nPM1300
Engineering C

Errata

v1.1

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Contents

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1 nPM1300 Engineering C Errata

This Errata document contains anomalies and configurations for the nPM1300 chip, Engineering C (QEAA-BA0, CAAA-BA0, QEAA-BC0).

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2 Revision history

See the following list for an overview of changes from previous versions of this document.

Version	Date	Change
nPM1300 Engineering C v1.1	25.10.2023	• Added: No. 27. "Programming BUCK voltage increases current consumption" • Added: No. 28. "BUCK mode transition is outside of specification" • Added: No. 29. "Increased BUCK Hysteretic quiescent current" • Added: No. 30. "BUCK output voltage accuracy is outside specification" • Added: No. 32. "Reduced BUCK Hysteretic efficiency "
nPM1300 Engineering C v1.0	28.06.2023	• Added: No. 24. "Restart fails after reset with VBUS and VBAT connected" • Added: No. 26. "nPM1300 is not USB compliant "

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3 New and inherited anomalies

The following anomalies are present in Engineering C of the nPM1300 chip.

ID	Module	Description	New in Engineering C
24	BUCK, CONTROL	Restart fails after reset with VBUS and VBAT connected	X
26	SYSREG	nPM1300 is not USB compliant	X
27	BUCK	Programming BUCK voltage increases current consumption	X
28	BUCK	BUCK mode transition is outside of specification	X
29	BUCK	Increased BUCK Hysteretic quiescent current	X
30	BUCK	BUCK output voltage accuracy is outside specification	X
32	BUCK	Reduced BUCK Hysteretic efficiency	X

Table 1: New and inherited anomalies

3.1 [24] BUCK, CONTROL: Restart fails after reset with VBUS and VBAT connected

This anomaly applies to Engineering C, build codes QEAA-BA0, CAAA-BA0.

Symptoms

BUCKs fail to start, and the chip is unresponsive to TWI.

Conditions

VBAT and VBUS are present when reset occurs. Exiting ship and hibernation mode by attaching VBUS are both considered a reset.

Consequences

Outputs do not remain active.

Workaround

Connect LSIN2 and LSOUT2 to VSYS. Do not use load switch 2 for any other purpose.

3.2 [26] SYSREG: nPM1300 is not USB compliant

This anomaly applies to Engineering C, build codes QEAA-BA0, CAAA-BA0.

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Symptoms

VBUS current is higher than 100 mA before determination of source current capability.

Conditions

VBUS is attached.

Consequences

nPM1300 does not comply with USB 100 mA limit. IBUS will reach 500 mA.

Workaround

None.

3.3 [27] BUCK: Programming BUCK voltage increases current consumption

This anomaly applies to Engineering C, build codes QEAA-BA0, CAAA-BA0, QEAA-BC0.

Symptoms

Quiescent current of BUCK is higher than expected.

Conditions

Host software sets BUCK voltage for the first time after a power-up event, and the value is the same as the voltage already set by VSET resistor. This is done by setting BUCKnSWCTRLSEL to SWCTRL while BUCKnNORMVOUT and BUCKnVOUTSTATUS are equal.

Consequences

BUCK quiescent current increases by 1 mA.

Workaround

Host software must initially ensure BUCKnNORMVOUT and BUCKnVOUTSTATUS are not equal when BUCKnSWCTRLSEL is set. Host software can set BUCKnNORMVOUT equal to BUCKnVOUTSTATUS once an alternate BUCKnNORMVOUT has been set.

3.4 [28] BUCK: BUCK mode transition is outside of specification

This anomaly applies to Engineering C, build codes QEAA-BA0, CAAA-BA0, QEAA-BC0.

Symptoms

BUCK changes mode from Hysteretic to PWM or from PWM to hysteretic at a load current that deviates from typical specification. Increased output voltage ripple or increased quiescent current might be seen as a result of this.

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Conditions

BUCK is enabled in AUTO mode. When input voltage is above 4.2 V and output voltage is set below 1.4 V, PWM to Hysteretic transition level has an increased spread. For high input voltages and high output voltages, Hysteretic to PWM transition can happen at a lower load current than expected.

Consequences

When BUCK is in PWM instead of being in Hysteretic mode, BUCK quiescent current can increase by approximately 4 mA causing lower efficiency at light load currents. When BUCK is toggling between PWM and Hysteretic modes, increased output voltage ripple might be observed.

Workaround

Force hysteretic or PWM mode through TWI or through a configured GPIO from host software. Choose mode to maximize efficiency.

3.5 [29] BUCK: Increased BUCK Hysteretic quiescent current

This anomaly applies to Engineering C, build codes QEAA-BA0, CAAA-BA0, QEAA-BC0.

Symptoms

BUCK quiescent current increases during Hysteretic load currents below typically 5 mA.

Conditions

BUCK load current has decreased to below 5 mA while in Hysteretic mode.

Consequences

BUCK quiescent current increases by approximately 300 µA.

Workaround

Prompt read or write over TWI from host below a load current of 5 mA.

3.6 [30] BUCK: BUCK output voltage accuracy is outside specification

This anomaly applies to Engineering C, build codes QEAA-BA0, CAAA-BA0, QEAA-BC0.

Symptoms

BUCK output voltage exhibits a negative transient.

Conditions

One or both of the following conditions are present:

- Data is transmitted on TWI lines.

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- BUCK is transitioning mode from PWM to Hysteretic when BUCKS are in auto mode and nPM1300 supplied only by VBAT. Resulting transient duration depends on load. Lower loads exhibit a longer transient.

Consequences

BUCK output voltage transient exceeds specification of ±5%. BUCK output voltage reduces by approximately 8%.

Workaround

If data is being transmitted on TWI lines, avoid TWI activity when output voltage accuracy is critical. Reducing driver strength of TWI reduces inaccuracy.

If BUCK is transitioning mode from PWM to Hysteretic when BUCKS are in auto mode and nPM1300 supplied only by VBAT, use forced PWM or Hysteric mode when output voltage accuracy is critical.

3.7 [32] BUCK: Reduced BUCK Hysteretic efficiency

This anomaly applies to Engineering C, build codes QEAA-BA0, CAAA-BA0, QEAA-BC0.

Symptoms

BUCK Hysteretic efficiency is 10% points lower than typically specified.

Conditions

BUCK is in Hysteretic mode.

Consequences

BUCK efficiency is reduced. Power draw is increased while in Hysteretic mode.

Workaround

None.

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