

AN6291, AN6291S

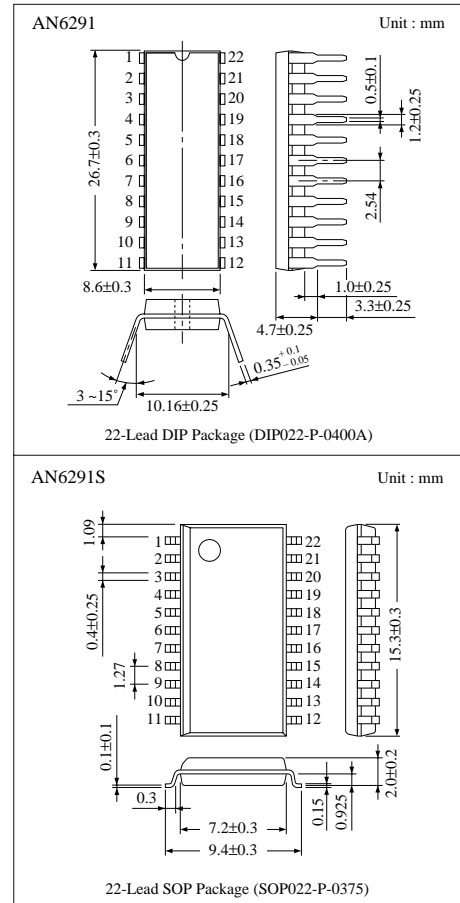
Dual dbx II Noise Reduction System ICs

■ Overview

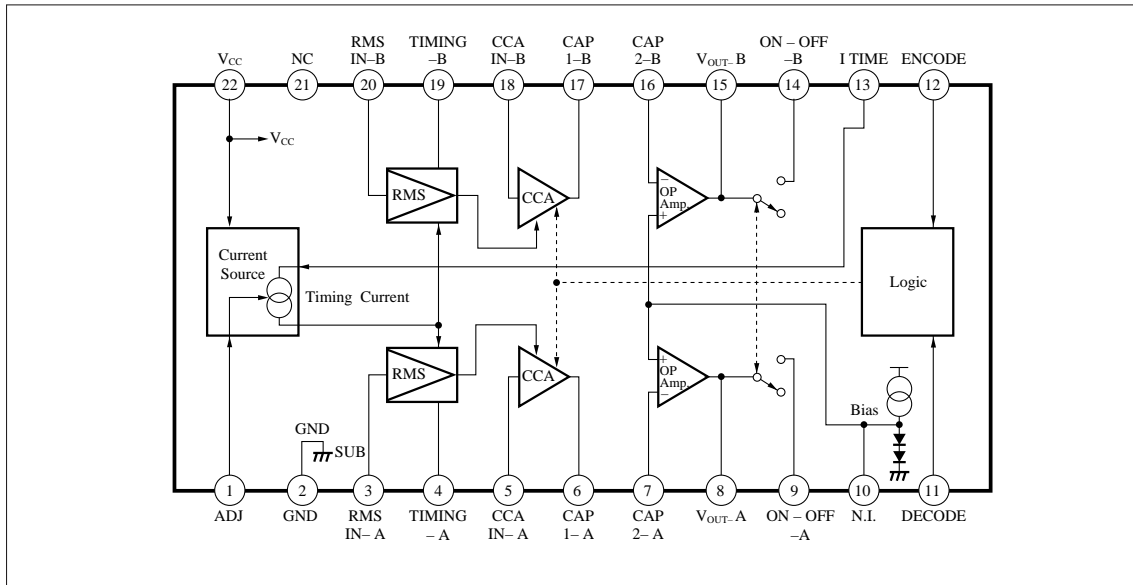
The AN6291 and the AN6291S are the single chip ICs suitably developed for noise reduction of dbxII type and used for stereo operation. They can be used for U.S. sound multiplex TV. 1.8V low voltage operation enables to apply for battery-operated equipment to the Hi-Fi deck. Package is available for 22-pin DIL plastic and 22-pin SOP package. Equipment can be minimized and high integration.

■ Features

- Wide dynamic range : 110dB
- Low operating voltage : $V_{CC (min.)} = 1.8V$
- Fewer external components
- Adjustment : only one
- Low power consumption
- Wide operating supply voltage range :
 $V_{CC (opr)} = 1.8V \text{ to } 14V$



■ Block Diagram



■ Pin Descriptions

| Pin No. | Pin Name | Pin No. | Pin Name |
|---------|------------------------------|---------|-----------------|
| 1 | Adjustment of timing current | 12 | ENCODE |
| 2 | GND | 13 | I TIME |
| 3 | RMS IN-A | 14 | ON-OFF-B |
| 4 | TIMING-A | 15 | VOUT-B |
| 5 | CCA IN-A | 16 | CAP-2-B |
| 6 | CAP-1-A | 17 | CAP-1-B |
| 7 | CAP-2-A | 18 | CCA IN-B |
| 8 | VOUT-A | 19 | TIMING-B |
| 9 | ON-OFF-A | 20 | RMS IN-B |
| 10 | N.I. | 21 | NC |
| 11 | DECODE | 22 | V _{CC} |

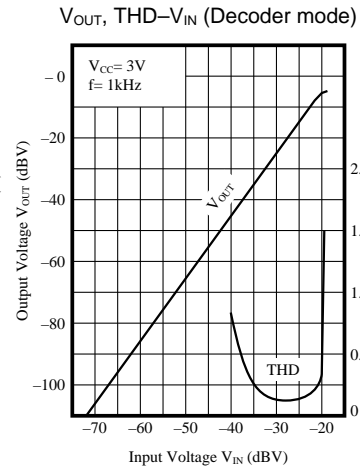
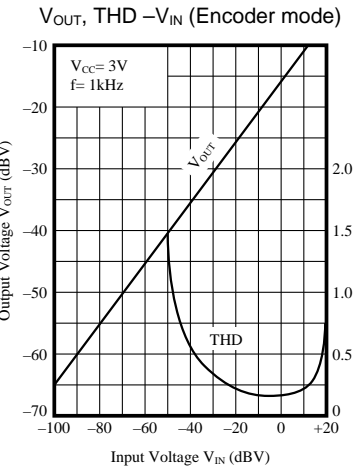
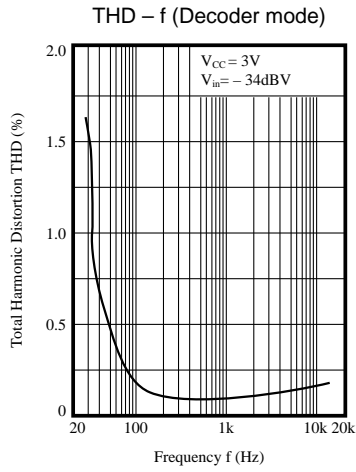
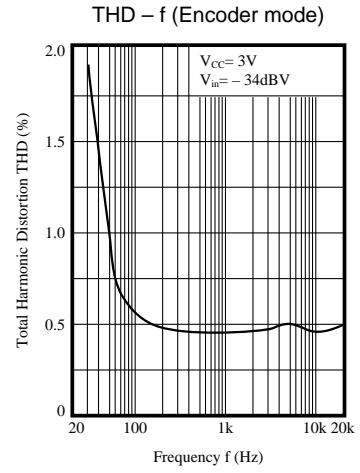
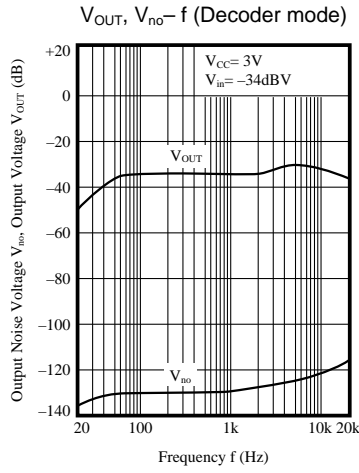
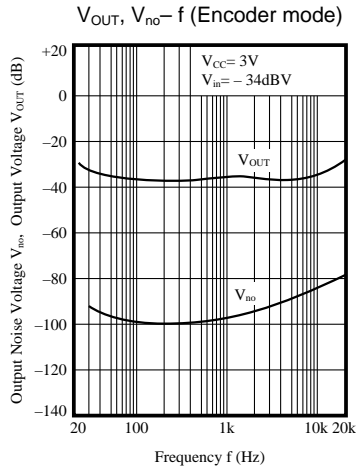
■ Absolute Maximum Ratings (Ta=25°C)

| Parameter | Symbol | Rating | Unit | |
|-------------------------------|------------------|------------------|-------------|----|
| Supply Voltage | V _{CC} | 14.4 | V | |
| Supply Current | I _{CC} | 5 | mA | |
| Power Dissipation (Ta=75°C) | P _D | 100 | mW | |
| Operating Ambient Temperature | T _{opr} | -20 ~ + 75 | °C | |
| Storage Temperature | AN6291 | T _{stg} | -55 ~ + 125 | °C |
| | AN6291S | T _{stg} | -40 ~ + 125 | °C |

■ Electrical Characteristics (V_{CC}=3V, Ta=25°C)

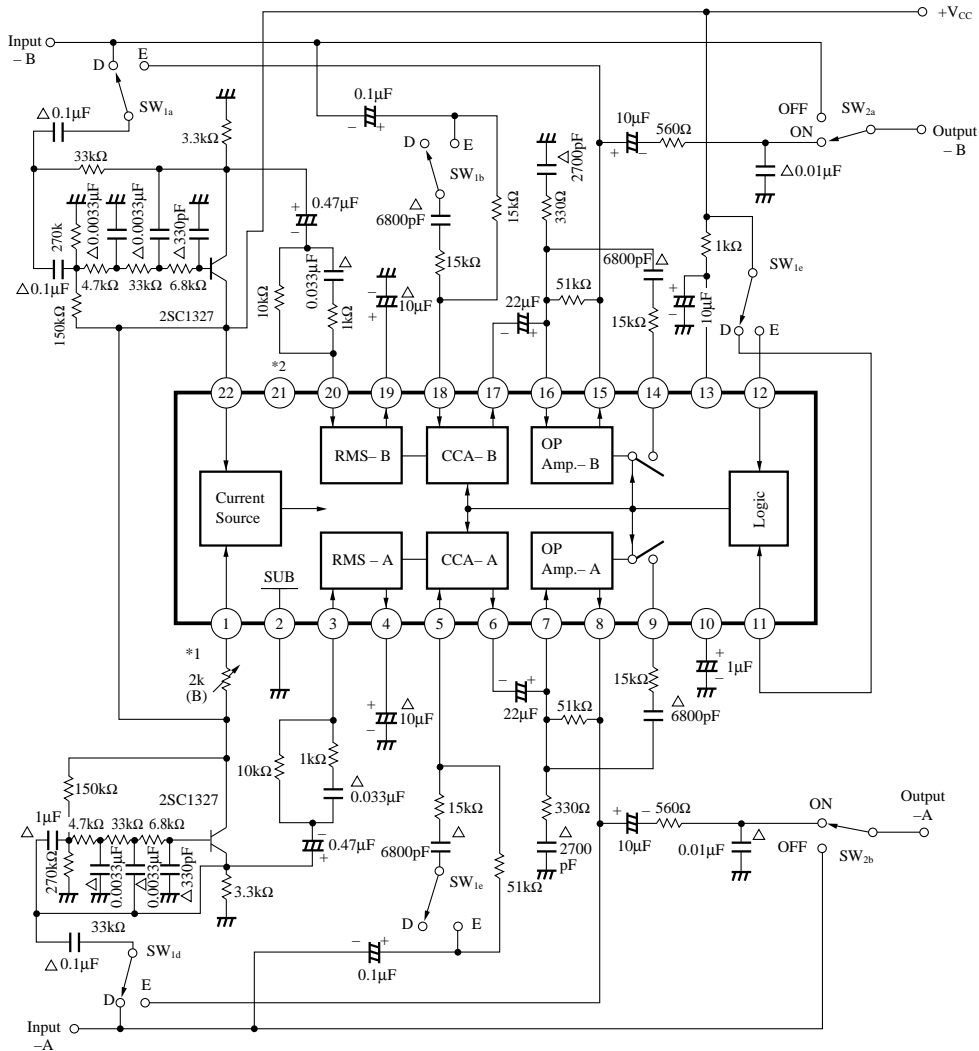
| Parameter | Symbol | Condition | min. | typ. | max. | Unit |
|---|--------------------|--|-----------------|------|------|------|
| Input/Output Characteristics/ENCODE Mode | V _{OE-1} | V _{IN} = + 20dB, f=1kHz | 7.5 | 10 | 12.5 | dB |
| | V _{OE-2} | V _{IN} = 0dB, f=1kHz | -2 | 0 | + 2 | |
| | V _{OE-3} | V _{IN} = -40dB, f=1kHz | -23 | -20 | -17 | |
| Input/Output Characteristics/DECODE Mode | V _{OD-1} | V _{IN} = + 10dB, f=1kHz | 17 | 20 | 23 | dB |
| | V _{OD-2} | V _{IN} = 0dB, f=1kHz | -2 | 0 | + 2 | |
| | V _{OD-3} | V _{IN} = -20dB, f=1kHz | -44 | -40 | -36 | |
| Maximum Output Voltage | ENCODE Mode | THD=1%, f=1kHz | 80 | 150 | — | mV |
| | DECODE Mode | | 200 | 450 | — | |
| Total Harmonic Distortion/DECODE Mode | THD _D | V _O = + 14dB, f=1kHz | — | 0.15 | 0.3 | % |
| Noise Output Voltage | ENCODE Mode | Input Short A-weight | — | 100 | 200 | μV |
| | DECODE Mode | | — | 3 | 6 | |
| Difference Between Channels | ENCODE Mode | V _{IN} = 0dB, f=1kHz | -1.2 | 0 | 1.2 | dB |
| | DECODE Mode | | CD _D | -1.2 | 0 | |
| Crosstalk/ENCODE Mode | CT | Measuring channel : Short Another channel : Output 200mV, f=1kHz | 50 | 60 | — | dB |
| Ripple Rejection Ratio/DECODE Mode | SVRR | f=60Hz, V=100mV, Input Short | 40 | 55 | — | dB |
| Quiescent Current | I _{CC} | V _{CC} = 3V, Input Short | — | 1.8 | 3.2 | mA |
| Input/Output Characteristics/dbx OFF Mode | V _{OFF} | V _{IN} = + 20dB, f=1kHz | 17 | 20 | 23 | dB |
| Total Harmonic Distortion/dbx OFF Mode | THD _{OFF} | V _{IN} = + 20dB, f=1kHz | — | 0.3 | 1 | % |
| Output Noise Voltage/dbx OFF Mode | V _{NOFF} | Input Short, A-weight | — | 10 | 20 | μV |

Note) 0dB= 20mV= -34dBV



■ Application Circuits

1 Switching circuit of recording/playback



Logical condition of recording/playback

| Pin11 | Pin12 | Mode |
|-----------------|-----------------|--------|
| V _{CC} | Open | DECODE |
| Open | V _{CC} | ENCODE |
| V _{CC} | V _{CC} | OFF |

* 1 Signals of 1kHz, 20mV are applied to the input of both channels at the same time, sinking current into the Pin13 should be adjusted to 15μA±5%. Standard value at V_{CC}=3V is about 1kΩ.

* 2 External circuit should not be connected with Pin21. Connected in the IC.

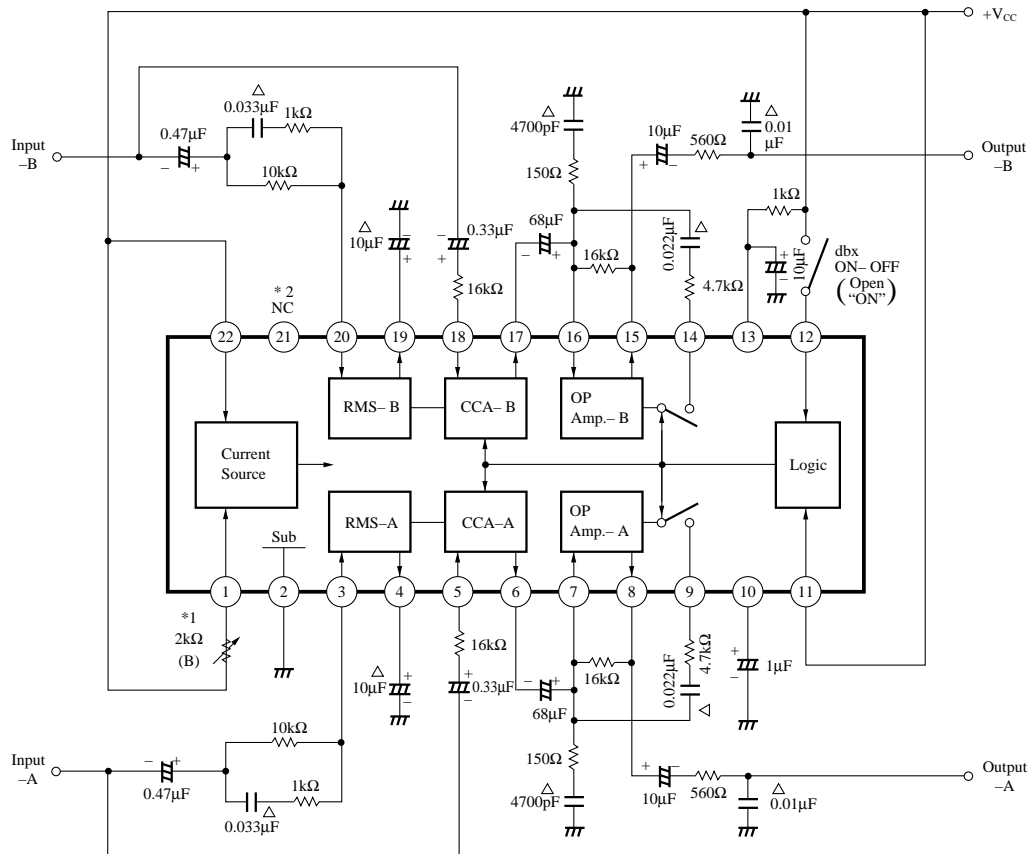
* 3 Users should follow the latest technical information from dbx company. Constant number might be changed.

Note 1) All the resistors and the capacitor with the mark Δ should be used in the error less than ±5%.

Note 2) S_{1a}~ S_{1e} : Switch record, playback (Above figure shows "PLAYBACK" mode).

Note 3) S_{2a}~ S_{2b} : dbx ON-OFF switch (Above figure shows "ON" mode).

2 Playback exclusive circuit (Designed noise at dbx OFF mode to be small)



* 1 Signals of 1kHz, 20mV are applied to the input of the both channels, adjust sinking current into the Pin13 to $15\mu\text{A}\pm 5\%$. Standard value at $V_{CC}=3\text{V}$ is about $1\text{k}\Omega$.

* 2 External circuit should not be connected with the Pin21. Connected in the IC.

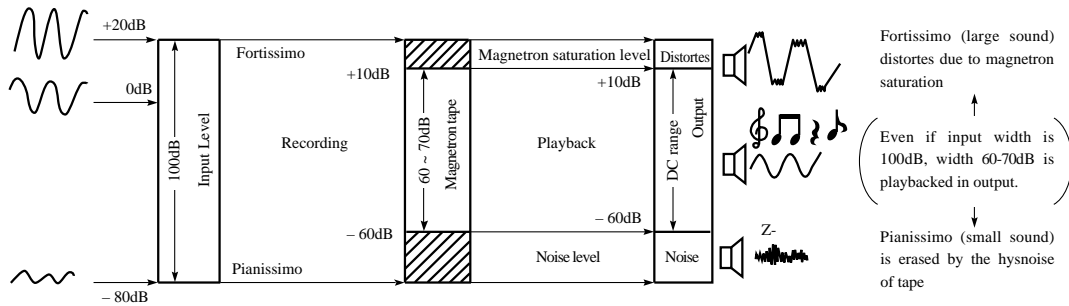
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Note 1) All the resistors and the capacitor with the mark Δ should be used in the error less than $\pm 5\%$.

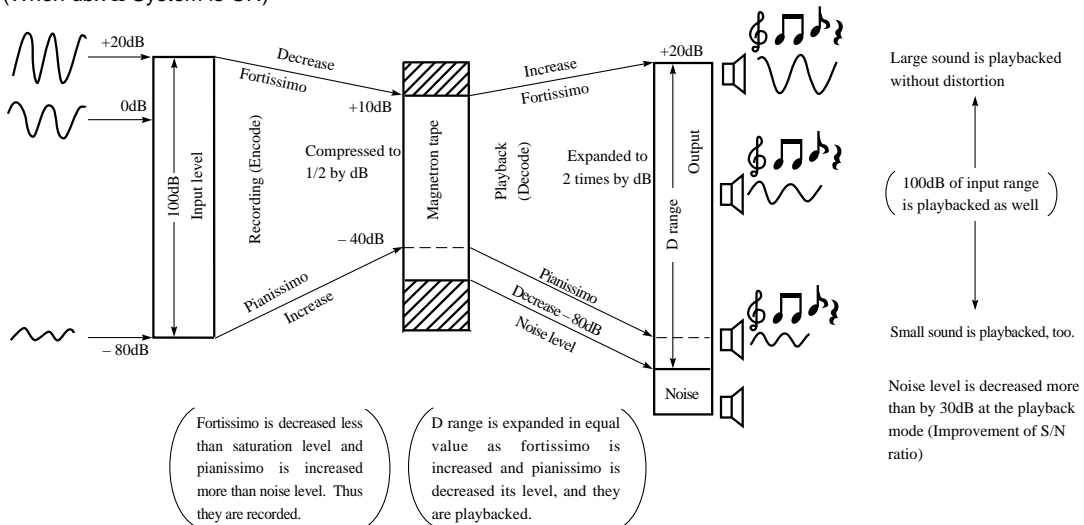
Note 2) Impedance of the input signal source should be less than 100Ω .

■ Effect of dbxII Noise Reduction System

(Without noise reduction system)



(When dbx II System is ON)



■ Cautions

- (1) When users use the AN6291 and the AN6291S, contract should be made between the dbx Technology Licensing. dbx licence and trademark should be contacted with the following.

the U.S.A. : dbx Technology Licensing

JAPAN Office : dbx Technology Licensing

433 California Street, Third Floor

Tel : 03-3378-0915

San Francisco, California 94104

Tel : 415-765-2801

Fax : 03-3374-5191

Fax : 415-765-2141

- (2) Capacitor between the Pin6 – 7 and Pin16 –17 is used to cut DC current.

When leakage of DC current is large, encode and decode characteristics is not right value, capacitor's leakage should be as minimum as possible.

- (3) The AN6291 is a low power consumption current type. So effecttion of wiring resistance is small and oscillation character-ist of pattern location is good, however, when impedance of the input pin is high, wiring should be shorter because it is easily effected by external noises.

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