



PE73100G P-Channel Enhancement Mode Power MOSFET

PE73100G Description

The PE73100G uses advanced trench technology to provide excellent $R_{DS(ON)}$ and low gate charge. It can be used in a wide variety of applications.

PE73100G General Features

- $V_{DS} = -30V$, $I_D = -100A$

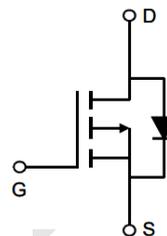
$R_{DS(ON)} < 3.2m\Omega$ @ $V_{GS} = -10V$

$R_{DS(ON)} < 5m\Omega$ @ $V_{GS} = -4.5V$

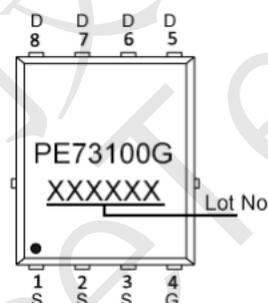
- High Power and current handling capability
- Lead free product is acquired
- Surface Mount Package

PE73100G Application

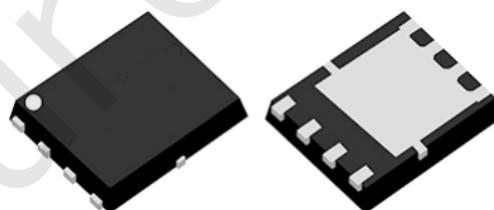
- PWM applications
- Load switch
- Power management



Schematic diagram



Marking and pin assignment



DFN5x6-8L

PE73100G Absolute Maximum Ratings (TC=25°C unless otherwise noted)

| Parameter | Symbol | Rating | Unit |
|--|----------------|------------|------|
| Drain-Source Voltage | V_{DS} | -30 | V |
| Gate-Source Voltage | V_{GS} | ± 20 | V |
| Drain Current-Continuous | I_D | -100 | A |
| Drain Current-Continuous (TC=100°C) | I_D | -72 | A |
| Pulsed Drain Current (Note 1) | I_{DM} | -350 | A |
| Maximum Power Dissipation | P_D | 83 | W |
| Single Pulsed Avalanche Energy (L=0.1mH) | E_{AS} | 405 | mJ |
| Operating Junction and Storage Temperature Range | T_J, T_{STG} | -55 To 150 | °C |

PE73100G Thermal Characteristic

| | | | |
|---|-----------------|-----|------|
| Thermal Resistance, Junction-to-Case (Note 2) | $R_{\theta JC}$ | 1.5 | °C/W |
|---|-----------------|-----|------|



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PE73100G Electrical Characteristics (TC=25°C unless otherwise noted)

| Parameter | Symbol | Condition | Min | Typ | Max | Unit |
|---|--------------|--|------|------|-----------|------------|
| Off Characteristics | | | | | | |
| Drain-Source Breakdown Voltage | BV_{DSS} | $V_{GS}=0V, I_D=-250\mu A$ | -30 | - | - | V |
| Zero Gate Voltage Drain Current | I_{DSS} | $V_{DS}=-24V, V_{GS}=0V$ | - | - | -1 | μA |
| Gate-Body Leakage Current | I_{GSS} | $V_{GS}=\pm 20V, V_{DS}=0V$ | - | - | ± 100 | nA |
| On Characteristics (Note 3) | | | | | | |
| Gate Threshold Voltage | $V_{GS(th)}$ | $V_{DS}=V_{GS}, I_D=-250\mu A$ | -1.2 | -1.6 | -2.5 | V |
| Drain-Source On-State Resistance | $R_{DS(on)}$ | $V_{GS}=-10V, I_D=-20A$ | - | 2.7 | 3.2 | m Ω |
| | | $V_{GS}=-4.5V, I_D=-10A$ | - | 4 | 5 | m Ω |
| Forward Transconductance | g_{FS} | $V_{DS}=-10V, I_D=-5A$ | - | 27 | - | S |
| Dynamic Characteristics (Note 4) | | | | | | |
| Input Capacitance | C_{iss} | $V_{DS}=-15V, V_{GS}=0V,$ $F=1.0MHz$ | - | 8000 | - | pF |
| Output Capacitance | C_{oss} | | - | 800 | - | pF |
| Reverse Transfer Capacitance (Note 4) | C_{rss} | | - | 630 | - | pF |
| Gate Resistance | R_g | $V_{DS}=0V, V_{GS}=0V, F=1.0MHz$ | - | 1.7 | - | Ω |
| Switching Characteristics | | | | | | |
| Turn-on Delay Time | $t_{d(on)}$ | $V_{DD}=-15V, I_D=-18A,$ $V_{GS}=-10V, R_G=6\Omega$ | - | 69 | - | nS |
| Turn-on Rise Time | t_r | | - | 56 | - | nS |
| Turn-Off Delay Time | $t_{d(off)}$ | | - | 68 | - | nS |
| Turn-Off Fall Time | t_f | | - | 16 | - | nS |
| Total Gate Charge | Q_g | $V_{DS}=-15V, I_D=-20A, V_{GS}=-10V$ | - | 147 | - | nC |
| Gate-Source Charge | Q_{gs} | | - | 25 | - | nC |
| Gate-Drain Charge | Q_{gd} | | - | 28 | - | nC |
| Drain-Source Diode Characteristics | | | | | | |
| Diode Forward Voltage (Note 3) | V_{SD} | $V_{GS}=0V, I_S=-18A$ | - | - | -1.2 | V |
| Maximum Body-Diode Current | I_S | | | | -100 | A |
| Body Diode Reverse Recovery Time | t_{rr} | $I_F=-18A, dI/dt=100A/\mu s$ | - | 25 | - | nS |
| Body Diode Reverse Recovery Charge | Q_{rr} | | - | 20 | - | nC |

Notes:

1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2. Surface Mounted on FR4 Board, $t \leq 10$ sec.
3. Pulse Test: Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 2\%$.
4. Guaranteed by design, not subject to product.



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PE73100G Typical Electrical and Thermal Characteristics

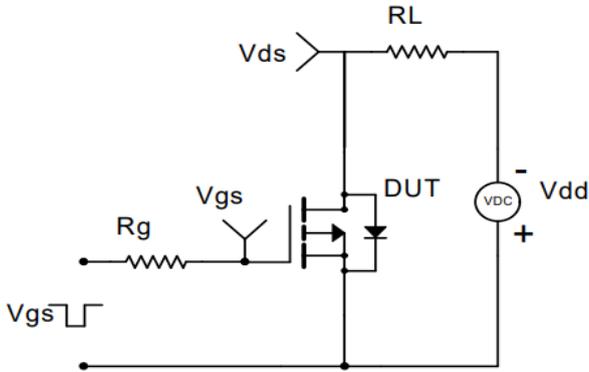


Figure 1 Switching Test Circuit

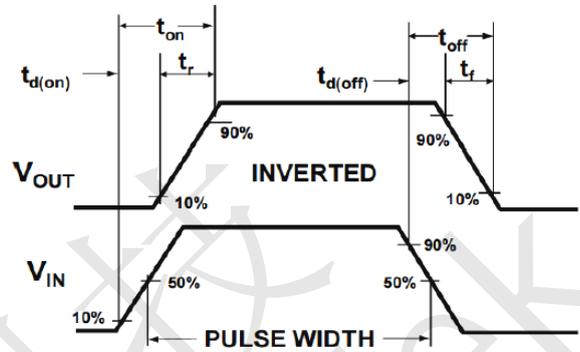


Figure 2 Switching Waveform

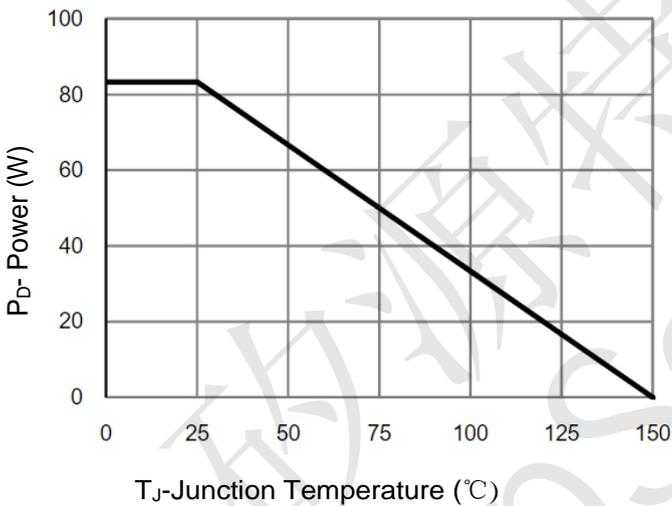


Figure 3 Power De-rating

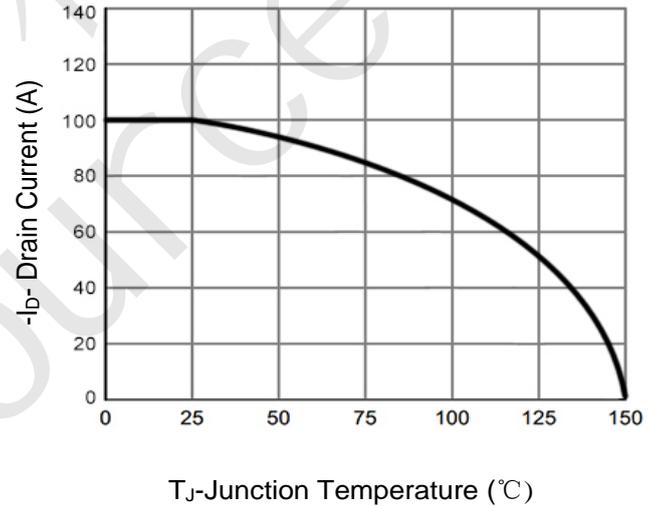


Figure 4 Drain Current

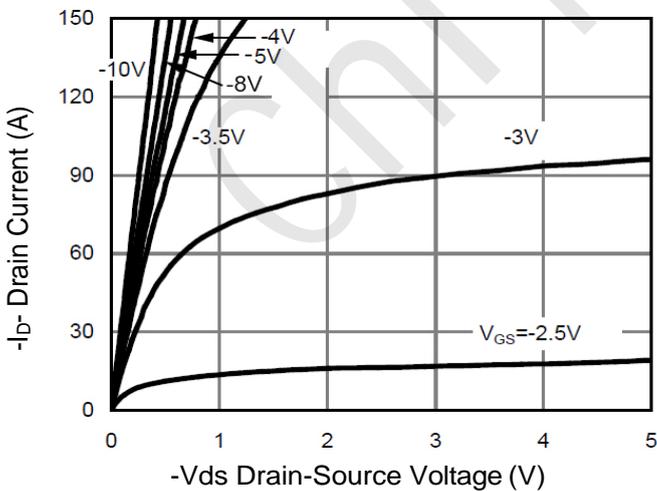


Figure 5 Output Characteristics

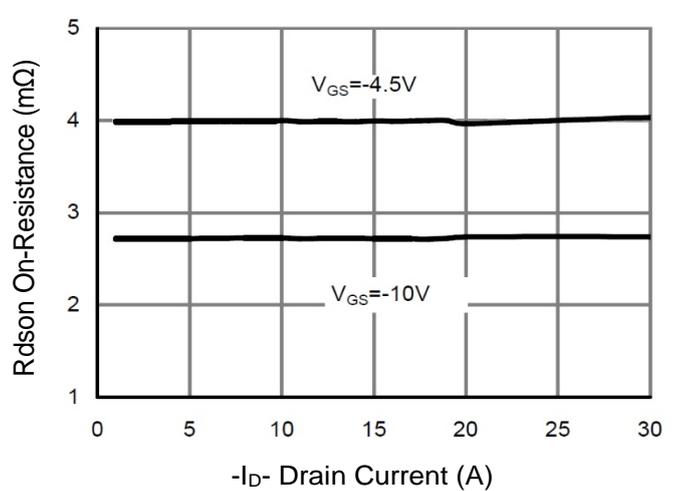


Figure 6 Rdson vs Drain Current



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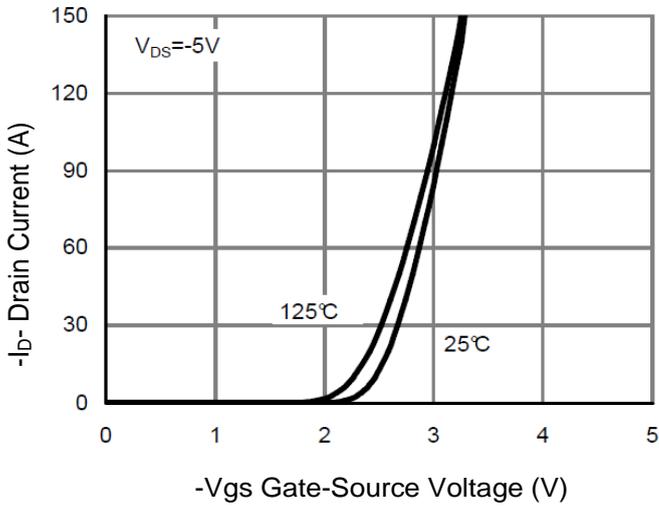


Figure 7 Transfer Characteristics

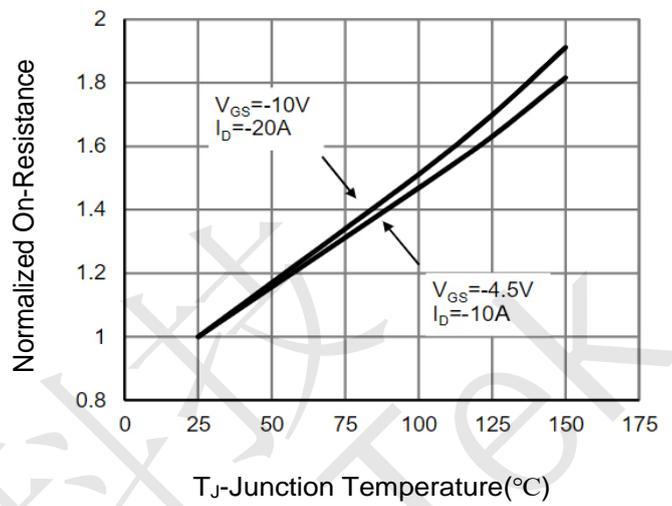


Figure 8 Rdson vs Junction Temperature

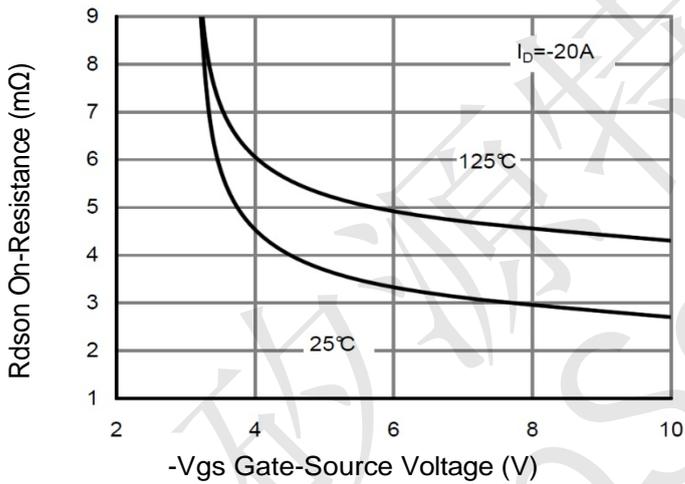


Figure 9 Rdson vs Vgs

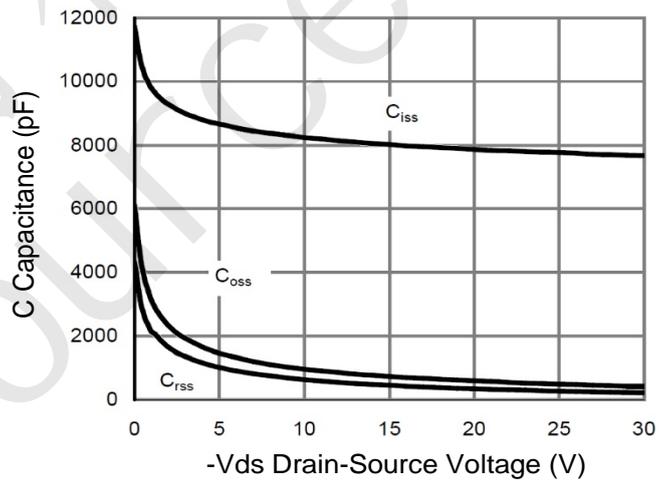


Figure 10 Capacitance vs Vds

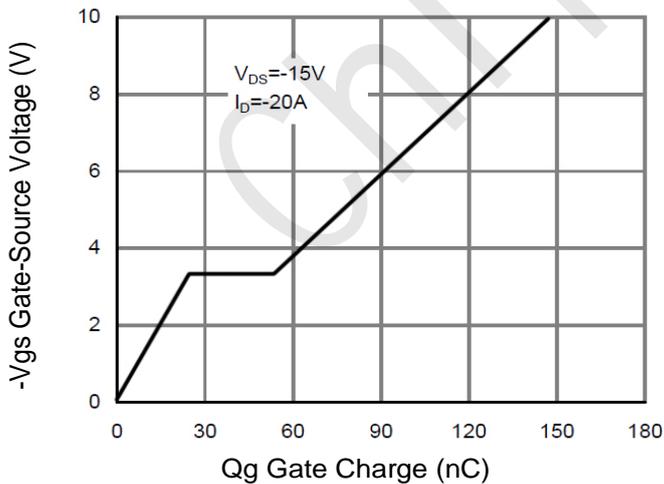


Figure 11 Gate Charge

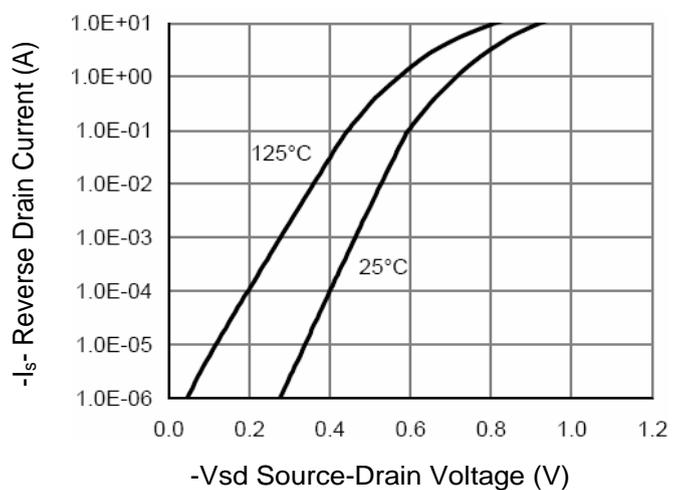


Figure 12 Source- Drain Diode Forward



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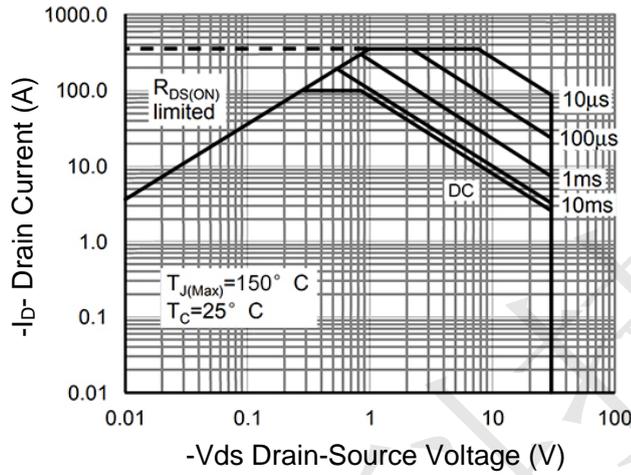


Figure 13 Safe Operation Area

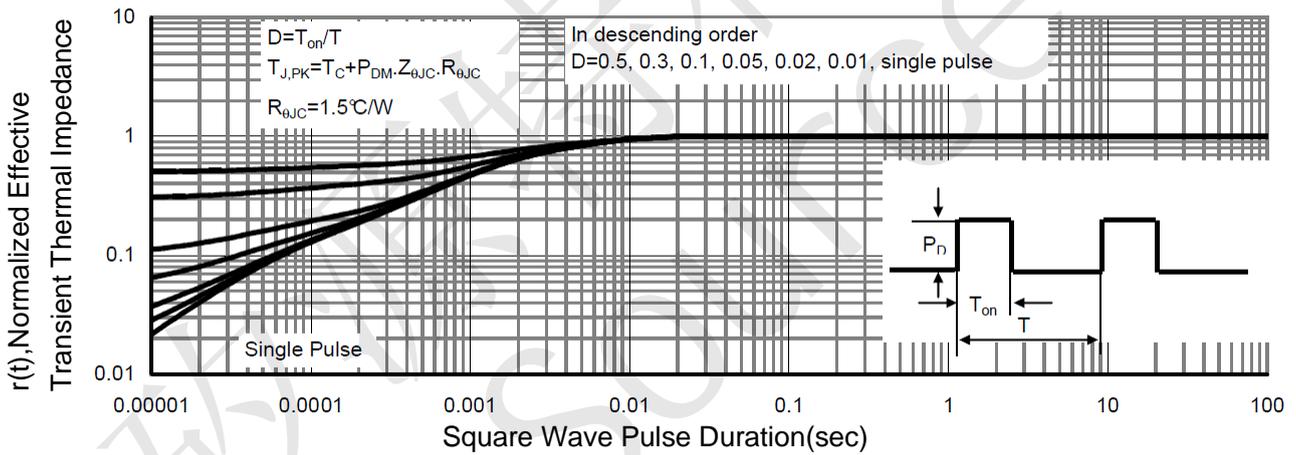
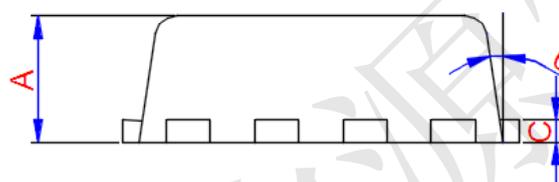
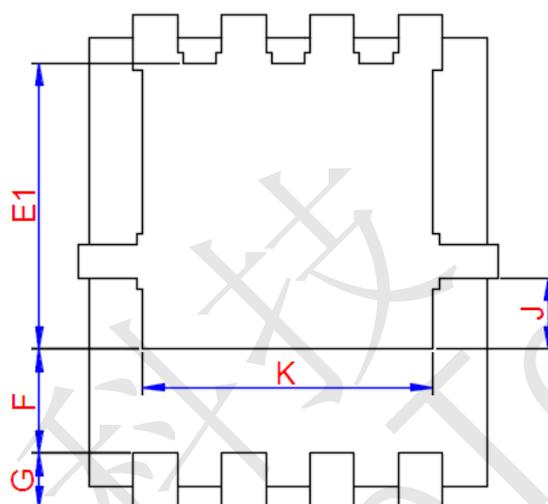
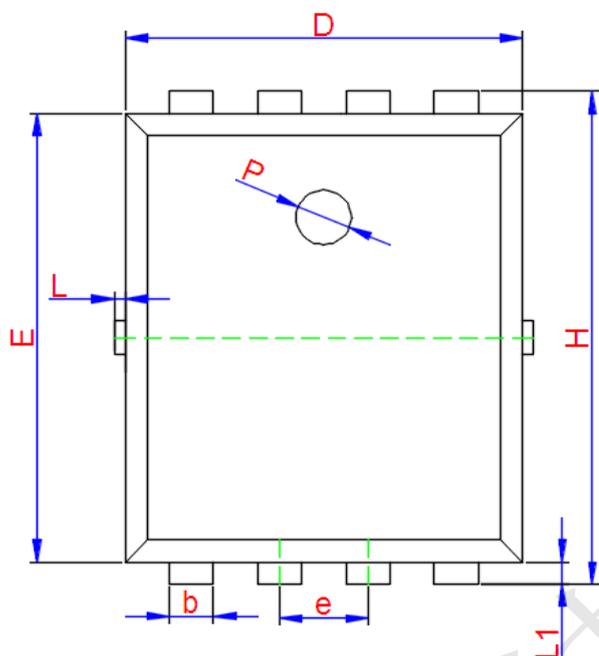


Figure 14 Normalized Maximum Transient Thermal Impedance



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PE73100G DFN5x6-8L Package Information



| Symbol | Dimensions In Millimeters | | |
|----------|---------------------------|-------|-------|
| | Min. | Typ. | Max. |
| A | 0.800 | 0.900 | 1.000 |
| b | 0.350 | 0.420 | 0.490 |
| c | 0.254TYP. | | |
| D | 4.900 | 5.000 | 5.100 |
| e | 1.270TYP. | | |
| E | 5.700 | 5.800 | 5.900 |
| E1 | 3.400TYP. | | |
| F | 1.400TYP. | | |
| G | 0.600TYP. | | |
| H | 5.950 | 6.080 | 6.200 |
| J | 0.950TYP. | | |
| K | 4.000TYP. | | |
| L | - | - | 0.150 |
| L1 | 0.100 | 0.140 | 0.180 |
| P | 1.000TYP. | | |
| θ | 6° | 10° | 14° |