i.MX 8QM / QP Update

i.MX 8 New Part Numbers

March 2024

i.MX 8 UPDATE

Due to performance issues on the automotive i.MX 8QM/QP family of products it has been decided to derate the clocking of the A72 core(s) to *1.3GHz from 1.6GHz.* This change will take place immediately for all new customer opportunities. The new part numbers will be available on NXP.com in Q1 2024.

What is next?

NXP will no longer offer 1.6GHz automotive part number for new opportunities. All new opportunities are required to order 1.3GHz auto grade part numbers. Existing engagements are unchanged. The new part number timeline for availability will be communicated as soon as commercially possible. All new part numbers below, for Auto 1.3GHz, are now in the system.

No New Opportunities		New Orderable Part Number
Auto 1.6GHz Part Number		**Auto 1.3GHz Part Number**
MIMX8QM6AVUFFAB	➡	MIMX8QM6AVUFEAB
MIMX8QM5AVUFFAB	➡	MIMX8QM5AVUFEAB
MIMX8QP6AVUFFAB	➡	MIMX8QP6AVUFEAB
MIMX8QP5AVUFFAB	➡	MIMX8QP5AVUFEAB

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Problem Statement:

i.MX 8QM and i.MX 8QP power distribution network (PDN) may have a high impedance peak due to on-die capacitance and package/board inductance to first-level board capacitors; Transient currents near the frequency of the peak may result in on-die voltage noise. Several customers problems are believed to be caused by deficiency in A72 Core PDN at cold temperature.

Root cause:

Simulations suggest functional failures (e.g., A72 core faults) may be related to supply noise impacting critical paths.

Customer Containment:

Customers in production are being requested to reduce A72 frequency to 1.3GHz and increase VDD typical to mitigate any respective issues. Lifetime stress assessment has been completed at higher voltage of 1.1v (nom) +37.5mV.

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Business Context

NXP's i.MX auto customers have experienced issues that were sensitive to specific applications for those who developed modules with i.MX8 QM and i.MX8 QP application processors. Dedicated A72 spec reductions eliminated these sensitivities to meet their mass production requirements while also reducing overall power budgets and meeting company initiatives with power management.

Sensitive application use cases include:
- A72's, when not properly optimized, can cause power noise issues exceeding tolerance limit
- Display problem under GPU use case using tensor flow lite

Customer Actions

Customers who are developing their applications or in production are requested to:
- Reduce A72 Over Drive Mode max frequency from 1.6GHz to 1.3GHz;
- Increase A72 VDD up to +37.5mV
- Disable GPU's Over Drive Mode;
- Increase VDD_GPU TYP voltage from 1V to 1.03125V to support max 650MHz of GPU core frequency

Key Differences

Key Differences	1.6GHz	1.3GHz
8QM A72 x2	1600 MHz	1296 MHz
8QP A72 x1	1600 MHz	1296 MHz
8QM GPU0	Core = 800 MHz	Core = 650 MHz
8QM GPU1	Core = 800 MHz	Core = 650 MHz
8QM VDD_GPU0	Overdrive Mode	Overdrive Mode removed
8QM VDD_GPU1	Overdrive Mode	Overdrive Mode removed
8QM VDD_GPU0 Nominal	Min .95V Typ 1.00V Max 1.10V	Min .980V Typ 1.03125V Max 1.14V
8QM VDD_GPU1 Nominal	Min .95V Typ 1.00V Max 1.10V	Min .980V Typ 1.03125V Max 1.14V

i.MX 8 UPDATE

i.MX 8 datasheets located here by end of Q1 2024

The SCFW is released as part of a Board Support Package (e.g. Linux, Android) which may vary in version number for a specific BSP.

For example, LF6.6.y_2.0.0 GA contains SCFW version 1.16, Whereas 5.10.0_1.0.0 GA contains SCFW version 1.8.0.

For i.MX 8 part numbers in this datasheet, LF6.6.y_2.0.0 GA and SCFW 1.16 or later MUST be used for the new i.MX 8 auto 1.3GHz part numbers.

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I.MX 8 1.3GHZ UPDATE - FAQ

Is there a new datasheet for the new 1.3GHz auto parts?

Yes, the new datasheets can be found <u>here</u> on the i.MX 8QM site (end of Q1 '24)

Is the i.MX 8X product line changing as well?

No, this change is for i.MX 8QM and i.MX 8QP only, no other product lines affected

When will the new part numbers be available to order for our customers?

The website has been updated with the new orderable 1.3GHz part numbers (mid Q1 '24)

What happens if my customer already has an order in place for the 1.6GHz part number?

The existing customer order is still valid, only <u>*NEW*</u> opportunities will be required to order 1.3GHz parts

Will my current customers still have access to the i.MX 8QM/QP 1.6GHz datasheets?

Yes, datasheets will continue to be available on NXP.com

Will NXP continue to support customers currently in production with the 1.6GHz part number?

Yes, NXP will continue to support i.MX 8 1.6GHz parts for NXP's 15-year longevity of their production programs.

If the customer is not in production, should they migrate to the new part numbers (1.3GHz)?

Yes, they should use the new 1.3GHz part number for new programs.

Will the 1.6GHz part numbers continue to be supported on the NXP longevity program?

Yes, they will be supported through 2034 as indicated on the i.MX 8 NXP site.

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