

### GENERAL DESCRIPTION

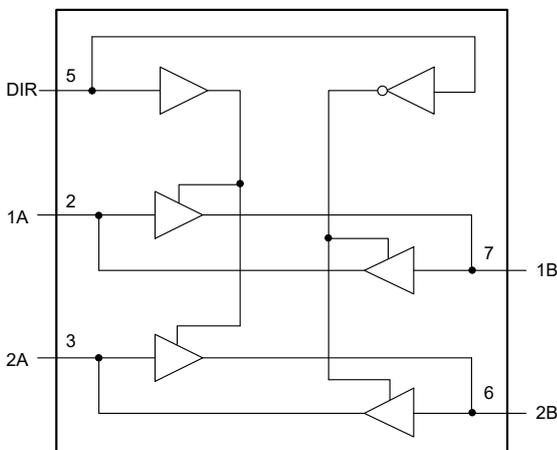
The 74AVCH2T45 is a 2-bit, dual-supply voltage level transceiver. The nA and nB are two data input-output ports, DIR is a direction control input, and  $V_{CCA}$  and  $V_{CCB}$  are dual-supply pins. The supply voltage of  $V_{CCA}$  and  $V_{CCB}$  can range from 0.8V to 3.6V, making the device suitable for translating among any of the 0.8V, 1.2V, 1.5V, 1.8V, 2.5V and 3.3V voltage nodes. The nA and DIR signals are referenced to  $V_{CCA}$  and nB signals are referenced to  $V_{CCB}$ .

When DIR is set high, it allows transmission from nA to nB. When DIR is set low, it allows transmission from nB to nA. In suspend mode, when either  $V_{CCA}$  or  $V_{CCB}$  input is at GND, both nA and nB are in the high-impedance state.

This device is highly suitable for partial power-down applications using power-off leakage current ( $I_{OFF}$ ) circuit. When the device is powered down, the current backflow will be prevented from passing through the device.

The active bus hold circuitry makes device unnecessary to use external pull-up/pull-down resistors by holding unused or floating data inputs at a valid logic level.

### LOGIC DIAGRAM



### FEATURES

- $V_{CCA}$  Supply Voltage Range: 0.8V to 3.6V
- $V_{CCB}$  Supply Voltage Range: 0.8V to 3.6V
- Inputs Accept Voltages up to 3.6V
- +12mA/-12mA Output Current
- Data Rates:
  - ◆ 500Mbps (1.8V to 3.3V Translation)
  - ◆ 320Mbps (< 1.8V to 3.3V Translation)
  - ◆ 320Mbps (Translate to 2.5V or 1.8V)
  - ◆ 280Mbps (Translate to 1.5V)
  - ◆ 240Mbps (Translate to 1.2V)
- Outputs in High-Impedance State when  $V_{CCA}$  or  $V_{CCB} = 0V$
- No External Pull-up/Pull-down Resistors are Required Due to the Bus Hold on Data Inputs
- -40°C to +125°C Operating Temperature Range
- Available in a Green VSSOP-8 Package

### FUNCTION TABLE

SUPPLY VOLTAGE	CONTROL INPUT	INPUT/OUTPUT <sup>(1)</sup>	
		nA	nB
$V_{CCA}, V_{CCB}$	DIR <sup>(2)</sup>	nA = nB	Inputs
0.8V to 3.6V	L	nA = nB	Inputs
0.8V to 3.6V	H	Inputs	nB = nA
GND <sup>(3)</sup>	X	Z	Z

H = High Voltage Level  
 L = Low Voltage Level  
 X = Don't Care  
 Z = High-Impedance State

#### NOTES:

1. For the I/O data, the input circuit is always active.
2. The DIR pin is referenced to  $V_{CCA}$ .
3. If at least one of  $V_{CCA}$  or  $V_{CCB}$  is at GND level, the device enters suspend mode.

## PACKAGE/ORDERING INFORMATION

MODEL	PACKAGE DESCRIPTION	SPECIFIED TEMPERATURE RANGE	ORDERING NUMBER	PACKAGE MARKING	PACKING OPTION
74AVCH2T45	VSSOP-8	-40°C to +125°C	74AVCH2T45XVS8G/TR	MEH XXXX	Tape and Reel, 3000

## MARKING INFORMATION

NOTE: XXXX = Date Code, Trace Code and Vendor Code.

YYY— Serial Number

XXXX

Vendor Code  
Trace Code  
Date Code - Year

Green (RoHS & HSF): SG Micro Corp defines "Green" to mean Pb-Free (RoHS compatible) and free of halogen substances. If you have additional comments or questions, please contact your SGMICRO representative directly.

ABSOLUTE MAXIMUM RATINGS <sup>(1)</sup>

Supply Voltage Range, $V_{CCA}$ .....	-0.5V to 4.6V
Supply Voltage Range, $V_{CCB}$ .....	-0.5V to 4.6V
Input Voltage Range, $V_I$ <sup>(2)</sup> .....	-0.5V to 4.6V
Output Voltage Range, $V_O$ <sup>(2)</sup>	
Suspend or 3-State Mode.....	-0.5V to 4.6V
Active Mode	
A Ports.....	-0.5V to MIN (4.6V, $V_{CCA} + 0.5V$ )
B Ports.....	-0.5V to MIN (4.6V, $V_{CCB} + 0.5V$ )
Output Current, $I_O$ ( $V_O = 0V$ to $V_{CCO}$ )	
High-State or Low-State.....	$\pm 50mA$
Input Clamp Current, $I_{IK}$ ( $V_I < 0$ ).....	-50mA
Output Clamp Current, $I_{OK}$ ( $V_O < 0V$ ).....	-50mA
Supply Current, $I_{CC}$ ( $I_{CCA}$ or $I_{CCB}$ ).....	100mA
Ground Current, $I_{GND}$ .....	-100mA
Junction Temperature <sup>(3)</sup> .....	+150°C
Storage Temperature Range.....	-65°C to +150°C
Lead Temperature (Soldering, 10s).....	+260°C
ESD Susceptibility	
HBM.....	6000V
CDM.....	1000V

## RECOMMENDED OPERATING CONDITIONS

Supply Voltage Range, $V_{CCA}$ .....	0.8V to 3.6V
Supply Voltage Range, $V_{CCB}$ .....	0.8V to 3.6V
Input Voltage Range, $V_I$ .....	0V to 3.6V
Output Voltage Range, $V_O$	
Suspend or 3-State Mode.....	0V to 3.6V
Active Mode	
A Ports.....	0V to $V_{CCA}$
B Ports.....	0V to $V_{CCB}$
High-State or Low-State Output Current, $I_O$ .....	$\pm 12mA$

Input Transition Rise or Fall Rate,  $\Delta t/\Delta V$

$V_{CCI} = 0.8V$ to $3.6V$ .....	5ns/V (MAX)
Operating Temperature Range.....	-40°C to +125°C

## OVERSTRESS CAUTION

- Stresses beyond those listed in Absolute Maximum Ratings may cause permanent damage to the device. Exposure to absolute maximum rating conditions for extended periods may affect reliability. Functional operation of the device at any conditions beyond those indicated in the Recommended Operating Conditions section is not implied.
- The minimum input voltage ratings and output voltage ratings may be exceeded if the input and output current ratings are observed.
- The performance capability of a high-performance integrated circuit in conjunction with its thermal environment can create junction temperatures which are detrimental to reliability.

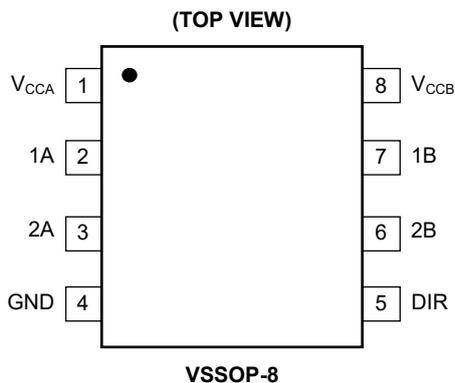
## ESD SENSITIVITY CAUTION

This integrated circuit can be damaged if ESD protections are not considered carefully. SGMICRO recommends that all integrated circuits be handled with appropriate precautions. Failure to observe proper handling and installation procedures can cause damage. ESD damage can range from subtle performance degradation to complete device failure. Precision integrated circuits may be more susceptible to damage because even small parametric changes could cause the device not to meet the published specifications.

## DISCLAIMER

SG Micro Corp reserves the right to make any change in circuit design, or specifications without prior notice.

## PIN CONFIGURATION

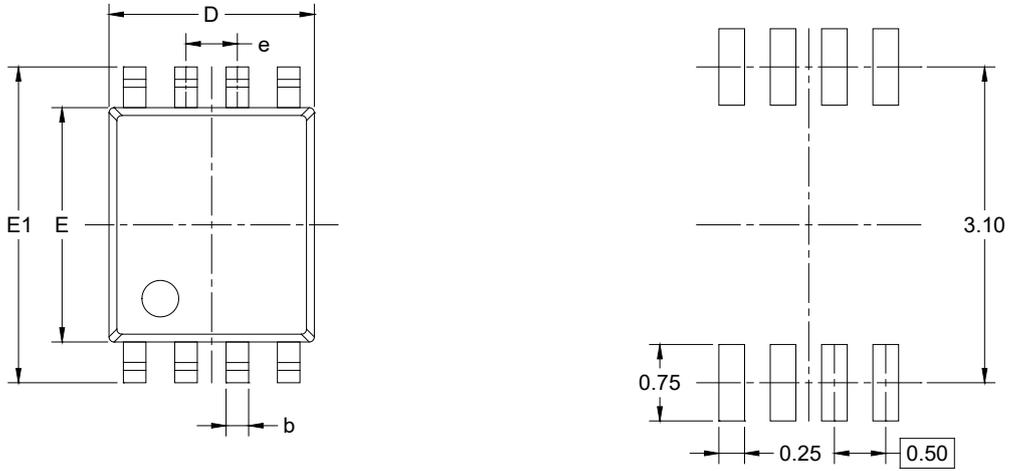


## PIN DESCRIPTION

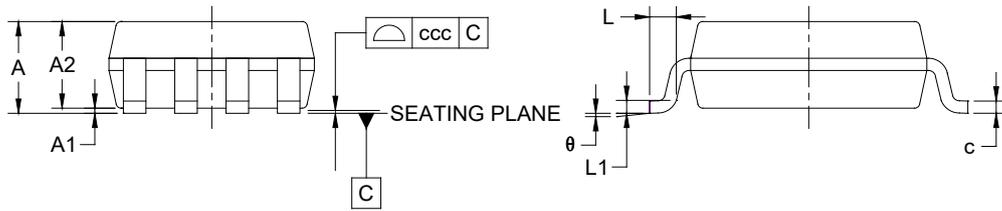
PIN	NAME	FUNCTION
1	$V_{CCA}$	Supply Voltage $V_{CCA}$ . The nA and DIR signals are referenced to $V_{CCA}$ .
2, 3	1A, 2A	Data Inputs/Outputs.
4	GND	Ground.
5	DIR	Direction Control Input.
7, 6	1B, 2B	Data Inputs/Outputs.
8	$V_{CCB}$	Supply Voltage $V_{CCB}$ . The nB signals are referenced to $V_{CCB}$ .

PACKAGE OUTLINE DIMENSIONS

VSSOP-8



RECOMMENDED LAND PATTERN (Unit: mm)



Symbol	Dimensions In Millimeters		
	MIN	MOD	MAX
A	-	-	1.000
A1	0.000	-	0.150
A2	0.600	-	0.850
b	0.170	-	0.270
c	0.080	-	0.230
D	1.900	-	2.100
E	2.200	-	2.400
E1	3.000	-	3.200
e	0.500 BSC		
L	0.150	-	0.400
L1	0.120 BSC		
θ	0°	-	8°
ccc	0.100		

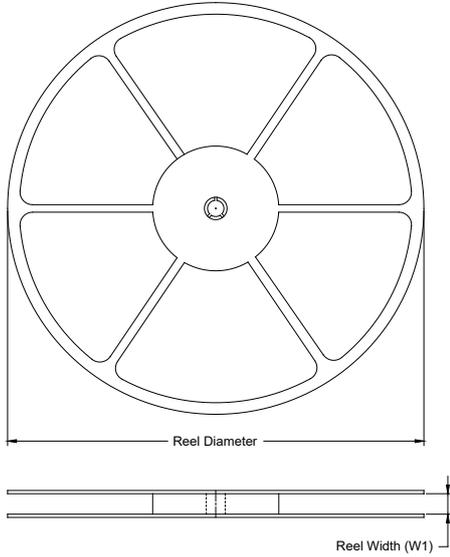
NOTES:

1. This drawing is subject to change without notice.
2. The dimensions do not include mold flashes, protrusions or gate burrs.
3. Reference JEDEC MO-187 CA.

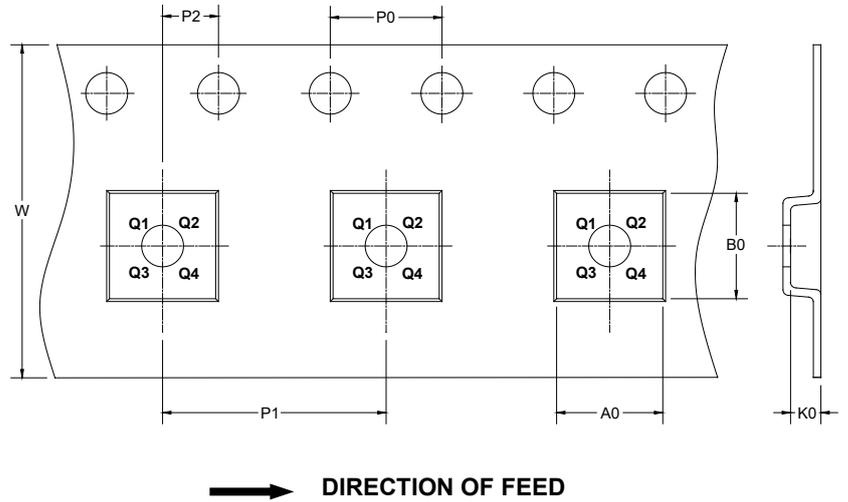
# PACKAGE INFORMATION

## TAPE AND REEL INFORMATION

### REEL DIMENSIONS



### TAPE DIMENSIONS



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

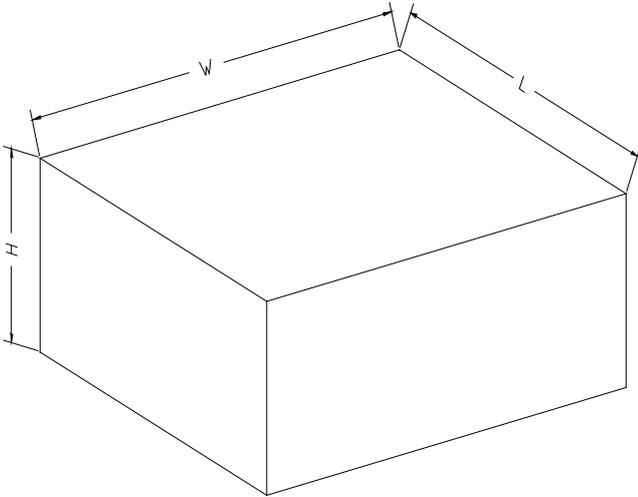
### KEY PARAMETER LIST OF TAPE AND REEL

Package Type	Reel Diameter	Reel Width W1 (mm)	A0 (mm)	B0 (mm)	K0 (mm)	P0 (mm)	P1 (mm)	P2 (mm)	W (mm)	Pin1 Quadrant
VSSOP-8	7"	9.5	2.25	3.35	1.05	4.0	4.0	2.0	8.0	Q3

000001

# PACKAGE INFORMATION

## CARTON BOX DIMENSIONS



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

## KEY PARAMETER LIST OF CARTON BOX

Reel Type	Length (mm)	Width (mm)	Height (mm)	Pizza/Carton
7" (Option)	368	227	224	8
7"	442	410	224	18

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