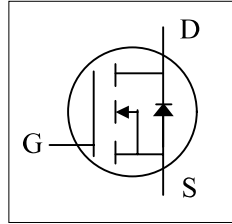


AP0903G

N-Channel Power MOSFET

- ▼ Simple Drive Requirement
- ▼ Good Thermal Dissipation
- ▼ Low On-resistance
- ▼ RoHS Compliant & Halogen-Free

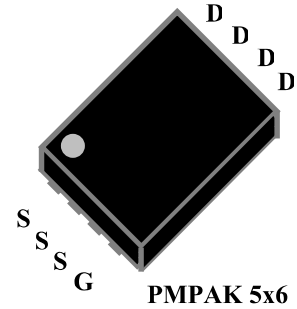


| | |
|--------------|------|
| BV_{DSS} | 30V |
| $R_{DS(ON)}$ | 10mΩ |
| I_D | 20A |

Description

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

The PMPAK[®] 5 x 6 package is special for DC-DC converters application and lower 1.0mm profile with backside heat sink.



Absolute Maximum Ratings@T_J=25°C(unless otherwise specified)

| Symbol | Parameter | Rating | Units |
|----------------------|---------------------------------------------|------------|-------|
| V_{DS} | Drain-Source Voltage | 30 | V |
| V_{GS} | Gate-Source Voltage | ±20 | V |
| $I_D@T_A=25^\circ C$ | Drain Current ³ , V_{GS} @ 10V | 20 | A |
| $I_D@T_A=70^\circ C$ | Drain Current ³ , V_{GS} @ 10V | 15 | A |
| I_{DM} | Pulsed Drain Current ¹ | 44 | A |
| $P_D@T_A=25^\circ C$ | Total Power Dissipation | 25 | W |
| T_{STG} | Storage Temperature Range | -55 to 150 | °C |
| T_J | Operating Junction Temperature Range | -55 to 150 | °C |

Thermal Data

| Symbol | Parameter | Value | Units |
|--------|-----------------------------------------------------------|-------|-------|
| Rthj-a | Maximum Thermal Resistance, Junction-ambient ³ | 35 | °C/W |

N-Channel Power MOSFET
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 | 30 | - | - | V |
| R _{DS(ON)} | Static Drain-Source On-Resistance ² | V _{GS} =10V, I _D =10A | - | - | 10 | mΩ |
| | | V _{GS} =4.5V, I _D =8A | - | - | 16 | mΩ |
| V _{GS(th)} | Gate Threshold Voltage | V _{DS} =V _{GS} , I _D =250uA | 1 | - | 3 | V |
| g _{fs} | Forward Transconductance | V _{DS} =10V, I _D =10A | - | 24 | - | S |
| I _{DSS} | Drain-Source Leakage Current | V _{DS} =30V, V _{GS} =0V | - | - | 10 | uA |
| | Drain-Source Leakage Current (T _j =70°C) | V _{DS} =24V, V _{GS} =0V | - | - | 250 | uA |
| I _{GSS} | Gate-Source Leakage | V _{GS} =±20V, V _{DS} =0V | - | - | ±100 | nA |
| Q _g | Total Gate Charge ² | I _D =10A | - | 8.7 | 14 | nC |
| Q _{gs} | Gate-Source Charge | V _{DS} =15V | - | 1.7 | - | nC |
| Q _{gd} | Gate-Drain ("Miller") Charge | V _{GS} =4.5V | - | 5 | - | nC |
| t _{d(on)} | Turn-on Delay Time ² | V _{DS} =15V | - | 10 | - | ns |
| t _r | Rise Time | I _D =1A | - | 7 | - | ns |
| t _{d(off)} | Turn-off Delay Time | R _G =6Ω | - | 24 | - | ns |
| t _f | Fall Time | V _{GS} =10V | - | 8 | - | ns |
| C _{iss} | Input Capacitance | V _{GS} =0V | - | 635 | 1010 | pF |
| C _{oss} | Output Capacitance | V _{DS} =25V | - | 215 | - | pF |
| C _{rss} | Reverse Transfer Capacitance | f=1.0MHz | - | 125 | - | pF |
| R _g | Gate Resistance | f=1.0MHz | - | 1.8 | - | Ω |

Source-Drain Diode

| Symbol | Parameter | Test Conditions | Min. | Typ. | Max. | Units |
|-----------------|------------------------------------|-------------------------------------------|------|------|------|-------|
| V _{SD} | Forward On Voltage ² | I _S =2.9A, V _{GS} =0V | - | - | 1.2 | V |
| t _{rr} | Reverse Recovery Time ² | I _S =10A, V _{GS} =0V, | - | 27 | - | ns |
| Q _{rr} | Reverse Recovery Charge | di/dt=100A/μs | - | 20 | - | nC |

Notes:

- 1.Pulse width limited by Max. junction temperature.
- 2.Pulse test
- 3.Surface mounted on 1 in² copper pad of FR4 board, t ≤10sec

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

N-Channel Power MOSFET

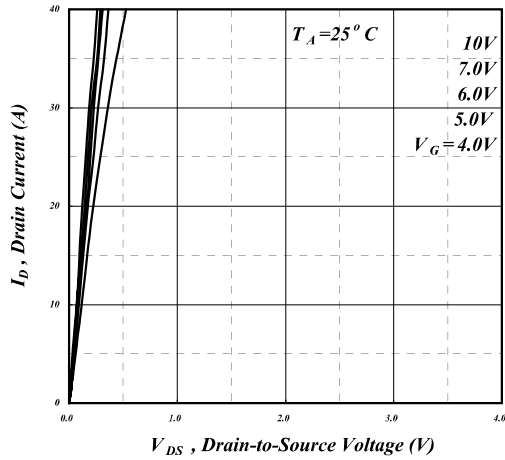


Fig 1. Typical Output Characteristics

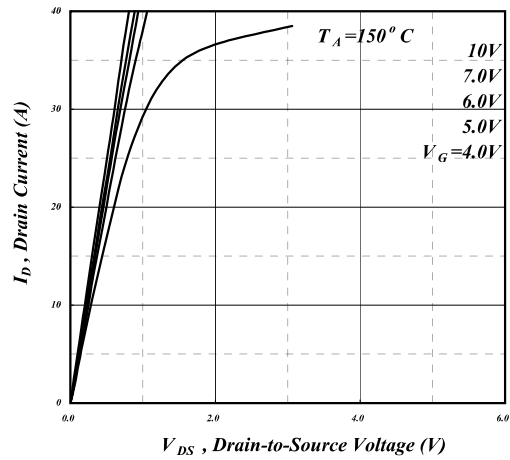


Fig 2. Typical Output Characteristics

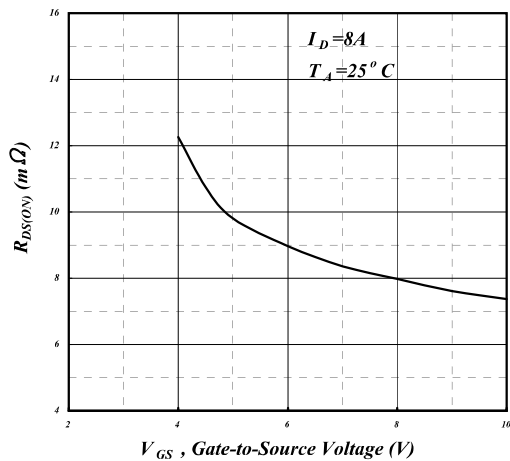


Fig 3. On-Resistance v.s. Gate Voltage

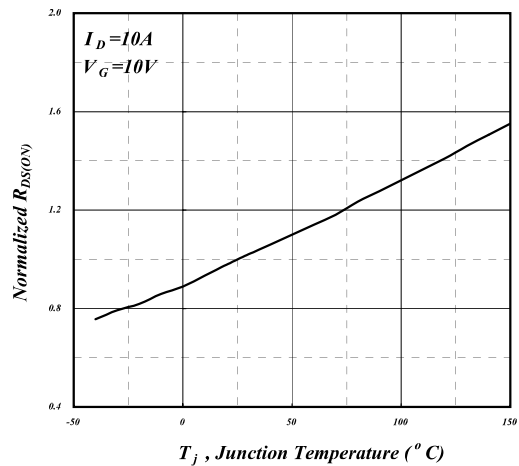


Fig 4. Normalized On-Resistance v.s. Junction Temperature

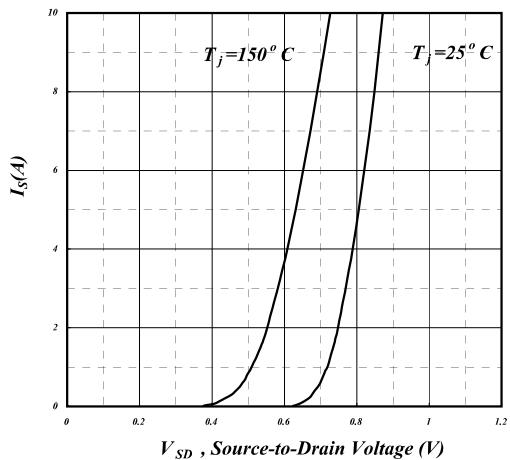


Fig 5. Forward Characteristic of Reverse Diode

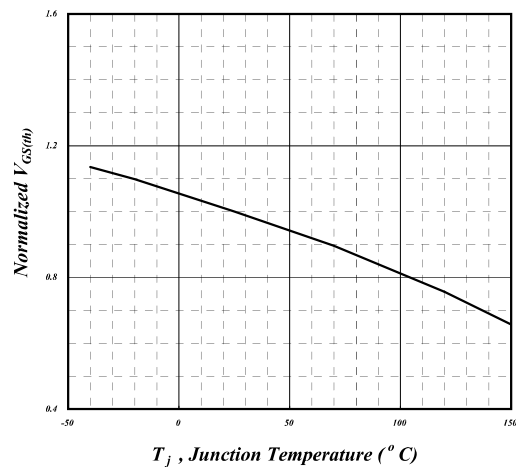


Fig 6. Gate Threshold Voltage v.s. Junction Temperature

N-Channel Power MOSFET

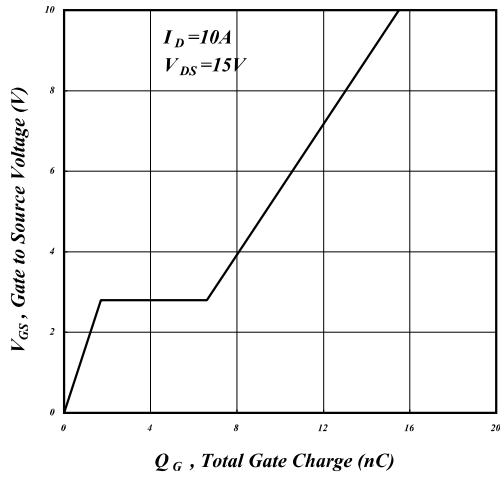


Fig 7. Gate Charge Characteristics

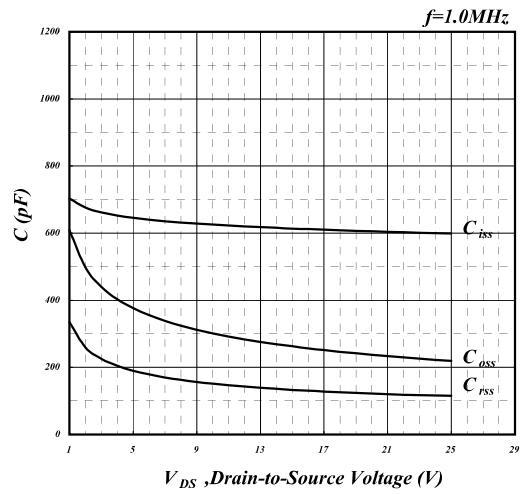


Fig 8. Typical Capacitance Characteristics

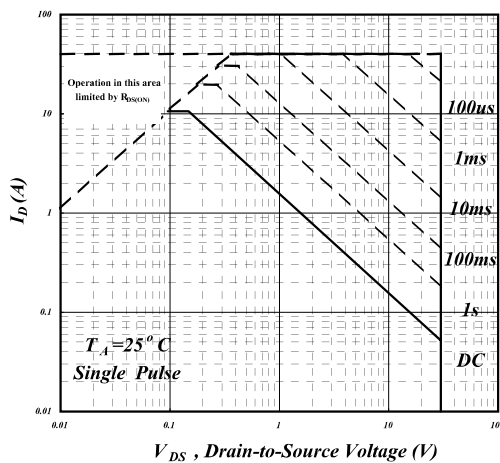


Fig 9. Maximum Safe Operating Area

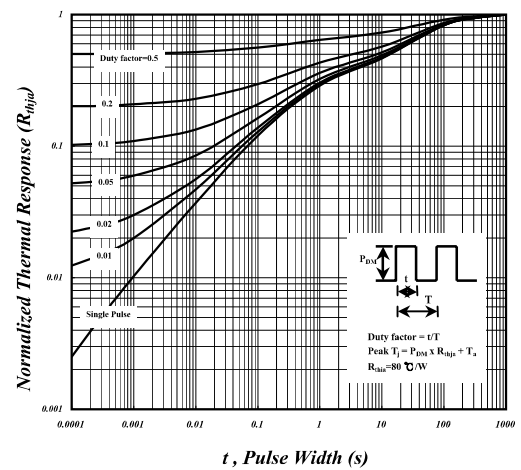


Fig 10. Effective Transient Thermal Impedance

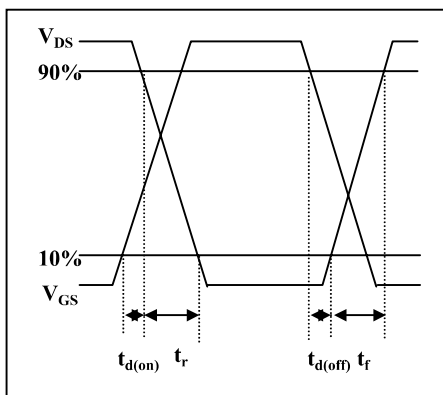


Fig 11. Switching Time Waveform

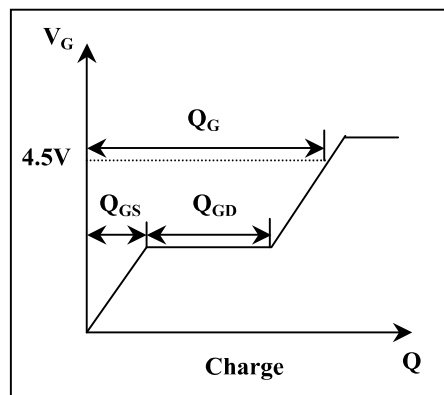
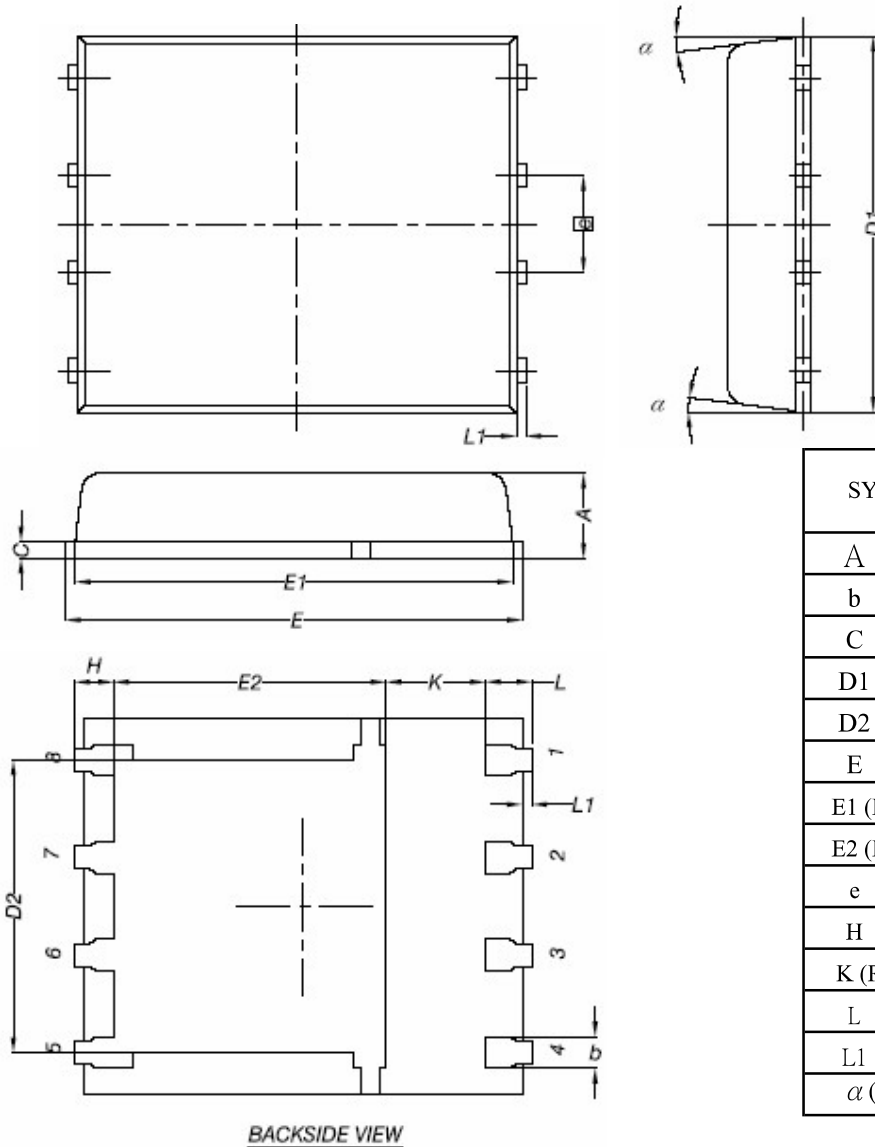


Fig 12. Gate Charge Waveform

AP0903G

N-Channel Power MOSFET

Package Outline : PMPAK 5x6



| SYMBOLS | Millimeters | | |
|----------------------|-------------|------|------|
| | MIN | NOM | MAX |
| A | 0.90 | 1.00 | 1.10 |
| b | 0.33 | 0.41 | 0.51 |
| C | 0.20 | - | - |
| D1 | 4.80 | 4.90 | 5.10 |
| D2 | - | - | 4.20 |
| E | 5.90 | 6.00 | 6.10 |
| E1 (Reference) | 5.70 | 5.75 | 5.80 |
| E2 (Reference) | 3.38 | 3.58 | 3.78 |
| e | 1.27 BSC | | |
| H | - | - | 0.62 |
| K (Reference) | 0.70 | - | - |
| L | 0.51 | 0.61 | 0.71 |
| L1 | - | - | 0.20 |
| α (Reference) | 0° | - | 12° |

- 1.All Dimension Are In Millimeters.
- 2.Dimension Does Not Include Mold Protrusions.