



Post Office Box 84
 Sherman, Texas 75090
 6412 Highway 75 South
 Sherman, Texas 75090

(903) 868-7111

Texas Instruments Enhanced Products Reliability Report

(Subject To Attached Disclaimers)

Device Type/Device Family: 8V18502AIPMREP
 Package Type: 64HTQFP
 Wafer Fabrication Facility: Ti Freising
 Assembly/Test Facility: Ti Taiwan
 Compiled: 04/11

Biased Life Test

Test Method: JESD22-A108
 Test Condition: 150°/500 hours
 Sample Size: 5706
 Rejects: 0
 Activation Energy (eV): .7
 Equivalent Device Hours: 649.9E6
 Failure Rate (FIT)*: 1.42

*Derated to +55°C with a 60% Confidence Level

Note: Data for EP product is specific to device technology and foundry. For this reason the FIT rate above may differ from Ti's external web page. This does not reflect a difference in quality but only a difference in sample size.

Package Related Tests

<u>Description</u>	<u>Condition</u>	<u>Referenced Method</u>	<u>Sample Size/Rejects</u>	
Biased Humidity or HAST	130°C / 85% / 250 hours	JESD22-A101 JESD22-A110	477/0	*
Autoclave	121 °C @ 2 atmospheres absolute for 96 hours	JESD22-A102	1936/0	*
Temperature Cycle	-65 °C to +150 °C non-biased for 1000 cycles	JESD22-A104	775/0	*
High Temp Storage	170 °C / 420 hours	JESD22-A103-A	598/0	*

* Preconditioning per JEDEC Std. 22, Method A112/A113

Initial Product Qualification

The subject Enhanced Plastic device, device family, and/or package family have passed Texas Instruments product qualification as follows:

<u>Description</u>	<u>Condition</u>	<u>Sample Size</u>	<u>Referenced Method</u>	
Electrical Characterization	TI Data Sheet	50 units/lot	N/A	
Electrostatic Discharge Sensitivity	HBM MM	3 units/voltage	EIA/JESD22-A114 EIA/JESD22-A115	
Latch-up	Per Technology	5/0 units/lot	EIA/JESD78	
Physical Dimensions	TI Data Sheet	5/0	EIA/JESD22- B100	
Thermal Impedance	Theta-JA on board	Per Pin-Package	EIA/JESD51	
Bias Life Test	125°C / 1000 hours or equivalent	116/0	JESD22-A108	*
Biased Humidity	85°C / 85% / 1000 hours or HAST	77/0	JESD22-A101	*
	130°C / 85% / 96 hours		JESD22-A110	
Autoclave	121 °C @ 2 atmospheres absolute for 96 hours	77/0	JESD22-A102	*
Temperature Cycle	-65 °C to +150 °C non-biased for 1,000 cycles	77/0	JESD22-A104	*
Solder Heat	260 °C for 10 seconds	22/0	JESD22-B106	
Resistance to Solvents	Ink symbol only	12/0	JESD22-B107	
Solderability	Condition A (steam age for 8 hours)	22/0	ANSI/J-STD-002-92	
Flammability	Method A / Method B	5/0	UL-1964	
Bond Strength	-	76/0 wires	ASTM F-459	
Die Shear	-	5/0	MIL-STD-883 Method 2019	
High Temp Storage	150 °C / 1,000 hours	45/0	JESD22-A103-A	*
Moisture Sensitivity	Surface Mount Only	12/0	J-STD-020-A	

* Precondition performed

Supplemental Device Characteristics

Die Revision:	C	Assembly Site:	TAI
Master Die:	LVTH18502C	Package Type:	PM
Wafer Fab:	TID	Pin Count:	64
Fab Technology:	BiCmos	Mold Compound:	KMC178
Fab Process:	ASL2BSE	Mount Compound:	Hitachi EN4085S2K3
Process Code:	50B30.2	Bond:	24.3u Au
Passivation:	10KACN	Lead Composition:	Cu
Metal 1:	TiWALCu2	Lead Finish:	NiPdAu
Metal 2:	TiWaalCu2	Die Size:	165x185x11 Mils

Quality and Reliability Data Disclaimer

The attached quality and reliability information is specific to the TI Enhanced Plastic product family of plastic encapsulated commercial-off-the-shelf (COTS) semiconductor products and components. Due to possible differences in product assembly and test baselines, this information is NOT APPLICABLE to TI standard, industrial, or automotive catalog commercial products.

Plastic encapsulated TI semiconductor devices are not designed and are not warranted to be suitable for use in some military applications and/or military environments. Use of plastic encapsulated TI semiconductor devices in military applications and/or military environments, in lieu of hermetically sealed ceramic devices, is understood to be fully at the risk of Buyer.

Quality and reliability data provided by Texas Instruments is intended to be an estimate of product performance based upon history only. It does not imply that any performance levels reflected in such data can be met if the product is operated outside the conditions expressly stated in the latest published data sheet for a device.

Existing industry standards for plastic encapsulated microcircuit qualification and reliability monitors are based upon historical data, experiments, and field experience with the use of these devices in commercial and industrial applications. The applicability of these standards in determining the suitability for use and safety performance in military and aerospace applications has not been established. Due to the multiple variations in field operating conditions, a component manufacturer can only base estimates of product life on models and the results of package and die level qualification.

The buyer's use of this data, and all consequences of such use, is solely the buyer's responsibility. Buyer assumes full responsibility to perform sufficient engineering and additional qualification testing in order to properly evaluate the buyer's application and determine whether a candidate device is suitable for use in that application. The information provided by TI shall not be considered sufficient grounds on which to base any such determination.

THIS INFORMATION IS PROVIDED "AS IS" WITHOUT ANY EXPRESS OR IMPLIED WARRANTY OF ANY KIND INCLUDING WARRANTIES OF MERCHANTABILITY, NONINFRINGEMENT OF INTELLECTUAL PROPERTY, OR FITNESS FOR ANY PARTICULAR PURPOSE. IN NO EVENT SHALL TI OR ITS SUPPLIERS BE LIABLE FOR ANY DAMAGES WHATSOEVER (INCLUDING, WITHOUT LIMITATION, DAMAGES FOR LOSS OF PROFITS, BUSINESS INTERRUPTION, LOSS OF INFORMATION) ARISING OUT OF THE USE OF OR INABILITY TO USE THE INFORMATION, EVEN IF TI HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES.

THIS INFORMATION SHOULD NOT BE USED TO ASSIST IN THE PRACTICE OF "UPRATING" OR "UPSCREENING" DEVICES FOR USE BEYOND THEIR RATED LIMITS.

TI may provide technical, applications or design advice, quality characterization, and reliability data or service providing these items shall not expand or otherwise affect TI's warranties as set forth in the Texas Instruments Incorporated Standard Terms and Conditions of Sale for Semiconductor Products and no obligation or liability shall arise from TI's provision of such items.

Quality and Reliability Data copyright © 2002, Texas Instruments Incorporated, all rights reserved.

IMPORTANT NOTICE

Texas Instruments Incorporated and its subsidiaries (TI) reserve the right to make corrections, modifications, enhancements, improvements, and other changes to its products and services at any time and to discontinue any product or service without notice. Customers should obtain the latest relevant information before placing orders and should verify that such information is current and complete. All products are sold subject to TI's terms and conditions of sale supplied at the time of order acknowledgment.

TI warrants performance of its hardware products to the specifications applicable at the time of sale in accordance with TI's standard warranty. Testing and other quality control techniques are used to the extent TI deems necessary to support this warranty. Except where mandated by government requirements, testing of all parameters of each product is not necessarily performed.

TI assumes no liability for applications assistance or customer product design. Customers are responsible for their products and applications using TI components. To minimize the risks associated with customer products and applications, customers should provide adequate design and operating safeguards.

TI does not warrant or represent that any license, either express or implied, is granted under any TI patent right, copyright, mask work right, or other TI intellectual property right relating to any combination, machine, or process in which TI products or services are used. Information published by TI regarding third-party products or services does not constitute a license from TI to use such products or services or a warranty or endorsement thereof. Use of such information may require a license from a third party under the patents or other intellectual property of the third party, or a license from TI under the patents or other intellectual property of TI.

Reproduction of TI information in TI data books or data sheets is permissible only if reproduction is without alteration and is accompanied by all associated warranties, conditions, limitations, and notices. Reproduction of this information with alteration is an unfair and deceptive business practice. TI is not responsible or liable for such altered documentation. Information of third parties may be subject to additional restrictions.

Resale of TI products or services with statements different from or beyond the parameters stated by TI for that product or service voids all express and any implied warranties for the associated TI product or service and is an unfair and deceptive business practice. TI is not responsible or liable for any such statements.

TI products are not authorized for use in safety-critical applications (such as life support) where a failure of the TI product would reasonably be expected to cause severe personal injury or death, unless officers of the parties have executed an agreement specifically governing such use. Buyers represent that they have all necessary expertise in the safety and regulatory ramifications of their applications, and acknowledge and agree that they are solely responsible for all legal, regulatory and safety-related requirements concerning their products and any use of TI products in such safety-critical applications, notwithstanding any applications-related information or support that may be provided by TI. Further, Buyers must fully indemnify TI and its representatives against any damages arising out of the use of TI products in such safety-critical applications.

TI products are neither designed nor intended for use in military/aerospace applications or environments unless the TI products are specifically designated by TI as military-grade or "enhanced plastic." Only products designated by TI as military-grade meet military specifications. Buyers acknowledge and agree that any such use of TI products which TI has not designated as military-grade is solely at the Buyer's risk, and that they are solely responsible for compliance with all legal and regulatory requirements in connection with such use.

TI products are neither designed nor intended for use in automotive applications or environments unless the specific TI products are designated by TI as compliant with ISO/TS 16949 requirements. Buyers acknowledge and agree that, if they use any non-designated products in automotive applications, TI will not be responsible for any failure to meet such requirements.

Following are URLs where you can obtain information on other Texas Instruments products and application solutions:

Products

Audio	www.ti.com/audio
Amplifiers	amplifier.ti.com
Data Converters	dataconverter.ti.com
DLP® Products	www.dlp.com
DSP	dsp.ti.com
Clocks and Timers	www.ti.com/clocks
Interface	interface.ti.com
Logic	logic.ti.com
Power Mgmt	power.ti.com
Microcontrollers	microcontroller.ti.com
RFID	www.ti-rfid.com
OMAP Mobile Processors	www.ti.com/omap
Wireless Connectivity	www.ti.com/wirelessconnectivity

Applications

Communications and Telecom	www.ti.com/communications
Computers and Peripherals	www.ti.com/computers
Consumer Electronics	www.ti.com/consumer-apps
Energy and Lighting	www.ti.com/energy
Industrial	www.ti.com/industrial
Medical	www.ti.com/medical
Security	www.ti.com/security
Space, Avionics and Defense	www.ti.com/space-avionics-defense
Transportation and Automotive	www.ti.com/automotive
Video and Imaging	www.ti.com/video

TI E2E Community Home Page

e2e.ti.com

Mailing Address: Texas Instruments, Post Office Box 655303, Dallas, Texas 75265
Copyright © 2011, Texas Instruments Incorporated