

FAN8200/FAN8200D/FAN8200MTC FAN8200MP

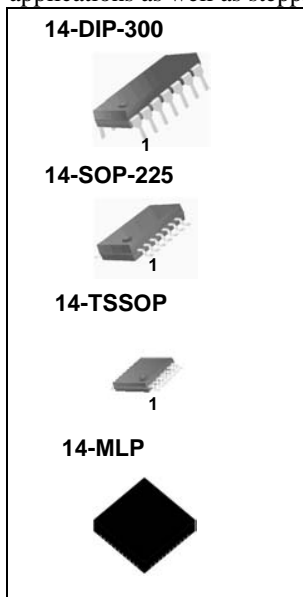
Low Voltage/Low Saturation Stepping Motor Driver

Features

- 3.3V and 5V MPU interface
- Dual H-bridge drivers for bipolar stepping motor drives
- Built-in vertical-PNP power transistors
- Wide supply voltage range ($V_{CC} = 2.5V \sim 7.0V$)
- Low saturation voltage ($0.4V @ 0.4A$)
- Built-in chip enable function for each bridge
- Built-in shoot-through current protection
- Built-in thermal shutdown(TSD) function

Description

The FAN8200/FAN8200D/FAN8200MTC/FAN8200MP is a monolithic integrated circuit designed for two-phase stepping motor drive systems. It has dual H-bridge drivers with vertical-PNP power transistors. Each of the bridges has an independant enable pin, therefore it can be used for other applications as well as stepping motor drive systems.



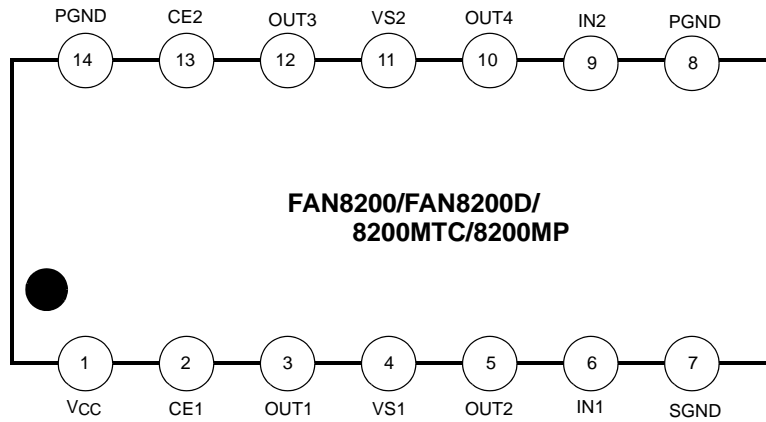
Typical Application

- General low voltage stepping motor driver
- Floppy disk driver
- Camera stepping motor driver
- PC camera or security equipment motion controller
- Two channel DC motor driver for a digital still camera (DSC)
- MPU interfaced general power driver (buffer)

Ordering Information

Device	Package	Operating Temp.
FAN8200	14-DIP-300	-20 ~ +75°C
FAN8200D	14-SOP-225	-20 ~ +75°C
FAN8200DTF	14-SOP-225	-20 ~ +75°C
FAN8200MTC	14-TSSOP	-20 ~ +75°C
FAN8200MTCX	14-TSSOP	-20 ~ +75°C
FAN8200MPX	14-MLP	-30 ~ +80°C

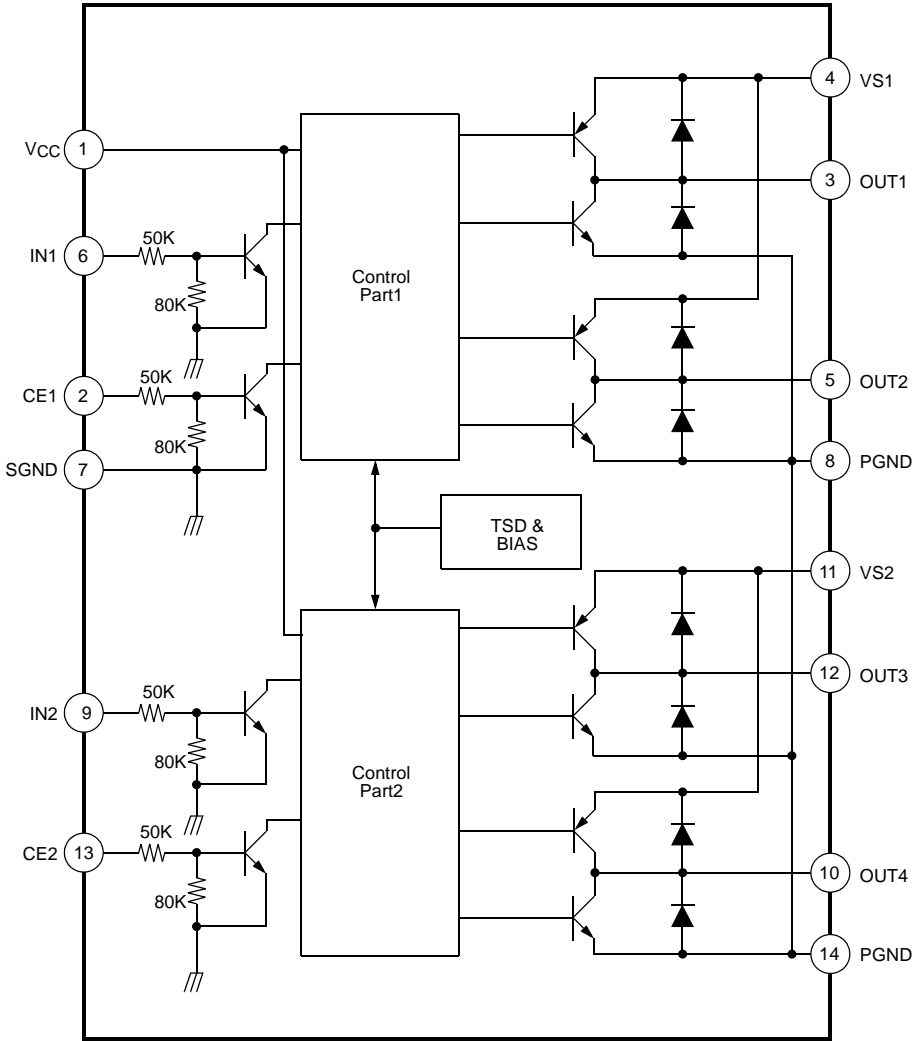
Pin Assignments



Pin Definitions

Pin Number	Pin Name	I/O	Pin Function Description
1	VCC	-	Logic part supply voltage
2	CE1	I	Chip enable 1
3	OUT1	O	Output 1
4	VS1	-	Power supply 1
5	OUT2	O	Output 2
6	IN1	I	Input 1
7	SGND	-	Signal ground
8	PGND	-	Power ground
9	IN2	I	Input 2
10	OUT4	O	Output 4
11	VS2	-	Power supply 2
12	OUT3	O	Output 3
13	CE2	I	Chip enable 2
14	PGND	-	Power ground

Internal Block Diagram



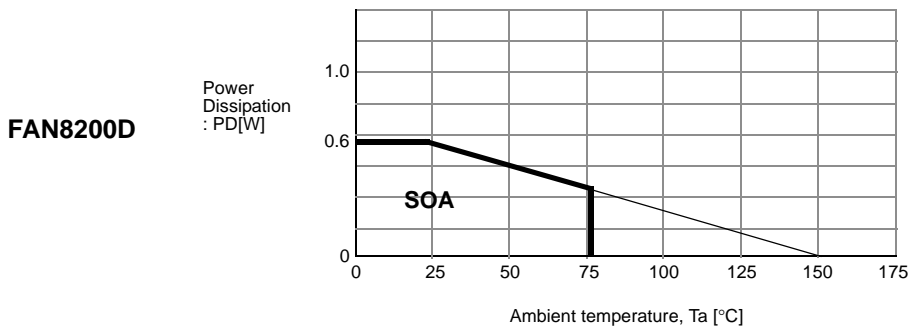
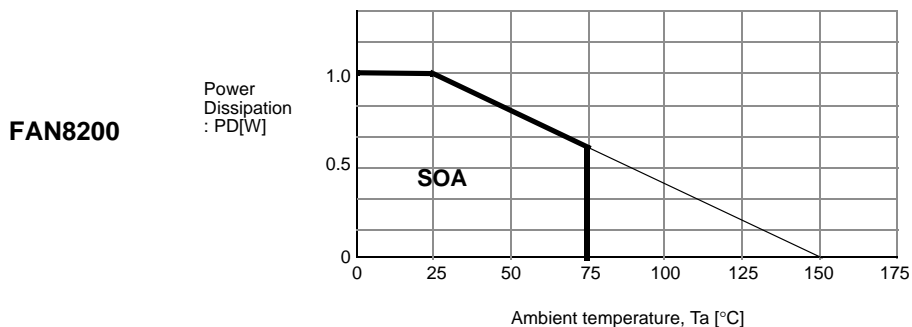
Absolute Maximum Ratings (Ta = 25°C)

Parameter	Symbol	Value	Unit
Supply voltage	V _{CC} (MAX)	9.0	V
Power supply voltage	V _S (MAX)	9.0	V
Output voltage	V _{OUT} (MAX)	V _S + V _{CF}	V
Input voltage	V _{IN} (MAX)	7.0	V
Peak output current per channel	I _O (PEAK)	1	A
Continuous output current per channel	I _O	0.65 (FAN8200) 0.4 (FAN8200D) 0.55 (FAN8200MTC) 0.35 (FAN8200MP)	A
Power dissipation	P _D ^{note}	1.0 (FAN8200) 0.6 (FAN8200D) 0.87 (FAN8200MTC) 0.8 (FAN8200MP)	W
Junction temperature	T _J	150	°C
Storage temperature	T _{STG}	-40 ~ 125	°C
Operating temperature	T _A	-20 ~ 75(FAN8200) -20 ~ 75(FAN8200D) -20 ~ 75(FAN8200MTC) -30 ~ 80(FAN8200MP)	°C

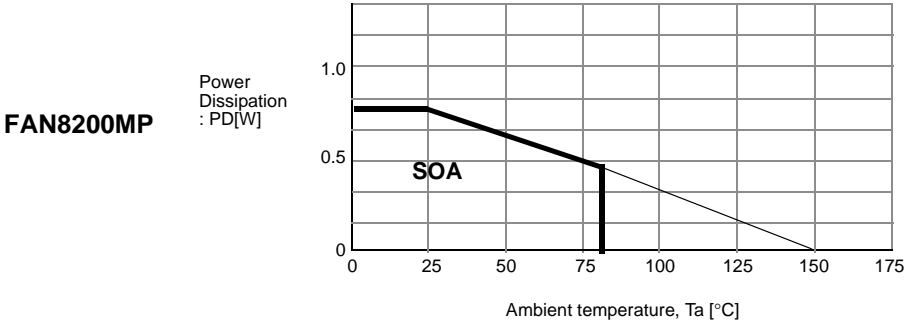
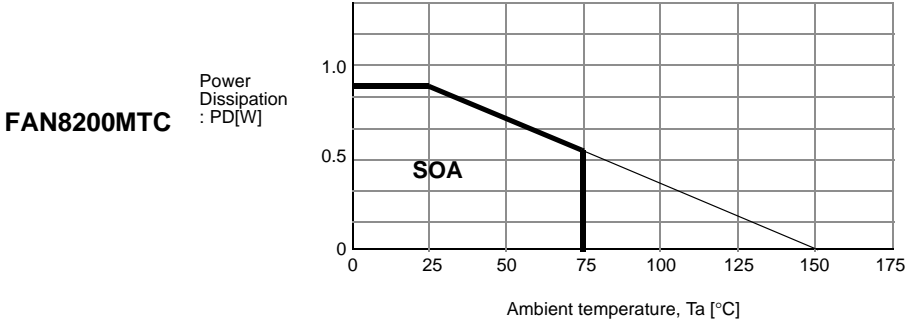
Notes:

- When mounted on 76.2mm × 114mm × 1.57mm PCB (glass epoxy material).
- Power dissipation reduces 8.0mW/°C for FAN8200, 4.8mW/°C for FAN8200D, 6.9mW/°C for FAN8200MTC and 6.4mW/°C FAN8200MP for Ta ≥ 25°C.
- Should not exceed PD and SOA(Safe Operating Area).

Power Dissipation Curve



Power Dissipation Curve (Continued)



Recommended Operating Conditions (Ta = 25°C)

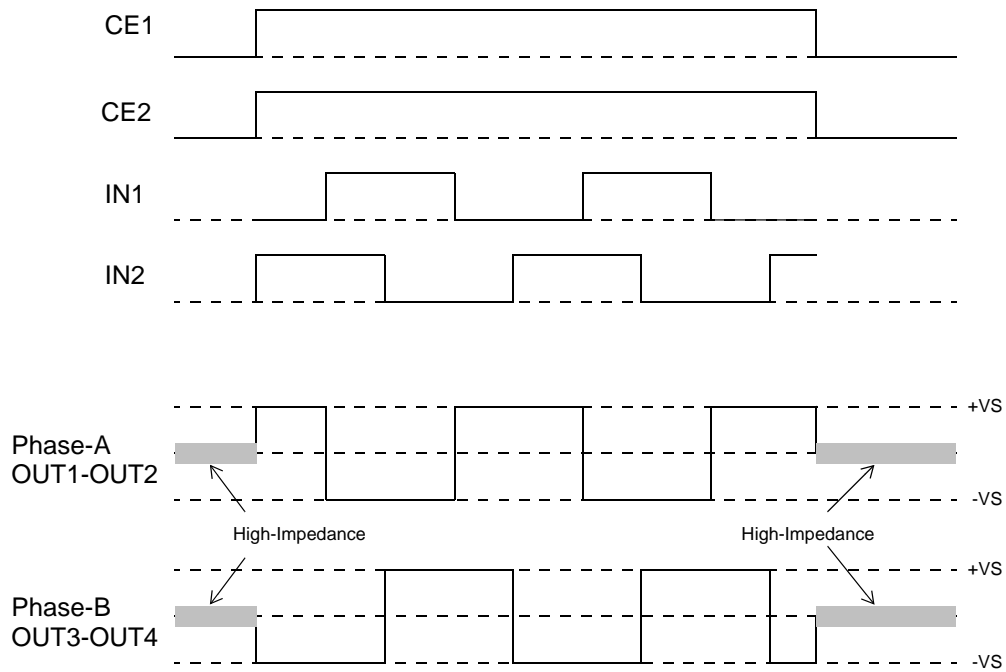
Parameter	Symbol	Min.	Typ.	Max	Unit
Logic circuit supply voltage	VCC	2.5	-	7.0	V
Power supply voltage	VS	2.5	-	7.0	V

Function Descriptions

CE1	IN1	OUT1	OUT2	CE2	IN2	OUT3	OUT4
Low	X	Z	Z	Low	X	Z	Z
High	Low	High	Low	High	Low	High	Low
High	High	Low	High	High	High	Low	High

X: don't care

Z: high-impedance



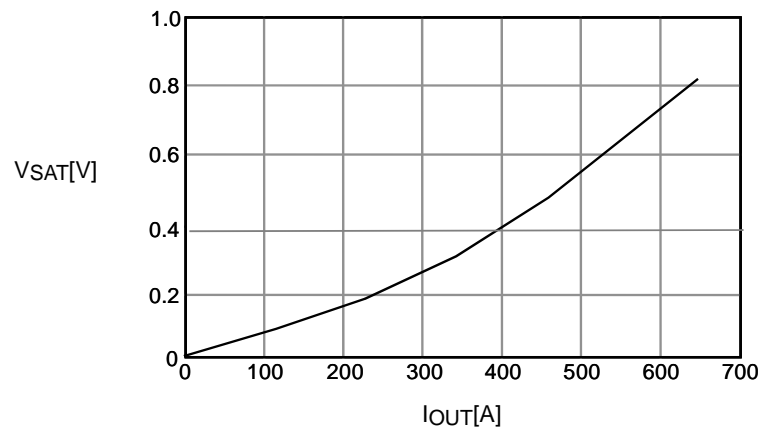
Electrical Characteristics

($T_a=25^{\circ}\text{C}$, $V_{CC}=5\text{V}$, $V_{S1}=3\text{V}$, $V_{S2}=3\text{V}$, unless otherwise specified)

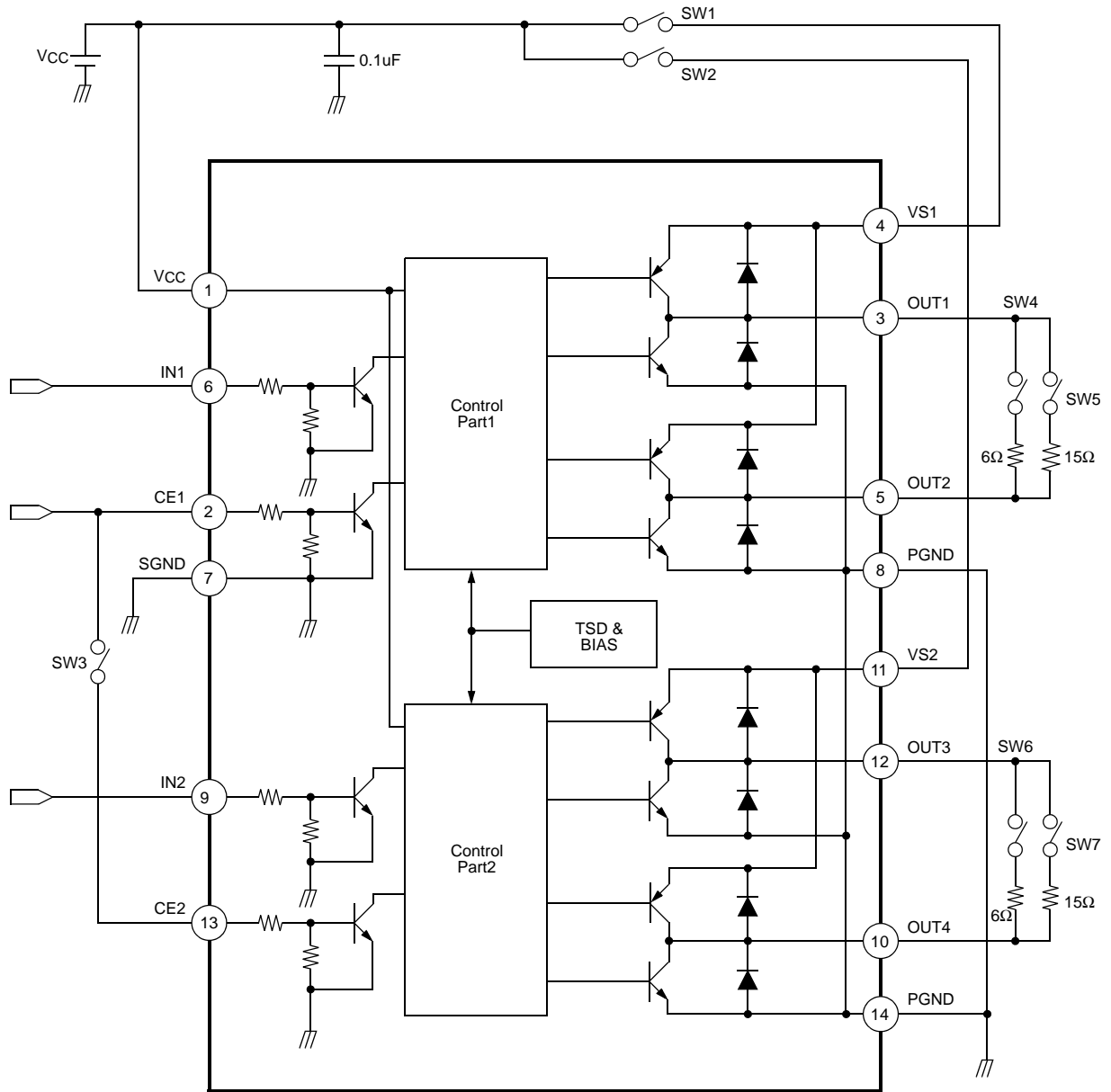
Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Supply current 1	I_{CC1}	$CE1, 2=0\text{V}$	-	0.1	10	μA
Supply current 2	I_{CC2}	$CE1=3\text{V}, CE2=0\text{V}$ or $CE1=0\text{V}, CE2=3\text{V}$	-	12	18	mA
Saturation voltage 1 (upper + lower total)	V_{SAT1}	$CE1=3\text{V}, IN1=3\text{V}$ or $0\text{V}, I_{OUT}=0.2\text{A}$	-	0.2	0.3	V
Saturation voltage 2 (upper + lower total)	V_{SAT2}	$CE1=3\text{V}, IN1=3\text{V}$ or $0\text{V}, I_{OUT}=0.4\text{A}$	-	0.4	0.6	V
Input high level voltage	V_{INH}	-	1.8	-	V_{CC}	V
Input low level voltage	V_{INL}	-	-0.3	-	0.7	V
Input current	I_{IN}	$IN=3\text{V}$, Each pin	-	100	200	μA
Chip enable current	I_{CE}	$CE=3\text{V}$, Each pin	-	100	200	μA
Clamp diode leakage current	I_{LEAK}	$V_{CC}=7\text{V}, V_S=7\text{V}$	-	-	30	μA
Clamp diode voltage	V_{CF}	$I_{OUT}=0.4\text{A}$	-	-	1.7	V

Typical Performance Characteristics

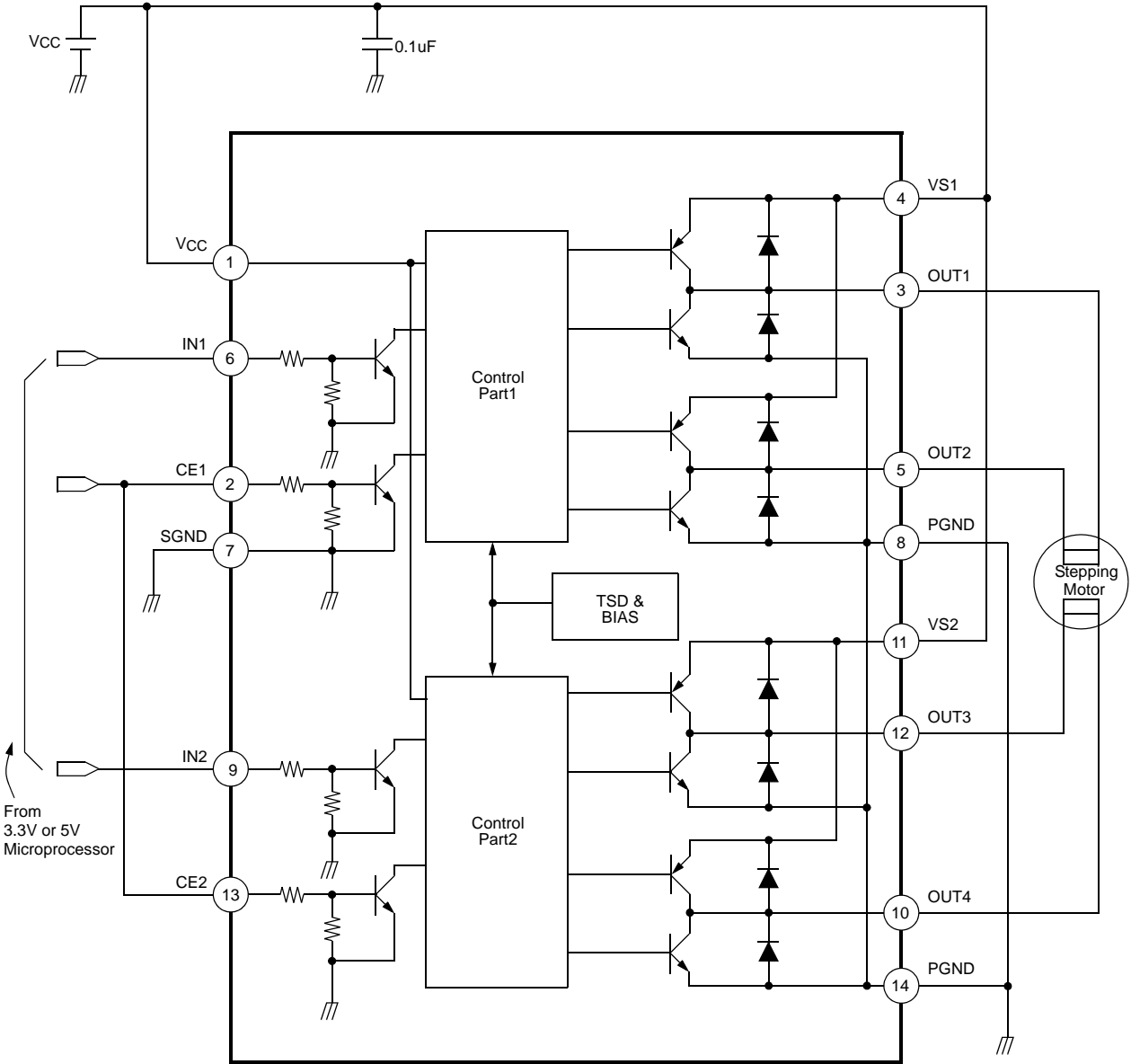
V_{SAT} vs. I_{OUT} Characteristics Graph



Test Circuits

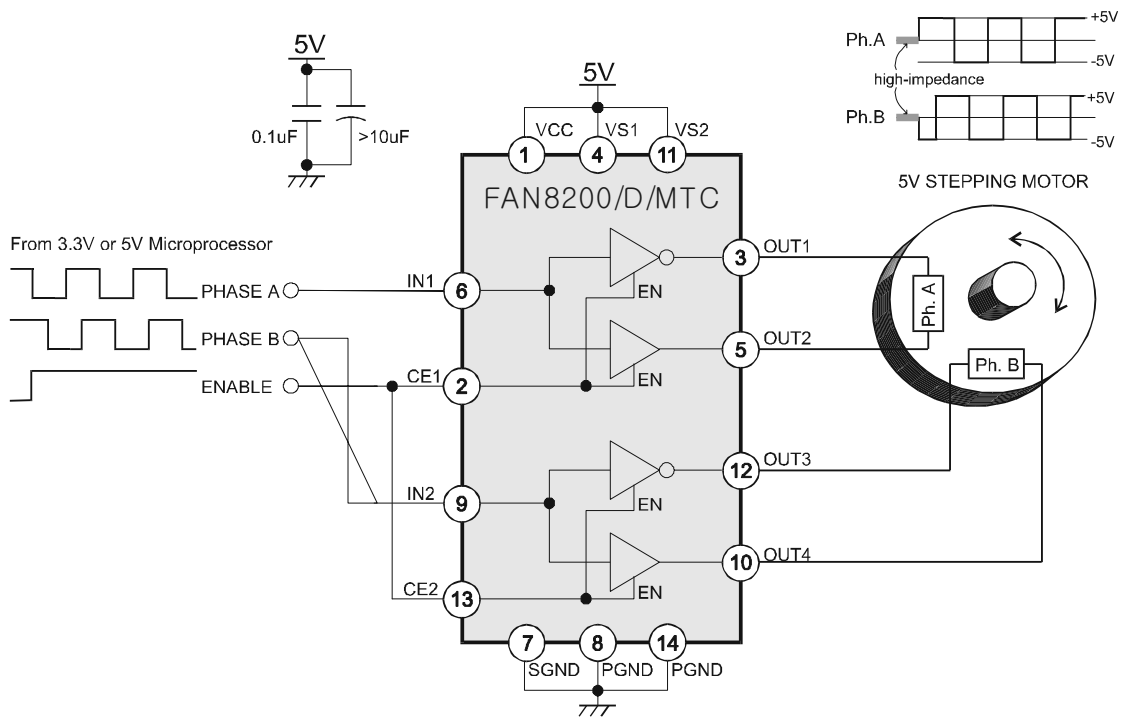


Typical Application Circuit



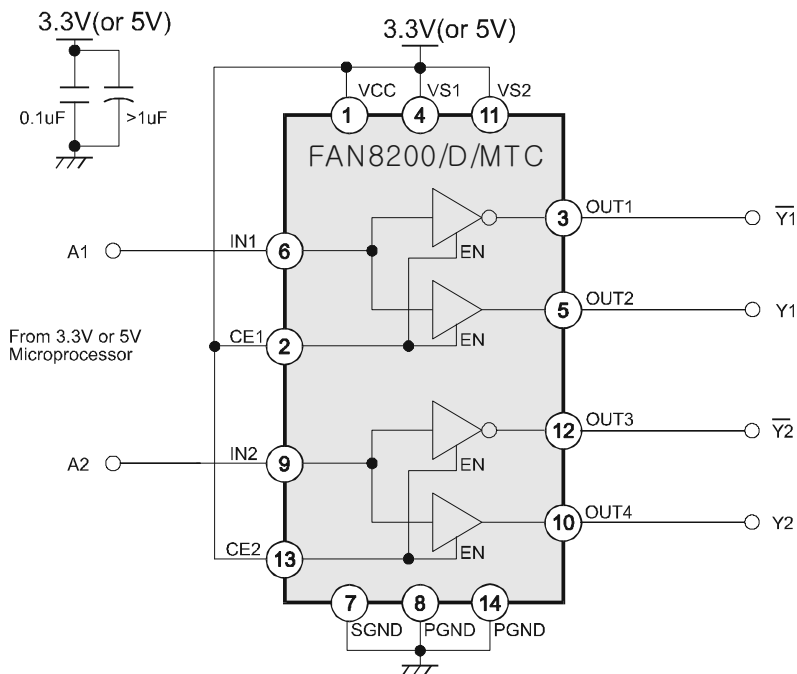
Application Example - Full Step Bipolar Drive

Circuit Schematics



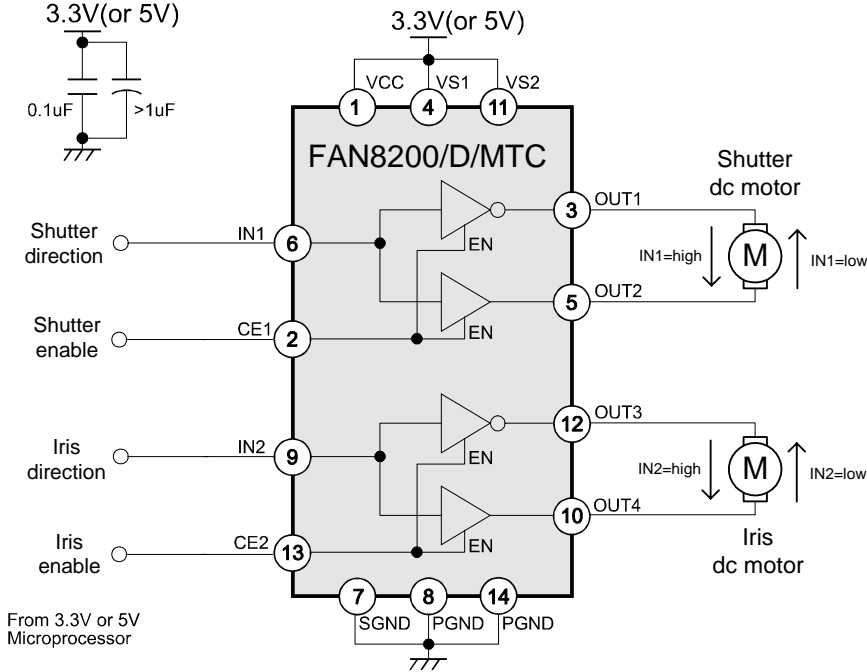
Application Example - Large Current Buffer

Circuit Schematics



Application Example - 2-Ch. dc Motor Driver for a Digital Still Camera(DSC)

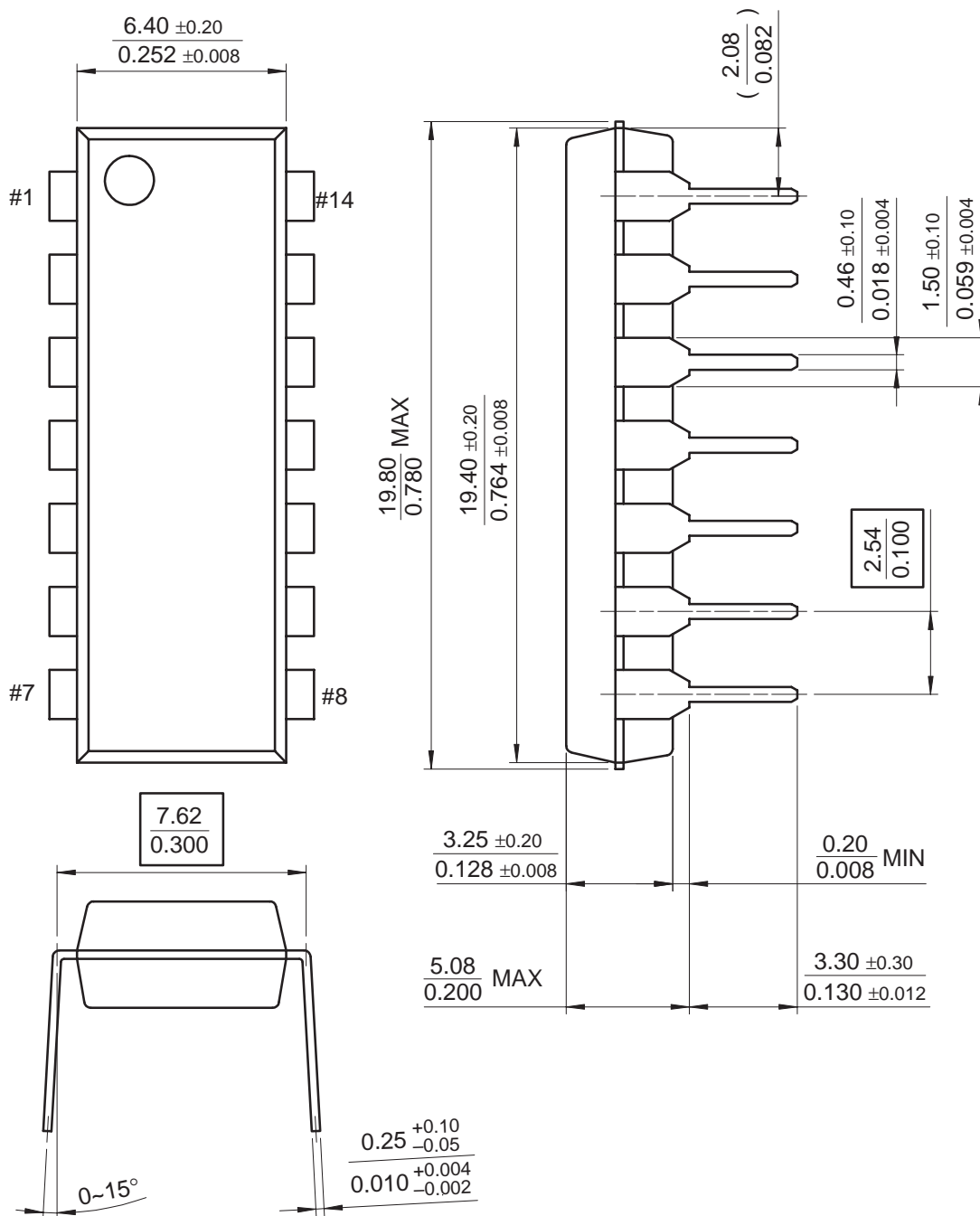
Circuit Schematics



Mechanical Dimensions (Unit: mm)

Package Dimensions

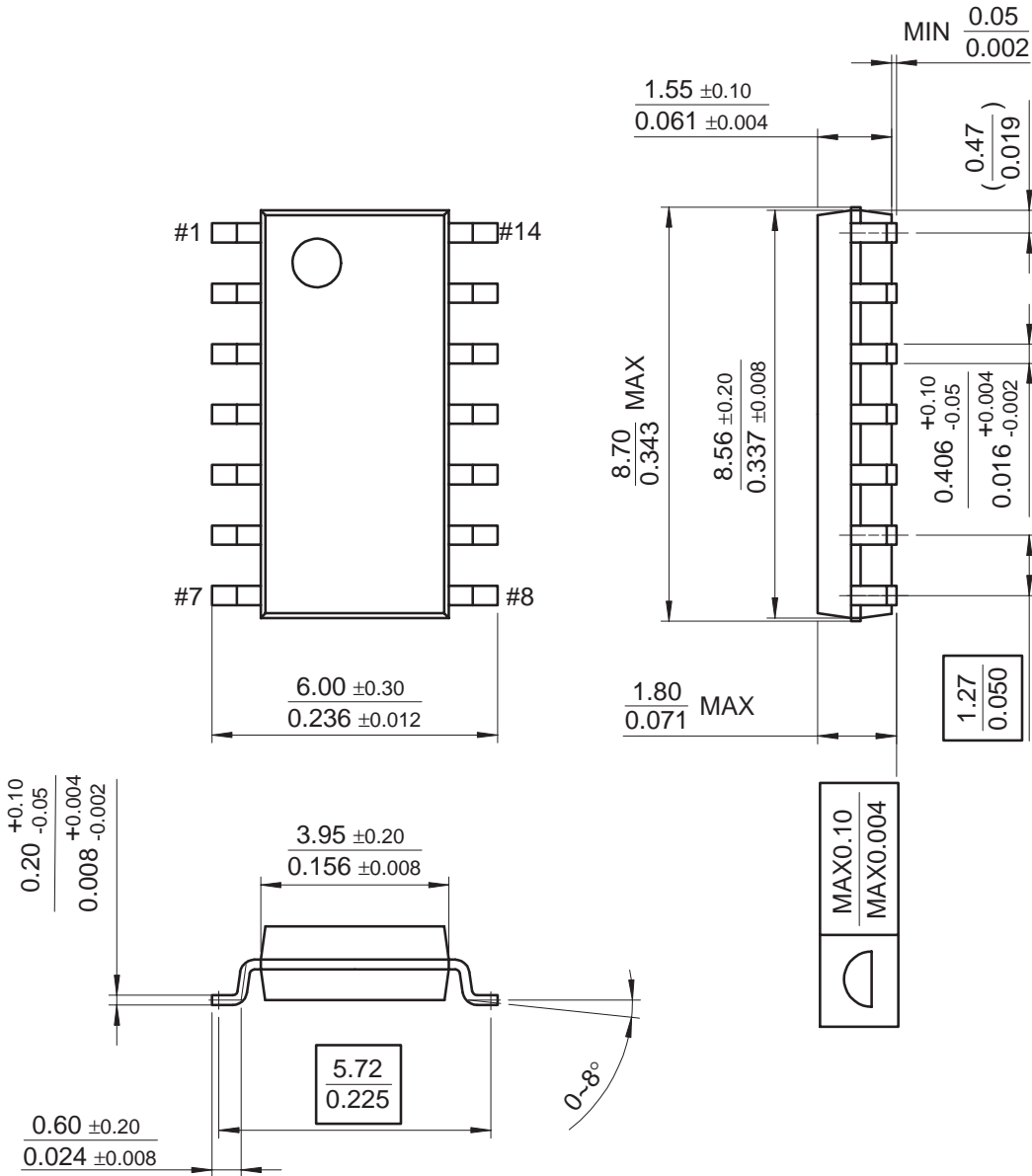
14-DIP-300



Mechanical Dimensions (Unit: mm) (Continued)

Package Dimensions

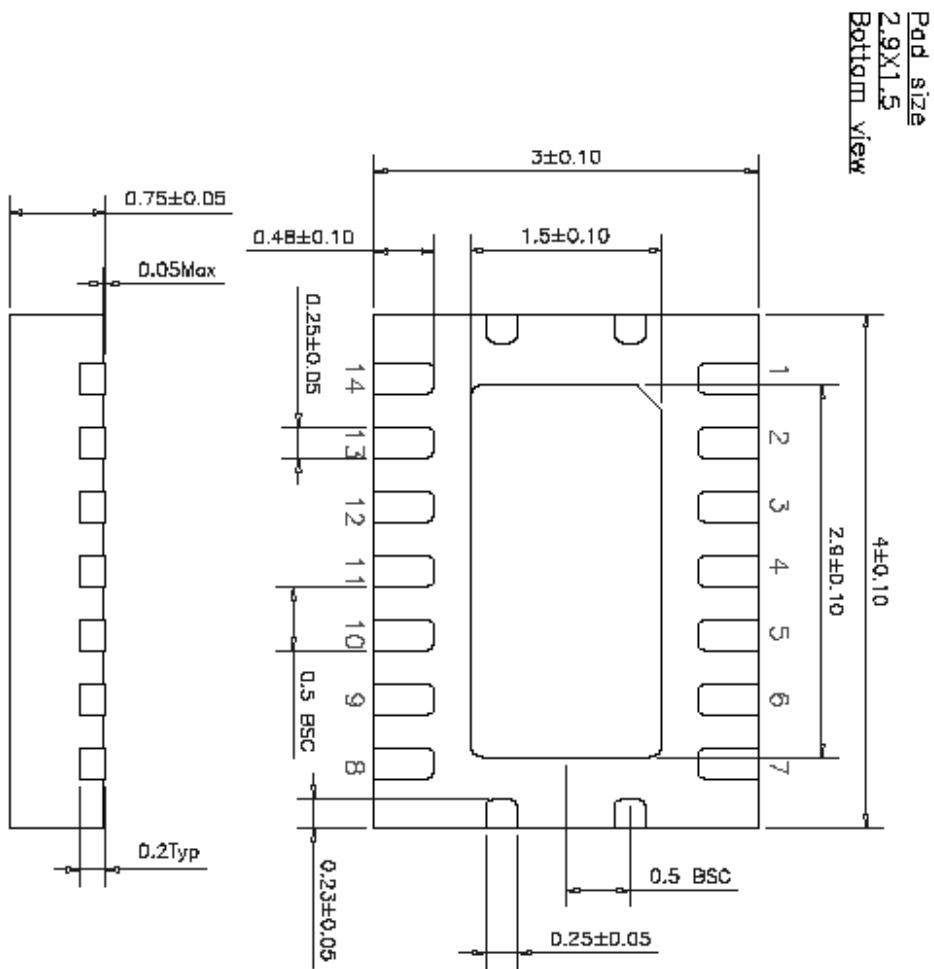
14-SOP-225



Mechanical Dimensions (Unit: mm) (Continued)

Package dimensions

14-MLP



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