

LM747QML

LM747QML Dual Operational Amplifier



Literature Number: SNOSAR6

LM747QML

Dual Operational Amplifier

General Description

The LM747 is a general purpose dual operational amplifier. The two amplifiers share a common bias network and power supply leads. Otherwise, their operation is completely independent.

Additional features of the LM747 are: no latch-up when input common mode range is exceeded, freedom from oscillations, and package flexibility.

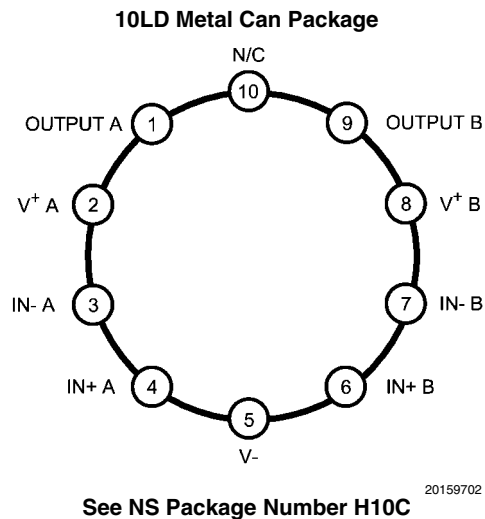
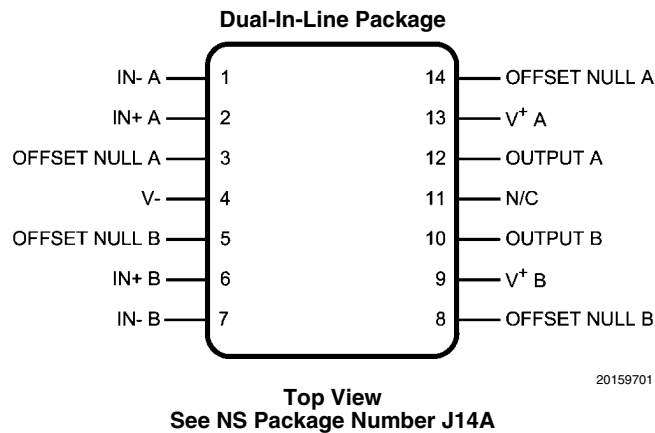
Features

- No frequency compensation required
- Short-circuit protection
- Wide common-mode and differential voltage ranges
- Low power consumption
- No latch-up

Ordering Information

NS Part Number	SMD Part Number	NS Package Number	Package Description
LM747H/883		H10C	10LD TO-100 Metal Can
LM747J/883		J14A	14LD Ceramic Dip

Connection Diagrams



Absolute Maximum Ratings *(Note 1)*

Supply voltage	±22V
Power Dissipation <i>(Note 2)</i>	800mW
Differential Input Voltage	±30V
Input Voltage <i>(Note 3)</i>	±15V
Output Short-Circuit Duration	Indefinite
Maximum Junction Temperature (T_{Jmax})	150°C
Operating Temperature Range	$-55^{\circ}\text{C} \leq T_A \leq +125^{\circ}\text{C}$
Storage Temperature Range	$-65^{\circ}\text{C} \leq T_A \leq +150^{\circ}\text{C}$
Lead Temperature (Soldering, 10 seconds)	+300°C

Quality Conformance Inspection

Mil-Std-883, Method 5005 - Group A

Subgroup	Description	Temp (°C)
1	Static tests at	+25
2	Static tests at	+125
3	Static tests at	-55
4	Dynamic tests at	+25
5	Dynamic tests at	+125
6	Dynamic tests at	-55
7	Functional tests at	+25
8A	Functional tests at	+125
8B	Functional tests at	-55
9	Switching tests at	+25
10	Switching tests at	+125
11	Switching tests at	-55
12	Settling time at	+25
13	Settling time at	+125
14	Settling time at	-55

LM747 Electrical Characteristics

DC Parameters

The following conditions apply, unless otherwise specified. $V_{CC} = \pm 15V$, $V_{CM} = 0V$

Symbol	Parameter	Conditions	Notes	Min	Max	Units	Sub-groups		
V_{IO}	Input Offset Voltage	$R_S = 50\Omega$, $V_{CM} = -12V$		-5.0	5.0	mV	1		
				-6.0	6.0	mV	2, 3		
		$R_S = 50\Omega$, $V_{CM} = 12V$		-5.0	5.0	mV	1		
				-6.0	6.0	mV	2, 3		
		$R_S = 50\Omega$		-5.0	5.0	mV	1		
				-6.0	6.0	mV	2, 3		
		$R_S = 50\Omega$, $V_{CC} = \pm 5V$		-5.0	5.0	mV	1		
				-6.0	6.0	mV	2, 3		
I_{IO}	Input Offset Current	$V_{CM} = -12V$		-200	200	nA	1		
				-500	500	nA	2, 3		
		$V_{CM} = 12V$		-200	200	nA	1		
				-500	500	nA	2, 3		
		$V_{CC} = \pm 5V$		-200	200	nA	1		
				-500	500	nA	2, 3		
		I_{IB}^+	Input Bias Current	$V_{CM} = -12V$		0.0	500	nA	1
						0.0	1500	nA	2, 3
$V_{CM} = 12V$				0.0	500	nA	1		
				0.0	1500	nA	2, 3		
$V_{CC} = \pm 5V$				0.0	500	nA	1		
				0.0	1500	nA	2, 3		
I_{IB}^-	Input Bias Current			$V_{CM} = -12V$		0.0	500	nA	1
						0.0	1500	nA	2, 3
		$V_{CM} = 12V$		0.0	500	nA	1		
				0.0	1500	nA	2, 3		
		$V_{CC} = \pm 5V$		0.0	500	nA	1		
				0.0	1500	nA	2, 3		
		$V_{IO\ Adj}^+$	Input Offset Voltage Adjustment Range		(Note 7)	6.0		mV	1, 2, 3
		$V_{IO\ Adj}^-$	Input Offset Voltage Adjustment Range		(Note 7)		-6.0	mV	1, 2, 3
PSRR+	Power Supply Rejection Ratio	$R_S = 50\Omega$, $V_{CC} = \pm 15V$ to $\pm 5V$		77		dB	1, 2, 3		
PSRR-	Power Supply Rejection Ratio	$R_S = 50\Omega$, $V_{CC} = \pm 15V$ to $\pm 5V$		77		dB	1, 2, 3		
CMRR	Common Mode Rejection Ratio	$R_S = 50\Omega$, $V_{CM} = \pm 12V$		70		dB	1, 2, 3		
I_{OS}^+	Output Short Circuit Current			-45	-9.0	mA	1, 2		
				-50	-9.0	mA	3		
I_{OS}^-	Output Short Circuit Current			9.0	45	mA	1, 2		
				9.0	50	mA	3		

Symbol	Parameter	Conditions	Notes	Min	Max	Units	Sub-groups
I _{CC}	Supply Current				5.6	mA	1
					5.0	mA	2
					6.6	mA	3
V _{OP+}	Output Voltage Swing	R _L = 10KΩ		12		V	1, 2, 3
		R _L = 2KΩ		10		V	1, 2, 3
		V _{CC} = ±20V, R _L = 10KΩ		16		V	1, 2, 3
		V _{CC} = ±20V, R _L = 2KΩ		15		V	1, 2, 3
V _{OP-}	Output Voltage Swing	R _L = 10KΩ			-12	V	1, 2, 3
		R _L = 2KΩ			-10	V	1, 2, 3
		V _{CC} = ±20V, R _L = 10KΩ			-16	V	1, 2, 3
		V _{CC} = ±20V, R _L = 2KΩ			-15	V	1, 2, 3
A _{VS+}	Open Loop Voltage Gain	V _O = 0 to +10V, R _L = 2K	(Note 6)	50		V/mV	1
				25		V/mV	2, 3
A _{VS-}	Open Loop Voltage Gain	V _O = 0 to -10V, R _L = 2K	(Note 6)	50		V/mV	1
				25		V/mV	2, 3
V _I	Input Voltage Range		(Note 4)	12	-12	V	1, 2, 3
V _{OP}	Output Voltage Swing	V _{CC} = ±5V	(Note 5)	2	-2	V	1, 2, 3

AC Parameters

The following conditions apply, unless otherwise specified.

AC: V_{CC} = ±15V, V_{CM} = 0V

Symbol	Parameter	Conditions	Notes	Min	Max	Units	Sub-groups
SR ⁺	Slew Rate	A _V = 1, V _I = -5V to +5V		0.2		V/μS	9
SR ⁻	Slew Rate	A _V = 1, V _I = +5V to -5V		0.2		V/μS	9
GBW	Gain Bandwidth	V _I = 50mV, f = 20KHz, R _L = 2KΩ		0.25		Mhz	9

Note 1: Absolute Maximum Ratings indicate limits beyond which damage to the device may occur. Operating Ratings indicate conditions for which the device is functional, but do not guarantee specific performance limits. For guaranteed specifications and test conditions, see the Electrical Characteristics. The guaranteed specifications apply only for the test conditions listed. Some performance characteristics may degrade when the device is not operated under the listed test conditions.

Note 2: The maximum power dissipation must be derated at elevated temperatures and is dictated by T_{Jmax} (maximum junction temperature), θ_{JA} (package junction to ambient thermal resistance), and T_A (ambient temperature). The maximum allowable power dissipation at any temperature is P_{Dmax} = (T_{Jmax} - T_A) / θ_{JA} or the number given in the Absolute Maximum Ratings, whichever is lower.

Note 3: For supply voltages less than ±15V, the absolute maximum input voltage is equal to the supply voltage.

Note 4: Parameter tested go-no-go only, guaranteed by CMRR test.

Note 5: Guaranteed parameter, not tested.

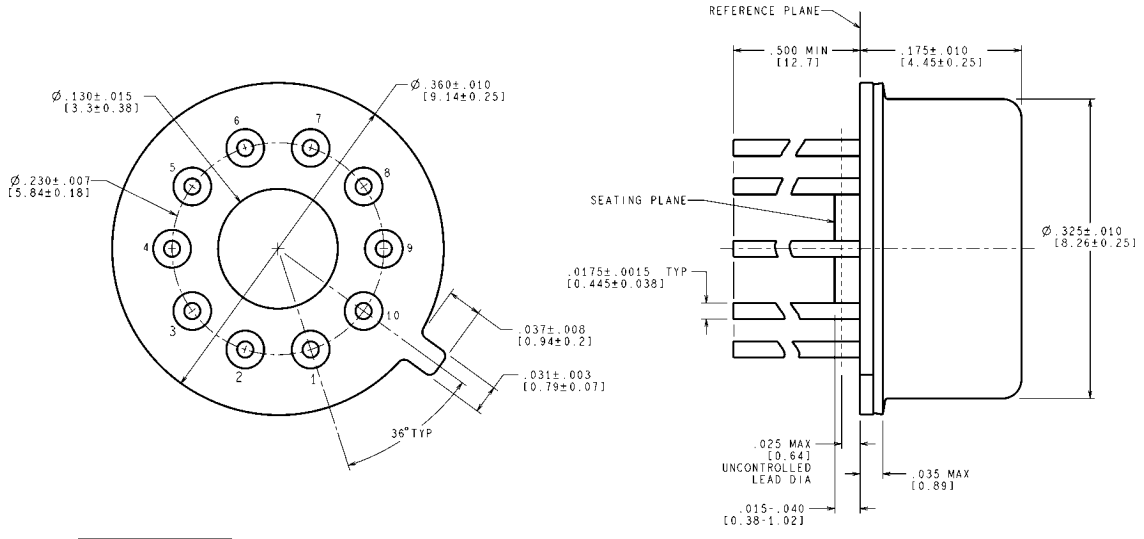
Note 6: Datalog reading in K = V/mV

Note 7: Tested for CERDIPs only.

Revision History

Released	Revision	Section	Changes
12/16/2010	A	New Release, Corporate format	1 MDS data sheet converted into one Corp. data sheet format. The drift table was eliminated from the 883 section since it did not apply; MNLM747-X Rev 0BL will be archived.

Physical Dimensions inches (millimeters) unless otherwise noted

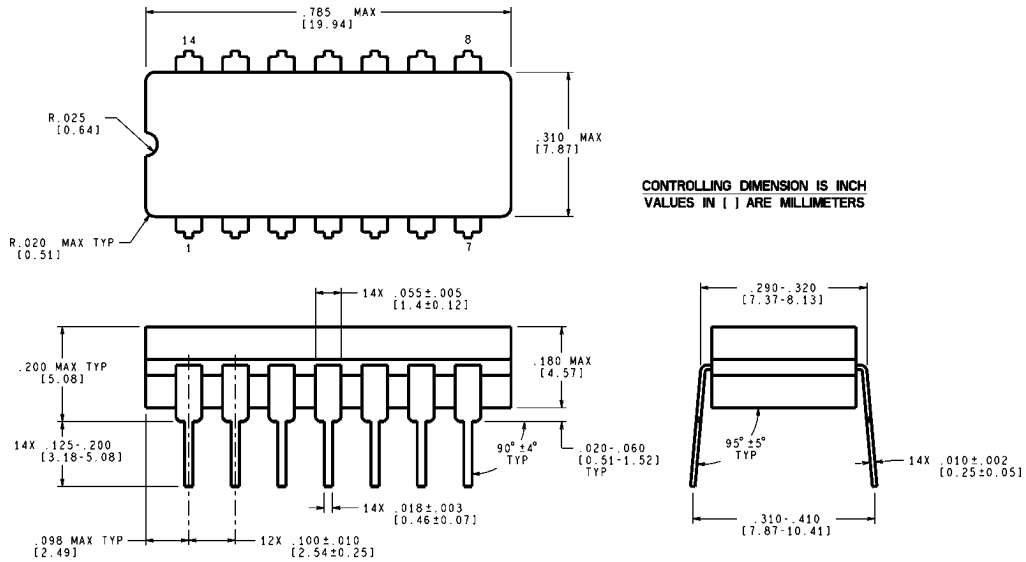


MIL-PRF-38535
CONFIGURATION CONTROL

CONTROLLING DIMENSION IS INCH
VALUES IN [] ARE IN MILLIMETERS

H10C (Rev G)

**10 Pin Metal Can Package (H)
NS Package Number H10C**



CONTROLLING DIMENSION IS INCH
VALUES IN [] ARE MILLIMETERS

J14A (Rev J)

**14 Pin Cerdip Package (J)
NS Package Number J14A**

Notes

LM747QML

Notes

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