MAX20067BGTJ/V+T

Summary:

This report summarizes the results of the reliability tests performed by Maxim to qualify the MAX20067B for automotive applications.

Conclusion:

The MAX20067B successfully meets the reliability requirements performed by Maxim in accordance with the automotive qualification standard, AEC-Q100.

Test Results/Lot information (Device Specific):

Table 1:

Lot Number:		JCHG8A006BQ		JBQX6Q001EB	
Part Number:		MAX20067BGTJ/V+		MAX20067GTJ/V+	
Temperature Grade:		2		2	
Fab Site:		MFN		MFN	
Fab Process Core:		S18		S18	
Metallization/# Layers:		AlCu / 4		AlCu / 4	
Passivation:		SiN / SiO2		SiN / SiO2	
Die Type:		AP72A-1A		AP72A-0B	
Package Assembly Site:		ASECL		ASECL	
Die Substrate:		Si		Si	
Package Type:		32L TQFN 5x5		32L TQFN 5x5	
Wire Bond Material/Dia.:		CuPd 1.3 mil		CuPd 1.3 mil	
Mold Compound:		G700LA		G700LA	
Die Attach:		EN4900G		EN4900G	
Leadframe Material:		COPPER		COPPER	
Lead Finish:		100% MATTE TIN		100% MATTE TIN	
Flammability Rating:		UL-94 (V-0 Rating)		UL-94 (V-0 Rating)	
Moisture Rating:		1		1	
Date Code:		2031		1724	
Rel Lot Number:		R42165A		R229223A	
Test		**Results**		**Results**	
		SS	*Temp*	*SS*	*Temp*
ESD (HBM)	2500V	0/5	RH	-	RH
ESD (CDM)	All Pins: 500V Corner Pins: 750V	0/5 0/5	RH RH	-	RH RH
Latch-Up	CI: 100mA OV: 1.5 x MOV	0/6 0/6	RH RH	-	RH RH
HTOL	192 hrs	-	RHC	0/77	RHC

Core Process Cumulative FIT Rate:

$\lambda = 0.02\ FITs\ (60\%\ confidence\ level\ @25°C)$
$\lambda = 0.24\ FITs\ (60\%\ confidence\ level\ @55°C)$

The following tables include the process and package level qualification data to support the product level qualification. Multiple tables may be included if multiple wafer fabrication or assembly subcontractors are used (multiple package variations may be included).

Test Results/Lot information (Package Technology): TQFN / ASECL

Table 2:

Lot Number:		TBJG5Q001HQ		EAQR7Q001H		EARB3Q001C		EAZR0A013BA	
Part Number:		MAX20066ATPA/V+		MAX20003ATPA/V+		MAX20080ATM/V+CFT		MAX20003ATPB/V+	
Temperature Grade:		1		1		1		1	
Fab Site:		TOWER JAZZ		EPSON		EPSON		EPSON	
Fab Process Core:		S18		S18		S18		S18	
Metallization/# Layers:		AlCu / 4		AlCu / 4		AlCu / 4		AlCu / 4	
Passivation:		SiN / SiO2		SiN / SiO2		SiN / SiO2		SiN / SiO2	
Die Type:		SP35A-0B		AP47A-0B		AP80B-0B		AP47A-0E	
Die Substrate		Si		Si		Si		Si	
Package Assembly Site:		ASECL		ASECL		ASECL		ASECL	
Package Type:		20L TQFN 4x4		20L TQFN 5x5		48L TQFN 7x7		20L TQFN 5x5	
Wire Bond Material/Dia.:		CuPd 1.3 mil		CuPd 1.3 mil		CuPd 1.0 mil		CuPd 1.3 mil	
Mold Compound:		G700LA		G700LA		G700LA		G700LA	
Die Attach:		EN4900G		EN4900G		EN4900G		EN4900G	
Leadframe Material:		COPPER		COPPER		COPPER		COPPER	
Lead Finish:		100% MATTE TIN		100% MATTE TIN		100% MATTE TIN		100% MATTE TIN	
Flammability Rating		UL-94 (V-0 Rating)		UL-94 (V-0 Rating)		UL-94 (V-0 Rating)		UL-94 (V-0 Rating)	
Moisture Rating:		1		1		1		1	
Date Code:		1611		1413		1410		1631	
Rel Lot Number:		R28336A		R27054A		R26792A		R27520D	
AEC #	**Test**	**Results**		**Results**		**Results**		**Results**	
		SS	*Temp*	*SS*	*Temp*	*SS*	*Temp*	*SS*	*Temp*
A1	**Preconditioning**	0/231	R	0/231	R	0/231	R	0/45	R
A2	**HAST**	0/77	RH	0/77	RH	0/77	RH	-	RH
A3	**Unbiased HAST**	0/77	R	0/77	R	0/77	R	-	R
A4	**Temperature Cycle**	500x – 0/77	RH	500x – 0/77	RH	500x – 0/77	RH	-	RH
A5	**Power Temp Cycle**	-	RH	-	RH	-	RH	1000x – 0/45	RH
C2	**Wire Bond Pull**	0/200	N/A	0/150	N/A	-	N/A	-	N/A
A6	**High Temp Storage**	1000hr – 0/45	RH	1000hr – 0/45	RH	-	RH	-	RH
C3	**Solderability**	0/15	N/A	-	N/A	-	N/A	-	N/A
B1	**High Temp Op/Life**	1000hr – 0/77	RHC	1000hr – 0/77	RHC	1000hr – 0/77	RHC	-	RHC

Test Results/Lot information (Package Technology): TQFN / UTL

Table 3:

Lot Number:		EAQR7Q001B		EAT03Q001D		EATO3Q002AA		EAZR0A030EB	
Part Number:		MAX20003ATPA/V+		MAX20003ATPA/V+		MAX20003ATPA/V+		MAX20003ATPB/V+	
Temperature Grade:		1		1		1		1	
Fab Site:		EPSON		EPSON		EPSON		EPSON	
Fab Process Core:		S18		S18		S18		S18	
Metallization/# Layers:		AlCu / 4		AlCu / 4		AlCu / 4		AlCu / 4	
Passivation:		SiN / SiO2		SiN / SiO2		SiN / SiO2		SiN / SiO2	
Die Type:		AP47A-0B		AP47A-0B		AP47A-0B		AP47A-0E	
Die Substrate		Si		Si		Si		Si	
Package Assembly Site:		UTL		UTL		UTL		UTL	
Package Type:		20L TQFN 5x5		20L TQFN 5x5		20L TQFN 5x5		20L TQFN 5x5	
Wire Bond Material/Dia.:		CuPd 1.3 mil		CuPd 1.3 mil		CuPd 1.3 mil		CuPd 1.3 mil	
Mold Compound:		G770HCD		G770HCD		G770HCD		G770HCD	
Die Attach:		AB8200T		AB8200T		AB8200T		AB8200T	
Leadframe Material:		COPPER		COPPER		COPPER		COPPER	
Lead Finish:		100% MATTE TIN		100% MATTE TIN		100% MATTE TIN		100% MATTE TIN	
Flammability Rating		UL-94 (V-0 Rating)		UL-94 (V-0 Rating)		UL-94 (V-0 Rating)		UL-94 (V-0 Rating)	
Moisture Rating:		1		1		1		1	
Date Code:		1412		1424		1435		1715	
Rel Lot Number:		R27054B		R27054D		R27054E		R29180A	
AEC #	**Test**	**Results**		**Results**		**Results**		**Results**	
		SS	*Temp*	*SS*	*Temp*	*SS*	*Temp*	*SS*	*Temp*
A1	**Preconditioning**	0/231	R	0/231	R	0/231	R	0/45	R
A2	**HAST**	0/77	RH	0/77	RH	0/77	RH	-	RH
A3	**Unbiased HAST**	0/77	R	0/77	R	0/77	R	-	R
A4	**Temperature Cycle**	500x – 0/77	RH	500x – 0/77	RH	500x – 0/77	RH	-	RH
A5	**Power Temp Cycle**	-	RH	-	RH	-	RH	1000x – 0/45	RH
C2	**Wire Bond Pull**	0/150	N/A	0/150	N/A	0/150	N/A	-	N/A
A6	**High Temp Storage**	1000hr – 0/45	RH	-	RH	-	RH	-	RH
C3	**Solderability**	0/15	N/A	-	N/A	-	N/A	-	N/A
B1	**High Temp Op/Life**	1000hr – 0/77	RHC	1000hr – 0/77	RHC	1000hr – 0/77	RHC	-	RHC

Test Results/Lot information (Wafer Process Technology): S18 / MFN

Table 4:

Lot Number:	JBPH4Q002CC	JBPH4Q002CA	JBPH43005AC	JBPH43004A
Part Number:	MAX20094ATIA/VY+	MAX20094ATIA/VY+	MAX20094ATIA/VY+	MAX20094ATIA/VY+
Temperature Grade:	1	1	1	1
Fab Site:	MFN	MFN	MFN	MFN
Fab Process Core:	S18	S18	S18	S18
Metallization/# Layers:	AlCu / 4	AlCu / 4	AlCu / 4	AlCu / 4
Passivation:	SiN / SiO2	SiN / SiO2	SiN / SiO2	SiN / SiO2
Die Type:	AP77A-0B	AP77A-0B	AP77A-0B	AP77A-0B
Die Substrate	Si	Si	Si	Si
Package Assembly Site:	UTL	UTL	UTL	ASECL
Package Type:	28L SWTQFN 5x5	28L SWTQFN 5x5	28L SWTQFN 5x5	28L SWTQFN 5x5
Wire Bond Material/Dia.:	CuPd 1.3 mil	CuPd 1.3 mil	CuPd 1.3 mil	CuPd 1.3 mil
Mold Compound:	G770HCD	G770HCD	G770HCD	G700LA
Die Attach:	AB8200T	AB8200T	AB8200T	EN4900G
Leadframe Material:	COPPER	COPPER	COPPER	COPPER
Lead Finish:	100% MATTE TIN	100% MATTE TIN	100% MATTE TIN	100% MATTE TIN
Flammability Rating	UL-94 (V-0 Rating)	UL-94 (V-0 Rating)	UL-94 (V-0 Rating)	UL-94 (V-0 Rating)
Moisture Rating:	1	1	1	1
Date Code:	1718	1718	1726	1725
Rel Lot Number:	R28961A	R28961B	R28961C	R28961G

AEC #	Test	Results		Results		Results		Results	
		SS	*Temp*	*SS*	*Temp*	*SS*	*Temp*	*SS*	*Temp*
A1	**Preconditioning**	0/231	R	0/231	R	0/231	R	-	R
A2	**HAST**	0/77	RH	0/77	RH	0/77	RH	-	RH
A3	**Unbiased HAST**	0/77	R	0/77	R	0/77	R	-	R
A4	**Temperature Cycle**	500x – 0/77	RH	500x – 0/77	RH	500x – 0/77	RH	-	RH
A6	**High Temp Storage**	1000hr – 0/77	RH	1000hr – 0/77	RH	1000hr – 0/77	RH	-	RH
B1	**High Temp Operating Life**	1000hr – 0/77	RHC	1000hr – 0/77	RHC	1000hr – 0/77	RHC	-	RHC
B2	**Early Life Failure Rate**	48hr – 0/800	RH	-	RH	48hr – 0/800	RH	48hr – 0/800	RH

Revision	Description of Revision and Author	Approved By	Effective By (Date)
A	Initial release.	J. Aquino	19 Jan 2021