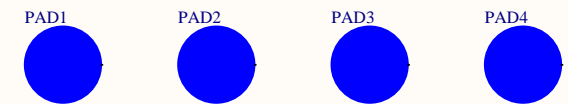
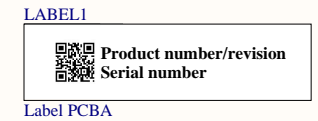
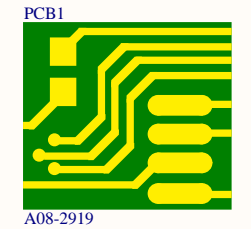
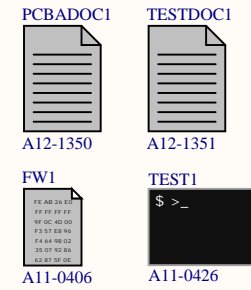


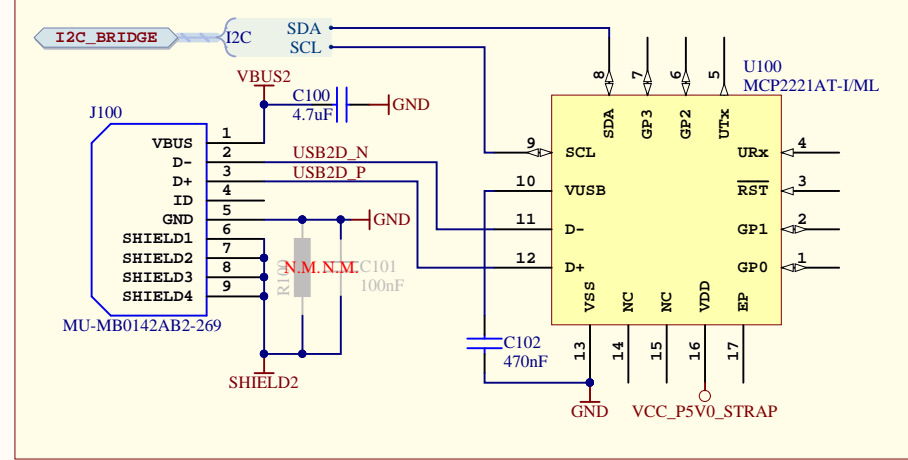
CIP Hybrid Power Starter Kit



Drawn By: Microchip Norway	MICROCHIP	
Engineer: HN		
Project Title CIP Hybrid Power Starter Kit		
Sheet Title Top Level		
Size A3	PCB Assembly Number: A09-3194	PCBA Revision: 3
	PCB Number: A08-2919	PCB Revision: 2
File: CIP_Hybrid_Power_TopLevel.SchDoc		Page: 1 of 4



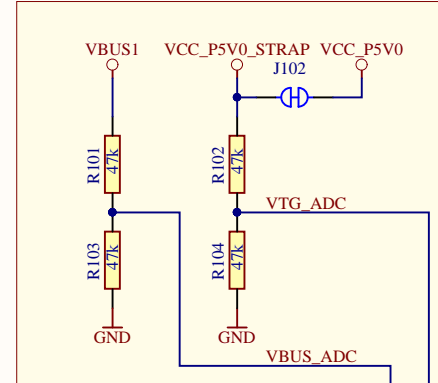
I2C-USB BRIDGE



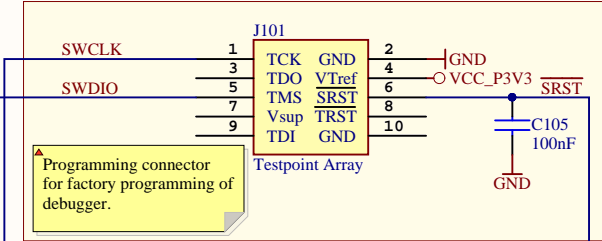
Interface	ICSP TARGET
CDC TX	UART RX
CDC RX	UART TX
DBG0	DAT
DBG1	CLK
DBG2	GPIO
DBG3	MCLR
VCC	-

MIC5528:
 Vin: 2.5V to 5.5V
 Vout: Fixed 3.3V
 I_{max}: 500mA
 Dropout: 260mV @ 500mA

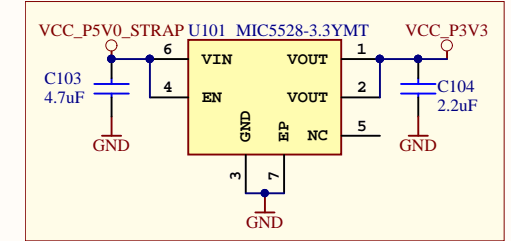
VOLTAGE SENSE



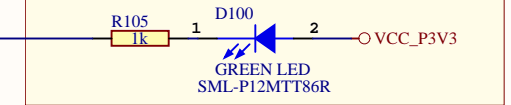
DEBUGGER TESTPOINT



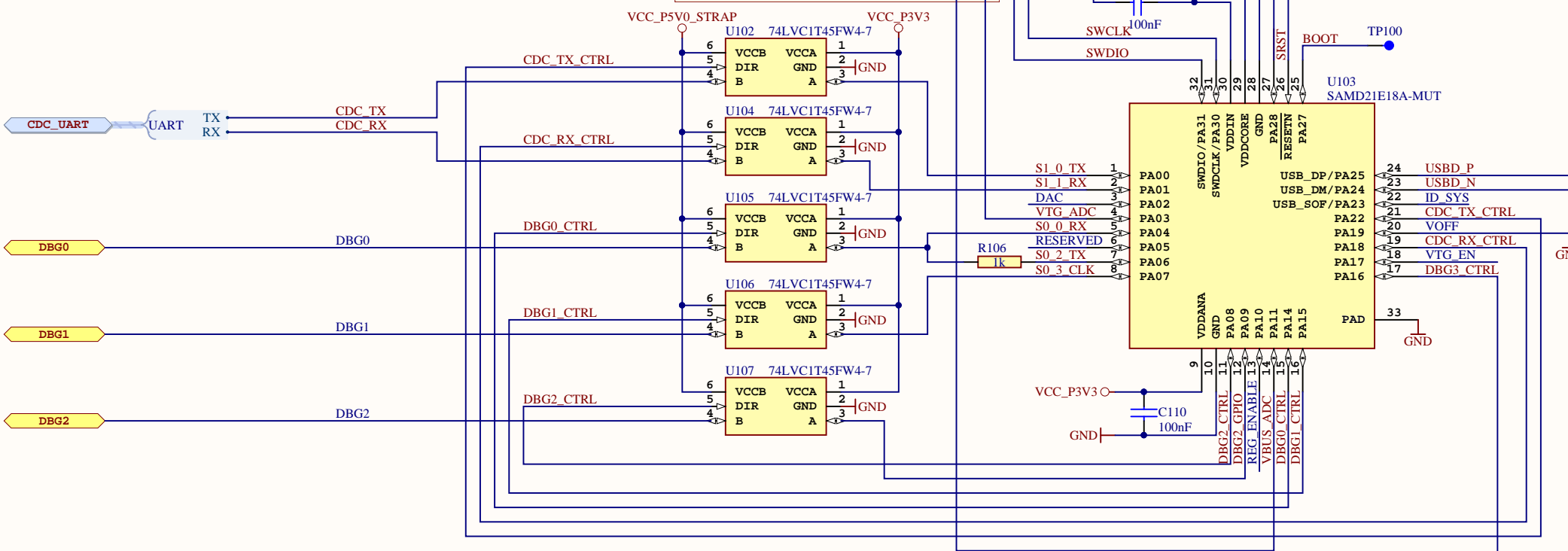
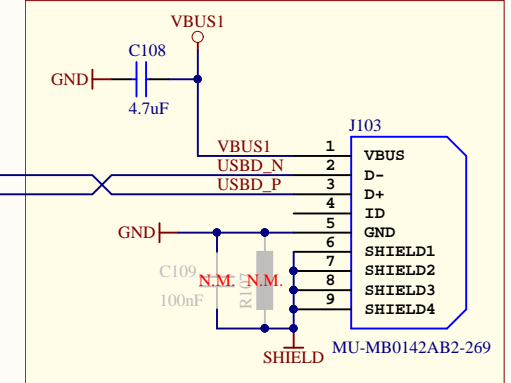
DEBUGGER REGULATOR



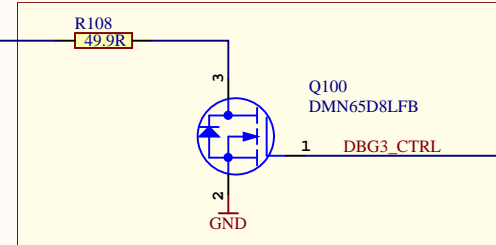
DEBUGGER POWER/STATUS LED



DEBUGGER USB MICRO-B CONNECTOR

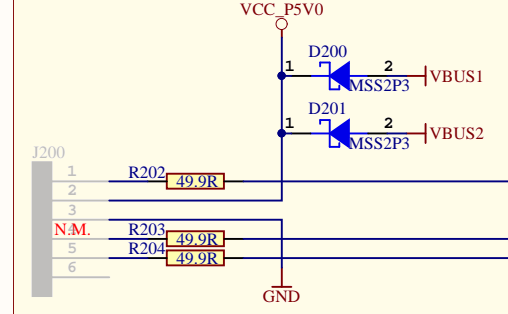


DBG3 OPEN DRAIN

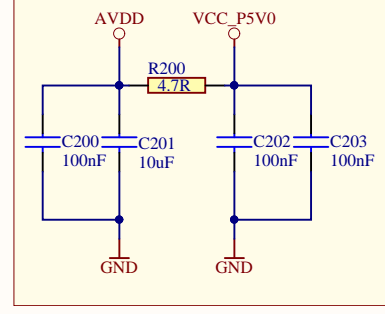


Drawn By: Microchip Norway		
Engineer: HN		
Project Title CIP Hybrid Power Starter Kit		
Sheet Title Debugger		
Size A3	PCB Assembly Number: A09-3194	PCBA Revision: 3
	PCB Number: A08-2919	PCB Revision: 2
File: CIP_Hybrid_Power_Debugger.SchDoc		Date: 18.12.2018
		Page: 2 of 4

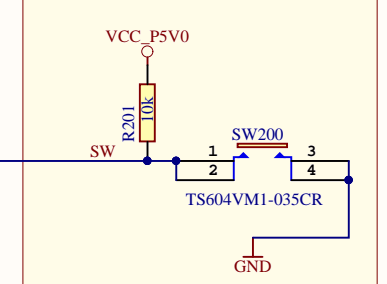
ICSP PROGRAMMING/DEBUGGING



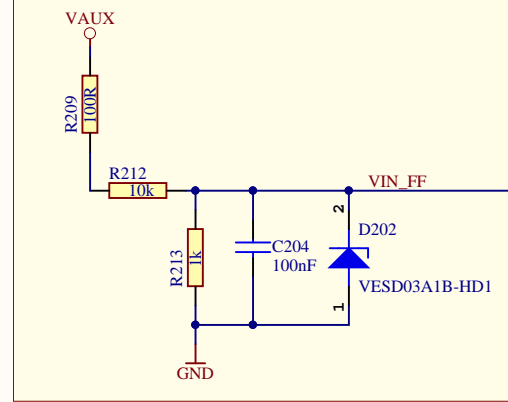
ANALOG POWER



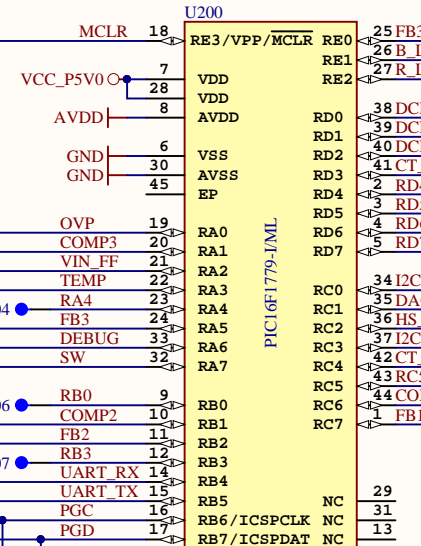
CONTROL SWITCH



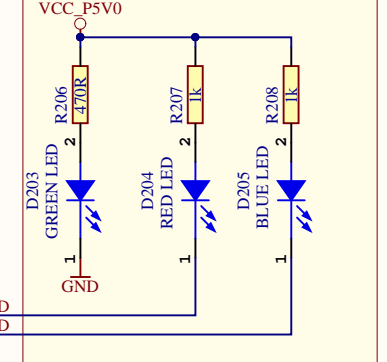
INPUT VOLTAGE FEEDBACK



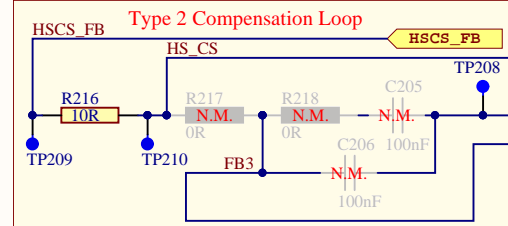
PWM CONTROLLER PIC16F1779



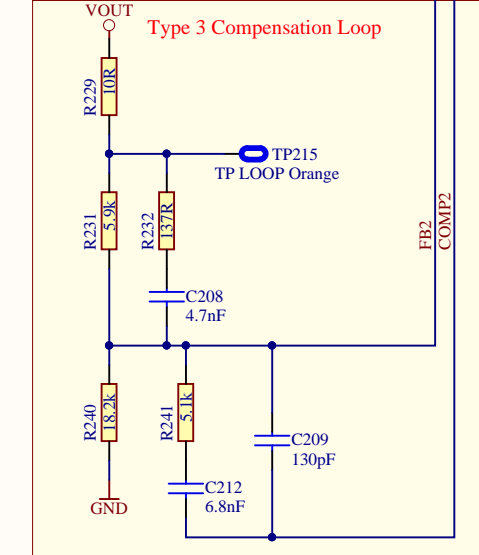
DEBUG LED



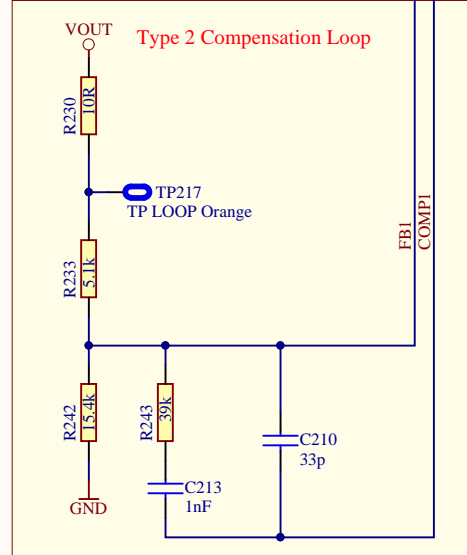
AVERAGE CURRENT MODE FEEDBACK



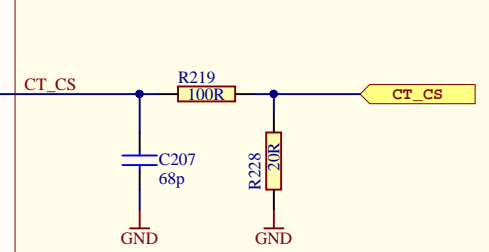
VOLTAGE MODE FEEDBACK



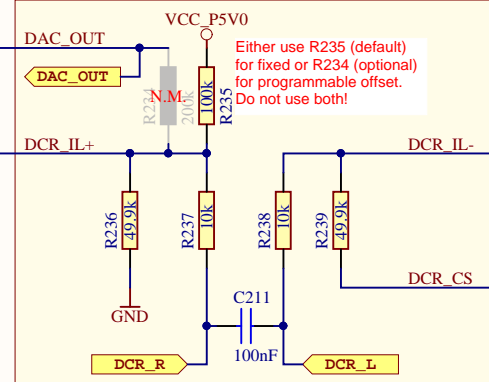
CURRENT MODE FEEDBACK



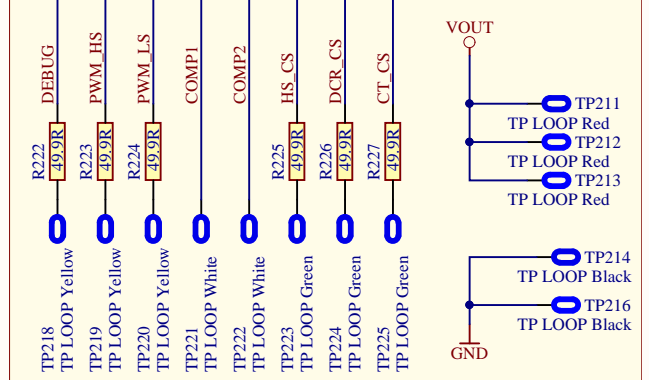
CURRENT SENSE TRANSFORMER FEEDBACK



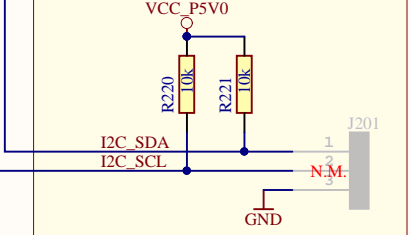
DCR INDUCTOR CURRENT SENSING



TEST POINTS



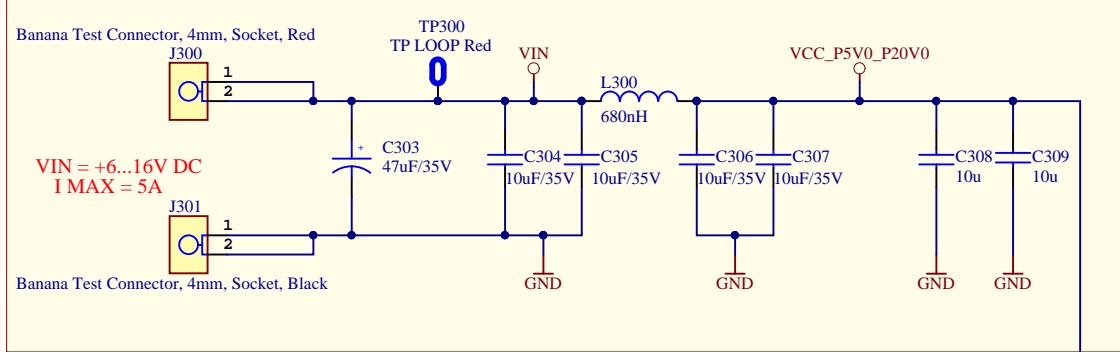
I2C PORT



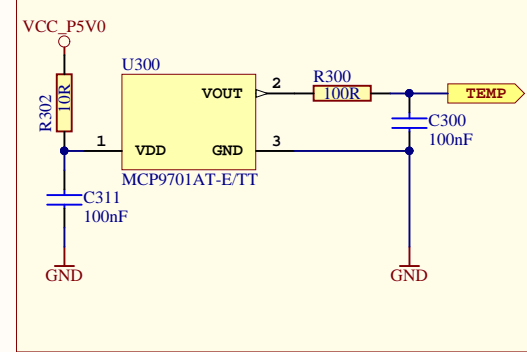
Drawn By: Microchip Norway Engineer: HN		
Project Title CIP Hybrid Power Starter Kit Sheet Title Target MCU		
Size A3	PCB Assembly Number: A09-3194 PCB Number: A08-2919	PCBA Revision: 3 PCB Revision: 2
File: CIP_Hybrid_Power_Target.SchDoc		Date: 18.12.2018 Page: 3 of 4



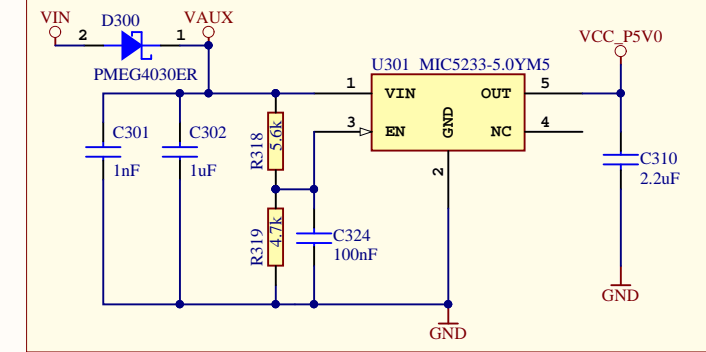
INPUT PI FILTER



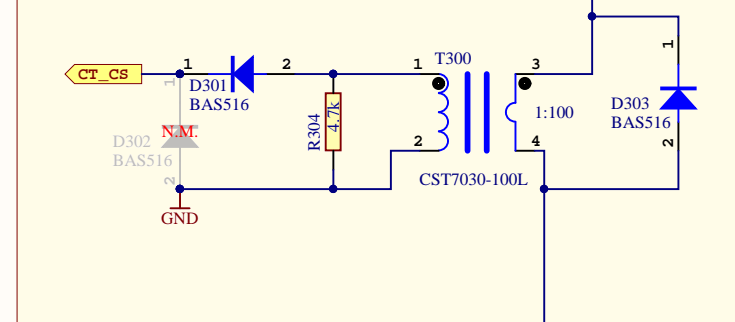
TEMPERATURE SENSOR



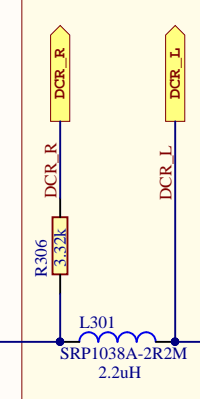
5V LDO REGULATOR



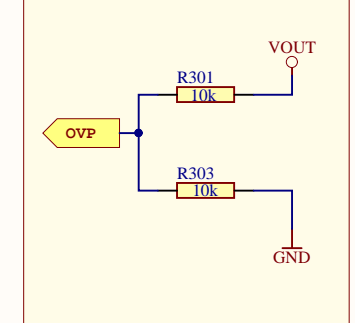
CURRENT SENSE TRANSFORMER



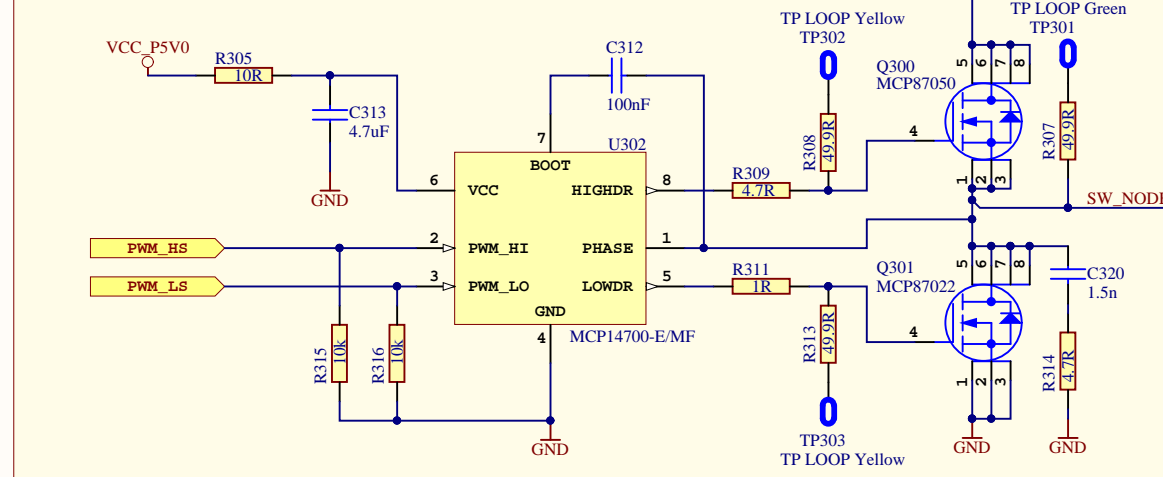
DCR SENSING



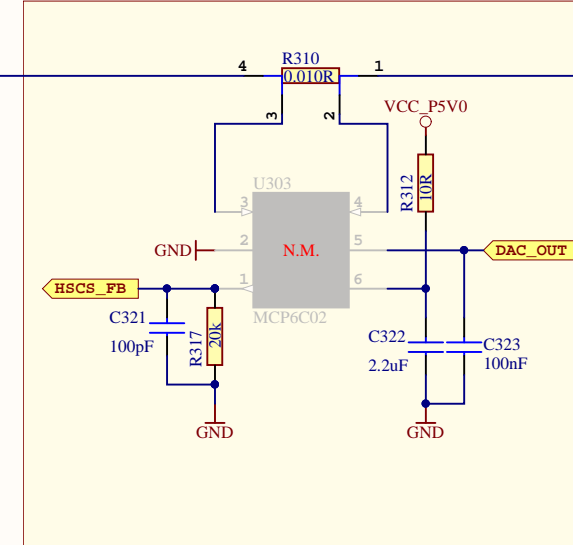
CROWBAR CIRCUIT



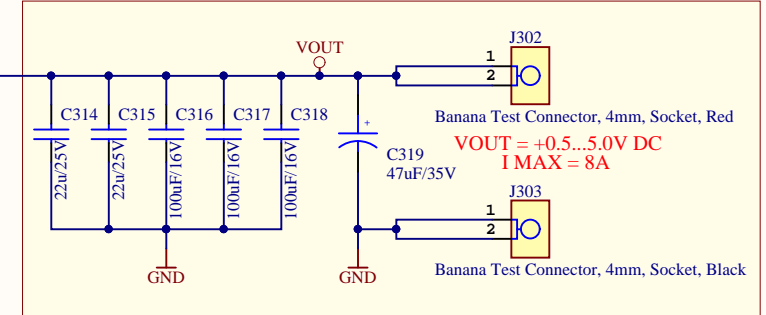
HALF-BRIDGE DRIVE



HIGH-SIDE SHUNT SENSING



OUTPUT

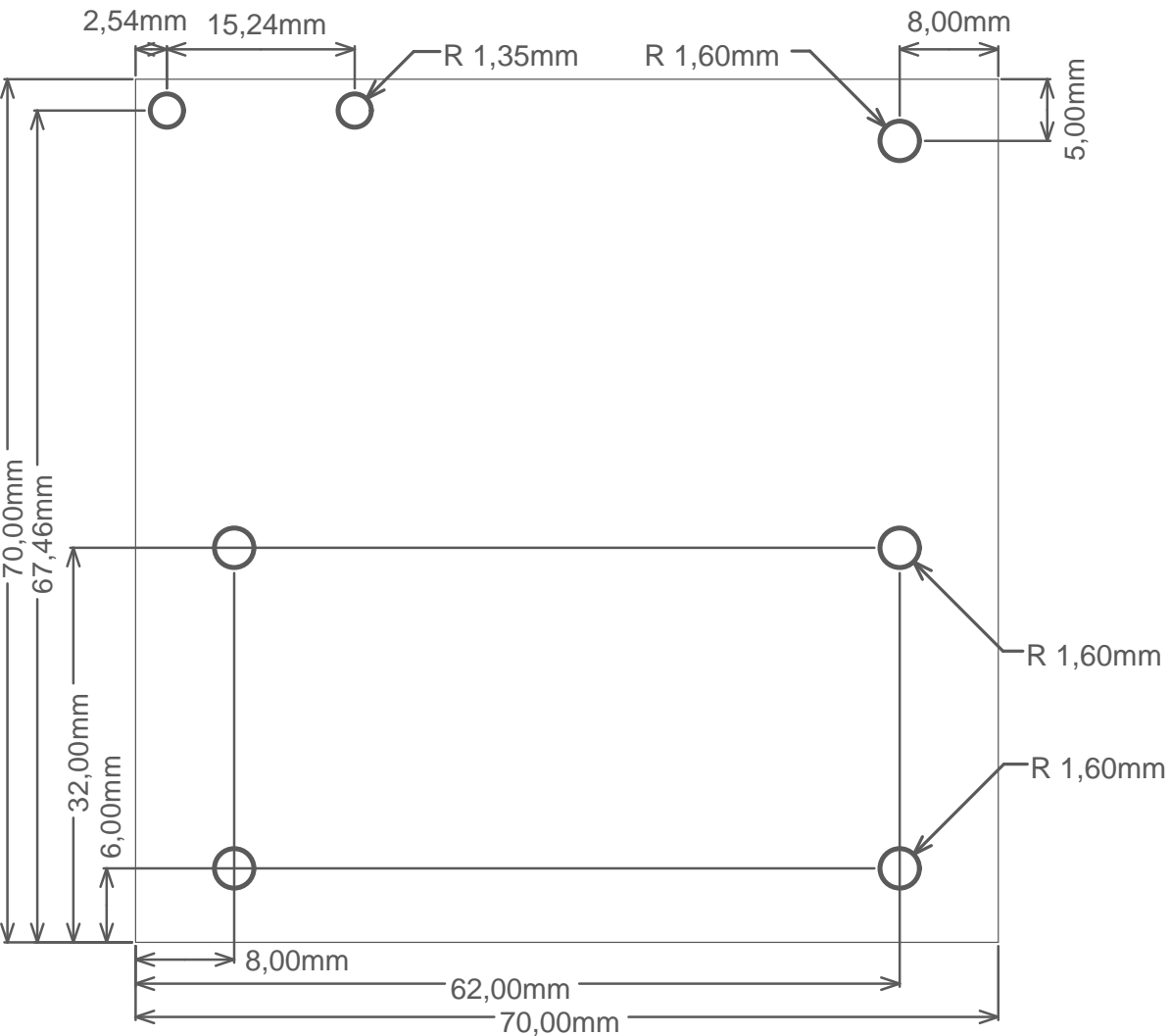


BUCK CONVERTER DESIGN PARAMETER

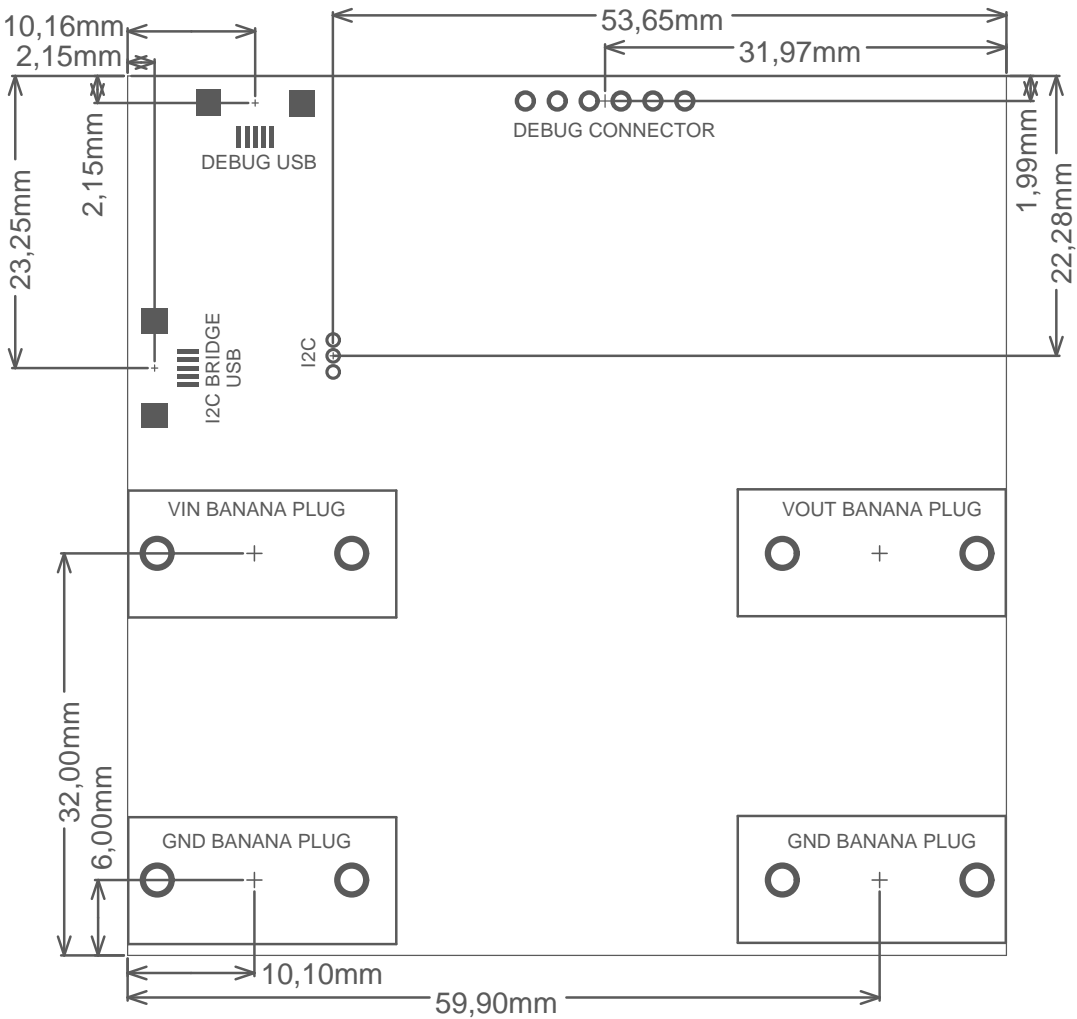
L = 2.2 uH
 C = 322 uF
 fR = 5980 Hz
 Z = 101 mR

Drawn By: Microchip Norway		
Engineer: HN		
Project Title CIP Hybrid Power Starter Kit	 Altium.com	
Sheet Title POWER		
Size A3	PCB Assembly Number: A09-3194	PCBA Revision: 3
	PCB Number: A08-2919	PCB Revision: 2
File: CIP_Hybrid_Power_Power.SchDoc		Date: 18.12.2018
		Page: 4 of 4

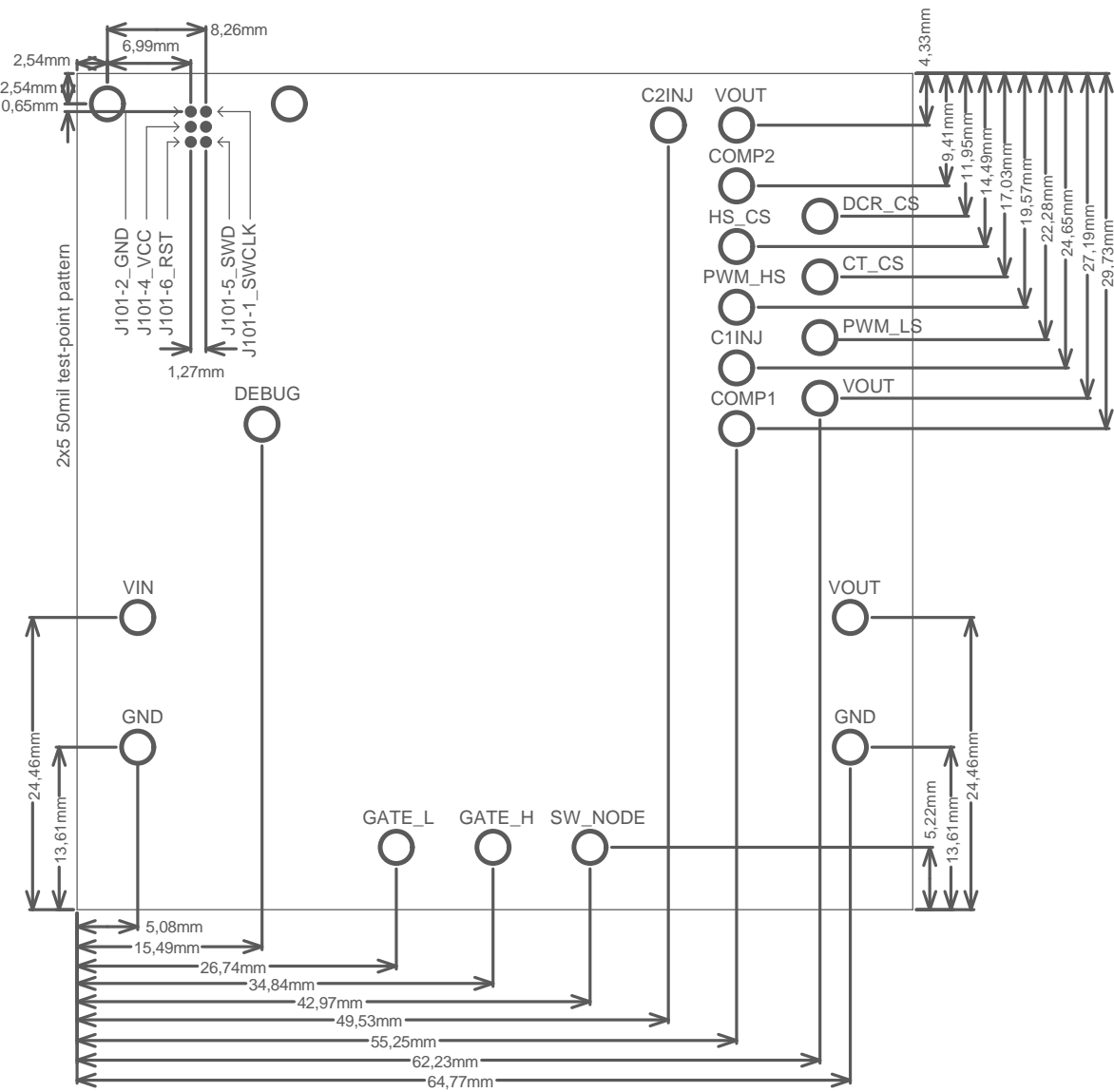
Mechanical Dimensions



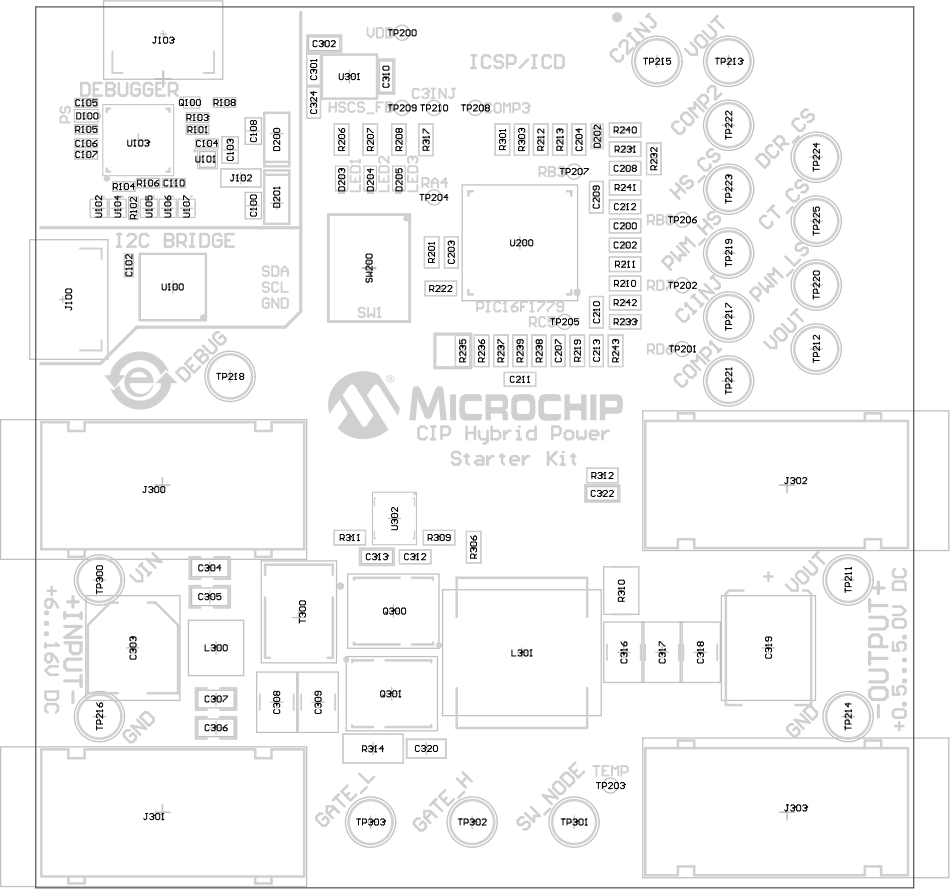
Connector Placement



Test Point Placement



 **MICROCHIP**
CIP Hybrid Power
Starter Kit



ICSP/ICD

OMP3

PIC16F1779

C211

L301

TEMP TP203

I2C BRIDGE

DEBUG

INPUT+

GND

VOUT

GND

OUTPUT+
+0.5...5.0V DC

DEBUGGER

I2C BRIDGE

DEBUG

INPUT+

GND

VOUT

GND

OUTPUT+
+0.5...5.0V DC

TP100

J101

PAD1

PAD2

MCLRPSU0 GND DATA CLK NC

PAD4

PAD3

R229

R202

R205

R203

R204

R245

R244

R209

R318

R319

R216

R215

R214

C201

R200

R226

R227

R225

R224

R223

R230

R221

R220

R228

C323

C321

R315

R316

D300

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C315

R302

C311

U300

C300

R300

R307

R308

R313

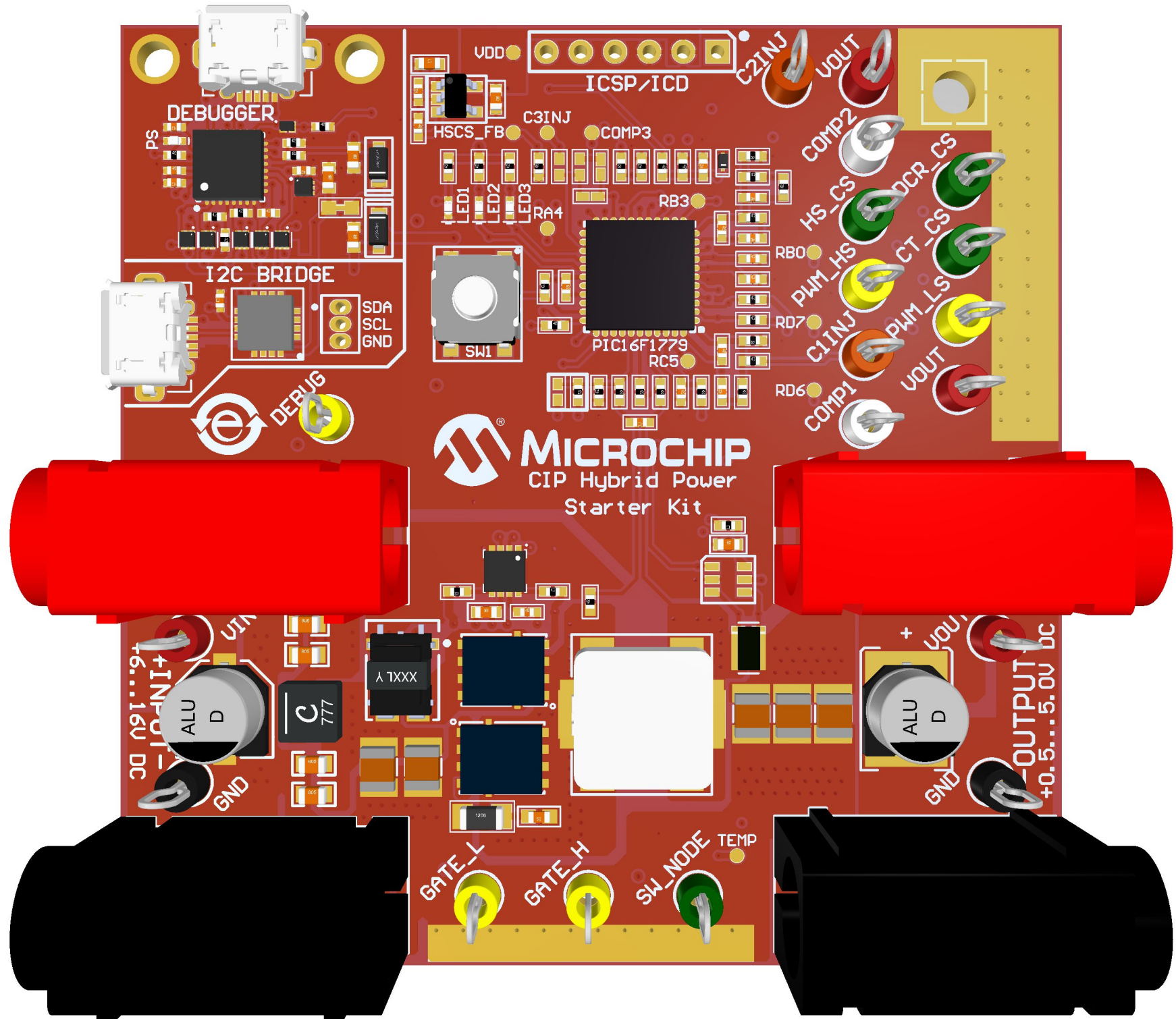
Microchip © 2018

PCBA LABEL

LABELL

A08-2919 Rev 2





MICROCHIP
CIP Hybrid Power
Starter Kit

DEBUGGER

I2C BRIDGE

ICSP/ICD

PIC16F1779

GATE_L

GATE_H

SW_NODE

TEMP

-OUTPUT
+0.5...5.0V DC

+INPUT
+6...16V DC

ALU
D

ALU
D

PS

DEBUG

XXXX

777

VDD

HSCS_FB

LED1

LED2

LED3

RA4

RB3

SW1

RC5

RD6

RD7

RB0

RD7

RD6

COMP1

COMP2

HS-CS

PWM_HS

C1INJ

PWM_LS

CT-CS

VOUT

VOUT

C2INJ

VOUT

VOUT

VOUT

VOUT

VOUT

VOUT

VOUT

VOUT

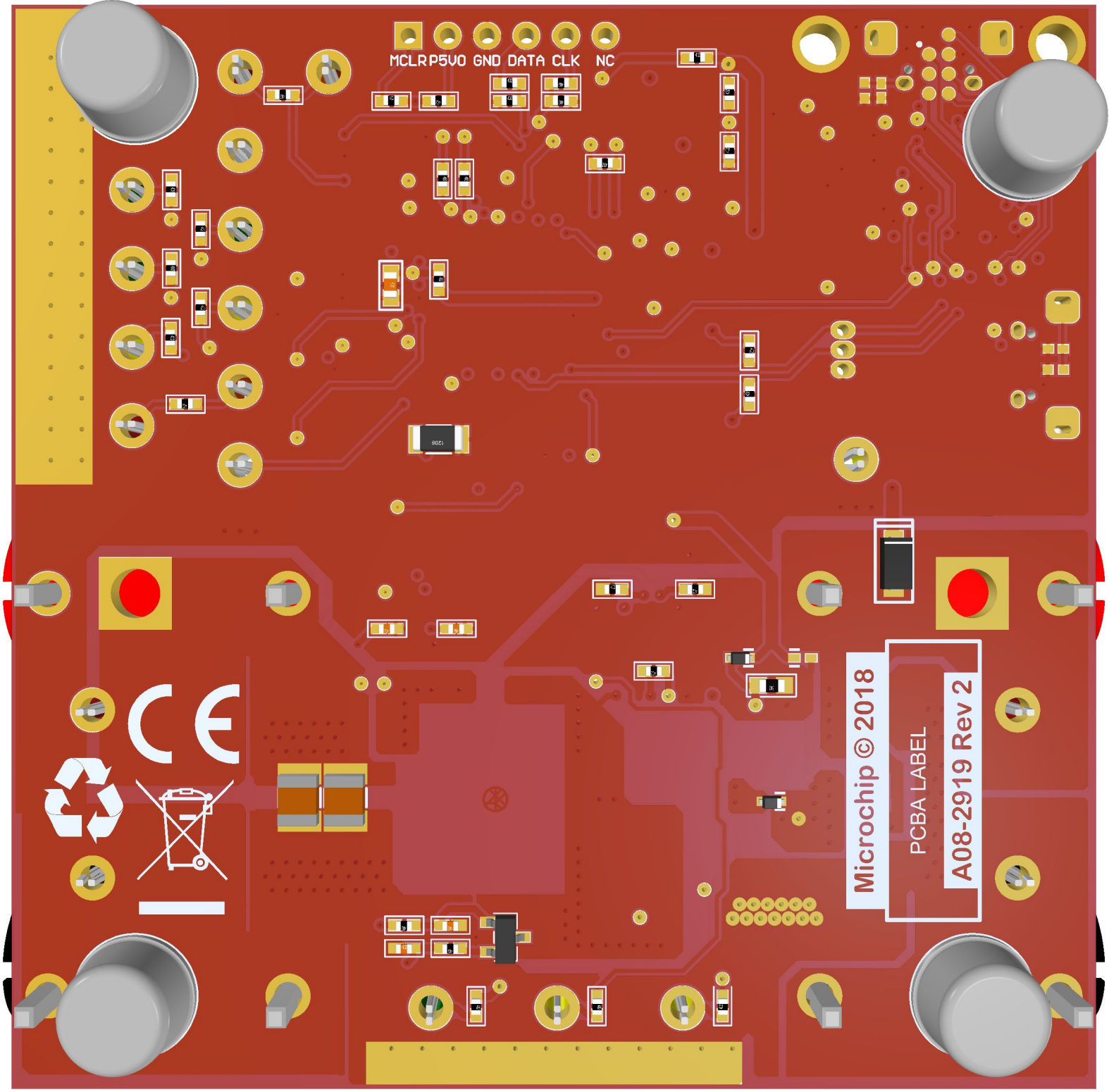
VOUT

VOUT

VOUT

VOUT

VOUT



MCLR P5V0 GND DATA CLK NC

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PCBA LABEL
A08-2919 Rev 2



