

**Power Products Division**

*Advance Information*

**HIGH AND LOW SIDE DRIVER**

The MPIC2113 is a high voltage, high speed, power MOSFET and IGBT driver with independent high and low side referenced output channels. Proprietary HVIC and latch immune CMOS technologies enable ruggedized monolithic construction. Logic inputs are compatible with standard CMOS or LSTTL outputs. 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 from 10 to 600 volts.

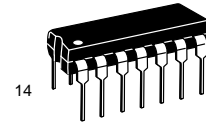
- Floating Channel Designed for Bootstrap Operation
- Fully Operational to +600 V
- Tolerant to Negative Transient Voltage
- dV/dt Immune
- Gate Drive Supply Range from 10 to 20 V
- Undervoltage Lockout for Both Channels
- Separate Logic Supply
- Operating Supply Range from 5 to 20 V
- Logic and Power Ground Operating Offset Range from -5 to +5 V
- 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

**PRODUCT SUMMARY**

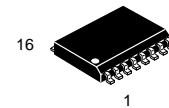
<b>V<sub>OFFSET</sub></b>	<b>600 V MAX</b>
<b>I<sub>O+/-</sub></b>	<b>2 A/2 A</b>
<b>V<sub>OUT</sub></b>	<b>10 – 20 V</b>
<b>t<sub>on/off</sub> (typical)</b>	<b>120 &amp; 94 ns</b>
<b>Delay Matching</b>	<b>10 ns</b>

**MPIC2113**

**HIGH AND LOW  
SIDE DRIVER**



**P SUFFIX**  
PLASTIC PACKAGE  
CASE 646-06



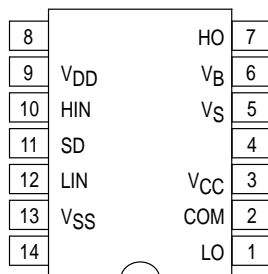
**DW SUFFIX**  
PLASTIC PACKAGE  
CASE 751G-02  
SOIC – WIDE

**ORDERING INFORMATION**

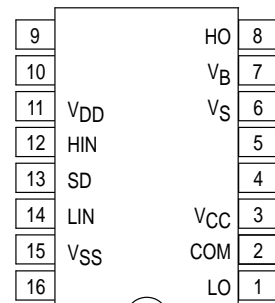
Device	Package
MPIC2113DW	SOIC WIDE
MPIC2113P	PDIP

**PIN CONNECTIONS**

(TOP VIEW)



14 LEADS PDIP MPIC2113P



16 LEADS SOIC (WIDE BODY)  
MPIC2113DW

This document contains information on a new product. Specifications and information herein are subject to change without notice.



**ELECTRICAL CHARACTERISTICS** ( $T_A = 25^\circ\text{C}$  unless otherwise specified)

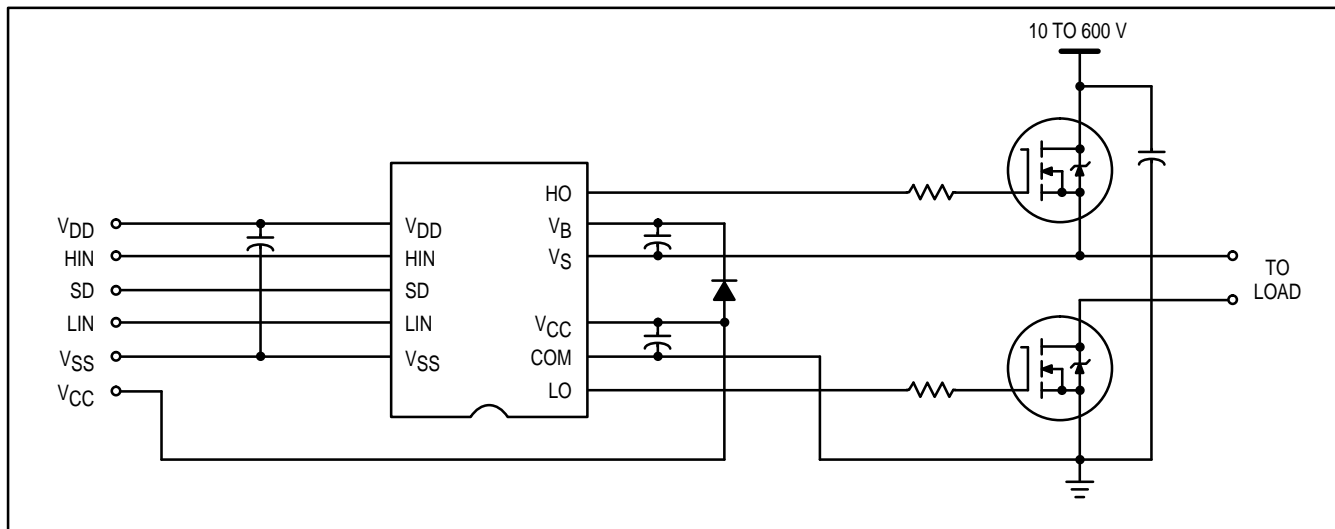
Characteristic	Symbol	Min	Typ	Max	Unit
<b>STATIC ELECTRICAL CHARACTERISTICS – SUPPLY CHARACTERISTICS</b>					
V <sub>BIAS</sub> (V <sub>CC</sub> , V <sub>BS</sub> , V <sub>DD</sub> ) = 15 V and V <sub>SS</sub> = COM unless otherwise specified. The V <sub>IN</sub> , V <sub>TH</sub> and I <sub>IN</sub> parameters are referenced to V <sub>SS</sub> and are applicable to all three logic input leads: HIN, LIN and SD. The V <sub>O</sub> and I <sub>O</sub> parameters are referenced to COM or V <sub>SS</sub> and are applicable to the respective output leads: HO or LO.					
Logic "1" Input Voltage	V <sub>IH</sub>	9.5	–	–	V
Logic "0" Input Voltage	V <sub>IL</sub>	–	–	6.0	
High Level Output Voltage, V <sub>BIAS</sub> -V <sub>O</sub> @ V <sub>IN</sub> = V <sub>IH</sub> , I <sub>O</sub> = 0 A	V <sub>OH</sub>	–	–	1.2	
Low Level Output Voltage, V <sub>O</sub> @ V <sub>IN</sub> = V <sub>IL</sub> , I <sub>O</sub> = 0 A	V <sub>OL</sub>	–	–	0.1	
Offset Supply Leakage Current @ V <sub>B</sub> = V <sub>S</sub> = 600 V	I <sub>LK</sub>	–	–	50	μA
Quiescent V <sub>BS</sub> Supply Current @ V <sub>IN</sub> = 0 V or V <sub>DD</sub>	I <sub>QBS</sub>	–	125	230	
Quiescent V <sub>CC</sub> Supply Current @ V <sub>IN</sub> = 0 V or V <sub>DD</sub>	I <sub>QCC</sub>	–	180	340	
Quiescent V <sub>DD</sub> Supply Current @ V <sub>IN</sub> = 0 V or V <sub>DD</sub>	I <sub>QDD</sub>	–	15	30	
Logic "1" Input Bias Current @ V <sub>IN</sub> = 15 V	I <sub>IN+</sub>	–	20	40	
Logic "0" Input Bias Current @ V <sub>IN</sub> = 0 V	I <sub>IN-</sub>	–	–	1.0	
V <sub>BS</sub> Supply Undervoltage Positive Going Threshold	V <sub>BSUV+</sub>	7.5	–	9.7	V
V <sub>BS</sub> Supply Undervoltage Negative Going Threshold	V <sub>BSUV-</sub>	7.0	–	9.4	
V <sub>CC</sub> Supply Undervoltage Positive Going Threshold	V <sub>CCUV+</sub>	7.4	–	9.6	
V <sub>CC</sub> Supply Undervoltage Negative Going Threshold	V <sub>CCUV-</sub>	7.0	–	9.4	
Output High Short Circuit Pulsed Current @ V <sub>OUT</sub> = 0 V, V <sub>IN</sub> = 15 V, PW ≤ 10 μs	I <sub>O+</sub>	2.0	2.5	–	A
Output Low Short Circuit Pulsed Current @ V <sub>OUT</sub> = 15 V, V <sub>IN</sub> = 0 V, PW ≤ 10 μs	I <sub>O-</sub>	2.0	2.5	–	

**DYNAMIC ELECTRICAL CHARACTERISTICS**

V<sub>BIAS</sub> (V<sub>CC</sub>, V<sub>BS</sub>, V<sub>DD</sub>) = 15 V and V<sub>SS</sub> = COM unless otherwise specified. T<sub>A</sub> = 25°C.

Turn-On Propagation Delay @ V <sub>S</sub> = 0 V	t <sub>on</sub>	–	120	150	ns
Turn-Off Propagation Delay @ V <sub>S</sub> = 600 V	t <sub>off</sub>	–	94	125	
Shutdown Propagation Delay @ V <sub>S</sub> = 600 V	t <sub>sd</sub>	–	110	140	
Turn-On Rise Time @ C <sub>L</sub> = 1000 pF	t <sub>r</sub>	–	25	35	
Turn-Off Fall Time @ C <sub>L</sub> = 1000 pF	t <sub>f</sub>	–	17	25	
Delay Matching, HS & LS Turn-On/Off	MT	–	–	10	

**TYPICAL CONNECTION**



# MPIC2113

## LEAD DEFINITIONS

Symbol	Lead Description
V <sub>DD</sub>	Logic Supply
HIN	Logic Input for High Side Gate Driver Output (HO), In Phase
SD	Logic Input for Shutdown
LIN	Logic Input for Low Side Gate Driver Output (LO), In Phase
V <sub>SS</sub>	Logic Ground
V <sub>B</sub>	High Side Floating Supply
HO	High Side Gate Drive Output
V <sub>S</sub>	High Side Floating Supply Return
V <sub>CC</sub>	Low Side Supply
LO	Low Side Gate Drive Output
COM	Low Side Return

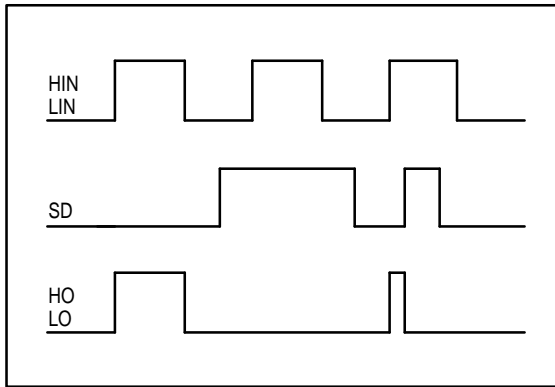


Figure 1. Input / Output Timing Diagram

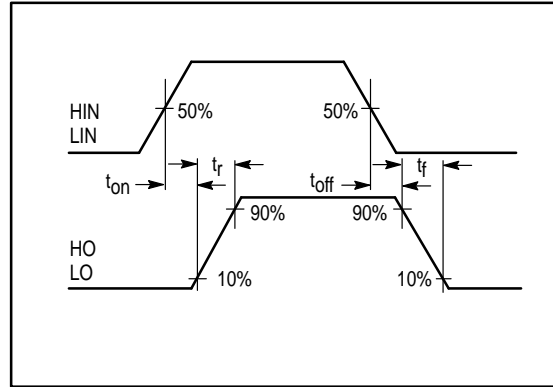


Figure 2. Switching Time Waveform Definitions

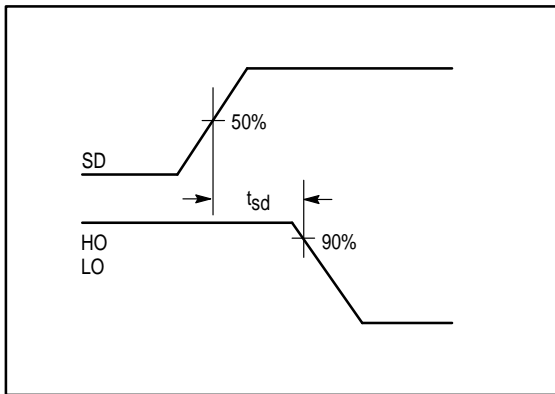


Figure 3. Shutdown Waveform Definitions

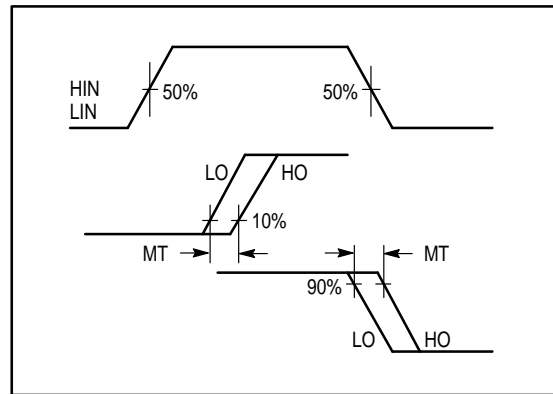
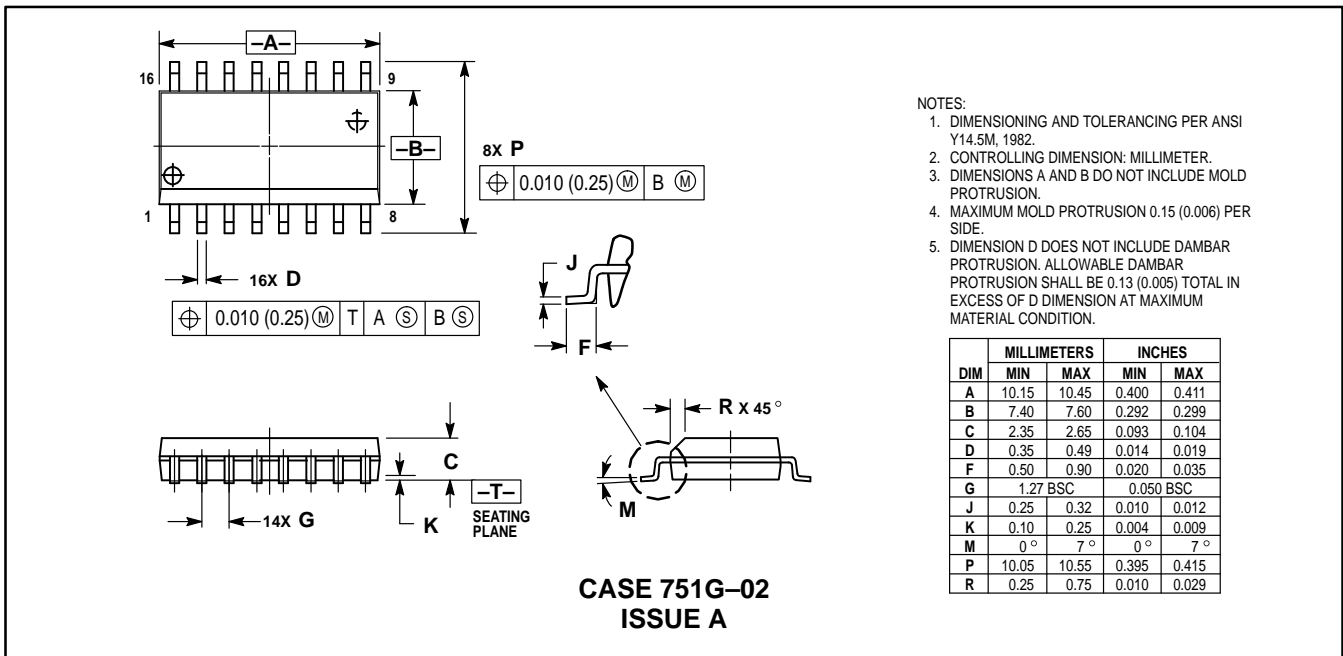
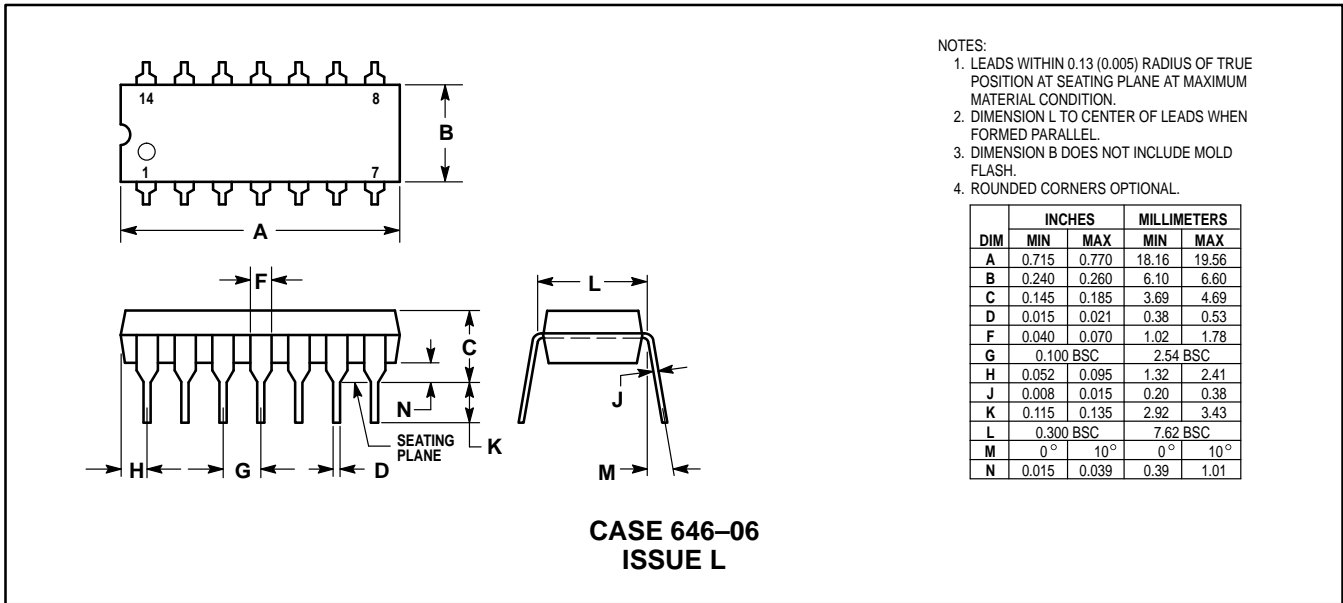



Figure 4. Delay Matching Waveform Definitions

PACKAGE DIMENSIONS



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