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.

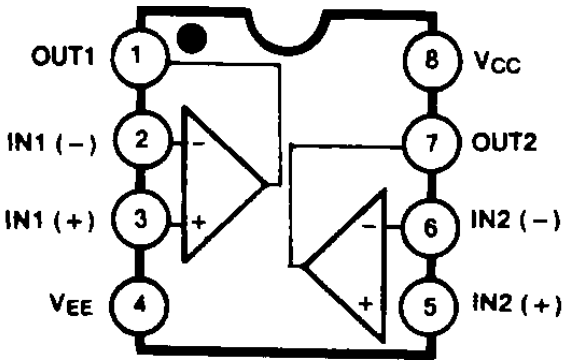
Descriptions

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

8-DIP

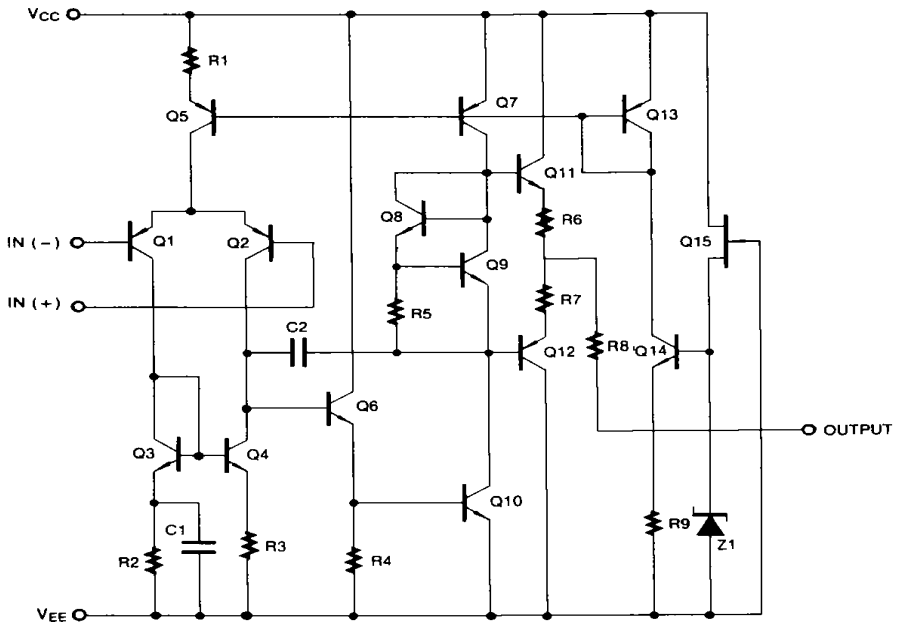
8-SOP

Internal Block Diagram



Schematic Diagram

(One Section Only)



Absolute Maximum Ratings

Parameter	Symbol	Value	Unit
Supply Voltage	V_{CC}	±22	V
Differential Input Voltage	$V_{I(DIFF)}$	30	V
Input Voltage	V_I	±15	V
Power Dissipation	P_D	400	mW
Operating Temperature Range MC4558C MC4558V	T_{OPR}	 0 ~ 70 -40 ~ 85	°C
Storage Temperature Range	T_{STG}	-65 ~ 150	°C

Electrical Characteristics

(V_{CC} = 15V, V_{EE} = - 15V ,T_A = 25 °C unless otherwise specified)

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

Note :

1. MC4558C : $T_{A(MIN)}$ ≤ T_A ≤ $T_{A(MAX)}$ = 0 ≤ T_A ≤ 70 °C , MC4558V : $T_{A(MIN)}$ ≤T_A≤$T_{A(MAX)}$ = -40≤T_A≤ +85 °C
2. Guaranteed by design.

Typical Performance Characteristics

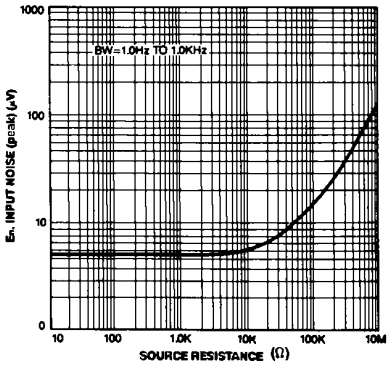


Figure 1. Burst Noise vs Source Resistance

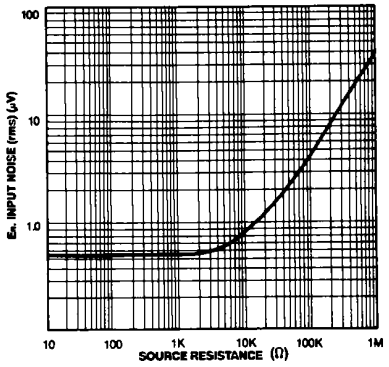


Figure 2. RMS Noise vs Source Resistance

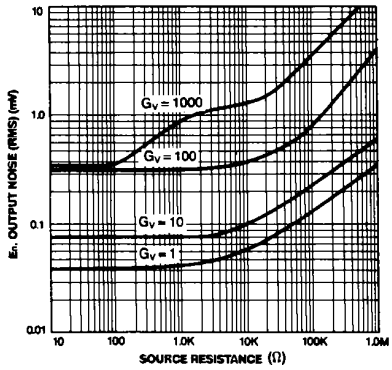


Figure 3. Output Noise vs Source Resistance

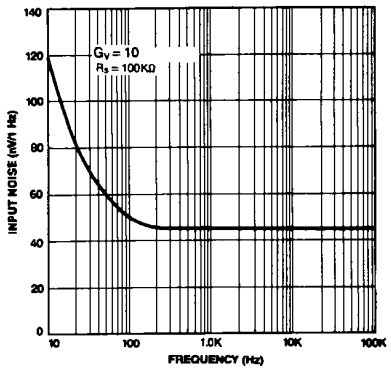


Figure 4. Spectral Noise Density

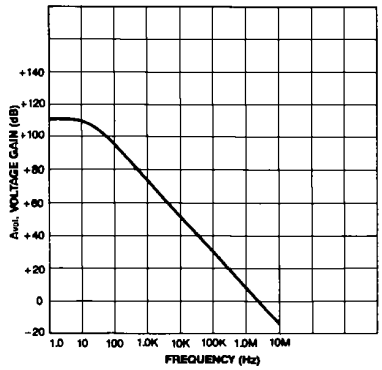


Figure 5. Open Loop Frequency Response

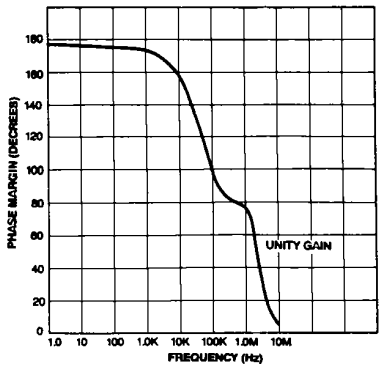


Figure 6. Phase Margin vs Frequency

Typical Performance Characteristics (continued)

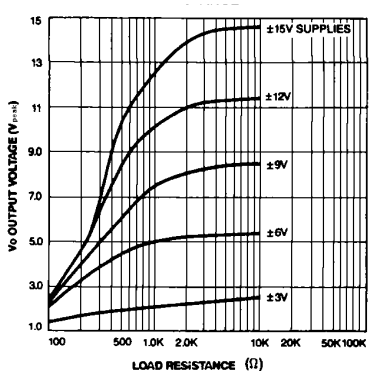


Figure 7. Positive Output Voltage Swing vs Load Resistance

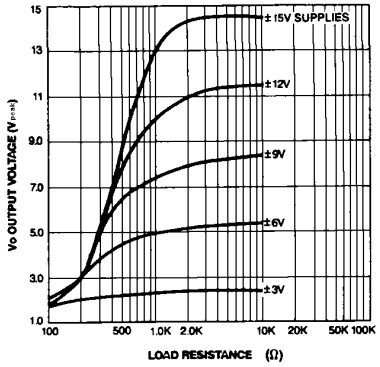


Figure 8. Negative Output Voltage Swing vs Load Resistance

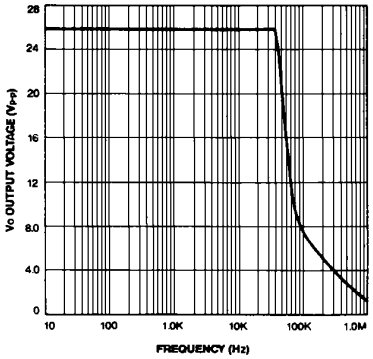
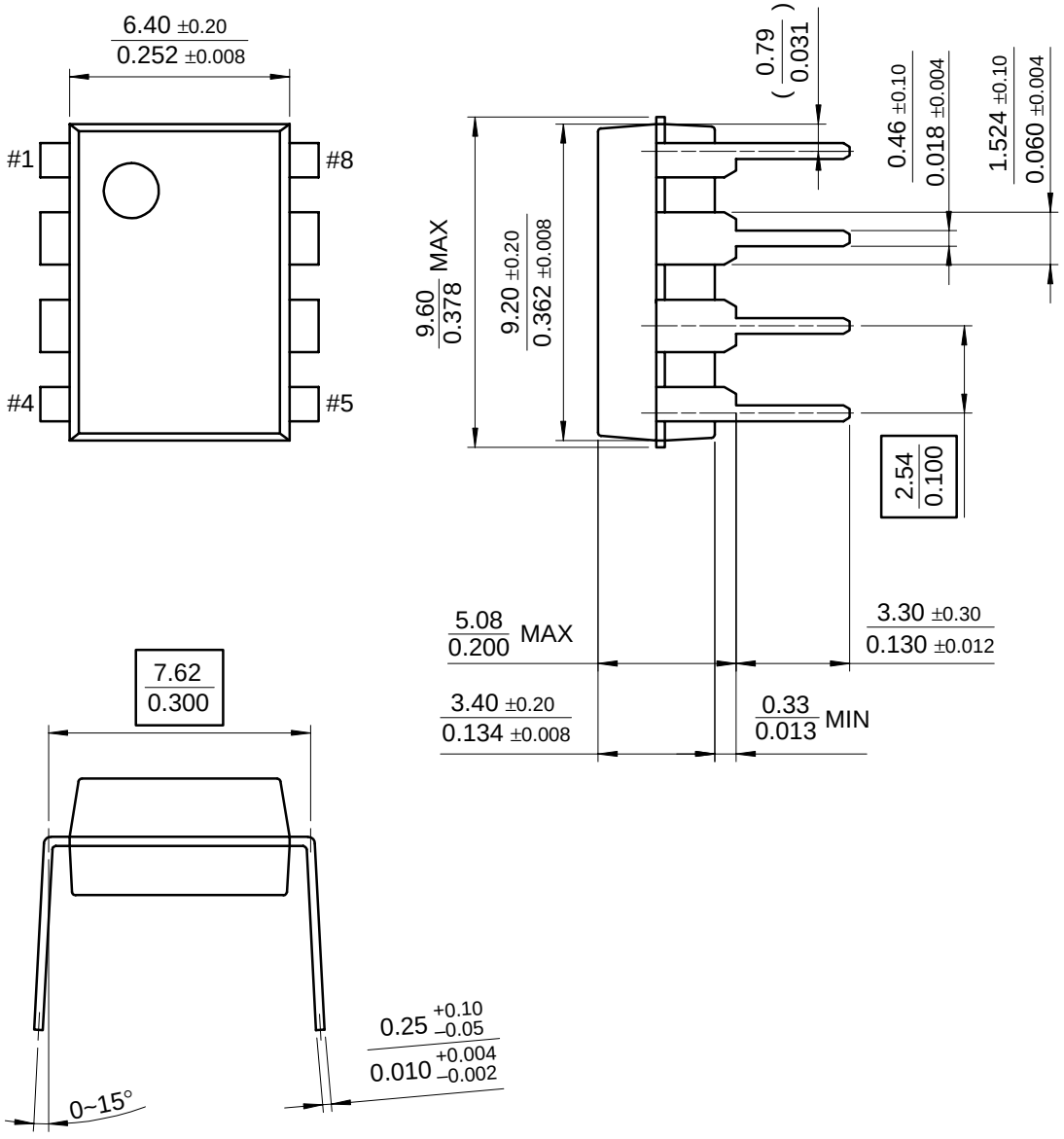


Figure 9. Power Bandwidth (Large Signal Output Swing vs Frequency)

Mechanical Dimensions

Package

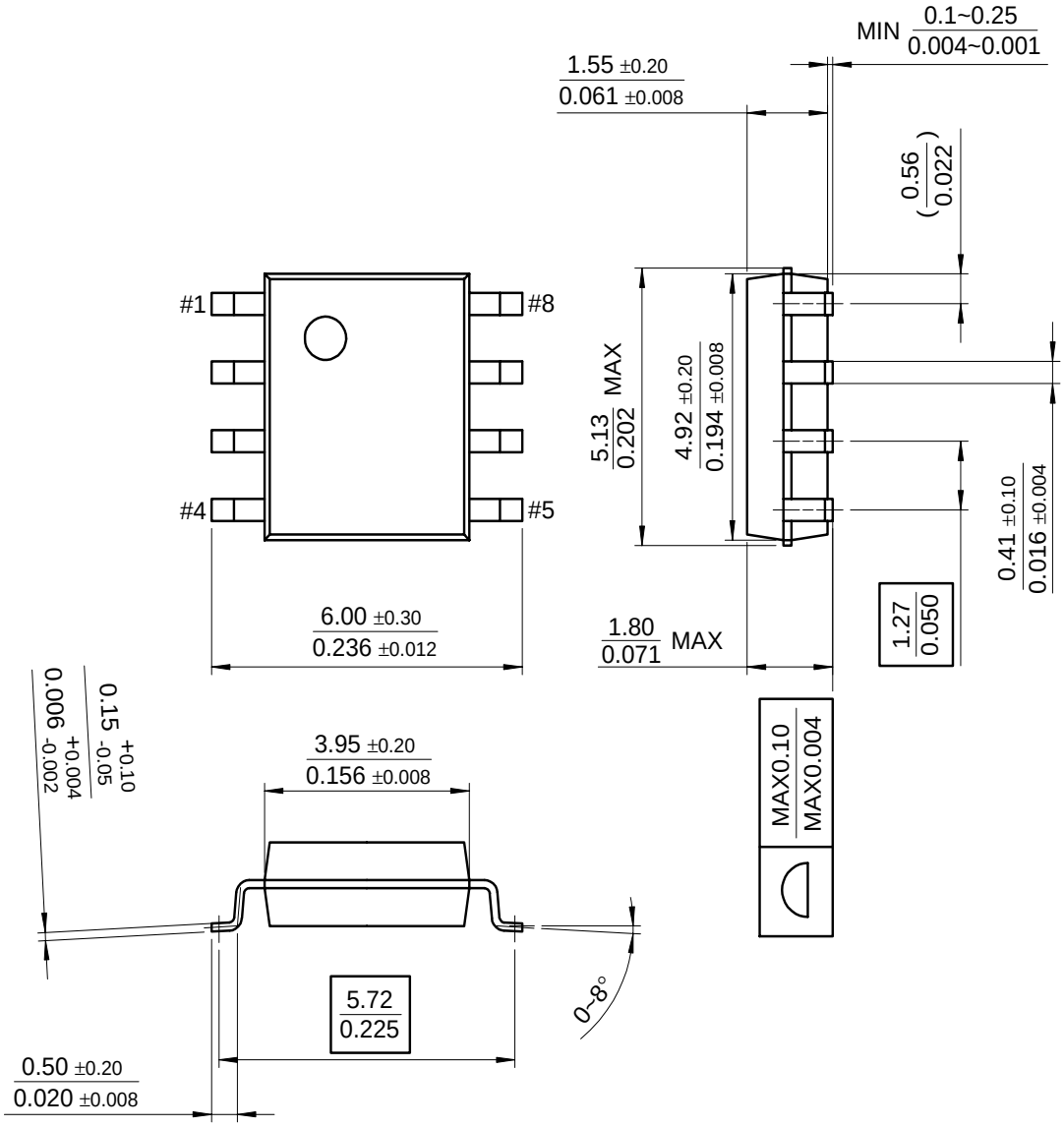
8-DIP



Mechanical Dimensions (Continued)

Package

8-SOP



Ordering Information

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