

# Current/Voltage Conversion Amplifier for CD Optical Pickups Monolithic IC MM1746XB

## Outline

This IC is a current/voltage converting amplifier developed for compact disc optical pickups including photodiode elements.

## Features

1. High speed frequency response  $f_c=6\text{MHz typ.}$
2. High sensitivity  $43\text{mV}/\mu\text{W typ.}$
3. Wide temperature range  $-20\sim+75^\circ\text{C}$
4. High-performance, compact transparent molded package.

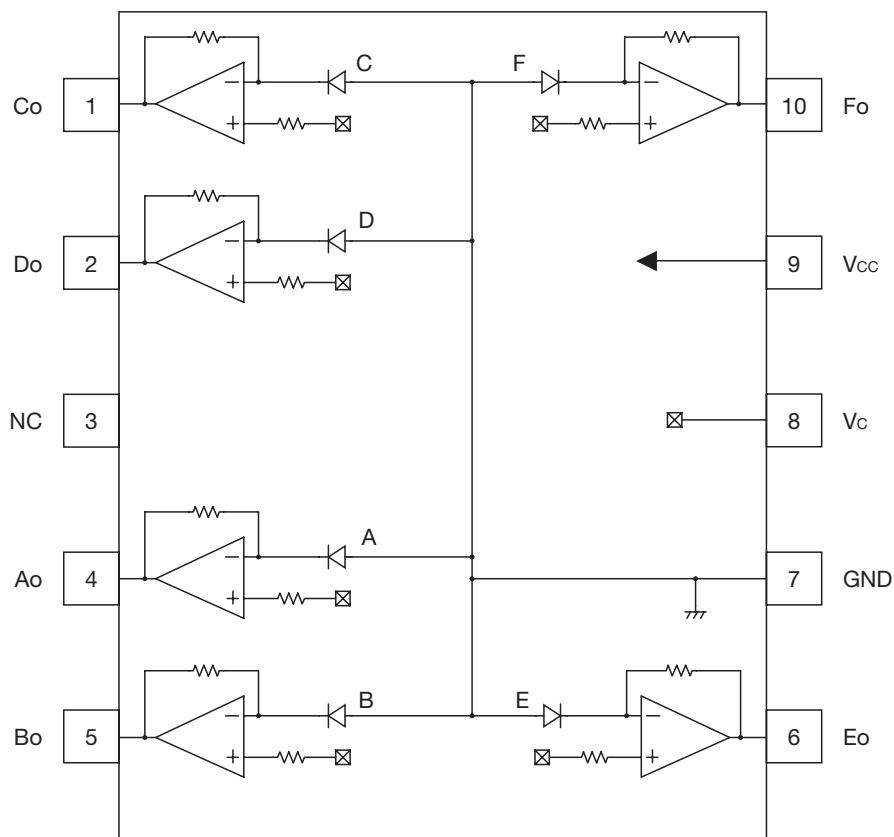
## Package

CMP-10C 4.0×5.0mm compact transparent molded package

## Applications

1. Music CD players
2. Portable music CD players

## Block Diagram



A, B, C, D, E, and F are photodiodes

Pin Description

Pin No.	Pin name	I/O	Functions	Internal equivalent circuit diagram
1 2 4 5	Co Do Ao Bo	Output	Output of electrical signal converted from optical signals.	
3	NC			
6 10	Eo Fo	Output	Output of electrical signal converted from optical signals.	
7	GND		GND Pin.	
8	Vc	Input	Center voltage input pin.	
9	Vcc	Input	Power voltage supply pin.	

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

Item	Symbol	Ratings	Units
Storage temperature	T <sub>STG</sub>	-40~+85	°C
Operating temperature	T <sub>OPR</sub>	-20~+75	°C
Supply voltage	V <sub>CC</sub> max.	6	V
Allowable loss	P <sub>d</sub>	200	mW

**Recommended Operating Conditions**

Item	Symbol	Ratings	Units
V <sub>CC</sub> Operating supply voltage	V <sub>CCOP</sub>	2.80~5.50	V
V <sub>C</sub> Operating supply voltage	V <sub>COP</sub>	1.40~V <sub>CC</sub> -1.4	V
Operating temperature	T <sub>OPR</sub>	-20~+75	°C

note 1 : V<sub>COP</sub>= 1/2 V<sub>CCOP</sub>

**Electrical Characteristics** (Except where noted otherwise Ta=25°C, V<sub>CC</sub>=5V, V<sub>C</sub>=2.5V)

Item	Symbol	Measurement conditions	Min.	Typ.	Max.	Units
Current consumption	I <sub>CC</sub>	In dark condition		5.0	7.0	mA
Output offset voltage (note 1-1)	V <sub>OFF</sub>	A~D In dark condition	-12	0	12	mV
		E, F In dark condition	-10	0	10	mV
Output offset voltage difference	ΔV <sub>OFF</sub>	(A+B) - (C+D) In dark condition	-12	0	12	mV
		(A+C) - (B+D) In dark condition	-12	0	12	mV
		(A+D) - (B+C) In dark condition	-12	0	12	mV
		E - F In dark condition	-10	0	10	mV
Output voltage (note 1-2, 4)	V <sub>O</sub>	A~D P <sub>o</sub> =10μW, λ=780nm	32.5	43.0	53.5	mV/μW
		E, F P <sub>o</sub> =10μW, λ=780nm	69.0	92.0	115.0	mV/μW
Maximum output voltage (note 1-3, 4)	V <sub>OMAX</sub>	A~D P <sub>o</sub> =100μW, λ=780nm	3.9	4.1		V
		E, F P <sub>o</sub> =100μW, λ=780nm	4.5	4.9		V
Frequency characteristics (note 1-4)	f <sub>c</sub>	A~D P <sub>o</sub> =10μW, λ=780nm 100kHz reference, -3dB	4.0	6.0		MHz
		E, F P <sub>o</sub> =10μW, λ=780nm 10kHz reference, -3dB	0.1	0.4		MHz

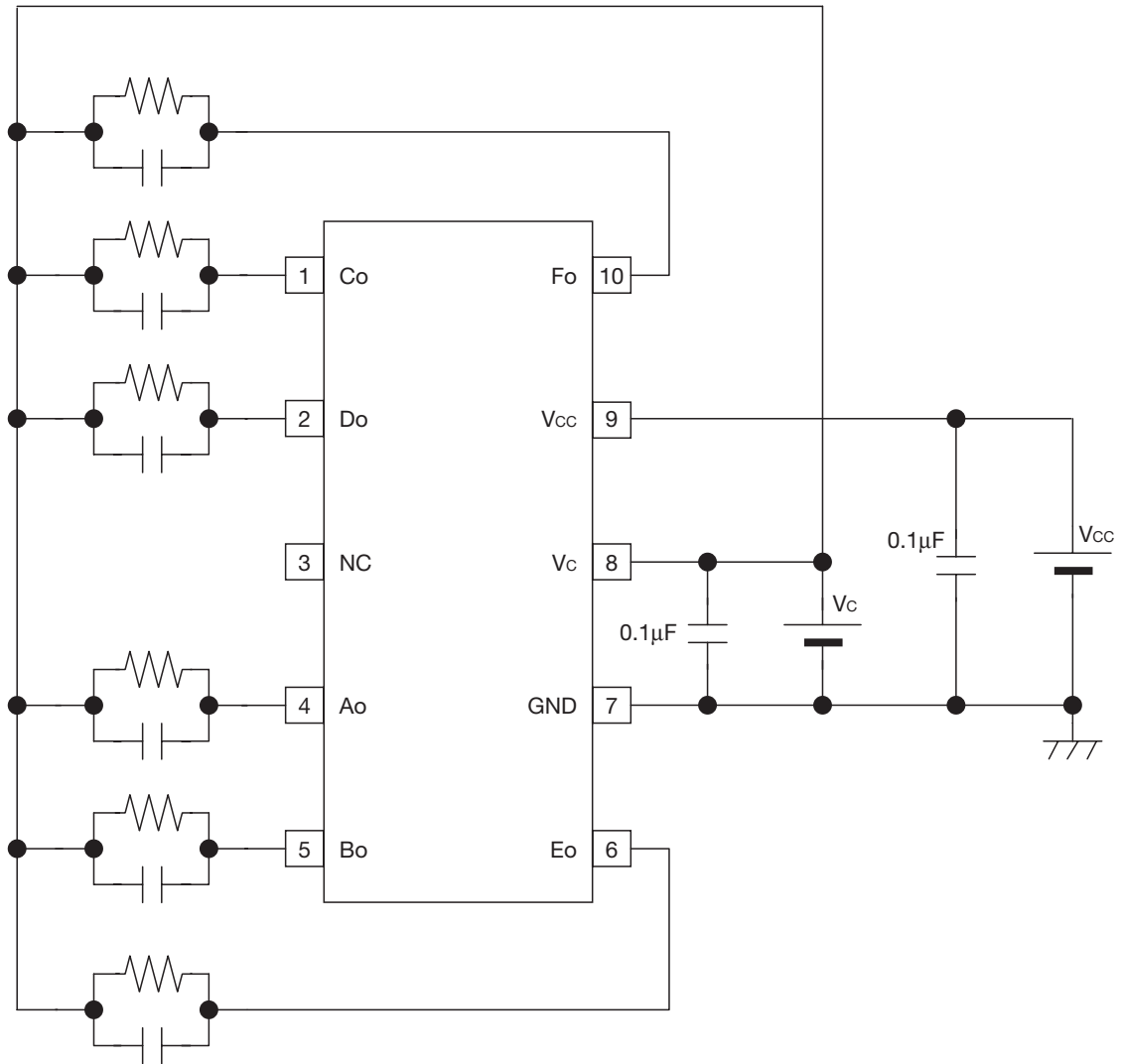
note1-1 : Measure output offset voltage A to F with reference to V<sub>C</sub>.

note1-2 : Measure output voltage with reference to output offset voltage.

note1-3 : Measure maximum output voltage with reference to GND.

note1-4 : Output voltage, Frequency characteristics and Maximum output voltage are guaranteed by design.

Measuring Circuit



\*Condition of load are all 10kΩ//10pF

Photo detector pattern dimensions

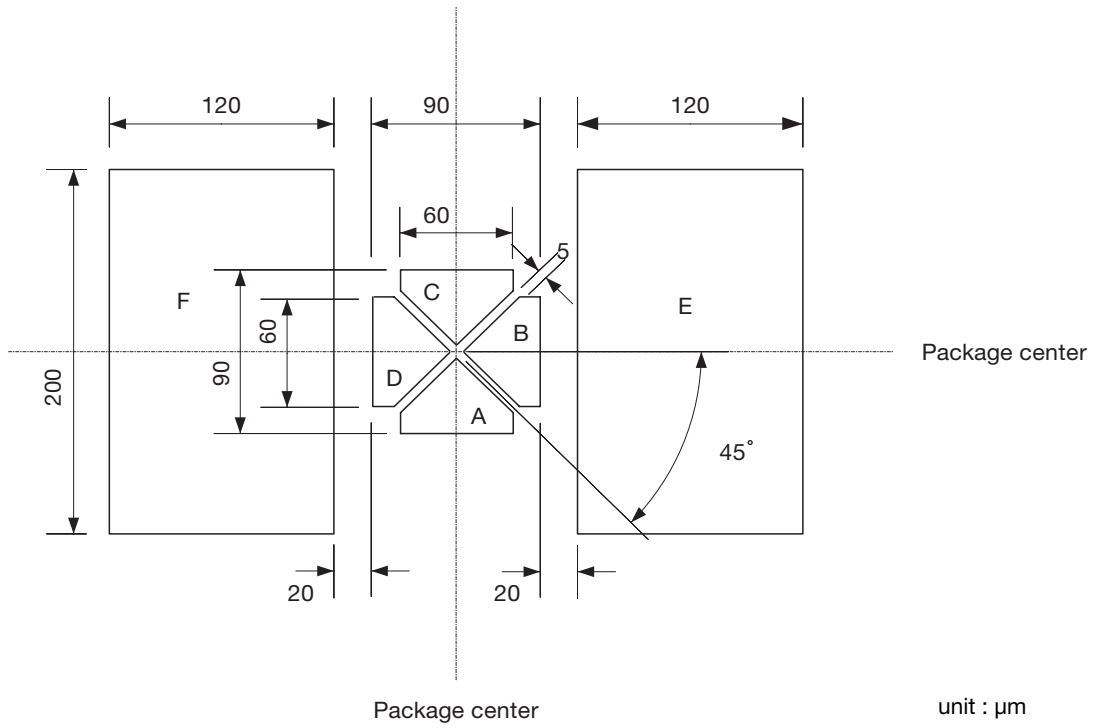


Photo detector position

