

UNISONIC TECHNOLOGIES CO., LTD

# UTR2117

Advance

# LINEAR INTEGRATED CIRCUIT

# **HIGH SIDE DRIVER**

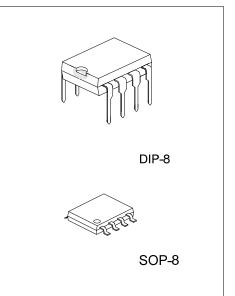
#### DESCRIPTION

The **UTR2117** are high voltage, high speed power MOSFET and IGBT driver. Proprietary HVIC and latch immune CMOS technologies enable ruggedized mono-lithic construction. The logic input is compatible with standard CMOS outputs. The output driver features a high pulse current buffer stage designed for minimum cross-conduction. The floating channel can be used to drive an N-channel power MOSFET or IGBT in the high-side or low-side configuration which operates up to 600V.



- \* Floating channel designed for bootstrap operation
- \* Fully operational to 600V
- \* Tolerant to negative transient voltage, dV/dt immune
- \* Gate drive supply range from 10 V to 20V
- \* Undervoltage lockout
- \* CMOS Schmitt-triggered inputs with pull-down
- \* Output in phase with input

#### ORDERING INFORMATION



Ordering Number		Package	Packing	
Lead Free	Lead Free Halogen Free			
UTR2117L-D08-T	UTR2117G-D08-T	DIP-8	Tube	
UTR2117L-S08-R	UTR2117G-S08-R	SOP-8	Tape Reel	

UTR2117G-D08-T		
Ţ ┬ Ҭ─── (1)Packing Type	(1) T: Tube, R: Tape Reel	
(2)Package Type	(2) D08: DIP-8, S08: SOP-8	
(3)Green Package	(3) G: Halogen Free and Lead Free, L: Lead Free	

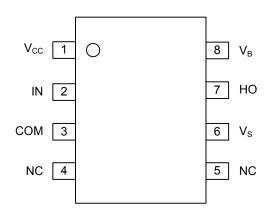
#### MARKING

DIP-8	SOP-8
8 7 6 5   UTC □□□□ → Date Code   UTR2117 □ L: Lead Free   UTR2117 □ →   G: Halogen Free □ ↓   L1 2 3 4	8 7 6 5   UTC □□□□ L: Lead Free   UTR2117 → G: Halogen Free   ● □□ Lot Code   1 2 3 4

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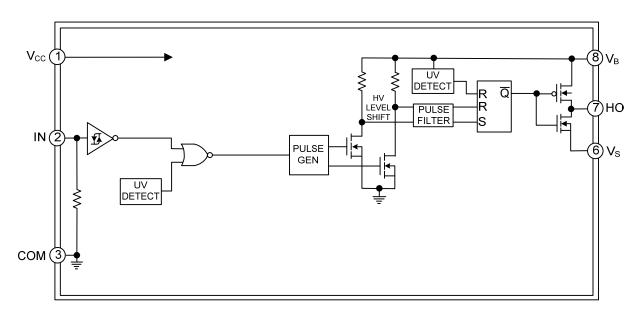
## PIN CONFIGURATION



#### PIN DESCRIPTION

PIN NO.	PIN NAME	DESCRIPTION
1	Vcc	Logic and gate drive supply
2	IN	Logic input for gate driver output (HO), in phase with HO
3	COM	Logic ground
4	NC	No Connect
5	NC	No Connect
6	Vs	High-side floating supply return
7	НО	High-side gate drive output
8	V <sub>B</sub>	High-side floating supply

#### BLOCK DIAGRAM





#### ■ **ABSOLUTE MAXIMUM RATING** (T<sub>A</sub>=25°C, unless otherwise specified)

PARAMETER		SYMBOL	RATINGS	UNIT
High-Side Floating Absolute Voltage		V <sub>B</sub>	-0.3 ~ 625	V
High-Side Floating Supply Of	fset Voltage	Vs	V <sub>B</sub> -25 ~ V <sub>B</sub> +0.3	V
High-Side Floating Output Vo	ltage	V <sub>HO</sub>	V <sub>S</sub> -0.3 ~ V <sub>S</sub> +0.3	V
Low-Side and logic Fixed Supply Voltage		V <sub>cc</sub>	-0.3 ~ 25	V
Logic Input Voltage (HIN &LIN)		V <sub>IN</sub>	-0.3 ~ V <sub>CC</sub> +0.3	V
Allowable Offset Supply Voltage Transient		dVs/dt	50	V
Power Dissipation	DIP-8		1	W
	SOP-8		0.83	W
Maximum Junction Temperature		TJ	+150	°C
Maximum Storage Temperature Range		T <sub>STG</sub>	-55 ~ +150	°C

Notes: 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. All voltage parameters are absolute voltages referenced to COM. The thermal resistance and power dissipation ratings are measured under board mounted and still air conditions.

#### RECOMMENDED OPERATING RATINGS

(For proper operation, the device should be used within the recommended conditions. The  $V_S$  offset ratings are tested with all supplies biased at 15V differential.)

PARAMETER	SYMBOL	RATINGS	UNIT
High-Side Floating Absolute Voltage	VB	V <sub>S</sub> +10 ~ V <sub>S</sub> +20	V
High-Side Floating Supply Offset Voltage	Vs	600 (Note 1)	V
Transient High side floating supply offset voltage	V <sub>ST</sub>	-50 (Note 2) ~ 600	V
High-Side Floating Output Voltage	V <sub>HO</sub>	$V_{\rm S} \sim V_{\rm B}$	V
Low-Side and logic Fixed Supply Voltage	Vcc	10 ~ 20	V
Logic Input Voltage (HIN &LIN)	V <sub>IN</sub>	0 ~ V <sub>CC</sub>	V
Ambient Temperature	T <sub>A</sub>	-40 ~ +125	°C

Notes: 1. Logic operational for  $V_S$  of -5V to +600V. Logic state held for  $V_S$  of -5V to - $V_{BS}$ .

2. Operational for transient negative VS of COM - 50 V with a 50 ns pulse width. Guaranteed by design. Refer to the Application Information section of this datasheet for more details.

#### ■ THERMAL DATA

PARAMETER		SYMBOL	RATINGS	UNIT
Junction to Ambient	DIP-8	θ <sub>JA</sub> <u>125</u> 150	°C/W	
	SOP-8		150	°C/W



### ELECTRICAL CHARACTERISTICS

 $[V_{BIAS} (V_{CC}, V_{BS})=15V \text{ and } T_A=25^{\circ}C \text{ unless otherwise specified. The }V_{IN}, V_{TH}, \text{ and IIN parameters are referenced to COM. The }V_O \text{ and }I_O \text{ parameters are referenced to COM and are applicable to the respective output leads: HO or LO.]}$ 

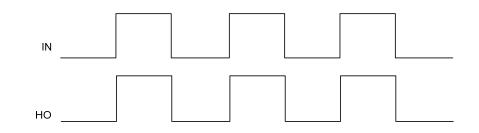
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Turn-ON Propagation Delay	t <sub>on</sub>	V <sub>S</sub> =0V, C <sub>L</sub> =1000pF		125	200	ns
Turn-OFF Propagation Delay	t <sub>OFF</sub>	V <sub>S</sub> =600V, C <sub>L</sub> =1000pF		105	180	ns
Turn-ON Rise Time	t <sub>r</sub>	C <sub>L</sub> =1000pF		75	130	ns
Turn-OFF Fall Time	t <sub>f</sub>	C <sub>L</sub> =1000pF		35	65	ns
Logic "1" (HIN) & Logic "0" (LIN) Input Voltage	V <sub>IH</sub>	V <sub>CC</sub> =10V~20V	9.5			V
Logic "0" (HIN) & Logic "1" (LIN) Input Voltage	VIL				6	V
High level Output Voltage, V <sub>BIAS</sub> - V <sub>O</sub>	V <sub>OH</sub>			0.05	0.2	V
Low Level Output Voltage, Vo	V <sub>OL</sub>	-I <sub>0</sub> =2mA		0.02	0.1	V
Offset Supply Leakage Current	I <sub>LK</sub>	V <sub>B</sub> =V <sub>S</sub> =600V			50	μA
Quiescent V <sub>BS</sub> Supply Current	I <sub>QBS</sub>			50	240	μA
Quiescent V <sub>CC</sub> Supply Current	l <sub>QCC</sub>	V <sub>IN</sub> =0V or V <sub>CC</sub>		70	340	μA
Logic "1" Input Bias Current	ll <sub>N+</sub>	V <sub>IN</sub> = V <sub>CC</sub>		20	40	μA
Logic "0" Input Bias Current	II <sub>N-</sub>	V <sub>IN</sub> =0V			5	μA
V <sub>BS</sub> Supply Undervoltage Positive Going Threshold	V <sub>BSUV+</sub>		7.6	8.6	9.6	V
V <sub>BS</sub> Supply Undervoltage Negative Going Threshold	V <sub>BSUV-</sub>		7.2	8.2	9.2	V
V <sub>CC</sub> Supply Undervoltage Positive Going Threshold	V <sub>CCUV+</sub>		7.6	8.6	9.6	V
V <sub>CC</sub> Supply Undervoltage Negative Going Threshold	V <sub>CCUV-</sub>		7.2	8.2	9.2	V
Output High Short Circuit Pulsed Current	I <sub>O+</sub>	V <sub>O</sub> =0V	200	290		mA
Output Low Short Circuit Pulsed Current	I <sub>O-</sub>	V <sub>0</sub> =15V	420	600		mA



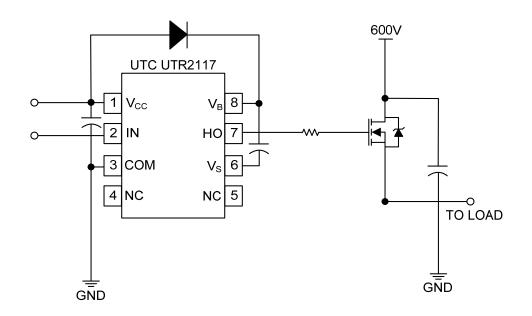
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## TIMING DIAGRAM



## TYPICAL APPLICATION CIRCUIT



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