AN7333S

4-Element Graphic Equalizer IC for Radio/Radio Cassette Recorder

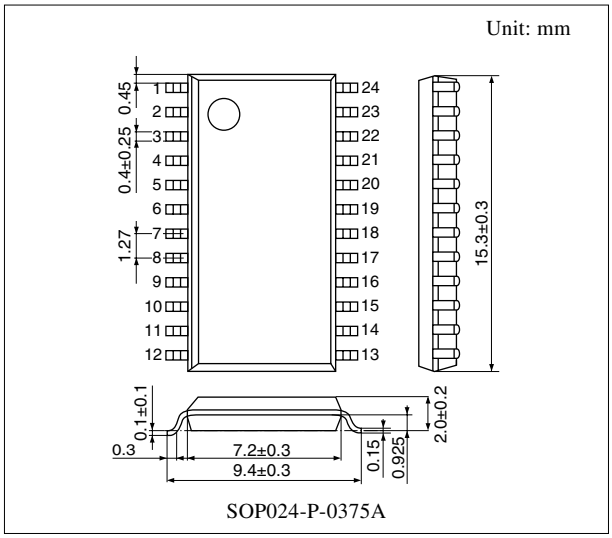
■ Overview

The AN7333S is an integrated circuit for 4-element graphic equalizers most suitable for radio cassette / portable component stereo equipment.

2-channel 4-element graphic equalizer can be configured by applying frequency setting capacitors and variable resistors externally. Non-step adjustment of the boost and the cutting quantitiy is possible by variable resistors.

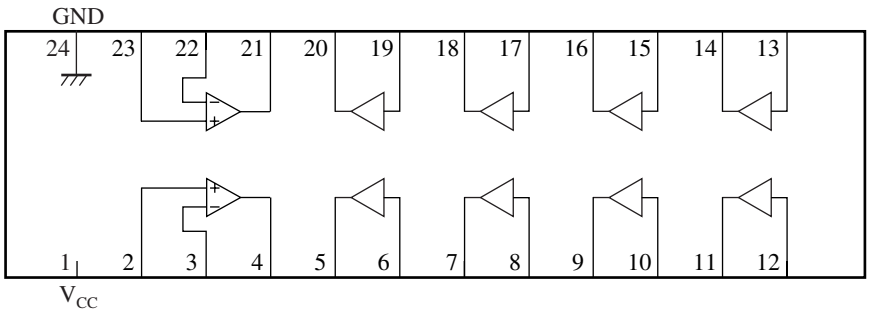
■ Features

- The resonance frequency can be freely set by optional selection of the capacitor capacitance.
- Low distortion rate: THD = 0.04% (V_{CC} = 5 V)
- Wide dynamic range: V_O = 800 mV[rms] (at Boost THD = 1%)
- Low noise level: V_{no} = 10 μV (V_{CC} = 5V)



Note) The package of this product will be changed to lead-free type (SOP024-P-0375C). See the new package dimensions section later of this datasheet.

■ Block Diagram



■ Pin Descriptions

Pin No.	Description	Pin No.	Description
1	Power supply	13	Input pin
2	Non inverting input	14	Negative feedback
3	Inverting input	15	Input pin
4	Output	16	Negative feedback
5	Negative feedback	17	Input pin
6	Input pin	18	Negative feedback
7	Negative feedback	19	Input pin
8	Input pin	20	Negative feedback
9	Negative feedback	21	Output
10	Input pin	22	Inverting input
11	Negative feedback	23	Non inverting input
12	Input pin	24	GND

■ Absolute Maximum Ratings

Parameter	Symbol	Rating	Unit
Supply voltage	V_{CC}	14.4	V
Supply current	I_{CC}	30	mA
Power dissipation	P_D	432	mW
Operating ambient temperature *1	T_{opr}	−20 to +75	°C
Storage temperature *1	T_{stg}	−55 to +125	°C

Note) ∗1: Except for the operating ambient temperature and storage temperature, all ratings are for T_a = 25°C.

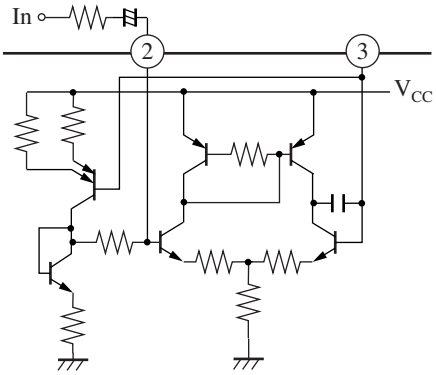
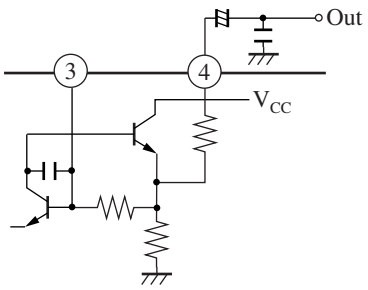
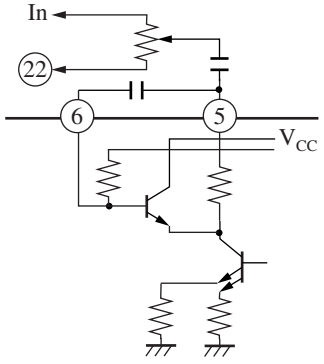
■ Recommended Operating Range

Parameter	Symbol	Range	Unit
Supply voltage	V_{CC1}, V_{CC2}	4 to 14	V

■ Electrical Characteristics at V_{CC} = 5 V, T_a = 25°C

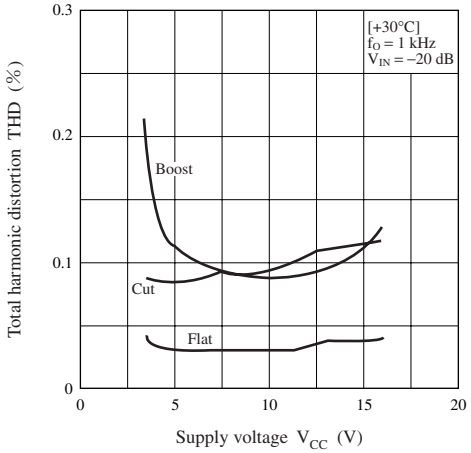
Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Total circuit current	I_{tot}	V_{IN} = 0 mV	—	7.5	—	mA
Voltage gain	G_V	f = 1 kHz, V_O = −10 dBV	—	−1.5	—	dB
Boost quantity	Boost	V_O = −20 dBV is set to 0 dBV	—	9.5	—	dB
Cut quantity	Cut	V_O = −20 dBV is set to 0 dBV	—	−9.5	—	dB
Total harmonic distortion	THD	f = 1 kHz, V_O = −20 dBV	—	0.04	—	%
Output noise voltage	V_{no}	R_g = 0 Ω, Total Flat, DIN/AUDIO	—	10	—	μV
Crosstalk	CT	f = 1 kHz, R_g = 0 Ω, Total Flat, V_O = −20 dBV	—	12	—	μV

■ Terminal Equivalent Circuits

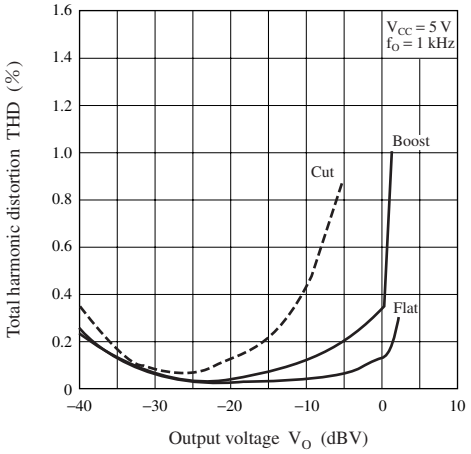
Pin No.	Equivalent circuit	Description	Pin voltage (V)
1	—	Power supply: Supply pin	5
2 23		Non inverting input: Output buffer circuit non-inverting input pin	$\frac{1}{2}$ V_{CC}
3 22		Inverting input: Output buffer circuit inverting input pin	Center electric potential
4 21		Output: Output buffer output pin	Center electric potential
5, 7, 9, 11, 14, 16, 18, 20		Negative feedback: Resonance circuit negative feedback pin	Center electric potential
6, 8, 10, 12, 13, 15, 17, 19		Input pin: Resonance circuit input pin	Center electric potential
24	—	GND pin:	0

■ Main Characteristics

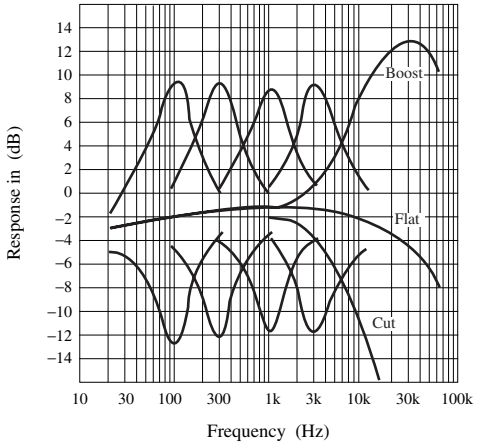
THD — V_{CC}



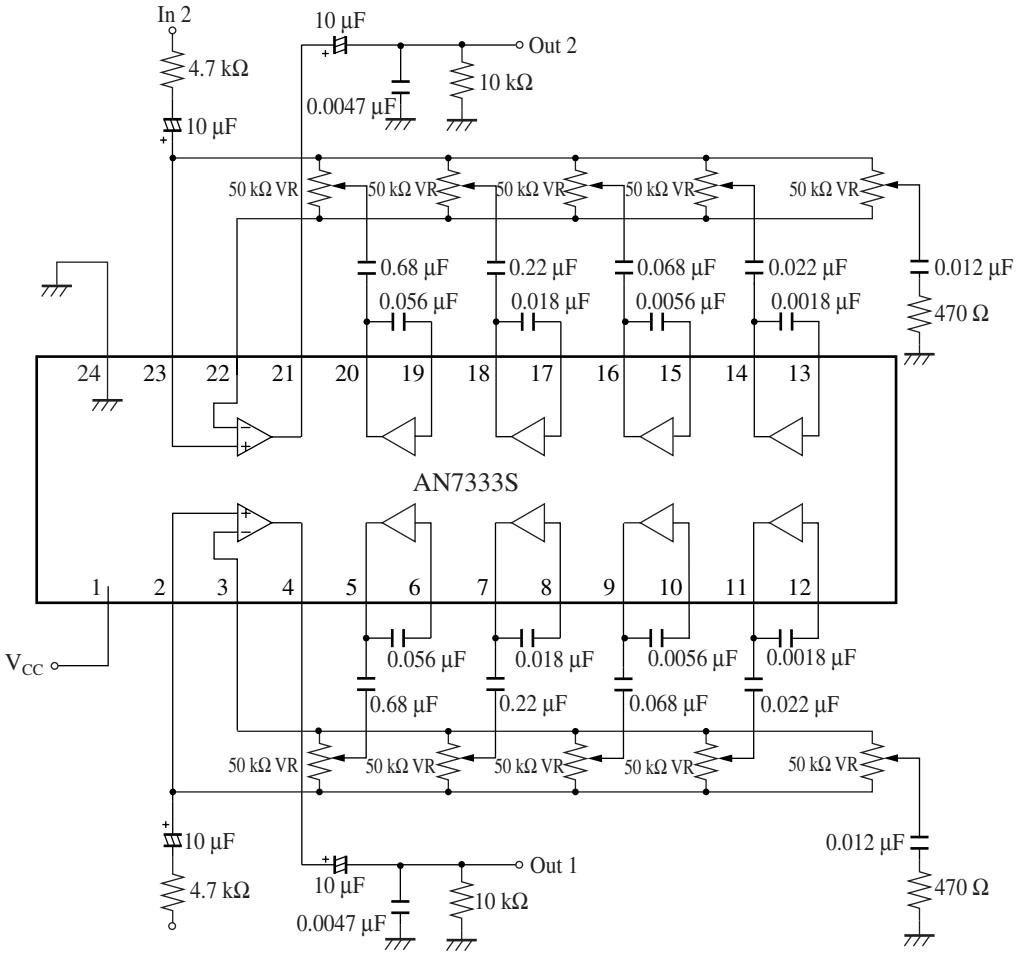
THD — V_O



Frequency characteristics

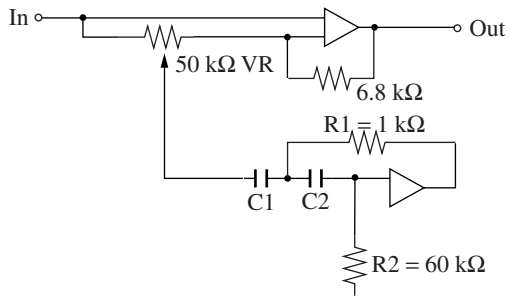


■ Application Circuit Example



Note) VR is B or G type.

• Resonant frequency fo



$$f_O = \frac{1}{2\pi\sqrt{C1 \times C2 \times R1 \times R2}}$$

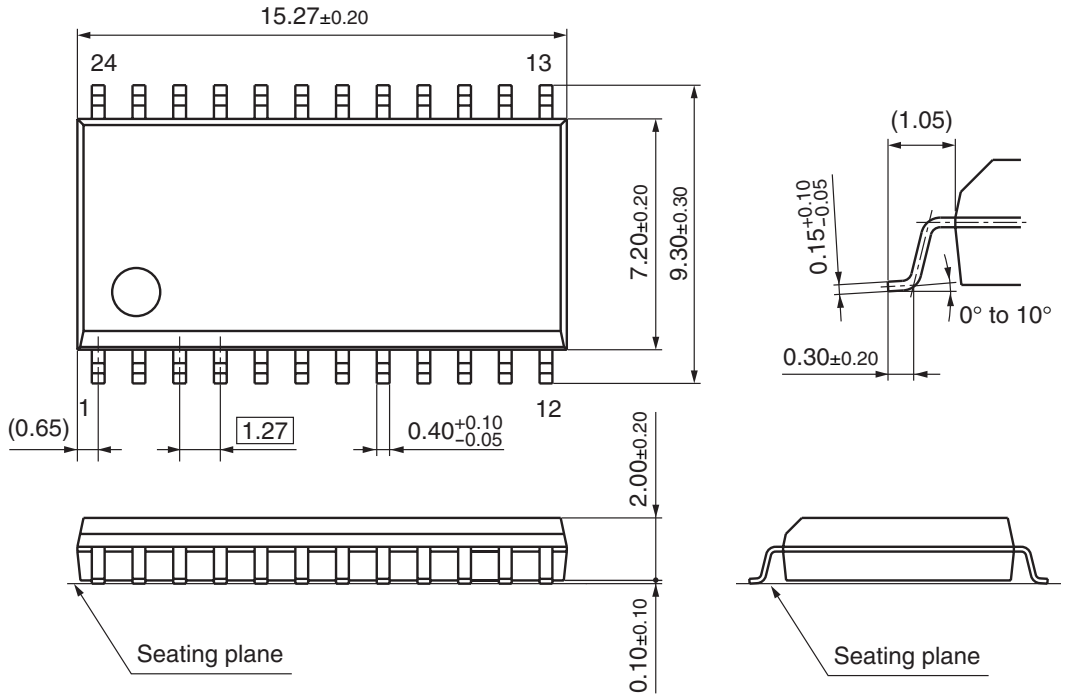
(Internal resistance: R1 = 1 kΩ, R2 = 60 kΩ)

∗ Internal resistance: As R1 and R2 of internal resistors are common in each oscillation circuit, f_O can be adjustable from an external capacitor.

∗ Gain can be adjusted by the 50 kΩ variable resistor.

■ New Package Dimensions (Unit: mm)

• SOP024-P-0375C (Lead-free package)



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