

## 8CH DARLINGTON SINK DRIVER

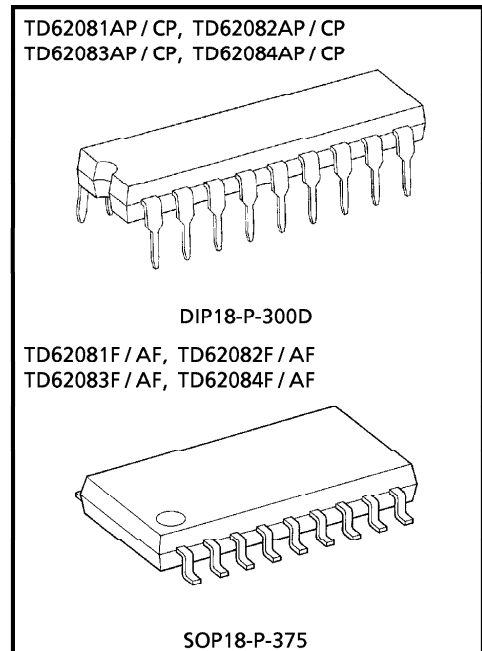
The TD62081AP/CP/F/AF Series are high-voltage, high-current darlington drivers comprised of eight NPN darlington pairs.

All units feature integral clamp diodes for switching inductive loads.

Applications include relay, hammer, lamp and display (LED) drivers.

### FEATURES

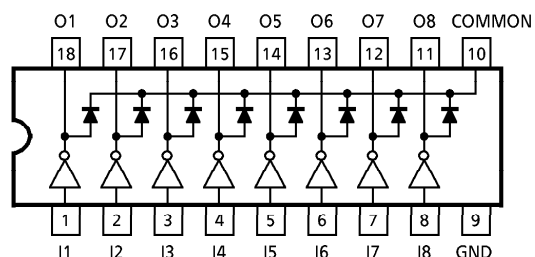
- Output current (single output)  
500mA (Max.) (TD62081AP/F/AF series)  
400mA (Max.) (TD62081CP series)
- High sustaining voltage output  
35V (Min.) (TD62081F series)  
50V (Min.) (TD62081AP/AF series)  
100V (Min.) (TD62081CP series)
- Output clamp diodes
- Inputs compatible with various types of logic.
- Package type-AP, CP : DIP-18pin
- Package type-F, AF : SOP-18pin



Weight DIP18-P-300D : 1.478g (Typ.)  
SOP18-P-375 : 0.41g (Typ.)

TYPE	INPUT BASE RESISTOR	DESIGNATION
TD62081AP/CP/F/AF	External	General Purpose
TD62082AP/CP/F/AF	10.5-k $\Omega$ + 7V Zenner diode	14~25V PMOS
TD62083AP/CP/F/AF	2.7k $\Omega$	TTL, 5V CMOS
TD62084AP/CP/F/AF	10.5k $\Omega$	6~15V PMOS, CMOS

### PIN CONNECTION (TOP VIEW)



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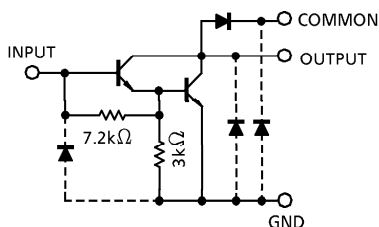
TD62081AP - 1

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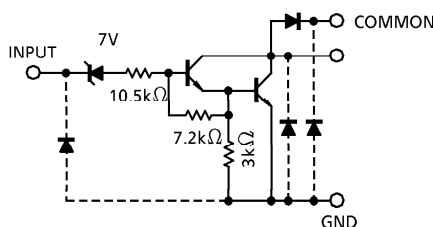
**TOSHIBA CORPORATION**

**SCHEMATICS (EACH DRIVER)**

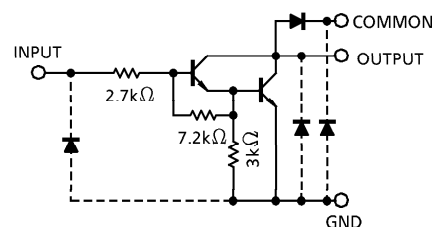
TD62081AP/CP/F/AF



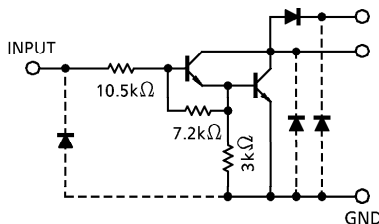
TD62082AP/CP/F/AF



TD62083AP/CP/F/AF



TD62084AP/CP/F/AF



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

**MAXIMUM RATINGS (Ta = 25°C)**

CHARACTERISTIC		SYMBOL	RATING	UNIT
Output Sustaining Voltage	AP, AF	V <sub>CE (SUS)</sub>	- 0.5~50	V
	CP		- 0.5~100	
	F		- 0.5~35	
Output Current	CP	I <sub>OUT</sub>	500	mA / ch
			400	
Input Voltage		V <sub>IN (Note 1)</sub>	- 0.5~30	V
Input Current		I <sub>IN (Note 2)</sub>	25	mA
Clamp Diode Reverse Voltage	AP, AF	V <sub>R</sub>	50	V
	CP		100	
	F		35	
Clamp Diode Forward Current	CP	I <sub>F</sub>	500	mA
			400	
Power Dissipation	AP, CP	P <sub>D</sub>	1.47	W
	F, AF		0.96	
Operating Temperature		T <sub>opr</sub>	- 40~85	°C
Storage Temperature		T <sub>stg</sub>	- 55~150	°C

(Note 1) Except TD62081AP/CP/F/AF

(Note 2) Only TD62081AP/CP/F/AF

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

CHARACTERISTIC		SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Output Sustaining Voltage	AP, AF	$V_{CE(SUS)}$		0	—	50	V
	CP			0	—	100	
	F			0	—	35	
Output Current	AP, CP	$I_{OUT}$	$T_{pw} = 25\text{ms}$ , Duty = 10%, 8 Circuits	0	—	347	mA / ch
			$T_{pw} = 25\text{ms}$ , Duty = 50%, 8 Circuits	0	—	123	
	F, AF		$T_{pw} = 25\text{ms}$ , Duty = 10%, 8 Circuits	0	—	268	
			$T_{pw} = 25\text{ms}$ , Duty = 50%, 8 Circuits	0	—	90	
Input Voltage	Except TD62081AP/ CP/F/AF	$V_{IN}$		0	—	30	V
Input Voltage (Output On)	TD62082AP/ CP/F/AF	$V_{IN(ON)}$		14	—	30	V
	TD62083AP/ CP/F/AF			3.5	—	30	
	TD62084AP/ CP/F/AF			8	—	30	
Input Current	Only TD62081AP/ CP/F/AF	$I_{IN}$		0	—	5	mA
Clamp Diode Reverse Voltage	AP, AF	$V_R$		—	—	50	V
	CP			—	—	100	
	F			—	—	35	
Clamp Diode Forward Current		$I_F$		—	—	400	mA
	CP			—	—	320	
Power Dissipation	AP, CP	$P_D$		—	—	0.52	W
	F, AF			—	—	0.4	

**ELECTRICAL CHARACTERISTICS** (Ta = 25°C)

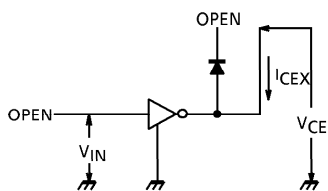
CHARACTERISTIC		SYMBOL	TEST CIRCUIT	TEST CONDITION	MIN.	TYP.	MAX.	UNIT	
Output Leakage Current	AP, AF CP F	I <sub>CEX</sub>	1	V <sub>CE</sub> = 50V	Ta = 25°C	—	—	50	
				V <sub>CE</sub> = 100V					
				V <sub>CE</sub> = 35V					
	AP, AF CP F			TD62082	V <sub>CE</sub> = 50V	Ta = 85°C	—	—	100
					V <sub>CE</sub> = 100V				
					V <sub>CE</sub> = 35V				
	AP, AF CP F			TD62084	V <sub>CE</sub> = 50V	V <sub>IN</sub> = 6V	—	—	500
					V <sub>CE</sub> = 100V				
					V <sub>CE</sub> = 35V				
	AP, AF CP F			TD62084	V <sub>CE</sub> = 50V	V <sub>IN</sub> = 1V	—	—	500
					V <sub>CE</sub> = 100V				
					V <sub>CE</sub> = 35V				
Collector-Emitter Saturation Voltage		V <sub>CE</sub> (sat)	2	I <sub>OUT</sub> = 350mA, I <sub>IN</sub> = 500μA	—	1.3	1.6	V	
				I <sub>OUT</sub> = 200mA, I <sub>IN</sub> = 350μA	—	1.1	1.3		
				I <sub>OUT</sub> = 100mA, I <sub>IN</sub> = 250μA	—	0.9	1.1		
Input Current	TD62082AP / CP / F / AF	I <sub>IN</sub> (ON)	2	V <sub>IN</sub> = 17V	—	0.82	1.25	mA	
	TD62083AP / CP / F / AF			V <sub>IN</sub> = 3.85V	—	0.93	1.35		
	TD62084AP / CP / F / AF			V <sub>IN</sub> = 5V	—	0.35	0.5		
				V <sub>IN</sub> = 12V	—	1.0	1.45		
		I <sub>IN</sub> (OFF)	4	I <sub>OUT</sub> = 500μA, Ta = 85°C	50	65	—	μA	
Input Voltage (Output On)	TD62082AP / CP / F / AF	V <sub>IN</sub> (ON)	5	V <sub>CE</sub> = 2V, I <sub>OUT</sub> = 300mA	—	—	13	V	
	TD62083AP / CP / F / AF			V <sub>CE</sub> = 2V, I <sub>OUT</sub> = 200mA	—	—	2.4		
				V <sub>CE</sub> = 2V, I <sub>OUT</sub> = 250mA	—	—	2.7		
				V <sub>CE</sub> = 2V, I <sub>OUT</sub> = 300mA	—	—	3.0		
				V <sub>CE</sub> = 2V, I <sub>OUT</sub> = 125mA	—	—	5.0		
				V <sub>CE</sub> = 2V, I <sub>OUT</sub> = 200mA	—	—	6.0		
				V <sub>CE</sub> = 2V, I <sub>OUT</sub> = 275mA	—	—	7.0		
	TD62084AP / CP / F / AF			V <sub>CE</sub> = 2V, I <sub>OUT</sub> = 350mA	—	—	8.0		
DC Current Transfer Ratio		h <sub>FE</sub>	2	V <sub>CE</sub> = 2V, I <sub>OUT</sub> = 350mA	1000	—	—		
Clamp Diode Reverse Current		I <sub>R</sub>	6	Ta = 25°C (Note)	—	—	50	μA	
				Ta = 85°C (Note)	—	—	100		
Clamp Diode Forward Voltage	CP	V <sub>F</sub>	7	I <sub>F</sub> = 350mA	—	—	2.0	V	
				I <sub>F</sub> = 280mA	—	—	1.8		
Input Capacitance		C <sub>IN</sub>	—		—	15	—	pF	

(Note) V<sub>R</sub> = V<sub>R</sub> MAX.

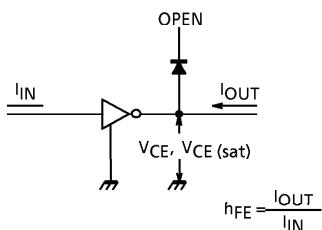
CHARACTERISTIC		SYMBOL	TEST CIRCUIT	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Turn-On Delay	AP, AF	$t_{ON}$	8	$R_L = 125\Omega, V_{OUT} = 50V$	—	0.1	—	$\mu s$
	CP			$R_L = 312\Omega, V_{OUT} = 100V$	—	0.1	—	
	F			$R_L = 87.5\Omega, V_{OUT} = 35V$	—	0.1	—	
Turn-Off Delay	AP, AF	$t_{OFF}$		$R_L = 125\Omega, V_{OUT} = 50V$	—	0.2	—	
	CP			$R_L = 312\Omega, V_{OUT} = 100V$	—	3.0	—	
	F			$R_L = 87.5\Omega, V_{OUT} = 35V$	—	0.2	—	

**TEST CIRCUIT**

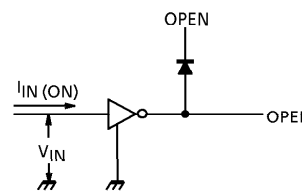
1.  $I_{CEX}$



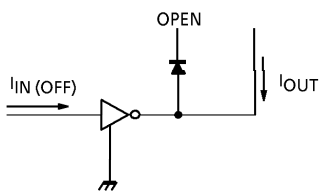
2.  $V_{CE(sat)}, h_{FE}$



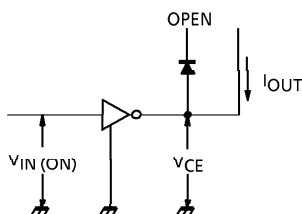
3.  $I_{IN(ON)}$



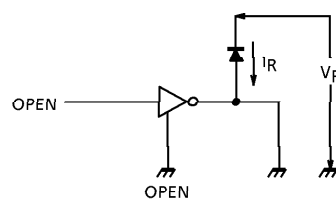
4.  $I_{IN(OFF)}$



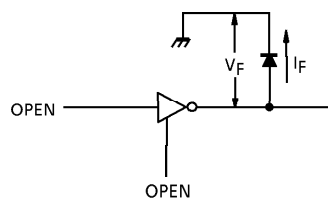
5.  $V_{IN(ON)}$



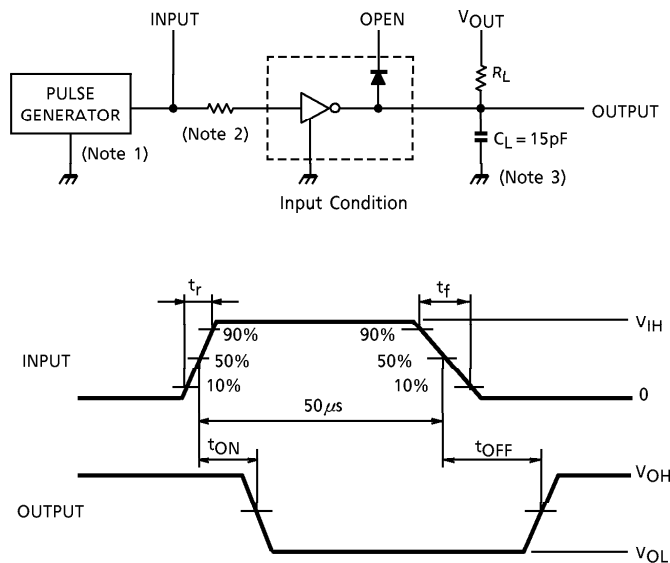
6.  $I_R$



7.  $V_F$



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

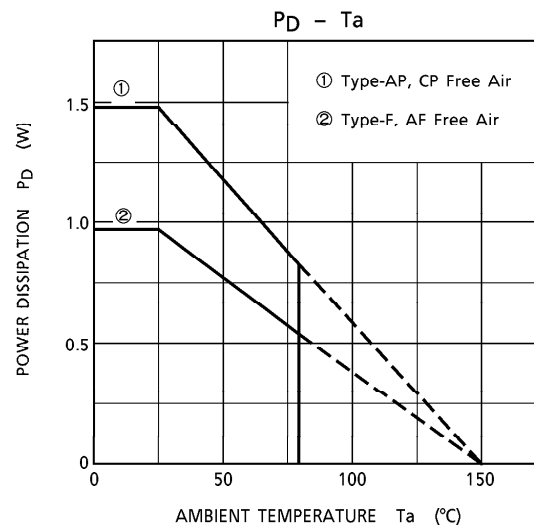
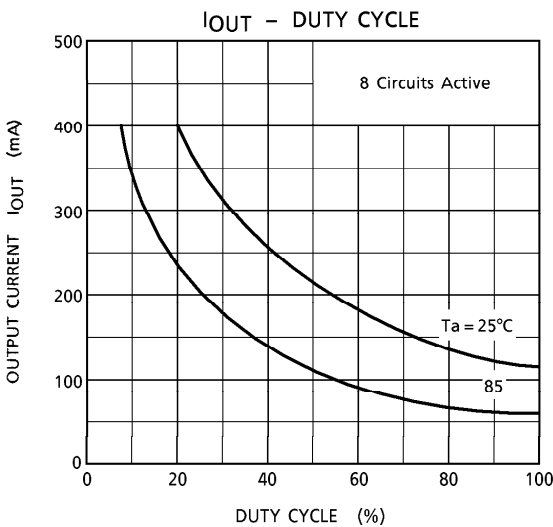
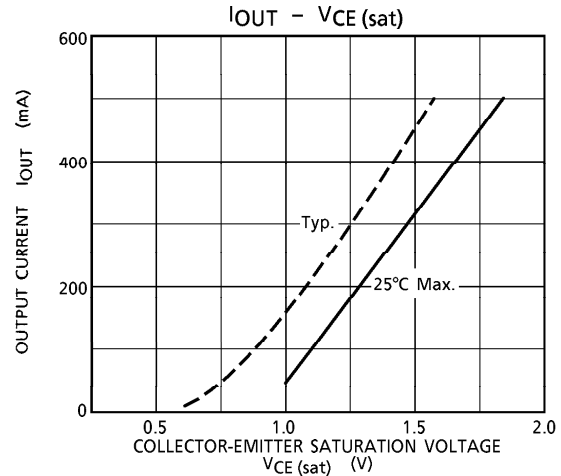
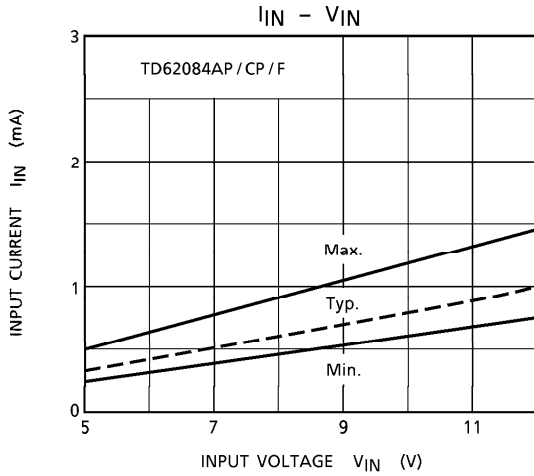
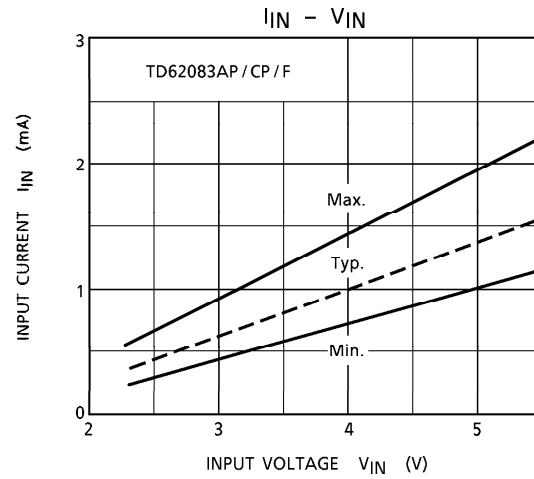
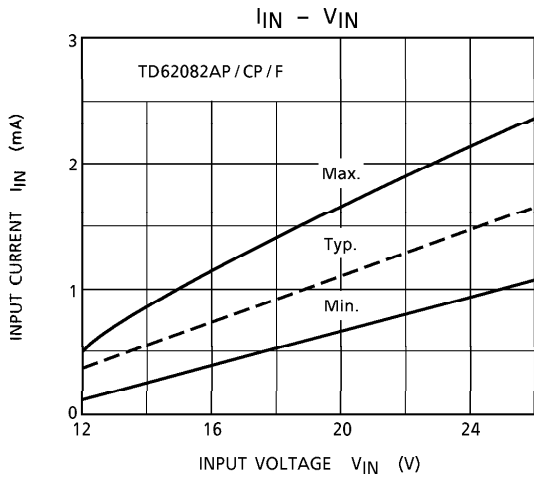


- (Note 1) Pulse Width  $50\mu s$ , Duty Cycle 10%  
Output Impedance  $50\Omega$ ,  $t_r \leq 5ns$ ,  $t_f \leq 10ns$   
(Note 2) See below.

INPUT CONDITION

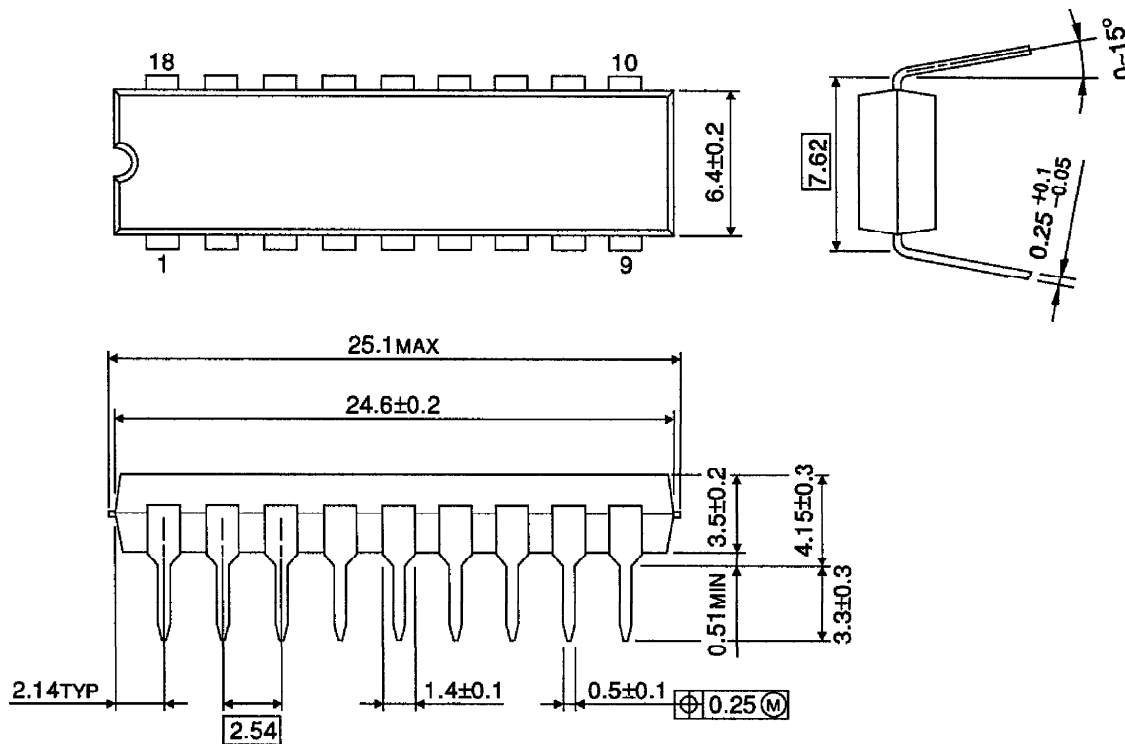
TYPE NUMBER	R1	$V_{IH}$
TD62081AP/CP/F/AF	$2.7k\Omega$	3V
TD62082AP/CP/F/AF	$0\Omega$	13V
TD62083AP/CP/F/AF	$0\Omega$	3V
TD62084AP/CP/F/AF	$0\Omega$	8V

- (Note 3)  $C_L$  includes probe and jig capacitance



OUTLINE DRAWING  
DIP18-P-300D

Unit : mm

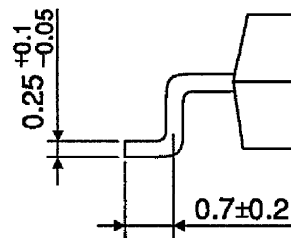
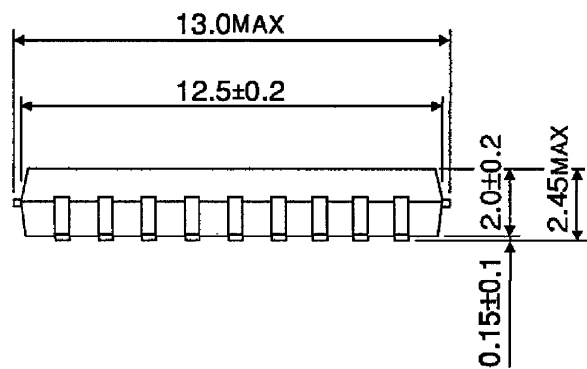
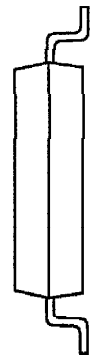
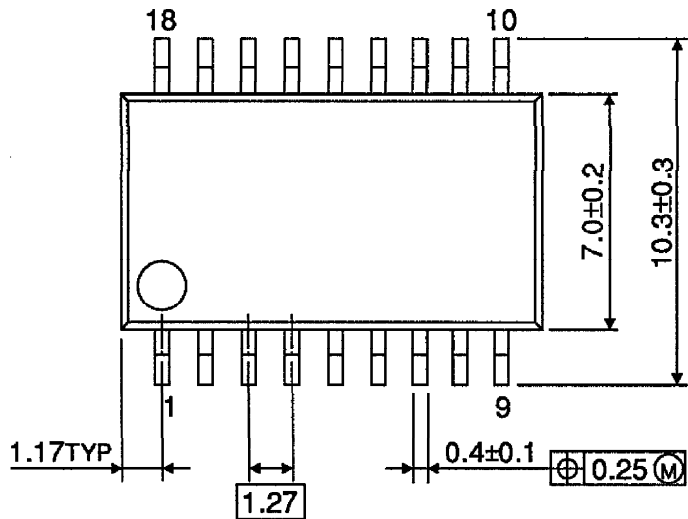


Weight : 1.478g (Typ.)



OUTLINE DRAWING  
SOP18-P-375

Unit : mm



Weight : 0.41g (Typ.)