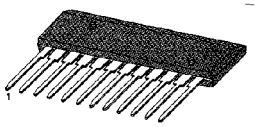
DC VOLUME, TONE CONTROL CIRCUIT

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

12- SIP



FUNCTIONS

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

FEATURES

- Easier compact set design
- All function enable DC controllable

ORDERING INFORMATION

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

BLOCK DIAGRAM

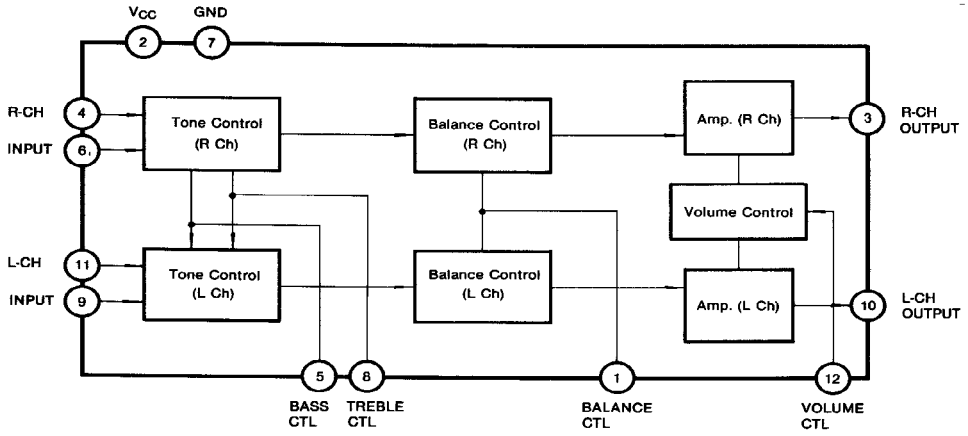


Fig. 1

ABSOLUTE MAXIMUM RATINGS (T_A =25℃)

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		℃
	Storage Temperature	T_{STG}	-55~+150		℃

ELECTRICAL CHARACTERISTICS (V_{CC} =12V, T_A =25℃)

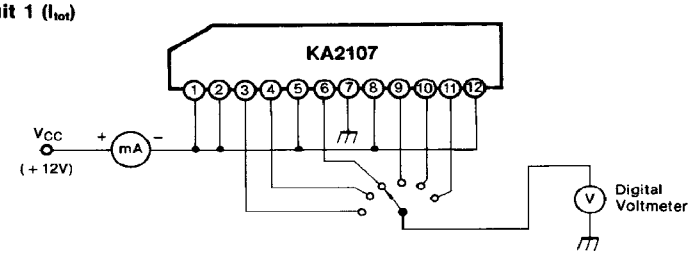
Characteristic		Symbol	Condition	Min	Typ	Max	Unit	Test Circuit
Supply Current		I_{TOT}	V_{CC}=12V	24	38	50	mA	1
Supply Voltage		$V_{3,\ 10-7}$	No input, V_{12}=V_{CC}, V_1=V_5=V_8=V_{CC}/2	8.0	8.4	8.8	V	2
Volume	Max Output Voltage	V_{OMAX}	f=1KHz, V_i=400mVrms	190	230	270	μVrms	2
	Channel Balance	CB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

ELECTRICAL CHARACTERISTICS (Continued)

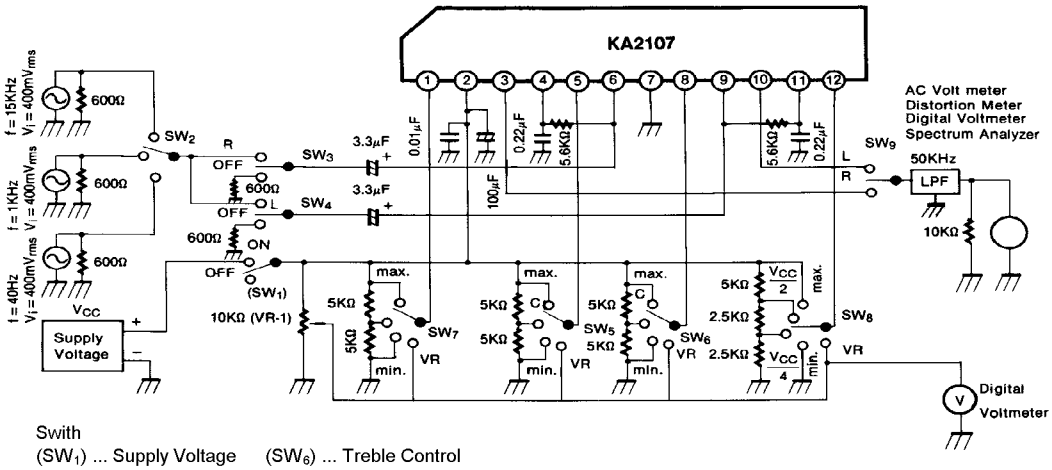
Characteristic	Symbol	Condition	Min	Typ	Max	Unit	Test Circuit
Cross Talk	CT	f =1KHz, V_I =400mV_{RMS} V_{12} =V_{CC}, V_1 =V_5 = V_8 =V_{CC}/2	-65	-80	—	dB	2
Output Noise Voltage	V_{NO}	No input, V_{12} =V_{CC}, V_1 =V_5 =V_8 =V_{CC}/2	—	80	120	μV_{RMS}	2
Total Harmonic Distorion	THD	f =1KHz, V_I =400mV_{RMS} V_{12} =V_{CC}, V_1 =V_5 =V_8 =V_{CC}/2	—	0.2	0.5	%	2
Input Resistance	$R_{I(6),(9)}$	f =1KHz	8.2	11.0	13.5	kΩ	
	$R_{I(4),(11)}$		11.0	16.0	22.0	kΩ	
Output Resistance	$R_{O(3),(10)}$	f =1KHz	60	110	160	Ω	

TEST CIRCUIT

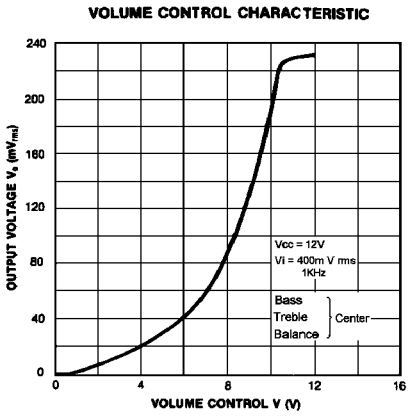
Test Circuit 1 (I_{tot})

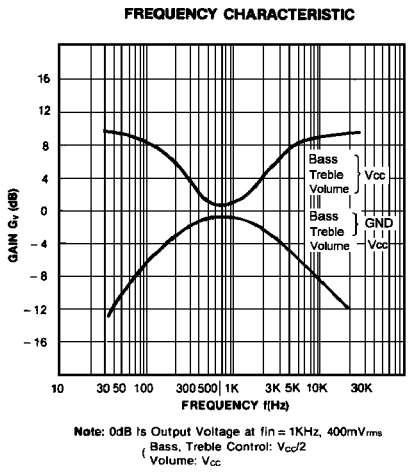


Test Circuit 2 ($V_{3,\ 10-7}$, V_{OMAX}, CB, $V_{(ST)}$, V_{MIN}, ATT_R, ATT_L, V_{40}/V_{1K}, V_{15K}/V_{1K}, CT, V_{NO}, THD)



Swith
(SW_1) ... Supply Voltage
(SW_2) ... Input Signal
(SW_3) ... R Side Input
(SW_4) ... L Side Input
(SW_5) ... Bass Control
(SW_6) ... Treble Control
(SW_7) ... Treble Control
(SW_8) ... Treble Control
(SW_9) ... Treble Control





Note: 0dB is Output Voltage at fin = 1KHz, 400mVrms
(Bass, Treble Control: Vcc/2
Volume: Vcc

TYPICAL APPLICATION CIRCUIT

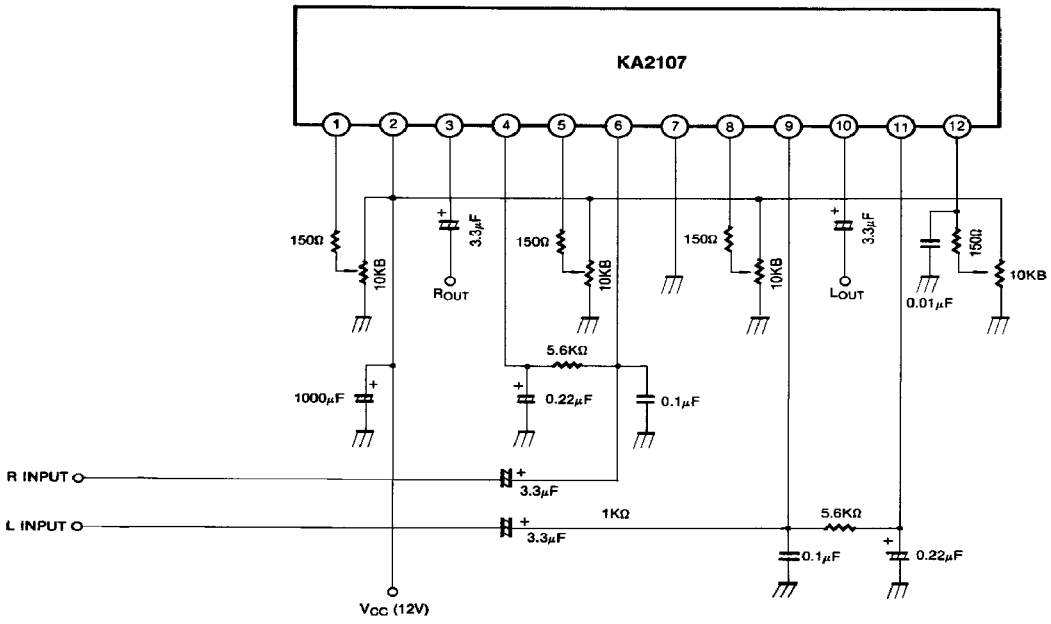


Fig.3

Dimensions in Milimeters