

# Step-Up DC/DC Converter (PWM) Monolithic IC MM1349

## Outline

This is a converter IC which steps up the DC input voltage to output a fixed voltage level. Utilizing technology for low-voltage operation, which is a feature of Mitsumi semiconductor processes, operation is possible beginning at 0.90V, making this device ideal for the power supply circuits of portable equipment driven by a single battery.

Because PWM oscillation is adopted, an output waveform can be obtained with a smaller peak-to-peak voltage than is possible for VFM devices.

## Features

1. Low-voltage operation possible, 0.90V (no-load)
2. Internal oscillation circuit
3. Adoption of PWM oscillation for output waveform with small peak-to-peak voltage
4. Numerous output voltages available (seven ranks)

## Package

SOT-25

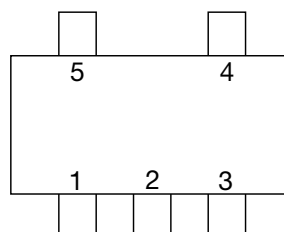
## Output Voltage Rank

Rank	A	B	C	D	E	G	H
Voltage (V)	5.0	3.5	3.2	3.0	2.7	2.5	2.2

## Applications

1. Pagers
2. Separate vibrators
3. Other portable equipment

## Pin Assignment

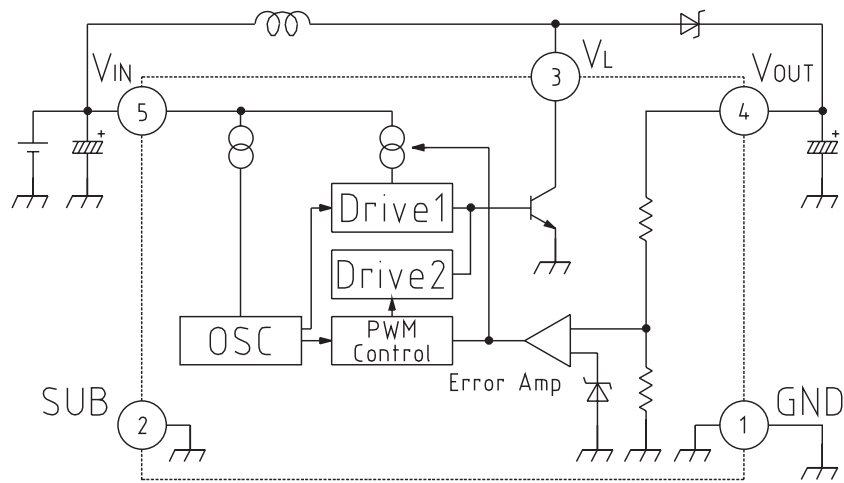


SOT-25

1	GND
2	SUB
3	V <sub>L</sub>
4	V <sub>OUT</sub>
5	V <sub>IN</sub>

\*Pin 2 is the SUB pin, and should be connected to GND.

**Block Diagram**



Note: Pin 2 is the SUB pin, and should be connected to GND.

**Absolute Maximum Ratings** (Ta=25°C)

Item	Symbol	Ratings	Units
Storage temperature	T <sub>STG</sub>	-40~+125	°C
Operating temperature	T <sub>OPR</sub>	-20~+75	°C
Voltage applied to V <sub>IN</sub> pin		-0.3~+10.0	V
Voltage applied to V <sub>OUT</sub> pin		-0.3~+10.0	V
Voltage applied to V <sub>L</sub> pin		-0.3~+10.0	V
Allowable loss	P <sub>d</sub>	150	mW

**Recommended Operating Conditions**

Item	Symbol	Ratings	Units
Operating temperature	T <sub>op</sub>	-20~+75	°C
Operating voltage	V <sub>op</sub>	+0.9~V <sub>OUT</sub>	V

**Electrical Characteristics** (Ta=25°C)(Except where noted otherwise, VIN=1.5V, Io=1mA)

Item	Symbol	Measurement conditions	Min.	Typ.	Max.	Units	
Operating voltage	V <sub>IN</sub>	No-load	0.90		V <sub>OUT</sub>	V	
Output voltage	V <sub>OUT</sub>	V <sub>IN</sub> =1.5V, I <sub>o</sub> =1mA	A	4.80	5.00	5.20	V
			B	3.36	3.50	3.64	
			C	3.07	3.20	3.33	
			D	2.88	3.00	3.12	
			E	2.59	2.70	2.81	
			F	2.40	2.50	2.60	
			G	2.11	2.20	2.29	
Output voltage temperature coefficient		Ta=-20~75°C		±100		ppm/°C	
Input fluctuations		V <sub>IN</sub> =1.1→1.7V, I <sub>o</sub> =1mA			1	%/V	
Load fluctuation		V <sub>IN</sub> =1.5V, I <sub>o</sub> =0→4mA			1	%/mA	
Efficiency		V <sub>IN</sub> =1.5V, I <sub>o</sub> =1mA		80		μA	
V <sub>L</sub> pin leakage current	I <sub>VLLK</sub>	V <sub>L</sub> =10V			1	μA	
Oscillation frequency	f <sub>OSC</sub>	V <sub>IN</sub> =1.5V, I <sub>o</sub> =1mA	35	65	95	kHz	

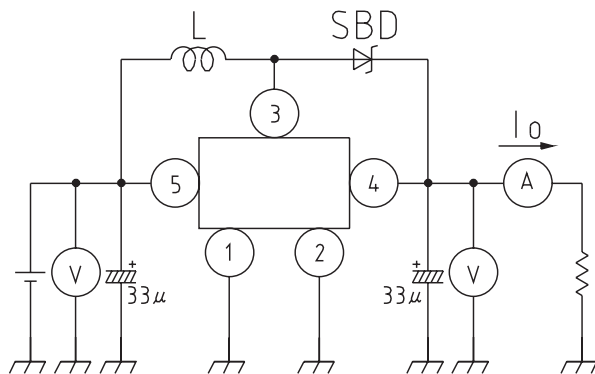
Note: These characteristics assume the following externally mounted components.

Coil: L=120μH (Mitsumi model C5-R)

Capacitor: C=33μF (tantalum electrolytic capacitor)

Schottky barrier diode (Rohm model RB451F)

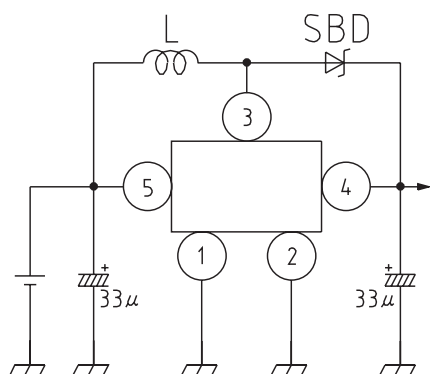
**Measuring Circuit**



Note 1: A: DC ammeter  
V: DC voltmeter

Note 2: L=120μH

**Application Circuits**



Coil: L=120μH (Mitsumi model C5-R)

Capacitor: C=33μF (tantalum electrolytic capacitor)

Schottky barrier diode (Rohm model RB451F)