聚辰半导体
GIANTEC SEMICONDUCTOR

Giantec Automotive EEPROM monitor Qualification Report

（2021.Q4）

Table 1. Product Information

General Information			
Product description	**EEPROM devices use the standard IIC or SPI bus communications.**		
Wafer fabrication location	**Shanghai, China**		
Electrical Wafer Sort test plant location	**Shanghai, China**		
Silicon process technology	**Part Name**	**Lot No/Date code**	**Remark**
0.13um	GT24C256B	DKU65603L1/ 2137	SOP8

Table 2. Package Description

Package Description	Assembly Plant Location	Final Test Plant Location
SOP8	Kunshan, China	Kunshan, China
TSSOP8	Kunshan, China	Kunshan, China
UDFN	Kunshan, China	Kunshan, China

Reliability / Qualification assessment: PASS

1 Reliability evaluation overview

1.1 Objectives

This document serves for the qualification of the Giantec EEPROM product used silicon process technology reliability evaluation.

The voltage and temperature ranges covered by this document are:

- 1.8 to 5.5 V at －40℃ to 125℃ for automotive grade 1
- 1.8 to 5.5 V at －40℃ to 105℃ for automotive grade 2
- 1.8 to 5.5 V at －40℃ to 85℃ for automotive grade 3

1.2 Device characteristics

They are electrically erasable programmable memory (EEPROM) devices based on advanced true EEPROM technology.

The devices use the Automotive standard IIC or SPI communications.

compliant with the very high level of reliability defined by the Automotive standard AEC-Q100.

Refer to the product datasheet for more details.

2 Reliability Test Results

This section contains a general description of the reliability evaluation strategy.

The named products are qualified using the standard Giantec procedures for quality and reliability.

2.1 Reliability test plan and result summary

The reliability test plan and the result summary are presented as follows :

- In *Table 3* for Device -Oriented tests
  (package :SOP8)
- In *Table 4* for Package-Oriented tests
  (package :SOP8、TSSOP8、UDFN)

Table 3. Device – Oriented reliability test plan and result summary

Test	Test short description					
	Method	**Conditions**	**Sample size**	**No. of lots**	**Duration**	**Results fail / sample size**
EDR	**Endurance**					
	AEC-Q100-005	cycling at max opretion temperature	77	1	N/A	0/77
		1KK E/W cycles at 25℃	77	1	N/A	0/77
	High temperature operating life after endurance					
	AEC-Q100-005	Post-cycling high temperature；then HTOL 125℃,6V	77	1	1000 hrs	0/77
	Low temperature operating life after endurance					
	JESD22-A108	Post-cycling high temperature；Then LTOL -10℃,6V	77	1	1000 hrs	0/77
	Data retention after endurance					
	AEC-Q100-005	Post-cycling high temperature;then HTSL 150℃	77	1	1000 hrs	0/77
ESD HBM	**Electrostatic dischange (human body model)**					
	AEC-Q100-002	C=100Pf, R=1500Ω	3	1	N/A	Class-3B

ESD MM	**Electrostatic dischange (machine model)**					
	AEC-Q100-003	C=200Pf, R=0Ω	3	1	N/A	Class-C
ESD CDM	**Electrostatic dischange (charged device model)**					
	AEC-Q100-011	R=1ohm Field induced changing method	3	1	N/A	Class-C3
LU	**Latch – up (current injection and overvoltage stress)**					
	AEC-Q100-004	Maximum operating Temperature	3	1	N/A	Class II Level A

Table 4. Package –Oriented reliability test plan and result summary

Test	**Test short description**					
	Method	**Conditions**	**Sample size**	**No. of lots**	**Duration**	**Results fail / sample size**
PC	**Precondintioning : moisture sensitivity level 1**					
	J-STD-020	MSL1	308	1	N/A	0/308
TC	**Temperature cycling**					
	JESD22-A104	-65℃/+150℃	77	1	1000 cycles	0/77
AC	**Autoclave (pressure pot)**					
	JESD22-A102	121℃,100%RH, 2ATM, 168h	77	1	168 hrs	0/77

UHAST	**Unbiased HAST**					
	JESD22-A118	130℃/ 85%RH, 2ATM, 96h,	77	1	96 hrs	0/77
HAST	**Biased HAST**					
	JESD22-A110	Vmax 130℃/ 85%RH, 2ATM, 96h,	77	1	96 hrs	0/77
HTSL	**High temperature storage life**					
	JESD22-A103	150℃,1000h	45	1	1008 hrs	0/45
ELFR	**Early life failure rate**					
	AEC-Q100-008	HTOL 125℃,6V	800	1	48 hrs	0/800

Revision History

Revision	Monitor Date	Description
V0	Q4. 2021	Automotive EEPROM Monitor Qual