

Ricoh's
Power
Management IC

R1580N Series

**34V Constant-Current LED Driver Controller
Using PWM-IN/Linear-OUT Dimming**

Now on Sale!

OUTLINE and FEATURES

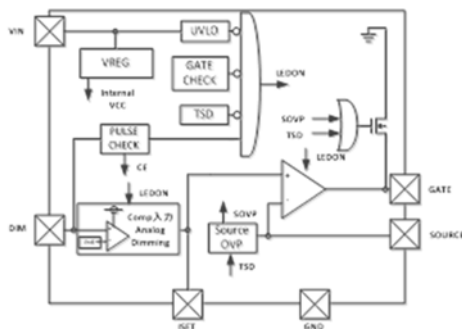
Linear Dimmable from 0.5%

The R1580N is a 34-V constant-current LED controller. In addition to a basic constant current control circuit, it has a linear dimming controller using a PWM input signal. A high-accuracy constant-current LED driver can be configured by only adding an Nch MOSFET, a current sensing resistor and capacitors to the R1580N. The R1580N is offered in a small 6-pin SOT-23-6 package.

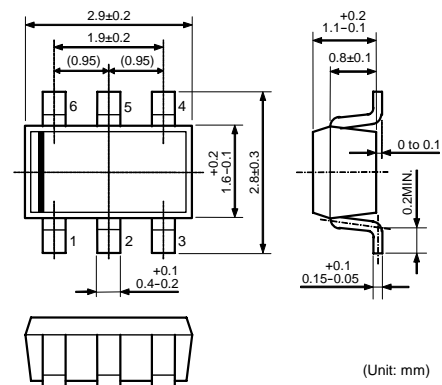
R1580 (LED Controller)

Input Voltage	: 3.6V ~ 34V	Operating Temperature	: -40°C ~ 85°C
Supply Current	: Typ. 320uA	Package	: SOT-23-6
Standby Current	: Typ. 140uA (001A/002A)	Thermal Shutdown Circuit (TSD)	
	: Typ. 28uA (003A)	Under-voltage Lockout Circuit (UVLO)	

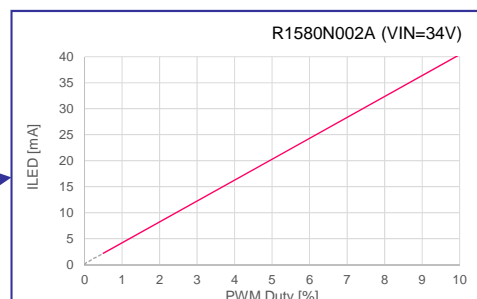
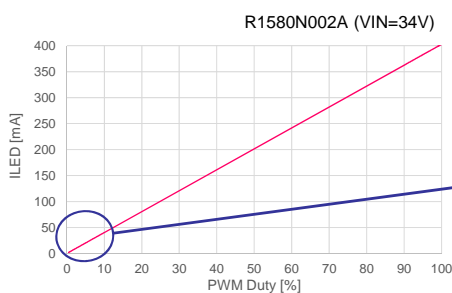
Block Diagram (001A/002A)



Package(SOT-23-6)



R1580 Accuracy



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SELECTION GUIDE

Product Variation	Dimming Range	Efficiency	Standby Current	PWM Signal Input
R1580N-001A	Good (1%-100%)	Good Ref Vol = 0.4 V (100%)	Good 140 μ A (Typ.)	Comparator H = 1.3 V, L = 1.1 V
R1580N-002A	Very Good (0.5%-100%)	Not Good Ref Vol = 0.8 V (100%)	Good 140 μ A (Typ.)	Comparator H = 1.3 V, L = 1.1 V
R1580N-003A	Good (1%-100%)	Good Ref Vol = 0.4 V (100%)	Very Good 28 μ A (Typ.)	CMOS-INV H = 1.2 V, L = 0.4 V

TYPICAL APPLICATION CIRCUIT

1. Power Source for LED

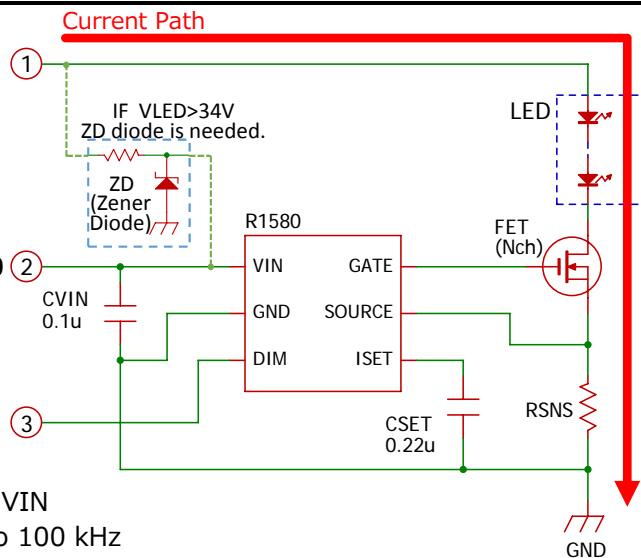
The external FET allows users to preset the desired output voltage/current without any restriction.

2. Power Source for R1580

1. can be used as a power source voltage if it is between 3.6 V to 34 V.

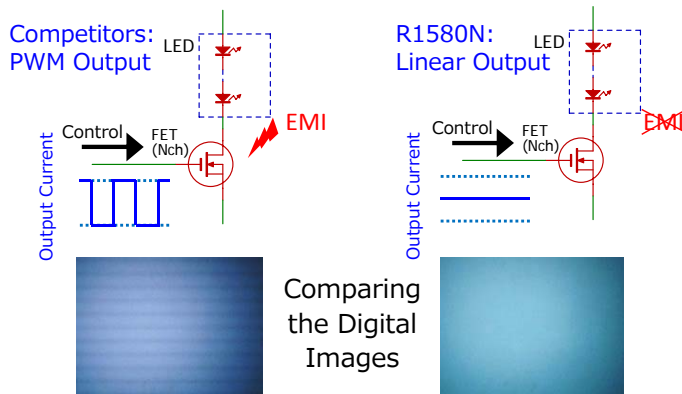
3. Current Control using a PWM Signal

Input voltage: lower than VIN
PWM frequency: 500 Hz to 100 kHz



The R1580x uses an external FET that allow users to preset their desired output current/voltage without any restriction. It converts the input PWM signal into a DC voltage corresponding to the duty ratio in order to drive the external FET to execute a constant-voltage/current control on the SOURCE pin voltage. The R1580N001A/003A and the R1580N002A are capable of adjusting the voltage/current down to 1/100 and 1/200, respectively.

PWM vs Linear



Comparing the Digital Images

The R1580N is a linear output type LED driver controller. Unlike general LED drivers with PWM dimming, it can provide smooth and consistent LED dimming over a wide dimming range without flicker even at low dimming levels. It also provides very little Electromagnetic Interference (EMI).