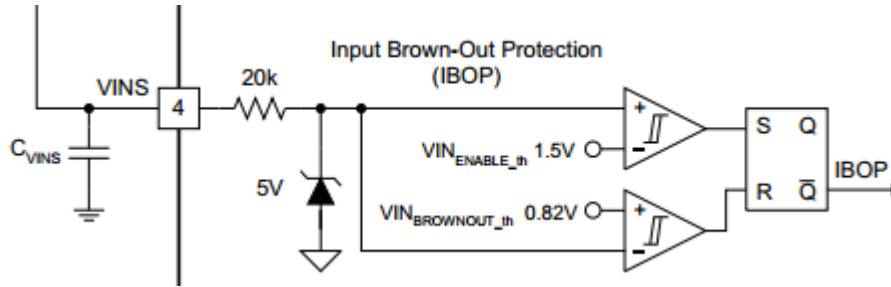# Discrete brown-out solution for the UCC28180

High Power Controllers Solutions Applications
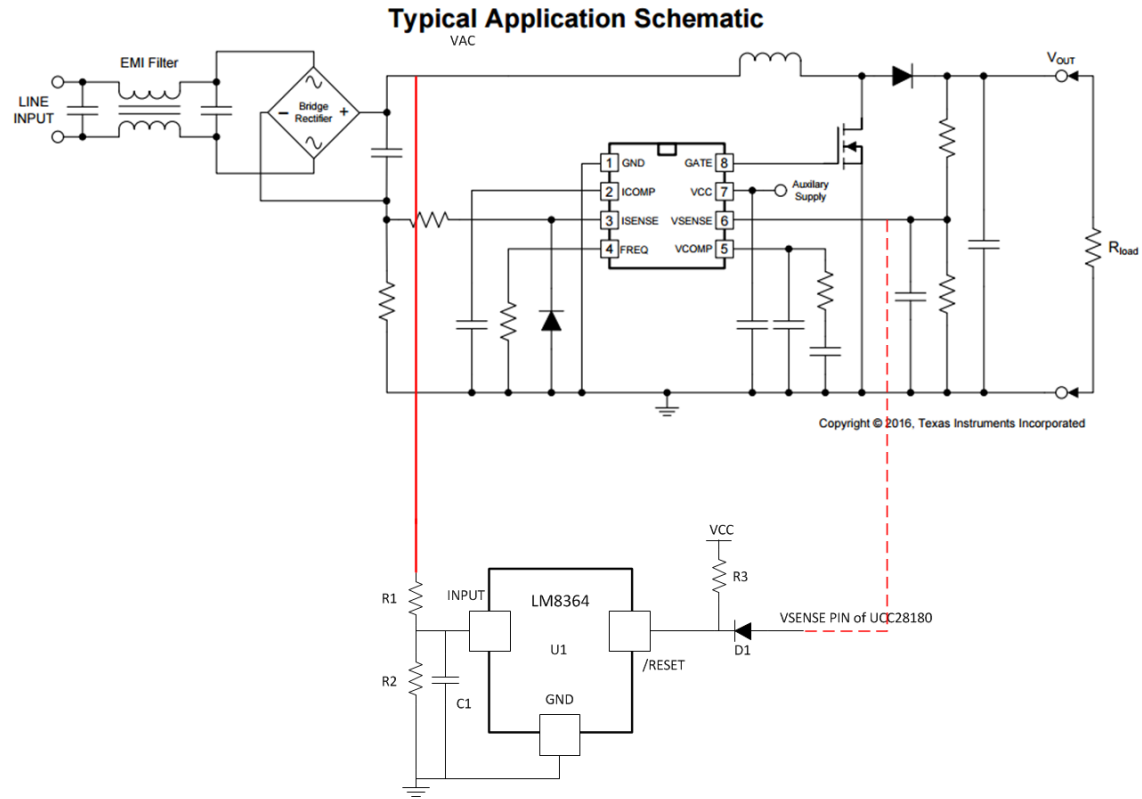
Brown out function of UCC28019A

There is brown out function inside UCC28019A.
UCC28180 does not have brown out function.
So discrete brown-out solution is needed for UCC28180.

Discrete brown-out function for the UCC28180

Typical Application Schematic

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To apply brown out function with UCC28180, a external circuit with LM8364 is needed.

R1/R2 forms a resistor divider and connect to VAC to sensing input ac voltage.

C1 is bypass capacitor of INPUT pin of LM8364.

The output of LM8364 is an open collector/drain which can be used to clamp the Vsense Pin of UCC28180 below 0.82V. Pull down Vsense pin will trigger OLP(open loop protection) to turn off UCC28180, and voltage of COMP is 0 in OLP fault mode, so ramp up would not be impacted.
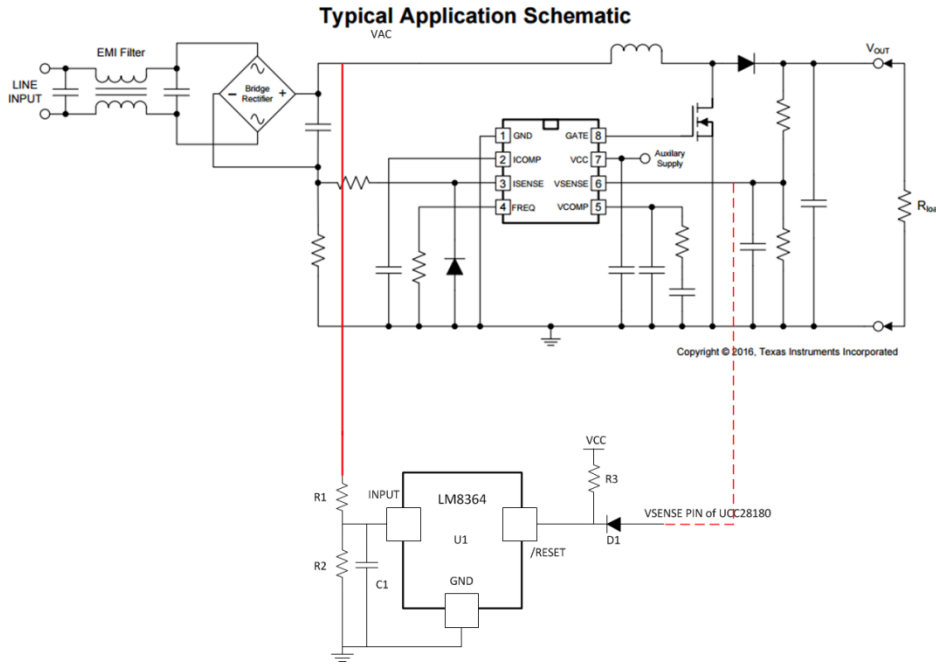
Calculation of discrete brown-out circuit

LM8364 is used for under voltage sensing circuits. Below is functional block diagram and timing waveforms of LM8364.
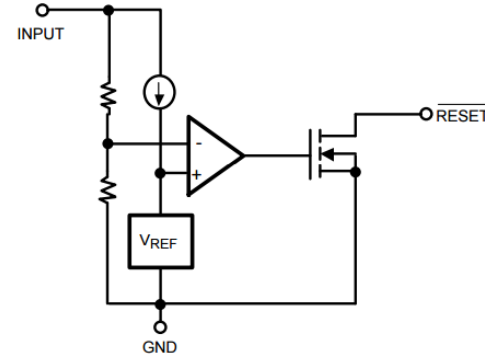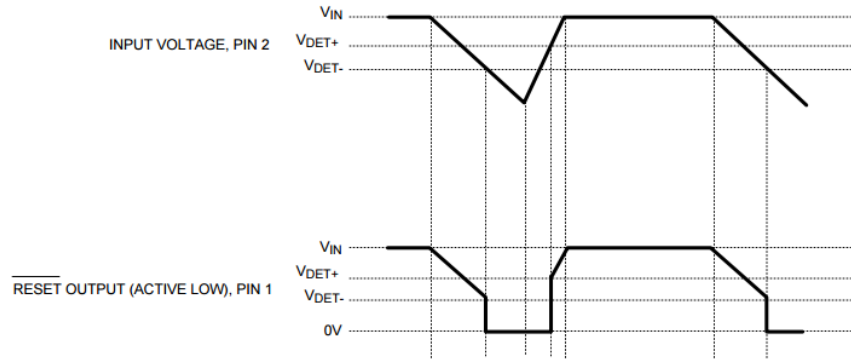
In this calculation, LM8364BALMF30 is selected.
V_{DET-}=3V, V_{DET+}=3.15V.

Calculation of discrete brown-out circuit

Typical Application Schematic

VAC

EMI Filter

LINE INPUT

Bridge Rectifier

GND	GATE
ICOMP	VCC
ISENSE	VSENSE
FREQ	VCOMP

Auxiliary Supply

V_{OUT}

R_{load}

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VCC

R3

R1   INPUT   LM8364

R2   C1   U1   GND   /RESET

D1   VSENSE PIN of UCC28180

Suppose, R2=806kohm.
And the brown out threshold of Vac is 80Vac

$$\frac{R2}{R1+R2} \times 80 \times 1.414 = 3$$

Then, R1=29.5Mohm
R3 is pull high resistor of /RESET pin.
R3=1.15Mohm
C1=47pF

With above components value, the brown in threshold is 84V.

Below is BOM for discrete brown-out circuit

U1	LM8364BALMF30
R1	29.5Mohm
R2	806kohm
R3	1.15Mohm
C1	47pF

TEXAS INSTRUMENTS