



UTR2113

Advance

LINEAR INTEGRATED CIRCUIT

HIGH AND LOW SIDE DRIVER

DESCRIPTION

The **UTR2113** are high voltage, high speed power MOSFET and IGBT drivers with independent high-side and low-side referenced output channels. Pro-prietary HVIC and latch immune CMOS technologies enable ruggedized monolithic construction. Logic in-puts are compatible with standard CMOS or LSTTL out-put, down to 3.3V logic. The output drivers feature a high pulse current buffer stage designed for minimum driver cross-conduction. Propagation delays are matched to simplify use in high frequency applications. The floating channel can be used to drive an N-channel power MOSFET or IGBT in the high-side configuration which operates up to 500V or 600V.

FEATURES

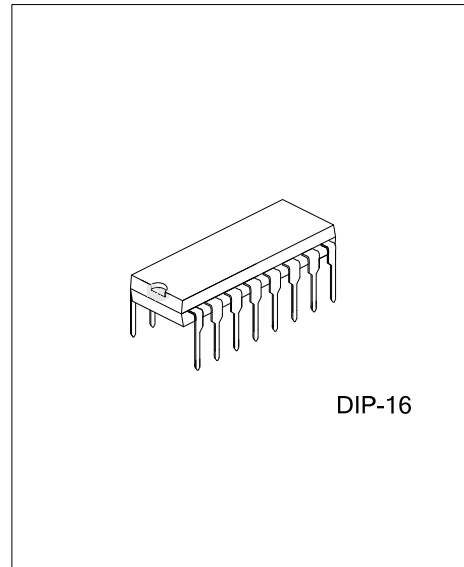
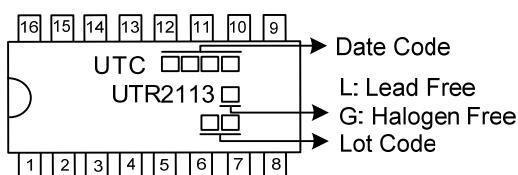
- * Floating channel designed for bootstrap operation
- * Fully operational to 500V or 600V
- * Tolerant to negative transient voltage, dV/dt immune
- * Gate drive supply range from 10V to 20V
- * Undervoltage lockout for both channels
- * 3.3V logic compatible
- * Separate logic supply range from 3.3V to 20V
- * Logic and power ground $\pm 5V$ offset
- * CMOS Schmitt-triggered inputs with pull-down
- * Cycle by cycle edge-triggered shutdown logic
- * Matched propagation delay for both channels
- * Outputs in phase with inputs

ORDERING INFORMATION

Ordering Number		Package	Packing
Lead Free	Halogen Free		
UTR2113L-D16-T	UTR2113G-D16-T	DIP-16	Tube

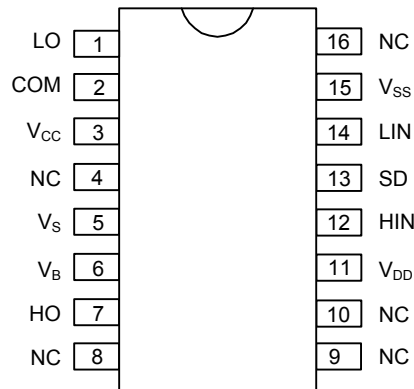
<p>UTR2113G-D16-T</p> <ul style="list-style-type: none"> (1) Packing Type (2) Package Type (3) Green Package 	<ul style="list-style-type: none"> (1) T: Tube (2) D16: DIP-16 (3) G: Halogen Free and Lead Free, L: Lead Free
---	---

MARKING



DIP-16

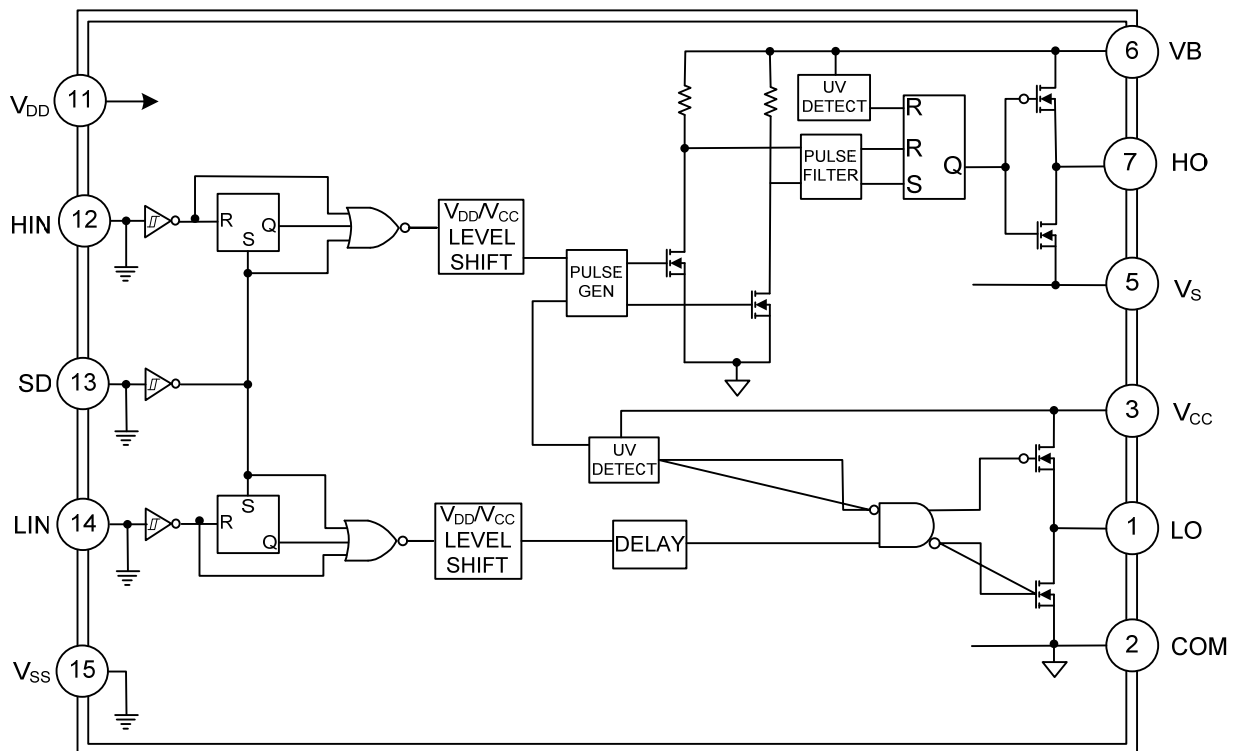
■ PIN CONFIGURATION



■ PIN DESCRIPTION

PIN NO.	PIN NAME	DESCRIPTION
1	LO	Low-side gate drive output
2	COM	Low-side return
3	V _{CC}	Low-side supply
4, 8~10, 16	NC	
5	V _S	High-side floating supply return
6	V _B	High-side floating supply
7	HO	High-side gate drive output
11	V _{DD}	Logic supply
12	HIN	Logic input for high-side gate driver output (HO), in phase
13	SD	Logic input for shutdown
14	LIN	Logic input for low-side gate driver output (LO), in phase
15	V _{SS}	Logic ground

■ BLOCK DIAGRAM



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

PARAMETER	SYMBOL	RATINGS	UNIT
High-Side Floating Absolute Voltage	V _B	620 (Note 3)	V
High-Side Floating Supply Offset Voltage	V _S	V _B +0.3	V
High-Side Floating Output Voltage	V _{HO}	V _B +0.3	V
Low-Side and logic Fixed Supply Voltage	V _{CC}	20 (Note 3)	V
Low-Side Output Voltage	V _{LO}	V _{CC} +0.3	V
Logic Supply Voltage	V _{DD}	V _{SS} +20 (Note 3)	V
Logic Supply Offset Voltage	V _{SS}	V _{CC}	V
Logic Input Voltage (HIN & LIN)	V _{IN}	V _{DD}	V
Allowable Offset Supply Voltage Transient	dVs/dt	50	V
Power Dissipation	P _D	1.25	W
Maximum Junction Temperature	T _J	+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.

3. All supplies are fully tested at 25V, and an internal 20V clamp exists for each supply.

■ RECOMMENDED OPERATING RATINGS

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

PARAMETER	SYMBOL	RATINGS	UNIT
High-Side Floating Supply Absolute Voltage	V _B	V _S +10 ~ V _S +20	V
High-Side Floating Supply Offset Voltage	V _S	600 (Note 1)	V
High-Side Floating Output Voltage	V _{HO}	V _S ~ V _B	V
Low-Side Fixed Supply Voltage	V _{CC}	10 ~ 20	V
Low-Side Output Voltage	V _{LO}	0 ~ V _{CC}	V
Logic Supply Voltage	V _{DD}	V _{SS} +3 ~ V _{SS} +20	V
Logic Supply Offset Voltage	V _{SS}	-5 ~ 5 (Note 2)	V
Logic Input Voltage (HIN, LIN & SD)	V _{IN}	V _{SS} ~ V _{DD}	V
Ambient Temperature	T _A	-40 ~ +125	°C

Notes: 1. Logic operational for V_S of -4V to +500V. Logic state held for V_S of -4 V to -V_{BS}.

2. When V_{DD} < 5 V, the minimum V_{SS} offset is limited to -V_{DD}.

■ THERMAL DATA

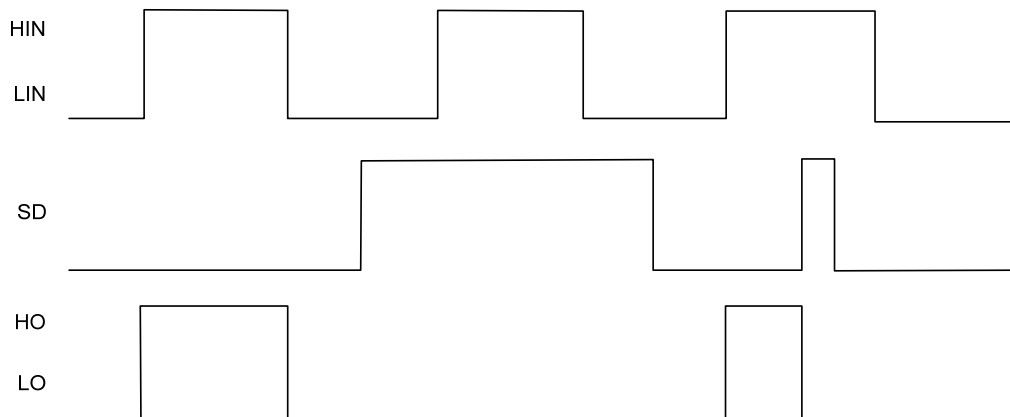
PARAMETER	SYMBOL	RATINGS	UNIT
Junction to Ambient	θ _{JA}	100	°C/W

■ ELECTRICAL CHARACTERISTICS

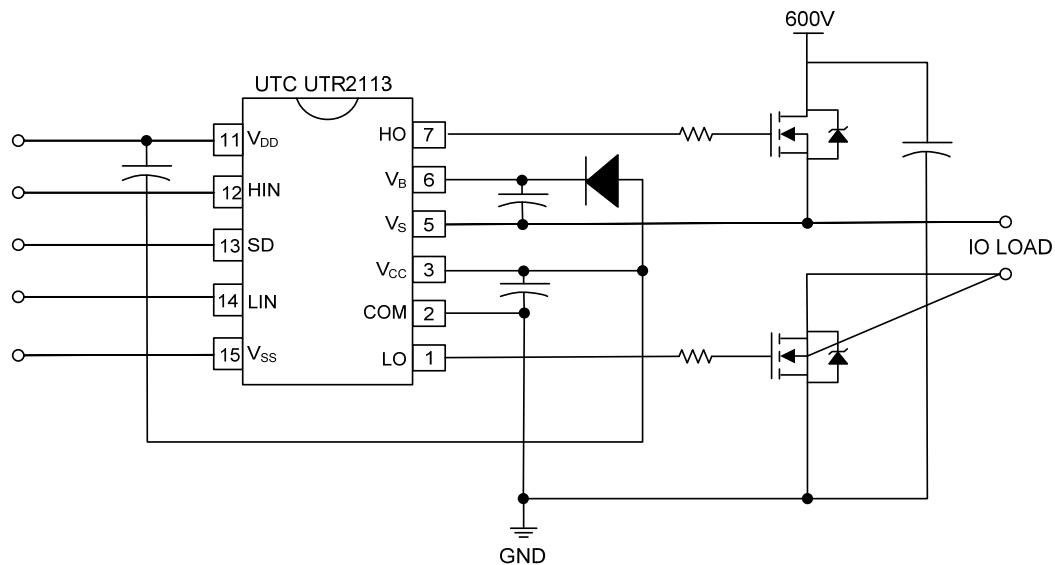
[V_{BIAS} (V_{CC} , V_{BS} , V_{DD})=15V, C_L =1000pF, V_{SS} =COM and T_A =25°C unless otherwise specified. The V_{IN} , V_{TH} , and I_{IN} parameters are referenced to V_{SS} and are applicable to all three logic input leads: HIN, LIN, and SD. The V_O and I_O parameters are referenced to COM and are applicable to the respective output leads: HO or LO.]

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Turn-ON Propagation Delay	t_{on}	$V_S=0V$		180	250	ns
Turn-OFF Propagation Delay	t_{OFF}	$V_S=600V$		120	150	ns
Shutdown Propagation Delay	t_{SD}			130	160	ns
Turn-ON Rise Time	t_r			25	35	ns
Turn-OFF Fall Time	t_f			17	25	ns
Turn-ON/OFF	MT				20	ns
Logic "1" Input Voltage	V_{IH}		10			V
Logic "0" Input Voltage	V_{IL}				5.5	V
High level Output Voltage, $V_{BIAS} - V_O$	V_{OH}	$I_O=0A$			1.5	V
Low Level Output Voltage, V_O	V_{OL}	$I_O=20mA$			0.15	V
Offset Supply Leakage Current	I_{LK}	$V_B=V_S=600V$			50	μA
Quiescent V_{BS} Supply Current	I_{QBS}	$V_{IN}=0V \sim V_{DD}$		125	230	μA
Quiescent V_{CC} Supply Current	I_{QCC}			180	340	μA
Quiescent V_{DD} Supply Current	I_{QDD}			15	30	μA
Logic "1" Input Bias Current	I_{IN+}	$V_{IN}=V_{DD}$		20	40	μA
Logic "0" Input Bias Current	I_{IN-}	$V_{IN}=0V$			5.0	μA
V_{BS} supply undervoltage positive going threshold	V_{BSUV+}		7.5	8.6	9.7	V
V_{BS} Supply Undervoltage Negative Going Threshold	V_{BSUV-}		7.0	8.2	9.4	V
V_{CC} Supply Undervoltage Positive Going Threshold	V_{CCUV+}		7.4	8.5	9.6	V
V_{CC} Supply Undervoltage Negative Going Threshold	V_{CCUV-}		7.0	8.2	9.4	V
Output High Short Circuit Pulsed Current	I_{O+}	$V_{IN}=V_{DD}$, $V_O=0V$, $P_W \leq 10\mu s$	2.0	2.5		A
Output Low Short Circuit Pulsed Current	I_{O-}	$V_{IN}=0V$, $V_O=15V$, $P_W \leq 15\mu s$	2.0	2.5		A

■ TIMING DIAGRAM



■ TYPICAL APPLICATION CIRCUIT



UTC assumes no responsibility for equipment failures that result from using products at values that exceed, even momentarily, rated values (such as maximum ratings, operating condition ranges, or other parameters) listed in products specifications of any and all UTC products described or contained herein. UTC products are not designed for use in life support appliances, devices or systems where malfunction of these products can be reasonably expected to result in personal injury. Reproduction in whole or in part is prohibited without the prior written consent of the copyright owner. UTC reserves the right to make changes to information published in this document, including without limitation specifications and product descriptions, at any time and without notice. This document supersedes and replaces all information supplied prior to the publication hereof.