BA3518F
BA3519F
BA3519FS

3 V dual pre- and power amplifier

The BA3518F, BA3519F, and BA3519FS ICs are dual channel preamplifier and power amplifiers. The BA3519F and BA3519FS ICs contain all basic signal circuits necessary for a tape player (including auto-reverse).

The preamplifiers are direct coupled and the power amplifiers have a built-in fixed-gain NF circuit, making an output coupling capacitor unnecessary.

Features

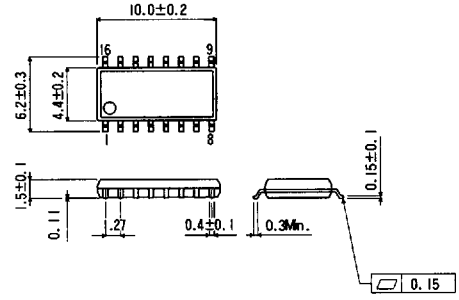
- available in SOP16, SOP22, and SOP-A24 packages
- low voltage operation (1.8 ~ 4.0Vdc)
- preamplifier has high voltage gain (75 dB), low noise (1.0 μV_{rms}) and low distortion (0.05%).
- power amplifier has high output (31 mW x 2), low noise (50 μV_{rms}) and low distortion (0.1%)
- preamplifier configured to allow for auto-reverse of tape cassette for BA3519F and BA3519FS
- transistor switches for metal-tape muting are included
- no oscillation protector required for power amplifier

Applications

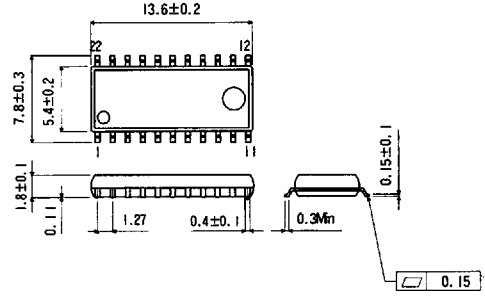
- 3 V tape player
- 3 V radio cassette player

Dimensions (Units : mm)

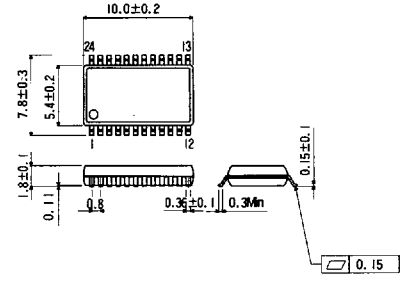
BA3518F (SOP16)



BA3519F (SOP22)

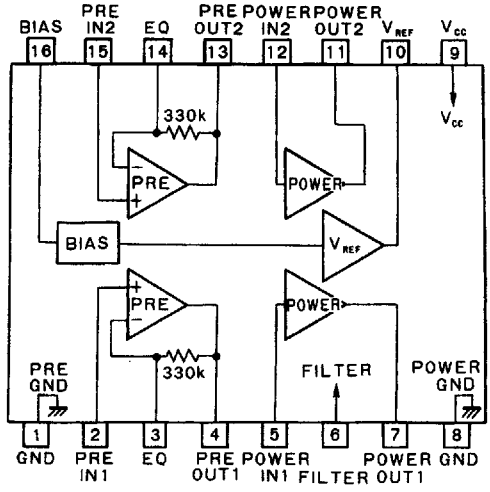


BA3519FS (SSOP-A24)

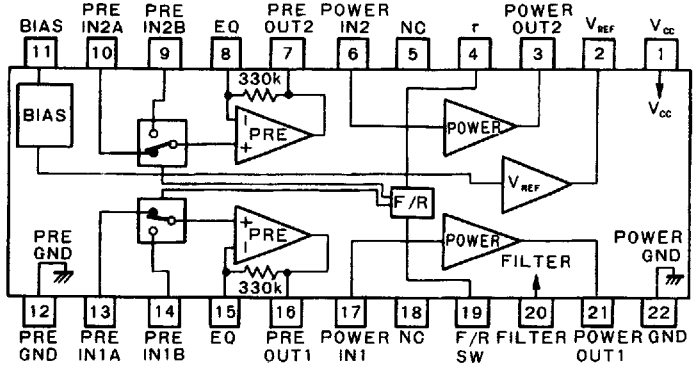


Block diagram

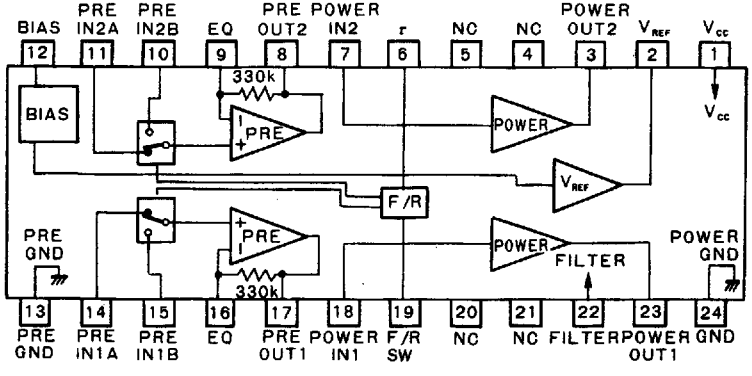
BA3518F



BA3519F



BA3519FS



Absolute maximum ratings (T_a= 25°C)

Parameter		Symbol	Limits	Unit	Conditions
Power supply voltage		V_{CC}	6.0	V	
Power dissipation	BA3518F	P_d	500	mW	Reduce power by 5.0 mW for each degree above 25°C. Mounted on 50 × 50 × 1.6 mm glass epoxy PCB.
	BA3519F		550		Reduce power by 5.5 mW for each degree above 25°C. Mounted on 50 × 50 × 1.6 mm glass epoxy PCB.
	BA3519FS		800		Reduce power by 8.0 mW for each degree above 25°C. Mounted on 90 × 50 × 1.6 mm glass epoxy PCB.
Operating temperature		T_{opr}	−25 ~ +75	°C	
Storage temperature		T_{stg}	−55 ~ +125	°C	

Recommended operating conditions (T_a= 25°C)

Parameter	Symbol	Min	Typical	Max	Unit	Conditions
Power supply voltage	V_{CC}	1.8	3.0	4.0	V	
Load resistance	R_L	16			Ω	V_{CC} = 3 V

Electrical characteristics (unless otherwise noted, T_a = 25°C, V_{CC} = 3 V, f = 1 kHz) (Sheet 1 of 2)

Parameter	Symbol	Min	Typical	Max	Unit	Conditions
Quiescent current	I_Q		14	23	mA	V_{IN} = 0 V_{rms}
Channel separation	CS	30	40		dB	R_g = 2.2 kΩ, R_L = 32 Ω
Preamplifier (R_L = 10 kΩ)						
Voltage gain (open circuit)	G_{VO}	68	75		dB	V_O = 200 V_{rms}
Voltage gain (close circuit)	G_{VC1}	36	39	42	dB	V_O = 100 V_{rms}
Output voltage	V_{OM}	300	400		mV_{rms}	THD = 1%
Total harmonic distortion	THD_1		0.05	0.20	%	V_O = 0.2 V_{rms}
Input bias current	I_{B1}		200	500	nA	V_{IN} = 0 V_{rms}
Input conversion noise voltage	V_{NIN}		1.0	1.8	μV_{rms}	R_g = 2.2 kΩ, BPF = 20 Hz ~ 20 kHz
Ripple rejection	RR_1	40	50		dB	V_{RR} = −20 dBm, f = 100 Hz
Forward-reverse crosstalk (BA3519F & BA3519FS)	CT_{F-R}	65	75		dB	Single channel, V_o = −10 dBm, R_g = 2.2 kΩ, IHF A
Power amplifier (R_L = 32Ω) (except P_{OUT} 2)						
Rated output 1	P_{OUT1}	25	31		mW/ch	R_L = 16 Ω, THD = 10%
Rated output 2	P_{OUT2}	15	18		mW/ch	R_L = 32 Ω, THD = 10%

Electrical characteristics (unless otherwise noted, T_a = 25°C, V_{CC} = 3 V, f = 1 kHz) (Sheet 2 of 2)

Parameter	Symbol	Min	Typical	Max	Unit	Conditions
Voltage gain (close circuit)	G_{VC2}	27.0	30.0	33.0	dB	V_O = 300 mV_{rms}
Total harmonic distortion	THD_2		0.1	0.9	%	P_O = 1 mW
Output noise voltage	V_{NO}		50	100	μV_{rms}	R_g = 0 Ω, BPF = 20 Hz ~ 20 kHz
Ripple rejection	RR_2	53	63		dB	V_{RR} = –20 dBm, f = 100 Hz,
Input resistance	R_{IN}	14	18.5	23	kΩ	

Figure 1 Test circuit (BA3519F, for BA3519FS, refer to block diagram)

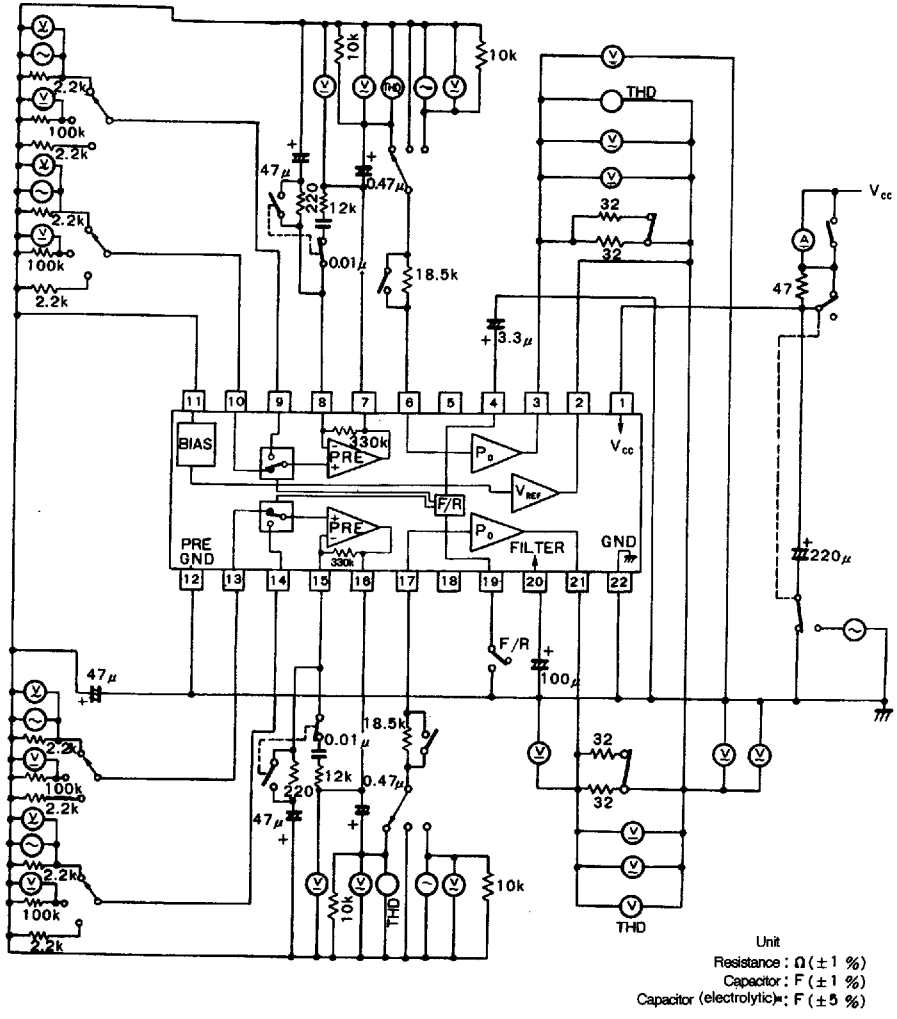


Figure 2 Test circuit (BA3518F)

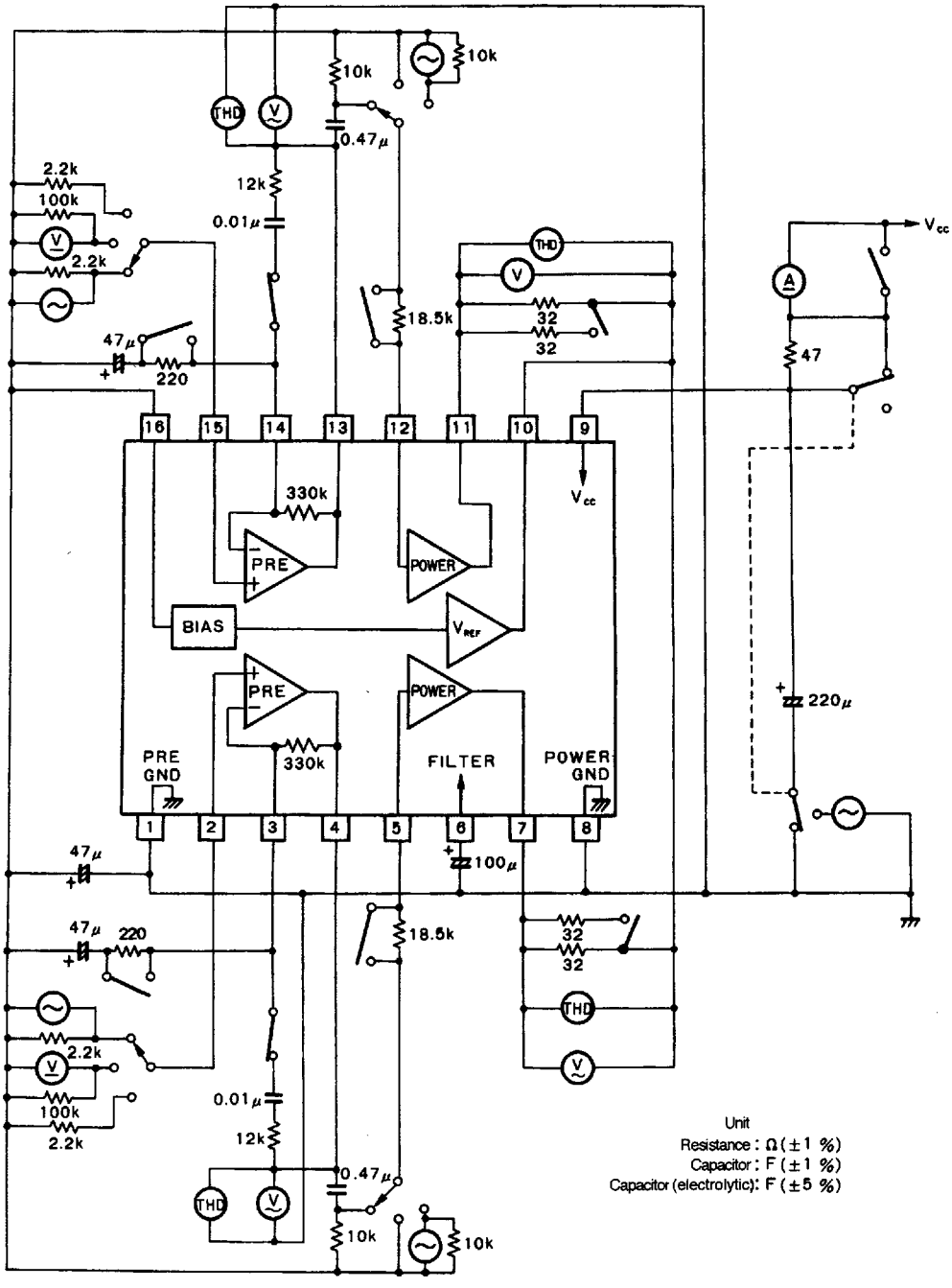


Figure 3 Application examples (BA3518F)

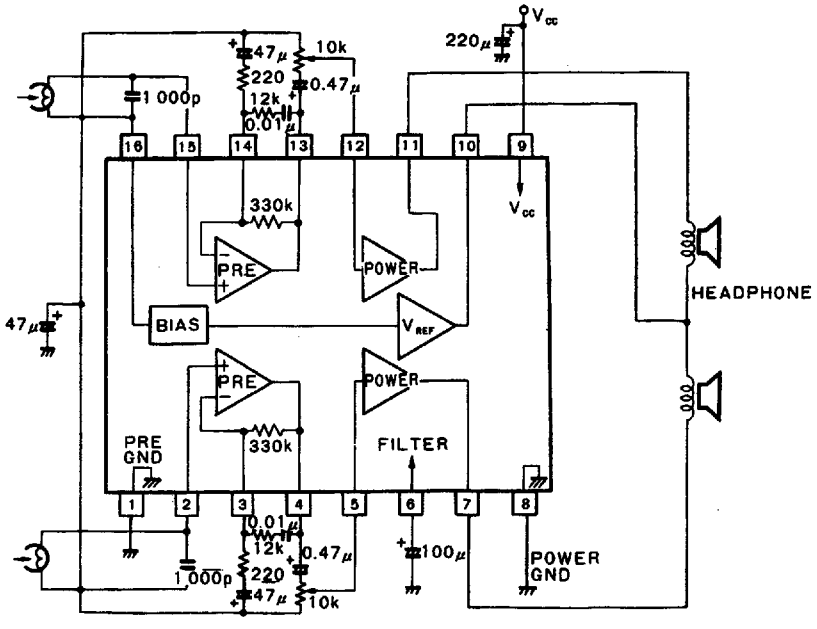


Figure 4 Application examples (BA3519F, for BA3519FS, refer to block diagram)

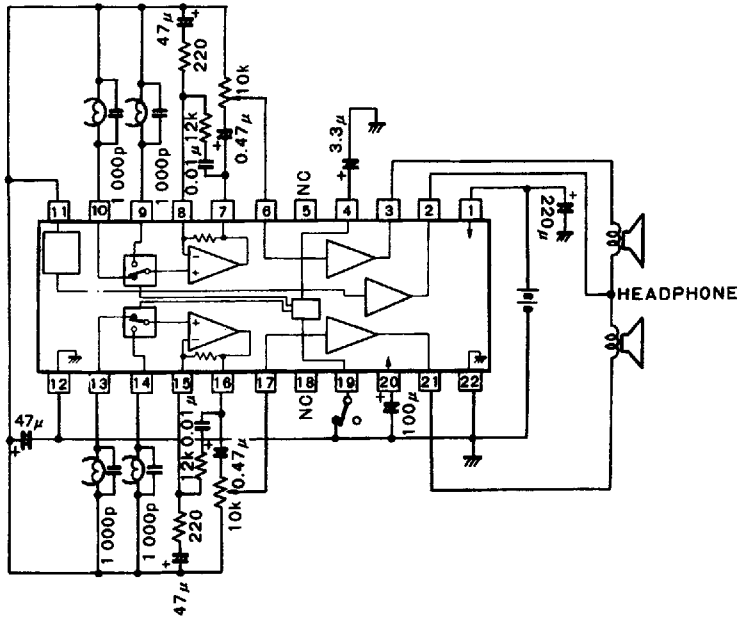
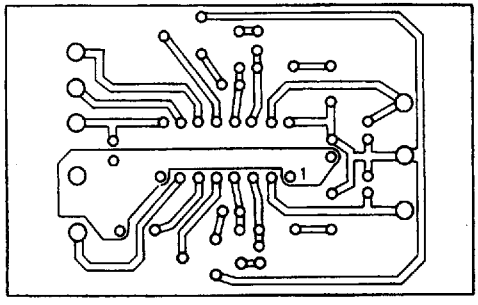
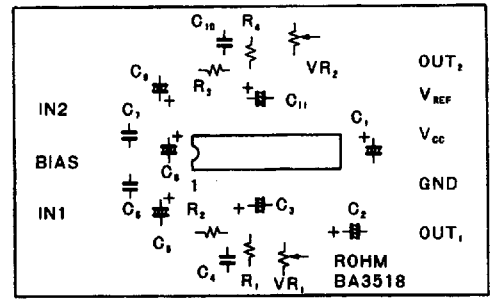


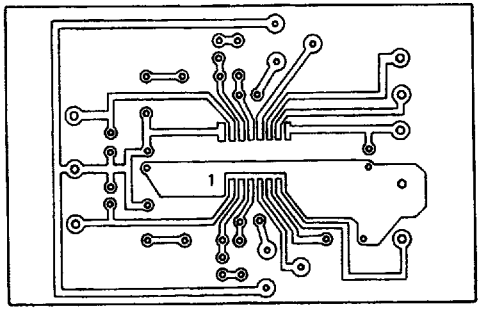
Figure 5 PCB layout for application examples

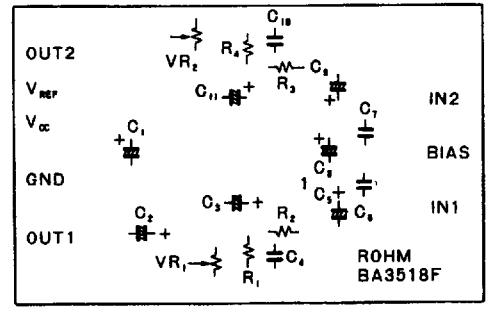
BA3518



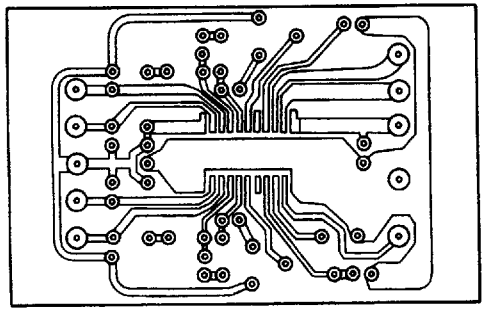


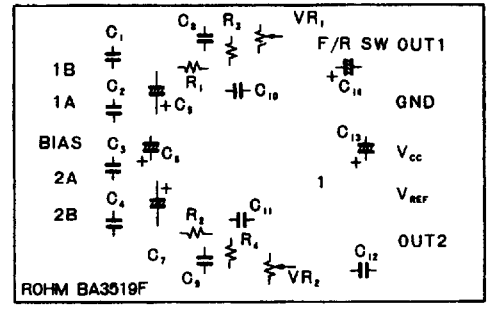
BA3518F





BA3519F





Solder side **Component side**

Electrical characteristics curves

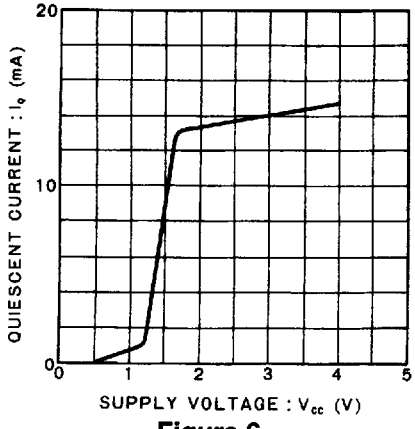


Figure 6

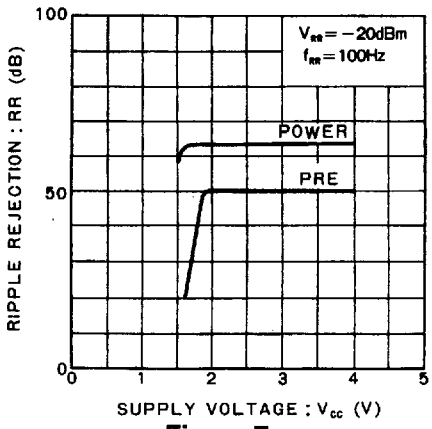


Figure 7

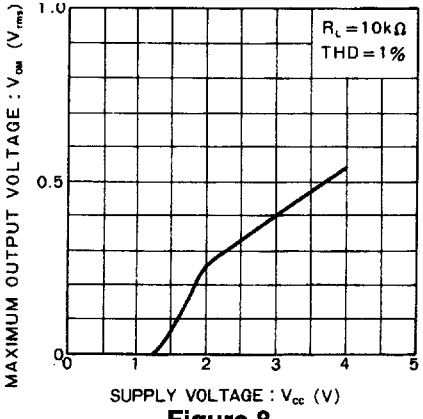


Figure 8

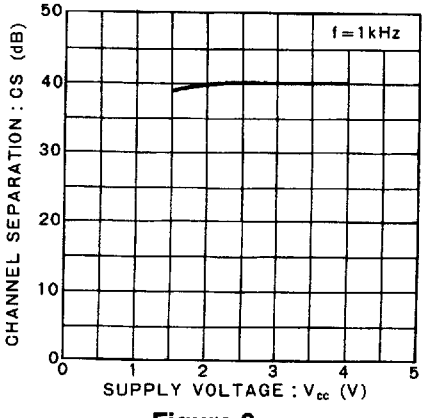


Figure 9

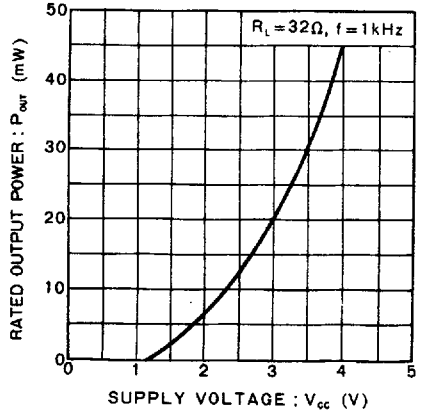


Figure 10

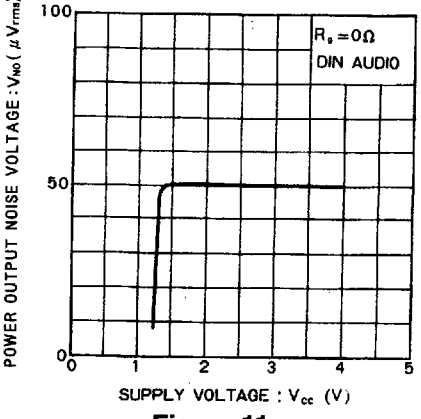


Figure 11

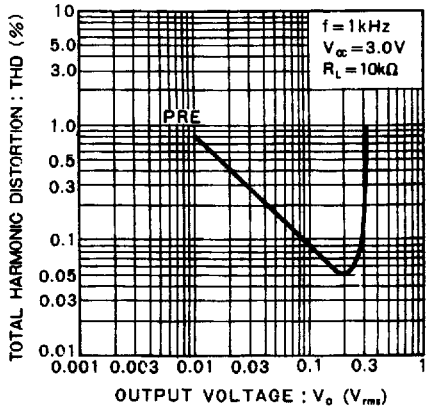


Figure 12

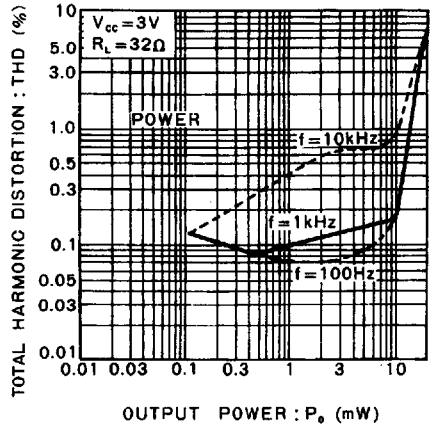


Figure 13