

Buffered H-Bridge

FEATURES

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

APPLICATIONS

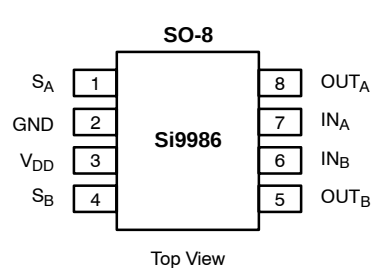
- VCM Driver
- Brushed Motor Driver
- Stepper Motor Driver
- Power Converter
- Optical Disk Drives
- Power Supplies
- High Performance Servo

DESCRIPTION

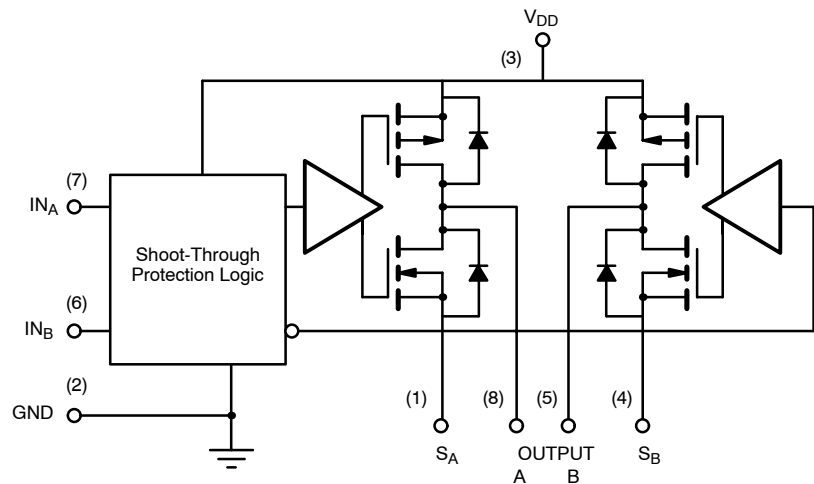
The Si9986 is an integrated, buffered H-bridge with TTL compatible inputs and the capability of delivering a continuous 1.0 A @ $V_{DD} = 12$ V (room temperature) at switching rates up to 200 kHz. Internal logic prevents the upper and lower outputs of either half-bridge from being turned on simultaneously. Unique input codes allow both outputs to be forced low (for braking) or forced to a high impedance level.

The Si9986 is available in both standard and lead (Pb)-free, 8-pin SOIC packages, 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 the industrial temperature range of -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
Si9986CY-T1	0 to 70°C	Tape and Reel
Si9986DY-T1	-40 to 85°C	
Si9986CY-T1—E3	0 to 70°C	Lead Free Tape and Reel
Si9986DY-T1—E3	-40 to 85°C	
Si9986CY	0 to 70°C	Bulk (tubes)
Si9986DY	-40 to 85°C	

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
Peak Output Current	1.5 A
Storage Temperature	−65 to 150°C
Maximum Junction Temperature (T_J)	150°C
Maximum V_{DD}	15 V

Power Dissipation ^b	1 W
θ_{JA}	100°C/W
Operating Temperature Range	
Si9986CY	0 to 70°C
Si9986DY	−40 to 85°C

Notes

- a. Device mounted with all leads soldered or welded to PC board.
b. Derate 10 mW/°C above 25°C.

RECOMMENDED OPERATING RANGE

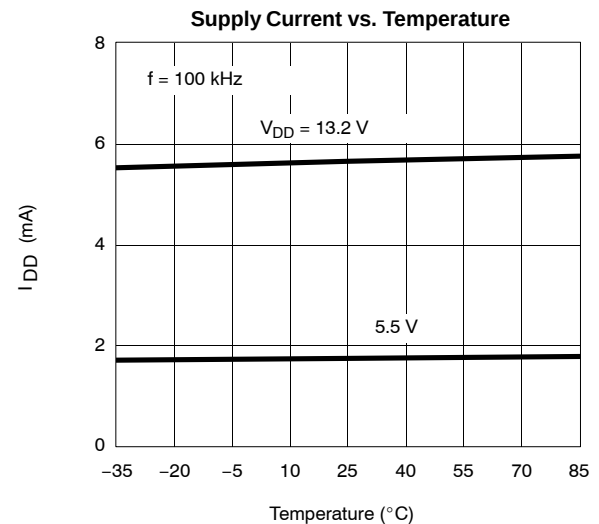
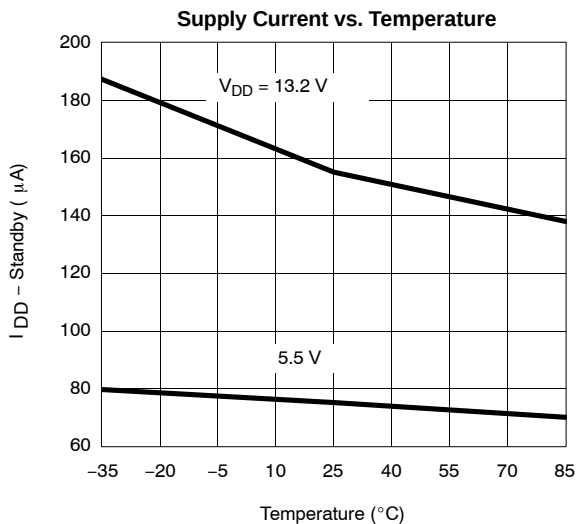
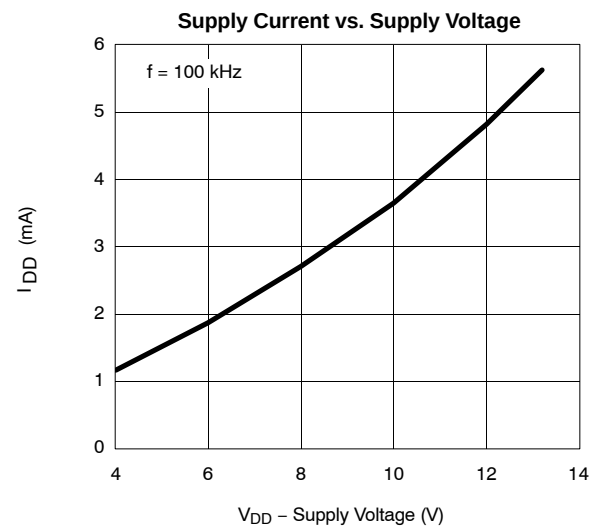
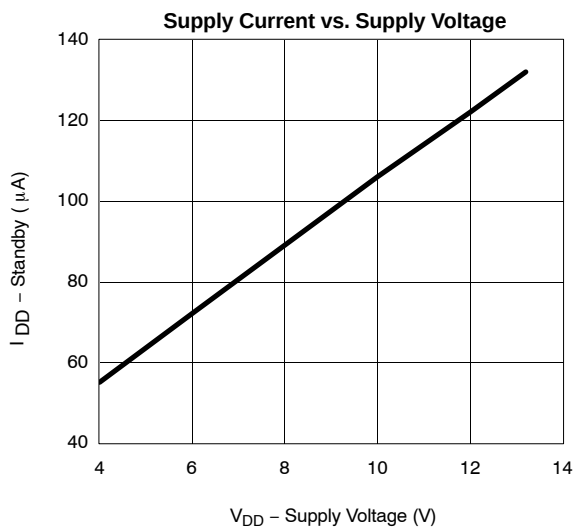
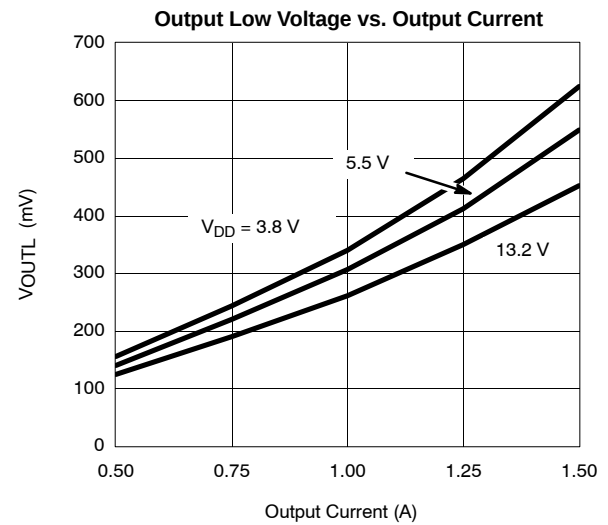
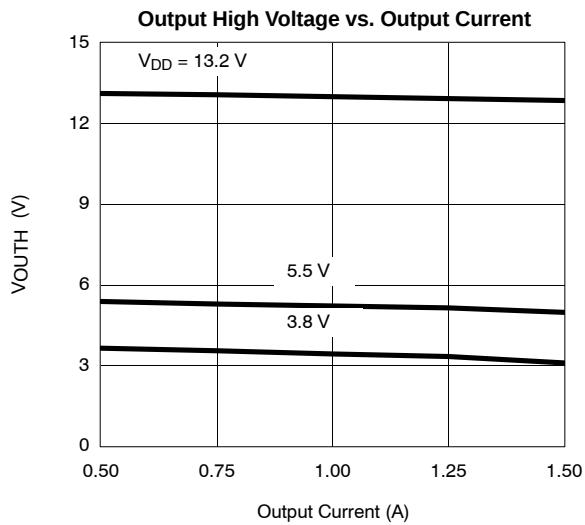
V_{DD}	3.8 V to 13.2 V
Maximum Junction Temperature (T_J)	125°C

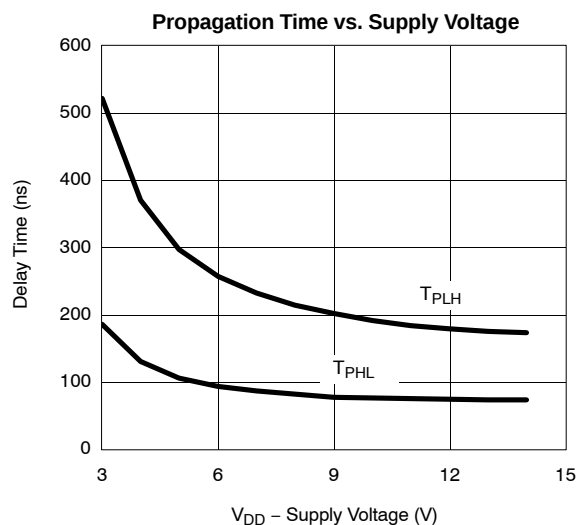
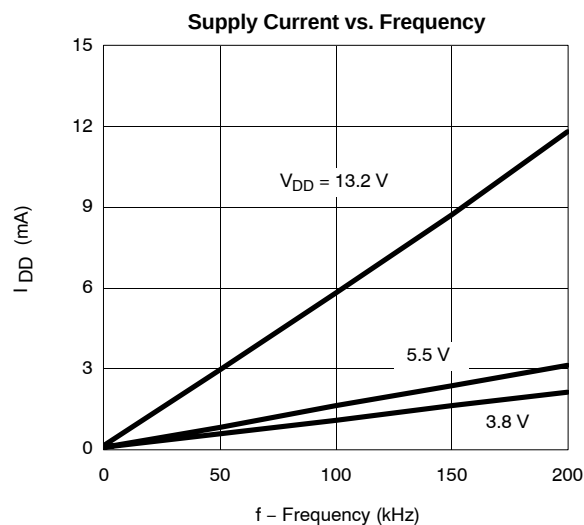
SPECIFICATIONS

Parameter	Symbol	Test Conditions Unless Otherwise Specified V _{DD} = 3.8 to 13.2 V S _A @ GND, S _B @ GND	Limits C Suffix, 0 to 70°C D Suffix, −40 to 85°C			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	V _{OUTH}	I _{OUT} = −500 mA	V _{DD} = 10.8 V	10.5	10.7	V	
			V _{DD} = 4.5 V	4.1	4.3		
		I _{OUT} = −300 mA, V _{DD} = 3.8 V		3.4	3.7		
Output Voltage Low	V _{OUTL}	I _{OUT} = 500 mA	V _{DD} = 10.8 V		0.2		0.3
			V _{DD} = 4.5 V		0.2		0.4
		I _{OUT} = 300 mA, V _{DD} = 3.8 V			0.1		0.4
Output Leakage Current High	I _{OLH}	I _{NA} = I _{NB} ≥ 2 V, V _{OUT} = V _{DD} = 13.2 V		−10	0	μA	
Output Leakage Current Low	I _{OLL}	V _{OUT} = 0, V _{DD} = 13.2 V			0		10
Output V Clamp High	V _{CLH}	I _{NA} = I _{NB} ≥ 2 V	I _{OUT} = 100 mA		V _{DD} +0.7	V	
Output V Clamp Low	V _{CLL}		I _{OUT} = −100 mA		−0.7		
Supply							
V _{DD} Supply Current	I _{DD}	I _N = 100 kHz, V _{DD} = 5 V			2	mA	
		I _{NA} = I _{NB} = 4.5 V, V _{DD} = 5.5 V				300	μA
Dynamic							
Propogation Delay Time	T _{PLH}	V _{DD} = 5 V			300	nS	
	T _{PHL}				100		

Notes

- a. The algebraic convention whereby the most negative value is a minimum and the most positive a maximum, is used in this data sheet.
b. Typical values are for DESIGN AID ONLY, not guaranteed nor subject to production testing.

**TYPICAL CHARACTERISTICS (25 °C UNLESS NOTED)**

TYPICAL CHARACTERISTICS (25 °C UNLESS NOTED)



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