

钍地半导体
Tudi Semiconductor

Product Specification

TUDI-DS34C86T

Quad CMOS Differential Line Receiver

网址 www.sztdbdt.com

用芯智造·卓越品质

semiconductor device manufacturer

- Design
- research and development
- production
- and sales

FEATURES

- ●CMOS Design for Low Power
- ●±0.2V Sensitivity Over the Input Common Mode Voltage Range
- ●Typical Propagation Delays:19 ns
- ●Typical Input Hysteresis:60 mV
- ●Inputs Won't Load Line when V_{cc}=0V
- ●Meets the Requirements of EIA Standard RS-422
- ●TRI-STATE Outputs for System Bus Compatibility
- ●Available in Surface Mount
- ●Open Input Failsafe Feature,Output High for Open Input

DESCRIPTION

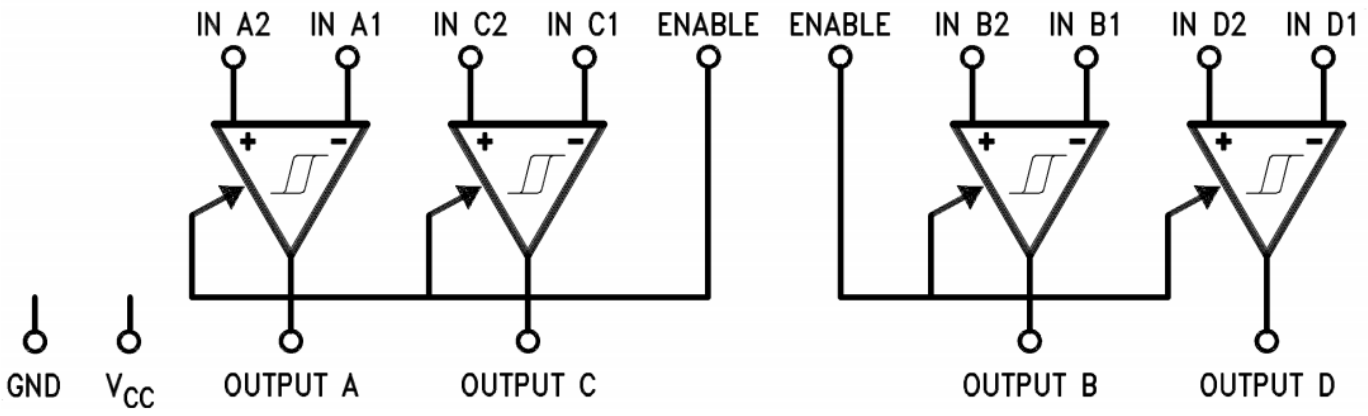
The DS34C86T is a quad differential ine receiverdesigned to meet the RS-422,RS-423,and FederalStandards 1020 and 1030 for balanced andunbalanced digital data transmission,while retainingthe low power characteristics of CMOS.

The DS34C86T has an input sensitivity of 200 mVover the common mode input voltage range of ± 7V.Hysteresis is provided to improve noise margin anddiscourage output instability for slowly changing inputwaveforms.

The DS34C86T features internal pull-up and pul-down resistors whch prevent output oscillation onunused channels.

Separate enable pins allow independent control ofreceiver pairs.The TRI-STATE outputs have 6 mAsource and sink capability.The DS34C86T is pincompatible with the DS3486.

Logic Diagram



Connection Diagram

Top View

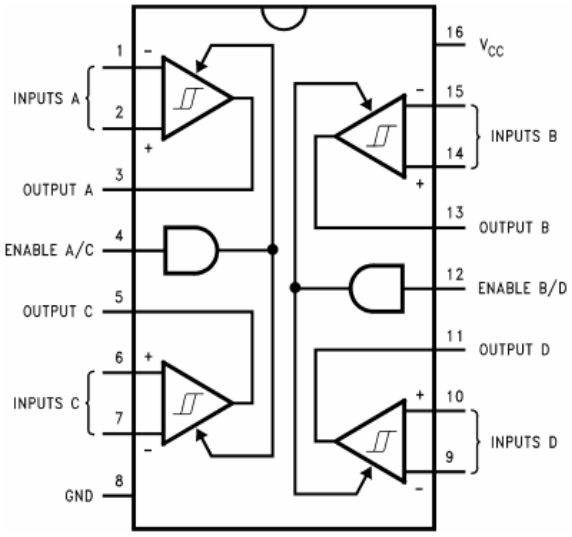


Figure 1. PDIP Package
See Package Numbers D0016A or NFG0016E

Truth Table(1)

Enable	Input	Output
L	X	Z
H	$V_{ID} \geq V_{TH}$ (Max)	H
H	$V_{ID} \leq V_{TH}$ (Min)	L
H	Open*	H

(1) Open, not terminated. Z = TRI-STATE

Absolute Maximum Ratings(1)(2)(3)(4)

Supply Voltage (V_{CC})	7V
Input Common Mode Range (V_{CM})	±14V
Differential Input Voltage (V_{DIFF})	±14V
Enable Input Voltage (V_{IN})	7V
Storage Temperature Range (T_{STG})	−65°C to +150°C
Lead Temperature (Soldering 4 sec)	260°C
Maximum Power Dissipation at 25°C(5)	
PDIP Package	1645 mW
SOIC Package	1190 mW
Current Per Output	±25 mA
This device does not meet 2000V ESD rating(1)	

(1) ESD Rating; HBM (1.5kΩ, 100 pF) Inputs ≥ 2000V All other pins ≥ 1000V EIAJ (0Ω, 200 pF) ≥ 350V
(2) Unless otherwise specified, all voltages are referenced to ground.
(3) Absolute Maximum Ratings are values beyond which the safety of the device cannot be specified. They are not meant to imply that the device should be operated at these limits. The “Electrical Characteristics” provide conditions for actual device operation.
(4) If Military/Aerospace specified devices are required, please contact the TI Sales Office/Distributors for availability and specifications.
(5) Ratings apply to ambient temperature at 25°C. Above this temperature derate NFG0016E Package 13.16 mW/°C, and D0016A Package 9.52 mW/°C.

Operating Conditions

	Min	Max	Unit
Supply Voltage (V_{CC})	4.50	5.50	V
Operating Temperature Range (T_A)	−40	+85	°C
Enable Input Rise or Fall Times		500	ns

DC Electrical Characteristics(1)

V_{CC} = 5V ±10% (unless otherwise specified)

Parameter		Test Conditions	Min	Typ	Max	Units
V_{TH}	Minimum Differential Input Voltage	V_{OUT} = V_{OH} or V_{OL} −7V < V_{CM}< +7V	−200	35	+200	mV
R_{IN}	Input Resistance	V_{IN} = −7V, +7V (Other Input = GND)	5.0	6.8	10	kΩ
I_{IN}	Input Current (Under Test)	V_{IN} = +10V, Other Input = GND		+1.1	+1.5	mA
		V_{IN} = −10V, Other Input = GND		−2.0	−2.5	mA
V_{OH}	Minimum High Level Output Voltage	V_{CC} = Min., $V_{(DIFF)}$ = +1V I_{OUT} = −6.0 mA	3.8	4.2		V
V_{OL}	Maximum Low Level Output Voltage	V_{CC} = Max., $V_{(DIFF)}$ = −1V I_{OUT} = 6.0 mA		0.2	0.3	V
V_{IH}	Minimum Enable High Input Level Voltage		2.0			V
V_{IL}	Maximum Enable Low Input Level Voltage				0.8	V
I_{OZ}	Maximum TRI-STATE Output Leakage Current	V_{OUT} = V_{CC} or GND, TRI-STATE Control = V_{IL}		±0.5	±5.0	µA
I_I	Maximum Enable Input Current	V_{IN} = V_{CC} or GND			±1.0	µA
I_{CC}	Quiescent Power Supply Current	V_{CC} = Max., $V_{(DIFF)}$ = +1V		16	23	mA
V_{HYST}	Input Hysteresis	V_{CM} = 0V		60		mV

(1) Unless otherwise specified, Min/Max limits apply across the operating temperature range. All typicals are given for V_{CC} = 5V and T_A = 25°C.

AC Electrical Characteristics(1)

V_{CC} = 5V ±10% (unless otherwise specified) (Figure 2, Figure 3, Figure 4)

Parameter		Test Conditions	Min	Typ	Max	Units
t_{PLH}, t_{PHL}	Propagation Delay Input to Output	C_L = 50 pF V_{DIFF} = 2.5V V_{CM} = 0V		19	30	ns
t_{RISE}, t_{FALL}	Output Rise and Fall Times	C_L = 50 pF V_{DIFF} = 2.5V V_{CM} = 0V		4	9	ns
t_{PLZ}, t_{PHZ}	Propagation Delay ENABLE to Output	C_L = 50 pF R_L = 1000Ω V_{DIFF} = 2.5V		13	18	ns
t_{PZL}, t_{PZH}	Propagation Delay ENABLE to Output	C_L = 50 pF R_L = 1000Ω V_{DIFF} = 2.5V		13	21	ns

(1) Unless otherwise specified, Min/Max limits apply across the operating temperature range. All typicals are given for V_{CC} = 5V and T_A = 25°C.

Comparison Table of Switching Characteristics into "LS-Type" Load(1)

V_{CC} = 5V, T_A = 25°C (Figure 5, Figure 6)

Parameter		DS34C86		DS3486		Units
		Typ	Max	Typ	Max	
$t_{PHL(D)}$	Propagation Delay Time Output High to Low	17		19		ns
$t_{PLH(D)}$	Propagation Delay Time Output Low to High	19		19		ns
t_{PLZ}	Output Low to TRI-STATE	13		23		ns
t_{PHZ}	Output High to TRI-STATE	12		25		ns
t_{PZH}	Output TRI-STATE to High	13		18		ns
t_{PZL}	Output TRI-STATE to Low	13		20		ns

(1) This table is provided for comparison purposes only. The values in this table for the DS34C86 reflect the performance of the device but are not tested or specified.

TEST AND SWITCHING WAVEFORMS

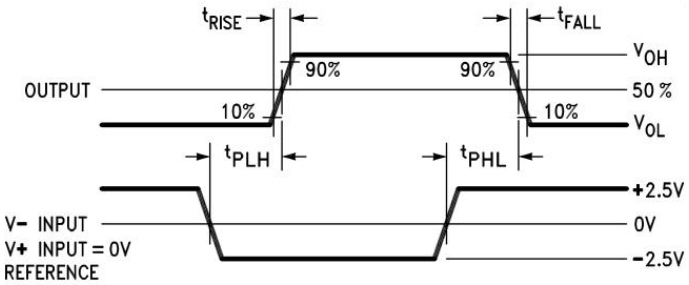
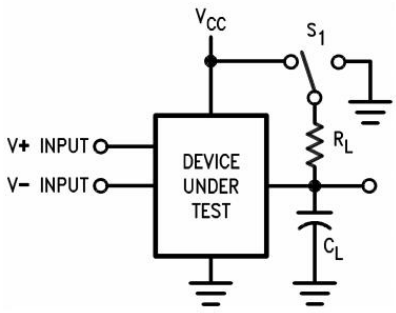


Figure 2. Propagation Delays



C_L Includes load and test jig capacitance.
S1 = V_{CC} for t_{PZL}, and t_{PLZ} measurements.
S1 = GND for t_{PZH}, and t_{PHZ} measurements.

Figure 3. Test Circuit for TRI-STATE Output Tests

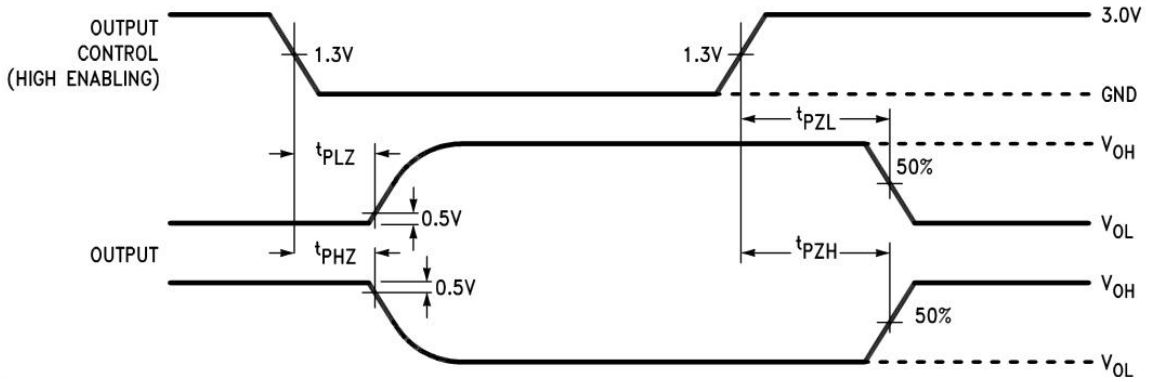
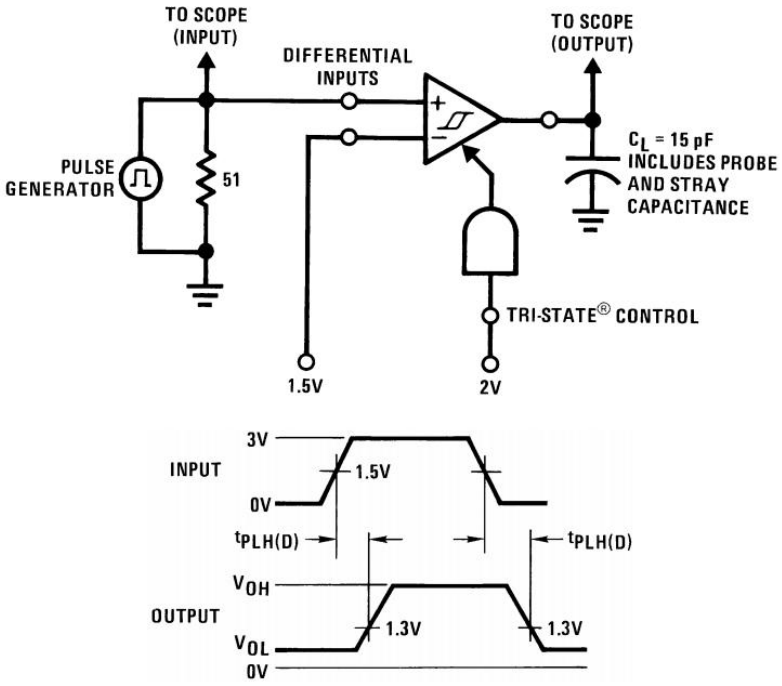


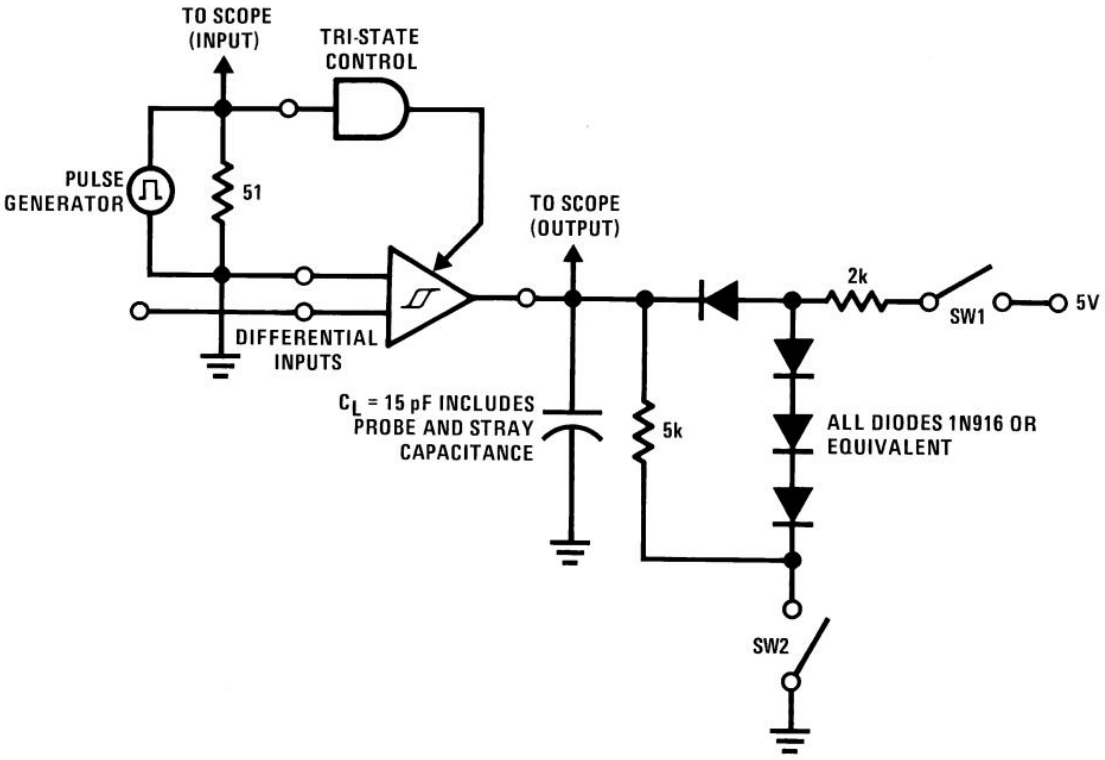
Figure 4. TRI-STATE Output Enable and Disable Waveforms

AC Test Circuits and Switching Time Waveforms



Input Pulse Characteristics:
$t_{TLH} = t_{THL}$ = 6 ns (10% to 90%)
PRR = 1 MHz, 50% duty cycle

Figure 5. Propagation Delay Differential Input to Output for "LS-Type" Load



1.5V for t_{PHZ} and t_{PLZ}
−1.5V for t_{PLZ} and t_{PZL}
Input Pulse Characteristics:
$t_{TLH} = t_{THL}$ = 6 ns (10% to 90%)
PRR = 1 MHz, 50% duty cycle

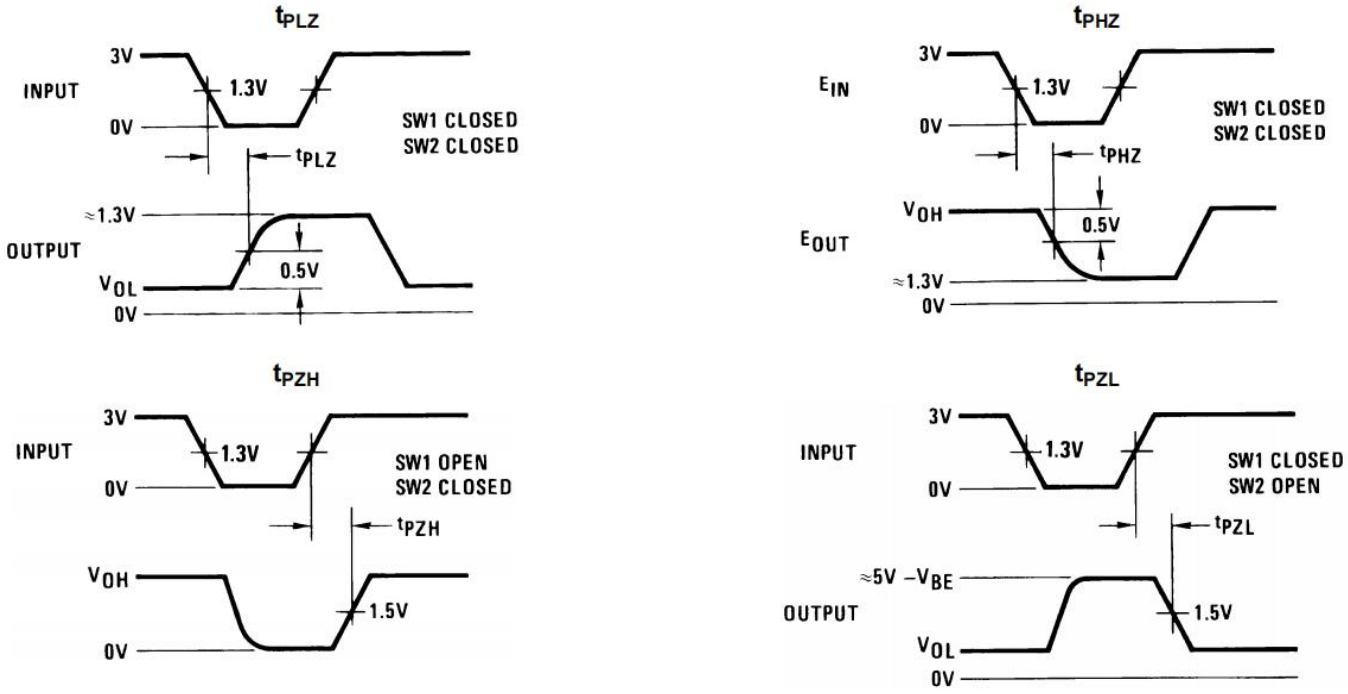
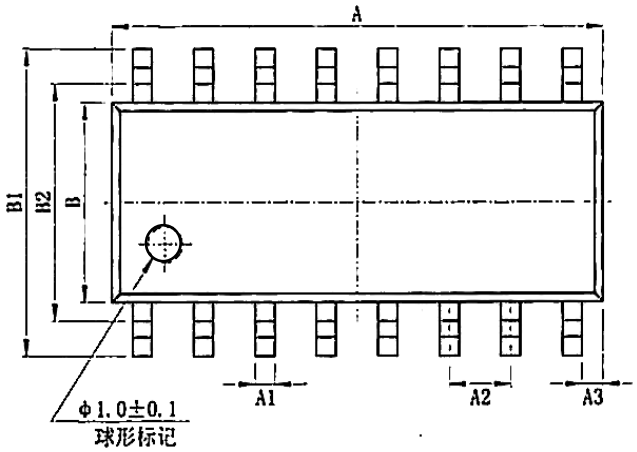


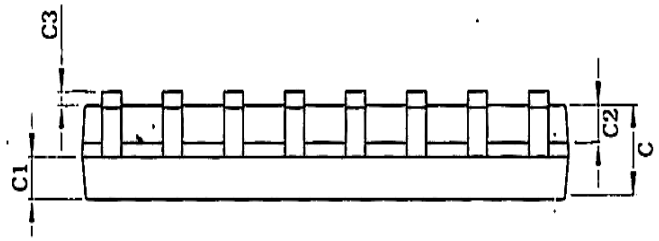
Figure 6. Propagation Delay TRI-STATE Control Unit to Output for "LS-Type" Load

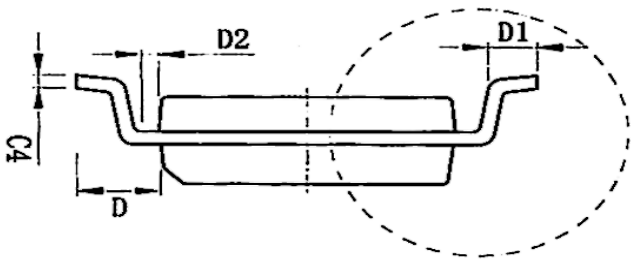
Order information

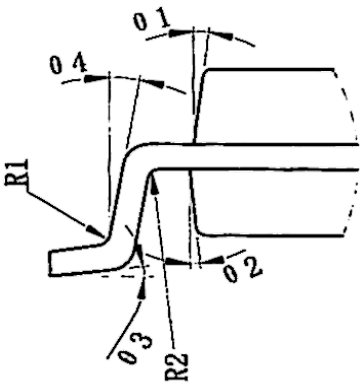
Order Number	Package	Package Quantity	Marking On The park
DS34C86TMX/NOPB-TUDI	SOP16	Tape,Reel,2500	DS34C86TMX/NOPB
DS34C86TN-TUDI	DIP16	Tube,25,A box of 1000	DS34C86TN

Package SOP16



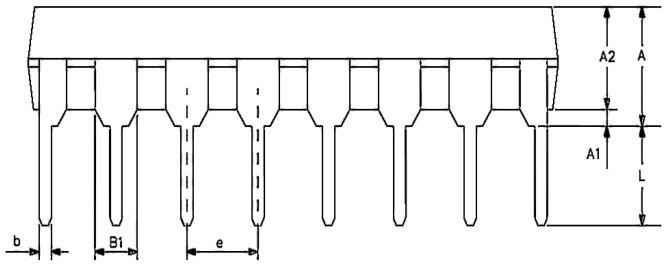


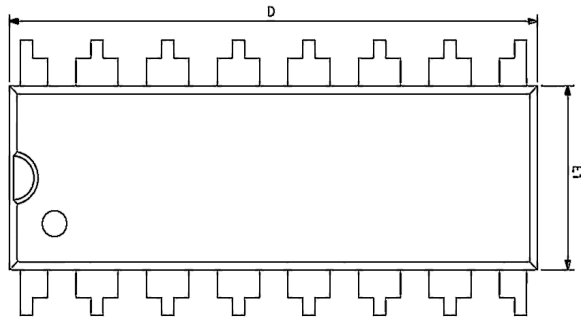


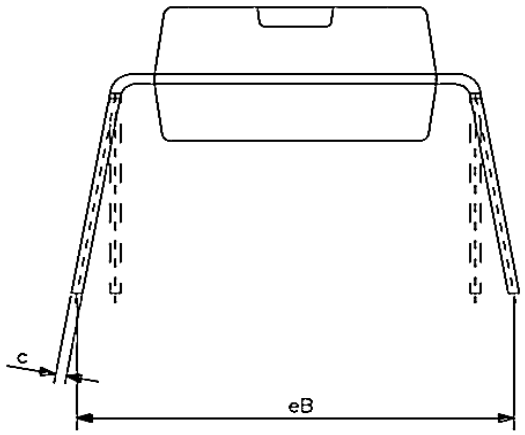


SIZE / SYMBOL	MIN./mm	MAX./mm
A	9.80	10.00
A1	0.356	0.456
A2	1.27TYP	
A3	0.302TYP	
B	3.85	3.95
B1	5.84	6.24
B2	5.00 TYP	
C	1.40	1.60
C1	0.61	0.71
C2	0.54	0.64
C3	0.05	0.25
C4	0.203	0.233
D	1.05 TYP	
D1	0.40	0.70
D2	0.15	0.25
R1	0.20TYP	
R2	0.20TYP	
01	8°~12°TYP4	
02	8°~12°TYP4	
03	0°~8°	
04	4°~12°	

Package DIP16







SIZE / SYMBOL	MIN./mm	MAX./mm
A2	3.20	3.60
A1	0.51	___
A	3.60	5.33
L	3.00	3.60
b	0.36	0.56
B1	1.52	
D	18.80	19.94
E1	6.20	6.60
e	2.54	
C	0.20	0.36
eB	7.62	9.30
R	0.20TYP	
R1	0.30TYP	
θ	0°	8°
θ1	45°TYP	
02	12°TYP	
03	0°	8°
04	0°	10°

Important statement:

●TUDI Semiconductor reserves the right to modify the product manual without prior notice! Before placing an order, customers need to confirm whether the obtained information is the latest version and verify the completeness of the relevant information.

●Any semi-guide product is subject to failure or malfunction under specified conditions. It is the buyer's responsibility to comply with safety standards when using TUDI Semiconductor products for system design and whole machine manufacturing.And take the appropriate safety measures to avoid the potential in the risk of loss of personal injury or loss of property situation!

●TUDI Semiconductor products have not been licensed for life support, military, and aerospace applications,and therefore TUDI Semiconductor is not responsible for any consequences arising from the use of this product in these areas.

●If any or all TUDI Semiconductor products (including technical data, services) described or contained in this document are subject to any applicable local export control laws and regulations, they may not be exported without an export license from the relevant authorities in accordance with such laws.

●The specifications of any and all TUDI Semiconductor products described or contained in this document specify the performance, characteristics, and functionality of said products in their standalone state, but do not guarantee the performance, characteristics, and functionality of said products installed in Customer's products or equipment. In order to verify symptoms and conditions that cannot be evaluated in a standalone device, the Customer should ultimately evaluate and test the device installed in the Customer's product device.

●TUDI Semiconductor documentation is only allowed to be copied without any alteration of the content and with the relevant authorization.TUDI Semiconductor assumes no responsibility or liability for altered documents.

●TUDI Semiconductor is committed to becoming the preferred semiconductor brand for customers, and TUDI Semiconductor will strive to provide customers with better performance and better quallity products.