

**TL081, TL081A, TL081B, TL082, TL082A, TL082B  
TL084, TL084A, TL084B**  
**JFET-INPUT OPERATIONAL AMPLIFIERS**  
SLOS081G – FEBRUARY 1977 – REVISED SEPTEMBER 2004

- Low Power Consumption
- Wide Common-Mode and Differential Voltage Ranges
- Low Input Bias and Offset Currents
- Output Short-Circuit Protection
- Low Total Harmonic Distortion . . . 0.003% Typ
- High Input Impedance . . . JFET-Input Stage
- Latch-Up-Free Operation
- High Slew Rate . . . 13 V/ $\mu$ s Typ
- Common-Mode Input Voltage Range Includes  $V_{CC+}$

### description/ordering information

The TL08x JFET-input operational amplifier family is designed to offer a wider selection than any previously developed operational amplifier family. Each of these JFET-input operational amplifiers incorporates well-matched, high-voltage JFET and bipolar transistors in a monolithic integrated circuit. The devices feature high slew rates, low input bias and offset currents, and low offset-voltage temperature coefficient. Offset adjustment and external compensation options are available within the TL08x family.

The C-suffix devices are characterized for operation from 0°C to 70°C. The I-suffix devices are characterized for operation from -40°C to 85°C. The Q-suffix devices are characterized for operation from -40°C to 125°C. The M-suffix devices are characterized for operation over the full military temperature range of -55°C to 125°C.

### ORDERING INFORMATION

T <sub>J</sub>	V <sub>IOMAX</sub> AT 25°C	PACKAGE†	ORDERABLE PART NUMBER	TOP-SIDE MARKING
0°C to 70°C	15 mV	PDIP (P)	Tube of 50	TL081CP
			Tube of 50	TL082CP
		PDIP (N)	Tube of 25	TL084CN
		SOIC (D)	Tube of 75	TL081CD
			Reel of 2500	TL081CDR
			Tube of 75	TL082CD
			Reel of 2500	TL082CDR
			Tube of 50	TL084CD
			Reel of 2500	TL084CDR
		SOP (PS)	Reel of 2000	TL081CPSR
			Reel of 2000	TL082CPSR
		SOP (NS)	Reel of 2000	TL084CNSR
		TSSOP (PW)	Tube of 150	TL082CPW
			Reel of 2000	TL082CPWR
			Tube of 90	TL084CPW
			Reel of 2000	TL084CPWR

† Package drawings, standard packing quantities, thermal data, symbolization, and PCB design guidelines are available at [www.ti.com/sc/package](http://www.ti.com/sc/package).



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On products compliant to MIL-PRF-38535, all parameters are tested unless otherwise noted. On all other products, production processing does not necessarily include testing of all parameters.

**TL081, TL081A, TL081B, TL082, TL082A, TL082B****TL084, TL084A, TL084B****JFET-INPUT OPERATIONAL AMPLIFIERS**

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**description/ordering information (continued)****ORDERING INFORMATION**

T <sub>J</sub>	V <sub>IOMAX</sub> AT 25°C	PACKAGE <sup>†</sup>	ORDERABLE PART NUMBER	TOP-SIDE MARKING
0°C to 70°C	6 mV	PDIP (P)	Tube of 50	TL081ACP
			Tube of 50	TL082ACP
		PDIP (N)	Tube of 25	TL084ACN
		SOIC (D)	Tube of 75	TL081ACD
			Reel of 2500	TL081ACDR
			Tube of 75	TL082ACD
			Reel of 2500	TL082ACDR
			Tube of 50	TL084ACD
			Reel of 2500	TL084ACDR
		SOP (PS)	Reel of 2000	TL082ACPSR
		SOP (NS)	Reel of 2000	TL084ACNSR
	3 mV	PDIP (P)	Tube of 50	TL081BCP
			Tube of 50	TL082BCP
		PDIP (N)	Tube of 25	TL084BCN
		SOIC (D)	Tube of 75	TL081BCD
			Reel of 2500	TL081BCDR
			Tube of 75	TL082BCD
			Reel of 2500	TL082BCDR
			Tube of 50	TL084BCD
			Reel of 2500	TL084BCDR
-40°C to 85°C	6 mV	PDIP (P)	Tube of 50	TL081IP
			Tube of 50	TL082IP
		PDIP (N)	Tube of 25	TL084IN
		SOIC (D)	Tube of 75	TL081ID
			Reel of 2500	TL081IDR
			Tube of 75	TL082ID
			Reel of 2500	TL082IDR
			Tube of 50	TL084ID
			Reel of 2500	TL084IDR
		TSSOP (PW)	Reel of 2000	TL082IPWR
-40°C to 125°C	9 mV	SOIC (D)	Tube of 50	TL084QD
			Reel of 2500	TL084QDR
-55°C to 125°C	9 mV	CDIP (J)	Tube of 25	TL084MJ
		LCCC (FK)	Reel of 55	TL084FK
	6 mV	CDIP (JG)	Tube of 50	TL082MJJ
		LCCC (FK)	Tube of 55	TL082MFK

<sup>†</sup> Package drawings, standard packing quantities, thermal data, symbolization, and PCB design guidelines are available at [www.ti.com/sc/package](http://www.ti.com/sc/package).

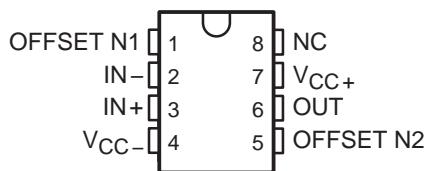
# TL081, TL081A, TL081B, TL082, TL082A, TL082B

TL084, TL084A, TL084B

## JFET-INPUT OPERATIONAL AMPLIFIERS

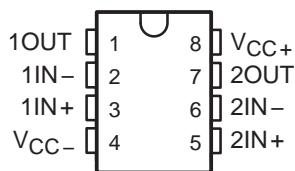
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**TL081, TL081A, TL081B  
D, P, OR PS PACKAGE  
(TOP VIEW)**

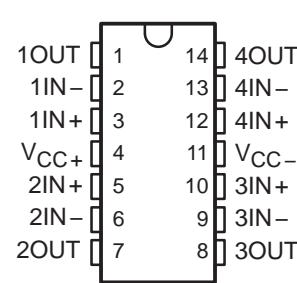


NC – No internal connection

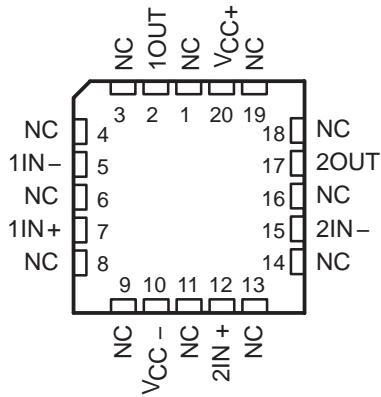
**TL082, TL082A, TL082B  
D, JG, P, PS, OR PW PACKAGE  
(TOP VIEW)**



**TL084, TL084A, TL084B  
D, J, N, NS, OR PW PACKAGE  
(TOP VIEW)**

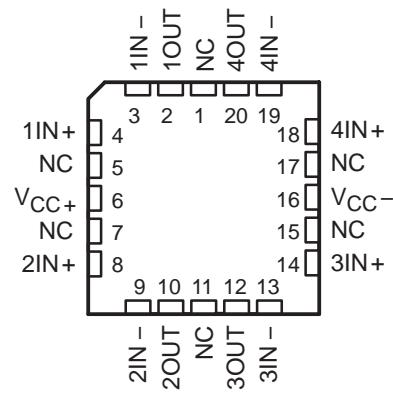


**TL082M . . . FK PACKAGE  
(TOP VIEW)**



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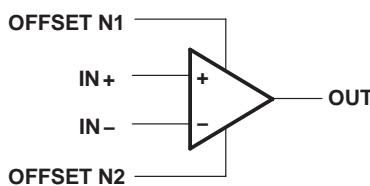
**TL084M . . . FK PACKAGE  
(TOP VIEW)**



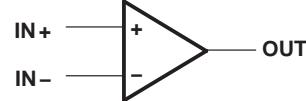
NC – No internal connection

### symbols

**TL081**



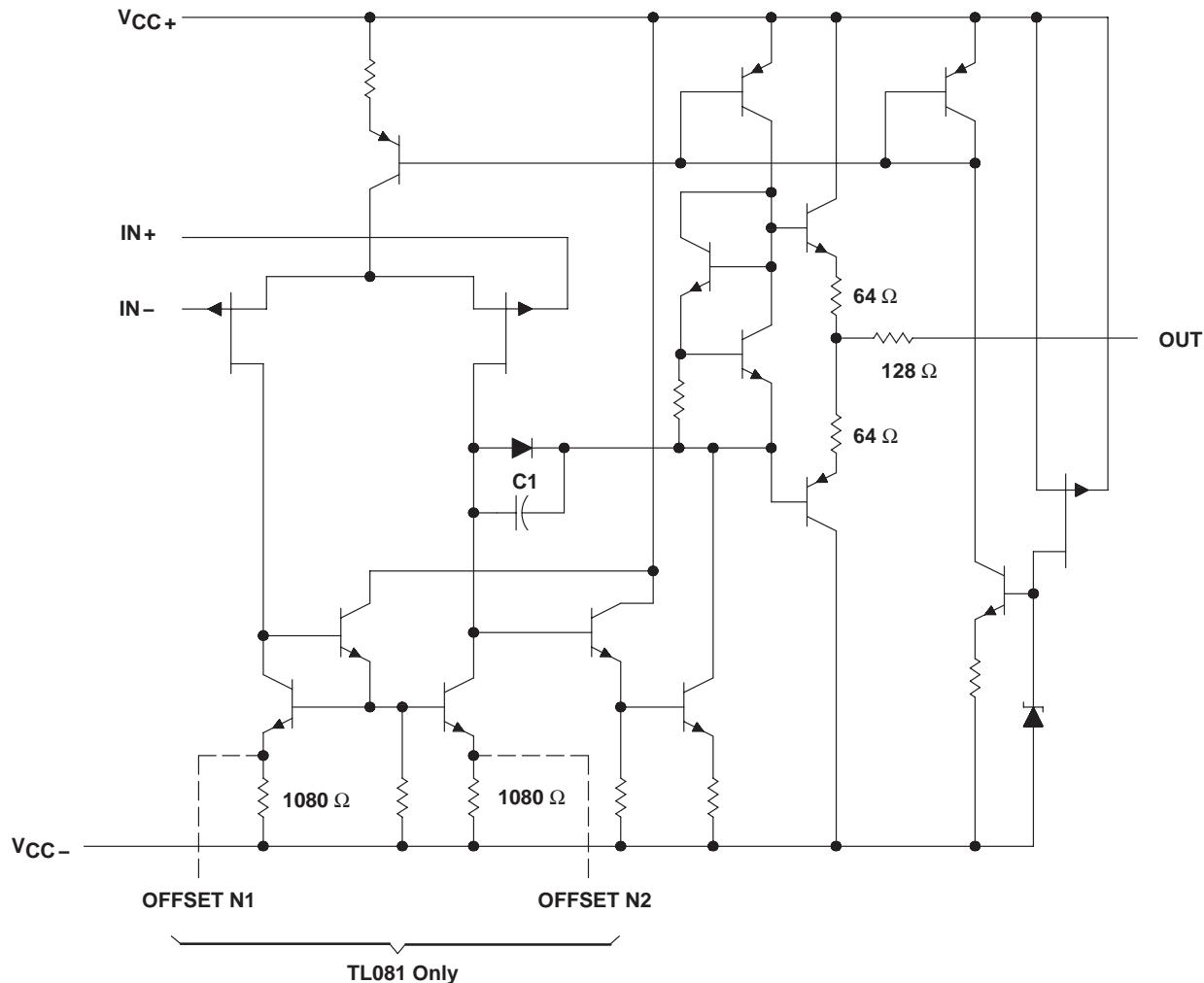
**TL082 (EACH AMPLIFIER)  
TL084 (EACH AMPLIFIER)**



**TL081, TL081A, TL081B, TL082, TL082A, TL082B  
TL084, TL084A, TL084B  
JFET-INPUT OPERATIONAL AMPLIFIERS**

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schematic (each amplifier)



Component values shown are nominal.

**TL081, TL081A, TL081B, TL082, TL082A, TL082B  
TL084, TL084A, TL084B  
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absolute maximum ratings over operating free-air temperature range (unless otherwise noted)<sup>†</sup>

	TL08_C TL08_AC TL08_BC	TL08_I	TL084Q	TL08_M	UNIT
Supply voltage, V <sub>CC+</sub> (see Note 1)	18	18	18	18	V
Supply voltage V <sub>CC-</sub> (see Note 1)	-18	-18	-18	-18	V
Differential input voltage, V <sub>ID</sub> (see Note 2)	±30	±30	±30	±30	V
Input voltage, V <sub>I</sub> (see Notes 1 and 3)	±15	±15	±15	±15	V
Duration of output short circuit (see Note 4)	Unlimited	Unlimited	Unlimited	Unlimited	
Continuous total power dissipation			See Dissipation Rating Table		
Operating free-air temperature range, T <sub>A</sub>	0 to 70	-40 to 85	-40 to 125	-55 to 125	°C
Package thermal impedance, θ <sub>JA</sub> (see Notes 5 and 6)	D package (8-pin)	97	97		°C/W
	D package (14-pin)	86	86		
	N package (14-pin)	76	76		
	NS package (14-pin)	80			
	P package (8-pin)	85	85		
	PS package (8-pin)	95	95		
	PW package (8-pin)	149			
	PW package (14-pin)	113	113		
Operating virtual junction temperature	150	150	150	150	°C
Case temperature for 60 seconds, T <sub>C</sub>	FK package			260	°C
Lead temperature 1.6 mm (1/16 inch) from case for 60 seconds	J or JG package			300	°C
Storage temperature range, T <sub>stg</sub>	-65 to 150	-65 to 150	-65 to 150	-65 to 150	°C

<sup>†</sup> Stresses beyond those listed under "absolute maximum ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated under "recommended operating conditions" is not implied. Exposure to absolute-maximum-rated conditions for extended periods may affect device reliability.

- NOTES:
1. All voltage values, except differential voltages, are with respect to the midpoint between V<sub>CC+</sub> and V<sub>CC-</sub>.
  2. Differential voltages are at IN+ with respect to IN-.
  3. The magnitude of the input voltage must never exceed the magnitude of the supply voltage or 15 V, whichever is less.
  4. The output may be shorted to ground or to either supply. Temperature and/or supply voltages must be limited to ensure that the dissipation rating is not exceeded.
  5. Maximum power dissipation is a function of T<sub>J(max)</sub>, θ<sub>JA</sub>, and T<sub>A</sub>. The maximum allowable power dissipation at any allowable ambient temperature is P<sub>D</sub> = (T<sub>J(max)</sub> - T<sub>A</sub>)/θ<sub>JA</sub>. Operating at the absolute maximum T<sub>J</sub> of 150°C can affect reliability.
  6. The package thermal impedance is calculated in accordance with JESD 51-7.

DISSIPATION RATING TABLE

PACKAGE	T <sub>A</sub> ≤ 25°C POWER RATING	DERATING FACTOR	DERATE ABOVE T <sub>A</sub>	T <sub>A</sub> = 70°C POWER RATING	T <sub>A</sub> = 85°C POWER RATING	T <sub>A</sub> = 125°C POWER RATING
D (14 pin)	680 mW	7.6 mW/°C	60°C	604 mW	490 mW	186 mW
FK	680 mW	11.0 mW/°C	88°C	680 mW	680 mW	273 mW
J	680 mW	11.0 mW/°C	88°C	680 mW	680 mW	273 mW
JG	680 mW	8.4 mW/°C	69°C	672 mW	546 mW	210 mW

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**electrical characteristics,  $V_{CC\pm} = \pm 15$  V (unless otherwise noted)**

PARAMETER	TEST CONDITIONS	$T_A^\dagger$	TL081C TL082C TL084C			TL081AC TL082AC TL084AC			TL081BC TL082BC TL084BC			TL081I TL082I TL084I			UNIT
			MIN	TYP	MAX	MIN	TYP	MAX	MIN	TYP	MAX	MIN	TYP	MAX	
$V_{IO}$	$V_O = 0$ $R_S = 50 \Omega$	$25^\circ C$ Full range	3	15	20	3	6	7.5	2	3	5	3	6	9	mV
$\alpha V_{IO}$	Temperature coefficient of input offset voltage	$V_O = 0$ $R_S = 50 \Omega$	Full range	18		18		18	18		18		18		$\mu V/C$
$I_{IO}$	Input offset current $\ddagger$	$V_O = 0$ Full range	$25^\circ C$	5	200	5	100		5	100		5	100		pA
$I_B$	Input bias current $\ddagger$	$V_O = 0$ Full range	$25^\circ C$	30	400	30	200		30	200		30	200		pA
$V_{ICR}$	Common-mode input voltage range		$25^\circ C$	$\pm 11$	$-12$	$\pm 11$	$-12$		$\pm 11$	$-12$		$\pm 11$	$-12$		20
$V_{OM}$	Maximum peak output voltage swing	$R_L = 10 k\Omega$ $R_L \geq 10 k\Omega$ $R_L \geq 2 k\Omega$	$25^\circ C$ Full range	$\pm 12$	$\pm 13.5$	$\pm 12$	$\pm 13.5$		$\pm 12$	$\pm 13.5$		$\pm 12$	$\pm 13.5$		V
$A_{VD}$	Large-signal differential voltage amplification	$V_O = \pm 10 V, R_L \geq 2 k\Omega$ $V_O = \pm 10 V, R_L \geq 2 k\Omega$	$25^\circ C$ Full range	25	200	50	200		50	200		50	200		V/mV
$B_1$	Unity-gain bandwidth		$25^\circ C$	15		25		25		25		25		25	MHz
$r_i$	Input resistance		$25^\circ C$			1012		1012		1012		1012		1012	$\Omega$
CMRR	Common-mode rejection ratio	$V_{IC} = V_{ICR\min}, R_S = 50 \Omega$ $V_O = 0, R_S = 50 \Omega$	$25^\circ C$	70	86	75	86	75	86	75	86	75	86	75	dB
$kSVR$	Supply-voltage rejection ratio ( $(\Delta V_{CC\pm}) / (\Delta V_{IO})$ )	$V_{CC} = \pm 15 V \text{ to } \pm 9 V, R_S = 50 \Omega$	$25^\circ C$	70	86	80	86	80	86	80	86	80	86	80	dB
$I_{CC}$	Supply current (per amplifier)	$V_O = 0, \text{ No load}$	$25^\circ C$	1.4	2.8	1.4	2.8	1.4	2.8	1.4	2.8	1.4	2.8	1.4	mA
$V_{O1}/V_{O2}$	Crosstalk attenuation	$A_{VD} = 100$	$25^\circ C$	120		120		120		120		120		120	dB

$\dagger$  All characteristics are measured under open-loop conditions with zero common-mode voltage, unless otherwise specified. Full range for  $T_A$  is  $0^\circ C$  to  $70^\circ C$  for TL08\_C, TL08\_AC, TL08\_BC and  $-40^\circ C$  to  $85^\circ C$  for TL08\_I.

$\ddagger$  Input bias currents of an FET-input operational amplifier are normal junction reverse currents, which are temperature sensitive, as shown in Figure 17. Pulse techniques must be used that maintain the junction temperature as close to the ambient temperature as possible.

**TL081, TL081A, TL081B, TL082, TL082A, TL082B  
TL084, TL084A, TL084B**  
**JFET-INPUT OPERATIONAL AMPLIFIERS**  
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**electrical characteristics,  $V_{CC} \pm = \pm 15$  V (unless otherwise noted)**

PARAMETER	TEST CONDITIONS <sup>†</sup>	TA	TL081M, TL082M			TL084Q, TL084M			UNIT
			MIN	TYP	MAX	MIN	TYP	MAX	
V <sub>IO</sub>	Input offset voltage $V_O = 0, R_S = 50 \Omega$	25°C	3	6		3	9		mV
		Full range		9			15		
$\alpha V_{IO}$	Temperature coefficient of input offset voltage $V_O = 0, R_S = 50 \Omega$	Full range		18			18		$\mu\text{V}/^\circ\text{C}$
I <sub>IO</sub>	Input offset current <sup>‡</sup> $V_O = 0$	25°C	5	100		5	100		pA
		125°C		20			20		nA
I <sub>IB</sub>	Input bias current <sup>‡</sup> $V_O = 0$	25°C	30	200		30	200		pA
		125°C		50			50		nA
V <sub>ICR</sub>	Common-mode input voltage range	25°C	–12 ±11 to 15			–12 ±11 to 15			V
V <sub>OM</sub>	R <sub>L</sub> = 10 kΩ	25°C	±12	±13.5		±12	±13.5		V
	R <sub>L</sub> ≥ 10 kΩ	Full range	±12			±12			
	R <sub>L</sub> ≥ 2 kΩ		±10	±12		±10	±12		
AVD	V <sub>O</sub> = ±10 V, R <sub>L</sub> ≥ 2 kΩ	25°C	25	200		25	200		V/mV
	V <sub>O</sub> = ±10 V, R <sub>L</sub> ≥ 2 kΩ	Full range	15			15			
B <sub>1</sub>	Unity-gain bandwidth	25°C		3			3		MHz
r <sub>i</sub>	Input resistance	25°C		10 <sup>12</sup>			10 <sup>12</sup>		Ω
CMRR	Common-mode rejection ratio $V_{IC} = V_{ICR\min}, V_O = 0, R_S = 50 \Omega$	25°C	80	86		80	86		dB
k <sub>SVR</sub>	Supply-voltage rejection ratio ( $\Delta V_{CC} \pm / \Delta V_{IO}$ )	V <sub>CC</sub> = ±15 V to ±9 V, V <sub>O</sub> = 0, R <sub>S</sub> = 50 Ω	25°C	80	86		80	86	dB
I <sub>CC</sub>	Supply current (per amplifier)	V <sub>O</sub> = 0, No load	25°C	1.4	2.8		1.4	2.8	mA
V <sub>O1</sub> /V <sub>O2</sub>	Crosstalk attenuation	A <sub>VD</sub> = 100	25°C	120			120		dB

<sup>†</sup> All characteristics are measured under open-loop conditions, with zero common-mode input voltage, unless otherwise specified.

<sup>‡</sup> Input bias currents of a FET-input operational amplifier are normal junction reverse currents, which are temperature sensitive, as shown in Figure 17. Pulse techniques must be used that maintain the junction temperatures as close to the ambient temperature as possible.

**operating characteristics,  $V_{CC} \pm = \pm 15$  V,  $T_A = 25^\circ\text{C}$  (unless otherwise noted)**

PARAMETER	TEST CONDITIONS			MIN	TYP	MAX	UNIT
SR	V <sub>I</sub> = 10 V, R <sub>L</sub> = 2 kΩ, C <sub>L</sub> = 100 pF, See Figure 1			8*	13		V/μs
	V <sub>I</sub> = 10 V, R <sub>L</sub> = 2 kΩ, C <sub>L</sub> = 100 pF, T <sub>A</sub> = –55°C to 125°C, See Figure 1				5*		
t <sub>r</sub>	Rise time V <sub>I</sub> = 20 mV, R <sub>L</sub> = 2 kΩ, C <sub>L</sub> = 100 pF, See Figure 1			0.05			μs
					20		%
V <sub>n</sub>	Equivalent input noise voltage R <sub>S</sub> = 20 Ω	f = 1 kHz			18		nV/√Hz
		f = 10 Hz to 10 kHz			4		μV
I <sub>n</sub>	Equivalent input noise current R <sub>S</sub> = 20 Ω,	f = 1 kHz			0.01		pA/√Hz
THD	V <sub>Irms</sub> = 6 V, f = 1 kHz	A <sub>VD</sub> = 1, R <sub>S</sub> ≤ 1 kΩ, R <sub>L</sub> ≥ 2 kΩ,			0.003		%

\*On products compliant to MIL-PRF-38535, this parameter is not production tested.

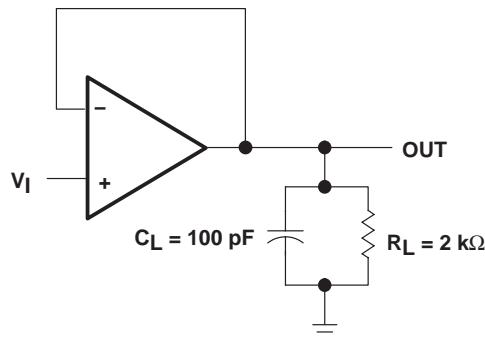
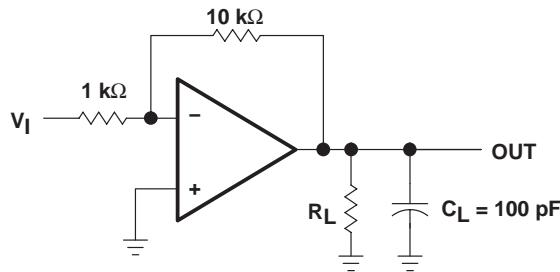
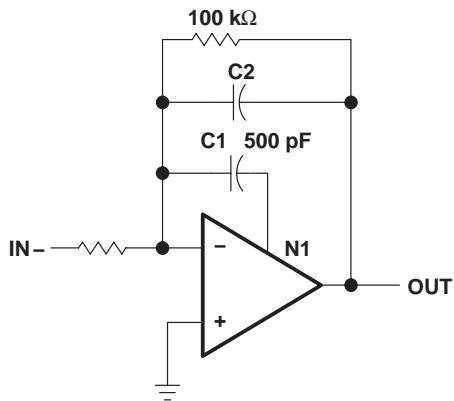
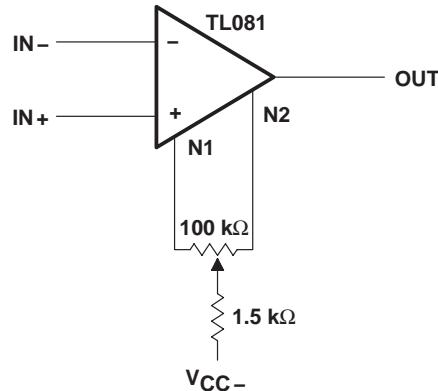


**TL081, TL081A, TL081B, TL082, TL082A, TL082B****TL084, TL084A, TL084B****JFET-INPUT OPERATIONAL AMPLIFIERS**

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**operating characteristics,  $V_{CC\pm} = \pm 15$  V,  $T_A = 25^\circ\text{C}$** 

PARAMETER	TEST CONDITIONS			MIN	TYP	MAX	UNIT	
SR Slew rate at unity gain	$V_I = 10$ V,	$R_L = 2$ k $\Omega$ ,	$C_L = 100$ pF,	See Figure 1	8	13		V/ $\mu$ s
$t_r$ Rise time	$V_I = 20$ mV,	$R_L = 2$ k $\Omega$ ,	$C_L = 100$ pF,	See Figure 1	0.05			$\mu$ s
Overshoot factor					20			%
$V_n$ Equivalent input noise voltage	$R_S = 20$ $\Omega$	$f = 1$ kHz			18			nV/ $\sqrt{\text{Hz}}$
		$f = 10$ Hz to 10 kHz			4			$\mu$ V
$I_n$ Equivalent input noise current	$R_S = 20$ $\Omega$ ,	$f = 1$ kHz			0.01			pA/ $\sqrt{\text{Hz}}$
THD Total harmonic distortion	$V_{I\text{rms}} = 6$ V, $f = 1$ kHz	$A_{VD} = 1$ ,	$R_S \leq 1$ k $\Omega$ ,	$R_L \geq 2$ k $\Omega$ ,	0.003			%

**PARAMETER MEASUREMENT INFORMATION****Figure 1****Figure 2****Figure 3****Figure 4**

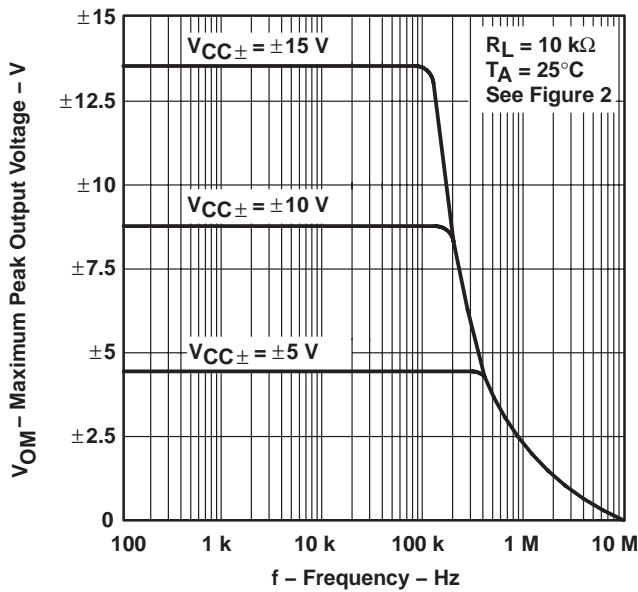
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**TYPICAL CHARACTERISTICS**

**Table of Graphs**

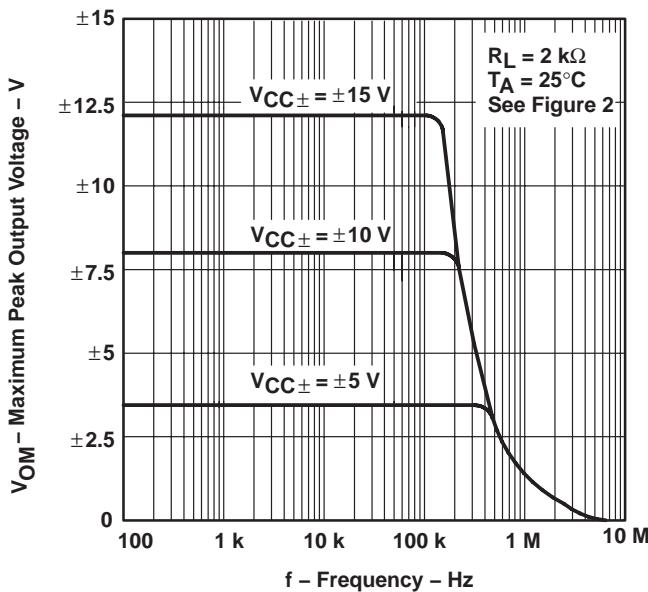
		FIGURE
V <sub>OM</sub>	Maximum peak output voltage	vs Frequency 5, 6, 7 vs Free-air temperature 8 vs Load resistance 9 vs Supply voltage 10
AVD	Large-signal differential voltage amplification	vs Free-air temperature 11 vs Frequency 12
	Differential voltage amplification	vs Frequency with feed-forward compensation 13
P <sub>D</sub>	Total power dissipation	vs Free-air temperature 14
I <sub>CC</sub>	Supply current	vs Free-air temperature 15 vs Supply voltage 16
I <sub>IB</sub>	Input bias current	vs Free-air temperature 17
	Large-signal pulse response	vs Time 18
V <sub>O</sub>	Output voltage	vs Elapsed time 19
CMRR	Common-mode rejection ratio	vs Free-air temperature 20
V <sub>n</sub>	Equivalent input noise voltage	vs Frequency 21
THD	Total harmonic distortion	vs Frequency 22

**MAXIMUM PEAK OUTPUT VOLTAGE  
vs  
FREQUENCY**



**Figure 5**

**MAXIMUM PEAK OUTPUT VOLTAGE  
vs  
FREQUENCY**



**Figure 6**

**TL081, TL081A, TL081B, TL082, TL082A, TL082B  
TL084, TL084A, TL084B  
JFET-INPUT OPERATIONAL AMPLIFIERS**

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**TYPICAL CHARACTERISTICS†**

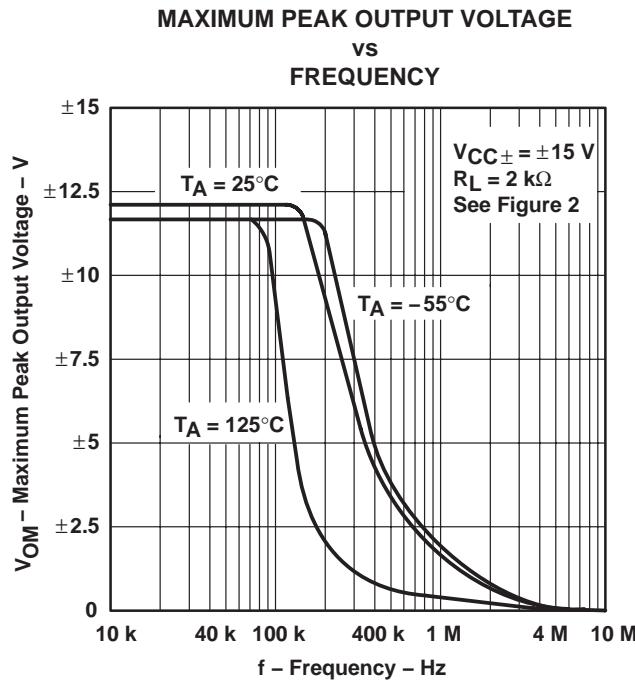


Figure 7

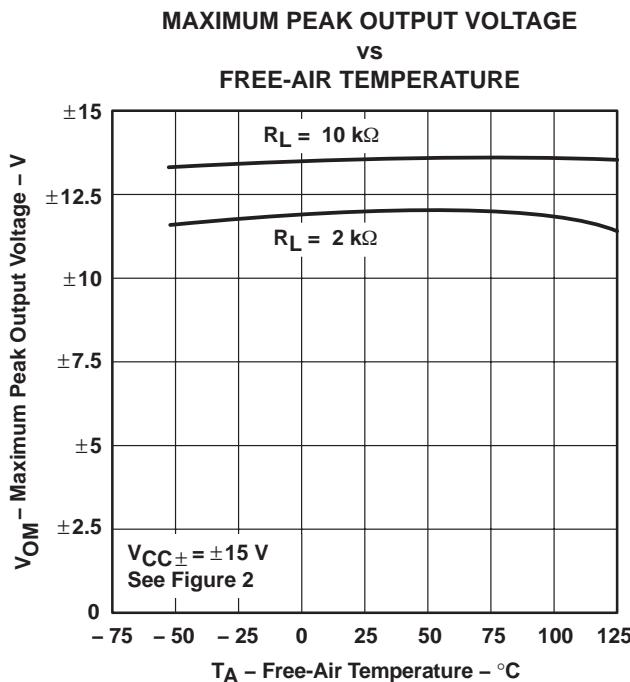


Figure 8

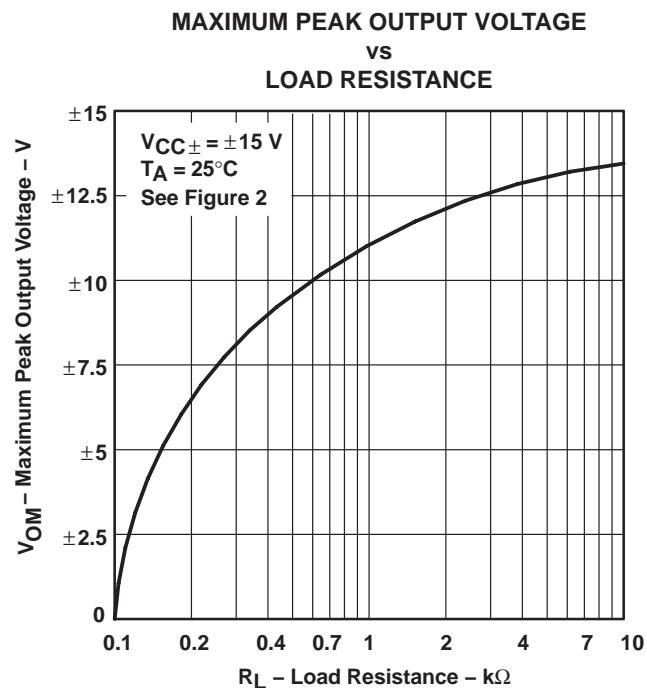


Figure 9

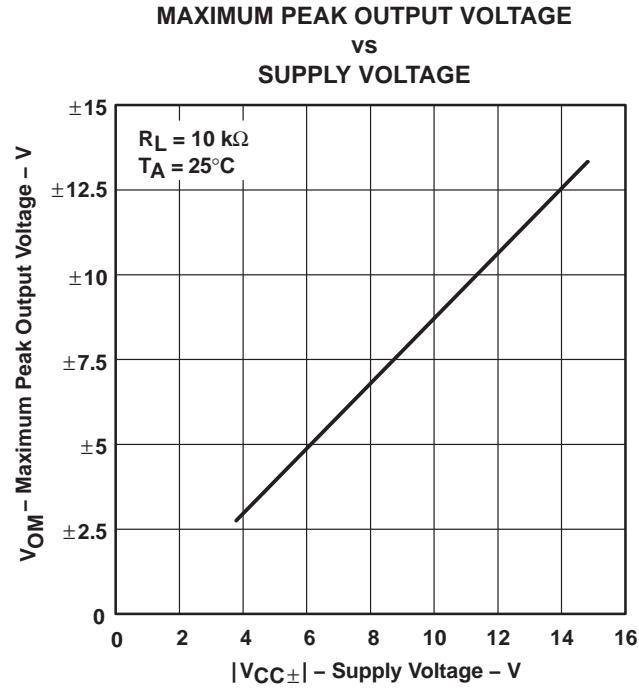


Figure 10

† Data at high and low temperatures are applicable only within the rated operating free-air temperature ranges of the various devices.

### TYPICAL CHARACTERISTICS<sup>†</sup>

**LARGE-SIGNAL  
DIFFERENTIAL VOLTAGE AMPLIFICATION  
vs  
FREE-AIR TEMPERATURE**

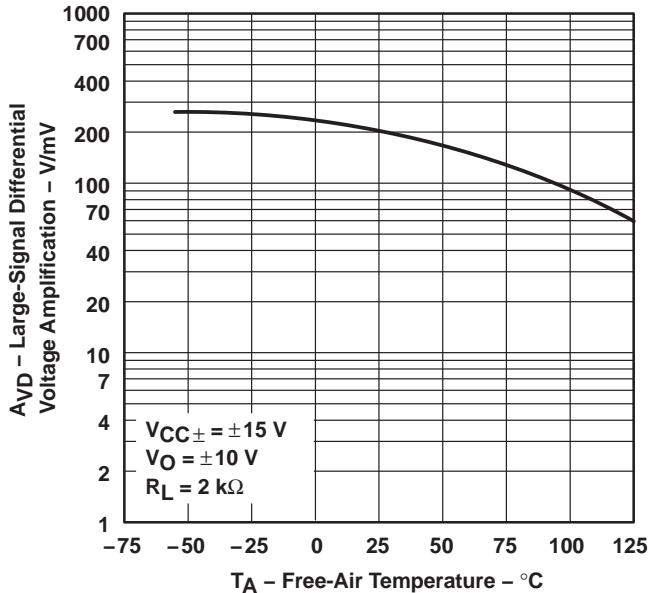


Figure 11

**LARGE-SIGNAL  
DIFFERENTIAL VOLTAGE AMPLIFICATION  
vs  
FREQUENCY**

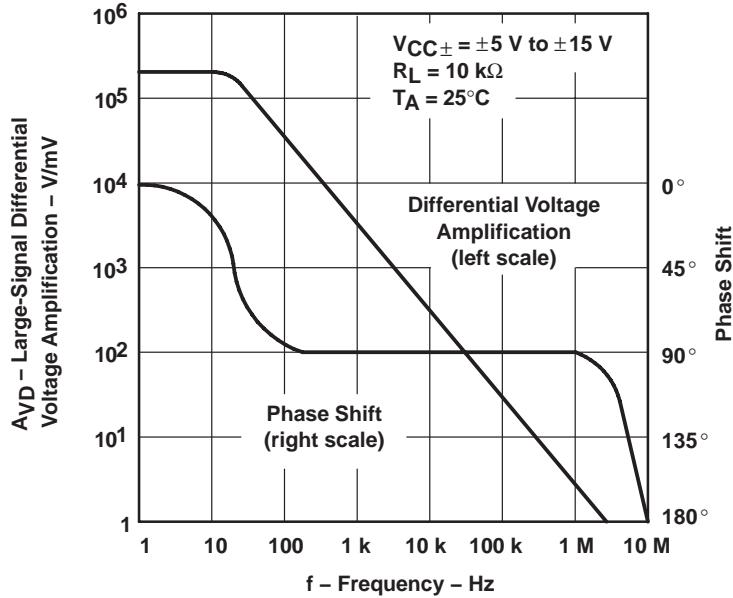


Figure 12

<sup>†</sup> Data at high and low temperatures are applicable only within the rated operating free-air temperature ranges of the various devices.

**TL081, TL081A, TL081B, TL082, TL082A, TL082B  
 TL084, TL084A, TL084B  
 JFET-INPUT OPERATIONAL AMPLIFIERS**

SLOS081G – FEBRUARY 1977 – REVISED SEPTEMBER 2004

**TYPICAL CHARACTERISTICS†**

**DIFFERENTIAL VOLTAGE AMPLIFICATION  
 VS  
 FREQUENCY WITH FEED-FORWARD COMPENSATION**

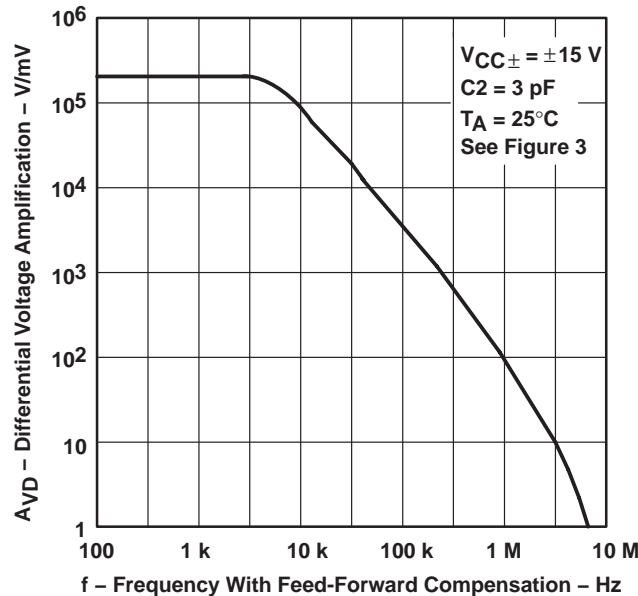


Figure 13

**TOTAL POWER DISSIPATION  
 VS  
 FREE-AIR TEMPERATURE**

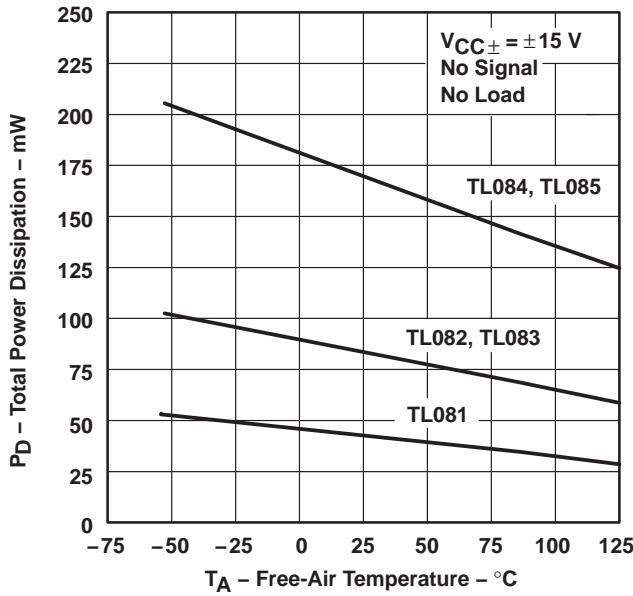


Figure 14

**SUPPLY CURRENT PER AMPLIFIER  
 VS  
 FREE-AIR TEMPERATURE**

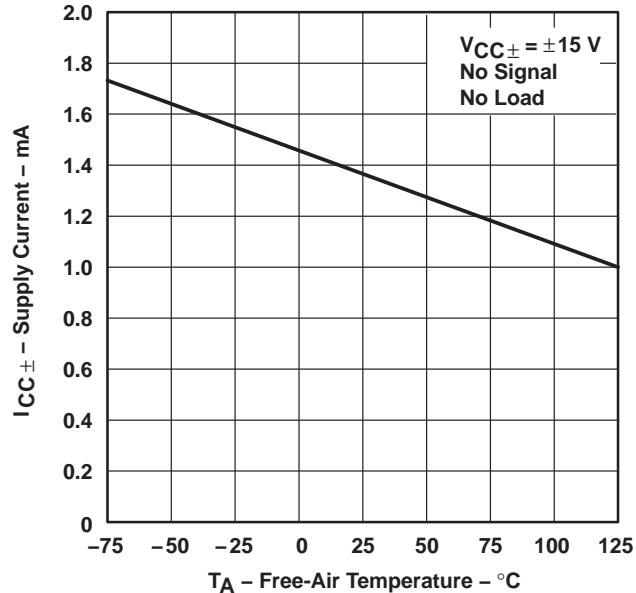


Figure 15

**SUPPLY CURRENT  
 VS  
 SUPPLY VOLTAGE**

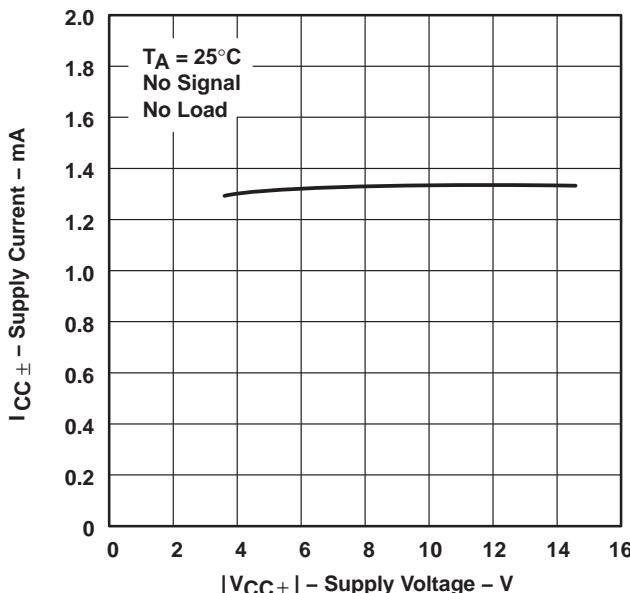


Figure 16

† Data at high and low temperatures are applicable only within the rated operating free-air temperature ranges of the various devices.

## TYPICAL CHARACTERISTICS†

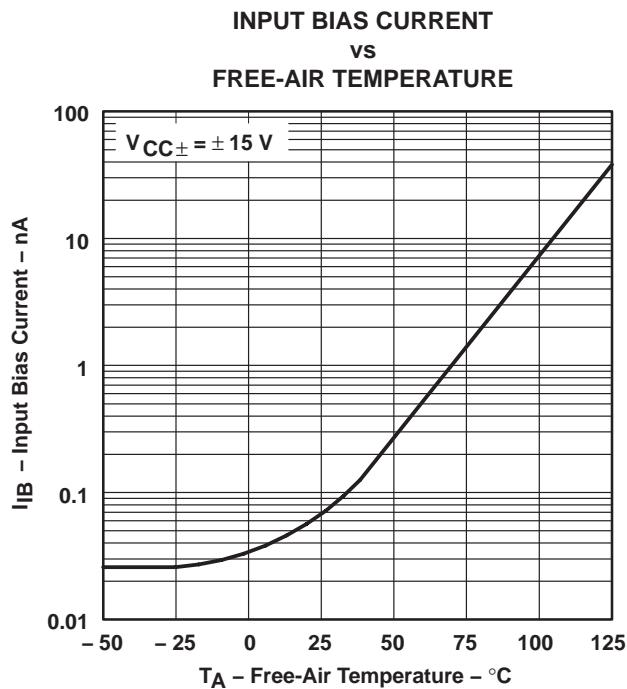


Figure 17

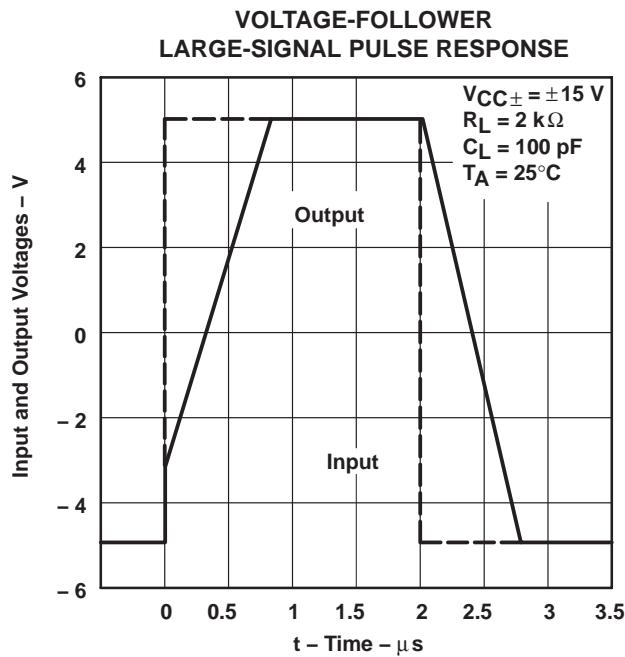


Figure 18

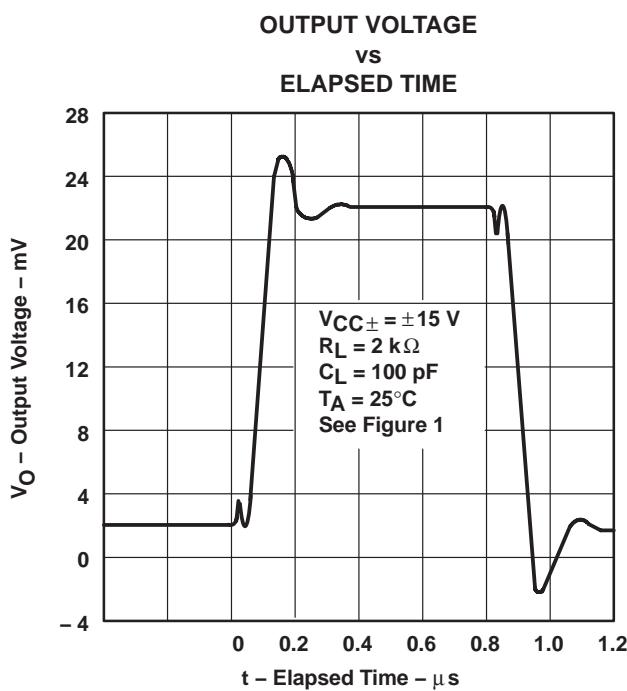


Figure 19

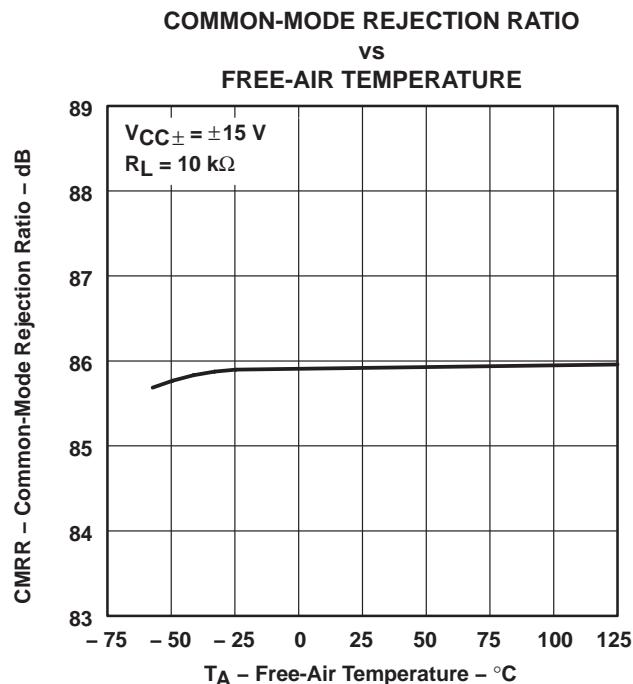


Figure 20

† Data at high and low temperatures are applicable only within the rated operating free-air temperature ranges of the various devices.

**TL081, TL081A, TL081B, TL082, TL082A, TL082B  
TL084, TL084A, TL084B  
JFET-INPUT OPERATIONAL AMPLIFIERS**

SLOS081G – FEBRUARY 1977 – REVISED SEPTEMBER 2004

**TYPICAL CHARACTERISTICS<sup>†</sup>**

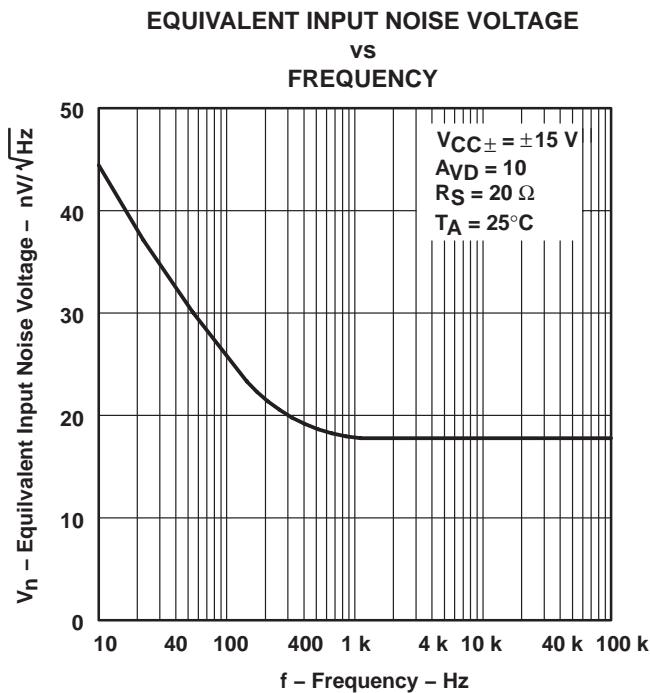


Figure 21

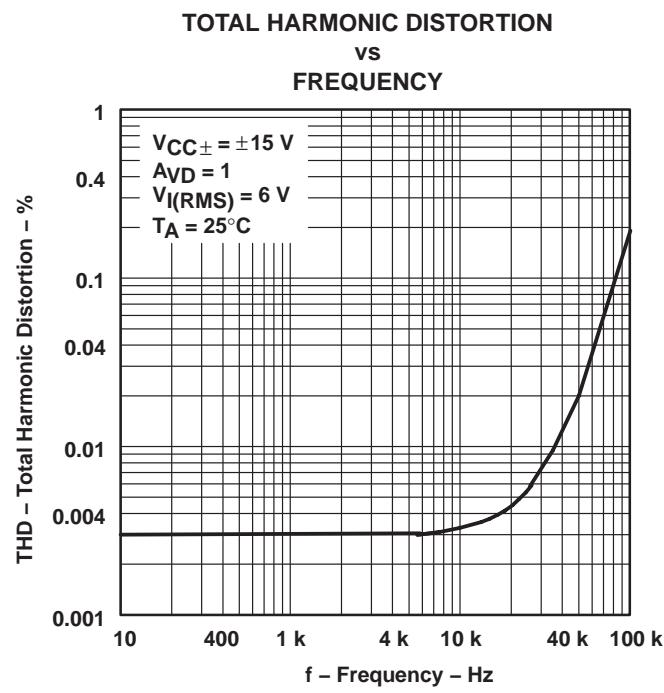


Figure 22

<sup>†</sup> Data at high and low temperatures are applicable only within the rated operating free-air temperature ranges of the various devices.

**APPLICATION INFORMATION**

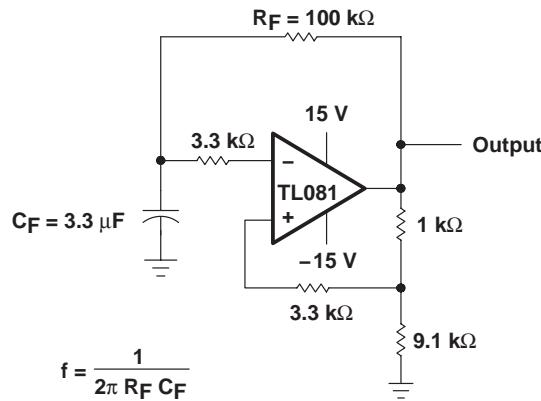


Figure 23

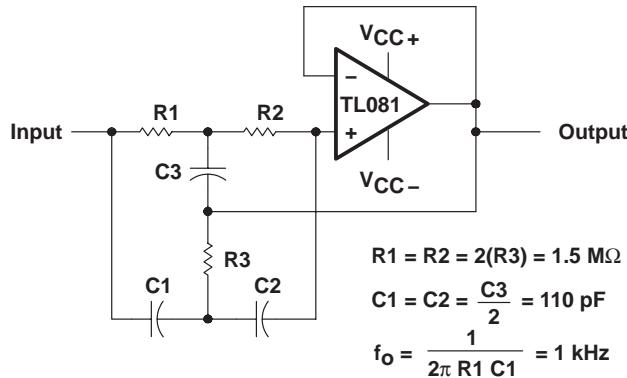
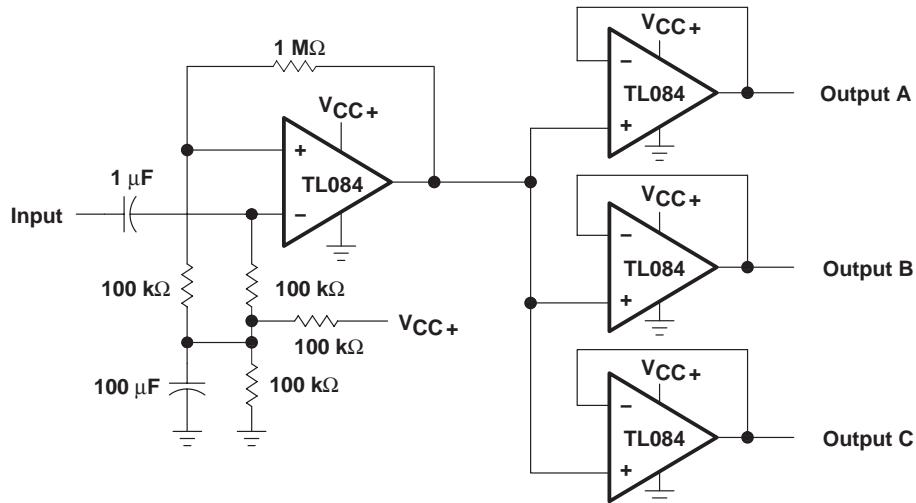
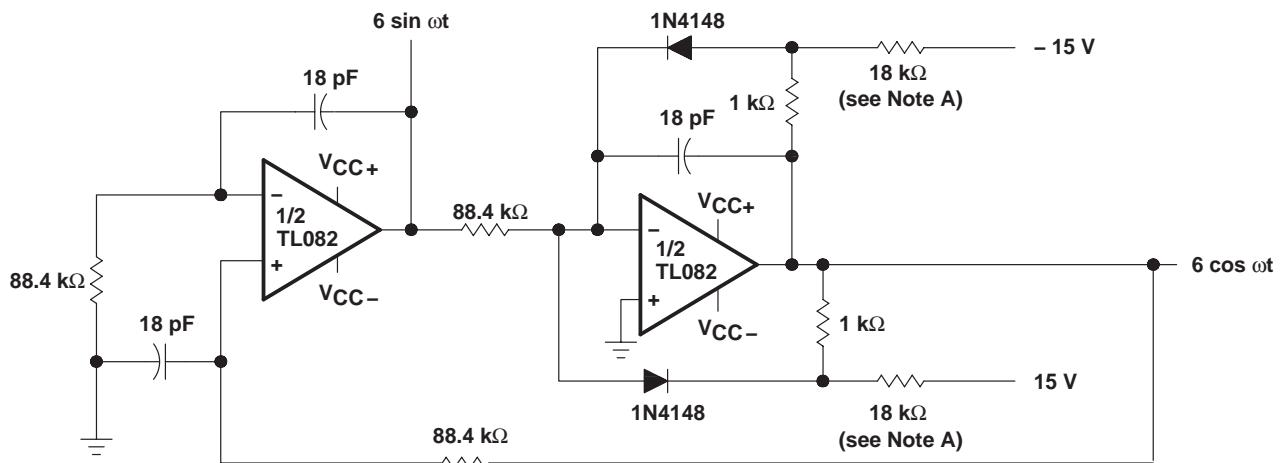


Figure 24

## APPLICATION INFORMATION



**Figure 25. Audio-Distribution Amplifier**



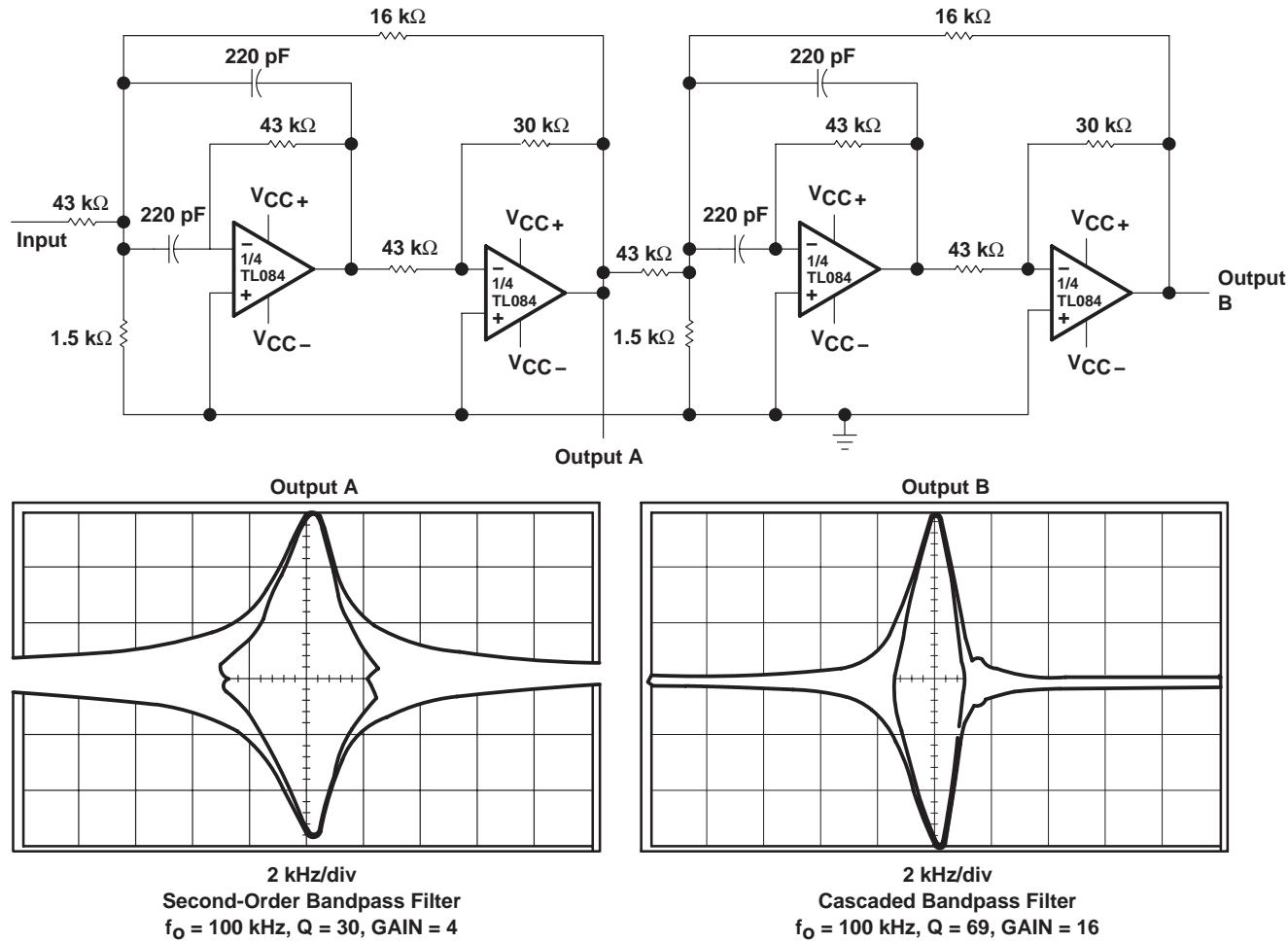
NOTE A: These resistor values may be adjusted for a symmetrical output.

**Figure 26. 100-KHz Quadrature Oscillator**

**TL081, TL081A, TL081B, TL082, TL082A, TL082B  
 TL084, TL084A, TL084B  
 JFET-INPUT OPERATIONAL AMPLIFIERS**

SLOS081G – FEBRUARY 1977 – REVISED SEPTEMBER 2004

**APPLICATION INFORMATION**



**Figure 27. Positive-Feedback Bandpass Filter**

**PACKAGING INFORMATION**

Orderable Device	Status <sup>(1)</sup>	Package Type	Package Drawing	Pins	Package Qty	Eco Plan <sup>(2)</sup>	Lead/Ball Finish	MSL Peak Temp <sup>(3)</sup>
5962-9851501Q2A	ACTIVE	LCCC	FK	20	1	TBD	POST-PLATE	Level-NC-NC-NC
5962-9851501QPA	ACTIVE	CDIP	JG	8	1	TBD	A42 SNPB	Level-NC-NC-NC
5962-9851503Q2A	ACTIVE	LCCC	FK	20	1	TBD	POST-PLATE	Level-NC-NC-NC
5962-9851503QCA	ACTIVE	CDIP	J	14	1	TBD	A42 SNPB	Level-NC-NC-NC
TL081ACD	ACTIVE	SOIC	D	8	75	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
TL081ACDE4	ACTIVE	SOIC	D	8	75	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
TL081ACDR	ACTIVE	SOIC	D	8	2500	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
TL081ACDRE4	ACTIVE	SOIC	D	8	2500	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
TL081ACJG	OBSOLETE	CDIP	JG	8		TBD	Call TI	Call TI
TL081ACP	ACTIVE	PDIP	P	8	50	Pb-Free (RoHS)	CU NIPDAU	Level-NC-NC-NC
TL081BCD	ACTIVE	SOIC	D	8	75	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
TL081BCDE4	ACTIVE	SOIC	D	8	75	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
TL081BCDR	ACTIVE	SOIC	D	8	2500	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
TL081BCDRE4	ACTIVE	SOIC	D	8	2500	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
TL081BCP	ACTIVE	PDIP	P	8	50	Pb-Free (RoHS)	CU NIPDAU	Level-NC-NC-NC
TL081BCPE4	ACTIVE	PDIP	P	8	50	Pb-Free (RoHS)	CU NIPDAU	Level-NC-NC-NC
TL081CD	ACTIVE	SOIC	D	8	75	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
TL081CDE4	ACTIVE	SOIC	D	8	75	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
TL081CDR	ACTIVE	SOIC	D	8	2500	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
TL081CDRE4	ACTIVE	SOIC	D	8	2500	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
TL081CP	ACTIVE	PDIP	P	8	50	Pb-Free (RoHS)	CU NIPDAU	Level-NC-NC-NC
TL081CPE4	ACTIVE	PDIP	P	8	50	Pb-Free (RoHS)	CU NIPDAU	Level-NC-NC-NC
TL081CPSR	ACTIVE	SO	PS	8	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
TL081CPSRE4	ACTIVE	SO	PS	8	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
TL081CPWLE	OBSOLETE	TSSOP	PW	8		TBD	Call TI	Call TI
TL081ID	ACTIVE	SOIC	D	8	75	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
TL081IDE4	ACTIVE	SOIC	D	8	75	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM

Orderable Device	Status <sup>(1)</sup>	Package Type	Package Drawing	Pins	Package Qty	Eco Plan <sup>(2)</sup>	Lead/Ball Finish	MSL Peak Temp <sup>(3)</sup>
TL081IDR	ACTIVE	SOIC	D	8	2500	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
TL081IDRE4	ACTIVE	SOIC	D	8	2500	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
TL081IP	ACTIVE	PDIP	P	8	50	Pb-Free (RoHS)	CU NIPDAU	Level-NC-NC-NC
TL081IPE4	ACTIVE	PDIP	P	8	50	Pb-Free (RoHS)	CU NIPDAU	Level-NC-NC-NC
TL081MFKB	OBsolete	LCCC	FK	20		TBD	Call TI	Call TI
TL081MJG	OBsolete	CDIP	JG	8		TBD	Call TI	Call TI
TL081MJGB	OBsolete	CDIP	JG	8		TBD	Call TI	Call TI
TL082ACD	ACTIVE	SOIC	D	8	75	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-2-260C-1YEAR
TL082ACDE4	ACTIVE	SOIC	D	8	75	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-2-260C-1YEAR
TL082ACDG4	ACTIVE	SOIC	D	8	75	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-2-260C-1YEAR
TL082ACDR	ACTIVE	SOIC	D	8	2500	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-2-260C-1YEAR
TL082ACDRE4	ACTIVE	SOIC	D	8	2500	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-2-260C-1YEAR
TL082ACDRG4	ACTIVE	SOIC	D	8	2500	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-2-260C-1YEAR
TL082ACP	ACTIVE	PDIP	P	8	50	Pb-Free (RoHS)	CU NIPDAU	Level-NC-NC-NC
TL082ACPE4	ACTIVE	PDIP	P	8	50	Pb-Free (RoHS)	CU NIPDAU	Level-NC-NC-NC
TL082ACPSR	ACTIVE	SO	PS	8	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
TL082ACPSRE4	ACTIVE	SO	PS	8	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
TL082BCD	ACTIVE	SOIC	D	8	75	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
TL082BCDE4	ACTIVE	SOIC	D	8	75	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
TL082BCDR	ACTIVE	SOIC	D	8	2500	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
TL082BCDRE4	ACTIVE	SOIC	D	8	2500	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
TL082BCP	ACTIVE	PDIP	P	8	50	Pb-Free (RoHS)	CU NIPDAU	Level-NC-NC-NC
TL082BCPE4	ACTIVE	PDIP	P	8	50	Pb-Free (RoHS)	CU NIPDAU	Level-NC-NC-NC
TL082CD	ACTIVE	SOIC	D	8	75	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-2-260C-1YEAR
TL082CDE4	ACTIVE	SOIC	D	8	75	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-2-260C-1YEAR
TL082CDG4	ACTIVE	SOIC	D	8	75	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-2-260C-1YEAR
TL082CDR	ACTIVE	SOIC	D	8	2500	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-2-260C-1YEAR

Orderable Device	Status <sup>(1)</sup>	Package Type	Package Drawing	Pins	Package Qty	Eco Plan <sup>(2)</sup>	Lead/Ball Finish	MSL Peak Temp <sup>(3)</sup>
TL082CDRE4	ACTIVE	SOIC	D	8	2500	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-2-260C-1YEAR
TL082CDRG4	ACTIVE	SOIC	D	8	2500	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-2-260C-1YEAR
TL082CJG	OBsolete	CDIP	JG	8		TBD	Call TI	Call TI
TL082CP	ACTIVE	PDIP	P	8	50	Pb-Free (RoHS)	CU NIPDAU	Level-NC-NC-NC
TL082CPE4	ACTIVE	PDIP	P	8	50	Pb-Free (RoHS)	CU NIPDAU	Level-NC-NC-NC
TL082CPSR	ACTIVE	SO	PS	8	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
TL082CPSRG4	ACTIVE	SO	PS	8	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
TL082CPW	ACTIVE	TSSOP	PW	8	150	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
TL082CPWE4	ACTIVE	TSSOP	PW	8	150	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
TL082CPWLE	OBsolete	TSSOP	PW	8		TBD	Call TI	Call TI
TL082CPWR	ACTIVE	TSSOP	PW	8	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
TL082CPWRE4	ACTIVE	TSSOP	PW	8	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
TL082ID	ACTIVE	SOIC	D	8	75	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-2-260C-1YEAR
TL082IDE4	ACTIVE	SOIC	D	8	75	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-2-260C-1YEAR
TL082IDG4	ACTIVE	SOIC	D	8	75	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-2-260C-1YEAR
TL082IDR	ACTIVE	SOIC	D	8	2500	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-2-260C-1YEAR
TL082IDRE4	ACTIVE	SOIC	D	8	2500	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-2-260C-1YEAR
TL082IDRG4	ACTIVE	SOIC	D	8	2500	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-2-260C-1YEAR
TL082IJG	OBsolete	CDIP	JG	8		TBD	Call TI	Call TI
TL082IP	ACTIVE	PDIP	P	8	50	Pb-Free (RoHS)	CU NIPDAU	Level-NC-NC-NC
TL082IPE4	ACTIVE	PDIP	P	8	50	Pb-Free (RoHS)	CU NIPDAU	Level-NC-NC-NC
TL082IPWR	ACTIVE	TSSOP	PW	8	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
TL082IPWRE4	ACTIVE	TSSOP	PW	8	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
TL082MFK	OBsolete	LCCC	FK	20		TBD	Call TI	Call TI
TL082MFKB	ACTIVE	LCCC	FK	20	1	TBD	POST-PLATE	Level-NC-NC-NC
TL082MJG	ACTIVE	CDIP	JG	8	1	TBD	A42 SNPB	Level-NC-NC-NC
TL082MJGB	ACTIVE	CDIP	JG	8	1	TBD	A42 SNPB	Level-NC-NC-NC
TL084ACD	ACTIVE	SOIC	D	14	50	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
TL084ACDE4	ACTIVE	SOIC	D	14	50	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM

Orderable Device	Status <sup>(1)</sup>	Package Type	Package Drawing	Pins	Package Qty	Eco Plan <sup>(2)</sup>	Lead/Ball Finish	MSL Peak Temp <sup>(3)</sup>
no Sb/Br)								
TL084ACDR	ACTIVE	SOIC	D	14	2500	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
TL084ACDRE4	ACTIVE	SOIC	D	14	2500	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
TL084ACN	ACTIVE	PDIP	N	14	25	Pb-Free (RoHS)	CU NIPDAU	Level-NC-NC-NC
TL084ACNE4	ACTIVE	PDIP	N	14	25	Pb-Free (RoHS)	CU NIPDAU	Level-NC-NC-NC
TL084ACNSR	ACTIVE	SO	NS	14	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
TL084ACNSRE4	ACTIVE	SO	NS	14	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
TL084BCD	ACTIVE	SOIC	D	14	50	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
TL084BCDE4	ACTIVE	SOIC	D	14	50	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
TL084BCDR	ACTIVE	SOIC	D	14	2500	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
TL084BCDRE4	ACTIVE	SOIC	D	14	2500	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
TL084BCN	ACTIVE	PDIP	N	14	25	Pb-Free (RoHS)	CU NIPDAU	Level-NC-NC-NC
TL084BCNE4	ACTIVE	PDIP	N	14	25	Pb-Free (RoHS)	CU NIPDAU	Level-NC-NC-NC
TL084CD	ACTIVE	SOIC	D	14	50	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
TL084CDE4	ACTIVE	SOIC	D	14	50	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
TL084CDR	ACTIVE	SOIC	D	14	2500	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
TL084CDRE4	ACTIVE	SOIC	D	14	2500	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
TL084CJ	OBsolete	CDIP	J	14		TBD	Call TI	Call TI
TL084CN	ACTIVE	PDIP	N	14	25	Pb-Free (RoHS)	CU NIPDAU	Level-NC-NC-NC
TL084CNE4	ACTIVE	PDIP	N	14	25	Pb-Free (RoHS)	CU NIPDAU	Level-NC-NC-NC
TL084CNSLE	OBsolete	SO	NS	14		TBD	Call TI	Call TI
TL084CNSR	ACTIVE	SO	NS	14	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
TL084CNSRG4	ACTIVE	SO	NS	14	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
TL084CPW	ACTIVE	TSSOP	PW	14	90	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
TL084CPWE4	ACTIVE	TSSOP	PW	14	90	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
TL084CPWLE	OBsolete	TSSOP	PW	14		TBD	Call TI	Call TI
TL084CPWR	ACTIVE	TSSOP	PW	14	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
TL084CPWRE4	ACTIVE	TSSOP	PW	14	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM

Orderable Device	Status <sup>(1)</sup>	Package Type	Package Drawing	Pins	Package Qty	Eco Plan <sup>(2)</sup>	Lead/Ball Finish	MSL Peak Temp <sup>(3)</sup>
no Sb/Br)								
TL084ID	ACTIVE	SOIC	D	14	50	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
TL084IDE4	ACTIVE	SOIC	D	14	50	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
TL084IDR	ACTIVE	SOIC	D	14	2500	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
TL084IDRE4	ACTIVE	SOIC	D	14	2500	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
TL084IJ	OBSOLETE	CDIP	J	14		TBD	Call TI	Call TI
TL084IN	ACTIVE	PDIP	N	14	25	Pb-Free (RoHS)	CU NIPDAU	Level-NC-NC-NC
TL084INE4	ACTIVE	PDIP	N	14	25	Pb-Free (RoHS)	CU NIPDAU	Level-NC-NC-NC
TL084MFK	ACTIVE	LCCC	FK	20	1	TBD	POST-PLATE	Level-NC-NC-NC
TL084MFKB	ACTIVE	LCCC	FK	20	1	TBD	POST-PLATE	Level-NC-NC-NC
TL084MJ	ACTIVE	CDIP	J	14	1	TBD	A42 SNPB	Level-NC-NC-NC
TL084MJB	ACTIVE	CDIP	J	14	1	TBD	A42 SNPB	Level-NC-NC-NC
TL084QD	ACTIVE	SOIC	D	14	50	TBD	CU NIPDAU	Level-1-220C-UNLIM
TL084QDR	ACTIVE	SOIC	D	14	2500	TBD	CU NIPDAU	Level-1-220C-UNLIM

<sup>(1)</sup> The marketing status values are defined as follows:

**ACTIVE:** Product device recommended for new designs.

**LIFEBUY:** TI has announced that the device will be discontinued, and a lifetime-buy period is in effect.

**NRND:** Not recommended for new designs. Device is in production to support existing customers, but TI does not recommend using this part in a new design.

**PREVIEW:** Device has been announced but is not in production. Samples may or may not be available.

**OBSOLETE:** TI has discontinued the production of the device.

<sup>(2)</sup> Eco Plan - The planned eco-friendly classification: Pb-Free (RoHS) or Green (RoHS & no Sb/Br) - please check <http://www.ti.com/productcontent> for the latest availability information and additional product content details.

**TBD:** The Pb-Free/Green conversion plan has not been defined.

**Pb-Free (RoHS):** TI's terms "Lead-Free" or "Pb-Free" mean semiconductor products that are compatible with the current RoHS requirements for all 6 substances, including the requirement that lead not exceed 0.1% by weight in homogeneous materials. Where designed to be soldered at high temperatures, TI Pb-Free products are suitable for use in specified lead-free processes.

**Green (RoHS & no Sb/Br):** TI defines "Green" to mean Pb-Free (RoHS compatible), and free of Bromine (Br) and Antimony (Sb) based flame retardants (Br or Sb do not exceed 0.1% by weight in homogeneous material)

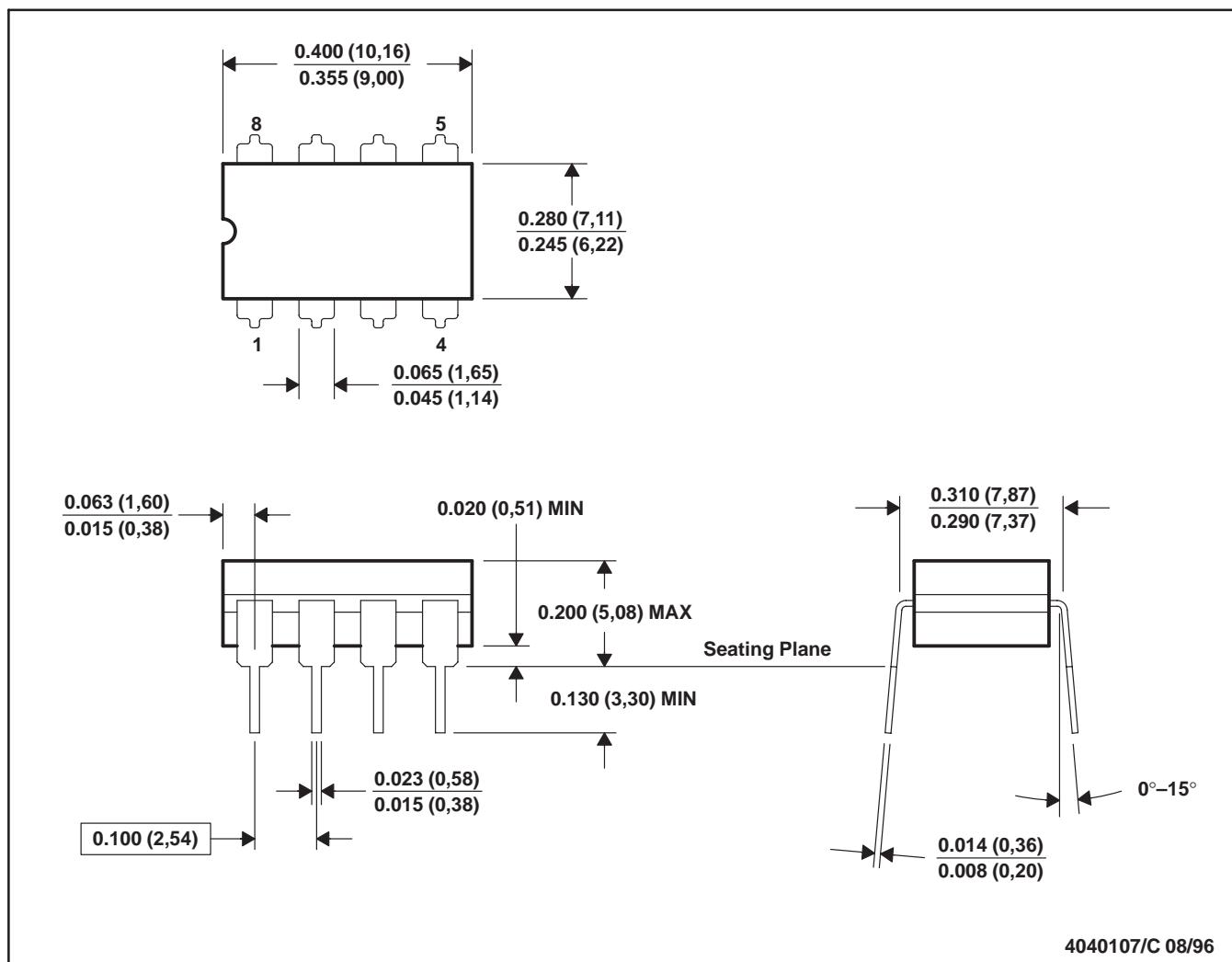
<sup>(3)</sup> MSL, Peak Temp. -- The Moisture Sensitivity Level rating according to the JEDEC industry standard classifications, and peak solder temperature.

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JG (R-GDIP-T8)

CERAMIC DUAL-IN-LINE

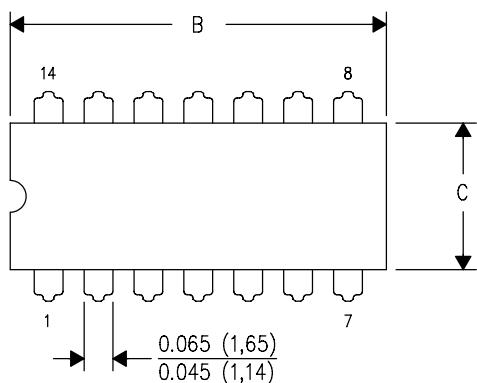


- NOTES:
- All linear dimensions are in inches (millimeters).
  - This drawing is subject to change without notice.
  - This package can be hermetically sealed with a ceramic lid using glass frit.
  - Index point is provided on cap for terminal identification.
  - Falls within MIL STD 1835 GDIP1-T8

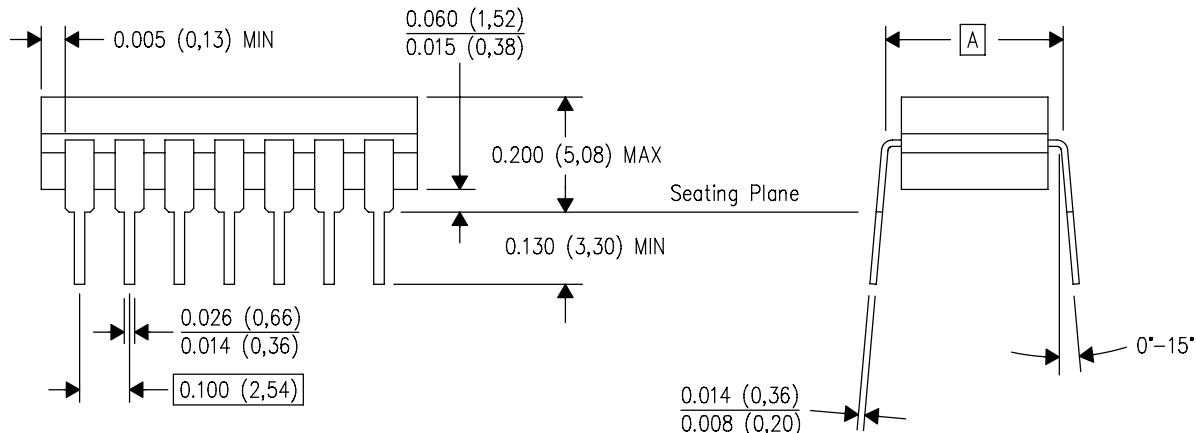
J (R-GDIP-T\*\*)

14 LEADS SHOWN

CERAMIC DUAL IN-LINE PACKAGE



PINS **\nDIM	14	16	18	20
A	0.300 (7,62) BSC	0.300 (7,62) BSC	0.300 (7,62) BSC	0.300 (7,62) BSC
B MAX	0.785 (19,94)	.840 (21,34)	0.960 (24,38)	1.060 (26,92)
B MIN	—	—	—	—
C MAX	0.300 (7,62)	0.300 (7,62)	0.310 (7,87)	0.300 (7,62)
C MIN	0.245 (6,22)	0.245 (6,22)	0.220 (5,59)	0.245 (6,22)



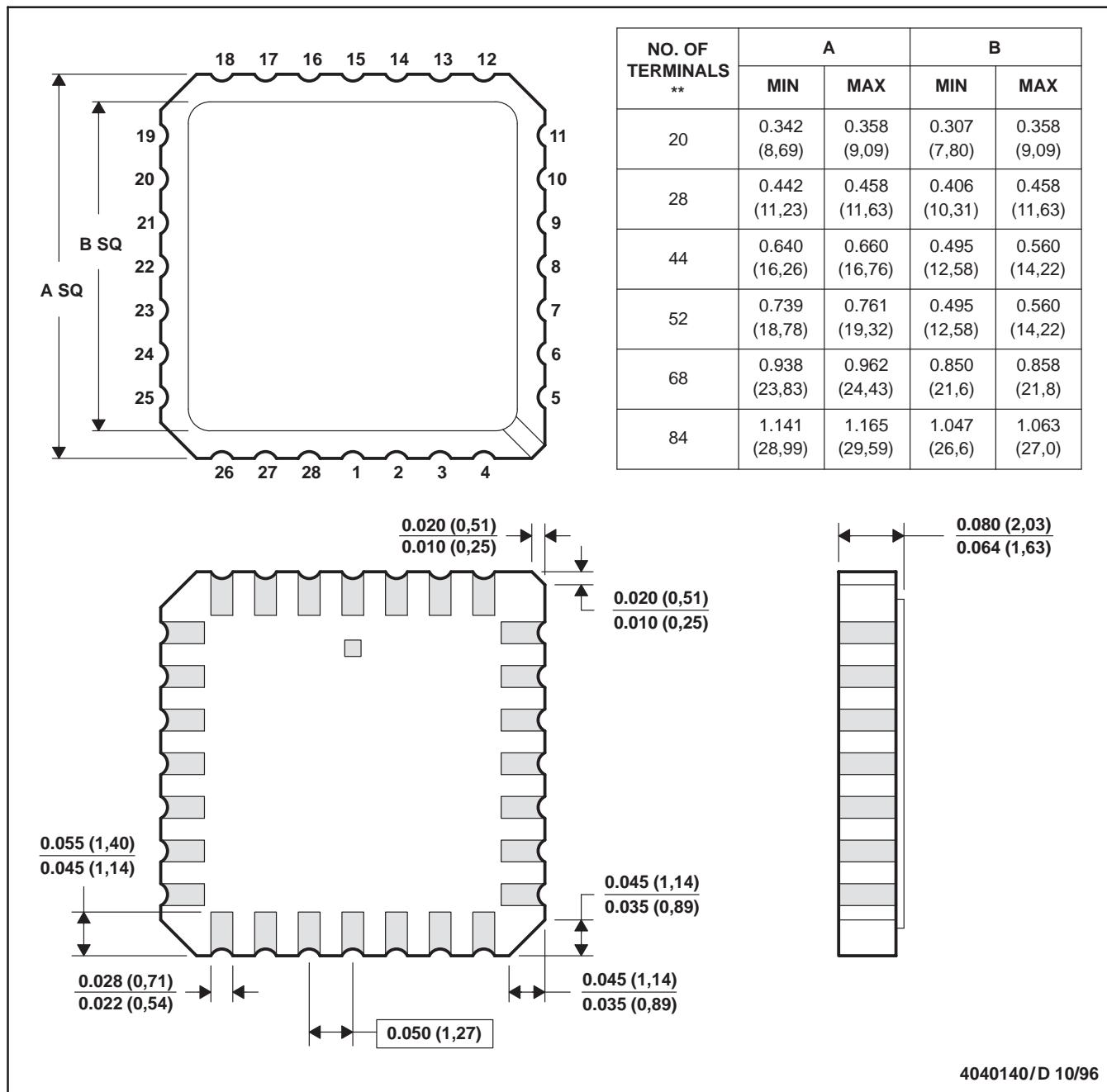
4040083/F 03/03

- NOTES:
- A. All linear dimensions are in inches (millimeters).
  - B. This drawing is subject to change without notice.
  - C. This package is hermetically sealed with a ceramic lid using glass frit.
  - D. Index point is provided on cap for terminal identification only on press ceramic glass frit seal only.
  - E. Falls within MIL STD 1835 GDIP1-T14, GDIP1-T16, GDIP1-T18 and GDIP1-T20.

## FK (S-CQCC-N\*\*)

## LEADLESS CERAMIC CHIP CARRIER

28 TERMINAL SHOWN



NOTES: A. All linear dimensions are in inches (millimeters).

B. This drawing is subject to change without notice.

C. This package can be hermetically sealed with a metal lid.

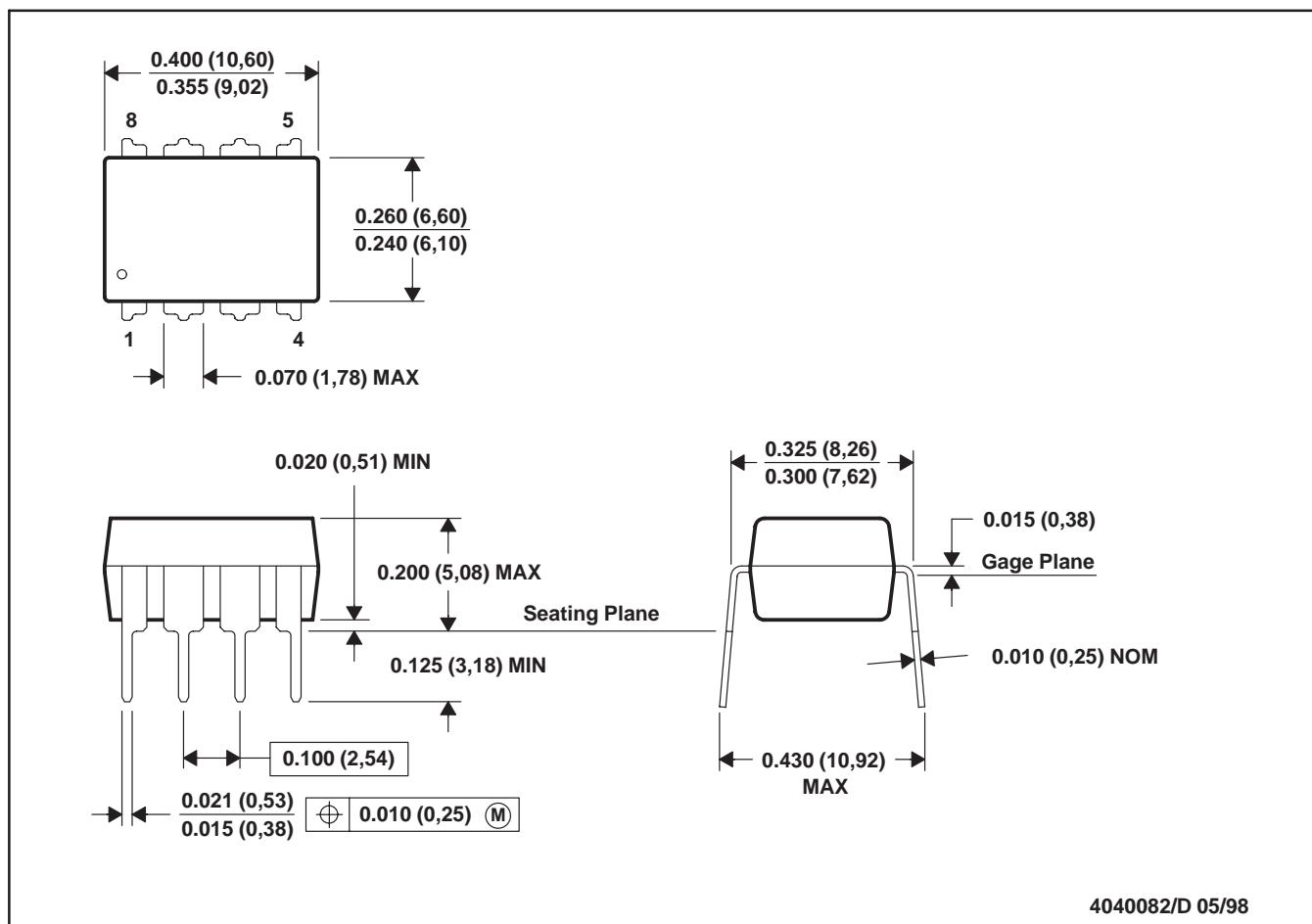
D. The terminals are gold plated.

E. Falls within JEDEC MS-004

4040140/D 10/96

P (R-PDIP-T8)

PLASTIC DUAL-IN-LINE



4040082/D 05/98

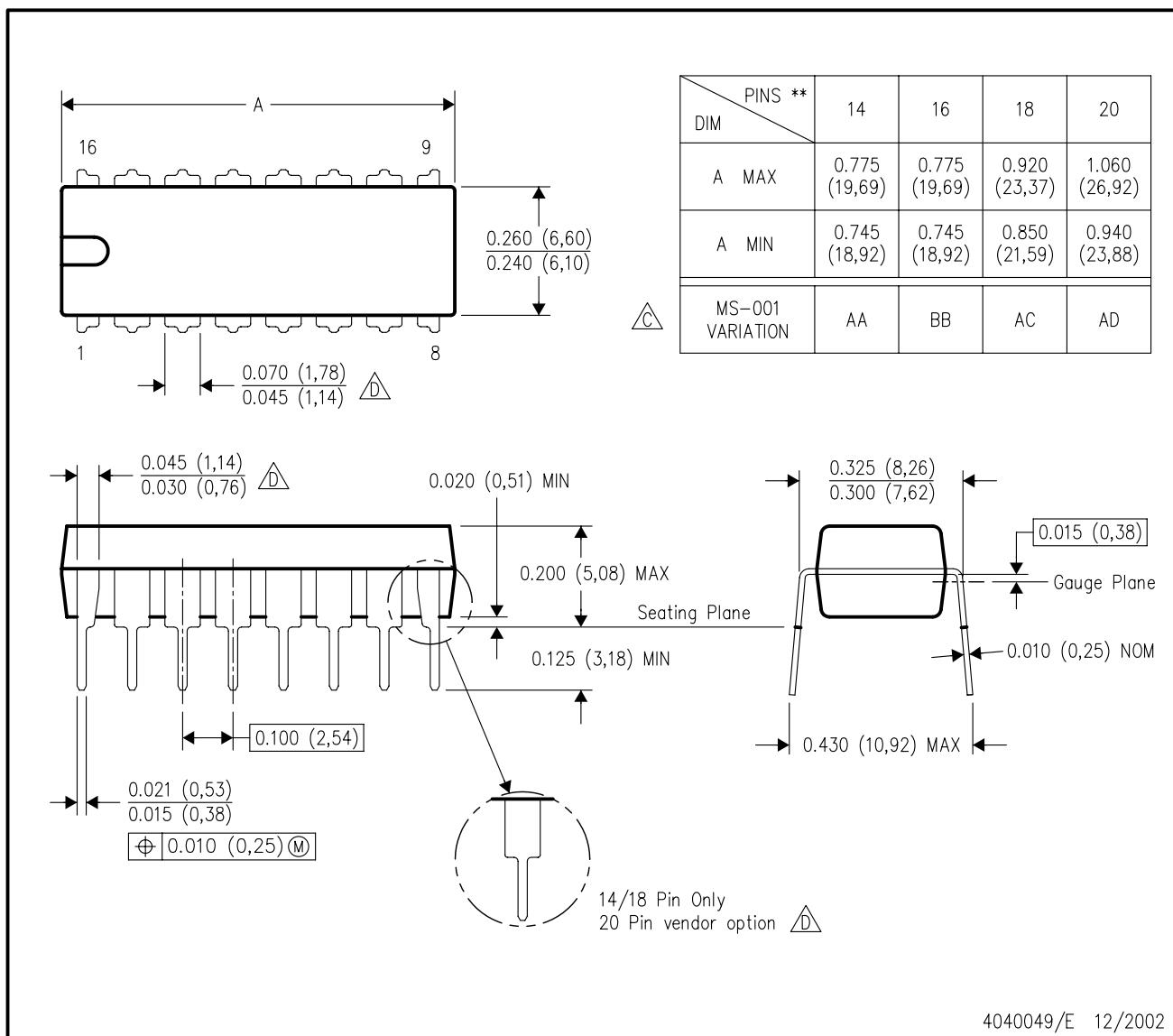
- NOTES:
- All linear dimensions are in inches (millimeters).
  - This drawing is subject to change without notice.
  - Falls within JEDEC MS-001

For the latest package information, go to [http://www.ti.com/sc/docs/package/pkg\\_info.htm](http://www.ti.com/sc/docs/package/pkg_info.htm)

## N (R-PDIP-T\*\*)

16 PINS SHOWN

## PLASTIC DUAL-IN-LINE PACKAGE



4040049/E 12/2002

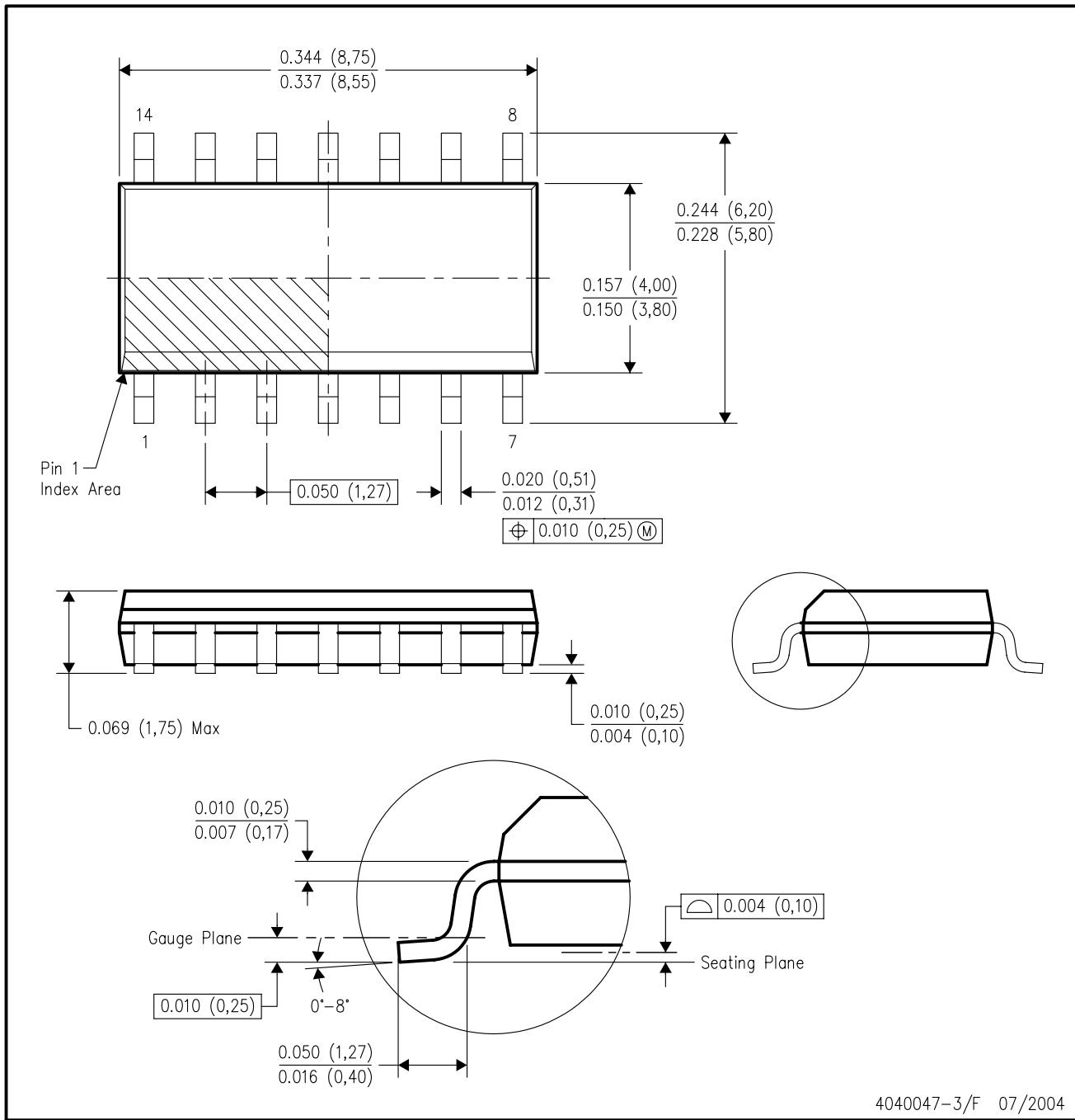
NOTES: A. All linear dimensions are in inches (millimeters).  
 B. This drawing is subject to change without notice.

Falls within JEDEC MS-001, except 18 and 20 pin minimum body length (Dim A).

The 20 pin end lead shoulder width is a vendor option, either half or full width.

## D (R-PDSO-G14)

## PLASTIC SMALL-OUTLINE PACKAGE

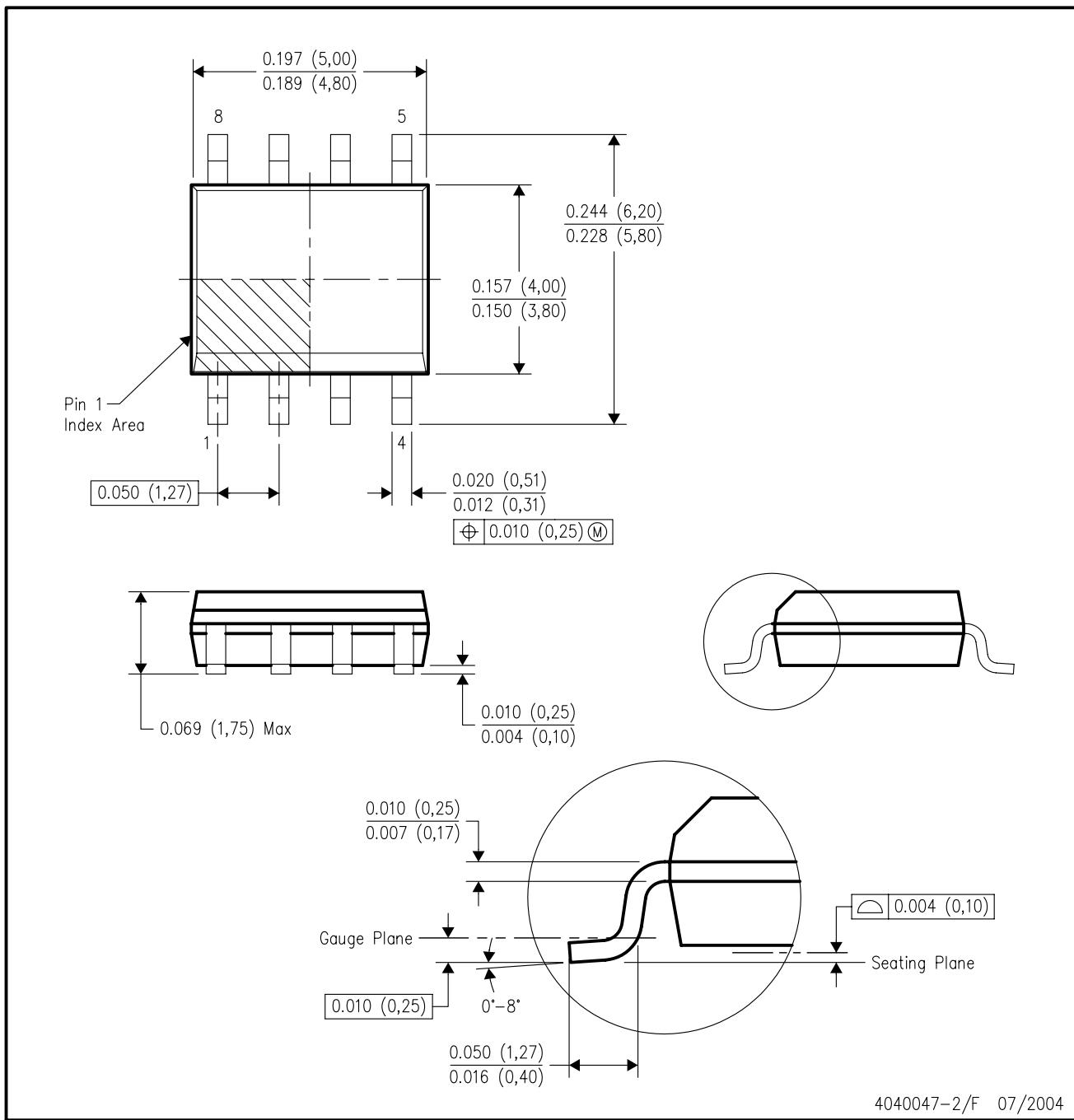


4040047-3/F 07/2004

- NOTES:
- All linear dimensions are in inches (millimeters).
  - This drawing is subject to change without notice.
  - Body dimensions do not include mold flash or protrusion not to exceed 0.006 (0,15).
  - Falls within JEDEC MS-012 variation AB.

## D (R-PDSO-G8)

## PLASTIC SMALL-OUTLINE PACKAGE



4040047-2/F 07/2004

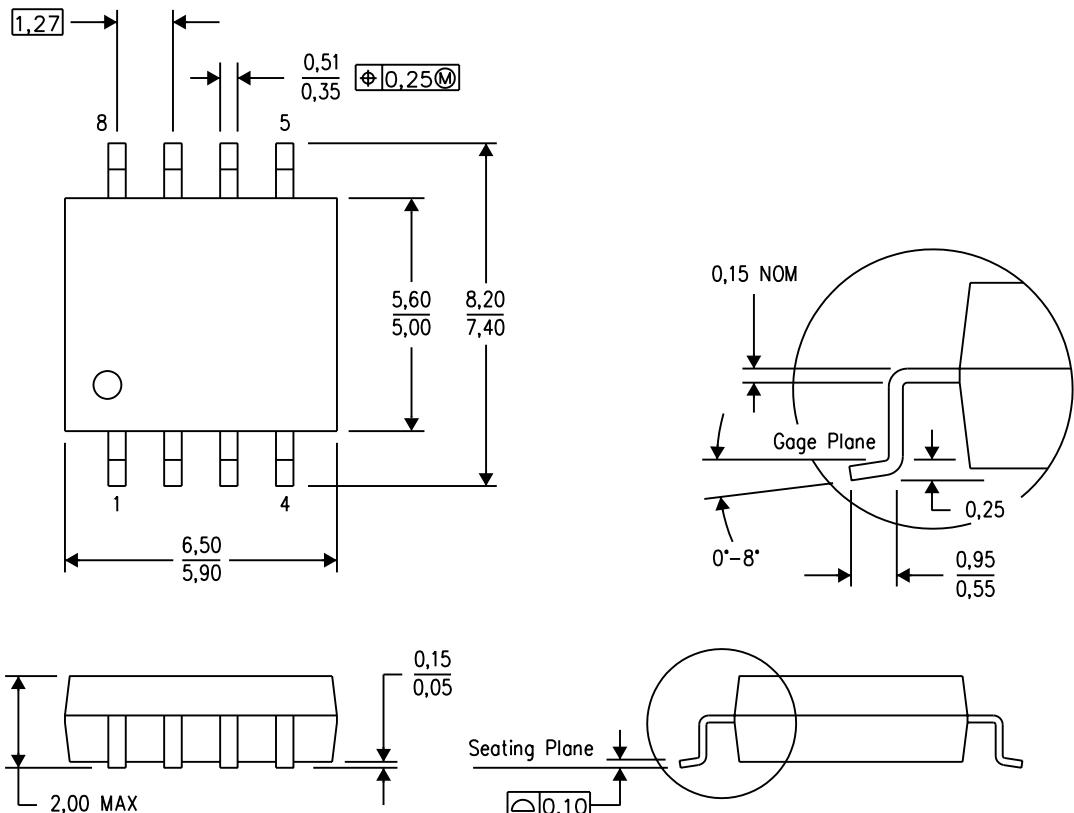
- NOTES:
- All linear dimensions are in inches (millimeters).
  - This drawing is subject to change without notice.
  - Body dimensions do not include mold flash or protrusion not to exceed 0.006 (0,15).
  - Falls within JEDEC MS-012 variation AA.

---

## MECHANICAL DATA

PS (R-PDSO-G8)

PLASTIC SMALL-OUTLINE PACKAGE



4040063/C 03/03

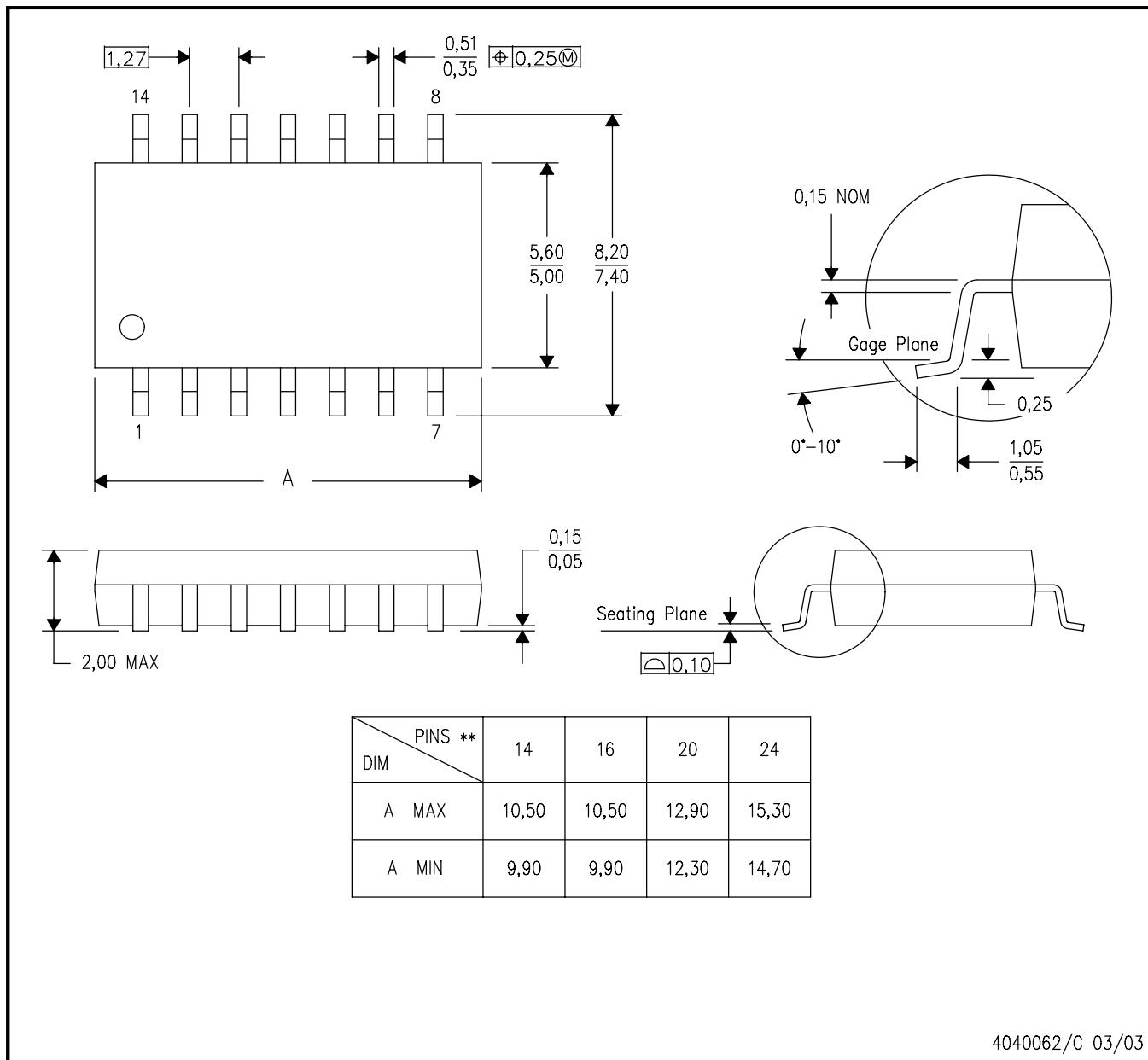
- NOTES:
- A. All linear dimensions are in millimeters.
  - B. This drawing is subject to change without notice.
  - C. Body dimensions do not include mold flash or protrusion, not to exceed 0,15.

## MECHANICAL DATA

**NS (R-PDSO-G\*\*)**

**14-PINS SHOWN**

**PLASTIC SMALL-OUTLINE PACKAGE**

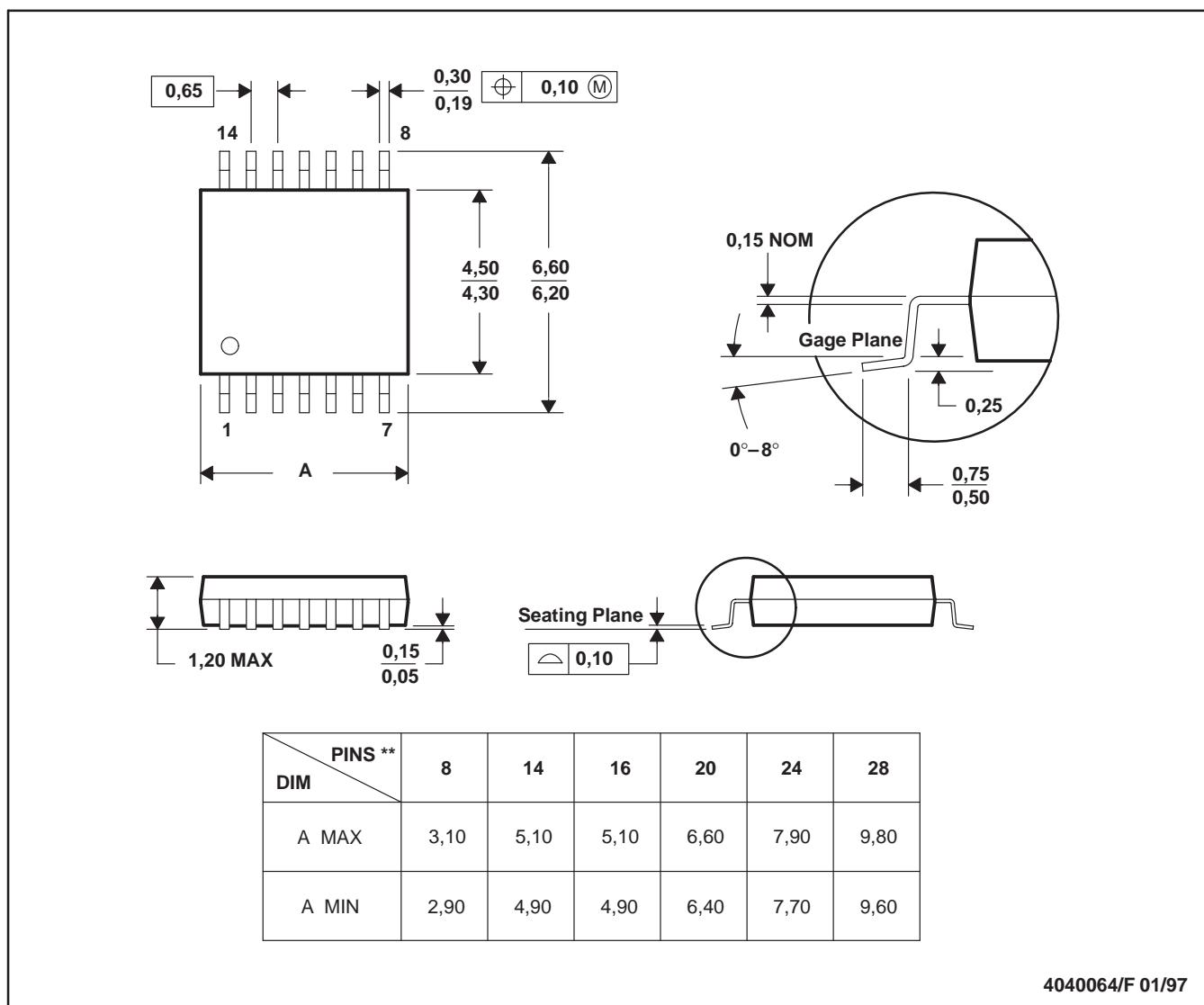


- NOTES: A. All linear dimensions are in millimeters.  
 B. This drawing is subject to change without notice.  
 C. Body dimensions do not include mold flash or protrusion, not to exceed 0,15.

PW (R-PDSO-G<sup>\*\*</sup>)

## PLASTIC SMALL-OUTLINE PACKAGE

14 PINS SHOWN



- NOTES:
- All linear dimensions are in millimeters.
  - This drawing is subject to change without notice.
  - Body dimensions do not include mold flash or protrusion not to exceed 0,15.
  - Falls within JEDEC MO-153

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Logic	logic.ti.com	Military	<a href="http://www.ti.com/military">www.ti.com/military</a>
Power Mgmt	power.ti.com	Optical Networking	<a href="http://www.ti.com/opticalnetwork">www.ti.com/opticalnetwork</a>
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		Telephony	<a href="http://www.ti.com/telephony">www.ti.com/telephony</a>
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View ROHS Compliant Devices clear gif

TL084, Status: ACTIVE

View RoHS Compliant Devices

 clear gif

Quad JFET-Input General-Purpose Operational Amplifier

 clear gif Features Quality & Pb-Free Data Related Products Tools & Software Samples Pricing/Packaging Inventory Symbols/Footprints Technical Documents Applications Notes Simulation Models Reference Designs

## Datasheet

 Download Datasheet

TL081, TL081A, TL081B, TL082, TL082A, TL082B, TL084, TL084A, TL084B (Rev. G) (tl084.pdf, 788 KB)

23 Sep 2004 [Download](#)

	<a href="#">TL081</a>	<a href="#">TL082</a>	<a href="#">TL084</a>
<b>Number of Channels</b>	1	2	4
<b>Available Channels</b>	S, D, Q	S, D, Q	S, D, Q
<b>Iq per channel(Max)(mA)</b>	2.8	2.8	2.8
<b>GBW(Typ)(MHz)</b>	3	3	3
<b>Slew Rate(Typ)(V/us)</b>	13	13	13
<b>VIO (25 deg C)(Max)(mV)</b>	15	15	15
<b>Offset Drift(Typ)(uV/C)</b>	18	18	18
<b>IIB(Max)(pA)</b>	400	400	400
<b>Pin/Package</b>	8PDIP,8SO,8SOIC	20LCCC,8CDIP,8PDIP,8SO,8SOIC,8TSSOP	14CDIP,14PDIP,14SO,14SOIC,14TSSOP,20LCCC
<b>CMRR(Min)(dB)</b>	70	70	70
<b>Approx. 1KU Price (US\$)</b>	.22	.29	.34
<b>Vn at 1kHz(Typ)(nV/rtHz)</b>	18	18	18
<b>Vs(Min)(V)</b>	7	7	7
<b>Vs(Max)(V)</b>	36	36	36
<b>Operating Temp Range(Celsius)</b>	-40 to 85,0 to 70	-40 to 85,-55 to 125,0 to 70	-40 to 125,-40 to 85,-55 to 125,0 to 70
	<a href="#">Samples</a>	<a href="#">Samples</a>	<a href="#">Samples</a>
	<a href="#">Inventory</a>	<a href="#">Inventory</a>	<a href="#">Inventory</a>

## Product Information

 Features Save this to your personal library

Low Power Consumption

Wide Common-Mode and Differential Voltage Ranges

Low Input Bias and Offset Currents

Output Short-Circuit Protection

Low Total Harmonic Distortion...0.003% Typ

High Input Impedance...JFET-Input Stage

Latch-Up-Free Operation

High Slew Rate...13 V/μs Typ

Common-Mode Input Voltage Range Includes Vcc+

## Description

The TL08x JFET-input operational amplifier family is designed to offer a wider selection than any previously developed operational amplifier family. Each of these JFET-input operational amplifiers incorporates well-matched, high-voltage JFET and bipolar transistors in a monolithic integrated circuit. The devices feature high slew rates, low input bias and offset currents, and low offset voltage

temperature coefficient. Offset adjustment and external compensation options are available within the TL08x family.

The C-suffix devices are characterized for operation from 0°C to 70°C. The I-suffix devices are characterized for operation from -40°C to 85°C. The Q-suffix devices are characterized for operation from -40°C to 125°C. The M-suffix devices are characterized for operation over the full military temperature range of -55°C to 125°C.

### Pricing/Packaging/CAD Design Tools/Samples

				Price	Packaging			CAD Design Tools		Samples
Device	Status	Temp (°C)	DSCC #	Budget Price (\$US)   QTY	Industry Standard (TI Pkg)   Pins	Top Side Marking	Standard Pack Quantity	Symbols	Footprints	Samples
5962-9851503Q2A	ACTIVE	-55 to 125		16.99   1KU	LCCC (FK)   20		1	<input type="checkbox"/>	<input type="checkbox"/>	Purchase Samples
5962-9851503QCA	ACTIVE	-55 to 125		4.49   1KU	CDIP (J)   14		1	<input type="checkbox"/>	<input type="checkbox"/>	Purchase Samples
TL084CD	ACTIVE	0 to 70		0.36   1KU	SOIC (D)   14	<a href="#">View</a>	50	<input type="checkbox"/>	<input type="checkbox"/>	Purchase Samples
TL084CDE4	ACTIVE	0 to 70		0.36   1KU	SOIC (D)   14	<a href="#">View</a>	50	<input type="checkbox"/>	<input type="checkbox"/>	Purchase Samples
TL084CDR	ACTIVE	0 to 70		0.34   1KU	SOIC (D)   14	<a href="#">View</a>	2500	<input type="checkbox"/>	<input type="checkbox"/>	Contact TI Distributor or Sales Office
TL084CDRE4	ACTIVE	0 to 70		0.34   1KU	SOIC (D)   14	<a href="#">View</a>	2500	<input type="checkbox"/>	<input type="checkbox"/>	<a href="#">Request Free Samples</a>
TL084CJ	OBsolete	0 to 70			CDIP (J)   14				<input type="checkbox"/>	Not Available
TL084CN	ACTIVE	0 to 70		0.34   1KU	PDIP (N)   14	<a href="#">View</a>	25	<input type="checkbox"/>	<input type="checkbox"/>	Contact TI Distributor or Sales Office
TL084CNE4	ACTIVE	0 to 70		0.34   1KU	PDIP (N)   14	<a href="#">View</a>	25	<input type="checkbox"/>	<input type="checkbox"/>	<a href="#">Request Free Samples</a>
TL084CNSLE	OBsolete	0 to 70			SO (NS)   14	<a href="#">View</a>			<input type="checkbox"/>	Not Available
TL084CNSR	ACTIVE	0 to 70		0.36   1KU	SO (NS)   14	<a href="#">View</a>	2000	<input type="checkbox"/>	<input type="checkbox"/>	Contact TI Distributor or Sales Office
TL084CNSRG4	ACTIVE	0 to 70		0.38   1KU	SO (NS)   14	<a href="#">View</a>	2000	<input type="checkbox"/>	<input type="checkbox"/>	<a href="#">Purchase Samples</a>
TL084CPW	ACTIVE	0 to 70		0.36   1KU	TSSOP (PW)   14	<a href="#">View</a>	90	<input type="checkbox"/>	<input type="checkbox"/>	<a href="#">Purchase Samples</a>
TL084CPWE4	ACTIVE	0 to 70		0.36   1KU	TSSOP (PW)   14	<a href="#">View</a>	90	<input type="checkbox"/>	<input type="checkbox"/>	<a href="#">Purchase Samples</a>
TL084CPWLE	OBsolete	0 to 70			TSSOP (PW)   14	<a href="#">View</a>			<input type="checkbox"/>	Not Available
TL084CPWR	ACTIVE	0 to 70		0.36   1KU	TSSOP (PW)   14	<a href="#">View</a>	2000	<input type="checkbox"/>	<input type="checkbox"/>	Contact TI Distributor or Sales Office
TL084CPWRE4	ACTIVE	0 to 70		0.36   1KU	TSSOP (PW)   14	<a href="#">View</a>	2000	<input type="checkbox"/>	<input type="checkbox"/>	<a href="#">Request Free Samples</a>
TL084ID	ACTIVE	-40 to 85		0.40   1KU	SOIC (D)   14	<a href="#">View</a>	50	<input type="checkbox"/>	<input type="checkbox"/>	<a href="#">Purchase Samples</a>
TL084IDE4	ACTIVE	-40 to 85		0.40   1KU	SOIC (D)   14	<a href="#">View</a>	50	<input type="checkbox"/>	<input type="checkbox"/>	<a href="#">Purchase Samples</a>
TL084IDR	ACTIVE	-40 to 85		0.40   1KU	SOIC (D)   14	<a href="#">View</a>	2500	<input type="checkbox"/>	<input type="checkbox"/>	Contact TI Distributor or Sales Office
TL084IDRE4	ACTIVE	-40 to 85		0.40   1KU	SOIC (D)   14	<a href="#">View</a>	2500	<input type="checkbox"/>	<input type="checkbox"/>	<a href="#">Request Free Samples</a>
TL084IJ	OBsolete	-40 to 85			CDIP (J)   14				<input type="checkbox"/>	Not Available
TL084IN	ACTIVE	-40 to 85		0.40   1KU	PDIP (N)   14	<a href="#">View</a>	25	<input type="checkbox"/>	<input type="checkbox"/>	Contact TI Distributor or Sales Office
TL084INE4	ACTIVE	-40 to 85		0.40   1KU	PDIP (N)   14	<a href="#">View</a>	25	<input type="checkbox"/>	<input type="checkbox"/>	<a href="#">Purchase Samples</a>
TL084MFK	ACTIVE	-55 to 125		16.99   1KU	LCCC (FK)   20		1	<input type="checkbox"/>	<input type="checkbox"/>	<a href="#">Purchase Samples</a>

TL084MFKB	ACTIVE	-55 to 125	5962-9851503Q2A	16.99   1KU	LCCC (FK)   20		1	<input type="checkbox"/>	<input type="checkbox"/>	Purchase Samples
TL084MJ	ACTIVE	-55 to 125		5.01   1KU	CDIP (J)   14		1	<input type="checkbox"/>	<input type="checkbox"/>	Purchase Samples
TL084MJB	ACTIVE	-55 to 125	5962-9851503QCA	4.49   1KU	CDIP (J)   14		1	<input type="checkbox"/>	<input type="checkbox"/>	Purchase Samples
TL084QD	ACTIVE	-40 to 125		0.70   1KU	SOIC (D)   14	View	50	<input type="checkbox"/>	<input type="checkbox"/>	Request Free Samples
TL084QDR	ACTIVE	-40 to 125		0.74   1KU	SOIC (D)   14	View	2500	<input type="checkbox"/>	<input type="checkbox"/>	Purchase Samples

Inventory									View all Distributors		Choose a Region	
	TI Inventory Status			Reported Distributor Inventory								
5962-9851503Q2A	As of 8:57 AM GMT, 29 Nov 2005			As of 8:57 AM GMT, 29 Nov 2005								
	In Stock	In Progress QTY   Date		Lead Time	Region	Company	In Stock	Purchase				
	858*	>10k   23 Jan		7 Weeks	None Reported		<a href="#">View Distributors</a>					
5962-9851503QCA	As of 8:57 AM GMT, 29 Nov 2005			As of 8:57 AM GMT, 29 Nov 2005								
	In Stock	In Progress QTY   Date		Lead Time	Region	Company	In Stock	Purchase				
	>10k*	9120   14 Dec		7 Weeks	None Reported		<a href="#">View Distributors</a>					
		>10k   28 Dec										
TL084CD	As of 8:57 AM GMT, 29 Nov 2005			As of 8:57 AM GMT, 29 Nov 2005								
	In Stock	In Progress QTY   Date		Lead Time	Region	Company	In Stock	Purchase				
	0*	>10k   24 Feb		13 Weeks	Americas	Avnet	>1k					
						DigiKey	>1k					
						Newark InOne	>1k					
						Arrow Northern Europe	>1k					
						Arrow Southern Europe	>1k					
						Avnet-SILICA	>1k					
						EBV Elektronik	>1k					
						Farnell InOne	>1k					
						Spoerle	>1k					
TL084CDE4	As of 8:57 AM GMT, 29 Nov 2005			As of 8:57 AM GMT, 29 Nov 2005								
	In Stock	In Progress QTY   Date		Lead Time	Region	Company	In Stock	Purchase				
	0*	>10k   24 Feb		13 Weeks	None Reported		<a href="#">View Distributors</a>					
TL084CDR	As of 8:57 AM GMT, 29 Nov 2005			As of 8:57 AM GMT, 29 Nov 2005								
	In Stock	In Progress QTY   Date		Lead Time	Region	Company	In Stock	Purchase				
	0*	>10k   23 Feb		12 Weeks	Americas	DigiKey	>1k					
						Abacus Polar	>1k					
						Arrow Northern Europe	>1k					
						Arrow Southern Europe	>1k					
						EBV Elektronik	>1k					
						Rutronik	>1k					
						Spoerle	>1k					
TL084CDRE4	As of 8:57 AM GMT, 29 Nov 2005			As of 8:57 AM GMT, 29 Nov 2005								
	In Stock	In Progress QTY   Date		Lead Time	Region	Company	In Stock	Purchase				

	0*	>10k   23 Feb	12 Weeks	None Reported <a href="#">View Distributors</a>			
<b>TL084CN</b>	As of 8:57 AM GMT, 29 Nov 2005			As of 8:57 AM GMT, 29 Nov 2005			
	In Stock	In Progress QTY   Date	Lead Time	Region	Company	In Stock	Purchase
	0*	5881   12 Dec	10 Weeks	Americas	Avnet	>1k	
		>10k   14 Dec			DigiKey	>1k	
					Newark InOne	>1k	
				Asia	P&S	165	
					Arrow Northern Europe	>1k	
				Europe	Arrow Southern Europe	>1k	
					Avnet-SILICA	>1k	
					EBV Elektronik	>1k	
					Farnell InOne	>1k	
					Rutronik	>1k	
<b>TL084CNE4</b>	As of 8:57 AM GMT, 29 Nov 2005			As of 8:57 AM GMT, 29 Nov 2005			
	In Stock	In Progress QTY   Date	Lead Time	Region	Company	In Stock	Purchase
	0*	5881   12 Dec	10 Weeks	None Reported <a href="#">View Distributors</a>			
		>10k   14 Dec					
<b>TL084CNSR</b>	As of 8:57 AM GMT, 29 Nov 2005			As of 8:57 AM GMT, 29 Nov 2005			
	In Stock	In Progress QTY   Date	Lead Time	Region	Company	In Stock	Purchase
	0*	389   6 Jan	8 Weeks	Americas	DigiKey	204	
		263   13 Jan					
		623   20 Jan					
		4000   24 Jan					
		3418   17 Feb					
<b>TL084CNSRG4</b>	As of 8:57 AM GMT, 29 Nov 2005			As of 8:57 AM GMT, 29 Nov 2005			
	In Stock	In Progress QTY   Date	Lead Time	Region	Company	In Stock	Purchase
	0*	387   9 Jan	10 Weeks	None Reported <a href="#">View Distributors</a>			
		261   16 Jan					
		619   23 Jan					
		957   30 Jan					
		358   13 Feb					
<b>TL084CPW</b>	As of 8:57 AM GMT, 29 Nov 2005			As of 8:57 AM GMT, 29 Nov 2005			
	In Stock	In Progress QTY   Date	Lead Time	Region	Company	In Stock	Purchase
	0*	254   30 Nov	12 Weeks	Americas	Avnet	>1k	
		>10k   3 Apr					
<b>TL084CPWE4</b>	As of 8:57 AM GMT, 29 Nov 2005			As of 8:57 AM GMT, 29 Nov 2005			
	In Stock	In Progress QTY   Date	Lead Time	Region	Company	In Stock	Purchase
	0*	254   30 Nov	12 Weeks	None Reported <a href="#">View Distributors</a>			
		>10k   3 Apr					
<b>TL084CPWR</b>	As of 8:57 AM GMT, 29 Nov 2005			As of 8:57 AM GMT, 29 Nov 2005			
	In Stock	In Progress QTY   Date	Lead Time	Region	Company	In Stock	Purchase
	0*	>10k   31 Jan	9 Weeks	None Reported <a href="#">View Distributors</a>			
<b>TL084CPWRE4</b>	As of 8:57 AM GMT, 29 Nov 2005			As of 8:57 AM GMT, 29 Nov 2005			
	In Stock	In Progress QTY   Date	Lead Time	Region	Company	In Stock	Purchase
	0*	>10k   31 Jan	9 Weeks	None Reported <a href="#">View Distributors</a>			
<b>TL084ID</b>	As of 8:57 AM GMT, 29 Nov 2005			As of 8:57 AM GMT, 29 Nov 2005			

	In Stock	In Progress QTY   Date	Lead Time	Region	Company	In Stock	Purchase
TL084IDE4	951*	>10k   22 Feb	12 Weeks	Americas	Avnet	>1k	
					DigiKey	>1k	
					Newark InOne	450	
				Europe	Arrow Northern Europe	>1k	
					Avnet-SILICA	>1k	
					EBV Elektronik	>1k	
					Rutronik	550	
					Spoerle	977	

TL084IDE4	As of 8:57 AM GMT, 29 Nov 2005			As of 8:57 AM GMT, 29 Nov 2005			
	In Stock	In Progress QTY   Date	Lead Time	Region	Company	In Stock	Purchase
	951*	>10k   22 Feb	12 Weeks	None Reported			

TL084IDR	As of 8:57 AM GMT, 29 Nov 2005			As of 8:57 AM GMT, 29 Nov 2005			
	In Stock	In Progress QTY   Date	Lead Time	Region	Company	In Stock	Purchase
TL084IDR	0*	>10k   24 Feb	13 Weeks	Americas	DigiKey	149	
					Avnet-SILICA	>1k	
					EBV Elektronik	>1k	
				Europe	Rutronik	>1k	
					Spoerle	>1k	

TL084IDRE4	As of 8:57 AM GMT, 29 Nov 2005			As of 8:57 AM GMT, 29 Nov 2005			
	In Stock	In Progress QTY   Date	Lead Time	Region	Company	In Stock	Purchase
	0*	>10k   24 Feb	13 Weeks	None Reported			

TL084IN	As of 8:57 AM GMT, 29 Nov 2005			As of 8:57 AM GMT, 29 Nov 2005			
	In Stock	In Progress QTY   Date	Lead Time	Region	Company	In Stock	Purchase
TL084IN	2600*	>10k   15 Dec	10 Weeks	Americas	Avnet	>1k	
					DigiKey	848	
					Newark InOne	522	
				Europe	Arrow Southern Europe	618	
					Avnet-SILICA	>1k	
					EBV Elektronik	>1k	
					Rutronik	275	
					Spoerle	>1k	

TL084INE4	As of 8:57 AM GMT, 29 Nov 2005			As of 8:57 AM GMT, 29 Nov 2005			
	In Stock	In Progress QTY   Date	Lead Time	Region	Company	In Stock	Purchase
	2600*	>10k   15 Dec	10 Weeks	None Reported			

TL084MFK	As of 8:57 AM GMT, 29 Nov 2005			As of 8:57 AM GMT, 29 Nov 2005			
	In Stock	In Progress QTY   Date	Lead Time	Region	Company	In Stock	Purchase
	211*	>10k   23 Jan	7 Weeks	Europe	Avnet-SILICA	66	

TL084MFKB	As of 8:57 AM GMT, 29 Nov 2005			As of 8:57 AM GMT, 29 Nov 2005			
	In Stock	In Progress QTY   Date	Lead Time	Region	Company	In Stock	Purchase
TL084MFKB	858*	>10k   23 Jan	7 Weeks	Americas	Avnet	22	
					Avnet-SILICA	22	
					Spoerle	8	

TL084MJ	As of 8:57 AM GMT, 29 Nov 2005			As of 8:57 AM GMT, 29 Nov 2005					
	In Stock	In Progress QTY   Date	Lead Time	Region	Company	In Stock	Purchase		
	2082*	>10k   28 Dec	7 Weeks	Americas Europe	Avnet	>1k			
					Avnet-SILICA	35			
					EBV Elektronik	>1k			
					Spoerle	57			
TL084MJB	As of 8:57 AM GMT, 29 Nov 2005			As of 8:57 AM GMT, 29 Nov 2005					
	In Stock	In Progress QTY   Date	Lead Time	Region	Company	In Stock	Purchase		
	>10k*	9120   14 Dec	7 Weeks	Americas Europe	Avnet	>1k			
					Arrow Northern Europe	161			
		>10k   28 Dec			Avnet-SILICA	89			
					EBV Elektronik	3			
TL084QD	As of 8:57 AM GMT, 29 Nov 2005			As of 8:57 AM GMT, 29 Nov 2005					
	In Stock	In Progress QTY   Date	Lead Time	Region	Company	In Stock	Purchase		
	100*	>10k   13 Jan	8 Weeks	Americas	Avnet	350			
					DigiKey	459			
TL084QDR	As of 8:57 AM GMT, 29 Nov 2005			As of 8:57 AM GMT, 29 Nov 2005					
	In Stock	In Progress QTY   Date	Lead Time	Region	Company	In Stock	Purchase		
	0*		6 Weeks	None Reported <a href="#">View Distributors</a>					

\* Our information is updated daily, so please check back with us soon if this does not meet your needs. You may also contact your [TI Authorized Distributor](#), including those [listed above](#), for real time stock information.

\*\* Lead time information is not available at this time. However, our information is updated daily so please check back with us soon. Please contact your preferred [TI Authorized Distributor](#) for additional information.

Quality & Lead (Pb)-Free Data					
	Product Content				MTBF/FIT Rate
Device	Eco Plan*	Lead/Ball Finish	MSL Rating/Peak Reflow	Details	Details
5962-9851503Q2A	TBD	POST-PLATE	Level-NC-NC-NC	<a href="#">View</a>	<a href="#">View</a>
5962-9851503QCA	TBD	A42 SNPB	Level-NC-NC-NC	<a href="#">View</a>	<a href="#">View</a>
TL084CD <input checked="" type="checkbox"/>	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	<a href="#">View</a>	<a href="#">View</a>
TL084CDE4 <input checked="" type="checkbox"/>	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	<a href="#">View</a>	<a href="#">View</a>
TL084CDR <input checked="" type="checkbox"/>	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	<a href="#">View</a>	<a href="#">View</a>
TL084CDRE4 <input checked="" type="checkbox"/>	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	<a href="#">View</a>	<a href="#">View</a>
TL084CN <input checked="" type="checkbox"/>	Pb-Free (RoHS)	CU NIPDAU	Level-NC-NC-NC	<a href="#">View</a>	<a href="#">View</a>
TL084CNE4 <input checked="" type="checkbox"/>	Pb-Free (RoHS)	CU NIPDAU	Level-NC-NC-NC	<a href="#">View</a>	<a href="#">View</a>
TL084CNSR <input checked="" type="checkbox"/>	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	<a href="#">View</a>	<a href="#">View</a>
TL084CNSRG4 <input checked="" type="checkbox"/>	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	<a href="#">View</a>	<a href="#">View</a>
TL084CPW <input checked="" type="checkbox"/>	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	<a href="#">View</a>	<a href="#">View</a>
TL084CPWE4 <input checked="" type="checkbox"/>	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	<a href="#">View</a>	<a href="#">View</a>
TL084CPWR <input checked="" type="checkbox"/>	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	<a href="#">View</a>	<a href="#">View</a>
TL084CPWRE4 <input checked="" type="checkbox"/>	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	<a href="#">View</a>	<a href="#">View</a>
TL084ID <input checked="" type="checkbox"/>	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	<a href="#">View</a>	<a href="#">View</a>
TL084IDE4 <input checked="" type="checkbox"/>	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	<a href="#">View</a>	<a href="#">View</a>
TL084IDR <input checked="" type="checkbox"/>	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	<a href="#">View</a>	<a href="#">View</a>
TL084IDRE4 <input checked="" type="checkbox"/>	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	<a href="#">View</a>	<a href="#">View</a>
TL084IN <input checked="" type="checkbox"/>	Pb-Free (RoHS)	CU NIPDAU	Level-NC-NC-NC	<a href="#">View</a>	<a href="#">View</a>
TL084INE4 <input checked="" type="checkbox"/>	Pb-Free (RoHS)	CU NIPDAU	Level-NC-NC-NC	<a href="#">View</a>	<a href="#">View</a>
TL084MFK	TBD	POST-PLATE	Level-NC-NC-NC	<a href="#">View</a>	<a href="#">View</a>
TL084MFKB	TBD	POST-PLATE	Level-NC-NC-NC	<a href="#">View</a>	<a href="#">View</a>
TL084MJ	TBD	A42 SNPB	Level-NC-NC-NC	<a href="#">View</a>	<a href="#">View</a>
TL084MJB	TBD	A42 SNPB	Level-NC-NC-NC	<a href="#">View</a>	<a href="#">View</a>
TL084QD	TBD	CU NIPDAU	Level-1-220C-UNLIM	<a href="#">View</a>	<a href="#">View</a>
TL084QDR	TBD	CU NIPDAU	Level-1-220C-UNLIM	<a href="#">View</a>	<a href="#">View</a>

\* The planned eco-friendly classification: Pb-Free (RoHS) or Green (RoHS & no Sb/Br) - please click on the Product Content Details "View" link in the table above for the latest availability information and additional product content details.

If the information you are requesting is not available online at this time, contact one of our [Product Information Centers](#) regarding the availability of this information.

## Technical Documents

### Datasheets

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**TL081, TL081A, TL081B, TL082, TL082A, TL082B, TL084, TL084A, TL084B (Rev. G)** (tl084.pdf, 788 KB)

23 Sep 2004 [Download](#)

### Application Notes

**Stability Analysis Of Voltage-Feedback Op Amps, Including Compensation Technique (Rev. A)** (sloa020a.htm, 9 KB)

12 Mar 2001 [Abstract](#)

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### User Guides

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### Simulation Models

#### Spice Model

**TL084, TL084A, TL084B, TL084X2 Spice Macromodel** (sloj071.zip, 0 KB)

10 Jan 2002 [zip](#)

### More Literature

**Standard Linear Products Cross-Reference (Rev. C)** (slyt017c.pdf, 632 KB)

05 Apr 2005 [Download](#)

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## Tools & Software

<input type="checkbox"/> Name	Part #	Company	Software/Tool Type
Universal EVM for Single/Dual OpAmps without Shutdown in MSOP/SOIC/SOT-23 Packages	OPAMPEVM-SOT23	Texas Instruments	Development Boards/EVMs
SPICE-Based Analog Simulation Program	TINA-TI	Texas Instruments	Simulators
DesignSoft SPICE-Based Analog Simulation Program	TINA-3P-DSK-SW	DesignSoft Inc	Simulators
Free Tool: Design Tools For All Amplifiers	ALLAMPLIFIERTOOLS	Texas Instruments	Application Software
Active Filter Design Application	FILTERPRO	Texas Instruments	Application Software



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