



UA8316

Preliminary

LINEAR INTEGRATED CIRCUIT

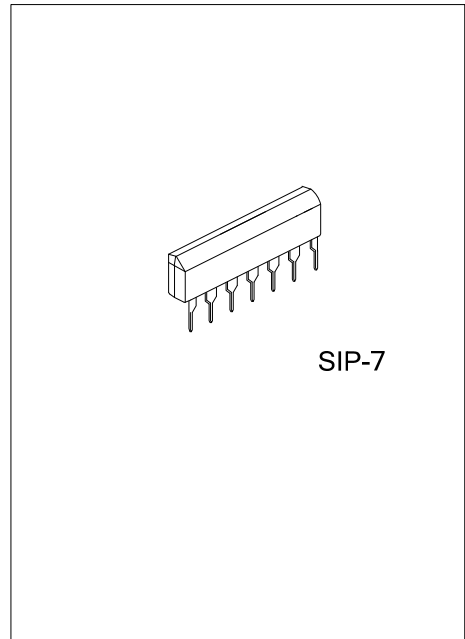
IGBT GATE DRIVER

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

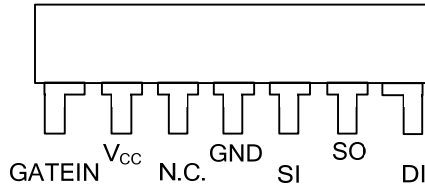
Ordering Number		Package	Packing
Lead Free	Halogen Free		
UA8316L-G07-T	UA8316G-G07-T	SIP-7	Tube

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

<p>UA8316L-G07-T</p> <ul style="list-style-type: none"> (1) Packing Type (2) Package Type (3) Lead Free 	<ul style="list-style-type: none"> (1) T: Tube (2) G07: SIP-7 (3) G: Halogen Free, L: Lead Free
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■ PIN CONFIGURATION

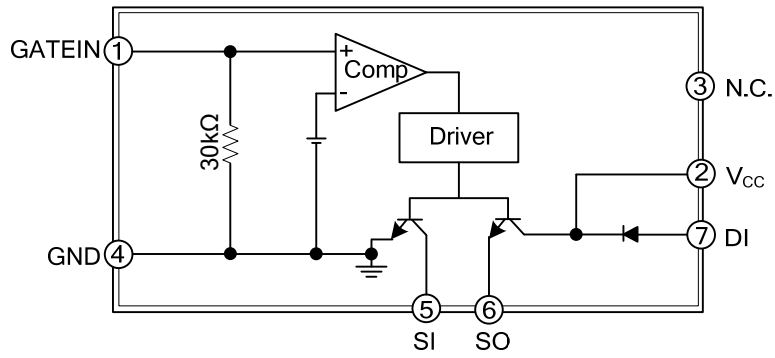


■ PIN DESCRIPTION

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

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■ BLOCK DIAGRAM



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■ ABSOLUTE MAXIMUM RATING ($T_A=25^\circ\text{C}$, 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	$^\circ\text{C}$
Storage Temperature	T_{STG}	-55~+150	$^\circ\text{C}$

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 $T_A>25^\circ\text{C}$, P_D decreases 7.4mW per degree.

■ ELECTRICAL CHARACTERISTICS ($T_A=25^\circ\text{C}$, Unless otherwise specified, $V_{CC}=20\text{V}$)

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}	$V_{CC}=20\text{V}$, GATEIN="H", No Load	0.7	1.25	1.9	mA
Current Consumption 2	I_{CC2}	$V_{CC}=20\text{V}$, 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	$V_{IN}=5\text{V}$	125	167	249	μA
Input Frequency (Reference)	F_{IN} GATE	When Load C=5600pF, R=10k Ω Connected			50	KHz
SI PIN						
"L" Level Output Voltage 1	V_{OL} SI1	VGATEIN=0V, $I_{OL}=30\text{mA}$			0.7	V
"L" Level Output Voltage 2	V_{OL} SI2	VGATEIN=0V, $I_{OL}=1\text{A}$			2	V
"L" Level Output Voltage 3	V_{OL} SI3	$V_{CC}=7\text{V}$, VGATEIN=0V, $I_{OL}=30\text{mA}$			1	V
"L" Level Output Voltage 4 (Output Voltage At Low Supply Voltage)	V_{OL} SI4	$2\text{V}\leq V_{CC}<7\text{V}$, VGATEIN=0V, No Load			1	V
"L" Level Output Voltage 5 (Output Voltage At Low Supply Voltage)	V_{OL} SI5	$2\text{V}\leq V_{CC}<7\text{V}$, VGATEIN=0V, $I_{OL}=30\text{mA}$			2	V
Off Leakage Current	I_{OFF} SI	VGATEIN=6V, $V_{IN}=20\text{V}$	-1		1	μA
SO PIN						
"H" Level Output Voltage 1	V_{OH} SO1	VGATEIN=6V, $I_{OH}=-30\text{mA}$	$V_{CC}-2$			V
"H" Level Output Voltage 2	V_{OH} SO2	VGATEIN=6V, $I_{OH}=-200\text{mA}$	$V_{CC}-5$			V
Off Leakage Current	I_{OFF} SO	VGATEIN=0V, $V_{IN}=0\text{V}$	-1		1	μA
DI PIN						
Input Clamp Voltage 1	V_{F} DI1	$I_{IN}=500\text{mA}$			$V_{CC}+1.5$	V
Input Clamp Voltage 2	V_{F} DI2	$V_{CC}=0\text{V}$, $I_{IN}=300\text{mA}$			$V_{CC}+1.0$	V

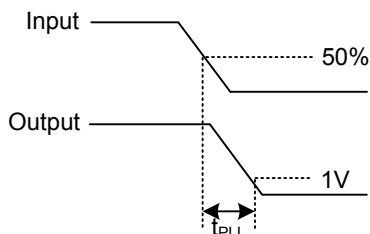
■ AC CHARACTERISTICS ($V_{CC}=20\text{V}$, $T_A=25^\circ\text{C}$, Unless otherwise specified)

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

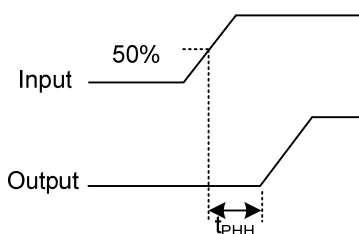
A. Propagation delay time 1 (t_{PLL})

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



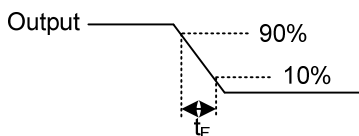
B. Propagation delay time 2 (t_{PHH})

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

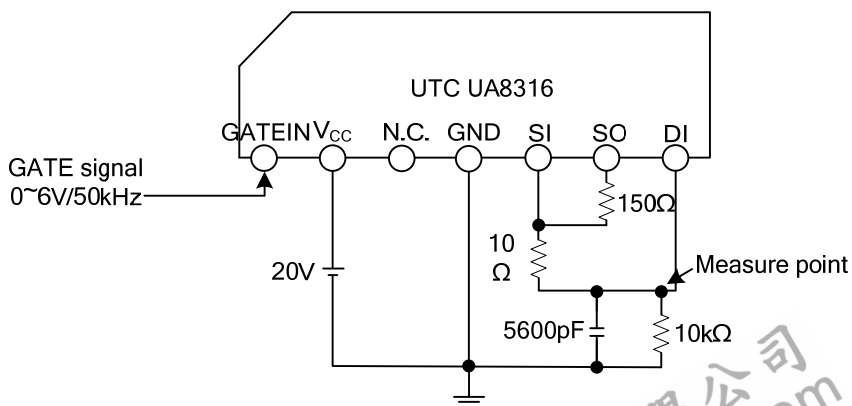


C. Output fall time (t_F)

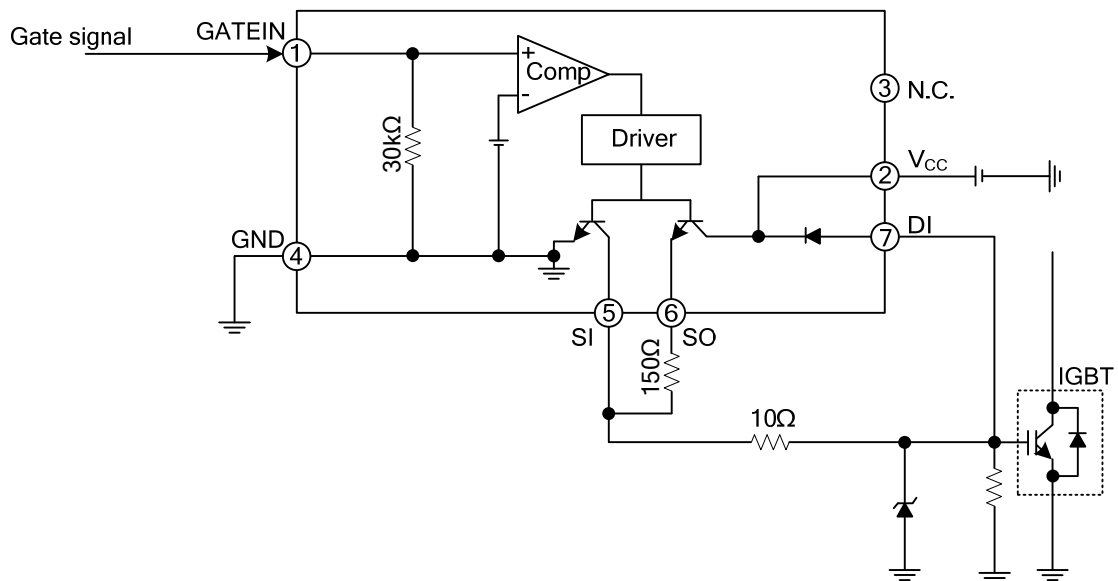
Output fall time from 90% to 10%



■ TEST CIRCUIT



■ TYPICAL APPLICATION CIRCUIT



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