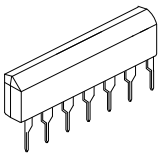
IGBT GATE DRIVER



SIP-7

■ DESCRIPTION

Integrating IGBT gate drive circuits on a single chip, The UTC **UA8316** is a dedicated IC and a high current can directly drive IGBT.

■ FEATURES

* A high current can directly drive IGBT
* Can directly control from a microcontroller
  Source current: -200mA (max), sink current 1A (max)
* Protect the IGBT gate at power on via a diode

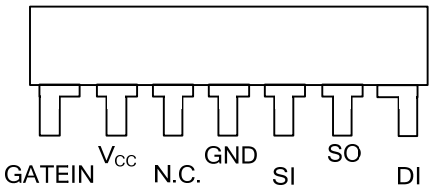
■ ORDERING INFORMATION

Ordering Number		Package	Packing
Lead Free	Halogen Free		
UA8316L-G07-T	UA8316G-G07-T	SIP-7	Tube

Note: xx: Output Voltage, refer to Marking Information.

UA8316L-G07-T (1)Packing Type (2)Package Type (3)Lead Free	(1) T: Tube (2) G07: SIP-7 (3) G: Halogen Free, L: Lead Free

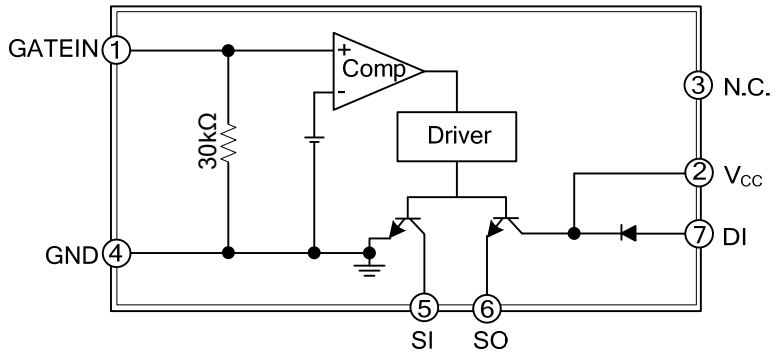
■ PIN CONFIGURATION



■ PIN DESCRIPTION

PIN NO.	PIN NAME	DESCRIPTION
1	GATEIN	Gate Signal Input
2	V_{CC}	Power Supply
3	N.C.	Not Connected
4	GND	Ground
5	SI	IGBT Gate Drive (Sink Side)
6	SO	IGBT Gate Drive (Source Side)
7	DI	IGBT Gate Protector Diode

■ BLOCK DIAGRAM



■ ABSOLUTE MAXIMUM RATING (T_A=25°C, Unless otherwise specified)

PARAMETER	SYMBOL	RATINGS	UNIT
Collector Supply Voltage	V_{CC}	25	V
Input Voltage	V_{IN}	GND-0.3~V_{CC}+0.3	V
Power Dissipation (Note 2)	P_D	925	mW
Operating Temperature	T_{OPR}	-20~+85	°C
Storage Temperature	T_{STG}	-55~+150	°C

Note: 1. Absolute maximum ratings are those values beyond which the device could be permanently damaged. Absolute maximum ratings are stress ratings only and functional device operation is not implied.
2. When T_A>25°C, P_D decreases 7.4mW per degree.

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

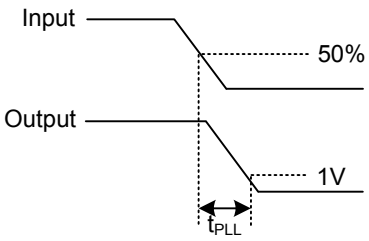
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
SUPPLY VOLTAGE BLOCK						
Operating Supply Voltage Range	V_{CC}		7		24	V
Current Consumption 1	I_{CC1}	V_{CC}=20V, GATEIN="H", No Load	0.7	1.25	1.9	mA
Current Consumption 2	I_{CC2}	V_{CC}=20V, GATEIN="L", No Load	4.2	6.25	8.8	mA
GATEIN PIN						
Input 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 (V_{CC}=20V, T_A=25°C, Unless otherwise specified)

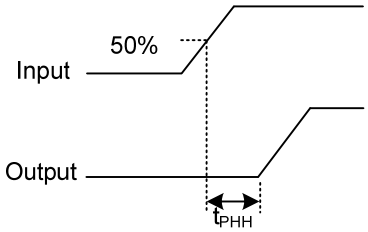
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Propagation Delay Time 1	t_{PLL}	See Test Circuit Diagram			2	μs
Propagation Delay Time 2	t_{PHH}	See Test Circuit Diagram			2	μs
Output Fall Time	t_F	See Test Circuit			0.5	μs

■ AC CHARACTERISTICS TEST CONDITIONS

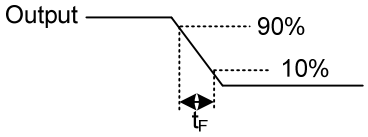
A. Propagation delay time 1 (t_{PLL})
Time from input of “L” level to GATEIN pin until output reaches 1V



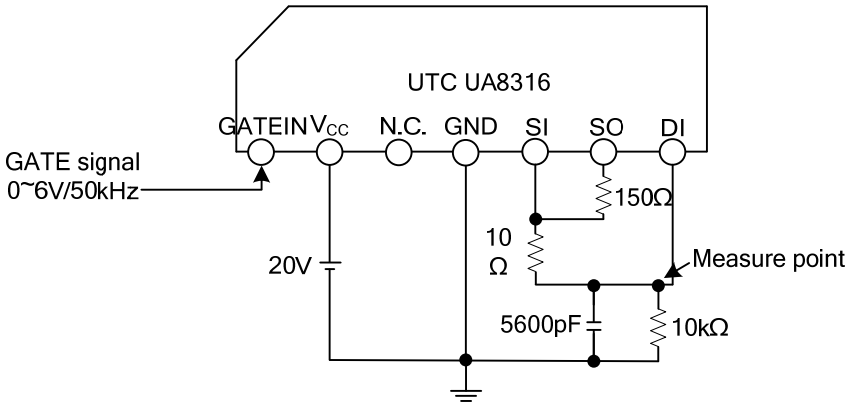
B. Propagation delay time 2 (t_{PHH})
Time from input of “H” level to GATEIN pin until output starts to rise



C. Output fall time (t_F)
Output fall time from 90% to 10%



■ TEST CIRCUIT



■ TYPICAL APPLICATION CIRCUIT