



LA3241

Preamplifier for Compact Cassette Recording-Only Use

Overview

The LA3241 is a preamp IC for compact cassette player recording-only use. The distinctive feature of the LA3241 is that it contains mechanical switches which have been so far connected externally as peripheral parts.

Applications

- Radio-cassette tape recorder/tape deck-use stereo compact cassette player.

Features

- Wide ALC : $ALC_W=60\text{dB}$ typ.
- 2-step ALC level : $ALC_{V_0}=0.42\text{V}, 0.65\text{V}$.
- On-chip electronic select switches permitting selection of normal/metal tape and normal/higher speed mode recording equalizer.
- On-chip mike amp : Gain 25dB typ fixed.
- Low-voltage operation because the Schottky barrier diode is used for ALC rectifier diode.
- Wide operating voltage : $V_{CC}=4.5$ to 14.0V.

Functions

- Recording preamp ×2
- Mike amp ×1
- ALC ×1
- Electronic switch ×6

Specifications

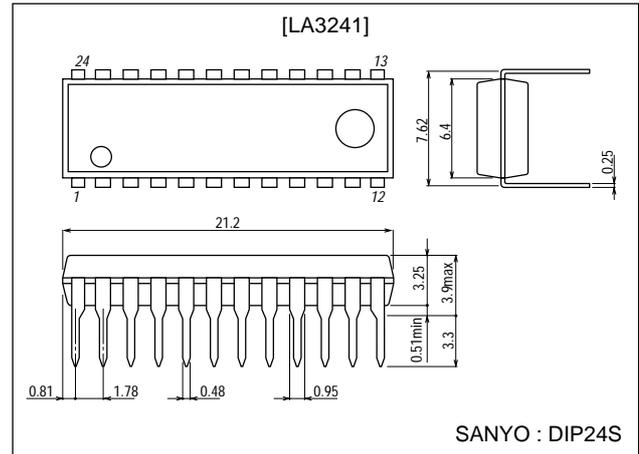
Maximum Ratings at $T_a = 25^\circ\text{C}$

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	$^\circ\text{C}$

Package Dimensions

unit:mm

3067-DIP24S



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

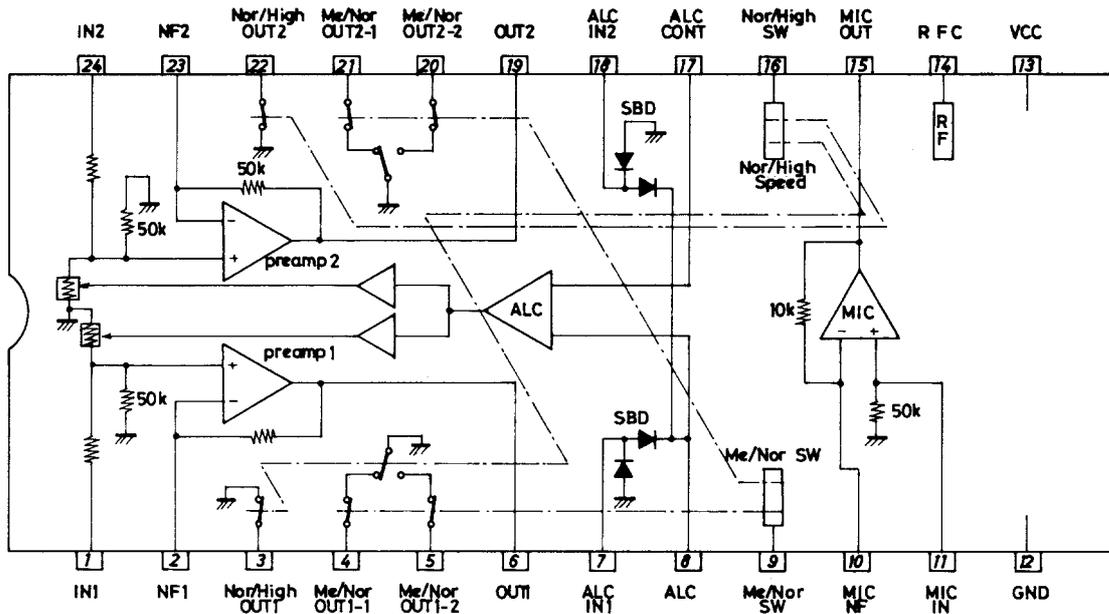
Parameter	Symbol	Conditions	Ratings	Unit
Recommended Supply Voltage	V_{CC}		6	V
Operating Voltage Range	$V_{CC\ op}$		4.5 to 14.0	V

Operating Characteristics at $T_a = 25^\circ\text{C}$, $V_{CC}=6\text{V}$, $R_L=10\text{k}\Omega$, $f=1\text{kHz}$, $0\text{dB}=0.775\text{V}$

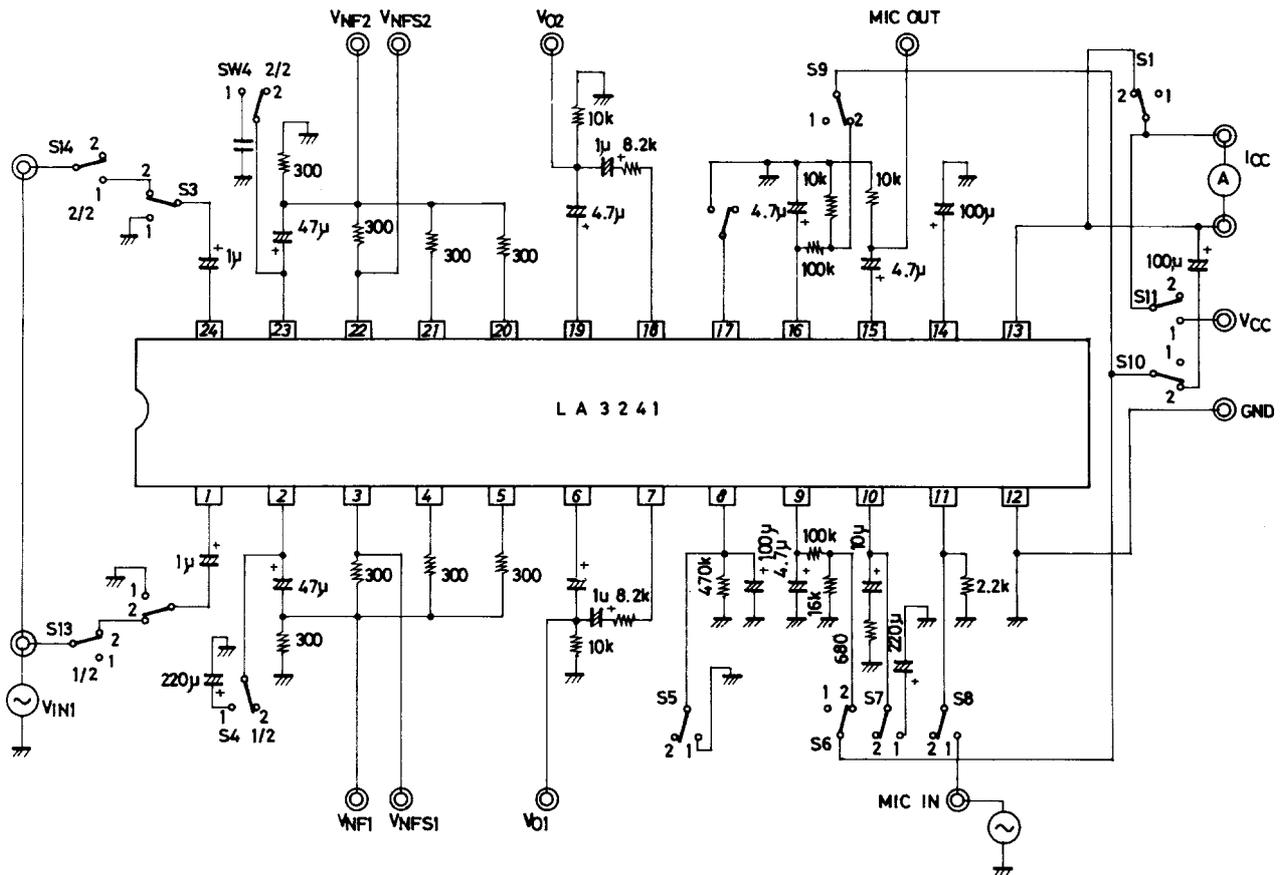
Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Quiescent Current	I_{CCO}	Me/Nor, Nor/High SW off	5	7.5	12	mA
Quiescent Current	I_{CCS}	Me/Nor, Nor/High SW on	12	16	20	mA
[REC Amp]						
Voltage Gain (Open)	V_{GO1}		75	85		dB
Voltage Gain (Closed)	V_{G1}	$V_O=0\text{dBm}$	42.5	44.5	46.0	dB
Total Harmonic Distortion	THD1	$V_O=0.4\text{V}$		0.1	0.7	%
Maximum Output Voltage	$V_{O\ max}$	THD=1%	0.7	1.0		V
Equivalent Input Noise Voltage	V_{NI1}	$R_g=2.2\text{k}\Omega$, BPF : 20Hz to 20kHz		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 \rightarrow Mike amp	50	75		dB
Channel Balance	CB	$V_i=-50\text{dBm}$		0	2	dB
[Mike Amp]						
Voltage Gain	V_{GO2}		40	50		dB
Voltage Gain	V_{G2}	$V_O=0\text{dBm}$	23	25	27	dB
Total Harmonic Distortion	THD2	$V_O=0.4\text{V}$		0.1	0.7	V
Maximum Output Voltage	V_{O2}	THD=1%	0.8	1.1		V
Equivalent Input Noise Voltage	V_{NI2}	$R_g=3.6\text{k}\Omega$, BPF : 20Hz to 20kHz		1.2	1.7	μV
Input Resistance	R_{I2}		40	50	60	$\text{k}\Omega$
Crosstalk	CT3	Mike amp \rightarrow REC amp	45	60		dB
[ALC]						
ALC Range	ALC_W	Input range when output distortion becomes 1% after ALC begins to be applied.	55	60		dB
ALC Balance	ALC_B	Output difference between CH1 and CH2.		0	2	dB
ALC Distortion	ALC_{THD}	$V_i=-40\text{dBm}$		0.15	0.80	%
ALC Output Voltage	ALC_{V_O}	$V_i=-40\text{dBm}$, pin 17 Gnd	0.33	0.42	0.53	V
		$V_i=-40\text{dBm}$, pin 17 opem	0.56	0.65	0.76	V
Crosstalk	CT4	Between REC amps	45	60		dB
	CT5	REC amp \rightarrow Mike amp	50	70		dB
[Switch]						
On-State Resistance	R_{On}			30	70	Ω
DC Feedback Resistance	R_{F1}		40	50	60	$\text{k}\Omega$

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Equivalent Circuit Block Diagram

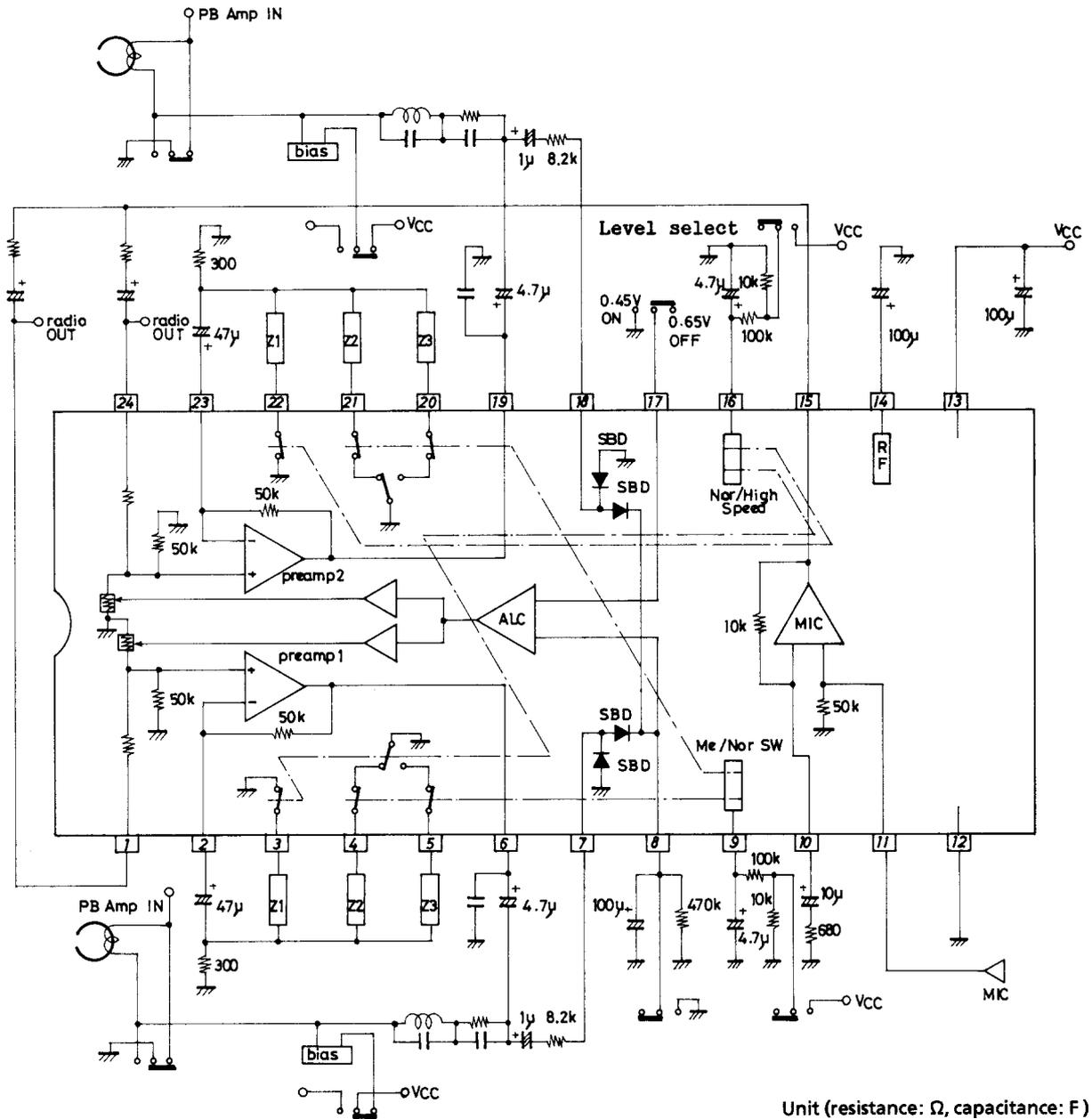


Test Circuit Diagram



Unit (resistance: Ω, capacitance: F)

Sample Application Circuit



Unit (resistance: Ω, capacitance: F)

(Notes)

1. The electronic select switch 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. The electronic select switch mode illustrated above shown no V_{CC} being impressed on Me/Nor SW^⑨ or Nor/High SW^⑩.
5. The ALC level on pin 7 should not be changed over while V_{CC} is impressed.

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