MILITARY SPECIFICATION SHEET

MICROCIRCUITS, LINEAR, 10-BIT DIGITAL-TO-ANALOG CONVERTER, MONOLITHIC SILICON

This amendment forms a part of MIL-M-38510/133A, dated 18 August 1986, and is approved for use by all Departments and Agencies of the Department of Defense.

The attached insertable replacement pages listed below are replacements for stipulated pages. When the new pages have been entered in the document, insert the amendment as the cover sheet to the specification.

Replacement page	Page replaced
25	25
26	Reprinted without change

Custodians:
Army - ER
Navy - EC
Air Force - 17
NASA - NA

Review activities:
Army - AR, MI
Navy - OS, SH
Air Force - 11, 19, 85, 99
DLA - ES

User activities:
Army - SM
Navy - AS, CG, MC

Preparing activity:
Air Force - 17

Agent:
DLA - ES

(Project 5962-1004)

DISTRIBUTION STATEMENT A. Approved for public release; distribution is unlimited.

TABLE III. Group A inspection - Continued.

Subgroup	Symbol	Test no.	Adapter pin numbers 4	5	7 thru 16	22 thru 37	Relays Energized	Measured pin No.	Value	Unit	Equation	Limits Min	Max	Unit
7 T_A = 25°C	L_E	246 247	" " " " " " " "	" " " " " " " "	0000 0000 01 0000 0000 10 0000 0001 00 ---- ---- -- ---- ---- -- 1111 1111 00 1111 1111 01 1111 1111 10 This subgroup checks all digital input codes, except zero code (V_{OS}) and full-scale code (V_{FS}) which were determined in test no. 40 V_{OS} = E20 V_{FS} = E19	1111 1111 1011 1111 1111 1111 0111 1111 1111 1110 1111 1111 ---- ---- ---- ---- ---- ---- ---- ---- 0000 0000 1111 1111 0000 0000 1011 1111 0000 0000 0111 1111	None "	19 "	E414 E415	V "	For each input code N calculate the corresponding linearity error in LSB. L_E = 10((EA/G1)+(N)(K)-V_{OS})) where EA = measured value E414 through E1429 G1 = error amplifier gain from step 27,28 N = DUT input digital code word in decimal form. Thus for 10 bits N = (A1)(2exp7)+(A2)(2exp6)+... +(A10)(2exp0) A1,A2...A10 are 0 or 1. K = actual volts/count scale factor. K = (E20-E19)/1023 Worst positive error Worst positive code Worst negative error Worst negative code	 -0.5	 0.5	 LSB OCT LSB OCT
8 T_A = +125°C	L_E	248 249	Same tests, terminal conditions, and limits as for subgroup 7, test 246 thru 247 except T_A = 125°C. V_{OS} and V_{FS} are the values determined in subgroup 2.									-0.5	+0.5	LSB OCT LSB OCT
8 T_A = -55°C	L_E	250 251	Same tests, terminal conditions, and limits as for subgroup 7, tests 246 thru 247 except T_A = -55°C. V_{OS} and V_{FS} are the values determined in subgroup 3.									-0.5	+0.5	LSB OCT LSB OCT
12 T_A = 25°C	t_{SLH}	252	All digital inputs switched simultaneously from logic low to logic high. For each device type output settling is to within 1/2 LSB of the rated accuracy. See figures 7 and 8.					6	t1	ns	t_{SLH} = t1		500	ns
	t_{SHL}	253	All digital inputs switched simultaneously from logic high to logic low. For each device type output settling is to within 1/2 LSB of the rated accuracy. See figures 7 and 8.					6	t2	ns	t_{SHL} = t2		500	ns
	N_0	254	V_{CC} = +5 V; V_{EE} = -15 V All digital inputs = +2.2 V See figure 9.					6	E416	µV rms	N_0 = E416/100		160	µV rms

4.4.3 Group C inspection. Group C inspection shall be in accordance with table III of method 5005 of MIL-STD-883 and as follows:

a. End-point electrical parameters shall be as specified in table II herein. Delta limits shall apply only to subgroup 1 of group C inspection for class B devices.

b. Steady-state life test (method 1005 of MIL-STD-883) conditions:

1. Test condition A, using the circuit shown on figure 5; or test condition D, using the circuit shown on figure 4; or test condition F, using the circuit shown on figure 5.

2. T_A = 125°C minimum.

3. Test duration: 1000 hours, except as permitted by appendix B of MIL-M-38510 and method 1005 of MIL-STD-883.

4.4.4 Group D inspection. Group D inspection shall be in accordance with table IV of method 5005 of MIL-STD-883. End-point electrical tests shall be as specified in table II herein.

4.4.5 Inspection of packaging. Inspection of packaging shall be in accordance with MIL-M-38510.

4.5 Methods of inspection. Methods of inspection shall be as specified in the appropriate tables. Electrical test circuits as prescribed herein or in the referenced test methods of MIL-STD-883 shall be acceptable. Other test circuits shall require the approval of the qualifying activity.

4.5.1 Voltage and current. All voltage values given are referenced to the ground terminal of the device under test (DUT). Current values given are for conventional current and are positive when flowing into the referenced terminal.

4.5.2 Life test and burn-in cooldown procedure. When devices are measured at +25°C following application of the steady-state life or burn-in test condition, they shall be cooled to within +10°C of their power stable condition at room temperature prior to removal of the bias.

TABLE IV. Group C delta limits at 25°C.

Parameter	Min	Max	Unit
IZS2	-0.1	+0.1	LSB
AE2	-0.1	+0.1	%
BPOE	-1.0	+1.0	LSB

5. PACKAGING

5.1 Packaging requirements. The requirements for packaging shall be in accordance with MIL-M-38510.

6. NOTES

6.1 Intended use. Microcircuits conforming to this specification are intended for original equipment design applications and logistic support of existing equipment.