



AMC358

DUAL OPERATIONAL AMPLIFIERS

DESCRIPTION

The AMC358 series is designed containing two independent, high gain operational amplifiers. It can operate from a single power supply over a wide range from 4.5V to 30V.

Not only it can be used in all conventional operation amplifiers circuits in single power supply systems, the AMC358 series is also ideal for transducer amplifiers, DC gain blocks and etc. In addition, without the need of $\pm 15V$ dual power supply voltages, the AMC358 series can be directly operated from the 5V power supply voltage which is also used for digital systems.

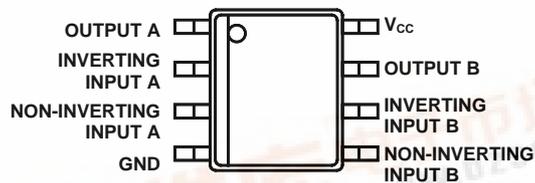
FEATURES

- Large DC voltage gain (typical 100 dB)
- Wide bandwidth (typical 1MHz)
- Operated by either single supply or dual supplies
- High accuracy output voltage
- Low input offset voltage (typical 2mV)
- Large output voltage swing: 0V to $V_{CC} - 1.5V$
- Low dropout voltage
- Input common-mode voltage range includes ground
- Low supply current drain
- Pin assignment identical to earlier LM358 series.

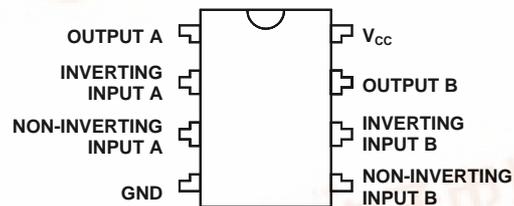
APPLICATIONS

- General Purpose Amplifiers
- Pulse Generator
- Square Wave Oscillator
- Low Drift Peak Detector
- Voltage Controlled Oscillator (VCO)
- Filters

PACKAGE PIN OUT



8-Pin Plastic S.O.I.C.
(Top View)

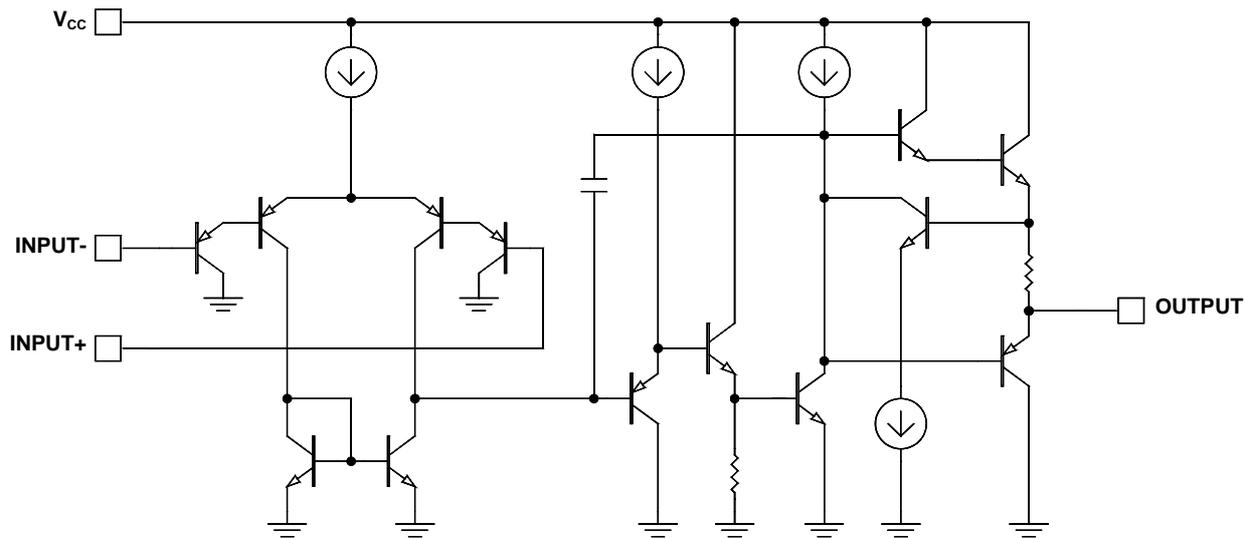


8-Pin Plastic DIP
(Top View)

ORDER INFORMATION

T_A (°C)	M	Plastic DIP 8-pin	DM	Plastic SOIC 8-pin
	0 to 70	AMC358MF		AMC358DMF
Note: All surface-mount packages are available in Tape & Reel. Append the letter "T" to part number (i.e. AMC358DMT). The letter "F" marked for Lead Free process.				



SCHEMATIC DIAGRAM (each amplifier)

ABSOLUTE MAXIMUM RATINGS (Note 1)

Input Supply Voltage	32V
Input Voltage	-0.3V to 30V
Differential Input Voltage	32V
Operating Junction Temperature Range, T_j	0°C to 150°C
Storage Temperature Range	-65°C to 150°C
Lead Temperature (soldering, 10 seconds)	260°C
Note 1: Exceeding these ratings could cause damage to the device. All voltages are with respect to Ground. Currents are positive into, negative out of the specified terminal.	

ELECTRICAL CHARACTERISTICS

 Unless otherwise specified, these specifications apply to the operating at specified free-air temperatures and $V_{CC} = 5V$.

Parameter	Symbol	Test Conditions	AMC358			Units		
			Min	Typ	Max			
Input Offset Voltage	V_{IO}	$T_A = 25\text{ }^\circ\text{C}$ (Note 2)		3	7	mV		
		$0\text{ }^\circ\text{C} \leq T_A \leq 70\text{ }^\circ\text{C}$			9			
Input Bias Current (Note 3)	I_{IB}	$T_A = 25\text{ }^\circ\text{C}$		- 20	- 250	nA		
		$0\text{ }^\circ\text{C} \leq T_A \leq 70\text{ }^\circ\text{C}$			500			
Input Offset Current	I_{IO}	$V_{CM} = 0V,$ $V_{OUT} = 1.4V$	$T_A = 25\text{ }^\circ\text{C}$		2	50	nA	
			$0\text{ }^\circ\text{C} \leq T_A \leq 70\text{ }^\circ\text{C}$			150		
Input Common-mode Voltage Range (Note 4)	V_{CM}	$V_{CC} = 30V$	$T_A = 25\text{ }^\circ\text{C}$	0		$V_{CC} - 1.5$	V	
			$0\text{ }^\circ\text{C} \leq T_A \leq 70\text{ }^\circ\text{C}$	0		$V_{CC} - 2.0$		
Supply Current	I_{CC}	No load	$0\text{ }^\circ\text{C} \leq T_A \leq 70\text{ }^\circ\text{C}$		0.7	1.2	mA	
		$V_{CC} = 30V$, No load			1.0	2.0		
High-level Output Voltage	V_{OH}	$V_{CC} = 30V,$ $0\text{ }^\circ\text{C} \leq T_A \leq 70\text{ }^\circ\text{C}$	$R_L = 2\text{ k}\Omega$	26			V	
			$R_L = 10\text{ k}\Omega$	27	28			
Low-level Output Voltage	V_{OL}	$R_L = 10\text{ k}\Omega, 0\text{ }^\circ\text{C} \leq T_A \leq 70\text{ }^\circ\text{C}$		5	100	mV		
Large Signal Voltage	A_{VD}	$V_{CC} = 15V, V_{OUT} = 1V\text{ to }11V,$ $R_L = 10\text{ k}\Omega, T_A = 25\text{ }^\circ\text{C}$	25	100		V/mV		
Common-mode Rejection Ratio	CMRR	$V_{CC} = 5V\text{ to }30V,$ $V_{CM} = 0V\text{ to }V_{CC} - 1.5V, T_A = 25\text{ }^\circ\text{C}$	65	85		dB		
Power Supply Rejection Ratio (Note 5)	KSVR	$V_{CC} = 5V\text{ to }30V, T_A = 25\text{ }^\circ\text{C}$		100		dB		
Cross Talk (note 5)		$f = 1\text{ kHz to }20\text{ kHz}, T_A = 25\text{ }^\circ\text{C}$		120		dB		
Output Current	Source	I_O	$V_{CC} = 15V, V_{IN}^+ - V_{IN}^- = 1V,$ $V_{OUT} = 2V, T_A = 25\text{ }^\circ\text{C}$	- 20	- 30		mA	
	Sink			$V_{CC} = 15V, V_{IN}^+ - V_{IN}^- = -1V,$ $V_{OUT} = 2V, T_A = 25\text{ }^\circ\text{C}$	10	20		
				$V_{CC} = 15V, V_{IN}^+ - V_{IN}^- = 1V,$ $V_{OUT} = 2mV, T_A = 25\text{ }^\circ\text{C}$	12	20		
Short Circuit Output Current (Note 6)	I_{OS}	$V_{CC} = 15V, T_A = 25\text{ }^\circ\text{C}$		± 40	± 60	mA		

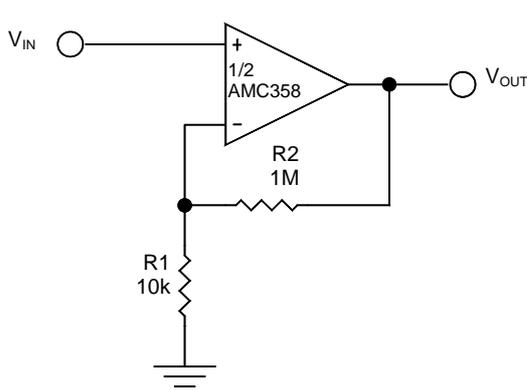
Note 2: $V_{OUT} \cong 1.4V, R_S = 0\Omega$, with V_{CC} from 4.5V to 30V; and over the full input common-mode range (0V to $V_{CC} - 1.5V$) at 25°C.

Note 3: Due to PNP input stage, the direction of the input current is out of the IC. It is essentially constant, independent of the state of the output, so no loading change exists on the input lines.

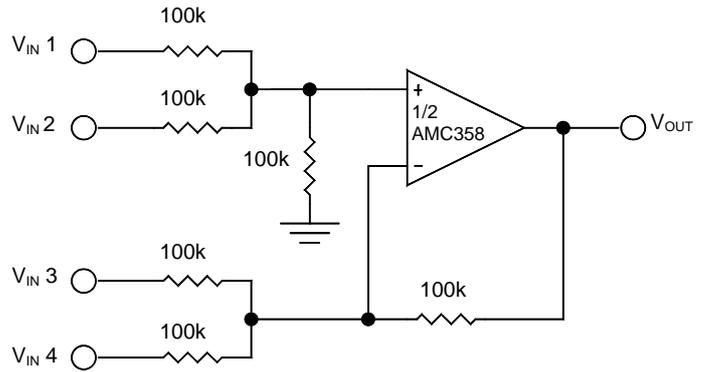
Note 4: The input common-mode voltage of either input signal voltage should not be allowed to go negative by more than 0.3V (at 25°C). The upper limit of the common-mode voltage range is $V_{CC} - 1.5V$ (at 25°C), but either or both inputs can go to 32V without damage, independent of the magnitude of V_{CC} .

Note 5: These parameters, although guaranteed, are not tested in production.

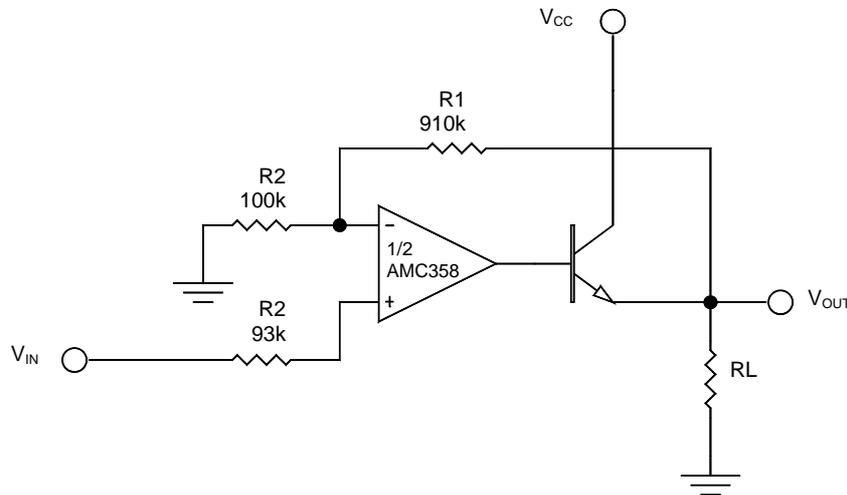
Note 6: Short Circuits from the output to V_{CC} can cause excessive heating and eventual destruction. When considering short circuits to ground, the maximum output current is approximately 40mA independent of the magnitude of V_{CC} . At values of supply voltage in excess of 15V, continuous short-circuit can exceed the power dissipation ratings and cause destruction. Destructive dissipation can result from simultaneous shorts on all amplifiers.

APPLICATION INFORMATION


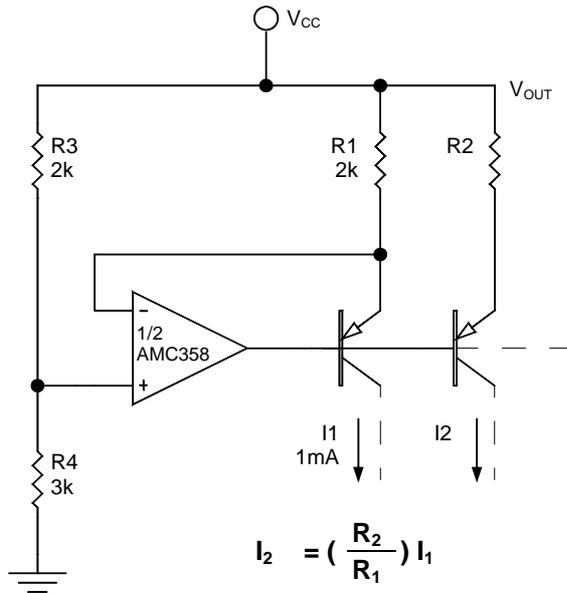
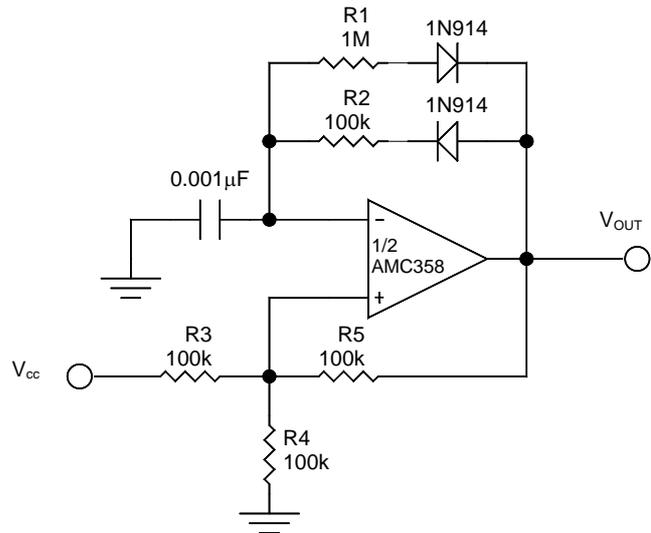
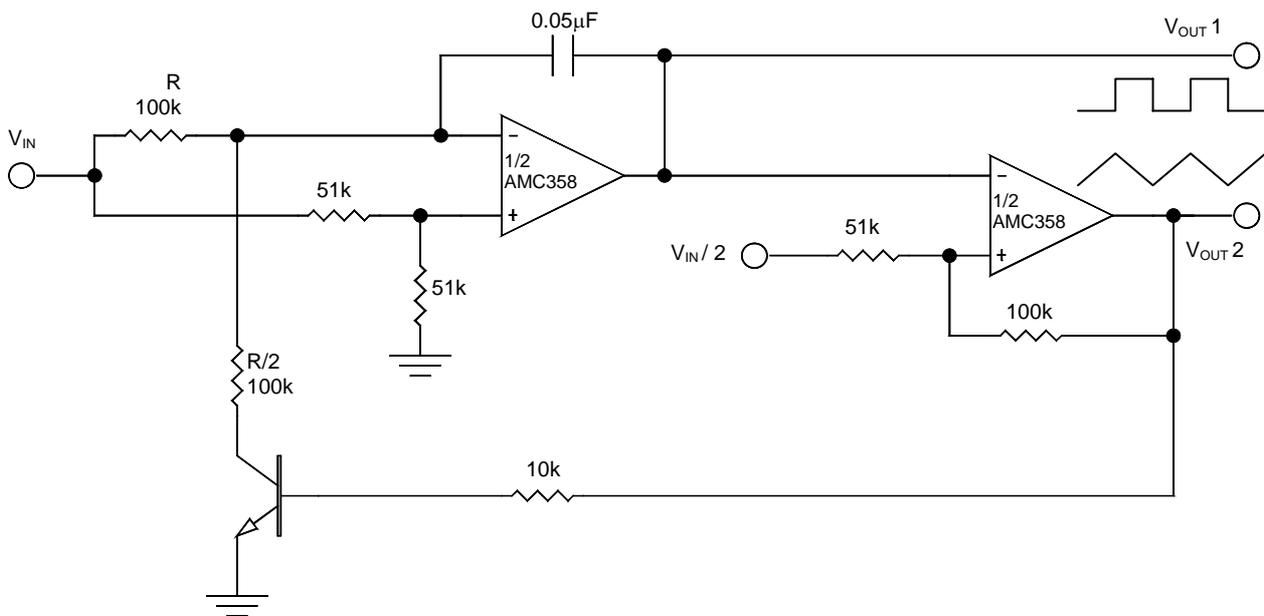
Non-Inverting DC Gain (0V Output)
Gain = 1 + (R2/R1)

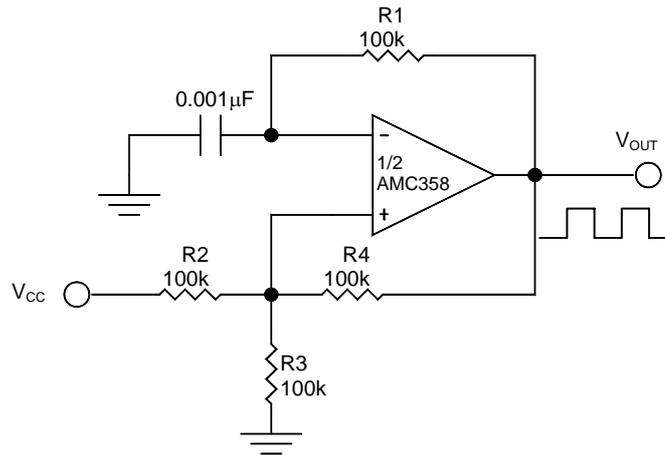
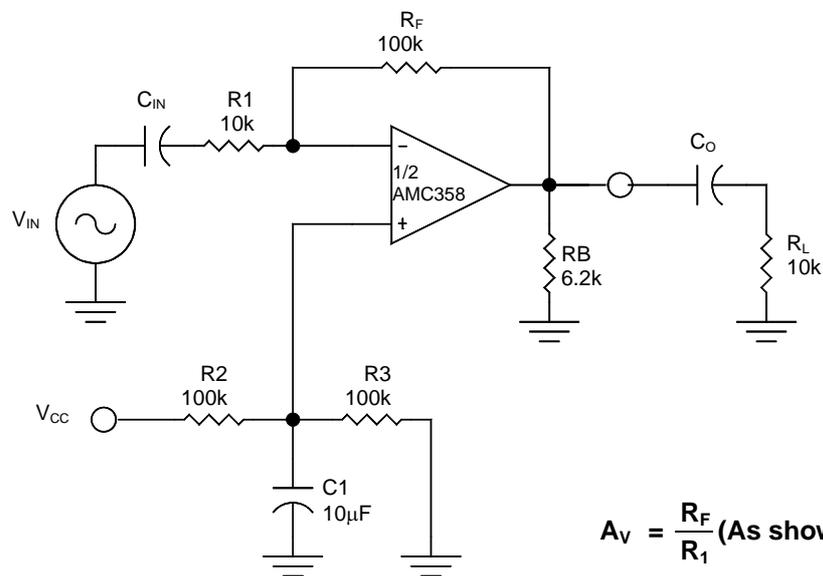


DC Summing Amplifier
(V_{IN}'S ≥ 0 V_{DC} and V_{OUT} ≥ 0 V_{DC})



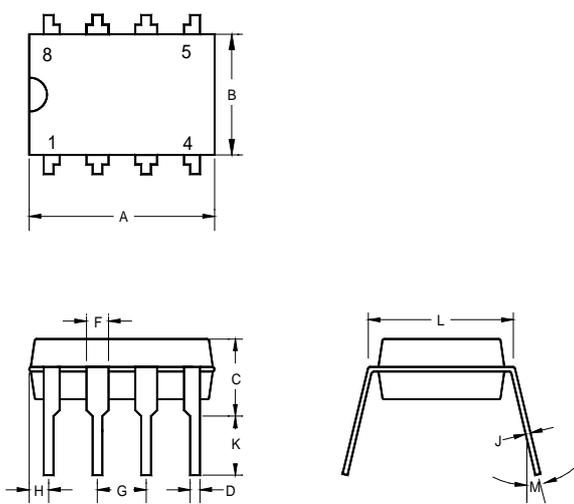
Power Amplifier

APPLICATION INFORMATION (continued)

Fixed Current Source

Pulse Generator

Voltage Controlled Oscillator (VCO)

APPLICATION INFORMATION (continued)

Square Wave Oscillator


$$A_v = \frac{R_F}{R_1} \text{ (As shown, } A_v = 10 \text{)}$$

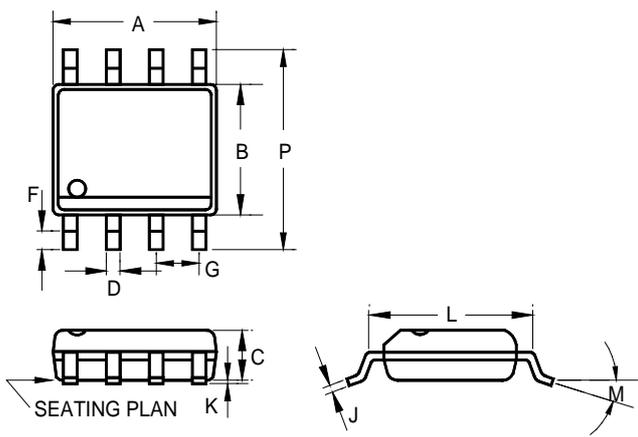
AC Coupled Amplifier

PACKAGE
8-Pin Plastic DIP


Top view showing pin numbers 1, 4, 5, 8 and dimensions A, B. Side view showing dimensions C, D, F, G, H, K, L, M. Lead angle view showing dimensions J, M.

	INCHES			MILLIMETERS		
	MIN	TYP	MAX	MIN	TYP	MAX
A	0.355	0.365	0.400	9.02	9.27	10.16
B	0.240	0.250	0.280	6.10	6.35	7.11
C	-	-	0.210	-	-	5.33
D	-	0.018	-	-	0.46	-
F	-	0.060	-	-	1.52	-
G	-	0.100	-	-	2.54	-
H	0.050	-	0.090	1.27	-	2.29
J	0.008	-	0.015	0.20	-	0.38
K	0.115	0.130	0.150	2.92	3.30	3.81
L	0.300 BSC.			7.62 BSC.		
M	-	7°	15°	-	7°	15°

Note: For 8-pin Plastic package, 60 units per tube

8-Pin Plastic S.O.I.C.


Top view showing dimensions A, B, P, F, D, G. Side view showing dimensions C, K. Lead angle view showing dimensions L, J, M. Seating plan view.

	INCHES			MILLIMETERS		
	MIN	TYP	MAX	MIN	TYP	MAX
A	0.183	-	0.202	4.65	-	5.13
B	0.144	-	0.163	3.66	-	4.14
C	0.068	-	0.074	1.35	-	1.88
D	0.010	-	0.020	0.25	-	0.51
F	0.015	-	0.035	0.38	-	0.89
G	0.050 BSC			1.27 BSC		
J	0.007	-	0.010	0.19	-	0.25
K	0.005	-	0.010	0.13	-	0.25
L	0.189	-	0.205	4.80	-	5.21
M	-	-	8°	-	-	8°
P	0.228	-	0.244	5.79	-	6.20

Note: For 8-pin S.O.I.C., 100 units per tube

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