

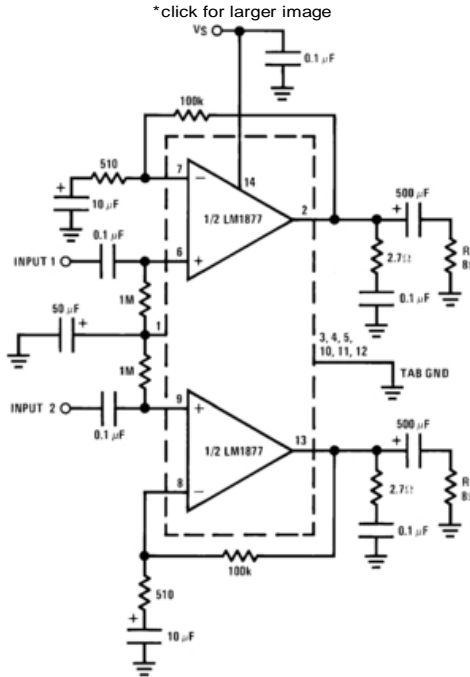


# LM1877 - Dual Audio Power Amplifier

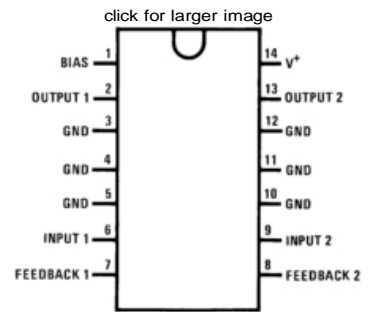
## Features

- 2W/channel
- -65 dB ripple rejection, output referred
- -65 dB channel separation, output referred
- Wide supply range, 6V-24V
- Very low cross-over distortion
- Low audio band noise
- AC short circuit protected
- Internal thermal shutdown

## Typical Application



## Connection Diagram



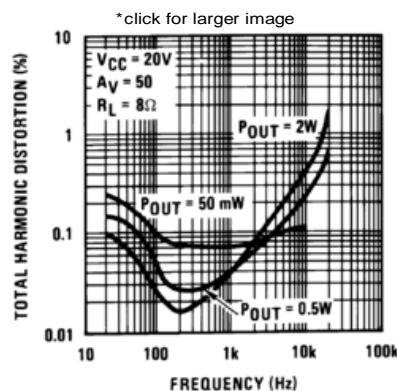
## Applications

- Multi-channel audio systems
- Stereo phonographs
- Tape recorders and players
- AM-FM radio receivers
- Servo amplifiers
- Intercom systems
- Automotive products

## Parametric Table

Channels	2 Channels
Mono/Stereo	Stereo
Supply Range	+6 - +24
Slew Rate	2 Volts/usec
Power@ 4Ohms, 1% THD	1.5 Watt
Power@ 8Ohms, 1% THD	1 Watt
Power@ 4Ohms, 10% THD	1.75 Watt
Power@ 8Ohms, 10% THD	1.3 Watt
THD	0.06 %
THD Conditions	Po=1W @ Vs=14V, RL=8ohms
Temperature Min	0 deg C
Temperature Max	70 deg C

## Typical Performance





RoHS Compliance Information

LM1877 Dual Audio Power Amplifier

LM1877 Dual Audio Power Amplifier (Japanese)

Package Availability, Models, Samples & Pricing

Part Number	Package						Factory Lead Time		Models			Std Pack Size	Package Marking Format
	Type	Pins	Spec.	MSL Rating	Peak Reflow	RoHS Report	CAD Symbols	Weeks					
LM1877M-9	SOIC WIDE	14	STD	2A	220	RoHS	N/A	Full production		N/A		rail of 50	NSUZXYTT LM1877M -9
			NOPB	3	260			8 weeks	2000				
LM1877MX-9	SOIC WIDE	14	STD	2A	220	RoHS	N/A	Full production		N/A		reel of 1000	NSUZXYTT LM1877M -9
			NOPB	3	260			6 weeks	5000				
LM1877N-9	MDIP	14	STD	1	NA	RoHS	N/A	Obsolete		N/A		rail of 25	NSUZXYTTE# LM1877N-9
			NOPB	1	NA			16 weeks	500				

Obsolete Versions

Obsolete Part	Alternate Part or Supplier	Source	Last Time Buy Date
LM1877N	NONE	NONE	09/08/98
LM1877N-9	LM1877MX-9	NATIONAL SEMICONDUCTOR CORP	11/16/2008
LM1877N-9A		NONE	06/03/2003

General Description

The LM1877 is a monolithic dual power amplifier designed to deliver 2W/channel continuous into 8Ω loads. The LM1877 is designed to operate with a low number of external components, and still provide flexibility for use in stereo phonographs, tape recorders and AM-FM stereo receivers, etc. Each power amplifier is biased from a common internal regulator to provide high power supply rejection, and output Q point centering. The LM1877 is internally compensated for all gains greater than 10.

Reliability Metrics

Part Number	Process	EFR Reject	EFR Sample Size	PPM *	LTA Rejects	LTA Device Hours	FITS	MTTF (Hours)
LM1877M-9	SLM	0	42786	0	0	3352500	2	951281028
LM1877MX-9	SLM	0	42786	0	0	3352500	2	951281028
LM1877N-9	SLM	0	42786	0	0	3352500	2	951281028

Note: The Early Failure Rates were calculated as point estimates. The Long Term Failure Rates were calculated at 60% confidence using the Arrhenius equation at 0.7eV activation energy and derating the assumed stress temperature of 150°C to a n application temperature of 55°C.

# LM1877

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### Features

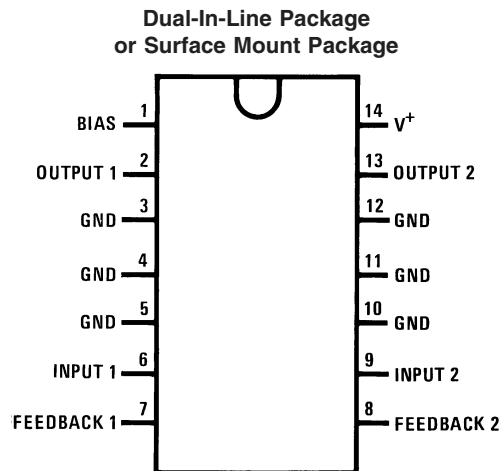
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## Connection Diagram



00791301

**Top View**

Order Number LM1877M-9 or LM1877N-9  
See NS Package Number M14B or N14A

**Absolute Maximum Ratings** (Note 1)

If Military/Aerospace specified devices are required, please contact the National Semiconductor Sales Office/Distributors for availability and specifications.

Supply Voltage	26V
Input Voltage	±0.7V
Operating Temperature	0°C to +70°C
Storage Temperature	-65°C to +150°C
Junction Temperature	150°C
Lead Temperature	
N-Package Soldering (10 sec.)	260°C

M-Package Infared (15 sec.)	220°C
M-Package Vapor Phase (60 sec.)	215°C
Thermal Resistance	
$\theta_{JC}$ (N-Package)	30°C/W
$\theta_{JA}$ (N-Package)	79°C/W
$\theta_{JC}$ (M-Package)	27°C/W
$\theta_{JA}$ (M-Package)	114°C/W

**Note 1:** Absolute Maximum Ratings indicate limits beyond which damage to the device may occur. Operating Ratings indicate conditions for which the device is functional, but do not guarantee specific performance limits.

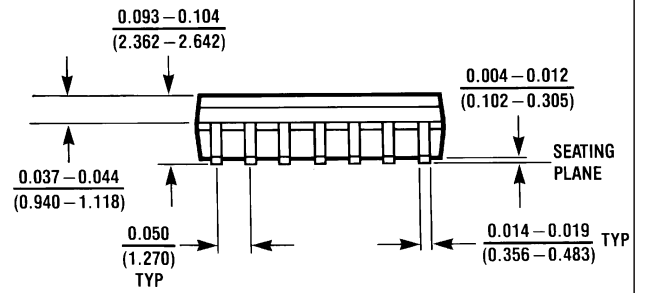
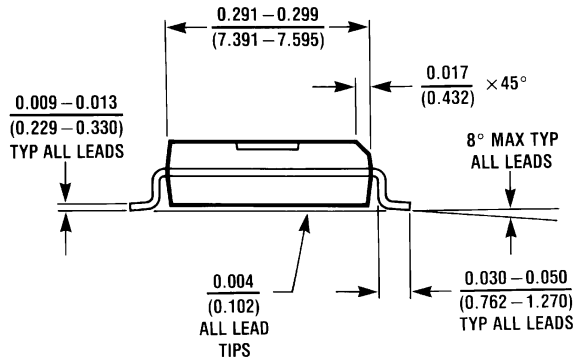
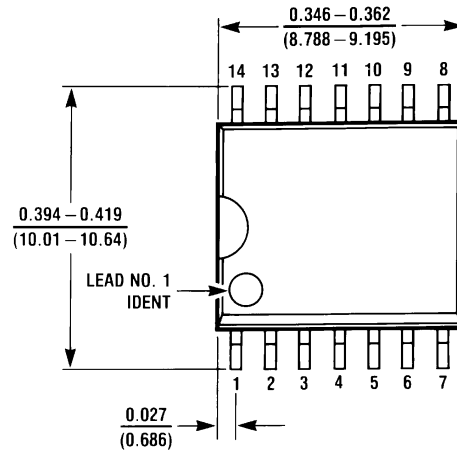
**Electrical Characteristics**

$V_S = 20V$ ,  $T_A = 25^\circ C$ , (Note 2)  $R_L = 8\Omega$ ,  $A_V = 50$  (34 dB) unless otherwise specified

Parameter	Conditions	Min	Typ	Max	Units
Total Supply Current	$P_O = 0W$		25	50	mA
Output Power LM1877	THD = 10% $V_S = 20V$ , $R_L = 8\Omega$ $V_S = 12V$ , $R_L = 8\Omega$	2.0	1.3		W/Ch W/Ch
Total Harmonic Distortion LM1877	$f = 1$ kHz, $V_S = 14V$				
	$P_O = 50$ mW/Channel		0.075		%
	$P_O = 500$ mW/Channel		0.045		%
	$P_O = 1$ W/Channel		0.055		%
Output Swing	$R_L = 8\Omega$		$V_S - 6$		Vp-p
Channel Separation	$C_F = 50$ $\mu F$ , $C_{IN} = 0.1$ $\mu F$ , $f = 1$ kHz, Output Referred				
	$V_S = 20V$ , $V_O = 4$ Vrms	-50	-70		dB
	$V_S = 7V$ , $V_O = 0.5$ Vrms		-60		dB
PSRR Power Supply Rejection Ratio	$C_F = 50$ $\mu F$ , $C_{IN} = 0.1$ $\mu F$ , $f = 120$ Hz, Output Referred				
	$V_S = 20V$ , $V_{RIPPLE} = 1$ Vrms	-50	-65		dB
	$V_S = 7V$ , $V_{RIPPLE} = 0.5$ Vrms		-40		dB
Noise	Equivalent Input Noise				
	$R_S = 0$ , $C_{IN} = 0.1$ $\mu F$ , BW = 20 Hz–20 kHz, Output Noise Wideband		2.5		$\mu V$
	$R_S = 0$ , $C_N = 0.1$ $\mu F$ , $A_V 200$		0.80		mV
Open Loop Gain	$R_S = 0$ , $f = 100$ kHz, $R_L = 8\Omega$		70		dB
Input Offset Voltage			15		mV
Input Bias Current			50		nA
Input Impedance	Open Loop		4		M $\Omega$
DC Output Level	$V_S = 20V$	9	10	11	V
Slew Rate			2.0		V/ $\mu s$
Power Bandwidth			65		kHz
Current Limit			1.0		A

**Note 2:** For operation at ambient temperature greater than 25°C, the LM1877 must be derated based on a maximum 150°C junction temperature.

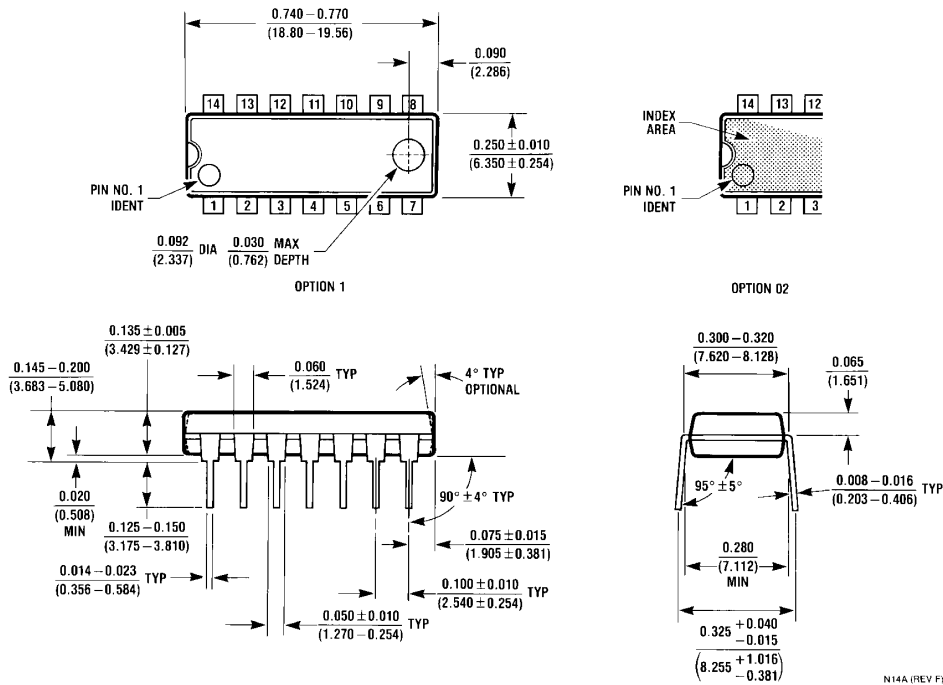
# Physical Dimensions

 inches (millimeters) unless otherwise noted


M14B (REV D)

Molded SOIC Package (M)  
 Order Number LM1877M-9  
 NS Package Number M14B

**Physical Dimensions** inches (millimeters) unless otherwise noted (Continued)



**Molded Dual-In-Line Package (N)**  
**Order Number LM1877N-9**  
**NS Package Number N14A**

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2. A critical component is any component of a life support device or system whose failure to perform can be reasonably expected to cause the failure of the life support device or system, or to affect its safety or effectiveness.

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