10 Measurements

This section details board performance, power consumption, output current precision etc.

10.1 Output current precision

In this test we demonstrate the correct current regulation at different Vf levels and different output current (imposed by the DALI stack in linear mode). The DALI working points are 1%, 25%, 50%, 75% and 100% of the nominal output power.

Table 18. Output current precision and Figure 24. Output current precision when Iout vs Vout compensation is active are acquired enabling the "Iout vs Vout compensation" flag to increase the Iout current precision.

Table 18. Output current precision

Nominal output current		Vf = 30 V	Vf = 45 V	Vf = 60 V	Vf = 75 V	Vf = 90 V
DALI	mA	mA	mA	mA	mA	mA
1%	10	15	13	11	10	8.5
25%	250	258	245	242	243	238
50%	500	545	475	475	488	494
75%	750	740	733	742	744	750
100%	1000	989	981	991	994	996

Figure 24. Output current precision when Iout vs Vout compensation is active

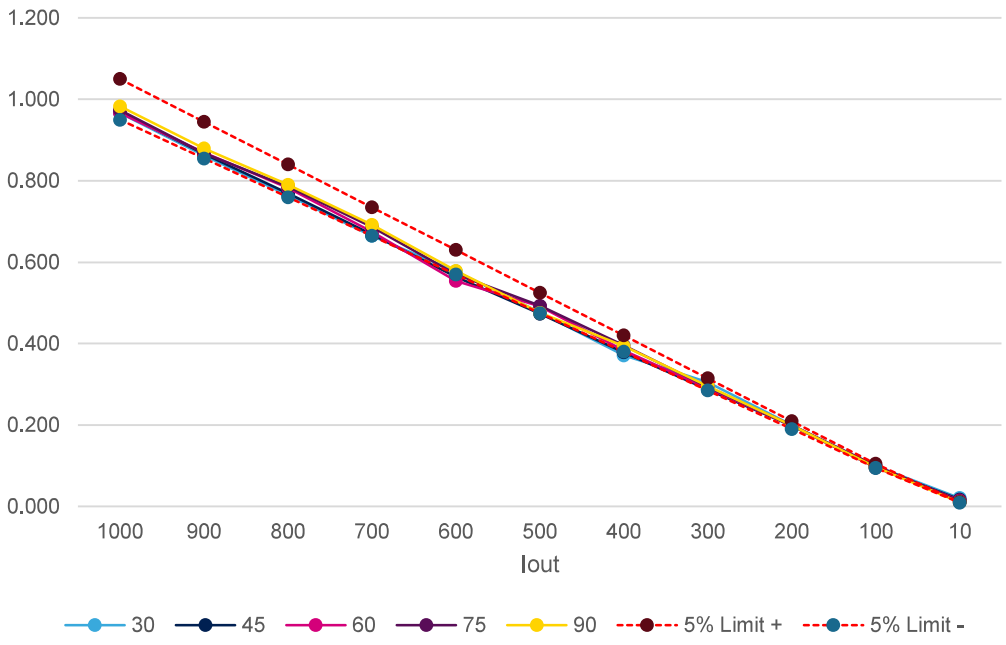
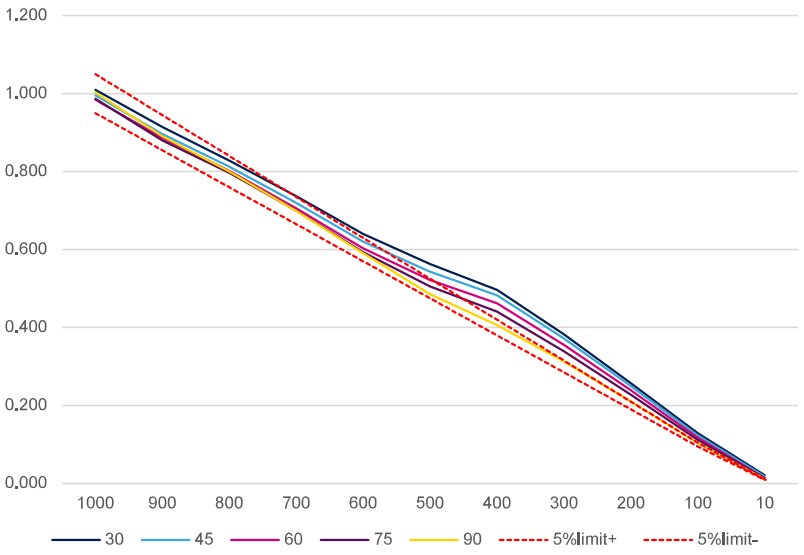


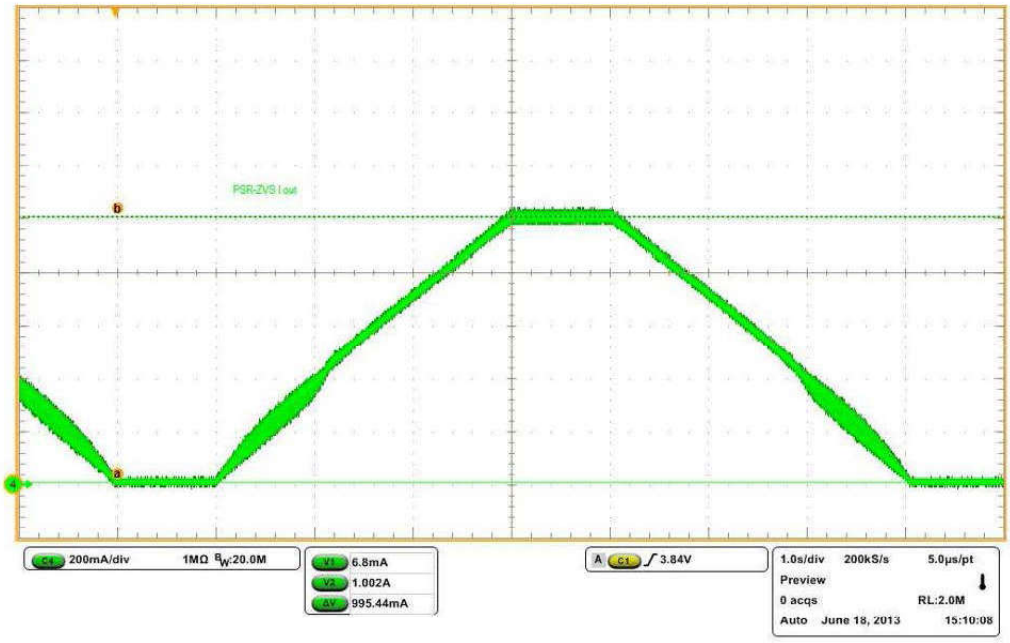
Figure 25. **Output current precision when Iout vs Vout compensation is not active**



10.2 Output current regulation

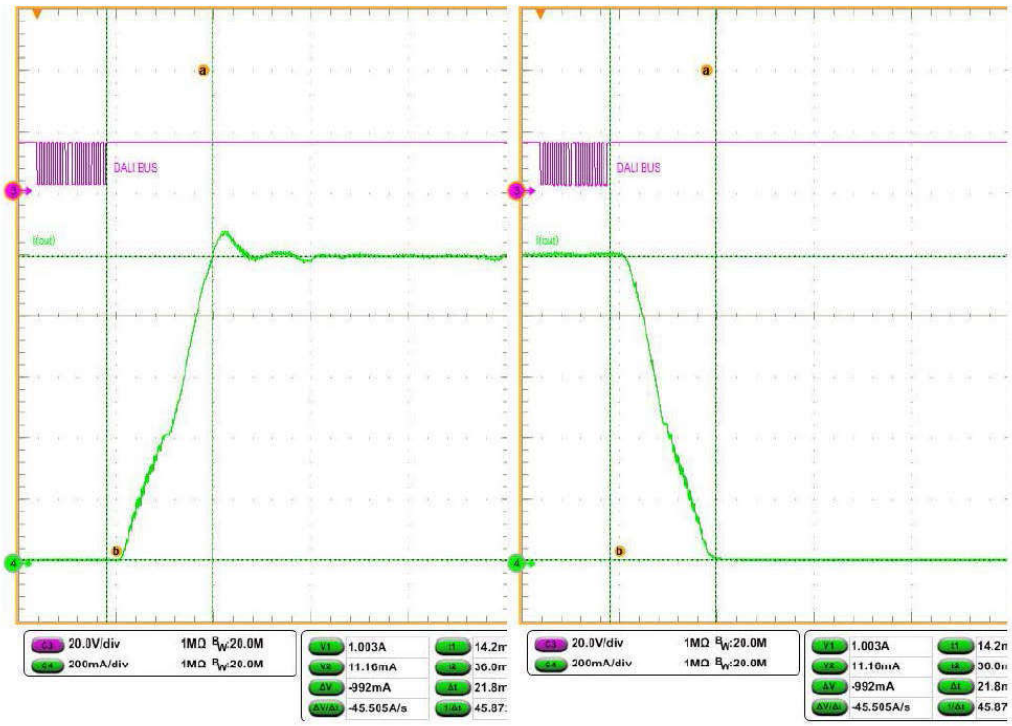
This section shows the current transaction from minimum to maximum power and from maximum to minimum power. The output current level is generated using the DAPC(254) and DAPC(85) DALI commands; each command is sent every 4 seconds. The output is captured with the current probe acquired on V_f = 90 V. The total transaction (up or down) is completed in 3 seconds using DALI fade transition and the linear table.

Figure 26. **Output current ramp-up and down**



The minimum Iout change (green line) is less than 26 ms, as per DALI requirements (see figure below).

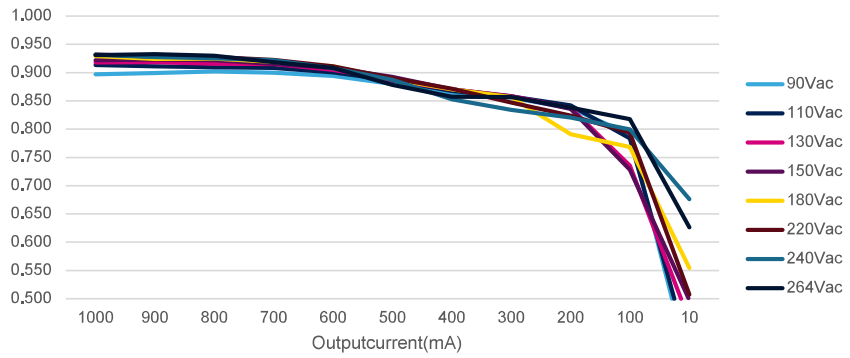
Figure 27. **Iout falling and rising time without DALI fading**



10.3 Efficiency

Figure 28. Evaluation board efficiency vs Load and Vac input shows the efficiency of the evaluation board at different input AC voltages and at different output power. The output power is applied via DALI commands and the output current is 10 mA and every 100 mA in the 100 mA to 1 A range. The output voltage of this test is fixed at 90 V. The board efficiency peaks at 92% for high loads. When the entire input voltage range is considered, the maximum efficiency at high load is more than 90%.

Figure 28. Evaluation board efficiency vs Load and Vac input



10.4 IDLE and minimum power

Table 19. Board standby power and power consumption in different conditions shows the power required by the STEVA-ILL066V2 evaluation board when the DALI puts the evaluation board in standby mode with the light-off command (no current on output LEDs string).

The table also shows the minimum input power when the output current is an open circuit, short-circuit or the lowest allowed current (~10 mA). All the values in the table are acquired using a mean value over 36 s.

Table 19. Board standby power and power consumption in different conditions

AC input voltage	standby (W)	Open Load (W)	Short-circuit (W)	Active - output 10mA@75Vf (W)
90	0.154	0.335	0.320	2.07
110	0.159	0.330	0.273	1.94
130	0.165	0.340	0.275	1.83
160	0.175	0.380	0.290	1.70
180	0.184	0.400	0.350	1.63
220	0.204	0.405	0.380	1.55
264	0.230	0.425	0.390	1.50

10.5 Demonstration board power factor and THD

The following figure show the power factor and the THD distortions of the STEVAL-ILL066V2 evaluation board. The value is given for different input AC voltages and under different load conditions.