

General Description

The LTA5532L is a dual operational amplifier, specially designed for improving the tone control, which is most suitable for the audio application.

Featuring noiseless, higher gain bandwidth, high output current and low distortion ratio, and it is most suitable not only for acoustic electronic parts of audio pre-amp and active filter, but also for error amplifier in servo application.

LTA5532L (dual) is available in SOIC-8L and DIP-8L packages.

Features and Benefits

- Operating Voltage: $\pm 4V$ to $\pm 20V$
- Low Distortion: 0.001% (Typical)
- Low Input Noise Voltage
- Wide GBW: 10MHz
- Slew Rate: $6V/\mu s$ (Typical)
- Bipolar Technology
- Temperature Range: $-40^{\circ}C$ to $+125^{\circ}C$

Applications

- Audio Preamplifiers
- Active Filters
- Pro Audio Mixers
- Multichannel Video Transcoders
- Industrial Measurement Equipment
- Video Broadcasting and Infrastructure: Scalable Platforms

Functional Block Diagram

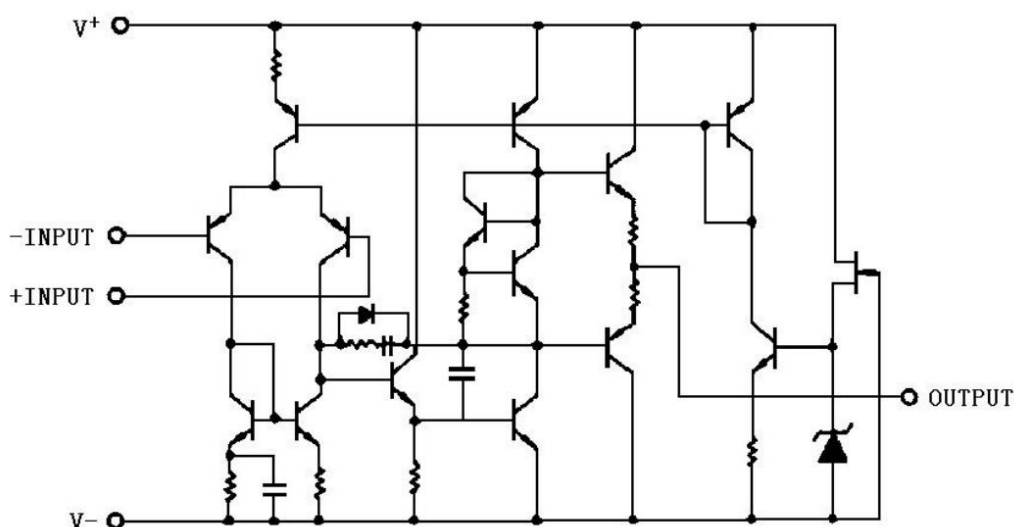


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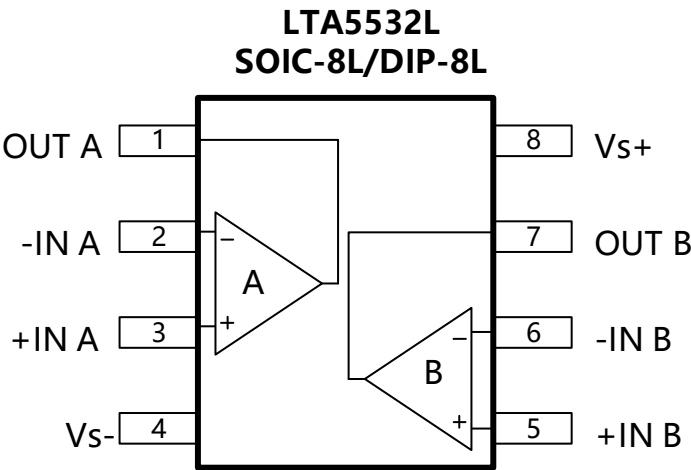
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Ordering Information

Part Number	Package Type	Package Size	Package Quantity	ECO Class	Mark Code
LTA5532LXS8/R8	SOIC-8L	4.90 mm *3.92 mm	Tape and Reel, 4 000	Green (RoHS & no Sb/Br)	X5532
LTA5532LXD8/U1	DIP-8L	9.20 mm *6.40 mm	Tube, 50	Green (RoHS & no Sb/Br)	X5532

Pin Configuration (Top View)



PIN Name	SOIC-8L, DIP-8L	Description
OUT A	1	Amplifier output A.
-IN A	2	Inverting input of the amplifier A.
+IN A	3	Non-inverting input of the amplifier A.
VS-	4	Negative power supply. It is normally tied to ground. It can also be tied to a voltage other than ground as long as the voltage between VS+ and VS- is from 8 V to 40 V.
+IN B	5	Non-inverting input of the amplifier B.
-IN B	6	Inverting input of the amplifier B.
OUT B	7	Amplifier output B.
VS+	8	Positive power supply. The voltage is from 8 V to 40 V. Split supplies are possible as long as the voltage between VS+ and VS- is from 8 V to 40 V.

Limiting Value

Parameter		Absolute Maximum Rating
Supply Voltage, V _{S+} to V _{S-}		44 V (±22V)
Signal Input Terminals: Voltage		±15 V
Signal Differential Input Voltage		±30 V
Storage Temperature Range, T _{stg}		−55 °C to +150 °C
Power dissipation	SOIC-8L	500 mW
	DIP-8L	1100 mW

ESD Rating

Parameter	Item	Value	Unit
Electrostatic Discharge Voltage	Human body model (HBM), per ANSI/ESDA/JEDEC JS-001	±1 500	V
	Charged device model (CDM), per ANSI/ESDA/JEDEC JS-002	±1 000	

40V, Low Noise, Dual Operational Amplifier

Electrical Characteristics

Unless otherwise noted, $T_A = 25^\circ\text{C}$, $V_S = \pm 15.0\text{ V}$

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
DC PERFORMANCE						
Input Offset Voltage	V _{OS}	R _S ≤ 10 kΩ		0.3	3	mV
Input Bias Current	I _B	V _{CM} = 0 V		150	1000	nA
Input Offset Current	I _{OS}	V _{CM} = 0 V		5	200	nA
Input Resistance	R _{IN}		50	300		kΩ
Large voltage gain	A _{VOL}	R _L ≥ 2 kΩ, V _O =20 V _{p-p}	90	120		dB
NOISE and DISTORTION PERFORMANCE						
Equivalent Input Noise Voltage	E _N	R _S = 300Ω		0.44	0.56	μV
Total Harmonic Distortion	THD	A _V = 20dB, V _O = 5V, R _L =2 kΩ, f = 1 kHz		0.001		%
INPUT CHARACTERISTICS						
Input Common Mode Voltage Range	V _{CM}		±12	±13.5		V
Common Mode Rejection Rate	CMRR	R _S ≤ 10 kΩ	80	110		dB
DYNAMIC PERFORMANCE						
Gain-Bandwidth Product	GBW			10		MHz
Unity-gain Bandwidth	f _T	A _V = 1		5.5		MHz
Slew Rate	SR	R _L ≤ 2 kΩ		6		V/μs
NOISE						
Input voltage noise	V _n	f = 0.1 to 10 Hz		0.133		μV _{PP}
Input voltage noise density	e _n	f=10kHz		2.8		nV/√ Hz
		f=1kHz		3.1		
Input current noise	I _n	f=1kHz		0.5		pA/√ Hz
OUTPUT CHARACTERISTICS						
Maximum peak to peak output voltage swing	V _{OM}	R _L ≥ 2 kΩ	±12	±13.5		V
Short-circuit Current	I _{source}	V _{in} = ± 1 V, V _O = 2V	See Figure 4			mA
	I _{sink}					
POWER SUPPLY						
Operating Supply Voltage	V _S	T _A = -40 to +85 °C	8		40	V
Power Supply Rejection Ratio	PSRR	R _L ≤ 10 kΩ	80	120		dB
Quiescent Current	I _Q	No Load		5	8	mA

Note: When an external capacitor is connected, it may cause oscillation. To avoid oscillation, it is recommended to connect a resistor (about 50 ohms) at the output terminal.

Typical Characteristics

At $T_A = 25^\circ\text{C}$, $V_S = \pm 15\text{ V}$, unless otherwise noted.

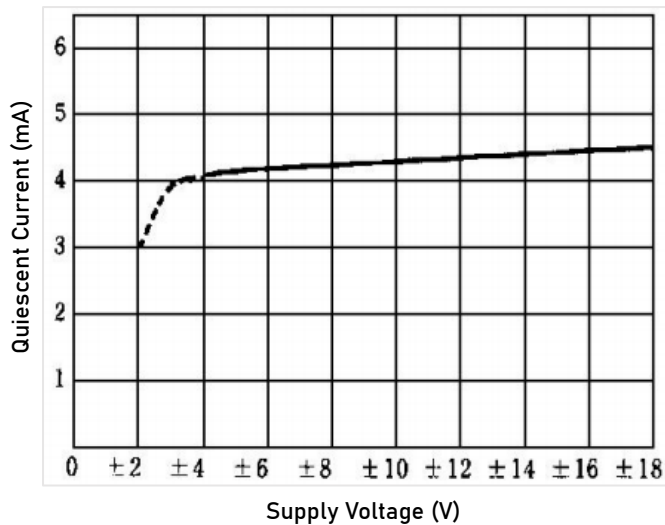


Figure 1. Quiescent Current vs. Supply Voltage
No input signal, $R_L = \infty$

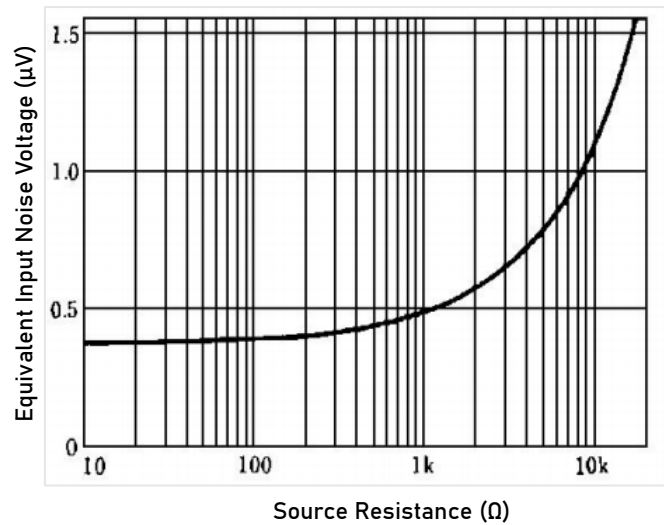


Figure 2. Equivalent Input Noise Voltage vs. Source Resistance

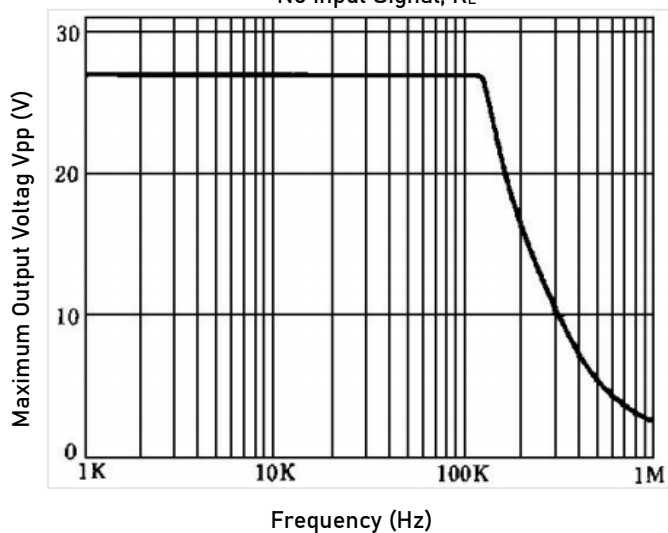


Figure 3. Maximum Output Voltage Vpp vs. Frequency

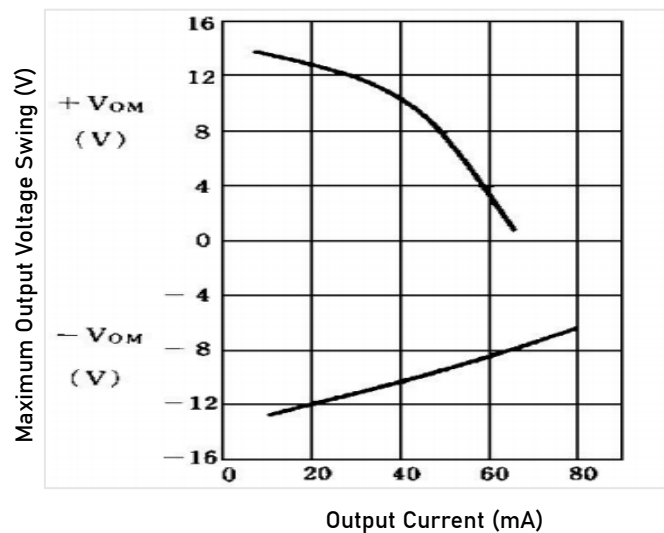


Figure 4. Maximum Output Voltage Swing vs. Output Current

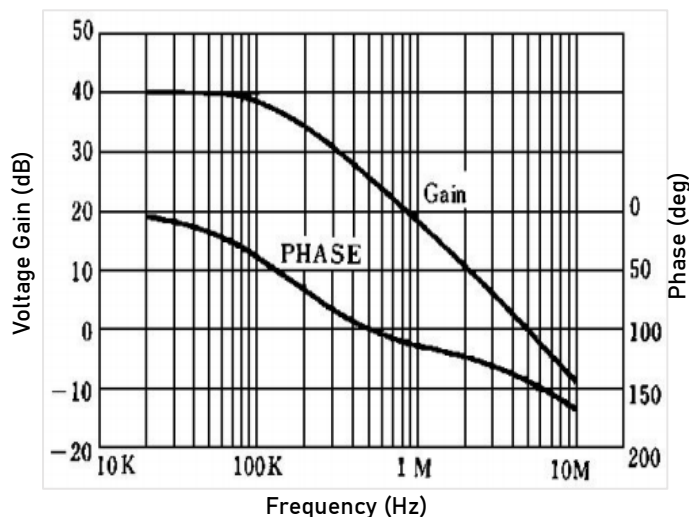


Figure 5. Voltage Gain, Phase vs. Frequency
 $R_L = 2\text{ k}\Omega$, $C_L = 100\text{ pF}$, 40dB Amp)

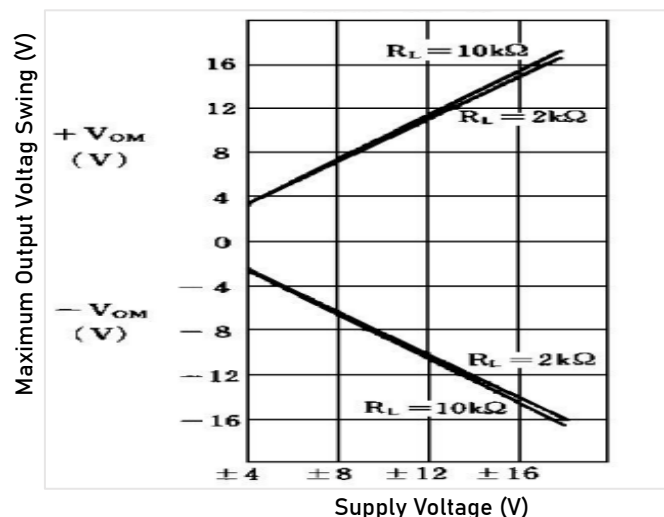


Figure 6. Maximum Output Voltage Swing vs. Supply Voltage

Typical Characteristics (Cont.)

At $T_A = 25^\circ\text{C}$, $V_S = \pm 15\text{ V}$, unless otherwise noted.

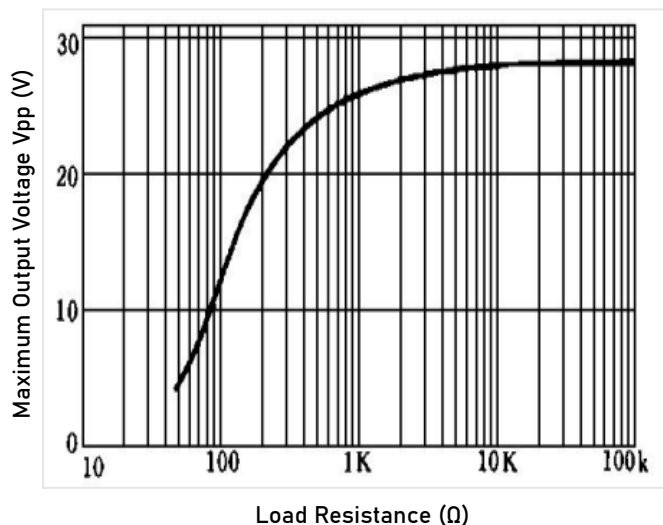
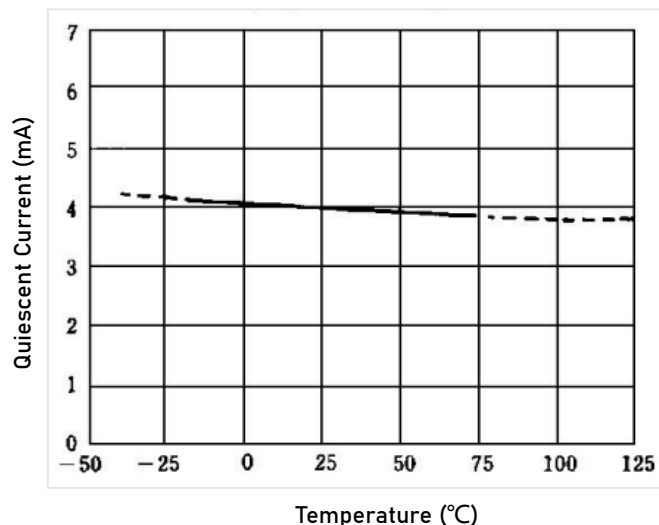
Figure 7. Maximum Output Voltage V_{pp} vs. Load Resistance

Figure 8. Quiescent Current vs. Temperature

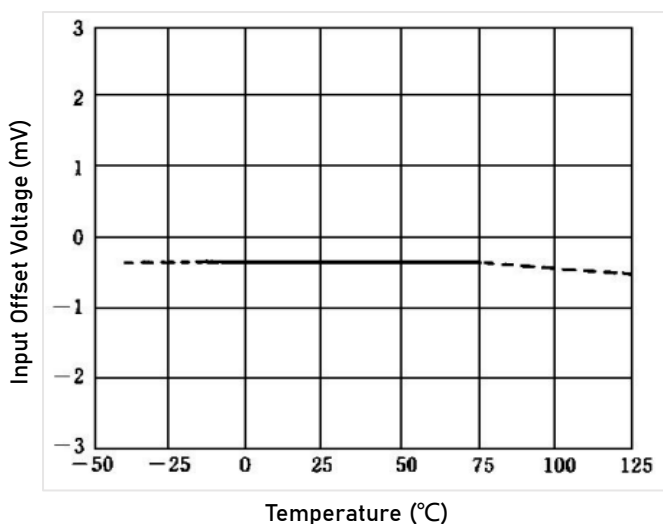


Figure 9. Input Offset Voltage vs. Temperature

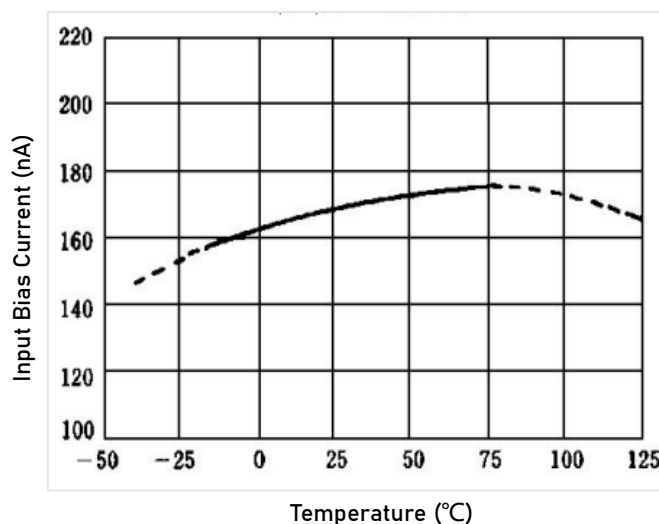


Figure 10. Input Bias Current vs. Temperature

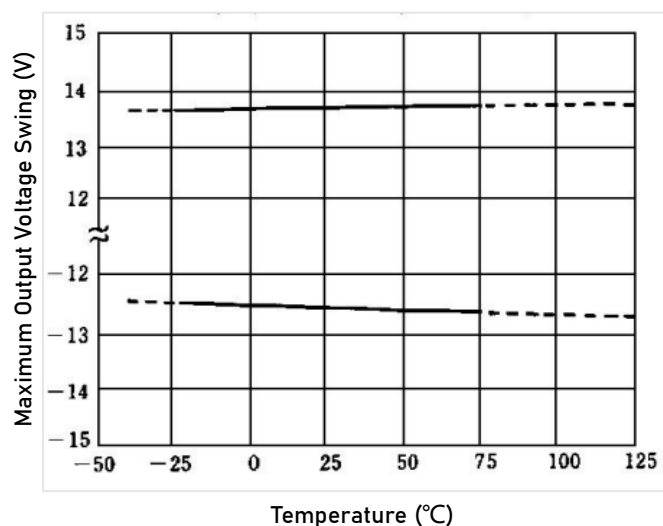


Figure 11. Maximum Output Voltage vs. Temperature

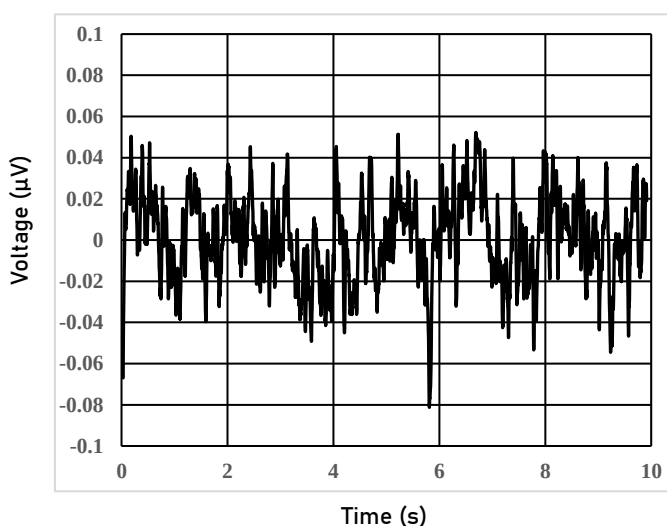


Figure 12. 0.1Hz to 10Hz Input Voltage Noise

Typical Characteristics (Cont.)

At $T_A = 25^\circ\text{C}$, $V_S = \pm 15\text{ V}$, unless otherwise noted.

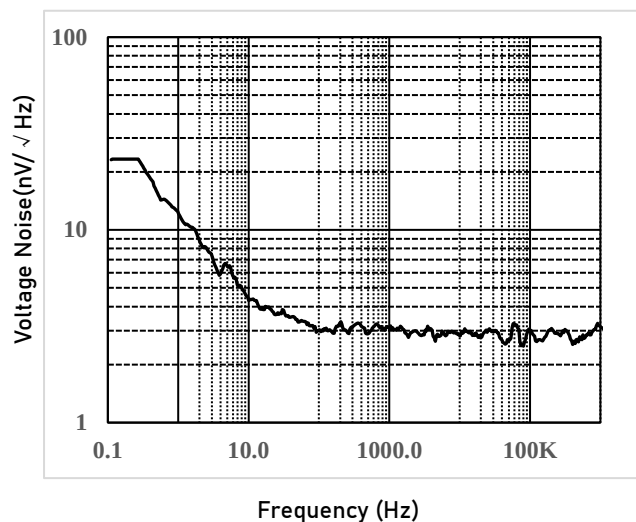


Figure 13. Voltage Noise Density as a function of Frequency

Application Notes

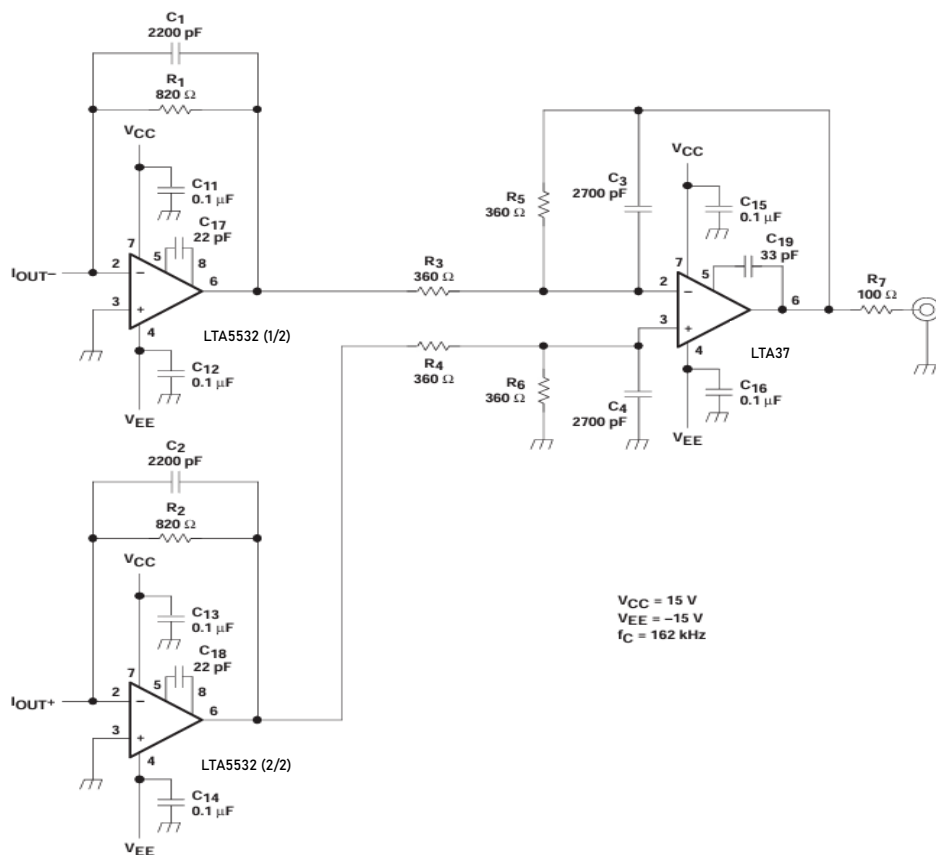


Figure 14. Application of LTA5532L in an I/V Circuit+Differential to Single Converter

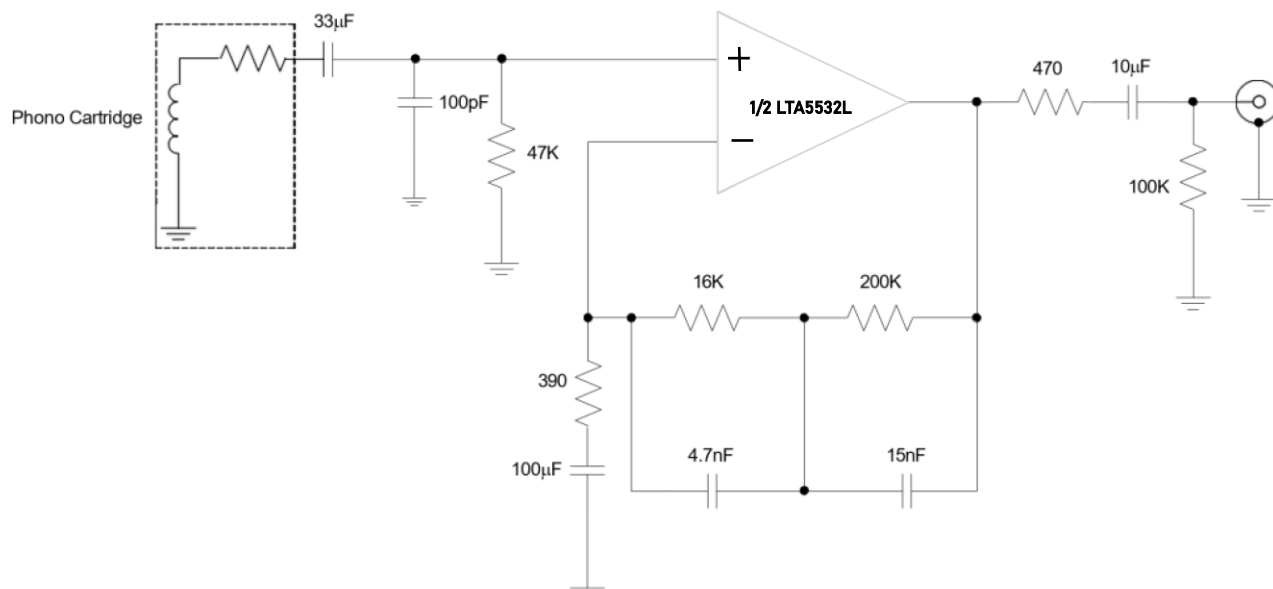
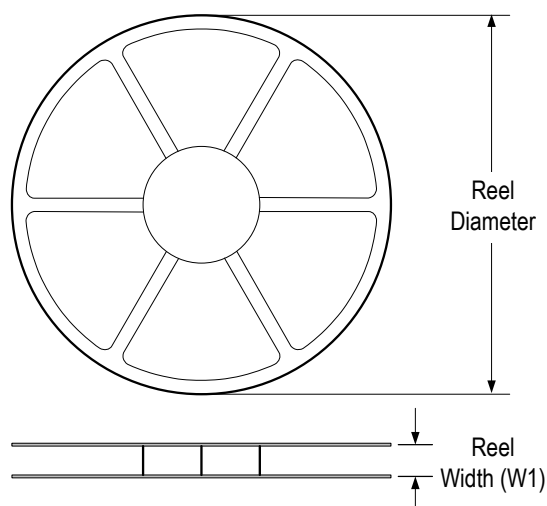


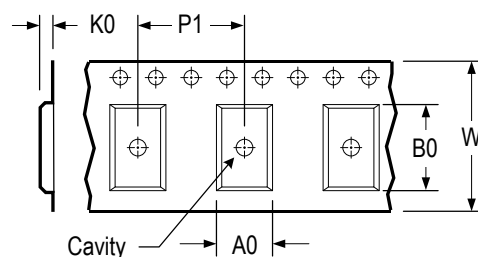
Figure 15. Application of LTA5532L in a RIAA Pre-Amp

Tape and Reel Information

REEL DIMENSIONS

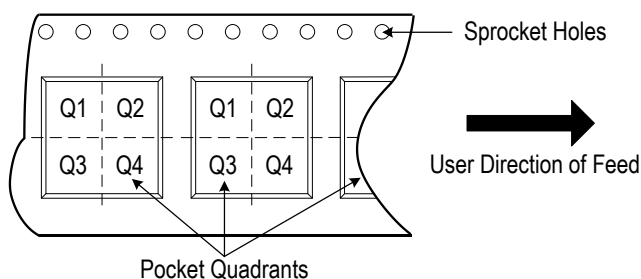


TAPE DIMENSIONS



A0	Dimension designed to accommodate the component width
B0	Dimension designed to accommodate the component length
K0	Dimension designed to accommodate the component thickness
W	Overall width of the carrier tape
P1	Pitch between successive cavity centers

QUADRANT ASSIGNMENTS FOR PIN 1 ORIENTATION IN TAPE

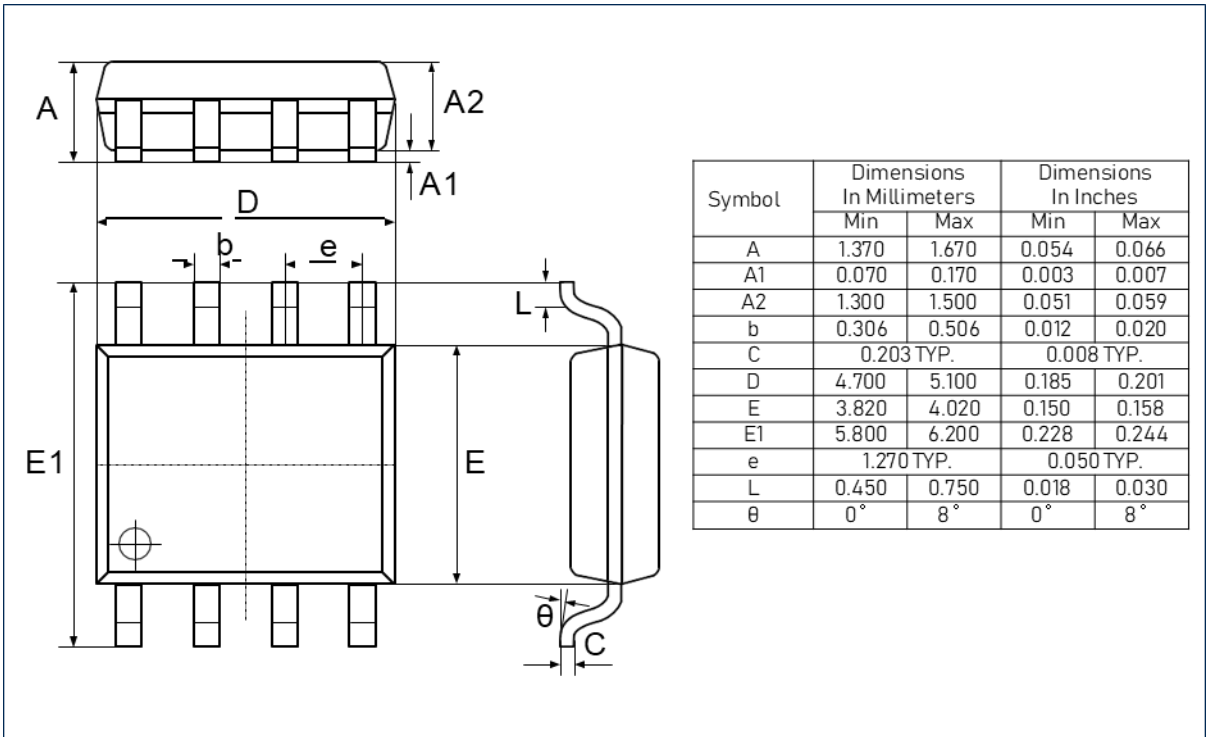


* All dimensions are nominal

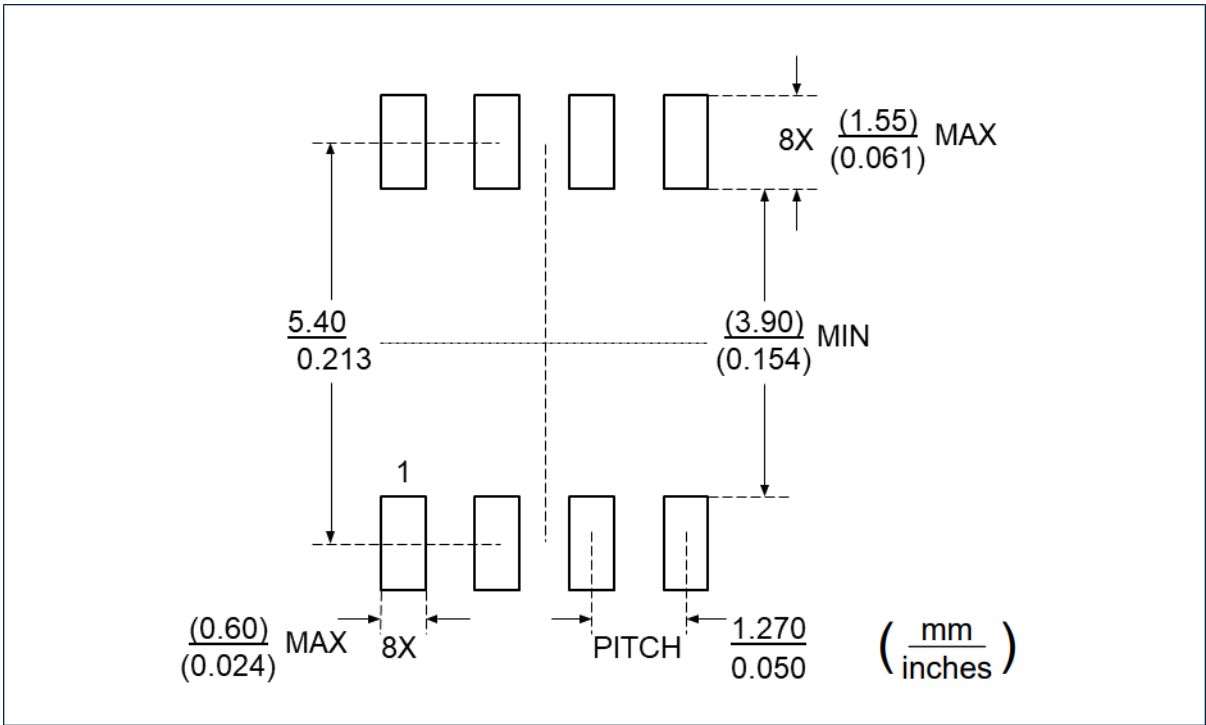
Device	Package Type	Pins	SPQ	Reel Diameter (mm)	Reel Width W1 (mm)	A0 (mm)	B0 (mm)	K0 (mm)	P1 (mm)	W (mm)	Pin 1 Quadrant
LTA5532LXS8/R8	SOIC	8	4 000	330	12.5	6.6	5.3	2.0	8.0	12.0	Q1

Package Outlines

DIMENSIONS, SOIC-8L

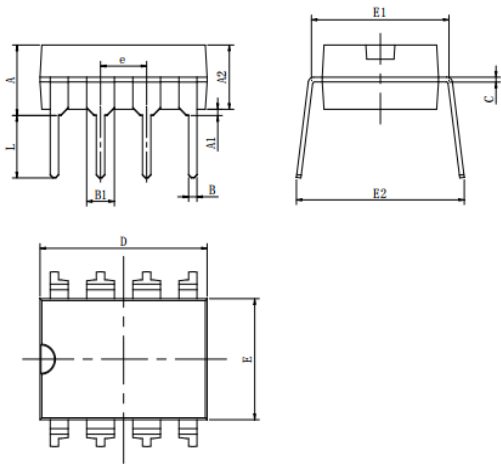


RECOMMENDED SOLDERING FOOTPRINT, SOIC-8L



Package Outlines (Cont.)

DIMENSIONS, DIP-8L



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	3.710	4.310	0.146	0.170
A1	0.510		0.020	
A2	3.200	3.600	0.126	0.142
B	0.380	0.570	0.015	0.022
B1	1.524(BSC)		0.060(BSC)	
C	0.204	0.360	0.008	0.014
D	9.000	9.400	0.354	0.370
E	6.200	6.600	0.244	0.260
E1	7.320	7.920	0.288	0.312
e	2.540(BSC)		0.100(BSC)	
L	3.000	3.600	0.118	0.142
E2	7.800	9.000	0.307	0.354

40V, Low Noise, Dual Operational Amplifier

Important Notice

Linearin is a global fabless semiconductor company specializing in advanced high-performance high-quality analog / mixed-signal IC products and sensor solutions. The company is devoted to the innovation of high performance, analog -intensive sensor front-end products and modular sensor solutions, applied in multi-market of medical & wearable devices, smart home, sensing of IoT, intelligent industrial & smart factory (industry 4.0), and automotives. Linearin's product families include widely-used standard catalog products, solution-based application specific standard products (ASSPs) and sensor modules that help customers achieve faster time-to-market products. Go to <http://www.linearin.com> for a complete list of Linearin product families.

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