

7CH DARLINGTON SINK DRIVER

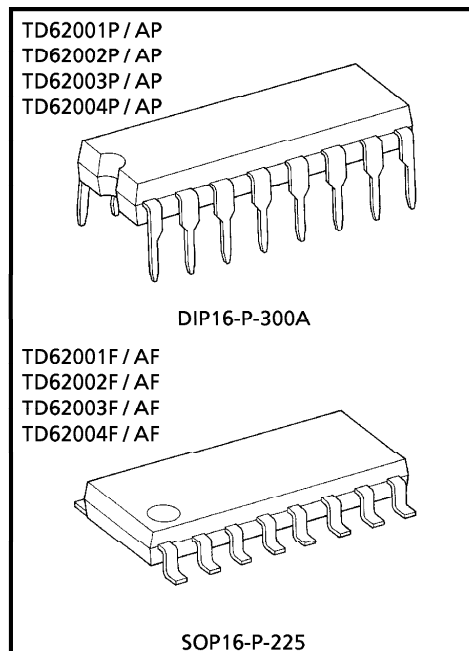
The TD62001P/AP/F/AF Series are high-voltage, high-current darlington drivers comprised of seven NPN darlington pairs.

All units feature integral clamp diodes for switching inductive loads.

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

FEATURES

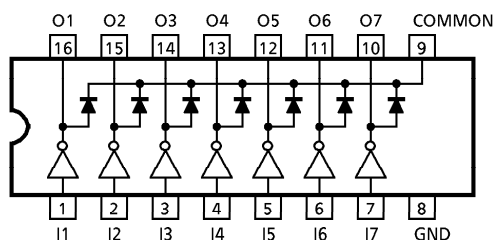
- Output current (single output) 500mA MAX.
- High sustaining voltage output
 35V MIN. (TD62001P/F Series)
 50V MIN. (TD62001AP/AF Series)
- Output clamp diodes
- Inputs compatible with various types of logic
- Package Type-P, AP : DIP-16pin
- Package Type-F, AF : SOP-16pin



Weight DIP16-P-300A : 1.11g (Typ.)
 SOP16-P-225 : 0.16g (Typ.)

TYPE	INPUT BASE RESISTOR	DESIGNATION
TD62001P/AP/F/AF	External	General Purpose
TD62002P/AP/F/AF	10.5-k Ω + 7V Zenner diode	14~25V PMOS
TD62003P/AP/F/AF	2.7k Ω	TTL, 5V CMOS
TD62004P/AP/F/AF	10.5k Ω	6~15V PMOS, CMOS

PIN CONNECTION (TOP VIEW)

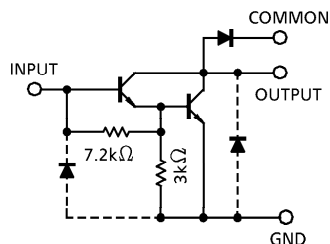


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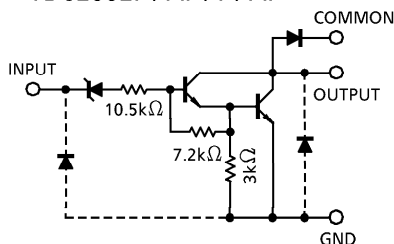
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SCHEMATICS (EACH DRIVER)

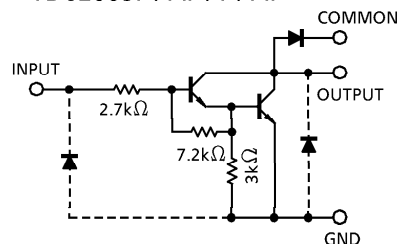
TD62001P / AP / F / AF



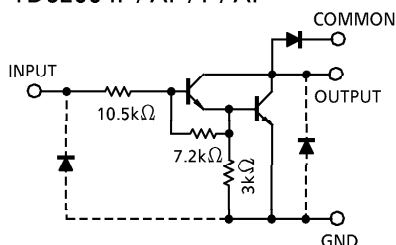
TD62002P / AP / F / AF



TD62003P / AP / F / AF



TD62004P / 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}	500	mA / ch
Input Voltage		V_{IN} (Note 1)	- 0.5~30	V
Input Current		I_{IN} (Note 2)	25	mA
Clamp Diode Reverse Voltage	P, F	V_R	35	V
	AP, AF		50	
Clamp Diode Forward Current		I_F	500	mA
Power Dissipation	P	P_D	1.0	W
	AP		1.47	
	F, AF		0.54 / 0.69 (Note 3)	
Operating Temperature	P	T_{opr}	- 30~75	°C
	AP, F, AF		- 40~85	
Storage Temperature		T_{stg}	- 55~150	°C

(Note 1) Except TD62001P / AP / F / AF

(Note 2) Only TD62001P / AP / F / AF

(Note 3) On glass epoxy PCB (30×30×1.6mm Cu 50%)

RECOMMENDED OPERATING CONDITIONS ($T_a = -40 \sim 85^\circ\text{C}$ and $T_a = -30 \sim 75^\circ\text{C}$ for only Type-P)

CHARACTERISTIC		SYMBOL	CONDITION		MIN.	TYP.	MAX.	UNIT
Output Sustaining Voltage	P, F	V _{CE (SUS)}			0	—	35	V
	AP, AF				0	—	50	
Output Current	AP	I _{OUT}	T _{pw} = 25ms 7 Circuits Ta = 85°C Tj = 120°C	Duty = 10%	0	—	370	mA / ch
	P			Duty = 50%	0	—	130	
				Duty = 10%	0	—	295	
				Duty = 50%	0	—	95	
				Duty = 10%	0	—	233	
	F, AF			Duty = 50%	0	—	70	
Input Voltage	Except TD62001P / AP / F / AF	V _{IN}			0	—	24	V
Input Voltage (Output On)	TD62002	V _{IN (ON)}	I _{OUT} = 400mA h _{FE} = 800		14.5	—	24	V
	TD62003				2.8	—	24	
	TD62004				6.2	—	24	
Input Voltage (Output Off)	TD62001	V _{IN (OFF)}			0	—	0.6	V
	TD62002				0	—	7.4	
	TD62003				0	—	0.7	
	TD62004				0	—	1.0	
Input Current	Only TD62001	I _{IN}			0	—	10	mA
Clamp Diode Reverse Voltage	P, F	V _R			—	—	35	V
	AP, AF				—	—	50	
Clamp Diode Forward Current		I _F			—	—	350	mA
Power Dissipation	P	P _D	Ta = 85°C		—	—	0.6	W
	AP				—	—	0.76	
	AF, F		(Note) Ta = 85°C		—	—	0.36	

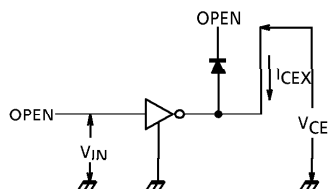
(Note) On glass epoxy PCB (30×30×1.6mm Cu 50%)

ELECTRICAL CHARACTERISTICS (Ta = 25°C unless otherwise noted)

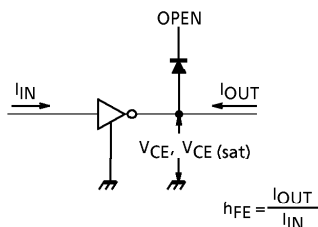
CHARACTERISTIC		SYMBOL	TEST CIR- CUIT	TEST CONDITION		MIN.	TYP.	MAX.	UNIT
Output Leakage Current	AP, AF	I _{CEX}	1	V _{CE} = 50V, Ta = 25°C		—	—	50	μA
				V _{CE} = 50V, Ta = 85°C		—	—	100	
	F			V _{CE} = 35V, Ta = 25°C		—	—	50	
				V _{CE} = 35V, Ta = 85°C		—	—	100	
	P			V _{CE} = 35V, Ta = 25°C		—	—	50	
				V _{CE} = 35V, Ta = 75°C		—	—	100	
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	
DC Current Transfer Ratio		h _{FE}	2	V _{CE} = 2V, I _{OUT} = 350mA		1000	—	—	
Input Current (Output On)	TD62002	I _{IN (ON)}	3	V _{IN} = 20V, I _{OUT} = 350mA		—	1.1	1.7	mA
	TD62003			V _{IN} = 2.4V, I _{OUT} = 350mA		—	0.4	0.7	
	TD62004			V _{IN} = 9.5V, I _{OUT} = 350mA		—	0.8	1.2	
Input Current (Output Off)	P	I _{IN (OFF)}	4	I _{OUT} = 500μA, Ta = 75°C		50	65	—	μA
	AP, F, AF			I _{OUT} = 500μA, Ta = 85°C		50	65	—	
Input Voltage (Output On)	TD62002	V _{IN (ON)}	5	V _{CE} = 2V h _{FE} = 800	I _{OUT} = 350mA	—	—	13.7	V
					I _{OUT} = 200mA	—	—	11.4	
	TD62003				I _{OUT} = 350mA	—	—	2.6	
					I _{OUT} = 200mA	—	—	2.0	
	TD62004				I _{OUT} = 350mA	—	—	4.7	
					I _{OUT} = 200mA	—	—	4.4	
Clamp Diode Reverse Current	AP, AF	I _R	6	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	
	P			V _R = 35V, Ta = 25°C		—	—	50	
				V _R = 35V, Ta = 75°C		—	—	100	
Clamp Diode Forward Voltage		V _F	7	I _F = 350mA		—	—	2.0	V
Input Capacitance		C _{IN}	—			—	15	—	pF
Turn-On Delay	P, F	t _{ON}	8	V _{OUT} = 35V, R _L = 87.5Ω C _L = 15pF		—	0.1	—	μs
	AP, AF			V _{OUT} = 50V, R _L = 125Ω C _L = 15pF		—	0.1	—	
Turn-Off Delay	P, F	t _{OFF}	8	V _{OUT} = 35V, R _L = 87.5Ω C _L = 15pF		—	0.2	—	
	AP, AF			V _{OUT} = 50V, R _L = 125Ω C _L = 15pF		—	0.2	—	

TEST CIRCUIT

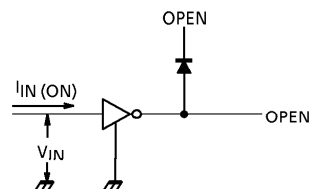
1. I_{CEX}



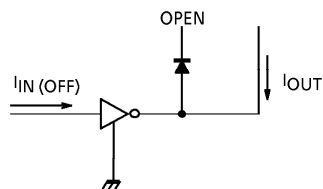
2. $V_{CE}(\text{sat})$, h_{FE}



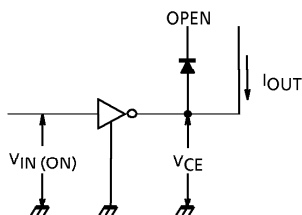
3. $I_{IN}(\text{ON})$



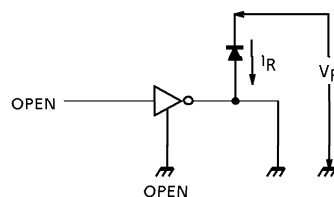
4. $I_{IN}(\text{OFF})$



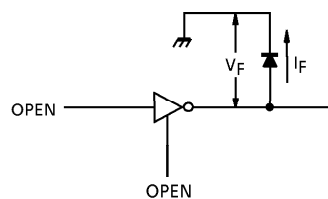
5. $V_{IN}(\text{ON})$



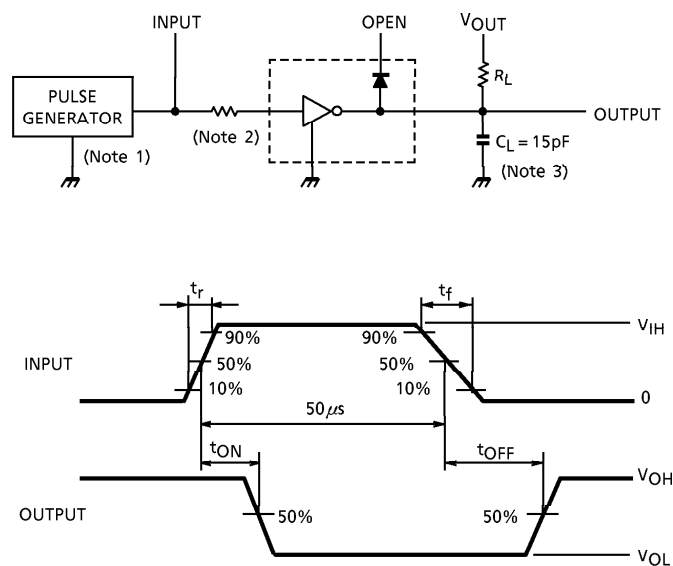
6. I_R



7. V_F



8. t_{ON} , t_{OFF}



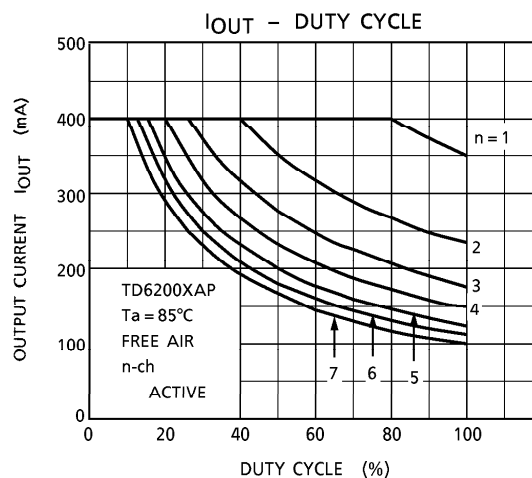
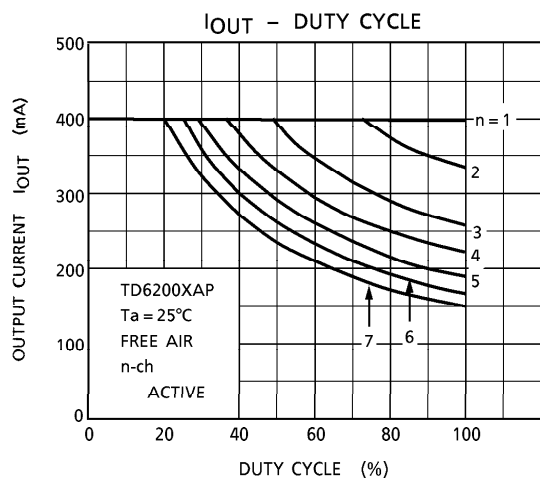
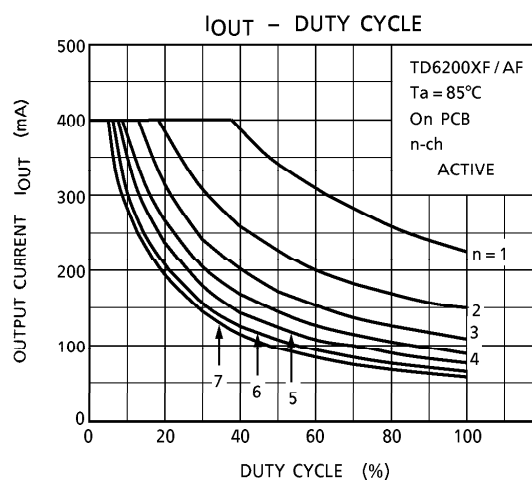
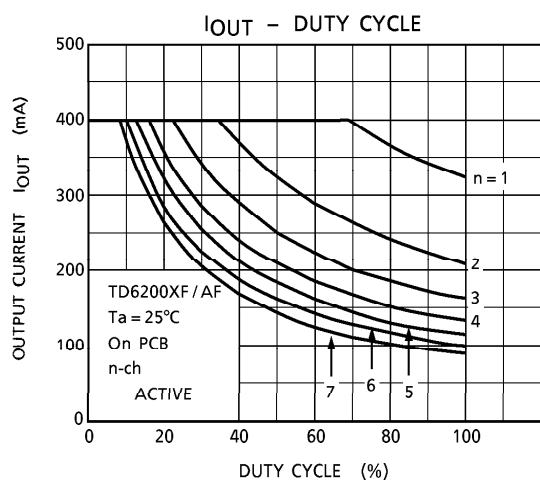
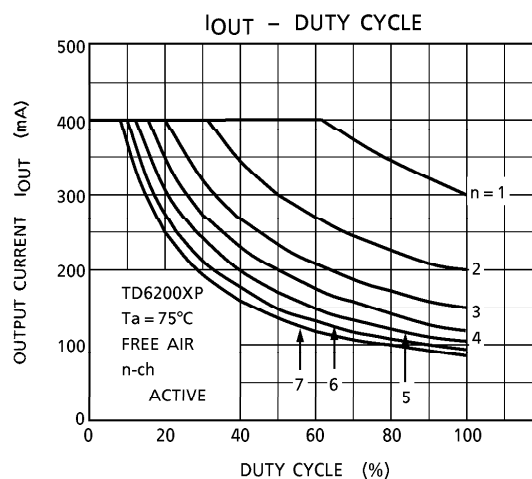
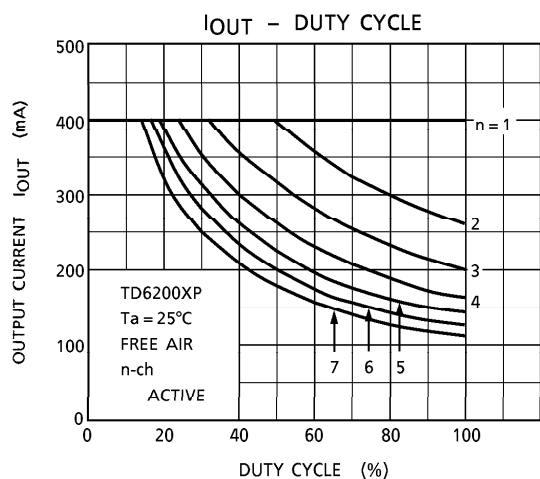
(Note 1) Pulse width $50\mu s$, duty cycle 10%
Output impedance 50Ω , $t_r \leq 5ns$, $t_f \leq 10ns$

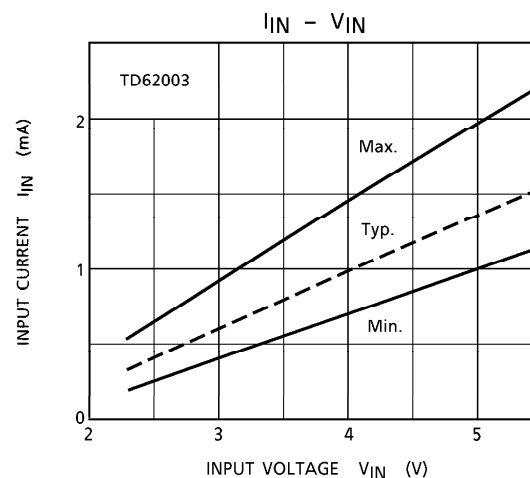
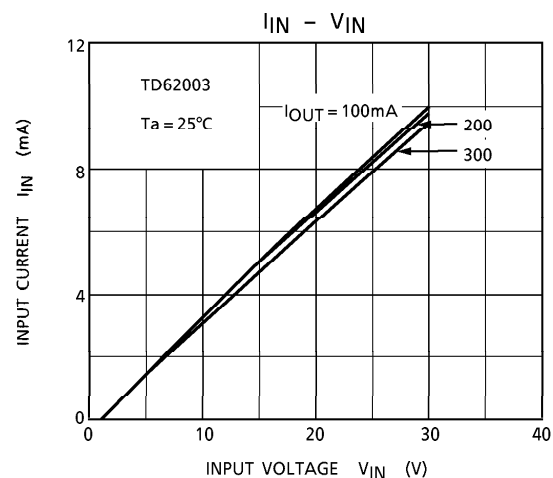
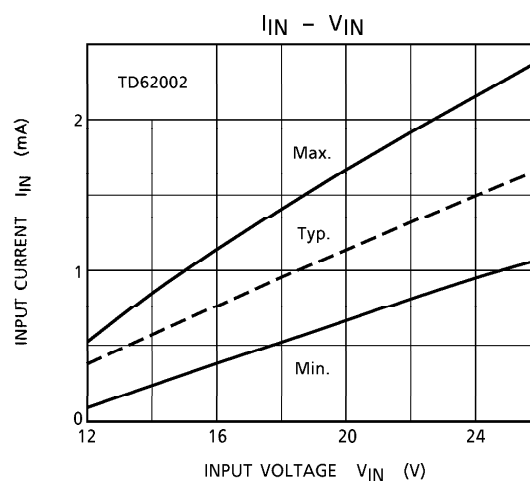
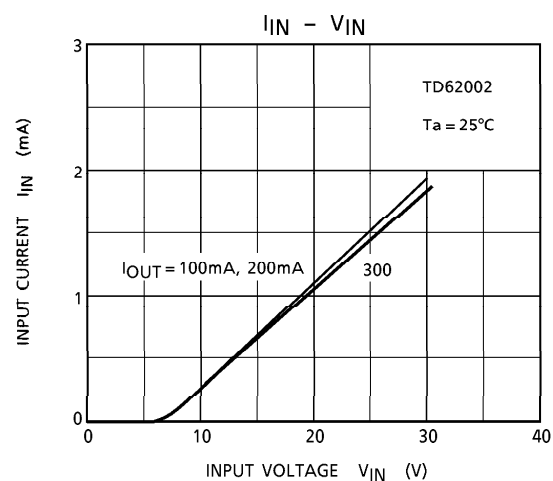
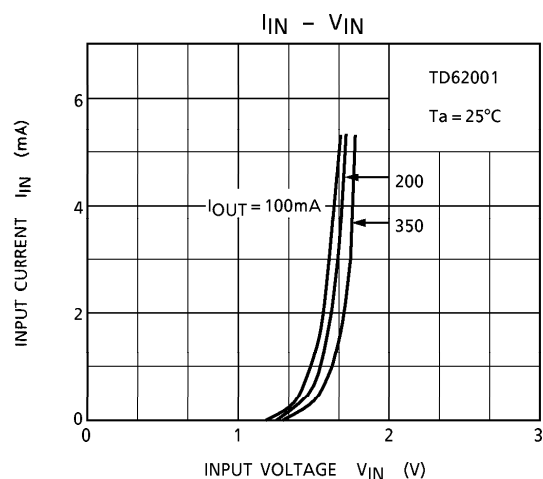
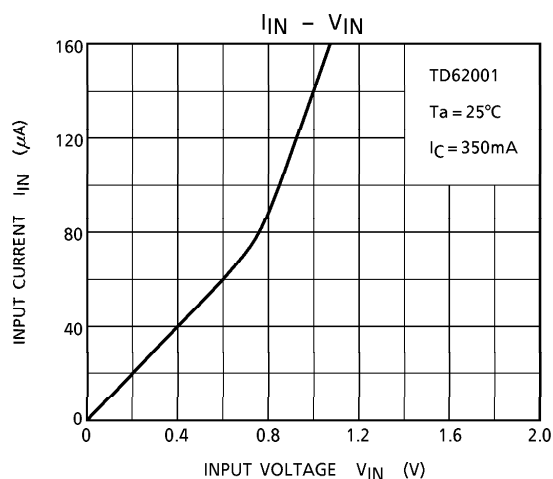
(Note 2) See below

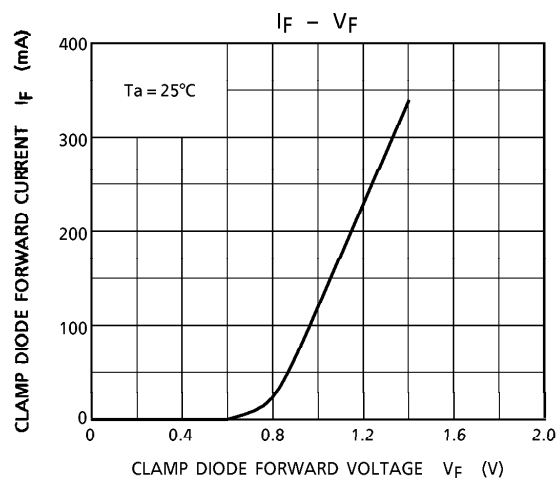
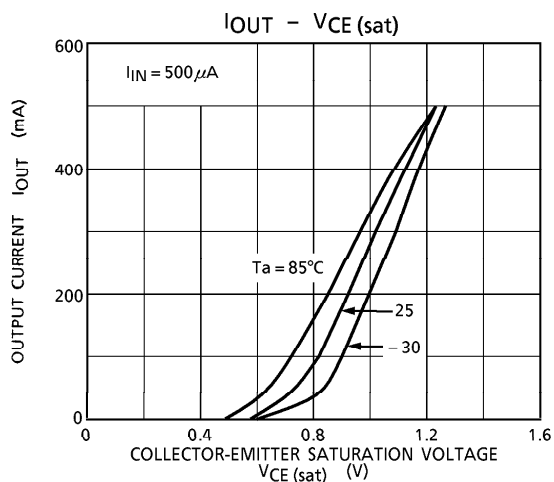
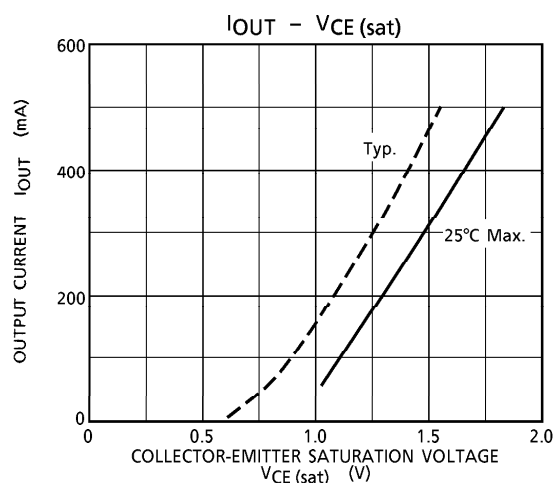
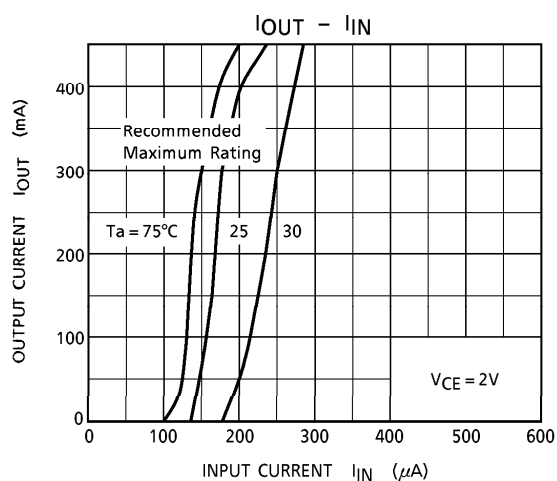
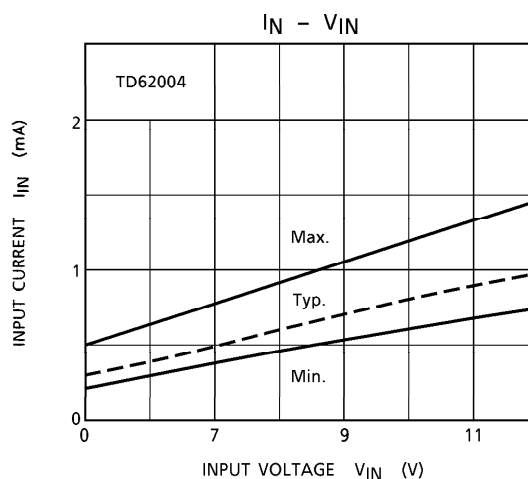
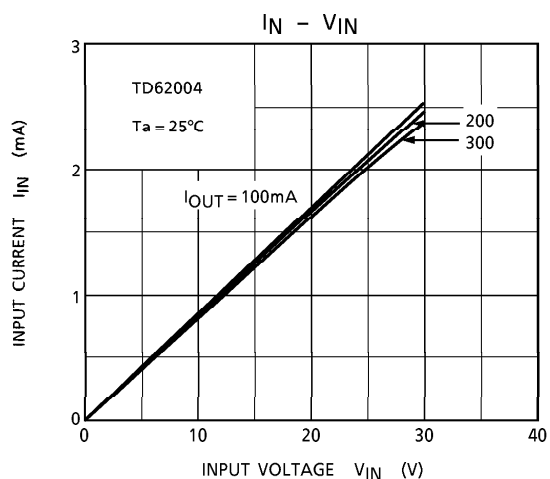
INPUT CONDITION

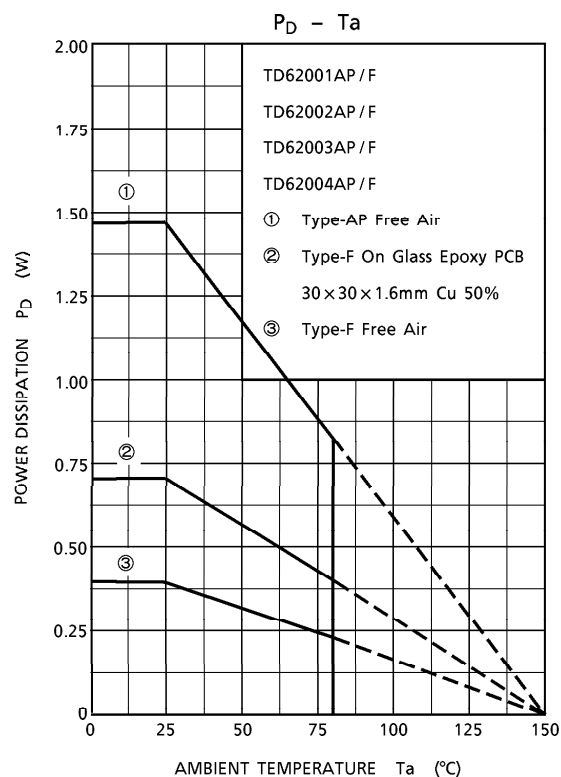
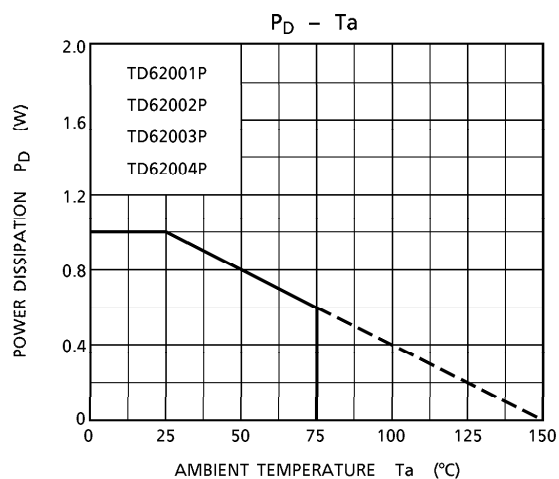
TYPE NUMBER	R1	V_{IH}
TD62001P / AP / F / AF	$2.7k\Omega$	3V
TD62002P / AP / F / AF	0	13V
TD62003P / AP / F / AF	0	3V
TD62004P / AP / F / AF	0	8V

(Note 3) C_L includes probe and jig capacitance.



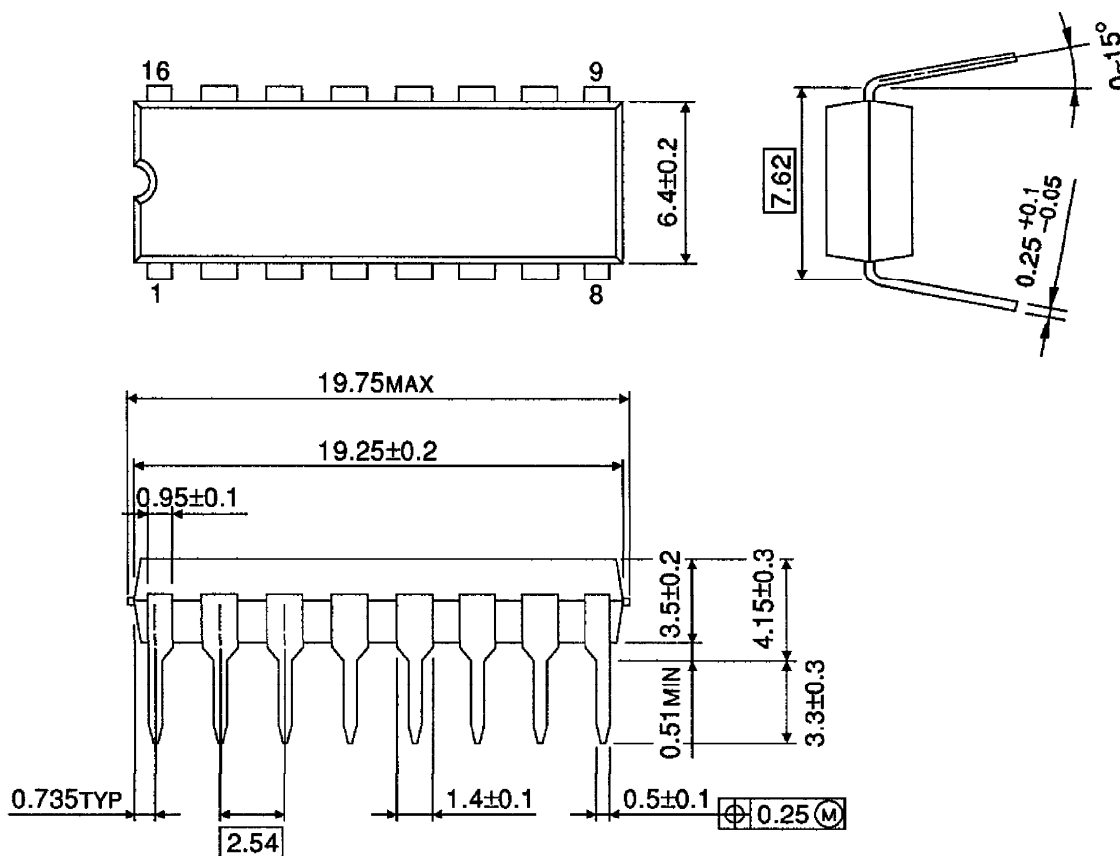






OUTLINE DRAWING
DIP16-P-300A

Unit : mm

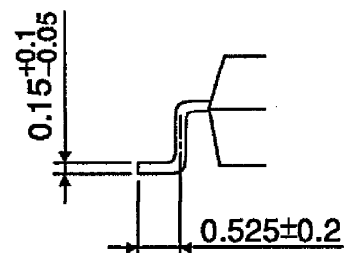
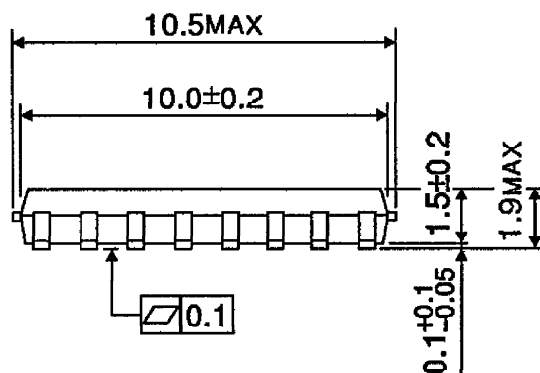
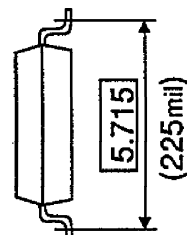
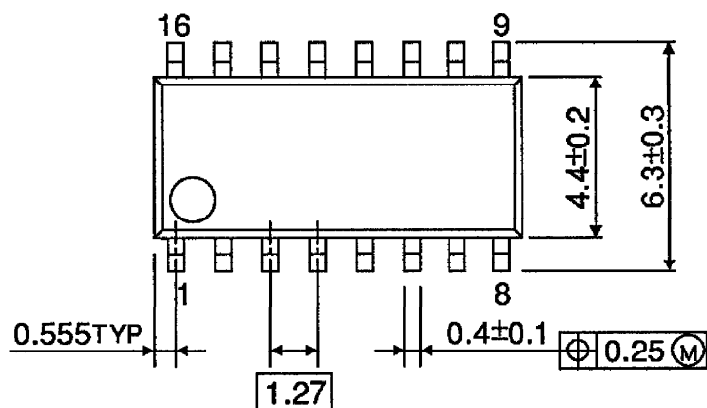


Weight : 1.11g (Typ.)

OUTLINE DRAWING

SOP16-P-225

Unit : mm



Weight : 0.16g (Typ.)