


**PRODUCT / PROCESS CHANGE NOTIFICATION**

**1. PCN basic data**

<b>1.1 Company</b>		STMicroelectronics International N.V
<b>1.2 PCN No.</b>	MDG/19/10333	
<b>1.3 Title of PCN</b>	TSMC (Taiwan) additional source for STM32F209 1MB & STM32F46 1MB products in M10/90nm technology	
<b>1.4 Product Category</b>	STM32F209 1MB & STM32F46 1MB in M10/90nm technology products	
<b>1.5 Issue date</b>	2019-03-19	

**2. PCN Team**

<b>2.1 Contact supplier</b>	
<b>2.1.1 Name</b>	KAR-LOK-ADRIAN CHIA
<b>2.1.2 Phone</b>	
<b>2.1.3 Email</b>	adrian.chia@st.com
<b>2.2 Change responsibility</b>	
<b>2.2.1 Product Manager</b>	Michel BUFFA
<b>2.1.2 Marketing Manager</b>	Veronique BARLATIER
<b>2.1.3 Quality Manager</b>	Pascal NARCHE

**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: Wafer fabrication	TSMC Fab14 (Taiwan)

**4. Description of change**

	<b>Old</b>	<b>New</b>
<b>4.1 Description</b>	Front-end sources: - ST Crolles CR300 (France) - ST Rousset R8 (France)	Front-end sources: - ST Crolles CR300 (France) - Existing source - ST Rousset R8 (France) - Existing source - TSMC Fab14 (Taiwan) - Additional source - There is no change in the product functionality.
<b>4.2 Anticipated Impact on form,fit, function, quality, reliability or processability?</b>	no change	

**5. Reason / motivation for change**

<b>5.1 Motivation</b>	Due to the success on the market of STM32 devices, ST Microcontrollers Division decided to qualify an additional front-end site to maintain state of the art service level to our customers thanks to extra capacity.
<b>5.2 Customer Benefit</b>	CAPACITY INCREASE

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

<b>6.1 Description</b>	Change is visible through diffusion traceability plant, in the marking: - "VG" for ST Rousset (France) - "VQ" for ST Crolles CR300 (France) - "9R" for TSMC Fab14 (Taiwan) Please refer to PCN 10333 – Additional information attached document.
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**7. Timing / schedule**

<b>7.1 Date of qualification results</b>	2018-03-02
<b>7.2 Intended start of delivery</b>	2018-03-02
<b>7.3 Qualification sample available?</b>	Not Applicable

8. Qualification / Validation			
<b>8.1 Description</b>	10333 MDG-MCD RER1715 PCN10333 TSMC Taiwan additional source for STM32 product....pptx		
<b>8.2 Qualification report and qualification results</b>	Available (see attachment)	<b>Issue Date</b>	2019-03-19

9. Attachments (additional documentations)
10333 Public product.pdf 10333 PCN10333_Division Note M10 Additional Source.pdf 10333 MDG-MCD RER1715 PCN10333 TSMC Taiwan additional source for STM32 product....pptx 10333 PCN10333_Additional information.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
	STM32F205REY6TR	
	STM32F205RGT6	
	STM32F205VBT6	
	STM32F205ZGT6	
	STM32F207IGT6	
	STM32F207VGT6	
	STM32F407VGT6	
	STM32F407ZET6	
	STM32F407ZGT6	
	STM32F415RGT6	
	STM32F415RGT6TR	
	STM32F207VCT6	

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## Public Products List

Public Products are off the shelf products. They are not dedicated to specific customers, they are available through ST Sales team, or Distributors, and visible on ST.com

**PCN Title :** TSMC (Taiwan) additional source for STM32F209 1MB & STM32F46 1MB products in M10/90nm technology

**PCN Reference :** MDG/19/10333

**Subject :** Public Products List

Dear Customer,

Please find below the Standard Public Products List impacted by the change.

STM32F207VCT7	STM32F205VGT6W	STM32F205VCT7TR
STM32F217IGT6	STM32F207IFH6TR	STM32F207IGT6U
STM32F405RGT6TR	STM32F205RCT6TR	STM32F405OYE6TR
STM32F407ZGT7	STM32F217VGT6	STM32F217VET6TR
STM32F207VCT6TR	STM32F207ZFT6	STM32F407VGT7
STM32F205RBT6TR	STM32F205RBT6	STM32F215RGT6
STM32F405RGT7TR	STM32F217VGT6TR	STM32F405VGT6J
STM32F217ZGT6	STM32F205VFT6TR	STM32F205VBT6
STM32F205VGT6V	STM32F405ZGT6V	STM32F207VGT6U
STM32F415RGT6	STM32F217IET6	STM32F405VGT6W
STM32F215RGT6TR	STM32F205VET6TR	STM32F207IGT7
STM32F205RET6	STM32F207ZET6	STM32F407IET6
STM32F205VFT6	STM32F417IGT6	STM32F205RGE6TR
STM32F417IET6	STM32F217VET6	STM32F205ZGT6W
STM32F207VGT6J	STM32F417ZGT6	STM32F205VCT7
STM32F205VGT6J	STM32F407IGH6	STM32F417IGH6TR
STM32F207IET6	STM32F407IEH6	STM32F207VFT6TR
STM32F205VET7	STM32F207VET6	STM32F205RGT7
STM32F415VGT6	STM32F205ZCT6TR	STM32F205VET6
STM32F205ZGT6J	STM32F407VET6	STM32F207VCT6
STM32F205RFT6	STM32F407IEH6TR	STM32F205RET6TR
STM32F215ZGT6	STM32F207ZCT7	STM32F415RGT6TR
STM32F205RGT6TR	STM32F207IGH6TR	STM32F407VGT6J
STM32F205ZCT6	STM32F407ZGT6J	STM32F407ZET6
STM32F207VET6TR	STM32F217ZET7	STM32F405ZGT6
STM32F207IFT6	STM32F205RCT6	STM32F407IGT7
STM32F205ZET7	STM32F407IGT6	STM32F405ZGT6J
STM32F407IGH6TR	STM32F207VGT6TR	STM32F207ZGT6J
STM32F407IEH7	STM32F217IGH6	STM32F417VGT6TR
STM32F417VET6	STM32F207VFT6	STM32F215ZGT7TR
STM32F207ICT6	STM32F215VGT6	STM32F217ZET6
STM32F207ZGT6	STM32F207ICH6	STM32F207ZGT6TR
STM32F215VGT7	STM32F207ZGT7	STM32F205VCT6
STM32F407IGH7	STM32F217IGH6U	STM32F205ZGT6TR
STM32F205VCT6TR	STM32F415ZGT6	STM32F207IEH6TR
STM32F407IGH6J	STM32F405VGT6TR	STM32F215VET6



## Public Products List

STM32F205VGT6	STM32F407VGT6	STM32F417IGT7
STM32F205VGT6TR	STM32F417VGT7	STM32F205RET7
STM32F417IGH6	STM32F215RET6	STM32F207VGT6
STM32F405RGT6W	STM32F205ZGT6	STM32F205RET7TR
STM32F407VET6TR	STM32F205VGT7	STM32F207IGH6U
STM32F205RGT6	STM32F207IGH7	STM32F405VGT6V
STM32F207IEH6	STM32F205RFT6TR	STM32F417VGT6
STM32F405RGT7	STM32F205VGT7TR	STM32F405ZGT7
STM32F405RGT6	STM32F217IGT7	STM32F415VGT6TR
STM32F207VGT7	STM32F407ZET7	STM32F207IGH6J
STM32F207ZCT6	STM32F205ZET6	STM32F205VET7TR
STM32F207IFH6	STM32F217IEH6	STM32F207IGT6
STM32F207ZCT7TR	STM32F215RET6TR	STM32F205RCT7
STM32F205ZET7TR	STM32F207ZGT6U	STM32F417ZET6
STM32F205RBT7	STM32F205ZCT7TR	STM32F205REY6TR
STM32F417IEH6	STM32F215ZGT7	STM32F405VGT7TR
STM32F405VGT7	STM32F405VGT6	STM32F407VGT6TR
STM32F215ZET6TR	STM32F405OGY6TR	STM32F215ZET6
STM32F207IGH6	STM32F205ZFT6	STM32F407ZGT6
STM32F415OGY6TR	STM32F207ZET6TR	STM32F205ZGT7
STM32F205ZCT7	STM32F205RGY6TR	STM32F407VGT7TR
STM32F205ZET6TR	STM32F407ZGT6TR	STM32F417VET6TR
STM32F205RGT6W	STM32F205RGT6V	STM32F417IGH6W
STM32F205ZGT6V	STM32F405OGY6VTR	STM32F405RGT6V
STM32F405ZGT6W	STM32F405OGY6WTR	



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**PRODUCT/PROCESS  
CHANGE NOTIFICATION  
PCN 10333 – Additional information**

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**TSMC (Taiwan) additional source  
for STM32F209 1MB & STM32F46 1MB products  
in M10/90nm technology**

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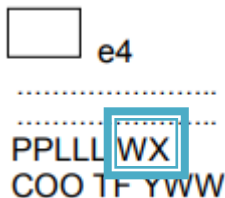
**MDG - Microcontrollers Division (MCD)**

**What are the changes?**

- Fab 14 TSMC is a fab already diffusing 90nm used for STM32L4 products.
- Masks are identical except few changes on dummy structures to adapt to fab equipment.
- Design database remains the same.

**How can the change be seen?**

The standard marking is:



**WX** code indicates the diffusion traceability plant code.

Please refer to the [DataSheet](#) for marking details.

The marking is changing as follows:

Existing		Additional	
WX code	Fab	WX code	Fab
VG	ST Rousset (France)	9R	TSMC Fab14 (Taiwan)
VQ	ST Crolles CR300 (France)	9R	TSMC Fab14 (Taiwan)



## MCU DIVISION NOTE – October 30<sup>th</sup>, 2017

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### M10/90nm Additional Front-end Source

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#### MMS - Microcontrollers Division (MCD)

Dear Customer,

We are in the process to transfer ST M10/90nm eNVM technology, currently used to produce our STM32F2x, STM32F4x and STM32F7x product to TSMC Fab 14 located in Taiwan. Fab14 is currently producing STM32L4x products.

Most of the STM32F2x, STM32F4x and STM32F7x volume production will be transferred to TSMC Fab 14.

This letter is a pre-announcement. Formal PCN will follow in coming weeks.

#### Why to add a source for M10 technology

- STM32F2x, STM32F4x and STM32F7x are experimenting a big success in the market and we are facing a growing and solid demand since months.
- Our two production sites ST Rousset R8 and ST Crolles CR300 fabs will not be able to absorb all future demand. Adding TSMC Fab14 as manufacturing source will provide the flexibility to cope with future demand and further growth.

#### Products involved

- STM32F2x
- STM32F4x
- STM32F7x

#### Timing:

- We intend to complete qualification of all part number by Q3 2018.
- First PCN announcing the first part number batch of transfer will be published mid-November 2017 for delivery starting in March 2018.
- ST will do its best to support customers during the short transition time.

Sincere regards.

Veronique Barlatier  
WW Commercial Marketing Manager  
ST Microcontroller Division





# RER1715 for PCN10333

## TSMC Taiwan Fab14 additional source for STM32 products in M10/90nm technology

### Reliability Evaluation Plan

Nov 8<sup>th</sup>, 2017

MMS MCD Quality & Reliability Department



# RER1715 TSMC Fab14 for STM32 products in M10/90nm technology

## STM32 Die Test Vehicles

Die Vehicle	Process Perimeter	Assembly Line	Package	Number of Reliability Lots
413	M10	ATP3	UFBGA10*10 176b	3 lots to qualify Process Perimeter Then 1 lot by Die
411		ATP3	UFBGA10*10 176b	
419		ATP3	TFBGA13*13 216b	
449		ATP3	TFBGA13*13 216b	
458	M10 ULP	JSCC	LQFP10*10 64L	3 lots to qualify Process Perimeter Then 1 lot by Die
423		ATP1	LQFP14*14 100L	
431		ATP1	LQFP14*14 100L	
441		ATP3	UFBGA10*10 144b	
433		ATP1	LQFP14*14 100L	
421		ATP1	LQFP14*14 100L	
452		ATP3	UFBGA10*10 176b	
463		ATP3	UFBGA10*10 144b	
434		ATP3	TFBGA13*13 216b	
451		ATP3	TFBGA13*13 216b	

# RER1715 TSMC Fab14 for STM32 products in M10/90nm technology

## STM32 Die Reliability Trials

Reliability Trial & Standard		Test Conditions	Pass Criteria	Lot Strategy	Units per Lot
ESD HBM	0060102 JESD22-A114ANSI/ESDA JEDEC JS-001	25°C	2kV (class 2)	1 to 3 lots	3
ESD CDM	ESD Charged Device Model ANSI/ESD STM5.3.1	Aligned with device datasheet	250V to 500V	1 lot	3
LU	0018695 JESD78	125°C REG-ON Configuration 125°C REG-OFF Configuration	No concern	1 to 3 lots	3 3
EDR + Bake	JESD22-A117 JESD22-A103	125°C & 3.6V Cycling 150°C Bake	10k cycles 1500h 1000h	1 to 3 lots 1 <sup>st</sup> lot 2 <sup>nd</sup> & 3 <sup>rd</sup> if any	77
EDR + Bake	JESD22-A117 JESD22-A103	25°C & 3.6V Cycling 150°C Bake	10k cycles 168h	1 to 3 lots	77
EDR + Bake	JESD22-A117 JESD22-A103	-40°C & 3.6V Cycling 150°C Bake	10k cycles 168h	1 to 3 lots	77
ELFR	MIL-STD-883 Method 1005 JESD22-A108 JESD74	125°C & 3.6V	48h	3 lots by process perimeter	500 units min per lot Total of 2000 units
HTOL	MIL-STD-883 Method 1005 JESD22-A108	125°C & 3.6V 100MHz	1200h 600h	1 <sup>st</sup> lot 2 <sup>nd</sup> & 3 <sup>rd</sup> if any	77

# RER1715 TSMC Fab14 for STM32 products in M10/90nm technology

## STM32 Package Test Vehicles

Package Line	Assembly Line	Package	Wire	Die Vehicle / Rawline (*)	Number of Reliability Lots
LQFP	ATP1	LQFP10*10 64L	Au	413 / 5W*413	3 lots to qualify M10 Technology Then 1 lot by Package Assembly Line
	JSCC	LQFP10*10 64L	Ag	413 / 5W*413	
	ATP1	LQFP14*14 100L	Au	431 / 1L*431	
	ATP1	LQFP20*20 144L	Au	413 / 1A*413	
	ASE	LQFP24*24 176L	Au	413 / 1T*413	
	ATP1	LQFP28*28 208L	Au	419 / UH*419	
QFN	JSCC	UQFN7*7 48L	Ag	458 / MI*458	
UFBGA	ATP3	UFBGA10*10 176b	Au	413 / MR*413	
TFBGA	ATP3	TFBGA8*8 100b	Au	449 / DY*449	
	ATP3	TFBGA13*13 216b	Au	419 / RM*419	
WLCSP	ATT1	WLCSP 36b	NA	458 / 8Q*458	
	ATT1	WLCSP 90b	NA	413 / RI*413	
	ATT1	WLCSP 143b	NA	419 / VH*419	
	ATT1	WLCSP 180b	NA	451 / 8Z*451	

# RER1715 TSMC Fab14 for STM32 products in M10/90nm technology

## STM32 Package Reliability Trials

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Reliability Trial & Standard		Test Conditions	Pass Criteria	Lot Strategy	Units per Lot
PC	Pre Conditioning: Moisture Sensitivity Jedec Level 3 J-STD-020/ JESD22-A113	Bake (125°C / 24h) Soak (30°C / 60% RH / 192h) for level 3 Convection reflow: 3 passes with Jedec level 3	3 Passes MSL3	1 to 3 lots	231 to 308 (**)
UHAST (*) (**)	Unbiased Highly Accelerated Temperature & Humidity Stress JESD22-A118	130°C, 85%RH, 2 Atm	96h	1 to 3 lots	77
TC (*)	Thermal Cycling JESD22-A104	-65°C +150°C	500Cy	1 to 3 lots	77
THB (*)	Temperature Humidity Bias JESD22-A101	85°C, 85% RH, bias	1000h	1 to 3 lots	77
HTSL (*)	High Temperature Storage Life JESD22-A103	150°C - no bias	1000h	1 to 3 lots	77
Construction Analysis	JESD22-B102	Including Solderability & Physical Dimensions	No concern	1 by package assembly line	15
	JESD22-B100/B108				10
ESD CDM	ESD Charged Device Model ANSI/ESD STM5.3.1	Aligned with device datasheet	250V to 500V	1 by package assembly line	3



(\*) Tests performed after preconditioning

(\*\*) UHAST not done for BGA

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