

AP60SC200DDT8

Halogen-Free Product

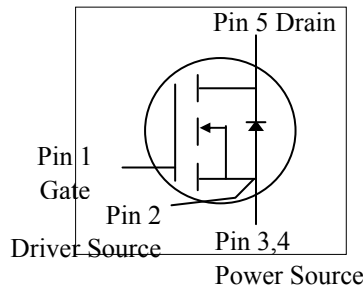


**Advanced Power
Electronics Corp.**

N-CHANNEL ENHANCEMENT MODE

POWER MOSFET

- ▼ 100% R_g & UIS Test
- ▼ Low t_{rr} / Q_{rr}
- ▼ Simple Drive Requirement
- ▼ RoHS Compliant & Halogen-Free

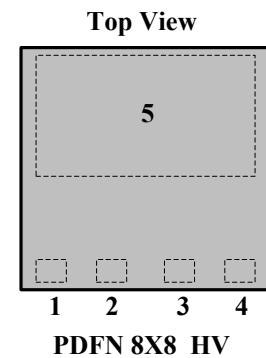


| | |
|-------------------------------|------|
| BV _{DSS} | 600 |
| R _{DS(ON)} | 0.2Ω |
| I _D ^{3,4} | 20A |

Description

AP60SC200D series are from Advanced Power innovated design and silicon process technology to achieve the lowest possible on-resistance and fast switching performance. It provides the designer with an extreme efficient device for use in a wide range of power applications.

The PDFN 8X8_HV package is a very low profile for commercial-industrial surface mount application and suited for switching power converters.



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

| Symbol | Parameter | Rating | Units |
|---------------------------------------|--------------------------------------------------------|------------|-------|
| V _{DS} | Drain-Source Voltage | 600 | V |
| V _{GS} | Gate-Source Voltage | ±20 | V |
| V _{GS} | Gate-Source Voltage, AC (f > 1Hz) | ±30 | V |
| I _D @T _C =25°C | Drain Current, V _{GS} @ 10V ^{3,4} | 20 | A |
| I _D @T _C =100°C | Drain Current, V _{GS} @ 10V ^{3,4} | 12 | A |
| I _{DM} | Pulsed Drain Current ¹ | 44 | A |
| dv/dt | MOSFET dv/dt Ruggedness (V _{DS} = 0 ...480V) | 40 | V/ns |
| P _D @T _C =25°C | Total Power Dissipation | 138.8 | W |
| P _D @T _A =25°C | Total Power Dissipation ⁷ | 2.5 | W |
| E _{AS} | Single Pulse Avalanche Energy ⁵ | 200 | mJ |
| dv/dt | Peak Diode Recovery dv/dt ⁶ | 15 | V/ns |
| 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 |
|--------------------|-----------------------------------------------------------|-------|-------|
| R _{thj-c} | Maximum Thermal Resistance, Junction-case | 0.9 | °C/W |
| R _{thj-a} | Maximum Thermal Resistance, Junction-ambient ⁷ | 50 | °C/W |



AP60SC200DDT8

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 =1mA | 600 | - | - | V |
| R _{DS(ON)} | Static Drain-Source On-Resistance ² | V _{GS} =10V, I _D =6.2A | - | - | 0.2 | Ω |
| V _{GS(th)} | Gate Threshold Voltage | V _{DS} =V _{GS} , I _D =250uA | 2.5 | - | 4.5 | V |
| g _{fs} | Forward Transconductance | V _{DS} =10V, I _D =6.2A | - | 13 | - | S |
| I _{DSS} | Drain-Source Leakage Current | V _{DS} =480V, V _{GS} =0V | - | - | 100 | uA |
| I _{GSS} | Gate-Source Leakage | V _{GS} =±20V, V _{DS} =0V | - | - | ±1 | uA |
| Q _g | Total Gate Charge | I _D =7.5A | - | 35 | 56 | nC |
| Q _{gs} | Gate-Source Charge | V _{DS} =480V | - | 12 | - | nC |
| Q _{gd} | Gate-Drain ("Miller") Charge | V _{GS} =10V | - | 16 | - | nC |
| t _{d(on)} | Turn-on Delay Time | V _{DD} =300V | - | 16 | - | ns |
| t _r | Rise Time | I _D =7.5A | - | 25 | - | ns |
| t _{d(off)} | Turn-off Delay Time | R _G =3.3Ω | - | 36 | - | ns |
| t _f | Fall Time | V _{GS} =10V | - | 7 | - | ns |
| C _{iss} | Input Capacitance | V _{GS} =0V | - | 1400 | 2240 | pF |
| C _{oss} | Output Capacitance | V _{DS} =100V | - | 55 | - | pF |
| C _{rss} | Reverse Transfer Capacitance | f=1.0MHz | - | 10 | - | pF |
| R _g | Gate Resistance | f=1.0MHz | - | 4.5 | 9 | Ω |

Source-Drain Diode

| Symbol | Parameter | Test Conditions | Min. | Typ. | Max. | Units |
|-----------------|---------------------------------|-------------------------------------------|------|------|------|-------|
| V _{SD} | Forward On Voltage ² | I _S =6.2A, V _{GS} =0V | - | 0.8 | 1.5 | V |
| t _{rr} | Reverse Recovery Time | I _S =7.5A, V _{GS} =0V | - | 170 | - | ns |
| Q _{rr} | Reverse Recovery Charge | di/dt=100A/μs | - | 1.4 | - | uC |

Notes:

- 1.Pulse width limited by max. junction temperature.
- 2.Pulse test
- 3.Limited by max. junction temperature. Maximum duty cycle D=0.75
- 4.Ensure that the junction temperature does not exceed T_{Jmax}.
- 5.Starting T_J=25°C, V_{DD}=90V, L=100mH, R_G=25Ω, V_{GS}=10V
- 6.I_{SD} ≤ I_D, V_{DD} ≤ BV_{DSS}, starting T_J = 25°C
- 7.Surface mounted on 1 in² copper pad of FR4 board

THIS PRODUCT IS SENSITIVE TO ELECTROSTATIC DISCHARGE, PLEASE HANDLE WITH CAUTION.

USE OF THIS PRODUCT AS A CRITICAL COMPONENT IN LIFE SUPPORT, AUTOMOTIVE OR OTHER SIMILAR SYSTEMS IS NOT AUTHORIZED.

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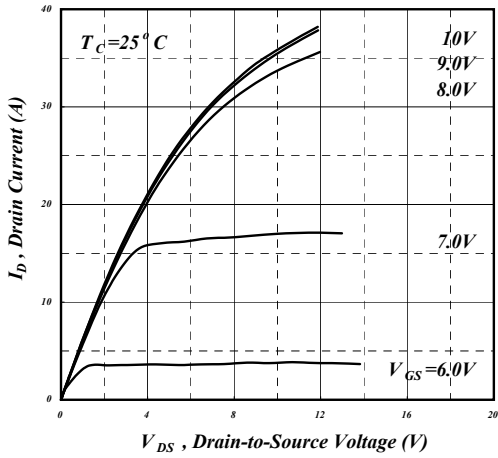


Fig 1. Typical Output Characteristics

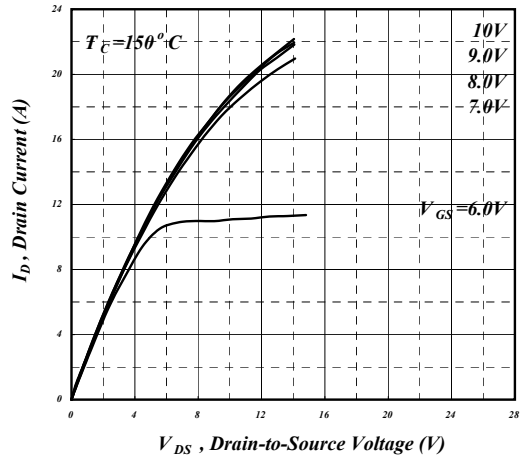


Fig 2. Typical Output Characteristics

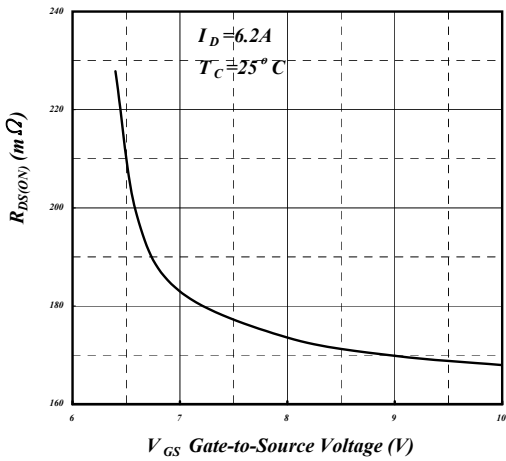


Fig 3. On-Resistance v.s. Gate Voltage

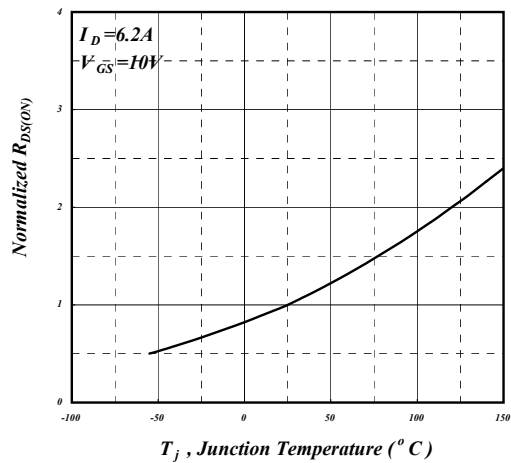


Fig 4. Normalized On-Resistance v.s. Junction Temperature

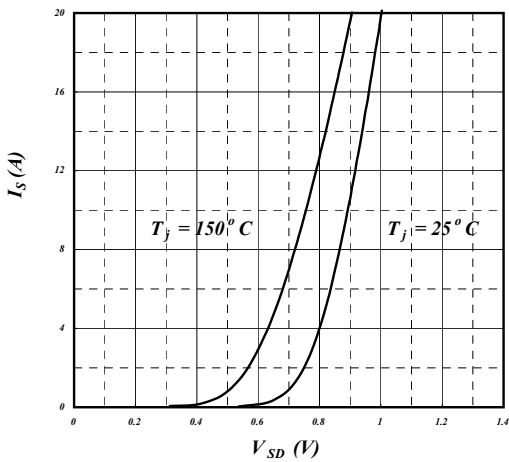


Fig 5. Forward Characteristic of Reverse Diode

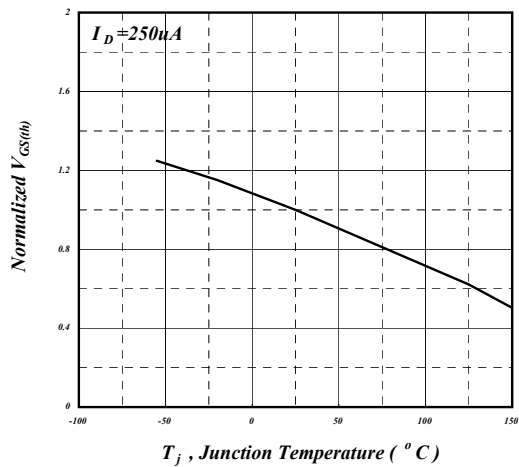


Fig 6. Gate Threshold Voltage v.s. Junction Temperature

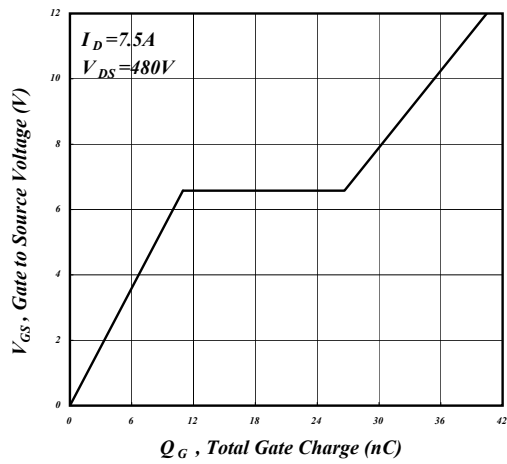


Fig 7. Gate Charge Characteristics

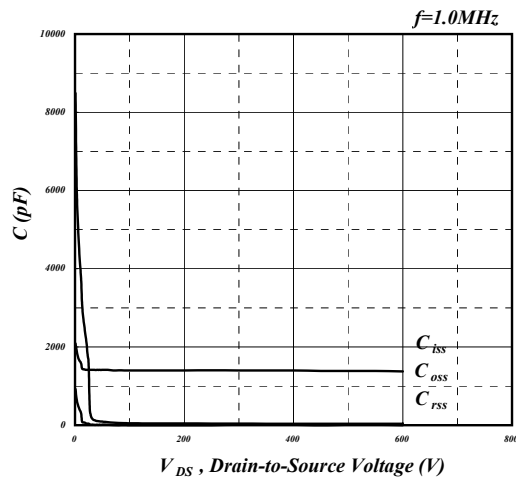


Fig 8. Typical Capacitance Characteristics

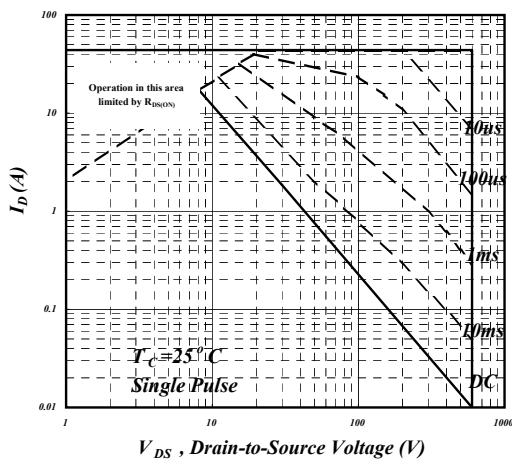


Fig 9. Maximum Safe Operating Area

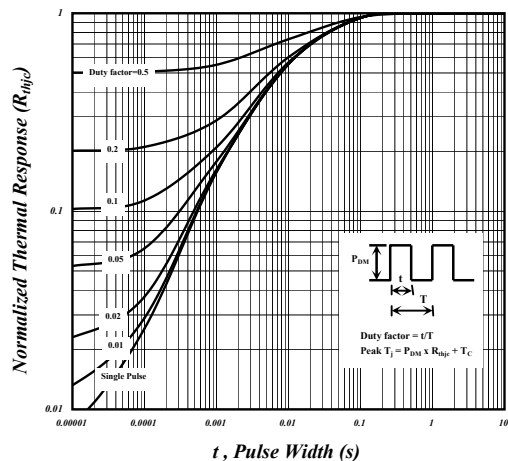


Fig 10. Effective Transient Thermal Impedance

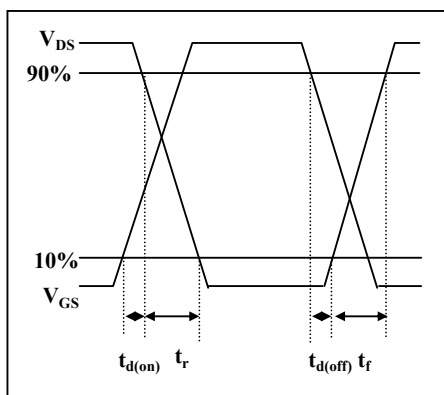


Fig 11. Switching Time Waveform

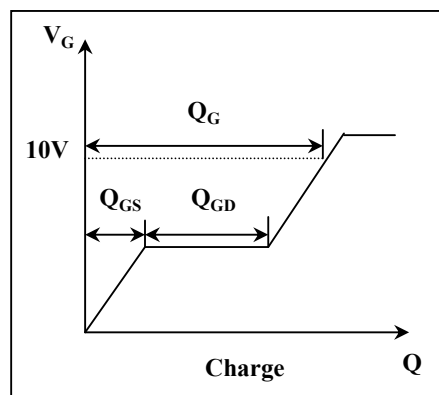


Fig 12. Gate Charge Waveform

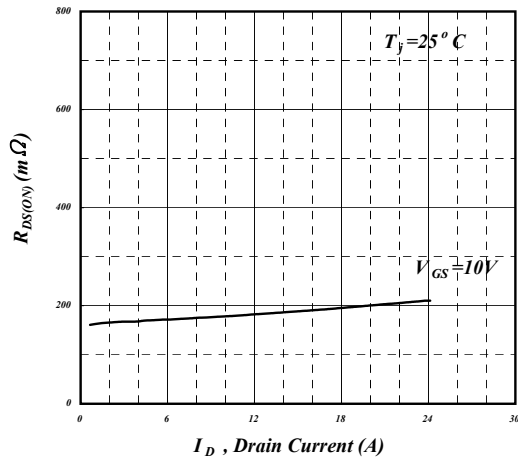


Fig 13. Typ. Drain-Source on State Resistance

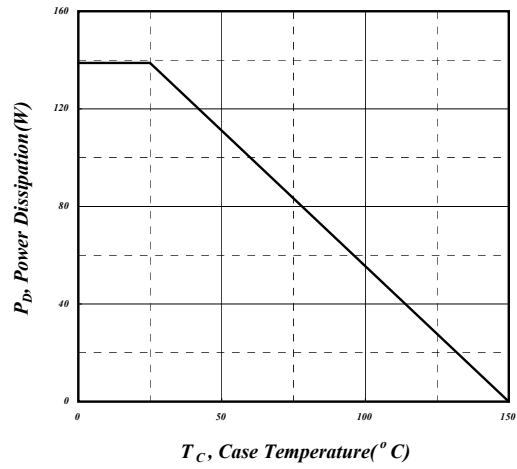
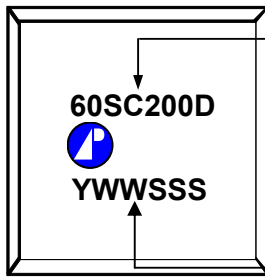


Fig 14. Total Power Dissipation



AP60SC200DDT8

MARKING INFORMATION



Part Number

Date Code (YWWSSS)

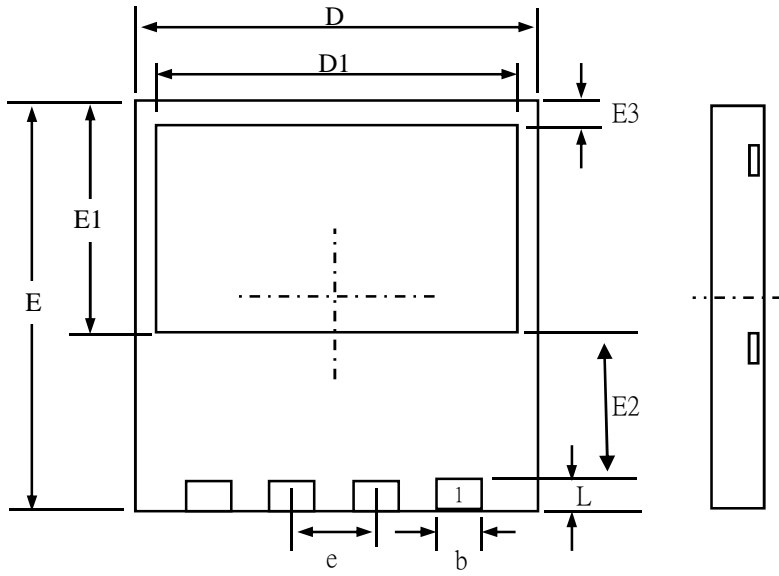
Y : Last Digit Of The Year

WW : Week

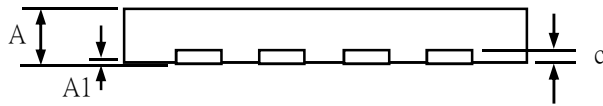
SSS : Sequence



Package Outline : PDFN 8x8_HV



BOTTOM VIEW



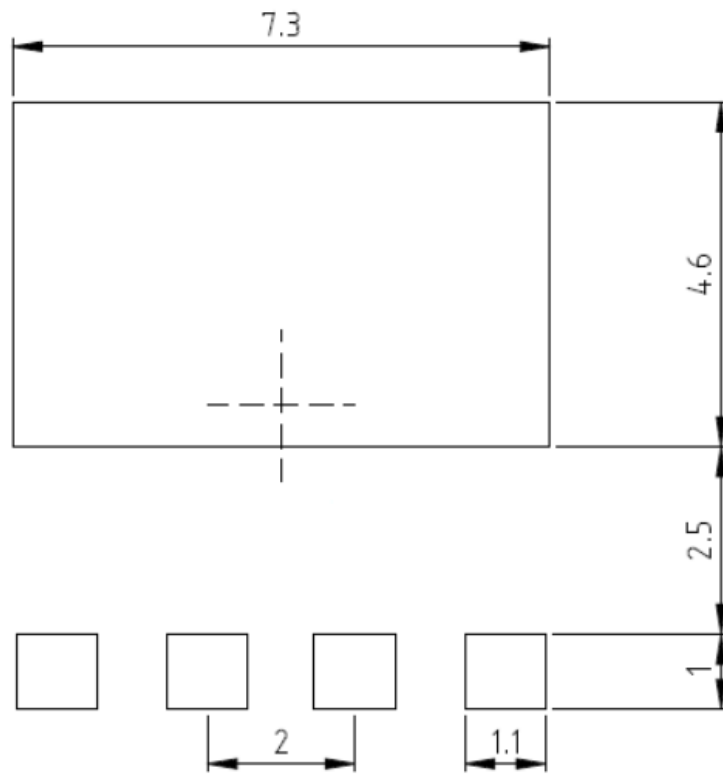
| SYMBOLS | Millimeters | | |
|---------|-------------|------|------|
| | MIN | NOM | MAX |
| A | 0.75 | 0.93 | 1.10 |
| A1 | 0.00 | -- | 0.05 |
| b | 0.90 | 1.00 | 1.10 |
| c | 0.10 | 0.20 | 0.30 |
| D | 7.90 | 8.00 | 8.10 |
| D1 | 7.10 | 7.20 | 7.30 |
| E | 7.90 | 8.00 | 8.10 |
| E1 | 4.25 | 4.55 | 4.85 |
| E2 | 2.65 | 2.75 | 2.85 |
| E3 | 0.30 | 0.40 | 0.50 |
| e | 2.00BSC | | |
| L | 0.40 | 0.50 | 0.60 |

1.All Dimension Are In Millimeters.

2.Dimension Does Not Include Burrs And Mold Flash.



PDFN 8x8 HV FOOTPRINT :



UNIT: mm