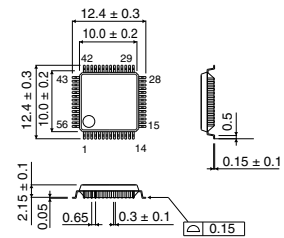


6-channel volume IC for 6.1-channel BD3813KS/BD3815KS

● Description

BD3813KS is a sound processor IC integrating gain amplifier, volume, bass, and treble needed for applications such as AV receiver, and mini component stereo into a single chip. Adoption of BD3812F a 2-channel volume IC enables a 6.1-channel and a 7.1-channel conversion. BiCMOS process has resulted in a wide dynamic range of 129dB.

● Dimension (Units : mm)



SQFP56

● Features

- 1) Dynamic range: 129dB (Tone bypass, VOL=MUTE, IHF-A)
- 2) Independent 6-channel for master volume (0~-95dB, MUTE 1dB/Step)
Utilization of resistor rudder has dramatically reduced residual noise as well as noise generated by switching.
- 3) Low consumption current design by adopting Bi-CMOS process
- 4) Maximum output voltage: 4.2Vrms ($V_{CC}=7V$, $V_{EE}=-7V$, $R_L=10k$)
- 5) Built-in 5-channel independent input gain amplifier convenient to amplify input signal (BD3813KS: 0, 6, 12dB), (BD3815KS: 0, 6, 18dB)
- 6) 2-channel output port
- 7) 2-wire serial control (For both 3.3V and 5V)

● Applications

AV receiver, mini component stereo systems

● Absolute Maximum Ratings (Ta=25°C)

| Parameter | Symbol | Limits | Unit |
|-----------------------------|-----------|------------|------|
| Supply voltage | V_{CC} | 15 | V |
| Power dissipation | P_d | 1000 | mW |
| Operating temperature range | T_{opr} | -20 ~ +75 | °C |
| Storage temperature range | T_{stg} | -55 ~ +125 | °C |

Derating : 10mW/°C for operation above Ta=25°C .

● Recommended Operating Conditions (Ta=25°C)

| Parameter | Symbol | Min. | Typ. | Max. | Unit |
|----------------|----------|------|------|------|------|
| Supply voltage | V_{CC} | ±5 | ±7 | ±7.3 | V |

● Electrical characteristics

(Unless otherwise noted:

$T_a=25^{\circ}\text{C}$, $V_{CC}=7\text{V}$, $V_{EE}=-7\text{V}$, $f=1\text{kHz}$, $V_{IN}=1\text{Vrms}$, $R_L=10\text{k}$, $R_G=600$, Input gain=0dB, Master volume=0dB, Bass and Treble=0dB)

| Parameter | Symbol | Min. | Typ. | Max. | Unit | Conditions |
|-------------------------------------|--------|------|-------|------|------------------|--|
| Circuit current | IQ | — | 8 | 20 | mA | No signal |
| Output voltage gain | Gv | -2 | 0 | 2 | dB | Measure : Pin31,29,27,25,23,21,19 |
| Total harmonic distortion rate | THD | — | 0.004 | 0.05 | % | Measure : Pin31,29,27,25,23,21,19, BW=400~30kHz |
| Maximum output voltage | Vomax | 3.4 | 4.2 | — | Vrms | Measure : Pin31,29,27,25,23,21,19, THD=1% |
| Output noise voltage | Vno | — | 2.0 | 12 | μVrms | Measure : Pin31,29, Rg=0, Tone : ON, BW=IHF-A |
| | | — | 1.5 | 8.0 | μVrms | Measure : Pin31,29, Rg=0, Tone : By-pass, BW=IHF-A |
| Cross talk between channels | CTC | — | -95 | -80 | dB | Measure : Pin29 (OUTFL), Rg=0, BW=IHF-A, Reference : Pin31 (OUTFR)=1Vrms |
| Cross talk between selectors | CTS | — | -95 | -80 | dB | Measure : Pin31,29,27,25,23,21,19, Rg=0, BW=IHF-A |
| Maximum attenuation | Vmin | — | -115 | -105 | dB | BW=IHF-A, $V_{IN}=3\text{Vrms}$, Measure : Pin31,29,27,25,23,21 |
| Input gain control range (BD3813KS) | GIG | 10 | 12 | 14 | dB | Measure : Pin31,29,27,25,23,21,19, $V_{IN}=0.4\text{Vrms}$ |
| Input gain control range (BD3815KS) | GIG | 16 | 18 | 20 | dB | Measure : Pin31,29,27,25,23,21,19, $V_{IN}=0.2\text{Vrms}$ |
| Treble maximum boost gain | GTB | 12 | 14 | 16 | dB | Measure : Pin31,29, f=15kHz, $V_{IN}=0.4\text{Vrms}$ |
| Bass maximum boost gain | GBB | 12 | 14 | 16 | dB | Measure : Pin31,29, f=100Hz, $V_{IN}=0.4\text{Vrms}$ |
| Port H output | PH | 4.5 | 4.9 | — | V | Measure : Pin11,12 $V_{DD}=5\text{V}$, $R_L=47\text{k}$ |

● Application Circuit

