Ordering number : ENA0936

SANYO Semiconductors
DATA SHEET

LA6220M — Monolithic Linear IC Rail-to-Rail Dual Operational Amplifier

Overview

The LA6220M dual operational amplifier is optimal for both consumer and industrial applications, including all types of transducer amplifier and DC amplifier circuit. It supports from ground to V_{CC} (rail to rail) as the voltage range for both inputs and outputs . It is optimal for the amplification of signals from all types of sensors.

Functions

- Does not require phase compensation
- Supports from ground to V_{CC} (rail to rail) as the voltage range for both inputs and outputs
- Low current dissipation : I_{CC} = 1.2mA typ/V_{CC} = +5V, $R_L = \infty$

Specifications

Maximum Ratings at Ta = 25°C

Parameter	Symbol	Conditions	Ratings	Unit
Maximum supply voltage	V_{CC} max		18	V
Differential input voltage	V_{ID}		±1	V
Maximum input voltage	V_{IN} max		-0.3 to +18	V
Allowable power dissipation	Pd max	Ta ≤ 25°C Mounted on specified board. *	0.8	W
Operating temperature	Topr		-30 to +75	°C
Storage temperature	Tstg		-55 to +150	°C

* Specified board size : 114.3×76.1×1.6mm^3, glass epoxy.

Recommended Operating Conditions at Ta = 25°C

Parameter	Symbol	Conditions	Ratings	Unit
Supply voltage	V_{CC}		2 to 17	V

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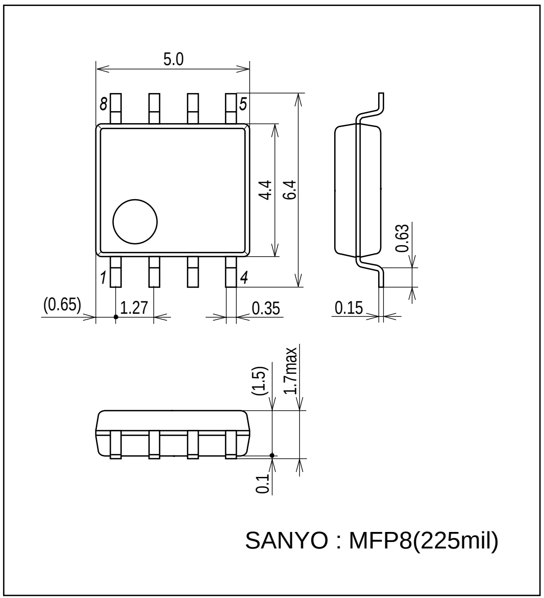
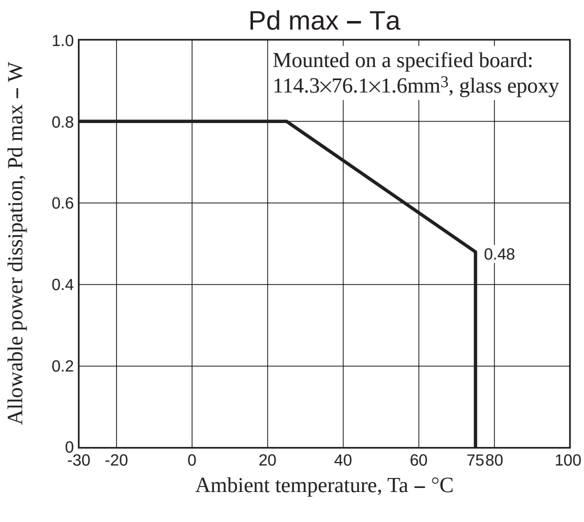
Electrical Characteristics at Ta = 25°C, V_{CC} = 5V, Otherwise unless specified.

Parameter	Symbol	Conditions	Test circuit	Ratings			Unit
				min	typ	max	
Input offset voltage	V_{IO}		1		±2	±7	mV
Input offset current	I_{IO}	I_{IN} (+)/I_{IN} (-)	2		±5	±50	nA
Input bias current	I_B	I_{IN} (+)/I_{IN} (-)	3, 4		45	250	nA
Common-mode input voltage range	VICM		5	0		V_{CC}	V
Common-mode rejection ration	CMR		5		80		dB
Large amplitude voltage	VG		6		100		V/mV
Output voltage range	$V_{OH}1A$	R_L = 20kΩ : Ta = 25°C	12	4.9			V
	$V_{OH}1B$	R_L = 20kΩ : Ta = -40 to 85°C	12	4.85			V
	$V_{OL}1$	R_L = 20kΩ	12			0.1	V
Output voltage range	$V_{OH}2$	R_L = 2kΩ	12	4.75			V
	$V_{OL}2$	R_L = 2kΩ	12			0.25	V
Supply voltage rejection ratio	SVR		11		80		dB
Channel separation	CS	f = 1kHz to 20kHz	7		80		dB
Current drain	I_{CC}		8		1.2	2.5	mA
Output current (source)	I_O source	V_{IN}+ = 1V, V_{IN}- = 0V	9	6	10		mA
Output current (sink)	I_O sink	V_{IN}+ = 0V, V_{IN}- = 1V	10	3	5		mA
Slew rate	SR	R_L = 2kΩ			0.35		V/µs
Gain-bandwidth product	Ft	R_L = 2kΩ			1		MHz
Phase margin	ΦM	R_L = 2kΩ			80		Deg

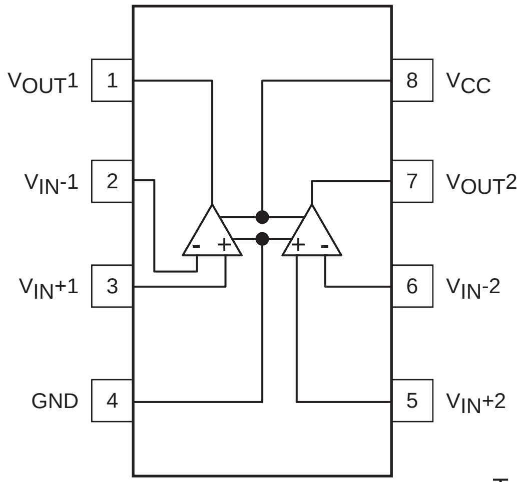
Package Dimensions

unit : mm (typ)
3032D



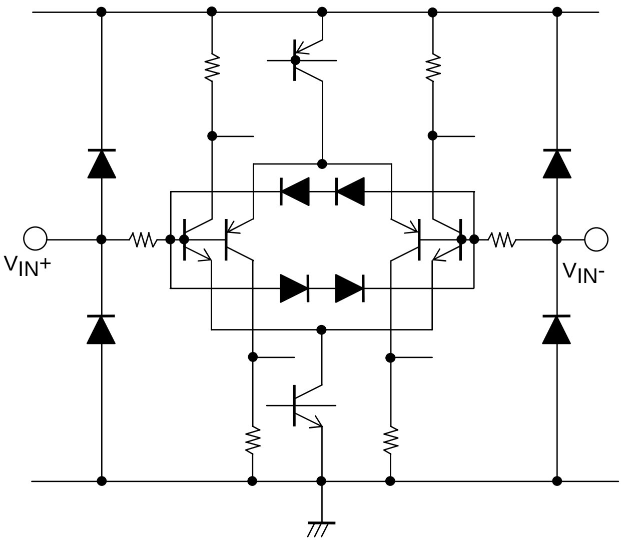
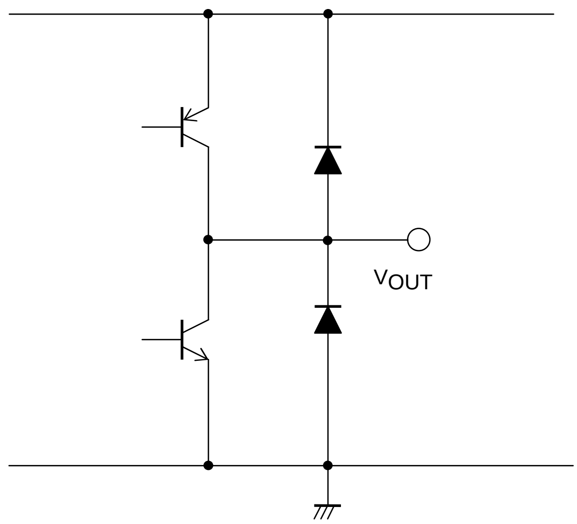


Pin Assignment



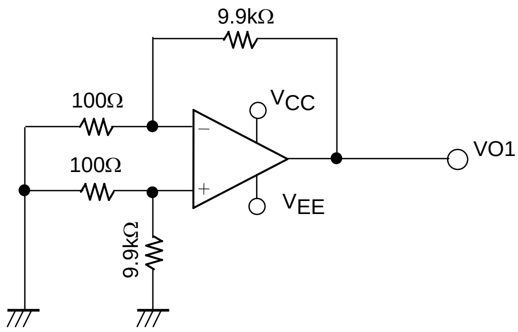
Top view

Pin Description

Pin No.	Symbol	function	Equivalent circuit
3 2 5 6	$V_{IN}+1$ $V_{IN}-1$ $V_{IN}+2$ $V_{IN}-2$	Noninverting inputs 1 Inverting inputs 1 Noninverting inputs 2 Inverting inputs 2	
1 7	$V_{OUT}1$ $V_{OUT}2$	Outputs 1 Outputs 2	

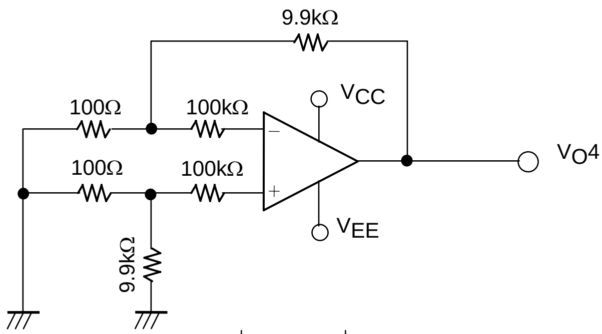
Test Circuits

1. Input offset voltage V_{IO}



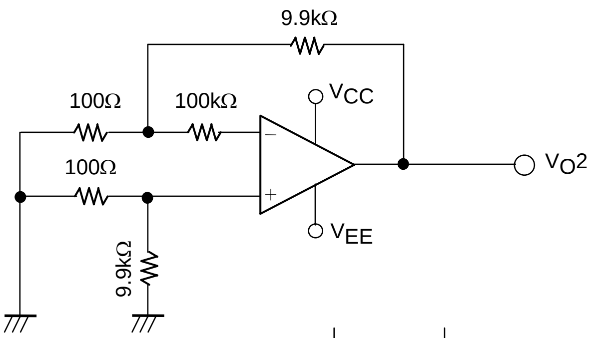
$V_{CC}/V_{EE} = \pm 2.5V$
$V_{IO} = V_O1/100$

2. Input offset current I_{IO}



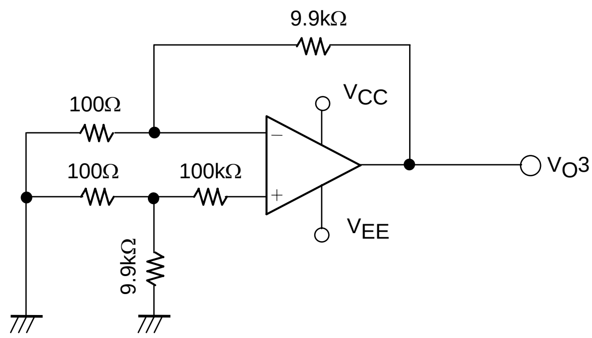
$$I_{IO} = \frac{|V_O4 - V_O1|}{100k\Omega \times 100}$$

3. Input bias current I_B (-)



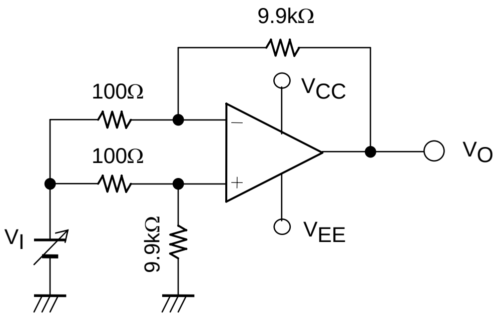
$$I_B(-) = \frac{|V_O2 - V_O1|}{100k\Omega \times 100}$$

4. Input bias current I_B (+)



$$I_B(+) = \frac{|V_O3 - V_O1|}{100k\Omega \times 100}$$

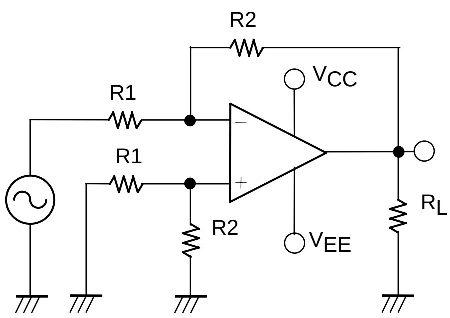
5. Common-mode rejection ratio (CMR)
Common-mode input voltage range (VICM)



CMR $V_I = \pm 2.5V$

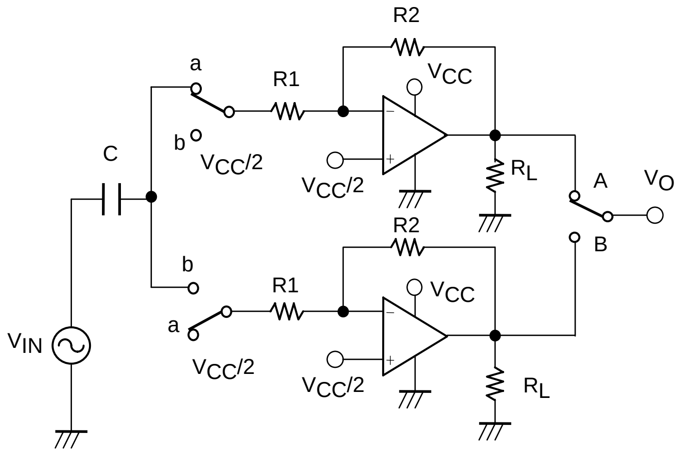
CMR = 20log (5×100/ $|\Delta V_O|$)

6. Voltage gain (VG)



$$VG = \frac{R2}{R1}$$

7. Channel separation (CS)



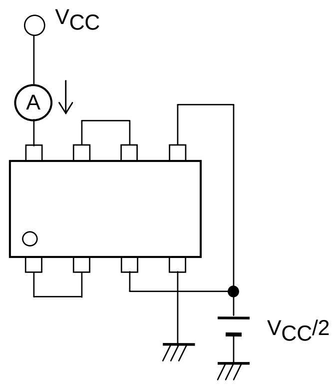
When the switch is the "a" position.

$$CS(A \to B) = 20\log \frac{R2V_{OA}}{R1V_{OB}}$$

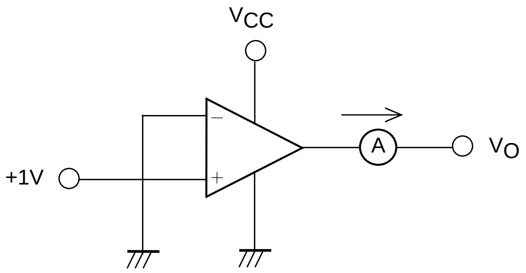
When the switch is the "b" position.

$$CS(B \to A) = 20\log \frac{R2V_{OB}}{R1V_{OA}}$$

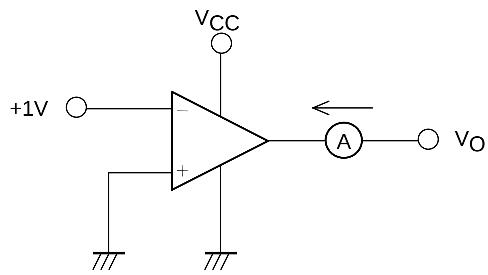
8. Current drain (I_{CC})



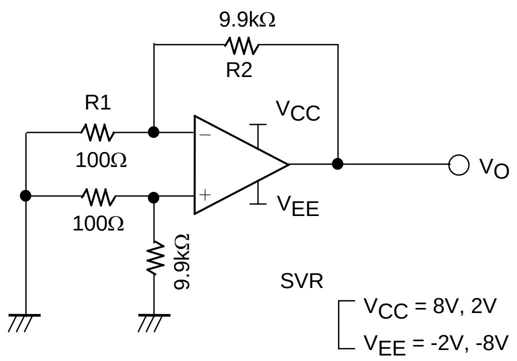
9. Output current ($I_O$source)



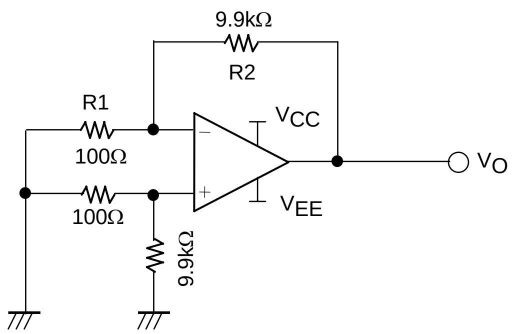
10. Output current ($I_O$sink)



11. Supply voltage rejection ratio SVR (+)



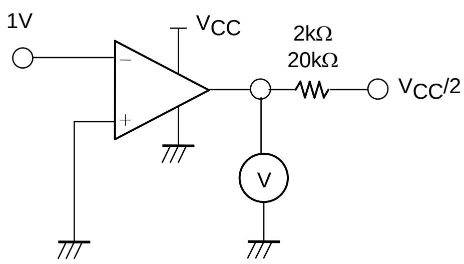
12. Supply voltage rejection ratio SVR (-)



$$SVR(+) = 20\log \left| \frac{\Delta V_{CC} \times 100}{\Delta V_O} \right|$$

$$SVR(-) = 20\log \left| \frac{\Delta V_{EE} \times 100}{\Delta V_O} \right|$$

13. Output voltage range (Isink)



14. Output voltage range (Isource)