PCN Number:	20161019000	PCN Date:	Oct. 24,2016
Title:	Important enhancements for CC1310 family of devices and Datasheet Updates		
Customer Contact:	PCN Manager	Dept:	Quality Services
Proposed 1st Ship Date:	Jan. 24, 2017	Estimated Sample Availability:	Date provided at sample request

Change Type:					
☐	Assembly Site	☒	Design	☐	Wafer Bump Site
☐	Assembly Process	☒	Data Sheet	☐	Wafer Bump Material
☐	Assembly Materials	☐	Part number change	☐	Wafer Bump Process
☐	Mechanical Specification	☐	Test Site	☐	Wafer Fab Site
☒	Packing/Shipping/Labeling	☐	Test Process	☐	Wafer Fab Materials
				☐	Wafer Fab Process

PCN Details

Description of Change:

With the introduction of CC1310 die Rev B Texas Instruments is announcing several important enhancements increasing the versatility and usability of all CC1310 part numbers going forward. This notification is to inform of minor design changes as well as software, tool chain and datasheet updates to select devices. Affected devices are listed in the Product Affected section of this document. The changes and updates are summarized as follows:

1) **Removed limitation on usage of on-chip 32 kHz RC oscillator**
   On die Rev B the built in 32 kHz RC oscillator (RCOSC_LF) can be used as the system low frequency oscillator to clock the RTC. The accuracy of the RTC when using this oscillator is within +/- 500 ppm when calibrated 1x per second. For radio networks that have more relaxed timing accuracy than the above, it is now possible to run the CC1310 die Rev B with only 1x crystal on the PCB (24 MHz).

2) **Removed limitation on frequency bands supported in CC1310**
   New frequency bands are supported for the CC1310 from die Rev B and onwards, starting with support for frequency bands in the 430-510 MHz range. This will allow customers to use the same device in a number of markets worldwide. Note that current die Rev A material will still be limited to 863-930 MHz only. SmartRF Studio 2.4.3 or later will detect die Rev A devices and issue an appropriate warning as to the applicable frequency range. Please remember to update SmartRF Studio accordingly.

3) **Removed limitation on Brown-out detector (BOD)**
   The brown-out detector (BOD) has been improved from die Rev A to die Rev B and the CC1310 datasheet restrictions regarding the BOD no longer apply. Restrictions do still apply for die Rev A material. More details regarding this item is found in section 6.7 – Power management in the CC1310 datasheet (SWRS181 update C, footnote 2).

4) **ESD correction**
   The ESD HBM and ESD CDM levels are corrected to ±3000V and ±500V respectively in the CC1310 datasheet. Note the following:

   - JEDEC document JEP155 states that 500-V HBM allows safe manufacturing with a standard ESD control process.
   - (2) JEDEC document JEP157 states that 250-V CDM allows safe manufacturing with a standard ESD control process.

5) DEVICE ID change

The DEVICE ID will be stepped between die Rev A (2B9BE02F) and die Rev B (3B9BE02F). The Device Identification Register, abbreviated TAPID and holding the DEVICE ID, is a register within the ICEPick status and control registers. This register is accessed via JTAG. Reading DEVICE ID can also be done in software, using the ICEPICK_DEVICE_ID or the USER_ID registers. Please refer to the CC13xx, CC26xx SimpleLink™ Wireless MCU Technical Reference Manual for details on these registers.

For FLASH-PROGRAMMER-2 version 1.7.2 or later no updates are required, while for earlier versions the software running on the tool must be updated. Else die Rev B will not be recognized. For the Uniflash Standalone Flash Tool die Rev B support is provided by using the application «Update»-feature. For third party Flash programmers please refer to the companies providing these flash programmers.

6) Mandatory Software update required

To maintain compatibility between die revisions it is mandatory that the software is updated to TI-RTOS version 2.16.01.14 or later. Please refer to the guidelines on the TI-RTOS web page for more details. Register settings supporting both die Rev A and die Rev B are generated using SmartRF Studio 2.4.3 or later.

Emphasis: Without applying the new software, correct operation of the CC1310 die Rev B device cannot be guaranteed!

For more info on the PCN please refer to the following Wiki:
http://processors.wiki.ti.com/index.php/CC1310_rev_B_PCN_information

7) Datasheet updates

The datasheet numbers will be changing:

	Current	**New**
Part Numbers	Datasheet Number	**Datasheet Number**
CC1310	SWRS181B	SWRS181C

The product datasheet is updated as seen in the change revision history below:

2 Revision History

NOTE: Page numbers for previous revisions may differ from page numbers in the current version.

Changes from October 28, 2015 to October 10, 2016	Page
• Added 32KB and 64KB to the *Features* bullet for in-system programmable flash	1
• Changed to the correct pin count in the *Features* bullet *RoHS-Compliant Package*	1
• Changed CC1310 Block Diagram	3
• Changed Figure 4-2, corrected typo in pin name	9
• Changed the table note in Absolute Maximum Ratings from: VDDS to: ground	14
• Changed ESD ratings for all pins in ESD Ratings	14
• Added OOK modulation power consumption to Section 5.4	15
• Added OOK modulation sensitivity to Section 5.6	16
• Added receive parameters for 431-MHz to 527-MHz band in Receive (RX) Parameters, 431 MHz to 527 MHz	17
• Added transmit parameters for 431-MHz to 527-MHz band in Transmit (TX) Parameters, 431 MHz to 527 MHz	19
• Changed ADC reference voltage to correct value in ADC Characteristics	21
• Added thermal characteristics for RHB and RSM packages	23
• Changed Figure 5-5 by extending the temperature	27
• Changed BOD restriction footnote in Table 6-2—restriction does not apply to die revision B and later	35
• Added Voltage Supply Domains	37
• Changed *Device Nomenclature* image	40

Reason for Change:

Adding support for the 32-kHz RC oscillator (RCOSC_LF), adding additional frequency bands, improving the Brown-out detector, correcting ESD performance, stepping the DEVICE ID, updating the CC1310 datasheet and the corresponding CC1310 Silicon Errata, software and toolchains with respective changes.

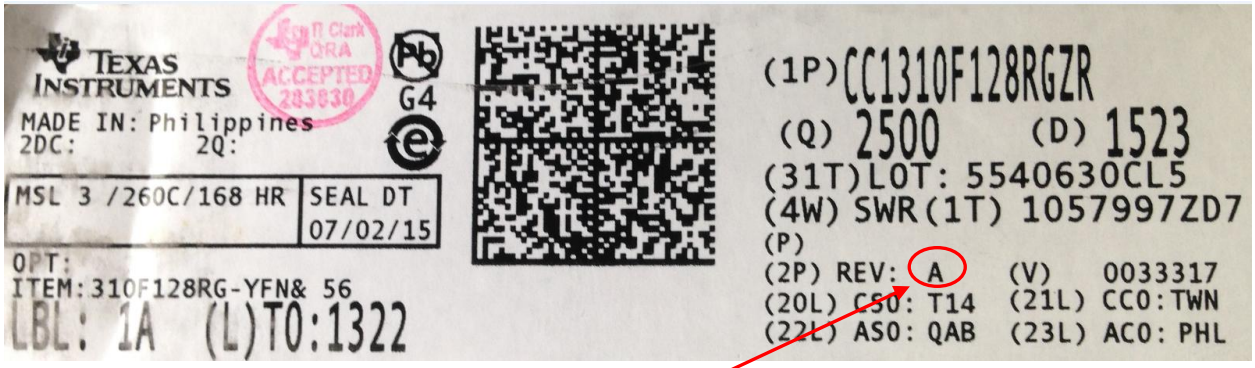
Anticipated impact on Form, Fit, Function, Quality or Reliability (positive / negative):

None

Changes to product identification resulting from this PCN:

CC1310 Die Revision		
(2P) REV:	Current: A	New: B

Sample product shipping label



The die revision is stated on the TI 2D shipping labels.

Product Affected:

CC1310F128RGZR	CC1310F64RGZR	CC1310F32RGZR	
CC1310F128RGZT	CC1310F64RGZT	CC1310F32RGZT	
CC1310F128RHBR	CC1310F64RHBR	CC1310F32RHBR	
CC1310F128RHBT	CC1310F64RHBT	CC1310F32RHBT	
CC1310F128RSMR	CC1310F64RSMR	CC1310F32RSMR	
CC1310F128RSMT	CC1310F64RSMT	CC1310F32RSMT	

Qualification Report

Product Attributes

Attributes	Qual Device: CC1350RGZ, RevB	Qual Device: CC1310RGZ, RevB	Qual Device: CC1310RHB, RevB	Qual Device: CC1310RSM, RevB
Qual ID	20151112-115928	20151112-115928	20151112-115928	20151112-115928
Assembly Site	CLARK	CLARK	CLARK	CLARK
Package Family	QFN 7 X 7 MM	QFN 7 X 7 MM	QFN 5x5 MM	QFN 4x4 MM
Wafer Fab Supplier	TSMC F14	TSMC F14	TSMC F14	TSMC F14
Wafer Fab Process	F021	F021	F021	F021

- QBS: Qual By Similarity
- Qual Device is qualified at LEVEL3-260CG

Qualification Results
Data Displayed as: Number of lots / Total sample size / Total failed

	Type	Test Name / Condition	Duration	Qual Device: CC1350RGZ, RevB	Qual Device: CC1310RGZ, RevB	Qual Device: CC1310RHB, RevB	Qual Device: CC1310RSM, RevB
	Qual ID			20151112-115928	20151112-115928	20151112-115928	20151112-115928
	CDM	ESD - CDM	500V & 750V (info)	1/3/0	QBS	QBS	QBS
	HBM	ESD - HBM	500, 1000V, 1500, 2000, 2500, 3000, 3500 (info), & 4000V (info)	1/3/0	QBS	QBS	QBS
	LU	Latchup	+/- 100 mA and 1.5 x Vmax @ 110C	1/3/0	QBS	QBS	QBS
	Char	Characterization	Per Datasheet	Pass	Pass	Pass	Pass

Quality and Environmental data is available at TI's external Web site: http://www.ti.com/

Green/Pb-free Status:
Qualified Pb-Free (SMT) and Green

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