



Si9987

Vishay Siliconix

Buffered H-Bridge

FEATURES

- 1.0-A H-Bridge
- 500-kHz Switching Rate
- Shoot-Through Limited
- TTL Compatible Inputs
- 3.8- to 13.2-V Operating Range
- Surface Mount Packaging

APPLICATIONS

- VCM Driver
- Brushed Motor Driver
- Stepper Motor Driver
- Power Converter
- Optical Disk Drives
- Power Supplies
- High Performance Servo

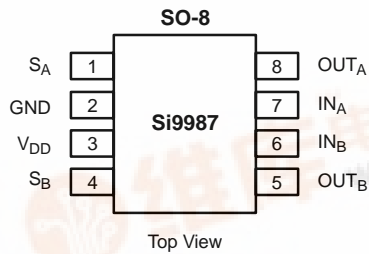
DESCRIPTION

The Si9987 is an integrated, buffered H-bridge with TTL compatible inputs and the capability of delivering a continuous 1.0 A @ $V_{DD} = 5.0\text{ V}$ (room temperature) at switching rates up to 500 kHz. Internal logic prevents the upper and lower outputs of either half-bridge from being turned on simultaneously. Unique input codes allow both outputs to be forced low (for braking) or

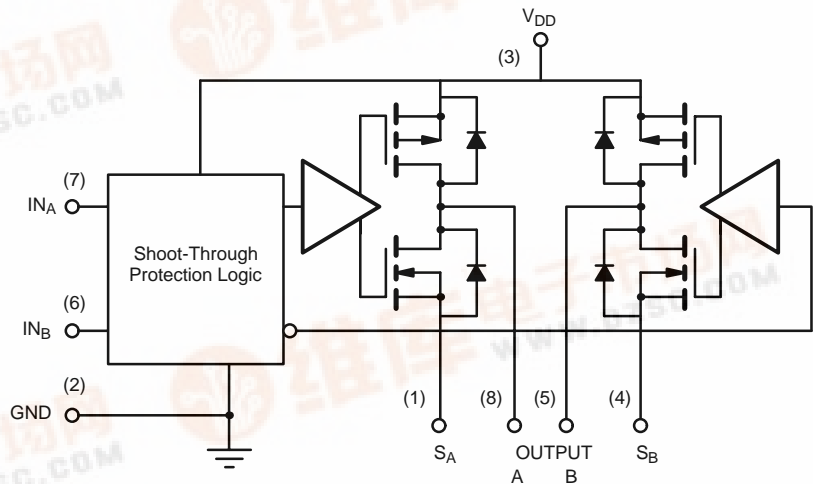
forced to a high impedance level.

The Si9987 is available in an 8-Pin SOIC package, specified to operate over a voltage range of 3.8 V to 13.2 V, and the commercial temperature range of 0 to 70°C (C suffix) and -40 to 85°C (D suffix).

FUNCTIONAL BLOCK DIAGRAM, PIN CONFIGURATION AND TRUTH TABLE



TRUTH TABLE			
IN _A	IN _B	OUT _A	OUT _B
1	0	1	0
0	1	0	1
0	0	0	0
1	1	HiZ	HiZ



ORDERING INFORMATION

Part Number	Temperature Range	Package
Si9987CY-T1	0 to 70°C	Tape and Reel
Si9987DY-T1	-40 to 85°C	
Si9987CY	0 to 70°C	Bulk (tubes)
Si9987DY	-40 to 85°C	



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ABSOLUTE MAXIMUM RATINGS^a

Voltage on any pin with respect to ground	−0.3 V to V _{DD} +0.3 V
Voltage on pins 5, 8 with respect to GND	−1 V to V _{DD} +1 V
Voltage on pins 1, 4	−0.3 V to GND +1 V
Maximum V _{DD}	15 V
Peak Output Current	1.5 A
Storage Temperature	−65 to 150°C
Maximum Junction Temperature (T _J)	150°C
Power Dissipation ^b	1 W
θ _{JA}	100°C/W

Continuous I _{OUT} Current (T _J = 135°C) ^c	
T _A = 25°C	± 1.02 A
T _A = 70°C	± 0.75 A
T _A = 85°C	± 0.65 A
Operating Temperature Range	
Si9987CY	0 to 70°C
Si9987DY	−40 to 85°C

- Notes
- Device mounted with all leads soldered or welded to PC board.
 - Derate 10 mW/°C above 25°C.
 - T_J = T_A + (P_D × θ_{JA}), P_D = Power Dissipation.

RECOMMENDED OPERATING RANGE

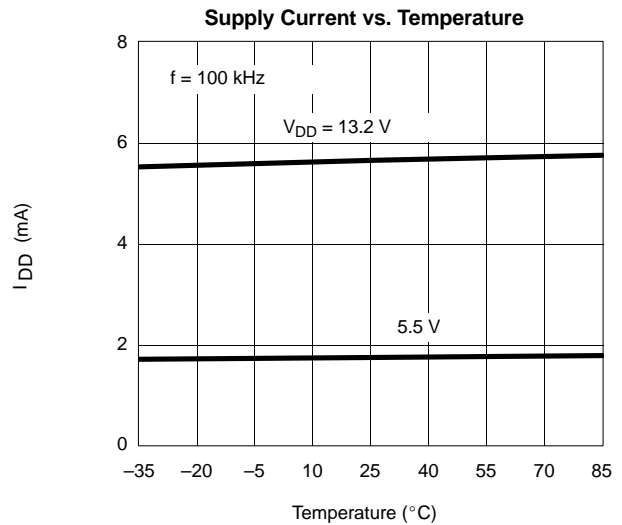
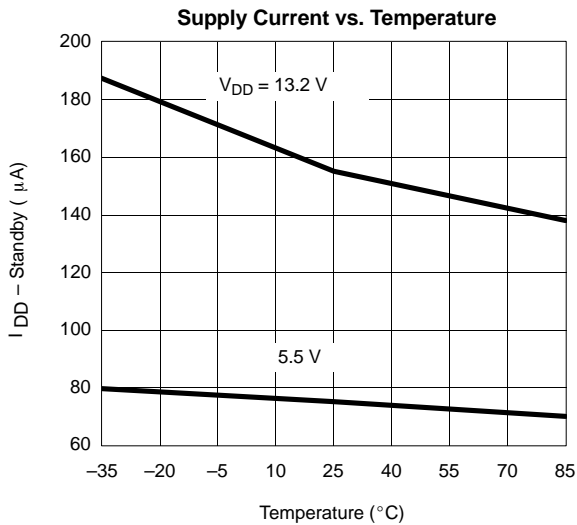
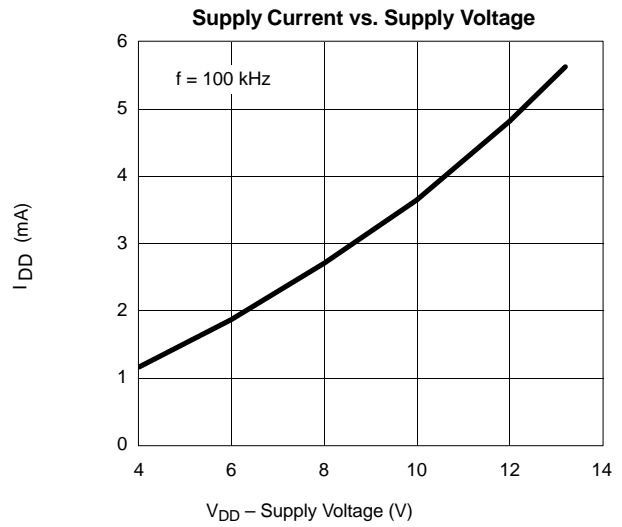
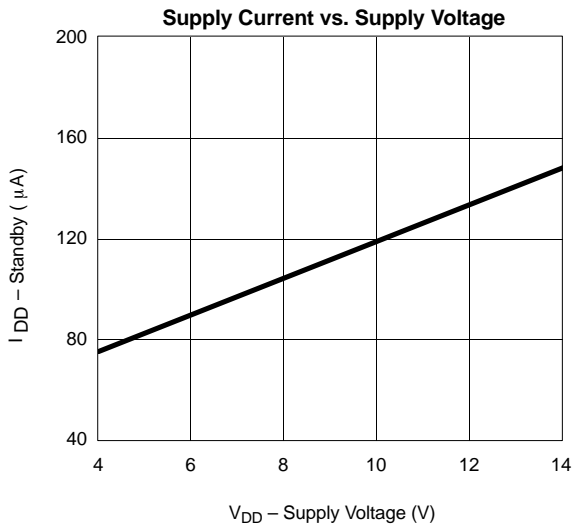
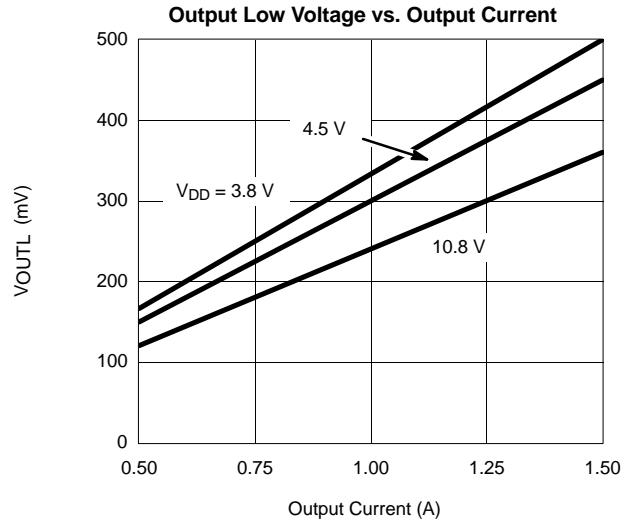
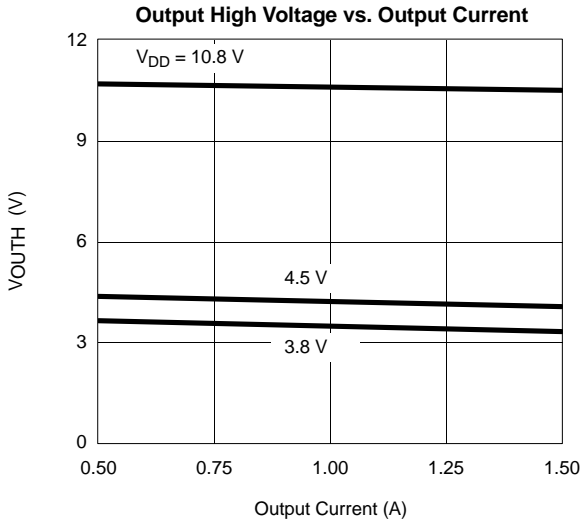
V _{DD}	3.8 V to 13.2 V
Maximum Junction Temperature (T _J)	135°C

SPECIFICATIONS							
Parameter	Symbol	Test Conditions Unless Specified V _{DD} = 3.8 to 13.2 V S _A @ GND, S _B @ GND		Limits			Unit
				Min ^a	Typ ^b	Max ^a	
Input							
Input Voltage High	V _{INH}		2				V
Input Voltage Low	V _{INL}				1		
Input Current with Input Voltage High	I _{INH}	V _{IN} = 2 V			1		μA
Input Current with Input Voltage Low	I _{INL}	V _{IN} = 0 V	−1				
Output							
Output Voltage High ^c	V _{OUTH}	I _{OUT} = −1 A	V _{DD} = 10.8 V	10.40	10.56		V
			V _{DD} = 4.5 V	4.00	4.20		
		I _{OUT} = −500 mA	V _{DD} = 10.8 V	10.60	10.68		
			V _{DD} = 4.5 V	4.25	4.35		
		I _{OUT} = −300 mA, V _{DD} = 3.8 V	3.63	3.70			
Output Voltage Low ^c	V _{OUTL}	I _{OUT} = 1 A	V _{DD} = 10.8 V		0.24	0.40	
			V _{DD} = 4.5 V		0.30	0.50	
		I _{OUT} = 500 mA	V _{DD} = 10.8 V		0.12	0.20	
			V _{DD} = 4.5 V		0.15	0.25	
		I _{OUT} = 300 mA, V _{DD} = 3.8 V		0.10	0.17		
Output Leakage Current Low	I _{OLL}	I _{NA} = I _{NB} ≥ 2 V, V _{OUT} = V _{DD} = 13.2 V		0	10		μA
Output Leakage Current High	I _{OLH}	V _{OUT} = 0, V _{DD} = 13.2 V	−10	0			
Output V Clamp High	V _{CLH}	I _{NA} = I _{NB} ≥ 2 V	I _{OUT} = 100 mA		V _{DD} +0.7	V _{DD} +0.9	V
Output V Clamp Low	V _{CLL}		I _{OUT} = −100 mA	−0.9	−0.7		
Supply							
V _{DD} Supply Current	I _{DD}	I _N = 100 kHz, V _{DD} = 5.5 V			1.8	2.5	mA
		I _{NA} = I _{NB} = 4.5 V, V _{DD} = 5.5 V			75	125	μA
Dynamic							
Propagation Delay Time	T _{PLH}	V _{DD} = 5 V			300		nS
	T _{PHL}				100		

- Notes
- The algebraic convention whereby the most negative value is a minimum and the most positive a maximum, is used in this data sheet.
 - Typical values are for DESIGN AID ONLY, not guaranteed nor subject to production testing.
 - Maximum value measured at T_J = 135°C. Typical value measured at T_J = T_A = 25°C (pulse width ≤ 300 μsec, duty cycle ≤ 2%).



TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)





TYPICAL CHARACTERISTICS (25 °C UNLESS NOTED)

