



Manufacturing and Test Overview of Military Products

Atmel is committed to producing products to the highest quality standards achievable through the constant use of Statistical Process Control techniques and a very active Continuous Improvement System. These systems influence the entire product life cycle from the initial product definition, through the subsequent product design and fabrication process, to the final test procedures.

Assembly and Screening

Without regard for the products' final end use all wafers produced by Atmel are fabricated with the assumption that they are destined for high reliability applications in the military marketplace. After fabrication, products directed towards use by the military will enter into special flows, beginning with the assembly operation, that will insure full compliance for class B microcircuits in accordance with 1.2.1 of MIL-STD-883, "Provisions for the use of MIL-STD-883 in conjunction with compliant non-JAN devices."

Figure 1 and 2 illustrate the standard flow for military products. It conforms to the requirements set forth in MIL-STD-883 method 5504.

Quality Conformance Inspection

As shown in Table 1, Atmel performs all the quality conformance inspections specified by MIL-STD-883 method 5005 for class B products. This testing includes Groups A and B on each individual inspection lot and Groups C and D on a periodic basis as defined in MIL-I-38535, Appendix A.

Lot specific Group A, Group B and pre-conditioning data and generic Group C and Group D data are available for customer procurement.

Military Product Programs

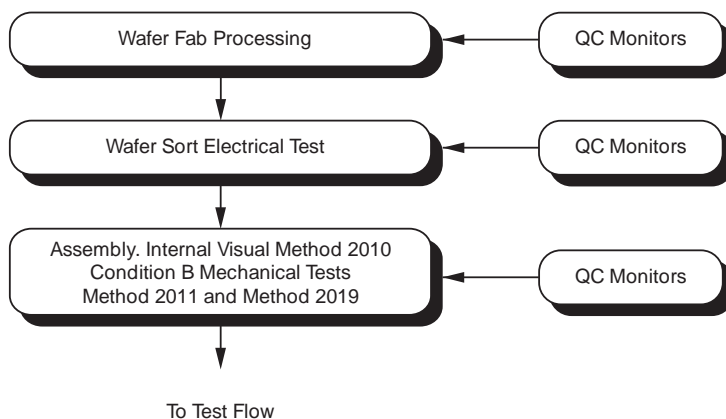
Atmel offers three programs for the procurement of military products:

(1) MIL-STD-883, Class B Program

Products procured to Atmel's MIL-STD-883 program are fully compliant with MIL-STD-883 paragraph 1.2.1, with no exceptions. These products are categorized as Atmel standard "883" products and may be procured by specifying the Atmel part number appended with the suffix /883. A Certificate of Compliance (C of C) is enclosed with each shipment. Refer to the product's data sheet for specific ordering information.

Figure 1. MIL-STD-883, Class B, Product Flow.

All Atmel products are manufactured to these standards.



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(2) Standard Microcircuit Drawing (SMD) Program

Products procured to the Standard Microcircuit Drawing are class B products fully compliant with MIL-STD-883 paragraph 1.2.1. In addition, these products are in full compliance with the applicable Standard Microcircuit Drawing. Atmel's test philosophy is to screen and test both Atmel Standard /883 products and products ordered by the SMD number identically.

Section 2, Table 1 lists currently approved Atmel SMD parts, organized by their Atmel part number. Section 2, Table 2 lists currently approved Atmel SMD parts, organized by their SMD number.

(3) Source Control Drawing (SCD) Program

Program procured to a source control drawing are class B products fully compliant with MIL-STD-883 paragraph 1.2.1 with optional additional tests as specified by the customer drawing. Atmel must review and accept a customer's SCD prior to order acceptance to assure compliance.

Figure 2. Test Flow (3), MIL-STD-883, Class B, SMD and SCD Test Flow.

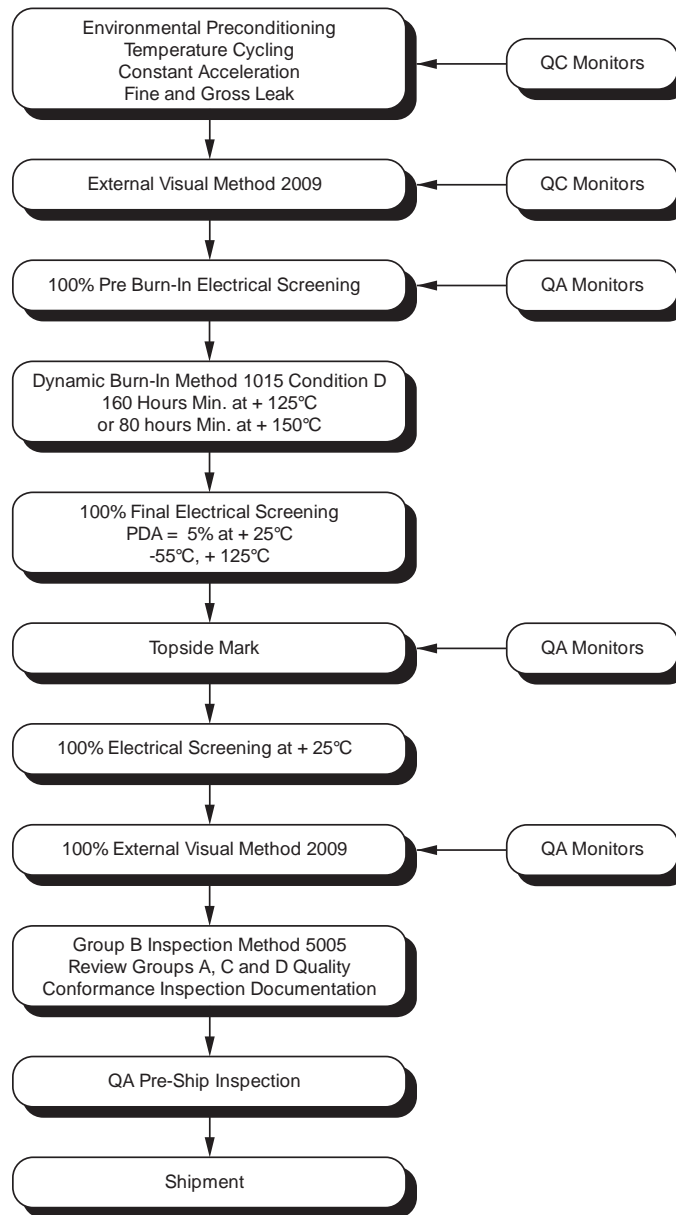


Table 1. Quality Conformance Inspections, Method 5005

Group A: Electrical Tests

Performed On Each Lot

Screen	MIL-STD-883 Table 1 Subgroups	LTPD
Static Tests at +25°C	1	2
Static Tests at +125°C	2	2
Static Tests at -55°C	3	2
Dynamic Tests at +25°C	4	2
Function Tests at +25°C	7	2
Function Tests at +125°C	8A	2
Function Tests at -55°C	8B	2
Switching Tests at +25°C	9	2
Switching Tests at +125°C	10	2
Switching Tests at -55°C	11	2

Group B: Assembly Integrity Tests

Performed On Each Lot

Screen	MIL-STD-883 Test Method	Conditions	Quantity (Accept No. or LTPD)
SUBGROUP 2 Resistance to Solvents	2015	Top and Bottom Marks	4(0)
SUBGROUP 3 Solderability	2003	+245°C +/-5°C	10
SUBGROUP 5 Bond Strength	2011	Condition D	15

Group C: Die Related Tests

Screen	MIL-STD-883 Test Method	Conditions	LTPD
SUBGROUP 1 Steady State Life Test End Point Electricals	1005 5005	Condition D As specified in the applicable device specification	5
Physical Dimensions	2016	MIL-M-38510, Appendix C	15

Group D: Package Related Tests

By Package Type, Assembly Location, and Exterior Lead Finish

Screen	MIL-STD-883 Test Method	Conditions	Quantity (Accept No. or LTPD)
SUBGROUP 1 Physical Dimensions	2016	MIL-M-38510, Appendix C	15
SUBGROUP 2 Lead Integrity	2004	Condition B2 (Condition D for LCC)	5
Seal: Fine	1014	Condition A or B	
Seal: Gross	1014	Condition C	
SUBGROUP 3 Thermal Shock	1011	Condition B, 15 Cycles	15
Temperature Cycling	1010	Condition C, 100 Cycles	
Moisture Resistance	1004	10 Cycles	
End Point Electricals	5005	As specified in the applicable device specification (within 42 hrs)	
Seal: Fine	1014	Condition A or B	
Seal: Gross	1014	Condition C	
Visual Examination		Per Visual of Method 1004 and 1010	
SUBGROUP 4 Mechanical Shock	2002	Condition B	15
Vibration Variable Freq.	2007	Condition A	
Constant Acceleration	2001	Condition E, 30 KG., Y1	
Seal: Fine	1014	Condition A or B	
Seal: Gross	1014	Condition C	
Visual Examination	1010		
End Point Electricals	5005	As specified in the applicable device specification	
SUBGROUP 5 Salt Atmosphere	1009	Condition A	15
Seal: Fine	1014	Condition A or B	
Seal: Gross	1014	Condition C	
Visual Examination		Per Visual of Method 1009	
SUBGROUP 6 Internal Water Vapor Content	1018	5,000 PPM Maximum Water Content at 100°C	3 (0) or 5 (1)
SUBGROUP 7 Adhesion of Lead Finish	2025	Glass Frit Seal Only (LTPD for Number of Leads)	15
SUBGROUP 8 Lid Torque	2024	Glass Frit Seal Only	5 (0)









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