

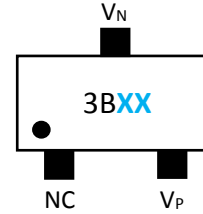
18mA ~ 60mA Constant Current Regulator

Features

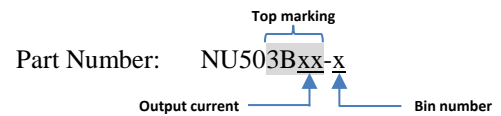
- The most easy used linear constant current LED driver
- Do not need to take VDD power
- 18mA~60mA constant current regulator
- 1.6V ~ 15V wide working voltage range
- 1uS current rising time, support power supply PWM dimming function
- Less than 1%/V line/load regulation
- 125°C ~160°C junction temperature current ramp down thermal protect
- -40°C ~ 85°C operating temperature
- 8kV ESD protection
- Pb free

Package Type

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



Ordering Information



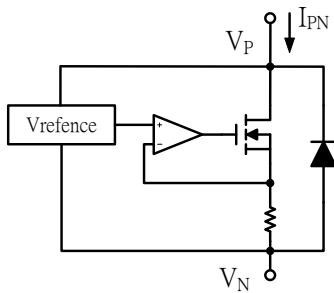
Parts available:

Part No.	Output current
NU503B20-1	18mA ~ 20mA
NU503B20-2	20mA ~ 22mA
NU503B30-1	27mA ~ 30mA
NU503B30-2	30mA ~ 33mA
NU503B40-1	36mA ~ 40mA
NU503B40-2	40mA ~ 44mA
NU503B55-1	50mA ~ 55mA
NU503B55-2	55mA ~ 60mA

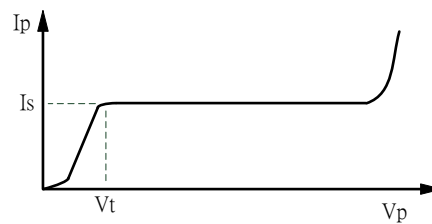
Applications

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

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 23-3	0.4
Thermal Resistance (On PCB, Ta=25°C)	R _{TH(j-a)}	SOT 23-3	300
Operating temperature	T _{OPR}	-40~+85	°C
Storage temperature	T _{STG}	-55~+150	°C

Electrical Characteristics and Recommended Operating Conditions

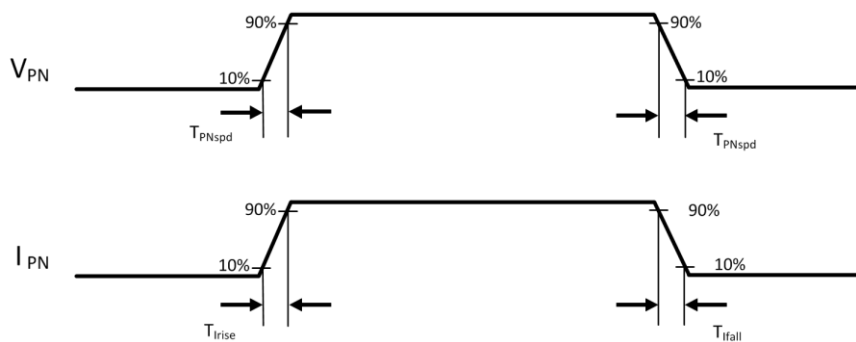
Characteristic	Symbol	Condition	Min.	Typ.	Max.	Unit
Minimum dropout voltage	V_{PNmin}	$I_{PN} = I_S$	-	1.6	1.7	V
Maximum output voltage	V_{PNmax}	$I_{PN} = I_S$	-	-	15	V
Recommended Maximum Operating Power Dissipation	PD_{RMP}	SOT 23-3 Room Temp.	-	-	0.25	W
Output current	I_S	Spec.	18	Bin def.	60	mA
Line/Load regulation	$\%/V_P$	$10V > V_{PN} > 1.6V$	-	-	± 1	$\%/V$
Chip current skew	I_{skew}	$V_{PN} = 3V$	-	-	± 5	$\%/Bin$

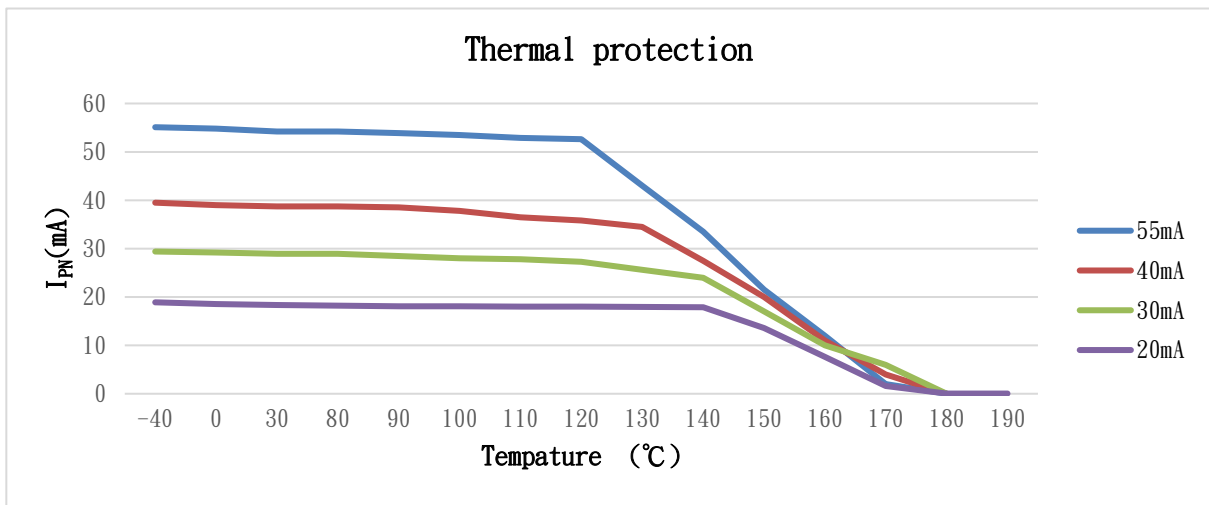
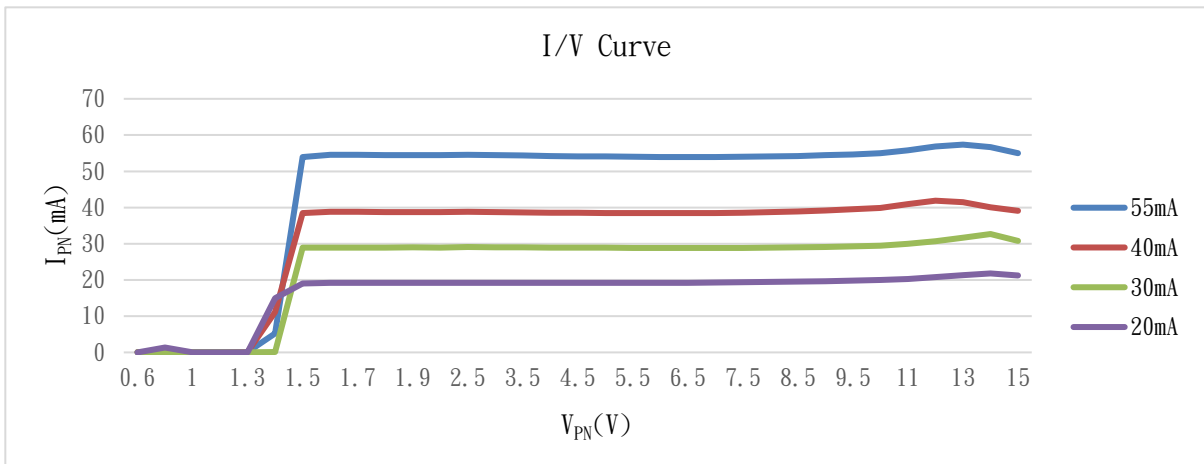
Switching Characteristics (T = 25°C)

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.

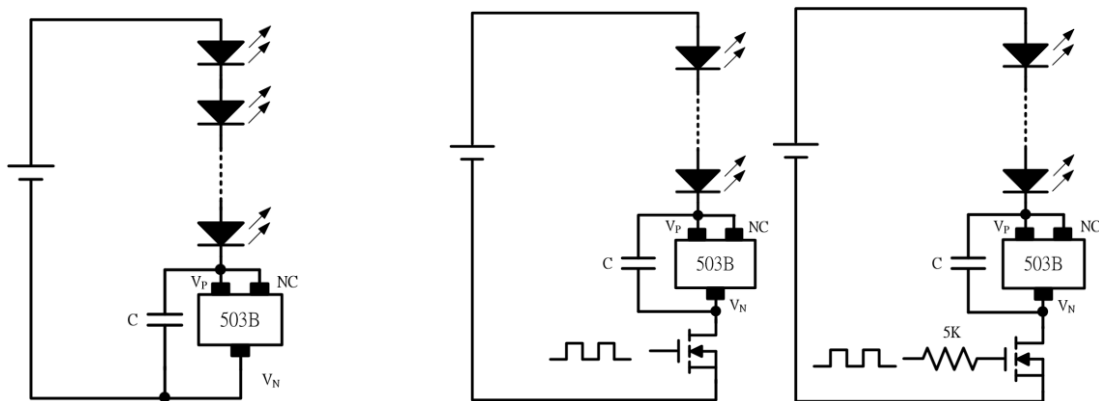
Timing Waveform





Application Circuits

- Lighting application
- LED dimming application

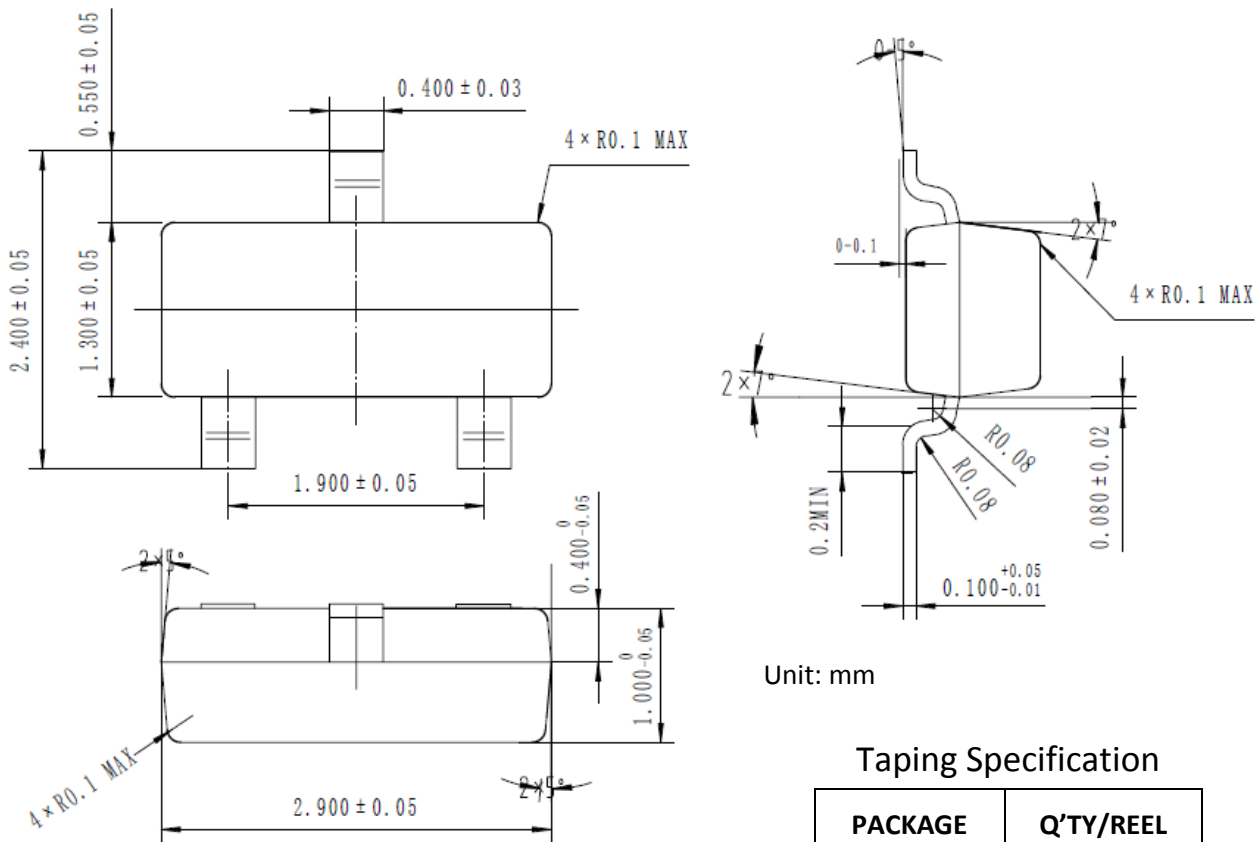


Note:

1. Generally, The capacitance of capacitor when self-power structure is used can be related with LED typical current. For example, if the typical current of LED is 20mA, the capacitance is about 20nF. The capacitance can be adjusted according to the requirement of real applications.
2. The copper area under thermal pad can be extended across the VP and NC pin for better heat dissipating.

Package Dimensions

- SOT23-3



Unit: mm

Taping Specification

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

Restrictions on product use

- NUMEN Tech. reserves the right to update these specifications in the future.
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