

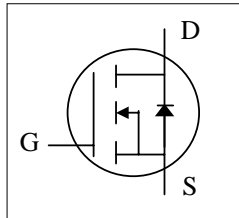
AP95T08GP

Preliminary



N-CHANNEL ENHANCEMENT MODE
POWER MOSFET

- ▼ Simple Drive Requirement
- ▼ Lower On-resistance
- ▼ Fast Switching Characteristic
- ▼ RoHS Compliant

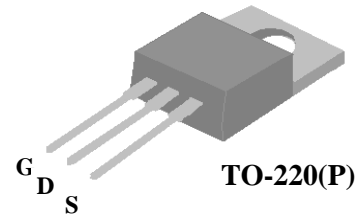


| | |
|--------------|-------------|
| BV_{DSS} | 80V |
| $R_{DS(ON)}$ | 7m Ω |
| I_D | 80A |

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 power applications and suited for low voltage applications such as DC/DC converters.



Absolute Maximum Ratings

| Symbol | Parameter | Rating | Units |
|---------------------------|--|------------|---------------|
| V_{DS} | Drain-Source Voltage | 80 | V |
| V_{GS} | Gate-Source Voltage | ± 20 | V |
| $I_D @ T_C = 25^\circ C$ | Continuous Drain Current, $V_{GS} @ 10V^3$ | 80 | A |
| $I_D @ T_C = 100^\circ C$ | Continuous Drain Current, $V_{GS} @ 10V$ | 70 | A |
| I_{DM} | Pulsed Drain Current ¹ | 320 | A |
| $P_D @ T_C = 25^\circ C$ | Total Power Dissipation | 300 | W |
| | Linear Derating Factor | 2 | W/ $^\circ C$ |
| T_{STG} | Storage Temperature Range | -55 to 175 | $^\circ C$ |
| T_J | Operating Junction Temperature Range | -55 to 175 | $^\circ C$ |

Thermal Data

| Symbol | Parameter | Value | Units |
|--------|-------------------------------------|----------|--------------|
| Rthj-c | Thermal Resistance Junction-case | Max. 0.5 | $^\circ C/W$ |
| Rthj-a | Thermal Resistance Junction-ambient | Max. 62 | $^\circ C/W$ |

Data and specifications subject to change without notice

200606071pre-1/4


Electrical Characteristics @ $T_j=25^\circ\text{C}$ (unless otherwise specified)

| Symbol | Parameter | Test Conditions | Min. | Typ. | Max. | Units |
|------------------------------|--|--|------|------|-----------|--------------------|
| BV_{DSS} | Drain-Source Breakdown Voltage | $V_{GS}=0V, I_D=1mA$ | 80 | - | - | V |
| $\Delta BV_{DSS}/\Delta T_j$ | Breakdown Voltage Temperature Coefficient | Reference to $25^\circ\text{C}, I_D=1mA$ | - | 0.06 | - | $V/^\circ\text{C}$ |
| $R_{DS(ON)}$ | Static Drain-Source On-Resistance ² | $V_{GS}=10V, I_D=60A$ | - | - | 7 | $m\Omega$ |
| $V_{GS(th)}$ | Gate Threshold Voltage | $V_{DS}=V_{GS}, I_D=250\mu A$ | 2 | - | 5 | V |
| g_{fs} | Forward Transconductance | $V_{DS}=10V, I_D=60A$ | - | 56 | - | S |
| I_{DSS} | Drain-Source Leakage Current ($T_j=25^\circ\text{C}$) | $V_{DS}=80V, V_{GS}=0V$ | - | - | 10 | μA |
| | Drain-Source Leakage Current ($T_j=150^\circ\text{C}$) | $V_{DS}=64V, V_{GS}=0V$ | - | - | 100 | μA |
| I_{GSS} | Gate-Source Leakage | $V_{GS}=\pm 20V$ | - | - | ± 100 | nA |
| Q_g | Total Gate Charge ² | $I_D=40A$ | - | 93 | 150 | nC |
| Q_{gs} | Gate-Source Charge | $V_{DS}=64V$ | - | 26 | - | nC |
| Q_{gd} | Gate-Drain ("Miller") Charge | $V_{GS}=10V$ | - | 42 | - | nC |
| $t_{d(on)}$ | Turn-on Delay Time ² | $V_{DS}=40V$ | - | 23 | - | ns |
| t_r | Rise Time | $I_D=40A$ | - | 96 | - | ns |
| $t_{d(off)}$ | Turn-off Delay Time | $R_G=3.3\Omega, V_{GS}=10V$ | - | 39 | - | ns |
| t_f | Fall Time | $R_D=1\Omega$ | - | 65 | - | ns |
| C_{iss} | Input Capacitance | $V_{GS}=0V$ | - | 4450 | 7120 | pF |
| C_{oss} | Output Capacitance | $V_{DS}=25V$ | - | 850 | - | pF |
| C_{rss} | Reverse Transfer Capacitance | $f=1.0MHz$ | - | 360 | - | pF |

Source-Drain Diode

| Symbol | Parameter | Test Conditions | Min. | Typ. | Max. | Units |
|----------|------------------------------------|----------------------|------|------|------|-------|
| V_{SD} | Forward On Voltage ² | $I_S=60A, V_{GS}=0V$ | - | - | 1.3 | V |
| t_{rr} | Reverse Recovery Time ² | $I_S=40A, V_{GS}=0V$ | - | 72 | - | ns |
| Q_{rr} | Reverse Recovery Charge | $di/dt=100A/\mu s$ | - | 170 | - | nC |

Notes:

1. Pulse width limited by Max. junction temperature.
2. Pulse test
3. Package limitation current is 80A, calculated continuous current based on maximum allowable junction temperature is 142A.

THIS PRODUCT IS AN ELECTROSTATIC SENSITIVE, PLEASE HANDLE WITH CAUTION.

THIS PRODUCT HAS BEEN QUALIFIED FOR CONSUMER MARKET. APPLICATIONS OR USES AS CRITICAL COMPONENT IN LIFE SUPPORT DEVICE OR SYSTEM ARE NOT AUTHORIZED.

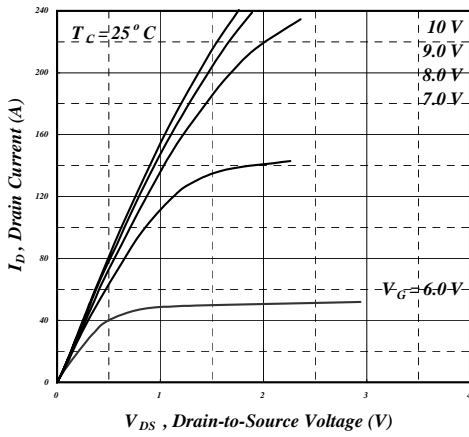


Fig 1. Typical Output Characteristics

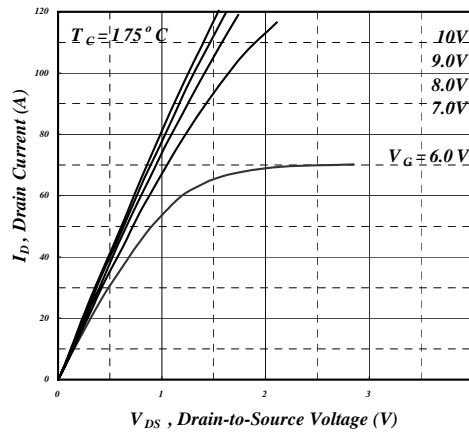


Fig 2. Typical Output Characteristics

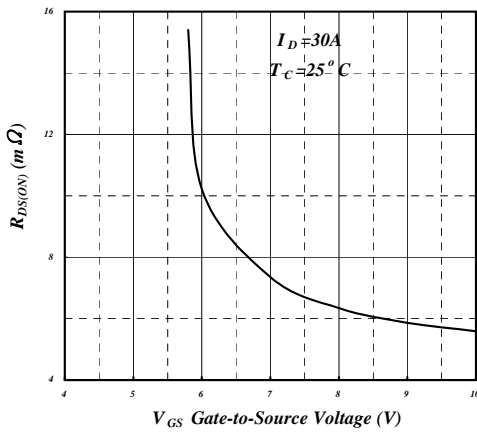


Fig 3. On-Resistance v.s. Gate Voltage

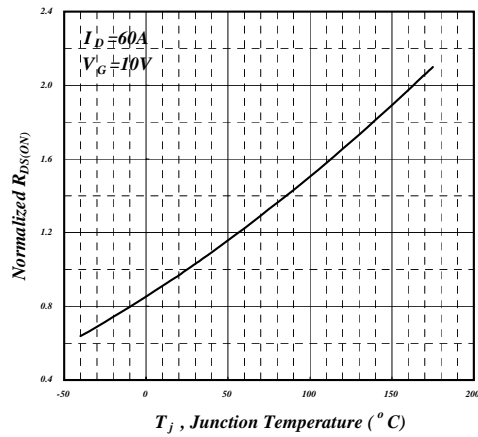


Fig 4. Normalized On-Resistance v.s. Junction Temperature

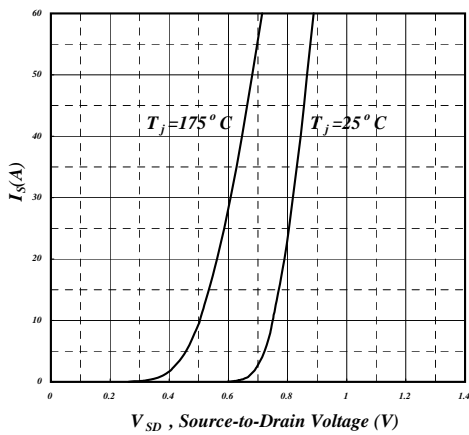


Fig 5. Forward Characteristic of Reverse Diode

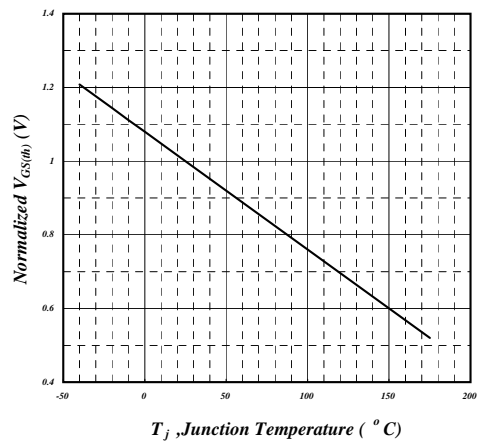


Fig 6. Gate Threshold Voltage v.s. Junction Temperature

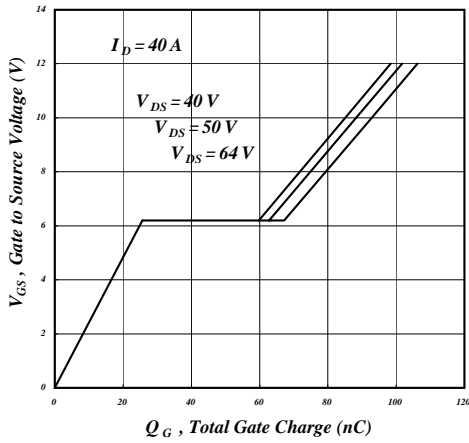


Fig 7. Gate Charge Characteristics

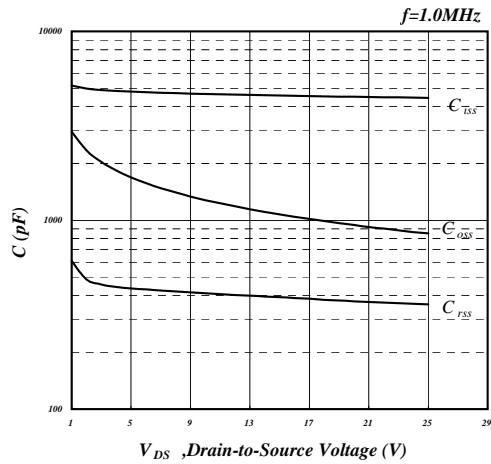


Fig 8. Typical Capacitance Characteristics

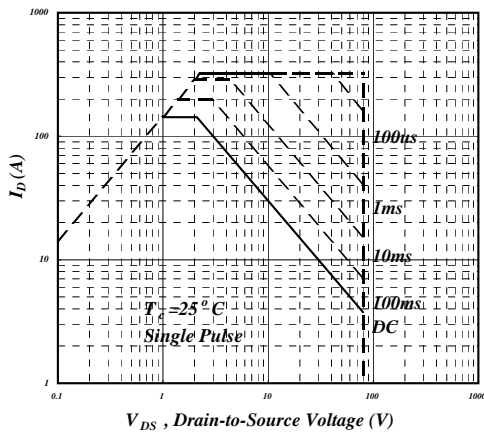


Fig 9. Maximum Safe Operating Area

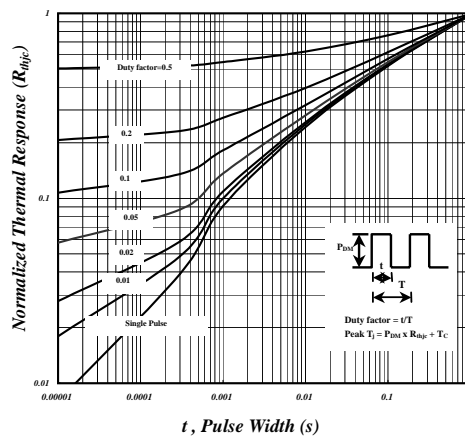


Fig 10. Effective Transient Thermal Impedance

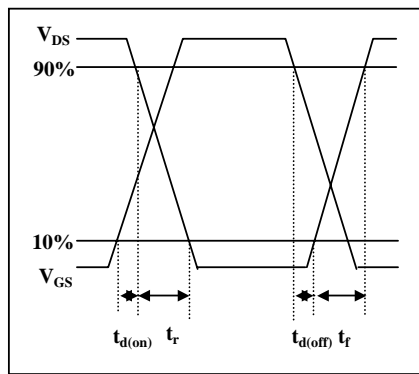


Fig 11. Switching Time Waveform

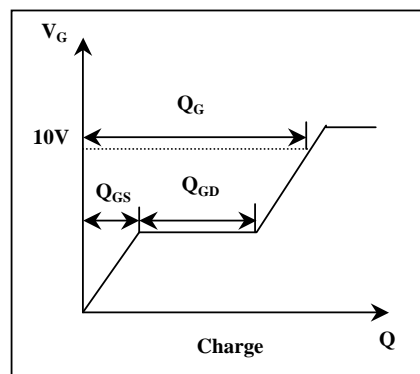


Fig 12. Gate Charge Waveform