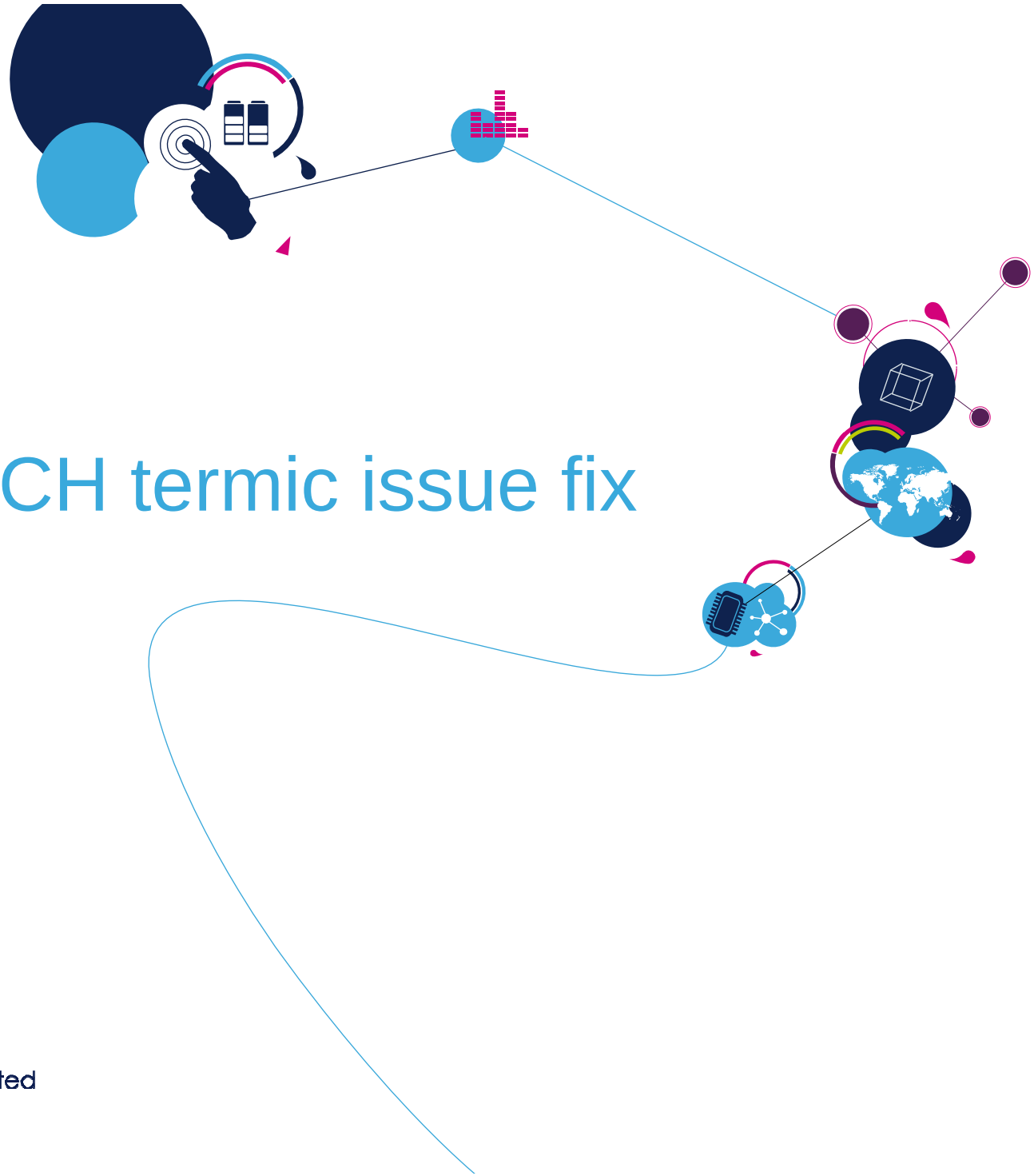


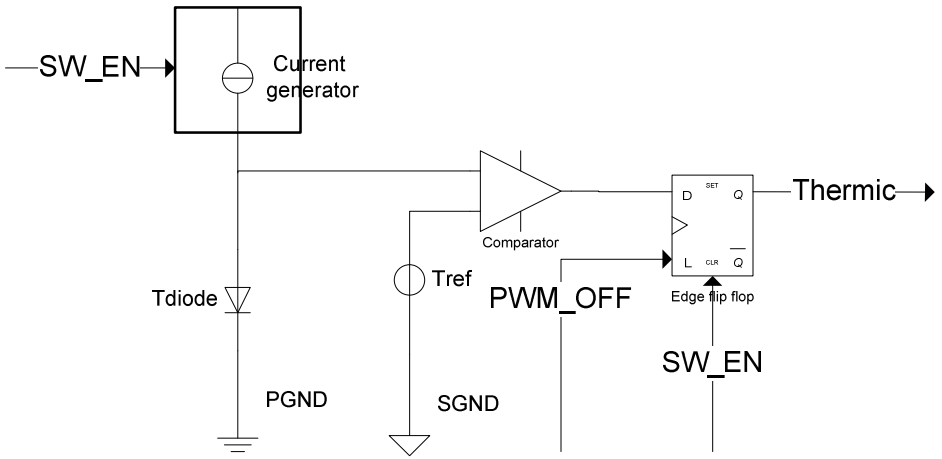
Viper0P ACH termic issue fix

A. Mariani

life.augmented

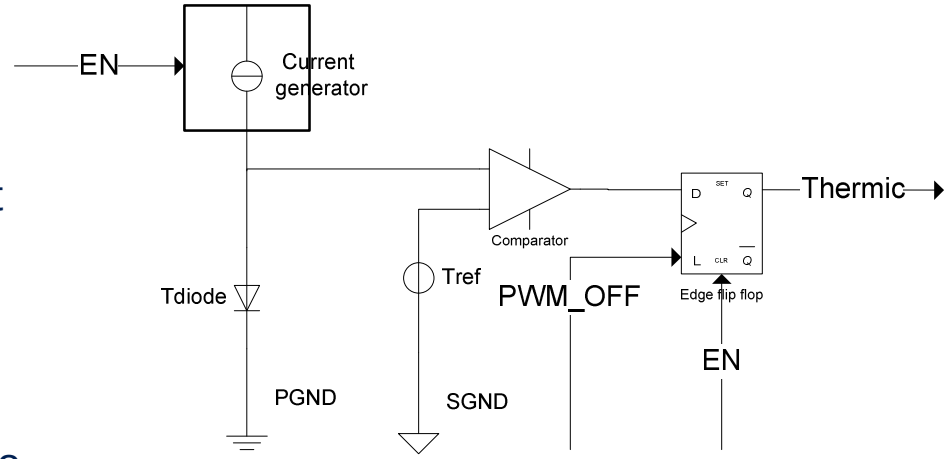
Thermic, AB version

- The temperature diode is polarized by a current generator
- SW_EN, the signal which enables the PWM operation, is used to enable the current generator
- In order to filter internal noise, thermic comparator output is read and latched during the edge of PWM_OFF, the signal which switch down the power
- During fault autorestart count, SW_EN is **low**, so the edge flip flop is reset



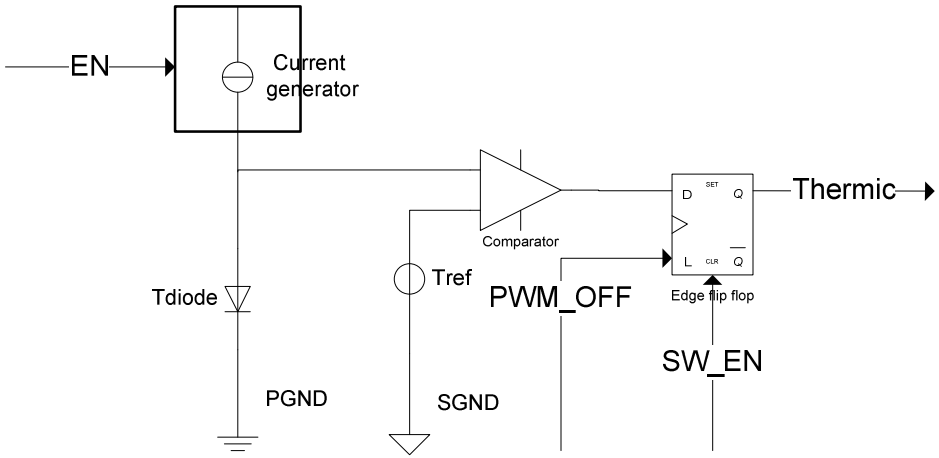
Thermic, AC version

- In order to anticipate current generator startup, EN has been used instead of SW_EN
- However, EN is **high** during fault autorestart count
- So, the edge flip flop is not reset, and at the end of the count, the device believe there's another thermic fault
- As a result, the device never enables switching operation, a behavior similar to a "latched protection"



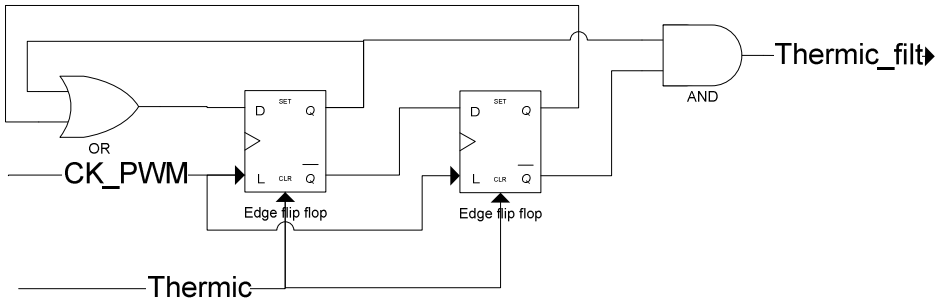
Thermic, new fix

- The solution is quite straightforward:
  - Current generator is enabled by EN signal
  - Edge flip flop is reset by SW_EN signal
- This fixes device latching if a thermic fault is triggered, bringing back the autorestart behavior
- However
  - Thermal diode is referenced to PGND
  - Thermal threshold Tref is referenced to SGND
- This could cause false triggering if, due to external noise spikes, PGND and SGND are not at the same potential



Thermic, new fix

- To prevent false triggering due to external noise spikes, the following digital filter is added
- Thermal protection is now based to Thermic_filt signal
- A digital counter rises Thermic_filt if Thermic signal occurs for three consecutive pwm cycles
  - False triggering due to external noise, which lasts for only one or two cycles are rejected



PCN10124 - MV4C - Metal fix ("AC" --> "AD") on die UAS3 - Viper0P

WHAT is the change?
Metal fix in the OTP (over temperature protection) circuitry.

Here below the list of the new finished goods and related commercial products:

Commercial Product	New Finished Good	Macro Package Description
VIPER0PLD	VIPER0PLD-4/	SO16 Narrow
VIPER0PLDTR	VIPER0PLDTR-4/	SO16 Narrow
VIPER0PHD	VIPER0PHD-4/	SO16 Narrow
VIPER0PHDTR	VIPER0PHDTR-4/	SO16 Narrow

WHY:
In order to improve the OTP immunity during the EMC application test (i.e. surge and burst test)
In order to have the IC automatic restart after the OTP intervention

WHEN will this change occur?

Engineering samples are available for immediate shipment
Production orders are available with a lead time of 12 weeks.

Commercial Product	Test Vehicle samples availability
VIPER0PLD	Upon request
VIPER0PLDTR	Upon request
VIPER0PHD	Upon request
VIPER0PHDTR	Upon request

HOW will the change be qualified?

This change will be qualified using the standard ST procedures for quality and reliability evaluation

IMPACTS OF THE CHANGE:

Form: No change
Fit: No change
Function: No change

APPENDICES:

- **Appendix_Explanatory note on Termic_issue.pdf**

IPD Reliability - Castelletto

Public Products List

Publict Products are off the shelf products. They are not dedicated to specific customers, they are available through ST Sales team, or Distributors, and visible on ST.com

PCN Title : Metal fix modification in the OTP (over temperature protection) circuitry for VIPER0P products

PCN Reference : AMG/17/10124

Subject : Public Products List

Dear Customer,

Please find below the Standard Public Products List impacted by the change.

VIPER0PHDTR	VIPER0PHD	VIPER0PLD
VIPER0PLDTR		

IMPORTANT NOTICE – PLEASE READ CAREFULLY

STMicroelectronics NV and its subsidiaries (“ST”) reserve the right to make changes, corrections, enhancements, modifications, and improvements to ST products and/or to this document at any time without notice. Purchasers should obtain the latest relevant information on ST products before placing orders. ST products are sold pursuant to ST’s terms and conditions of sale in place at the time of order acknowledgement.

Purchasers are solely responsible for the choice, selection, and use of ST products and ST assumes no liability for application assistance or the design of Purchasers’ products.

No license, express or implied, to any intellectual property right is granted by ST herein.

Resale of ST products with provisions different from the information set forth herein shall void any warranty granted by ST for such product.

ST and the ST logo are trademarks of ST. All other product or service names are the property of their respective owners.

Information in this document supersedes and replaces information previously supplied in any prior versions of this document.