



**MMS – MCD
Application Team**

STM8L Training Slides

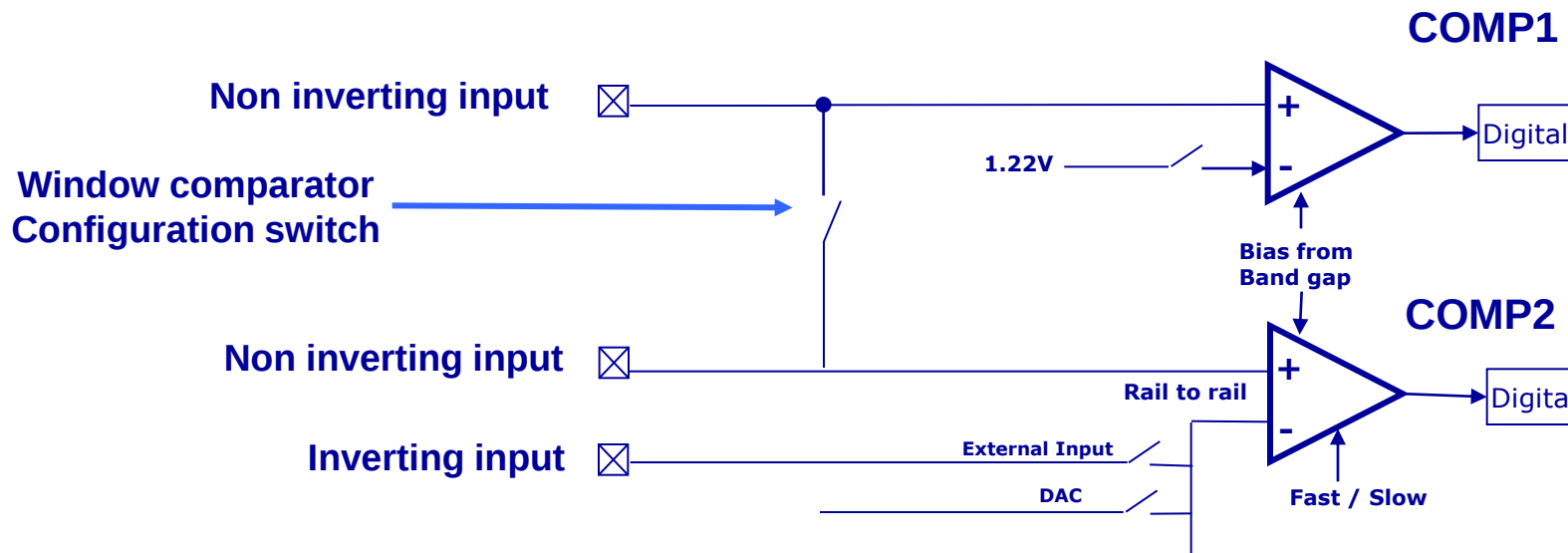
Comparators

**(different comparator types in
STM8L15x and STM8L10x)**

Comparators Overview (STM8L15x)



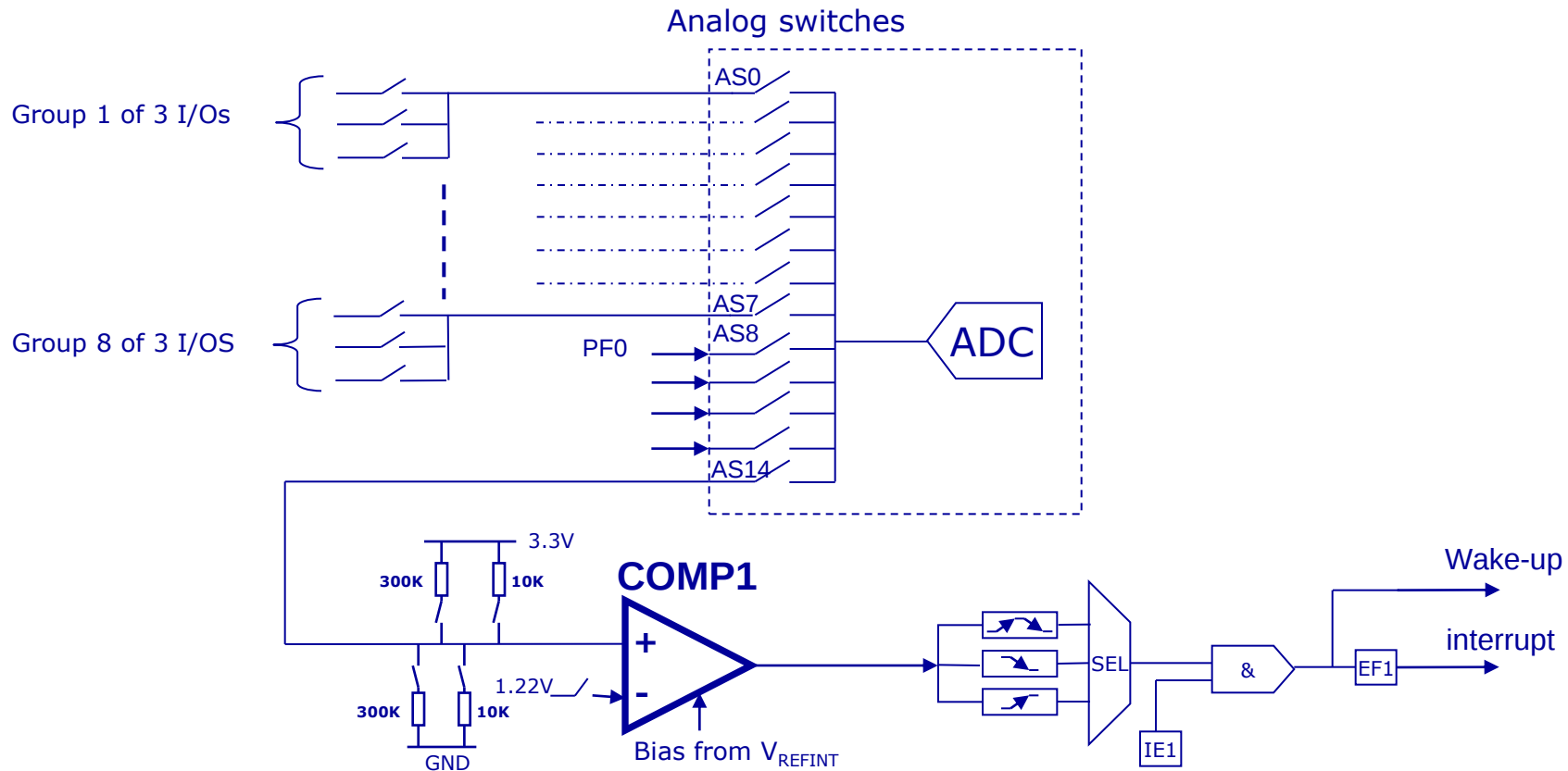
- The STM8L15x contains two comparators COMP1 and COMP2 sharing the same current bias
- One comparator COMP1 with fixed threshold: Internal reference voltage $V_{\text{REFINT}} = 1.22 \text{ V}$
- One rail-to-rail comparator COMP2 with selectable threshold
- The two comparators can be combined into window comparators



Comparator 1 features (STM8L15x)



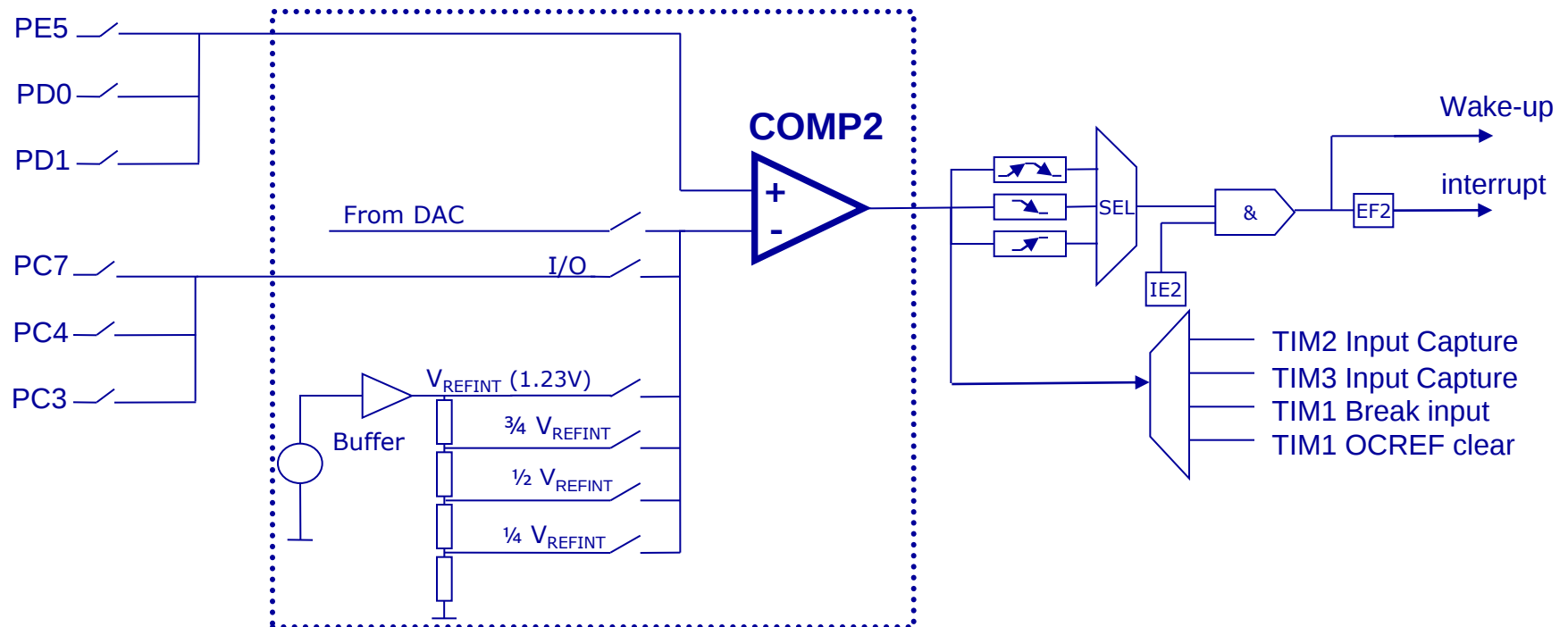
- Fixed threshold: Internal reference voltage V_{REFINT}
- Non-inverting input selectable from 25 I/Os
- Selectable edge detection (rising, falling or both rising and falling) with interrupt capability and exit from low power modes.



Comparator 2 features (STM8L15x)



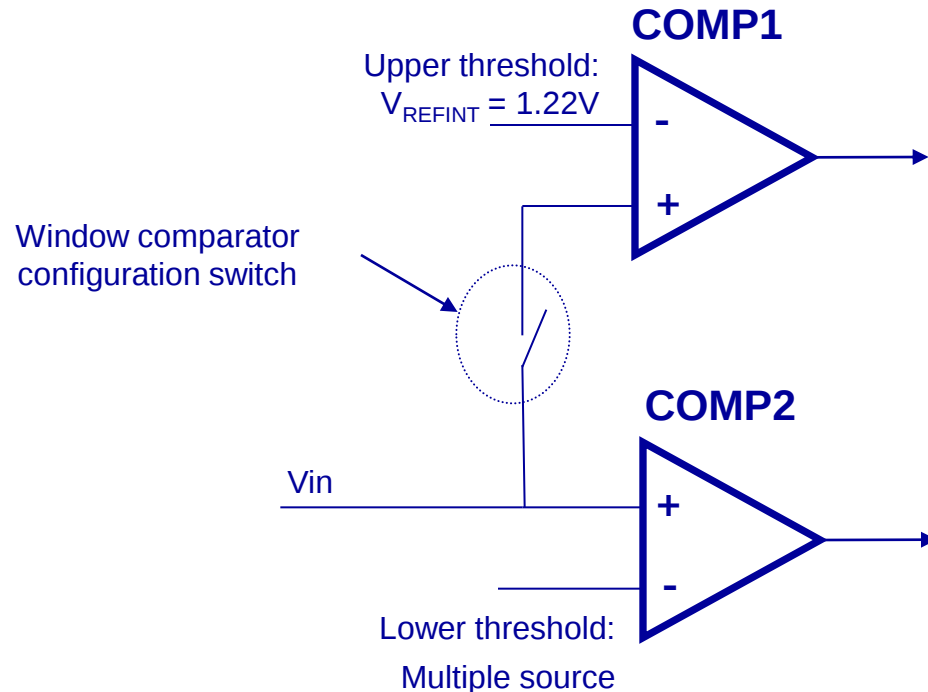
- Rail-to-rail comparator with selectable threshold: Internal reference voltage V_{REFINT} , V_{REFINT} submultiples (1/4, 1/2, 3/4), DAC output or one of three external I/Os.
- Selectable non-inverting input: PD0, PD1 or PE5.
- COMP2 output can be redirected to TIM1 BRK, TIM1 OCREF Clear, TIM2 Input Capture 1 or TIM3 Input Capture 1.
- Selectable edge detection (rising, falling or rising and falling) with interrupt capability and exit from low power modes.



Comparator 1 and Comparator 2: Window mode



- Window interrupt and Wake-up modes:
 - $V_{in} > \text{Upper threshold}$
 - $V_{in} < \text{Lower threshold}$
 - $\text{Lower threshold} < V_{in} < \text{Upper threshold}$ (inside window)
 - $V_{in} < \text{Lower threshold}$ or $V_{in} > \text{Upper threshold}$ (outside window)



Quiz (STM8L15x)



- How many comparators there are in STM8L15x ?

- How many I/Os can be connected to COMP1 non inverting input ?

- How many Input can be connected to COMP2 inverting input ?

- What are the possible output redirection for COMP2 ?

Comparators Overview (STM8L10x)

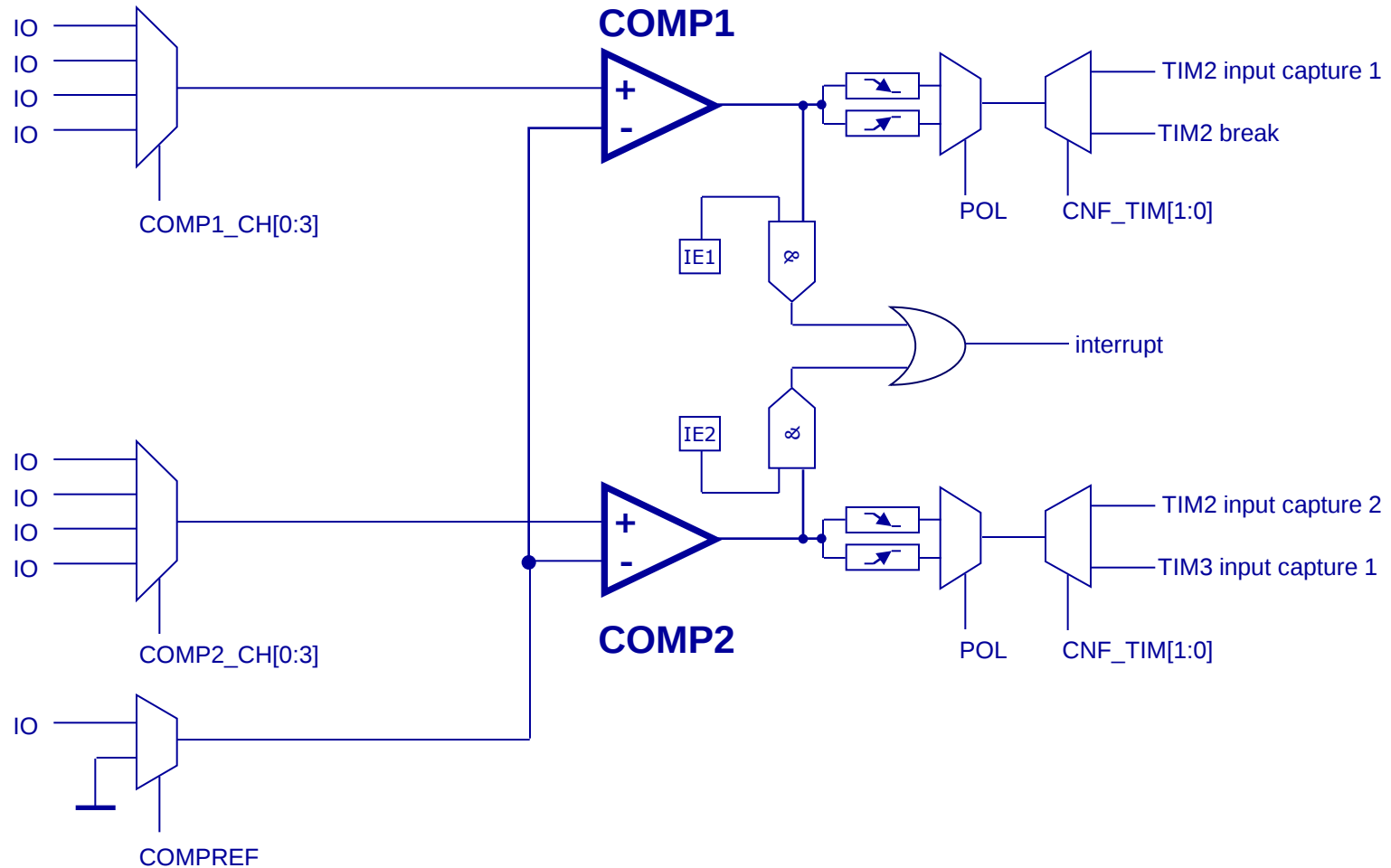


- The STM8L10x contains two comparators COMP1 and COMP2 sharing the same current bias
- COMP1 and COMP2 have the same reference signal (inverting input) – ground or external pin (selectable)
- Each comparator has 4 input channels (non-inverting input)
- Interrupt generation on rising edge (exit from Wait)
- Input capture or break generation on TIM2 or TIM3 (selectable rising or falling edge)

Comparators schematic (STM8L10x)



- Schematic:



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