

FH1607B

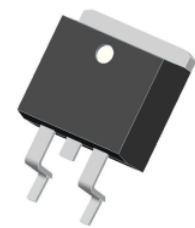
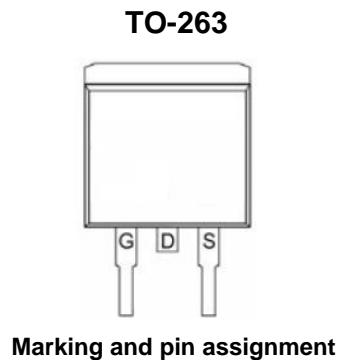
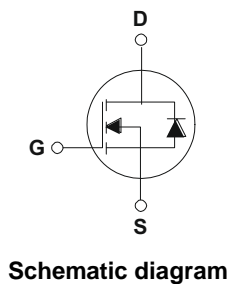
N-Channel Enhancement Mode MOSFET

Features

- 68V/80A
 $R_{DS(ON)} = 6.8\text{m}\Omega$ (typ.) @ $V_{GS}=10\text{V}$
- 100% avalanche tested
- Reliable and Rugged

Applications

- Switching application
- Power Management for Inverter Systems.


Absolute Maximum Ratings

| Symbol | Parameter | Rating | Unit |
|--|--|---------------------------------|---------------------------|
| Common Ratings ($T_C=25^\circ\text{C}$ Unless Otherwise Noted) | | | |
| V_{DSS} | Drain-Source Voltage | 68 | V |
| V_{GSS} | Gate-Source Voltage | ± 25 | |
| T_J | Maximum Junction Temperature | 175 | $^\circ\text{C}$ |
| T_{STG} | Storage Temperature Range | -55 to 175 | $^\circ\text{C}$ |
| I_S | Diode Continuous Forward Current | $T_C=25^\circ\text{C}$ 80 | A |
| Mounted on Large Heat Sink | | | |
| I_{DM} | Pulsed Drain Current * | 320** | A |
| I_D | Continuous Drain Current | $T_C=25^\circ\text{C}$ 80 | A |
| | | $T_C=100^\circ\text{C}$ 66 | |
| P_D | Maximum Power Dissipation | $T_C=25^\circ\text{C}$ 115 | W |
| | | $T_C=100^\circ\text{C}$ 57.7 | |
| $R_{\theta JC}$ | Thermal Resistance-Junction to Case | 1.3 | $^\circ\text{C}/\text{W}$ |
| $R_{\theta JA}$ | Thermal Resistance-Junction to Ambient | 62.5 | |
| Avalanche Ratings | | | |
| E_{AS} | Avalanche Energy, Single Pulsed | $L=0.5\text{mH}$ 320*** | mJ |

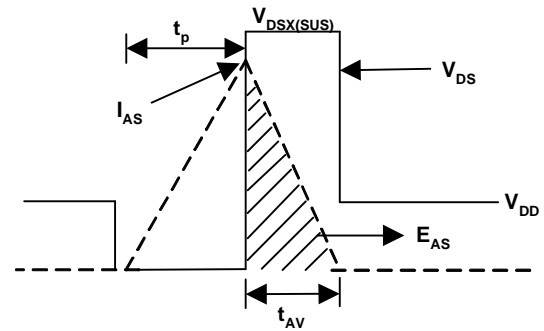
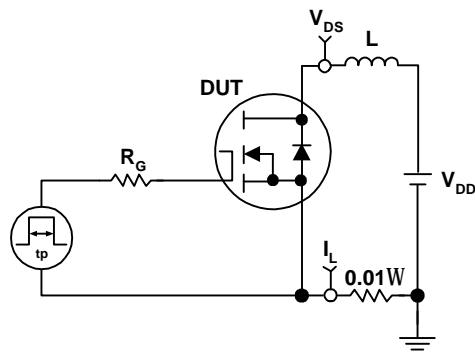
Note : * Repetitive rating ; pulse width limited by junction temperature
 ** Drain current is limited by junction temperature
 *** $V_D=55\text{V}$

Electrical Characteristics ($T_C = 25^\circ\text{C}$ Unless Otherwise Noted)

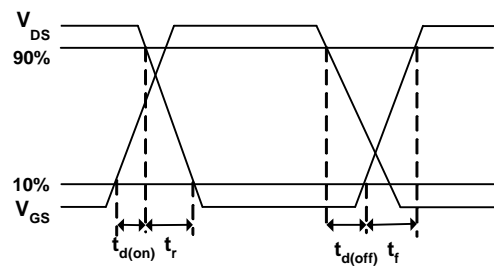
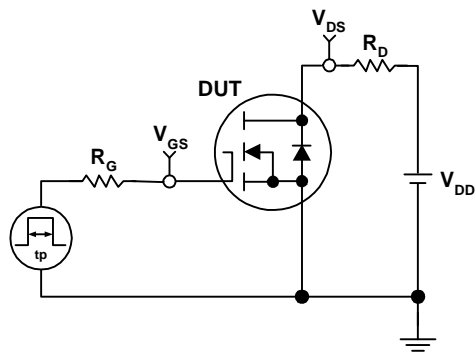
| Symbol | Parameter | Test Conditions | Min. | Typ. | Max. | Unit |
|------------------------------------|----------------------------------|---|------|------|-----------|------------|
| Static Characteristics | | | | | | |
| BV_{DSS} | Drain-Source Breakdown Voltage | $V_{GS}=0V, I_{DS}=250\mu A$ | 68 | - | - | V |
| I_{DSS} | Zero Gate Voltage Drain Current | $V_{DS}=68V, V_{GS}=0V$ $T_J=85^\circ\text{C}$ | - | - | 1 10 | μA |
| $V_{GS(th)}$ | Gate Threshold Voltage | $V_{DS}=V_{GS}, I_{DS}=250\mu A$ | 2 | 3 | 4 | V |
| I_{GSS} | Gate Leakage Current | $V_{GS}=\pm 25V, V_{DS}=0V$ | | | ± 100 | nA |
| $R_{DS(ON)}^*$ | Drain-Source On-state Resistance | $V_{GS}=10V, I_{DS}=40A$ | - | 6.8 | 7.8 | m Ω |
| Diode Characteristics | | | | | | |
| V_{SD}^* | Diode Forward Voltage | $I_{SD}=40A, V_{GS}=0V$ | - | 0.8 | 1 | V |
| t_{rr} | Reverse Recovery Time | $I_{SD}=40A, dI_{SD}/dt=100A/\mu s$ | | 33 | | ns |
| Q_{rr} | Reverse Recovery Charge | | - | 61 | - | nC |
| Dynamic Characteristics | | | | | | |
| R_G | Gate Resistance | $V_{GS}=0V, V_{DS}=0V, F=1\text{MHz}$ | - | 1.8 | - | Ω |
| C_{iss} | Input Capacitance | $V_{GS}=0V,$ $V_{DS}=25V,$ Frequency=1.0MHz | - | 3203 | - | pF |
| C_{oss} | Output Capacitance | | - | 362 | - | |
| C_{rss} | Reverse Transfer Capacitance | | - | 277 | - | |
| $t_{d(ON)}$ | Turn-on Delay Time | $V_{DD}=34V, R_G=3\ \Omega,$ $I_{DS}=40A, V_{GS}=10V,$ | - | 15 | - | ns |
| T_r | Turn on Rise Time | | | 13 | | |
| $t_{d(OFF)}$ | Turn-off Delay Time | | - | 20 | - | |
| T_f | Turn-off Fall Time | | - | 8 | - | |
| Gate Charge Characteristics | | | | | | |
| Q_g | Total Gate Charge | $V_{DS}=55V, V_{GS}=10V,$ $I_{DS}=40A$ | - | 84 | - | nC |
| Q_{gs} | Gate-Source Charge | | - | 14 | - | |
| Q_{gd} | Gate-Drain Charge | | - | 30 | - | |

Note * : Pulse test ; pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$.

Avalanche Test Circuit and Waveforms

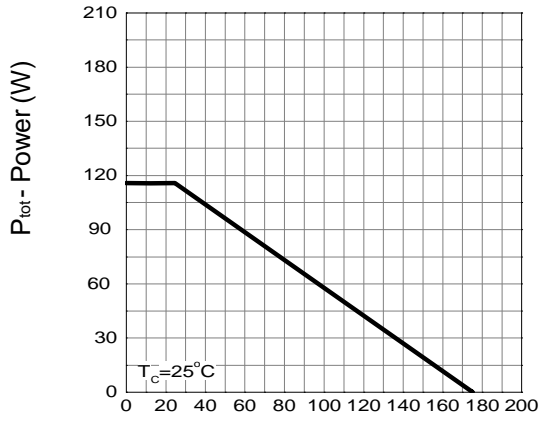


Avalanche Test Circuit and Waveforms



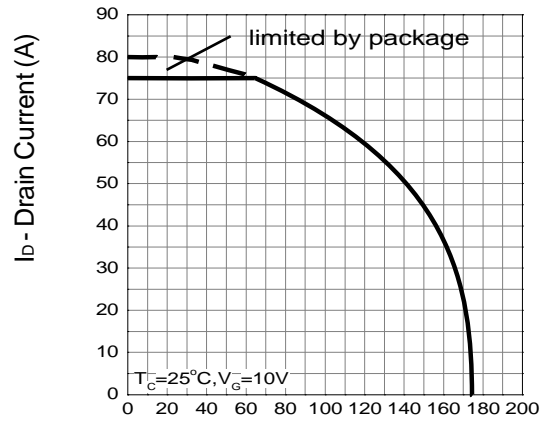
Typical Operating Characteristics

Power Dissipation



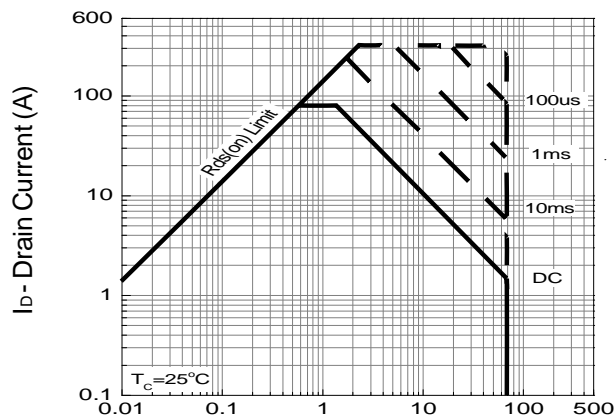
T_c - Case Temperature (°C)

Drain Current



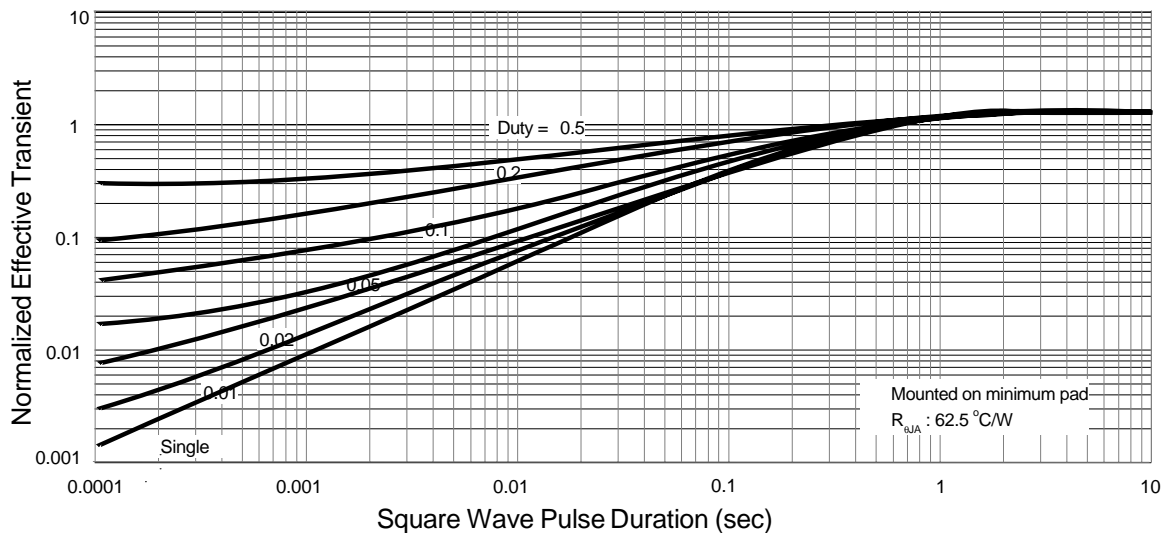
T_c - Case Temperature (°C)

Safe Operation Area



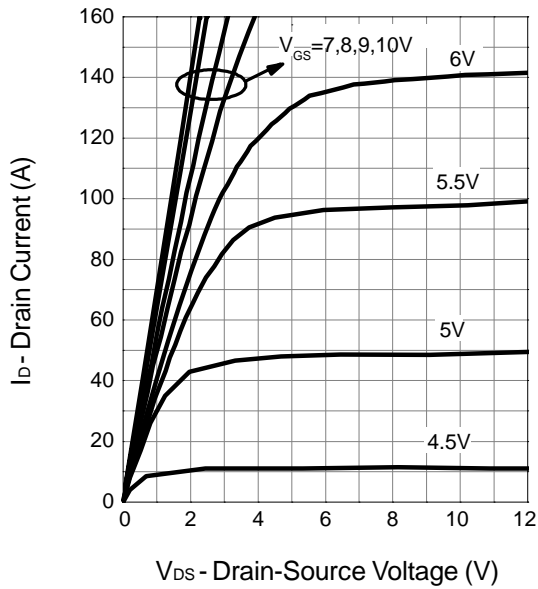
V_{DS} - Drain - Source Voltage (V)

Thermal Transient Impedance

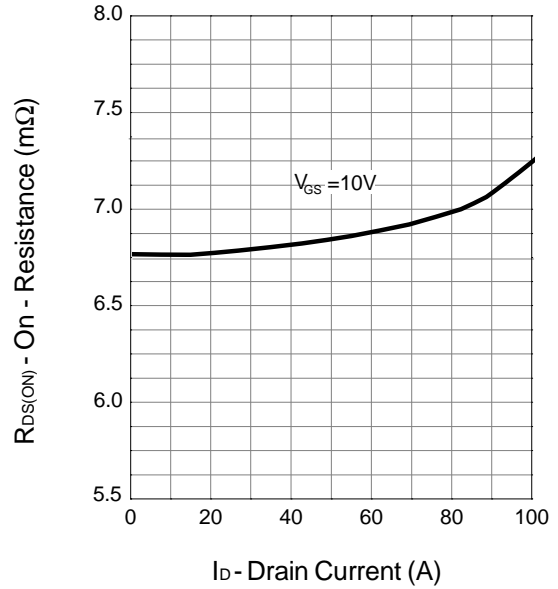


Typical Operating Characteristics (Cont.)

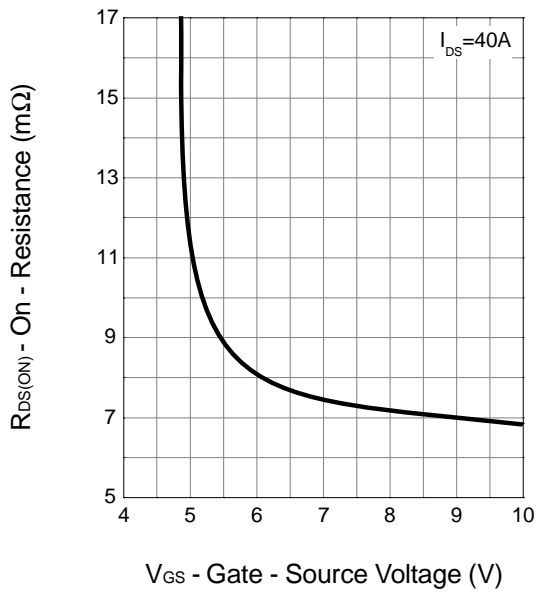
Output Characteristics



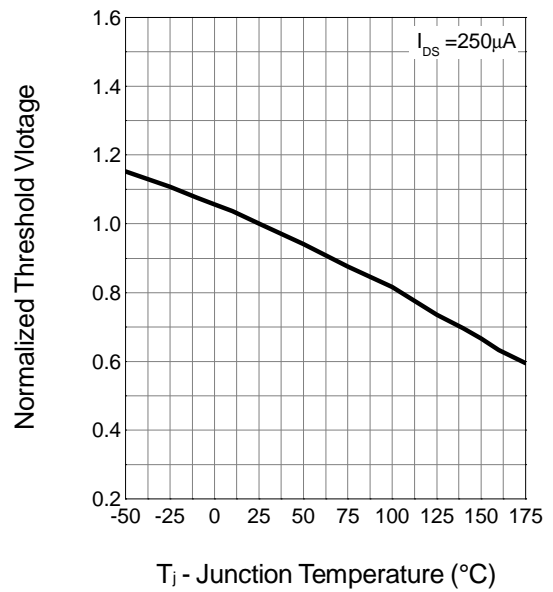
Drain-Source On Resistance



Drain-Source On Resistance

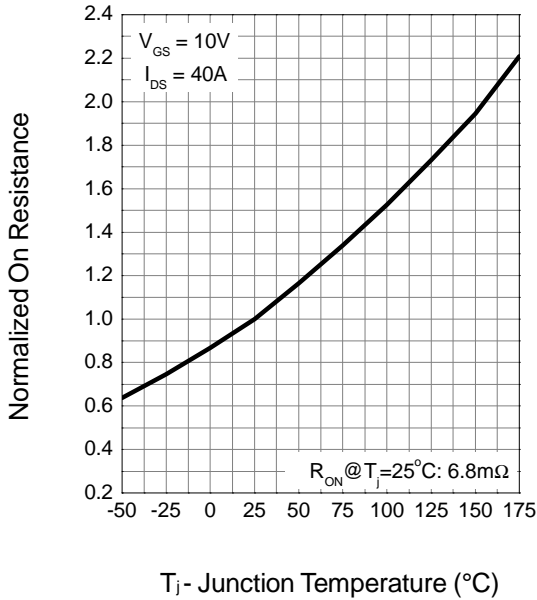


Gate Threshold Voltage

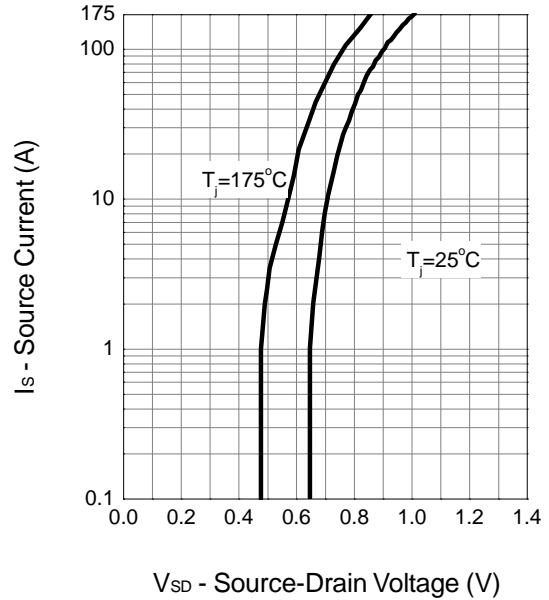


Typical Operating Characteristics (Cont.)

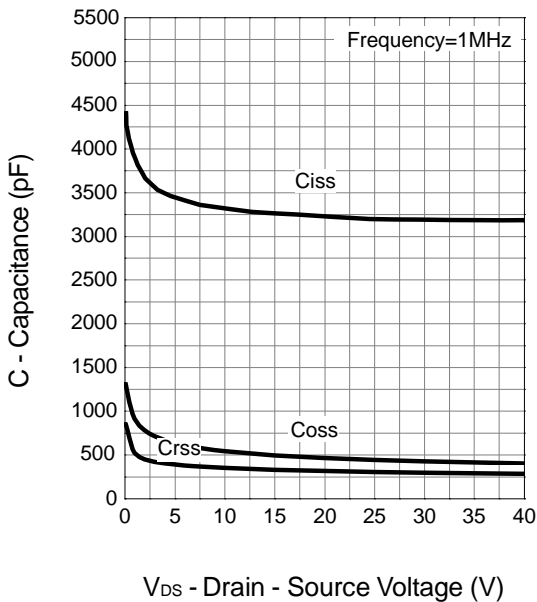
Drain-Source On Resistance



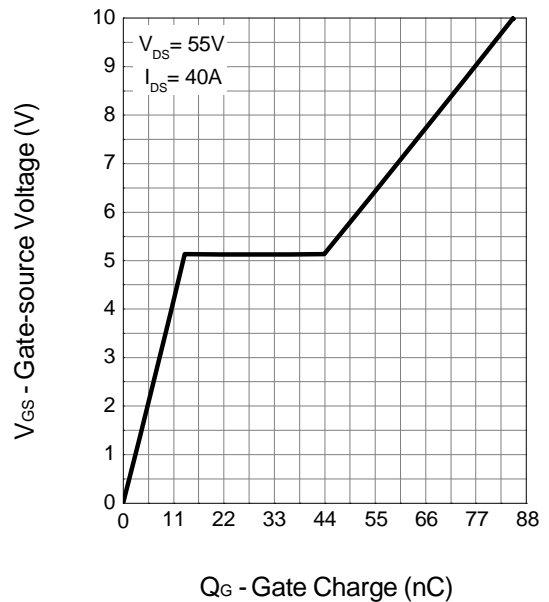
Source-Drain Diode Forward



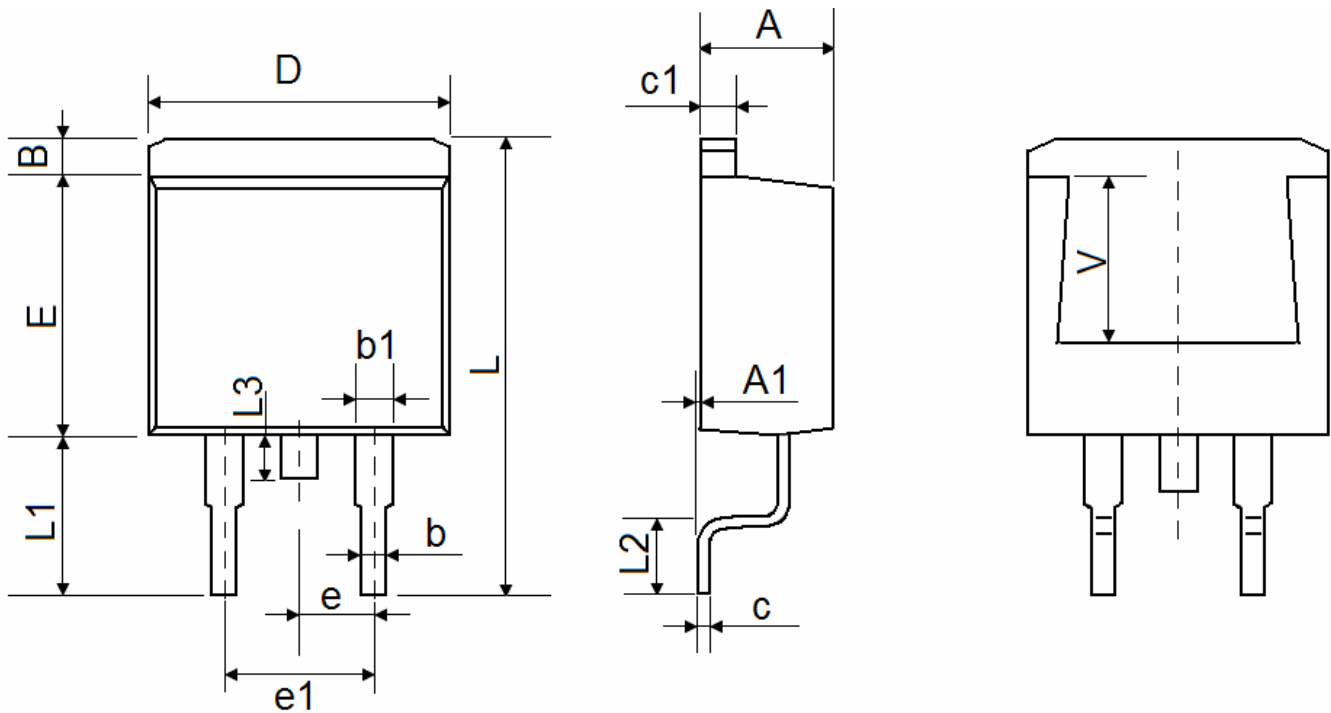
Capacitance



Gate Charge



TO-263-2L Package Information



| Symbol | Dimensions In Millimeters | | Dimensions In Inches | |
|--------|---------------------------|--------|----------------------|-------|
| | Min. | Max. | Min. | Max. |
| A | 4.470 | 4.670 | 0.176 | 0.184 |
| A1 | 0.000 | 0.150 | 0.000 | 0.006 |
| B | 1.170 | 1.370 | 0.046 | 0.054 |
| b | 0.710 | 0.910 | 0.028 | 0.036 |
| b1 | 1.170 | 1.370 | 0.046 | 0.054 |
| c | 0.310 | 0.530 | 0.012 | 0.021 |
| c1 | 1.170 | 1.370 | 0.046 | 0.054 |
| D | 10.010 | 10.310 | 0.394 | 0.406 |
| E | 8.500 | 8.900 | 0.335 | 0.350 |
| e | 2.540 TYP. | | 0.100 TYP. | |
| e1 | 4.980 | 5.180 | 0.196 | 0.204 |
| L | 15.050 | 15.450 | 0.593 | 0.608 |
| L1 | 5.080 | 5.480 | 0.200 | 0.216 |
| L2 | 2.340 | 2.740 | 0.092 | 0.108 |
| L3 | 1.300 | 1.700 | 0.051 | 0.067 |
| V | 5.600 REF | | 0.220 REF | |