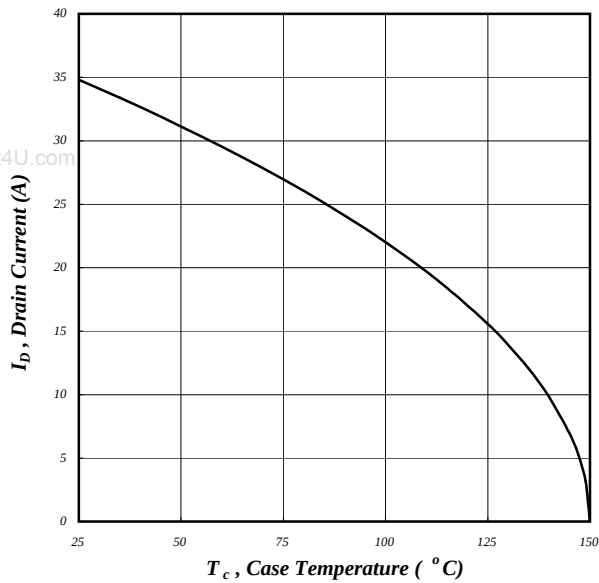
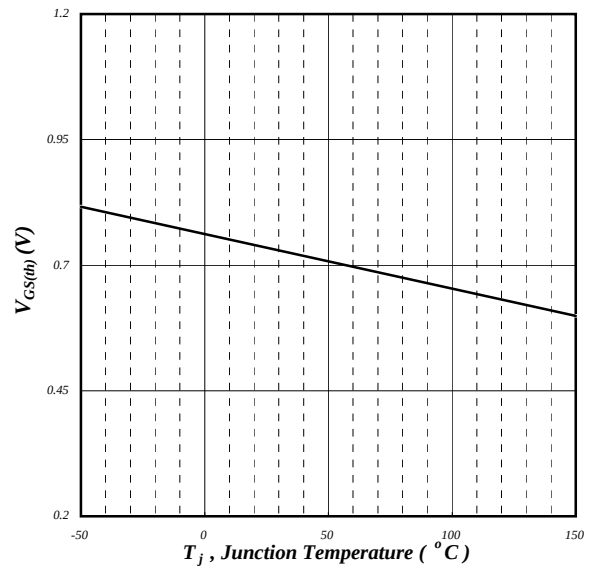
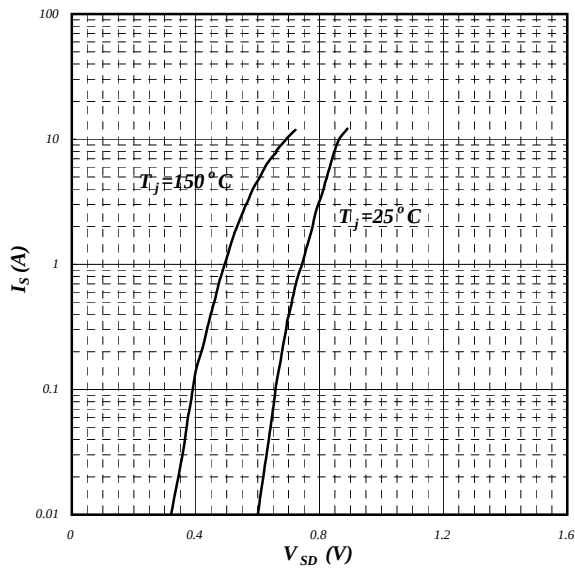
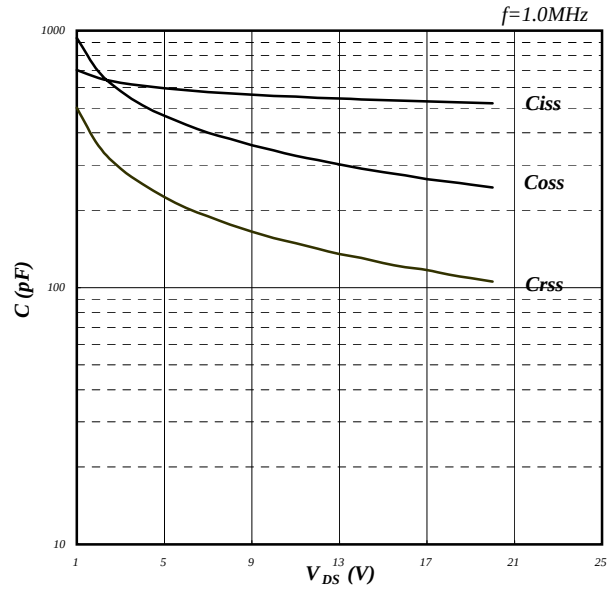
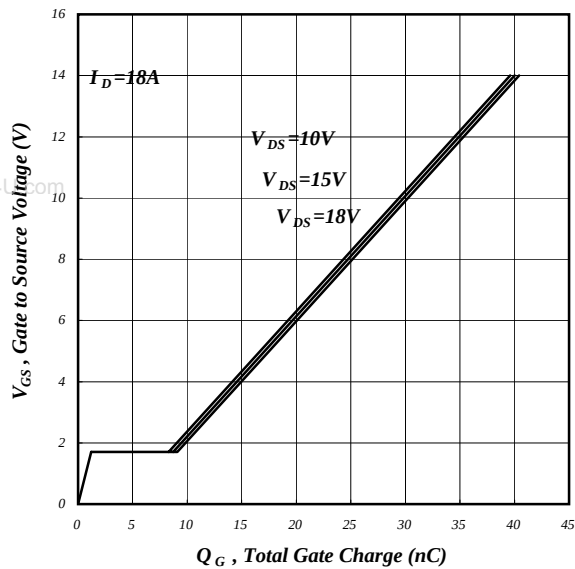


Fig 4. Normalized On-Resistance v.s. Junction Temperature





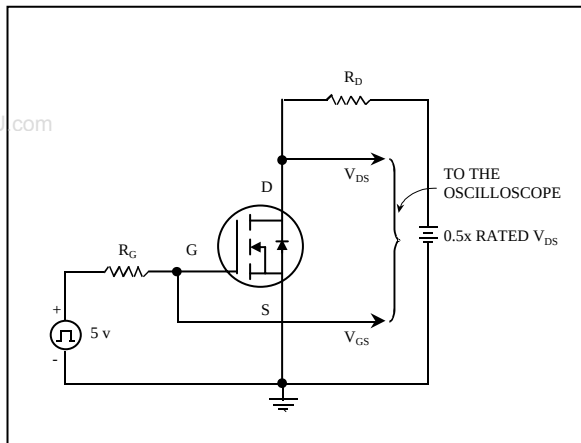


Fig 13. Switching Time Circuit

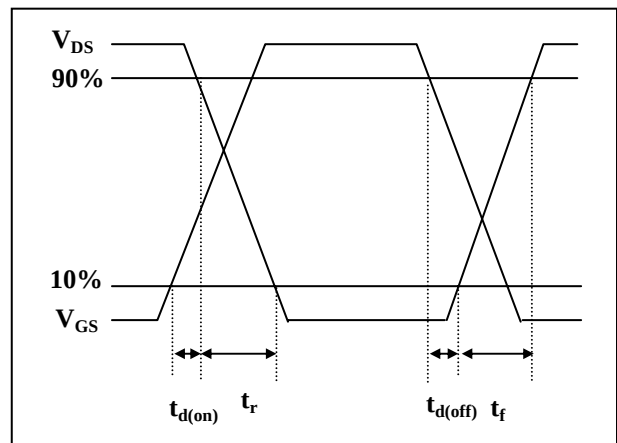


Fig 14. Switching Time Waveform

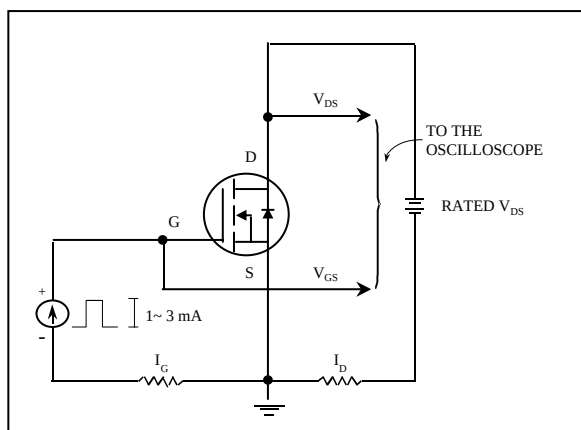


Fig 15. Gate Charge Circuit

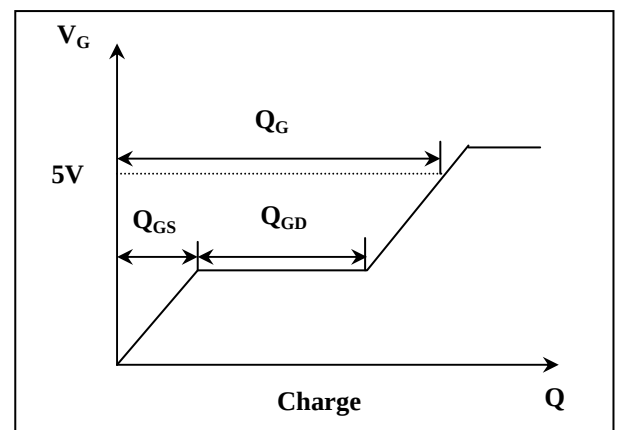


Fig 16. Gate Charge Waveform