Voltage Detector IC

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Agenda

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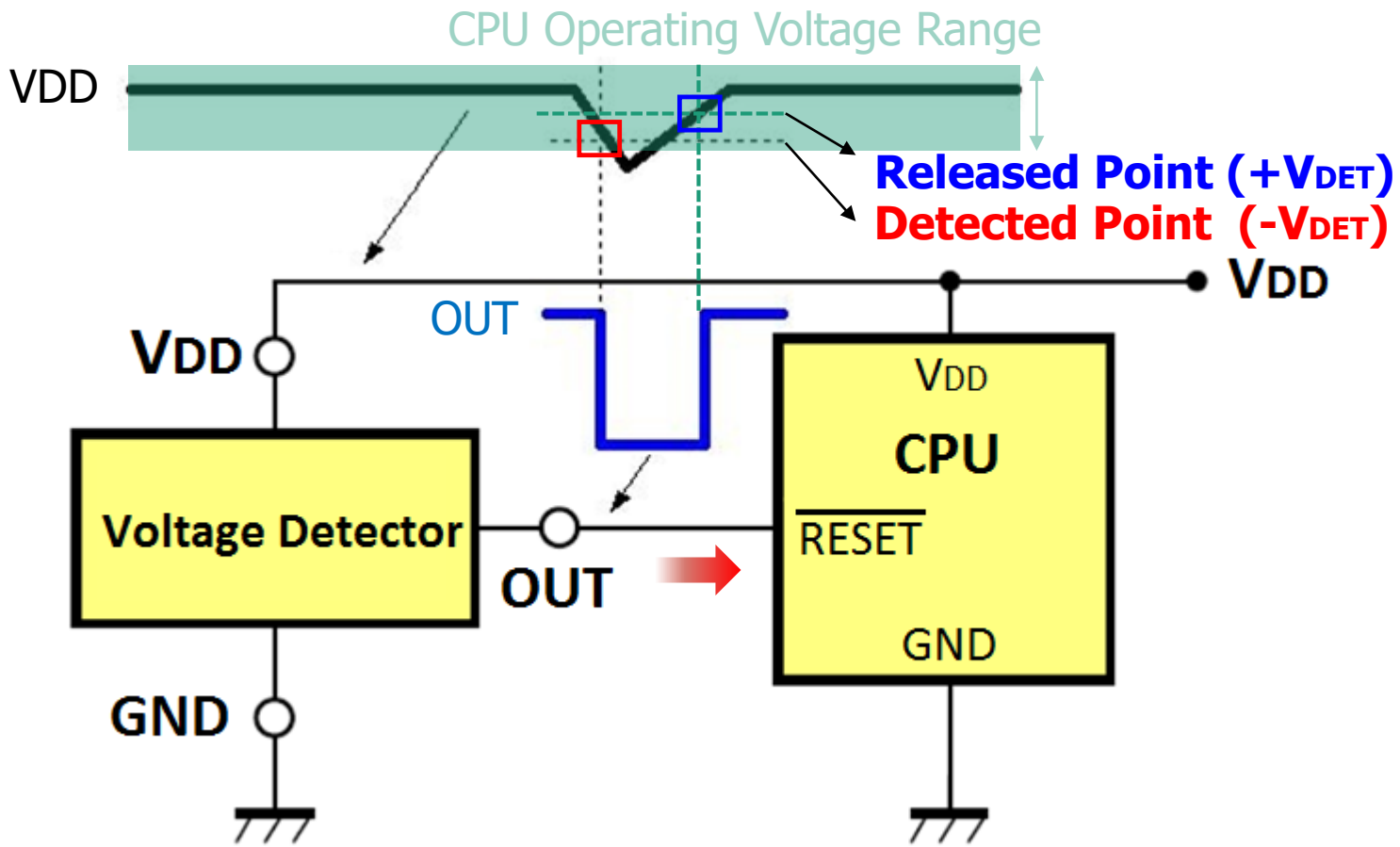
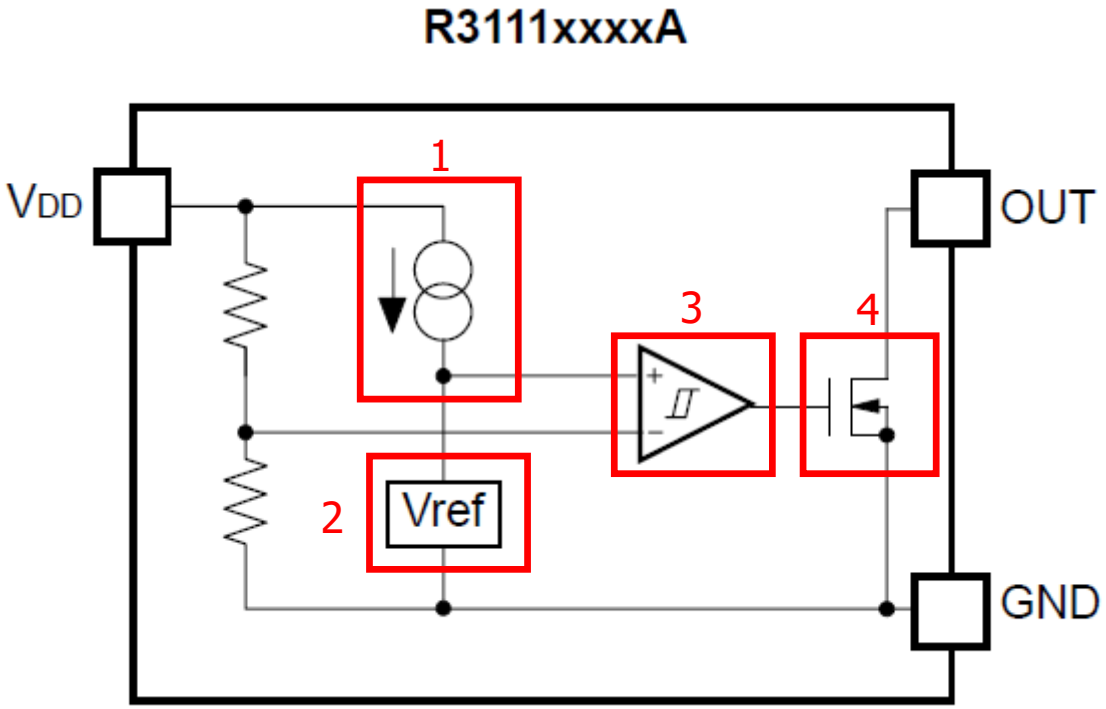
- Brief
- Structure
- Application
- Classification
- Additional Function
- How to select VD?
- RICOH VD IC Introduce

Note: $+V_{DET} = -V_{DET} + V_{HYS}$



When $V_{DD} < -V_{DET}$ → OUT becomes Low to reset CPU
When $V_{DD} > +V_{DET}$ → OUT becomes High to leave reset



Block Diagram

1. Constant current circuit : To enhance the accuracy and stability of Comparator.
2. Reference voltage : The detecting voltage (-V_{DET}), it was trimmed by laser.
3. Comparator : To compare the V_{DD} and Vref.
4. Nch. MOSFET : The switch to control the "High" or "Low" output of OUT pin.

Application (Power On Reset)

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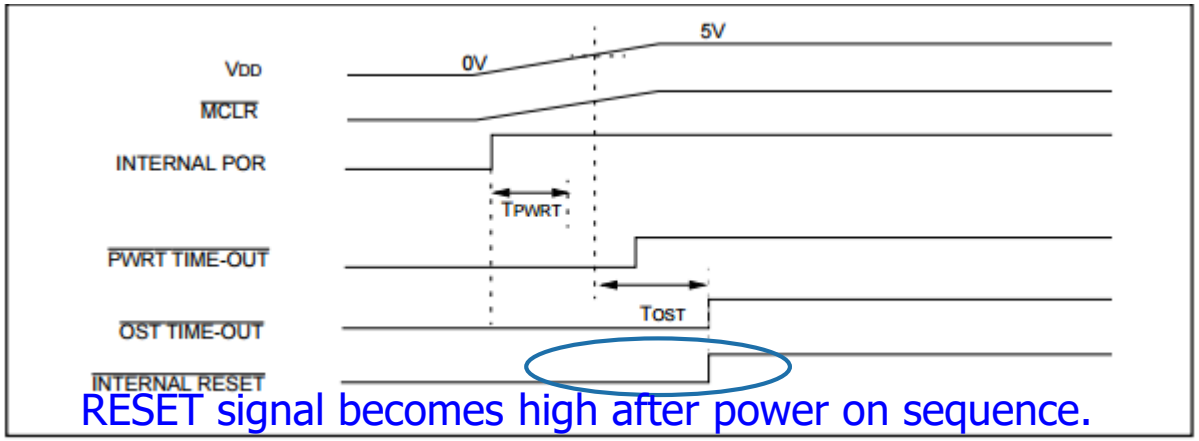
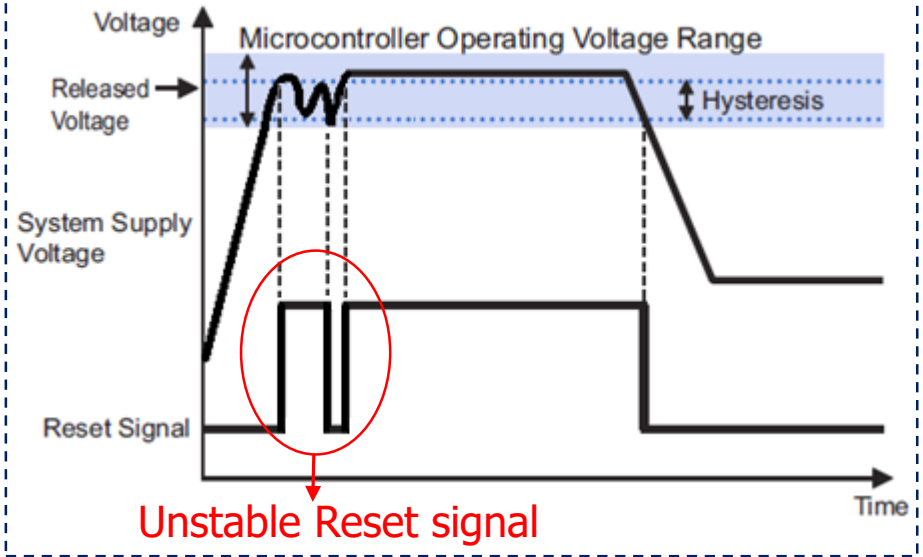
Microchip MCU
Power ON Sequence



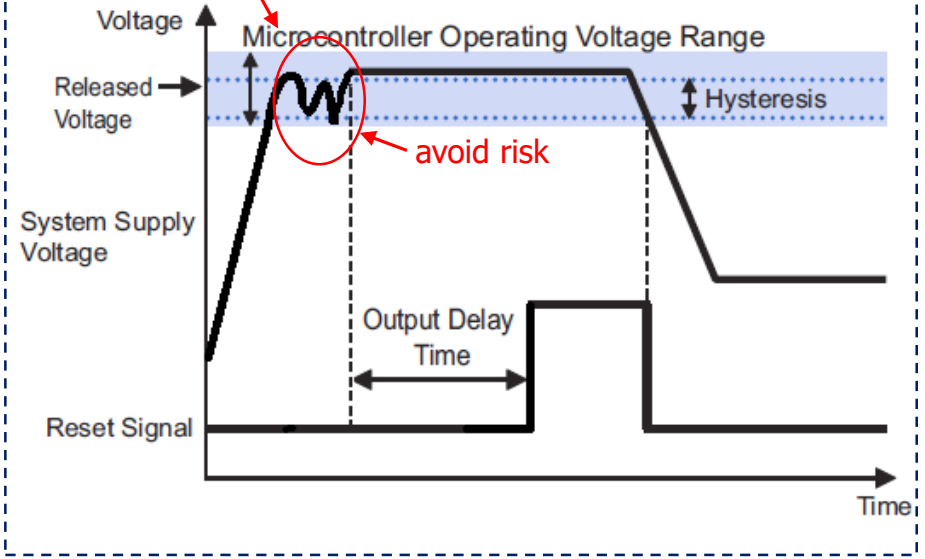
RESET signal becomes high after power on sequence.

Reset signal become unstable if there is no output delay time.



Unstable Reset signal

To avoid unstable power during power on sequence.



Application (Low Voltage Indicator)

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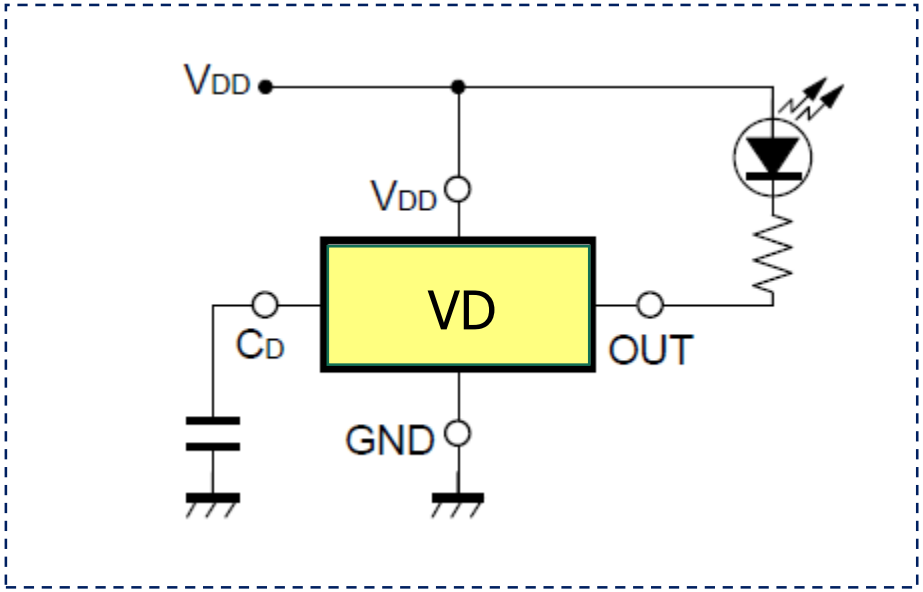
Lighted when the power runs out!



Nch Open Drain Output

When VDD < -VDET → OUT was pulled to GND.
Nch. Open Drain Output type is necessary.

Application

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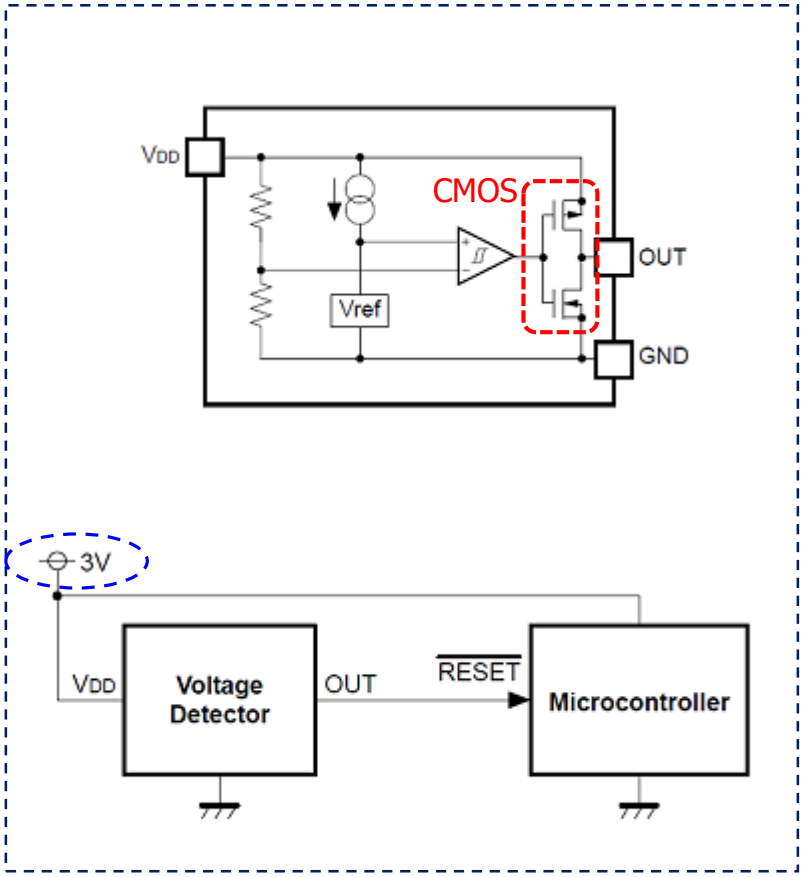
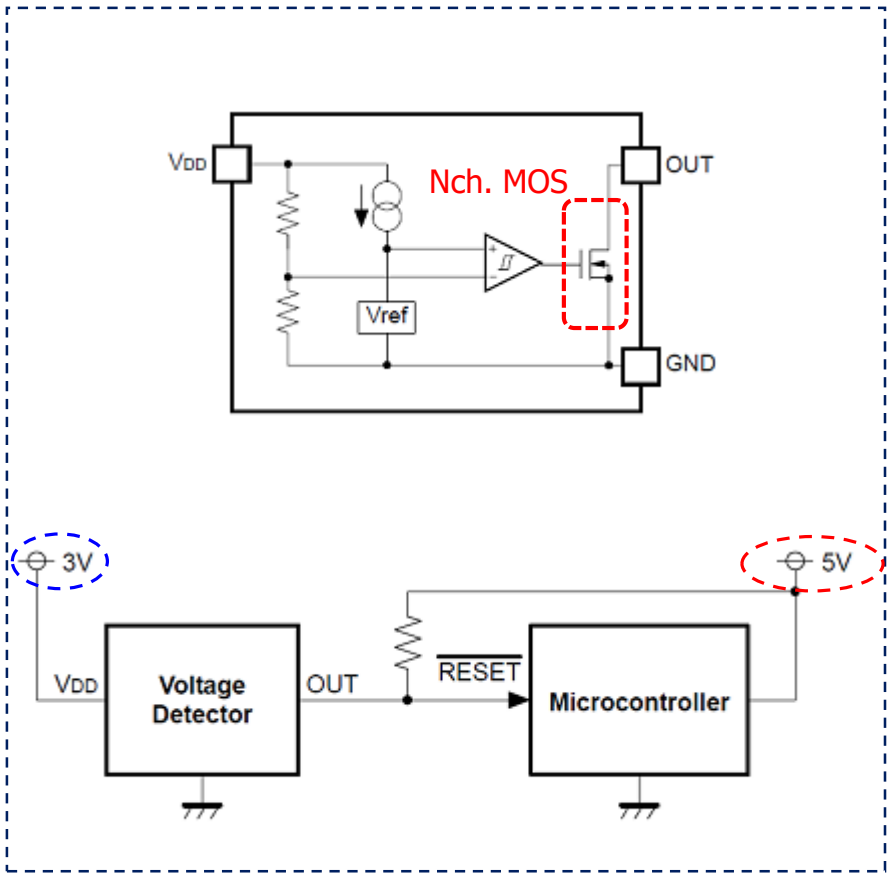
Classification

By Output Type



CMOS Output Type

If detecting voltage is same as backend device.



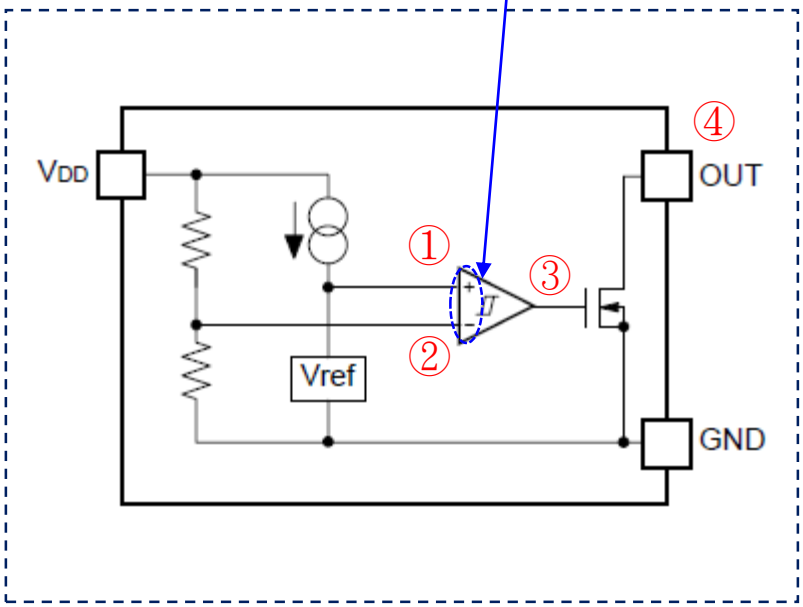
Nch. Open Drain Output Type

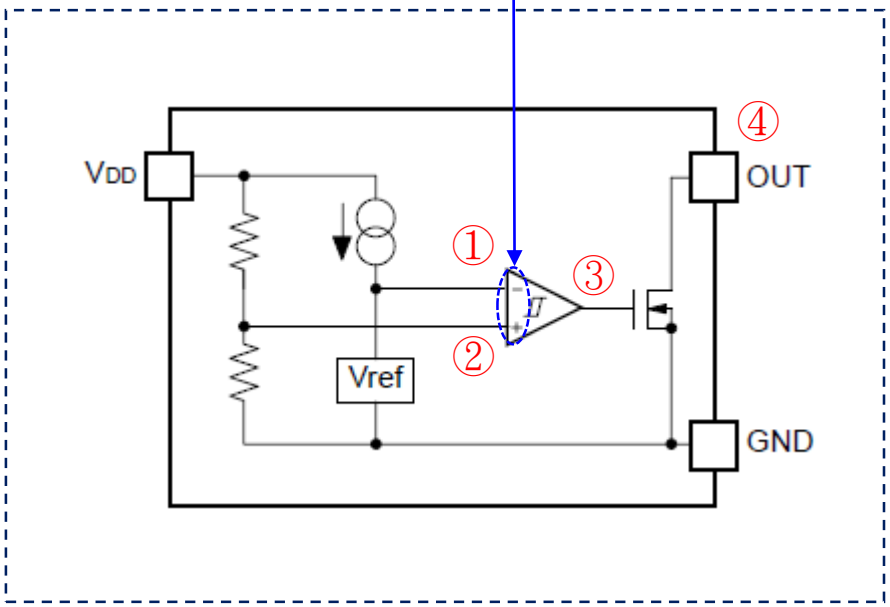
Pulled up resister is necessary.

Classification

By Reset Signal

The input source of comparator are reversed.





Output Low at Detection

① Assume Vref=3V
② Compare with VDD
③ If VDD < Vref, comparator output “H”
④ N-MOSFET turns ON, then OUT becomes “L”

Output High at Detection

① Assume Vref=3V
② Compare with VDD
③ If VDD < Vref, comparator output “L”
④ N-MOSFET turns ON, then OUT keeps “H”

How to select VD?

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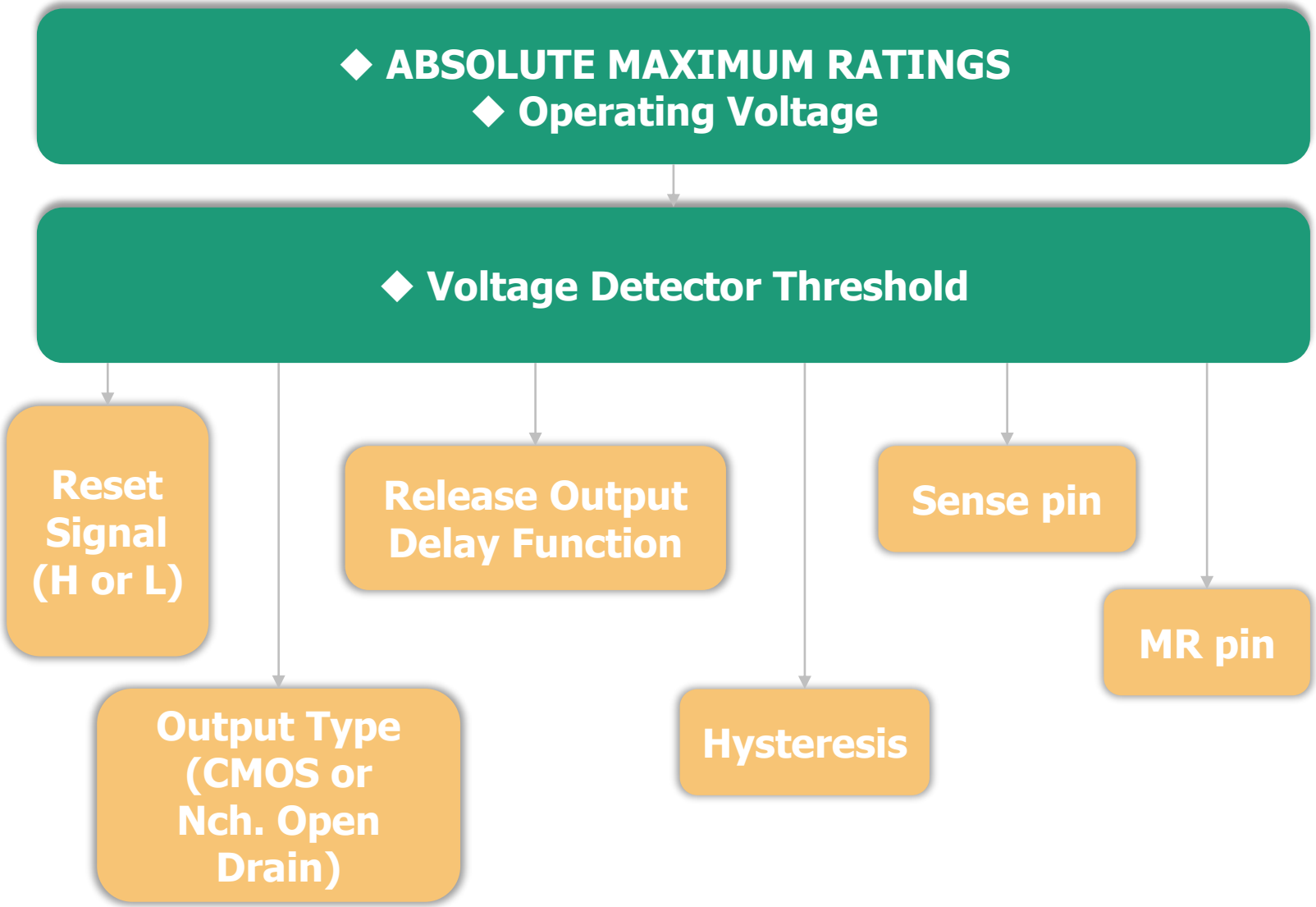

RICOH VD Introduce

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High Absolute Maximum Rating (High Operating Voltage)

R3111 : 12V (10V)
RN5VD : 12V (10V)
R3119 : 50V (36V)
R3150NxxxA/B : 50V (36V)

Reset Signal (Output High)

R3133D
R3111xxxxB
R3150NxxxB
R3150NxxxF

Sense pin

R3117
R3118
R3119NxxxE
R3150NxxxE/F

MR pin

RP300
R3132
R3133D
R3134N

Hysteresis

R3114 R3112
R3116 R3117
R3118 R3111
R3119 R3150
RN5VD

Low Supply Current

R3114 : 0.35μA
R3112 : 0.5μA
R3116 : 0.35μA
R3118 : 0.4μA

欲知詳情請洽...

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- FAE team

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Ricoh VD官網資訊:

http://www.e-devices.ricoh.co.jp/en/products/product_power/vd/

Thank You!