

SCOPE: ULTRA-LOW OFFSET VOLTAGE OPERATIONAL AMPLIFIER

<u>Device Type</u>	<u>Generic Number</u>	<u>Circuit Function</u>
01	OP07A(x)/883B	Operational Amplifier, ultra low offset
02	OP07(x)/883B	Operational Amplifier, low offset

Case Outline(s). The case outlines shall be designated in Mil-Std-1835 and as follows:

<u>Outline Letter</u>	<u>Mil-Std-1835</u>	<u>Case Outline</u>	<u>Package Code</u>
J	MACY1-X8	8-Pin Metal Can	G99
Z	GDIP1-T8 or CDIP2-T8	8-Pin Cerdip	J8
RC	CQCC1-N20	20-Pin Ceramic LCC	L20

Absolute Maximum Ratings

Supply Voltage.....	±22V
Input Voltage $\frac{1}{2}$	±22V
Differential Input Voltage Range	±30V
Output Short Circuit Duration	Indefinite
Lead Temperature (soldering, 60 seconds)	+300°C
Storage Temperature	-65°C to +150°C

Continuous Power Dissipation	$T_A = 70^\circ\text{C}$
8-Lead Can (derate 6.67mW/°C above +70°C)	533mW
8-Pin Cerdip (derate 8.00mW/°C above +70°C)	640mW
20-Pin LCC (derate 9.09mW/°C above +70°C)	727mW

Junction Temperature T_J

Thermal Resistance, Junction to Case, θ_{JC} :

Case Outline 8-Lead Can	45°C/W
Case Outline 8-Pin Cerdip	55°C/W
Case Outline 20-Pin LCC	See Mil-Std-1835

Thermal Resistance, Junction to Case, θ_{JA} :

Case Outline 8-Lead Can	150°C/W
Case Outline 8-Pin Cerdip	125°C/W
Case Outline 20-Pin LCC	110°C/W

Recommended Operating Conditions.

Ambient Operating Range (T_A)	-55°C to 125°C
Supply Voltage Range (V_{CC})	±5.0V to ±20V

<u>Ordering Information.</u>	<u>PKG.Code</u>
01 OP07AJ/883B	G99
01 OP07AZ/883B	J8
01 OP07ARC/883B	L20
02 OP07J/883B	G99
02 OP07Z/883B	J8
02 OP07RC/883B	L20

NOTE 1: For Supply voltages less than ±22V, the absolute maximum input voltage is equal to the supply voltages.

TEST	Symbol	CONDITIONS <u>1/</u> -55 °C ≤ T _A ≤ +125°C Unless otherwise specified	Group A Subgroup	Device type	Limits Min	Limits Max	Units
Input Offset Voltage	V _{IO}	<u>2/</u> , <u>3/</u>	1	01 02	-25 -75	25 75	μV
		<u>3/</u>	2,3	01 02	-60 -200	60 200	
Input Offset Voltage Temperature Sensitivity	$\frac{\Delta V_{IO}}{\Delta T}$	<u>4/</u>	2,3	01 02	-0.6 -1.3	0.6 1.3	μV/°C
Input Bias Current	+I _{IB} & -I _{IB}	<u>2/</u>	1	01 02	-2.0 -3.0	2.0 3.0	nA
			2,3	01 02	-4.0 -6.0	4.0 6.0	
Input Offset Current	+I _{IO}		1	01 02	-2.0 -2.8	2.0 2.8	nA
			2,3	01 02	-4.0 -5.6	4.0 5.6	
Power Supply Rejection Ratio	+PSRR -PSRR	V _{CC} + = 20V to 5V, V _{CC} - = -15V V _{CC} + = 15V, V _{CC} - = -20V to -5V	1	ALL		10	μV/V
	+PSRR -PSRR	V _{CC} + = 20V to 5V, V _{CC} - = -15V V _{CC} + = 15V, V _{CC} - = -20V to -5V	2,3			20	
Common mode rejection ratio	CMRR	V _{CM} = ±13V	1 2,3	ALL	110 106		dB
Output short circuit current	I _{OS} +	t ≤ 25ms	1	ALL	-60		mA
	I _{OS} -					50	
Supply Current	I _{CC}		1 2,3	ALL		4 5	mA
Output Voltage Swing (minimum)	V _{OP}	R _L = 1kΩ	4,5,6	ALL	-10	10	V
		R _L = 2000Ω			-12	12	
Open loop voltage gain (single ended)	A _{VS}	<u>6/</u>	4	01 02	300 200		V/mV
			5,6	01 02	200 150		

- 1/ $V_{CC} = \pm 15V$, unnull, $V_{CM} = 0$.
- 2/ Users are cautioned to use the Group C end-point limits for design purposes due to drift experienced with this parameter during steady-life test. See Table 3.
- 3/ Testing will occur at least 250ms after application of power.
- 4/ Shall be guaranteed if not tested to the specified parameters.
- 5/ Continuous short circuit limits are considerably less than the indicated test limits since maximum power dissipation cannot be exceeded.
- 6/ $V_{OUT} = 0V$ to $+10V$ for $AVS(+)$ and $V_{OUT} = 0$ to -10 for $AVS(-)$. $R_L = 2000$ Ohms.

TABLE 3. GROUP C END-POINT ELECTRICAL PARAMETERS

$T_A = +25^{\circ}C$, $\pm V_{CC} = \pm 15V$, $V_{CM} = 0V$

TEST	DEVICE	END-POINT LIMITS		DELTA		UNITS
		MIN	MAX	MIN	MAX	
V_{IO}	01	-100	+100	-75	75	μV
V_{IO}	02	-175	+175	-100	100	μV
$\pm I_{IB}$	01	-3.0	+3.0	-1.0	1.0	nA
$\pm I_{IB}$	02	-4.5	+4.5	1.5	1.5	nA

QUALITY ASSURANCE

Sampling and inspection procedures shall be in accordance with MIL-Prf-38535, Appendix A as specified in Mil-Std-883.

Screening shall be in accordance with Method 5004 of Mil-Std-883. Burn-in test Method 1015:

1. Test Condition, A, B, C, or D.
2. TA = +125C minimum.
3. Interim and final electrical test requirements shall be specified in Table 2.

Quality conformance inspection shall be in accordance with Method 5005 of Mil-Std-883, including Groups A, B, C, and D inspection.

Group A inspection:

1. Tests as specified in Table 2.
2. Selected subgroups in Table 1, Method 5005 of Mil-Std-883 shall be omitted.

Group C and D inspections:

- a. End-point electrical parameters shall be specified in Table 1.
- b. Steady-state life test, Method 1005 of Mil-Std-883:
 1. Test condition A, B, C, D.
 2. TA = +125C, minimum
 3. Test duration, 1000 hours, except as permitted by Method 1005 of Mil-Std-883.

TABLE 2. ELECTRICAL TEST REQUIREMENTS

Mil-Std-883 Test Requirements	Subgroups per Method 5005, Table 1
Interim Electric Parameters Method 5004	1
Final Electrical Parameters Method 5005	1*, 2, 3, 4
Group A Test Requirements Method 5005	1, 2, 3, 4, 5, 6
Group C and D End-Point Electrical Parameters Method 5005	1**

* PDA applies to Subgroup 1 only.

** Table 3 limits used for V_{IO} and $\pm I_{IB}$ in place of Table 1 limits.