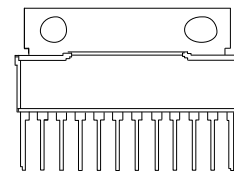
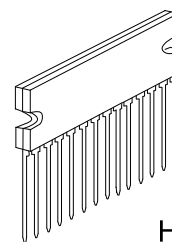


**PA7522****LINEAR INTEGRATED CIRCUIT****DUAL 3-W BTL AUDIO  
POWER AMPLIFIER**■ **DESCRIPTION**

The UTC **PA7522** is an audio power amplifier IC for the stereo system. In the BTL (balanced transformer less) method, fewer external parts and easier design for applications are required.

■ **FEATURES**

- \* 3-W output (8Ω) with supply voltage of 8V
- \* On-chip standby function
- \* On-chip volume function

**HSIP-12A****HSIP-14B**

Lead-free: PA7522L  
Halogen-free: PA7522G

■ **ORDERING INFORMATION**

| Ordering Number |                   |                 | Package  | Packing |
|-----------------|-------------------|-----------------|----------|---------|
| Normal          | Lead Free Plating | Halogen Free    |          |         |
| PA7522-H12-A-T  | PA7522L-H12-A-T   | PA7522G-H12-A-T | HSIP-12A | Tube    |
| PA7522-H14-B-T  | PA7522L-H14-B-T   | PA7522G-H14-B-T | HSIP-14B | Tube    |

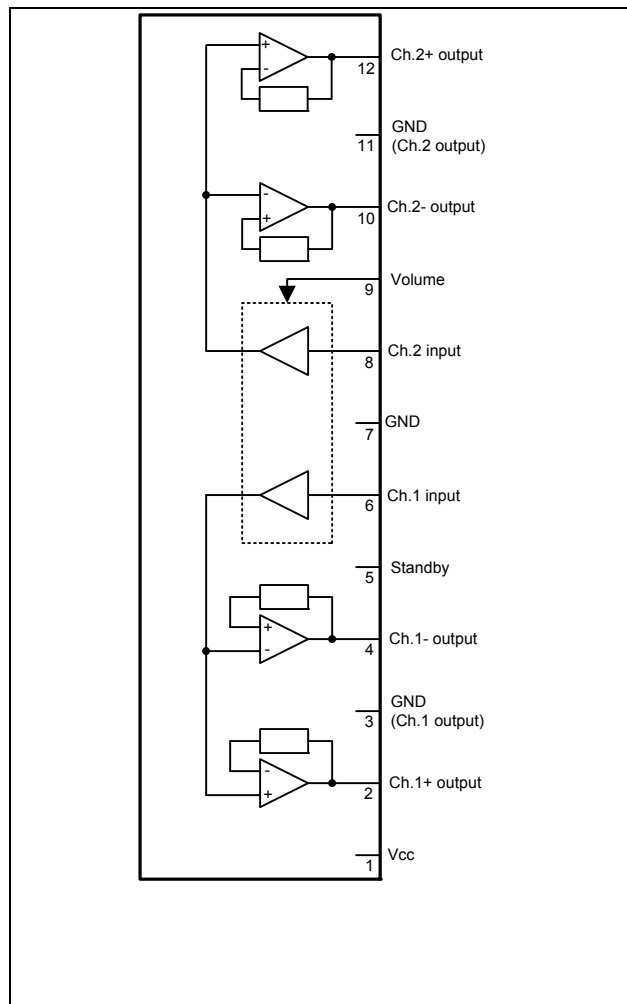
|                                                                                       |                                                                                                                 |
|---------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------|
| <p>PA7522L-H12-A-T</p> <p>(1)Packing Type<br/>(2)Package Type<br/>(3)Lead Plating</p> | <p>(1) T: Tube<br/>(2) H12-A: HSIP-12A, H14-B: HSIP-14B<br/>(3) G: Halogen Free, L: Lead Free, Blank: Pb/Sn</p> |
|---------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------|

### ■ PIN DESCRIPTION

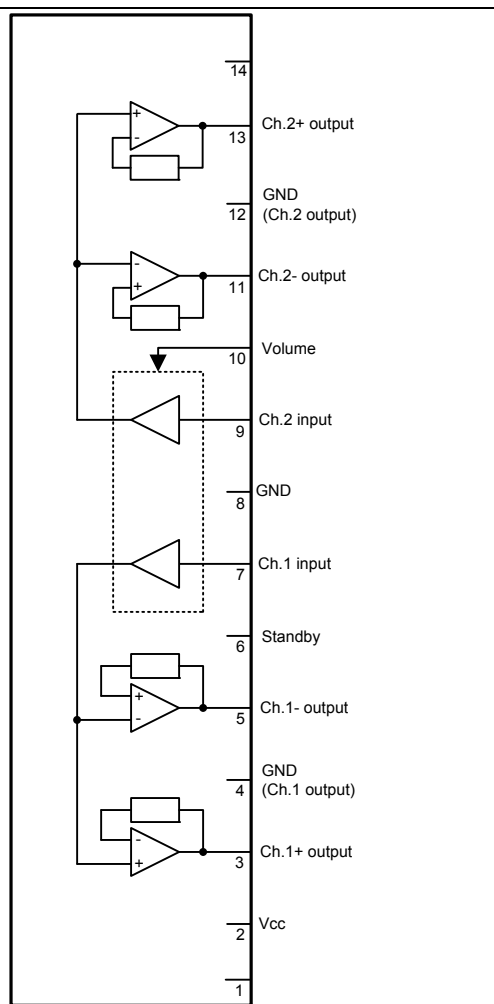
| PIN NO.  |          | PIN NAME        | DESCRIPTION                                 |
|----------|----------|-----------------|---------------------------------------------|
| HSIP-12A | HSIP-14B |                 |                                             |
| -        | 1        | NC              | No connect                                  |
| 1        | 2        | V <sub>CC</sub> | Supply voltage                              |
| 2        | 3        | Ch.1+ output    | Ch.1+ output                                |
| 3        | 4        | GND             | Ground (output ch.1)                        |
| 4        | 5        | Ch.1- output    | Ch.1 - output                               |
| 5        | 6        | Standby         | Standby (standby state if this pin is open) |
| 6        | 7        | Ch.1 input      | Ch.1 input                                  |
| 7        | 8        | GND             | Ground (input)                              |
| 8        | 9        | Ch.2 input      | Ch.2 input                                  |
| 9        | 10       | Volume          | Volume (max. volume if this pin is open.)   |
| 10       | 11       | Ch.2- output    | Ch.2 - output                               |
| 11       | 12       | GND             | Ground (output ch.2)                        |
| 12       | 13       | Ch.2+ output    | Ch.2 + output                               |
| -        | 14       | NC              | No connect                                  |

### ■ BLOCK DIAGRAM

**HSIP-12A**



**HSIP-14B**



### ■ ABSOLUTE MAXIMUM RATINGS (Ta = 25°C)

| PARAMETER                     | SYMBOL           | RATINGS    | UNIT |
|-------------------------------|------------------|------------|------|
| Supply Voltage (At no signal) | V <sub>CC</sub>  | 14         | V    |
| Supply Current                | I <sub>CC</sub>  | 2.0        | A    |
| Power Dissipation(Ta = 70°C)  | P <sub>D</sub>   | 1.92       | W    |
| Operating Temperature         | T <sub>OPR</sub> | -20 ~ +85  | °C   |
| Storage Temperature           | T <sub>STG</sub> | -40 ~ +150 | °C   |

Note: Absolute maximum ratings are those values beyond which the device could be permanently damaged.

Absolute maximum ratings are stress ratings only and functional device operation is not implied.

### ■ RECOMMENDED OPERATING RATINGS

| PARAMETER      | SYMBOL          | RATINGS    | UNIT |
|----------------|-----------------|------------|------|
| Supply voltage | V <sub>CC</sub> | 3.5 ~ 13.5 | V    |

### ■ ELECTRICAL CHARACTERISTICS

(V<sub>CC</sub>=8.0V, R<sub>L</sub>=8Ω, f=1kHz, Ta=25°C±2°C, unless otherwise specified.)

| PARAMETER                   | SYMBOL              | TEST CONDITIONS                                                                 | MIN  | TYP  | MAX  | UNIT    |
|-----------------------------|---------------------|---------------------------------------------------------------------------------|------|------|------|---------|
| Quiescent Circuit Current   | I <sub>D</sub>      | V <sub>IN</sub> =0mV, Vo1.=0V                                                   |      | 45   | 100  | mA      |
| Standby Current             | I <sub>STN-BY</sub> | V <sub>IN</sub> =0mV, Vo1.=0V                                                   |      | 1    | 10   | μA      |
| Output Noise Voltage (Note) | V <sub>NO</sub>     | R <sub>G</sub> =10KΩ, Vo1.=0V                                                   |      | 0.10 | 0.4  | mV(rms) |
| Output Offset Voltage       | V <sub>OFF</sub>    | R <sub>G</sub> =10KΩ, Vo1.=0V                                                   | -250 | 0    | 250  | mV      |
| Total Harmonic Distortion   | THD                 | P <sub>OUT</sub> =0.5W, Vo1.=1.25V                                              |      | 0.10 | 0.5  | %       |
| Maximum Output Power        | P <sub>OUT1</sub>   | THD=10%, Vo1.=1.25V                                                             | 2.4  | 3.0  |      | W       |
| Ripple Rejection (Note)     | RR                  | R <sub>G</sub> =10KΩ, Vo1.=0V<br>V <sub>R</sub> =1V(rms), f <sub>R</sub> =120Hz | 30   | 50   |      | dB      |
| Voltage Gain                | G <sub>v</sub>      | P <sub>OUT</sub> =0.5W, Vo1.=1.25V                                              | 31   | 33   | 35   | dB      |
| Volume Attenuation Rate*    | Att                 | P <sub>OUT</sub> =0.5W, Vo1.=0V                                                 | 70   | 85   |      | dB      |
| Channel Balance 1           | CB1                 | P <sub>OUT</sub> =0.5W, Vo1.=1.25V                                              | -1   | 0    | 1    | dB      |
| Channel Balance 2           | CB2                 | P <sub>OUT</sub> =0.5W, Vo1.=0.6V                                               | -3   | 0    | 3    | dB      |
| Intermediate Voltage Gain   | G <sub>VM</sub>     | P <sub>OUT</sub> =0.5W, Vo1.=0.6V                                               | 20.5 | 23.5 | 26.5 | dB      |
| Channel Crosstalk           | C <sub>T</sub>      | P <sub>OUT</sub> =0.5W, Vo1.=1.25V                                              | 40   | 55   |      | dB      |

Note: In measuring, the filter for the range of 15 Hz ~ 30 kHz (12 dB/OCT) is used.

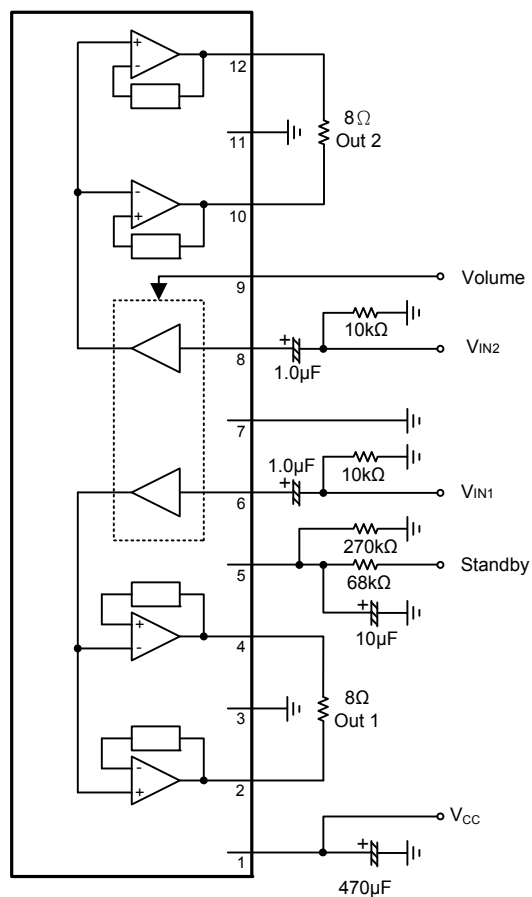
**■ TERMINAL EQUIVALENT CIRCUITS AT  $V_{CC}=8V$** 

| PIN NO.  |          | PIN NAME          | VOLTAGE                                                                |
|----------|----------|-------------------|------------------------------------------------------------------------|
| HSIP-12A | HSIP-14B |                   |                                                                        |
| 1        | 2        | $V_{CC}$          | 8V                                                                     |
| 2        | 3        | Ch.1 + output pin | 3.6V (at no signal)                                                    |
| 3        | 4        | GND               | 0V                                                                     |
| 4        | 5        | Ch.1 - output pin | 3.9V (at no signal)                                                    |
| 5        | 6        | Standby pin       | 0V or 5V (Standby off at supply 5V.<br>Standby at 0.4V less or open. ) |
| 6        | 7        | Ch.1 input pin    | 1.4V (Input circuit bias voltage is output)                            |
| 7        | 8        | GND               | 0V                                                                     |
| 8        | 9        | Ch.2 input pin    | 1.4V (Input circuit bias voltage is output)                            |
| 9        | 10       | Volume pin        | Supply to 0V ~ 1.25V                                                   |
| 10       | 11       | Ch.2-output pin   | 3.9V (at no signal)                                                    |
| 11       | 12       | GND               | 0V                                                                     |
| 12       | 13       | Ch.2+ output pin  | 3.6V (at no signal)                                                    |

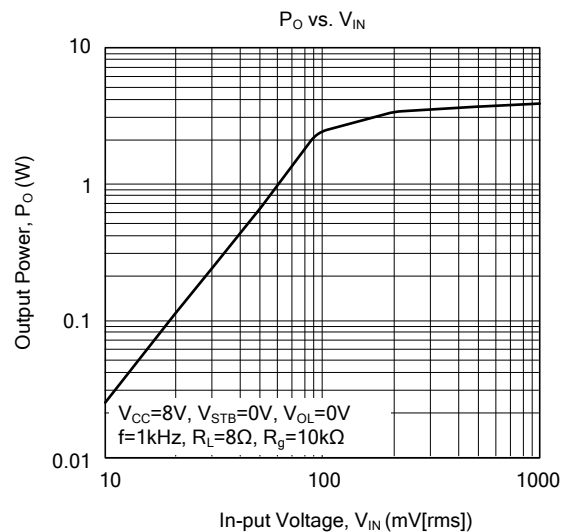
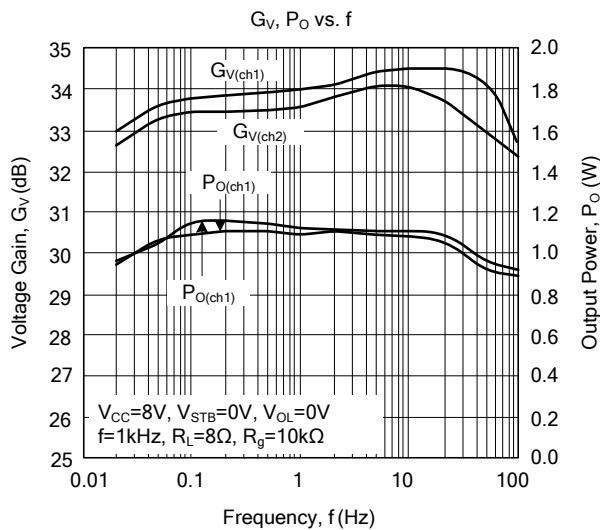
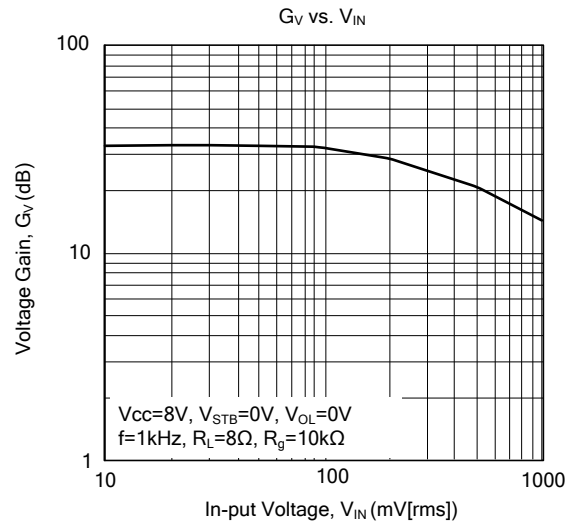
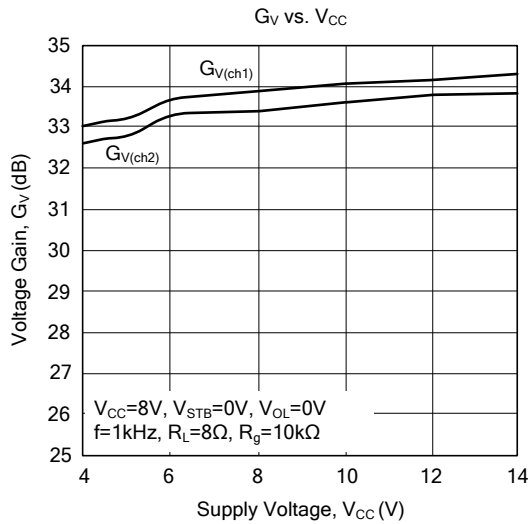
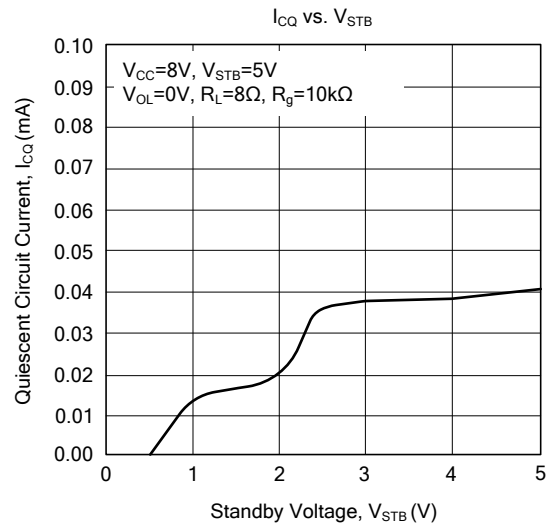
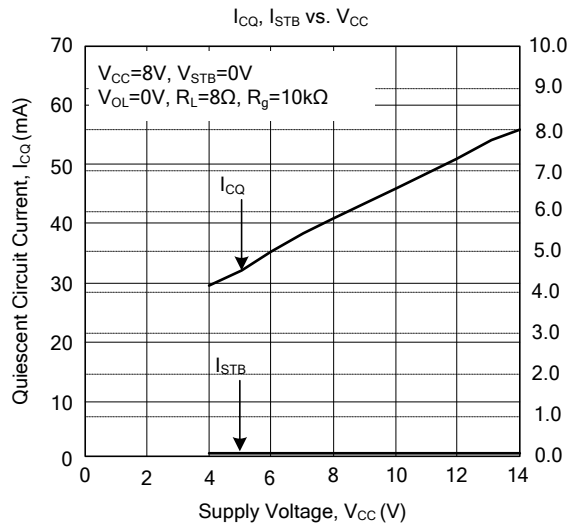
**■ USAGE NOTES**

- \* Please avoid the short-circuits to  $V_{CC}$ , ground, or load short-circuit.
- \* Please connect the cooling fin with the GND potential.
- \* The thermal shutdown circuit operates at about  $T_J=150^{\circ}C$ . However, the thermal shutdown circuit is reset automatically if the temperature drops.
- \* Please carefully design the heat radiation especially when you take out high power at high  $V_{CC}$ .
- \* Please connect only the ground of signal with the signal GND of the amplifier in the previous stage.

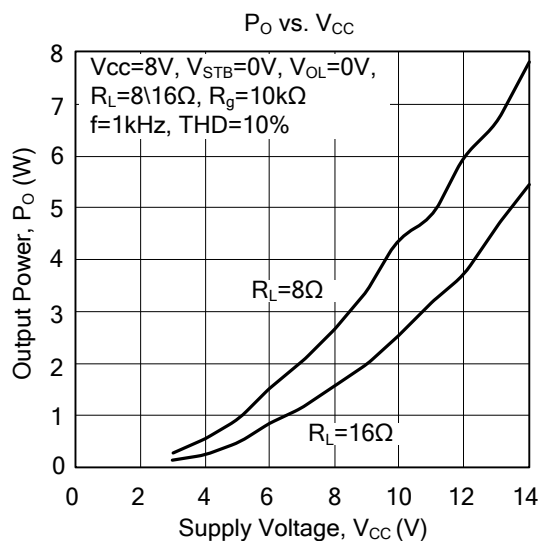
### ■ APPLICATION CIRCUIT EXAMPLE



## TYPICAL CHARACTERISTICS



# ■ TYPICAL CHARACTERISTICS(Cont.)



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