

1.0 SCOPE

This specification covers the detail requirements for a low-noise precision instrumentation amplifier.

It is highly recommended that this data sheet be used as a baseline for new military or aerospace spec control drawings.

1.2 Part Number. The complete part numbers per Table I of this specification follow:

Device	Part Number	Package
A	AMP-01AX/883	X
B	AMP-01BX/883	X
B	AMP-01BTC/883	TC

1.2.3 Case Outline.

Letter	Case Outline (Lead finish per MIL-M-38510)
X	18-lead ceramic dual-in-line package (CERDIP)
TC	28-contact hermetic leadless chip carrier (LCC)

1.3 Absolute Maximum Ratings. ($T_A = 25^\circ\text{C}$, unless otherwise noted)

Supply Voltage.....	$\pm 18\text{V}$
Power Dissipation.....	500mW
Common-Mode Input Voltage	Supply Voltage
Differential Input Voltage	
$R_G \geq 2\text{k}\Omega$	$\pm 20\text{V}$
$R_G < 2\text{k}\Omega$	$\pm 10\text{V}$
Output Short-Circuit Duration	Indefinite
Storage Temperature Range.....	-65°C to $+150^\circ\text{C}$
Operating Temperature Range	-55°C to $+125^\circ\text{C}$
Lead Temperature (Soldering, 60 sec).....	$+300^\circ\text{C}$

1.5 Thermal Characteristics:

Thermal Resistance, CERDIP (X) package:

Junction-to-Case (θ_{JC}) = 35°C/W MAX

Junction-to Ambient (θ_{JA}) = 120°C/W MAX

Thermal Resistance, LCC (TC) package:

Junction-to-Case (θ_{JC}) = 35°C/W MAX

Junction-to Ambient (θ_{JA}) = 104°C/W MAX

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TABLE 1

$V_S = \pm 15V$; $R_S = 100\Omega$; $R_L = 2k\Omega$; $T_A = 25^\circ C$ unless otherwise specified.

			AMP-01/883				
Characteristics	Symbol	Special Conditions	LIMITS A		LIMITS B		Units
			Min	Max	Min	Max	
Input Offset Voltage	V _{IOS}		—	50	—	100	μV
		-55°C ≤ T _A ≤ +125°C	—	80	—	150	μV
Average Input Offset Drift	TCV _{IOS}	-55°C ≤ T _A ≤ +125°C	—	0.3	—	1.0	μV/°C
Output Offset Voltage	V _{OOS}		—	3	—	6	mV
		-55°C ≤ T _A ≤ +125°C	—	6	—	10	mV
Output Offset Voltage Drift	TCV _{OOS}	R _G = ∞ -55°C ≤ T _A ≤ +125°C	—	50	—	120	μV/°C
Offset Referred to Input vs. Positive Supply	+PSR	V+ = +5V to +15V; V- = -15V -55°C ≤ T _A ≤ +125°C					
		G = 1000	120	—	110	—	dB
		G = 100	110	—	100	—	dB
		G = 10	95	—	90	—	dB
		G = 1	75	—	70	—	dB
Offset Referred to Input vs. Negative Supply	-PSR	V- = -5V to -15V; V+ = +15V -55°C ≤ T _A ≤ +125°C					
		G = 1000	105	—	105	—	dB
		G = 100	90	—	90	—	dB
		G = 10	70	—	70	—	dB
		G = 1	50	—	50	—	dB
Output Short-Circuit Current	I _{SC} ⁺		60	120	60	120	mA
	I _{SC} ⁻		-120	-60	-120	-60	mA
Input Bias Current	I _B		—	±4	—	±6	nA
		-55°C ≤ T _A ≤ +125°C	—	±10	—	±15	nA
Input Offset Current	I _{OS}		—	1	—	2	nA
		-55°C ≤ T _A ≤ +125°C	—	3	—	6	nA



TABLE 1 (Continued)

$V_S = \pm 15V$; $R_S = 100\Omega$; $R_L = 2k\Omega$; $T_A = 25^\circ C$ unless otherwise specified.

AMP-01/883									
Characteristics	Symbol	Special Conditions	LIMITS A		LIMITS B		Units		
			Min	Max	Min	Max			
Common-Mode Rejection	CMR	V _{CM} = ±10V, 1kΩ Source Imbalance							
		G = 1000	125	—	115	—	dB		
		G = 100	120	—	110	—	dB		
		G = 10	100	—	95	—	dB		
		G = 1	85	—	75	—	dB		
		V _{CM} = ±10V, 1kΩ Source Imbalance							
		-55°C ≤ T _A ≤ +125°C							
		G = 1000	120	—	110	—	dB		
		G = 100	115	—	105	—	dB		
		G = 10	95	—	90	—	dB		
		G = 1	80	—	75	—	dB		
		Gain Equation Accuracy	G.E.	$G = \frac{20R_S}{R_G}$	—	0.6	—	0.8	%
				Accuracy Measured from G = 1 to 1000					
Gain Range	G		1.0	1000	1.0	1000	V/V		
Output Voltage Swing	V _O	R _L = 500n, 2kn	±13	—	±13	—	V		
		R _L ≥ 50n (Note 1)	±2.5	—	±2.5	—	V		
		R _L = 500n, 2kn -55°C ≤ T _A ≤ +125°C	±12	—	±12	—	V		
Reference Input Resistance	R _{INREF}		35	65	35	65	kn		



TABLE 1 (Continued)

$V_S = \pm 15V$; $R_S = 100\Omega$; $R_L = 2k\Omega$; $T_A = 25^\circ C$ unless otherwise specified.

			AMP-01/883				
Characteristics	Symbol	Special Conditions	LIMITS A		LIMITS B		Units
			Min	Max	Min	Max	
Quiescent Current	I _Q	+V Linked to +V _{OP} -V Linked to -V _{OP} -55°C ≤ T _A ≤ +125°C	—	4.8	—	4.8	mA
Slew Rate	SR	G = 10	3.5	—	3.0	—	V/μs

NOTES:
1. For test conditions, refer to Fig. 5, page 6-19 of the 1988 PMI Analog Products Databook.



TABLE 2

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**Electrical Test Requirements
For Class B Devices**

MIL-STD-883 Test Requirements	Subgroups (see Table 3)
Interim Electrical Parameters (pre Burn-In)	1
Final Electrical Test Parameters	1*, 2, 3, 4, 5, 6, 7, 8
Group A Test Requirements	1, 2, 3, 4, 5, 6, 7, 8

* PDA applies to Subgroup 1 only. I_B is excluded from PDA.
No other Subgroups are included in PDA.


TABLE 3
Group A Inspection
 $V_S = \pm 15V$; $R_S = 100\Omega$; $R_L = 2k\Omega$; $T_A = T_J$ unless otherwise specified.

			AMP-01/883				
Subgroup	Symbol	Special Conditions	LIMITS A		LIMITS B		Units
			Min	Max	Min	Max	
Subgroup 1	I _B		—	±4	—	±6	nA
T _A = +25°C	I _{OS}		—	1	—	2	nA
		V+ = +5V, +15V; V- = -15V					
	+PSR	G = 1000	120	—	110	—	dB
		G = 100	110	—	100	—	dB
		G = 10	95	—	90	—	dB
		G = 1	75	—	70	—	dB
		V- = -5V, -15V; V+ = +15V					
	-PSR	G = 1000	105	—	105	—	dB
		G = 100	90	—	90	—	dB
		G = 10	70	—	70	—	dB
		G = 1	50	—	50	—	dB
		V _{CM} = ±10V, 1kΩ Source Imbalance					
	CMR	G = 1000	125	—	115	—	dB
		G = 100	120	—	110	—	dB
		G = 10	100	—	95	—	dB
		G = 1	85	—	75	—	dB
	G.E.	$G = \frac{20R_S}{R_G}$	—	0.6	—	0.8	%
		Accuracy Measured at G = 1, 10, 100, and 1000					
	G		1.0	1000	1.0	1000	V/V
	I _{SC} ⁺		60	120	60	120	mA
I _{SC} ⁻		-120	-60	-120	-60	mA	
R _{INREF}		35	65	35	65	kΩ	


TABLE 3
Group A Inspection (Continued)
 $V_S = \pm 15V$; $R_S = 100\Omega$; $R_L = 2k\Omega$; $T_A = T_J$ unless otherwise specified.

AMP-01/883							
Subgroup	Symbol	Special Conditions	LIMITS A		LIMITS B		Units
			Min	Max	Min	Max	
Subgroup 1 (Continued)	I_Q	+V Linked to +V _{OP} -V Linked to -V _{OP}	—	4.8	—	4.8	mA
Subgroup 2	V_{IOS}		—	80	—	150	μV
$T_A = +125^{\circ}C$	V_{OOS}		—	6	—	10	mV
	TCV_{OOS}	$R_G = \infty$	—	50	—	120	μV/°C
	I_B		—	±10	—	±15	nA
	I_{OS}		—	3	—	6	nA
		V+ = +5V, +15V; V- = -15V					
	+PSR	G = 1000	120	—	110	—	dB
		G = 100	110	—	100	—	dB
		G = 10	95	—	90	—	dB
		G = 1	75	—	70	—	dB
		V- = -5V, -15V; V+ = +15V					
	-PSR	G = 1000	105	—	105	—	dB
		G = 100	90	—	90	—	dB
		G = 10	70	—	70	—	dB
		G = 1	50	—	50	—	dB
		V _{CM} = ±10V; 1kΩ Source Imbalance					
	CMR	G = 1000	120	—	110	—	dB
		G = 100	115	—	105	—	dB
		G = 10	95	—	90	—	dB
		G = 1	80	—	75	—	dB
	I_Q	+V Linked to +V _{OP} -V Linked to -V _{OP}	—	4.8	—	4.8	mA



TABLE 3

Group A Inspection (Continued)

$V_S = \pm 15V$; $R_S = 100\Omega$; $R_L = 2k\Omega$; $T_A = T_J$ unless otherwise specified.

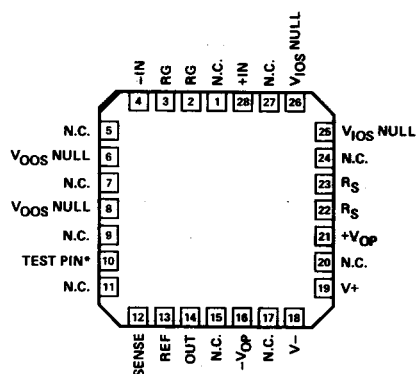
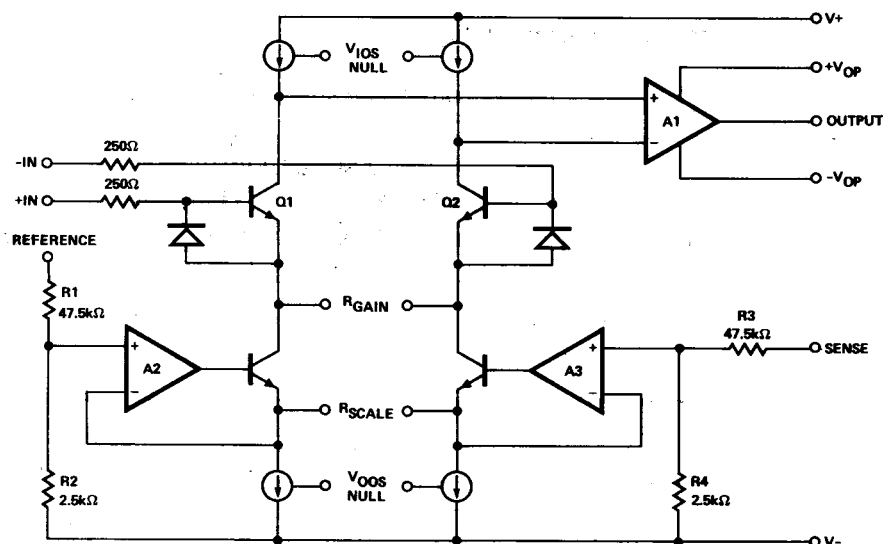
AMP-01/883							
Subgroup	Symbol	Special Conditions	LIMITS A		LIMITS B		Units
			Min	Max	Min	Max	
Subgroup 3 $T_A = -55^{\circ}\text{C}$	All Tests, Limits and Conditions are the same as for Subgroup 2.						
Subgroup 4 $T_A = +25^{\circ}\text{C}$	V_{IOS}		–	50	–	100	μV
	V_{OOS}		–	3	–	6	mV
	V_{O}	$R_{\text{L}} = 500\Omega, 2\text{k}\Omega$	± 13	–	± 13	–	V
		$R_{\text{L}} = 50\Omega$ (Note 1)	± 2.5	–	± 2.5	–	V
Subgroup 5 $T_A = +125^{\circ}\text{C}$	V_{O}	$R_{\text{L}} = 500\Omega, 2\text{k}\Omega$	± 12	–	± 12	–	V
Subgroup 6 $T_A = -55^{\circ}\text{C}$	All Tests, Limits and Conditions are the same as for Subgroup 5.						
Subgroup 7 $T_A = +25^{\circ}\text{C}$	SR	G = 10	3.5	–	3.0	–	V/ μs
Subgroup 8 $T_A = -55^{\circ}\text{C}, +125^{\circ}\text{C}$	TCV_{IOS}		–	0.3	–	1.0	$\mu\text{V}/^{\circ}\text{C}$

NOTES:

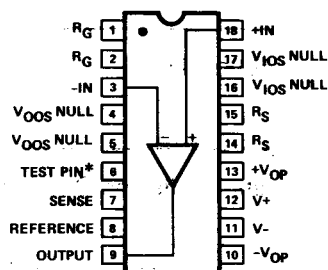
1. For test conditions, refer to Fig. 5, page 6-19 of the 1988 PMI Analog Products Databook.



3.2.1 Simplified Schematic and Pin Connections



AMP-01BTC/883
28-LEAD LCC
(TC-Suffix)



18-PIN HERMETIC DIP
(X-Suffix)

3.2.4 Microcircuit Group Assignment. This microcircuit is covered by microcircuit group 49.

4.2 Life Test/Burn-In Circuit.

