

## Product Summary

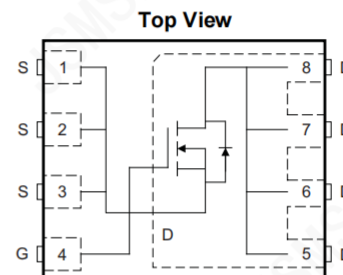
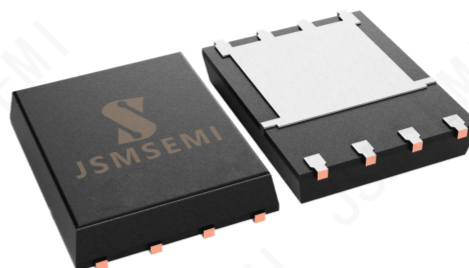
- $V_{DS}$  40V
- $I_D$  200A
- $R_{DS(ON)}$  (at  $V_{GS}=10V$ ) <0.9m $\Omega$
- 100% EAS Tested
- 100%  $\nabla V_{DS}$  Tested

## General Description

- Split gate trench MOSFET technology
- Excellent package for heat dissipation
- High density cell design for low  $R_{DS(ON)}$
- Moisture Sensitivity Level 1
- Epoxy Meets UL 94 V-0 Flammability Rating
- Halogen Free

## Applications

- Power switching application
- Uninterruptible power supply
- DC-DC convertor



## ■ Absolute Maximum Ratings ( $T_A=25^\circ\text{C}$ unless otherwise noted)

| Parameter                              |                         | Symbol         | Limit    | Unit             |
|----------------------------------------|-------------------------|----------------|----------|------------------|
| Drain-source Voltage                   |                         | $V_{DS}$       | 40       | V                |
| Gate-source Voltage                    |                         | $V_{GS}$       | $\pm 20$ | V                |
| Drain Current                          | $T_C=25^\circ\text{C}$  | $I_D$          | 200      | A                |
|                                        | $T_C=100^\circ\text{C}$ |                | 150      |                  |
| Pulsed Drain Current <sup>A</sup>      |                         | $I_{DM}$       | 520      | A                |
| Avalanche energy <sup>B</sup>          |                         | EAS            | 480      | mJ               |
| Total Power Dissipation <sup>C</sup>   | $T_C=25^\circ\text{C}$  | $P_D$          | 200      | W                |
|                                        | $T_C=100^\circ\text{C}$ |                | 120      |                  |
| Junction and Storage Temperature Range |                         | $T_J, T_{STG}$ | -55~+175 | $^\circ\text{C}$ |

## ■ Thermal resistance

| Parameter                                           |              | Symbol          | Typ | Max | Units              |
|-----------------------------------------------------|--------------|-----------------|-----|-----|--------------------|
| Thermal Resistance Junction-to-Ambient <sup>D</sup> | Steady-State | $R_{\theta JA}$ | 30  |     | $^\circ\text{C/W}$ |
| Thermal Resistance Junction-to-Case                 | Steady-State | $R_{\theta JC}$ | 0.4 |     |                    |

**■ Electrical Characteristics** ( $T_J=25^{\circ}\text{C}$  unless otherwise noted)

| Parameter                             | Symbol              | Conditions                                                                                | Min | Typ  | Max  | Units |
|---------------------------------------|---------------------|-------------------------------------------------------------------------------------------|-----|------|------|-------|
| Static Parameter                      |                     |                                                                                           |     |      |      |       |
| Drain-Source Breakdown Voltage        | BV <sub>DSS</sub>   | V <sub>GS</sub> = 0V, I <sub>D</sub> =250μA                                               | 30  | -    | -    | V     |
|                                       |                     | V <sub>GS</sub> = 0V, I <sub>D</sub> =1mA                                                 | 30  | -    | -    | V     |
| Zero Gate Voltage Drain Current       | I <sub>DSS</sub>    | V <sub>DS</sub> =40V, V <sub>GS</sub> =0V                                                 | -   | -    | 1    | μA    |
|                                       |                     | V <sub>DS</sub> =40V, V <sub>GS</sub> =0V, T <sub>j</sub> =150°C                          | -   | -    | 100  |       |
| Gate-Body Leakage Current             | I <sub>GSS</sub>    | V <sub>GS</sub> = ±20V, V <sub>DS</sub> =0V                                               | -   | -    | ±100 | nA    |
| Gate Threshold Voltage                | V <sub>GS(th)</sub> | V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> =250μA                                 | 1.0 | 1.7  | 2.5  | V     |
| Static Drain-Source On-Resistance     | R <sub>DS(on)</sub> | V <sub>GS</sub> = 10V, I <sub>D</sub> =50A                                                | -   | 0.7  | 0.9  | mΩ    |
|                                       |                     | V <sub>GS</sub> =4.5V, I <sub>D</sub> =50A                                                | -   | 1.1  | 1.4  |       |
| Diode Forward Voltage                 | V <sub>SD</sub>     | I <sub>S</sub> =50A, V <sub>GS</sub> =0V                                                  | -   | -    | 1.2  | V     |
| Gate resistance                       | R <sub>G</sub>      | f=1MHz                                                                                    | -   | 2.5  | -    | Ω     |
| Maximum Body-Diode Continuous Current | I <sub>S</sub>      |                                                                                           | -   | -    | 200  | A     |
| Dynamic Parameters                    |                     |                                                                                           |     |      |      |       |
| Input Capacitance                     | C <sub>iss</sub>    | V <sub>DS</sub> =20V, V <sub>GS</sub> =0V, f=1MHz                                         | -   | 6200 | -    | pF    |
| Output Capacitance                    | C <sub>oss</sub>    |                                                                                           | -   | 2150 | -    |       |
| Reverse Transfer Capacitance          | C <sub>rss</sub>    |                                                                                           | -   | 65   | -    |       |
| Switching Parameters                  |                     |                                                                                           |     |      |      |       |
| Total Gate Charge                     | Q <sub>g</sub>      | V <sub>GS</sub> =10V, V <sub>DS</sub> =20V, I <sub>D</sub> =20A                           | -   | 125  | -    | nC    |
| Gate-Source Charge                    | Q <sub>gs</sub>     |                                                                                           | -   | 30   | -    |       |
| Gate-Drain Charge                     | Q <sub>gd</sub>     |                                                                                           | -   | 32   | -    |       |
| Reverse Recovery Charge               | Q <sub>rr</sub>     | I <sub>F</sub> =50A, di/dt=100A/us                                                        | -   | 63   | -    | nC    |
| Reverse Recovery Time                 | t <sub>rr</sub>     |                                                                                           | -   | 95   | -    | ns    |
| Turn-on Delay Time                    | t <sub>D(on)</sub>  | V <sub>GS</sub> =10V, V <sub>DD</sub> =20V, I <sub>D</sub> =20A<br>R <sub>GEN</sub> =1.6Ω | -   | 30   | -    | ns    |
| Turn-on Rise Time                     | t <sub>r</sub>      |                                                                                           | -   | 42   | -    |       |
| Turn-off Delay Time                   | t <sub>D(off)</sub> |                                                                                           | -   | 80   | -    |       |
| Turn-off fall Time                    | t <sub>f</sub>      |                                                                                           | -   | 31   | -    |       |

A. Repetitive rating; pulse width limited by max. junction temperature.

 B.  $T_J=25^{\circ}\text{C}$ ,  $V_G=10\text{V}$ ,  $R_G=25\Omega$ ,  $L=0.5\text{mH}$ 

 C.  $P_d$  is based on max. junction temperature, using junction-case and junction-ambient thermal resistance.

■ Typical Electrical and Thermal Characteristics Diagrams

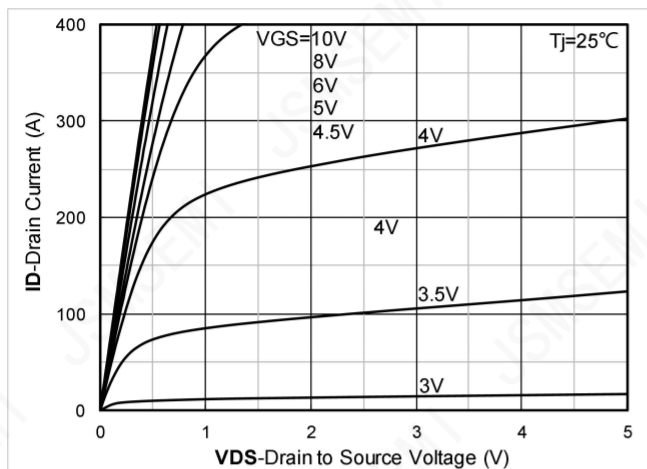


Figure 1. Output Characteristics

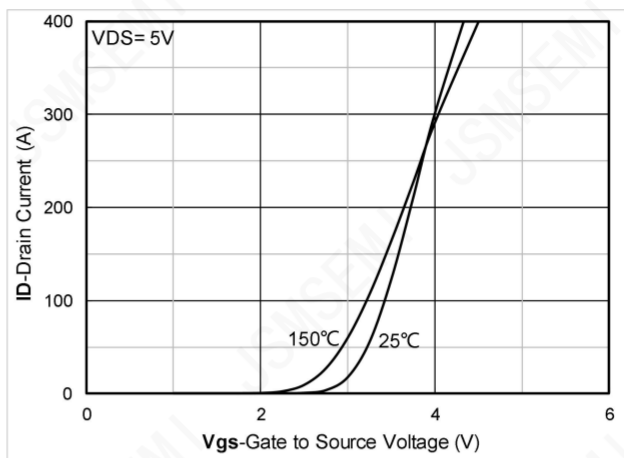


Figure 2. Transfer Characteristics

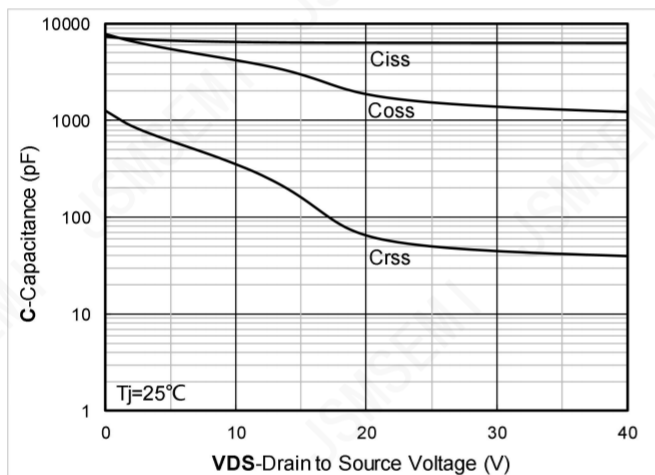


Figure 3. Capacitance Characteristics

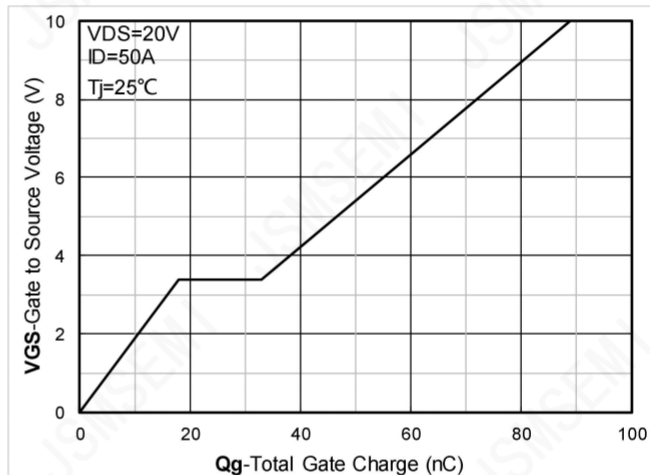


Figure 4. Gate Charge

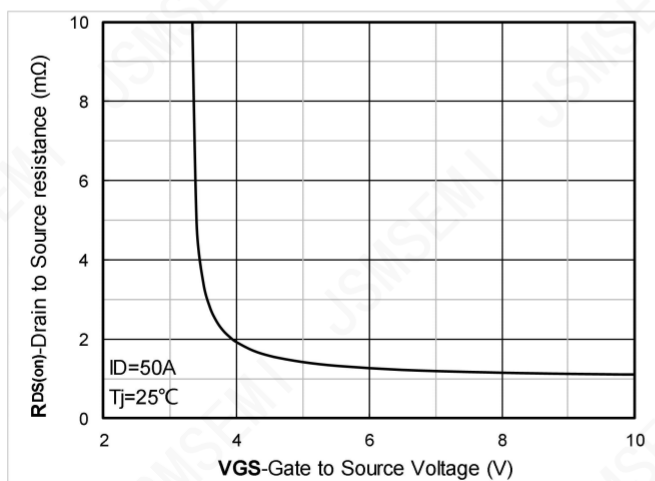


Figure 5. On-Resistance vs Gate to Source Voltage

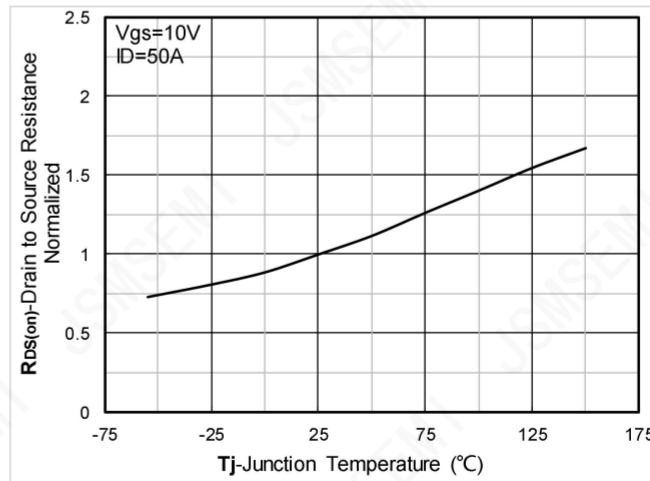


Figure 6. Normalized On-Resistance

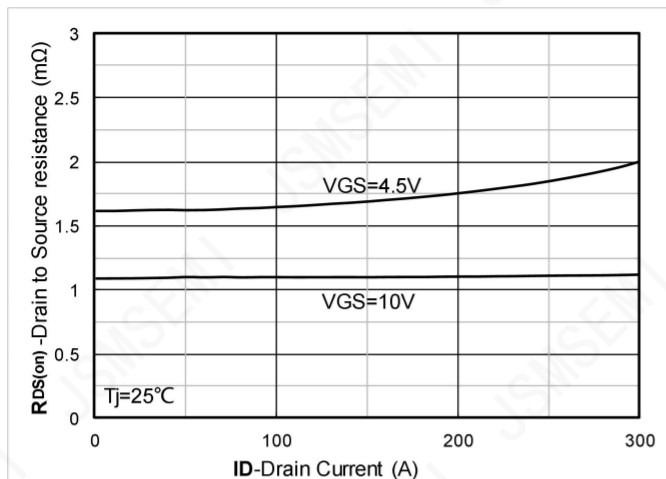


Figure 7.  $R_{DS(on)}$  VS Drain Current

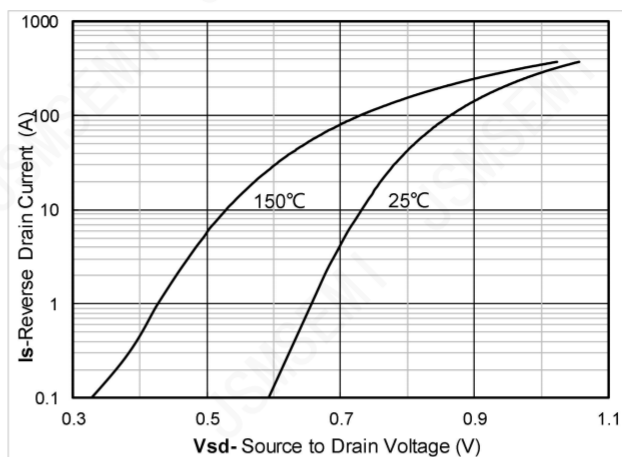


Figure 8. Forward characteristics of reverse diode

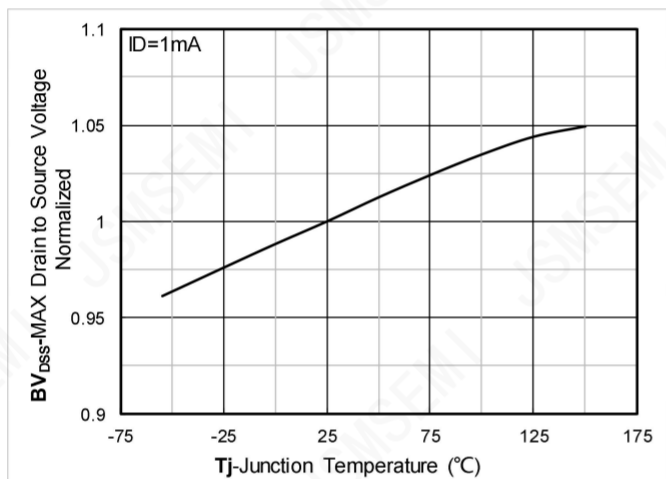


Figure 9. Normalized breakdown voltage

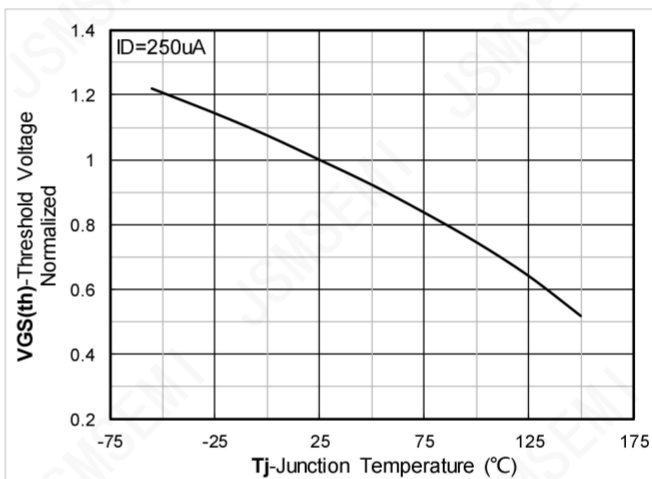


Figure 10. Normalized Threshold voltage

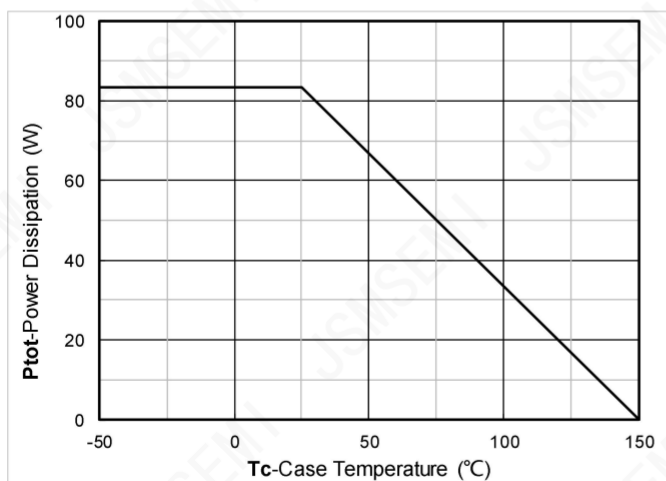


Figure 11. Power dissipation

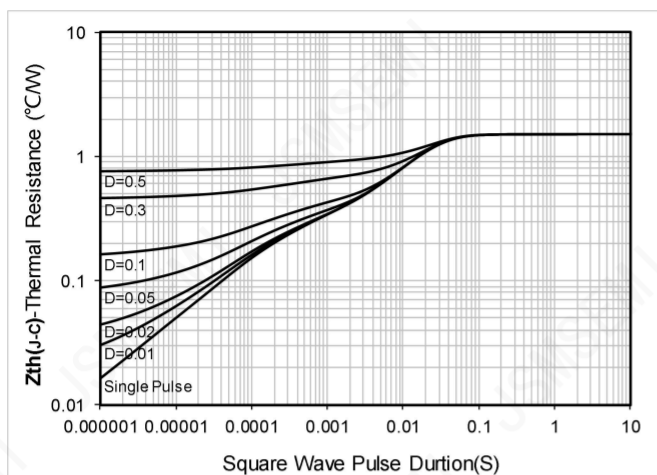


Figure 12. Maximum Transient Thermal Impedance

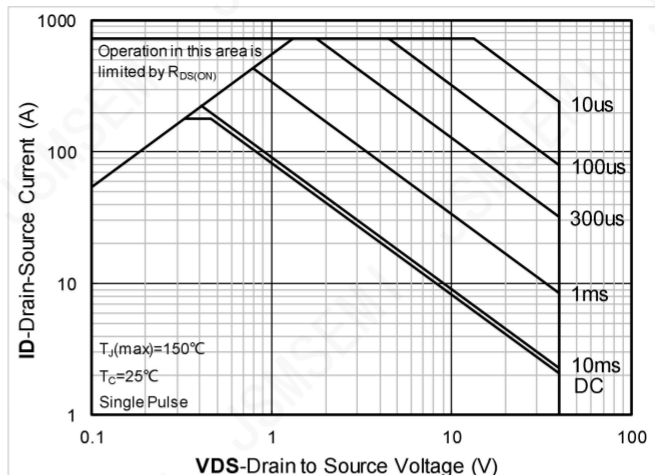


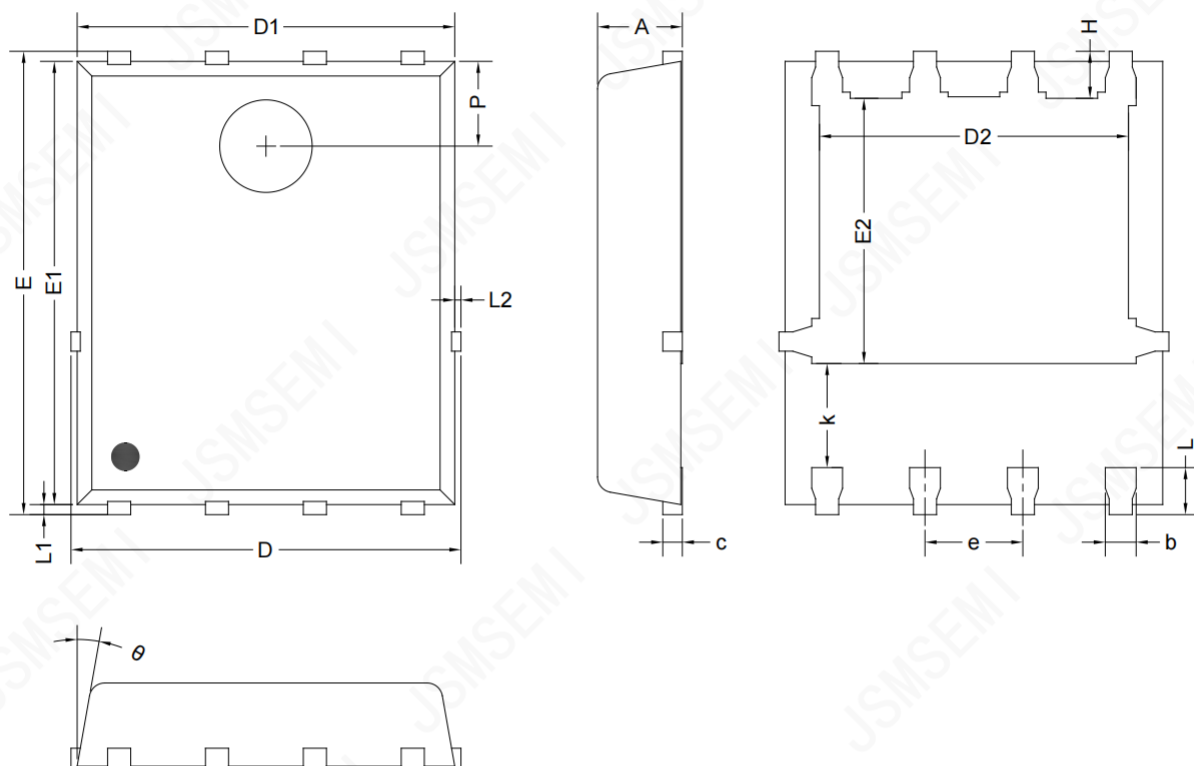
Figure 13. Safe Operation Area

## Ordering Information

| Ordernumber | Package    | Marking information | Operation Temperature Range | MSL Grade | Ship,Quantity | Green |
|-------------|------------|---------------------|-----------------------------|-----------|---------------|-------|
| AON6522     | DFN5060-8L | JSM6522             | -55 to 175°C                | 1         | T&R,5000      | RoHS  |

## Package Information

### PDFN5060-8L



| Symbol | Dimensions In Millimeters |       |       |
|--------|---------------------------|-------|-------|
|        | MIN                       | NOM   | MAX   |
| A      | 1.000                     | 1.100 | 1.200 |
| b      | 0.350                     | 0.400 | 0.450 |
| c      | 0.210                     | 0.250 | 0.340 |
| D      | 4.800                     | -     | 5.100 |
| D1     | 4.800                     | 4.900 | 5.000 |
| D2     | 3.910                     | 4.010 | 4.110 |
| E      | 5.900                     | 6.000 | 6.100 |
| E1     | 5.700                     | 5.750 | 5.800 |
| E2     | 3.340                     | 3.440 | 3.540 |
| e      | 1.270 BSC                 |       |       |
| H      | 0.510                     | 0.610 | 0.710 |
| k      | 1.100                     | -     | -     |
| L      | 0.510                     | 0.610 | 0.710 |
| L1     | 0.060                     | 0.130 | 0.200 |
| L2     | -                         | -     | 0.100 |
| P      | 1.000                     | 1.100 | 1.200 |
| θ      | 8°                        | 10°   | 12°   |

NOTE: This drawing is subject to change without notice.