

LM748 Series Operational Amplifiers

REFERENCE TABLE

Code	Stock No.
LM748H	28915H
LM748CH	28916F
LM748CN	30602F

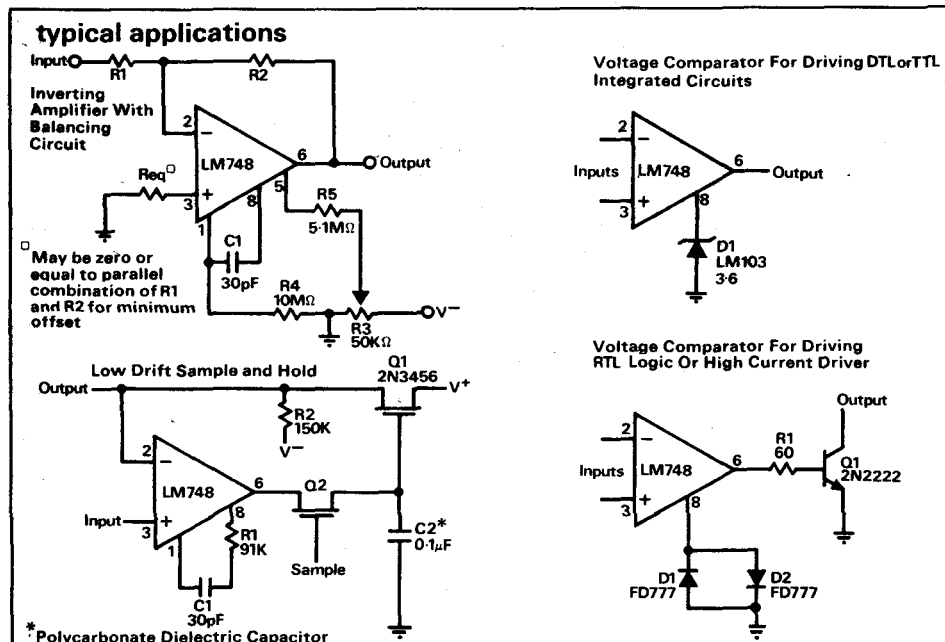
GENERAL DESCRIPTION

The LM748 series is a general purpose operational amplifier built on a single silicon chip. The resulting close match and tight thermal coupling gives low offsets and temperature drift as well as fast recovery from thermal transients.

FEATURES

- Frequency compensation with a single 30pF capacitor
- Operation from $\pm 5V$ to $\pm 20V$
- Low current drain: 1.8mA at $\pm 20V$
- Continuous short-circuit protection
- Operation as a comparator with differential inputs as high as $\pm 30V$
- No latch-up when common mode range is exceeded
- Same pin configuration as the LM101

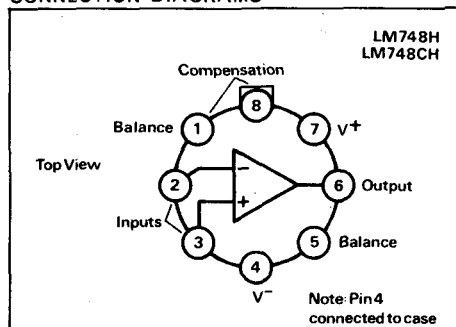
TYPICAL APPLICATIONS



The unity-gain compensation specified makes the circuit stable for all feedback configurations, even with capacitive loads. However, it is possible to optimise compensation for best high frequency performance at any gain. As a comparator, the output can be clamped at any desired level to make it compatible with logic circuits.

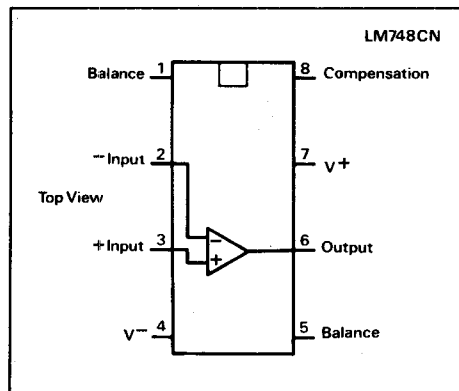
The LM748 is specified for operation over the $-55^{\circ}C$ to $+125^{\circ}C$ military temperature range. The LM748C is specified for operation over the $0^{\circ}C$ to $+70^{\circ}C$ temperature range.

CONNECTION DIAGRAMS



See outline drawing No. 97 for dimensions.

CONNECTION DIAGRAM



See outline drawing No. 103 for dimensions.

ABSOLUTE MAXIMUM RATINGS

Supply Voltage	$\pm 22\text{V}$
Power Dissipation (Note 1)	500mW
Differential Input Voltage	$\pm 30\text{V}$
Input Voltage (Note 2)	$\pm 15\text{V}$
Output Short-Circuit Duration (Note 3)	Indefinite
Operating Temperature Range	—55°C to +125°C
LM748	0°C to +70°C
LM748C	
Storage Temperature Range	—65°C to +150°C
Lead Temperature (Soldering, 10 sec)	300°C

ELECTRICAL CHARACTERISTICS (Note 4)

Parameter	Conditions	Min.	Typ.	Max.	Units
Input Offset Voltage	$T_A = 25^\circ\text{C}, R_S \leq 10\text{ k}\Omega$		1.0	5.0	mV
Input Offset Current	$T_A = 25^\circ\text{C}$		40	200	nA
Input Bias Current	$T_A = 25^\circ\text{C}$		120	500	nA
Input Resistance	$T_A = 25^\circ\text{C}$	300	800		k Ω
Supply Current	$T_A = 25^\circ\text{C}, V_S = \pm 15\text{V}$		1.8	2.8	mA
Large Signal Voltage Gain	$T_A = 25^\circ\text{C}, V_S = \pm 15\text{V}$ $V_{OUT} = \pm 10\text{V}, R_L \geq 2\text{ k}\Omega$	50	160		V/mV
Input Offset Voltage	$R_S \leq 10\text{ k}\Omega$			6.0	mV
Average Temperature Coefficient of Input Offset Voltage	$R_S \leq 10\text{ k}\Omega$		3.0		$\mu\text{V}/^\circ\text{C}$
Input Offset Current	$T_A = 0^\circ\text{C to } 70^\circ\text{C}$ $T_A = -55^\circ\text{C to } 125^\circ\text{C}$			300 500	nA nA
Input Bias Current	$T_A = 0^\circ\text{C to } 70^\circ\text{C}$ $T_A = -55^\circ\text{C to } 125^\circ\text{C}$			0.8 1.5	μA μA
Supply Current	$T_A = +125^\circ\text{C}; V_S = \pm 15\text{V}$ $T_A = -55^\circ\text{C to } 125^\circ\text{C}$		1.2 1.9	2.25 3.3	mA mA
Large Signal Voltage Gain	$V_S = \pm 15\text{V}, V_{OUT} = \pm 10\text{V}$ $R_L \geq 2\text{ k}\Omega$	25			V/mV
Output Voltage Swing	$V_S = \pm 15\text{V}, R_L = 10\Omega$ $R_L = 2\text{ k}\Omega$	± 12 ± 10	± 14 ± 13		V V
Input Voltage Range	$V_S = \pm 15\text{V}$	± 12			V
Common Mode Rejection Ratio	$R_S \leq 10\text{ k}\Omega$	70	90		dB
Supply Voltage Rejection Ratio	$R_S \leq 10\text{ k}\Omega$	77	90		dB

Note 1: For operating at elevated temperatures the devices must be derated based on a maximum junction to case thermal resistance of 45°C per watt, or 150°C per watt junction to ambient.

Note 2: For supply voltages less than $\pm 15\text{V}$, the absolute maximum input voltage is equal to the supply voltage.

Note 3: Continuous short circuit is allowed for case temperatures to +125°C and ambient temperatures to +70°C.

Note 4: These specifications apply for $\pm 5\text{V} \leq V_S \leq +15\text{V}$ and $-55^\circ\text{C} \leq T_A \leq 125^\circ\text{C}$, unless otherwise specified. With the LM748C, however, all temperature specifications are limited to $0^\circ\text{C} \leq T_A \leq 70^\circ\text{C}$.