



AOS
SEMICONDUCTOR

产品规格说明书

Product Data Sheet

AOS573xx

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电源管理IC



通信接口芯片



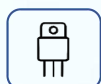
二三极管



LDO稳压器



逻辑器件



MOSFETs



运算放大器



显示驱动



MCU单片机



光电器件



Octal D-Type Transparent Latch With 3-State Output

DESCRIPTIONS

The AOS573 is an 8-bit D-type transparent latch with 3-state outputs. The device features latch enable (LE) and output enable (OE) inputs. When LE is high, data at the inputs enter the latches. In this condition the latches are transparent, a latch output will change each time its corresponding D input changes. When LE is low the latches store the information that was present at the inputs a set-up time preceding the high-to-low of LE.

FEATURES

- ★ Power-Supply Range: 1.65V to 5.5V
- ★ Common 3-state Output Enable Input
- ★ Balanced Propagation Delays
- ★ Overvoltage Tolerant Inputs to 5.5V
- ★ Low Power Consumption: 8 μ A(Max)
- ★ Low Input Current: 1 μ A(Max)
- ★ Extended Temperature: -40°C to +125°C

APPLICATIONS

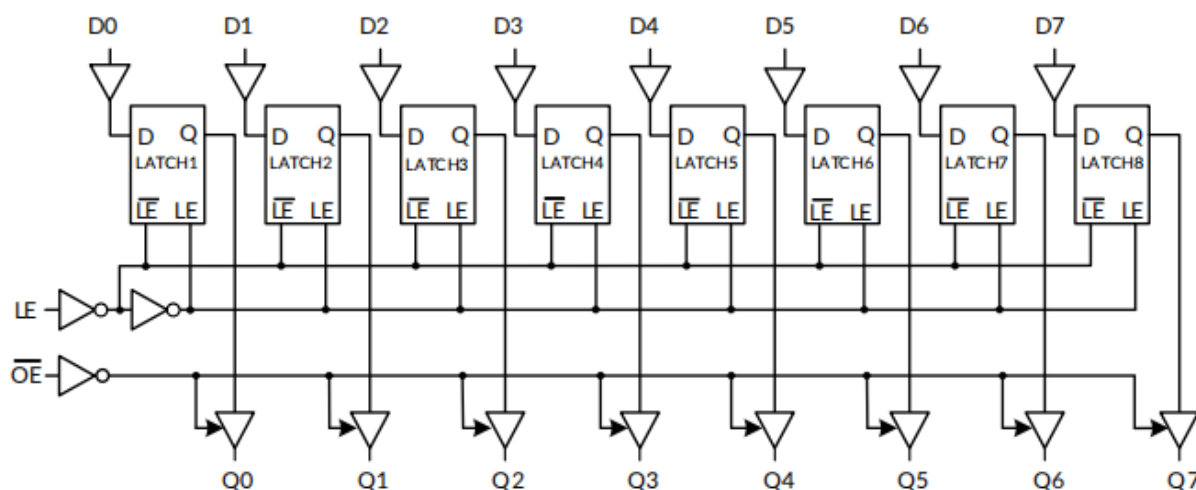
- ★ Power Sub-Station Industrial
- ★ Personal Electronics
- ★ Test and Measurement Solutions
- ★ Patient Monitoring

Device Information ⁽¹⁾

PART NUMBER	PACKAGE	BODY SIZE (NOM)
AOS573	TSSOP20	6.50mm × 4.40mm
	SOP20	12.80mm × 7.50mm

(1) For all available packages, see the orderable addendum at the end of the data sheet.

FUNCTIONAL BLOCK DIAGRAM





Function Table

INPUTS			Internal Latch	OUTPUT
OE	LE	Dn		Qn
L	H	L	L	L
		H	H	H
L	L	l	L	L
		h	H	H
H	L	l	L	Z
		h	H	Z

NOTE:

- (1) H=High Voltage Level, h=High voltage level one set-up time prior to the High-to-Low LE transition
L=Low Voltage Level, l=Low voltage level one set-up time prior to the High-to-Low LE transition
Z=High-impedance OFF-State.

PACKAGE/ORDERING INFORMATION⁽¹⁾

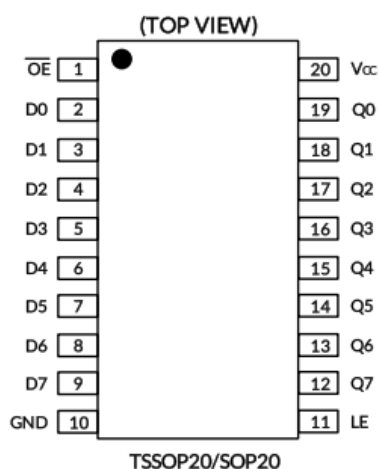
PRODUCT	ORDERING NUMBER	TEMPERATURE RANGE	PACKAGE LEAD	PACKAGE MARKING ⁽²⁾	MSL ⁽³⁾	PACKAGE OPTION
AOS573	AOS573XTSS20	-40℃~+125℃	TSSOP20	AOS573	MSL3	Tape and Reel,4000
	AOS573XS20	-40℃~+125℃	SOP20	AOS573	MSL3	Tape and Reel,1500

NOTE:

- (1) This information is the most current data available for the designated devices. This data is subject to change without notice and revision of this document. For browser-based versions of this data sheet, refer to the right-hand navigation.
- (2) There may be additional marking, which relates to the lot trace code information(data code and vendor code),the logo or the environmental category on the device.
- (3) AOS classify the MSL level with using the common preconditioning setting in our assembly factory conforming to the JEDEC industrial standard J-STD-20F, Please align with AOS if your end application is quite critical to the preconditioning setting or if you have special requirement.



PIN CONFIGURATIONS



PIN DESCRIPTION

PIN	NAME	TYPE ⁽¹⁾	FUNCTION
TSSOP20/SOP20			
1	OE	I	3-State output enable input (Active Low)
2	D0	I	Data input
3	D1	I	Data input
4	D2	I	Data input
5	D3	I	Data input
6	D4	I	Data input
7	D5	I	Data input
8	D6	I	Data input
9	D7	I	Data input
10	GND	G	Ground.
11	LE	I	Latch enable input (Active High)
12	Q7	O	Data output
13	Q6	O	Data output
14	Q5	O	Data output
15	Q4	O	Data output
16	Q3	O	Data output
17	Q2	O	Data output
18	Q1	O	Data output
19	Q0	O	Data output
20	V _{CC}	P	Supply voltage

(1) I=input, O=output, P=power.



Specifications

Absolute Maximum Ratings

Over operating free-air temperature range (unless otherwise noted)⁽¹⁾

SYMBOL	PARAMETER		MIN	MAX	UNIT
V _{CC}	Supply voltage range		-0.5	7	V
I _{IK}	Input clamp current	V _I <0		± 50	mA
I _{OK}	Output clamp current	V _O <0		± 50	mA
I _O	Continuous output current	V _O =0V to V _{CC}		± 50	mA
	Continuous current through V _{CC} or GND			± 100	mA
θ _{JA}	Package thermal impedance ⁽²⁾	TSSOP20		40	°C / W
		SOP20		40	
T _J	Junction temperature ⁽³⁾		-40	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, and functional operation of the device at these or any other conditions beyond those indicated under Recommended Operating Conditions is not implied. Exposure to absolute-maximum-rated conditions for extended periods may affect device reliability.
- (2) The package thermal impedance is calculated in accordance with JEDEC-51.
- (4) The maximum power dissipation is a function of T_{J(MAX)}, R_{θJA}, and T_A. The maximum allowable power dissipation at any ambient temperature is $P_D = (T_{J(MAX)} - T_A) / R_{\theta JA}$. All numbers apply for packages soldered directly onto a PCB.



ESD Ratings

The following ESD information is provided for handling of ESD-sensitive devices in an ESD protected area only.

			VALUE	UNIT
$V_{(ESD)}$	Electrostatic discharge	Human-Body Model (HBM), MIL-STD-883K METHOD 3015.9	± 2000	V
		Charged-Device Model (CDM), ANSI/ESDA/JEDEC JS-002-2018	± 1000	
		Machine Model (MM), JESD22-A115	± 200	



ESD SENSITIVITY CAUTION

ESD damage can range from subtle performance degradation to complete device failure. Precision integrated circuits may be more susceptible to damage because very small parametric changes could cause the device not to meet its published specifications.

**Recommended Operating Conditions**

V_{CC} is the supply voltage associated with the input port and output port. ⁽¹⁾⁽²⁾

PARAMETER	SYMBOL	V _{CC}	MIN	MAX	UNIT
Supply voltage	V _{CC}		1.65	5.5	V
High-level input voltage(V _{IH})	Inputs ⁽³⁾	1.65V to 1.95V	V _{CCI} x 0.65		
		2.3V to 2.7V	1.7		
		3V to 3.6V	2		
		4.5V to 5.5V	V _{CCI} x 0.7		
Low-level input voltage(V _{IL})	Inputs ⁽³⁾	1.65V to 1.95V		V _{CCI} x 0.35	
		2.3V to 2.7V		0.7	
		3V to 3.6V		0.8	
		4.5V to 5.5V		V _{CCI} x 0.3	
Input voltage (V _I)	Input voltage		0	5.5	
Output voltage(V _O)	Output voltage		0	V _{CC}	
High-level output current (I _{OH})		1.65V to 1.95V		-4	mA
		2.3V to 2.7V		-8	
		3V to 3.6V		-24	
		4.5V to 5.5V		-24	
Low-level output current (I _{OL})		1.65V to 1.95V		4	
		2.3V to 2.7V		8	
		3V to 3.6V		24	
		4.5V to 5.5V		24	
Input transition rise or fall rate (Δt/Δv)	Data inputs	1.65V to 1.95V		20	ns/V
		2.3V to 2.7V		20	
		3V to 3.6V		10	
		4.5V to 5.5V		5	
T _A Operating free-air temperature			-40	125	°C

- (1) All unused or driven (floating) data inputs (I/Os) of the device must be held at logic HIGH or LOW (preferably V_{CC} or GND) to ensure proper device operation and minimize power.
- (2) All unused control inputs must be held at V_{CC} or GND to ensure proper device operation and minimize power consumption.
- (3) For V_{CC} values not specified in the data sheet, $V_{IH\ min}=V_{CC} \times 0.7V$, $V_{IL\ max}=V_{CC} \times 0.3V$.



Electrical Characteristics

over recommended operating free-air temperature range (unless otherwise noted)

PARAMETER	CONDITIONS	V _{CC}	TEMP	MIN ⁽²⁾	TYP ⁽³⁾	MAX ⁽²⁾	UNIT
V _{OH}	I _{OH} =-100 μA	V _I =V _{IH}	1.65V to 5.5V	V _{CC} -0.1			V
	I _{OH} =-4mA	V _I =V _{IH}	1.65V	1.2			
	I _{OH} =-8mA	V _I =V _{IH}	2.5V	1.9			
	I _{OH} =-24mA	V _I =V _{IH}	3.3V	2.4			
	I _{OH} =-24mA	V _I =V _{IH}	4.5V	3.8			
V _{OL}	I _{OH} =100 μA	V _I =V _{IL}	1.65V to 5.5V			0.1	V
	I _{OH} =4mA	V _I =V _{IL}	1.65V			0.45	
	I _{OH} =8mA	V _I =V _{IL}	2.5V			0.3	
	I _{OH} =24mA	V _I =V _{IL}	3.3V			0.55	
	I _{OH} =24mA	V _I =V _{IL}	4.5V			0.55	
I _I	All inputs	V _I =5.5V or GND	5.5V	25°C		±0.1	μA
			5.5V	Full		±5	
I _{off}		V _I or V _O =5.5V	5.5V	25°C		±0.1	
			5.5V	Full		±10	
I _{OZ}		V _O =V _{CC} or GND	1.65V to 5.5V	25°C		±0.1	
			1.65V to 5.5V	Full		±10	
I _{CC}	V _{CC} supply current	V _O =V _{CC} or GND ⁽⁴⁾ I _O =0	1.65V to 5.5V	+25°C		0.1	8
			1.65V to 5.5V	Full		80	
C _I		f=1MHz	1.65V to 5.5V	25°C		3	pF
C _{PD}		f=1MHz	no load	25°C		13	

- (1) Limits are 100% production tested at 25°C. Limits over the operating temperature range are ensured through correlations using statistical quality control (SQC) method.
- (2) Typical values represent the most likely parametric norm as determined at the time of characterization. Actual typical values may vary over time and will also depend on the application and configuration.
- (3) For I/O ports, the parameter I_{OZ} includes the input leakage current.
- (4) Hold all unused data inputs of the device at V_{CC} or GND to assure proper device operation.



Switching Characteristics

over operating free-air temperature range(unless otherwise noted)

PARAMETER	TEST CONDITIONS	V _{CC} =1.8V ± 0.15V			V _{CC} =2.5V ± 0.2V			V _{CC} =3.3V ± 0.3V			V _{CC} =5V ± 0.5V			UNIT
		MIN	TYP	MAX	MIN	TYP	MAX	MIN	TYP	MAX	MIN	TYP	MAX	
t _{pd}	C _L =50pF, from D (input) to Q (output)		25			12			10			8		ns
	C _L =50pF, from LE (input) to Q (output)		37			23			18			14		
t _{en}	C _L =50pF, from OE (input) to Q (output)		27			17			14			10		
t _{dis}	C _L =50pF, from OE (input) to Q (output)		22			14			12			9		
t _t	C _L =50pF to any Q (output)		20			10			8			7		
t _{pd}	C _L =150pF, from D (input) to Q (output)		35			17			16			14		
	C _L =150pF, from LE (input) to Q (output)		46			26			21			17		
t _{en}	C _L =150pF, from OE (input) to Q (output)		36			21			17			12		
t _{dis}	C _L =150pF, from OE (input) to Q (output)		33			23			21			20		
t _t	C _L =150pF to any Q (output)		56			21			16			15		

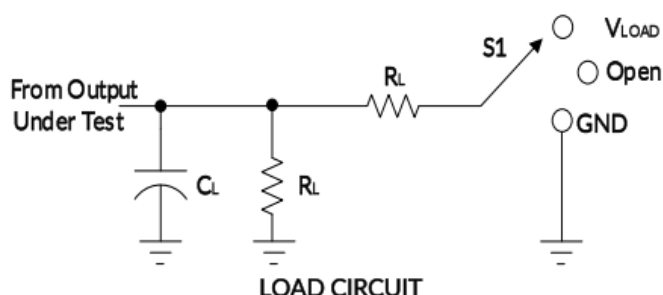
Timing Requirements

over operating free-air temperature range (unless otherwise noted).

PARAMETER	TEST CONDITIONS	V _{CC} =1.8V ± 0.15V			V _{CC} =2.5V ± 0.2V			V _{CC} =3.3V ± 0.3V			V _{CC} =5V ± 0.5V			UNIT
		MIN	TYP	MAX	MIN	TYP	MAX	MIN	TYP	MAX	MIN	TYP	MAX	
t _w	Pulse duration, LE high		75			65			60			30		ns
t _{su}	Setup time, data before LE↓		16			16			16			16		
t _h	Hold time, data after LE↓		19			17			16			16		

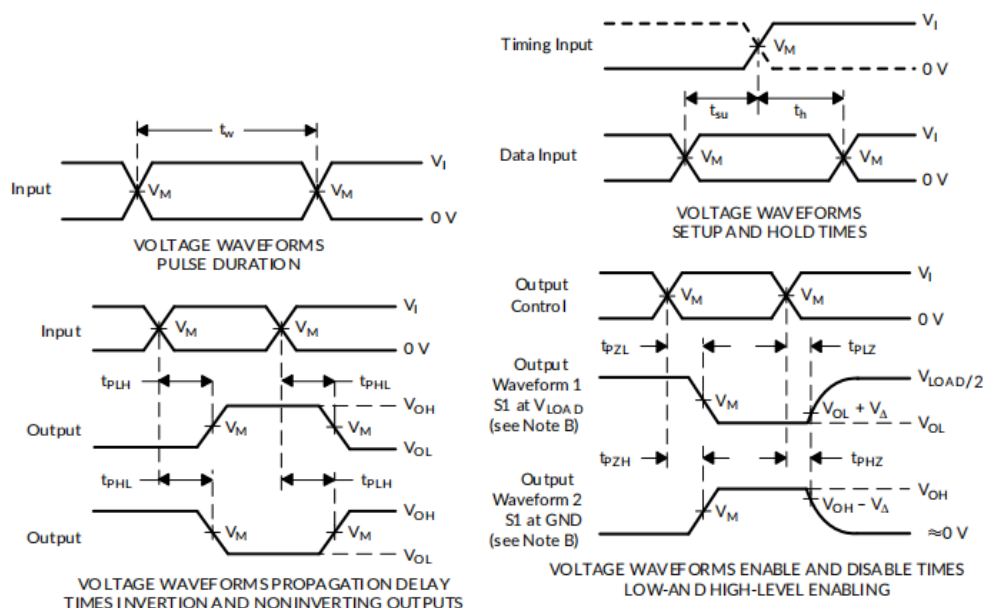


Parameter Measurement Information



TEST	S1
t_{pd}	Open
t_{PLZ}/t_{PZL}	V_{LOAD}
t_{PHZ}/t_{PZH}	GND

V_{CC}	INPUTS		V_M	V_{LOAD}	C_L	R_L	V_{TP}
	V_I	t_r/t_f					
$1.8V \pm 0.15V$	V_{CC}	$\leq 2ns$	$V_{CC}/2$	$2 \times V_{CC}$	50pF or 150pF	2k Ω	0.15V
$2.5V \pm 0.2V$	V_{CC}	$\leq 2ns$	$V_{CC}/2$	$2 \times V_{CC}$	50pF or 150pF	2k Ω	0.15V
$3.3V \pm 0.3V$	3V	$\leq 2.5ns$	1.5V	6V	50pF or 150pF	2k Ω	0.3V
$5V \pm 0.5V$	V_{CC}	$\leq 2.5ns$	$V_{CC}/2$	$2 \times V_{CC}$	50pF or 150pF	2k Ω	0.3V

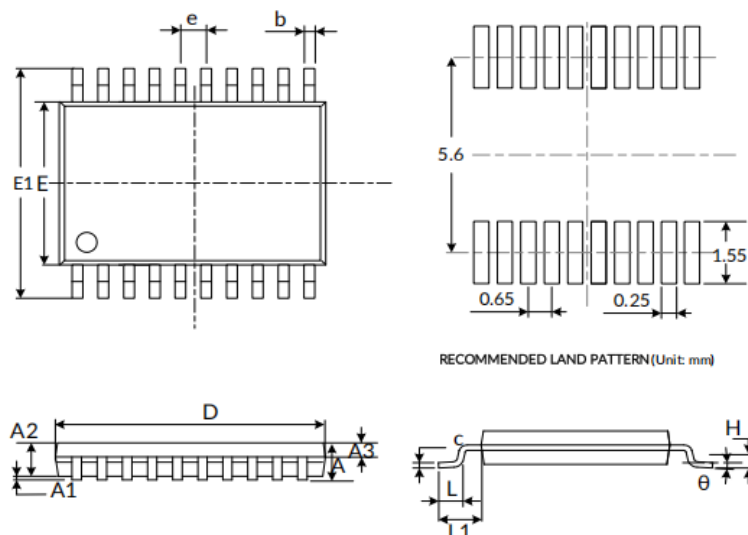


- NOTES: A. C_L includes probe and jig capacitance.
 B. Waveform 1 is for an output with internal conditions such that the output is low, except when disabled by the output control.
 Waveform 2 is for an output with internal conditions such that the output is high, except when disabled by the output control.
 C. All input pulses are supplied by generators having the following characteristics: PRR $\leq 10MHz$, $Z_0 = 50\Omega$.
 D. The outputs are measured one at a time, with one transition per measurement.
 E. t_{PLZ} and t_{PHZ} are the same as t_{dis} .
 F. t_{PZL} and t_{PZH} are the same as t_{en} .
 G. t_{PLH} and t_{PHL} are the same as t_{pd} .
 H. All parameters and waveforms are not applicable to all devices.

Figure 1. Load Circuit and Voltage Waveforms



PACKAGE OUTLINE DIMENSIONS
TSSOP20⁽⁴⁾



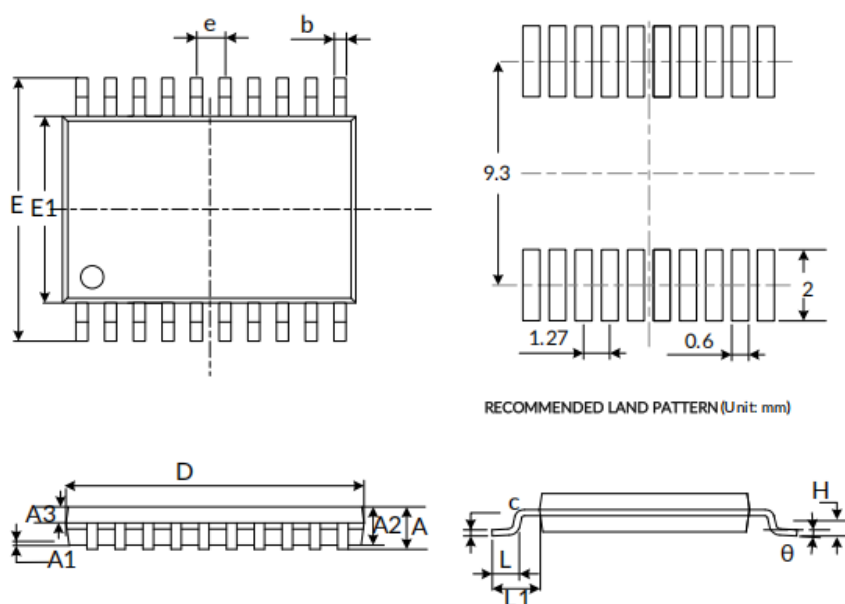
Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A ⁽¹⁾		1.200		0.047
A1	0.050	0.150	0.002	0.006
A2	0.800	1.050	0.031	0.041
A3	0.390	0.490	0.015	0.020
b	0.200	0.290	0.008	0.011
c	0.130	0.170	0.005	0.007
D ⁽¹⁾	6.400	6.600	0.252	0.260
E ⁽¹⁾	4.300	4.500	0.169	0.177
E1	6.200	6.600	0.244	0.260
e	0.650(BSC) ⁽²⁾		0.026(BSC) ⁽²⁾	
L	0.450	0.750	0.018	0.030
H	0.250(TYP)		0.010(TYP)	
θ	0 °	8 °	0 °	8 °
L1	1.00(REF) ⁽³⁾		0.039(REF) ⁽³⁾	

NOTE:

1. Plastic or metal protrusions of 0.15mm maximum per side are not included.
2. BSC (Basic Spacing between Centers), "Basic" spacing is nominal.
3. REF is the abbreviation for Reference.
4. This drawing is subject to change without notice.



SOP20⁽⁴⁾



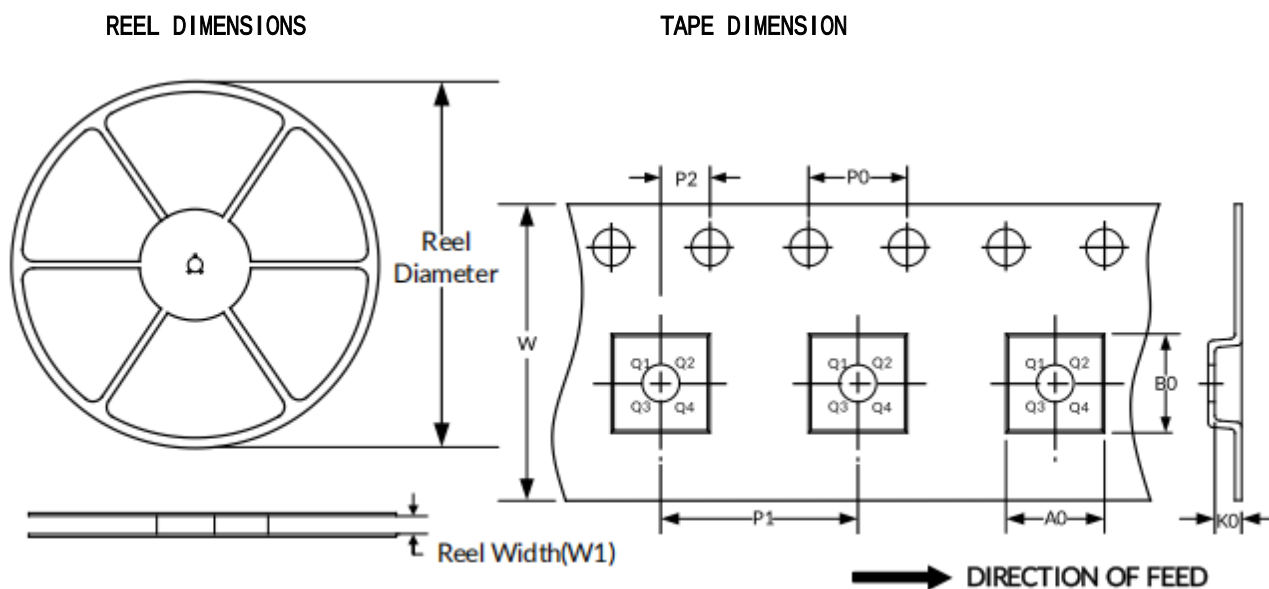
Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A ⁽¹⁾		2.650		0.104
A1	0.100	0.300	0.004	0.012
A2	2.250	2.350	0.089	0.093
A3	0.970	1.070	0.038	0.042
b	0.390	0.470	0.015	0.019
c	0.250	0.290	0.010	0.011
D ⁽¹⁾	12.700	12.900	0.500	0.508
E ⁽¹⁾	10.100	10.500	0.398	0.413
E1 ⁽¹⁾	7.400	7.600	0.291	0.299
e	1.270(BSC) ⁽²⁾		0.050(BSC) ⁽²⁾	
L	0.700	1.000	0.028	0.039
H	0.250(TYP)		0.010(TYP)	
θ	0 °	8 °	0 °	8 °
L1	1.400(REF) ⁽³⁾		0.055(REF) ⁽³⁾	

NOTE:

1. Plastic or metal protrusions of 0.15mm maximum per side are not included.
2. BSC (Basic Spacing between Centers), "Basic" spacing is nominal.
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4. This drawing is subject to change without notice.



TAPE AND REEL INFORMATION



NOTE: The picture is only for reference. Please make the object as the standard.

KEY PARAMETER LIST OF TAPE AND REEL

Package Type	Reel Diameter	Reel Width(mm)	A0 (mm)	B0 (mm)	K0 (mm)	P0 (mm)	P1 (mm)	P2 (mm)	W (mm)	Pin1 Quadrant
TSSOP20	13''	12.4	6.75	6.95	1.20	4.0	8.0	2.0	16.0	Q1
SOP20	13''	24.4	10.75	13.55	2.65	4.0	12.0	2.0	24.0	Q1

NOTE:

1. All dimensions are nominal.
2. Plastic or metal protrusions of 0.15mm maximum per side are not included.