TLK100 External Voltages EVM

This User Guide details the design and operation of the evaluation module (EVM) for the TLK100.

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1 TLK100 EVM Purpose and Content

The purpose of Industrial Ethernet TLK100EXTEVM is to provide Texas Instruments customers the ability to quickly design and market systems containing the TLK100 chip. Customers are encouraged to copy EVM components to expedite their design process. TLK100EXTEVM operates using only a single voltage (5V from the MII). All other voltages: 3.3V, 1.8V, 1.1V are produced on the EVM using on-board LDO regulators.

The EVM kit contains:

- TLK100EXTEVM Unit.
- Printed copy of this User's Guide.
- TLK100EXTEVM schematic.

2 Information and Specifications

This section contains specifications of the TLK100EXTEVM card, as well as a description of the card's interfaces, connectors, jumpers and LEDs.

2.1 Usage Setup and Configuration

Power for the TLK100EXTEVM is supplied via MII connector.

- If 5V is supplied, the on-board voltage regulator, U200, will convert 5V to 3.3V for the device. J200 should be removed.
- If 3.3V is supplied from the MII connector, J200 needs to be on. R204 should be assembled and R203 should be removed.

2.2 Address Settings

The PMD address for TLK100EXTEVM Physical Layer device is set by the following jumpers:

J207: PHY ID [0]
J206: PHY ID [1]
J205: PHY ID [2]

- **Default board setting for the PHY Address is 01 h**
- The board may be set to PHY Address 00h-07h by adding jumper J205-J207.

2.3 TLK100EXTEVM Connections

Table 1. TLK100EXTEVM Connections

Jumper	Name	Function
P200	MII Male Connector	MII interface
J200	MII 3V3 option	Use 3V3 MII supply
J203	RESET N	Reset the device
U207	RJ45	RJ45 Ethernet connector
J205-J207(Not populated)	PHY ID[0:2]	Config PHY ID address
J202	25M out	25M clock output
J201	CFG CROSSOVR	Disable auto crossover and enable.

3 TLK100EXTEVM Specification

3.1 Overview

The TLK100EXTEVM is Texas Instruments demo platform that allows customer evaluation of the TLK100 device and demonstrate the advanced features specified in TLK100 datasheet.

The EVM supports 10/100 Base-T and is complaint with IEEE 802.3 standard

TLK100EXTEVM works with a single supply (5V or 3.3V) from the MII. All other voltages required for the TLK100 are generated on board using on board regulators.

The TLK100EXTEVM designed to operate the TLK100 device without using the TLK100 internal LDO Regulators. When working in this mode the power consumption of the device is extremely low (see datasheet for more details).

TLK100EXTEVM is designed to work in industrial temperatures.

3.2 Required Resources

Any equipment that provides a standard IEEE 802.3, Clause 22 MII DTE interface; e.g. SmartBits/Netcom box.

3.3 Features

The TLK100EXTEVM features:

- Industrial Temperatures (–40°C – 85°C)
- Industrial temperature external magnetics
- On-board LDO regulators for 3.3V, 1.8V and 1.1V supply voltage
- Control and status:
  - Configurable 8 PHY Addresses - 01 h (default) or any other address between 00h-07h using jumpers as described in Table 1.
  - 6 LEDs: 3 power, 3 status LEDs (Speed, Link and Active Data)
- Strap options:
  - MDI_EN jumper (Crossover disable).
  - Resistors strapping options:
    - Configurable PHY Addresses 08h-31h
    - CFG_ANEG_MODE
    - CFG_ANAEG_SPD_0 ,1
    - LED_CONFIGURATION
  - RESET _N jumper
- Connections for the following interfaces:
  - MII connector
  - RJ-45 connector
- Single-sided component placement
- On-board clock – Crystal/Oscillator Dual Footprint
- On-board power supplied by MII connector *only*, jumper to configure 5V or 3.3V

3.4 EVM Block Diagram

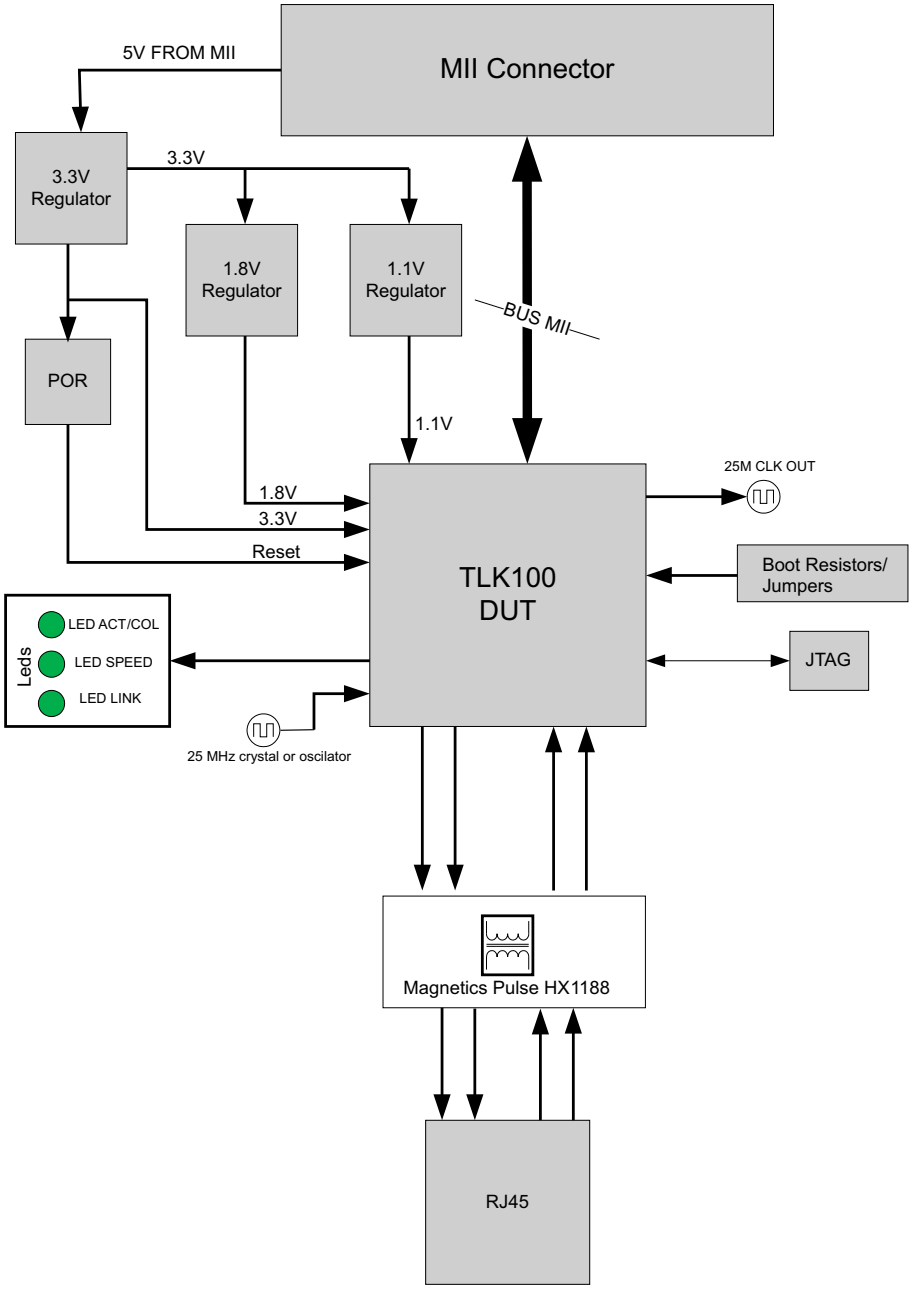

Figure 1. EVM Block Diagram

3.5 PCB Physical Layout

- FR4 material
- Trace impedance Differential impedance 100 ohms, ±5%
- Uniform supply and ground plane
- 4 layers
- Combination of through-hole and surface mount technology

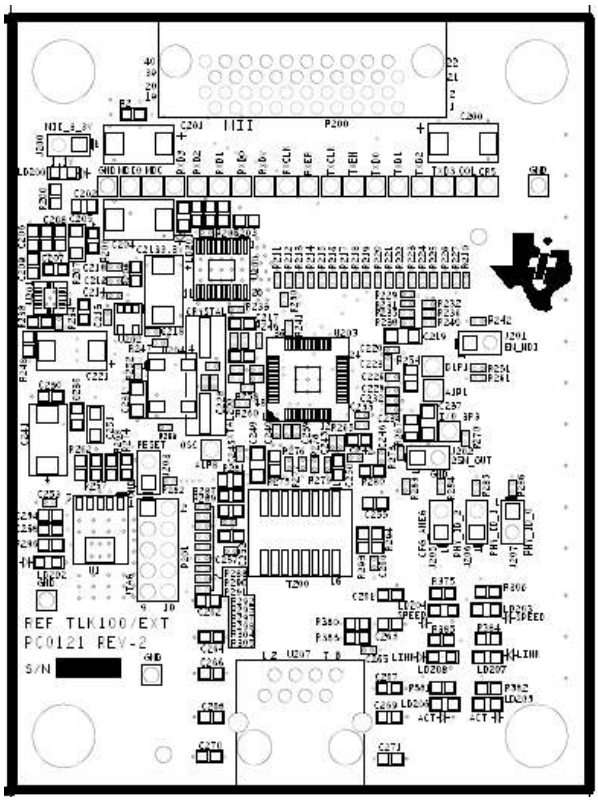

Figure 2. EVM Layout

4 Software

The EVM does not require any specific software and can be controlled from networking equipment that supports MII interface. However, for SmartBits users, TI can provide proprietary GUI that simplifies the controllability of the TLK100EXTEVM through SmartBits and allows advanced features such as cable diagnostic tool.

5 Additional Information

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6 EVM Schematics

The EVM schematics are appended to this User's Guide.

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EVM WARNINGS AND RESTRICTIONS

It is important to operate this EVM within the power supply voltage range of 5 V or 3.3 V.

Exceeding the specified input range may cause unexpected operation and/or irreversible damage to the EVM. If there are questions concerning the input range, please contact a TI field representative prior to connecting the input power.

Applying loads outside of the specified output range may result in unintended operation and/or possible permanent damage to the EVM. Please consult the EVM User's Guide prior to connecting any load to the EVM output. If there is uncertainty as to the load specification, please contact a TI field representative.

During normal operation, some circuit components may have case temperatures greater than 60°C. The EVM is designed to operate properly with certain components above 60°C as long as the input and output ranges are maintained. These components include but are not limited to linear regulators, switching transistors, pass transistors, and current sense resistors. These types of devices can be identified using the EVM schematic located in the EVM User's Guide. When placing measurement probes near these devices during operation, please be aware that these devices may be very warm to the touch.

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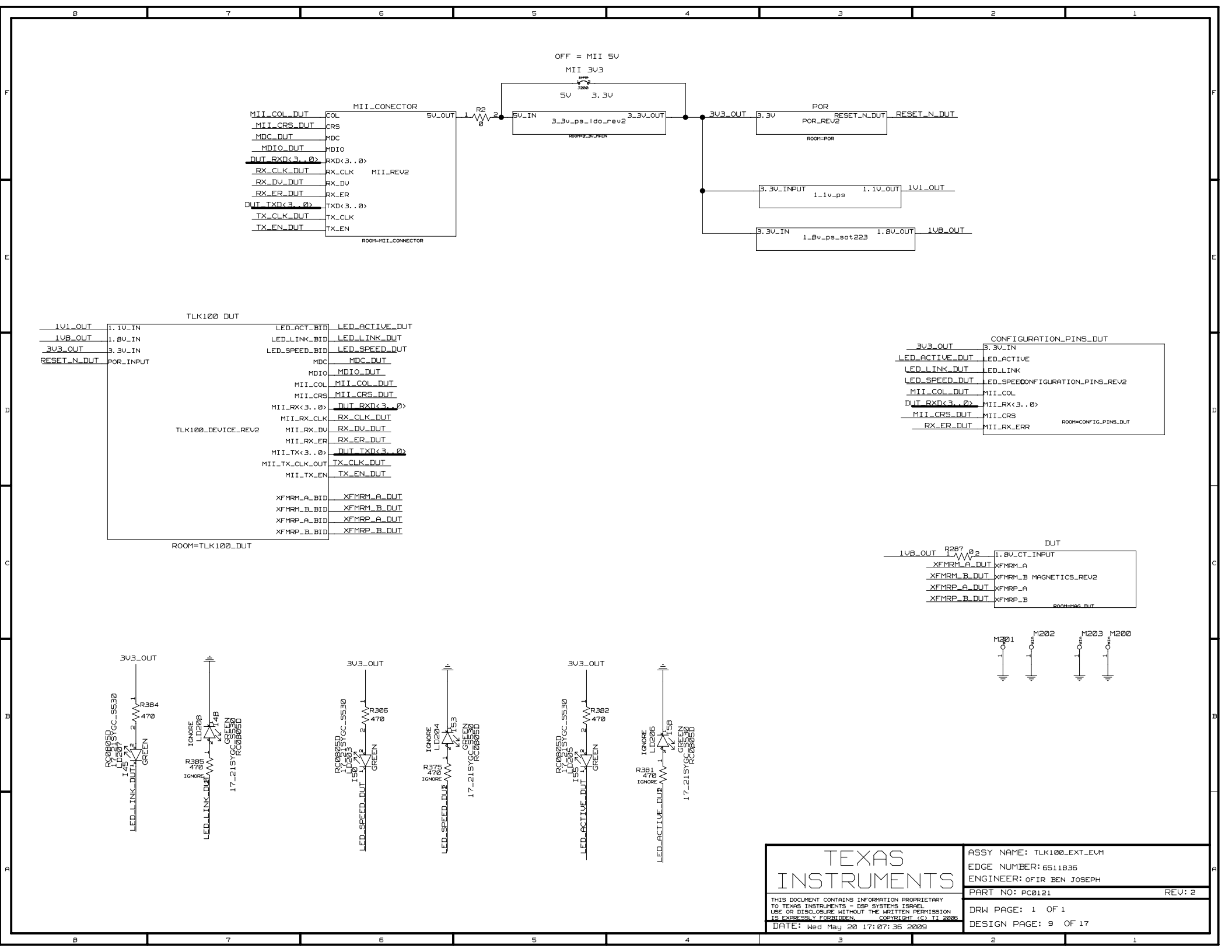

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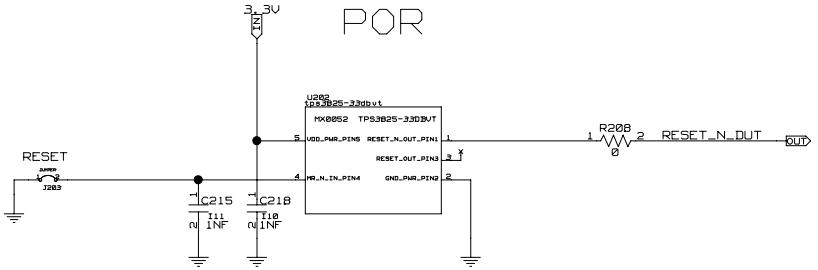

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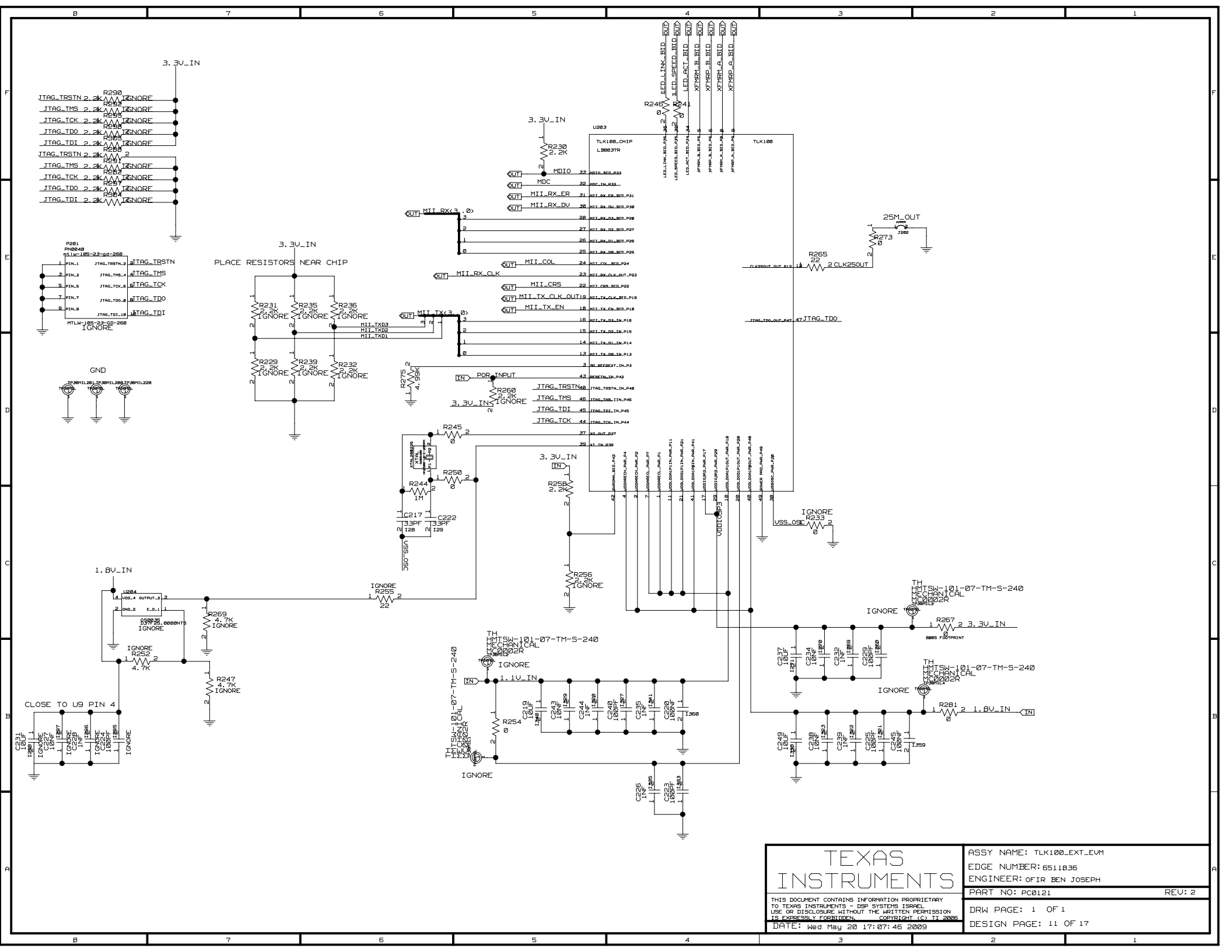

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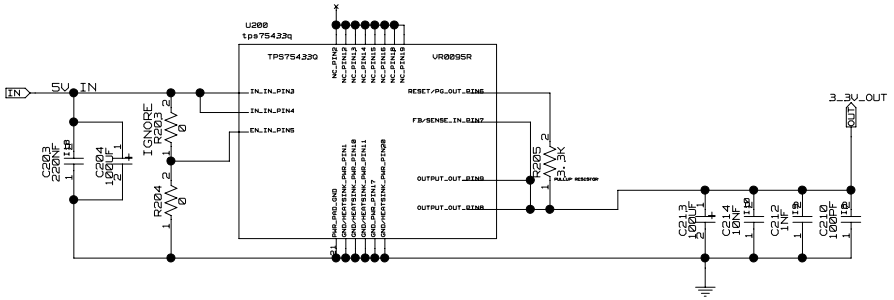

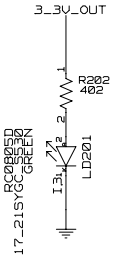

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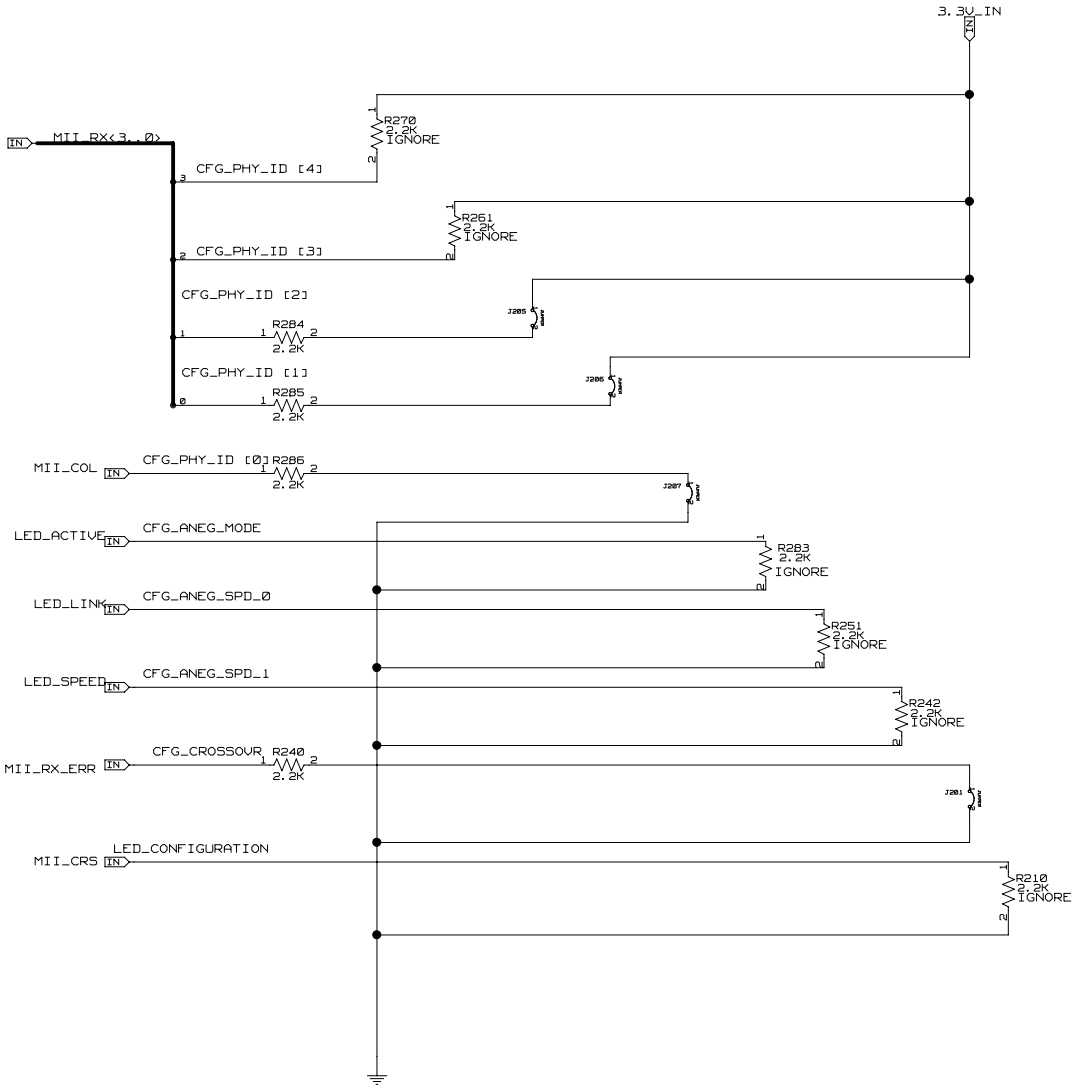

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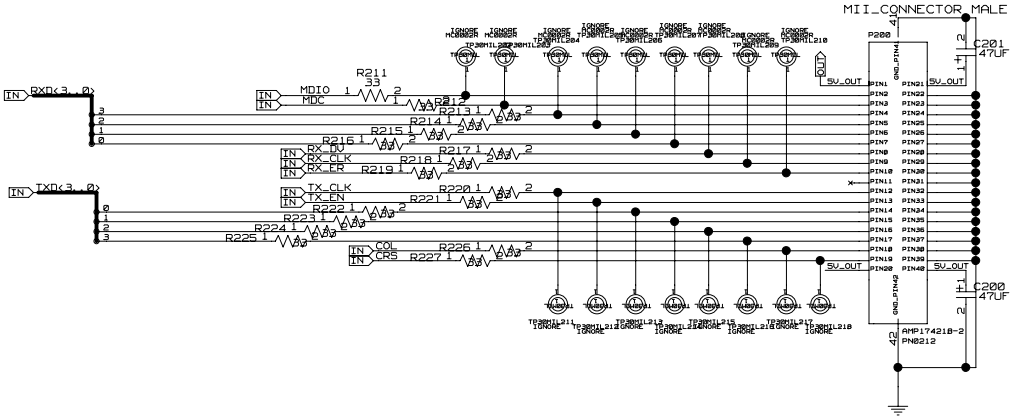

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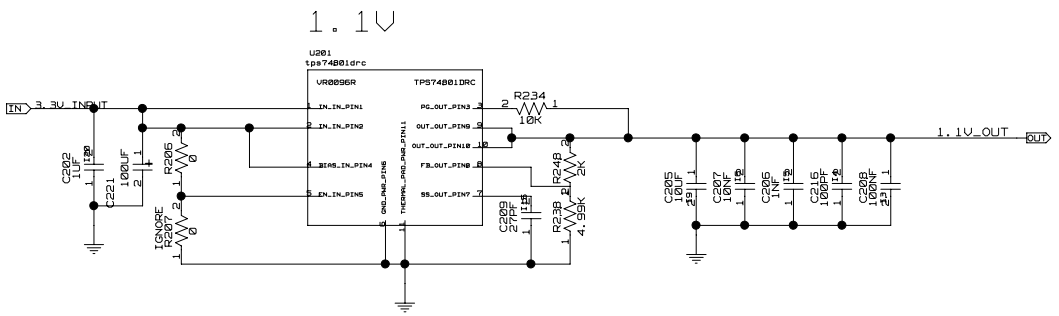

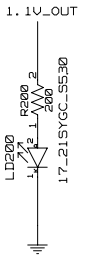

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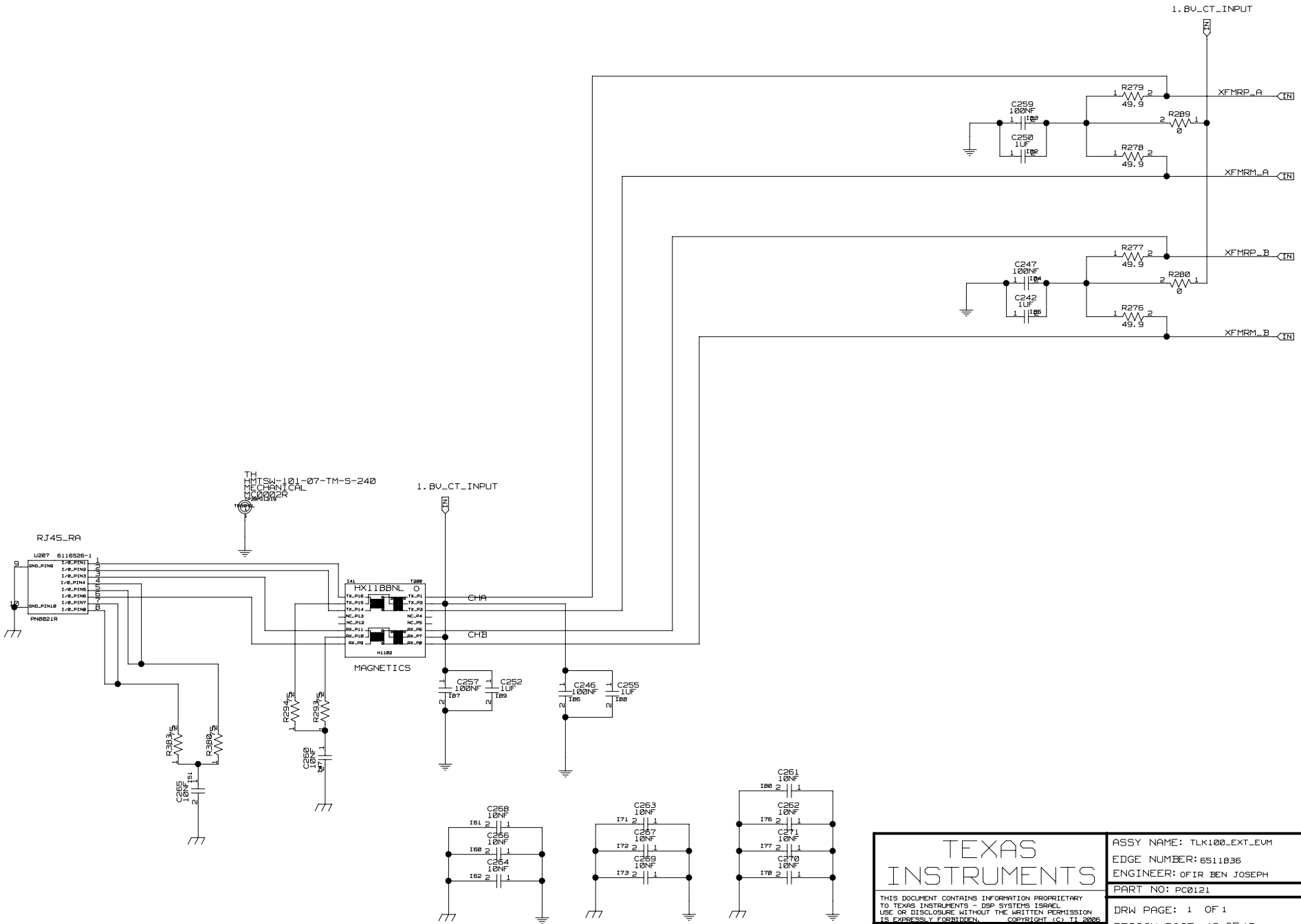
MAGNETICS



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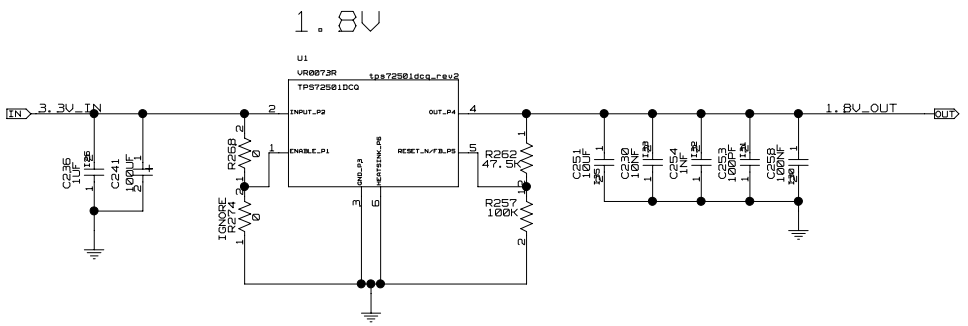

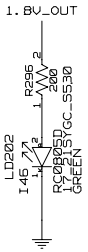

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