

Features

- Wide Supply Voltage Range from 1.65 V to 5.5 V
- Overvoltage Tolerant Inputs to 5.5 V
- Low Threshold Inputs Support
- Translator at 1.8 V, 2.5 V, 3.3 V, and 5.0 V
- I_{OFF} Supports Partial Power-down Protection
- ESD Protection: ± 4 -kV HBM Model, ± 1 -kV CDM Model
- Latch-up Performance Exceeds 100 mA per JESD 78, Class II

Applications

- Computing
- Tablet PC
- Television
- Wearable Device
- Server
- Industrial Equipment

Description

The T74LV1T34 is a single translating buffer with V_{CC} supply from 1.65 V to 5.5 V. The low threshold inputs support the level-up translation and level-down by 5.5 V tolerant. I_{OFF} circuits can prevent backflow current during power-down, thus supporting partial power-down protection.

The T74LV1T34 is available in the SOT23-5 package and is characterized from -40°C to 125°C .

Device Table

Device	Package	Body Size
T74LV1T34-S5TR	SOT23-5	2.9 mm x 1.6 mm

Typical Application Circuit

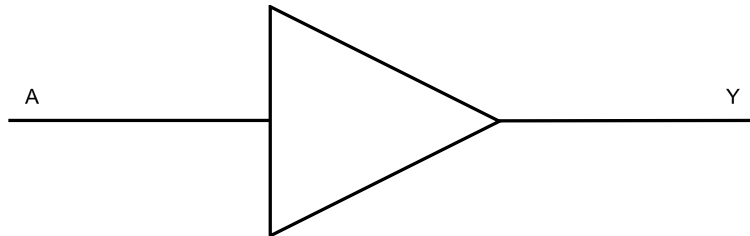


Table of Contents

Features	1
Applications	1
Description	1
Device Table	1
Typical Application Circuit	1
Revision History	3
Pin Configuration and Functions	4
Specifications	5
Absolute Maximum Ratings ⁽¹⁾	5
ESD, Electrostatic Discharge Protection.....	5
Recommended Operating Conditions.....	5
Thermal Information.....	6
Electrical Characteristics – DC Parameter.....	7
Electrical Characteristics – AC Parameter.....	9
Parameter Measurement Waveforms.....	10
Application and Implementation	11
Typical Application.....	11
Tape and Reel Information	12
Package Outline Dimensions	13
SOT23-5.....	13
Land Pattern	14
SOT23-5.....	14
Order Information	15
IMPORTANT NOTICE AND DISCLAIMER	16

Revision History

Date	Revision	Notes
2025-08-01	Rev.Pre.0	Initial version.
2026-01-07	Rev.A.0	Released version.

Pin Configuration and Functions

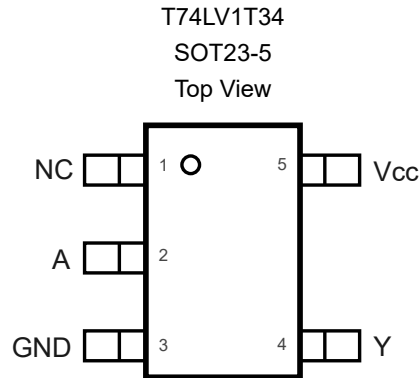


Table 1. Pin Functions

Pin No.	Name	I/O	Description
1	NC	-	Not connected
2	A	I	Input A
3	GND	Power	Ground
4	Y	O	Output Y
5	V _{CC}	Power	Supply pin

Function Table

Table 2. Truth Table

Input	Output
A	Y
L	L
H	H

(1) H = High voltage level.

(2) L = Low voltage level.

(3) X = Don't care.

Specifications

Absolute Maximum Ratings ⁽¹⁾

Parameter		Min	Max	Unit
V _{CC}	Supply Voltage	−0.5	6.5	V
V _I	Input Voltage ⁽²⁾	−0.5	6.5	V
V _O	Output Voltage, in Power-off Mode ⁽²⁾	−0.5	6.5	V
V _O	Output Voltage, in Active Mode ⁽²⁾	−0.5	V _{CC} + 0.5	V
I _O	Continuous Output Current	−25	25	mA
I _{IK}	Input Clamp Current, V _I < 0	−20		mA
I _{OK}	Output Clamp Current, V _O < 0	−20		mA
	Continuous Current through V _{CC} or GND	−50	50	mA
T _J	Junction Temperature		150	°C
T _{STG}	Storage Temperature	−65	150	°C

- (1) Stresses beyond those listed under Absolute Maximum Ratings may cause permanent damage to the device. These are stress ratings only, which do not imply functional operation of the device at these or any other conditions beyond those indicated under Recommended Operating Conditions. Exposure to absolute-maximum-rated conditions for extended periods may affect device reliability.
- (2) The minimum input and output voltage ratings may be exceeded if the input and output current ratings are observed.

ESD, Electrostatic Discharge Protection

Symbol	Parameter	Condition	Minimum Level	Unit
HBM	Human Body Model ESD	ANSI/ESDA/JEDEC JS-001, all pins ⁽¹⁾	±4,000	V
CDM	Charged Device Model ESD	ANSI/ESDA/JEDEC JS-002, all pins ⁽²⁾	±1,000	V

- (1) JEDEC document JEP155 states that 500-V HBM allows safe manufacturing with a standard ESD control process.
- (2) JEDEC document JEP157 states that 250-V CDM allows safe manufacturing with a standard ESD control process.

Recommended Operating Conditions

All unused inputs of the device must be held at V_{CC} or GND to ensure proper device operation.

Parameter		Min	Typ	Max	Unit
V _{CC}	Supply Voltage	1.65		5.5	V
V _I	Input Voltage	0		5.5	V
V _O	Output Voltage	0		V _{CC}	V
T _A	Ambient Temperature	−40		125	°C
Δt/ΔV	Input Transition Rise-and-Fall Rate			20	ns/V

Thermal Information

Package Type	θ_{JA}	θ_{JC}	Unit
SOT23-5	185	93.4	°C/W

Electrical Characteristics – DC Parameter

All test conditions: $T_A = -40^{\circ}\text{C}$ to 125°C , all typical values are measured at $T_A = 25^{\circ}\text{C}$, unless otherwise noted.

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
V_{IH}	High-Level Input Voltage	$V_{CC} = 1.65\text{ V to }1.8\text{ V}$	1			V
		$V_{CC} = 2\text{ V}$	1.03			V
		$V_{CC} = 2.25\text{ V to }2.5\text{ V}$	1.18			V
		$V_{CC} = 2.75\text{ V}$	1.23			V
		$V_{CC} = 3\text{ V to }3.3\text{ V}$	1.37			V
		$V_{CC} = 3.6\text{ V}$	1.48			V
		$V_{CC} = 4.5\text{ to }5\text{ V}$	2.03			V
		$V_{CC} = 5.5\text{ V}$	2.11			V
V_{IL}	Low-Level Input Voltage	$V_{CC} = 1.65\text{ V to }2\text{ V}$			0.45	V
		$V_{CC} = 2.25\text{ V to }2.75\text{ V}$			0.71	V
		$V_{CC} = 3\text{ V to }3.6\text{ V}$			0.65	V
		$V_{CC} = 4.5\text{ V to }5.5\text{ V}$			0.8	V
V_{OH}	High-Level Output Voltage	$I_{OH} = -20\text{ }\mu\text{A};$ $V_{CC} = 1.65\text{ V to }5.5\text{ V}$	$V_{CC} - 0.1$			V
		$I_{OH} = -2\text{ mA}; V_{CC} = 1.65\text{ V}$	1.2			V
		$I_{OH} = -2\text{ mA}; V_{CC} = 1.8\text{ V}$	1.4			V
		$I_{OH} = -2.3\text{ mA}; V_{CC} = 2.3\text{ V}$	2			V
		$I_{OH} = -3\text{ mA}; V_{CC} = 2.3\text{ V}$	1.93			V
		$I_{OH} = -3\text{ mA}; V_{CC} = 2.5\text{ V}$	2.15			V
		$I_{OH} = -3\text{ mA}; V_{CC} = 3\text{ V}$	2.7			V
		$I_{OH} = -5.5\text{ mA}; V_{CC} = 3\text{ V}$	2.49			V
		$I_{OH} = -5.5\text{ mA}; V_{CC} = 3.3\text{ V}$	2.8			V
		$I_{OH} = -4\text{ mA}; V_{CC} = 4.5\text{ V}$	4.1			V
		$I_{OH} = -8\text{ mA}; V_{CC} = 4.5\text{ V}$	3.9			V
		$I_{OH} = -8\text{ mA}; V_{CC} = 5\text{ V}$	4.4			V
V_{OL}	Low-Level Output Voltage	$I_{OL} = 20\text{ }\mu\text{A};$ $V_{CC} = 1.65\text{ V to }5.5\text{ V}$			0.1	V
		$I_{OL} = 2\text{ mA}; V_{CC} = 1.65\text{ V}$			0.25	V
		$I_{OL} = 2.3\text{ mA}; V_{CC} = 2.3\text{ V}$			0.15	V
		$I_{OL} = 3\text{ mA}; V_{CC} = 2.3\text{ V}$			0.2	V
		$I_{OL} = 3\text{ mA}; V_{CC} = 3\text{ V}$			0.15	V
		$I_{OL} = 5.5\text{ mA}; V_{CC} = 3\text{ V}$			0.25	V
		$I_{OL} = 4\text{ mA}; V_{CC} = 4.5\text{ V}$			0.2	V
		$I_{OL} = 8\text{ mA}; V_{CC} = 4.5\text{ V}$			0.35	V

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
I_I	Input Leakage Current	$V_I = \text{GND or } V_{CC};$ $V_{CC} = 0 \text{ V to } 5.5 \text{ V}$	-1	± 0.1	1	μA
I_{OFF}	Power-off Leakage Current	$V_I \text{ or } V_O = 0 \text{ V to } 5.5 \text{ V};$ $V_{CC} = 0 \text{ V}$	-1	± 0.1	1	μA
I_{CC}	Supply Current	$V_I = \text{GND or } V_{CC}; I_O = 0 \text{ A};$ $V_{CC} = 1.65 \text{ V to } 5.5 \text{ V}$		0.1	2	μA
ΔI_{CC}	Additional Supply Current	$V_I = 0.3 \text{ V or } 1.1 \text{ V}; I_O = 0 \text{ A};$ $V_{CC} = 1.8 \text{ V}$		0.5	10	μA
		$V_I = 0.3 \text{ V or } 3.4 \text{ V}; I_O = 0 \text{ A};$ $V_{CC} = 5.5 \text{ V}$		0.1	1	mA
$C_I^{(1)}$	Input Capacitance	$V_I = V_{CC} \text{ or } \text{GND}$		2.3		pF
$C_O^{(1)}$	Output Capacitance	$V_O = V_{CC} \text{ or } \text{GND}$		2.5		pF

(1) Spec limit is based on bench characterization and design simulation, not tested in production.

Electrical Characteristics – AC Parameter

All test conditions: $T_A = -40^{\circ}\text{C}$ to 125°C , all typical values are measured at $T_A = 25^{\circ}\text{C}$, unless otherwise noted.

Symbol ⁽¹⁾	Parameter	Conditions	Min	Typ	Max	Unit
$t_{PD}^{(2)}$	Propagation Delay at 15-pF C_{LOAD}	$V_{CC} = 1.8\text{ V}$	3.7	7.5	12.2	ns
		$V_{CC} = 2.5\text{ V}$	2.5	4.7	8	ns
		$V_{CC} = 3.3\text{ V}$	1.9	3.9	6.3	ns
		$V_{CC} = 5\text{ V}$	1.3	3.6	5	ns
	Propagation Delay at 30-pF C_{LOAD}	$V_{CC} = 1.8\text{ V}$	4.2	9.5	13.4	ns
		$V_{CC} = 2.5\text{ V}$	2.7	5.3	8.8	ns
		$V_{CC} = 3.3\text{ V}$	2.1	4.3	7	ns
		$V_{CC} = 5\text{ V}$	1.7	4.1	5.5	ns
$C_{PD}^{(3)}$	Power Dissipation Capacitance	$f = 10\text{ MHz};$ $V_{CC} = 1.8\text{ V}$		4.8		pF
		$f = 10\text{ MHz};$ $V_{CC} = 2.5\text{ V}$		5.2		pF
		$f = 10\text{ MHz};$ $V_{CC} = 3.3\text{ V}$		5.7		pF
		$f = 10\text{ MHz};$ $V_{CC} = 5\text{ V}$		6.9		pF

(1) Spec limit is based on bench characterization and design simulation, not tested in production.

(2) t_{PD} is the same as t_{PLH} and t_{PHL} .

(3) C_{PD} is used to determine the dynamic power dissipation (PD in μW).

$$P_D = C_{PD} \times V_{CC}^2 \times f_i \times N + \Sigma(C_L \times V_{CC}^2 \times f_o)$$

Where:

f_i = Input frequency in MHz;

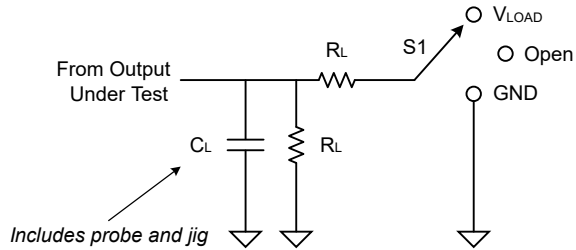
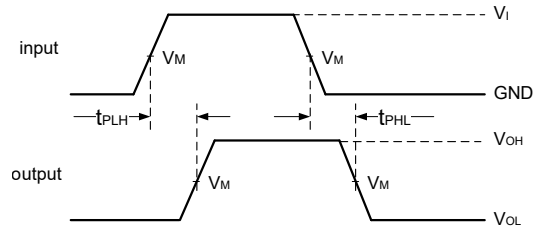
f_o = Output frequency in MHz;

C_L = Output load capacitance in pF;

V_{CC} = Supply voltage in Volts;

N = Number of inputs switching;

$\Sigma(C_L \times V_{CC}^2 \times f_o)$ = Sum of the outputs.

Parameter Measurement Waveforms

Figure 1. Timing Measurement Load Circuit

Figure 2. Propagation Delay Times
Table 3. Test Data

V _{CC}	Inputs		C _L	R _L	V _M		S1
	V _I	t _r /t _f			Inputs	Outputs	
1.8 V	V _{CC}	≤ 2 ns	15 pF, 30 pF	1 MΩ	0.5V _I	0.5V _{CC}	Open
2.5 V	V _{CC}	≤ 2 ns	15 pF, 30 pF	1 MΩ	0.5V _I	0.5V _{CC}	Open
3.3 V	3 V	≤ 2.5 ns	15 pF, 30 pF	1 MΩ	0.5V _I	0.5V _{CC}	Open
5 V	3 V	≤ 2.5 ns	15 pF, 30 pF	1 MΩ	0.5V _I	0.5V _{CC}	Open

Application and Implementation

Note

Information in the following application sections is not part of the 3PEAK's component specification and 3PEAK does not warrant its accuracy or completeness. 3PEAK's customers are responsible for determining suitability of components for their purposes. Customers should validate and test their design implementation to confirm system functionality.

Typical Application

Figure 3 shows the typical application schematic.

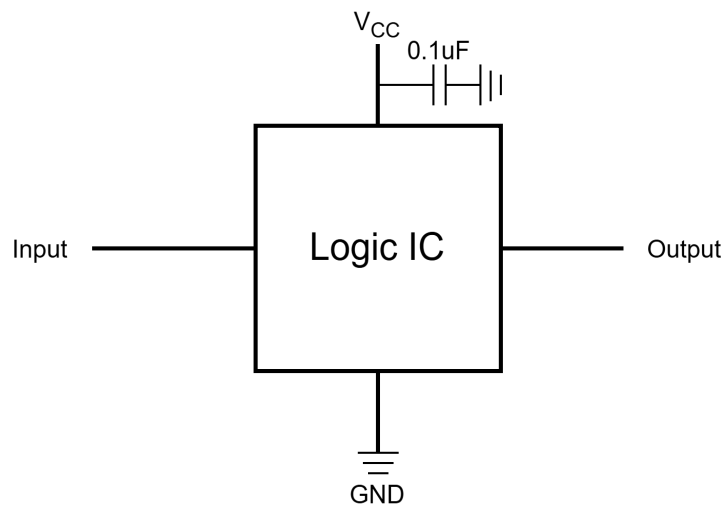
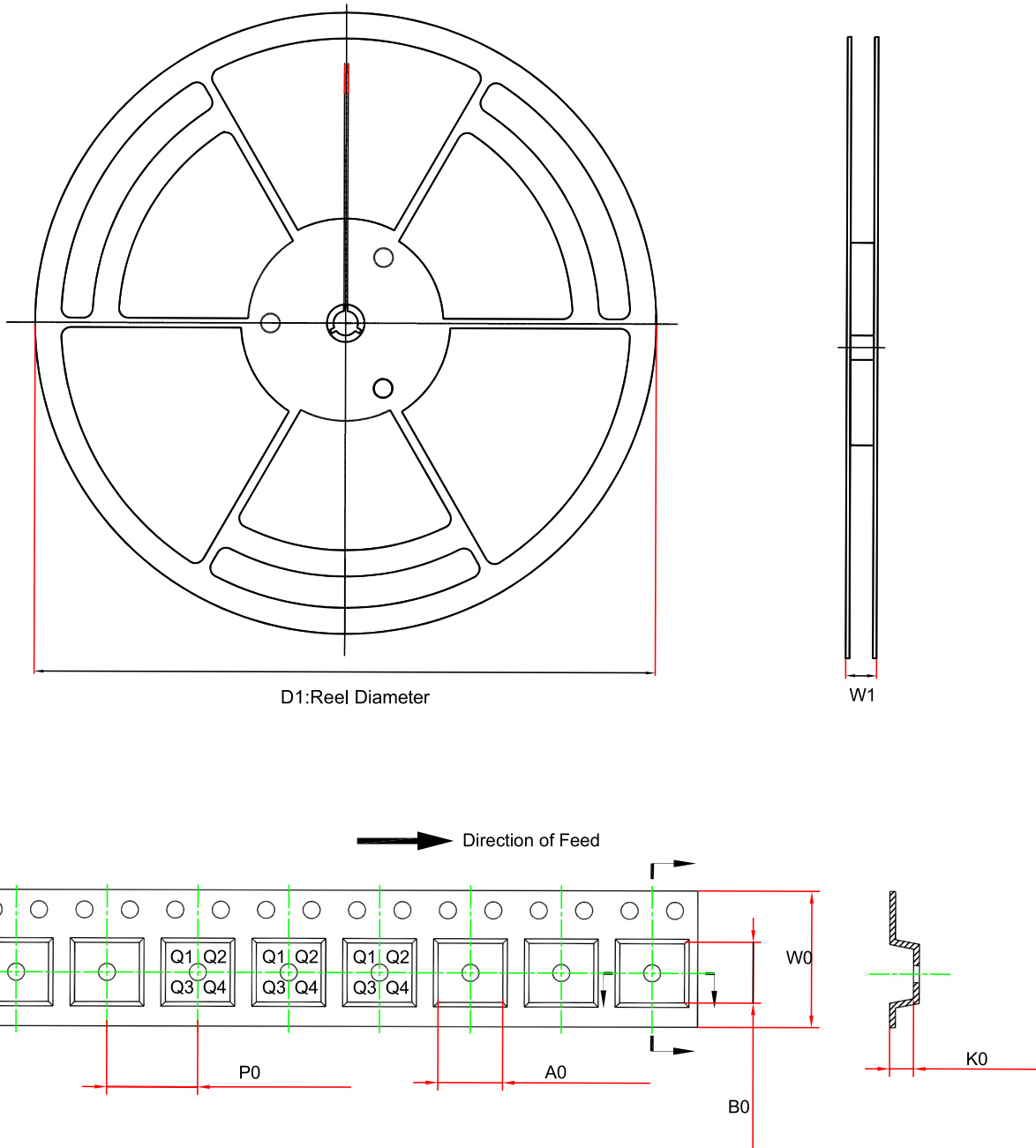


Figure 3. Typical Application Circuit

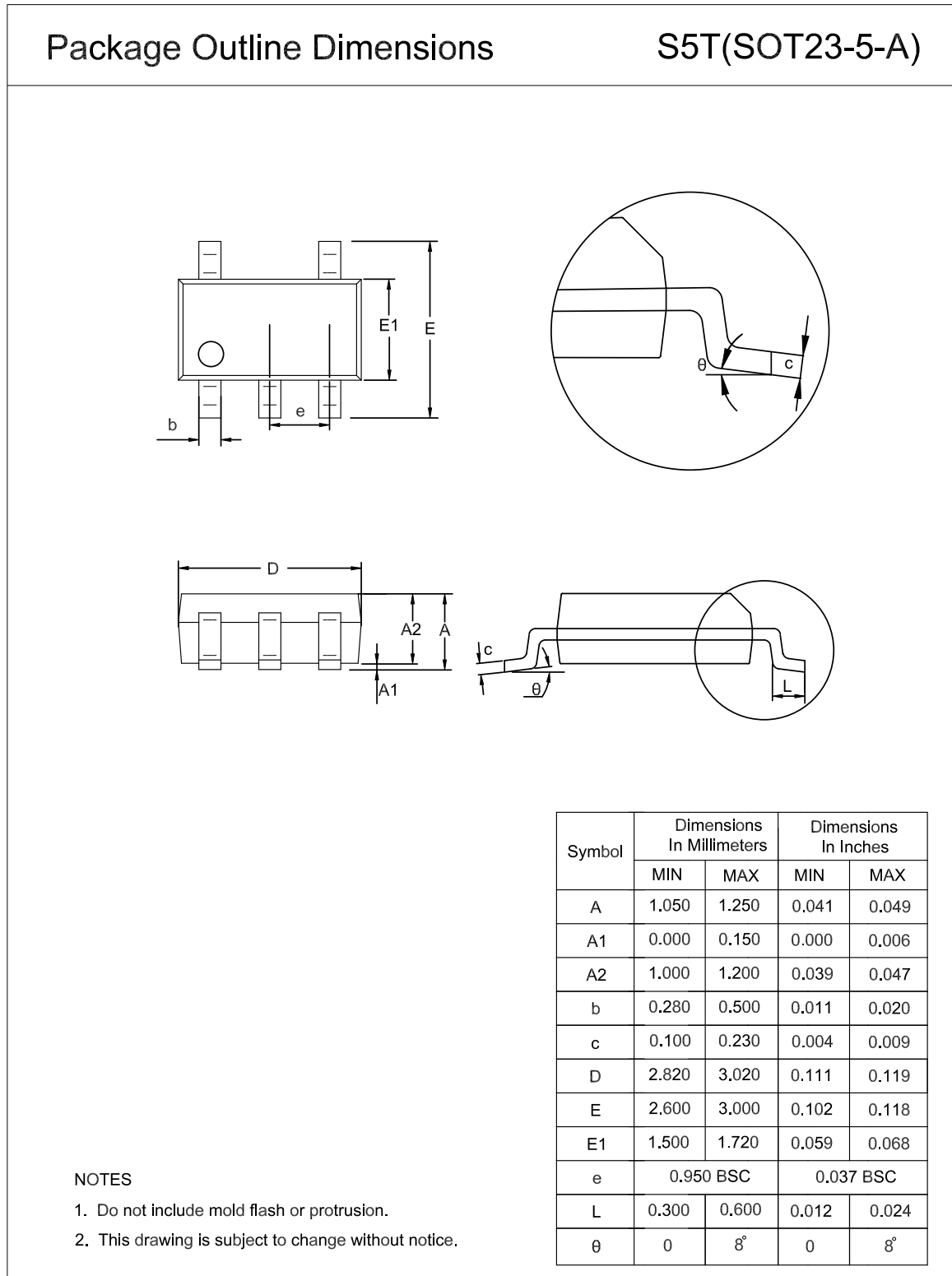
Tape and Reel Information



Order Number	Package	D1 (mm)	W1 (mm)	A0 (mm)	B0 (mm)	K0 (mm)	P0 (mm)	W0 (mm)	Pin1 Quadrant
T74LV1T34-S5TR	SOT23-5	180	12	3.3	3.25	1.4	4	8	Q3

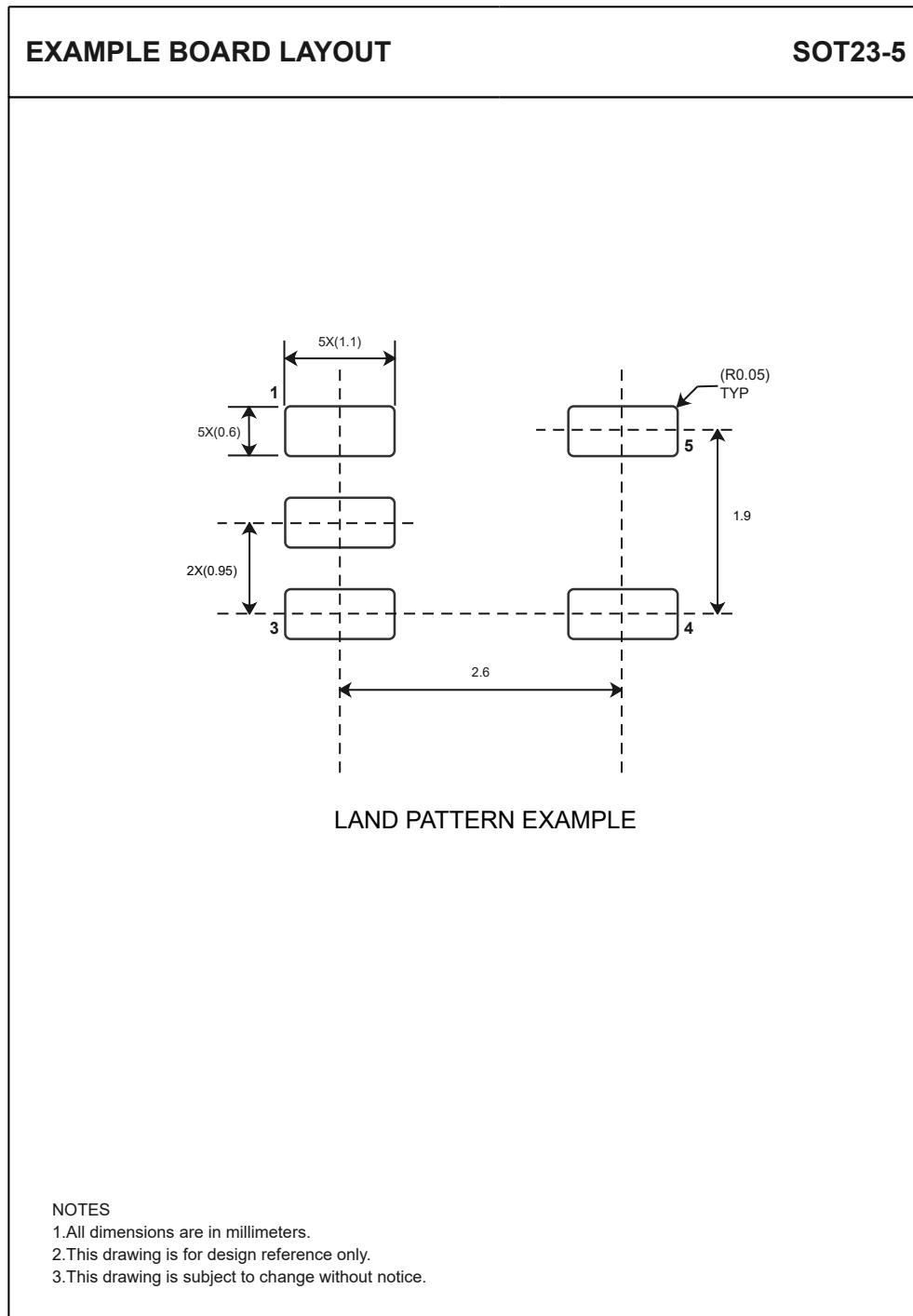
Package Outline Dimensions

SOT23-5



Land Pattern

SOT23-5



Order Information

Order Number	Operating Temperature Range	Package	Marking Information	MSL	Transport Media, Quantity	Eco Plan
T74LV1T34-S5TR	-40 to 125°C	SOT23-5	SQ	MSL3	Tape and Reel,3000	Green

Green: 3PEAK defines "Green" to mean RoHS compatible and free of halogen substances.

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