

Hardware Unit Test Report

USB_5V drop/overload Test

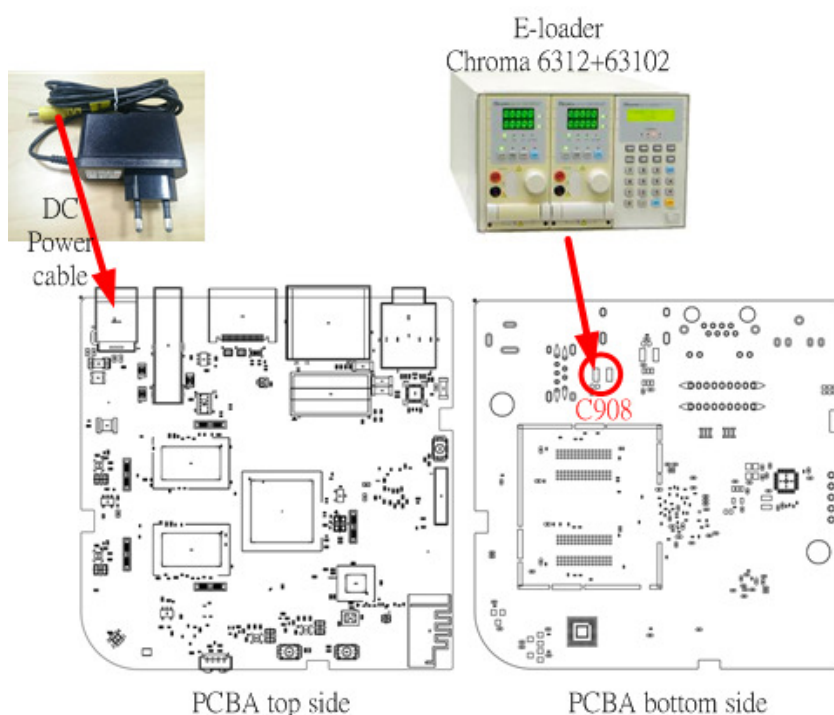
Hardware version	FW version	Sample No.	eMMC Flash P/N
V005	4.9.113 #1MonFeb 1122:40:43 CST 2019	S/N:	KLM8G1GETF-B041

1. Power Test Setup

The measure test point is USB_5V and the capacitor C908 can be measured by E-loader and Oscilloscope.

E-loader: Chroma 6312+63102

Oscilloscope: TDS5054B



2. Test Condition

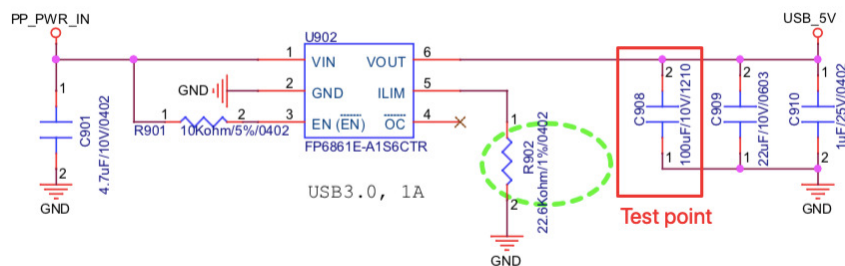
Overload test:

Chroma E-loader is setup to USB_5V(C908) for test drop/overload test. See the below circuit as USB_5V to USB connector. USB_5V is designed as 1.13A output for USB output power. The current limit resistor is 22.6Kohm.

Drop test:

USB 2.0 available current is 500mA, USB 3.0 is 500mA and 900mA. Here will test for 500mA and 900mA to test the voltage drop in 5%, i.e., 4.75V~5.25V.

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Design Current Limit (mA)	Ideal R_{ILIM} Value (k Ω)	1% Tolerance Real R_{ILIM} (k Ω)	Actual Limits (with R_{ILIM} tolerance)		
			I_{LIM} Min. (mA)	I_{LIM} Typ. (mA)	I_{LIM} Max. (mA)
120	212.50	213	92.03	119.72	148.66
200	127.50	129	158.65	197.67	240.41
300	85.00	85.6	245.65	297.90	353.64
400	63.75	64.2	333.81	397.20	463.59
500	51.00	51.1	425.75	499.02	574.64
600	42.50	42.7	515.58	597.19	680.44
700	36.43	36.5	609.43	698.63	788.69
800	31.88	32	701.20	796.88	892.64
850	30.04	30	751.14	850	948.53
900	28.33	28.4	796.33	897.89	998.74
1000	25.50	25.5	893.22	1000.00	1105.27
1100	23.18	23.2	987.91	1099.14	1208.09
1130	22.94	22.6	1015.9	1128.32	1238.25
1200	21.25	21.3	1082.12	1197.18	1309.24
1300	19.62	19.6	1182.46	1301.02	1415.83
1400	18.21	18.2	1279.66	1401.10	1518.08
1500	17.00	16.9	1384.85	1508.88	1627.73
1600	15.94	15.8	1487.86	1613.92	1734.15
1660	15.68	15.4	1529.09	1655.84	1776.5
1700	15.00	15	1572.59	1700.00	1821.05
2000	12.75	12.9	1761.46	1976.74	2196.38

Table1. Common R_{ILIM} Resistor Selections Guide

Add loader from 0A to 1.2A, and check the voltage drop and current cut-off point. The test result is as Item **3 Result and Picture**.

3. Result and Picture

Power Rail	Power IC / MOSFET P/N	Spec	Measurement point	Result	Picture	Result Pass/Fail
USB_5V overload	FP6861E-A1S6CTR	1.13A	C908	1.12A	Fig. 1	Pass
USB_5V 2.0 drop [500mA loader]	FP6861E-A1S6CTR	4.75V	C908	4.92V	Fig. 2	Pass
USB_5V 3.0 drop [900mA loader]	FP6861E-A1S6CTR	4.75V	C908	4.8V	Fig. 3	Pass

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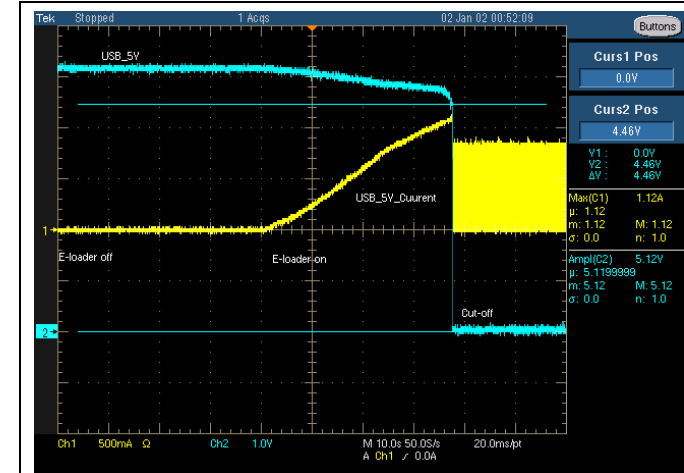


Fig. 1: USB_5V with E-loader[0A~1.2A]

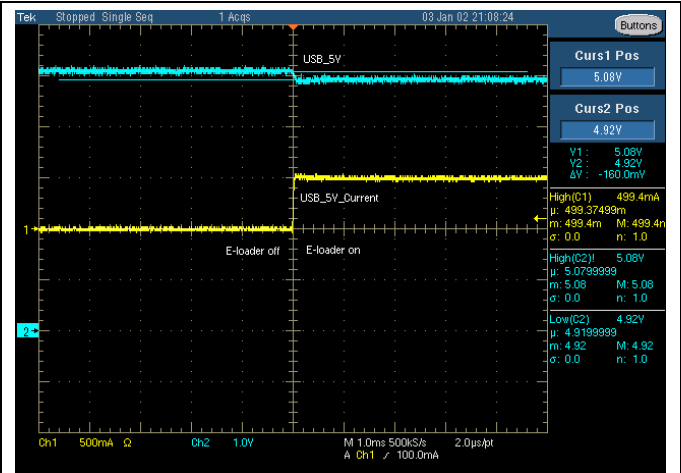


Fig. 2: USB_5V with E-loader [500mA]

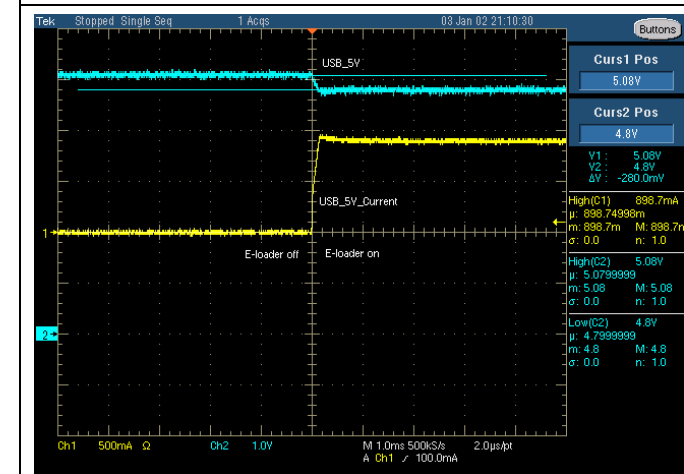


Fig. 3: USB_5V with E-loader [900mA]