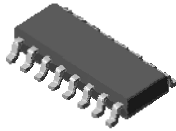
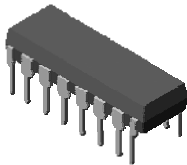


Semiconductor

http:// www.auk.co.kr



SOP-16



DIP-16

ORDERING INFORMATION

Product	Marking	Package
S377x	S377x	SOP-20
S377xP	S377xP	DIP-18

▲ Marking Detail Information

S377x....[1]

YWW....[2]

[1] Device Code [x: Item Code]

[2] Year & Week Code

Description

The S377x Series are high-voltage, high-current Darlington transistor arrays. Each consists of seven NPN Darlington pairs that feature high-voltage outputs with common-cathode clamp diodes for switching inductive loads. The collector-current rating of a single Darlington pair is 500mA. The Darlington pairs can be paralleled for higher current capability. Applications include relay drivers, hammer drivers, lamp drivers, display drivers (LED and gas discharge), line drivers, and logic buffers.

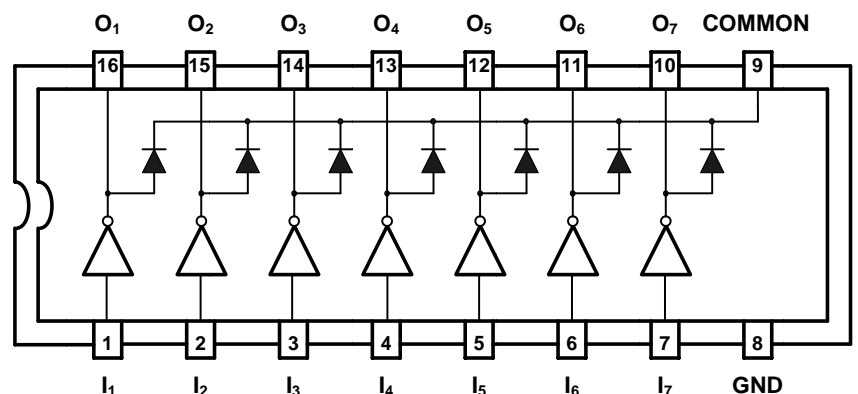
Application

- ◆ Relay Controller
- ◆ Lamp and Display LED Driver
- ◆ Motor Driver

Features and Benefits

- ◆ Output Current (single output) 500mA(Max.)
- ◆ High sustaining voltage output
- ◆ Output clamp diode
- ◆ Inputs compatible with various types of logic
- ◆ Package : SOP-16, DIP-16

Block Diagram & Pin Configuration



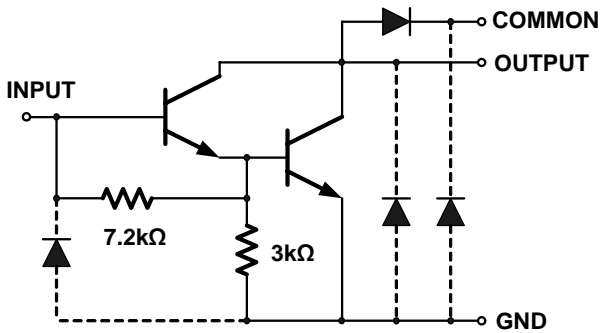
I_x : Input Port

O_x : Output Port

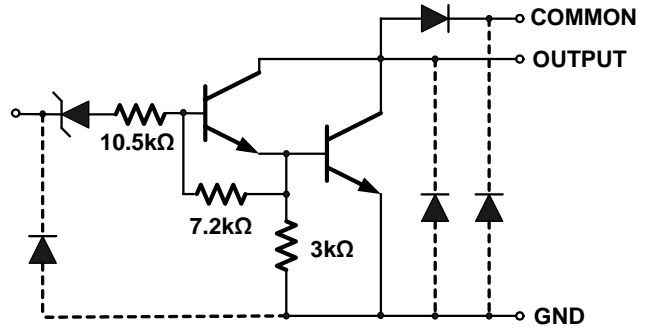
GND : Ground

COMMON : Common

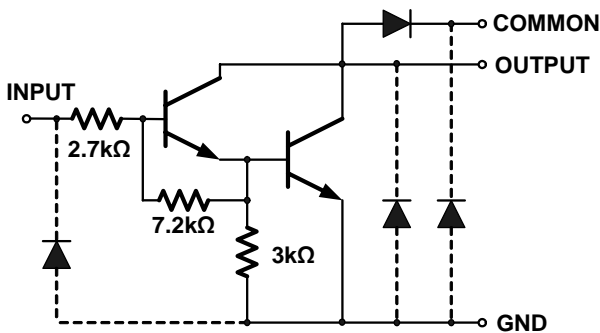
◆ Schematics (Each Driver)



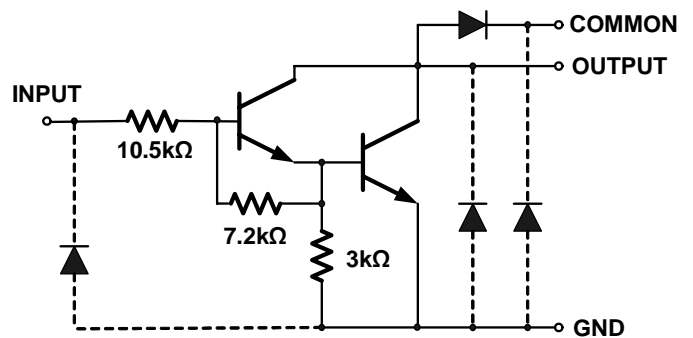
S3771



S3772



S3773



S3774

◆ Product Line-up

Product Name	Input Bias Resistor	Designation	Operating Temperature	Package
S3771	External	General Purpose	-40~85°C	SOP-16
S3772	7V Zener Diode + 10.5KΩ	14~25V PMOS	-40~85°C	SOP-16
S3773	2.7KΩ	TTL, 5V CMOS	-40~85°C	SOP-16
S3774	10.5KΩ	6~15 PMOS, CMOS	-40~85°C	SOP-16
S3771P	External	General Purpose	-40~85°C	DIP-16
S3772P	7V Zener Diode + 10.5KΩ	14~25V PMOS	-40~85°C	DIP-16
S3773P	2.7KΩ	TTL, 5V CMOS	-40~85°C	DIP-16
S3774P	10.5KΩ	6~15 PMOS, CMOS	-40~85°C	DIP-16

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

Parameter	Symbol	Rating		Unit
		SOP-16	DIP-16	
Output Sustaining Voltage	V_{IN}	-0.5~50		V
Output Current	I_{OUT}	500		mA / ch
Input Voltage*	V_{IN}	-0.5~30		V
Input Current**	I_{IN}	25		mA
Clamp Diode	Reverse Voltage	V_R	50	V
	Forward Current	I_F	500	mA
GND Terminal Current	I_{GND}	2.8		A
Power Dissipation	P_d	0.54	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		$^\circ\text{C}$

*(Except S3771/P), **(Only S3771/P)

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

Characteristic	Symbol	Test Condition	Min.	Typ.	Max.	Unit	
Output Sustaining Voltage	$V_{CE(SUS)}$	-	0	-	50	V	
Output Current	I_{OUT}	TPW=25ms, DF=10%, 7 Circuits	0	-	400	mA	
		TPW=25ms, DF=30%, 7 Circuits	0	-	200		
Input Voltage	V_{IN}	Except S3771/P	0	-	30	V	
Input Current	I_{IN}	Only S3771/P	0	-	5	mA	
Clamp Diode Reverse Voltage	V_R	-	-	-	50	V	
Clamp Diode Forward Current	I_F	-	-	-	400	mA	
Power Dissipation	DIP-16	P_D	$T_a = 85^\circ\text{C}$	-	-	0.6	W
	SOP-16		$T_a = 85^\circ\text{C}^*$	-	-	0.32	

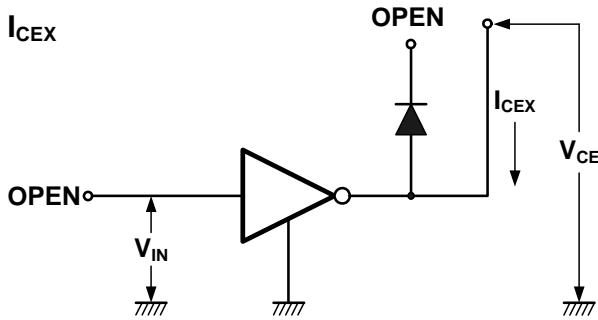
* (On glass epoxy PCB (30 x 30 x 1.6mm Cu50%)

◆ **Electrical characteristics** (Ta=-40~85°C; unless otherwise specified)

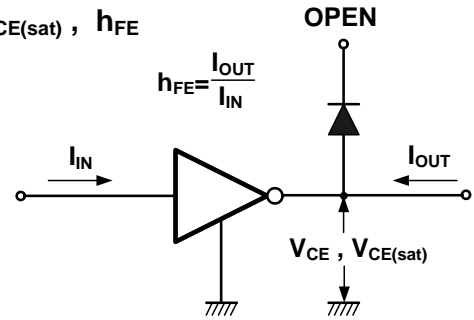
Characteristic		Symbol	Test Circuit	Test Condition	Min.	Typ.	Max.	Unit
Output Leakage Current		I _{CEX}	1	V _{CE} =50V, Ta=25°C	-	-	50	uA
				V _{CE} =50V, Ta=85°C	-	-	100	
	S3772/P			V _{CE} =50V, V _{IN} =6V	-	-	500	
	S3774/P			V _{CE} =50V, V _{IN} =1V	-	-	500	
Collector – Emitter Saturation Voltage		V _{CE(SAT)}	2	I _{OUT} =350mA, I _{IN} =500uA	-	1.3	1.6	V
				I _{OUT} =200mA, I _{IN} =350uA	-	1.1	1.3	
				I _{OUT} =100mA, I _{IN} =250uA	-	0.9	1.1	
Input Current	S3772/P	I _{IN(ON)}	3	V _{IN} =17V	-	0.82	1.25	mA
	S3773/P			V _{IN} =3.85V	-	0.93	1.35	
	S3774/P			V _{IN} =5V	-	0.35	0.5	
				V _{IN} =12V	-	1.0	1.45	
		I _{IN(OFF)}	4	I _{OUT} =500uA, Ta=85°C	50	65	-	uA
Input Voltage	S3772/P	V _{IN(ON)}	5	V _{CE} =2V, I _{OUT} =300mA	-	-	13	V
	S3773/P			V _{CE} =2V, I _{OUT} =200mA	-	-	2.4	
				V _{CE} =2V, I _{OUT} =250mA	-	-	2.7	
				V _{CE} =2V, I _{OUT} =300mA	-	-	3.0	
				V _{CE} =2V, I _{OUT} =125mA	-	-	5.0	
				V _{CE} =2V, I _{OUT} =200mA	-	-	6.0	
				V _{CE} =2V, I _{OUT} =275mA	-	-	7.0	
	S3774/P			V _{CE} =2V, I _{OUT} =350mA	-	-	8.0	
DC Current Transfer Ratio		h _{FE}	2	V _{CE} =2V, I _{OUT} =350mA	1000	-	-	
Clamp Diode Reverse Current		I _R	6	V _R =50V, Ta=25°C	-	-	50	uA
				V _R =50V, Ta=85°C	-	-	100	
Clamp Diode Forward Voltage		V _F	7	I _F =350mA	-	-	2.0	V
Input Capacitance		C _{IN}		-	-	15	-	pF
Turn-ON Delay		t _{ON}	8	V _{OUT} =50V, R _L =163Ω, C _L =15pF	-	0.1	-	uS
Turn-OFF Delay		t _{OFF}			-	0.2	-	

Test Circuit

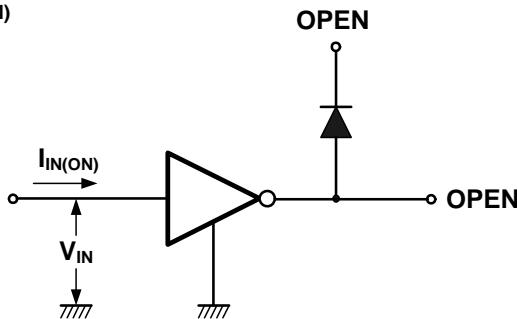
1. I_{CEX}



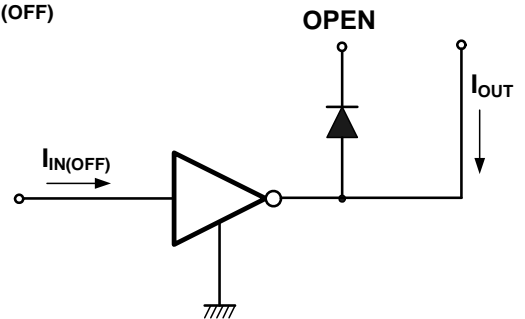
2. $V_{CE(sat)}$, h_{FE}



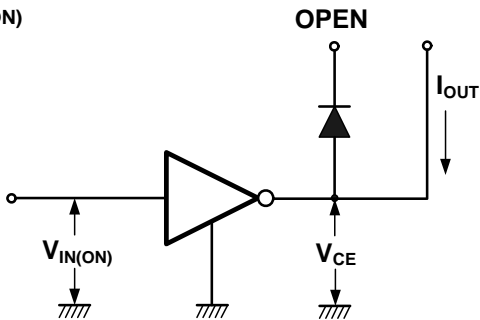
3. $I_{IN(ON)}$



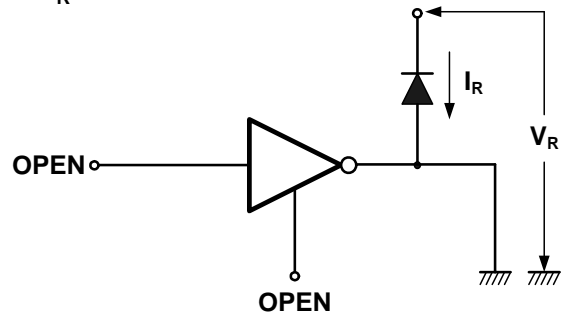
4. $I_{IN(OFF)}$



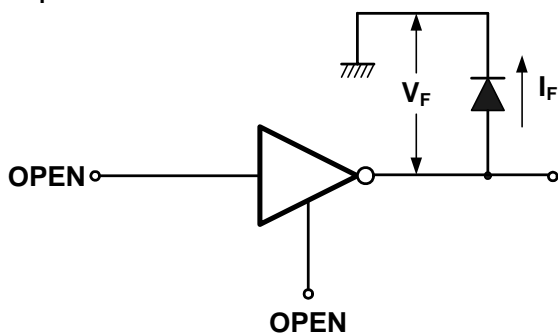
5. $V_{IN(ON)}$



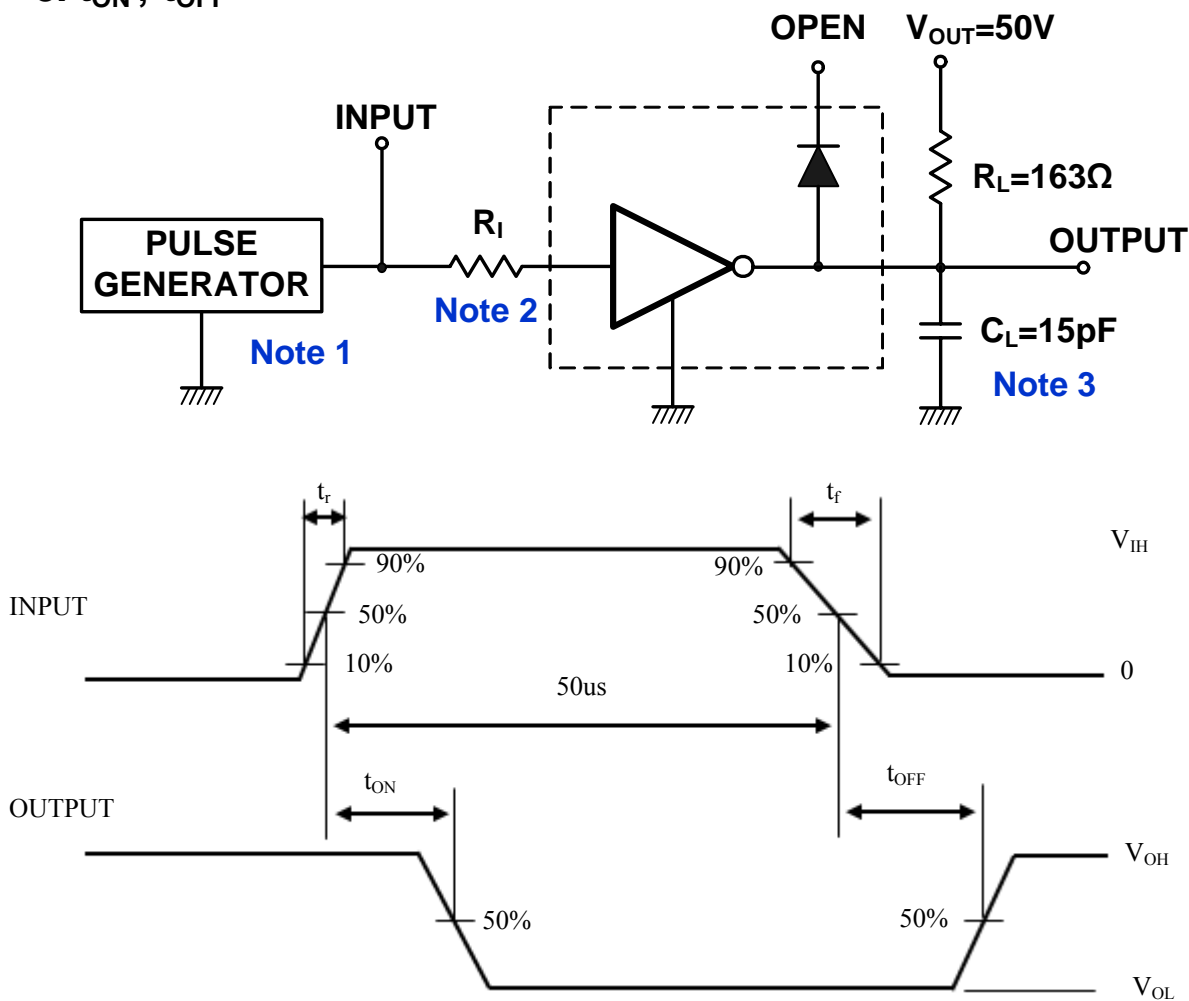
6. I_R



7. V_F



8. t_{ON} , t_{OFF}



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

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

Note 2 : See below

Input Condition

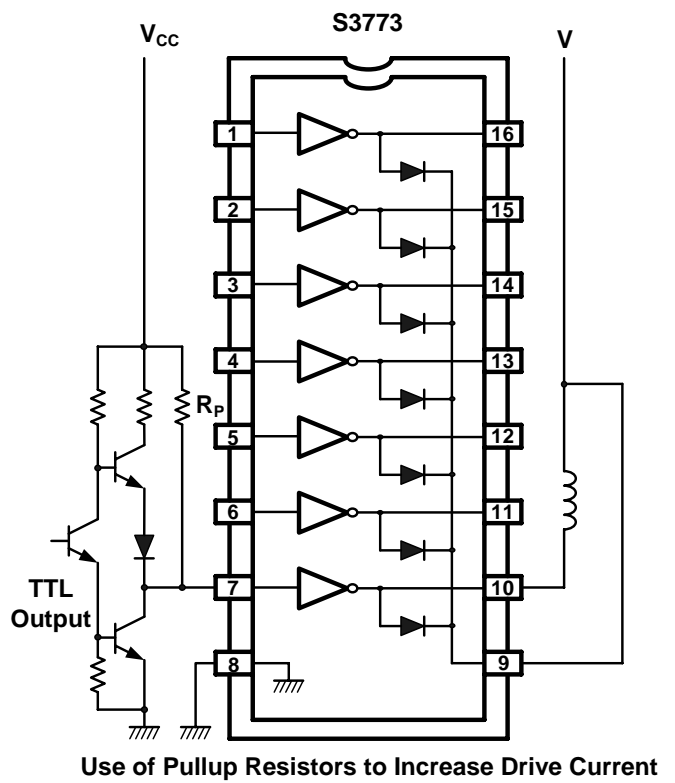
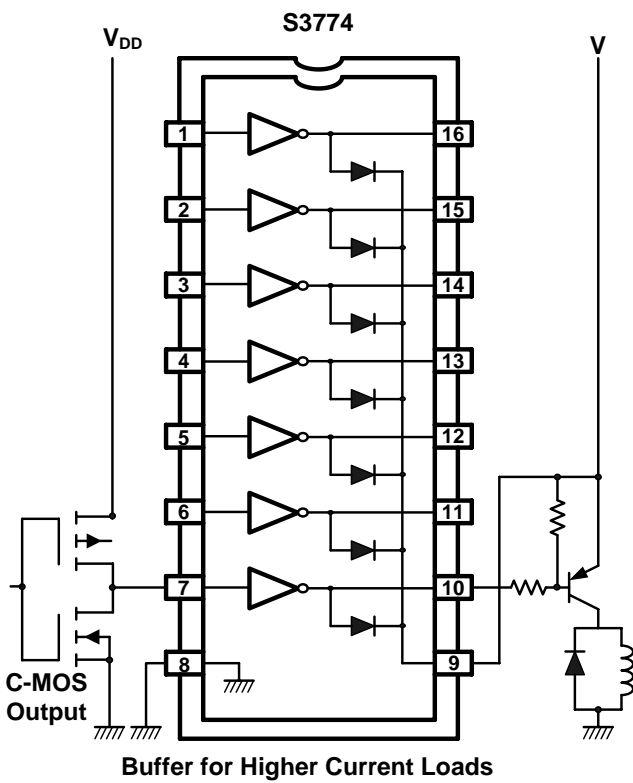
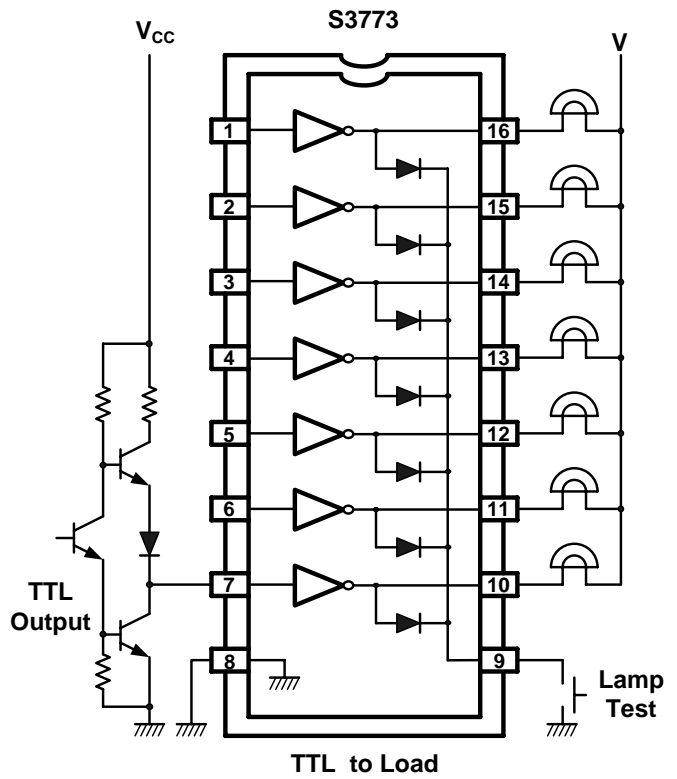
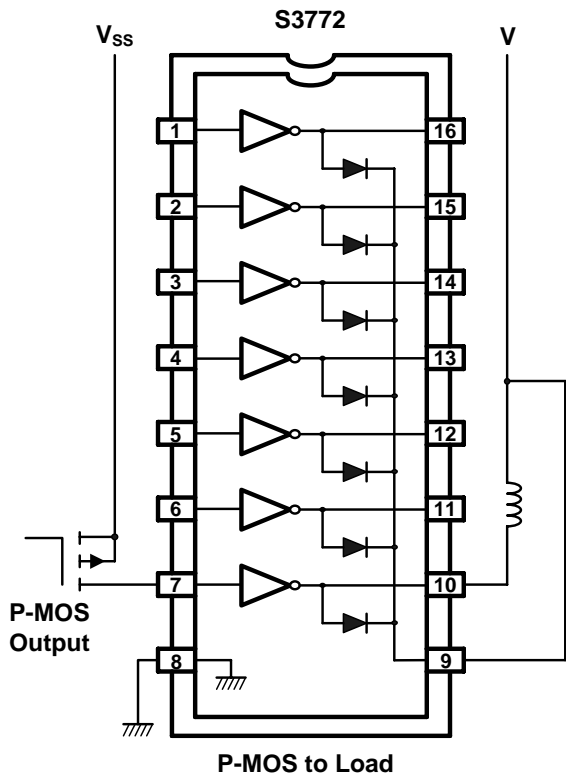
Item Code	R_I	V_{IH}
S3771/P	2.7KΩ	3V
S3772/P	0	13V
S3773/P	0	3V
S3774/P	0	8V

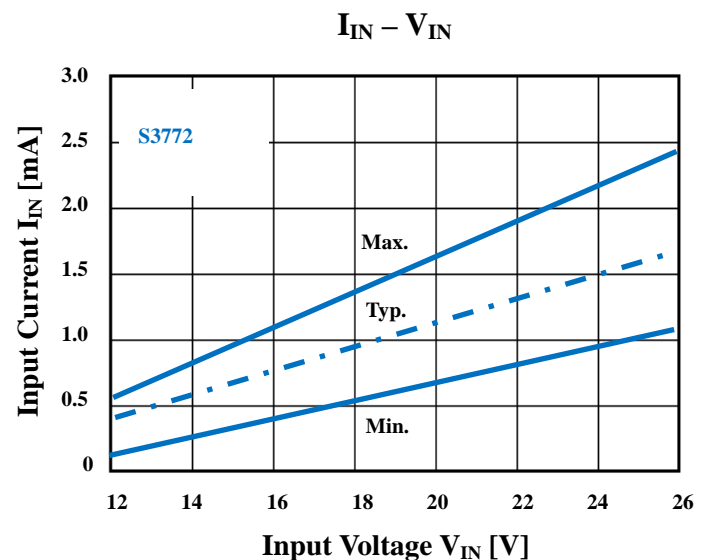
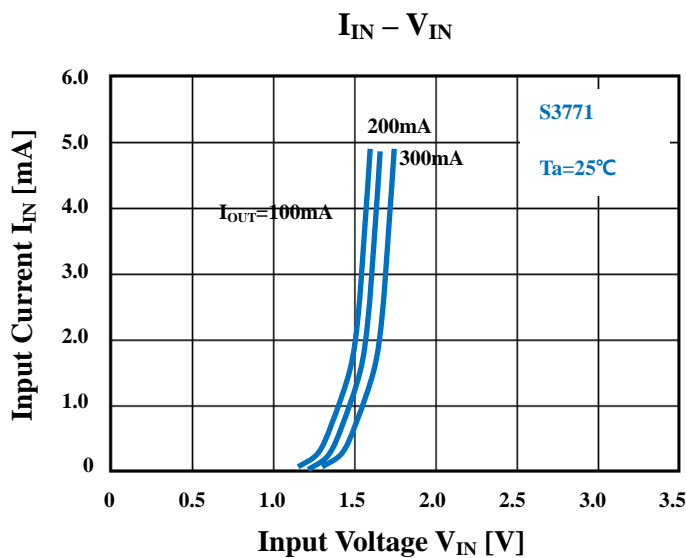
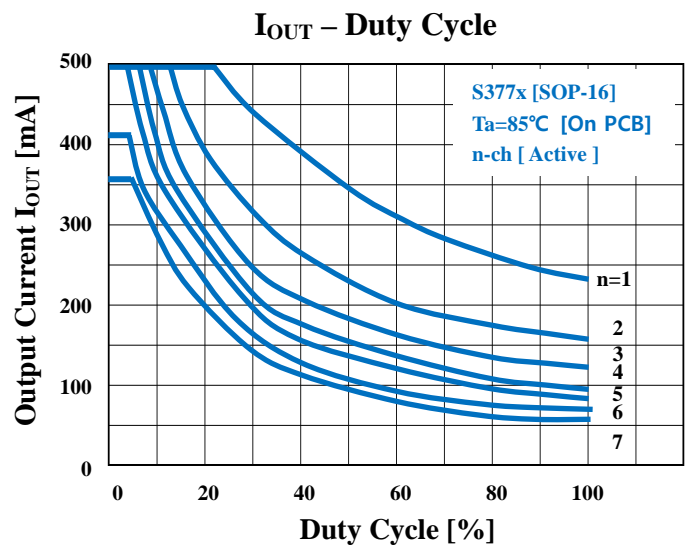
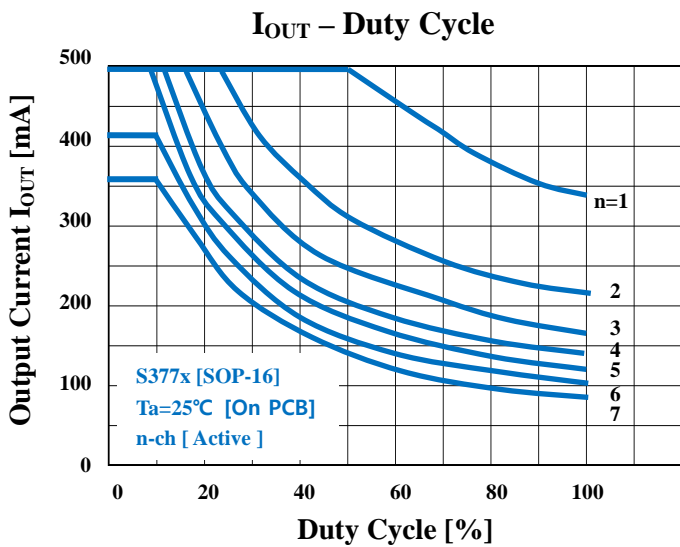
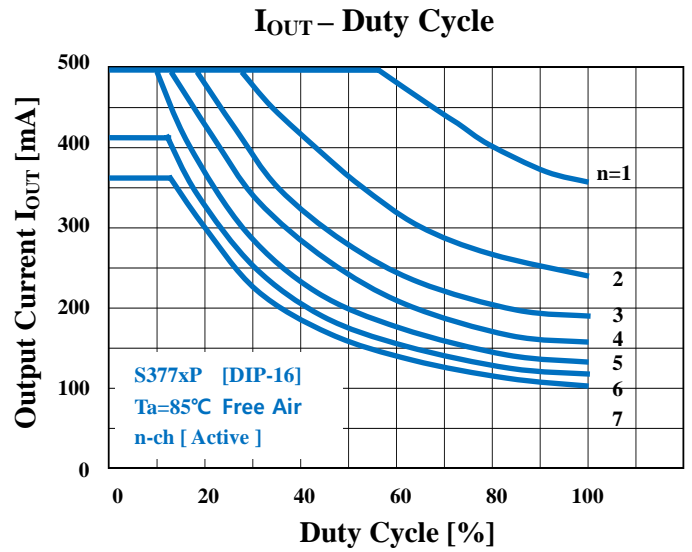
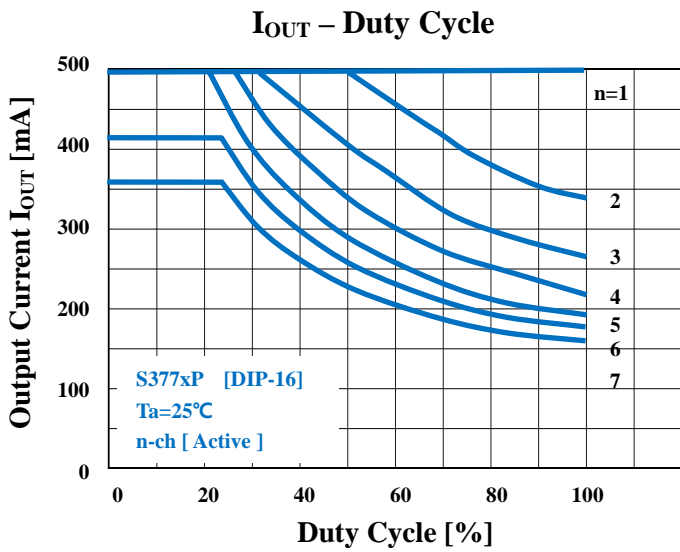
Note 3 : CL includes probe and jig capacitance

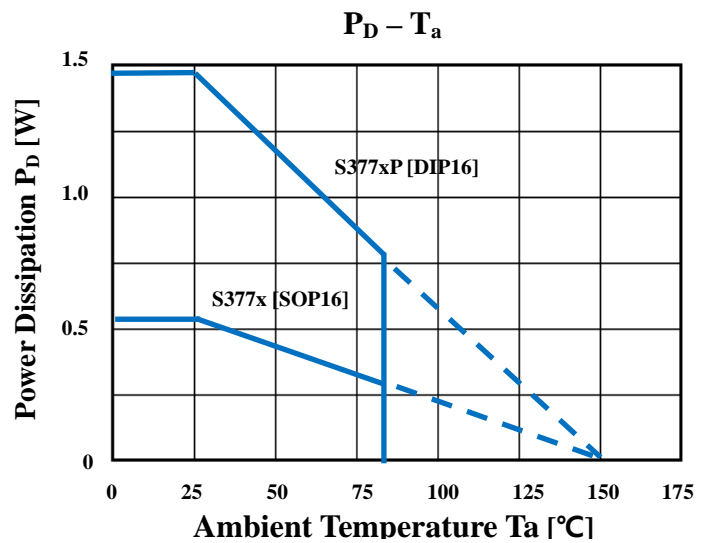
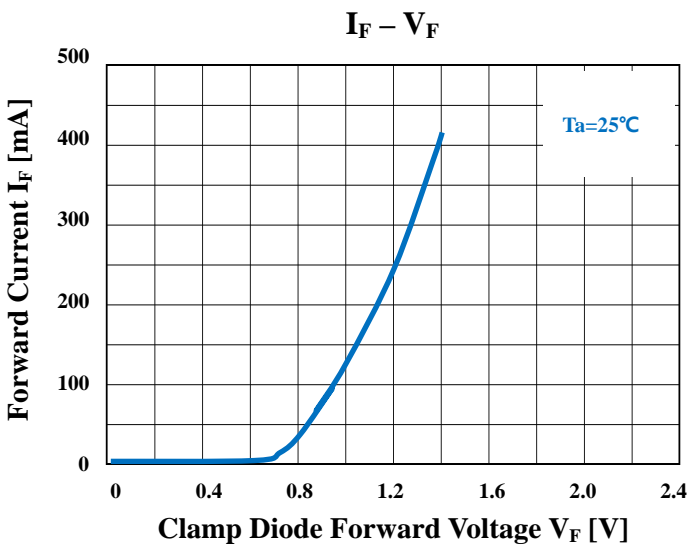
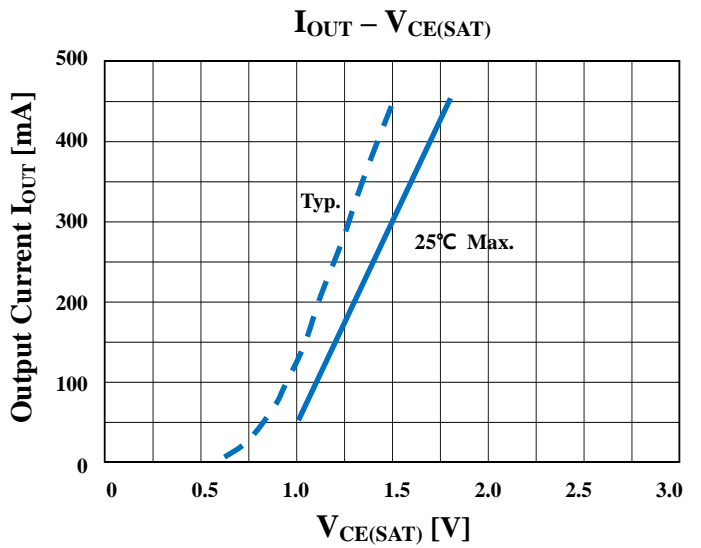
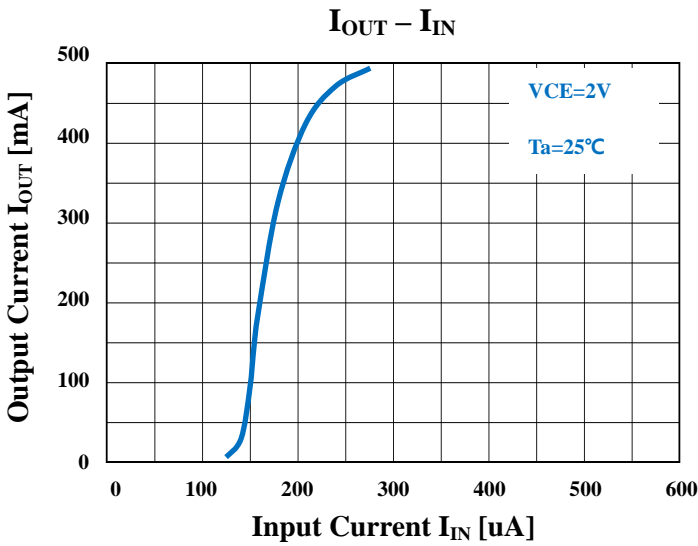
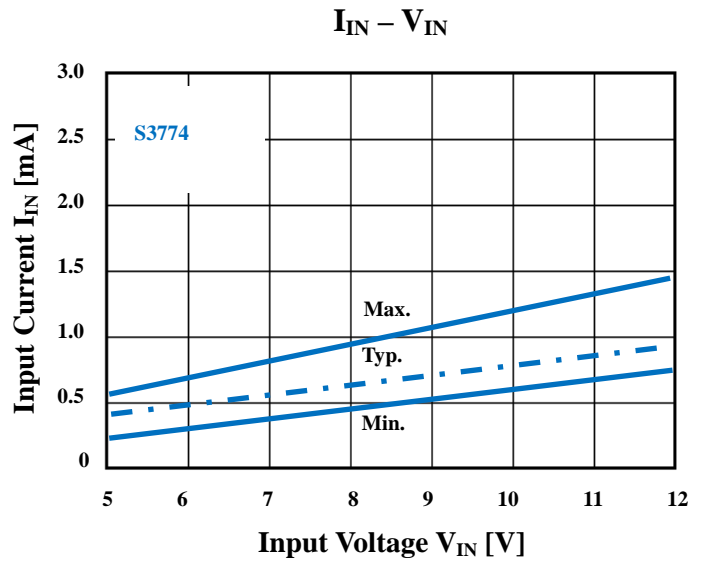
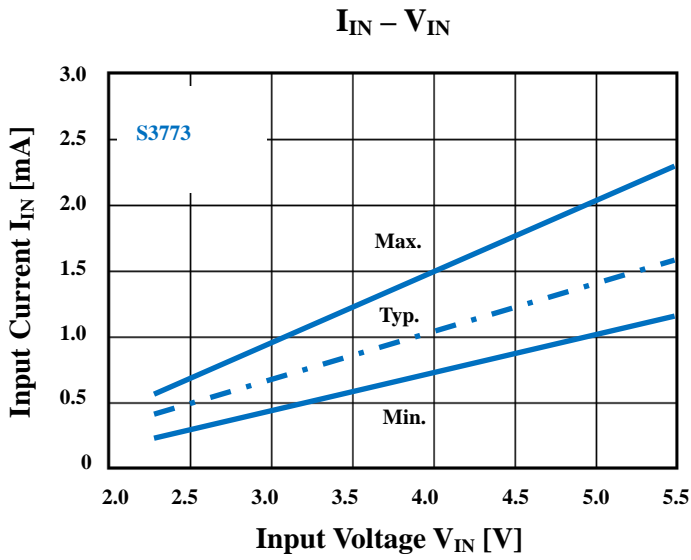
Precautions for using

This IC does not include built-in protection circuits for excess current or overvoltage. If this IC is subjected to excess current or overvoltage, it may be destroyed. Hence, the utmost care must be taken when systems which incorporate this IC are designed. Utmost care is necessary in the design of the output line, COMMON and GND line since IC may be destroyed due to short-circuit between outputs, air contamination fault, or fault by improper grounding.

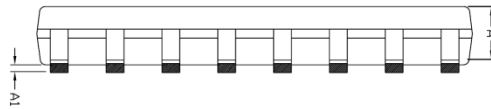
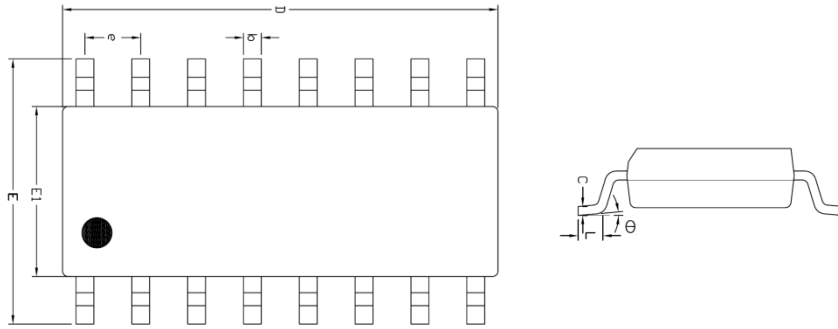
Application Circuit





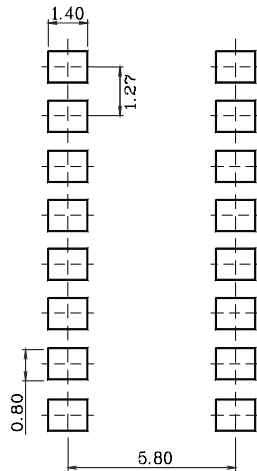


◆ SOP-16 Outline Dimension (Unit : mm)

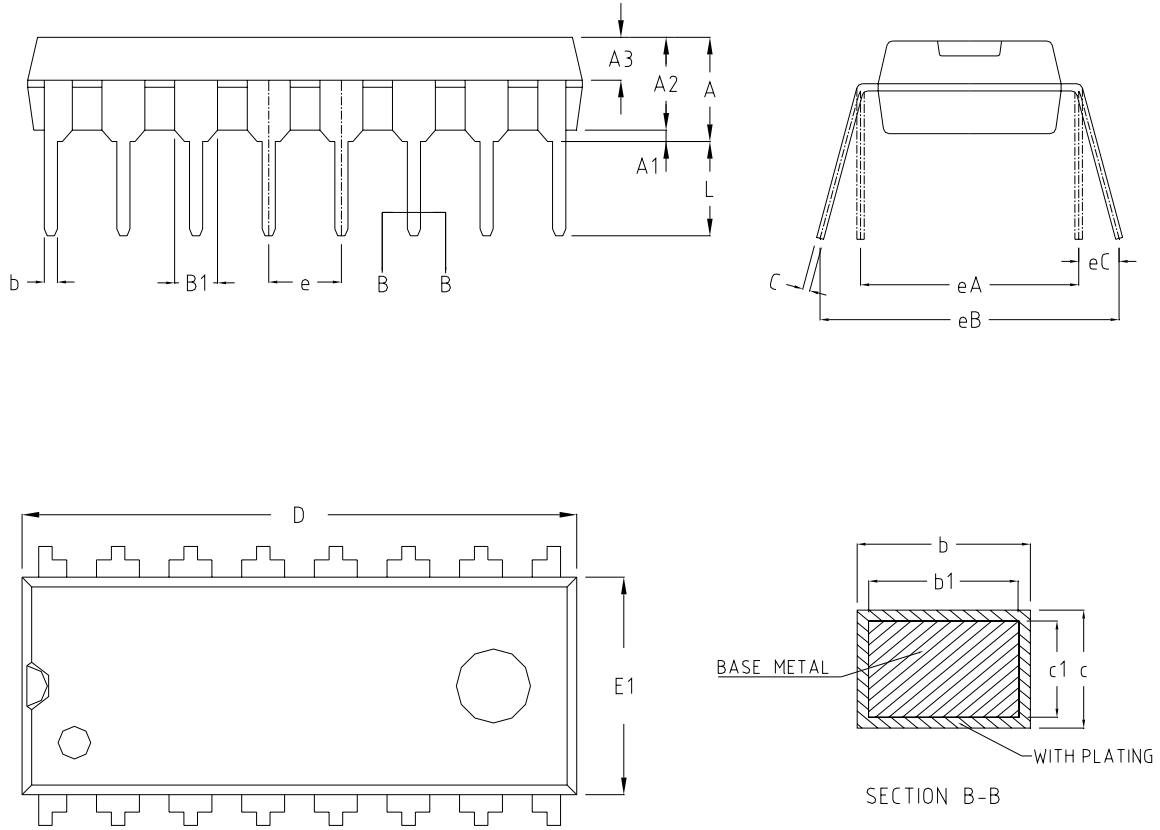


SYMBOL	MILLIMETER(mm)			NOTE
	MINIMUM	NOMINAL	MAXIMUM	
A	1.245	—	1.445	
A1	0.125	0.175	0.275	
b	0.320	0.420	0.520	
c	0.170	0.220	0.270	
D	9.806	9.906	10.006	
E	5.870	6.020	6.170	
E1	3.761	3.861	3.961	
e	1.270 BSC			
L	0.462	0.562	0.662	
θ	0 °	—	8 °	

※ Recommend PCB solder land [Unit: mm]



◆ DIP-16(CS) 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	18.90	19.10	19.30
E1	6.15	6.35	6.55
e	2.54BSC		
eA	7.62BSC		
eB	7.62	-	9.50
eC	0	-	0.94
L	3.00	-	-

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