# N-Channel Enhancement Mode Power MOSFET

## Description

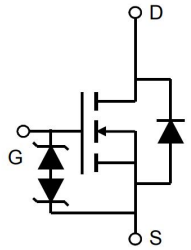
The G3K8N15HE uses advanced trench technology to provide excellent $R_{DS(ON)}$ , low gate charge. It can be used in a wide variety of applications.

## General Features

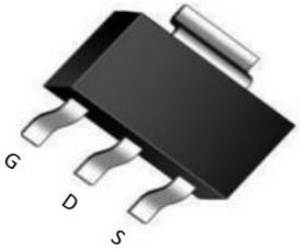
- $V_{DS}$ 150V
- $I_D$ (at $V_{GS}$ = 10V) 2A
- $R_{DS(ON)}$ (at $V_{GS}$ = 10V) < 370mΩ
- $R_{DS(ON)}$ (at $V_{GS}$ = 4.5V) < 390mΩ
- 100% Avalanche Tested
- RoHS Compliant
- ESD (HBM)> 2.5KV

## Application

- Power switch
- DC/DC converters




Schematic diagram




SOT-223

## Ordering Information

| Device | Package | Marking | Packaging |
|---|---|---|---|
| G3K8N15HE | SOT-223 | G3K8N15 | 2500psc/cReel |

## Absolute Maximum Ratings $T_C$ = 25ºC, unless otherwise noted

| Parameter | Symbol | Value | Unit |
|---|---|---|---|
| Drain-Source Voltage | $V_{DS}$ | 150 | V |
| Continuous Drain Current | $I_D$ | 2 | A |
| Pulsed Drain Current (note1) | $I_{DM}$ | 8 | A |
| Gate-Source Voltage | $V_{GS}$ | ±20 | V |
| Power Dissipation | $P_D$ | 2.16 | W |
| Operating Junction and Storage Temperature Range | $T_J$, $T_{stg}$ | -55 To 150 | ºC |

## Thermal Resistance

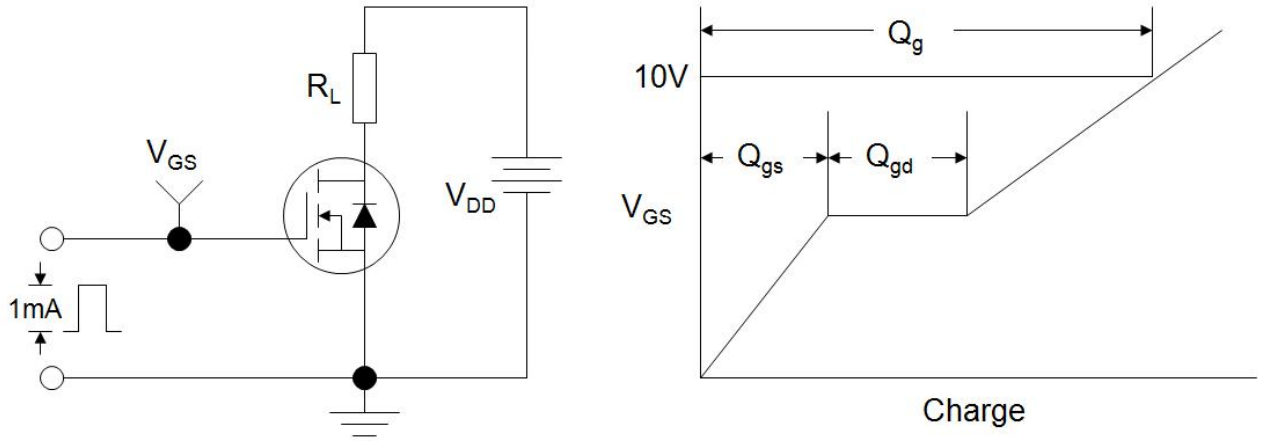
| Parameter | Symbol | Value | Unit |
|---|---|---|---|
| Thermal Resistance, Junction-to-Ambientt, t≤10s | $R_{thJA}$ | 58 | ºC/W |

| **Specifications** $T_J$ = 25ºC, unless otherwise noted | | | | | | |
|---|---|---|---|---|---|---|
| **Parameter** | **Symbol** | **Test Conditions** | **Value** | | | **Unit** |
| | | | **Min.** | **Typ.** | **Max.** | |
| **Static Parameters** | | | | | | |
| Drain-Source Breakdown Voltage | $V_{(BR)DSS}$ | $V_{GS}$ = 0V, $I_D$ = 250μA | 150 | -- | -- | V |
| Zero Gate Voltage Drain Current | $I_{DSS}$ | $V_{DS}$ = 150V, $V_{GS}$ = 0V | -- | -- | 1 | μA |
| Gate-Source Leakage | $I_{GSS}$ | $V_{GS}$ = ±20V | -- | -- | ±100 | nA |
| Gate-Source Threshold Voltage | $V_{GS(th)}$ | $V_{DS}$ = $V_{GS}$, $I_D$ = 250μA | 1.0 | 2.0 | 2.5 | V |
| Drain-Source On-Resistance | $R_{DS(on)}$ | $V_{GS}$ = 10V, $I_D$ = 2A | -- | 300 | 370 | mΩ |
| | | $V_{GS}$ = 4.5V, $I_D$ = 2A | -- | 315 | 390 | |
| Forward Transconductance | $g_{FS}$ | $V_{GS}$ = 5V, $I_D$ = 2A | -- | 5 | -- | S |
| **Dynamic Parameters** | | | | | | |
| Input Capacitance | $C_{iss}$ | $V_{GS}$ = 0V, $V_{DS}$ = 75V, f = 1.0MHz | -- | 558 | -- | pF |
| Output Capacitance | $C_{oss}$ | | -- | 17 | -- | |
| Reverse Transfer Capacitance | $C_{rss}$ | | -- | 13 | -- | |
| Total Gate Charge | $Q_g$ | $V_{DD}$ = 75V, $I_D$ = 2A, $V_{GS}$ = 10V | -- | 20 | -- | nC |
| Gate-Source Charge | $Q_{gs}$ | | -- | 3 | -- | |
| Gate-Drain Charge | $Q_{gd}$ | | -- | 5 | -- | |
| Turn-on Delay Time | $t_{d(on)}$ | $V_{DD}$ = 75V, $I_D$ = 2A, $R_G$ = 6Ω | -- | 8 | -- | ns |
| Turn-on Rise Time | $t_r$ | | -- | 11 | -- | |
| Turn-off Delay Time | $t_{d(off)}$ | | -- | 21 | -- | |
| Turn-off Fall Time | $t_f$ | | -- | 15 | -- | |
| **Drain-Source Body Diode Characteristics** | | | | | | |
| Continuous Body Diode Current | $I_S$ | $T_C$ = 25ºC | -- | -- | 2 | A |
| Body Diode Voltage | $V_{SD}$ | $T_J$ = 25ºC, $I_{SD}$ = 2A, $V_{GS}$ = 0V | -- | -- | 1.2 | V |
| Reverse Recovery Charge | Qrr | $I_F$ = 2A, $V_{GS}$ = 0V di/dt=100A/us | -- | 266 | -- | nC |
| Reverse Recovery Time | Trr | | -- | 103 | -- | ns |

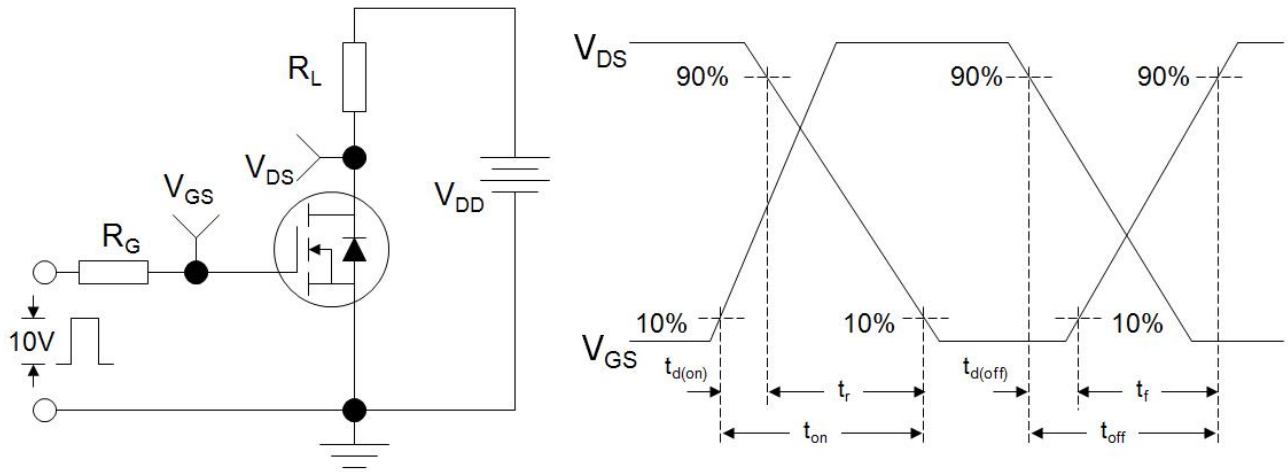
**Notes**

1. Repetitive Rating: Pulse width limited by maximum junction temperature
2. Identical low side and high side switch with identical $R_G$

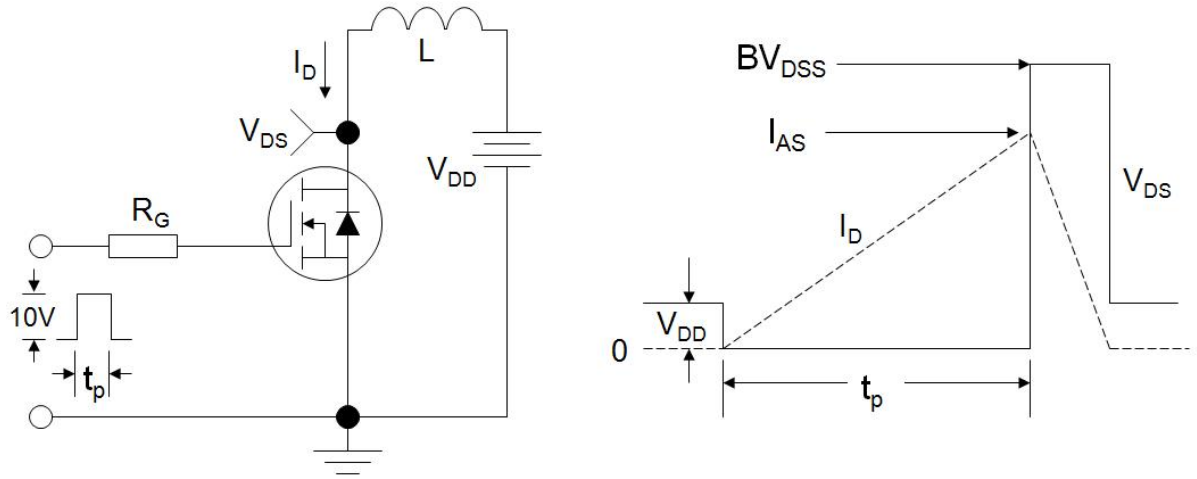
**Gate Charge Test Circuit**




**Switch Time Test Circuit**




**EAS Test Circuit**



**Typical Characteristics** $T_J$ = 25ºC, unless otherwise noted

**Figure 1. Output Characteristics**

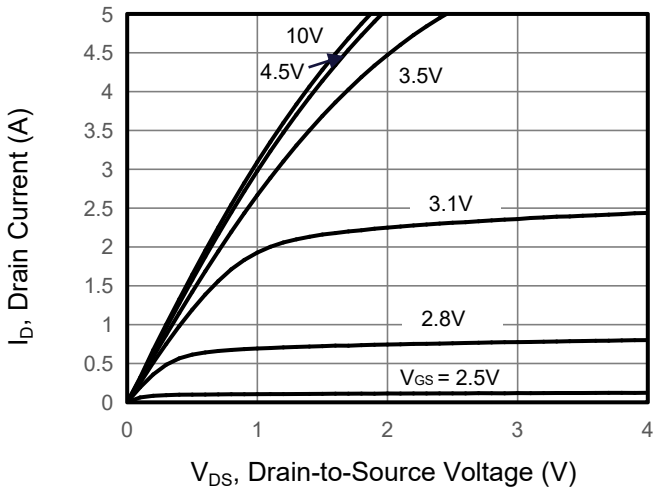



**Figure 2. Transfer Characteristics**

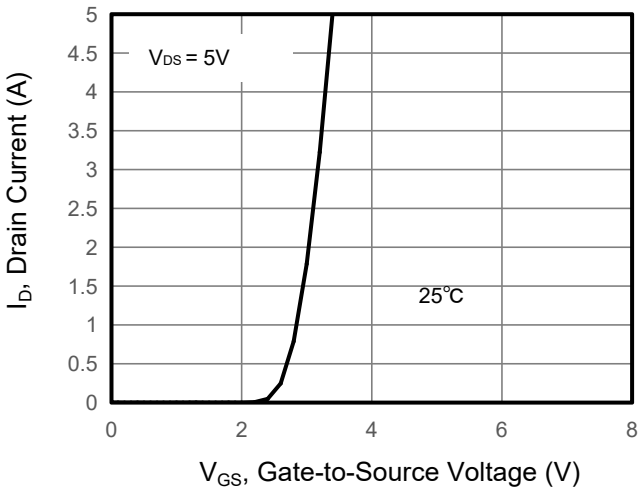



**Figure 3. Drain Source On Resistance**

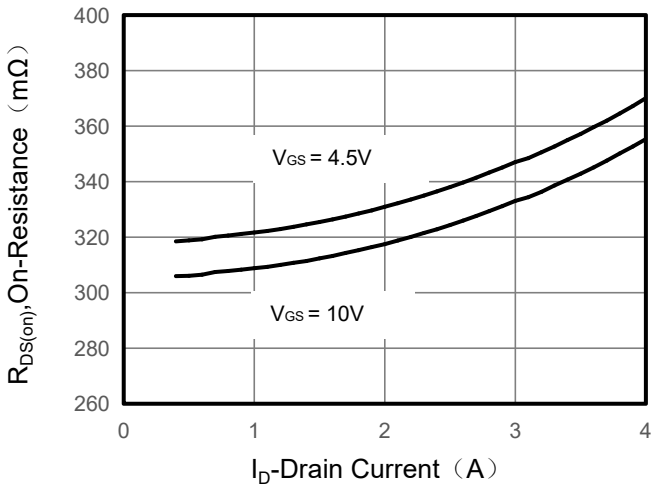



**Figure 4. Gate Charge**

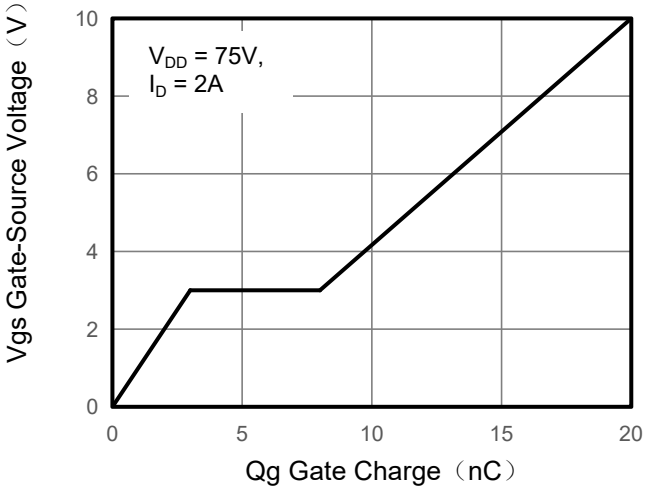



**Figure 5. Capacitance**

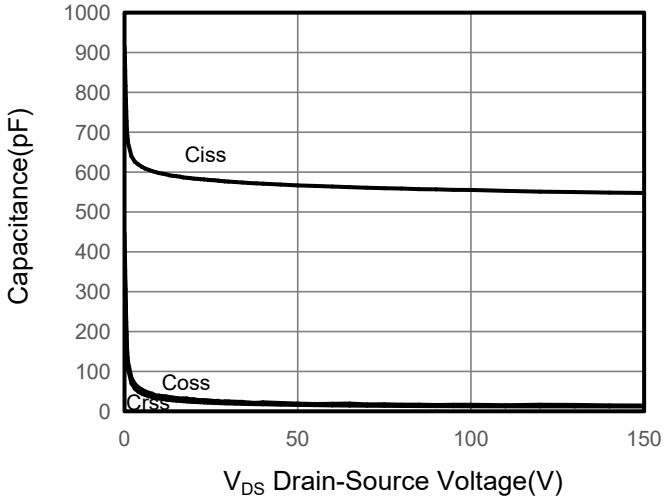
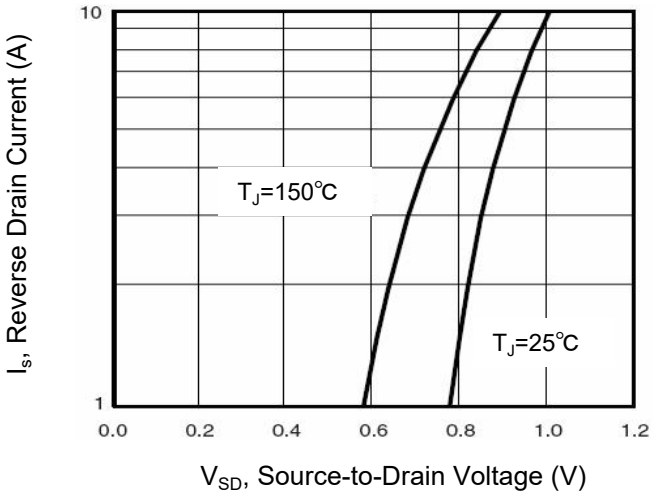



**Figure 6. Source-Drain Diode Forward**



**Typical Characteristics** $T_J$ = 25ºC, unless otherwise noted

**Figure 7. Drain-Source On-Resistance**

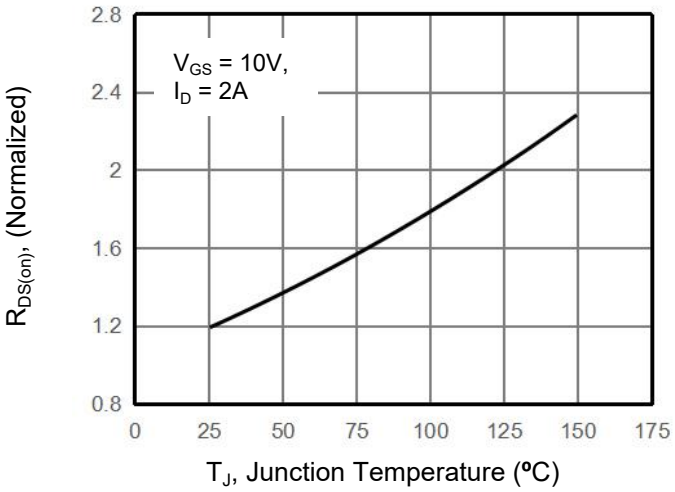



**Figure 8. Safe Operation Area**

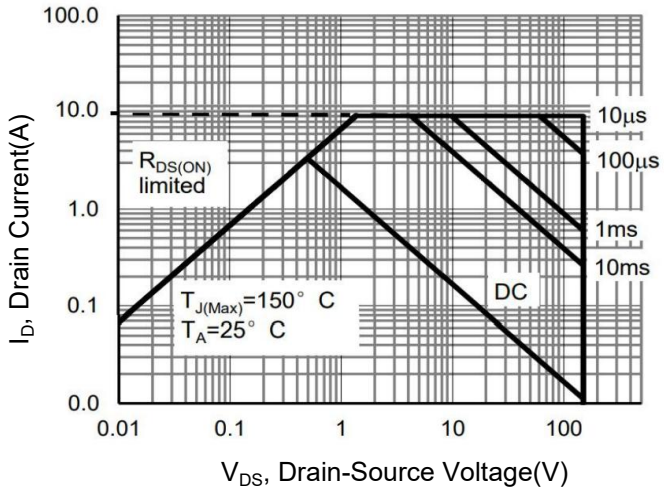
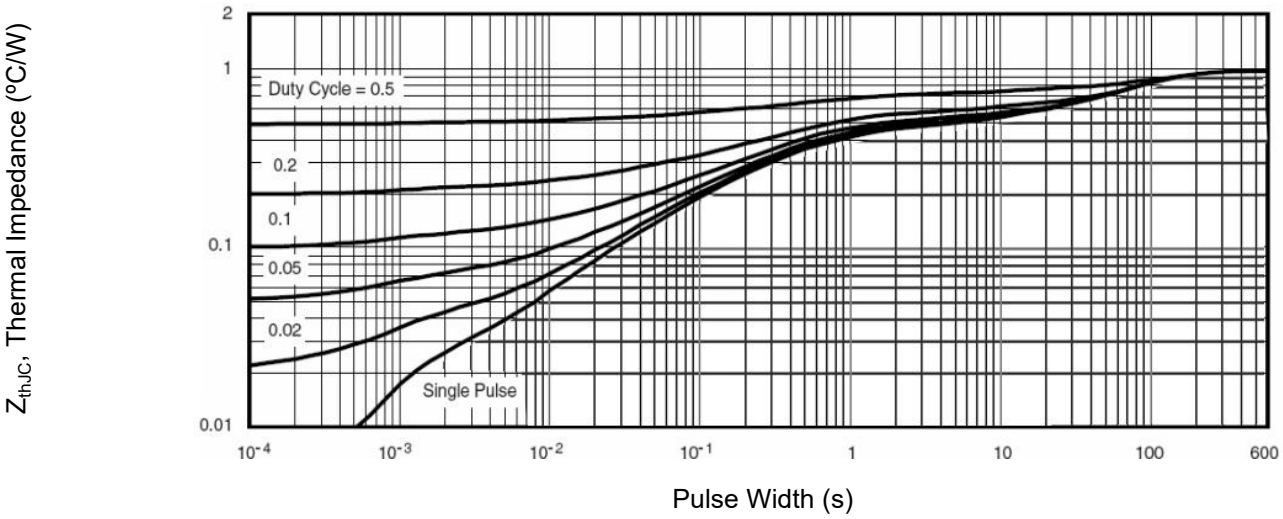
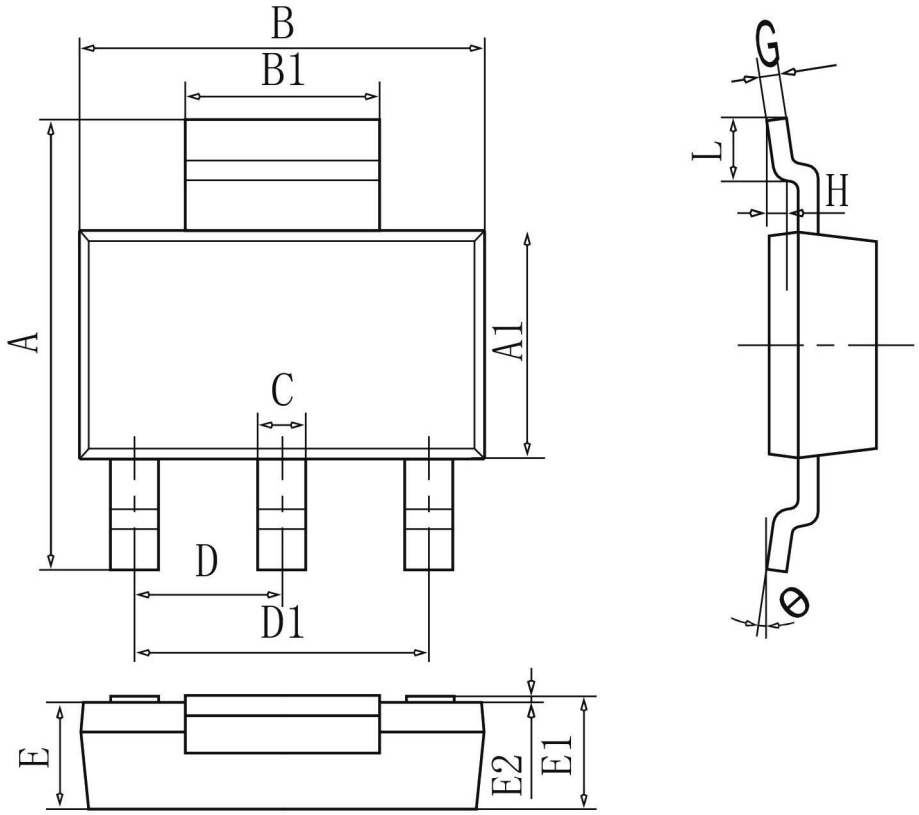



**Figure 9. Normalized Maximum Transient Thermal Impedance**



**SOT-223 Package Information**




| DIM | MIN | NOM | MAX |
|---|---|---|---|
| A | 6.80 | 7.00 | 7.20 |
| A1 | 3.30 | 3.50 | 3.70 |
| B | 6.40 | 6.60 | 6.80 |
| B1 | 2.96 | 3.00 | 3.10 |
| C | 0.66 | 0.70 | 0.80 |
| D | 2.25 | 2.30 | 2.35 |
| D1 | 4.60REF | | |
| E | 1.50 | 1.60 | 1.70 |
| E1 | 1.65REF | | |
| E2 | 0.02 | 0.06 | 0.10 |
| G | 0.255 | 0.305 | 0.355 |
| H | 0.25GAUGR | | |
| L | 0.90 | – | – |
| θ | 0° | – | 10° |
| All Dimensions in mm | | | |