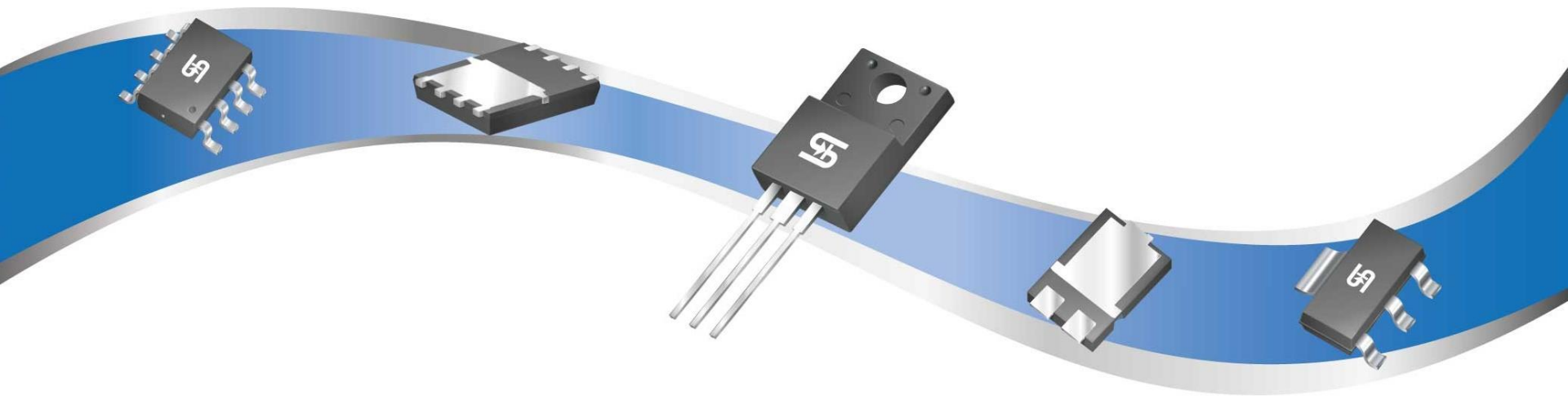
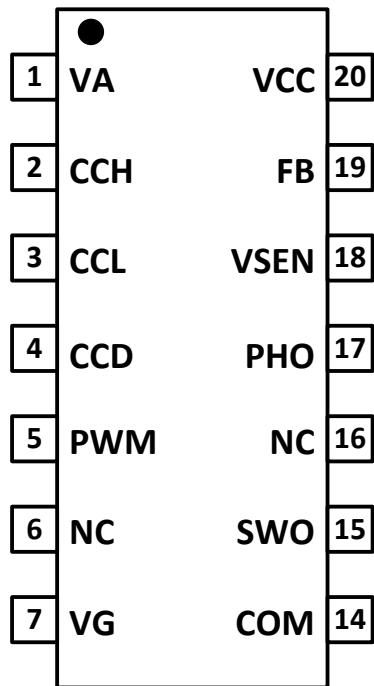


TS19340CS14 USER MANUAL



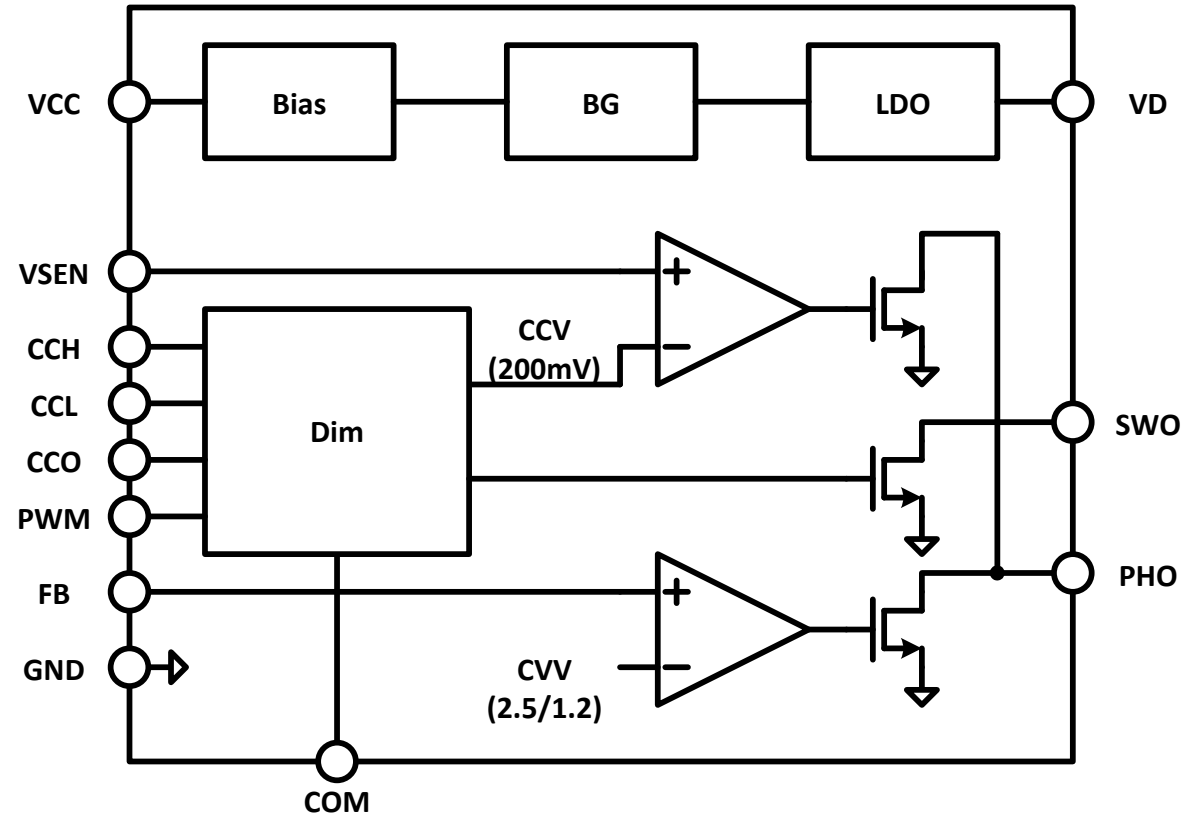
PIN DESCRIPTION

SOP-14



PIN NO.	NAME	FUNCTION
1	VD	3.3V low drop out voltage
2	CCH	Constant current high limit voltage
3	CCL	Constant current low limit voltage
4	CCO	LED current cut-off voltage
5	PWM	PWM input pin
6	N/C	No connection
7	GND	Ground
8	COM	PWM pulse filter pin
9	SWO	Open drain output of the comparator for LED current cut-off function
10	N/C	No connection
11	PHO	Open drain output of the two internal operational amplifier for photo coupler
12	VSEN	Current sense pin
13	FB	Voltage sense pin
14	VCC	Power supply pin

FUNCTION BLOCK DIAGRAM

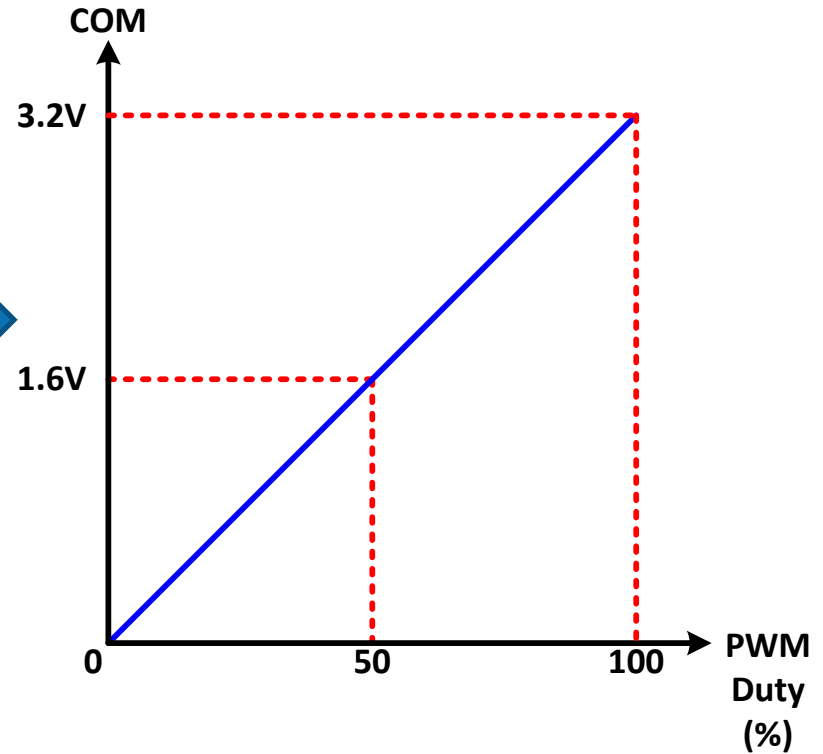
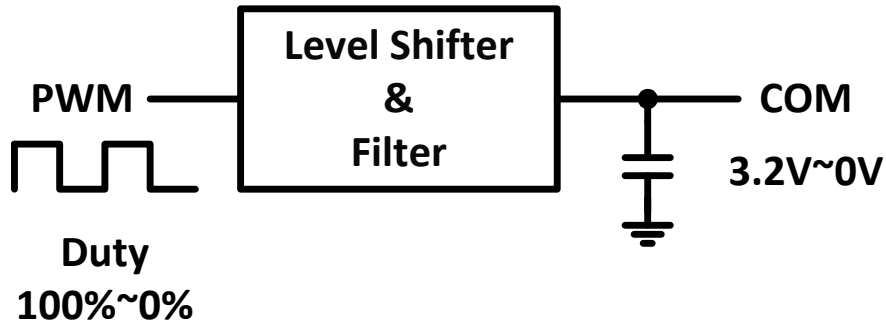


Function Description

- CC / CV Controller
- PWM / Linear Dimming
- LED Current Cut-Off Function
- High Accuracy Internal Reference Voltage
- Built-in 3.3V LDO

PIN DETAIL DESCRIPTION – PWM PIN & COM PIN

PWM Duty Change to DC Level



PIN DETAIL DESCRIPTION – CCH / CCL / CCD

CCH → Constant current high limit voltage

CCL → Constant current low limit voltage

CCO → LED Current Cut Off Voltage

SWO → Open drain output of the comparator for LED current cut-off function

For VSENSE Reference Voltage

COM > CCH → VSENSE Reference Voltage = CCH / 16

CCH ≥ COM ≥ CCL → VSENSE Reference Voltage = COM / 16

CCL > COM → VSENSE Reference Voltage = CCL / 16

For FB Reference Voltage

COM & CCH > CCO → FB Reference Voltage = 2.5V

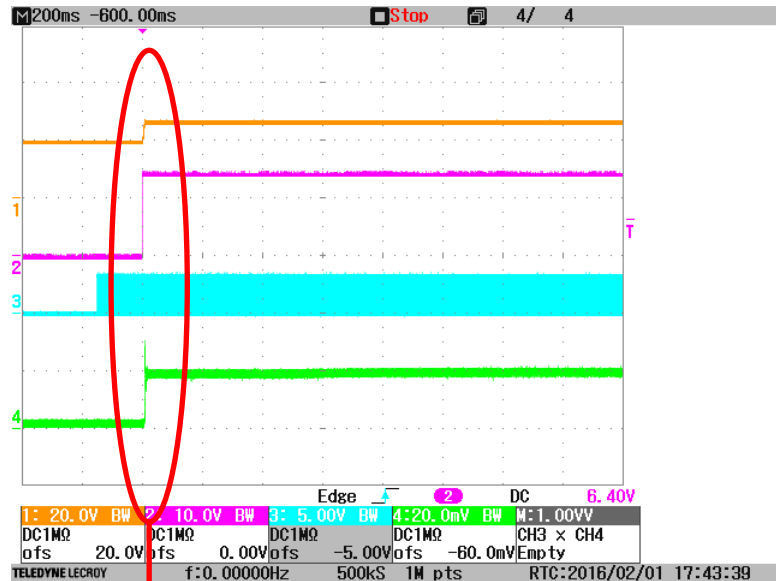
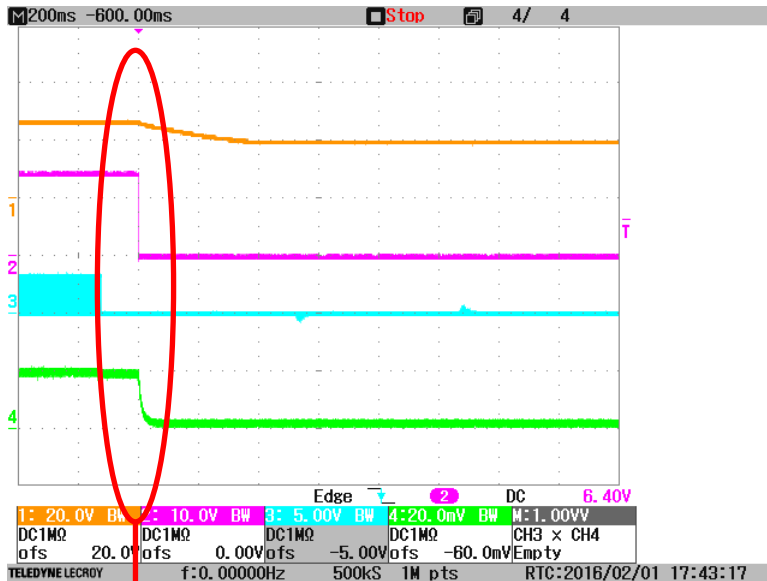
COM or CCH < CCO → FB Reference Voltage = 1.2V

SWO FUNCTION @ LINEAR DIMMING

COM & CCH > CCO → SWO Pull High

COM or CCH < CCO → SWO Pull Low

CH1 → Vout CH2 → SWO CH3 → PWM CH4 → Iout



CCO = 150mV (about 4.5%)

PWM = 10% → 0%

CCH = VD (3.3V)

SWO = H → L

CCO = 150mV (about 4.5%)

PWM = 0% → 10%

CCH = VD (3.3V)

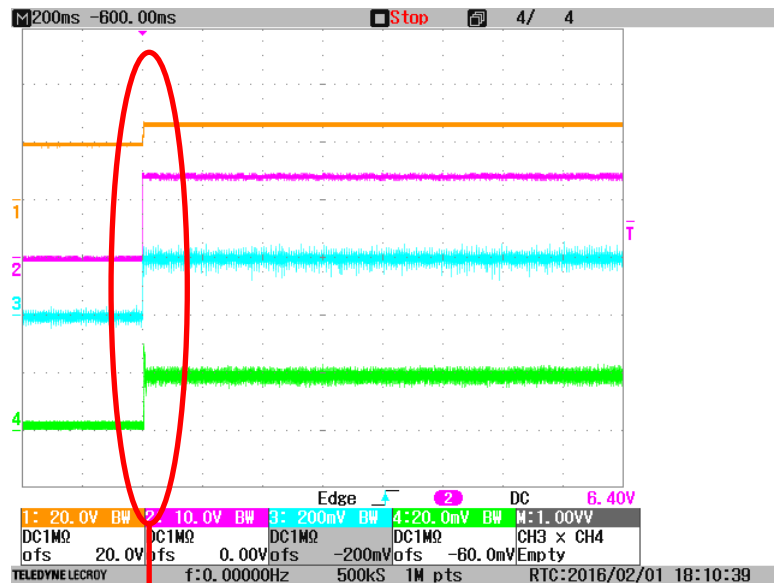
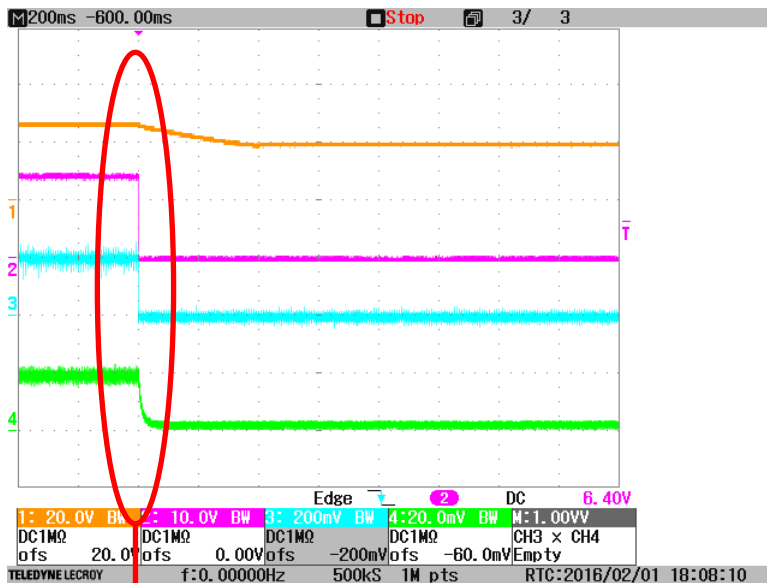
SWO = L → H

SWO FUNCTION @ LINEAR DIMMING

COM & CCH > CCO → SWO Pull High

COM or CCH < CCO → SWO Pull Low

CH1 → Vout CH2 → SWO CH3 → CCH CH4 → Iout

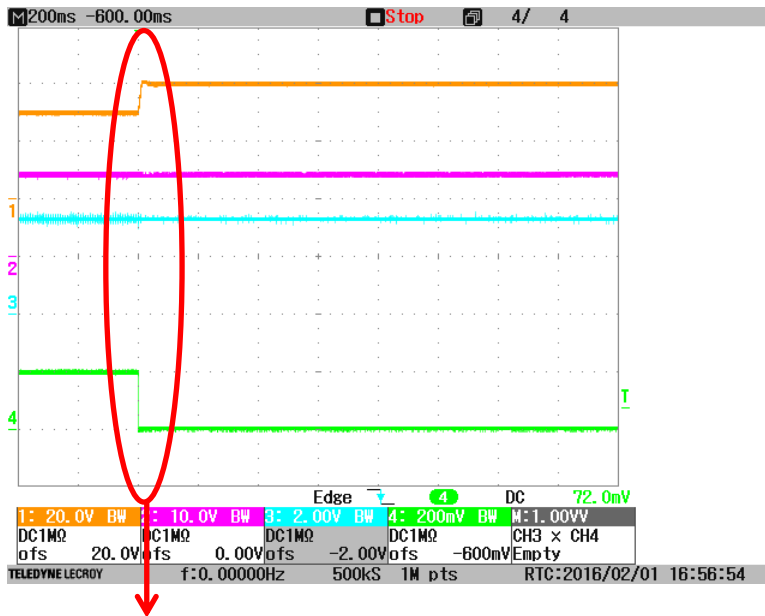


CCO = 150mV
 PWM = VD (3.3V)
 CCH = 200mV → 0mV
 SWO = H → L

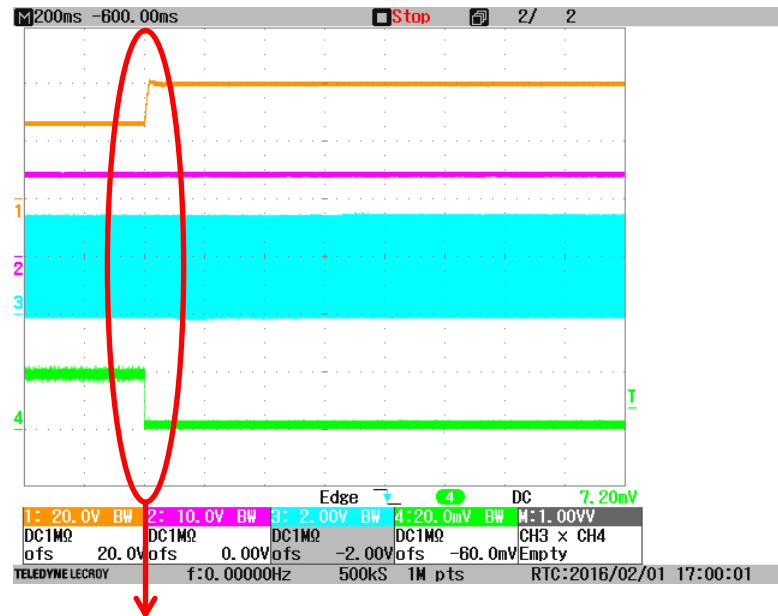
CCO = 150mV
 PWM = VD (3.3V)
 CCH = 0mV → 200mV
 SWO = L → H

LED OPEN TEST

CH1 → Vout CH2 → SWO CH3 → PWM CH4 → Iout

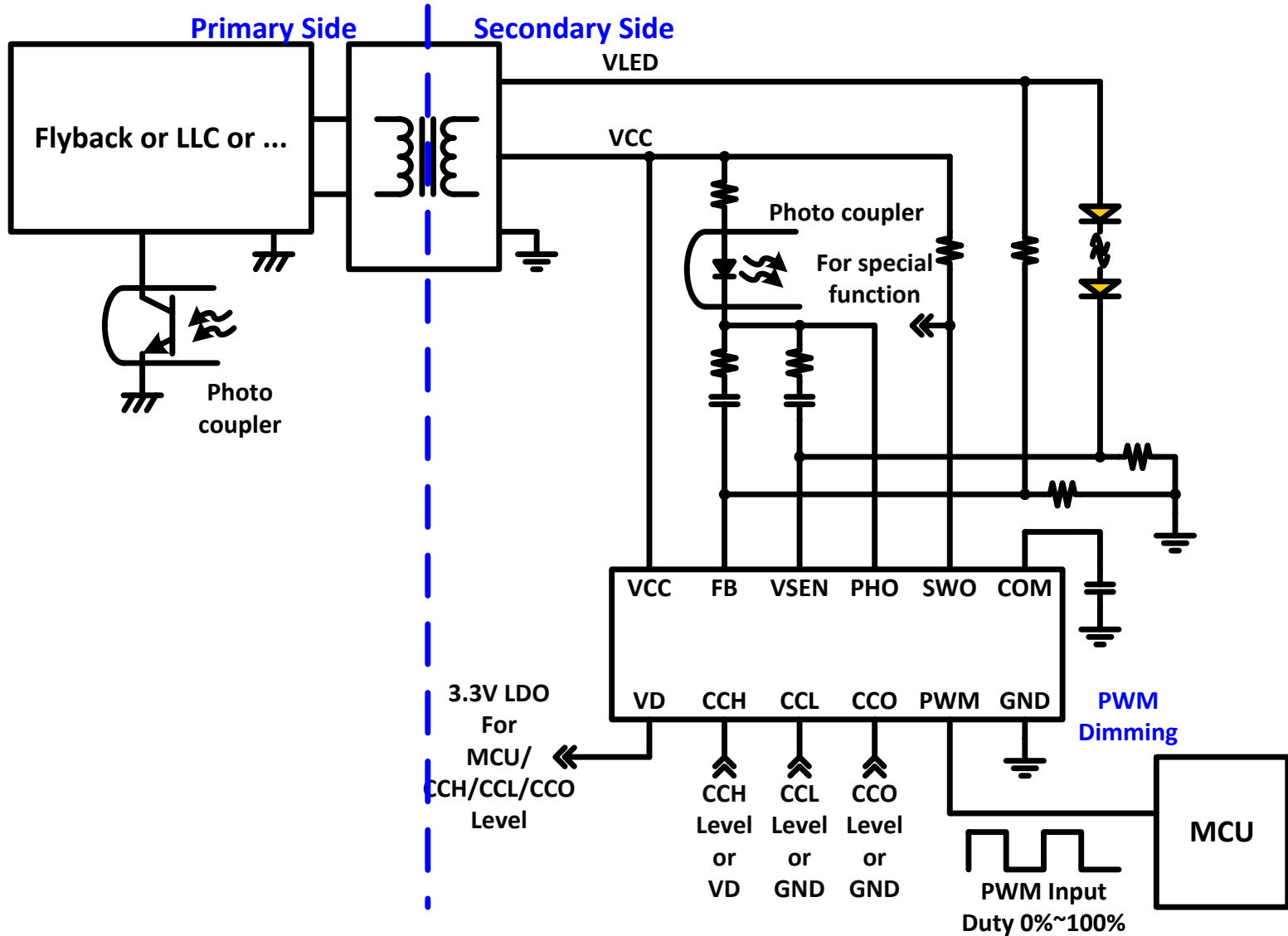


PWM Duty = 100%
LED Open
Iout = 200mA → 0mA



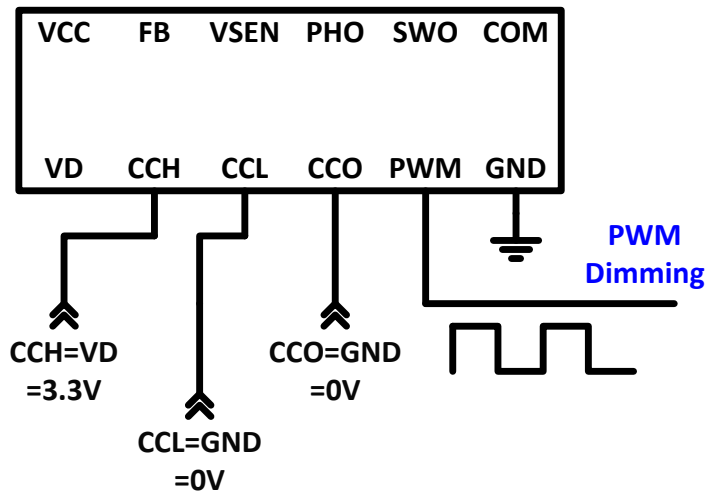
WM Duty = 10%
LED Open
Iout = 200mA → 0mA

APPLICATION CIRCUIT DIAGRAM – PWM DIM



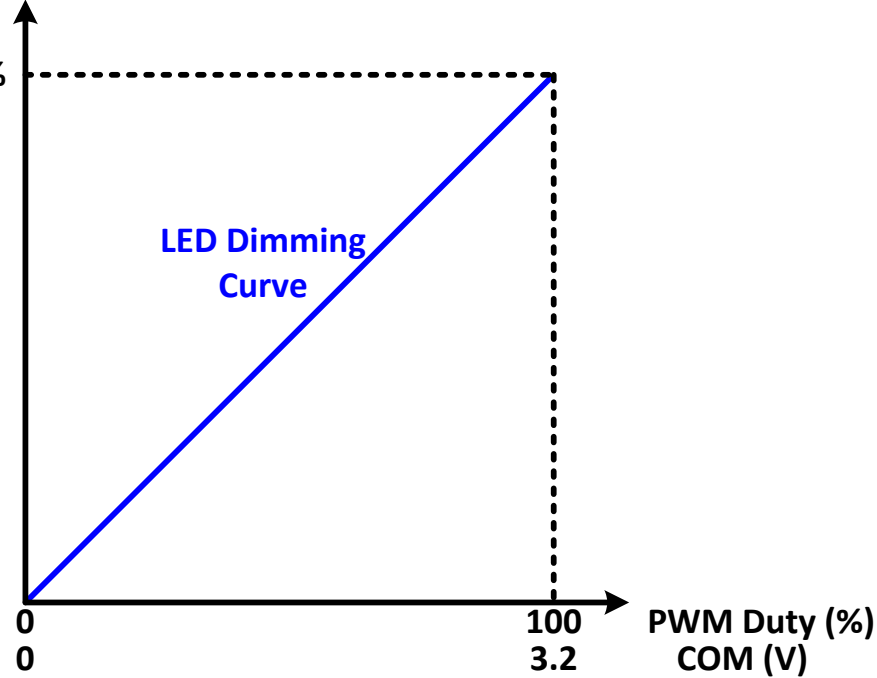
PWM DIMMING CURVE – EXAMPLE 1

CCH / CCL / CCO Setting



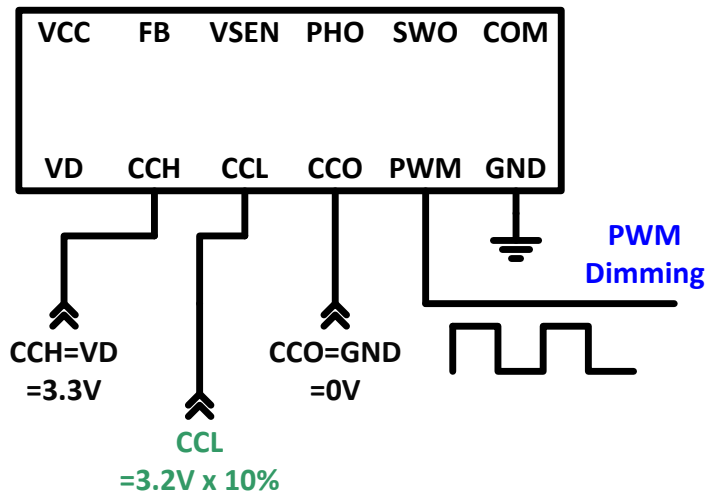
VSEN Reference Voltage / LED Current Ratio

200mV / 100%

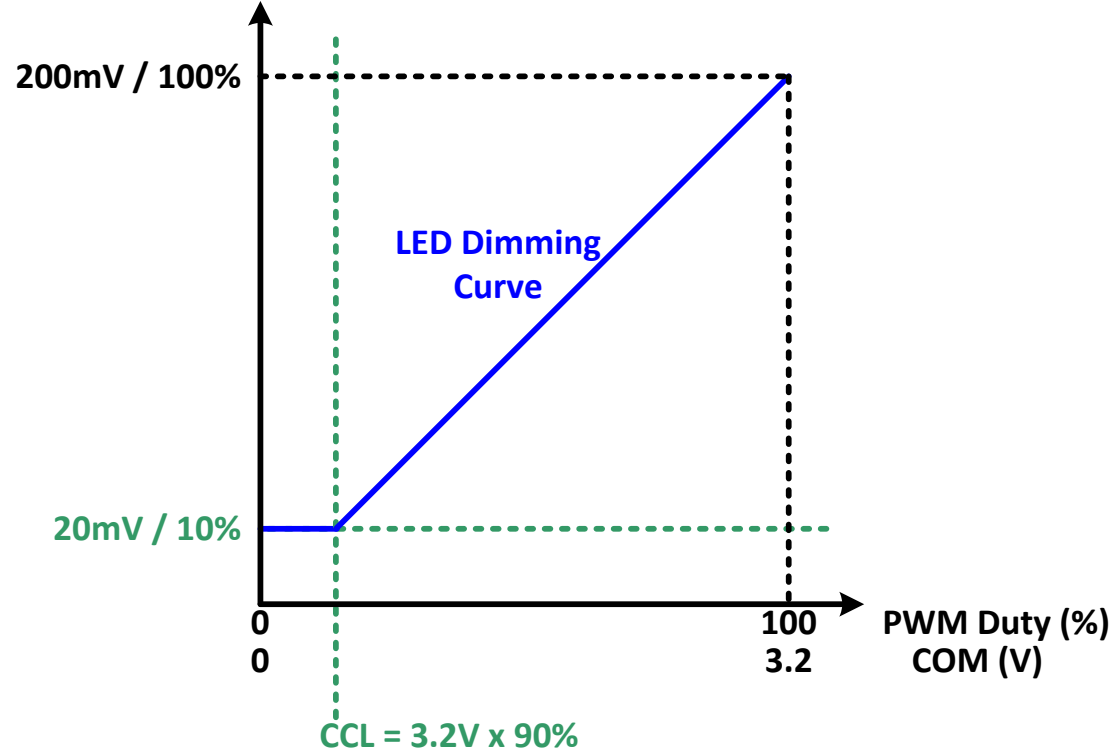


PWM DIMMING CURVE – EXAMPLE 2

CCH / CCL / CCO Setting

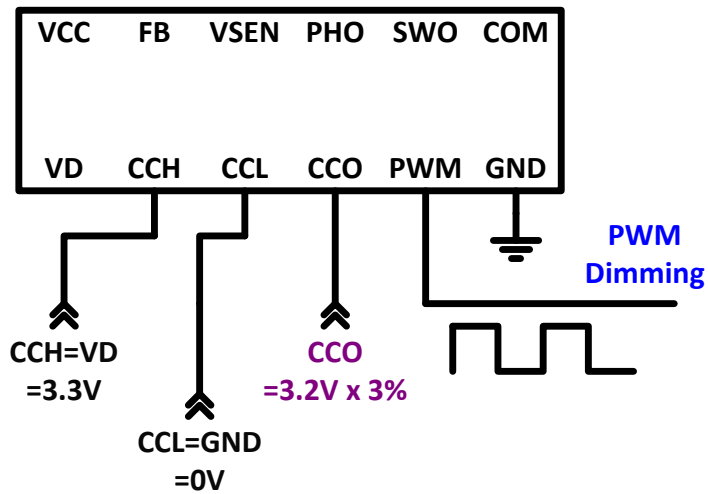


VSEN Reference Voltage / LED Current Ratio

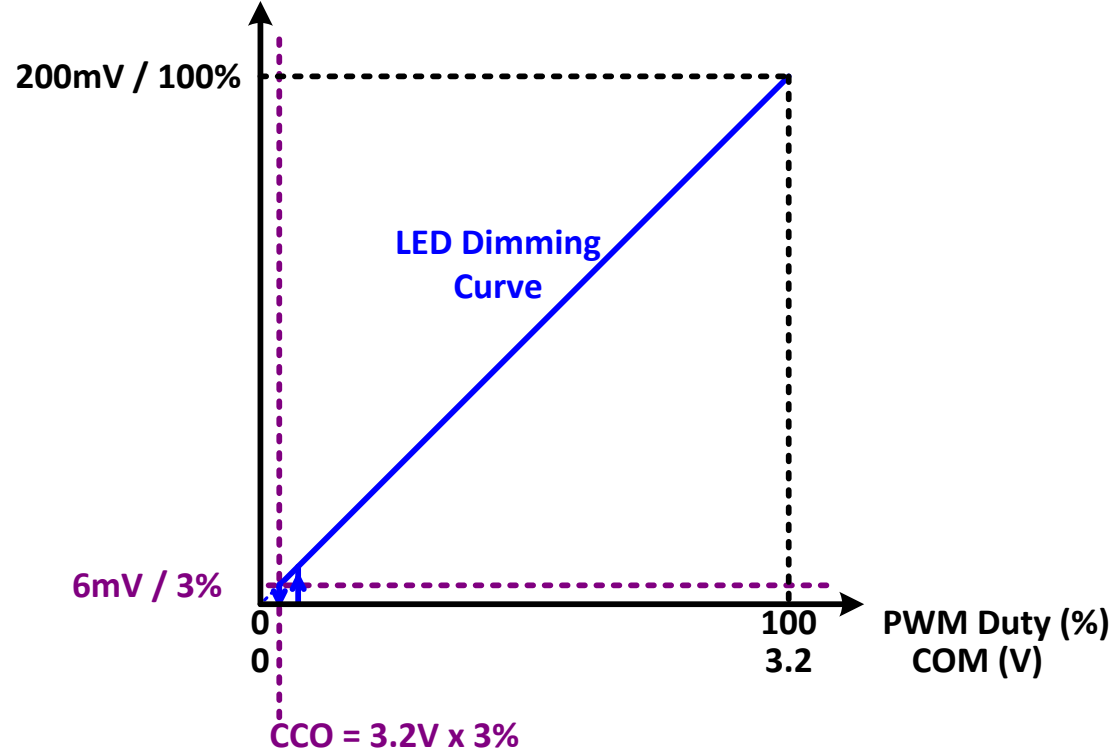


PWM DIMMING CURVE – EXAMPLE 3

CCH / CCL / CCO Setting

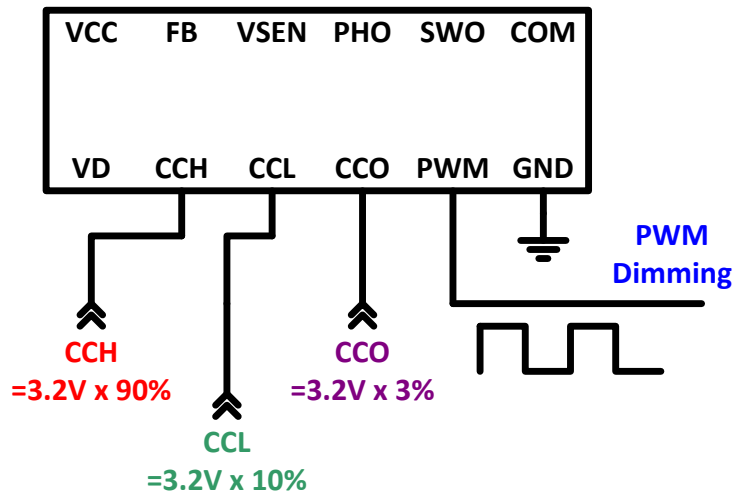


VSEN Reference Voltage / LED Current Ratio

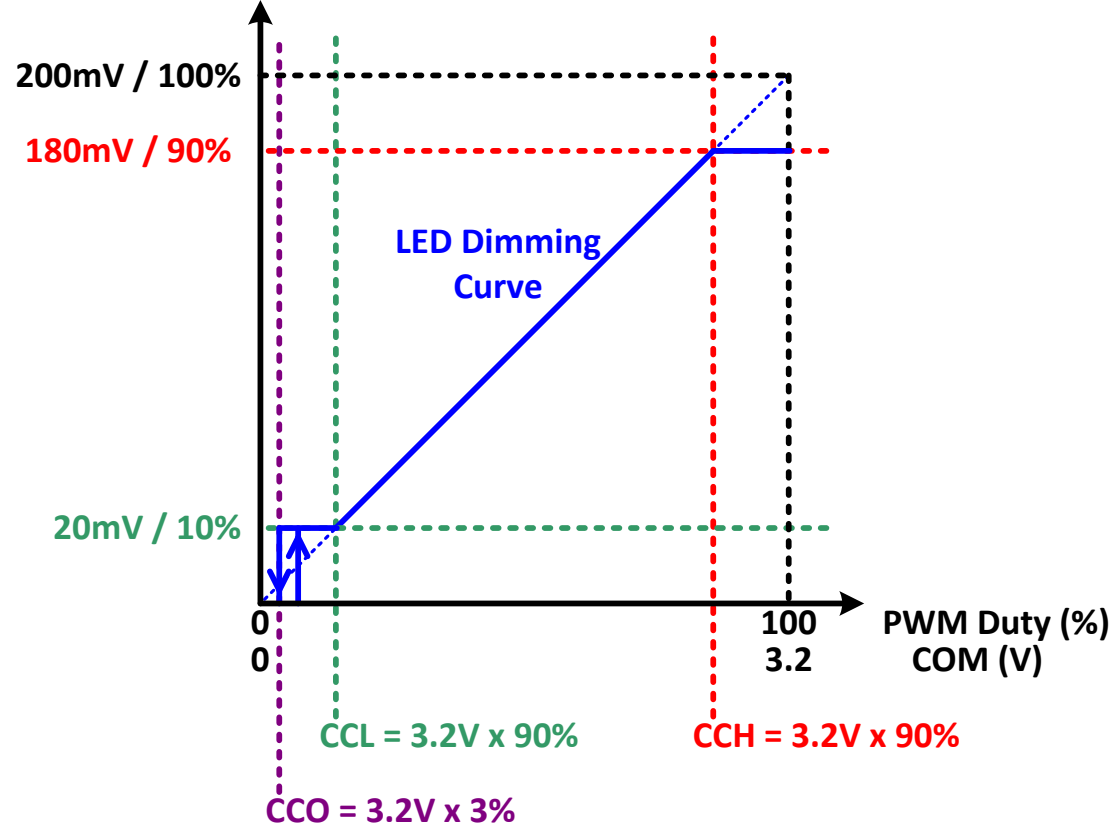


PWM DIMMING CURVE – EXAMPLE 4

CCH / CCL / CCO Setting

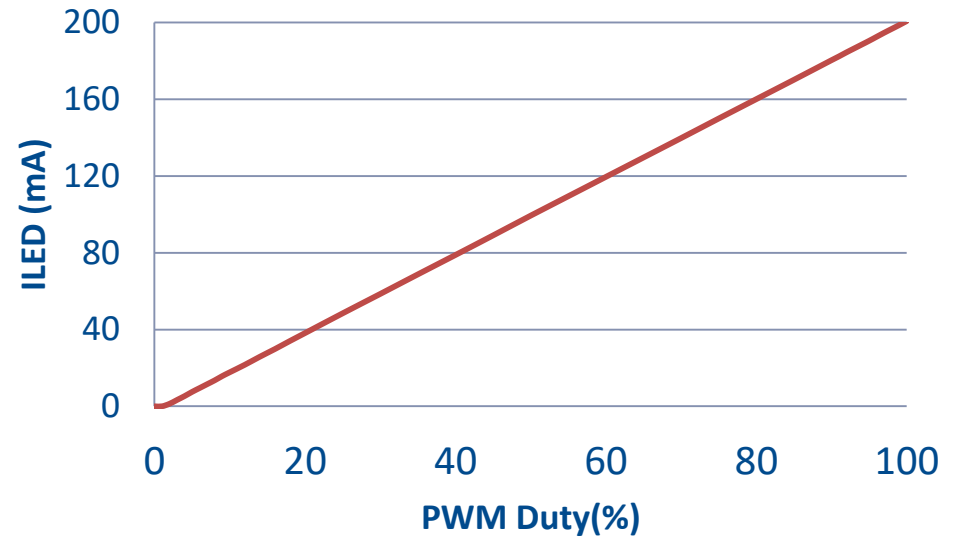
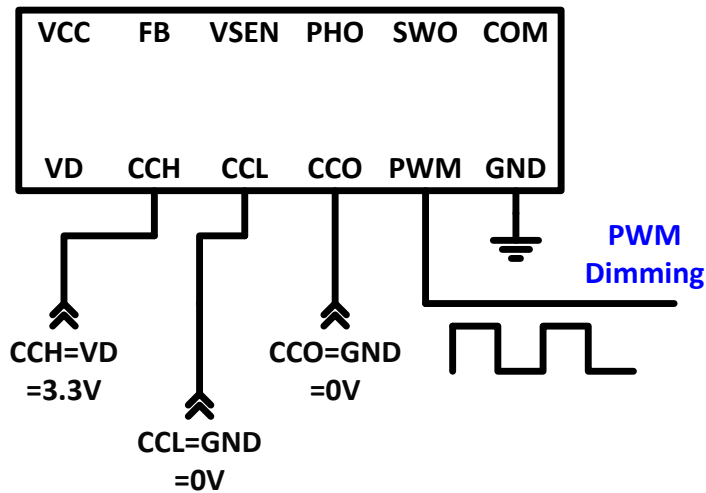


VSEN Reference Voltage / LED Current Ratio



PWM DIMMING CURVE – REAL DESIGN 1

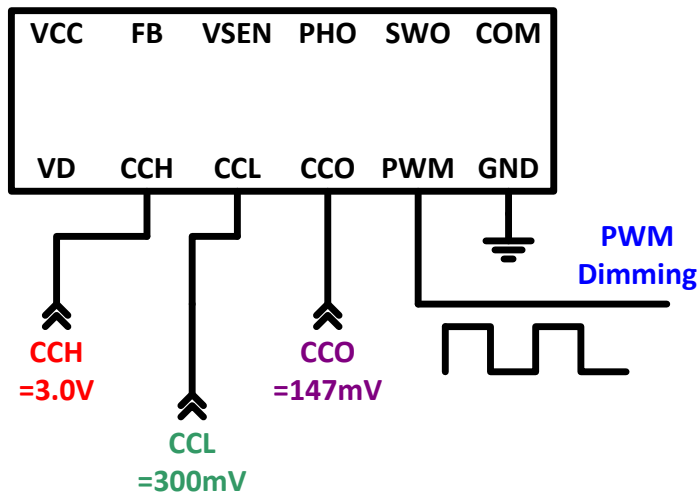
CCH / CCL / CCO Setting



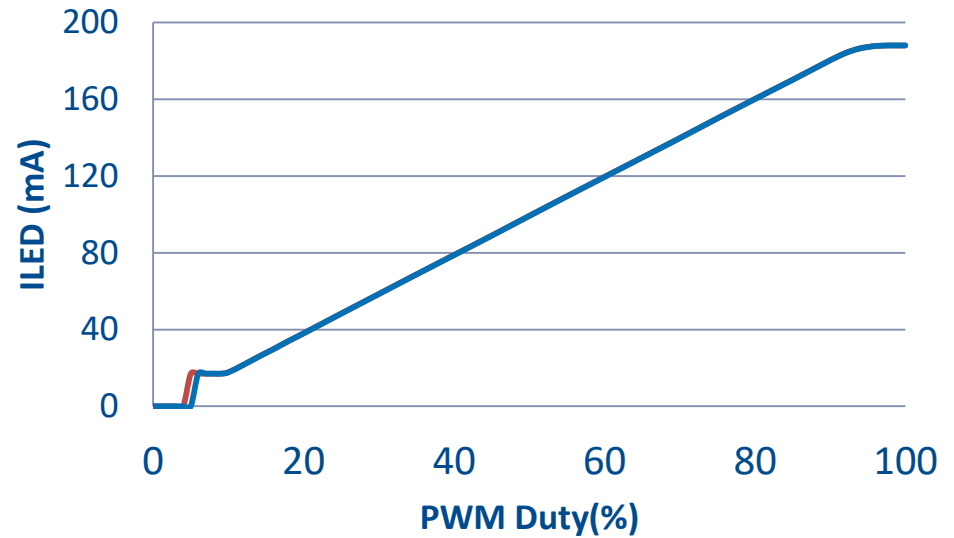
PWM Dimming Frequency = 1KHz

PWM DIMMING CURVE – REAL DESIGN 2

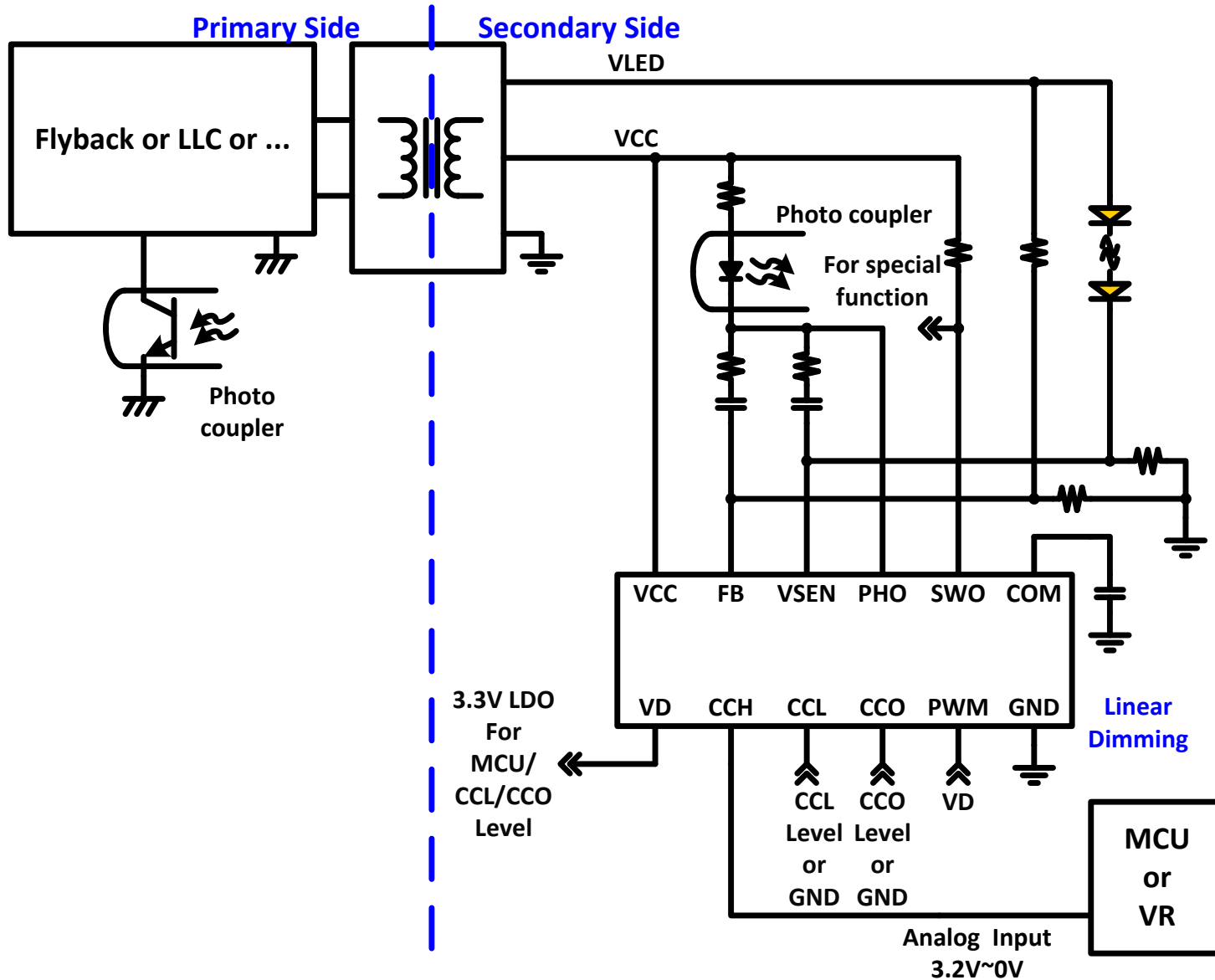
CCH / CCL / CCO Setting



PWM Dimming Frequency = 1KHz



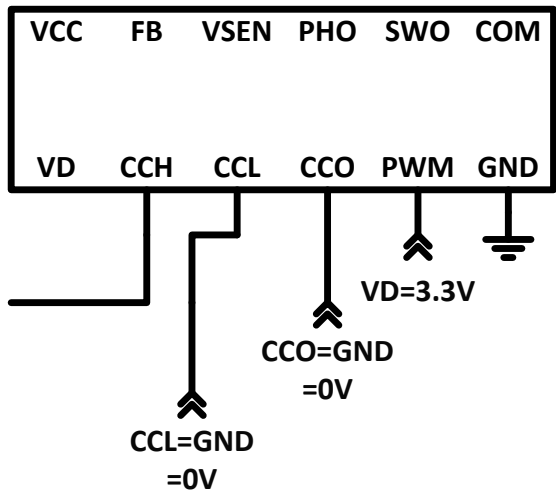
APPLICATION CIRCUIT DIAGRAM – LINEAR DIM



LINEAR DIMMING CURVE – EXAMPLE 1

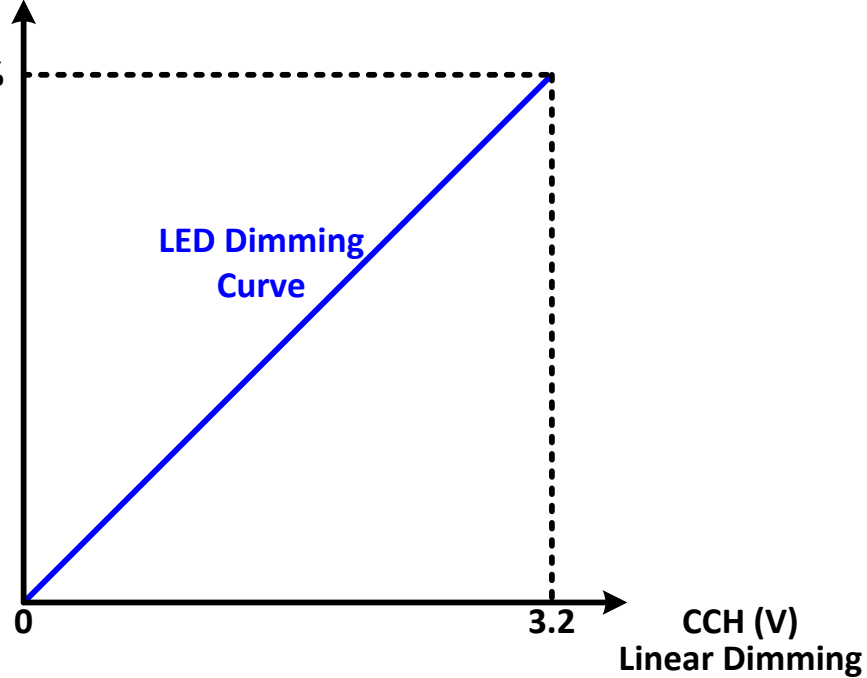
CCH / CCL / CCO Setting

Linear Dimming
3.2V~0V



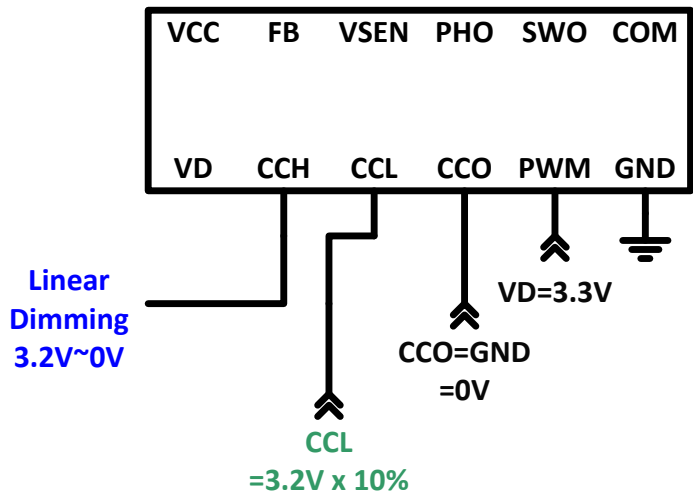
VSEN Reference Voltage / LED Current Ratio

200mV / 100%

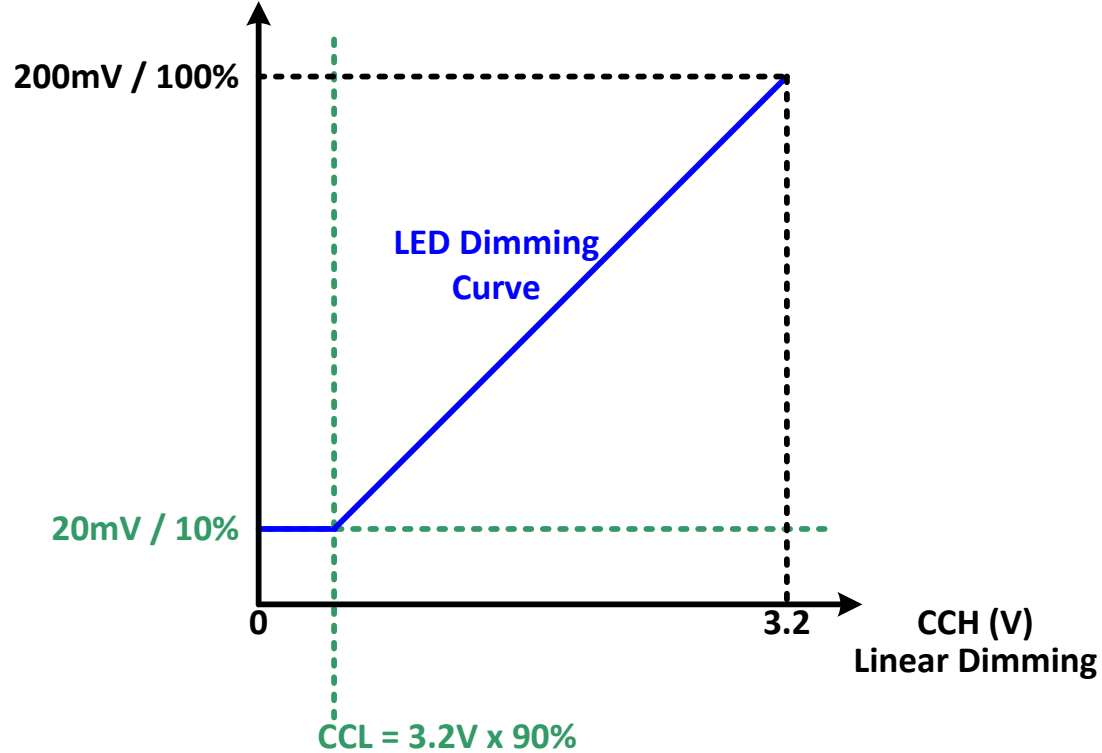


LINEAR DIMMING CURVE – EXAMPLE 2

CCH / CCL / CCO Setting

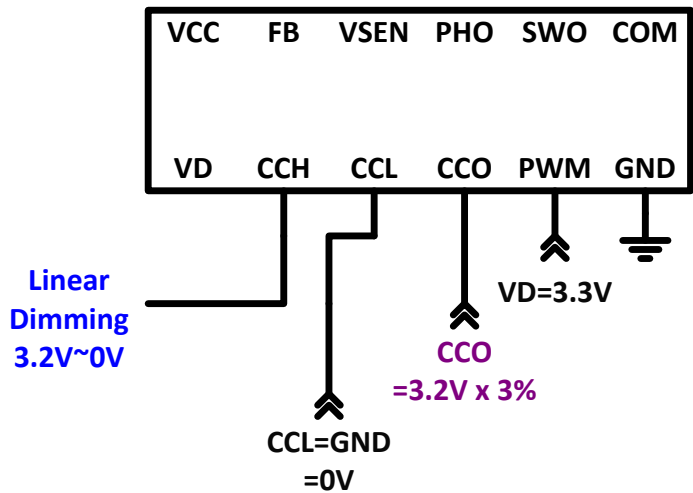


VSEN Reference Voltage / LED Current Ratio

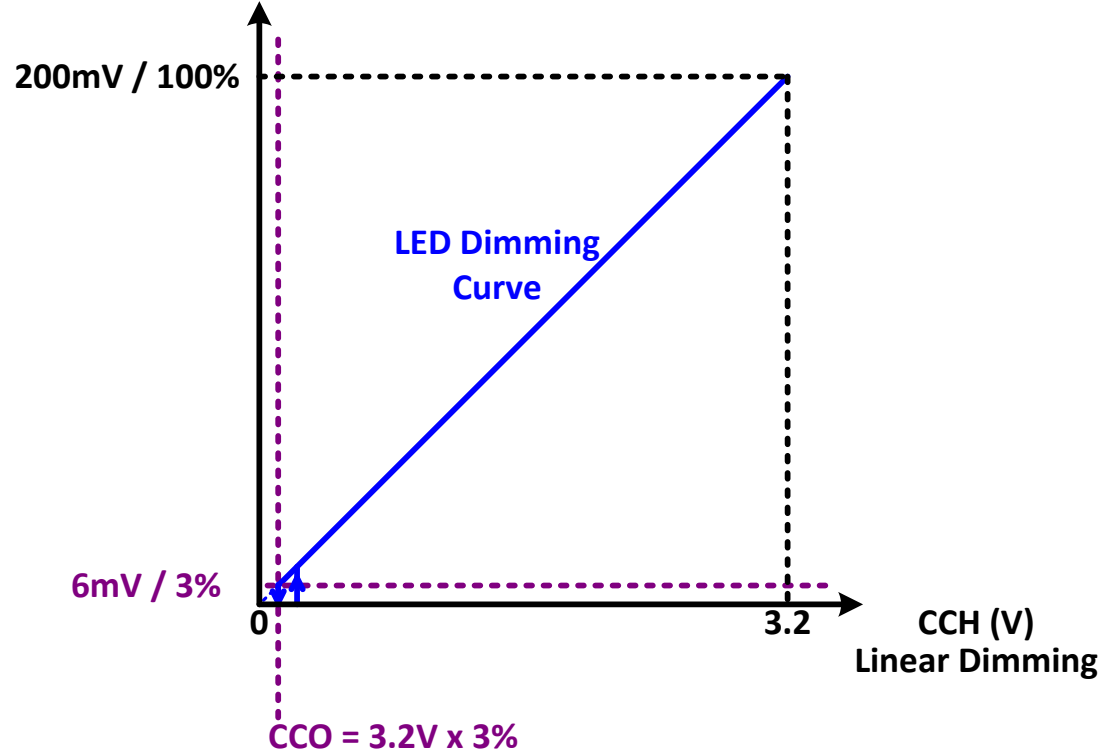


LINEAR DIMMING CURVE – EXAMPLE 3

CCH / CCL / CCO Setting

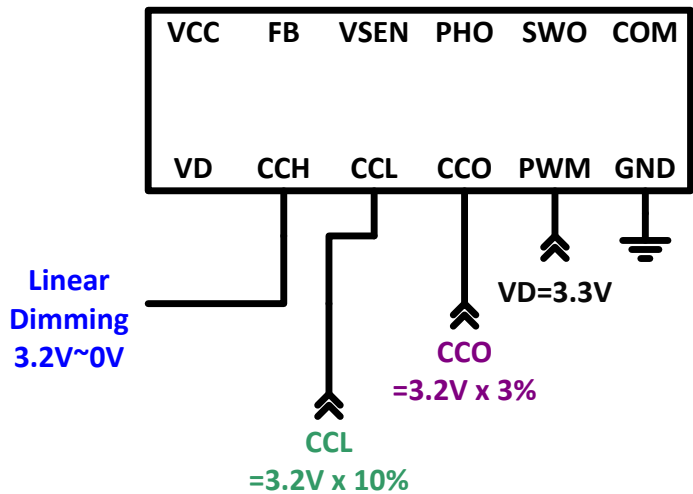


VSEN Reference Voltage / LED Current Ratio



LINEAR DIMMING CURVE – EXAMPLE 4

CCH / CCL / CCO Setting

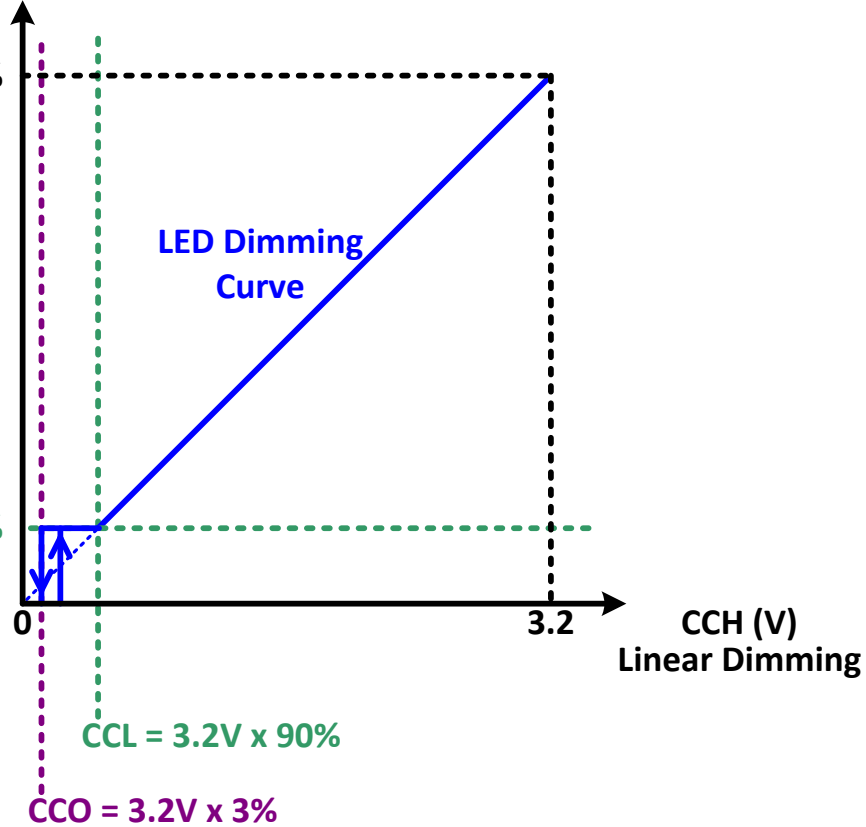


VSEN Reference Voltage / LED Current Ratio

200mV / 100%

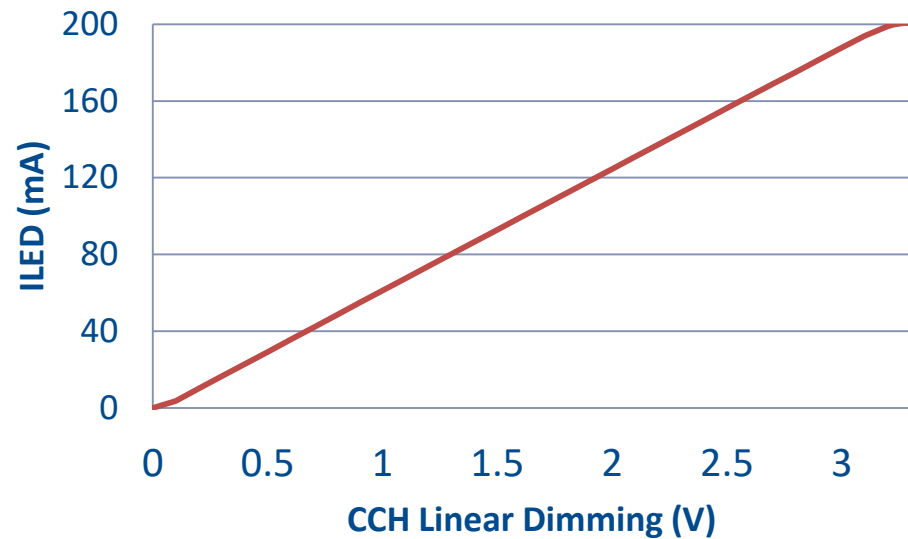
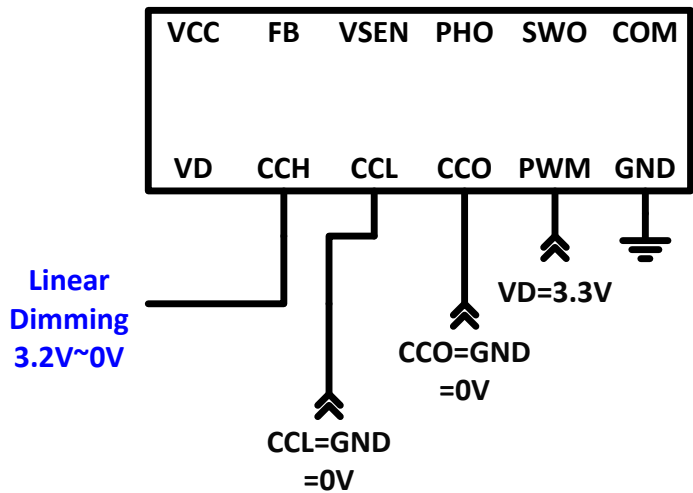
180mV / 90%

20mV / 10%



LINEAR DIMMING CURVE – REAL DESIGN 1

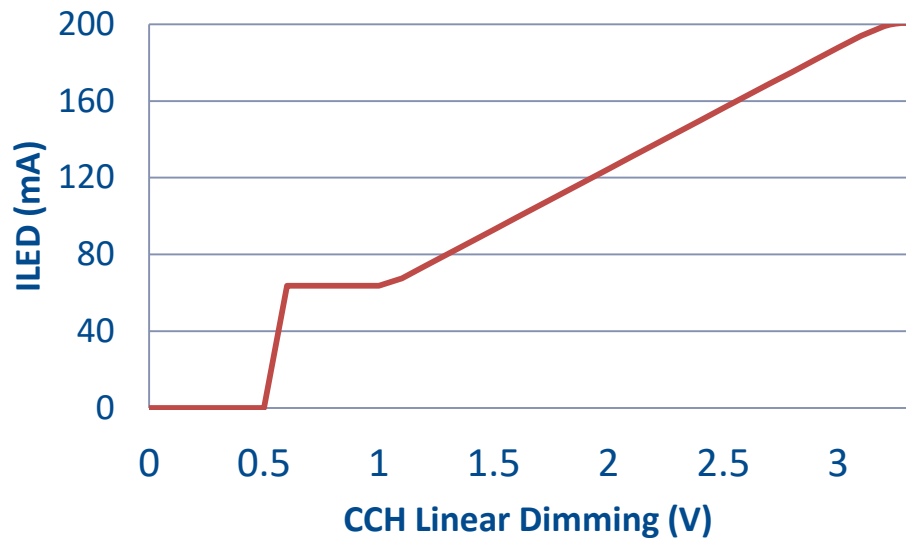
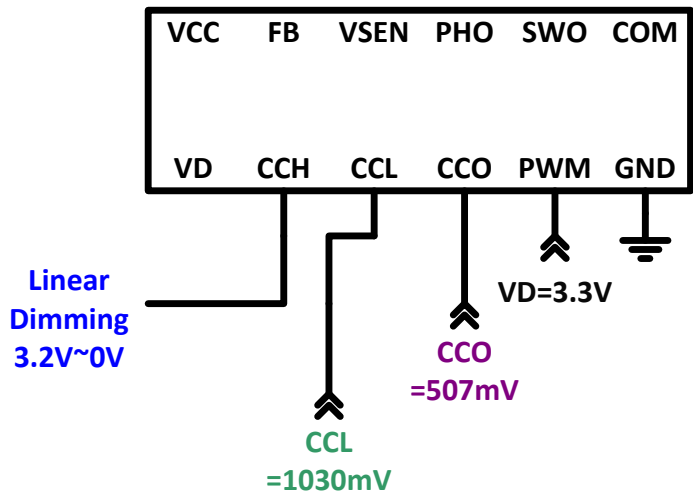
CCH / CCL / CCO Setting



Linear Dimming Voltage = 3.2V~0V

LINEAR DIMMING CURVE – REAL DESIGN 1

CCH / CCL / CCO Setting



Linear Dimming Voltage = 3.2V~0V

THANK YOU

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