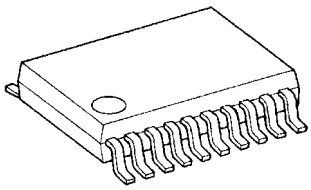
TOSHIBA BIPOLAR DIGITAL INTEGRATED CIRCUIT SILICON MONOLITHIC

TD62387AFN,TD62388AFN

8CH LOW INPUT ACTIVE DARLINGTON SINK DRIVER

The TD62387AFN and TD62388AFN are non−inverting transistor arrays, which are comprised of eight NPN darlington output stages and PNP input stages.
All unites feature integral clamp diodes for switching inductive loads.
These devices are Low Level input active drivers and are suitable for operations with TTL, 5 V CMOS and 5 V Microprocessor which have sink current output drivers.
Applications include relay, hammer, lamp and LED driver.



SSOP20-P-225-0.65A

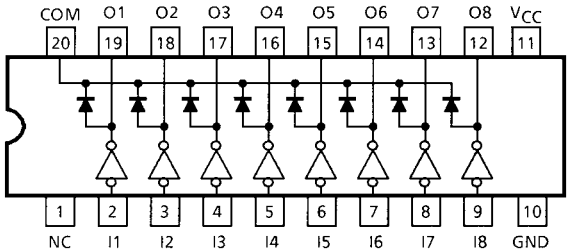
Weight: 0.09 g (Typ.)

FEATURES

- Package Type : SSOP20 pin (0.65 mm pitch)
- High Sustaining Voltage : 50 V (Min)
- Output Current (Single Output) : 500 mA / ch (Max)
- Output Clamp Diodes
- Input : LOW LEVEL ACTIVE
- Standard Supply Voltage
- Inputs Compatible with TTL and 5 V CMOS

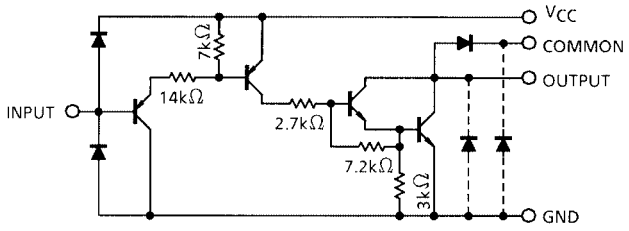
TYPE	$V_{IN(ON)}$
TD62387AFN	0 V~V_{CC} − 3.7 V
TD62388AFN	

PIN CONNECTION (TOP VIEW)

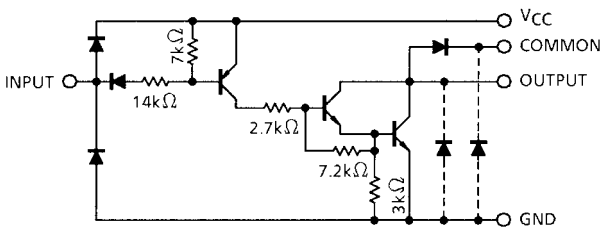


SCHEMATICS (EACH DRIVER)

TD62387AFN



TD62388AFN



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

MAXIMUM RATINGS (Ta = 25°C)

CHARACTERISTIC	SYMBOL	RATING	UNIT
Supply Voltage	V_{CC}	−0.5~7.0	V
Output Sustaining Voltage	$V_{CE\ (SUS)}$	−0.5~50	V
Output Current	I_{OUT}	500	mA / ch
Input Voltage	V_{IN}	−0.5~7.0	V
Input Current	I_{IN}	−10	mA
Clamp Diode Reverse Voltage	V_R	50	V
Clamp Diode Forward Current	I_F	500	mA
Power Dissipation	P_D	0.96 (Note)	W
Operating Temperature	T_{opr}	−40~85	°C
Storage Temperature	T_{stg}	−55~150	°C

Note: On Glass Epoxy PCB (50 × 50 × 1.6 mm Cu 40%)

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

CHARACTERISTIC	SYMBOL	CONDITION		MIN	TYP.	MAX	UNIT
Supply Voltage	V_{CC}			4.5	5.0	5.5	V
Output Sustaining Voltage	$V_{CE\ (SUS)}$			0	—	50	V
Output Current	I_{OUT} (Note)	DC 1 Circuit		0	—	350	mA / ch
		T_{pw} = 25 ms, 8 Circuits, Ta = 85°C, T_j = 120°C	Duty = 10%	0	—	180	
			Duty = 50%	0	—	90	
Input Voltage	V_{IN}			0	—	5.5	V
Clamp Diode Reverse Voltage	V_R			—	—	50	V
Clamp Diode Forward Current	I_F			—	—	400	mA
Power Dissipation	P_D			—	—	0.4	W

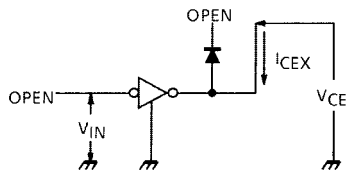
Note: On Glass Epoxy PCB (50 × 50 × 1.6 mm Cu 40%)

ELECTRICAL CHARACTERISTICS (Ta = 25°C)

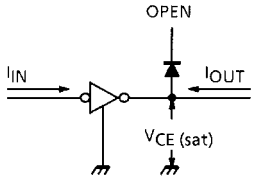
CHARACTERISTIC		SYMBOL	TEST CIR-CUIT	TEST CONDITION	MIN	TYP.	MAX	UNIT
Output Leakage Current		I_{CEX}	1	V_{CC} = 5.5 V, I_{IN} = 0 V_{OUT} = 50 V, Ta = 85°C	—	—	100	μA
Output Saturation Voltage		$V_{CE\ (sat)}$	2	V_{CC} = 4.5 V V_{IN} = $V_{IN\ (ON)}$ Max. I_{OUT} = 350 mA	—	1.4	2.0	V
Input Current	Output On	$I_{IN\ (ON)}$	3	V_{CC} = 5.5 V, V_{IN} = 0.4 V	—	−0.32	−0.45	mA
				V_{CC} = 5.5 V, V_{IN} = −20 V	—	—	−2.6	
	Output Off	$I_{IN\ (OFF)}$	4		—	—	−4.0	μA
Input Voltage (Output on)		$V_{IN\ (ON)}$	5		—	—	V_{CC} − 3.7	V
Clamp Diode Reverse Current		I_R	6	V_R = 50 V, Ta = 25°C (Note 1)	—	—	50	μA
				V_R = 50 V, Ta = 85°C (Note 1)	—	—	100	
Clamp Diode Forward Current		V_F	7	I_F = 350 mA	—	—	2.0	V
				I_F = 280 mA	—	—	1.8	
Supply Current		$I_{CC\ (ON)}$	8	V_{CC} = 5.5 V, V_{IN} = 0	—	17	22	mA
		$I_{CC\ (OFF)}$		V_{CC} = 5.5 V, V_{IN} = V_{CC}	—	—	100	μA
Turn−On Delay		t_{ON}	9	V_{CC} = 5 V, V_{OUT} = 50 V(Note1) R_L = 125 Ω, C_L = 15 pF	—	0.1	—	μs
Turn−Off Delay		t_{OFF}			—	3	—	

TEST CIRCUIT

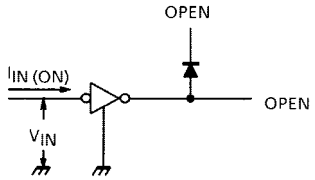
1. I_{CEX}



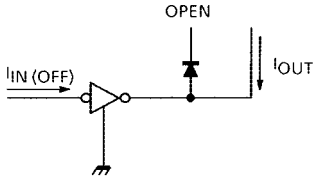
2. $V_{CE\ (sat)}$



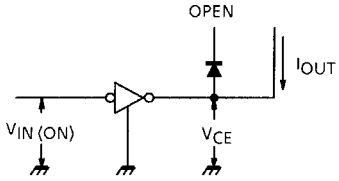
3. $I_{IN\ (ON)}$



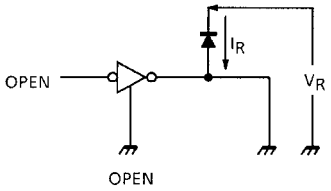
4. $I_{IN\ (OFF)}$



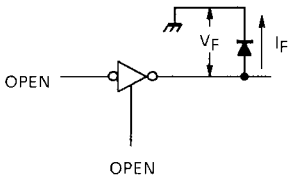
5. $V_{IN\ (ON)}$



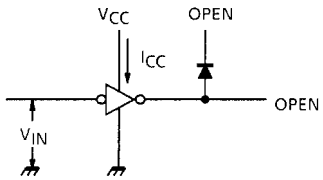
6. I_R



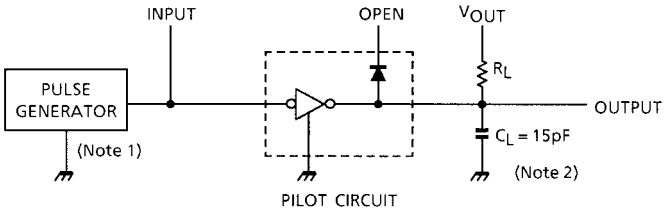
7. V_F

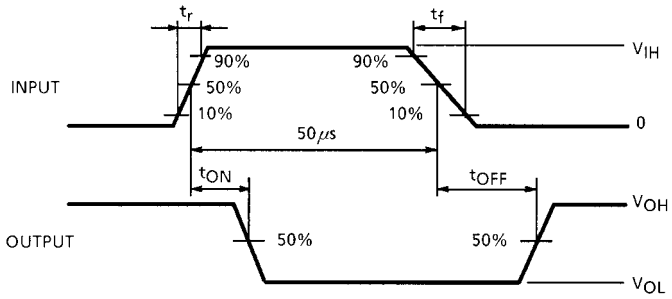


8. I_{CC}



9. t_{ON}, t_{OFF}



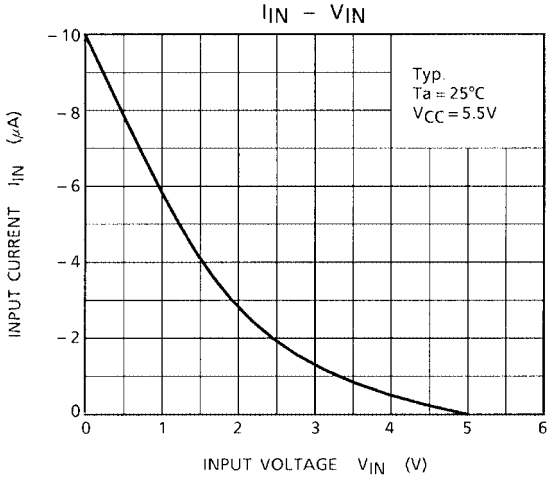


Note 1: Pulse Width 50 μs, Duty Cycle 10%
Output Impedance 50 Ω, $t_r \leq 5$ ns, $t_f \leq 10$ ns
Note 2: C_L includes probe and jig capacitance.

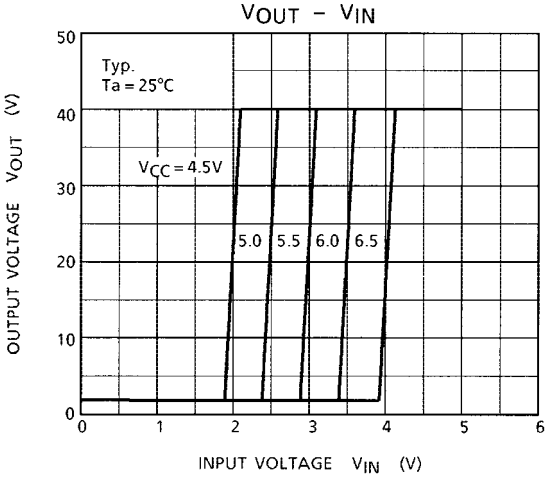
PRECAUTIONS for USING

This IC does not integrate protection circuits such as overcurrent and overvoltage protectors.
Thus, if excess current or voltage is applied to the IC, the IC may be damaged. Please design the IC so that excess current or voltage will not be applied to the IC.
Utmost care is necessary in the design of the output line, V_{CC}, COMMON and GND line since IC may be destroyed due to short−circuit between outputs, air contamination fault, or fault by improper grounding.

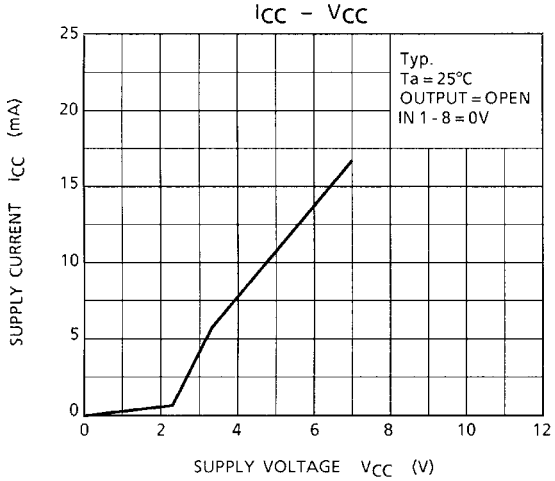
I_{IN} – V_{IN}



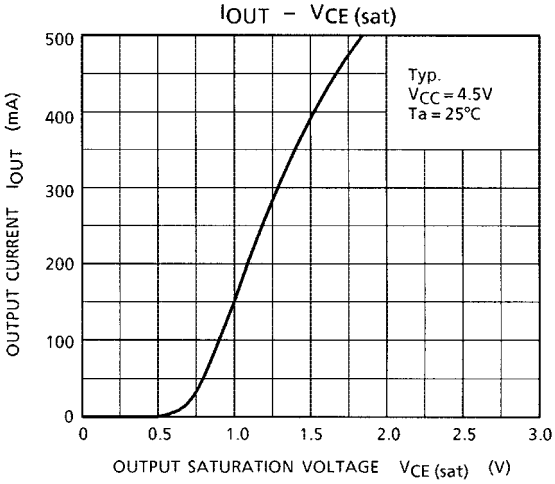
V_{OUT} – V_{IN}



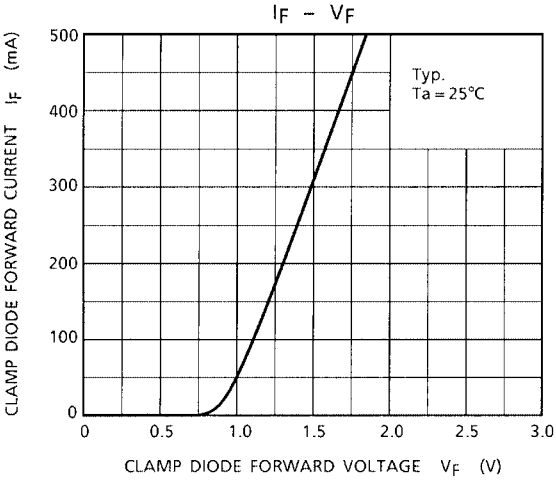
I_{CC} – V_{CC}



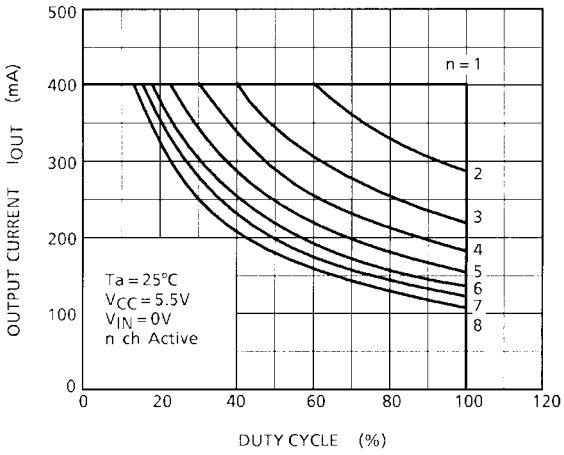
I_{OUT} – $V_{CE\,(sat)}$



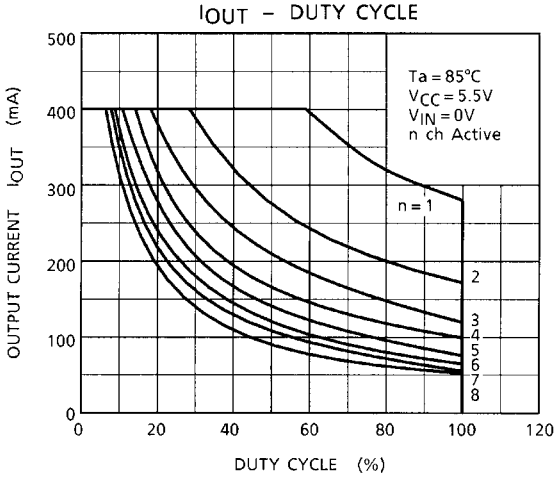
I_F – V_F



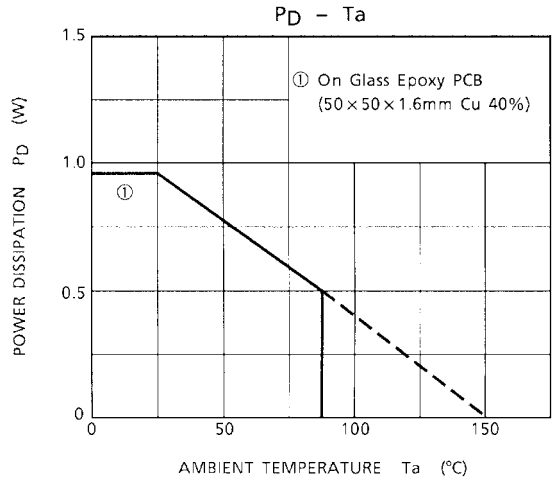
I_{OUT} – DUTY CYCLE



I_{OUT} – DUTY CYCLE

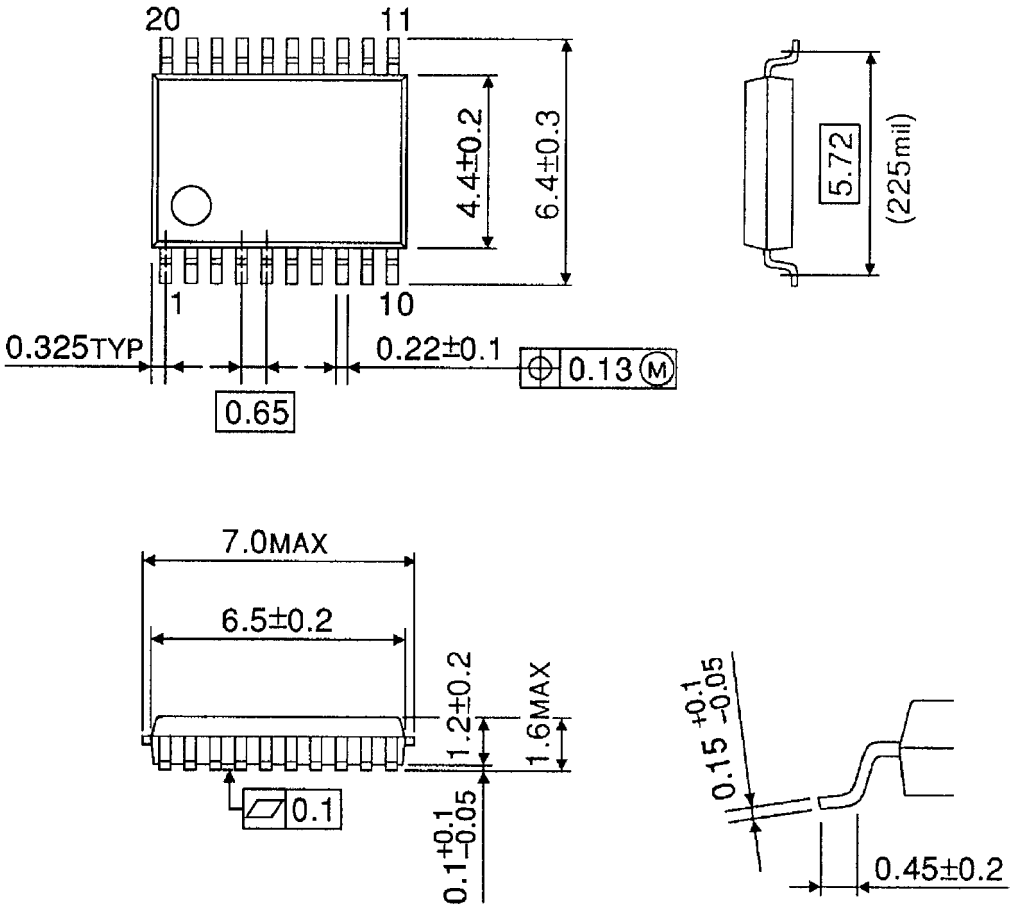


P_D – Ta



PACKAGE DIMENSIONS

SSOP20−P−225−0.65A Unit: mm



Weight: 0.09 g (Typ.)

RESTRICTIONS ON PRODUCT USE

000707EBA

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