NOTICE OF CHANGE

NOT MEASUREMENT SENSITIVE

MIL-HDBK-179A
NOTICE 1
JUNE 5, 1996

DEPARTMENT OF DEFENSE
HANDBOOK

MICROCIRCUIT ACQUISITION HANDBOOK

TO ALL HOLDERS OF MIL-HDBK-179A:

1. THE FOLLOWING PAGES OF MIL-HDBK-179A HAVE BEEN REVISED AND SUPERSEDE THE PAGES LISTED:

NEW PAGE	DATE	SUPERSEDED PAGE	DATE
21	20 July 1995	21	Reprinted without change
22	5 June 1996	22	20 July 1996

2. RETAIN THIS NOTICE AND INSERT BEFORE TABLE OF CONTENTS.

3. Holders of MIL-HDBK-179A will verify that page changes and additions indicated above have been entered. This notice page will be retained as a check sheet. This issuance, together with appended pages, is a separate publication. Each notice is to be retained by stocking points until the handbook is completely revised or canceled.

Custodians:
Army - CR
Navy - EC
Air Force - 17

Review Activities:
Army - AR, MI
Navy - NW
Air Force - 19, 85, 99
DLA - ES
OSD - SO

Preparing activity:
Army - CR
Agent:
DLA - ES
(Project 5962-1658)

AMSC N/A

FSC 5962

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

5.2.2 Device selection criteria spreadsheet guide. The information required in each data item of the spreadsheet is explained in a. through i. The descriptions are typical inputs which could meet the data item requirements. Additional inputs which will meet the intent of the data item should be included.

a. Part type and number: Description of device: microprocessor, memory; controller, amplifier, etc. Identification of part through catalog number, Standard Microcircuit Drawing (SMD), Source Control Drawing (SCD), etc, with accompanying drawing containing package outline, temperature range, power capability, etc.

b. End item application experience: What equipment has this device (part number) been used in, preferably equipment manufactured by the equipment manufacturer? If this is not available, then verifiable data from other government or commercial equipment applications should be pursued and provided. Applicable information would include number of parts used and use history in these systems. If the equipment manufacturer had used this device in another application; data could include types of devices used (SMT, DIP, etc), experience at board assembly, and field reliability. What has been the incoming or assembly first test experience? Has cause of reject been determined and is it device design or process related? Vendor outgoing final test data may be acceptable.

c. Reliability assurance: How will the equipment manufacturer assure the microcircuit will meet the end item use (reliability) requirement? An approach which implements diagnostics of stress tested parts and field failure returns with feedback to correct problems in design or processing is a technique to assure product reliability. Correct device selection for the circuit design implemented is mandatory. A continuous process improvement methodology for assembly operations will assure the greatest quality, highest yield and lowest defect rate. Assessment could be based on possible failure mechanisms and how the supplier and user will assure any impact is eliminated. PCMs (process control monitors) and SECs (standard evaluation circuits) are test devices used as process control monitors and process validation circuits respectively. Theoretical modeling software programs are available to assess the reliability of a packaged assembly at initial design.

d. Use environment: What is the specific end item this device will be used in? What will be the environmental extremes the device will be subjected to and the frequency of these stresses (cycles per year) if applicable. How have these conditions been addressed in category c. above? (see 6.2.1).

e. Derating: Has the equipment manufacturer's circuit designer provided adequate margin (safety factor) between worst case circuit design and device specification performance limits? Provide comparison of design factors and specification limits.

f. Purchased to which qualification system: Provide the qualification system identification to which the microcircuit will be procured. If an accepted military or industry standard, indication of system is the only requirement. If not standard or changes to a standard proposed then detail documentation is required.

g. Proposed additional assurance: This category will be for the identification of added value screening or sampled testing required to assure meeting system requirements. Further assurances from the supplier should be obtained, such as certificate of compliance and warranty.

h. Guaranteed operating temperature: Provide the vendor guaranteed operating temperature for the device under consideration for use in your equipment application. Using parts outside the manufacturer's guaranteed temperature range is

not recommended. Any attempt to use parts outside the specified temperature limits will need to be thoroughly justified.

i. Radiation Hardness Assurance (RHA): RHA is required for all devices intended for operation in a radiation environment and specifies how the equipment manufacturer will ensure that the microcircuit will meet the end item use (radiation hardness) requirements for all specified environments. (See Appendix A for RHA discussion.)

FIGURE 2. Device selection criteria spreadsheet [1/]

PART TYPE AND NUMBER	END ITEM APPLICATION	RELIABILITY ASSURANCE	USE ENVIRONMENT
Microprocessor SNJ XXYY Drawing with package outline	IBM PC Ford Radio AN/PRC-70, etc.	PCM SEC Life test-need test conditions Failure rate calculation Failure mechanism Field data	Aircraft, tank, etc. Temperature, RH, temperature cycle, vibration, shock, etc. for each environment

DERATING	PURCHASED TO QUAL SYSTEM	PROPOSED ADDITIONAL ASSURANCE	GUARANTEED OPERATING TEMPERATURE	PEM	RHACC
Worst case operating electrical conditions (1% of spec limits)	Vendor self-audit ISO -9000 MIL-PRF-38535 JEDEC-STD-47 CLASS M/883 compliant CDF-AEC-A100 Details required	Screens QCI Certificate of compliance Warranty Rad-hard [2/]			Environment Levels ASIC considerations [2/]

[1/] used with the Device Selection Criteria Guide (See 5.2.2)
[2/] see Appendix A

SUPERSEDES PAGE 22 OF MIL-HDBK-179A