

TOSHIBA BIPOLAR DIGITAL INTEGRATED CIRCUIT SILICON MONOLITHIC

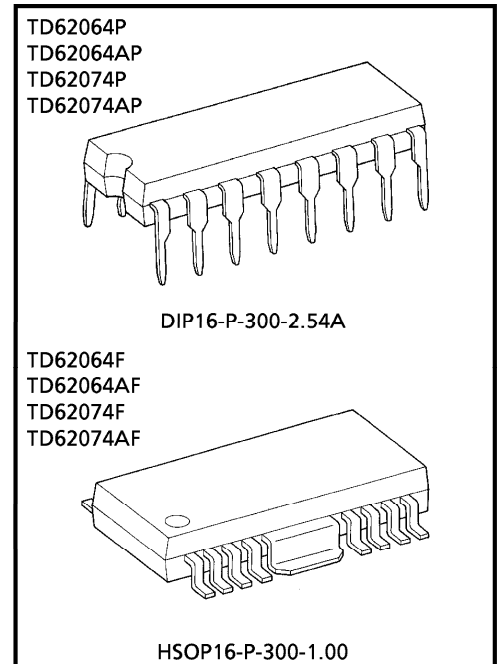
**TD62064P, TD62064AP, TD62064F, TD62064AF**  
**TD62074P, TD62074AP, TD62074F, TD62074AF**

**4CH HIGH-CURRENT DARLINGTON SINK DRIVER**

The TD62064P/AP/F/AF and TD62074P/AP/F/AF are high-voltage, high-current darlington drivers comprised of four NPN darlington pairs. All units feature integral clamp diodes for switching inductive loads and all units of TD62074P/AP/F/AF feature uncommitted collectors and emitters for isolated darlington applications. For proper operation, the substrate (SUB) must be connected to the most negative voltage. Applications include relay, hammer, lamp and stepping moter drivers.

**FEATURES**

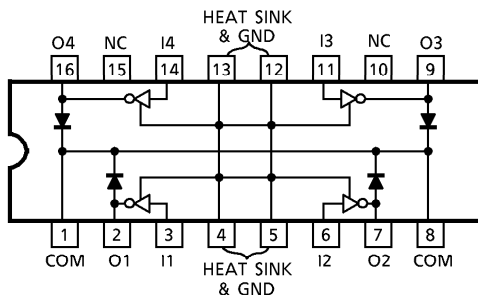
- Output current (single output) 1.5A (Max.)
- High sustaining voltage output  
 35V (Min.) (TD62064P/F, 074P/F)  
 50V (Min.) (TD62064AP/AF, 074AP/AF)
- Output clamp diodes : TD62064P/AP/F/AF
- Isolated darlington array : TD62074P/AP/F/AF
- Input compatible with TTL and 5V CMOS
- GND and SUB terminal = heat sink
- Package type-P, AP : DIP-16pin
- Package type-F, AF : HSOP-16pin



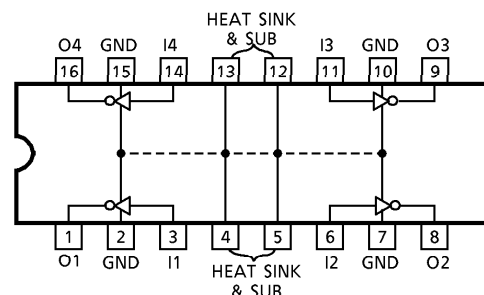
**Weight**  
 DIP16-P-300-2.54A : 1.11g (Typ.)  
 HSOP16-P-300-1.00 : 0.50g (Typ.)

**PIN CONNECTION (TOP VIEW)**

TD62064P/AP



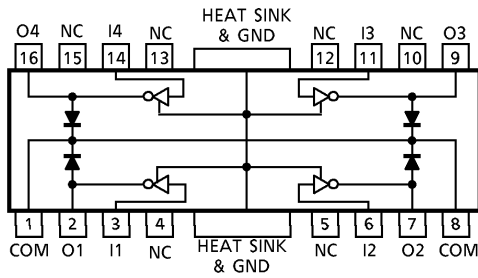
TD62074P/AP



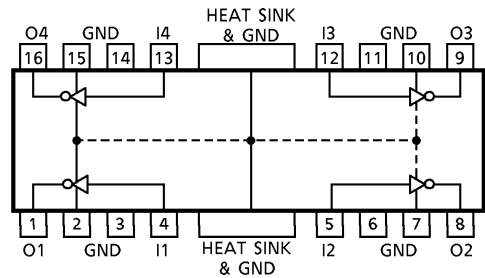
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TD62064F / AF

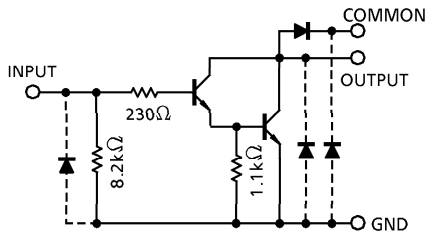


TD62074F / AF

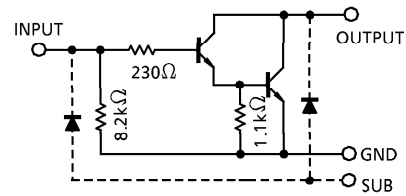


**SCHEMATICS (EACH DRIVER)**

TD62064P / AP / F / AF



TD62074P / AP / 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	P, F	V <sub>CE (SUS)</sub>	- 0.5~35	V
	AP, AF		- 0.5~50	
Output Current		I <sub>OUT</sub>	1.5	A / ch
Input Current		I <sub>IN</sub>	50	mA
Input Voltage		V <sub>IN</sub>	- 0.5~17	V
Clamp Diode Reverse Voltage	P, F	V <sub>R</sub> (Note 1)	35	V
	AP, AF		50	
Clamp Diode Forward Current		I <sub>F</sub> (Note 1)	1.5	A / ch
Isolated Voltage	P, F	V <sub>SUB</sub> (Note 2)	35	V
	AP, AF		50	
Power Dissipation	P, AP	P <sub>D</sub>	1.47 / 2.7 (Note 3)	W
	F, AF		0.9 / 1.4 (Note 4)	
Operating Temperature		T <sub>opr</sub>	- 40~85	°C
Storage Temperature		T <sub>stg</sub>	- 55~150	°C

(Note 1) TD62064P / AP / F / AF

(Note 2) TD62074P / AP / F / AF

(Note 3) On Glass Epoxy (50 × 50 × 1.6mm Cu 50%)

(Note 4) On Glass Epoxy (60 × 30 × 1.6mm Cu 30%)

**RECOMMENDED OPERATING CONDITIONS (Ta = -40~85°C)**

CHARACTERISTIC		SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Output Sustaining Voltage	P, F	V <sub>CE (SUS)</sub>		0	—	35	V
	AP, AF			0	—	50	
Output Current	P, AP (Note 1)	I <sub>OUT</sub>	DC1 Circuit, Ta = 25°C	0	—	1250	mA / ch
			T <sub>pw</sub> = 25ms 4 Circuits	Duty = 10%	0	—	
	Duty = 50%			0	—	390	
	F, AF (Note 2)		T <sub>j</sub> = 120°C	Duty = 10%	0	—	
Ta = 85°C		Duty = 50%	0	—	172		
Input Voltage		V <sub>IN</sub>		0	—	8	V
	(Output On)	V <sub>IN (ON)</sub>	I <sub>OUT</sub> = 1.25A	2.5	—	8	V
	(Output Off)	V <sub>IN (OFF)</sub>		0	—	0.4	V
Input Current		I <sub>IN</sub>		0	—	20	mA
Clamp Diode Reverse Voltage	P, F	V <sub>R</sub>	TD62064P / AP / F / AF	0	—	35	V
	AP, AF			0	—	50	
Clamp Diode Forward Current		I <sub>F</sub>		—	—	1.25	A
Isolation Voltage	P, F	V <sub>SUB</sub>	TD62074P / AP / F / AF	—	—	35	V
	AP, AF			—	—	50	
Power Dissipation	P, AP	P <sub>D</sub>	Ta = 85°C (Note 1)	—	—	1.4	W
	F, AF		Ta = 85°C (Note 2)	—	—	0.7	

(Note 1) On Glass Epoxy (50×50×1.6mm Cu 50%)

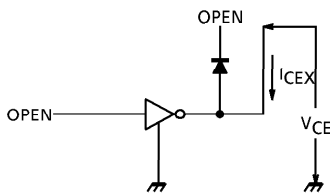
(Note 2) On Glass Epoxy (60×30×1.6mm Cu 30%)

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

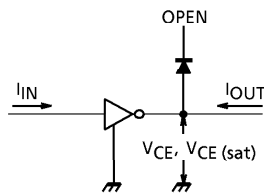
CHARACTERISTIC		SYMBOL	TEST CIRCUIT	TEST CONDITION	MIN.	TYP.	MAX.	UNIT	
Output Leakage Current	AP, AF	$I_{CEX}$	1	$V_{CE} = 50V, Ta = 25^{\circ}C$	—	—	50	$\mu A$	
				$V_{CE} = 50V, Ta = 85^{\circ}C$	—	—	500		
	P, F			$V_{CE} = 35V, Ta = 25^{\circ}C$	—	—	50		
				$V_{CE} = 35V, Ta = 85^{\circ}C$	—	—	500		
Collector-Emitter Saturation Voltage		$V_{CE(sat)}$	2	$I_{OUT} = 1.25A, I_{IN} = 2mA$	—	—	1.6	V	
				$I_{OUT} = 0.75A, I_{IN} = 935\mu A$	—	—	1.25		
DC Current Transfer Ratio		$h_{FE}$	2	$V_{CE} = 2V$		800	—		
					$I_{OUT} = 0.25A$	1500	—		
Input Voltage (Output On)		$V_{IN(ON)}$	3	$I_{OUT} = 1.25A, I_{IN} = 2mA$	—	—	2.4	V	
Clamp Diode Leakage Current	AP, AF	$I_R$	4	$V_R = 50V, Ta = 25^{\circ}C$	—	—	50	$\mu A$	
				$V_R = 50V, Ta = 85^{\circ}C$	—	—	100		
	F			$V_R = 35V, Ta = 25^{\circ}C$	—	—	50		
				$V_R = 35V, Ta = 85^{\circ}C$	—	—	100		
Clamp Diode Forward Voltage		$V_F$	5	$I_F = 1.25A$	—	—	2	V	
Input Capacitance		$C_{IN}$	6	$V_{IN} = 0V, f = 1MHz$	—	15	—	pF	
Turn-On Delay	P, F	$t_{ON}$	7	$C_L = 15pF$	$V_{OUT} = 35V$ $R_L = 29\Omega$	—	0.1	$\mu s$	
	AP, AF				$V_{OUT} = 50V$ $R_L = 42\Omega$				
Turn-Off Delay	P, F	$t_{OFF}$			$V_{OUT} = 35V$ $R_L = 29\Omega$	—	1.0		—
	AP, AF				$V_{OUT} = 50V$ $R_L = 42\Omega$				

**TEST CIRCUIT**

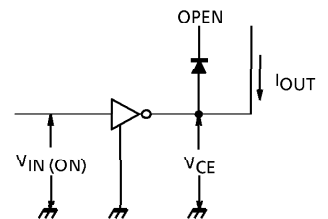
1.  $I_{CEX}$



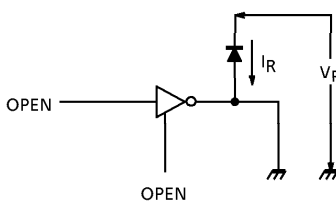
2.  $V_{CE(sat)}, h_{FE}$



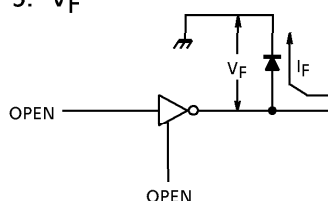
3.  $V_{IN(ON)}$



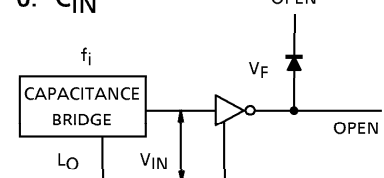
4.  $I_R$



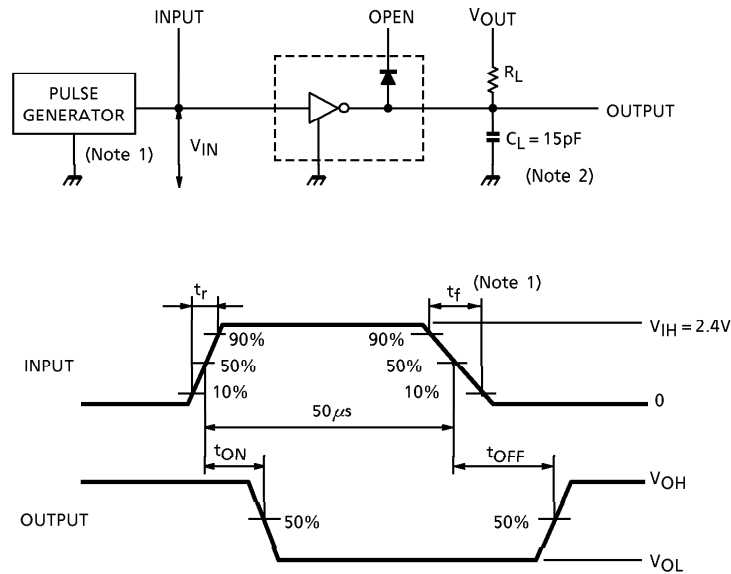
5.  $V_F$



6.  $C_{IN}$



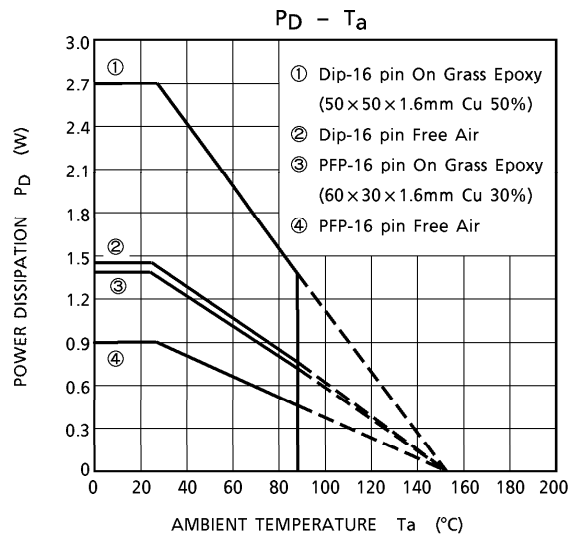
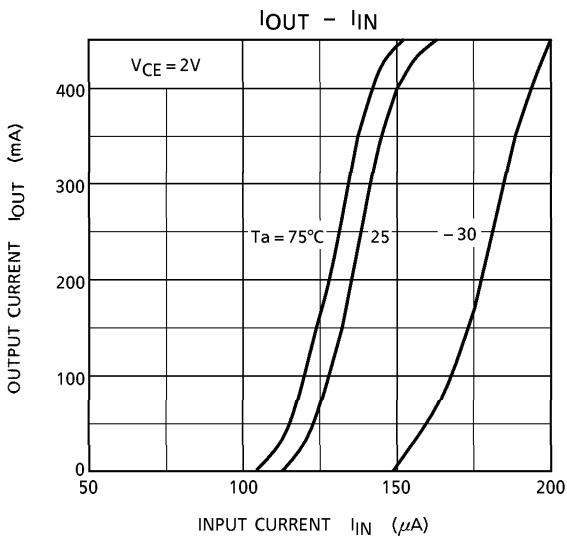
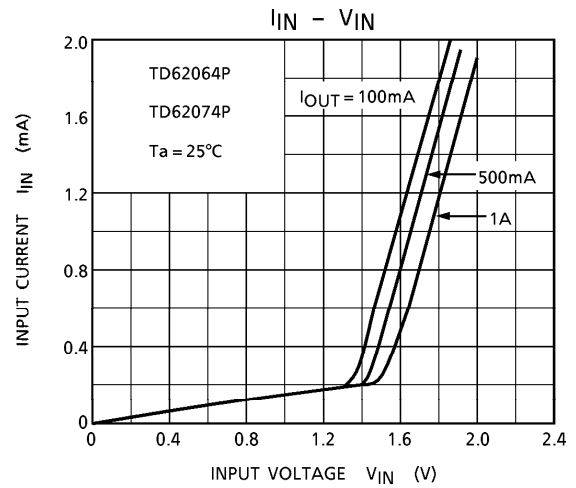
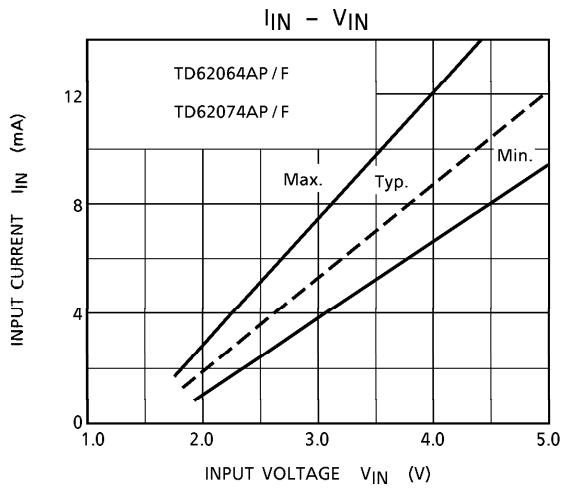
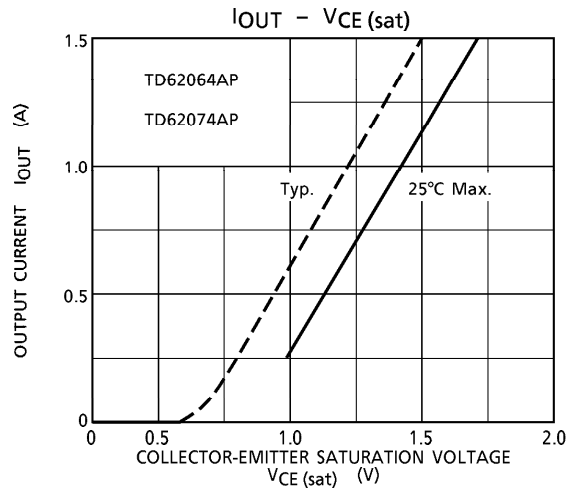
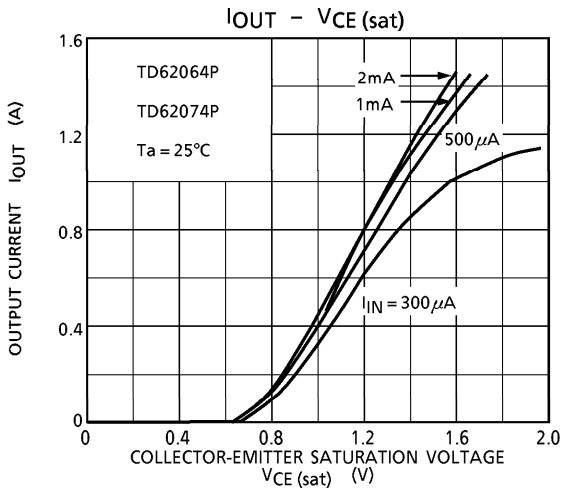
7.  $t_{ON}$ ,  $t_{OFF}$

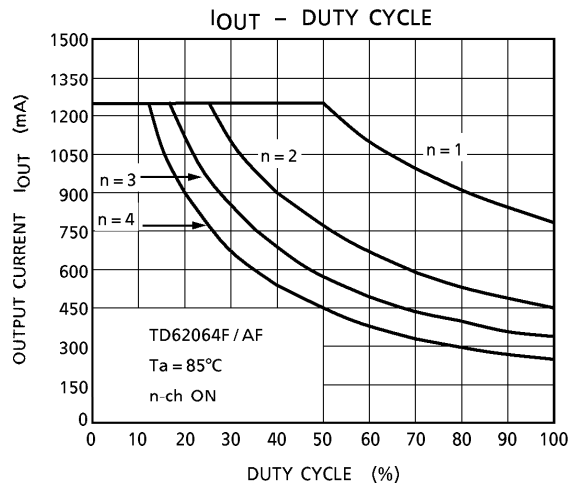
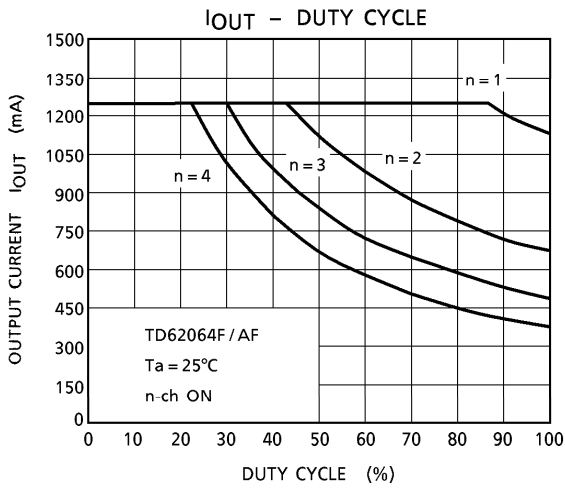
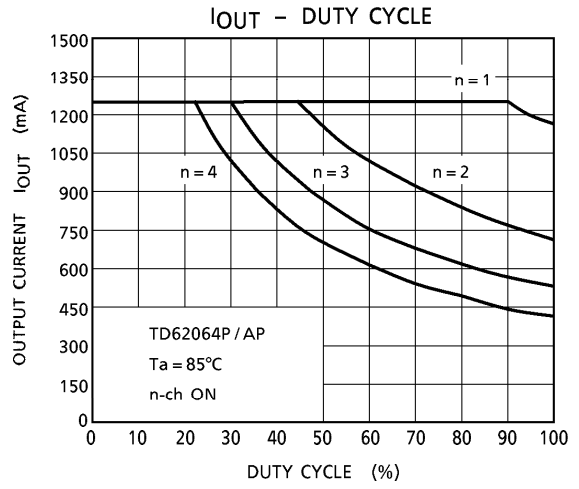
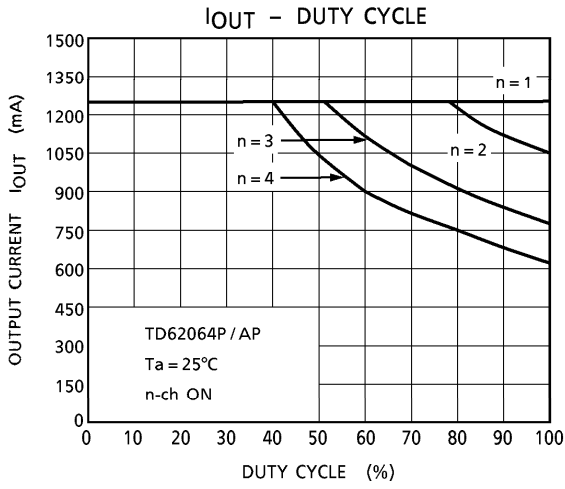


- (Note 1) Pulse Width  $50\mu s$ , Duty Cycle 10%  
Output Impedance  $50\Omega$ ,  $t_r \leq 5ns$ ,  $t_f \leq 10ns$
- (Note 2)  $C_L$  includes probe and jig capacitance

**PRECAUTIONS for USING**

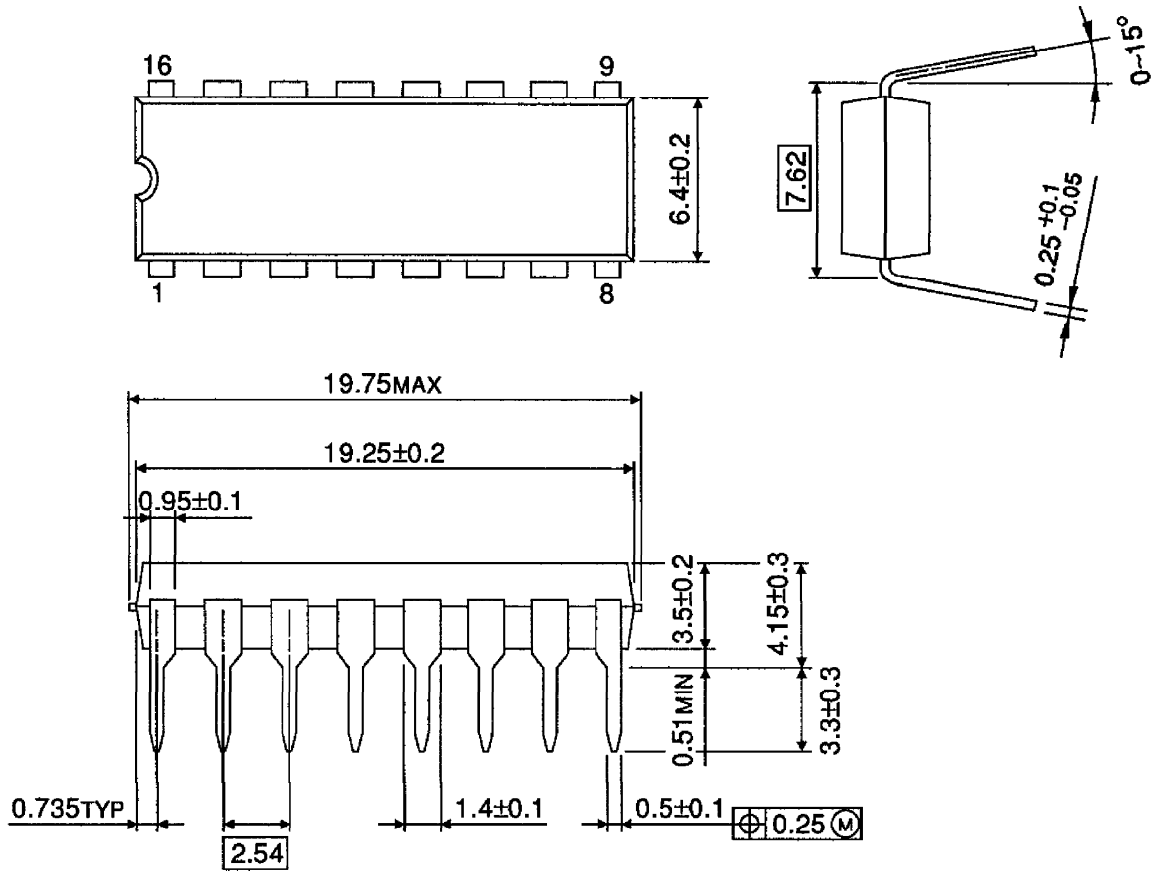
Utmost care is necessary in the design of the output line, COMMON and GND line since IC may be destroyed due to short-circuit between outputs, air contamination fault, or fault by improper grounding.





PACKAGE DIMENSIONS  
DIP16-P-300-2.54A

Unit : mm

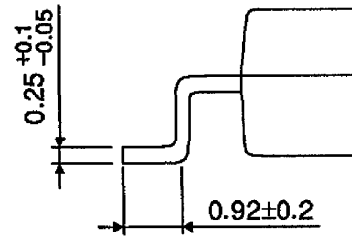
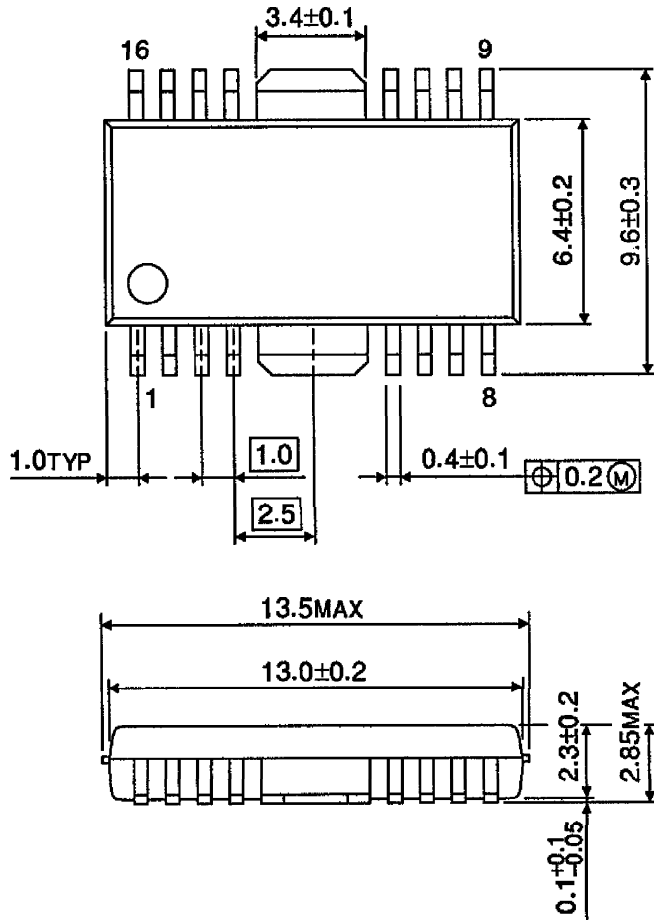


Weight : 1.11g (Typ.)



PACKAGE DIMENSIONS  
HSOP16-P-300-1.00

Unit : mm



Weight : 0.50g (Typ.)