

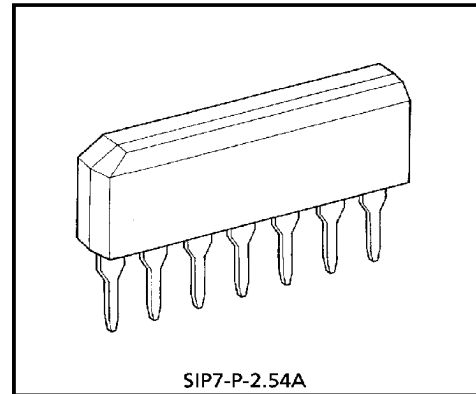
# TA8316AS

## IGBT GATE DRIVER

TA8316AS is a dedicated IC integrating IGBT gate drive circuits on a single chip.  
A high current directly drives IGBT.

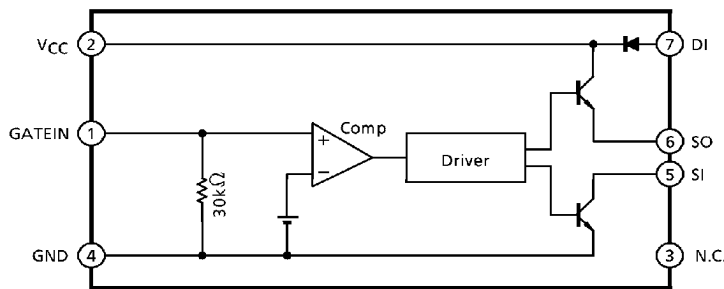
### FEATURES

- Can directly control from a microcontroller
- Can directly drive the IGBT gate using a high current.  
Source current : -200mA (max), sink current 1A (max)
- Incorporates a diode to protect the IGBT gate at power on.



SIP7-P-2.54A  
Weight : 0.72g (Typ.)

### BLOCK DIAGRAM



961001EBA1

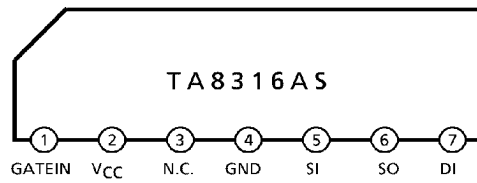
● TOSHIBA is continually working to improve the quality and the reliability of its products. Nevertheless, semiconductor devices in general can malfunction or fail due to their inherent electrical sensitivity and vulnerability to physical stress. It is the responsibility of the buyer, when utilizing 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 foreign exchange and foreign trade control 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 CONNECTION**



**PIN FUNCTIONS**

PIN No.	PIN NAME	FUNCTION
1	GATEIN	Gate Signal Input Pin
2	VCC	System Power Supply
3	N.C.	Not Connected
4	GND	GND
5	SI	IGBT Gate Drive Pin 1 (Sink Side)
6	SO	IGBT Gate Drive Pin 2 (Source Side)
7	DI	IGBT Gate Protector Diode Pin

**MAXIMUM RATINGS (Ta = 25°C)**

CHARACTERISTIC	SYMBOL	RATING	UNIT
Collector Supply Voltage	V <sub>CC</sub>	25	V
Input Voltage	V <sub>in</sub>	GND - 0.3 ~ V <sub>CC</sub> + 0.3	V
Operating Temperature	T <sub>opr</sub>	- 20 ~ 85	°C
Storage Temperature	T <sub>stg</sub>	- 55 ~ 150	°C
Power Dissipation *	P <sub>D</sub>	925	mW

\* When Ta > 25°C, P<sub>D</sub> decreases 7.4mW per degree.

ELECTRICAL CHARACTERISTICS (Ta = 25°C, Unless otherwise specified, V<sub>CC</sub> = 20V)

CHARACTERISTIC	SYMBOL	TEST CIRCUIT	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Supply Voltage Block							
Operating Supply Voltage Range	V <sub>CC</sub>	—	—	7	—	24	V
Current Consumption 1	I <sub>CC1</sub>	—	V <sub>CC</sub> = 20V, GATEIN = "H", No Load	0.7	1.25	1.9	mA
Current Consumption 2	I <sub>CC2</sub>	—	V <sub>CC</sub> = 20V, GATEIN = "L", No Load	4.2	6.25	8.8	mA
(GATEIN Pin)							
Input Dynamic Range	V <sub>in</sub> GATEIN	—	—	0	—	V <sub>CC</sub> - 2.2	V
Threshold Voltage 1	V <sub>th</sub> GATE1	—	GATE Signal L→H	—	2.63	3	V
Threshold Voltage 2	V <sub>th</sub> GATE2	—	GATE Signal H→L	1.5	2.27	—	V
Input Current	I <sub>in</sub> GATE	—	V <sub>in</sub> = 5V	125	167	249	μA
Input Frequency (Reference)	f <sub>in</sub> GATE	—	When Load C = 5600pF, R = 10kΩ Connected	—	—	50	kHz
(SI Pin)							
"L" Level Output Voltage 1	V <sub>OL</sub> SI1	—	VGATEIN = 0V, I <sub>OL</sub> = 30mA	—	—	0.7	V
"L" Level Output Voltage 2	V <sub>OL</sub> SI2	—	VGATEIN = 0V, I <sub>OL</sub> = 1A	—	—	2	V
"L" Level Output Voltage 3	V <sub>OL</sub> SI3	—	V <sub>CC</sub> = 7V, VGATEIN = 0V, I <sub>OL</sub> = 30mA	—	—	1	V
"L" Level Output Voltage 4 (Output Voltage At Low Supply Voltage)	V <sub>OL</sub> SI4	—	2V ≤ V <sub>CC</sub> < 7V, VGATEIN = 0V, No Load	—	—	1	V
"L" Level Output Voltage 5 (Output Voltage At Low Supply Voltage)	V <sub>OL</sub> SI5	—	2V ≤ V <sub>CC</sub> < 7V, VGATEIN = 0V, I <sub>OL</sub> = 30mA	—	—	2	V
Off Leakage Current	I <sub>off</sub> SI	—	VGATEIN = 6V, V <sub>in</sub> = 20V	-1	—	1	μA
(SO Pin)							
"H" Level Output Voltage 1	V <sub>OH</sub> SO1	—	VGATEIN = 6V, I <sub>OH</sub> = -30mA	V <sub>CC</sub> - 2	—	—	V
"H" Level Output Voltage 2	V <sub>OH</sub> SO2	—	VGATEIN = 6V, I <sub>OH</sub> = -200mA	V <sub>CC</sub> - 5	—	—	V
Off Leakage Current	I <sub>off</sub> SO	—	VGATEIN = 0V, V <sub>in</sub> = 0V	-1	—	1	μA
(DI Pin)							
Input Clamp Voltage 1	V <sub>F</sub> DI1	—	I <sub>in</sub> = 500mA	—	—	V <sub>CC</sub> + 1.5	V
Input Clamp Voltage 2	V <sub>F</sub> DI2	—	V <sub>CC</sub> = 0V, I <sub>in</sub> = 300mA	—	—	V <sub>CC</sub> + 1.0	V

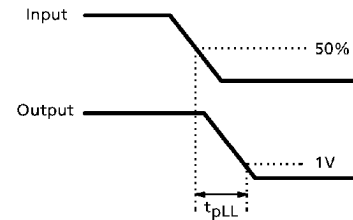
**AC CHARACTERISTICS** (Ta = 25°C, Unless otherwise specified, VCC = 20V)

CHARACTERISTIC	SYMBOL	TEST CIRCUIT	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Propagation Delay Time 1	tpLL	—	See test circuit diagram	—	—	2	μs
Propagation Delay Time 2	tpHH	—	See test circuit diagram	—	—	2	μs
Output Fall Time	tf	—	See test circuit	—	—	0.5	μs

**AC CHARACTERISTICS TEST CONDITIONS**

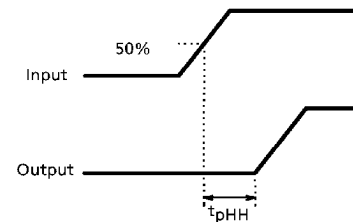
① Propagation delay time 1 (tpLL)

Time from input of "L" level to GATEIN pin until output reaches 1V



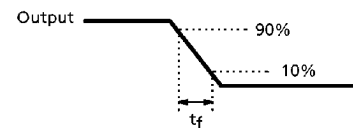
② Propagation delay time 2 (tpHH)

Time from input of "H" level to GATEIN pin until output starts to rise

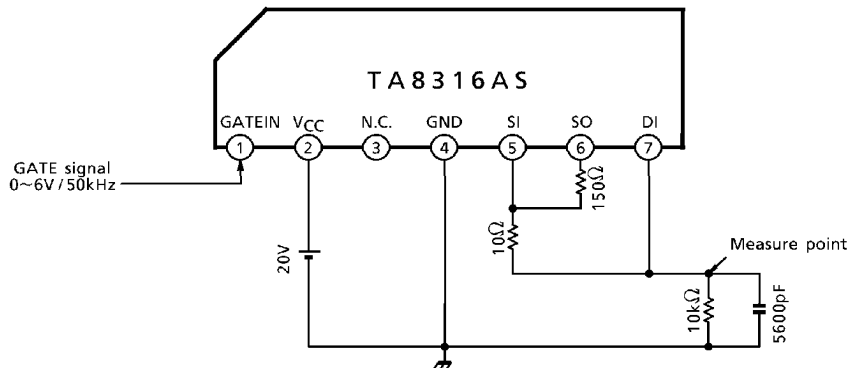


③ Output fall time (tf)

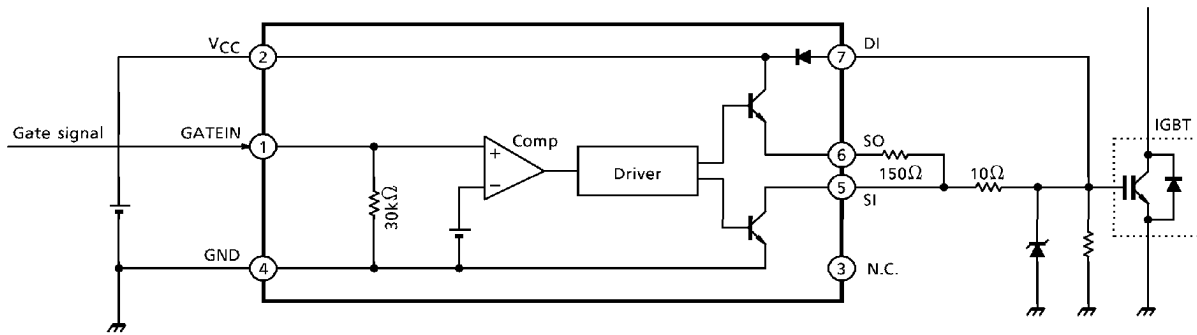
Output fall time from 90% to 10%



**DIAGRAM OF AC CHARACTERISTICS TEST CIRCUIT**

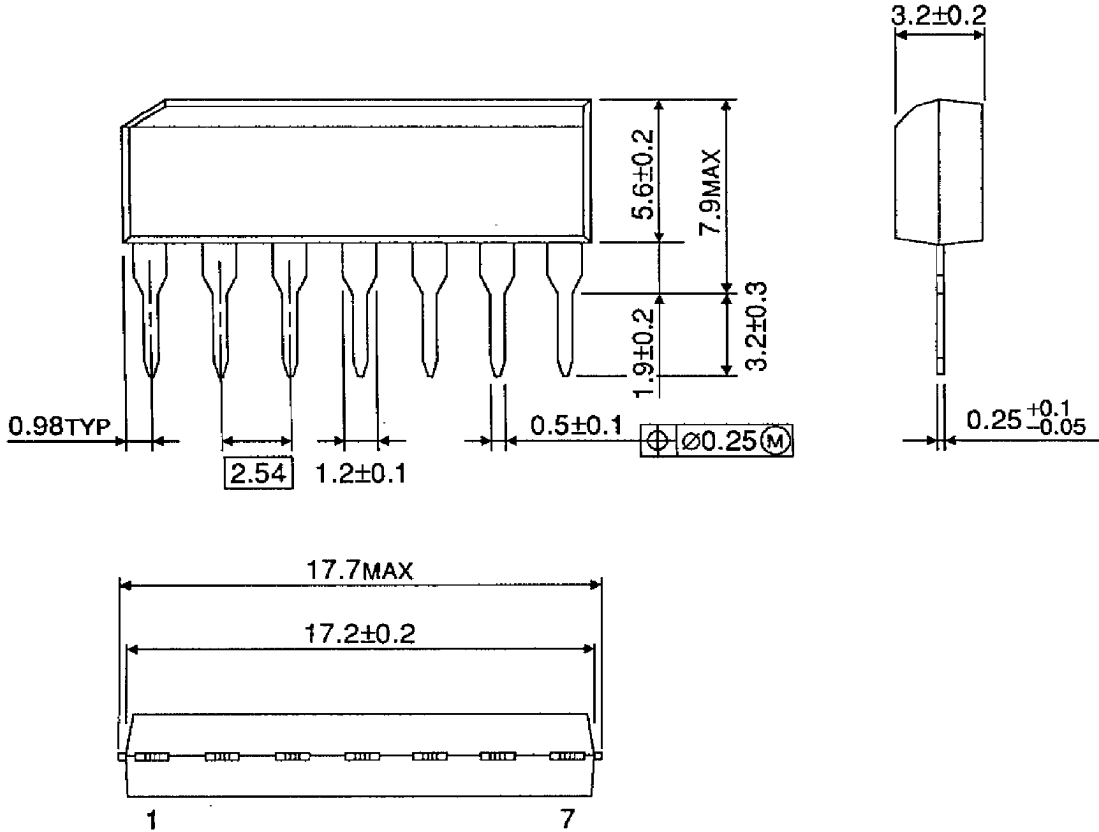


APPLICATION CIRCUIT



OUTLINE DRAWING  
SIP7-P-2.54A

Unit : mm



Weight : 0.72g (Typ.)