

600V Half-bridge Driver

DESCRIPTION

The ZMCS5621 are high voltage, high speed power MOSFET and IGBT drivers, can be used to drive an N-channel power MOSFET or IGBT in the high side configuration which operates up to 600 volts. The logic input is compatible with standard CMOS or LSTTL output, down to 3.3V logic. The high and low side drivers have a matching transmission delay time to simplify dead-time control in high frequency applications..

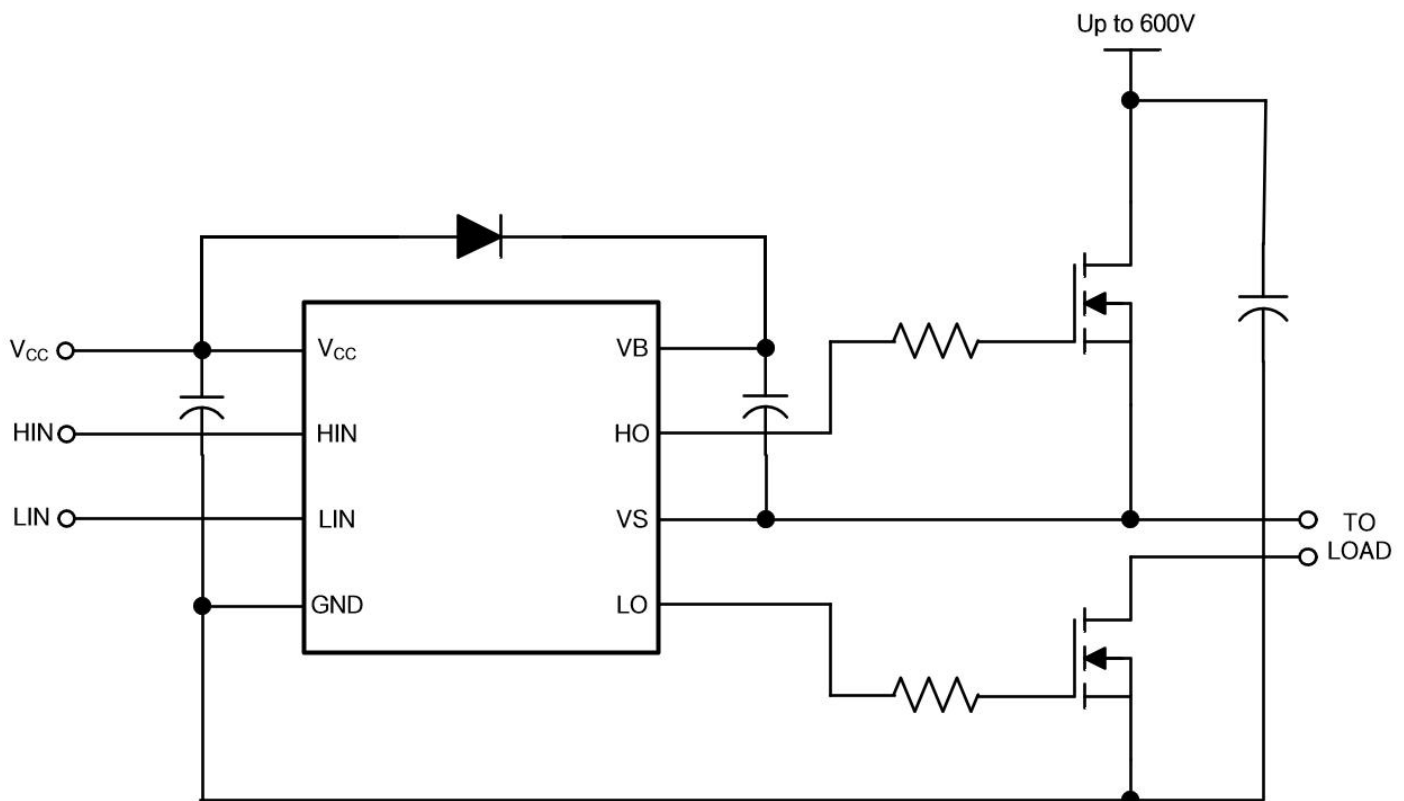
APPLICATIONS

- Small and Medium Power Motor Drivers
- Power MOSFET or IGBT Drivers
- Half-bridge Power Converter
- Full-Bridge Power Converter

FEATURES

- Operating voltage up to 600V
- Logic input compatible with CMOS and 3.3V TTL
- dV/dt immunity to ± 50 V/nS
- Gate drive supply range from 10 to 20V
- Undervoltage protection
- Output source/sink Current capability 200mA/450mA
- Matched propagation delay for both channels

Typical Application Circuit

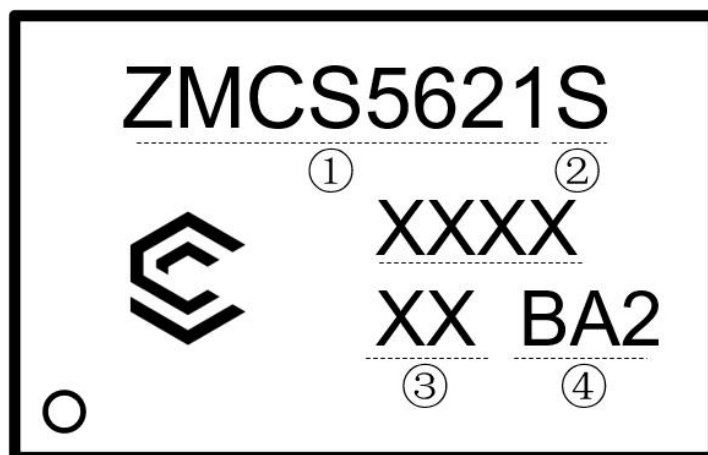


Ordering Information

Tube	Tape and reel	Form factor	Packing
ZMCS5621S	ZMCS5621S	SOP8	Taping

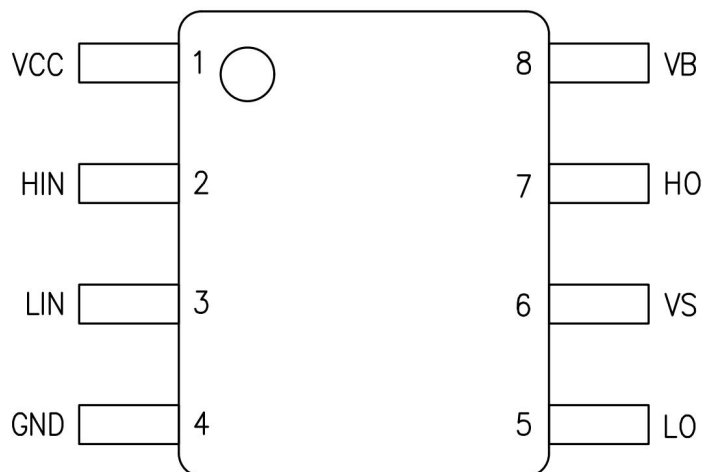
Product identification information:

- ① Product model
- ② Form factor: "S" represented SOP8
- ③ The batch number of the product
- ④ Product internal control mark



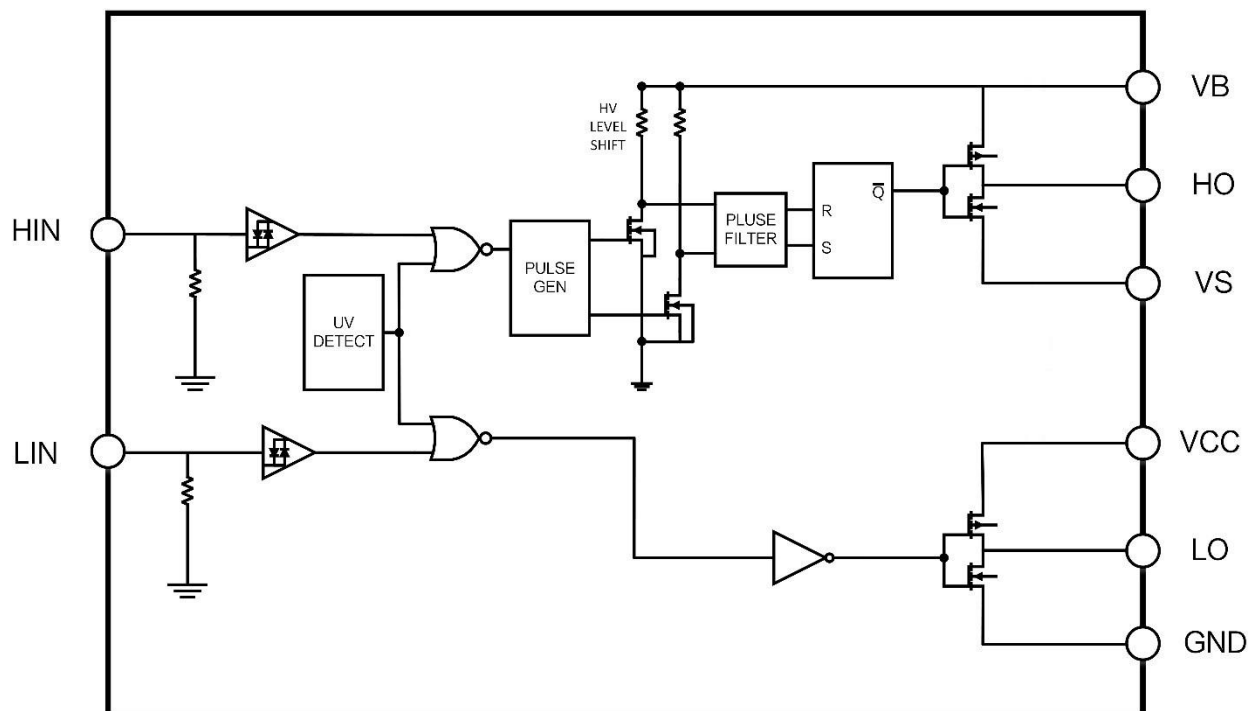
SOP8 schematic diagram of the package

Pin Functions



Pin	Name	Description
1	V_{CC}	Low side supply voltage
2	HIN	Logic input for high side gate driver output (HO)
3	LIN	Logic input for low side gate driver output (LO)
4	COM	Ground
5	LO	Low side gate drive output
6	V_S	High side floating supply return
7	HO	High side gate drive output
8	V_B	High side floating supply

Block Diagram



Absolute Maximum Ratings ⁽¹⁾

V_B Voltage.....	-0.3~625V	V_{IN} Voltage.....	-0.3~ V_{CC} +0.3V
V_S Voltage.....	V_B -20~ V_B +0.3V	Junction Temperature.....	150°C
V_{CC} Voltage.....	-0.3~25V	Storage Temperature.....	-55°C~+150°C
V_{HO} Voltage.....	V_S -0.3~ V_B +0.3V	ESD Rating Human Body Model.....	±2KV
V_{LO} Voltage.....	-0.3~ V_{CC} +0.3V		

(1) Exceeding the maximum operating range can cause permanent damage to the chip. These are stress ratings only and do not imply that the chip functions beyond the specified conditions under these or any other conditions. Working at limit values for long periods of time may affect the reliability of the chip.

Operating Ratings ⁽¹⁾

参数	Min	Max	Units
V_B Voltage	V_S +10	V_S +20	V
V_S Voltage	-5	600	V
V_{HO} Voltage	V_S	V_B	V
V_{CC} Voltage	10	20	V
V_{LO} Voltage	0	V_{CC}	V
V_{IN} Voltage	0	V_{CC}	V
Operating Junction Temperature	-40	125	°C

(1) Recommended operating conditions refer to the conditions under which the chip operates normally. For accurate specifications and test conditions, please refer to Electrical Characteristics.

Electrical Characteristics

$V_{CC}=V_B=15V, C_L=1nF, T=25^{\circ}C.$

Symbol	Parameter	Min	Typ	Max	Units
V_{UVCC+}	VCC supply undervoltage positive going threshold	8	8.7	9.9	V
V_{UVCC-}	VCC supply undervoltage negative going threshold	7.4	8.2	9	
I_{LK}	Offset supply leakage current			50	uA
I_{QBS}	Quiescent VBS supply current		60	110	
I_{QCC}	Quiescent VCC supply current		230	350	
V_{OH}	High level output voltage, VBIAS - VO		0.05	0.5	V
V_{OL}	Low level output voltage, VO		0.02	0.1	
I_{O+}	Output high short circuit pulsed current	100	200		mA
I_{O-}	Output low short circuit pulsed current	200	280		
V_{IH}	Logic "1" input voltage	2.5			V
V_{IL}	Logic "0" input voltage			0.8	
I_{IN+}	Logic "1" input bias current		3	10	uA
I_{IN+}	Logic "0" input bias current		3	10	uA
I_{IN-}	HIN Turn-on propagation delay			1	
t_{ONH}	HIN Turn-off propagation delay		690	860	ns
t_{OFFH}	VCC supply undervoltage positive going threshold		170	250	

Electrical Characteristics (continued) $V_{CC}=V_B=15V$, $T=25^{\circ}C$.

Symbol	Parameter	Min	Typ	Max	Units
t_{ONL}	LIN Turn-on propagation delay		690	860	ns
t_{OFFL}	LIN Turn-off propagation delay		170	250	
MT	Delay matching			80	
t_R	HO/LO Turn-on rise time		40	150	
t_F	HO/LO Turn-off fall time		25	40	

Timing Diagrams

➤ Function Timing Diagram

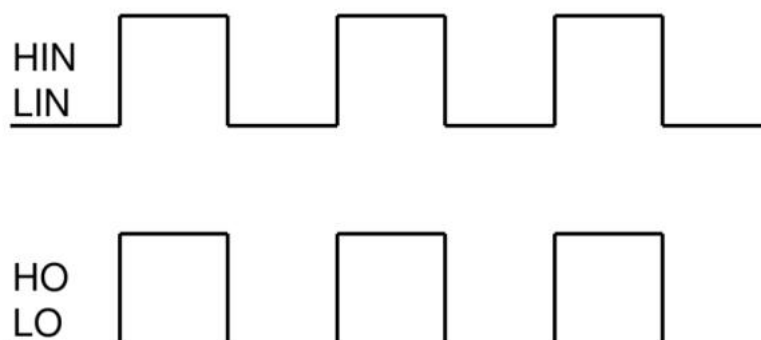


Figure 1. Input/Output Timing Diagram

➤ Rising/falling time definition

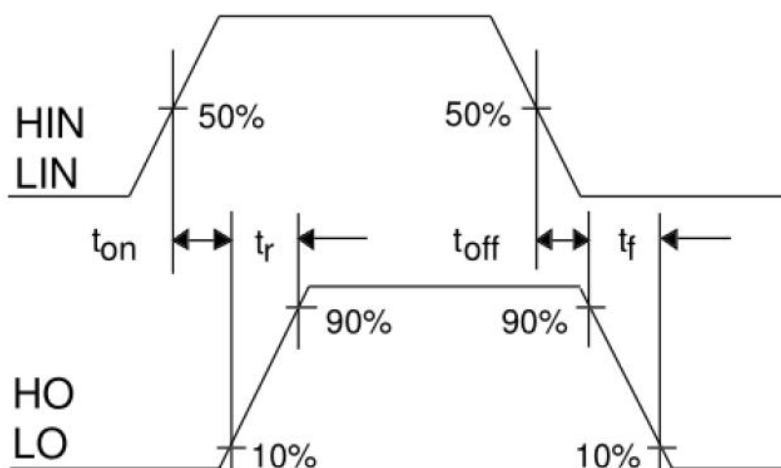


Figure 2. Delay Matching and Rising/falling time definition

➤ Dead Time Definition

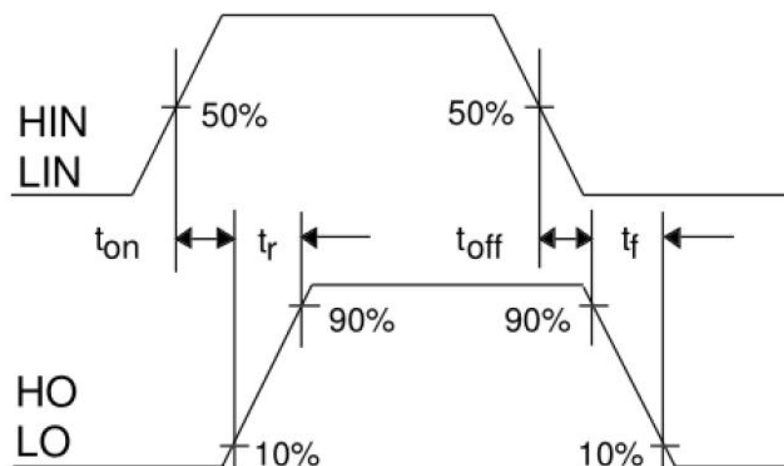


Figure 3. Delay Matching Definition

➤ Delay Matching Definition

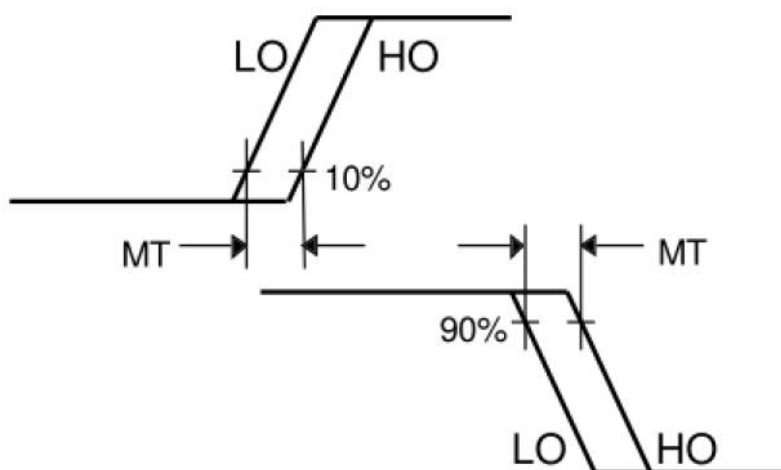
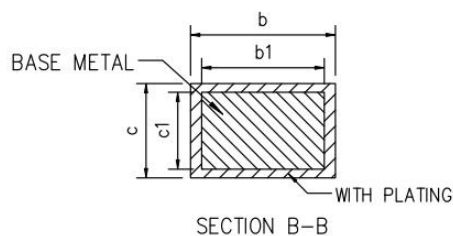
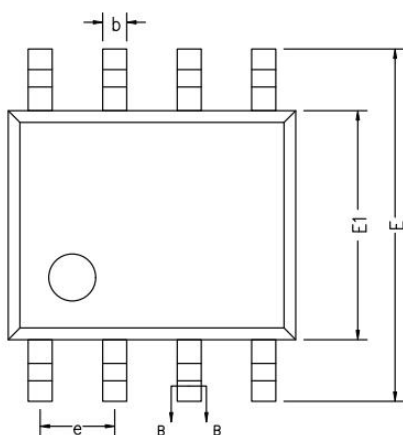
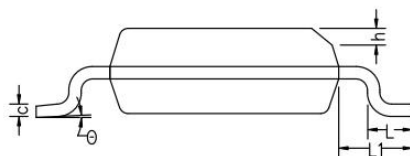
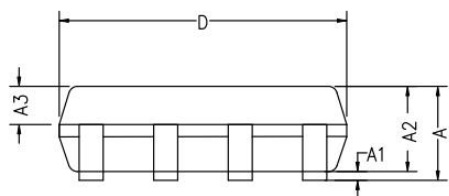


Figure 4. Delay Matching Definition

Pod Diagram

SOP8



SYMBOLS	MILLIMETERS		
	MIN	NOM	MAX
A	—	—	1.750
A1	0.100	—	0.225
A2	1.300	1.400	1.500
A3	0.600	0.650	0.700
b	0.390	—	0.470
b1	0.380	0.410	0.440
c	0.200	—	0.240
c1	0.190	0.200	0.210
D	4.800	4.900	5.000
E	5.800	6.000	6.200
E1	3.800	3.900	4.000
e	1.27BSC		
h	0.250	—	0.500
L	0.500	—	0.800
L1	1.05REF		
θ	0°	—	8°

Important Notice:

Suzhou Convert Semiconductor Co., Ltd. reserves the right to change the specifications without prior notice. Suzhou Convert Semiconductor Co., Ltd. assumes no responsibility for any use of its products for special purposes. Suzhou Convert Semiconductor Co., Ltd. has no obligation to provide use and application support for products used for specific purposes. Suzhou Convert Semiconductor Co., Ltd. does not transfer its patent license and any other related license rights.