

AN6291, AN6291S

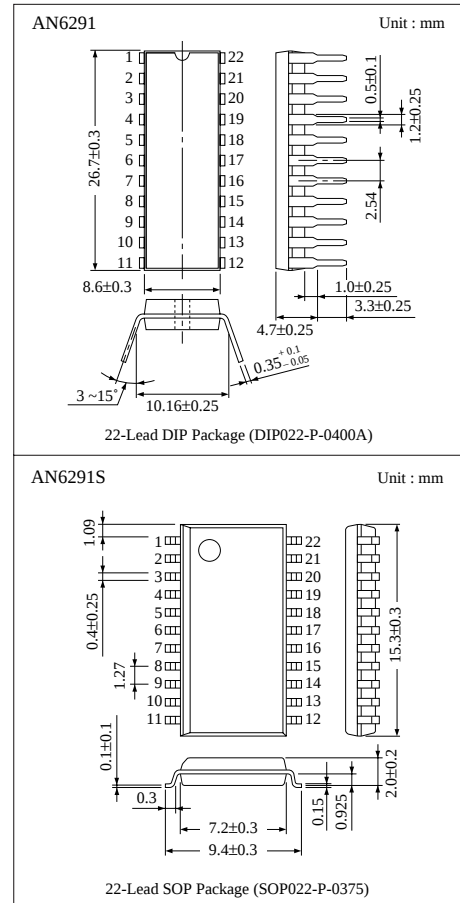
Dual dbx II Noise Reduction System ICs

■ Overview

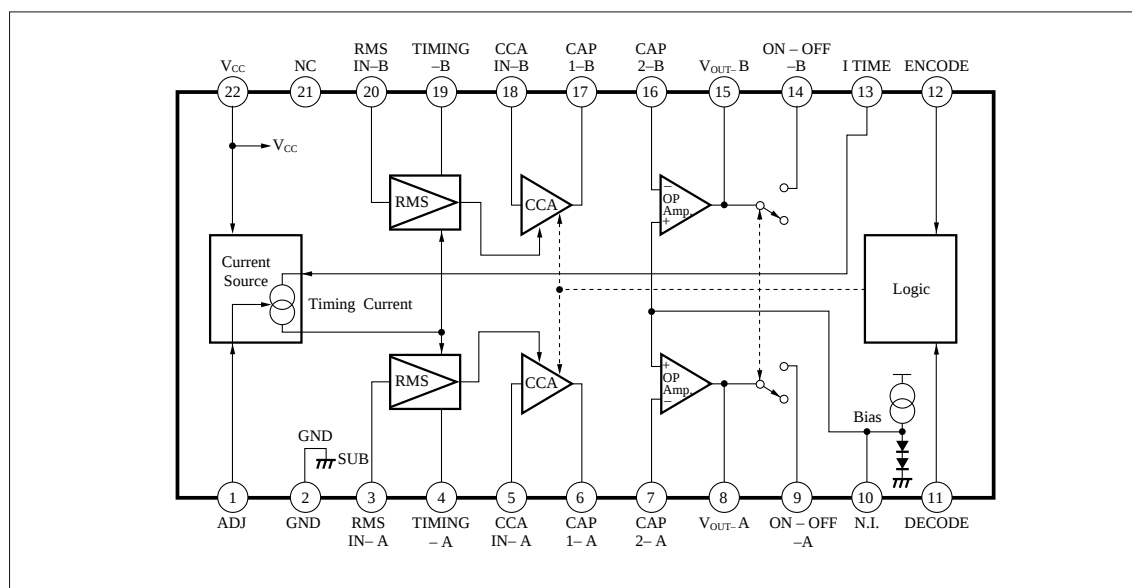
The AN6291 and the AN6291S are the single chip ICs suitably developed for noise reduction of dbxII type and used for stereo operation. They can be used for U.S. sound multiplex TV. 1.8V low voltage operation enables to apply for battery-operated equipment to the Hi-Fi deck. Package is available for 22-pin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

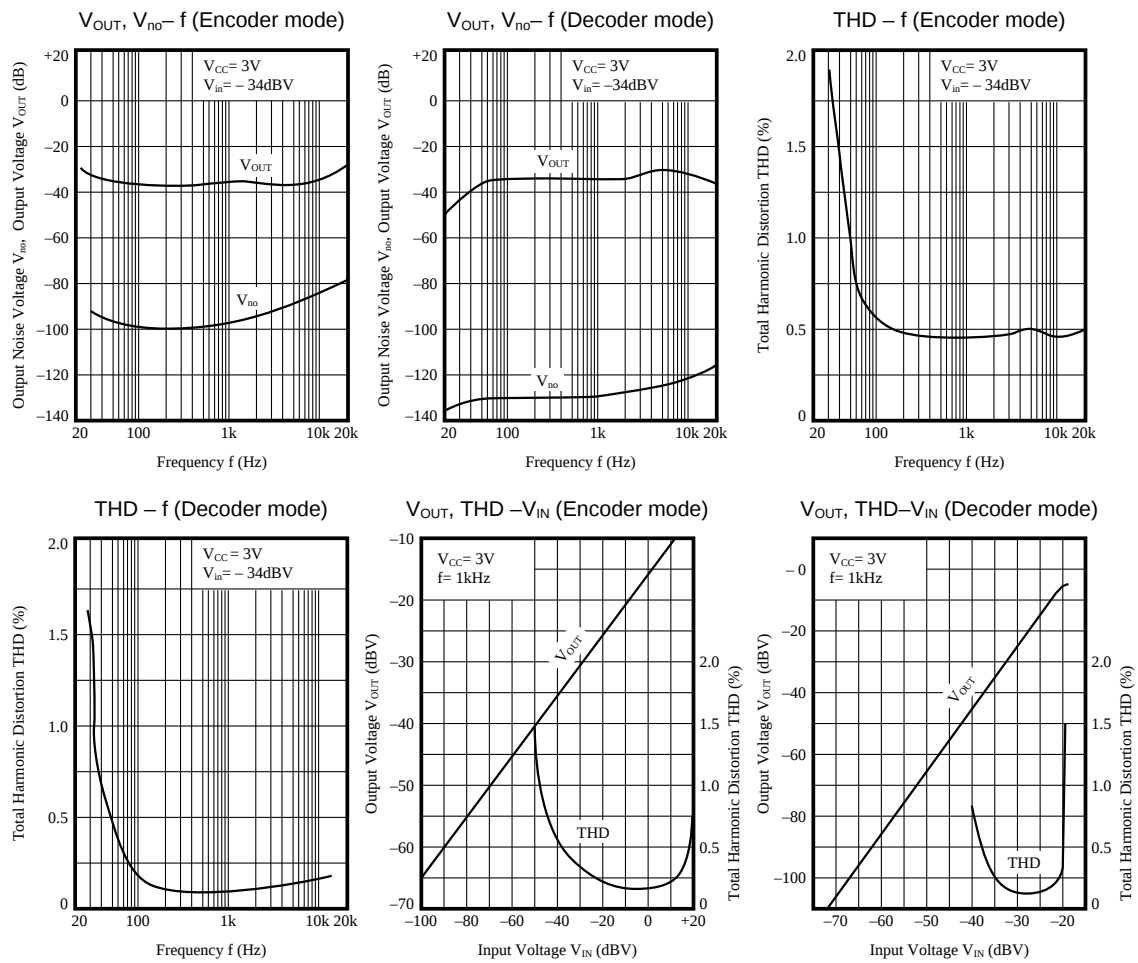
■ Absolute Maximum Ratings (Ta=25°C)

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)

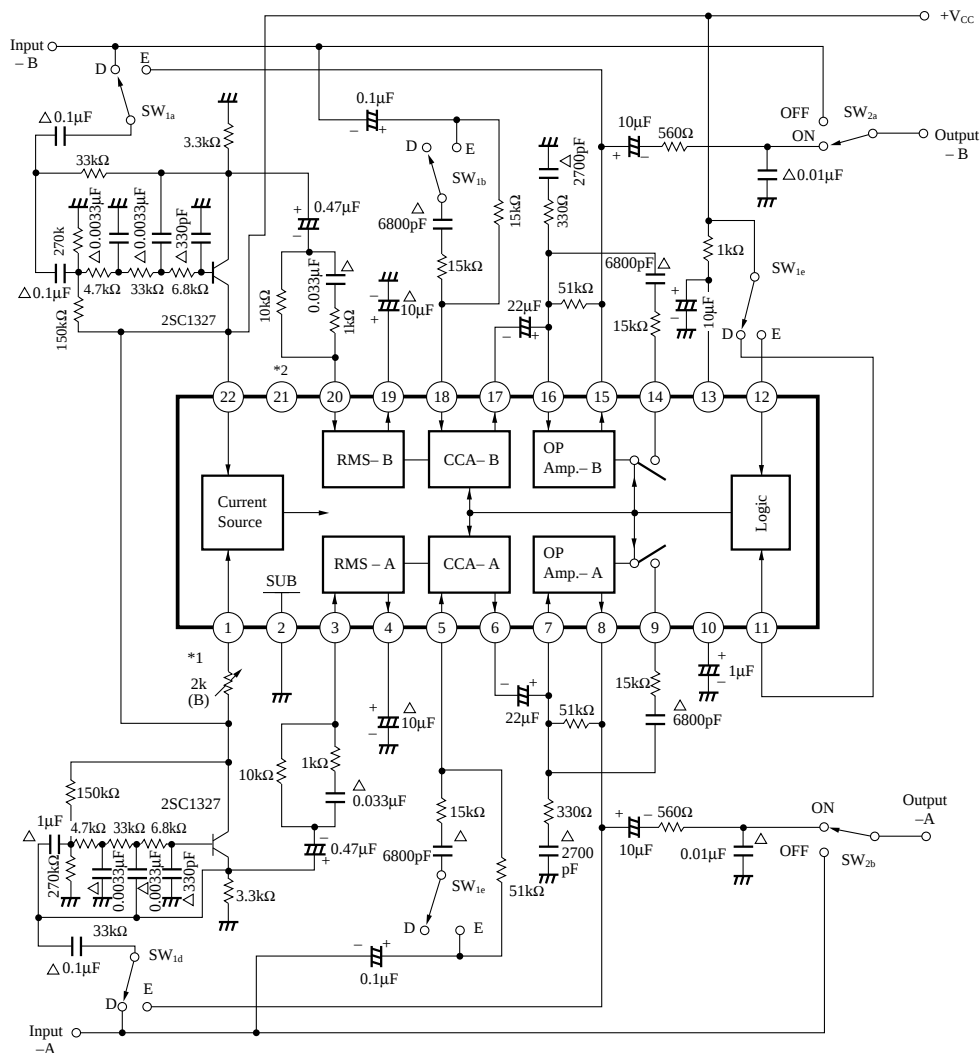
Parameter		Symbol	Condition	min.	typ.	max.	Unit
Input/Output Characteristics/ENCODE Mode		V _{OE-1}	V _{IN} = + 20dB, f=1kHz	7.5	10	12.5	dB
		V _{OE-2}	V _{IN} = 0dB, f=1kHz	-2	0	+ 2	
		V _{OE-3}	V _{IN} = -40dB, f=1kHz	-23	-20	-17	
Input/Output Characteristics/DECODE Mode		V _{OD-1}	V _{IN} = + 10dB, 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	V _{OME}	THD=1%, f=1kHz	80	150	—	mV
	DECODE Mode	V _{OMD}		200	450	—	
Total Harmonic Distortion/DECODE Mode		THD _D	V _O = + 14dB, f=1kHz	—	0.15	0.3	%
Noise Output Voltage	ENCODE Mode	V _{NOE}	Input Short A-weight	—	100	200	μV
	DECODE Mode	V _{NOD}		—	3	6	
Difference Between Channels	ENCODE Mode	CD _E	V _{IN} = 0dB, f=1kHz	-1.2	0	1.2	dB
	DECODE Mode	CD _D		-1.2	0	1.2	
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 _{N_{OFF}}	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 $15\mu A \pm 5\%$. Standard value at $V_{CC}=3V$ is about $1k\Omega$.

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

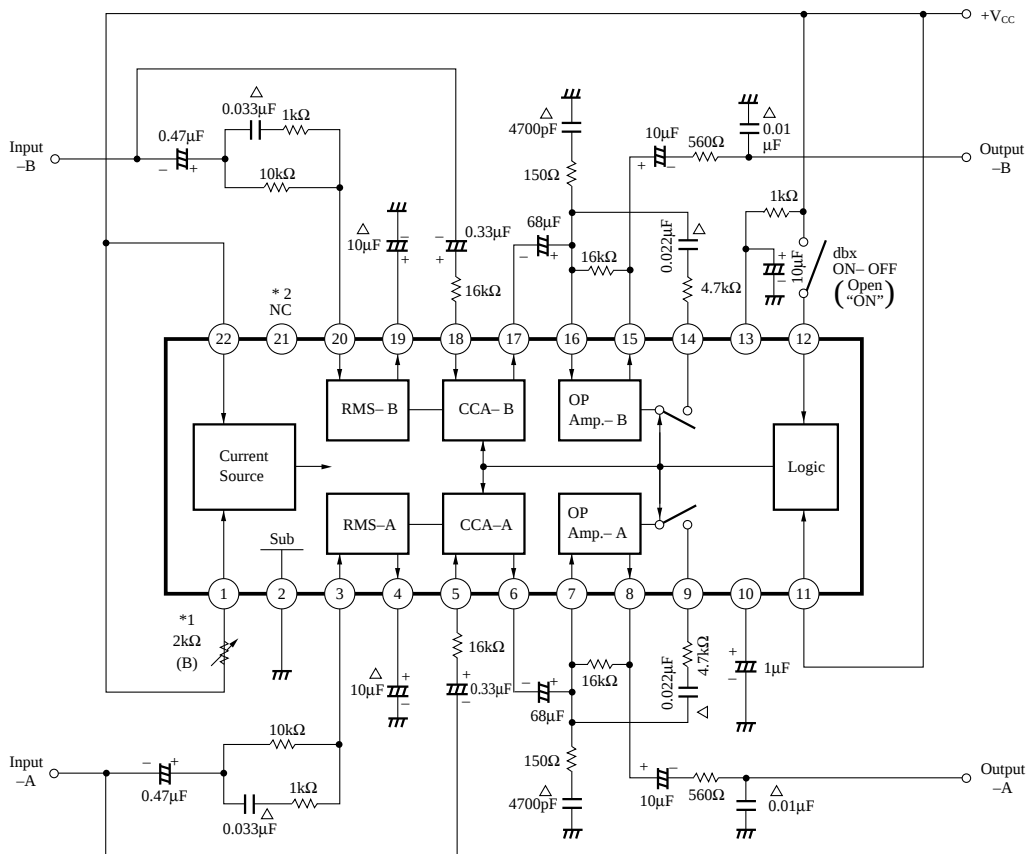
* 3 Users should follow the latest technical information from dbx company. Constant number might be changed.

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

Note 2) $S_{1a} \sim S_{1e}$: Switch record, playback (Above figure shows “PLAYBACK” mode).

Note 3) $S_{2a} \sim S_{2b}$: 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 $15\mu A \pm 5\%$. Standard value at $V_{CC}=3V$ is about $1k\Omega$.

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

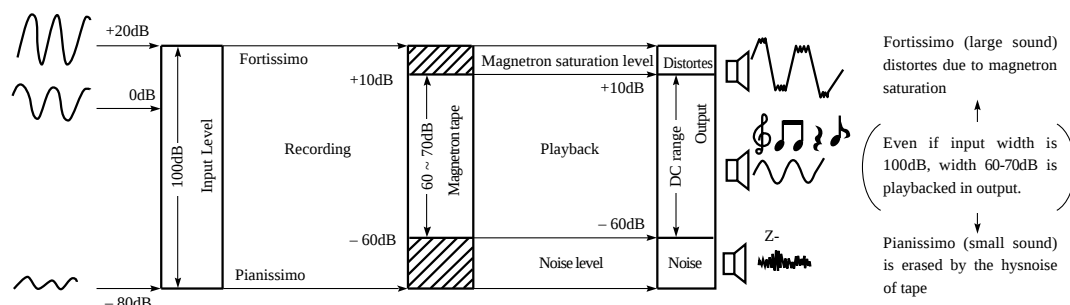
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Note 1) All the resistors and the capacitor with the mark Δ should be used in the error less than $\pm 5\%$.

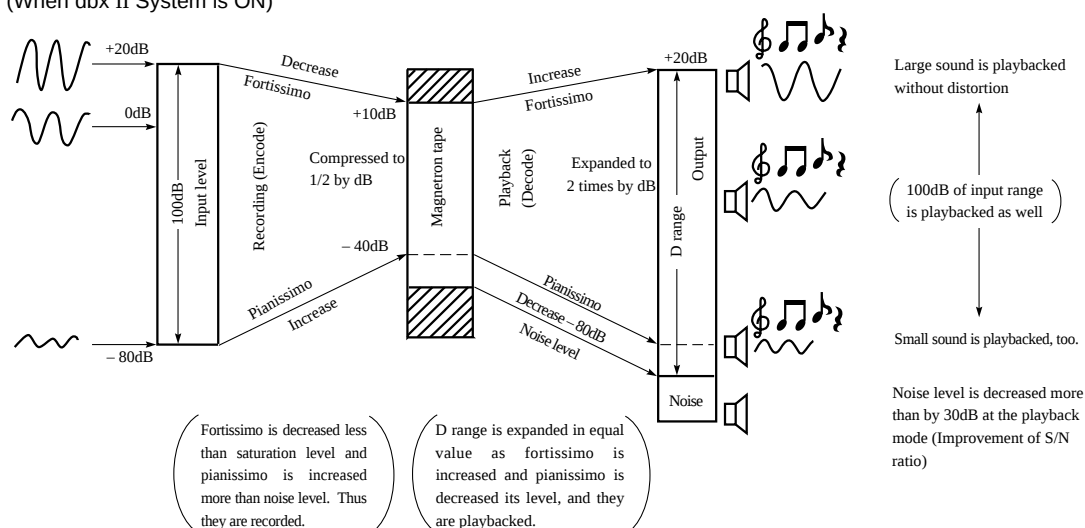
Note 2) Impedance of the input signal source should be less than 100Ω .

■ Effect of dbxII Noise Reduction System

(Without noise reduction system)



(When dbx II System is ON)



■ Cautions

- 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
 433 California Street, Third Floor
 San Francisco, California 94104
 Tel : 415-765-2801
 Fax : 415-765-2141
 JAPAN Office : dbx Technology Licensing
 Tel : 03-3378-0915
 Fax : 03-3374-5191
- 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.
- The AN6291 is a low power consumption current type. So effect 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.