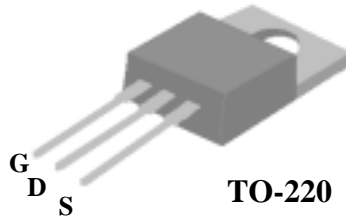




- ▼ Dynamic dv/dt Rating
- ▼ Repetitive Avalanche Rated
- ▼ Fast Switching
- ▼ Simple Drive Requirement

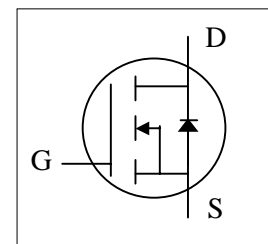


| | |
|--------------|-------|
| BV_{DSS} | 200V |
| $R_{DS(ON)}$ | 400mΩ |
| I_D | 9A |

Description

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

The TO-220 package is universally preferred for all commercial-industrial applications at power dissipation levels to approximately 50 watts. The through-hole version (AP630GP) is available for low-profile applications.



Absolute Maximum Ratings

| Symbol | Parameter | Rating | Units |
|-------------------------|--|------------|-------|
| V_{DS} | Drain-Source Voltage | 200 | V |
| V_{GS} | Gate-Source Voltage | ± 30 | V |
| $I_D @ T_C=25^\circ C$ | Continuous Drain Current, V_{GS} @ 10V | 9 | A |
| $I_D @ T_C=100^\circ C$ | Continuous Drain Current, V_{GS} @ 10V | 5.7 | A |
| I_{DM} | Pulsed Drain Current ¹ | 36 | A |
| $P_D @ T_C=25^\circ C$ | Total Power Dissipation | 74 | W |
| | Linear Derating Factor | 0.59 | W/°C |
| E_{AS} | Single Pulse Avalanche Energy ² | 240 | mJ |
| I_{AR} | Avalanche Current | 9 | A |
| E_{AR} | Repetitive Avalanche Energy | 7 | mJ |
| T_{STG} | Storage Temperature Range | -55 to 150 | °C |
| T_J | Operating Junction Temperature Range | -55 to 150 | °C |

Thermal Data

| Symbol | Parameter | Value | Unit |
|--------|-------------------------------------|----------|------|
| Rthj-c | Thermal Resistance Junction-case | Max. 1.7 | °C/W |
| Rthj-a | Thermal Resistance Junction-ambient | Max. 62 | °C/W |



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 | 200 | - | - | V |
| ΔBV _{DSS} /ΔT _j | Breakdown Voltage Temperature Coefficient | Reference to 25°C, I _D =1mA | - | 0.248 | - | V/°C |
| R _{DS(ON)} | Static Drain-Source On-Resistance | V _{GS} =10V, I _D =5A | - | - | 400 | mΩ |
| V _{GS(th)} | Gate Threshold Voltage | V _{DS} =V _{GS} , I _D =250uA | 2 | - | 4 | V |
| g _{fs} | Forward Transconductance | V _{DS} =10V, I _D =5A | - | 40 | - | S |
| I _{DSS} | Drain-Source Leakage Current (T _j =25°C) | V _{DS} =200V, V _{GS} =0V | - | - | 10 | uA |
| | Drain-Source Leakage Current (T _j =150°C) | V _{DS} =160V, V _{GS} =0V | - | - | 100 | uA |
| I _{GSS} | Gate-Source Forward Leakage | V _{GS} = ± 30V | - | - | ±100 | nA |
| Q _g | Total Gate Charge ³ | I _D = 9A | - | 25 | - | nC |
| Q _{gs} | Gate-Source Charge | V _{DS} =160V | - | 3.6 | - | nC |
| Q _{gd} | Gate-Drain ("Miller") Charge | V _{GS} =10V | - | 14 | - | nC |
| t _{d(on)} | Turn-on Delay Time ³ | V _{DD} =100V | - | 8 | - | ns |
| t _r | Rise Time | I _D = 9A | - | 26 | - | ns |
| t _{d(off)} | Turn-off Delay Time | R _G =10Ω, V _{GS} =10V | - | 34 | - | ns |
| t _f | Fall Time | R _D =11Ω | - | 22 | - | ns |
| C _{iss} | Input Capacitance | V _{GS} =0V | - | 515 | - | pF |
| C _{oss} | Output Capacitance | V _{DS} =25V | - | 90 | - | pF |
| C _{riss} | Reverse Transfer Capacitance | f=1.0MHz | - | 40 | - | 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 =1.3V | - | - | 9 | A |
| I _{SM} | Pulsed Source Current (Body Diode) ¹ | | - | - | 36 | A |
| V _{SD} | Forward On Voltage ³ | T _j =25°C , I _S =9A, V _{GS} =0V | - | - | 1.3 | V |

Notes:

- 1.Pulse width limited by safe operating area.
- 2.Starting T_j=25°C , V_{DD}=50V , L=4.5mH , R_G=25Ω , I_{AS}=9A.
- 3.Pulse width ≤300us , duty cycle ≤2%.

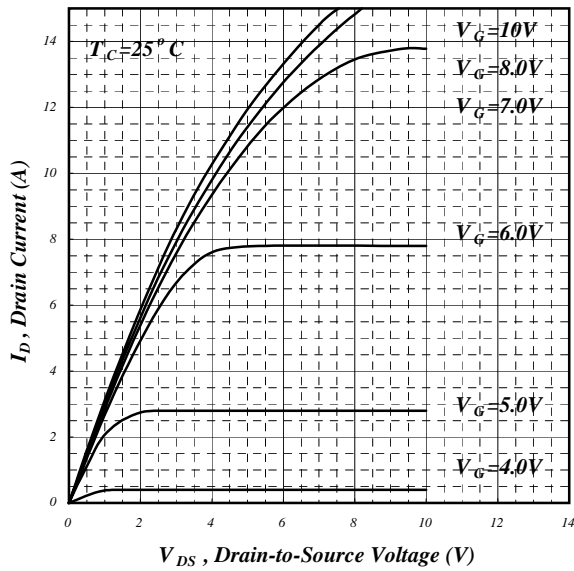


Fig 1. Typical Output Characteristics

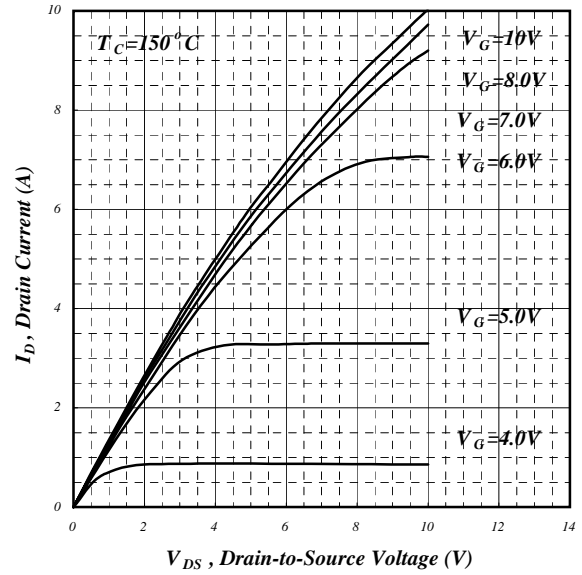


Fig 2. Typical Output Characteristics

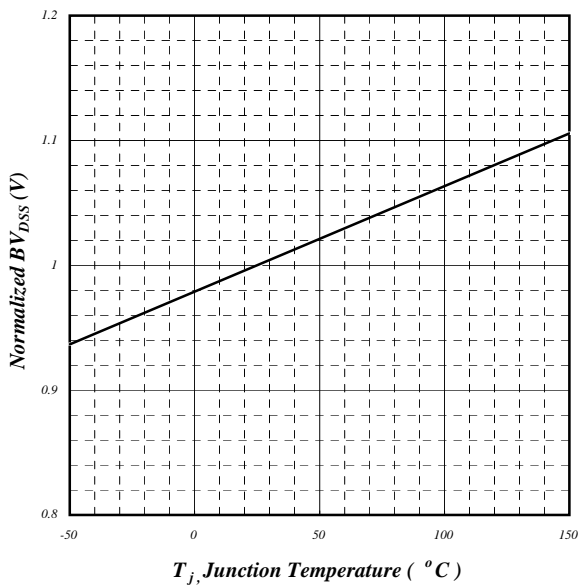


Fig 3. Normalized BV_{DSS} v.s. Junction Temperature

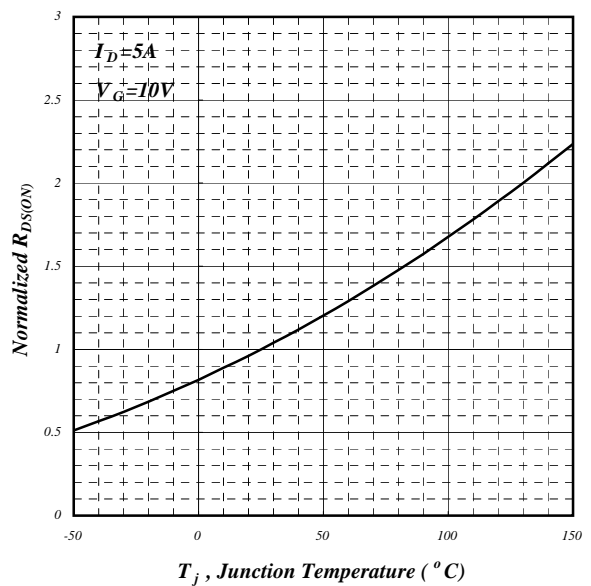


Fig 4. Normalized On-Resistance v.s. Junction Temperature

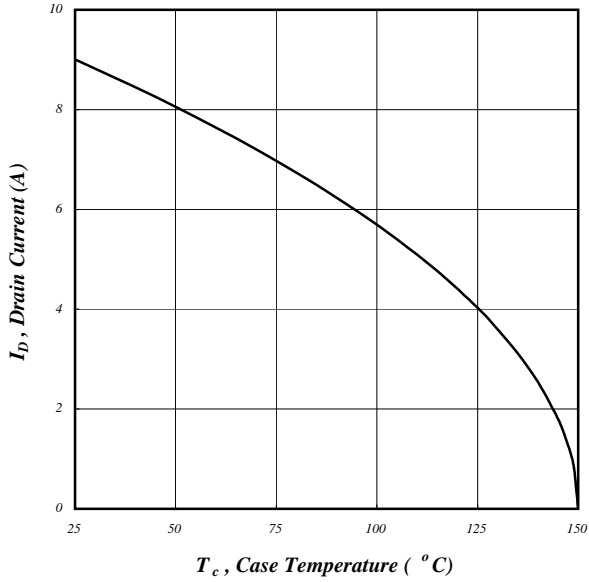


Fig 5. Maximum Drain Current v.s. Case Temperature

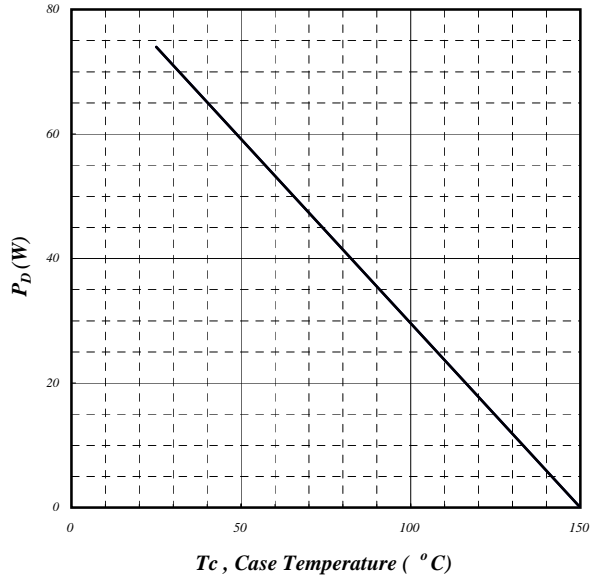


Fig 6. Typical Power Dissipation

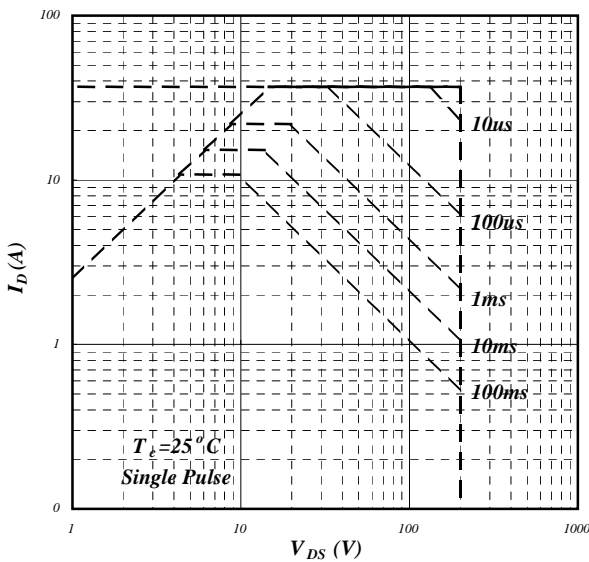


Fig 7. Maximum Safe Operating Area

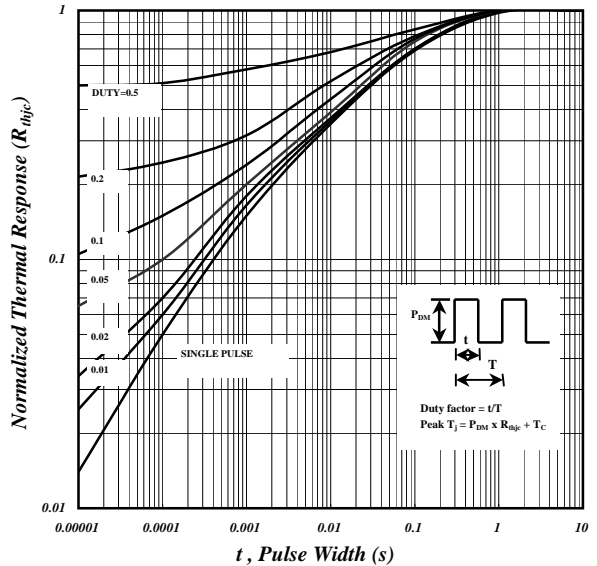


Fig 8. Effective Transient Thermal Impedance

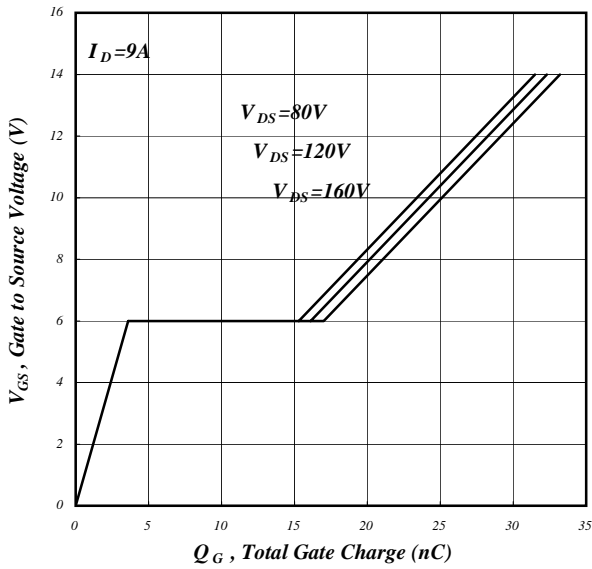


Fig 9. Gate Charge Characteristics

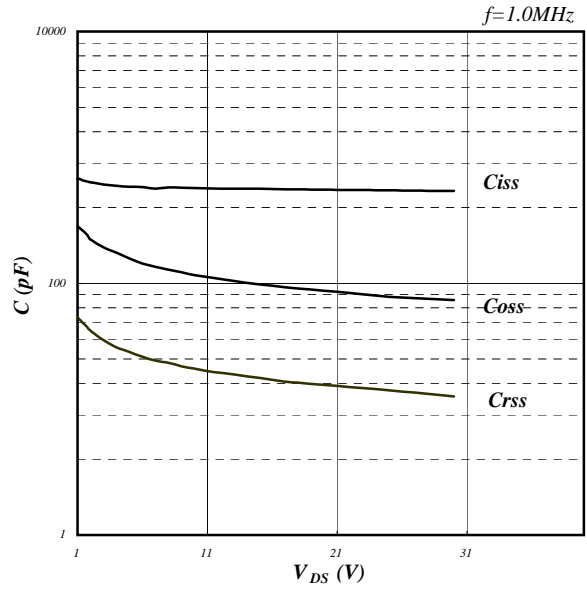


Fig 10. Typical Capacitance Characteristics

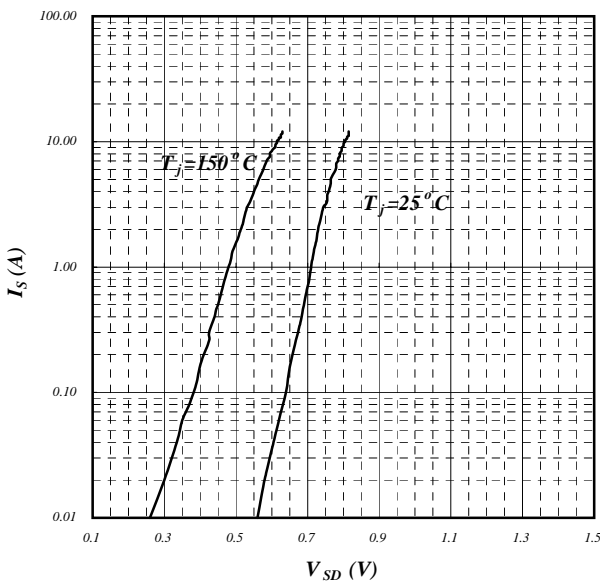


Fig 11. Forward Characteristic of Reverse Diode

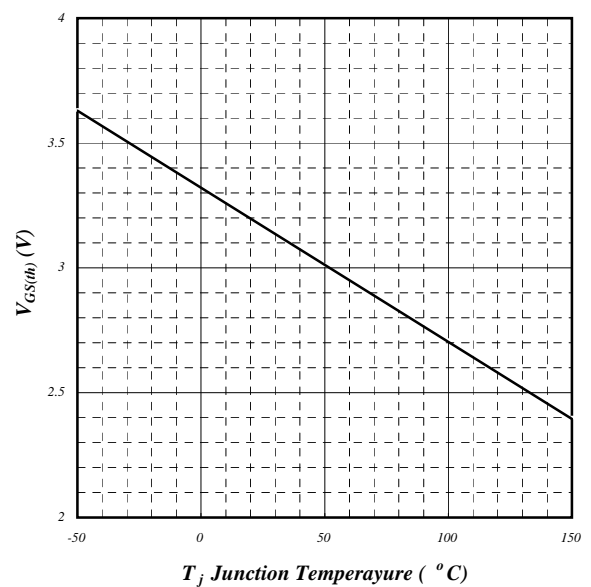


Fig 12. Gate Threshold Voltage v.s. Junction Temperature

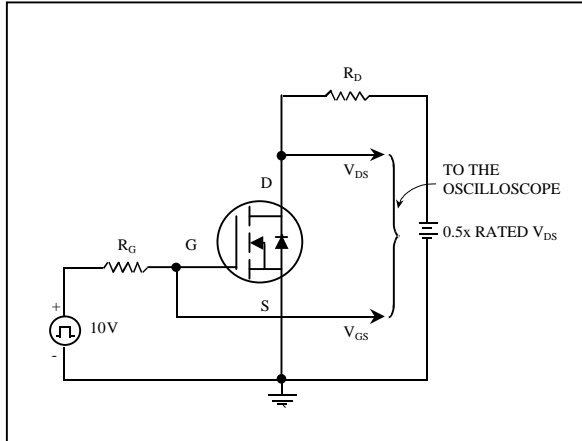


Fig 13. Switching Time Circuit

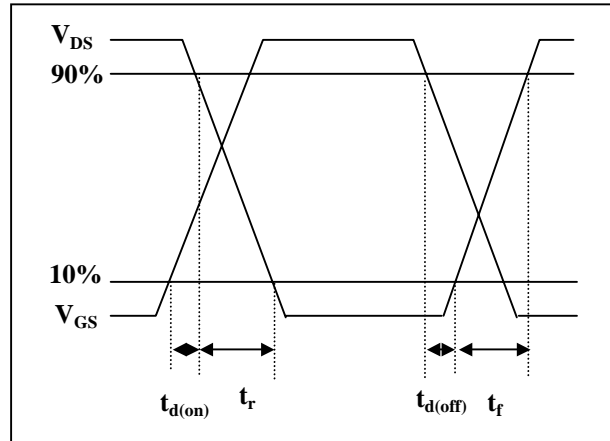


Fig 14. Switching Time Waveform

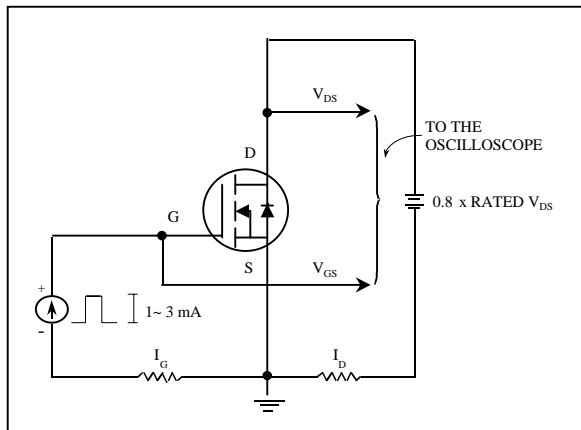


Fig 15. Gate Charge Circuit

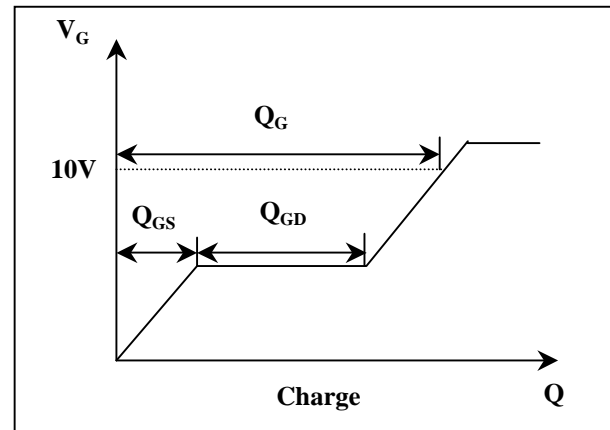


Fig 16. Gate Charge Waveform