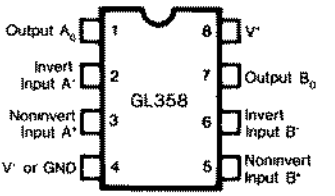
GL358/358A
DUAL OPERATIONAL AMPLIFIER

Description

The GL358 consists of two independent, high gain, internally frequency compensated operational amplifiers which were specifically to operate from a single power supply over a wide range of voltage and the power supply current drain is independent of the magnitude of the power supply voltage

Application areas include transducer amplifiers, dc gain blocks and all the conventional OP AMP circuits which now can be more easily implemented in single power systems.

Pin Configuration



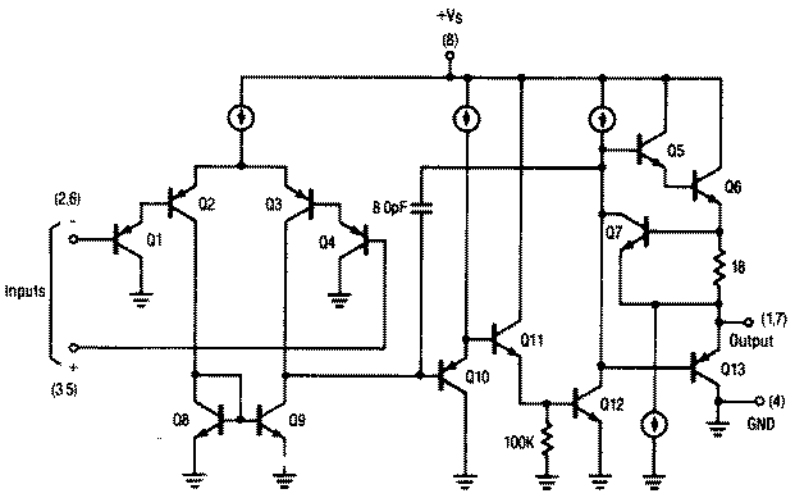
Features

- **Input Common Mode Voltage Range Includes Ground.**
- **Wide Power Supply Range. (Single or Duel Supply) 3V to 30V or ±1.5V to ±16V**
- **Large Output Voltage Swing. 0V to $V^+ - 1.5V$**
- **Internally Frequency Compensated for Unity Gain.**
- **Low Input Bais Current.**
- **Low Input Offset Voltage.**
- **Very Low Supply Current Drain.**

Absolute Maximum Ratings

Supply Voltage, V+	32 or ±16	V
Differential Input Voltage	±32	V
Input Voltage	−0.3 to 32	V
Power Pissipation	570	mW
Operating Temperature Range	0 to 70	°C
Storage Temperature Range	−55 to 125	°C
Lead Temperature	260	°C

Schematic Diagram (Each Amplifier)



Electrical Characteristics:

Unless otherwise stated, these specification apply for V^+=5V, V^+Max=30V and 0°C≤T_A≤70°C

PARAMETER	SYMBOL	TEST CONDITIONS		GL358			GL358A			UNIT
				MIN	TYP	MAX	MIN	TYP	MAX	
Input Offset Voltage	V_{IO}	V^+=5V to Max, V_O=1.4V, R_S=0Ω V_{ICR}=0V to V^+−1.5V T_A=25°C			±2	±7 ±9		±2	±3 ±5	mV
Input Offset Current	I_{IO}	$I_{IN}(+)-I_{IN}(-)$, V_O=1.4V T_A=25°C			±5	±50 ±150		±5	±30 ±75	nA
Input Bias Current	I_{IB}	$I_{IN}(+)$ or $I_{IN}(-)$, V_O=1.4V T_A=25°C			45 40	250 500		45 40	100 200	nA
Input Common-Mode Voltage range	V_{ICR}	V^+=5V to Max T_A=25°C		0 to V^+−1.5V V^+−2.0V			0 to V^+−1.5V V^+−2.0V			V
Supply Current	I^+,I^-	R_L=∞	V^+=5V, V_O=2.5V		0.7	1.2		0.7	1.2	mA
			V^+=Max, V_O=15V		1	2		1	2	
Large-Signal Voltage Gain	A_{VD}	V^+=15V, R_L≥2KΩ V_O=−5V to +5V T_A=25°C		25 15	100		25 15	100		V/mV
Output Voltage	V_{OH}	V^+=MAX	R_L=2KΩ	26			26			V
			R_L≥10KΩ	27	28		27	28		
Swing	V_{OL}	V^+=5V, R_L≤10KΩ			5	20		5	20	mV
Common Mode Rejection Ratio	CMRR	T_A=25°C V^+=5V to Max		65	70		65	85		dB
Power Supply Rejection Ratio	PSRR	V^+=5V to Max T_A=25°C		65	100		65	100		dB
Output Current	Source	$V_{IN(+)}$=1V, $V_{IN(-)}$=0V T_A=25°C V^+=15V, V_O=4V		20	40		20	40		mA
	Sink	V^+=15V $V_{IN(-)}$=1V	V_O=15V	10	20		10	20		mA
		$V_{IN(+)}$=0V T_A=25°C	V_O=200mV	12	50		12	50		μA
Short Circuit Current	I_{OS}	V^+=5V T_A=25°C V_O=0V			40	60		40	60	mA
Input Offset Voltage Drift	$\Delta V_{OS}/\Delta T$				7			7		uV/°C
Input Offset Current Drift	$\Delta I_{IO}/\Delta T$				10			10		pA/°C

TYPICAL PERFORMANCE CURVES

Figure 1 – Input Voltage Range

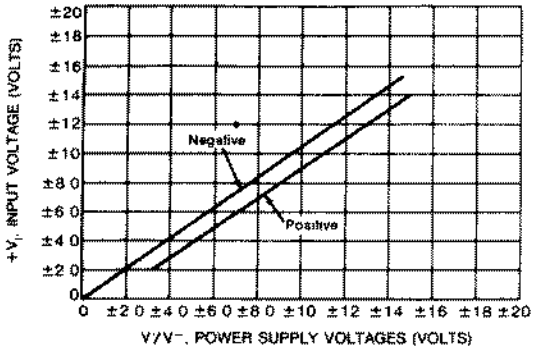


Figure 2 – Open Loop Frequency Response

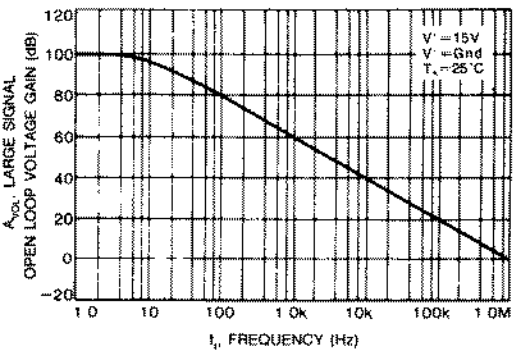


Figure 3 – Large Signal Frequency Response

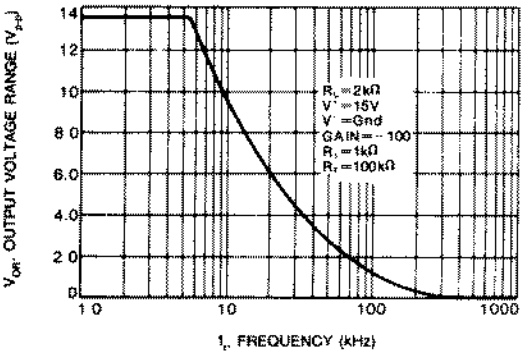


Figure 4 – Small Signal Voltage Follower Pulse Response (Non Inverting)

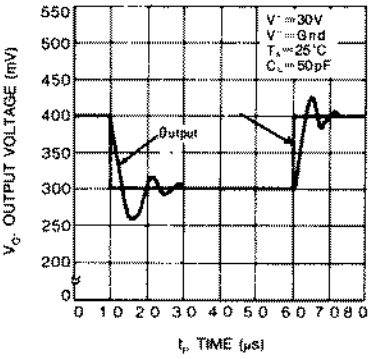


Figure 5 – Power Supply Current versus Power Supply Voltage

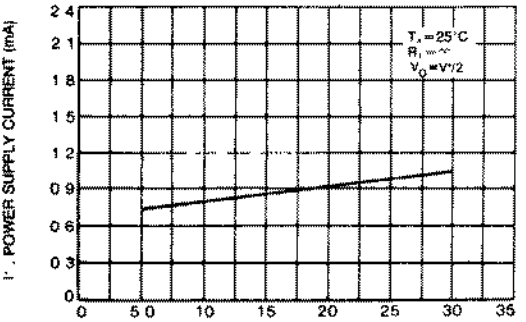
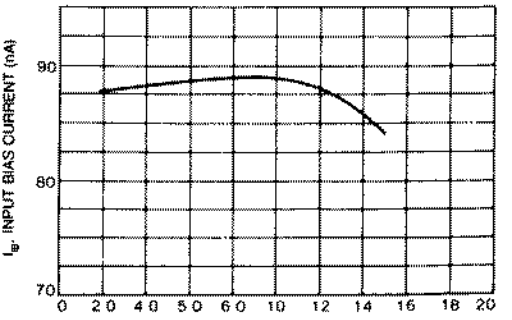
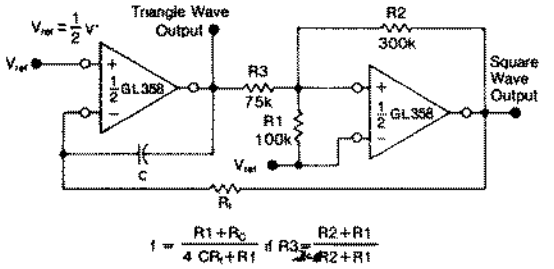


Figure 6 – Input Bias Current versus Supply Voltage



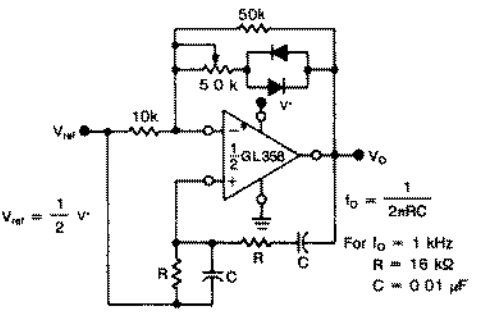
Typical Application

Figure 1 — Function Generator



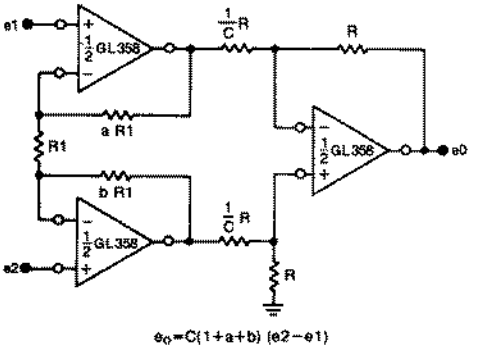
$$f = \frac{R1+R_f}{4\,CR_fR1} \text{ if } R3=\frac{R2+R1}{2}$$

Figure 2 — Wien Bridge Oscillator



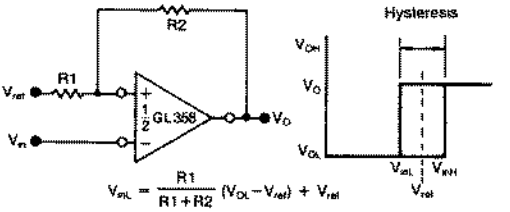
$$f_O = \frac{1}{2\pi RC}$$

Figure 3 — High Impedance Differentiel Amplifier



$$e_0 = C(1+a+b)(e2-e1)$$

Figure 4 — Comparator With Hysteresis

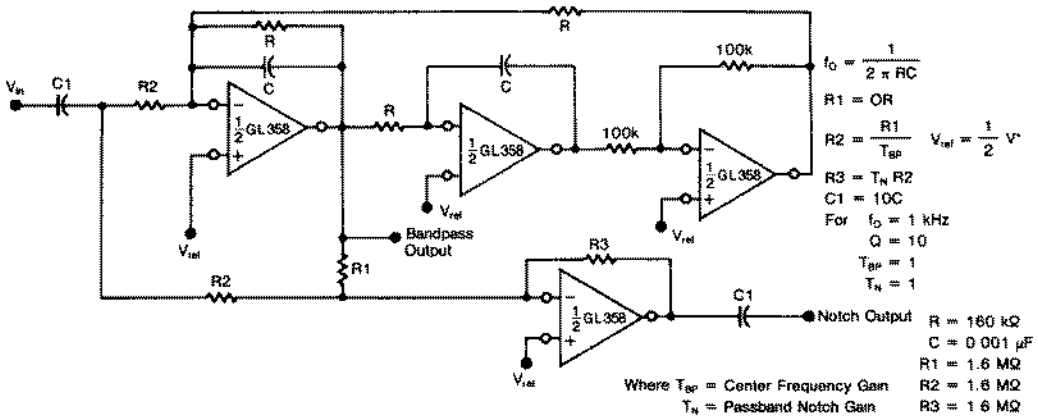


$$V_{inL} = \frac{R1}{R1+R2}(V_{OL}-V_{ref}) + V_{ref}$$

$$V_{inH} = \frac{R1}{R1+R2}(V_{OH}-V_{ref}) + V_{ref}$$

$$H = \frac{R1}{R1+R2}(V_{OH}-V_{OL})$$

Figure 5 — Bi-Quad Filter



$$f_O = \frac{1}{2\pi RC}$$

R1 = OR

$$R2 = \frac{R1}{T_{BP}} \qquad V_{ref} = \frac{1}{2}V^+$$

$R3 = T_N\,R2$

C1 = 10C

For f_O = 1 kHz
Q = 10
T_{BP} = 1
T_N = 1

R = 160 kΩ
C = 0.001 μF
R1 = 1.6 MΩ
R2 = 1.6 MΩ
R3 = 1.6 MΩ

Where T_{BP} = Center Frequency Gain
T_N = Passband Notch Gain