CC2420
Reliability Report

CONCLUSION
The CC2420 meets the 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 CC2420 is based on the Chipcon SmartRF$^{®}$-03 platform. It is designed in an industry standard 0.18μm mixed signal CMOS process with 1 poly layer and 4 metal layers.

Package reliability (QLP-48 Pb free)
Moisture Sensitivity Level	JEDEC Level 3
Temp Cycling	-65/150°C, 1000 cycles
High Temp Storage Test	150°C, 1000 hrs.
Autoclave	121°C / 100% RH, 2 atm, 168 hrs

ESD and Latch-Up
Latch-up testing according to JEDEC 17.
Minimum immunity level: ± 100mA at all pins. VDD abs. max. rating + 20% at all supply pins.
ESD test according to Mil. Std. 883E 3015 Human Body Model.

Minimum immunity level non-RF pin groups: 1kV, except:

DI to VCO_GUARD	0.75kV	DI to DIO	0.75kV
DI to AVDD_PRE	0.75kV	VCO_GUARD to AVDD_RF2	0.75kV
DI to AVDD_RF2	0.5kV	VCO_GUARD to DVDD1.8	0.5kV
DI to AVDD_IF2	0.75kV	VCO_GUARD to DVDD_RAM	0.75kV
DI to AVDD_ADC	0.5kV	AVDD_VCC to DVDD_RAM	0.75kV
DI to DVDD3.3	0.5kV	AVDD_SW to DVDD_ADC	0.75kV
DI to DVDD1.8	0.75kV	AVDD_SW to AVDD_XOSC	0.75kV
DI to AVDD_XOSC	0.5kV	AVDD_RF2 to DVDD_RAM	0.75kV
DI to AVDD_CHP	0.5kV	AVDD_IF2 to DVDD1.8	0.75kV
DI to DGND	0.75kV	DVDD3.3 to AVDD_CHP	0.5kV
DI to DSUB_PADS	0.75kV	DVDD1.8 to AVDD_CHP	0.5kV
DI to DSUB_CORE	0.75kV	DVDD1.8 to DSUB_CORE	0.75kV
DIO to AVDD_CHP	0.5kV	DVDD1.8 to DVDD_RAM	0.75kV
AO&AI to DVDD1.8	0.5kV	AVDD_CHP to DVDD_RAM	0.5kV
AO&AI to DSUB_CORE	0.75kV	DI to DI	0.5kV

Minimum immunity level RF pin groups: 0.5kV, except:

RF_IO to VCO_GUARD	0.25kV	RF_IO to AVDD_IF1	0.25kV
RF_IO to AVDD_VCC	0.25kV	RF_IO to AVDD_CHP	0.25kV
RF_IO to AVDD_PRE	0.25kV	RF_IO to VCO_GND	0.1kV
RF_IO to AVDD_RF1	0.25kV	RF_IO to DSUB_PADS	0.25kV
RF_IO to TXRX_SWITCH	0.25kV	RF_IO to DSUB_CORE	0.1kV
RF_IO to AVDD_ADC	0.25kV	RF_IO to DVDD_RAM	0.25kV
RF_IO to DVDD_ADC	0.25kV	RF_IO to RF_IO	0.25kV

RF_IO to DVDD1.8	0.25kV	RF_IO to DIO	0.25kV

Transfer to Production

First Article Inspection (testing at –40/+25/+85°C)
Production test limits extraction based on statistical methods.
Accelerated lifetime test. Minimum expected lifetime (*): 10 years at 58°C,
1.4 years at 85°C, FIT of approx. 60 (at room temp) with 60% confidence level.
(*) based on test of 9 devices at 125°C and 1 device at 25°C for 1070 hours, 0 failures. Devices from lot W61665.07.

Production test

Final test +25°C
QA sampling (-40/+25/+85 °C)

Tape & Reel specification

Package: QLP 48 - Pb free
Tape Width: 16,0mm
Component Pitch: 12,0mm
Hole Pitch: 4,0mm
13inch tape with 4000 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 CC2420 meets the Chipcon product reliability qualification standards and has an acceptable level of reliability.

Revision history

1.0 Initial version
1.1 Fixed minor typing error
1.2 Removed information about field return

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