



74AVC2T245Q

Automotive, 2-Bit Dual-Supply Translating Transceiver with Configurable Voltage Translation and 3-State Outputs

GENERAL DESCRIPTION

The 74AVC2T245Q is a 2-bit, dual-supply voltage level transceiver with 3-state outputs and bidirectional level translation. The An and Bn are two data input-output ports. DIRn are the direction control inputs and $\overline{OE}$ is the output enable input. V_{CCA} and V_{CCB} are the supply pins. The supply voltage of V_{CCA} and V_{CCB} can range from 0.8V to 3.6V, making the device suitable for bidirectional translating among any of the 0.8V, 1.2V, 1.5V, 1.8V, 2.5V and 3.3V low voltage nodes. The An, DIRn and $\overline{OE}$ signals are referenced to V_{CCA} and Bn signals are referenced to V_{CCB} .

When DIRn is set high, it allows transmission from An to Bn. When DIRn is set low, it allows transmission from Bn to An. $\overline{OE}$ can make the outputs disabled in order to effectively isolate the buses. In suspend mode, both An and Bn are in high-impedance state when either V_{CCA} or V_{CCB} is at GND level.

This device is highly suitable for partial power-down applications by using power-off circuit. When the device is powered down, the outputs are disabled, and the current backflow can be prevented from passing through the device.

The device is AEC-Q100 qualified (Automotive Electronics Council (AEC) standard Q100 Grade 1) and it is suitable for automotive applications.

The 74AVC2T245Q is available in a Green UTQFN -1.8×1.4-10L package. It operates over a temperature range of -40°C to +125°C.

FEATURES

- AEC-Q100 Qualified for Automotive Applications Device Temperature Grade 1
 $T_A = -40^{\circ}\text{C}$ to $+125^{\circ}\text{C}$
- V_{CCA} Supply Voltage Range: 0.8V to 3.6V
- V_{CCB} Supply Voltage Range: 0.8V to 3.6V
- Inputs Accept Voltages Higher than the Supply Voltage and up to 3.6V
- Typical Data Rates:
 - ♦ 380Mbps ($\geq 1.8\text{V}$ to 3.3V Translation)
 - ♦ 200Mbps ($\geq 1.1\text{V}$ to 3.3V Translation)
 - ♦ 200Mbps ($\geq 1.1\text{V}$ to 2.5V Translation)
 - ♦ 200Mbps ($\geq 1.1\text{V}$ to 1.8V Translation)
 - ♦ 150Mbps ($\geq 1.1\text{V}$ to 1.5V Translation)
 - ♦ 100Mbps ($\geq 1.1\text{V}$ to 1.2V Translation)
- Support Partial Power-Down Mode
- Outputs in High-Impedance State when V_{CCA} or $V_{CCB} = 0\text{V}$
- -40°C to +125°C Operating Temperature Range
- Available in a Green UTQFN-1.8×1.4-10L Package

APPLICATIONS

Automotive Applications
Battery Powered Equipment
Enterprise Equipment
Telecom Equipment
Medical Equipment

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PACKAGE/ORDERING INFORMATION

MODEL	PACKAGE DESCRIPTION	SPECIFIED TEMPERATURE RANGE	ORDERING NUMBER	PACKAGE MARKING	PACKING OPTION
74AVC2T245Q	UTQFN-1.8×1.4-10L	-40°C to +125°C	74AVC2T245QUWQ10G/TR	18B XXX	Tape and Reel, 3000

MARKING INFORMATION

NOTE: XXX = Date Code and Trace Code.

YYY — Serial Number
XXX
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

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 ⁽¹⁾ -0.5V to 4.6V
Output Voltage Range, V_O ⁽¹⁾⁽²⁾
Suspend or 3-State Mode -0.5V to 4.6V
Active Mode -0.5V to MIN(4.6V, V_{CCO} + 0.5V)
Input Clamp Current, I_{IK} ($V_I < 0V$) -50mA
Output Clamp Current, I_{OK} ($V_O < 0V$) -50mA
Continuous Output Current, I_O ($V_O = 0V$ to V_{CCO} ⁽²⁾) ±50mA
Continuous Current through $V_{CCA/B}$ or GND ±100mA
Junction Temperature ⁽³⁾ +150°C
Storage Temperature Range -65°C to +150°C
Lead Temperature (Soldering, 10s) +260°C
ESD Susceptibility ⁽⁴⁾⁽⁵⁾
HBM ±5000V
CDM ±1000V

NOTES:

1. The input and output voltage ratings may be exceeded if the input and output clamp current ratings are observed.
2. V_{CCO} is the supply voltage associated with the data output ports.
3. The performance capability of a high-performance integrated circuit in conjunction with its thermal environment can create junction temperatures which are detrimental to reliability.
4. For human body model (HBM), all pins comply with AEC-Q100-002 specification.
5. For charged device model (CDM), all pins comply with AEC-Q100-011 specification.

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 0V to V_{CCO}
Input Transition Rise or Fall Rate, $\Delta t/\Delta V$
 $V_{CCI} = 0.8V$ to 3.6V 10ns/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.

ESD SENSITIVITY CAUTION

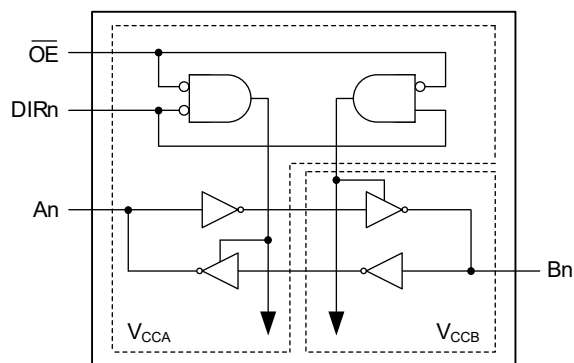
This integrated circuit can be damaged if ESD protections are not considered carefully. SGMICRO recommends that all integrated circuits be handled with appropriate precautions. Failure to observe proper handling and installation procedures can cause damage. ESD damage can range from subtle performance 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.

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LOGIC DIAGRAM



FUNCTION TABLE

CONTROL INPUTS			INPUT/OUTPUT	
$\overline{OE}$	DIR1	DIR2	An	Bn
L	L	X	A1 = B1	Input B1
L	H	X	Input A1	B1 = A1
L	X	L	A2 = B2	Input B2
L	X	H	Input A2	B2 = A2
H	X	X	Z	Z

H = High Voltage Level

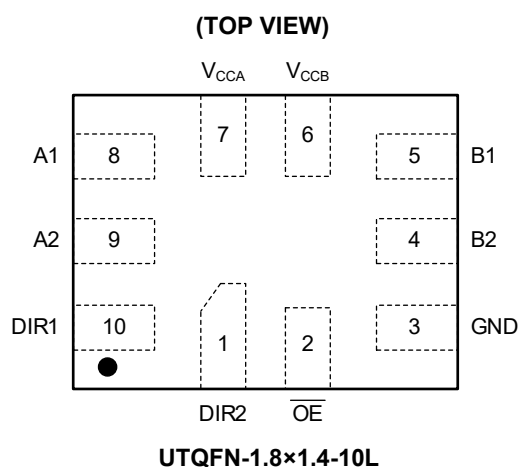
L = Low Voltage Level

Z = High-Impedance State.

X = Don't Care

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PIN CONFIGURATION

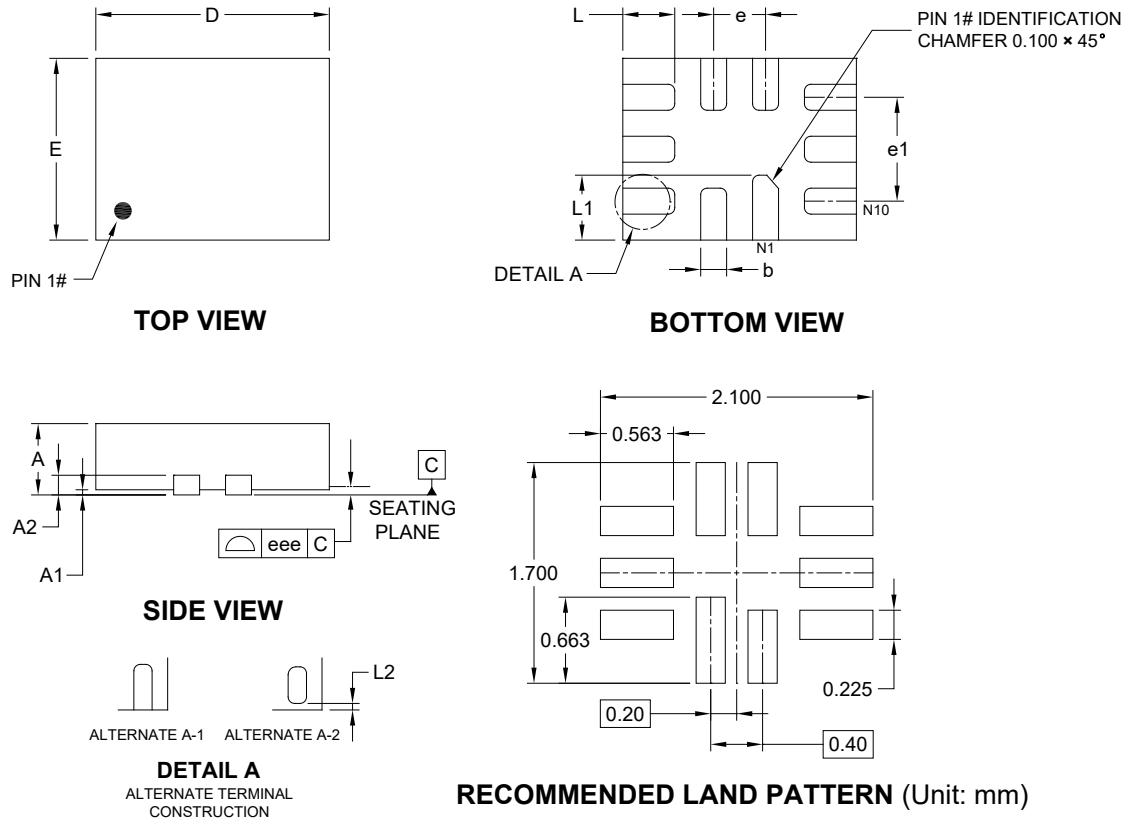


PIN DESCRIPTION

PIN	NAME	FUNCTION
10	DIR1	Direction Control Input 1. DIR1 controls the signal direction of channel A1 and B1.
1	DIR2	Direction Control Input 2. DIR2 controls the signal direction of channel A2 and B2.
2	$\overline{OE}$	Output Enable Input (Active-Low).
3	GND	Ground.
5, 4	B1, B2	Data Inputs/Outputs.
6	V_{CCB}	Supply Voltage V_{CCB} . The Bn signals are referenced to V_{CCB} .
7	V_{CCA}	Supply Voltage V_{CCA} . The An, DIRn and $\overline{OE}$ signals are referenced to V_{CCA} .
8, 9	A1, A2	Data Inputs/Outputs.

PACKAGE OUTLINE DIMENSIONS

UTQFN-1.8×1.4-10L



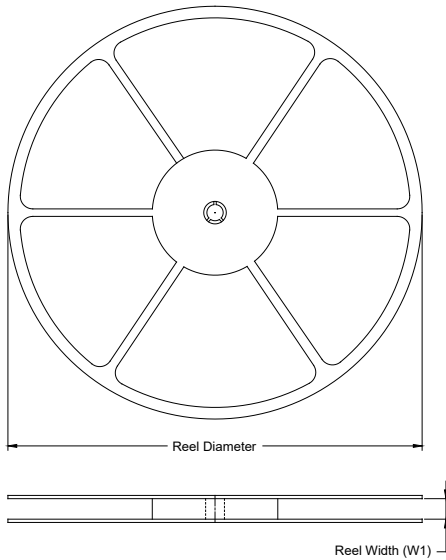
Symbol	Dimensions In Millimeters		
	MIN	NOM	MAX
A	0.450	-	0.600
A1	0.000	-	0.050
A2	0.152 REF		
b	0.150	0.200	0.250
D	1.750	1.800	1.850
E	1.350	1.400	1.450
e	0.400 TYP		
e1	0.800 REF		
L	0.350	0.400	0.450
L1	0.450	0.500	0.550
L2	0.000	-	0.100
eee	-	0.080	-

NOTE: This drawing is subject to change without notice.

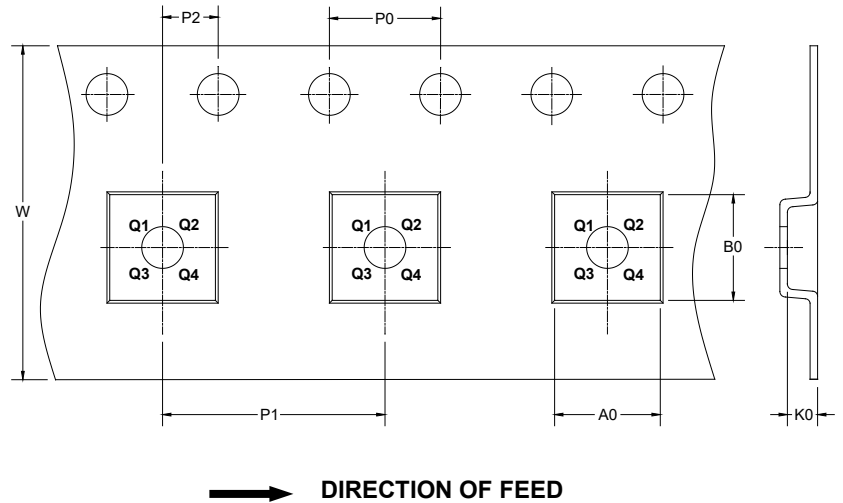
PACKAGE INFORMATION

TAPE AND REEL INFORMATION

REEL DIMENSIONS



TAPE DIMENSIONS



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

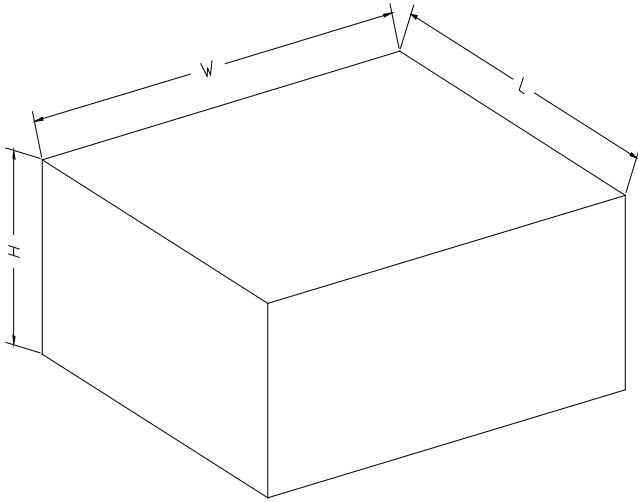
KEY PARAMETER LIST OF TAPE AND REEL

Package Type	Reel Diameter	Reel Width W1 (mm)	A0 (mm)	B0 (mm)	K0 (mm)	P0 (mm)	P1 (mm)	P2 (mm)	W (mm)	Pin1 Quadrant
UTQFN-1.8×1.4-10L	7"	9.0	1.75	2.10	0.70	4.0	4.0	2.0	8.0	Q1

DD0001

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

DD0002