

LM4558A Operational Amplifiers

1 Introduction

The LM4558A consists of two high performance operational amplifiers. The IC features high gain, low equivalent input noise voltage, high input resistance, excellent channel separation, wide range of operating voltage and internal frequency compensation.

It can work with $\pm 18\text{V}$ maximum power supply voltage or single power supply up to 36V .

The LM4558A is available in SOP packages.

2 Features

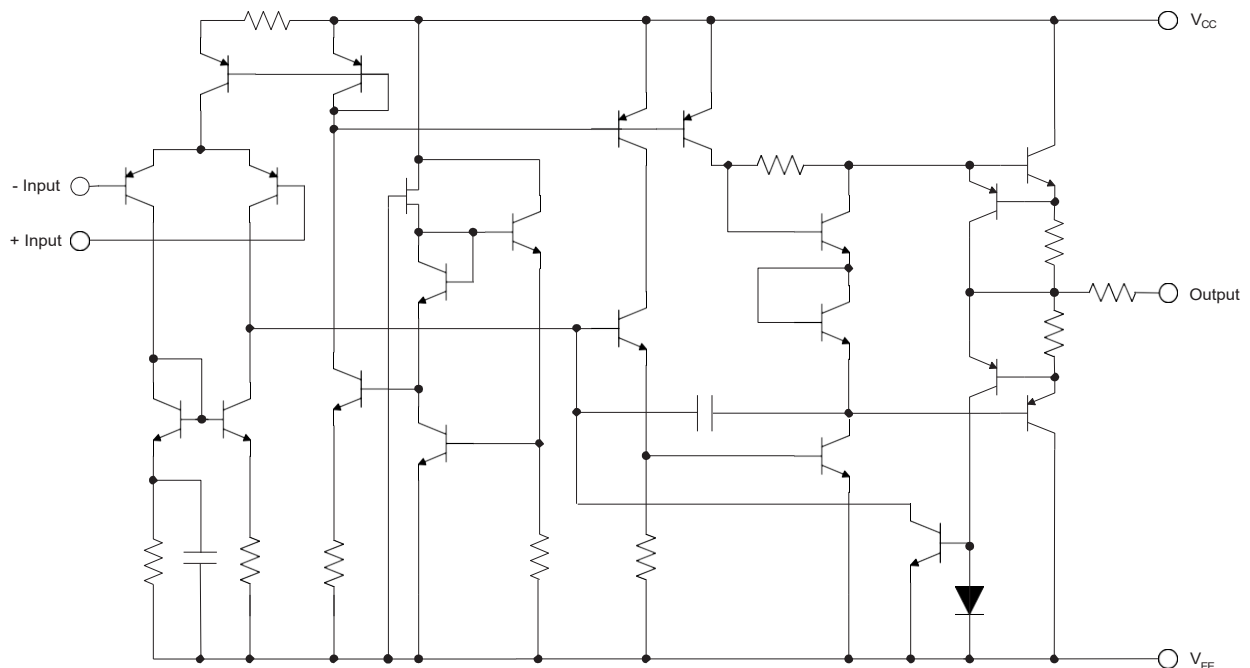
- Internally Frequency Compensated
- Large Signal Voltage Gain: 100dB Typical
- Gain and Phase Match between Amplifiers
- Gain Bandwidth Product (at 10kHz): 5.5MHz
- Pin to Pin Compatible with MC1458

3 Applications

- Audio AC-3 Decoder System
- Audio Amplifier

4 Available Packages

PART NUMBER	PACKAGE
LM4558A	SOP8



Functional Block Diagram of LM4558A (Each Amplifier)

7 Specifications

7.1 Absolute Maximum Ratings

(over operating ambient temperature range, unless otherwise specified)⁽¹⁾

CHARACTERISTIC		SYMBOL	VALUE	UNIT
Maximum power supply	Single supply	V_{CC}	36	V
	Dual supplies		± 18	
Maximum differential input range		V_{ID}	± 30	V
Maximum input range (either input)		V_{IN}	± 15	V
Operating Temperature Range		T_{OPR}	0 ~ 70	°C
Storage Temperature Range		T_{STG}	-65 ~ 150	°C

(1) Stresses beyond those listed under *Absolute Maximum Ratings* may cause permanent damage to the device. These are stress ratings only, which do not imply functional operation of the device at these or any other conditions beyond those indicated under *Recommended Operating Conditions*. Exposure to absolute-maximum rated conditions for extended periods may affect device reliability.

7.2 Thermal Information

THERMAL METRIC ⁽²⁾	SYMBOL	SOP8	UNIT
Junction-to-ambient thermal resistance	$R_{\theta JA}$	165.0	°C/W
Junction-to-case thermal resistance	$R_{\theta JC}$	45.0	°C/W
Reference maximum power dissipation (continuous)	$P_{D Ref}$	0.61	W

(2) $T_A = 25^\circ\text{C}$, measured on evaluation board with 1oz. copper traces of minimum pad size, all device outputs were active.

7 Specifications

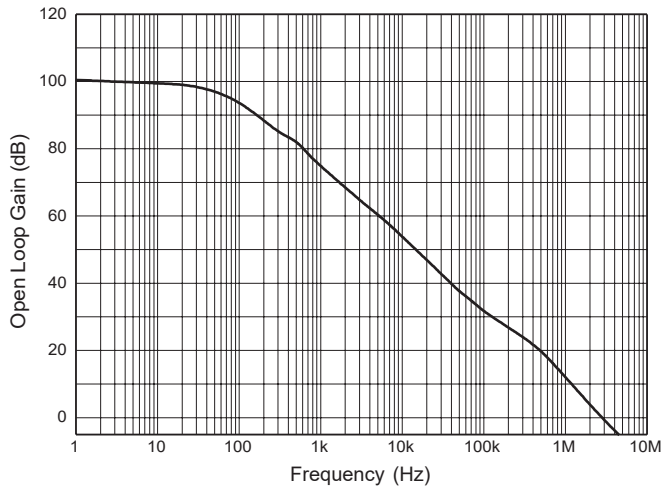
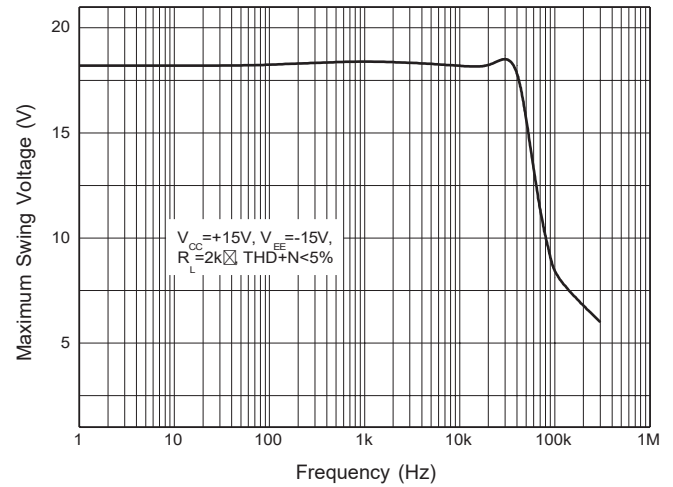
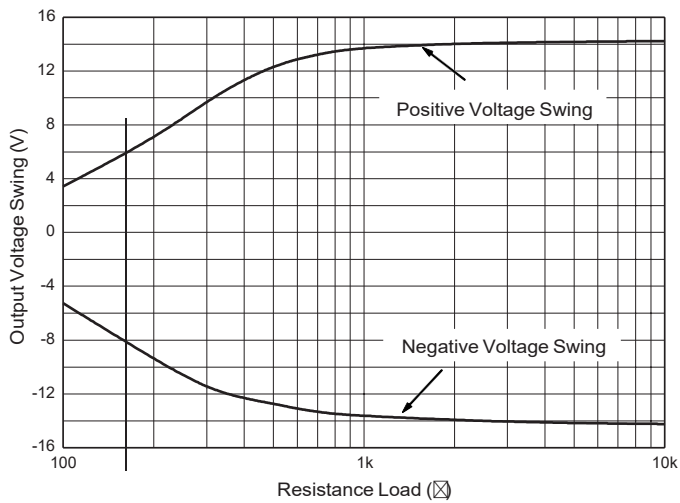
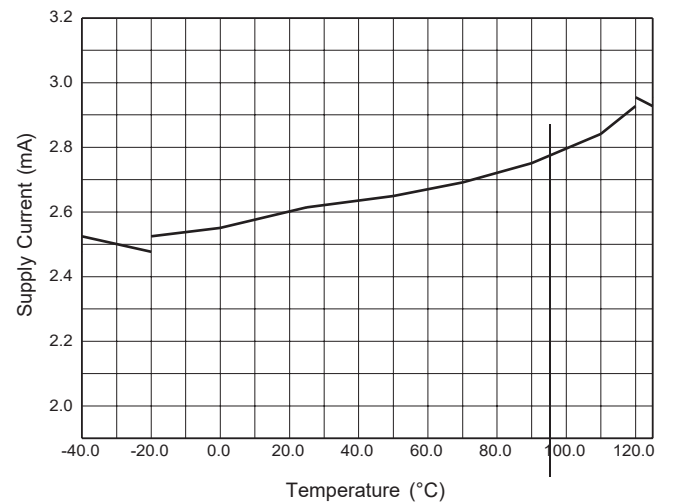
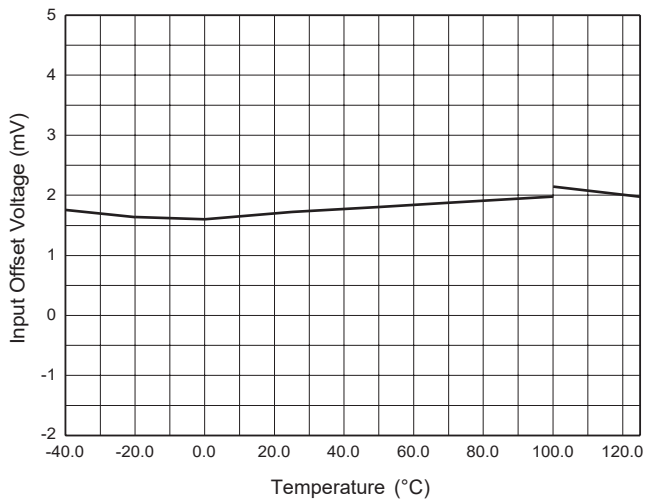
7.3 Electrical Characteristics

$V_{CC} = +15V$, $V_{EE} = -15V$, $T_A = 25^\circ C$, unless otherwise specified.

PARAMETER	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT
Input Offset Voltage	V_{IO}	-	-	1	5	mV
Input Offset Current	I_{IO}	$V_{CM} = 0V$	-	10	200	nA
Input Bias Current	I_{IB}	$V_{CM} = 0V$	-	70	500	nA
Large Signal Voltage Gain	A_{VD}	$R_L = 2k\Omega$, $V_O = \pm 10V$	85	100	-	dB
Supply Voltage Rejection Ratio	SVR	$R_S \leq 10k\Omega$	77	100	-	dB
Supply Current	I_{CC}	All Amplifiers, no load	-	2.5	4.5	mA
Input Common Mode Voltage Range	V_{ICM}	-	± 12	-	-	V
Common Mode Rejection Ratio	CMRR	$R_S \leq 10k\Omega$	70	95	-	dB
Output Voltage Swing	V_O	$R_L \geq 10k\Omega$	± 12	± 14	-	V
		$R_L \geq 2k\Omega$	± 10	± 13	-	
Slew Rate	SR	$V_I = \pm 10V$, $R_L = 2k\Omega$, $C_L = 100pF$, unity gain	-	1.8	-	V/ μs
Rise Time	T_R	$V_I = \pm 20mV$, $R_L = 2k\Omega$, $C_L = 100pF$, unity gain	-	0.3	-	μs
Overshoot	K_{OV}	$V_I = \pm 20mV$, $R_L = 2k\Omega$, $C_L = 100pF$, unity gain	-	15	-	%
Input Resistance	R_i	-	-	0.5	-	M Ω
Output Resistance	R_O	-	-	45	-	Ω
Unity Gain Bandwidth	B	Gain = 0dB	-	2.8	-	MHz
Gain Bandwidth Product	GBWP	$V_I = \pm 10mV$, $R_L = 2k\Omega$, $C_L = 100pF$, $f = 10kHz$	-	5.5	-	MHz
Total Harmonic Distortion Plus Noise	THD+N	$f = 1kHz$, $A_V = 6dB$, $R_L = 10k\Omega$, $V_O = 1V_{RMS}$	-	0.002	-	%
Equivalent Input Noise Voltage Density	e_N	$R_S = 100\Omega$, $f = 1kHz$	-	10	-	$\frac{\square\square}{\sqrt{Hz}}$

7 Specifications

7.4 Typical Characteristics

Open Loop Voltage Gain vs. Frequency

Maximum Output Voltage Swing vs. Frequency

Maximum Output Voltage Swing vs. Load Resistance

Supply Current vs. Temperature

Input Offset Voltage vs. Temperature

Input Bias Current vs. Temperature
