



PRODUCT/PROCESS CHANGE NOTIFICATION

PCN APM-SLI/07/2837
Notification Date 08/16/2007

**New Assembly + Test line for TO92 package in FUJITSU
Nantong (China) subcontractor qualification
SLI - LINEAR & INTERFACE**

Table 1. Change Identification

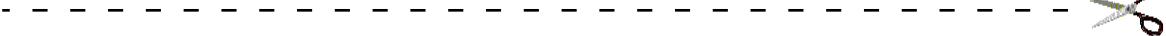
Product Identification (Product Family/Commercial Product)	TL431 + TL1431 in TO92 package
Type of change	Multiple types of changes
Reason for change	Additional capacity
Description of the change	Qualification of a new assembly & test line for TO92 package in subcontractor Fujitsu Nantong (China). Samples available now are: TL431ACZ & TL431CZ. Others parts available upon specific customers request.
Product Line(s) and/or Part Number(s)	See attached
Description of the Qualification Plan	See attached
Change Product Identification	First digit of trace-ability code become "U"
Manufacturing Location(s)	1]Sc - Wooseok Weihai - China 2]Sc - Wooseok Weihai - China

Table 2. Change Implementation Schedule

Forecasted implementation date for change	09-Aug-2007
Forecasted availability date of samples for customer	09-Aug-2007
Forecasted date for STMicroelectronics change Qualification Plan results availability	09-Aug-2007
Estimated date of changed product first shipment	15-Nov-2007

Table 3. List of Attachments

Customer Part numbers list	
Qualification Plan results	



Customer Acknowledgement of Receipt		PCN APM-SLI/07/2837
Please sign and return to STMicroelectronics Sales Office		Notification Date 08/16/2007
<input type="checkbox"/> Qualification Plan Denied <input type="checkbox"/> Qualification Plan Approved <input type="checkbox"/> Change Denied <input type="checkbox"/> Change Approved	Name:	
	Title:	
	Company:	
	Date:	
	Signature:	
Remark		

DOCUMENT APPROVAL

Name	Function
Gilot, Yves	Division Marketing Manager
Kaire, Jean-Claude	Division Product Manager
Paccard, Francoise	Division Q.A. Manager

QUALIFICATION REPORT

PCN reference: APM-SLI/07/2837
Qualification Report n°: QATO92F2
Qualification Type: Capacity Increase
Process: TO92 package
Date of issue: 8th August 2007

Reference documents:

- SOP 2.5.9 Process critical and key parameters
- 0076604 Process Qualification and release to production
- 0078588 Reliability requirements for product qualification
- 0046008 Process control plan for Front End
- 0060531 FMEA procedure
- 0061050 Back end qualification procedure
- 0091984 Construction analysis
- 0037709 Package construction analysis
- 7006451 Management of manufacturing source change
- 0033689 Process flow chart



Content

1 PROCESS MAIN SPECIFICATION CHANGE

- 1.1 Process specification change
- 1.2 Risk assessment

2 QUALIFICATION PLAN

- 2.1 Test vehicle description
- 2.2 Process qualification requirements
- 2.3 Assembly and Final Test qualification requirements
- 2.4 Reliability qualification requirements

3 QUALIFICATION RESULTS

- 3.1 Process qualification results
- 3.2 Assembly and Final Test qualification results
- 3.3 Reliability qualification results

CONCLUSION

1. PROCESS MAIN SPECIFICATION CHANGE

1.1 Process specification change

Assembly plant: Fujitsu-Nantong is already qualified by STM for other products in TO92 package

	Current Process	Modified process
Assembly location	Wooseok Weihai	Fujitsu - Nantong
Frame	Copper	Copper
Die attach glue	Ablestik amicon c990j	Ablestik 84-1 Imisr4
Wire	Gold 1mils	Gold 1mils
Molding compound	ST-7100ds	Samsung SL7300HX
Lead finishing	Sn (100%)	Sn (100%)

Test change: new test plant for 0431 line

	Current process	Modified process
Test location	Wooseok Weihai	Fujitsu - Nantong
Tester type	AZ400S	ETS

1.2 Risk assessment

Type of risk Q: Quality E: Electrical R: Reliability	Parameter	Possible effect	Qualification check
E	Datasheet parameter	Parameter deviation	Yield verification and datalog analysis on one lot

No reliability risk foreseen since assembly plant already qualified

2. QUALIFICATION PLAN

2.1 Test vehicle description

This qualification is based upon other product qualification and TV1 is the product to qualify.

	TV1	TV2	TV3
Line	0431	EZ6P	431S
Plant	Fujitsu - Nantong	Fujitsu - Nantong	Fujitsu - Nantong
Sales Type	TL431		
FE process	Bipolar	PMOS	Bipolar
Package	TO92	TO92	TO92
Die size (µm)	1220 X 990	1140 X 1820	620 x 880
Die thickness (µm)	280	280	280
Metallisation	AlSiCu	AlSi	AlSiCu
Passivation	Nitride	Nitride	Nitride + Pvpapox
Back side	Raw silicon	TiNiAu	Raw silicon
Leadframe	Copper	Copper	Copper
Lead finishing	Sn (100%)	Sn (100%)	Sn (100%)
Glue	Ablestik 84-1 Imisr4	Ablestik 84-1 Imisr4	Ablestik 84-1 Imisr4
Molding compound	Samsung SL7300HX	Samsung SL7300HX	Samsung SL7300HX
Wire	1 mils	2 mils	1 mils

2.2 Process qualification requirements

	TV1	TV2	TV3
Flow Chart comparison	X		X
Control Plan comparison	X		X
FMEA study	X		X
Construction analysis		X	
Quantity of qualification lots	1	1	1

2.3 Assembly and Final Test qualification requirements

	TV1	TV2	TV3	Comment
Quantity of qualification lot	1	1	1	
Package type	TO92	TO92	TO92	
Lot average yield	X			1 lot datalog verification
Parameters distribution	X			
Test capability	x			Golden and Vref distribution analysis

2.4 Reliability qualification requirements.

Tests	Conditions	Step	TV1	TV2	TV3
HTB	Tj=150C Vs=absolute max rating	168h	78		78
		1000h	78		
THB	Ta=85C RH=85% Vs=nominal	168h 1000h	78 78		
TMC	Ta=-65/+150C	100cy	78		78
		500cy	78		78
		1000cy	78		
PPT	Ta=121C P=2atm	168h	78		78
		240h	78		78
Env seq	TMC + PPT	100cy 48h	78 78		
TMSK	Ta = -65 / +150C	100shk 500shk	78 78		

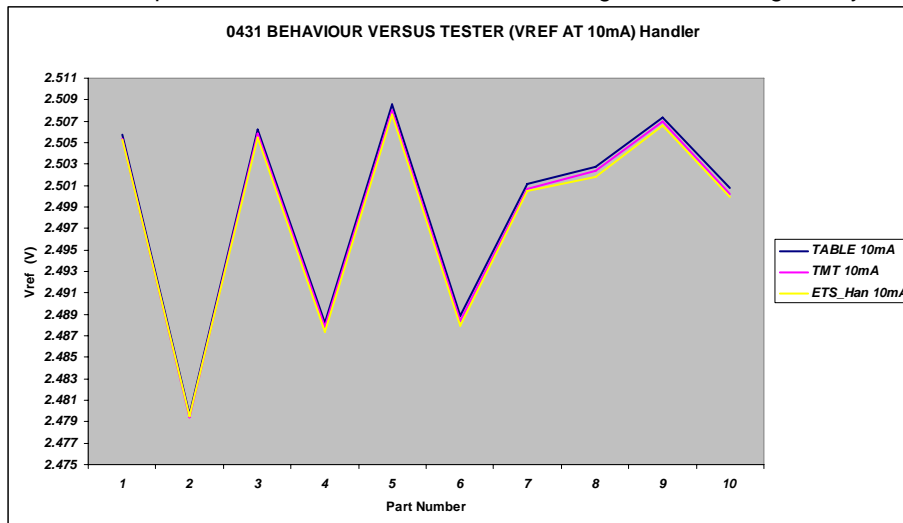
3. QUALIFICATION RESULTS

3.1 Process qualification results

	TV1	TV2	TV3	Comments
Flow Chart comparison	7652738		7652738	OK
Control Plan comparison	7652738		7652738	OK
FMEA study	NFME.D.098		NFME.D.098	
Construction analysis		CT LIB 23445		Conform to ST specification

3.2 Assembly and FT qualification results

Tester capability verification: 10 golden units were tested on bench and TMT tester in STM and on ETS tester in Fujitsu-Nantong. Below graph illustrates testers alignment for one parameter (Vref @ 10 mA). All datasheet parameters results on ETS tester are aligned to results given by STM reference testers.



Yield and parameters distribution verification: one lot of 6400 units has been tested in Fujitsu-Nantong. Yield is conform to standard production lots. Datasheet Parameters distribution are also similar to standard lots. In particular Vref distribution is aligned to a standard production lot.

3.3 Reliability qualification results

Tests	Conditions	Step	TV1	TV2	TV3
HTB	Tj = 150C Vs = absolute max rating	168	0/78		0/78
		1000	0/78		0/78
THB	Ta = 85C RH = 85% Vs = nominal	168	0/78		
		1000	0/78		
TMC	Ta = -65 / +150C	100	0/78		0/78
		500	0/78		0/78
		1000	0/78		
PPT	Ta = 121C P = 2atm	168	0/78		0/78
		240	0/78		0/78
Env seq	TMC + PPT	100	0/78		
		48h	0/78		
TMSK	Ta = -65 / +150C	100shk	0/78		
		500shk	0/78		

CONCLUSION:

Fujitsu-Nantong is now qualified to run product line 0431 in TO92 package.

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