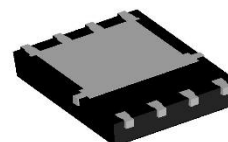


SNM042R5DNA

Single N-Channel, 40V, 121A, Power MOSFET

<http://www.sitcores.com/>

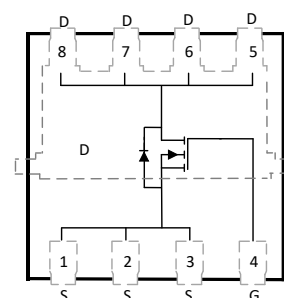
V_{DS} (V)	Max. $R_{DS(on)}$ (m Ω)
40	2.5 @ $V_{GS}=10V$
	4.4 @ $V_{GS}=4.5V$



PDFN5X6-8L

Description

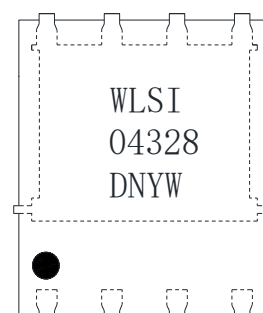
The SNM042R5DNA is N-Channel enhancement MOS Field Effect Transistor. Uses advanced trench technology and design to provide excellent $R_{DS(ON)}$ with low gate charge. This device is suitable for use in DC-DC conversion, power switch and charging circuit. Standard Product SNM042R5DNA is in compliance with RoHS.



Pin configuration (Top view)

Features

- Trench Technology
- Supper high density cell design
- Low ON resistance
- Low Threshold Voltage
- Package PDFN5X6-8L
- 100% UIS and Rg Tested
- MSL3



WLSI =Company (Group) Code
 04328 =Device Code
 DN =Special Code
 Y =Year
 W =Week (A~z)

Marking

Order information

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

Device	Package	Shipping
SNM042R5DN A-8/TR	PDFN5X6-8L	5000/Tape&Reel

Absolute Maximum ratings

Parameter	Symbol	Maximum	Unit
Drain-Source Voltage	V_{DS}	40	V
Gate-Source Voltage	V_{GS}	± 20	
Continuous Drain Current	I_D	$T_C=25^{\circ}\text{C}$ 121	A
		$T_C=100^{\circ}\text{C}$ 76	A
Pulsed Drain Current ^c	I_{DM}	224	A
Continuous Drain Current	I_{DSM}	$T_A=25^{\circ}\text{C}$ 41	A
		$T_A=70^{\circ}\text{C}$ 33	
Avalanche Energy $L=0.5\text{mH}$	E_{AS}	156	mJ
Power Dissipation ^b	P_D	$T_C=25^{\circ}\text{C}$ 64	W
		$T_C=100^{\circ}\text{C}$ 26	
Power Dissipation ^d	P_{DSM}	$T_A=25^{\circ}\text{C}$ 7.2	W
		$T_A=70^{\circ}\text{C}$ 4.6	
Operating Junction Temperature	T_J	-55 to 150	$^{\circ}\text{C}$
Storage Temperature Range	T_{STG}	-55 to 150	$^{\circ}\text{C}$

Thermal resistance ratings

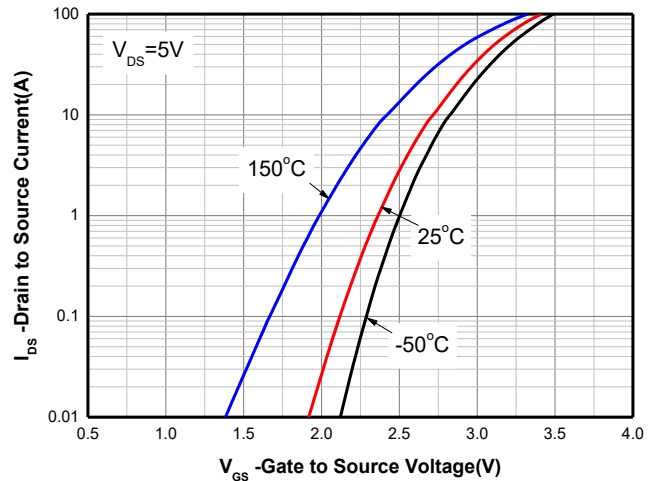
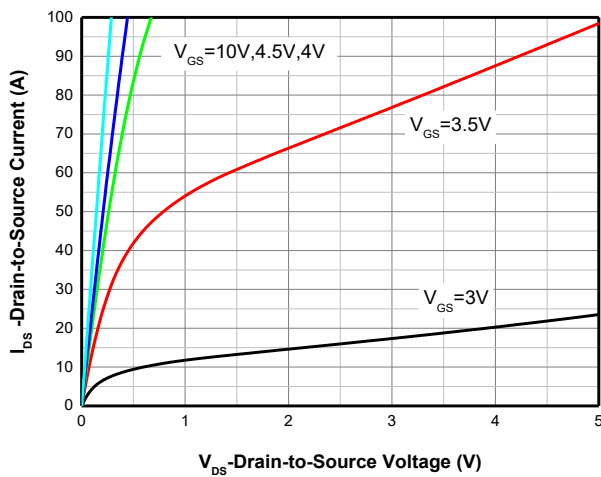
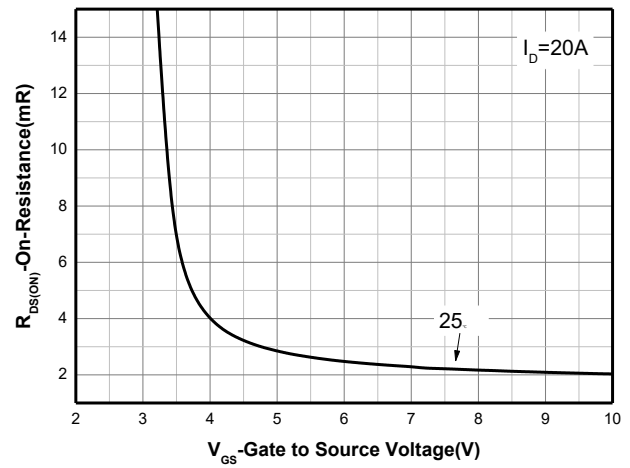
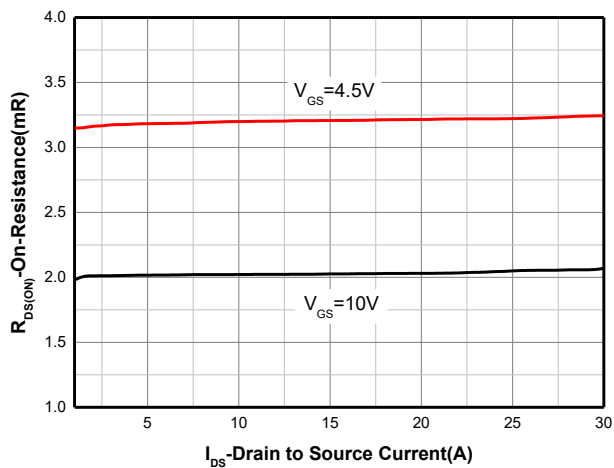
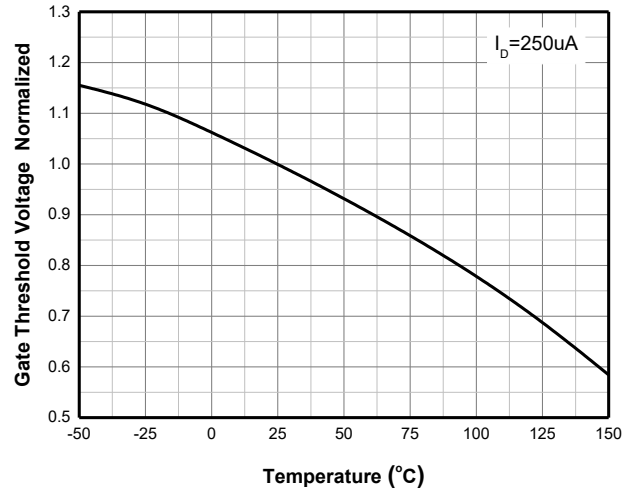
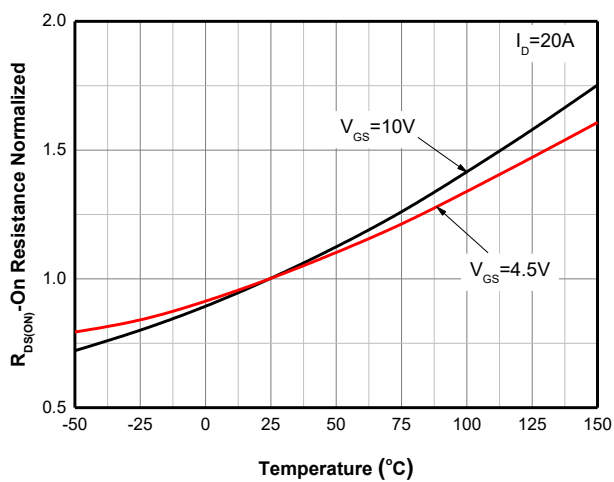
Single Operation					
Parameter		Symbol	Typical	Maximum	Unit
Junction-to-Ambient Thermal Resistance ^a	$t \leq 10\text{ s}$	$R_{\theta JA}$	14	17	$^{\circ}\text{C/W}$
	Steady State		39	47	
Junction-to-Case Thermal Resistance	Steady State	$R_{\theta JC}$	1.4	2.0	

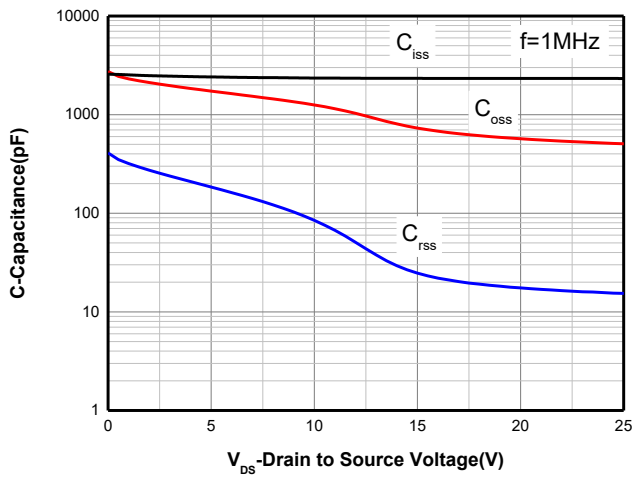
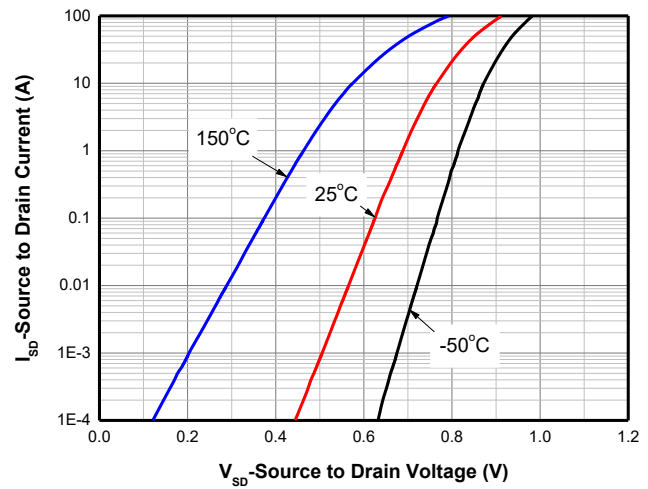
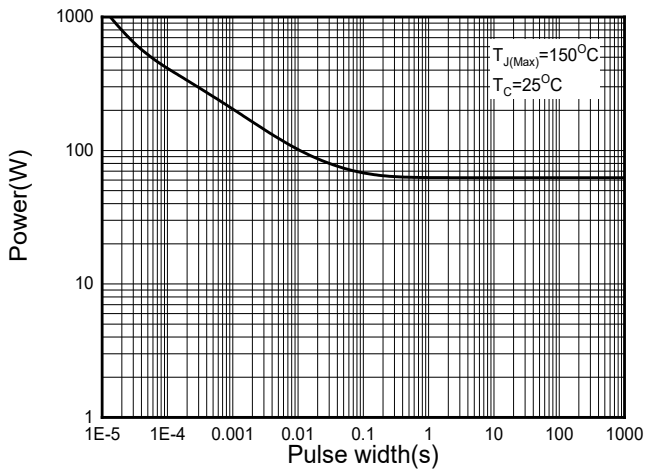
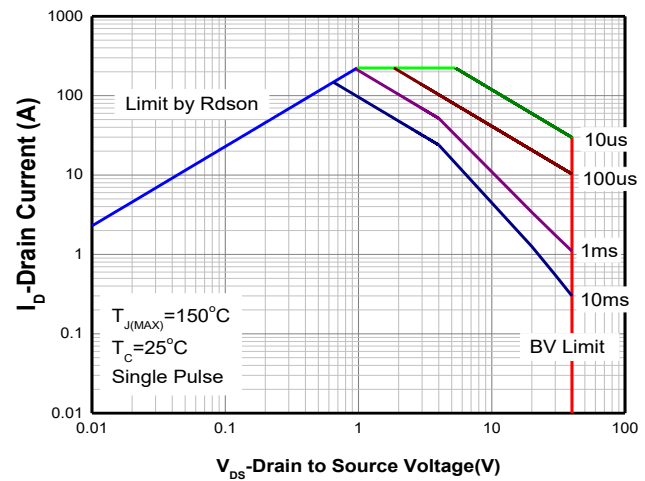
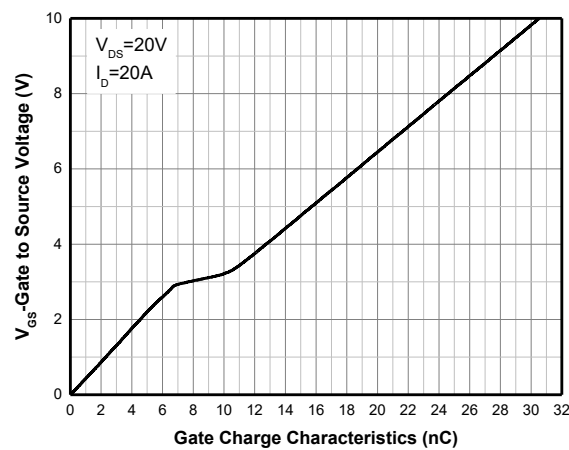
Note:

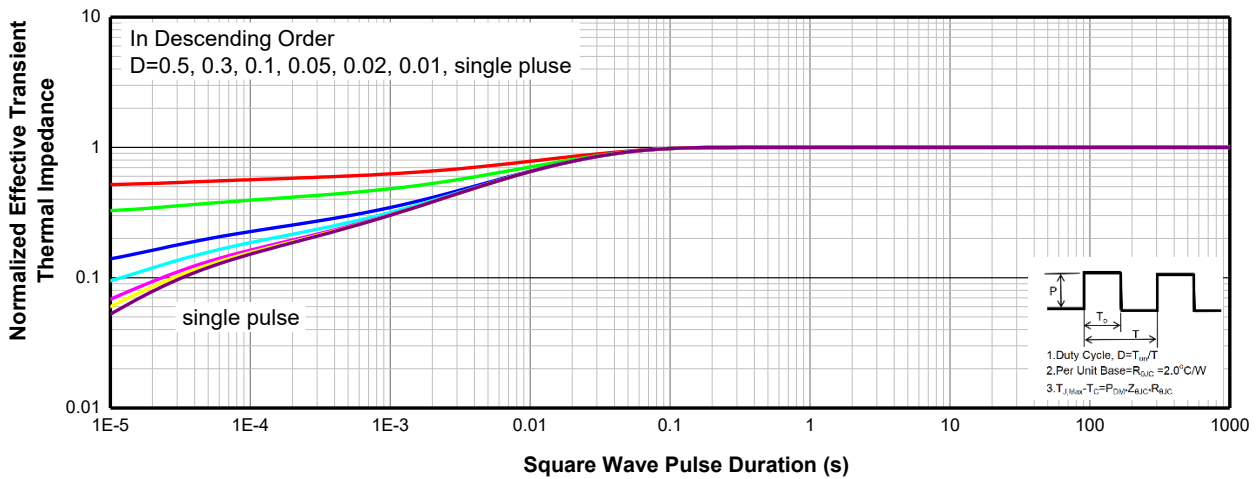
- a FR-4 board (38mm X 38mm X t1.6mm, 70um Copper) partially covered with copper (645mm² area).
- b The power dissipation P_D is based on $T_{J(MAX)}=150^{\circ}\text{C}$, using junction-to-case thermal resistance, and is more useful in setting the upper dissipation limit for cases where additional heat sinking is used.
- c Repetitive rating, ~10us pulse width, duty cycle ~1%, keep initial $T_J = 25^{\circ}\text{C}$, the maximum allowed junction temperature of 150°C .
- d The power dissipation P_{DSM} is based on Junction-to-Ambient thermal resistance $R_{\theta JA}$ $t \leq 10\text{s}$ value and the $T_{J(MAX)}=150^{\circ}\text{C}$.
- e The static characteristics are obtained using ~380us pulses, duty cycle ~1%.
- f The parameter is not subject to production test – verified by design / characterization.

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

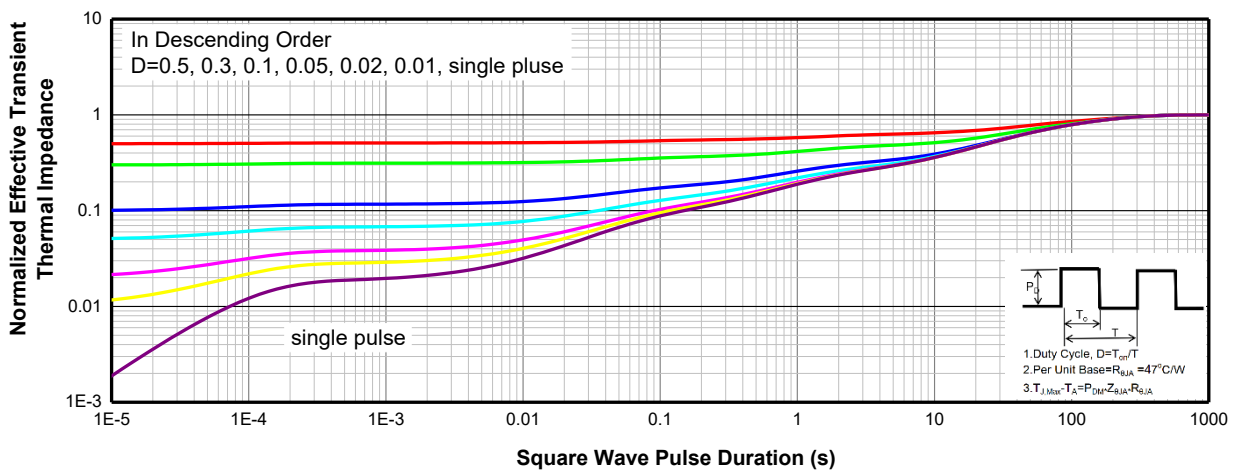
Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
OFF CHARACTERISTICS						
Drain-to-Source Breakdown Voltage	BV _{DSS}	V _{GS} = 0 V, I _D = 250uA	40			V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = 40V, V _{GS} = 0V			1	μA
Gate-to-source Leakage Current	I _{GSS}	V _{DS} = 0 V, V _{GS} = ±20V			±100	nA
ON CHARACTERISTICS						
Gate Threshold Voltage	V _{GS(TH)}	V _{GS} = V _{DS} , I _D = 250uA	1.2	1.7	2.2	V
Drain-to-source On-resistance ^e	R _{DS(on)}	V _{GS} =10V, I _D = 20A		2.1	2.5	mΩ
		V _{GS} = 4.5V, I _D =20A		3.2	4.4	
CHARGES, CAPACITANCES AND GATE RESISTANCE ^f						
Input Capacitance	C _{ISS}	V _{GS} = 0V, f = 1.0MHz, V _{DS} = 20 V		2326		pF
Output Capacitance	C _{OSS}			560		
Reverse Transfer Capacitance	C _{RSS}			19		
Total Gate Charge	Q _{G(10V)}	V _{GS} = 10 V, V _{DD} = 20V, I _D = 20A		30.6		nC
Total Gate Charge	Q _{G(4.5V)}			14.5		
Gate-to-Source Charge	Q _{GS}			7.1		
Gate-to-Drain Charge	Q _{GD}			3.3		
Gate Resistance	R _g	F = 1MHz		0.7		Ω
SWITCHING CHARACTERISTICS ^f						
Turn-On Delay Time	td(ON)	V _{DS} =20V, V _{GS} =10V, I _D =20A, R _{GEN} =1.6Ω,		9		ns
Rise Time	tr			41.6		
Turn-Off Delay Time	td(OFF)			27.6		
Fall Time	tf			10.6		
BODY DIODE CHARACTERISTICS						
Forward Voltage	V _{SD}	V _{GS} = 0 V, I _S = 20A		0.8	1.2	V
Maximum Continuous Current	I _S				64	A
Body Diode Reverse Recovery Time ^f	trr	I _F =20A, di/dt=100A/us		25		ns
Body Diode Reverse Recovery Charge ^f	Q _{rr}	I _F =20A, di/dt=100A/us		12.4		nC

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

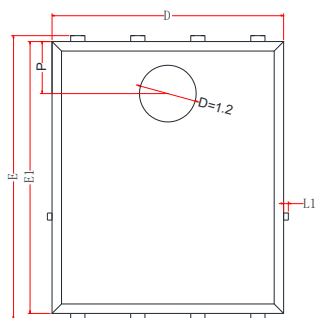

Capacitance

Body Diode Forward Voltage ^e

Single Pulse power

Safe Operating Area

Gate Charge Characteristics



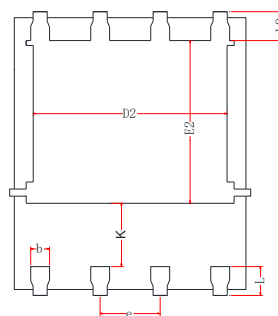
Transient Thermal Response (Junction-to-Case)



Transient Thermal Response (Junction-to-Ambient)

PACKAGE OUTLINE DIMENSIONS
PDFN5x6-8L


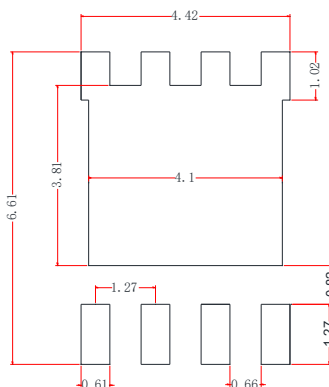
TOP VIEW



BOTTOM VIEW



SIDE VIEW

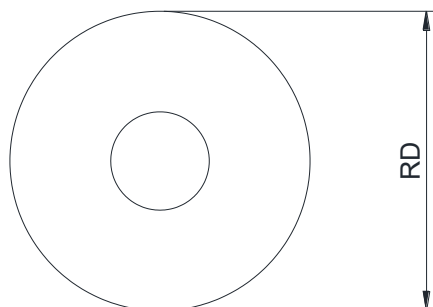


RECOMMENDED LAND PATTERN (Unit:mm)

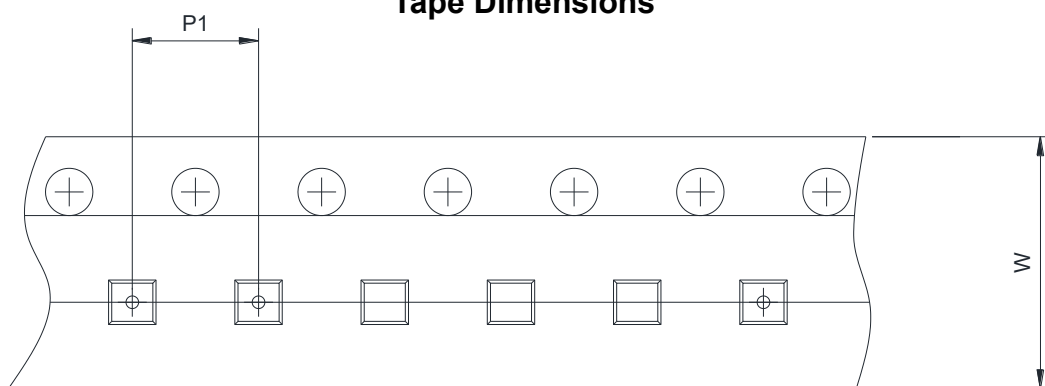
Symbol	Dimensions in Millimeters		
	Min.	Typ.	Max.
A	0.90	0.95	1.00
b	0.35	0.40	0.45
c	0.21	0.25	0.34
D	4.80	4.90	5.00
D2	3.82	-	4.11
E	5.90	6.00	6.10
E1	5.70	5.75	5.80
E2	3.18	-	3.54
e	1.27BSC		
K	1.10	-	-
L	0.51	0.61	0.71
L1	-	-	0.10
L2	0.51	0.61	0.71
P	1.00	1.10	1.20
θ	8°	-	12°

TAPE AND REEL INFORMATION

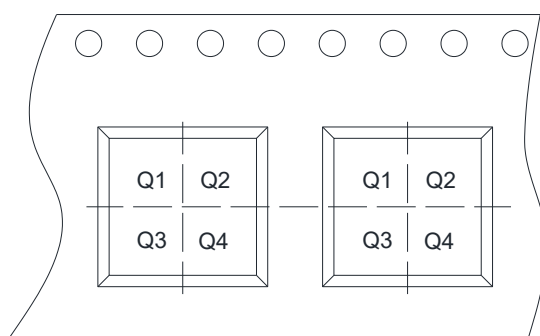
Reel Dimensions



Tape Dimensions



Quadrant Assignments For PIN1 Orientation In Tape




 User Direction of Feed

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