## • General Description

It combines advanced trench MOSFET technology with a low resistance package to provide extremely low $R_{DS(ON)}$.

## • Features

■ Advance device constructure

■Low $R_{DS(ON)}$ to minimize conduction loss

■Low Gate Charge for fast switching

■Low Thermal resistance

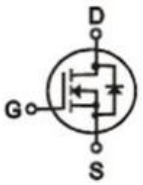
## •Application

■ Synchronous Rectification for AC-DC/DC-DC converter

■Oring switches

■Power Tools

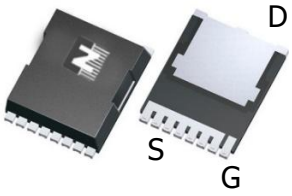
## • Product Summary




$V_{DS}$=80V

$R_{DS(ON)}$ =1.6mΩ

$I_D$=240A




TOLL

RoHS

## •Ordering Information:

| | |
|---|---|
| Part NO. | ZMS015N08HR |
| Marking | ZMS015N08 |
| Packing Information | REEL TAPE |
| Basic ordering unit (pcs) | 2000 |

## •Absolute Maximum Ratings ($T_C$ =25℃)

| **Parameter** | **Symbol** | Rating | Unit |
|---|---|---|---|
| Drain-Source Voltage | $V_{DS}$ | 80 | V |
| Gate-Source Voltage | $V_{GS}$ | ±20 | V |
| Continuous Drain Current | $I_{D@}T_C$=25℃ | 240 | A |
| | $I_{D@}T_C$=75℃ | 182 | A |
| | $I_{D@}T_C$=100℃ | 151 | A |
| Pulsed Drain Current ① | $I_{DM}$ | 720 | A |
| Diode continuous forward current | $I_S$ | 175 | A |
| Diode pulse current | $I_{S,pulse}$ | 525 | A |
| Total Power Dissipation | $P_D@T_C$=25℃ | 290 | W |
| Operating Junction Temperature | $T_J$ | -55 to 150 | ℃ |
| Storage Temperature | $T_{STG}$ | -55 to 150 | ℃ |
| Single Pulse Avalanche Energy@L=0.1mH | $E_{AS}$ | 480 | mJ |

## •Thermal resistance

| Parameter | Symbol | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|
| Thermal resistance, junction - case | $R_{thJC}$ | - | - | 0.43 | °C/W |
| Thermal resistance, junction - ambient | $R_{thJA}$ | - | - | 40 | °C/W |
| Soldering temperature, wavesoldering for 10s | $T_{sold}$ | - | - | 265 | °C |

## •Electronic Characteristics

| Parameter | Symbol | Condition | Min. | Typ | Max. | Unit |
|---|---|---|---|---|---|---|
| Drain-Source Breakdown Voltage | $BV_{DSS}$ | $V_{GS}$ =0V, $I_D$ =250uA | 80 | | | V |
| Gate Threshold Voltage | $V_{GS(TH)}$ | $V_{GS}$ =$V_{DS}$, $I_D$ =250uA | 2 | | 4 | V |
| Drain-Source Leakage Current | $I_{DSS}$ | $V_{DS}$=80V, $V_{GS}$ =0V | | | 1.0 | uA |
| Gate- Source Leakage Current | $I_{GSS}$ | $V_{GS}$=±20V, $V_{DS}$ =0V | | | ±100 | nA |
| Static Drain-source On Resistance | $R_{DS(ON)}$ | $V_{GS}$=10V, $I_D$=30A | | 1.6 | 2.1 | mΩ |
| Forward Transconductance | $g_{FS}$ | $V_{DS}$ =10V, $I_D$=40A | | 28 | | s |
| Source-drain voltage | $V_{SD}$ | Is=100A | | | 1.28 | V |

## •Electronic Characteristics

| Parameter | Symbol | Condition | Min. | Typ | Max. | Unit |
|---|---|---|---|---|---|---|
| Input capacitance | $C_{iss}$ | f = 1MHz<br>$V_{DS}$=25V | - | 9130 | - | pF |
| Output capacitance | $C_{oss}$ | | - | 6640 | - | |
| Reverse transfer capacitance | $C_{rss}$ | | - | 117 | - | |

## •Gate Charge characteristics($T_a$ = 25℃)

| Parameter | Symbol | Condition | Min. | Typ | Max. | Unit |
|---|---|---|---|---|---|---|
| Gate Risistance | Rg | f = 1MHz | | 2.5 | | Ω |
| Total gate charge | $Q_g$ | $V_{DD}$ =30V<br>$I_D$ = 30A<br>$V_{GS}$ = 10V | - | 121 | - | nC |
| Gate - Source charge | $Q_{gs}$ | | - | 24 | - | |
| Gate - Drain charge | $Q_{gd}$ | | - | 23 | - | |
| Turn-On Time | $t_{on}$ | $V_{GS}$=10V, $V_{DS}$=15V<br>$R_G$ =3.3Ω,<br>$I_D$ =25A | | 112 | | ns |
| Turn-ON Delay time | $t_{D(on)}$ | | | 41 | | |
| Turn-ON Rise time | $t_r$ | | | 65 | | ns |
| Turn-Off Delay time | $t_{D(off)}$ | | | 130 | | ns |

| | | | | | | |
|---|---|---|---|---|---|---|
| Turn-Off Fall time | $t_f$ | | | 34 | | ns |
| Reverse Recovery Time | $t_{RR}$ | VDD = 20 V, dIS/dt = 100 A/s, IS = 30 A | | 85 | | ns |
| Charge Time | $t_a$ | | | 34 | | ns |
| Discharge Time | $t_b$ | | | 28 | | ns |
| Reverse Recovery Charge | $Q_{RR}$ | | | 120 | | nC |

Note: ① Pulse Test : Pulse width ≤ 10μs, Duty cycle ≤ 1% ;

Fig.1 Gate-Charge Characteristics

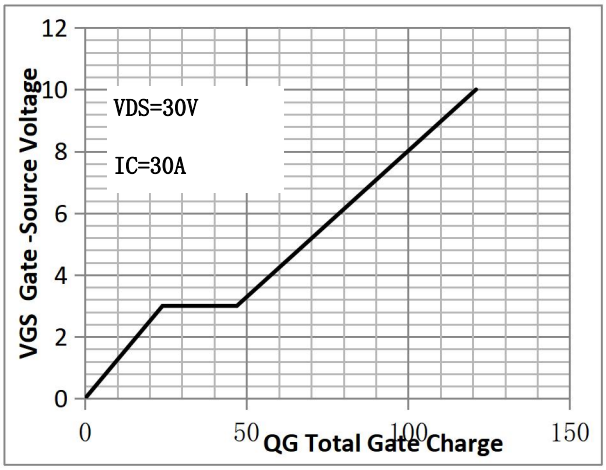



Fig.2 Capacitance Characteristics

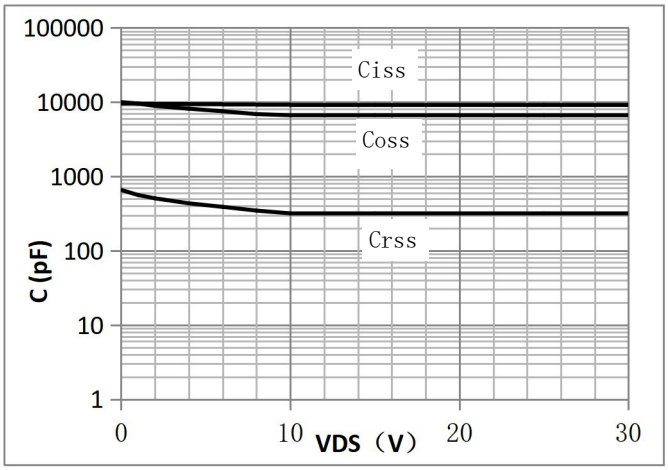



Fig.3 Power Dissipation

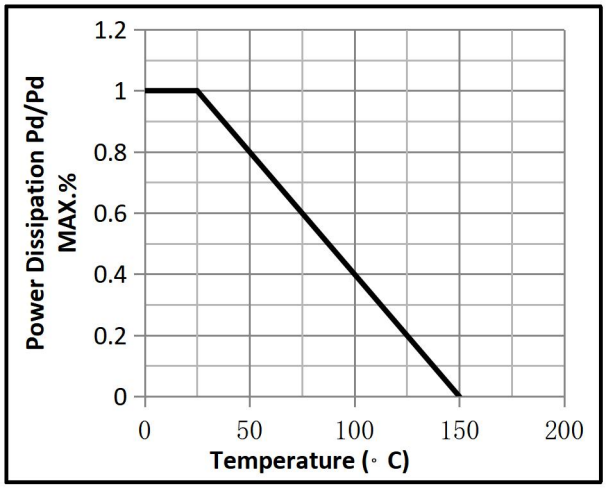



Fig.4 Typical output Characteristics

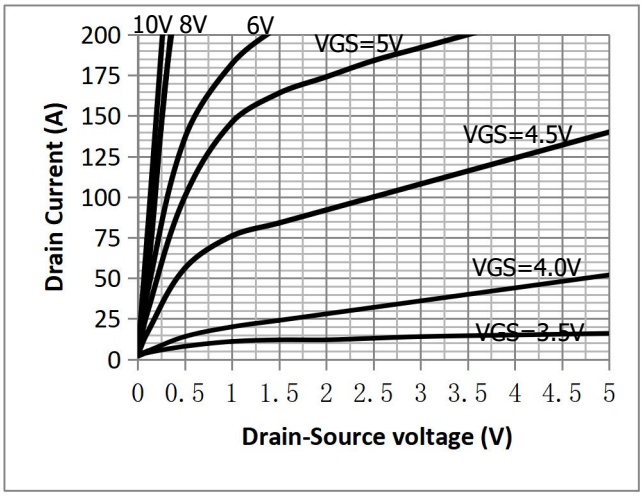


Fig.5 Threshold Voltage V.S Junction Temperature

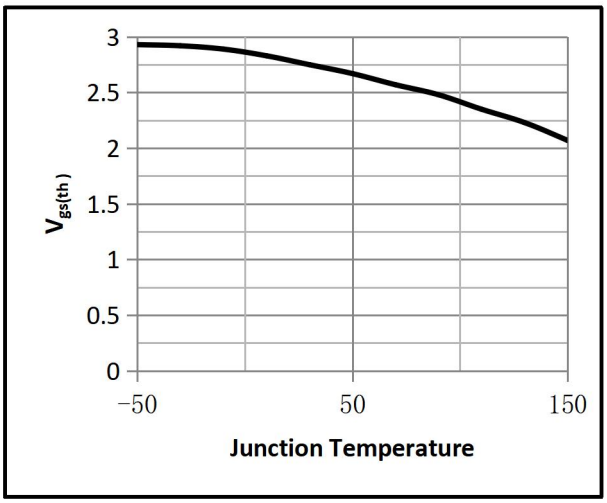



Fig.6 Resistance V.S Drain Current

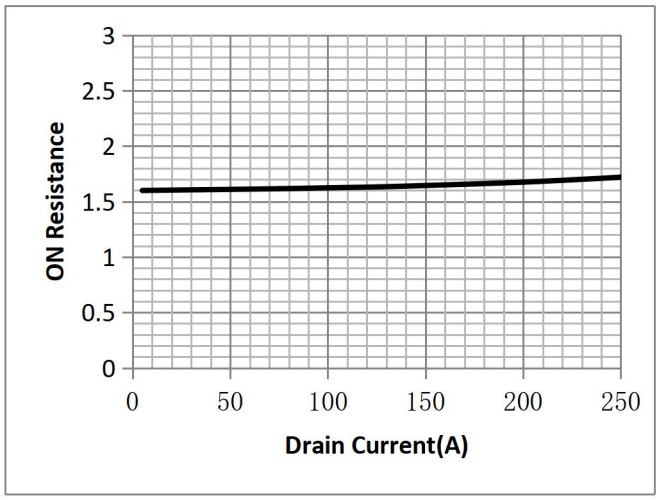



Fig.7 On-Resistance VS Gate Source Voltage

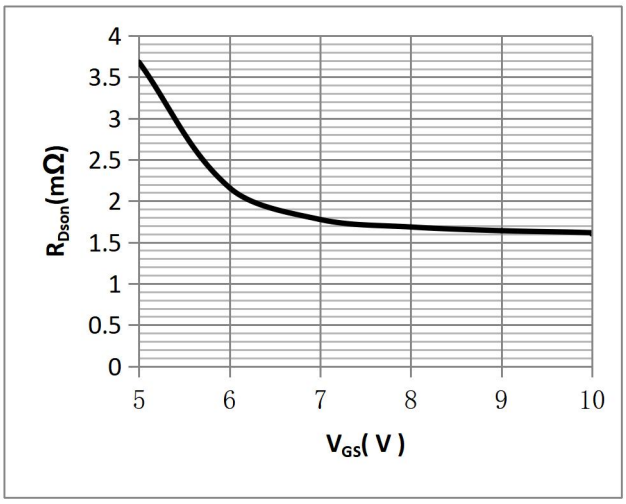



Fig.8 On-Resistance V.S Junction Temperature

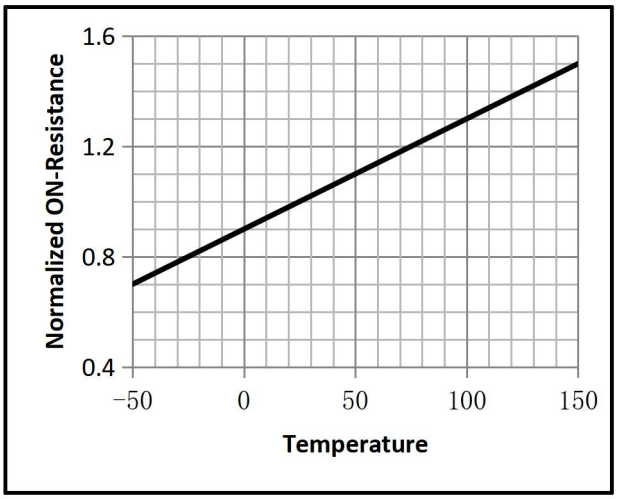



Fig.9 SOA Maximum Safe Operating Area

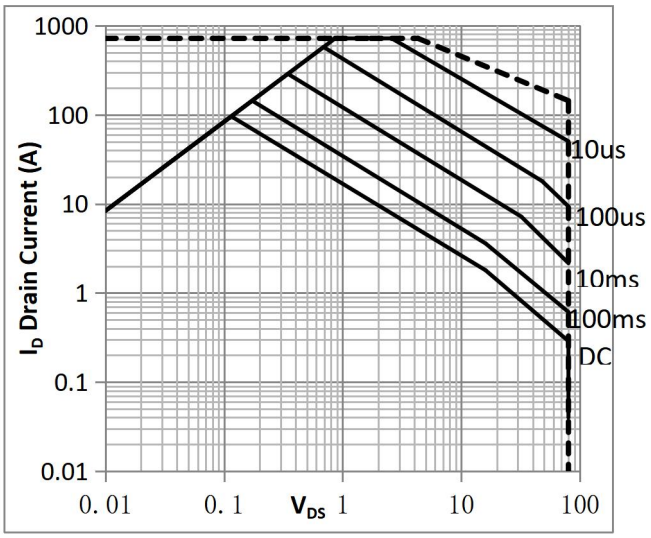



Fig.10 ID-Junction Temperature

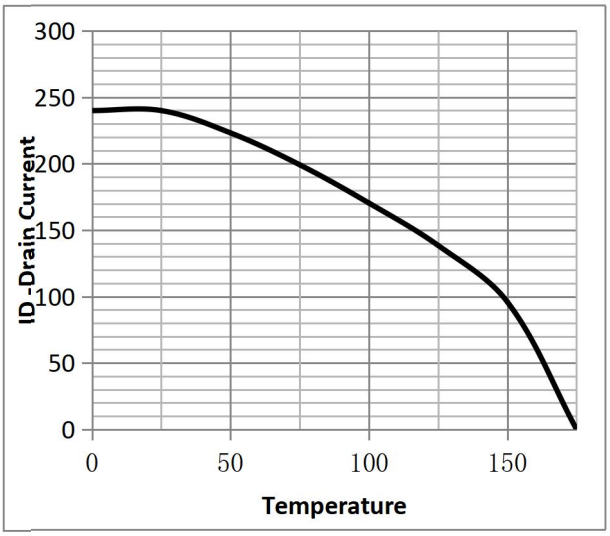


Figure.11Diode Forward Voltage vs. Current

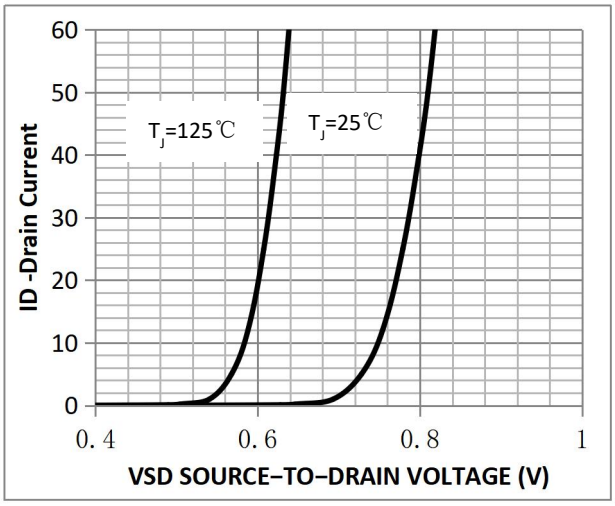



Figure.12 Transfer Characteristics

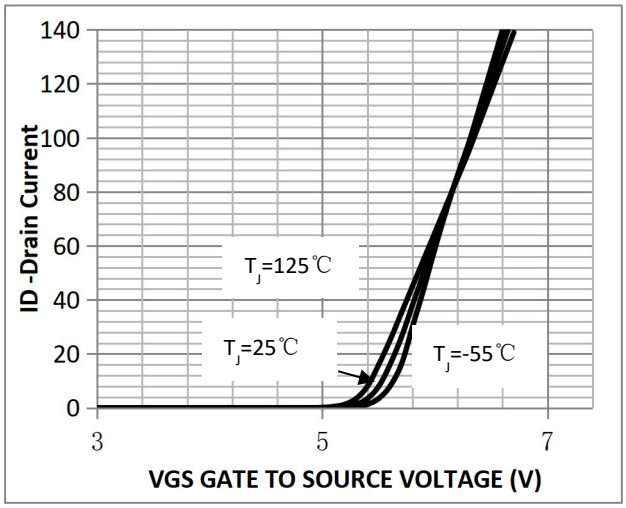



Fig.13 Switching Time Measurement Circuit

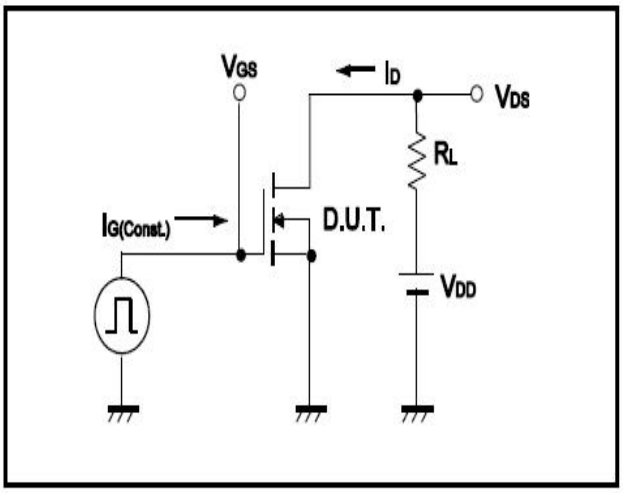



Fig.14 Gate Charge Waveform

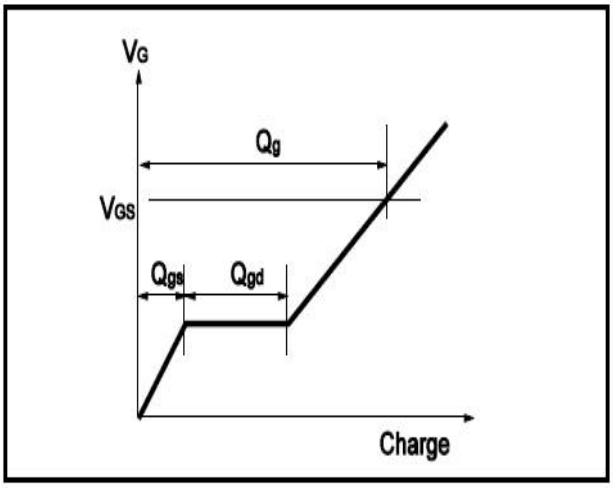



Fig.15 Switching Time Measurement Circuit

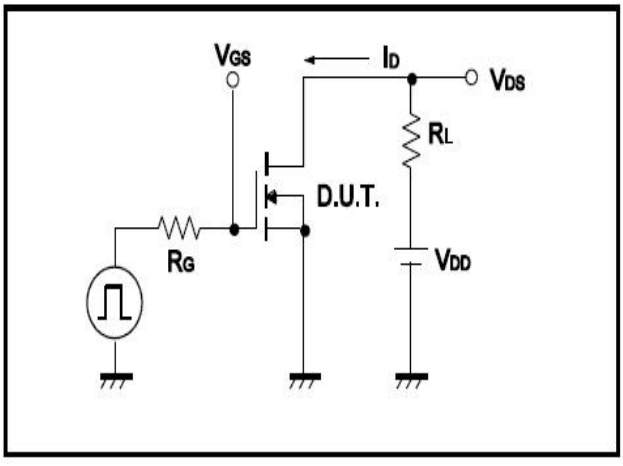
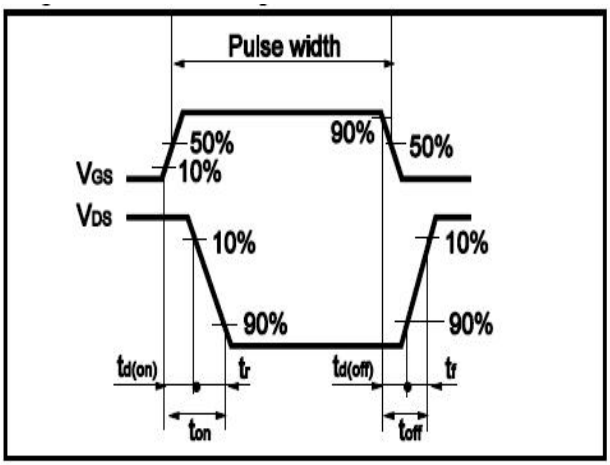
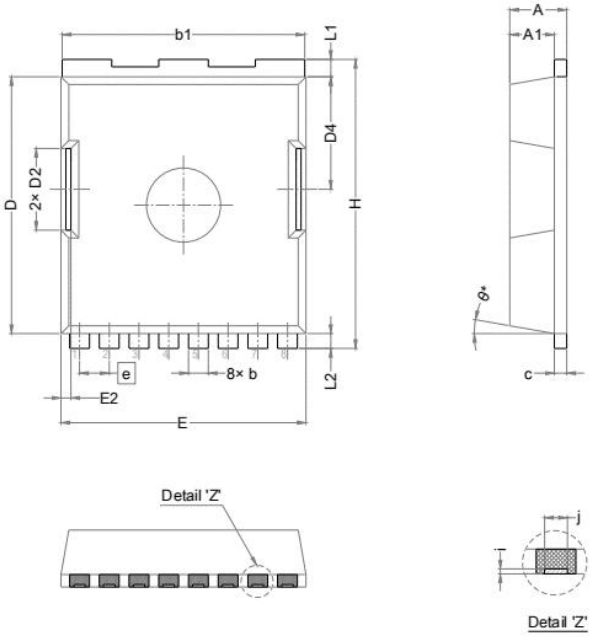


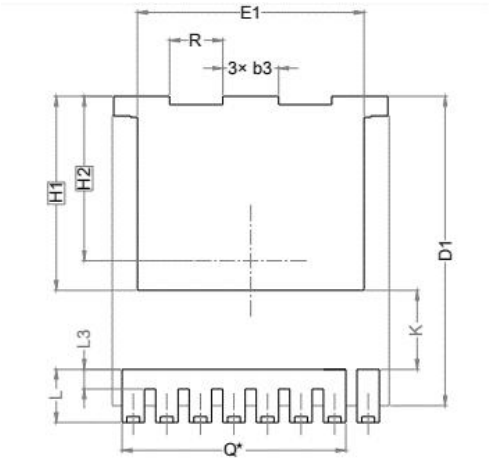

Fig.16 Gate Charge Waveform

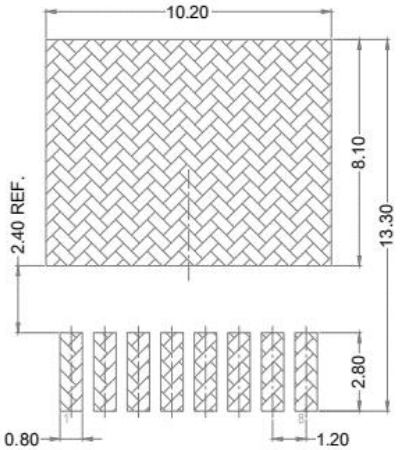


## ●Dimensions (TOLL)

Unit：mm




| SYMBOL | DIMENSIONS | | |
|---|---|---|---|
| | MIN. | NOM. | MAX. |
| A | 2.20 | 2.30 | 2.40 |
| A1 | 1.70 | 1.80 | 1.90 |
| b | 0.70 | 0.80 | 0.90 |
| b1 | 9.70 | 9.80 | 9.90 |
| b3 | 1.90 | 2.00 | 2.10 |
| c | 0.40 | 0.50 | 0.60 |
| D | 10.28 | 10.38 | 10.48 |
| D1 | 10.98 | 11.08 | 11.18 |
| D2 | 3.20 | 3.30 | 3.40 |
| D4 | 4.45 | 4.55 | 4.65 |
| E | 9.80 | 9.90 | 10.00 |
| E1 | 8.00 | 8.10 | 8.20 |
| E2 | 0.30 | 0.40 | 0.50 |
| e | | 1.20 BSC | |
| H | 11.58 | 11.68 | 11.78 |
| H1 | | 6.95 BSC | |
| H2 | | 5.89 BSC | |
| i | | 0.10 REF. | |
| j | | 0.46 REF. | |
| K | | 2.80 REF. | |
| L | 1.60 | 1.90 | 2.10 |
| L1 | 0.60 | 0.70 | 0.80 |
| L2 | 0.50 | 0.60 | 0.70 |
| L3 | 0.60 | 0.70 | 0.80 |
| N | | 8 | |
| Q | | 6.80 REF. | |
| R | 1.80 | 1.90 | 2.00 |
| θ | | 10° REF. | |