AN7375N/NS

Low Voltage Dual Dolby* B-type Noise Reduction Processor

■ Description

The AN7375N/NS are the monolithic integrated circuits designed for dolby B-type noise reduction system of low voltage operation. Two channels built-in one chip enable stereo construction.

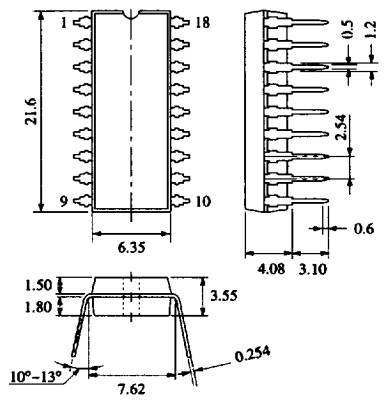
■ Features

- Low voltage operation: 1.8V ~ 4.5V
- Low current consumption: 4mA type
- Fewer external components
- Dolby ON/OFF switch built-in

* "Dolby" and the double-D symbol are trademarks of Dolby Laboratories Licensing Corporation.

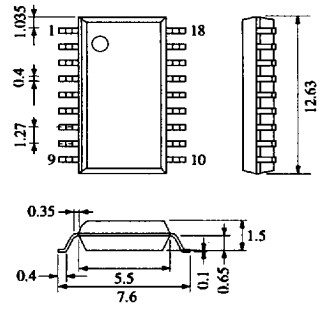
Note: When users use this product, licensing contract should be made between the Dolby Research Center. Details should be contacted with the following:
Dolby Research Center: Tokyo Office (Far Eastan Continental Inc.)
Tel: 03-3584-0039

AN7375N Unit : mm



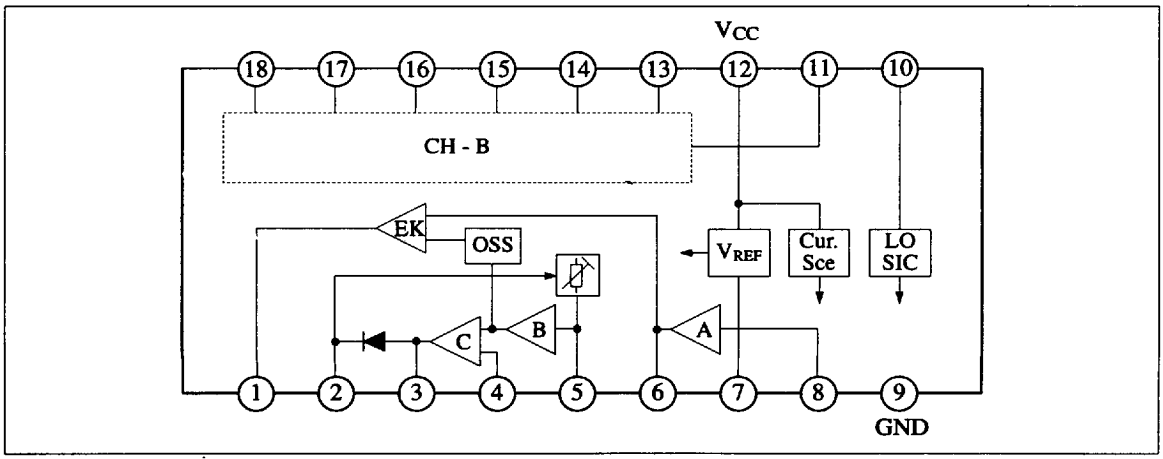
18-Lead DIL Plastic Package (18-DIP)

AN7375NS Unit : mm



18-Lead PANAFLAT Plastic Package (SO-18D)

■ Block Diagram



■ Absolute Maximum Ratings (Ta=25°C)

Item		Symbol	Rating	Unit
Supply Voltage		V_{CC}	6	V
Supply Current		I_{CC}	10	mA
Power Dissipation (Ta = 75°C)		P_D	60	mW
Operating Ambient Temperature		Topr	-20 ~ +75	°C
Storage Temperature	AN7375N	Tstg	-55 ~ +150	°C
	AN7375NS		-55 ~ +125	°C

Operating Supply Voltage Range: V_{CC} = 1.8V ~ 4.5V

■ Electrical Characteristics (V_{CC}=3V, Ta=25±2°C) *1,*2

Item	Symbol	Test Cct	Condition	min.	typ.	max.	Unit
Quiescent Current	I_{CQ}	1	REC. NR OFF non-signal		4.0	6.0	mA
Input Amp. Gain	G_{VA}	2	Pin 8 - 6, Pin 11 - 13, V_{in} = 1kHz, 0dB	10.0	11.0	12.0	dB
Recording Frequency Characteristics-1	$f_{C(R-1)}$	3	REC. NR ON, V_{in} = 1kHz, -20dB	2.7	4.2	5.7	dB
Recording Frequency Characteristics-2	$f_{C(R-2)}$	3	REC. NR ON, V_{in} = 1kHz, -40dB	5.2	6.2	7.2	dB
Recording Frequency Characteristics-3	$f_{C(R-3)}$	3	REC. NR ON, V_{in} = 5kHz, 0dB	-0.7	0.3	1.3	dB
Recording Frequency Characteristics-4	$f_{C(R-4)}$	3	REC. NR ON, V_{in} = 5kHz, -20dB	1.7	3.2	4.7	dB
Recording Frequency Characteristics-5	$f_{C(R-5)}$	3	REC. NR ON, V_{in} = 5kHz, -40dB	9.3	10.3	11.3	dB
Total Harmonic Distortion-1	THD_{-1}	3	REC. NR ON, V_{in} = 1kHz, 0dB		0.1	0.5	%
Total Harmonic Distortion-2	THD_{-2}	3	PB. NR ON, V_{in} = 1kHz, 0dB		0.1	0.5	%
Maximum Output Voltage-1	$V_{O(max.-1)}$ *3	3	REC. NR ON, f = 1kHz, THD = 1%	12	15		dB
Signal to Noise Ratio-1	S/N_{-1}	4	REC. NR ON, R_g = 10kΩ, CCIR/ARM	64	69		dB
Signal to Noise Ratio-2	S/N_{-2}	4	PB. NR ON, R_g = 10kΩ, CCIR/ARM	75	85		dB
Crosstalk	CT	5	PB. NR ON, V_{in} = 1kHz, 0dB	50	60		dB
Channel Balance	CB	6	PB. NR ON, V_{in} = 1kHz, 0dB	-1	0	1	dB
Switch Voltage	V_{OFF}	3	Pin 10 applied voltage which NR is OFF			0.3	V

*1 Dolby level = 0dB (Signal level which becomes 100mV output at test point when 400Hz signal is applied to input pin at REC. NR (OFF))

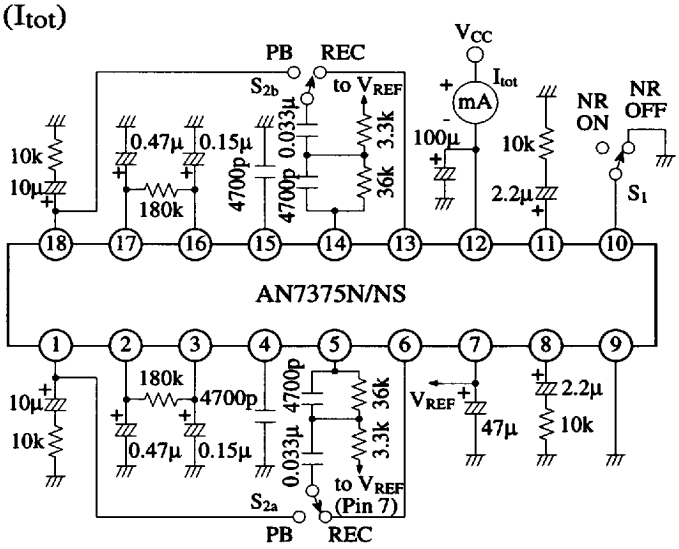
*2 Measure Ch. A and Ch. B

*3 Measure at V_{CC} = 1.8V

■ Pin

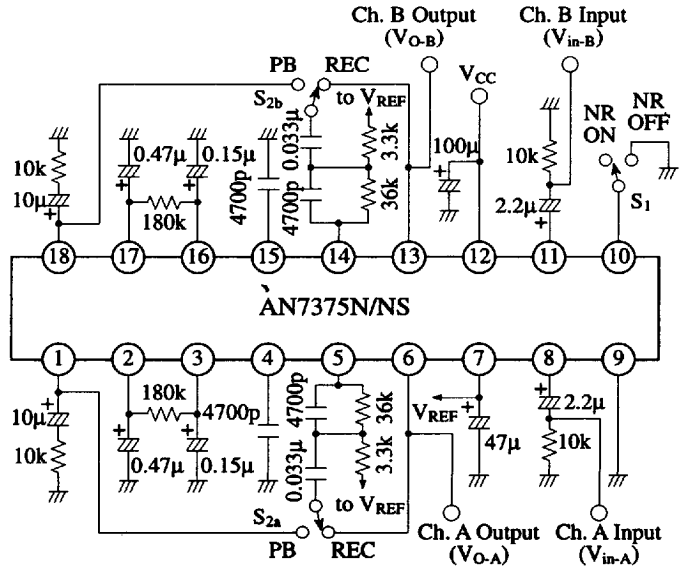
Pin No	Pin Name	Pin No	Pin Name
1	Output Ch.A	10	NR ON/OFF Switch
2	Time Constant-2 Ch.A	11	Input Ch.B
3	Time Constant-1 Ch.A	12	V_{CC}
4	High Pass Filter Ch.A	13	Input Amp. Output Ch.B
5	Side Chain Input Ch.A	14	Side Chain Input Ch.B
6	Input Amp. Output Ch.A	15	High Pass Filter Ch.B
7	Reference Voltage	16	Time Constant-1 Ch.B
8	Input Ch.A	17	Time Constant-2 Ch.B
9	GND	18	Output Ch.B

Test Circuit 1 (I_{tot})



Test Circuit 2 (G_{VA})

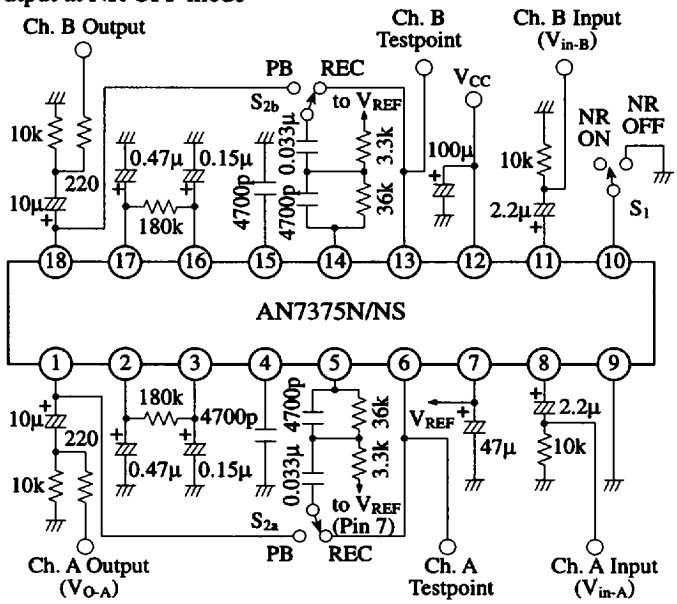
$$G_{VA} = 20 \times \log \frac{V_O}{V_{in}}$$



Test Circuit 3 ($f_{C(R-1)}$, $f_{C(R-2)}$, $f_{C(R-3)}$, $f_{C(R-4)}$, $f_{C(R-5)}$, THD_{1-2}, $V_{Omax.-1}$)

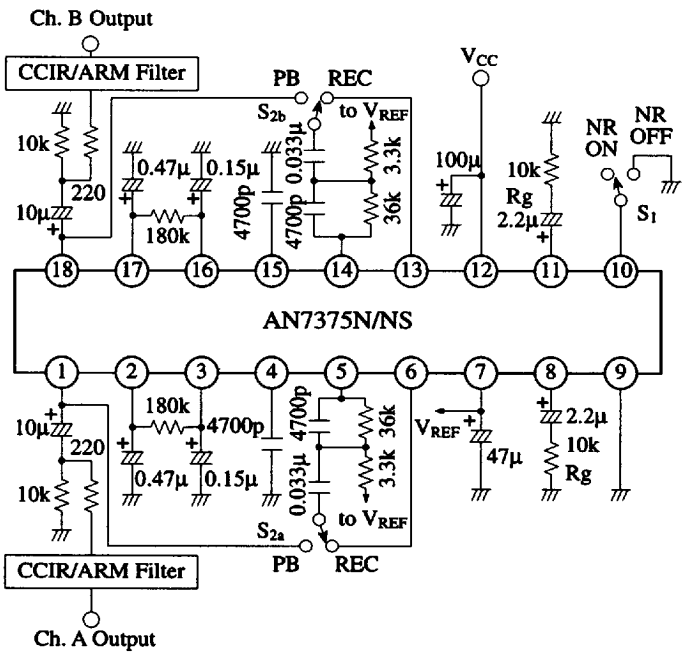
$f_{C(R-1)}$ ~ $f_{C(R-5)}$ is a ratio between output at NR ON mode and output of NR OFF.
Following formula is applied.

$$f_{C(R)} = 20 \times \log \frac{\text{Output at NR ON mode}}{\text{Output at NR OFF mode}}$$



Test Circuit 4 (SN_{-1}, SN_{-2})

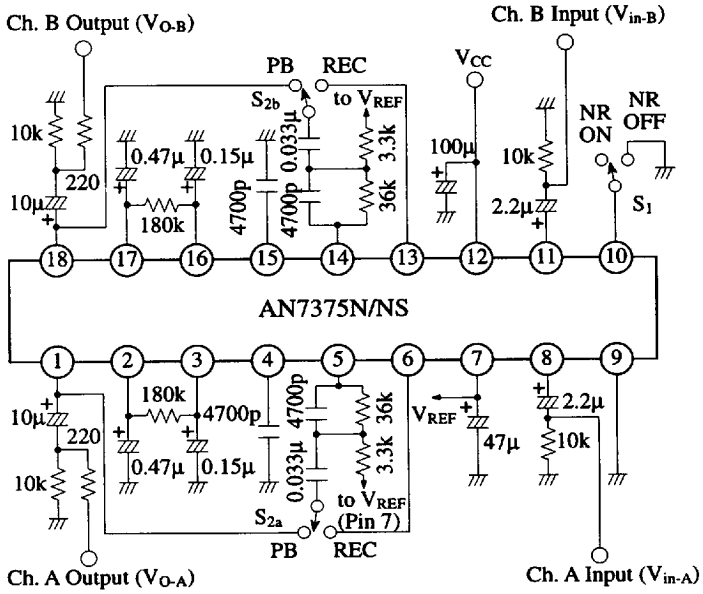
$$SN = 20 \times \log \frac{\text{Noise level (mV)}}{100\text{(mV)}}$$



Test Circuit 5 (CT)

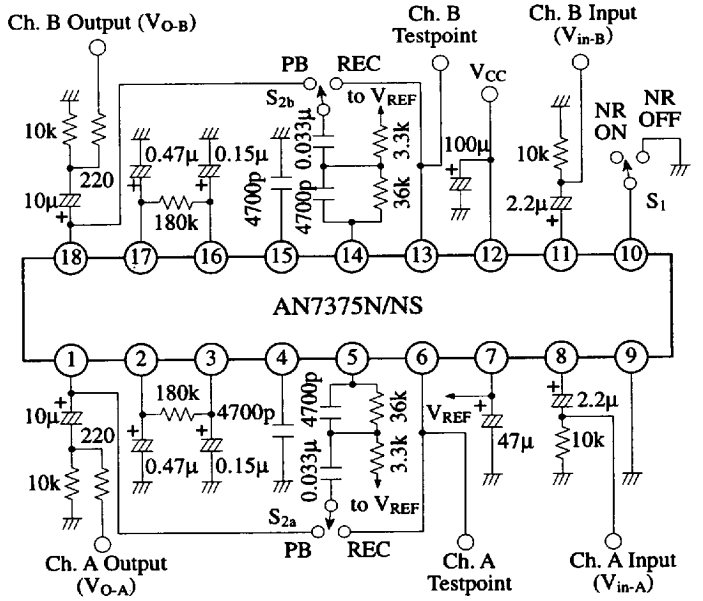
CT is obtained by measuring signal level leaked to the other output ($V_{O\text{-}B}$ output at $V_{in\text{-}A}$ input) when input is applied to either $V_{in\text{-}A}$ or $V_{in\text{-}B}$.

$$CT = 20 \times \log \frac{\text{leakage signal level (mV) to another output}}{100\ (\text{mV})}$$

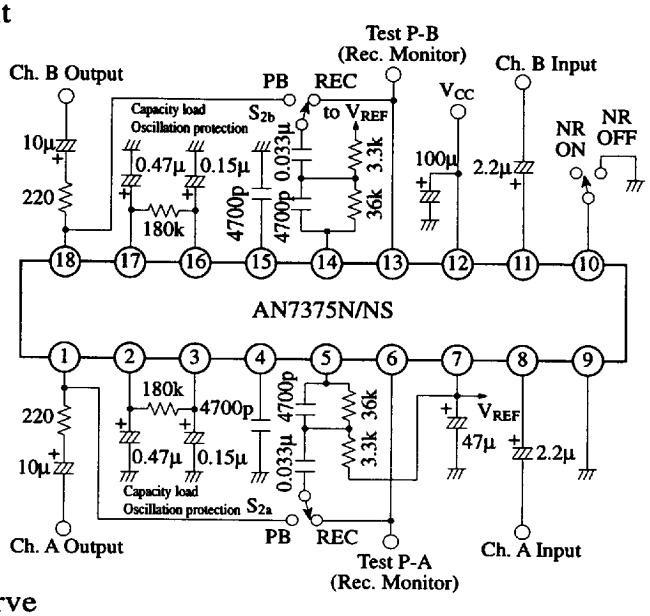


Test Circuit 6 (CB)

$$BL = 20 \times \log \frac{V_{O\text{-}B}}{V_{O\text{-}A}}$$



■ Application Circuit



■ Characteristics Curve