

TOSHIBA

TA8316AS

TENTATIVE TOSHIBA BIPOLAR LINEAR INTEGRATED CIRCUIT SILICON MONOLITHIC

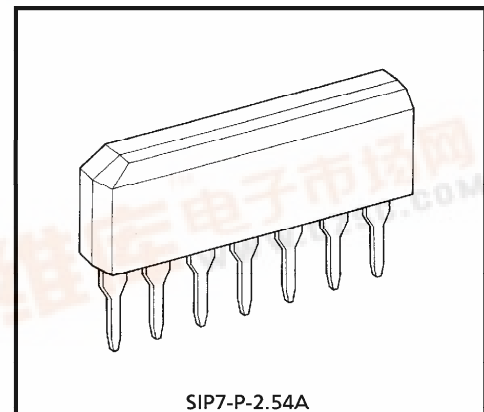
TA8316AS

IGBT GATE DRIVER

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

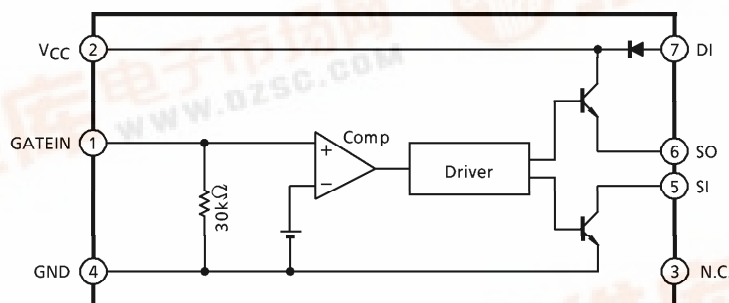
FEATURES

- 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.



Weight : 0.72g (Typ.)

BLOCK DIAGRAM

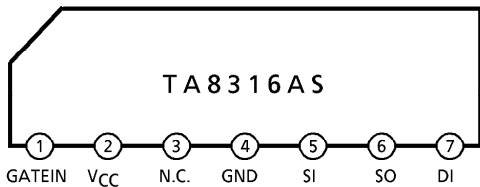


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PIN CONNECTION



PIN FUNCTIONS

| PIN No. | PIN NAME | FUNCTION |
|---------|-----------------|-------------------------------------|
| 1 | GATEIN | Gate Signal Input Pin |
| 2 | V _{CC} | 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 _{CC} | 25 | V |
| Input Voltage | V _{in} | GND – 0.3~V _{CC} + 0.3 | V |
| Operating Temperature | T _{opr} | – 20~85 | °C |
| Storage Temperature | T _{stg} | – 55~150 | °C |
| Power Dissipation * | P _D | 925 | mW |

* When Ta>25°C, P_D decreases 7.4mW per degree.

ELECTRICAL CHARACTERISTICS (Ta = 25°C, Unless otherwise specified, V_{CC} = 20V)

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

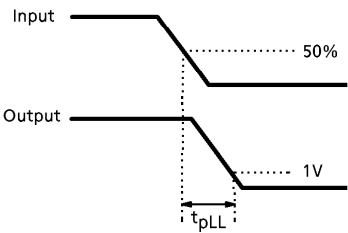
AC CHARACTERISTICS (Ta = 25°C, Unless otherwise specified, VCC = 20V)

| 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

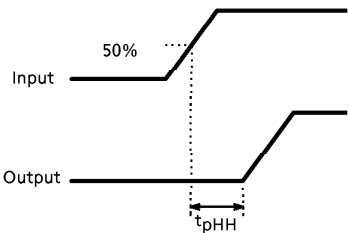
① Propagation delay time 1 (tpLL)

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%

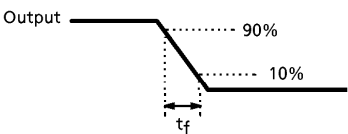
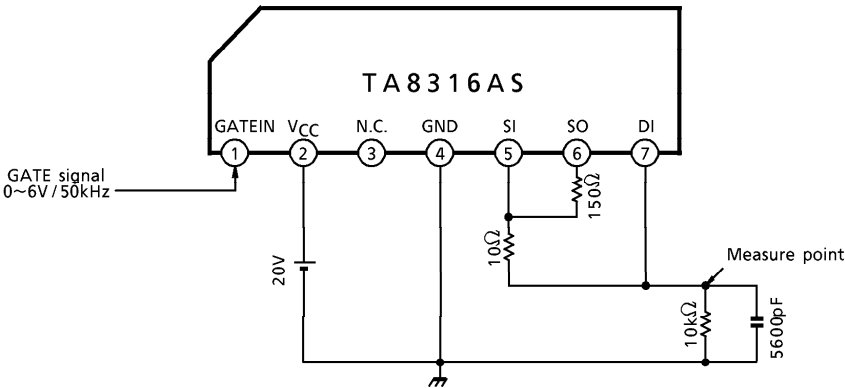
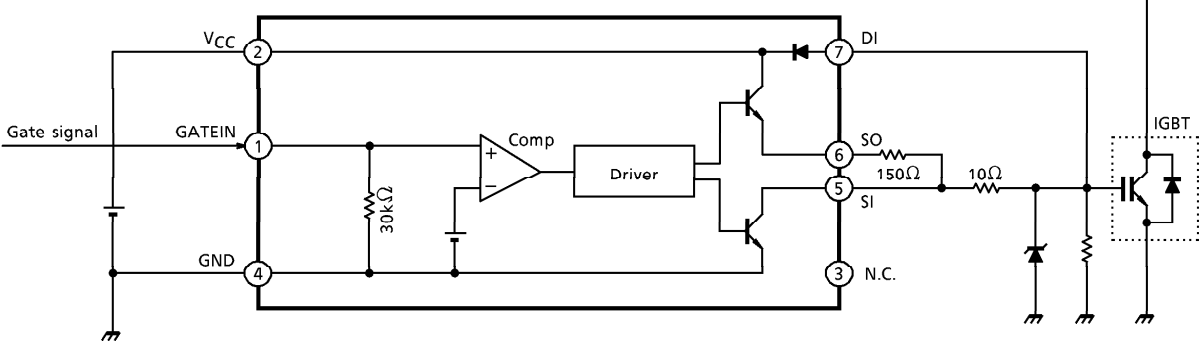


DIAGRAM OF AC CHARACTERISTICS TEST CIRCUIT

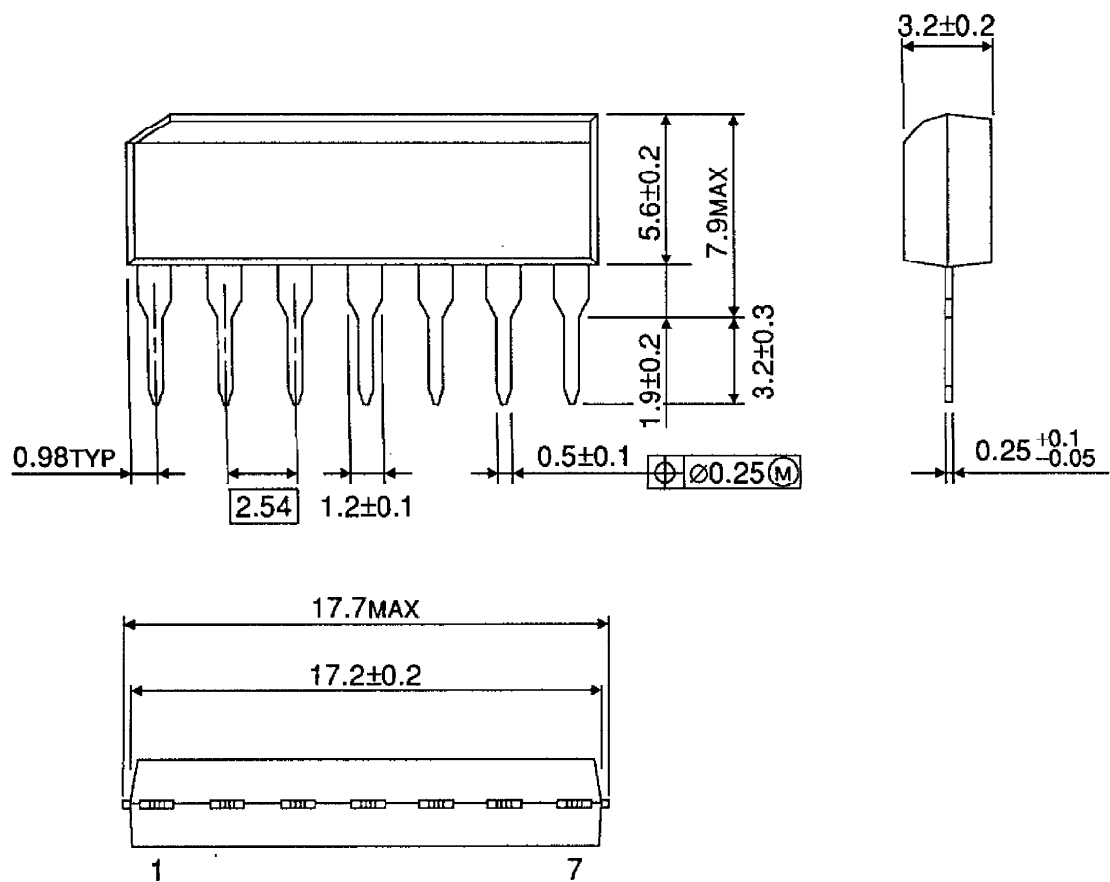


APPLICATION CIRCUIT



OUTLINE DRAWING
SIP7-P-2.54A

Unit : mm



Weight : 0.72g (Typ.)