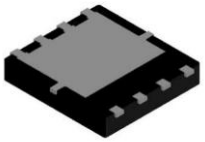
SNM062R9DNA

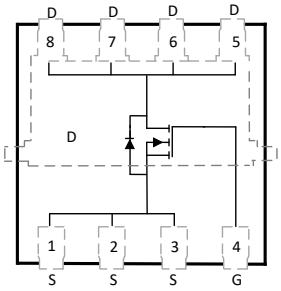
Single N-Channel, 60V, 129A, Power MOSFET

http://www.sitcores.com/

V_{DS} (V)	Max. $R_{DS(on)}$ (mΩ)
60	2.9 @ V_{GS}=10V
	5.0 @ V_{GS}=4.5V



PDFN5X6-8L



Pin configuration (Top view)

Description

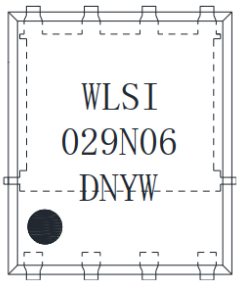
The SNM062R9DNA is N-Channel enhancement MOS Field Effect Transistor. Uses advanced trench technology and design to provide excellent $R_{DS(ON)}$ with low gate charge. This device is suitable for use in DC-DC conversion, power switch and charging circuit. Standard Product SNM062R9DNA is Pb-free.

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 (Group) Code
029N06	=Device Code
DN	=Special Code
Y	=Year
W	=Week(A~z)

Marking

Order information

Device	Package	Shipping
SNM062R9DNA-8/TR	PDFN5X6-8L	5000/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	129	A
	T_C=100°C		82	A
Pulsed Drain Current [c]		I_{DM}	355	A
Continuous Drain Current	T_A=25°C	I_{DSM}	37	A
	T_A=70°C		29	
Avalanche Energy L=0.3mH		E_{AS}	200	mJ
Power Dissipation [b]	T_C=25°C	P_D	89	W
	T_C=100°C		36	
Power Dissipation [a]	T_A=25°C	P_{DSM}	7.2	W
	T_A=70°C		4.6	
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	$R_{\theta JA}$	14.0	17.5	°C/W
	Steady State		38.8	46.6	
Junction-to-Case Thermal Resistance	Steady State	$R_{\theta JC}$	1.0	1.4	

Note:

a FR-4 board (38mm X 38mm X t1.6mm, 70um Copper) partially covered with copper (645mm^2 area). 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. The value is only for reference, any application depends on the user's specific board design.

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.

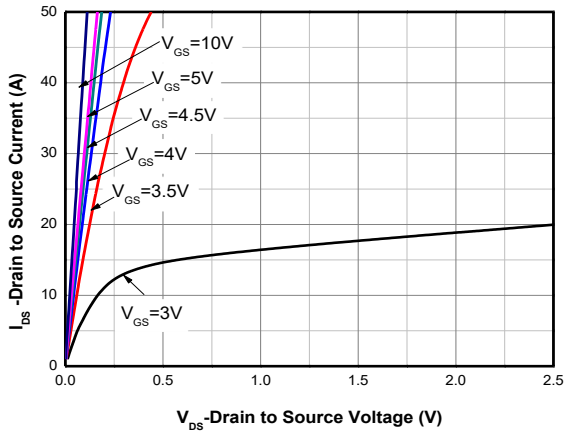
c Repetitive rating, ~10us pulse width, duty cycle ~1%, keep initial T_J =25°C, the maximum allowed junction temperature of 150°C.

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

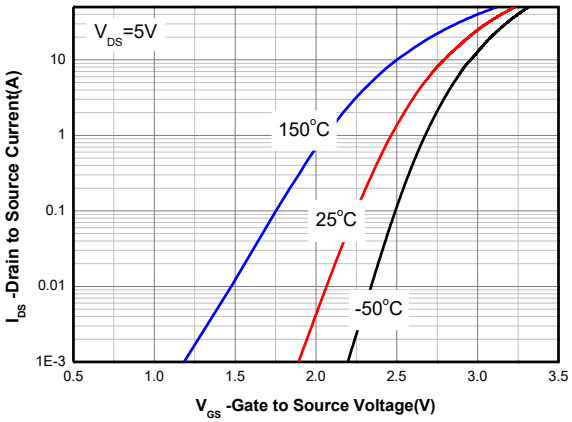
Electronics Characteristics (Ta=25°C, unless otherwise noted)

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} = 60V, 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	1.3	1.8	2.3	V
Drain-to-source On-resistance	$R_{DS(on)}$	V_{GS} = 10V, I_D = 20A		2.3	2.9	mΩ
Drain-to-source On-resistance	$R_{DS(on)}$	V_{GS} = 4.5V, I_D = 20A		3.6	5.0	mΩ
CHARGES, CAPACITANCES AND GATE RESISTANCE						
Input Capacitance	C_{ISS}	V_{GS} = 0V, f = 1.0MHz, V_{DS} = 30 V		3394		pF
Output Capacitance	C_{OSS}			1646		
Reverse Transfer Capacitance	C_{RSS}			60		
Total Gate Charge	$Q_{G(TOT)}$	V_{GS} =10V, V_{DD} = 30V, I_D =20 A		55.7		nC
Total Gate Charge	$Q_{G(TOT)}$	V_{GS} =4.5V, V_{DD}= 30V, I_D =20 A		28.0		
Gate-to-Source Charge	Q_{GS}	V_{GS} = 10V,V_{DD} = 30V, I_D =20 A		9.6		
Gate-to-Drain Charge	Q_{GD}			11.0		
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=3.0Ω,ID=20A		10		ns
Rise Time	tr			32		
Turn-Off Delay Time	td(OFF)			37		
Fall Time	tf			20		
Body Diode Reverse Recovery Time	trr	I_F=20A, dI/dt=100A/μs		51		ns
Body Diode Reverse Recovery Charge	Qrr	I_F=20A, dI/dt=100A/μs		54		nC
BODY DIODE CHARACTERISTICS						
Forward Voltage	V_{SD}	V_{GS} = 0 V, I_S = 1A		0.7	1.2	V

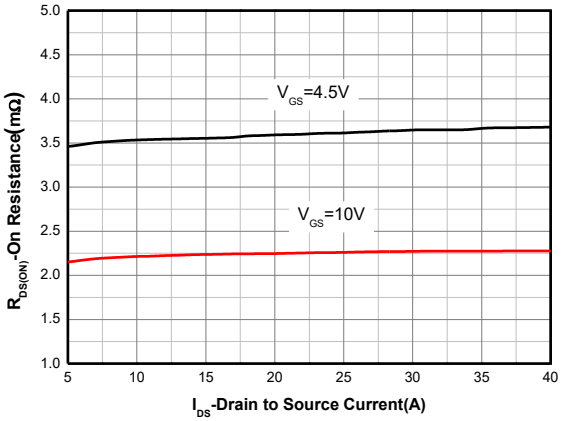
Typical Characteristics (Ta=25°C, unless otherwise noted)



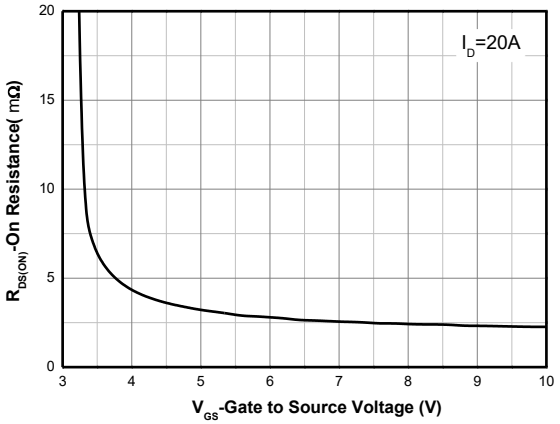
Output Characteristics[d]



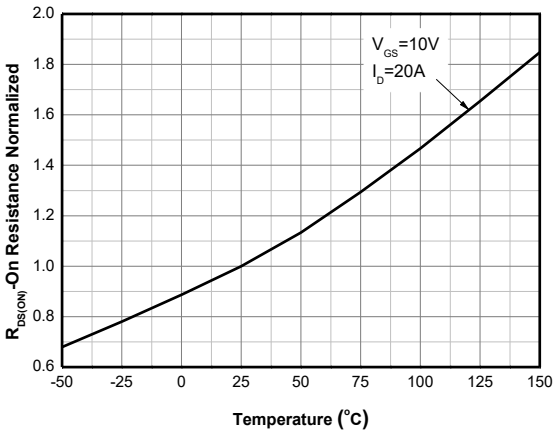
Transfer Characteristics[d]



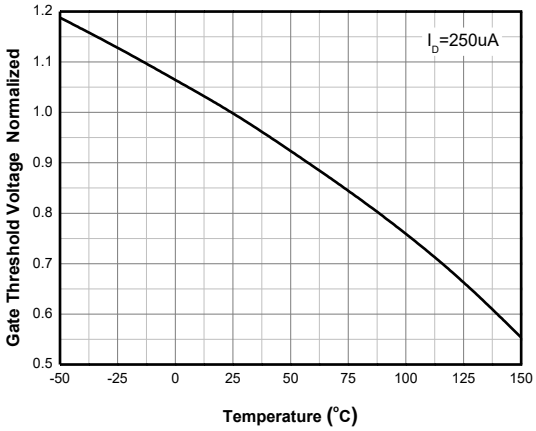
On-Resistance vs. Drain Current[d]



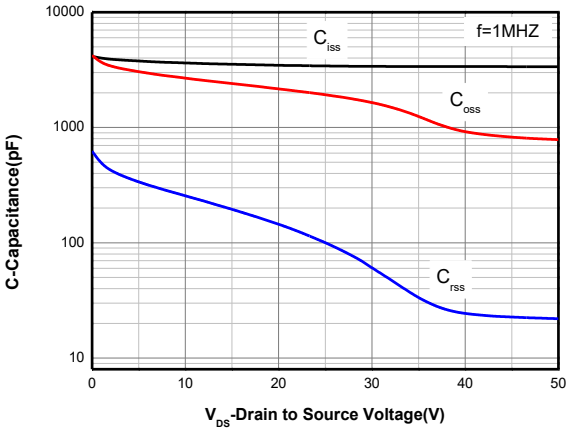
On-Resistance vs. Gate-to-Source Voltage[d]



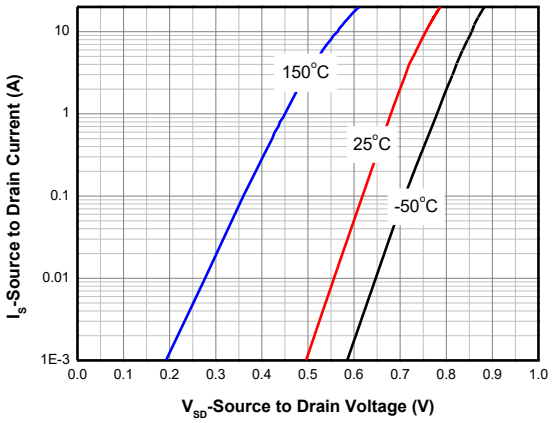
On-Resistance vs. Junction Temperature [d]



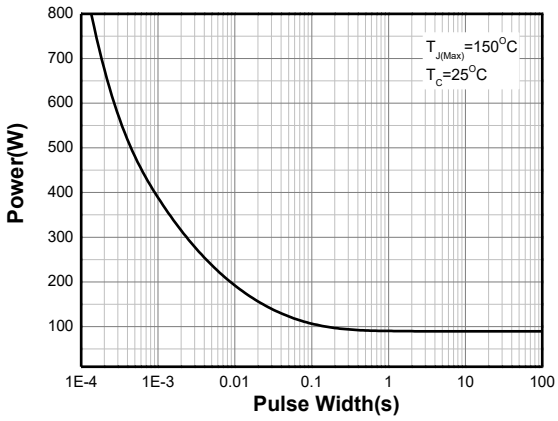
Threshold Voltage vs. Temperature[d]



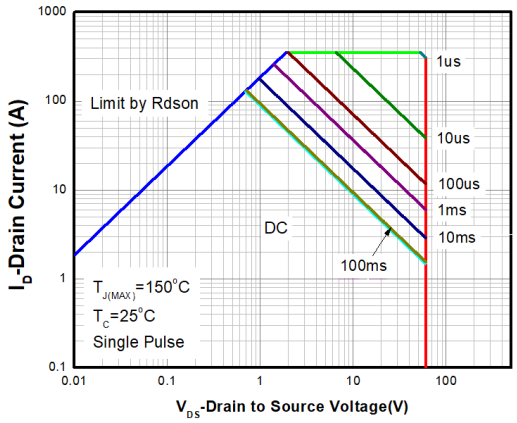
Capacitance



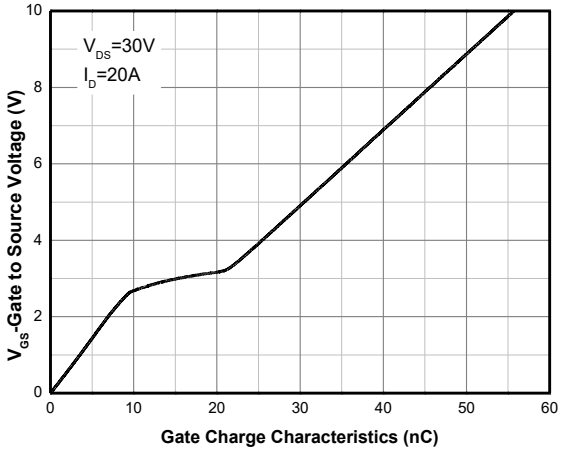
Body Diode Forward Voltage [d]



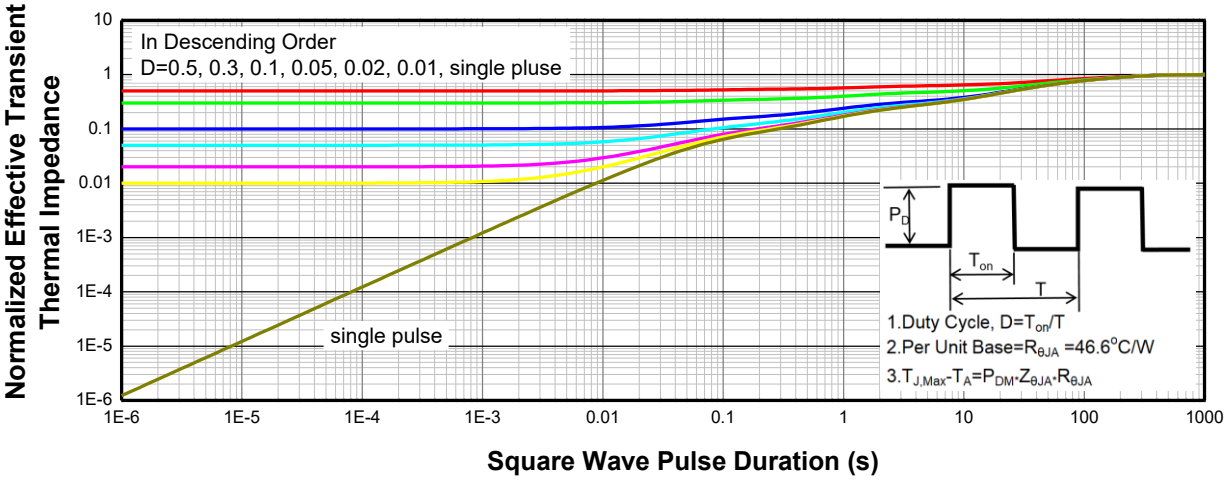
Single Pulse power



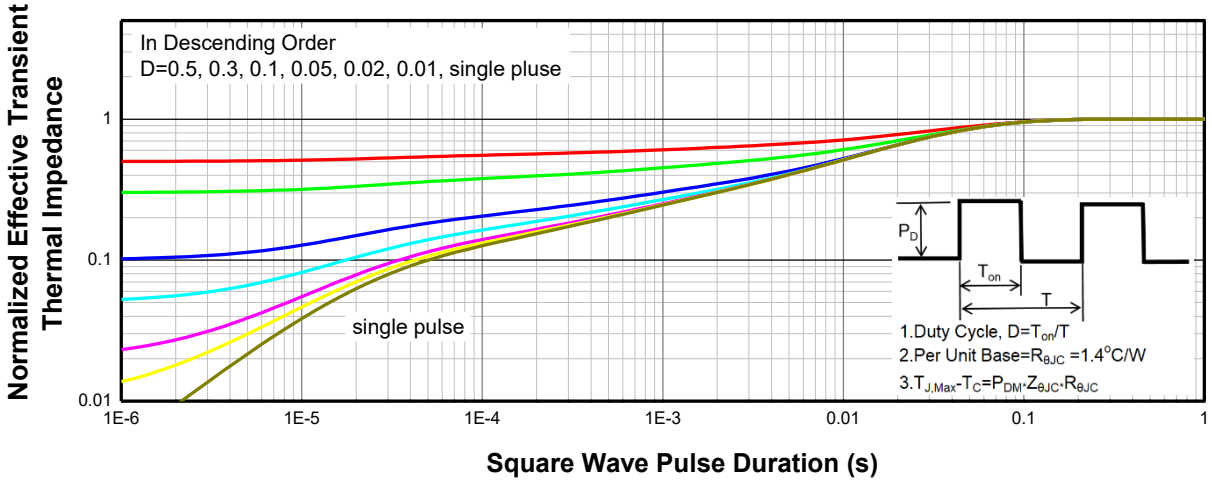
Safe Operating Area



Gate Charge Characteristics



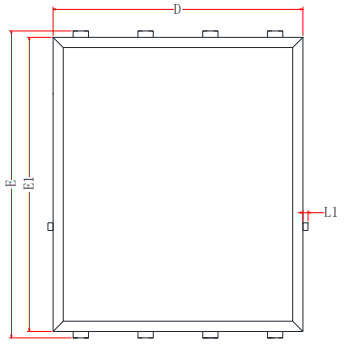
Transient Thermal Response (Junction-to- Ambient)



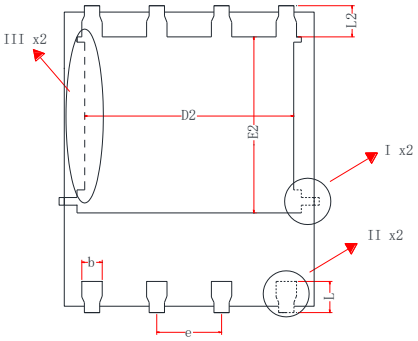
Transient Thermal Response (Junction-to-Case)

PACKAGE OUTLINE DIMENSIONS

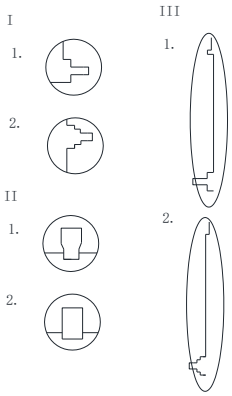
PDFN5x6-8L

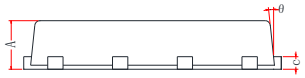


TOP VIEW

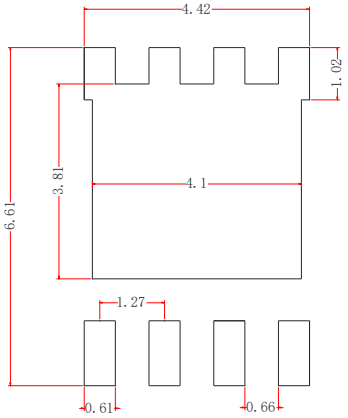


BOTTOM VIEW





SIDE VIEW

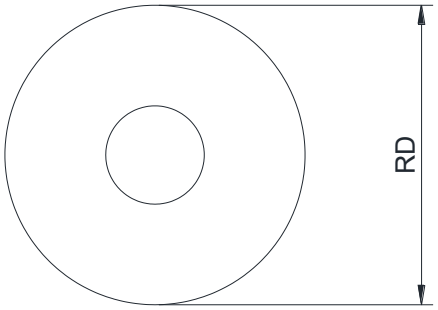


RECOMMENDED LAND PATTERN(Unit:mm)

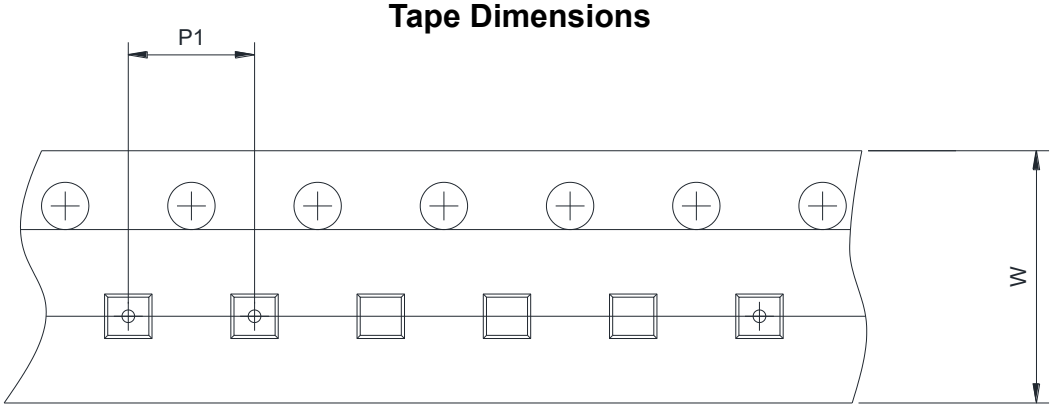
Symbol	Dimensions in Millimeters		
	Min.	Typ.	Max.
A	0.85	0.95	1.00
c	0.15	-	0.34
D	4.80	-	5.30
D2	3.82	-	4.45
E	5.90	-	6.15
E1	5.45	-	5.80
E2	3.18	3.45	3.73
e	1.27BSC		
b	0.30	0.40	0.50
L	0.45	-	0.71
L1	0.00	-	0.15
L2	0.68Ref		
θ	0°	-	12°

TAPE AND REEL INFORMATION

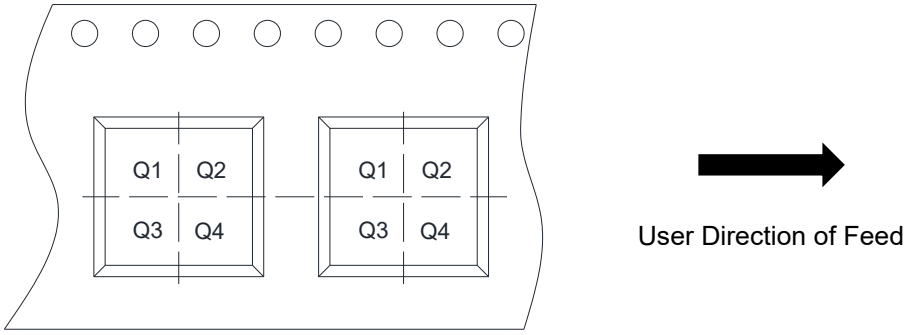
Reel Dimensions



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