

# IC for DC Motor Control Monolithic IC MM1038

## Outline

This IC is used to control the revolution rate of motors which can be controlled by low voltages. It can be used to configure a high-precision FG motor using few external components. In particular, a unique new circuit design with improved low-voltage operating characteristics enables configuration of sets such as headphone stereos with auto-reverse functions which are unaffected by power supply voltage drops when the motor is reversed, making them ideal for speed control of low-voltage DC motors.

## Features

1. Operation at low voltages possible
2. Broad power supply voltage range
3. Small input current
4. Few external components, small package
5. Speed is easily changed over a wide range; accommodates two-speed operation

## Package

SOP-8A (MM1038AF)  
 SOP-8D (MM1038CF)

## Absolute Maximum Ratings

Item	Symbol	Ratings		Units
Operating temperature	T <sub>OPR</sub>	-10~+60		°C
Storage temperature	T <sub>STG</sub>	-30~+125		°C
Power supply current	V <sub>CC</sub>	-0.3~10		V
Output current	I <sub>L</sub>	700		mA
Power consumption I *1	Pd I	Ta=25°C 340	Ta=40°C 290	mW
Power consumption II *2	Pd II	Ta=25°C 690	Ta=40°C 580	mW

\*1: Power consumption I : Unit

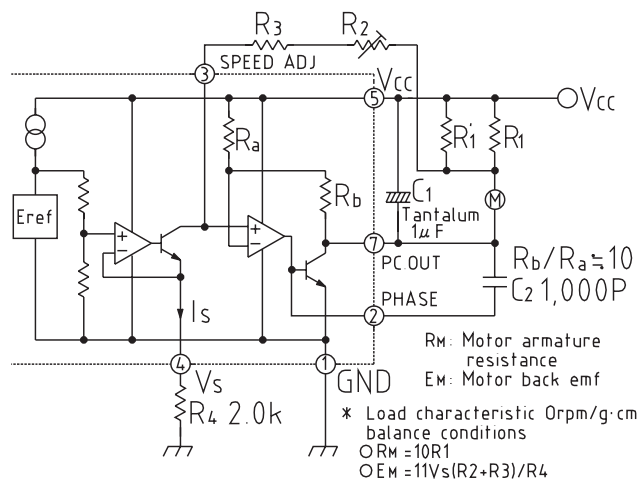
\*2: Power consumption II : when mounted on board  
 (55.0×20.0 mm, t=0.8 mm, copper area 30%)

## Electrical Characteristics (Except where noted otherwise, Ta=25°C)

Item	Symbol	Measurement conditions	Min.	Typ.	Max.	Units
Consumption current	$I_d$	A1		1.75	4.0	mV
Startup current	$I_{MS}$	A2 when $R_v$ is $1.5\Omega$	500			mV
Reference voltage	$V_S$	A1 when SW1 is off	90	100	110	mV
Reference voltage fluctuation I	$\Delta V_{S1}$	$V_S$ fluctuation rate for $V_{CC}$ between 1.5 and 3.5 V with $V_{CC}=3.0$ V as reference		0.1	0.5	%/V
Reference voltage fluctuation II	$\Delta V_{S2}$	$V_S$ fluctuation rate for $I_M$ between 25 and 200 mA with $I_M=100$ mA as reference		0.05	0.05	%/mA
Reference voltage fluctuation III	$\Delta V_{S3}$	$V_S$ fluctuation rate for $T_a$ between -10 and as reference 60 °C with $T_a=25^\circ\text{C}$		0.01		%/°C
Output saturation voltage	$V_{O\text{SAT}}$	V2 SW2 on, when $I_M$ is 200mA		0.2	0.3	V
Bridge ratio	K	$V_4/V_3$	9.5	10	10.5	
Bridge ratio fluctuation I	$\Delta K_1$	K fluctuation rate for $V_{CC}$ between 1.5 and 3.5 V with $V_{CC}=3.0$ V as reference		0.1	0.2	%/V
Bridge ratio fluctuation II	$\Delta K_2$	K fluctuation rate for $I_M$ between 25 and 200 mA with $I_M=100$ mA as reference		0.01	0.06	%/mA
Bridge ratio fluctuation III	$\Delta K_3$	K fluctuation rate for $T_a$ between -10 and 60 °C with $T_a=25^\circ\text{C}$ as reference		0.01		%/°C

Measurement conditions: Except where noted otherwise,  $V_{CC}=3.0$  V,  $I_M=100$  mA, SW1=on, SW2=off

## Block Diagram



## Measuring Circuit

