

TOSHIBA BIPOLAR LINEAR INTEGRATED CIRCUIT SILICON MONOLITHIC

# TA2026SN, TA2026F

## UNBALANCED TO BALANCES SIGNAL CONVERTER

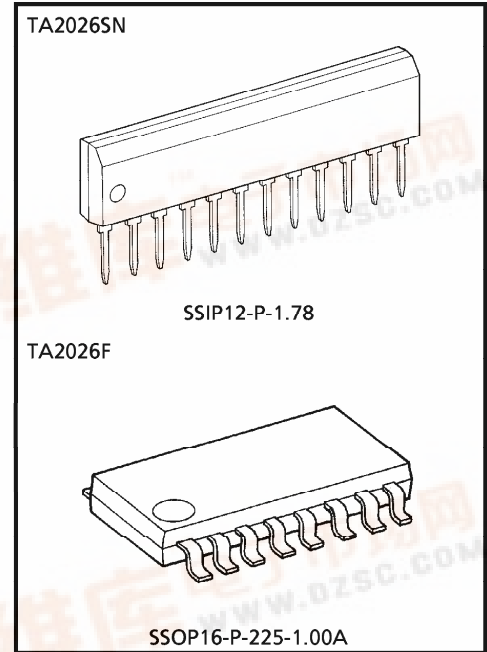
The TA2026SN, TA2026F are unbalanced to balanced signal converter IC for component type car audio equipments. Noise level of audio signal increases by ground noise and induction noise while transferred between head unit and other equipments. To reduce these effect, balanced signal transfer system is effective.

TA2026SN, TA2026F have built-in dual balanced signal output amplifier and audio muting circuit.

In application with ground isolator IC ; TA8181SN, TA8181F for line input stage, high performance balanced signal transfer system can be composed.

### FEATURES

- Dual Channel
- Voltage Gain :  $G_V = 6\text{dB}$  (Typ.)
- Maximum Output Voltage  
:  $V_{OM} = 3V_{rms}$  (Typ.)  
( $V_{CC} = 8V$ ,  $f = 1\text{kHz}$ ,  $\text{THD} = 0.1\%$ )
- Total Harmonic Distortion  
:  $\text{THD} = 0.004\%$  (Typ.)  
( $V_{CC} = 8V$ ,  $f = 1\text{kHz}$ ,  $V_{out} = 1V_{rms}$ )
- Output Noise Voltage  
:  $V_{NO} = 1.8\mu V_{rms}$  (Typ.)  
( $V_{CC} = 8V$ ,  $R_g = 620\Omega$ ,  $\text{BW} = 20\text{Hz} \sim 20\text{kHz}$ )
- Audio Muting Circuit  
:  $\text{ATT} = -90\text{dB}$  (Typ.)
- Small Package  
: 1.778mm pitch Shrink Single In-line 12pin : TA2026SN  
1.0mm pitch mini flat 16pin : TA2026F
- Operating Supply Voltage Range  
:  $V_{CC}(\text{opr.}) = 5 \sim 12V$  ( $T_a = 25^\circ\text{C}$ )



Weight  
 SSIP12-P-1.78 : 0.65g (Typ.)  
 SSOP16-P-225-1.00A : 0.14g (Typ.)

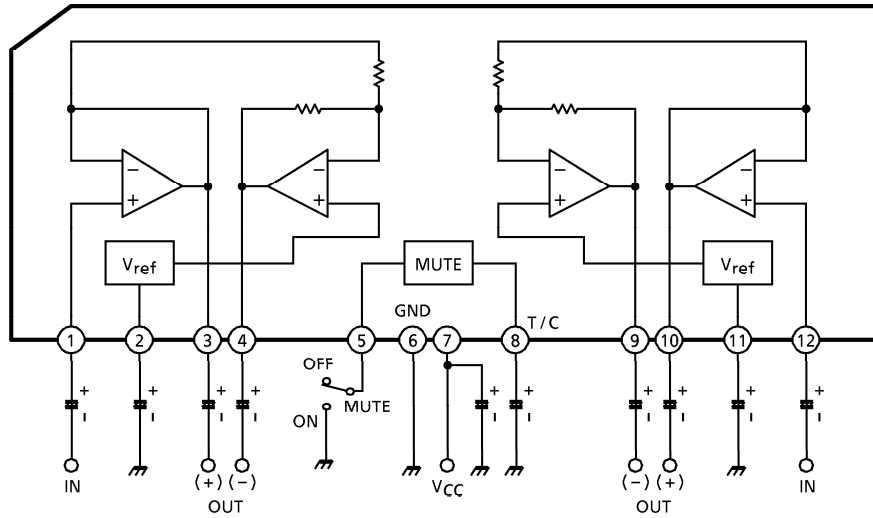
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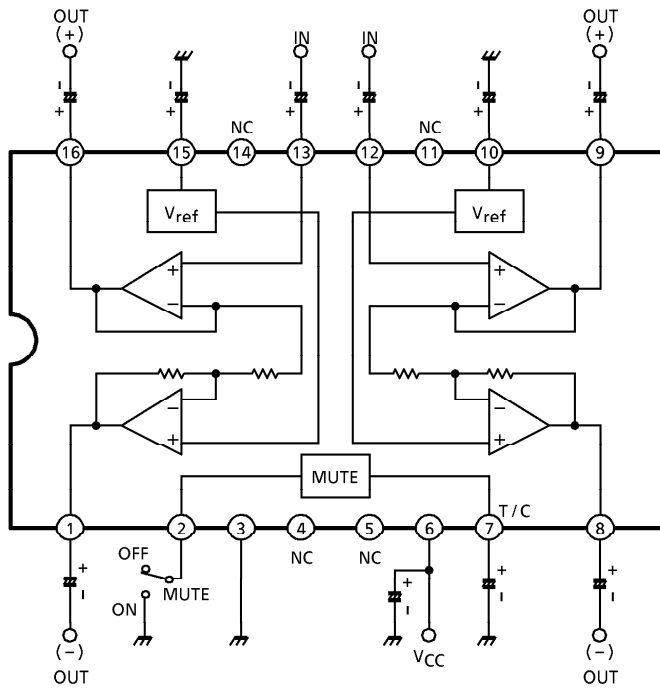


**BLOCK DIAGRAM**

TA2026SN



TA2026F



**MAXIMUM RATINGS** (Ta = 25°C)

CHARACTERISTIC	SYMBOL	RATING	UNIT
Supply Voltage	V <sub>CC</sub>	15	V
Power Dissipation	TA2026SN	750	mW
	TA2026F	350	
Operating Temperature	T <sub>opr</sub>	- 30~85	°C
Storage Temperature	T <sub>stg</sub>	- 55~150	°C

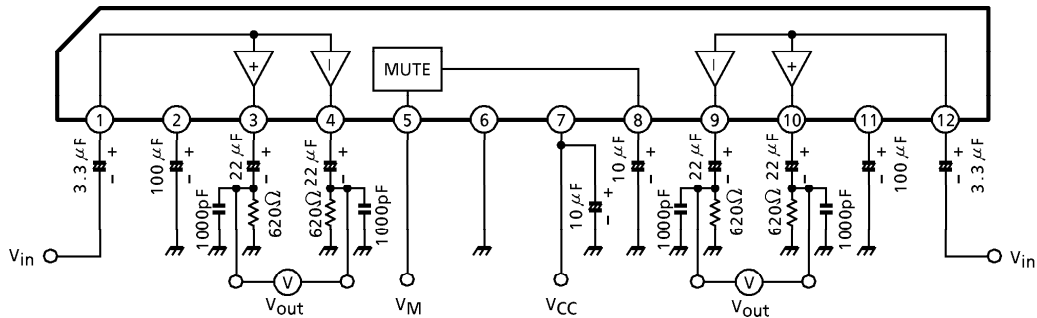
(Note) Derated above Ta = 25°C in the proportion of 6mW/°C for TA2026SN, 2.8mW/°C for TA2026F.

**ELECTRICAL CHARACTERISTICS** (Unless otherwise specified, V<sub>CC</sub> = 8V, f = 1kHz, R<sub>L</sub> = 620Ω, Ta = 25°C)

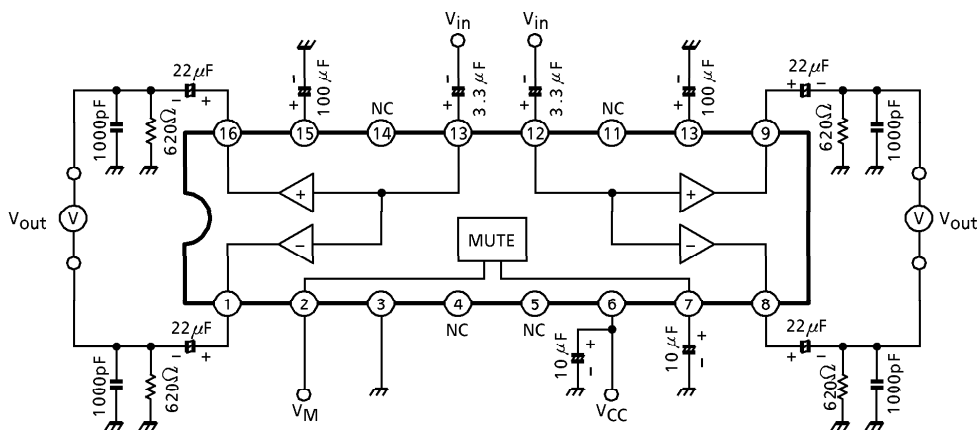
CHARACTERISTIC	SYMBOL	TEST CIRCUIT	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Quiescent Current	I <sub>CCQ</sub>	—	V <sub>in</sub> = 0	6	11	17	mA
Voltage Gain	G <sub>V</sub>	—	Balanced output gain	4.0	5.7	8.0	dB
	G <sub>V</sub> (+)	—	Non-inverting gain	- 1.5	- 0.5	+ 0.5	
	G <sub>V</sub> (-)	—	Inverting gain	- 1.5	- 0.5	+ 0.5	
Gain Tracking	ΔG <sub>V</sub>	—	G <sub>V</sub> (+) - G <sub>V</sub> (-)	- 1.0	0	+ 1.0	dB
Maximum Output Voltage	V <sub>om</sub>	—	THD = 0.1%	2.5	3.1	—	V <sub>rms</sub>
Total Harmonic Distortion	THD	—	V <sub>out</sub> = 1V <sub>rms</sub>	—	0.004	0.01	%
Output Noise Voltage	V <sub>no</sub>	—	R <sub>g</sub> = 620Ω, Filter BW = 20Hz~20kHz	—	1.8	3.0	μV <sub>rms</sub>
Cross Talk	C.T.	—	V <sub>out</sub> = 2V <sub>rms</sub>	—	- 70	- 60	dB
Ripple Rejection Ratio	R.R.	—	V <sub>rip</sub> = 1V <sub>rms</sub> , f <sub>rip</sub> = 100Hz, R <sub>g</sub> = 620Ω	—	- 60	- 50	dB
Mute Attenuation	ATT	—	Ref : V <sub>out</sub> = 2V <sub>rms</sub>	—	- 90	- 80	dB
Mute ON Control Voltage	V <sub>M ON</sub>	—	MUTE = ON	0	—	1.0	V
	V <sub>M OFF</sub>	—	MUTE = OFF	3.0	—	V <sub>CC</sub>	
Input Resistance	R <sub>IN</sub>	—	—	—	100	—	kΩ

**TEST CIRCUIT**

TA2026SN

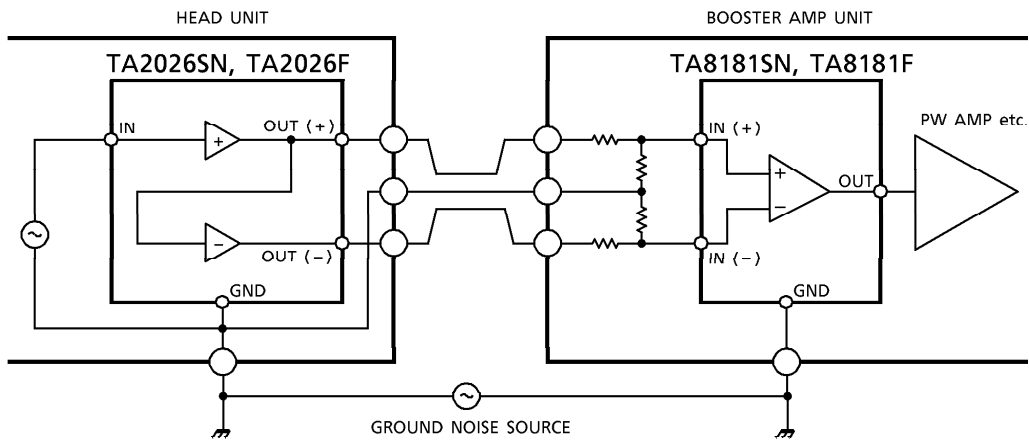


TA2026F



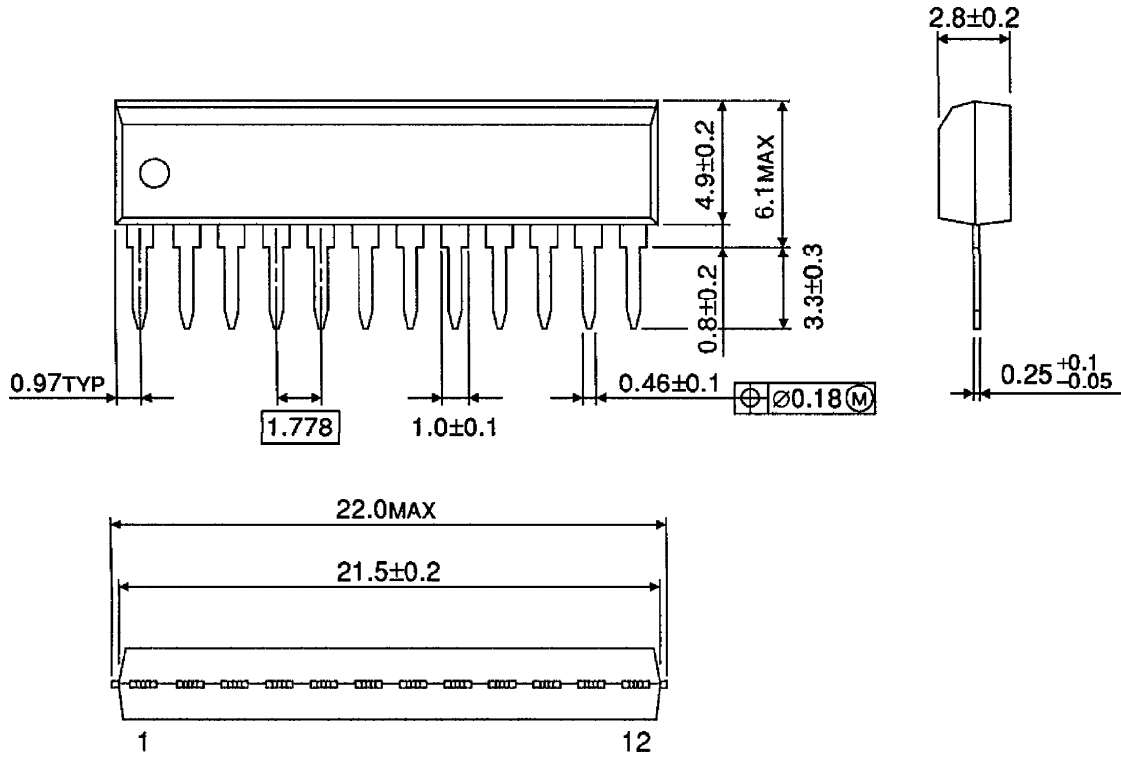
**APPLICATION CIRCUIT**

TA2026SN, TA2026F + TA8181SN, TA8181F BALANCED SIGNAL TRANSFER SYSTEM



OUTLINE DRAWING  
SSIP12-P-1.78

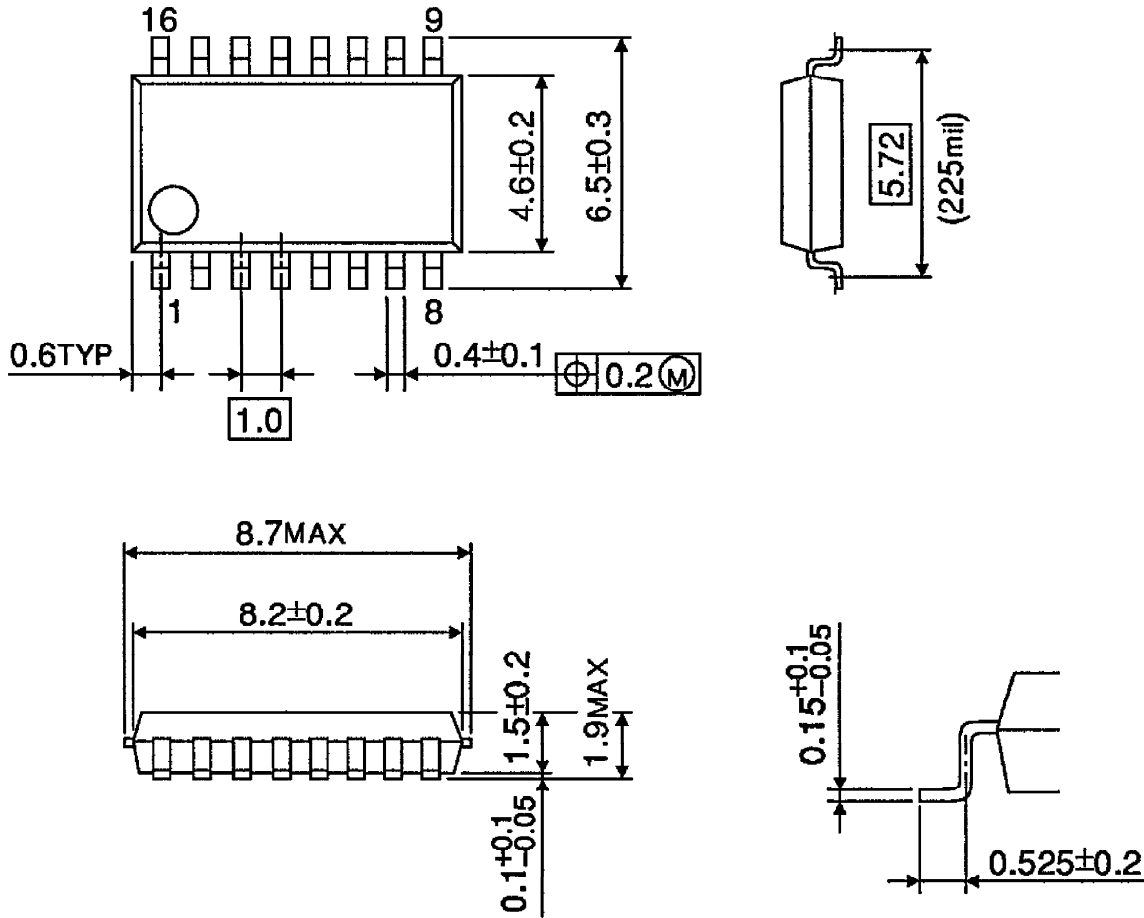
Unit : mm



Weight : 0.65g (Typ.)

OUTLINE DRAWING  
SSOP16-P-225-1.00A

Unit : mm



Weight : 0.14g (Typ.)