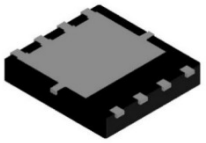
# WNM6006

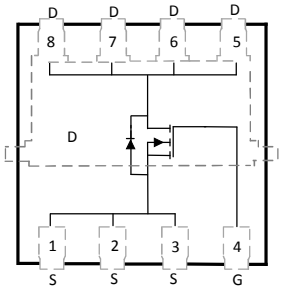
## Single N-Channel, 60V, 100A, Power MOSFET

http://www.omnivision-group.com/

| $V_{DS}$ (V) | Max. $R_{DS(on)}$ (mΩ) |
|---|---|
| 60 | 3.4 @ $V_{GS}$=10V |
| | 6.0 @ $V_{GS}$=6V |



PDFN5X6-8L




Pin configuration (Top view)

## Description

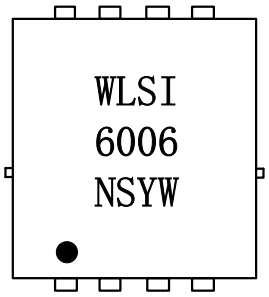
The WNM6006 is N-Channel enhancement MOS Field Effect Transistor. Uses advanced trench technology and design to provide excellent $R_{DS(ON)}$ with low gate charge. This device is suitable for use in DC-DC conversion, power switch and charging circuit. Standard Product WNM6006 is in compliance with RoHS.

## Features

- Trench Technology
- Supper high density cell design
- Low ON resistance
- Package PDFN5X6-8L

## Applications

- DC/DC converters
- Power supply converters circuit
- Load/Power Switching for portable device




WLSI = Company Code
6006 = Device Code
NS = Special Code
Y = Year
W = Week(A~z)

**Marking**

## Order information

| Device | Package | Shipping |
|---|---|---|
| WNM6006-8/TR | PDFN5X6-8L | 3000/Tape&Reel |

## Absolute Maximum ratings

| Parameter | | Symbol | Maximum | Unit |
|---|---|---|---|---|
| Drain-Source Voltage | | $V_{DS}$ | 60 | V |
| Gate-Source Voltage | | $V_{GS}$ | ±20 | |
| Continuous Drain Current | $T_C$=25°C | $I_D$ | 100 | A |
| | $T_C$=100°C | | 63 | A |
| Pulsed Drain Current [c] | | $I_{DM}$ | 310 | A |
| Continuous Drain Current | $T_A$=25°C | $I_{DSM}$ | 32 | A |
| | $T_A$=70°C | | 25 | |
| Avalanche Energy L=0.3mH | | $E_{AS}$ | 158 | mJ |
| Power Dissipation [b] | $T_C$=25°C | $P_D$ | 62 | W |
| | $T_C$=100°C | | 25 | |
| Power Dissipation [d] | $T_A$=25°C | $P_{DSM}$ | 6.3 | W |
| | $T_A$=70°C | | 4.0 | |
| Operating Junction Temperature | | $T_J$ | -55 to 150 | °C |
| Storage Temperature Range | | $T_{STG}$ | -55 to 150 | °C |

## Thermal resistance ratings

| Single Operation | | | | | |
|---|---|---|---|---|---|
| Parameter | | Symbol | Typical | Maximum | Unit |
| Junction-to-Ambient Thermal Resistance [a] | t ≤ 10 s | $R_{\theta JA}$ | 16 | 20 | °C/W |
| | Steady State | | 41 | 50 | |
| Junction-to-Case Thermal Resistance | Steady State | $R_{\theta JC}$ | 1.5 | 2.0 | |

**Note:**

a FR-4 board (38mm X 38mm X t1.6mm, 70um Copper) partially covered with copper (645mm$^2$ area).

b The power dissipation $P_D$ is based on $T_{J(MAX)}$=150°C, using junction-to-case thermal resistance, and is more useful in setting the upper dissipation limit for cases where additional heat sinking is used.

c Repetitive rating, ~10us pulse width, duty cycle ~1%, keep initial $T_J$ =25°C, the maximum allowed junction temperature of 150°C.

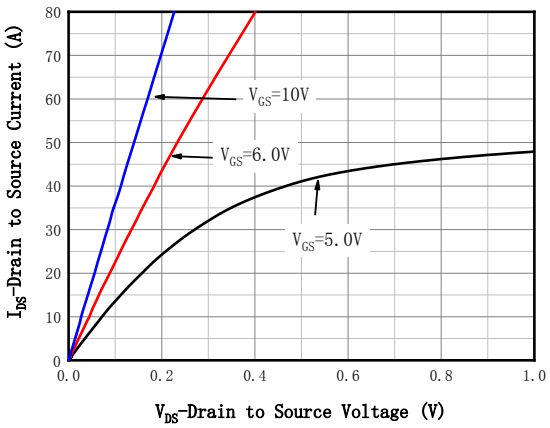
d The power dissipation $P_{DSM}$ is based on Junction-to-Ambient thermal resistance $R_{\theta JA}$ t≤10s value and the $T_{J(MAX)}$=150°C.

e The static characteristics are obtained using ~380us pulses, duty cycle ~1%.

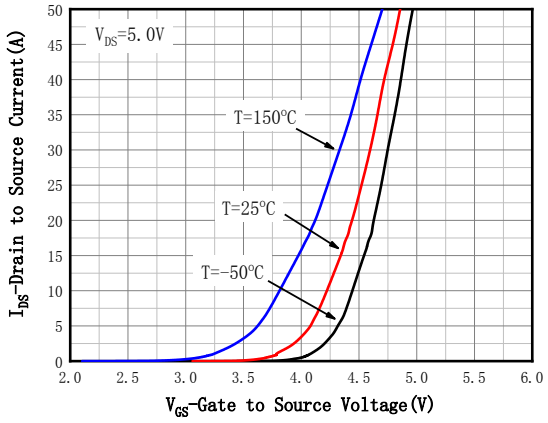
## Electronics Characteristics (Ta=25°C, unless otherwise noted)

| Parameter | Symbol | Test Conditions | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|
| **OFF CHARACTERISTICS** | | | | | | |
| Drain-to-Source Breakdown Voltage | $BV_{DSS}$ | $V_{GS}$ = 0 V, $I_D$ = 250uA | 60 | | | V |
| Zero Gate Voltage Drain Current | $I_{DSS}$ | $V_{DS}$ =48V, $V_{GS}$ = 0V | | | 1 | uA |
| Gate-to-source Leakage Current | $I_{GSS}$ | $V_{DS}$ = 0 V, $V_{GS}$ = ±20V | | | ±100 | nA |
| **ON CHARACTERISTICS** | | | | | | |
| Gate Threshold Voltage | $V_{GS(TH)}$ | $V_{GS}$ = $V_{DS}$, $I_D$ = 250uA | 2 | 3 | 4 | V |
| Drain-to-source On-resistance | $R_{DS(on)}$ | $V_{GS}$ =10V, $I_D$ = 15A | | 2.5 | 3.4 | mΩ |
| Drain-to-source On-resistance | $R_{DS(on)}$ | $V_{GS}$ =6V, $I_D$ = 10A | | 4.2 | 6.0 | mΩ |
| **CHARGES, CAPACITANCES AND GATE RESISTANCE** | | | | | | |
| Input Capacitance | $C_{ISS}$ | $V_{GS}$ = 0V, f = 1.0MHz, $V_{DS}$ = 30 V | | 2910 | | pF |
| Output Capacitance | $C_{OSS}$ | | | 1720 | | |
| Reverse Transfer Capacitance | $C_{RSS}$ | | | 55 | | |
| Total Gate Charge | $Q_{G(TOT)}$ | $V_{GS}$ = 10 V, $V_{DS}$ = 30V, $I_D$ = 15A | | 42 | | nC |
| Threshold Gate Charge | $Q_{G(TH)}$ | | | 9.0 | | |
| Gate-to-Source Charge | $Q_{GS}$ | | | 14 | | |
| Gate-to-Drain Charge | $Q_{GD}$ | | | 7.5 | | |
| Gate Resistance | $R_g$ | f=1MHz | | 1.2 | | Ω |
| **SWITCHING CHARACTERISTICS** | | | | | | |
| Turn-On Delay Time | td(ON) | $V_{GS}$ = 10 V, $V_{DS}$ = 30 V, $R_G$=4.7Ω,ID=15A | | 17 | | ns |
| Rise Time | tr | | | 37 | | |
| Turn-Off Delay Time | td(OFF) | | | 33 | | |
| Fall Time | tf | | | 23 | | |
| **BODY DIODE CHARACTERISTICS** | | | | | | |
| Forward Voltage | $V_{SD}$ | $V_{GS}$ = 0 V, $I_S$ = 1A | | 0.7 | 1.2 | V |

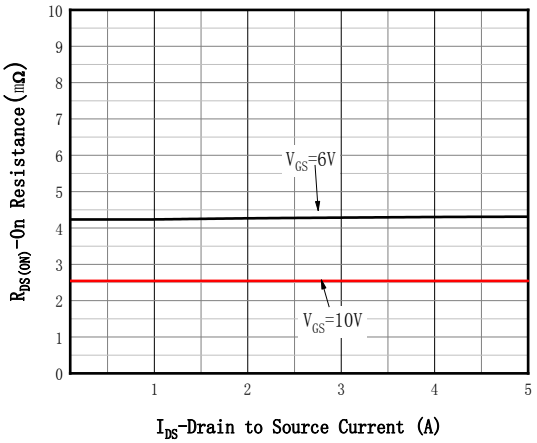
## Typical Characteristics (Ta=25°C, unless otherwise noted)



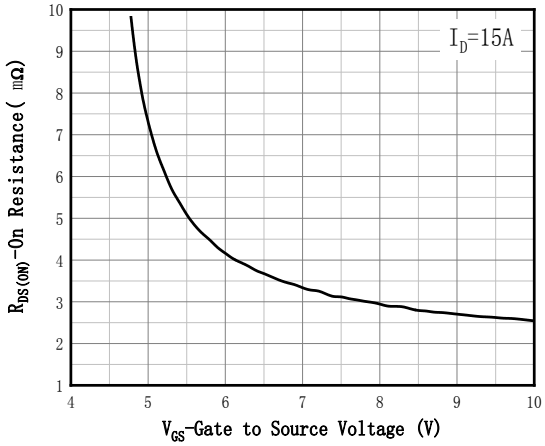

**Output Characteristics**



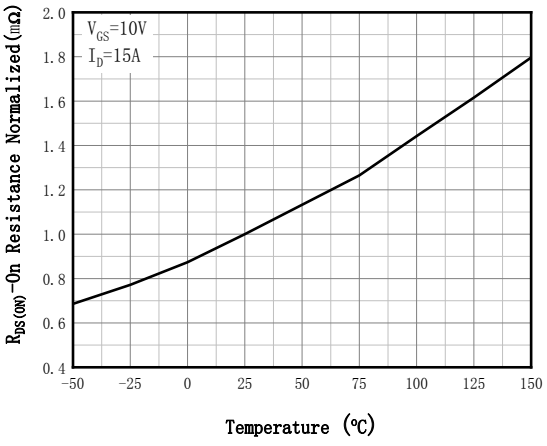

**Transfer Characteristics**



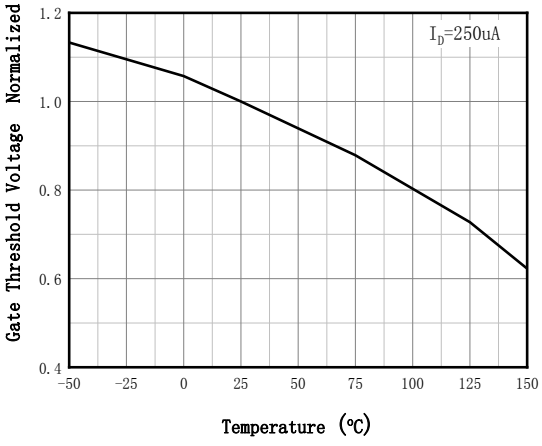

**On-Resistance vs. Drain Current**



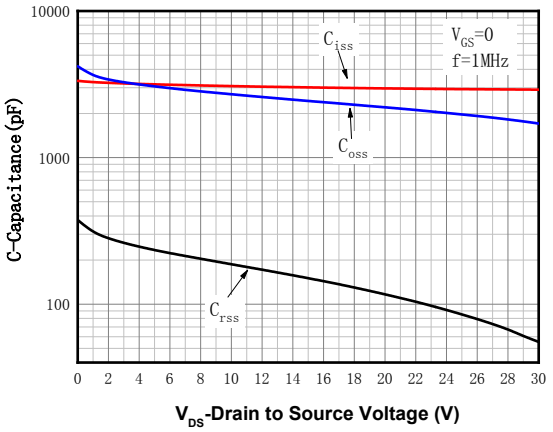

**On-Resistance vs. Gate-to-Source Voltage**



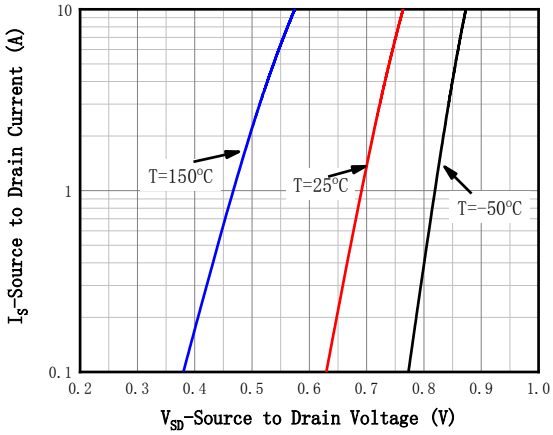

**On-Resistance vs. Junction Temperature** [e]



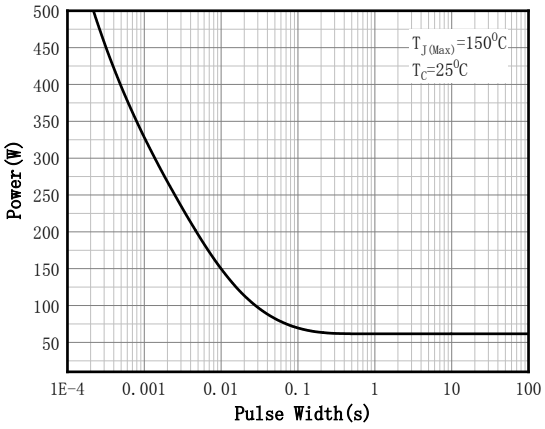

**Threshold Voltage vs. Temperature**



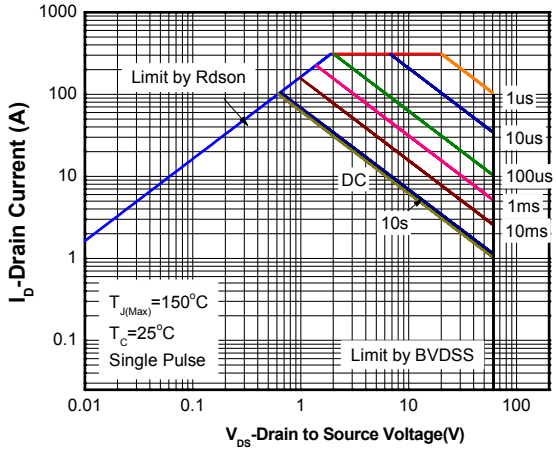

**Capacitance**



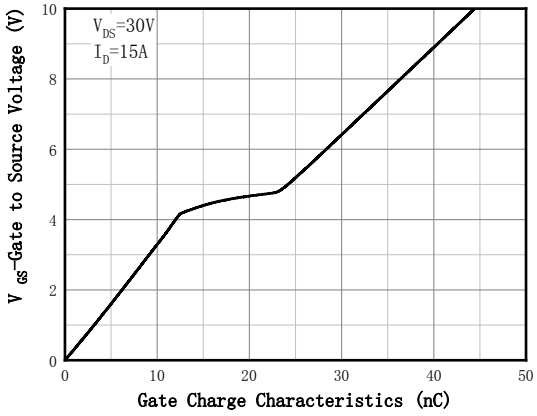

**Body Diode Forward Voltage** [e]



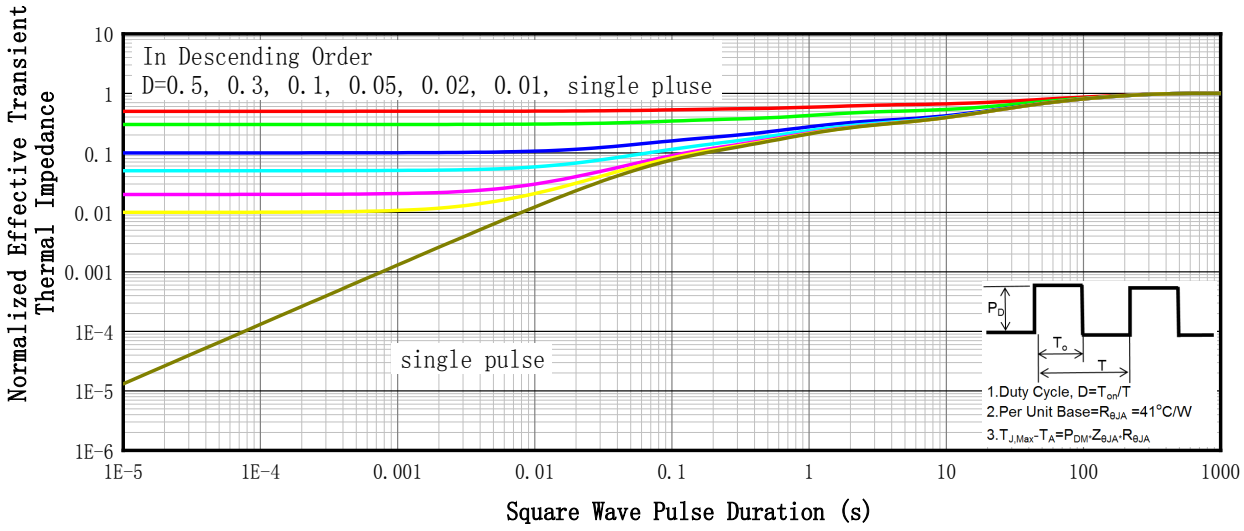

**Single Pulse power**



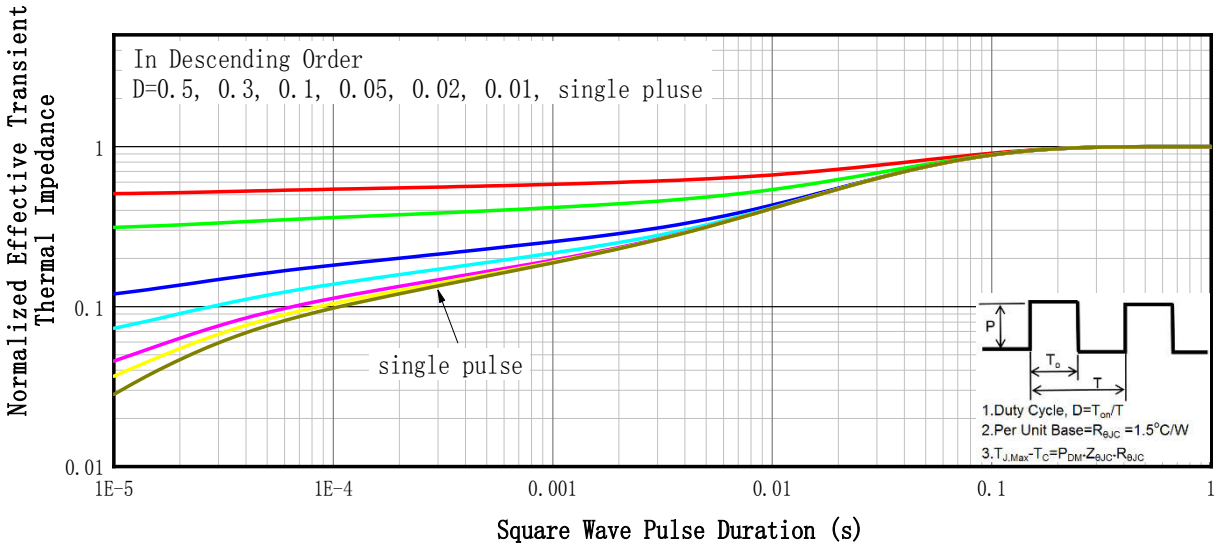

**Safe Operating Power**




**Gate Charge Characteristics**



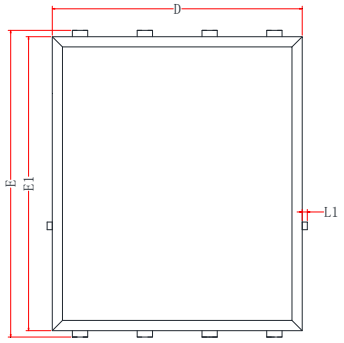

**Transient Thermal Response (Junction-to- Ambient)**



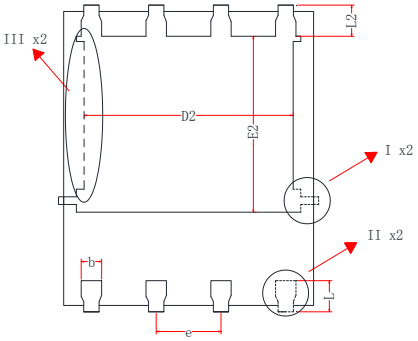

**Transient Thermal Response (Junction-to-Case)**

## PACKAGE OUTLINE DIMENSIONS

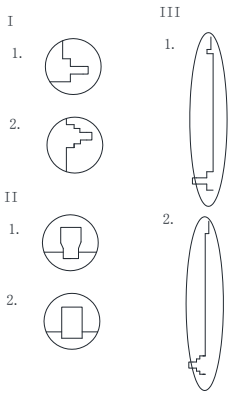
### PDFN5x6-8L

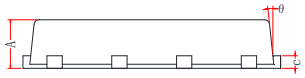



TOP VIEW

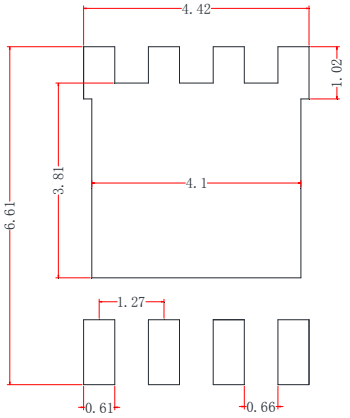



BOTTOM VIEW




SIDE VIEW

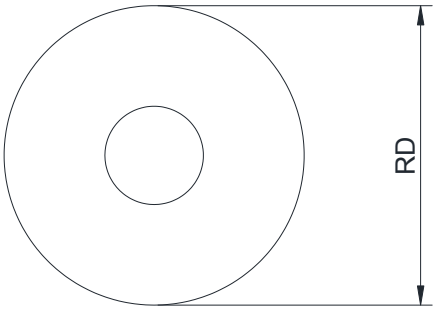



RECOMMENDED LAND PATTERN(Unit:mm)

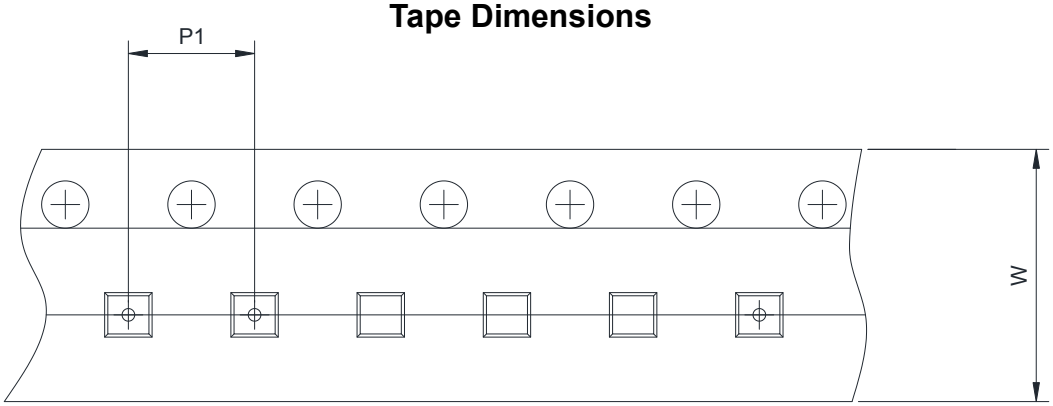
| Symbol | Dimensions in Millimeters | | |
|---|---|---|---|
| | Min. | Typ. | Max. |
| A | 0.85 | 0.95 | 1.00 |
| c | 0.15 | - | 0.34 |
| D | 4.80 | - | 5.30 |
| D2 | 3.82 | - | 4.45 |
| E | 5.90 | - | 6.15 |
| E1 | 5.45 | - | 5.80 |
| E2 | 3.18 | 3.45 | 3.73 |
| e | 1.27BSC | | |
| b | 0.30 | 0.40 | 0.50 |
| L | 0.45 | - | 0.71 |
| L1 | 0.00 | - | 0.15 |
| L2 | 0.68Ref | | |
| θ | 0° | - | 12° |

## TAPE AND REEL INFORMATION

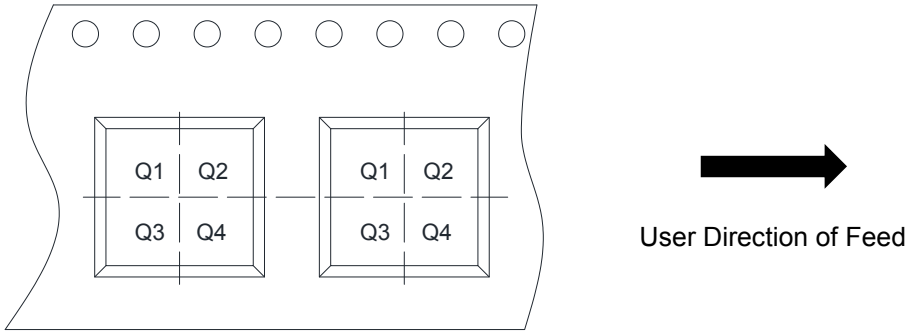
### Reel Dimensions




### Tape Dimensions




### Quadrant Assignments For PIN1 Orientation In Tape




| | | |
|---|---|---|
| RD | Reel Dimension | ☐ 7inch ☑ 13inch |
| W | Overall width of the carrier tape | ☐ 8mm ☑ 12mm ☐ 16mm |
| P1 | Pitch between successive cavity centers | ☐ 2mm ☐ 4mm ☑ 8mm |
| Pin1 | Pin1 Quadrant | ☑ Q1 ☐ Q2 ☐ Q3 ☐ Q4 |

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