Renesas Starter Kit for RX72T
CPU Board Schematics

REV	REF	DATE	DRAWN BY
1.00	New	07.12.2018	KOS
2.00	Release (TRAC #242)	18.03.2019	KOS

SHEET	DESCRIPTION
1	INDEX
2	RX72T MCU
3	MCU Pin Function Select
4	PSU
5	E1/E2 Lite Emulator, MCU & Emulator Mode Setting, Pull-up Resistors
6	Reset, Switches, LEDs
7	USB to Serial Interface
8	Pmod Interface, IIC EEPROM
9	Application Headers
10	MCU Pin Headers
11	CAN, LIN
12	USB0 Host/Function

Note:

C : Capacitor
D : Diode
R : Fixed Resistor
RV : Potentiometer
MR : Resistor Array
L : Inductor
U : Integrated Circuit
X : Crystal, Oscillator
RES : Reset Switch
SW : Switch
LED : Light Emitting Diode
PWR : Power Jack
J : Connector, Jumper

*** "DNF" marking means that component is not fitted by default.**

Board Code:

RTK5572TKCC00000BE : RSKRX72T MP Board
RTK5572TKCC00010BE : RSKRX72T MP Board (Encrypted version)

Abbreviations:

CAN : Controller Area Network
IIC : Philips(TM) Inter-Integrated Circuit Connection Bus
LED : Light Emitting Diode
LIN : Local Interconnect Network
MCU : Microcontroller Unit
PSU : Power Supply Unit
RSK : Renesas Starter Kit
USB : Universal Serial Bus

REEL Drawing No. D016172_04

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Title: RSKRX72T [Index]		
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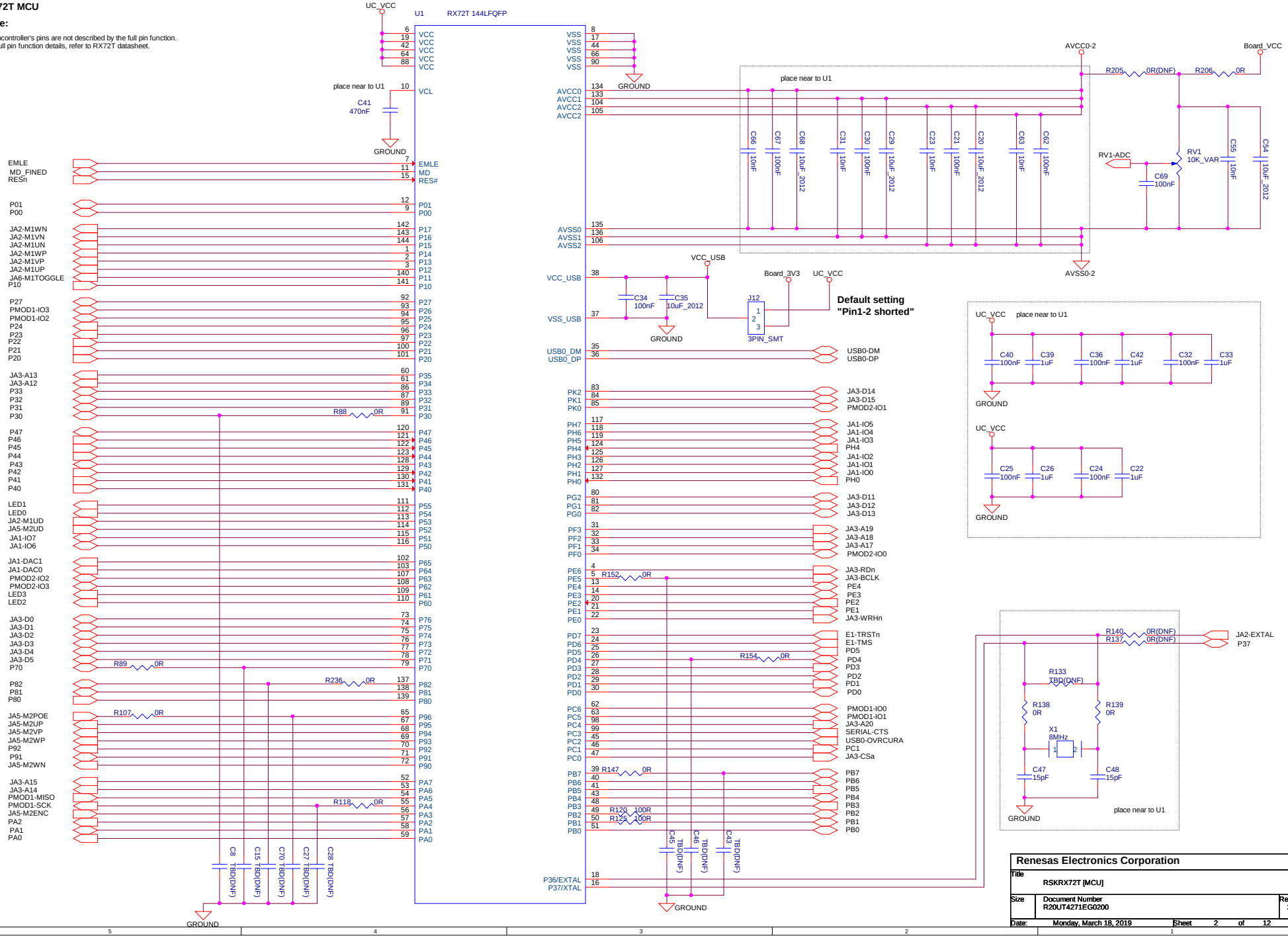
RX72T MCU

Note:

Microcontroller's pins are not described by the full pin function.
For full pin function details, refer to RX72T datasheet.



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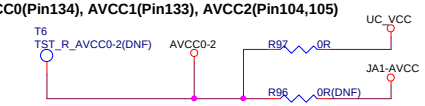
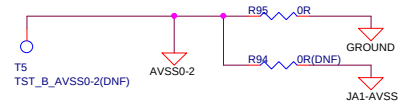
MCU Pin Function Select

AVCC0(Pin134), AVCC1(Pin133), AVCC2(Pin104,105)



AVSS0(Pin135), AVSS1(Pin136), AVSS2(Pin106)



RES#(Pin15) — RESn → E1-RESn, SW-RESn, JA2-RESn

EMLE(Pin7) — EMLE → E1-EMLE, JP-EMLE

MD_FINED(Pin11) — MD_FINED → E1-MD_FINED, DSW-MD_FINED

P01(Pin12) — P01 → R35 0R, R123 0R(DNF) → JA5-M2HSIN2, JA3-A10

P00(Pin9) — P00 → R126 0R, R24 0R, R129 0R(DNF) → E1-UB, DSW-UB, JA1-IRQd_M2HSIN0, JA3-A11

P10(Pin141) — P10 → R203 0R, R67 0R → SW1, JA5-IRQe_M2HSIN1

P27(Pin92) — P27 → R60 0R, R61 0R(DNF) → JA2-M1ENC, JA3-CSb

P24(Pin95) — P24 → R202 0R, R83 0R(DNF) → LINNSLP, PMOD2-CS

P23(Pin96) — P23 → R165 0R, R171 0R(DNF), R72 0R(DNF) → LINTXD, JA6-TXDc, PMOD2-MOSI

P22(Pin97) — P22 → R167 0R, R170 0R(DNF), R52 0R(DNF) → LINRXD, JA6-RXDc, PMOD2-MISO

P21(Pin100) — P21 → R247 0R(DNF), R8 0R(DNF) → SW3, JA1-ADTRG

P20(Pin101) — P20 → R248 0R, R9 0R → SW3, JA1-ADTRG

P33(Pin86) — P33 → R178 0R, R179 0R(DNF) → JA2-M1TRCCLK, JA3-D7

P32(Pin87) — P32 → R177 0R, R176 0R(DNF) → JA2-M1TRDCLK, JA3-D8

P31(Pin89) — P31 → R109 0R(DNF), R105 0R → JA3-D9, SERIAL-RTS

P30(Pin91) — P30 → R63 0R(DNF), R62 0R → JA3-D10, PMOD2-SCK

P46(Pin121) — P46 → AVCC0-2, R40 10K(DNF), R21 0R → JA5-ADC6

P45(Pin122) — P45 → AVCC0-2, R41 10K(DNF), R22 0R → JA5-ADC5

P44(Pin123) — P44 → AVCC0-2, R42 10K(DNF), R23 0R → JA5-ADC4

P42(Pin129) — P42 → AVCC0-2, R4 10K(DNF), R5 0R → JA1-ADC2

P41(Pin130) — P41 → AVCC0-2, R128 10K(DNF), R127 0R → JA1-ADC1

P40(Pin131) — P40 → R235 0R, R234 0R(DNF) → RV1-ADC, JA1-ADC0

P70(Pin79) — P70 → R120 0R, R119 0R(DNF) → JA2-M1POE, JA3-D6

P82(Pin137) — P82 → R238 0R, R239 0R(DNF), R241 0R(DNF), R237 0R(DNF), R242 0R(DNF) → JA5-M2UIN, JA3-ALE, JA3-WAIT, JA6-M1UIN, JA6-SCKc

P81(Pin138) — P81 → R16 0R, R80 0R(DNF), R168 0R(DNF) → JA5-M2VIN, JA3-CSc, JA6-M1VIN

P80(Pin139) — P80 → R15 0R, R169 0R(DNF) → JA5-M2WIN, JA6-M1WIN

P92(Pin70) — P92 → R32 0R, R187 0R(DNF) → JA5-M2UN, JA2-TIMOUT0

P91(Pin71) — P91 → R14 0R, R185 0R(DNF) → JA5-M2VN, JA2-TIMIN0

PA2(Pin57) — PA2 → R212 0R, R155 0R(DNF) → PMOD1-CS, JA3-A0

PA1(Pin58) — PA1 → R76 0R, R19 0R(DNF), R38 0R(DNF) → CAN1RX, JA5-CAN1RX, JA5-M2TOGGLE

PA0(Pin59) — PA0 → R91 0R, R57 0R(DNF) → CAN1TX, JA5-CAN1TX

PB7(Pin39) — PB7 → R192 0R, R193 0R(DNF) → JA2-SCKa, JA3-A4

PB6(Pin40) — PB6 → R195 0R, R198 0R, R148 0R(DNF) → SERIAL-RXD, JA2-RXDa, JA3-A3

PB5(Pin41) — PB5 → R143 0R, R199 0R, R146 0R(DNF) → SERIAL-TXD, JA2-TXDa, JA3-A2

PB4(Pin43) — PB4 → R188 0R, R156 0R(DNF) → JA2-CTSaRTSa, JA3-A1

PB3(Pin48) — PB3 → R245 0R, R197 0R → SW2, JA2-IRQa_M1HSIN0

PB2(Pin49) — PB2 → E2P-SDA, JA1-SDA

PB1(Pin50) — PB1 → R189 0R, R190 0R(DNF) → E2P-SCL, JA1-SCL, JA2-IRQb_M1HSIN1

PB0(Pin51) — PB0 → R217 0R, R218 0R(DNF) → PMOD1-MOSI, JA2-IRQc_M1HSIN2

PC1(Pin46) — PC1 → R98 0R, R92 0R(DNF) → USB0-VBUSEN, JA3-A16

PD5(Pin25) — PD5 → R231 0R, R194 0R(DNF), R172 0R(DNF) → E1-TDI_RXD, SERIAL-RXD, JA6-RXDb

PD4(Pin26) — PD4 → R101 0R, R99 0R(DNF) → E1-TCK_FINEC, JA6-SCKb

PD3(Pin27) — PD3 → R230 0R, R142 0R(DNF), R173 0R(DNF) → E1-TDO_TXD, SERIAL-TXD, JA6-TXDb

PD2(Pin28) — PD2 → R132 0R, R124 0R(DNF) → USB0-VBUS, JA3-A7

PD1(Pin29) — PD1 → R186 0R, R120 0R(DNF) → JA2-TIMOUT1, JA3-A6

PD0(Pin30) — PD0 → R184 0R, R126 0R(DNF) → JA2-TIMIN1, JA3-A5

PE4(Pin13) — PE4 → R34 0R, R66 0R(DNF) → JA5-M2TRCCLK, JA3-A9

PE3(Pin14) — PE3 → R33 0R, R65 0R(DNF) → JA5-M2TRDCLK, JA3-A8

PE2(Pin20) — PE2 → JP-UPSEL, JA2-NMIn

PE1(Pin21) — PE1 → R68 0R, R115 0R(DNF) → JA3-WRLn, JA3-WRn

PH4(Pin124) — PH4 → AVCC0-2, R39 10K(DNF), R20 0R, R58 0R(DNF), AVSS0-2 → JA5-ADC7

PH0(Pin132) — PH0 → AVCC0-2, R6 10K(DNF), R7 0R, R223 0R(DNF), AVSS0-2 → JA1-ADC3

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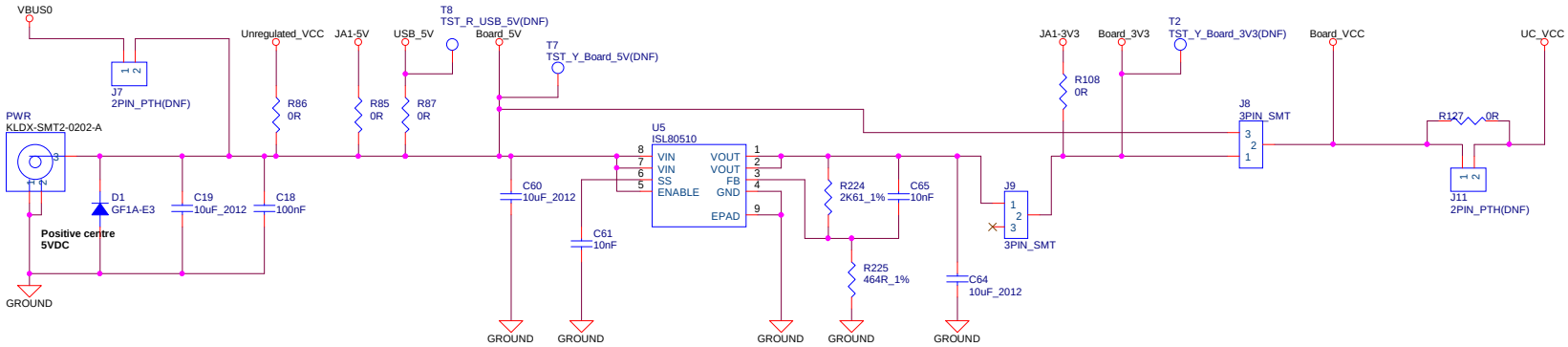
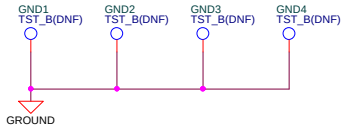
Power Supply Unit



Ground Test Point



Power Supply Configuration

J7	J8	J9	J12	Power Supply Source	VCC_USB	Board_VCC / UC_VCC	Board_5V	Unavailable Feature	
open	2-3 shorted	2-3 shorted	1-2 shorted	E2-Lite / E1(3.3V)	3.3V	3.3V	3.3V	CAN, LIN, 5V Interface Pmods, USB(Host)(Function-Buspower), 5V Interface EEPROM	<- Default Settings
open	2-3 shorted	1-2 shorted	2-3 shorted	E1(5V)	3.3V	5V	5V	Pmod LCD and other 3V3 Interface Pmods, USB(Host)(Function-Buspower)	
open	2-3 shorted	2-3 shorted	1-2 shorted	E1(5V) / PWR / Unregulated_VCC / JA1-5V	5V	5V	5V	Pmod LCD and other 3V3 Interface Pmods, USB(Host)(Function-Buspower, Selfpower), 3V3 Interface EEPROM	
open	1-2 shorted	1-2 shorted	1-2 or 2-3 shorted	PWR / Unregulated_VCC / JA1-5V	3.3V	3.3V	5V	5V Interface Pmods, USB(Function-Buspower)	
open	2-3 shorted	1-2 shorted	2-3 shorted	PWR / Unregulated_VCC / JA1-5V	3.3V	5V	5V	Pmod LCD and other 3V3 Interface Pmods, USB(Function-Buspower)	
shorted pin	1-2 shorted	1-2 shorted	1-2 or 2-3 shorted	VBUS	3.3V	3.3V	5V	5V Interface Pmods, USB(Host)(Function-Selfpower)	
shorted pin	2-3 shorted	1-2 shorted	2-3 shorted	VBUS	3.3V	5V	5V	Pmod LCD and other 3V3 Interface Pmods, USB(Host)(Function-Selfpower)	

Note1: USB-Selfpower at J14(2-3) or Fit R162
USB-Buspower at J14(1-2) and DNF R162

Note2: 3V3 Interface EEPROM at Fit R28, DNF R51
5V Interface EEPROM at DNF R28, Fit R51 (When 3.3V power is supplied from E2Lite or E1, It becomes 3.3V interface.)

Note3: When 3.3V power is supplied from E2Lite or E1, 3.3V is supplied to 5V power line on the circuit.

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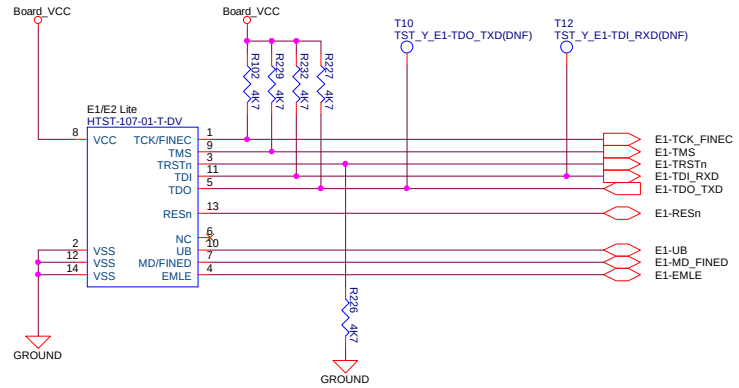
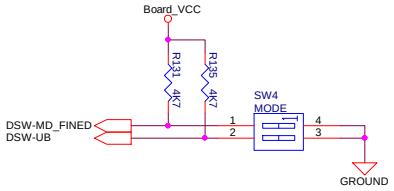
E1/E2 Lite Emulator Interface

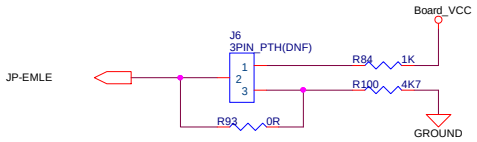


MCU & Emulator Mode Setting



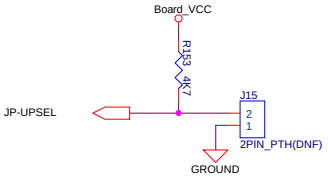
MCU Operating Mode Configuration

SW4 Pin1	SW4 Pin2	Operating Mode
OFF	Don't care	Single Chip Mode
ON	ON	SCI Boot Mode
ON	OFF	User Boot Mode



Emulator Configuration

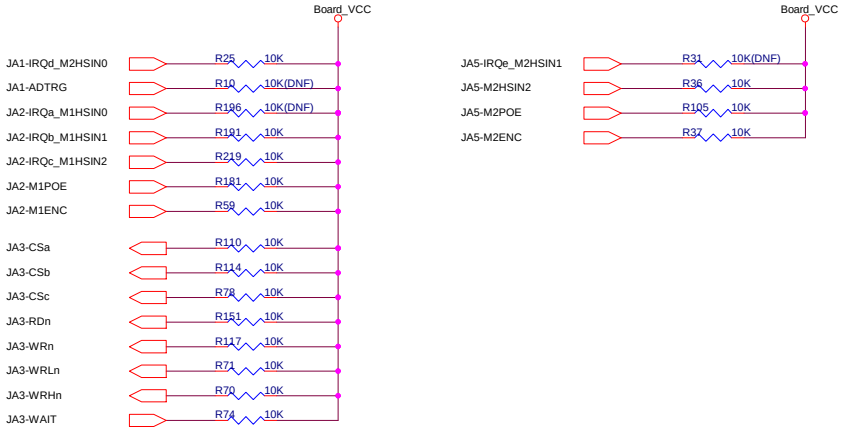
J6	Emulator Configuration
Shorted Pin1-2	E1/E2 Lite debugging with Hot plug-in
Shorted Pin2-3	E1/E2 Lite normal debugging Microcontroller single operation (without emulator)
All open	DO NOT SET



Power Configuration for USB Boot Mode

J15	Power Configuration
Open	Bus Powered
Shorted	Self Powered

Pull-up resistors



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Title: RSKRX72T [E1/E2 Lite, MCU & Emulator Mode Setting, Pull-up resistors]		
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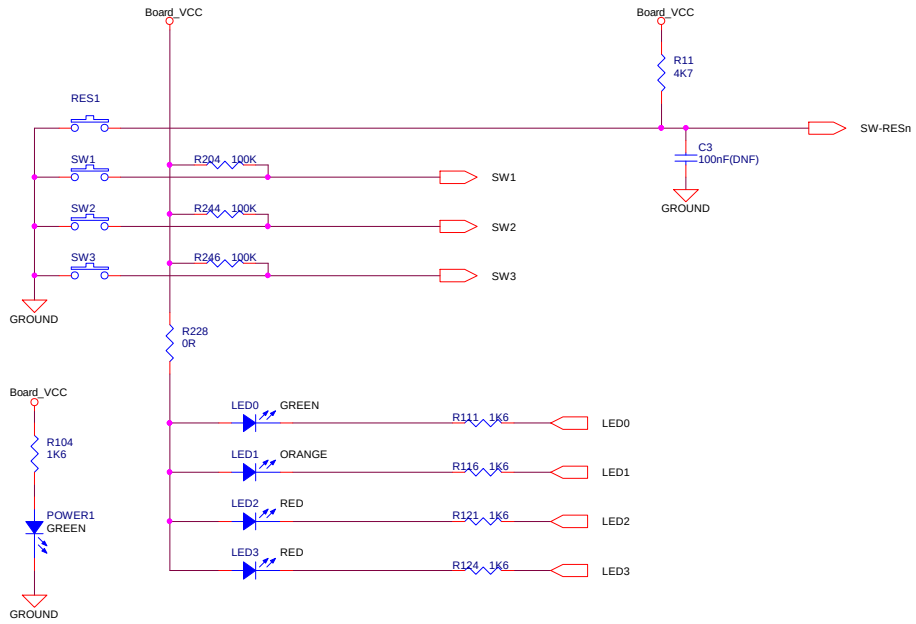
Reset, Switches, LEDs



Renesas Electronics Corporation		
Title: RSKRX72T [Reset, Switches, LEDs]		
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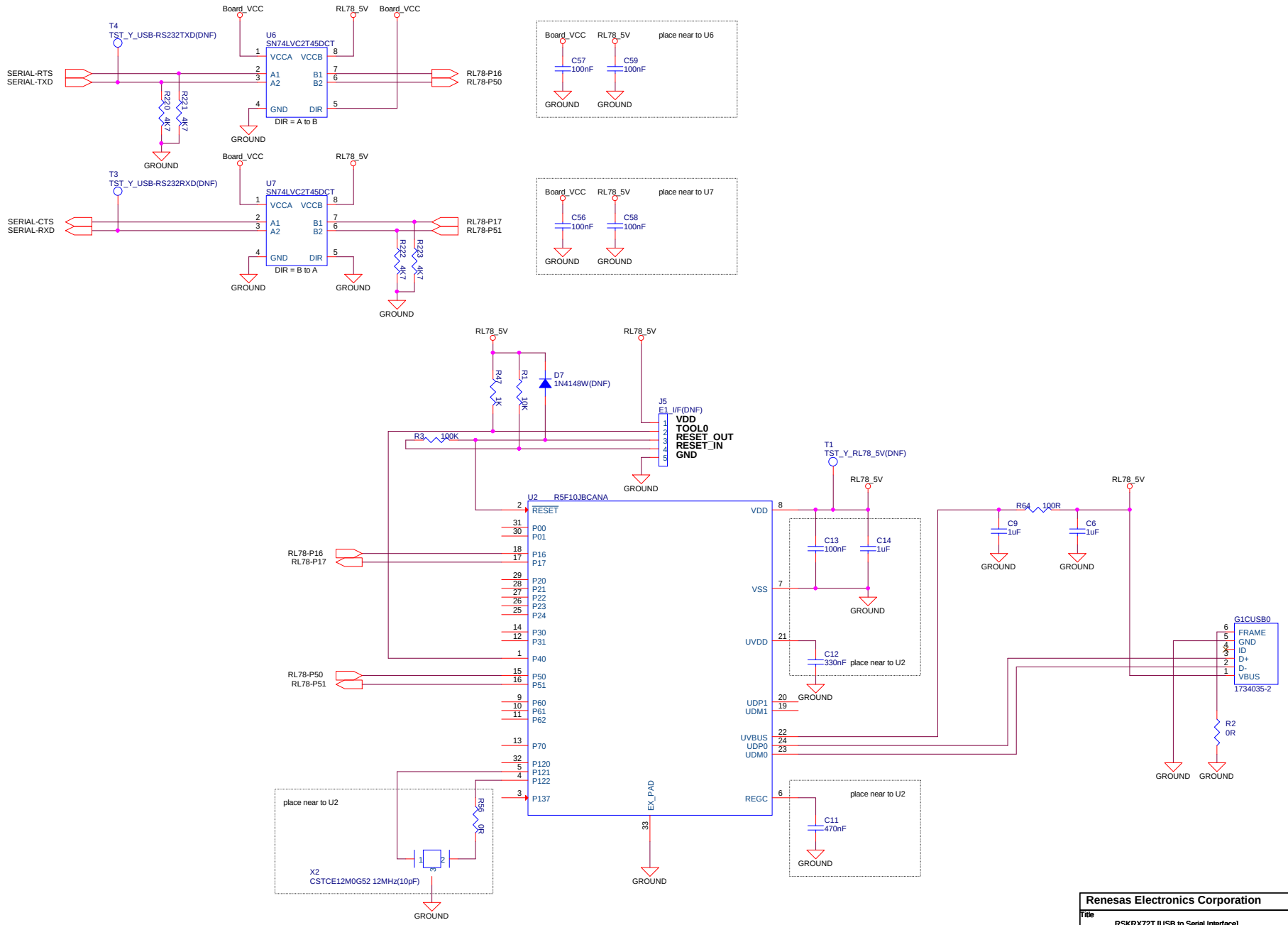
USB to Serial Interface



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Title: RSKRX72T [USB to Serial Interface]		
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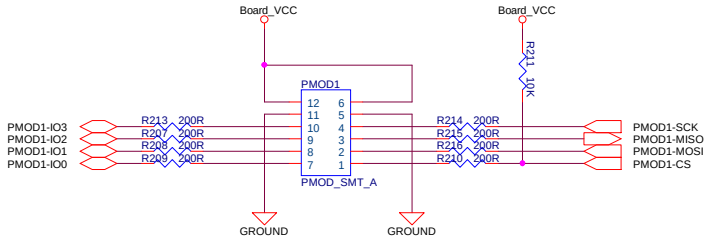
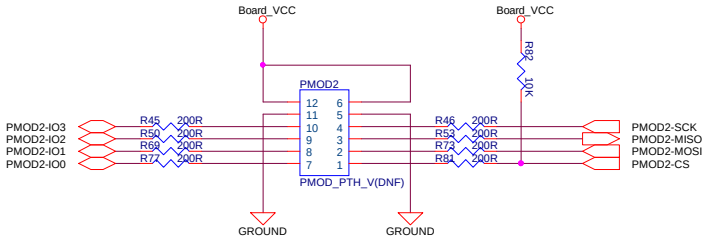
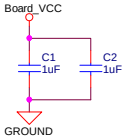
Pmod Interface

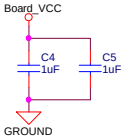
PMOD1: Angle type connector

PMOD2: Vertical type connector (spare)





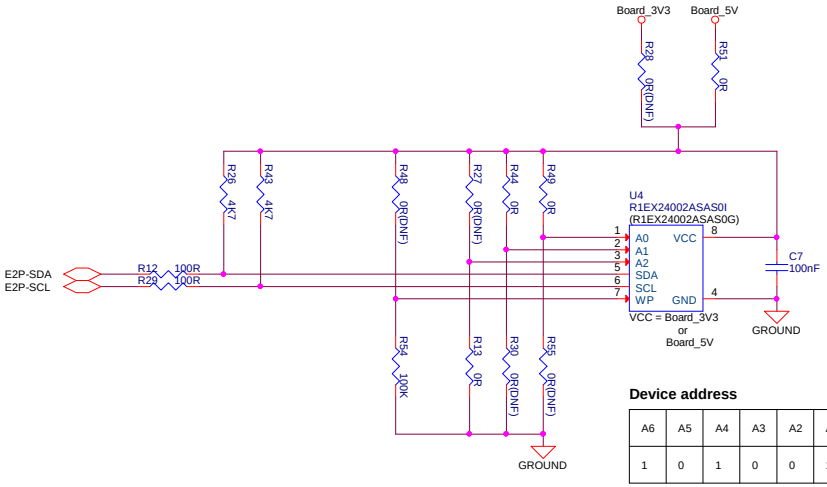




IIC EEPROM(2Kbits) - RIIC

Warning:

NEVER FIT R28 and R51 simultaneously.



Device address

A6	A5	A4	A3	A2	A1	A0
1	0	1	0	0	1	1

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Title: RSKRX72T [Pmod Interface, IIC EEPROM]			
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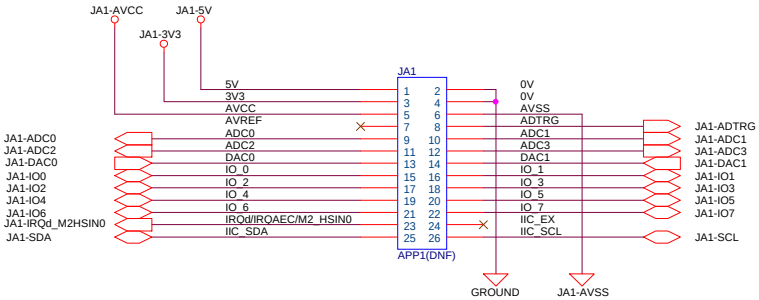
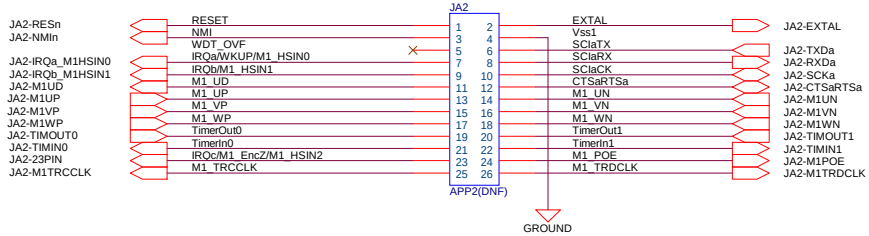
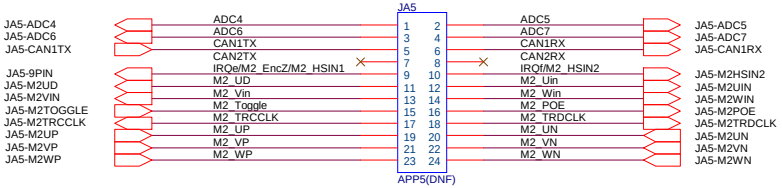
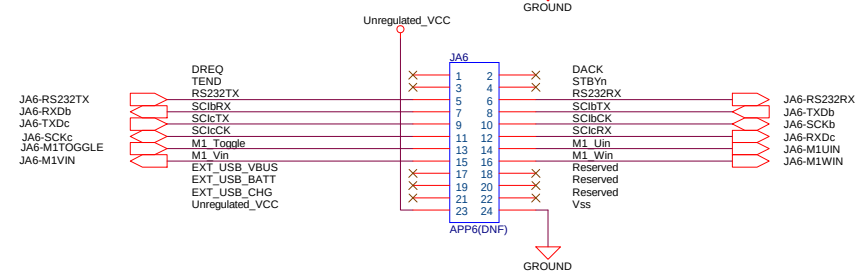
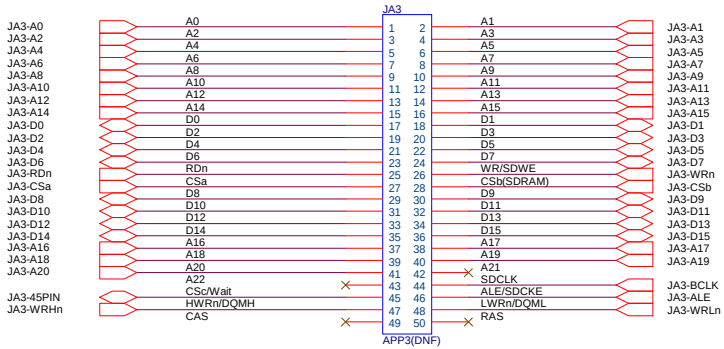
Application Headers



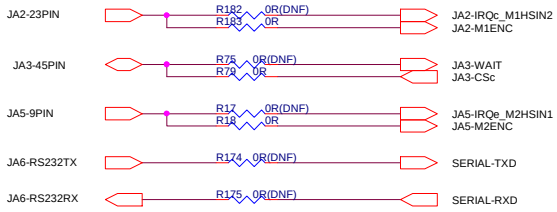








Application Header Function Select



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Title: RSKRX72T [Application Headers]		
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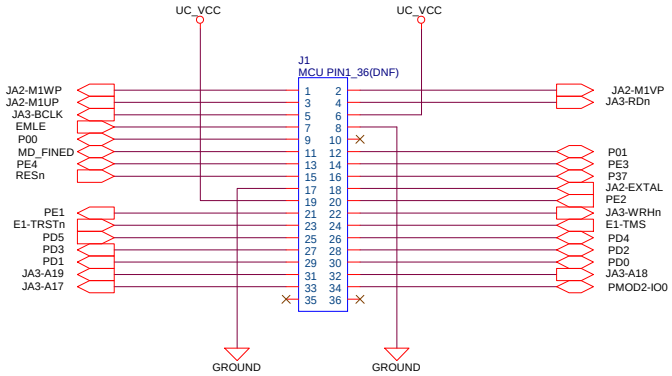
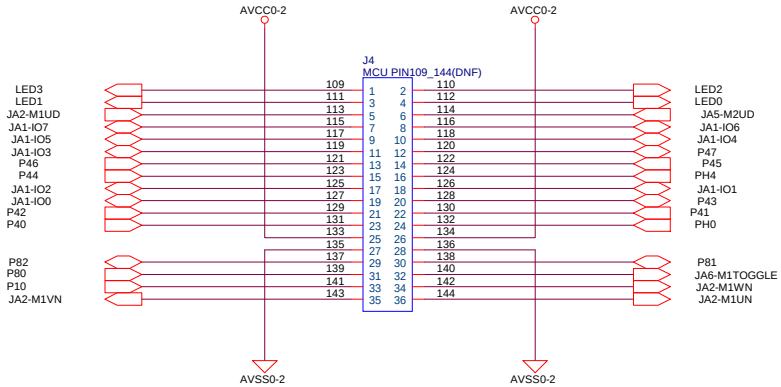
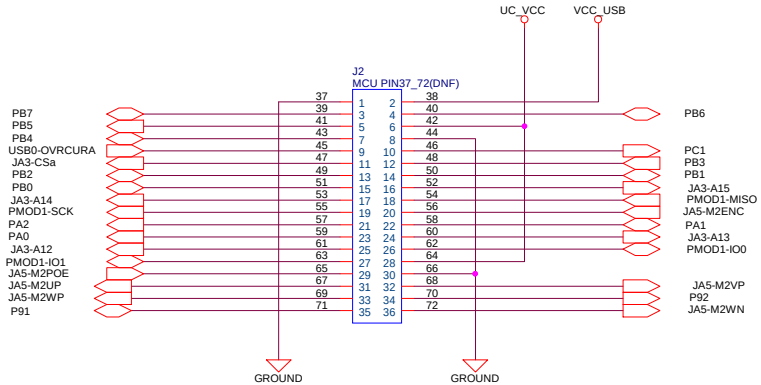
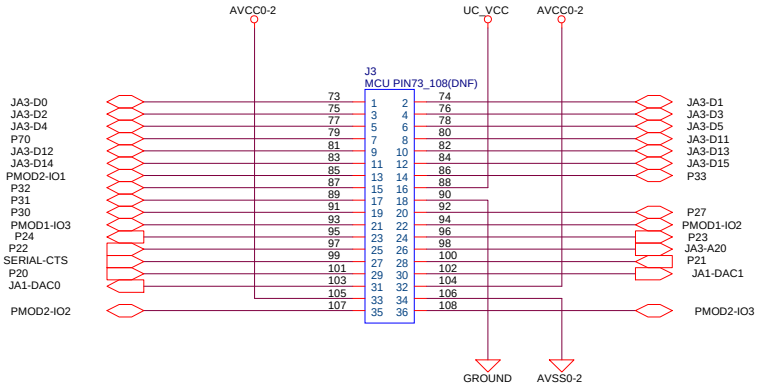
MCU Pin Headers









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Title: RSKRX72T [MCU Pin Headers]		
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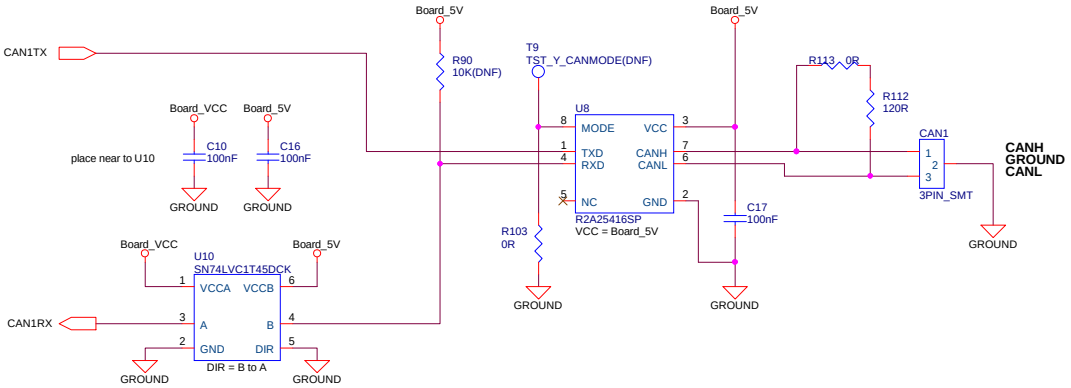
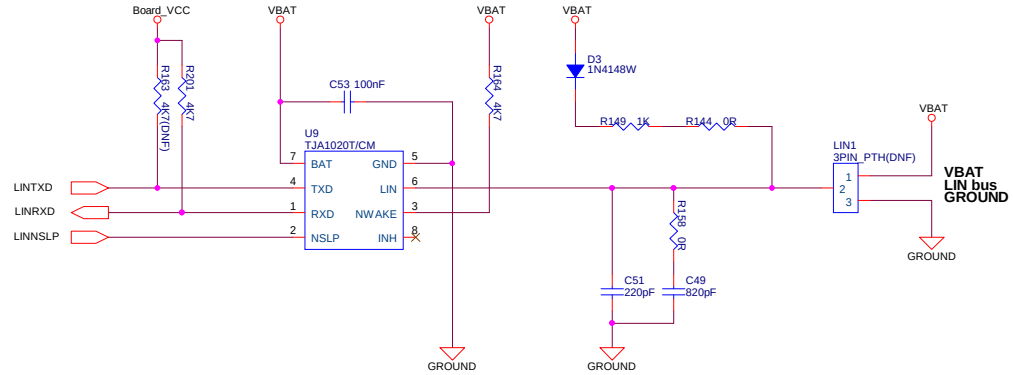
CAN



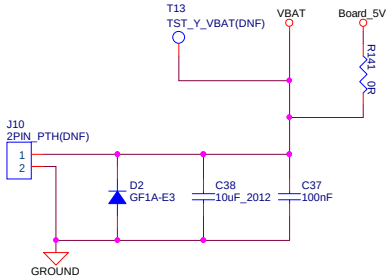
LIN



LIN Mode Configuration

	Fit	Remove
Master	R144, R158	---
Slave	---	R144, R158

VBAT Supply



Warning:

Remove R141 if VBAT > 5V is possible.

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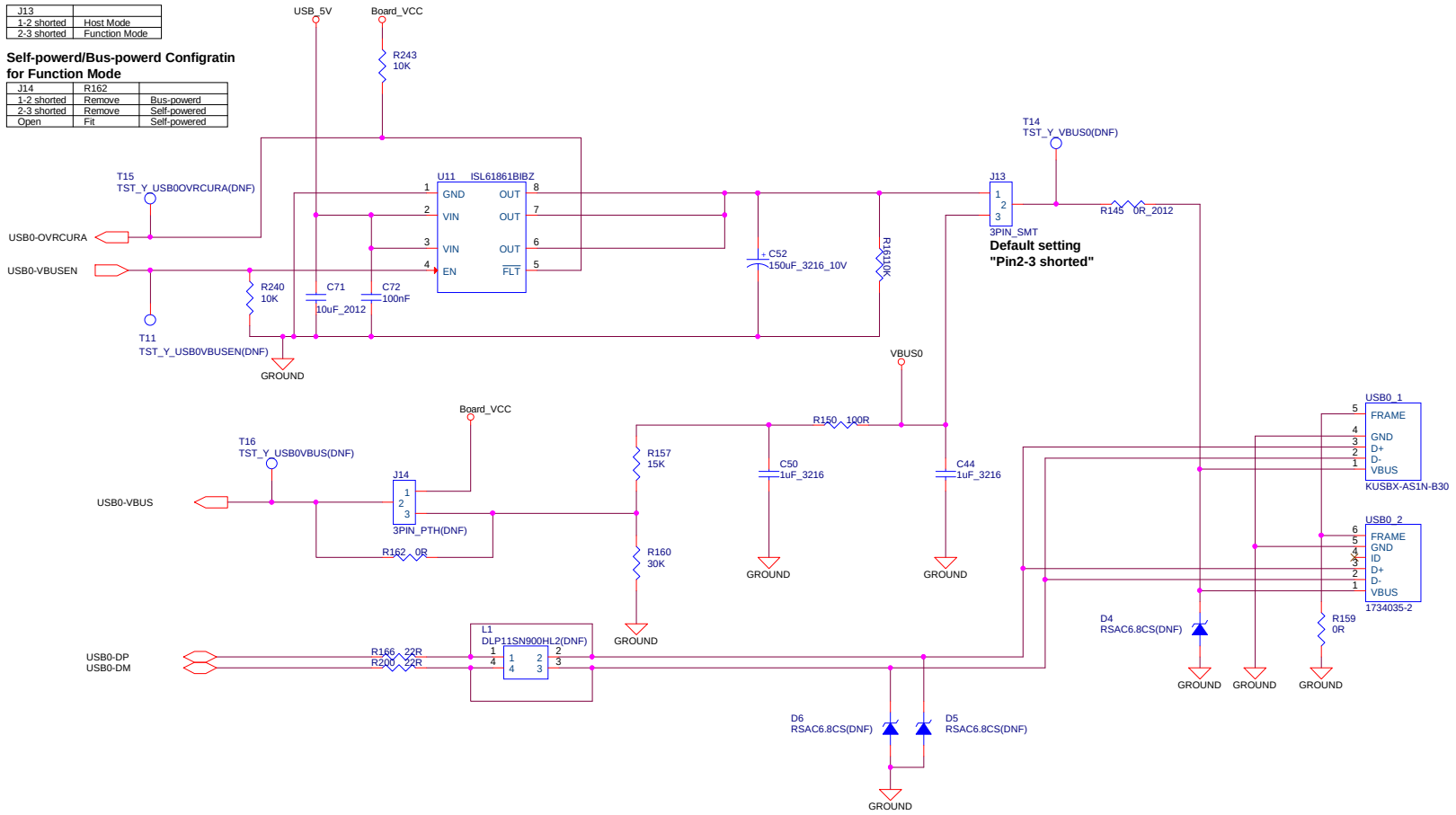
USB0 Host/Function

USB0 Host/Function Select

J13	
1-2 shorted	Host Mode
2-3 shorted	Function Mode

Self-powerd/Bus-powerd Configratin for Function Mode

J14	R162	
1-2 shorted	Remove	Bus-powerd
2-3 shorted	Remove	Self-powered
Open	Fit	Self-powered



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Revision History

REV	DATE	SHEET	DESCRIPTION
1.00	07.12.2018	ALL	New
2.00	18.03.2019	ALL	1st release edition.
		1	Adds Board Code (Encrypted version).
		2	Changes U1 name.
		4	Fix Power Supply Configuration Table.
			Changes NOTE2.
			Adds NOTE3.
		8	Change status R28 -> R28(DNF), R51(DNF) -> R51
			Changes Device Address in U4. (A7 -> A6)

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