

ALC650 application circuit Version 11

(To keep away from confusing chip version and circuit version, circuit version is named by number.)

Comparison between ALC650/ ALC202/ALC201/ ALC101

	Built-In Amplifier
ALC650	Pin-35/36
ALC202A	Pin-35/36
ALC202	Pin-39/41
ALC201A	Pin-35/36
ALC201	Pin-39/41
ALC101	Pin-35/36

	ALC650	ALC202	ALC202A	ALC201	ALC201A	ALC101
Pin-35/36	Front-Out	Line-Out	AMP-Out	Line-Out	AMP-Out	AMP
Pin-39/41	Surr.-Out	AMP-Out	Line-Out	AMP-Out	Line-Out	None
Pin-43	Center-Out	GPIO0	GPIO0	Jack-Detect	Jack-Detect	X
Pin-44	LFE-Out	GPIO1	GPIO1	X	X	X
Pin-31 (C27)	1uf	1uf	1uf	1uf	1uf	X
Pin-32 (C29)	1uf	1uf	1uf	1uf	1uf	X
Pin-34	Front-MIC	X	X	X	X	X
Pin-39 (C44)	1uf	+100uf	1uf	+100uf	1uf	X
Pin-41 (C45)	1uf	+100uf	1uf	+100uf	1uf	X
Pin-45	GPIO0	ID0	X	ID0	ID0	X
Pin-46	XTLSEL	ID1, XTLSEL	XTLSEL	ID1	ID1	XTLSEL
Pin-47	SPDIFI (E version)	EAPD, JD	EAPD	EAPD	EAPD	EAPD
Pin-48	SPDIFO	SPDIFO	SPDIFO	SPDIFO	SPDIFO	X

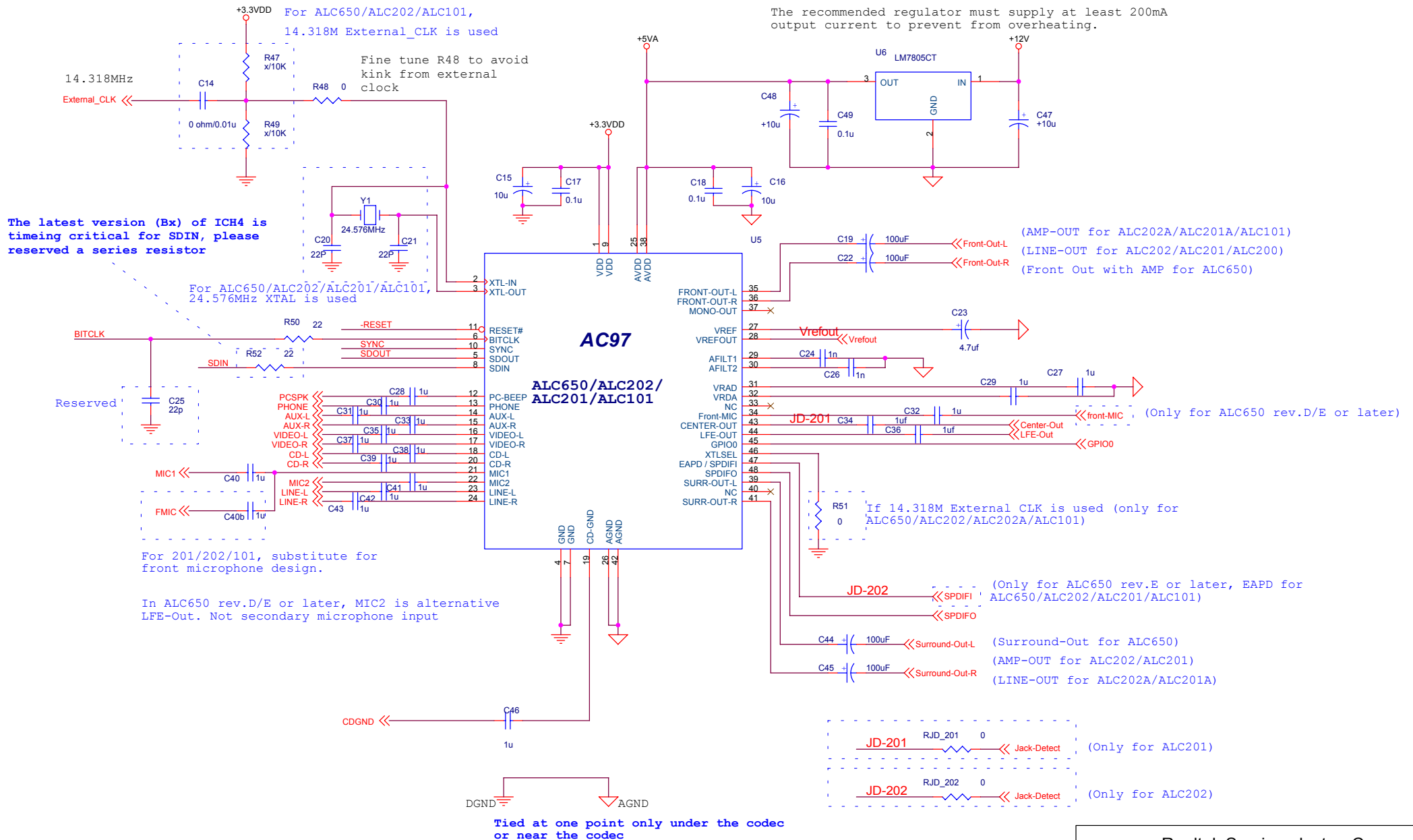
Revision History

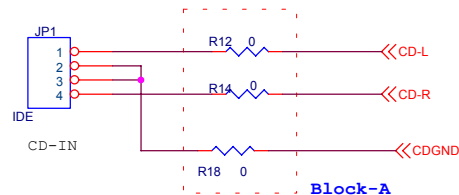
- version 07 (1) For ALC650 E version, Vrefout can be disabled in jack share mode, use Vrefout to bias microphone input. ("Analog_IO1.sch")
(2) Modify S/PDIF-In circuits to accommodate optical receiver and RCA input. (ALC650 E version)
- version 08 (1) Modify front panel MIC bias circuits in "Analog_IO2.SCH" and "ALC650_202_201_101.SCH"
(2) Improve GPIO control circuit for MIC bias voltage
(3) Suggest low cost S/PDIF optical fiber component
- version 09 (1) Delete demo circuit of TDA1308.
(2) Suggest a low cost external S/PDIF cable module in page 5
(3) Add a series resistor R52=22 ohm at SDIN in page 1
- version 10 (1) In '5_SPDIF_Cable.SCH', receiver TORX176/173 is instead of TORX178/179.
- version 11 (1) XTLSEL (pin-46) should be pulled low to digital GND if 14.318MHz external clock is the clock source .
(2) S/PDIF-IN bias resistor R7 is 100K for E version, 75K for F version (4_SPDIF_IO.SCH, 5_SPDIF_Cable.SCH)

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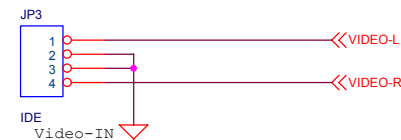
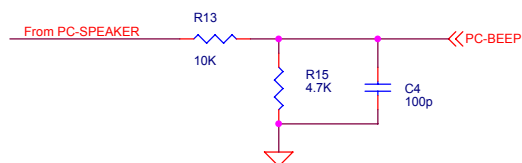
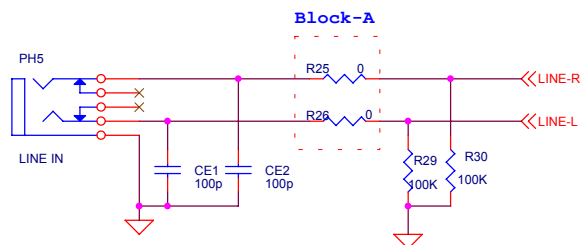
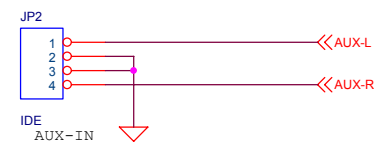
R47, R49 and C14 can bias external clock to acceptable level once the driving strength of external clock is weak.

The recommended regulator must supply at least 200mA output current to prevent from overheating.



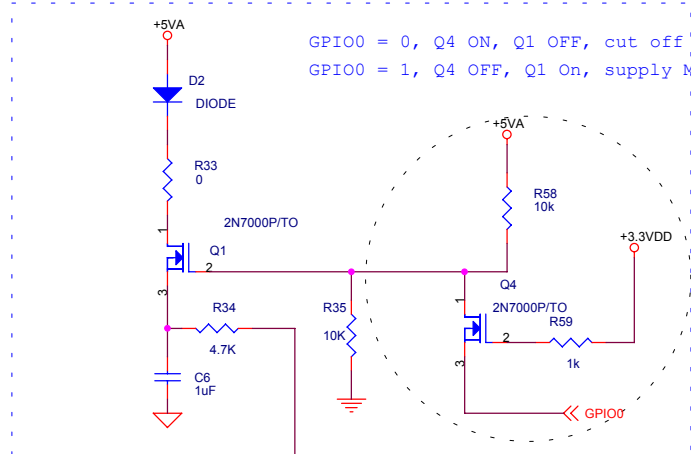


****Those resistors in Block-A are used to fine-tune performance, system designer had better keep those resistors.**

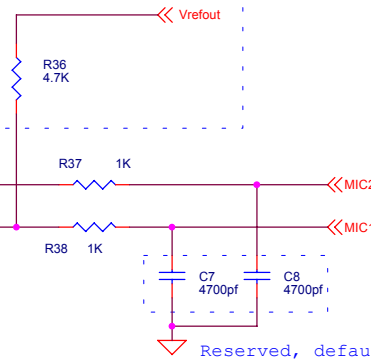


(Can be Surr-Out only for ALC650)

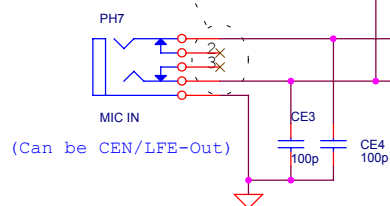
option 1: For ALC650 rev.D, select this bias circuit to share MIC-In and CEN/LFE-Out



option 2: For ALC650 rev.E/ALC201/ALC202/ALC101, select this bias circuit



If MIC-IN is designed to be shared with CEN/LFE-Out, keep 2/3 are floated

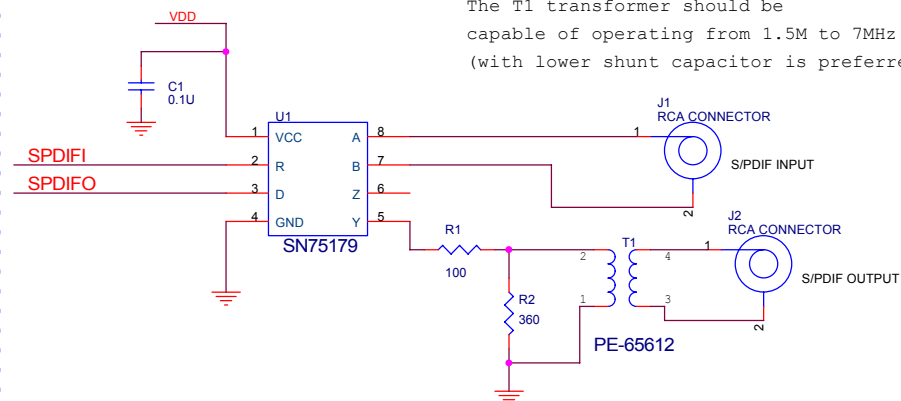


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Option (I): S/PDIF signal use RCA connector

+ Line Driver/ Receiver (is suitable for long transmission line)

The T1 transformer should be capable of operating from 1.5M to 7MHz (with lower shunt capacitor is preferred)



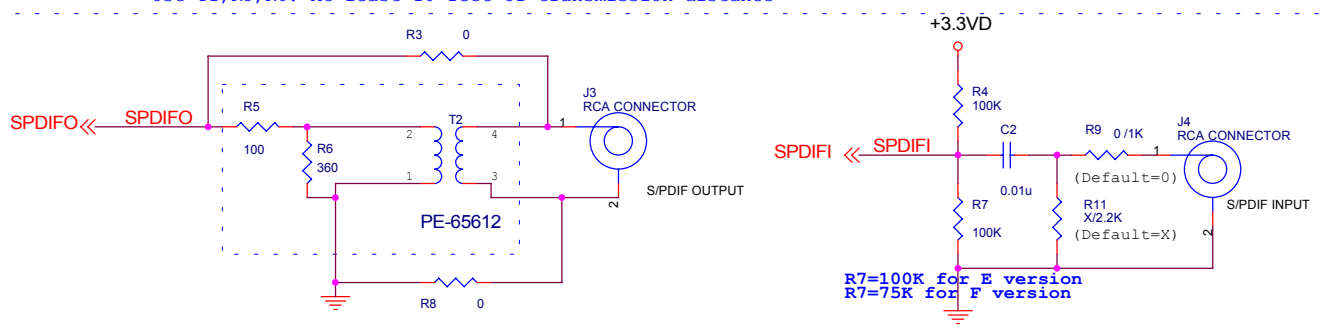
Note:

Option(I) /(II) /(III) are optional

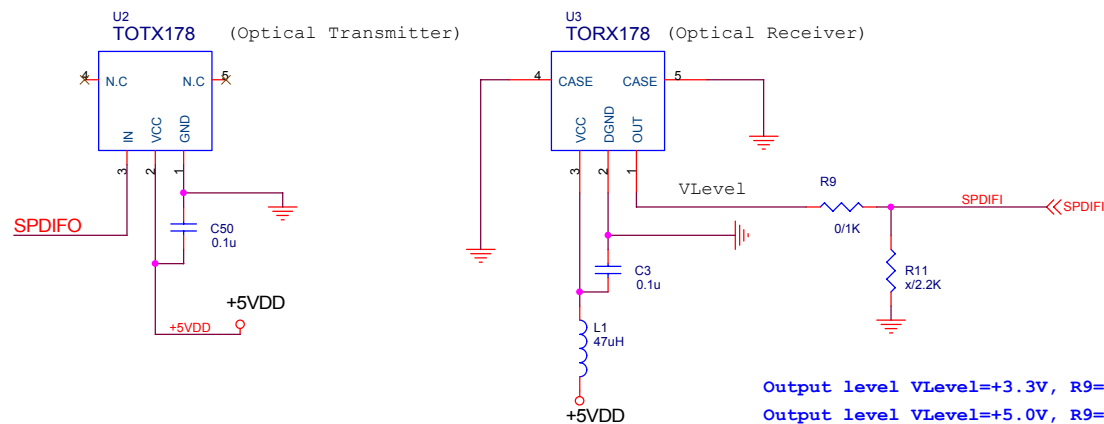
Option (III): Without Line Driver/ Receiver

Use R3 and R8: Guaranteed transmission distance <= 7 feet

Use T1,R5,R6: At least 10 feet of transmission distance



Option (II): S/PDIF signal use fiber optic transmitter and receiver module



S/PDIF Output: ALC650, ALC202, ALC201

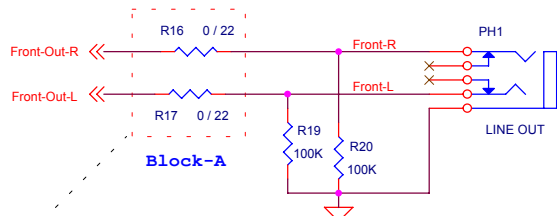
S/PDIF Input: ALC650 rev.E or later only

Output level VLevel=+3.3V, R9=0 ohm, R11=removed
Output level VLevel=+5.0V, R9=1k ohm, and R11=2k ohm should be mounted

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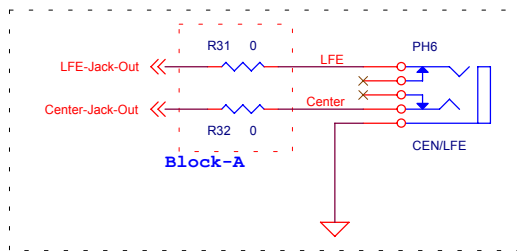
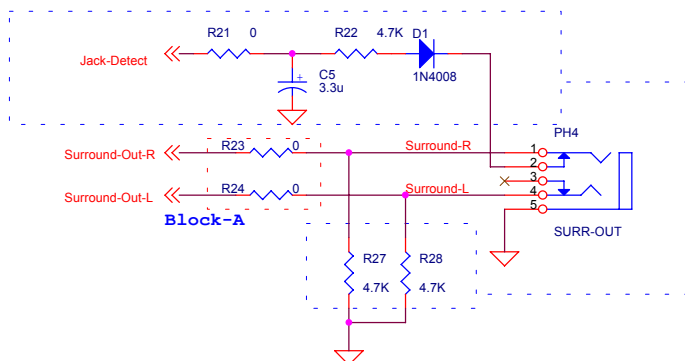
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(R16, R17 not mounted if front panel header mounted)



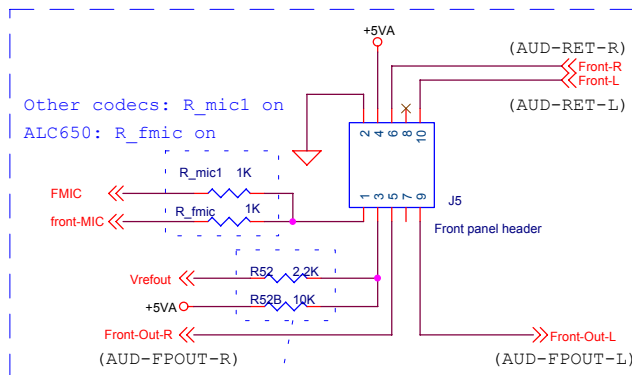
If AVDD is supplied by 78L05 has only 100mA current, change R16 and R17 to 20ohm to limit current consumption.

(For ALC201/ALC202 if Jack-Detect function want to be enabled)
 Jack-Detect = Low: HP was not plugged-in.
 Jack-Detect = High: HP was plugged-in.



(Only for ALC650)

Block-A: to fine tune performance, system designer had better keep those resistors.

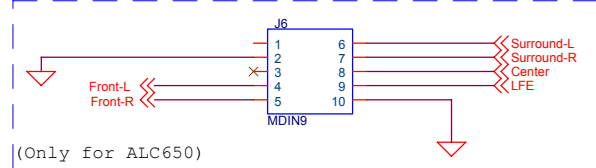


R52: ALC650 rev.D/ALC202/ALC201/ALC101
 R52B: ALC650 rev.E

Block-B

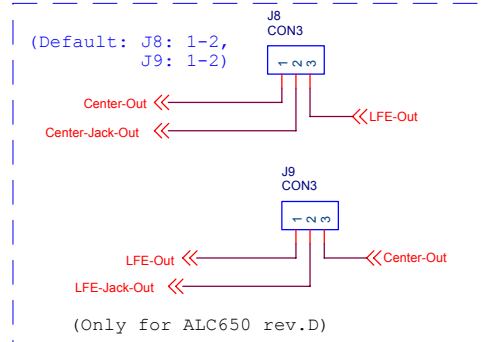
(Option: for front panel header)

Block-C (6 channel analog output in Mini Din connector)



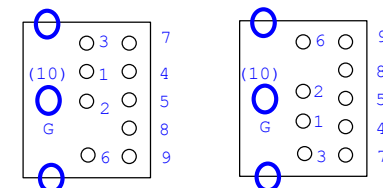
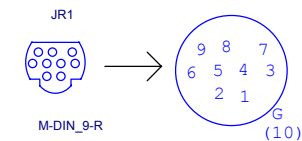
(Only for ALC650)

Block-D (For different definition about LFE and Center)



(Only for ALC650 rev.D)

MDIN9



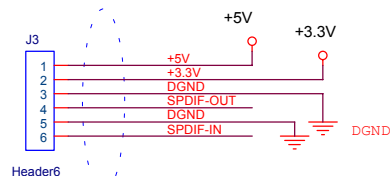
"Bottom View"

"Top View"

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Analog Output and Front panel circuits		1.0	
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*The S/PDIF cable module should be confirmed by Realtek.



28AWG copper line

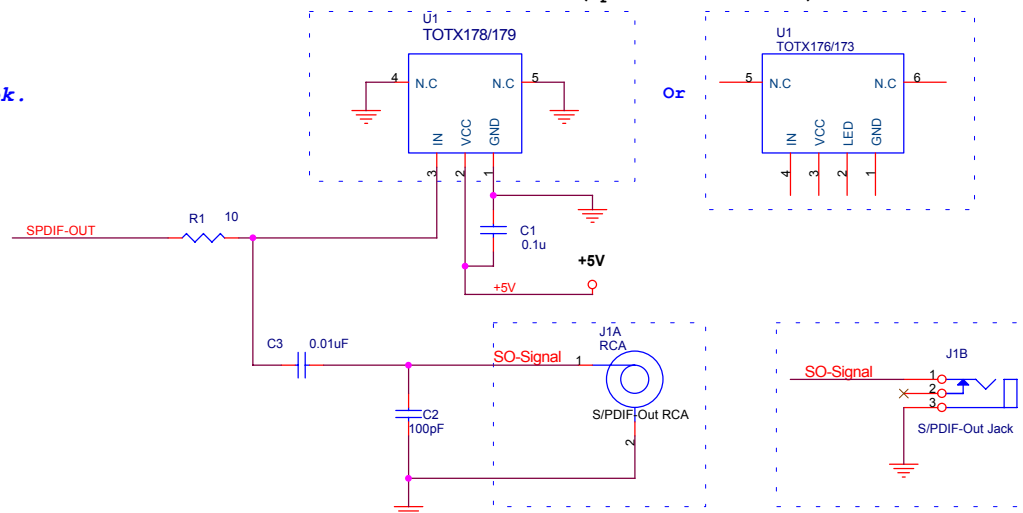
Recommended maximum length is less than 6 inches

74HC04 is used to improve sensitivity for S/PDIF-In signal, it can be removed and R10=0 if only optical receiver is used.

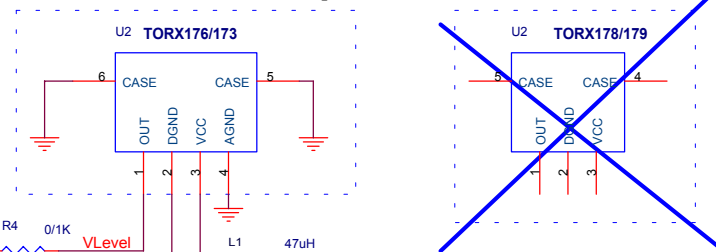
Be aware of that ALC650 E and later version only support one pin of S/PDIF-In input, so the operation between optical receiver and RCA connector is exclusive.

It means that optical receiver and RCA connector can not input signal at the same time.

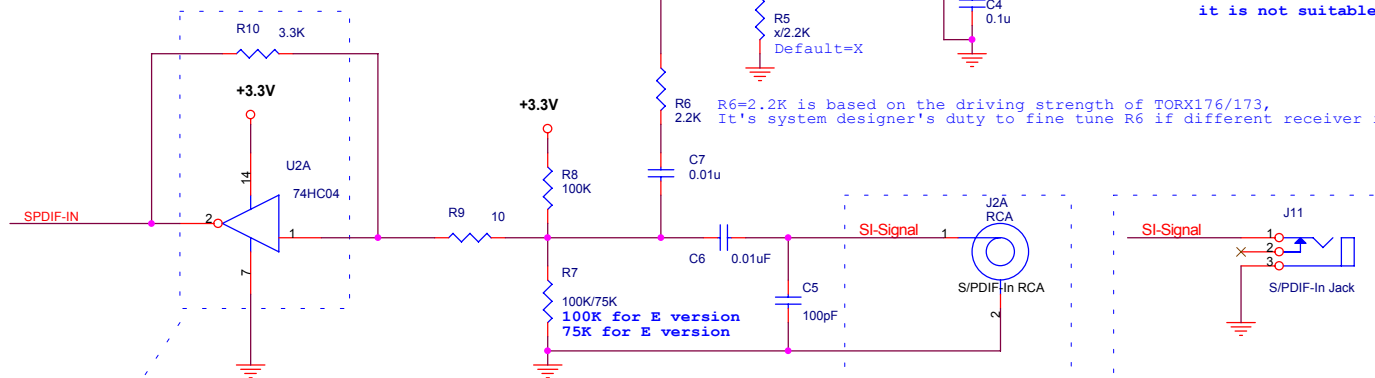
(Optical Transmitter)



(Optical Receiver)



No Automatic Threshold Control to stabilize output, it is not suitable for connecting to RCA signal



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