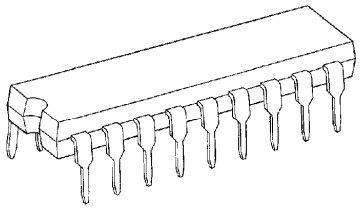
TOSHIBA BIPOLAR DIGITAL INTEGRATED CIRCUIT SILICON MONOLITHIC

TD62783AP, TD62783F, TD62783AF
TD62784AP, TD62784F, TD62784AF

8CH HIGH-VOLTAGE SOURCE DRIVER

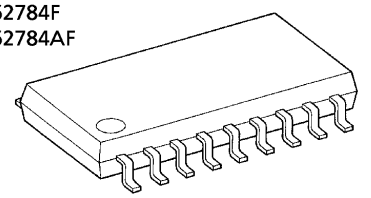
The TD62783AP / F / AF Series are comprised of eight source current Transistor Array.
These drivers are specifically designed for fluorescent display applications.
Applications include relay, hammer and lamp drivers.

TD62783AP
TD62784AP



DIP18-P-300-2.54D

TD62783F
TD62783AF
TD62784F
TD62784AF



SOP18-P-375-1.27

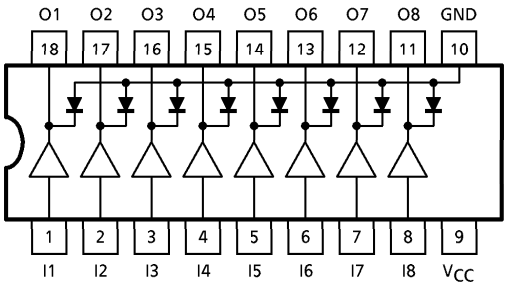
Weight
DIP18-P-300-2.54D : 1.47g (Typ.)
SOP18-P-375-1.27 : 0.41g (Typ.)

FEATURES

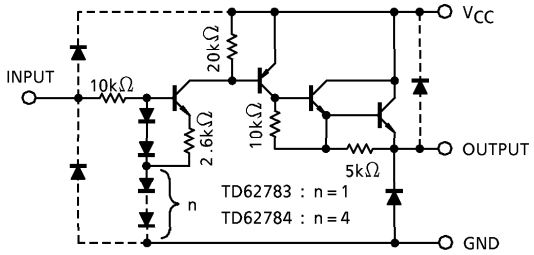
- High output voltage Type-AP, AF : V_{CC} = 50V MIN.
  Type-F : V_{CC} = 35V MIN.
- Output current (single output) I_{OUT} = −500mA MIN.
- Output clamp diodes
- Single supply voltage
- Input compatible with various types of logic
- Package Type-AP : DIP-18pin
- Package Type-F, AF : SOP-18pin

TYPE	DESIGNATION
TD62783AP / F / AF	TTL, 5V CMOS
TD62784AP / F / AF	6~15V PMOS, CMOS

PIN CONNECTION (TOP VIEW)



SCHEMATICS (EACH DRIVER)



(Note) The input and output parasitic diodes cannot be used as clamp diodes.

961001EBA2

MAXIMUM RATINGS (Ta = 25°C)

CHARACTERISTIC		SYMBOL	RATING	UNIT
Supply Voltage	AP, AF	V_{CC}	50	V
	F		35	
Output Current		I_{OUT}	− 500	mA / ch
Input Voltage		V_{IN} (Note 1)	15	V
		V_{IN} (Note 2)	30	
Clamp Diode Reverse Voltage	AP, AF	V_R	50	V
	F		35	
Clamp Diode Forward Current		I_F	500	mA
Power Dissipation	AP	P_D (Note 3)	1.47	W
	F, AF		0.96	
Operating Temperature		T_{opr}	− 40~85	°C
Storage Temperature		T_{stg}	− 55~150	°C

(Note 1) Only TD62783AP / F / AF
(Note 2) Only TD62784AP / F / AF
(Note 3) Delated above 25°C in the proportion of 11.7W / °C (AP Type), 7.7W / °C (F, AF Type).

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

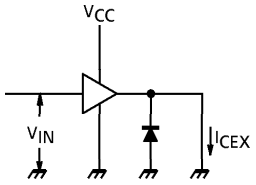
CHARACTERISTIC			SYMBOL	TEST CONDITION		MIN.	TYP.	MAX.	UNIT
Supply Voltage		AP, AF	V_{CC}	—		—	—	50	V
		F		—		—	—	35	
Output Current			I_{OUT}	T_a = 85°C T_j = 120°C T_{pw} = 25ms	Duty = 10% 8 Circuits	—	—	− 260	mA / ch
					Duty = 50% 8 Circuits	—	—	− 59	
					Duty = 10% 8 Circuits	—	—	− 180	
		AF, F			Duty = 50% 8 Circuits	—	—	− 38	
Input Voltage		TD62783AP / F / AF	V_{IN}	—		—	—	12	V
		TD62784AP / F / AF		—		—	—	24	
Input Voltage	Output On	TD62783AP / F / AF	V_{IN} (ON)	—		2.0	5.0	15	V
		TD62784AP / F / AF		—		4.5	12.0	30	
	Output Off	TD62783AP / F / AF	V_{IN} (OFF)	—		0	—	0.8	
		TD62784AP / F / AF		—		0	—	2.0	
Clamp Diode Reverse Voltage		AP	V_R	—		—	—	50	V
		F, AF		—		—	—	35	
Clamp Diode Forward Current			I_F	—		—	—	400	mA
Power Dissipation		AP	P_D	—		—	—	0.52	W
		F, AF		—		—	—	0.35	

ELECTRICAL CHARACTERISTICS (Ta = 25°C)

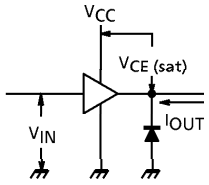
CHARACTERISTIC		SYMBOL	TEST CIR-CUIT	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Output Leakage Current		I_{CEX}	1	$V_{CC} = V_{CC}$ MAX. $V_{IN} = 0.4V$, Ta = 25°C	—	—	100	μA
Output Saturation Voltage		$V_{CE (sat)}$	2	$V_{IN} = V_{IN (ON)}$, $I_{OUT} = -350mA$	—	—	2.0	V
				$V_{IN} = V_{IN (ON)}$, $I_{OUT} = -225mA$	—	—	1.9	
				$V_{IN} = V_{IN (ON)}$, $I_{OUT} = -100mA$	—	—	1.8	
Input Current	TD62783AP / F / AF	$I_{IN (ON)}$	3	$V_{IN} = 2.4V$	—	36	52	μA
				$V_{IN} = 3.85V$	—	180	260	
	TD62784AP / F / AF			$V_{IN} = 5V$	—	92	130	
				$V_{IN} = 12V$	—	790	1130	
Input Voltage	TD62783AP / F / AF	$V_{IN (ON)}$	4	$V_{CE} = 2.0V$	—	—	2.0	V
	TD62784AP / F / AF			$I_{OUT} = -350mA$	—	—	4.5	
	TD62783AP / F / AF	$V_{IN (OFF)}$		$I_{OUT} = -500\mu A$	0.8	—	—	
	TD62784AP / F / AF				2.0	—	—	
Supply Current		$I_{CC (ON)}$	3	$V_{IN} = V_{IN (ON)}$, $V_{CC} = 50V$	—	—	2.5	mA / ch
Clamp Diode Reverse Current	AP, AF	I_R	5	$V_R = 50V$	—	—	50	μA
	F			$V_R = 35V$	—	—	50	
Clamp Diode Forward Voltage		V_F	6	$I_F = 350mA$	—	—	2.0	V
Turn-On Delay		t_{ON}	7	$V_{CC} = V_{CC}$ MAX. $R_L = 125\Omega$, $C_L = 15pF$, $R_L = 88\Omega$ (F)	—	0.15	—	μs
Turn-Off Delay		t_{OFF}			—	1.8	—	

TEST CIRCUIT

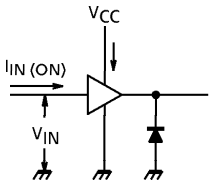
1. I_{CEX}



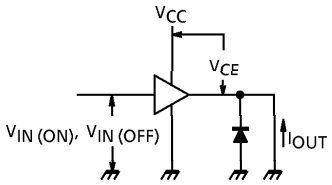
2. $V_{CE\ (sat)}$



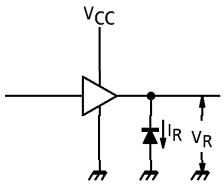
3. $I_{IN\ (ON)}$, I_{CC}



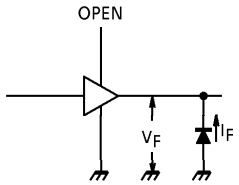
4. $V_{IN\ (ON)}$, $V_{IN\ (OFF)}$



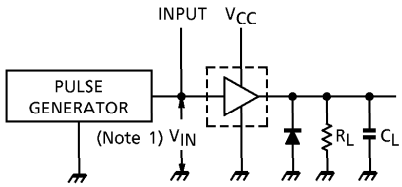
5. I_R

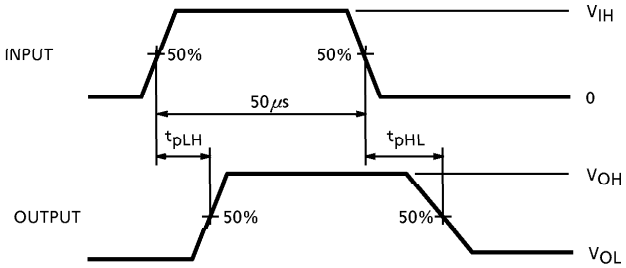


6. V_F



7. t_{ON}, t_{OFF}



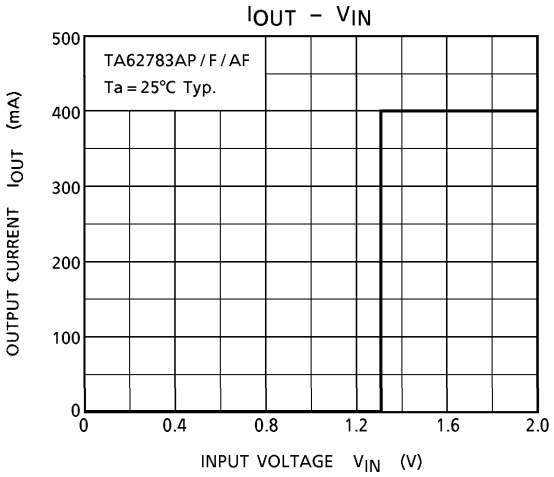


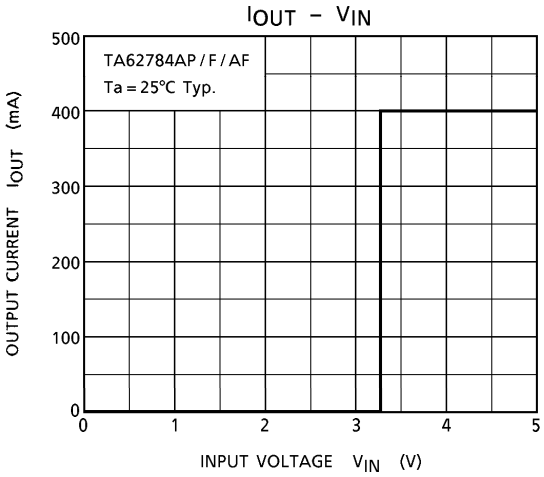
(Note 1) Pulse width 50μs, duty cycle 10%
Output impedance 50Ω, $t_r \leqq 5$ns, $t_f \leqq 10$ns

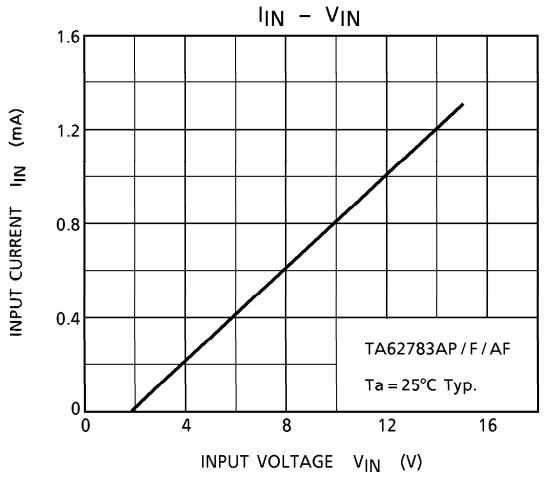
(Note 2) C_L includes probe and jig capacitance

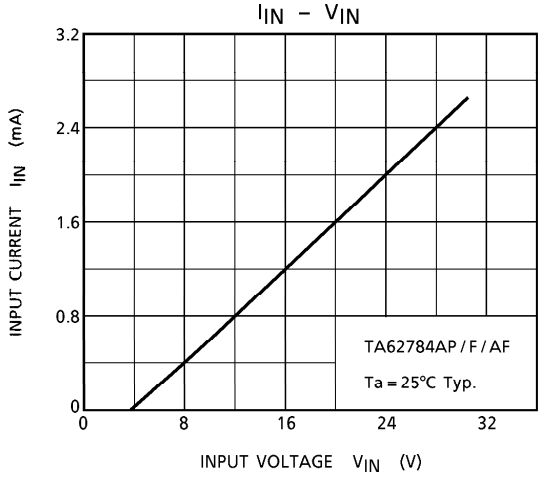
PRECAUTIONS for USING

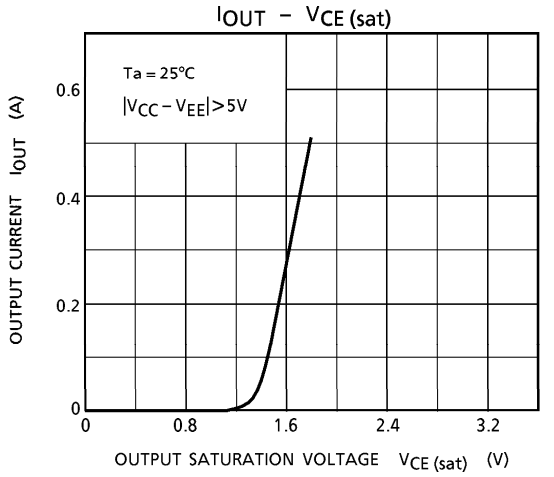
Utmost care is necessary in the design of the output line, V_{CC} and GND line since IC may be destroyed due to short-circuit between outputs, air contamination fault, or fault by improper grounding.

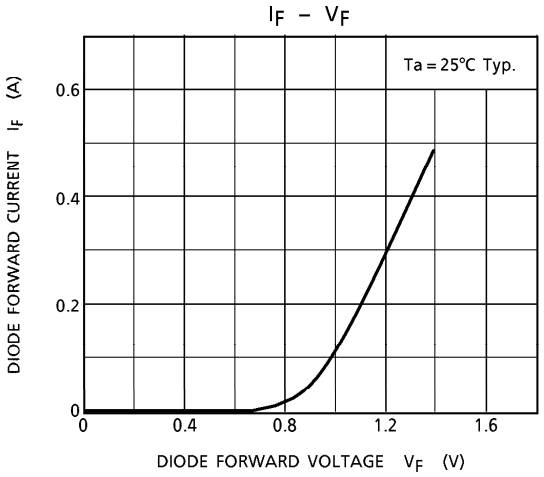

I_{OUT} – V_{IN}
TA62783AP / F / AF
Ta = 25°C Typ.
OUTPUT CURRENT I_{OUT} (mA)
500
400
300
200
100
0
0
0.4
0.8
1.2
1.6
2.0
INPUT VOLTAGE V_{IN} (V)

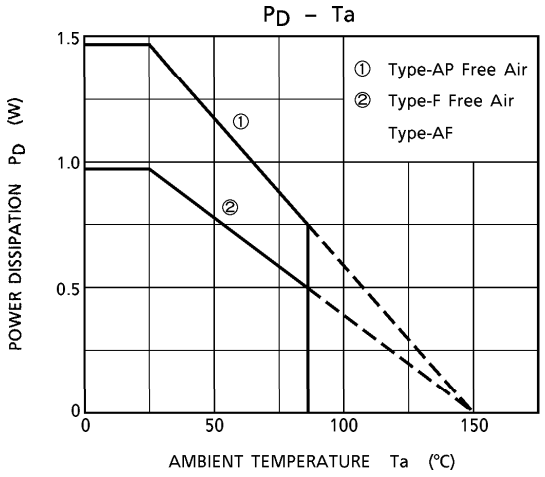

I_{OUT} – V_{IN}
TA62784AP / F / AF
Ta = 25°C Typ.
OUTPUT CURRENT I_{OUT} (mA)
500
400
300
200
100
0
0
1
2
3
4
5
INPUT VOLTAGE V_{IN} (V)


I_{IN} – V_{IN}
INPUT CURRENT I_{IN} (mA)
1.6
1.2
0.8
0.4
0
0
4
8
12
16
TA62783AP / F / AF
Ta = 25°C Typ.
INPUT VOLTAGE V_{IN} (V)


I_{IN} – V_{IN}
INPUT CURRENT I_{IN} (mA)
3.2
2.4
1.6
0.8
0
0
8
16
24
32
TA62784AP / F / AF
Ta = 25°C Typ.
INPUT VOLTAGE V_{IN} (V)


I_{OUT} – $V_{CE\ (sat)}$
Ta = 25°C
$|V_{CC} - V_{EE}| > 5V$
OUTPUT CURRENT I_{OUT} (A)
0.6
0.4
0.2
0
0
0.8
1.6
2.4
3.2
OUTPUT SATURATION VOLTAGE $V_{CE\ (sat)}$ (V)

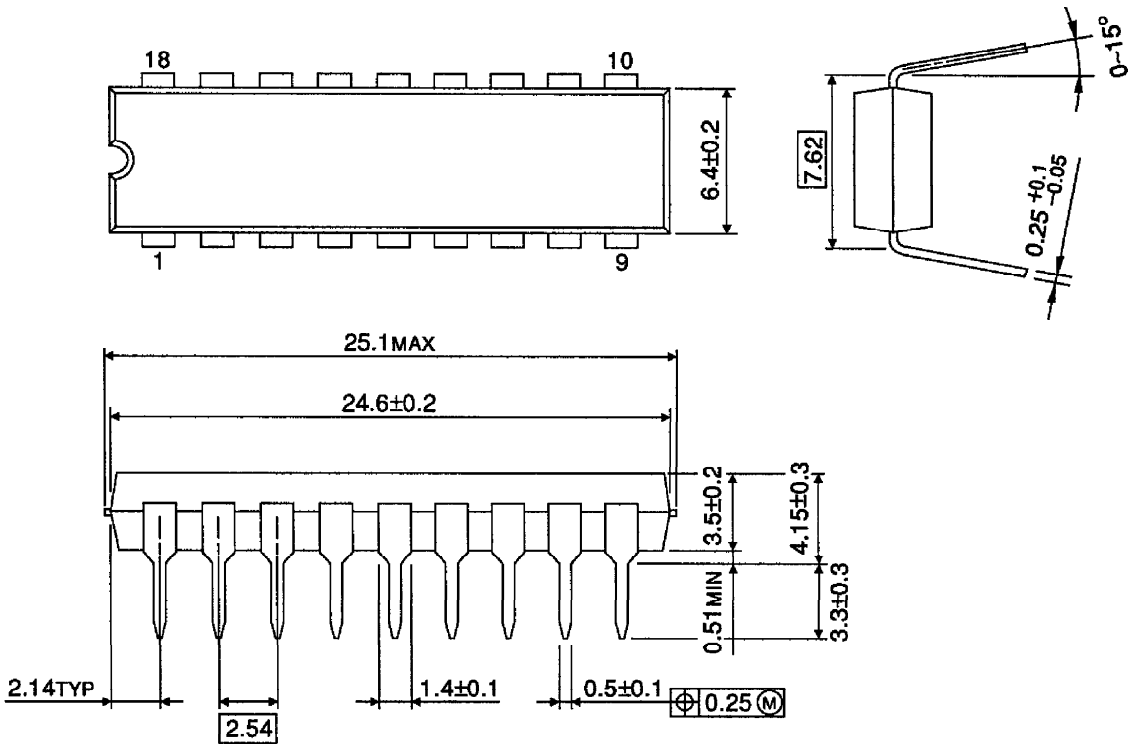

I_F – V_F
Ta = 25°C Typ.
DIODE FORWARD CURRENT I_F (A)
0.6
0.4
0.2
0
0
0.4
0.8
1.2
1.6
DIODE FORWARD VOLTAGE V_F (V)


P_D – Ta
1.5
1.0
0.5
0
① Type-AP Free Air
② Type-F Free Air
Type-AF
①
②
0
50
100
150
POWER DISSIPATION P_D (W)
AMBIENT TEMPERATURE Ta (°C)

OUTLINE DRAWING

DIP18-P-300-2.54D

Unit : mm

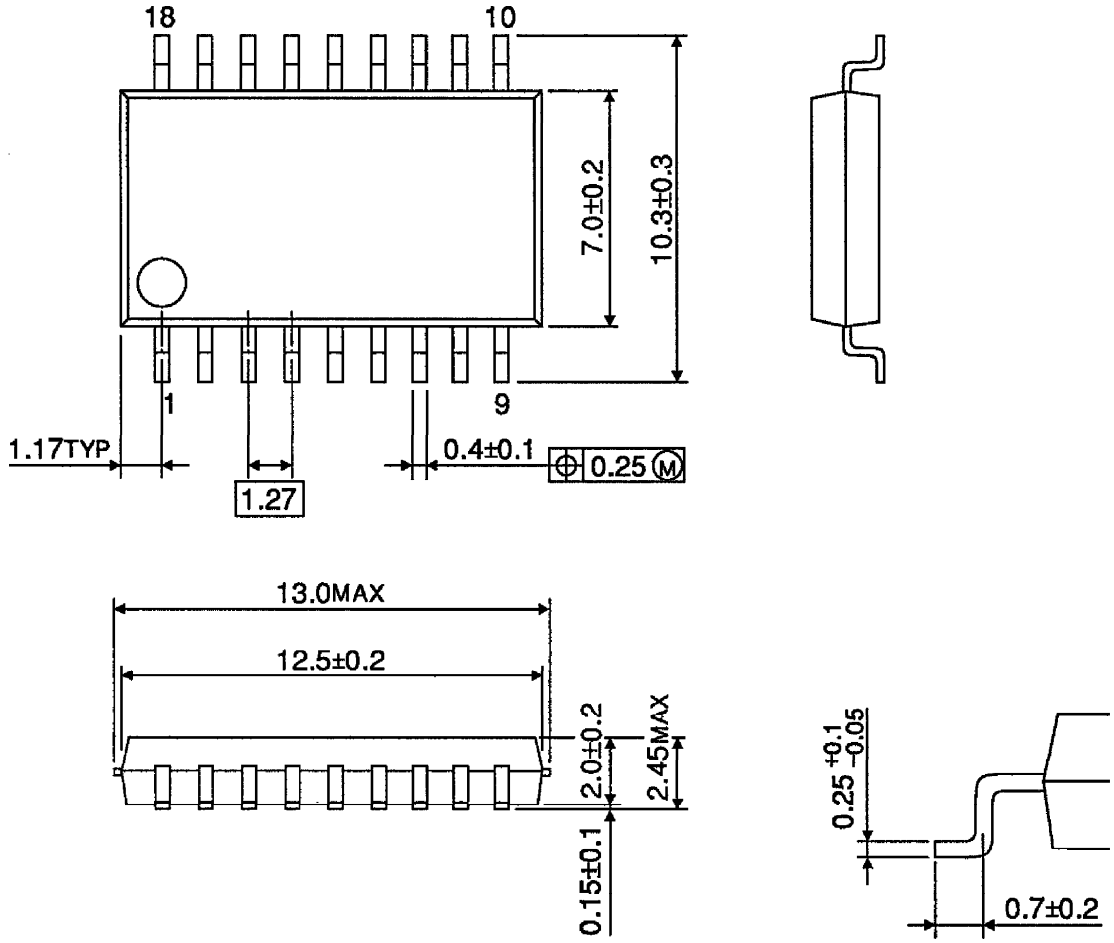


Weight : 1.47g (Typ.)

OUTLINE DRAWING

SOP18-P-375-1.27

Unit : mm



Weight : 0.41g (Typ.)