Dual Channel, 30V/10A Isolated Gate Driver

GENERAL DESCRIPTION

The SiLM8263/64/65 isolated driver family is an isolated dual channel gate driver with different configurations. The SiLM8263/64 are configured as high-side/low-side drivers, while the SiLM8265 are configured as dual drivers. It can provide 10A source and 10A sink peak output current. Programmable dead time (DT) feature is available in SiLM8263/64. Pulling high the DIS pin shuts down both outputs simultaneously, and allows for normal operation when the DIS pin is open or pulled low. As a fail-safe measure, primary-side logic failures force both outputs low.

The VDDA and VDDB supply voltage are up to 30 V. A wide input VDDI range from 3 V to 18 V makes the driver suitable for interfacing with both analog and digital controllers. All the supply voltage pins have under voltage lock-out (UVLO) protection.

The SiLM8263/64/65 has 2.5000V_{RMS} isolation with LGA5X5-13 package per UL1577.

High CMTI, low propagation delay, small size and flexible configuration make the SiLM8263/64/65 family is suitable for a wide range of isolated MOSFET/IGBT and SiC or GaN FET gate drive applications.

FEATURE

- 10A peak source current
- 10A peak sink current
- 60ns (Typ.) propagation delay
- 25ns (Max.) pulse width distortion
- 10ns (Max.) channel delay matching
- 150kV/us (Min.) common mode transient immunity (CMTI)
- Wide input voltage: 3V to 18V
- Up to 30V driver output voltage
- 5V reverse polarity voltage handling capability on input stage
- Operating temperature: –40°C to +125°C
- Safety certifications (Pending):
  - 2.5000V_{RMS} isolation for 1 minute per UL 1577 with LGA5X5-13 package
  - DIN V VDE 0884-11

APPLICATION

- AC/DC or DC/DC power supplies in server, telecom and industry
- DC/AC solar inverters
- EV battery charging

APPLICATION CIRCUIT

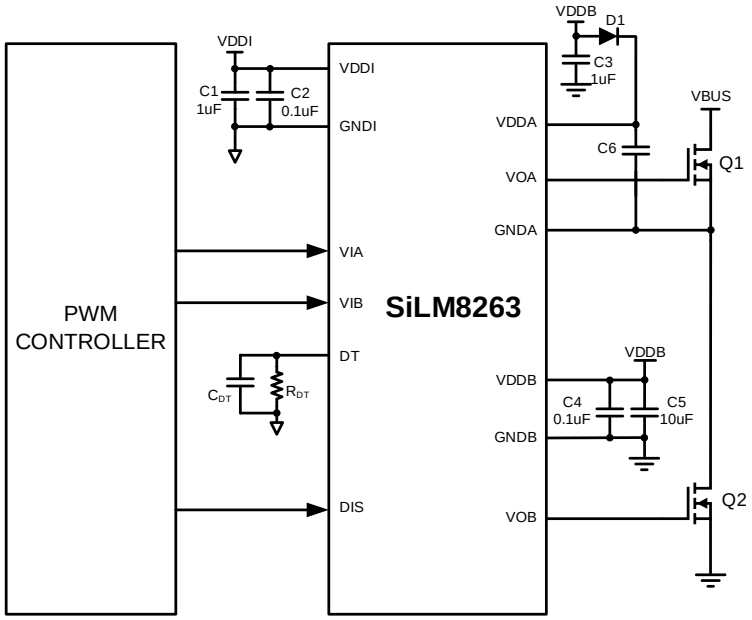

Figure 1. SiLM8263 Application Circuit

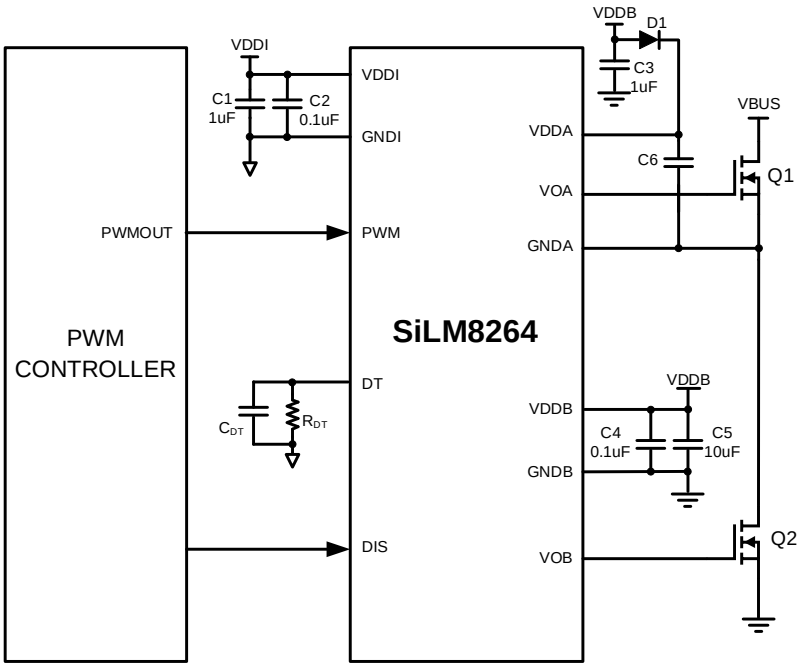

Figure 2. SiLM8264 Application Circuit

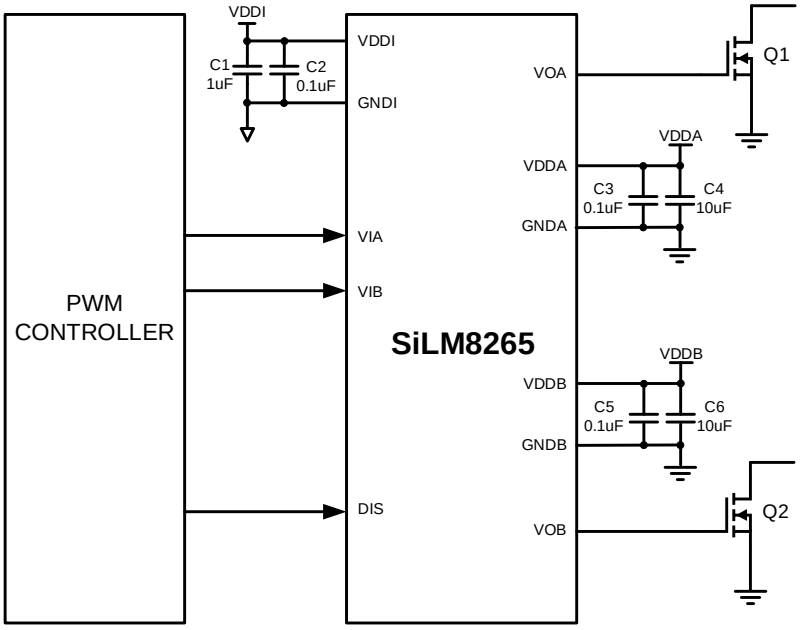

Figure 3. SiLM8265 Application Circuit

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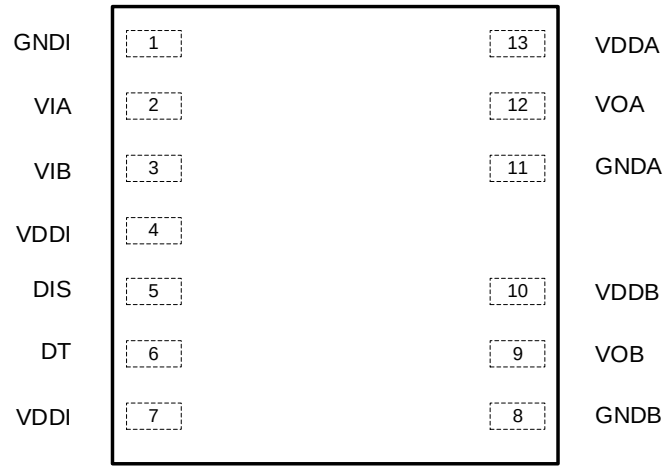
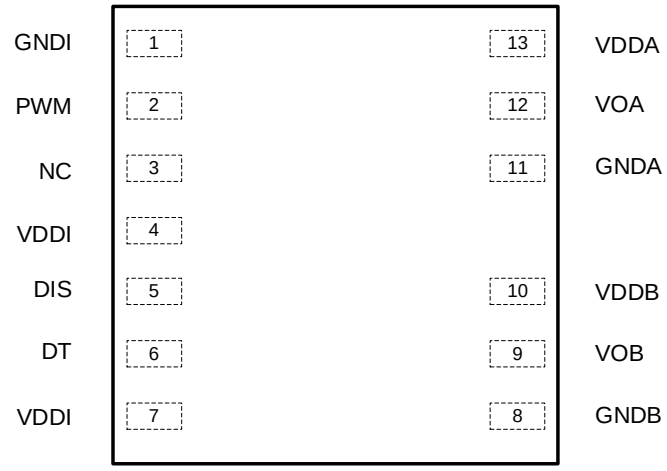
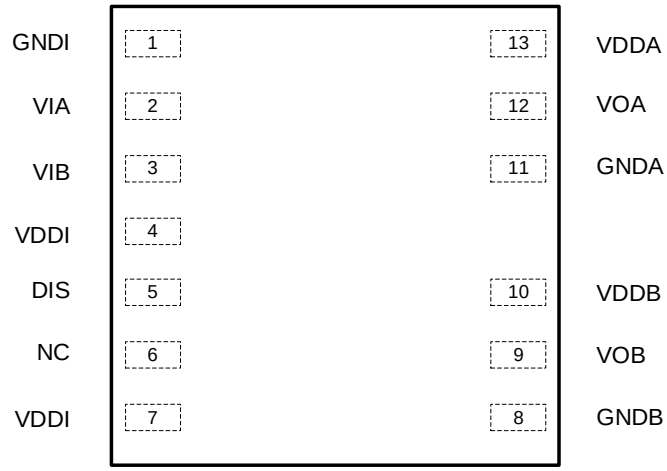
PIN CONFIGURATION

Part Number	Pin Configuration (Top View)
SiLM8263	
SiLM8264	
SiLM8265	

PIN DESCRIPTION

Table 1. SiLM8263 Pin Description

No.	Pin	Description
1	GNDI	Input power ground.
2	VIA	Input of driver A. The output of driver A is in phase with the input. This pin is pulled low internally if left open. Recommend to connect this pin to ground if not used for better noise immunity.
3	VIB	Input of driver B. The output of driver B is in phase with the input. This pin is pulled low internally if left open. Recommend to connect this pin to ground if not used for better noise immunity.
4	VDDI	Input power supply. A local low ESR and ESL capacitor should be connected between VDDI and GNDI.
5	DIS	Device disable input. When DIS pin is high, both driver is disabled and driver output is low. When DIS pin is low, it allows the device to perform in normal operation.
6	DT	Dead time programming input. Connect a resistor between DT and GNDI to program the dead time. A bypassing capacitor, 2.2nF or greater, is recommended to be put between DT and GNDI to achieve better noise immunity.
7	VDDI	Input power supply. This pin is internally connected to pin3.
8	GNDB	Power ground of driver B.
9	VOB	Output of driver B.
10	VDDB	Power supply of driver B. A local low ESR and ESL capacitor should be connected between VDDB and GNDB.
11	GNDA	Power ground of driver A.
12	VOA	Output of driver A.
13	VDDA	Power supply of driver A. A local low ESR and ESL capacitor should be connected between VDDA and GNDA.

Table 2. SiLM8264 Pin Description

No.	Pin	Description
1	GNDI	Input power ground.
2	PWM	PWM input. The output of driver A is in phase with PWM input and the output of driver B is out of phase with PWM input.
3	NC	No connection
4	VDDI	Input power supply. A local low ESR and ESL capacitor should be connected between VDDI and GNDI.
5	DIS	Device disable input. When DIS pin is high, both driver is disabled and driver output is low. When DIS pin is low, it allows the device to perform in normal operation.
6	DT	Dead time programming input. Connect a resistor between DT and GNDI to program the dead time. A bypassing capacitor, 2.2nF or greater, is recommended to be put between DT and GNDI to achieve better noise immunity.
7	VDDI	Input power supply. This pin is internally connected to pin3.
8	GNDB	Power ground of driver B.

No.	Pin	Description
9	VOB	Output of driver B.
10	VDDB	Power supply of driver B. A local low ESR and ESL capacitor should be connected between VDDB and GNDB.
11	GNDA	Power ground of driver A.
12	VOA	Output of driver A.
13	VDDA	Power supply of driver A. A local low ESR and ESL capacitor should be connected between VDDA and GNDA.

Table 3. SiLM8265 Pin Description

No.	Pin	Description
1	GNDI	Input power ground.
2	VIA	Input of driver A. The output of driver A is in phase with the input. This pin is pulled low internally if left open. Recommend to connect this pin to ground if not used for better noise immunity.
3	VIB	Input of driver B. The output of driver B is in phase with the input. This pin is pulled low internally if left open. Recommend to connect this pin to ground if not used for better noise immunity.
4	VDDI	Input power supply. A local low ESR and ESL capacitor should be connected between VDDI and GNDI.
5	DIS	Device disable input. When DIS pin is high, both driver is disabled and driver output is low. When DIS pin is low, it allows the device to perform in normal operation.
6	NC	No connection
7	VDDI	Input power supply. This pin is internally connected to pin3.
8	GNDB	Power ground of driver B.
9	VOB	Output of driver B.
10	VDDB	Power supply of driver B. A local low ESR and ESL capacitor should be connected between VDDB and GNDB.
11	GNDA	Power ground of driver A.
12	VOA	Output of driver A.
13	VDDA	Power supply of driver A. A local low ESR and ESL capacitor should be connected between VDDA and GNDA.

FUNCTIONAL BLOCK DIAGRAM

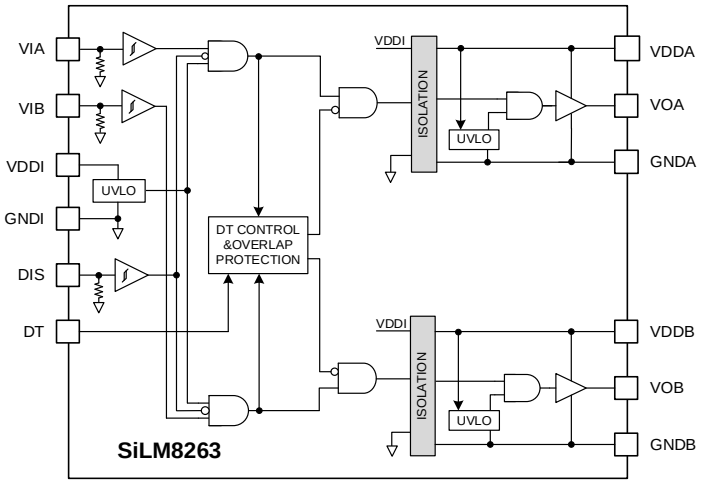


Figure 4. SiLM8263 Functional Block Diagram

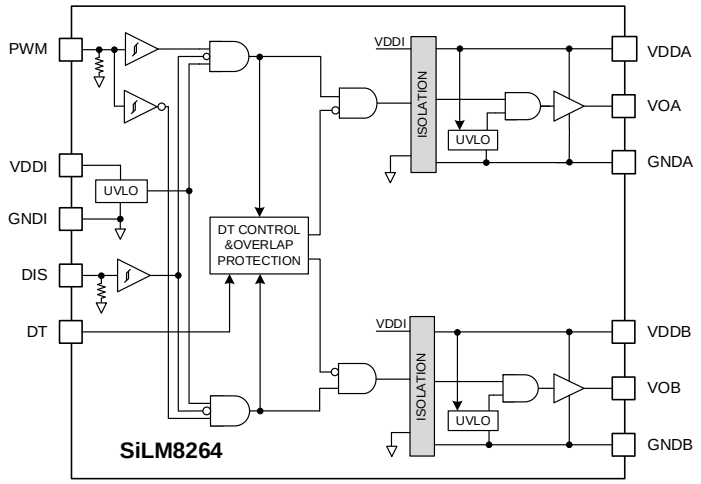


Figure 5. SiLM8264 Functional Block Diagram

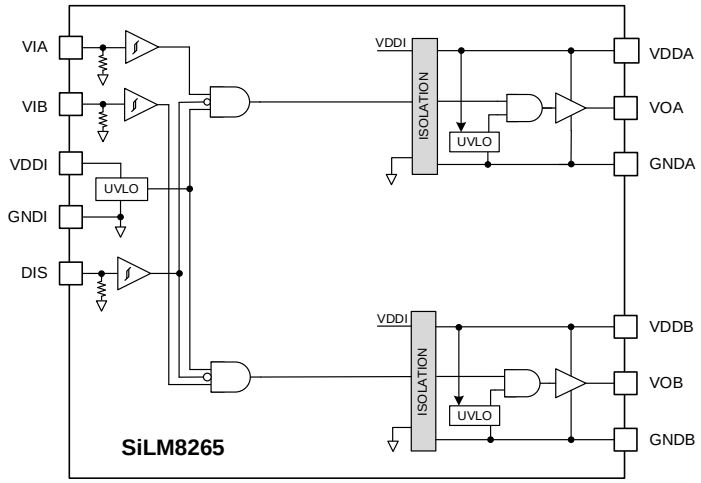


Figure 6. SiLM8265 Functional Block Diagram

ORDERING INFORMATION

Order Part No.	Package	QTY
SiLM8263GAHB-DG	LGA5X5-13, Pb-Free	5000/Reel
SiLM8263AAHB-DG	LGA5X5-13, Pb-Free	5000/Reel
SiLM8263BAHB-DG	LGA5X5-13, Pb-Free	5000/Reel
SiLM8263DAHB-DG	LGA5X5-13, Pb-Free	5000/Reel
SiLM8264GAHB-DG	LGA5X5-13, Pb-Free	5000/Reel
SiLM8264AAHB-DG	LGA5X5-13, Pb-Free	5000/Reel
SiLM8264BAHB-DG	LGA5X5-13, Pb-Free	5000/Reel
SiLM8264DAHB-DG	LGA5X5-13, Pb-Free	5000/Reel
SiLM8265GAHB-DG	LGA5X5-13, Pb-Free	5000/Reel
SiLM8265AAHB-DG	LGA5X5-13, Pb-Free	5000/Reel
SiLM8265BAHB-DG	LGA5X5-13, Pb-Free	5000/Reel
SiLM8265DAHB-DG	LGA5X5-13, Pb-Free	5000/Reel

FAMILY OVERVIEW

Part Number	Input Configuration	Output Configuration	Programmable Dead Time	Overlap Protection	Isolation Rating	UVLO
SiLM8263GA	VIA,VIB	HS/LS	Yes	Yes	2.5 kV_{RMS}	3.5V/3V
SiLM8263AA	VIA,VIB	HS/LS	Yes	Yes	2.5 kV_{RMS}	5.5V/5V
SiLM8263BA	VIA,VIB	HS/LS	Yes	Yes	2.5 kV_{RMS}	8.5V/7.5V
SiLM8263DA	VIA,VIB	HS/LS	Yes	Yes	2.5 kV_{RMS}	12.5V/11.5V
SiLM8264GA	PWM	HS/LS	Yes	Yes	2.5 kV_{RMS}	3.5V/3V
SiLM8264AA	PWM	HS/LS	Yes	Yes	2.5 kV_{RMS}	5.5V/5V
SiLM8264BA	PWM	HS/LS	Yes	Yes	2.5 kV_{RMS}	8.5V/7.5V
SiLM8264DA	PWM	HS/LS	Yes	Yes	2.5 kV_{RMS}	12.5V/11.5V
SiLM8265GA	VIA,VIB	Dual Driver	No	No	2.5 kV_{RMS}	3.5V/3V
SiLM8265AA	VIA,VIB	Dual Driver	No	No	2.5 kV_{RMS}	5.5V/5V
SiLM8265BA	VIA,VIB	Dual Driver	No	No	2.5 kV_{RMS}	8.5V/7.5V
SiLM8265DA	VIA,VIB	Dual Driver	No	No	2.5 kV_{RMS}	12.5V/11.5V

ABSOLUTE MAXIMUM RATINGS[1]

Symbol	Definition	Min	Max	Unit
V_{DDI}	Input Power Supply Voltage	-0.3	20	V
V_{IA},V_{IB}, V_{DIS},V_{PWM}	Input Signal Voltage	-7	20	V
V_{DDA}, V_{DDB}	Driver Power Supply	-0.3	35	V
V_{OUTA}	Driver Output Voltage	-0.3	V_{DDA}+0.3	V
V_{OUTB}		-0.3	V_{DDB}+0.3	V
V_{ch2ch}	Channel to Channel Voltage, GNDA to GNDB		700	V
T_J	Junction Temperature	-40	150	°C
T_S	Storage Temperature	-55	150	°C

RECOMMENDED OPERATION CONDITIONS[1]

Symbol	Definition	Min	Max	Unit
V_{DDI}	Input Power Supply Voltage	3	18	V
V_{IA},V_{IB}, V_{DIS},V_{PWM}	Input Signal Voltage	-5	18	V
V_{DDA}, V_{DDB}	Driver Power Supply for 3.5V UVLO	4	30	V
V_{DDA}, V_{DDB}	Driver Power Supply for 5.5V UVLO	6	30	V
V_{DDA}, V_{DDB}	Driver Power Supply for 8.5V UVLO	9.1	30	V
V_{DDA}, V_{DDB}	Driver Power Supply for 12.5V UVLO	13.6	30	V
R_{DT}	Resistance range on DT	5	220	kΩ
C_{DT}	Capacitance of C_{DT}		10	nF
T_J	Junction Temperature	-40	150	°C
T_A	Ambient Temperature	-40	125	°C

ESD RATINGS

Symbol	Definition	Value	Units
V_{ESD}	HBM	±4000	V
	CDM	±1500	

THERMAL INFORMATION

Symbol	Definition	Value	Unit
$R_{\theta JA}$	Junction to ambient thermal resistance	100	°C/W
$R_{\theta JC(TOP)}$	Junction to case (top) thermal resistance	40	°C/W

Note 1: V_{DDI}, V_{IA}, V_{IB}, V_{DIS}, V_{PWM} are reference to GNDI; V_{DDA}, V_{OUTA} are referenced to GNDA; V_{DDB}, V_{OUTB} are referenced to GNDB;

PACKAGE SPECIFICATIONS

Symbol	Definition	Min.	Typ.	Max.	Units
R_{IO}	Resistance (Input Side to Output Side)		10^{12}		Ω
C_{IO}	Capacitance (Input Side to Output Side)		1.8		pF

INSULATION SPECIFICATIONS

Symbol	Definition	Test Condition	Value	Units
CLR	External clearance	Shortest terminal to terminal distance through air	>3.5	mm
CPG	External creepage	Shortest terminal to terminal distance across the package surface	>3.5	mm
DTI	Distance through the insulation	Minimum internal gap	>16	um
CTI	Comparative tracking index	DIN EN 60112 (VDE 0303-11), IEC 60112	>600	V
	Material Group		I	
	Overvoltage category	Rated mains voltages ≤150Vrms	I-III	
		Rated mains voltages ≤300Vrms	I-II	
DIN V VDE 0884-11(1)				
V_{IORM}	Maximum repetitive peak isolation voltage		792	V_{PK}
V_{IOWM}	Maximum isolation working voltage		560	V_{RMS}
V_{IOTM}	Maximum transient isolation voltage	60s	3535	V_{PK}
V_{IOSM}	Maximum surge isolation voltage	Test method per IEC62368-1, 1.2/50us waveform, V_{TEST}=1.3 x V_{IOSM}	3500	V_{PK}
q_{pd}	Apparent charge	Method b2: $V_{pd(m)}$=1.5 X V_{IORM}, t_m=1 s	≤5	pC
	Climatic Category		40/125/21	
	Pollution Degree		2	
UL1577(1)				
V_{ISO}	Withstand Isolation Voltage	V_{TEST}=V_{ISO}, t=60s (qualification), V_{TEST}=1.2 x V_{ISO}, t=1s (100% production)	2500	V_{RMS}

Note 1: Certification pending

ELECTRICAL CHARACTERISTICS (DC)

V_{DDI} = 5 V, 0.1μF capacitor from VDDI to GNDI, V_{DDA} = V_{DDB} =15V, 1μF capacitor from VDDA and VDDB to GNDA and GNDB, T_A = –40°C to +125°C, unless otherwise specified.

Symbol	Parameter	Condition	Min	Typ	Max	Unit
Input Power Supply						
V_{DDI}	Input Supply Voltage		3		18	V
$V_{UVLO\_VDDI\_R}$	VDDI UVLO Rising		2.55	2.7	2.85	V
$V_{UVLO\_VDDI\_F}$	VDDI UVLO Falling		2.35	2.5	2.65	V
V_{UVLO_HYS}	VDDI UVLO Hysteresis			0.2		V
I_{VDDI}	Quiescent Current	V_{IA} = 0V, V_{IB} = 0V	1.4	2	2.6	mA
	Operation Current	C_{LOAD}=100pF, f_{sw}= 50kHz, (50% Duty Cycle), both channel		3.1		mA
Logic Interface						
V_{IH}	High Level Input Threshold Voltage at VIA, VIB, DIS and PWM			1.7		V
V_{IL}	Low Level Input Threshold Voltage at VIA, VIB, DIS and PWM			1.1		V
R_{PD}	Pull down Resistance on VIA,VIB,DIS and PWM		126	180	280	kΩ
Driver Power Supply						
$V_{UVLO\_VDDA\_R}$, $V_{UVLO\_VDDB\_R}$	VDDA, VDDB UVLO Rising	3.5V UVLO Version	3.2	3.5	3.8	V
		5.5V UVLO Version	5.1	5.5	5.9	V
		8.5V UVLO Version	8	8.5	9	V
		12.5V UVLO Version	11.5	12.5	13.5	V
$V_{UVLO\_VDDA\_F}$, $V_{UVLO\_VDDB\_F}$	VDDA, VDDB UVLO Falling	3.5V UVLO Version	2.7	3	3.3	V
		5.5V UVLO Version	4.6	5	5.4	V
		8.5V UVLO Version	7	7.5	8	V
		12.5V UVLO Version	10.5	11.5	12.5	V
$V_{UVLO\_VDDA\_HYS}$, $V_{UVLO\_VDDB\_HYS}$	VDDA, VDDB UVLO Hysteresis	3.5V UVLO Version		0.5		V
		5.5V UVLO Version		0.5		V
		8.5V UVLO Version		1		V
		12.5V UVLO Version		1		V
I_{VDDA}, I_{VDDB}	Quiescent Current	V_{IA} = 0V, V_{IB} = 0V		1.4	2.1	mA
	Operation Current	C_{LOAD}=1nF, f_{sw}= 50kHz, (50% Duty Cycle), each channel		2.7	3.5	mA

Symbol	Parameter	Condition	Min	Typ	Max	Unit
OUTPUT						
I_{OH}	Peak Source Current			10		A
I_{OL}	Peak Sink Current			10		A
V_{OH}	High Level Output Voltage	I_O=-20mA		8	15	mV
V_{OL}	Low Level Output Voltage	I_O=20mA		8	15	mV
Dead Time						
t_{DT}	Dead time	R_{DT}=20kΩ	160	200	240	ns

SWITCHING CHARACTERISTICS (AC)

V_{DDI} = 5 V, 0.1μF capacitor from VDDI to GNDI, V_{DDA} = V_{DDB} =15V, 1μF capacitor from VDDA and VDDB to GNDA and GNDB, T_A = –40°C to +125°C, unless otherwise specified.

Symbol	Parameter	Condition	Min	Typ	Max	Unit
Switching Characteristics						
t_{PLH}	Propagation Delay, Low to High	C_{LOAD}=1nF, f_{sw}=1kHz, (50% Duty Cycle)		60	90	ns
t_{PHL}	Propagation Delay, High to Low			60	90	ns
t_r	Turn on Rise Time				15	ns
t_f	Turn off Fall Time				15	ns
t_{PWD}	Pulse Width Distortion				25	ns
t_{DM}	Propagation Delay Matching between OUTA and OUTB				10	ns
$t_{UVLO\_REC\_VDDI}$	VDDI UVLO Recovery Delay			15		μs
$t_{UVLO\_REC\_VDDA/B}$	VDDA, VDDB UVLO Recovery Delay			20		μs
$CMTI_H$	High Level Static Common Mode Transient Immunity	V_{CM}=1000V, T_A=25°C	150	200		kV/μs
$CMTI_L$	Low Level Static Common Mode Transient Immunity	V_{CM}=1000V, T_A=25°C	150	200		kV/μs

PARAMETER MEASUREMENT INFORMATION

Propagation Delay and Pulse Width Distortion

Figure 7 shows the timing diagram of the propagation delay t_{PLH} and t_{PHL}, pulse distortion t_{PWD} and delay matching t_{DM} from the input V_{IA} and V_{IB}. Short the DT pin to VDDI to disable the dead time function.

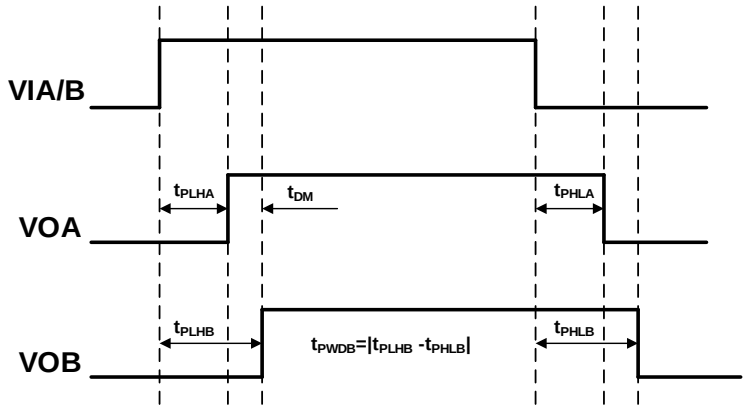


Figure 7. Propagation Delay and Pulse Width Distortion

Rise and Fall Time Testing

Figure 8 shows the criteria for measuring rise time (t_r) and fall time (t_f).

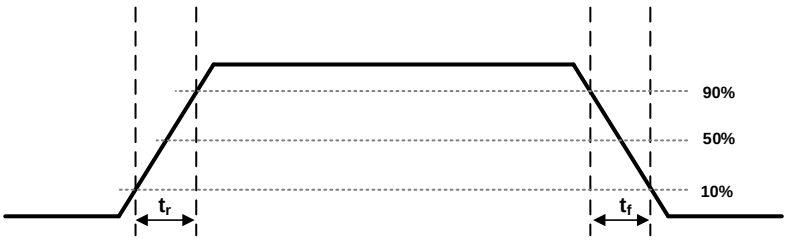


Figure 8. Turn On Rise Time and Turn Off Fall Time

CMTI Testing

Figure 9 is the simplified diagram of the CMTI testing. Common mode voltage is set to 1000V.

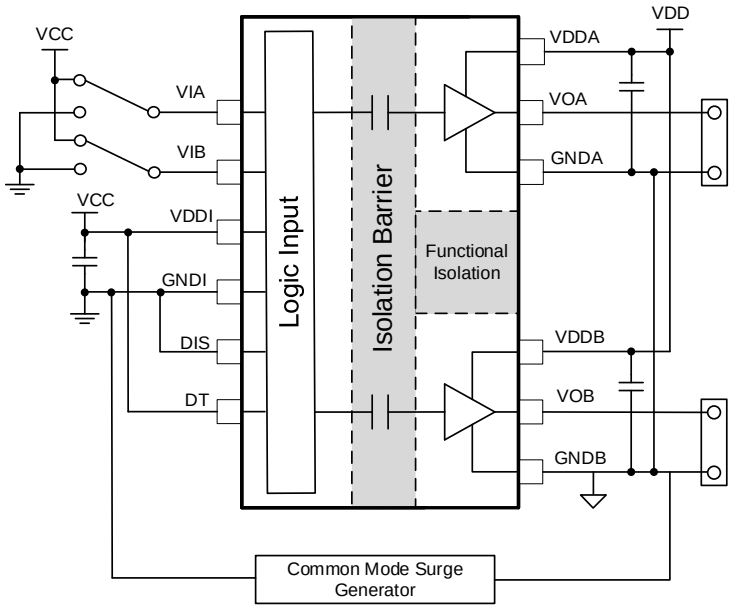


Figure 9. CMTI Test Circuit

FEATURE DESCRIPTION

SiLM8263/64/65 is a flexible dual channel isolated gate driver that can drive IGBTs and MOSFETs. It has 10A peak output current capability with maximum output driver supply voltage of 30V. SiLM8263/64/65 has many features that allow it to integrate well with control circuitry and protect the gates it drives such as: resistor programmable dead time control, an DIS pin, and under voltage lock out (UVLO) for both input and output voltages.

Under Voltage Lockout

The SiLM8263/64/65 has under voltage lock out (UVLO) protection feature on each driver power supply voltage between the VDDA (VDDB) and GNDA (GNDB) pins. When the VDDx voltage is lower than $V_{UVLO\_VDDX\_R}$, during device start up or lower than $V_{UVLO\_VDDX\_F}$, after start up, the VDDA (VDDB) UVLO feature holds the driver output low, regardless of the status of the input pins. A hysteresis on the UVLO feature prevents glitch when there is noise from the power supply.

The SiLM8263/64/65 also monitors the input power supply and there is an internal under voltage lock out protection feature on the VDDI. The driver outputs (VOA and VOB) are hold low when the voltage on the VDDI is lower than $V_{UVLO\_VDDI\_R}$ during start up or lower than $V_{UVLO\_VDDI\_F}$ after start up. There is a hysteresis on the VDDI UVLO feature to prevent glitch due the noise on the VDDI power supply.

Disable Input Function

When the DIS is pulled high, the VOA and VOB are pulled low regardless of the states of VIA and VIB. When the DIS pin is pulled low, the VOA and VOB are allowed for normal operation and controlled by the VIA and VIB.

The DIS input has no effect if VDDI is below its UVLO threshold and VOA, VOB remain low. There is an internal pull down resistor on the DIS pin.

Control Input and Output Logic

The VIA and VIB input control the corresponding output channel, VOA and VOB. A logic high signal on VIA (VIB) causes the output of VOA (VOB) to go high. And a logic low on VIA (VIB) causes the output of VOA (VOB) to go low.

For PWM input versions (SiLM8264), when the PWM input is high, the VOA is high and VOB is low. And when the PWM input is low, the VOA is low and VOB is high.

The Table 4 and Table 5 show the relationship between VIA,VIB, PWM, DIS, UVLO and Output of VOA and VOB.

Table 4. Relationship between Input and Output with VIA, VIB input

VIA	VIB	DIS	VDDI UVLO	VDDA UVLO	VDDB UVLO	VOA	VOB	Note
H	L	L	No	No	No	H	L	
L	H	L	No	No	No	L	H	
L	L	L	No	No	No	L	L	
H	H	L	No	No	No	H	H	Dual driver
						L	L	HS/LS
X	X	H	No	No	No	L	L	Device disabled
X	X	X	Yes	No	No	L	L	VDDI UVLO active
H	X	L	No	No	Yes	H	L	VDDB UVLO active
L	X	L	No	No	Yes	L	L	
X	H	L	No	Yes	No	L	H	VDDA UVLO active
X	L	L	No	Yes	No	L	L	

Table 5. Relationship between Input and Output with PWM input

PWM	DIS	VDDI UVLO	VDDA UVLO	VDDB UVLO	VOA	VOB	Note
H	L	No	No	No	H	L	
L	L	No	No	No	L	H	
X	H	No	No	No	L	L	Device disabled
X	X	Yes	No	No	L	L	VDDI UVLO active
H	L	No	No	Yes	H	L	VDDB UVLO active
L	L	No	No	Yes	L	L	
H	L	No	Yes	No	L	L	VDDA UVLO active
L	L	No	Yes	No	L	H	

Dead-time Program

For the high side/low side configuration driver, there is a dead-time between VOA and VOB. The dead-time delay (t_{DT}) is programmed by a resistor (R_{DT}) connected from the DT input to ground and it can be calculated with below equation.

$$t_{DT}[\text{ns}] \approx 10\times R_{DT}[\text{k}\Omega]$$

Here, t_{DT} is the dead-time delay, R_{DT} is the resistance value between DT and ground.

The DT pin can be connected to VDDI or left floating to provide a nominal dead time at approximately 400 ps.

A bypassing capacitor, 2.2nF or greater, is recommended to be put between DT and GNDI to achieve better noise immunity.

The Figure 10 shows the input and output logic with dead-time in different condition.

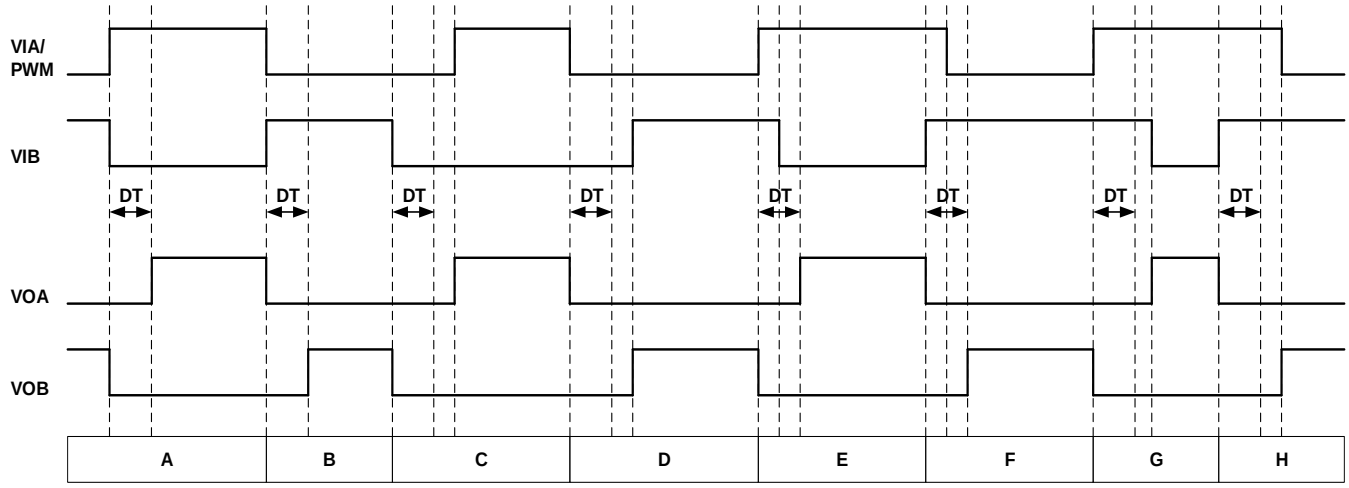


Figure 10. Input and output logic with dead-time

Condition A: VIA goes high and VIB goes low. VOB goes low immediately and VOA goes high after the programmed dead-time.

Condition B: VIA goes low and VIB goes high. VOA goes low immediately and VOB goes high after the programmed dead-time.

Condition C: VIB goes low and VIA still low. VOB goes low immediately. Since the VIA input dead-time is longer than the programmed dead-time, the VOA goes high immediately when the VIA input goes high.

Condition D: VIA goes low and VIB still low. VOA goes low immediately. Since the VIB input dead-time is longer than the programmed dead-time, the VOB goes high immediately when the VIB input goes high.

Condition E: VIA goes high while VIB and VOB are still high, the overlap time is shorter than the programmed dead-time. To avoid overshoot, VOB goes low immediately when the VIA goes high. The VOA goes high after the programmed dead-time.

Condition F: VIB goes high while VIA and VOA are still high, the overlap time is shorter than the programmed dead-time. To avoid overshoot, VOA goes low immediately when the VIB goes high. The VOB goes high after the programmed dead-time.

Condition G: VIA goes high while VIB and VOB are still high, the overlap time is longer than the programmed dead-time. To avoid overshoot, VOB goes low immediately when the VIA goes high. Since the overlap time is longer than the programmed dead-time, the VOA goes high immediately when the VIB goes low.

Condition H: VIB goes high while VIA and VOA are still high, the overlap time is longer than the programmed dead-time. To avoid overshoot, VOA goes low immediately when the VIB goes high. Since the overlap time is longer than the programmed dead-time, the VOB goes high when the VIA goes low.

APPLICATION INFORMATION

The circuit in Figure 11 shows the typical application circuit for SiLM8263/64/65 to driver a typical half bridge configuration which could be used in several popular power converter topologies such as synchronous buck, synchronous boost, half bridge, full bridge, LLC etc. topologies and 3-phase motor drive applications.

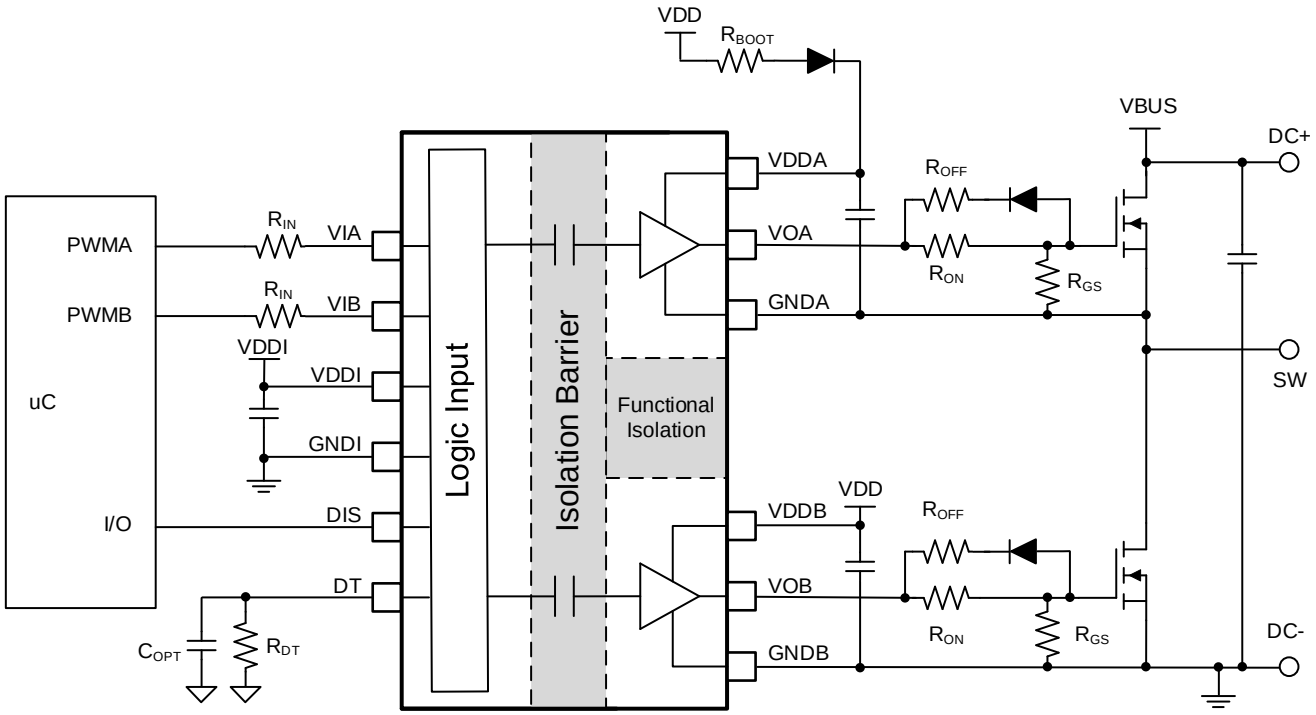
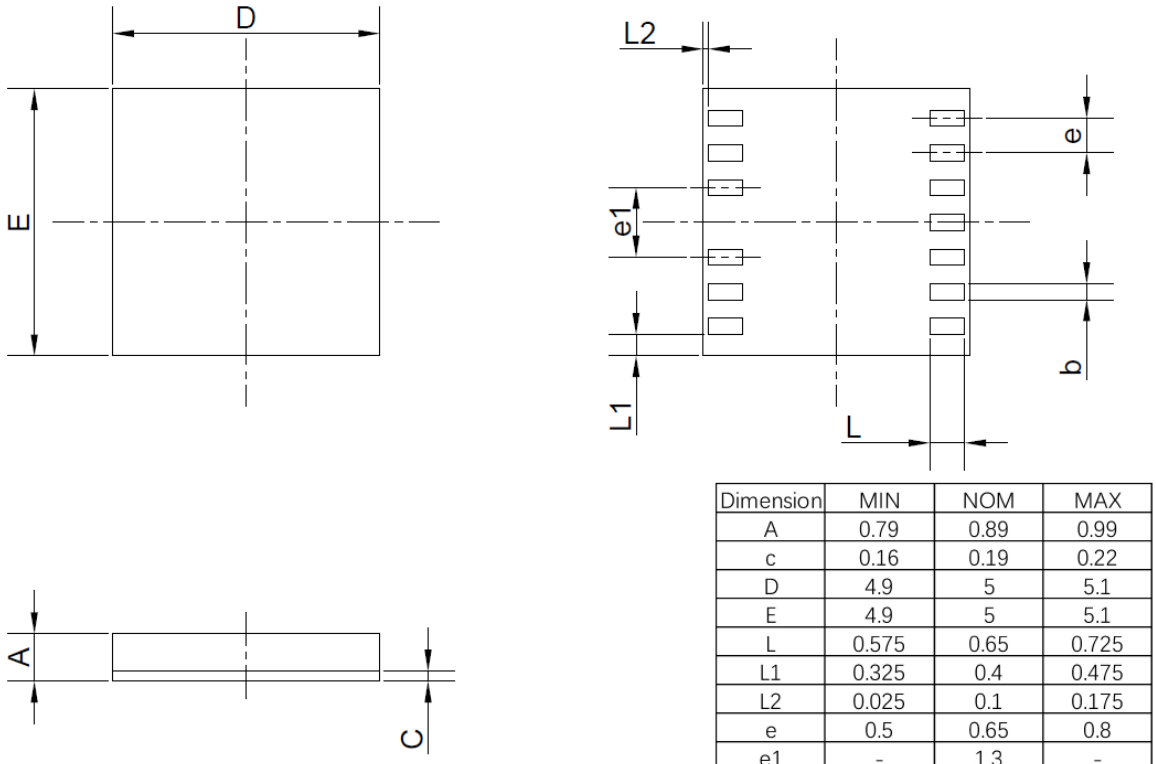


Figure 11. Typical Application Schematic

PACKAGE CASE OUTLINES



Dimension	MIN	NOM	MAX
A	0.79	0.89	0.99
c	0.16	0.19	0.22
D	4.9	5	5.1
E	4.9	5	5.1
L	0.575	0.65	0.725
L1	0.325	0.4	0.475
L2	0.025	0.1	0.175
e	0.5	0.65	0.8
e1	-	1.3	-
b	0.25	0.3	0.35
Unit : mm			

Figure 12. LGA5X5-13 Package Outline Dimensions

REVISION HISTORY

Note: page numbers for previous revisions may differ from page numbers in current version

Page or Item	Subjects (major changes since previous revision)
Rev 0.1 datasheet: 2023-05-15	
Whole document	Initial preliminary datasheet release
Rev 0.2 datasheet: 2023-06-05	
Whole document	Change the package name from LGA13 to LGA5x5-13