

**SANYO**

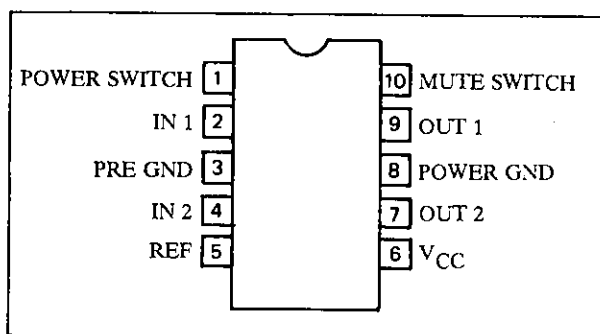
No. 4024

**LA4534M****3V CD Headphone-stereo Power Amp**

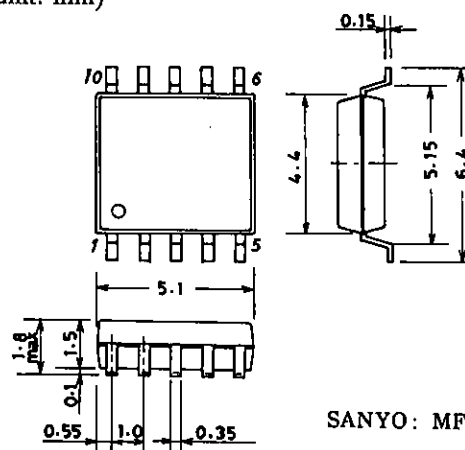
The LA4534M is a low noise, low distortion headphone-stereo power IC designed for use in a portable CD.

**Features**

- Low power consumption
- Can drive 16- $\Omega$  load
- Excellent performance with reduced supply voltage
- Excellent ripple rejection
- Power switch function, built-in muting circuit
- Low noise (7  $\mu$ V), low gain (11 dB)

**Pinout****Package Dimensions 3086A**

(unit: mm)



SANYO: MFP10S

# LA4534M

## Maximum Ratings at Ta = 25°C

			unit
Maximum Supply Voltage	V <sub>CC</sub> max	Quiescent time	4.5 V
Allowable Power Dissipation	Pd max		300 mW
Operating Temperature	Topg		-20 to +75 °C
Storage Temperature	Tstg		-40 to +125 °C

## Operating Conditions at Ta = 25°C

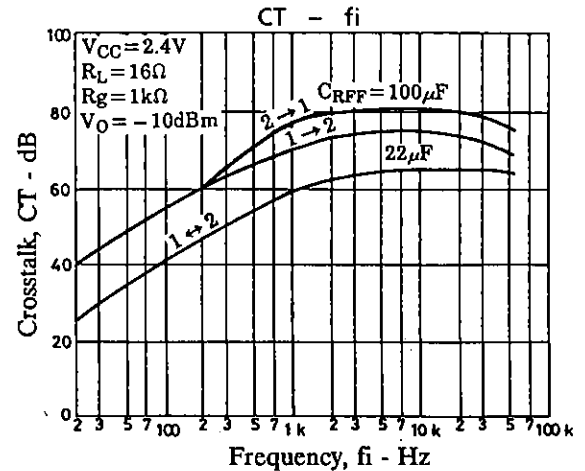
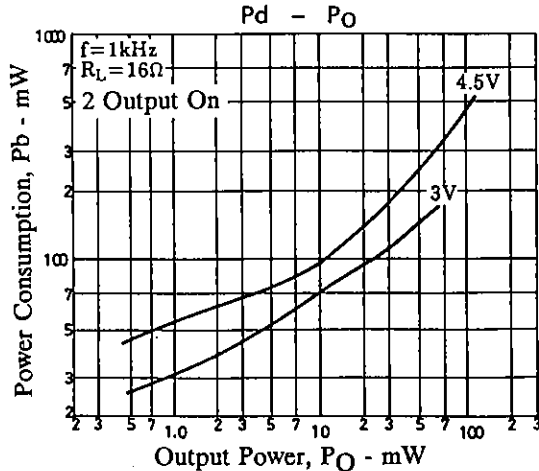
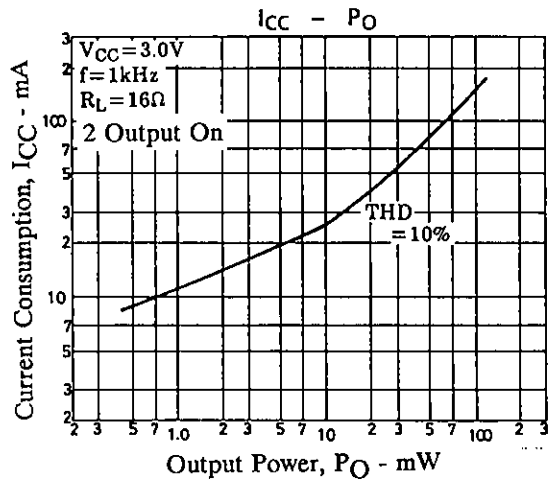
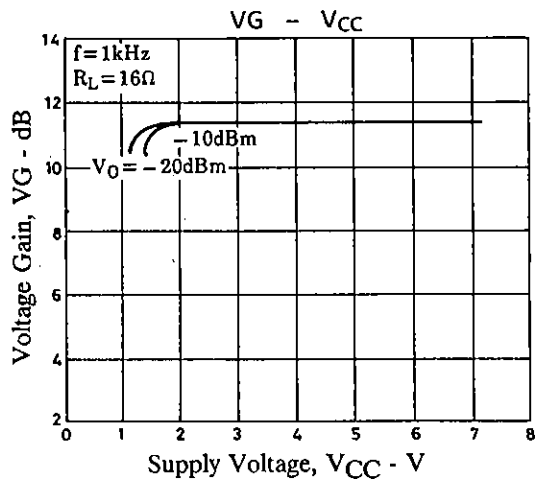
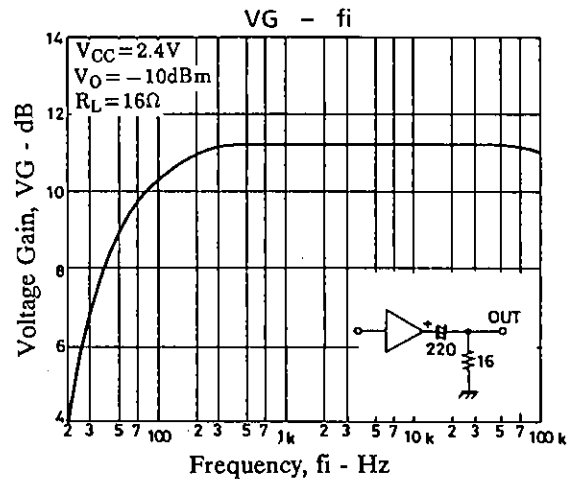
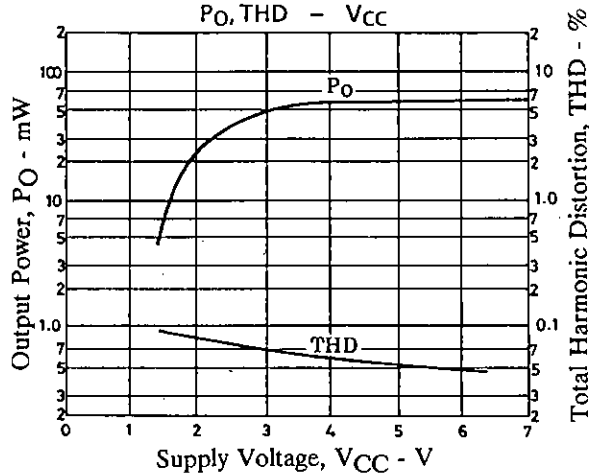
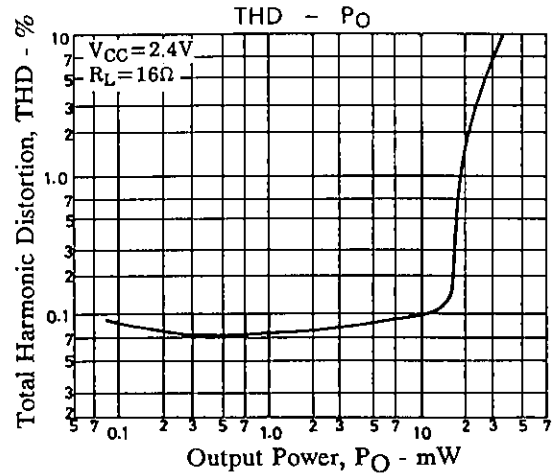
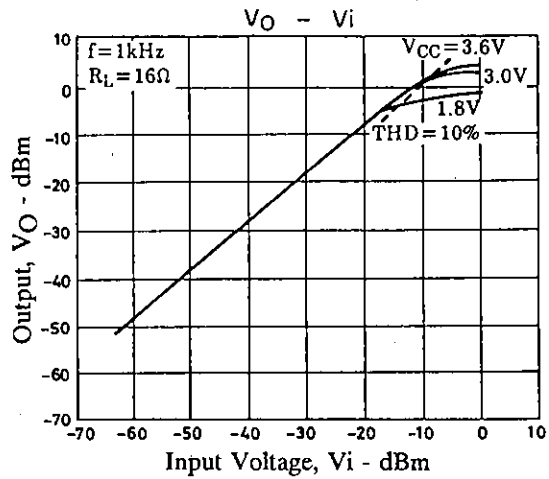
			unit
Recommended Supply Voltage	V <sub>CC</sub>	3.0	V
Operating Voltage Range	V <sub>CC</sub> op	1.6 to 4.0	V
Recommended Load Impedance	R <sub>L</sub>	16 to 32	Ω

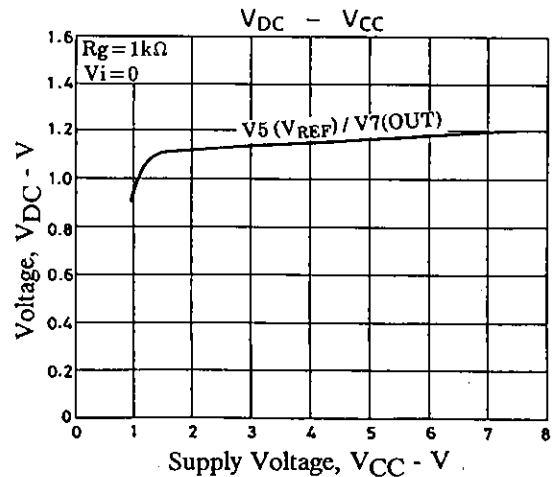
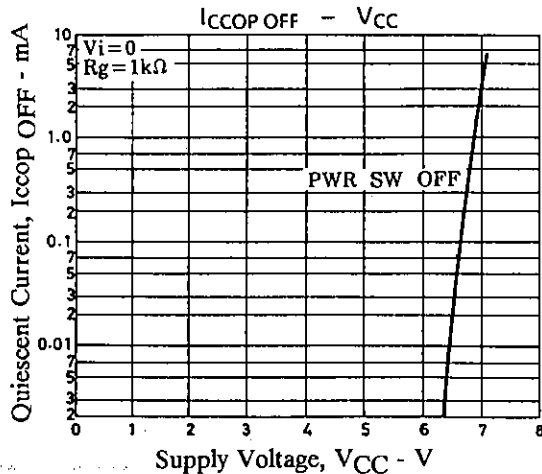
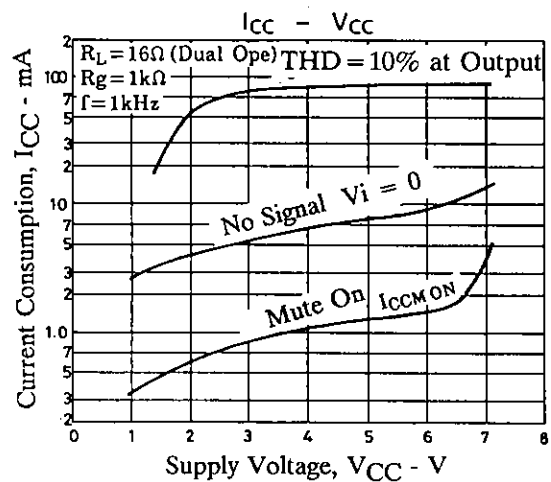
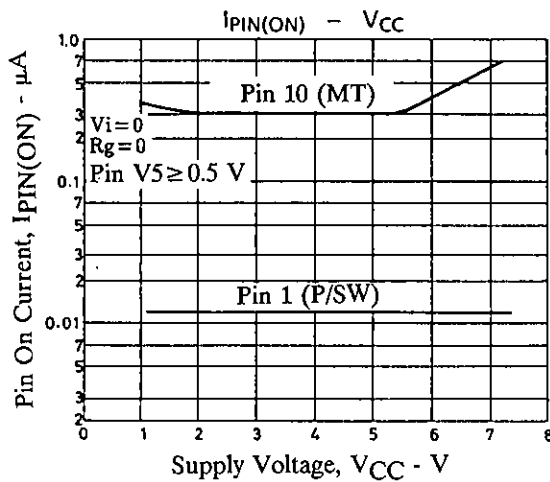
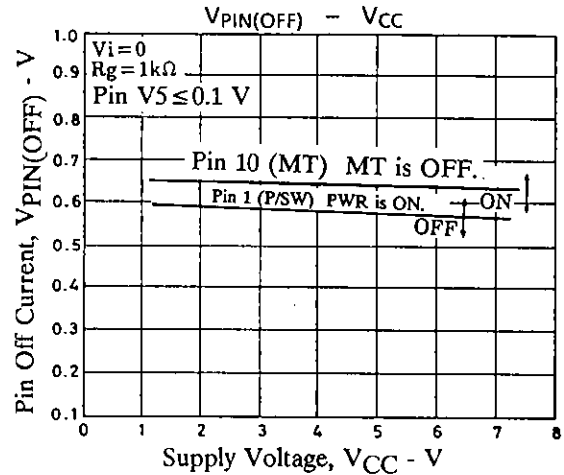
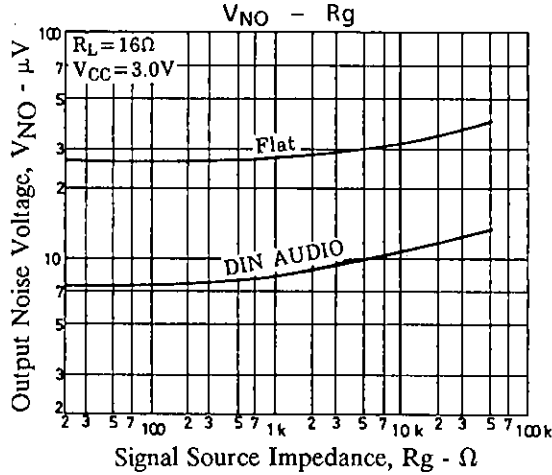
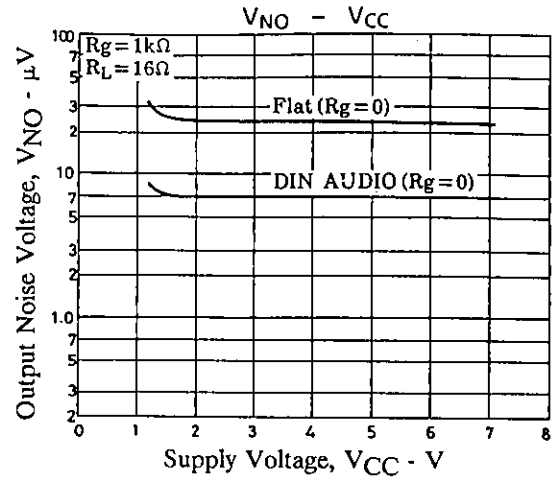
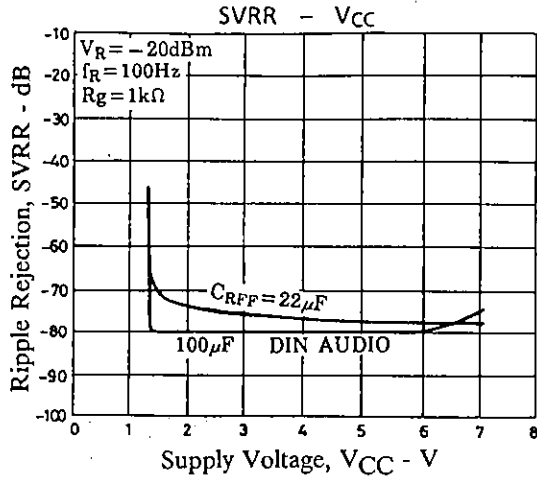
## Operating Characteristics at Ta = 25°C, R<sub>L</sub> = 16 Ω, R<sub>g</sub> = 600 Ω, Measurements taken with specified circuit

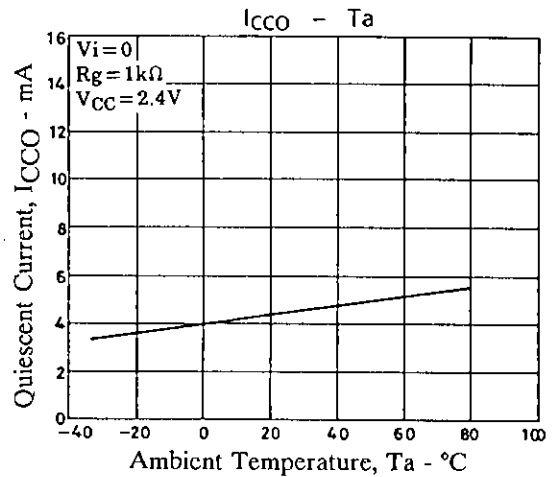
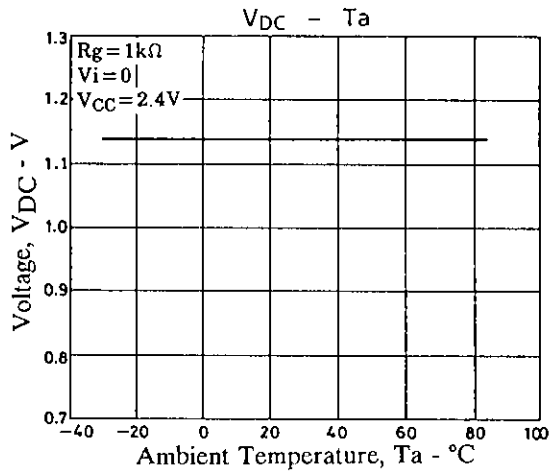
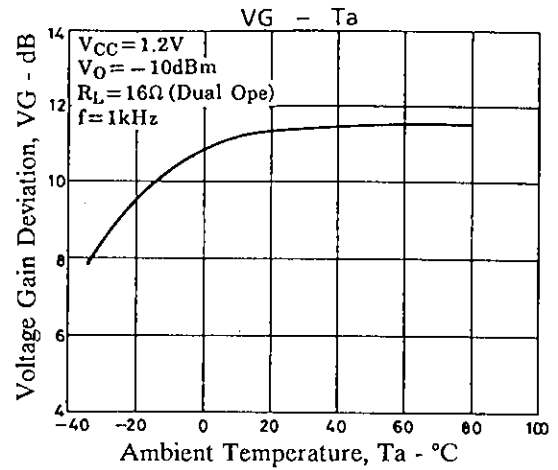
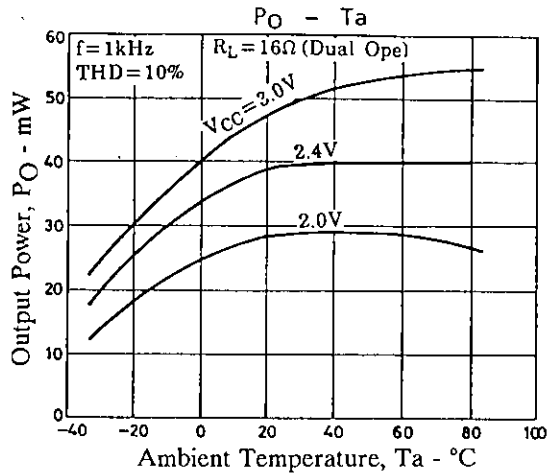
			min	typ	max	unit
Quiescent Current	I <sub>cco</sub> (1)	V <sub>CC</sub> = 2.4 V, Quiescent time		5.4	10	mA
	I <sub>cco</sub> (2)	V <sub>CC</sub> = 4.5 V, Pin 10 to GND		1.1	2.0	mA
	I <sub>cco</sub> (3)	V <sub>CC</sub> = 4.5 V, Pin 1 to GND			1.0	μA
Voltage Gain	VG (1)	V <sub>CC</sub> = 2.4 V, f = 1 kHz, V <sub>O</sub> = -10 dBm	9	11	13	dB
	VG (2)	V <sub>CC</sub> = 1.6 V, f = 1 kHz, V <sub>O</sub> = -20 dBm	9	11	13	dB
Voltage Gain Variations	ΔVG (1)	V <sub>CC</sub> = 2.4 V, f = 1 kHz, V <sub>O</sub> = -10 dBm			1.0	dB
	ΔVG (2)	V <sub>CC</sub> = 1.6 V, f = 1 kHz, V <sub>O</sub> = -20 dBm			1.0	dB
Total Harmonic Distortion	THD	V <sub>CC</sub> = 2.0 V, f = 1 kHz, P <sub>O</sub> = 1 mW		0.08	0.24	%
Output Power	P <sub>O</sub>	V <sub>CC</sub> = 3.0 V, f = 1 kHz, THD = 10%	25	50		mW
Crosstalk	CT	V <sub>CC</sub> = 2.4 V, f = 1 kHz, R <sub>g</sub> = 1 kΩ, V <sub>O</sub> = -10 dBm	40	50		dB
Ripple Rejection	SVRR	V <sub>CC</sub> = 1.6 V, f = 100 Hz, R <sub>g</sub> = 1 kΩ, V <sub>R</sub> = -20 dBm, BPF = 100 Hz	50	70		dB
Output Noise Voltage	V <sub>NO</sub>	V <sub>CC</sub> = 4.5 V, R <sub>g</sub> = 1 kΩ, BPF = 20 Hz to 20 kHz		7	20	μV
Power Off Effect	V <sub>O</sub> (off)	V <sub>CC</sub> = 1.6 V, f = 100 Hz, Pin 1 to GND, V <sub>i</sub> = -10 dBm			-80	dBm
Mute Effect	V <sub>O</sub> (MT)	V <sub>CC</sub> = 1.6 V, f = 100 Hz, Pin 10 to GND, V <sub>i</sub> = -10 dBm			-80	dBm
Power On Current Sensitivity	I <sub>l</sub> (on)	V <sub>CC</sub> = 1.5 V, V <sub>5</sub> ≥ 0.85 V		0.05	1.0	μA
Power Off Voltage Sensitivity	V <sub>1</sub> (off)	V <sub>CC</sub> = 1.5 V, V <sub>5</sub> ≤ 0.1 V	0.5	0.6		V
Mute Off Current Sensitivity	I <sub>l0</sub> (off)	V <sub>CC</sub> = 1.5 V, V <sub>5</sub> ≥ 0.85 V		0.2	1.0	μA
Mute On Voltage Sensitivity	V <sub>10</sub> (on)	V <sub>CC</sub> = 1.5 V, V <sub>5</sub> ≤ 0.1 V	0.5	0.65		V

Note) Quiescent current is the current flowing into pin 6. Current flowing into pin 1 or 10 is the maximum value and calculated from the equation (V pin -0.5 V)/16 [V/kΩ], increasing total current.

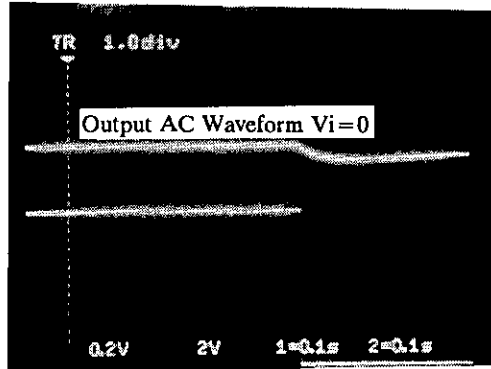




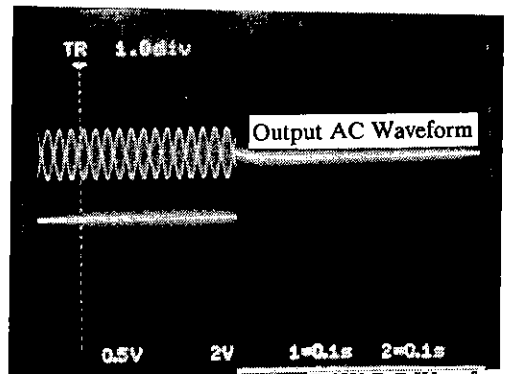




P.S.W OFF

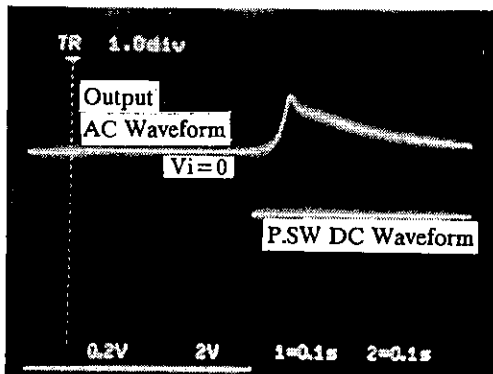


P.S.W DC Waveform  
P.S.W OFF

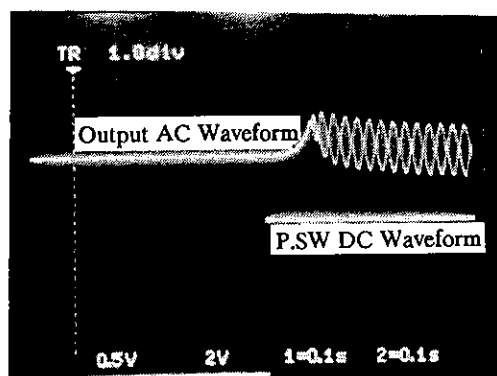


P.S.W DC Waveform  
P.S.W OFF

P.S.W ON

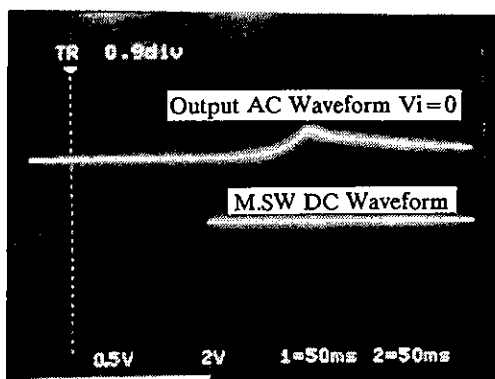


P.S.W ON

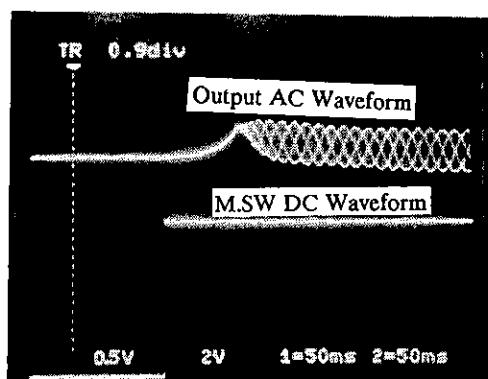


P.S.W ON

M.SW OFF

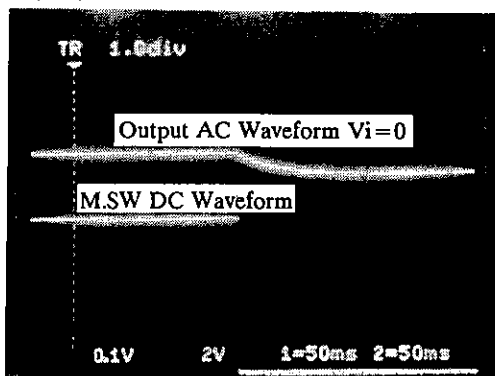


M.SW OFF

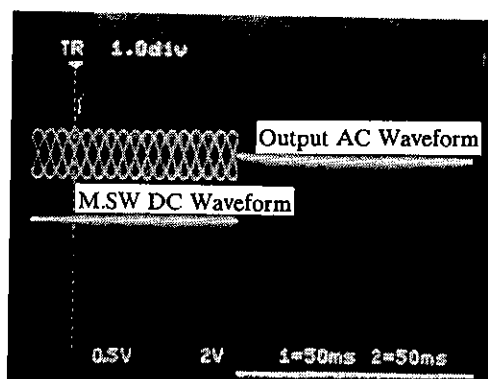


M.SW OFF

M.SW ON



M.SW ON

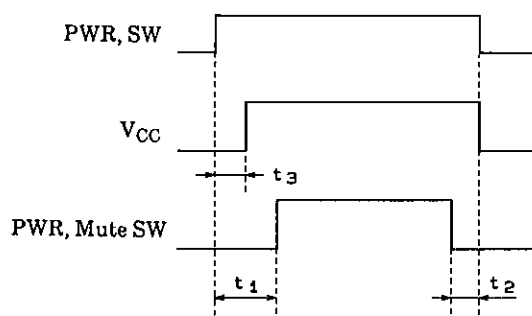


M.SW ON

**Note on Application**

Minimizing pop noise

The switching sequence shown below will generate minimum pop noises.



A00500

For minimum pop noise, the PWR mute switch should be turned on  $t_1$  (approx. 0.1 sec) after power-on and turned off  $t_2$  (approx. 0.1 sec) before power-off. That is, turn on and off the PWR mute switch while both power and  $V_{CC}$  are on.

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