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Preface

NOTICE TO CUSTOMERS

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For the most up-to-date information on development tools, see the MPLAB® IDE online help. Select the Help menu, and then Topics to open a list of available online help files.

INTRODUCTION

This chapter contains general information that will be useful to know before using the EVB-USB7206 Evaluation Kit. Items discussed in this chapter include:

- Document Layout
- Conventions Used in this Guide
- Warranty Registration
- The Microchip Web Site
- Development Systems Customer Change Notification Service
- Customer Support
- Document Revision History

DOCUMENT LAYOUT

This document describes how to use the EVB-USB7206 Evaluation Kit as a demonstration platform optimized for portable applications. The manual layout is as follows:

- **Chapter 1. "Overview"** – This chapter shows a brief description of the EVB-USB7206 Evaluation Kit.
- **Chapter 2. "Getting Started"** – This chapter provides information about setup and operation of the EVB-USB7206 Evaluation Kit.
- **Chapter 3. "EVB-USB7206 Evaluation Kit"** – This chapter includes information about the hardware configuration of the EVB-USB7206 Evaluation Kit.
- **Appendix A. "USB7206 Schematics"** – This appendix shows the EVB-USB7206 Evaluation Kit schematics.
- **Appendix B. "Bill of Materials"** – This appendix shows the EVB-USB7206 Evaluation Kit Bill of Materials (BOM).
- **Appendix C. "PCB Silk Screens"** – This appendix shows the EVB-USB7206 Evaluation Kit silk screen.

CONVENTIONS USED IN THIS GUIDE

This manual uses the following documentation conventions:

DOCUMENTATION CONVENTIONS

Description	Represents	Examples
Arial font:		
Italic characters	Referenced books	*MPLAB® IDE User's Guide*
	Emphasized text	...is the *only* compiler...
Initial caps	A window	the Output window
	A dialog	the Settings dialog
	A menu selection	select Enable Programmer
Quotes	A field name in a window or dialog	"Save project before build"
Underlined, italic text with right angle bracket	A menu path	*File>Save*
Bold characters	A dialog button	Click **OK**
	A tab	Click the **Power** tab
N'Rnnnn	A number in verilog format, where N is the total number of digits, R is the radix and n is a digit.	4'b0010, 2'hF1
Text in angle brackets < >	A key on the keyboard	Press <Enter>, <F1>
Courier New font:		
Plain Courier New	Sample source code	`#define START`
	Filenames	`autoexec.bat`
	File paths	`c:\mcc18\h`
	Keywords	`_asm, _endasm, static`
	Command-line options	`-Opa+, -Opa-`
	Bit values	`0, 1`
	Constants	`0xFF, 'A'`
Italic Courier New	A variable argument	`file.o, where file can be any valid filename`
Square brackets [ ]	Optional arguments	`mcc18 [options] file [options]`
Curly brackets and pipe character: { | }	Choice of mutually exclusive arguments; an OR selection	`errorlevel {0|1}`
Ellipses...	Replaces repeated text	`var_name [, var_name...]`
	Represents code supplied by user	`void main (void) { ... }`

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- **Emulators** – The latest information on Microchip in-circuit emulators. This includes the MPLAB® REAL ICE™ and MPLAB ICE 2000 in-circuit emulators.
- **In-Circuit Debuggers** – The latest information on the Microchip in-circuit debuggers. This includes MPLAB ICD 3 in-circuit debuggers and PICkit 3 debug express.
- **MPLAB IDE** – The latest information on Microchip MPLAB IDE, the Windows Integrated Development Environment for development systems tools. This list is focused on the MPLAB IDE, MPLAB IDE Project Manager, MPLAB Editor and MPLAB SIM simulator, as well as general editing and debugging features.
- **Programmers** – The latest information on Microchip programmers. These include production programmers such as MPLAB REAL ICE in-circuit emulator, MPLAB ICD 3 in-circuit debugger and MPLAB PM3 device programmers. Also included are nonproduction development programmers such as PICSTART Plus and PIC-kit 2 and 3.

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- Field Application Engineer (FAE)
- Technical Support

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Technical support is available through the web site at:
http://www.microchip.com/support

DOCUMENT REVISION HISTORY

Revisions	Section/Figure/Entry	Correction
DS50002937A (11-26-19)	Initial release	

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Chapter 1. Overview

1.1 INTRODUCTION

The EVB-USB7206 is a demonstration and evaluation platform that provides the necessary requirements and interface options for evaluating the USB7206, a 6-port High-Speed (HS) USB smart hub on a 4-layer RoHS-compliant Printed Circuit Board (PCB). This allows the user to gain an understanding of the product and accelerate the integration of the USB7206 into the user's design.

The EVB-USB7206 is compliant with the USB 2.0 HS, Full-Speed (FS), and Low-Speed (LS) USB signaling. The EVB-USB7206 is also compliant with USB 3.2 Gen2 on the upstream port and on downstream ports 1 to 5.

The evaluation platform supports six downstream ports: five Gen2 ports, and one USB2.0 port with Type-A connectors. The EVB-USB7206 platform also supports battery charging on all six downstream ports (maximum of 10A; see Note 1) at any one time. The EVB-USB7206 supports FlexConnect role reversal for any of the six downstream ports with the upstream port.

The EVB-USB7206 has four configurations for operation through internal default settings and supports custom configurations either via I^2C or through the external 16-Mbit SPI Flash device.

The EVB-USB7206 demonstrates driver compatibility with Microsoft® Windows® 10, Windows 8.x, Windows 7, Windows XP, Mac OS® X 10.4+, and Linux® hub drivers.

For more information about EVB-USB7206, see **Section 1.2 "Features"**.

Note 1: Requires a 12V, 85W supply.

1.2 FEATURES

- Microchip's PortSwap, PHYBoost™, and VariSense™ technologies
- USB7206 in a 100-pin QFN RoHS-compliant package
- USB 3.2-compliant (Gen2 operation)
- USB 2.0-compliant (HS, FS, and LS operation)
- 5V-tolerant USB pins
- Self-powered operation
- USB Gen2 Type-B upstream port
- Six downstream USB ports:
  - Five Gen2 downstream ports
  - One USB 2.0-only downstream port
- All downstream ports support individual port power and overcurrent sense
- All downstream ports can be enabled for battery charging with the battery charging select shunts J10 and J14. (BC1.2 or SE1, 2.1A maximum per port)
- Onboard SPI Flash for external downloadable firmware
- Operates from a single-voltage (+12.0V, regulated) external power supply
- Onboard 25 MHz crystal or oscillator input
- Single onboard +5.2V, 15A regulator

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- Single onboard +3.3V, 0.5A regulator
- Single onboard +1.2V, 2A regulator
- Port Power LED indicators
- SPI Flash activity blue LED indicator
- Reset red LED indicator
- Green LED indicators for 5V, 3.3V, and 1.2V regulator outputs
- Terminal block connector for use with an external 12 VDC bench supply
- Barrel connector for use with a Microchip 12V power supply
- Removable or non-removable downstream port options can be configured with select shunt on J13.
- Bridge peripheral functions:
  - USB-to-UART (CDC)
  - USB-to-I^2S™ Audio Codec
  - USB-to-I^2C

1.3 BLOCK DIAGRAM

Figure 1-1 shows the block diagram of EVB-USB7206.

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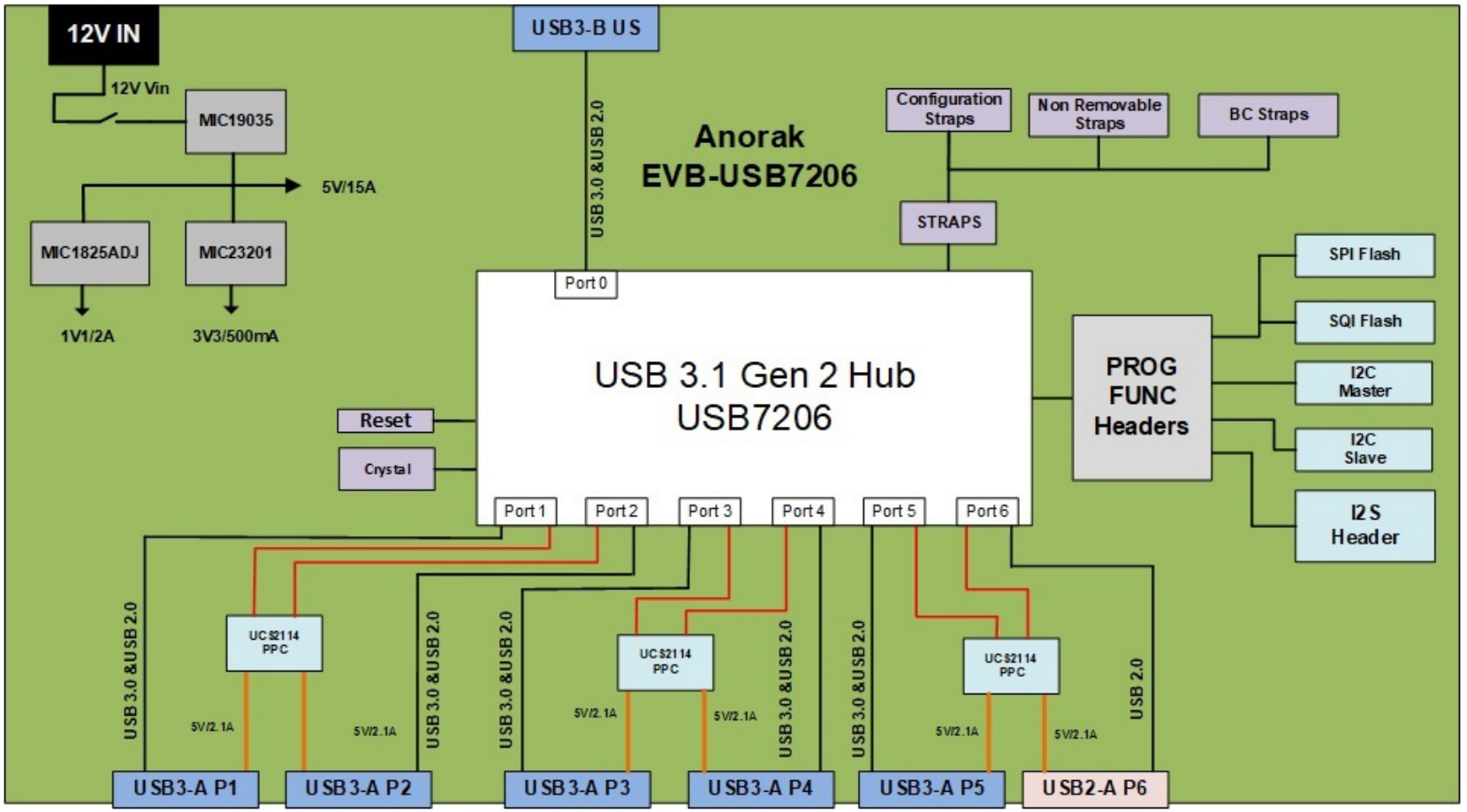
FIGURE 1-1: EVB-USB7206 BLOCK DIAGRAM



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1.4 REFERENCES

Concepts and materials available in the following document may be helpful when reading this document. Visit www.microchip.com for the latest version.

- *USB7206 Data Sheet*

1.5 ACRONYMS AND DEFINITIONS

TABLE 1-1: ACRONYMS AND DEFINITIONS

Acronym	Definition
BC1.2	The latest USB-IF specified USB battery charging standard
CDP	Charging Downstream Port, a BC1.2-compliant port that allows simultaneous USB data and USB charging
DCP	Dedicated Charging Port, a BC1.2-compliant port which is only capable of USB charging (no data)
DFP	Downstream Facing Port
EVB	Evaluation Board
OTP	One-Time Programmable Memory
SDP	Standard Downstream Port, a standard USB port with no high-current battery charging capabilities
SE1	Type of Battery Charging (non-USB compliant) that sets the USB D+/D- to specific DC voltages to communicate charging capability
Type-C	Reversible USB Connector
USB-IF	USB Integrators Forum, a collection of corporate-sponsored members responsible for developing USB specifications
Gen2	USB Specification 3.2 Gen2

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Chapter 2. Getting Started

2.1 INTRODUCTION

The Microchip EVB-USB7206 is designed for flexible configuration solutions. It can be configured through default internal register settings, a downloadable external firmware to an onboard SPI Flash (OTP memory), SMBus, and onboard configuration switches. When configured with the default internal register settings, the device operates as a USB 3.1 Gen1 hub with one upstream Gen1 port, two downstream Gen2 ports, and two downstream USB 2.0 ports, with Microchip's standard VID/PID/DID settings.

Microchip provides a comprehensive software programming tool, MPLAB® Connect Configurator (MPLABCC), for configuring USB7206 functions, registers, and OTP memory. USB7206 requires MPLABCC version 2.1.0 or greater.

For additional information on the MPLABCC programming tool, refer to Software Libraries within the Microchip USB7206 product page at www.microchip.com/USB7206.

2.2 KIT CONTENTS

The EVB-USB7206 Evaluation Kit includes the basic equipment necessary for evaluation. The items included in the kit are:

- EVB-USB7206 Evaluation Board
- Type-A to Type-B USB Cable

2.3 QUICK START

To quickly start using the board, perform the following steps:

1. Connect a 12V power supply to the barrel connector (J4) or the terminal block (52) on the EVB-USB7206.
2. Using a Type-A to Type-B USB cable, connect the EVB-USB7206 to a USB host via the upstream "Port 0" USB Type-B socket (J1).

Devices may now be connected to any of the downstream ports to enumerate and use those devices with the USB host.

To perform additional configuration or evaluate specific features, launch the MPLABCC software on your USB host or manipulate the hardware configuration options detailed in the next sections.

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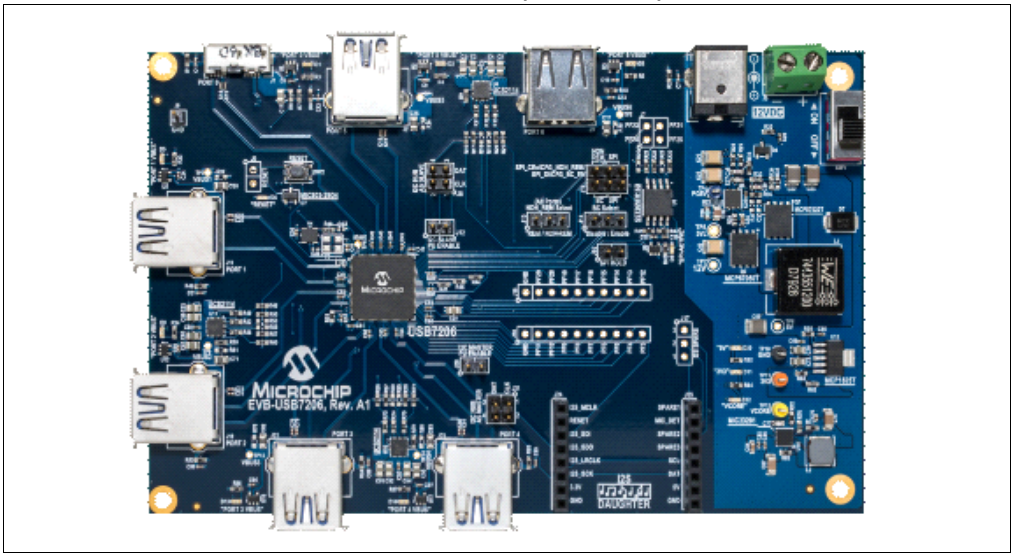
Chapter 3. EVB-USB7206 Evaluation Kit

3.1 HARDWARE CONFIGURATION OPTIONS

Figure 3-1 shows the top view of the EVB-USB7206.

FIGURE 3-1: EVB-USB7206 REV B (TOP VIEW)



3.1.1 Configuration

3.1.1.1 EXTERNAL SPI FLASH

Upon power-up, the USB7206 first looks for an external SPI ROM device and a valid signature in the Flash. If one is found, the external ROM is enabled and code execution is initiated from the external SPI ROM device.

To enable operation from the SPI device, install shunts to pins 1–2 and 3–4 of J7. When code is executing from an SPI ROM device, a blue LED "SPI-ACTIVE" (D8) illuminates.

Note 1:	CFG_BC and CFG_Non-Rem options are deselected when SPI shunts are installed on J10. When operating in SPI mode, all configuration is handled by the code executing from the SPI ROM device.
2:	If the SPI Flash is not properly programmed or has an invalid signature, the USB7206 reverts to internal defaults even if the SPI ROM is selected.

3.1.1.2 INTERNAL DEFAULT CONFIGURATIONS WITH STRAPPING OPTIONS

When the USB7206 does not detect a valid SPI Flash image and does not look for SMBus2 configuration upon power-up, the USB7206 uses internal default register settings. It also sets the Vendor ID, Product ID, Language ID, Device ID, and additional settings from the internal ROM code.

If configuration is not done through SPI or SMBus2, additional configuration is available through two functions: CFG_BC_EN and CFG_NON-REM. The controls are configured by selecting one of the six resistor values for each pin. The EVB-USB7206

demonstrates two of the six possible resistor values for each of CFG_BC_EN and CFG_NON-REM. These straps are sensed by the USB7206 device at power-on to determine the resultant configuration of the device.

To select the CFG_BC_EN and CFG_NON-REM modes, shunts must be connected to J12, J15, and J17 headers.

To use the battery charging strap options, connect a shunt to pins 2–3 of J12 and another shunt to J15 according to Table 3-1. For the NON_REM strap options, connect a shunt to pins 5 to 6 of J12 and connect a shunt to J17 according to Table 3-2.

TABLE 3-1: BATTERY CHARGING OPTIONS (CFG_BC_EN - J15)

J15 Shunt Position	(J12 is shunted pins 2–3.)
2–3	All ports are BC 1.2-disabled.
1–2	All downstream ports are BC1.2-enabled.

TABLE 3-2: NON-REMOVABLE PORT OPTIONS (CFG_NON-REM - J17)

J17 Shunt Position	(J12 is shunted pins 5–6.)
1–2	All ports are non-removable.
2–3	All ports are removable.

3.1.2 Power Source – Self Powered

The EVB-USB7206 only supports self-powered operation. Power is supplied through one +12.0V regulated external power supply. The power supply is connected to the 2.5 mm connector J1 on the board. Alternatively, an external voltage can be supplied to the screw terminal "12V" (J2). The +12.0V feeds a 15A regulator that outputs +5.2V (nominal) across the board and also supplies the +3.3V regulator and the 1.2V regulator.

CAUTION

The supplied 12.0V external power supply cannot support simultaneous battery charging on all downstream ports. Use a higher power supply if the required test use case exceeds the power capability of the supply. Failure to heed to this warning could result in damage to the 12.0V external power supply.

3.1.3 Downstream Port Power Control

USB power to the six downstream ports is controlled via port power controllers with auto-discharge functionality. All downstream ports support BC 1.2 battery charging.

The two downstream USB Type-C® ports are each capable of up to 3A of current at 5V. The two downstream USB Type-A ports are capable of up to 2.1A at 5V.

3.1.4 USB Type-C® Ports

The USB7206 has two USB3.1 Gen 1 PHYs for each Type-C port. This eliminates the need for an external multiplexer. The USB7206 also features integrated Type-C control signal (CC) detection to determine when and in what orientation a USB Type-C® attach has been made. It powers only the USB3.1 GEN 1 PHY needed for USB communication. To reduce power, the USB7206 powers down unused USB3.1 Gen 1 PHYs. In cases where no USB Type-C attach is detected, both USB3.1 Gen 1 PHYs associated with that port are powered down.

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3.1.5 LED Indicators

Table 3-3 describes the LED indicators on the EVB-USB7206.

TABLE 3-3: EVB-USB7206 LED INDICATOR DESCRIPTIONS

Ref. Des.	Label	Description
D1	SPI-ACTIVE	Indicates SPI Flash Memory activity.
D2	RESET	The RST_N signal is asserted.
D4	PORT 1 VBUS	Illuminates when 5V to upstream PORT1 VBUS is present.
D6	PORT 3 VBUS	Illuminates when 5V to upstream PORT3 VBUS is present.
D7	5V	Illuminates when 5V is present from the 5V voltage regulator.
D8	3V3	Illuminates when 3.3V is present from the 3.3V voltage regulator.
D9	VCORE	Illuminates when 1.2V (VCORE) is present from the 1.2V regulator.
D10	PORT 4 VBUS	Illuminates when 5V to upstream PORT4 VBUS is present.
D11	PORT 2 VBUS	Illuminates when 5V to upstream PORT2 VBUS is present.

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3.1.6 Switches

Table 3-4 describes the switches on the EVB-USB7206.

TABLE 3-4: EVB-USB7206 SWITCH DESCRIPTIONS

Ref. Des.	Label	Description
SW1	RESET	Momentary push-button switch to assert RST_N.
SW2	ON/OFF	Connects or disconnects the 12 VDC supply.

3.1.7 Connector Descriptions

Table 3-5 describes the connectors included on the PCB.

TABLE 3-5: EVB-USB7206 CONNECTOR DESCRIPTIONS

Ref. Des.	Type	Label	Description
J1	USB Type-B Connector	PORT0	Upstream Type-B Gen2 connection
J2	USB Type-A Connector	PORT5	Downstream Type-A Gen2 Port 5 USB connection
J3	USB Type-A Connector	PORT6	Downstream Type-A USB 2.0 Port 6 USB connection
J4	Barrel Jack	12VDC	12 VDC supply connection (center pin positive)
J5	2-pin terminal block	—	Alternative 12 VDC supply connection. Pin 1 is positive.
J6	1x1 Header	GND	Circuit Ground
J7	2x2 Header	PF24 PF23 PF25 PF21	SPI data pins provided for debugging SPI memory
J8	2x2 Header	SI2C_CLK SI2C_DAT	Hub Slave I^2C Header
J9	2x1 Header	Ext.Reset	Connection for an external reset switch
J10	2x3 Header	SPI_DI/CFG_BC_EN SPI_CEn/CFG_NON_REM	Selects between SPI memory capability and BC/NON_REM capability. For SPI, connect pins 1–2 and 4–5. For BC, connect pins 2–3. For NON_REM, connect pins 5–6.
J11	USB Type-A Connector	PORT1	Downstream Type-A Gen2 Port 1 USB connection
J12	1x2 Header	PU	Pull-up resistors, Slave I^2C
J13	1x3 Header	NON_REM_SELECT	See Table 3-2.
J14	1x3 Header	BC SELECT	See Table 3-1.
J15	1x2 Header	HOLD	When shunted, disables the SPI memory.
J16	1x10 Header	—	PF12 – PF29
J17	1x3 Header	—	Audio Code (Spare)
J18	1x10 Header	—	PF3 – PF11
J19	USB Type-A Connector	PORT2	Downstream Type-A Gen2 Port 2 USB connection
J20	1x2 Header	PU	Pull-up resistors, Master I^2C

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TABLE 3-5: EVB-USB7206 CONNECTOR DESCRIPTIONS (CONTINUED)

Ref. Des.	Type	Label	Description
J21	2x2 Header	MI2C_CLK MI2C_DAT	Hub Master I^2C Header
J22	USB Type-A Connector	PORT3	Downstream Type-A Gen2 Port 3 USB connection
J23	USB Type-A Connector	PORT4	Downstream Type-A Gen2 Port 4 USB connection
J24	1x10 Header	—	Audio Codec Socket
J25	1x10 Header	—	Audio Codec Socket

3.1.8 Test Points

Table 3-6 describes the test points on the EVB-USB7206. A header may be permanently installed on the through-hole test points if needed.

TABLE 3-6: EVB-USB7206 TEST POINT DESCRIPTIONS

Ref. Des.	Type	Description
TP1	Test Pad	PORT5 VBUS
TP2	Test Pad	PORT6 VBUS
TP3	Test Pad	PORT1 VBUS
TP4	Test Loop (Blue)	5VL
TP5	Test Loop (Red)	PG5V
TP6	Test Pad	ATEST
TP7	Test Loop (Red)	12V
TP8	Test Pad	5V
TP9	Test Pad	PORT2 VBUS
TP10	Test Loop (Black)	GND
TP11	Test Loop (Orange)	3V3
TP12	Test Loop (Yellow)	LVCORE
TP13	Test Pad	PORT3 VBUS
TP14	Test Pad	PORT4 VBUS

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NOTES:

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Appendix A. USB7206 Schematics

A.1 INTRODUCTION

This appendix shows the EVB-USB7206 Evaluation Kit schematic.

FIGURE A-1: EVB-USB7206 USB7X02 PART A

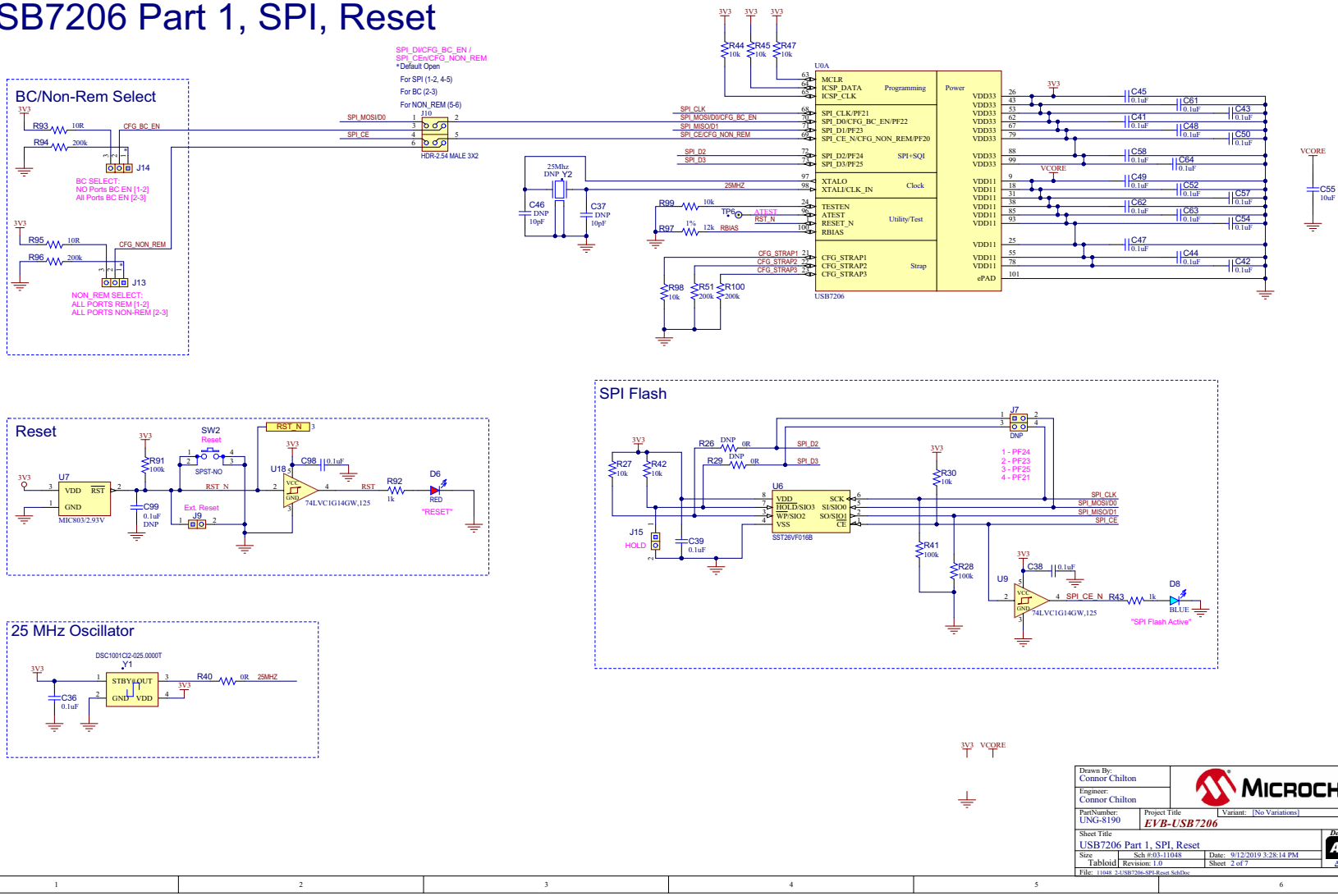

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FIGURE A-2: EVB-USB7206 USB7X02 PART B AND AUDIO CODEC INTERFACE

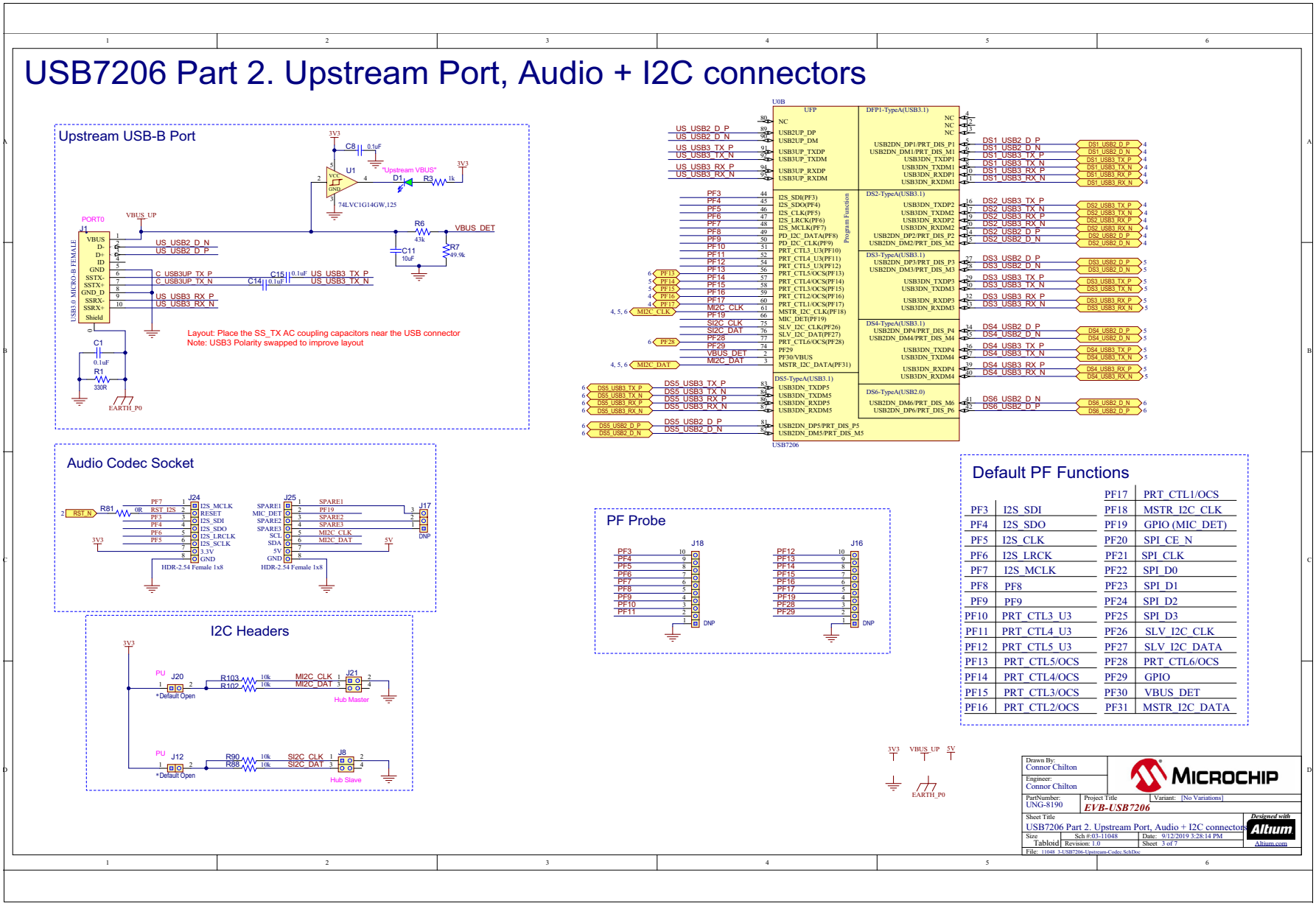

FIGURE A-3: EVB-USB7206 MEMORY AND MIKROBUS

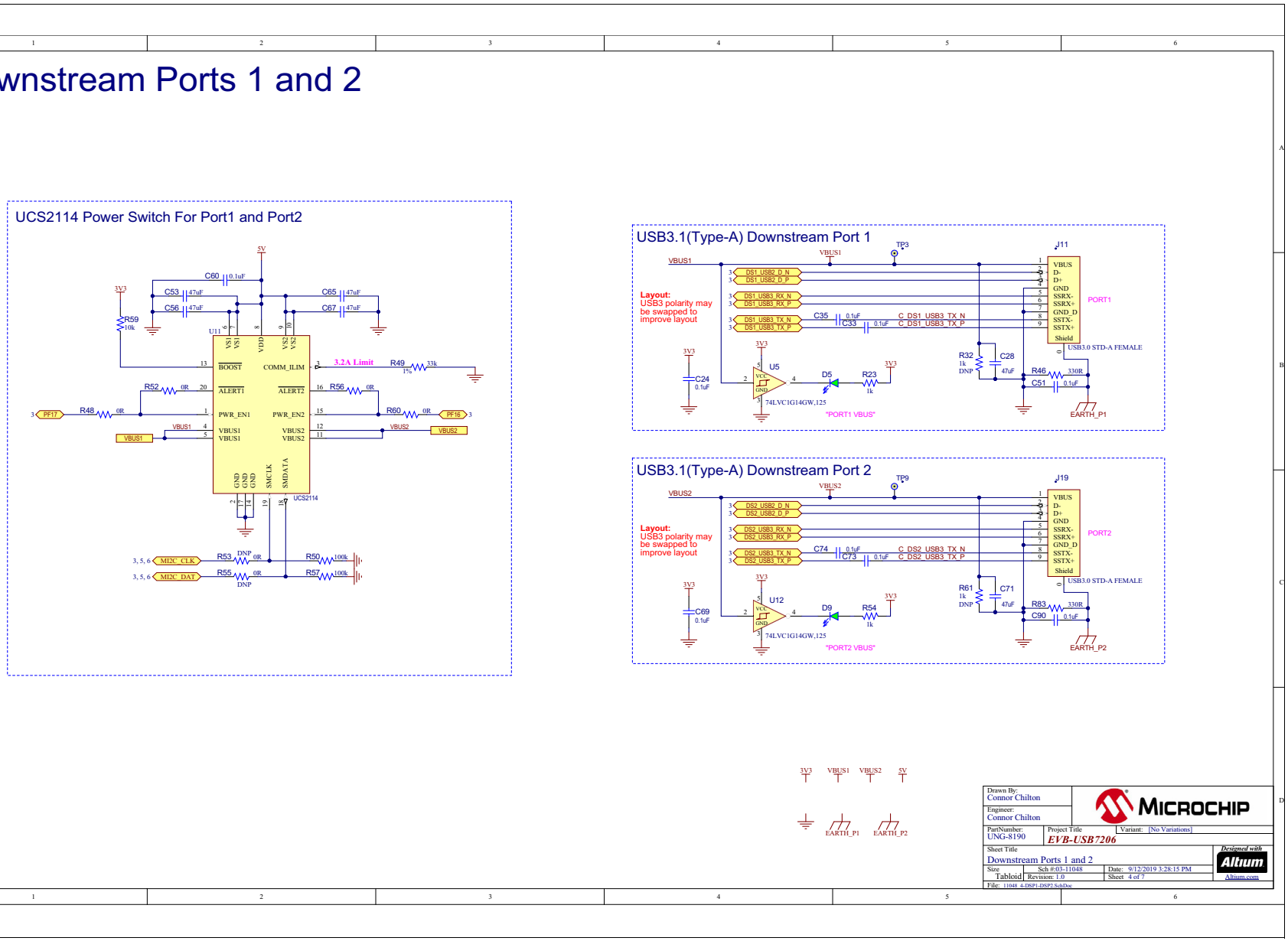

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FIGURE A-4: EVB-USB7206 USB A PORTS AND POWER SWITCH

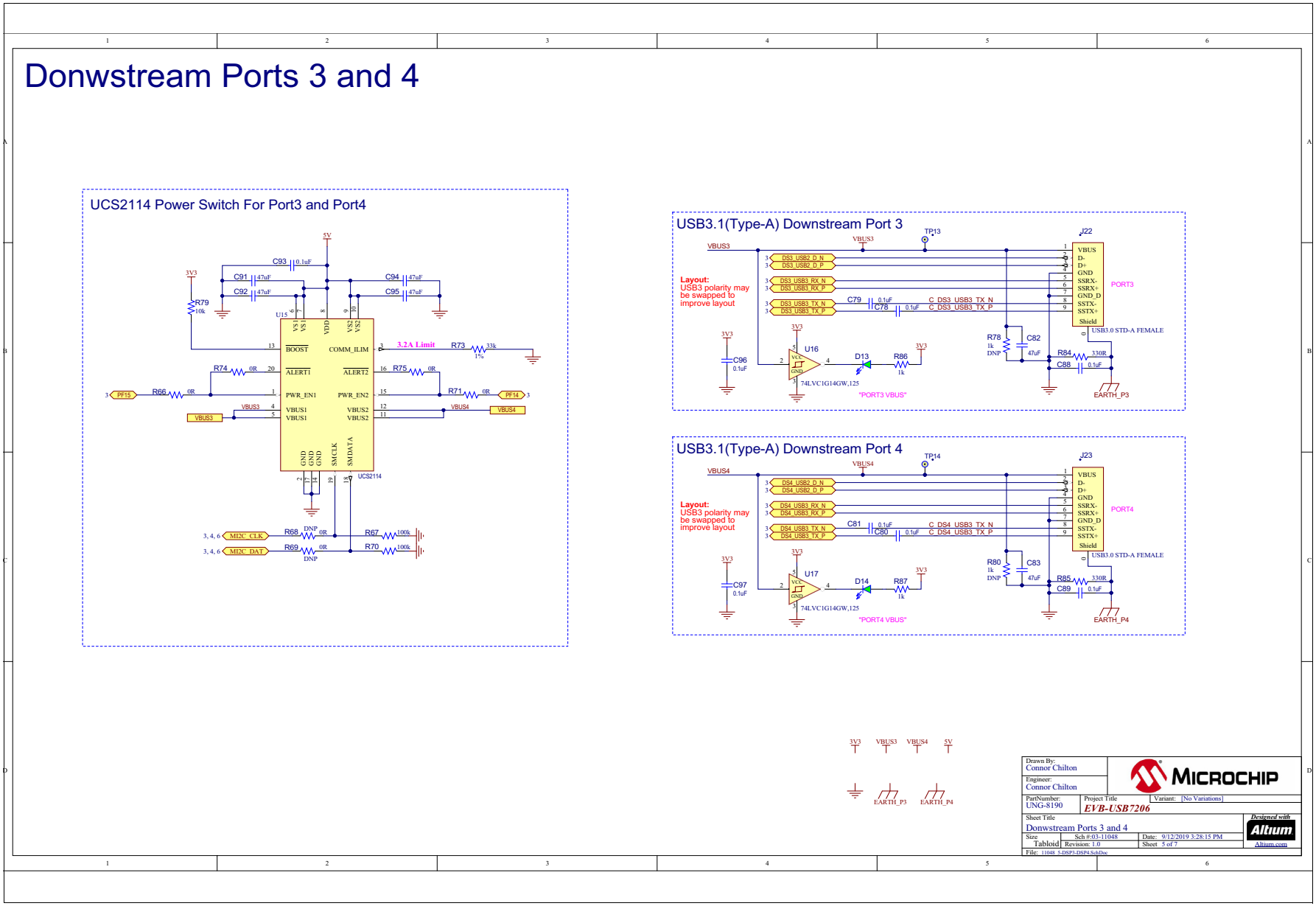

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FIGURE A-5: EVB-USB7206 USB C UPSTREAM AND POWER SWITCH

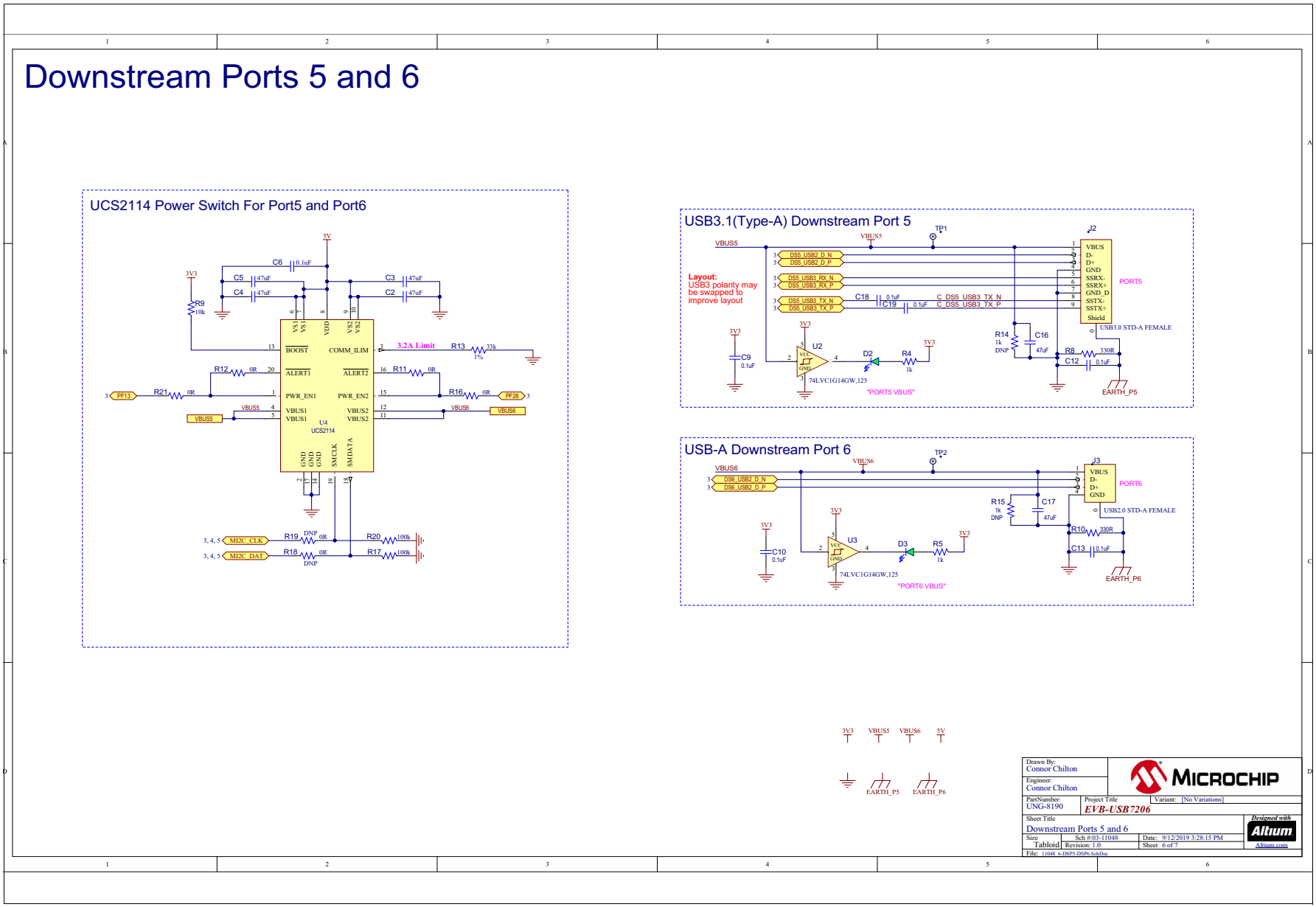

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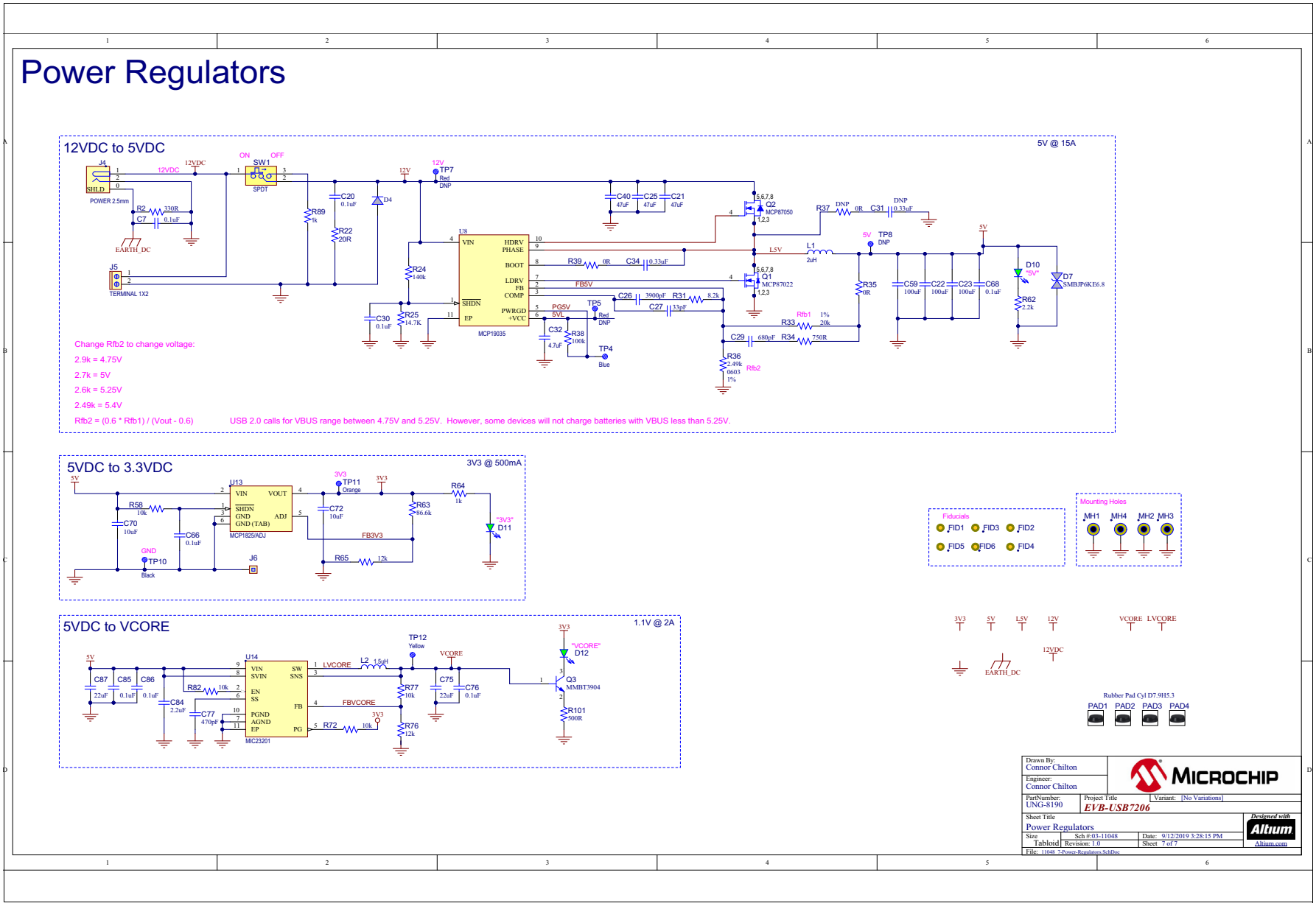
FIGURE A-6: EVB-USB7206 USB C DOWNSTREAM 1



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NOTES:

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Appendix B. Bill of Materials

B.1 INTRODUCTION

This appendix contains the EVB-USB7206 Evaluation Board Bill of Materials (BOM).

TABLE B-1: EVB-USB7206 BILL OF MATERIALS

Item	Quantity	Designator	Description	Populated	Manufacturer	Manufacturer Part Number
1	35	C1, C6, C7, C14, C15, C20, C30, C36, C38, C39, C41, C42, C43, C44, C45, C47, C48, C49, C50, C52, C54, C57, C58, C60, C61, C62, C63, C64, C66, C68, C76, C85, C86, C93, C98	CAP CER 0.1uF 16V 10% X7R SMD 0402	YES	Murata	GRM155R71C104KA88D
2	12	C2, C3, C4, C5, C53, C56, C65, C67, C91, C92, C94, C95	CAP CER 47uF 6.3V 20% X5R SMD 0805	YES	Taiyo Yuden	JMK212BJ476MG-T
3	23	C8, C9, C10, C12, C13, C18, C19, C24, C33, C35, C51, C69, C73, C74, C78, C79, C80, C81, C88, C89, C90, C96, C97	CAP CER 0.1uF 35V 10% X7R SMD 0402	YES	TDK Corporation	CGA2B3X7R1V104K050BB
4	4	C11, C55, C70, C72	CAP CER 10uF 16V 10% X5R SMD 0805	YES	Wurth Electronics Inc	885012107014
5	6	C16, C17, C28, C71, C82, C83	CAP CER 47uF 10V 20% X5R SMD 0805	YES	TDK Corporation	C2012X5R1A476M125AC
6	3	C21, C25, C40	CAP CER 47uF 16V 10% X5R SMD 1210	YES	Murata Electronics North America	GRM32ER61C476KE15K
7	3	C22, C23, C59	CAP CER 100uF 10V 20% X5R SMD 1210	YES	Taiyo Yuden	LMK325BJ107MM-T
8	1	C26	CAP CER 3900pF 50V 5% C0G SMD 0603	YES	TDK	C1608C0G1H392J080AA
9	1	C27	CAP CER 33pF 50V 5% NP0 SMD 0603	YES	Cal-Chip	GMC10CG330J50NTLF
10	1	C29	CAP CER 680pF 50V 5% NP0 SMD 0603	YES	Panasonic	ECJ-1VC1H681J
11	1	C31	CAP CER 0.33uF 16V 10% X7R SMD 0603	DNP	Murata	GRM188R71C334KA01D
12	1	C32	CAP CER 4.7uF 35V 10% X7R SMD 0805	YES	TDK Corporation	C2012X7R1V475K125AC
13	1	C34	CAP CER 0.33uF 16V 10% X7R SMD 0603	YES	Murata	GRM188R71C334KA01D
14	2	C37, C46	CAP CER 10pF 50V 5% NP0 SMD 0402	DNP	Murata	GRM1555C1H100JZ01D
15	2	C75, C87	CAP CER 22uF 10V 10% X7R SMD 1206	YES	Samsung Electro-Mechanics America, Inc	CL31B226KPHNNNE
16	1	C77	CAP CER 470pF 25V 5% NP0 SMD 0603	YES	AVX	06033A471JAT2A
17	1	C84	CAP CER 2.2uF 10V 10% X7R SMD 0603	YES	Murata	GRM188R71A225KE15D
18	1	C99	CAP CER 0.1uF 16V 10% X7R SMD 0402	DNP	Murata	GRM155R71C104KA88D
19	10	D1, D2, D3, D5, D9, D10, D11, D12, D13, D14	DIO LED GREEN 2V 30mA 35mcd Clear SMD 0603	YES	Lite-On Inc	LTST-C191KGKT
20	1	D4	DIO RECT MMBD914-7-F 1.25V 200mA 75V SMD SOT-23-3	YES	Diodes Incorporated	MMBD914-7-F

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TABLE B-1: EVB-USB7206 BILL OF MATERIALS (CONTINUED)

Item	Quantity	Designator	Description	Populated	Manufacturer	Manufacturer Part Number
21	1	D6	DIO RED 2V 20mA 54mcd CLEAR SMD 0603	YES	Lite-On Inc.	LTST-C191KRKT
22	1	D7	DIO TVS SMBJP6KE6.8CA 5.8V 600W DO-214AA_SMB	YES	Micro Commercial Co	SMBJP6KE6.8CA-TP
23	1	D8	DIO LED BLUE 2.8V 20mA 15mcd Clear SMD 0603	YES	Lite-On	LTST-C193TBKT-5A
24	1	J1	CON USB3.0 MICRO-B FEMALE SMD R/A	YES	Hirose Electric Co Ltd	ZX360D-B-10P
25	5	J2, J11, J19, J22, J23	CON USB3.0 STD-A FEMALE TH R/A	YES	Wurth Electronics Inc	692121030100
26	1	J3	CON USB2.0 STD-A FEMALE TH R/A	YES	TE Connectivity AMP Connectors	292303-1
27	1	J4	CON POWER 2.5mm 5.5mm TH R/A	YES	CUI Inc.	PJ-063BH
28	1	J5	CON TERMINAL 5.08mm 1X2 Female 16-30AWG 13.5A TH RA	YES	TE Connectivity	282836-2
29	1	J6	CON HDR-2.54 Male 1x1 Gold 5.84MH TH VERT	YES	TE Connectivity	5-146280-1
30	1	J7	CON HDR-2.54 Male 2x2 Gold 5.84MH TH VERT	DNP	Samtec	TSW-102-07-G-D
31	2	J8, J21	CON HDR-2.54 Male 2x2 Gold 5.84MH TH VERT	YES	Samtec	TSW-102-07-G-D
32	4	J9, J12, J15, J20	CON HDR-2.54 Male 1x2 Gold 5.84MH TH VERT	YES	FCI	77311-118-02LF
33	1	J10	CON HDR-2.54 Male 3x2 Gold 5.84MH TH VERT	YES	Samtec Inc.	TSW-102-07-G-T
34	2	J13, J14	CON HDR-2.54 Male 1x3 Gold 5.84MH TH VERT	YES	FCI	68000-103HLF
35	2	J16, J18	CON HDR-2.54 Male 1x10 Gold 5.84MH TH VERT	DNP	Greenconn	GPHA101-1002A001B1BA
36	1	J17	CON HDR-2.54 Male 1x3 Gold 5.84MH TH VERT	DNP	FCI	68000-103HLF
37	2	J24, J25	CON HDR-2.54 Female 1x8 Tin TH VERT	YES	Sullins	PPTC081LFBN-RC
38	1	L1	INDUCTOR 2uH 23A 20% SMD L12.8W12.8H6.2	YES	Wurth Electronics Inc.	7443551200
39	1	L2	INDUCTOR 1.5uH 3A 20% SMD L5W5H2.2	YES	Murata Electronics North America	LQH5BPN1R5NT0L
40	4	PAD1, PAD2, PAD3, PAD4	MECH HW RUBBER PAD CYLINDRICAL D7.9 H5.3 BLACK	MECH	3M	SJ61A11
41	1	Q1	MCHP ANALOG MOSFET N-CH 25V 100A 0.0026R MCP87022T-U/MF PDFN-8	YES	Microchip Technology Inc.	MCP87022T-U/MF
42	1	Q2	MCHP ANALOG MOSFET N-CH 25V 100A 0.006R MCP87050-U/MF PDFN-8	YES	Microchip Technology Inc.	MCP87050T-U/MF
43	1	Q3	TRANS BJT NPN MMBT3904 40V 200mA 310mW SOT-23-3	YES	Diodes Incorporated	MMBT3904-7
44	8	R1, R2, R8, R10, R46, R83, R84, R85	RES TKF 330R 1% 1/10W SMD 0603	YES	Panasonic	ERJ-3EKF3300V
45	11	R3, R4, R5, R23, R43, R54, R64, R86, R87, R89, R92	RES TKF 1k 1% 1/10W SMD 0603	YES	Panasonic	ERJ-3EKF1001V
46	1	R6	RES TKF 43k 1% 1/10W SMD 0603	YES	Yageo	9C06031A4302FKHFT
47	1	R7	RES TKF 49.9k 1% 1/10W SMD 0603	YES	Panasonic	ERJ-3EKF4992V

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TABLE B-1: EVB-USB7206 BILL OF MATERIALS (CONTINUED)

Item	Quantity	Designator	Description	Populated	Manufacturer	Manufacturer Part Number
48	16	R9, R27, R30, R42, R44, R45, R47, R58, R59, R79, R88, R90, R98, R99, R102, R103	RES TKF 10k 1% 1/10W SMD 0603	YES	ROHM	MCR03EZPFX1002
49	14	R11, R12, R16, R21, R40, R48, R52, R56, R60, R66, R71, R74, R75, R81	RES TKF 0R 1/10W SMD 0603	YES	Panasonic	ERJ-3GSY0R00V
50	3	R13, R49, R73	RES TKF 33k 1% 1/10W SMD 0603	YES	Panasonic	ERJ-3EKF3302V
51	6	R14, R15, R32, R61, R78, R80	RES TKF 1k 1% 1/10W SMD 0603	DNP	Panasonic	ERJ-3EKF1001V
52	9	R17, R20, R28, R41, R50, R57, R67, R70, R91	RES TKF 100k 1% 1/10W SMD 0603	YES	Panasonic	ERJ-3EKF1003V
53	9	R18, R19, R26, R29, R37, R53, R55, R68, R69	RES TKF 0R 1/10W SMD 0603	DNP	Panasonic	ERJ-3GSY0R00V
54	1	R22	RES TKF 20R 1% 1/10W SMD 0603	YES	Panasonic	ERJ-3EKF20R0V
55	1	R24	RES TKF 140k 1% 1/10W SMD 0603	YES	Panasonic	ERJ-3EKF1403V
56	1	R25	RES TKF 14.7K 1% 1/10W SMD 0603	YES	Panasonic Electronic Components	ERJ-3EKF1472V
57	1	R31	RES TKF 8.2k 1% 1/10W SMD 0603	YES	Panasonic	ERJ-3EKF8201V
58	1	R33	RES TKF 20k 1% 1/10W SMD 0603	YES	Yageo	9C06031A2002FKHFT
59	1	R34	RES TKF 750R 1% 1/10W SMD 0603	YES	Vishay	CRCW0603750RFKEA
60	2	R35, R39	RES TKF 0R 1/10W SMD 0603	YES	NIC Components	NRC06Z0TRF
61	1	R36	RES TKF 2.49k 1% 1/10W SMD 0603	YES	Panasonic	ERJ-3EKF2491V
62	1	R38	RES TF 100k 1% 1/8W SMD 0603	YES	Vishay	MCT06030C1003FP500
63	4	R51, R94, R96, R100	RES TKF 200k 1% 1/10W SMD 0603	YES	Panasonic	ERJ-3EKF2003V
64	1	R62	RES TKF 2.2k 1% 1/10W SMD 0603	YES	Panasonic	ERJ-3EKF2201V
65	1	R63	RES TKF 86.6k 1% 1/10W SMD 0603	YES	Panasonic Electronic Components	ERJ-3EKF8662V
66	2	R65, R97	RES TKF 12k 1% 1/10W SMD 0603	YES	Yageo	RC0603FR-0712KL
67	2	R72, R82	RES TKF 10k 1% 1/10W SMD 0603	YES	Vishay	CRCW060310K0FKEA
68	1	R76	RES TKF 12k 1% 1/10W SMD 0603	YES	Stackpole Electronics Inc	RMCF0603FT12K0
69	1	R77	RES TKF 10k 1% 1/10W SMD 0603	YES	Panasonic	ERJ-3EKF1002V
70	2	R93, R95	RES TKF 10R 1% 1/10W SMD 0603	YES	Panasonic	ERJ-3EKF10R0V
71	1	R101	RES TKF 500R 5% 1/10W SMD 0603	YES	Stackpole Electronics Inc	RMC 1/16 500 5% R
72	1	SW1	SWITCH SLIDE SPDT 120V 6A 1101M2S3CQE2 TH	YES	C&K Components	1101M2S3CQE2
73	1	SW2	SWITCH TACT SPST 16V 50mA PTS810 SJM 250 SMTR LFS SMD	YES	C&K Components	PTS810 SJM 250 SMTR LFS
74	1	TP4	CON TP LOOP BLUE Ag TH	YES	Keystone Electronics	5117

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TABLE B-1: EVB-USB7206 BILL OF MATERIALS (CONTINUED)

Item	Quantity	Designator	Description	Populated	Manufacturer	Manufacturer Part Number
75	3	TP5, TP7, TP8	MISC, TEST POINT MULTI PURPOSE MINI RED	DNP	Keystone	5000
76	1	TP10	MISC, TEST POINT MULTI PURPOSE MINI BLACK	YES	Keystone	5001
77	1	TP11	CON TP LOOP Orange TH	YES	Keystone Electronics	5003
78	1	TP12	MISC, TEST POINT PC MINI, 0.040" D YELLOW	YES	Keystone	5004
79	1	U0	MCHP INTERFACE USB HUB USB7206 VQFN100	YES	Microchip Technology Inc.	USB7206
80	9	U1, U2, U3, U5, U9, U12, U16, U17, U18	74LVC1G14GW,125 SCHMITT-TRG INVERTER	YES	NXP	74LVC1G14GW,125
81	3	U4, U11, U15	MCHP INTERFACE USB Power Controller UCS2114 QFN-20	YES	Microchip Technology Inc.	UCS2114-1-V/LX
82	1	U6	MCHP MEMORY SERIAL FLASH 16M 104MHz SST26VF016B-104I/SM SOIJ-8	YES	Microchip Technology Inc.	SST26VF016B-104I/SM
83	1	U7	MCHP ANALOG SUPERVISOR 2.93V MIC803-29D4VM3-TR SOT-23-3	YES	Microchip Technology Inc.	MIC803-29D4VM3-TR
84	1	U8	MCHP ANALOG PWM CONTROLLER 600kHz MCP19035-BAABE/MF DFN-10	YES	Microchip Technology Inc.	MCP19035-BAABE/MF
85	1	U13	MCHP ANALOG LDO ADJ MCP1825T-ADJE/DC SOT-223-5	YES	Microchip Technology Inc.	MCP1825T-ADJE/DC
86	1	U14	MCHP ANALOG SWITCHER Buck 0.95V to 3.6V 2A MIC23201YML-TR MLF-10	YES	Microchip Technology Inc.	MIC23201YML-TR
87	1	Y1	MCHP CLOCK OSCILLATOR SINGLE 25MHZ DSC1001CI2-025.0000T CDFN-4	YES	Microchip Technology Inc.	DSC1001CI2-025.0000T
88	1	Y2	CRYSTAL 25MHz 10pF SMD ABM8G	DNP	Abracon LLC	ABM8G-25.000MHZ-4Y-T3

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NOTES:

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Appendix C. PCB Silk Screens

C.1 INTRODUCTION

This appendix shows the top and bottom silk screen images of the EVB-USB7206 PCB.

FIGURE C-1: EVB-USB7206 TOP SILK SCREEN IMAGE

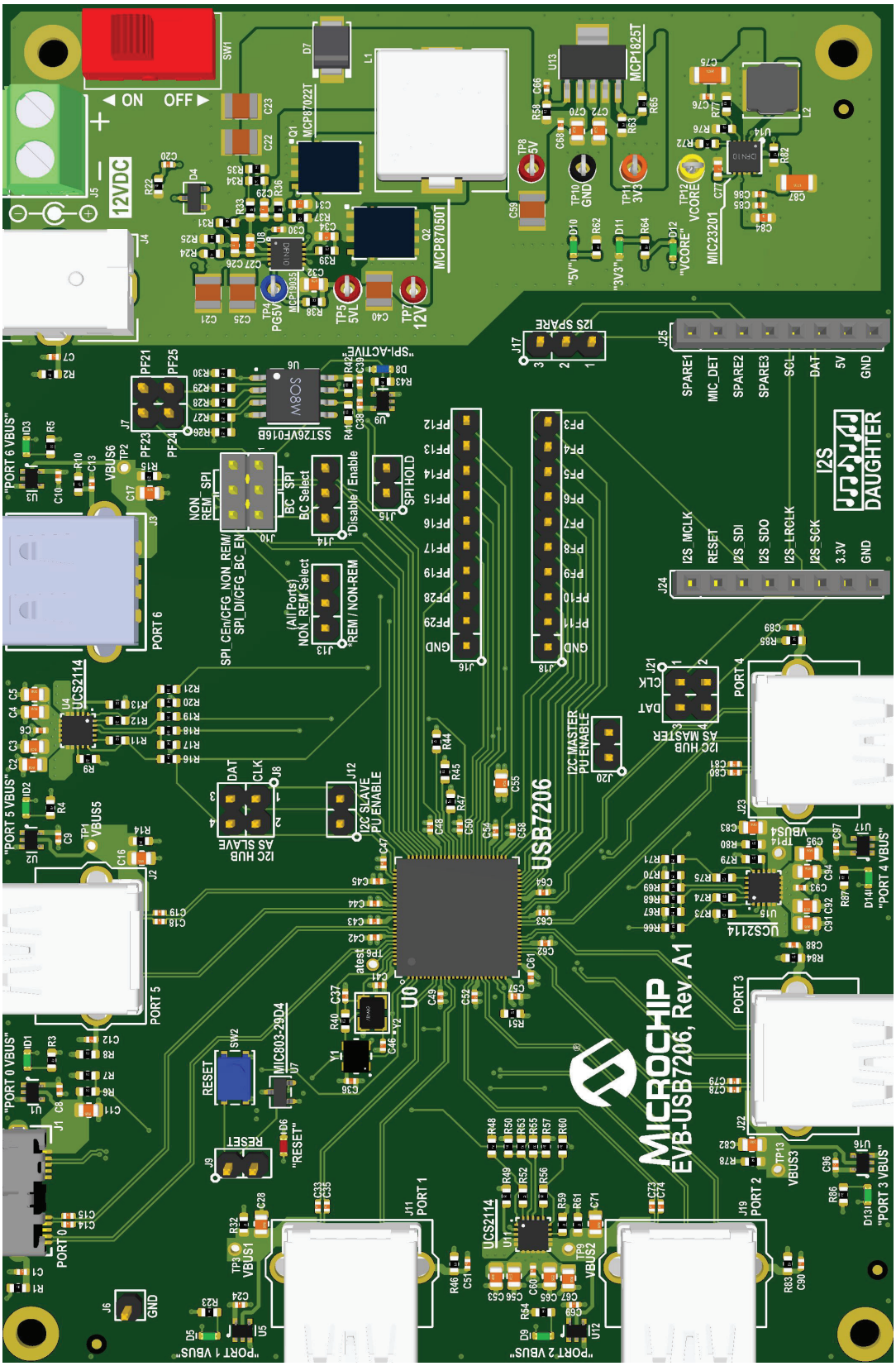

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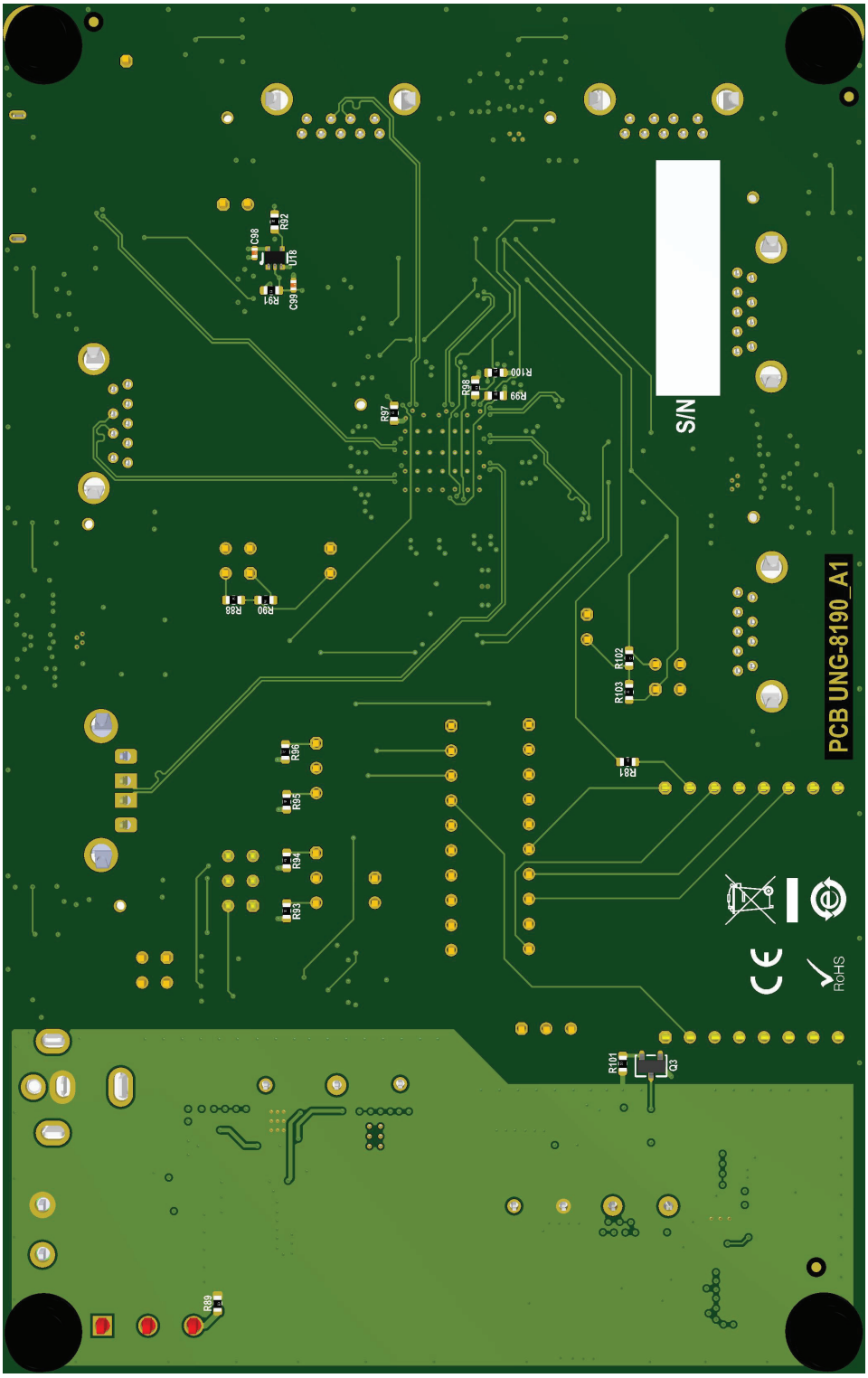
FIGURE C-2: EVB-USB7206 BOTTOM SILK SCREEN IMAGE



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China - Chengdu
Tel: 86-28-8665-5511

China - Chongqing
Tel: 86-23-8980-9588

China - Dongguan
Tel: 86-769-8702-9880

China - Guangzhou
Tel: 86-20-8755-8029

China - Hangzhou
Tel: 86-571-8792-8115

China - Hong Kong SAR
Tel: 852-2943-5100

China - Nanjing
Tel: 86-25-8473-2460

China - Qingdao
Tel: 86-532-8502-7355

China - Shanghai
Tel: 86-21-3326-8000

China - Shenyang
Tel: 86-24-2334-2829

China - Shenzhen
Tel: 86-755-8864-2200

China - Suzhou
Tel: 86-186-6233-1526

China - Wuhan
Tel: 86-27-5980-5300

China - Xian
Tel: 86-29-8833-7252

China - Xiamen
Tel: 86-592-2388138

China - Zhuhai
Tel: 86-756-3210040

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India - Bangalore
Tel: 91-80-3090-4444

India - New Delhi
Tel: 91-11-4160-8631

India - Pune
Tel: 91-20-4121-0141

Japan - Osaka
Tel: 81-6-6152-7160

Japan - Tokyo
Tel: 81-3-6880- 3770

Korea - Daegu
Tel: 82-53-744-4301

Korea - Seoul
Tel: 82-2-554-7200

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Tel: 60-3-7651-7906

Malaysia - Penang
Tel: 60-4-227-8870

Philippines - Manila
Tel: 63-2-634-9065

Singapore
Tel: 65-6334-8870

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Tel: 886-3-577-8366

Taiwan - Kaohsiung
Tel: 886-7-213-7830

Taiwan - Taipei
Tel: 886-2-2508-8600

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Fax: 49-89-627-144-44

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Tel: 49-8031-354-560

Israel - Ra'anana
Tel: 972-9-744-7705

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Tel: 39-0331-742611
Fax: 39-0331-466781

Italy - Padova
Tel: 39-049-7625286

Netherlands - Drunen
Tel: 31-416-690399
Fax: 31-416-690340

Norway - Trondheim
Tel: 47-7288-4388

Poland - Warsaw
Tel: 48-22-3325737

Romania - Bucharest
Tel: 40-21-407-87-50

Spain - Madrid
Tel: 34-91-708-08-90
Fax: 34-91-708-08-91

Sweden - Gothenberg
Tel: 46-31-704-60-40

Sweden - Stockholm
Tel: 46-8-5090-4654

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Tel: 44-118-921-5800
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