8.2.2 Using a Separate VS Supply for Low Vin Operation

In some applications, it is desired to operate LM5050-1 from low supply voltage. The LM5050-1 can operate with a 1-V rail voltage, provided its VS pin is biased from 5 V to 75 V. The detail of such application is depicted in Figure 27.

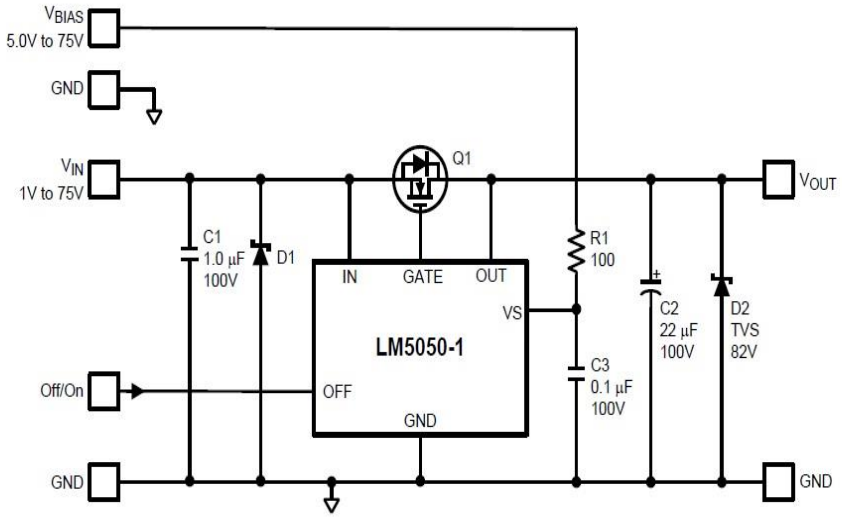

Figure 27. Using a Separate vs Supply for Low Vin Operation Schematic

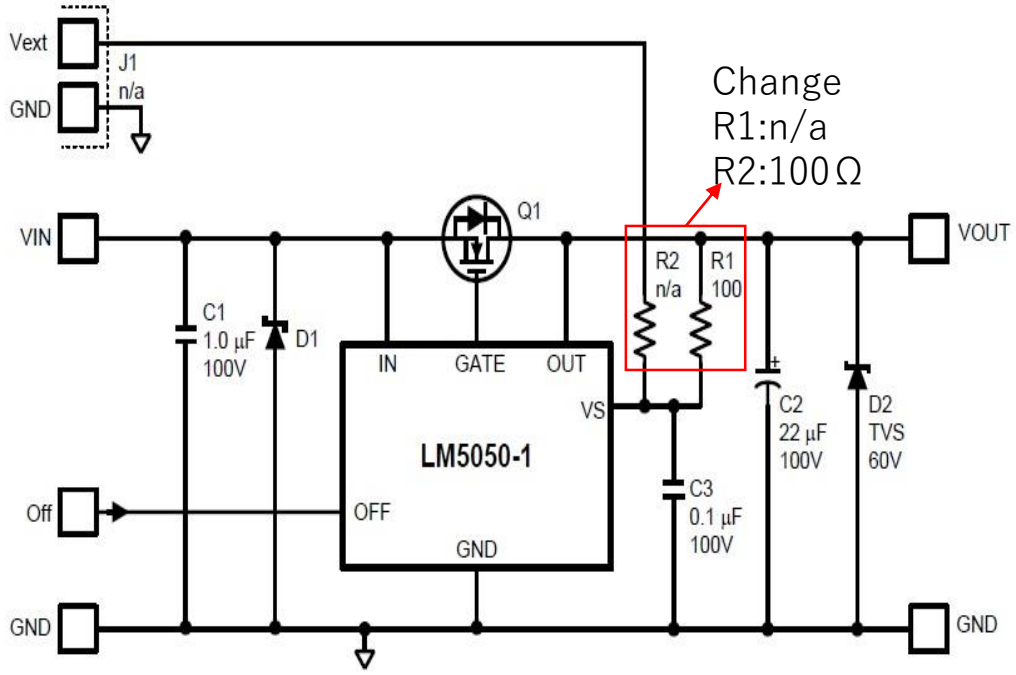

Figure 5. Schematic Diagram
AN−2087 LM5050−1 EVAL Evaluation Board

Using TI‘s EVM (AN-2087 LM 5050-1 EVM)
The circuit of Figure 27 on Datasheet P18 is created and evaluated.

There are two kinds of conditions.
① Vin = 5 V Iout = 10 A
② Vin = 3.3 V Iout = 10 A
Voltage is supplied from Vext. (Vext = 5.0 V to 75 V)
At this time it will be in the following state.
・Vext = 5.3 to 7.15 V: Q 1 is turned OFF
・Vext = 7.15 V or higher: Q1 does not turn OFF.
Q1: In the data sheet, it is possible to operate with Vin = 1 V - 75 V.
Why does not it work when Vin = 7.5 V or more?
Please also tell me about measures.
Q2: Why is the EVM at Vin = 6V or higher?