

**Power Products Division**

*Advance Information*

**SINGLE CHANNEL DRIVER**

The MPIC2117 is a high voltage, high speed, power MOSFET and IGBT driver. Proprietary HVIC and latch immune CMOS technologies enable ruggedized monolithic construction. The logic input is compatible with standard CMOS outputs. 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 or low side configuration which operates from 10 to 600 volts.

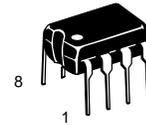
- Floating Channel Designed for Bootstrap Operation
- Fully Operational to +600 V
- Tolerant to Negative Transient Voltage
- dV/dt Immune
- Gate Drive Supply Range from 10 to 20 V
- Undervoltage Lockout
- CMOS Schmitt-triggered Input with Pull-down
- Output In Phase with Input

**PRODUCT SUMMARY**

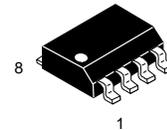
<b>V<sub>OFFSET</sub></b>	<b>600 V MAX</b>
<b>I<sub>O+/-</sub></b>	<b>200 mA/420 mA</b>
<b>V<sub>OUT</sub></b>	<b>10 – 20 V</b>
<b>t<sub>on/off</sub> (typical)</b>	<b>125 &amp; 105 ns</b>

**MPIC2117**

**SINGLE CHANNEL DRIVER**



**P SUFFIX**  
PLASTIC PACKAGE  
CASE 626-05



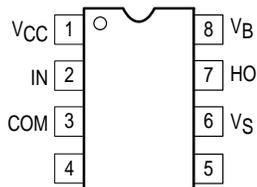
**D SUFFIX**  
PLASTIC PACKAGE  
CASE 751-05  
(SO-8)

**ORDERING INFORMATION**

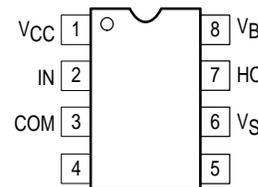
Device	Package
MPIC2117D	SOIC
MPIC2117P	PDIP

**PIN CONNECTIONS**

(TOP VIEW)



8 LEADS DIP  
MPIC2117P

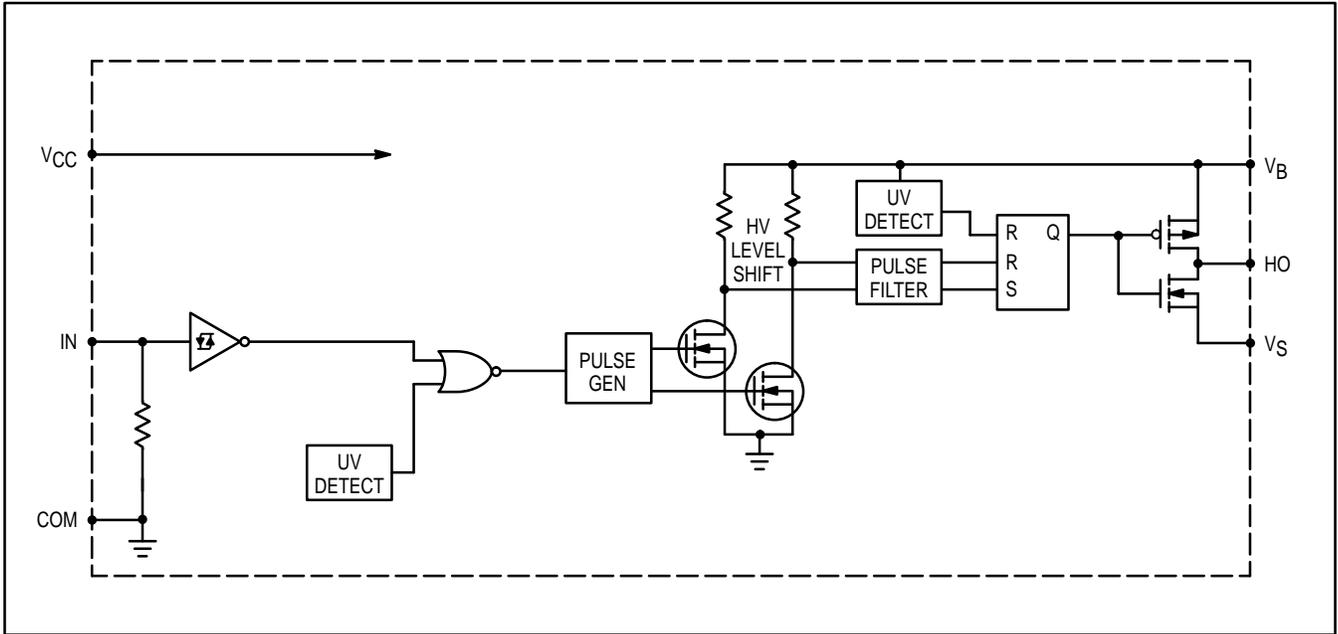


8 LEAD SOIC  
MPIC2117D

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

REV 1

SIMPLIFIED BLOCK DIAGRAM



ABSOLUTE MAXIMUM RATINGS

Absolute Maximum Ratings indicate sustained limits beyond which damage to the device may occur. 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.

Rating	Symbol	Min	Max	Unit
High Side Floating Supply Absolute Voltage	$V_B$	-0.3	625	$V_{DC}$
High Side Floating Supply Offset Voltage	$V_S$	$V_B-25$	$V_B+0.3$	
High Side Floating Output Voltage	$V_{HO}$	$V_S-0.3$	$V_B+0.3$	
Logic Supply Voltage	$V_{CC}$	-0.3	25	
Logic Input Voltage	$V_{IN}$	-0.3	$V_{CC}+0.3$	
Allowable Offset Supply Voltage Transient	$dV_S/dt$	-	50	V/ns
*Package Power Dissipation @ $T_A \leq +25^\circ C$	$P_D$	-	1.0	Watt
	-	-	0.625	
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	-	125	$^\circ C/W$
		-	200	
Operating and Storage Temperature	$T_j, T_{stg}$	-55	150	$^\circ C$
Lead Temperature for Soldering Purposes, 10 seconds	$T_L$	-	260	$^\circ C$

RECOMMENDED OPERATING CONDITIONS

The Input/Output logic timing Diagram is shown in Figure 1. For proper operation the device should be used within the recommended conditions. The  $V_S$  offset rating is tested with all supplies biased at 15 V differential.

High Side Floating Supply Absolute Voltage	$V_B$	$V_S+10$	$V_S+20$	V
High Side Floating Supply Offset Voltage	$V_S$	Note 1	600	
High Side Floating Output Voltage	$V_{HO}$	$V_S$	$V_B$	
Logic Supply Voltage	$V_{CC}$	10	20	
Logic Input Voltage	$V_{IN}$	0	$V_{CC}$	
Ambient Temperature	$T_A$	-40	125	$^\circ C$

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

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

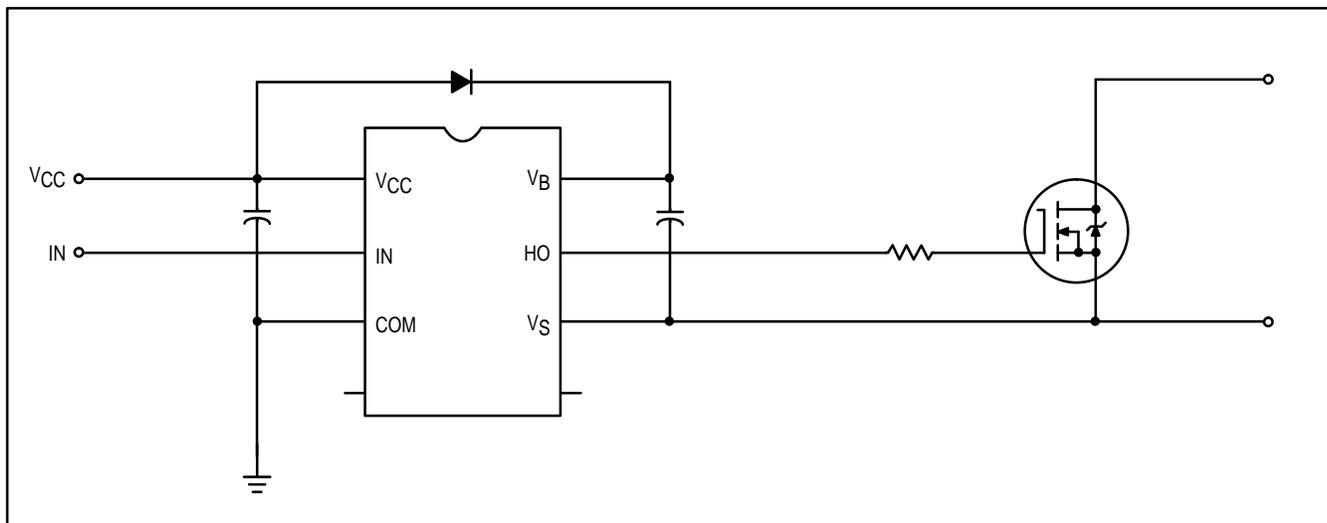
Characteristic	Symbol	Min	Typ	Max	Unit
<b>STATIC ELECTRICAL CHARACTERISTICS</b>					
$V_{\text{BIAS}} (V_{\text{CC}}, V_{\text{BS}}) = 15\text{ V}$ unless otherwise specified. The $V_{\text{IN}}$ , $V_{\text{TH}}$ and $I_{\text{IN}}$ parameters are referenced to COM. The $V_{\text{O}}$ and $I_{\text{O}}$ parameters are referenced to COM and are applicable to the respective output leads: HO or LO.					
Logic "1" Input Voltage @ $V_{\text{CC}} = 10\text{ V}$	$V_{\text{IH}}$	6.4	–	–	V <sub>DC</sub>
Logic "1" Input Voltage @ $V_{\text{CC}} = 15\text{ V}$	$V_{\text{IH}}$	9.5	–	–	
Logic "1" Input Voltage @ $V_{\text{CC}} = 20\text{ V}$	$V_{\text{IH}}$	12.6	–	–	
Logic "0" Input Voltage @ $V_{\text{CC}} = 10\text{ V}$	$V_{\text{IL}}$	–	–	3.8	
Logic "0" Input Voltage @ $V_{\text{CC}} = 15\text{ V}$	$V_{\text{IL}}$	–	–	6.0	
Logic "0" Input Voltage @ $V_{\text{CC}} = 20\text{ V}$	$V_{\text{IL}}$	–	–	8.3	
High Level Output Voltage, $V_{\text{BS}}-V_{\text{O}}$ @ $V_{\text{IN}} = V_{\text{IH}}, I_{\text{O}} = 0\text{ A}$	$V_{\text{OH}}$	–	–	100	mV
Low Level Output Voltage, $V_{\text{O}}$ @ $V_{\text{IN}} = V_{\text{IL}}, I_{\text{O}} = 0\text{ A}$	$V_{\text{OL}}$	–	–	100	
Offset Supply Leakage Current @ $V_{\text{B}} = V_{\text{S}} = 600\text{ V}$	$I_{\text{LK}}$	–	–	50	$\mu\text{A}$
Quiescent $V_{\text{BS}}$ Supply Current @ $V_{\text{IN}} = 0\text{ V}$ or $V_{\text{CC}}$	$I_{\text{QBS}}$	–	50	–	
Quiescent $V_{\text{CC}}$ Supply Current @ $V_{\text{IN}} = 0\text{ V}$ or $V_{\text{CC}}$	$I_{\text{QCC}}$	–	70	–	
Logic "1" Input Bias Current @ $V_{\text{IN}} = 15\text{ V}$	$I_{\text{IN}+}$	–	20	40	
Logic "0" Input Bias Current @ $V_{\text{IN}} = 0\text{ V}$	$I_{\text{IN}-}$	–	–	1.0	
$V_{\text{BS}}$ Supply Undervoltage Positive Going Threshold	$V_{\text{BSUV}+}$	–	8.5	–	V
$V_{\text{BS}}$ Supply Undervoltage Negative Going Threshold	$V_{\text{BSUV}-}$	–	8.2	–	
$V_{\text{CC}}$ Supply Undervoltage Positive Going Threshold	$V_{\text{CCUV}+}$	–	8.6	–	
$V_{\text{CC}}$ Supply Undervoltage Negative Going Threshold	$V_{\text{CCUV}-}$	–	8.2	–	
Output High Short Circuit Pulsed Current @ $V_{\text{OUT}} = 0\text{ V}, V_{\text{IN}} = 15\text{ V}, \text{PW} \leq 10\ \mu\text{s}$	$I_{\text{O}+}$	200	250	–	mA
Output Low Short Circuit Pulsed Current @ $V_{\text{OUT}} = 15\text{ V}, V_{\text{IN}} = 0\text{ V}, \text{PW} \leq 10\ \mu\text{s}$	$I_{\text{O}-}$	420	500	–	

**DYNAMIC ELECTRICAL CHARACTERISTICS**

$V_{\text{BIAS}} (V_{\text{CC}}, V_{\text{BS}}) = 15\text{ V}$  unless otherwise specified

Turn-On Propagation Delay @ $V_{\text{S}} = 0\text{ V}$	$t_{\text{on}}$	–	125	–	ns
Turn-Off Propagation Delay @ $V_{\text{S}} = 600\text{ V}$	$t_{\text{off}}$	–	105	–	
Turn-On Rise Time @ $C_{\text{L}} = 1000\text{ pF}$	$t_{\text{r}}$	–	80	–	
Turn-Off Fall Time @ $C_{\text{L}} = 1000\text{ pF}$	$t_{\text{f}}$	–	40	–	

**TYPICAL CONNECTION**



# MPIC2117

## LEAD DEFINITIONS

Symbol	Lead Description
V <sub>CC</sub>	Logic Supply
IN	Logic Input for High Side Gate Driver Outputs (HO), In Phase with HO
COM	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

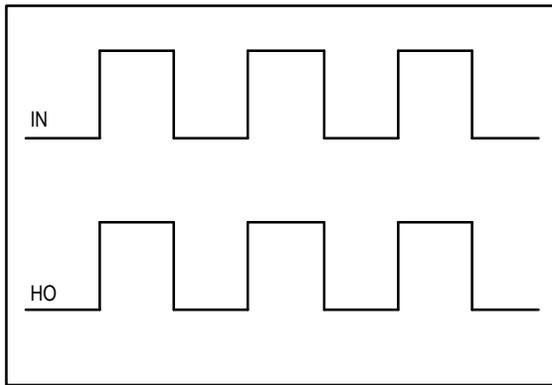


Figure 1. Input / Output Timing Diagram

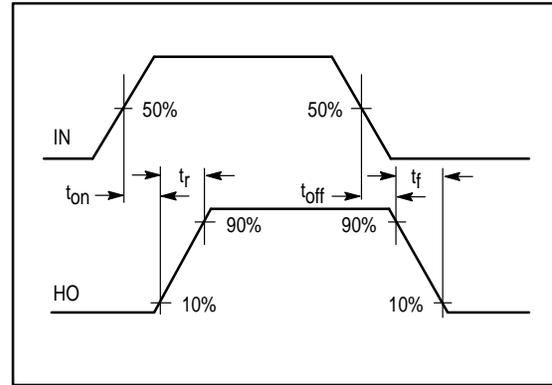
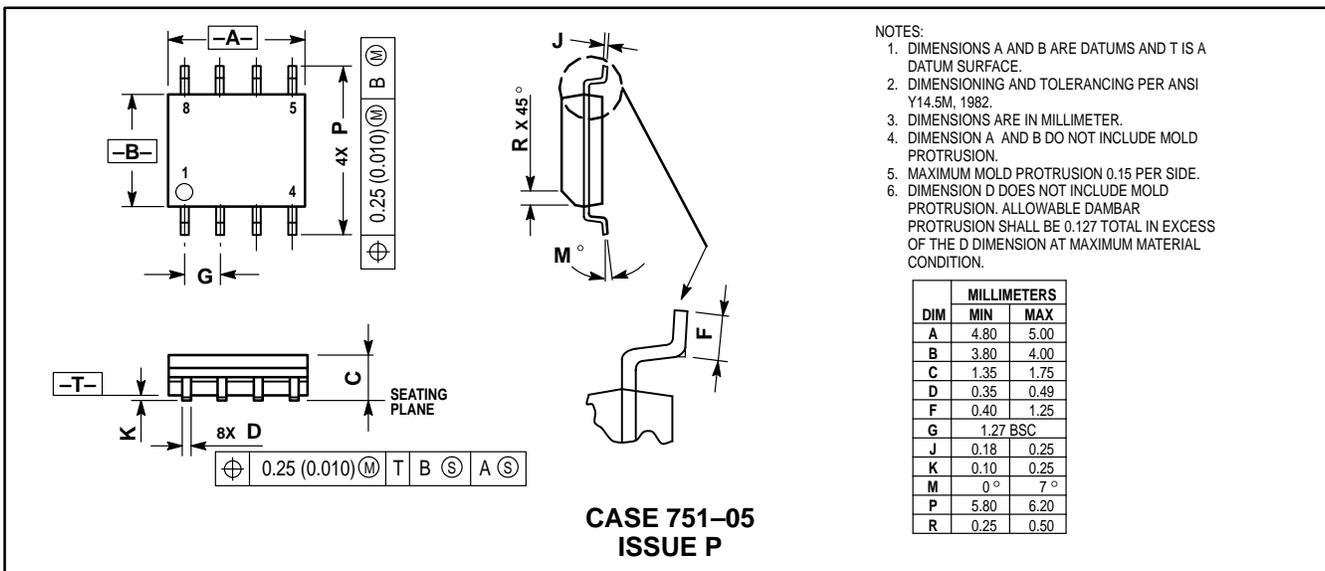
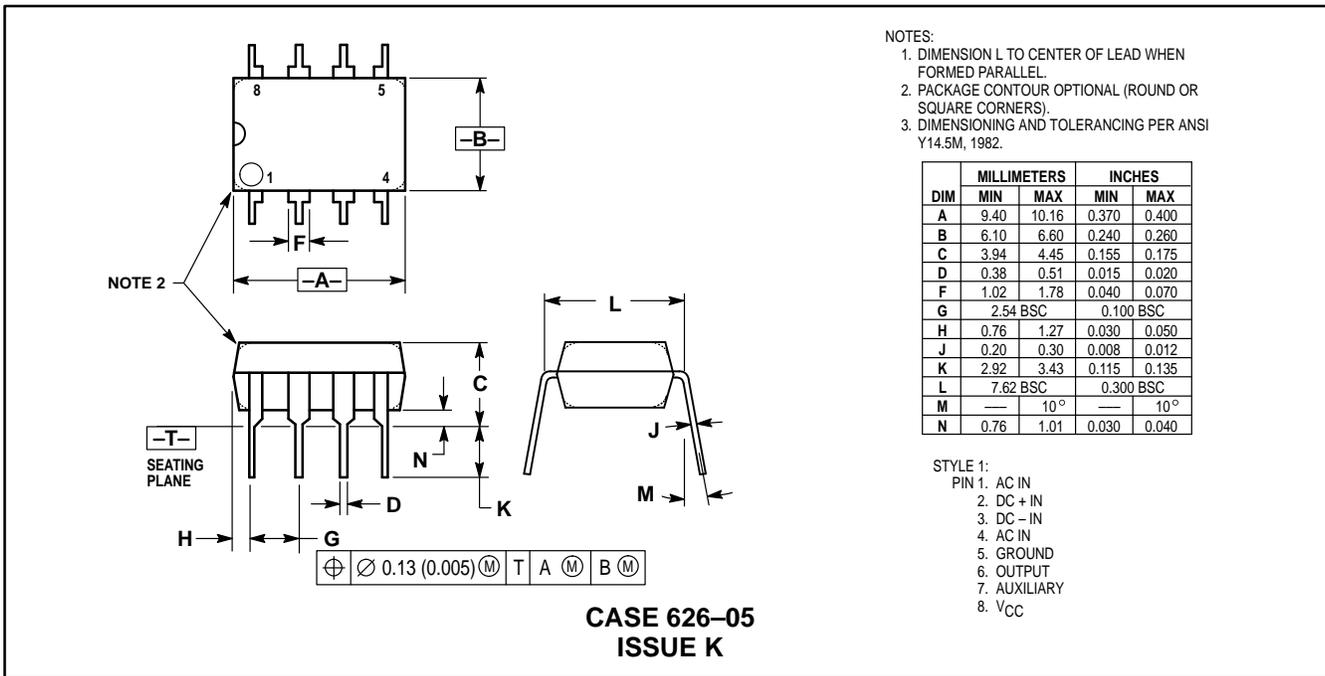


Figure 2. Switching Time Waveform Definitions

PACKAGE DIMENSIONS



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