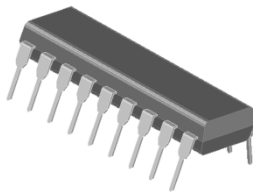

**SOP-20**

**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.

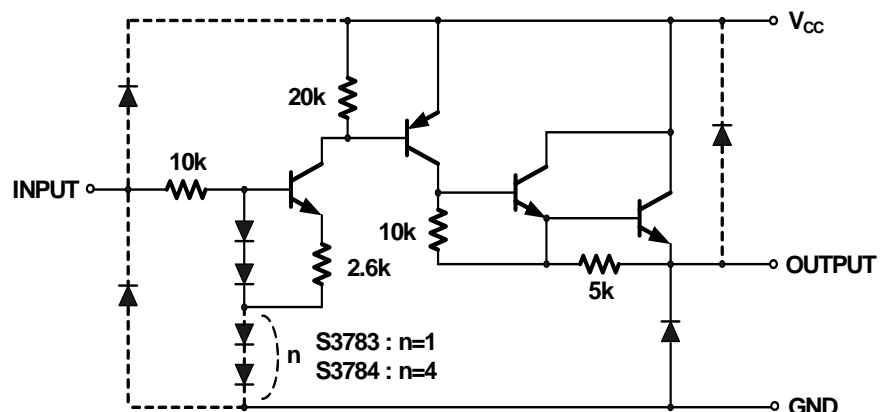
## Application

- ◆ Relay Controller
- ◆ Lamp and Display LED Driver
- ◆ Hammer Drivers

## Features and Benefits

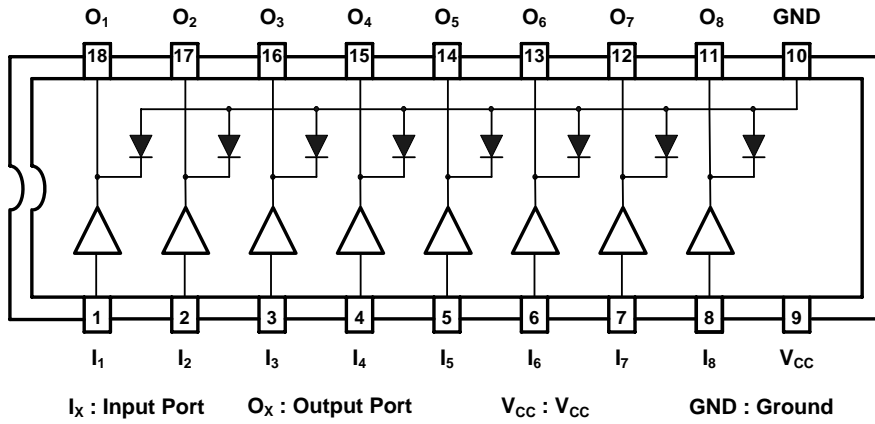
- ◆ Output Current (single output) -500mA(Max.)
- ◆ High Output Voltage : VCC=50V(Min.)
- ◆ Output clamp diode
- ◆ Single supply voltage
- ◆ Inputs compatible with various types of logic
- ◆ Package : SOP-20, DIP-18

## Schematics

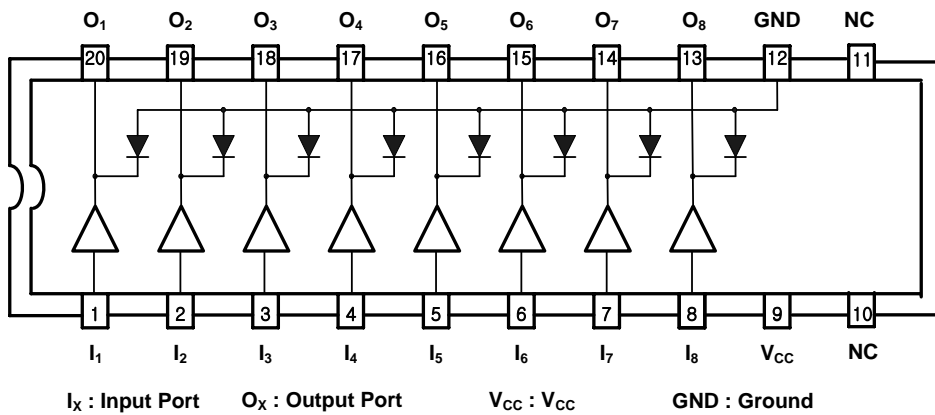


## ◆ Block Diagram & Pin Configuration

### DIP-18 Package



### SOP-20 Package



## ◆ Product Line-up

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

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

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		$^\circ\text{C}$	
Operate Temperature Range	$T_{opr}$	-40 ~ +85		$^\circ\text{C}$	
Storage Temperature Range	$T_{stg}$	-55 ~ +150		$^\circ\text{C}$	

◆ Recommended Operating Conditions (  $T_a = -40 \sim 85^\circ\text{C}$  )

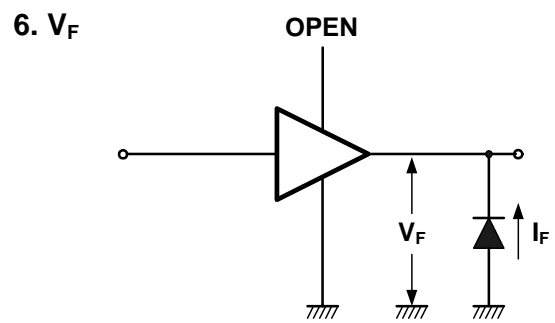
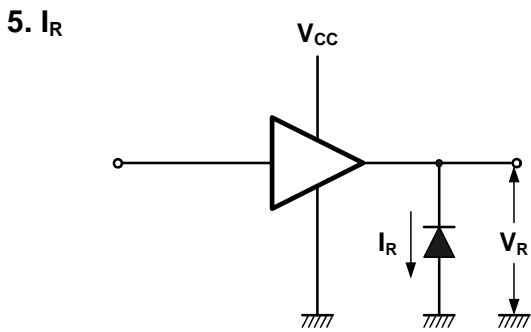
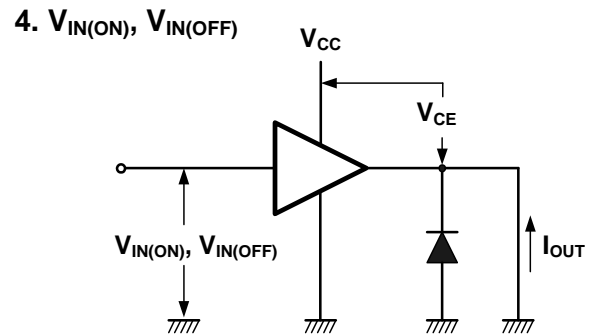
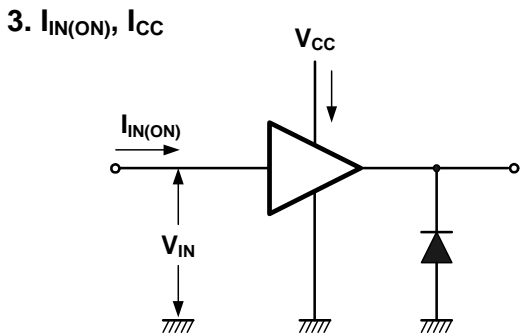
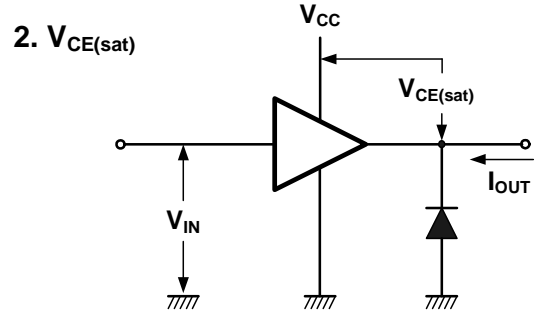
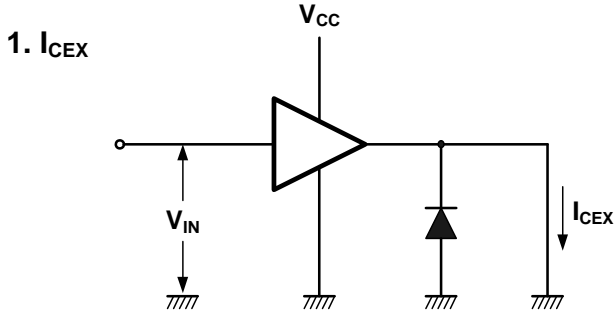
Characteristic		Symbol	Test Condition	Min.	Typ.	Max.	Unit	
Supply Voltage		$V_{CC}$	-	-	-	50	V	
Output Current	S3783P S3784P	$I_{OUT}$	$T_a = 85^\circ\text{C}$	Duty=10% 8Circuits	-	-	-260	mA/ch
				Duty=50% 8Circuits	-	-	-59	
	$T_j = 120^\circ\text{C}$		TPW=25ms	Duty=10% 8Circuits	-	-	-180	
				Duty=50%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

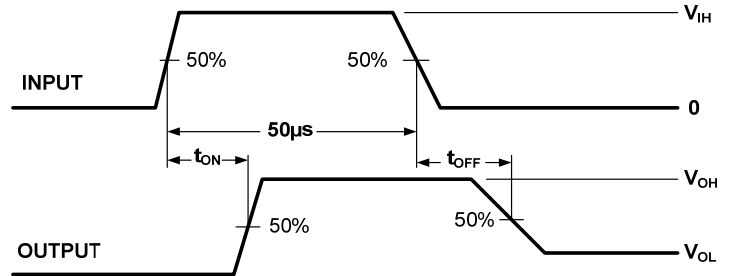
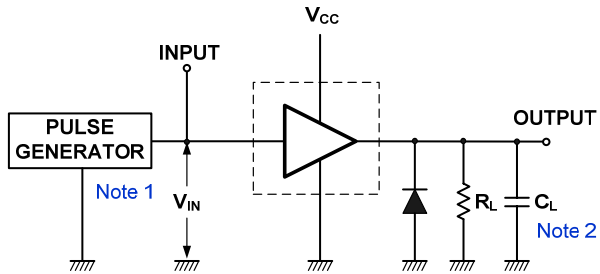
\* ( On glass epoxy PCB ( 75 x 114 x 1.6mm Cu20% ) )

◆ Electrical characteristics (Ta=-25°C)

Characteristic	Symbol	Test Circuit	Test Condition	Min.	Typ.	Max.	Unit
Output Leakage Current	$I_{CEX}$	1	$V_{CE}=50V, T_a=25^\circ C$	-	-	100	$\mu A$
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	$\mu A$
			$V_{IN}=3.85V$	-	180	260	
Input Voltage	$V_{IN(ON)}$	4	$V_{CE}=2V, I_{OUT}=-350mA$	-	-	2.0	V
	$V_{IN(OFF)}$		$I_{OUT}=-500\mu A$	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	$\mu A$
Clamp Diode Forward Voltage	$V_F$	6	$I_F=350mA$	-	-	2.0	V
Turn-ON Delay	$t_{ON}$	8	$V_{CC}=V_{CCMAX}, R_L=125\Omega, C_L=15pF$	-	0.15	-	$\mu S$
Turn-OFF Delay	$t_{OFF}$			-	1.8	-	

Test Circuit



7.  $t_{ON}$ ,  $t_{OFF}$ 

Note 1 : Pulse width  $50\mu\text{s}$ , duty cycle 10%

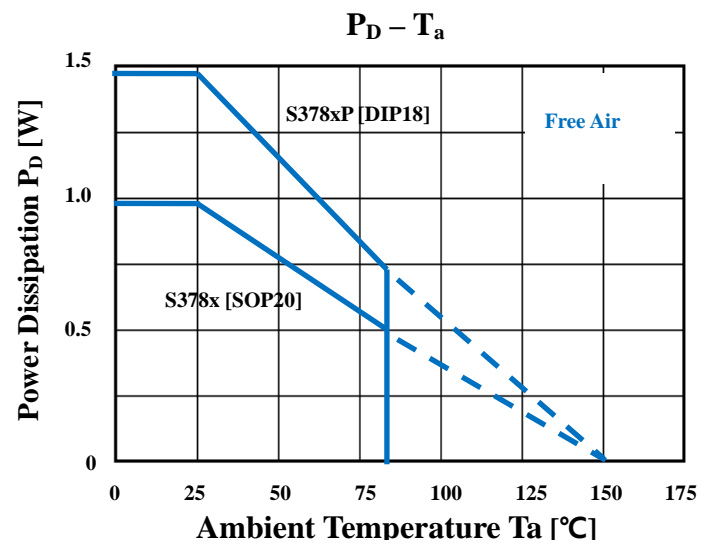
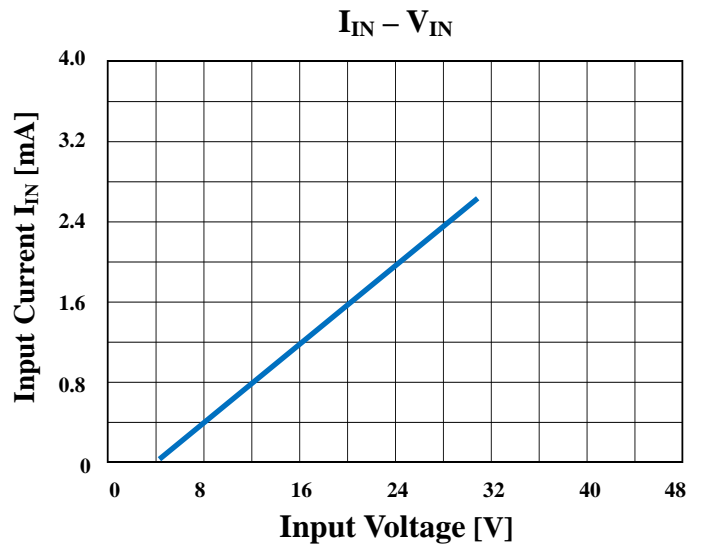
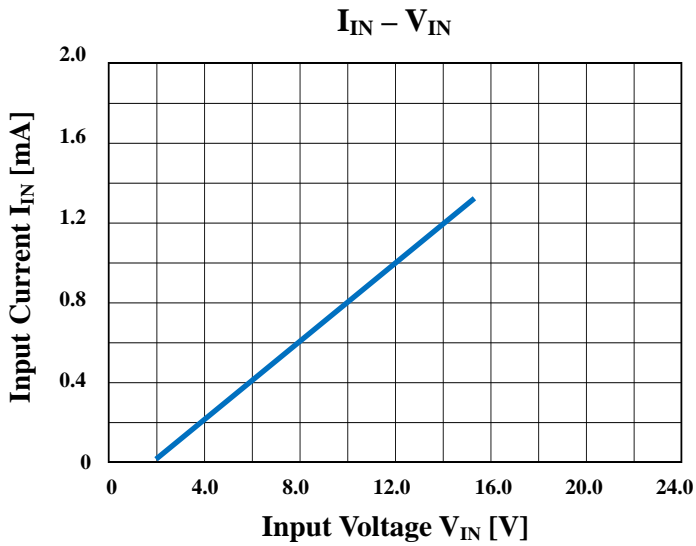
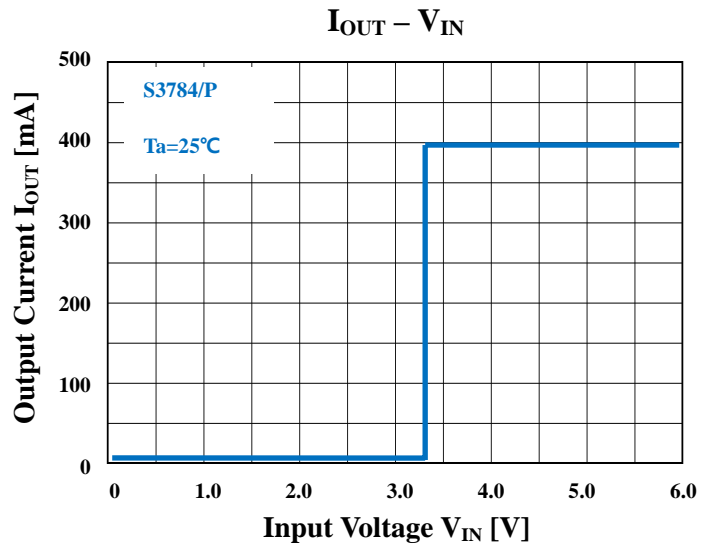
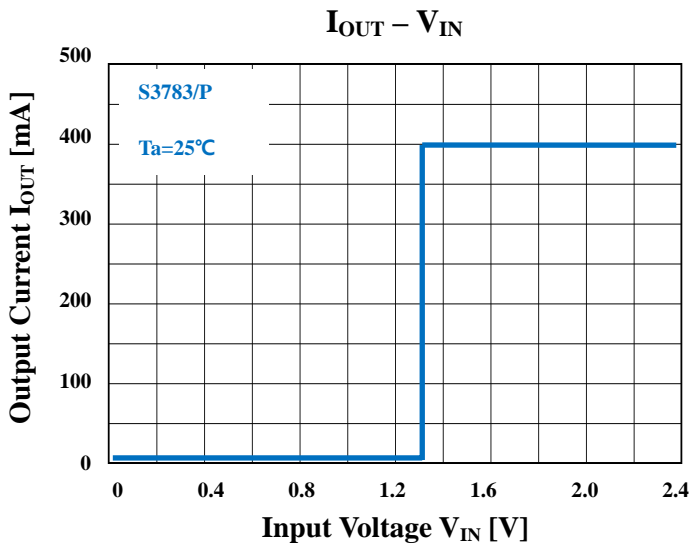
Output impedance  $50\Omega$ ,  $t_r \leq 5\text{ns}$ ,  $t_f \leq 10\text{ns}$

Note 2 :  $C_L$  includes probe and jig capacitance

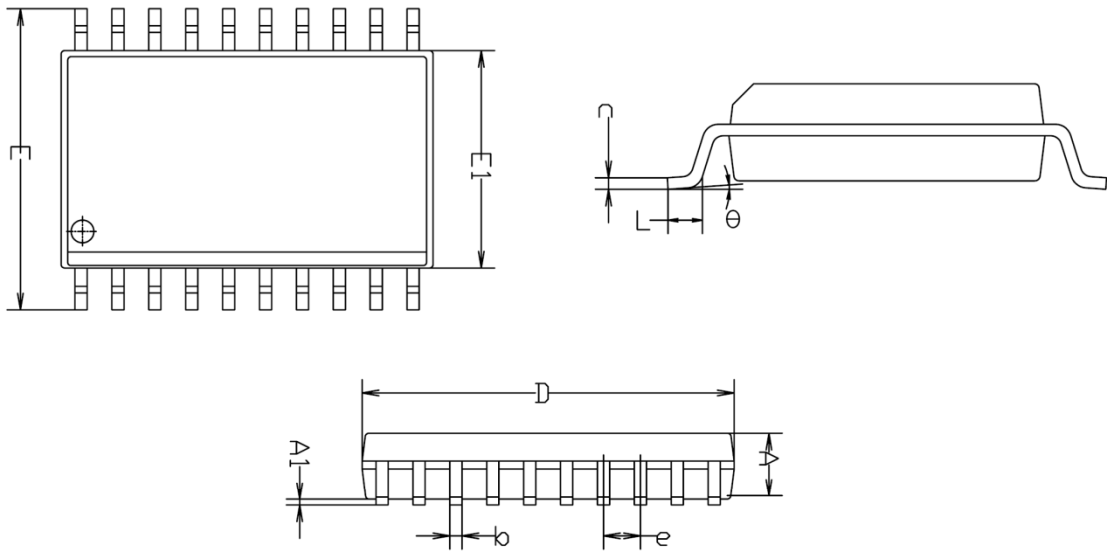
## Precautions for using

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.

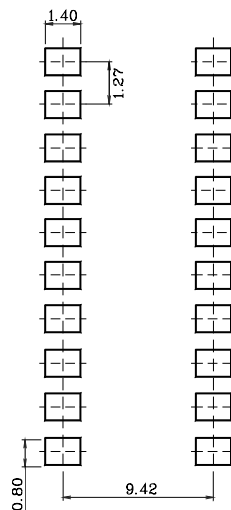


◆ SOP-20 Outline Dimension (Unit : mm)

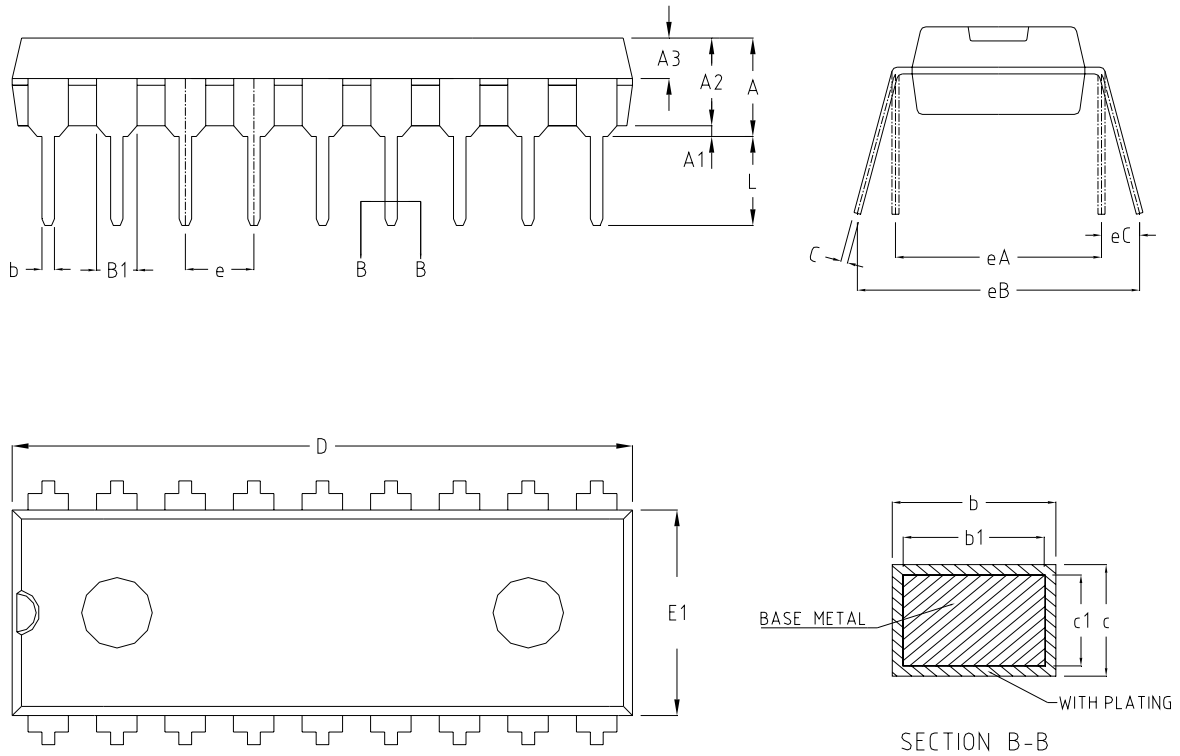


SYMBOL	MILLIMETER(mm)			NOTE
	MINIMUM	NOMINAL	MAXIMUM	
A	2.261	—	2.342	
A1	0.102	0.201	0.300	
b	0.320	0.420	0.520	
c	0.170	0.220	0.270	
D	12.600	12.800	13.000	
E	10.109	10.376	10.643	
E1	7.391	7.493	7.595	
e	1.270 BSC			
L	0.406	—	1.067	
θ	0 °	—	8 °	

※ 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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