

1.0 SCOPE

This specification covers the detail requirements for a high-speed, precision JFET-input operational 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:

<u>Device</u>	<u>Part Number</u>	<u>Package</u>
A	OP-44AJ/883	J
A	OP-44AZ/883	Z
A	OP-44ARC/883	RC

1.2.3 Case Outline.

<u>Letter</u>	<u>Case Outline (Lead finish per MIL-M-38510)</u>
J	8-lead metal can (TO-99)
Z	8-lead ceramic dual-in-line package (CERDIP)
RC	20-contact hermetic leadless chip carrier (LCC)

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

Supply Voltage.....	$\pm 20\text{V}$
Power Dissipation.....	500mW
Input Voltage (Note 1).....	$\pm 20\text{V}$
Differential Input Voltage (Note 1).....	$\pm 40\text{V}$
Output Short-Circuit Duration	Indefinite
Storage Temperature Range.....	-65°C to $+150^\circ\text{C}$
Lead Temperature (Soldering, 60 sec).....	$+300^\circ\text{C}$
Operating Temperature Range	-55°C to $+125^\circ\text{C}$

NOTES:

1. For supply voltages less than $\pm 20\text{V}$, the absolute maximum input voltage is equal to the supply voltages.

1.5 Thermal Characteristics:

Thermal Resistance, TO-99 (J) package:

Junction-to-Case (θ_{JC}) = 45°C/W MAX

Junction-to-Ambient (θ_{JA}) = 150°C/W MAX

Thermal Resistance, CERDIP (Z) package:

Junction-to-Case (θ_{JC}) = 26°C/W MAX

Junction-to-Ambient (θ_{JA}) = 119°C/W MAX

Thermal Resistance, LCC (RC) package:

Junction-to-Case (θ_{JC}) = 30°C/W MAX

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

TABLE 1

$V_S = \pm 15V$; $R_S = 50\Omega$; $V_{CM} = 0V$; $T_A = T_J = +25^\circ C$ unless otherwise specified.

			OP-44/883		
Characteristics	Symbol	Special Conditions	LIMITS A		Units
			Min	Max	
Input Offset Voltage	V_{OS}		—	1.0	mV
		$-55^\circ C \leq T_A \leq +125^\circ C$	—	2.0	mV
Input Offset Voltage Temperature Coefficient	TCV_{OS}	$-55^\circ C \leq T_A \leq +125^\circ C$	—	10	$\mu V/^\circ C$
Input Offset Current	I_{OS}		—	40	pA
		$T_A = T_J = +125^\circ C$	—	1	nA
Input Bias Current	I_B		—	± 200	pA
		$T_A = T_J = +125^\circ C$	—	± 20	nA
Common-Mode Rejection (Note 1)	CMR	$V_{CM} = I_{VR} = \pm 11V$	86	—	dB
		$V_{CM} = I_{VR} = \pm 11V$ $-55^\circ C \leq T_A \leq +125^\circ C$	84	—	dB
Power Supply Rejection Ratio	PSRR	$V_S = \pm 10V$ to $\pm 20V$	—	40	$\mu V/V$
		$V_S = \pm 10V$ to $\pm 20V$ $-55^\circ C \leq T_A \leq +125^\circ C$	—	50	$\mu V/V$
Output Voltage Swing	V_O	$R_L = 1k\Omega$	± 11.5	—	V
		$R_L = 2k\Omega$ $-55^\circ C \leq T_A \leq +125^\circ C$	± 11.0	—	V
Supply Current	I_{SY}	$V_O = 0V$, No Load	—	7.5	mA
		$V_O = 0V$, No Load $-55^\circ C \leq T_A \leq +125^\circ C$	—	7.5	mA
Short-Circuit Current Limit	I_{SC}	Output Shorted to Ground	± 20	± 60	mA
		Output Shorted to Ground $-55^\circ C \leq T_A \leq +125^\circ C$	± 8	± 60	mA

TABLE 1 (Continued)

$V_S = \pm 15V$; $R_S = 50\Omega$; $V_{CM} = 0V$; $T_A = T_J = +25^\circ C$ unless otherwise specified.

OP-44/883					
Characteristics	Symbol	Special Conditions	LIMITS A		Units
			Min	Max	
Slew Rate	SR	$A_{VCL} = +3, R_L = 2k\Omega$	100	—	V/ μ s
		$A_{VCL} = +3, R_L = 2k\Omega$	80	—	V/ μ s
		$-55^{\circ}\text{C} \leq T_A \leq +125^{\circ}\text{C}$			
External V_{OS} Trim Range	V_{OSadj}	$R_{POT} = 10k\Omega$	± 2.5	± 10	mV
Large-Signal Voltage Gain	A_{VO}	$V_O = \pm 10\text{V}, T_A = +25^{\circ}\text{C}$			
		$R_L = 10k\Omega$	500	—	V/mV
		$R_L = 2k\Omega$	200	—	V/mV
		$R_L = 1k\Omega$	100	—	V/mV
		$V_O = \pm 10\text{V}$			
		$-55^{\circ}\text{C} \leq T_A \leq +125^{\circ}\text{C}$			
		$R_L = 10k\Omega$	160	—	V/mV
		$R_L = 2k\Omega$	80	—	V/mV
Rise Time (Note 2)	t_r		—	50	ns
Overshoot (Note 2)	OS		—	40	%

NOTES:

1. IVR is defined as the V_{CM} range used for the CMR test.
2. See test conditions and test circuit, Figure 1A and 1B.

TABLE 2

OP-44/883

**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, 9

* PDA applies to Subgroup 1 only.
No other Subgroups are included in PDA.

TABLE 3**Group A Inspection**

$V_S = \pm 15V$; $R_S = 50\Omega$; $V_{CM} = 0V$; $T_A = T_J$ unless otherwise specified.

OP-44/883					
LIMITS A					
Subgroup	Symbol	Special Conditions	Min	Max	Units
Subgroup 1 T _A = +25 °C	V _{OS}		–	1.0	mV
	I _B		–	±200	pA
	I _{OS}		–	40	pA
	CMR	V _{CM} = ±11V	86	–	dB
	PSRR	V _S = ±10V, ±20V	–	40	μV/V
	I _{SC}	Output Shorted to Ground	±20	±60	mA
	I _{SY}	V _O = 0V, No Load	–	7.5	mA
	V _{OS} adj	R _{POT} = 10kΩ	±2.5	±10	mV
Subgroup 2 T _A = +125 °C	V _{OS}		–	2.0	mV
	TCV _{OS}		–	10	μV/°C
	I _B		–	±20	nA
	I _{OS}		–	1	nA
	CMR	V _{CM} = ±11V	84	–	dB
	PSRR	V _S = ±10V, ±20V	–	50	μV/V
	I _{SC}	Output Shorted to Ground	±8	±60	mA
	I _{SY}	V _O = 0V, No Load	–	7.5	mA
Subgroup 3 qT _A = -55 °C	All Tests, Limits and Conditions are the same as for Subgroup 2 with the exclusion of I _B and I _{OS} which are not tested at this temperature.				

TABLE 3**Group A Inspection (Continued)** $V_S = \pm 15V$; $R_S = 50\Omega$; $V_{CM} = 0V$; $T_A = T_J$ unless otherwise specified.

Subgroup	Symbol	Special Conditions	OP-44/883 LIMITS A		Units
			Min	Max	
Subgroup 4	V_O	$R_L = 1k\Omega$	± 11.5	—	V
$T_A = +25^\circ C$	A_{VO}	$V_O = \pm 10V, R_L = 10k\Omega$	500	—	V/mV
		$V_O = \pm 10V, R_L = 2k\Omega$	200	—	V/mV
		$V_O = \pm 10V, R_L = 1k\Omega$	100	—	V/mV
Subgroup 5	V_O	$R_L = 2k\Omega$	± 11.0	—	V
$T_A = +125^\circ C$	A_{VO}	$V_O = \pm 10V, R_L = 10k\Omega$	160	—	V/mV
		$V_O = \pm 10V, R_L = 2k\Omega$	80	—	V/mV
Subgroup 6 $T_A = -55^\circ C$	All Tests, Limits and Conditions are the same as for Subgroup 5.				
Subgroup 7 $T_A = +25^\circ C$	SR	$A_{VCL} = +3, R_L = 2k\Omega$	100	—	V/ μs
Subgroup 8 $T_A = -55, +125^\circ C$	SR	$A_{VCL} = +3, R_L = 2k\Omega$	80	—	V/ μs
Subgroup 9 $T_A = +25^\circ C$	t_r	See t_r , OS test circuit, Figure 1A, 1B.	—	50	μs
	OS	See t_r , OS test circuit, Figure 1A, 1B.	—	40	%

Rise Time and Overshoot Test Circuit

Figure 1A

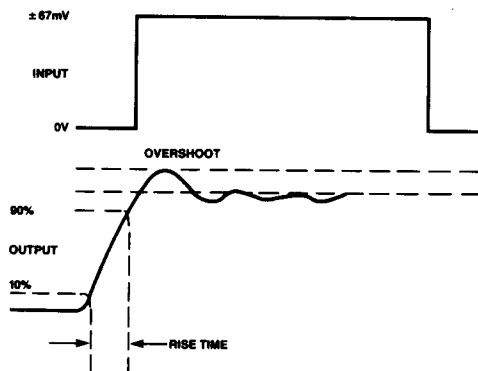
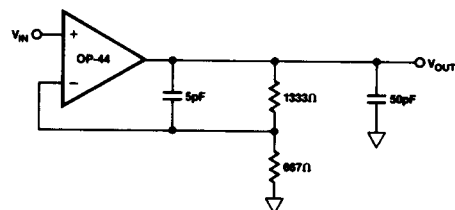
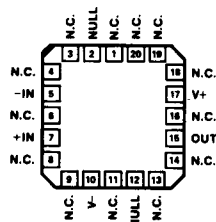
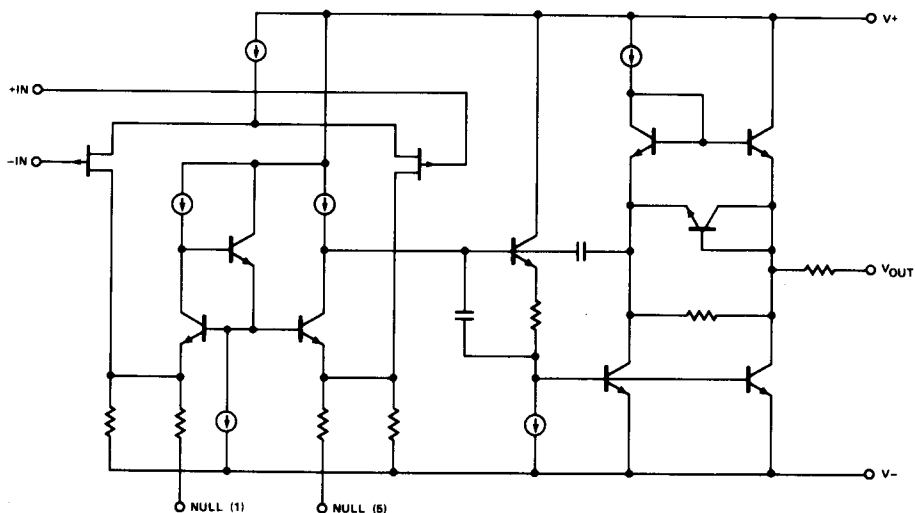


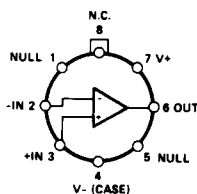
Figure 1B



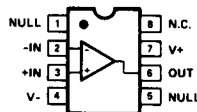
3.2.1 Simplified Schematic and Pin Connections.



20-CONTACT HERMETIC LCC
(RC-Suffix)



TO-99
(J-Suffix)

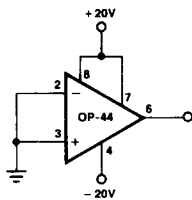


8-PIN HERMETIC DIP
(Z-Suffix)

OP-44

3.2.4 Microcircuit Group Assignment. This microcircuit is covered by microcircuit group 61.

4.2 Life Test/Burn-In Circuit.



J AND Z PACKAGES