

UNISONIC TECHNOLOGIES CO., LTD

UTR2101

LINEAR INTEGRATED CIRCUIT

HALF-BRIDGE DRIVER

DESCRIPTION

The **UTR2101** is a high voltage, high speed power MOSFET and IGBT driver with independent high-side and low-side referenced output channels. Proprietary HVIC and latch immune CMOS technologies enable ruggedized monolithic construction. The logic input is compatible with standard CMOS or LSTTL output, down to 3.5V logic. The output drivers feature a high pulse current buffer stage designed for minimum driver cross-conduction. The floating channel can be used to drive an N-channel power MOSFET or IGBT in the high-side configuration which operates up to 600V.

FEATURES

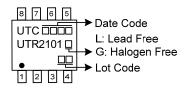
- * Floating channel designed for bootstrap operation
- * Fully operational to +600V
- * Tolerant to negative transient voltage, dV/dt immune
- * Gate drive supply range from 10V to 20V
- * Undervoltage lockout
- * 3.5V, 5V, and 15V input logic compatible
- * Matched propagation delay for both channels
- * Outputs in phase with inputs

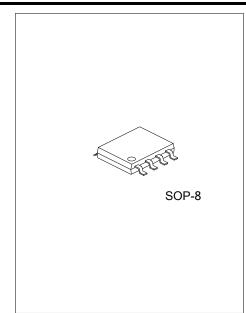
RDERING INFORMATION

Ordering Number		Dookogo	Dealing	
Lead Free	Halogen Free	Package	Packing	
UTR2101L-S08-R	UTR2101G-S08-R	SOP-8	Tape Reel	

UTR2101 <u>G-S08-R</u>	
(1)Packing Type	(1) R: Tape Reel
(2)Package Type	(2) S08: SOP-8
(3)Green Package	(3) G: Halogen Free and Lead Free, L: Lead Free

MARKING

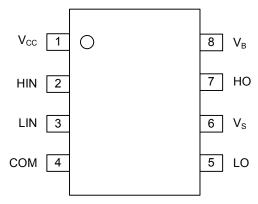




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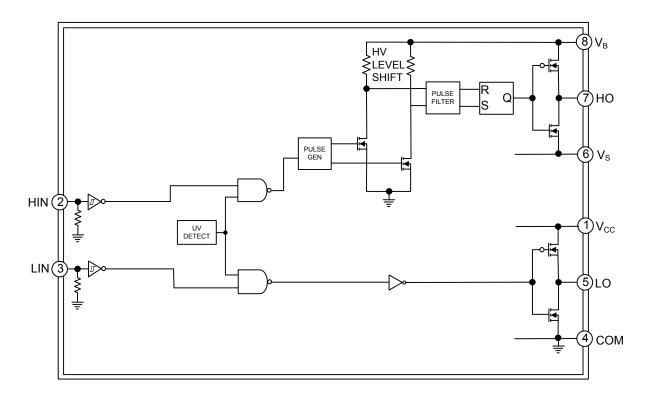
■ PIN CONFIGURATION



PIN DESCRIPTION

PIN NO.	PIN NAME	DESCRIPTION
1	V _{CC}	Low-side and logic fixed supply
2	HIN	Logic input for high-side gate driver output (HO), in phase
3	LIN	Logic input for low-side gate driver output (LO), out of phase
4	COM	Low-side return
5	LO	Low-side gate drive output
6	Vs	High-side floating supply return
7	НО	High-side gate drive output
8	VB	High-side floating supply

BLOCK DIAGRAM





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

PARAMETER	SYMBOL	RATINGS	UNIT
High-Side Floating Absolute Voltage	VB	625	V
High-Side Floating Supply Offset Voltage	Vs	V _B -25 ~ V _B +0.3	V
High-Side Floating Output Voltage	V _{HO}	V _S -0.3 ~ V _S +0.3	V
Low-Side and logic Fixed Supply Voltage	V _{CC}	25	V
Low-Side Output Voltage	V _{LO}	V _{CC} +0.3	V
Logic Input Voltage (HIN &LIN)	V _{IN}	V _{CC} +0.3	V
Power Dissipation	PD	0.625	W
Maximum Junction Temperature	TJ	+150	°C
Maximum Storage Temperature Range	T _{STG}	-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

PARAMETER	SYMBOL	RATINGS	UNIT
High-Side Floating Absolute Voltage	VB	V _S +10 ~ V _S +20	V
High-Side Floating Supply Offset Voltage	Vs	600 (Note)	V
High-Side Floating Output Voltage	V _{HO}	$V_{S} \sim V_{B}$	V
Low-Side and logic Fixed Supply Voltage	Vcc	10 ~ 20	V
Low-Side Output Voltage	V _{LO}	0 ~ V _{CC}	V
Logic Input Voltage (HIN &LIN)	V _{IN}	0 ~ V _{CC}	V
Ambient Temperature	T _A	-40 ~ +125	°C

Note: Logic operational for V_{S} of -5V to +600V. Logic state held for V_{S} of -5V to -V_{\text{BS}..}

THERMAL DATA

PARAMETER	SYMBOL	RATINGS	UNIT
Junction to Ambient	θ _{JA}	200	°C/W



ELECTRICAL CHARACTERISTICS

 $[V_{BIAS} (V_{CC}, V_{BS})=15V \text{ and } T_A=25^{\circ}C \text{ unless otherwise specified. The }V_{IN}, V_{TH}, \text{ and IIN parameters are referenced to COM. The }V_0 \text{ and }I_0 \text{ parameters are referenced to COM and are applicable to the respective output leads: HO or LO.]}$

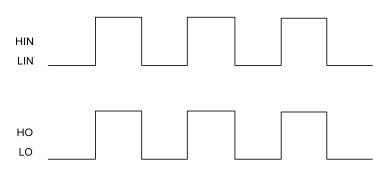
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Turn-ON Propagation Delay	t _{on}	V _S =0V		160	300	ns
Turn-OFF Propagation Delay	t _{OFF}	V _S =600V		400	600	ns
Turn-ON Rise Time	tr			20	90	ns
Turn-OFF Fall Time	t _f			20	90	ns
Delay matching, HS & LS Turn-ON/OFF	MT				90	ns
Logic "1" input voltage	VIH	V _{CC} =10V~20V	3.5			V
Logic "0" input voltage	V _{IL}				1.5	V
High level Output Voltage, V_{BIAS} - V_{O}	V _{OH}	L = 2m A		0.02	0.2	V
Low Level Output Voltage, Vo	V _{OL}	-I ₀ =2mA		0.02	0.1	V
Offset Supply Leakage Current	I _{LK}	$V_B = V_S = 600V$			50	μA
Quiescent V _{BS} Supply Current	I_{QBS} $(-0)/(cr.5)$			15	55	μA
Quiescent V _{CC} Supply Current	I _{QCC}	-V _{IN} =0V or 5V		150	270	μA
Logic "1" Input Bias Current	II _{N+}	V _{IN} =5V		3	10	μA
Logic "0" Input Bias Current	II _{N-}	V _{IN} =0V			1	μA
V _{CC} Supply Undervoltage Positive Going Threshold	V _{CCUV+}		8	8.9	9.8	V
V _{CC} Supply Undervoltage Negative Going Threshold	V _{CCUV-}		7.4	8.2	9	V
Output High Short Circuit Pulsed Current	I _{O+}	P _w ≤10µs, V _o =0V	130	290		mA
Output Low Short Circuit Pulsed Current	I _{O-}	P _w ≤10µs, V ₀ =15V	200	360		mA



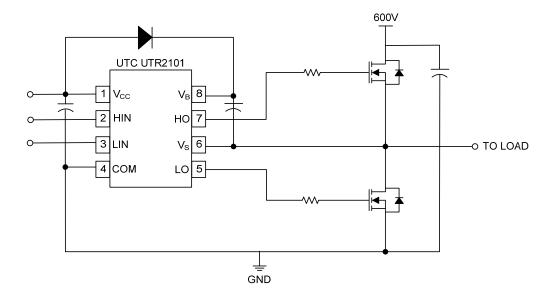
UTR2101

LINEAR INTEGRATED CIRCUIT

TIMING DIAGRAM



TYPICAL APPLICATION CIRCUIT



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