



# PRODUCT INFORMATION LETTER

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PIL MMS-MIC/12/7477  
Dated 11 Oct 2012

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**STM32F20x, STM32F21x Low Speed Oscillator consumption  
reduction      Product Information Letter 7220 update**

PIL MMS-MIC/12/7477 - Dated 11 Oct 2012

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| Sales Type/product family label  | STM32F20x, STM32F21x family products   |
| Type of change   | Product design change  |
| Reason for change  | Current consumption Reduction in VBAT mode   |
| Description  | Update of the Product Information Letter referenced "MMS-MIC/12/7220" in order to provide more exhaustive information on the changes from revY to revX of these devices. |
| Forecasted date of implementation  | 10-Oct-2012  |
| Forecasted date of samples for customer  | 10-Oct-2012  |
| Forecasted date for <b>STMicroelectronics</b> change Qualification Plan results availability | 10-Oct-2012  |
| Involved ST facilities   | ST Rousset diffusion plant   |

## DOCUMENT APPROVAL

| Name            | Function          |
|-----------------|-------------------|
| Colonna, Daniel | Marketing Manager |
| Delannoy, Alain | Process Owner     |
| Narche, Pascal  | Q.A. Manager      |



## PRODUCT INFORMATION LETTER

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### STM32F20x, STM32F21x Low Speed Oscillator consumption reduction Product Information Letter 7220 update

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#### MMS - Microcontrollers Division (MCD)

Dear Customer,

This letter is an update of the Product Information Letter referenced "MMS-MIC/12/7220" in order to provide more exhaustive information on the changes from revY to revX of these devices.

#### Adding informations:

RevY devices were presenting :

1/ a high consumption induced by a Low Speed Oscillator (32.678KHz Real Time Clock) higher transconductance (Gm) than targeted.

2/ a Gm higher than  $7\mu\text{A/V}$  instead of the usual target lower than  $3\mu\text{A/V}$  for such low power oscillators.

On revX devices,

1/ the power consumption of the Low Speed Oscillator has been improved from  $3\mu\text{A}$  to  $1\mu\text{A}$  in typical conditions ( $V_{DD}=3.3\text{Volts}$  and  $25\text{ C}$ )

2/ consequently the Gm has been reduced down to its initial target of  $2.8\mu\text{A/V}$ .

This allows a better current consumption in VBAT mode while keeping the Low Speed Oscillator and Real Time Clock active for low power applications.

During the validation of the STM32F4, we evidenced that the STM32 Flash Interface could be improved to operate up to 168MHz. As part of our cross fertilization activities, the same validation has been executed on the STM32F2 devices and the flash interface improvement were not evidenced as mandatory for STM32F2 120MHz operating frequency. Nevertheless, in line with our continuous improvement policy and by precautionary principle, the improved version of the Flash interface has been embedded into the revX of STM32F2. This change does not affect the form, the fit or the function of the device.

Notice that this PIL is now implemented as indicated in previous PIL 7220.

PIL 7220 already sent, still up to date :

We wish to inform you about an improvement related to the Low Speed Oscillator on STM32F20x and STM32F21x devices.

### **What is the change?**

On revX devices, the power consumption of the Low Speed Oscillator (32.678KHz Real Time Clock) has been reduced from 3 $\mu$ A to 1 $\mu$ A at typical conditions (VDD=3.3Volts and 25°C), thus providing better current consumption in VBAT mode while keeping the Low Speed Oscillator and Real Time Clock active for low power applications.

### **Why?**

The power consumption of the Low Speed Oscillator of the Real Time Clock is reduced by factor of 3 at typical conditions, which is perfect for low power applications.

### **When?**

The design improvement will be implemented week 18 2012.

### **How will the change be qualified?**

This change is already qualified using the standard STMicroelectronics Corporate Procedures for Quality and Reliability, in full compliancy with the JESD-47 international standard.

### **Qualification plan**

See Qualification plan attached at the end of this document.

### **What is the impact of the change?**

ST decreased the power consumption on VBAT from 3 $\mu$ A to 1 $\mu$ A (25°C and 3.3volts), while keeping the same functionality for the Low Speed Oscillator in terms of oscillations and all other features.

BEFORE:

**Table 21. Typical and maximum current consumptions in V<sub>BAT</sub> mode**

| Symbol               | Parameter                    | Conditions                                       | Typ                     |                         |                         |
|----------------------|------------------------------|--|-------------------------|-------------------------|-------------------------|
|                      |                              |  | T <sub>A</sub> = 25 °C  |                         |                         |
|                      |                              |  | V <sub>DD</sub> = 1.8 V | V <sub>DD</sub> = 2.4 V | V <sub>DD</sub> = 3.3 V |
| I <sub>DD_VBAT</sub> | Backup domain supply current | Backup SRAM ON, RTC ON                           | 3.2                     | 3.4                     | 3.7                     |
|                      |                              | Backup SRAM OFF, low-speed oscillator and RTC ON | 2.6                     | 2.7                     | 3.0                     |
|                      |                              | Backup SRAM ON, RTC OFF                          | 0.7                     | 0.7                     | 0.8                     |
|                      |                              | Backup SRAM OFF, RTC OFF                         | 0.1                     | 0.1                     | 0.1                     |

NOW:

| Symbol               | Parameter                    | Conditions                                       | Typ                      |                          |                          |
|----------------------|------------------------------|--|--------------------------|--------------------------|--------------------------|
|                      |                              |  | T <sub>A</sub> = 25 °C   |                          |                          |
|                      |                              |  | V <sub>BAT</sub> = 1.8 V | V <sub>BAT</sub> = 2.4 V | V <sub>BAT</sub> = 3.3 V |
| I <sub>DD_VBAT</sub> | Backup domain supply current | Backup SRAM ON, low-speed oscillator and RTC ON  | 1.29                     | 1.42                     | 1.68                     |
|                      |                              | Backup SRAM OFF, low-speed oscillator and RTC ON | 0.62                     | 0.73                     | 0.96                     |
|                      |                              | Backup SRAM ON, RTC OFF                          | 0.79                     | 0.81                     | 0.86                     |
|                      |                              | Backup SRAM OFF, RTC OFF                         | 0.10                     | 0.10                     | 0.10                     |

**How can the change be seen?**

Traceability of the change is ensured by ST internal tools.

- The new revision letter of the die is changed from "Y" to "X". The die revision is marked onto the package of the part.
- The Finish good identification is changed from 32F2xxxx\$4 to 32F2xxxx\$5. The Finish good identification is printed onto the labels of the inner box and outer box.

We remain available for any complementary information you may need concerning this change.

With our sincere regards.

Michel Buffa  
Microcontroller Division General Manager

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