BCR601 Errata Sheet

60 V linear LED controller with active headroom control (AHC)

About this document

Scope and purpose

This errata sheet lists a known issue of BCR601 active headroom control in combination with some AC-DC converters used as first stage.

Intended audience

Engineers designing LED drivers containing BCR601 and an AC-DC stage in front of it.

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1 Known issues

1.1 Stability of internal error amplifier for AHC

The linear LED driver BCR601 contains two independent regulation loops. One loop is for stabilizing the LED current and the second loop regulates the overhead voltage of the active element of this current regulator, typically a MOSFET. This second regulator was found to become unstable in combination with some AC-DC converters used as first stage.

The mentioned instability is detectable as high-frequency (~ 300 kHz) oscillation at pin 'OPTO' which is pin number three. When the oscillation occurs, the headroom control will not work at all and the output of the error amplifier is typically almost at ground level.

This oscillation occurs when the capacitive load caused by the first stage is below a certain level and can be easily and safely suppressed with the workaround given below.

It is important to understand that this is not an oscillation of the closed feedback loop but of the error amplifier itself. Consequently, it is virtually independent of the values loop compensation components (C2 and R8 of the reference design).

Workaround

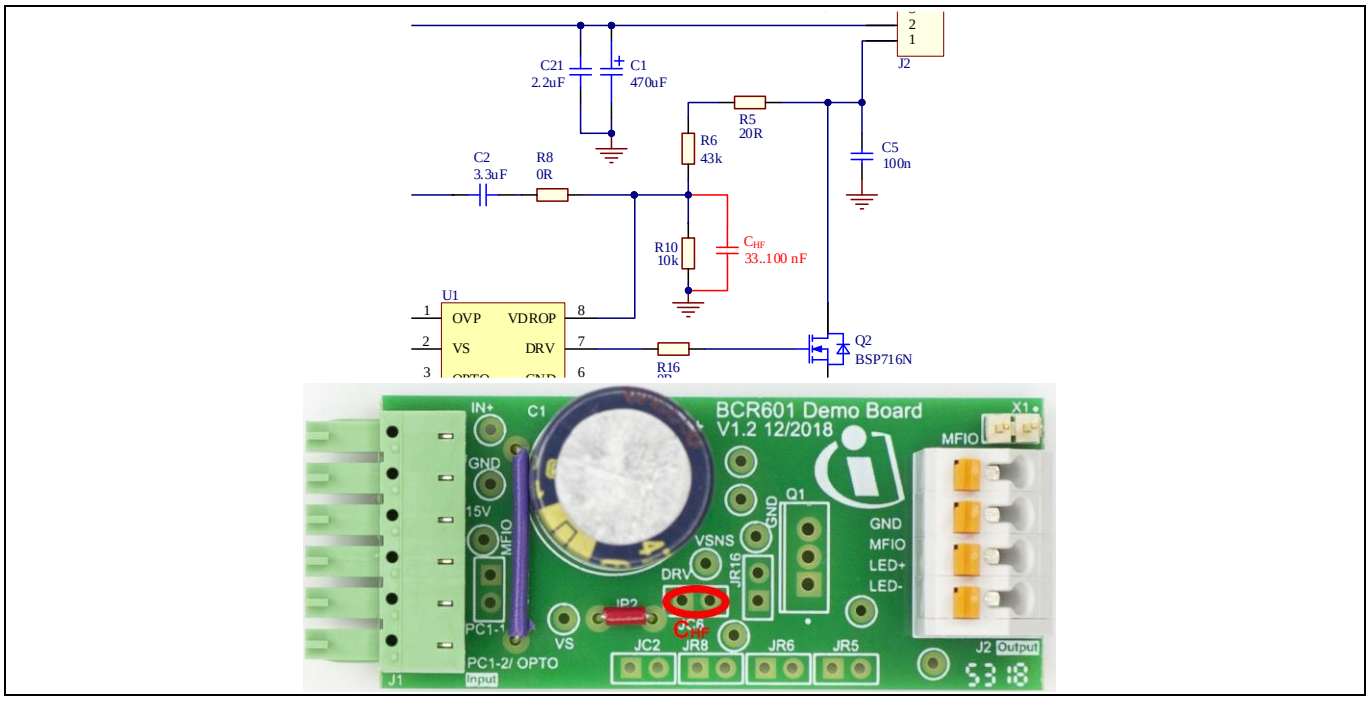


Figure 1 How to implement the workaround in the BCR601 reference design

Add a capacitance of 33 nF to 100 nF either from pin 'OPTO' to ground or from pin 'VDROP' (pin number 8) to ground. Although both positions work equally well, the connection from 'VDROP' to ground is recommended and was found to give unconditional stability for the error amplifier. How the additional capacitor can be fitted to the BCR601 reference board is shown in **Figure 1**.

Note: This workaround does not affect stability of the overall feedback loop. Proper selection of C2 and R8 is still necessary and depends on the AC-DC stage used.

Revision history

Document version	Date of release	Description of changes
V 1.0	2021-08-24	New

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