

**PRODUCT / PROCESS CHANGE NOTIFICATION**

**1. PCN basic data**

<b>1.1 Company</b>		STMicroelectronics International N.V
<b>1.2 PCN No.</b>	ADG/18/10695	
<b>1.3 Title of PCN</b>	Capacity Extension for DPAK Mixed Wire Products in Tong Fu Microelectronics	
<b>1.4 Product Category</b>	Power MOSFET	
<b>1.5 Issue date</b>	2018-02-01	

**2. PCN Team**

<b>2.1 Contact supplier</b>	
<b>2.1.1 Name</b>	ROBERTSON HEATHER
<b>2.1.2 Phone</b>	+1 8475853058
<b>2.1.3 Email</b>	heather.robertson@st.com
<b>2.2 Change responsibility</b>	
<b>2.2.1 Product Manager</b>	Riccardo NICOLOSO
<b>2.1.2 Marketing Manager</b>	Antonino PELLEGRINO
<b>2.1.3 Quality Manager</b>	Vincenzo MILITANO

**3. Change**

<b>3.1 Category</b>	<b>3.2 Type of change</b>	<b>3.3 Manufacturing Location</b>
Transfer	Line transfer for a full process or process brick (process step, control plan, recipes) from one site to another site: Assembly site (SOP 2617)	Tong Fu Microelectronics

**4. Description of change**

	<b>Old</b>	<b>New</b>
<b>4.1 Description</b>	DPAK Mixed Wire products manufactured in ST's Shenzhen Plant	DPAK Mixed Wire products manufactured also in Tong Fu MicroElectronics Subcon based in China
<b>4.2 Anticipated Impact on form,fit, function, quality, reliability or processability?</b>	No Impact in terms of electrical, physical and functional aspects	

**5. Reason / motivation for change**

<b>5.1 Motivation</b>	Capacity Extension and improvement in Flexibility to better manage the customer orders
<b>5.2 Customer Benefit</b>	CAPACITY INCREASE

**6. Marking of parts / traceability of change**

<b>6.1 Description</b>	by Q.A. number
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**7. Timing / schedule**

<b>7.1 Date of qualification results</b>	2018-01-23
<b>7.2 Intended start of delivery</b>	2018-04-02
<b>7.3 Qualification sample available?</b>	Upon Request

**8. Qualification / Validation**

<b>8.1 Description</b>	10695 PCN - Capacity Extension for DPAK Mixed Wire to Tong Fu Microelectronics.pdf		
<b>8.2 Qualification report and qualification results</b>	Available (see attachment)	<b>Issue Date</b>	2018-02-01

**9. Attachments (additional documentations)**

10695 Public product.pdf  
10695 PCN - Capacity Extension for DPAK Mixed Wire to Tong Fu Microelectronics.doc  
10695 PCN - Capacity Extension for DPAK Mixed Wire to Tong Fu Microelectronics.pdf

**10. Affected parts**

10. 1 Current		10.2 New (if applicable)
10.1.1 Customer Part No	10.1.2 Supplier Part No	10.1.2 Supplier Part No
	STD10P10F6	

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Automotive Discrete Group (ADG)  
Power Transistor Division

**Process Change Information**

**Capacity Extension for DPAK Mixed Wire Products in Tong Fu Microelectronics**

Dear Customer,

Following the continuous improvement of our service and in order to increase productivity, we are pleased to announce that some DPAK products using mixed wires as bonding solution, currently manufactured in our ST's Shenzhen back end will be also produced in one of our qualified back end subcontractors, Tong Fu Microelectronics based in China (TFME).

The parts produced in TFME guarantee the same quality and electrical characteristics as per current production.

In the next pages, we are reporting the qualification plan to reach full maturity.

The change has been classified as **Class 1** according to the ZVEI and ST internal rules.

Assessment of impact on Supply Chain regarding following aspects		Remaining risks on Supply Chain?	
- contractual agreements - technical interface of processability/manufacturability of customer - form, fit, function, quality performance, reliability			
ID	Type of change	No	Yes
<b>PROCESS - ASSEMBLY</b>			
SEM-PA-18	Move of all or part of assembly to a different location/site/subcontractor.	<b>P</b>	<b>P</b>

The qualification of the change will be completed according the qualification plan reported in the following pages.

Sincerely Yours!

## Capacity Extension for DPAK Mixed Wire Products to Tong Fu Microelectronics

<b>ST Part number:</b>	<p>ST PNs: <b>See List below</b></p> <ol style="list-style-type: none"> <li>1. <b>ELDO105F6</b></li> <li>2. <b>STD10P10F6</b></li> <li>3. <b>STD80N6F7</b></li> </ol> <p>Package: <b>DPAK</b></p>																																				
<b>Reason and background of the change</b>	To allow flexibility and increase Capacity																																				
<b>Detailed description of change(s), including affected type of changes</b>	DPAK products using mixed wires as bonding solution, currently manufactured in our ST's Shenzhen back end to be produced in one of our qualified back end subcontractors, Tong Fu Microelectronics based in China (TFME).																																				
<b>Impact on form, fit, function, or reliability.</b>	No Impact																																				
<b>Datasheet</b>	No Impact																																				
<b>Benefit of the change</b>	Capacity and flexibility increase.																																				
<b>Qualification Plan and Implementation date for change</b>	<p>The qualification will be completed according to the following plan:</p> <table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <thead> <tr style="background-color: #212121; color: white;"> <th>Test Vehicles</th> <th>N. of Lots</th> <th>Reliability Plan</th> <th>Parametric Verification</th> <th>Forecast (wk)</th> </tr> </thead> <tbody> <tr> <td>STD80N6F7</td> <td>2</td> <td>Complete</td> <td>X</td> <td>13</td> </tr> <tr> <td>STD10P10F6</td> <td>1</td> <td>Complete</td> <td>X</td> <td>13</td> </tr> </tbody> </table> <p><b><u>Reliability Plan</u></b></p> <table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <thead> <tr style="background-color: #e0e0e0;"> <th>Stress</th> <th>PC (*)</th> <th>Steps</th> </tr> </thead> <tbody> <tr> <td><b>HTRB</b></td> <td>N</td> <td>168, 500, 1000hrs</td> </tr> <tr> <td><b>HTGB</b></td> <td>N</td> <td>168, 500, 1000hrs</td> </tr> <tr> <td><b>TC</b></td> <td>Y</td> <td>100, 200, 500cy</td> </tr> <tr> <td><b>AC</b></td> <td>Y</td> <td>96H</td> </tr> <tr> <td><b>H3TRB</b></td> <td>Y</td> <td>168, 500, 1000hrs</td> </tr> <tr> <td><b>IOL</b></td> <td>Y</td> <td>8.6Kcy</td> </tr> </tbody> </table> <p><b>Note:</b> PC = Preconditioning</p> <p>Planned Implementation Date → wk 13/2018  Planned Shipment Date → wk 13/2018</p>	Test Vehicles	N. of Lots	Reliability Plan	Parametric Verification	Forecast (wk)	STD80N6F7	2	Complete	X	13	STD10P10F6	1	Complete	X	13	Stress	PC (*)	Steps	<b>HTRB</b>	N	168, 500, 1000hrs	<b>HTGB</b>	N	168, 500, 1000hrs	<b>TC</b>	Y	100, 200, 500cy	<b>AC</b>	Y	96H	<b>H3TRB</b>	Y	168, 500, 1000hrs	<b>IOL</b>	Y	8.6Kcy
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<b>Traceability Information</b>	By QA Number																																				

	Item	Current Production	Proposed Change
Gap Analysis	Leadframe	Dual Gauge	Single Gauge (*)
	Molding Compound	EME G620A	EME G620A
	Gate Wire	Cu – 2 mils	Cu – 2 mils
	Source Wire	Al – 10 mils	Al – 10 mils
	Die Attach	Pb/Sn/Ag (95,5/2/2,5)	Pb/Sn/Ag (95,5/2/2,5)

**Note:** no need to use Dual Gauge frame for the involved Products Die Sizes  
**Conclusion:** no critical GAP has been identified between the current and proposed solution

	ST Plant - Current	TFME - Proposed
Package Outline		

Footprint	<p style="text-align: center;"><b>No Change in FOOTPRINT</b></p>
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Here below the Dimensional comparison between:

- **ST Standard Frame, ST Large Frame:** both qualified for the involved products.
- **TFME Large Frame:** the one we are using to produce the products in the subcon.

DIM.	TYPE "A"			TYPE "A2"			TYPE "C2"		
	STD-ST			LARGE-ST			LARGE-TFME		
	mm			mm			mm		
	MIN	TYP	MAX	MIN	TYP	MAX	MIN	TYP	MAX
<b>A</b>	2.2		2.4	2.2		2.4	2.2	2.3	2.38
<b>A1</b>	0.9		1.1	0.9		1.1	0.9	1.01	1.1
<b>A2</b>	0.03		0.23	0.03		0.23	0		0.1
<b>b</b>	0.64		0.9	0.64		0.9	0.72		0.85
<b>b4</b>	5.2		5.4	5.2		5.4	5.13	5.33	5.46
<b>c</b>	0.45		0.6	0.45		0.6	0.47		0.6
<b>c2</b>	0.48		0.6	0.48		0.6	0.47		0.6
<b>D</b>	6		6.2	6		6.2	6	6.1	6.2
<b>D1</b>	4.95	5.1	5.25	4.95	5.1	5.25	5.1		5.6
<b>E</b>	6.4		6.6	6.4		6.6	6.5	6.6	6.7
<b>E1</b>	4.6	4.7	4.8	5.1	5.2	5.3	5.2		5.5
<b>e</b>	2.16	2.28	2.4	2.16	2.28	2.4	2.186	2.286	2.386
<b>e1</b>	4.4		4.6	4.4		4.6			
<b>H</b>	9.35		10.1	9.35		10.1	9.8	10.1	10.4
<b>L</b>	1		1.5	1		1.5	1.4	1.5	1.7
<b>(L1)</b>	2.6	2.8	3	2.6	2.8	3		2.9	
<b>L2</b>	0.65	0.8	0.95	0.65	0.8	0.95	0.9		1.25
<b>L3</b>								0.51	
<b>L4</b>	0.6		1	0.6		1	0.6	0.8	1
<b>L6</b>								1.80	
<b>∅ 1</b>							5°	7°	9°
<b>∅ 2</b>							5°	7°	9°
<b>R</b>		0.2			0.2				
<b>V2</b>	0°		8°	0°		8°	0°		8°

Dimensional  
Analysis