

**LA3242**

Preamplifier for Compact Cassette Recorder Recording-only Use

Overview

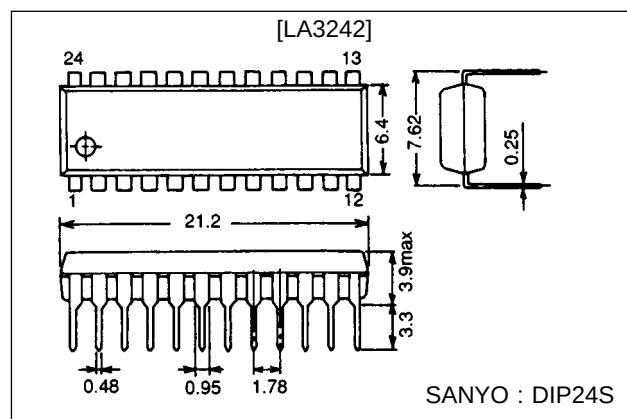
The LA3242 is a preamp IC for compact cassette recorder recording-only use. The distinctive feature of the LA3242 is that it contains mechanical switches which have been so far connected externally as peripheral parts.

Features

- On-chip electronic select switches permitting selection of normal/higher speed recording and metal(chrome)/normal tape recording mode by using the dedicated control pins.
- Two ALC output pins making it easy to make up a Dolby recording system.
- The control voltage from a microcomputer, etc. can be used to turn ON/OFF the ALC and to set the ALC control voltage to the initial value.
- On-chip microphone amplifier making it easy to provide microphone mixing.
- Wide operating voltage range ($V_{CC} = 4.5$ to 14.0 V).
- Can be used in conjunction with playback-only preamp LA3246 to make up a double-cassette dubbing system.

Package Dimensions

unit : mm

3067-DIP24S

Functions

- Recording preamplifier ×2
- Microphone amplifier ×1
- ALC output ×2
- Electronic switch ×6

Specifications

Maximum Ratings at $T_a = 25^\circ\text{C}$

Parameter	Symbol	Conditions	Ratings	Unit
Maximum supply voltage	V_{CC} max		16	V
Allowable power dissipation	P_d max		720	mW
Operating temperature	T_{opr}		-20 to +75	$^\circ\text{C}$
Storage temperature	T_{stg}		-40 to +125	$^\circ\text{C}$

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

Parameter	Symbol	Conditions	Ratings	Unit
Recommended supply voltage	V_{CC}		6	V
Operating voltage range	V_{CC} op		4.5 to 14.0	V

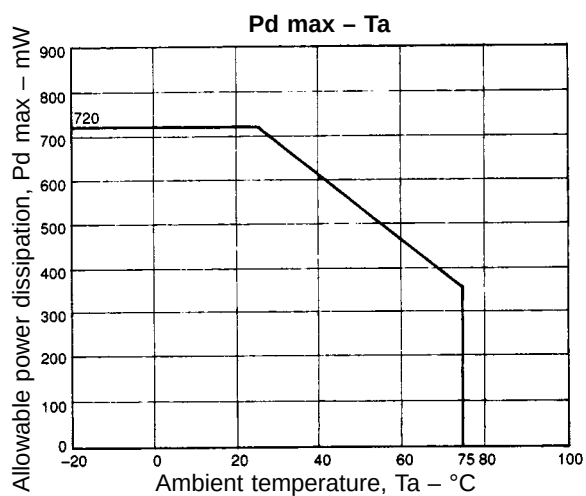
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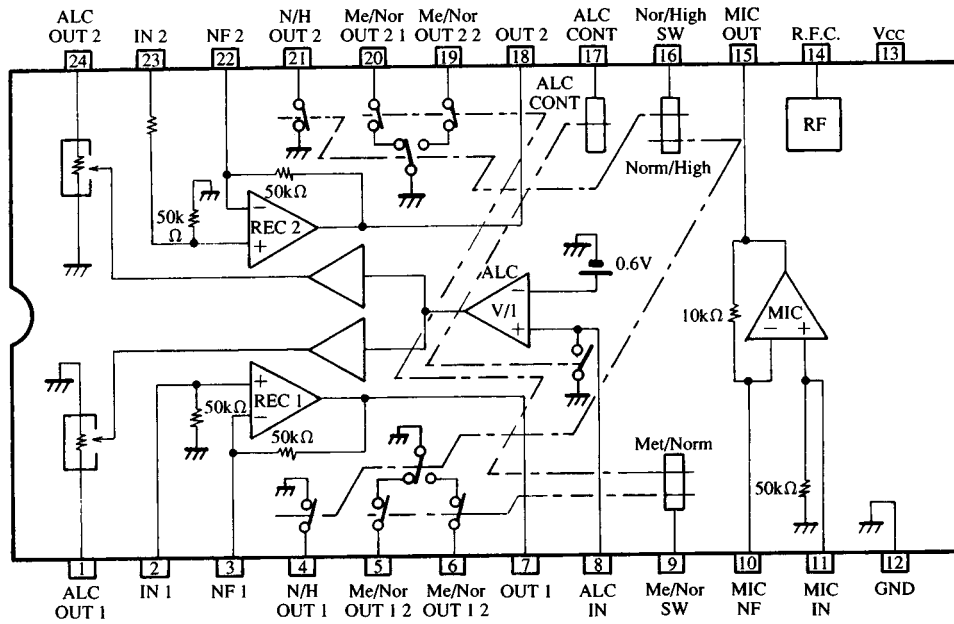
D3097HA(II)/N257TA/7027TA,TS No.2620-1/12

Operating Characteristics at $T_a = 25^\circ\text{C}$, $V_{CC} = 6.0\text{ V}$, $R_L = 10\text{ k}\Omega$, $f = 1\text{ kHz}$, $0\text{ dB} = 0.775\text{ V}$

Parameter	Symbol	Conditions	min	typ	max	Unit
Quiescent current	I_{CCO}	Me/Nor, Nor/High SW OFF	5	7.5	12	mA
Quiescent current	I_{CCS}	Me/Nor, Nor/High SW ON	12	16	20	mA
[REC Amp]						
Voltage gain (Open)	V_{G01}		75	85		dB
Voltage gain (Closed)	V_{G1}	$V_O = 0\text{ dBm}$	42.5	44.5	46.0	dB
Total harmonic distortion	THD 1	$V_O = 0.4\text{ V}$		0.1	0.7	%
Maximum output voltage	$V_O\text{ max}$	THD = 1%	0.7	1.0		V
Equivalent input noise voltage	V_{Ni1}	$R_g = 2.2\text{ k}\Omega$, B.P.F = 20 Hz to 20 kHz		1.1	1.7	μV
Input resistance	R_{i1}		40	50	60	$\text{k}\Omega$
Crosstalk	CT1	Between REC amps	50	60		dB
	CT2	REC amp→Microphone amp	50	75		dB
Channel balance	V_{BL}	$V_{IN} = -50\text{ dBm}$		0	2	dB
[Microphone Amp]						
Voltage gain (Open)	V_{G02}		60	70		dB
Voltage gain (Closed)	V_{G2}	$V_O = 0\text{ dBm}$	23	25	27	dB
Total harmonic distortion	THD2	$V_O = 0.4\text{ V}$		0.05	0.5	%
Maximum output voltage	$V_O\text{ max}$	THD = 1%	0.8	1.1		V
Equivalent input noise voltage	V_{Ni2}	$R_g = 2.2\text{ k}\Omega$, B.P.F = 20 Hz to 20 kHz		1.1	1.7	μV
Input resistance	R_{i2}		40	50	60	$\text{k}\Omega$
Crosstalk	CT3	Microphone amp→REC amp	45	60		dB
[ALC]						
ALC range	ALC_W	Input range when output distortion becomes 1% after ALC begins to the applied.	40	45		dB
ALC balance	ALC_B	Output difference between CH1 and CH2		0	2	dB
ALC distortion	ALC_{THD}	$V_{IN} = -40\text{ dBm}$		0.15	0.8	%
ALC output voltage	ALC_{VO}	$V_{IN} = -40\text{ dBm}$	0.33	0.42	0.53	V
Crosstalk	CT4	Between REC amps	45	60		dB
Crosstalk	CT5	REC amp→Microphone amp	50	70		dB
ALC ON-state voltage	ALC_{on}	Voltage on pin 17			1.0	V
ALC OFF-state voltage	ALC_{off}	Voltage on pin 17	1.5			V
[Switch]						
ON-state resistance	R_{ON}			30	70	Ω
DC feedback resistance	R_{F1}		40	50	60	$\text{k}\Omega$

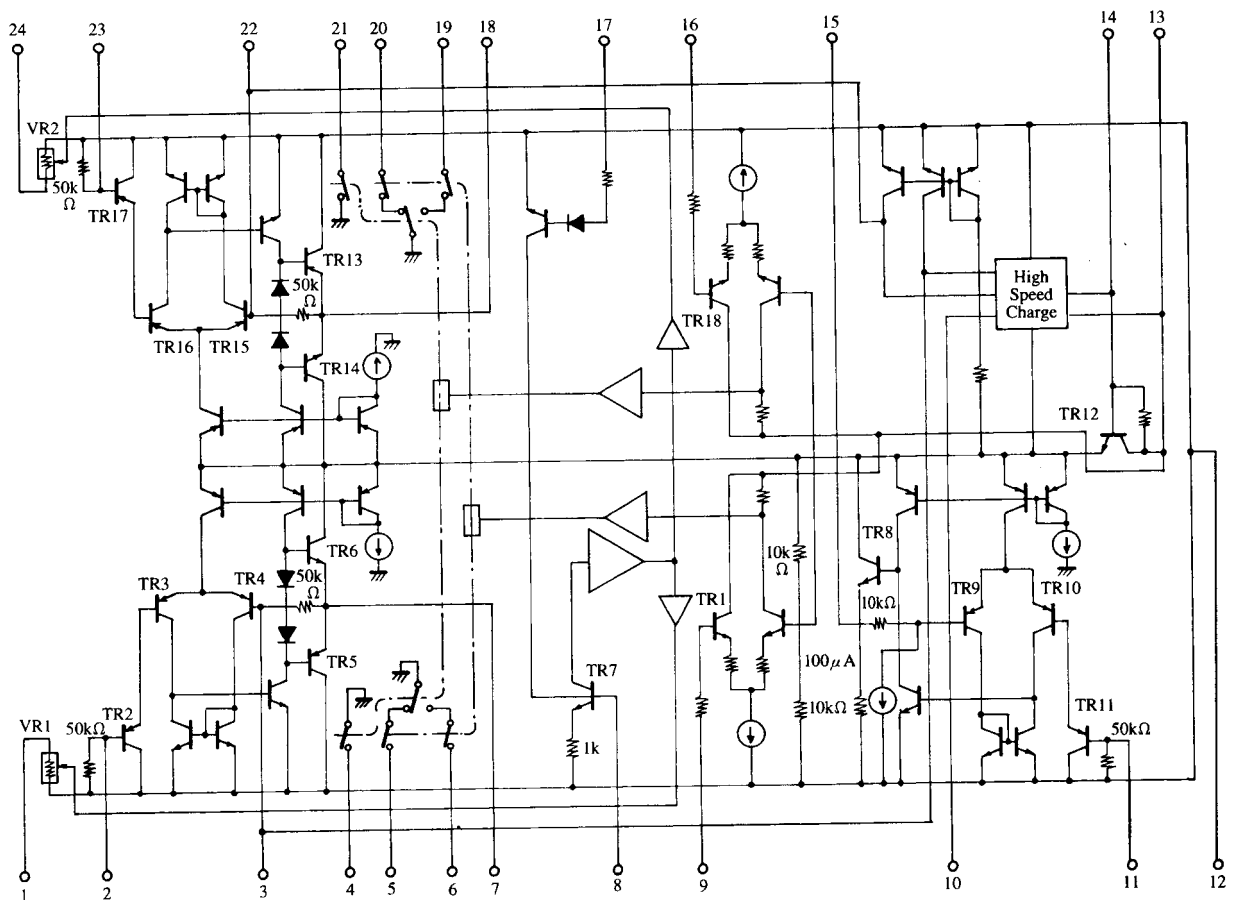


Equivalent Circuit Block Diagram

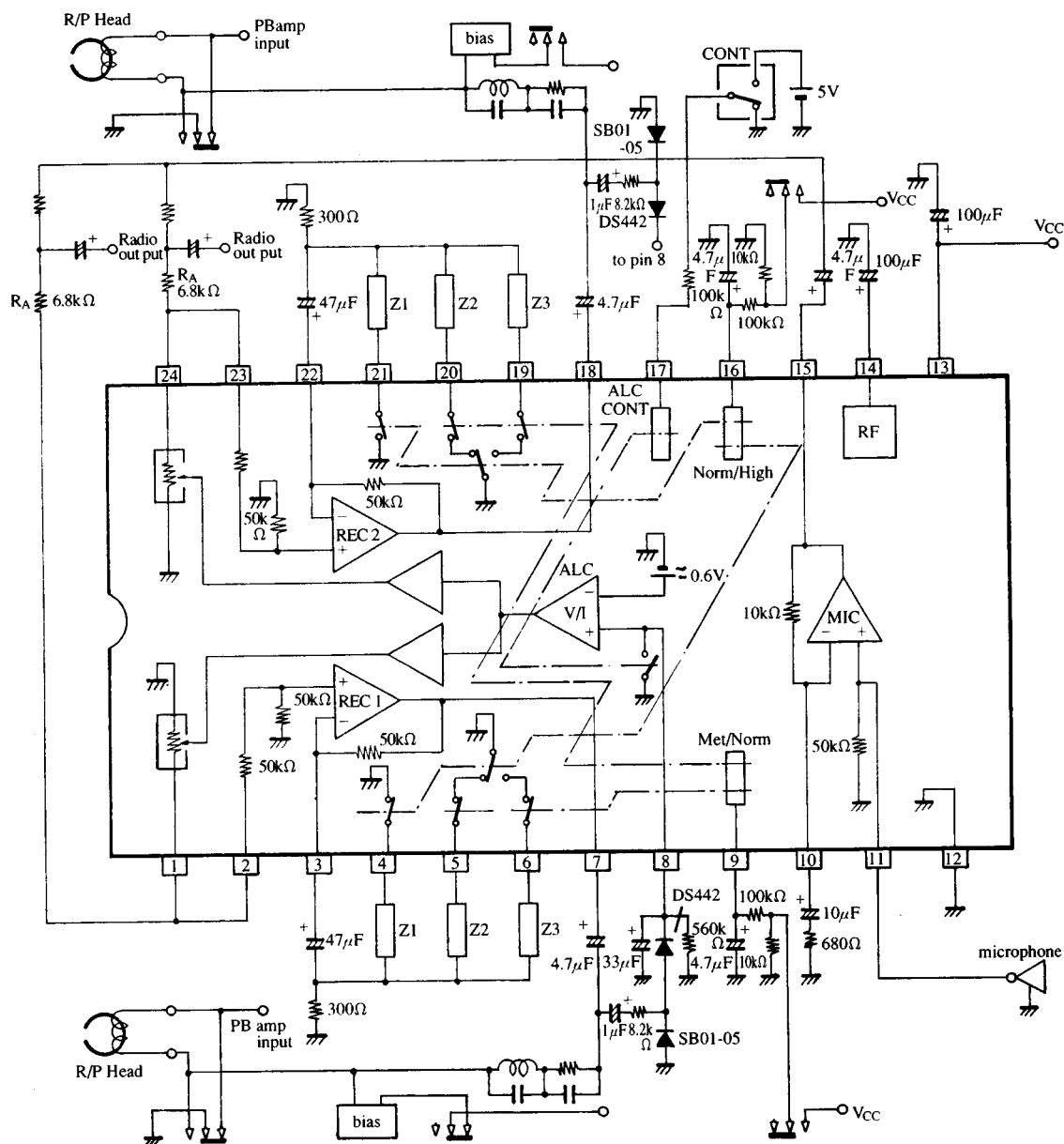


Top view

Equivalent Circuit



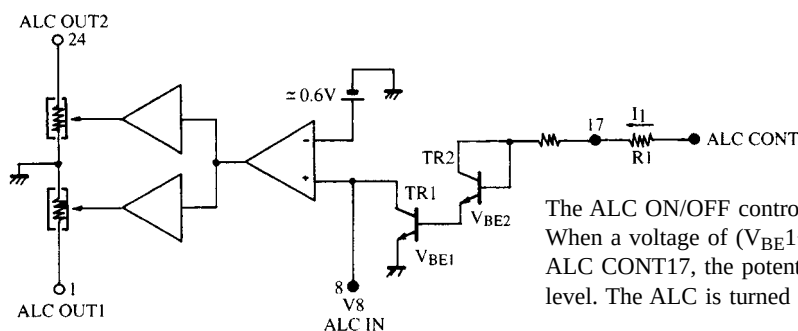
Sample Application Circuit



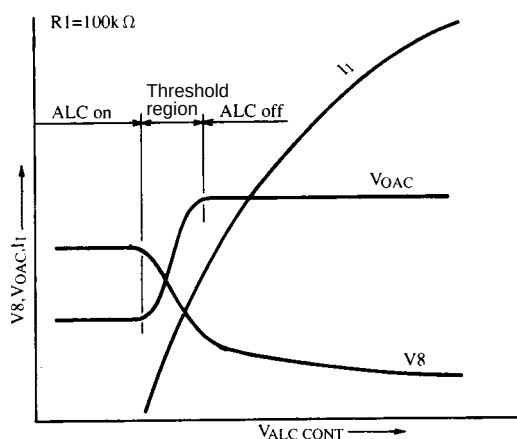
Note:

1. The electronic select switching level is approximately $(V_{CC} - 0.9)/2$.
2. REC amplifier NF parameters Z1 through Z3 should be selected to accommodate the recording level and frequency response that will be required in metal/normal tape and normal/higher speed modes.
3. Z1 through Z3 may be configured with coil "L", capacitor "C", and resistor "R".
4. When electronic control pins 9 and 16 are at the GND level, each electronic switch is turned ON.
5. When ALC ON/OFF control pin 17 is at 1 V or less/1.5 V or greater, the ALC is turned ON/OFF, respectively ($T_a = 25^\circ\text{C}$).
6. The ALC width depends on external resistor R_A .

(5) ALC control pin and ON/OFF level

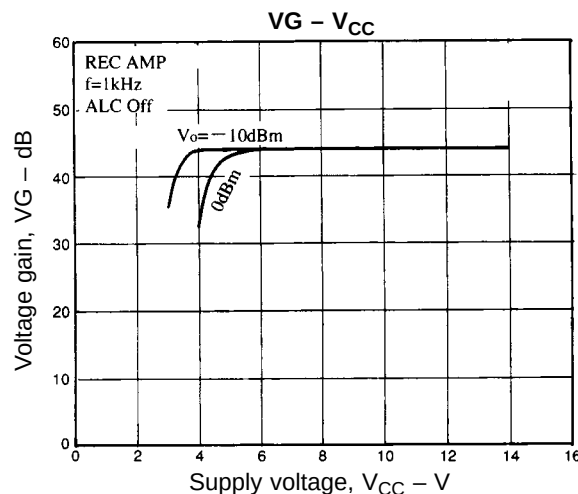
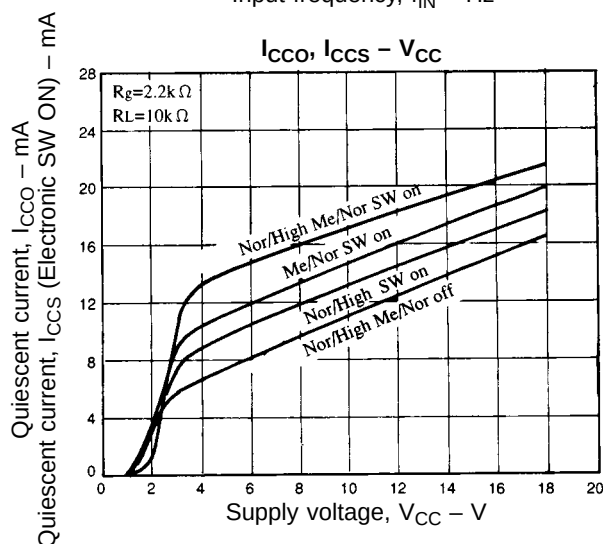
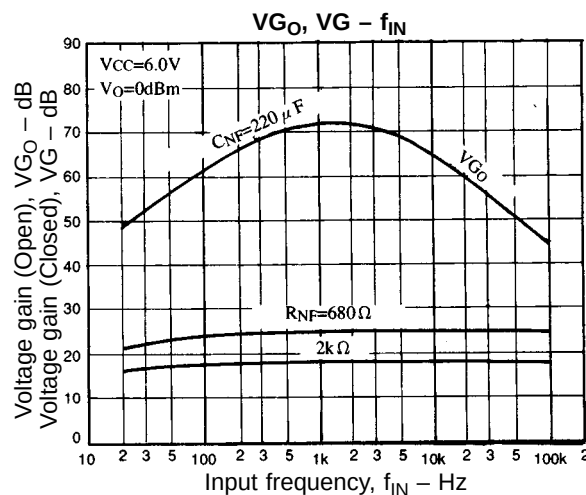
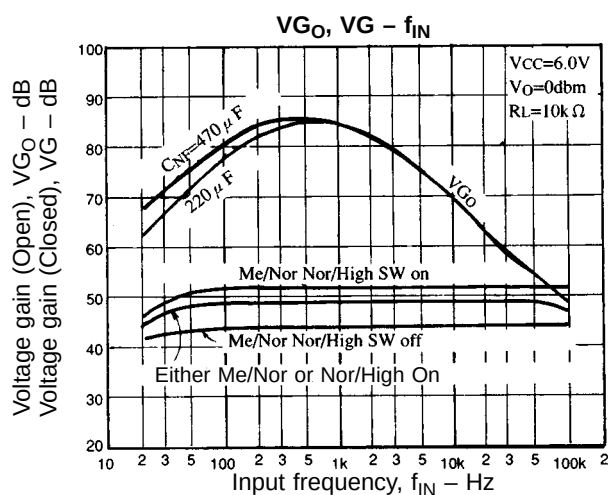


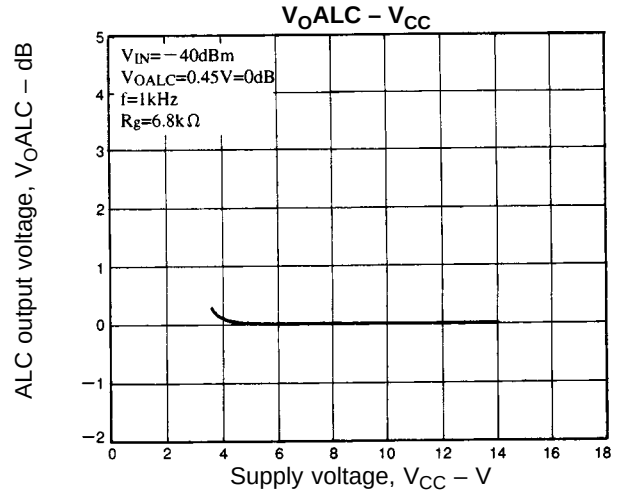
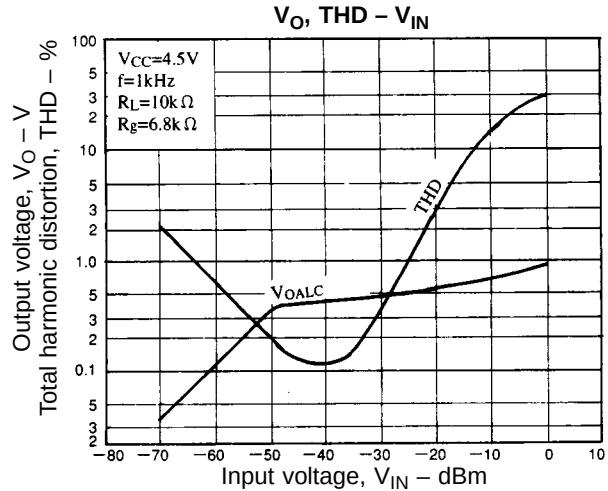
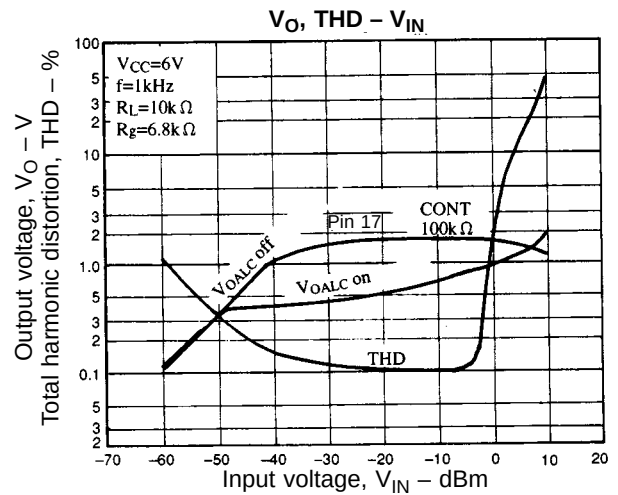
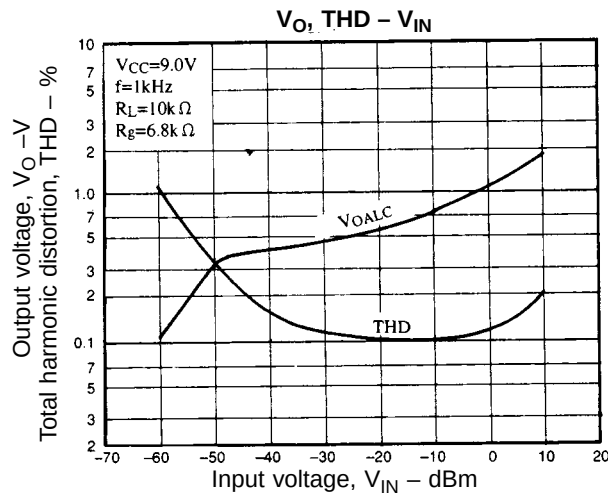
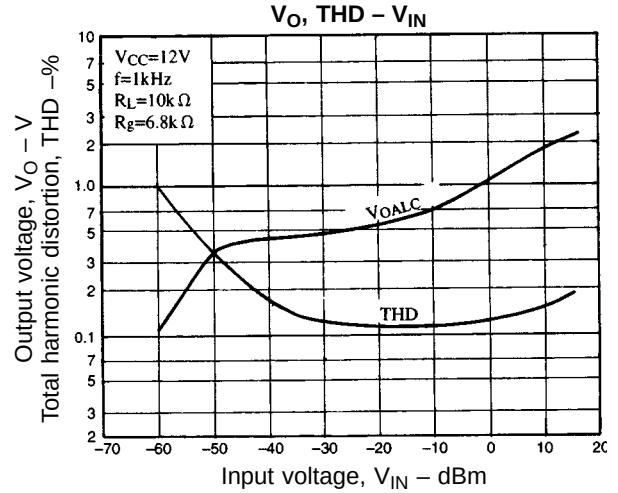
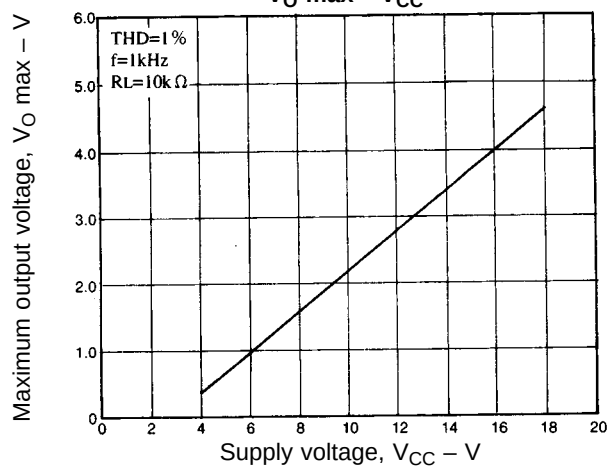
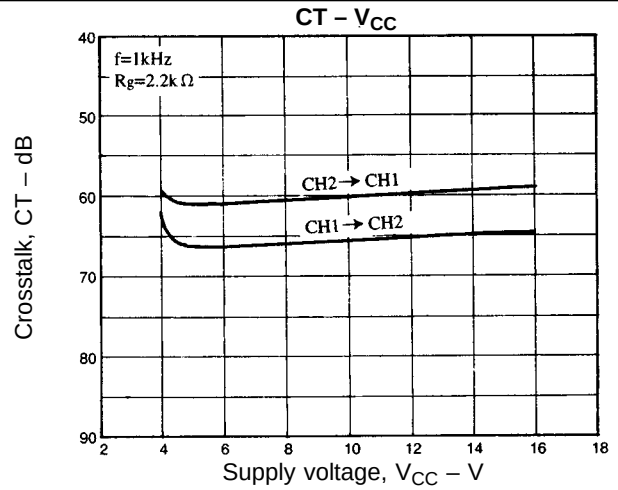
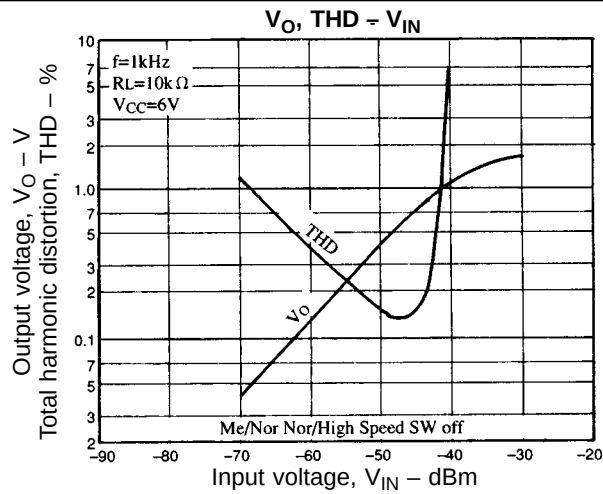
The ALC ON/OFF control circuit is configured as shown left. When a voltage of $(V_{BE1} + V_{BE2}) = 1.5\text{ V}$ or greater is applied to the ALC CONT17, the potential on the ALC IN (pin 8) drops to GND level. The ALC is turned OFF (ALC function release).

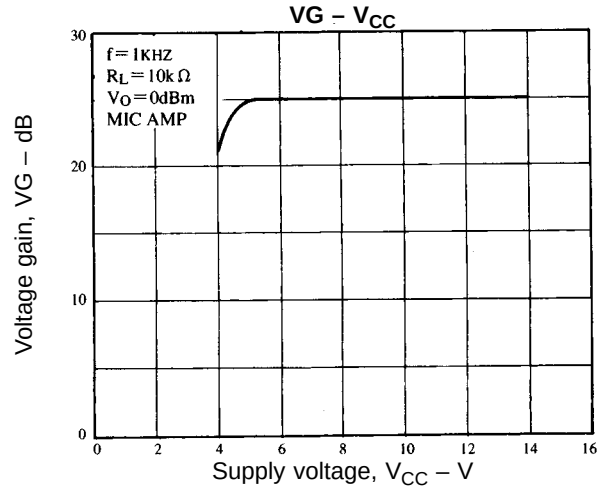
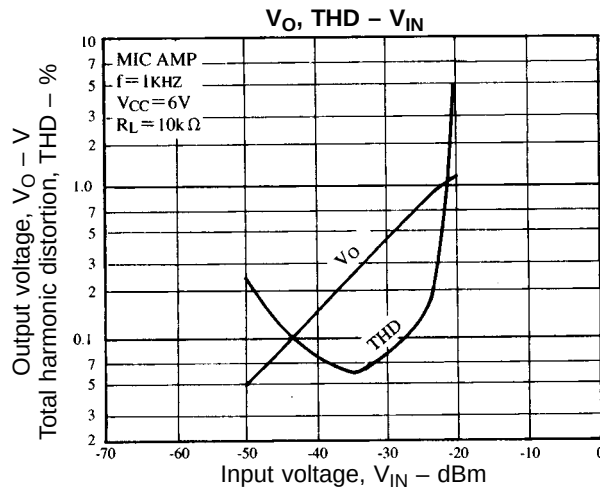
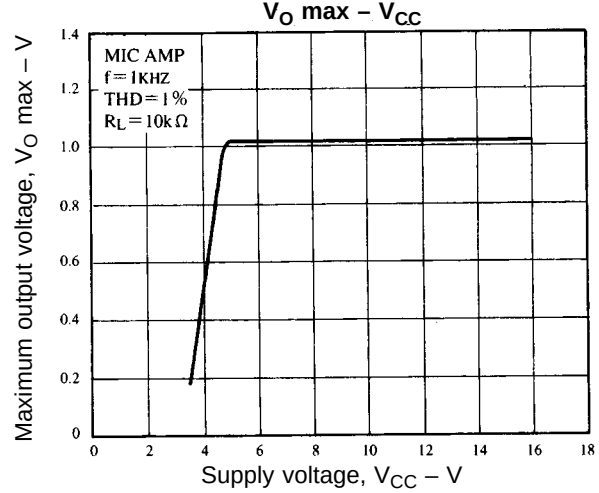
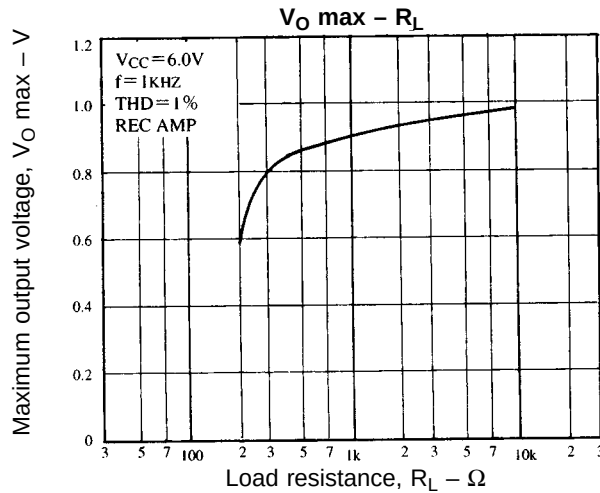
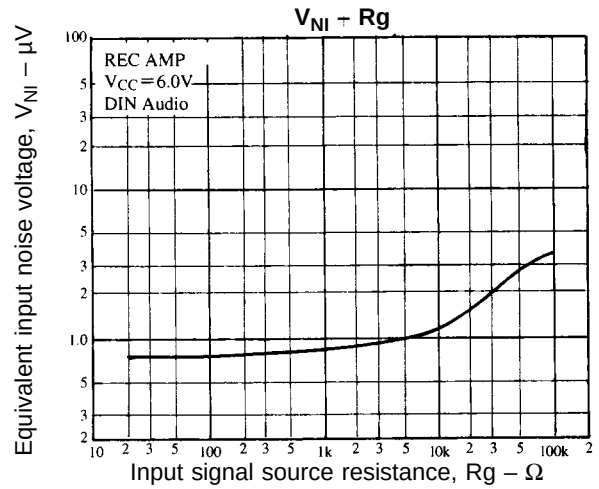
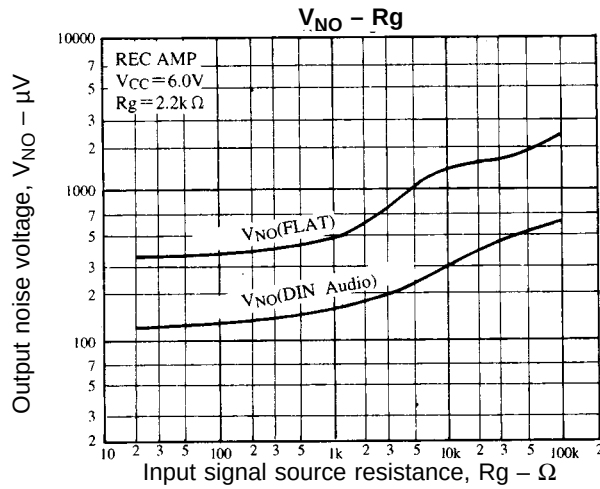
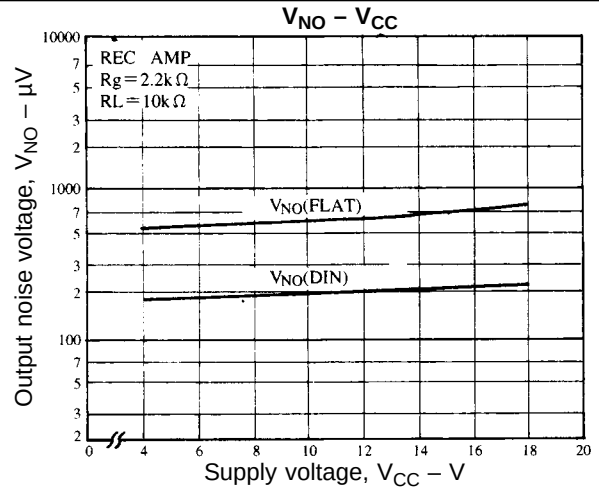
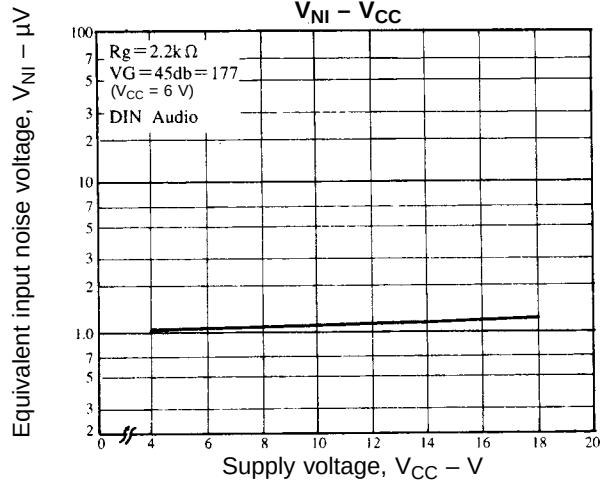


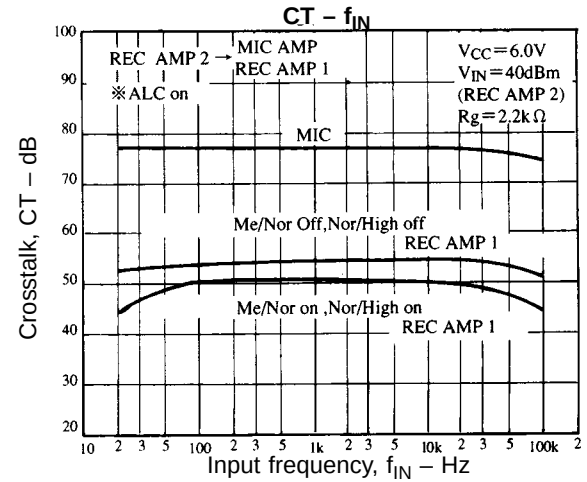
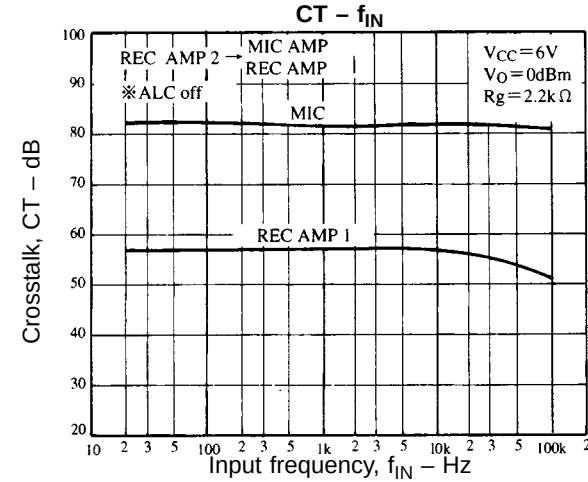
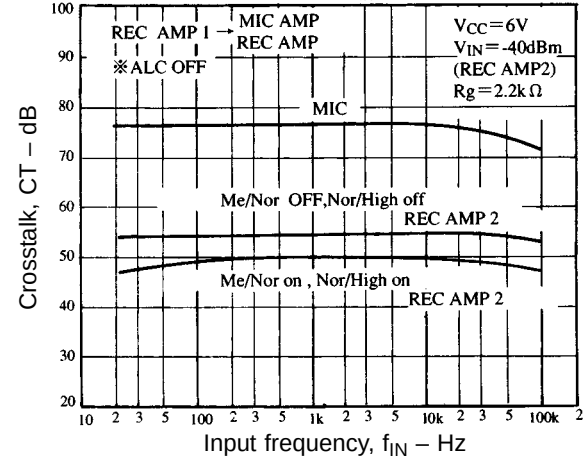
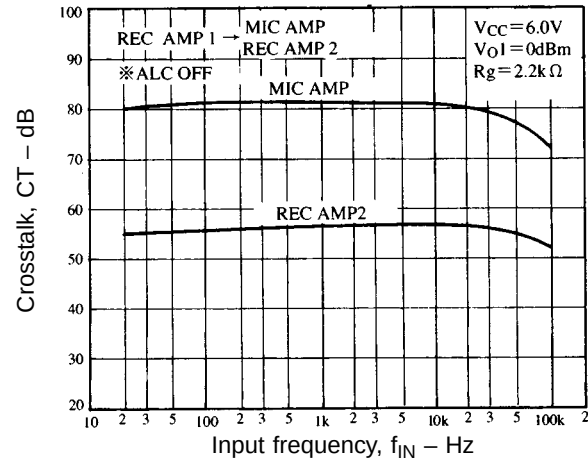
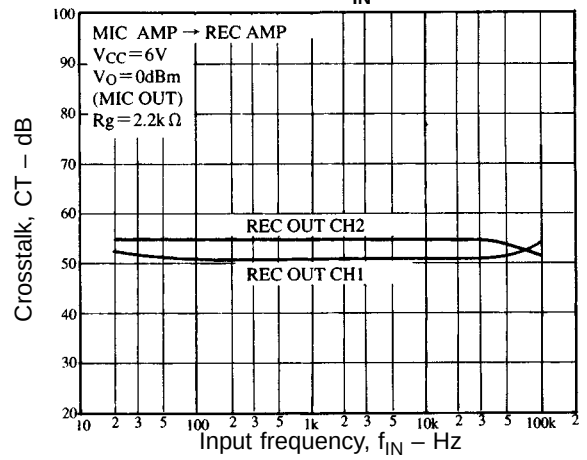
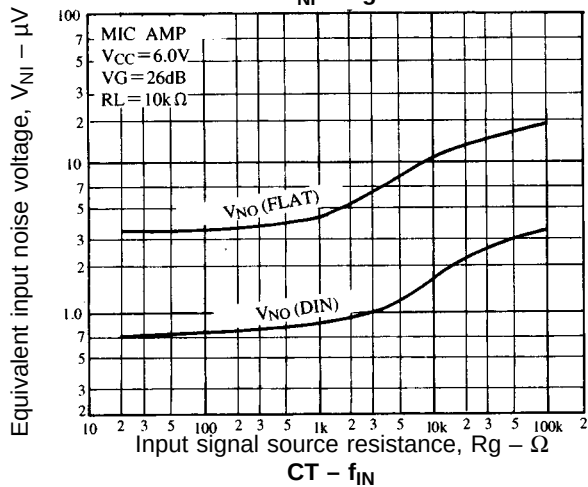
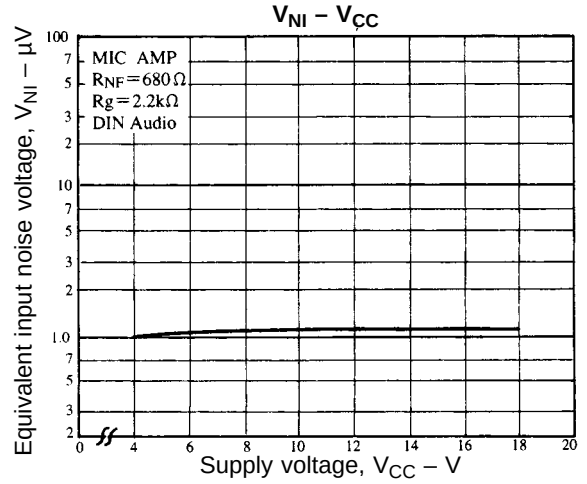
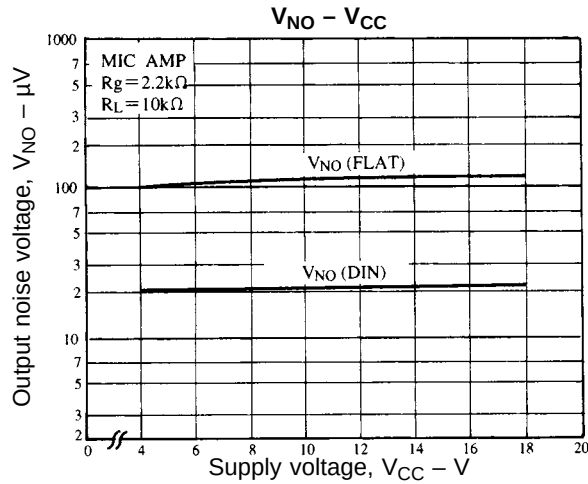
REC amplifier output V_{OAC} is controlled by the ALC CONT voltage and the threshold region has a range of approximately 0.5 V. The ALC CONT voltage is set to 1.0 V or less/1.5 V or greater to turn ON/OFF the ALC, respectively.

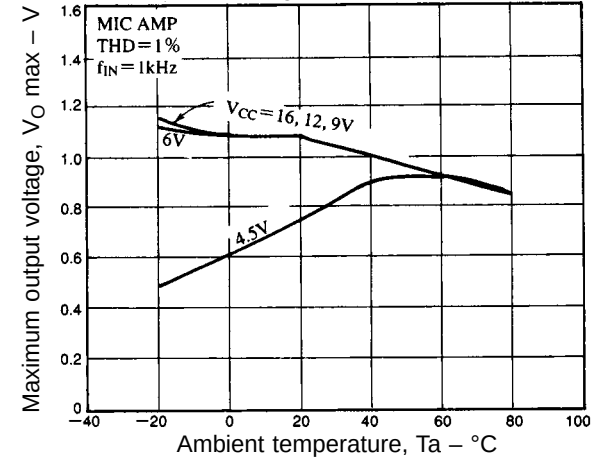
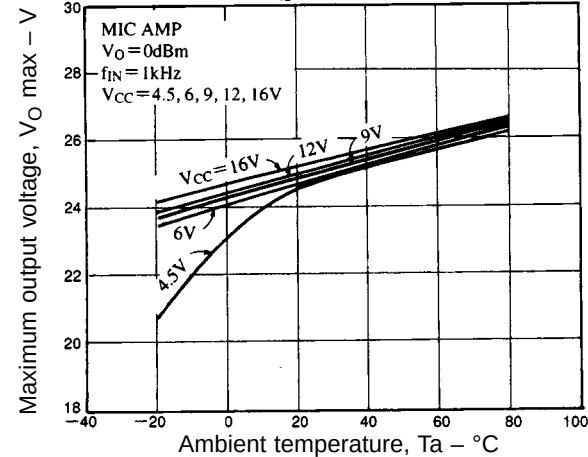
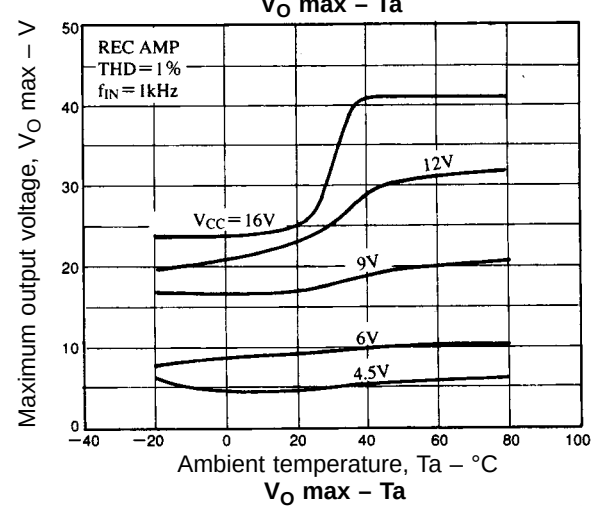
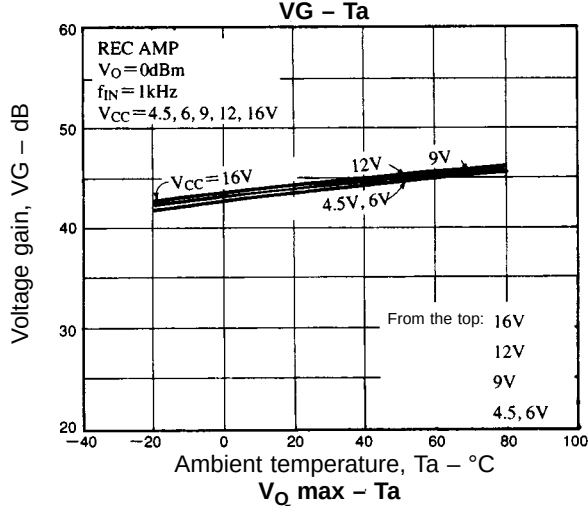
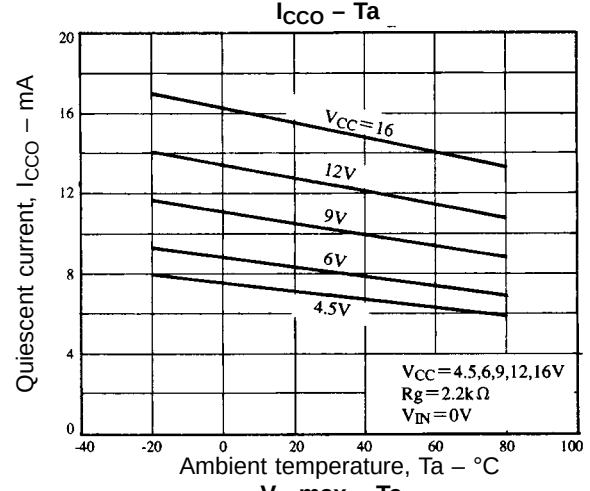
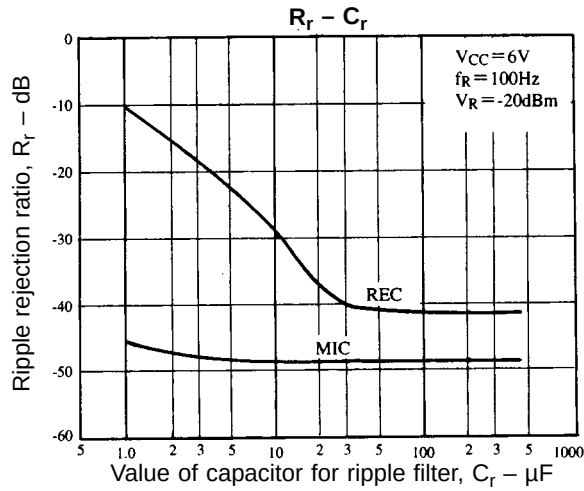
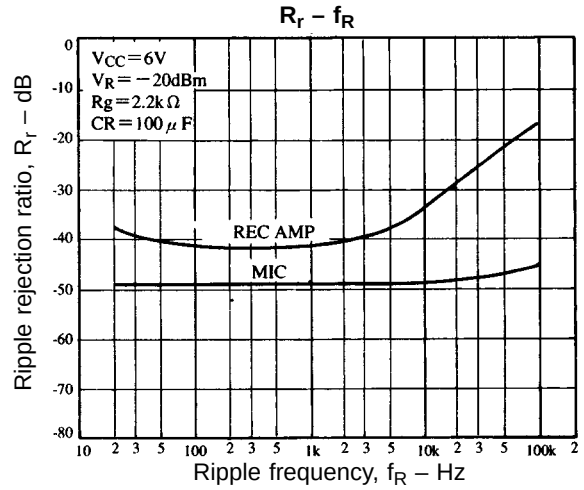
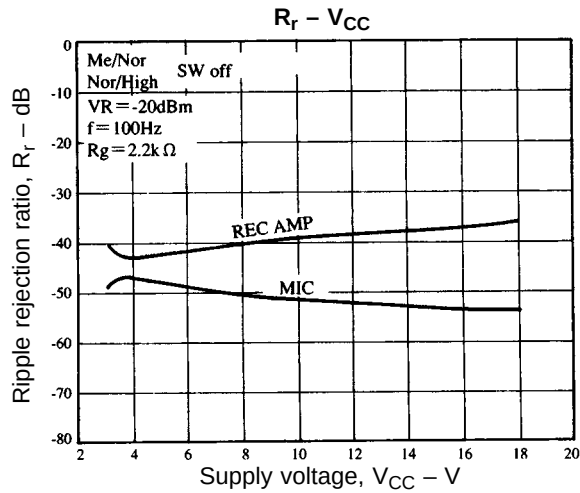
(Refer to Data V_{OAC} , V_8 , $I_1 - V_{ALC\ CONT}$.)

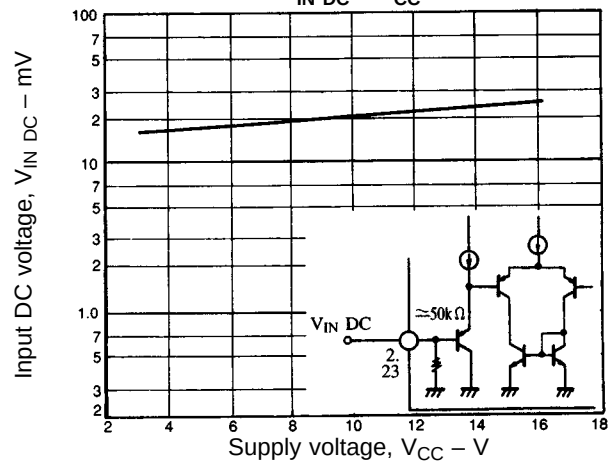
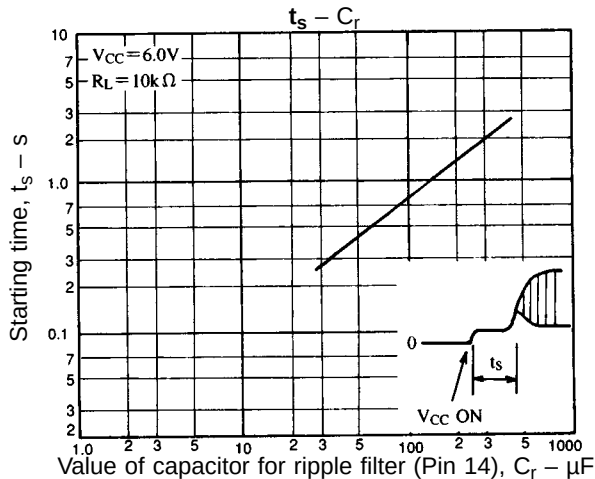
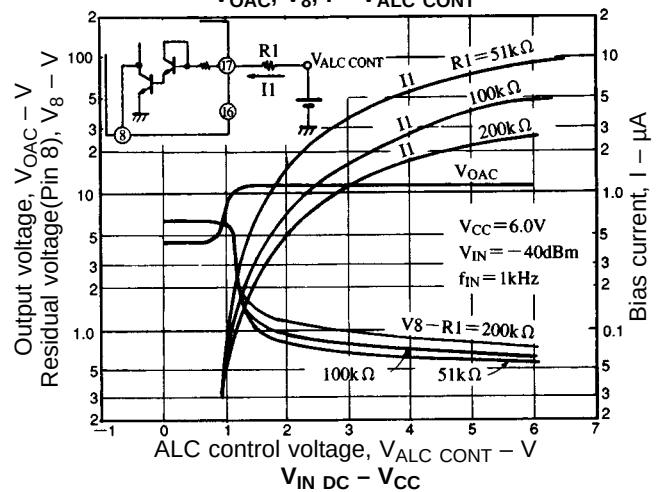
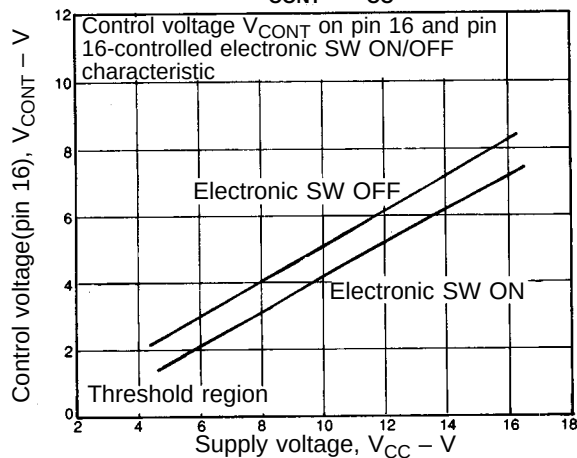
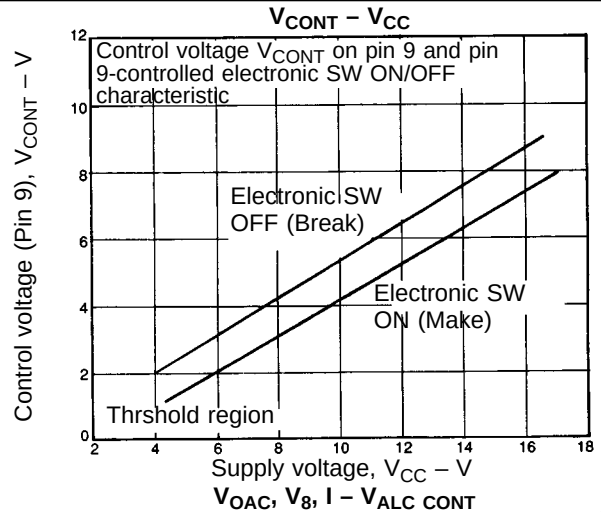
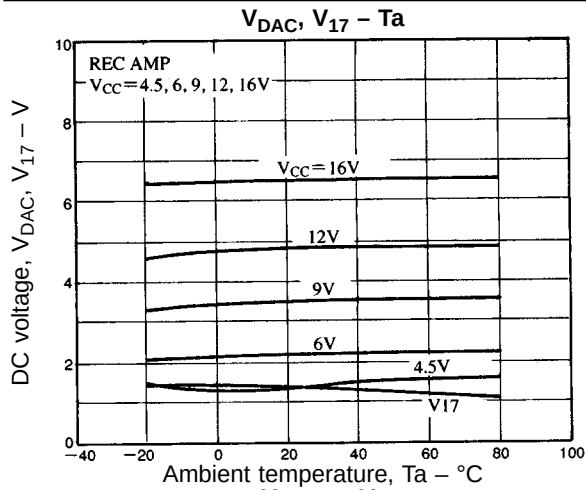












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