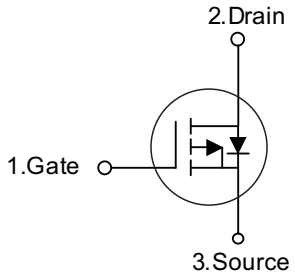
## ■ PRODUCT CHARACTERISTICS

| | |
|---|---|
| VDSS | -20V |
| $R_{DS}$(on)Typ(@$V_{GS}$=-4.5 V) | 60mΩ |
| $R_{DS}$(on)typ(@$V_{GS}$ =-2.5 V) | 75mΩ |
| ID | -3A |

Symbol

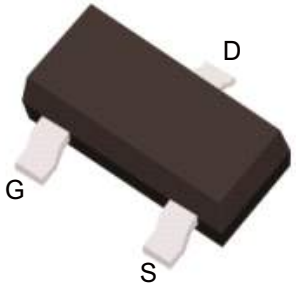



## ■ APPLICATIONS

- Load switch for portable
- DC/DC converter

## ■ FEATURES

* High Density Cell Design For Ultra Low On-Resistance
* Advanced trench process technology




## ■ ORDER INFORMATION

| Order codes | | Package | Packing |
|---|---|---|---|
| Halogen-Free | Halogen | | |
| N/A | MOT2301 | SOT-23 | 3000pieces/Real |

## ■ ABSOLUTE MAXIMUM RATINGS ($T_C$ = 25°C unless otherwise noted)

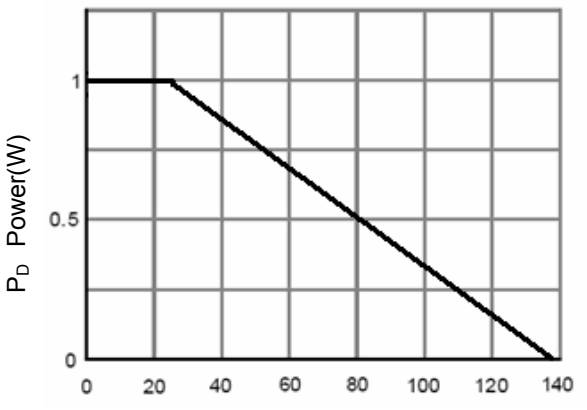
| Parameter | | Symbol | Limit | Unit |
|---|---|---|---|---|
| Drain-Source Voltage | | $V_{DS}$ | -20 | V |
| Gate-Source Voltage | | $V_{GS}$ | ±10 | V |
| Continuous Drain Current | | $I_D$ | -3 | A |
| Pulsed Drain Current | | $I_{DM}$ | -10 | A |
| Maximum Power Dissipation | TA = 25° | $P_D$ | 1.25 | W |
| | TA = 75°C | | 0.8 | W |
| Operating Junction and Storage Temperature Range | | $T_J$, $T_{stg}$ | -55 to 150 | °C |
| Junction-to-Ambient Thermal Resistance (PCB mounted) | | $R_{thJA}$ | 100 | °C/W |
| Junction-to-Ambient Thermal Resistance (PCB mounted) | | $R_{thJA}$ | 166 | °C/W |

## ■ELECTRICAL CHARACTERISTICS ( $T_C$=25°C, unless otherwise specified)

| Parameter | Symbol | Test condition | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|
| **Static** | | | | | | |
| Drain-Source Breakdown Voltage | $BV_{DSS}$ | $V_{GS}$ = 0V, $I_D$= -250uA | 20 | - | - | V |
| Drain-Source On-State Resistance | $R_{DS(on)}$ | $V_{GS}$ = -4.5V, $I_D$ = -3.0A | - | 60 | 100 | mΩ |
| | | $V_{GS}$ = -2.5V, $I_D$ = -2.0A | - | 75 | 120 | mΩ |
| Gate Threshold Voltage | $V_{GS(th)}$ | $V_{DS}$ =$V_{GS}$, $I_D$ = -250uA | 0.4 | - | 1 | V |
| Zero Gate Voltage Drain Curren | $I_{DSS}$ | $V_{DS}$ = -20V, $V_{GS}$ = 0V | - | - | -1 | uA |
| | | $V_{DS}$ = -16V, $V_{GS}$ = 0V TJ=55°C | - | - | -10 | uA |
| Gate Body Leakage | $I_{GSS}$ | $V_{GS}$ = ± 10V, $V_{DS}$ = 0V | - | - | ±100 | nA |
| Forward Transconductance | $g_{fs}$ | $V_{DS}$ = -5V, $I_D$ = -2.8A | - | 6.5 | - | S |
| **Dynamic** | | | | | | |
| Total Gate Charge | $Q_g$ | $V_{DS}$ = -6V, $I_D$ ≅ -2.3A<br>$V_{GS}$ = -4.5V | - | 5.8 | - | nC |
| Gate-Source Charge | $Q_{gs}$ | | - | 0.85 | - | nC |
| Gate-Drain Charge | $Q_{gd}$ | | - | 1.7 | - | nC |
| Turn-On Delay Time | $t_{d(on)}$ | $V_{DD}$ = -6V, RL=6Ω<br>$I_D$ ≅ -1.A, $V_{GEN}$ = -4.5V<br>$R_G$ = 6Ω | - | 13 | - | ns |
| Turn-On Rise Time | $t_r$ | | - | 36 | - | ns |
| Turn-Off Delay Time | $t_{d(off)}$ | | - | 42 | - | ns |
| Turn-Off Fall Time | $t_f$ | | - | 34 | - | ns |
| Input Capacitance | $C_{iss}$ | $V_{DS}$ = -6V, $V_{GS}$ = 0V<br>f = 1.0 MHz | - | 415 | - | pF |
| Output Capacitance | $C_{oss}$ | | - | 223 | - | pF |
| Reverse Transfer Capacitance | $C_{rss}$ | | - | 87 | - | pF |
| **Source-Drain Diode** | | | | | | |
| Max. Diode Forward Current | $I_S$ | | - | - | -3.0 | A |
| Diode Forward Voltage | $V_{SD}$ | $I_S$ = -1.0A, $V_{GS}$ = 0V | - | - | -1.2 | V |

■ TYPICAL CHARACTERISTICS

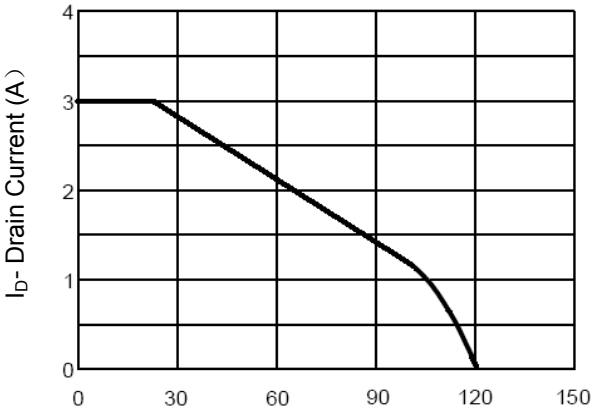
**Figure 1:Switching Test Circuit**




$T_J$-Junction Temperature(℃)

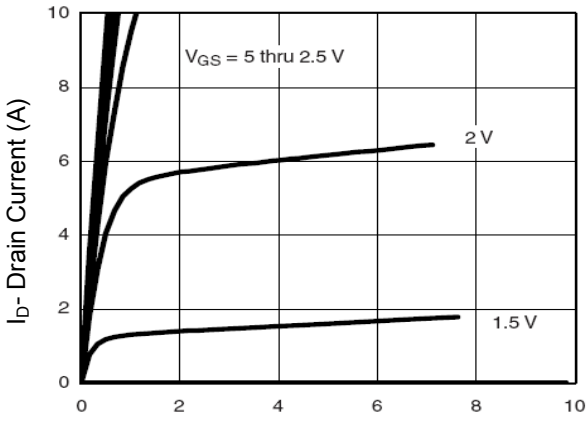
**Figure 3 Power Dissipation**

**Figure 2:Switching Waveforms**



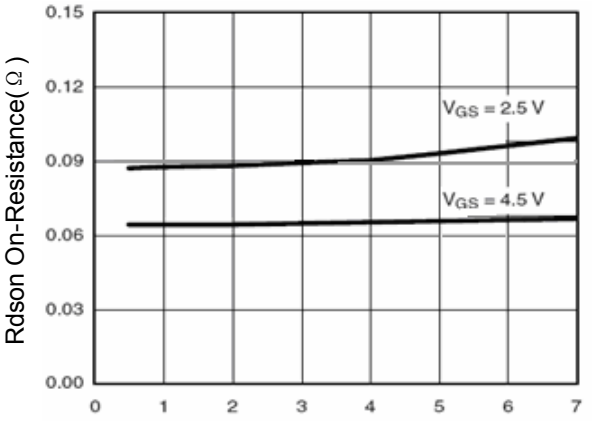

$T_J$-Junction Temperature(℃)

**Figure 4 Drain Current**



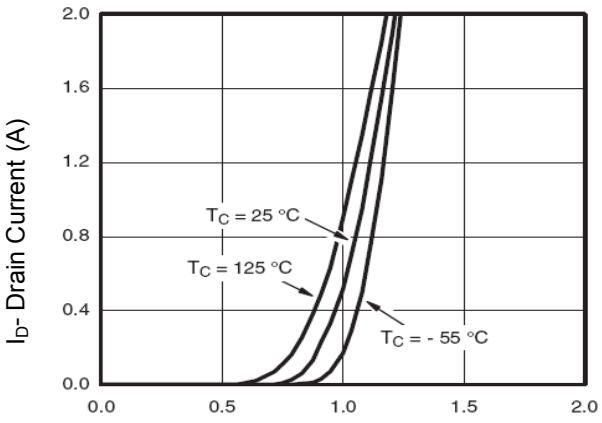

Vds Drain-Source Voltage (V)

**Figure 5 Output CHARACTERISTICS**



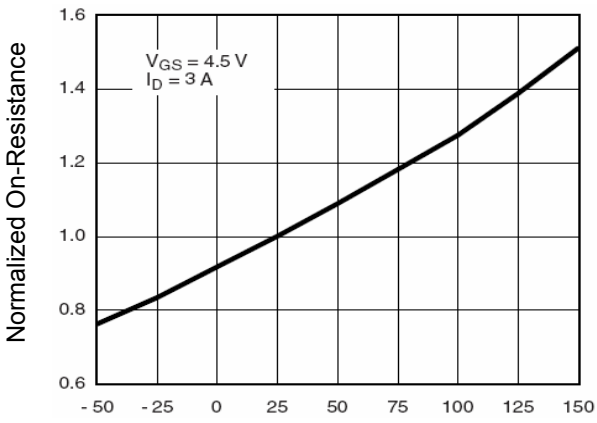

$I_D$- Drain Current (A)

**Figure 6 Drain-Source On-Resistance**




Vgs Gate-Source Voltage (V)

**Figure 7 Transfer Characteristics**




$T_J$-Junction Temperature(℃)

**Figure 8 Drain-Source On-Resistance**

■ TYPICAL CHARACTERISTICS(Cont.)

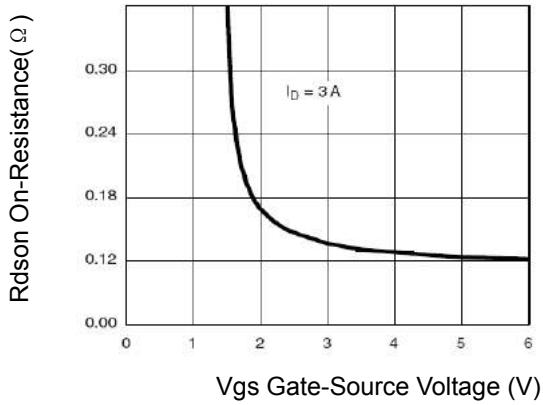



**Figure 9 Rdson vs Vgs**

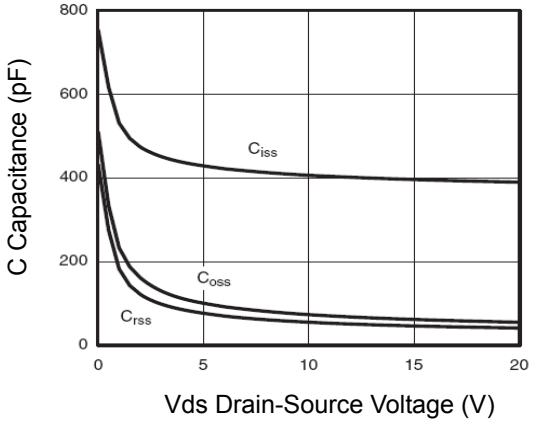



**Figure 10 Capacitance vs Vds**

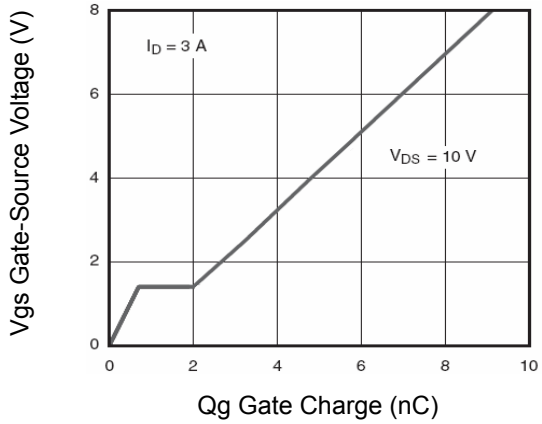



**Figure 11 Gate Charge**

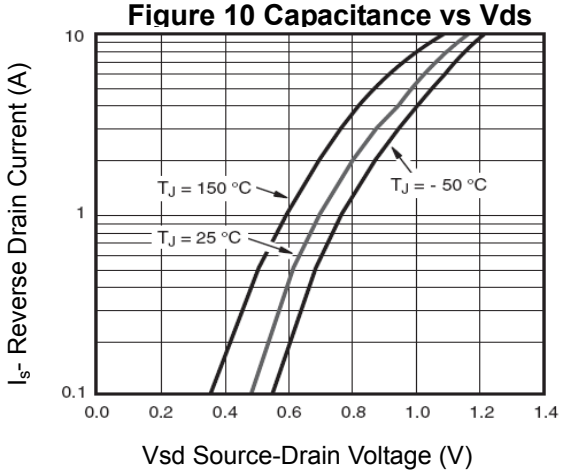



**Figure 12 Source- Drain Diode Forward**

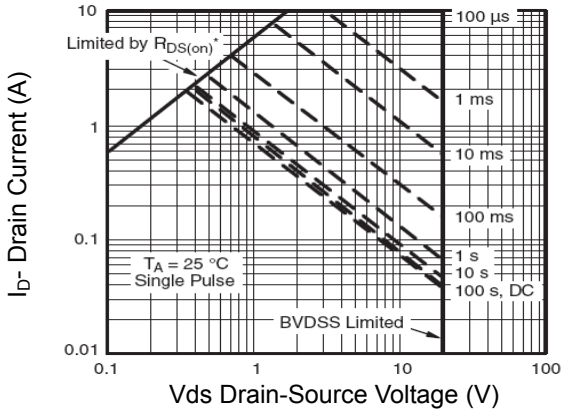



**Figure 13 Safe Operation Area**

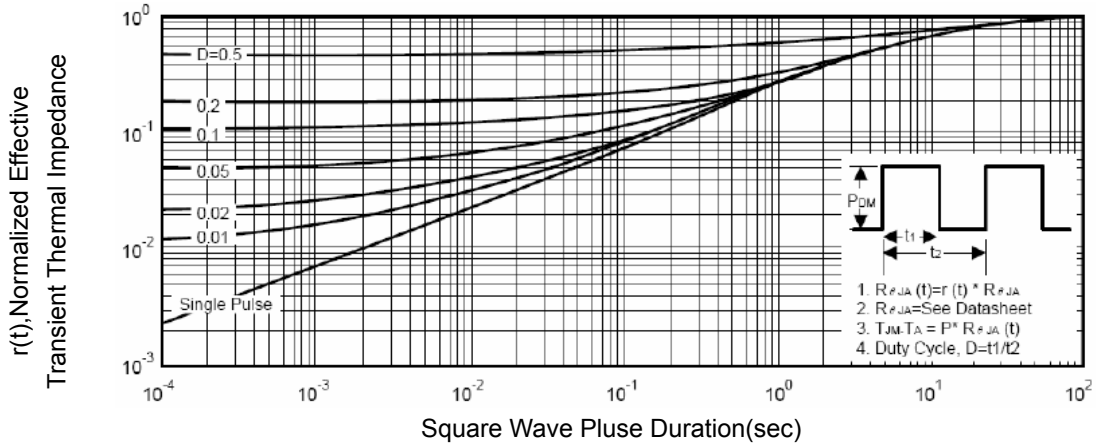
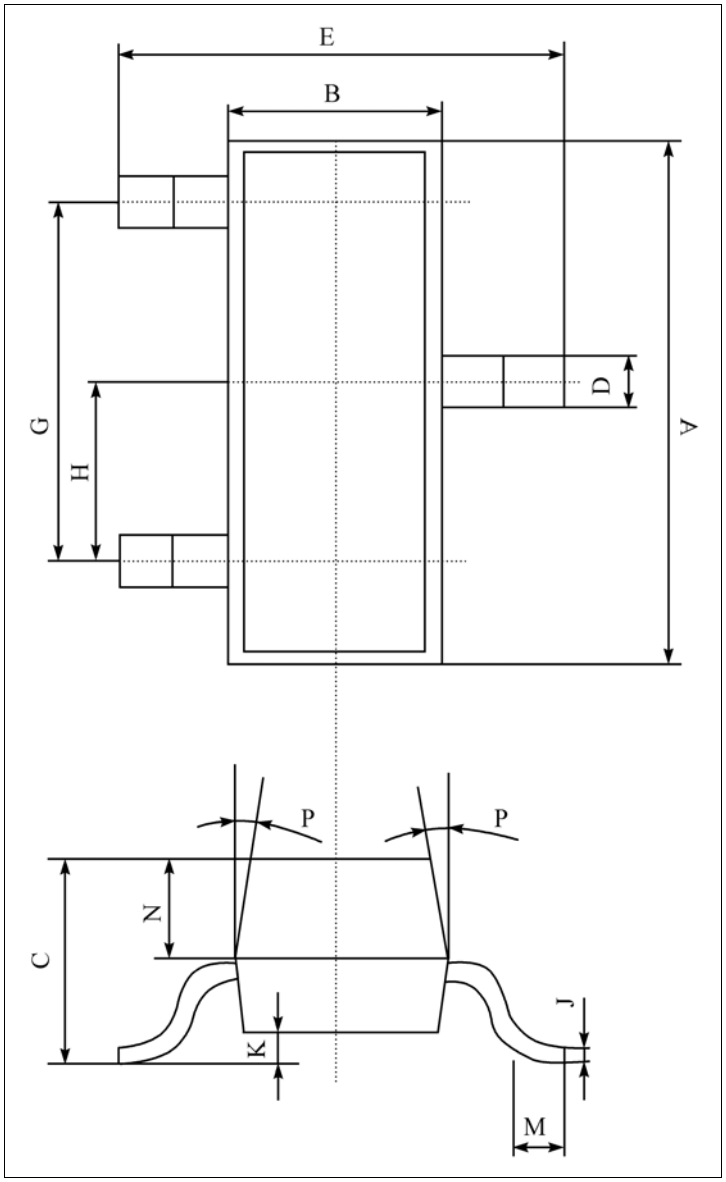



**Figure 14 Normalized Maximum Transient Thermal Impedance**

■SOT-23-3L PACKAGE OUTLINE DIMENSIONS



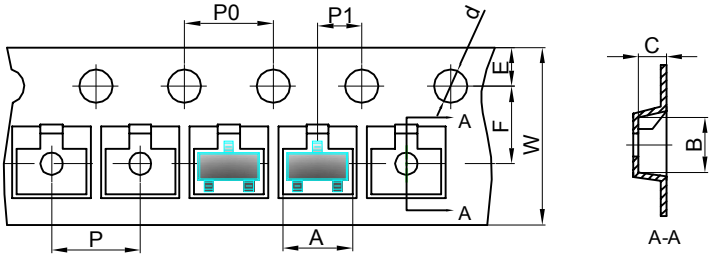

单位（UNIT）：mm

| 序号 | 数值及公差 |
|---|---|
| A | 2.90±0.10 |
| B | 1.30±0.10 |
| C | 1.00±0.10 |
| D | 0.40±0.10 |
| E | 2.40±0.20 |
| G | 1.90±0.10 |
| H | 0.95±0.05 |
| J | 0.13±0.05 |
| K | 0.00-0.10 |
| M | ≥0.20 |
| N | 0.60±0.10 |
| P | 7±2° |

Packing
SOT-23 包装规格
SMD片式表面贴封装
包装方式: 载带卷盘包装
Tape & Reel, 3Kpcs/Reel
每卷数量3000只（3Kpcs/Reel）
每盒数量45000只（45Kpcs/BOX）
每箱数量180000只（180Kpcs/Cartons）

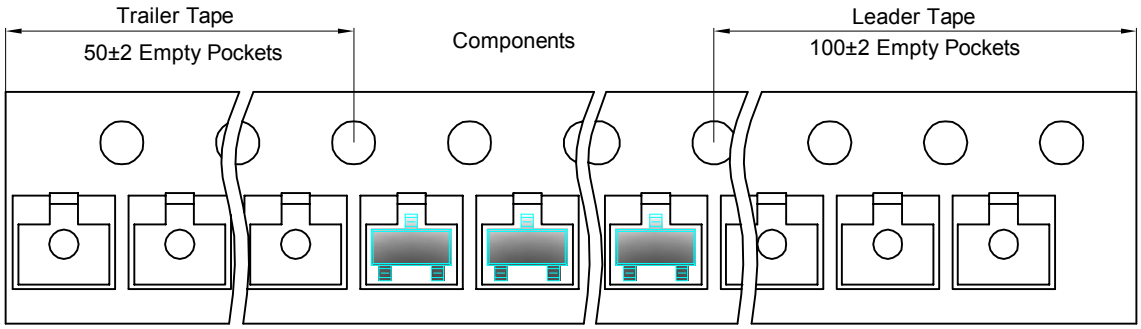
# SOT-23 Tape and reel

## SOT-23 Embossed Carrier Tape

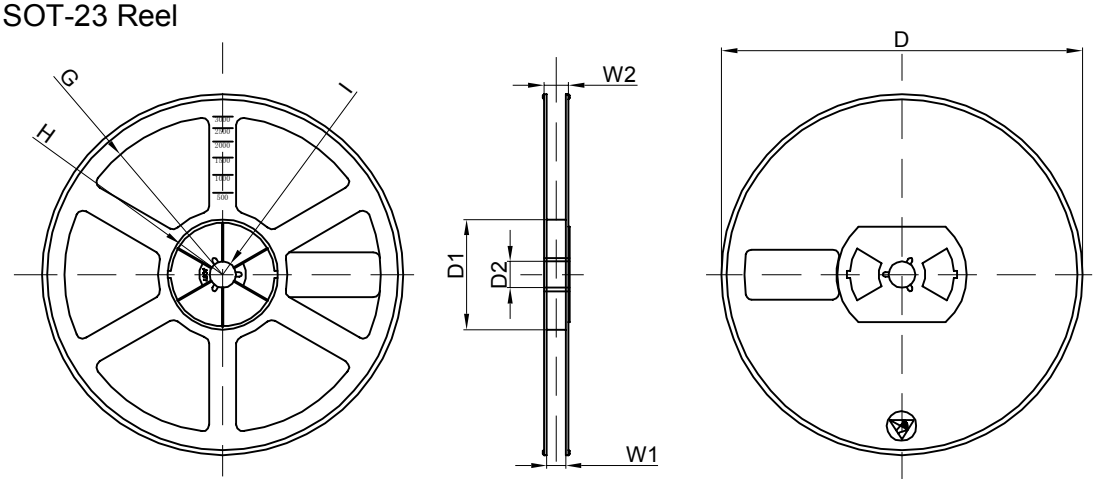



| Dimensions are in millimeter | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Pkg type | A | B | C | d | E | F | P0 | P | P1 | W |
| SOT-23 | 3.15 | 2.77 | 1.22 | Ø1.50 | 1.75 | 3.50 | 4.00 | 4.00 | 2.00 | 8.00 |

## SOT-23 Tape Leader and Trailer




## SOT-23 Reel




| Dimensions are in millimeter | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Reel Option | D | D1 | D2 | G | H | I | W1 | W2 |
| 7"Dia | Ø178.00 | 54.40 | 13.00 | R78.00 | R25.60 | R6.50 | 9.50 | 12.30 |

| REEL | Reel Size | Box | Box Size(mm) | Carton | Carton Size(mm) | G.W.(kg) |
|---|---|---|---|---|---|---|
| 3000 pcs | 7 inch | 45,000 pcs | 192×192×193 | 180,000 pcs | 404×404×214 | |