

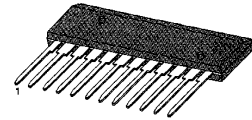
**DC VOLUME, TONE CONTROL CIRCUIT**

The KA2107 is a monolithic integrated circuit designed for 2 channel volume and tone control.

**FUNCTIONS**

- DC Volume Control
- DC Tone Control (Bass & Treble)
- Balance Control (R, L-Ch)

12-SIP



**ORDERING INFORMATION**

Device	Package	Operating Temperature
KA2107	12-SIP	-20°C ~+70°C

**FEATURES ORDERING INFORMATION**

- Easier compact set design
- All function enable DC controllable

**BLOCK DIAGRAM**

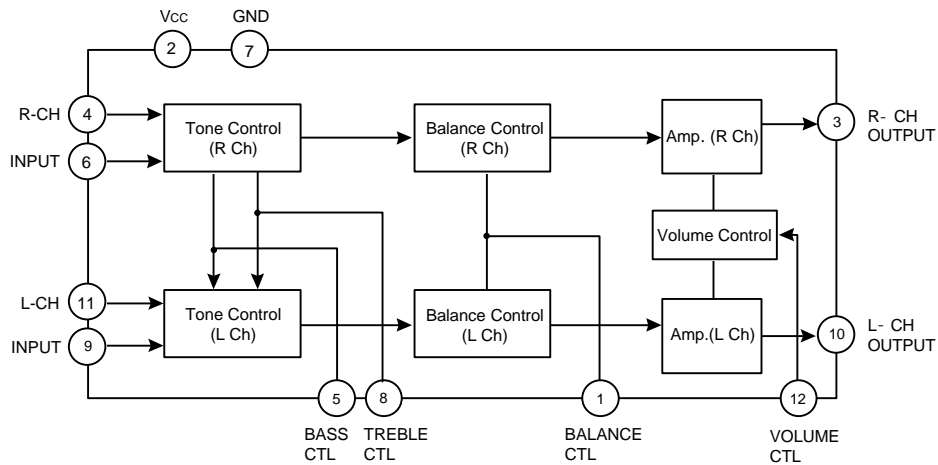


Fig. 1

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

Characteristic		Symbol	Value		Unit
Voltage	Supply Voltage	$V_{CC}$	14.4		V
	Circuit Voltage	$V_{1,4,5,6-7}$ $V_{8,9,11,12-7}$	0	$V_{2-7}$	V
Current	Supply Current	$I_2$	64		mA
	Circuit Current	$I_3, I_{10}$	-40	-	mA
Power Dissipation		$P_D$	920		mW
Temperature	Operating Temperature	$T_{OPR}$	-20~+70		$^\circ\text{C}$
	Storage Temperature	$T_{STG}$	-55~+150		$^\circ\text{C}$

ELECTRICAL CHARACTERISTICS ( $V_{CC}=12\text{V}$ ,  $T_A = 25^\circ\text{C}$ )

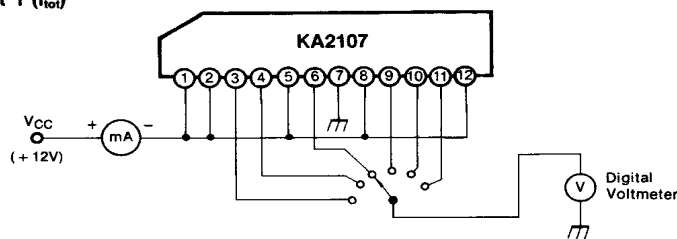
Characteristic		Symbol	Condition	Min	Typ	Max	Unit	Test Circuit
Supply Current		$I_{TOT}$	$V_{CC}=12\text{V}$	24	38	50	mA	1
Supply Voltage		$V_{3, 10-7}$	No input, $V_{12}=V_{CC}$ , $V_1=V_5=V_8=V_{CC}/2$	8.0	8.4	8.8	V	2
Volume	Max Output Voltage	$V_{OMAX}$	$f=1\text{KHz}$ , $V_f=400\text{mVms}$	190	230	270	mVms	2
	Channel Balance	CB	$V_{12}=V_{CC}$ , $V_1=V_5=V_8=V_{CC}/2$	-	+0.2	$\pm 1.0$	dB	2
	Output Starting Voltage	$V_{(ST)}$	$f=1\text{KHz}$ , $V_f=400\text{mVms}$ $V_{12}=V_R$ , $V_1=V_5=V_8=V_{CC}/2$	0.40	0.65	0.90	V	2
	Residual Noise Level	$V_{MIN}$	$f=1\text{KHz}$ , $V_f=400\text{mVms}$ $V_{12}=0\text{V}$ , $V_1=V_5=V_8=V_{CC}/2$	-	25	50	$\mu\text{Vms}$	2
Balance	Attenuation (R-Ch)	$ATT_R$	$f=1\text{KHz}$ , $V_f=400\text{mVms}$ , $V_{12}=V_{CC}$ , $V_5=V_8=V_{CC}/2$ , $V_{OR}$ , $V_1=(5.5/12) \cdot V_{CC}$ (at VR.1), $V_{OR2}$ , $V_1=0\text{V}$	-32	-45	-	dB	2
	Attenuation (L-Ch)	$ATT_L$	$f=1\text{KHz}$ , $V_f=400\text{mVms}$ , $V_{12}=V_{CC}$ , $V_5=V_8=V_{CC}/2$ , $V_{OL1}$ , $V_1=(6.5/12) \cdot V_{CC}$ (at VR.1), $V_{OL2}$ , $V_1=V_{CC}$	-32	-45	-	dB	2
Tone	Low Frequency Boost Control	$V_{40}/V_{1K}$	$V_{1K}$ : Output Voltage at $f=1\text{KHz}$ , $V_f=400\text{mVms}$ $V_{12}=V_{CC}$ , $V_1=V_5=V_8=V_{CC}/2$ $V_{40}$ : Output Voltage at $f=40\text{Hz}$ , $V_f=40\text{mVms}$ $V_{12}=V_{CC}$ , $V_5=V_8=V_{CC}$	8	10	12	dB	2
	Low Frequency Cut Control	$V_{40}/V_{1K}$	$V_{1K}$ : Output Voltage at $f=1\text{KHz}$ , $V_f=400\text{mVms}$ $V_{12}=V_{CC}$ , $V_1=V_5=V_8=V_{CC}/2$ $V_{40}$ : Output Voltage at $f=40\text{Hz}$ , $V_f=40\text{mVms}$ $V_{12}=V_{CC}$ , $V_5=V_8=0\text{V}$	-7.5	-12	-16	dB	2
	High Frequency Boost Control	$V_{15K}/V_{1K}$	$V_{1K}$ : Output Voltage at $f=1\text{KHz}$ , $V_f=400\text{mVms}$ $V_{12}=V_{CC}$ , $V_1=V_5=V_8=V_{CC}/2$ $V_{15K}$ : Output Voltage at $f=15\text{KHz}$ , $V_f=40\text{mVms}$ $V_{12}=V_{CC}$ , $V_5=V_8=V_{CC}$	7.5	10	13	dB	2
	High Frequency Cut Control	$V_{15K}/V_{1K}$	$V_{1K}$ : Output Voltage at $f=1\text{KHz}$ , $V_f=400\text{mVms}$ $V_{12}=V_{CC}$ , $V_1=V_5=V_8=V_{CC}/2$ $V_{15K}$ : Output Voltage at $f=40\text{Hz}$ , $V_f=40\text{mVms}$ $V_{12}=V_{CC}$ , $V_5=V_8=0\text{V}$	-7.5	-12	-18	dB	2

**ELECTRICAL CHARACTERISTICS** (Continued)

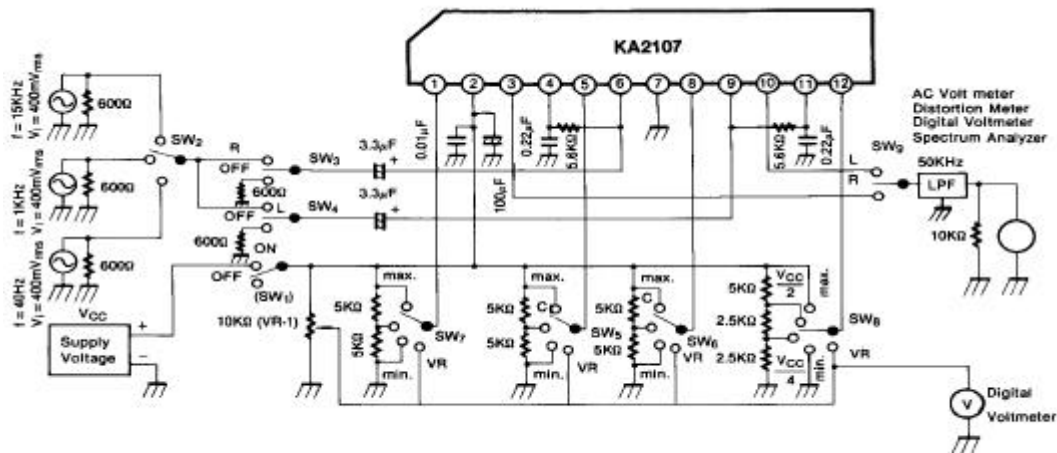
Characteristic	Symbol	Condition	Min	Typ	Max	Unit	Test Circuit
Cross Talk	CT	$f = 1\text{KHz}$ , $V_1 = 400\text{mV}_{\text{rms}}$ $V_{12} = V_{CC}$ , $V_1 = V_5 = V_8 = V_{CC}/2$	-65	-80	-	dB	2
Output Noise Voltage	$V_{\text{NO}}$	No input, $V_{12} = V_{CC}$ , $V_1 = V_5 = V_8 = V_{CC}/2$	-	80	120	$\mu\text{V}_{\text{rms}}$	2
Total Harmonic Distortion	THD	$f = 1\text{KHz}$ , $V_1 = 400\text{mV}_{\text{rms}}$ $V_{12} = V_{CC}$ , $V_1 = V_5 = V_8 = V_{CC}/2$	-	0.2	0.5	%	2
Input Resistance	$R_{1(6),(9)}$	$f = 1\text{KHz}$	8.2	11.0	13.5	$\text{K}\Omega$	
	$R_{1(4),(11)}$		11.0	16.0	22.0	$\text{K}\Omega$	
Output Resistance	$R_{O(3),(10)}$	$f = 1\text{KHz}$	60	110	160	$\Omega$	

**TEST CIRCUIT**

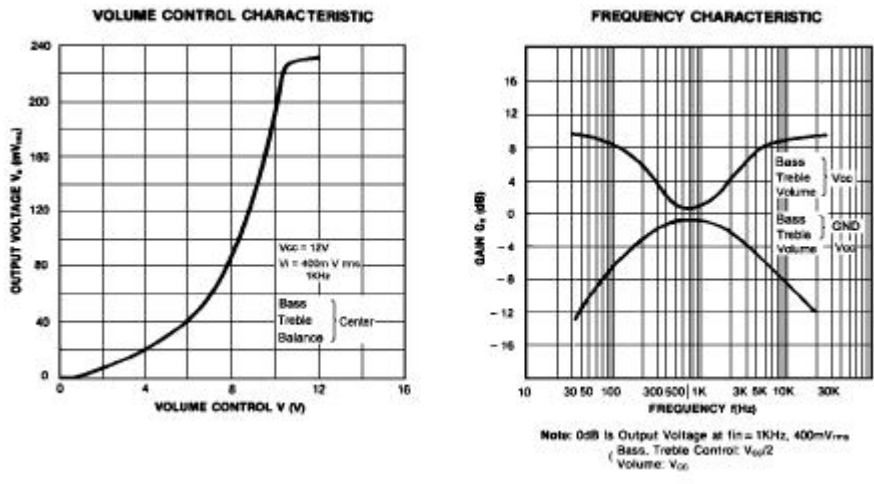
Test Circuit 1 ( $I_{\text{tot}}$ )



Test Circuit 2 ( $V_3$ , 10-7,  $V_{\text{OMAX}}$ , CB,  $V_{\text{ST}}$ ,  $V_{\text{MIN}}$ , ATT<sub>R</sub>, ATT<sub>L</sub>,  $V_{40}/V_{1K}$ ,  $V_{15K}/V_{1K}$ , CT,  $V_{\text{NO}}$ , THD)



- Switch
- (SW<sub>1</sub>) ... Supply Voltage
  - (SW<sub>2</sub>) ... Input Signal
  - (SW<sub>3</sub>) ... R Side Input
  - (SW<sub>4</sub>) ... L Side Input
  - (SW<sub>5</sub>) ... Bass Control
  - (SW<sub>6</sub>) ... Treble Control
  - (SW<sub>7</sub>) ... Balance Control
  - (SW<sub>8</sub>) ... Volume Control
  - (SW<sub>9</sub>) ... Output Control



TYPICAL APPLICATION CIRCUIT

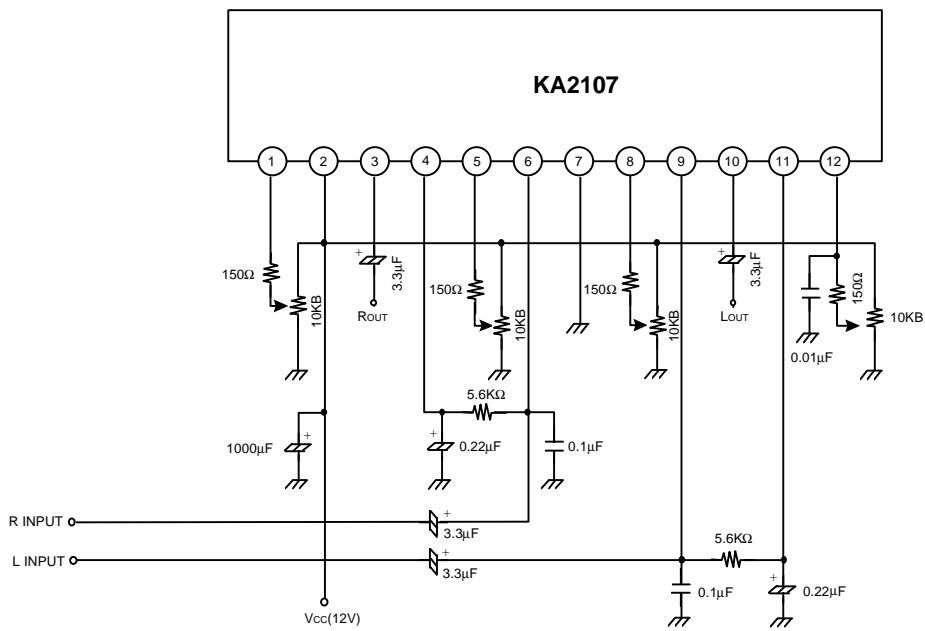


Fig. 3