

# 4-channel PWM driver for CD and MD players

## BH6518FS

The BH6518FS is a 4-channel PWM driver for CD and MD player motors and actuators. The power MOSFET in the output stage assures low power consumption for applications.

### ●Applications

CD and MD players

### ●Features

- 1) Internal 4-ch power MOS H-bridge.
- 2) Adaptable for PWM input.
- 3) Built-in charge-pump circuit for step-up.
- 4) Low ON resistance : 1.2Ω (Typ.).
- 5) Thermal shutdown circuit.
- 6) Low power consumption.
- 7) 32pin SSOP-A package. Compact package.

### ●Absolute maximum ratings (Ta=25°C)

Parameter	Symbol	Limits	Unit
H-bridge supply voltage	V <sub>M</sub>	9	V
Control circuit supply voltage	V <sub>DD</sub>	9	V
Predriver supply voltage	V <sub>G</sub> (2pin)	12	V
Driver output current	I <sub>o</sub>	1000	mA
Power dissipation	P <sub>d</sub>	850*	mW
Operating temperature	T <sub>opr</sub>	-40~+85	°C
Storage temperature	T <sub>stg</sub>	-55~+150	°C

\* PCB(70mm×70mm×1.6mm glass epoxy) mounting.  
Reduced by 6.8mW for each increase in Ta of 1°C over 25°C.

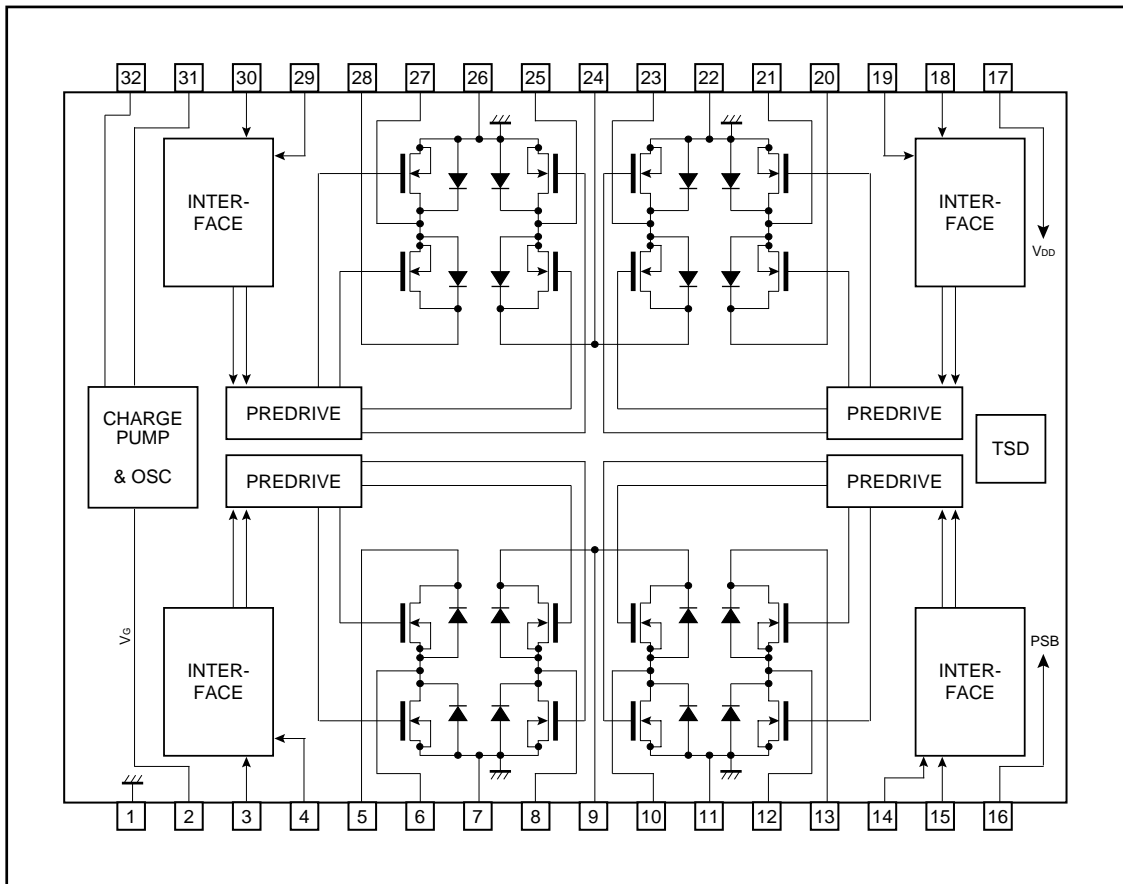
### ●Recommended operating conditions (Ta=25°C)

Parameter	Symbol	Min.	Typ.	Max.	Unit
H-bridge supply voltage	V <sub>M</sub> *	1.6	5.0	5.5	V
Control circuit supply voltage	V <sub>DD</sub>	2.7	3.0	5.5	V
Predriver supply voltage	V <sub>G</sub> (2pin)	V <sub>M</sub> +3.0	10	11.5	V
Pulse input frequency	f <sub>IN</sub>	—	176.4	200	kHz

\* When the internal charge pump is not used. When it is used : 2.7~5.5V.

## Optical disc ICs

## ●Block diagram



## ●Pin descriptions

Pin No.	Pin name	Functions
1	GND	Predrive ground
2	V <sub>G</sub>	Gate voltage supply
3	IN4R	CH4 reverse input
4	IN4F	CH4 forward input
5	VM4	Power supply
6	OUT4F	CH4 forward output
7	PGND4	Power ground
8	OUT4R	CH4 reverse output
9	VM34	Power supply
10	OUT3R	CH3 reverse output
11	PGND3	Power ground
12	OUT3F	CH3 forward output
13	VM3	Power ground
14	IN3F	CH3 forward input
15	IN3R	CH3 reverse input
16	PSB	Power cut

Pin No.	Pin name	Functions
17	V <sub>BD</sub>	Predrive power supply
18	IN1R	CH1 reverse input
19	IN1F	CH1 forward input
20	VM1	Power supply
21	OUT1F	CH1 forward output
22	PGND1	Power ground
23	OUT1R	CH1 reverse output
24	VM12	Power supply
25	OUT2R	CH2 reverse output
26	PGND2	Power ground
27	OUT2F	CH2 forward output
28	VM2	Power supply
29	IN2F	CH2 forward input
30	IN2R	CH2 reverse input
31	CAPA+	Charge pump capacitor connect terminal +
32	CAPA-	Charge pump capacitor connect terminal -

Optical disc ICs

●Input / Output terminal equivalent circuit

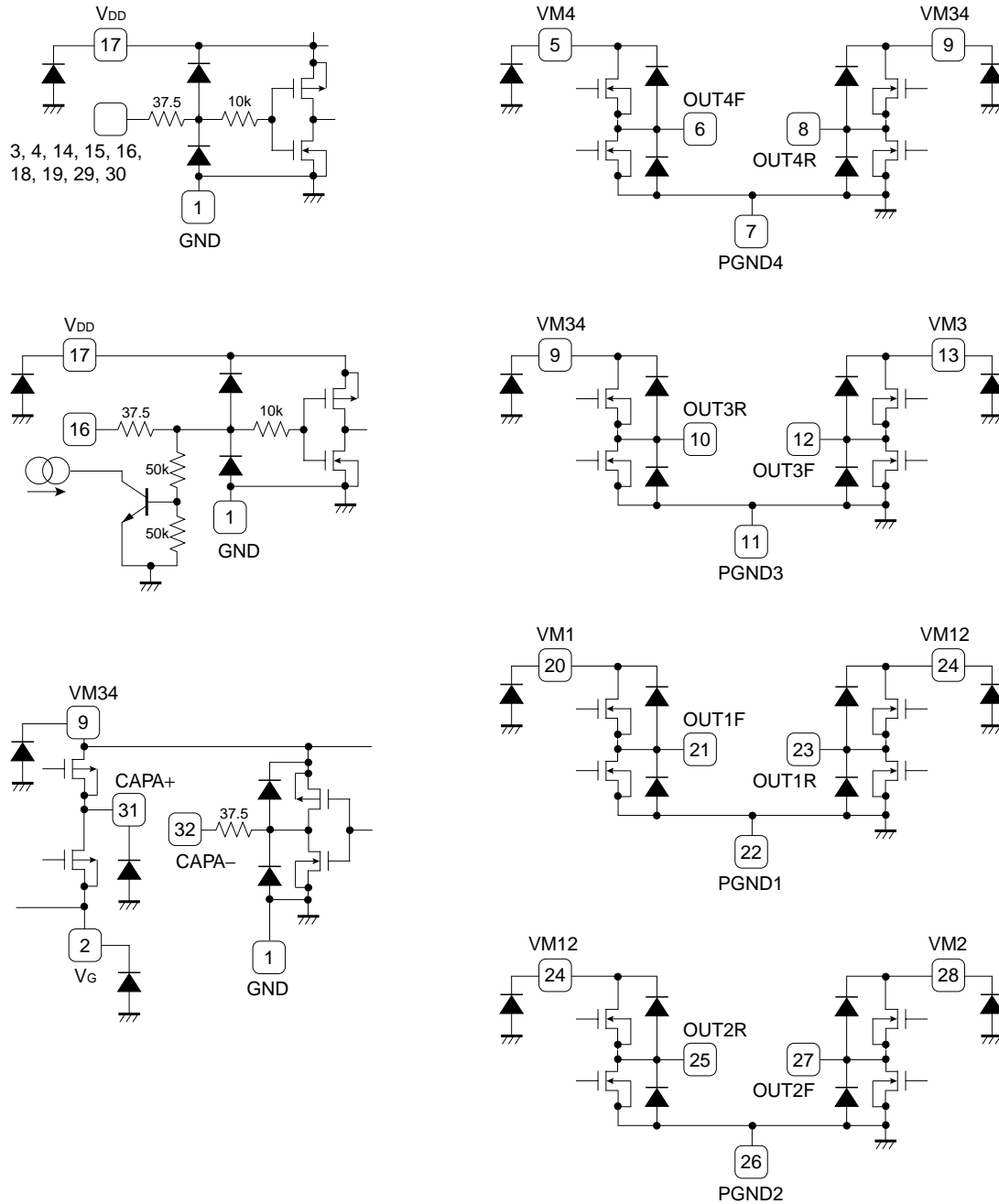


Fig.1

## Optical disc ICs

## ●Electrical characteristics

(unless otherwise noted, Ta=25°C, V<sub>M</sub>=5V, V<sub>DD</sub>=3V, V<sub>G</sub>=step up output, f<sub>IN</sub>=176kHz, R<sub>L</sub>=8Ω-47μH.)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions	Measurement circuit
H-bridge supply current							
No input	I <sub>MST</sub>	–	320	380	μA	V <sub>DD</sub> =3V, V <sub>M</sub> =5V	Fig.2
Control supply current							
No input	I <sub>DD1</sub>	–	100	210	μA		Fig.2
Operating	I <sub>DD2</sub>	–	110	220	μA	I <sub>DD1</sub> +4CH driven simultaneously	Fig.2
PSB	I <sub>DD3</sub>	–	–	1	μA		Fig.2
Pre-drive supply voltage (charge-pump output)							
No input	V <sub>GST</sub>	8.8	9.95	12	V		Fig.2
Operating	V <sub>GA</sub>	7.9	8.5	11	V	4CH driven simultaneously	Fig.2
Logic input characteristics							
Input high level voltage	V <sub>IH</sub>	V <sub>DD</sub> -0.6	–	–	V		Fig.2
Input low level voltage	V <sub>IL</sub>	–	–	0.6	V		Fig.2
Input high level current	I <sub>IH</sub>	–	–	1	μA		Fig.2
Input low level current	I <sub>IL</sub>	-1	–	–	μA		Fig.2
Output ON resistance	R <sub>ON</sub>	–	1.2	2.0	Ω	Sum of top and bottom ON resistance V <sub>M</sub> =2.5V, V <sub>DD</sub> =3V, V <sub>G</sub> =10V (V <sub>G</sub> is external supply)	Fig.2
Output delay time	t <sub>RISE</sub>	–	0.2	1	us		Fig.2
	t <sub>FALL</sub>	–	0.2	1	us		Fig.2
Minimum output pulse width	t <sub>MIN</sub>	220	–	–	ns	Output pluse width 2/3 t <sub>MIN</sub>	Fig.2
Oscillation frequency	f <sub>OSC</sub>	150	370	520	kHz	31pin wave monitor	Fig.2

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Optical disc ICs

● Measurement circuit

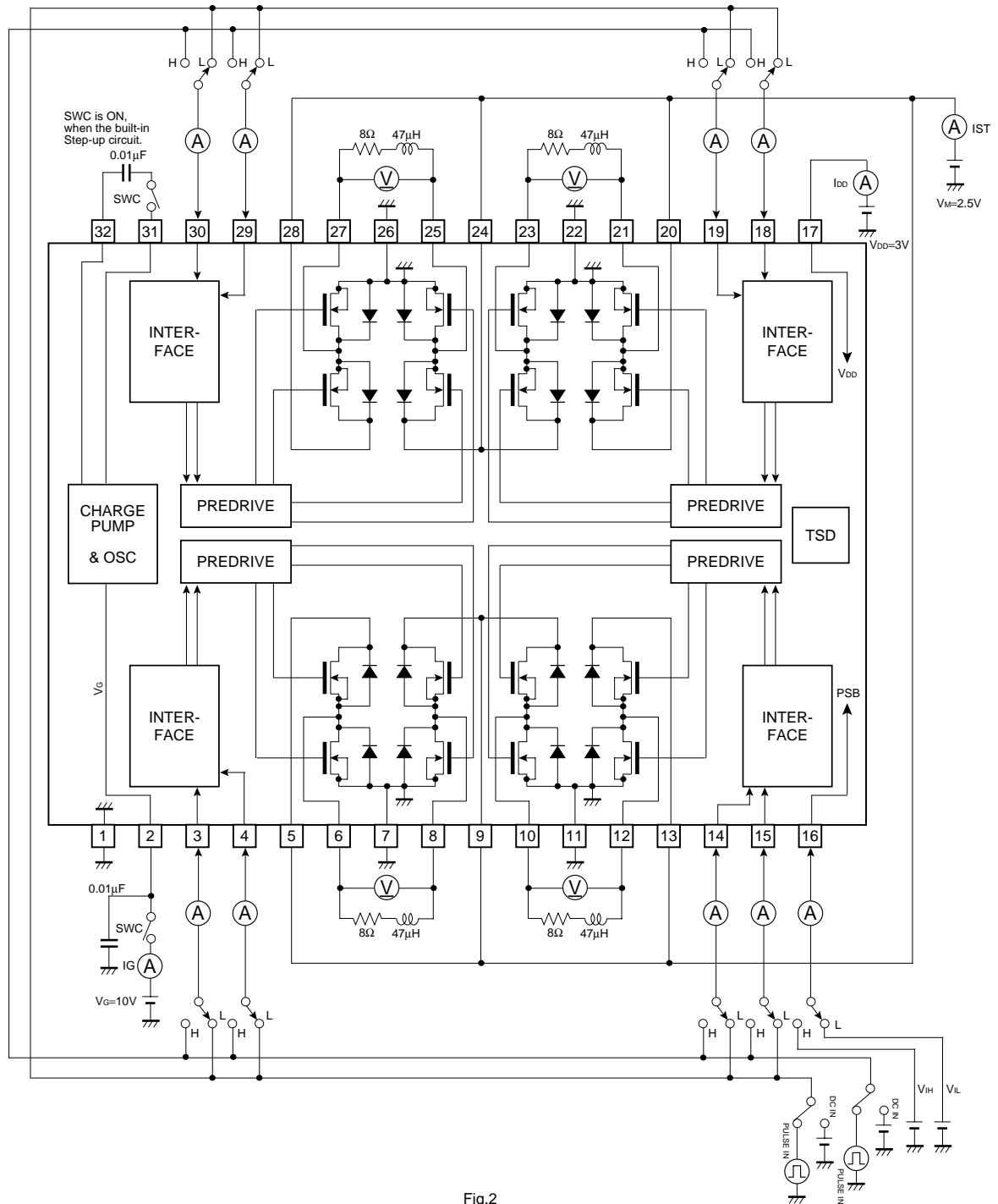


Fig.2

Optical disc ICs

●Application circuit

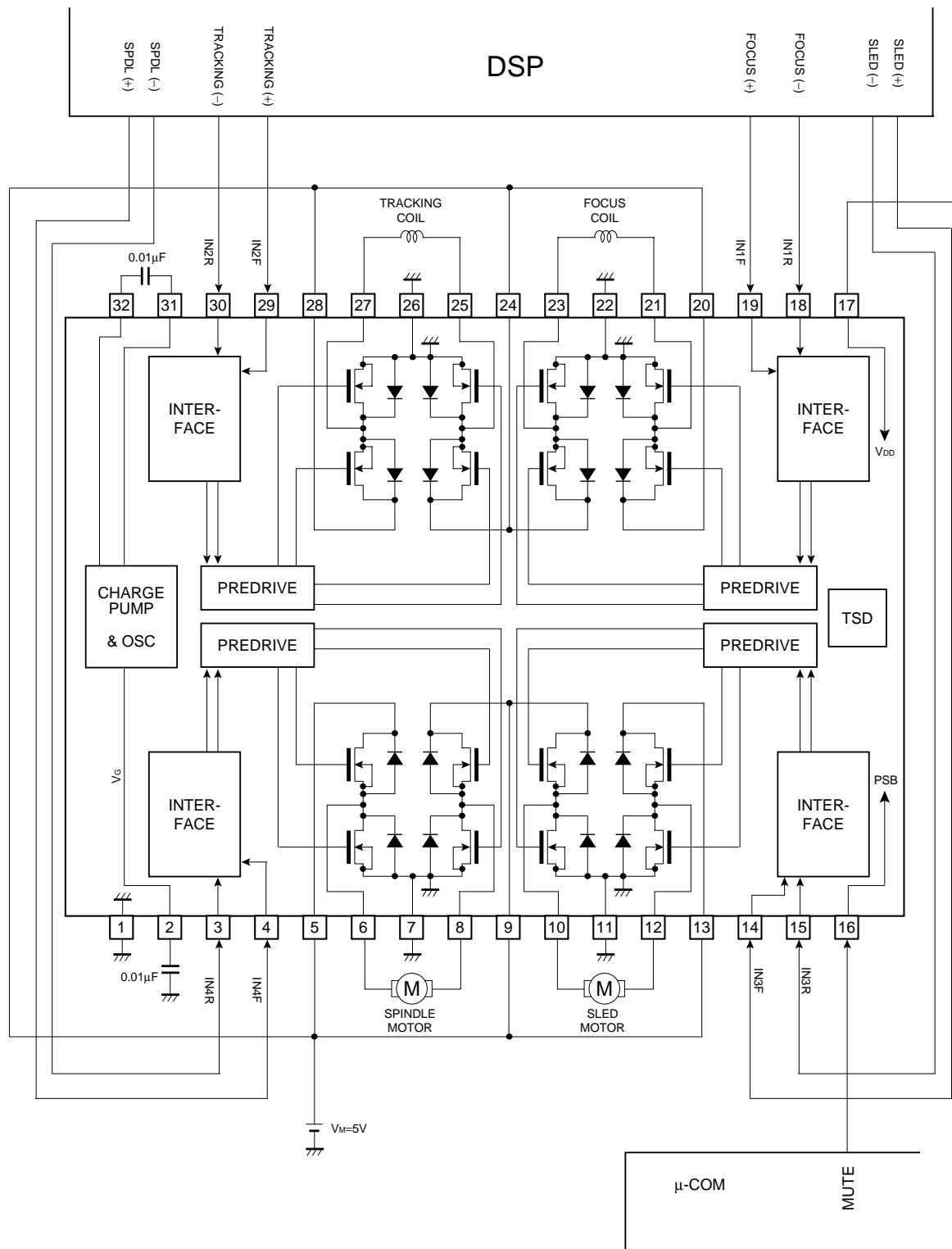


Fig.3

Optical disc ICs

●Operation notes

- (1)  $V_G$  voltage is double of 9pin voltage. Therefore, if without voltage supply on 9pin, Charge pump do not generate  $V_G$ . And adjust  $V_M$ , not to over absolute maximum rating of  $V_G$ .
- (2) In case of supply  $V_G$  by external power supply, please remove capacitor between 31 to 32pin.
- (3) Recommendable charge pump capacitance is 0.01~0.1 $\mu$ F. Much more capacitance may not be effective.
- (4) A thermal shutdown circuit (over temperature protection circuit) is built in to prevent the IC from thermal breakdown. Use the IC under the allowable thermal loss of the package (0.85W). In case the IC is left running exceeding the allowable loss, the junction temperature rises, and the thermal shutdown circuit works at the junction temperature of 175°C (Typ.) (the output of all the channels are brought to open status). When the junction temperature drops to 150°C (Typ.), the IC start operating again.

●External characteristic curves

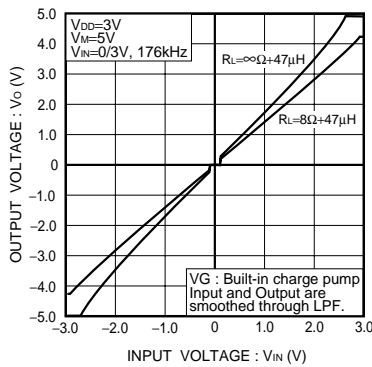


Fig.4 I/O characteristics

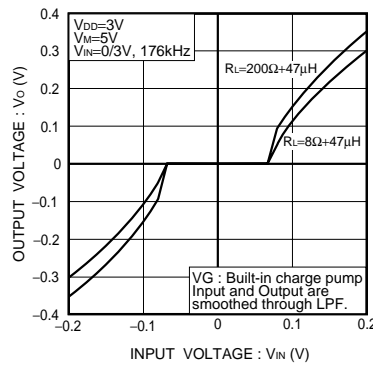


Fig.5 I/O characteristics during ultralow input

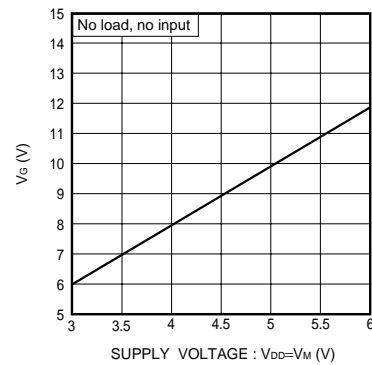


Fig.6 Supply voltage vs. charge-pump output

●External dimensions (Units : mm)

