

GAP9 PCB Design

Checklist

Rel.1.2

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When designing GAP9 into a system, please pay attention to the following points :

First, make sure you have looked up the '**GAP9 Hardware Integration Guide**'. The latest updated version is available on our website : <https://greenwaves-technologies.com/gap9-resources/>

> *GAP9 Datasheet & Integration Guidelines* > *GAP9 Hardware Integration Guide*

In particular, do not overlook the following :

BOOT Pins –

These must not be left floating and should be pulled to appropriate values.

Refer to Section 4, Paragraph '*Boot Pins*' in the HW Integration Guide and Paragraph 5.2.1.2 of the datasheet.

e-Fuse Power Supply (VQPS) –

It is essential to provision means to supply 1.8V on GAP9 pin VQPS_FUSE_1V8 (except perhaps in some very specific cases). In addition, the powering up/down of this power supply must meet certain sequencing and timing requirements.

Refer to Section 3, Paragraph '*eFuse Power Supply*' in the HW Integration Guide and Paragraph 5.2.14 of the datasheet. In particular, it is strongly recommended to provide 1.8V on that pin when programming is required, but to keep it open or grounded at all other times. In addition, slew rate control is required (VQPS must have rise time no faster than 50us), at least in production.

eMRAM Magnetic Immunity –

GAP9 embeds an MRAM (Magnetic Random Access Memory) Non-Volatile Memory. Although it is extremely robust, in very dense product designs, some precautions might need to be taken.

Specifically, if your product includes an internal magnet or a strong dynamic speaker driver, whose backplate surface field is greater 500-600 Gauss at any point (peak value) and which cannot be positioned further away than just a few millimeters from GAP9, or if your design is such that an external magnet may come within 4mm or so of GAP9, then it is preferable to check your configuration in further details : please contact GreenWaves Technologies.

A full Application Note on the subject will be released shortly.

Finally, feel free to reach out to GreenWaves Technologies at any time for support. **Upon request, we are always open to reviewing your schematics and, possibly, PCB layout, in a confidential manner.**

Note also that a number of useful Guides and Application Notes, as well as the most recent GAP9 datasheet, are available on our web page (again through the link provided at the top of this documents).

Thank you for selecting GAP9 and let us make some great products together.