

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.

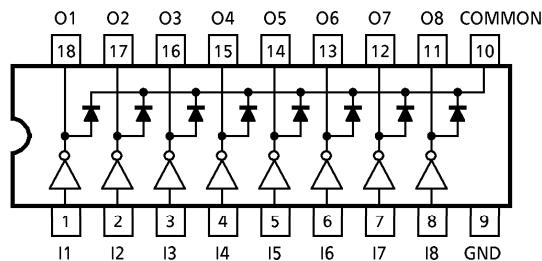
Applications include relay, hammer, lamp and display (LED) drivers.

FEATURES

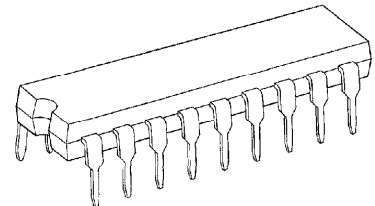
- Output current (single output)
 500mA (Max.) (TD62081AP/F/AF series)
 400mA (Max.) (TD62081CP series)
- High sustaining voltage output
 35V (Min.) (TD62081F series)
 50V (Min.) (TD62081AP/AF series)
 100V (Min.) (TD62081CP series)
- Output clamp diodes
- Inputs compatible with various types of logic.
- 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 Zenner 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)

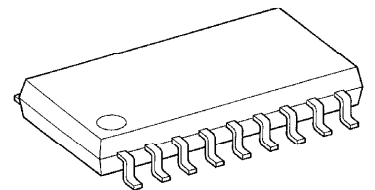


TD62081AP/CP, TD62082AP/CP
 TD62083AP/CP, TD62084AP/CP



DIP18-P-300-2.54D

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



SOP18-P-375-1.27

Weight

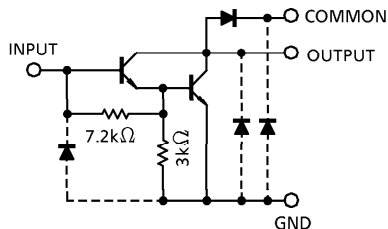
DIP18-P-300-2.54D : 1.478g (Typ.)
 SOP18-P-375-1.27 : 0.41g (Typ.)

980910EBA2

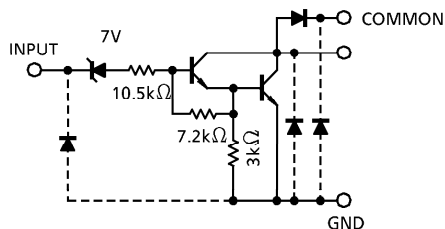
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SCHEMATICS (EACH DRIVER)

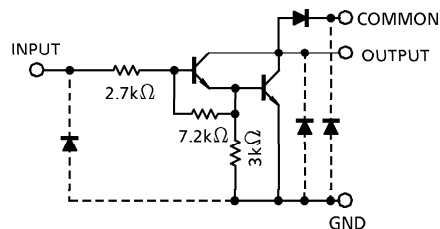
TD62081AP / CP / F / AF



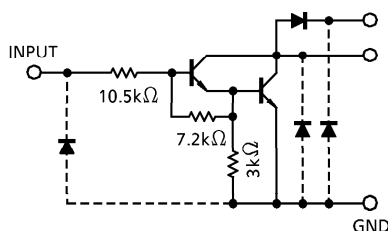
TD62082AP / CP / F / AF



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 Voltage (Output Off)	TD62082AP / CP / F / AF	V _{IN (OFF)}		0	—	7.4	V
	TD62083AP / CP / F / AF			0	—	0.5	
	TD62084AP / CP / F / AF			0	—	1.0	
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)

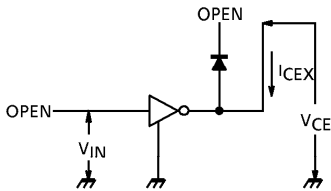
CHARACTERISTIC		SYMBOL	TEST CIR- CUIT	TEST CONDITION		MIN.	TYP.	MAX.	UNIT	
Output Leakage Current		AP, AF	I _{CEX}	1	V _{CE} = 50V	Ta = 25°C	—	—	50	μA
		CP			V _{CE} = 100V					
		F			V _{CE} = 35V					
		AP, AF			V _{CE} = 50V	Ta = 85°C	—	—	100	
		CP			V _{CE} = 100V					
		F			V _{CE} = 35V					
		AP, AF			V _{CE} = 50V	V _{IN} = 6V	—	—	500	
	TD62082	CP			V _{CE} = 100V					
		F			V _{CE} = 35V					
					AP, AF	V _{CE} = 50V	V _{IN} = 1V	—	—	
	TD62084	CP			V _{CE} = 100V					
		F			V _{CE} = 35V					
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			
	TD62084AP / CP / F / AF			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 MAX.

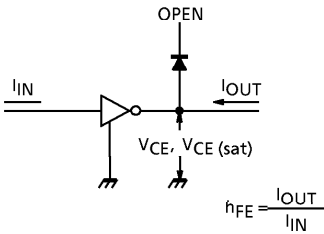
CHARACTERISTIC		SYMBOL	TEST CIR- CUIT	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Turn-On Delay	AP, AF	t _{ON}	8	R _L = 125Ω, V _{OUT} = 50V	—	0.1	—	μs
	CP			R _L = 312Ω, V _{OUT} = 100V	—	0.1	—	
	F			R _L = 87.5Ω, V _{OUT} = 35V	—	0.1	—	
Turn-Off Delay	AP, AF	t _{OFF}		R _L = 125Ω, V _{OUT} = 50V	—	0.2	—	
	CP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

TEST CIRCUIT

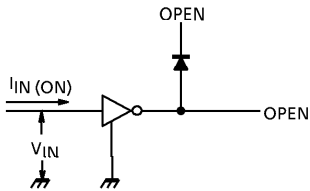
1. I_{CEX}



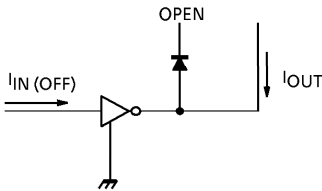
2. V_{CE} (sat), h_{FE}



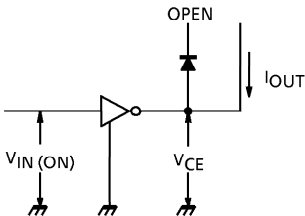
3. I_{IN} (ON)



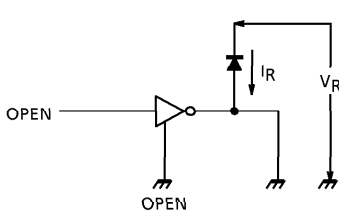
4. I_{IN} (OFF)



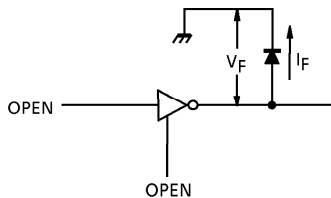
5. V_{IN} (ON)



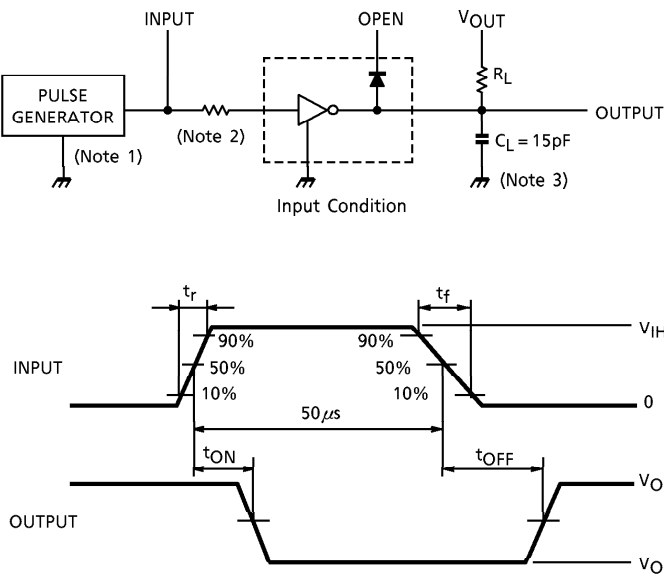
6. I_R



7. V_F



8. t_{ON} , t_{OFF}



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

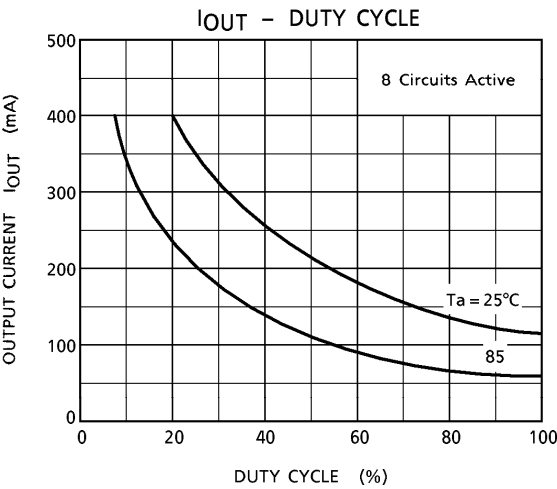
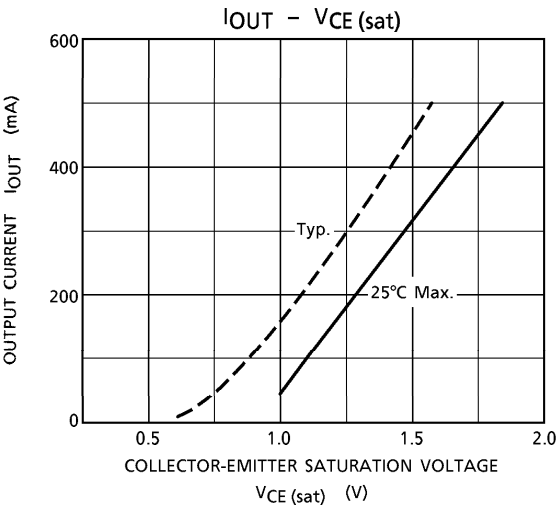
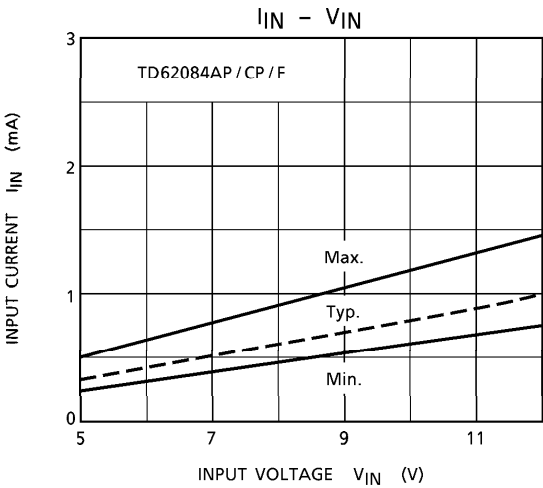
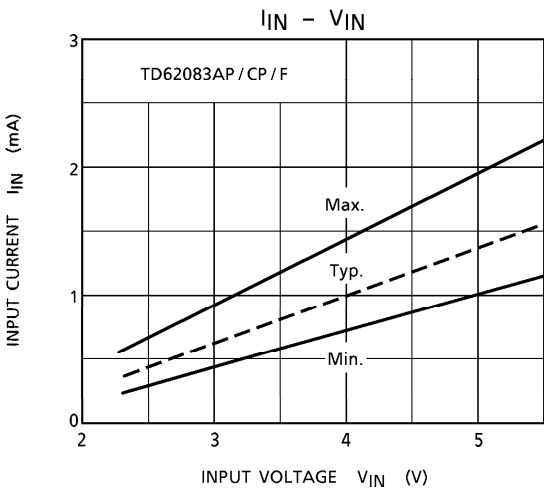
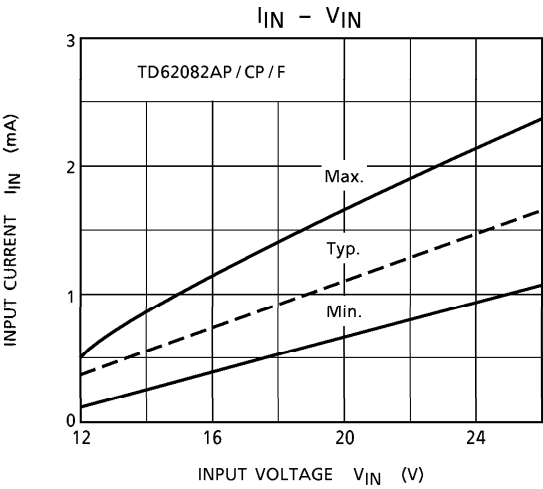
INPUT CONDITION

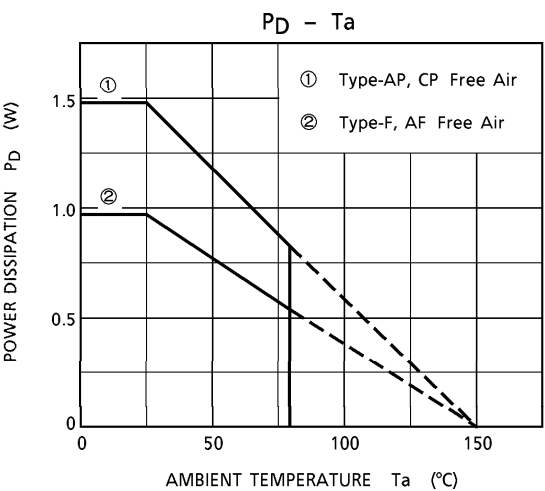
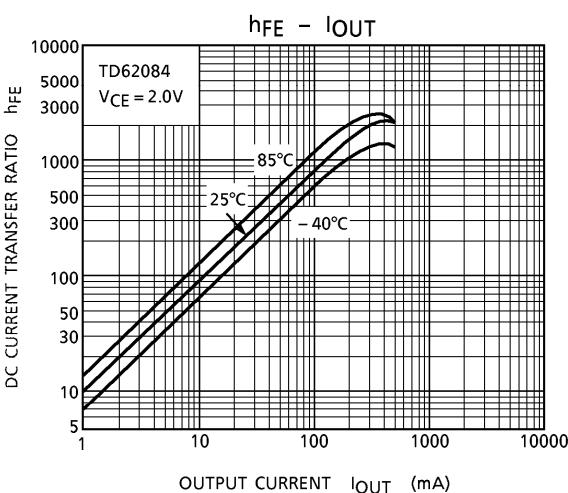
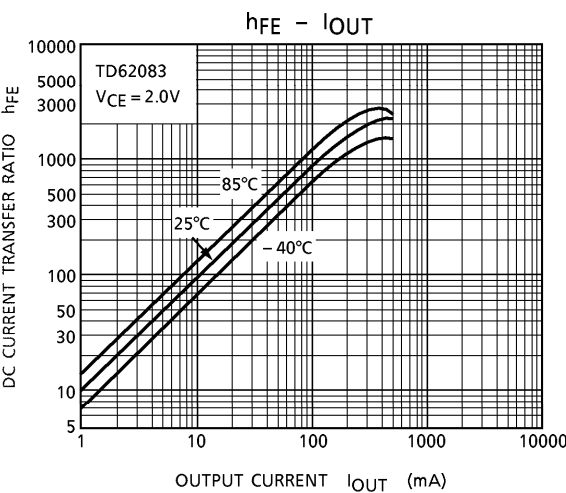
TYPE NUMBER	R1	V_{IH}
TD62081AP/CP/F/AF	$2.7k\Omega$	3V
TD62082AP/CP/F/AF	0Ω	13V
TD62083AP/CP/F/AF	0Ω	3V
TD62084AP/CP/F/AF	0Ω	8V

- (Note 3) C_L includes probe and jig capacitance

PRECAUTIONS for USING

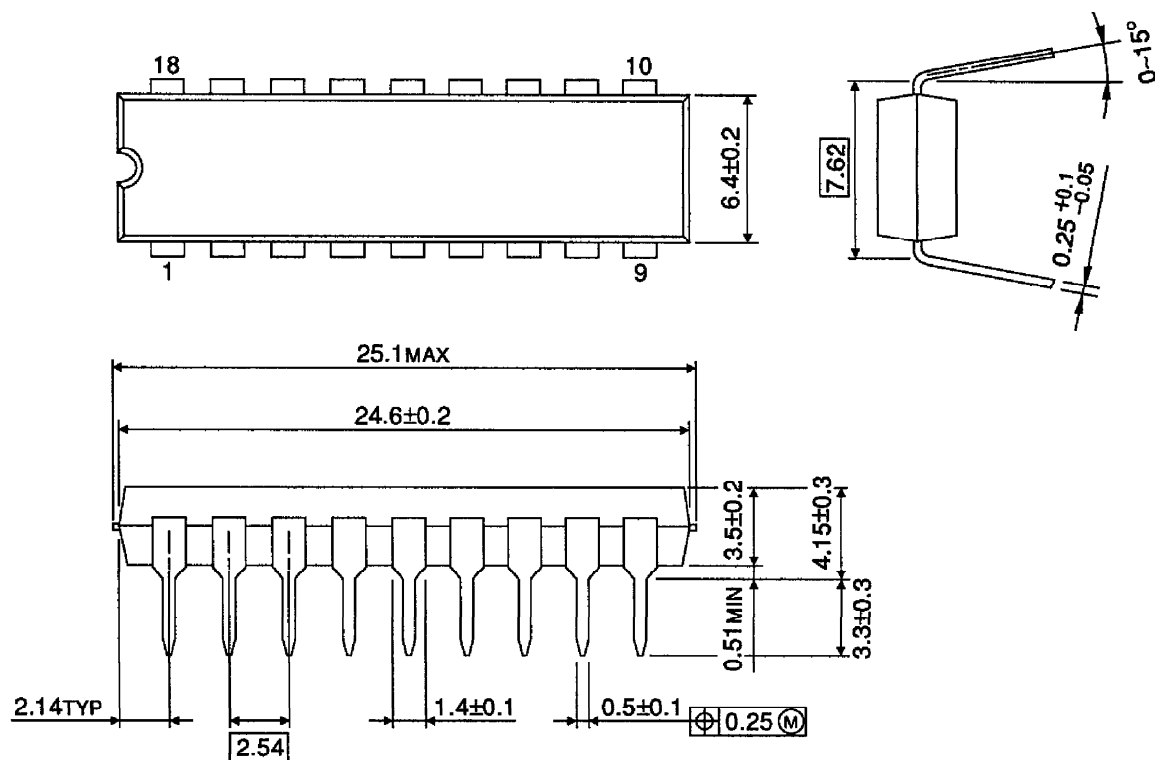
Utmost care is necessary in the design of the output line, COMMON and GND line since IC may be destroyed due to short-circuit between outputs, air contamination fault, or fault by improper grounding.





PACKAGE DIMENSIONS
DIP18-P-300-2.54D

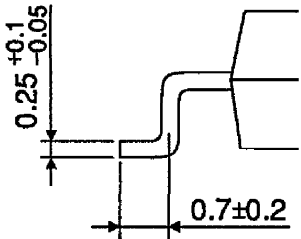
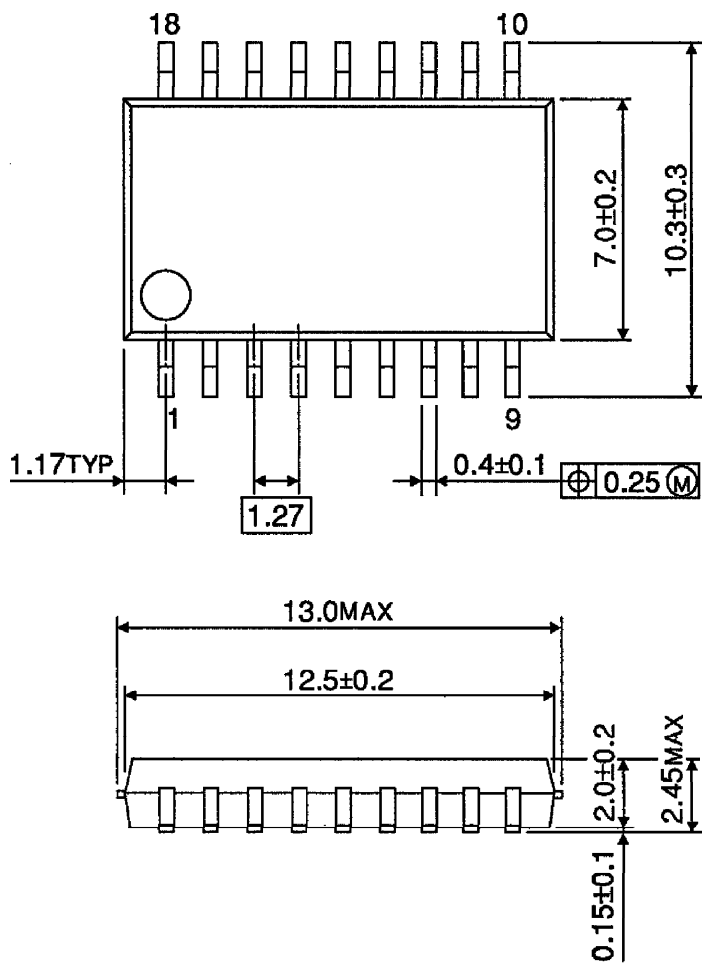
Unit : mm



Weight : 1.478g (Typ.)

PACKAGE DIMENSIONS
SOP18-P-375-1.27

Unit : mm



Weight : 0.41g (Typ.)