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| REV | DESCRIPTION | DATE | APPROVED |
|-----|--|----------|----------|
| A | Initial schematic ready for layout - Alpha Release | 04/01/07 | RRP |
| B | Pre-production release - Beta Release | 07/01/07 | RRP |
| C | Production release for 0.50 mm | 09/01/07 | RRP |
| D | Pre-production release for 0.65 mm | 09/28/07 | RRP |

| Memory Address Table | | |
|----------------------|------------------|--------------------|
| CHIP SELECT | BASE ADDRESS HEX | FUNCTION |
| CE0 - NAND CS0 | 0x0200 0000 | NAND FLASH CS0 R/W |
| CE0 - NAND CS1 | 0x0200 4000 | NAND FLASH CS1 R/W |
| CE1 - PHY/MAC CHIP | 0x0401 4000 | DM9000A READ WRITE |

| ARM ADDRESSING | | | | | | | | | | | | | | | |
|----------------|-----|-----|-----|-----|----|----|----|----|----|----|----|----|----|----|------|
| A14 | A13 | A12 | A11 | A10 | A9 | A8 | A7 | A6 | A5 | A4 | A3 | A2 | A1 | A0 | WORD |
| | X | X | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| | | | | | F | | | | F | | | | F | | |

| I2C Address Table | | | |
|-------------------|-----------|---------|------------------------------------|
| ADDRESS HEX | BINARY | DEVICE | FUNCTION |
| 0x25 | 00100011B | MSP430 | RTC, IR CTL, IO CTL, POWER MONITOR |
| 0x1B | 00011011B | AIC33 | AUDIO CODEC - 00110(MFP1) (MFP0) |
| 0x5D | 01011101B | TVP5146 | VIDEO DECODER - 101110(I2CA) |

SCHEMATIC CONTENTS

- SHEET01 - TITLE
- SHEET02 - DM355 SERIAL I/O
- SHEET03 - DM355 DDR2 INTERFACE
- SHEET04 - DM355 EMIF
- SHEET05 - DM355 USB
- SHEET06 - DM355 VIDEO
- SHEET07 - DM355 JTAG, CLKS, RESET
- SHEET08 - DM355 POWER/GND-pins
- SHEET09 - DM355 DECOUPLING CAPS

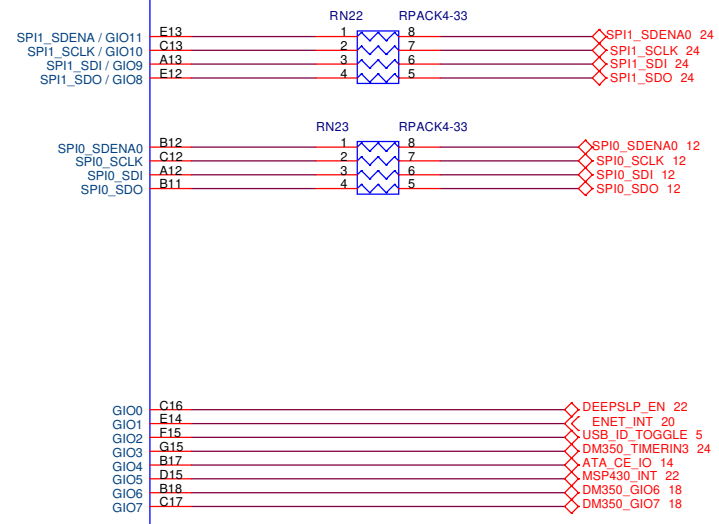
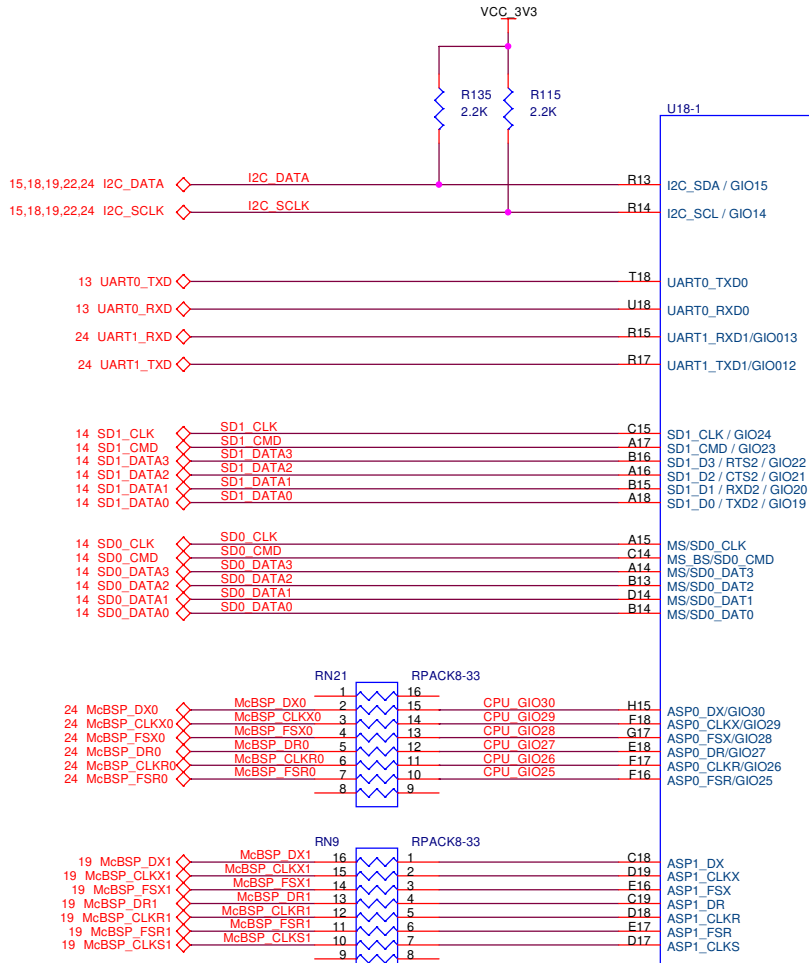
- SHEET10 - DDR2 MEMORY
- SHEET11 - JTAG CONNECTORS
- SHEET12 - NAND FLASH, SPI EEPROM, EMIF I/O DC
- SHEET13 - RS232 INTERFACE
- SHEET14 - SD/MMC IF - CE ATA IF
- SHEET15 - VIDEO INPUT MULTIPLEXER
- SHEET16 - IMAGER INTERFACE
- SHEET17 - 5146 DECODER
- SHEET18 - VIDEO DAUGHTER CARD IF
- SHEET19 - AIC33

- SHEET20 - DM9000A ENET CONTROLLER
- SHEET21 - ETHERNET CONNECTOR
- SHEET22 - MSP430
- SHEET23 - LEDS/SWITCHED ETC
- SHEET24 - I/O DAUGHTER CARD IF
- SHEET26 - CORE PWR SUPPLY, MSP430 PWR SUPPLY
- SHEET27 - 3V3 AND 1V8 POWER SUPPLY

REVISION STATUS OF SHEETS

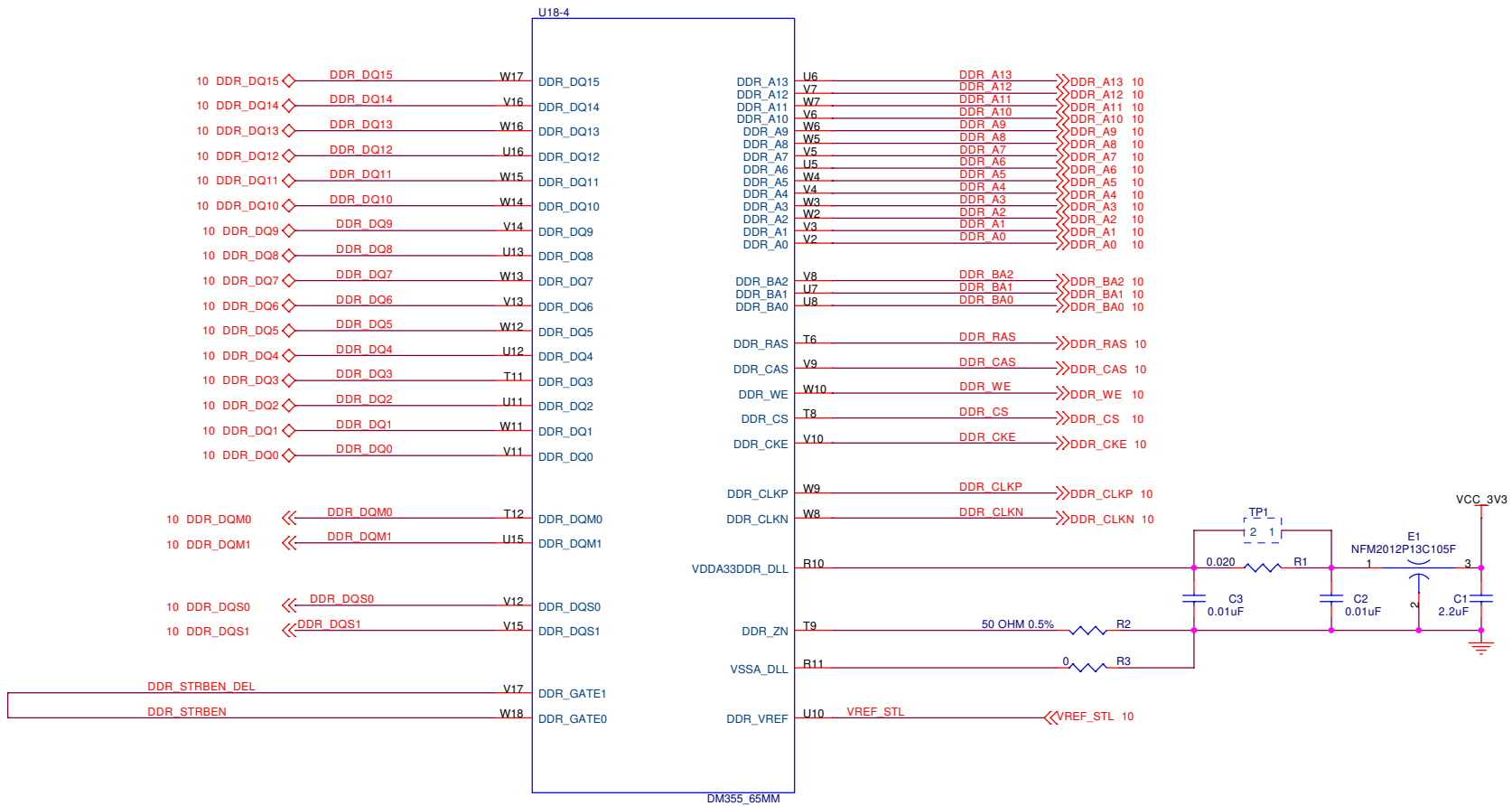
| REV | DATE | DESCRIPTION | BY | CHK | DATE | DESCRIPTION | BY | CHK | DATE | DESCRIPTION | BY | CHK | DATE |
|-----|------------|--|----------|-----|------------|---------------------------------------|----------|--------|------------|--------------------------------|-------------|--------|------------|
| A | 04/01/2007 | Initial schematic ready for layout - Alpha Release | DWN | RRP | 04/01/2007 | Pre-production release - Beta Release | CHK | T.W.K. | 04/01/2007 | Production release for 0.50 mm | ENGR | RRP | 04/01/2007 |
| B | 07/01/07 | Pre-production release - Beta Release | ENGR-MGR | RRP | 04/01/2007 | Pre-production release for 0.65 mm | ENGR-MGR | RRP | 04/01/2007 | Production release for 0.50 mm | CA | C.M.D. | 04/01/2007 |
| C | 09/01/07 | Production release for 0.50 mm | MFG | RRP | 04/01/2007 | Pre-production release for 0.65 mm | RLSE | RRP | 04/01/2007 | Production release for 0.50 mm | APPLICATION | RRP | 04/01/2007 |

| SPECTRUM DIGITAL INCORPORATED | | | |
|--------------------------------|------------------------------|-------------|---------------|
| Title: DM355 Evaluation Module | | | |
| Page Contents: TITLE SHEET | | | |
| Size: B | DWG NO | 509902-0001 | Revision: D2 |
| Date: | Wednesday, November 07, 2007 | | Sheet 1 of 26 |



DM355_65MM

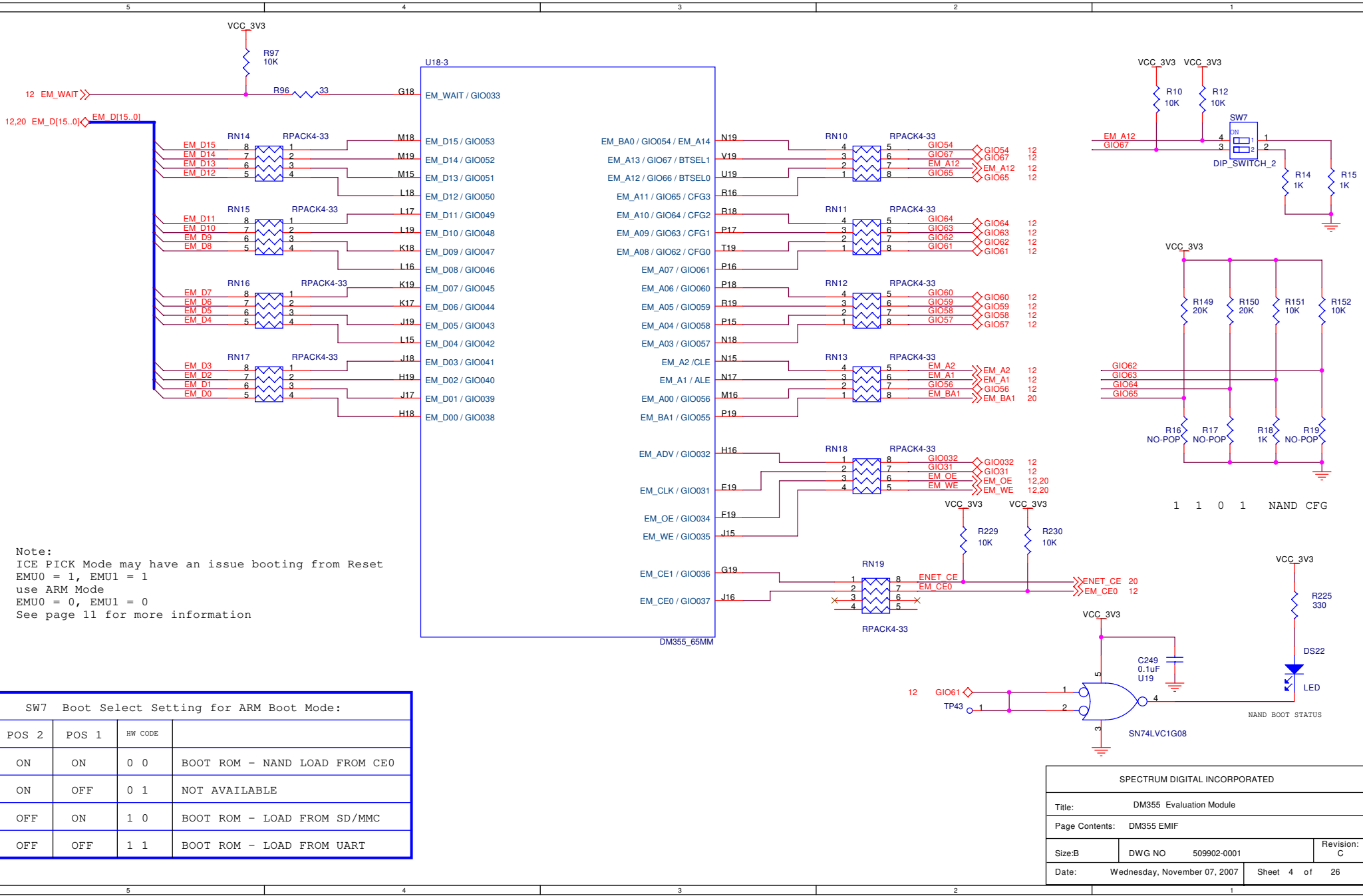
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|---------------------------------|------------------------------|-------------|-------------|
| SPECTRUM DIGITAL INCORPORATED | | | |
| Title: DM355 Evaluation Module | | | |
| Page Contents: DM355 SERIAL I/O | | | |
| Size: B | DWG NO | 509902-0001 | Revision: D |
| Date: | Wednesday, November 07, 2007 | Sheet 2 of | 26 |



Trace to DDR memory
for delay compensation

This net is equal to the DDR_CLKP (or DDR_CLKN)
plus
the length of DDR_DQXX Average Trace length

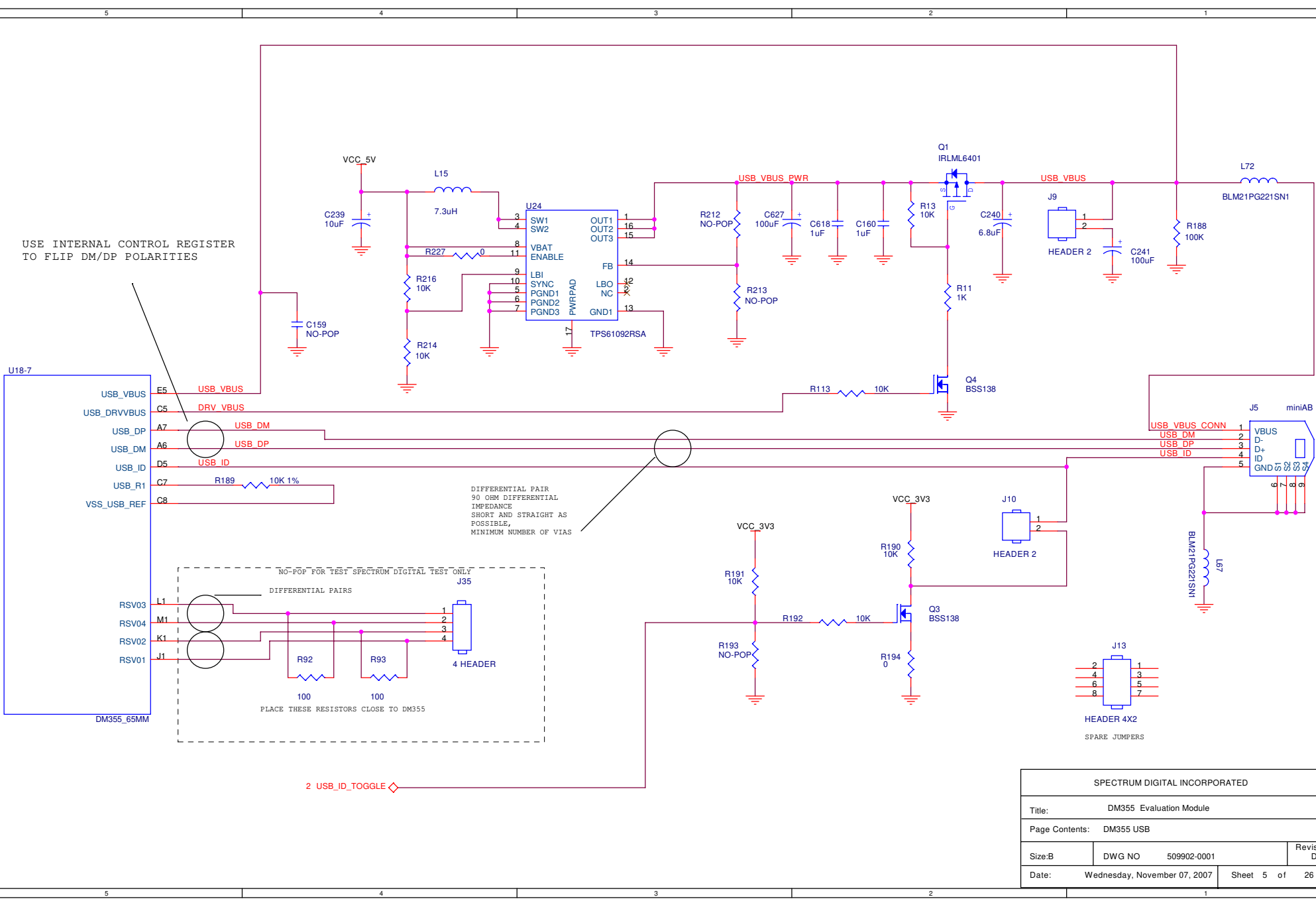
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| SPECTRUM DIGITAL INCORPORATED | | | |
| Title: DM355 Evaluation Module | | | |
| Page Contents: DM355 DDR INTERFACE | | | |
| Size: B | DWG NO | 509902-0001 | Revision: D |
| Date: | Wednesday, November 07, 2007 | Sheet 3 of 26 | |



Note:
 ICE PICK Mode may have an issue booting from Reset
 EMU0 = 1, EMU1 = 1
 use ARM Mode
 EMU0 = 0, EMU1 = 0
 See page 11 for more information

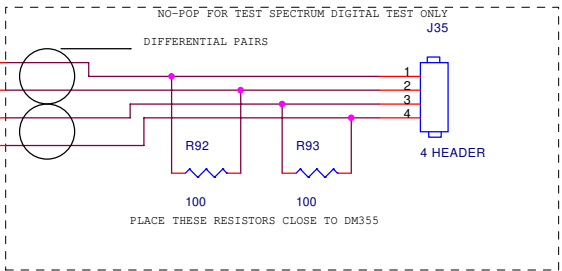
| SW7 Boot Select Setting for ARM Boot Mode: | | | |
|--|-------|---------|-------------------------------|
| POS 2 | POS 1 | HW CODE | |
| ON | ON | 0 0 | BOOT ROM - NAND LOAD FROM CE0 |
| ON | OFF | 0 1 | NOT AVAILABLE |
| OFF | ON | 1 0 | BOOT ROM - LOAD FROM SD/MMC |
| OFF | OFF | 1 1 | BOOT ROM - LOAD FROM UART |

| SPECTRUM DIGITAL INCORPORATED | | | |
|--------------------------------|------------------------------|---------------|-------------|
| Title: DM355 Evaluation Module | | | |
| Page Contents: DM355 EMIF | | | |
| Size: B | DWG NO | 509902-0001 | Revision: C |
| Date: | Wednesday, November 07, 2007 | Sheet 4 of 26 | |



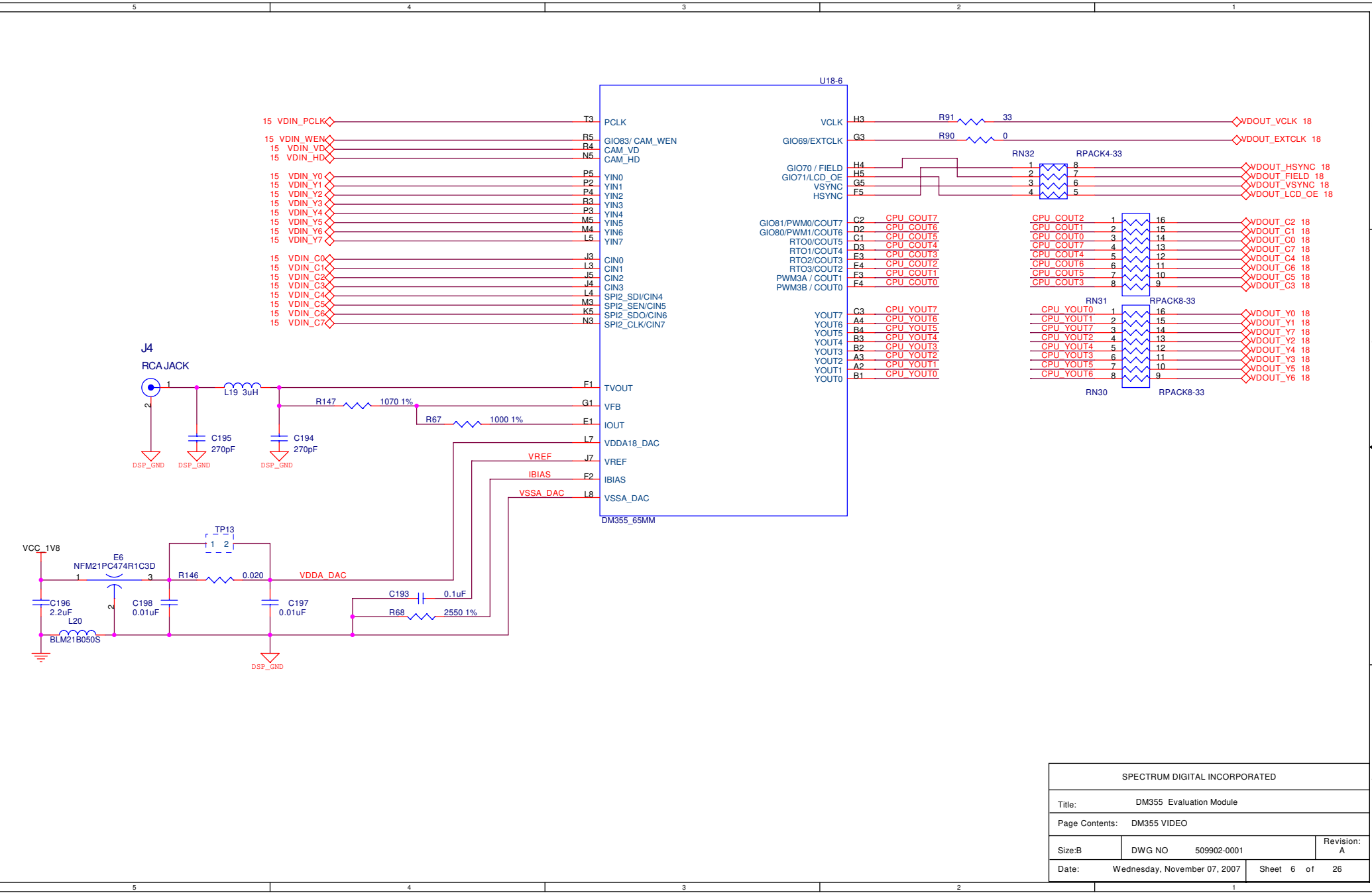
USE INTERNAL CONTROL REGISTER TO FLIP DM/DP POLARITIES

DIFFERENTIAL PAIR 90 OHM DIFFERENTIAL IMPEDANCE SHORT AND STRAIGHT AS POSSIBLE, MINIMUM NUMBER OF VIAS

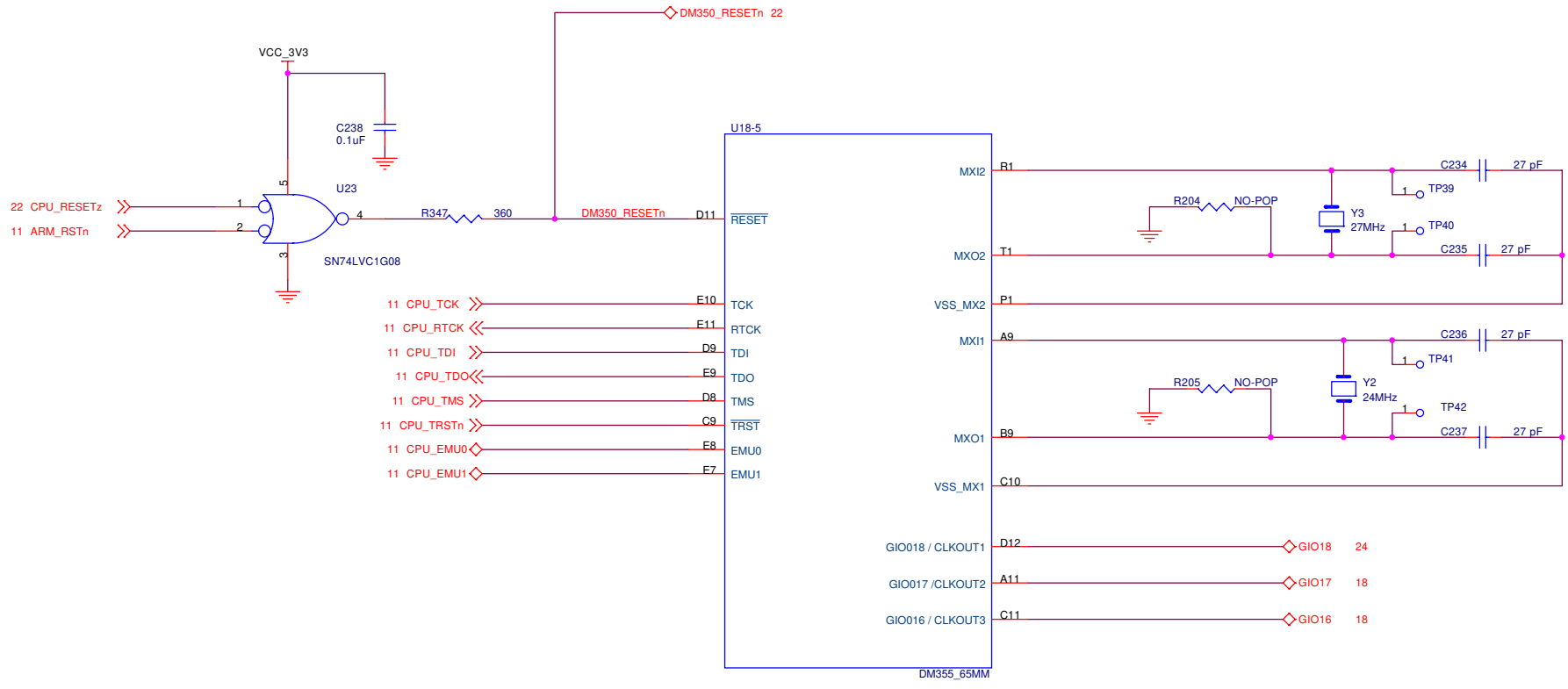


2 USB_ID_TOGGLE

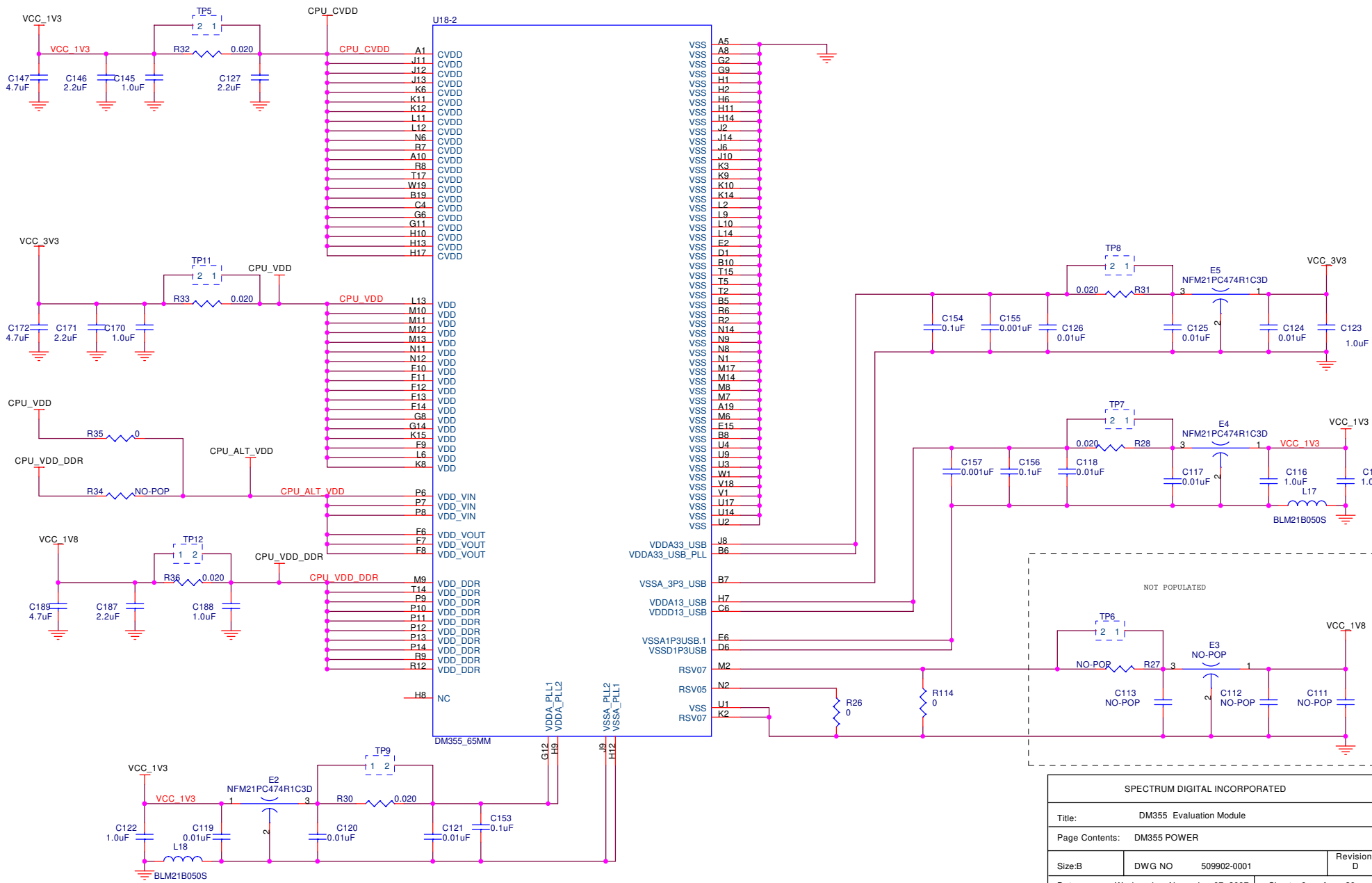
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| SPECTRUM DIGITAL INCORPORATED | | | |
| Title: DM355 Evaluation Module | | | |
| Page Contents: DM355 USB | | | |
| Size: B | DWG NO | 509902-0001 | Revision: D2 |
| Date: | Wednesday, November 07, 2007 | Sheet 5 of | 26 |



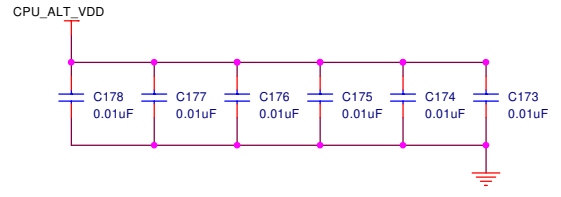
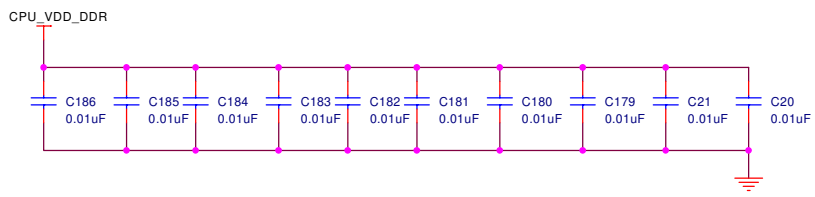
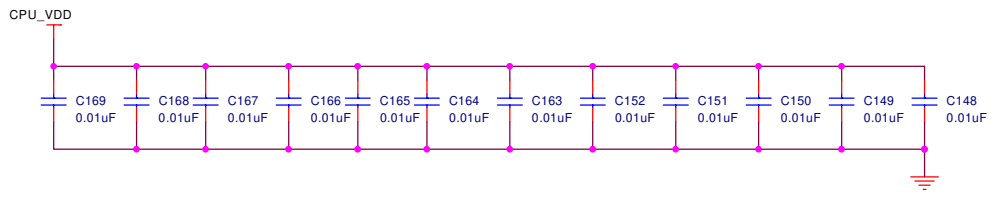
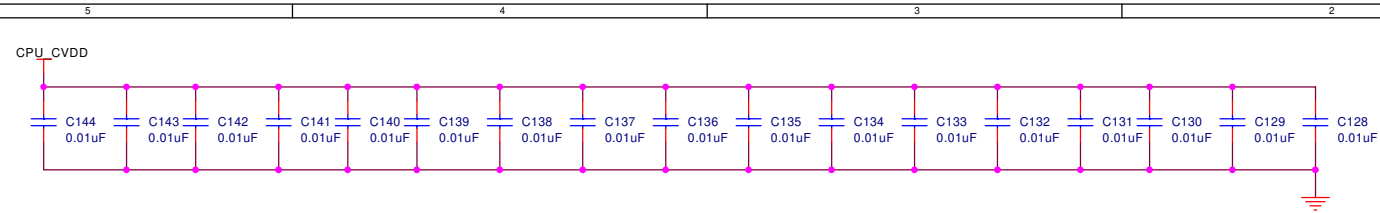
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| SPECTRUM DIGITAL INCORPORATED | | | |
| Title: DM355 Evaluation Module | | | |
| Page Contents: DM355 VIDEO | | | |
| Size: B | DWG NO | 509902-0001 | Revision: A |
| Date: | Wednesday, November 07, 2007 | Sheet 6 of | 26 |



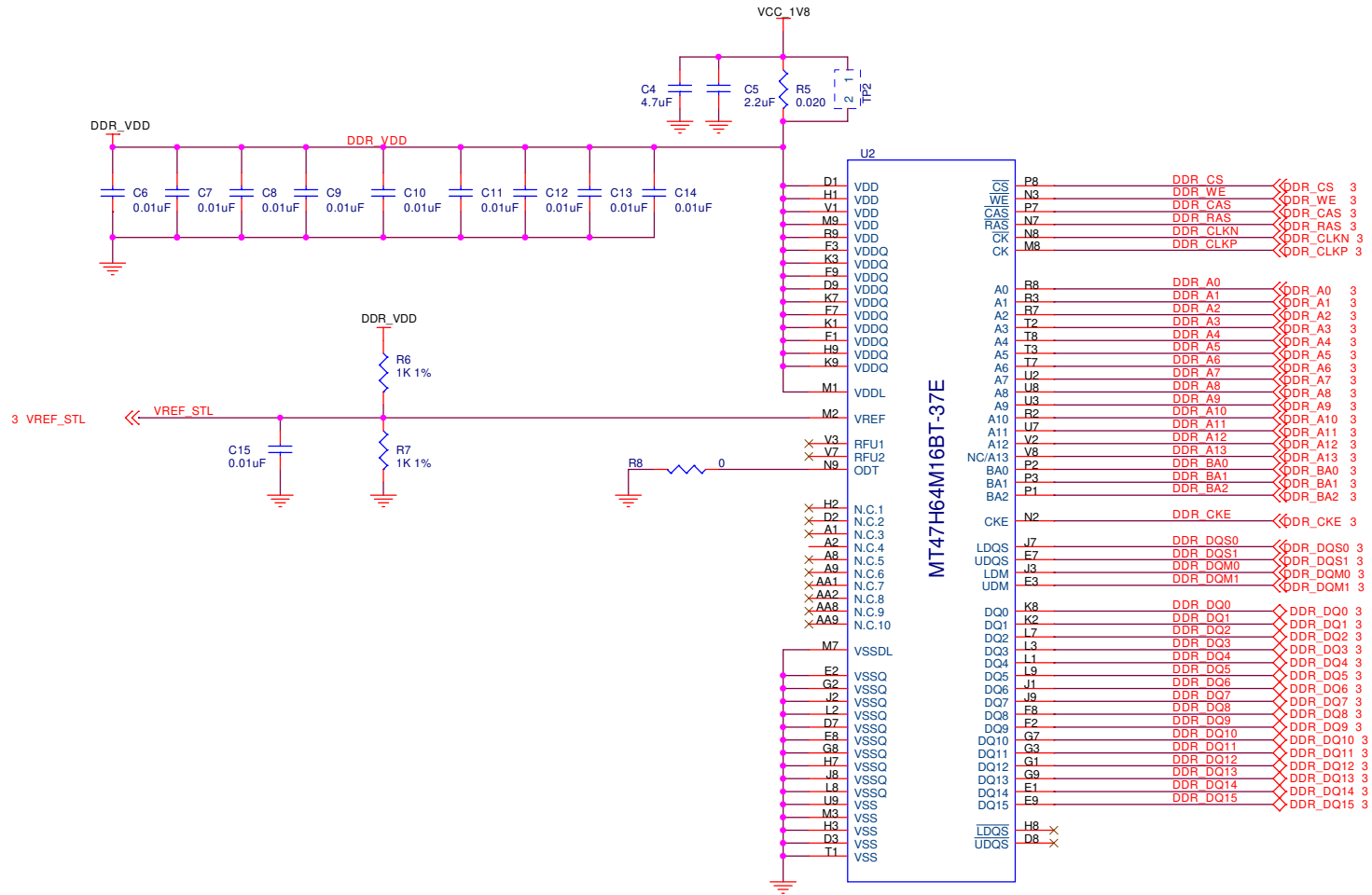
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| SPECTRUM DIGITAL INCORPORATED | | | |
| Title: DM355 Evaluation Module | | | |
| Page Contents: DM355 JTAG,RESET,CLOCKS | | | |
| Size: B | DWG NO | 509902-0001 | Revision: A |
| Date: | Wednesday, November 07, 2007 | | Sheet 7 of 26 |



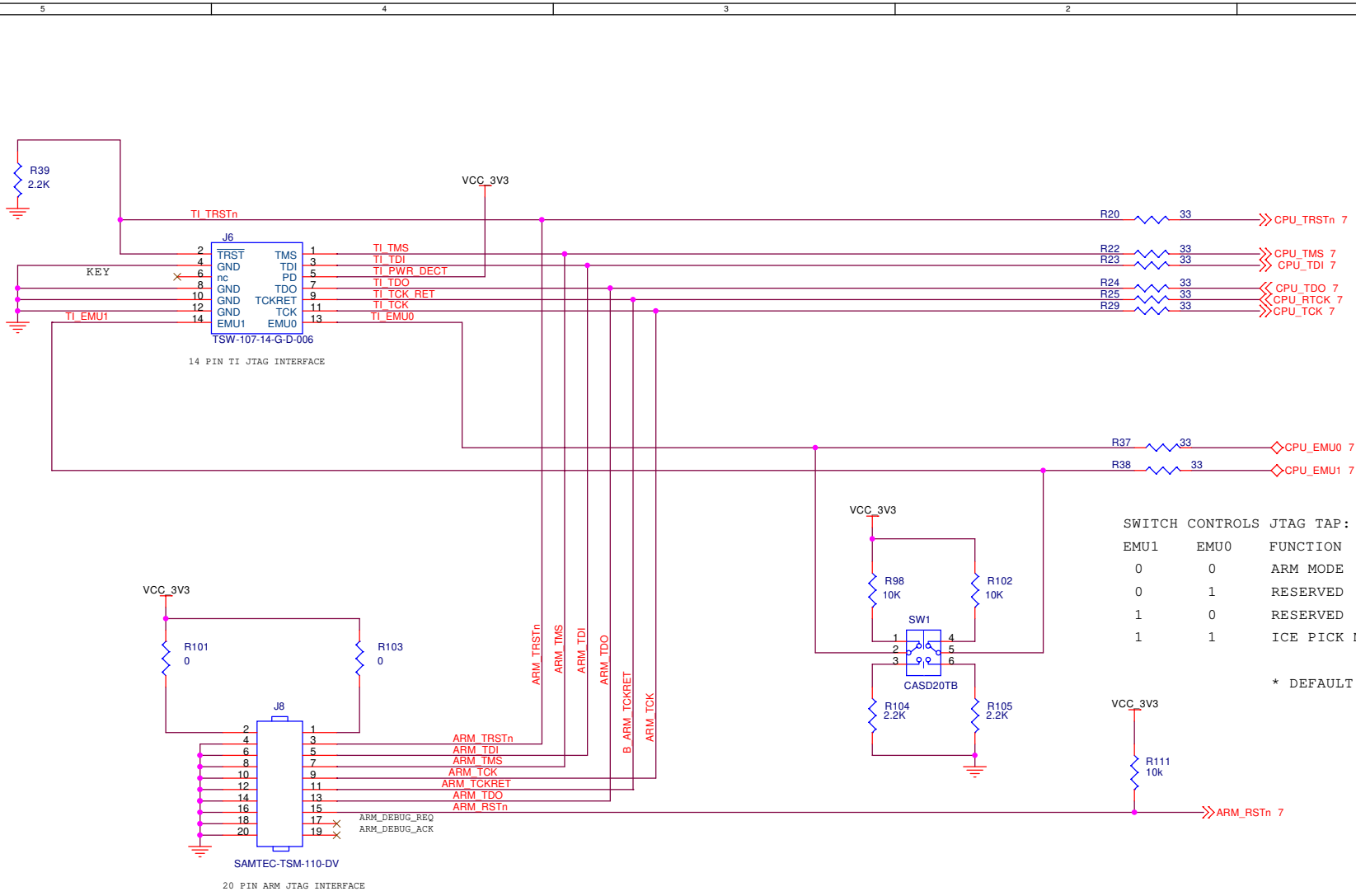
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| SPECTRUM DIGITAL INCORPORATED | | | |
| Title: DM355 Evaluation Module | | | |
| Page Contents: DM355 POWER | | | |
| Size: B | DWG NO | 509902-0001 | Revision: D |
| Date: | Wednesday, November 07, 2007 | Sheet 8 of 26 | |



| | | | |
|--|------------------------------|-------------|---------------|
| SPECTRUM DIGITAL INCORPORATED | | | |
| Title: DM355 Evaluation Module | | | |
| Page Contents: DM350 DECOUPLING CAPACITORS | | | |
| Size: B | DWG NO | 509902-0001 | Revision: A |
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| | | | |
|--------------------------------|------------------------------|-------------|-------------|
| SPECTRUM DIGITAL INCORPORATED | | | |
| Title: DM355 Evaluation Module | | | |
| Page Contents: DDR2 MEMORY | | | |
| Size: B | DWG NO | 509902-0001 | Revision: A |
| Date: | Wednesday, November 07, 2007 | Sheet 10 of | 26 |

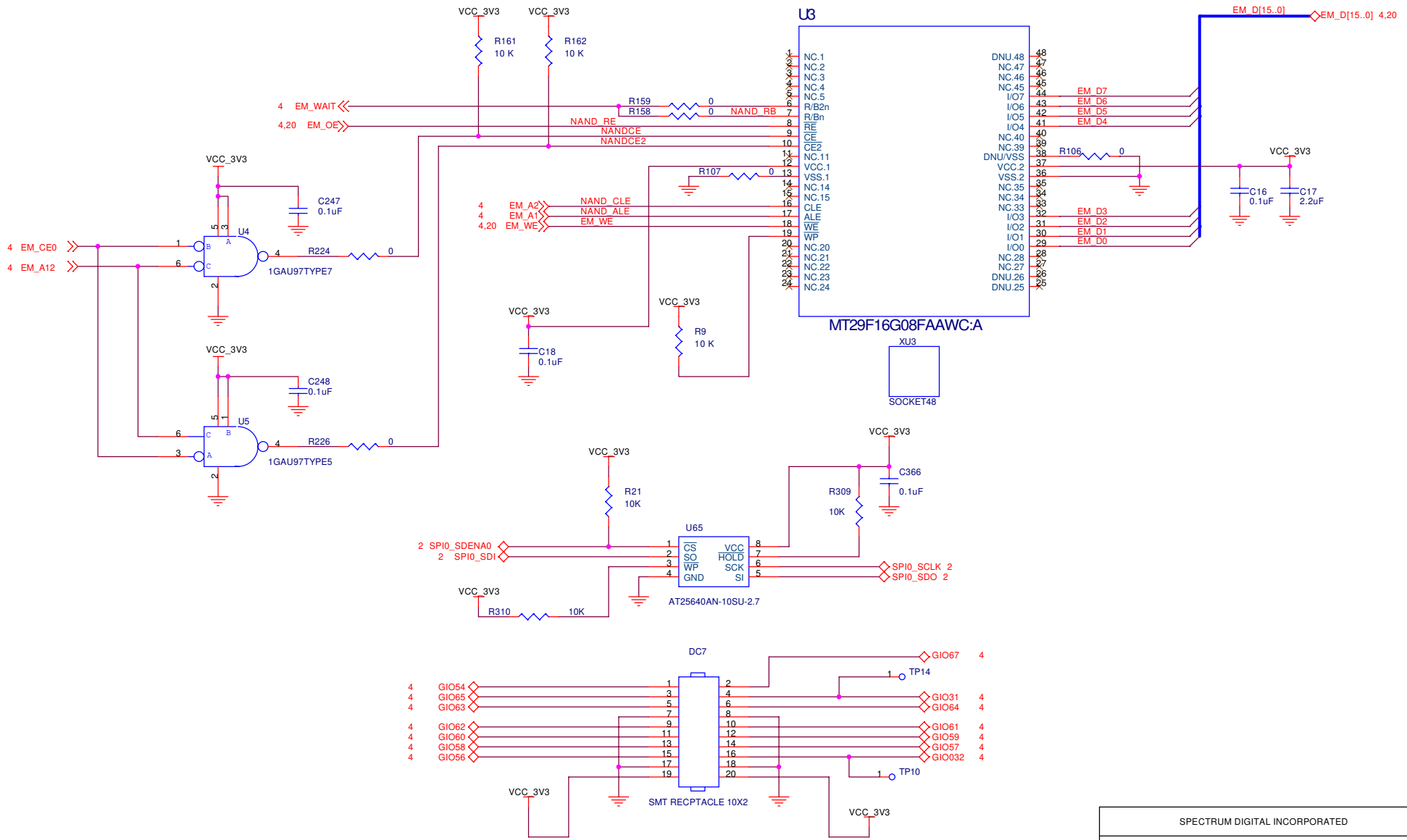


SWITCH CONTROLS JTAG TAP:

| EMU1 | EMU0 | FUNCTION |
|------|------|-----------------|
| 0 | 0 | ARM MODE |
| 0 | 1 | RESERVED |
| 1 | 0 | RESERVED |
| 1 | 1 | ICE PICK MODE * |

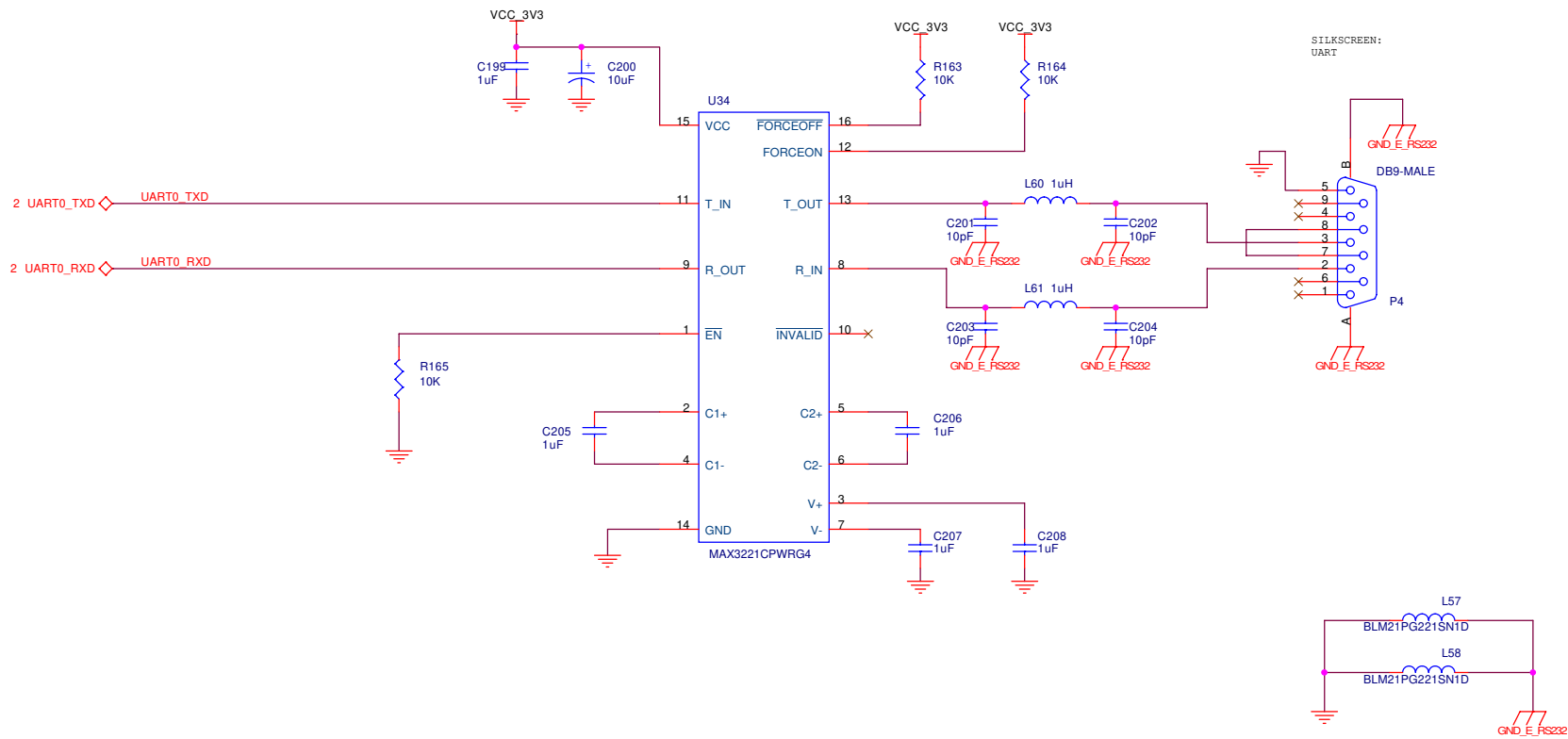
* DEFAULT

| | | | |
|--------------------------------|------------------------------|----------------|-------------|
| SPECTRUM DIGITAL INCORPORATED | | | |
| Title: DM355 Evaluation Module | | | |
| Page Contents: JTAG INTERFACE | | | |
| Size: B | DWG NO | 509902-0001 | Revision: A |
| Date: | Wednesday, November 07, 2007 | Sheet 11 of 26 | |



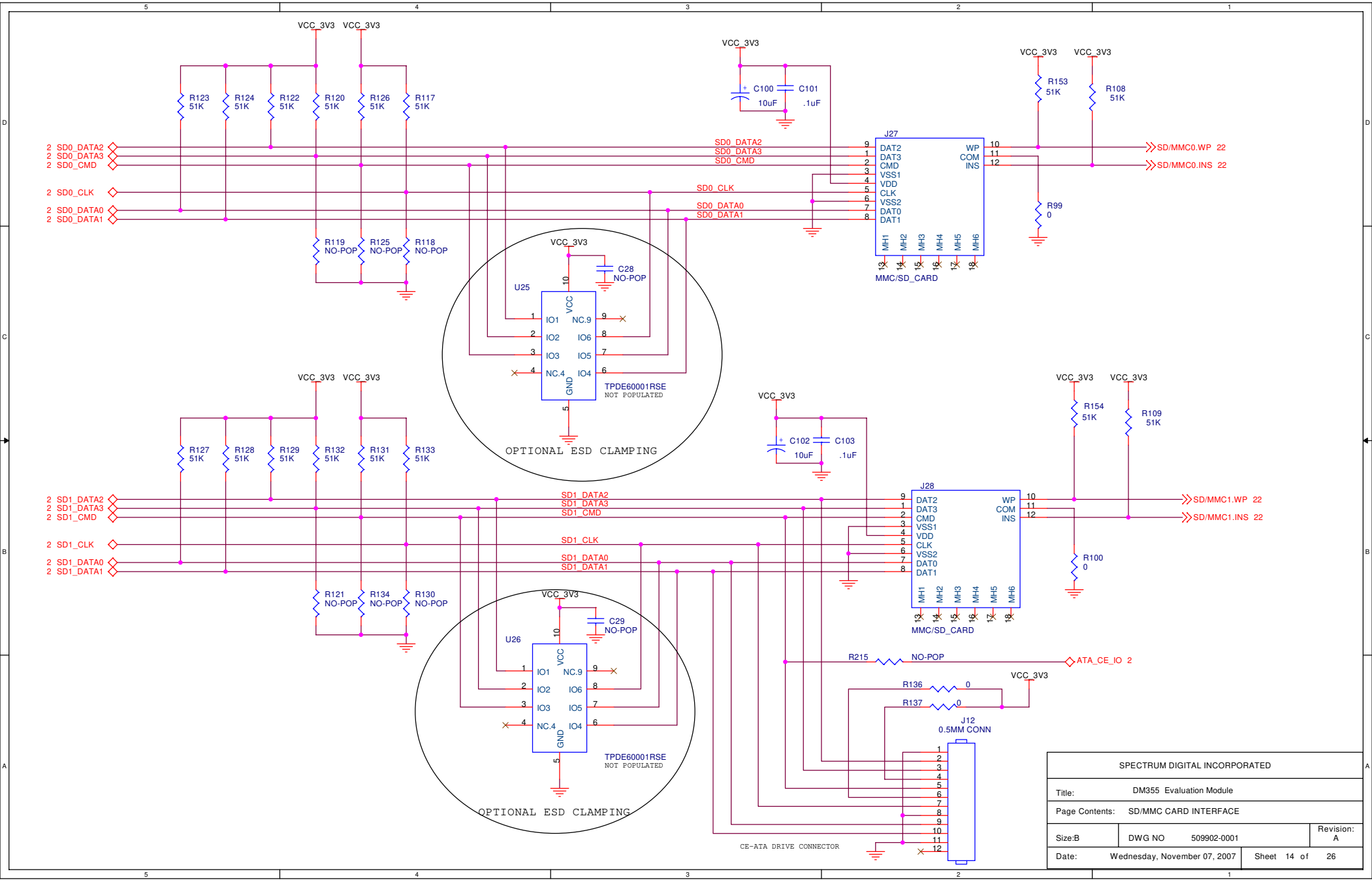
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| SPECTRUM DIGITAL INCORPORATED | | | |
| Title: DM355 Evaluation Module | | | |
| Page Contents: NAND FLASH, SPI EEPROM, EMIF I/O DC | | | |
| Size: B | DWG NO: 509902-0001 | Revision: D2 | |
| Date: Wednesday, November 07, 2007 | Sheet 12 of 26 | | |

5 4 3 2 1

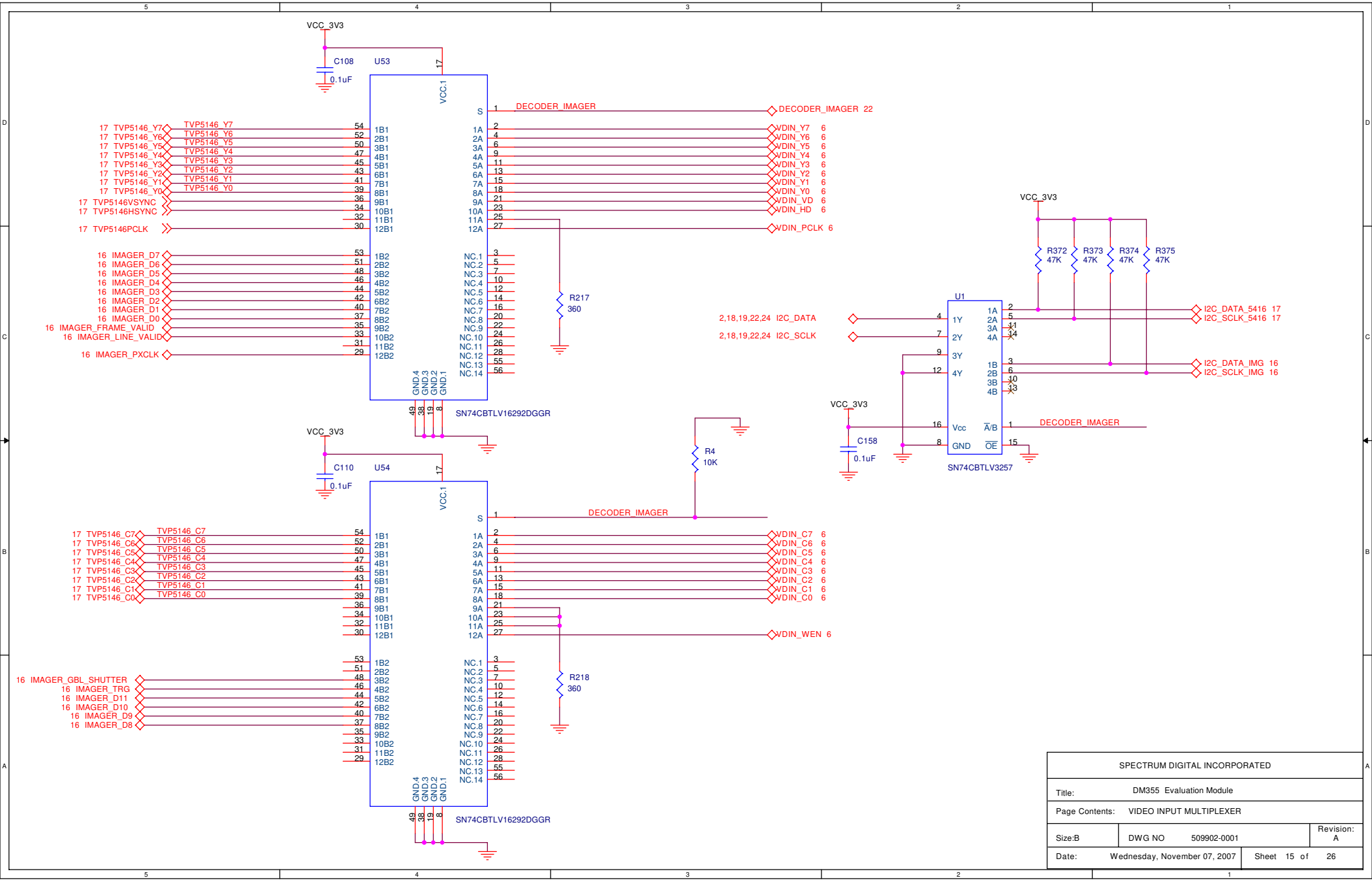


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| SPECTRUM DIGITAL INCORPORATED | | | |
| Title: DM355 Evaluation Module | | | |
| Page Contents: RS232 | | | |
| Size: B | DWG NO | 509902-0001 | Revision: A |
| Date: | Wednesday, November 07, 2007 | Sheet 13 of | 26 |

5 4 3 2 1

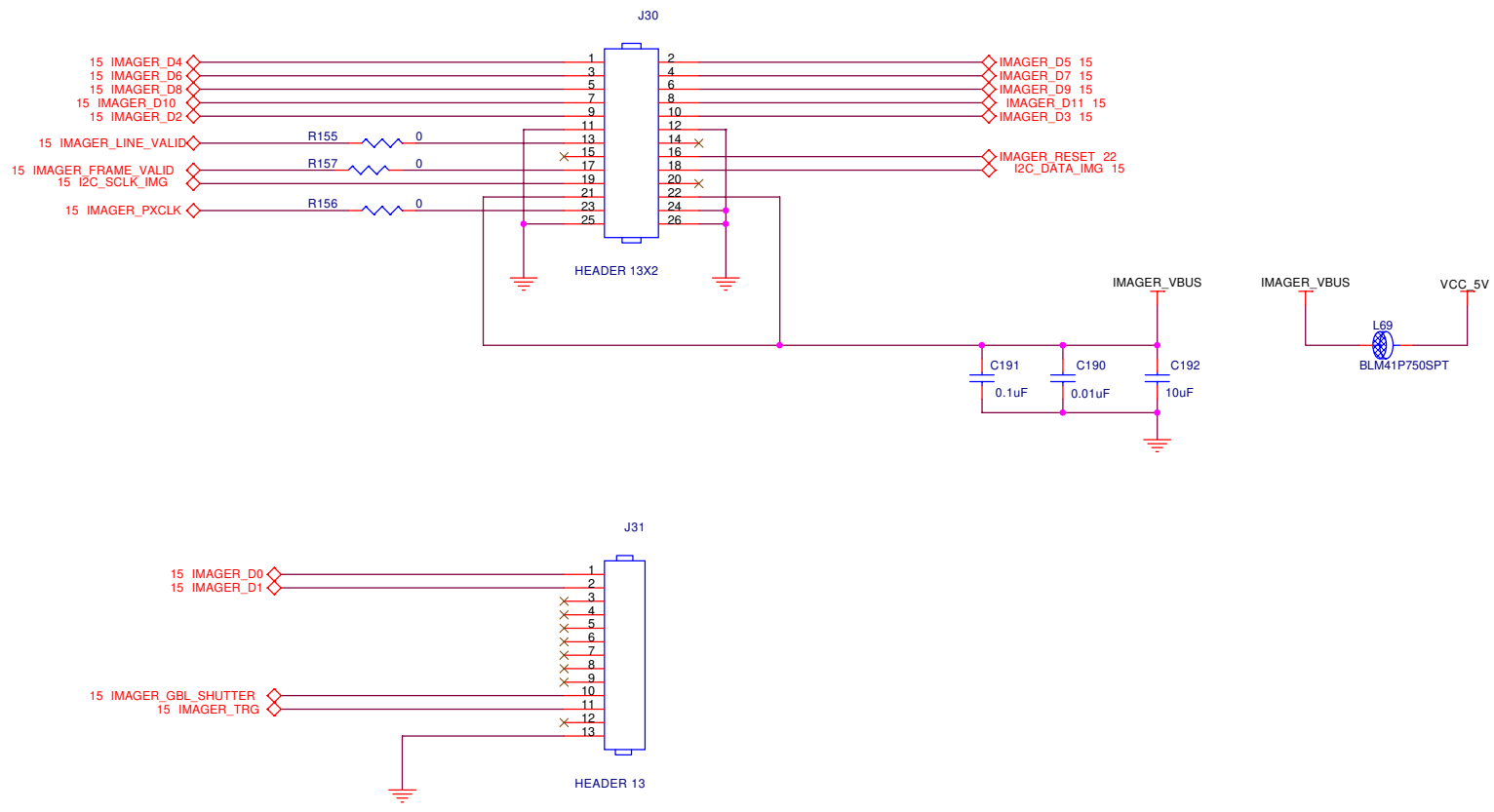


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| SPECTRUM DIGITAL INCORPORATED | | | |
| Title: DM355 Evaluation Module | | | |
| Page Contents: SD/MMC CARD INTERFACE | | | |
| Size: B | DWG NO | 509902-0001 | Revision: A |
| Date: Wednesday, November 07, 2007 | Sheet 14 of 26 | | |



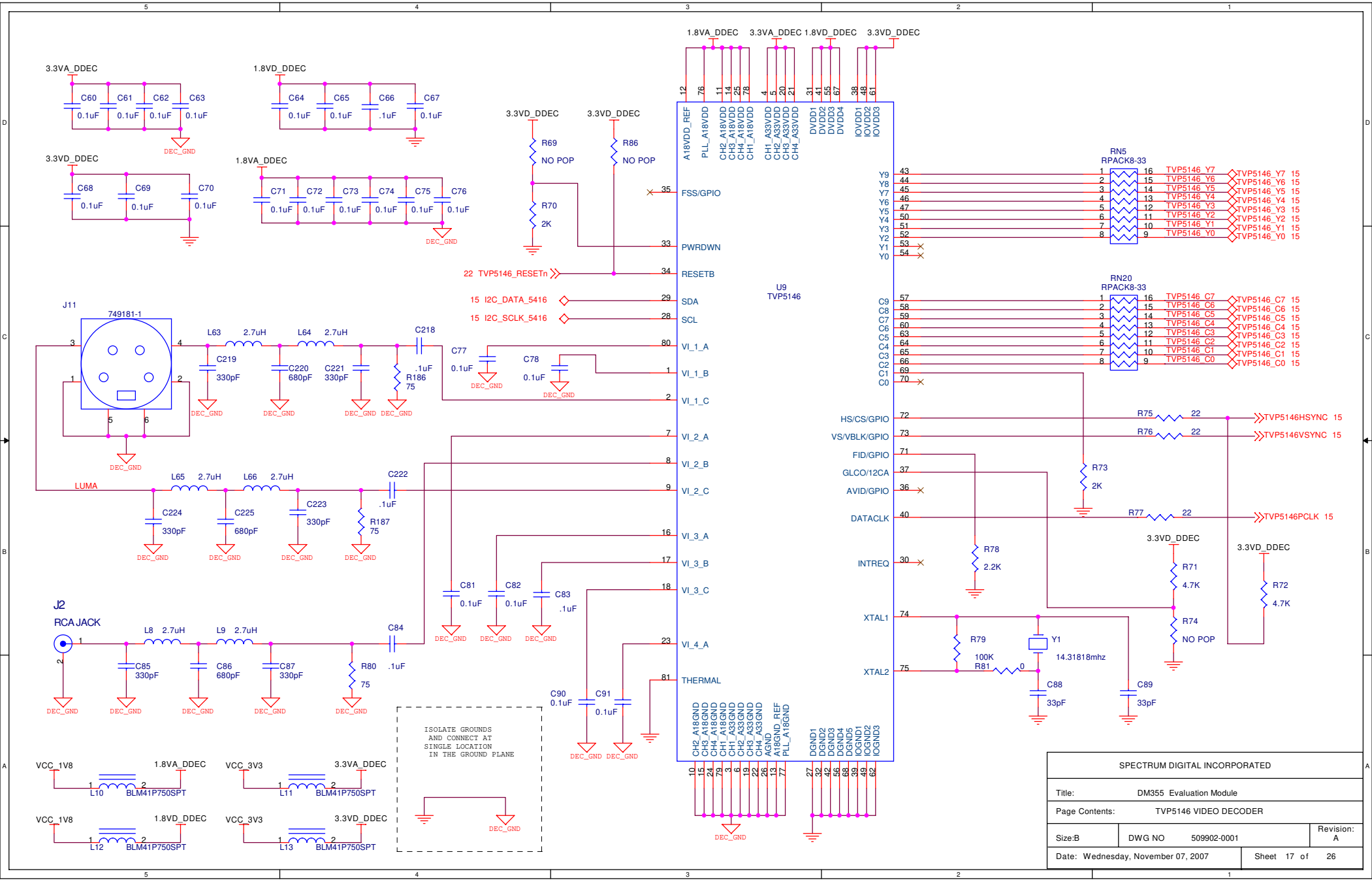
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| SPECTRUM DIGITAL INCORPORATED | | | |
| Title: DM355 Evaluation Module | | | |
| Page Contents: VIDEO INPUT MULTIPLEXER | | | |
| Size: B | DWG NO | 509902-0001 | Revision: A |
| Date: | Wednesday, November 07, 2007 | Sheet 15 of | 26 |

5 4 3 2 1

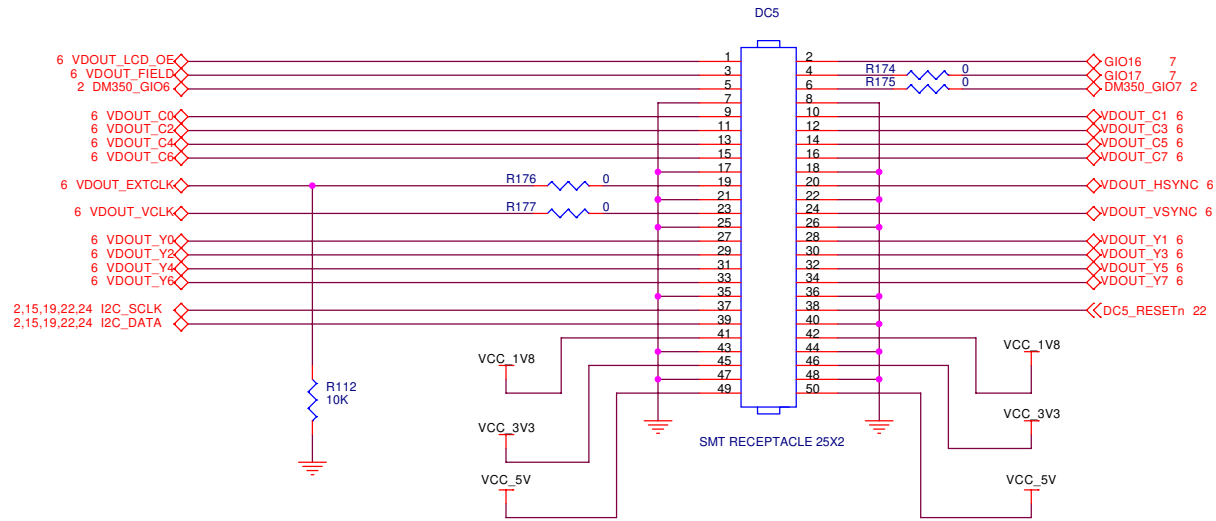


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| SPECTRUM DIGITAL INCORPORATED | | | |
| Title: DM355 Evaluation Module | | | |
| Page Contents: IMAGER INTERFACE | | | |
| Size: B | DWG NO | 509902-0001 | Revision: A |
| Date: | Wednesday, November 07, 2007 | | Sheet 16 of 26 |

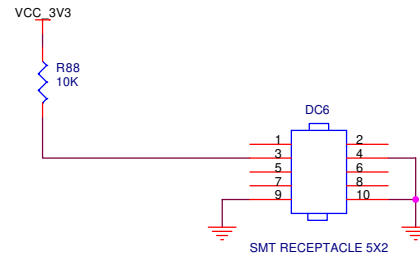
5 4 3 2 1



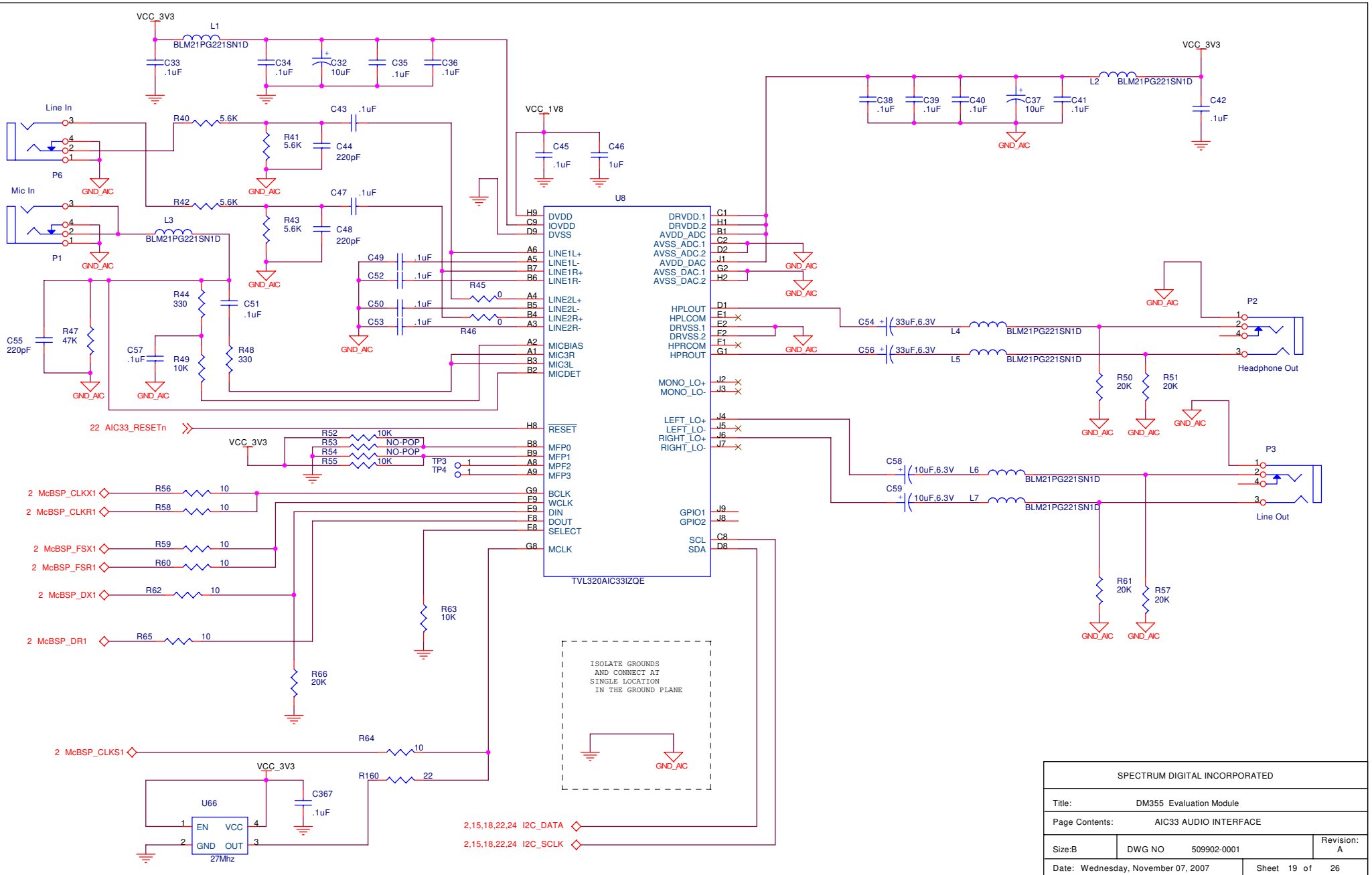
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| SPECTRUM DIGITAL INCORPORATED | | | |
| Title: DM355 Evaluation Module | | | |
| Page Contents: TVP5146 VIDEO DECODER | | | |
| Size: B | DWG NO: 509902-001 | Revision: A | |
| Date: Wednesday, November 07, 2007 | | Sheet 17 of 26 | |



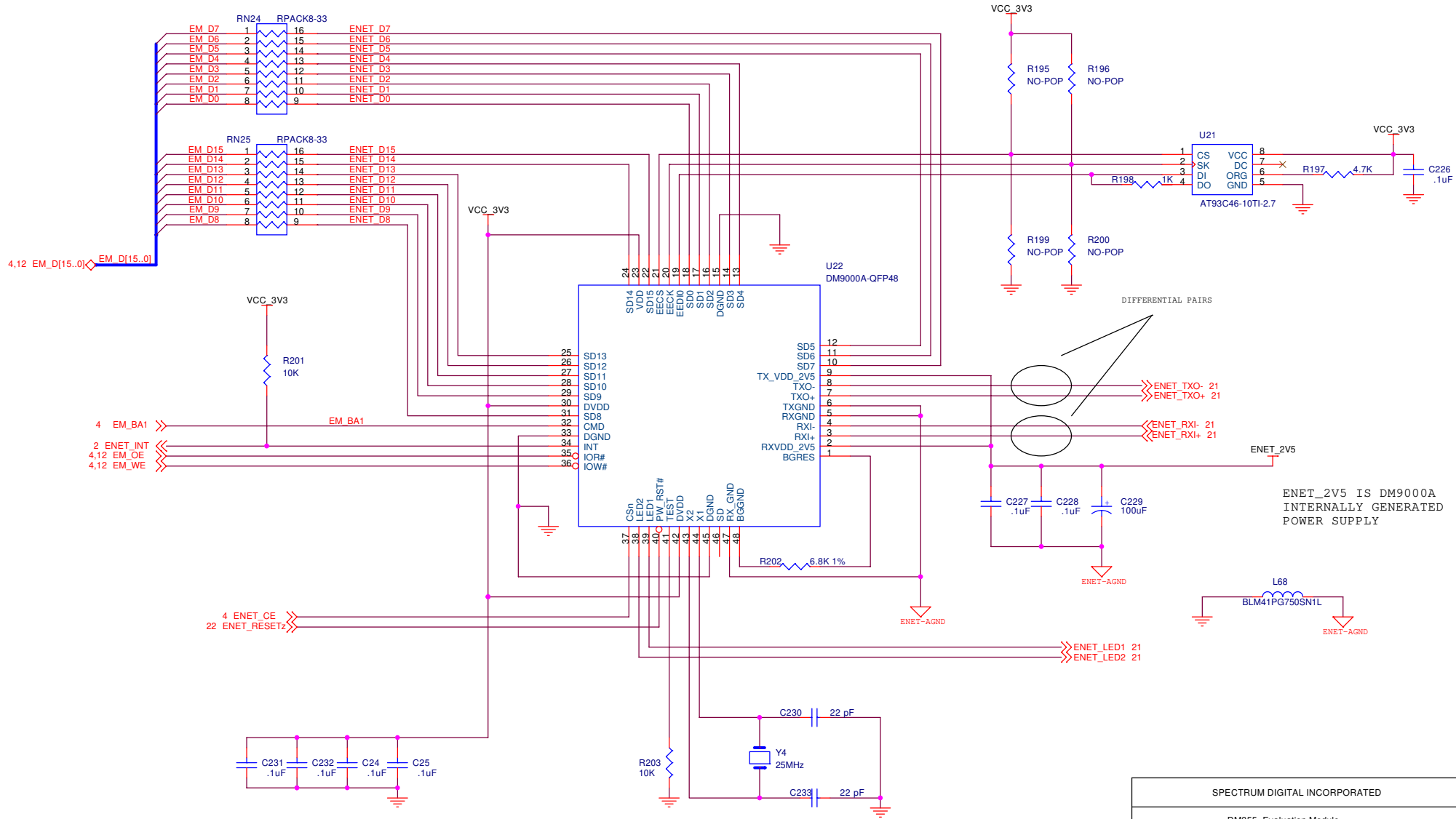
VIDEO OUTPUT CONNECTOR



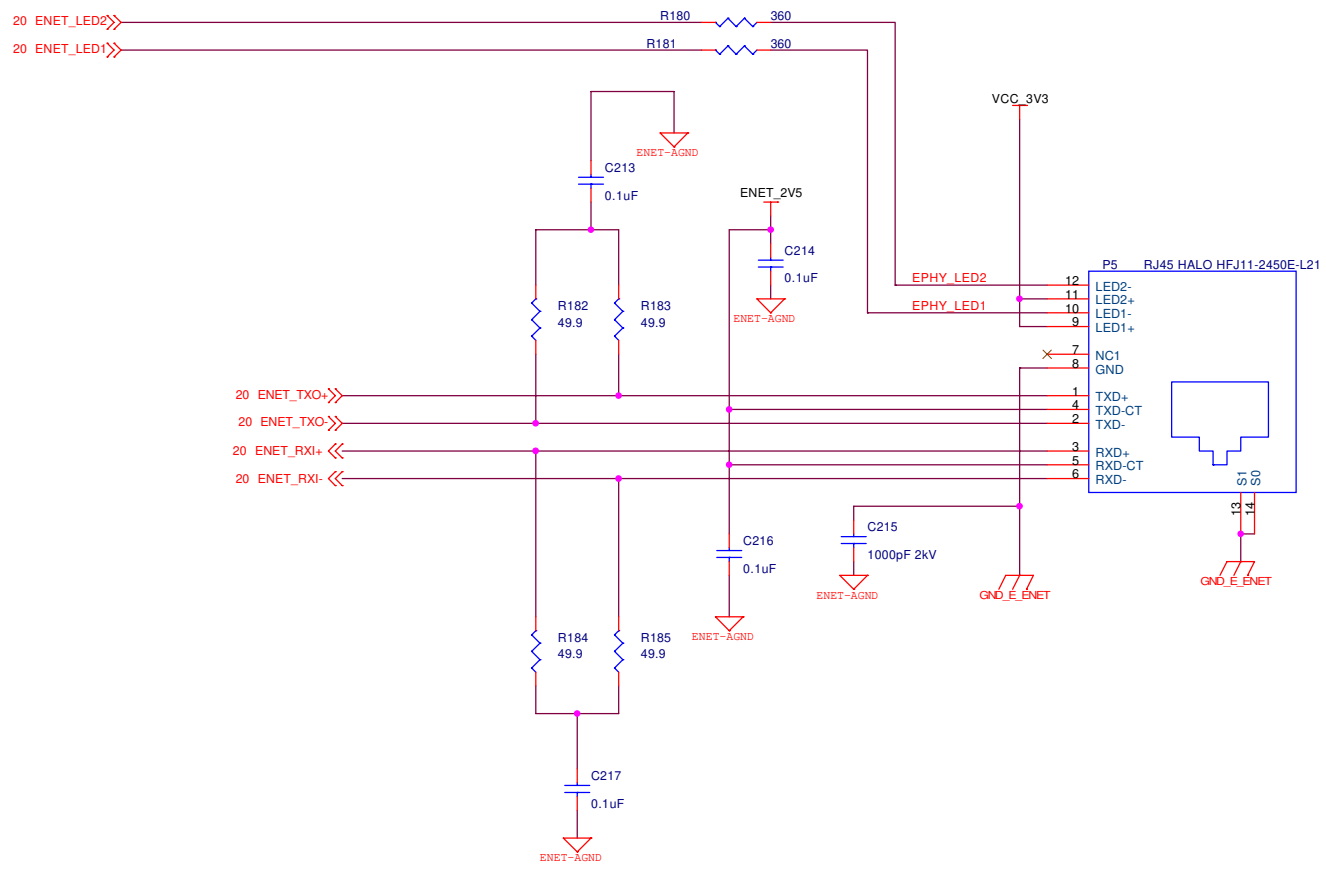
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| SPECTRUM DIGITAL INCORPORATED | | | |
| Title: DM355 Evaluation Module | | | |
| Page Contents: THS8200 DAUGHTER CARD INTERFACE | | | |
| Size: B | DWG NO | 509902-0001 | Revision: A |
| Date: | Wednesday, November 07, 2007 | | Sheet 18 of 26 |



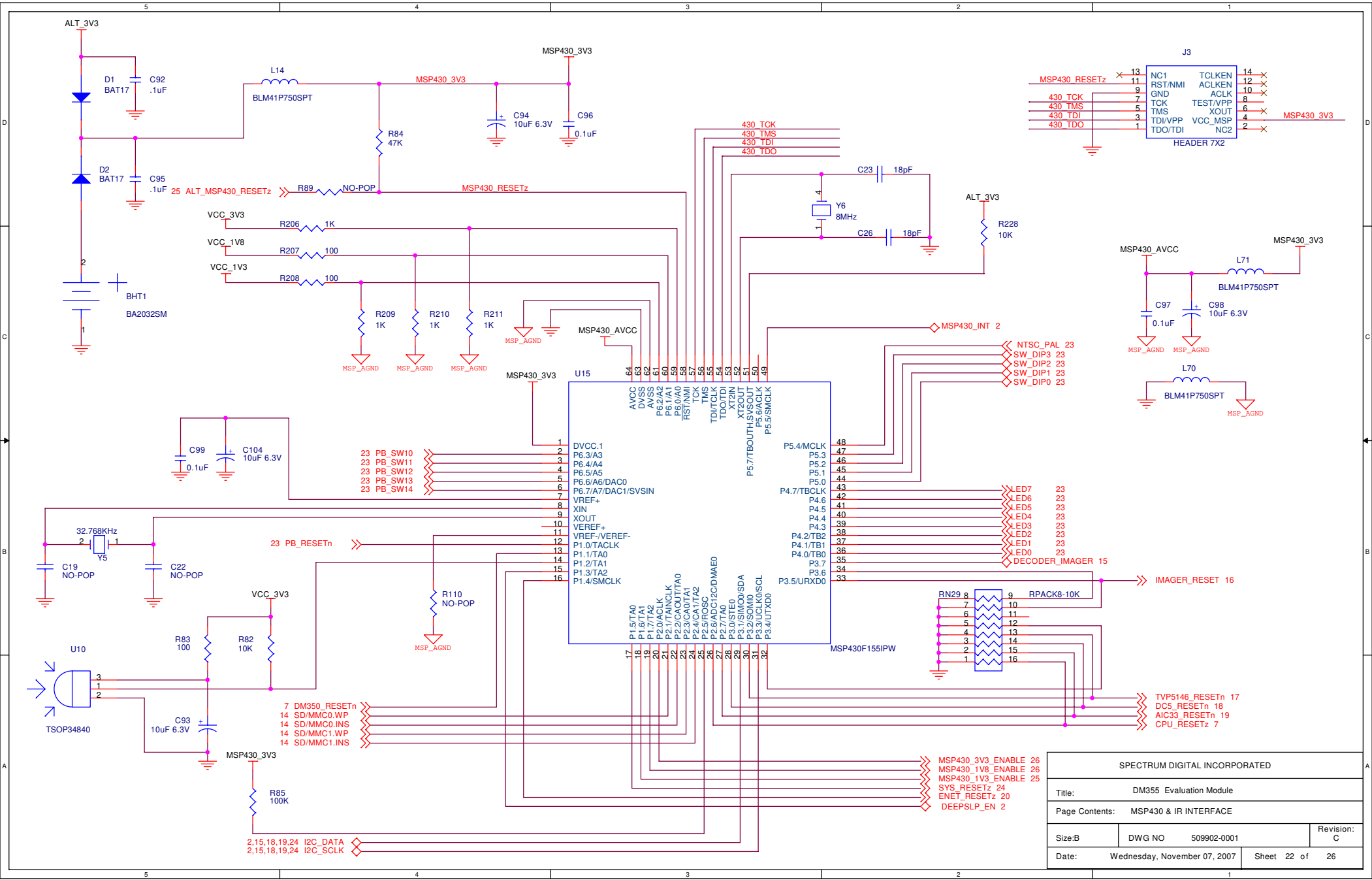
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| SPECTRUM DIGITAL INCORPORATED | | | |
| Title: | | DM355 Evaluation Module | |
| Page Contents: | | AIC33 AUDIO INTERFACE | |
| Size: B | DWG NO | 509902-0001 | Revision: A |
| Date: Wednesday, November 07, 2007 | | Sheet 19 of 26 | |



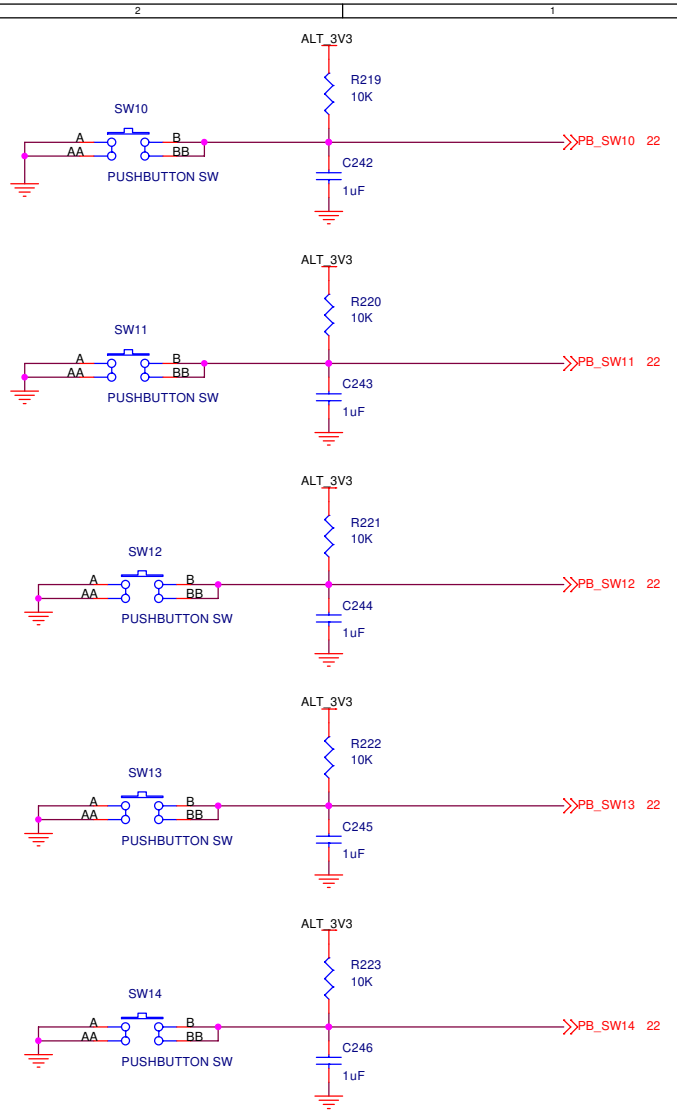
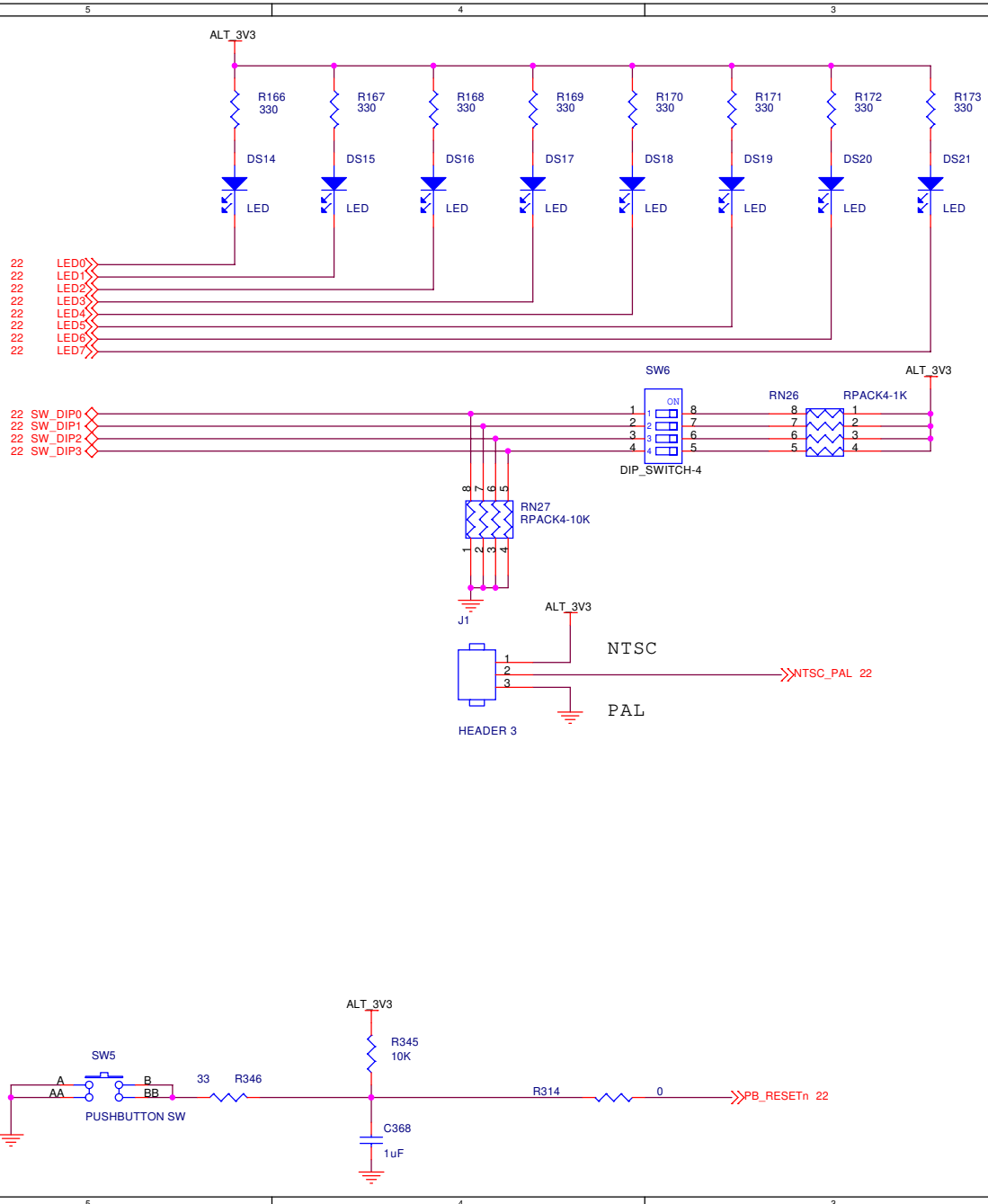
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| SPECTRUM DIGITAL INCORPORATED | | | |
| Title: DM355 Evaluation Module | | | |
| Page Contents: Ethernet Interface | | | |
| Size: B | DWG NO | 509902-0001 | Revision: A |
| Date: | Wednesday, November 07, 2007 | Sheet 20 of 26 | |



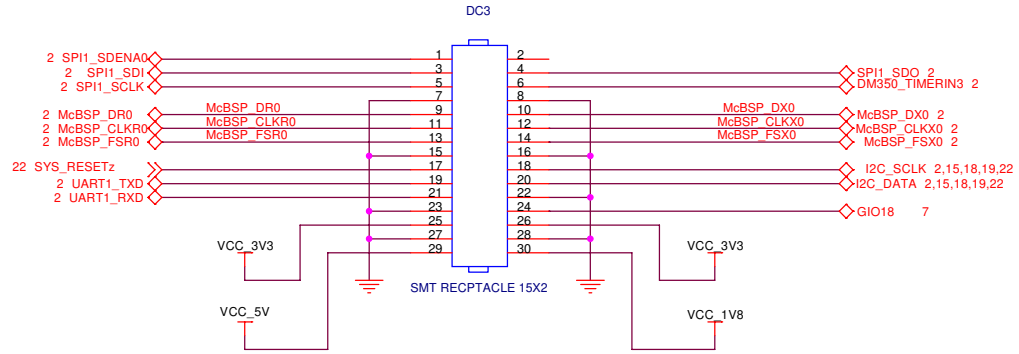
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| SPECTRUM DIGITAL INCORPORATED | | | |
| Title: DM355 Evaluation Module | | | |
| Page Contents: ETHERNET OUTPUT | | | |
| Size: B | DWG NO | 509902-0001 | Revision: A |
| Date: | Wednesday, November 07, 2007 | Sheet 21 of | 26 |



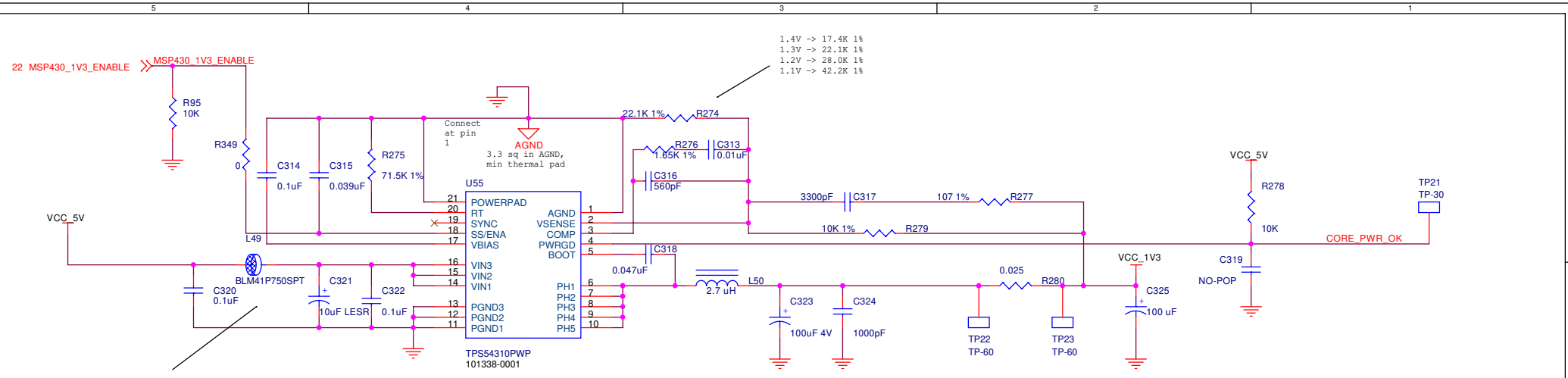
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| SPECTRUM DIGITAL INCORPORATED | | | |
| Title: DM355 Evaluation Module | | | |
| Page Contents: MSP430 & IR INTERFACE | | | |
| Size: B | DWG NO: 509902-0001 | Revision: C | |
| Date: Wednesday, November 07, 2007 | Sheet 22 of 26 | | |



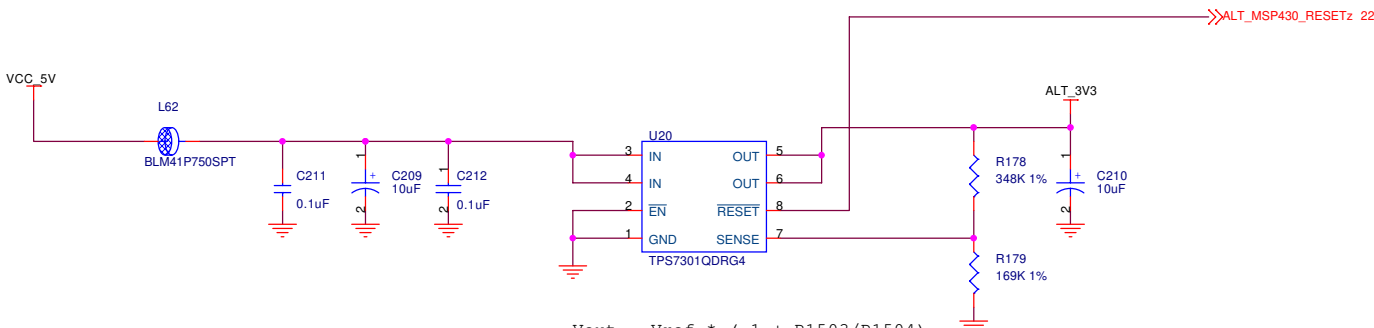
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| SPECTRUM DIGITAL INCORPORATED | | | |
| Title: DM355 Evaluation Module | | | |
| Page Contents: SWITCHES, LEDS ETC | | | |
| Size: B | DWG NO | 509902-0001 | Revision: A |
| Date: | Wednesday, November 07, 2007 | Sheet 23 of | 26 |



| | | | |
|--|------------------------------|-------------|-------------|
| SPECTRUM DIGITAL INCORPORATED | | | |
| Title: DM355 Evaluation Module | | | |
| Page Contents: I/O DAUGHTER CARD INTERFACE | | | |
| Size: B | DWG NO | 509902-0001 | Revision: A |
| Date: | Wednesday, November 07, 2007 | Sheet 24 of | 26 |



EMI SUPPRESSION. LOCATE NEAR EACH REGULATOR. 6 VIAS FROM PAD TO PLANE OR DIRECT TIE.

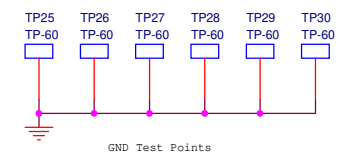


$$V_{out} = V_{ref} * (1 + R_{1503}/R_{1504})$$

$$V_{ref} = 1.182 \text{ Volts}$$

$$V_{out} = 3.6 \text{ volts}$$

$$R_{1503} = 346K$$



| | | | |
|--|------------------------------|-------------|-------------|
| SPECTRUM DIGITAL INCORPORATED | | | |
| Title: DM355 Evaluation Module | | | |
| Page Contents: POWER SUPPLY MSP430_3V3, DSP CORE(1V3) | | | |
| Size: B | DWG NO | 509902-0001 | Revision: A |
| Date: | Wednesday, November 07, 2007 | Sheet 25 of | 26 |