

Qualification requirements have been removed for device types 01, 04, 05, 06, 07 and 08 see scope.

INCH-POUND
MIL-M-38510/13F
AMENDMENT 8
4 August 1999
SUPERSEDING
AMENDMENT 7
8 September 1995

MILITARY SPECIFICATION

Inactive for new design as of 7 September 1995

MICROCIRCUITS, DIGITAL, BIPOLAR, TTL,
COUNTERS, MONOLITHIC SILICON

This amendment forms a part of MIL-M-38510/13F, dated 16 April 1982, and is approved for use by all Departments and Agencies of the Department of Defense.

PAGE 1

Title: Delete and substitute as printed above.

1.1, delete and substitute:

“1.1 Scope. This specification covers the detail requirements for monolithic silicon, TTL, binary and decade counters. Qualification requirements are removed for device types 01, 04, 05, 06, 07 and 08. For the remaining device types 02, 03, and 09, two product assurance classes and a choice of case outlines and lead finishes are provided and are reflected in the complete part number. All device types are inactive for new design after the date of this amendment.”

1.2.3, delete letter B in its entirety and substitute:

“B F-3 (14-lead, 3/16" x 1/4"), flat package”.

PAGE 2

1.3, delete “Thermal resistance, junction-to-case (Θ_{JC}) 0.09°C/mW for flat package; 0.08°C/mW for dual-n-line package” and substitute:

“Thermal resistance, junction-to-case (Θ_{JC})
Cases A, B, C, D, E, and F (See MIL-STD-1835).”

1.3, after junction temperature (T_J): Add “2”.

1.4, after supply voltage: Add “(V_{CC})”.

1.4, width of clock pulse, $t_{W(CLOCK)}$, device types 03, 04, 05, and 06: Delete “30 ns” and substitute “25 ns”.

1.4, setup time, $t_{(SETUP)}$, device types 03, 04, 05, and 06: Delete “Enable P - - - - - 25 ns minimum”.

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.

<u>Replacement page</u>	<u>Page replaced</u>
41	41
42	42

MIL-M-38510/13F
AMENDMENT 8

1.4, following hold time operating conditions, add enable time conditions as follows:

"Enable time, $t_{(ENABLE)}$, device types 03, 04, 05, and 06, Enable P ----- 25 ns minimum".

Following footnote 1/, add:

"2/ Maximum junction temperature shall not be exceeded except for allowable short duration burn-in screening conditions in accordance with method 5004 of MIL-STD-883."

PAGE 3

3.1 Detail specification. Add the following sentence, "Certification and Qualification requirements have been removed for device types 01, 04, 05, 06, 07, and 08."

3.2.3, delete and substitute:

"3.2.3 Schematic circuits. Schematic circuits shall be submitted to the preparing activity prior to inclusion of a manufacturer's device in the specification and shall be submitted to the qualifying activity and agent activity (DESC-ECS) as a prerequisite for qualification. All qualified manufacturers' schematics shall be maintained by the agent activity and will be available upon request."

3.6, delete and substitute:

"3.6 Marking. Marking shall be in accordance with MIL-M-38510."

3.6 Marking. Add the following sentence "The JAN or J certification mark shall not be used for device types 01, 04, 05, 06, 07, and 08."

PAGE 4

TABLE I, I_{IL2} , device types 08 and 09, minimum limits column: Delete "-0.7" and substitute "-0.5".

TABLE I, I_{IL5} , device types 08 and 09, minimum limits column: Delete "-0.7" and substitute "-0.5".

TABLE I, I_{IL6} , device types 08 and 09, minimum limits column: Delete "-0.7" and substitute "-0.5".

PAGE 6

TABLE II, group A test requirements, class B devices column: Add "8".

PAGE 7

4.2a(1), delete and substitute as follows:

"(1) Test condition D or E, using the circuit shown on figure 5, or equivalent. Test condition A and the applicable test circuit shall be allowed with the approval of the qualifying activity."

4.2c, delete and substitute:

"c. The percent defective allowable (PDA) shall be as specified in MIL-M-38510."

4.3 Qualification inspection. Add the following sentence, "Qualification inspection is not required for device types 01, 04, 05, 06, 07 and 08."

4.4.3c(1), delete and substitute as follows:

"(1) Test condition D or E, using the circuit shown on figure 5, or equivalent. Test condition A and the applicable test circuit shall be allowed with the approval of the qualifying activity."

4.4.3c(3), delete "appendix B of MIL-M-38510" and substitute "method 1005 of MIL-STD-883".

- 6.1: Delete in its entirety.
- 6.2 Delete in its entirety, and replace as follows: "Intended use. Microcircuits conforming to this specification are intended for Government microcircuit applications (original equipment) and logistic purposes. Device types 01, 04, 05, 06, 07, and 08 is intended for use for logistic support of existing equipment."
- 6.3 Ordering data. Paragraphs d - h, delete and replace as follows,
- "d. Requirements for notification of change of product or process to the contracting activity for device types 01, 04, 05, 06, 07, and 08, if applicable."
 - "e. For device types 02, 03, and 09, requirements for failure analysis (including required test condition of method 5003 of MIL-STD-883), corrective action, and reporting of results, if applicable."
 - "f. Requirements for packaging and packing, device types 01, 04, 05, 06, 07, and 08. Requirement for product assurance options, device types 02, 03, and 09."
 - "h. For device types 02, 03, and 09, requirements for "JAN" marking."
- 6.4, delete "GND ----- Electrical ground (common terminal)" and substitute:
"GND ----- Ground zero voltage potential".

PAGES 38 AND 39

FIGURES 6 and 7, note 1, delete "PRR = 1 MHz" and substitute "PRR \leq 1 MHz".

PAGE 43

FIGURE 8C, note 1, delete " $t_p = 20$ ns" and substitute " $t_p = 25$ ns".

FIGURE 8C, note 1, delete " $V_{GEN} = 4.5$ V" and substitute " $V_{GEN} = 3.0$ V".

PAGES 44, 45, AND 46

FIGURES 9, 10, and 10A, note 1, delete "PRR = 1 MHz" and substitute "PRR \leq 1 MHz".

MIL-M-38510/13F
AMENDMENT 8

PAGE 49

TABLE III, footnote 14/, delete and substitute as follows:

"14/ The limits shown shall be as follows:

Test	Min/Max limits (mA) for circuit				
	A	B	C	D	E
I _{IL1}	-0.4/-1.3	-0.4/-1.3	-0.3/-1.3	-0.7/-1.6	-0.7/-1.6
I _{IL2}	-1.4/3.2	-0.7/-3.2	-0.7/-3.2	-0.7/-3.2	-0.7/-3.2
I _{IL3}	-1.4/-4.8	-0.7/-4.8	-0.7/-4.8	-1.4/-6.4	-1.4/-6.4

PAGE 52

TABLE III, footnote 14/, delete and substitute as follows:

"14/ The limits shown shall be as follows:

Test	Min/Max limits (mA) for circuit				
	A	B	C	D	E
I _{IL1}	-0.4/-1.3	-0.4/-1.3	-0.4/-1.3	-0.7/-1.6	-0.7/-1.6
I _{IL2}	-0.7/3.2	-0.7/-3.2	-0.7/-3.2	-0.7/-3.2	-0.7/-3.2
I _{IL3}	-0.7/-3.2	-0.7/-3.2	-0.7/-3.2	-0.7/-3.2	-0.7/-3.2

PAGE 53

TABLE III, test numbers 43 and 45, minimum limits column: Add "9/" after -0.7. Make this same change on pages 58 and 68.

* TABLE III, test number 46, Clear, Data Input A, Data Input D and Enable P columns: Delete "4.5 V" and substitute "5.5 V"

* TABLE III, test number 46, minimum limits column: Add "9/" after -1.0.

PAGE 57

TABLE III, add new footnote 9/ as follows: "9/ Minimum limit for circuit C shall be -0.5 mA."

Make this same change on pages 62, 67, and 72.

PAGE 63

TABLE III, test numbers 43 through 45, minimum limits column: add "9/" after -0.7.

PAGE 64

TABLE III, test numbers 47 through 51, pin 2: Delete "D".

PAGE 72

TABLE III, subgroup column: Add "11"; conditions: Add "Same tests, terminal conditions, and limits as subgroup 10, except T_C = -55° C."

MIL-M-38510/13F
AMENDMENT 8

PAGES 80 AND 86

TABLE III, device types 08 and 09, subgroup column: Add "8"; conditions: Add "Repeat subgroup 7 at $T_C = +125^\circ\text{C}$ and $T_C = -55^\circ\text{C}$."

PAGE 82

TABLE III, device type 09, test numbers 1 through 4, minimum and maximum limits columns: Add "19" after -0.7 and -1.6, respectively.

TABLE III, test number 6, symbol column: Delete " I_{IL8} ".

PAGES 85 AND 86

TABLE III, subgroup column: Delete " $T_C = +125^\circ\text{C}$ " and substitute $T_C = 25^\circ\text{C}$ ".

PAGE 87

TABLE III, footnote 4/, delete and substitute: "See figure 10A. Apply waveform E for tests 161 and 178 and waveform H for tests 162 and 179."

TABLE III, add footnote 19/ at bottom of page as follows:

"19/ The limits shall be -0.5 mA minimum and -1.3 mA maximum for circuit E."

PAGE 88

6.6 Delete in its entirety and replace as follows:

"6.6 Substitutability. The cross-reference information below is presented for the convenience of users. Microcircuits covered by this specification will functionally replace the listed generic-industry type. Generic-industry microcircuit types may not have equivalent or reliability factors equivalent to MIL-M-38510 device types and may have slight physical variations in relation to case size. The presence of this information shall not be deemed as permitting substitution of generic-industry types for MIL-M-38510 types or as a waiver of any of the provisions of MIL-M-38510.

<u>Military device type</u>	<u>Generic-industry type</u>
01 <u>1</u> /	5492
02	5493
03	54160
04 <u>1</u> /	54163A
05 <u>1</u> /	54162
06 <u>1</u> /	54161
07 <u>1</u> /	5490
08 <u>1</u> /	54192
09	54193

1/ Qualification requirements removed for this device type."

MIL-M-38510/13F
 AMENDMENT 8

"6.7 Manufacturers' designators. Manufacturers' circuits which form a part of this specification are designated with an "X" as shown in table IV herein.

TABLE IV, circuit B column: Add manufacturers designation for device type 09.

TABLE IV. Manufacturers' designation.

Circuit	A	B	C	D	E	F
Device type	Texas instruments	National	Motorola	Advanced micro devices	Signetics Corp	Fairchild Semiconductor
02	X	X	X		X	
03	X	X	X		X	
09	X		X		X	

6.8 Add:

"6.8 Generic test Data. This shall apply only for device types 01, 04, 05, 06, 07, and 08. Generic test data may be used to satisfy the requirements of 4.4.3. Group C generic test data shall be on data codes no more than one year old and on a die in the same microcircuit group (see appendix E of MIL-M-38510) with the same material, design and process and from the same plant as the die represented. Group " (see 4.4.4) generic data shall be on date codes no more than one year and on the same package type (see terms, definitions, and symbols of MIL-M-38510) and from the same plant as the package represented. The vendor is required to retain the generic data for a period of not less than 36 months from the date of shipment."

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

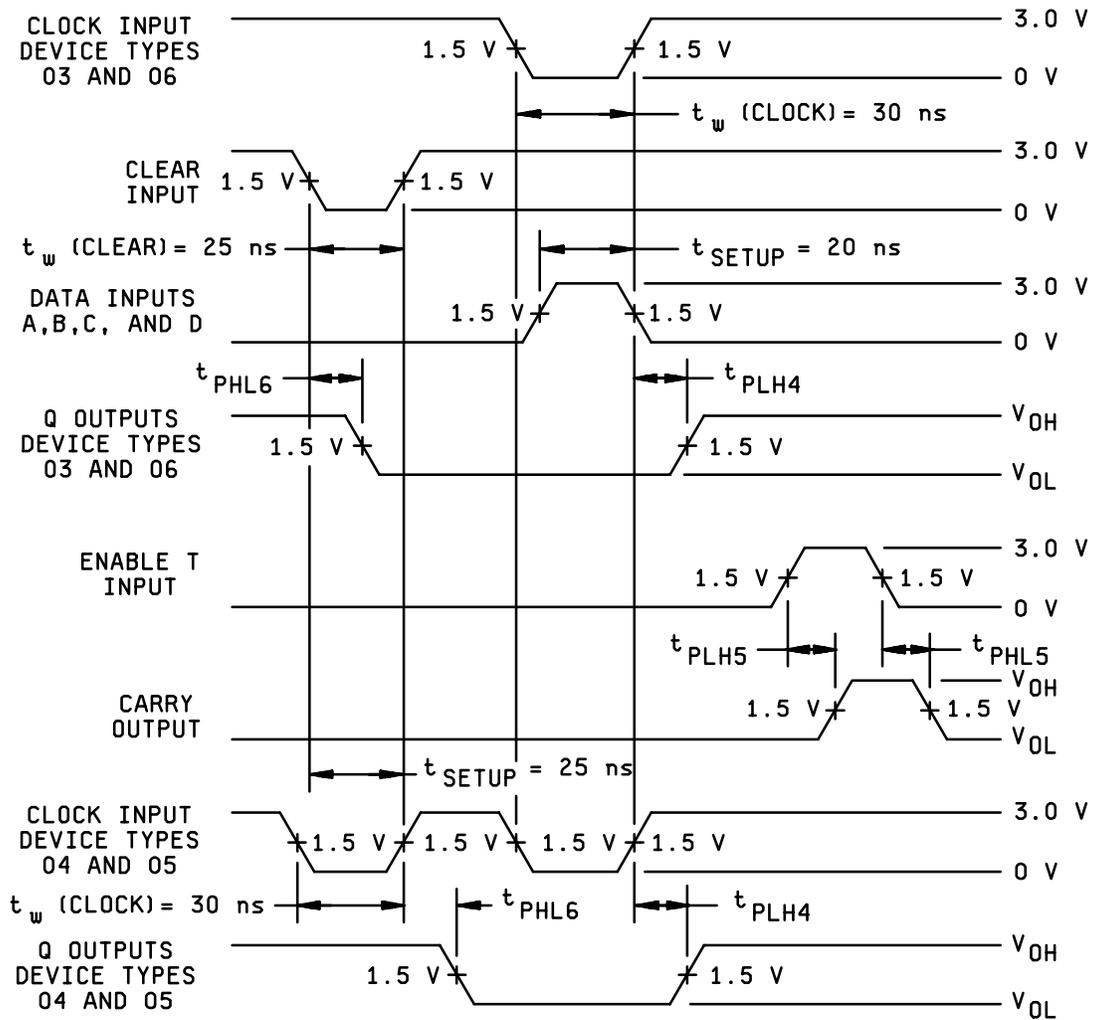
Custodians:
 Army - CR
 Navy - EC
 Air Force - 11
 DLA-CC

Preparing activity:
 DLA - CC

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

(Project 5962-1853)

MIL-M-38510/13F
AMENDMENT 8



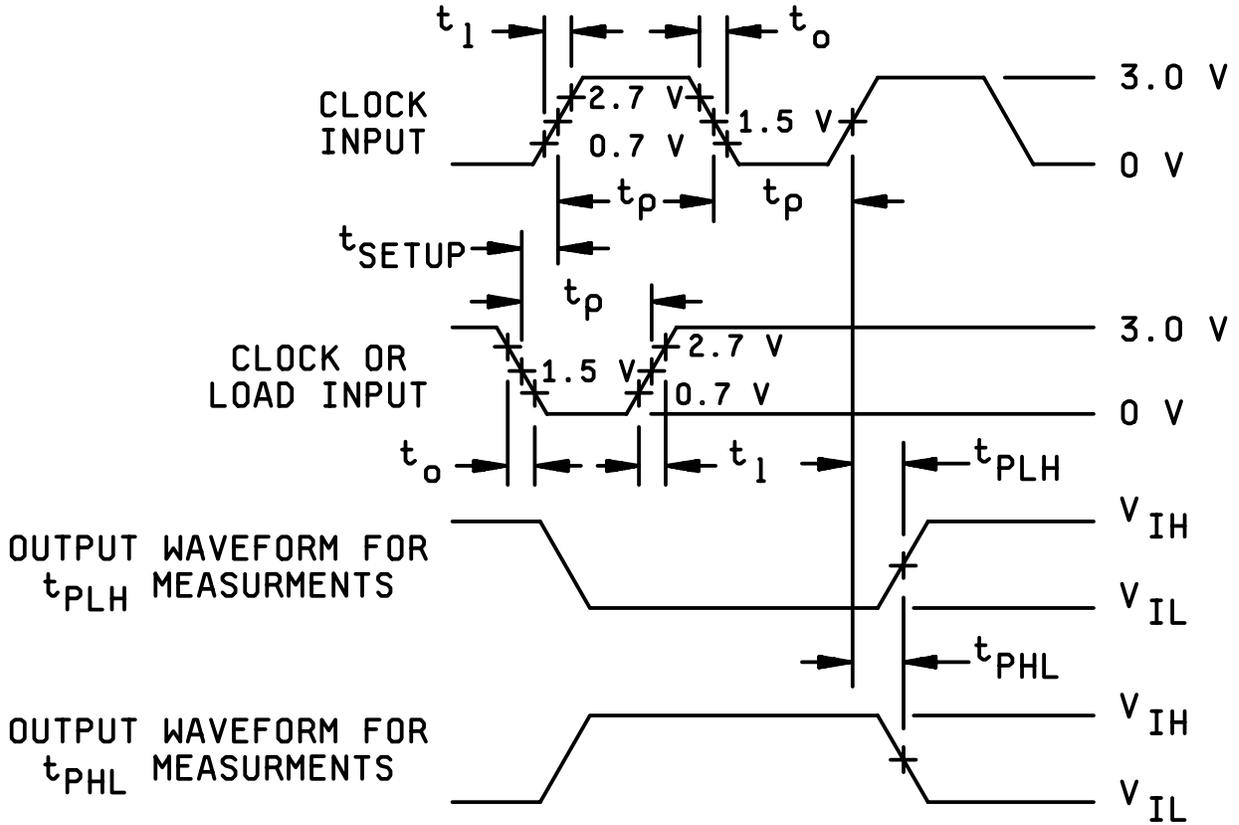
NOTES:

1. The input pulses are supplied by a generator having the following characteristics:
 $t_r \leq 10 \text{ ns}$, $t_f \leq 10 \text{ ns}$, $\text{PRR} \leq 1 \text{ MHz}$, $Z_{\text{OUT}} = 50\Omega$.
2. Enable T duty cycle $\leq 50 \%$, $\text{PRR} = 1 \text{ MHz}$.

FIGURE 8A. Switching time test circuits and waveforms for device types 03, 04, 05, and 06 - Continued.

Supersedes page 41 of MIL-M-38510/13F of 16 April 1982

MIL-M-38510/13F
AMENDMENT 8



NOTES:

1. The input pulses are supplied by a generator having the following characteristics:
 $t_0 = t_1 \leq 10$ ns, $PRR \leq 1$ MHz, $Z_{OUT} = 50\Omega$.
2. The t_{SETUP} for load pulse = 30 ns; t_{SETUP} for clear pulse = 25 ns.

FIGURE 8b. Switching time test circuits and waveforms for device types 03, 04, 05, and 06 - Continued.

Supersedes page 42 of MIL-M-38510/13F of 16 April 1982