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**Nimrod**

Sheet: /

File: reDIP-64.kicad\_sch

**Title: reDIP 64**

Size: A4

Date: 2021-06-16

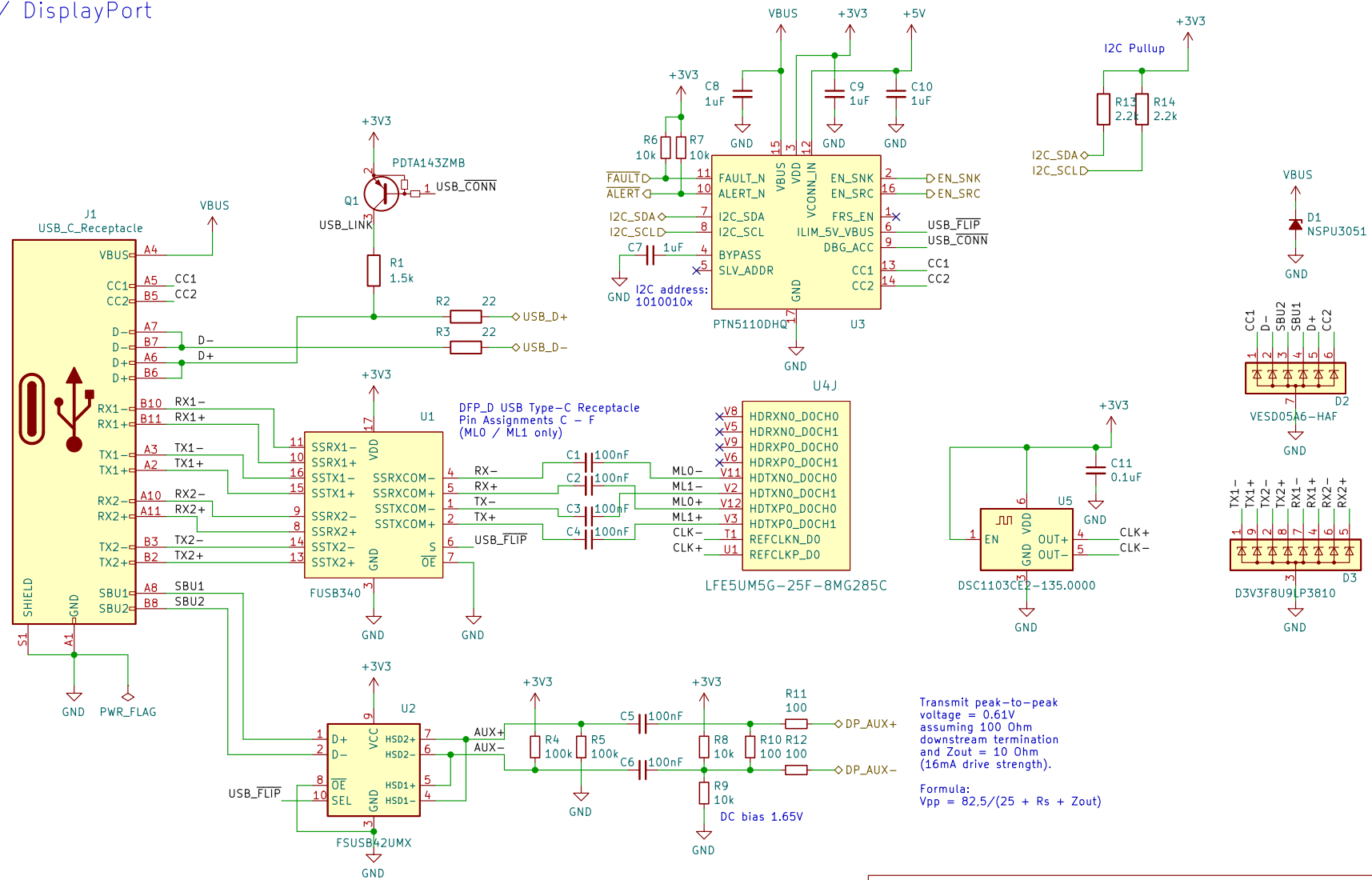
**Rev: 0.2**

KiCad E.D.A. kicad (5.99.0-10952-g410dbe17de)

Id: 1/6



USB / DisplayPort



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**Nimrod**

Sheet: /USB\_DisplayPort/

File: reDIP-64-USB.kicad\_sch

Title: reDIP 64

Size: A4	Date: 2021-06-16
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KiCad E.D.A. kicad (5.99.0-10952-g410dbe17de)

Rev: 0.2

Id: 2/6



Power

VBUS

U6 FPF1048

EN\_SNK D

C13 1uF

GND

A2

VIN

VOUT

A1

+5V

D4 PMEG2020EPK

C18 1uF

GND

VCC

PWR\_FLAG

U7 FPF2195

FAULT

B1

VOUT

FLAGB

ISSET

C12 1uF

R15 453

GND

GND

GND

B2

VIN

ON

A2

EN\_SRC

C19 1uF

GND

Current limit min. 900mA

+5V

PWR\_FLAG

FB1

C32 4.7uF

BLM18KG601SN1

U8 MYRGP330100W21RA

VIN

VOUT

L1

LX

CE

PGND

AGND

GND

C34 10uF

BLM18KG601SN1

+3V3

PWR\_FLAG

FB3

TP3

+3V3

VCCA

U10 NCP163AMX120TBG

IN

OUT

EN

GND

C36 1uF

GND

C39 1uF

GND

TP5

+5V

PWR\_FLAG

FB2

C33 4.7uF

BLM18KG601SN1

U9 MYRGP120100W21RA

VIN

VOUT

L1

LX

CE

PGND

AGND

GND

C35 10uF

BLM18KG601SN1

+1V2

PWR\_FLAG

FB4

TP4

+3V3

VCCA

U11 NCP163AMX250TBG

IN

OUT

EN

GND

C37 1uF

GND

C40 1uF

GND

TP6

+3V3

VCCA

U12 NCP163AMX300TBG

IN

OUT

EN

GND

C38 1uF

GND

C41 1uF

GND

TP7

+3V0

VCCA

+2V5

VCCA+2V5

VCC\_AUX[2]

VCC\_AUX[4]

VCC\_CH0

VCC\_CH1

VCC\_CH2

VCC\_CH3

VCC\_CH4

VCC\_CH5

VCC\_CH6

VCC\_CH7

VCC\_CH8

VCC\_CH9

VCC\_CH10

VCC\_CH11

VCC\_CH12

VCC\_CH13

VCC\_CH14

VCC\_CH15

VCC\_CH16

VCC\_CH17

VCC\_CH18

VCC\_CH19

VCC\_CH20

VCC\_CH21

VCC\_CH22

VCC\_CH23

VCC\_CH24

VCC\_CH25

VCC\_CH26

VCC\_CH27

VCC\_CH28

VCC\_CH29

VCC\_CH30

VCC\_CH31

VCC\_CH32

VCC\_CH33

VCC\_CH34

VCC\_CH35

VCC\_CH36

VCC\_CH37

VCC\_CH38

VCC\_CH39

VCC\_CH40

VCC\_CH41

VCC\_CH42

VCC\_CH43

VCC\_CH44

VCC\_CH45

VCC\_CH46

VCC\_CH47

VCC\_CH48

VCC\_CH49

VCC\_CH50

VCC\_CH51

VCC\_CH52

VCC\_CH53

VCC\_CH54

VCC\_CH55

VCC\_CH56

VCC\_CH57

VCC\_CH58

VCC\_CH59

VCC\_CH60

VCC\_CH61

VCC\_CH62

VCC\_CH63

VCC\_CH64

VCC\_CH65

VCC\_CH66

VCC\_CH67

VCC\_CH68

VCC\_CH69

VCC\_CH70

VCC\_CH71

VCC\_CH72

VCC\_CH73

VCC\_CH74

VCC\_CH75

VCC\_CH76

VCC\_CH77

VCC\_CH78

VCC\_CH79

VCC\_CH80

VCC\_CH81

VCC\_CH82

VCC\_CH83

VCC\_CH84

VCC\_CH85

VCC\_CH86

VCC\_CH87

VCC\_CH88

VCC\_CH89

VCC\_CH90

VCC\_CH91

VCC\_CH92

VCC\_CH93

VCC\_CH94

VCC\_CH95

VCC\_CH96

VCC\_CH97

VCC\_CH98

VCC\_CH99

VCC\_CH100

VCC\_CH101

VCC\_CH102

VCC\_CH103

VCC\_CH104

VCC\_CH105

VCC\_CH106

VCC\_CH107

VCC\_CH108

VCC\_CH109

VCC\_CH110

VCC\_CH111

VCC\_CH112

VCC\_CH113

VCC\_CH114

VCC\_CH115

VCC\_CH116

VCC\_CH117

VCC\_CH118

VCC\_CH119

VCC\_CH120

VCC\_CH121

VCC\_CH122

VCC\_CH123

VCC\_CH124

VCC\_CH125

VCC\_CH126

VCC\_CH127

VCC\_CH128

VCC\_CH129

VCC\_CH130

VCC\_CH131

VCC\_CH132

VCC\_CH133

VCC\_CH134

VCC\_CH135

VCC\_CH136

VCC\_CH137

VCC\_CH138

VCC\_CH139

VCC\_CH140

VCC\_CH141

VCC\_CH142

VCC\_CH143

VCC\_CH144

VCC\_CH145

VCC\_CH146

VCC\_CH147

VCC\_CH148

VCC\_CH149

VCC\_CH150

VCC\_CH151

VCC\_CH152

VCC\_CH153

VCC\_CH154

VCC\_CH155

VCC\_CH156

VCC\_CH157

VCC\_CH158

VCC\_CH159

VCC\_CH160

VCC\_CH161

VCC\_CH162

VCC\_CH163

VCC\_CH164

VCC\_CH165

VCC\_CH166

VCC\_CH167

VCC\_CH168

VCC\_CH169

VCC\_CH170

VCC\_CH171

VCC\_CH172

VCC\_CH173

VCC\_CH174

VCC\_CH175

VCC\_CH176

VCC\_CH177

VCC\_CH178

VCC\_CH179

VCC\_CH180

VCC\_CH181

VCC\_CH182

VCC\_CH183

VCC\_CH184

VCC\_CH185

VCC\_CH186

VCC\_CH187

VCC\_CH188

VCC\_CH189

VCC\_CH190

VCC\_CH191

VCC\_CH192

VCC\_CH193

VCC\_CH194

VCC\_CH195

VCC\_CH196

VCC\_CH197

VCC\_CH198

VCC\_CH199

VCC\_CH200

VCC\_CH201

VCC\_CH202

VCC\_CH203

VCC\_CH204

VCC\_CH205

VCC\_CH206

VCC\_CH207

VCC\_CH208

VCC\_CH209

VCC\_CH210

VCC\_CH211

VCC\_CH212

VCC\_CH213

VCC\_CH214

VCC\_CH215

VCC\_CH216

VCC\_CH217

VCC\_CH218

VCC\_CH219

VCC\_CH220

VCC\_CH221

VCC\_CH222

VCC\_CH223

VCC\_CH224

VCC\_CH225

VCC\_CH226

VCC\_CH227

VCC\_CH228

VCC\_CH229

VCC\_CH230

VCC\_CH231

VCC\_CH232

VCC\_CH233

VCC\_CH234

VCC\_CH235

VCC\_CH236

VCC\_CH237

VCC\_CH238

VCC\_CH239

VCC\_CH240

VCC\_CH241

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VCC\_CH244

VCC\_CH245

VCC\_CH246

VCC\_CH247

VCC\_CH248

VCC\_CH249

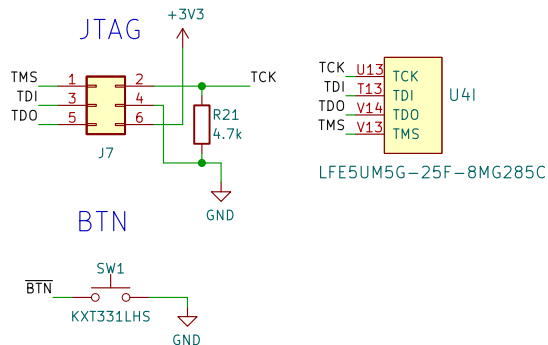
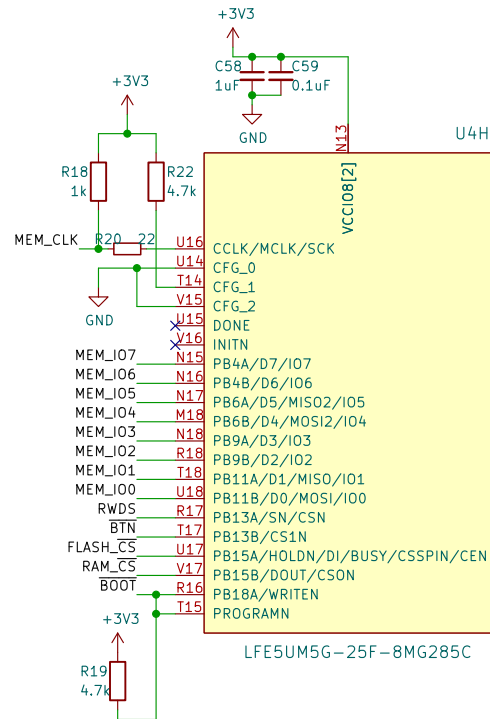
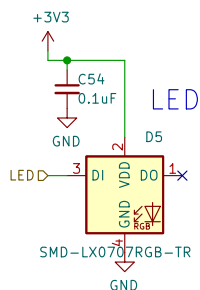
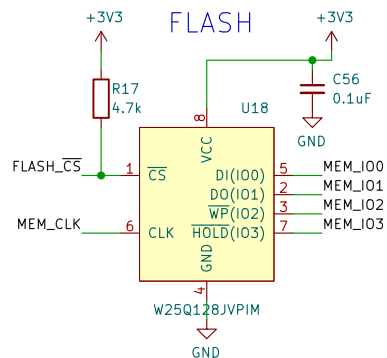
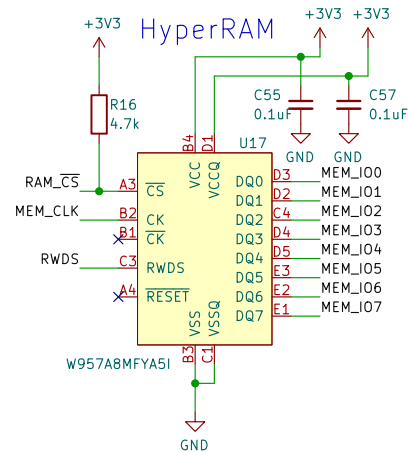
VCC\_CH250

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## Config / Memory



Example derivation of clocks:

- \* Audio: 135MHz/5 = 27MHz -> SGT5000 PLL -> 24.576MHz
- \* USB: 135MHz -> ECP5 PLL1 -> 48MHz
- \* HyperRAM: 135MHz, 135MHz/2 = 67.5MHz, or 135MHz/3 = 45MHz
- \* FLASH: 135MHz, 135MHz/2, or 135MHz/3 (max 50MHz for 03h Read Data Instruction)  
Note: 135MHz is above datasheet maximum FR of 133MHz

Commodore 64, no clock input:

- \*  $\emptyset\_COLOR*4$ : 135MHz -> ECP PLL2 -> 17.734472MHz\*4 (PAL) / 14.31818MHz\*4 (NTSC)
- \* DOT CLOCK:  $\emptyset\_COLOR*4/9 = 7.88\text{MHz}$  (PAL) /  $\emptyset\_COLOR*4/7 = 8.1818\text{MHz}$  (NTSC)
- \* COLOR CLOCK:  $\emptyset\_COLOR*4/16 = 4.433618\text{MHz}$  (PAL) / 3.579545MHz (NTSC)

Commodore 64,  $\emptyset\_COLOR$  as input:

- \*  $\emptyset\_COLOR*4$ : 135MHz -> ECP5 PLL2 -> 17.734472MHz\*4 (PAL) / 14.31818MHz\*4 (NTSC)
- \* DOT CLOCK: See above
- \* COLOR CLOCK: See above

Commodore 64, DOT CLOCK as input:

- \*  $\emptyset\_COLOR*4$ : DOT\_CLOCK -> ECP5 PLL2 -> 7.88MHz\*9 (PAL) / 8.1818MHz\*7 (NTSC)  
Note: 7.88MHz is below datasheet PLL minimum FIN of 8MHz
- \* COLOR CLOCK: See above

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**Nimrod**

Sheet: /Config\_Memory/

File: reDIP-64-Config.kicad\_sch

**Title: reDIP 64**

Size: A4 Date: 2021-06-16

KiCad E.D.A. kicad (5.99.0-10952-g410dbe17de)

**Rev: 0.2**

Id: 5/6

Audio

SGTL5000XNLA3 (U19)

Pin connections:

- VDDIO (12) to +3V3
- VDDD (20) to +3V0
- VDDA (3) to +3V3
- VAG (5) to GND (C61: 0.1uF)
- EXT\_IN\_2D (8) to GND (C62: 1uF)
- EXT\_IND (9) to GND (C63: 1uF)
- MIC (10) to GND
- MIC\_BIAS (11) to GND
- I2S\_MCLKD (13) to SYS\_MCLK (13)
- I2S\_LRCLKD (14) to I2S\_LRCLK (14)
- I2S\_SCLKD (15) to I2S\_SCLK (15)
- I2S\_DOUT (16) to I2S\_DOUT (16)
- I2S\_DIND (17) to I2S\_DIN (17)
- I2C\_SDA (18) to CTRL\_DATA (18)
- I2C\_SCL (19) to CTRL\_CLK (19)
- I2C address: 0001010x
- HP\_R (1) to HP\_R (1)
- HP\_VGND (2) to GND
- HP\_L (4) to HP\_L (4)
- AUDIO\_OUT\_2 to HP\_R (1) (C66: 1uF)
- AUDIO\_OUT to HP\_L (4) (C67: 1uF)
- GND (21) to GND

SGTL5000XNLA3 (U19)

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**Nimrod**

Sheet: /Audio/  
File: reDIP-64-Audio.kicad\_sch

**Title: reDIP 64**

Size: A4	Date: 2021-06-16	Rev: 0.2
KiCad E.D.A. kicad (5.99.0-10952-g410dbe17de)		Id: 6/6

Id: 6/6

