

RTL8105E/RTL8111E/RTL8111F/RTL8111EP/ RTL8111GN/RTL8106EN 48 Pin Reference Schematic V106

PAGE	INDEX
1.	Title Page
2.	POWER
3.	CONTROLLER
4.	Reserved Component
5.	Optional Function
6.	R-BOM
7.	Change Note

4

3

2

1

4

3

2

1

For RTL8111E Series / RTL8111F Series / RTL8111GN Series

* C12 to C17 are for VDD33 pins-- 12, 27, 39, 42, 47, 48.

For RTL8105E-VB

* C12 to C16 are for VDD33 pins-- 27, 39, 42, 47, 48.

For RTL8106EN Series

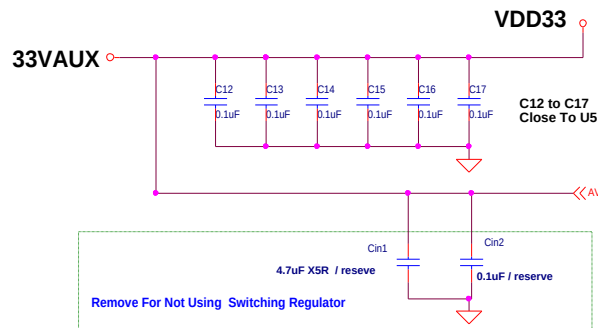
* C12 to C14 are for VDD33 pins-- 35, 47, 48.

For RTL8105E Series (except for VB)

* C12 to C15 are for VDD33 pins-- 27, 39, 47, 48.

For RTL8111EP

* C12 to C16 for VDD33 pins -- 12, 39, 42, 47, 48.



**** Power Sequence Must Refer to Layout Guide.****

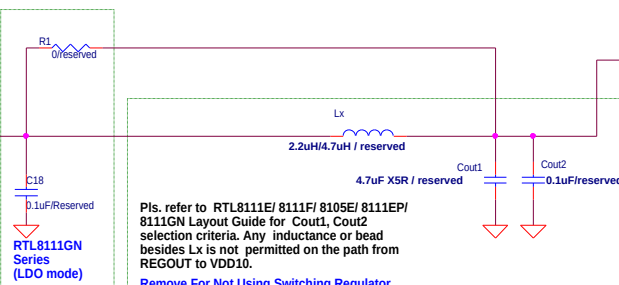
External 1.05V Supply When Not Using Switching Regulator for RTL8105E Series and RTL8111E Series (except for VL).

External 1.0V Supply When Not Using SWRLDO mode for RTL8111GN Series.

External 1.0V Supply is Not permitted for RTL8111EP.

External Power Supply is Not Permitted for RTL8106EN Series.

If Using External 1.05V / 1.0V Supply, Pls. refer to the following "3.3V and 1.05V / 1.0V Power-Supply Configurations" and contact Realtek FAE.



3.3V and 1.05V / 1.0V Power-Supply Configurations

	1.05V / 1.0V source	Lx	Cout1,2	Cin1,2	R23	R24	R1	C18
8111E Series/8111F Series/8105E Series/8111EP/8111GN Series	SWR	○	○	○	○	○	○	○
8105E Series (except for VB)	LDO	×	×	×	×	○	×	×
8106EN Series	LDO	×	×	×	×	×	○	○
8111GN Series	LDO	×	×	×	×	○	○	○
8111GN Series	External	×	×	×	×	○	×	○
8111E Series/8111F Series/8105E-VB	External	×	×	×	×	○	×	×
8105E Series (except for VB)	External	×	×	×	○	×	×	×

Note:

1. R1, R23 and R24 are reserved for the convenience of changing the 1.05V / 1.0V supply source between SWR/LDO mode and external supply.

No design change of PCB model is needed with these 3 resistors reserved.

2. Please refer to the table above when using different 1.05V / 1.0V supply source.

If only one 1.05V / 1.0V supply source is selected for one PCB model, i.e. no other choices are reserved:
1. R1, R23 and R24 are not necessary.
2. Just make a path of short to replace the use of R23/R24/R1 on the table.

3. SWR mode only (8111E series / 8111F series / 8105E series / 8111EP / 8111GN series):

(1) R23 => short ENSWREG to AVDD33_REG.

(3) R24/R1 => not necessary.

4. LDO mode only (8105E series, except for VB):

(1) R24 => short ENSWREG to GND

(2) R23 => not necessary.

5. LDO mode only (8111GN series):

(1) R24 => short ENSWREG to GND

(2) R23 => not necessary.

(3) R1 => short REGOUT to VDD10.

6. External supply only (8111E series / 8111F series / 8105E series):

(1) R24 => short ENSWREG to GND

(2) R23 => not necessary.

7. External supply only (8105E Series, except for VB):

(1) R23 => short ENSWREG to AVDD33_REG.

(2) R24 => not necessary.

8. External supply only (8111GN series):

(1) R24 => short ENSWREG to GND.

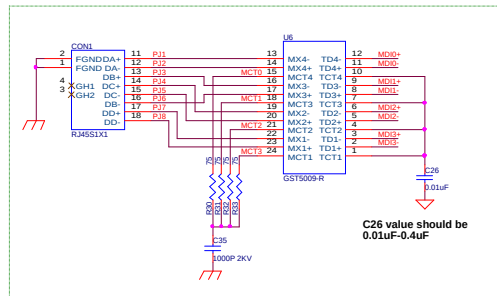
(3) R23/R1 => not necessary.

9. External supply only (8111EP):

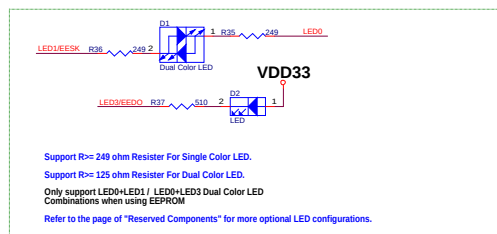
External 1.0V supply is Not permitted for RTL8111EP.

Realtek Semiconductor Corp.		
No. 2, Innovation Road II, Hsinchu Science Park, Hsinchu 300, Taiwan		
Title RTL8105E/8111E/8111F/8111EP/8111GN/8106EN Reference Schematic: Power		
Size A3	Document Number RTL8105E/8111E/8111F/8111EP/8111GN/8106EN Reference Schematic	Rev
Date: Tuesday, April 15, 2014	Sheet 2	of 7

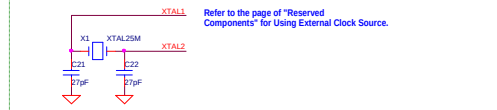
Connector



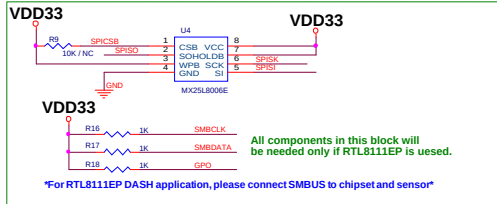
LED



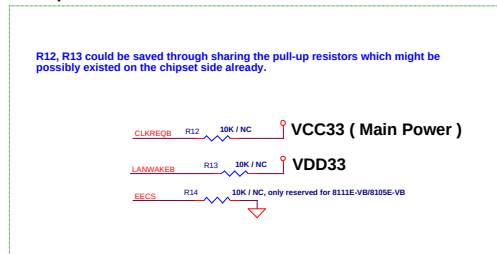
XTAL



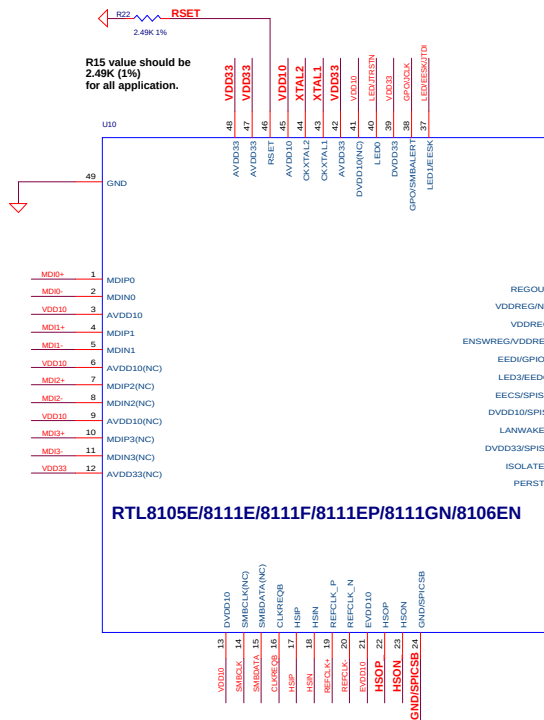
SPI Flash for RTL8111EP



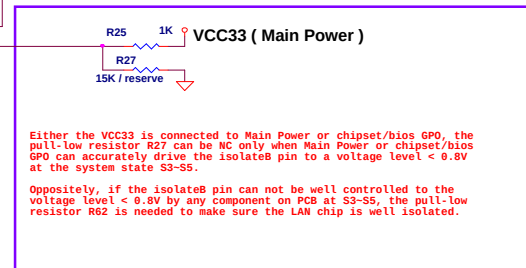
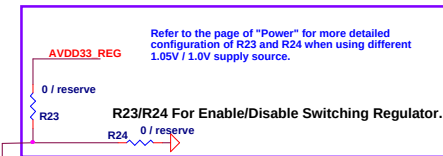
Pull-up resistors



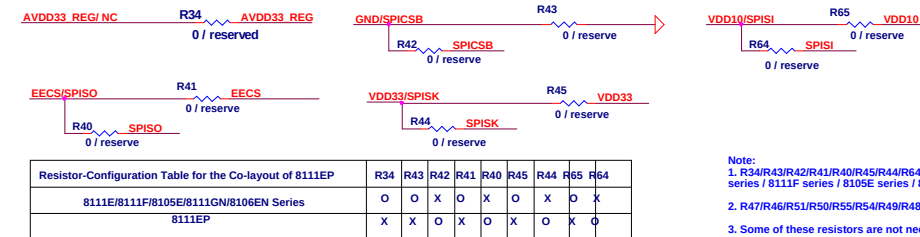
Controller



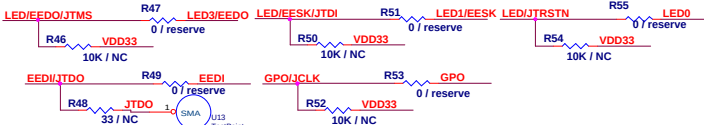
D



R40, R42, R44, R64 are for RTL8111EP. R34, R41, R43, R45, R65 are for RTL8105E/8111E/8111F/8111GN/8106EN.



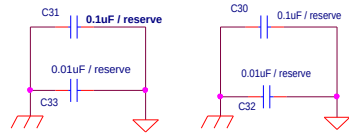
R46, R48, R50, R52, R54 are NC and for Realtek internal debug.



Note:

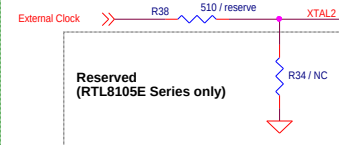
- R34/R43/R42/R41/R40/R45/R44/R64/R65 are reserved for the convenience of 8111EP colay with 8111E series / 8111F series / 8105E series / 8111GN series / 8106EN series.
- R47/R46/R51/R50/R55/R54/R49/R48/R53/R52 are reserved for the convenience of debug of 8111EP.
- Some of these resistors are not necessary if the convenience of co-layout on PCB or debug is not taken into consideration.
- For 8111E series / 8111F series / 8105E series / 8111GN series / 8106EN series
 - R34/R43/R42/R41/R40/R45/R44/R64/R65 are reserved for the convenience of 8111EP colay with 8111E series / 8111F series / 8105E series / 8111GN series / 8106EN series.
 - R47/R46/R51/R50/R55/R54/R49/R48/R53/R52 are reserved for the convenience of debug of 8111EP.
- For 8111EP
 - R42/R40/R44/R64 => Simply make it short on PCB to replace the 0-ohm resistors.
 - R34/R43/R41/R45/R65 are not necessary.
- Configurations of R46/R50/R54/R48/R52, please refer to Table "Resistor-Configuration Table for the debug of 8111EP"

Reserved for Noise Isolation



C30, C31, C32, C33 Reserved for Noise Isolation between Chassis GND and System GND (optional)

Reserved for Using External Clock Source

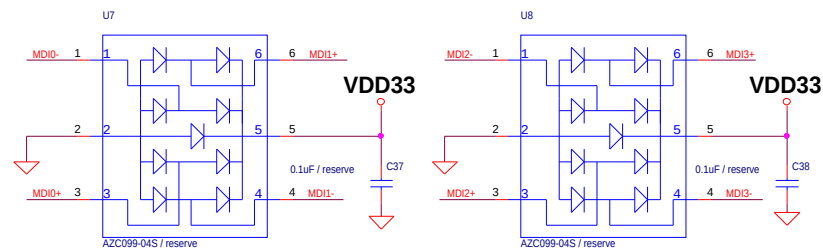


R34, R38 Reserved for Using External Clock Source (optional)

Pin44- XTAL2 is External Clock Input Pin.
Pin43- XTAL1 must be floating when using external clock source.

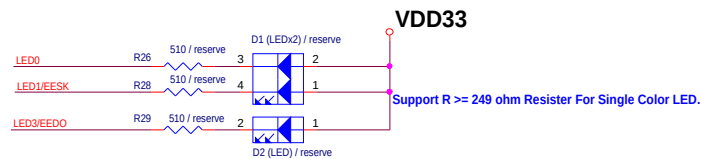
R38 is needed when using external clock source.

Reserved for TVS Components

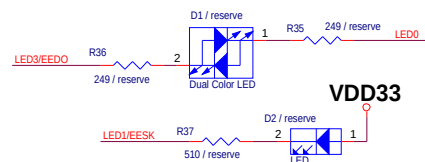


Note :
1. U7, U8 and C37, C38 reserved for line-to-line Surge and Cable ESD on the secondary side. (optional)
2. Gas Tube is for line-to-ground Surge on the primary side. (optional)

Optional LED Configurations



R26, R28, R29 and D1, D2 Reserved for only Single Color LED Configuration (optional)



Support R<= 249 ohm Resistor For Single Color LED.

Support R<= 125 ohm Resistor For Dual Color LED.

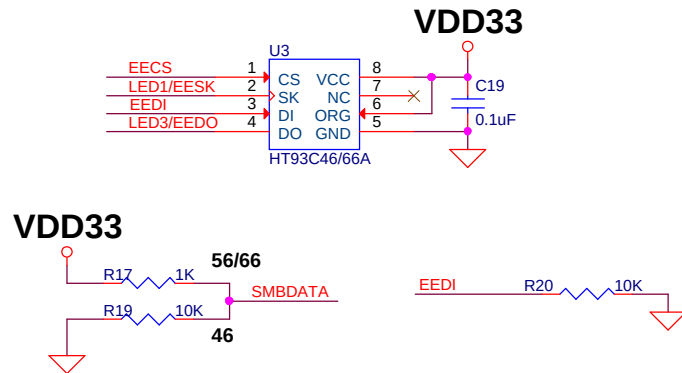
Only support LED0+LED1 / LED0+LED3 Dual Color LED Combinations when using EEPROM

R35, R36, R37 and D1, D2 Reserved for Single Color + Dual Color LED Configuration (optional)

Realtek Semiconductor Corp.		
No.2, Innovation Road II, Hsinchu Science Park, Hsinchu 300, Taiwan		
File		
RTL8105E/8111E/8111F/8111EP/8111GN/8106EN: Reserved Components		
Size	Document Number	Rev
A3	RTL8105E/8111E/8111F/8111EP/8111GN/8106EN Reference Schematic	
Date:	Tuesday, April 15, 2014	Sheet 4 of 7

For RTL8111E Series, RTL8111F Series and RTL8111GN Series with EEPROM / ASF Function (2 Options)

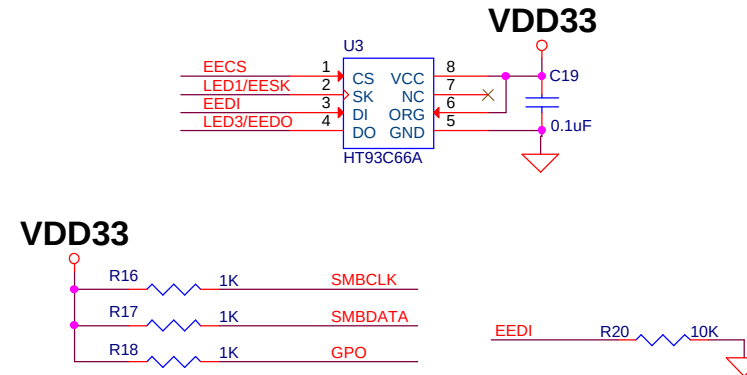
Using EEPROM without ASF function



1. All components in this block will be needed only if an EEPROM is used without ASF function.
Using R17 For 93C56/66
Using R19 For 93C46

Note: For RTL8111E-VL, RTL8111F Series and RTL8111GN Series, R17 must be 1K.

Using EEPROM(93C66) with ASF function

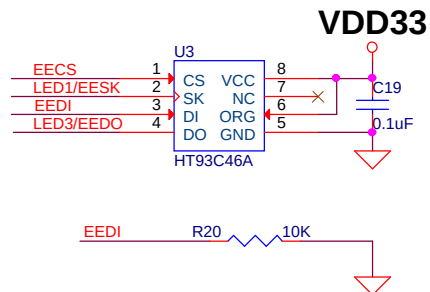


1. Only RTL8111E-VB/VC support ASF function
2. All components in this block will be needed only if an EEPROM of 93C66 is used with ASF function.

Note: This block is also for RTL8111E-VC using EEPROM_Less with ASF function.

For RTL8105E/8106EN Series EEPROM Function (1 Option)

Using EEPROM (93C46)



1. All components in this block will be needed only if an EEPROM of 93C46 is used.

Realtek Semiconductor Corp.		
No.2, Innovation Road II, Hsinchu Science Park, Hsinchu 300, Taiwan		
Title		
RTL8105E/8111E/8111F/8111EP/8111GN/8106EN Reference Schematic: Optional Function		
Size	Document Number	Rev
A4	RTL8105E/8111E/8111F/8111EP/8111GN/8106EN Reference Schematic	
Date:	Tuesday, April 15, 2014	Sheet 5 of 7

Item	Quantity	Reference	Part
1	1	CON1	RJ45S1X1
2	18	C1, Cout2, Cin2, C2, C3, C4, C5, C6, C7, C11, C12, C13, C14, C15, C16, C17, C34, C36	0.1uF
3	2	Cout1, Cin1	4.7uF X5R
4	1	C10	1uF
5	2	C21, C22	27pF
6	1	C26	0.01uF
7	1	C35	1000P 2KV
8	1	D1	Dual Color LED
9	1	D2	LED
10	1	LX	2.2uH/4.7uH
11	1	R15	2.49K 1%
12	1	R25	1K
13	4	R30, R31, R32, R33	75
14	2	R35, R36	249
15	1	R37	510
16	1	U5	RTL8105E/8111E/8111F/8111GN
17	1	U6	GST5009-R
18	1	X1	XTAL25M

Note:

1. This is an R-BOM example of RTL8111F series, which only the efuse is used without ASF function, and no circuit/component is reserved for the convinience of co-layout.
2. The R-BOM here is calculated with the SWR mode for 1.05V / 1.0V supply only, and no circuit reserved for selecting external-supply source.

Item	Quantity	Reference	Part
1	1	CON1	RJ45S1X1
2	18	C1, Cout2, Cin2, C2, C3, C4, C5, C6, C7, C11, C12, C13, C14, C15, C16, C17, C34, C36	0.1uF
3	2	Cout1, Cin1	4.7uF X5R
4	1	C10	1uF
5	2	C21, C22	27pF
6	1	C26	0.01uF
7	1	C35	1000P 2KV
8	1	D1	Dual Color LED
9	1	D2	LED
10	1	Lx	2.2uH/4.7uH
11	1	R15	2.49K 1%
12	1	R9	3.6K
13	1	R16, R17, R18, R25	1K
14	4	R30, R31, R32, R33	75
15	2	R35, R36	249
16	1	R37	510
17	4	R46, R50, R52, R54	10K / NC
18	5	R47, R49, R51, R53, R55	0
19	1	R48	33 / NC
20	1	U4	MX25L8006E
21	1	U5	RTL8105E/8111E/8111F/8111EP/8111GN
22	1	U6	GST5009-R
23	1	X1	XTAL25M

Note:

1. This is an R-BOM example of RTL8111EP normal operation, and no circuit/component is reserved for the convinience of co-layout.
2. The R-BOM here is calculated with the SWR mode for 1.05V / 1.0V supply only, and no circuit reserved for selecting external-supply source.

Realtek Semiconductor Corp.		
No.2, Innovation Road II, Hsinchu Science Park, Hsinchu 300, Taiwan		
Title		
RTL8105E/8111E/8111F/8111EP/8111GN/8106EN Reference Schematic: R-BOM		
Size	Document Number	Rev
	RTL8105E/8111E/8111F/8111EP/8111GN/8106EN Reference Schematic	
Date:	Tuesday, April 15, 2014	Sheet 6 of 7

Change Notice from 1.00 to 1.01

1. Modify the description for Lx inductor selection and External 1.0V/1.05V supply in "Power" page.
2. Remove R3 in "Power" page and modify 3.3V and 1.05V / 1.0V Power-Supply Configurations in "Power" page.
3. Modify the description for R27 in "Controller" page.
4. Update colay with 8111EP.

Change Notice from 1.01 to 1.02

1. Update colay with 8111GN Series
2. Update colay with 8106EN Series
3. Update notes for TVS Components on the sheet of Reserved Components (page 4).

Change Notice from 1.02 to 1.03

1. Change 2-pin REGOUT to 1-pin REGOUT and 1-pin NC for RTL8111EP on "CONTROLLER" page.
2. Modify notes for external 1.0V supply on "POWER" page.
3. Modify table and notes of "3.3V and 1.05V / 1.0V Power-Supply Configurations" on "POWER" page.
4. Add RTL8111EP on "Optional Function" page.
5. The connection point of CLKREQB change from VDD33 to VCC33.

Change Notice from 1.03 to 1.04

1. Remove R39 on "CONTROLLER" page.
2. Add note for RTL8111EP DASH application in the block "SPI Flash for RTL8111EP" on "CONTROLLER" page.

Change Notice from 1.04 to 1.05

1. Modify System State at ISOLATEB Pin Description. (Page 3)

Change Notice from 1.05 to 1.06

1. Modify Register Configuration
2. Add Test Point after JTDO

Realtek Semiconductor Corp.		
No.2, Innovation Road II, Hsinchu Science Park, Hsinchu 300, Taiwan		
Title RTL8105E/8111E/8111F/8111EP/8111GN/8106EN Reference Schematic: Change Notes		
Size	Document Number RTL8105E/8111E/8111F/8111EP/8111GN/8106EN Reference Schematic	Rev
Date:	Tuesday, April 15, 2014	Sheet 7 of 7