

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.

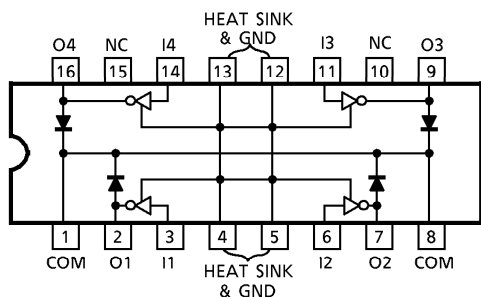
Applications include relay, hammer, lamp and stepping motor drivers.

FEATURES

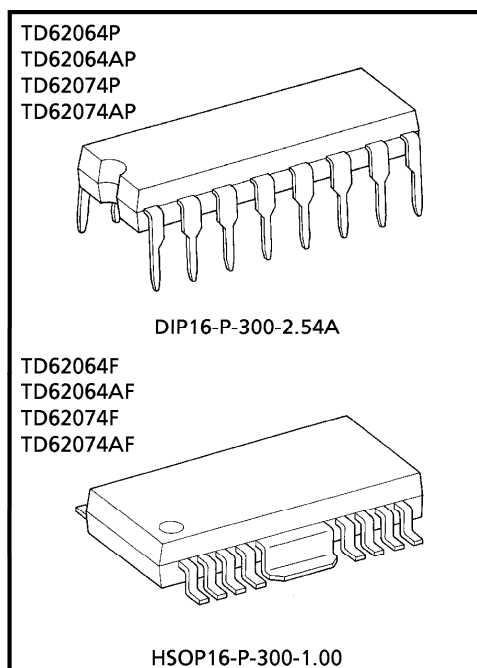
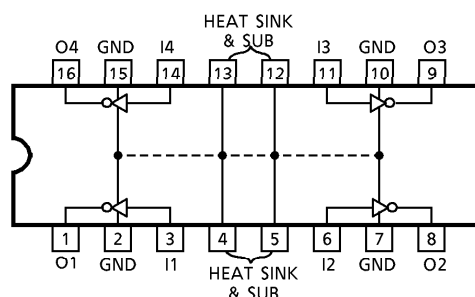
- Output current (single output) 1.5A (Max.)
- High sustaining voltage output
35V (Min.) (TD62064P/F, 074P/F)
50V (Min.) (TD62064AP/AF, 074AP/AF)
- Output clamp diodes : TD62064P/AP/F/AF
- Isolated darlington array : TD62074P/AP/F/AF
- Input compatible with TTL and 5V CMOS
- GND and SUB terminal = heat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

PIN CONNECTION (TOP VIEW)

TD62064P/AP



TD62074P/AP



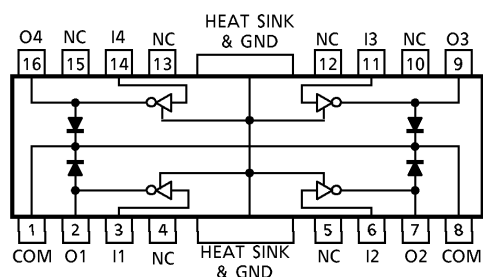
Weight

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

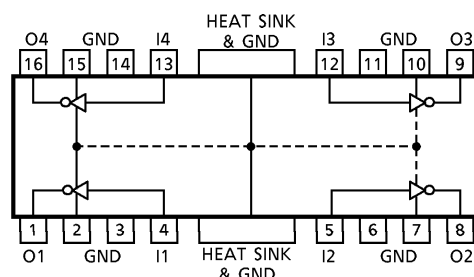
980910EBA2

- TOSHIBA is continually working to improve the quality and the reliability of its products. Nevertheless, semiconductor devices in general can malfunction or fail due to their inherent electrical sensitivity and vulnerability to physical stress. It is the responsibility of the buyer, when utilizing TOSHIBA products, to observe standards of safety, and to avoid situations in which a malfunction or failure of a TOSHIBA product could cause loss of human life, bodily injury or damage to property. In developing your designs, please ensure that TOSHIBA products are used within specified operating ranges as set forth in the most recent products specifications. Also, please keep in mind the precautions and conditions set forth in the TOSHIBA Semiconductor Reliability Handbook.
- The products described in this document are subject to the foreign exchange and foreign trade laws.
- The information contained herein is presented only as a guide for the applications of our products. No responsibility is assumed by TOSHIBA CORPORATION for any infringements of intellectual property or other rights of the third parties which may result from its use. No license is granted by implication or otherwise under any intellectual property or other rights of TOSHIBA CORPORATION or others.
- The information contained herein is subject to change without notice.

TD62064F / AF

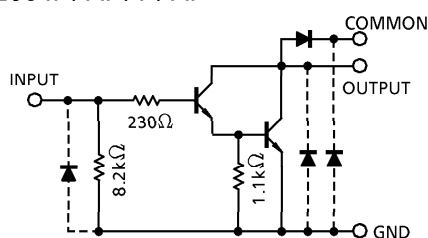


TD62074F / AF

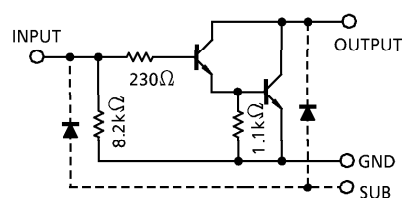


SCHEMATICS (EACH DRIVER)

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	$V_{CE(SUS)}$	- 0.5~35	V
	AP, AF		- 0.5~50	
Output Current		I_{OUT}	1.5	A / ch
Input Current		I_{IN}	50	mA
Input Voltage		V_{IN}	- 0.5~17	V
Clamp Diode Reverse Voltage	P, F	V_R (Note 1)	35	V
	AP, AF		50	
Clamp Diode Forward Current		I_F (Note 1)	1.5	A / ch
Isolated Voltage	P, F	V_{SUB} (Note 2)	35	V
	AP, AF		50	
Power Dissipation	P, AP	P_D	1.47 / 2.7 (Note 3)	W
	F, AF		0.9 / 1.4 (Note 4)	
Operating Temperature		T_{opr}	- 40~85	°C
Storage Temperature		T_{stg}	- 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 _{CE (SUS)}			0	—	35	V
	AP, AF				0	—	50	
Output Current		I _{OUT}	DC1 Circuit, Ta = 25°C		0	—	1250	mA / ch
	P, AP (Note 1)		T _{pw} = 25ms 4 Circuits T _j = 120°C Ta = 85°C	Duty = 10%	0	—	1250	
				Duty = 50%	0	—	390	
	F, AF (Note 2)			Duty = 10%	0	—	907	
				Duty = 50%	0	—	172	
Input Voltage		V _{IN}			0	—	8	V
	(Output On)	V _{IN (ON)}	I _{OUT} = 1.25A		2.5	—	8	V
	(Output Off)	V _{IN (OFF)}			0	—	0.4	V
Input Current		I _{IN}			0	—	20	mA
Clamp Diode Reverse Voltage	P, F	V _R	TD62064P / AP / F / AF		0	—	35	V
	AP, AF				0	—	50	
Clamp Diode Forward Current		I _F			—	—	1.25	A
Isolation Voltage	P, F	V _{SUB}	TD62074P / AP / F / AF		—	—	35	V
	AP, AF				—	—	50	
Power Dissipation	P, AP	P _D	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%)

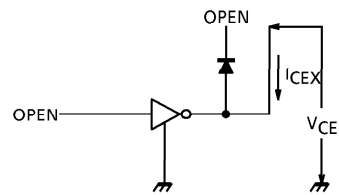
(Note 2) On Glass Epoxy (60×30×1.6mm Cu 30%)

ELECTRICAL CHARACTERISTICS (Ta = 25°C)

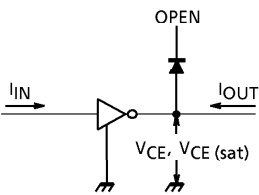
CHARACTERISTIC		SYMBOL	TEST CIRCUIT	TEST CONDITION		MIN.	TYP.	MAX.	UNIT
Output Leakage Current	AP, AF	I _{CEX}	1	V _{CE} = 50V, Ta = 25°C		—	—	50	μA
	V _{CE} = 50V, Ta = 85°C			—	—	500			
	P, F			V _{CE} = 35V, Ta = 25°C		—	—	50	
				V _{CE} = 35V, Ta = 85°C		—	—	500	
Collector-Emitter Saturation Voltage		V _{CE (sat)}	2	I _{OUT} = 1.25A, I _{IN} = 2mA		—	—	1.6	V
				I _{OUT} = 0.75A, I _{IN} = 935μA		—	—	1.25	
DC Current Transfer Ratio		h _{FE}	2	V _{CE} = 2V	I _{OUT} = 1.0A	—	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°C		—	—	50	μA
	V _R = 50V, Ta = 85°C			—	—	100			
	F			V _R = 35V, Ta = 25°C		—	—	50	
				V _R = 35V, Ta = 85°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 = 29Ω	—	0.1	—	μs
	AP, AF				V _{OUT} = 50V R _L = 42Ω				
Turn-Off Delay	P, F	t _{OFF}			V _{OUT} = 35V R _L = 29Ω	—	1.0	—	
	AP, AF				V _{OUT} = 50V R _L = 42Ω				

TEST CIRCUIT

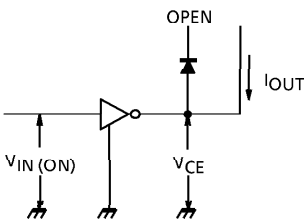
1. I_{CEX}



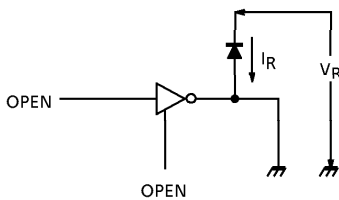
2. $V_{CE(sat)}$, h_{FE}



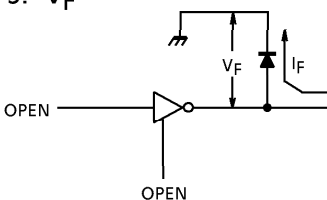
3. $V_{IN(ON)}$



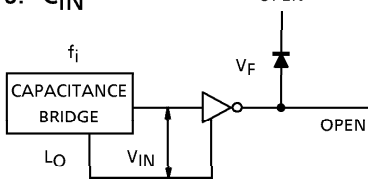
4. I_R

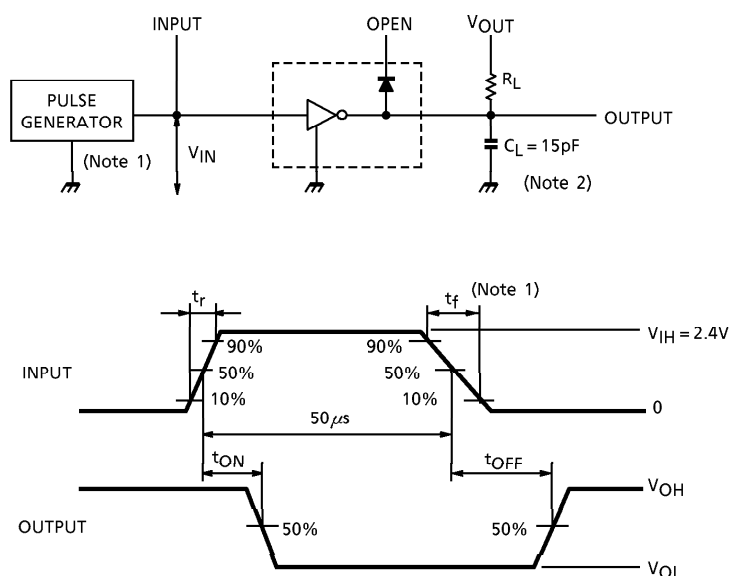


5. V_F



6. C_{IN}



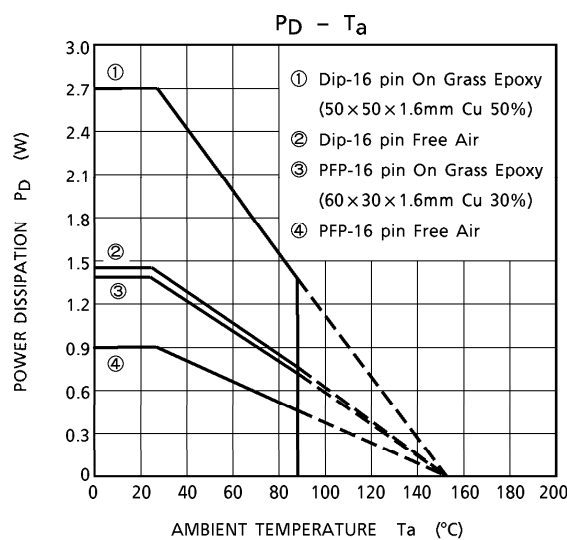
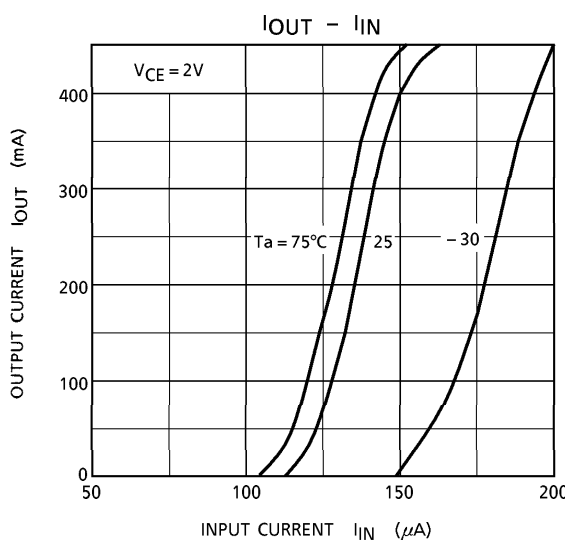
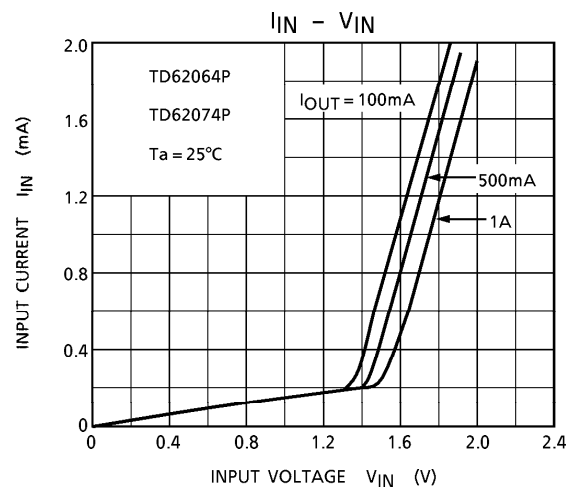
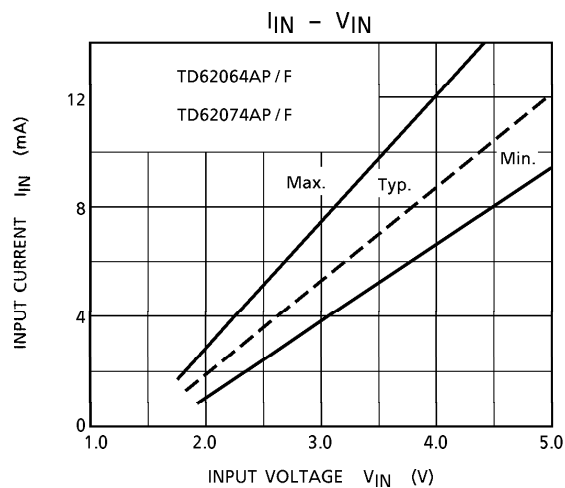
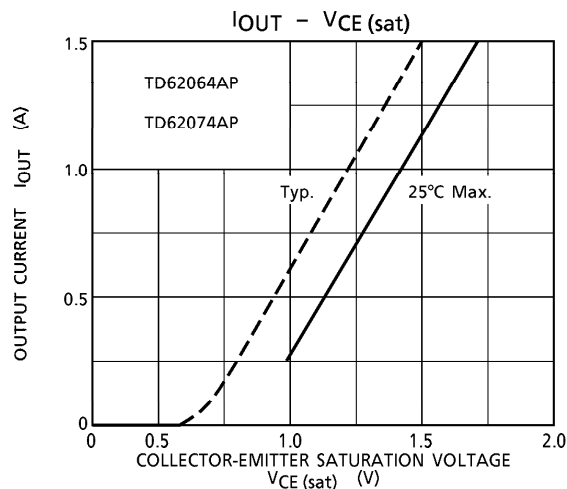
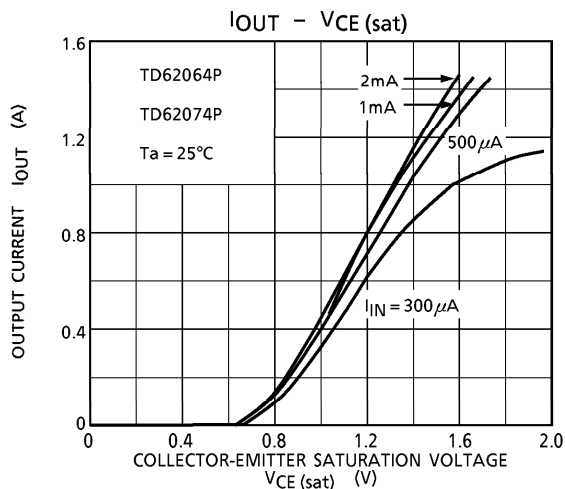
7. t_{ON} , t_{OFF} 

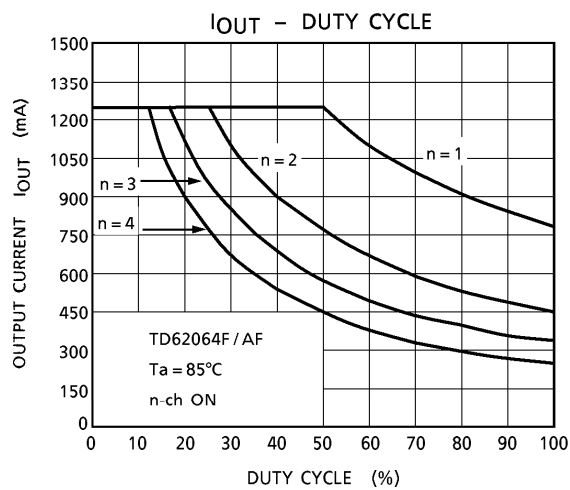
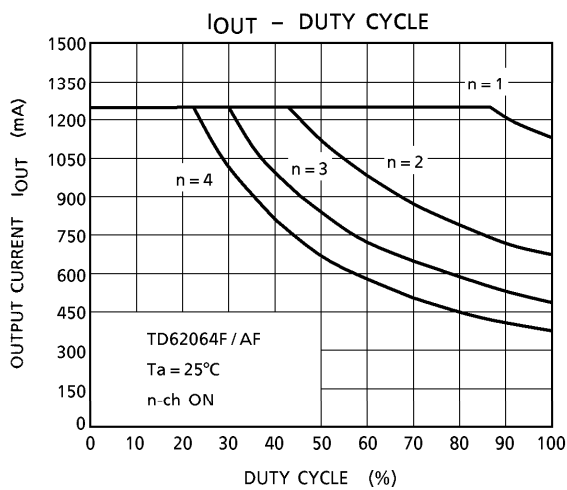
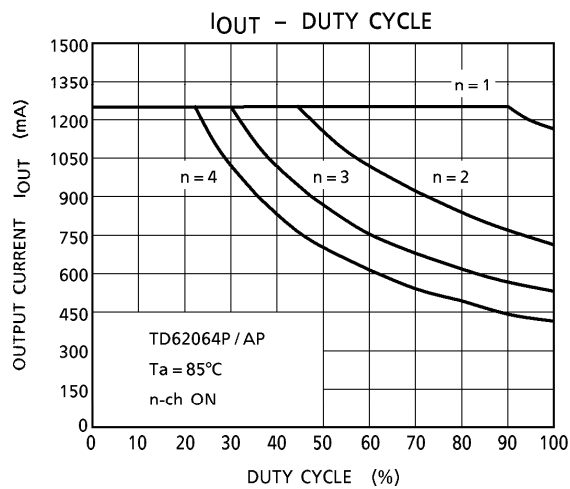
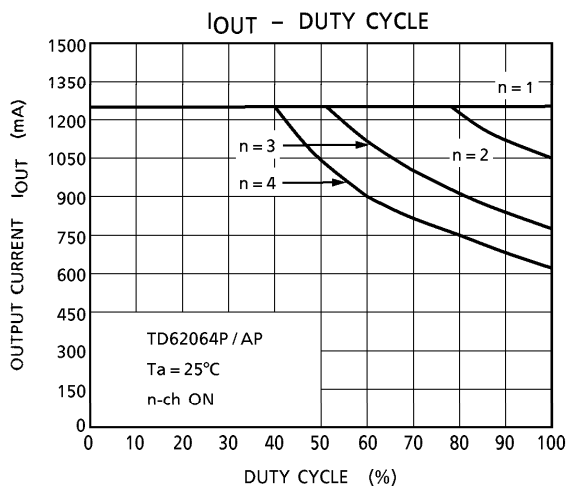
(Note 1) Pulse Width $50\mu\text{s}$, Duty Cycle 10%
Output Impedance 50Ω , $t_r \leq 5\text{ns}$, $t_f \leq 10\text{ns}$

(Note 2) C_L includes probe and jig capacitance

PRECAUTIONS for USING

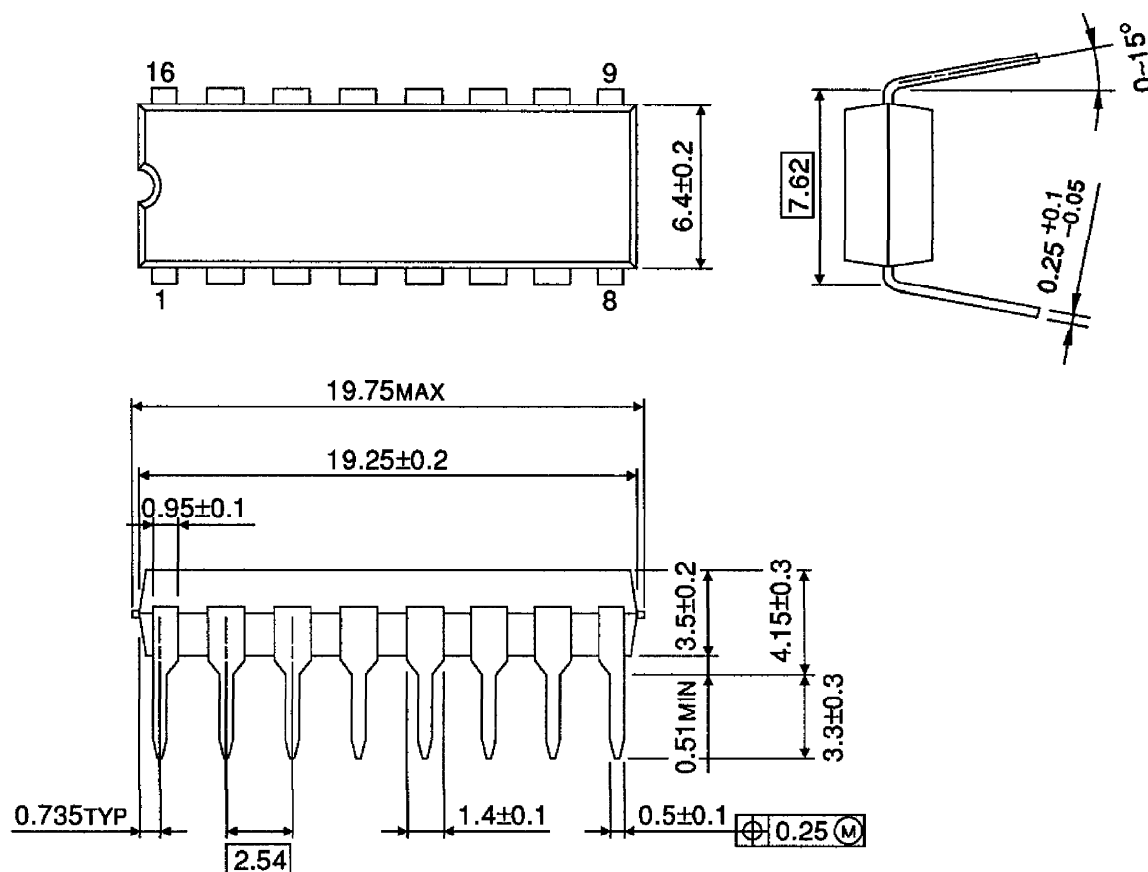
Utmost care is necessary in the design of the output line, COMMON and GND line since IC may be destroyed due to short-circuit between outputs, air contamination fault, or fault by improper grounding.





PACKAGE DIMENSIONS
DIP16-P-300-2.54A

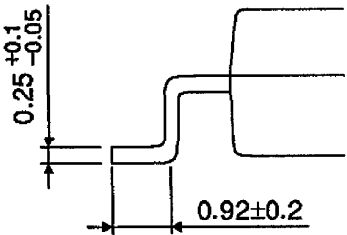
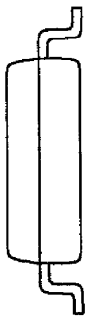
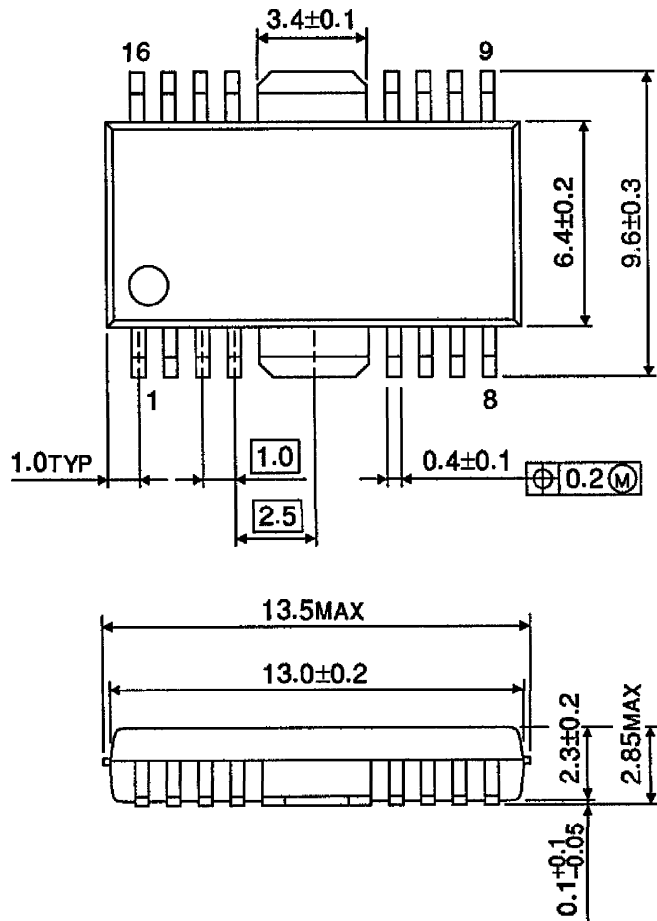
Unit : mm



Weight : 1.11g (Typ.)

PACKAGE DIMENSIONS
HSOP16-P-300-1.00

Unit : mm



Weight : 0.50g (Typ.)