



## IGBT GATE DRIVER D8316

### DESCRIPTION

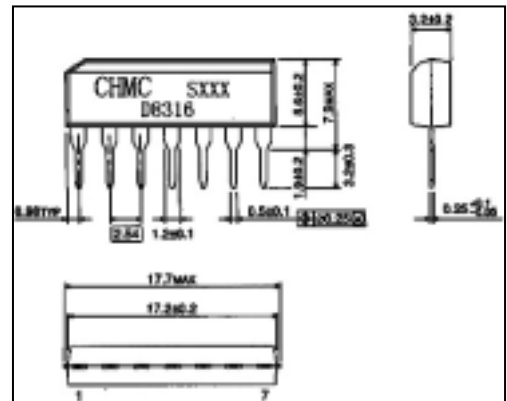
D8316 is a dedicated IC integrating IGBT gate drive circuit on a single chip.

A high current directly drives IGBT.

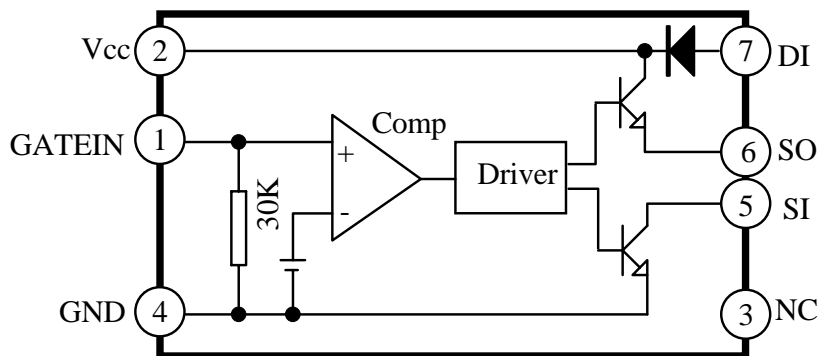
### FEATURE

- 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.

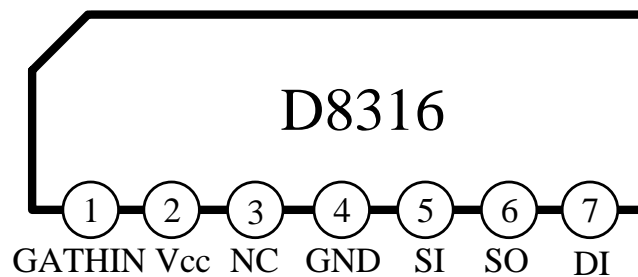
Outline Drawing



### BLOCK DIAGRAM



### PIN CONNECTION



**PIN FUNCTIONS**

PIN NO	PIN NAME	FUNCTION	PIN NO.	PIN NAME	FUNCTION
1	GATEIN	Gate signal input pin	5	SI	IGBT gate drive pin1 (sink side)
2	Vcc	System power supply	6	SO	IGBT gate drive pin2 (source side)
3	NC	Not connected	7	DI	IGBT gate protector diode pin
4	GND	GND			

**ABSOLUTE MAXIMUM RATINGS** (Ta=25°C)

Characteristic	Symbol	Value	Unit
Collector Supply Voltage	Vcc	25	V
Input Voltage	VIN	GND-0.3~Vcc+0.3	V
Power Dissipation*	PD	925	mW
Operating Temperature	Tamb	-20~85	°C
Storage Temperature	Tstg	-55~150	°C

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

## ELECTRICAL CHARACTERISTICS

(Unless otherwise specified: Ta=25°C, Vcc=20V)

Characteristic	Test condition	Symbol	Min	Typ	Max	Unit
<b>Supply Voltage Block</b>						
Operating Supply Voltage Range		V <sub>cc</sub>	7		24	V
Current consumption 1	GATHIN= " H "	I <sub>cc1</sub>	0.7	1.25	1.9	mA
Current consumption 2	GATHIN= " L "	I <sub>cc2</sub>	4.2	6.25	8.8	mA
<b>GATEIN Pin</b>						
Input Dynamic Range		V <sub>IN</sub> GATHIN	0		V <sub>cc</sub> -2.2	V
Threshold Voltage 1	GATE Signal L→H	V <sub>TH</sub> GATH1		2.63	3	V
Threshold Voltage 1	GATE Signal H→L	V <sub>TH</sub> GATH2	1.5	2.27		V
Input Current	V <sub>IN</sub> =5V	I <sub>TH</sub> GATH	125	167	249	μA
Input Frequency (Reference)	When load C=5600pF , R=10kΩ connected	f <sub>TH</sub> GATH			50	kHz
<b>SI Pin</b>						
"L" level output Voltage 1	V <sub>GATHIN</sub> =0V , I <sub>OL</sub> =30mA	V <sub>OL</sub> S11			0.7	V
"L" level output Voltage 2	V <sub>GATHIN</sub> =0V , I <sub>OL</sub> =1A	V <sub>OL</sub> S12			2	V
"L" level output Voltage 3	V <sub>cc</sub> =7V , V <sub>GATHIN</sub> =0V , I <sub>OL</sub> =30mA	V <sub>OL</sub> S13			1	V
"L" level output Voltage 4 (Output Voltage at Low Supply Voltage)	2V ≤ V <sub>cc</sub> < 7V , V <sub>GATHIN</sub> =0V , No Load	V <sub>OL</sub> S14			1	V
"L" level output Voltage 5 (Output Voltage at Low Supply Voltage)	2V ≤ V <sub>cc</sub> < 7V , V <sub>GATHIN</sub> =0V , I <sub>OL</sub> =30mA	V <sub>OL</sub> S15			2	V
Off Leakage Current	V <sub>GATHIN</sub> =6V , V <sub>IN</sub> =20V	I <sub>OFF</sub> S1	-1		1	μA
<b>SO Pin</b>						
"H" level output Voltage 1	V <sub>GATHIN</sub> =6V , I <sub>OH</sub> =-30mA	V <sub>OH</sub> SO1	V <sub>cc</sub> -2			V
"H" level output Voltage 2	V <sub>GATHIN</sub> =6V , I <sub>OH</sub> =-200mA	V <sub>OH</sub> SO2	V <sub>cc</sub> -5			V
Off Leakage Current	V <sub>GATHIN</sub> =0V , V <sub>IN</sub> =0V	I <sub>OFF</sub> SO	-1		1	μA
<b>DI Pin</b>						
Input Clamp Voltage 1	I <sub>IN</sub> =500mA	V <sub>F</sub> DI1			V <sub>cc</sub> +1.5	V
Input Clamp Voltage 2	V <sub>cc</sub> =0V , I <sub>IN</sub> =300mA	V <sub>F</sub> DI2			V <sub>cc</sub> +1	V

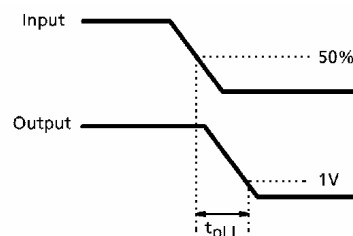
## AC CHARACTERISTICS ( Unless otherwise specified , Vcc=20V , Tamb=25 )

Characteristic	Test condition	Symbol	Min	Typ	Max	Unit
Propagation Delay Time 1	See test circuit diagram	$t_{pLL}$			2	$\mu s$
Propagation Delay Time 2	See test circuit diagram	$t_{pHH}$			2	$\mu s$
Output Fall Time	See test circuit	$t_f$			0.5	$\mu s$

### AC CHARACTERISTICS TEST CONDITIONS

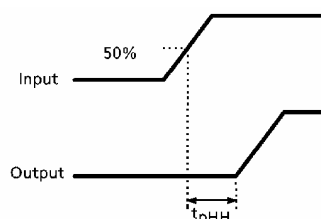
#### 1 . Propagation Delay Time 1 ( $t_{pLL}$ )

Time from input of “L” level to GATEIN pin until output reaches 1V.



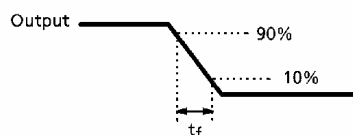
#### 2 . Propagation Delay Time 2 ( $t_{pHH}$ )

Time from input of “H” level to GATEIN pin until output starts to rise.

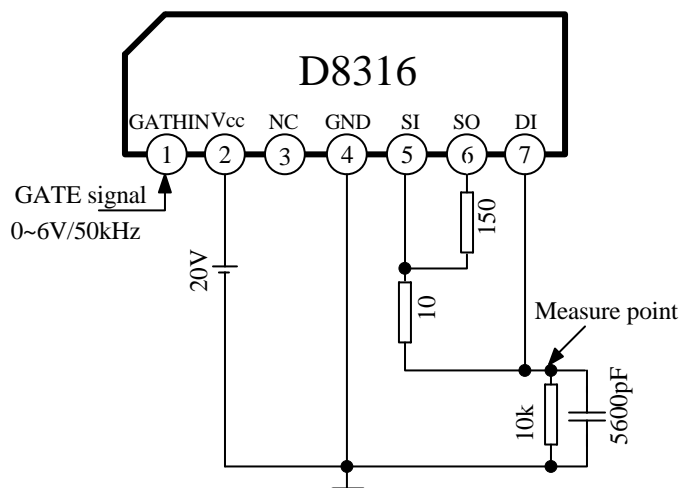


#### 3 . Output Fall Time

Output fall time from 90% to 10%.



### DIAGRAM OF AC CHARACTERISTICS TEST CIRCUIT



APPLICATION CIRCUIT

