

**20mA Constant Current Regulator**

**Features**

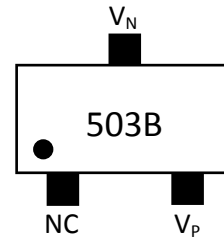
- The most easy used linear constant current LED driver
- Do not need to take  $V_{DD}$  power
- 20mA constant current regulator
- 1.6V ~ 15V wide working voltage range
- 1uS current rising time, support power supply PWM dimming function
- Less than 1%/V line/load regulation
- 125°C ~ 160°C junction temperature current ramp down thermal protect
- -40°C ~ 85°C operating temperature
- Pb free

**Applications**

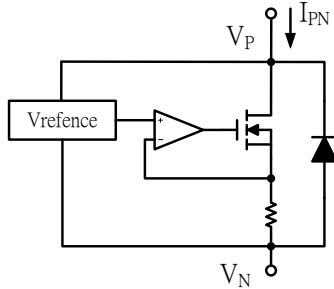
- LED strip
- General LED lighting
- LCD back lighting
- LED torch / flashlight

**Package Type**

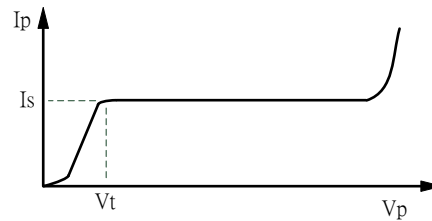
- SOT 23-3 (2.9mm \* 1.3mm)



**Block Diagram and Ideal IV characteristic**



IV curve



**Maximum Ratings (T = 25°C)**

Characteristic	Symbol		Rating	Unit
Supply voltage	$V_{PN}$		-0.2 ~ 16	V
Reverse voltage	$V_R$		0.5	V
Power Dissipation (Ta=25°C)	PD	SOT 23	0.25	W
Thermal Resistance (On PCB, Ta=25°C)	$R_{TH(j-a)}$	SOT 23	300	°C /W
Operating temperature	$T_{OPR}$		-40~+85	°C
Storage temperature	$T_{STG}$		-55~+150	°C

**Electrical Characteristics and Recommended Operating Conditions**

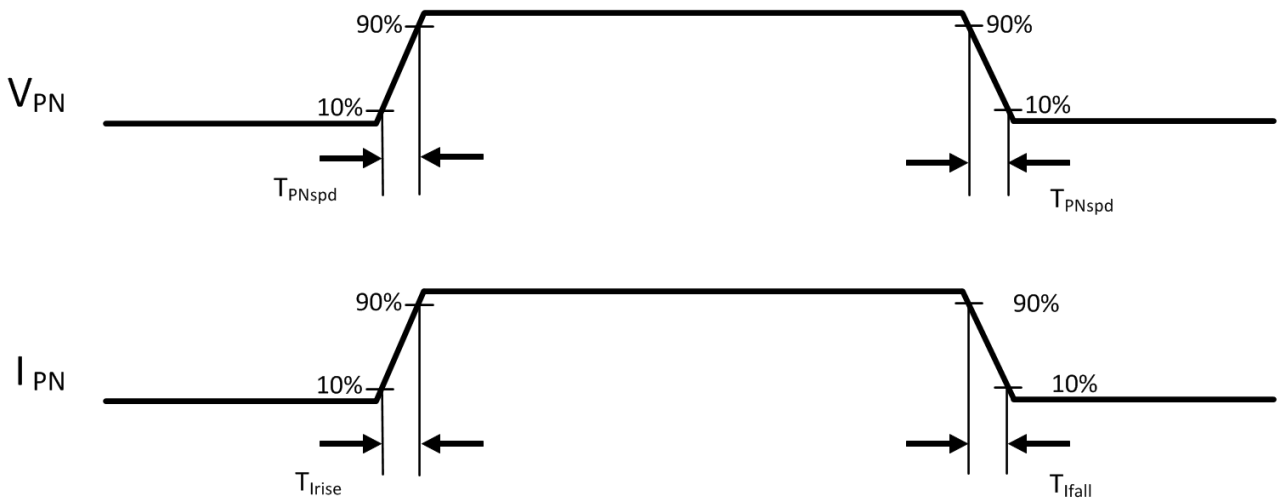
Characteristic	Symbol	Condition	Min.	Typ.	Max.	Unit
Minimum dropout voltage	$V_{PNmin}$	$I_{PN} = I_S$	-	1.5	1.6	V
Maximum output voltage	$V_{PNmax}$	$I_{PN} = I_S$	-	-	15	V
Output current	$I_S$	Spec.	-	20	-	mA
Line/Load regulation	$\%/V_P$	$10V > V_{PN} > 1.6V$	-	-	$\pm 1$	$\%/V$

**Switching Characteristics (T = 25°C)**

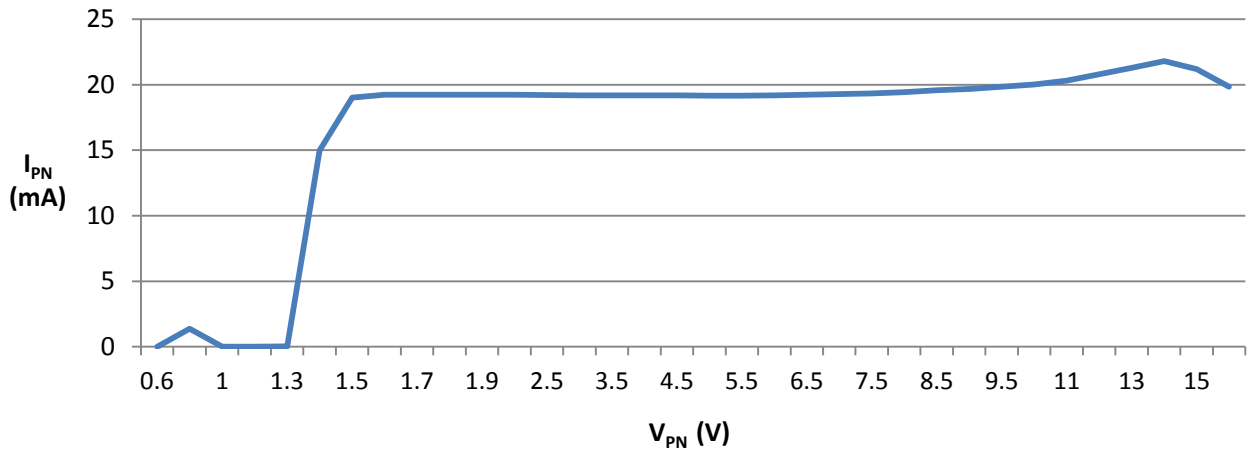
Characteristic	Symbol	Condition	Min.	Typ.	Max.	Unit
Output current rising time	$T_{Irise}$	$V_{PN} = 0V \rightarrow 3V$	-	0.25	1	$\mu S$
Output current falling time	$T_{Ifall}$	$V_{PN} = 3V \rightarrow 0V$	-	0.1	0.5	$\mu S$
Supply voltage rising and falling speed <sup>*1</sup>	$T_{PNspd}$	$V_{PN} \leq 5V$	0.05	-	-	$\mu S$
		$V_{PN} > 5V$	5	-	-	

\*1 For the stable reason, the rising and falling speed of supply voltage ( $V_{PN}$ ) on NU503B should be slower when higher  $V_{PN}$  than 5V is adopted. Fast and high  $V_{PN}$  transition will bring the timing of output current instable. Please refer to typical application circuit in this specification for proper using.

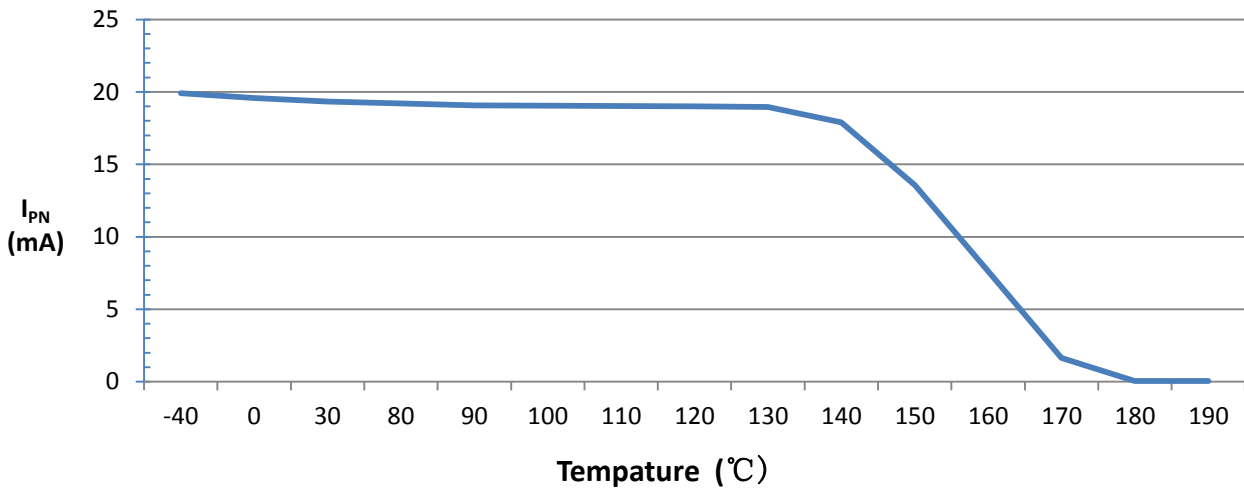
**Timing Waveform**



**I/V curve**

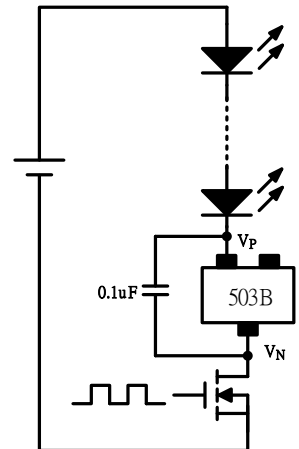
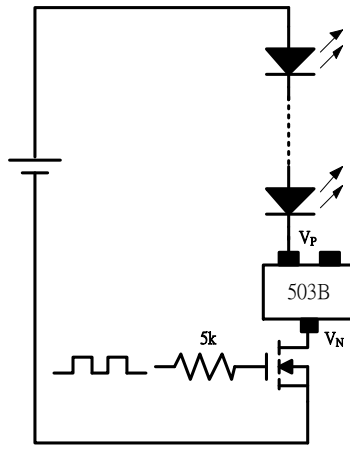
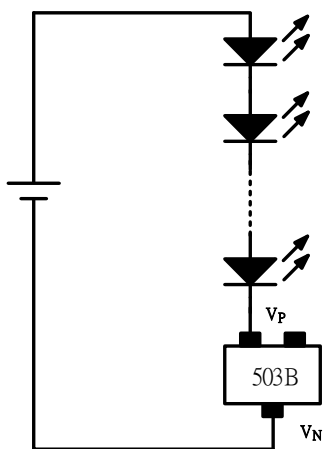


**Thermal protection**



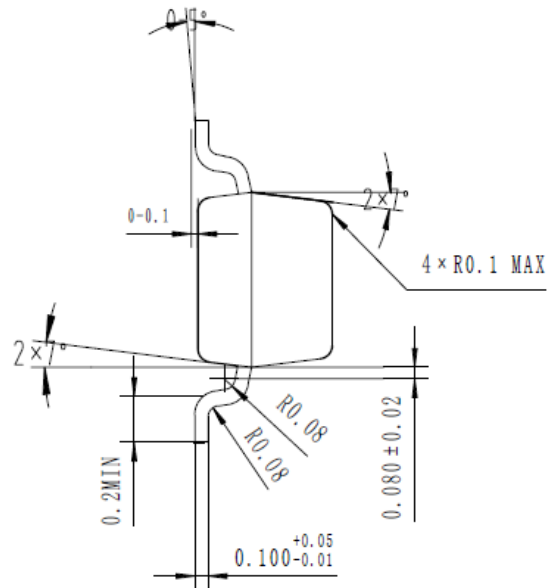
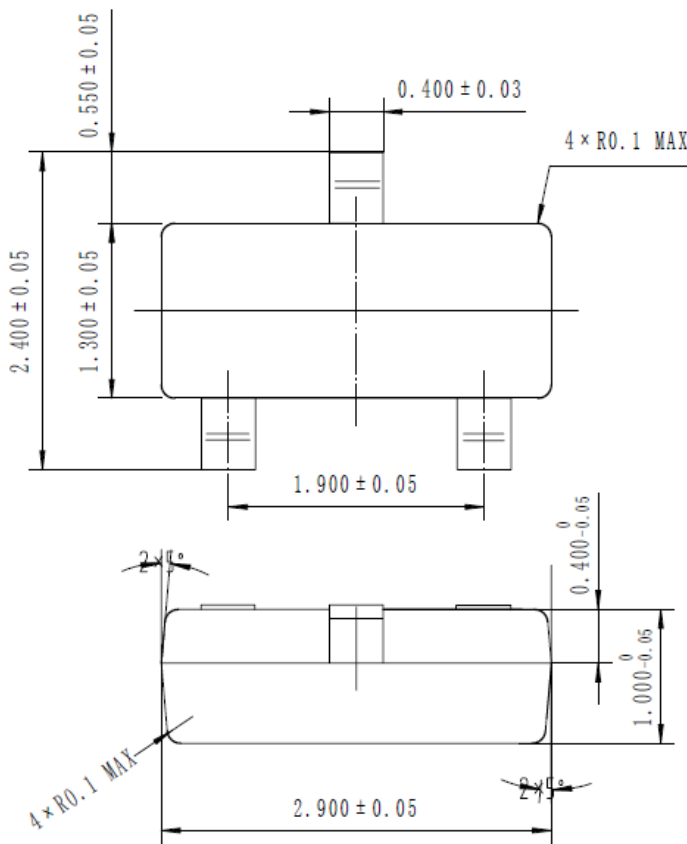
**Application Circuits**

- Lighting application
- LED dimming application



**Package Dimensions**

- SOT23-3



Unit: mm

**Taping Specification**

PACKAGE	Q'TY/REEL
SOT23-3 (1.3mm)	3,000 ea

**Restrictions on product use**

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