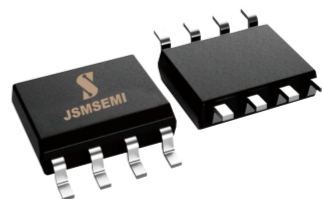


## 1 Description

The SDH21263 is a high voltage, high speed power MOSFET drivers with dependent high- and low-side referenced output channels.

Proprietary HVIC and latch immune CMOS technologies enable ruggedized monolithic construction. The logic input is compatible with standard CMOS or LSTTL output, down to 3.3 V logic. 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 in the high-side configuration which operates up to 200 V.



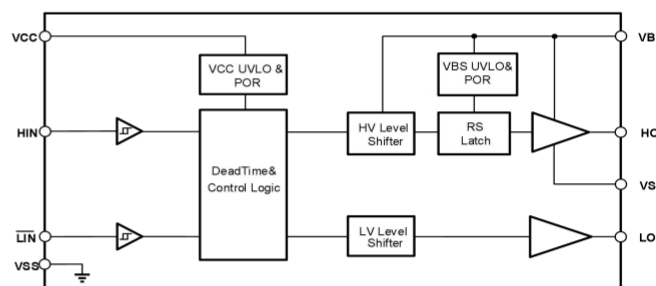
## 3 Application

- Motor Control
- Air Conditioners/ Washing Machines
- General Purpose Inverters
- Micro/Mini Inverter Drives

## 2 Features and Benefits

- Floating channel designed for bootstrap operation
- Fully operational to +250 V
- 3.3V, 5V and 15V input logic compatible
- dV/dt noise Immunity  $\pm 50$  V/nsec
- Allowable negative Vs capability: -9V
- Gate drive supply range from 6 V to 20V
- Cross-conduction prevention logic
  - Deadtime:200ns
- Matched propagation delay for both channels
- Wide operating temperature range -40°C ~125°C
- Typically output Source/Sink current capability: 1.2A/1.5A
- RoSH compatible

## Functional Block Diagram



#### 4 Function Pin Description

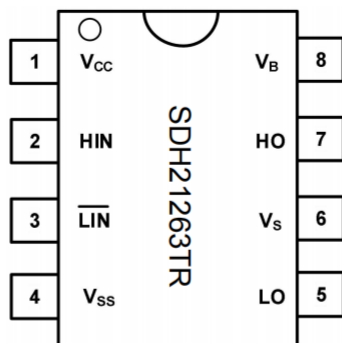


Figure4-1 8-Pin SOIC8 Top view

Table 4-1 Lead Definitions

Number	Symbol	Description
1	V <sub>CC</sub>	Low side and logic fixed supply
2	HIN	Logic input for high side gate driver output (HO), in phase
3	$\overline{\text{LIN}}$	Logic input for low side gate driver output (LO), out of phase
4	V <sub>SS</sub>	Low side return
5	LO	Low side gate drive output
6	V <sub>S</sub>	High side floating supply return
7	HO	High side gate drive output
8	V <sub>B</sub>	High side floating supply

## 5 Product specifications

### 5.1 Absolute Maximum Ratings

Exceeding the limit maximum rating may cause permanent damage to the device. All voltage parameters are rated with reference to VSS and an ambient temperature of 25°C.

Symbol	Definition	MIN.	MAX.	Units
V <sub>B</sub>	High side floating supply	-0.3	275	V
V <sub>S</sub>	High side floating supply return	V <sub>B</sub> - 25	V <sub>B</sub> + 0.3	
V <sub>HO</sub>	High side gate drive output	V <sub>S</sub> - 0.3	V <sub>B</sub> + 0.3	
V <sub>CC</sub>	Low side and main power supply	-0.3	25	
V <sub>LO</sub>	Low side gate drive output	-0.3	V <sub>CC</sub> + 0.3	
V <sub>IN</sub>	Logic input of HIN & LIN	-0.3	V <sub>CC</sub> + 0.3	
dV <sub>S</sub> /dt	Allowable Offset Supply Voltage Transient	—	50	V/ns

### 5.2 ESD rating

Symbol	Definition	MIN.	MAX.	Units
ESD	HBM Model	1500	—	V
	Machine Model	500	—	V

### 5.3 Rated power

Symbol	Definition	MIN.	MAX.	Units
P <sub>D</sub>	Package Power Dissipation @ TA ≤ 25°C	—	625	mW

### 5.4 Thermal information

Symbol	Definition	MIN.	MAX.	Units
R <sub>thJA</sub>	Thermal Resistance, Junction to Ambient	--	200	°C/W
T <sub>J</sub>	Junction Temperature	—	150	°C
T <sub>S</sub>	Storage Temperature	-55	150	
T <sub>L</sub>	Lead Temperature (Soldering, 10 seconds)	—	300	

### 5.5 Recommended Operating Conditions

For proper operation, the device should be used under the following recommended conditions. The bias ratings of VS and VSS are measured at a supply voltage of 15V, and unless otherwise specified, the ratings of all voltage parameters are referenced to VSS and the ambient temperature is 25°C.

Symbol	Definition	MIN.	MAX.	Units
V <sub>B</sub>	High side floating supply	V <sub>S</sub> + 6	V <sub>S</sub> + 20	V
V <sub>S</sub>	High side floating supply return	-9	250	
V <sub>HO</sub>	High side gate drive output	V <sub>S</sub>	V <sub>B</sub>	
V <sub>CC</sub>	Low side and main power supply	6	20	
V <sub>LO</sub>	Low side gate drive output	0	V <sub>CC</sub>	
V <sub>IN</sub>	Logic input of HIN & LIN	0	V <sub>CC</sub>	
T <sub>A</sub>	Ambient temperature	-40	125	°C

Note1: Transient negative VS can be used for VSS-50V with a pulse width of 50ns, guaranteed by design..

Note2: When the input pulse width is less than 1us, the input pulse cannot be transmitted normally .

## 5.6 Electrical Characteristics

Valid for temperature range at  $T_A=25^\circ\text{C}$ ,  $V_{CC}=V_B=15\text{V}$ ,  $C_L=1\text{nF}$ , unless otherwise specified

### 5.6.1 Dynamical electrical characteristics

Symbol	Definition	MIN.	TYP.	MAX.	Units	Test Condition
$t_{ON}$	Turn-on propagation delay	—	150	250	ns	$V_S=0\text{V}$
$t_{OFF}$	Turn-off propagation delay	—	140	250	ns	$V_S=250\text{V}$
$t_R$	Turn-on rise time	—	50	100	ns	
$t_F$	Turn-off fall time	—	40	100	ns	
DT	Deadtime	—	200	--	ns	
MT	Matching delay ON and OFF	—	—	50	ns	

### 5.6.2 Static electrical characteristics

Valid for temperature range at  $T_A=25^\circ\text{C}$ ,  $V_{CC}=V_B=15\text{V}$ ,  $C_L=1\text{nF}$ , unless otherwise specified.

Symbol	Definition	MIN.	TYP.	MAX.	Units	Test Condition
$V_{CCUV+}$	VCC supply UVLO threshold	—	5.5	—	V	
$V_{CCUV-}$		—	5.0	—	V	
$I_{LK}$	High-side floating supply leakage current	—	—	50	$\mu\text{A}$	$V_B=V_S=250\text{V}$
$I_{QBS}$	Quiescent $V_B$ supply current	—	40	120	$\mu\text{A}$	$V_{IN}=0\text{V}$ or $5\text{V}$
$I_{QCC}$	Quiescent VCC supply current	—	160	280	$\mu\text{A}$	$V_{IN}=0\text{V}$ or $5\text{V}$
$V_{IH}$	Logic "1" (HIN&LIN) input voltage	2.5	—	—	V	
$V_{IL}$	Logic "0" (HIN&LIN) input voltage	—	—	0.8	V	
$V_{OH}$	High level output voltage, $V_{BIAS} - V_O$	—	—	0.2	V	$I_O=0\text{A}$
$V_{OL}$	Low level output voltage, $V_O$	—	—	0.1	V	$I_O=0\text{A}$
$I_{IN+}$	Logic "1" Input bias current	—	10	20	$\mu\text{A}$	$HIN=5\text{V}$ , $LIN=0\text{V}$
$I_{IN-}$	Logic "0" Input bias current	—	15	30	$\mu\text{A}$	$HIN=0\text{V}$ , $LIN=5\text{V}$
$I_{O+}$	Output high short circuit pulsed current	—	1.2	—	A	$V_O=0\text{V}$ $PW\leq 10\mu\text{s}$
$I_{O-}$	Output low short circuit pulsed current	—	1.5	—	A	$V_O=15\text{V}$ $PW\leq 10\mu\text{s}$

## 6 Function Description

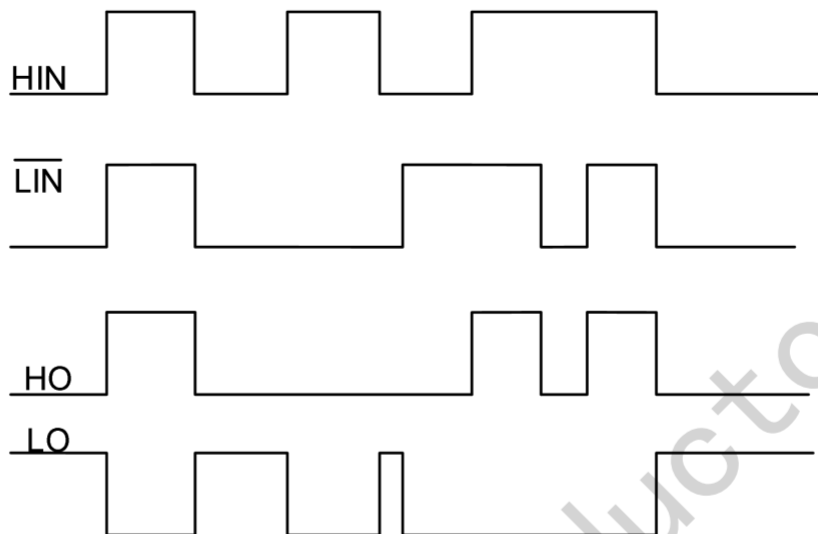


Figure 6-1 SDH21263TR Input and output timing waveform

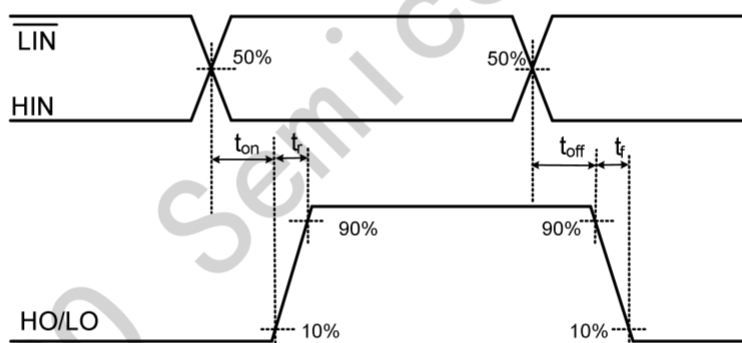


Figure 6-2 Propagation Time Waveform Definition

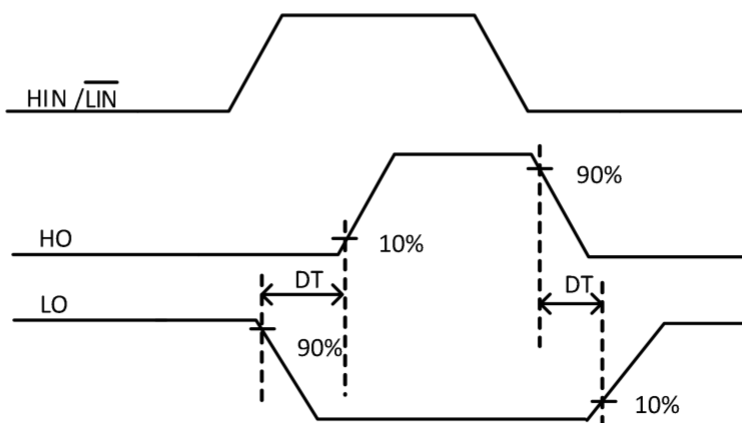


Figure 6-3 Cross Conduction Prevention Delay Time Waveform Definition

## 7 SDH21263TR Description

### 7.1 Function Block Diagram

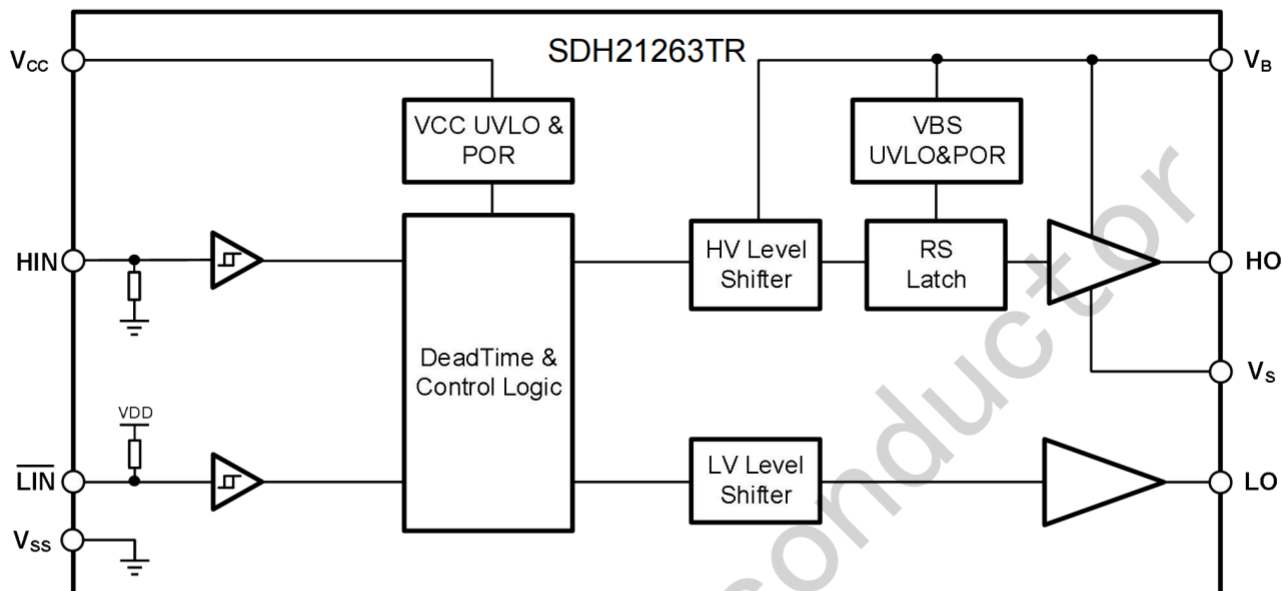


Figure 7-1 Function Block Diagram of SDH21263TR

### 7.2 Chip operating logic

Table 7-1 I/O logical table

INPUT		OUTPUT	
HIN	LIN/	HO	LO
L	L	L	H
L	H	L	L
H	L	L	L
H	H	H	L

Note: H stands for high level; L stands for low level

8 Application message

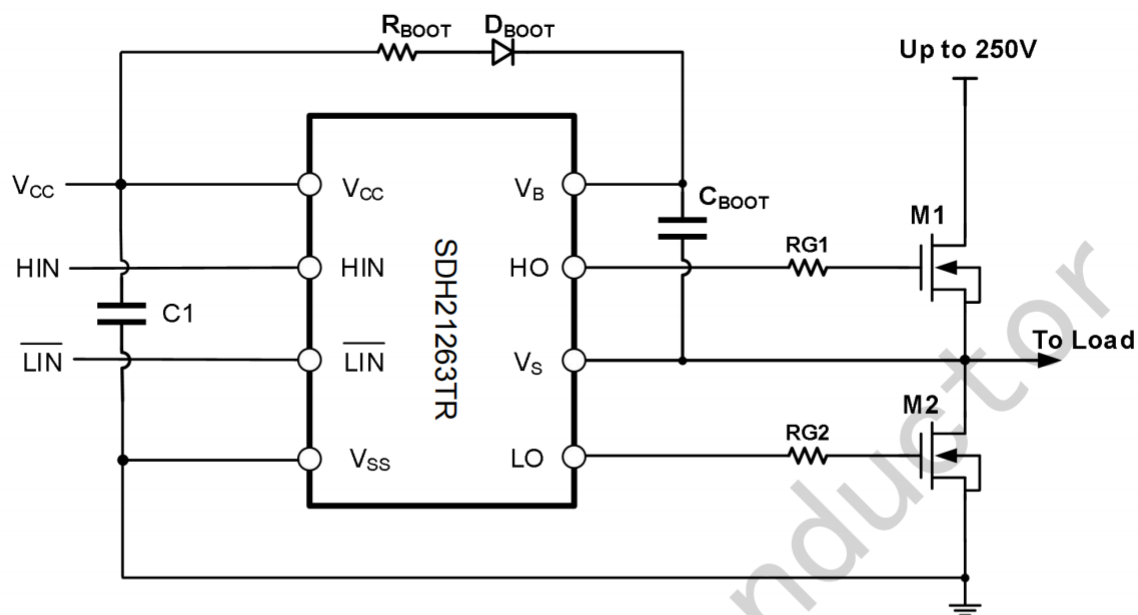
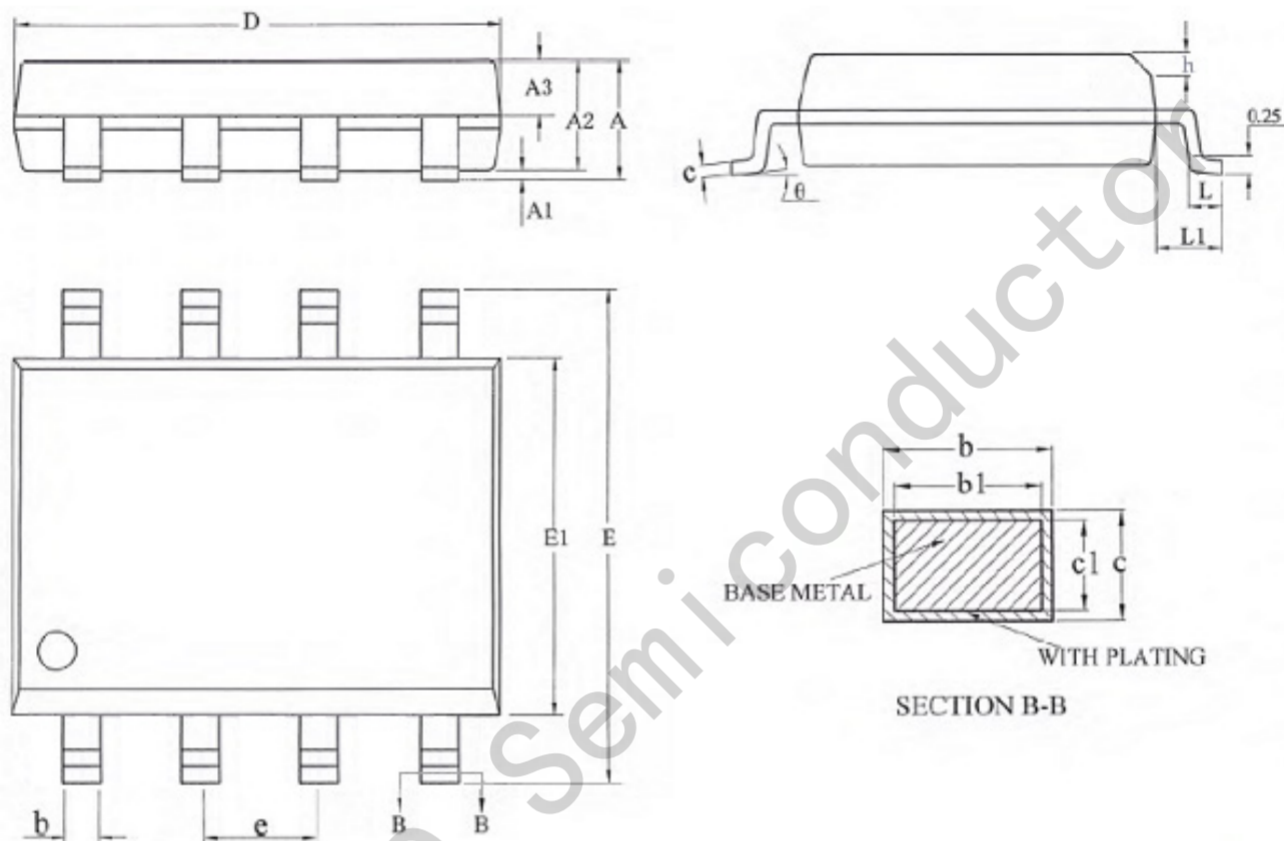


Figure 8-1 Typical application circuit of SDH21263TR

## SOIC-8 Package Outlines



## SOIC-8 Package Dimensions

Size Symbol	MIN(mm)	TYP(mm)	MAX(mm)	Size Symbol	MIN(mm)	TYP(mm)	MAX(mm)
A	-	-	1.75	D	4.70	4.90	5.10
A1	0.10	-	0.225	E	5.80	6.00	6.20
A2	1.30	1.40	1.50	E1	3.70	3.90	4.10
A3	0.60	0.65	0.70	e	1.27BSC		
b	0.39	-	0.48	h	0.25	-	0.50
b1	0.38	0.41	0.43	L	0.50		
c	0.21	-	0.26	L1	1.05BSC		
c1	0.19	0.20	0.21	$\theta$	0	-	8°