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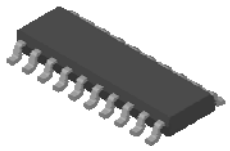
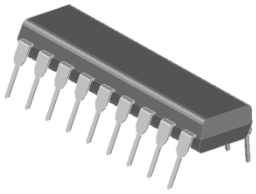
S378x

8CH Darlington TR Source Driver



SOP-20



DIP-18

ORDERING INFORMATION

Product	Marking	Package
S378x	S378x	SOP-20
S378xP	S378xP	DIP-18

▲ **Marking Detail Information**

S378x….[1]
YWW….[2]

[1] Device Code [x: Item Code]

[2] Year & Week Code

Description

The S378x Series are comprised of eight source current Transistor Array. These drivers are specifically designed for fluorescent display applications. Applications include relay, hammer and lamp drivers.

Application

◈ Relay Controller

◈ Lamp and Display LED Driver

◈ Hammer Drivers

Features and Benefits

◈ Output Current (single output) -500mA(Max.)

◈ High Output Voltage : VCC=50V(Min.)

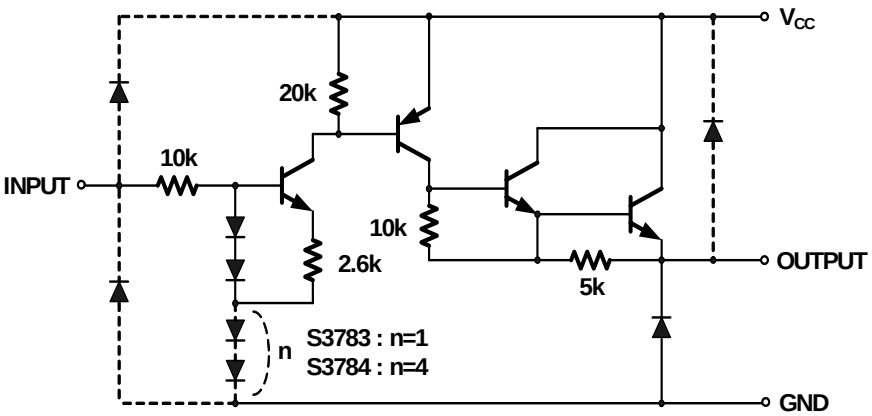
◈Output clamp diode

◈Single supply voltage

◈ Inputs compatible with various types of logic

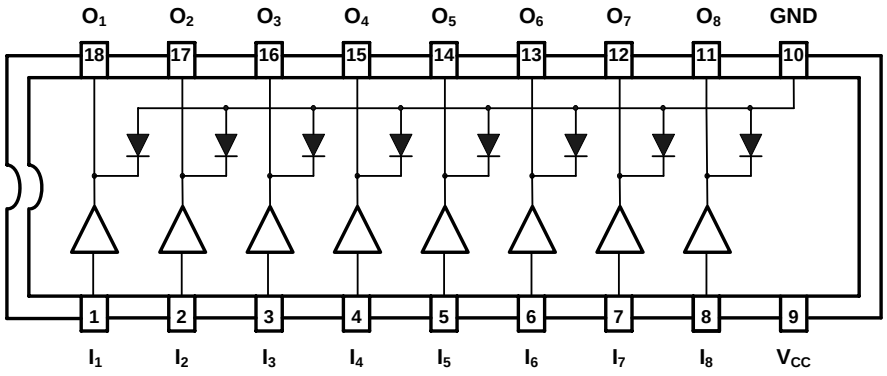
◈ Package : SOP-20, DIP-18

Schematics



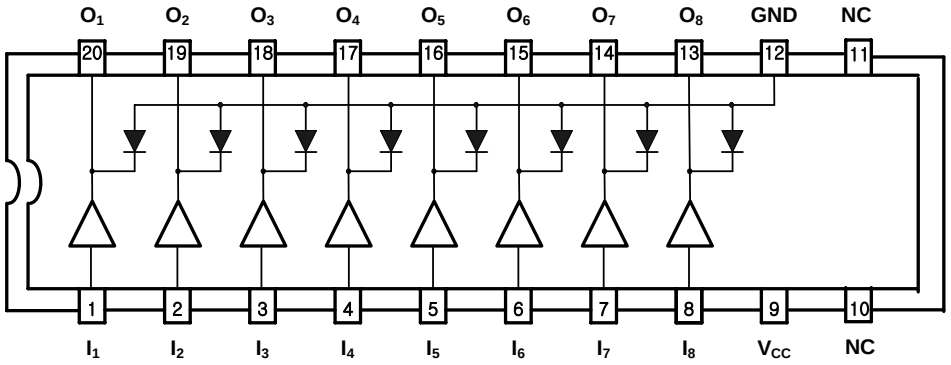
◈ Block Diagram & Pin Configuration

DIP-18 Package



I_X : Input Port O_X : Output Port V_{CC} : V_{CC} GND : Ground

SOP-20 Package



I_X : Input Port O_X : Output Port V_{CC} : V_{CC} GND : Ground

◈ Product Line-up

Product Name	Designation	Operating Temperature	Package
S3783	TTL, 5V CMOS	-40~85℃	SOP-20
S3784	6~15 PMOS, CMOS	-40~85℃	SOP-20
S3783P	TTL, 5V CMOS	-40~85℃	DIP-18
S3784P	6~15 PMOS, CMOS	-40~85℃	DIP-18

◈ Absolute Maximum Ratings (Ta = 25℃)

Parameter		Symbol	Rating		Unit
			SOP-20	DIP-18	
Supply Voltage		V_{CC}	50		V
Output Current		I_{OUT}	-500		mA / ch
Input Voltage	S3783/P	V_{IN}	15		V
	S3784/P		30		
Clamp Diode	Reverse Voltage	V_R	50		V
	Forward Current	I_F	500		mA
Power Dissipation		P_d	0.96	1.47	W
Junction Temperature		T_J	150		°C
Operate Temperature Range		T_{opr}	-40 ~ +85		°C
Storage Temperature Range		T_{stg}	-55 ~ +150		°C

◈ Recommended Operating Conditions (Ta=-40~85°C)

Characteristic			Symbol	Test Condition		Min.	Typ.	Max.	Unit
Supply Voltage			V_{CC}	-		-	-	50	V
Output Current		S3783P S3784P	I_{OUT}	Ta=85°C T_j=120°C TPW=25ms	Duty=10% 8Circuits	-	-	-260	mA/ch
					Duty=50% 8Circuits	-	-	-59	
		S3783 S3784			Duty=10% 8Circuits	-	-	-180	
					Duty=50% 8Circuits	-	-	-38	
Input Voltage		S3783/P	V_{IN}	-		-	-	12	V
		S3784/P		-		-	-	24	
Input Voltage	Output On	S3783/P	$V_{IN(ON)}$	-		2.0	5.0	15	V
		S3784/P				4.5	12	30	
	Output Off	S3783/P	$V_{IN(OFF)}$			0	-	0.8	
		S3784/P				0	-	2.0	
Clamp Diode Reverse Voltage			V_R	-		-	-	50	V
Clamp Diode Forward Current			I_F	-		-	-	400	mA
Power Dissipation		DIP-18	P_D	Ta=85°C		-	-	0.76	W
		SOP-20		Ta=85°C*		-	-	0.68	

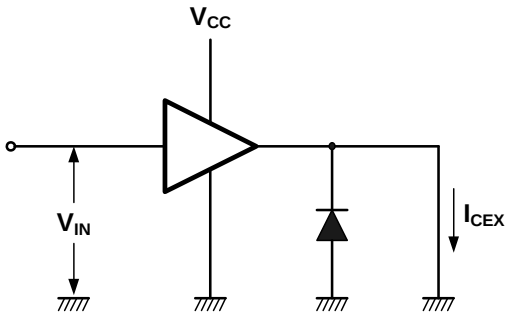
* (On glass epoxy PCB (75 x 114 x 1.6mm Cu20%)

◈ Electrical characteristics (Ta=-25°C)

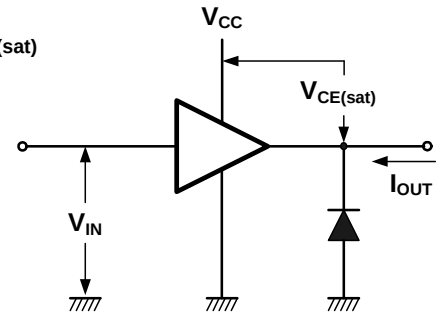
Characteristic	Symbol	Test Circuit	Test Condition	Min.	Typ.	Max.	Unit
Output Leakage Current	I_{CEX}	1	V_{CE}=50V, Ta=25°C	-	-	100	uA
Output Saturation Voltage	$V_{CE(SAT)}$	2	V_{IN}=$V_{IN(ON)}$, I_{OUT}=-350mA	-	-	2.0	V
			V_{IN}=$V_{IN(ON)}$, I_{OUT}=-225mA	-	-	1.9	
			V_{IN}=$V_{IN(ON)}$, I_{OUT}=-100mA	-	-	1.8	
Input Current	$I_{IN(ON)}$	3	V_{IN}=2.4V	-	36	52	uA
			V_{IN}=3.85V	-	180	260	
Input Voltage	$V_{IN(ON)}$	4	V_{CE}=2V, I_{OUT}=-350mA	-	-	2.0	V
	$V_{IN(OFF)}$		I_{OUT}=-500uA	0.8	-	-	
Supply Current	$I_{CC(ON)}$	3	V_{IN}=$V_{IN(ON)}$, V_{CC}=50V	-	-	2.5	mA/ch
Clamp Diode Reverse Current	I_R	5	V_R=50V	-	-	50	uA
Clamp Diode Forward Voltage	V_F	6	I_F=350mA	-	-	2.0	V
Turn-ON Delay	t_{ON}	8	V_{CC}= V_{CCMAX}, R_L=125Ω, C_L=15pF	-	0.15	-	uS
Turn-OFF Delay	t_{OFF}			-	1.8	-	

Test Circuit

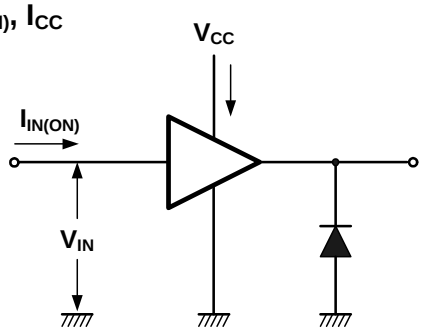
1. I_{CEX}



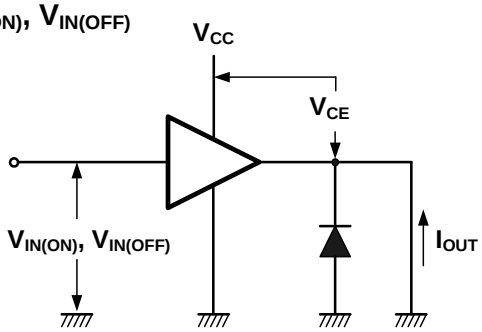
2. $V_{CE(sat)}$



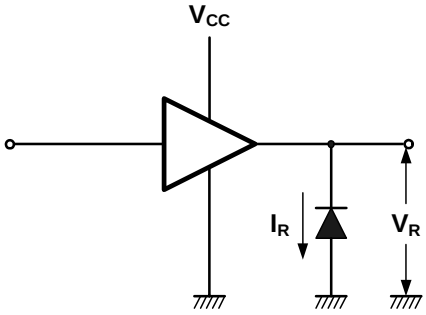
3. $I_{IN(ON)}$, I_{CC}



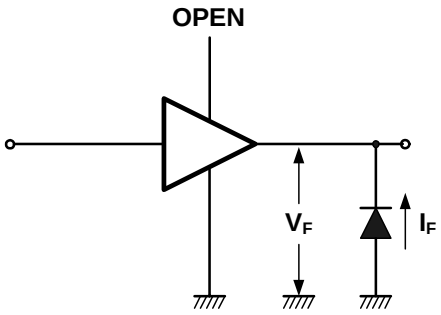
4. $V_{IN(ON)}$, $V_{IN(OFF)}$



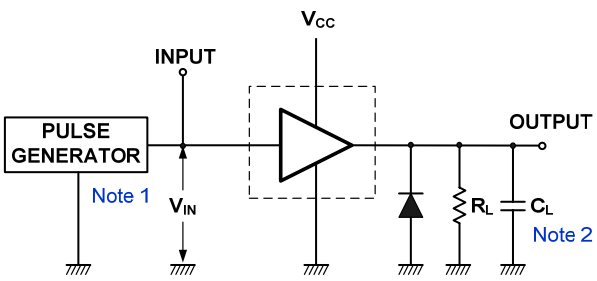
5. I_R

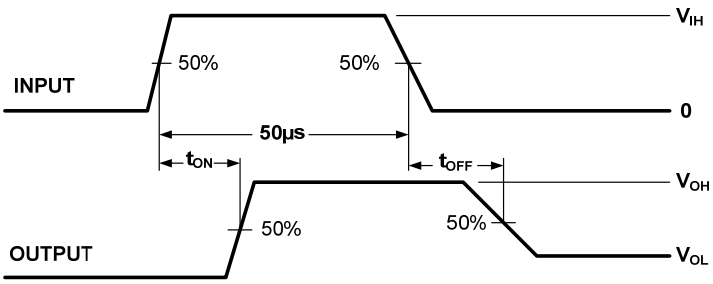


6. V_F



7. t_{ON} , t_{OFF}





Note 1 : Pulse width 50µs, duty cycle 10%

Output impedance 50Ω, tr≤5ns, tf≤10ns

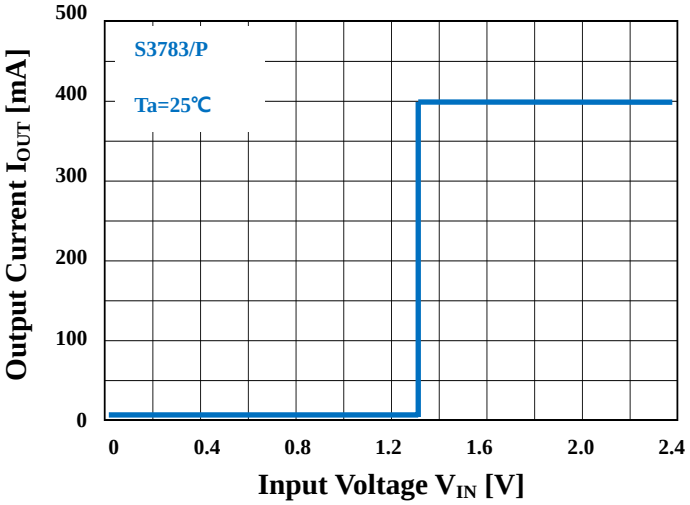
Note 2 : CL includes probe and jig capacitance

Precautions for using

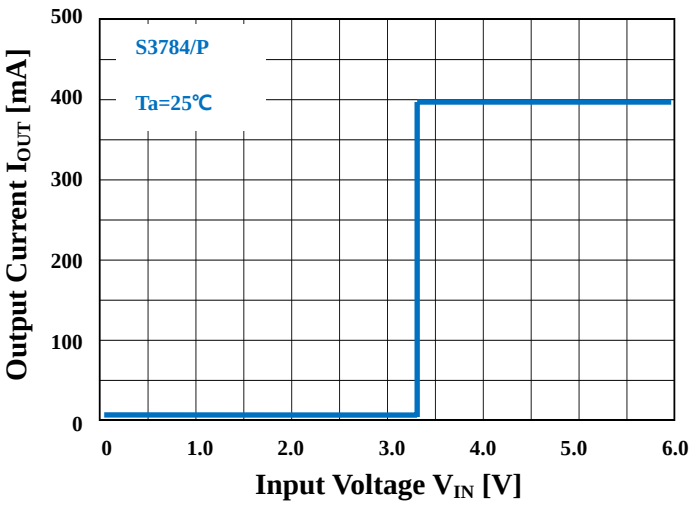
This IC does not integrate protection circuits such as over-current and over-voltage protectors.

Thus, if excess current or voltage is applied to the IC, the IC may be damaged. Please design the IC so that excess current or voltage will not be applied to the IC. Utmost care is necessary in the design of the output line, VCC and GND line since IC may be destroyed due to short−circuit between outputs, air contamination fault, or fault by improper grounding.

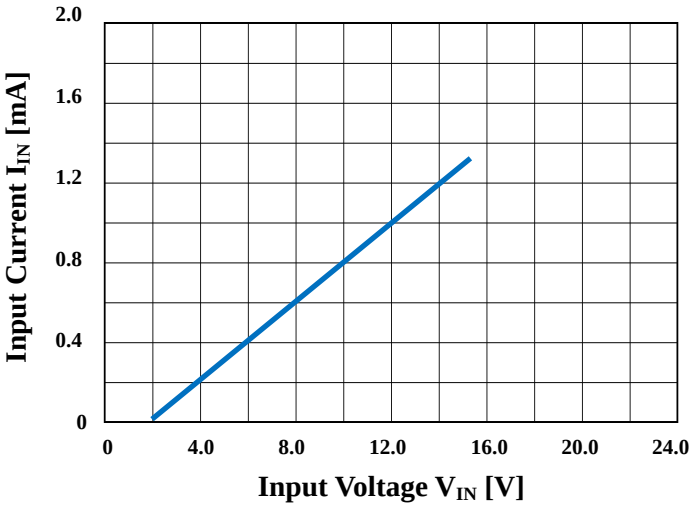
$I_{OUT} - V_{IN}$



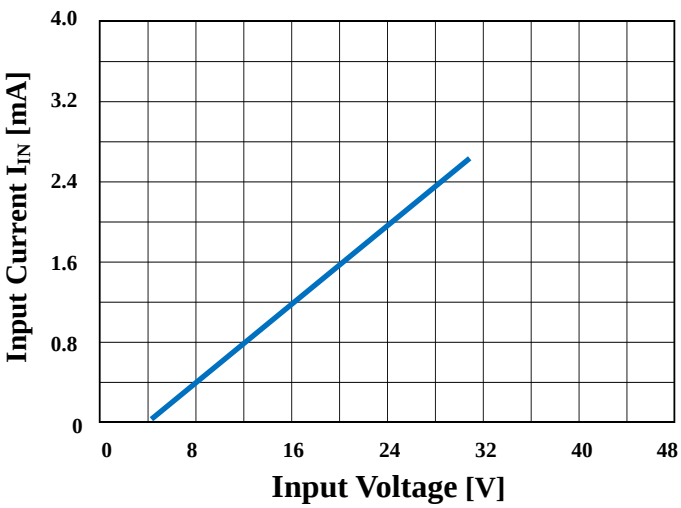
$I_{OUT} - V_{IN}$



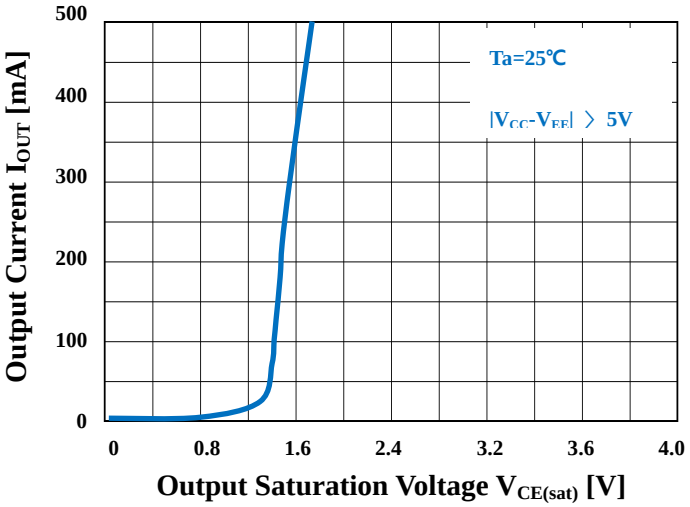
$I_{IN} - V_{IN}$



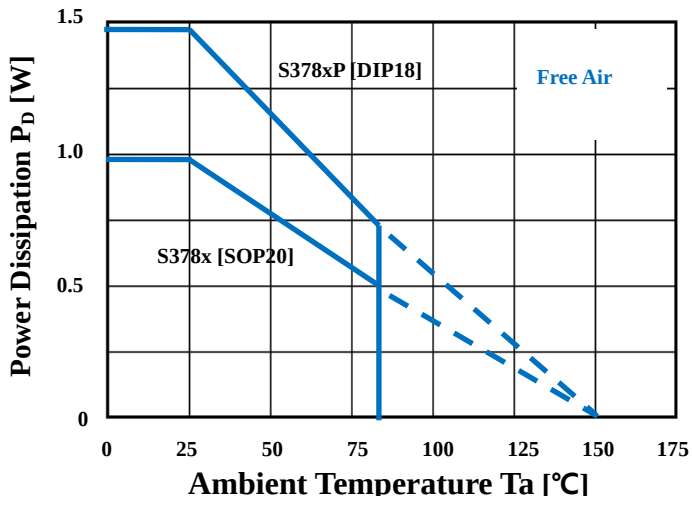
$I_{IN} - V_{IN}$



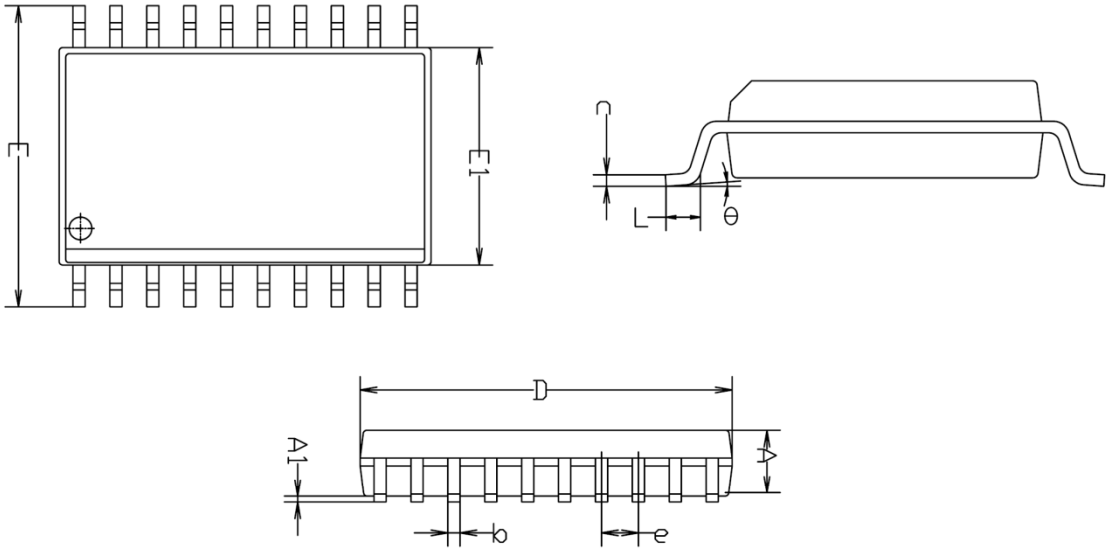
$I_{OUT} - V_{CE(sat)}$



$P_D - T_a$

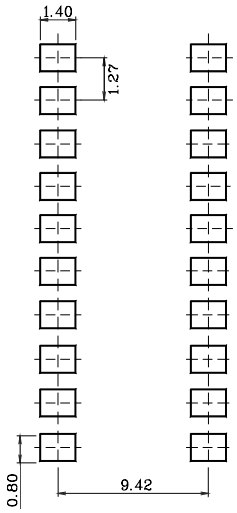


◈ SOP-20 Outline Dimension (Unit : mm)

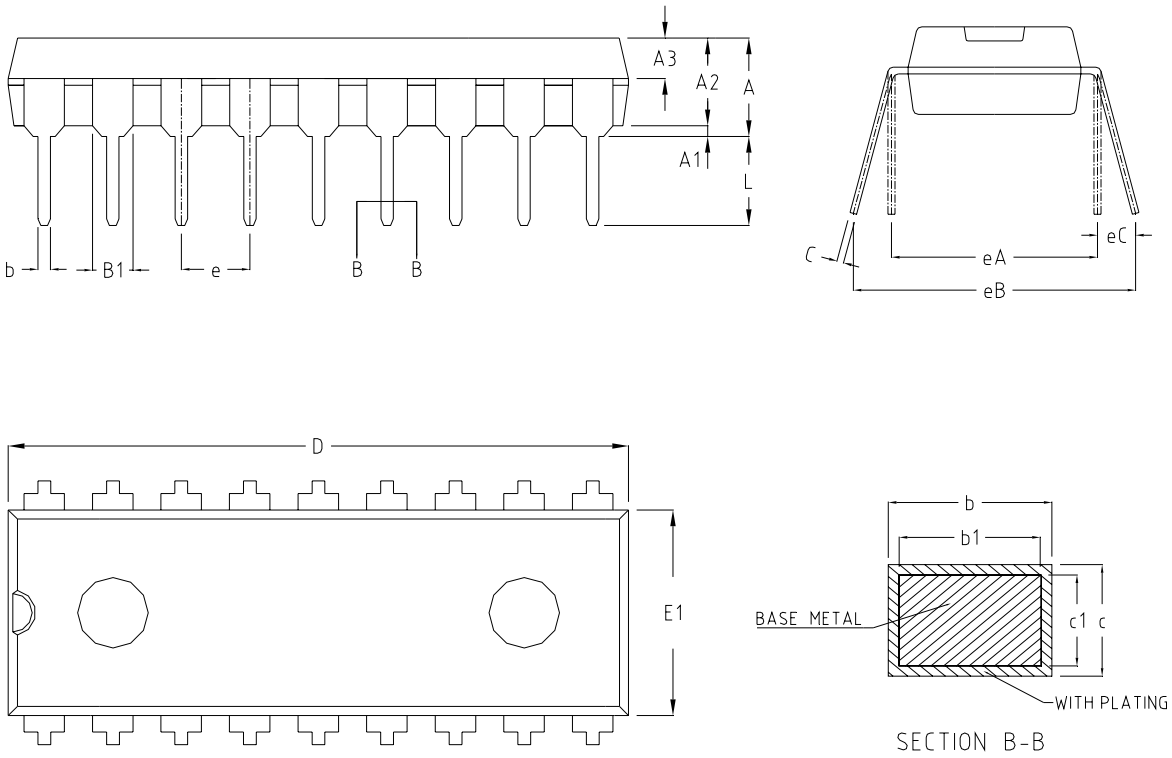


SYMBOL	MILLIMETER(mm)			NOTE
	MINIMUM	NOMINAL	MAXIMUM	
A	2.261	—	2.342	
A1	0.102	0.201	0.300	
b	0.320	0.420	0.520	
c	0.170	0.220	0.270	
D	12.600	12.800	13.000	
E	10.109	10.376	10.643	
E1	7.391	7.493	7.595	
e	1.270 BSC			
L	0.406	—	1.067	
θ	0 °	—	8 °	

※ Recommend PCB solder land [Unit: mm]



◈ DIP-18 Outline Dimension (Unit : mm)



SYMBOL	MILLIMETERS		
	MINIMUM	NOMINAL	MAXIMUM
A	3.60	3.80	4.00
A1	0.51	-	-
A2	3.10	3.30	3.50
A3	1.42	1.52	1.62
b	0.44	-	0.53
b1	0.43	0.46	0.48
B1	1.52BSC		
c	0.25	-	0.31
c1	0.24	0.25	0.26
D	22.70	22.90	23.10
E1	6.40	6.60	6.80
e	2.54BSC		
eA	7.62BSC		
eB	7.62	-	9.50
eC	0	-	0.94
L	3.00	-	-

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