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## 34 V Constant-Current LED Driver Controller Evaluation Board

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No. EEV-365-002A-0020-220511

R1580N002A-0020-EV is the evaluation board for R1580 which has the below features, benefits and specifications.

### OUTLINE

The R1580N is a 34-V constant-current LED driver controller. Internally, this device consists of a linear dimming controller using a PWM input signal, a thermal shutdown circuit (TSD), and an undervoltage lockout circuit (UVLO) in addition to the basic constant-current control circuits. A flicker-free wide-dimming constant-current LED driver can be configured by only adding an Nch MOSFET, a current sensing resistor and capacitors to the R1580N. The FET to control current flow is placed externally, so that the R1580N will not give any influence on the current range capable of dealing with. The R1580N is linear dimmable with using a PWM signal on the DIM pin. The R1580N is capable of performing a constant-current control corresponding to the different PWM duty cycles. The R1580N002A is linear dimmable as low as 0.5% PWM duty cycle. Unlike other LED drivers with PWM dimming, the R1580N can provide a smooth flicker-free dimming operation using linear dimming. The R1580N is offered in a small 6-pin SOT-23-6 package.

### FEATURES

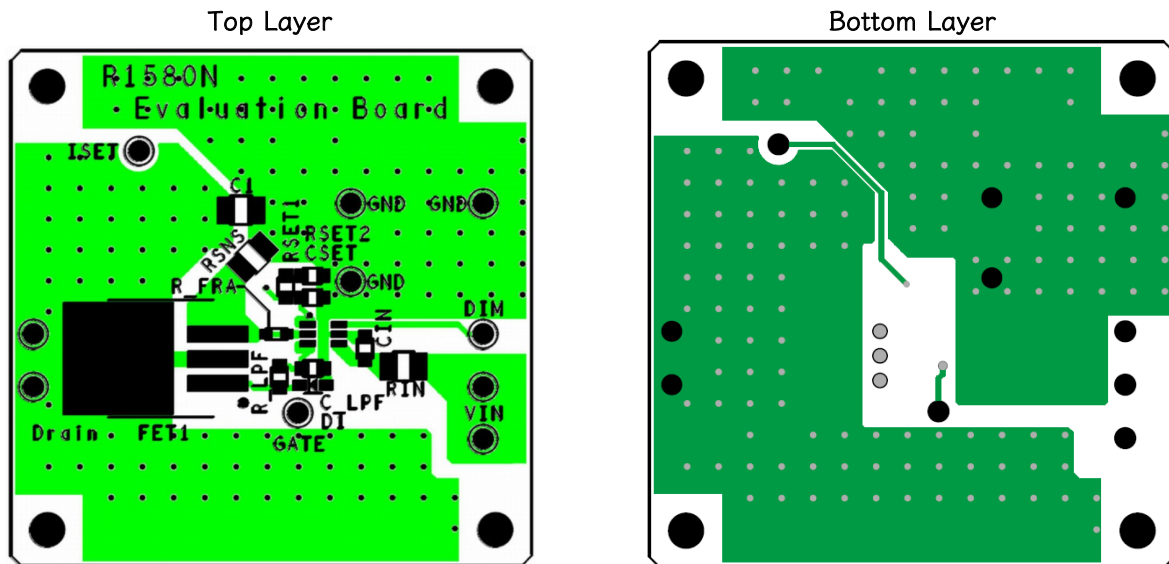
#### **R1580N002A**

- Input Voltage Range (Max. Rating): 3.6 V to 34.0 V (36.0 V)
- Operating Temperature Range: -40°C to 85°C
- Line Regulation: Typ. 0.01%/V
- Thermal Shutdown Protection
- Linear Dimmable Using a PWM Signal
- LED current set value: 20 mA
- Package: SOT-23-6
- For more details on R1580 IC, please refer to <https://www.nisshinbo-microdevices.co.jp/en/pdf/datasheet/r1580-ea.pdf>

#### **R1580N002A (Comparator Input, 0.5% PWM Duty)**

- Max. SOURCE Pin Voltage Accuracy (100% PWM Duty): Typ. 800 mV ±16 mV
- Min. SOURCE Pin Voltage Accuracy (0.5% PWM Duty): Typ. 4 mV ±2 mV
- Supply Current: Typ. 320 μA, Standby Current: Typ. 140 μA

## PCB LAYOUT



## ABSOLUTE MAXIMUM RATINGS

### Absolute Maximum Ratings

Symbol	Parameter			Rating	Unit
$V_{IN}$	VIN Pin Voltage			-0.3 to 36	V
$V_{DIM}$	DIM Pin Voltage			-0.3 to $V_{IN} + 0.3$	V
$V_{ISET}$	ISET Pin Voltage			-0.3 to $V_{IN} + 0.3$	V
$V_{SOURCE}$	SOURCE Pin Voltage			-0.3 to 6.5	V
$V_{GATE}$	GATE Pin Voltage			-0.3 to $V_{IN} + 0.3$	V
$I_{DIM}$	DIM Pin Current			20	mA
$P_D$	Power Dissipation <sup>(1)</sup>	SOT-23-6	JEDEC STD.51-7	660	mW
$T_j$	Junction Temperature Range			-40 to 125	°C
$T_{stg}$	Storage Temperature Range			-55 to 125	°C

### ABSOLUTE MAXIMUM RATINGS

Electronic and mechanical stress momentarily exceeded absolute maximum ratings may cause the permanent damages and may degrade the life time and safety for both device and system using the device in the field. The functional operation at or over these absolute maximum ratings are not assured.

## RECOMMENDED OPERATING CONDITIONS

### Recommended Operating Conditions

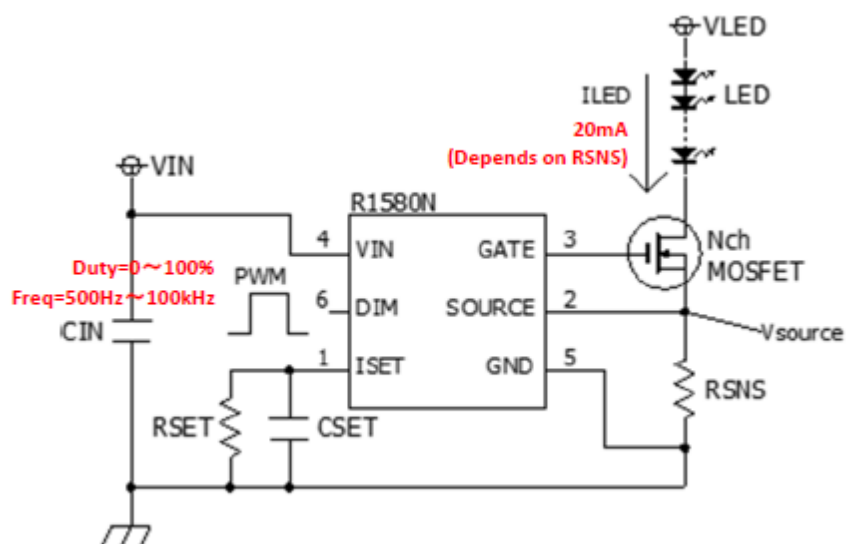
Symbol	Parameter			Rating	Unit
$V_{IN}$	Operating Input Voltage			3.6 to 34	V
$T_a$	Operating Temperature Range			-40 to 85	°C

### RECOMMENDED OPERATING CONDITIONS

All of electronic equipment should be designed that the mounted semiconductor devices operate within the recommended operating conditions. The semiconductor devices cannot operate normally over the recommended operating conditions, even if when they are used over such conditions by momentary electronic noise or surge. And the semiconductor devices may receive serious damage when they continue to operate over the recommended operating conditions.

<sup>(1)</sup> Refer to *POWER DISSIPATION* for detailed information.

## TYPICAL APPLICATION



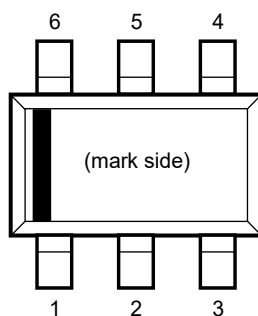
R1580N002A-0020-EV Typical Application Circuit

Recommended Components<sup>(1)</sup>

Symbol	Value
CIN	0.1 $\mu$ F
CSET	0.22 $\mu$ F
FET	
RSNS	20 $\Omega$ + 20 $\Omega$
RSET	OPEN

<sup>(1)</sup>The bill of materials will be attached on the shipment of each purchased evaluation board.

## PIN DESCRIPTIONS



**SOT-23-6 Pin Configuration**

### SOT-23-6 Pin Description

Pin No.	Pin Name	Description
1	ISET	Current Setting Pin
2	SOURCE	Nch MOSFET Source Input Pin
3	GATE	Nch MOSFET Gate Output Pin
4	VIN	Power Supply Pin
5	GND	Ground Pin
6	DIM	PWM Signal Input Pin



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