

TOSHIBA BIPOLAR DIGITAL INTEGRATED CIRCUIT SILICON MONOLITHIC

TD62081AP, TD62081CP, TD62081F, TD62081AF, TD62082AP, TD62082CP
 TD62082F, TD62082AF, TD62083AP, TD62083CP, TD62083F, TD62083AF
 TD62084AP, TD62084CP, TD62084F, TD62084AF

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.

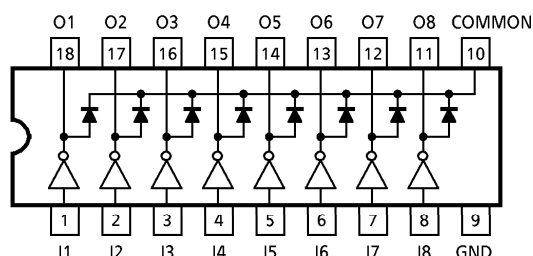
Applications include relay, hammer, lamp and display (LED) drivers.

FEATURES

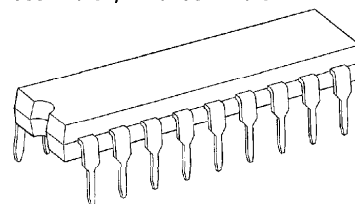
- Output current (single output)
 500mA (Max.) (TD62081AP/F/AF series)
 400mA (Max.) (TD62081CP series)
- High sustaining voltage output
 35V (Min.) (TD62081F series)
 50V (Min.) (TD62081AP/AF series)
 100V (Min.) (TD62081CP series)
- Output clamp diodes
- Inputs compatible with various types of logic.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

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

PIN CONNECTION (TOP VIEW)

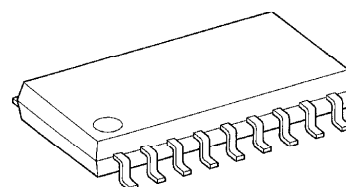


TD62081AP/CP, TD62082AP/CP
 TD62083AP/CP, TD62084AP/CP



DIP18-P-300-2.54D

TD62081F/AF, TD62082F/AF
 TD62083F/AF, TD62084F/AF



SOP18-P-375-1.27

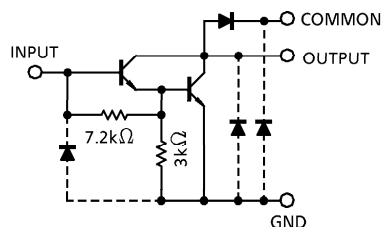
Weight
 DIP18-P-300-2.54D : 1.478g (Typ.)
 SOP18-P-375-1.27 : 0.41g (Typ.)

961001EBA2

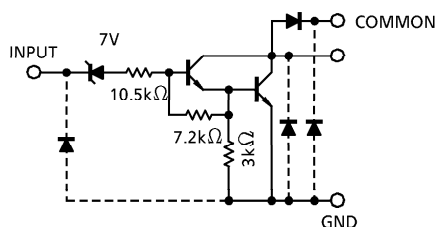
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SCHEMATICS (EACH DRIVER)

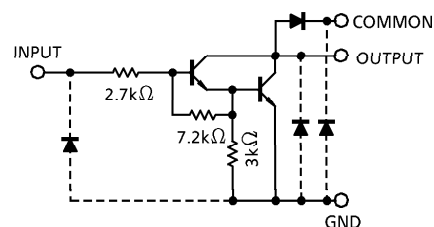
TD62081AP / CP / F / AF



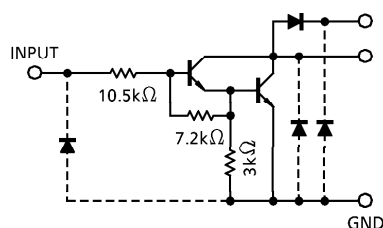
TD62082AP / CP / F / AF



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 _{CE (SUS)}	− 0.5~50	V
	CP		− 0.5~100	
	F		− 0.5~35	
Output Current		I _{OUT}	500	mA / ch
CP			400	
Input Voltage		V _{IN} (Note 1)	− 0.5~30	V
Input Current		I _{IN} (Note 2)	25	mA
Clamp Diode Reverse Voltage	AP, AF	V _R	50	V
	CP		100	
	F		35	
Clamp Diode Forward Current		I _F	500	mA
CP			400	
Power Dissipation	AP, CP	P _D	1.47	W
	F, AF		0.96	
Operating Temperature		T _{opr}	− 40~85	°C
Storage Temperature		T _{stg}	− 55~150	°C

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

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

RECOMMENDED OPERATING CONDITIONS (Ta = -40~85°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} = 25ms, Duty = 10%, 8 Circuits	0	—	347	mA / ch
			T _{pw} = 25ms, Duty = 50%, 8 Circuits	0	—	123	
	F, AF		T _{pw} = 25ms, Duty = 10%, 8 Circuits	0	—	268	
			T _{pw} = 25ms, 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)

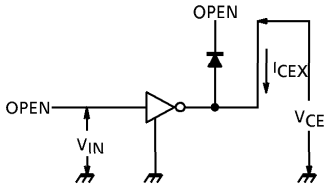
CHARACTERISTIC		SYMBOL	TEST CIR- CUIT	TEST CONDITION		MIN.	TYP.	MAX.	UNIT	
Output Leakage Current		AP, AF	1	V _{CE} = 50V	Ta = 25°C	—	—	50	μA	
		CP								V _{CE} = 100V
		F								
		AP, AF		V _{CE} = 50V	Ta = 85°C	—	—	100		
		CP								V _{CE} = 100V
		F								
	TD62082	AP, AF		V _{CE} = 50V	V _{IN} = 6V	—	—	500		
		CP								V _{CE} = 100V
		F								
	TD62084	AP, AF		V _{CE} = 50V	V _{IN} = 1V	—	—	500		
		CP								V _{CE} = 100V
		F								
Collector-Emitter Saturation Voltage		V _{CE} (sat)	2	I _{OUT} = 350mA, I _{IN} = 500μA	—	1.3	1.6	V		
				I _{OUT} = 200mA, I _{IN} = 350μA	—	1.1	1.3			
				I _{OUT} = 100mA, I _{IN} = 250μA	—	0.9	1.1			
Input Current	TD62082AP / CP / F / AF	I _{IN} (ON)	2	V _{IN} = 17V	—	0.82	1.25	mA		
	TD62083AP / CP / F / AF			V _{IN} = 3.85V	—	0.93	1.35			
	TD62084AP / CP / F / AF			V _{IN} = 5V	—	0.35	0.5			
				V _{IN} = 12V	—	1.0	1.45			
			I _{IN} (OFF)	4	I _{OUT} = 500μA, Ta = 85°C	50	65	—	μA	
Input Voltage (Output On)	TD62082AP / CP / F / AF	V _{IN} (ON)	5	V _{CE} = 2V, I _{OUT} = 300mA	—	—	13	V		
	TD62083AP / CP / F / AF			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			
				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	Ta = 25°C (Note)	—	—	50	μA		
				Ta = 85°C (Note)	—	—	100			
Clamp Diode Forward Voltage		V _F	7	I _F = 350mA	—	—	2.0	V		
CP	I _F = 280mA			—	—	1.8				
Input Capacitance		C _{IN}	—		—	15	—	pF		

(Note) $V_R = V_R \text{ MAX.}$

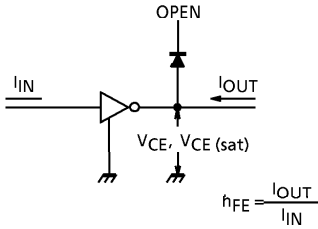
CHARACTERISTIC		SYMBOL	TEST CIR- CUIT	TEST CONDITION	MIN.	TYP.	MAX.	UNIT	
Turn-On Delay	AP, AF	t _{ON}	8	R _L = 125Ω, V _{OUT} = 50V	—	0.1	—	μs	
	CP			R _L = 312Ω, V _{OUT} = 100V	—	0.1	—		
	F			R _L = 87.5Ω, V _{OUT} = 35V	—	0.1	—		
Turn-Off Delay	AP, AF	t _{OFF}		R _L = 125Ω, V _{OUT} = 50V	—	0.2	—		
	CP			R _L = 312Ω, V _{OUT} = 100V	—	3.0	—		
	F			R _L = 87.5Ω, V _{OUT} = 35V	—	0.2	—		

TEST CIRCUIT

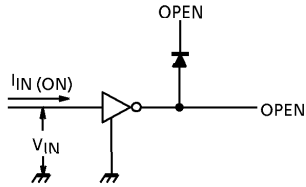
1. I_{CEX}



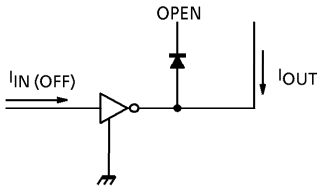
2. $V_{CE(sat)}, h_{FE}$



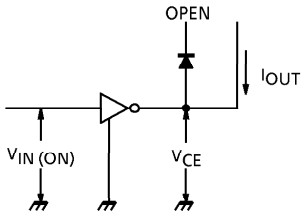
3. $I_{IN(ON)}$



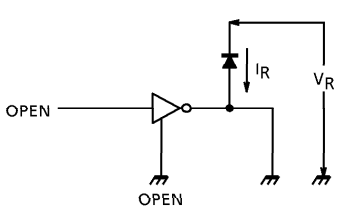
4. $I_{IN(OFF)}$



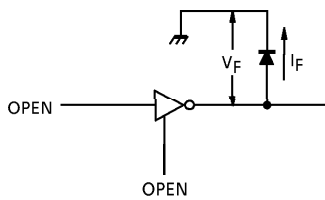
5. $V_{IN(ON)}$

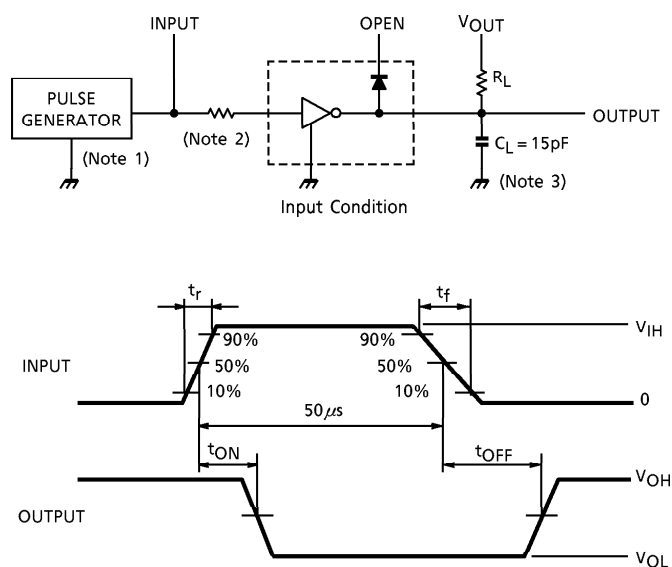


6. I_R



7. V_F



8. t_{ON} , t_{OFF} 

(Note 1) Pulse Width $50\mu\text{s}$, Duty Cycle 10%
Output Impedance 50Ω , $t_r \leq 5\text{ns}$, $t_f \leq 10\text{ns}$

(Note 2) See below.

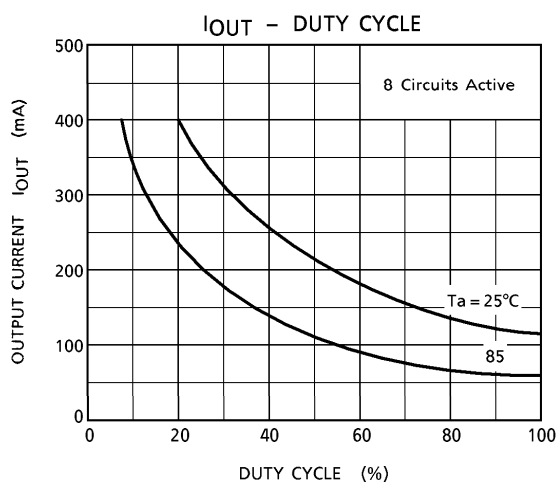
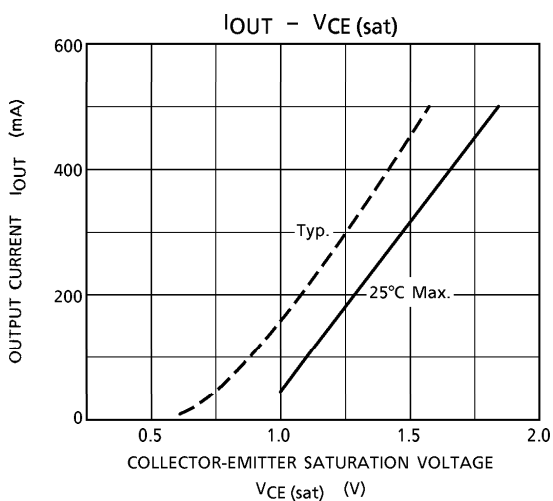
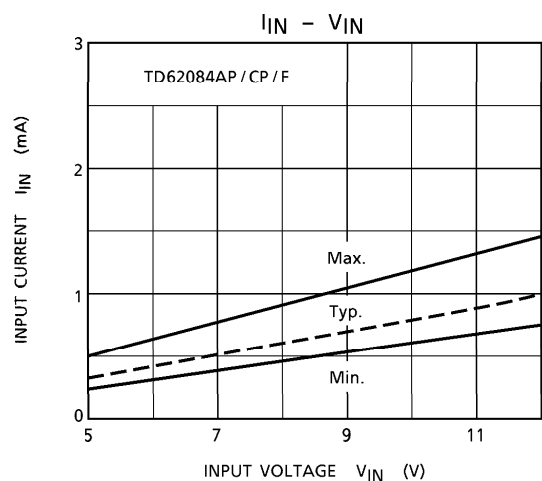
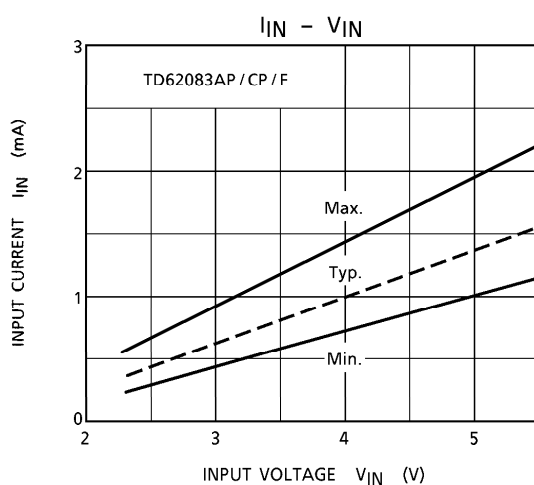
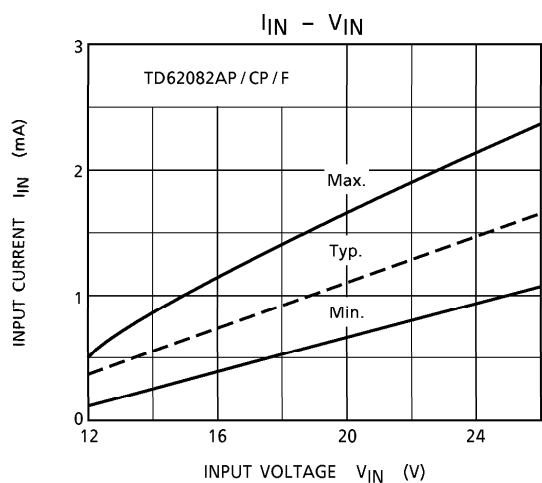
INPUT CONDITION

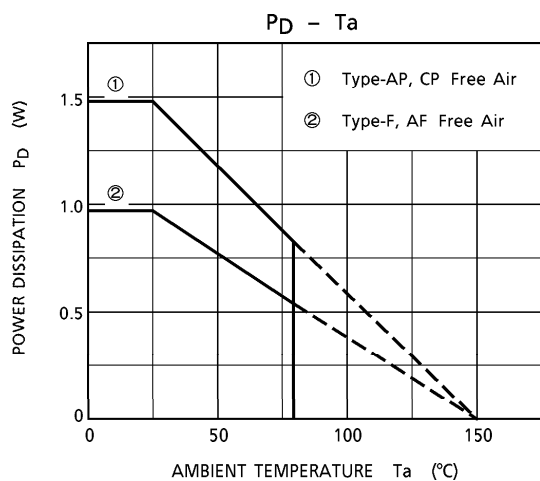
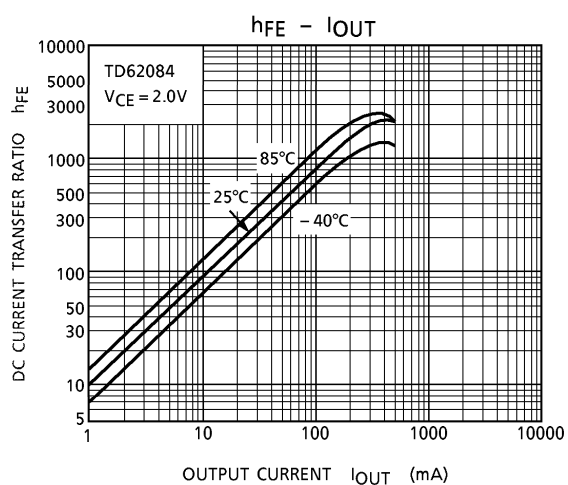
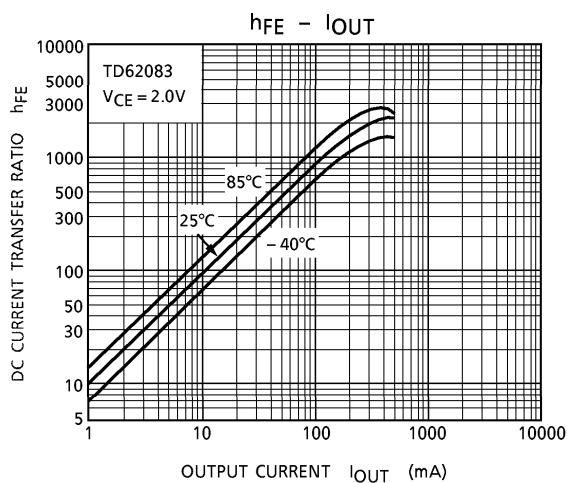
TYPE NUMBER	R1	V_{IH}
TD62081AP/CP/F/AF	$2.7\text{k}\Omega$	3V
TD62082AP/CP/F/AF	0Ω	13V
TD62083AP/CP/F/AF	0Ω	3V
TD62084AP/CP/F/AF	0Ω	8V

(Note 3) C_L includes probe and jig capacitance

PRECAUTIONS for USING

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.

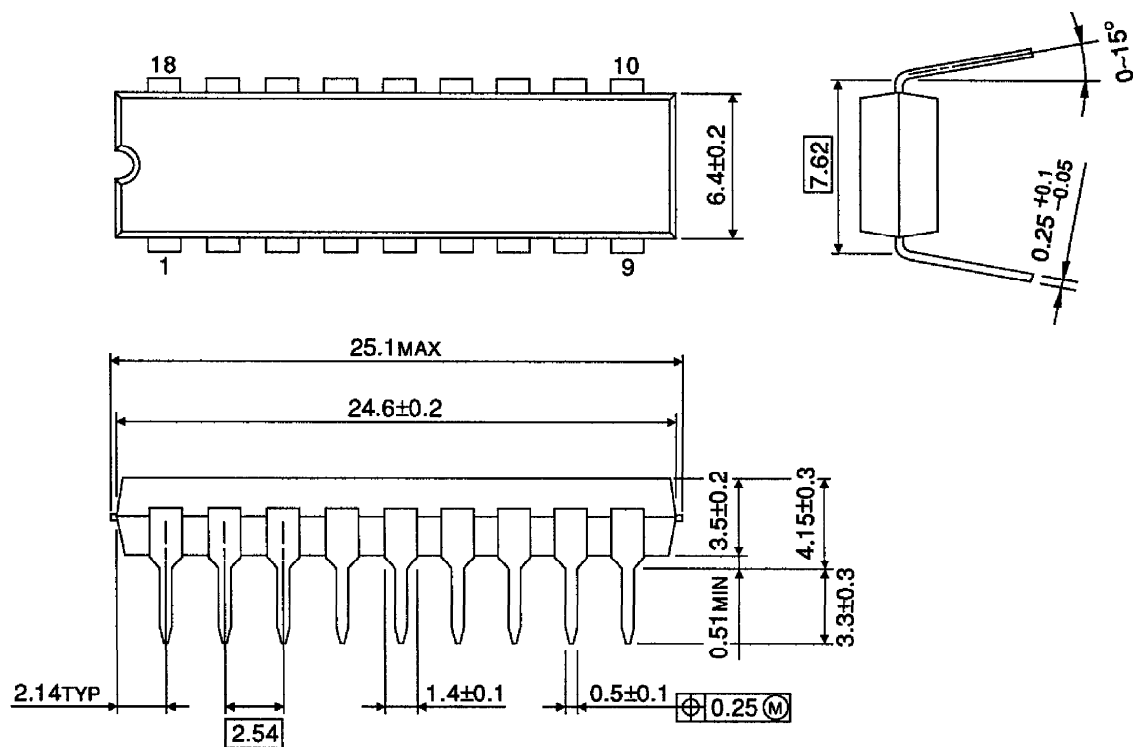




OUTLINE DRAWING

DIP18-P-300-2.54D

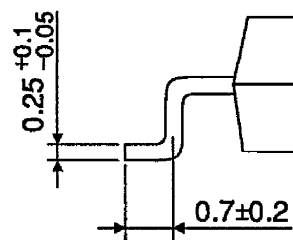
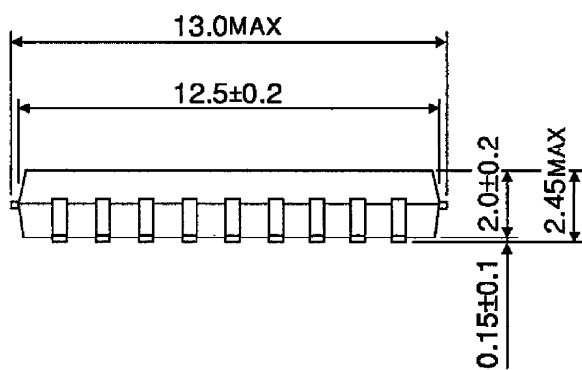
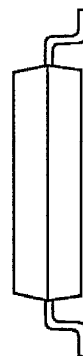
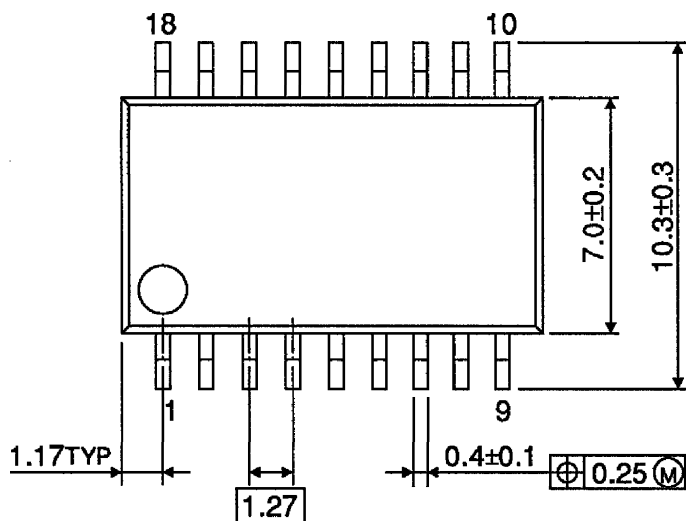
Unit : mm



Weight : 1.478g (Typ.)

OUTLINE DRAWING
SOP18-P-375-1.27

Unit : mm



Weight : 0.41g (Typ.)