



To Date Progress Report on Test Optimization For Associated QPL and QML Manufacturers

**12 December 03
DSCC-VQ**

Progress Report on Test Optimization

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General specifications that specify Statistical Process Control (SPC) requirements: 53

General specifications that permit full optimization of tests
(e.g., reduction/deletion/modification): 4

General specifications that permit reduction in frequency of periodic inspection tests
or deletion of selected tests: 28

The following general specifications permit full optimization of tests (e.g., reduction/deletion/modification):

- MIL-PRF-38535 Microcircuits - QML
- MIL-PRF-38535 Appendix "A" Microcircuits - QPL
- MIL-PRF-38534 Hybrid - QML
- MIL-PRF-19500 Semiconductors - QPL

The following specifications allow for the reduction of the frequency of periodic tests or the deletion of selected tests:

QPL Capacitors

QPL Resistors

MIL-PRF-20	MIL-PRF-39018	MIL-PRF-122	MIL-PRF-39009
MIL-PRF-39001	MIL-PRF-39022	MIL-R-22684	MIL-PRF-39015
MIL-PRF-39003	MIL-PRF-55365	MIL-PRF-914	MIL-PRF-39035
MIL-PRF-39006	MIL-PRF-55681	MIL-R-39005	MIL-PRF-55182
MIL-PRF-39014	MIL-PRF-83421	MIL-R-9007	MIL-PRF-55342
MIL-PRF-49137		MIL-PRF-39017	MIL-PRF-83401

Crystal

Fuse

Relay

MIL-PRF-3098	MIL-PRF-23419	MIL-PRF-28750
	MIL-PRF-19207	

Printed Circuit Boards/Printed Wiring Boards

MIL-PRF-31032

The following QPL manufacturers have reduced the frequency of periodic inspection tests:

<u>Manufacturers</u>	<u>Specifications</u>	<u>Test Reduced</u>	<u>Date</u>
ATC	MIL-PRF-55681	Humidity Thermal Shock and Immersion Voltage Temperature Limits	Jul 93
AVX (Myrtle Beach)	MIL-PRF-20	Temperature Coefficient and Capacitance Drift Shock (specified pulse) Vibration (high frequency) Thermal Shock and Immersion Cycling Terminal Strength Marking Legibility Resistance to Solvents	Jun 95
AVX (Myrtle Beach)	MIL-PRF-39014	Voltage Temperature Limits Vibration (high frequency) Immersion Shock (specified pulse) Terminal Strength Marking Legibility Resistance to Solvents	Jun 95
Cooper Bussmann Goldshore, MD	MIL-PRF-15160	Exempt from testing current carrying capacity Terminal Strength Overload Interrupt	Sep 93
Component Research	MIL-C-83241	Reduced frequency from 6 months to 3 Years	Mar 95
Dearborn Electronics			Mar 95
Electronic Concepts			Mar 95
		Salt Spray Immersion Resistance to Soldering heat Moisture Resistance Dielectric Absorption Terminal Strength Resistance to Solvents	

<u>Manufacturers</u>	<u>Specifications</u>	<u>Test Reduced</u>	<u>Date</u>
Cornell Dubilier	MIL-PRF-39018	Reduced frequency from 2 months to 3 years: Stability Shock Terminal Strength Salt Spray Thermal Shock and Immersion Surge Voltage Barometric Pressure Reverse Voltage Aging High Temperature Verification	Jun 94
Dale	MIL-PRF-55342	Adhesion Low Temperature Operation Short Time Overload Resistance to Temperature Characteristic	May 94
Dale	MIL-PRF-55182	Resistance to Temperature Characteristic	Jan 95
Dale	RNR55, 57, 60, 70	Resistance to Solvents Visual and Mechanical Examination	Jan 95
Dale	MIL-R-22684	Short Time Overload Resistance to Temperature Characteristic Dielectric Withstanding Voltage	Jun 94
Dale	MIL-PRF-39017	Short Time Overload Resistance to Solvents Resistance to Temperature Characteristic	Jun 94
Dale	MIL-PRF-83401	Terminal Strength Short Time Overload Insulation Resistance Dielectric Withstanding Voltage Thermal Shock Low Temperature Storage High Temperature Exposure Resistance to Solvents Resistance to Temperature Characteristic	Jun 94

<u>Manufacturers</u>	<u>Specifications</u>	<u>Test Reduced</u>	<u>Date</u>
Dearborn Electronics Electronic Concepts	MIL-C-39022	Reduced frequency from 2 months to 3 years Subgroup 1A Salt Spray, Immersion Subgroup 1B Resistance to Soldering Heat Moisture Resistance Subgroup 1C Terminal Strength Resistance to Solvents	Mar 95 Feb 98
Dearborn Electronics Electronic Concepts	MIL-C-55514	Reduced frequency from 6 months to 3 years: Resistance to Soldering Heat High (frequency vibration) Shock (specified pulse)	Mar 95 Aug 94
IRC Shallcross	MIL-R-39005	Dielectric Withstanding Voltage Insulation Resistance Low Temperature Storage Low Temperature Operation Terminal Strength Short Time Overload Thermal Shock Resistance to Soldering Heat Shock (specified pulse) Vibration (high frequency)	Dec 94
Kemet	MIL-PRF-39003	Shock Vibration Thermal Shock and Immersion Marking Legibility Resistance to Solvents Temperature Coefficient and Capacitance Drift	Oct 93
Kemet	MIL-PRF-55681	Voltage Temperature Limits Thermal Shock and Immersion Humidity	Oct 93

<u>Manufacturers</u>	<u>Specifications</u>	<u>Test Reduced</u>	<u>Date</u>
Kemet	MIL-PRF-39014	Voltage Temperature Limits Vibration Immersion Shock Terminal Strength Marking Legibility Resistance to Solvents	Nov 93
Kemet	MIL-PRF-39003	Reduced frequency from 3 months to 1 year: Shock Vibration Thermal Shock and Immersion Resistance to Solvents Resistance to Soldering Heat Moisture Resistance Sleeving	Dec 93
Kemet	MIL-PRF-55365	Thermal Shock Resistance to Solvents	Dec 93
Kemet	MIL-PRF-49137	<i>Group C-1 from 6 months to 1 year on 12 units</i> TM 213 Mechanical Shock TM 204 Vibration TM 107 Thermal Shock All Tests from MIL-STD-202	Jan 98
Kemet	MIL-PRF-49137	<i>Group C-2 from 6 months to 3 years on 18 units</i> TM 210 Resistance to Solder Heat TM 211 Terminal Strength TM 106 Moisture Resistance All Tests from MIL-STD-202	Jan 98
Kemet	MIL-PRF-49137	<i>Group C-3 from 6 months to 1 year on 10 units</i> TM 215 Resistance to solvents Test from MIL-STD-202	Jan 98
Kemet	MIL-PRF-49137	<i>Group C-4 from 6 months to 1 year on 25 units</i> TM 108 Life test Test from MIL-STD-202	Jan 98

<u>Manufacturers</u>	<u>Specifications</u>	<u>Test Reduced</u>	<u>Date</u>
McCoy	MIL-PRF-3098	Reduced frequency from 12 months to 36 months Solderability Shock Vibration Thermal Shock Seal Salt Spray Moisture Resistance Terminal Strength Visual and Mechanical Aging	Sep 98
M-Tron	MIL-PRF-3098	Reduced frequency from 12 months to 36 months Solderability Shock Vibration Thermal Shock Seal Salt Spray Moisture Resistance Terminal Strength Visual and Mechanical Aging	Aug 98
MSI Mini Systems Inc.	MIL-PRF-55342	Group B : Reduced Frequency from weekly to annually: Short Time overload Adhesion	Jul 95
MSI Mini Systems Inc.	MIL-PRF-55342	Group C: Reduced Frequency from monthly to annually Thermal Shock Low Temperature Operations High Temperature Exposure	Mar 96
State of the Art	MIL-PRF-55342	Adhesion Short Time Overload Resistance to Temperature Characteristic	Jun 93
State of the Art	MIL-PRF-55342	Thermal Shock Low Temperature Operation High Temperature Exposure	Jul 93
SEMCO	MIL-PRF-39001	Vibration Shock Terminal Strength	Dec 93

<u>Manufacturers</u>	<u>Specifications</u>	<u>Test Reduced</u>	<u>Date</u>
Vishay	MIL-PRF-55182	Shock Vibration	Feb 94

The following QML-38534 Manufacturers have reduced repetitive PI testing by eliminating the following end-of-line tests:

<u>Manufacturers</u>	<u>Specification</u>	<u>Test deleted</u>	<u>Date</u>
Aeroflex	MIL-PRF-38534	Group B: Die Shear, Solderability , Internal Visual and Mechanical Group D: Thermal Shock, Stabilization Bake , Lead Integrity , Fine Leak	Aug 94
Agilent	MIL-PRF-38534	Same group B and D listed above	Jul 93
Analog Devices	MIL-PRF-38534	Same group B and D listed above	Mar 94
Apex Microtechnology	MIL-PRF-38534	Same group B and D listed above	Jul 90
Austin Semiconductor	MIL-PRF-38534	Same group B and D listed above	Jan 99
BAE Systems Cincinnati Electronics	MIL-PRF-38534	Same group B and D listed above	Jan 92
BI Technologies	MIL-PRF-38534	Same group B and D listed above	Nov 93
Boeing	MIL-PRF-38534	Same group B and D listed above	Feb 91
C-MAC Microcircuits	MIL-PRF-38534	Same group B and D listed above	Aug 90
CMC Electronque	MIL-PRF-38534	Same group B and D listed above	Mar 02
Cougar	MIL-PRF-38534	Same group B and D listed above	May 98
Crane Interpoint	MIL-PRF-38534	Same group B and D listed above	Sep 91
Datel	MIL-PRF-38534	Same group B and D listed above	Aug 93
Data Device Corp.	MIL-PRF-38534	Same group B and D listed above	Jan 90
DDC Ireland	MIL-PRF-38534	Same group B and D listed above	Sep 93
EMS	MIL-PRF-38534	Same group B and D listed above	Jan 93
Fairchild	MIL-PRF-38534	Same group B and D listed above	Feb 00
Hytex	MIL-PRF-38534	Same group B and D listed above	Jul 92
Interpoint Taiwan Corp	MIL-PRF-38534	Same group B and D listed above	Sep 97
Lockheed Martin Control Systems	MIL-PRF-38534	Same group B and D listed above	Oct 96
Lockheed Martin, FL	MIL-PRF-38534	Same group B and D listed above	Apr 98
M. S. Kennedy	MIL-PRF-38534	Same group B and D listed above	Jul 95
Micro Precision Technologies	MIL-PRF-38534	Same group B and D listed above	Nov 98
Micropac Industries	MIL-PRF-38534	Same group B and D listed above	Nov 95
MPC Products Corp.	MIL-PRF-38534	Same group B and D listed above	May 95
Natel	MIL-PRF-38534	Same group B and D listed above	Jan 90
National Hybrid	MIL-PRF-38534	Same group B and D listed above	Jul 93
Remec	MIL-PRF-38534	Same group B and D listed above	Oct 93
REMEC Q-bit	MIL-PRF-38534	Same group B and D listed above	Jan 90
Sensitron	MIL-PRF-38534	Same group B and D listed above	July 98
Solitron	MIL-PRF-38534	Same group B and D listed above	Sep 92
Teledyne	MIL-PRF-38534	Same group B and D listed above	Nov 89
Warner Robins AFB	MIL-PRF-38534	Same group B and D listed above	Nov 99
White Electronic Designs	MIL-PRF-38534	Same group B and D listed above	Mar 98

Note: These test elimination were accomplished by each of the listed manufacturers when they chose to utilize in-line PI testing rather than end-of-line PI testing. The Group B tests listed above represent only part of the group B tests. The remainder are replaced with additional in-process tests/inspections or have always had the option of being eliminated by in-process testing. The group D tests listed above are all of the group D tests, thereby completely eliminating group D. The date listed is the approximate date of either switching to in-line PI from end-of-line PI testing or entrance into the program performing in-line PI testing.

All QML-38534 manufacturers have replaced repetitive Group A testing with an in-line test setup verification. The manufacturers were once required to perform a separate Group A test following the screening test, but are now permitted to perform the Group A test as a screening test, thus eliminating repetitive Group A tests. This includes approximately 46 qualified manufacturers.

The following manufacturers have successfully implemented a Technical Review Board (TRB) as described in appendix A of MIL-PRF-38534 and are authorized to optimize tests:

<u>Manufacturer</u>	<u>Specification</u>	<u>Date of Completion</u>
Analog Devices	MIL-PRF-38534	Sep 95
Austin Semiconductor	MIL-PRF-38534	Dec 98
Boeing	MIL-PRF-38534	Jul 98
Cougar Components	MIL-PRF-38534	May 98
Data Device Corp.	MIL-PRF-38534	Jan 99
Lockheed Martin Control Systems, IN	MIL-PRF-38534	Apr 96
Lockheed Martin, FL	MIL-PRF-38534	Jul 98
REMEC	MIL-PRF-38534	Aug 95
White Electronic Designs	MIL-PRF-38534	July 00
*Raytheon Scotland Limited	MIL-PRF-38534	Jun 03

The following QML-38534 manufacturers have been approved to eliminate, reduce, or modify the following tests :

<u>Manufacturer</u>	<u>Specification</u>	<u>Test optimized</u>	<u>Date</u>
Agilent	MIL-PRF-38534	Eliminate PIND	May 02
Agilent	MIL-PRF-38534	Eliminate internal water-vapor content testing for parts assembled with a particular junction compound.	Sep 02
Analog Devices	MIL-PRF-38534	Active element evaluation: eliminate tests and alternate flow	TRB
Analog Devices	MIL-PRF-38534	Passive element evaluation: eliminate tests and alternate flow	TRB
Analog Devices	MIL-PRF-38534	Substrate evaluation: alternate flow	TRB
Analog Devices	MIL-PRF-38534	Adhesive evaluation: alternate flow	TRB
Analog Devices	MIL-PRF-38534	Wirebonding: alternate frequency of process controls	TRB
Analog Devices	MIL-PRF-38534	Screening: eliminate temperature cycling and constant acceleration for certain products	TRB
Analog Devices	MIL-PRF-38534	Group B: decrease bond strength and move internal visual and mechanical to pre-cap	TRB
Analog Devices	MIL-PRF-38534	Group B: eliminate hermetically for certain packages, eliminate die shear, resistance to solvents deleted except for gold plated lids, eliminate physical dimensions, solderability performed at solder tinning subcontractor	TRB
Analog Devices	MIL-PRF-38534	Group B for DC/DC converters: physical dimensions, resistance to solvents, bond strength, solderability, and seal tests eliminated. Die shear moved to group C. Internal visual and mechanical moved to in-line.	TRB
Analog Devices	MIL-PRF-38534	Eliminated fine/gross leak at screening	Jul 95
Analog Devices	MIL-PRF-38534	Eliminated Group B solderability testing for all QML grades of AD 14160 BGA packages.	Nov 99
Analog Devices	MIL-PRF-38534	Eliminate element evaluation tests for 0603NPO capacitors	May 01
Apex Microtechnology	MIL-PRF-38534	Perform constant acceleration after burn-in	Jun 90

<u>Manufacturer</u>	<u>Specification</u>	<u>Test optimized</u>	<u>Date</u>
Apex Microtechnology	MIL-PRF-38534	Replace sample socket checks with 100% device check at burn-in	Jun 02
Boeing	MIL-PRF-38534	Allow specific types of voids in the insulation material of multi-layer thick film substrates	Jun 98
CMC Electronque	MIL-PRF-38534	Perform temperature aging prior to solderability on a 6 month basis rather than every package lot	Mar 02
Cougar Components	MIL-PRF-38534	Alternate element evaluation flow for parallel plate capacitors	May 98
Cougar Components	MIL-PRF-38534	Alternate element evaluation flow for end-terminated capacitors	May 98
Data Device Corporation	MIL-PRF-38534	Alternate active element evaluation of one product	Nov 95
Data Device Corporation	MIL-PRF-38534	Reduce frequency of solderability testing at incoming inspection on packages with solder dipped leads	Nov 96
Data Device Corporation	MIL-PRF-38534	Reduction of incoming testing for active and passive components	Jul 97
Data Device Corporation	MIL-PRF-38534	Move the sequence of fine and gross leak testing on packages with brazed leads	Oct 97
Data Device Corporation	MIL-PRF-38534	Alternate element evaluation for ASICs and memory	Apr 98
Data Device Corporation	MIL-PRF-38534	Alternate visual inspection for tantalum capacitors	May 98
Data Device Corporation	MIL-PRF-38534	Eliminate solderability testing on packages with solder dipped leads	Oct 98
*Data Device Corporation	MIL-PRF-38534	Burn-in time reduced to 48 hours for selected parts	Jun 02
*Data Device Corporation	MIL-PRF-38534	Reduction of element evaluation for Beta transformers	Dec 01
*Data Device Corporation	MIL-PRF-38534	Remove wirebond inspection during internal visual inspection and reduce the magnification levels	Apr 02
*Data Device Corporation	MIL-PRF-38534	Allow polymer attached die to be replaced up to three times	Apr 00
*Data Device Corporation	MIL-PRF-38534	Perform skip-lot testing on electrical tests and wire pull tests for certain active components: DDC P/Ns J PRIME (0.8) 9437-0214-8111 and J PRIME (1.25) 9437-0214-2101.	Mar 99
*Data Device Corporation	MIL-PRF-38534	No screening of sample devices when doing alternate IC evaluation option of paragraph C.3.6 of MIL-PRF-38534	Aug 96

<u>Manufacturer</u>	<u>Specification</u>	<u>Test optimized</u>	<u>Date</u>
Datel	MIL-PRF-38534	Use of MRB for element evaluation	May 98
DDC Ireland	MIL-PRF-38534	Eliminate leak testing following solder dipping operation for packages with brazed leads	Oct 98
EMS Technologies	MIL-PRF-38534	Move RGA testing in-line	Jul 99
Interpoint	MIL-PRF-38534	Eliminate leak testing following lead forming of “soft lead” packages	May 98
Advanced Analog/IR	MIL-PRF-38534	Allow certain operations (e.g. soldering) outside class 100k clean room	Nov 97
Lockheed Martin, Florida	MIL-PRF-38534	Eliminate electrical testing at element evaluation for certain active devices	Dec 98
Lockheed Martin, Florida	MIL-PRF-38534	Subgroup 3 package evaluation tests will be periodic rather than every lot for LCCs	Dec 98
Lockheed Martin Control Systems	MIL-PRF-38534	Variation of sample sizes during wirebond process control	Nov 98
M. S. Kennedy	MIL-PRF-38534	Reduction of element evaluation tests for active and passive components	Jun 96
M. S. Kennedy	MIL-PRF-38534	Reduce frequency of resistance to solvents and physical dimension at group B	Oct 96
M. S. Kennedy	MIL-PRF-38534	Further Reduction of element evaluation for active devices, passive devices, and substrates	Aug 99
M. S. Kennedy	MIL-PRF-38534	Reduce burn-in time from 160 hours to 48 hours for MSK0041	May 01
National Hybrid	MIL-PRF-38534	No repeat of fine/gross leak	Feb 96
National Hybrid	MIL-PRF-38534	For certain active devices, some final electrical tests are performed during element evaluation and not repeated.	Nov 98
National Hybrid	MIL-PRF-38534	Eliminate nondestructive bond pull test on compound bonds if rework or repair.	Nov 01
REMEC	MIL-PRF-38534	Permit in-line processing data from element suppliers	Apr 95
REMEC	MIL-PRF-38534	Use MIL-STD-202 instead of MIL-STD-883 for fine and gross leak	Jun 95

<u>Manufacturer</u>	<u>Specification</u>	<u>Test optimized</u>	<u>Date</u>
REMEC	MIL-PRF-38534	Temperature cycle screening: alternate timing, temperature, cycles	Sep 96
*VPT/Delta	MIL-PRF-38534	Eliminate testing of Q during element evaluation of inductors and transformers	Apr 03
White Electronic Designs	MIL-PRF-38534	Eliminate temperature age at solderability test on parts with solder leads	Apr 98
White Electronic Designs	MIL-PRF-38534	20 (1) sample at element evaluation specific SRAM ICs	Oct 98
White Electronic Designs	MIL-PRF-38534	Integral Substrate/Package evaluation: Replace 100% leak test with sample of 3(0).	May 00
White Electronic Designs	MIL-PRF-38534	For element evaluation, replace 100% visual of Samsung active components with 1.0% Normal Inspection Level II AQL.	Mar 01

The following QML-38535 manufacturers have been approved by their Technical Review Board (TRB) to optimize (reduce/modify/delete) the following tests:

<u>Manufacturer</u>	<u>Specification</u>	<u>Test optimized</u>	<u>Date</u>
AMI Semiconductor	MIL-PRF-38535	Eliminate leak testing after lead rework on CPGAs, CQFPs, JLDCCs, and sidebrazed with lead count of 28L and lower.	Dec 96
AMI Semiconductor	MIL-PRF-38535	Leverage off QML Plastic reliability monitors for Group C requirement	Jan 97
AMI Semiconductor	MIL-PRF-38535	Post burn-in electrical test window extended from 96 hours to 336 hours.	Jun 97
AMI Semiconductor	MIL-PRF-38535	Leverage off generic/commercial Data for Group B requirements. Reduced from every inspection lots to every 3 months.	May 98
AMI Semiconductor	MIL-PRF-38535	Burn-in reduction from 80 hours to 20 hours at 150 ⁰ C, or from 160 hours to 42 hours at 125 ⁰ C	May 98
AMI Semiconductor	MIL-PRF-38535	Final electrical test, room temperature performed in lieu of hot and cold temperature on properly guard banded test programs. A sample Group A test is performed at -55C and +125C.	May 98

<u>Manufacturer</u>	<u>Specification</u>	<u>Test optimized</u>	<u>Date</u>
Analog Devices	MIL-PRF-38535	Eliminated - 100% fine leak screen on QML-Q TO and solder seal (side braze, LCC, flat pack, LDCC, JLCC, ceramic) packages at Manila Philippines facility. (QML-Q level)-Wilmington.	February 97
Analog Devices	MIL-PRF-38535	Reduction - Burn-in from 160 hours to 48 hours on complimentary Bipolar wafer fabrication line. (QML-Q level)-Wilmington.	July 97
Analog Devices	MIL-PRF-38535	Eliminated - 100% gross leak screen on all packages assembled at Manila Philippines facility. (QML-Q level)-Wilmington.	Aug 96
Analog Devices	MIL-PRF-38535	Eliminated – 100% Group B tests on all packages assembled at Manila Philippines facility. (QML-Q level)-Wilmington.	Oct 96
Analog Devices	MIL-PRF-38535	Eliminated – 100% Group D periodic tests on all packages assembled at Manila Philippines facility. (QML-Q level)-Wilmington & Santa Clara`.	Oct 96 Wilmington Dec 02 Santa Clara

<u>Manufacturer</u>	<u>Specification</u>	<u>Test optimized</u>	<u>Date</u>
Analog Devices	MIL-PRF-38535	Reduction of 100% burn-in from 160 to 48 hours for military products on the BIMOS process at the Wilmington MA facility.	Jan 02
Analog Devices	MIL-PRF-38535	Replace Group B-3 Solderability Testing with setup samples for Class B/Q solder lead finish devices at the Santa Clara facility.	April 02
Analog Devices	MIL-PRF-38535	Eliminated Alternate Group B2 - Resistance to Solvents is being replaced with a monitor whose frequency is twice per shift and 2 units per solvents - Santa Clara. (B & Q level)	June 02
*Analog Devices	MIL-PRF-38535	Eliminated - QCI/TCI Class B and Q Group B5 Testing (Bond Strength Test, Mil STD 883 Method 2011) - Santa Clara. Monitor will be retained.	Aug 02
Analog Devices	MIL-PRF-38535	Alternate criteria for Group E testing - will test two units per wafer up to 22 units for the wafer lot. Upon need will begin to test four units per wafer for the rest of the lot. (QML Radiation Assured V level) – Santa Clara	Oct 02
Analog Devices	MIL-PRF-38535	Eliminated – 100% Non Destructive Bond Pull test for QML V level product assembled at the Manila Philippines facility. - Santa Clara	Dec 02
Atmel-Nantes	MIL-PRF-38535	Eliminated Non Destructive Bond Pull	Oct 00
Atmel-Nantes	MIL-PRF-38535	Alternate criteria for internal wire separation, Test Method 2010 Internal visual. 1 Megabit SRAM 5962-89898.	April 01
Cypress	MIL-PRF-38535	Burn-in reduction from 80 hours to 12 hours on selected SRAM devices (CY7C122 series)	Aug 96
Cypress	MIL-PRF-38535	Burn-in reduction from 80 hours to 12 hours on selected programmable logic products (CY7C322 series)	May 01
Cypress	MIL-PRF-38535	Burn-in reduction from 80 hours to 12 hours on the universal bus transceiver (CY7B933LMB).	May 01

<u>Manufacturer</u>	<u>Specification</u>	<u>Test optimized</u>	<u>Date</u>
Cypress	MIL-PRF-38535	Burn-in reduction from 80 hours to 12 hours on selected programmable logic products. (CY7C341, 342, 343, 344, 346 series)	May 01
Cypress	MIL-PRF-38535	Group D coverage is expanded from 26 to 52 weeks for selected military products	Sep 96
Cypress	MIL-PRF-38535	Group B solderability and wire bond are done as in-line process control	Sep 96
Cypress	MIL-PRF-38535	Group A room and cold temperature testing for all CMOS devices eliminated	Oct 96
Cypress	MIL-PRF-38535	Programmability test at the end of process flow. 12 (2) eliminated Group A electrical test following the programmability test 10 (0) eliminated. Test now performed at wafer probe.	Jun 97
Cypress	MIL-PRF-38535	Burn-in reduction from 80 hours to 12 hours (for 5962-8859402, 03 WA, CY7C122-35DMB CY7C122-25DMB devices)	Jan 97
Cypress	MIL-PRF-38535	Burn-in reduction from 80 hours to 12 hours (contact DSCC or Cypress for list of part number(s) affected. Only PAL devices affected)	Sep 96
Cypress	MIL-PRF-38535	Burn-in reduction from 105 Hours at 5.75V to 24 hours at 6.6V for part number 7C344A in Fab 2 (SMD 5962-9061101 programmable logic device, UV erasable 32 macrocell)	Jun 97
Cypress	MIL-PRF-38535	Burn-in reduction from 105 hours at 140 °C to 18 hours at 140 °C. 5962-93144, 5962-92062	Sep 97
Cypress	MIL-PRF-38535	Internal water vapor sample for each microcircuit inspection lot eliminated on all die QML military products. Alternative monitors are monthly water vapor checked on seal furnace and periodic Group D water vapor testing.	Jun 97

<u>Manufacturer</u>	<u>Specification</u>	<u>Test optimized</u>	<u>Date</u>
Cypress	MIL-PRF-38535	<p>Burn-in elimination on Programmable Logic Device 5962-886070 Cypress Number 7C322X/F from Fab 2.</p> <p>A process screen of write/bake¹/read/erase and an early failure rate process monitor² is in effect. Re-qualification will be performed with major fab changes.</p> <ol style="list-style-type: none"> 1. 250 deg C for 8 hrs 2. 150 deg C for 48hr (3 month samples taken from the same process technology family per fabrication site) 	Sep 00
Cypress	MIL-PRF-38535	High power die visual inspection eliminated on all QML military products: alternative monitors are the KLA analysis and defect reduction programs in wafer fabrication. Temperature cycling, burn-in and high temperature electrical tests are used to screen out fabrication related defects.	Jun 97
Cypress	MIL-PRF-38535	Centrifuge screening eliminated on all QML military products. Alternative controls are assembly in-process monitors.	Jun 97
*Cypress	MIL-PRF-38535	Elimination of Group A Hot and Cold temperature testing for the following 5962 Cypress SMDs 99519, 99521, 99522, 99523, 99524, 99525, 99526, 97599, 96896, *97598	May 02 Aug 03
Intersil	MIL-PRF-38535	Package grouping for group D sampling for Q and V products (contact DSCC or Harris for more details)	Nov 95
Intersil	MIL-PRF-38535	Substitute die attach as a criteria for microcircuits definition for group C in lieu of 6 month criteria (all Q level products)	Feb 96
Intersil	MIL-PRF-38535	<p>Burn-in reduction for Class B/Q and S/V for 64K PROMS</p> <p>@ 125°C from 240 hours to 160 hours class V and 160 hours to 120 hours class Q</p> <p>@ 135°C from 180 hours to 120 hours class V and 120 hours to 80 hours class Q</p>	May 97

<u>Manufacturer</u>	<u>Specification</u>	<u>Test optimized</u>	<u>Date</u>
Intersil	MIL-PRF-38535	Wafer lot acceptance for thermal stability (CV measurements) is modified for class S. Lot size increased to all products run through continuous vacuum metal deposition. Stringent monitor of the gate oxide performed. CV measurements are performed during maintenance cycle.	Apr 97
Intersil	MIL-PRF-38535	Gross Leak testing is eliminated for Class Q and V. Fine leak is performed immediately after centrifuge for class V. Applicable for solder sealed/ side brazed packages assembled at Palm Bay, Florida and Kuala Lumpur (Feb 99), Malaysia facilities.	Aug 97
Intersil	MIL-PRF-38535	Lead finish will no longer be a QCI window-grouping factor.	Apr 98
Intersil	MIL-PRF-38535	Class V life test results may be used as an approved reference for a lesser QML grade. Applies only for wafers of the same diffusion lot.	Apr 98
Intersil	MIL-PRF-38535	Elimination of cold temperature testing (-55° C) for CD4XXX Logic. Guard bands at hot and room temperatures are sufficient to find cold temperature rejects.	Sep 98
Intersil	MIL-PRF-38535	Assembly process monitors are used in lieu of Group B wire strength test (Subgroup 5a for Q and subgroup 2c for V level). Applies at Kuala Lumpur and Palm Bay facilities.	Sep 98
Intersil	MIL-PRF-38535	Group A Test Elimination Palm Bay (Class Q/B and Class V/S Product) for Select Products	Sep 98
Intersil	MIL-PRF-38535	Elimination of post lead trim hermeticity (fine and gross leak) monitor for metal can packages At Kuala Lumpur Malaysia assembly	Feb 99
Intersil	MIL-PRF-38535	Elimination of Group A testing for devices electrically screened at Palm Bay Florida Facilities. Process monitors instituted on electrical test equipment to ensure accuracy and repeatability.	Feb 99

<u>Manufacturer</u>	<u>Specification</u>	<u>Test optimized</u>	<u>Date</u>
Intersil	MIL-PRF-38535	Elimination of Group A testing for devices electrically screened at Kuala Lumpur Facilities. Process monitors instituted on electrical test equipment to ensure accuracy and repeatability.	July 99
Intersil	MIL-PRF-38535	Elimination of X-ray Inspection (TM 2012) for Seam welded TO-257 package. Fine leak screening reinstated.	Sep 99
Intersil	MIL-PRF-38535	Reduction of sample size for group D2 Lead integrity testing TM 2004 (Class V, Q, T) from 45 leads to 15 leads. New sample still taken from 3 units.	June 01
Intersil	MIL-PRF-38535	Internal water vapor sample reduction. Eutectic reduced from 2 units/ welder from 3 lots weekly to 2 units/welder from 1 lot monthly. Epoxy reduced from 2 units/welder from 3 lots weekly to 2 units/welder from 1 lot monthly.	June 01
IDT	MIL-PRF-38535	Group A test elimination on all military devices	Jun 98
Honeywell SSEC	MIL-PRF-38535	Group A test eliminated, perform separately only upon customer request.	Nov 90
Honeywell SSEC	MIL-PRF-38535	Group B: Class Q and V, solderability has been substituted with incoming inspection. Class Q: Remaining tests for single chip packages reduced to quarterly in lieu of every lot. Class V: Reduced sample testing for die shear strength. Empty package or rejected devices may be used where conformance to the test purpose is evident.	Nov 90 Nov 98 Nov 98

<u>Manufacturer</u>	<u>Specification</u>	<u>Test optimized</u>	<u>Date</u>
Honeywell SSEC	MIL-PRF-38535	Group C: Class Q: Standard Evaluation Circuit for Single chip packages reduced to quarterly.	Nov 98
Honeywell SSEC	MIL-PRF-38535	Group D: Class Q and V performed every 6 months Subgroup 1: Physical dimensions substituted with incoming package evaluation Subgroup 3: 48 hour window eliminated after moisture resistance. Subgroup 5: All tests substituted with incoming package evaluation. Subgroup 7 : Adhesion of lead substituted with incoming package evaluation	Mar 99 Nov 90
Honeywell SSEC	MIL-PRF-38535	Burn-in time reduced with elevated voltage for all devices.	Nov 98
Honeywell SSEC	MIL-PRF-38535	Destructive bond pull is an option to 100% non-destructive bond pull testing on specified bonders.	Nov 93
Honeywell SSEC	MIL-PRF-38535	Elimination of PIND screen for standard ASIC flow for QML Class Q.	Jun 98
Lockheed Martin Federal Systems	MIL-PRF-38535	T1B test eliminated (all logic C4 and wire bond single chip modules)	Mar 95
Lockheed Martin Federal Systems	MIL-PRF-38535	Static burn-in for class V flow eliminated (all except FPGA/PROM and 2 μ products)	Sep 95
Lockheed Martin Federal Systems	MIL-PRF-38535	Eliminated non-destruct wirebond pull	Dec 98
Lockheed Martin Federal Systems	MIL-PRF-38535	Removed Stabilization bake	Dec 98
Lockheed Martin Federal Systems	MIL-PRF-38535	Elimination of PIND	Dec 98

<u>Manufacturer</u>	<u>Specification</u>	<u>Test optimized</u>	<u>Date</u>
National	MIL-PRF-38535	Ceramic packages	May 95
		Metal can packages	Jun 96
		Level B/Q only	
		M2001, Constant Acceleration eliminated for screen.	

<u>Manufacturer</u>	<u>Specification</u>	<u>Test optimized</u>	<u>Date</u>
National	MIL-PRF-38535	<p>AC, ACT, ACQ, ACTQ, FCT and SCAN families, unless otherwise indicated.</p> <p>1. Level B/Q only</p> <ul style="list-style-type: none"> • 55 °C electrical eliminated for screen and Group A. • 125°C electrical moved from screen/ Group A after burn-in, to screen / Group A before burn-in. • AC, ACT parts that use 2.0 μm technology (except rad hard): Burn-in reduced from screen to fab lot sample. Life test frequency increased from yearly to quarterly and will use non-burned-in parts. • ACQ, ACTQ parts that use 1.5 μm technology (except rad hard): Burn-in reduced from screen to fab lot sample. Life test frequency increased from yearly to quarterly and will use non-burned-in parts. <p>2. Level S/V only.</p> <ul style="list-style-type: none"> • AC, ACT, ACQ, ACTQ, FCT, ABT, FAST, LS, TTL families: Sample size used for inspecting metallization at passivation steps in Method 2018, SEM Inspection, reduced from two wafers to one wafer for Method 5007, Wafer Lot Acceptance. • Static low burn-in eliminated for screening. Static high burn-in screening retained. 	<p>Jun 96</p> <p>Oct 97</p> <p>July 00</p> <p>April 02</p> <p>Aug 98</p> <p>Aug 98</p>

<u>Manufacturer</u>	<u>Specification</u>	<u>Test optimized</u>	<u>Date</u>
National	MIL-PRF-38535	<p>AC, ACT, ACQ, ACTQ, FCT and SCAN families, unless otherwise indicated. (Continued)</p> <p>3. Level B/Q and Level S/V</p> <ul style="list-style-type: none"> AC, ACT parts that use 2.0 μm technology: Accelerated annealing test (i.e. threshold voltage rebound effect test) in Method 1019, Ionizing Radiation (Total Dose) eliminated for Subgroup E-2. 	Sep 96
National	MIL-PRF-38535	<p>TTL family for level B/Q only</p> <p>F_{max}, input timing electrical at 25°C, 125°C, -55°C eliminated for screen and Group A.</p>	May 96
National	MIL-PRF-38535	<p>FAST family for level B/Q only</p> <p>1. F_{max}, input timing electrical at 25° C, 125° C, -55° C eliminated for screen and Group A.</p> <p>2. 125° C, -55° C electrical moved from screen/Group A after burn-in to screen/Group A before burn-in.</p> <p>3. Burn-in reduced from screen to fab lot sample. Life test frequency increased from yearly to quarterly and will use non-burned-in parts.</p>	<p>May 96</p> <p>Sep 98</p> <p>Dec 98</p>
National	MIL-PRF-38535	<p>Selected part numbers in the interface (data transmission) family (LFAST) for level S/V only.</p> <p>Minimum percentage of the metallization cross sectional area required over the passivation steps in Method 2018, SEM Inspection, reduced from 50% to 30% for Method 5007, Wafer Lot Acceptance.</p>	Jun 97

<u>Manufacturer</u>	<u>Specification</u>	<u>Test optimized</u>	<u>Date</u>
National	MIL-PRF-38535	All part numbers for level S/V only 1. Method 5007, parts a. and c., Thermal Stability test (C-V plot) reduced from each wafer lot to pre-designated maintenance events of the sputter metal deposition system (e.g. venting, etc.)	Oct 99
National	MIL-PRF-38535	DS26LS31 for level B/Q only Burn-in reduced from screen to fab lot sample. Life test frequency increased from yearly to quarterly and will use non-burned-in parts.	July 00
National	MIL-PRF-38535	LM124 LM 139 Level B/Q only Burn-in reduced from screen to fab lot sample. Life test frequency increased from yearly to quarterly and will use non-burned-in parts.	Aug 00 Jan 01
National	MIL-PRF-38535	LM 129 level B/Q only If a sample of a fab lot contains no rejects with the temperature coefficient test moved from electrical screen after burn-in to electrical screen before burn-in, remainder of fab lot is used with the temperature coefficient test before burn-in.	Dec 00
National	MIL-PRF-38535	LS 244 level B/Q only 125° C, -55° C electrical moved from screen/ Group A after burn-in to screen/Group A before burn-in.	Jan 01
ST Microelectronics	MIL-PRF-38535	Eliminated Nondestructive Bond pull	Oct 00
Temic Semiconductor, MHS S.A.	MIL-PRF-38535	Performance of fine and gross leak prior to lead trim and form, on multi-layer packages, for both class Q and V	June 00
Texas Instruments	MIL-PRF-38535	D-8, lid torque eliminated (all cerdip, cerflat glass sealed packages class Q only)	Oct 93

<u>Manufacturer</u>	<u>Specification</u>	<u>Test optimized</u>	<u>Date</u>
Texas Instruments	MIL-PRF-38535	100% burn-in eliminated (all TTL, LS, STTL products line. All package configurations.)	Jun 94
Texas Instruments	MIL-PRF-38535	constant acceleration eliminated (all products in the 8, 14, 16, 20 pin DIP)	Jun 94
Texas Instruments	MIL-PRF-38535	temperature cycles eliminated (all products in the 8, 14, 16, 20 pin DIP)	Jun 94
Texas Instruments	MIL-PRF-38535	100% high magnification inspection eliminated (TTL, LS, STTL, ALS HCMOS, F, AS, and 55 series products lines. All package configurations)	Jun 94
Texas Instruments	MIL-PRF-38535	100% burn-in on certain linear products eliminated (contact TI or DSCC for specific linear products)	Sep 94
Texas Instruments	MIL-PRF-38535	Group A sample testing of alpha V_{IO} , alpha I_{IO} and various noise tests on certain linear products eliminated (contact TI or DSCC for specific linear products)	Sep 94
Texas Instruments	MIL-PRF-38535	Final electrical, 25 °C (ALS, AS, FAST, 54ABT32316 parent device types eliminated)	Nov 95
Texas Instruments	MIL-PRF-38535	100% burn-in (HCMOS, all packages) eliminated	Feb 95
Texas Instruments	MIL-PRF-38535	100% burn-in (ALS, AS, FAST) eliminated	Aug 95
Texas Instruments	MIL-PRF-38535	100% temperature cycle (all CPAK) eliminated	Aug 95
Texas Instruments	MIL-PRF-38535	100% constant acceleration (all CPAK) eliminated	Aug 95
Texas Instruments	MIL-PRF-38535	100% -55 °C screening and group A (HC and HCT) eliminated	Mar 95
Texas Instruments	MIL-PRF-38535	100% -55 °C screening (ABT, AC, ACT, BCT) eliminated	Aug 96
Texas Instruments	MIL-PRF-38535	Burn-in reduction on 4 Meg DRAM	Aug 96

<u>Manufacturer</u>	<u>Specification</u>	<u>Test optimized</u>	<u>Date</u>
Texas Instruments	MIL-PRF-38535	Physical dimensions (D1), moisture resistance (D3), insulation resistance (D3) (for all ceramic packages in Taiwan and Singapore facilities) eliminated	Oct 96
UTMC	MIL-PRF-38535	100% non-destructive bond pull eliminated	Sep 91
UTMC	MIL-PRF-38535	Reduced temperature cycles from 50 to 10 cycles	Sep 94
UTMC	MIL-PRF-38535	Marking permanency eliminated	Sep 94
UTMC	MIL-PRF-38535	Group B eliminated: B-1 resistance to solvents B-2 wire bond strength B-2 die shear and B-3 solderability is now performed in-line	Sep 94
UTMC	MIL-PRF-38535	D-1 physical dimensions eliminated (using supplier control and data)	Sep 94
UTMC	MIL-PRF-38535	D-2 lead integrity eliminated. (Use supplier data for gold lead finish package. Supplier performs receiving inspection functional test on each package family)	Sep 94
UTMC	MIL-PRF-38535	D-6 internal water vapor content is eliminated (representative packages are sampled in-line on a quarterly basis)	Sep 94
UTMC	MIL-PRF-38535	D-7 adhesion of lead finish is eliminated (uses supplier process control data for gold lead finish and UTMC process control data for solder lead finish)	Sep 94
UTMC	MIL-PRF-38535	100% radiography eliminated	Apr 96
UTMC	MIL-PRF-38535	Static 1& 2 burn-in for class V eliminated	Jul 96
UTMC	MIL-PRF-38535	Accelerated burn-in beyond the present time/temperature regression called out in table 1 of MIL-STD-883 TM 1015 is used for both class Q and V products.	Jul 96
UTMC	MIL-PRF-38535	Moisture resistance eliminated (TM 1004)	Aug 96

<u>Manufacturer</u>	<u>Specification</u>	<u>Test optimized</u>	<u>Date</u>
UTMC	MIL-PRF-38535	Eliminated delta calculation on CMOS devices with QIDD delta requirement.	Aug 96
UTMC	MIL-PRF-38535	Group A electrical performed in line	Feb 97
UTMC	MIL-PRF-38535	D-3 thermal series is eliminated	Mar 97
UTMC	MIL-PRF-38535	Internal Visual (TM 2010) eliminated	Mar 97
UTMC	MIL-PRF-38535	PIND class Q eliminated	Aug 97
UTMC	MIL-PRF-38535	Percent defective allowed after burn in was increased.	May 98
UTMC	MIL-PRF-38535	Established new step coverage criteria for TM 2018	Dec 98
UTMC	MIL-PRF-38535	Elimination of constant acceleration on all class Q & V lines.	Mar 99
UTMC	MIL-PRF-38535	Salt Atmosphere eliminated	June 99
UTMC	MIL-PRF-38535	PIND allowance for simultaneous placement of two devices on the transducer for selected parts.	Sep 99
Xilinx	MIL-PRF-38535	Cold and room temp electrical testing eliminated for 0.35 um, XC4000XL device family, with hot guard-banded test limits.	Mar 98
Xilinx	MIL-PRF-38535	Burn-In has been eliminated on the following product. XC3020, XC3042, XC3090 XC3142A, XC3190A, XC3195A XC4003A, XC4005, XC4010, XC4013 XC4005E, XC4010E, XC4013E, XC4025E	July 99

* Indicates changes from the previous report

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