

**TOSHIBA****TA8486F**

TOSHIBA BIPOLAR LINEAR INTEGRATED CIRCUIT MULTI-CHIP

# TA8486F

## DRIVER FOR LOW-SATURATION VOLTAGE MOTORS

The TA8486F is a multi-chip IC containing ten low-saturation voltage discrete transistors.

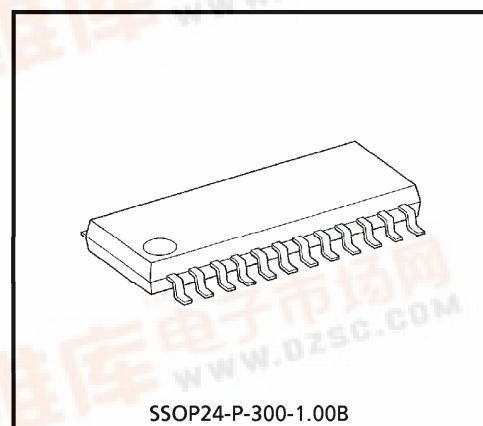
The TA8486F is perfect as a driver for low-saturation driven motor drive transistors. 2.0 A is possible as the output current.

Care must be taken over thermal conditions during usage.

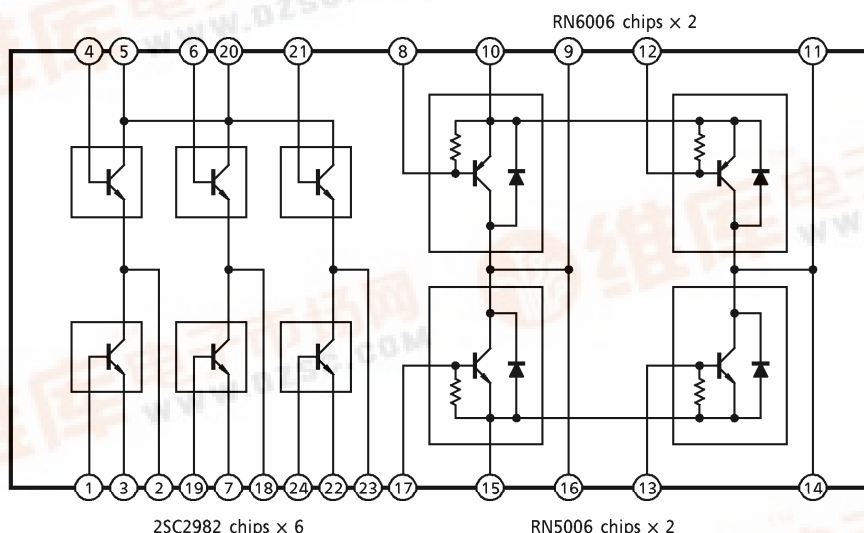
### FEATURES

- Most suitable as a high-efficiency motor driver circuit
- Enclosed in a compact package: SSOP24

### BLOCK DIAGRAM



Weight : 0.27 g (Typ.)

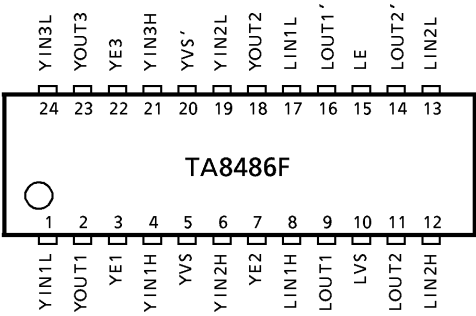


(Note) Short circuiting between output and line to ground faults may result in damage to the IC. Ensure that great care is taken during the design of the output line,  $V_{CC}$  ( $V_M$ ,  $V_S$ ,  $V_{EE}$ ) and the GND line.

980910EBA1

- TOSHIBA is continually working to improve the quality and the reliability of its products. Nevertheless, semiconductor devices in general can malfunction or fail due to their inherent electrical sensitivity and vulnerability to physical stress. It is the responsibility of the buyer, when utilizing TOSHIBA products, to observe standards of safety, and to avoid situations in which a malfunction or failure of a TOSHIBA product could cause loss of human life, bodily injury or damage to property. In developing your designs, please ensure that TOSHIBA products are used within specified operating ranges as set forth in the most recent products specifications. Also, please keep in mind the precautions and conditions set forth in the TOSHIBA Semiconductor Reliability Handbook.
- The products described in this document are subject to the foreign exchange and foreign trade laws.
- The information contained herein is presented only as a guide for the applications of our products. No responsibility is assumed by TOSHIBA CORPORATION for any infringements of intellectual property or other rights of the third parties which may result from its use. No license is granted by implication or otherwise under any intellectual property or other rights of TOSHIBA CORPORATION or others.
- The information contained herein is subject to change without notice.

PIN ASSIGNMENTS (TOP VIEW)



MAXIMUM RATINGS (Ta = 25°C)

H-bridge

CHARACTERISTIC	SYMBOL	RATING	UNIT
Power Voltage	VCC	10	V
Voltage Between the Collector and Base	V <sub>CBO</sub>	10	V
Voltage Between the Collector and Emitter	V <sub>CER</sub>	10	V
Voltage Between the Emitter and Base	V <sub>EBO</sub>	6	V
Output Transistor Current	I <sub>OUT</sub>	2	A
Base Current	I <sub>B</sub>	± 0.4	A
Diode Forward Current	I <sub>F</sub>	2 (Note 1)	A
Power Dissipation	P <sub>D</sub>	830 (Note 2)	mW
Connection Temperature	T <sub>j</sub>	150	°C
Operating Temperature	T <sub>opr</sub>	− 40~85	°C
Storage Temperature	T <sub>stg</sub>	− 55~150	°C

(Note 1) T = 10 ms one-shot pulse

(Note 2) Unit (package total)

## Three-phase motor

CHARACTERISTIC	SYMBOL	RATING	UNIT
Power Voltage	$V_{CC}$	15	V
Voltage Between the Collector and Base	$V_{CBO}$	15	V
Voltage Between the Collector and Emitter	$V_{CEO}$	15	V
Voltage Between the Emitter and Base	$V_{BE0}$	6	V
Output Transistor Current	$I_O$	2	A
Base Current	$I_B$	0.4	A
Power Dissipation	$P_D$	830 (Note 1)	mW
Connection Temperature	$T_j$	150	°C
Operating Temperature	$T_{opr}$	-40~85	°C
Storage Temperature	$T_{stg}$	-55~150	°C

(Note 1) Unit (package total)

ELECTRICAL CHARACTERISTICS ( $T_a = 25^\circ\text{C}$ )

## H-bridge

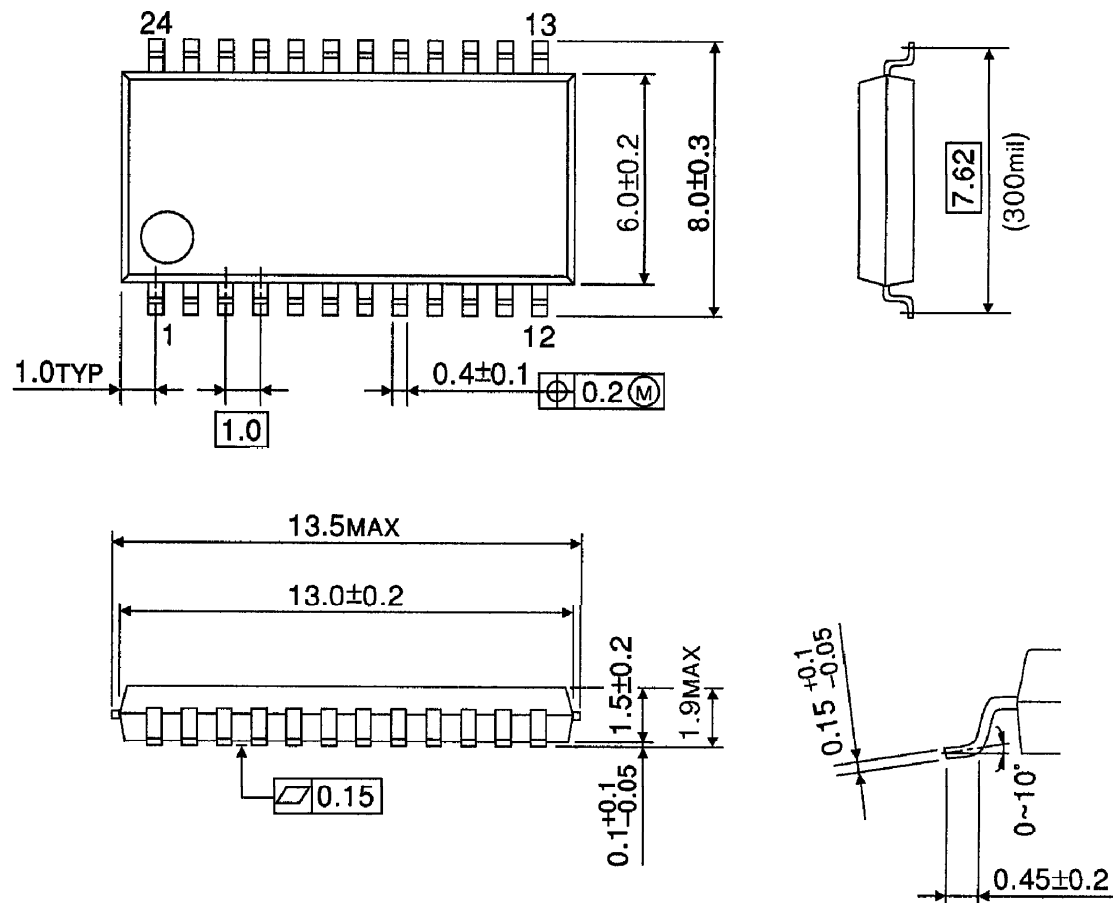
CHARACTERISTIC		SYMBOL	TEST CIRCUIT	TEST CONDITION	MIN	TYP.	MAX	UNIT
Direct Current Amplification		$h_{FE}(1)$	—	$V_{CE} = 1\text{ V}, I_C = 0.5\text{ A}$	160	—	600	—
		$h_{FE}(2)$	—	$V_{CE} = 1\text{ V}, I_C = 2.0\text{ A}$	60	130	—	
Output Saturation Voltage	Upper	$V_{CE}(\text{sat})$	—	$I_C = -1\text{ A}, I_B = -25\text{ mA}$	—	-0.15	-0.25	V
	Lower			$I_C = 1\text{ A}, I_B = 25\text{ mA}$	—	0.25	0.35	
	Upper and Lower			$I_C = 1\text{ A}, I_B = 25\text{ mA}$	—	0.4	0.6	
Transition Frequency		$f_T$	—	$V_{CE} = 2\text{ V}, I_C = 0.5\text{ A}$	—	150	—	MHz
Output Leak Current	Upper	$I_{OL}$	—	$V_{CC} = -10\text{ V}$	—	0	-5	$\mu\text{A}$
	Lower			$V_{CC} = 10\text{ V}$	—	0	5	
Diode Forward Voltage	Upper	$V_F$	—	$I_F = 300\text{ mA}$	—	1.1	1.3	V
	Lower			$I_F = 300\text{ mA}$	—	1.1	1.3	
Resistance Between the Base and Emitter		$R_{BE}$	—	—	7	10	13	$\text{k}\Omega$
Voltage Between the Base and Emitter		$V_{BE}(\text{PNP})$	—	$V_{CE} = -1\text{ V}, I_C = -2\text{ A}$	—	-0.84	-1.5	V
		$V_{BE}(\text{NPN})$	—	$V_{CE} = 1\text{ V}, I_C = 2\text{ A}$	—	0.84	1.5	

## Three-phase motor

CHARACTERISTIC		SYMBOL	TEST CIRCUIT	TEST CONDITION	MIN	TYP.	MAX	UNIT
Direct Current Amplification		$h_{FE} (1)$	—	$V_{CE} = 0.4 \text{ V}, I_C = 30 \text{ mA}$	160	—	600	—
		$h_{FE} (2)$	—	$V_{CE} = 0.4 \text{ V}, I_C = 0.2 \text{ A}$	160	—	600	
$h_{FE}$ Ratio		$h_{FE} (1) / h_{FE} (2)$	—	$V_{CE} = 0.4 \text{ V}, I_C = 30 \text{ mA}$ $/ V_{CE} = 0.4 \text{ V}, I_C = 0.2 \text{ A}$	0.75	—	1.25	—
Output Saturation Voltage	Upper	$V_{CE} (\text{sat})$	—	$I_C = 1 \text{ A}, I_B = 25 \text{ mA}$	—	0.2	0.35	V
	Lower			$I_C = 1 \text{ A}, I_B = 25 \text{ mA}$	—	0.2	0.35	
	Upper and Lower			$I_C = 1 \text{ A}, I_B = 25 \text{ mA}$	—	0.4	0.7	
Transition Frequency		$f_T$	—	$V_{CE} = 2 \text{ V}, I_C = 0.5 \text{ A}$	—	140	—	MHz
Output Leak Current	Upper	$I_{OL}$	—	$V_{CC} = 15 \text{ V}$	—	0	10	$\mu\text{A}$
	Lower			$V_{CC} = 15 \text{ V}$	—	0	10	
Voltage Between the Base and Emitter		$V_{BE} (\text{NPN})$	—	$V_{CE} = 1 \text{ V}, I_C = 2 \text{ A}$	—	0.84	1.5	V

PACKAGE DIMENSIONS  
SSOP24-P-300-1.00B

Unit : mm



Weight : 0.27 g (Typ.)