

20mA Constant Current Regulator

Features

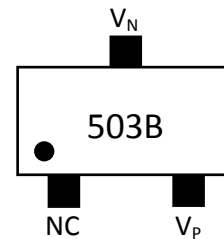
- The most easy used linear constant current LED driver
- Do not need to take V_{DD} power
- 20mA constant current regulator
- 1.6V ~ 15V wide working voltage range
- 1uS current rising time, support power supply PWM dimming function
- Less than 1%/V line/load regulation
- 125°C ~ 160°C junction temperature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

Applications

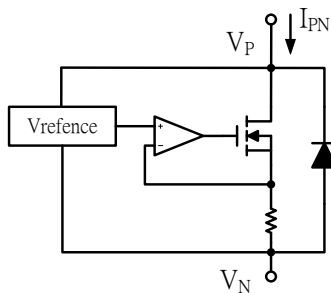
- LED strip
- General LED lighting
- LCD back lighting
- LED torch / flashlight

Package Type

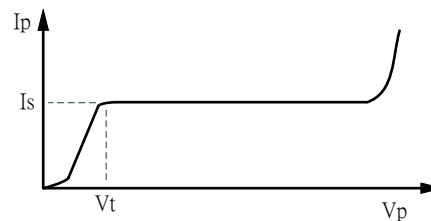
- SOT 23-3 (2.9mm * 1.3mm)



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

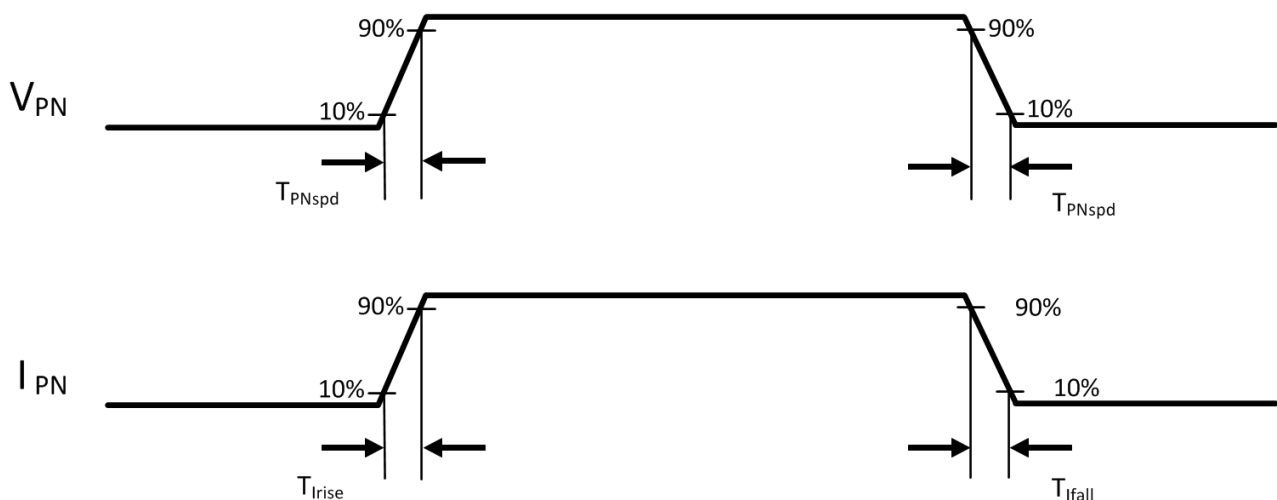
Characteristic	Symbol	Condition	Min.	Typ.	Max.	Unit
Minimum dropout voltage	V_{PNmin}	$I_{PN} = I_S$	-	1.5	1.6	V
Maximum output voltage	V_{PNmax}	$I_{PN} = I_S$	-	-	15	V
Output current	I_S	Spec.	-	20	-	mA
Line/Load regulation	$\%/V_P$	$10V > V_{PN} > 1.6V$	-	-	± 1	$\%/V$

Switching Characteristics (T = 25°C)

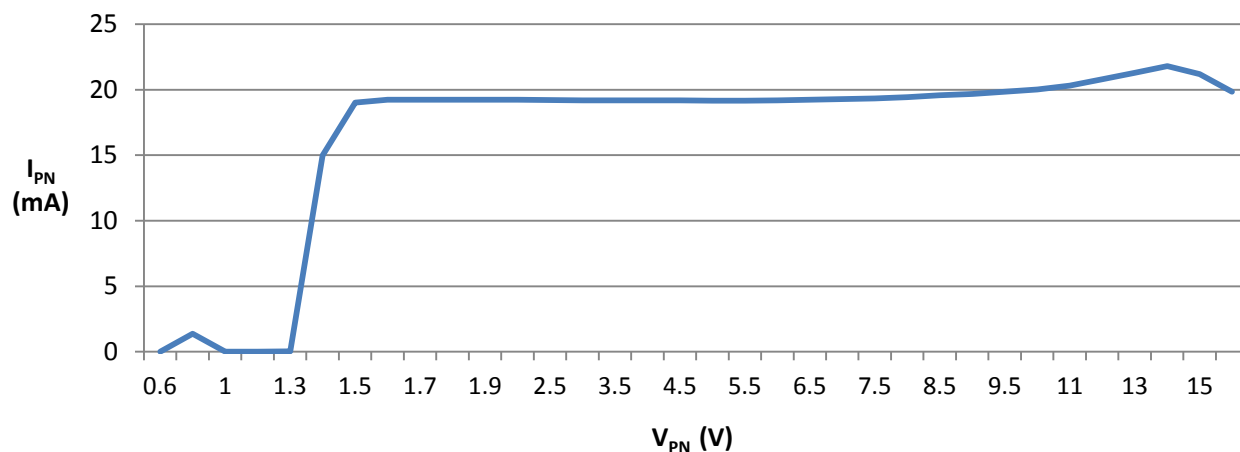
Characteristic	Symbol	Condition	Min.	Typ.	Max.	Unit
Output current rising time	T_{Irise}	$V_{PN} = 0V \rightarrow 3V$	-	0.25	1	μS
Output current falling time	T_{Ifall}	$V_{PN} = 3V \rightarrow 0V$	-	0.1	0.5	μS
Supply voltage rising and falling speed *1	T_{PNspd}	$V_{PN} \leq 5V$	0.05	-	-	μS
		$V_{PN}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

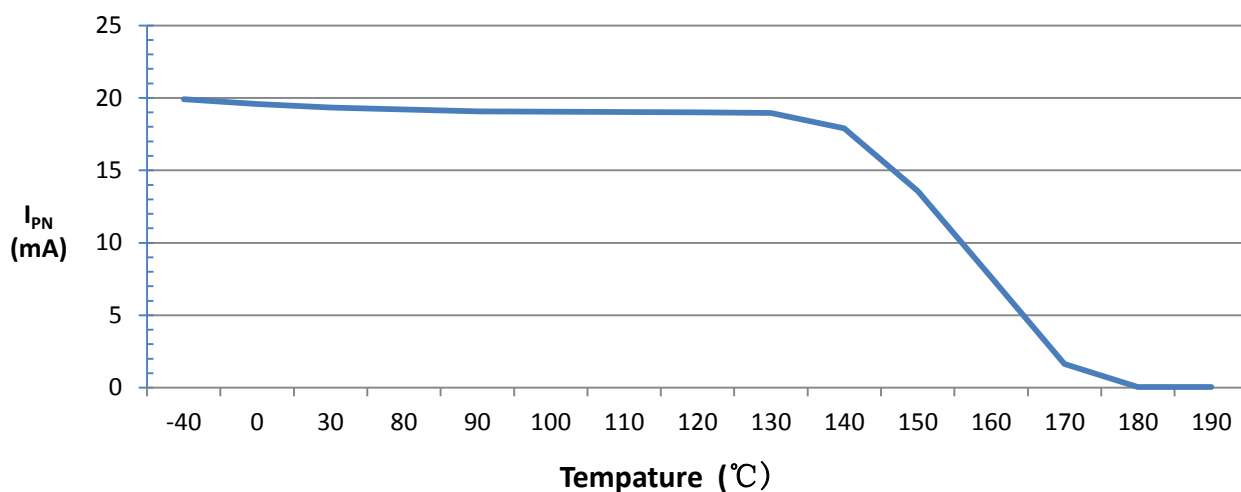
Timing Waveform



I/V curve



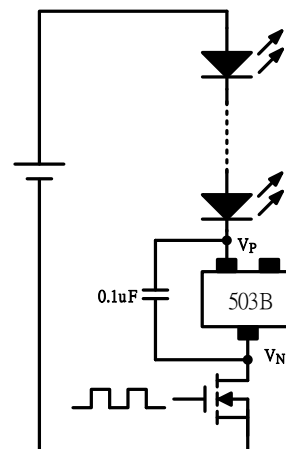
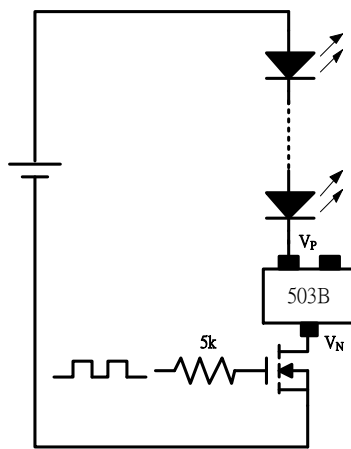
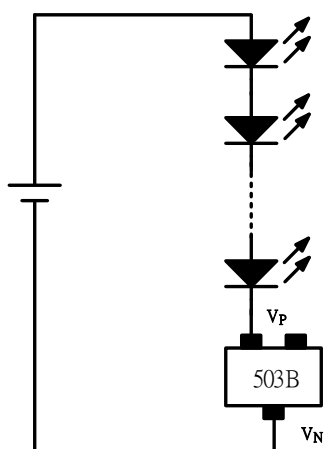
Thermal protection



Application Circuits

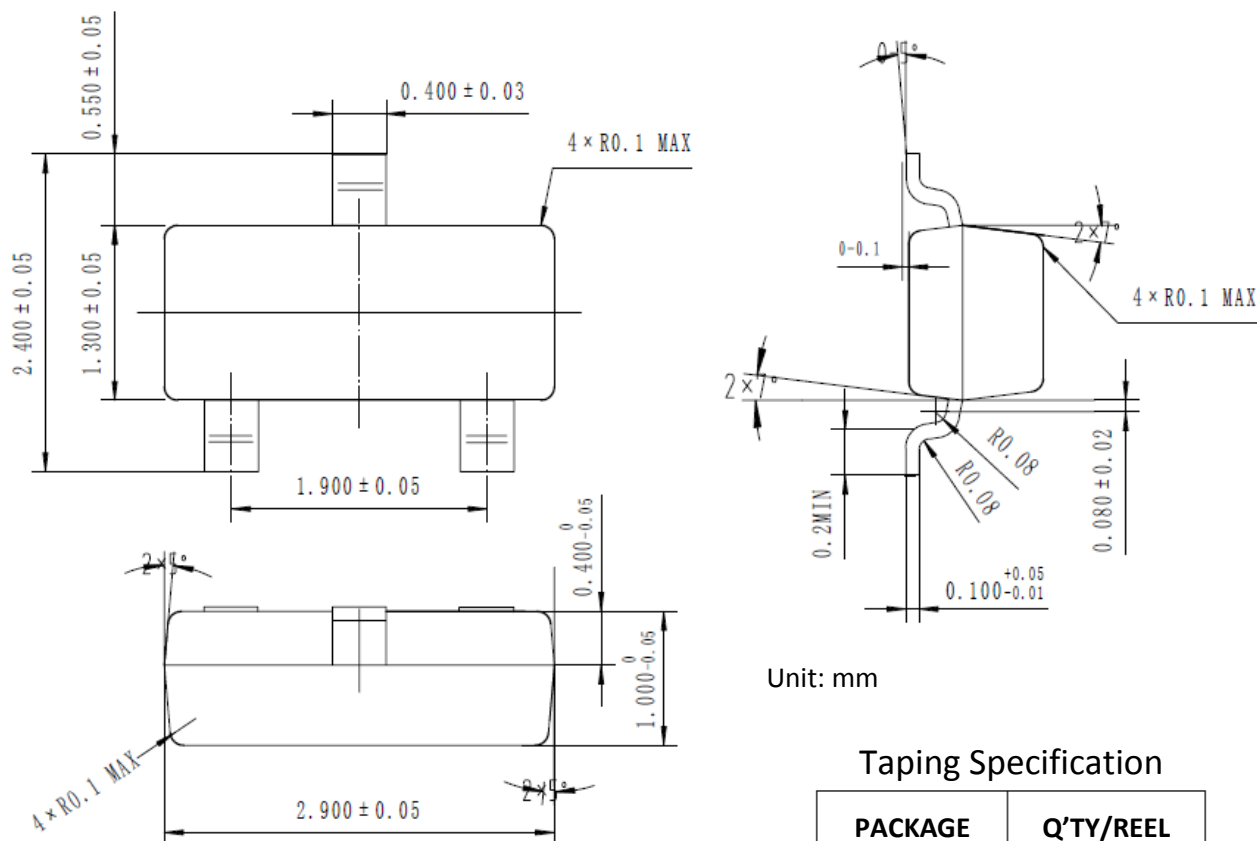
- Lighting application

- LED dimming application



Package Dimensions

● SOT23-3



Taping Specification

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

Restrictions on product use

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