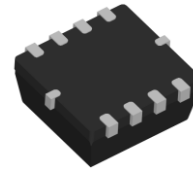


WNMD2162

Dual N-Channel, 20V, 4.8A, Power MOSFET

[Http://www.sh-willsemi.com](http://www.sh-willsemi.com)

V_{DS} (V)	Typical $R_{DS(on)}$ (m Ω)
20	14 @ $V_{GS}= 4.5V$
	14.5 @ $V_{GS}= 3.8V$
	15 @ $V_{GS}= 3.1V$
	16 @ $V_{GS}= 2.5V$
ESD protected	



PDFN2.9×2.8-8L

Descriptions

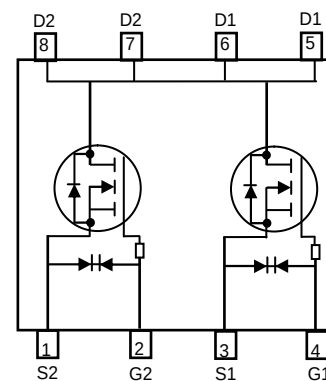
The WNMD2162 is Dual N-Channel enhancement MOS Field Effect Transistor. Uses advanced trench technology and design to provide excellent $R_{DS(ON)}$ with low gate charge. This device is suitable for use in DC-DC conversion, power switch and charging circuit. Standard Product WNMD2162 is Pb-free and Halogen-free.

Features

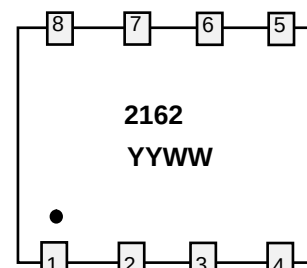
- Trench Technology
- Supper high density cell design
- Excellent ON resistance for higher DC current
- Extremely Low Threshold Voltage
- Small package PDFN2.9×2.8-8L

Applications

- Driver for Relay, Solenoid, Motor, LED etc.
- DC-DC converter circuit
- Power Switch
- Load Switch
- Charging



Pin configuration (Top view)



2162 = Device Code

YY = Year

WW = Week

Marking
Order information

Device	Package	Shipping
WNMD2162-8/TR	PDFN 2.9×2.8-8L	3000/Reel&Tape

Absolute Maximum ratings

Parameter		Symbol	10 S	Steady State	Unit
Drain-Source Voltage		V _{DS}	20		V
Gate-Source Voltage		V _{GS}	±10		
Continuous Drain Current ^{a,e}	T _A =25°C	I _D	4.8	4.8	A
	T _A =70°C		4.8	4.8	
Maximum Power Dissipation ^a	T _A =25°C	P _D	1.7	1.0	W
	T _A =70°C		1.1	0.6	
Continuous Drain Current ^{b,e}	T _A =25°C	I _D	4.8	4.8	A
	T _A =70°C		4.8	3.7	
Maximum Power Dissipation ^b	T _A =25°C	P _D	1.6	0.9	W
	T _A =70°C		1.0	0.5	
Pulsed Drain Current ^c		I _{DM}	40		A
Operating Junction Temperature		T _J	-55~+150		°C
Lead Temperature		T _L	260		°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	$t \leq 10\text{ s}$	$R_{\theta JA}$	61	72	$^{\circ}\text{C/W}$
	Steady State		102	128	
Junction-to-Ambient Thermal Resistance ^b	$t \leq 10\text{ s}$	$R_{\theta JA}$	65	75	
	Steady State		120	148	
Junction-to-Case Thermal Resistance		$R_{\theta JC}$	54	63	

a Surface mounted on FR-4 Board using 1 square inch pad size, 1oz copper;.

b Surface mounted on FR-4 board using minimum pad size, 1oz copper;.

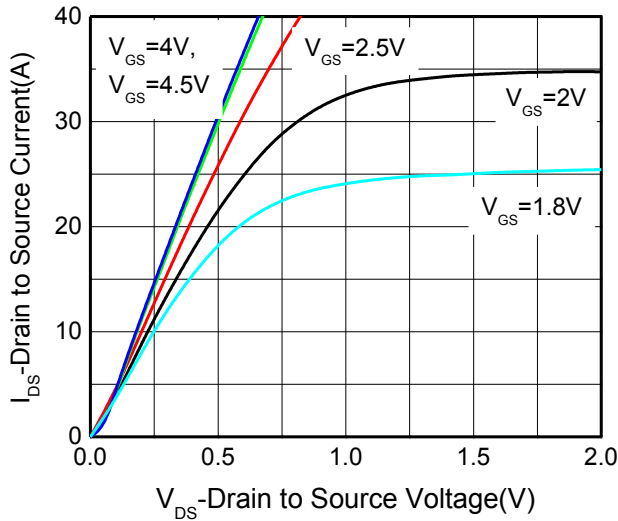
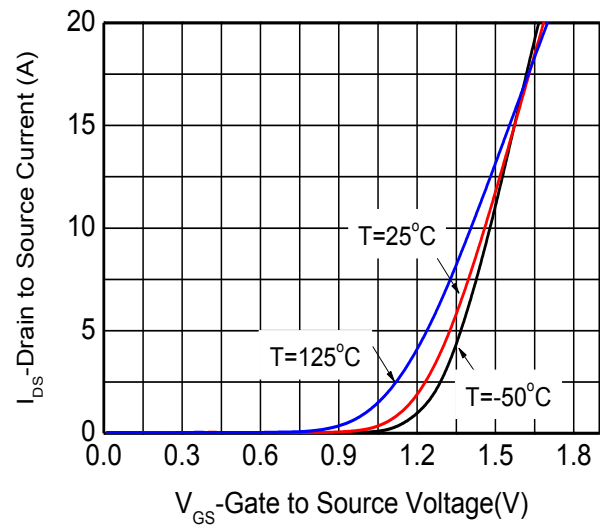
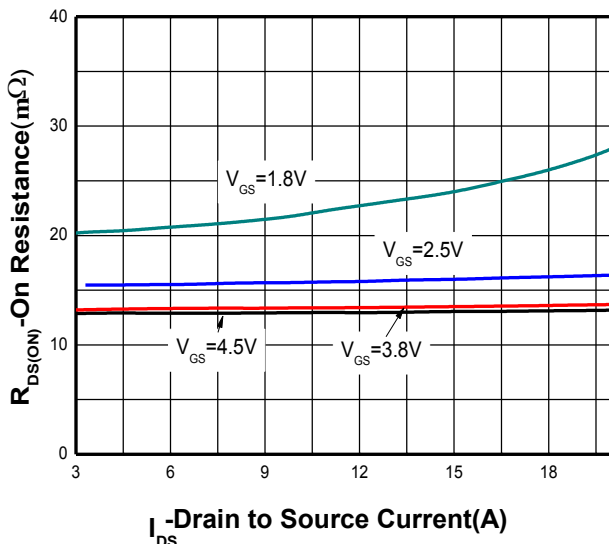
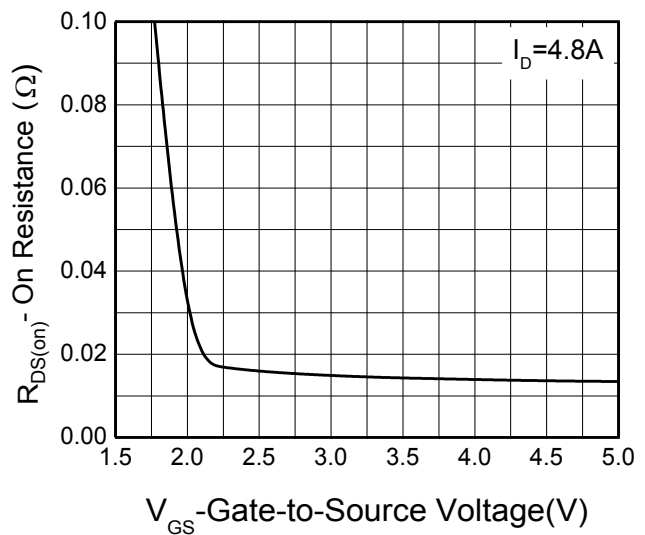
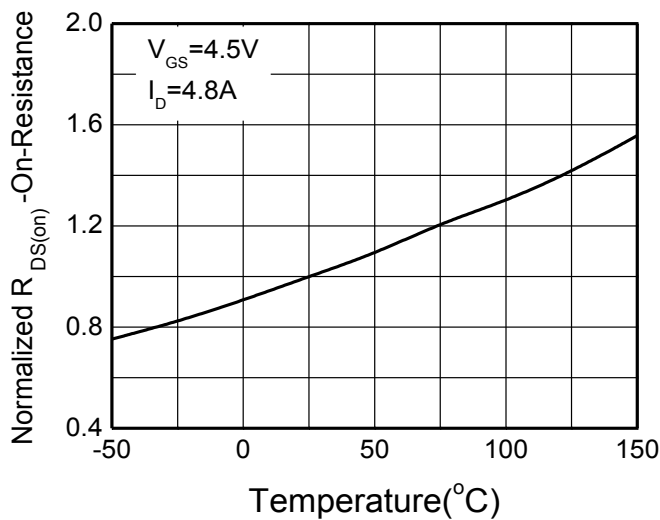
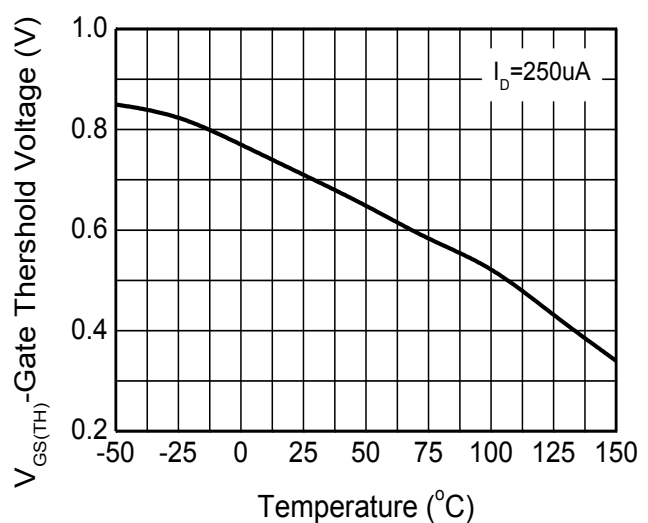
c Pulse width $<380\mu\text{s}$, Duty Cycle $<2\%$;

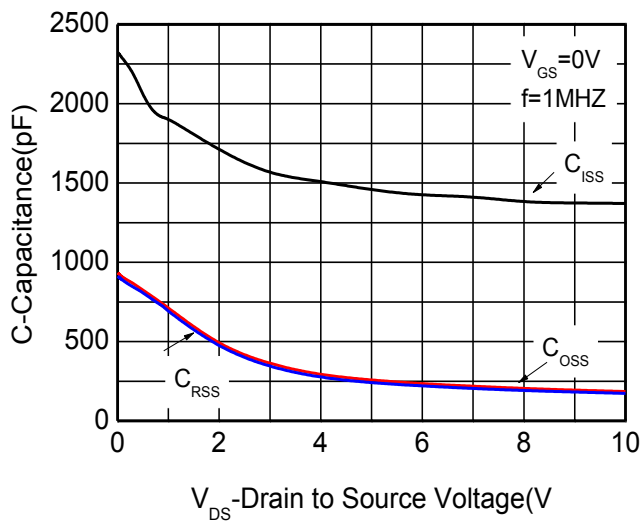
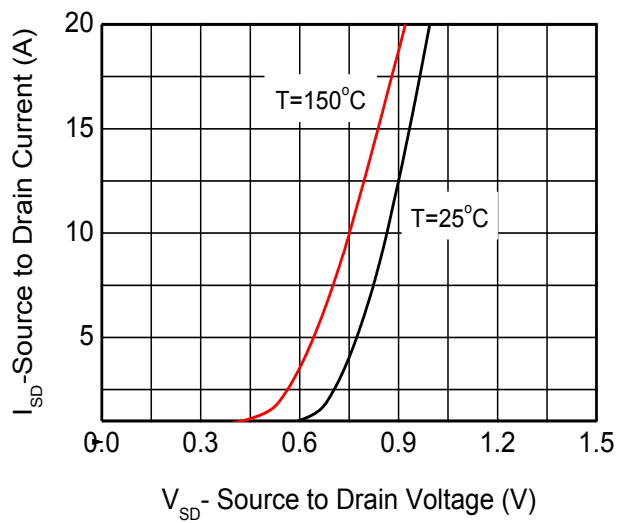
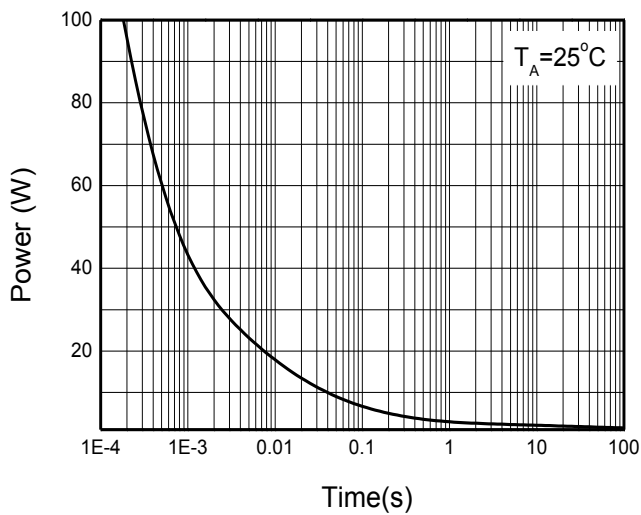
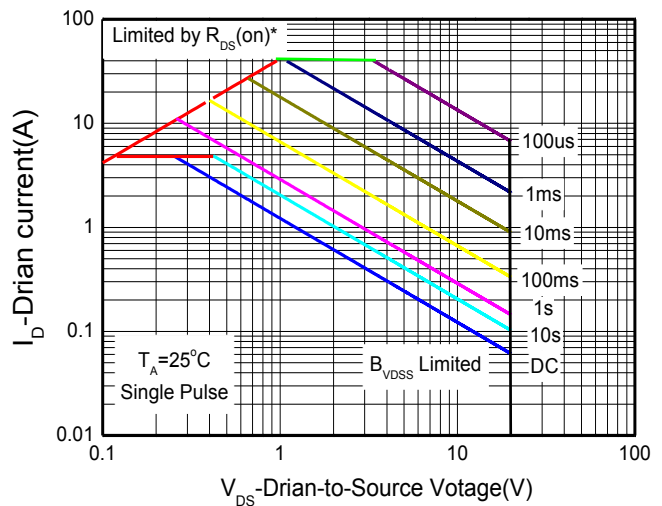
d Maximum junction temperature $T_J=150^{\circ}\text{C}$;

e Current rating is limited by wire-bonding.

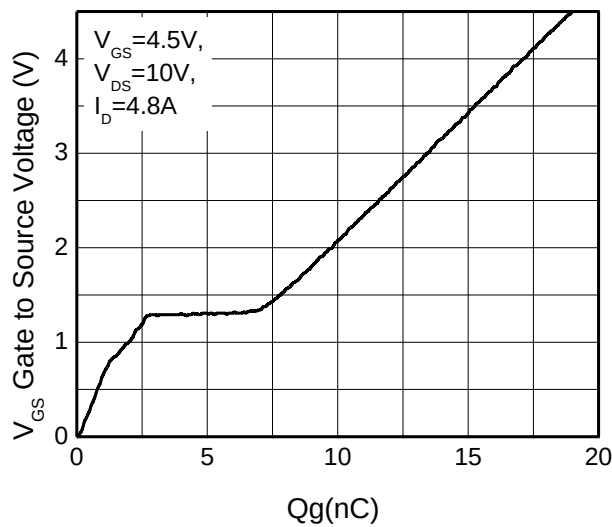
Electronics Characteristics (Ta=25°C, unless otherwise noted)

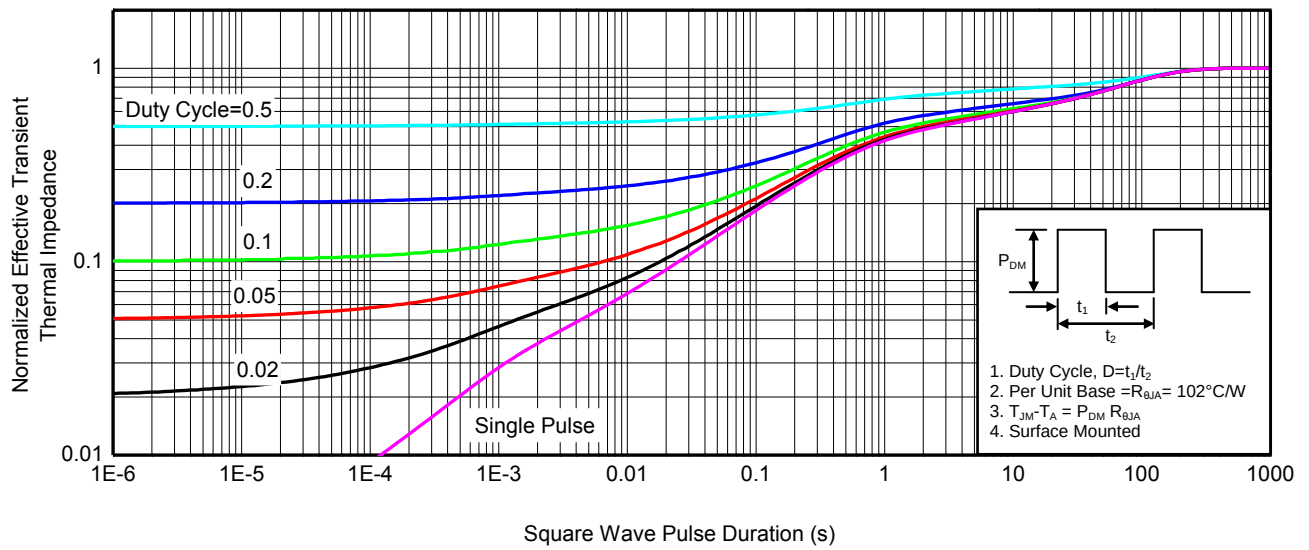
Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
OFF CHARACTERISTICS						
Drain-to-Source Breakdown Voltage	BV _{DSS}	V _{GS} = 0 V, I _D = 250uA	20			V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =16V, V _{GS} = 0V			1	uA
Gate-to-source Leakage Current	I _{GSS}	V _{DS} = 0 V, V _{GS} = ±10V			±5	uA
ON CHARACTERISTICS						
Gate Threshold Voltage	V _{GS(TH)}	V _{GS} = V _{DS} , I _D = 250uA	0.5	0.7	1.0	V
Drain-to-source On-resistance	R _{DS(on)}	V _{GS} = 4.5V, I _D = 4.8A	10	14	17	mΩ
		V _{GS} = 3.8V, I _D = 4.2A	10.5	14.5	18	
		V _{GS} = 3.1V, I _D = 4.0A	11	15	20	
		V _{GS} = 2.5V, I _D = 3.0A	12	16	24	
Forward Transconductance	G _{FS}	V _{DS} = 5.0V, I _D = 4.8A		17		S
CHARGES, CAPACITANCES AND GATE RESISTANCE						
Input Capacitance	C _{ISS}	V _{GS} = 0 V, f = 1.0MHz, V _{DS} = 10 V		1371		pF
Output Capacitance	C _{OSS}			185		
Reverse Transfer Capacitance	C _{RSS}			172		
Total Gate Charge	Q _{G(TOT)}	V _{GS} = 4.5 V, V _{DS} = 10 V, I _D =4.8 A		18.9		nC
Threshold Gate Charge	Q _{G(TH)}			1.3		
Gate-to-Source Charge	Q _{GS}			2.8		
Gate-to-Drain Charge	Q _{GD}			6.4		
SWITCHING CHARACTERISTICS						
Turn-On Delay Time	td(ON)	V _{GS} = 4.5 V, V _{DS} = 6 V, R _L =4.8 Ω , R _G =6Ω		29		ns
Rise Time	tr			35		
Turn-Off Delay Time	td(OFF)			260		
Fall Time	tf			125		
BODY DIODE CHARACTERISTICS						
Forward Voltage	V _{SD}	V _{GS} = 0 V, I _S = 1.0A		0.65	1.5	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

Threshold voltage vs. Temperature

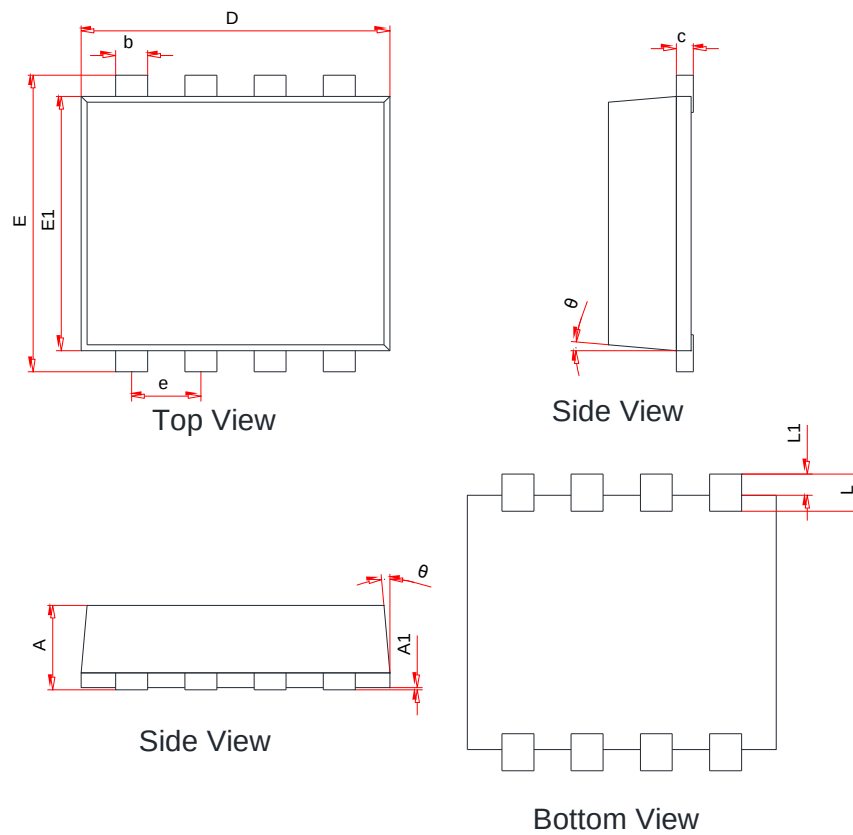

Capacitance

Body diode forward voltage

Single pulse power


* $V_{GS} >$ minimum V_{GS} at which $R_{DS(on)}$ is specified

Safe operating power

Gate Charge Characteristics



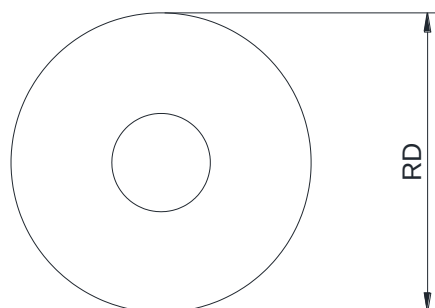
Transient thermal response (Junction-to-Ambient)

Package outline dimensions
PDFN2.9*2.8-8L


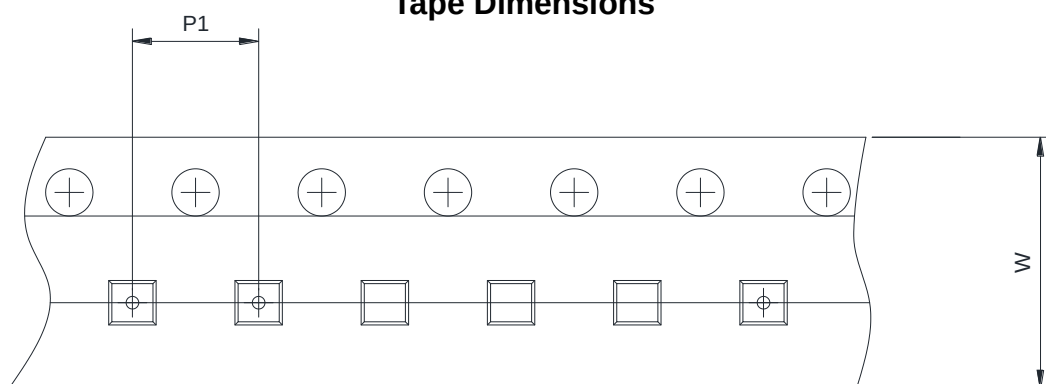
Symbol	Dimensions in Millimeters		
	Min.	Typ.	Max.
A	0.75	0.80	0.85
A1	0.00	-	0.02
c	0.11	-	0.26
b	0.25	-	0.40
D	2.80	2.90	3.00
E	2.70	2.80	2.90
E1	2.30	2.40	2.50
e	0.650 BSC		
L	0.35 Ref.		
L1	0.20 Ref.		
θ	0 ° Ref.		

TAPE AND REEL INFORMATION

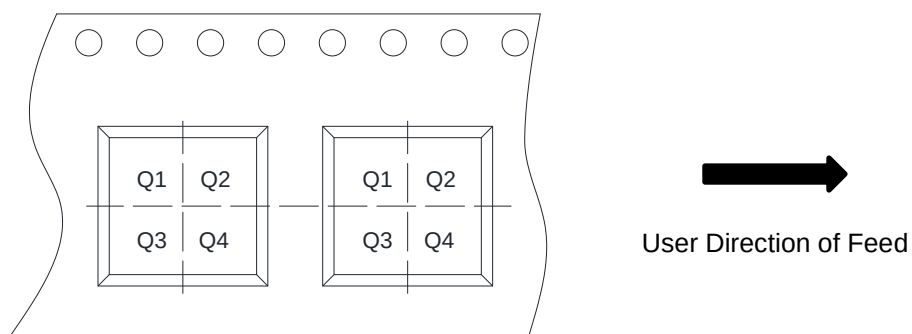
Reel Dimensions



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