

Product change notification

PCN09-05-RTE

C&K components

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Document revision

Revision	Date	Description	Author
A	26-jun-09	Creation	Eric GRANGE

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1. Purpose

Following the ROHS change done on RTE series, the 02 and 03 versions were not promoted as “lead free compatible”, able to sustain new soldering temperature level. The internal P/N were nominated with “ROHS” extension and not “LFT” extension

This weakness results from the design of 02 and 03 versions for which the tactile effect is done by the plastic actuator.

Evaluation of new plastic resins for such actuators leads successfully to resist to lead free soldering temperatures.

2. Change definition

Implementation of new plastic resins for actuator for RTE02 and RTE03 series, from yellow to black, to award series to lead free process compliance.

3. Change impact and qualification method

The change has no impact on the product, except for the minimum torque level, from 1N.cm to 0.75N.cm. Please refer to annex 2 for specification update.

A full qualification has been carried out to validate the new actuator. The corresponding qualification file is available upon request.

4. Application

4.1 Overview

The application will be done by including the new actuator into production. Difference can be check by the color which changes from yellow to black.

4.2 Product range affected

- RTE02
- RTE03

You will find in the annex 1 the complete P/N list. Please note that specific P/N's are not covered by this PCN.

4.3 Date of application & time frame

- Application for all customers: starting W30/09.

4.4 Ordering, pricing and stock handling policy

- Ordering: designations remain unchanged, internal P/N will be updated from “ROHS” to “LFT” extensions
- Prices, sales conditions remain unchanged.
- Stock handling: no obsolescence and no specification modification is applied on any P/N. No return or scrap for obsolescence will be accepted.

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5. Acknowledgement

We recommend acknowledging this PCN no later than July 3rd 2009 to your closest sales representative.

6. Support

For any question, please contact your sales representative.

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Annex 1 : P/N affected by the change

Old P/N	New P/N	Désignation
Y36A12001FPROHS	Y36A12001FP LFT	Rte0212n05
Y36A12003FPROHS	Y36A12003FP LFT	Rte0212n04
Y36A12101FPROHS	Y36A12101FP LFT	Rte0212r05
Y36A12103FPROHS	Y36A12103FP LFT	Rte0212r04
Y36A13612FPROHS	Obsoleted	Rte0200nos Rohs Spvt.PI 13612
Y36B00004FPROHS	Y36B00004FP LFT	Rte0300n04 En Tube
Y36B02304FPROHS	Y36B02304FP LFT	Rte0302m04 En Tube
Y36B06003FPROHS	Obsoleted	Rte0306n04 Position 5
Y36B06403FPROHS	Obsoleted	Rte0306g04 Position 5
Y36B12001FPROHS	Y36B12001FP LFT	Rte0312n05
Y36A02002FPROHS	Obsoleted	Rte0202n04 P-T
Y36A00001FPROHS	Y36A00001FP LFT	Rte0200n05
Y36A00003FPROHS	Y36A00003FP LFT	Rte0200n04
Y36A10001FPROHS	Y36A10001FP LFT	Rte0210n05
Y36A10003FPROHS	Y36A10003FP LFT	Rte0210n04
Y36A00101FPROHS	Y36A00101FP LFT	Rte0200r05
Y36A00103FPROHS	Y36A00103FP LFT	Rte0200r04
Y36A10101FPROHS	Y36A10101FP LFT	Rte0210r05
Y36A10103FPROHS	Y36A10103FP LFT	Rte0210r04
Y36A00401FPROHS	Y36A00401FP LFT	Rte0200g05
Y36A00403FPROHS	Y36A00403FP LFT	Rte0200g04
Y36B00401FPROHS	Y36B00401FP LFT	Rte0300g05
Y36B00403FPROHS	Y36B00403FP LFT	Rte0300g04
Y36A01001FPROHS	Y36A01001FP LFT	Rte0201n05
Y36A01003FPROHS	Y36A01003FP LFT	Rte0201n04
Y36A11001FPROHS	Y36A11001FP LFT	Rte0211n05
Y36A11003FPROHS	Y36A11003FP LFT	Rte0211n04
Y36A01101FPROHS	Y36A01101FP LFT	Rte0201r05
Y36A01103FPROHS	Y36A01103FP LFT	Rte0201r04
Y36A11101FPROHS	Y36A11101FP LFT	Rte0211r05
Y36A11103FPROHS	Y36A11103FP LFT	Rte0211r04
Y36A02001FPROHS	Y36A02001FP LFT	Rte0202n05
Y36A02003FPROHS	Y36A02003FP LFT	Rte0202n04
Y36B02403FPROHS	Y36B02403FP LFT	Rte0302g04
Y36B00001FPROHS	Y36B00001FP LFT	Rte0300n05
Y36B00003FPROHS	Y36B00003FP LFT	Rte0300n04
Y36B10001FPROHS	Y36B10001FP LFT	Rte0310n05
Y36B10003FPROHS	Y36B10003FP LFT	Rte0310n04
Y36B00101FPROHS	Y36B00101FP LFT	Rte0300r05
Y36B00103FPROHS	Y36B00103FP LFT	Rte0300r04
Y36B10101FPROHS	Y36B10101FP LFT	Rte0310r05
Y36B10103FPROHS	Y36B10103FP LFT	Rte0310r04
Y36B01001FPROHS	Y36B01001FP LFT	Rte0301n05
Y36B01003FPROHS	Y36B01003FP LFT	Rte0301n04
Y36B11001FPROHS	Y36B11001FP LFT	Rte0311n05

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Y36B11003FPROHS	Y36B11003FP LFT	Rte0311n04
Y36B01101FPROHS	Y36B01101FP LFT	Rte0301r05
Y36B01103FPROHS	Y36B01103FP LFT	Rte0301r04
Y36B11101FPROHS	Y36B11101FP LFT	Rte0311r05
Y36B11103FPROHS	Y36B11103FP LFT	Rte0311r04
Y36B02001FPROHS	Y36B02001FP LFT	Rte0302n05
Y36B02003FPROHS	Y36B02003FP LFT	Rte0302n04
Y36B02301FPROHS	Y36B02301FP LFT	Rte0302m05
Y36B02303FPROHS	Y36B02303FP LFT	Rte0302m04

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Annex 2 : Specification update

Please refer to following pages



PRODUCT SPECIFICATION

RTE 02-03 LFT / LFG

Ref. / PS-RTE-234

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ISSUE 1: JUNE 2009

Approvals:

Laurent Kubat Engineering Manager	Date
Remi Antoine Product Quality Manager	
Daniel Pequegnot Laboratory Manager	
Eric Grange Product Manager	
J�rome Brochot Quality Director	

Note

This specification, attached documents and attached drawings cannot be communicated to anybody without written agreement of C&K.



PRODUCT SPECIFICATION

June 2009

RTE 02-03 LFT / LFG

Issue 1

Ref. / PS-RTE-234

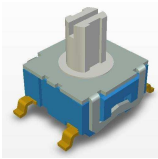
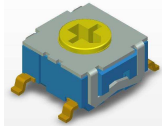
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Revision record:

Revision	Date	Comments
Issue 1	June 25 th , 2009	Creation according to ECR 4073

SUMMARY

- 1. Description / Main Features**
- 2. Construction**
- 3. Electrical data**
- 4. Mechanical data**
- 5. Physical data**
- 6. Operating environment**
- 7. Additional data : storage and handling environment**
- 8. Additional data : process environment**
- 9. Applicable norms**

1 - Description


The RTE 02 or 03 positions are coded types of subminiature rotary switches designed for manual insertion and automatic Pick and Place.

Main Features

- Thermoplastic actuator
- Actuator type : see table p.6
- Terminal type : see table p.6
- Terminal plating :
 - LFT (lead free tin)
 - LFG (lead free gold)
- ROHS compliance
- Compatible with lead free soldering processes.
- Packaging : see table p.6
- Marking
 - On the product : according to drawing
 - On the packaging reel: bar code.

2 - Construction

Function	Rotary switch , Code : Single pole
Contact type	2 or 3 positions
Terminals	THT or SMT

3 - Electrical data

	Contact plating : Ag or Au (<i>see table page 6</i>)
Min/max voltage	20 mVdc – 30 Vdc
Min/max current	<ul style="list-style-type: none"> • Ag version : 1 mA – 100 mA • Au version : 10 μA – 100 mA
Dielectric strength :	≥ 500 Vrms
Contact resistance	<ul style="list-style-type: none"> • Initial measurement : ≤ 100 mΩ • After life test : ≤ 150 mΩ
Insulation resistance :	Initial measurement: $\geq 10^{13}$ Ω

4 - Mechanical data

Mechanical stop resistance	without
Actuating torque	0.75 Ncm \leq Actuating torque ≤ 3 Ncm
Overload	20 N max
Rotation	2 directions

5 - Physical data

Dimensions & layout	According to drawing. (<i>drawing N° on the table page 6</i>)
Angle between 2 positions	See table page 6
Mass	0.5 g ± 0.1

6 - Operating environment

Operating temperatures	- 25°C / + 85°C
Damp heat	40°C / 93% HR / 21 days According to NF EN 60068-2-3
Operating life	375 indexations
Vibrations	10-500 Hz / 10 g / 3 axis No discontinuity > 1 μ s According to NF EN 60068-2-6
Mechanical shocks	$\frac{1}{2}$ sinusoidal / 50 g / 11 ms 3 shocks in each direction of the 3 axis No discontinuity > 1 μ s According to NF EN 60068-2-27
Flowing mixed gas corrosion test	Gas composition : <ul style="list-style-type: none"> - H₂S : 0.01 ± 0.005 ppm - NO₂ : 0.2 ± 0.02 ppm - Cl₂ : 0.01 ± 0.005 ppm - SO₂ : 0.2 ± 0.02 ppm Temperature: 25°C / HR: 75% / Duration: 10 days. According to NF EN 60068-2-60 method 4

- only for gold version -

7 - Additional data : storage and handling environment

Transport conditions	According to specification NF H00-060
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Storage temperatures :	- 55°C (10 days) / + 85°C (4 days)
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8 - Additional data : process environment

Soldering process :

- Surface Mount Terminals
- Thru-Hole Terminals
- Lead free reflow soldering process
According to C&K Procedure : PS-LF-001
- Lead free single or double wave soldering
process.
According to C&K Procedure : PS-LF-002

Nota: Customer must check that product will fit in his application through his reflow profile.

IP Code	IP 50
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Washing process	No clean process
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Chemical agent	N.A.
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9 - Applicable norms

Testing procedure (C&K spec)	Proc-essai 16
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Legal norm (EHS)	C&K procedure
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PRODUCT SPECIFICATION

June 2009

RTE 02-03

Issue 1

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Designation	ESD protection	Actuator	Terminals	Switch function	Contact plating	Angle between 2 positions	Drawing N°	Packaging
RTE 02								
RTE 02 00 G 05	Without	Flush, Screwdriver slot	SMT	Single pole	Ag	120°	CU36M20403FP	In reel - 1250 p/reel
RTE 02 00 G 04	Without	Flush, Screwdriver slot	SMT	Single pole	Au	120°	CU36M20403FP	In reel - 1250 p/reel
RTE 02 00 N 05	Without	Flush, Screwdriver slot	THT	Single pole	Ag	120°	CU36M20005FP	In tube
RTE 02 00 N 04	Without	Flush, Screwdriver slot	THT	Single pole	Au	120°	CU36M20005FP	In tube
RTE 02 10 N 05	With	Flush, Screwdriver slot	THT	Single pole	Ag	120°	CU36M20005FP	In tube
RTE 02 10 N 04	With	Flush, Screwdriver slot	THT	Single pole	Au	120°	CU36M20005FP	In tube
RTE 02 01 N 05	Without	Extended shaft	THT	Single pole	Ag	120°	CU36M21003FP	In tube
RTE 02 01 N 04	Without	Extended shaft	THT	Single pole	Au	120°	CU36M21003FP	In tube
RTE 02 11 N 05	With	Extended shaft	THT	Single pole	Ag	120°	CU36M21003FP	In tube
RTE 02 11 N 04	With	Extended shaft	THT	Single pole	Au	120°	CU36M21003FP	In tube
RTE 02 02 N 05	Without	Shaft for button	THT	Single pole	Ag	120°	CU36M22003FP	In tube
RTE 02 02 N 04	Without	Shaft for button	THT	Single pole	Au	120°	CU36M22003FP	In tube
RTE 02 12 N 05	With	Shaft for button	THT	Single pole	Ag	120°	CU36M22003FP	In tube
RTE 02 12 N 04	With	Shaft for button	THT	Single pole	Au	120°	CU36M22003FP	In tube
RTE 02 00 R 05	Without	Flush, Screwdriver slot	Reverse THT	Single pole	Ag	120°	CU36M20103FP	In tube
RTE 02 00 R 04	Without	Flush, Screwdriver slot	Reverse THT	Single pole	Au	120°	CU36M20103FP	In tube
RTE 02 10 R 05	With	Flush, Screwdriver slot	Reverse THT	Single pole	Ag	120°	CU36M20103FP	In tube
RTE 02 10 R 04	With	Flush, Screwdriver slot	Reverse THT	Single pole	Au	120°	CU36M20103FP	In tube
RTE 02 01 R 05	Without	Extended shaft	Reverse THT	Single pole	Ag	120°	CU36M21102FP	In tube
RTE 02 01 R 04	Without	Extended shaft	Reverse THT	Single pole	Au	120°	CU36M21102FP	In tube
RTE 02 11 R 05	With	Extended shaft	Reverse THT	Single pole	Ag	120°	CU36M21102FP	In tube



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RTE 02-03

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RTE 02 11 R 04	With	Extended shaft	Reverse THT	Single pole	Au	120°	CU36M21102FP	In tube
RTE 02 12 R 05	With	Shaft for button	Reverse THT	Single pole	Ag	120°	CU36M22004FP	In tube
RTE 02 12 R 04	With	Shaft for button	Reverse THT	Single pole	Au	120°	CU36M22004FP	In tube
RTE 03								
RTE 03 00 G 05	Without	Flush, Screwdriver slot	SMT	Single pole	Ag	60°	CU36M20403FP	In reel - 1250 p/reel
RTE 03 00 G 04	Without	Flush, Screwdriver slot	SMT	Single pole	Au	60°	CU36M20403FP	In reel - 1250 p/reel
RTE 03 02 G 04	Without	Shaft for button	SMT	Single pole	Au	60°	CU36M22403FP	In reel - 750 p/reel
RTE 03 00 N 05	Without	Flush, Screwdriver slot	THT	Single pole	Ag	60°	CU36M30005FP	In tube
RTE 03 00 N 04	Without	Flush, Screwdriver slot	THT	Single pole	Au	60°	CU36M30005FP	In tube
RTE 03 10 N 05	With	Flush, Screwdriver slot	THT	Single pole	Ag	60°	CU36M30005FP	In tube
RTE 03 10 N 04	With	Flush, Screwdriver slot	THT	Single pole	Au	60°	CU36M30005FP	In tube
RTE 03 01 N 05	Without	Extended shaft	THT	Single pole	Ag	60°	CU36M31003FP	In tube
RTE 03 01 N 04	Without	Extended shaft	THT	Single pole	Au	60°	CU36M31003FP	In tube
RTE 03 11 N 05	With	Extended shaft	THT	Single pole	Ag	60°	CU36M31003FP	In tube
RTE 03 11 N 04	With	Extended shaft	THT	Single pole	Au	60°	CU36M31003FP	In tube
RTE 03 02 N 05	Without	Shaft for button	THT	Single pole	Ag	60°	CU36M32003FP	In tube
RTE 03 02 N 04	Without	Shaft for button	THT	Single pole	Au	60°	CU36M32003FP	In tube
RTE 03 12 N 05	With	Shaft for button	THT	Single pole	Ag	60°	CU36M32003FP	In tube
RTE 03 12 N 04	With	Shaft for button	THT	Single pole	Au	60°	CU36M32003FP	In tube
RTE 03 00 R 05	Without	Flush, Screwdriver slot	Reverse THT	Single pole	Ag	60°	CU36M30103FP	In tube
RTE 03 00 R 04	Without	Flush, Screwdriver slot	Reverse THT	Single pole	Au	60°	CU36M30103FP	In tube
RTE 03 10 R 05	With	Flush, Screwdriver slot	Reverse THT	Single pole	Ag	60°	CU36M30103FP	In tube
RTE 03 10 R 04	With	Flush, Screwdriver slot	Reverse THT	Single pole	Au	60°	CU36M30103FP	In tube
RTE 03 01 R 05	Without	Extended shaft	Reverse THT	Single pole	Ag	60°	CU36M31102FP	In tube
RTE 03 01 R 04	Without	Extended shaft	Reverse THT	Single pole	Au	60°	CU36M31102FP	In tube



PRODUCT SPECIFICATION

June 2009

RTE 02-03

Issue 1

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RTE 03 11 R 05	With	Extended shaft	Reverse THT	Single pole	Ag	60°	CU36M31102FP	In tube
RTE 03 11 R 04	With	Extended shaft	Reverse THT	Single pole	Au	60°	CU36M31102FP	In tube
RTE 03 02 M 05	Without	Shaft for button	Manual	Single pole	Ag	60°	CU36M32302FP	In box
RTE 03 02 M 04	Without	Shaft for button	Manual	Single pole	Au	60°	CU36M32302FP	In box
RTE 03 02 M 04 in tube	Without	Shaft for button	Manual	Single pole	Au	60°	CU36M32302FP	In tube
RTE 03 00 G 07	Without	Flush, Screwdriver slot	SMT	Single pole	Au	60°	CU36B00403FP LFG	In reel - 1250 p/reel

Annex 3 : Qualification report

Please refer to following pages

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LABORATORY**QUALIFICATION REPORT**

Report N° : **043-09C** Date : **17-February-2009** Page : **1 / 27**

Product & Traceability

Family	Sub-Family	Designation	Date code	Quantity
RTE	RTE03	RTE 0300 G08		190

Test Subject

Complete qualification of RTE0300G08 with actuator molded with LUVICON plastic material (This plastic material can be used with the LF reflow processes)

Contents

§	Designation	Comments	page
1	Heading		
2	Approvals		
3	Product specification		
4	Qualification file		
5	Description & traceability of samples		
6	Abstract of results of measurements & tests		
7	Results summary		
8	Appendix 's		

General Conclusion

**See pages results.
Except the torque after life test, all results are satisfying**

Laboratory Technician	Laboratory Manager	Quality Director
C.COMBET	Daniel PEQUEGNOT	Jérôme BROCHOT



LABORATORY

QUALIFICATION REPORT : QUALIFICATION FILE for SWITCHES

Report N° : 043-09C

Date : 17-February-2009

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According to C&K Spec's (Product RTE & tests) and SCHNEIDER Electric GHE1011100 rev 05

Group #	Performed measurements or tests	Applicable measurements or tests	IEC STD	Applicable standards : This qualification file is established according to PROC-16 Ed 03. Severity	Test duration	Tests Sub-Groups																
						Total	3.1	4.1	5.1	5.2	5.3	5.4	5.5	5.7	6.1	6.2	6.3	6.7				
Total quantity of parts						190	20	20	20	20	20	20	20	20	20	5	20	0	5			
Samples # for each tests/measurements file						Duration	1	21	41	61	81	101	121	141	161	166	206					
0	0	INITIAL MEASUREMENTS	Visual Examination	X	2 days	180	20	20	20	20	20	20	20	20	20	20	5	20	0	5		
			Mechanical measurements	X																		
			Mechanical torque	X																		
			Electrical measurements	X																		
			Electrical coding	X																		
			Dielectric strength	X																		
			Contact resistance	X																		
			Insulation resistance between terminals :	X																		
Bounce time	X																					
1	1.1 1.2	SOLDERING	Without solder paste		2 days	60	20	20	20	20	20	20	20	20	20	20	5	20	0	5		
			With solder on PCB	X																		
2	2	MEASUREMENTS AFTER SOLDERING (2 Reflows lead free)	Visual Examination	X	2 days	160	20	20	20	20	20	20	20	20	20	20	20	5	20	0	5	
			Mechanical measurements	X																		
			Mechanical torque	X																		
			Electrical measurements	X																		
			Electrical coding	X																		
			Dielectric strength	X																		
			Contact resistance	X																		
			Insulation resistance between terminals :	X																		
Bounce time	X																					
3	3.1	LIFE MEASUREMENTS	Life test on PCB	X	1000 cycles	20	20															
4	4.1	VIBRATION	Sinusoidal Vibrations on PCB	X	60068-2-6	10		10														
			Mechanical shock on PCB	X	60068-2-27	10		10														
Climatic category : 55/100/83																						
5	5.1 5.2 5.3 5.4 5.5 5.6 5.7	ENVIRONMENTAL TESTS	Thermal Shocks	X	60068-2-14	8 days	20		20													
			Humidity storage (Continuous) on PCB	X	60068-2-78	4 days	20			20												
			Dry Heat storage	X	60068-2-2	4 days	20				20											
			Cold storage	X	60068-2-1	10 days	20					20										
			Humidity storage cyclic	X	60068-2-30	21 days	20						20									
			Corrosion test	X	60068-2-52	3 days	20										20					
			Solderability	X	60068-2-58	1 day	5															
6	6.1 6.2 6.7	ROBUSTNESS	Solder heat resistance	X	60068-2-58	1 day	20															
			Robustness of terminals	X	60068-2-21	5																
			each terminal should be tested : test Ub																			
7	7	MEASUREMENTS AFTER TESTS	Visual Examination	X	2 days	190	20	20	20	20	20	20	20	20	20	20	5	20	0	5		
			Mechanical measurements	X																		
			Electrical measurements	X																		
Cumulative Measurements or tests by sub-group X : Applicable measurement or test																						
						Destructive tests																



LABORATORY

QUALIFICATION REPORT

Report N° : 043-09C

Date : 17-February-2009

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Performed measurements or tests	Applicable measurements or tests	N° of tested parts	Accepted parts		Failed parts		Lab. report Page
			Qty	%	Qty	%	
INITIAL MEASUREMENTS							
Initial							
Mechanical torque	x	180	180	100	0	0	App 0.a Mech
Electrical measurements	x	180	180	100	0	0	App 0.a Elect
AFTER 2 LEAD FREE MEASUREMENTS							
After 2 lead free							
Mechanical torque	x	160	160	100	0	0	App 2.a Mech
Electrical measurements	x	160	160	100	0	0	App 2.a Elect
LIFE MEASUREMENTS							
Life test							
Mechanical torque	x	20	7	35	0	0	App 3.1 Mech
Electrical measurements	x	20	20	100	0	0	App 3.1.a Elect
ENVIRONNEMENTAL TESTS							
Vibration							
Mechanical torque	x	20	20	100	0	0	App 4.1 Mech
Electrical measurements	x	20	20	100	0	0	App 4.1.a Elect
Thermal shocks							
Mechanical torque	x	20	20	100	0	0	App 5.1 Mech
Electrical measurements	x	20	20	100	0	0	App 5.1.a Elect
Humidity storage continuous on PCB							
Mechanical torque	x	20	20	100	0	0	App 5.2 Mech
Electrical measurements	x	20	20	100	0	0	App 5.2.a Elect
Dry heat							
Mechanical torque	x	20	20	100	0	0	App 5.3 Mech
Electrical measurements	x	20	20	100	0	0	App 5.3.a Elect
Cold storage							
Mechanical torque	x	20	20	100	0	0	App 5.4 Mech
Electrical measurements	x	20	20	100	0	0	App 5.4.a Elect
Humidity storage cyclic							
Mechanical torque	x	20	20	100	0	0	App 5.5 Mech
Electrical measurements	x	20	20	100	0	0	App 5.5.a Elect
Corrosion test							
Mechanical torque	x	20	20	100	0	0	App 5.7 Mech
Electrical measurements	x	20	20	100	0	0	App 5.7.a Elect
ROBUSTNESS							
Solderability							
Pictures	x	5	5	100	0	0	App 6.1 pictures
Solder heat resistance							
Mechanical torque	x	20	20	100	0	0	App 6.2 Mech
Electrical measurements	x	20	20	100	0	0	App 6.2.a Elect
Robustness of terminals							
Pictures	x	5	5	100	0	0	App 6.7 rob of term

TEST GROUP :	o	TEST NAME :	o Initial measurement
MEASUREMENT	Mechanical characteristics		Initial
Tests /measurements conditions			
Temperat.	15 à 35 °C	Humidity	25 à 75 %
		Pressure	86 à 106 kPa



CW

CCW

Equipments			
Step of Flow	Processus	Measurement or test	Equipment
1	ENVIRONMENTAL	Torque	Somphy 40 à 600cm.cN

Sample	Torque (max) CW	Torque (max) CCW
1	270	180
2	280	185
3	270	200
4	270	180
5	260	200
6	265	195
7	270	205
8	280	190
9	270	200
10	270	200
11	280	195
12	270	200
13	280	190
14	270	200
15	280	190
16	260	200
17	280	205
18	265	200
19	260	200
20	265	190
21	260	200
22	280	200
23	280	190
24	280	230
25	270	210
26	290	200
27	260	180
28	280	200
29	290	200
30	280	180
31	290	210
32	290	200
33	280	190
34	290	220
35	290	205
36	280	180
37	260	210
38	280	205
39	270	220
40	290	205
41	270	210
42	280	210
43	270	205
44	290	200
45	290	200
46	270	200
47	270	205
48	270	200
49	280	200
50	260	195
51	260	210
52	260	200
53	270	210
54	260	210
55	270	210
56	290	205
57	270	205
58	280	205
59	260	200
60	290	230

Sample	Torque (max) CW	Torque (max) CCW
61	265	200
62	280	200
63	260	205
64	280	215
65	265	215
66	270	190
67	260	200
68	290	200
69	290	185
70	290	215
71	280	220
72	260	180
73	285	180
74	270	180
75	280	205
76	270	205
77	280	180
78	260	205
79	270	200
80	260	180
81	270	200
82	290	220
83	290	220
84	260	200
85	260	200
86	285	200
87	280	210
88	280	210
89	280	200
90	260	185
91	260	200
92	270	190
93	290	180
94	260	195
95	280	200
96	270	210
97	280	210
98	280	200
99	270	210
100	260	190
101	260	225
102	280	205
103	280	220
104	280	220
105	270	220
106	270	200
107	280	200
108	270	220
109	270	210
110	290	230
111	280	205
112	275	220
113	275	200
114	280	220
115	270	210
116	290	230
117	280	220
118	280	220
119	280	220
120	275	210

Sample	Torque (max) CW	Torque (max) CCW
121	260	220
122	280	220
123	260	200
124	260	220
125	280	210
126	280	220
127	270	200
128	280	200
129	290	210
130	290	210
131	290	210
132	290	240
133	280	220
134	270	200
135	270	200
136	280	210
137	270	200
138	290	200
139	290	240
140	270	210
141	280	200
142	280	215
143	275	200
144	280	215
145	280	220
146	260	180
147	275	220
148	260	200
149	280	200
150	290	205
151	290	215
152	280	185
153	270	210
154	265	200
155	260	210
156	265	200
157	280	215
158	280	205
159	270	205
160	280	205
166	280	190
167	270	200
168	270	220
169	260	215
170	260	200
171	280	210
172	280	205
173	290	205
174	280	220
175	280	220
176	280	210
177	290	220
178	290	220
179	285	205
180	250	200
181	285	220
182	270	175
183	280	200
184	260	180
185	260	175



LABORATORY

Report N° : 043-09C

QUALIFICATION REPORT

Date : 17-févr.-09

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TEST GROUP :	o	TEST NAME :	o Initial measurement
MEASUREMENT	Mechanical characteristics		Initial
Tests /measurements conditions			
Temperat.	15 à 35 °C	Humidit	25 à 75 %
		Pressure	86 à 106 kPa



CW

CCW

Equipments

Step of Flow	Processus	Measurement or test	Equipment
1	ENVIRONMENTAL	Torque	Somphy 40 à 600cm.cN

	Torque (max) CW	Torque (max) CCW
Max (spec)	300	300
Mini (spec)	75	75
max	290	240
mini	250	175
Average	275	204
Std dev	10,14	12,59
M.OK	180	180
% M.OK	100%	100%
M.N-OK	0	0
% M.N-OK	0%	0%

Tested parts	180	Number of non-conform parts	0	% of non-conform parts	0,0%
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TEST GROUP :	o	TEST NAME :	o initial measurement
MEASUREMENT	Electrical characteristics		After Initial
Tests /measurements conditions			
Temperat.	15 à 35 °C	Humidity	25 à 75 % Pressure 86 à 106 kPa

Equipments			
Step of Flow	Processus	Measurement or test	Equipment
1	MECHANICAL	Contact Resistance	SEFELEC RCN2
2	MECHANICAL	Codage	BOITE A LUMIERE
3	MECHANICAL	Dielectric Withstanding	SEFELEC DXS56
4	MECHANICAL	Insulation Resistance	SEFELEC DXS56
5	MECHANICAL	Bounces	LECROY Wave surfer 424 (200MHz)

Sample N°	Rc 1 mΩ	Rc 2 mΩ	Rc 3 mΩ	Codage	Voltage Proof C+C+1 / 2+3 at 500V	Voltage Proof C+C+2 / 1+3 at 500V	Ri (100V) between terminal C+C+1 / 2+3 GΩ	Ri (100V) between terminal C+C+2 / 1+3 GΩ	Bounces ms
1	16	16	16	Pass	Pass	Pass	> 1GΩ	> 1GΩ	0
2	16	15	15	Pass	Pass	Pass	> 1GΩ	> 1GΩ	0
3	15	15	15	Pass	Pass	Pass	> 1GΩ	> 1GΩ	0
4	15	15	14	Pass	Pass	Pass	> 1GΩ	> 1GΩ	0
5	15	15	15	Pass	Pass	Pass	> 1GΩ	> 1GΩ	0
6	16	16	16	Pass	Pass	Pass	> 1GΩ	> 1GΩ	0
7	16	15	15	Pass	Pass	Pass	> 1GΩ	> 1GΩ	0
8	16	16	15	Pass	Pass	Pass	> 1GΩ	> 1GΩ	0
9	16	16	15	Pass	Pass	Pass	> 1GΩ	> 1GΩ	0
10	15	15	14	Pass	Pass	Pass	> 1GΩ	> 1GΩ	0
11	17	15	14	Pass	Pass	Pass	> 1GΩ	> 1GΩ	0
12	15	15	14	Pass	Pass	Pass	> 1GΩ	> 1GΩ	0
13	15	16	15	Pass	Pass	Pass	> 1GΩ	> 1GΩ	0
14	15	16	15	Pass	Pass	Pass	> 1GΩ	> 1GΩ	0
15	16	16	16	Pass	Pass	Pass	> 1GΩ	> 1GΩ	0
16	15	15	15	Pass	Pass	Pass	> 1GΩ	> 1GΩ	0
17	16	15	14	Pass	Pass	Pass	> 1GΩ	> 1GΩ	0
18	16	16	15	Pass	Pass	Pass	> 1GΩ	> 1GΩ	0
19	15	15	13	Pass	Pass	Pass	> 1GΩ	> 1GΩ	0
20	16	16	15	Pass	Pass	Pass	> 1GΩ	> 1GΩ	0
21	15	16	16	Pass	Pass	Pass	> 1GΩ	> 1GΩ	0
22	17	17	16	Pass	Pass	Pass	> 1GΩ	> 1GΩ	0
23	15	15	16	Pass	Pass	Pass	> 1GΩ	> 1GΩ	0
24	15	16	16	Pass	Pass	Pass	> 1GΩ	> 1GΩ	0
25	15	16	16	Pass	Pass	Pass	> 1GΩ	> 1GΩ	0
26	15	15	16	Pass	Pass	Pass	> 1GΩ	> 1GΩ	0
27	14	16	16	Pass	Pass	Pass	> 1GΩ	> 1GΩ	0
28	14	16	16	Pass	Pass	Pass	> 1GΩ	> 1GΩ	0
29	15	16	16	Pass	Pass	Pass	> 1GΩ	> 1GΩ	0
30	15	14	15	Pass	Pass	Pass	> 1GΩ	> 1GΩ	0
31	16	16	15	Pass	Pass	Pass	> 1GΩ	> 1GΩ	0
32	15	16	16	Pass	Pass	Pass	> 1GΩ	> 1GΩ	0
33	15	16	16	Pass	Pass	Pass	> 1GΩ	> 1GΩ	0
34	15	16	17	Pass	Pass	Pass	> 1GΩ	> 1GΩ	0
35	15	16	15	Pass	Pass	Pass	> 1GΩ	> 1GΩ	0
36	15	16	16	Pass	Pass	Pass	> 1GΩ	> 1GΩ	0
37	15	16	16	Pass	Pass	Pass	> 1GΩ	> 1GΩ	0
38	15	16	16	Pass	Pass	Pass	> 1GΩ	> 1GΩ	0
39	15	16	15	Pass	Pass	Pass	> 1GΩ	> 1GΩ	0
40	16	17	16	Pass	Pass	Pass	> 1GΩ	> 1GΩ	0
41	15	15	15	Pass	Pass	Pass	> 1GΩ	> 1GΩ	0
42	15	16	15	Pass	Pass	Pass	> 1GΩ	> 1GΩ	0
43	15	16	15	Pass	Pass	Pass	> 1GΩ	> 1GΩ	0
44	15	15	15	Pass	Pass	Pass	> 1GΩ	> 1GΩ	0
45	16	16	16	Pass	Pass	Pass	> 1GΩ	> 1GΩ	0
46	16	16	15	Pass	Pass	Pass	> 1GΩ	> 1GΩ	0
47	15	16	15	Pass	Pass	Pass	> 1GΩ	> 1GΩ	0
48	15	16	15	Pass	Pass	Pass	> 1GΩ	> 1GΩ	0
49	16	16	16	Pass	Pass	Pass	> 1GΩ	> 1GΩ	0
50	17	16	15	Pass	Pass	Pass	> 1GΩ	> 1GΩ	0
51	14	16	15	Pass	Pass	Pass	> 1GΩ	> 1GΩ	0

TEST GROUP :	2	TEST NAME :	Measurement after soldering
MEASUREMENT	Mechanical characteristics		After soldering process
Tests / measurements conditions			
Temperat.	15 à 35 °C	Humidity	25 à 75 %
		Pressure	86 à 106 kPa



CW

CCW

Equipments			
Step of Flow	Processus	Measurement or test	Equipment
1	ENVIRONMENTAL	Torque	Somphy 40 à 600cm.cN

Sample	Torque (max) CW	Torque (max) CCW
1	200	140
2	195	160
3	195	165
4	200	150
5	200	140
6	195	140
7	190	145
8	185	145
9	200	160
10	190	145
11	200	160
12	185	140
13	200	130
14	185	140
15	200	150
16	180	140
17	185	150
18	185	155
19	190	135
20	190	140
21	190	145
22	210	150
23	200	125
24	200	160
25	205	150
26	200	125
27	190	150
28	200	120
29	195	140
30	200	120
31	205	145
32	210	125
33	200	120
34	200	160
35	200	160
36	180	110
37	180	155
38	200	150
39	210	160
40	195	145
41	195	140
42	190	160
43	200	170
44	185	130
45	180	120
46	185	150
47	185	160
48	180	155
49	190	130
50	185	120
51	190	120
52	195	145
53	180	155
54	180	160
55	195	155
56	190	150
57	195	140
58	200	160
59	185	140
60	190	160

Sample	Torque (max) CW	Torque (max) CCW
61	200	160
62	200	140
63	180	140
64	200	140
65	180	145
66	200	130
67	180	140
68	200	155
69	200	120
70	190	140
71	190	165
72	180	145
73	180	135
74	185	140
75	190	160
76	200	145
77	200	140
78	185	150
79	200	140
80	180	130
81	200	150
82	170	145
83	170	150
84	185	145
85	180	140
86	170	130
87	180	150
88	165	140
89	180	160
90	190	140
91	180	150
92	180	140
93	180	130
94	175	130
95	180	160
96	180	160
97	185	155
98	190	150
99	185	150
100	180	140
101	210	180
102	200	140
103	190	160
104	200	160
105	200	160
106	190	160
107	210	160
108	210	170
109	190	140
110	205	160
111	200	165
112	190	150
113	190	140
114	190	150
115	200	160
116	210	170
117	210	180
118	190	150
119	180	140
120	190	140

Sample	Torque (max) CW	Torque (max) CCW
121	200	160
122	210	180
123	190	180
124	200	180
125	200	160
126	205	160
127	200	170
128	190	180
129	200	180
130	210	170
131	190	180
132	205	180
133	200	180
134	185	165
135	180	160
136	190	160
137	180	160
138	200	120
139	190	165
140	190	160
141	170	130
142	180	155
143	175	130
144	190	160
145	180	150
146	170	125
147	185	140
148	180	150
149	195	130
150	200	140
151	190	160
152	180	120
153	190	140
154	195	140
155	180	145
156	195	130
157	185	150
158	190	145
159	185	145
160	190	155

TEST GROUP :	2	TEST NAME :	Measurement after soldering
MEASUREMENT		Mechanical characteristics	After soldering process
Tests /measurements conditions			
Temperat.	15 à 35 °C	Humidity	25 à 75 %
		Pressure	86 à 106 kPa



CW

CCW

Equipments			
Step of Flow	Processus	Measurement or test	Equipment
1	ENVIRONMENTAL	Torque	Somphy 40 à 600cm.cN

	Torque (max) CW	Torque (max) CCW
Max (spec)	300	300
Mini (spec)	75	75
max	210	180
mini	165	110
Average	191	149
Std dev	9,98	15,14
M.OK	160	160
% M.OK	100%	100%
M.N-OK	0	0
% M.N-OK	0%	0%

Tested parts	160	Number of non-conform parts	0	% of non-conform parts	0,0%
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Comments

M.OK : Number of conform Measurements
M.N-OK : Number of non conform Measurements

% M.OK : Percentage of conform Measurements
% M.N-OK : Percentage of non conform Measurements

TEST GROUP :	2	TEST NAME :	Measurement after soldering
MEASUREMENT	Electrical characteristics		After soldering process
Tests /measurements conditions			
Temperat.	15 à 35 °C	Humidity	25 à 75 %
		Pressure	86 à 106 kPa

Equipments			
Step of Flow	Processus	Measurement or test	Equipment
1	MECHANICAL	Contact Resistance	SEFELEC RCN2
2	MECHANICAL	Codage	BOITE A LUMIERE
3	MECHANICAL	Dielectric Withstanding	SEFELEC DXS56
4	MECHANICAL	Insulation Resistance	SEFELEC DXS56
5	MECHANICAL	Bounces	LECRY Wave surfer 424 (200MHz)

Sample N°	Rc 1 mΩ	Rc 2 mΩ	Rc 3 mΩ	Codage
1	25	20	20	Pass
2	20	22	20	Pass
3	21	22	20	Pass
4	23	26	21	Pass
5	25	25	24	Pass
6	21	23	21	Pass
7	22	22	21	Pass
8	21	24	20	Pass
9	21	24	24	Pass
10	19	21	21	Pass
11	25	22	22	Pass
12	20	21	21	Pass
13	20	21	23	Pass
14	20	23	22	Pass
15	28	24	23	Pass
16	21	23	22	Pass
17	20	24	21	Pass
18	25	23	21	Pass
19	23	22	21	Pass
20	20	21	20	Pass
21	21	21	22	Pass
22	22	23	22	Pass
23	20	20	21	Pass
24	20	22	21	Pass
25	20	21	20	Pass
26	20	20	19	Pass
27	20	22	22	Pass
28	19	21	20	Pass
29	22	22	22	Pass
30	23	21	21	Pass
31	18	22	21	Pass
32	23	21	21	Pass
33	20	21	22	Pass
34	21	22	21	Pass
35	19	21	20	Pass
36	21	21	21	Pass
37	21	20	21	Pass
38	21	22	22	Pass
39	20	22	21	Pass
40	21	23	21	Pass
41	17	19	18	Pass
42	17	18	17	Pass
43	17	18	16	Pass
44	17	17	17	Pass
45	18	18	16	Pass
46	16	16	15	Pass
47	16	18	17	Pass
48	16	17	16	Pass
49	15	16	16	Pass
50	17	17	17	Pass
51	16	17	16	Pass

Voltage Proof C+C+1 / 2+3 at 500V	Voltage Proof C+C+2 / 1+3 at 500V	Ri (100V) between terminal C+C+1 / 2+3 GΩ	Ri (100V) between terminal C+C+2 / 1+3 GΩ	Bounces ms
Pass	Pass	> 1GΩ	> 1GΩ	0
Pass	Pass	> 1GΩ	> 1GΩ	0
Pass	Pass	> 1GΩ	> 1GΩ	0
Pass	Pass	> 1GΩ	> 1GΩ	0
Pass	Pass	> 1GΩ	> 1GΩ	0
Pass	Pass	> 1GΩ	> 1GΩ	0
Pass	Pass	> 1GΩ	> 1GΩ	0
Pass	Pass	> 1GΩ	> 1GΩ	0
Pass	Pass	> 1GΩ	> 1GΩ	0
Pass	Pass	> 1GΩ	> 1GΩ	0
Pass	Pass	> 1GΩ	> 1GΩ	0
Pass	Pass	> 1GΩ	> 1GΩ	0
Pass	Pass	> 1GΩ	> 1GΩ	0
Pass	Pass	> 1GΩ	> 1GΩ	0
Pass	Pass	> 1GΩ	> 1GΩ	0
Pass	Pass	> 1GΩ	> 1GΩ	0
Pass	Pass	> 1GΩ	> 1GΩ	0
Pass	Pass	> 1GΩ	> 1GΩ	0
Pass	Pass	> 1GΩ	> 1GΩ	0
Pass	Pass	> 1GΩ	> 1GΩ	0
Pass	Pass	> 1GΩ	> 1GΩ	0
Pass	Pass	> 1GΩ	> 1GΩ	0
Pass	Pass	> 1GΩ	> 1GΩ	0
Pass	Pass	> 1GΩ	> 1GΩ	0
Pass	Pass	> 1GΩ	> 1GΩ	0
Pass	Pass	> 1GΩ	> 1GΩ	0
Pass	Pass	> 1GΩ	> 1GΩ	0
Pass	Pass	> 1GΩ	> 1GΩ	0
Pass	Pass	> 1GΩ	> 1GΩ	0
Pass	Pass	> 1GΩ	> 1GΩ	0
Pass	Pass	> 1GΩ	> 1GΩ	0
Pass	Pass	> 1GΩ	> 1GΩ	0
Pass	Pass	> 1GΩ	> 1GΩ	0
Pass	Pass	> 1GΩ	> 1GΩ	0
Pass	Pass	> 1GΩ	> 1GΩ	0
Pass	Pass	> 1GΩ	> 1GΩ	0
Pass	Pass	> 1GΩ	> 1GΩ	0
Pass	Pass	> 1GΩ	> 1GΩ	0
Pass	Pass	> 1GΩ	> 1GΩ	0
Pass	Pass	> 1GΩ	> 1GΩ	0
Pass	Pass	> 1GΩ	> 1GΩ	0
Pass	Pass	> 1GΩ	> 1GΩ	0
Pass	Pass	> 1GΩ	> 1GΩ	0
Pass	Pass	> 1GΩ	> 1GΩ	0
Pass	Pass	> 1GΩ	> 1GΩ	0

TEST GROUP :	2	TEST NAME :	Measurement after soldering	
MEASUREMENT	Electrical characteristics		After	soldering process
Tests /measurements conditions				
Temperat.	15 à 35 °C	Humidity	25 à 75 %	Pressure 86 à 106 kPa

Equipments				
Step of Flow	Processus	Measurement or test	Equipment	
1	MECHANICAL	Contact Resistance	SEFELEC RCN2	
2	MECHANICAL	Codage	BOITE A LUMIERE	
3	MECHANICAL	Dielectric Withstanding	SEFELEC DXS56	
4	MECHANICAL	Insulation Resistance	SEFELEC DXS56	
5	MECHANICAL	Bounces	LECRY Wave surfer 424 (200MHz)	

Sample	Rc 1	Rc 2	Rc 3	Codage
N°	mΩ	mΩ	mΩ	
52	17	19	18	Pass
53	15	16	16	Pass
54	17	19	19	Pass
55	16	16	16	Pass
56	18	17	18	Pass
57	17	16	15	Pass
58	15	17	16	Pass
59	16	18	16	Pass
60	17	19	17	Pass
61	19	21	23	Pass
62	19	22	21	Pass
63	23	20	19	Pass
64	20	20	20	Pass
65	23	21	21	Pass
66	22	22	20	Pass
67	19	21	21	Pass
68	21	22	22	Pass
69	20	21	19	Pass
70	19	22	20	Pass
71	21	20	20	Pass
72	19	21	21	Pass
73	19	21	21	Pass
74	20	22	19	Pass
75	21	22	19	Pass
76	21	22	21	Pass
77	20	21	20	Pass
78	20	21	21	Pass
79	22	23	21	Pass
80	21	22	21	Pass
81	16	18	16	Pass
82	16	17	15	Pass
83	19	20	17	Pass
84	15	18	19	Pass
85	18	19	16	Pass
86	17	18	17	Pass
87	17	18	17	Pass
88	19	18	17	Pass
89	17	19	16	Pass
90	18	18	16	Pass
91	21	17	16	Pass
92	16	18	17	Pass
93	16	18	17	Pass
94	17	17	16	Pass
95	16	18	17	Pass
96	16	18	16	Pass
97	16	19	17	Pass
98	16	17	16	Pass
99	17	19	17	Pass
100	16	17	16	Pass
101	17	16	15	Pass
102	19	18	16	Pass

Voltage Proof C+C+1/ 2+3	Voltage Proof C+C+2/ 1+3	Ri (100V) between terminal C+C+1/ 2+3	Ri (100V) between terminal C+C+2/ 1+3	Bounces
at 500V	at 500V	GΩ	GΩ	ms
Pass	Pass	> 1GΩ	> 1GΩ	0
Pass	Pass	> 1GΩ	> 1GΩ	0
Pass	Pass	> 1GΩ	> 1GΩ	0
Pass	Pass	> 1GΩ	> 1GΩ	0
Pass	Pass	> 1GΩ	> 1GΩ	0
Pass	Pass	> 1GΩ	> 1GΩ	0
Pass	Pass	> 1GΩ	> 1GΩ	0
Pass	Pass	> 1GΩ	> 1GΩ	0
Pass	Pass	> 1GΩ	> 1GΩ	0
Pass	Pass	> 1GΩ	> 1GΩ	0
Pass	Pass	> 1GΩ	> 1GΩ	0
Pass	Pass	> 1GΩ	> 1GΩ	0
Pass	Pass	> 1GΩ	> 1GΩ	0
Pass	Pass	> 1GΩ	> 1GΩ	0
Pass	Pass	> 1GΩ	> 1GΩ	0
Pass	Pass	> 1GΩ	> 1GΩ	0
Pass	Pass	> 1GΩ	> 1GΩ	0
Pass	Pass	> 1GΩ	> 1GΩ	0
Pass	Pass	> 1GΩ	> 1GΩ	0
Pass	Pass	> 1GΩ	> 1GΩ	0
Pass	Pass	> 1GΩ	> 1GΩ	0
Pass	Pass	> 1GΩ	> 1GΩ	0
Pass	Pass	> 1GΩ	> 1GΩ	0
Pass	Pass	> 1GΩ	> 1GΩ	0
Pass	Pass	> 1GΩ	> 1GΩ	0
Pass	Pass	> 1GΩ	> 1GΩ	0
Pass	Pass	> 1GΩ	> 1GΩ	0
Pass	Pass	> 1GΩ	> 1GΩ	0
Pass	Pass	> 1GΩ	> 1GΩ	0
Pass	Pass	> 1GΩ	> 1GΩ	0
Pass	Pass	> 1GΩ	> 1GΩ	0
Pass	Pass	> 1GΩ	> 1GΩ	0
Pass	Pass	> 1GΩ	> 1GΩ	0
Pass	Pass	> 1GΩ	> 1GΩ	0
Pass	Pass	> 1GΩ	> 1GΩ	0
Pass	Pass	> 1GΩ	> 1GΩ	0
Pass	Pass	> 1GΩ	> 1GΩ	0
Pass	Pass	> 1GΩ	> 1GΩ	0
Pass	Pass	> 1GΩ	> 1GΩ	0
Pass	Pass	> 1GΩ	> 1GΩ	0
Pass	Pass	> 1GΩ	> 1GΩ	0
Pass	Pass	> 1GΩ	> 1GΩ	0
Pass	Pass	> 1GΩ	> 1GΩ	0
Pass	Pass	> 1GΩ	> 1GΩ	0
Pass	Pass	> 1GΩ	> 1GΩ	0
Pass	Pass	> 1GΩ	> 1GΩ	0



LABORATORY

QUALIFICATION REPORT

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TEST GROUP :	2	TEST NAME :	Measurement after soldering
MEASUREMENT	Electrical characteristics		After soldering process
Tests /measurements conditions			
Temperat.	15 à 35 °C	Humidity	25 à 75 %
		Pressure	86 à 106 kPa

Equipments			
Step of Flow	Processus	Measurement or test	Equipment
1	MECHANICAL	Contact Resistance	SEFELEC RCN2
2	MECHANICAL	Codage	BOITE A LUMIERE
3	MECHANICAL	Dielectric Withstanding	SEFELEC DXS56
4	MECHANICAL	Insulation Resistance	SEFELEC DXS56
5	MECHANICAL	Bounces	LECRY Wave surfer 424 (200MHz)

Sample	Rc 1	Rc 2	Rc 3	Codage
N°	mΩ	mΩ	mΩ	
103	20	16	16	Pass
104	16	20	19	Pass
105	17	17	18	Pass
106	18	17	16	Pass
107	17	15	15	Pass
108	17	15	16	Pass
109	17	19	18	Pass
110	18	17	16	Pass
111	17	16	17	Pass
112	17	16	16	Pass
113	17	18	17	Pass
114	17	17	17	Pass
115	17	17	17	Pass
116	17	17	17	Pass
117	16	14	16	Pass
118	16	16	15	Pass
119	16	17	18	Pass
120	15	16	16	Pass
121	17	18	18	Pass
122	17	16	16	Pass
123	21	20	22	Pass
124	16	16	14	Pass
125	16	17	17	Pass
126	16	18	15	Pass
127	16	17	16	Pass
128	16	17	16	Pass
129	17	16	16	Pass
130	17	17	16	Pass
131	18	18	16	Pass
132	17	16	16	Pass
133	18	17	18	Pass
134	18	18	17	Pass
135	16	18	16	Pass
136	16	19	17	Pass
137	17	17	17	Pass
138	17	18	16	Pass
139	17	18	16	Pass
140	16	17	17	Pass
141	19	18	18	Pass
142	16	19	17	Pass
143	16	18	16	Pass
144	15	19	16	Pass
145	18	18	17	Pass
146	17	17	15	Pass
147	18	20	18	Pass
148	17	17	17	Pass
149	19	20	18	Pass
150	17	18	16	Pass
151	21	18	17	Pass
152	19	17	16	Pass
153	16	18	16	Pass

Voltage Proof C+C+1 / 2+3	Voltage Proof C+C+2 / 1+3	Ri (100V) between terminal C+C+1 / 2+3	Ri (100V) between terminal C+C+2 / 1+3	Bounces
at 500V	at 500V	GΩ	GΩ	ms
Pass	Pass	> 1GΩ	> 1GΩ	0
Pass	Pass	> 1GΩ	> 1GΩ	0
Pass	Pass	> 1GΩ	> 1GΩ	0
Pass	Pass	> 1GΩ	> 1GΩ	0
Pass	Pass	> 1GΩ	> 1GΩ	0
Pass	Pass	> 1GΩ	> 1GΩ	0
Pass	Pass	> 1GΩ	> 1GΩ	0
Pass	Pass	> 1GΩ	> 1GΩ	0
Pass	Pass	> 1GΩ	> 1GΩ	0
Pass	Pass	> 1GΩ	> 1GΩ	0
Pass	Pass	> 1GΩ	> 1GΩ	0
Pass	Pass	> 1GΩ	> 1GΩ	0
Pass	Pass	> 1GΩ	> 1GΩ	0
Pass	Pass	> 1GΩ	> 1GΩ	0
Pass	Pass	> 1GΩ	> 1GΩ	0
Pass	Pass	> 1GΩ	> 1GΩ	0
Pass	Pass	> 1GΩ	> 1GΩ	0
Pass	Pass	> 1GΩ	> 1GΩ	0
Pass	Pass	> 1GΩ	> 1GΩ	0
Pass	Pass	> 1GΩ	> 1GΩ	0
Pass	Pass	> 1GΩ	> 1GΩ	0
Pass	Pass	> 1GΩ	> 1GΩ	0
Pass	Pass	> 1GΩ	> 1GΩ	0
Pass	Pass	> 1GΩ	> 1GΩ	0
Pass	Pass	> 1GΩ	> 1GΩ	0
Pass	Pass	> 1GΩ	> 1GΩ	0
Pass	Pass	> 1GΩ	> 1GΩ	0
Pass	Pass	> 1GΩ	> 1GΩ	0
Pass	Pass	> 1GΩ	> 1GΩ	0
Pass	Pass	> 1GΩ	> 1GΩ	0
Pass	Pass	> 1GΩ	> 1GΩ	0
Pass	Pass	> 1GΩ	> 1GΩ	0
Pass	Pass	> 1GΩ	> 1GΩ	0
Pass	Pass	> 1GΩ	> 1GΩ	0
Pass	Pass	> 1GΩ	> 1GΩ	0
Pass	Pass	> 1GΩ	> 1GΩ	0
Pass	Pass	> 1GΩ	> 1GΩ	0
Pass	Pass	> 1GΩ	> 1GΩ	0
Pass	Pass	> 1GΩ	> 1GΩ	0
Pass	Pass	> 1GΩ	> 1GΩ	0
Pass	Pass	> 1GΩ	> 1GΩ	0
Pass	Pass	> 1GΩ	> 1GΩ	0

TEST GROUP :	2	TEST NAME :	Measurement after soldering
MEASUREMENT	Electrical characteristics	After	soldering process
Tests /measurements conditions			
Temperat.	15 à 35 °C	Humidity	25 à 75 %
Pressure	86 à 106 kPa		

Equipments			
Step of Flow	Processus	Measurement or test	Equipment
1	MECHANICAL	Contact Resistance	SEFELEC RCN2
2	MECHANICAL	Codage	BOITE A LUMIERE
3	MECHANICAL	Dielectric Withstanding	SEFELEC DXS56
4	MECHANICAL	Insulation Resistance	SEFELEC DXS56
5	MECHANICAL	Bounces	LECROY Wave surfer 424 (200MHz)

Sample	Rc 1	Rc 2	Rc 3	Codage
N°	mΩ	mΩ	mΩ	
154	15	16	15	Pass
155	16	16	16	Pass
156	15	16	15	Pass
157	17	18	17	Pass
158	16	18	17	Pass
159	18	17	16	Pass
160	17	17	16	Pass
Maxi	28	26	24	
Mini	15	14	14	
Average	18	19	18	Pass
Std dev	2,50	2,43	2,42	
Mini (SPEC)				Pass
Max (SPEC)	500	500	500	
Cp				
CpK	64,21	65,97	66,38	
M.OK	160	160	160	160
% M.OK	100%	100%	100%	100%
M.N-OK	0	0	0	0
% M.N-OK	0%	0%	0%	0%

Voltage Proof C+C+1 / 2+3	Voltage Proof C+C+2 / 1+3	Ri (100V) between terminal C+C+1 / 2+3	Ri (100V) between terminal C+C+2 / 1+3	Bounces
at 500V	at 500V	GΩ	GΩ	ms
Pass	Pass	> 1GΩ	> 1GΩ	0
Pass	Pass	> 1GΩ	> 1GΩ	0
Pass	Pass	> 1GΩ	> 1GΩ	0
Pass	Pass	> 1GΩ	> 1GΩ	0
Pass	Pass	> 1GΩ	> 1GΩ	0
Pass	Pass	> 1GΩ	> 1GΩ	0
Pass	Pass	> 1GΩ	> 1GΩ	0
Pass	Pass	> 1GΩ	> 1GΩ	0
				0
		> 1 GΩ	> 1 GΩ	0
Pass	Pass	Pass	Pass	0
				0,00
Pass	Pass	1,E+00	1,E+00	
160	160	160	160	160
100%	100%	100%	100%	100%
0	0	0	0	0
0%	0%	0%	0%	0%

Tested parts	160	Number of non-conform parts	0
		% of non-conform parts	0,0%

Comments

M.OK : Number of non conform Measurements
M.N-OK : Number of non conform Measurements

% M.OK : Percentage of non conform Measurements
% M.N-OK : Percentage of non conform Measurements

TEST GROUP :	3	TEST NAME :	L3,1 Life measurement		
MEASUREMENT	Mechanical characteristics		After	life test	
Tests /measurements conditions					
Temperat.	15 à 35 °C	Humidity	25 à 75 %	Pressure	86 à 106 kPa

TEST CHARACTERISTICS		
Applicable spec or norm		Applicable Lab Process #
Description of test #1	Life test 1500 indexing	Durée de vie des switches : EVALUATION DE LA FIABILITE PLabo21A

Equipments			
Step of Flow	Processus	Measurement or test	Equipment
1	ENVIRONMENTAL	SwitchLife	Banc RTE
2	MECHANICAL	Torque	Somphy 40 à 600cm.cN

in the 2 directions : CW & CCW



CW



CCW

Sample	Torque (max) CW	Torque (max) CCW
1	140	100
2	100	80
3	115	100
4	105	80
5	100	85
6	140	100
7	125	90
8	140	100
9	120	100
10	100	80
11	105	85
12	140	110
13	105	90
14	150	120
15	140	100
16	100	80
17	100	100
18	90	80
19	120	90
20	100	80

	Torque (max)	Torque (max) CCW
Max (spec)	300	300
Mini (spec)	75	75
max	150	120
mini	90	80
Average	117	93
Std dev	18,80	11,53
M.OK	20	20
% M.OK	100%	100%
M.N-OK	0	0
% M.N-OK	0%	0%

Tested parts	20	Number of non-conform parts	0	% of non-conform parts	0,0%
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Comments

M.OK : Number of conform Measurements

M.N-OK : Number of non conform Measurements

% M.OK : Percentage of conform Measurements

% M.N-OK : Percentage of non conform Measurements

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TEST GROUP :	4	TEST NAME :	4.1 sinusoidal vibrations & shocks
MEASUREMENT	Mechanical characteristics	After	Sinusoidal vibrations & shocks
Tests /measurements conditions			
Temperat.	15 à 35 °C	Humidity	25 à 75 %
		Pressure	86 à 106 kPa

in the 2 directions : CW & CCW



CW

CCW

Equipments			
Step of Flow	Processus	Measurement or test	Equipment
1	ENVIRONMENTAL	Sinusoidal vibrations & shocks	TIRA vib 5220
2	MECHANICAL	Torque	Somphy 40 à 600cm.cN

TEST CHARACTERISTICS		
Applicable spec or norm		Applicable Lab Process #
Description of test #1	Sinusoidal vibration	Laboratory procedure ref : PLAB-070 & PLAB-072

Sample	Torque (max) CW	Torque (max) CCW
21	180	150
22	220	150
23	190	110
24	200	160
25	200	160
26	200	120
27	180	145
28	200	120
29	200	145
30	195	120
31	210	160
32	200	120
33	200	120
34	200	165
35	210	165
36	195	110
37	185	155
38	210	160
39	200	160
40	210	155

	Torque (max)	Torque (max) CCW
Max (spec)	300	300
Mini (spec)	75	75
max	220	165
mini	180	110
Average	199	143
Std dev	10,17	20,03
M.OK	20	20
% M.OK	100%	100%
M.N-OK	0	0
% M.N-OK	0%	0%

Tested parts	20	Number of non-conform parts	0	% of non-conform parts	0,0%
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Comments

M.OK : Number of conform Measurements

% M.OK : Percentage of conform Measurements

M.N-OK : Number of non conform Measurements

% M.N-OK : Percentage of non conform Measurements

TEST GROUP :	5	TEST NAME :	5,1 Environnemental tests		
MEASUREMENT	Mechanical characteristics		After	Thermal shocks	
Tests /measurements conditions					
Temperat.	15 à 35 °C	Humidity	25 à 75 %	Pressure	86 à 106 kPa

Characteristics of thermal shocks			
Min. temperature	-55°C	Duration of storage (1 cycle)	1 hour
Max. temperature	125°C		
Transition time	<30 sec		
Number of cycles	200		

in the 2 directions : CW & CCW



CW

CCW

Equipments			
Step of Flow	Processus	Measurement or test	Equipment
1	ENVIRONMENTAL	THERMAL	Etuve E05 WEISS TS130
2	MECHANICAL	Torque	Somphy 40 à 600cm.cN

Sample	Torque (max) CW	Torque (max) CCW
41	180	155
42	190	160
43	200	155
44	190	145
45	185	130
46	205	160
47	200	155
48	205	180
49	200	130
50	190	120
51	200	145
52	200	140
53	205	160
54	200	145
55	205	160
56	200	150
57	200	140
58	205	140
59	195	155
60	210	160

	Torque (max)	Torque (max) CCW
Max (spec)	300	300
Mini (spec)	75	75
max	210	180
mini	180	120
Average	198	149
Std dev	7,66	13,70
M.OK	20	20
% M.OK	100%	100%
M.N-OK	0	0
% M.N-OK	0%	0%

Tested parts	20	Number of non-conform parts	0	% of non-conform parts	0,0%
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Comments

M.OK : Number of conform Measurements

% M.OK : Percentage of conform Measurements

M.N-OK : Number of non conform Measurements

% M.N-OK : Percentage of non conform Measurements

TEST GROUP :	5	TEST NAME :	5,2 Environmental tests		
MEASUREMENT	Mechanical characteristics		After	Humidity Storage (continuous) on PCB	
Tests /measurements conditions					
Temperat.	15 à 35 °C	Humidity	25 à 75 %	Pressure	86 à 106 kPa

Characteristics of cyclic humidity storage			
Storage temperature	40°C	Duration of storage	96 hours
% relative humidity	93%		
Recovery after storage	1 hour		

in the 2 directions : CW & CCW



Equipments			
Step of Flow	Processus	Measurement or test	Equipment
1	ENVIRONMENTAL		Etuve E05 WEISS TS130
2	MECHANICAL	Torque	Somphy 40 à 600cm.cN

Sample	Torque (max) CW	Torque (max) CCW
61	180	135
62	190	120
63	180	125
64	180	130
65	180	125
66	180	120
67	175	125
68	180	120
69	170	110
70	175	120
71	160	105
72	180	130
73	180	120
74	170	115
75	170	120
76	160	130
77	170	120
78	170	120
79	170	120
80	170	105

	Torque (max)	Torque (max) CCW
Max (spec)	300	300
Mini (spec)	75	75
max	190	135
mini	160	105
Average	175	121
Std dev	7,42	7,83
M.OK	20	20
% M.OK	100%	100%
M.N-OK	0	0
% M.N-OK	0%	0%

Tested parts	20	Number of non-conform parts	0	% of non-conform parts	0,0%
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Comments

M.OK : Number of conform Measurements
M.N-OK : Number of non conform Measurements

% M.OK : Percentage of conform Measurements
% M.N-OK : Percentage of non conform Measurements

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TEST GROUP :	5	TEST NAME :	5,3 Environmental test		
MEASUREMENT	Mechanical characteristics		After	Dry heat storage	
Tests /measurements conditions					
Temperat.	15 à 35 °C	Humidity	25 à 75 %	Pressure	86 à 106 kPa

Characteristics of Dry heat storage			
Storage temperature	100°C	Duration of storage	4 days
Recovery after storage	0 hour		

in the 2 directions : CW & CCW



CW

CCW

Equipments			
Step of Flow	Processus	Measurement or test	Equipment
1	ENVIRONMENTAL	DRY HEAT	Etuve Eo6 HERAEUS
2	MECHANICAL	Torque	Somphy 40 à 600cm.cN

TEST CHARACTERISTICS			
Applicable spec or norm		Applicable Lab Process #	
Description of test #1	Dry heat storage	Laboratory procedure ref : PLAB-031	

Sample	Torque (max) CW	Torque (max) CCW
81	180	150
82	160	150
83	160	145
84	180	140
85	180	140
86	160	130
87	165	140
88	165	140
89	175	145
90	170	120
91	165	140
92	180	130
93	185	130
94	170	135
95	180	150
96	180	155
97	185	140
98	175	145
99	180	140
100	165	140

	Torque (max)	Torque (max) CCW
Max (spec)	300	300
Mini (spec)	75	75
max	185	155
mini	160	120
Average	173	140
Std dev	8,65	8,35
M.OK	20	20
% M.OK	100%	100%
M.N-OK	0	0
% M.N-OK	0%	0%

Tested parts	20	Number of non-conform parts	0	% of non-conform parts	0,0%
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Comments

M.OK : Number of conform Measurements
M.N-OK : Number of non conform Measurements

% M.OK : Percentage of conform Measurements
% M.N-OK : Percentage of non conform Measurements

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TEST GROUP :	5	TEST NAME :	5,4 Environnemental test		
MEASUREMENT	Mechanical characteristics		After	Cold storage	
Tests /measurements conditions					
Temperat.	15 à 35 °C	Humidity	25 à 75 %	Pressure	86 à 106 kPa

Characteristics of Cold storage			
Storage temperature	-55°C	Duration of storage	10 DAYS
Recovery after storage	1 hour		

in the 2 directions : CW & CCW



CW

CCW

Equipments			
Step of Flow	Processus	Measurement or test	Equipment
1	ENVIRONMENTAL	COLD STORAGE	Etuve E05 WEISS TS130
2	MECHANICAL	Torque	Somphy 40 à 600cm.cN

TEST CHARACTERISTICS			
Applicable spec or norm		Applicable Lab Process #	
Description of test #1	Cold storage	Laboratory procedure ref :	PLAB-034

Sample	Torque (max) CW	Torque (max) CCW
101	205	160
102	200	140
103	200	155
104	220	140
105	220	160
106	200	155
107	210	160
108	215	185
109	200	140
110	220	160
111	200	160
112	200	160
113	210	140
114	200	150
115	205	160
116	220	180
117	215	180
118	205	160
119	210	140
120	200	140

	Torque (max)	Torque (max) CCW
Max (spec)	300	300
Mini (spec)	75	75
max	220	185
mini	200	140
Average	208	156
Std dev	8,03	13,94
M.OK	20	20
% M.OK	100%	100%
M.N-OK	0	0
% M.N-OK	0%	0%

Tested parts	20	Number of non-conform parts	0	% of non-conform parts	0,0%
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Comments

M.OK : Number of conform Measurements
M.N-OK : Number of non conform Measurements

% M.OK : Percentage of conform Measurements
% M.N-OK : Percentage of non conform Measurements

TEST GROUP :	5	TEST NAME :	5,5 Environnemental test		
MEASUREMENT	Mechanical characteristics		After	Humidity storage cyclic	
Tests /measurements conditions					
Temperat.	15 à 35 °C	Humidity	25 à 75 %	Pressure	86 à 106 kPa

Characteristics of cyclic humidity storage

Storage temperature	55°C	Duration	21 days
% relative humidity	93%		

in the 2 directions : CW & CCW



CW

CCW

Equipments

Step of Flow	Processus	Measurement or test	Equipment
1	ENVIRONMENTAL	COLD STORAGE	Etuve E05 WEISS TS130
2	MECHANICAL	Torque	Somphy 40 à 600cm.cN

Sample	Torque (max) CW	Torque (max) CCW
121	160	120
122	170	125
123	160	110
124	180	120
125	165	120
126	170	120
127	150	110
128	170	120
129	180	130
130	170	125
131	165	120
132	165	140
133	155	130
134	160	120
135	160	110
136	170	120
137	160	120
138	160	110
139	180	130
140	150	105

	Torque (max)	Torque (max) CCW
Max (spec)	300	300
Mini (spec)	75	75
max	180	140
mini	150	105
Average	165	120
Std dev	8,89	8,50
M.OK	20	20
% M.OK	100%	100%
M.N-OK	0	0
% M.N-OK	0%	0%

Tested parts	20	Number of non-conform parts	0	% of non-conform parts	0,0%
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Comments

M.OK : Number of conform Measurements

% M.OK : Percentage of conform Measurements

M.N-OK : Number of non conform Measurements

% M.N-OK : Percentage of non conform Measurements



TEST GROUP :	5	TEST NAME :	5,7 Enviromental test		
MEASUREMENT	Mechanical characteristics	After	Corrosion test (Salt spray cyclic)		
Tests /measurements conditions					
Temperat.	15 à 35 °C	Humidity	25 à 75 %	Pressure	86 à 106 kPa

in the 2 directions : CW & CCW



Equipments

Step of Flow	Processus	Measurement or test	Equipment
1	ENVIRONMENTAL	Humidity 22h (x3)	Etuve E02 WEISS TS180
2	ENVIRONMENTAL	Salt mist 2h (x3)	Etuve E10
3	MECHANICAL	Torque	Somphy 40 à 600cm.cN

Sample	Torque (max) CW	Torque (max) CCW
141	155	110
142	145	120
143	145	105
144	150	110
145	160	110
146	140	105
147	150	110
148	140	120
149	160	105
150	160	105
151	155	130
152	150	100
153	160	105
154	160	110
155	145	105
156	160	100
157	165	115
158	150	110
159	155	105
160	150	110

	Torque (max)	Torque (max) CCW
Max (spec)	300	300
Mini (spec)	75	75
max	165	130
mini	140	100
Average	153	110
Std dev	7,34	7,24
M.OK	20	20
% M.OK	100%	100%
M.N-OK	0	0
% M.N-OK	0%	0%

Tested parts	20	Number of non-conform parts	0	% of non-conform parts	0,0%
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Comments

M.OK : Number of conform Measurements

% M.OK : Percentage of conform Measurements

M.N-OK : Number of non conform Measurements

% M.N-OK : Percentage of non conform Measurements



LABORATORY

Report N° :

043-09C

QUALIFICATION REPORT

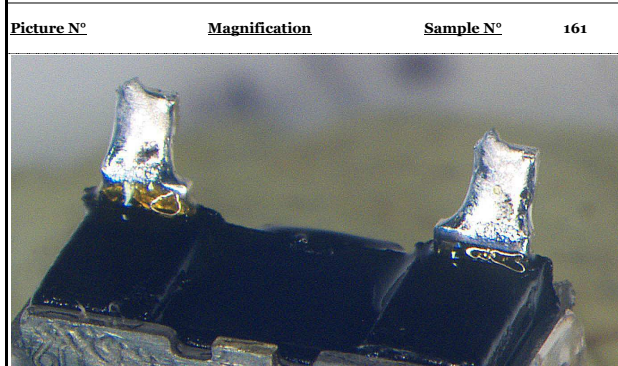
Date :

17-févr.-09

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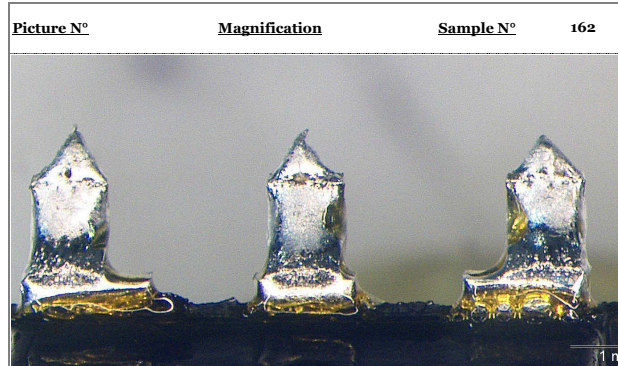
TEST GROUP :	6	TEST NAME :	6,10 Robustness		
MEASUREMENT	Visual inspection	After	Solderability		
Tests /measurements conditions					
Temperat.	15 à 35 °C	Humidity	25 à 75 %	Pressure	86 à 106 kPa



Title :

Comment :

OK



Title :

Comment :

OK

Conclusion :

Satisfying results.

TEST GROUP :	6	TEST NAME :	6,2 Robustness		
MEASUREMENT	Mechanical characteristics		After	Solder heat resistance (3 cycles)	
Tests /measurements conditions					
Temperat.	15 à 35 °C	Humidity	25 à 75 %	Pressure	86 à 106 kPa

Characteristics of test

hoven cycle :

RFW006. solder heat resistance

in the 2 directions : CW & CCW



CW



CCW

Equipments

Step of Flow	Processus	Measurement or test	Equipment
1	MECHANICAL	Torque	Somphy 40 à 600cm.cN

Sample	Torque (max) CW	Torque (max) CCW
166	200	140
167	195	140
168	180	150
169	195	160
170	180	150
171	200	150
172	200	160
173	200	155
174	205	165
175	200	170
176	205	160
177	195	160
178	200	160
179	200	155
180	185	150
181	200	155
182	180	130
183	185	140
184	180	140
185	190	130

	Torque (max)	Torque (max) CCW
Max (spec)	300	300
Mini (spec)	75	75
max	205	170
mini	180	130
Average	194	151
Std dev	8,87	11,19
M.OK	20	20
% M.OK	100%	100%
M.N-OK	0	0
% M.N-OK	0%	0%

Tested parts	20	Number of non-conform parts	0	% of non-conform parts	0,0%
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Comments

M.OK : Number of conform Measurements

% M.OK : Percentage of conform Measurements

M.N-OK : Number of non conform Measurements

% M.N-OK : Percentage of non conform Measurements



LABORATORY

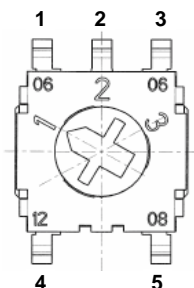
QUALIFICATION REPORT

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Date : 17-févr.-09

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TEST GROUP :	6	TEST NAME :	6,7 Robustness		
MEASUREMENT	Mechanical characteristics	After	Robustness of terminals		
Tests /measurements conditions					
Temperat.	15 à 35 °C	Humidity	25 à 75 %	Pressure	86 à 106 kPa



Sample	Torque (max) CW	Torque (max) CCW
206	280	185
207	280	200
208	290	205
209	275	200
210	270	215

Sample	Nombre de pliages avant casse				
	Patte 1	Patte 2	Patte 3	Patte 4	Patte 5
206	6	7	6	5	8
207	5	5	6	6	7
208	5	7	5	6	7
209	5	7	5	5	7
210	6	7	5	6	7
Maxi	6	7	6	6	8
Mini	5	5	5	5	7
Average	5,40	6,60	5,40	5,60	7,20
Std dev	0,5	0,9	0,5	0,5	0,4

Tested parts	5	Number of non-conform parts	0	% of non-conform parts	0,0%
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Comments

M.OK : Number of conform Measurements
M.N-OK : Number of non conform Measurements

% M.OK : Percentage of conform Measurements
% M.N-OK : Percentage of non conform Measurements