

UK-KREPE-TR-01

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2/12/2021

Verification of battery protection circuitry

Functional verification of the battery protection circuitry (BPC) was performed by shorting the battery pack together downstream of the BPC. The results of this test are shown in Fig. 1. The top trace shows the pack voltage prior, during, and after a short circuit scenario. The bottom trace is the current draw from the pack. As you can see, after 6 milliseconds, the BPC engages and cells are disconnected from the output and current draw from the pack drops to zero amps. In addition, a low voltage cutoff test was performed on the KREPE Experiments with the battery protection circuitry in place that verifies electrical systems are disabled when battery voltage reaches less than 3.3 volts.

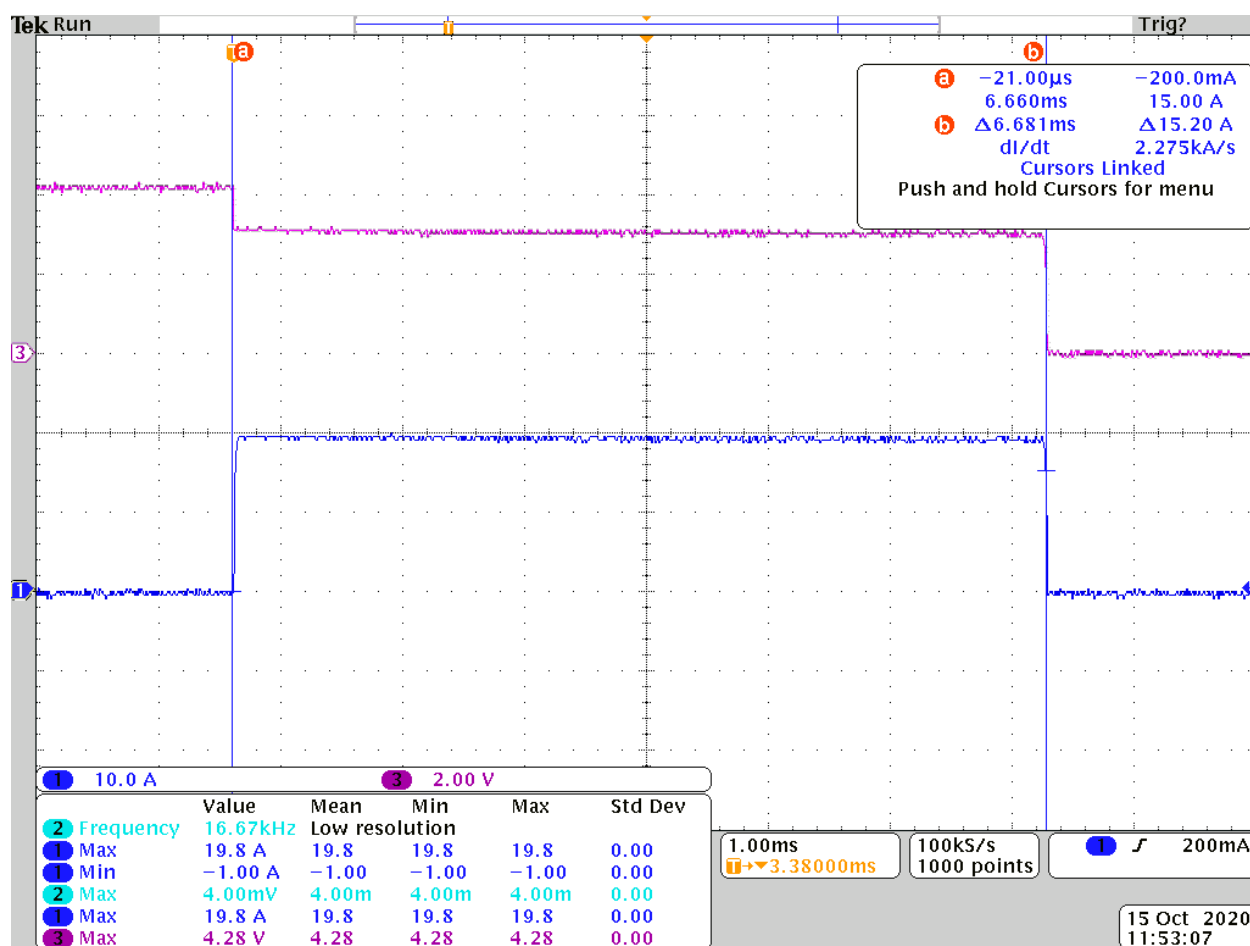


Figure 1: Overcurrent protection engaging on the battery protection circuitry.

Functional testing before and after vibration

After this initial visual inspection, functional testing was performed before and after vibration testing at MSFC. All KREPE Experiments were tested to ensure that they power up into the dormant state upon removal of the pull tab. The test to ensure a capsule starts and goes into dormant mode consists of pulling the pull-tab and listening for startup beeps. Then, listen for an additional two minutes and ensure no activation beep is detected. In addition to not hearing the activation beep, it was additionally confirmed that the capsules did not activate because no iridium packets were received.

Table 1: Functional test before vibe

Part #	Serial #	Date	Pass/Fail	Initial
KREPE-001	001	1/30/2021 10:44 EST	PASS	MR
KREPE-001	002	1/30/2021 10:51 EST	PASS	MR
KREPE-002	N/A	1/30/2021 11:11 EST	PASS	MR

Table 2: Functional test after vibe

Part #	Serial #	Date	Pass/Fail	Initial
KREPE-001	001	2/4/2021 15:37 EST	PASS	MR
KREPE-001	002	2/4/2021 10:51 EST	PASS	MR
KREPE-002	N/A	2/4/2021 11:00 EST	PASS	MR