

# User's Guide Latching Current Limiter (LCL) ZES744LCL EVM

## Abstract

The User's Guide describes the operation of the Latching Current Limiter (LCL) ZES44LCL EVM evaluation module. It provides the detail how to setup, configure the Latching Current Limiter as designed to monitor the supply current into an electronics system, the LCL disconnects the power to the electronics system when the supply current exceeds a preconfigured threshold. This document applies only to the ZES744LCL EVM.

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### 3. ZES744LCL EVM Operational Range, T<sub>A</sub> = 25 degC

Specification	Test Conditions	Min	Typ	Max	Unit
Power Input Voltage (V <sub>DDH</sub> )		4		60	V
Input Voltage control circuit (V <sub>DDSV</sub> )			4.5	5	V
Output Voltage (V <sub>OUT</sub> )		4		60	V
Output current (I <sub>OUT</sub> )				4	A

Limitation Current (Trip Current) is defined by R<sub>S</sub> with the following equation.

$$I_{limitation (Trip)} = \frac{100 \times 10^{-3} V}{R_S} A$$

TC_OFF	CS_Disable Switch(S3)	Description settings
Latched (J8 shunt)	1	TC_OFF reset after LCL latched
Re-Triggerable (J8 open)	0	LCL trip 8th times, TC_OFF can reset

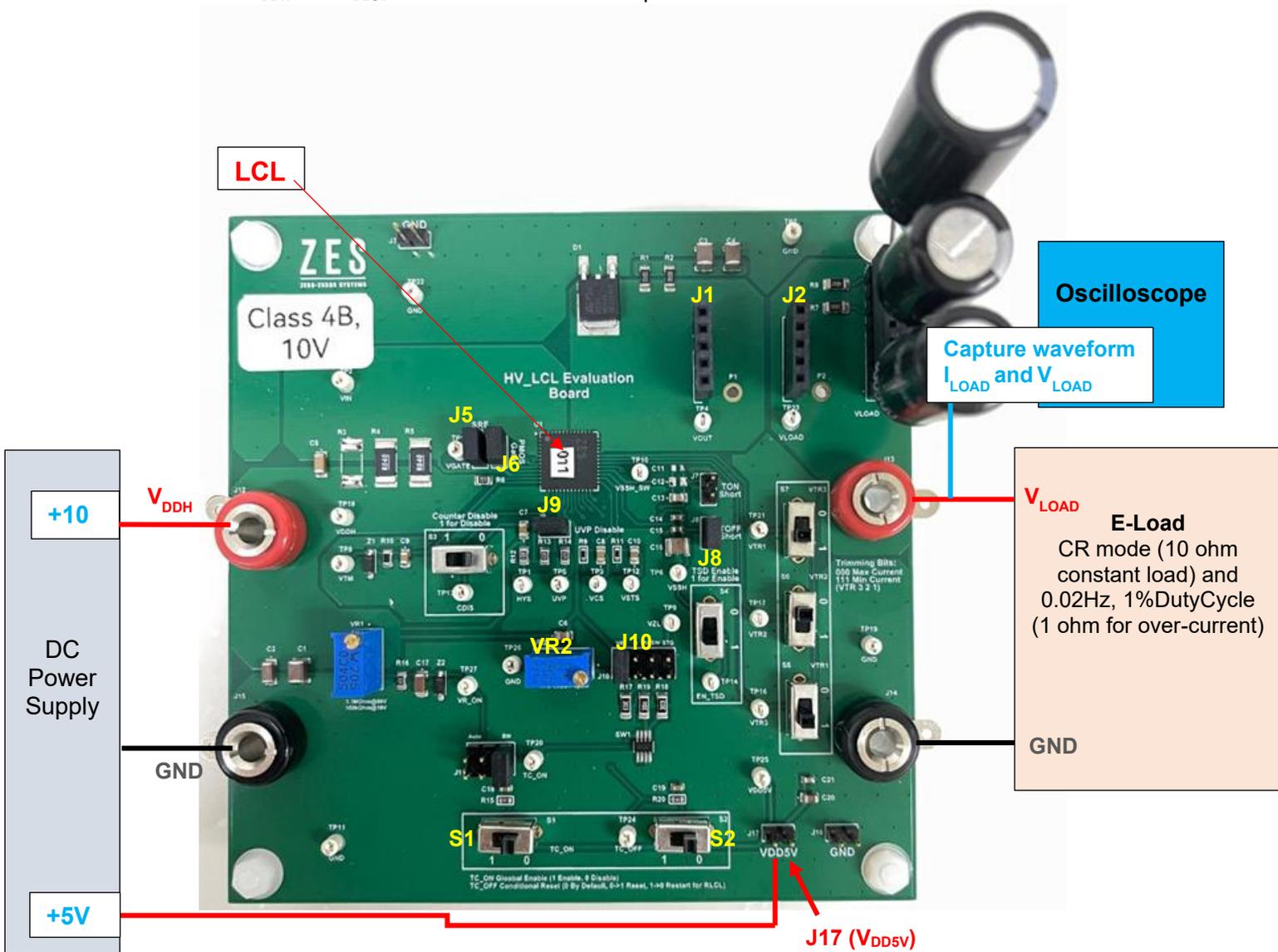


## 5. List of items Required

- DC Power supply
- Variable “constant resistance” Electronics-load(E-load)
- Banana plugs cables
- Oscilloscope
- Current probe

## 6. ZES744LCL EVM (strictly for $V_{DDH} = 10V$ only) Set-up connections

- Ensure VR2 to 2k ohm.
- Ensure there is shunt across J5, J6, J9, **J10** at VR position.
- Selection of J8: Shunt is Latched mode/ J8 shunt removed is Re-trigger mode.
- Ensure switch S1 and S2 are at “0” position before turn on DC supply 10V to  $V_{DDH}$  and 5V to  $V_{DD5V}$ .
- Connect banana cable from DC Power Supply to ZES744LCL EVM  $V_{DDH}$  and  $V_{DD5V}$  header-pin (J17).
- Connect J1 and J2 with a thick wire or inductor as per require.
- Connect banana cable from ZES744LCL EVM  $V_{LOAD}$  connector to Electronics load(E-load) constant resistance mode.
- After turn on  $V_{DDH}$  and  $V_{DD5V}$  then set switch S1 to “1” position.

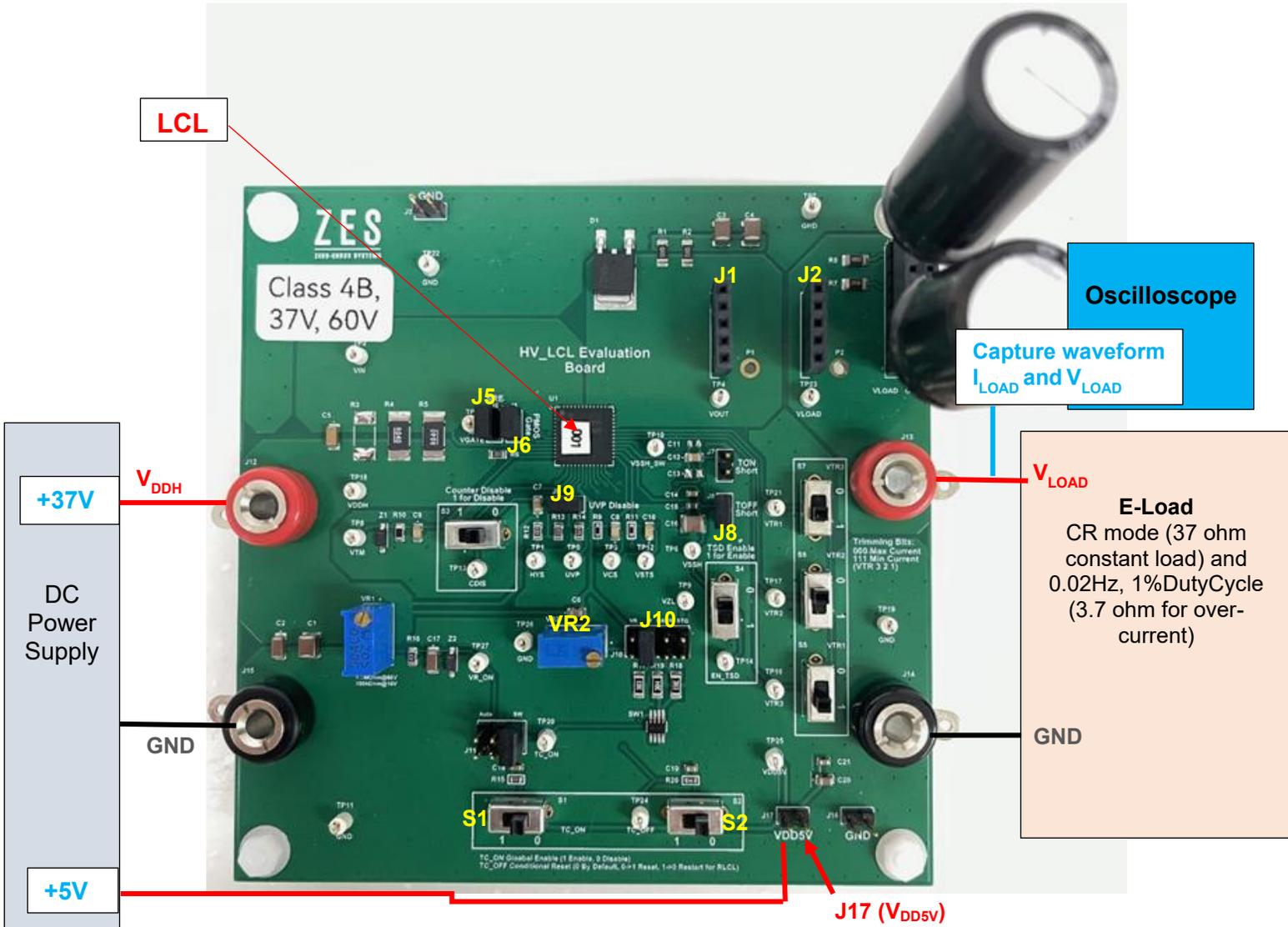


## 7. Power-up Procedure

- With above set-up connections, power on the DC Power supply 10V and 5V to ZES744LCL EVM  $V_{DDH}$  and  $V_{DD5V}$ .
- Connect oscilloscope and E-load to  $V_{LOAD}$ , connector and monitor the output.

## 8. ZES744LCL EVM (strictly for $V_{DDH} = 37V$ only) Set-up connections

- Ensure VR2 to 15.5k ohm.
- Ensure there is shunt across J5, J6, J9, **J10** at VR position.
- Selection of J8: Shunt is Latched mode/ J8 shunt removed is Re-trigger mode.
- Ensure switch S1 and S2 are at "0" position before turn on DC supply 37V to  $V_{DDH}$  and 5V to  $V_{DD5V}$ .
- Connect banana cable from DC Power Supply to ZES744LCL EVM  $V_{DDH}$  and  $V_{DD5V}$  header-pin (J17).
- Connect J1 and J2 with a thick wire or inductor as per require.
- Connect banana cable from ZES744LCL EVM  $V_{LOAD}$  connector to Electronics load(E-load) constant resistance mode.
- After turn on  $V_{DDH}$  and  $V_{DD5V}$  then set switch S1 to "1" position.

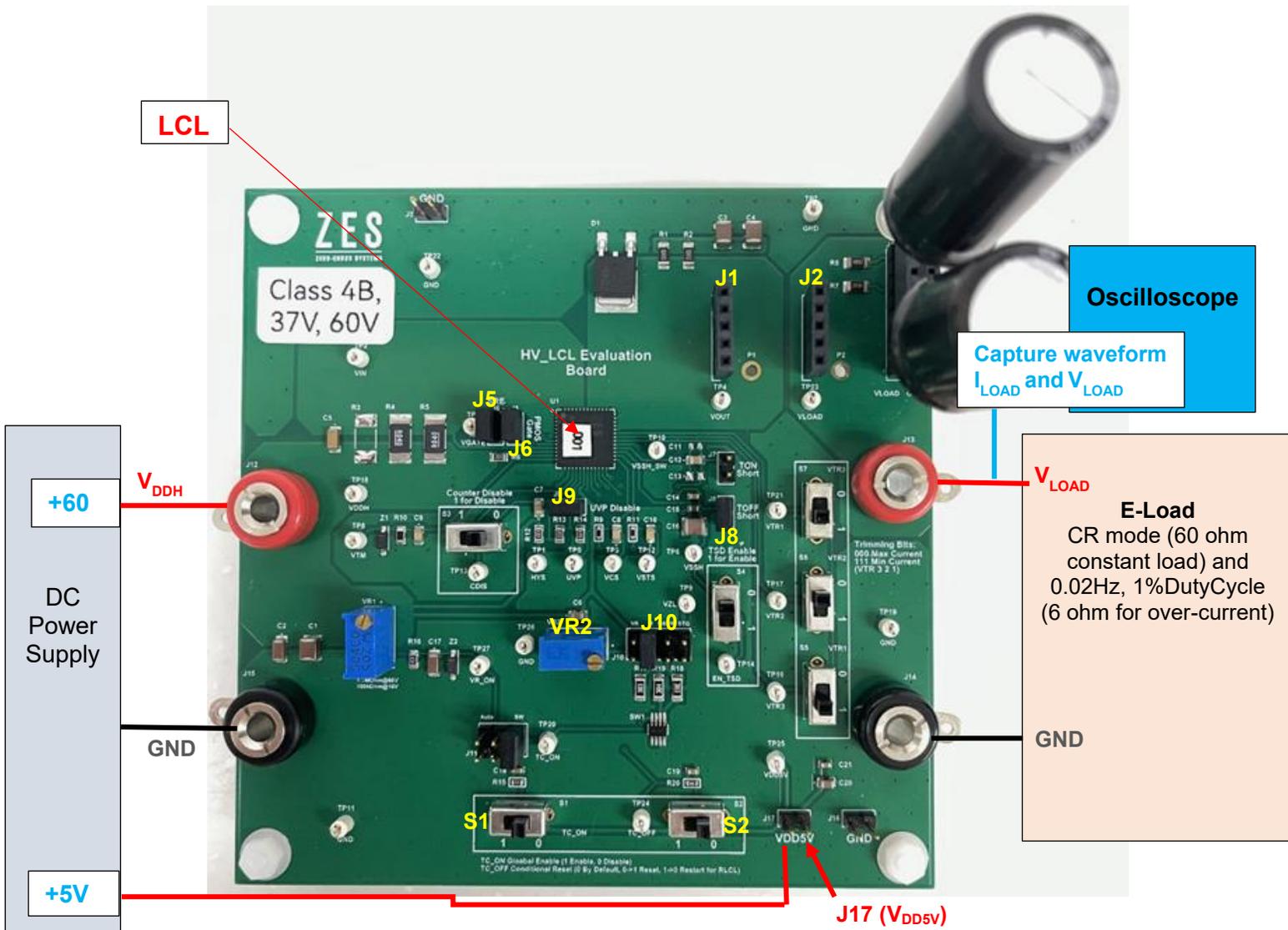


## 9. Set-up Procedure

- With above set-up connections, power on the DC Power supply 37V and 5V to ZES744LCL EVM  $V_{DDH}$  and  $V_{DD5V}$ .
- Connect oscilloscope and E-load to  $V_{LOAD}$ , connector and monitor the output.

## 10. ZES744LCL EVM (strictly for $V_{DDH} = 60V$ only) Set-up connections

- Ensure there is shunt across J5, J6, J9, J10 at R position.
- Selection of J8: Shunt is Latched mode/ J8 shunt removed is Re-trigger mode.
- Ensure switch S1 and S2 are at "0" position before turn on DC supply 60V to  $V_{DDH}$  and 5V to  $V_{DD5V}$ .
- Connect banana cable from DC Power Supply to ZES744LCL EVM  $V_{DDH}$  and  $V_{DD5V}$  header-pin (J17).
- Connect J1 and J2 with a thick wire or inductor as per require.
- Connect banana cable from ZES744LCL EVM  $V_{LOAD}$  connector to Electronics load(E-load) constant resistance mode.
- After turn on  $V_{DDH}$  and  $V_{DD5V}$  then set switch S1 to "1" position.



## 11. Set-up Procedure

- With above set-up connections, power on the DC Power supply 60V and 5V to ZES744LCL EVM  $V_{DDH}$  and  $V_{DD5V}$ .
- Connect oscilloscope and E-load to  $V_{LOAD}$ , connector and monitor the output.

## 12. Measuring Output when Over-current

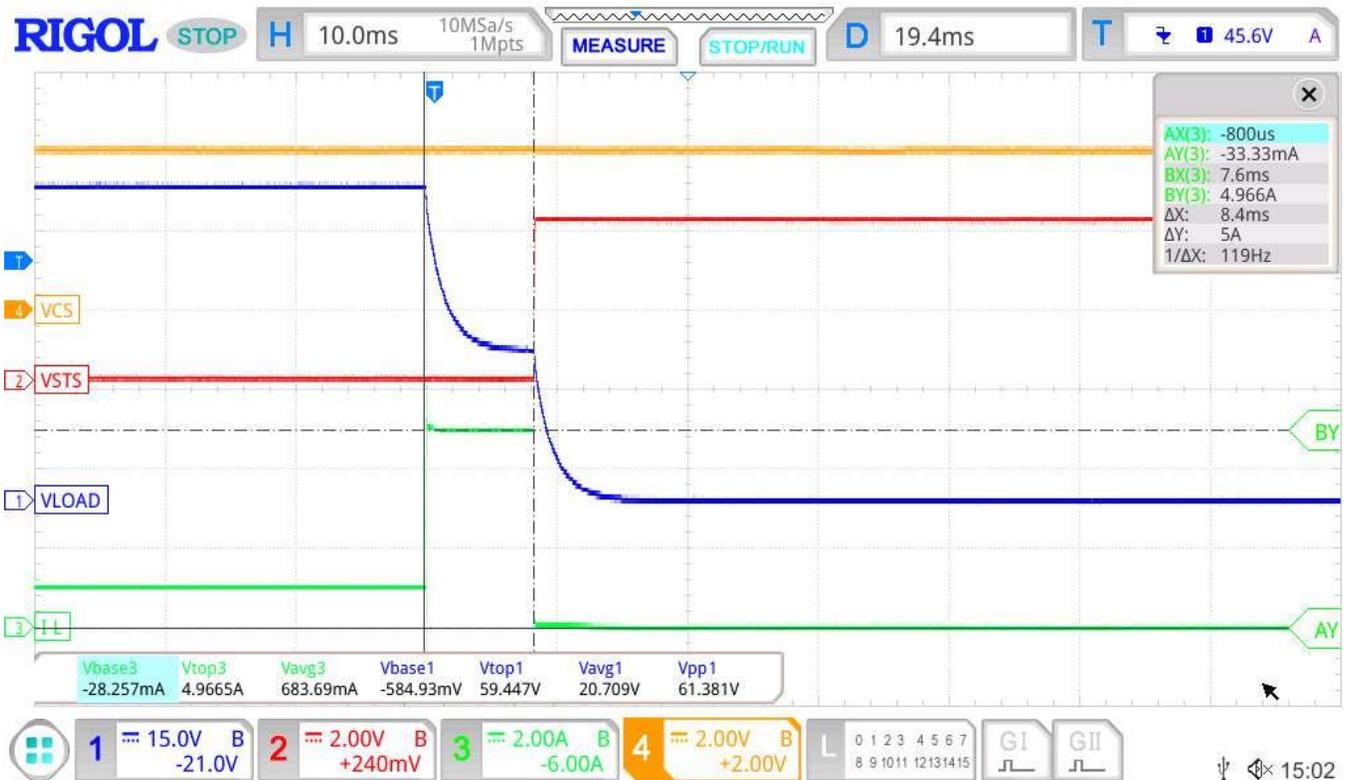
- a. ZES744LCL EVM rev1.0 of the output waveforms below with oscilloscope  $V_{OUT}$ (Blue),  $I_{OUT}$ (Green),  $V_{CS}$ (Orange) and  $V_{STS}$ (Red).

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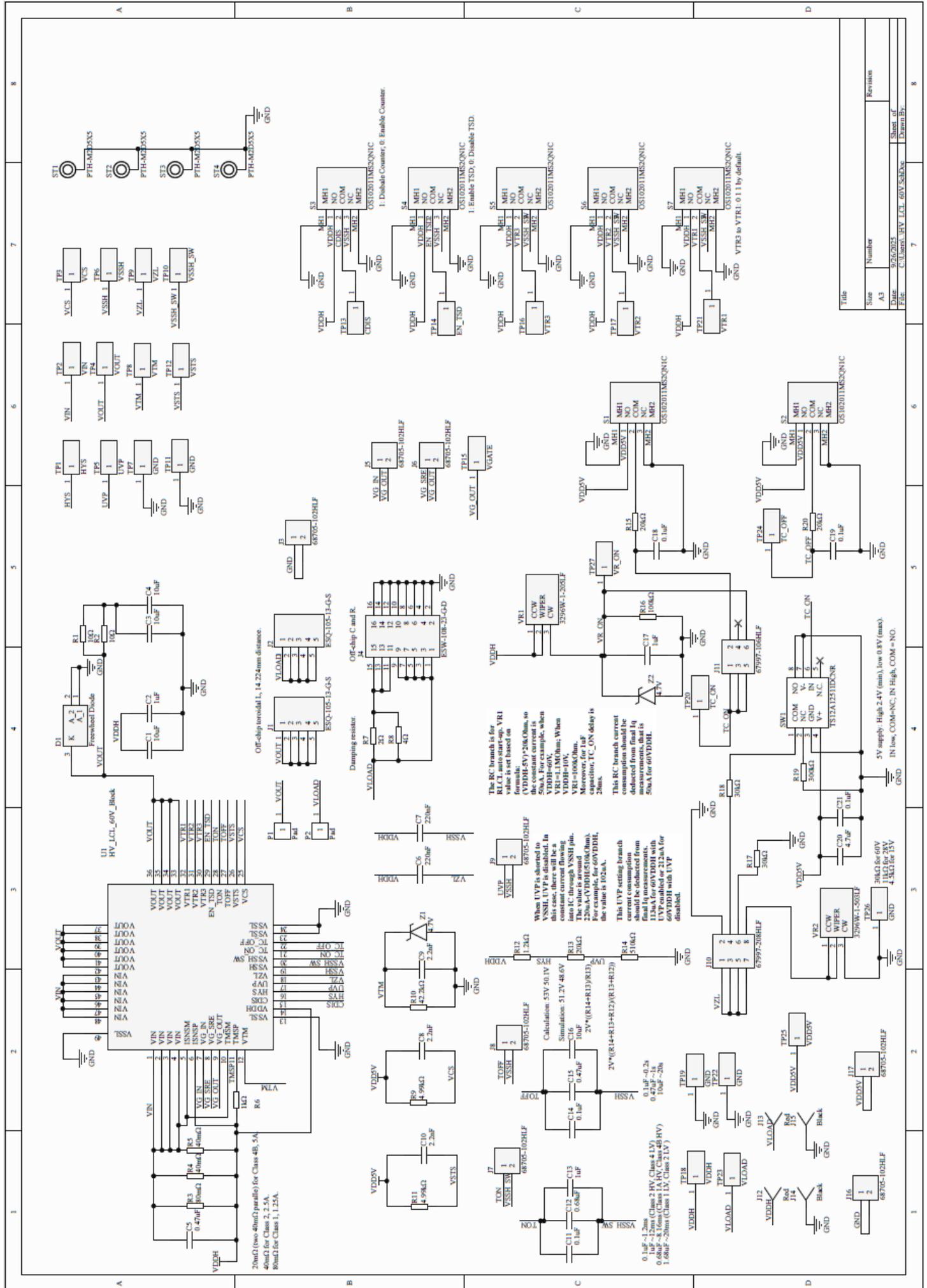


### Zoom-in

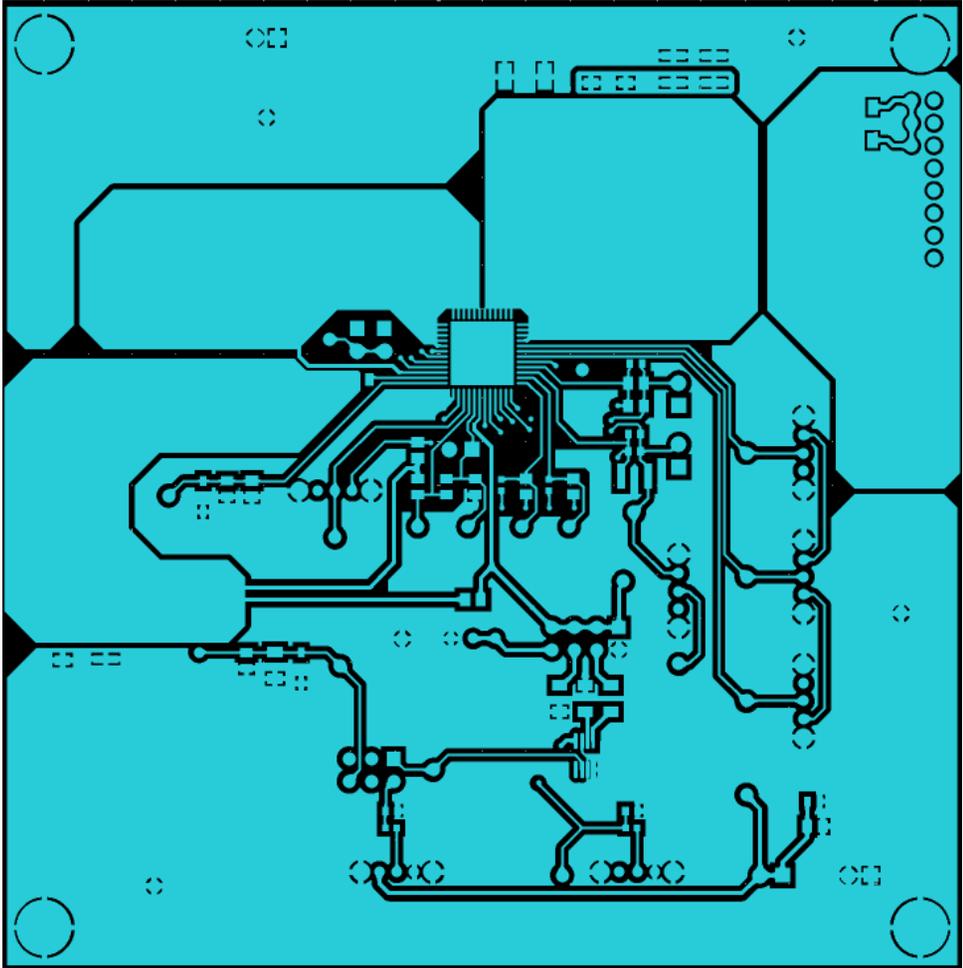
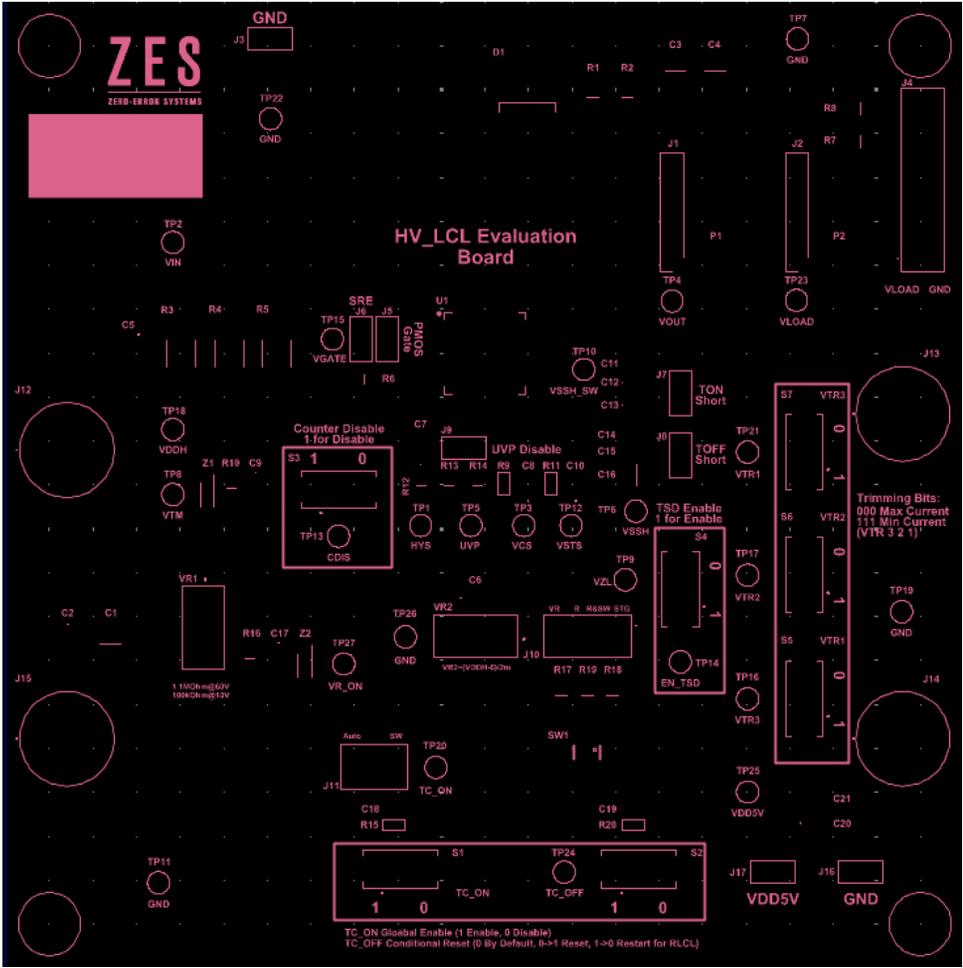
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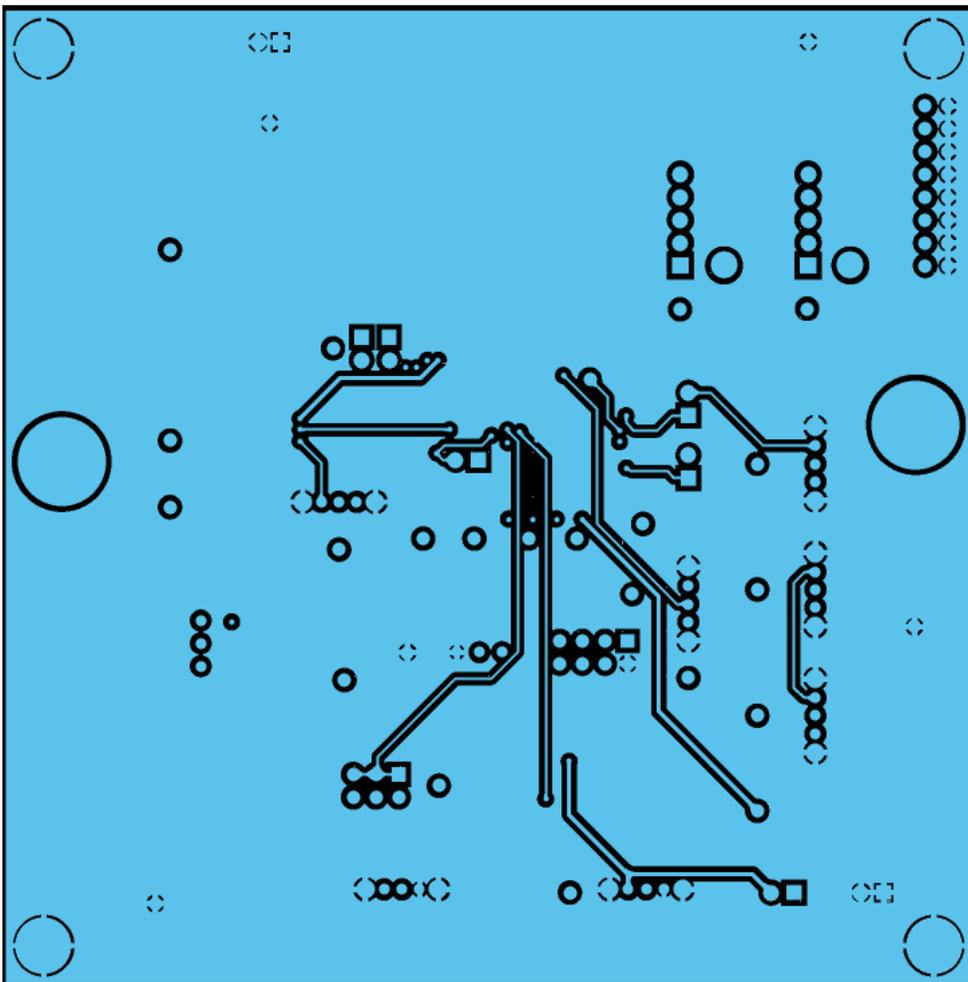
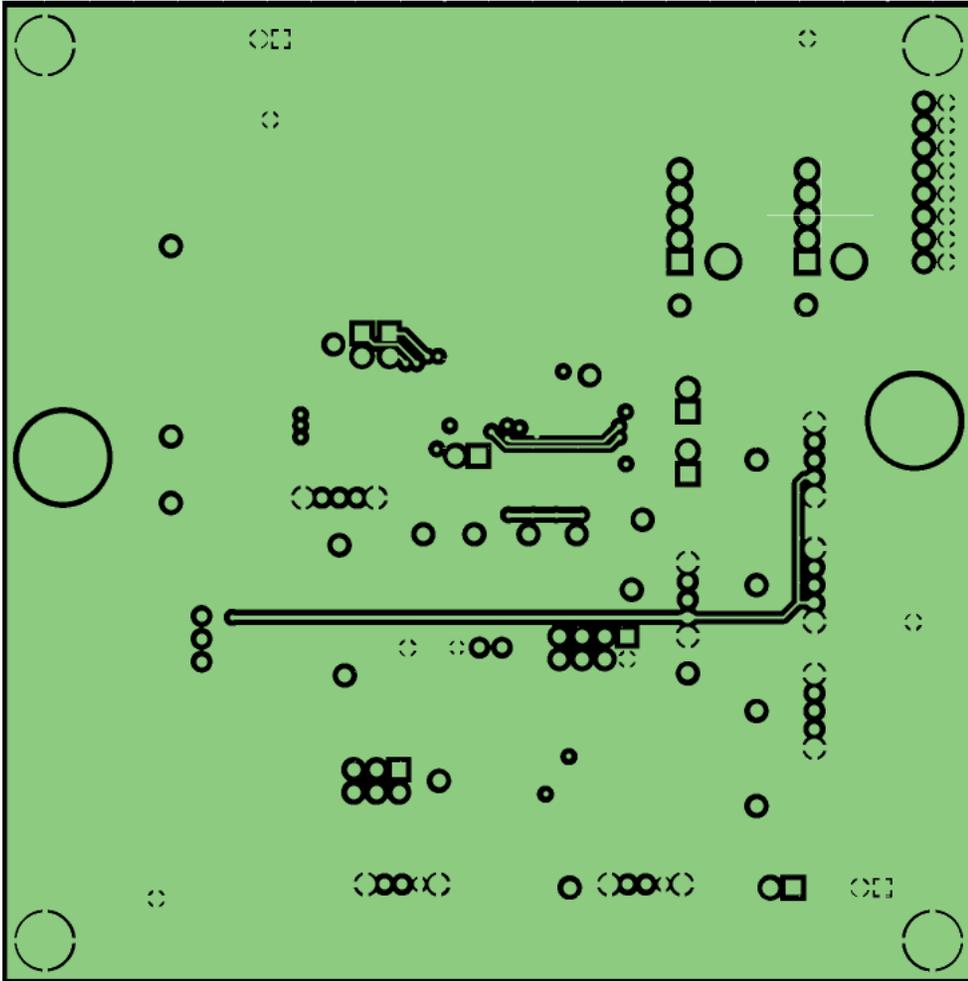


## 13. ZES744LCL EVM Schematic



## 14. ZES744LCL EVM PCB layout





Appendix

Revision History

Revision No.	Notes	Date
Rev 1.0	Preliminary version	Feb, 2026

For price, delivery, and ordering information please contact [sales@zero-errorsystems.com](mailto:sales@zero-errorsystems.com)

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