#### TOSHIBA BI-CMOS INTEGRATED CIRCUIT SILICON MONOLITHIC

#### TB62003P,TB62003F,TB62003FW,TB62004P,TB62004F,TB62004FW,TB62006P TB62006F,TB62006FW,TB62007P,TB62007F,TB62007FW,TB62008P,TB62008F TB62008FW,TB62009P,TB62009F,TB62009FW

#### 8CH DMOS TRANSISTOR ARRAY WITH GATE

TB62003P, TB62003F, TB62003FW INVERTER & DMOS DRIVER

TB62004P, TB62004F, TB62004FW THROUGH & DMOS DRIVER

TB62006P, TB62006F, TB62006FW NAND & DMOS DRIVER

TB62007P, TB62007F, TB62007FW AND & DMOS DRIVER

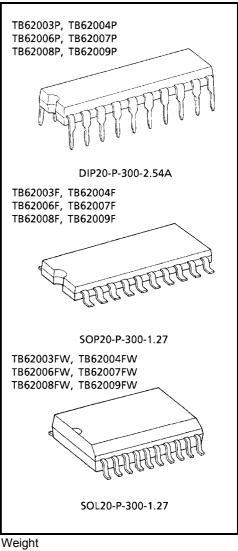
TB62008P, TB62008F, TB62008FW NOR & DMOS DRIVER

TB62009P, TB62009F, TB62009FW OR & DMOS DRIVER

The TB62003 Series are high-voltage, high-current arrays comprised of eight N-ch DMOS pairs.

#### FEATURES

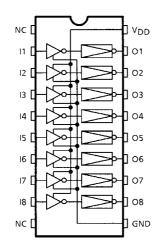
- Package : Type-P DIP-20 pin Type-F SOP-20 pin (200 mil) Type-FW SOL-20 pin (300 mil)
- Output rating : 35 V (Min.) / 200 mA (Max.)
- Low power



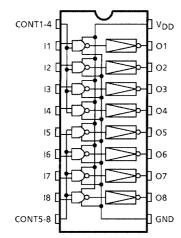
: 2.25 g (Typ.)
: 0.25 g (Typ.)
: 0.48 g (Typ.)

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

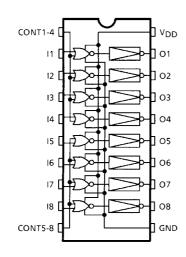
### TB62003P / F / FW



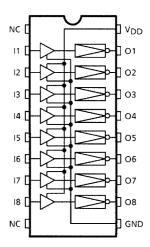
#### TB62003P / F / FW



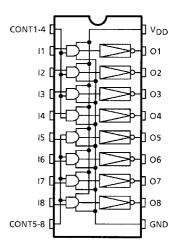




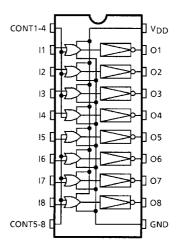
### TB62004P / F / FW



## TB62007P / F / FW







## **TRUTH TABLE**

#### TB62006P / F / FW

	INF	OUT	PUT		
11~4	15~8	CONT1~4	CONT5~8	O3~4	O5~8
Н	Х	Н	Х	OFF	NOT FIX
н	x	L	х	ON	NOT FIX
L	х	Н	х	ON	NOT FIX
L	х	L	х	ON	NOT FIX
х	Н	х	Н	NOT FIX	OFF
х	н	х	L	NOT FIX	ON
х	L	х	н	NOT FIX	ON
х	L	х	L	NOT FIX	ON

X: Don't Care

#### TB62007P / F / FW

	INF	OUT	PUT		
11~4	15~8	CONT1~4	CONT5~8	O3~4	O5~8
н	X	Н	Х	ON	NOT FIX
н	x	L	х	OFF	NOT FIX
L	x	Н	х	OFF	NOT FIX
L	x	L	х	OFF	NOT FIX
х	н	х	Н	NOT FIX	ON
х	н	х	L	NOT FIX	OFF
Х	L	х	Н	NOT FIX	OFF
Х	L	х	L	NOT FIX	OFF

X: Don't Care

### TB62008P / F / FW

	INF		OUT	PUT	
11~4	15~8	CONT1~4	CONT5~8	O3~4	O5~8
н	X	Н	х	OFF	NOT FIX
н	x	L	х	OFF	NOT FIX
L	X	Н	х	OFF	NOT FIX
L	X	L	х	ON	NOT FIX
х	Н	х	Н	NOT FIX	OFF
х	Н	х	L	NOT FIX	OFF
Х	L	х	Н	NOT FIX	OFF
Х	L	Х	L	NOT FIX	ON

X: Don't Care

#### TB62009P / F / FW

	INF	OUT	PUT		
11~4	15~8	CONT1~4	CONT5~8	O3~ 4	O5~8
Н	х	Н	х	ON	NOT FIX
Н	х	L	х	ON	NOT FIX
L	х	Н	х	ON	NOT FIX
L	х	L	х	OFF	NOT FIX
х	Н	х	Н	NOT FIX	ON
Х	Н	Х	L	NOT FIX	ON
Х	L	Х	Н	NOT FIX	ON
Х	L	Х	L	NOT FIX	OFF

X: Don't Care

## MAXIMUM RATINGS (Ta = 25°C)

CHARACTERISTIC		SYMBOL	RATING	UNIT
Supply Voltage		V <sub>DD</sub>	7	V
DC Output Voltage		V <sub>DS</sub>	-0.5~35	V
DC Output Current		I <sub>DS</sub>	200	mA / ch
DC Input Voltage		V <sub>IN</sub>	-0.4+V <sub>DD</sub> +0.4	V
DC Input Current		I <sub>IN</sub>	±5	mA
Input Diode Current		I <sub>ID</sub>	±5	mA
Output Diode Current	lок		5	mA
	Р		1.47	
Power Dissipation	F	PD	0.96 (Note 1)	W
FW			1.00 (Note 2)	
Operating Temperature		T <sub>opr</sub>	-40~85	°C
Storage Temperature		T <sub>stg</sub>	-55~150	°C

Note 1: On Glass Epoxy PCB (50 × 50 × 1.6 mm Cu 40%)

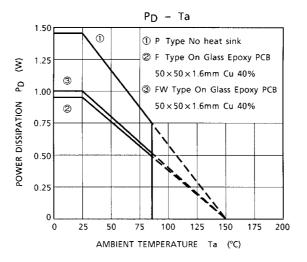
Note 2: Delated above 25°C in the proportion of 7.7 mW / °C (F Type), 8.0 mW / °C (FW Type).

## **RECOMMENDED OPERATING CONDITION (Ta = -40~85°C)**

CHARACTERIS	CHARACTERISTIC SYMBOL CONDITION		CONDITION		MIN	TYP.	MAX	UNIT					
Supply Voltage Range		V <sub>DD</sub>	_		4.5	_	5.5	V					
DC Output Voltage		V <sub>DS</sub>	—		_	_	30	V					
	Р				_	_	170						
	F	Duty 80%	Duty 80%		_	_	90						
DC Output Current	FW			la a	la e	la a	la a	la e		8ch On	_	_	140
DC Output Current	Р	IDS		V <sub>DD</sub> = 5.0 V		_	150	ch					
	F	Duty 100%	Duty 100%		_	_	80						
	FW				_	_	120						
DC Input Voltage		V <sub>IN</sub>	_		GND	_	V <sub>DD</sub>	V					

## ELECTRICAL CHARACTERISTICS (Ta = 25°C, V<sub>DD</sub> = 5.0 V)

CHARACTERISTIC	SYMBOL	TEST CIR- CUIT	TEST CONDITION	MIN	TYP.	MAX	UNIT
Output Leakage Current	I <sub>OZ</sub>	_	V <sub>DS</sub> = 35 V	_		50	μA
	V <sub>DS</sub>	—	I <sub>DS</sub> = 150 mA	_	0.70	0.8	v
Low-Level Output Voltage		_	I <sub>DS</sub> = 200 mA	_	0.94	1.2	v
Output Resistance	R <sub>ON</sub>	_	I <sub>DS</sub> = 200 mA	_	4.7	6.0	Ω
DC Input Current	I <sub>IN</sub>	_	V <sub>IN</sub> = GND, V <sub>IN</sub> = V <sub>DD</sub>	_	_	±1.0	μA
High-Level Input Voltage	V <sub>IN (H)</sub>	_	—	3.5	_	V <sub>DD</sub> +0.4	V
	V <sub>IN (L)</sub>	_	_	-0.4	_	1.5	
Operating Supply Current	I <sub>DDopr</sub>	_	8ch On, Output open f <sub>IN</sub> = 1MHz	_	2	_	μA
Output Diode Forward Voltage	V <sub>FK</sub>	_	I <sub>OK</sub> = 5 mA	_	0.6	_	V
Turn-On Delay	t <sub>ON</sub>	_	I <sub>OUT</sub> = 170 mA	_	300	_	20
Turn-Off Delay	tOFF	_	—	_	300	_	ns
Supply Current	I <sub>DD</sub>	_	_			10	μA
Input Capacitance	C <sub>IN</sub>	_	_	_	15	_	pF



#### **PRECAUTIONS for USING**

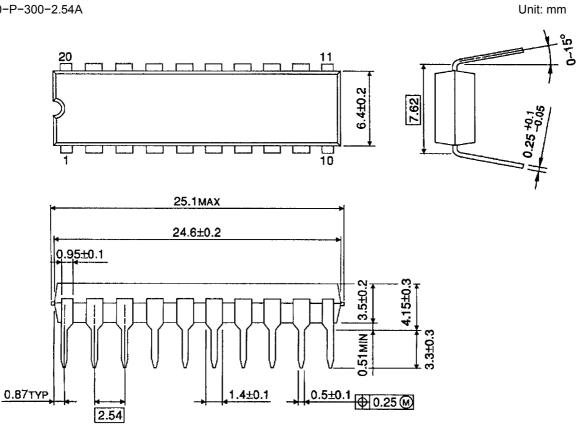
This IC does not integrate protection circuits such as overcurrent and overvoltage protectors.

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> (V<sub>DD</sub>) and GND line since IC may be destroyed due to short–circuit between outputs, air contamination fault, or fault by improper grounding.

## PACKAGE DIMENSIONS

DIP20-P-300-2.54A

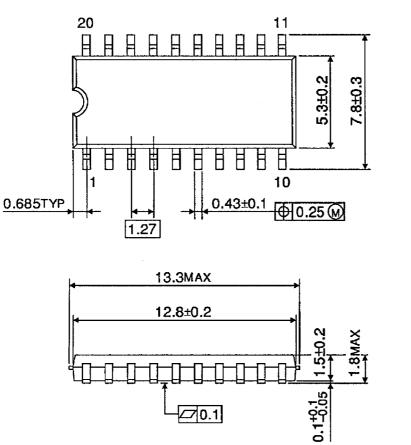


Weight: 2.25 g (Typ.)

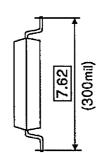
Unit: mm

## **PACKAGE DIMENSIONS**

SOP20-P-300-1.27



∠7 0.1



 $0.15_{-0.05}^{+0.1}$ 0.8±0.2

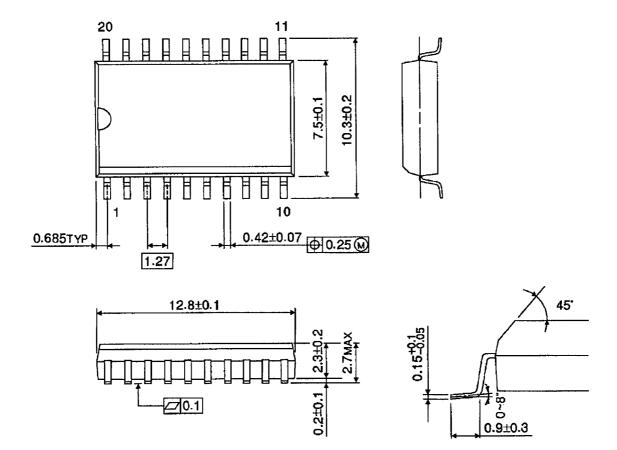
Weight: 0.25 g (Typ.)



### PACKAGE DIMENSIONS

SOL20-P-300-1.27

Unit: mm



Weight: 0.48 g (Typ.)

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