

Nitto GE100 Series Mold Compound Automotive

Qualification Report

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Revision History

Nitto GE100 Series Mold Compound Automotive RPT107 (v1.0) June 16, 2008

The following table shows the revision history for this document.

	Version	Revision
06/16/08	1.0	Initial Xilinx release.

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Nitto GE100 Series Mold Compound Automotive Qualification Report

Overview

This qualification report summarizes the results of the reliability tests performed to qualify Nitto GE100 series mold compound for Wire Bonding BGA package technology at SPIL and Amkor assembly sites for automotive applications.

Qualification Objective

The objective of this qualification is to qualify Nitto GE100 Series mold compound material for Xilinx automotive plastic molded BGA package portfolio.

Reliability Test Conditions and Passing Criteria

The qualification was performed following the AEC-Q100 guidance. The test conditions, test methods and passing criteria are summarized in the table below

Table 1: Reliability Test Conditions and Passing Criteria

Stress	ABV	Test Condition	Test Methods (AEC-Q100)	Criteria
Preconditioning	PC	MSL 3; 30°C / 60% RH, 192 hours, 3x Reflow	J-STD-020 JESD22 A113	0 failure
Temperature Humidity Biased	THB	85°C / 85% RH, Vccmax 1000 hours	JESD22 A101	0 failure
Unbiased HAST	UHST	130°C / 85% RH, 96 hours	JESD22 A118	0 failure
Biased HAST	HAST	130°C / 85% RH, Vccmax 96 hours	JESD22 A110	0 failure
Temperature Cycling	TC	-55°C to 125°C, 1000 cycles (condition B)	JESD22 A104	0 failure
High Temperature Storage Life	HTSL	150°C, 1000 hours	JESD22 A103	0 failure
Wire Bond Pull Strength	WBP	Post 1000 cy. of TC	MIL-STD-883-2011	0 failure

Qualification Vehicles

The qualification vehicles were selected from several product families as well as from several different package sizes and pin counts for reliability tests. The following table summarizes the package and product types that are covered by the qualification extension of the qualification vehicles.

Table 2: Assembly Sites, Qualification Vehicles and Products, Qualified by Similarity

Assembly site	Package Types	Qualification Vehicle	Qualified by similarity
SPIL	FG(G)400, FG(G)456, FG(G)484, FG(G)676	XA3S1500-FGG676, XA3S1600E-FGG484, XA3S1400A-FGG676, XA3SD3400A- FGG676	XA3S400, XA3S1000, XA3S1500, XA3S1200E, XA3S1600E, XA3S400A, XA3S700A, XA3S1400A
	FT(G)256	XA2S300E-FTG256, XA3S400A-FTG256	XA2S150E, XA2S200E, XA2S300E, XA3S200, XA3S400, XA3S1000, XA3S250E, XA3S500E, XA3S1200E, XA3S200A, XA3S400A
Amkor	CP(G)132	XA3S500E-CPG132	XA2C128, XA2C256, XA3S100E, XA3S250E, XA3S500E

Table 3: Major Package Built Information for Qualification Samples Used in This Qualification

Package/Device	FTG256	FGG484	FGG676	CPG132
Assembly Location	SPIL	SPIL	SPIL	Amkor
MSL	3	3	3	3
Peak Reflow Temperature	260°C	250°C	250°C	260°C
Mold Compound	Nitto GE100 series	Nitto GE100 series	Nitto GE100 series	Nitto GE100 series
Bond Wire	Au	Au	Au	Au
Die Attached Epoxy	Ablebond 2300 series	Ablebond 2300 series	Ablebond 2300 series	Ablebond 2300 series
Substrate Material	BT	BT	BT	BT

Summary of Qualification Results

Table 4: Summary of Stress Test Results for FGG Packages

Stress Test	Product	Fab lot #	Assy lot #	Assy Loc	Duration	Sample	Result
HTS	XA3S1600E-FGG484	KMN53	17633	SPIL	1000	45	Pass
	XA3S1600E-FGG484	KMQ26	17690	SPIL	1000	45	Pass
	XA3S1600E-FGG484	KMQ26	17691	SPIL	1000	45	Pass
	XA3SD3400A-FGG676	KLH68	17994	SPIL	1000	45	Pass
TC	XA3S1500-FGG676	KNJ95.A1	17634	SPIL	1000	77	Pass
	XA3S1500-FGG676	KNN58.A1	17695	SPIL	1000	77	Pass
	XA3S1500-FGG676	KNN58.A1	17694	SPIL	1000	77	Pass
	XA3SD3400A-FGG676	KLH68	17994	SPIL	1000	77	Pass
	XA3SD3400A-FGG676	KLT42	18045	SPIL	1000	77	Pass
	XA3SD3400A-FGG676	KYG34	18180	SPIL	1000	77	Pass
UHST	XA3S1500-FGG676	KNJ95.A1	17634	SPIL	96	77	Pass
	XA3S1500-FGG676	KNN58.A1	17695	SPIL	96	77	Pass
	XA3S1500-FGG676	KNN58.A1	17694	SPIL	96	77	Pass
	XA3SD3400A-FGG676	KLH68	17994	SPIL	96	77	Pass
	XA3SD3400A-FGG676	KLT42	18045	SPIL	96	77	Pass
	XA3SD3400A-FGG676	KYG34	18180	SPIL	96	77	Pass
THB	XA3S1600E-FGG484	KMN53	17633	SPIL	1000	77	Pass
	XA3S1600E-FGG484	KMQ26	17690	SPIL	1000	77	Pass
	XA3S1600E-FGG484	KMQ26	17691	SPIL	1000	77	Pass
	XA3S1400A-FGG676	KQM99	17993	SPIL	1000	77	Pass
HAST	XA3S1400A-FGG676	KPK14	18044	SPIL	96	77	Pass
	XA3S1400A-FGG676	KTM16	18087	SPIL	96	77	Pass
WBP	XA3S1500-FGG676	KNJ95.A1	17634	SPIL	Post-TC	5	Pass
	XA3S1500-FGG676	KNN58.A1	17695	SPIL			
	XA3S1500-FGG676	KNN58.A1	17694	SPIL			
	XA3SD3400A-FGG676	KLH68	17994	SPIL	Post-TC	5	Pass
	XA3SD3400A-FGG676	KLT42	18045	SPIL			
	XA3SD3400A-FGG676	KYG34	18180	SPIL			

Table 5: Summary of Stress Test Results for FTG Packages

Stress Test	Product	Fab lot #	Assy lot #	Assy Loc	Duration	Sample	Result
HTS	XA2S300E-FTG256	KLQ42	17642	SPIL	1000	45	Pass
	XA2S300E-FTG256	KNN65	17692	SPIL	1000	45	Pass
	XA2S300E-FTG256	KNN65	17693	SPIL	1000	45	Pass
	XA3S400A-FTG256	KMQ53	17988	SPIL	1000	45	Pass
TC	XA2S300E-FTG256	KLQ42	17642	SPIL	1000	77	Pass
	XA2S300E-FTG256	KNN65	17692	SPIL	1000	77	Pass
	XA2S300E-FTG256	KNN65	17693	SPIL	1000	77	Pass
	XA3S400A-FTG256	KMQ53	17988	SPIL	1000	77	Pass
	XA3S400A-FTG256	KRS34	18046	SPIL	1000	77	Pass
	XA3S400A-FTG256	KMN45	18094	SPIL	1000	77	Pass
UHST	XA2S300E-FTG256	KLQ42	17642	SPIL	96	77	Pass
	XA2S300E-FTG256	KNN65	17692	SPIL	96	77	Pass
	XA2S300E-FTG256	KNN65	17693	SPIL	96	77	Pass
	XA3S400A-FTG256	KMQ53	17988	SPIL	96	77	Pass
	XA3S400A-FTG256	KRS34	18046	SPIL	96	77	Pass
	XA3S400A-FTG256	KMN45	18094	SPIL	96	77	Pass
THB	XA2S300E-FTG256	KLQ42	17642	SPIL	1000	77	Pass
	XA2S300E-FTG256	KNN65	17692	SPIL	1000	77	Pass
	XA2S300E-FTG256	KNN65	17693	SPIL	1000	77	Pass
	XA3S400A-FTG256	KMQ53	17988	SPIL	1000	77	Pass
	XA3S400A-FTG256	KRS34	18046	SPIL	1000	77	Pass
	XA3S400A-FTG256	KMN45	18094	SPIL	1000	77	Pass
WBP	XA2S300E-FTG256	KLQ42	17642	SPIL	Post-TC	5	Pass
	XA2S300E-FTG256	KNN65	17692	SPIL			
	XA2S300E-FTG256	KNN65	17693	SPIL			
	XA3S400A-FTG256	KMQ53	17988	SPIL	Post-TC	5	Pass
	XA3S400A-FTG256	KRS34	18046	SPIL			
	XA3S400A-FTG256	KMN45	18094	SPIL			

Table 6: Summary of Stress Test Results for CPG Packages

Stress Test	Product	Fab lot #	Assy lot #	Assy Loc	Duration	Sample	Result
HTS	XA3S500E-CPG132	KMF44	17736	Amkor	1000	45	Pass
TC	XA3S500E-CPG132	KLS06	17735	Amkor	1000	77	Pass
	XA3S500E-CPG132	KMF44	17736	Amkor	1000	77	Pass
	XA3S500E-CPG132	KMQ31	17737	Amkor	1000	77	Pass
UHST	XA3S500E-CPG132	KLS06	17735	Amkor	96	77	Pass
	XA3S500E-CPG132	KMF44	17736	Amkor	96	77	Pass
	XA3S500E-CPG132	KMQ31	17737	Amkor	96	77	Pass
THB	XA3S500E-CPG132	KLS06	17735	Amkor	1000	77	Pass
	XA3S500E-CPG132	KMF44	17736	Amkor	1000	77	Pass
	XA3S500E-CPG132	KMQ31	17737	Amkor	1000	76 ⁽¹⁾	Pass
WBP	XA3S500E-CPG132	KLS06	17735	Amkor	Post-TC	5	Pass
	XA3S500E-CPG132	KMF44	17736	Amkor			
	XA3S500E-CPG132	KMQ31	17737	Amkor			

Notes:

1. One unit missing during etest.

