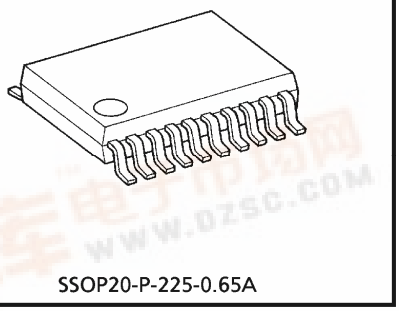
TOSHIBA BIPOLAR DIGITAL INTEGRATED CIRCUIT SILICON MONOLITHIC

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, 5V CMOS and 5V Microprocessor which have sink current output drivers.
Applications include relay, hammer, lamp and LED driver.



SSOP20-P-225-0.65A

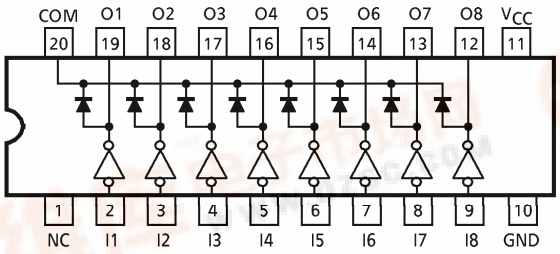
Weight : 0.09g (Typ.)

FEATURES

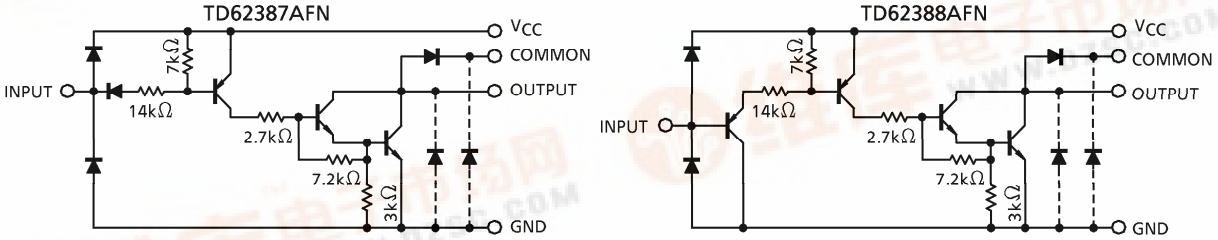
- Package Type : SSOP20 pin
- High Sustaining Voltage : 50V (Min.)
- Output Current (Single Output) : 500mA / ch (Max.)
- Output Clamp Diodes
- Input : LOW LEVEL ACTIVE
- Standard Supply Voltage
- Inputs Compatible with TTL and 5V CMOS

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

PIN CONNECTION (TOP VIEW)



SCHEMATICS (EACH DRIVER)



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

961001EBA2

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	W
Operating Temperature	T_{opr}	−40~85	°C
Storage Temperature	T_{stg}	−55~150	°C

* : On Glass Epoxy PCB (50 × 50 × 1.6mm 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}*	DC 1Circuit		0	—	350	mA / ch
		T_{pw} = 25ms, 8Circuits	Duty = 10%	0	—	180	
		Ta = 85°C, T_j = 120°C	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

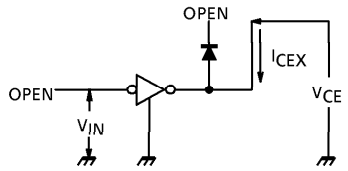
* : On Glass Epoxy PCB (50 × 50 × 1.6mm Cu 40%)

ELECTRICAL CHARACTERISTICS (Ta = 25°C)

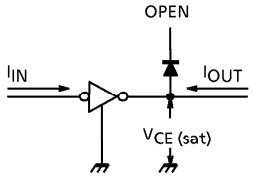
CHARACTERISTIC		SYMBOL	TEST CIR-CUIT	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Output Leakage Current		I_{CEX}	1	V_{CC} = 5.5V, I_{IN} = 0 V_{OUT} = 50V, Ta = 85°C	—	—	100	μA
Output Saturation Voltage		$V_{CE\ (sat)}$	2	V_{CC} = 4.5V, V_{IN} = $V_{IN\ (ON)}$Max. I_{OUT} = 350mA	—	1.4	2.0	V
Input Current	Output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

TEST CIRCUIT

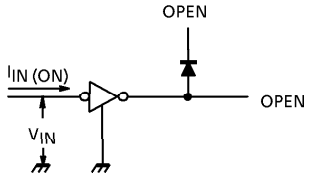
1. I_{CEX}



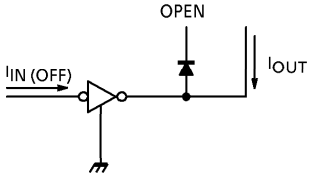
2. $V_{CE\ (sat)}$



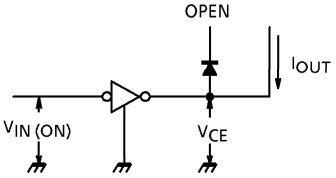
3. $I_{IN\ (ON)}$



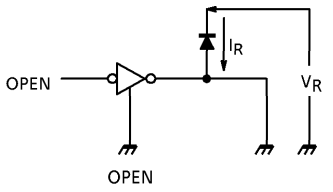
4. $I_{IN\ (OFF)}$



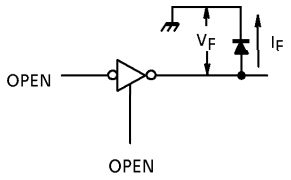
5. $V_{IN\ (ON)}$



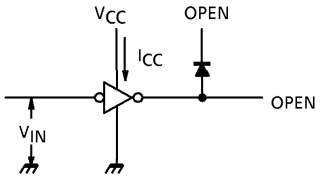
6. I_R



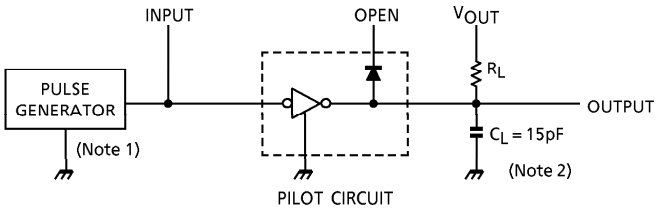
7. V_F

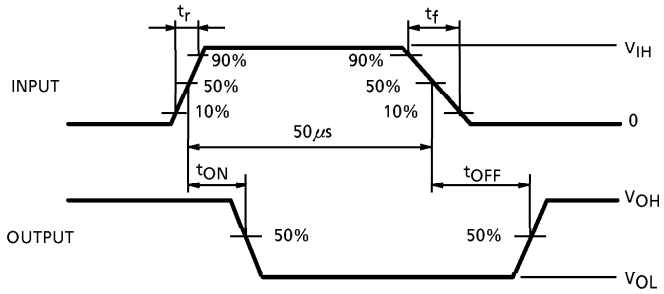


8. I_{CC}



9. t_{ON}, t_{OFF}





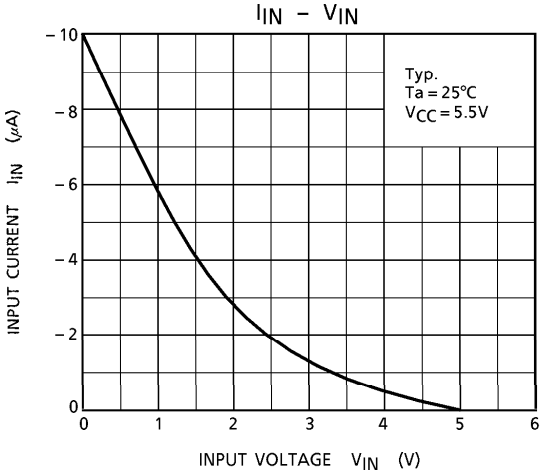
(Note 1) Pulse Width 50μs, Duty Cycle 10%
Output Impedance 50Ω, $t_r \leqq$ 5ns, $t_f \leqq$ 10ns

(Note 2) C_L includes probe and jig capacitance.

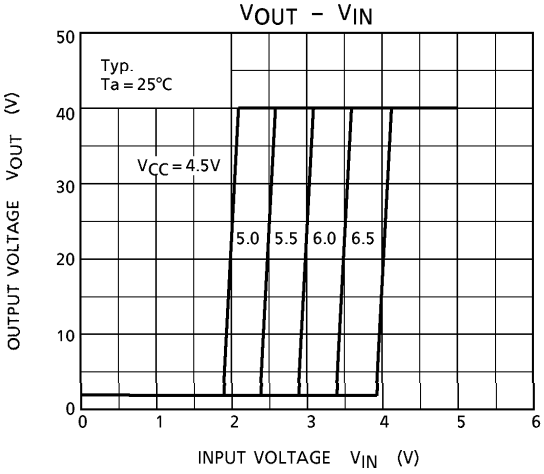
PRECAUTIONS for USING

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

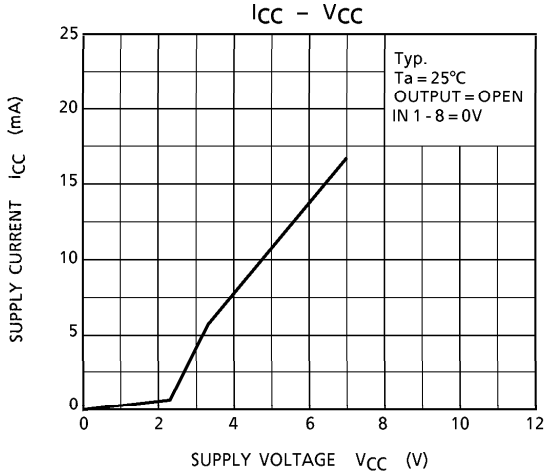
I_{IN} – V_{IN}



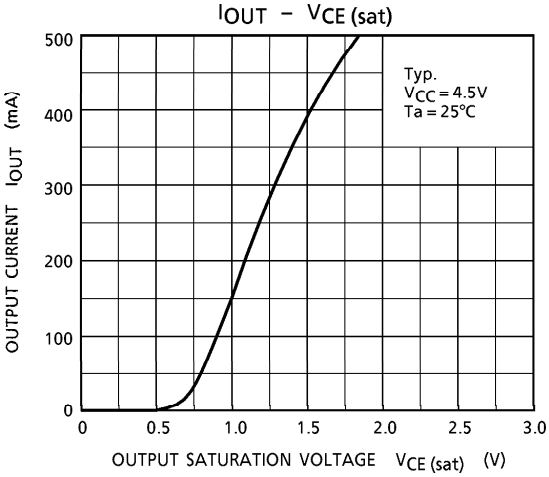
V_{OUT} – V_{IN}



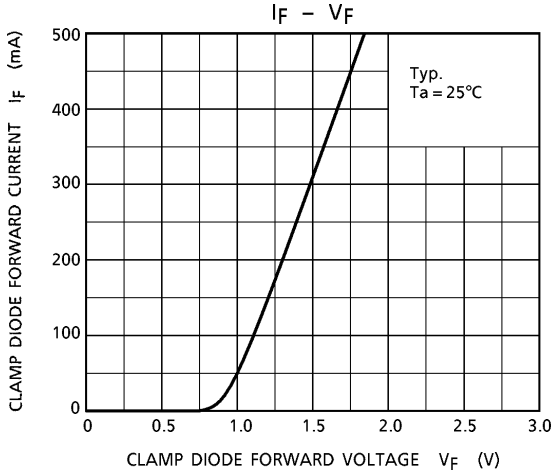
I_{CC} – V_{CC}



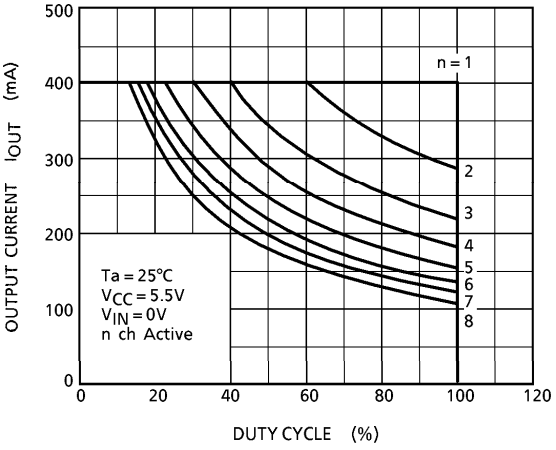
I_{OUT} – $V_{CE\,(sat)}$



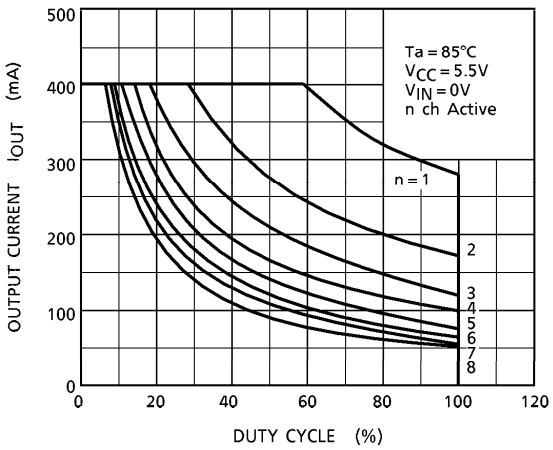
I_F – V_F



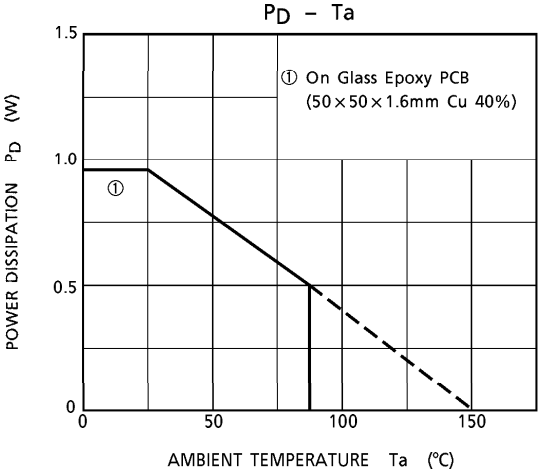
I_{OUT} – DUTY CYCLE



I_{OUT} – DUTY CYCLE

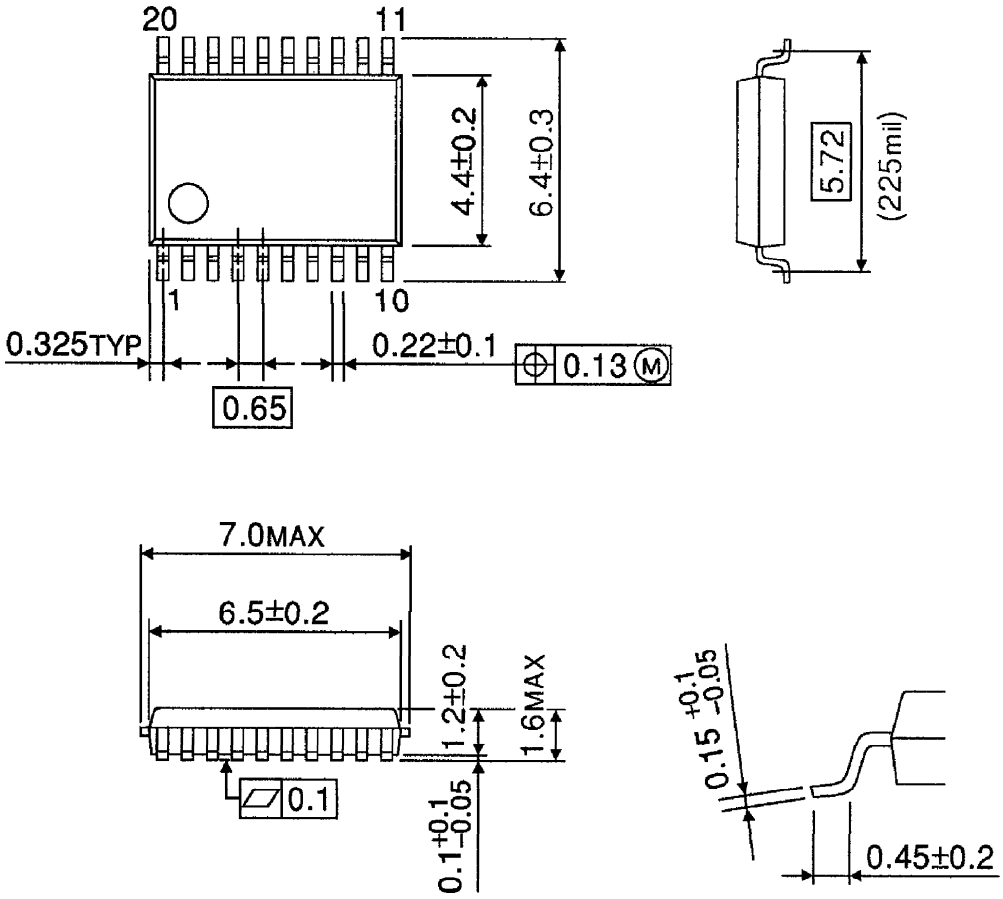


P_D – Ta



OUTLINE DRAWING

SSOP20-P-225-0.65A Unit : mm



Weight : 0.09g (Typ.)