

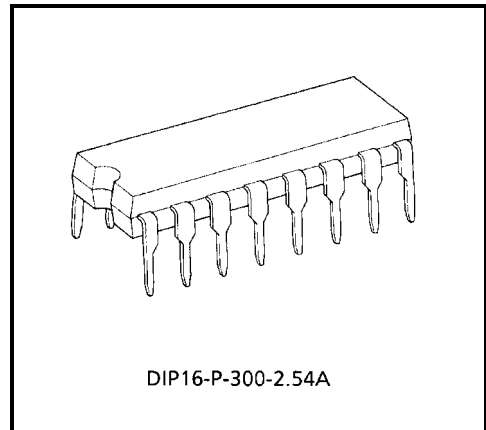
TD62003PA,TD62003APA,TD62004PA,TD62004APA

7CH DARLINGTON SINK DRIVER

The TD62003PA / APA Series are high-voltage, high-current darlington drivers comprised of seven NPN darlington pairs. All units feature integral clamp diodes for switching inductive loads. Applications include relay, hammer, lamp and display (LED) drivers.

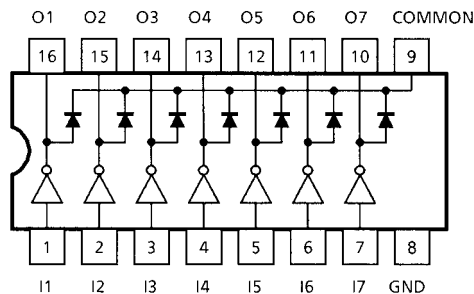
FEATURES

- Output current (single output) 500 mA (Max.)
- High sustaining voltage output
35 V (Min.) (TD62003PA series)
50 V (Min.) (TD62003APA series)
- Output clamp diodes
- Inputs compatible with various types of logic.
TD62003PA, APA $R_{IN} = 2.7 \text{ k}\Omega$
TD62004PA, APA $R_{IN} = 10.5 \text{ k}\Omega$
- Package DIP-16 pin

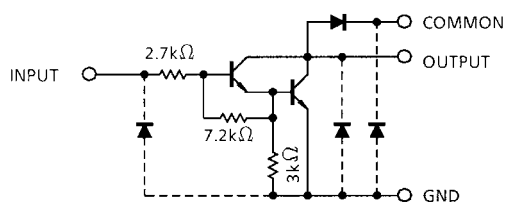
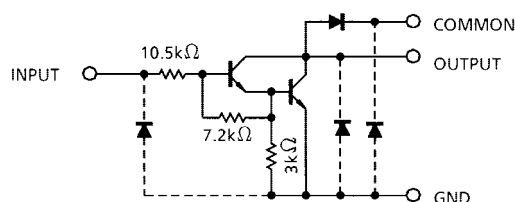


Weight: 1.11g (Typ.)

PIN CONNECTION (TOP VIEW)



SCHEMATICS (EACH DRIVER)

TD62003PA / APA

TD62004PA / APA


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	PA	$V_{CE(SUS)}$	-0.5~35	V
	APA		-0.5~50	
Output Current		I_{OUT}	500	mA / ch
Input Voltage		V_{IN}	-0.5~30	V
Clamp Diode Reverse Voltage	PA	V_R	35	V
	APA		50	
Clamp Diode Forward Current		I_F	500	mA
Power Dissipation		P_D	1.47	W
Operating Temperature	PA	T_{opr}	-30~75	°C
	APA		-40~85	
Storage Temperature		T_{stg}	-55~150	°C

RECOMMENDED OPERATING CONDITIONS

(Ta = -40~85°C for Type-APA and Ta = -30~75°C for Type-PA)

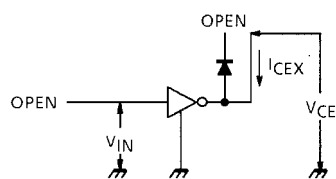
CHARACTERISTIC		SYMBOL	CONDITION		MIN	TYP.	MAX	UNIT	
Output Sustaining Voltage	PA	$V_{CE(SUS)}$			0	—	35	V	
	APA				0	—	50		
Output Current	PA	I_{OUT}	$T_{pw} = 25\text{ ms}$ 7 Circuits	Duty = 10%	0	—	370	mA / ch	
	Duty = 50%			0	—	140			
	APA			Duty = 10%	0	—	400		
				Duty = 50%	0	—	170		
Input Voltage			V_{IN}			0	—	24	V
	TD62003	$V_{IN(ON)}$	$I_{OUT} = 400\text{ mA}, h_{FE} = 800$		2.8	—	24	V	
	TD62004				6.2	—	24		
	TD62003	$V_{IN(OFF)}$			0	—	0.7	V	
	TD62004				0	—	1.0		
Clamp Diode Reverse Voltage	PA	V_R			—	—	35	V	
	APA				—	—	50		
Clamp Diode Forward Current		I_F			—	—	350	mA	
Power Dissipation		P_D	$T_a = 85^{\circ}\text{C}$		—	—	0.52	W	

ELECTRICAL CHARACTERISTICS (Ta = 25°C)

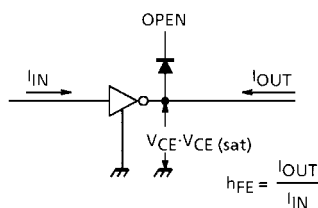
CHARACTERISTIC		SYMBOL	TEST CIR- CUIT	TEST CONDITION	MIN	TYP.	MAX	UNIT	
Output Leakage Current	APA	I _{CEX}	1	V _{CE} = 50 V, T _a = 25°C	—	—	50	μA	
				V _{CE} = 50 V, T _a = 85°C	—	—	100		
	PA			V _{CE} = 35 V, T _a = 25°C	—	—	50		
				V _{CE} = 35 V, T _a = 75°C	—	—	100		
Collector-Emitter Saturation Voltage		V _{CE (sat)}	2	I _{OUT} = 350 mA, I _{IN} = 500 μA	—	1.3	1.6	V	
				I _{OUT} = 200 mA, I _{IN} = 350 μA	—	1.1	1.3		
				I _{OUT} = 100 mA, I _{IN} = 250 μA	—	0.9	1.1		
DC Current Transfer Ratio		h _{FE}	2	V _{CE} = 2 V, I _{OUT} = 350 mA	1000	—	—		
Input Current (Output On)	TD62003	I _{IN (ON)}	3	V _{IN} = 2.4 V, I _{OUT} = 350 mA	—	0.4	0.7	mA	
	TD62004			V _{IN} = 9.5 V, I _{OUT} = 350 mA	—	0.8	1.3		
	PA	I _{IN (OFF)}	4	I _{OUT} = 500 μA, T _a = 75°C	50	65	—	μA	
	APA			I _{OUT} = 500 μA, T _a = 85°C	50	65	—		
Input Voltage (Output On)	TD62003	V _{IN (ON)}	5	V _{CE} = 2 V h _{FE} = 800	I _{OUT} = 350 mA	—	—	2.6	V
					I _{OUT} = 200 mA	—	—	2.0	
	TD62004				I _{OUT} = 350 mA	—	—	4.7	
					I _{OUT} = 200 mA	—	—	4.4	
Clamp Diode Reverse Current	APA	I _R	6	V _R = 50 V, T _a = 25°C	—	—	50	μA	
				V _R = 50 V, T _a = 85°C	—	—	100		
	PA			V _R = 35 V, T _a = 25°C	—	—	50		
				V _R = 35 V, T _a = 75°C	—	—	100		
Clamp Diode Forward Voltage		V _F	7	I _F = 350 mA	—	—	2.0	V	
Input Capacitance		C _{IN}	—		—	15	—	pF	
Turn-On Delay	PA	t _{ON}	8	V _{OUT} = 35 V, R _L = 85 Ω C _L = 15 pF	—	0.1	—	μs	
	APA			V _{OUT} = 50 V, R _L = 125 Ω C _L = 15 pF	—	0.1	—		
Turn-Off Delay	PA	t _{OFF}	8	V _{OUT} = 35 V, R _L = 85 Ω C _L = 15 pF	—	0.2	—		
	APA			V _{OUT} = 50 V, R _L = 125 Ω C _L = 15 pF	—	0.2	—		

TEST CIRCUIT

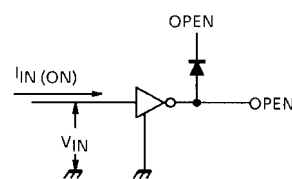
1. I_{CEX}



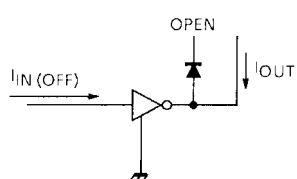
2. $V_{CE(sat)}$, h_{FE}



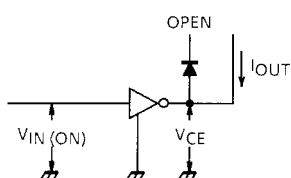
3. $I_{IN(ON)}$



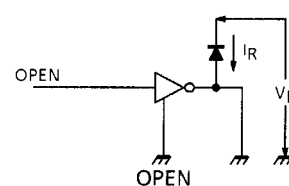
4. $I_{IN(OFF)}$



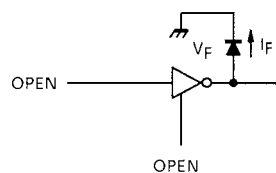
5. $V_{IN(ON)}$



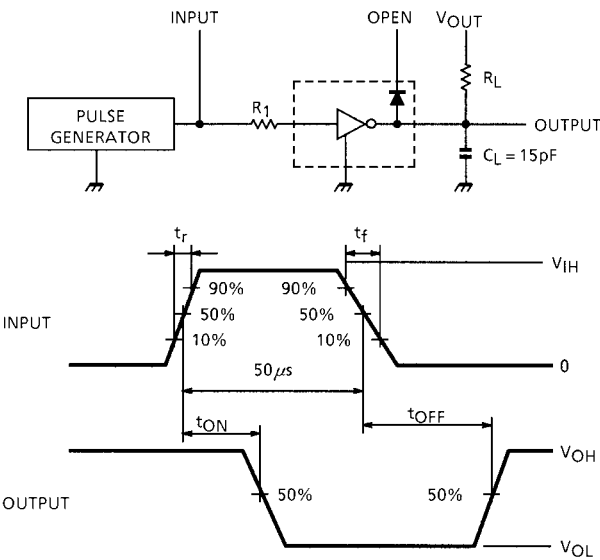
6. I_R



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

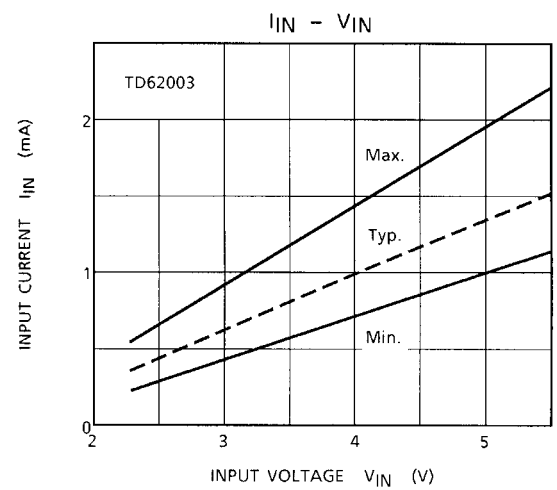
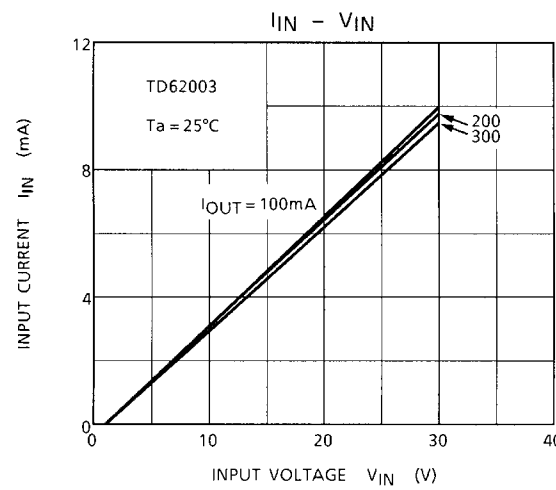
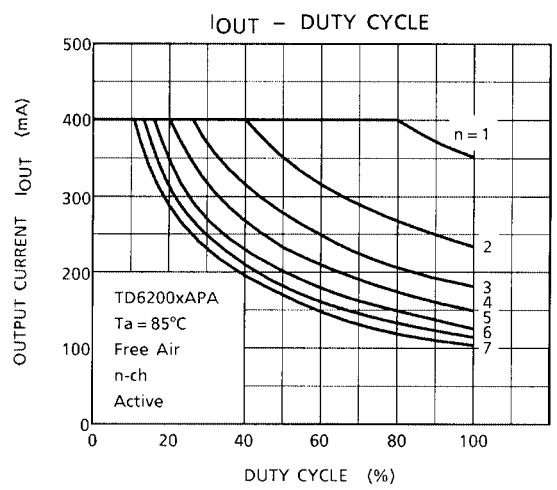
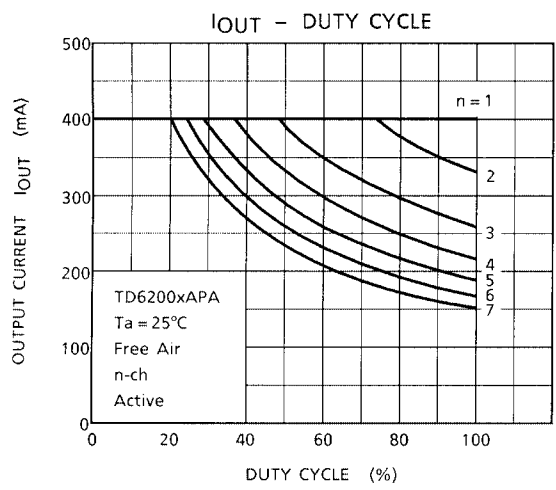
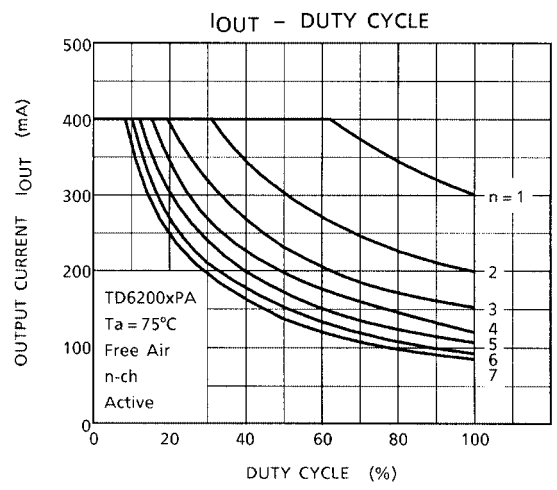
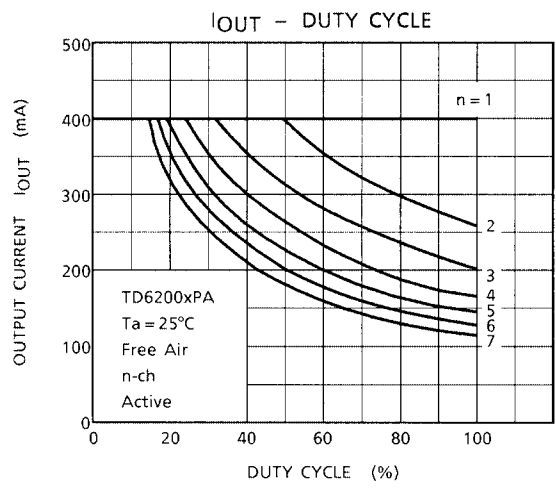
INPUT CONDITION

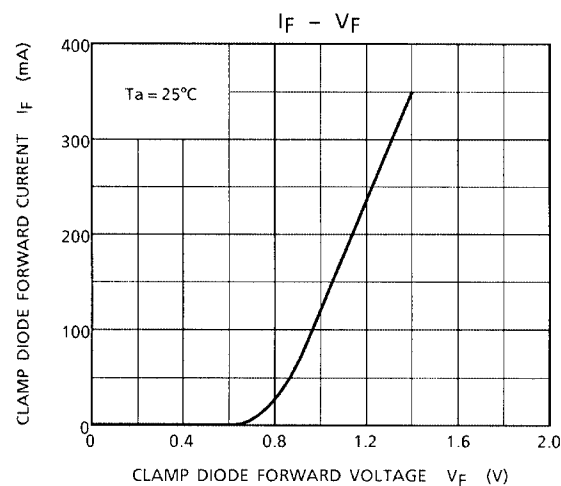
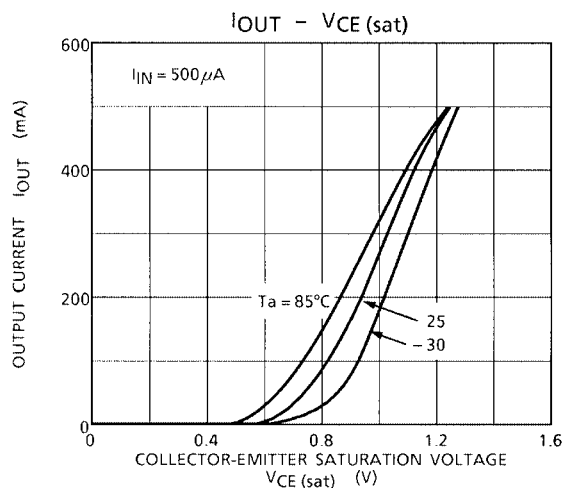
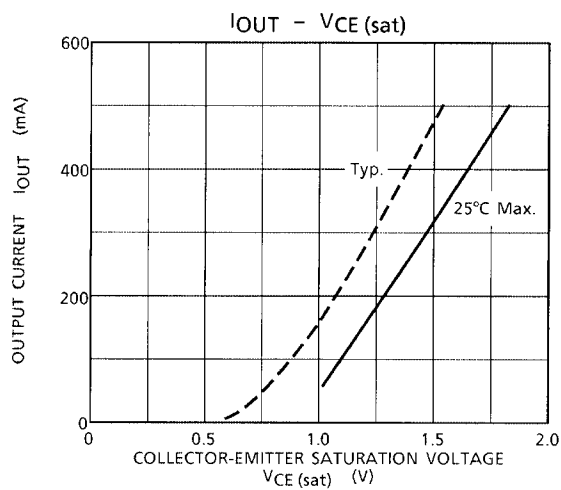
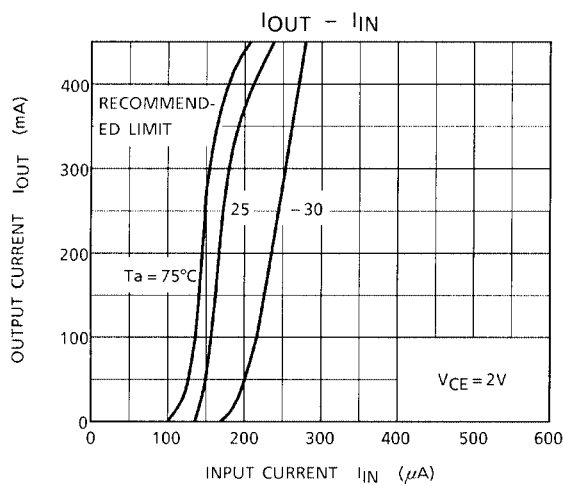
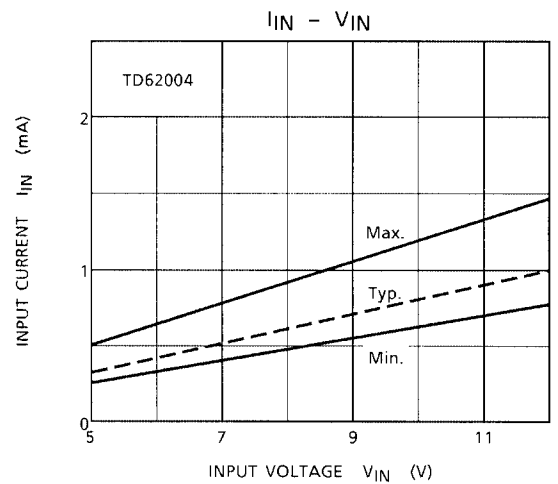
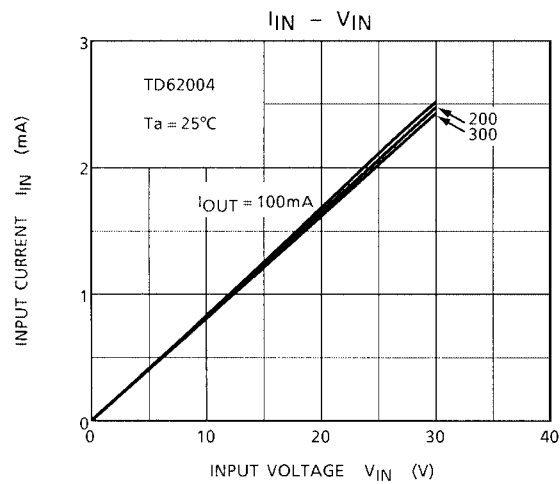
TYPE NUMBER	R_1	V_{IH}
TD620003PA / APA	0	3 V
TD620004 / APA	0	8 V

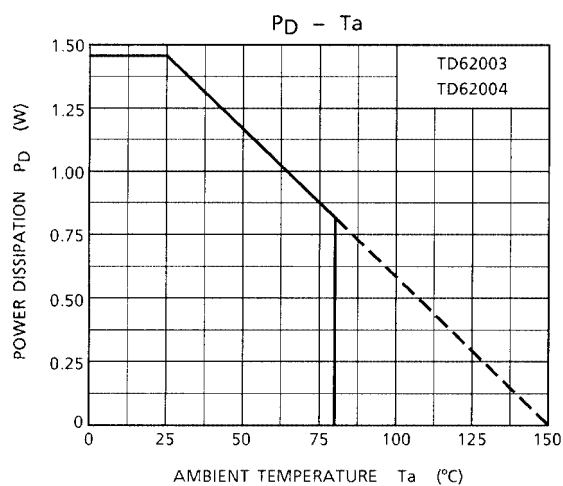
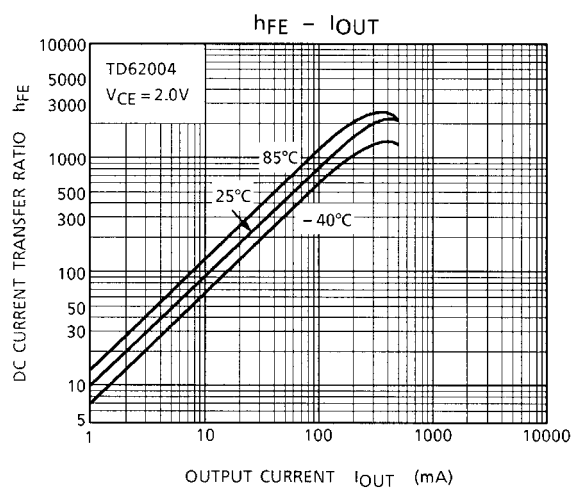
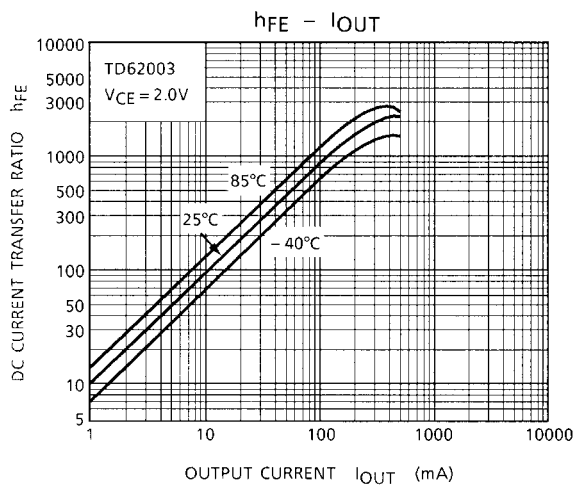
Note 3: C_L includes probe and jig capacitance

PRECAUTIONS for USING

This IC does not include built-in protection circuits for excess current or overvoltage.
If this IC is subjected to excess current or overvoltage, it may be destroyed.
Hence, the utmost care must be taken when systems which incorporate this IC are designed. 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.



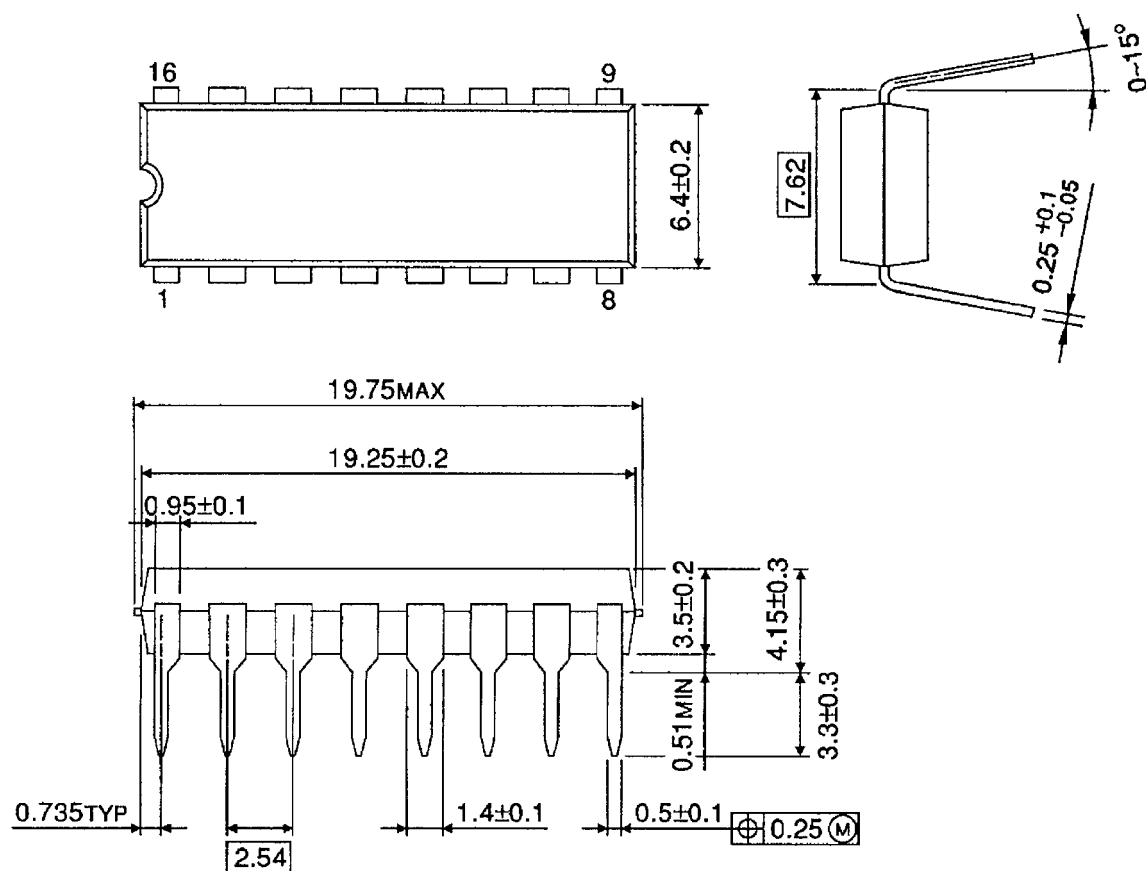




PACKAGE DIMENSIONS

DIP16-P-300-2.54A

Unit : mm



Weight: 1.11 g (Typ.)

RESTRICTIONS ON PRODUCT USE

000707EBA

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