

# VA7505

## LOW VOLTAGE LINEAR AMPLIFIER

### PRELIMINARY INFORMATION

#### FEATURES

- Operating Supply Voltage Range: 1.0 - 1.6V
- 72dB of Gain
- Transducer Current Variable: 0.2 to 20mA
- Low External Parts Count

#### DESCRIPTION

The VA7505 is a family of low voltage linear amplifiers consisting of three members.

The VA7505J is an operational amplifier driving a single class A output stage with open collector output. Also provided are a pair of Schottky diodes which provide the capability for symmetrical peak clipping by shunting the diodes in a feedback configuration or directly across the load. The internal feedback loop provides a stable quiescent point for the output stage over the entire operating voltage range. This allows for trimming of the output current with the use of a single external resistor. The input stage and microphone are fused separately by an internal decoupling resistor to increase battery line signal rejection.

The VA7505K is a low current version of the VA7505J. All characteristics are identical to the VA7505J with the exception of an external resistor across pin 6 to pin 4 which reduces the bias current, thereby reducing the battery current resulting in longer battery life.

The VA7505L is an internal unconditionally stable operational amplifier with a single class A output stage. A negative feedback loop is provided to ensure stability over a wide temperature range. Current trimming in the output stage for inductive or resistive loads can be accomplished by connecting an emitter resistor from the bias pin to ground.

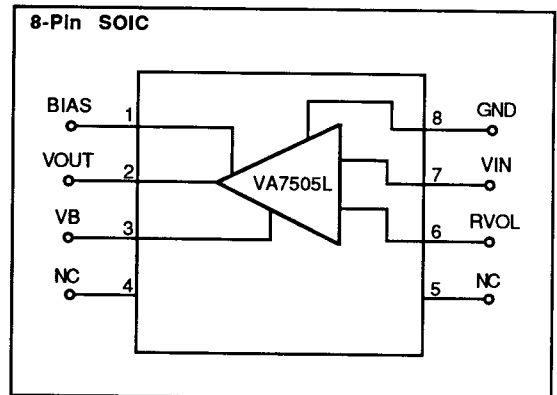
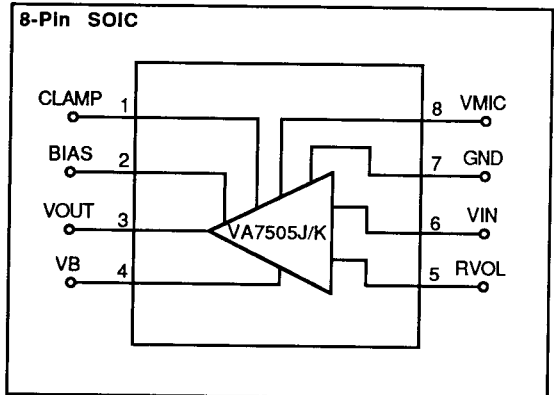
#### ABSOLUTE MAXIMUM RATINGS

Supply Voltage	3V
Power Dissipation	25mW
Operating Temperature	-10°C to +40°C

#### PACKAGE TYPES AVAILABLE

- 8-Pin SOIC

#### PIN CONNECTIONS



## ELECTRICAL CHARACTERISTICS (Package or Wafer Test Limits)

PARAMETER	TEST CONDITIONS	VA7505J		VA7505K		VA7505L		UNITS
		MIN	MAX	MIN	MAX	MIN	MAX	
Gain	$V_b = 1.55V, f = 1KHz, V_O = 0.707V_{rms}$ $R_L = 1K\Omega$ , Test Figure 1.3	68	76	—	—	68	76	dB
	$V_b = 1.3V, f = 1KHz, V_O = 0.200V_{rms}$ $R_L = 6K\Omega$ , Test Figure 2	—	—	70	78	—	—	
Temperature Coefficient of Gain	$V_b = 1.55V, f = 500, 800, 1600 KHz$ , $V_O = 0.707V_{rms}, R_L = 1K\Omega$ , Test Figure		6	—	—		6	dB/°C
	$V_b = 1.3V, f = 500, 800, 1600 KHz$ $V_O = 0.200V_{rms}, R_L = 2, 4, 6, K\Omega$ , Test Figure 2		—		6		—	
Amplifier Current	$V_b = 1.55V$ , Input Shorted		400	—	—		400	$\mu A$
Transducer Current	$V_b = 1.55V$ , Input Shorted	1.1	1.5	0.13	—	1.1	1.5	mA
	$V_b = 1.3V$ , Input Shorted		—		130		—	$\mu A$
Total Current	$V_b = 1.55V$ , Input Shorted		1.9		—		1.9	mA
	$V_b = 1.3V$ , Input Shorted		—		320		—	$\mu A$
Input Referred Noise	$V_b = 1.55V$ , Input Shorted		2.0		—		2.0	$\frac{\mu V_{rms}}{\sqrt{Hz}}$
	$V_b = 1.3V$ , Input Shorted		—		2.2		—	
Volume Control Range	$V_b = 1.55V$ , Volume Control Full-On		36		—		36	dB
	$V_b = 1.3V$ , Volume Control Full-On		—		36		—	
Input Impedance			27		27	8		K $\Omega$

Figure 1: Test Figure (VA7505J)

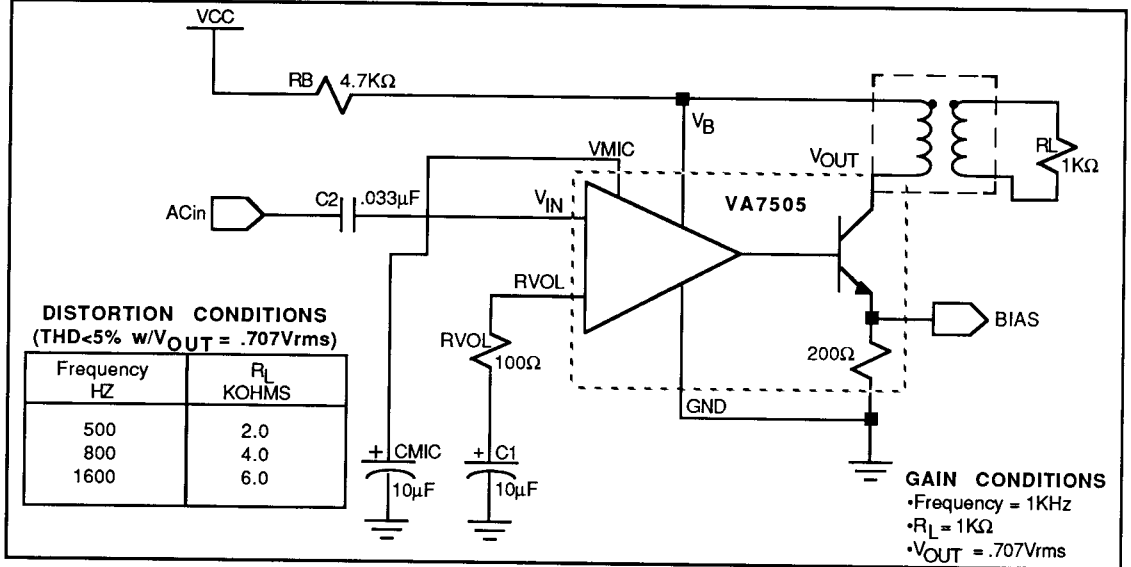
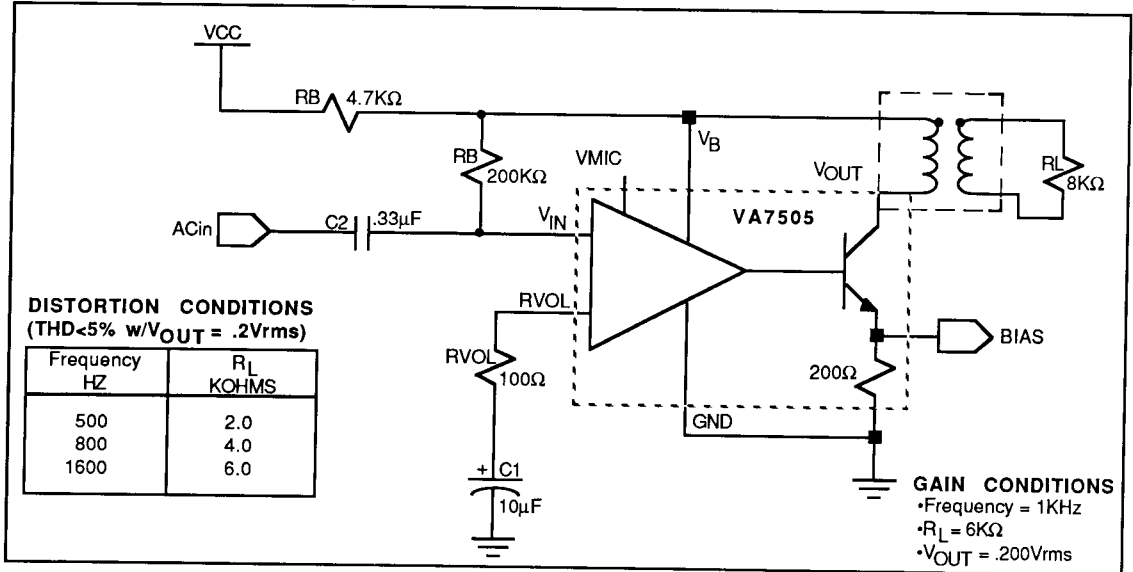
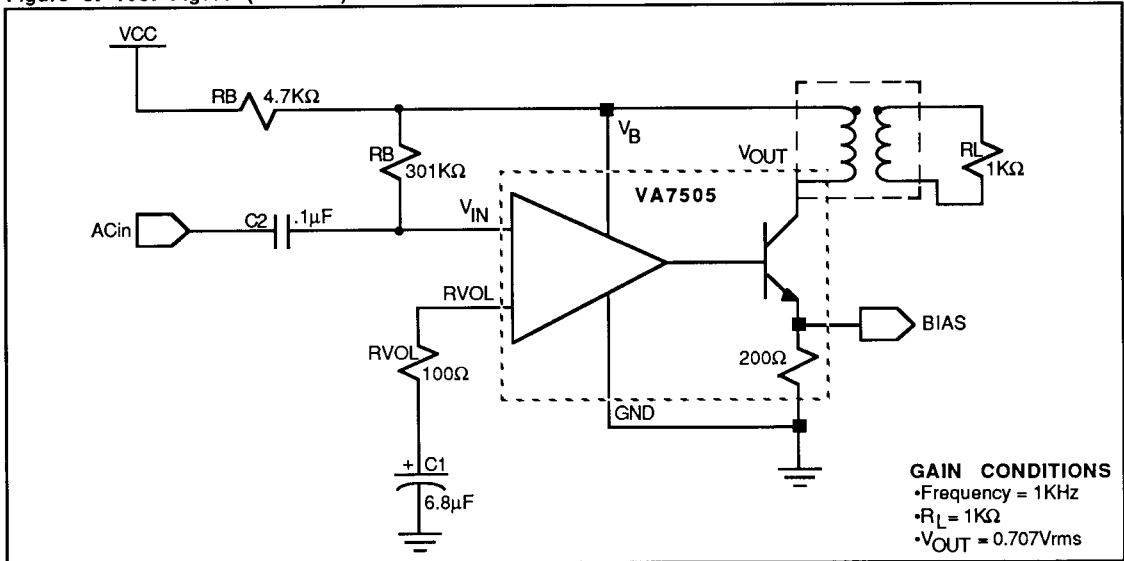


Figure 2: Test Figure (VA7505K)



LSP FAMILY DATA SHEETS

Figure 3: Test Figure (VA7505L)

**DIE POLICY****Electrical Characteristics**

Each die is electrically tested to the commercial grade DC parameters to guard band limits at 25°C and guarantees operation over the full temperature range.

**Quality Assurance**

All dice are 100% visually inspected to the requirement of MIL-STD-883C, Method 2010.2, Condition 3.

All dice are glass passivated with only the bonding pads exposed to provide scratch protection

All dice are provided with gold backing.

**Shipping Packages/Order Information**

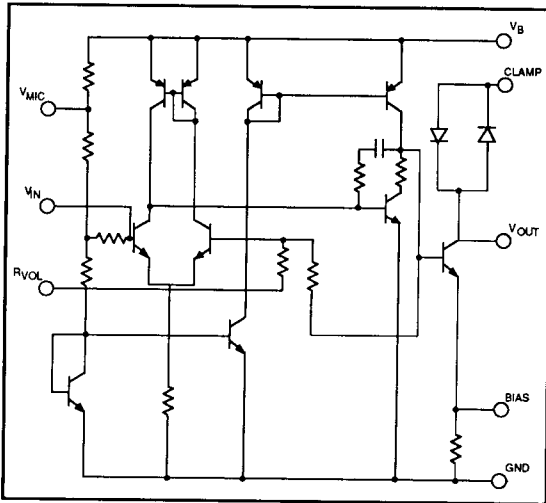
All dice are packaged in die crates with individual compartments which prevent damage to the die during shipping. Minimum order for dice is 100, supplied only in multiples of 100.

*Note: Die Size = 0.050 x 0.050 inch (2500 sq. mils)*

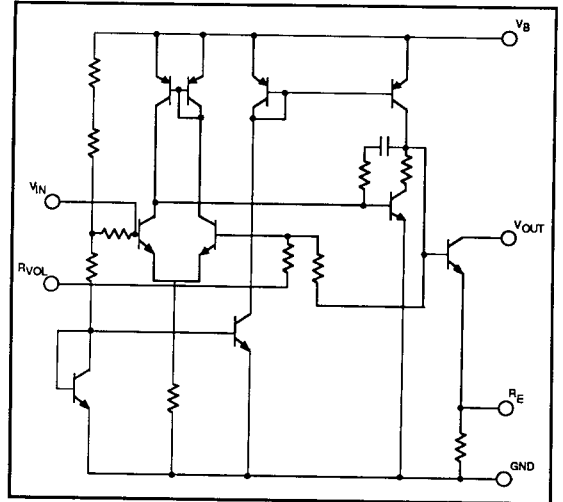
*1.27 x 1.27 mm (1.61 sq. mm)*

*Die map available upon request.*

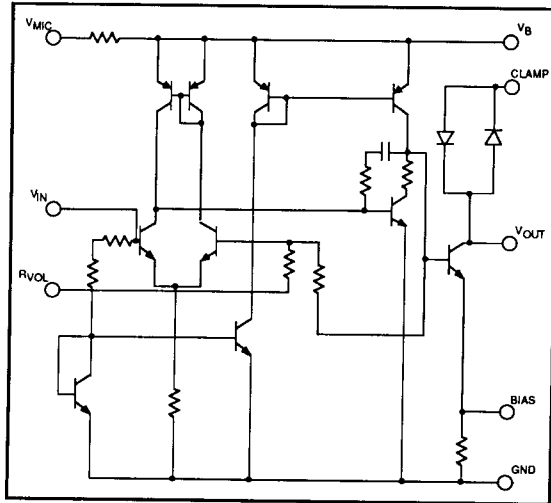
SIMPLIFIED SCHEMATIC VA7505J



SIMPLIFIED SCHEMATIC VA7505L



SIMPLIFIED SCHEMATIC VA7505K



LSP FAMILY DATA SHEETS