

# **KORG**

## **Analogue Bass Machine**

### **volca bass**

#### **(volca-bass)**

# **SERVICE MANUAL**



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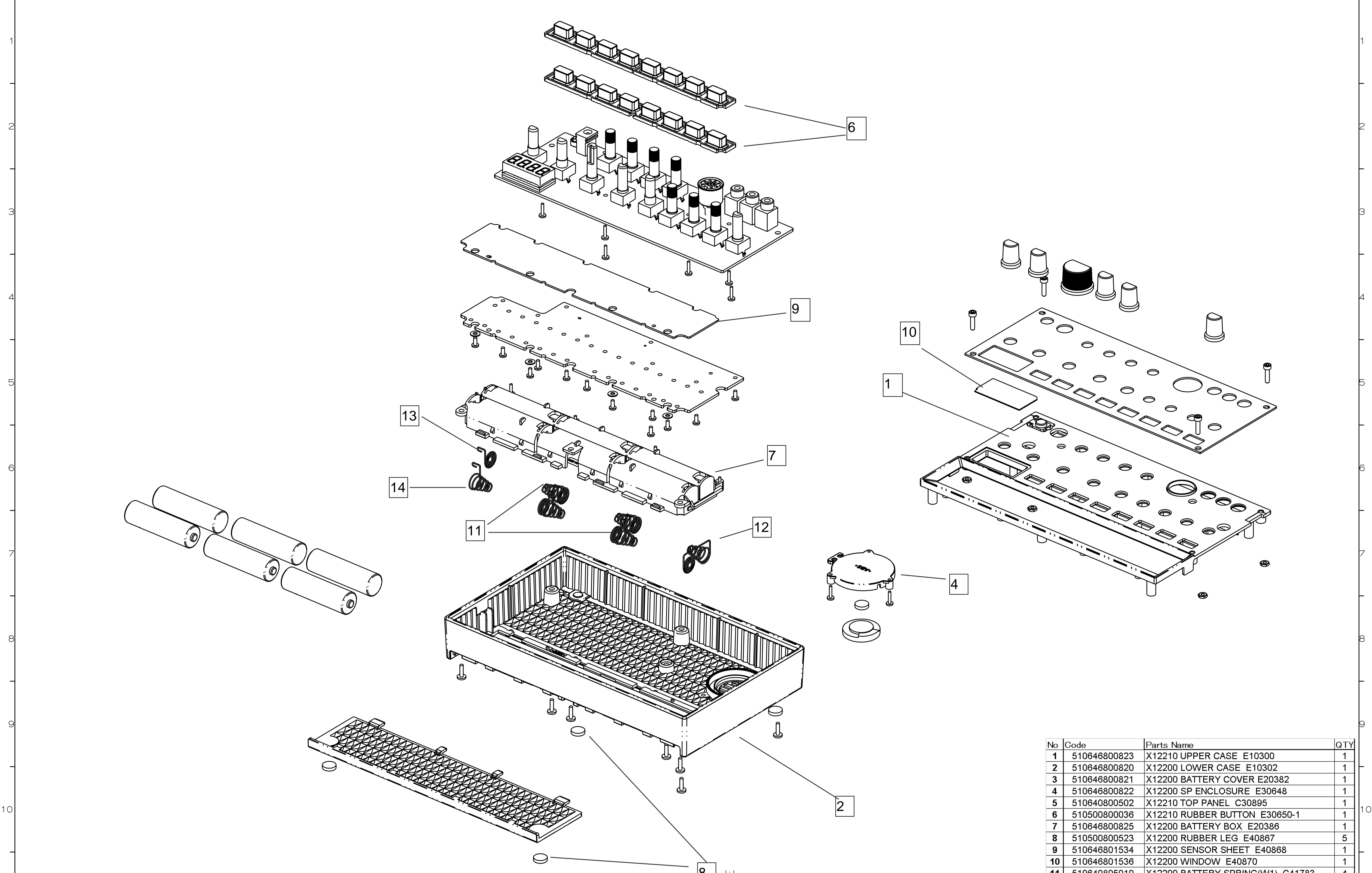
**PARTS LIST: 23**

# **KORG**

**Issued: Sep. 23, 2013**

**Ver. 1.0**

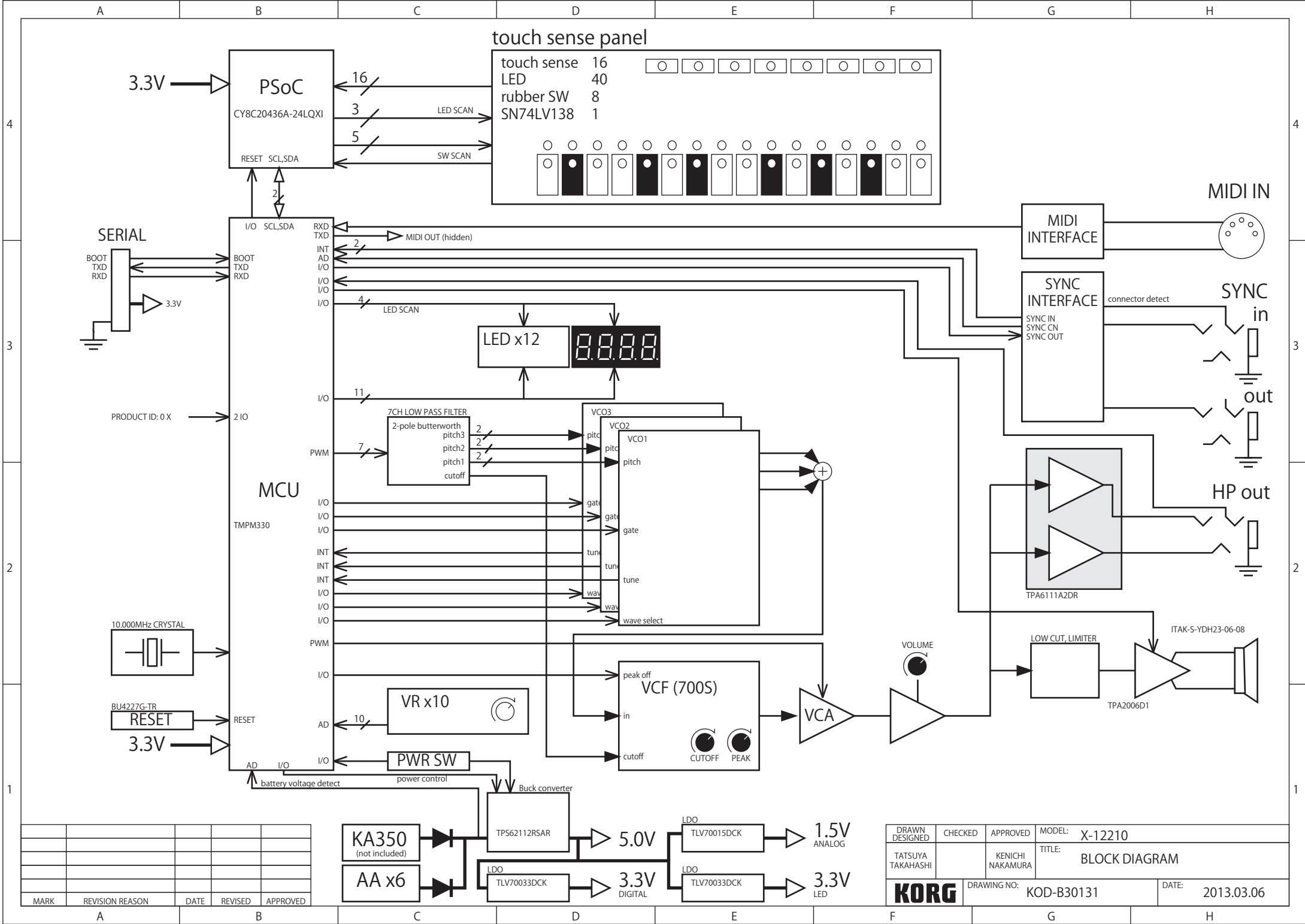
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No	Code	Parts Name	QTY
1	510646800823	X12210 UPPER CASE E10300	1
2	510646800820	X12200 LOWER CASE E10302	1
3	510646800821	X12200 BATTERY COVER E20382	1
4	510646800822	X12200 SP ENCLOSURE E30648	1
5	510640800502	X12210 TOP PANEL C30895	1
6	510500800036	X12210 RUBBER BUTTON E30650-1	1
7	510646800825	X12200 BATTERY BOX E20386	1
8	510500800523	X12200 RUBBER LEG E40867	5
9	510646801534	X12200 SENSOR SHEET E40868	1
10	510646801536	X12200 WINDOW E40870	1
11	510640805010	X12200 BATTERY SPRING(W1) C41783	4
12	510640805011	X12200 BATTERY SPRING(W2) C41784	1
13	510640805012	X12200 BATTERY SPRING(+) C41785	1
14	510640805013	X12200 BATTERY SPRING(-) C41786	1
15	510646502392	X-1200/10 VR-KNOB-L(V) KOC-E30313	1
16	510646502393	X-1200/10 VR-KNOB-S(V) KOC-E30312	5

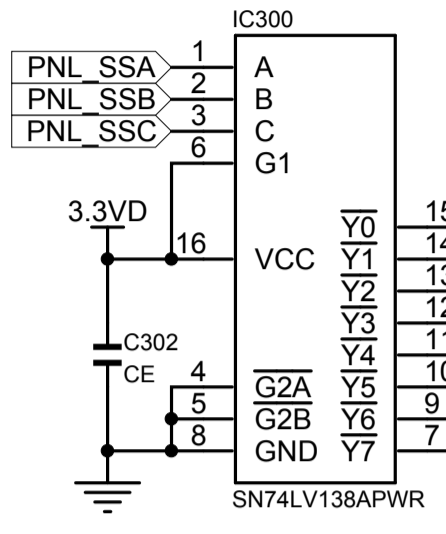
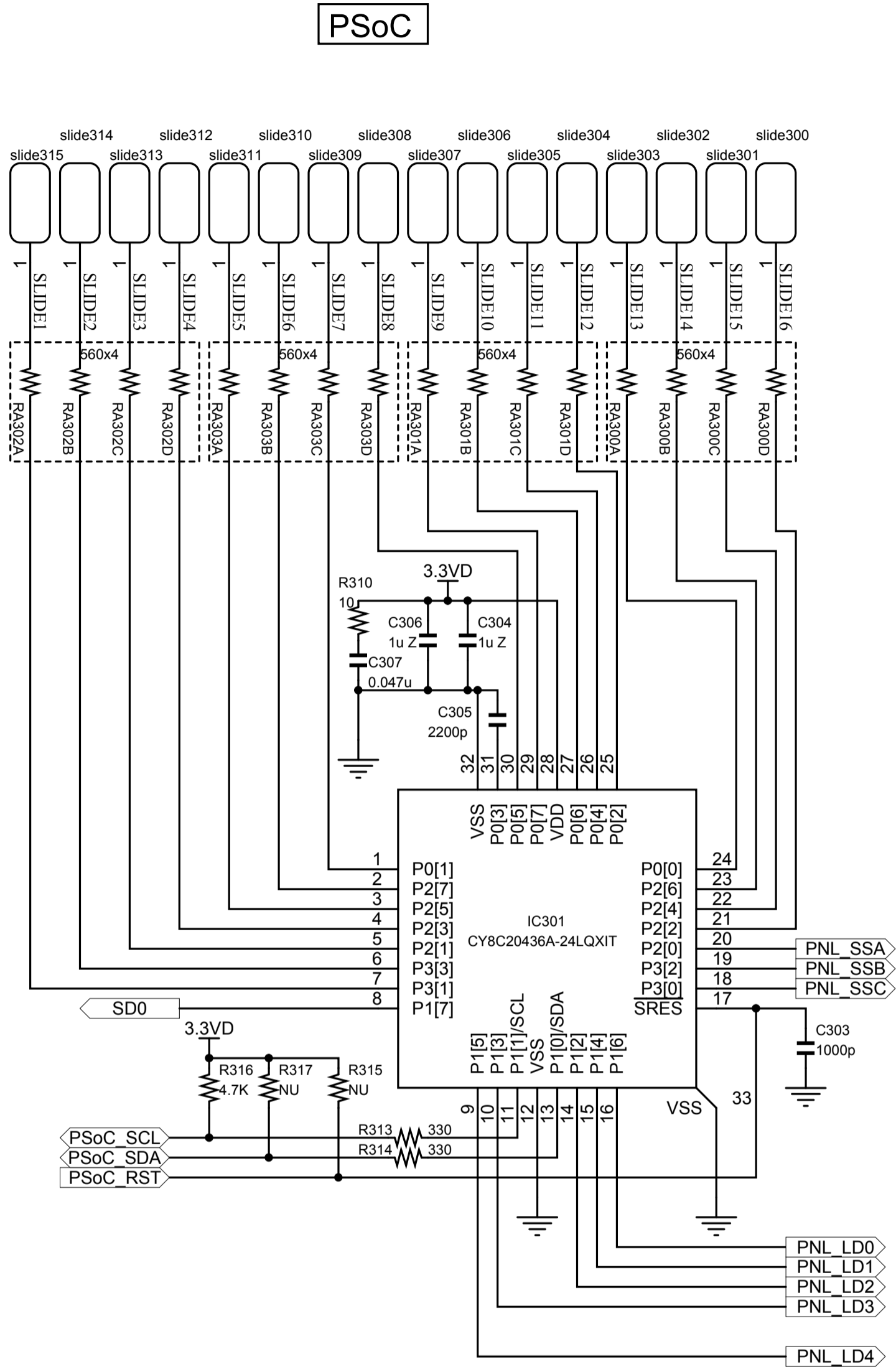
COMMERCIAL TOLERANCE

REVISION MARK	REVISION REASON	REVISION DATE	REVISION BY	APPROVED
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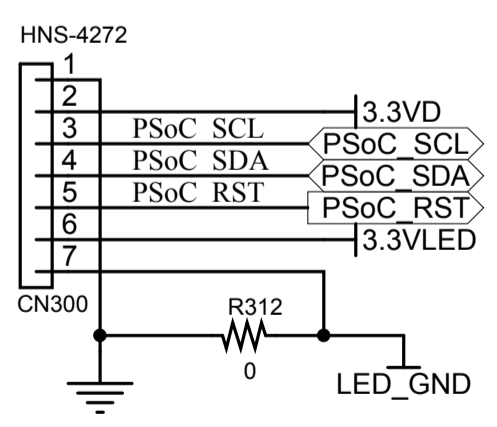
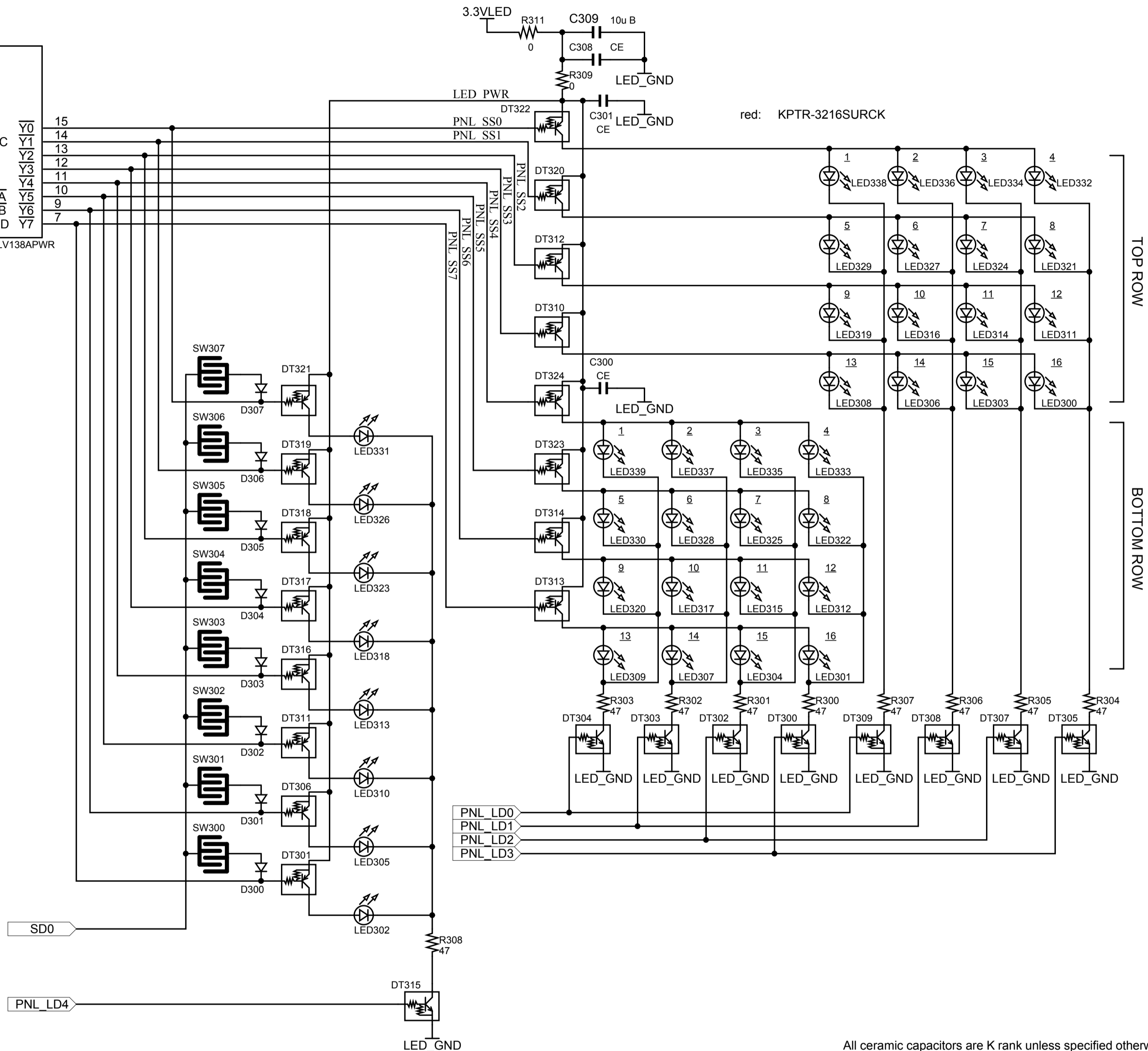


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DRAWN DESIGNED	CHECKED	APPROVED	MODEL: X-12210
TATSUYA TAKAHASHI		KENICHI NAKAMURA	TITLE: BLOCK DIAGRAM
<b>KORG</b> DRAWING NO: KOD-B30131			DATE: 2013.03.06



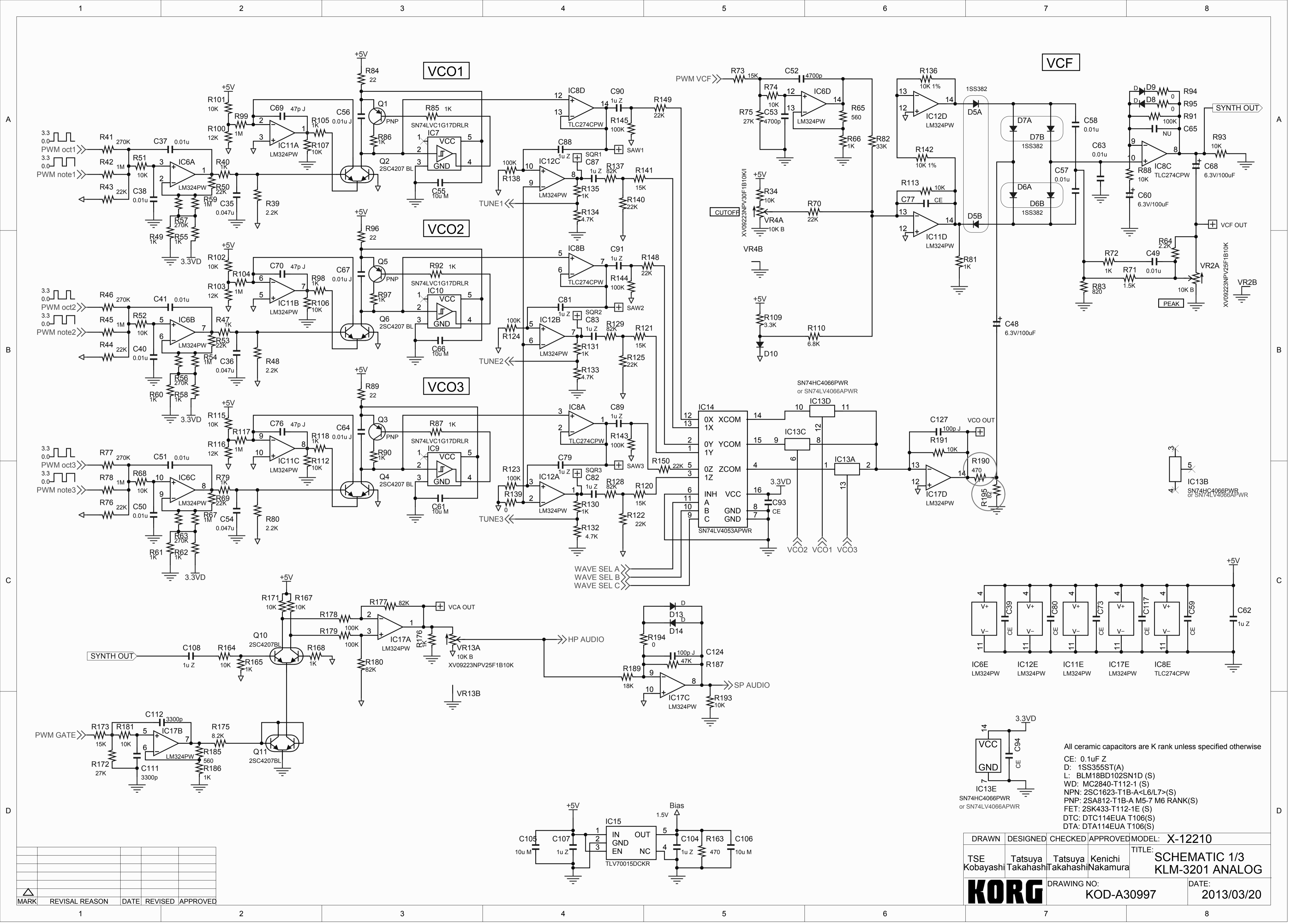
**LED MATRIX**



All ceramic capacitors are K rank unless specified otherwise  
 CE: 0.1uF Z  
 D: 1SS355ST(A)  
 L: BLM18BD102SN1D (S)  
 WD: MC2840-T112-1 (S)  
 NPN: 2SC1623-T1B-A<L6/L7>(S)  
 PNP: 2SA812-T1B-A M5-7 M6 RANK(S)  
 FET: 2SK433-T112-1E (S)  
 DTC: DTC114EUA T106 (S)  
 DTA: DTA114EUA T106(S)

MARK	REVISION REASON	DATE	REVISED	APPROVED

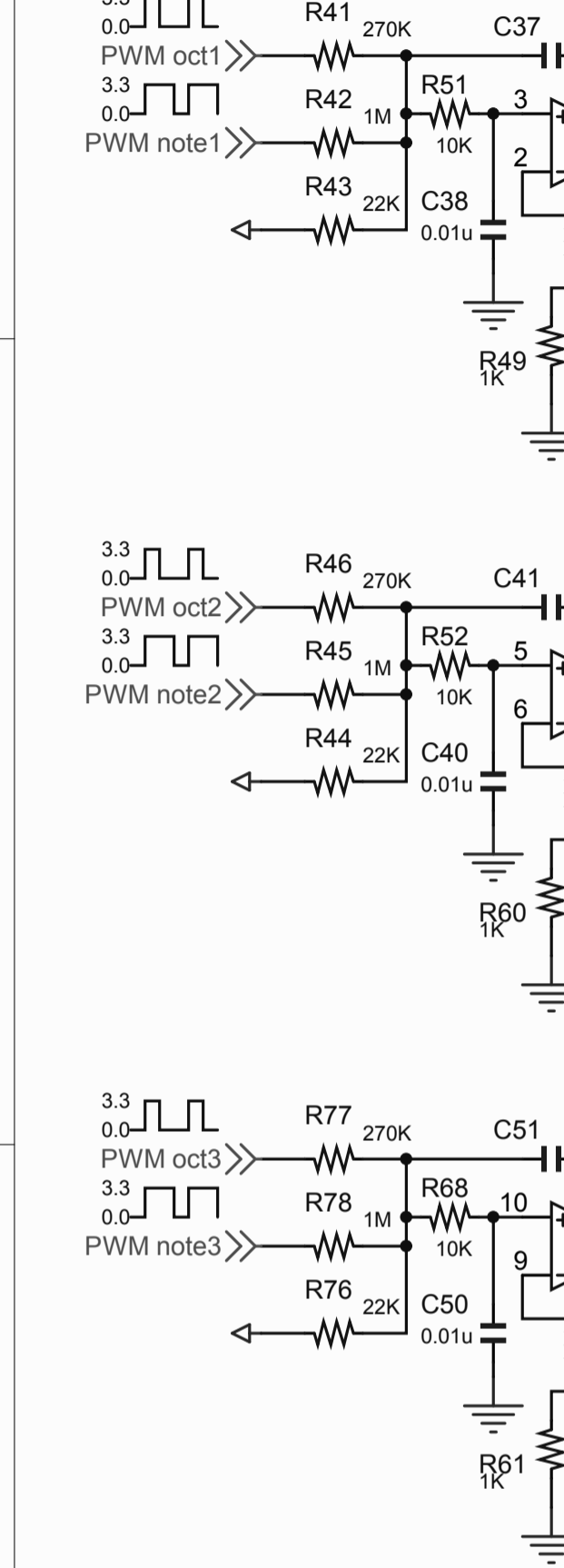
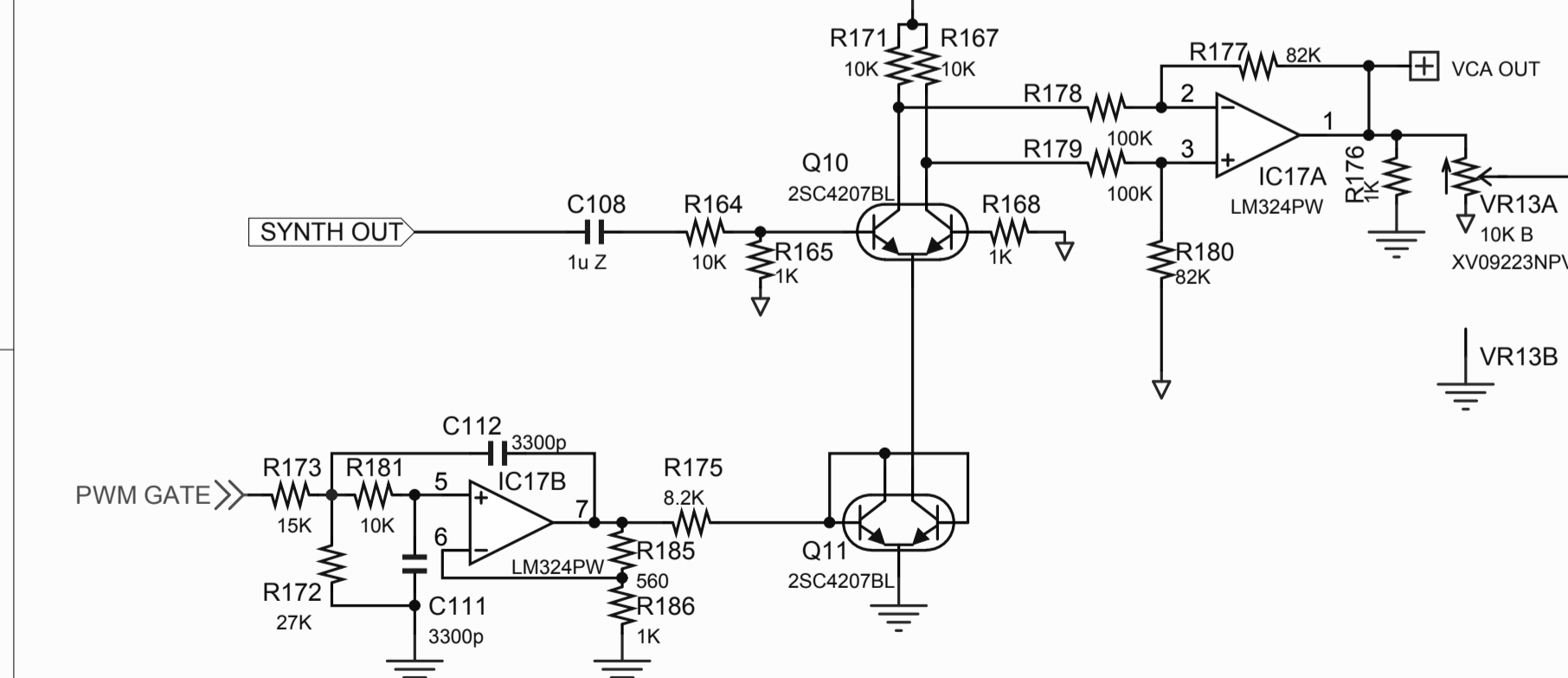
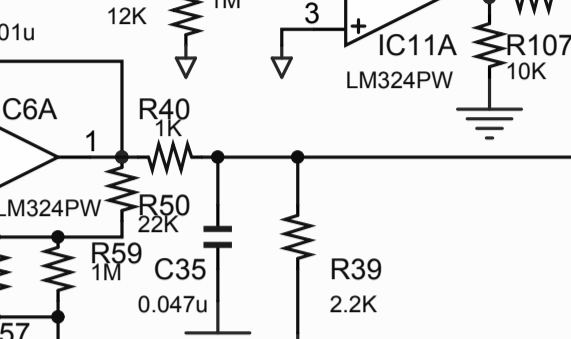
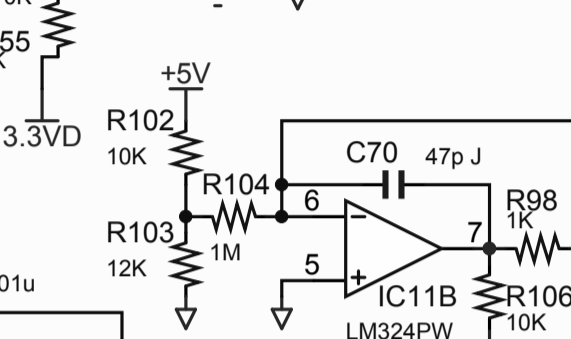
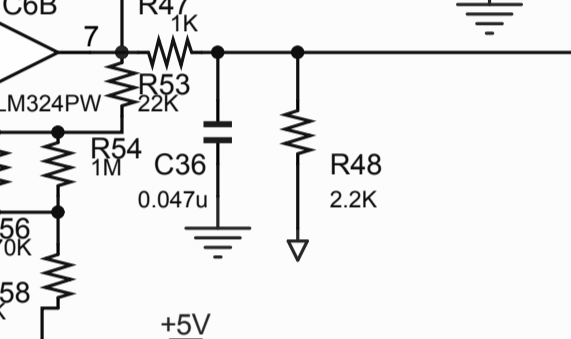
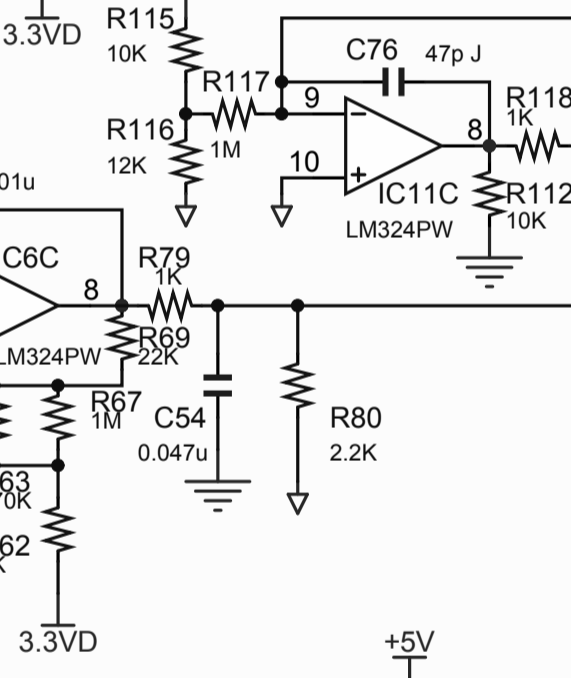
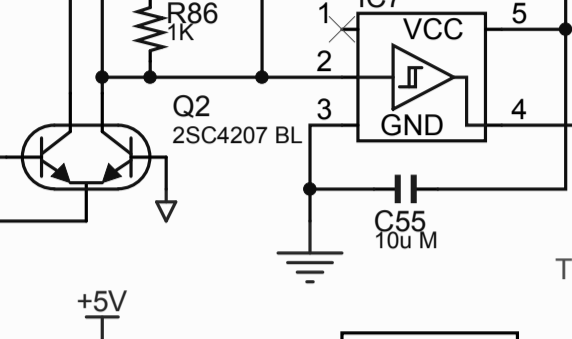
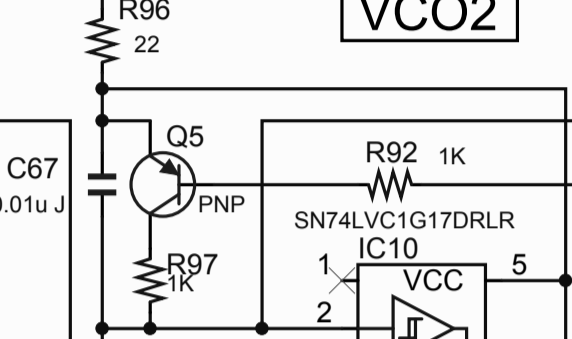
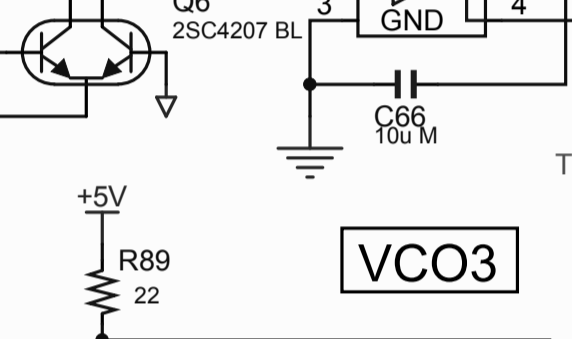
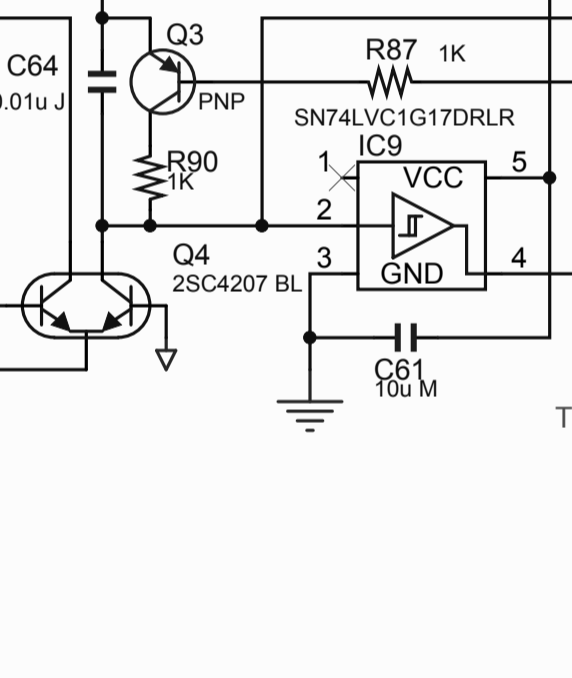
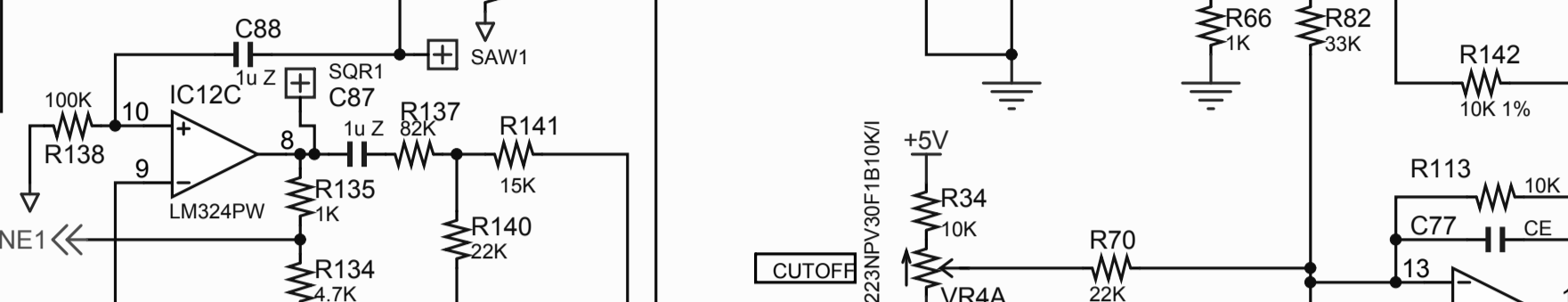
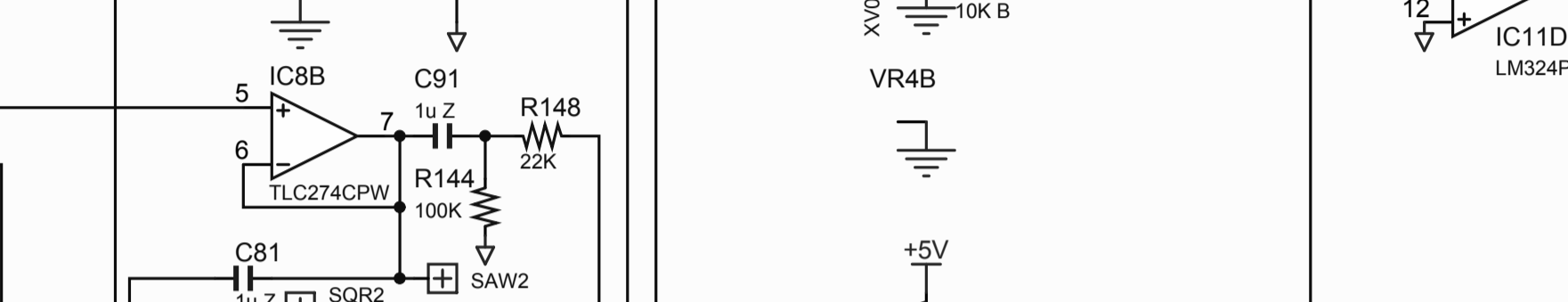
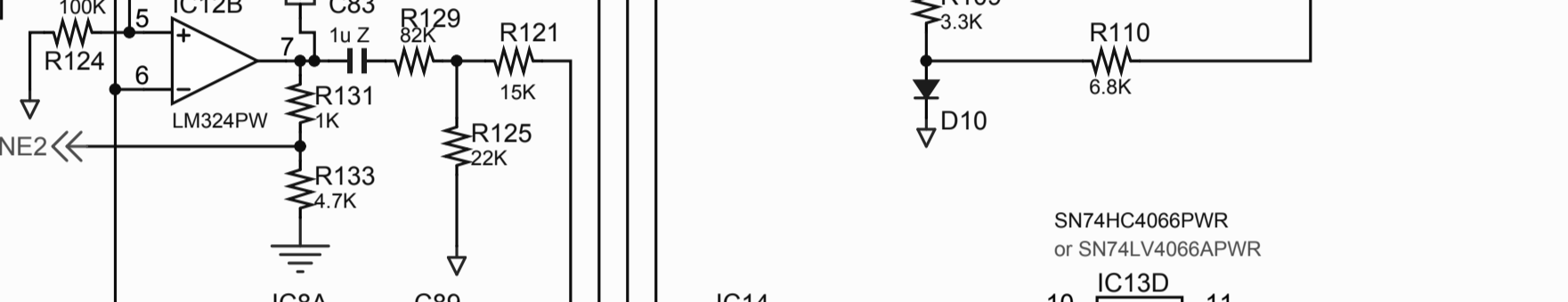
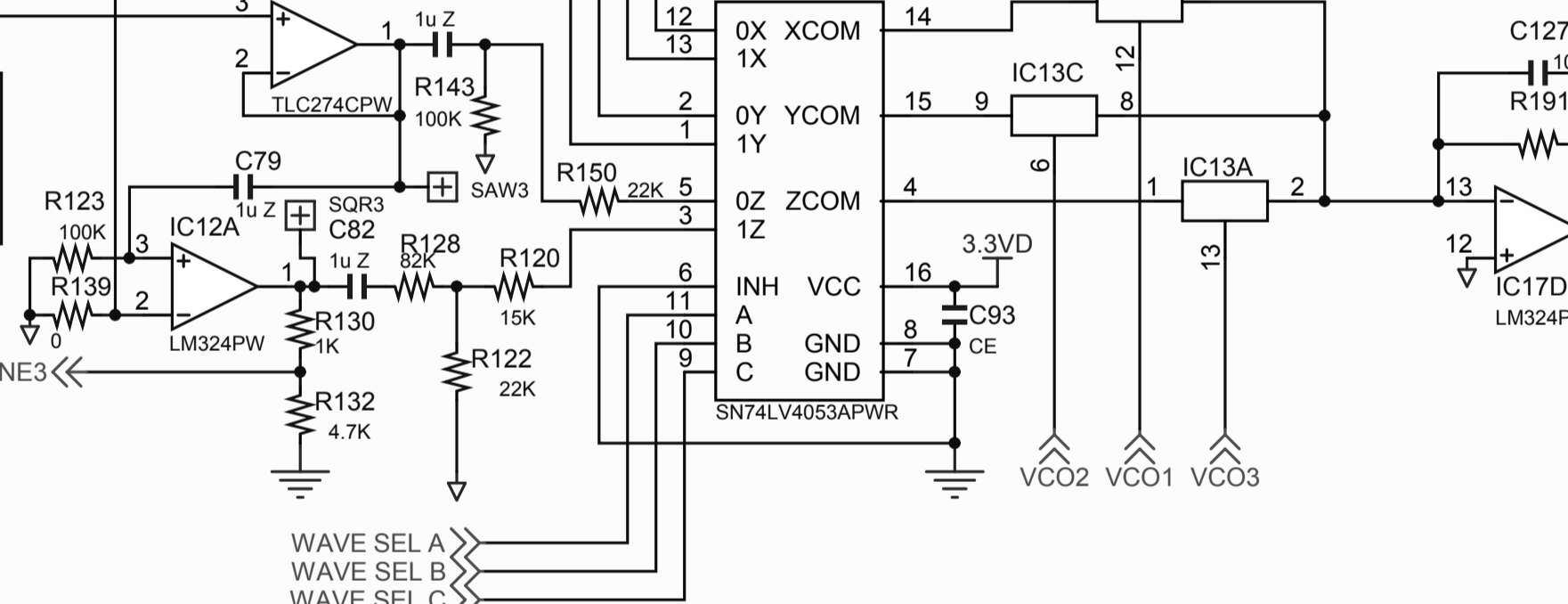
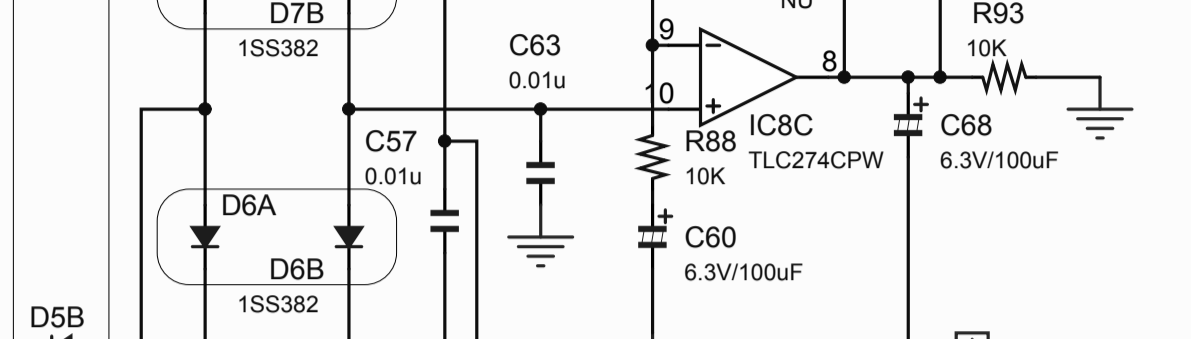
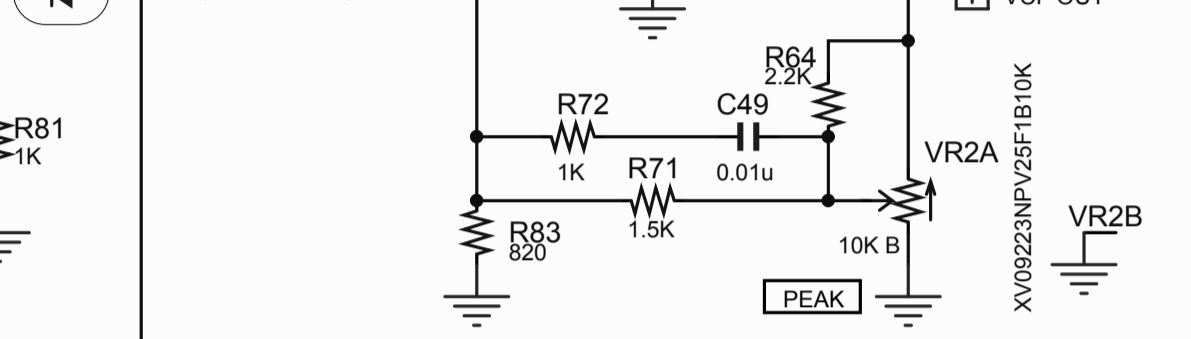
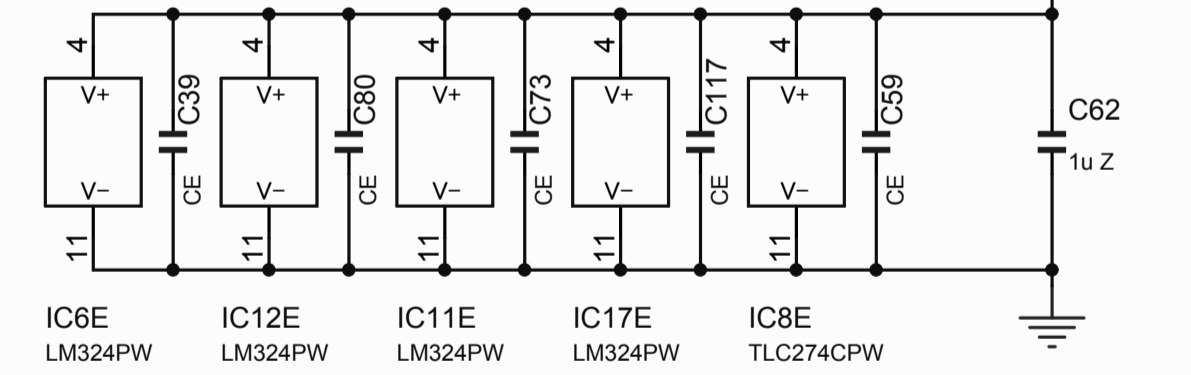
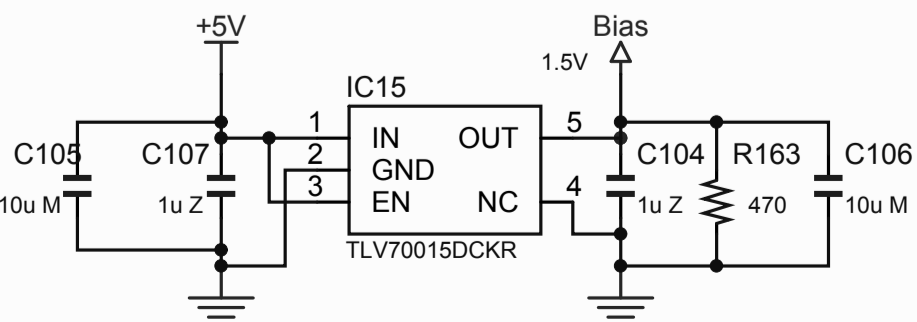
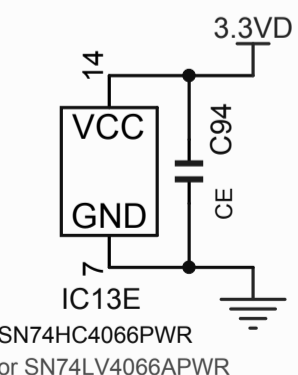
DRAWN	DESIGNED	CHECKED	APPROVED	MODEL: X-12210
TSE Kobayashi	Tatsuya Takahashi	Tatsuya Takahashi	Kenichi Nakamura	TITLE: PANEL SCHEMATIC 1/1 KLM-3200
<b>KORG</b>				DRAWING NO: KOD-A30996
				DATE: 2013/03/20



MARK	REVISION	REASON	DATE	REVISED	APPROVED

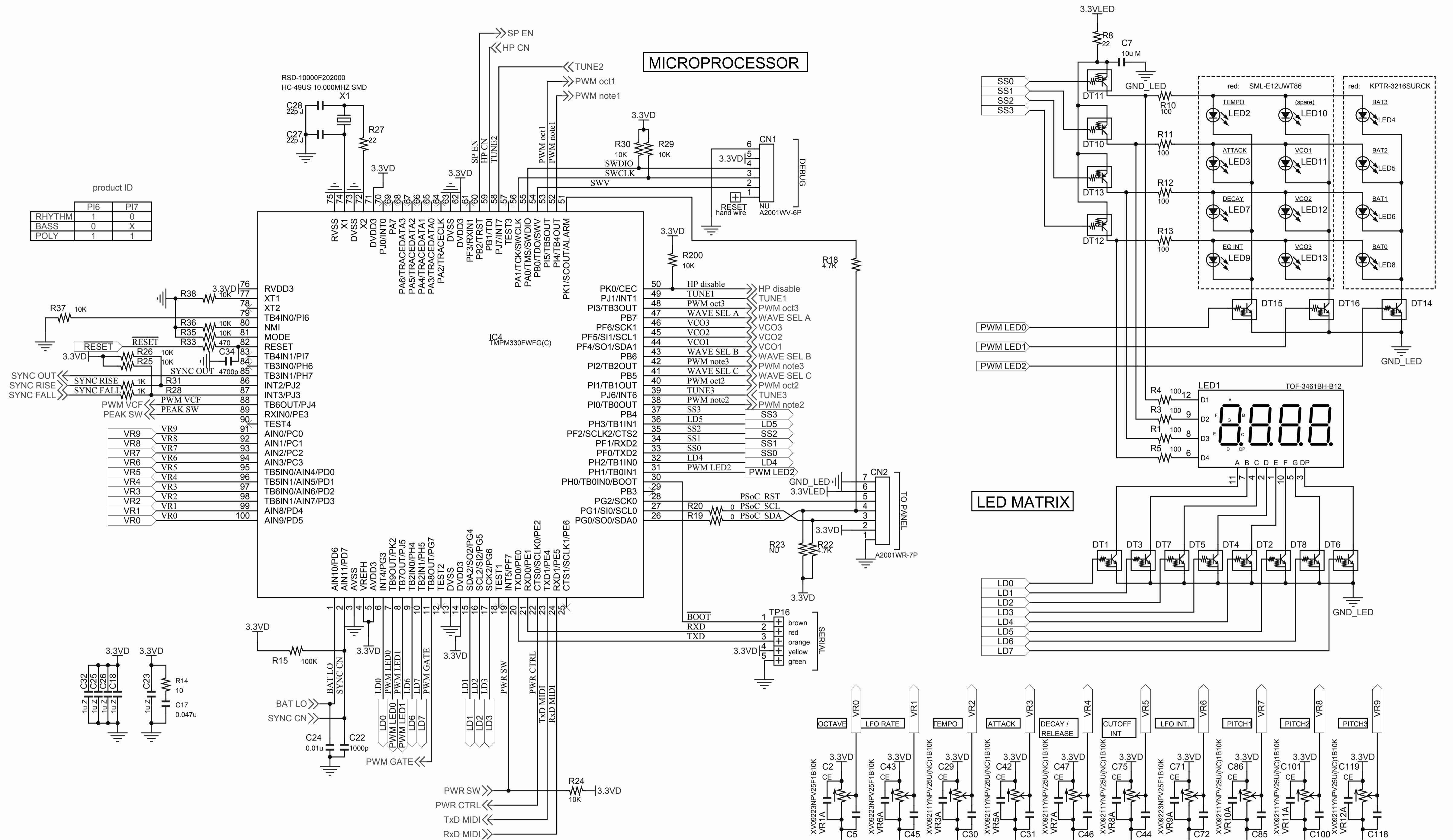
DRAWN	DESIGNED	CHECKED	APPROVED	MODEL: X-12210
TSE Kobayashi	Tatsuya Takahashi	Tatsuya Takahashi	Kenichi Nakamura	TITLE: SCHEMATIC 1/3 KLM-3201 ANALOG
DRAWING NO: KOD-A30997			DATE: 2013/03/20	

All ceramic capacitors are K rank unless specified otherwise  
 CE: 0.1uF Z  
 D: 1SS355ST(A)  
 L: BLM18BD102SN1D (S)  
 WD: MC2840-T112-1 (S)  
 PN: 2SC1623-T1B-A<L6/L7>(S)  
 FET: 2SK433-T112-1E (S)  
 DTC: DTC114EUA T106(S)  
 DTA: DTA114EUA T106(S)



product ID

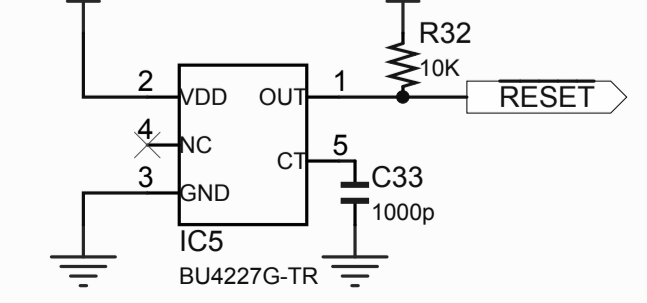
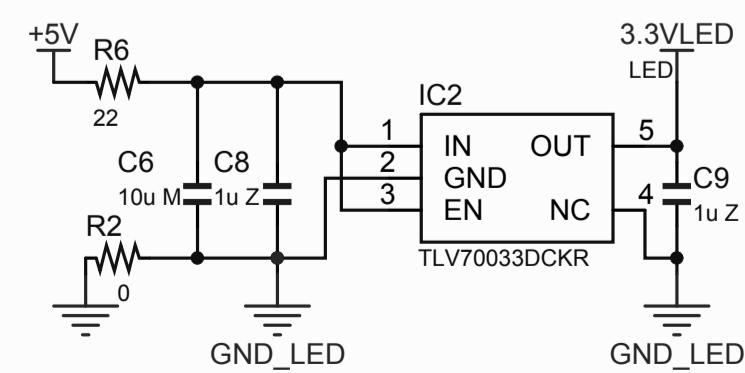
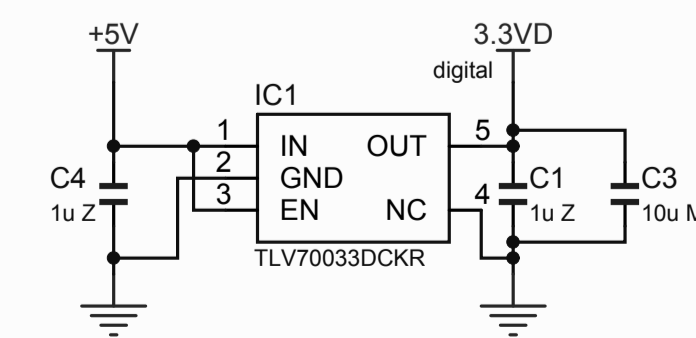
	PI6	PI7
RHYTHM	1	0
BASS	0	X
POLY	1	1



All ceramic capacitors are K rank unless specified otherwise

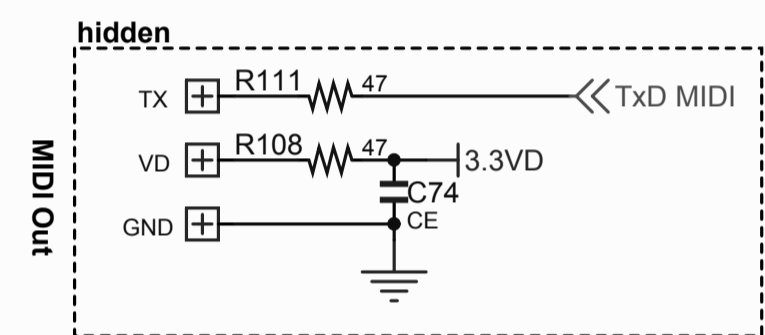
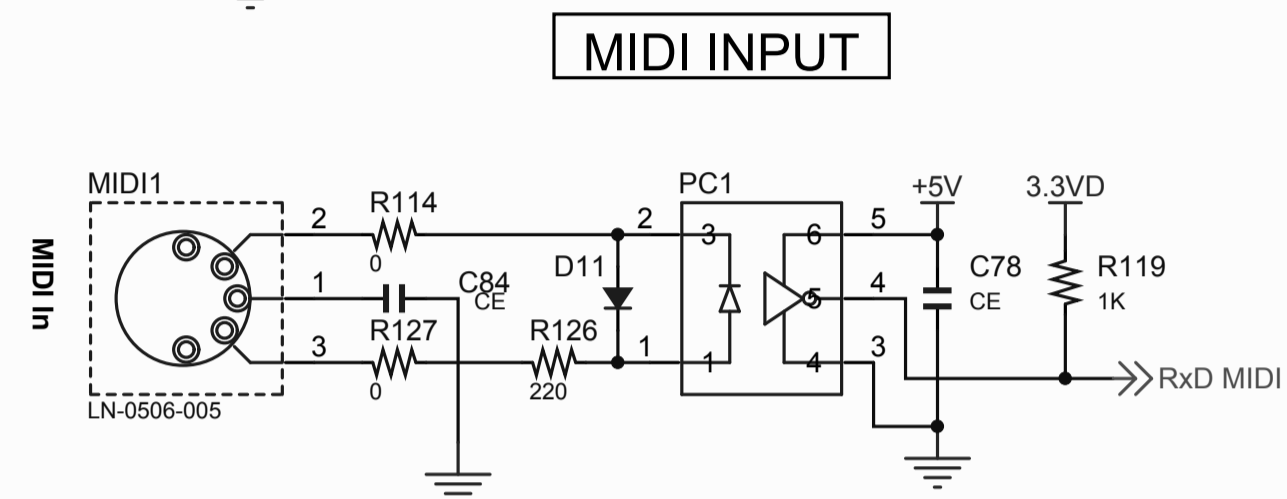
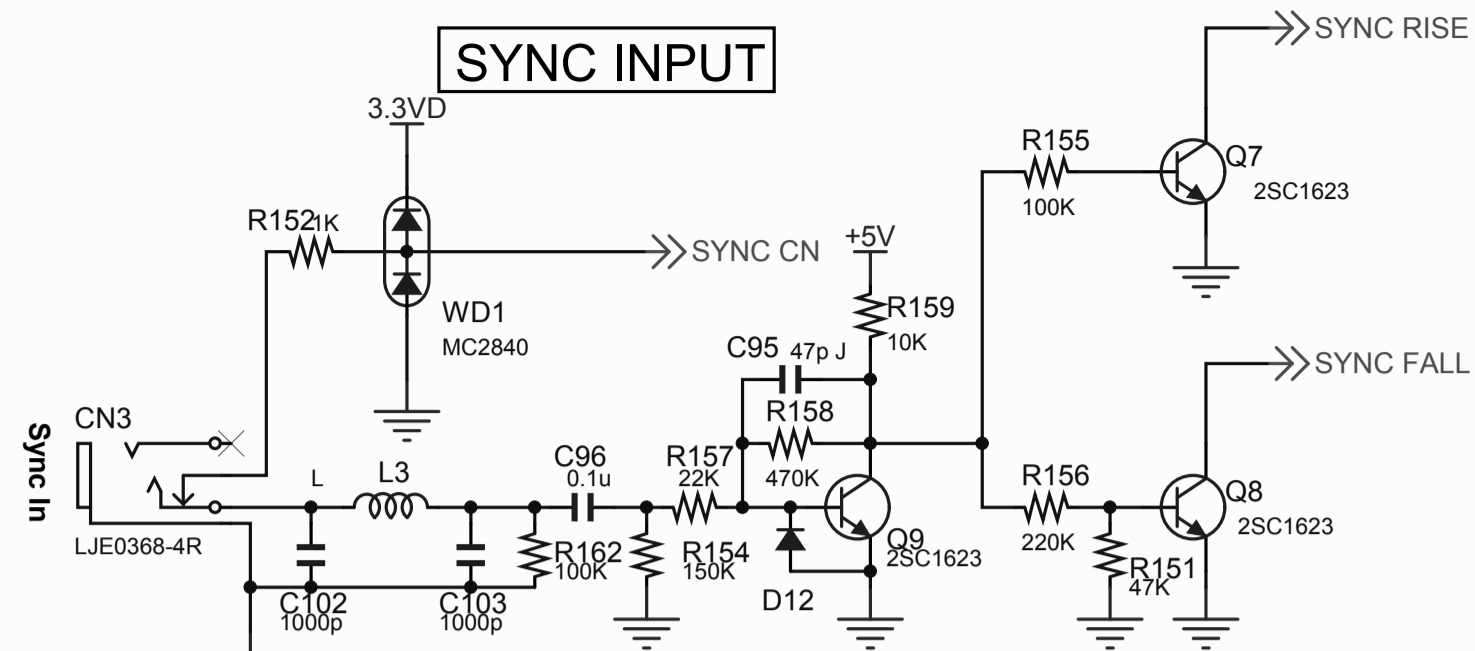
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MARK	REVISION	REASON	DATE	REVISED	APPROVED

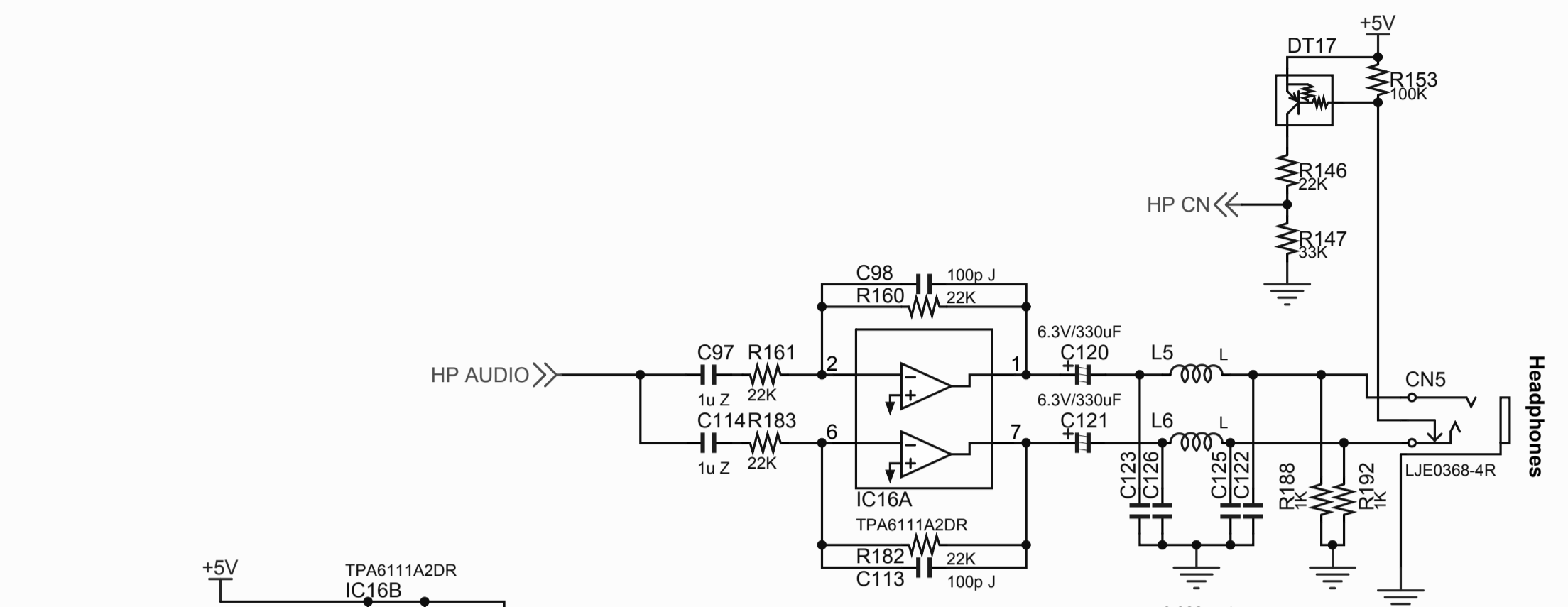


DRAWN	DESIGNED	CHECKED	APPROVED	MODEL: X-12210
TSE Kobayashi	Tatsuya Takahashi	Tatsuya Takahashi	Kenichi Nakamura	TITLE: SCHEMATIC 2/3 KLM-3201 DIGITAL
DRAWING NO: KOD-A30998			DATE: 2013/03/20	

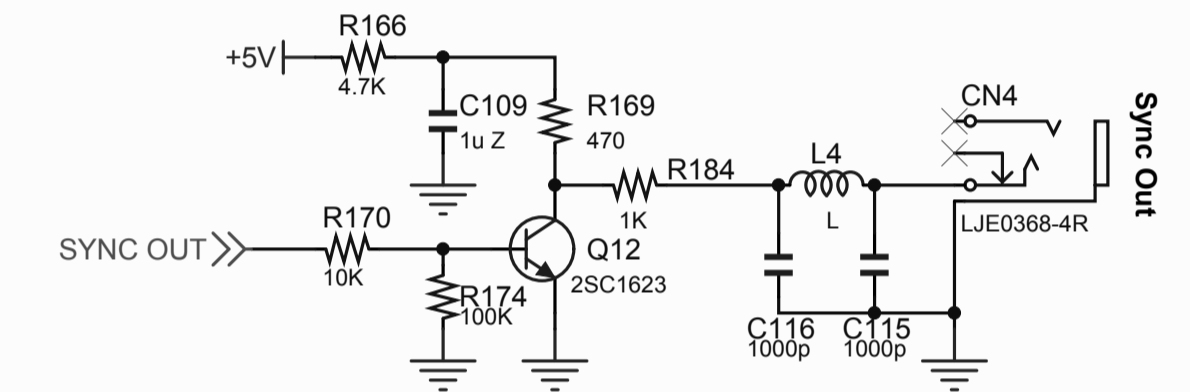




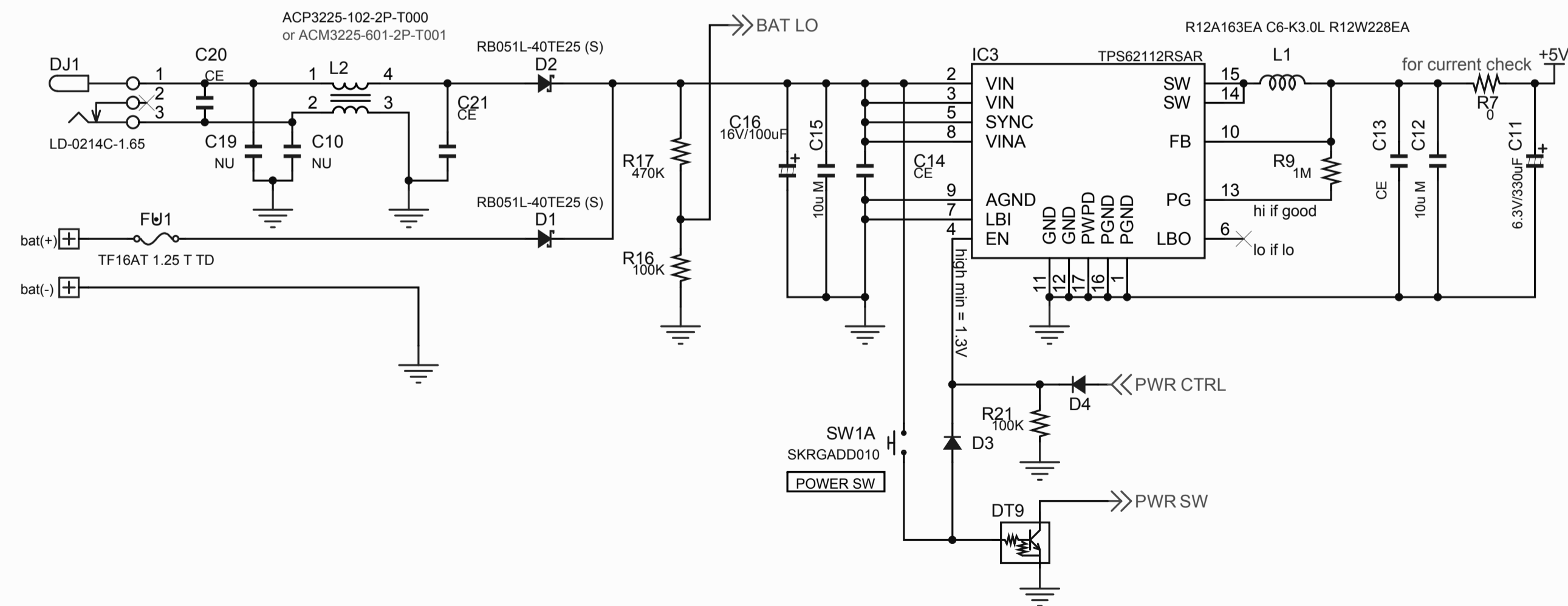
### HP AMP



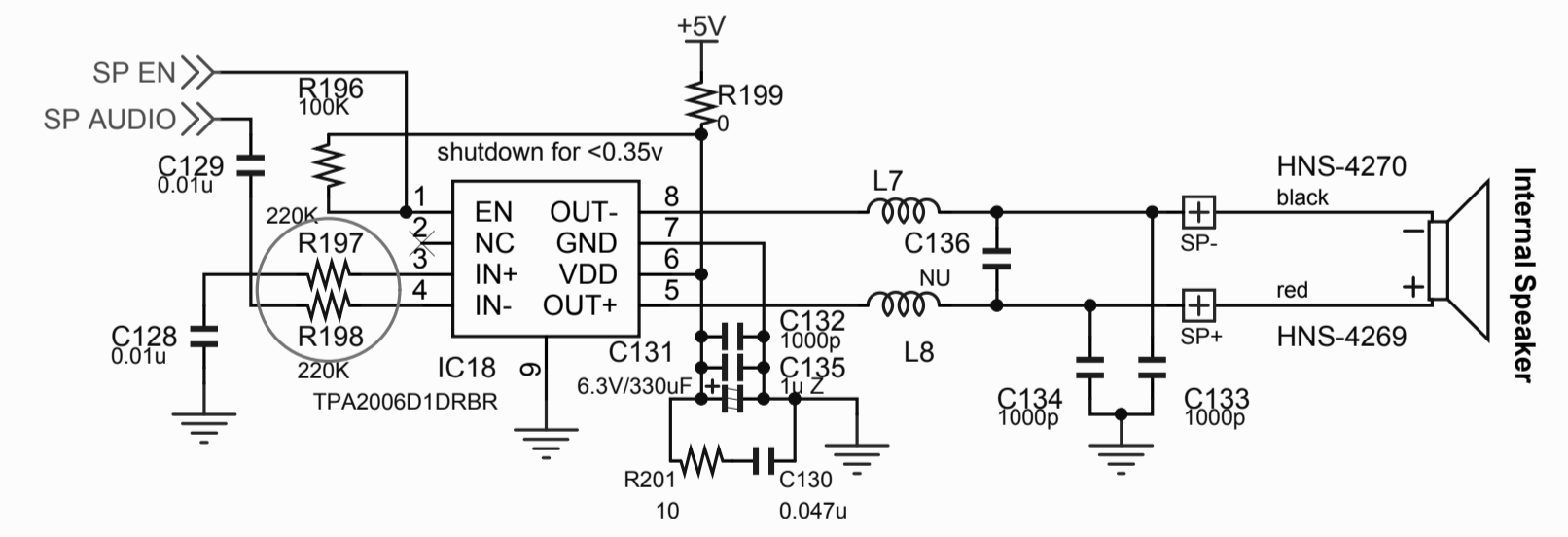
### SYNC OUTPUT



### 5V POWER SUPPLY



### SP AMP

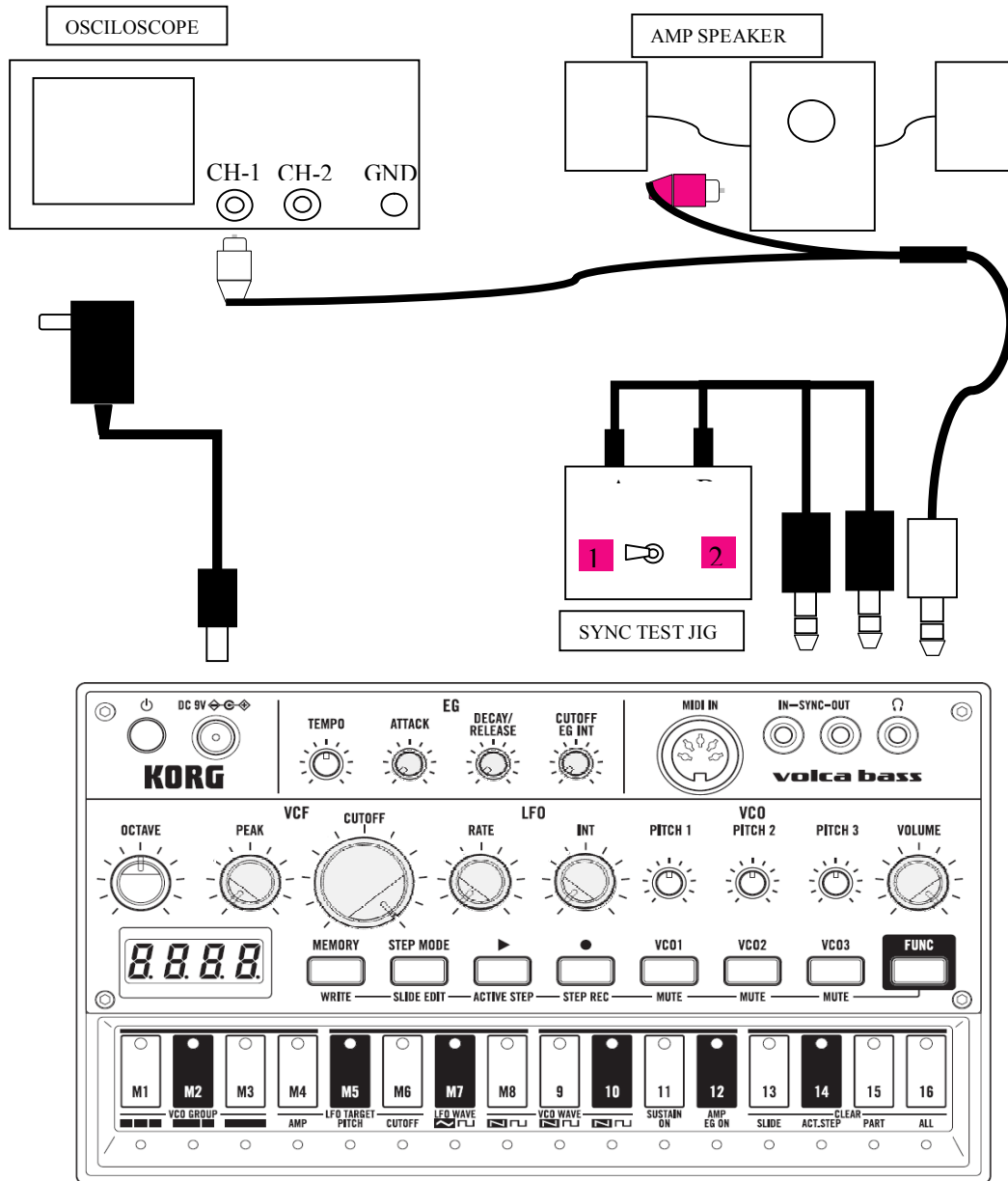


- CE: 0.1uF Z
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- FET: 2SK433-T112-1E (S)
- DTC: DTC114EUA T106(S)
- DTA: DTA114EUA T106(S)

DRAWN	DESIGNED	CHECKED	APPROVED	MODEL: X-12210
TSE Kobayashi	Tatsuya Takahashi	Tatsuya Takahashi	Kenichi Nakamura	TITLE: SCHEMATIC 3/3 KLM-3201 JACK
DRAWING NO: KOD-A30999			DATE: 2013/03/20	

MARK	REVISION REASON	DATE	REVISED	APPROVED

**TEST MODE  
Setting**



**Use equipment**

SYNC TEST JIG (see schematic bellow)

Oscilloscope

Amp speaker

AC Adaptor KA350

Battery LR6 x6

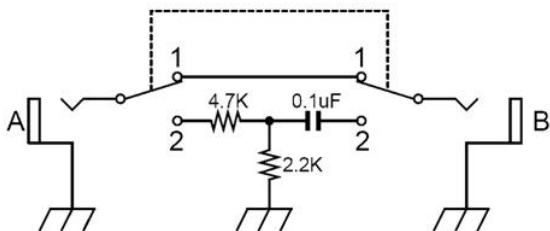
MIDI control Keyboard

AC Adaptor (USB 5V/500mA)

MIDI cable



## SYNC TEST JIG SCHEMATIC



### Oscilloscope setting.

VERTICAL: CH1 500mV/DIV, DC coupling  
 HORIZONTAL: 2.5mS/DIV

### How to start test mode

Turn on the power while holding down the [Play],[Rec] and [VCO2] button.

### Summary of the test mode

There is a [stand-by state] and [test execution state] state at the time of inspection.

Usually it is in [test execution state], but it is in standby mode by interrupting the test all the LED blinks when an error occurs during the inspection.

With the exception of the error display and LED inspection, inspection number is displayed on the 7-segment LED.

### Test Mode Introduction

Inspection Number	Display	inspection item	
0	0. *	Internal inspection(Pin,ROM,Panel)	
1	1. *	LED and button check	
2	2. *	Rotary switch check	*1)
3	3. *	AD and knob inspection	
4	4. *	Synchronization function inspection	
5	5. *	Audio check	*1)
6	6. *	Audio PCB inspection	*1)
7	7. *	Battery inspection	*1)
8	8. *	Checking the tuner function	*1)
14	14. *	Electrostatic sensor display	*1)
15	15. *	Power off test	*1)

\*1) This test is not required.

### Test Mode Operation

Operation in the [test execution state] state

[VCO1]+[VCO3] button	Exiting the test running and return to the previous inspection.
[VCO1]+[FUNC] button	Exiting the test running and proceed to the next inspection.
[VCO1]+[VCO2] button	Exiting the test running and change to standby mode
[VCO3] button	Return to the previous step.
[FUNC] button	Skip to the next step.

Operation in the standby state

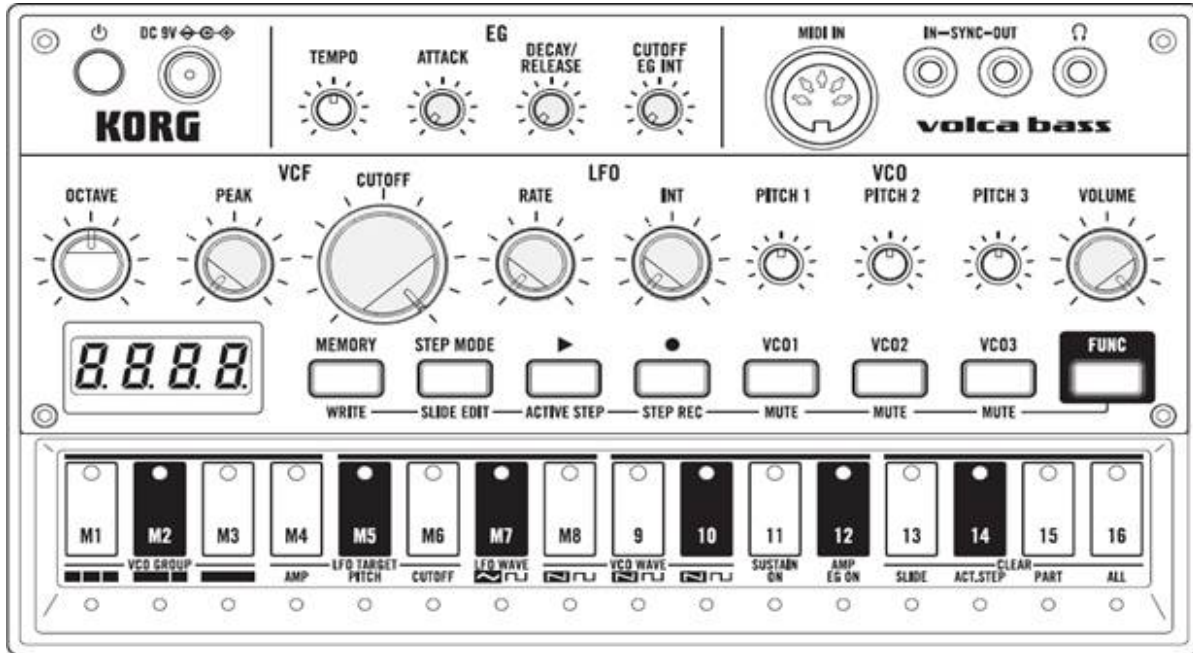
[VCO3] button	It returns to the previous inspection keep standby.
[FUNC] button	It proceeds to the next inspection keep standby.
[VCO2] button	To start the inspection in stand-by state
[VCO1]+[VCO2]button	error contents display

**1.The appearance inspection**

- (1) Place on a flat surface, make sure that there is no wobble.
- (2) Make sure that no scratch, cracks in the case and knob.
- (3) Make sure that the interruption of the silk printing, there is no bleeding.
- (4) Make sure that the lifting of the Volume,LED,Jack and Button etc., there is no slope.
- (5) Make sure that there is no other visible damage.

**2. Launch Test mode**

Connect the jig and products as setting figure.  
 Please do not connect the cable still in the [SYNC IN] and [SYNC OUT] terminal.  
 Please set the knob of products as shown in the following figure.



PEAK	CUTOFF	VOLUME
min	MAX	MAX

Turn on the power while holding down the [Play] and [Rec] button.  
 Release the button after displaying "tEst" in 7segLED.

**3. Internal inspection. (inspection No. 0)**

The following checks are executed.

- (1) Pin check inspection
- (2) ROM check sum
- (3) Panel check sum
- (4) Self tuning inspection

Proceed to the next inspection automatically if the inspection passed.

It change stand-by state and NG state is displayed if the inspection NG

Please refer to the list of errors at the end of the "test mode description" about the error contents.

**4. LED and button check (inspection number 1)**

**4-1. Confirmation of system version**

Remains of 7-segment of "tEst" display, please wait a few seconds.

Each version will be displayed in sequence the 7segLED.

The following is displayed in the case of version 1.00.

1.00 : System Version

P1.00 : Panel Version

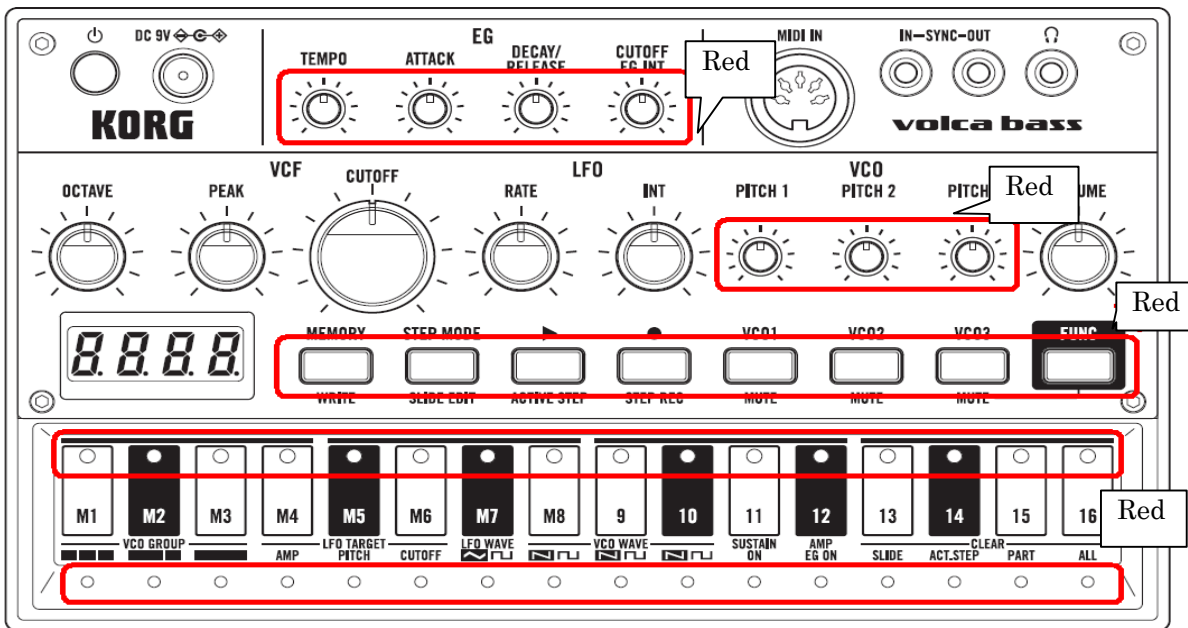
Check each version.

Push [FUNC] button to proceed next inspection after checking version

#### 4-2. Check the LED lights of all

Make sure that each LED is the following colors and that the LED is lit all.

Make sure that there is no not light LED, the brightness of LED is uniform, and there is no difference in color tone.



knob&7seg	Red	Button & Battery	Yellow	Rear LED x4	Red
-----------	-----	------------------	--------	-------------	-----

Proceed to the next inspection by pushing [FUNC] button if the inspection passed.

#### 4-3. LED and button check

Following table is the order of inspection.

Please press the button on the cell to the right of the lit LED.

LED	Operation button
MEMORY	MEMORY
STEP	STEP
PLAY	PLAY
REC	REC
VCO1	VCO1
VCO2	VCO2
VCO3	VCO3
FUNC	FUNC

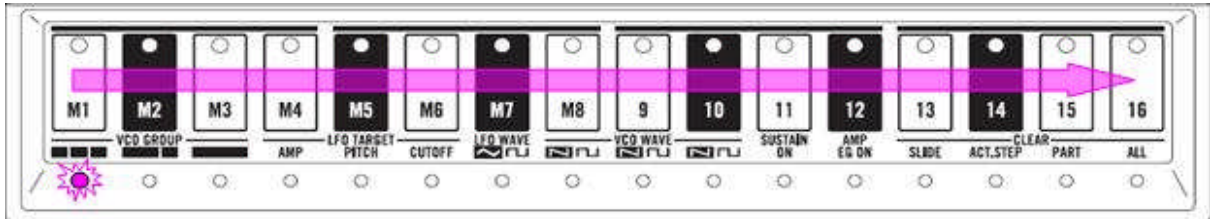
Proceed to the next inspection if the inspection passed.

It change stand-by state and NG state is displayed if the inspection NG by pushing the button that is different from the target

Please refer to the list of errors at the end of the "test mode description" about the error contents.

#### 4-4 .Touch switch inspection

LED on the lower left touch switch is lit. Touch the left edge of the touch switch, by sliding your finger while the touch as it is to the right edge, and release your finger across the right edge.



Upper LED of the touch position lights and lower LED the next position lights.

Proceed to the next inspection if the inspection passed.

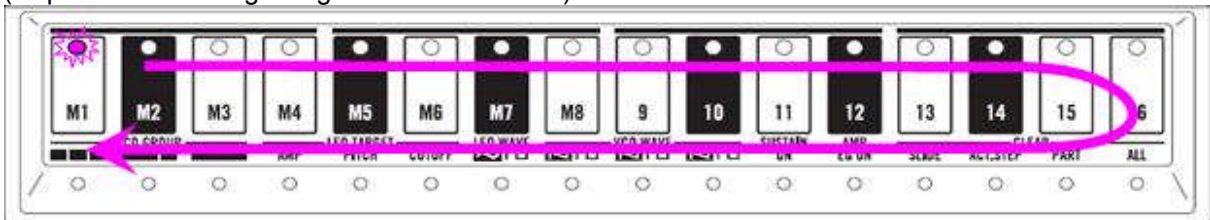
It change stand-by state and NG state is displayed if the inspection NG by pushing the button that is different from the target

Please refer to the list of errors at the end of the "test mode description" about the error contents.

#### 4-5. Inspection sequential lighting touch switch LED

LED touch switch lights in order. Make sure to light in order one by one.

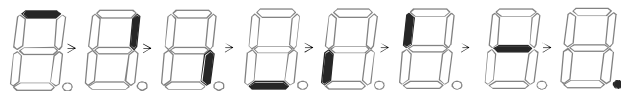
If you touch to the right edge, make sure that the LED of the touch switch is lit one by one in order. (Repeat from the beginning it is lit until the end)



Proceed to the next inspection by pushing [REC] button if the inspection passed.

#### 4-6 Inspection sequential lighting 7segLED

1 to each digit, 7-segment LED lights in the order shown on the right figure.



After verifying the 7-segment LED on the 4-digit, and then proceed to the next test by pressing the [FUNC] button.

### 5. AD and knob inspection (inspection number 3)

Operate in the order of the following description inspection target knob.

Turn the knob full right rotation and turn it full left rotation. If the knob is turned to the right edge already,

turn to the right after you turn to the left a little.

Inspection target	operation	lighting
TEMPO	Right edge to Left edge	ON
ATTACK	Right edge to Left edge	ON
DECAY/RELEASE	Right edge to Left edge	ON
CUTOFF EG INT	Right edge to Left edge	ON
OCTAVE	Right edge to Left edge	
LFO RATE	Right edge to Left edge	
LFO INT	Right edge to Left edge	
PITCH 1	Right edge to Left edge	ON
PITHC 2	Right edge to Left edge	ON
PITCH 3	Right edge to Left edge	ON

A/D value of target knob is displayed on the LED of bottom of the touch switch.  
Make sure that the value which is displayed on the LED of bottom of the touch switch change smoothly .

Make sure that there is no catch and rub when you move the knob.

Knob to light up, make sure at the same time that it is lit.

Proceed to the next inspection automatically if the inspection passed.

It change stand-by state and NG state is displayed if the inspection NG

Please refer to the list of errors at the end of the "test mode description" about the error contents.

#### 6. Synchronization function inspection (inspection number 4)

Make sure the following points, please start the inspection.

The Sync. Cable is not connected.

Setting the sync. test jig is set to [1]

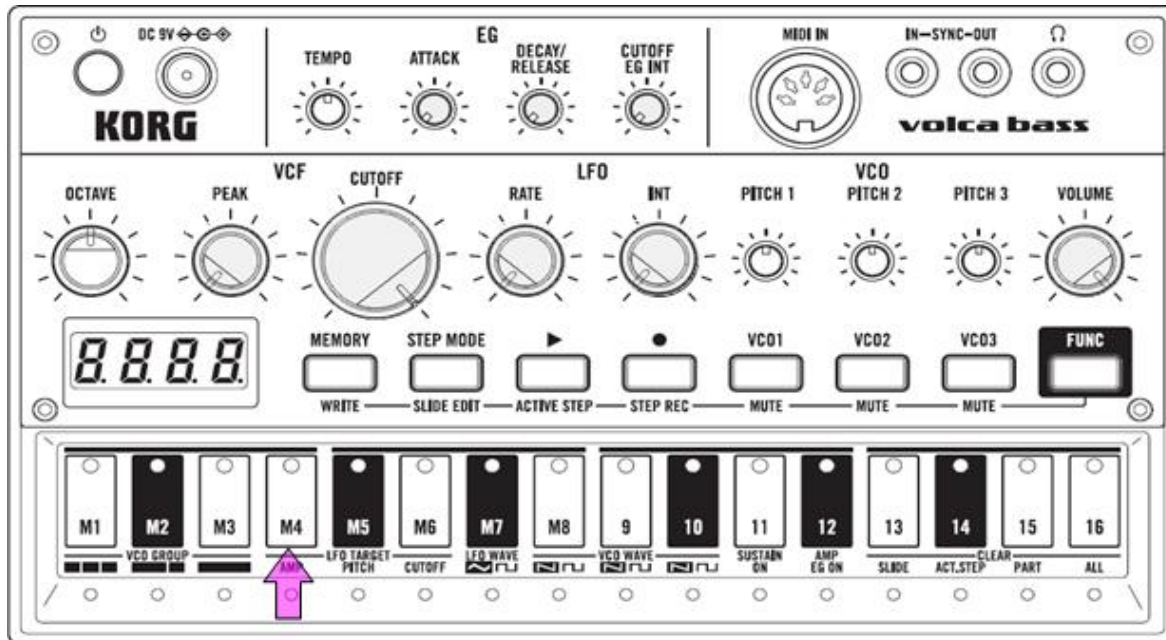
- (1) In a state where cable is not connected [SYNC IN] terminal is checked.  
If it detects connecting cable, the result is NG..  
It is displayed as ""4.2"" in the 7-segment in the case of a pass.  
It change stand-by state and NG state is displayed.
- (2) Connect the sync. Cable.  
It is displayed as "4.3" in the 7-segment if it detect the cable is connected.  
It is a failed inspection in case it does not appear as "4.3" in the 7-segment.
- (3) Push [VC02] button, it start loop check and display "4.4" in the 7-segment.  
It is displayed as "4.2" in the 7-segment in the case of a pass.  
It change stand-by state and NG state is displayed if the inspection NG
- (4) Change setting to [2] of the sync. test jig .  
Push [STEP] button, it restart loop check.  
Proceed to the next inspection automatically if the inspection passed. Do not use the inspection here.  
It change stand-by state and NG state is displayed if the inspection NG

Please refer to the list of errors at the end of the "test mode description" about the error contents.

It appears the "5.1" to 7-segment, to turn off the power.

Release the power switch appears as "OOFF" the 7-segment.

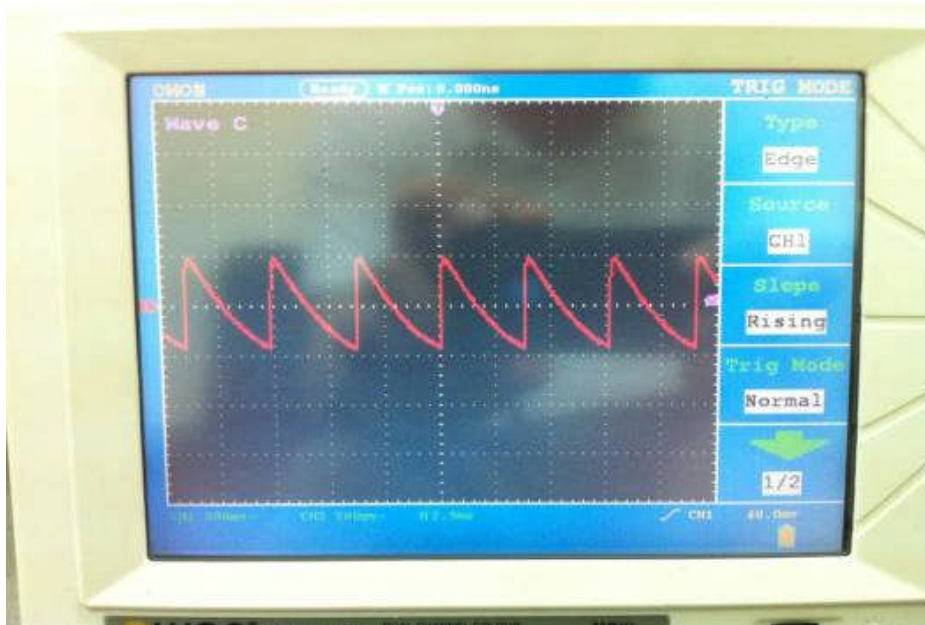
## 7. Sound check (In a state in which the user uses)



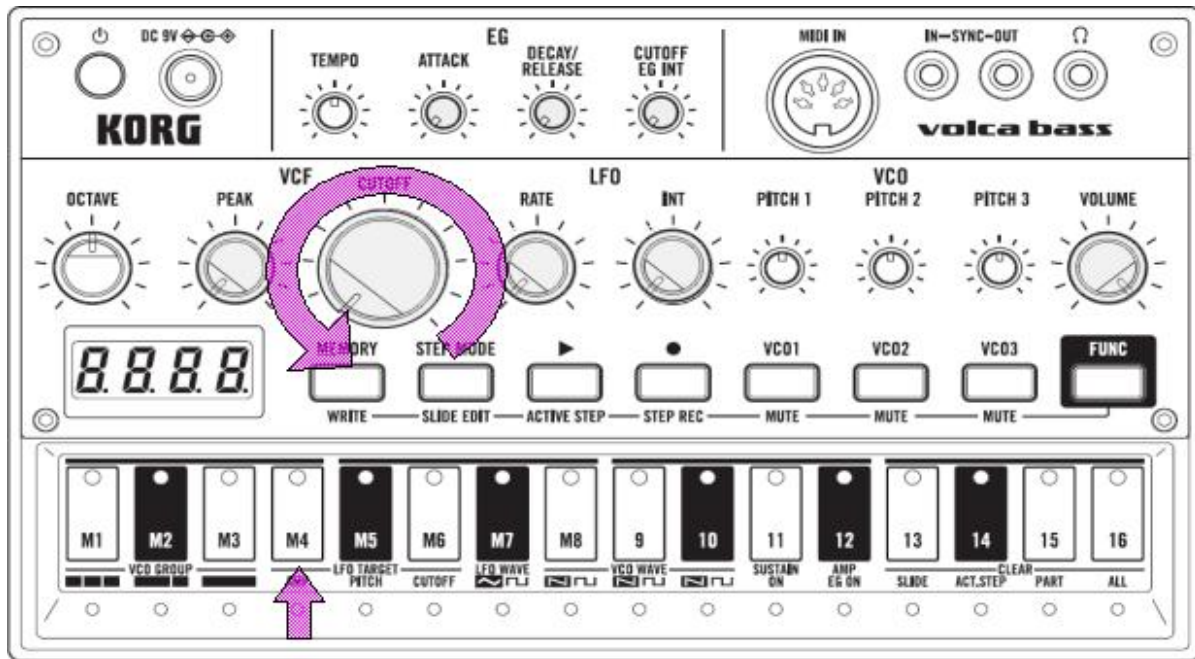
The display will indicate ""OFF"" when you hold down the power button.

Please release it appears.

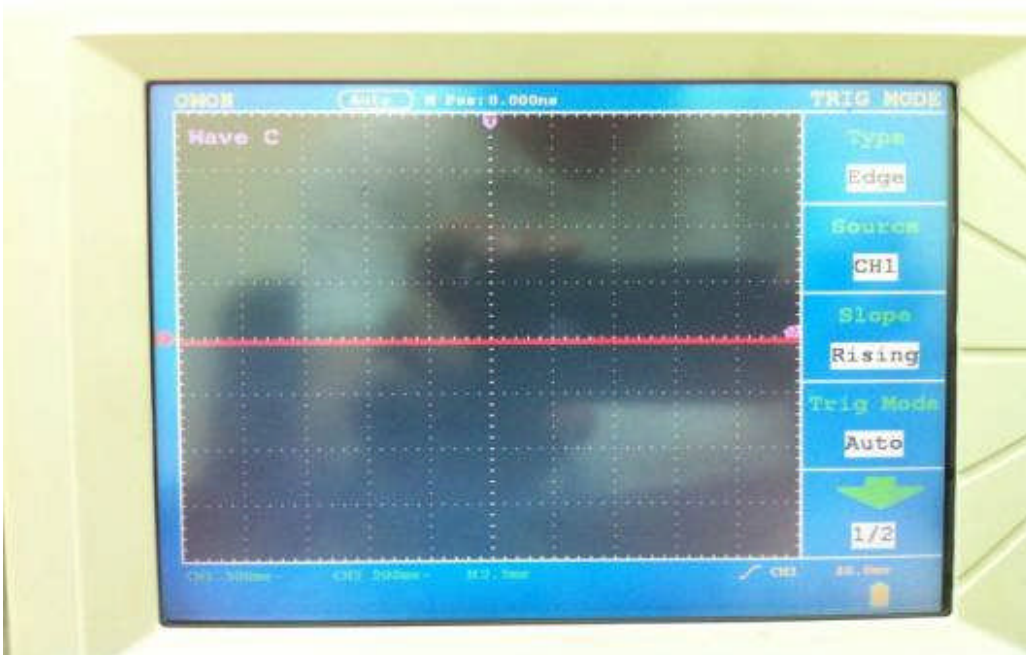
Touching the "M4" of touch pad, sound comes out from the amplifier. Please check the waveform on an oscilloscope.



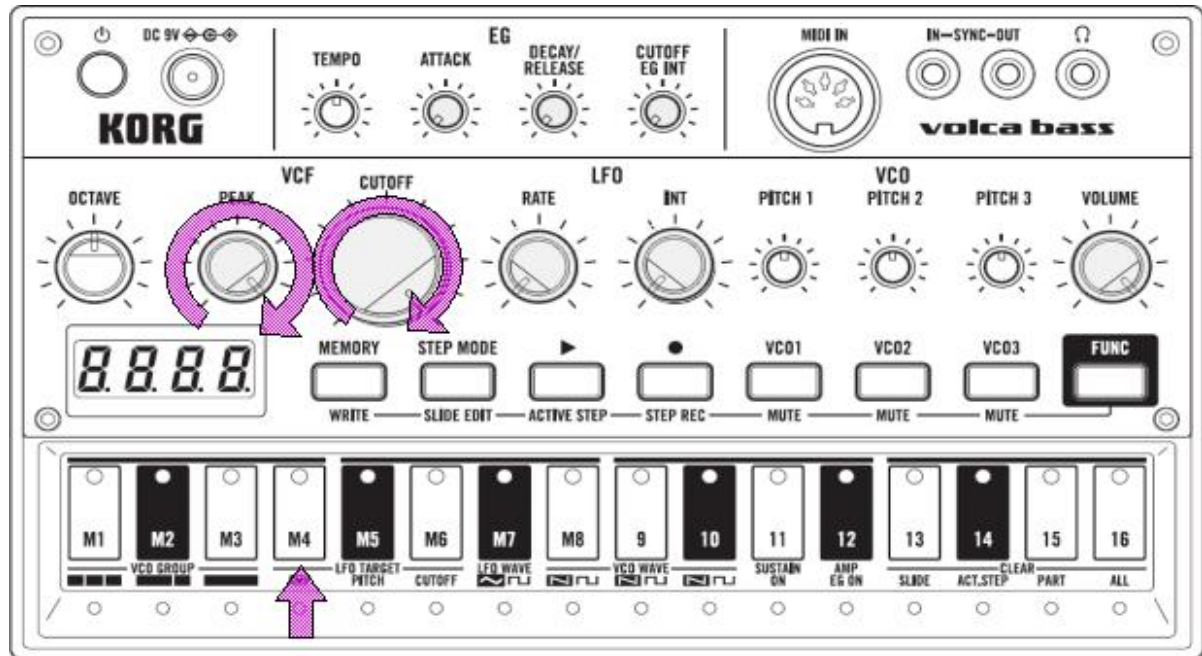
Please turn to MIN as follows: [CUTOFF] knob.



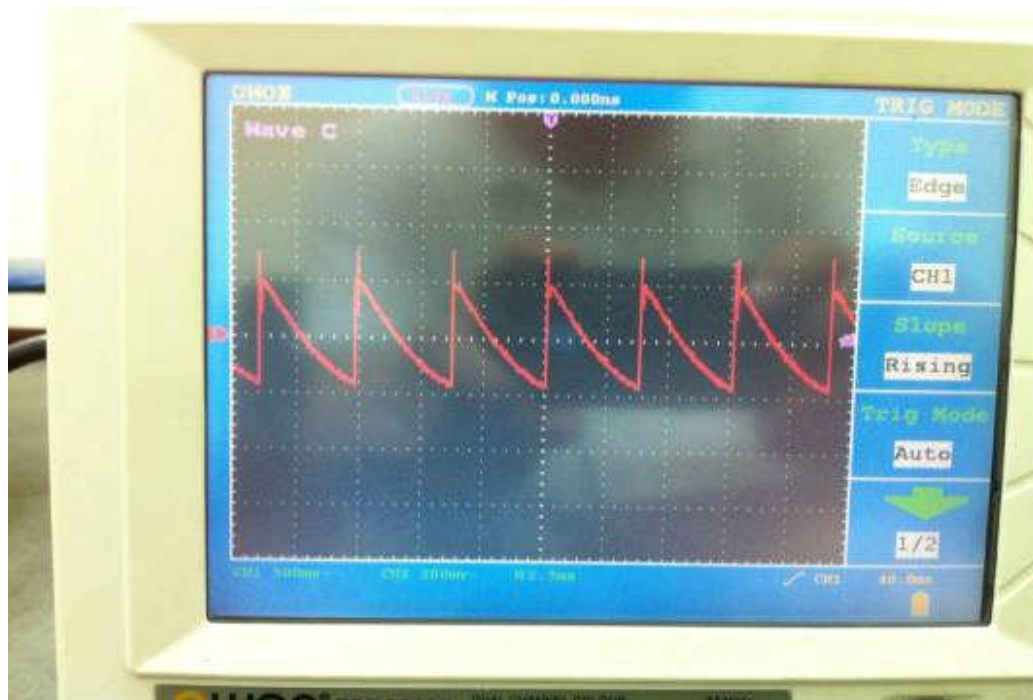
Touching the "M4" of touch pad, sound comes out from the amplifier. Please check the waveform on an oscilloscope  
There is no sound from the speakers and waveform does not appear to oscilloscope



Turn "CUTOFF" knob and "PEARK" knob to MAX position.

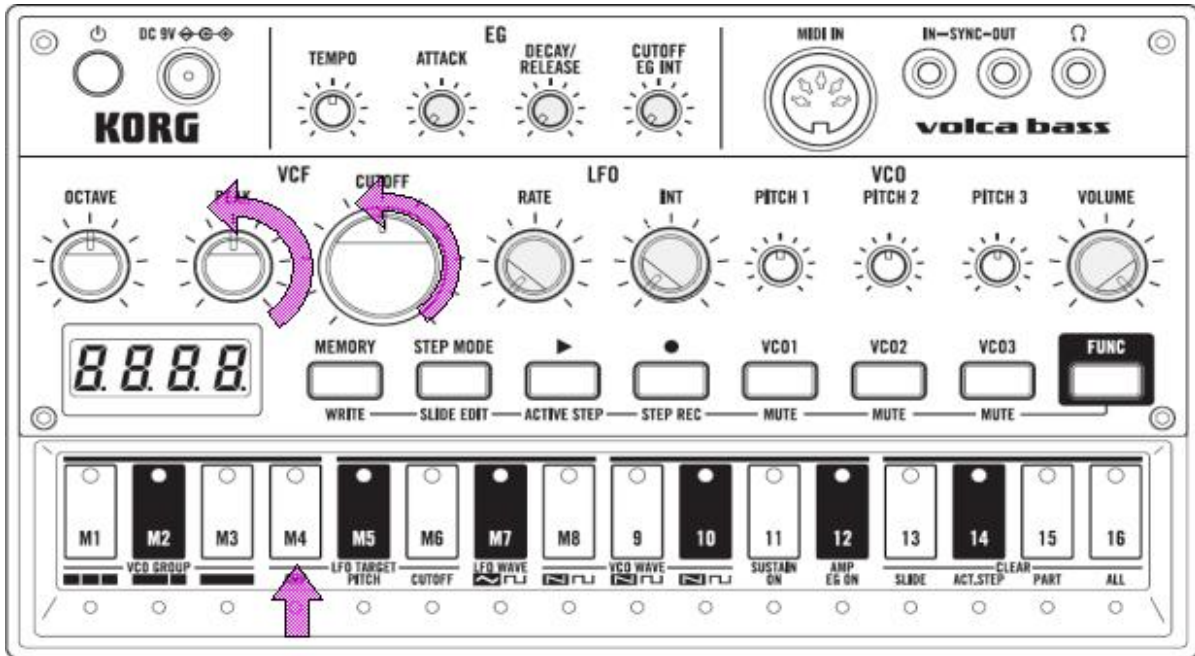


Touching the "M4" of touch pad, sound comes out from the amplifier. Please check the waveform on an oscilloscope.

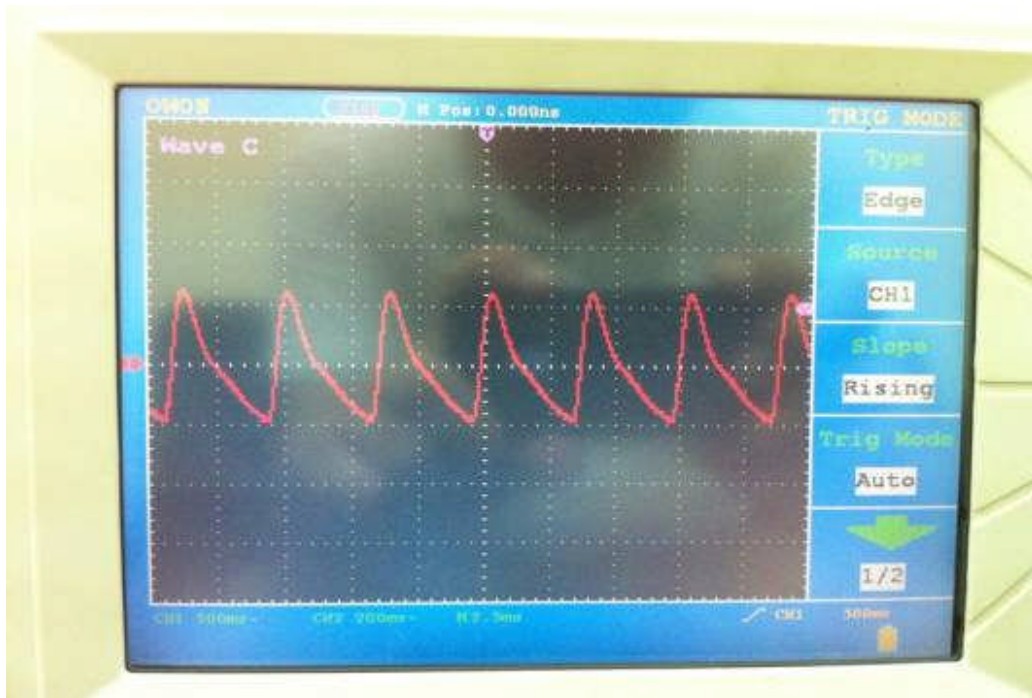




Turn "CUTOFF" knob and "PEARK" knob to MID position.



Touching the "M4" of touch pad, sound comes out from the amplifier. Please check the waveform on an oscilloscope.

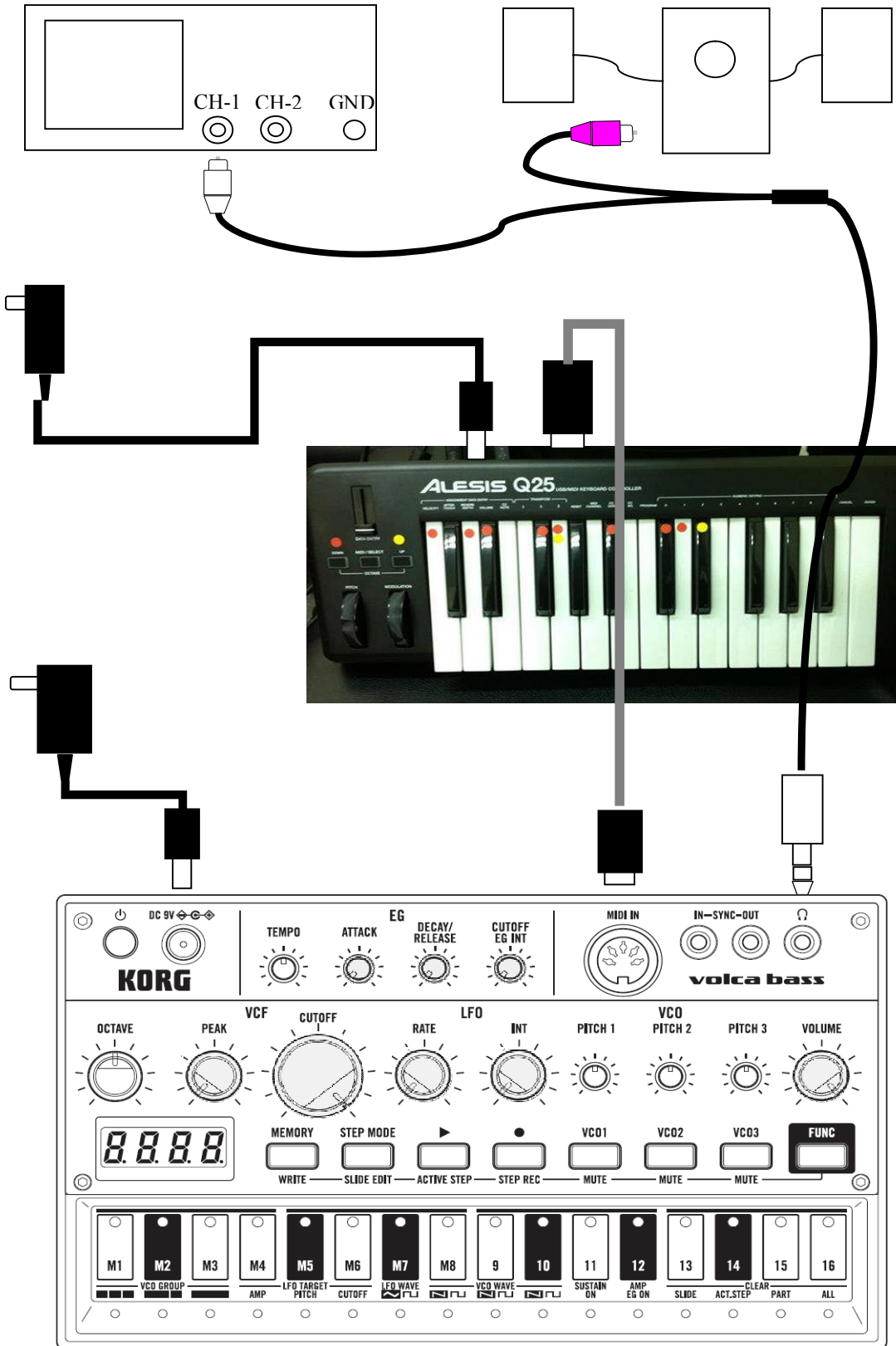


# MIDI CONTROL KEYBOARD initialize setting

## Setting

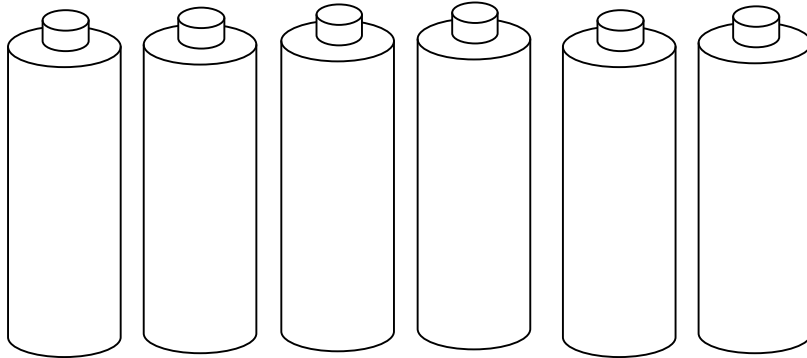
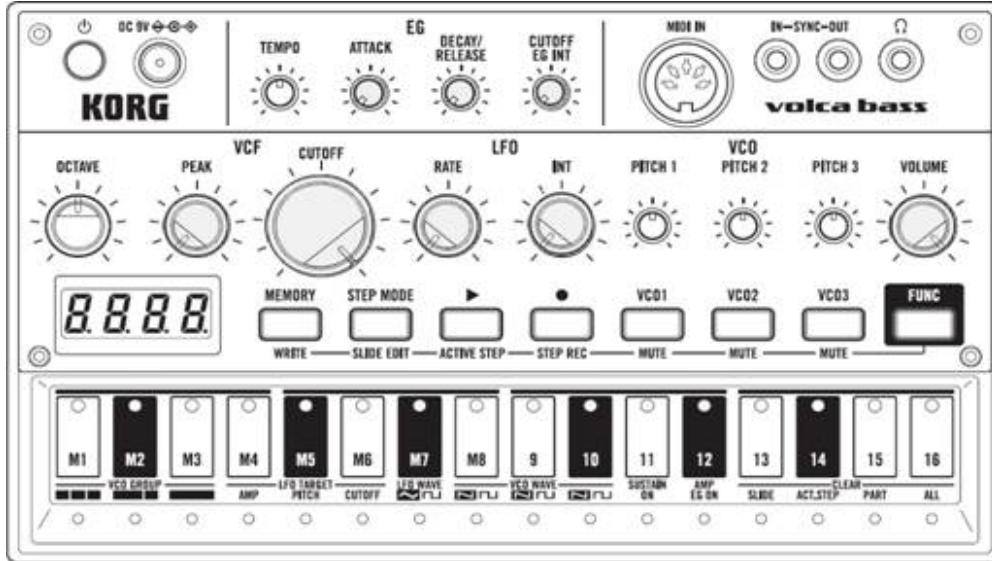
OSCILSCOPE

AMP SPEAKER



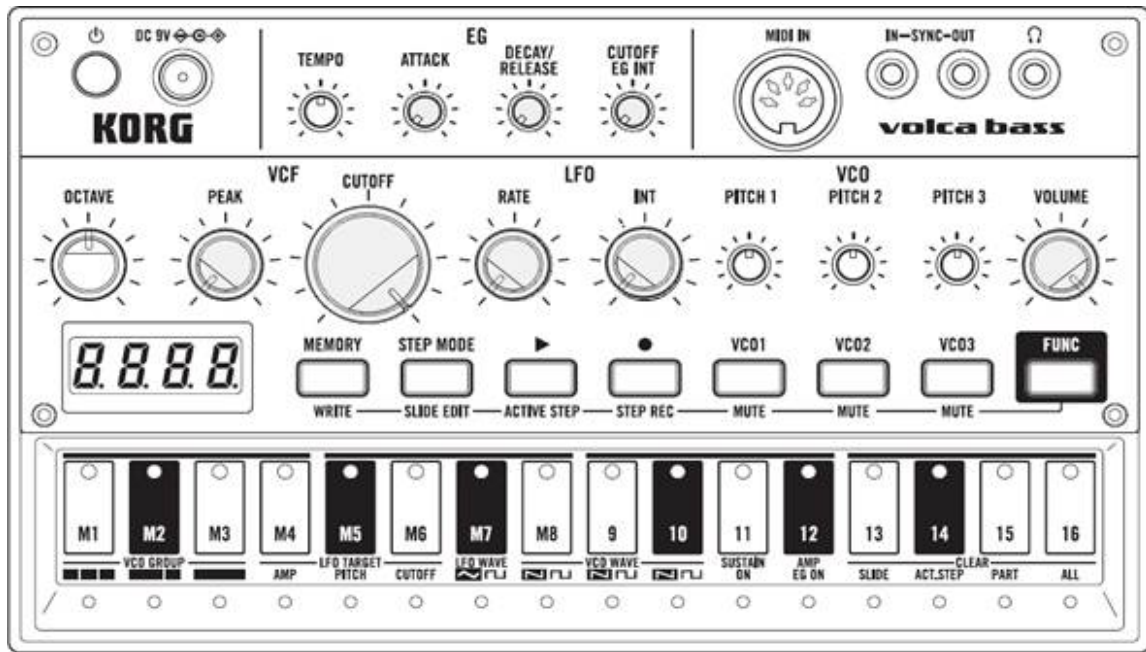
PConnect USB cable to the MIDI control keyboard  
Make sure that you play the MIDI CONTROL KEYBOARD, volca bass will sound.

### Confirmation of speaker sound in battery drive Setting



### Check speaker sound in battery drive

- Put six LR6 batteries in the battery box to unplug all the cables as shown above.
- Turn on the power by pressing the power button.
- Push PLAY[>] button to start DEMO.
- Make sure that the DEMO performance is sounding from the speakers.
- Connect the headphones, make sure that the sound from the speakers disappear.
- Make sure that the sound is coming from both sides of the headphones.
- If there is no problem, turn off the power by pressing the power button.
- Set to ship setting the knobs, remove the batteries, test is complete.
- Return the battery cover, make sure that there is no dirt on the surface appearance, to return to packing.



**Appendix error list**

**The common subject matter about the error display**

If an error occurs during the inspection, all LED flashes, waiting to be entered.

At this time, you can check the error content by simultaneously pressing the [MEMORY] button the [STEP] button.

Each time it is pressed, appears inspection number "10 \*\*", 1 error information "10 \*\*", error information 2 "20 \*\*" is visited at the same time the [VCO1] key + [VCOP] key.

Content of the information will vary depending on the inspection number, please refer to the error table of another inspection.

For operations other than those described here, please refer to "Operation in the standby state" and "test mode operation".

**Error Display list of internal inspection**

(A) If "10F\*\*" is displayed on the seven-segment

- (A-1) If "10Fd" is displayed on the seven-segment, the main ROM checksum error.
  - (A-2) If "10FE" is displayed on the seven-segment, the panel ROM checksum error.
  - (A-3) If "10FF" is displayed on the seven-segment, self tuning error.
- Please check the (PIN 38,39,40,42,48,49,52,53,58 etc. CPU) where relevant.

(B) Case except (A)

7-segment "10 \*\*\*" display indicates the pin that detected the anomaly.  
 7-segment "20 \*\*\*" display indicates the abnormal cause.

(B-1) If "20FF" is displayed on the seven-segment

State of the pin that detected the abnormality is invalid.

(B-2) If the "FF" other messages of "20 \*\*\*" is displayed in "\*\*\*\*" the 7-segment.

The status is invalid between pin that was adjacent to the "\*\*\*\*".

Correspondence table of Pin number displayed as "\*\*\*\*" is shown below.

Display	Pin	Display	Pin	Display	Pin	Display	Pin	Display	Pin	Display	Pin
00	55	14	37	50	33	65	16	80	38	94	88
01	56	15	41	51	34	66	17	81	40	95	8
02	64	16	43	52	35	67	11	82	42	97	58
03	65	17	47	53	61	70	30	83	48	A0	50
04	66	37	2	54	44	71	31	85	53	A1	51

05	67	40	20	55	45	72	32	86	79	A2	7
06	68	41	21	56	46	73	36	87	83		
07	69	43	89	60	26	74	9	90	70		
10	54	44	23	61	27	75	10	91	49		
12	60	45	24	63	6	76	84	92	86		
13	29	46	25	64	15	77	85	93	87		

Please check the CPU pins in question is not a short and adjacent Pin or Open,.

**Error Display List of LED / button test**(inspection number [1.3])

**Error Display List of Touch pad check**(inspection number [1.4])

※ message content is exactly the same inspection of the above two.

Please refer to the error display the following table also inspection of both.

When it detects the pressing of the button that is different from the assumption, it is an error.

"10\*\*\*": "\*\*\*" is expected button number.

"20\*\*\*": "\*\*\*" is detected button number.

The following is a table of correspondence inspection button and display value.

Display	Type	Name	Display	Type	Name
00	touch	M1	0C	touch	13
01	touch	M2	0d	touch	14
02	touch	M3	0E	touch	15
03	touch	M4	0F	touch	16
04	touch	M5	10	rubber	MEMORY
05	touch	M6	11	rubber	STEP
06	touch	M7	12	rubber	PLAY
07	touch	M8	13	rubber	REC
08	touch	9	14	rubber	VCO1
09	touch	10	15	rubber	VCO2
0A	touch	11	16	rubber	VCO3
0b	touch	12	17	rubber	FUNC

**Error Display List of A/D (knob) inspection**(inspection number [3.#])

(A) If "108\*" is displayed on the seven-segment

It is error value (jump value of unexpected) to be tested A / D.

The following is a table of correspondence inspection A / D and display value.

Display(A)	Display(B)	knob name	CPU pin No.
1087	1007	TEMPO	98
1086	1006	ATTACK	97
1085	1005	DECAY/RELEASE	96
1084	1004	CUTOFF EG INT	95
1089	1009	OCRAVE	100
1088	1008	LFO RATE	99
1083	1003	LFO INT	94
1082	1002	PITCH 1	93
1081	1001	PITCH 2	92
1080	1000	PITCH 3	91

(A)-1 If "2001" is displayed on the seven-segment, Increase or decrease of the A / D is reversed.

(A)-2 If "2002" is displayed on the seven-segment, A/D value is jumpy.

(B) If "100\*" is displayed on the seven-segment

Value change except target A/D has been detected.

Please check the CPU pin or knob around the target A/D or the A/D to change is detected.  
 About correspondence to be tested A/D display, please refer to the above table.  
 A/D a change is detected is indicated 7-segment display in the "20 \*\*\*".  
 Correspondence between the A/D of "\*\*\*\*" see table below.  
 "\*\*\*\*" Is a bit pattern."

bit pattern	knob name	CPU pin No.	knob name	CPU pin No.
___*__	PITCH 3	91	LFO RATE	99
___*_	PITCH 2	92	OCTABE	100
___*__	PITCH 1	93	BATTERY	1
___*_	LFO INT	94	SYNC CN	2
___*__	CUTOFF EG INT	95		
___*_	DECAY/RELEASE	96		
___*__	ATTACK	97		
___*_	TEMPO	98		

**Synchronization function inspection error table.**(Inspection Number[4,\*])

If the error occurs in this test, please check A / D and the corresponding SYNC IN terminal and SYNC OUT terminal, and, (2, 85, 86, 87 CPU PIN) interrupt.

Error number table is shown below.

7segment Display[100#]	error contents	7segment Display [20##]
1001	Connecting to Syncln terminal is detected at the time of entering the test	
1002	Change of A / D except terminal of Syncln is detected.	Interference A/D number. Please refer to the table number A/D of (knob) inspection.
1003	An error has occurred in the loop test for the first time.	The meaning of each digit in the binary representation (Bit0) Rise undetected during Rise inspection (Bit1) Fall undetected during Fall inspection. (Bit2) Rise detected during Fall inspection. (Bit3) Fall detected during Rise inspection.
1004	An error has occurred in the loop test for the second time.	

**Error Display a list of power-off test**(inspection number [15.#])

(note) (\*)After pressing the button, if the LED flashes  
 It can not complete the power-off operation.  
 Please check power switch, control pin (CPU PIN 22) etc..

## KORG volca-bass Parts List

Part Number	Category	Part Name	Location	Reference	QTY
510410523002	LOUD SPEAKER	ITAK-S-YDH23-06-08	Assembly		1
510C90843200	CIRCUIT ASS'Y BOARD	KLM-3200/1	Assembly		1
510476800534	HARNESS	HNS-4267(Bat+)	Assembly		1
510476800535	HARNESS	HNS-4268(Bat-)	Assembly		1
510476800536	HARNESS	HNS-4269(SP+)	Assembly		1
510476800537	HARNESS	HNS-4270(SP-)	Assembly		1
510312511525	LED	KPTR-3216SURCK	KLM-3200	[KLM-3200][TOP]LED300, LED301, LED302, LED303, LED304, LED305, LED306, LED307, LED308, LED309, LED310, LED311, LED312, LED313, LED314, LED315, LED316, LED317, LED318, LED319, LED320, LED321, LED322, LED323, LED324, LED325, LED326, LED327, LED328, LED329,	40
510470524627	HARNESS	HNS-4272	KLM-3200	[KLM-3200][TOP]CN300	1
510100521007	FUSE	TF16AT 1.25 T TD	KLM-3201	[KLM-3201][TOP]FU1	1
510310511506	SCHOTTKY DIODE	RB051L-40TE25 (S)	KLM-3201	[KLM-3201][TOP]D1, D2	2
510312511525	LED	KPTR-3216SURCK	KLM-3201	[KLM-3201][TOP]LED4, LED5, LED6, LED8	4
510312512017	Chip LED	SML-E12UWT86	KLM-3201	[KLM-3201][TOP]LED2, LED3, LED7, LED9, LED10, LED11, LED12, LED13	8
510316521502	SEGMENT LED	TOF-3461BH-B12	KLM-3201	[KLM-3201][TOP]LED1	1
510320514030	RESET IC	BU4227G-TR	KLM-3201	[KLM-3201][TOP]IC5	1
510320516125	AUDIO ASSP	TPA6111A2DR	KLM-3201	[KLM-3201][TOP]IC16	1
510320516126	DC-DC Converter	TPS62112RSAR	KLM-3201	[KLM-3201][TOP]IC3	1
510320516168	OPAMP	LM324PWR	KLM-3201	[KLM-3201][TOP]IC6, IC11, IC12, IC17	4
510320516169	OPAMP	TLC274CPWR	KLM-3201	[KLM-3201][TOP]IC8	1
510320516170	LDO IC	TLV70015DCKR	KLM-3201	[KLM-3201][TOP]IC15	1
510320516175	LDO IC	TLV70033DCKR	KLM-3201	[KLM-3201][TOP]IC1, IC2	2
510320516176	POWER AMP IC	TPA2006D1DRBR	KLM-3201	[KLM-3201][TOP]IC18	1
510320520029	PHOTO COUPLER	PS9117A-F3-AX(M)	KLM-3201	[KLM-3201][TOP]PC1	1
510335522028	CRYSTAL	RSD-10000F202000	KLM-3201	[KLM-3201][TOP]X1	1
510360525003	ROTARY VR	XV09211YNPV25U(NC)1B10K	KLM-3201	[KLM-3201][TOP]VR3, VR5, VR7, VR8, VR10, VR11, VR12	7
510360525009	ROTARY VR	XV09223NPV25F1B10K	KLM-3201	[KLM-3201][TOP]VR1, VR2, VR6, VR9, VR13	5
510360525013	ROTARY VR	XV09223NPV30F1B10K/I	KLM-3201	[KLM-3201][TOP]VR4	1
510374520020	TACT SW	SKRGADD010	KLM-3201	[KLM-3201][TOP]SW1	1
510402510501	INDUCTOR	R12A163EA C6-K3.0L R12W228EA	KLM-3201	[KLM-3201][TOP]L1	1
510450524517	DIN PLUG/JACK	LD-0214C-1.65	KLM-3201	[KLM-3201][TOP]DJ1	1
510450524518	DIN JACK	LN-0506-005	KLM-3201	[KLM-3201][TOP]MIDI1	1
510450524519	PHONE JACK	LJE0368-4R	KLM-3201	[KLM-3201][TOP]CN3, CN4, CN5	3
510646800823		X12210 UPPER CASE E10300	HOOKUP 1		1
510646800820		X12200 LOWER CASE E10302	HOOKUP 2		1
510646800821		X12200 BATTERY COVER E20382	HOOKUP 3		1
510646800822		X12200 SP ENCLOSURE E30648	HOOKUP 4		1
510640800502		X12210 TOP PANEL C30895	HOOKUP 5		1
510500800036		X12210 RUBBER BUTTON E30650-1	HOOKUP 6		1
510646800825		X12200 BATTERY BOX E20386	HOOKUP 7		1
510500800523		X12200 RUBBER LEG E40867	HOOKUP 8		5
510646801534		X12200 SENSOR SHEET E40868	HOOKUP 9		1
510646801536		X12200 WINDOW E40870	HOOKUP 10		1
510640805010		X12200 BATTERY SPRING(W1) C41783	HOOKUP 11		4
510640805011		X12200 BATTERY SPRING(W2) C41784	HOOKUP 12		1
510640805012		X12200 BATTERY SPRING(+) C41785	HOOKUP 13		1
510640805013		X12200 BATTERY SPRING(-) C41786	HOOKUP 14		1
510646502392		X-1200/10 VR-KNOB-L(V) KOC-E30313	HOOKUP 15		1
510646502393		X-1200/10 VR-KNOB-S(V) KOC-E30312	HOOKUP 16		5
510470524501	HARNESS	HNS-4147			1