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 ~ 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 intergrated 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.

14-DIP-300

14-SOP-225

14-TSSOP

14-MLP

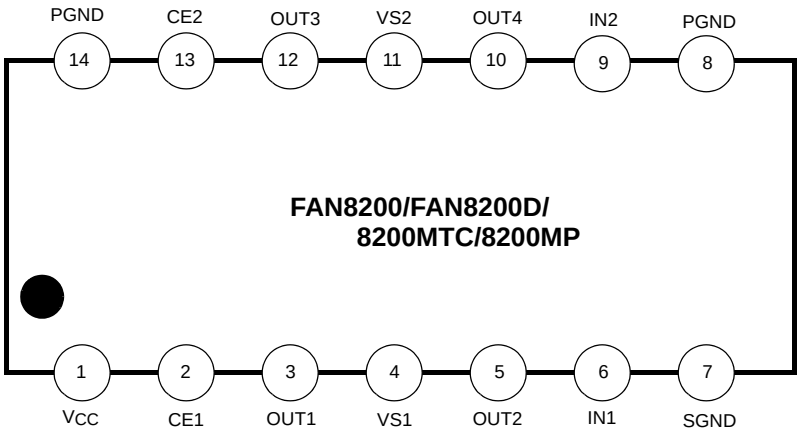
Typical Application

- 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

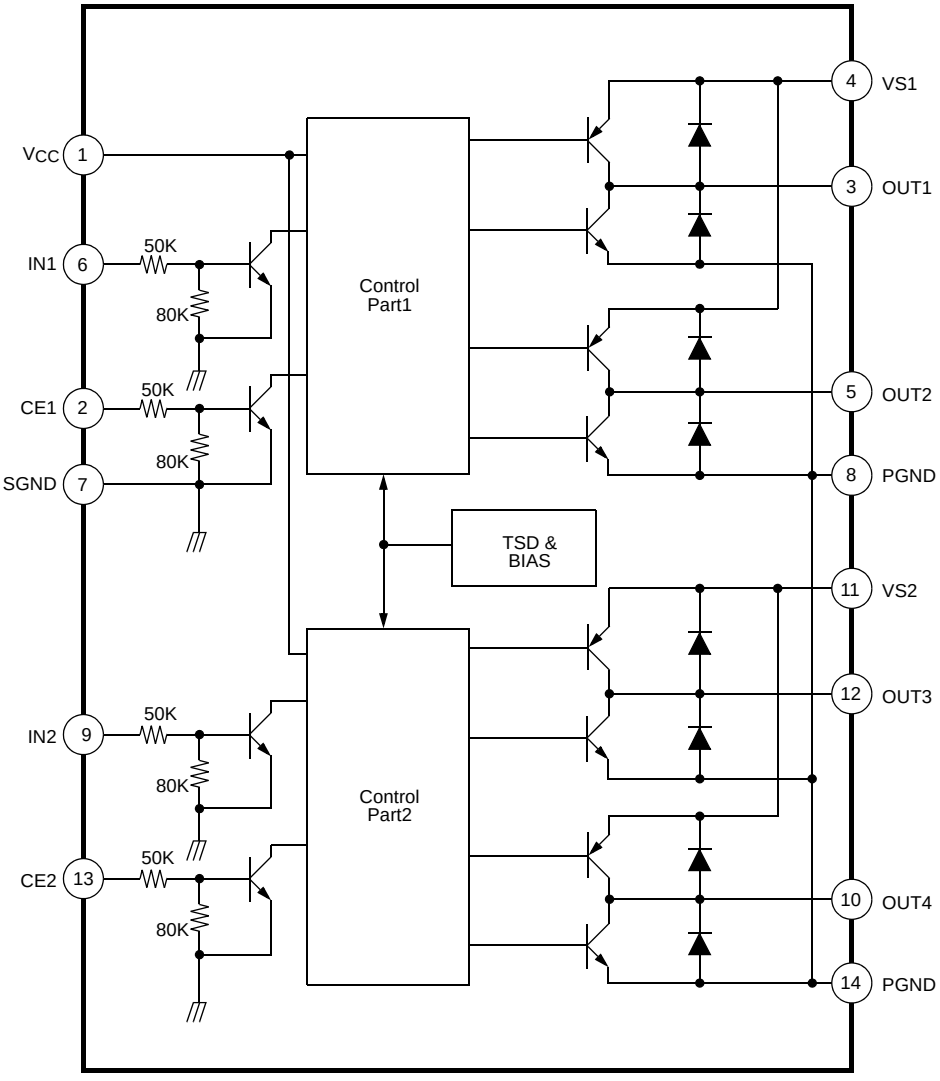
Pin Assignments



Pin Definitions

Pin Number	Pin Name	I/O	Pin Function Description
1	V_{CC}	-	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)

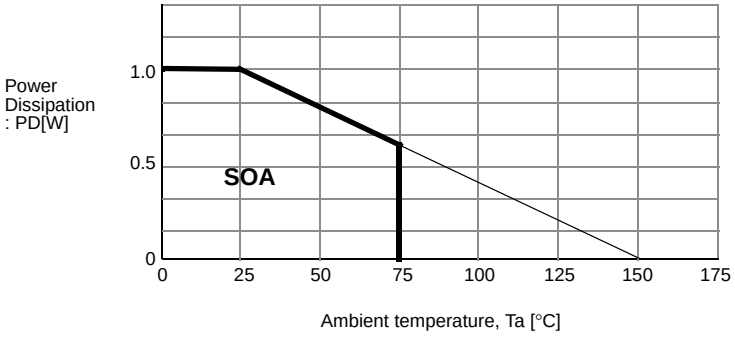
Parameter	Symbol	Value	Unit
Supply voltage	$V_{CC(MAX)}$	9.0	V
Power supply voltage	$V_{S(MAX)}$	9.0	V
Output voltage	$V_{OUT(MAX)}$	$V_S + V_{CF}$	V
Input voltage	$V_{IN(MAX)}$	7.0	V
Peak output current per channel	$I_{O(PEAK)}$	1	A
Continuous output current per channel	I_O	0.65 (FAN8200) 0.4 (FAN8200D) 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 temperture	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:

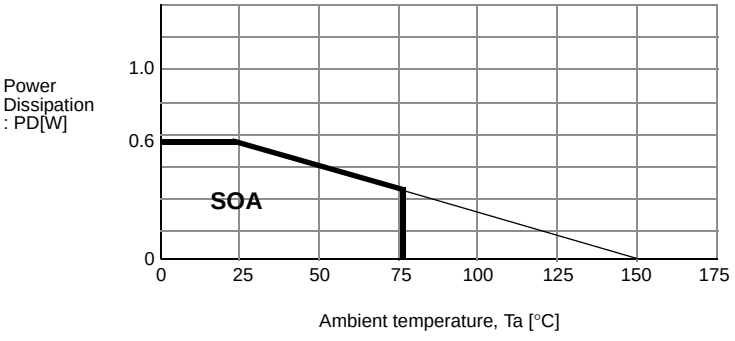
1. When mounted on 76.2mm × 114mm × 1.57mm PCB (glass epoxy material).
2. Power dissipation reduces 8.0mW/°C for FAN8200, 4.8mW/°C for FAN8200D, 6.9mW/°C for FAN8200MTC and 6.4mW/°C FAN8200MP for Ta ≥ 25°C.
3. Should not exceed P_D and SOA(Safe Operating Area).

Power Dissipation Curve

FAN8200

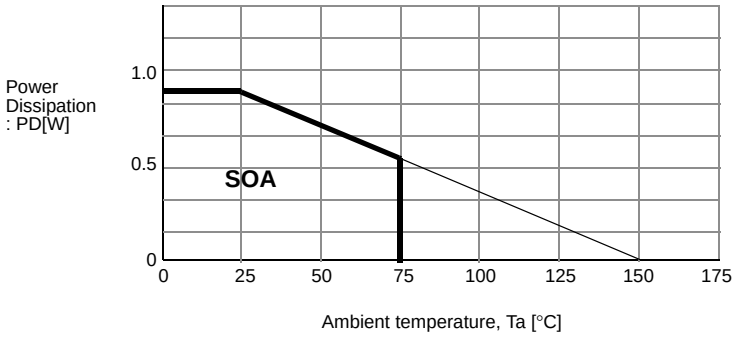


FAN8200D

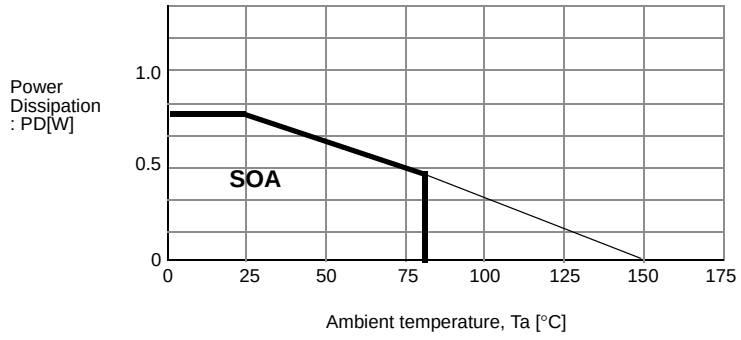


Power Dissipation Curve (Continued)

FAN8200MTC



FAN8200MP



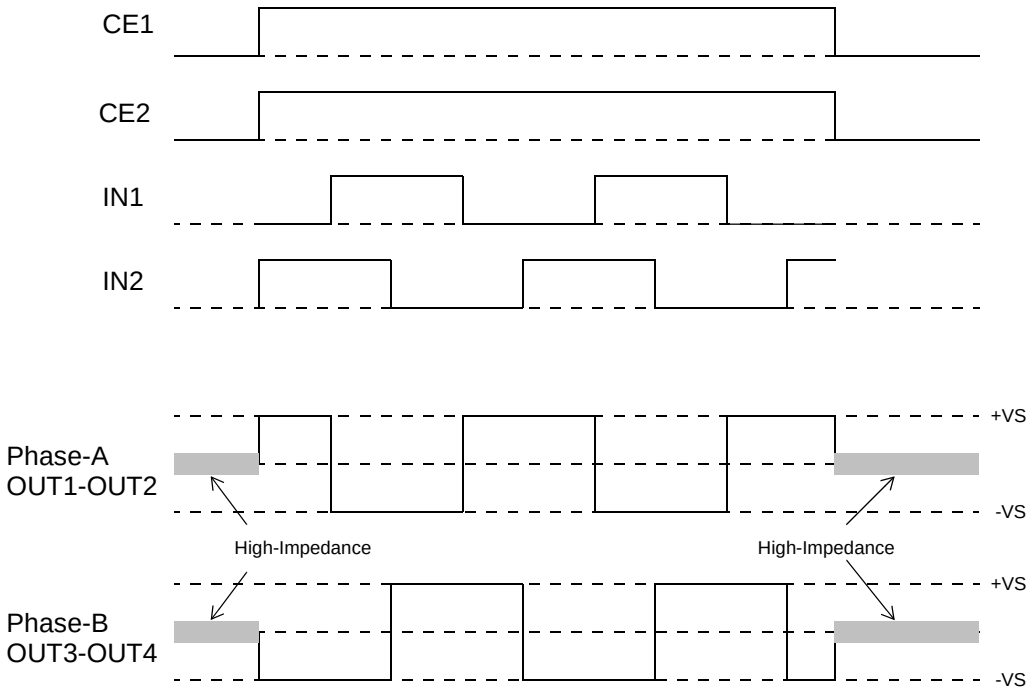
Recommended Operating Conditions (Ta = 25°C)

Parameter	Symbol	Min.	Typ.	Max	Unit
Logic circuit supply voltage	V_{CC}	2.5	-	7.0	V
Power supply voltage	V_S	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



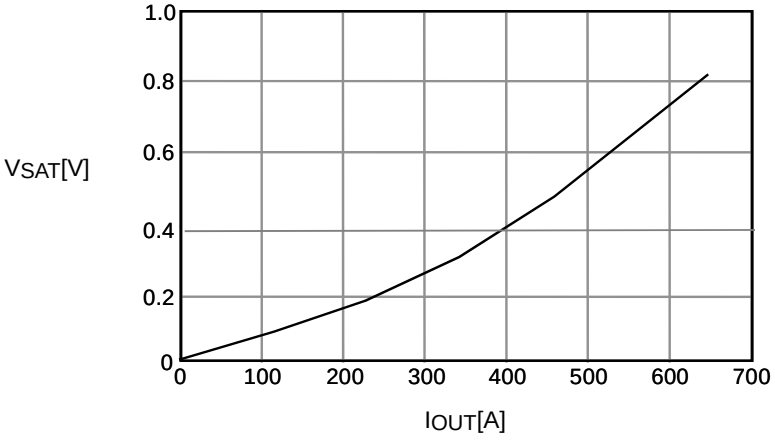
Electrical Characteristics

(Ta=25°C, V_{CC}=5V, V_{S1}=3V, V_{S2}=3V, unless otherwise specified)

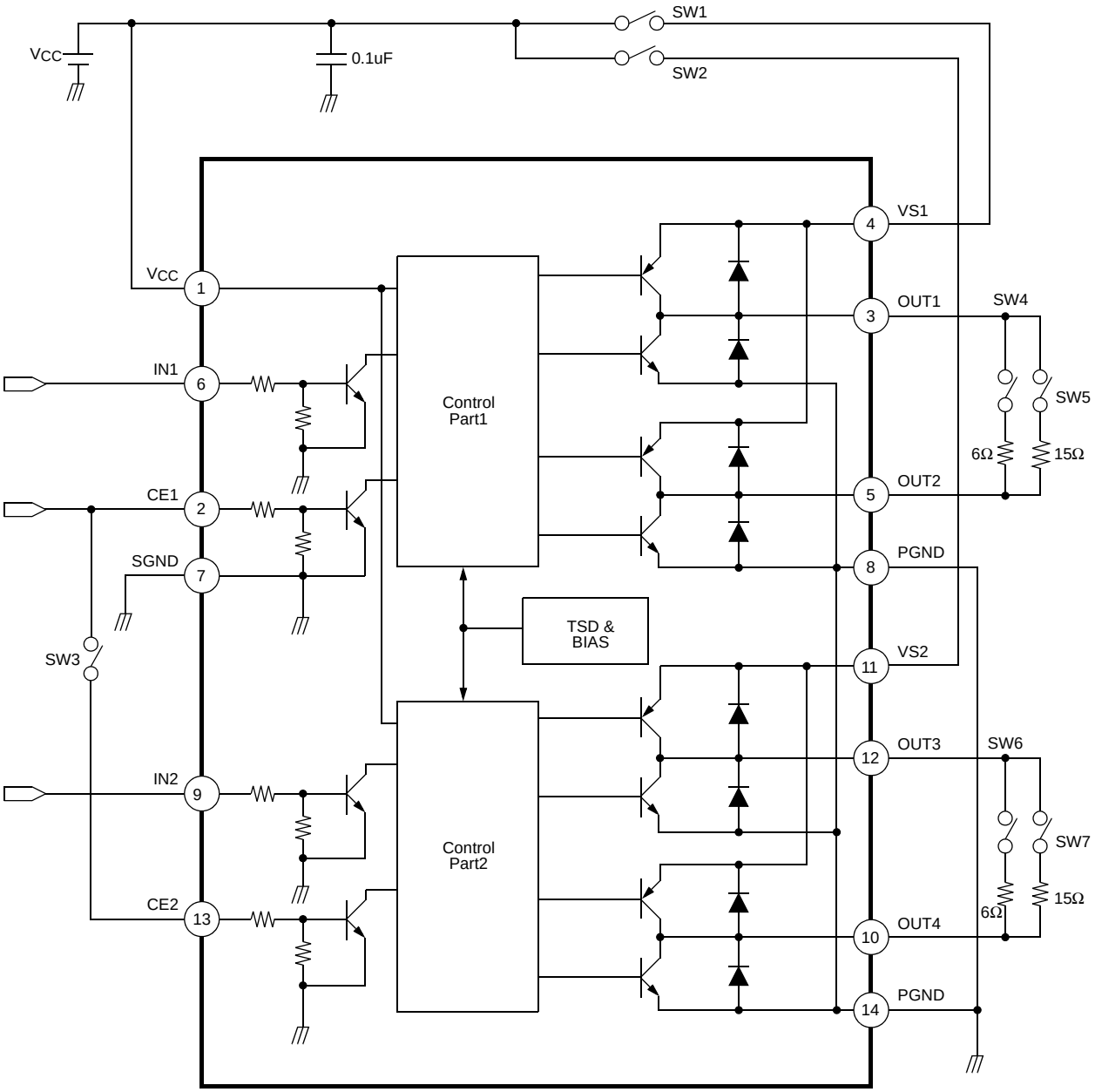
Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Supply current 1	I_{CC1}	CE1, 2=0V	-	0.1	10	uA
Supply current 2	I_{CC2}	CE1=3V, CE2=0V or CE1=0V, CE2=3V	-	12	18	mA
Saturation voltage 1 (upper + lower total)	V_{SAT1}	CE1=3V, IN1=3V or 0V, I_{OUT}=0.2A	-	0.2	0.3	V
Saturation voltage 2 (upper + lower total)	V_{SAT2}	CE1=3V, IN1=3V or 0V, I_{OUT}=0.4A	-	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=3V, Each pin	-	100	200	uA
Chip enable current	I_{CE}	CE=3V, Each pin	-	100	200	uA
Clamp diode leakge current	I_{LEAK}	V_{CC}=7V, V_S=7V	-	-	30	uA
Clamp diode voltage	V_{CF}	I_{OUT}=0.4A	-	-	1.7	V

Typical Performance Characteristics

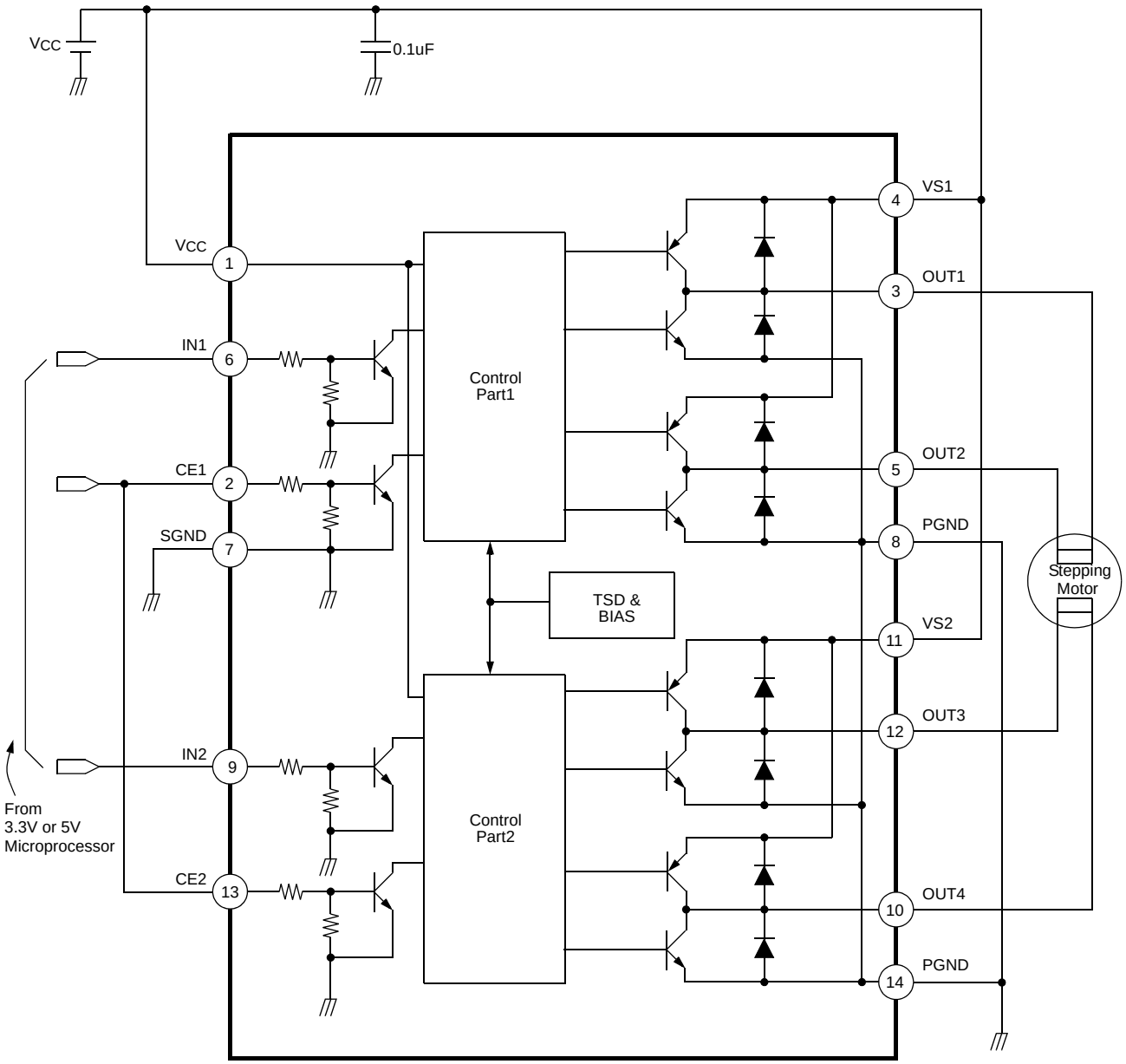
V_{SAT} vs. I_{OUT} Characteristics Graph



Test Circuits

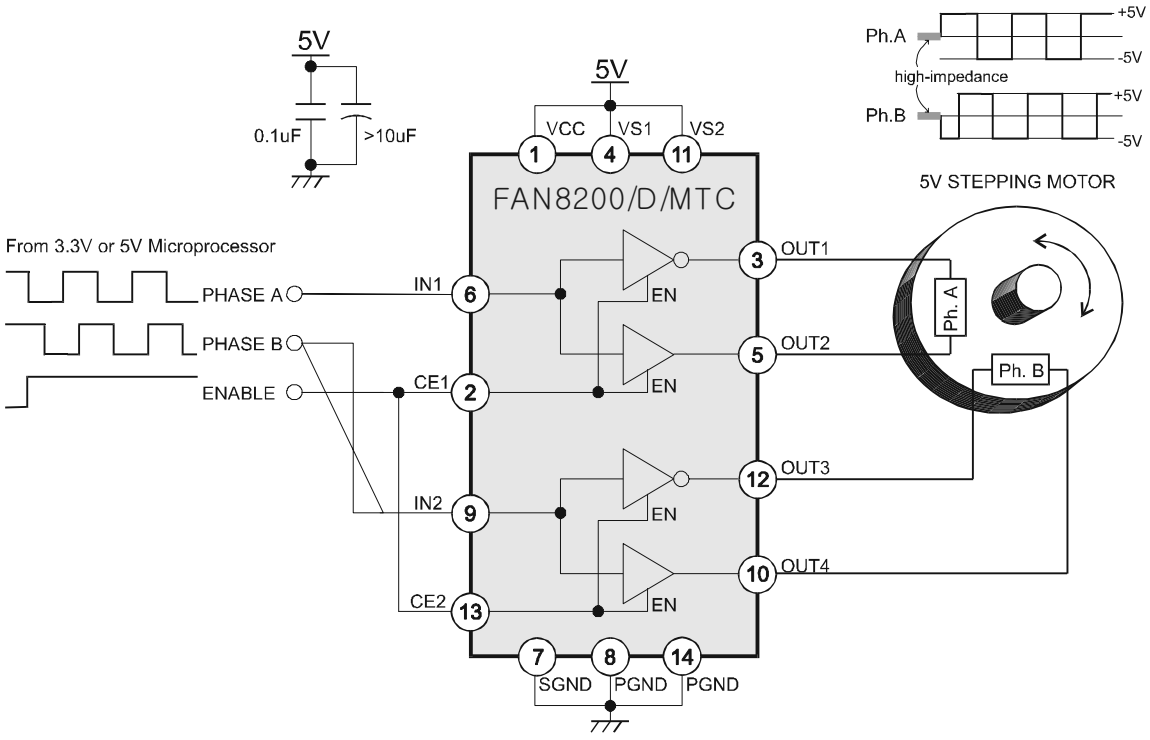


Typical Application Circuit



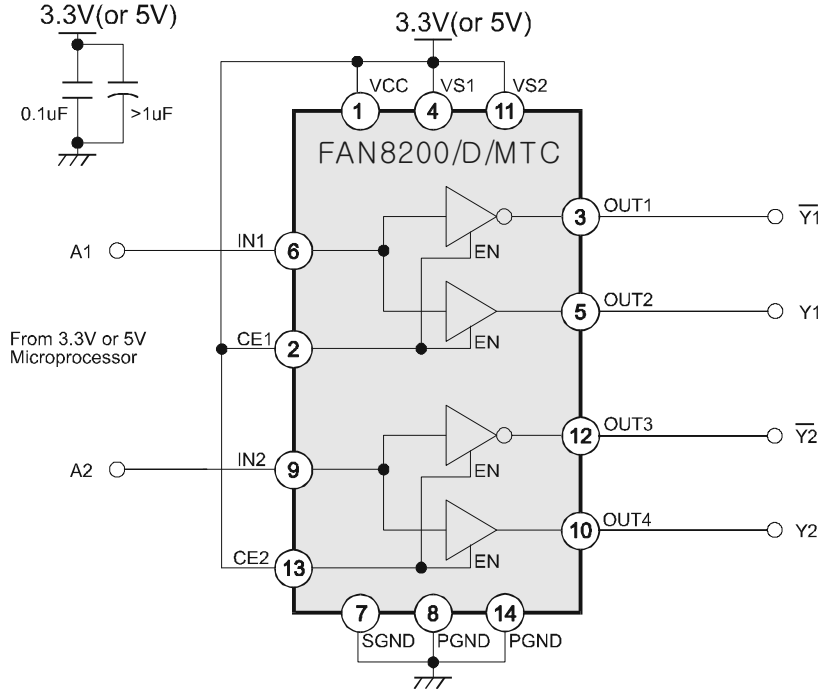
Application Example - Full Step Bipolar Drive

Circuit Schematics



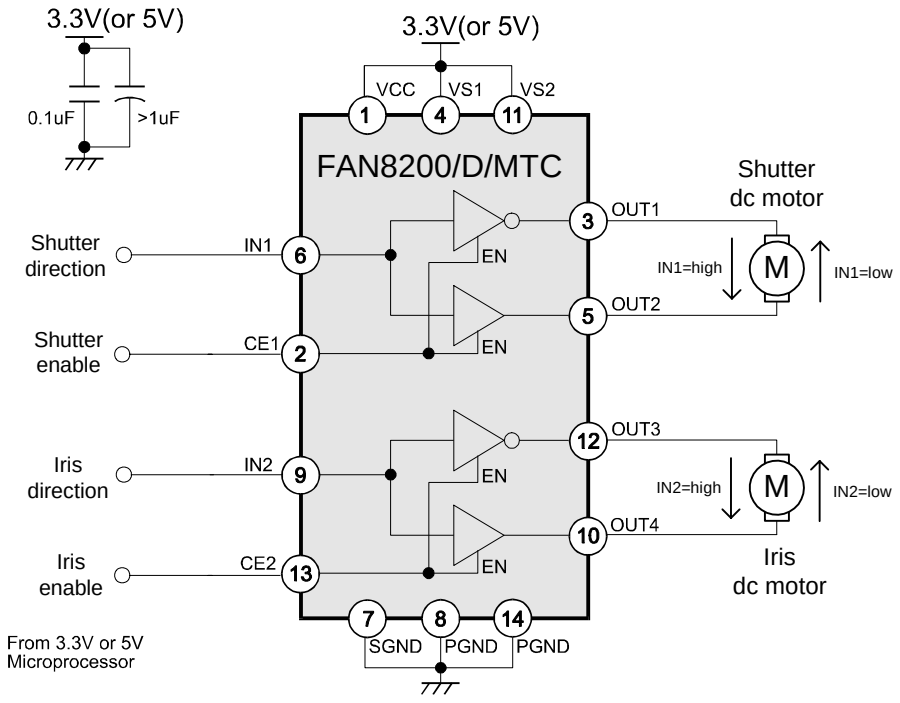
Application Example - Large Current Buffer

Circuit Schematics



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

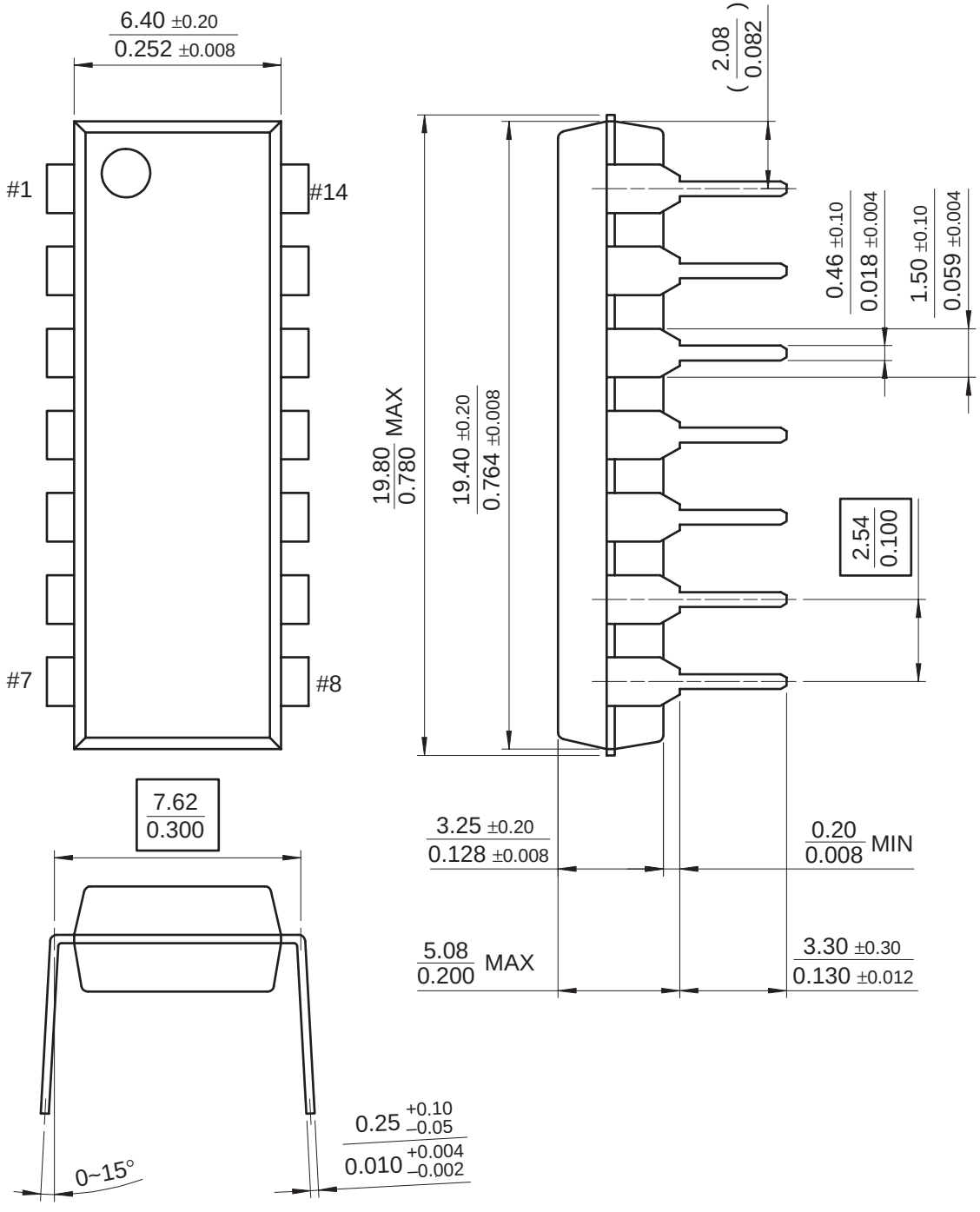
Circuit Schematics



Mechanical Dimensions (Unit: mm)

Package Dimensions

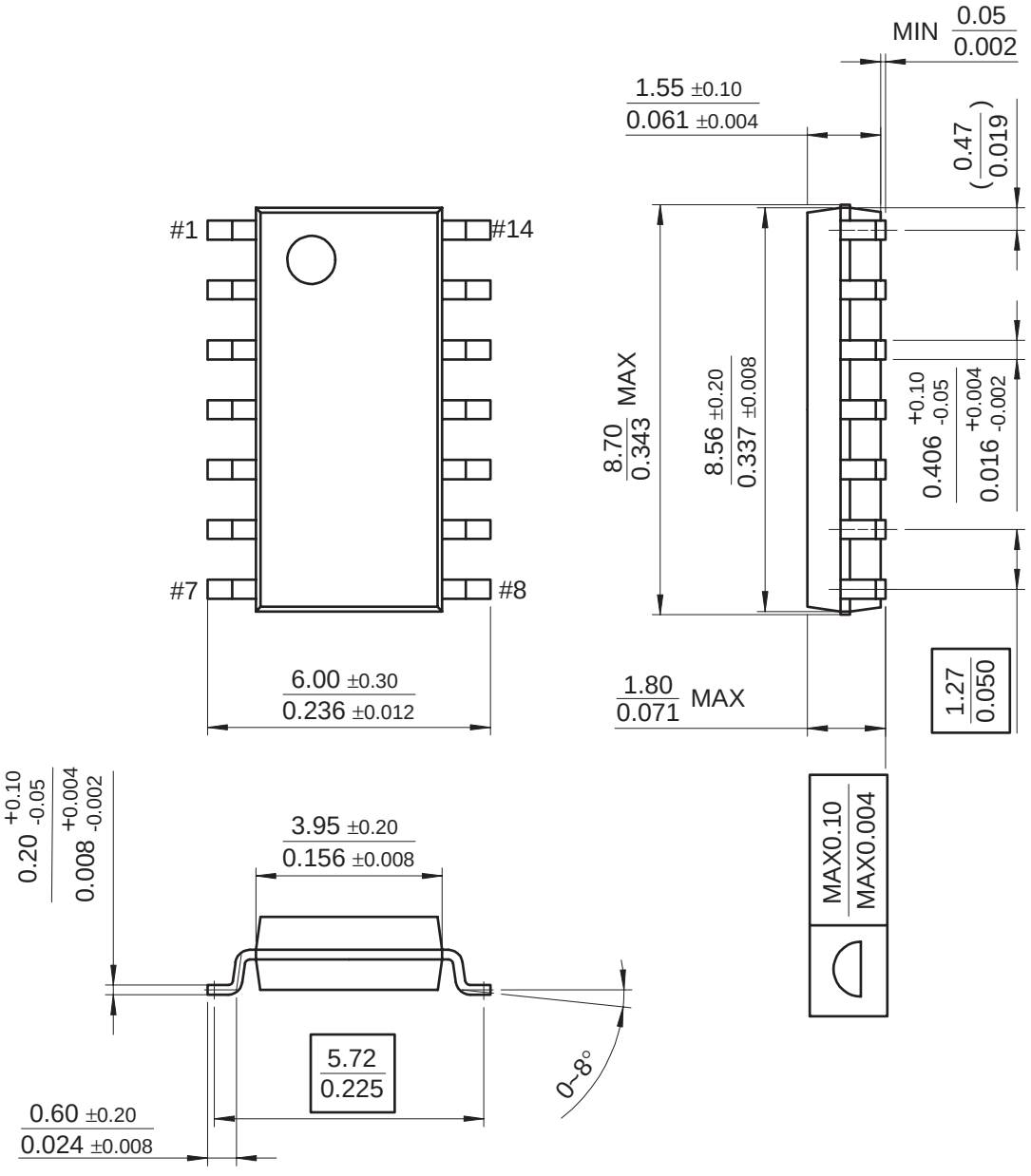
14-DIP-300



Mechanical Dimensions (Unit: mm) (Continued)

Package Dimensions

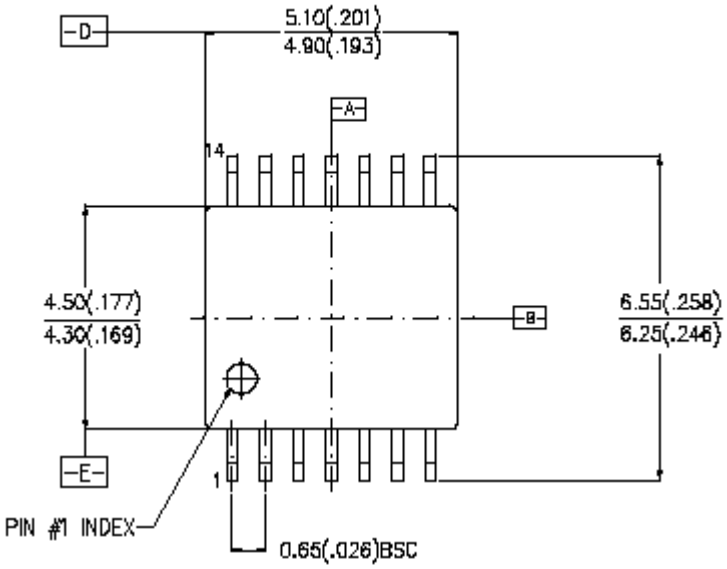
14-SOP-225

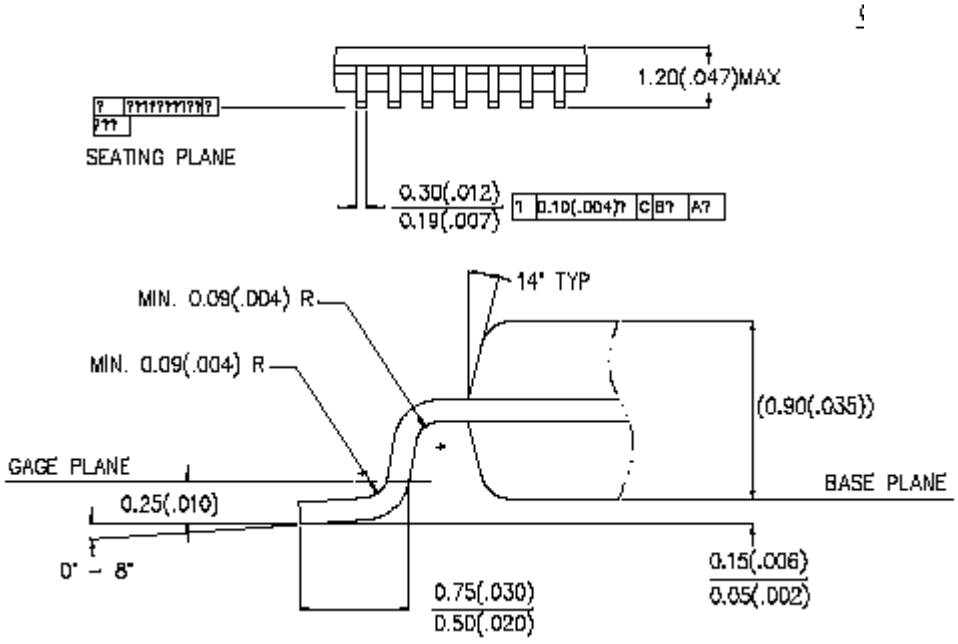


Mechanical Dimensions (Unit: mm) (Continued)

Package dimensions

14-TSSOP





Mechanical Dimensions (Unit: mm) (Continued)

Package dimensions

14-MLP