

Single Buffer Gate With 3-state Output**Features**

- Supply Voltage Range from 2.0V to 5.5V
- ± 8 mA Output Drive at 5.0V
- CMOS low power consumption
- Schmitt Trigger Action at All Inputs Make the Circuit Tolerant for Slower Input Rise and Fall Time.
- ESD Protection per JESD 22
 - Exceeds 200-V Machine Model (A115-A)
 - Exceeds 2000-V Human Body Model (A114-A)
 - Exceeds 1000-V Charged Device Model (C101C)
- Latch-Up Exceeds 100mA per JESD 78, Class II

General Description

The HCR74AHC1G126 is a single non-inverting buffer /bus driver with a 3-state output. The output enters a high impedance state when a LOW-level is applied to the output enable (OE) pin. The device is designed for operation with a power supply range of 2.0V to 5.5V.

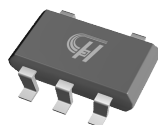
The HCR74AHC1G126 is available in Green SOT23-5 / SC70-5 (SOT-353) and DFN-1x1.45-6 packages. It operates over an ambient temperature range from -40°C to +125°C.

Applications

- General Purpose Logic
- Wide array of products such as:
 - PCs, networking, notebooks, netbooks, PDAs
 - Computer peripherals, hard drives, CD/DVD ROM
 - TV, DVD, DVR, set top box
 - Personal Navigation / GPS
 - Cameras/Video Recorders



DFN-1x1.45-6



SC70-5(SOT-353)



SOT-23-5

Figure 1. Package Type of HCR74AHC1G126

Single Buffer Gate With 3-state Output

Pin Configuration

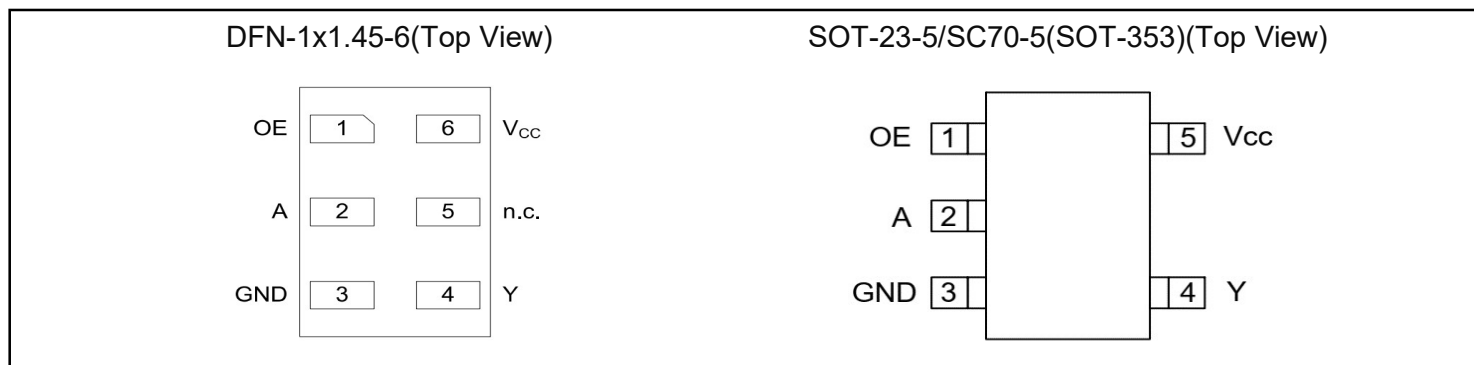


Figure 2. Pin Configuration of HCR74AHC1G126 (Top View)

Pin Function Table

Pin		NAME	FUNCTION
SOT-23-5 SC70-5 /SOT-353	DFN- 1x1.45-6		
1	1	OE	Output enable Input.
2	2	A	Data Input.
3	3	GND	Ground.(0V)
4	4	Y	Data Output.
5	6	VCC	Supply Voltage.
-	5	n.c	not connect to GND

Logic Diagram

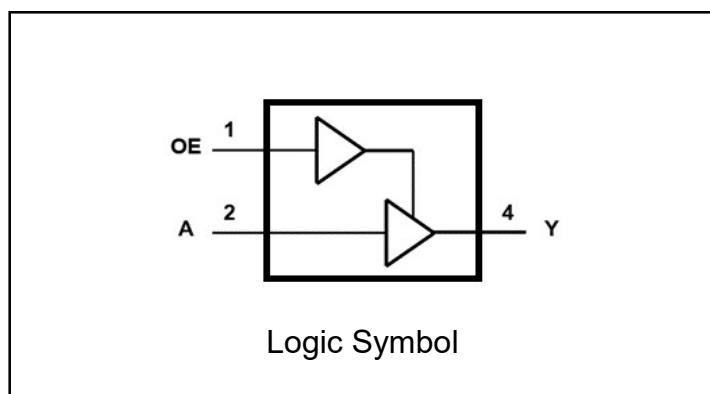


Figure 3. Logic Diagram

Function Table

Inputs		Output
OE	A	Y
H	H	H
H	L	L
L	X	Z

Note:

H=HIGH Voltage Level

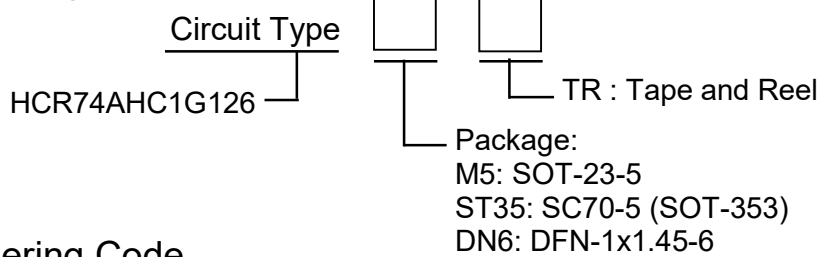
L=LOW Voltage Level

X=don't care

Z=high-impedance OFF-state

Single Buffer Gate With 3-state Output

Ordering Information



Ordering Code

Part Number	Marking ^[1]	Temperature Range	Package	Quantity per Reel
HCR74AHC1G126M5TR	EEXX	-40°C to +125°C	SOT-23-5	3000pcs/TR
HCR74AHC1G126ST35TR	EEXX	-40°C to +125°C	SC70-5 (SOT-353)	3000pcs/TR
HCR74AHC1G126DN16TR	EEXX	-40°C to +125°C	DFN-1x1.45-6	5000pcs/TR

note [1]. The "EE " is product type , and the "XX" = Date Code-Year, X = Date code-Month.

Absolute Maximum Ratings ^{Note 2}

Parameter	Conditions	Symbol	Value	Unit
Supply Voltage	-	V _{CC}	-0.5 to 6.5	V
Input Voltage	-	V _{IN}	-0.5 to 6.5	V
Voltage applied to output in high or low state	-	V _O	-0.5 to V _{CC} +0.5	V
Input Clamping Current	V _I < 0	I _{IK}	-20	mA
Output Clamping Current	V _O < 0 or V _O > V _{CC}	I _{OK}	±20	mA
Output Current	V _O = 0 to V _{CC}	I _O	±25	mA
Supply Current	-	I _{CC}	50	mA
Ground Current	-	I _{GND}	-50	mA
Total Power Dissipation		P _{tot}	250	mW
Operating Junction Temperature		T _J	-40 to +150	°C
Storage Temperature Range		T _{STG}	-65 to +150	°C
Lead Temperature (Soldering, 10s)		T _{LEAD}	+250	°C
Human Body Model ESD Protection		ESD HBM	2	KV
Charged Device Model ESD Protection		ESD CDM	1	KV
Machine Model ESD Protection		ESD MM	200	V

Note 2: Stresses beyond the absolute maximum may result in immediate failure or reduced reliability. These are stress values and device operation should be within recommend values.

Single Buffer Gate With 3-state Output

Recommend Operating Conditions ^{note3}

Parameter		Symbol	Min.	Typ.	Max.	Unit
Operating Voltage		V _{CC}	2.0	-	5.5	V
High-level Input Voltage	V _{CC} =2V	V _{IH}	1.5	-	-	V
	V _{CC} =3V		2.1	-	-	
	V _{CC} =5.5V		3.85	-	-	
Low-level Input Voltage	V _{CC} =2V	V _{IL}	-	-	0.5	V
	V _{CC} =3V		-	-	0.9	
	V _{CC} =5.5V		-	-	1.65	
Input Voltage	-	V _I	0	-	5.5	V
Output Voltage	-	V _O	0	-	V _{CC}	V
High-level Output Current	V _{CC} =2V	I _{OH}	-	-	-50	uA
	V _{CC} =3.3V±0.3V		-	-	-4	mA
	V _{CC} =5V±0.5V		-	-	-8	
Low-level Output Current	V _{CC} =2V	I _{OL}	-	-	50	uA
	V _{CC} =5V±0.5V		-	-	4	mA
	V _{CC} =3V		-	-	8	
Input Transition rise or fall rate	V _{CC} =3.3V±0.3V	$\Delta t/\Delta V$	-	-	100	ns/V
	V _{CC} =5.0V±0.5V		-	-	20	
Operating free-air temperature	-	T _A	-40	-	+125	'C

Note 3: Unused inputs should be held at VCC or Ground.

Single Buffer Gate With 3-state Output

Electrical Characteristics

DC Characteristics

(TA, voltages are referenced to GND(ground=0V), unless otherwise specified.)

Parameter	Symbol	Test Condition	VCC	25°C			-40°C to 85°C		-40°C to 125°C		Unit
			(V)	Min	Type	Max	Min	Max	Min	Max	Unit
HIGH-Level Output Voltage	VOH	IOH=-50uA	2.0	1.90	2.00	-	1.90	-	1.90	-	V
			3.0	2.90	3.00	-	2.90	-	2.90	-	
			4.5	4.40	4.50	-	4.40	-	4.40	-	
		IOH=-4mA	3.0	2.58	-	-	2.48	-	2.48	-	
		IOH=-8mA	4.5	3.94	-	-	3.8	-	3.7	-	
Low-Level Output Voltage	VOL	IOL=50uA	2.0	-	-	0.1	-	0.1	-	0.1	V
			3.0	-	-	0.1	-	0.1	-	0.1	
			4.5	-	-	0.1	-	0.1	-	0.1	
		IOL=4mA	3.0	-	-	0.36	-	0.44	-	0.55	
		IOL=8mA	4.5	-	-	0.36	-	0.44	-	0.55	
Input Current	II	VI=5.5V or GND	0 to 5.5	-	-	±0.1	-	±1	-	±2	uA
Z-state Leakage Current	Ioz	Vo=0 to 5.5V	5.5	-	-	0.25	-	2.5	-	10	uA
Supply Current	ICC	VI=5.5V or GND, IO=0A	5.5	-	-	1.0	-	10	-	40	uA
Input Capacitance	CI	VI=VCC - or GND	5.5	-	2.0	10	-	10	-	10	pF
Thermal Resistance Junction-to-Ambient	θJA	SOT-23-5	Note4	-	195	-	-	-	-	-	'C/W
		SC70-5 (SOT-353)		-	430	-	-	-	-	-	
Thermal Resistance Junction-to-Case	θJC	SOT-23-5	Note4	-	58	-	-	-	-	-	'C/W
		SC70-5 (SOT-353)		-	155	-	-	-	-	-	

Note 4. Test conditions for SOT-23-5, and SC70-5 (SOT-353): Device mounted on FR-4 substrate PC board,

2oz copper, with minimum recommended pad layout

Single Buffer Gate With 3-state Output

Electrical Characteristics (Con.)

Switching Characteristics

(VCC=3.3V±0.3V (See Figure 4))

Parameter	From (Input)	TO (OUTPUT)	VCC	25°C			-40°C to 85°C		-40°C to 125°C		Unit
			(V)	Min	Type	Max	Min	Max	Min	Max	
tpd	A	Y	CL=15pF	0.6	4.4	8.0	0.6	9.5	0.6	10.0	ns
			CL=50pF	0.6	6.3	11.5	0.6	13.0	0.6	14.5	ns
ten	OE	Y	CL=15pF	0.6	4.9	8.0	0.6	9.5	0.6	10.0	ns
			CL=50pF	0.6	7.0	11.5	0.6	13.0	0.6	14.5	ns
tdis	OE	Y	CL=15pF	0.6	6.3	9.7	0.6	11.5	0.6	12.5	ns
			CL=50pF	0.6	9.0	13.2	0.6	15.0	0.6	16.5	ns

(VCC=5V±0.5V (See Figure 4))

Parameter	From (Input)	TO (OUTPUT)	VCC	25°C			-40°C to 85°C		-40°C to 125°C		Unit
			(V)	Min.	Typ.	Max.	Min.	Max.	Min.	Max.	
tpd	A	Y	CL=15pF	0.6	3.4	5.5	0.6	6.5	0.6	7.0	ns
			CL=50pF	0.6	4.7	7.5	0.6	8.5	0.6	9.5	ns
ten	OE	Y	CL=15pF	0.6	3.6	5.6	0.6	6.3	0.6	7.0	ns
			CL=50pF	0.6	5.4	8.0	0.6	9.0	0.6	9.5	ns
tdis	OE	Y	CL=15pF	0.6	4.3	6.8	0.6	8.0	0.6	8.5	ns
			CL=50pF	0.6	6.1	8.8	0.6	10.0	0.6	11.0	ns

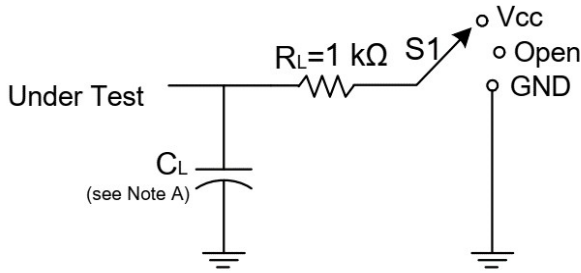
Operating Characteristics

TA=25°C

Parameter		Test Conditions	VCC=5V	Unit
			Typ.	
Cpd	Power dissipation capacitance	f=1MHz, No Load	12	pF

Single Buffer Gate With 3-state Output

Parameter Measurement Information



TEST	S1
t_{PLH}/t_{PHL}	Open
t_{PLZ}/t_{PZL}	Vload
t_{PHZ}/t_{PZH}	GND

V _{CC}	Inputs		V _M	C _L	V _Δ
	V _I	t_r/t_f			
3.3V±0.3V	V _{CC}	≤3ns	V _{CC} /2	15pF	0.3V
5V±0.5V	V _{CC}	≤3ns	V _{CC} /2	15pF	0.3V
3.3V±0.3V	V _{CC}	≤3ns	V _{CC} /2	50pF	0.3V
5V±0.5V	V _{CC}	≤3ns	V _{CC} /2	50pF	0.3V

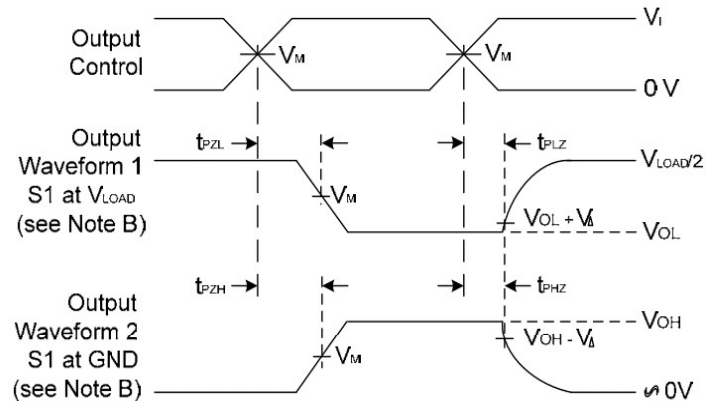
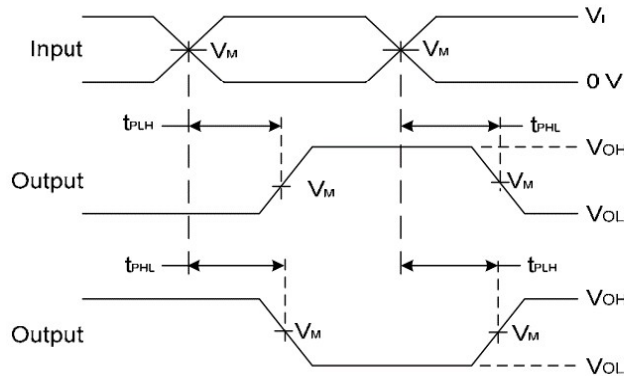
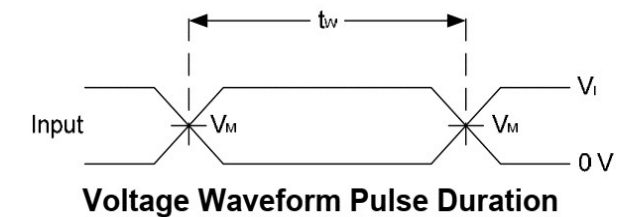


Figure 4. Load Circuit and Voltage Waveforms

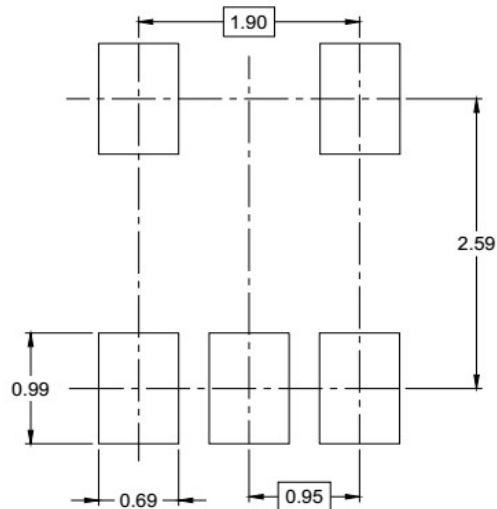
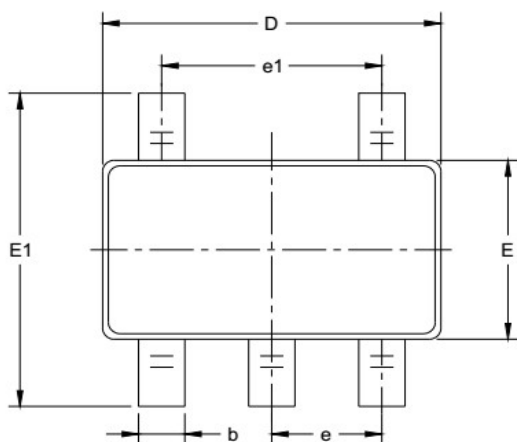
- Notes:
- A. Includes test lead and test apparatus capacitance.
 - B. All pulses are supplied at pulse repetition rate ≤ 1 MHz.
 - C. Inputs are measured separately one transition per measurement.
 - D. t_{PLZ} and t_{PHZ} are the same as t_{dis} .
 - E. t_{PZL} and t_{PZH} are the same as t_{EN} .
 - F. t_{PLH} and t_{PHL} are the same as t_{PD} .

Single Buffer Gate With 3-state Output

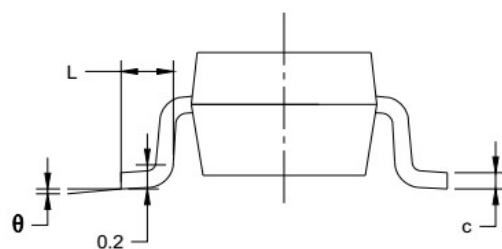
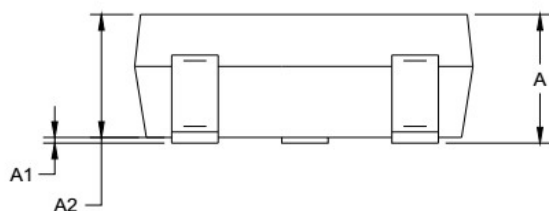
Mechanical Dimensions

PKG: SOT-23-5 (M5)

Unit: mm(inch)



RECOMMENDED LAND PATTERN (Unit: mm)



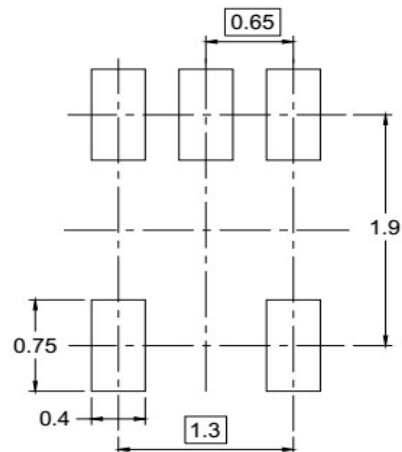
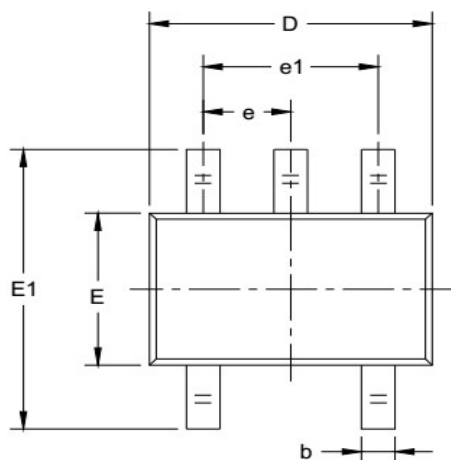
Symbol	Dimensions In Millimeters		Dimensions In Inches	
	MIN	MAX	MIN	MAX
A	1.050	1.250	0.041	0.049
A1	0.000	0.100	0.000	0.004
A2	1.050	1.150	0.041	0.045
b	0.300	0.500	0.012	0.020
c	0.100	0.200	0.004	0.008
D	2.820	3.020	0.111	0.119
E	1.500	1.700	0.059	0.067
E1	2.650	2.950	0.104	0.116
e	0.950 BSC		0.037 BSC	
e1	1.900 BSC		0.075 BSC	
L	0.300	0.600	0.012	0.024
θ	0°	8°	0°	8°

Single Buffer Gate With 3-state Output

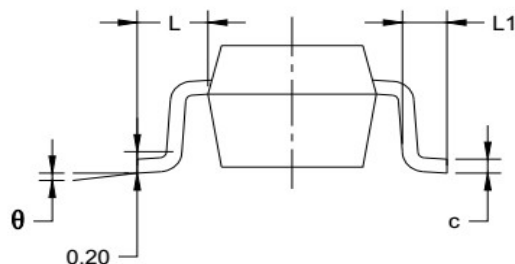
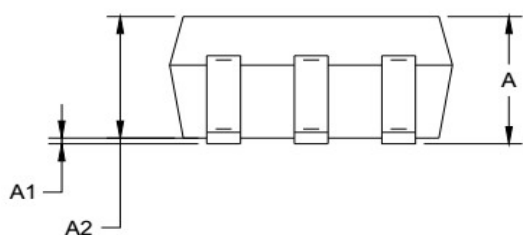
Mechanical Dimensions(Con.)

PKG: SC70-5 (ST35)

Unit: mm(inch)



RECOMMENDED LAND PATTERN (Unit: mm)

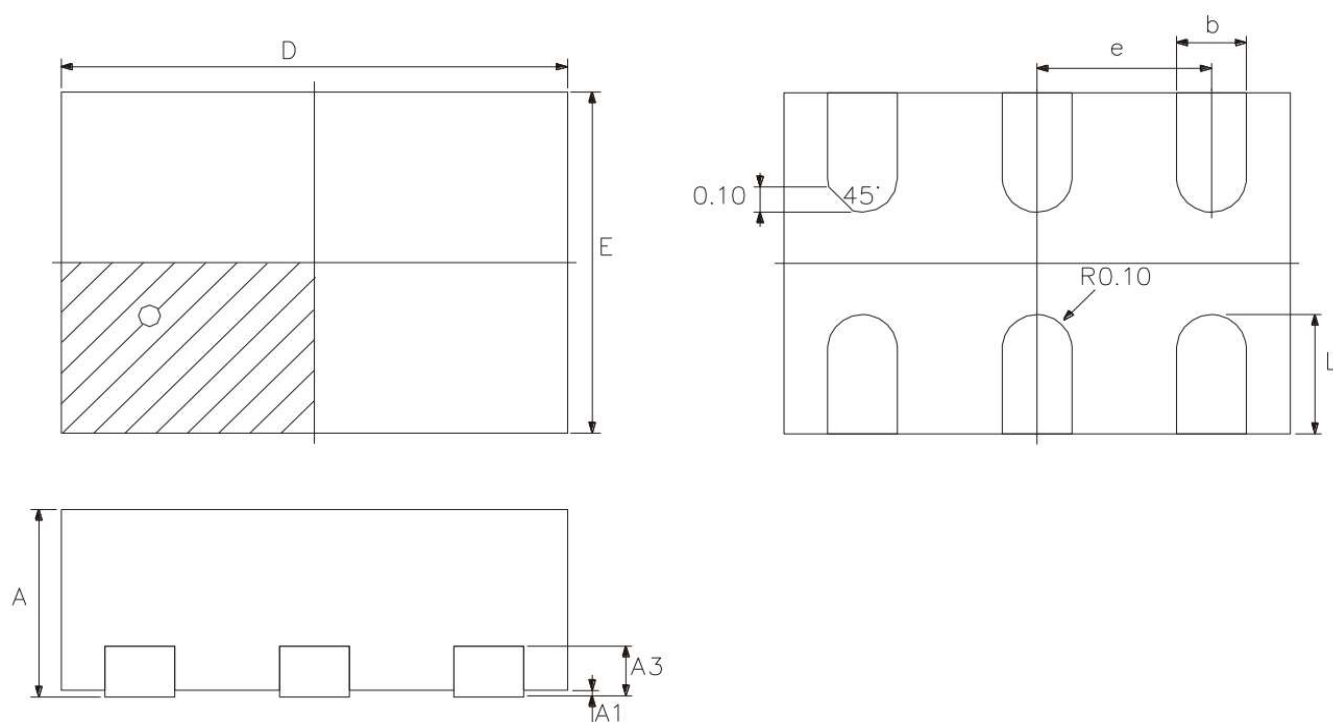


Symbol	Dimensions In Millimeters		Dimensions In Inches	
	MIN	MAX	MIN	MAX
A	0.900	1.100	0.035	0.043
A1	0.000	0.100	0.000	0.004
A2	0.900	1.000	0.035	0.039
b	0.150	0.350	0.006	0.014
c	0.080	0.150	0.003	0.006
D	2.000	2.200	0.079	0.087
E	1.150	1.350	0.045	0.053
E1	2.150	2.450	0.085	0.096
e	0.65 TYP		0.026 TYP	
e1	1.300 BSC		0.051 BSC	
L	0.525 REF		0.021 REF	
L1	0.260	0.460	0.010	0.018
θ	0°	8°	0°	8°

Single Buffer Gate With 3-state Output
Mechanical Dimensions(con.)

PKG: DFN-1x1.45-6 (DN16)

it: mm(inch)

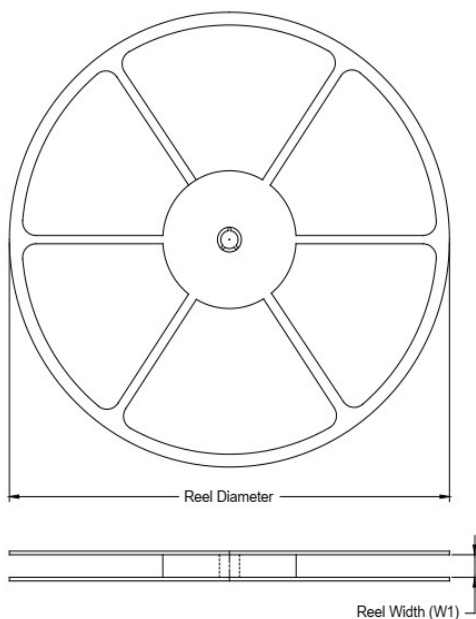


Symbol	Dimensions In Millimeters	
	Min.	Max.
A	0.51	0.60
A1	0.00	0.05
A3	0.15	
b	0.15	0.25
D	1.45	
E	1.00	
e	0.50	
L	0.25	0.45

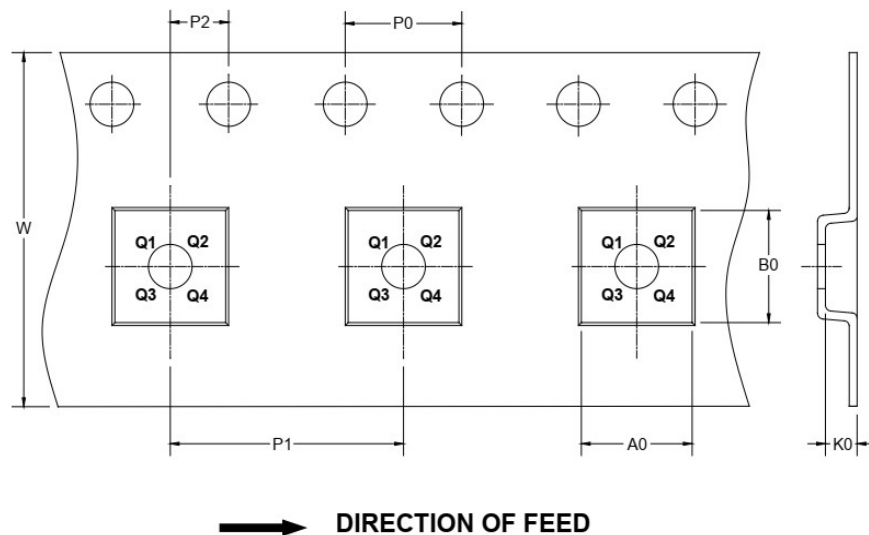
Single Buffer Gate With 3-state Output

Tape and Reel Information

REEL DIMENSIONS



TAPE DIMENSIONS



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

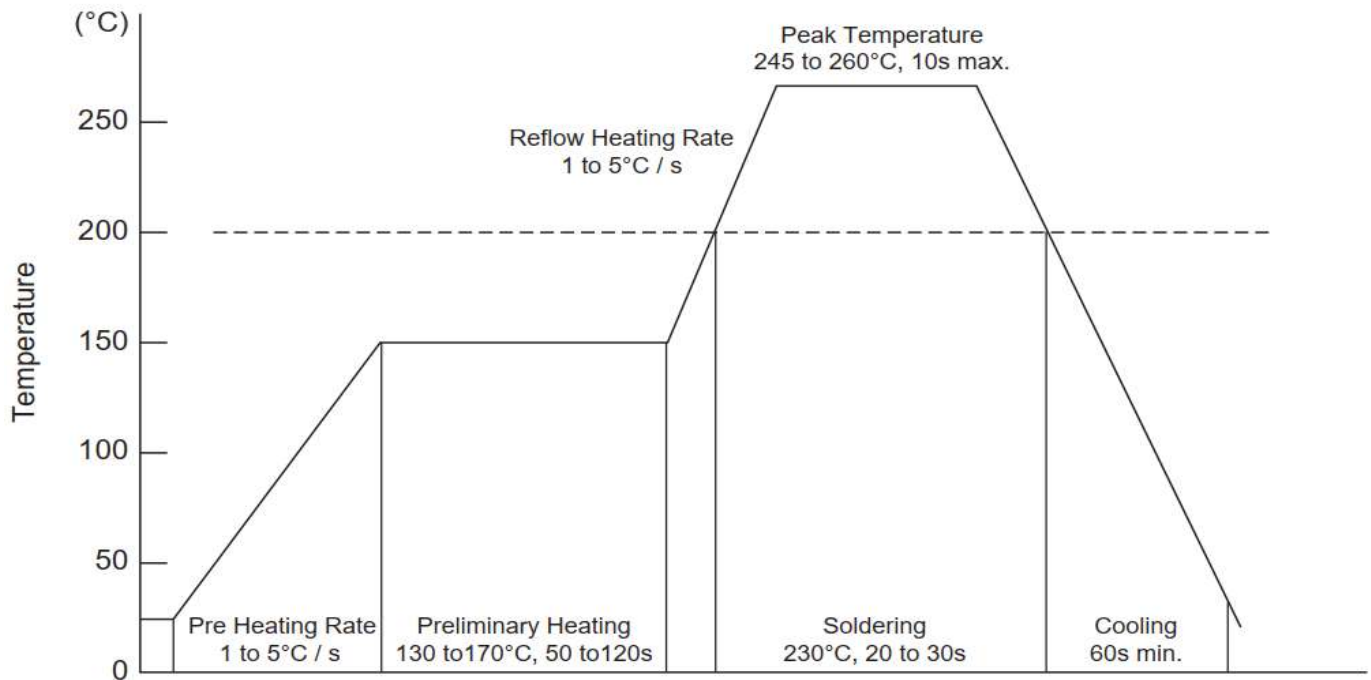
Key Parameter List of Tape and Reel

Package Type	Reel Diameter	Reel Width W1 (mm)	A0 (mm)	B0 (mm)	K0 (mm)	P0 (mm)	P1 (mm)	P2 (mm)	W (mm)	Pin1 Quadrant
SOT-23-5	7"	9.5	3.20	3.20	1.40	4.0	4.0	2.0	8.0	Q3
SC70-5/SOT353	7"	9.5	2.25	2.55	1.20	4.0	4.0	2.0	8.0	Q3
DFN-1x1.45-6	7"	9.5	1.55	2.00	1.00	4.0	4.0	2.0	8.0	Q3

Single Buffer Gate With 3-state Output

Conditins of Soldering and Storage

- * Recommended condition of reflow soldering



Recommended peak temperature is over 245°C, if peak temperature is below 245°C, you may adjust the following parameters:

- * Time length of peak temperature (longer)
 - * Time length of soldering (longer)
 - * Thickness of solder paste (thicker)
- * Conditions of hand soldering
 - * Temperature : 300°C
 - * Time : 3s max
 - * Times : one time
 - * Storage conditions
 - * Temperature
5 to 40°C
 - * Humidity
30 to 80% RH
 - * Recommended period
One year after manufacturing