High voltage pre-driver circuit SDC9300

Overview

SDC9300 is a high-voltage, high-speed drive power MOS tube and The IGBT front-stage drive circuit has independent upper and lower drive channels. Made with high voltage IC technology, it has extremely high anti-interference capability. Compatible with standard CMOS or LSTTL outputs down to 3.3V.

The output drivers feature a high pulse current buffer design to maximize Minimizes the effect of output shoot-through. The upper channel can drive up to 600V NMOS tube or IGBT.

Features

ÿ The upper channel adopts high voltage design, with a maximum working voltage of 600V Able to withstand high-speed voltage changes

ÿ Drive voltage range 10 V to 20 V

ÿ Under voltage lockout function

ÿ Compatible with 3.3V, 5V and 15V input logic

ÿ Precise matching of delay control between upper and lower channels

ÿ Logic and power ground +/- 5V offset

ÿ With better noise immunity

ÿ Output is in phase with input

application

ÿ Bridge circuit pre-driver

SOPÿ8 DIPÿ8

Figure 1. Package outline

Pin Description

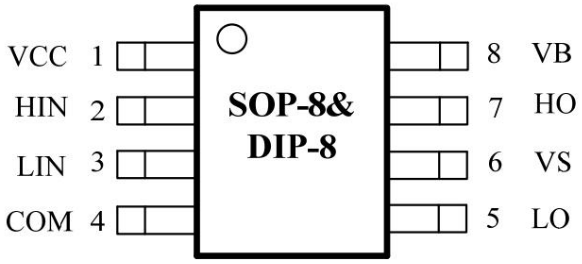


Figure 2. Pin distribution

serial number	name	Functional Description
1	VCC	powered by
2	DON'T	Upper channel logic input
3	LIN	Lower channel logic input
4	WITH	Lower channel reference
5	IT	Lower channel output
6	VS	Upper channel reference
7	TO	Upper channel output
8	VB	Upper channel power supply

Table 1. Pin Description

Functional Block Diagram

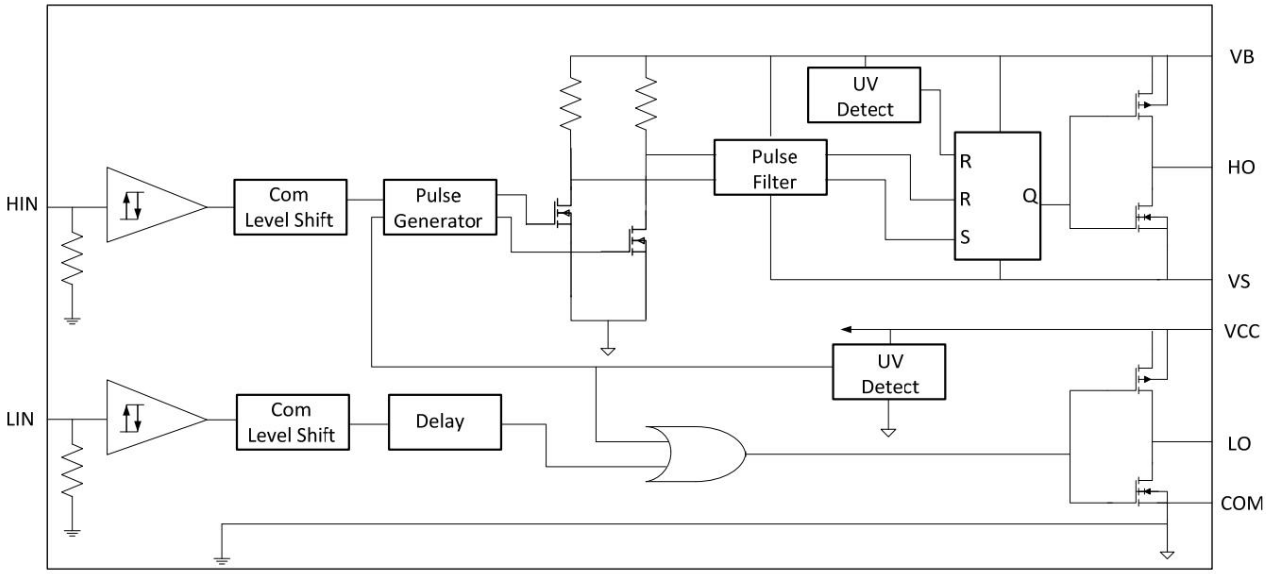
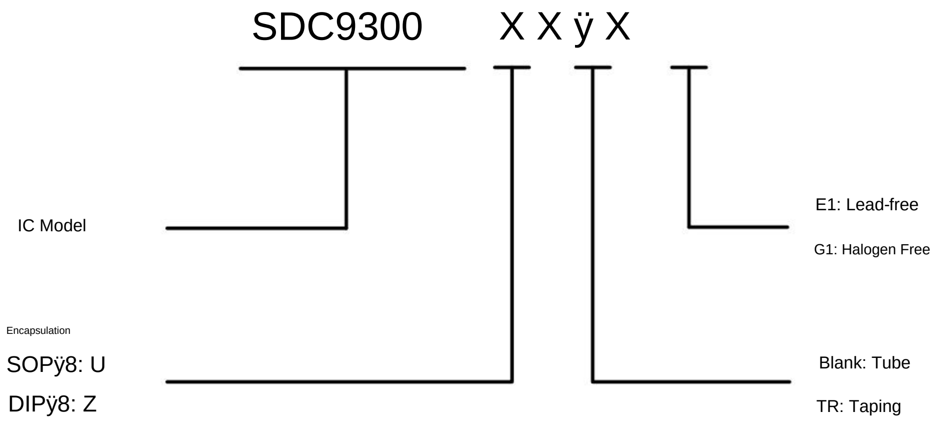


Figure 3. Functional block diagram

Ordering Information



Package	temperature range	Product Number		Identification number		Packaging
		Lead Free	Halogen Free	Lead Free	Halogen Free	
SOPÿ8	ÿ40°C~125°C	SDC9300UTRÿE1	SDC9300UTRÿG1	9300	9300G	Taping
DIPÿ8		SDC9300ZÿE1	SDC9300ZÿG1	9300	9300G	Tube

Limit parameters (Note: Do not exceed the maximum value in application to prevent damage. Long-term operation at the maximum value may affect the reliability of the device)

parameter	symbol	Minimum	Maximum value unit	
Upper channel power supply	VB	ÿ0.3	625	V
voltage Upper channel reference	VS	VBÿ25	VB+0.3	V
voltage Upper channel output	VHO	VSÿ0.3	VB+0.3	V
voltage	VCC	ÿ0.3	25	V
Power supply Lower channel	VLO	ÿ0.3	VCC+0.3	V
output voltage Logic input	COME	COM-0.3	VCC+0.3	V
voltage Upper channel reference voltage Change	dVs/dt		50	V/nS
rate Package power consumption 1	Pd1	ÿÿ	0.625	IN
(SOP-8) Package power consumption	Pd2	ÿÿ	1	IN
2 (DIP-8) Maximum	Tj	ÿÿ	150	°C
junction temperature Storage temperature	Tsj	ÿ50	150	°C

Table 2. Limit parameters

Recommended operating conditions

parameter	symbol	Minimum	Maximum value unit	
Upper channel power supply	VB	VS+10	VS+20	V
voltage Upper channel reference	VS	ÿÿ	600	V
voltage Upper channel output	VHO	VS	VB	V
voltage	VCC	10	20	V
Power supply Lower channel	VLO	0	VCC	V
output voltage Logic input	COME	WITH	VCC	V
voltage Ambient temperature	FACING	ÿ40	125	°C

Table 3. Recommended operating conditions

Electrical Characteristics

Unless otherwise noted, (VBIAS (VCC, VBS) = 15V, VS = COM, TA = 25°C. VIL, VIH and LIN are referenced to the VS/COM pin and apply to the respective

Input pin. VO and IO refer to COM pin and apply to respective output pins: HO and LO)

Parameter conditions	symbol		Min.Typ.Max.Unit			
Static electrical parameters						
Logic input high level Logic	HIV	VCC=10V~20V	2.9	ÿÿ	ÿÿ	V
input low level High level	WILL	VCC=10V~20V	ÿÿ	ÿÿ	0.8	V
saturation voltage Low	VOH	VBIAS-VOÿIO=20mA	ÿÿ	0.5	1.2	V
level saturation voltage	VOL	I=20mA	ÿÿ	0.2	0.6	V
drop High voltage leakage	FIRST	VB=VS=600V	ÿÿ	ÿÿ	50	uA
VBS static operating current	IQBS	VIN=0V or 5V	20	50	130	uA
VCC Quiescent Operating	IQCC	VIN=0V or 5V	60	130	180	uA
Current High Level Input Bias	IIN+	VIN=5V	ÿÿ	5	20	uA
Current Low Level Input Bias Current	IINÿÿ	VIN=0V	ÿÿ	ÿÿ	2	uA
Undervoltage lockout release voltage	VCCUV+ VBSUV+	ÿÿ	8.0	8.9	9.8	V
Undervoltage lockout voltage	VCCUVÿ VBSUVÿ	ÿÿ	7.4	8.2	9.0	V
Undervoltage Lockout Hysteresis	VCCUVH VBSUVH	ÿÿ	0.3	0.7	ÿÿ	V
Output pull-up capability	IO+	VO=0V PWÿ10uS	120	200	ÿÿ	mA
Output pull-down capability	IO-	VO=15V PWÿ10uS	220	300	ÿÿ	mA
Dynamic electrical characteristics VBIAS (VCCÿVBS)=15VÿVS=COMÿCL=1000pFÿTA=25°C						
Turn-on delay time TON Turn-	Ton	VS=0V	ÿÿ	220 300		nS
off delay time TOFF Delay	Toff	VS=0V or 600V	ÿÿ	190 280		nS
matching error Output	MT	ÿÿ	ÿÿ	0	30	nS
rise time	Tr	VS=0V	ÿÿ	80	180	nS
Output Fall Time	Tf	VS=0V	ÿÿ	50	80	nS

Table 4. Electrical characteristics

Typical application circuit

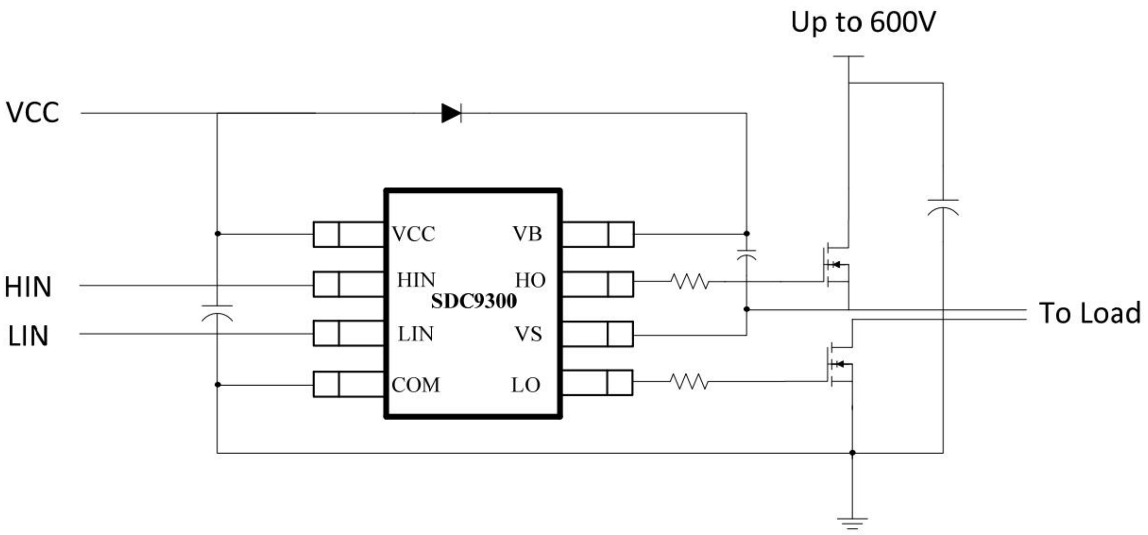


Table 4. Typical application circuits

Package size

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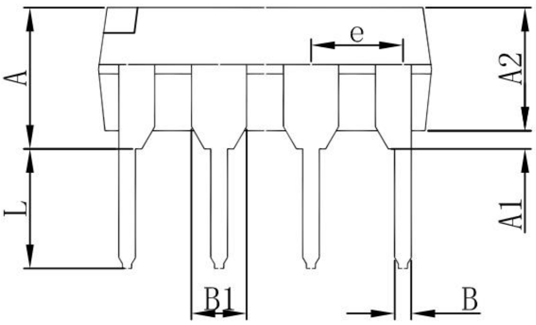
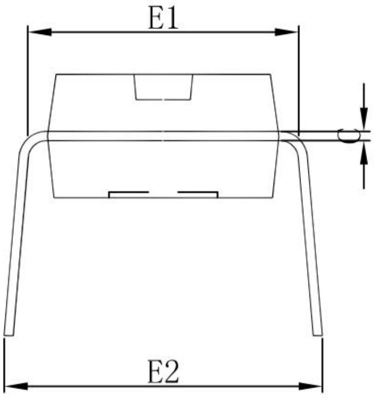
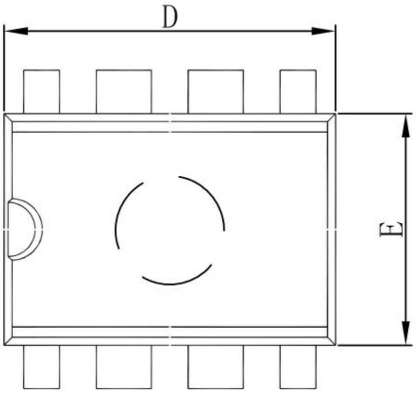
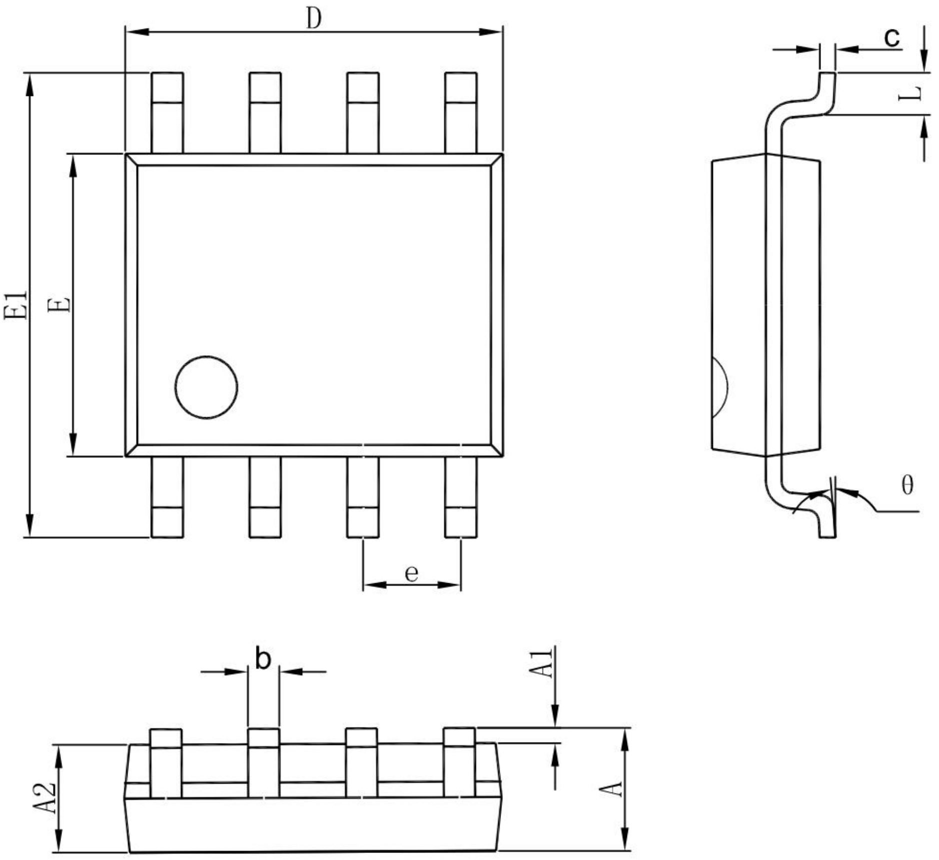






Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	3.710	4.310	0.146	0.170
A1	0.510		0.020	
A2	3.200	3.600	0.126	0.142
B	0.380	0.570	0.015	0.022
B1	1.524(BSC)		0.060(BSC)	
C	0.204	0.360	0.008	0.014
D	9.000	9.400	0.354	0.370
AND	6.200	6.600	0.244	0.260
E1	7.320	7.920	0.288	0.312
and	2.540(BSC)		0.100(BSC)	
L	3.000	3.600	0.118	0.142
E2	8.400	9.000	0.331	0.354

SOPÿ8



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.350	1.750	0.053	0.069
A1	0.100	0.250	0.004	0.010
A2	1.350	1.550	0.053	0.061
b	0.330	0.510	0.013	0.020
c	0.170	0.250	0.007	0.010
D	4.700	5.100	0.185	0.201
and	1.270(BSC)		0.050(BSC)	
AND	5.800	6.200	0.228	0.244
E1	3.800	4.000	0.150	0.157
L	0.400	1.270	0.016	0.050
i	0°	8°	0°	8°

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