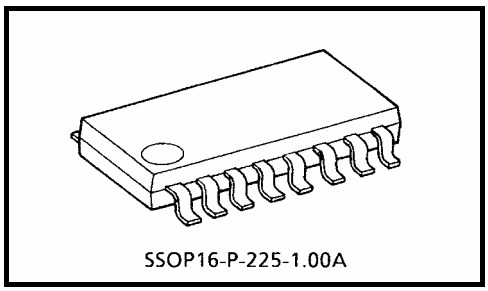
TOSHIBA Bipolar Digital Integrated Circuit Multi Chip

TD62M2701FG

Low Saturation Voltage H-Bridge Driver

TD62M2701FG is multi-chip H-bridge driver IC incorporates 4 low saturation discrete transistors which equipped bias-resistor and fly-wheel diode. This IC is suitable for forward-reverse control on a battery use motor drive applications.

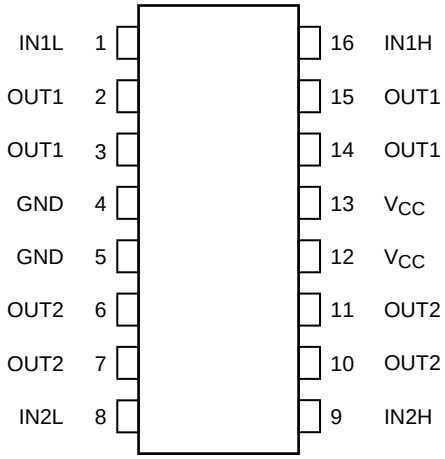


Weight: 0.14 g (typ.)

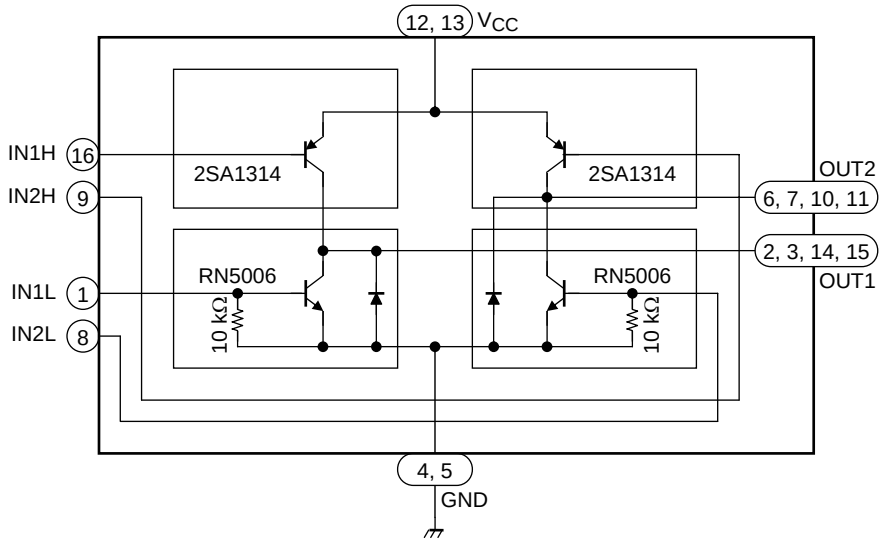
Features

- Suitable for high efficiency motor drive circuit
- Built-in fly-wheel diode (lower side)
- Built-in bias resistor (lower side): R = 10 kΩ (typ.)
- SSOP 16 (1 mm pitch) package sealed
- Low saturation voltage: $V_{CE\ (sat)}$ (upper + lower) = 0.23 V (typ.): I_O = 1 A
  = 0.45 V (typ.): I_O = 2 A

Pin Assignment (top view)



Block Diagram



Maximum Ratings (Ta = 25°C)

Characteristics	Symbol	Rating	Unit
Supply voltage	V_{CC}	10	V
Collector-base voltage	V_{CBO}	10	V
Collector-emitter voltage	V_{CER}	10	V
Emitter-base voltage	V_{EBO}	6	V
Output current	I_{OUT}	2	A
	$I_{O\ (PEAK)}$	4 (Note 1)	
Base current	I_B	±0.4	A
	$I_{B\ (PEAK)}$	±0.8 (Note 1)	
Diode forward current	I_F	2 (Note 2)	A
Power dissipation	P_D	490	mW
Junction temperature	T_j	150	°C
Operating temperature	T_{opr}	−40 to 85	°C
Storage temperature	T_{stg}	−55 to 150	°C

Note 1: T = 10 ms max and maximum duty is less than 30%

Note 2: T = 10 ms single pulse

Electrical Characteristics (Ta = 25°C)

Characteristics		Symbol	Test Circuit	Test Condition	Min	Typ.	Max	Unit
Current gain	Upper side	$h_{FE\ (1)}$	—	V_{CE} = −1 V, I_C = −0.5 A	200	—	700	—
	Lower side	$h_{FE\ (1)}$	—	V_{CE} = 1 V, I_C = 0.5 A	160	—	700	
		$h_{FE\ (2)}$	—	V_{CE} = 1 V, I_C = 2.0 A	60	130	—	
Output saturation voltage	Upper side	$V_{CE\ (sat)}$	—	I_C = −1 A, I_B = −25 mA	—	−0.10	−0.22	V
				I_C = −2 A, I_B = −50 mA	—	−0.20	−0.45	
	Lower side		—	I_C = 1 A, I_B = 25 mA	—	0.13	0.22	
				I_C = 2 A, I_B = 50 mA	—	0.25	0.45	
	Summing total		—	I_C = 0.5 A, I_B = 12.5 mA	—	—	0.20	
				I_C = 1 A, I_B = 25 mA	—	0.23	0.42	
				I_C = 2 A, I_B = 50 mA	—	0.45	0.85	
Transition frequency		f_T	—	V_{CE} = 2 V, I_C = 0.5 A	—	150	—	MHz
Output leakage current	Upper side	I_{OL}	—	V_{CC} = −10 V	—	0	−5	μA
	Lower side			V_{CC} = 10 V	—	0	5	
Diode forward voltage (lower Side)		V_F	—	I_F = 300 mA	—	0.89	1.2	V
				I_F = 450 mA, 10 ms	—	1.60	—	
Base-emitter resistance		R_{BE}	—	—	7	10	13	kΩ
Base-emitter forward voltage	Upper side	$V_{BE\ (PNP)}$	—	V_{CE} = −1 V, I_C = −2 A	—	−0.84	−1.5	V
	Lower side	$V_{BE\ (NPN)}$	—	V_{CE} = 1 V, I_C = 2 A	—	0.84	1.5	

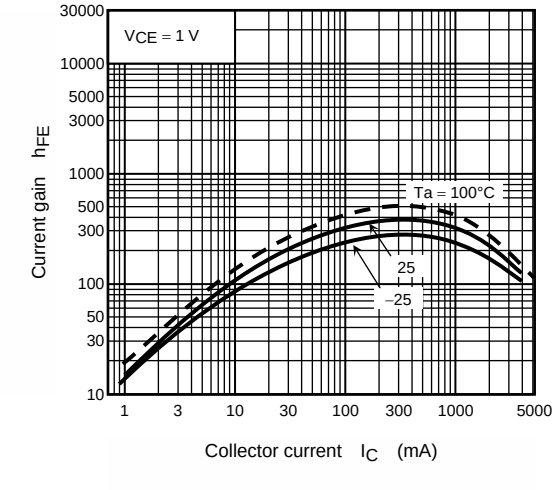
Precautions for Using

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

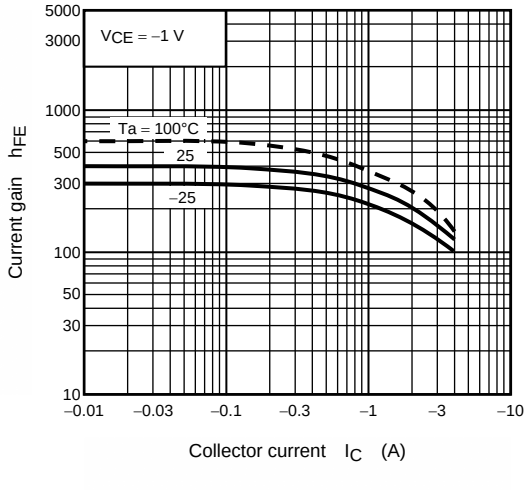
Thus, if excess current or voltage is applied to the IC, the IC may be damaged. Please design the IC so that excess current or voltage will not be applied to the IC.

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

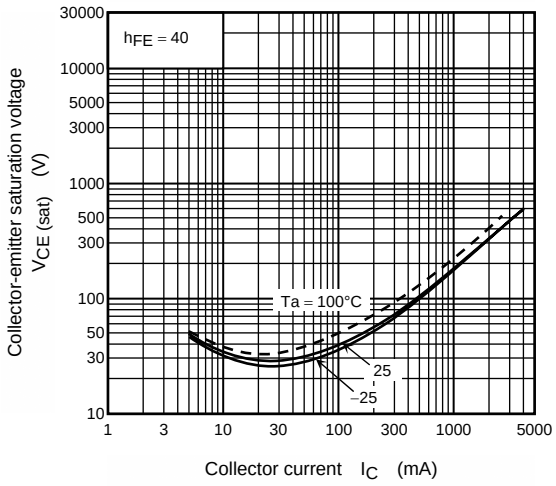
$h_{FE} - I_C$ (lower side)



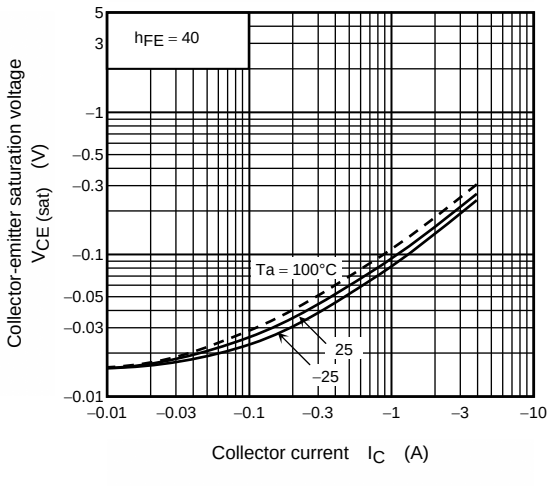
$h_{FE} - I_C$ (upper side)



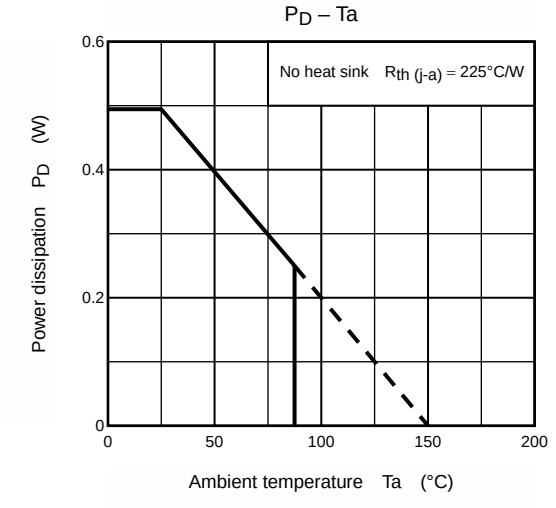
$V_{CE\ (sat)} - I_C$ (lower side)



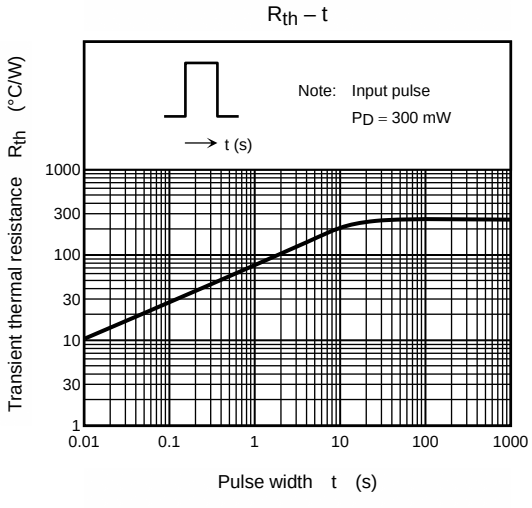
$V_{CE\ (sat)} - I_C$ (upper side)



$P_D - Ta$

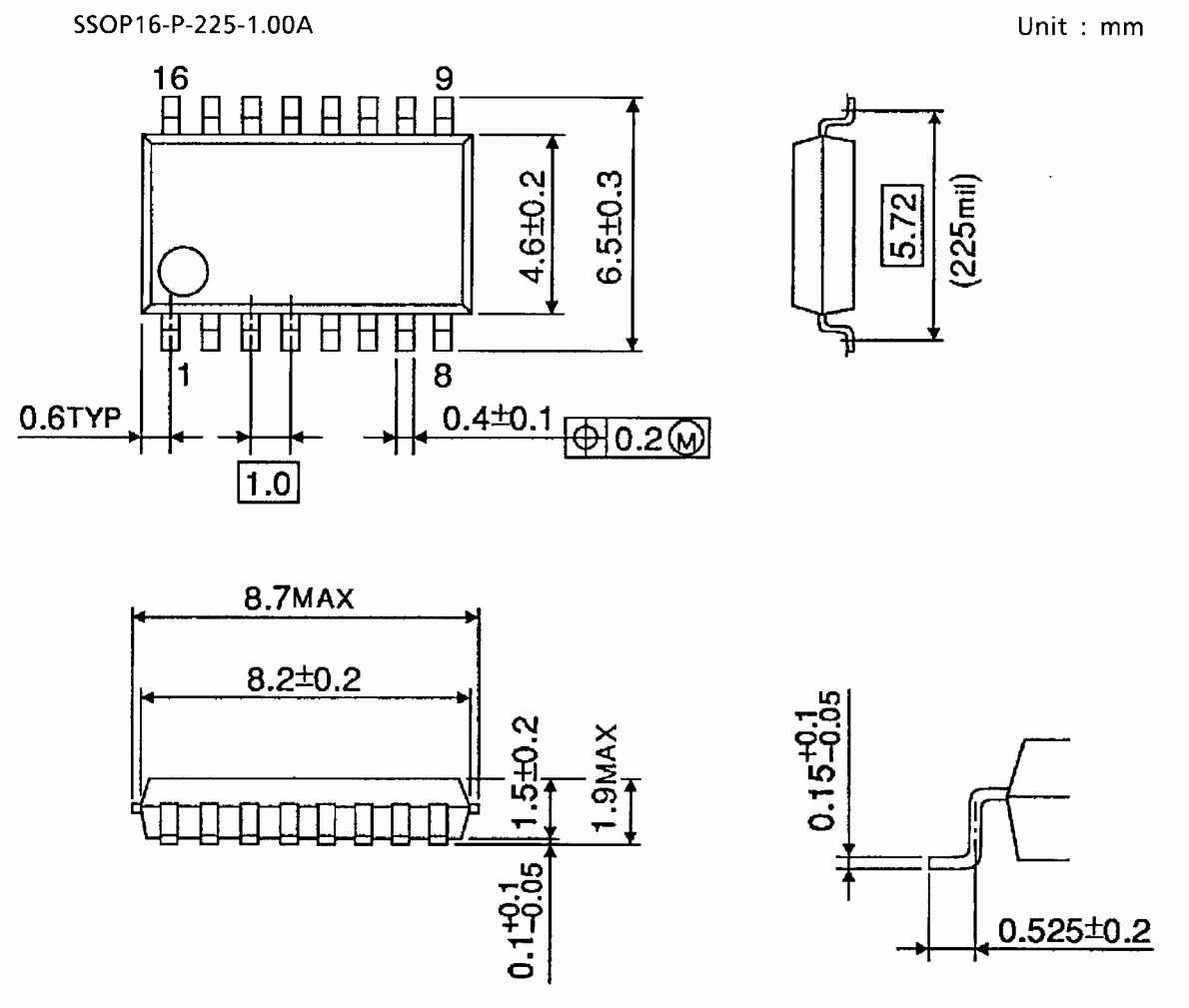


$R_{th} - t$



Package Dimensions

SSOP16-P-225-1.00A Unit : mm



Weight: 0.14 g (typ.)

About solderability, following conditions were confirmed

- Solderability

  (1) Use of Sn-63Pb solder Bath
  - solder bath temperature = 230°C
  - dipping time = 5 seconds
  - the number of times = once
  - use of R-type flux

  (2) Use of Sn-3.0Ag-0.5Cu solder Bath
  - solder bath temperature = 245°C
  - dipping time = 5 seconds
  - the number of times = once
  - use of R-type flux

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