Silicon Monolithic Bipolar Digital Integrated Circuit

TD62001AP/AF
TD62002AP/AF
TD62003AP/AF
TD62004AP/AF

7-channel Darlington Sink Driver

The TD62001AP/AF Series features high-voltage, high-current Darlington drivers composed of seven NPN Darlington pairs.

All units feature integral clamp diodes for switching inductive loads.

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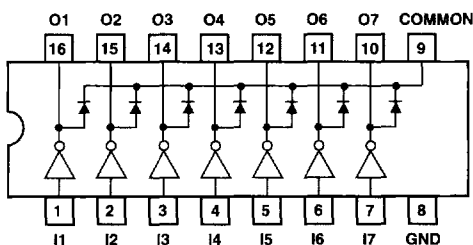
Features

- Output current (single output) 500mA MAX

- High sustaining voltage output:
     50V MIN. (TD62001AP/AF Series)

- Output clamp diodes

- Inputs compatible with various types of logic

- Package Type-AP: DIP-16pin

- Package Type-AF: SOP-16pin

TD62001AP
TD62002AP
TD62003AP
TD62004AP

DIP16-P-300A

TD62001AF
TD62002AF
TD62003AF
TD62004AF
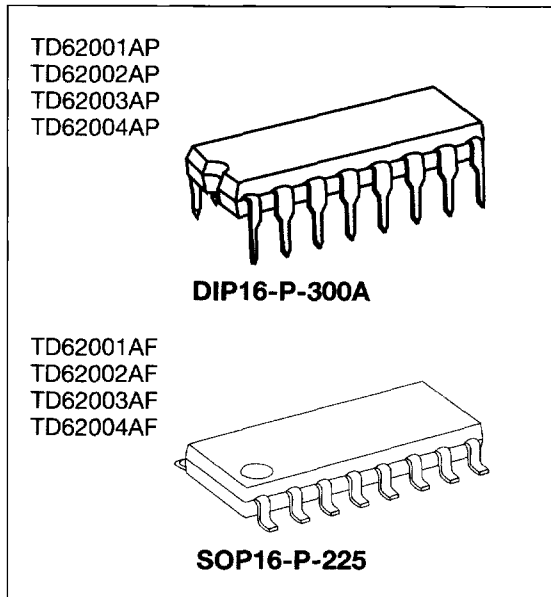
SOP16-P-225

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

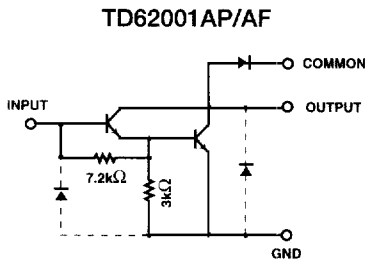| TYPE	INPUT BASE RESISTOR	DESIGNATION
TD62001AP/AF	External	General Purpose
TD62002AP/AF	10.5-kΩ + 7V Zener diode	14~25V PMOS
TD62003AP/AF	2.7KΩ	TTL, 5V CMOS
TD62004AP/AF	10.5kΩ	6~15V PMOS, CMOS

Pin Connection (Top View)

Schematics (Each Driver)

TD62001AP/AF

INPUT — COMMON — OUTPUT — 7.2kΩ — 3kΩ — GND

TD62002AP/AF

INPUT 7V — COMMON — OUTPUT — 10.5kΩ — 7.2kΩ — 3kΩ — GND

TD62003AP/AF

INPUT — COMMON — OUTPUT — 2.7kΩ — 7.2kΩ — 3kΩ — GND

TD62004AP/AF

INPUT — COMMON — OUTPUT — 10.5kΩ — 7.2kΩ — 3kΩ — GND
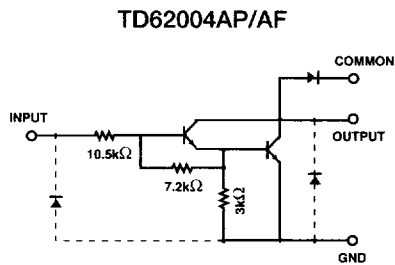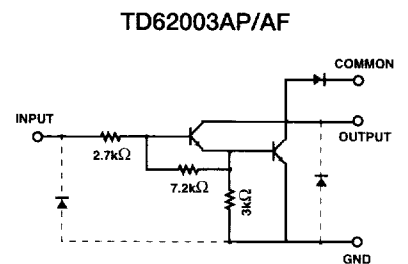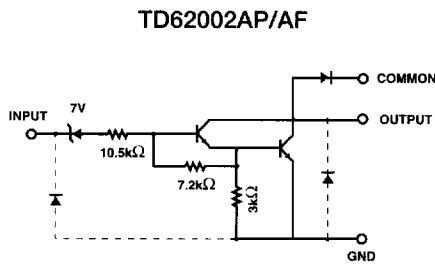
Maximum Ratings (Ta=25°C)

Characteristic		Symbol	Rating	Unit
Output Sustaining Voltage	AP, AF	V_{CE} (SUS)	-0.5 ~ 50	V
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	AP, AF	V_R	50	V
Clamp Diode Forward Current		I_F	500	mA
Power Dissipation	AP	P_D	1.47	W
	AF		0.69 (Note 3)	
Operating Temperature	AP, AF	T_{opr}	-40 ~ 85	°C
Storage Temperature		T_{stg}	-55 ~ 150	°C

Note 1: Except TD62001AP/AF
Note 2: Only TD62001AP/AF
Note 3: On glass epoxy PCB (30 x 30 x 1.6mm Cu 50%)

Recommended Operating Conditions (Ta=-40~85°C and Ta=-30~75°C for only Type-P)

Characteristic		Symbol	Test Condition		Min.	Typ.	Max.	Unit
Output Sustaining Voltage	AP, AF	V$_{CE}$ (SUS)			0	—	50	V
Output Current	AP	I$_{OUT}$	Tpw = 25ms	Duty = 10%	0	—	370	mA / ch
			7 Circuits	Duty = 50%	0	—	130	
	AF		Ta = 85°C	Duty = 10%	0	—	233	
			Tj = 120°C	Duty = 50%	0	—	70	
Input Voltage	Except TD62001AP/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	AP, AF	V$_{R}$			—	—	50	V
Clamp Diode Forward Current		I$_{F}$			—	—	350	mA
Power Dissipation	AP	P$_{D}$	Ta = 85°C		—	—	0.76	W
	AF		(Note) Ta = 85°C		—	—	0.36	

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

Electrical Characteristics (Ta=25°C unless otherwise noted)

Characteristic		Symbol	Test Circuit	Test Condition		Min.	Typ.	Max.	Unit
Output Leakage Current	AP, AF			$V_{CE}=50V$, Ta=25°C		—	—	50	μA
				$V_{CE}=50V$, Ta=85°C		—	—	100	
Collector-Emitter Saturation Voltage		$V_{CE(sat)}$	2	$I_{OUT}=350mA$, $I_{IN}=500\mu A$		—	1.3	1.6	
				$I_{OUT}=200mA$, $I_{IN}=350\mu A$		—	1.1	1.3	V
				$I_{OUT}=100mA$, $I_{IN}=250\mu A$		—	0.9	1.1	
DC Current Transfer Ratio		h_{FE}	2	$V_{CE}=2V$, $I_{OUT}=350mA$		1000	—	—	
Input Current (Output On)	TD62002	$I_{IN(ON)}$	2	$V_{IN}=20V$, $I_{OUT}=350mA$		—	1.1	1.7	
	TD62003			$V_{IN}=2.4V$, $I_{OUT}=350mA$		—	0.4	0.7	mA
	TD62004			$V_{IN}=9.5V$, $I_{OUT}=350mA$		—	0.8	1.2	
Input Current (Output Off)	AP, AF	$I_{IN(OFF)}$	4	$I_{OUT}=500\mu A$ Ta=85°C		50	65	—	μA
Input Voltage (Output On)	TD62002	$V_{IN(ON)}$	5	$V_{CE}=2V$ $h_{FE}=800$	$I_{OUT}=350mA$	—	—	13.7	V
					$I_{OUT}=350mA$	—	—	11.4	
	TD62003				$I_{OUT}=350mA$	—	—	2.6	
					$I_{OUT}=350mA$	—	—	2.0	
	TD62004				$I_{OUT}=350mA$	—	—	4.7	
					$I_{OUT}=350mA$	—	—	4.4	
Clamp Diode Revese Current	AP, AF	I_R	6	$V_R=50V$, Ta=25°C		—	—	50	μA
				$V_R=50V$, Ta=85°C		—	—	100	
Clamp Diode Forward Voltage		V_F	7	$I_F=350mA$		—	—	2.0	V
Input Capacitance		C_{IN}	—			—	15	—	pF
Turn-On Delay	AP, AF	t_{ON}	8	$V_{OUT}=50V$, $R_L=125\Omega$, $C_L=15pF$		—	0.1	—	μs
Turn-Off Delay	AP, AF	t_{OFF}	8	$V_{OUT}=50V$, $R_L=125\Omega$, $C_L=15pF$		—	0.2	—	