

TOSHIBA BIPOLAR LINEAR INTEGRATED CIRCUIT SILICON MONOLITHIC

TA2050S, TA2050F

GROUND ISOLATOR IC

TA2050S/F are ground isolator IC designed for car audio equipments.

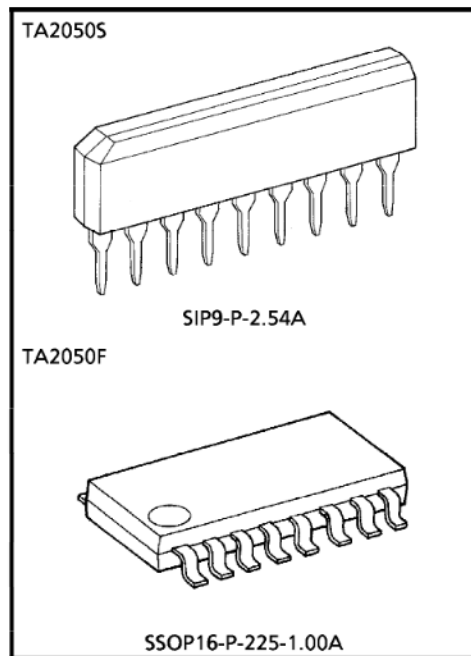
These IC contains dual channel differential amplifier with built-in feedback resistors.

The effect of ground noise due to difference grounding points on car chassis between head unit and other component unit can be reduced by high common mode rejection performance.

Non-inverting and inverting application are available.

FEATURES

- Dual Channel Differential Amplifier
- Built-in feedback Resistor
- High Common Mode Rejection Ratio
: CMRR = 60dB (Typ.) ($V_{CC} = 8V$, $f = 1kHz$, $V_{CM} = 1V_{rms}$)
- Low Noise
: $V_{NO} = 1.7\mu V_{rms}$ (Typ.)
($V_{CC} = 8V$, $R_g = 620\Omega$, Filter = 20Hz~20kHz)
- Low Distortion
: THD = 0.002% (Typ.) ($V_{CC} = 8V$, $f = 1kHz$, $V_{IN} = 1V_{rms}$)
- Package
: TA2050S Single-Inline 9pins (SIP-9)
TA2050F 1mm pitch Flat package 16pins (MFP-16)
- Operating Supply Voltage Range
: $V_{CC(opr)} = 5\sim 10V$ ($T_a = 25^\circ C$)



Weight

SIP9-P-2.54A	: 0.92g (Typ.)
SSOP16-P-225-1.00A	: 0.14g (Typ.)

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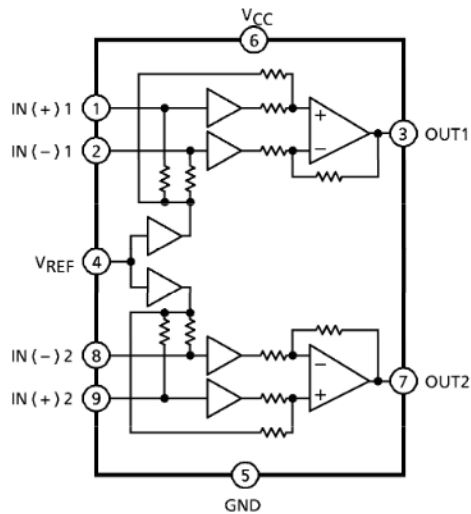
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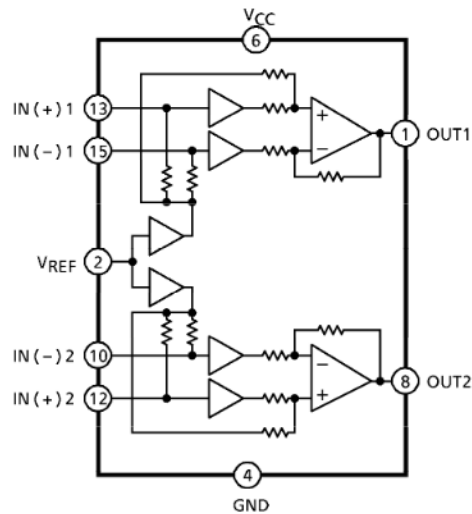
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BLOCK DIAGRAM

TA2050S

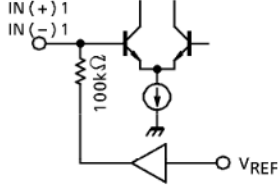
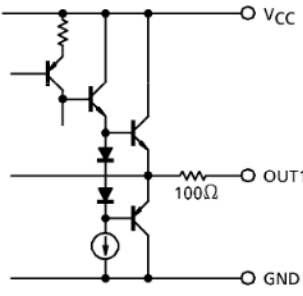
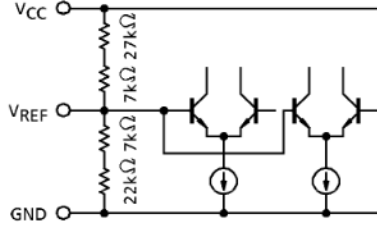


TA2050F



※ 3, 5, 7, 9, 11, 14, 16pin : NC

TERMINAL EXPLANATION

TERMINAL NAME		SYMBOL	CONTENTS	EQUIVALENT CIRCUIT
S	F			
1	13	IN (+) 1	Noninverting input terminal for channel 1. This terminal is biased by resistor (100k Ω (Typ.)) from internal reference amplifier.	
2	15	IN (-) 1	Inverting line input terminal for channel 1. This terminal is biased by resistor (100k Ω (Typ.)) from internal reference amplifier.	
3	1	OUT1	Channel 1 output terminal. Output resistor is 100 Ω (Typ.).	
4	2	VREF	Reference voltage terminal. Individual built-in reference amp for each channel.	
5	4	GND	—	—
6	6	VCC	—	—
7	8	OUT2	Channel 2 output terminal. Output resistor is 100 Ω (Typ.).	Same as OUT1
8	10	IN (-) 2	Channel 2 output terminal. Output resistor is 100 Ω (Typ.).	Same as IN (+) 1, IN (-) 1
9	12	IN (+) 2	Channel 2 output terminal. Output resistor is 100 Ω (Typ.).	
—	3 5 7 9 11 14 16	N.C	Non. connection terminal for TA2050F.	—

MAXIMUM RATINGS ($T_a = 25^\circ\text{C}$)

CHARACTERISTIC	SYMBOL	RATING	UNIT
Supply Voltage	V_{CC}	15	V
Power Dissipation	P_D (Note)	900	mW
		350	
Operating Temperature	T_{opr}	$-30 \sim 85$	$^\circ\text{C}$
Storage Temperature	T_{stg}	$-55 \sim 150$	$^\circ\text{C}$

(Note) Derated above $T_a = 25^\circ\text{C}$ in the proportion of $7.2\text{mW}/^\circ\text{C}$ for TA2050S, $2.8\text{mW}/^\circ\text{C}$ for TA2050F.

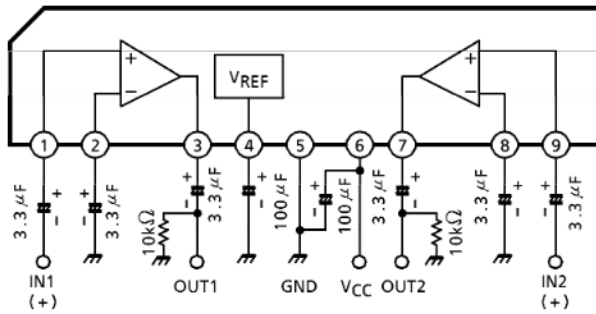
ELECTRICAL CHARACTERISTICS

(Unless otherwise specified, $V_{CC} = 8\text{V}$, $f = 1\text{kHz}$, $R_L = 10\text{k}\Omega$, noninverting configuration, $T_a = 25^\circ\text{C}$)

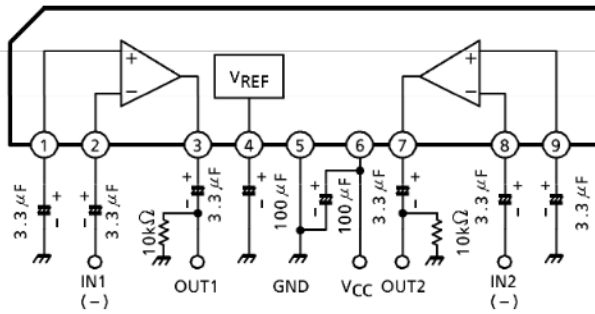
CHARACTERISTIC	SYMBOL	TEST CIR-CUIT	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Quiescent Current	I_{CCQ}	—	$V_{in} = 0$	6	9	15	mA
Voltage Gain	G_V	—	—	-1	0	+1	dB
Maximum Output Voltage	$V_{OM(1)}$	—	Noninverting, THD = 1%	1.3	1.7	—	V_{rms}
	$V_{OM(2)}$	—	Inverting, THD = 1%	1.0	1.2	—	
Total Harmonic Distortion	THD	—	$V_{out} = 1V_{rms}$ Filter BW = 400Hz~30kHz	—	0.002	0.01	%
Cross Talk	C.T.	—	$V_{in} = 1V_{rms}$	—	-86	-75	dB
Input Resistance	R_{IN}	—	—	—	100	—	$\text{k}\Omega$
Output Resistance	R_{OUT}	—	—	—	100	—	Ω
Output Noise Voltage	V_{NO}	—	$R_g = 620\Omega$ DIN AUDIO Weighting	—	1.7	3.0	μV_{rms}
Common Mode Rejection Ratio	CMRR	—	—	—	-60	-50	dB
Maximum Common mode Input Voltage	$V_{CM(MAX)}$	—	CMRR = -50dB	1.0	1.6	—	V_{rms}
Ripple Rejection Ratio	R.R.	—	$f = 100\text{Hz}$	—	-57	-50	dB

TEST CIRCUIT

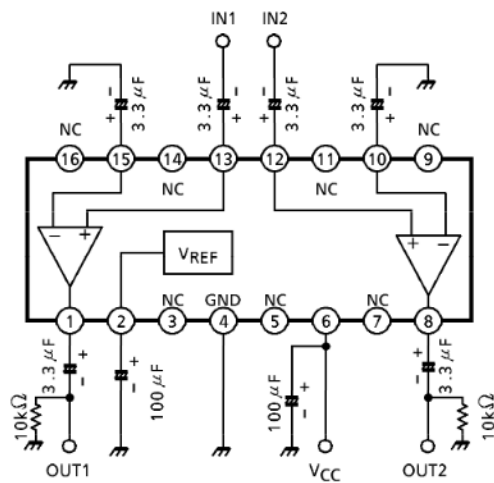
TA2050S non-inverting circuit



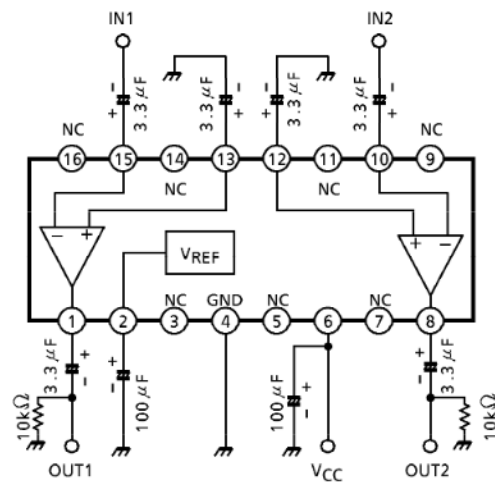
TA2050S inverting circuit

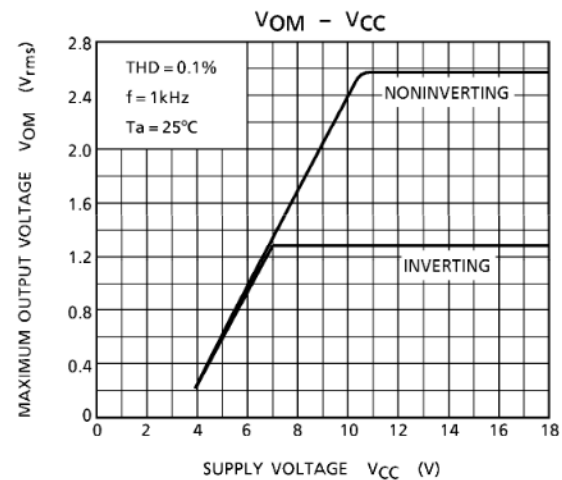
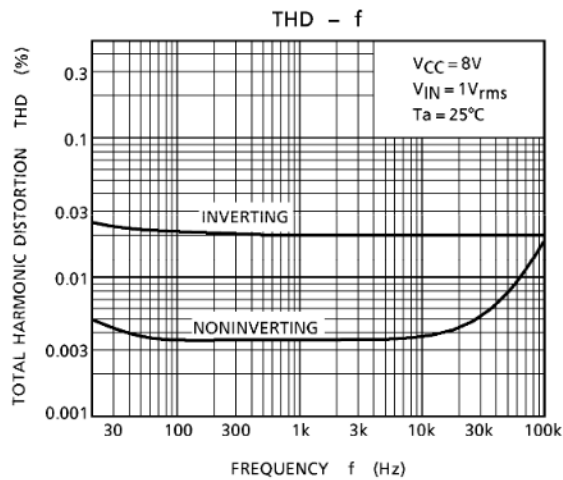
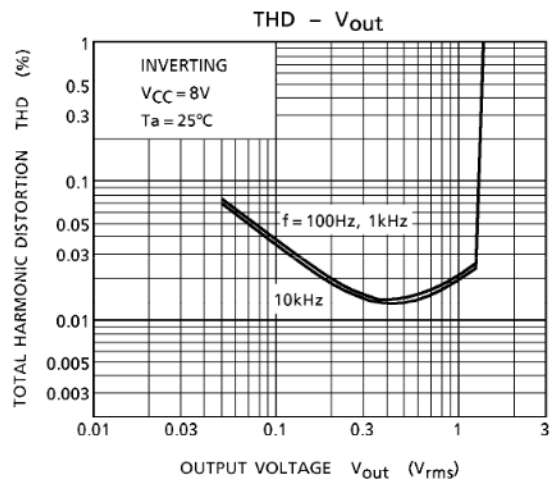
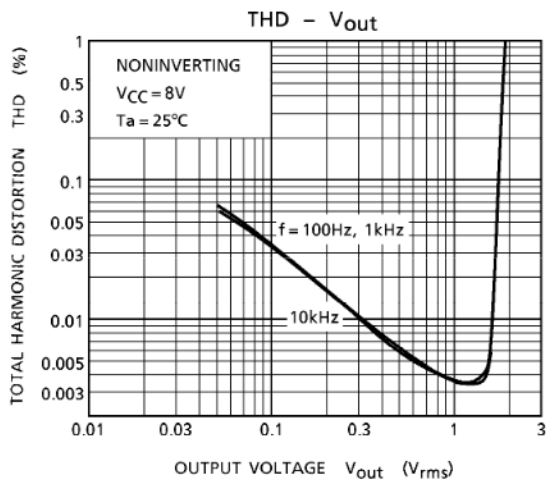
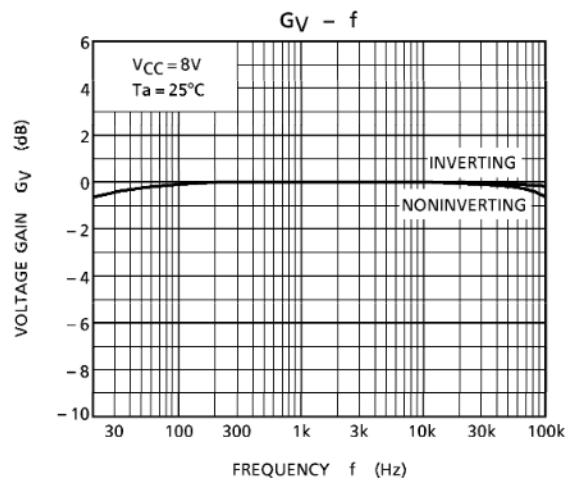
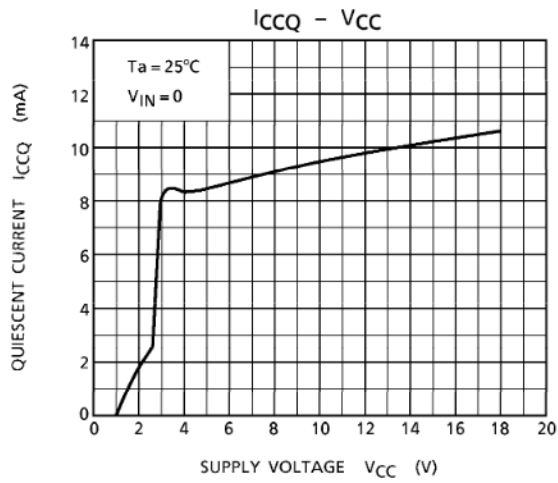


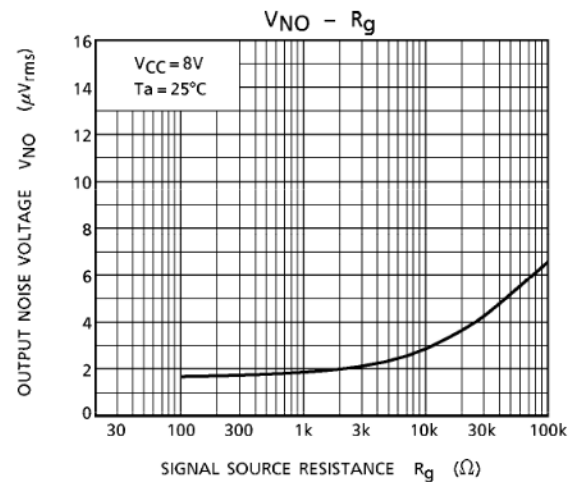
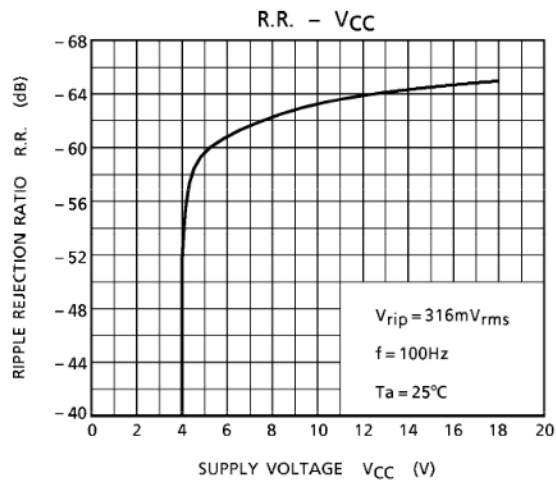
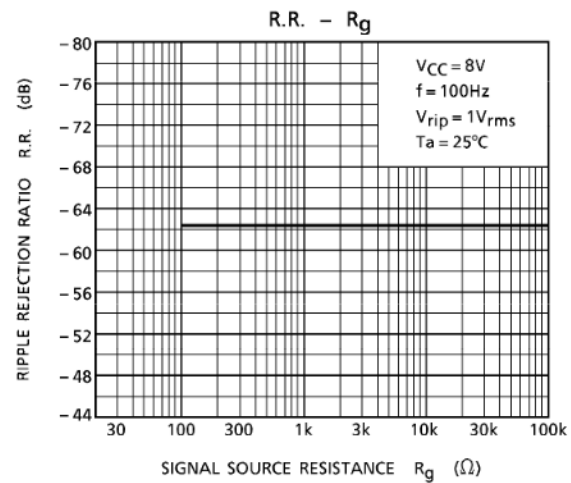
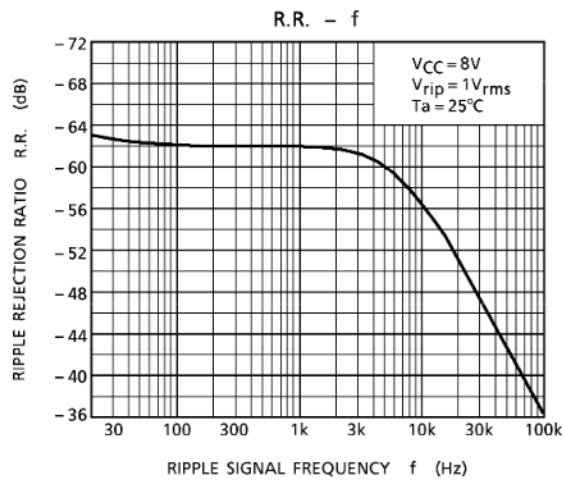
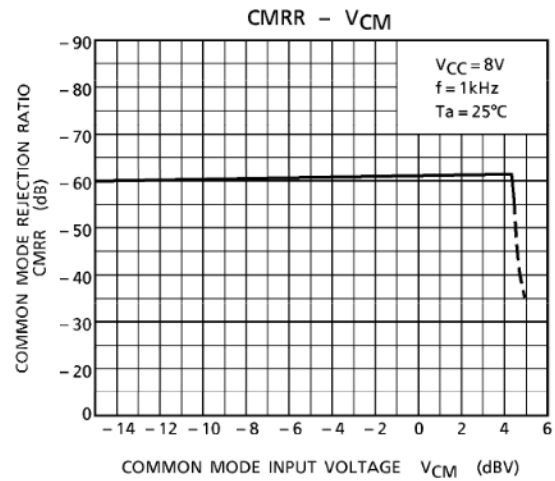
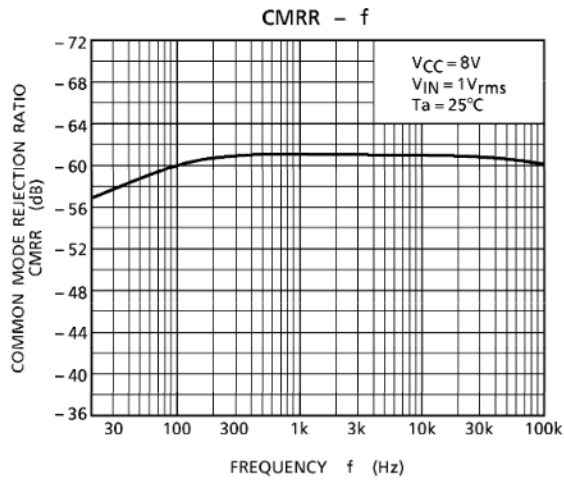
TA2050F non-inverting circuit

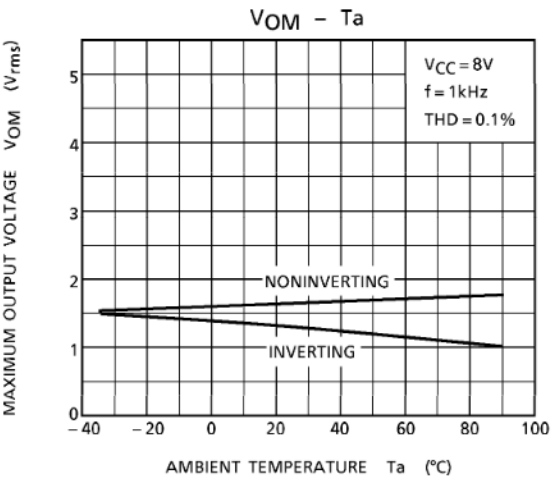
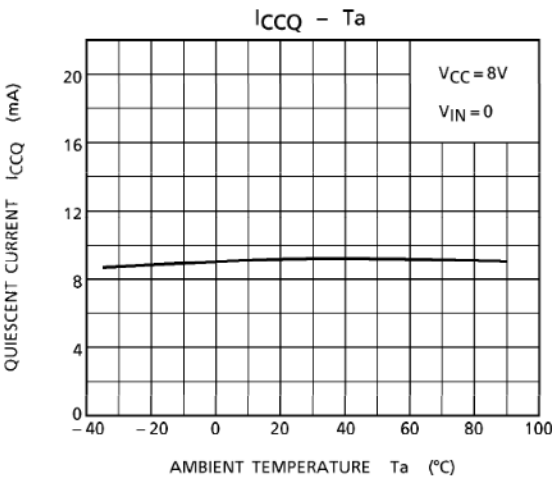


TA2050F inverting circuit



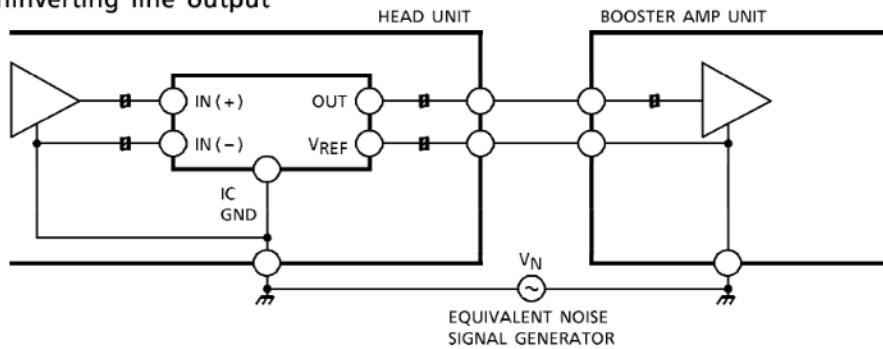




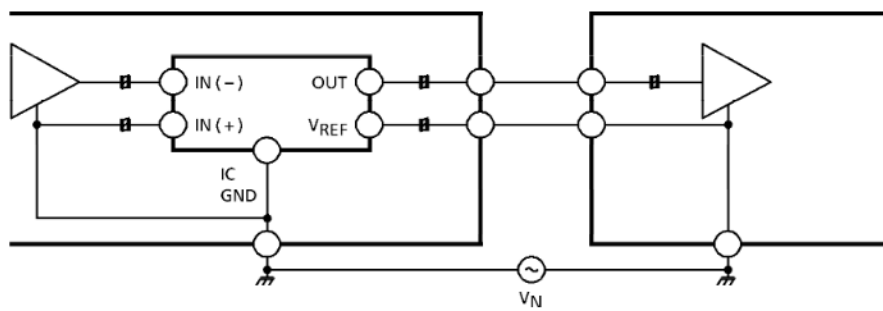


APPLICATION BLOCK DIAGRAM

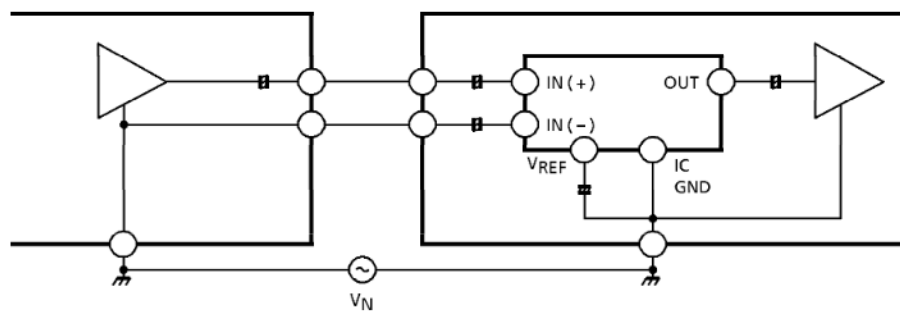
(1) Noninverting line output



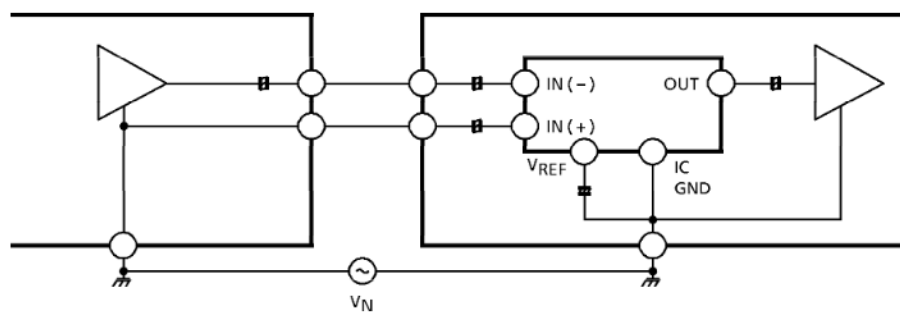
(2) Inverting line output



(3) Noninverting line input

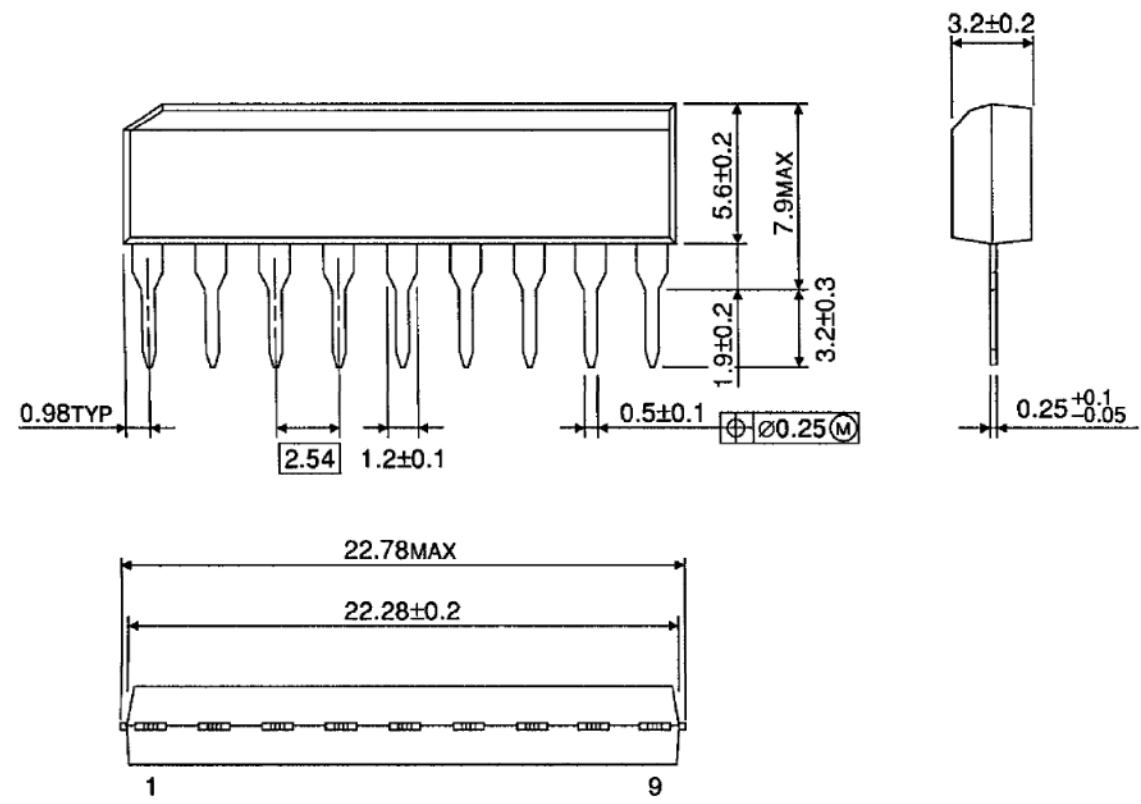


(4) Inverting line input



OUTLINE DRAWING
SIP9-P-2.54A

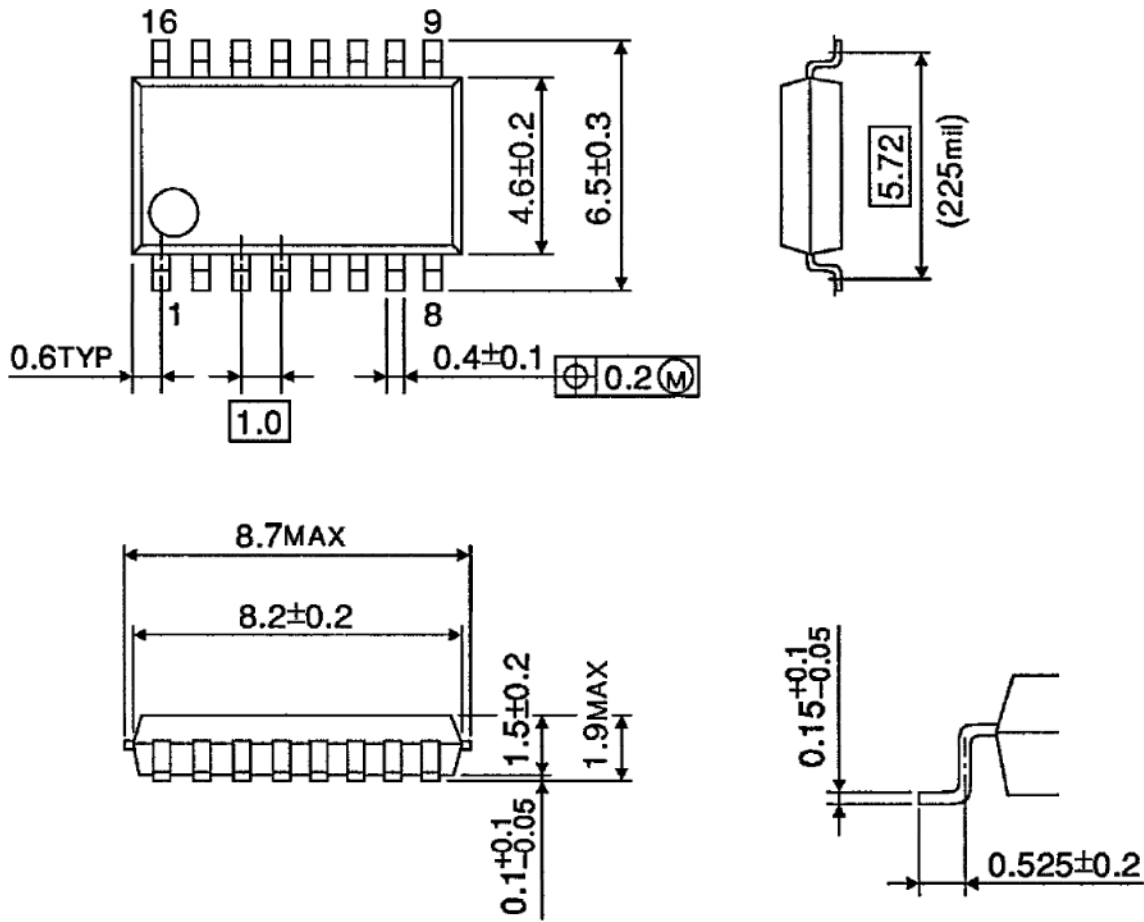
Unit : mm



Weight : 0.92g (Typ.)

OUTLINE DRAWING
SSOP16-P-225-1.00A

Unit : mm



Weight : 0.14g (Typ.)