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MT7986 Thermal Service Application Note

2021/3/11 Judy Huang

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Version History

Version	Date	Author (Optional)	Description
0.1	2021-3-11	Judy Huang	Initial draft
1.0	2022-2-2	Micheal Su	Official release

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Outline

- Purpose
- Thermal Interrupt Control Flow
- Thermal ADC and Temperature Transformation
- iwpriv command

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Purpose

- Get HW temperature status, and trigger thermal interrupt for temperature related action handler. SW can set thermal task by composing thermal interrupt flag, thermal interrupt threshold, and thermal task handler.
- Once an HW interrupt is triggered, thermal task handler would execute and config new interrupt threshold.

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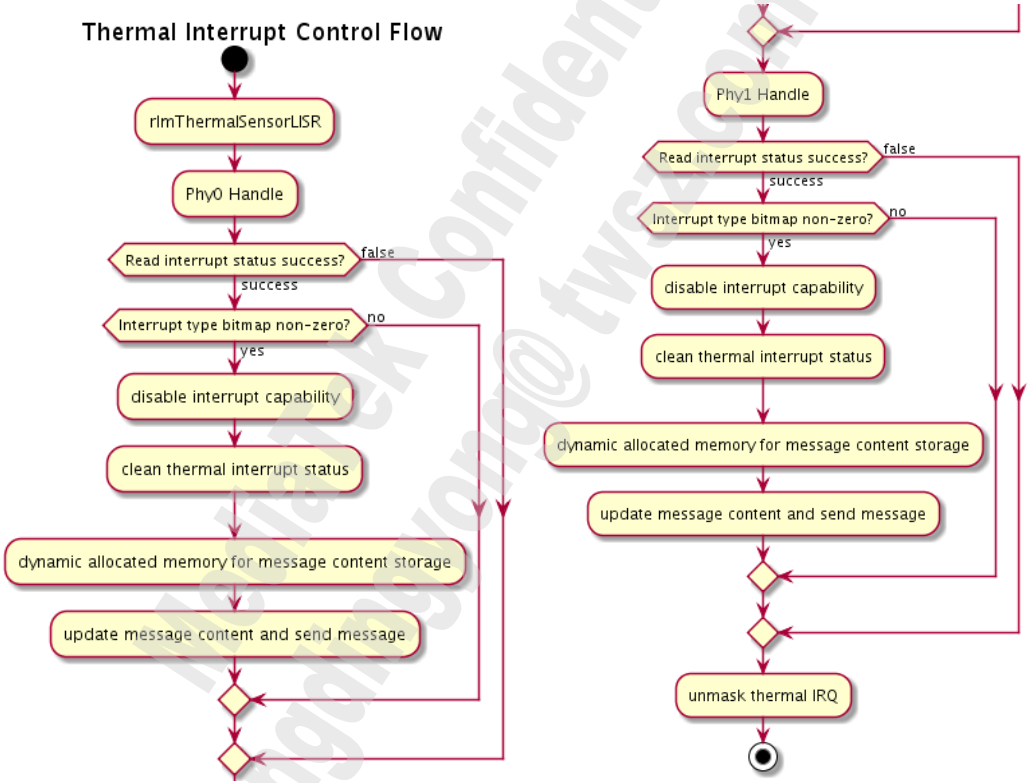
Thermal Interrupt Control Flow



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Thermal ADC and Temperature Transformation

- **Read Efuse column for transformation relationship slope calibration value and offset calibration value.**
- **For thermal adc value Y(n), Temperature in Celcius**
- **T(n) = (Y(n)-Calibration Part) * (THERMO_TEMP_SWEEP/ THERMO_CODE_SWEEP + Slope/100) + THERMO_REF_OFFSET_DEF + Compensation Offset**

Element	Efuse Offset (mt7915)	Field Description
THADC Analog part	0x9A6	
THADC Slope part	0x9A7	[7]: valid bit (1: valid, 0: invalid) [4:0]: slope variance value (2's complement)
THADC Calibration part	0x9A8	[7]: valid bit (1: valid, 0: invalid) [6:0]: adc calibration value P.S. Default value is 54 when invalid
THADC Compensation Offest	0x9A9	[7]: valid bit (1: valid, 0: invalid) [6:0]: offset compensation value (2's complement)

THERMO_TEMP_SWEEP = 209
THERMO_CODE_SWEEP = 100
THERMO_REF_OFFSET_DEF = 28

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iwpriv command

- # read temperature (temperature in ℃)
  - iwpriv ra0 set get_thermal_sensor=0
- # read temperature (ADC value)
  - iwpriv ra0 set get_thermal_sensor=1
- # check thermal tasks: threshold/ trigger enable
  - iwpriv ra0 set ThermalTaskInfo=0

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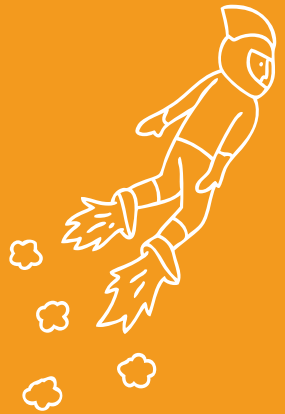

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