

# MC4558

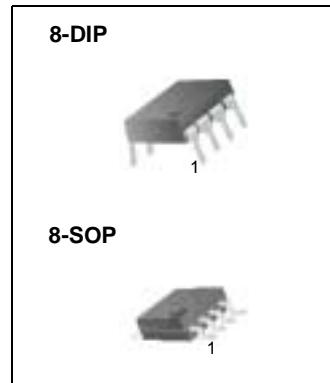
## Dual Operational Amplifier

### Features

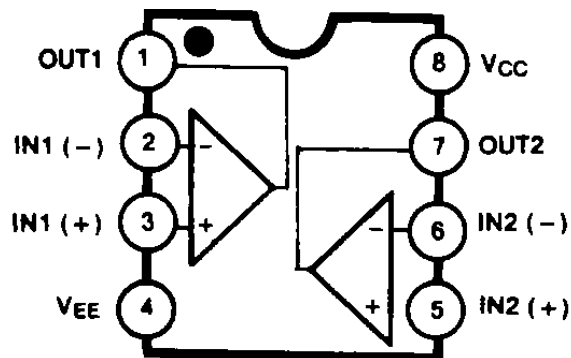
- No frequency compensation required.
- No latch up.
- Large common mode and differential voltage range.
- Parameter tracking over temperature range.
- Gain and phase match between amplifiers.
- Internally frequency compensated.
- Low noise input transistors.

### Descriptions

The MC4558 series is a monolithic integrated circuit designed for dual operational amplifier.

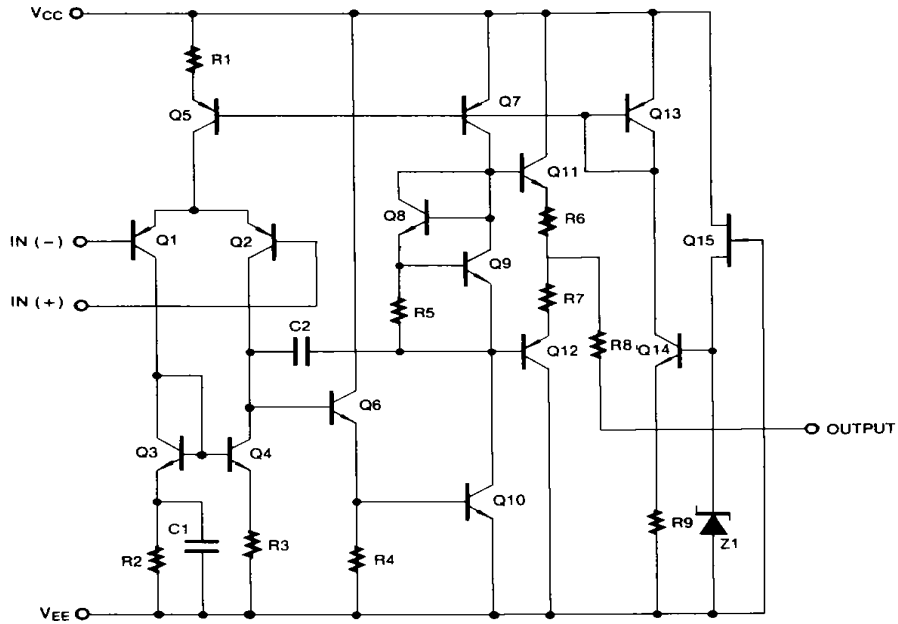


### Internal Block Diagram



## Schematic Diagram

(One Section Only)



## Absolute Maximum Ratings

Parameter	Symbol	Value	Unit
Supply Voltage	V <sub>CC</sub>	±22	V
Differential Input Voltage	V <sub>I(DIFF)</sub>	30	V
Input Voltage	V <sub>I</sub>	±15	V
Power Dissipation	P <sub>D</sub>	400	mW
Operating Temperature Range MC4558C MC4558V	T <sub>OPR</sub>	0 ~ 70 -40 ~ 85	°C
Storage Temperature Range	T <sub>STG</sub>	-65 ~ 150	°C

## Electrical Characteristics

(VCC = 15V, VEE = -15V, TA = 25 °C unless otherwise specified)

Parameter	Symbol	Conditions	MC4558C/MC4558V			Unit	
			Min	Typ	Max		
Input Offset Voltage	V <sub>IO</sub>	R <sub>S</sub> ≤ 10KΩ Note 1	-	2	6	mV	
			-	-	7.5		
Input Offset Current	I <sub>IO</sub>		-	5	200	nA	
			T <sub>A</sub> = T <sub>A</sub> (MAX)	-	-		300
			T <sub>A</sub> = T <sub>A</sub> (MIN)	-	-		300
Input Bias Current	I <sub>BIAS</sub>		-	30	500	nA	
			T <sub>A</sub> = T <sub>A</sub> (MAX)	-	-		800
			T <sub>A</sub> = T <sub>A</sub> (MIN)	-	-		800
Large Signal Voltage Gain	G <sub>V</sub>	V <sub>O</sub> (P-P) = ±10V, R <sub>L</sub> ≤ 2KΩ Note 1	20	200	-	V/mV	
			-	-	-		
Common Mode Input Voltage Range	V <sub>I(R)</sub>		±12	±13	-	V	
			-	-	-		
Common Mode Rejection Ratio	CMRR	R <sub>S</sub> ≤ 10KΩ Note 1	70	90	-	dB	
			-	-	-		
Supply Voltage Rejection Ratio	PSRR	R <sub>S</sub> ≤ 10KΩ Note 1	76	90	-	dB	
			76	90	-		
Output Voltage Swing	V <sub>O</sub> (P.P)	R <sub>L</sub> ≥ 10KΩ	±12	±14	-	V	
		R <sub>L</sub> ≥ 2KΩ	±10	±13	-		
Supply Current (Both Amplifiers)	I <sub>CC</sub>		-	3.5	5.8	mA	
			T <sub>A</sub> = T <sub>A</sub> (MAX)	-	-		5.0
			T <sub>A</sub> = T <sub>A</sub> (MIN)	-	-		6.7
Power Consumption (Both Amplifiers)	P <sub>C</sub>		-	70	170	mW	
			T <sub>A</sub> = T <sub>A</sub> (MAX)	-	-		150
			T <sub>A</sub> = T <sub>A</sub> (MIN)	-	-		200
Slew Rate (Note2)	SR	V <sub>I</sub> = 10V, R <sub>L</sub> ≥ 2KΩ C <sub>I</sub> ≤ 100pF	1.2	-	-	V/μs	
Rise Time (Note2)	T <sub>R</sub>	V <sub>I</sub> = 20mV, R <sub>L</sub> ≥ 2KΩ C <sub>I</sub> ≤ 100pF	-	0.3	-	μs	
Overshoot (Note2)	OS	V <sub>I</sub> = 20mV, R <sub>L</sub> ≥ 2KΩ C <sub>I</sub> ≤ 100pF	-	15	-	%	

### Note :

- MC4558C : T<sub>A</sub>(MIN) ≤ T<sub>A</sub> ≤ T<sub>A</sub>(MAX) = 0 ≤ T<sub>A</sub> ≤ 70 °C , MC4558V : T<sub>A</sub>(MIN) ≤ T<sub>A</sub> ≤ T<sub>A</sub>(MAX) = -40 ≤ T<sub>A</sub> ≤ +85 °C
- Guaranteed by design.

# Typical Performance Characteristics

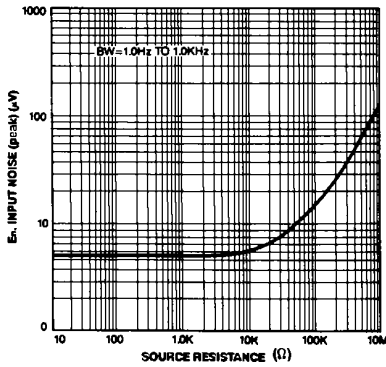


Figure 1. Burst Noise vs Source Resistance

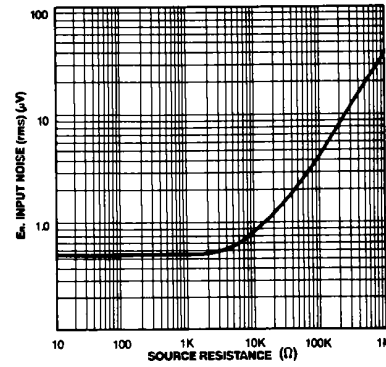


Figure 2. RMS Noise vs Source Resistance

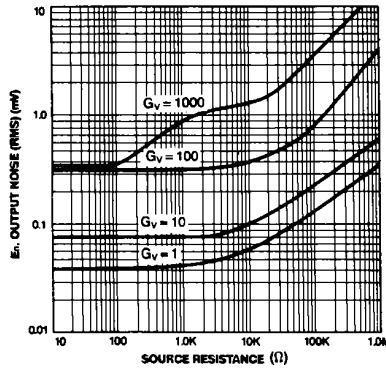


Figure 3. Output Noise vs Source Resistance

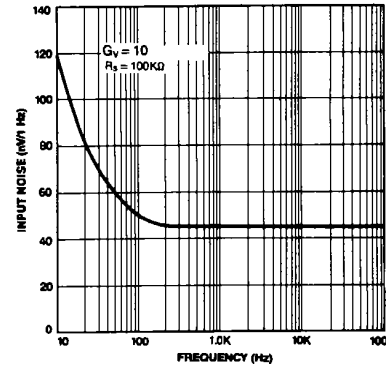


Figure 4. Spectral Noise Density

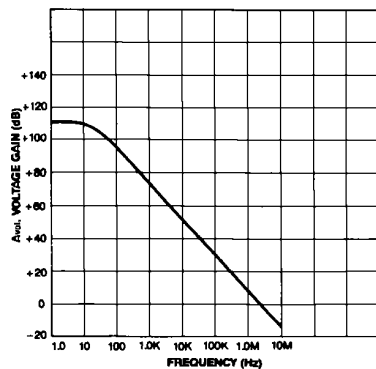


Figure 5. Open Loop Frequency Response

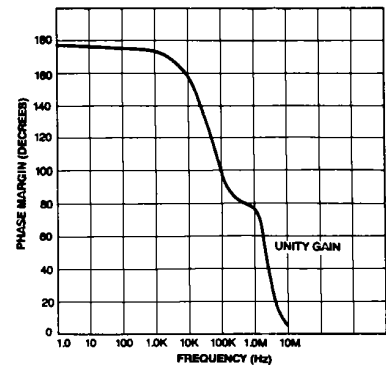


Figure 6. Phase Margin vs Frequency

## Typical Performance Characteristics (continued)

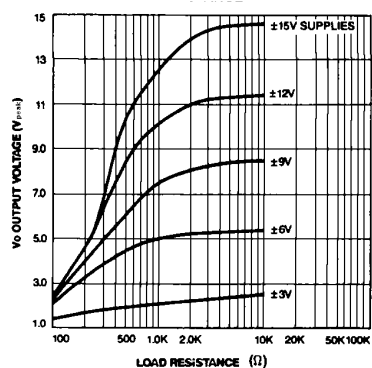


Figure 7. Positive Output Voltage Swing vs Load Resistance

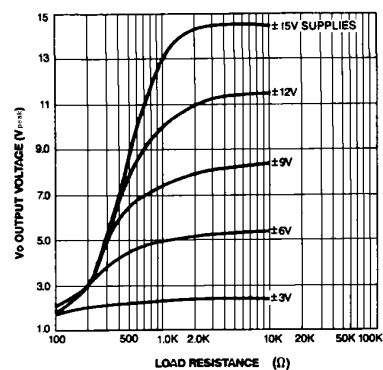


Figure 8. Negative Output Voltage Swing vs Load Resistance

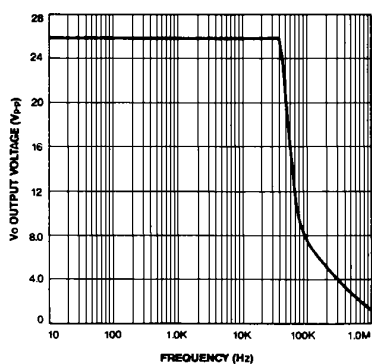
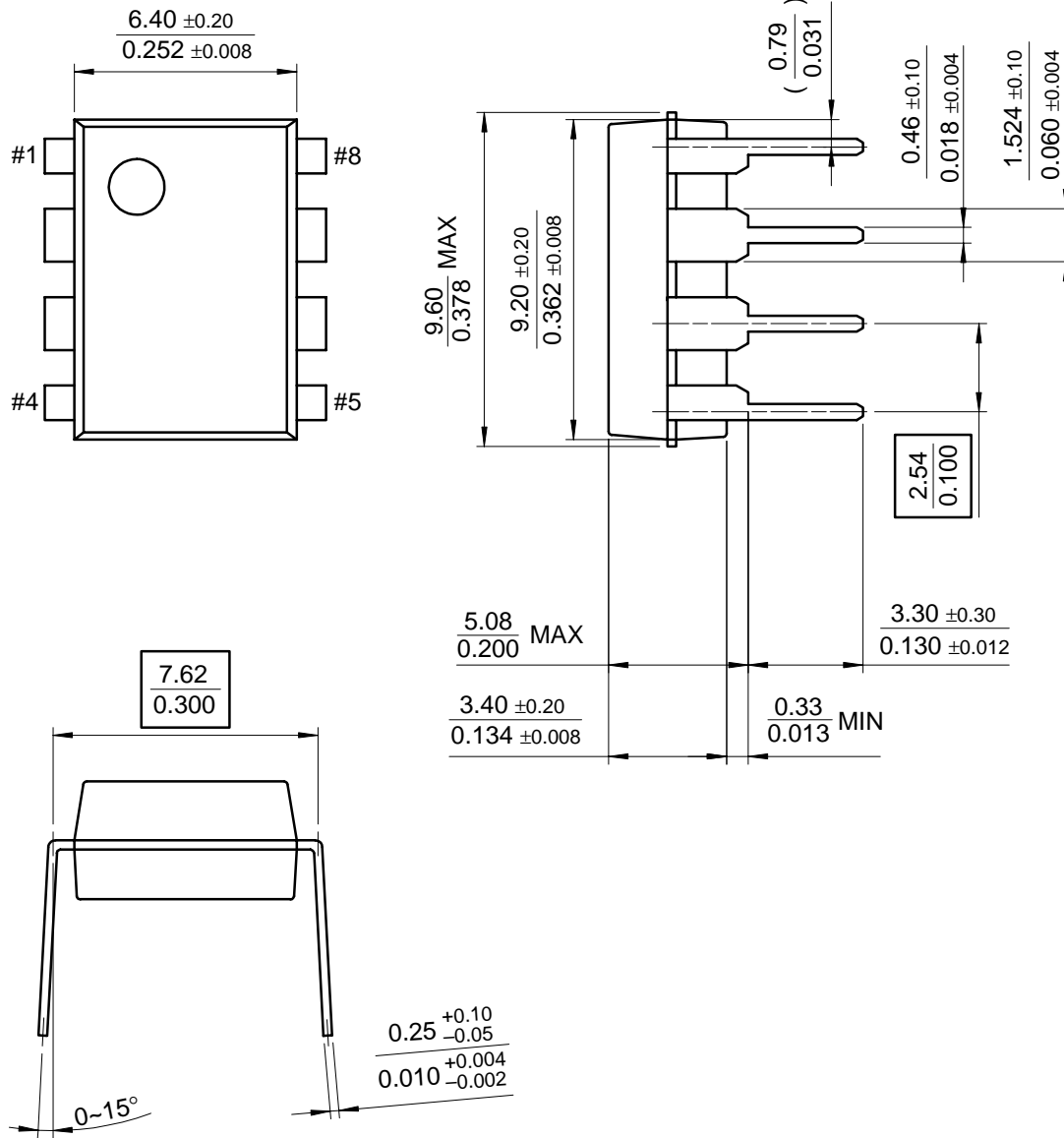


Figure 9. Power Bandwidth  
(Large Signal Output Swing vs Frequency)

# Mechanical Dimensions

## Package

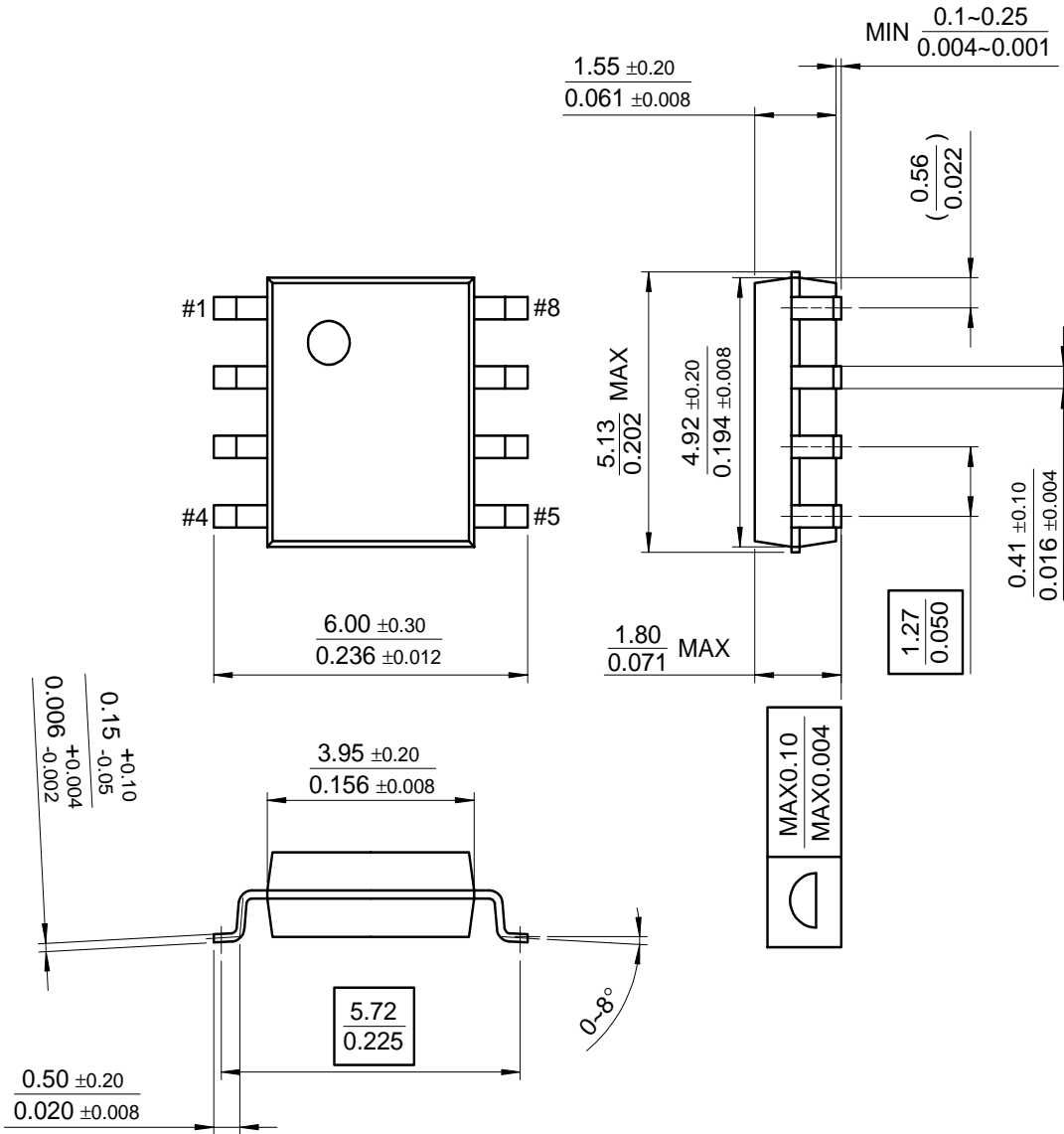
### 8-DIP



Mechanical Dimensions (Continued)

Package

8-SOP



**Ordering Information**

<b>Product Number</b>	<b>Package</b>	<b>Operating Temperature</b>
MC4558CP	8-DIP	0 ~ + 70°C
MC4558CD	8-SOP	
MC4558VP	8-DIP	-40 ~ +85°C
MC4558VD	8-SOP	





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