WS4622C

2A, 38 mΩ, 250nA Quiescent current and 90nA Standby current Load Switch

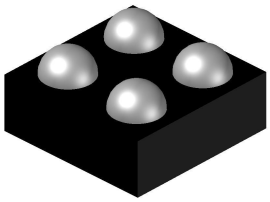
Http://www.sh-willsemi.com

Descriptions

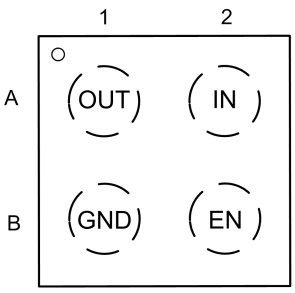
The WS4622C is a single channel load switch with ultra-low on resistance MOSFET. It is designed for load switching applications with ultra-low quiescent current (250nA) and ultra-low standby current (90nA).The device is controlled by external logic pin, allowing optimization of battery life, and portable device autonomy.

The WS4622C contains a P-channel MOSFET that can operate over an input voltage range of 1.2V to 5.5V and can support a maximum continuous current of 2A. Output discharge path is designed to reduce voltage on the output rail quickly.

The WS4622C are available in a small 1 x 1mm CSP-4L Package. Standard products are Pb-free and Halogen-free.



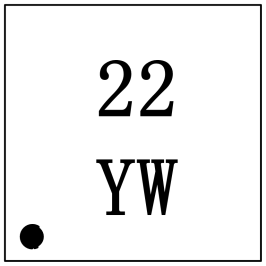
CSP-4L



Pin Configuration (Top View)

Features

- Input Voltage Range :1.2V~5.5V
- Main switch Ron : 38mΩ @ 4.2V
- Maximum Output current : 2A.
- Quiescent current : 250nA @ Typ
- Standby current : 90nA @ Typ
- Recommend capacitor : 1μF
- Active High EN Pin
- Output Auto-discharge
- CSP-4L 1 x 1 mm



CSP-4L
22 : Device code
Y : Year code
W : Week code

Marking

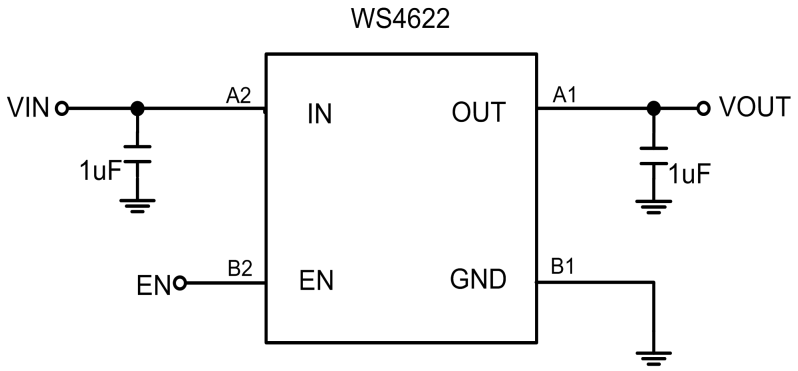
Applications

- MP3/MP4 Players
- Cellphones, radiophone, digital cameras
- Bluetooth, wireless handsets
- Others portable electronics device

Order information

Device	Marking	Package	Shipping
WS4622C-4/TR	22YW	CSP-4L	3000/Reel&Tape

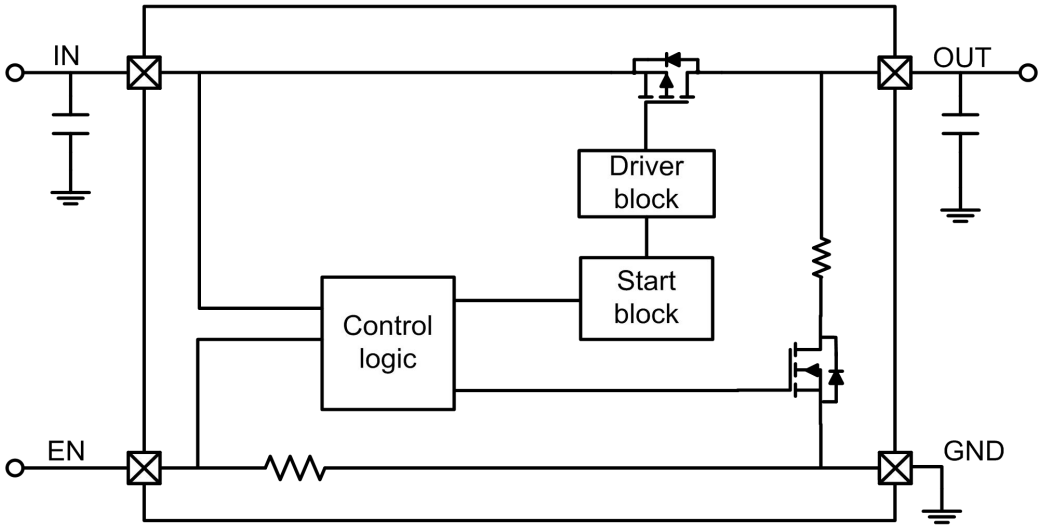
Typical Application



Pin Description

PIN	Symbol	Description
A1	OUT	Output pin
A2	IN	Input pin
B1	GND	Ground
B2	EN	Enable (Active high)

Block Diagram



Absolute Maximum Ratings

Parameter		Value	Unit
V_{IN} Range		-0.3～6.5	V
V_{EN} Range		-0.3～6.5	V
V_{OUT} Range		-0.3～6.5	V
Storage Temperature Range		-40 ~ 150	°C
Junction Temperature Range		-40 ~ 125	°C
Lead Temperature		260	°C
Moisture Sensitivity		Level-1	
ESD Ratings	HBM	8000	V
	MM	400	V

Recommend Operating Ratings

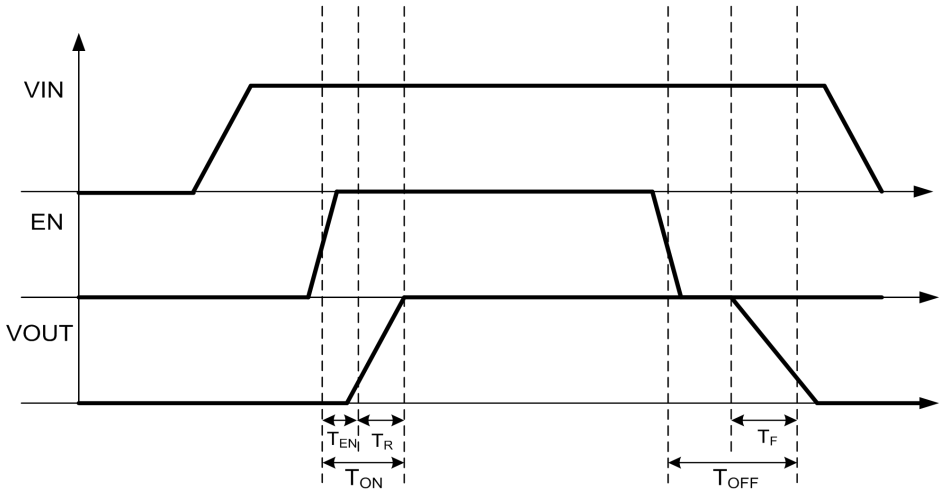
Parameter	Value	Unit
Operating Power voltage	1.2～5.5	V
Enable Voltage	0~5.5	V
Maximum DC current	2	A
Operating ambient temperature	-40～85	°C
Operating Junction temperature	-40～125	°C
Decoupling input capacitor	1	uF
Decoupling output capacitor	1	uF
Power Dissipation Rating(25 °C,WLCSP package)	0.5	W
Power Dissipation Rating(85 °C,WLCSP package)	0.2	W
Thermal Resistance, $R_{\theta JA}$ (CSP-4L)	100	°C/W

Electronics Characteristics

(Ta=25°C, V_{IN}=5V, C_{IN}=C_{OUT}=1 μ F, unless otherwise noted)

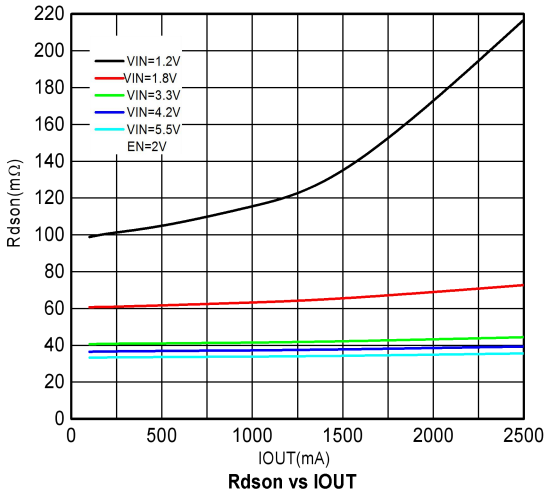
Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Input Voltage	V_{IN}		1.2		5.5	V
Static drain-source on-state resistance	R_{DSON}	V_{IN} =5.5,I_{OUT} =200mA		34	42	mΩ
		V_{IN} =4.2,I_{OUT} =200mA		38	47	
		V_{IN} =3.3,I_{OUT} =200mA		42	52	
		V_{IN} =1.8,I_{OUT} =200mA		62	88	
		V_{IN} =1.2,I_{OUT} =200mA		104	250	
Output discharge path	R_{DIS}	EN=Low,V_{IN}=3.3V		65	120	Ω
EN logic high voltage	V_{ENH}		0.9			V
EN logic low voltage	V_{ENL}				0.5	V
EN pull down resistor	R_{PD}			4		MΩ
Standby current	I_{STD}	EN=Low, No load		90	500	nA
Quiescent current	I_Q	EN=High,No load		250	500	nA
Enable time	T_{EN}	V_{IN} =3.6,RL=25ohm		40		μs
Output rise time	T_R	V_{IN} =3.6,RL=25ohm		30		μs
ON time(T_{EN}+T_R)	T_{ON}	V_{IN} =3.6,RL=25ohm		70		μs
Output fall time	T_F	V_{IN} =3.6,RL=25ohm		42		μs

TIMINGS

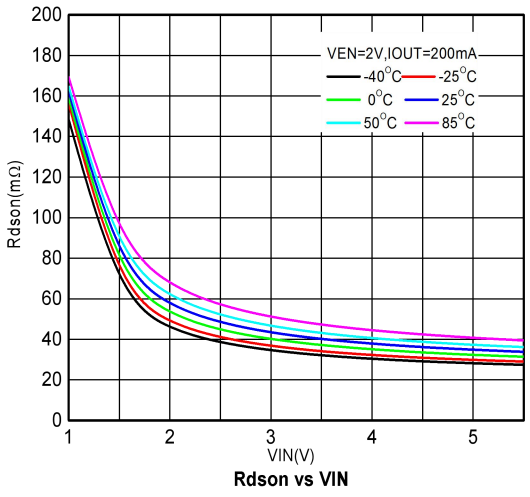


Enable, rise and fall time

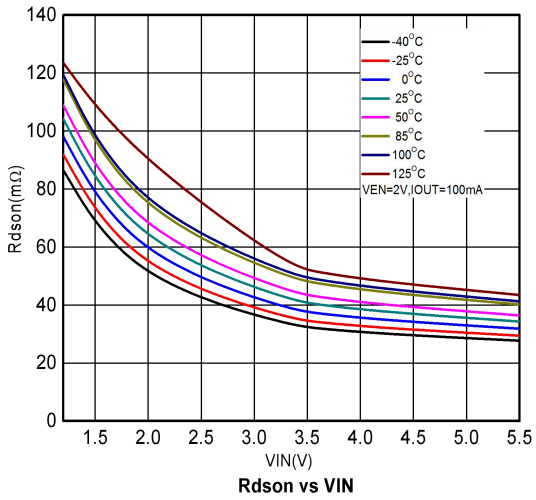
Typical characteristics (Ta=25°C, V_{IN}=5V, I_{OUT}=200mA, C_{IN}=C_{OUT}=1 μ F, unless otherwise noted)



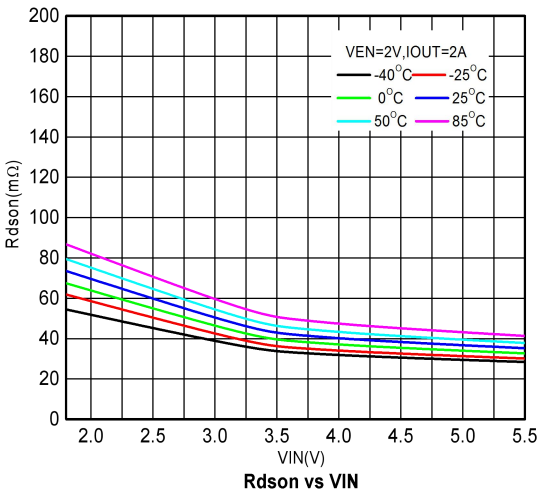
Rdson vs IOUT



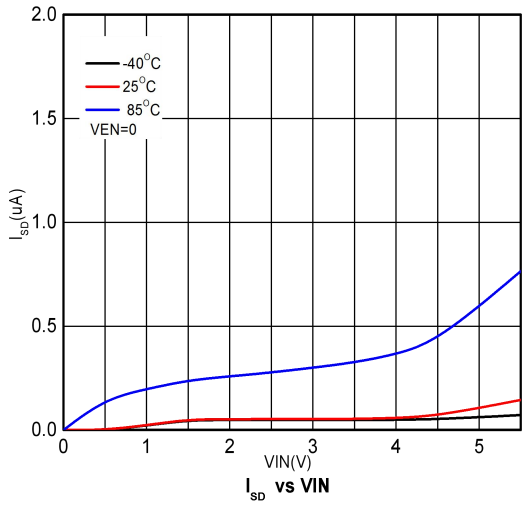
Rdson vs VIN



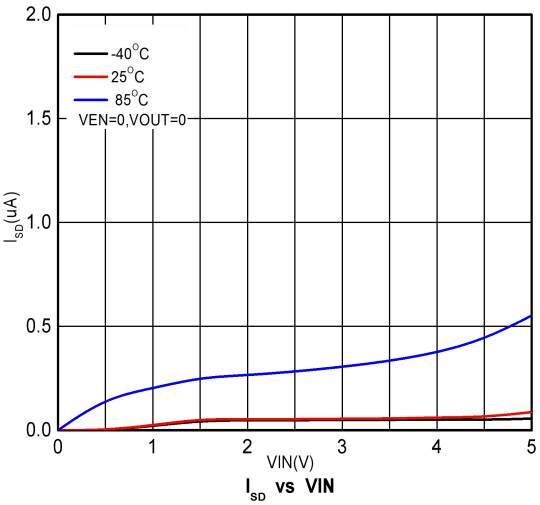
Rdson vs VIN



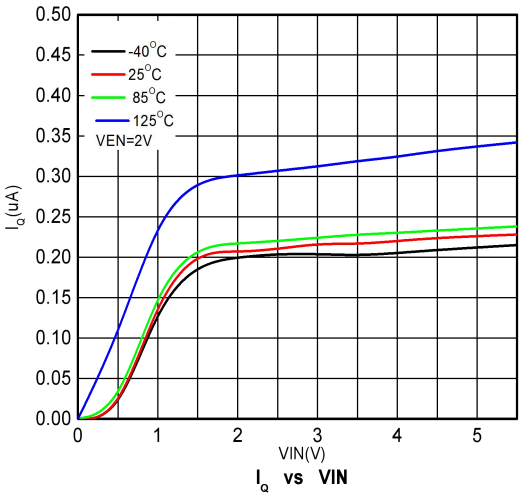
Rdson vs VIN



ISD vs VIN



ISD vs VIN

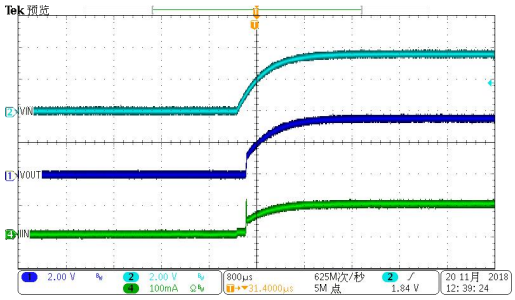

0.50
0.45
0.40
0.35
0.30
0.25
0.20
0.15
0.10
0.05
0.00
-40°C
25°C
85°C
125°C
VEN=2V
I_Q(uA)
0
1
2
3
4
5
VIN(V)

I_Q vs VIN

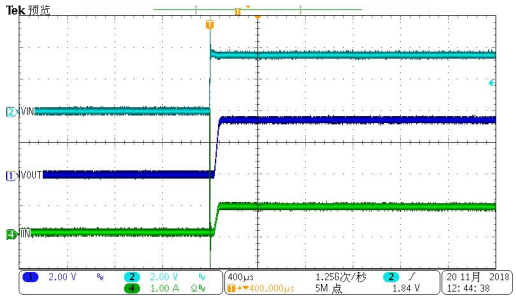
Turn On & Turn Off

（1）Start from VIN.

VIN=VEN=3.6V,IOUT=100mA

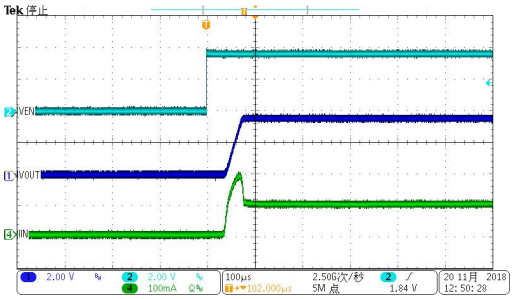


VIN=VEN=3.6V,IOUT=1A

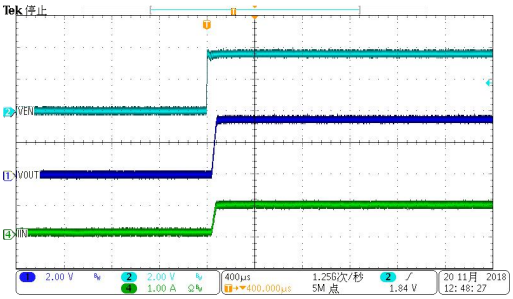


（2）Start from EN

VIN=VEN=3.6V,IOUT=100mA

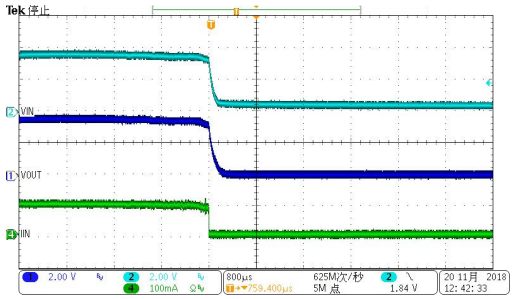


VIN=VEN=3.6V,IOUT=1A

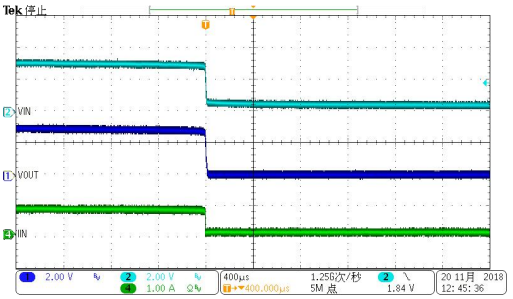


（3）Shutdown from VIN

VIN=VEN=3.6V,IOUT=100mA

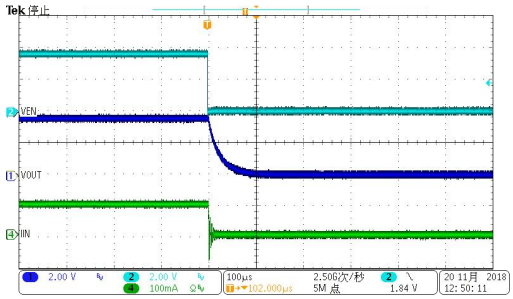


VIN=VEN=3.6V,IOUT=1A

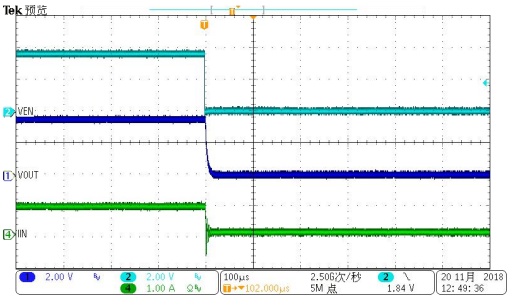


（4）Shutdown from EN

VIN=VEN=3.6V,IOUT=100mA

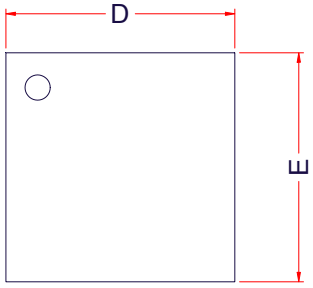


VIN=VEN=3.6V,IOUT=1A

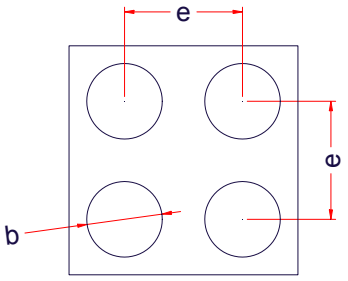


ACKAGE OUTLINE DIMENSIONS

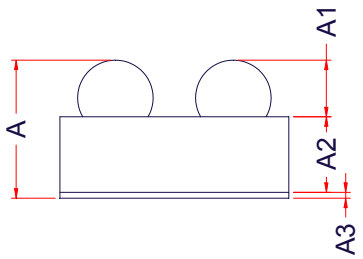
CSP-4L



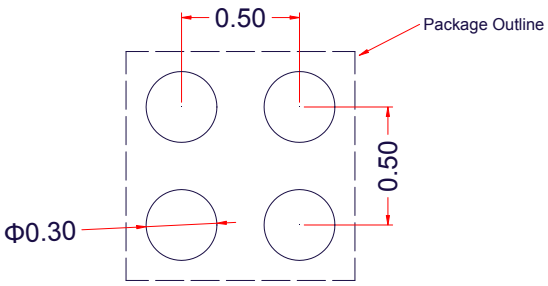
TOP VIEW



BOTTOM VIEW



SIDE VIEW

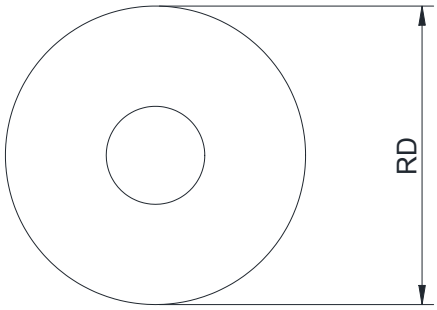


RECOMMENDED LAND PATTERN (unit：mm)

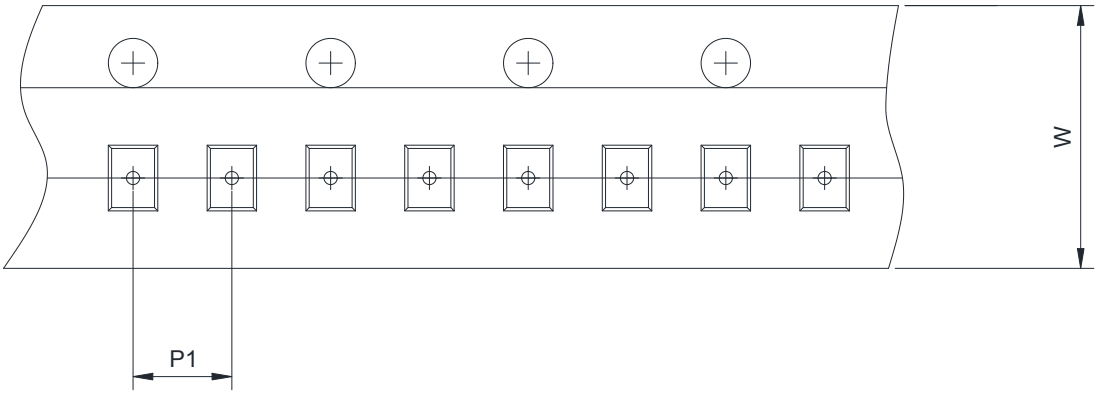
Symbol	Dimensions in Millimeters		
	Min.	Typ.	Max.
A	0.55	0.58	0.62
A1	0.22	0.24	0.26
A2	0.30	0.32	0.34
A3	0.03 Ref.		
D	0.94	0.97	1.00
E	0.94	0.97	1.00
e	0.50BSC		
b	0.30	0.32	0.34

TAPE AND REEL INFORMATION

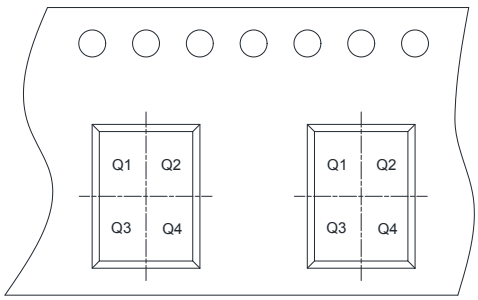
Reel Dimensions



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