

MILITARY SPECIFICATION

Inactive for new design as of 13 July 1995

MICROCIRCUITS, LINEAR, LOW POWER, LOW NOISE, BI-FET  
OPERATIONAL AMPLIFIERS, MONOLITHIC SILICON

This amendment forms a part of MIL-M-38510/119A, dated  
07 August 1987, and is approved for use by all  
Departments and Agencies of the Department of Defense.

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1.2.1, Add footnote for device type 06 as follows "Devices may be monolithic or they may consist of two separate independent die."

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3.1 Detail specifications, delete in its entirety and substitute "3.1 Item requirements. The individual item requirements shall be in accordance with MIL-M-38510, and as specified herein. The individual item requirements for devices marked with the "Q" certification mark shall be in accordance with MIL-I-38535 and as specified herein or as modified in the device manufacturer's Quality Management (QM) plan. The modification in the QM plan shall not effect the form, fit, or function as described herein."

\* 3.1, at the end of the paragraph add the following sentence:

"This slash sheet has been modified to allow the manufacturer to use the alternate die/fabrication requirements of paragraph A.3.2.2 of MIL-PRF-38535 or other alternative approved by the Qualifying Activity."

3.4, Electrical performance characteristics, delete in its entirety and substitute "For dual and quad packages, the idle devices shall be connected as grounded followers or in the case of devices maintained in servo test loops, the idle devices shall have their outputs forced to ground via the output control voltage."

\* Add the following paragraph 3.6.3 :

"3.6.3 Certification/compliance mark. The certification mark for device classes Q and V shall be "QML" or "Q" as required in MIL-PRF-38535. For class Q product built in accordance with A.3.2.2 of MIL-PRF-38535 or other alternative approved by the Qualifying Activity, the "QD" certification mark shall be used in place of the "QML" or "Q" certification mark.

4.1, Sampling and inspection, delete in its entirety and substitute "4.1 Sampling and Inspection. Sampling and inspection procedures shall be in accordance with MIL-M-38510 and methods 5004, 5005, and 5007, as applicable, of MIL-STD-883, except as modified herein. For devices marked with the "Q" certification mark, sampling and inspection procedures shall be in accordance with MIL-I-38535 or as modified in the device manufacturer's Quality Management (QM) plan. The modification in the QM plan shall not effect the form, fit, or function as described herein.

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Table I, add new footnote "1/" to the conditions column.

Table I, Input offset current test, footnote "1/" will be renumbered as footnote "2/".

Table I, Input bias current test, footnote "2/" will be renumbered as footnote "3/".

Table I, Input bias current test, footnote "3/" will be renumbered as footnote "4/".

Table I, Input voltage common mode rejection test, footnote "4/" will be renumbered as footnote "5/".

Table I, Adjustment for input offset voltage test, footnote "5/" will be renumbered as footnote "6/".

Table I, Output short circuit current (for positive output) test, footnote "6/" will be renumbered as footnote "7/".

Table I, Input bias current test, delete in its entirety and substitute the follow :  
 “

Input bias current <u>3/ 4/</u>	+I <sub>B</sub> , -I <sub>B</sub>	V <sub>CC</sub> = ±15 V, V <sub>CM</sub> = +11 V, t ≤ 25 ms	T <sub>J</sub> = +25°C	ALL	-200	1200	pA
			T <sub>J</sub> = +125°C	ALL	-10	70	nA
		V <sub>CC</sub> = ±15 V, V <sub>CM</sub> = 0 V, t ≤ 25 ms	T <sub>J</sub> = +25°C	ALL	-200	+200	pA
			T <sub>J</sub> = +125°C	ALL	-10	50	nA
		V <sub>CC</sub> = ±15 V, V <sub>CM</sub> = -11 V, t ≤ 25 ms	T <sub>J</sub> = +25°C	ALL	-400	200	pA
			T <sub>J</sub> = +125°C	ALL	-10	50	nA

Table I, add new footnote “1/” to the condition column.

Table I, Output short circuit current (for negative output) test, footnote “6/” will be renumbered as footnote “7/”.

Table I, Open loop voltage gain (single ended) test, delete in its entirety and substitute the following :  
 “

Open loop voltage gain (single ended) <u>8/</u>	A <sub>Vs(+)</sub>	V <sub>OUT</sub> = 0 V to 10 V, R <sub>L</sub> = 10 kΩ	T <sub>A</sub> = +25°C	01, 02, 03	5		V/mV
			T <sub>A</sub> = -55°C, +125°C	01, 02, 03	4		
		V <sub>OUT</sub> = 0 V to 10 V, R <sub>L</sub> = 2 kΩ	T <sub>A</sub> = +25°C	04, 05, 06	50		
			T <sub>A</sub> = -55°C, +125°C	04, 05, 06	25		
	A <sub>Vs(-)</sub>	V <sub>OUT</sub> = -10 V to 0 V, R <sub>L</sub> = 10 kΩ	T <sub>A</sub> = +25°C	01, 02, 03	5		
			T <sub>A</sub> = -55°C, +125°C	01, 02, 03	4		
		V <sub>OUT</sub> = -10 V to 0 V, R <sub>L</sub> = 2 kΩ	T <sub>A</sub> = +25°C	04, 05, 06	50		
			T <sub>A</sub> = -55°C, +125°C	04, 05, 06	25		

Table I, Open loop voltage gain (single ended), A<sub>Vs</sub>, test, footnote “7/” will be renumbered as footnote “8/”.

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Table I, add new footnote "1" to the condition column.

Table I, Channel separation test, footnote "8" will be renumbered as footnote "9".

Footnotes, Add new footnote as follows, "1/ For devices marked with the "Q" certification mark, the parameters listed herein may be guaranteed if not tested to the limits specified in accordance with the manufacturer's QM plan.

Footnote "1" will be renumbered as footnote "2".

Footnote "2" will be renumbered as footnote "3".

Footnote "3" will be renumbered as footnote "4".

Footnote "4" will be renumbered as footnote "5".

Footnote "5" will be renumbered as footnote "6".

Footnote "6" will be renumbered as footnote "7".

Footnote "7" will be renumbered as footnote "8".

Footnote "8" will be renumbered as footnote "9".

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Figure 1, device types 03 and 06, cases C and D, pin 11, delete "V-/GND" and substitute "V-"

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Figure 4, Test circuit for burn-in and steady state life tests, delete "Conditions @ T<sub>A</sub> = +125°C" and substitute "Conditions @ T<sub>A</sub> ≥ +125°C".

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Figure 9, Test circuit for settling time, delete note 4 in its entirety and substitute "4. Settling time t<sub>s</sub>, measured on pin 5, is the interval during which the summing mode is not nulled to within ±5 mV."

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Footnote 1/, add the following sentence, "For devices marked with the "Q" certification mark, the parameters listed herein may be guaranteed if not tested to the limits specified in accordance with the manufacturer's QM plan."

Footnote 7/, delete in its entirety and substitute "7/ For device types 02, 03, 05, and 06 maximum limit shown is for 1 operating amplifier only, this value is double for the dual device (i.e. 2 x 3.5 = 7 mA at 25°C and 125°C i.e. 2 x 4.0 = 8 mA at -55°C), quadruple for the quad devices."

Note : The margins of this amendment are marked with asterisks to indicate where changes from the previous amendment were made. This was done as a convenience only and the Government assumes no liability whatsoever for any inaccuracies in these notations. Bidders and contractors are cautioned to evaluate the requirements of this document based on the entire content irrespective of the marginal notations and relationship to the last previous amendment.

CONCLUDING MATERIAL

Custodians:  
Army - CR  
Navy - EC  
Air Force - 11  
DLA - CC

Preparing activity:  
DLA - CC

Review activities:  
Army - AR, MI, SM  
Navy - AS, CG, MC, OS, SH, TD  
Air Force - 19, 99

(Project 5962-1870)

Civil Agency Coordinating Activity:  
NASA - NA