Calculating the Input Current of the LDO

Asked 10 months agoModified 10 months agoViewed 563 times



I have an LDO with output specification of 1.8V and 0.45A of load current.

Input voltage is 3.3V. To find out the input current, is my below calculation correct?



Input Current = (1.8V * 0.45A) / 3.3V = 0.245A. Am I correct?



But the LDO just has a pass through element inside it right? It can't be 0.245A as the input current? What mistake am I making here?

I tried to search and found this <u>link</u>. The answers mention about ground pin current. Can someone also explain me what is ground pin current and how we need to consider it in the calculation?

voltage	power	dc-dc-converter	Ido	linear-regulator
---------	-------	-----------------	-----	------------------

ShareCiteFollow

asked Oct 22, 2021 at 6:42

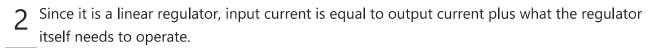


Sorted by:

2 Answers Highest score (defa



No that is not correct.





The current the regulator itself needs to operate from the input current will equal to current coming out of the ground pin.



answered Oct 22, 2021 at 6:45



Justme

Oh, Ok. But if instead of the linear regulator, I use a DC-DC Buck converter for the same input and output specifications, my input current would be 0.245A, right? But considering 85% efficiency, my input current would be 0.288A, right? - Newbie Oct 22, 2021 at 6:47

1 Yes, but that does not relate to LDOs in any way. – Justme Oct 22, 2021 at 6:59

Thank you very much for the answer - Newbie Oct 22, 2021 at 7:05



No, the calculation isn't correct. The LDO input current is almost equal (greater) than output current. You can say that it will be approx 0.45A.

ShareCiteFollow

answered Oct 22, 2021 at 6:46 Marko Buršič



Oh, thank you. I am using this IC. ti.com/lit/ds/symlink/... . On table 6.5, Its given as the quiescent current max is 95uA. So my input current would be 0.45A+95uA, right? - Newbie Oct 22, 2021 at 6:48

And, but if instead of a linear regulator, if I use a DC-DC Buck converter, my calculation of input current, would be correct, right? – Newbie Oct 22, 2021 at 6:49

@Newbie 1st,2nd - Correct. A DC/DC converter would be almost correct calc, except you have to account for self power and efficiency. A LDO has (3.3-1.8)x0.45=0.675W dissipation, which isn't such high. But if you have limited PCB space and battery powered device, then you should go for DC/DC converter. There

are also converters with multiple outputs, PMIC so it could give you 3.3V and 1.8V from same converter. – Marko Buršič Oct 22, 2021 at 6:58

Thank you very much for the answer. – Newbie Oct 22, 2021 at 7:05