

PM008P060DG

-60V -120A 8.5mΩ Si Single P-ch Enhancement Mode MOSFET with Normal Diode

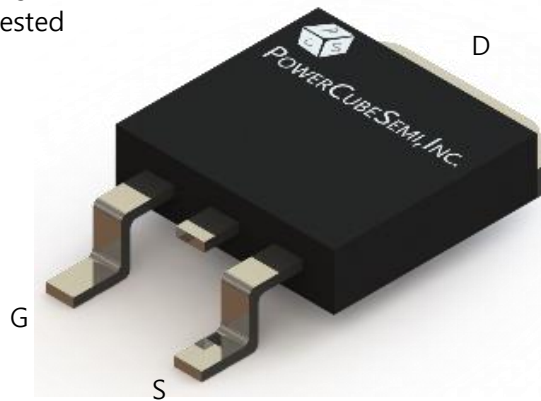
Features

Si P-Ch Enhancement Mode Power MOSFET

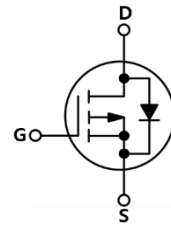
- Rated to -60V at -120Amps @ $T_j = 25^\circ\text{C}$
- Max $R_{DS(on)} = 8.5\text{ m}\Omega$
- Typ $R_{DS(on)} = 7\text{ m}\Omega$
- Gate Charge(Typ. $Q_g=230\text{ nC}$)
- 100% Avalanche Tested

Application

- Power switch
- DC/DC converters



PKG type : TO-263 (D2PAK)



Description

The PM008P060DG uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge. It can be used in a wide variety of applications.

Absolute Maximum Ratings

| Symbol | Parameter | Test Condition | Value | Unit |
|------------|--------------------------------|---|------------|------------------|
| BV_{DSS} | Drain-source breakdown Voltage | $V_{GS}=0V, I_D=-250\mu A$ | -60 | V |
| I_D | Drain current | $T_c=25^\circ\text{C}$ | -120 | A |
| I_{DM} | Drain current | Pulse width limited by junction temperature | -480 | A |
| V_{GS} | Gate-source voltage | | ± 20 | V |
| E_{AS} | Single pulsed avalanche energy | $V_{GS}=-10V, R_G=25\Omega$ $V_{DD}=-50V, L=0.5mH$ | 650 | mJ |
| P_d | Power dissipation | $T_c=25^\circ\text{C}$ | 277 | W |
| T_j | Operating junction | | 150 | $^\circ\text{C}$ |
| T_{stg} | Storage temperature | | -55 to 150 | $^\circ\text{C}$ |

Package Marking and Ordering Information

| Device Marking | Device | Package | Packing Method | Tape width | Quantity |
|----------------|-----------|---------|----------------|------------|----------|
| PM008P060DG | PM008P060 | TO-263 | REEL | - | 800 |

Electrical Characteristics of Si MOSFET

| Symbol | Parameter | Test Condition | Numerical | | | Unit |
|--------------|---|--|-----------|------|-----------|------------|
| | | | Min | Typ. | Max. | |
| BV_{DSS} | Drain-source breakdown voltage | $V_{GS} = 0V, I_D = -250\mu A, T_J = 25^\circ C$ | -60 | - | - | V |
| I_{DSS} | Zero gate voltage drain current | $V_{DS} = -60V, V_{GS} = 0V$ | - | - | -1 | μA |
| I_{GSS} | Gate-source leakage current | $V_{GS} = \pm 20V$ | - | - | ± 100 | nA |
| $V_{GS(th)}$ | Gate threshold voltage | $V_{DS} = V_{GS}, I_D = -250\mu A$ | -1 | -2.5 | -3 | V |
| $R_{DS(ON)}$ | Static drain-source on state resistance | $V_{GS} = -10V, I_D = -20A$ | - | 7 | 8.5 | m Ω |
| g_{FS} | Forward transconductance | $V_{DS} = -5V, I_D = -20A$ | - | 32 | - | S |
| $t_{d(on)}$ | Turn-on Delay time | $V_{DD} = -30V, I_D = -60A, R_G = 1\Omega$ | - | 20 | - | ns |
| t_r | Turn-on Rise time | | - | 25 | - | |
| $t_{d(off)}$ | Turn-off Delay time | | - | 110 | - | |
| t_f | Turn-off Fall time | | - | 50 | - | |

**Electrical Characteristics of Si MOSFET**

| Symbol | Parameter | Test Condition | Numerical | | Unit |
|-----------------|--------------------------------------|--|-----------|------|------|
| | | | Typ. | Max. | |
| $R_{\theta JC}$ | Thermal resistance, Junction to case | | 0.45 | - | °C/W |
| C_{iss} | Input capacitance | $V_{DS} = -30V, V_{GS} = 0V,$ $f = 1.0MHz$ | 12215 | - | pF |
| C_{oss} | Output capacitance | | 946 | - | |
| C_{rss} | Reverse transfer capacitance | | 673 | - | |
| $Q_{g(tot)}$ | Total gate charge at 10V | $V_{DD} = -30V, I_D = -60A$ $V_{GS} = -10V$ | 230 | - | nC |
| Q_{gs} | Gate to source gate charge | | 50 | - | |
| Q_{gd} | Gate to drain "Miller" charge | | 35 | - | |

Electrical Characteristics of Si Diode

| Symbol | Parameter | Test Condition | Numerical | | Unit |
|----------|--|---|-----------|------|------|
| | | | Typ. | Max. | |
| I_S | Maximum continuous drain to source diode forward current | $T_c = 25^\circ C$ | - | -120 | A |
| V_{SD} | Drain to source diode forward voltage | $I_{SD} = -20A, V_{GS} = 0V$ | - | -1.2 | V |
| T_{rr} | Reverse recovery time | $I_F = -30A, V_{GS} = 0V,$ $di_f/dt = -100A/\mu s$ | 91 | - | ns |
| Q_{rr} | Reverse recovery charge | | 0.21 | - | nC |

Typical Characteristics

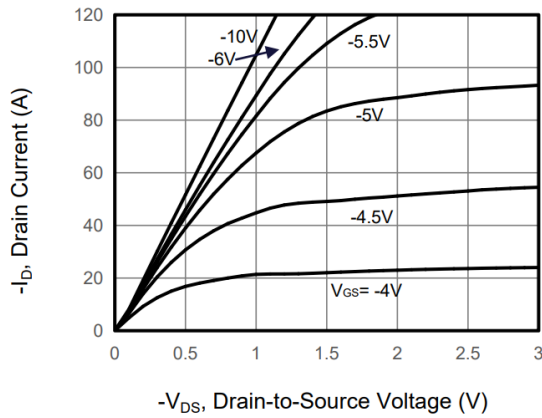


Figure 1. Output Characteristics

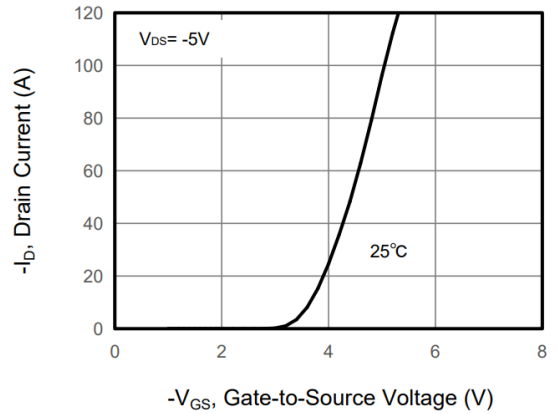


Figure 2. Transfer Characteristics

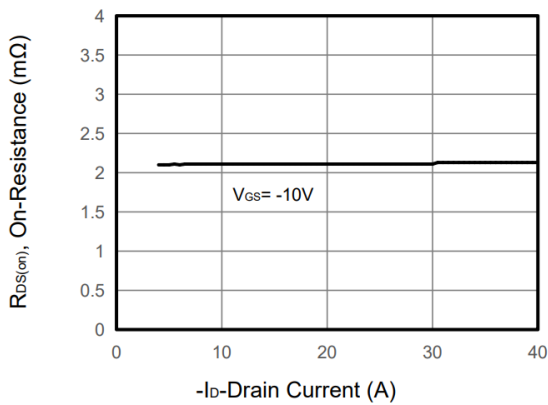


Figure 3. Drain Source On Resistance

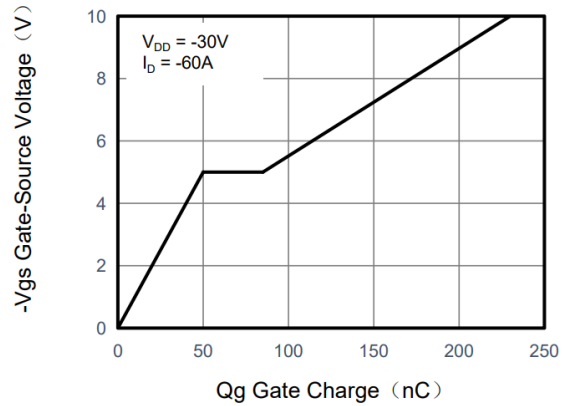


Figure 4. Gate Charge

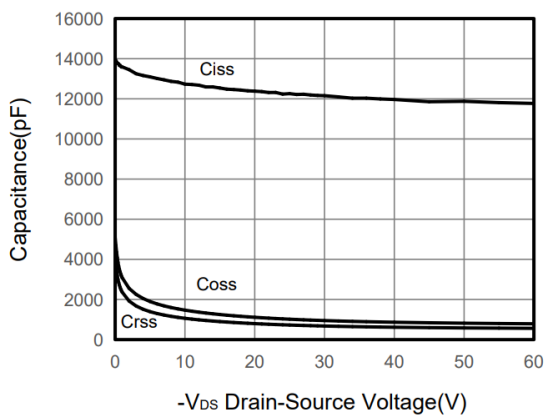


Figure 5. Capacitance

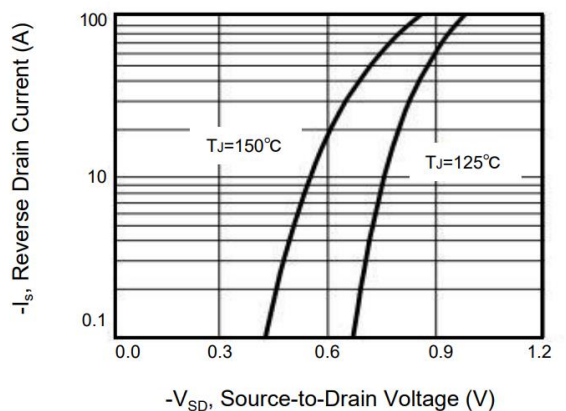


Figure 6. Source-Drain Diode Forward

Typical Characteristics

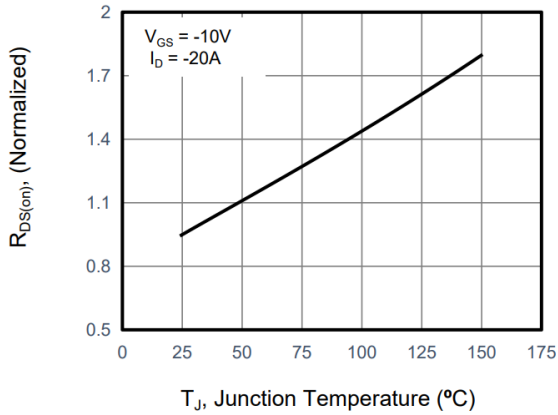


Figure 7. Drain-Source On-Resistance

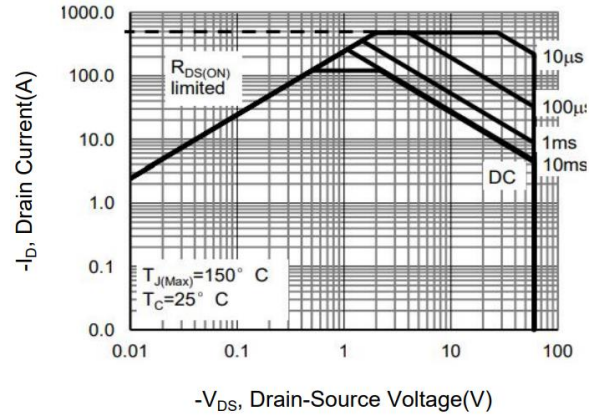


Figure 8. Safe Operation Area

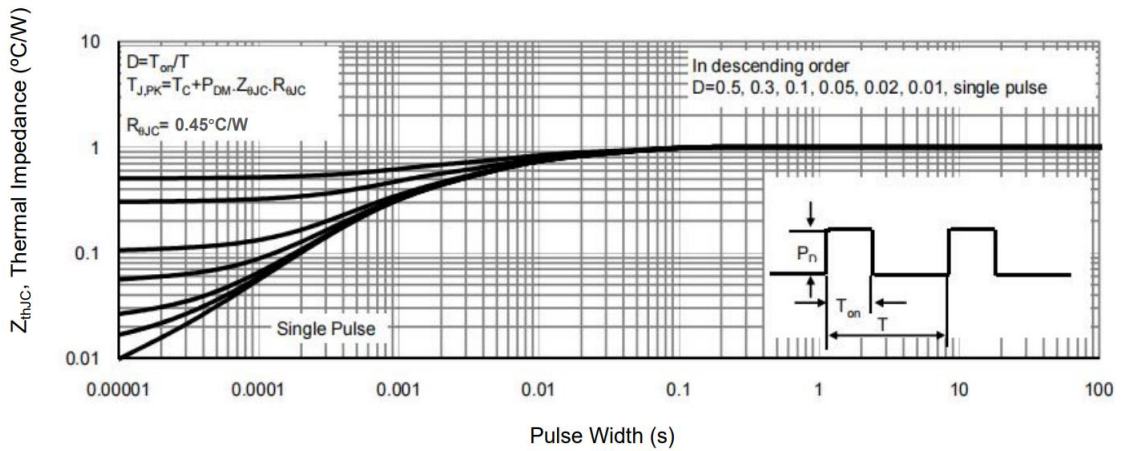
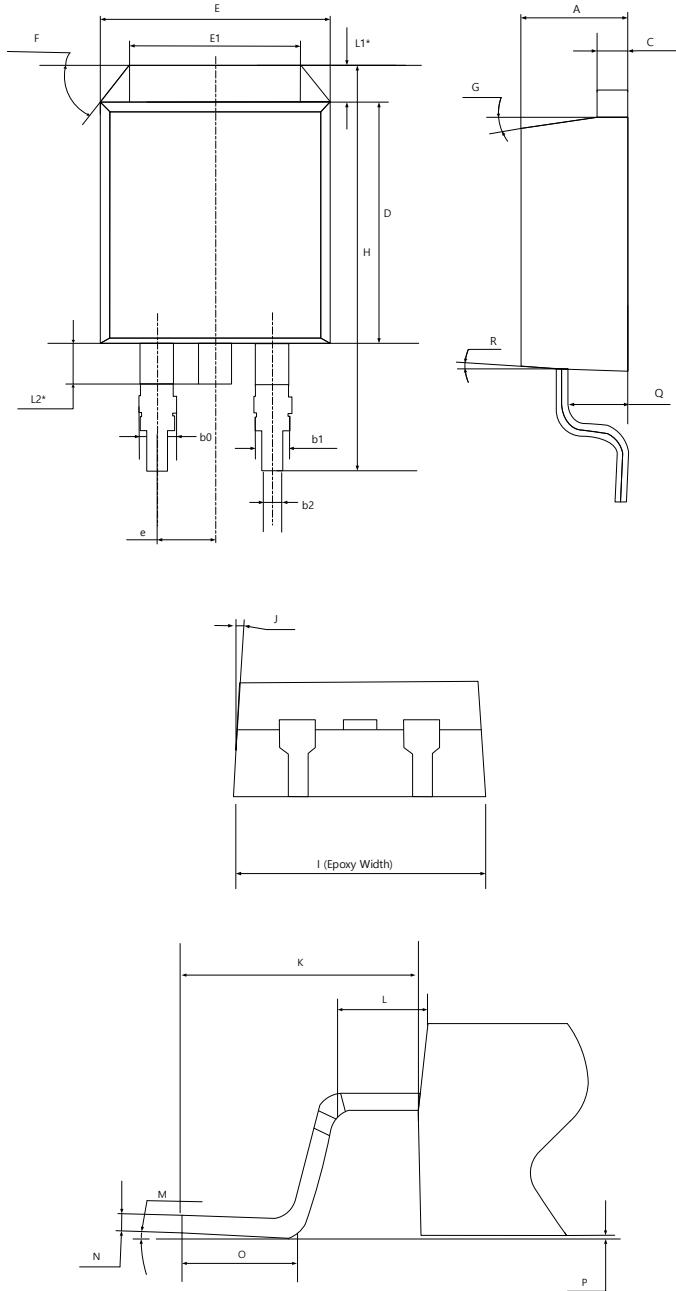


Figure 9. Normalized Maximum Transient Thermal Impedance

Package Outline

Unit : mm



| SYMBOL | DIMENSIONS | | |
|--------|------------|-----------|-------|
| | MIN | NOM | MAX |
| A | 4.40 | 4.60 | 4.80 |
| b0 | 1.17 | 1.37 | 1.57 |
| b1 | 1.17 | 1.27 | 1.37 |
| b2 | 0.70 | 0.80 | 0.90 |
| C | 1.17 | 1.27 | 1.37 |
| D | 8.50 | 8.70 | 8.90 |
| E | 9.80 | 10.00 | 10.20 |
| E1 | 6.50 | - | - |
| e | 2.44 | 2.54 | 2.64 |
| F | - | 30° (Ref) | - |
| G | - | 7.0° | - |
| H | 15.00 | 15.30 | 15.60 |
| I | 9.80 | 10.00 | 10.20 |
| J | - | 3.0° | - |
| K | 5.00 | 5.30 | 5.60 |
| L | 1.80 | 2.00 | 2.20 |
| L1 | 1.07 | 1.27 | 1.47 |
| L2 | 1.20 | 1.50 | 1.80 |
| M | 0.0° | - | 8.0° |
| N | 0.30 | 0.45 | 0.60 |
| O | 2.34 | 2.54 | 2.74 |
| P | 0 | - | 0.25 |
| Q | 2.37 | 2.67 | 2.97 |
| R | - | 7.0° | - |