

**LA4800V****3 V Stereo Headphone Power Amplifier****Overview**

The LA4800V is a headphone stereo power amplifier IC that features a high signal-to-noise ratio, high ripple rejection, low distortion and low current consumption, making it ideal for portable CD players.

Functions

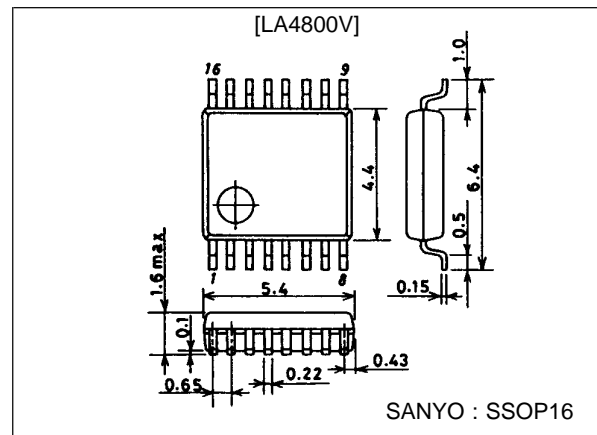
- Headphone stereo power amplifier
- Beep tone
- Power switch
- Power mute switch

Features

- 96 dB (typ) high S/N ratio at 7 μ V
- 76 dB (typ) high ripple rejection
- 0.07% (typ) low distortion with $R_L = 16 \Omega$
- 6.2 mA (typ) low current consumption
- Outputs do not require electrolytic capacitors.
- Available in 16-pin SSOPs

Package Dimensions

unit : mm

3178-SSOP16**Specifications****Maximum Ratings at $T_a = 25^\circ\text{C}$**

Parameter	Symbol	Conditions	Ratings	Unit
Maximum supply voltage	$V_{CC \text{ max}}$		4.5	V
Power dissipation	$P_d \text{ max}$		375	mW
Operating temperature range	T_{opr}		-15 to 50	$^\circ\text{C}$
Storage temperature range	T_{stg}		-40 to 150	$^\circ\text{C}$

Recommended Operating Ranges at $T_a = 25^\circ\text{C}$

Parameter	Symbol	Conditions	Ratings	Unit
Supply voltage	V_{CC}		3.0	V
Load resistance	R_L		16 to 32	Ω
Operating supply voltage range	$V_{CC \text{ op}}$		1.8 to 3.6	V

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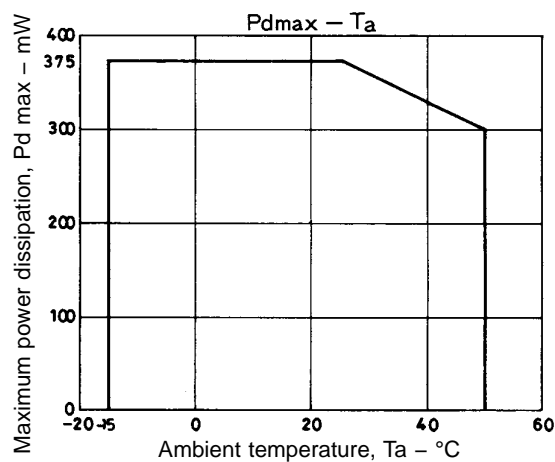
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32896HA(II)/60393TS No.4335-1/11

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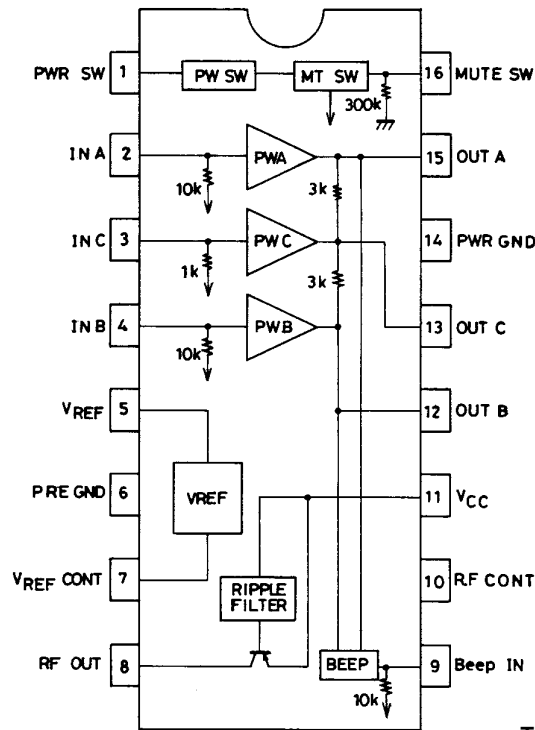
**Operating Characteristics at $T_a = 25^\circ\text{C}$, $V_{CC} = 2.5\text{ V}$, $R_L = 16\ \Omega$, $f = 1\text{ kHz}$ unless otherwise noted.
Values in parentheses indicate $V_{CC} = 3.0\text{ V}$**

Parameter	Symbol	Conditions	min	typ	max	Unit
Quiescent supply current	I_{CCO1}	IC OFF		0.05	1.0	μA
	I_{CCO2}	Mute ON		1.6 (1.65)	3.0	mA
	I_{CCO3}	No input signal		6.2 (6.8)	9.0	mA
Voltage gain	VG	$V_O = -10\text{ dBm}$	10.3	11.8	13.3	dB
Channel balance	V_{RL}	$V_O = -10\text{ dBm}$	-1	0	1	dB
Output power	P_O	$V_{CC} = 3.0\text{ V}$, THD = 10%	15	25		mW
Total harmonic distortion	THD	$V_O = 0.35\text{ V}$		0.075	0.2	%
Output noise voltage	V_{NO}	$R_g = 1\text{ k}\Omega$, DIN AUDIO		7.8	15	μV
Crosstalk	CT	$f = 1\text{ kHz}$, TUN, $V_O = -10\text{ dBm}$	35	45		dB
Ripple rejection	R.R	$V_{CC} = 1.7\text{ V}$, $f = 100\text{ Hz}$, $V_{CR} = -20\text{ dBm}$, TUN = 100 Hz	65	76		dB
Mute attenuation	V_{OFF}	THD = 1%	-80	-96		dB
Beep tone output voltage	$V_{O\text{ BEEP}}$	$V_I = -13.5\text{ dBm}$ (sine wave)	1.5	3.0		mV
Output DC offset voltage	$V_{DC\text{ OFF}}$	$V_I = 0\text{ V}$, $R_g = 1\text{ k}\Omega$	-20	0	20	mV
Power ON current sensitivity	$I_{1\text{ ON}}$	$V_{CC} = 1.7\text{ V}$, $V_5 \cong 1.0\text{ V}$		50	60	μA
Power OFF voltage sensitivity	$V_{1\text{ OFF}}$	$V_{CC} = 1.7\text{ V}$, $V_5 \cong 0.1\text{ V}$	0.5	0.6		V
Mute OFF current sensitivity	$I_{16\text{ OFF}}$	$V_{CC} = 1.7\text{ V}$, $V_5 \cong 1.0\text{ V}$		4.5	6.0	μA
Mute OFF voltage sensitivity	$V_{16\text{ OFF}}$	$V_{CC} = 1.7\text{ V}$	1.0	1.25	1.5	V
Mute ON voltage sensitivity	$V_{16\text{ ON}}$	$V_{CC} = 1.7\text{ V}$		0.9	1.0	V



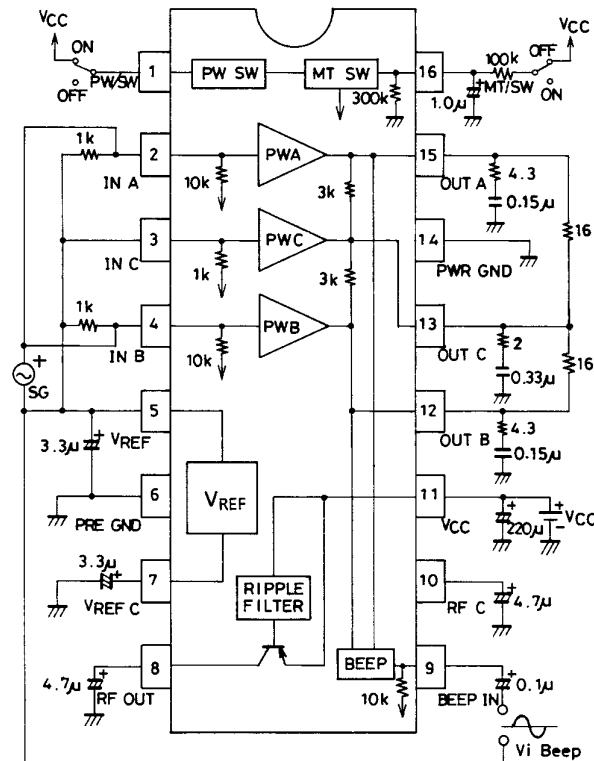
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Pin Assignment and Block Diagram



Top view
Unit (resistance: Ω)

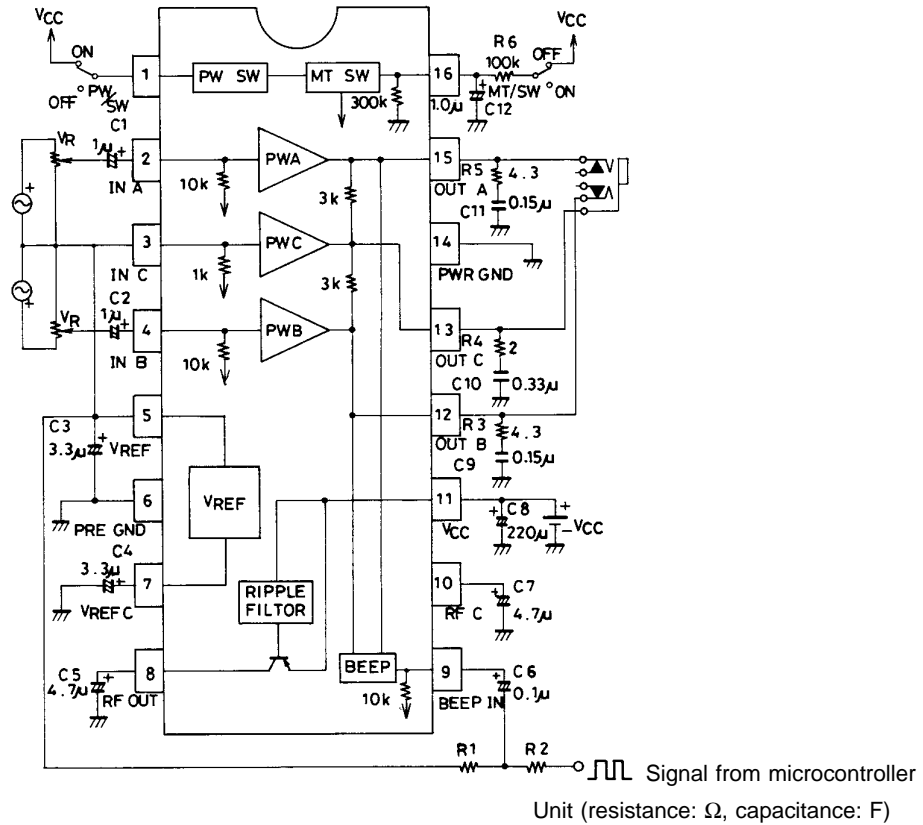
Test Circuit



Unit (resistance: Ω , capacitance: F)

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Sample Application Circuit



Pin Description

$V_{CC} = 2.5\text{ V}$

Unit (resistance: Ω)

Pin number	Pin name	V_{DC} (V)	Equivalent circuit	Pin description
1	PWR SW	0 to 0.7		Power switch Turns ON the power to the V_{CC} pin.
2	IN A	1.1		Power input pins 10 k Ω input resistance
4	IN B			
3	IN C	1.1		Power amplifier common input pin Usually connected to Vref

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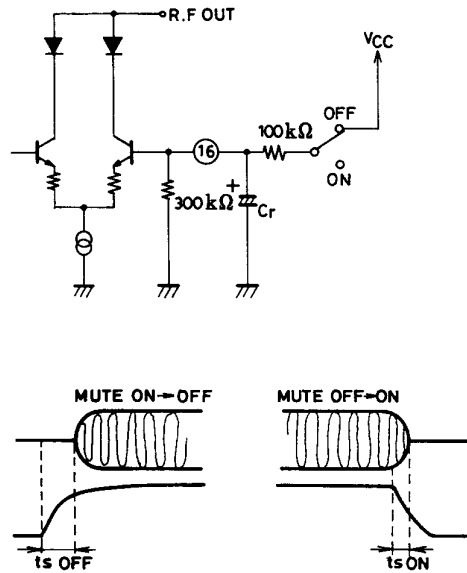
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Unit (resistance: Ω)

Pin number	Pin name	V _{DC} (V)	Equivalent circuit	Pin description
5	V _{REFOUT}	1.1		1.1 V fixed bias
6	PRE GND			Preamplifier ground
7	V _{REFCONT}	1.1		1.1 V reference control pin
8	RF OUT	2.2		Preset to approximately $V_{CC} \times 0.88$ V
9	Beep IN	1.1		Beep tone input pin Active only when mute is ON.
10	RF CONT	2.2		RF control pin
11	V _{CC}			Power supply
12 13 15	OUT B OUT C OUT A	1.1 1.1 1.1		Power output pins Pin 13 is the headphone center common drive. (No electrolytic capacitors required)
14	PWR GND			Power amplifier ground
16	MUTE SW	0 to 1.85		The mute pin is floating when ON, and tied to V_{CC} through a 100 k Ω when OFF.

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Mute time adjustment

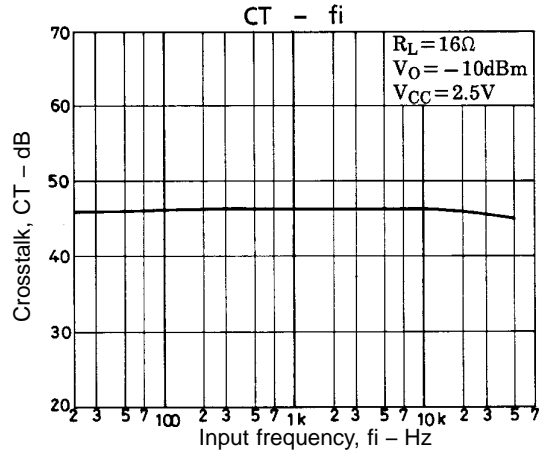
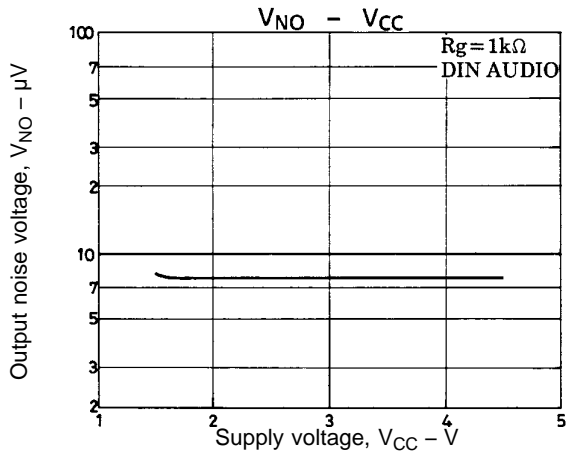
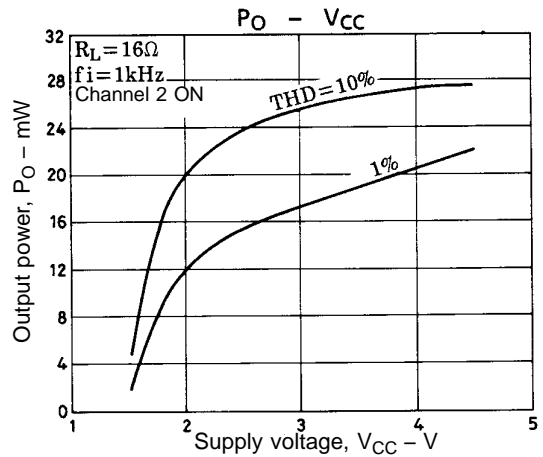
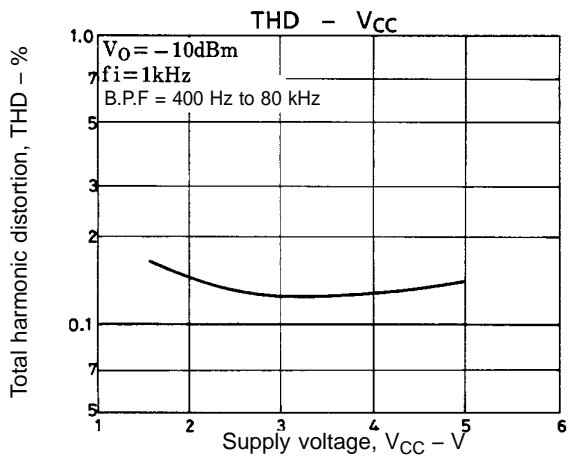
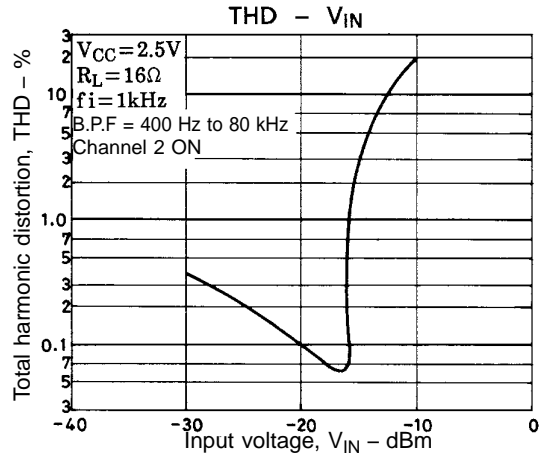
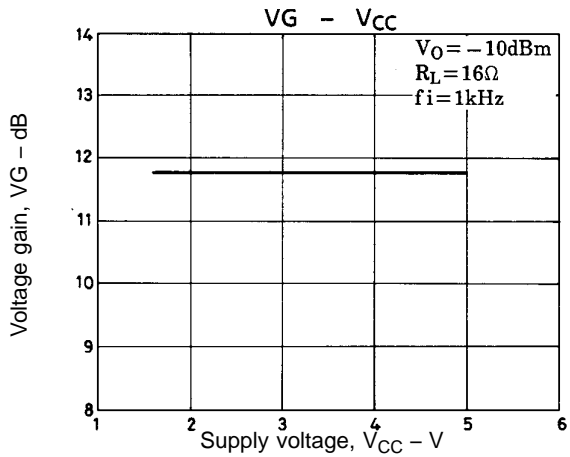
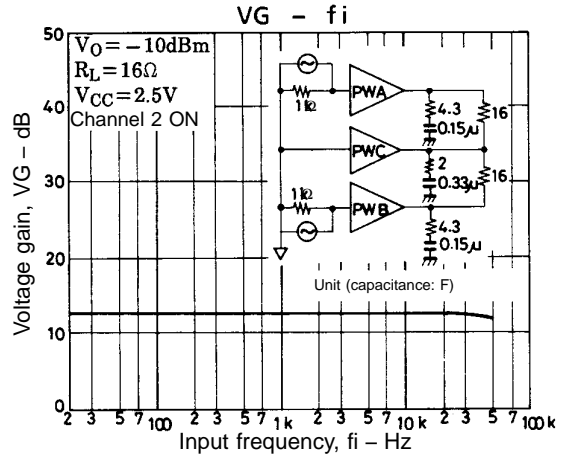
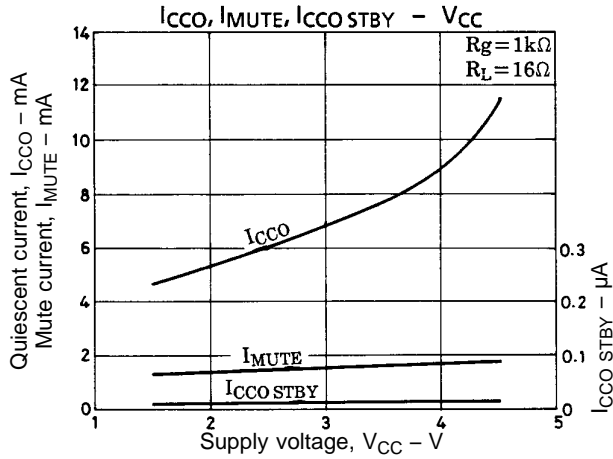


The mute ON/OFF switching waveforms are shown in the figure above. The settling time t_s is determined by the capacitor C_r connected to pin 16. The recommended value of C_r is 1 μF . If the value used is less than 1 μF , pop noise will increase.

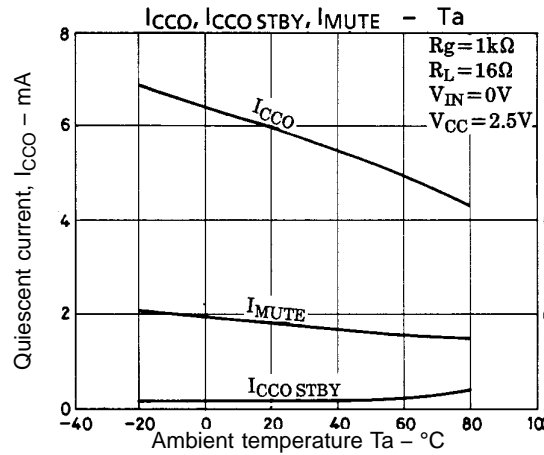
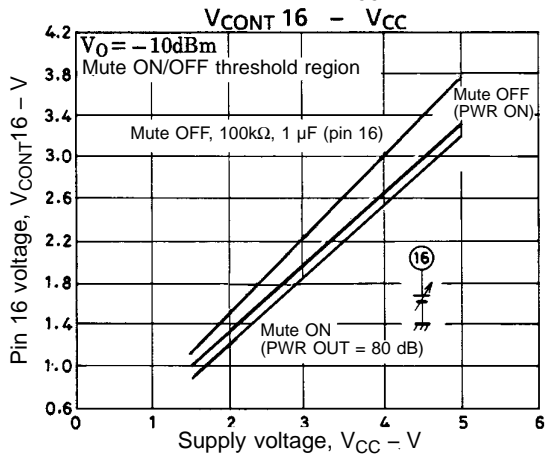
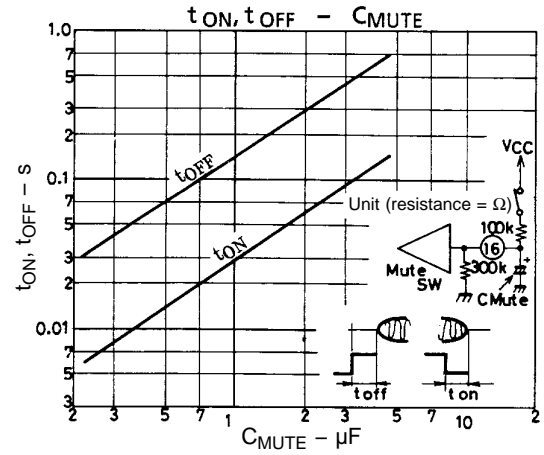
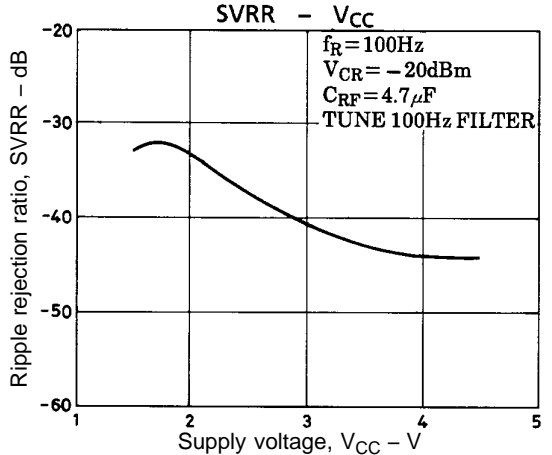
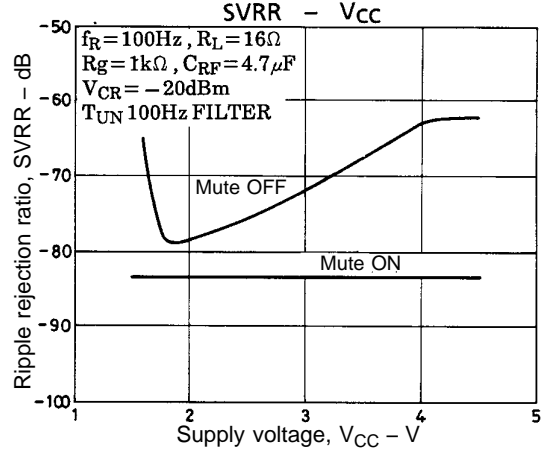
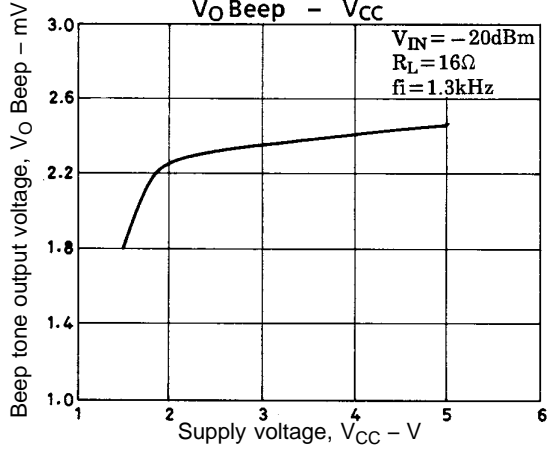
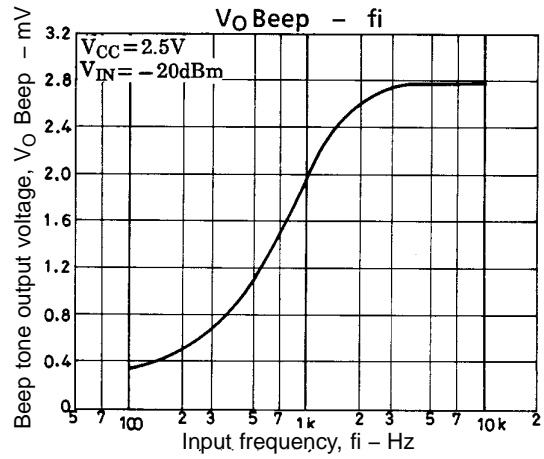
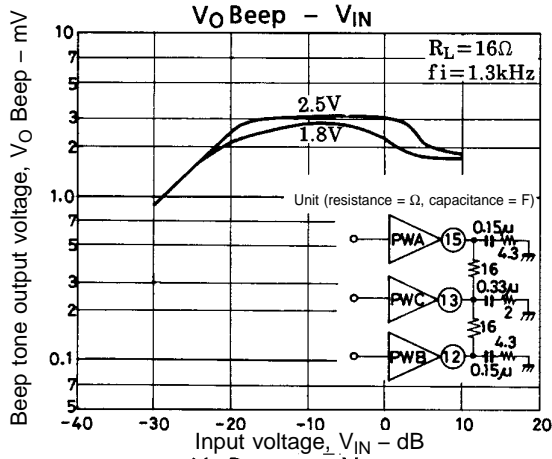
The setting time for different values of C_r are shown in the table below.

C_r (μF)	$t_{s \text{ OFF}}$ (ms)	$t_{s \text{ ON}}$ (ms)
0.1	15	3.2
1.0	150	30
2.2	300	56

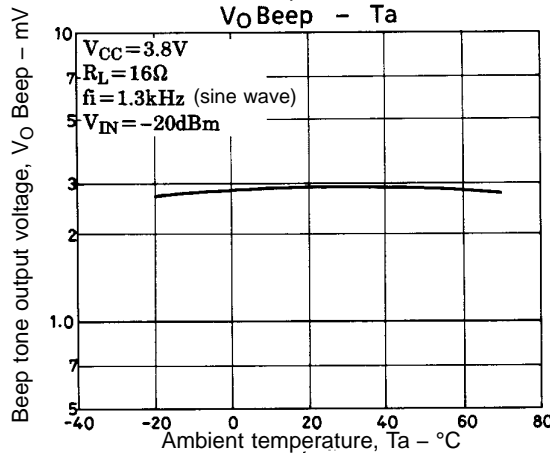
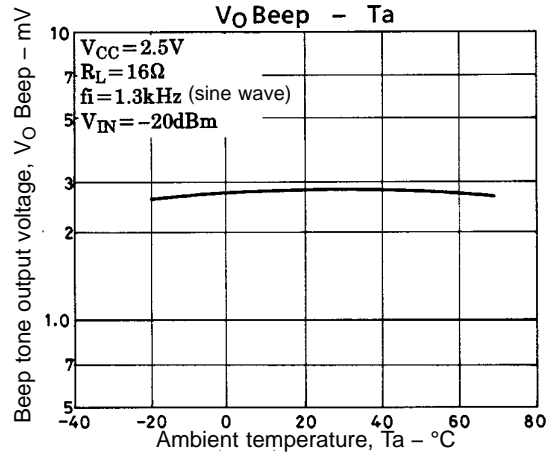
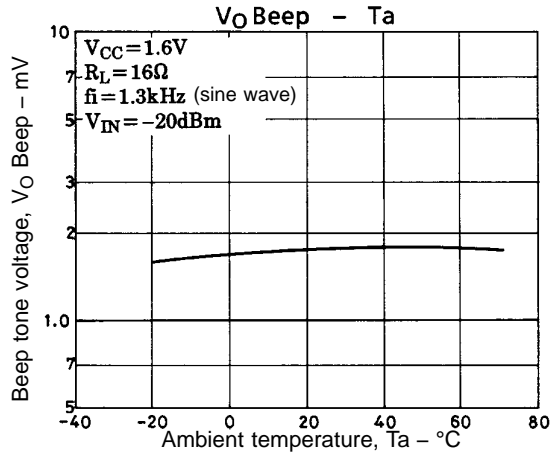
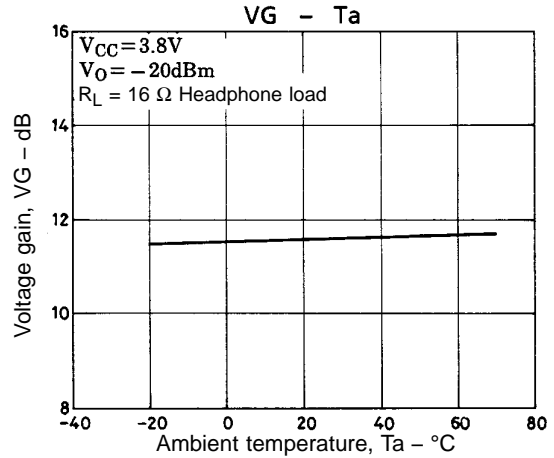
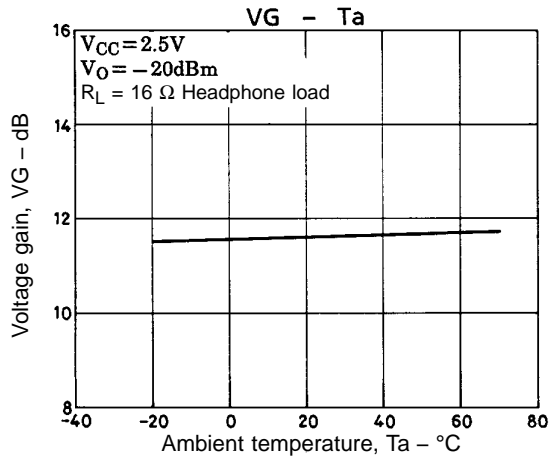
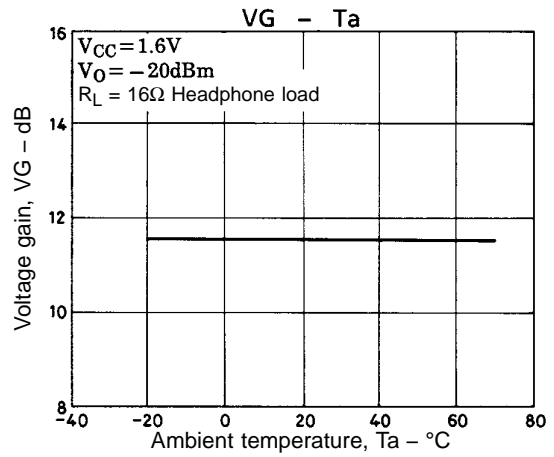
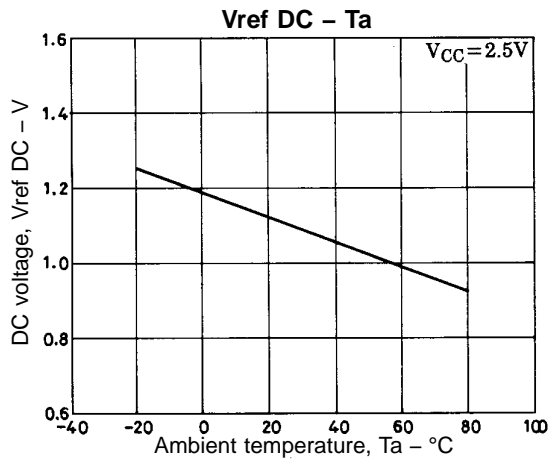
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