#### TOSHIBA BIPOLAR DIGITAL INTEGRATED CIRCUIT SILICON MONOLITHIC

# TD62476P,TD62477P,TD62478P,TD62479P

## 2CH PERIPHERAL AND / NAND / OR / NOR DRIVERS

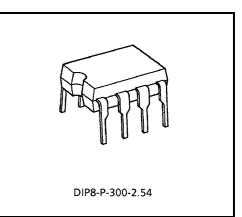
The TD62476P, TD62477P, TD62478P, TD62479P are comprised of two NPN single output stages and control inputs which can gate the outputs.

All units feature integral clamp diodes for switching inductive loads.

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

## FEATURES

- Output current (single output) 350 mA (Max)
- High sustaining voltage output 35 V (Min)
- Output clamp diodes
- Inputs compatible with TTL and 5 V CMOS
- Standard supply voltage
- Package type-P: DIP-8 pin



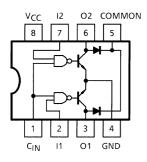
Weight: 0.45 g (Typ.)

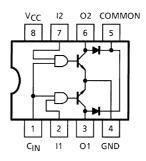
TD62476P			TD62477P			TD62478P			TD62479P			
INF	PUT	OUTPUT	INPUT		OUTPUT	INPUT		OUTPUT	INPUT		OUTPUT	
CIN		0011 01	CIN			CIN	I	0011 01	CIN	I	001101	
0	0	ON	0	0	OFF	0	0	ON	0	0	OFF	
0	1	OFF	0	1	OFF	0	1	OFF	0	1	ON	
1	0	OFF	1	0	OFF	1	0	OFF	1	0	ON	
1	1	OFF	1	1	ON	1	1	OFF	1	1	ON	

#### **PIN CONNECTION (TOP VIEW)**

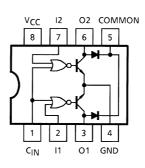
TD62476P

TD62477P

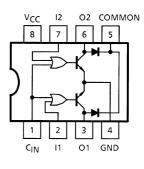




TD62478P



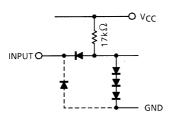
TD62479P

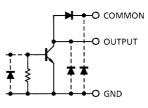


# EQUIVALENT OF INPUTS AND OUTPUTS

Equivalent of inputs

Equivalent of outputs





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

### MAXIMUM RATINGS (Ta = 25°C)

CHARACTERISTICS	SYMBOL	RATING	UNIT
Supply Voltage	V <sub>CC</sub>	-0.5~7.0	V
Input Voltage	V <sub>IN</sub>	-0.5~5.5	V
Output Sustaining Voltage	V <sub>CE (SUS)</sub>	-0.5~35	V
Output Current	IOUT	350	mA / ch
Clamp Diode Reverse Voltage	V <sub>R</sub>	35	V
Clamp Diode Forward Current	١ <sub>F</sub>	300	mA
Power Dissipation	P <sub>D</sub> (Note)	0.9	W
Operating Temperature	T <sub>opr</sub>	-30~75	°C
Storage Temperature	T <sub>stg</sub>	-55~150	°C

Note: Delated above 25°C in the proportion of 7.2 mW / °C.

# **RECOMMENDED OPERATING CONDITIONS (Ta = -30~75°C)**

CHARACTERISTIC	SYMBOL	CONDITION	MIN	TYP.	MAX	UNIT
Supply Voltage	V <sub>CC</sub>	—	4.5	5.0	5.5	V
Output Sustaining Voltage	V <sub>CE (SUS)</sub>	—	0	-	35	V
Output Current	lev-	DC 1 Circuit	0	_	300	mA /
	IOUT	DC 2 Circuits	0	_	200	ch
Input Voltage	V <sub>IN</sub>	—	4.5	-	V <sub>CC</sub>	V
Clamp Diode Reverse Voltage	V <sub>R</sub>	—	-	-	35	V
Clamp Diode Forward Current	١ <sub>F</sub>	—	_	—	300	mA
Power Dissipation	PD	—	-	—	0.4	W

# ELECTRICAL CHARACTERISTICS (Ta = 25°C)

CHARACTERISTIC			SYMBOL	TEST CIR- CUIT	TEST C	ONDITION	MIN	TYP.	MAX	UNIT	
Input Voltage		"H" Level		VIH	1	—		2.0	-	_	V
	ige	"L" Leve	el	V <sub>IL</sub>	1		_	_	_	0.8	v
Output Current		"H" Level		I <sub>OH</sub>	2	V <sub>CC</sub> = 4.5V, V <sub>IH</sub> = 2.0 V V <sub>IL</sub> = 0.8V, V <sub>OH</sub> = 35 V		_	_	10	μA
						V <sub>CC</sub> = 4.5 V	I <sub>OUT</sub> = 100 mA	_	0.15	0.30	
Output Voltage		"L" Level	V <sub>OL</sub>	3	V <sub>IH</sub> = 2.0 V	I <sub>OUT</sub> = 200 mA	_	0.28	0.45	V	
						V <sub>IL</sub> = 0.8 V	I <sub>OUT</sub> = 300 mA	_	0.45	0.60	
			el	Ι <sub>ΙΗ</sub>	4	$V_{CC}$ = 5.5 V, $V_{IN}$ = 5.5 V		_	-	10	μA
Input Current		"L" I	Ι	IIL	5	V <sub>CC</sub> = 5.5 V, V <sub>IN</sub> = 0.4 V		—	-0.26	-0.4	mA
			Level C <sub>IN</sub>					—	-0.52	-0.8	
Clamp Dio	Clamp Diode Reverse Current			I <sub>R</sub>	6	$V_{CC}$ = 4.5 V, $V_{R}$ = 35 V		—	-	10	μA
Clamp Dio	de Forward	forward Voltage $V_F$ 7 $V_{CC}$ = 4.5 V, I <sub>F</sub> = 300 mA - 1.5				1.75	V				
		TD6247	'6P		5		V <sub>IN</sub> = 5 V	—	8.4	14	
	Output	TD6247	7P				V <sub>IN</sub> = 0 V	—	0.6	0.85	
	Off	TD6247	'8P	Іссн		5		V <sub>IN</sub> = 5 V	_	9	14
Supply		TD6247	'9P			V <sub>CC</sub> = 5.5 V	V <sub>IN</sub> = 0 V	_	1.1	1.8	mA
Current		TD6247	'6P	ICCL	4		V <sub>IN</sub> = 5 V	_	38	55	
	Output	TD6247	7P				V <sub>IN</sub> = 0 V	_	36	53	
	On	TD6247	'8P				V <sub>IN</sub> = 5 V	_	39	56	
		TD6247	'9P				V <sub>IN</sub> = 0 V	_	36	63	

# SWITCHING CHARACTERISTICS (Ta = 25°C)

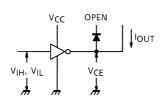
CHARACTERI	SYMBOL	TEST CIR- CUIT	CONDITION	MIN	TYP.	MAX	UNIT	
Propagation Delay	"H" Level	t <sub>pLH</sub>	—	C <sub>L</sub> = 15 pF, R <sub>L</sub> = 120Ω		0.7	١	μs
Time	"L" Level	t <sub>pHL</sub>	_	ομ = 13 βi , κ <u>μ</u> = 120Ω		0.2		μο

# <u>TOSHIBA</u>

# **TEST CIRCUIT**

1. VIH, VIL

3. Vol



Vcc

VIH (ON)

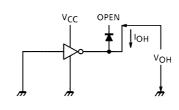
OPEN

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Vol

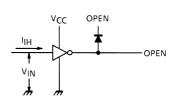
JOUT



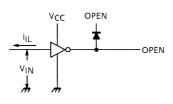


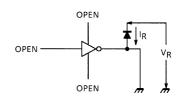


6. I<sub>R</sub>

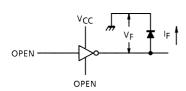






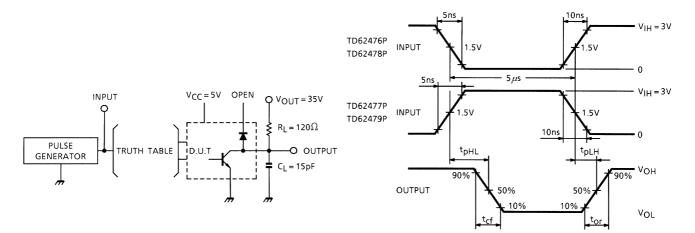


7. V<sub>F</sub>



# TEST CIRCUIT OF SWITCHING CHARACTERISTIC

#### **TEST WAVEFORM**



# **PRECAUTIONS for USING**

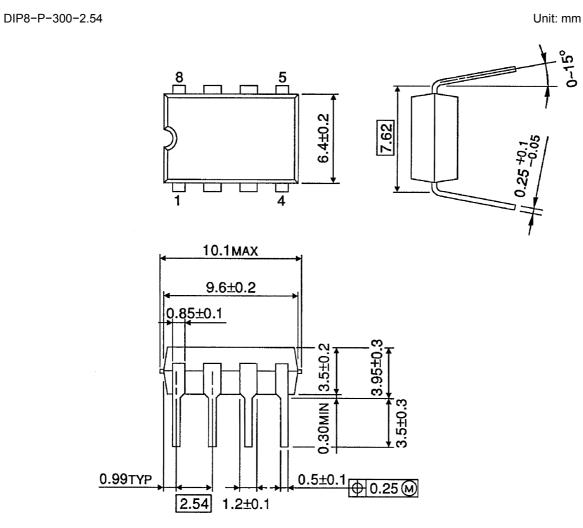
This IC does not integrate protection circuits such as overcurrent and overvoltage protectors. Thus, if excess current or voltage is applied to the IC, the IC may be damaged. Please design the IC so that excess current or voltage will not be applied to the IC.

Utmost care is necessary in the design of the output line, V<sub>CC</sub>, COMMON and GND line since IC may be destroyed due to short-circuit between outputs, air contamination fault, or fault by improper grounding

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# **TOSHIBA**

#### PACKAGE DIMENSIONS



Weight: 0.45 g (Typ.)

#### RESTRICTIONS ON PRODUCT USE

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