



钜地半导体
Tudi Semiconductor

Product Specification

TUDI-BA12003B

7 Circuits Darlington Transistor Array

网址 www.sztdbdt.com Q

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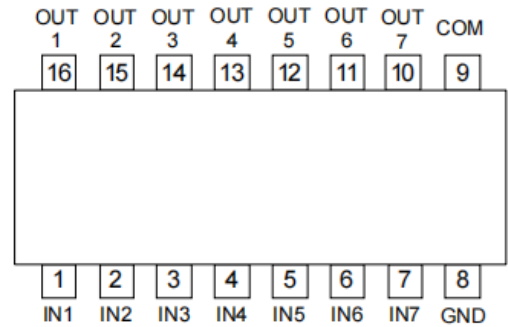
**semiconductor device
manufacturer**

- Design
- research and development
- production
- and sales



Features

- Built-in 7 circuits
- High output break down voltage
- High DC output current gain
- Built-in input resistor to limit base current
- Built-in output surge absorption clamp diode



DIP16 / SOP16 (TOP VIEW)

Applications

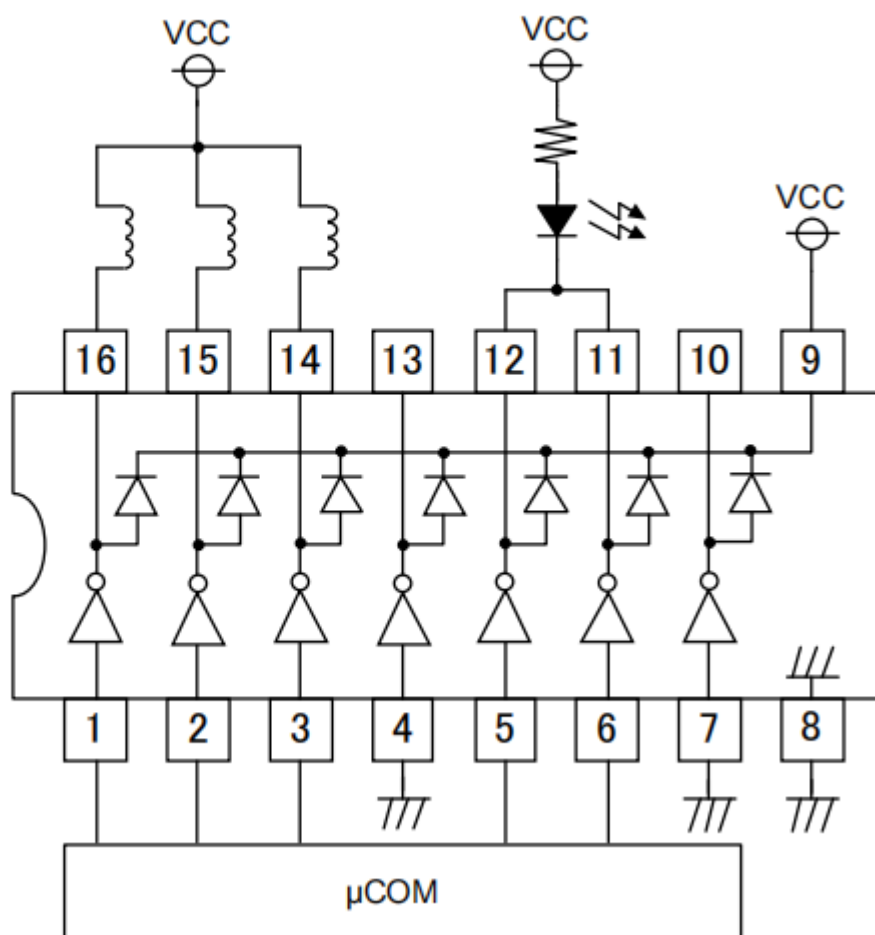
- Motor Drivers
- LED Drivers
- Solenoid Drivers
- Low Side Switch

General Description

BA12003B/BF, BA12004B/BF are darlington transistor array consist of 7 circuits, input resistor to limit base current and output surge absorption clamp diode.



Typical Application Circuit

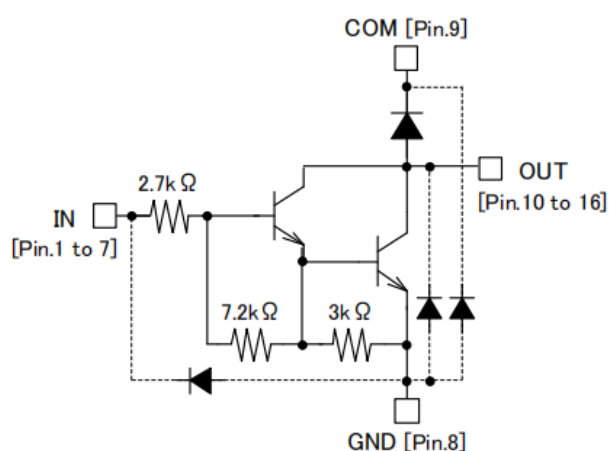




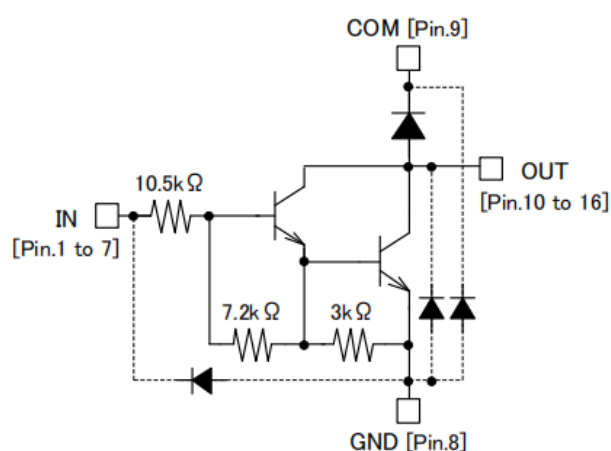
Pin Description

Pin No.	Pin Name	Function	Pin No.	Pin Name	Function
1	IN1	Input 1	9	COM	Clamp diode cathode
2	IN2	Input 2	10	OUT7	Output 7
3	IN3	Input 3	11	OUT6	Output 6
4	IN4	Input 4	12	OUT5	Output 5
5	IN5	Input 5	13	OUT4	Output 4
6	IN6	Input 6	14	OUT3	Output 3
7	IN7	Input 7	15	OUT2	Output 2
8	GND	Ground	16	OUT1	Output 1

I/O Equivalence Circuit



BA12003B / BA12003BF



BA12004B / BA12004BF

Note : The diode indicating the junction with a dotted line is a parasitic element.

Note : The input and output parasitic diodes cannot be used as clamp diodes.



Absolute Maximum Ratings ($T_A=25^{\circ}\text{C}$)

Parameter		Symbol	Rating	Unit
Output Voltage		V_{CE}	-0.5 to +60	V
Output Current		I_O	500	mA/circuit
Input Voltage		V_I	-0.5 to +30	V
Diode Reverse Voltage		V_R	60	V
Diode Forward Current		I_F	500	mA/ circuit
GND Terminal Current		I_{GND}	2.3 ^(Note 1)	A
Power Dissipation	DIP16	P_D	1.25 ^(Note 2)	W
	SOP16		0.62 ^(Note 3)	
Operating Temperature		T_{opr}	-40 to +85	$^{\circ}\text{C}$
Storage Temperature		T_{stg}	-55 to +150	$^{\circ}\text{C}$

(Note 1) Pulse width $\leq$ 20ms, Duty Cycle $\leq$ 10%, 7 circuits flow the same current.

(Note 2) Reduce 10.0mW per 1°C above 25°C .

(Note 3) Mounted on 70mm x 70mm x 1.6mm glass epoxy board. Reduce 5.0mW per 1°C above 25°C .

Caution: Operating the IC over the absolute maximum ratings may damage the IC. The damage can either be a short circuit between pins or an open circuit between pins and the internal circuitry. Therefore, it is important to consider circuit protection measures, such as adding a fuse, in case the IC is operated over the absolute maximum ratings.

Electrical Characteristics (Unless otherwise specified, GND=0V $T_A=25^{\circ}\text{C}$)

Parameter	Symbol	Limit			Unit	Conditions	Test Circuit
		Min	Typ	Max			
Output Leakage Current	I_L	-	-	10	μA	$V_{CE}=60\text{V}$	1
Output DC Current Gain	h_{FE}	1000	2400	-	-	$V_{CE}=2.0\text{V}$, $I_O=350\text{mA}$	2
Output Saturation Voltage1	V_{CEsat1}	-	0.94	1.1	V	$I_O=100\text{mA}$, $I_I=250\mu\text{A}$	2
Output Saturation Voltage2	V_{CEsat2}	-	1.14	1.3	V	$I_O=200\text{mA}$, $I_I=350\mu\text{A}$	2
Output Saturation Voltage3	V_{CEsat3}	-	1.46	1.6	V	$I_O=350\text{mA}$, $I_I=500\mu\text{A}$	2
Input Voltage1	BA12003	V_{I1}	2.0	-	V	$V_{CE}=2.0\text{V}$, $I_O=100\text{mA}$	3
	BA12004		5.0	-			
Input Voltage2	BA12003	V_{I2}	2.4	-	V	$V_{CE}=2.0\text{V}$, $I_O=200\text{mA}$	3
	BA12004		6.0	-			
Input Voltage3	BA12003	V_{I3}	3.4	-	V	$V_{CE}=2.0\text{V}$, $I_O=350\text{mA}$	3
	BA12004		8.0	-			
Input Current	BA12003	I_I	-	0.90	mA	$V_I=3.85\text{V}$	4
	BA12004		-	0.39		$V_I=5.0\text{V}$	
Diode Reverse Current	I_R	-	-	50	μA	$V_R=60\text{V}$	5
Diode Forward Voltage	V_F	-	1.73	2.0	V	$I_F=350\text{mA}$	6
Input Capacity	C_I	-	30	-	pF	$V_I=0\text{V}$, $f=1\text{MHz}$	7



Test Circuit

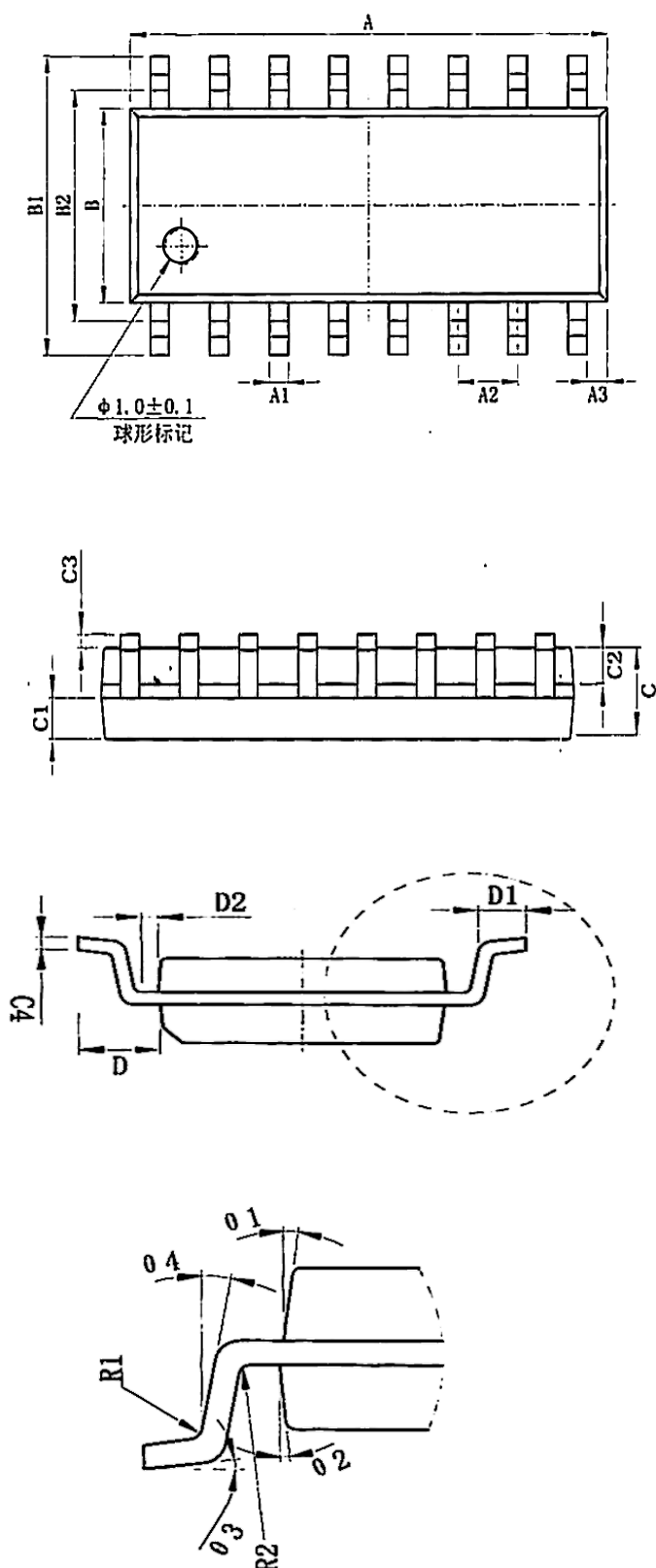
1. Output Leakage Current I_L	2. DC Current Gain $h_{FE}=I_O/I_I$ Output Saturation Voltage V_{CEsat}	3. Input Voltage V_I
4. Input Current I_I	5. Diode Reverse Current I_R	6. Diode Forward Voltage V_F
7. Input Capacity C_I TEST SIGNAL LEVEL 20mVrms		



Order information

Order Number	Package	Package Quantity	Marking On The park
BA12003BF-E2-TUDI	SOP16	Tape,Reel,2500	BA12003BF-E2

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°	



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