

Low Power Dual Operational Amplifiers

General Description:

The uP358M is a dual, high gain and internally frequency compensated operational amplifier, which can operate from 3V to 36V single supply or from $\pm 1.5\text{V}$ to $\pm 18\text{V}$ dual supplies.

The uP358M features low power, low offset voltage and low bias current. It is well suited for a wide range of applications.

The uP358M is compatible with industry standard 358.

The uP358M is available in SOIC-8 package. It is specified over the $-40\text{ }^{\circ}\text{C}$ to $+85\text{ }^{\circ}\text{C}$ temperature range

Features:

Internally Frequency Compensated for Unity Gain

- Large Voltage Gain: 100dB (Typical)
- Low Input Bias Current: 20nA (Typical)
- Low Input Offset Voltage: 1mV (Typical)
- Low Supply Current: 0.5mA (Typical)
- Wide Power Supply Voltage: Single Supply: 3V to 36V or dual Supplies: $\pm 1.5\text{V}$ to $\pm 18\text{V}$

Applications:

- Battery Chargers
- Power Supplies
- Communications
- Wearable Products

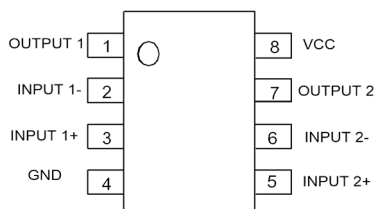


Figure 1. SOIC-8 Package of uP358M

Ordering Information

Device Name	Package	Mark ID	Packing
μP358M	SOIC-8	358M	4000/Tape and reel

Functional Block Diagram:

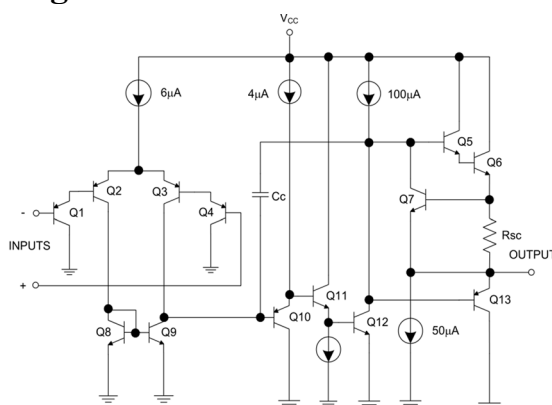


Figure 2. Functional Block Diagram of μP358M

Typical Application

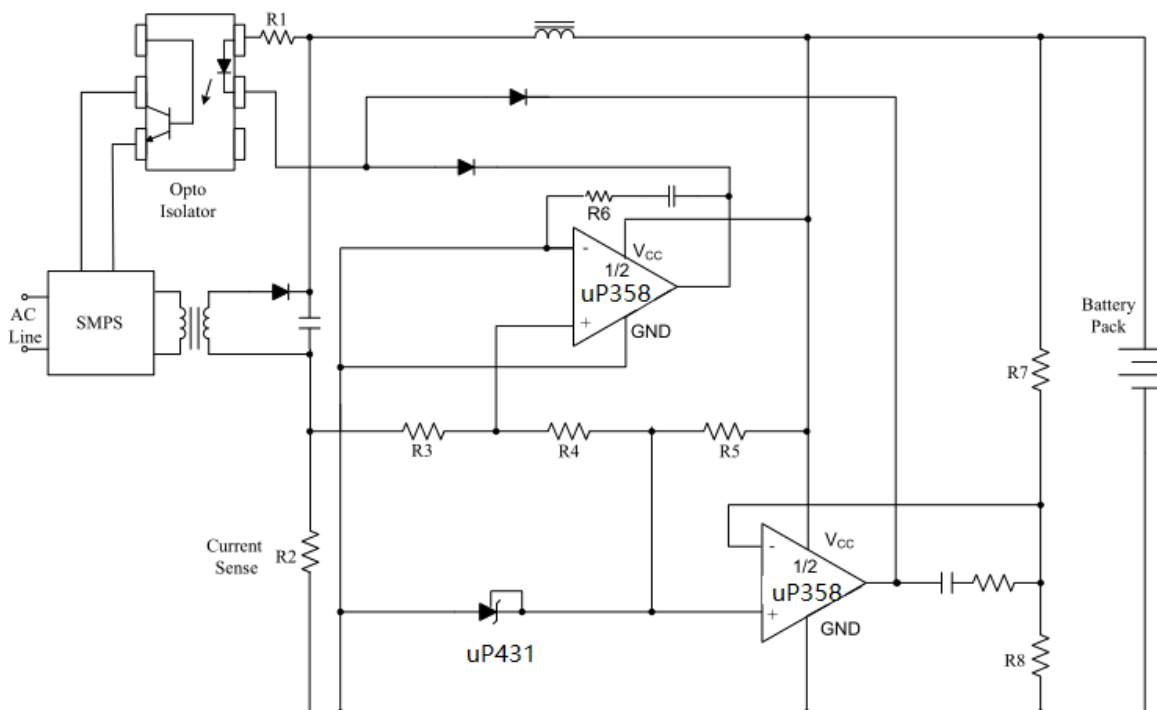


Figure 3. Typical application of μ P358M

Absolute Maximum Rating (Operation temperature range applies unless otherwise specified.)

Parameter	Symbol	Value	Unit
Power Supply Voltage	V _{CC}	36V	V
Differential Input Voltage	V _{ID}	36V	V
Input Voltage	V _{IC}	-0.3 to 36V	V
Input Current (V _{IN} < -0.3V)	I _{IN}	50	mA
Output Short Current to Ground	-	Continuous	
Power Dissipation	P _D	550	mW
Storage temperature Range	T _{STG}	-65 to 150	°C
ESD(HBM)		2000	V

Note: 1. Absolute maximum ratings indicate stresses beyond which may cause permanent damage to the device.

Recommended Operation Ratings:

Parameter	Symbol	Min.	Max.	Unit
Input voltage	V_{IN}		30	V
Operating junction Temperature	T_J	-40	125	°C

Electrical Parameter Of uP358M ($V_{CC}=5V, T_A=25^{\circ}C$ unless otherwise specified).

Parameters	Symbol	Test Conditions	Test Results			Unit
			Min	Typ.	Max	
Input offset voltage	V_{IO}	$V_o=1.4V, R_S=0\Omega, V_{CC}=5\sim 30V$	-3	1	3	mV
V_{IO} Temperature shift	$V_{IO}/\Delta T$	-40~85°C	-	7		uV/°C
Input Offset Current	I_{IO}	$V_{CM}=0V$	-	5	30	nA
Input Bias Current	I_{BIAS}	$V_{CM}=0V$	-	20	200	nA

Operating current	I_{CC}	$V_{CC}=5V, -40\sim 85^{\circ}C, R_L=\infty$	-	0.5	1	mA
		$V_{CC}=30V, -40\sim 85^{\circ}C, R_L=\infty$	-	0.7	1.5	
Large Signal Voltage Gain	G_V	$V_{CC}=5V, R_L\geq 2K\Omega, V_o=1V$ to 11V, $-40\sim 85^{\circ}C$	-	100	-	dB
Common Mode Rejection Ratio	CMRR	$V_{CM}=0V$ to $V_{CC}-1.5V$, $-40\sim 85^{\circ}C$	60	70	-	dB
Supply voltage Rejection Ratio	PSRR	$T_A=25^{\circ}C, V_{CC}=5\sim 30V$, $-40\sim 85^{\circ}C$	-	100	-	dB
Sink current	I_{SINK}	$V_{IN+}=0, V_{IN-}=1V, V_o=2V, V_{CC}=15V$	6	10	-	mA
Source current	I_{SOURCE}	$V_{IN+}=1, V_{IN-}=0V, V_o=2V, V_{CC}=15V$	20	40	-	
Short current to Gnd	I_{SC}	$V_{CC}=15V$	-	40	60	
Output voltage swing	V_{OH}	$V_{CC}=30V, R_L\geq 2K\Omega$	26	28	-	V
	V_{OL}	$V_{CC}=5V, R_L=10K\Omega$	-	0.5	1	mV
Gain Bandwidth	G_{BW}	-	-	1.2	-	MHz

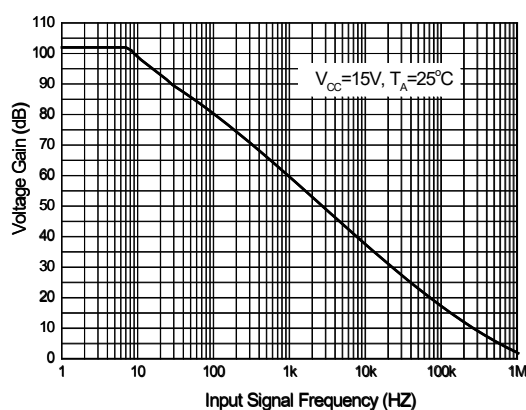


Figure 4, Voltage gain vs input signal frequency

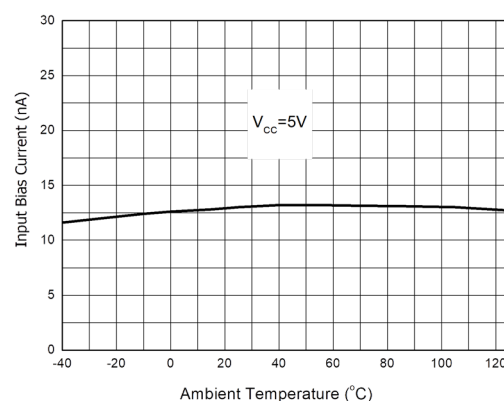


Figure 5, Input bias current vs ambient temperature (°C)

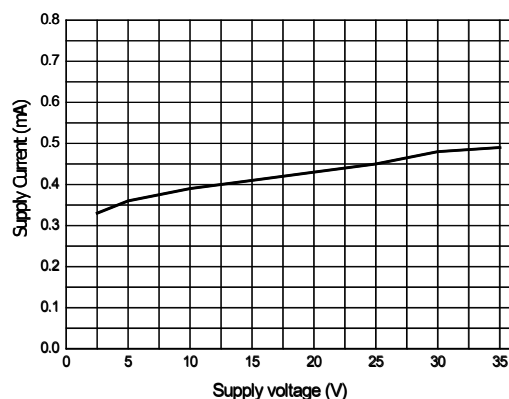


Figure 6, Supply current vs supply voltage (V)

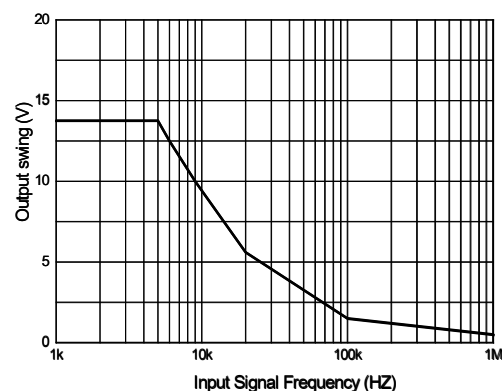


Figure 7, Large signal frequency response

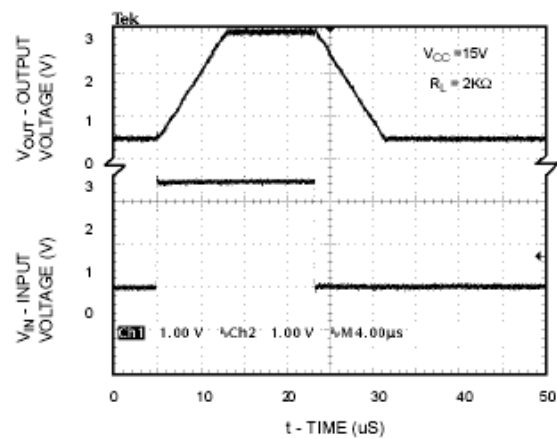


Figure 8, Voltage follower pulse response

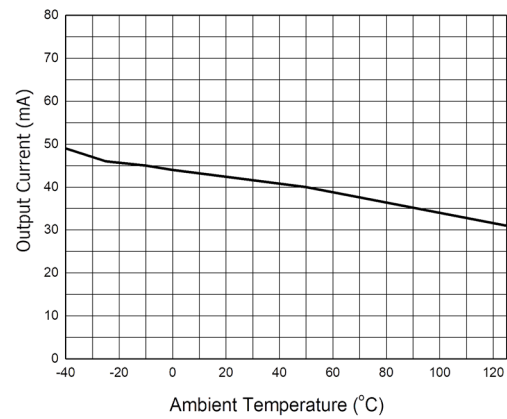
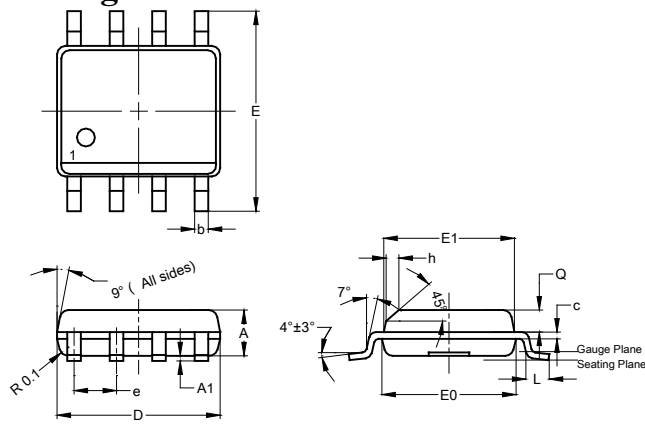


Figure 9, Output current vs ambient temperature (°C)

Package Outline



SOIC-8			
Dim	Min	Max	Typ
A	1.40	1.50	1.45
A1	0.10	0.20	0.15
b	0.30	0.50	0.40
c	0.15	0.25	0.20
D	4.85	4.95	4.90
E	5.90	6.10	6.00
E1	3.80	3.90	3.85
E0	3.85	3.95	3.90
e	—	—	1.27
h	—	—	0.35
L	0.62	0.82	0.72
Q	0.60	0.70	0.65
All Dimensions in mm			