



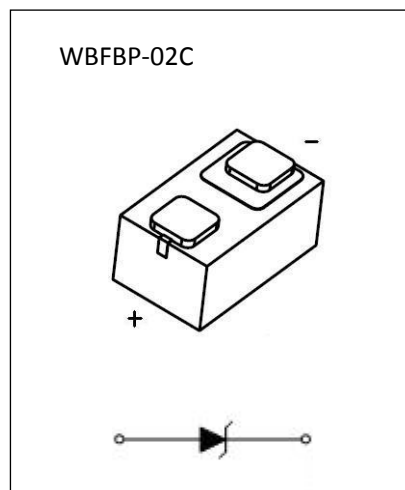
## WBFBP-02C Plastic-Encapsulate Diodes

### DW52C2V4LED02-DW52C43LED02

ZENER DIODE

#### FEATURES

- Ultra-Small Leadless Surface Mount Package
- Ideally Suited for Automated Assembly Processes



#### Maximum Ratings ( $T_a=25^{\circ}\text{C}$ unless otherwise specified)

| Characteristic                               | Symbol          | Value      | Unit                 |
|----------------------------------------------|-----------------|------------|----------------------|
| Forward Voltage (Note 1) @ $I_F=10\text{mA}$ | $V_F$           | 0.9        | V                    |
| Power Dissipation                            | $P_D$           | 100        | mW                   |
| Thermal Resistance, Junction to Ambient Air  | $R_{\theta JA}$ | 1250       | $^{\circ}\text{C/W}$ |
| Junction Temperature                         | $T_J$           | 150        | $^{\circ}\text{C}$   |
| Storage Temperature                          | $T_{STG}$       | -55 ~ +150 | $^{\circ}\text{C}$   |

#### Notes:

1. Short duration pulse test used to minimize self-heating effect.

# ELECTRICAL CHARACTERISTICS

T<sub>a</sub>=25°C unless otherwise specified

| Type Number    | Marking Code | Zener Voltage Range (Note1)     |        |        |                 | Maximum Zener Impedance (Note 2) |                                  |                 | Maximum Reverse Current (Note1) |                | Typical Temperature Coefficient @I <sub>ZTC</sub> mV/°C |      | Test Current I <sub>ZTC</sub> |
|----------------|--------------|---------------------------------|--------|--------|-----------------|----------------------------------|----------------------------------|-----------------|---------------------------------|----------------|---------------------------------------------------------|------|-------------------------------|
|                |              | V <sub>Z</sub> @I <sub>ZT</sub> |        |        | I <sub>ZT</sub> | Z <sub>ZT</sub> @I <sub>ZT</sub> | Z <sub>ZK</sub> @I <sub>ZK</sub> | I <sub>ZK</sub> | I <sub>R</sub>                  | V <sub>R</sub> |                                                         |      |                               |
|                |              | Nom(V)                          | Min(V) | Max(V) | mA              | Ω                                |                                  | mA              | uA                              | V              | Min                                                     | Max  | mA                            |
| DW52C2V4LED02  | WX           | 2.4                             | 2.2    | 2.6    | 5               | 100                              | 600                              | 1.0             | 50                              | 1.0            | -3.5                                                    | 0    | 5                             |
| DW52C2V7LED02  | W1           | 2.7                             | 2.5    | 2.9    | 5               | 100                              | 600                              | 1.0             | 20                              | 1.0            | -3.5                                                    | 0    | 5                             |
| DW52C3V0LED02  | W2           | 3.0                             | 2.8    | 3.2    | 5               | 95                               | 600                              | 1.0             | 10                              | 1.0            | -3.5                                                    | 0    | 5                             |
| DW52C3V3LED02  | W3           | 3.3                             | 3.1    | 3.5    | 5               | 95                               | 600                              | 1.0             | 5                               | 1.0            | -3.5                                                    | 0    | 5                             |
| DW52C3V6LED02  | W4           | 3.6                             | 3.4    | 3.8    | 5               | 90                               | 600                              | 1.0             | 5                               | 1.0            | -3.5                                                    | 0    | 5                             |
| DW52C3V9LED02  | W5           | 3.9                             | 3.7    | 4.10   | 5               | 90                               | 600                              | 1.0             | 3                               | 1.0            | -3.5                                                    | 0    | 5                             |
| DW52C4V3 LED02 | W6           | 4.3                             | 4.0    | 4.6    | 5               | 90                               | 600                              | 1.0             | 3                               | 1.0            | -3.5                                                    | 0    | 5                             |
| DW52C4V7 LED02 | W7           | 4.7                             | 4.4    | 5.0    | 5               | 80                               | 500                              | 1.0             | 3                               | 2.0            | -3.5                                                    | 0.2  | 5                             |
| DW52C5V1 LED02 | 9Y           | 5.1                             | 4.8    | 5.4    | 5               | 60                               | 480                              | 1.0             | 2                               | 2.0            | -2.7                                                    | 1.2  | 5                             |
| DW52C5V6 LED02 | 9A           | 5.6                             | 5.2    | 6.0    | 5               | 40                               | 400                              | 1.0             | 1                               | 2.0            | -2.0                                                    | 2.5  | 5                             |
| DW52C6V2 LED02 | 9B           | 6.2                             | 5.8    | 6.6    | 5               | 10                               | 150                              | 1.0             | 3                               | 4.0            | 0.4                                                     | 3.7  | 5                             |
| DW52C6V8 LED02 | 9C           | 6.8                             | 6.4    | 7.2    | 5               | 15                               | 80                               | 1.0             | 2                               | 4.0            | 1.2                                                     | 4.5  | 5                             |
| DW52C7V5 LED02 | 9D           | 7.5                             | 7.0    | 7.9    | 5               | 15                               | 80                               | 1.0             | 1                               | 5.0            | 2.5                                                     | 5.3  | 5                             |
| DW52C8V2 LED02 | 9E           | 8.2                             | 7.7    | 8.7    | 5               | 15                               | 80                               | 1.0             | 0.7                             | 5.0            | 3.2                                                     | 6.2  | 5                             |
| DW52C9V1 LED02 | 9F           | 9.1                             | 8.5    | 9.6    | 5               | 15                               | 100                              | 1.0             | 0.5                             | 6.0            | 3.8                                                     | 7.0  | 5                             |
| DW52C10 LED02  | 9G           | 10                              | 9.4    | 10.60  | 5               | 20                               | 150                              | 1.0             | 0.2                             | 7.0            | 4.5                                                     | 8.0  | 5                             |
| DW52C11 LED02  | 9H           | 11                              | 10.4   | 11.6   | 5               | 20                               | 150                              | 1.0             | 0.1                             | 8.0            | 5.4                                                     | 9.0  | 5                             |
| DW52C12 LED02  | 9J           | 12                              | 11.40  | 12.70  | 5               | 25                               | 150                              | 1.0             | 0.1                             | 8.0            | 6.0                                                     | 10.0 | 5                             |
| DW52C13 LED02  | 9K           | 13                              | 12.4   | 14.1   | 5               | 30                               | 170                              | 1.0             | 0.1                             | 8.0            | 7.0                                                     | 11.0 | 5                             |
| DW52C15 LED02  | 9L           | 15                              | 13.8   | 15.6   | 5               | 30                               | 200                              | 1.0             | 0.1                             | 10.5           | 9.2                                                     | 13.0 | 5                             |
| DW52C16 LED02  | 9M           | 16                              | 15.30  | 17.1   | 5               | 40                               | 200                              | 1.0             | 0.1                             | 11.2           | 10.4                                                    | 14.0 | 5                             |
| DW52C18 LED02  | 9N           | 18                              | 16.8   | 19.1   | 5               | 45                               | 225                              | 1.0             | 0.1                             | 12.6           | 12.4                                                    | 16.0 | 5                             |
| DW52C20 LED02  | 9P           | 20                              | 18.8   | 21.20  | 5               | 55                               | 225                              | 1.0             | 0.1                             | 14.0           | 14.4                                                    | 18.0 | 5                             |
| DW52C22 LED02  | 9R           | 22                              | 20.8   | 23.30  | 5               | 55                               | 250                              | 1.0             | 0.1                             | 15.4           | 16.4                                                    | 20.0 | 5                             |
| DW52C24 LED02  | 9S           | 24                              | 22.80  | 25.60  | 5               | 70                               | 250                              | 1.0             | 0.1                             | 16.8           | 18.4                                                    | 22.0 | 5                             |
| DW52C27LED02   | 9T           | 27                              | 25.1   | 28.9   | 2               | 80                               | 300                              | 0.5             | 0.1                             | 18.9           | 21.4                                                    | 25.3 | 2                             |
| DW52C30LED02   | 9U           | 30                              | 28.0   | 32.0   | 2               | 80                               | 300                              | 0.5             | 0.1                             | 21.0           | 24.4                                                    | 29.4 | 2                             |
| DW52C33LED02   | 9V           | 33                              | 31.0   | 35.0   | 2               | 80                               | 325                              | 0.5             | 0.1                             | 23.1           | 27.4                                                    | 33.4 | 2                             |
| DW52C36 LED02  | 9W           | 36                              | 34.0   | 38     | 2               | 90                               | 350                              | 0.5             | 0.1                             | 25.2           | 36.5                                                    | 45.5 | 5                             |
| DW52C39 LED02  | 9X           | 39                              | 37.0   | 41     | 2               | 130                              | 350                              | 0.5             | 0.1                             | 27.3           | 36.8                                                    | 49.8 | 5                             |
| DW52C43LED02   | 9Y           | 43                              | 40.0   | 46.0   | 5               | 100                              | 700                              | 1.0             | 0.1                             | 32             | 10.0                                                    | 12.0 | 5                             |

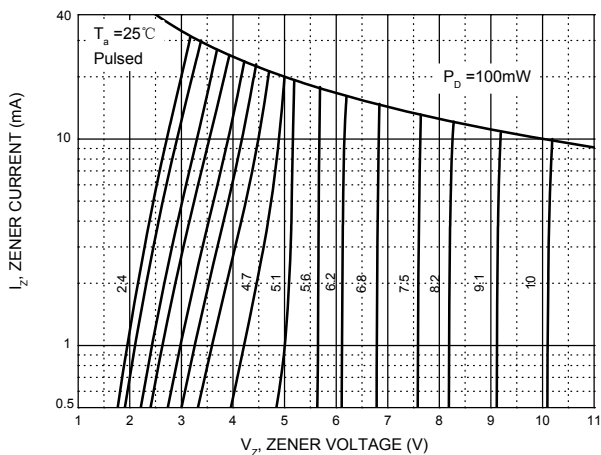
## Notes:

1.Short duration pulse test used to minimize self-heating effect.

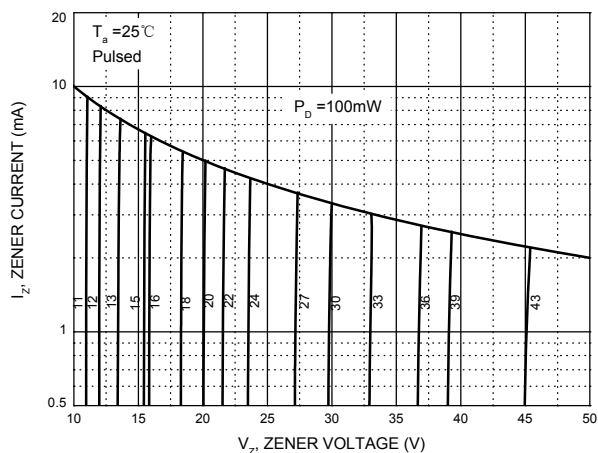
2.f=1MHz

# Typical Characteristics

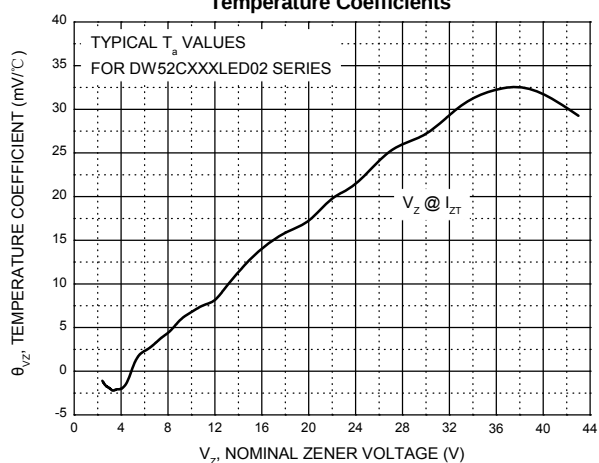
Zener Characteristics ( $V_z$  Up to 10 V)



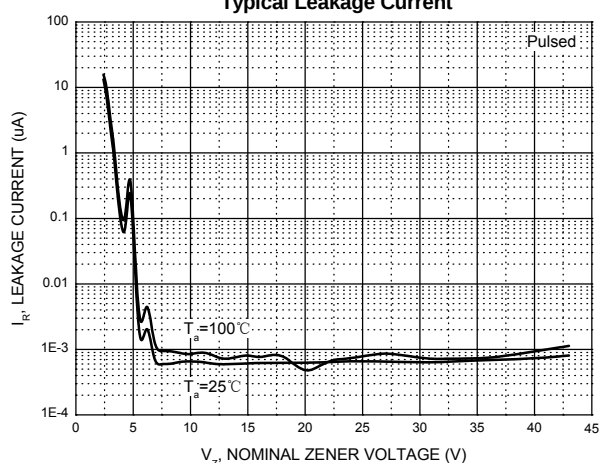
Zener Characteristics (11 V to 43 V)



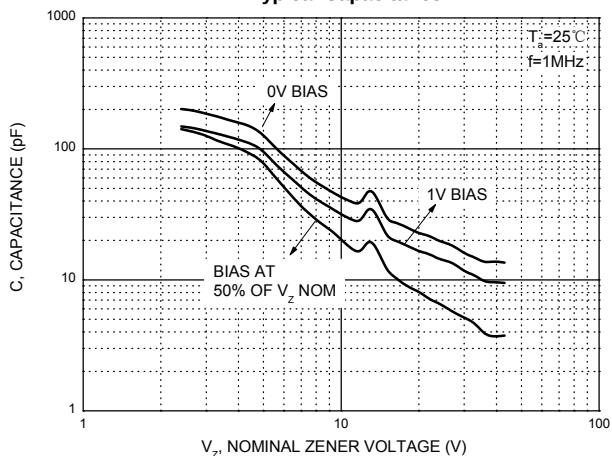
Temperature Coefficients



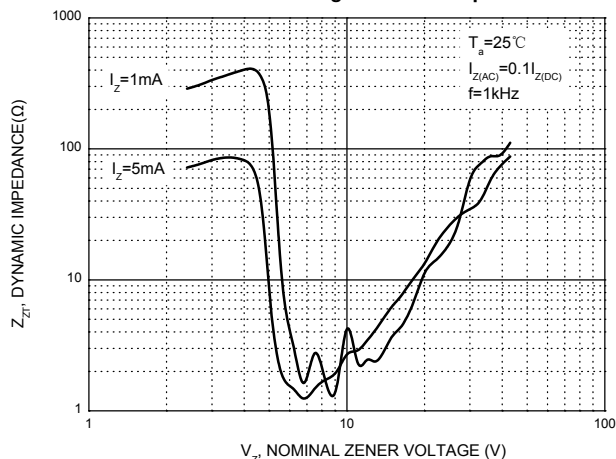
Typical Leakage Current



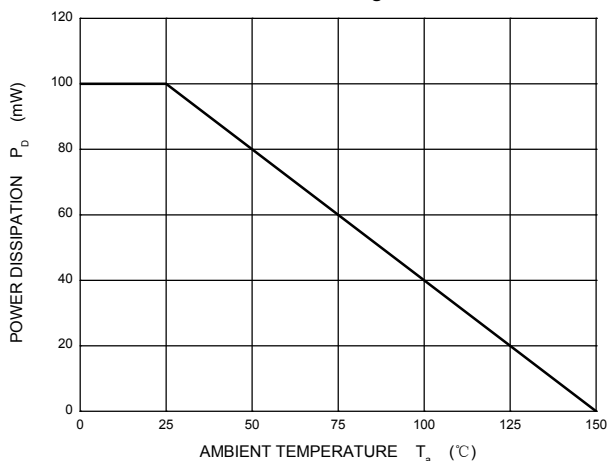
Typical Capacitance



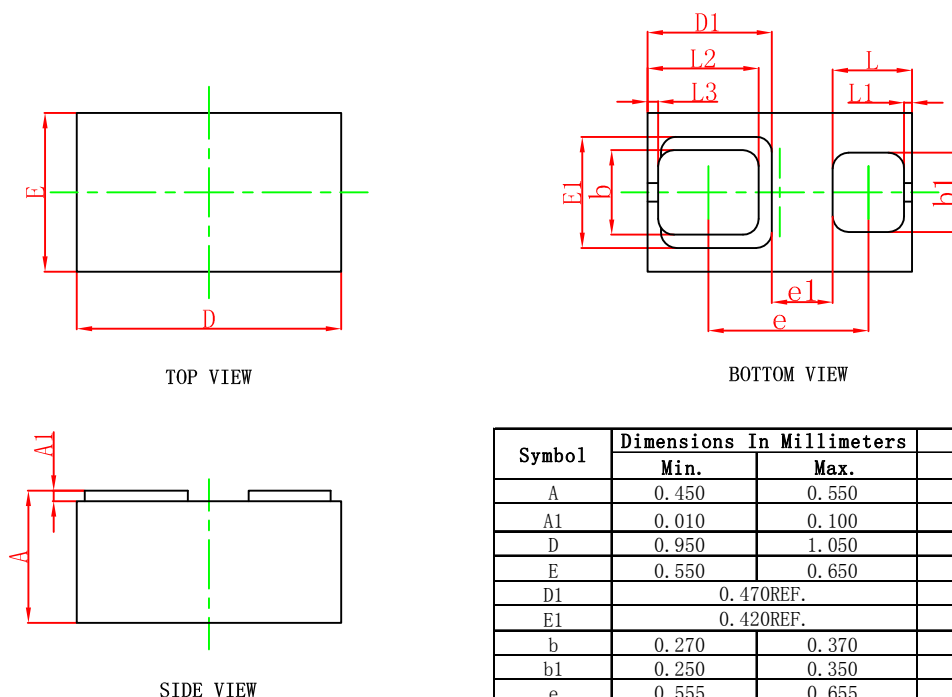
Effect of Zener Voltage on Zener Impedance



Power Derating Curve

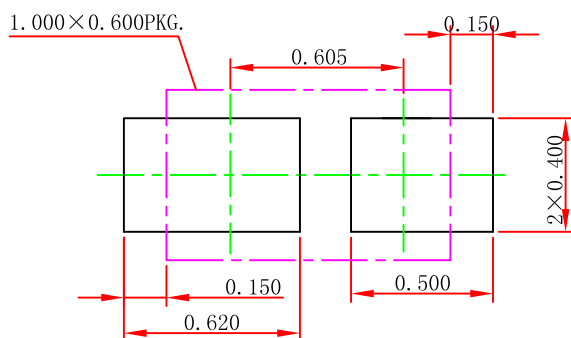


## WBFBP-02C Package Outline Dimensions



| Symbol | Dimensions In Millimeters |       | Dimensions In Inches |       |
|--------|---------------------------|-------|----------------------|-------|
|        | Min.                      | Max.  | Min.                 | Max.  |
| A      | 0.450                     | 0.550 | 0.018                | 0.022 |
| A1     | 0.010                     | 0.100 | 0.000                | 0.004 |
| D      | 0.950                     | 1.050 | 0.037                | 0.041 |
| E      | 0.550                     | 0.650 | 0.022                | 0.026 |
| D1     | 0.470REF.                 |       | 0.019REF.            |       |
| E1     | 0.420REF.                 |       | 0.017REF.            |       |
| b      | 0.270                     | 0.370 | 0.011                | 0.015 |
| b1     | 0.250                     | 0.350 | 0.010                | 0.014 |
| e      | 0.555                     | 0.655 | 0.022                | 0.026 |
| e1     | 0.230REF.                 |       | 0.009REF.            |       |
| L      | 0.250                     | 0.350 | 0.010                | 0.014 |
| L1     | 0.030REF.                 |       | 0.001REF.            |       |
| L2     | 0.370                     | 0.470 | 0.015                | 0.019 |
| L3     | 0.040REF.                 |       | 0.002REF.            |       |

## WBFBP-02C Suggested Pad Layout



### Note:

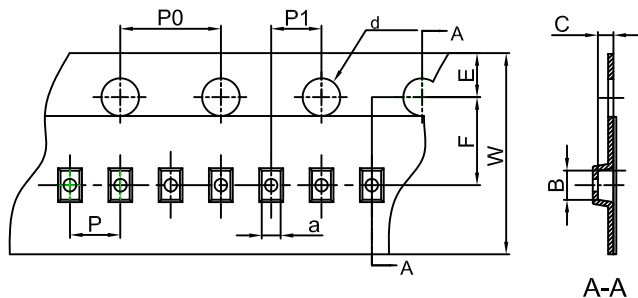
1. Controlling dimension: in millimeters.
2. General tolerance:  $\pm 0.050\text{mm}$ .
3. The pad layout is for reference purposes only.

### NOTICE

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

## DFN/FBP(1.0X0.6) Tape and Reel

### DFN/FBP(1.0×0.6) Embossed Carrier Tape

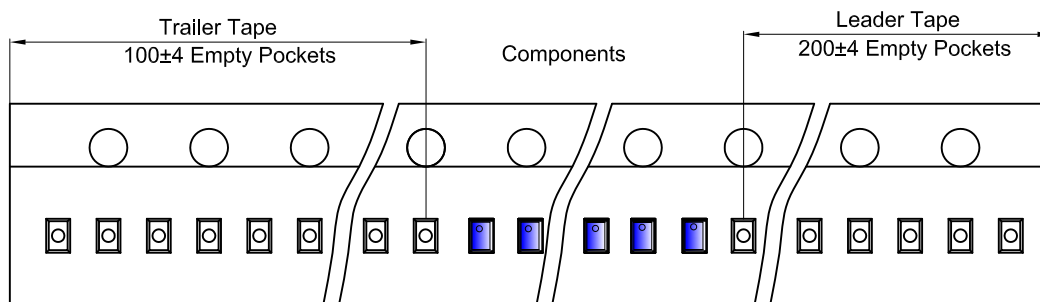


#### Packaging Description:

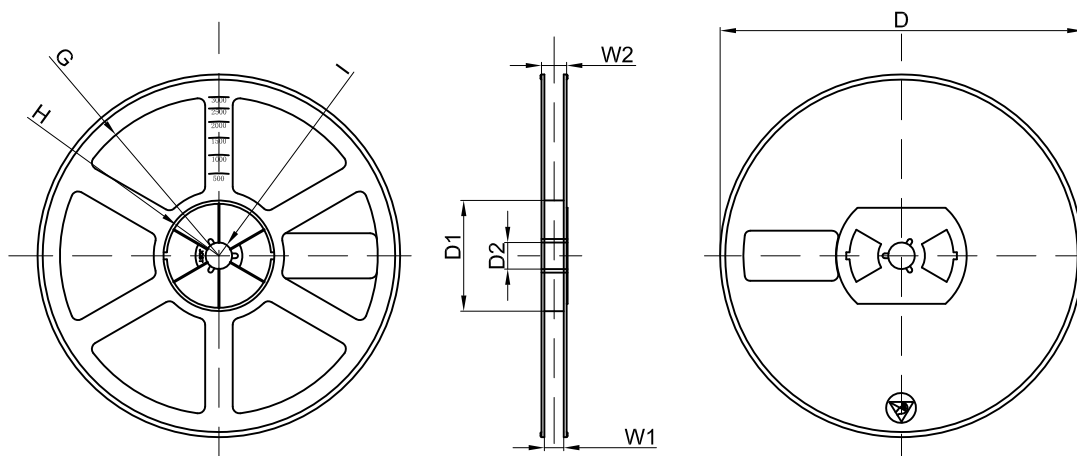
**DFN/FBP(1.0×0.6)** parts are shipped in tape. The carrier tape is made from a dissipative (carbon filled) polycarbonate resin. The cover tape is a multilayer film (Heat Activated Adhesive in nature) primarily composed of polyester film, adhesive layer, sealant, and anti-static sprayed agent. These reeled parts in standard option are shipped with 10,000 units per 7" or 17.8cm 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    |
| DFN/FBP(1.0×0.6)             | 0.66 | 1.15 | 0.66 | Ø1.50 | 1.75 | 3.50 | 4.00 | 2.00 | 2.00 | 8.00 |

### DFN/FBP(1.0×0.6) Tape Leader and Trailer



### DFN/FBP(1.0×0.6) 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) |
|-----------|-----------|-------------|--------------|-------------|-----------------|----------|
| 10000 pcs | 7 inch    | 150,000 pcs | 203×203×195  | 600,000 pcs | 438×438×220     |          |