XN44272L

Single Channel Low-Side Gate Driver

Features

- Output source/sink current capability 1.5 A/1.5 A
- Gate drive supply range from 13 V to 20 V
- Undervoltage lockout
- CMOS Schmitt-triggered inputs
- 3.3 V, 5 V and 15 V input logic compatible
- Outputs in phase with inputs
- Enable input
- SOT23-5L package available
- RoHS compliant

Product summary

$I_{O+/-}$ (typ.)	= 1.5 A/1.5 A
V_{OUT}	= 13 V - 20 V
$t_{on/off}$ (typ.)	= 50 ns/50 ns

Package

SOT23-5L

Application

- General purpose gate driver
- Industrial applications
- Switched-mode power supplies

Description

The XN44272L is a low-voltage, wide VCC range, power MOSFET and IGBT non-inverting gate driver. Proprietary latch immune CMOS technologies enable ruggedized monolithic construction. The logic input is compatible with standard CMOS or LSTTL output. The output driver features a current buffer stage. The design also includes an enable input with internal pull up.

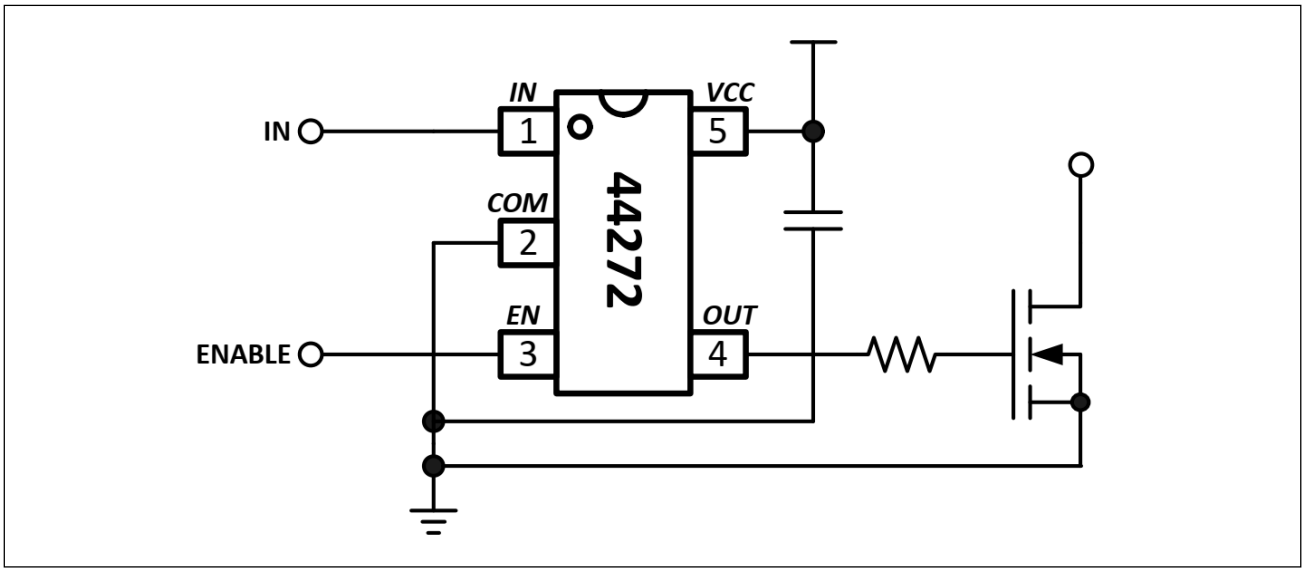

Figure 1 Typical application diagram

Ordering information

Base Part Number	Package	Standard Pack		Orderable Part Number
		Form	Quantity	
XN44272L	SOT23-5L	Tape and Reel	3000	XN44272LTR

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1. Block diagram

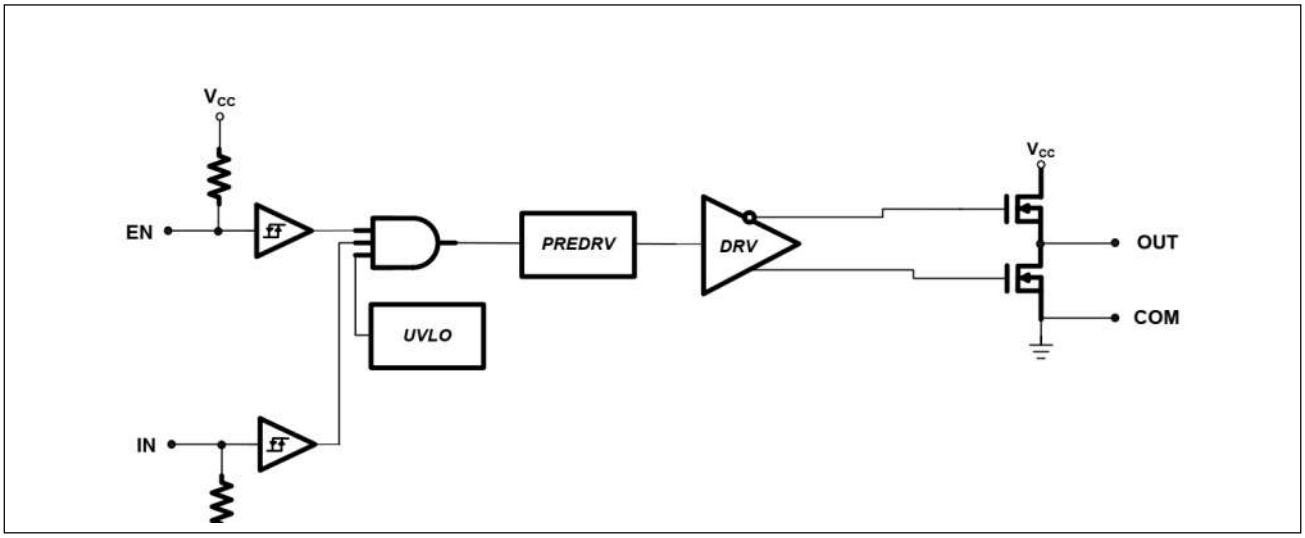


Figure 2 Function block diagram

2. Lead definitions

Table 1 XN44272L lead definitions

Pin no	Name	Function
1	IN	Logic input for gate driver output, in phase
2	COM	Ground
3	EN	Enable input
4	OUT	Gate driver output
5	VCC	Supply voltage

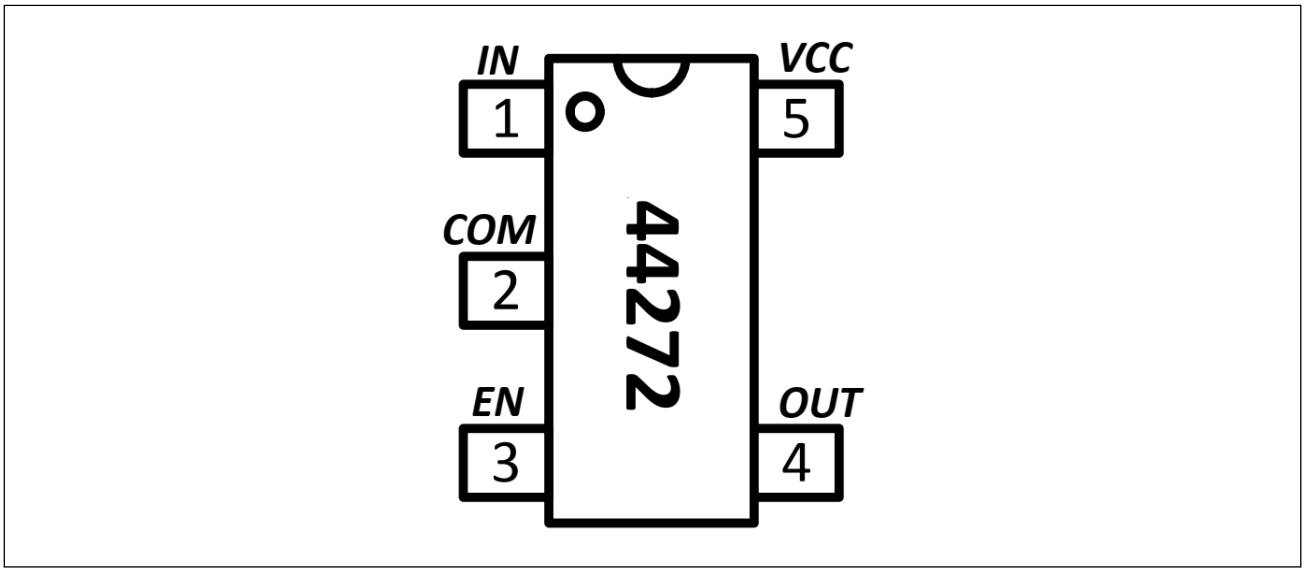


Figure 3 XN44272L lead assignments SOT23-5L(top view)

3. Electrical parameters

3.1 Absolute maximum ratings

Absolute maximum ratings indicate sustained limits beyond which damage to the device may occur. All voltage parameters are absolute voltages referenced to COM unless otherwise stated in the table. The thermal resistance and power dissipation ratings are measured under board mounted and still air conditions.

Table 2 Absolute maximum ratings

Symbol	Definition	Min.	Max.	Units
V_{CC}	Low side supply voltage	-0.3	25	V
V_O	Low-side output voltage	-0.3	V_{CC}+0.3	
V_{IN}	Logic input voltage	COM-0.3	V_{CC}+0.3	
Rth_{JA}	Thermal resistance, junction to ambient	-	200	℃/W
T_J	Junction temperature	-	150	℃
T_S	Storage temperature	-55	150	
T_L	Lead temperature (soldering, 10 seconds)	-	300	

3.2 Recommended operating conditions

For proper operation, the device should be used within the recommended conditions. All voltage parameters are absolute voltages referenced to COM unless otherwise stated in the table.

Table 3 Recommended operating conditions

Symbol	Definition	Min.	Max.	Units
V_{CC}	Supply voltage	13	18	V
V_O	Low-side output voltage	0	V_{CC}	
V_{IN}	Logic input voltage	0	V_{CC}	
T_A	Ambient temperature	-40	125	℃

3.3 Static electrical characteristics

(V_{CC} – COM) = 15 V, and T_A = 25°C unless otherwise specified. The V_{IL}, V_{IH} and I_{IN} parameters are referenced to COM and are applicable to the respective input leads: IN、 EN. The V_O and I_O parameters are referenced to COM and are applicable to the respective output leads OUT. The V_{CCUV} parameters are referenced to COM.

Table 4 Static electrical characteristics

Symbol	Definition	Min.	TYP.	Max.	Units	Test Conditions
V_{CCUV+}	V_{CC} supply undervoltage positive going threshold	11.6	12.1	12.6	V	
V_{CCUV-}	V_{CC} supply undervoltage negative going threshold	11	11.6	12.1		
V_{CCUVHY}	V_{CC} supply undervoltage hysteresis	-	0.5	-		
I_{QCC}	Quiescent V_{CC} supply current	150	200	250	uA	V_{IN} = 0 V or 5V
V_{OH}	High level output voltage drop, V_{BIAS}-V_O	-	-	1	V	I_O = 20 mA
V_{OL}	Low level output voltage drop, V_O	-	-	0.1		
I_{o+}	Peak output current turn-on	-	1.5	-	A	V_O = 0 V PW = 10 µs
I_{o-}	Peak output current turn-off	-	1.5	-		V_O = 15 V PW = 10 µs
V_{IH}	Logic “1” input voltage	2.5	-	-	V	V_{CC}=13 V to 20 V
V_{IL}	Logic “0” input voltage	-	-	0.8		
V_{EN+}	EN input rising threshold	2.0	2.1	2.2		
V_{EN-}	EN input falling threshold	1.2	1.3	1.4		
I_{IN+}	Input bias current (H_O = High)	-	55	80	uA	V_{IN} = 5 V
I_{IN-}	Input bias current (H_O = Low)	-10	0	-		V_{IN} = 0 V

3.3 Dynamic electrical characteristics

V_{CC} = 15 V, T_A = 25°C and C_L = 1000 pF unless otherwise specified.

Table 5 Dynamic electrical characteristics

Symbol	Definition	Min.	TYP.	Max.	Units	Test Conditions
t_{ON}	Turn-on propagation delay	-	50	-	ns	V_{IN} = 0 or 5 V
t_{OFF}	Turn-off propagation delay	-	50	-		
t_R	Turn-on rise time	-	25	-		V_{IN} = 0 or 5 V C_L = 1 nF
t_F	Turn-off fall time	-	25	-		
t_{EN}	Enable propagation delay	-	50	-		

4. Switching and timing relationships

The relationship between the input and output signals of the XN44272L are illustrated below. From these figures, we can see the definitions of several timing parameters (i.e.,t_{ON}, t_{OFF}, t_R, and t_F) associated with this device.

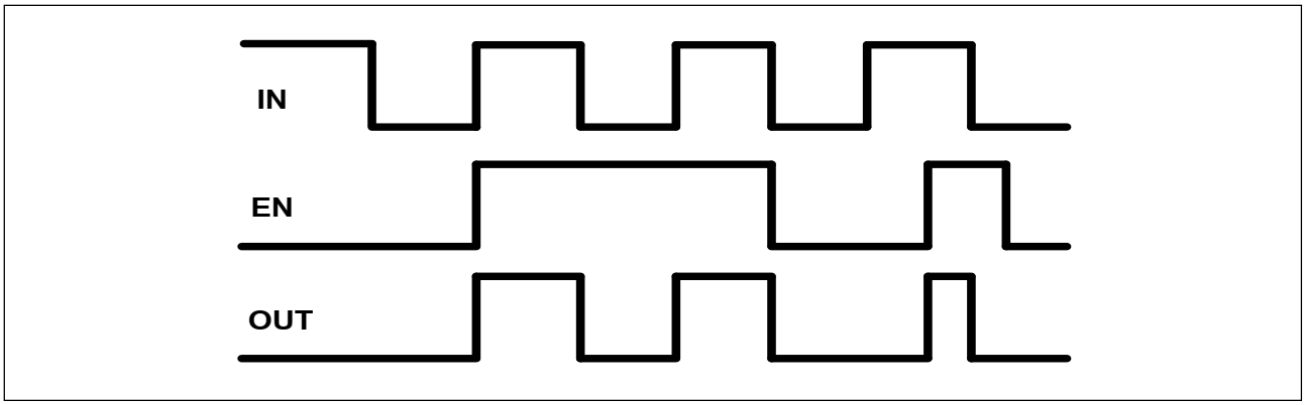


Figure 4 Input/Output timing diagram

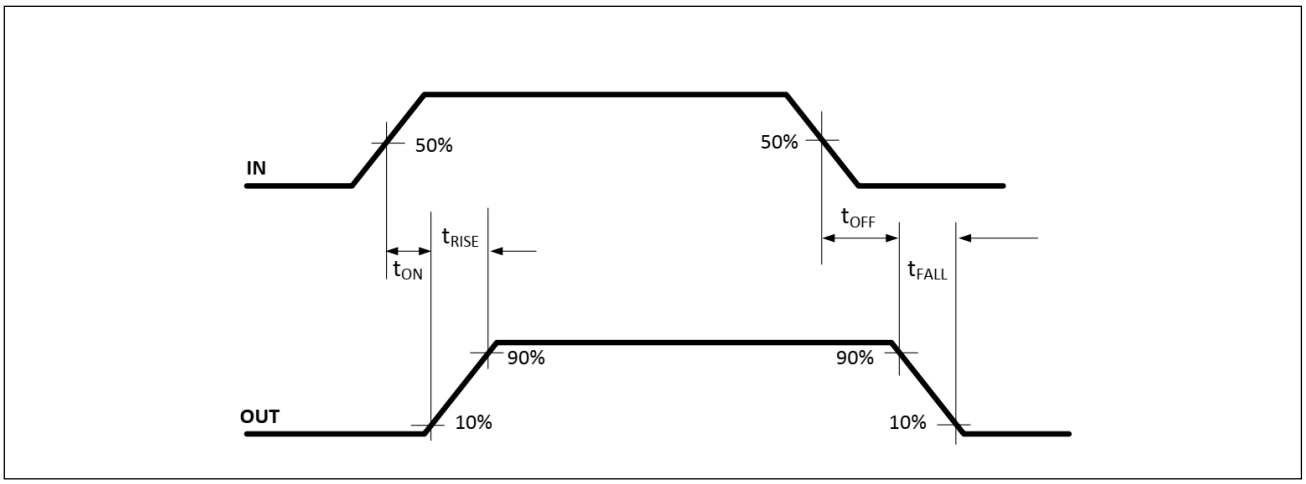
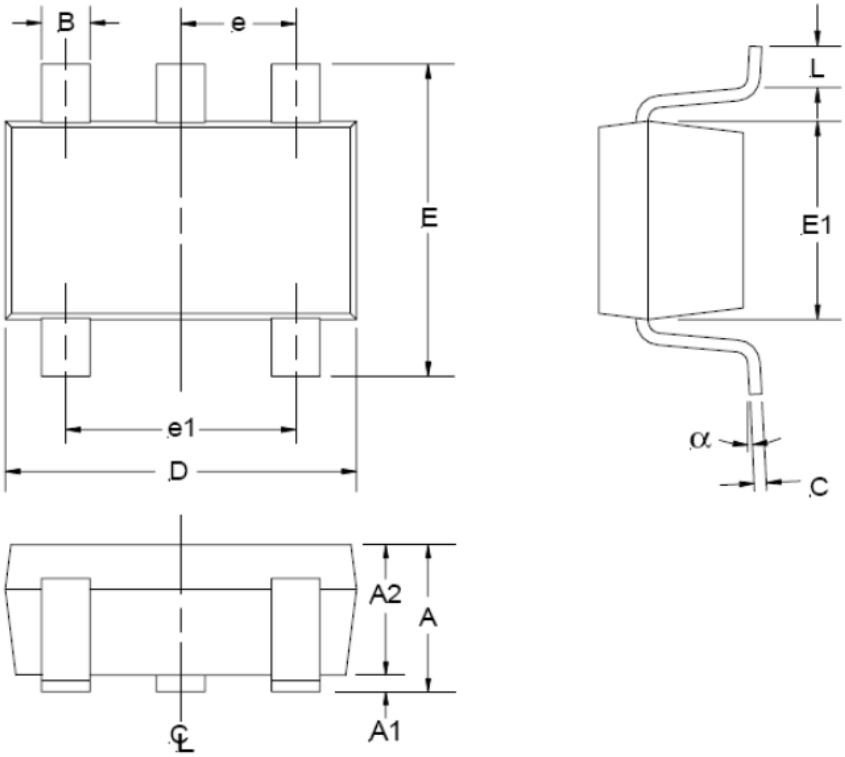


Figure 5 Switching time waveforms

5. Package information SOT23-5L



SYMBOL	MIN	MAX
A	0.90	1.45
A1	0.00	0.15
A2	0.90	1.30
B	0.25	0.50
C	0.09	0.20
D	2.80	3.00
E	2.60	3.00
E1	1.50	1.75
e	0.95 REF	
e1	1.90 REF	
L	0.35	0.55
α	0°	10°

NOTE: ALL MEASUREMENTS ARE IN MILLIMETERS.

Figure 5 Package outline SOT23-5L

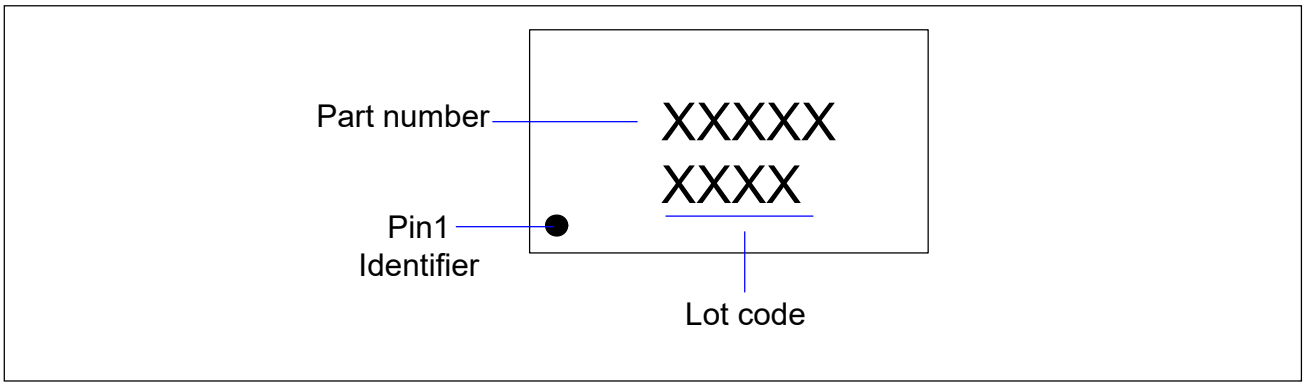
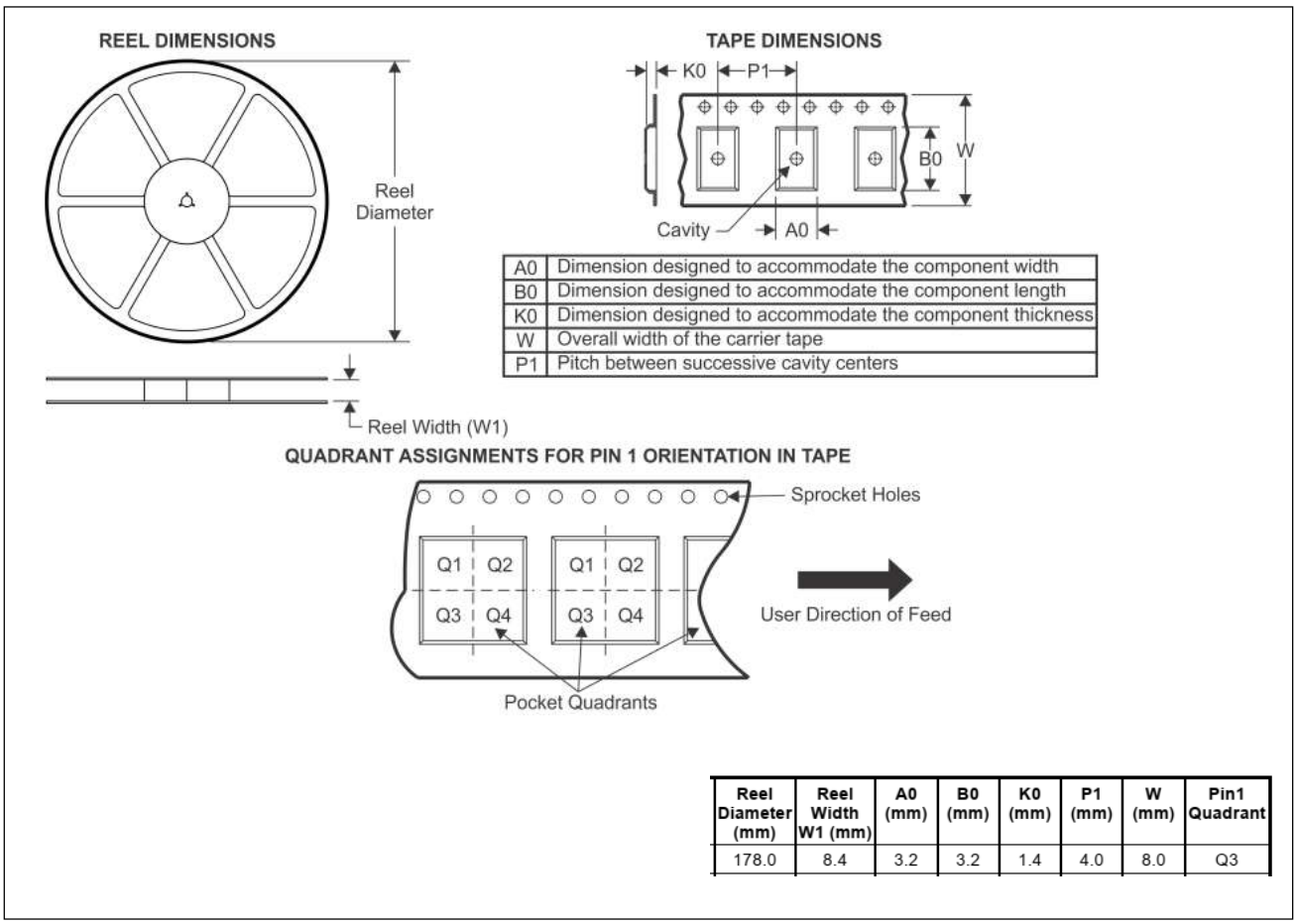


Figure 6 Marking information SOT23-5L



Reel Diameter (mm)	Reel Width W1 (mm)	A0 (mm)	B0 (mm)	K0 (mm)	P1 (mm)	W (mm)	Pin1 Quadrant
178.0	8.4	3.2	3.2	1.4	4.0	8.0	Q3

Figure 7 Tape and reel details SOT23-5L

6. Qualification information

Table 7 Qualification information

Moisture sensitivity level		SOT23-5L	MSL3, 260°C (per IPC/JEDEC J-STD-020)
ESD	Charged device model	Class C3 (> 1.0 kV) (per JESD22-C101)	
	Human body model	Class 2 (per JEDEC standard JESD22-A114)	
IC latch-up test		Class II Level A (per JESD78)	
RoHS compliant		Yes	

Revision history

Document version	Date of release	Description of changes
1.0	2020-12-01	Preliminary datasheet
2.0	2021-02-26	First release version

For technical support, please contact Xiner's Technical Assistance Center
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