Ordering number:ENN528D

Monolithic Linear IC

LA4140

0.5W AF Power Amplifier

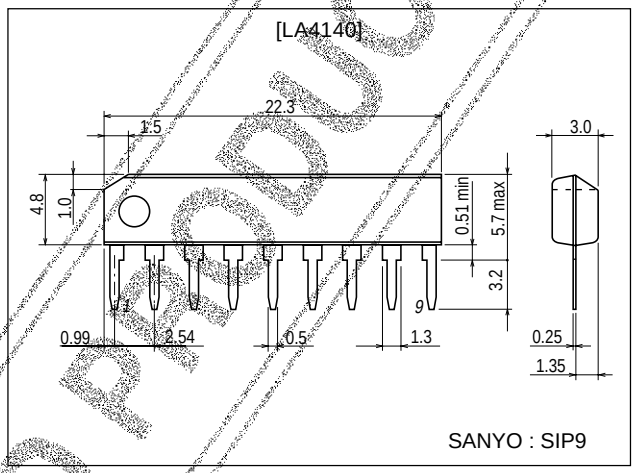
Features

- Output power 0.5W typ (V_{CC}=6V, R_L=8Ω, THD=10%).
- Low quiescent current.
- Wide operating voltage range : V_{CC}=3.5 to 12V.
- 9-pin SIP permitting sets to be small-sized and eliminating the need to use a heat sink.

Package Dimensions

unit:mm

3017C-SIP9



Specifications

Absolute Maximum Ratings at Ta = 25˚C

Parameter	Symbol	Conditions	Ratings	Unit
Maximum Supply Voltage	V_{CC} max	Quiescent mode	14	V
		Operating mode R_L=16Ω	14	V
		Operating mode R_L=8Ω	12	V
Maximum Output Current	I_O		500	mA
Allowable Power Dissipation	Pd max*		*750	mW
Operating Temperature	Topr		–20 to +70	˚C
Storage Temperature	Tstg		–40 to +150	˚C

* Pd max : Installed on 50×50mm2 PCB, See figure of Pd max – Ta.

Recommended Operating Conditions at Ta = 25˚C

Parameter	Symbol	Conditions	Ratings	Unit
Supply Voltage	V_{CC}		6	V
Load Resistance	R_L		8	Ω

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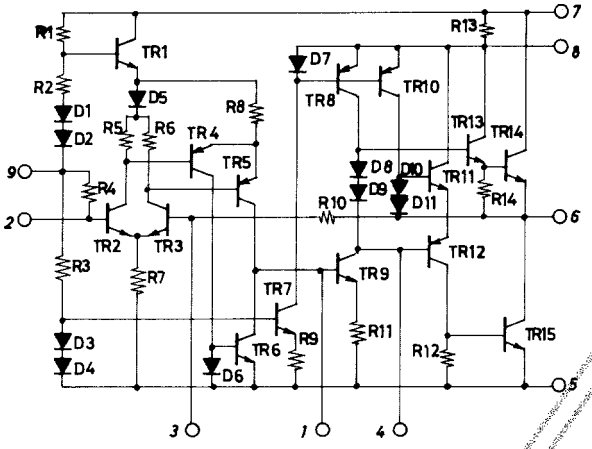
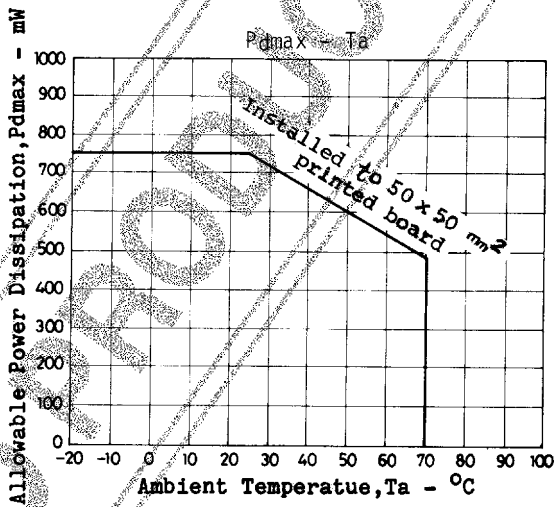
Operating Characteristics at Ta = 25˚C, V_{CC}=6V, R_L=8Ω, Rg=600Ω, R_f=47Ω, f=1kHz

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Quiescent Current	I_{CCO}			11		mA
Voltage Gain	VG		47	50	52	dB
Output Power	Po	THD=1%	0.45	0.5		V
Total Harmonic Distortion	THD	Po=100mW		0.3	1.0	%
Input Resistance	r_i			15k		Ω
Output Noise Voltage	V_{NI}	Rg=10kΩ, via filter of 50Hz to 20kHz		0.4	1.0	mV

Equivalent Circuit





Notice for Using IC

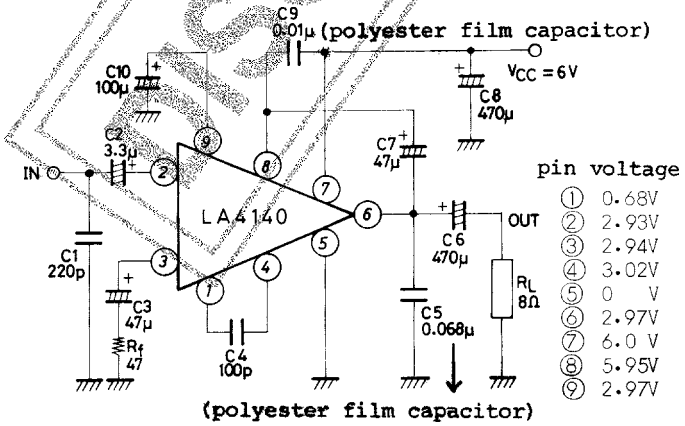
(1) Maximum Ratings
Enough margin converting supply voltage drifting should be prepared and disigning over maximum ratings should be absolutely avoided because operation near these ratings causes going across the ratings and leading to destruction.

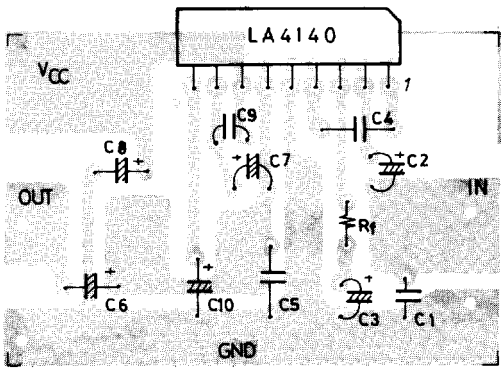
(2) Terminating Pins
Turning the circuit on leaving pin to pin of IC shorted causes destruction of failure. Turn on ascertaining that solder has never shorted pins when setting IC to printed board.

(3) Location
When used in a radio receiver, IC is designed to locate apart from a bar antenua enough.

(4) Printed Pattern Designing
As designing a printed pattern, lines of power supply, output adn ground are to be widely short and pattern and peripheral parts are considerably set not to feedback from output to input.
Also, a capacitor C8 at power line, C5 and C9 of anti-oscillator are to be arranged near to pins of IC.

Application





An Example of Printed Pattern
(bottom view, 35 x 50 mm2)

[Peripheral Parts]

C1, 220pF : Anti-noise capacitor.

C2, 3.3μF : Coupling capacitor. Large C2 makes operating noise of variable resistor large. Small one makes frequency response of low frequency range narrow.

C3, 47μF : Feedback capacitor. Small C3 makes the starting time short, but frequency response of low range narrow.

C4, 100pF : For frequency response adjusting of high range, but excessive small one is apt to oscillate.

C5, 0.068μF : For anti-oscillation. Polyester film capacitor is available which has good thermal and high frequency characteristics.

C6, 470μF : Output capacitor. It deciders power of low frequency.

C7, 47μF : Bootstrap capacitor. Excssive small C7 causes wave from clipping point to be unbalanced at low frequency range.

C8, 470μF : Filter capacitor.

C9, 0.01μF : Anti-oscillation. Polyester film capacitor is available.

C10, 100μF : Filter capacitor. Rejects power line hum. Small C10 decreases ripple rejection ratio.

R_f, 47Ω : Decides voltage gain. Closed loop voltage gain is nearly calculated as follows. But about ±3dB tolerance should be prepared owing to scatter of internal resistance of IC.

$$VG=20 \log (15000/R_f\ [\Omega])\ [dB]$$