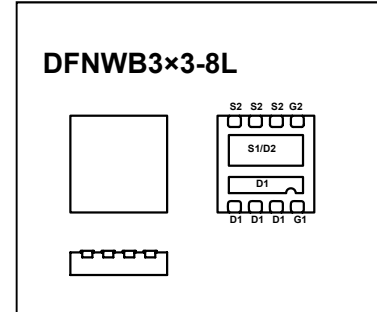




**JIANGSU CHANGJING ELECTRONICS TECHNOLOGY CO., LTD.**  
**DFNWB3×3-8L Plastic-Encapsulate MOSFETS**

**CJBM3020 N-Channel Power MOSFET**

|               |                  |       |
|---------------|------------------|-------|
| $V_{(BR)DSS}$ | $R_{DS(on)}$ TYP | $I_D$ |
| 30V           | 8.8mΩ@10V        | 20A   |
|               | 15mΩ@4.5V        |       |



**DESCRIPTION**

The CJBM3020 uses advanced trench technology and design to provide excellent  $R_{DS(ON)}$  with low gate charge. It can be used in a wide variety of applications

**FEATURES**

- Battery switch
- Load switch
- High density cell design for ultra low  $R_{DS(ON)}$
- Fully characterized avalanche voltage and current
- Excellent package for good heat dissipation
- Special process technology for high ESD capability

**APPLICATIONS**

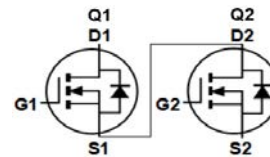
- SMPS and general purpose applications
- Hard switched and high frequency circuits
- Uninterruptible Power Supply

**MARKING**



BM3020=Part No. Solid  
 dot=Pin1 indicator  
 XX=Code

**EQUIVALENT CIRCUIT**



**MAXIMUM RATINGS (  $T_a=25^{\circ}C$  unless otherwise noted )**

| Parameter  | Symbol         | Limit    | Unit |
|--|----------------|----------|------|
| Drain-Source Voltage                             | $V_{DS}$       | 30       | V    |
| Gate-Source Voltage                              | $V_{GS}$       | ±20      | V    |
| Continuous Drain Current                         | $I_D^{①}$      | 20       | A    |
| Pulsed Drain Current                             | $I_{DM}^{②}$   | 80       | A    |
| Single Pulsed Avalanche Energy                   | $E_{AS}^{③}$   | 48       | mJ   |
| Power Dissipation                                | $P_D^{①}$      | 24.5     | W    |
| Operating Junction and Storage Temperature Range | $T_J, T_{stg}$ | -55~+150 | °C   |

**Thermal Characteristics**

| Parameter  | Symbol              | Value |      | Unit |
|--|---------------------|-------|------|------|
|  |                     | Typ   | Max  |      |
| Thermal Resistance from Junction to Case                     | $R_{\theta JC}$     | 3.4   | 5.1  | °C/W |
| Thermal Resistance from Junction to Ambient ( $t \leq 10s$ ) | $R_{\theta JA}^{⑥}$ | 56    | 83.3 | °C/W |

# MOSFET ELECTRICAL CHARACTERISTICS

$T_a=25^\circ\text{C}$  unless otherwise specified

| Parameter                                       | Symbol                | Test Condition  | Min | Typ | Max       | Unit      |
|---|-----------------------|---|-----|-----|-----------|-----------|
| <b>Off characteristics</b>                      |                       |   |     |     |           |           |
| Drain-source breakdown voltage                  | $V_{(BR)DSS}$         | $V_{GS} = 0V, I_D = 250\mu A$   | 30  |     |           | V         |
| Zero gate voltage drain current                 | $I_{DSS}$             | $V_{DS} = 24V, V_{GS} = 0V$   |     |     | 1         | $\mu A$   |
| Gate-body leakage current                       | $I_{GSS}$             | $V_{DS} = 0V, V_{GS} = \pm 20V$                                       |     |     | $\pm 100$ | nA        |
| <b>On characteristics</b> <sup>④</sup>          |                       |   |     |     |           |           |
| Gate-threshold voltage                          | $V_{GS(th)}$          | $V_{DS} = V_{GS}, I_D = 250\mu A$                                     | 1.0 | 1.6 | 3.0       | V         |
| Static drain-source on-state resistance         | $R_{DS(on)}$          | $V_{GS} = 10V, I_D = 12A$   |     | 8.8 | 14        | $m\Omega$ |
|   |                       | $V_{GS} = 4.5V, I_D = 10A$  |     | 15  | 20        | $m\Omega$ |
| Forward transconductance                        | $g_{FS}$              | $V_{DS} = 5V, I_D = 10A$  |     | 20  |           | S         |
| <b>Dynamic characteristics</b> <sup>④ ⑤</sup>   |                       |   |     |     |           |           |
| Input capacitance                               | $C_{iss}$             | $V_{DS} = 15V, V_{GS} = 0V,$<br>$f = 1MHz$                            |     | 999 |           | pF        |
| Output capacitance                              | $C_{oss}$             |   |     | 145 |           |           |
| Reverse transfer capacitance                    | $C_{rss}$             |   |     | 132 |           |           |
| <b>Switching characteristics</b> <sup>④ ⑤</sup> |                       |   |     |     |           |           |
| Total gate charge                               | $Q_g$                 | $V_{DS} = 15V,$<br>$V_{GS} = 10V, I_D = 14A$                          |     | 15  |           | nC        |
| Gate-source charge                              | $Q_{gs}$              |   |     | 2.6 |           |           |
| Gate-drain charge                               | $Q_{gd}$              |   |     | 5.3 |           |           |
| Turn-on delay time                              | $t_{d(on)}$           | $V_{DD} = 15V, V_{GS} = 10V,$<br>$R_L = 1.2\Omega, R_{GEN} = 3\Omega$ |     | 6.2 |           | ns        |
| Turn-on rise time                               | $t_r$                 |   |     | 5.3 |           |           |
| Turn-off delay time                             | $t_{d(off)}$          |   |     | 43  |           |           |
| Turn-off fall time                              | $t_f$                 |   |     | 7.1 |           |           |
| <b>Drain-Source Diode Characteristics</b>       |                       |   |     |     |           |           |
| Drain-source diode forward voltage              | $V_{SD}$ <sup>④</sup> | $V_{GS} = 0V, I_S = 10A$  |     |     | 1.2       | V         |
| Continuous drain-source diode forward current   | $I_S$ <sup>①</sup>    |   |     |     | 20        | A         |

Notes:

1.  $T_C=25^\circ\text{C}$  Limited only by maximum temperature allowed.

2.  $P_W \leq 10\mu s$ , Duty cycle  $\leq 1\%$ .

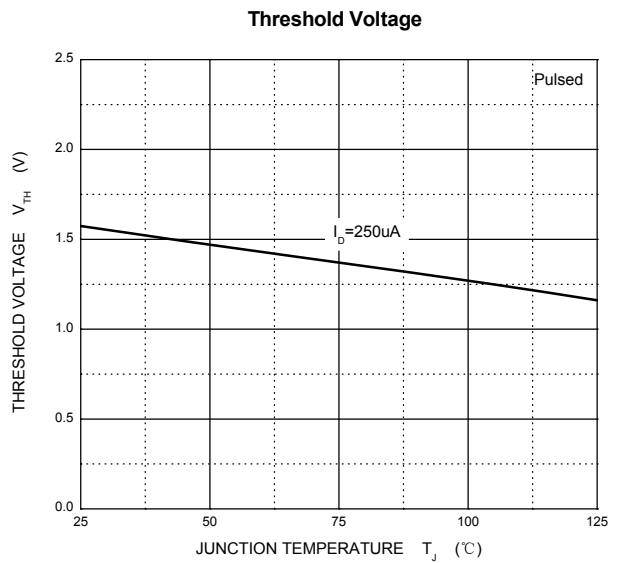
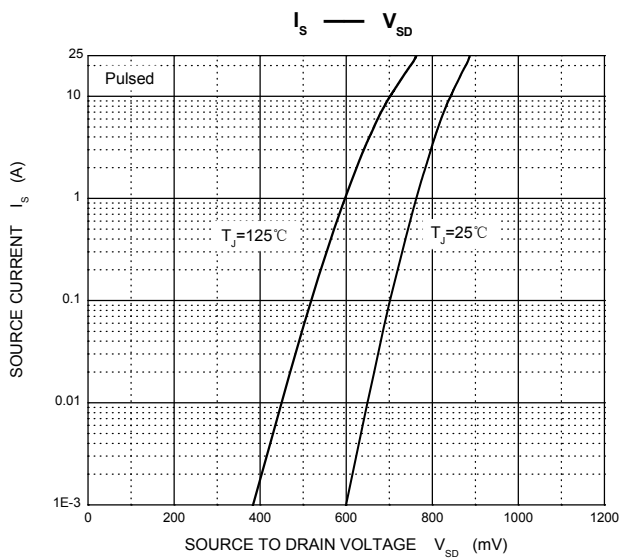
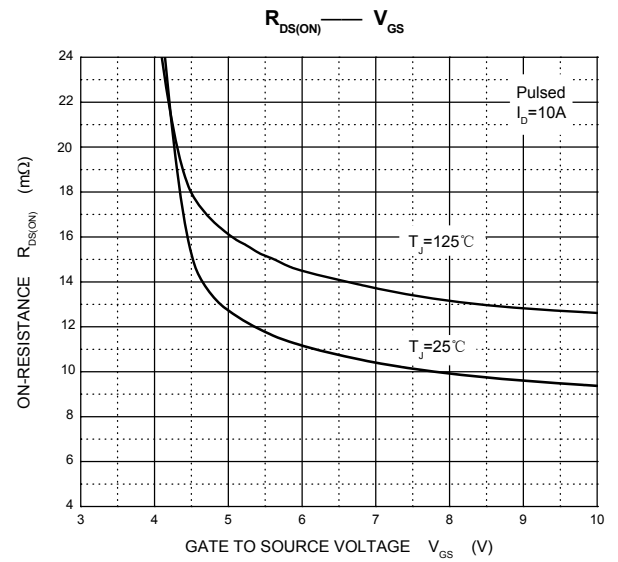
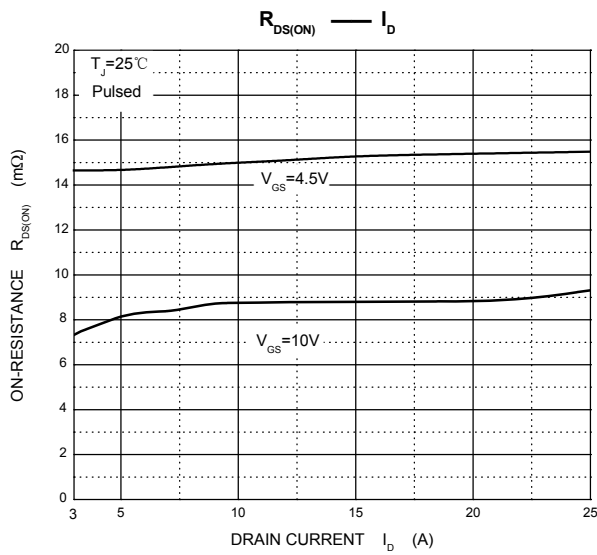
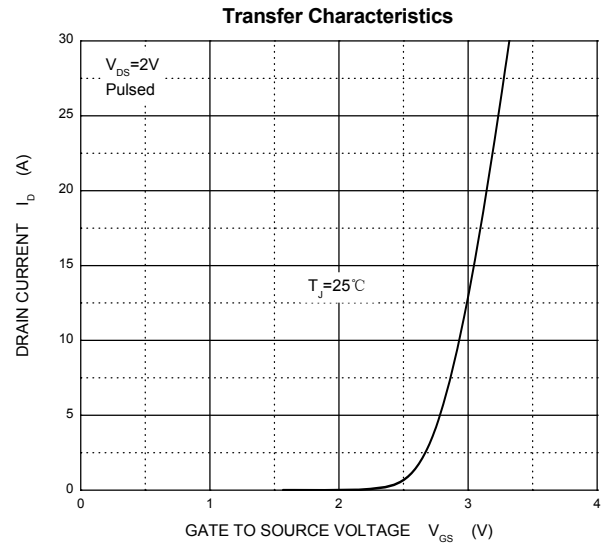
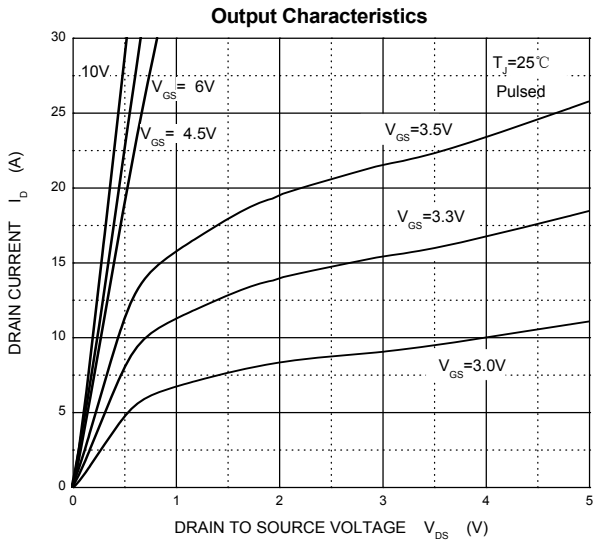
3. EAS condition:  $V_{DD} = 15V, V_{GS} = 10V, L = 0.1mH, R_g = 25\Omega$  Starting  $T_J = 25^\circ\text{C}$ .

4. Pulse Test : Pulse Width  $\leq 300\mu s$ , duty cycle  $\leq 2\%$ .

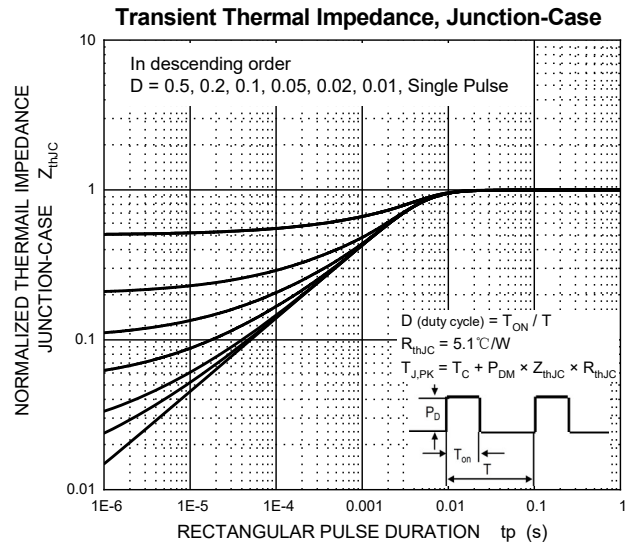
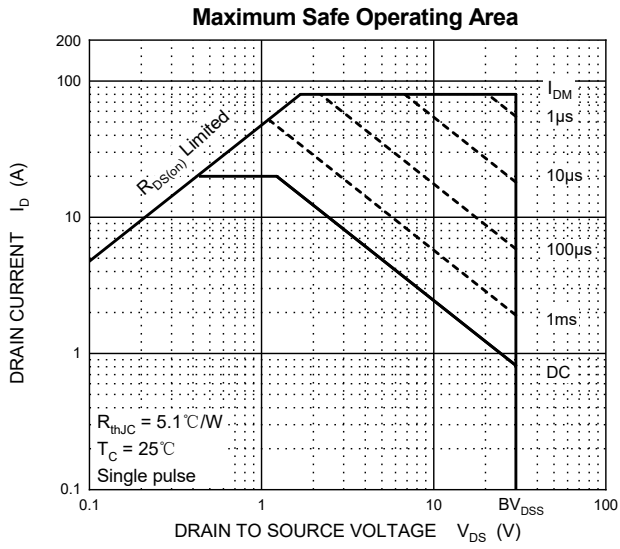
5. Guaranteed by design, not subject to production.

6. The value of  $R_{\theta JA}$  is measured with the device mounted on 1 in<sup>2</sup> FR-4 board with 2oz. Copper, in a still air environment with  $T_a = 25^\circ\text{C}$ .

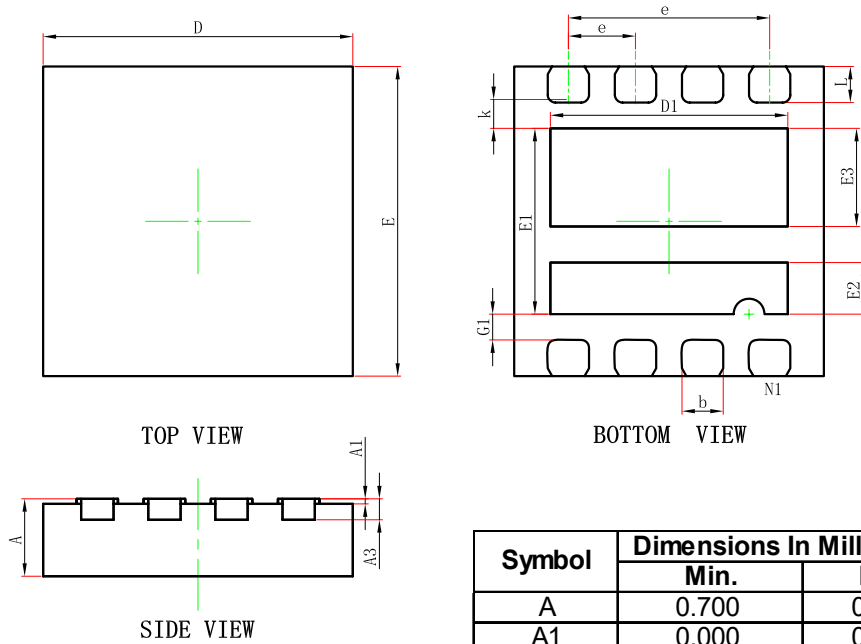
# Typical Characteristics



# Typical Characteristics



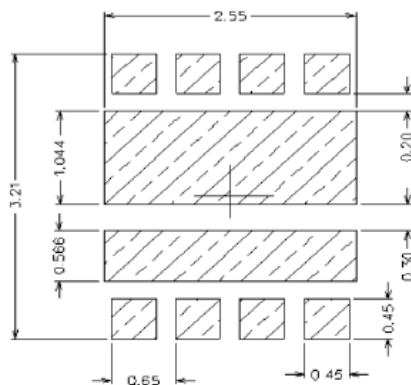
## DFNWB3×3-8L-E Package Outline Dimensions



| Symbol | Dimensions In Millimeters |       | Dimensions In Inches |       |
|--------|---------------------------|-------|----------------------|-------|
|        | Min.                      | Max.  | Min.                 | Max.  |
| A      | 0.700                     | 0.800 | 0.028                | 0.031 |
| A1     | 0.000                     | 0.050 | 0.000                | 0.002 |
| A3     | 0.203REF.                 |       | 0.008REF.            |       |
| D      | 2.950                     | 3.050 | 0.116                | 0.120 |
| E      | 2.950                     | 3.050 | 0.116                | 0.120 |
| D1     | 2.250                     | 2.350 | 0.089                | 0.093 |
| E1     | 1.700                     | 1.900 | 0.067                | 0.075 |
| E2     | 0.450                     | 0.550 | 0.018                | 0.022 |
| E3     | 0.900                     | 1.000 | 0.035                | 0.039 |
| k      | 0.200                     | 0.300 | 0.008                | 0.012 |
| G1     | 0.200                     | 0.300 | 0.008                | 0.012 |
| b      | 0.350                     | 0.450 | 0.014                | 0.018 |
| e      | 0.650BSC                  |       | 0.026BSC             |       |
| e1     | 1.95BSC                   |       | 0.077BSC             |       |
| L      | 0.300                     | 0.400 | 0.012                | 0.016 |

## DFNWB3×3-8L Suggested Pad Layout

### RECOMMENDED LAND PATTERN



#### Note:

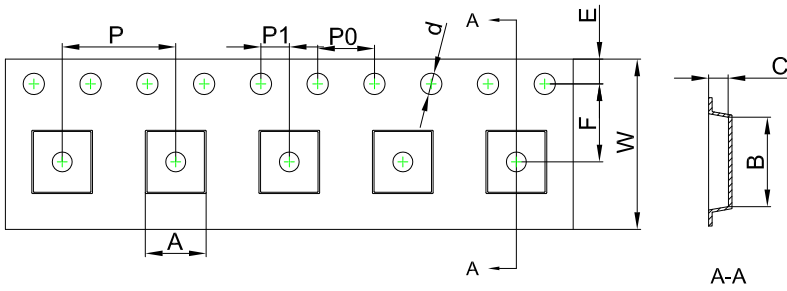
1. Controlling dimension: in millimeters.
2. General tolerance:  $\pm 0.050$  mm.
3. The pad layout is for reference purposes only.

### NOTICE

JSCJ reserves the right to make modifications, enhancements, improvements, corrections or other changes without further notice to any product herein. JSCJ does not assume any liability arising out of the application or use of any product described herein.

# DFNWB3×3-8L Tape and Reel

## DFNWB3×3-8L Embossed Carrier Tape

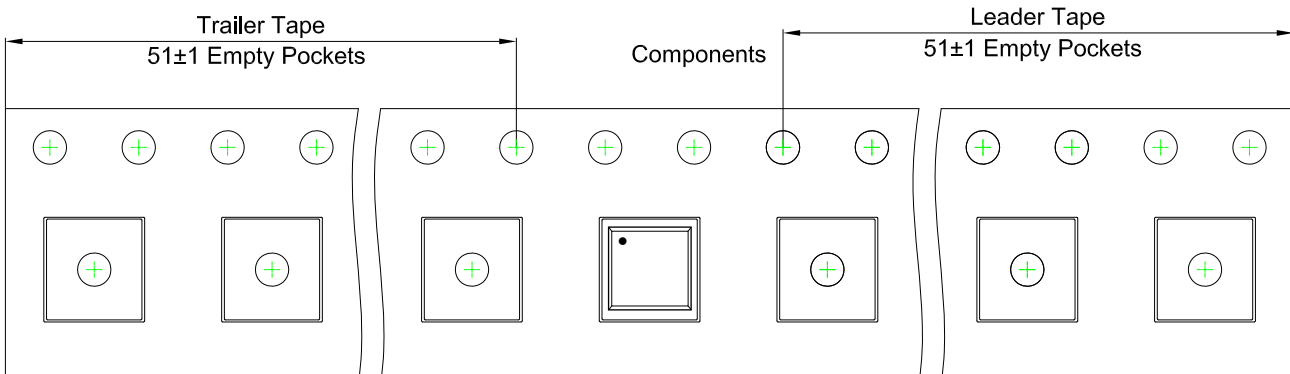


### Packaging Description:

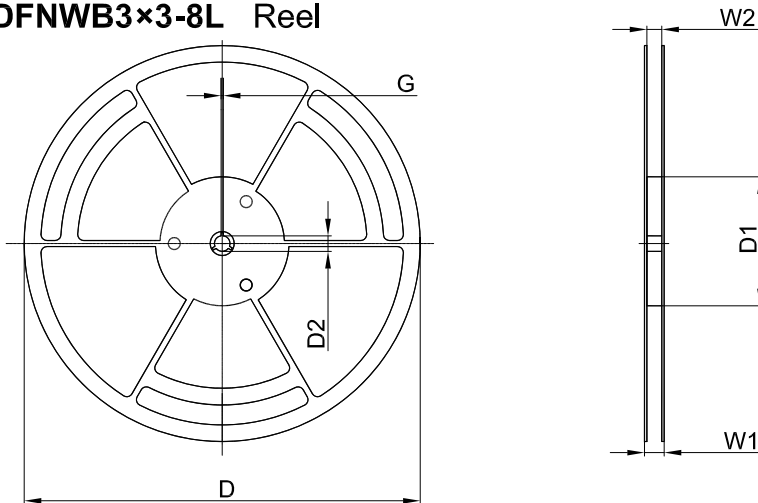
**DFNWB3x3-8L** parts are shipped in tape. The carrier tape is made from a dissipative (carbon filled) polycarbonate resin. The cover tape is a multilayer film (Heat Activated Adhesive in nature) primarily composed of polyester film, adhesive layer, sealant, and anti-static sprayed agent. These reeled parts in standard option are shipped with 5,000 units per 13" or 33.0 cm diameter reel. The reels are clear in color and is made of polystyrene plastic (anti-static coated).

| Dimensions are in millimeter |      |      |      |       |      |      |      |      |      |       |
|------------------------------|------|------|------|-------|------|------|------|------|------|-------|
| Pkg type                     | A    | B    | C    | d     | E    | F    | P0   | P    | P1   | W     |
| <b>DFNWB3×3-8L</b>           | 3.35 | 3.35 | 1.13 | Ø1.50 | 1.75 | 5.50 | 4.00 | 8.00 | 2.00 | 12.00 |

## DFNWB3×3-8L Tape Leader and Trailer



## DFNWB3×3-8L Reel



| Dimensions are in millimeter |         |        |       |      |       |       |
|------------------------------|---------|--------|-------|------|-------|-------|
| Reel Option                  | D       | D1     | D2    | G    | W1    | W2    |
| 13" Dia                      | Ø330.00 | 100.00 | 13.00 | 1.90 | 17.60 | 12.40 |

| REEL      | Reel Size | Box        | Box Size(mm) | Carton     | Carton Size(mm) |
|-----------|-----------|------------|--------------|------------|-----------------|
| 5,000 pcs | 13 inch   | 10,000 pcs | 360×360×65   | 50,000 pcs | 378×358×382     |