

## PW4606P

### 30V N-Channel + P-Channel MOSFET

-7A -30V;  $R_{DS(ON)typ}=41m\Omega@-4.5V$ ,  $R_{DS(ON)typ}=29m\Omega@-10V$ .  
 6.5A30V;  $R_{DS(ON)typ}=30m\Omega@4.5V$ ,  $R_{DS(ON)typ}=23m\Omega@10V$ .

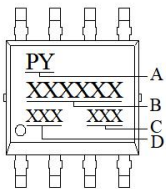
#### FEATURE

- Low drain-source ON-resistance
- High forward transfer admittance
- Low leakage current

#### Application

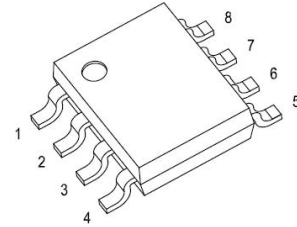
- Low voltage applications

#### MARKING:

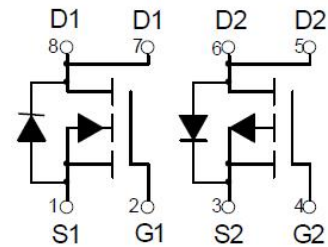


| SYMBOL | Explanation         |
|--------|---------------------|
| A      | Trademark           |
| B      | Product Name        |
| C      | Date Code           |
| D      | Product Information |

#### SOP8



#### Schematic diagram



**ABSOLUTE MAXIMUM RATINGS (T<sub>a</sub>=25°C unless otherwise noted)**

| Parameter  | Symbol           | Value     | Unit |
|--|------------------|-----------|------|
| <b>P-MOSFET</b>  |                  |           |      |
| Drain-Source Voltage                                       | V <sub>DS</sub>  | -30       | V    |
| Gate-Source Voltage  | V <sub>GS</sub>  | ±20       | V    |
| Continuous Drain Current <sup>(1)</sup>                    | I <sub>D</sub>   | -7        | A    |
| Pulsed Drain Current                                       | I <sub>DM</sub>  | -28       | A    |
| Power Dissipation  | P <sub>D</sub>   | 2.1       | W    |
| <b>N-MOSFET</b>  |                  |           |      |
| Drain-Source Voltage                                       | V <sub>DS</sub>  | 30        | V    |
| Gate-Source Voltage  | V <sub>GS</sub>  | ±20       | V    |
| Continuous Drain Current                                   | I <sub>D</sub>   | 6.5       | A    |
| Pulsed Drain Current <sup>(1)</sup>                        | I <sub>DM</sub>  | 26        | A    |
| Power Dissipation  | P <sub>D</sub>   | 2.1       | W    |
| <b>Temperature and Thermal Resistance</b>                  |                  |           |      |
| Thermal Resistance from Junction to Ambient <sup>(2)</sup> | R <sub>θJA</sub> | 59.5      | °C/W |
| Junction Temperature Range                                 | T <sub>J</sub>   | 150       | °C   |
| Storage Temperature  | T <sub>STG</sub> | -55~ +150 | °C   |

**P-CHANNEL MOSFET ELECTRICAL CHARACTERISTICS(T<sub>a</sub>=25°C unless otherwise noted)**

| Parameter                                      | Symbol               | Test Condition  | Min  | Type | Max  | Unit |
|--|----------------------|---|------|------|------|------|
| <b>STATIC CHARACTERISTICS</b>                  |                      |   |      |      |      |      |
| Drain-source breakdown voltage                 | V <sub>(BR)DSS</sub> | V <sub>GS</sub> = 0V, I <sub>D</sub> = -250μA   | -30  |      |      | V    |
| Zero gate voltage drain current                | I <sub>DSS</sub>     | V <sub>DS</sub> = -24V, V <sub>GS</sub> = 0V  |      |      | -1   | μA   |
| Gate-body leakage current                      | I <sub>GSS</sub>     | V <sub>GS</sub> = ±20V, V <sub>DS</sub> = 0V  |      |      | ±100 | nA   |
| Gate threshold voltage                         | V <sub>GS(th)</sub>  | V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = -250μA                                   | -1.0 | -1.5 | -2.5 | V    |
| Drain-source on-resistance <sup>(3)</sup>      | R <sub>DS(on)</sub>  | V <sub>GS</sub> = -10V, I <sub>D</sub> = -6.0A  |      | 29   | 35   | mΩ   |
|  |                      | V <sub>GS</sub> = -4.5V, I <sub>D</sub> = -5.0A   |      | 41   | 58   |      |
| Forward tranconductance                        | g <sub>FS</sub>      | V <sub>DS</sub> = -5V, I <sub>D</sub> = -6.0A   | 5    | 13   |      | S    |
| Diode forward voltage <sup>(3)</sup>           | V <sub>DS</sub>      | I <sub>S</sub> = -1.0A, V <sub>GS</sub> = 0V  |      |      | -1.2 | V    |
| <b>DYNAMIC CHARACTERISTICS<sup>(4)</sup></b>   |                      |   |      |      |      |      |
| Input Capacitance                              | C <sub>iss</sub>     | V <sub>DS</sub> = -15V, V <sub>GS</sub> = 0V, F = 1.0MHz                                      |      | 910  |      | pF   |
| Output Capacitance                             | C <sub>oss</sub>     |   |      | 105  |      |      |
| Reverse Transfer Capacitance                   | C <sub>rss</sub>     |   |      | 95   |      |      |
| Total gate charge                              | Q <sub>g</sub>       | V <sub>DS</sub> = -15V, I <sub>D</sub> = -6A, V <sub>GS</sub> = -4.5V                         |      | 9.5  |      | nC   |
| Gate-source charge                             | Q <sub>gs</sub>      |   |      | 2    |      |      |
| Gate-drain charge                              | Q <sub>gd</sub>      |   |      | 3    |      |      |
| <b>SWITCHING CHARACTERISTICS<sup>(4)</sup></b> |                      |   |      |      |      |      |
| Turn-on delay time                             | t <sub>d(on)</sub>   | V <sub>DD</sub> = -15V, I <sub>D</sub> = -6A<br>V <sub>GS</sub> = -10V, R <sub>GEN</sub> = 6Ω |      | 7    |      | nS   |
| Turn-on rise time                              | t <sub>r</sub>       |   |      | 3    |      |      |
| Turn-off delay time                            | t <sub>d(off)</sub>  |   |      | 20   |      |      |
| Turn-off fall time                             | t <sub>f</sub>       |   |      | 12   |      |      |

**N-CHANNEL MOSFET ELECTRICAL CHARACTERISTICS(T<sub>a</sub>=25°C unless otherwise noted)**

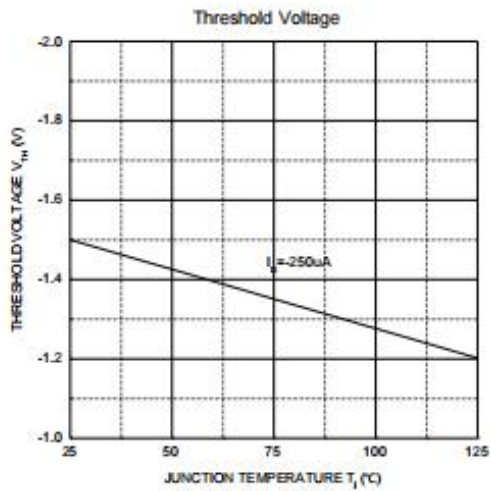
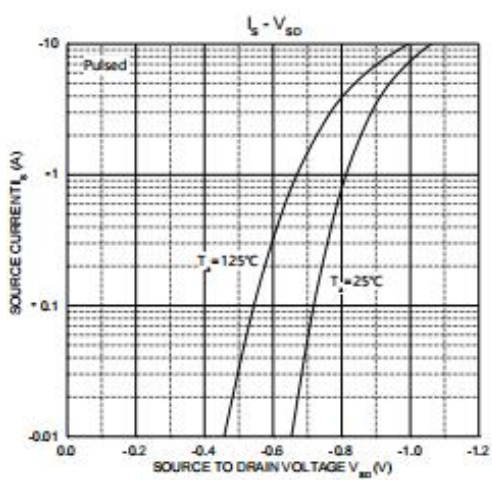
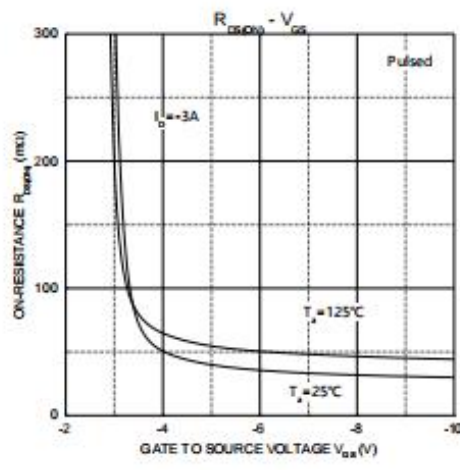
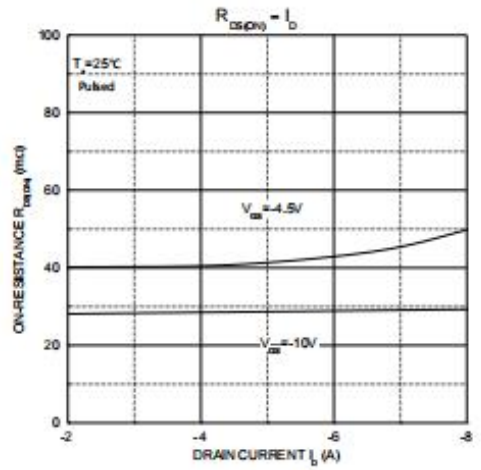
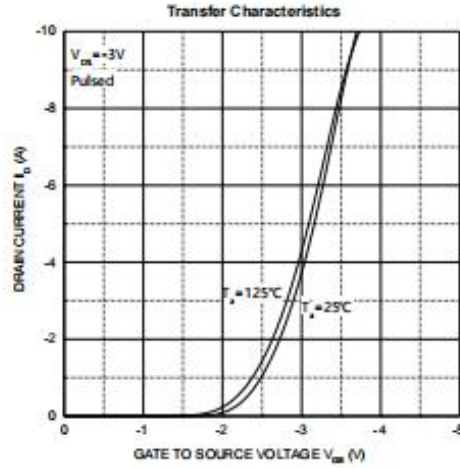
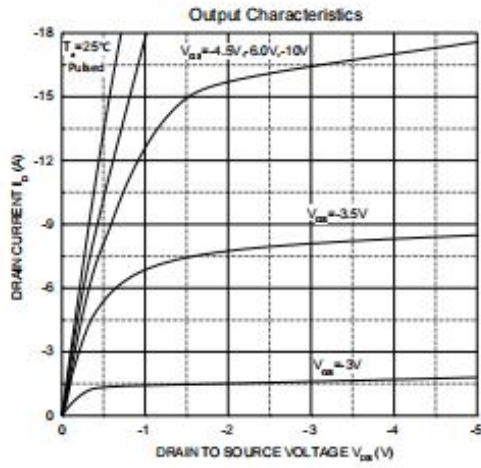
| Parameter                                      | Symbol               | Test Condition   | Min | Type | Max  | Unit |
|--|----------------------|--|-----|------|------|------|
| <b>STATIC CHARACTERISTICS</b>                  |                      |  |     |      |      |      |
| Drain-source breakdown voltage                 | V <sub>(BR)DSS</sub> | V <sub>GS</sub> = 0V, I <sub>D</sub> = 250μA   | 30  |      |      | V    |
| Zero gate voltage drain current                | I <sub>DSS</sub>     | V <sub>DS</sub> = 24V, V <sub>GS</sub> = 0V  |     |      | 1    | μA   |
| Gate-body leakage current                      | I <sub>GSS</sub>     | V <sub>GS</sub> = ±20V, V <sub>DS</sub> = 0V   |     |      | ±100 | nA   |
| Gate threshold voltage                         | V <sub>GS(th)</sub>  | V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = 250μA                                 | 1.0 | 1.5  | 2.5  | V    |
| Drain-source on-resistance <sup>(3)</sup>      | R <sub>DS(on)</sub>  | V <sub>GS</sub> = 10V, I <sub>D</sub> = 6.0A   |     | 23   | 28   | mΩ   |
|  |                      | V <sub>GS</sub> = 4.5V, I <sub>D</sub> = 5.0A  |     | 30   | 42   |      |
| Forward tranconductance                        | g <sub>FS</sub>      | V <sub>DS</sub> = 5V, I <sub>D</sub> = 6.5A  | 10  | 43   |      | S    |
| Diode forward voltage <sup>(3)</sup>           | V <sub>DS</sub>      | I <sub>S</sub> = 1.0A, V <sub>GS</sub> = 0V  |     |      | 1.2  | V    |
| <b>DYNAMIC CHARACTERISTICS<sup>(4)</sup></b>   |                      |  |     |      |      |      |
| Input Capacitance                              | C <sub>iss</sub>     | V <sub>DS</sub> = 15V, V <sub>GS</sub> = 0V, F = 1.0MHz                                    |     | 670  |      | pF   |
| Output Capacitance                             | C <sub>oss</sub>     |  |     | 65   |      |      |
| Reverse Transfer Capacitance                   | C <sub>rss</sub>     |  |     | 55   |      |      |
| Total gate charge                              | Q <sub>g</sub>       | V <sub>DS</sub> = 15V, I <sub>D</sub> = 6.5A, V <sub>GS</sub> = 4.5V                       |     | 9.5  |      | nC   |
| Gate-source charge                             | Q <sub>gs</sub>      |  |     | 1.5  |      |      |
| Gate-drain charge                              | Q <sub>gd</sub>      |  |     | 3    |      |      |
| <b>SWITCHING CHARACTERISTICS<sup>(4)</sup></b> |                      |  |     |      |      |      |
| Turn-on delay time                             | t <sub>d(on)</sub>   | V <sub>DD</sub> = 15V, R <sub>L</sub> = 2.7Ω, V <sub>GS</sub> = 10V, R <sub>GEN</sub> = 3Ω |     | 3.3  |      | nS   |
| Turn-on rise time                              | t <sub>r</sub>       |  |     | 4.8  |      |      |
| Turn-off delay time                            | t <sub>d(off)</sub>  |  |     | 26   |      |      |
| Turn-off fall time                             | t <sub>f</sub>       |  |     | 4    |      |      |

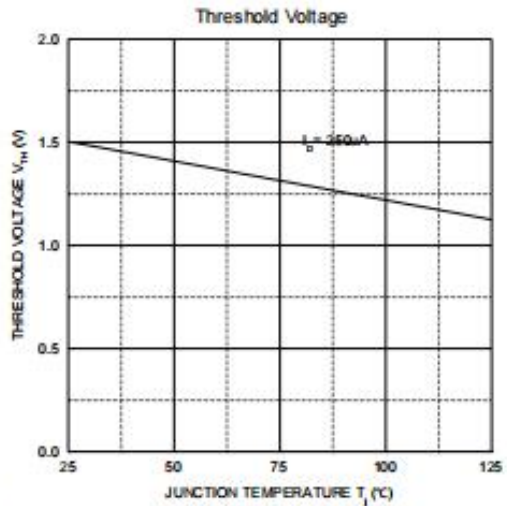
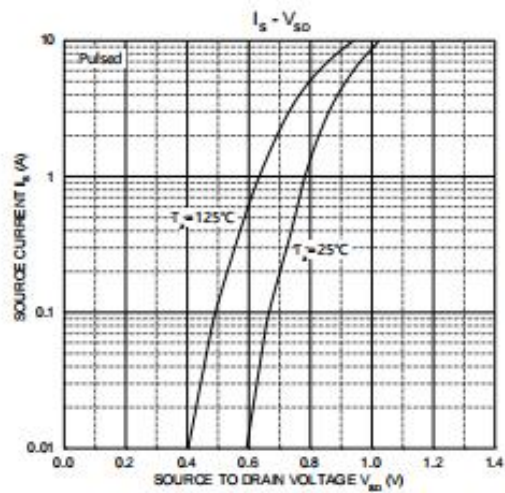
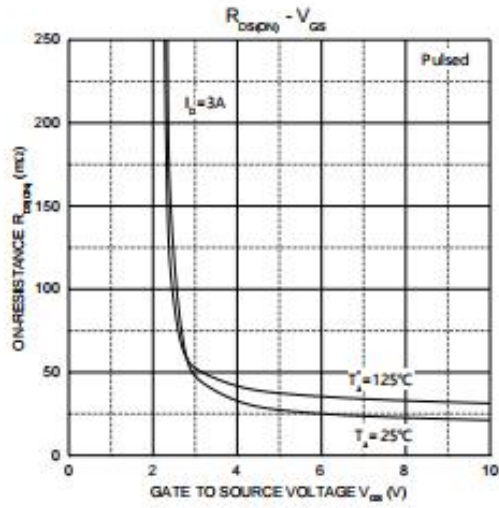
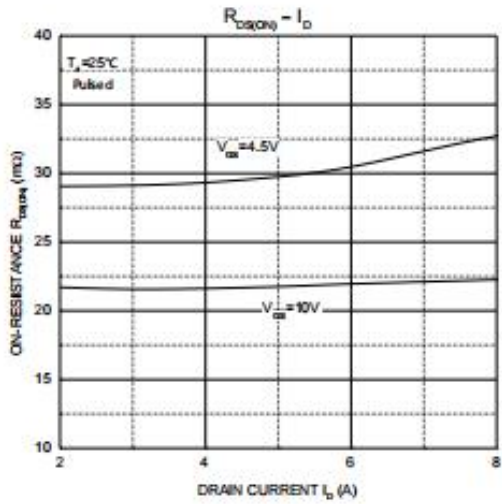
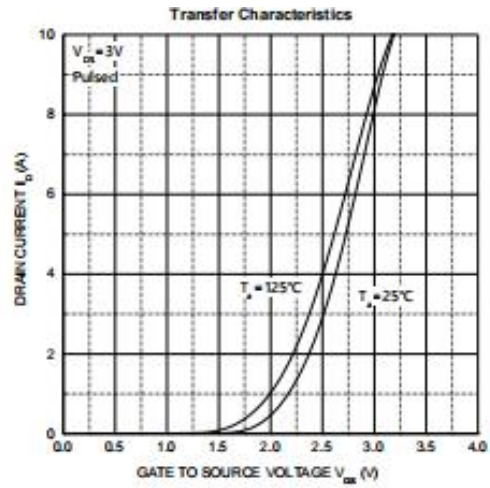
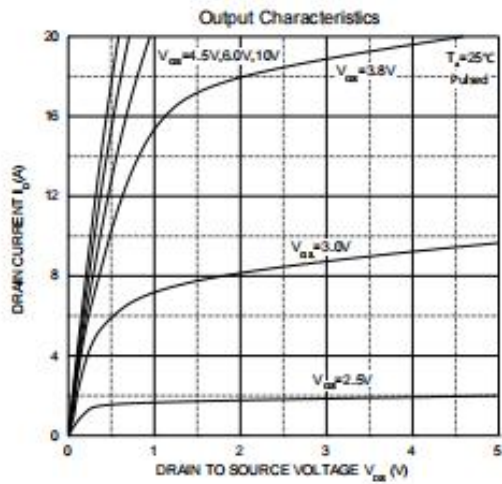
**Notes:**

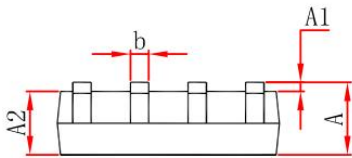
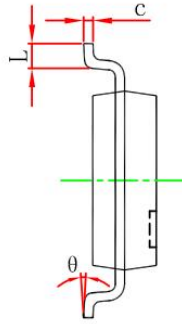
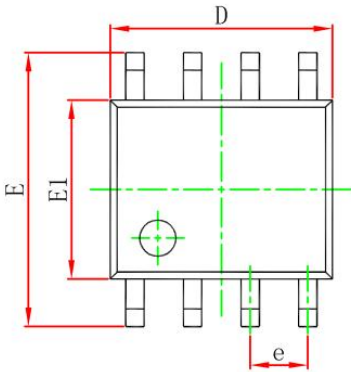
- 1.Repetitive Rating : Pulse width limited by maximum junction temperature.
- 2.Surface Mounted on FR4 Board, t < 5 sec.
- 3.Pulse Test : Pulse Width ≤ 300μs, Duty Cycle ≤ 2%.
- 4.Guaranteed by design, not subject to production testing.

**Typical Electrical and Thermal Characteristics**

P-Channel MOS





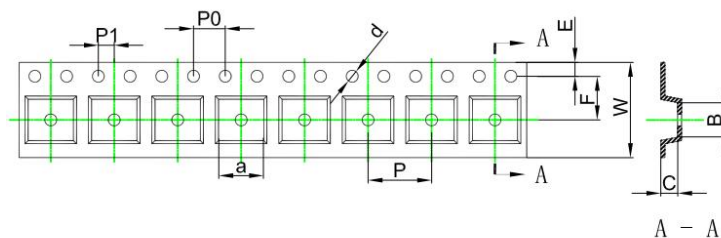


| Symbol   | Dimensions In Millimeters |       | Dimensions In Inches |       |
|----------|---------------------------|-------|----------------------|-------|
|          | Min                       | Max   | Min                  | Max   |
| A        | 1.350                     | 1.750 | 0.053                | 0.069 |
| A1       | 0.100                     | 0.250 | 0.004                | 0.010 |
| A2       | 1.350                     | 1.550 | 0.053                | 0.061 |
| b        | 0.330                     | 0.510 | 0.013                | 0.020 |
| c        | 0.170                     | 0.250 | 0.007                | 0.010 |
| D        | 4.800                     | 5.000 | 0.189                | 0.197 |
| e        | 1.270 (BSC)               |       | 0.050 (BSC)          |       |
| E        | 5.800                     | 6.200 | 0.228                | 0.244 |
| E1       | 3.800                     | 4.000 | 0.150                | 0.157 |
| L        | 0.400                     | 1.270 | 0.016                | 0.050 |
| $\theta$ | 0°                        | 8°    | 0°                   | 8°    |



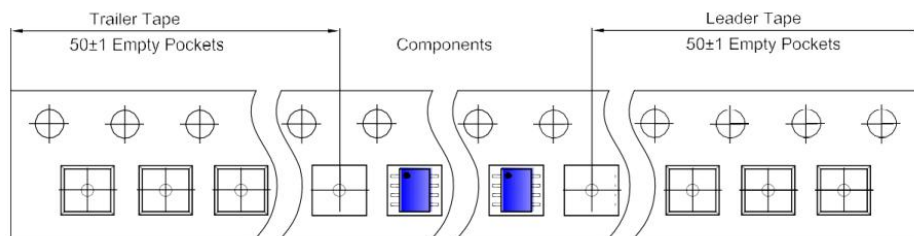
## SOP8 Tape and Reel

### SOP8 Embossed Carrier Tape

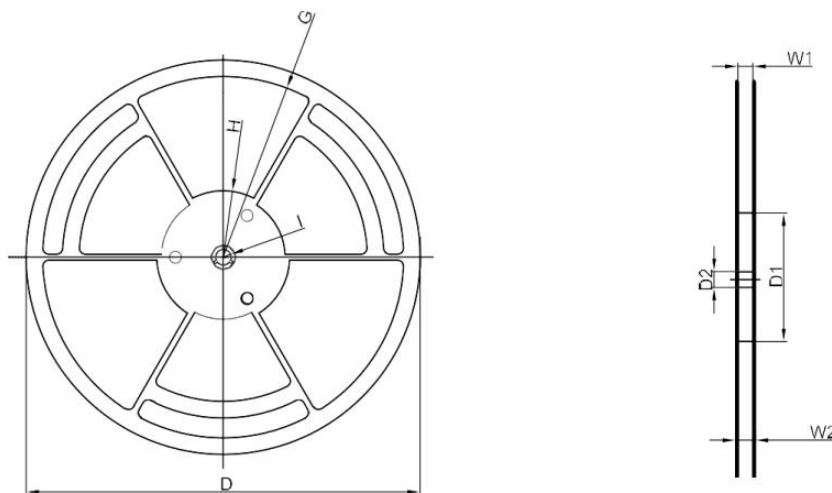


| Dimensions are in millimeter |      |      |      |       |      |      |      |      |      |       |
|------------------------------|------|------|------|-------|------|------|------|------|------|-------|
| Pkg type                     | a    | B    | C    | d     | E    | F    | P0   | P    | P1   | W     |
| SOP8                         | 6.40 | 5.40 | 2.10 | Ø1.50 | 1.75 | 5.50 | 4.00 | 8.00 | 2.00 | 12.00 |

### SOP8 Tape Leader and Trailer



### SOP8 Reel



| Dimensions are in millimeter |         |        |       |         |        |       |       |       |
|------------------------------|---------|--------|-------|---------|--------|-------|-------|-------|
| Reel Option                  | D       | D1     | D2    | G       | H      | I     | W1    | W2    |
| 13" Dia                      | Ø330.00 | 100.00 | 13.00 | R151.00 | R56.00 | R6.50 | 12.40 | 17.60 |

| REEL      | Reel Size | Box       | Box Size(mm) | Carton     | Carton Size(mm) | G.W.(kg) |
|-----------|-----------|-----------|--------------|------------|-----------------|----------|
| 4,000 pcs | 13 inch   | 8,000 pcs | 360×360×65   | 64,000 pcs | 565×380×390     |          |