



## MICROCIRCUIT DATA SHEET

**MJLM741A-X REV OBL**

Original Creation Date: 08/04/95  
Last Update Date: 09/26/96  
Last Major Revision Date: 08/04/95

### SINGLE OPERATIONAL AMPLIFIER

#### Industry Part Number

LM741A

#### Prime Die

LM741A

#### Controlling Document

38510/10101, AMEND. 2 REV G

#### NS Part Numbers

JL741BCA  
JL741BGA  
JL741BHA  
JL741BPA  
JL741SCA  
JL741SGA  
JL741SHA  
JL741SPA

#### Processing

MIL-STD-883, Method 5004

#### Quality Conformance Inspection

MIL-STD-883, Method 5005

#### Subgrp 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

## Electrical Characteristics

### DC PARAMETERS

(The following conditions apply to all the following parameters, unless otherwise specified.)  
DC:  $\pm V_{cc} = \pm 20V$ ,  $R_s = 0$ ,  $V_{cm} = 0$

SYMBOL	PARAMETER	CONDITIONS	NOTES	PIN-NAME	MIN	MAX	UNIT	SUB-GROUPS		
Vio	Input Offset Voltage	$+V_{cc} = 35V$ , $-V_{cc} = -5V$ , $V_{cm} = -15V$			-3	+3	mV	1		
					-4	+4	mV	2, 3		
		$+V_{cc} = 5V$ , $-V_{cc} = -35V$ , $V_{cm} = +15V$			-3	+3	mV	1		
					-4	+4	mV	2, 3		
		$V_{cm} = 0V$			-3	+3	mV	1		
					-4	+4	mV	2, 3		
		$+V_{cc} = 5V$ , $-V_{cc} = -5V$ , $V_{cm} = 0V$			-3	+3	mV	1		
					-4	+4	mV	2, 3		
		Iio	Input Offset Current	$+V_{cc} = 35V$ , $-V_{cc} = -5V$ , $R_s = 100K$ , $V_{cm} = -15V$			-30	+30	nA	1, 2
							-70	+70	nA	3
$+V_{cc} = 5V$ , $-V_{cc} = -35V$ , $R_s = 100K$ , $V_{cm} = +15V$					-30	+30	nA	1, 2		
					-70	+70	nA	3		
$R_s = 100K$ , $V_{cm} = 0V$					-30	+30	nA	1, 2		
					-70	+70	nA	3		
$+V_{cc} = 5V$ , $-V_{cc} = -5V$ , $R_s = 100K$ , $V_{cm} = 0V$					-30	+30	nA	1, 2		
					-70	+70	nA	3		
+Iib	Input Bias Current			$+V_{cc} = 35V$ , $-V_{cc} = -5V$ , $R_s = 100K$ , $V_{cm} = -15V$			1	110	nA	1, 2
							1	265	nA	3
		$+V_{cc} = 5V$ , $-V_{cc} = -35V$ , $R_s = 100K$ , $V_{cm} = +15V$			1	110	nA	1, 2		
					1	265	nA	3		
		$R_s = 100K$ , $V_{cm} = 0V$			1	110	nA	1, 2		
					1	265	nA	3		
		$+V_{cc} = 5V$ , $-V_{cc} = -5V$ , $R_s = 100K$ , $V_{cm} = 0V$			1	110	nA	1, 2		
					1	265	nA	3		

## Electrical Characteristics

### DC PARAMETERS (Continued)

(The following conditions apply to all the following parameters, unless otherwise specified.)  
DC:  $\pm V_{CC} = \pm 20V$ ,  $R_s = 0$ ,  $V_{cm} = 0$

SYMBOL	PARAMETER	CONDITIONS	NOTES	PIN-NAME	MIN	MAX	UNIT	SUB-GROUPS
-I <sub>ib</sub>	Input Bias Current	+V <sub>CC</sub> = 35V, -V <sub>CC</sub> = -5V, R <sub>s</sub> = 100K, V <sub>cm</sub> = -15V			1	110	nA	1, 2
					1	265	nA	3
		+V <sub>CC</sub> = 5V, -V <sub>CC</sub> = -35V, R <sub>s</sub> = 100K, V <sub>cm</sub> = +15V			1	110	nA	1, 2
					1	265	nA	3
		R <sub>s</sub> = 100K, V <sub>cm</sub> = 0V			1	110	nA	1, 2
					1	265	nA	3
+V <sub>CC</sub> = 5V, -V <sub>CC</sub> = -5V, R <sub>s</sub> = 100K, V <sub>cm</sub> = 0V			1	110	nA	1, 2		
			1	265	nA	3		
+PSRR	Power Supply Rejection Ratio	+V <sub>CC</sub> = 10V, -V <sub>CC</sub> = -20V			-50	50	uV/V	1
					-100	100	uV/V	2, 3
-PSRR	Power Supply Rejection Ratio	+V <sub>CC</sub> = 20V, -V <sub>CC</sub> = -10V			-50	50	uV/V	1
					-100	100	uV/V	2, 3
V <sub>io</sub> (adj+)	Adjustment Of Input Offset Voltage				+5		mV	1, 2, 3
V <sub>io</sub> (adj-)	Adjustment Of Input Offset Voltage					-5	mV	1, 2, 3
Delta V <sub>io</sub> /Delta T	Temperature Coefficient of Input Offset Voltage	25 C ≤ TA ≤ 125 C	2		-15	+15	uV/°C	2
		-55 C ≤ TA ≤ 25 C	2		-15	+15	uV/°C	3
Delta I <sub>io</sub> /Delta T	Temperature Coefficient of Input Offset Current	25 C ≤ TA ≤ 125 C	2		-200	200	pA/°C	2
		-55 C ≤ TA ≤ 25 C	2		-500	500	pA/°C	3
CMRR	Common Mode Rejection Ratio	V <sub>CC</sub> = ±35V to ±5V, V <sub>cm</sub> = ±15V			80		dB	1, 2, 3
I <sub>os</sub> +	Output Short Circuit Current	+V <sub>CC</sub> = +15V, -V <sub>CC</sub> = -15V, V <sub>cm</sub> = -15V, t ≤ 25mS			-60		mA	1, 2, 3
I <sub>os</sub> -	Output Short Circuit Current	+V <sub>CC</sub> = +15V, -V <sub>CC</sub> = -15V, V <sub>cm</sub> = 15V, t ≤ 25mS				+60	mA	1, 2, 3
I <sub>CC</sub>	Power Supply Current	+V <sub>CC</sub> = +15V, -V <sub>CC</sub> = -15V	1			3.8	mA	1
			1			2.59	mA	2
			1			4.2	mA	3

## Electrical Characteristics

### DC PARAMETERS (Continued)

(The following conditions apply to all the following parameters, unless otherwise specified.)  
DC:  $\pm V_{cc} = \pm 20V$ ,  $R_s = 0$ ,  $V_{cm} = 0$

SYMBOL	PARAMETER	CONDITIONS	NOTES	PIN-NAME	MIN	MAX	UNIT	SUB-GROUPS
Avs+	Large Signal (Open Loop) Voltage Gain	Vout = +15V, Rl = 2K	3		50		V/mV	4
			3		25		V/mV	5, 6
		Vout = +15V, Rl = 10K	3		50		V/mV	4
			3		25		V/mV	5, 6
Avs-	Large Signal (Open Loop) Voltage Gain	Vout = -15V, Rl = 2K	3		50		V/mV	4
			3		25		V/mV	5, 6
		Vout = -15V, Rl = 10K	3		50		V/mV	4
			3		25		V/mV	5, 6
Avs	Large Signal (Open Loop) Voltage Gain	$\pm V_{cc} = \pm 5V$ , Vout = $\pm 2V$ , Rl = 2K	3		10		V/mV	4, 5, 6
		$\pm V_{cc} = \pm 5V$ , Vout = $\pm 2V$ , Rl = 10K	3		10		V/mV	4, 5, 6
+Vop	Output Voltage Swing	Rl = 10K, Vcm = -20V			+16		V	4, 5, 6
		Rl = 2K, Vcm = -20V			+15		V	4, 5, 6
-Vop	Output Voltage Swing	Rl = 10K, Vcm = 20V				-16	V	4, 5, 6
		Rl = 2K, Vcm = 20V				-15	V	4, 5, 6

### AC PARAMETERS

(The following conditions apply to all the following parameters, unless otherwise specified.)  
AC:  $\pm V_{cc} = \pm 20V$ ,  $R_s = 0$ ,  $V_{cm} = 0$

TR(tr)	Rise Time	Rl = 2K Ohms, Cl = 100pF, Vin = +50mV, Av = 1, f < 1KHz	4			800	nS	7, 8A, 8B
TR(os)	Overshoot	Rl = 2K Ohms, Cl = 100pF, Vin = +50mV, Av = 1, f < 1KHz	4			25	%	7, 8A, 8B
Sr+	Slew Rate Rise	Av = 1, Vin = -5V to +5V			0.3		V/uS	7, 8A, 8B
Sr-	Slew Rate Fall	Av = 1, Vin = +5V to -5V			0.3		V/uS	7, 8A, 8B
NI(BB)	Noise Input Broadband	Bw = 10Hz to 5KHz, Rs = 0 Ohms	5			15	$\mu V_{rms}$	7
NI(PC)	Noise Input Popcorn	Bw = 10Hz to 5KHz, Rs = 20K Ohms	5			40	$\mu V_{pk}$	7

## Electrical Characteristics

### DC PARAMETERS: DRIFT VALUES

(The following conditions apply to all the following parameters, unless otherwise specified.)

DC:  $\pm V_{cc} = \pm 20V$ ,  $R_s = 0$ ,  $V_{cm} = 0V$ . "Delta calculations performed on JAN S and QMLV devices at group B, subgroup 5 only".

SYMBOL	PARAMETER	CONDITIONS	NOTES	PIN-NAME	MIN	MAX	UNIT	SUB-GROUPS
Vio	Input Offset Voltage	$V_{cm} = 0V$			-0.5	0.5	mV	1
+Iib	Input Bias Current	$R_s = 100K$ , $V_{cm} = 0V$			-12	12	nA	1
-Iib	Input Bias Current	$R_s = 100K$ , $V_{cm} = 0V$			-12	12	nA	1

Note 1:  $I_{cc}$  limit at +125 C is not to be changed without approval from Product Engineering Manager.

Note 2: Calculated parameter.

Note 3: Datalog in  $K = V/mV$ .

Note 4: Test on LTX or bench test.

Note 5: Test on either A360, J273 AC or bench test.