

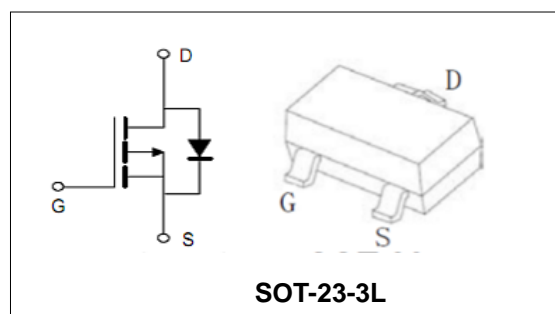
**-12V/-6A P-Channel Enhancement Mode MOSFET****Features**

- High power and current handing capability
- Surface mount package
- Lead free product is acquired

| | | |
|-----------------|-----|----|
| BVDSS | -12 | V |
| ID | -6 | A |
| RDSON@VGS=-4.5V | 19 | mΩ |
| RDSON@VGS=-2.5V | 26 | mΩ |

Applications

- PWM applications
- Load switch
- Power management

**Order Information**

| Product | Package | Marking | Reel Size | Reel | Carton |
|---------|-----------|---------|-----------|---------|-----------|
| PT2333 | SOT-23-3L | S33 | 7inch | 3000PCS | 180000PCS |

Absolute Maximum Ratings

| Symbol | Parameter | Rating | Unit |
|--|--|----------------------------------|------|
| Common Ratings (TC=25°C Unless Otherwise Noted) | | | |
| $V_{(BR)DSS}$ | Drain-Source Breakdown Voltage | -12 | V |
| V_{GS} | Gate-Source Voltage | ±12 | V |
| T_J | Maximum Junction Temperature | 150 | °C |
| T_{STG} | Storage Temperature Range | -55 to 150 | °C |
| I_S | Diode Continuous Forward Current | $T_A = 25^\circ\text{C}$ -6 | A |
| Mounted on Large Heat Sink | | | |
| I_{DM} | Pulse Drain Current Tested (Silicon Limit) (Note1) | $T_A = 25^\circ\text{C}$ -20 | A |
| I_D | Continuous Drain current | $T_A = 25^\circ\text{C}$ -6 | A |
| P_D | Maximum Power Dissipation | $T_A = 25^\circ\text{C}$ 1.25 | W |
| $R_{\theta JA}$ | Thermal Resistance Junction-to-Ambient (Note2) | 100 | °C/W |

**-12V/-6A P-Channel Enhancement Mode MOSFET**

| Symbol | Parameter | Condition | Min. | Typ. | Max. | Unit |
|--|--|--|-------|-------|------|------|
| Static Electrical Characteristics @ T_J = 25°C (unless otherwise stated) | | | | | | |
| V _{(BR)DSS} | Drain- Source Breakdown Voltage | VGS=0V ID=-250μA | -12 | -- | -- | V |
| I _{DSS} | Zero Gate Voltage Drain current | VDS=-12V,VGS=0V | -- | -- | -1 | μA |
| I _{GSS} | Gate-Body Leakage Current | VGS=±12V,VDS=0V | -- | -- | ±100 | nA |
| V _{GS(TH)} | Gate Threshold Voltage | VDS=VGS,ID=-250μA | -0.45 | -0.65 | -1 | V |
| R _{DS(ON)} | Drain-Source On-State Resistance (Note3) | VGS=-4.5V, ID=-6A | -- | 19 | 30 | mΩ |
| | | VGS=-2.5V, ID=-5A | -- | 26 | 45 | mΩ |
| Dynamic Electrical Characteristics @ T_J = 25°C (unless otherwise stated) (Note4) | | | | | | |
| C _{iss} | Input Capacitance | VDS= -6V, VGS=0V, F=1MHz | -- | 1100 | -- | pF |
| C _{oss} | Output Capacitance | | -- | 390 | -- | pF |
| C _{rss} | Reverse Transfer Capacitance | | -- | 300 | -- | pF |
| Q _g | Total Gate Charge | VDS= -6V, ID= -6A, VGS= -4.5V | -- | 11.5 | -- | nC |
| Q _{gs} | Gate-Source Charge | | -- | 1.5 | -- | nC |
| Q _{gd} | Gate-Drain Charge | | -- | 3.2 | -- | nC |
| Switching Characteristics (Note4) | | | | | | |
| t _{d(on)} | Turn-on Delay Time | VDD=-6V, ID=-1A, RG=6Ω, VGS=-4.5V | -- | 25 | -- | nS |
| t _r | Turn-on Rise Time | | -- | 45 | -- | nS |
| t _{d(off)} | Turn-off Delay Time | | -- | 72 | -- | nS |
| t _f | Turn-off Fall Time | | -- | 60 | -- | nS |
| Source- Drain Diode Characteristics @ T_J = 25°C (unless otherwise stated) | | | | | | |
| V _{SD} | Forward on voltage (Note3) | IS=-1A,VGS=0V | -- | -- | -1.2 | V |

Note:

1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2. Surface Mounted on FR4 Board, t ≤ 10 sec
3. Pulse Test: pulse width ≤ 300 us, duty cycle ≤ 2%.
4. Guaranteed by design, not subject to production testing.



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Typical Characteristics

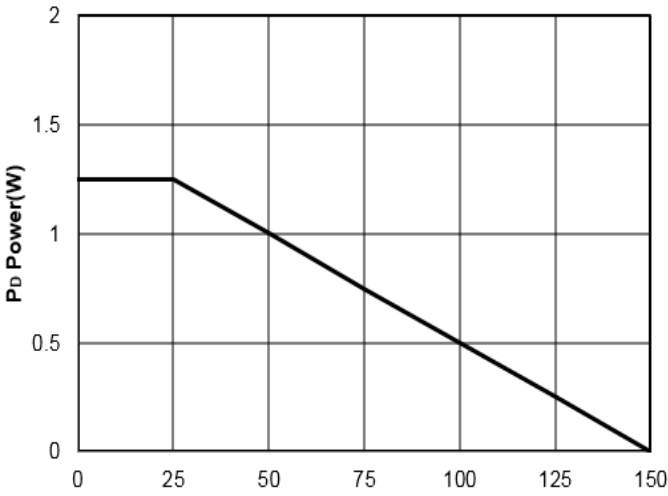


Figure1: Tj Junction Temperature (°C)

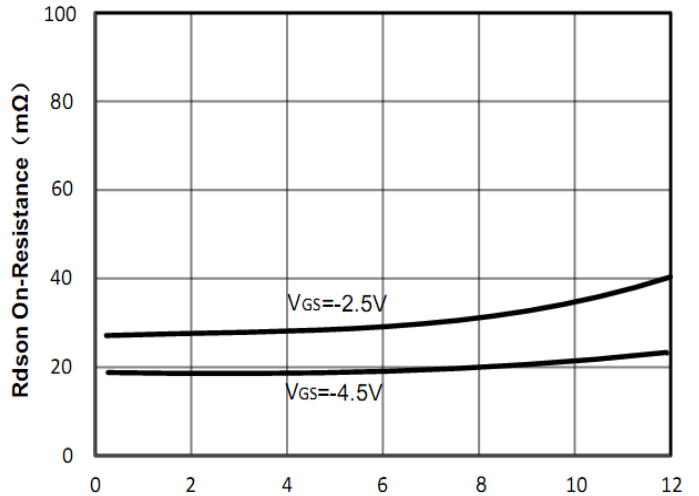


Figure2: -Id Drain Current (A)

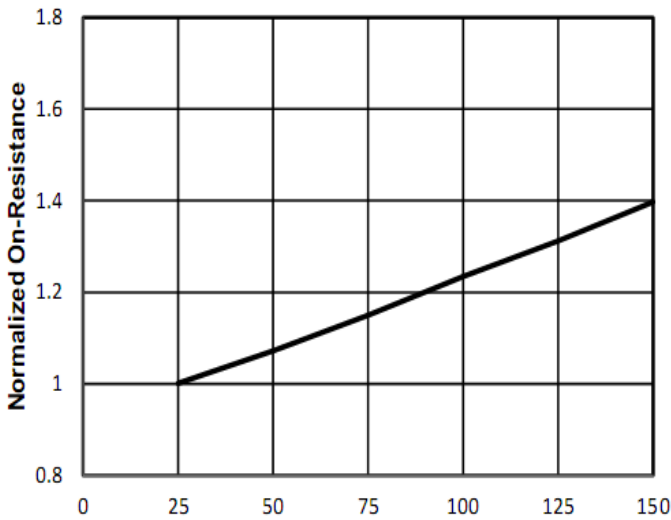


Figure3: Tj Junction Temperature (°C)

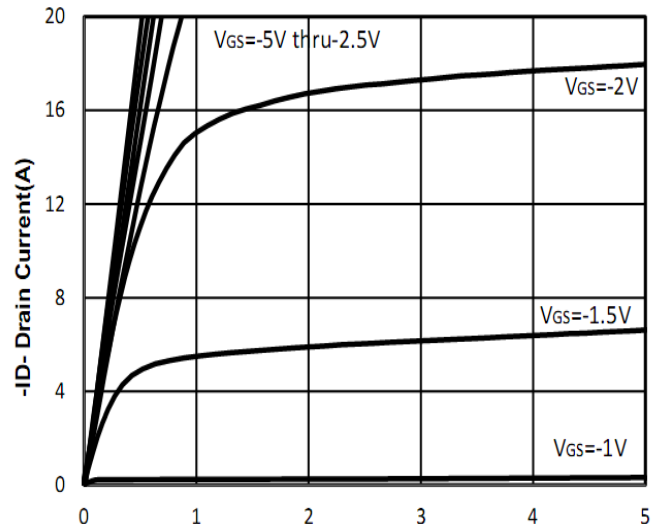


Figure4: -Vds Drain-Source Voltage (V)

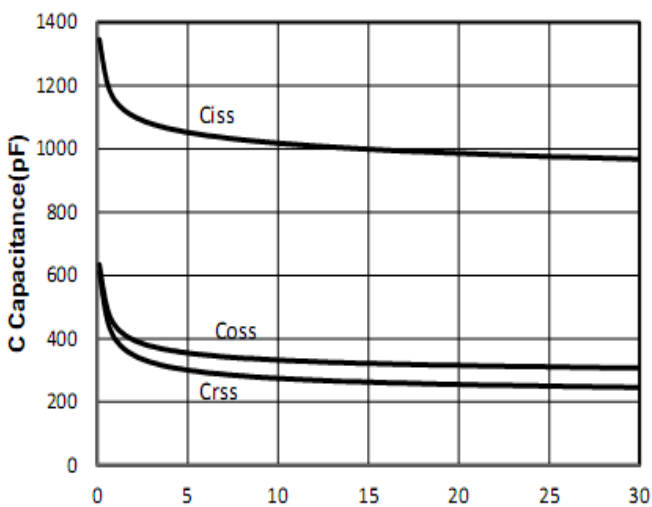


Figure5: -Vds Drain-Source Voltage (V)

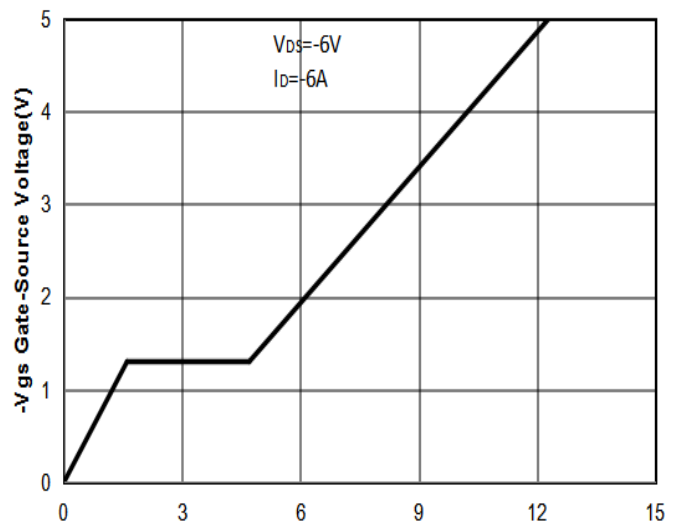


Figure6: Qg Gate Charge (nC)



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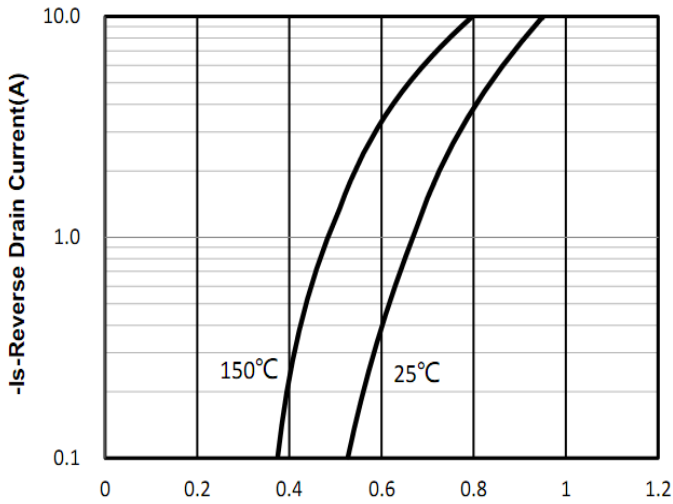


Figure7: -Vsd Source-Drain Voltage (V)

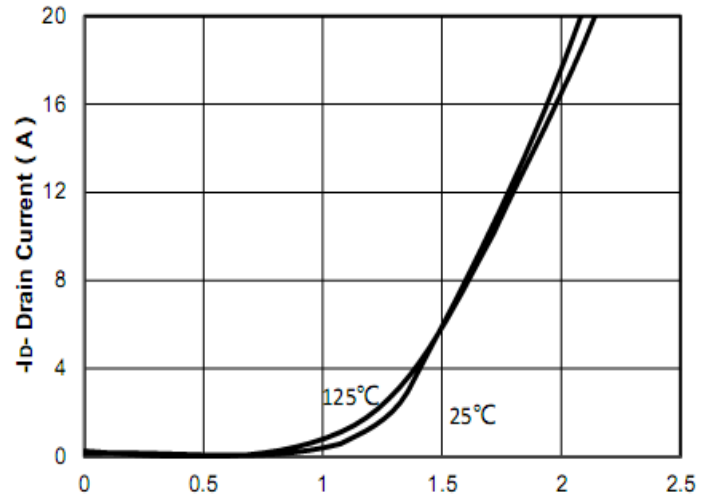


Figure8: -Vgs Gate-Source Voltage (V)

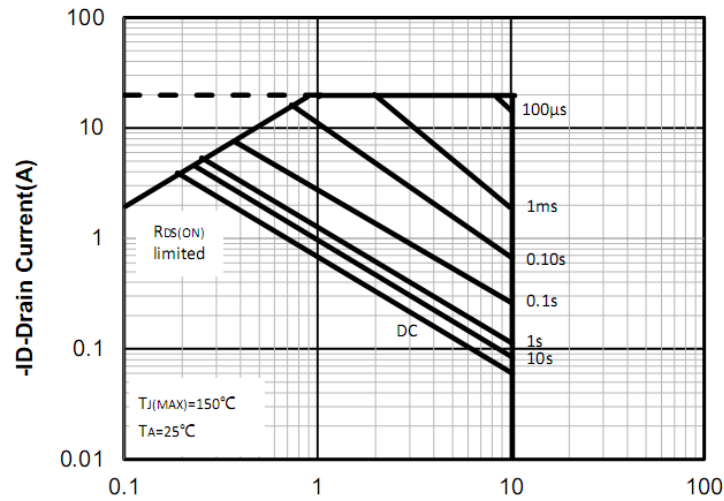


Figure9: -Vds Drain -Source Voltage (V)

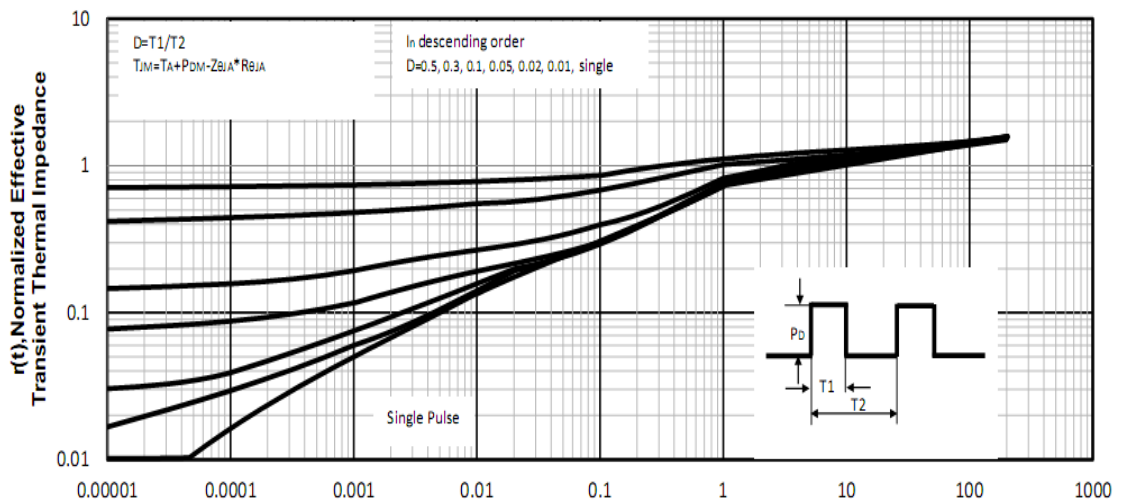
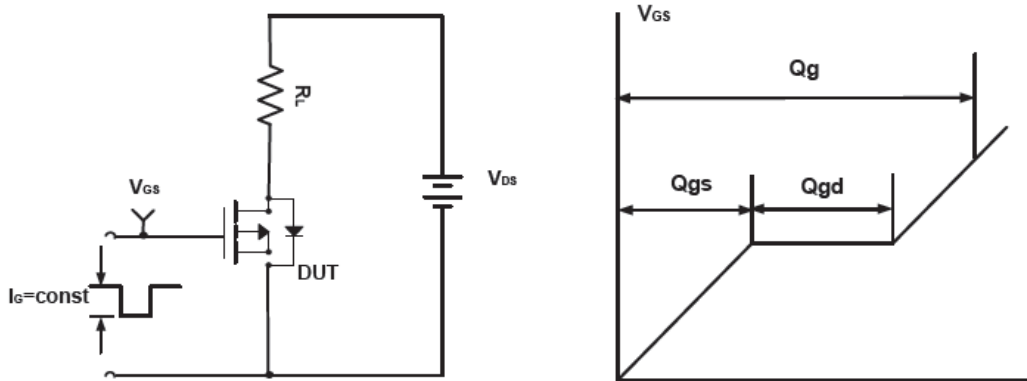
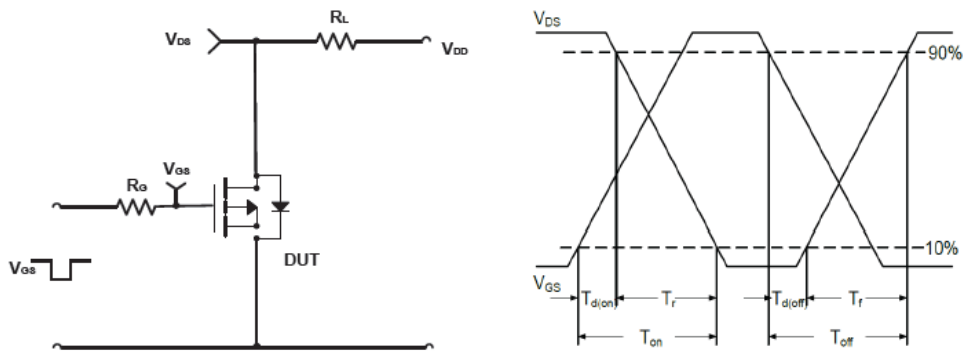
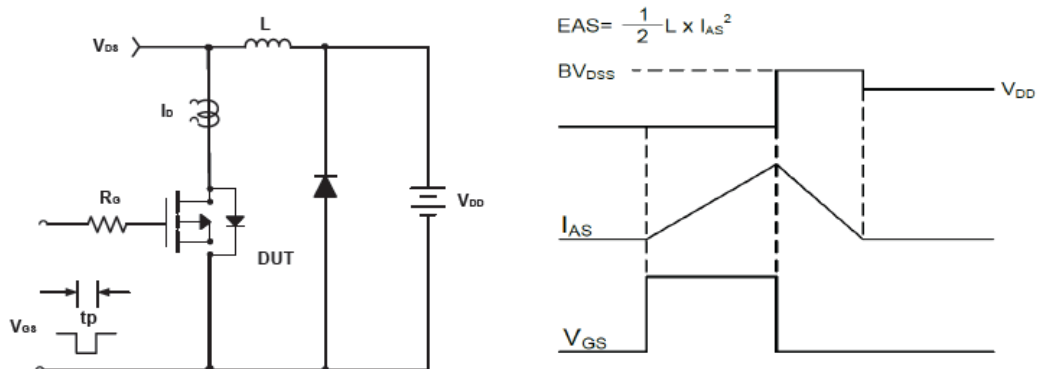
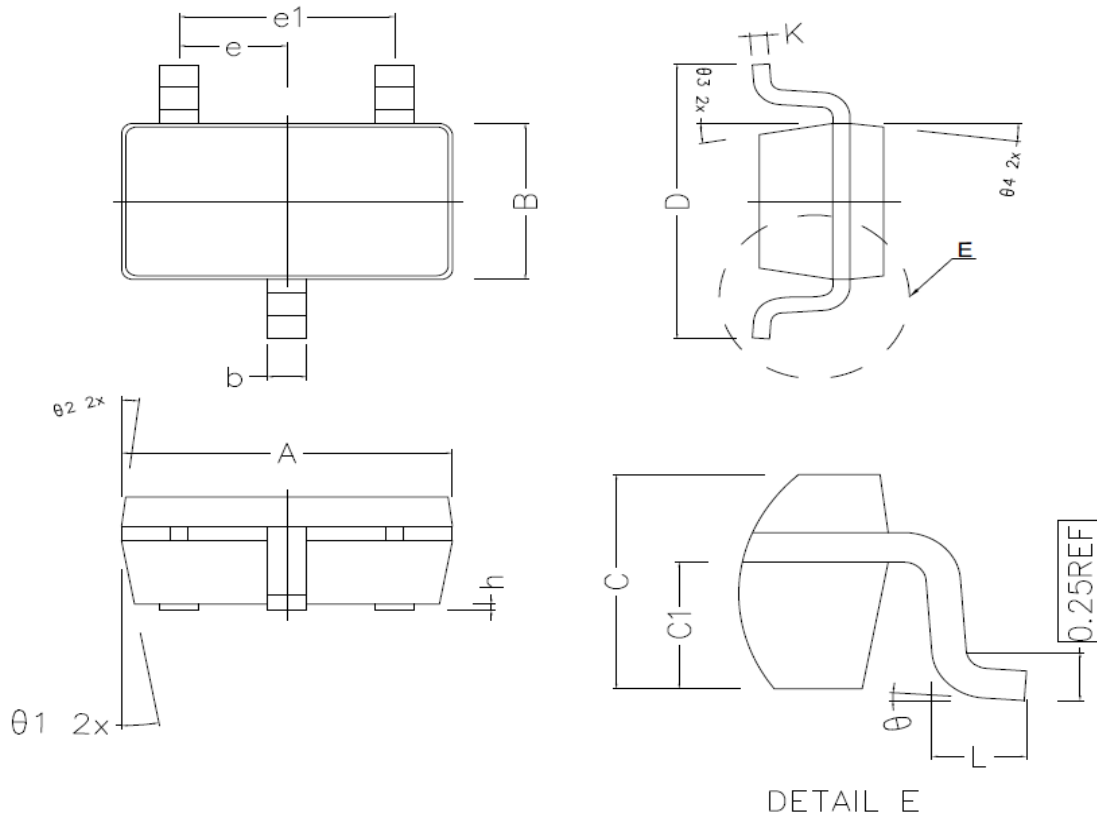


Figure10: Square Wave Pulse Duration (sec)

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Test Circuit and Waveform:

Figure A Gate Charge Test Circuit & Waveforms

Figure B Switching Test Circuit & Waveforms

Figure C Unclamped Inductive Switching Circuit & Waveforms

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SOT-23-3L Package Outline Dimensions (Units: mm)


| COMMON DIMENSIONS (UNITS OF MEASURE IS mm) | | | |
|---|-----------|--------|-------|
| | MIN | NORMAL | MAX |
| A | 2.820 | 2.920 | 3.020 |
| B | 1.500 | 1.600 | 1.700 |
| C | 1.050 | 1.100 | 1.150 |
| C1 | 0.600 | 0.650 | 0.700 |
| D | 2.650 | 2.800 | 2.950 |
| L | 0.300 | 0.450 | 0.600 |
| b | 0.280 | 0.350 | 0.420 |
| h | 0.020 | 0.050 | 0.100 |
| K | 0.120 | — | 0.230 |
| e | 0.950TYPE | | |
| e1 | 1.900TYPE | | |
| θ_1 | 10° TYPE | | |
| θ_2 | 7° TYPE | | |
| θ_3 | 10° TYPE | | |
| θ_4 | 7° TYPE | | |
| θ | 0° ~ 8° | | |