CC2430/CC2431 Fxxx
Reliability Report

CONCLUSION
The CC2430/CC2431 Fxxx meets the Texas Instruments Norway's (former Chipcon) product reliability qualification standards based on the procedures and tests documented in the following.

Design phase
Design is made for robustness using extensive corner simulations for:
- Process variations
- Minimum/maximum operating temperature
- Minimum/maximum operating voltage
- Minimum/maximum process limitations

Process
The CC2430/CC2431 Fxxx is based on the Texas Instruments Norway SmartRF®-04 platform. It is designed in an industry standard 0.18μm mixed signal CMOS process with 1 poly layer, 4 metal layers and embedded flash.

Package reliability (QLP 48 - Pb free)

Test Type	Conditions/Duration	Pass/Fail
Autoclave	121°C, 240 Hrs	77/0
Temp Cycle	-65/+150°C, 1000 Cycles	77/0
High Temp Storage Bake	170C (420 Hrs)	77/0
X-ray	Top side only	10/0
Moisture Sensitivity	level 3 @ 260C peak +0/-5C	12/0

ESD and Latch-Up
Latch-up testing according to EIA/JESD-78, class I.
Minimum immunity level: ± 100mA at all pins. VDD absolute maximum rating x1.5 at all pins (note that some pins are 1.8v VDD tolerant only).

ESD test according to JEDEC STD 22, method A114, Human Body Model, with additional CDM testing. Die passes 1000V HBM, but fails at higher voltages, die passes 200V CDM but fails at higher voltages.

Transfer to Production
First Article Inspection (testing at –40/+25/+85°C)
Production test limits extraction based on statistical methods.
Accelerated lifetime test. MTBF[1] 3.2*10^7 hours, FIT[2] 31 based on 25°C usage temperature, 60% confidence level, 0.75eV activation energy, 125°C test temperature, 1070 hours test duration, 18 devices sample size, 0 failures.

Production test
100% Final test +25 °C
QA sampling +85 °C

[1] Mean Time Between Failures
[2] Failures-in-Time. The number of failures per 10^9 device hours

Tape & Reel specification

Package:	QLP 48 - Pb free
Tape Width:	16,0mm
Component Pitch:	12,0mm
Hole Pitch:	4,0mm

13 inch tape with 2500 pcs.
Carrier tape and reel is in accordance with EIA specification 481.

Solderability

Recommended soldering profile is according to IPC/JEDEC J-STD-020C July 2004

Summary

The above data show that CC2430/CC2431 Fxxx meets the Texas Instruments Norway's (former Chipcon) product reliability qualification standards and has an acceptable level of reliability.

Revision history

1.0 Initial version
2.0 Updated as part of RAMP Phase

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