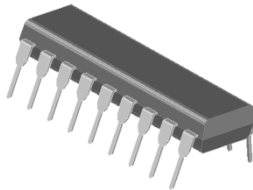

SOP-20

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.

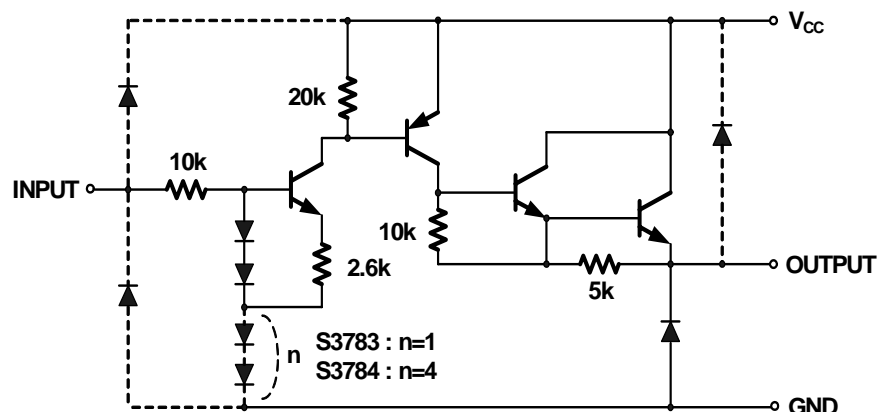
Application

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

Features and Benefits

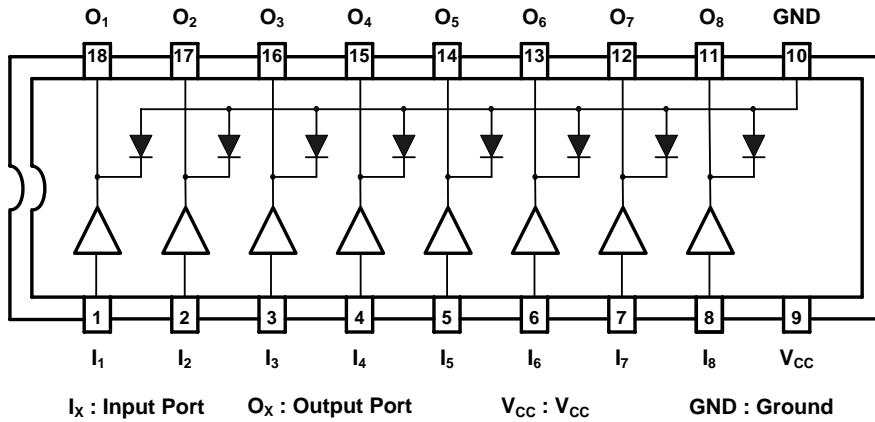
- ◆ Output Current (single output) -500mA(Max.)
- ◆ High Output Voltage : VCC=50V(Min.)
- ◆ Output clamp diode
- ◆ Single supply voltage
- ◆ Inputs compatible with various types of logic
- ◆ Package : SOP-20, DIP-18

Schematics

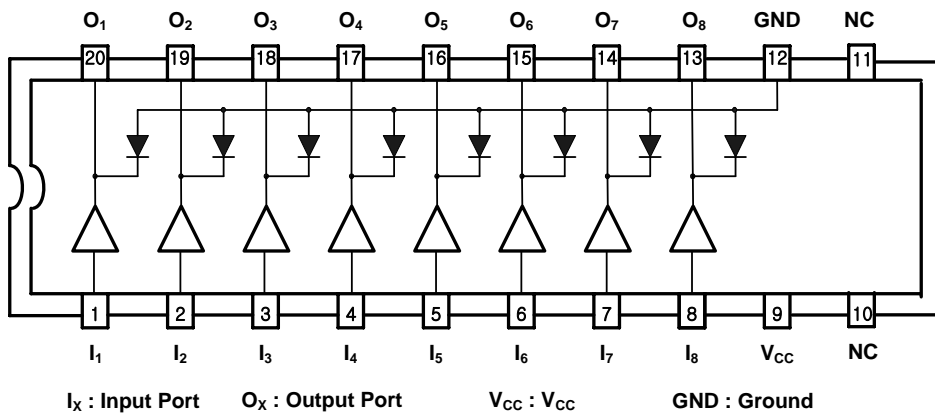


◆ Block Diagram & Pin Configuration

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

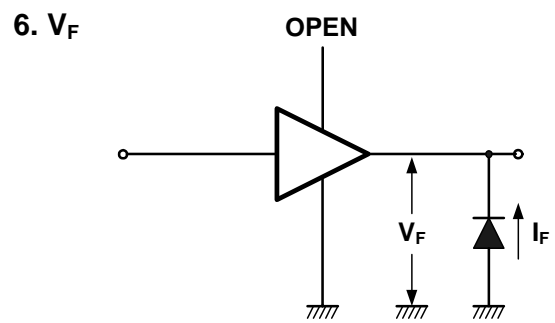
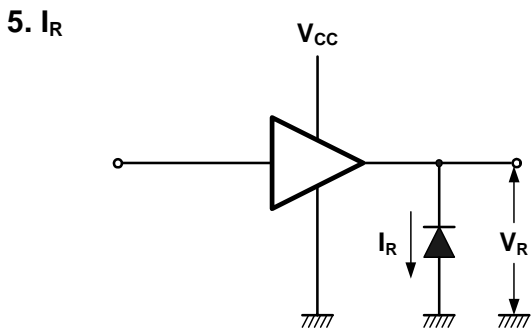
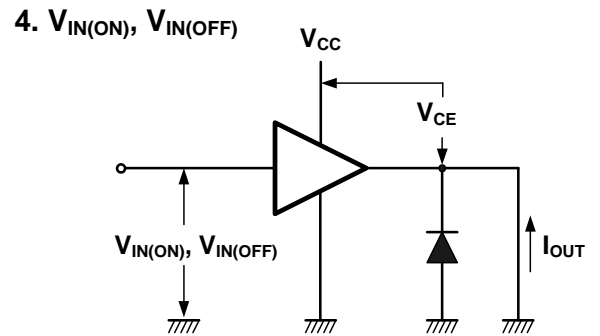
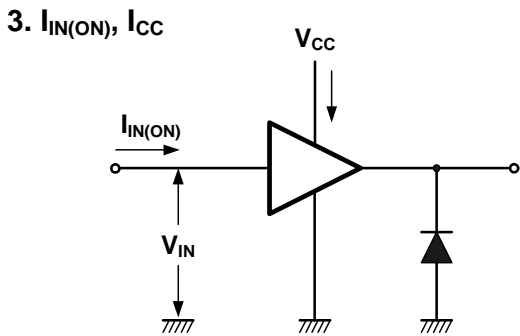
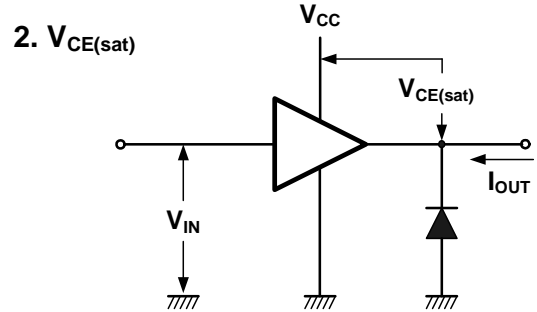
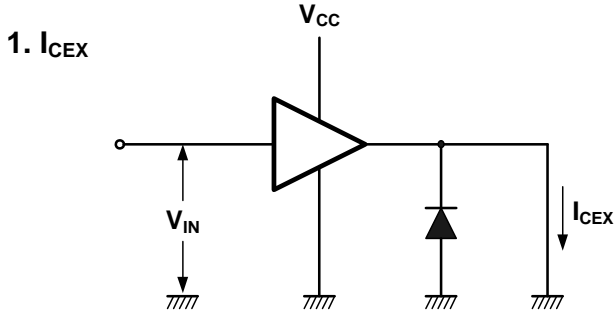
Characteristic		Symbol	Test Condition	Min.	Typ.	Max.	Unit	
Supply Voltage		V_{CC}	-	-	-	50	V	
Output Current	S3783P S3784P	I_{OUT}	$T_a = 85^\circ\text{C}$	Duty=10% 8Circuits	-	-	-260	mA/ch
				Duty=50% 8Circuits	-	-	-59	
	$T_j = 120^\circ\text{C}$		TPW=25ms	Duty=10% 8Circuits	-	-	-180	
				Duty=50% 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		

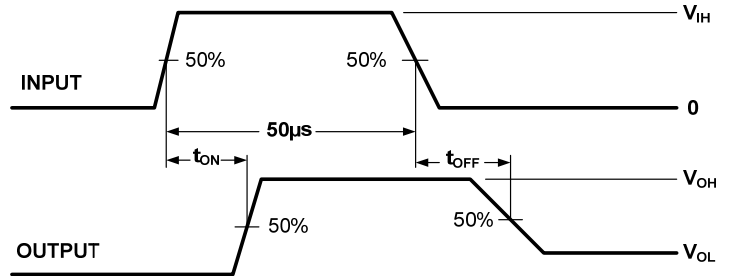
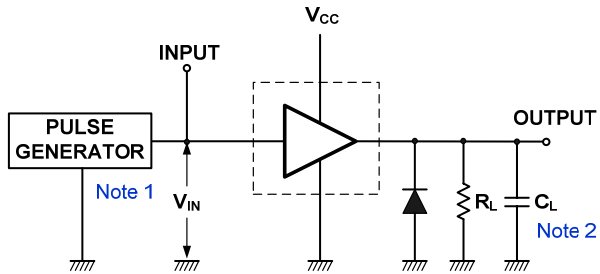
* (On glass epoxy PCB (75 x 114 x 1.6mm Cu20%))

◆ 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	μA
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	μA
			$V_{IN}=3.85V$	-	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	μA
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	-	μS
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%

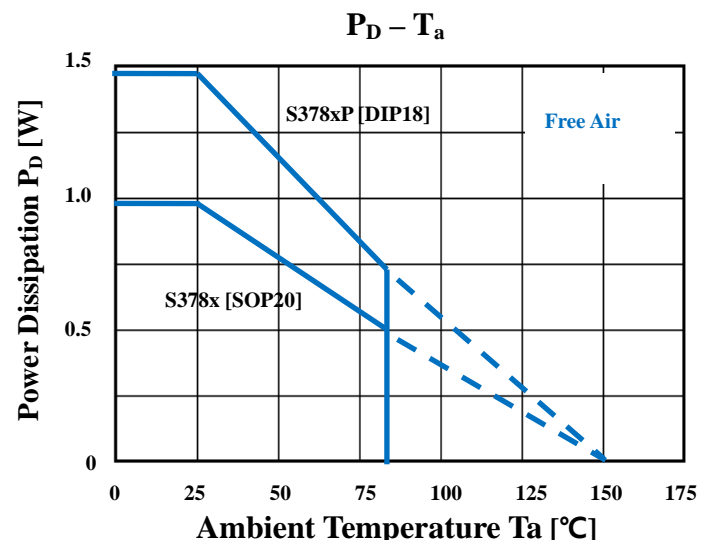
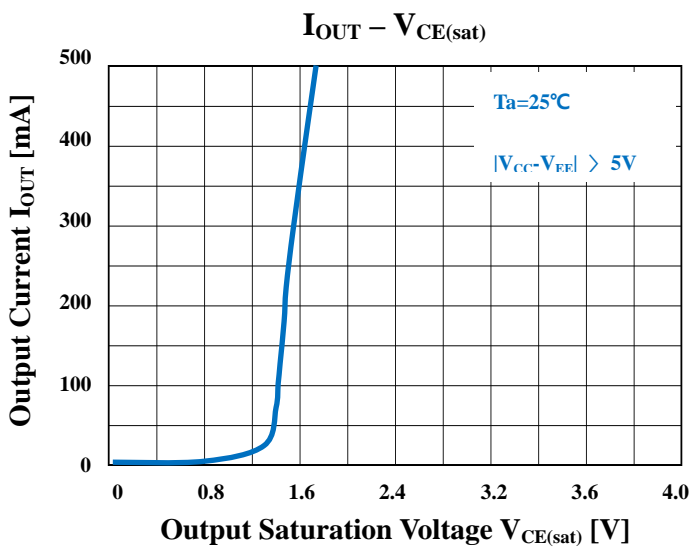
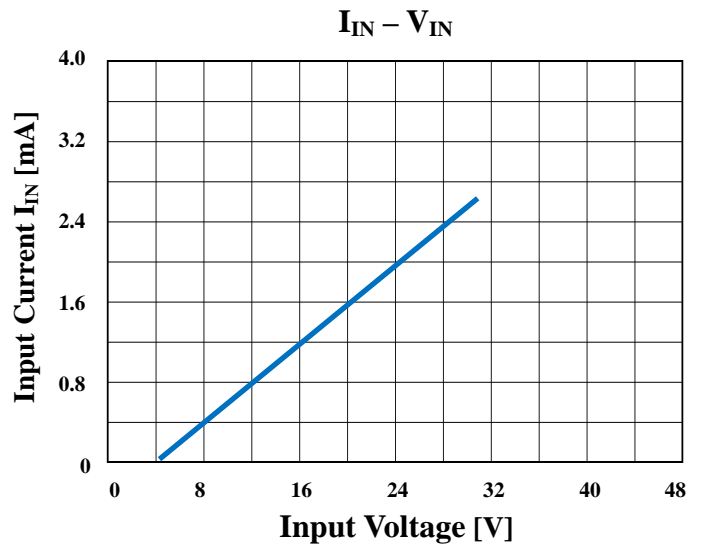
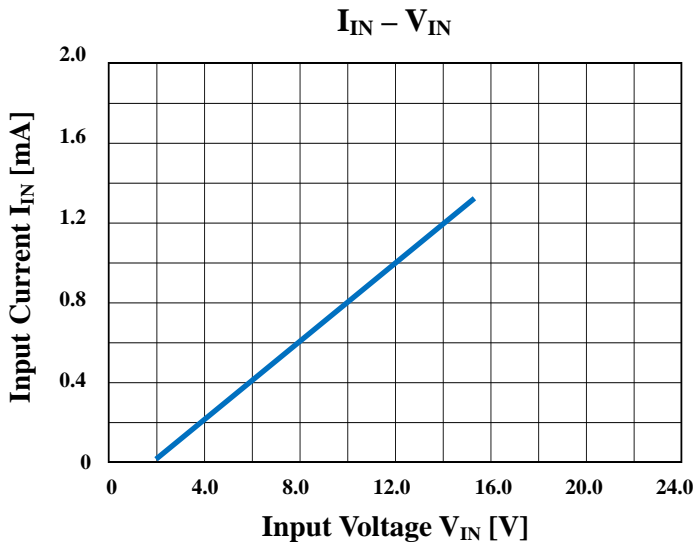
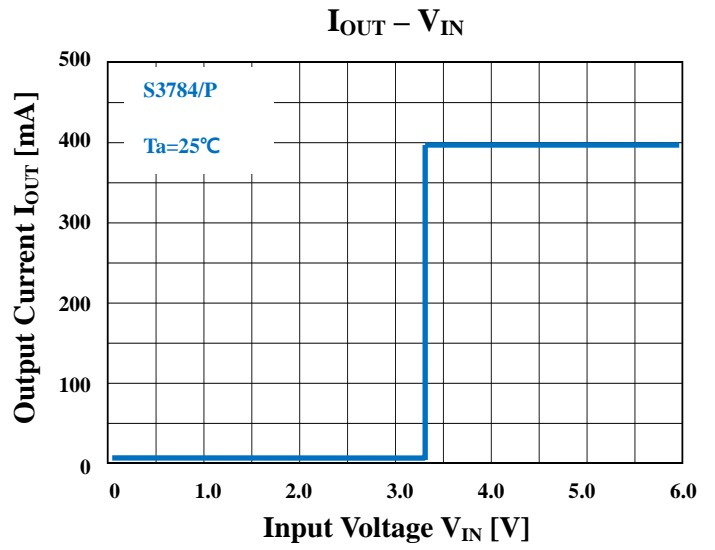
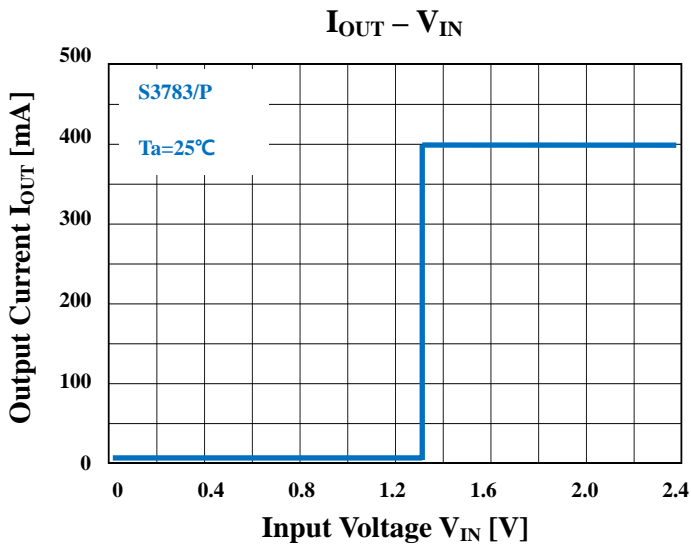
Output impedance 50Ω , $t_r \leq 5\text{ns}$, $t_f \leq 10\text{ns}$

Note 2 : C_L includes probe and jig capacitance

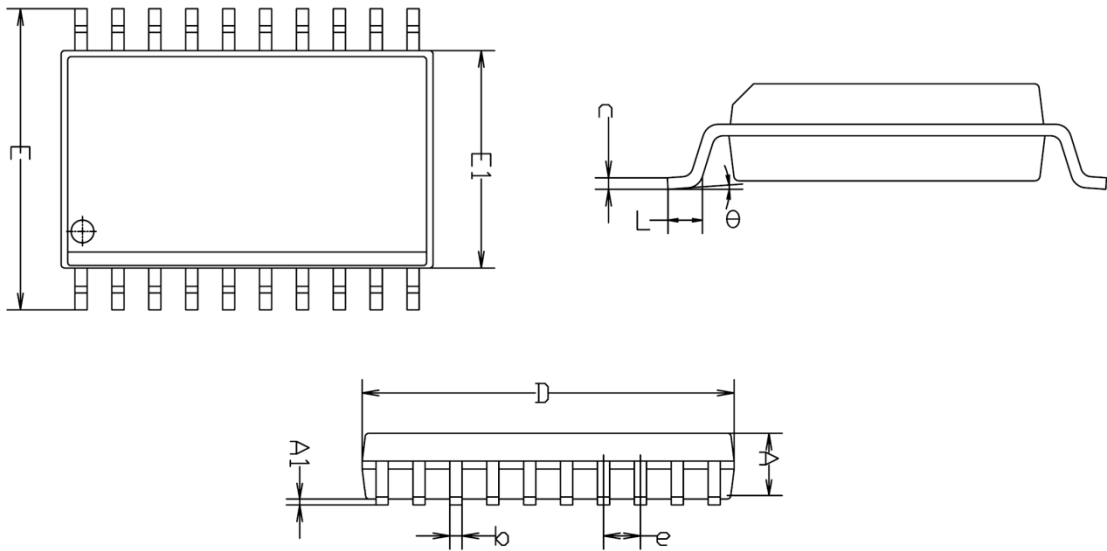
Precautions for using

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.

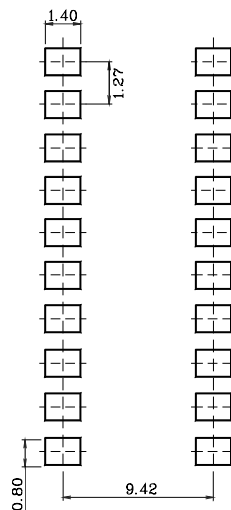


◆ SOP-20 Outline Dimension (Unit : mm)

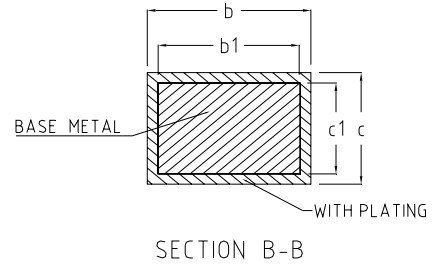
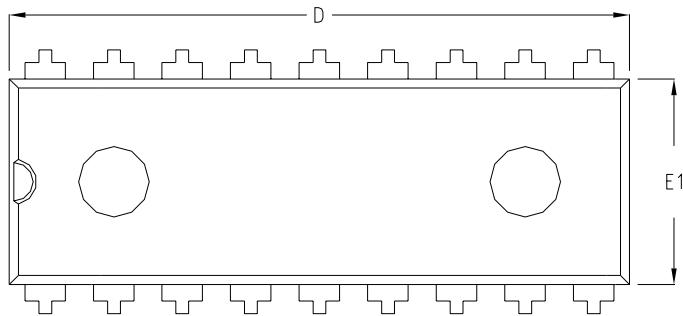
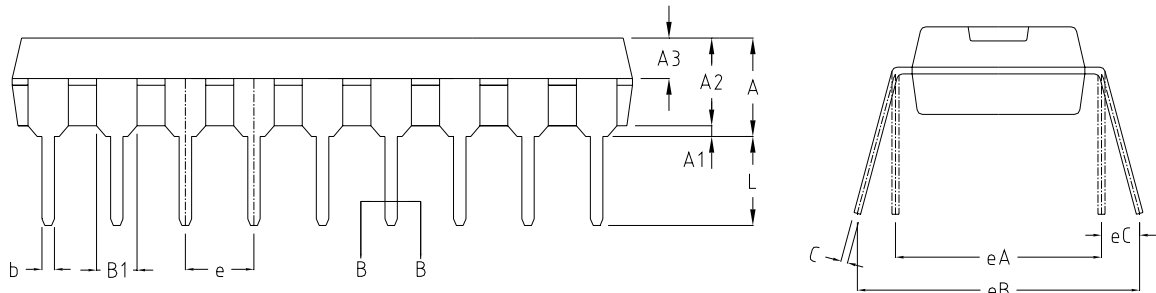


SYMBOL	MILLIMETER(mm)			NOTE
	MINIMUM	NOMINAL	MAXIMUM	
A	2.261	—	2.342	
A1	0.102	0.201	0.300	
b	0.320	0.420	0.520	
c	0.170	0.220	0.270	
D	12.600	12.800	13.000	
E	10.109	10.376	10.643	
E1	7.391	7.493	7.595	
e	1.270 BSC			
L	0.406	—	1.067	
theta	0 °	—	8 °	

※ 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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