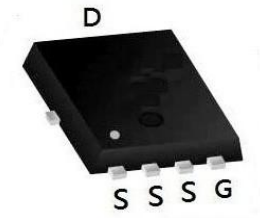
**P-Ch 30V Fast Switching MOSFETs**

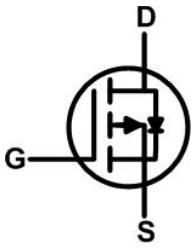
★ 100% EAS Guaranteed
★ Green Device Available
★ Super Low Gate Charge
★ Excellent CdV/dt effect decline
★ Advanced high cell density Trench technology

**Product Summary**

| BVDSS | RDSON | ID |
|---|---|---|
| -30V | 7.5mΩ | -55A |

**PDFN3333-8L Pin Configuration**




## Description

The XXW60P03D is the highest performance trench P-ch MOSFETs with extreme high cell density, which provide excellent RDSON and gate charge for most of the synchronous buck converter applications .

The XXW60P03D meet the RoHS and Green Product requirement, 100% EAS guaranteed with full function reliability approved.

## Absolute Maximum Ratings ($T_A$ = 25°C, unless otherwise noted)

| Parameter | | Symbol | Value | Unit |
|---|---|---|---|---|
| Drain-Source Voltage | | $V_{DS}$ | -30 | V |
| Gate-Source Voltage | | $V_{GS}$ | ±20 | V |
| Continuous Drain Current | $T_C$=25°C | $I_D$ | -55 | A |
| | $T_C$=100°C | | -30 | |
| Pulsed Drain Current[1] | | $I_{DM}$ | -168 | A |
| Single Pulse Avalanche Energy[2] | | EAS | 45 | mJ |
| Total Power Dissipation | $T_C$=25°C | $P_D$ | 37 | W |
| Operating Junction and Storage Temperature Range | | $T_J$, $T_{STG}$ | -55 to 150 | °C |

## Thermal Characteristics

| Parameter | Symbol | Value | Unit |
|---|---|---|---|
| Thermal Resistance from Junction-to-Ambient[3] | $R_{\theta JA}$ | 75 | °C/W |
| Thermal Resistance from Junction-to-Case | $R_{\theta JC}$ | 3.36 | °C/W |

## Electrical Characteristics ($T_J$ = 25°C, unless otherwise noted)

| Parameter | | Symbol | Test Conditions | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|---|
| **Static Characteristics** | | | | | | | |
| Drain-Source Breakdown Voltage | | $V_{(BR)DSS}$ | $V_{GS}$ = 0V, $I_D$ = -250μA | -30 | - | - | V |
| Gate-body Leakage current | | $I_{GSS}$ | $V_{DS}$ = 0V, $V_{GS}$ = ±20V | - | - | ±100 | nA |
| Zero Gate Voltage Drain Current | $T_J$=25℃ | $I_{DSS}$ | $V_{DS}$ = -30V, $V_{GS}$ = 0V | - | - | -1 | μA |
| | $T_J$=100℃ | | | - | - | -100 | |
| Gate-Threshold Voltage | | $V_{GS(th)}$ | $V_{DS}$ = $V_{GS}$, $I_D$ = -250μA | -1.0 | - | -2.5 | V |
| Drain-Source On-Resistance[4] | | $R_{DS(on)}$ | $V_{GS}$ = -10V, $I_D$ = -30A | - | 7.5 | 14 | mΩ |
| | | | $V_{GS}$ = -4.5V, $I_D$ = -15A | - | 10 | 22 | |
| Forward Transconductance[4] | | $g_{fs}$ | $V_{DS}$ = -5V, $I_D$ = -30A | - | 57 | - | S |
| **Dynamic Characteristics**[5] | | | | | | | |
| Input Capacitance | | $C_{iss}$ | $V_{DS}$ = -15V, $V_{GS}$ =0V, f =1MHz | - | 2396 | - | pF |
| Output Capacitance | | $C_{oss}$ | | - | 325 | - | |
| Reverse Transfer Capacitance | | $C_{rss}$ | | - | 283 | - | |
| Gate Resistance | | $R_g$ | f =1MHz | - | 10.5 | - | Ω |
| **Switching Characteristics**[5] | | | | | | | |
| Total Gate Charge | | $Q_g$ | $V_{GS}$ = -10V,$V_{DS}$ = -15V, $I_D$= -30A | - | 30 | - | nC |
| Gate-Source Charge | | $Q_{gs}$ | | - | 5 | - | |
| Gate-Drain Charge | | $Q_{gd}$ | | - | 7.5 | - | |
| Turn-On Delay Time | | $t_{d(on)}$ | $V_{GS}$ = -10V, $V_{DD}$ = -15V, $R_G$ = 3Ω, $I_D$= -30A | - | 14.1 | - | ns |
| Rise Time | | $t_r$ | | - | 20 | - | |
| Turn-Off Delay Time | | $t_{d(off)}$ | | - | 94 | - | |
| Fall Time | | $t_f$ | | - | 65 | - | |
| Body Diode Reverse Recovery Time | | $t_{rr}$ | $I_F$ = -30A, dI/dt = 100A/μs | - | 19 | - | ns |
| Body Diode Reverse Recovery Charge | | $Q_{rr}$ | | - | 9 | - | nC |
| **Drain-Source Body Diode Characteristics** | | | | | | | |
| Diode Forward Voltage[4] | | $V_{SD}$ | $I_S$ = -1A, $V_{GS}$ = 0V | - | - | -1.2 | V |
| Continuous Source Current | $T_C$=25°C | $I_S$ | - | - | - | -55 | A |

Note :

1. Repetitive rating, pulse width limited by junction temperature $T_{J(MAX)}$=150°C.
2. The EAS data shows Max. rating . The test condition is $V_{DD}$= -25V, $V_{GS}$= -10V, L= 0.1mH, $I_{AS}$= -30A.
3. The data tested by surface mounted on a 1 inch2 FR-4 board with 2OZ copper, The value in any given application depends on the user's specific board design.
4. The data tested by pulsed , pulse width ≤ 300us , duty cycle ≤ 2%.
5. This value is guaranteed by design hence it is not included in the production test.

## Typical Characteristics

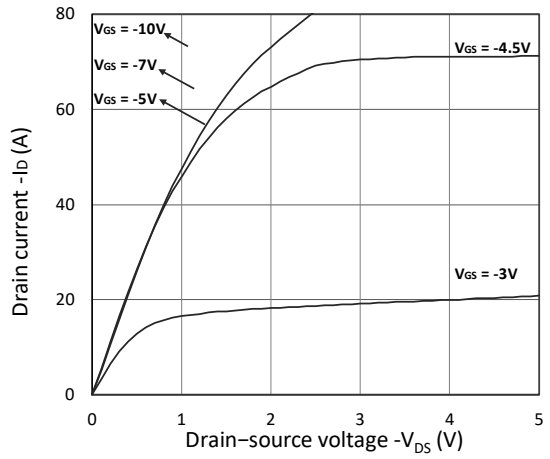



Figure 1. Output Characteristics

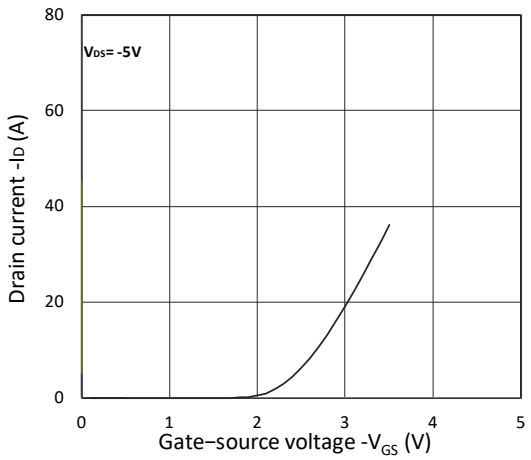



Figure 2. Transfer Characteristics

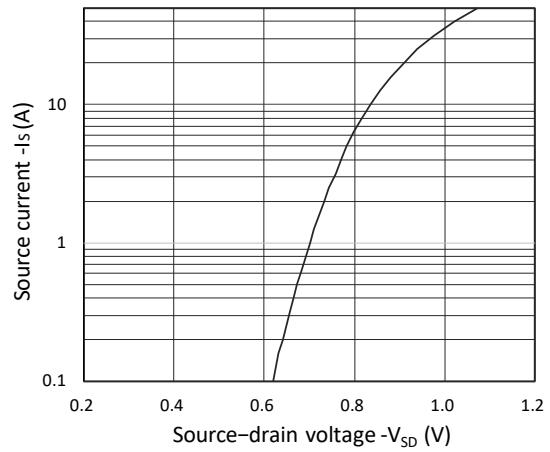



Figure 3. Forward Characteristics of Reverse

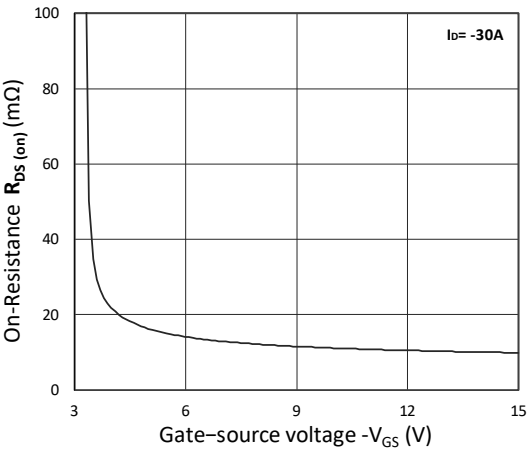



Figure 4. $R_{DS(ON)}$ vs. $V_{GS}$

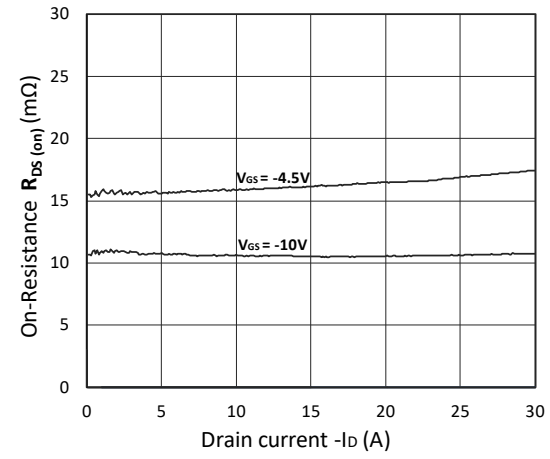



Figure 5. $R_{DS(ON)}$ vs. $I_D$

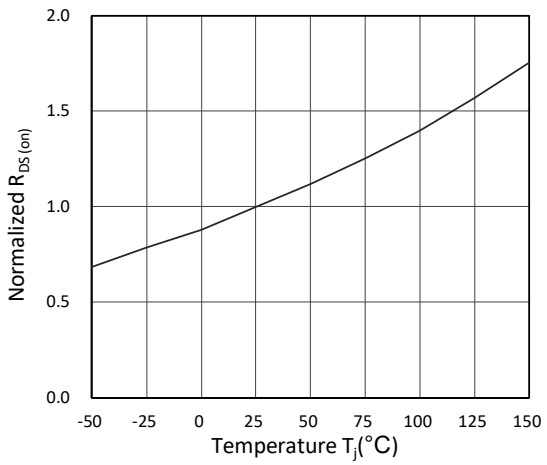



Figure 6. Normalized $R_{DS(on)}$ vs. Temperature

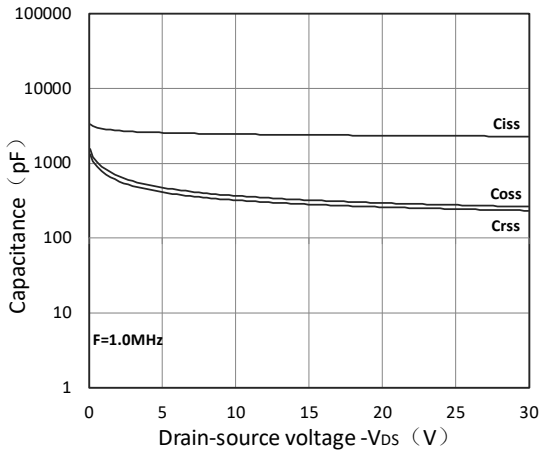



Figure 7. Capacitance Characteristics

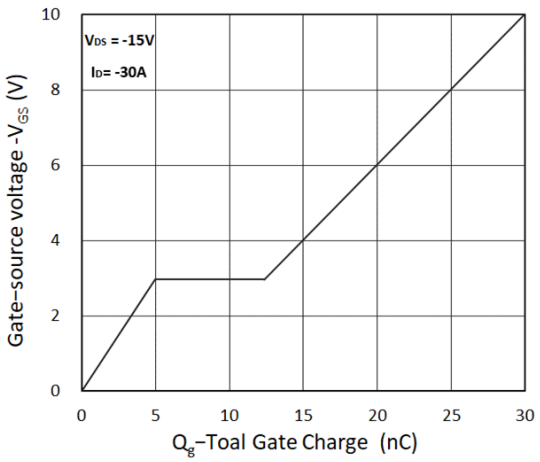



Figure 8. Gate Charge Characteristics

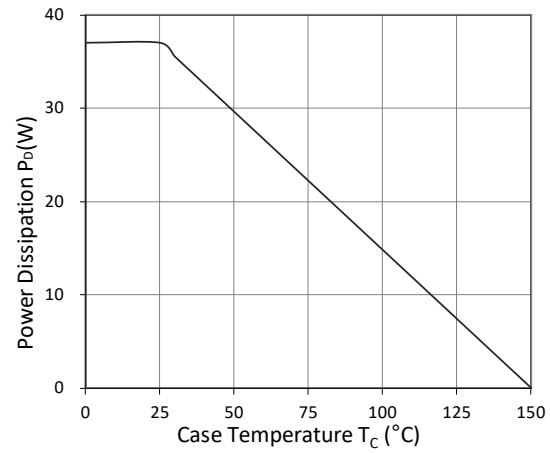



Figure 9. Power Dissipation

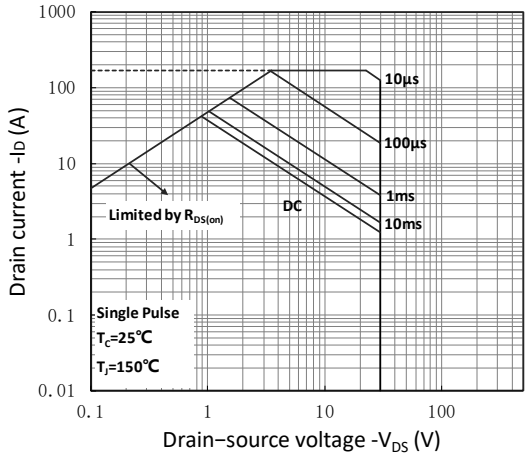



Figure10. Safe Operating Area

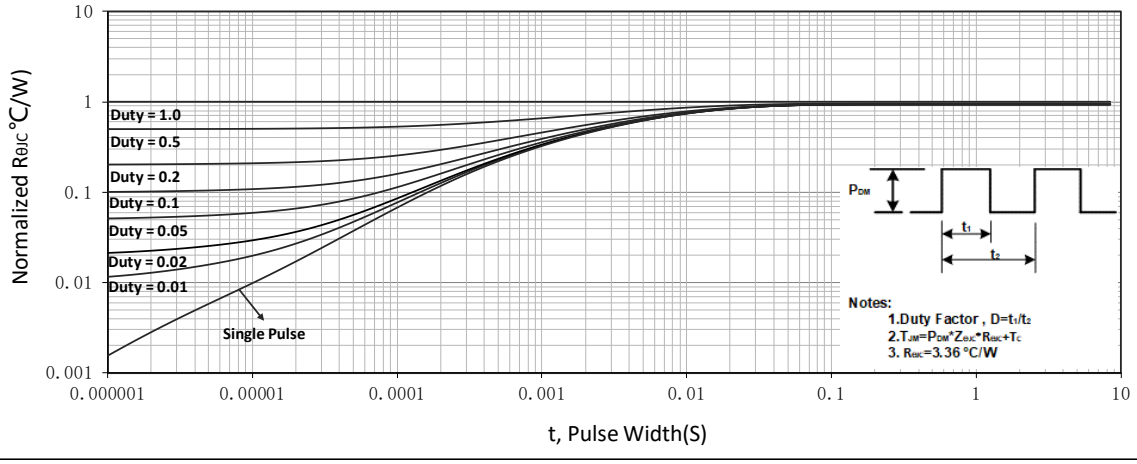
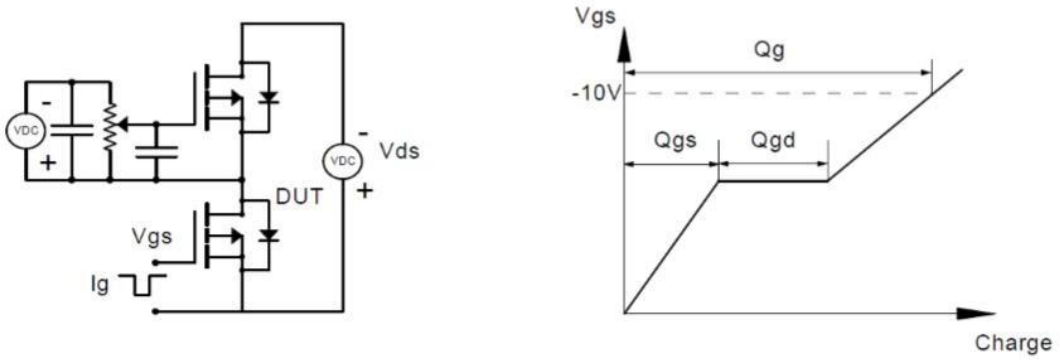


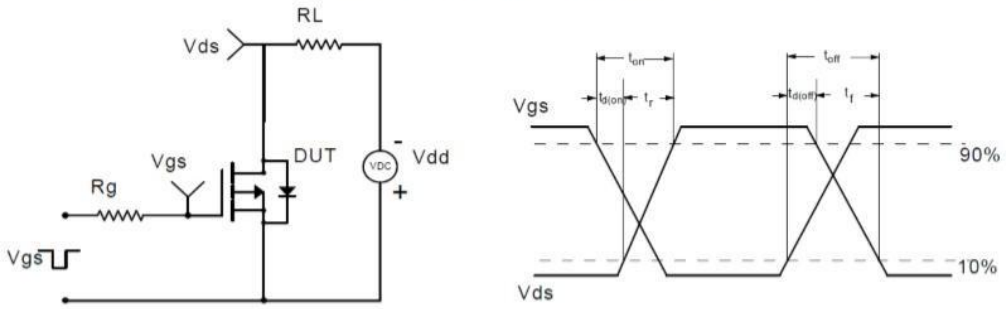

Figure 11. Normalized Maximum Transient Thermal Impedance

## Test Circuit

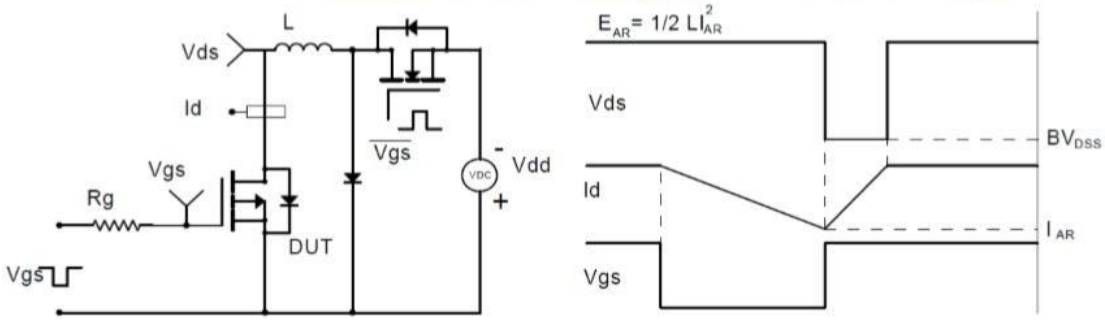
Gate Charge Test Circuit & Waveform



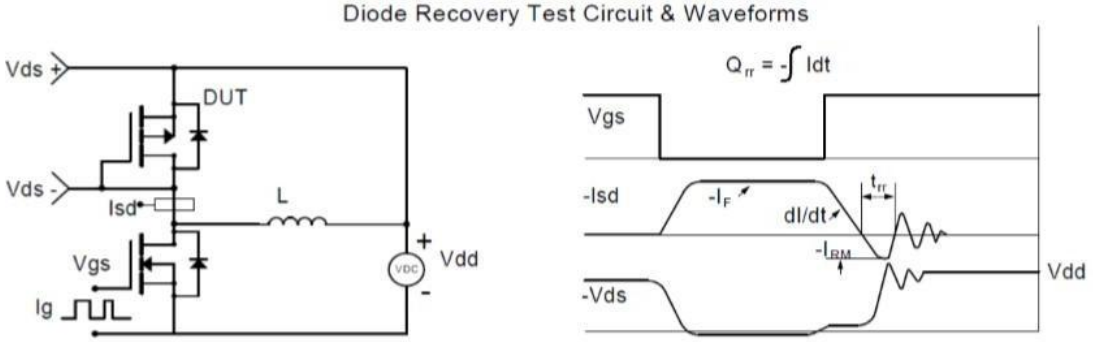

Resistive Switching Test Circuit & Waveforms



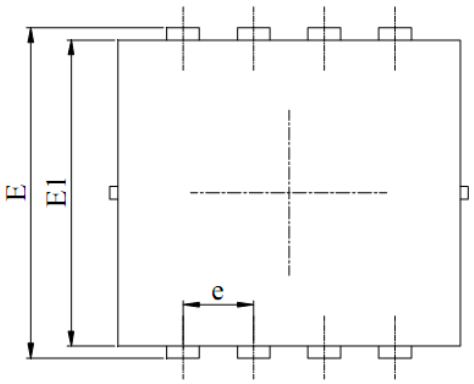

Unclamped Inductive Switching (UIS) Test Circuit & Waveforms



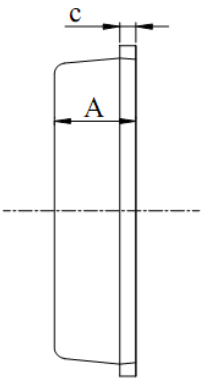

Diode Recovery Test Circuit & Waveforms



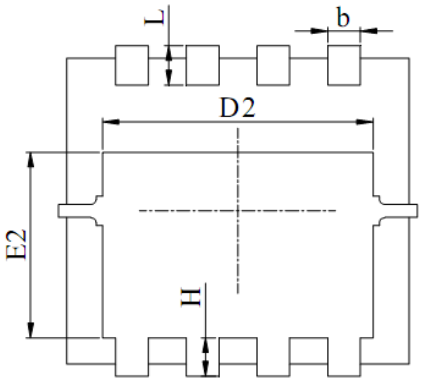
## Package Mechanical Data-PDFN3333-8L-Single



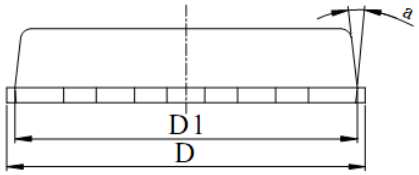

Top View




Side View



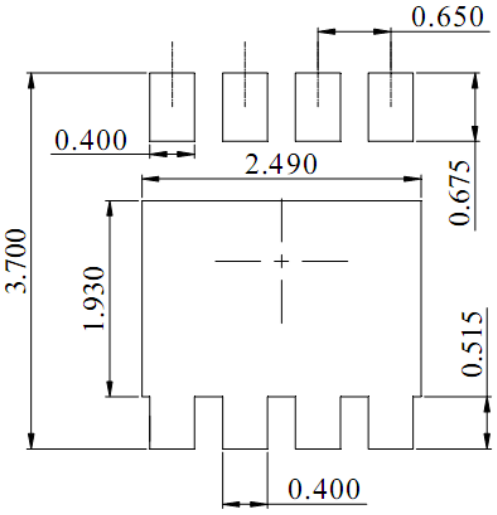

Bottom View




Front View

NOTES:
1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M,1994.
2. ALL DIMNESIONS IN MILLIMETER (ANNGLE IN DEGREE).
3. DIMENSIONS D1 AND E1 DO NOT INCLUDE MOLD FLASH PROTRUSIONS OR GATE BURRS.

| DIM. | MILLIMETER | | |
|---|---|---|---|
| | MIN. | NOM. | MAX. |
| A | 0.70 | 0.75 | 0.80 |
| b | 0.25 | 0.30 | 0.35 |
| c | 0.10 | 0.20 | 0.25 |
| D | 3.00 | 3.15 | 3.25 |
| D1 | 2.95 | 3.05 | 3.15 |
| D2 | 2.39 | 2.49 | 2.59 |
| E | 3.20 | 3.30 | 3.40 |
| E1 | 2.95 | 3.05 | 3.15 |
| E2 | 1.70 | 1.80 | 1.90 |
| e | 0.65 BSC | | |
| H | 0.30 | 0.40 | 0.50 |
| L | 0.25 | 0.40 | 0.50 |
| a | --- | --- | 15° |




DIMENSIONS:MILLIMETERS