TLK100 Internal Voltages EVM

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

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1 TLK100INTEVM Purpose and Content

The purpose of TLK100INTEVM 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.

TLK100INTEVM operates using only a single voltage (5V from the MII). All other voltages are internally produced.

The EVM kit contains:

- TLK100INTEVM Unit
- Printed copy of this User's Guide
- TLK100INTEVM Schematic

2 Information and Specifications

This section contains specifications of the TLK100INTEVM card, as well as a description of the card's interfaces, connectors, jumpers and LEDs.

2.1 Usage Setup and Configuration

Power for the TLK100INTEVM is supplied via MII connector.

- If 5V is supplied, the on-board U100 voltage regulator converts the 5V to 3.3V for the device. J100 should be removed.
- If 3.3V is supplied from the MII connector, J100 needs to be on; R101 should be assembled and R102 should be removed.

2.2 Address Settings

The PMD address for TLK100INTEVM Physical Layer device is set by the following jumpers:

J107: PHY ID [0]
J106: PHY ID [1]
J105: 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 J105-J107.

2.3 TLK100INTEVM Connections

The following table describes the connections of the TLK100INTEVM:

Table 1. TLK100INTEVM Connections

Jumper	Name	Function
P100	MII Male Connector	MII interface
J100	MII 3V3 option	Use 3V3 MII supply
J102	RESET N	Reset the device
J108	Central Tap voltage selector	Use 3.3V/1.8V central tap voltage
U105	RJ45	RJ45 Ethernet connector
J105-J107(Not populated)	PHY ID[0:2]	Config PHY ID address
J103	25M out	25M clock output
J101	MDI_EN	Disable auto crossover and enable.

3 TLK100INTEVM Specification

3.1 Overview

The TLK100INTEVM is a Texas Instruments platform that allows evaluation of the TLK100 device; and, it demonstrates the advanced features specified in the TLK100 data sheet. The EVM supports 10/100 Base-T and is compliant with IEEE 802.3 standard.

The TLK100INTEVM works with a single supply (5V or 3.3V) from the MII. All other voltages required for the TLK100 are internally generated in the device.

The TLK100INTEVM 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 TLK100INTEVM features:

- Industrial temperatures (–40°C to +85°C)
- Industrial temperature external magnetics.
- Control and status:
  - Configurable 8 PHY Addresses – 01h (default) or any other address between 00h-07h using jumpers as described in Table 1.
  - 4 LEDs – 1 power, 3 status (Speed, Link, and Active Data)
- Strap Options:
  - MDI_EN jumper (Crossover disable)
  - Resistor 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
- 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

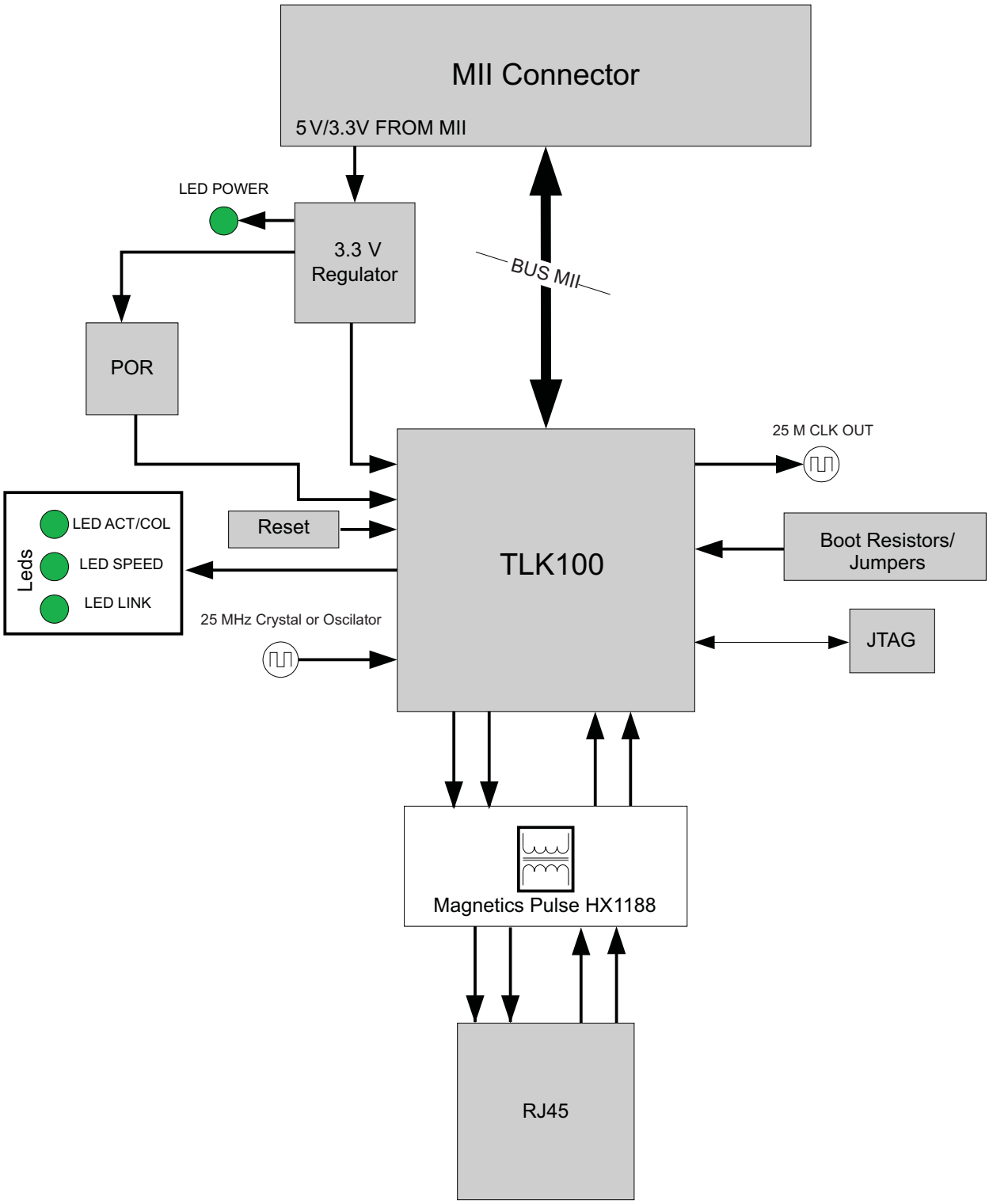

Figure 1. EVM Block Diagram

3.5 PCB Physical Layout

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

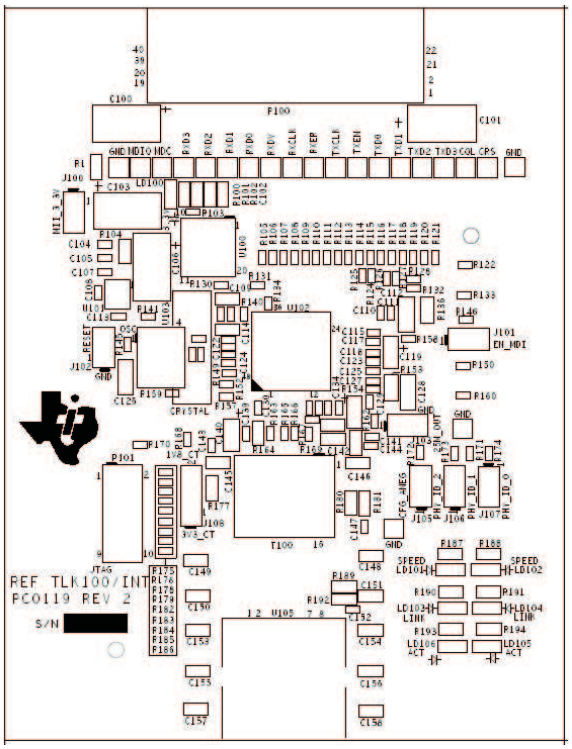

Figure 2. EVM Layout

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 TLK100INTEVM through SmartBits and allows advanced features such as a cable diagnostic tool.

5 EVM Schematics

The schematics are appended to the 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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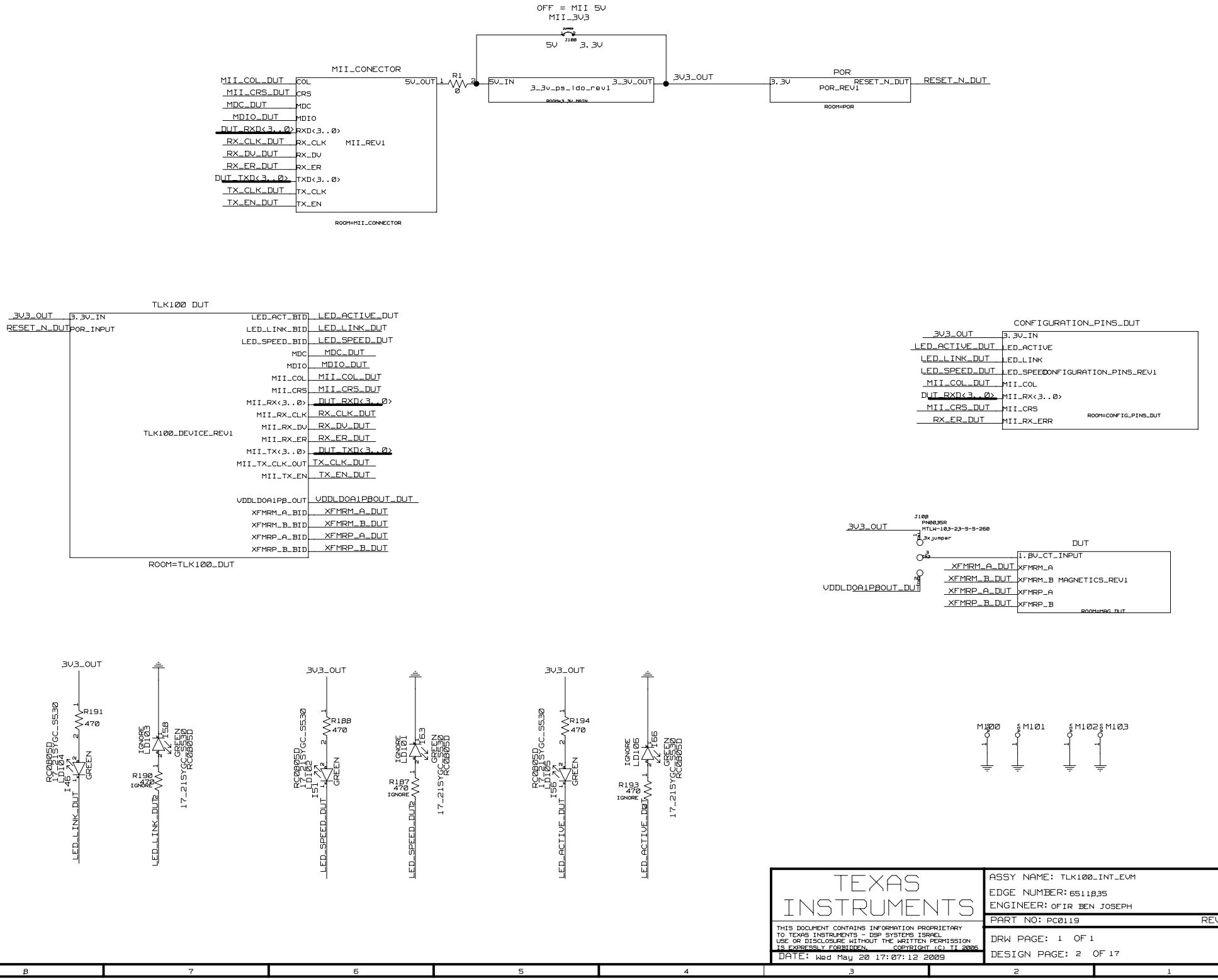
OFF = MII 5V
MII_3V3
J100
5V
3.3V
MII_CONECTOR
MII_COL_DUT
MII_CRS_DUT
MDC_DUT
MDIO_DUT
DUT_RXD<3..0>
RX_CLK_DUT
RX_DV_DUT
RX_ER_DUT
DUT_TXD<3..0>
TX_CLK_DUT
TX_EN_DUT
COL
CRS
MDC
MDIO
RXD<3..0>
RX_CLK
RX_DV
RX_ER
TXD<3..0>
TX_CLK
TX_EN
MII_REV1
5V_OUT
R1
0
5V_IN
3_3V_OUT
3_3v_ps_ldo_rev1
ROOM=3_3V_MAIN
3V3_OUT
POR
3.3V
RESET_N_DUT
POR_REV1
ROOM=POR
ROOM=MII_CONECTOR
TLK100 DUT
3V3_OUT
RESET_N_DUT
3.3V_IN
POR_INPUT
TLK100_DEVICE_REV1
LED_ACT_BID
LED_LINK_BID
LED_SPEED_BID
MDC
MDIO
MII_COL
MII_CRS
MII_RX<3..0>
MII_RX_CLK
MII_RX_DV
MII_RX_ER
MII_TX<3..0>
MII_TX_CLK_OUT
MII_TX_EN
VDDLDOA1PB_OUT
XFMRM_A_BID
XFMRM_B_BID
XFMRP_A_BID
XFMRP_B_BID
LED_ACTIVE_DUT
LED_LINK_DUT
LED_SPEED_DUT
MDC_DUT
MDIO_DUT
MII_COL_DUT
MII_CRS_DUT
DUT_RXD<3..0>
RX_CLK_DUT
RX_DV_DUT
RX_ER_DUT
DUT_TXD<3..0>
TX_CLK_DUT
TX_EN_DUT
VDDLDOA1PBOUT_DUT
XFMRM_A_DUT
XFMRM_B_DUT
XFMRP_A_DUT
XFMRP_B_DUT
ROOM=TLK100_DUT
CONFIGURATION_PINS_DUT
3V3_OUT
LED_ACTIVE_DUT
LED_LINK_DUT
LED_SPEED_DUT
MII_COL_DUT
DUT_RXD<3..0>
MII_CRS_DUT
RX_ER_DUT
3.3V_IN
LED_ACTIVE
LED_LINK
LED_SPEED
MII_COL
MII_RX<3..0>
MII_CRS
MII_RX_ERR
CONFIGURATION_PINS_REV1
ROOM=CONFIG_PINS_DUT
J108
PN08356R
MTLW-103-23-S-S-260
3V3_OUT
3.3V jumper
VDDLDOA1PBOUT_DUT
DUT
1.8V_CT_INPUT
XFMRM_A_DUT
XFMRM_B_DUT
XFMRP_A_DUT
XFMRP_B_DUT
XFMRM_A
XFMRM_B
XFMRP_A
XFMRP_B
MAGNETICS_REV1
ROOM=MAG_DUT
M100
M101
M102
M103
3V3_OUT
R191
470
RC0805D
17-21SYGC-S530
LD104
GREEN
LED_LINK_DUT
R190
470
IGNORE
LD103
GREEN
R188
470
LD102
GREEN
LED_SPEED_DUT
R187
470
IGNORE
LD101
GREEN
R194
470
LD105
GREEN
LED_ACTIVE_DUT
R193
470
IGNORE
LD106
GREEN
LED_ACTIVE_DUT
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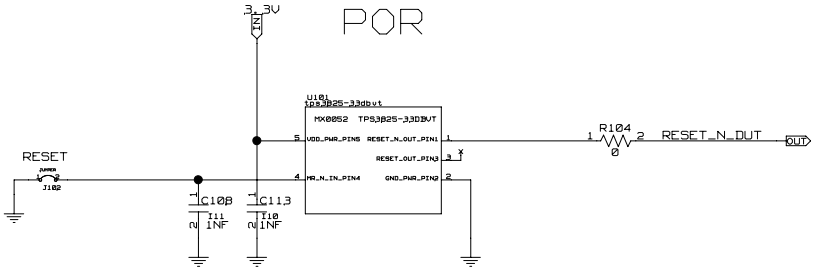
DESIGN PAGE: 2 OF 17



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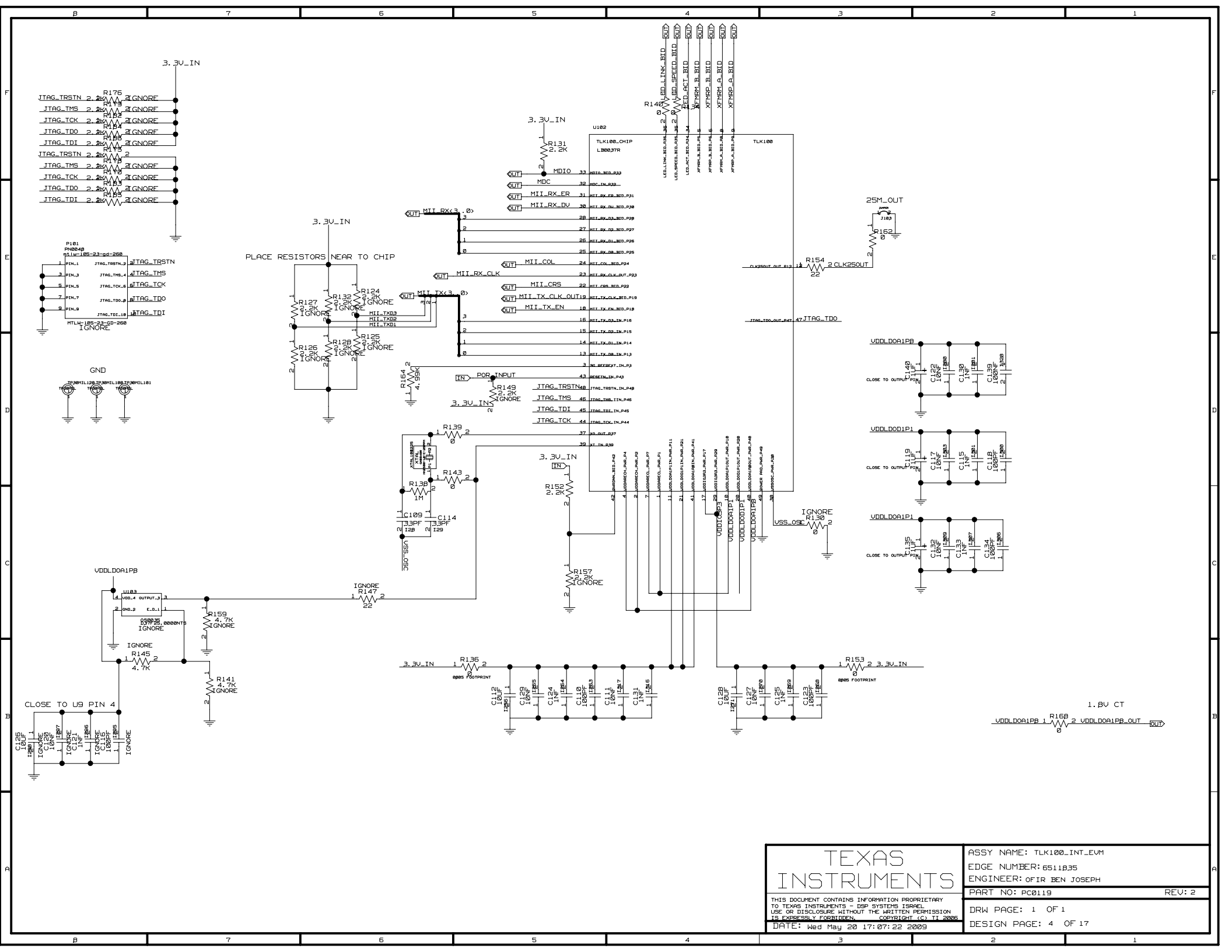

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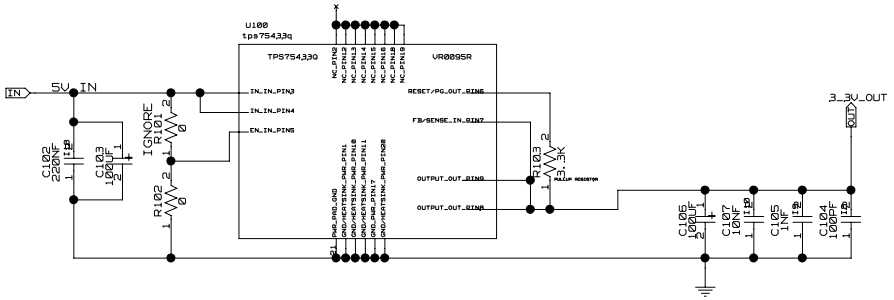

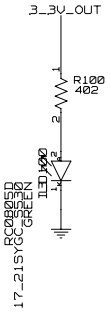

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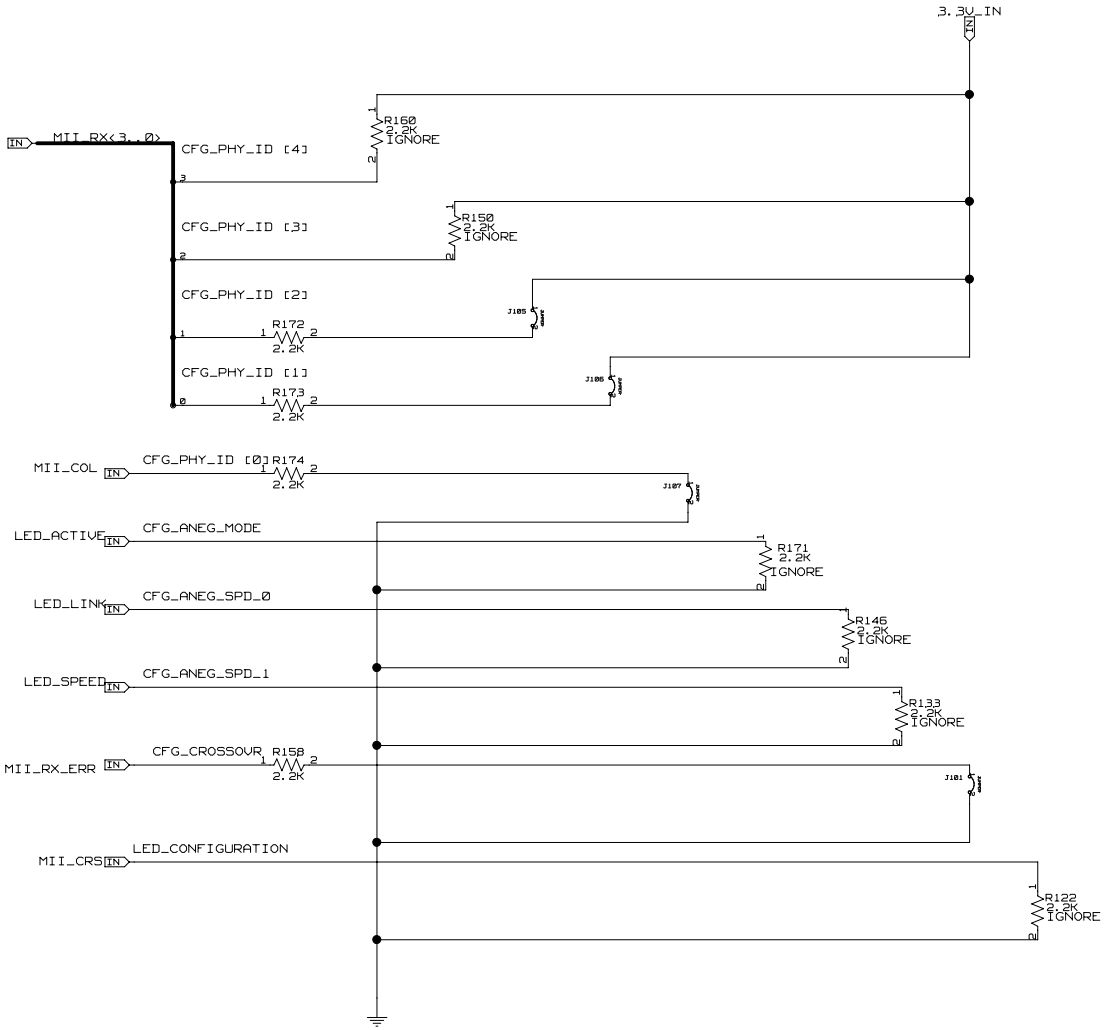

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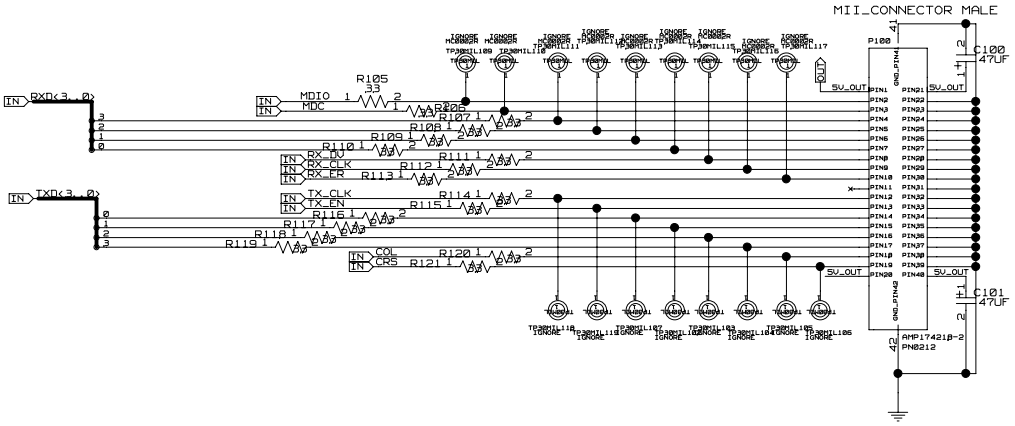

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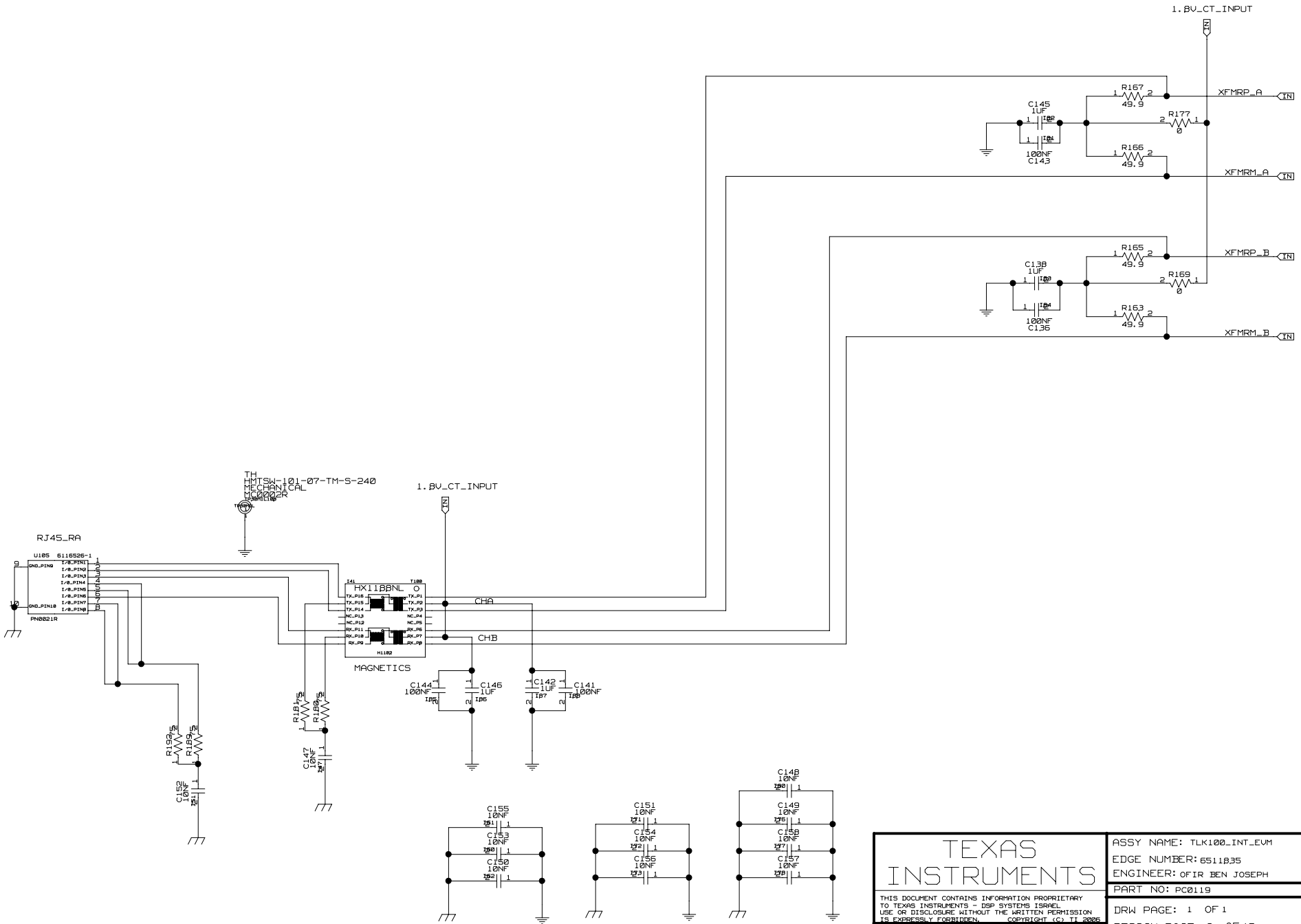
MAGNETICS



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