SSD/FLASH MEASURES OF QUALITY

OVER **25 YEARS** OF MEMORY, TEST & MANUFACTURING EXPERTISE.

Environmental Reliability	Reliability & Error Handling	Compliances
Hardware Verification Procedure	Security Sets	Long Term Endurance

Environmental Reliability / Hardware Verification Procedure

- ITAR Certified
- Environmental awareness with ISO 14000
- Corporate CSR
- Certified to ISO 9000, TL 9000 & AS 9100
- In-house reliability tools & thermal-cycle, shock chambers

Reliability & Error Handling / Security Sets

- MTBF calculation using the Belco remodeling method
- Real-time monitoring of field DPPM
- Weekly reviews of MRB with closed loop feedback action
- Weekly monitoring of First pass yield, RTY, scrap, in process defects
- Bi-annual CSI monitoring of all suppliers

Compliances / Long Term Endurance

- Local MIL 810 testing & certification available
- In-house Failure Analysis
- All inspectors IPC CERTIFIED
- All QE's have ASQ certifications
- In-house designed test programs
- Long product life cycles through PCN/ECN, LTB & LTS processes

ENVIRONMENTAL/RELIABILITY

Mil-Std-810F Test Suite

- Altitude
- Low temp operating
- Thermal Shock
- Vibration
- Acceleration
- High temp operating
- Humidity
- Thermal cycling
- Mechanical shock
- Explosive atmosphere

SMART/SECURITY FEATURE SET

SMART Command Set

▸ Return status

▸ Threshold not exceeded bit

▸ Read attribute data

▸ SMART logging

SMART Command Transport Functionality

SMART Attributes

▸ Drive health notification

▸ Performance monitoring

▸ Program/erase cycel count to predict life

▸ Runtime bad blocks

ATA Security Feature Set

▸ Test each security mode

▸ Test transactions between modes

▸ Test each mode across power cycles

ATA Security Erase

Instant Erase

Military Security Erase

256-bit AES Encryption

LONG TERM ENDURANCE

Long Term Endurance Test

▸ Verify bad blocks increasing after extensive number of program/erase cycles

▸ Verify spare blocks are being remapped to replace bad blocks

▸ Verify data integrity is maintained across all data (user & static)

▸ Verify no read/write errors reported to host

▸ Monitor SMART attributes for accuracy

Power Cycling During Write Operations

▸ Verify firmware and metadata integrity

▸ Verify write performance maintained over multiple cycles

▸ Verify static data integrity

▸ If supercap supported, verify integrity of "in flight" writes

▸ Vary timing of power down event relative to when write commands are issued

▸ Vary command type, sectors transferred, data pattern each cycle

HARDWARE VERIFICATION PROCEDURE

Power Consumption, Component Temps

▸ Supply currents measure under varying load & operating modes

▸ Component case temps measured under worst case loads

AC Timing

▸ Setup time, hold time, output enable access time

▸ All interface modes

▸ NAND timing verified for each NAND configuration supported

▸ Reset to ready

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TECHNOLOGY

R 2.00