

		DRAWING NAME	DRAWING No.	REV	DATE
	01	BLOCK DIAGRAM FOR MODEL GX-6000	E3-6991-5393-30-01K	0	2014.7.28
	02	DIAGRAM FOR I.S. KEEP FOR MODEL GX-6000	E3-6991-5361-10-01K	2	2014.12.16
	03	OUTER STRUCTURE GX-6000	M3-4777-01-01K	0	2014.7.18
	04	MAIN UNIT GX-6000	M2-4777-01-01K	1	2014.9.30
	05	SCHEMATIC MAIN PCB FOR MODEL GX-6000	E3-6991-5372-80-01K	0	2014.7.14
	06	SCHEMATIC MAIN PCB FOR MODEL GX-6000	E3-6991-5372-80-02K	0	2014.7.14
	07	SCHEMATIC MAIN PCB FOR MODEL GX-6000	E3-6991-5372-80-03K	0	2014.7.14
	08	SCHEMATIC MAIN PCB FOR MODEL GX-6000	E3-6991-5372-80-04K	0	2014.7.14
	09	SCHEMATIC MAIN PCB FOR MODEL GX-6000	E3-6991-5372-80-05K	0	2014.7.14
	10	PARTS LIST OF MAIN PCB	PLT-6991-5372-80 (1/4)	0	2014.7.14
	11	PARTS LIST OF MAIN PCB	PLT-6991-5372-80 (2/4)	3	2014.12.16
	12	PARTS LIST OF MAIN PCB	PLT-6991-5372-80 (3/4)	1	2014.11.5
	13	PARTS LIST OF MAIN PCB	PLT-6991-5372-80 (4/4)	0	2014.7.14
	14	MAIN PCB FOR MODEL GX-6000	E3-6991-5372-80-01A	0	2014.7.14
	15	MAIN PCB FOR MODEL GX-6000	E3-6991-5372-80-02A	0	2014.7.14
	16	SCHEMATIC SENSOR PCB FOR MODEL GX-6000	E3-6991-5373-50-01K	1	2014.11.5
	17	PARTS LIST OF SENSOR PCB	PLT-6991-5373-50 (1/1)	2	2014.12.16
	18	SENSOR PCB FOR MODEL GX-6000	E4-6991-5373-50-01A	1	2014.11.5
	19	SENSOR to MAIN WIRE FOR MODEL GX-6000	E4-6991-5382-70-01K	0	2014.7.14
	20	PUMP RP-12	M4-4181-61-01K	3	2013.1.29
	21	Buzzer BZ-9K	E4-6991-5008-70-01K	0	2011.2.28
	22	COMBUSTIBLE GAS SENSOR NC SENSOR	M3-4462-64-05K	3	2012.4.17
	23	TOXIC GAS SENSOR	M4-4084-92-03K	0	2014.7.30
	24	OXYGEN SENSOR	M4-4080-82-07K	0	2014.7.30
	25	SMART SENSOR Type-ESS	M4-4486-01-01K	0	2014.7.30
	26	TOXIC GAS SENSOR	M4-4084-30-08K	0	2014.7.30
	27	ESS SENSOR PCB	E3-6991-5384-10-01K	0	2014.7.14
	28	SMART SENSOR Type-DES	M4-4630-20-01K	0	2014.7.24
	29	DES SENSOR PCB	E3-6991-5385-90-01K	1	2015.5.25
	30	DES DIGITAL PCB	E3-6991-5386-60-01K	1	2015.2.24

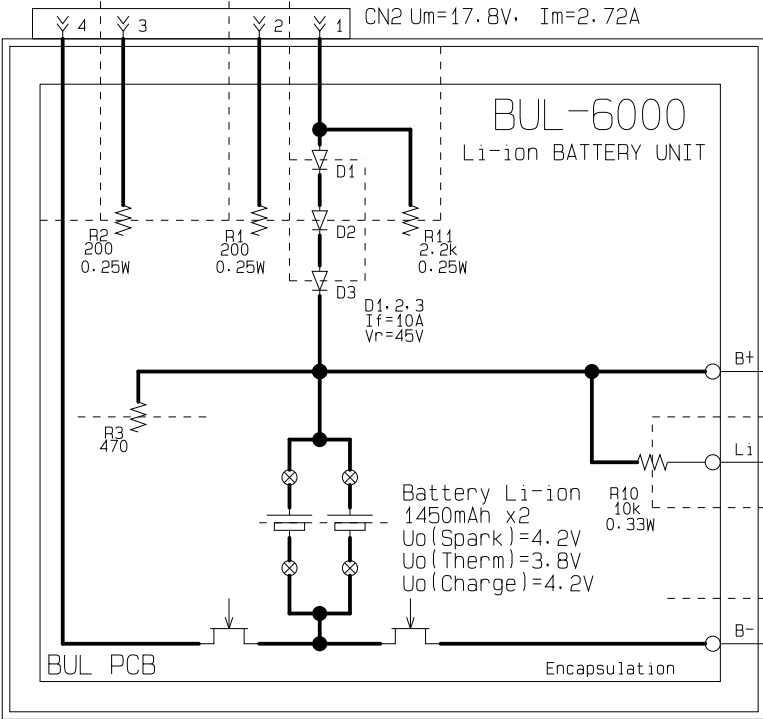
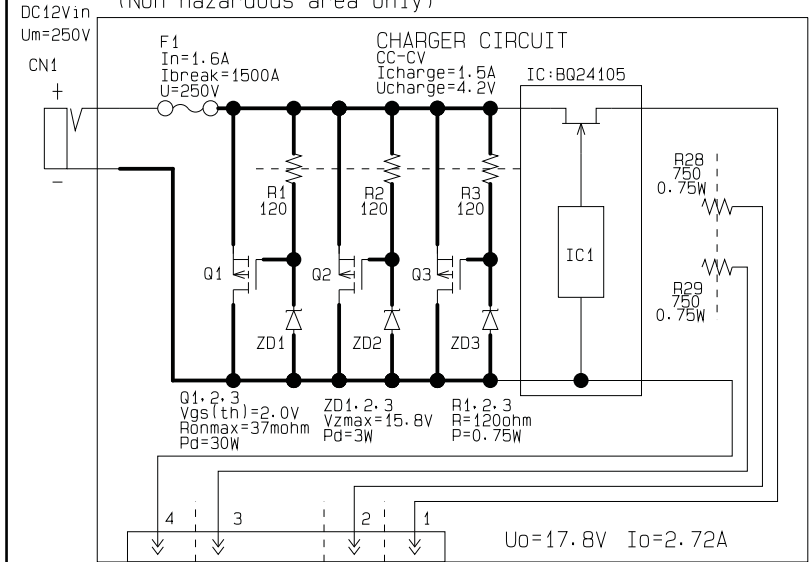
		DRAWING NAME	DRAWING No.	REV	DATE
	31	T- 3/4 BPA LAMP OL-8270BPA	E4-6991-5129-60-01K	0	2012.2.24
	32	SMART SENSOR Type-PLS	M4-4830-01-01K	1	2015.3.25
	33	PIS SENSOR PCB	E4-6991-5387-30-01K	2	2015.3.25
	34	PIS DIGITAL PCB	E3-6991-5388-10-01K	1	2015.3.25
	35	BUL-6000	M3-4777-03-01K	0	2014.7.28
	36	BUL PCB	E3-6991-5389-80-01K	1	2014.9.5
	37	BUD-6000	M3-4777-04-01K	1	2015.3.6
	38	BUD PCB	E4-6991-5390-50-01K	1	2014.9.5
	39	DIAGRAM FOR I.S. KEEP FOR MODEL BC-6000 / SDM-6000	E4-6991-5395-80-01K	1	2014.9.5
*	40	LABEL	M4-4777-01-01K	6	2021.4.23
	41	LABEL BC-6000 / SDM-6000	M4-4777-01-02K	0	2014.7.28
	42	SCHEMATIC CHARGER PCB FOR MODEL BC-6000	E3-6991-5255-80-01K	0	2014.12.16
	43	CHARGER PCB FOR MODEL BC-6000	E3-6991-5255-80-01A	0	2014.12.16
	44	SCHEMATIC CHARGER PCB FOR MODEL SDM-6000	E3-6991-5445-60-01K	1	2015.3.5
	45	CHARGER PCB FOR MODEL SDM-6000	E3-6991-5445-60-01A	2	2015.6.12
	46	SMART SENSOR Type-OSS	M4-4080-01-01K	0	2015.2.24
	47	OSS SENSOR PCB	E4-6991-5457-00-01K	0	2015.2.24
	48	OSS DIGITAL PCB	E3-6991-5458-70-01K	0	2015.2.24
	49	OXYGEN SENSOR	M4-4080-01-02K	0	2015.2.24
	50	BC-6000	M3-4777-02-01K	1	2015.3.23
	51	SDM-6000	M3-4395-23-01K	1	2015.3.23



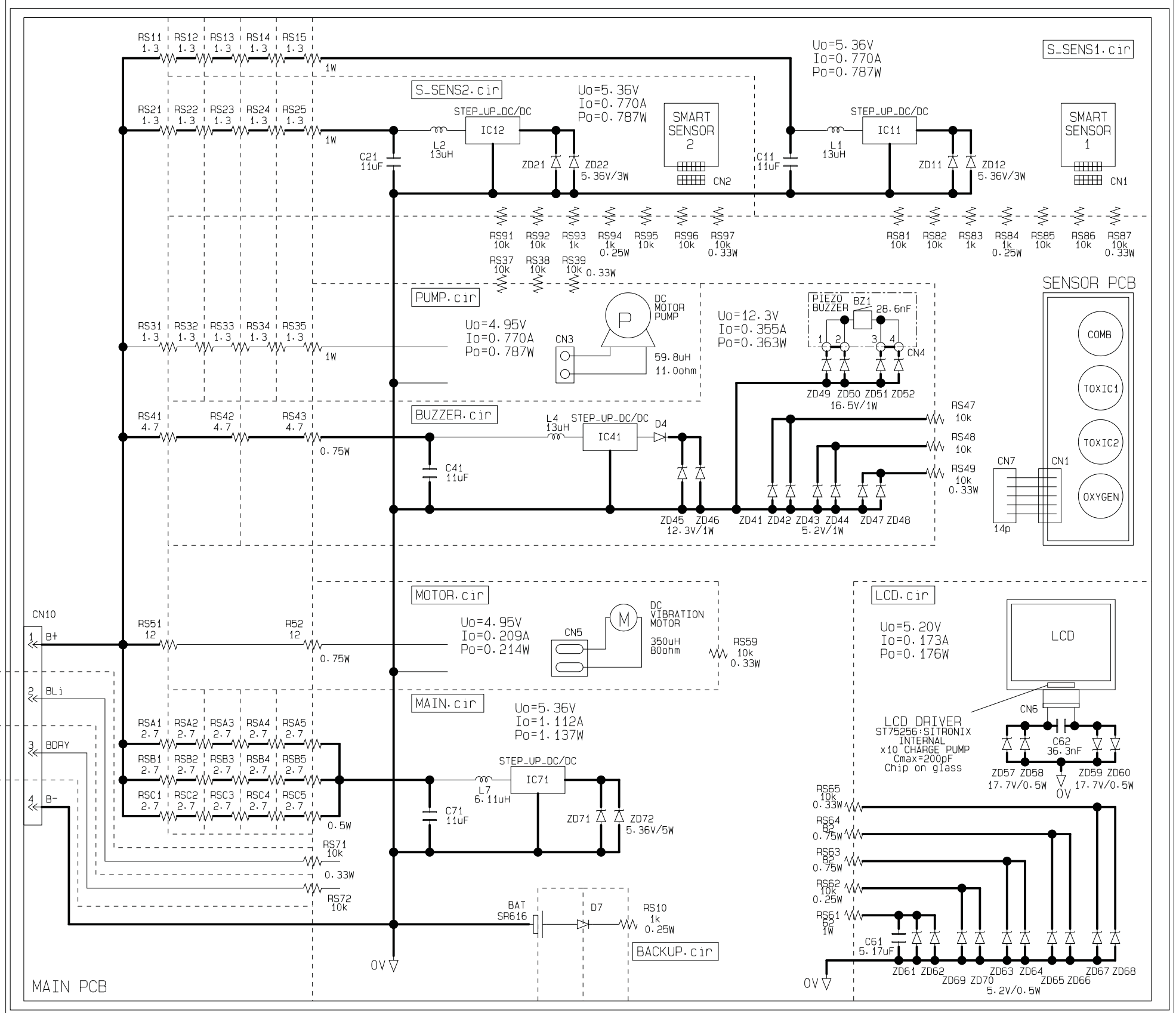
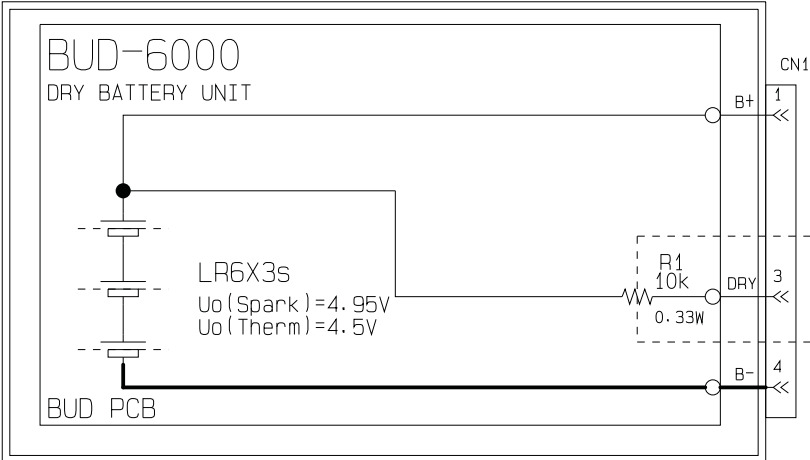
注 記 NOTES		改版担当者 REV. BY	改版日 REVISED	名 称 NAME
改版回数 REV.	No.40 6	小野圭	2021.4.23	INDEX
承認 APPROVED	検 討 CHECKED	製 図 DRAWN	作成日 DATE	図 番 DWG. NO.
石橋勝	北村正英	小野圭	2015.3.6	E3-6991-5470-70-01K
RIKEN KEIKI 理研計器株式会社 機密情報 / CONFIDENTIAL				



BATTERY CHARGER  
BC-6000/SDM-6000  
(Non hazardous area only)



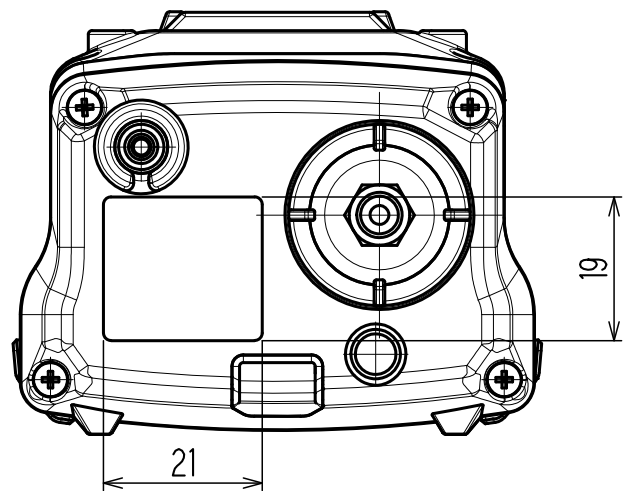
The battery unit  
even the end user is  
possible to replace.  
(Non hazardous area only)



注 記 NOTES RS78→RS71、RS79→RS72		改版担当者 REV. BY 小野圭	改版日 REVISED 2014. 12. 16	名 称 NAME DIAGRAM FOR I. S. KEEP FOR MODEL GX-6000
改版回数 REV. 2	総頁数 PAGES 1	製 図 DRAWN 小野圭	作成日 DATE 2014. 6. 23	図 番 DWG. NO. E3-6991-5361-10-01K
承 認 APPROVED 石橋勝	検 討 CHECKED 北村正英			
R RIKEN KEIKI 理研計器株式会社 機密情報 / CONFIDENTIAL				

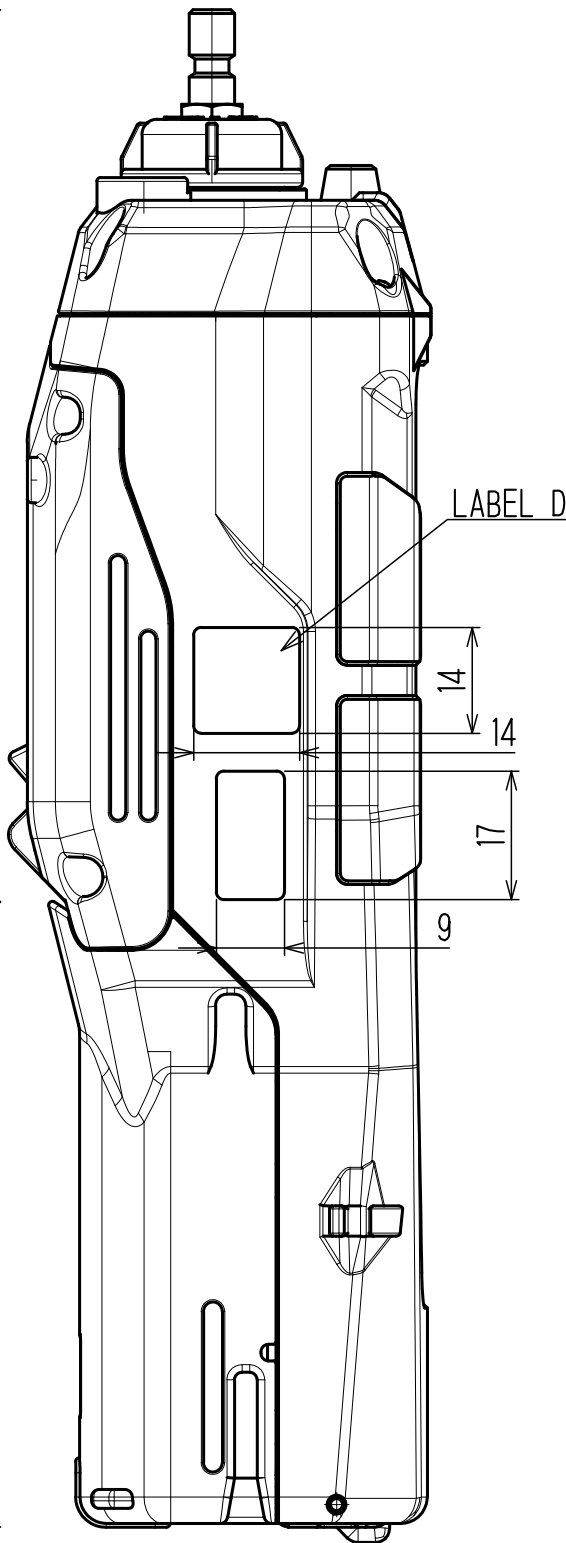
(MEMO)  
1. --- marks means SEPARATE  
2. — marks means INFALLIBLE CONNECTION

寸法	C		I		G		π		m		D		C	
	18未満		18以上50未満		50以上120未満		120以上260未満		260以上500未満		500以上1000未満		1000以上	
精級	0.1	0.15	0.2	0.3	0.4	0.6	0.8	1.2	1.6	2.0	2.5	3.0	3.5	3.5
中級	0.2	0.3	0.4	0.6	0.8	1.2	1.6	2.0	2.5	3.0	3.5	4.0	4.5	4.5
粗級	0.4	0.6	0.8	1.2	1.6	2.0	2.5	3.0	3.5	4.0	4.5	5.0	5.5	5.5

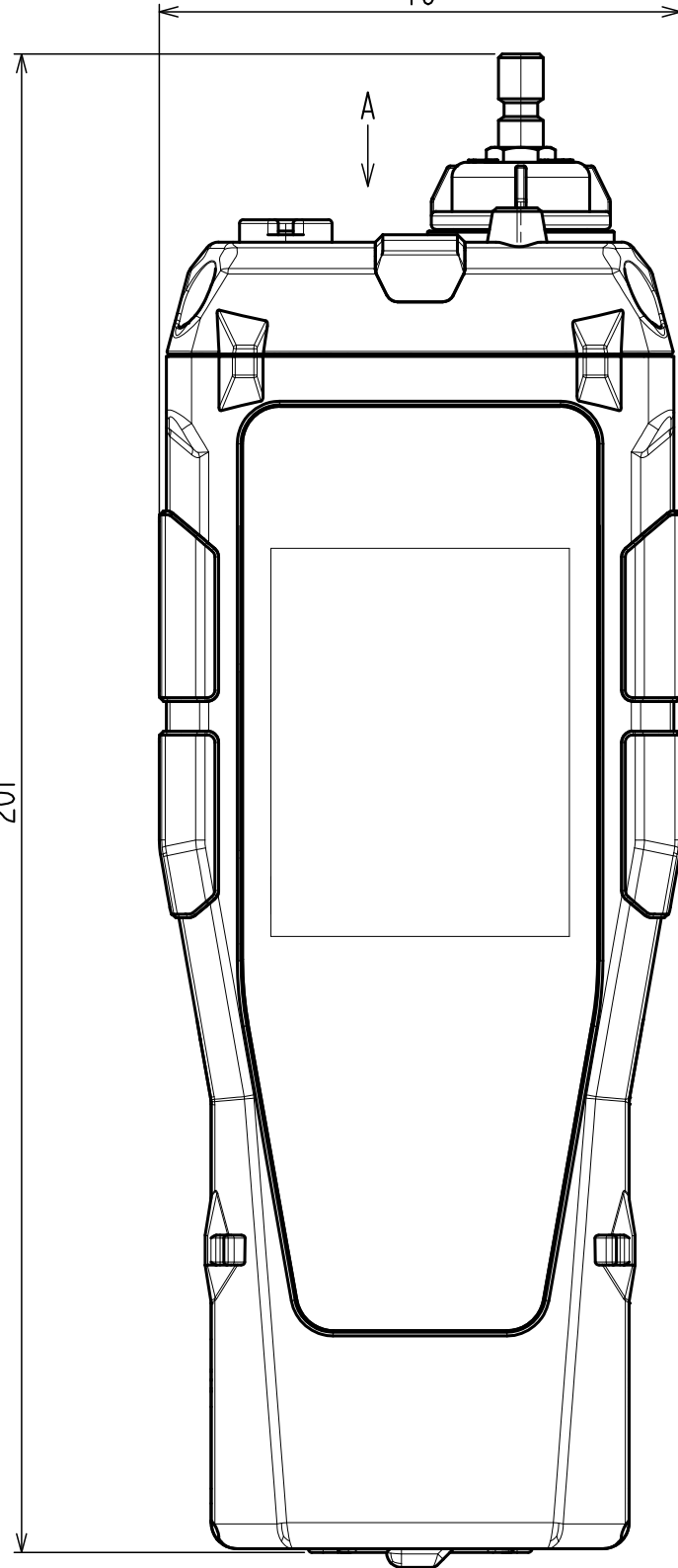


VIEW A

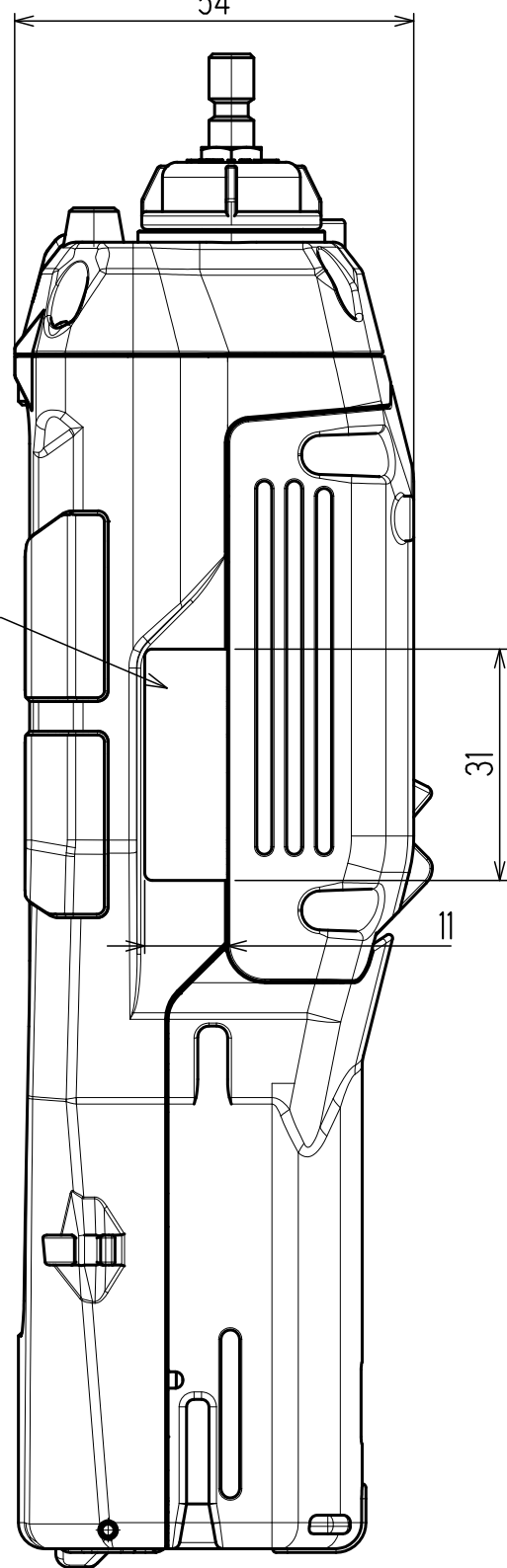
BATTERY UNIT  
BUL-8000  
M3-4777-03-01K  
OR  
BUD-8000  
M3-4777-04-01K



201



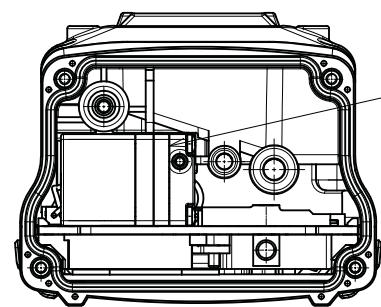
LABEL A



PROTECTION GRADE:MORE THAN IP 20

表面处理 TREAT.	許容差 TOL.	尺 度 SCALE	投影法 PROJECTION	名 称 NAME
材 質 MAT.		1 : 1		OUTER STRUCTURE GX-6000
承認 APPROVED	検 討 CHECKED	製 図 DRAWN	作成日 DATE	図 番 DWG. NO.
青良治	近藤晴彦	海野裕作	2014. 7. 18	M3-4777-01-01K
△ 記 事 年 月 日 訂 正 者 RIKEN KEIKI 理研計器株式会社 機密情報 / CONFIDENTIAL				

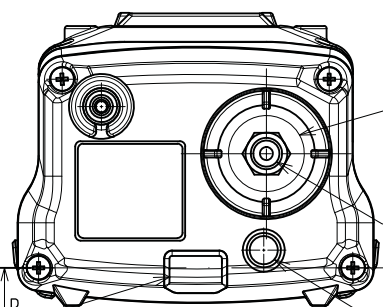
1 2 3 4 5 6 7 8 9 10 11



PUMP  
M4-4181-61-01K

FIGURE WITHOUT TOP COVER

ALARM LAMP  
MATERIAL:PC  
SURFACE AREA:120mm<sup>2</sup>

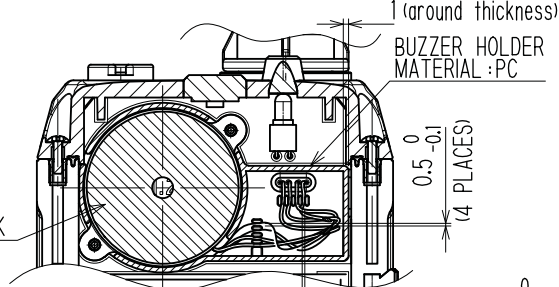


FILTER CASE  
MATERIAL:PC  
SURFACE AREA:397mm<sup>2</sup>

NIPPLE  
MATERIAL:STAINLESS STEEL

BUZZER  
E4-6991-5008-70-01K

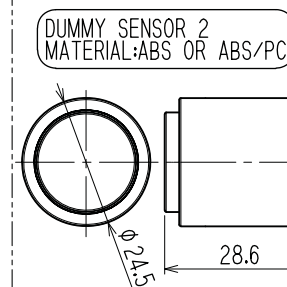
ALARM LAMP  
MATERIAL:PC  
SURFACE AREA:60cm<sup>2</sup>



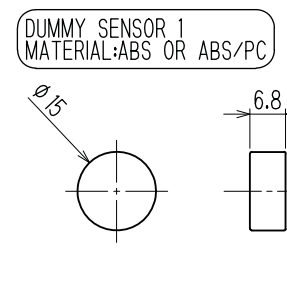
B-B SECTION

CABLE CLAMPING FOR BUZZER

SENSOR COVER  
ABS/PC ESC9448N(BLACK)  
RESISTANCE LESS THAN 1[GΩ]  
RIKEN TECHNOS CORP

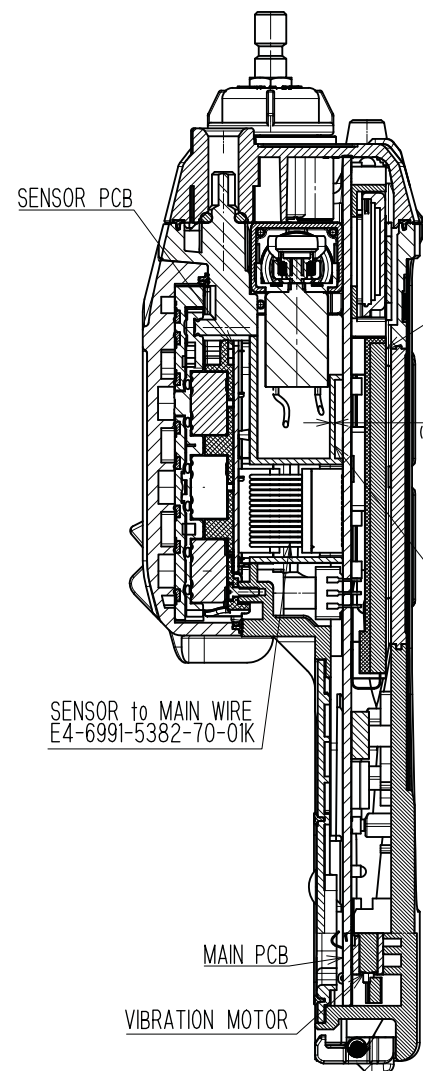


DUMMY SENSOR 2  
MATERIAL:ABS OR ABS/PC



DUMMY SENSOR 1  
MATERIAL:ABS OR ABS/PC

A-A SECTION



SENSOR PCB

LCD

1 (around thickness)

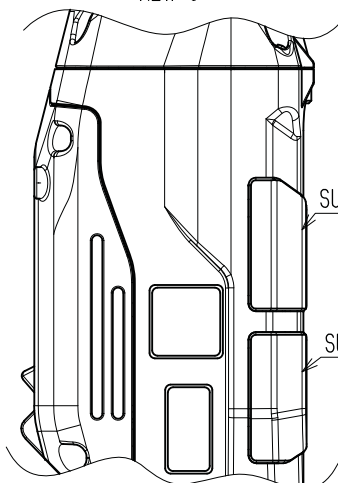
PUMP CASE  
MATERIAL:PC

SENSOR to MAIN WIRE  
E4-6991-5382-70-01K

MAIN PCB

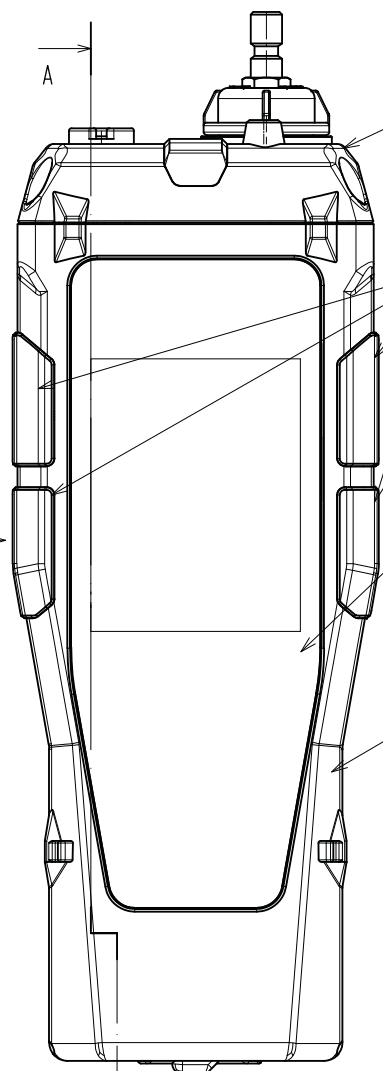
VIBRATION MOTOR

VIEW C



SURFACE AREA:290mm<sup>2</sup>

SURFACE AREA:290mm<sup>2</sup>



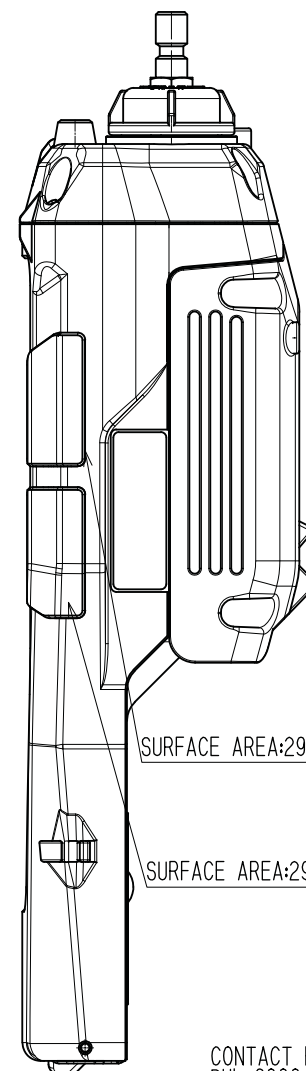
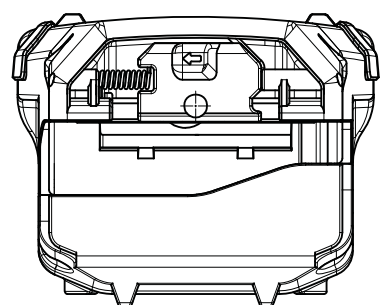
TOP COVER  
ABS/PC ESC9448N(BLACK)  
RESISTANCE LESS THAN 1[GΩ]  
RIKEN TECHNOS CORP

ALARM LAMP  
MATERIAL:PC

PANEL SHEET

△ PET ST-PET  
RESISTANCE LESS THAN 1[GΩ]  
ACHILLES CORP  
OR  
PET 300R  
RESISTANCE LESS THAN 1[GΩ]  
TOYOBO CO LTD

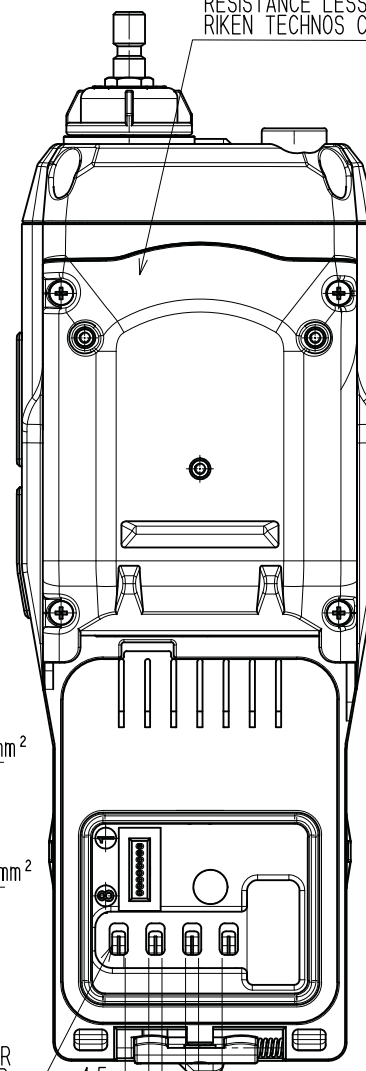
HOUSING  
ABS/PC ESC9448N(BLACK)  
RESISTANCE LESS THAN 1[GΩ]  
RIKEN TECHNOS CORP



SURFACE AREA:290mm<sup>2</sup>

SURFACE AREA:290mm<sup>2</sup>

CONTACT FOR  
BUL-6000 OR  
BUD-6000



SMART SENSOR 2  
M4-4486-01-01K  
OR  
M4-4630-20-01K  
OR  
M4-4830-01-01K  
OR  
DUMMY SENSOR 2

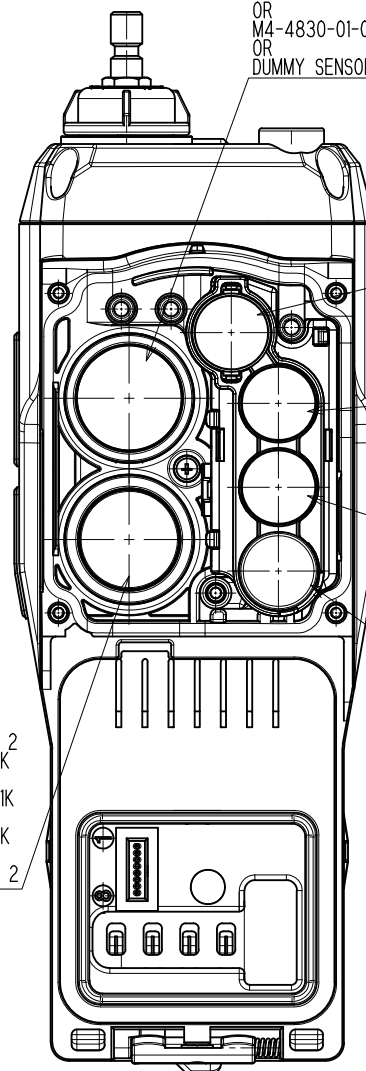


FIGURE WITHOUT SENSOR COVER.SENSOR PACKING

COMBUSTIBLE  
GAS SENSOR  
M3-4462-64-05K  
OR  
DUMMY SENSOR 1

TOXIC  
GAS SENSOR 1  
M4-4084-92-03K  
OR  
DUMMY SENSOR 1

TOXIC  
GAS SENSOR 2  
M4-4084-92-03K  
OR  
DUMMY SENSOR 1

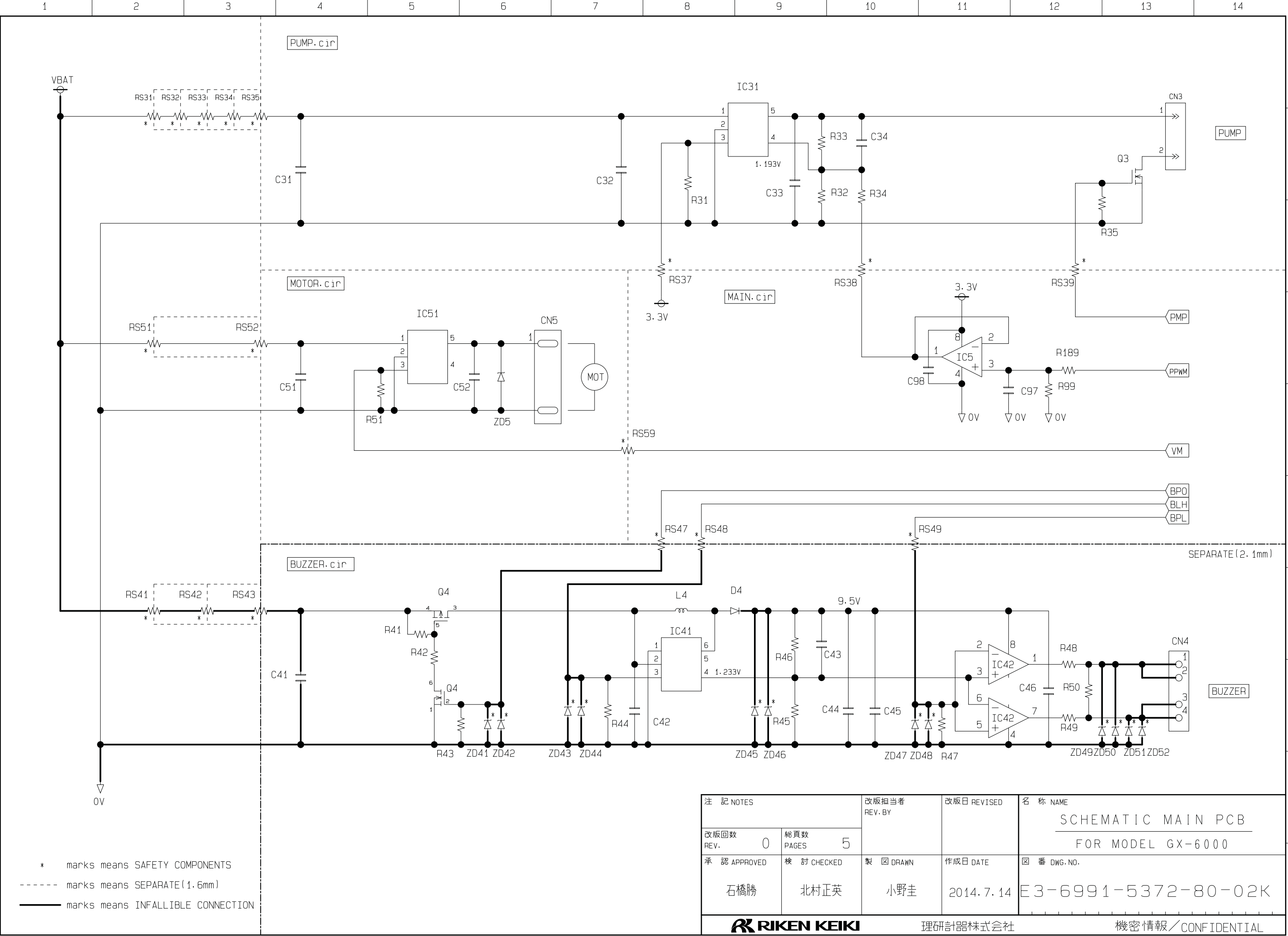
OXYGEN SENSOR  
M4-4080-82-07K  
OR  
DUMMY SENSOR 1

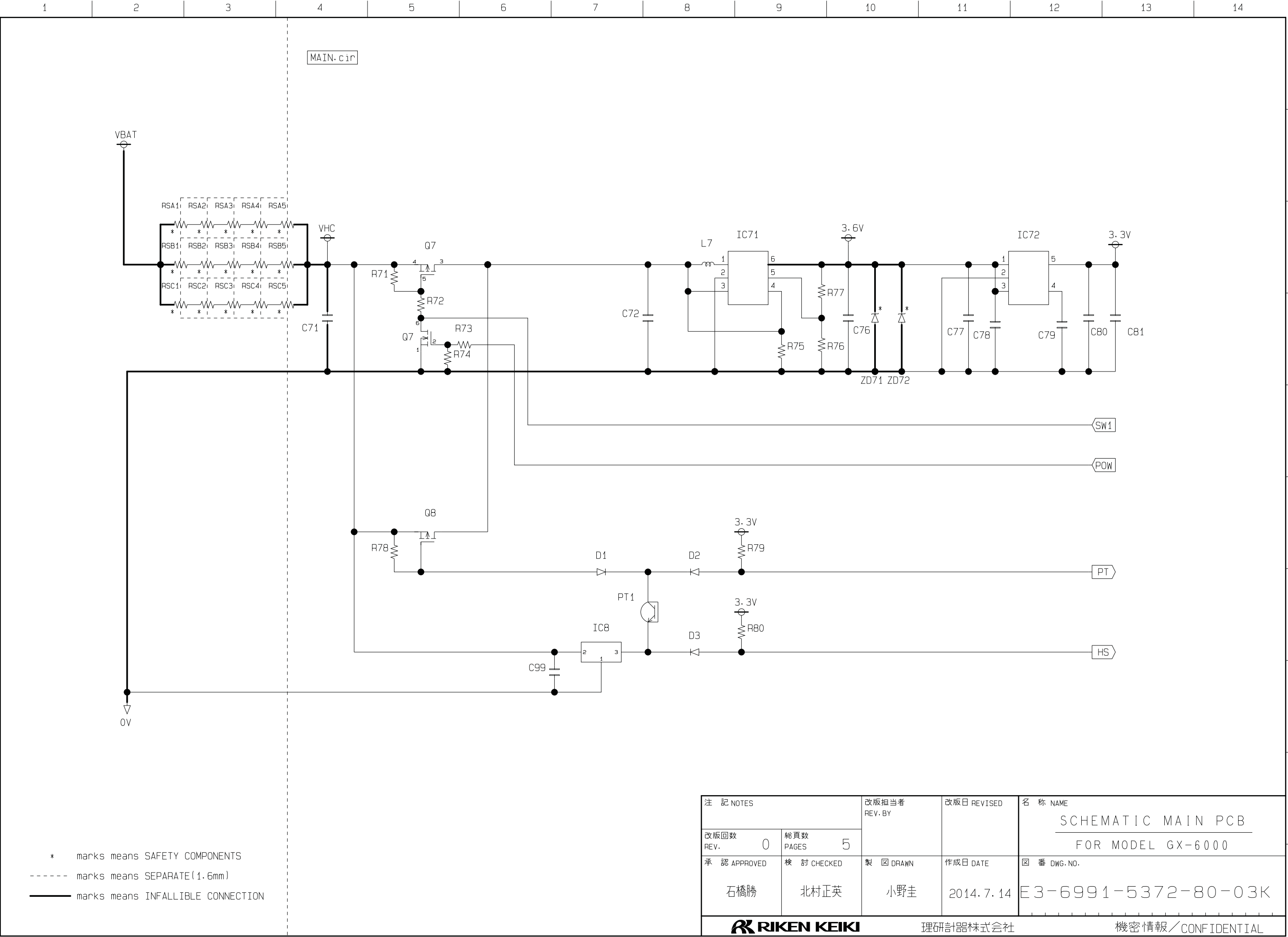
寸法	1000以下	500以下1000未満	250以下500未満	120以下250未満	50以下120未満	18以下50未満	15未満
精度	0.7	0.5	0.4	0.3	0.2	0.15	0.1
中級	1.2	1.0	0.8	0.6	0.4	0.3	0.2
粗級	2.5	2.0	1.6	1.2	0.8	0.6	0.4

表面処理 TREAT.	許容差 TOL.	尺度 SCALE	投影法 PROJECTION	名称 NAME
材質 MAT.		1:1		MAIN UNIT GX-6000
承認 APPROVED	検討 CHECKED	製図 DRAWN	作成日 DATE	図番 DWG. NO.
青良治	近藤晴彦	海野裕作	2014. 7. 22	M2-4777-01-01K













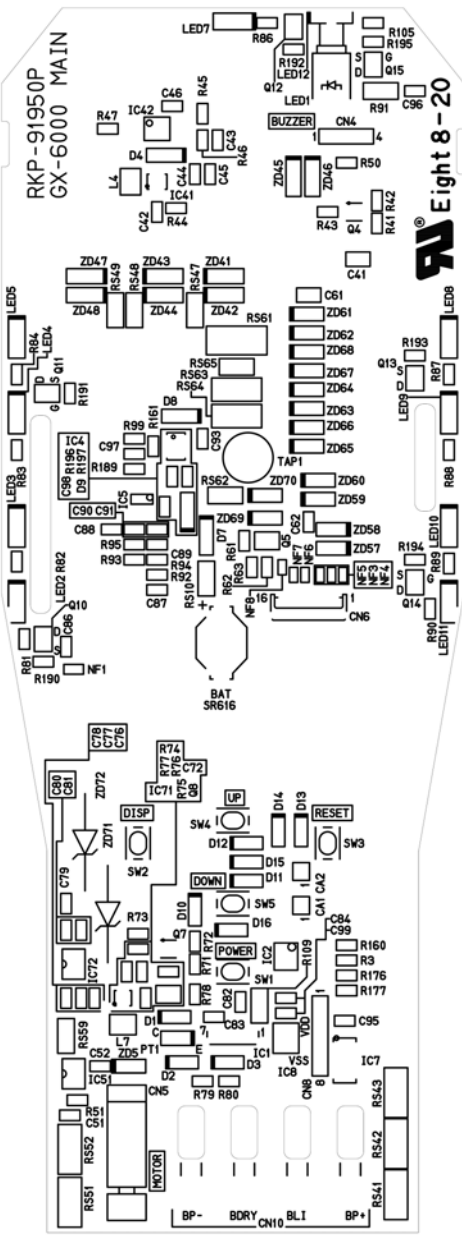


Mark of drawing		Kind of parts		Rating/Model of parts	Remarks
IC1		IC (IrDA module)		RPM841-H16	m
IC2		IC (IrDA encoder/decoder)		TIR1000IPW	m
IC3		IC (FRAM)		MB85RC256	m
IC4		IC (RTC)		RX-8564LC	m
IC5,9		IC (OPAMP)		S-89713B-K8T2	m
IC6		IC (Serial flash memory)		AT45DB081E-MHN	m
IC7		IC (Digital MEMS Accelerometer)		ADXL343	m
IC8		IC (Hole IC)		S-5716A –M3T1	m
IC10		IC (CPU)		R5F5210BBDFP	m
IC11,21		IC (DC/DC Converter)		TPS61020	m
IC71		IC (DC/DC Converter)		LTC3526	m
IC12,22,72		IC (Voltage regulator)		TPS73133	m
IC31		IC (Voltage regulator)		TPS79901	m
IC41		IC (DC/DC Converter)		TPS61041DRV	m
IC42		IC (Comparator)		TS3702IPT	m
IC51		IC (Voltage regulator)		S-1200B30-M5T1	m
Q1,2,4,7		N+Pch FET		NTLJD3119C	m
Q3		N-ch FET		SSM3K123TU	m
Q5,10-17		N-ch FET		SSM3K36TU or RUF025N02	m
Q8		P-ch FET		SSM3J130TU	m
NOTE	m marked parts are mounted or not.				
REV.	0	NAME	PARTS LIST OF MAIN PCB		
DATE	2014.7.14	DWG.No.	PLT-6991-5372-80 (1/4)		
RIKEN KEIKI CO., LTD.					

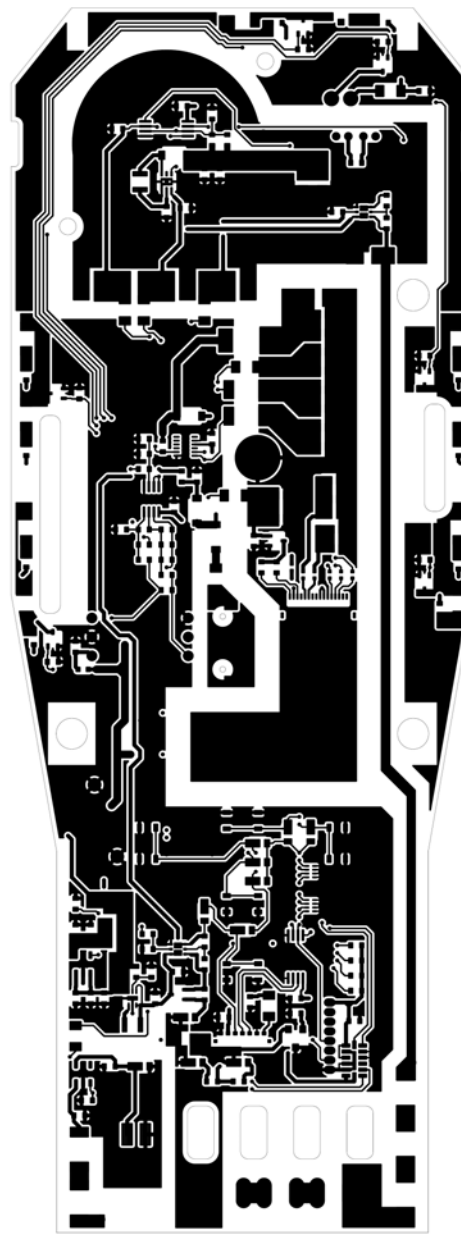
Mark of drawing	Kind of parts	Rating/Model of parts	Remarks
D1-3,10-16	Schottky barrier diode	RB160VA-40	m
D7	Schottky barrier diode	MMSD301, ON Semiconductor Vr = 30 V, If = 0.2 A	*
D4,8,9	Schottky barrier diode	MMSD301	m
ZD5	Zener diode	TFZ 5.1B	m
ZD61-70	Zener diode	TFZ 5.1B , ROHM Vz = 4.94 - 5.20V , 0.5W	*
ZD11,12,21,22	Zener diode	1SMB5918B, ON Semiconductor Vz = 4.84 - 5.36 V, 3W	*
ZD13,23	Zener diode	TFZ 6.8B	m
ZD41,42,43,44,47,48	Zener diode	KDZ4.7B , ROHM Vz = 4.70 – 5.20V , 1W	*
ZD45,46	Zener diode	KDZ11B , ROHM Vz = 11.0 – 12.3V , 1W	*
ZD49,50,51,52	Zener diode	KDZ15B , ROHM Vz = 14.7 – 16.5V , 1W	*
ZD57,58,59,60	Zener diode	TFZ 18B , ROHM Vz = 16.82 – 17.70V , 0.5W	*
ZD71,72	Zener diode	1N5338BG , ON Semiconductor Vz = 4.84 - 5.36 V, 5W	*
LED1	LED Lamp	HLMP-NW50 or NSPW300DS	m
LED2,3,4,5,7,8,9,10,11	LED Lamp	1105W	m
LED12	LED Lamp	HSMZ-C110	m
R1-3,5-9,11-16,21-26, R31-35,41-47,50,51, R61-63,71-84,86-90, R92-107,110-117,124, R130,131,140-142,160, R161,174,176,177, R182-186,189-199	Chip fixed resistor or Chip jumper	10 ohm-10M ohm / 1%, 0.1W or 50m ohm max, 1A (1608)	m
R48,49,91,109	Chip fixed resistor	2.2 ohm-100k ohm / 1%, 0.25W (3216)	m
RN1,2,3,4,5,6	Chip fixed resistor array	100 ohm-1M ohm x4 / 5%, 0.1W (1608 x 4)	m
NOTE	* marked parts are for safety. m marked parts are mounted or not. ( ) Parts size code		
REV.	3	NAME	PARTS LIST OF MAIN PCB
DATE	2014.12.16	DWG.No.	PLT-6991-5372-80 (2/4)
RIKEN KEIKI CO., LTD.			

Mark of drawing	Kind of parts	Rating/Model of parts	Remarks
RS11-15,21-25,31-35	Chip fixed resistor	RK73HW3ATTE1R30F, KOA 1.3ohm / 1%, 1W	*
RS37-39,47-49,59,62, R65,71,72,81,82,85-87, R91,92,95-97	Chip fixed resistor	ESR18EZPD1002, ROHM 10k ohm / 0.5%, 0.33W	*
RS10,83,84,93,94	Chip fixed resistor	MCR18EZPF1001, ROHM 1k ohm / 1%, 0.25W	*
RS41,42,43	Chip fixed resistor	RK73HW2HTTE4R70F, KOA 4.7 ohm / 1%, 0.75W	*
RS51,52	Chip fixed resistor	RK73HW2HTTE12R0F, KOA 12 ohm / 1%, 0.75W	*
RS61	Chip fixed resistor	RK73HW3ATTE62R0F, KOA 62 ohm / 1%, 1W	*
RS63,64	Chip fixed resistor	RK73HW2HTTE82R0F, KOA 82 ohm / 1%, 0.75W	*
RSA1-5,RSB1-5, RSC1-5	Chip fixed resistor	RPL18T2R7F,TAIYOSHA 2.7 ohm / 1%, 0.5W	*
C1-6,12,16,18,22,26, C28,32,42,46,78,80, C82,84-89,92,94,95, C97-99	Chip multilayer capacitor	0.1uF / 10% , 50V	m
C7,8,13,23,34,43, C90,91	Chip multilayer capacitor	10pF-1000pF / 10% , 50V	m
C9,17,27,79	Chip multilayer capacitor	0.01uF / 10% , 50V	m
C11,21,41,71	Chip multilayer capacitor	10uF / 10% , 10V	m
C14,24,51,52,72,77, C83,93,96	Chip multilayer capacitor	1uF / 10% , 25V	m
C15,19,25,29,31,33	Chip multilayer capacitor	2.2uF / 10% , 16V	m
C44	Chip multilayer capacitor	0.47uF / 10% , 25V	m
C45	Chip multilayer capacitor	0.22uF / 10% , 25V	m
C61,76,81	Chip multilayer capacitor	4.7uF / 10% , 16V	m
C62	Chip multilayer capacitor	33000pF / 10% , 50V	m
CA1,2,3	Chip multilayer capacitor array	0.01uF x4 / 20%, 50V	m
NOTE	* marked parts are for safety. m marked parts are mounted or not.		
REV.	1	NAME	PARTS LIST OF MAIN PCB
DATE	2014.11.5	DWG.No.	PLT-6991-5372-80 (3/4)
RIKEN KEIKI CO., LTD.			

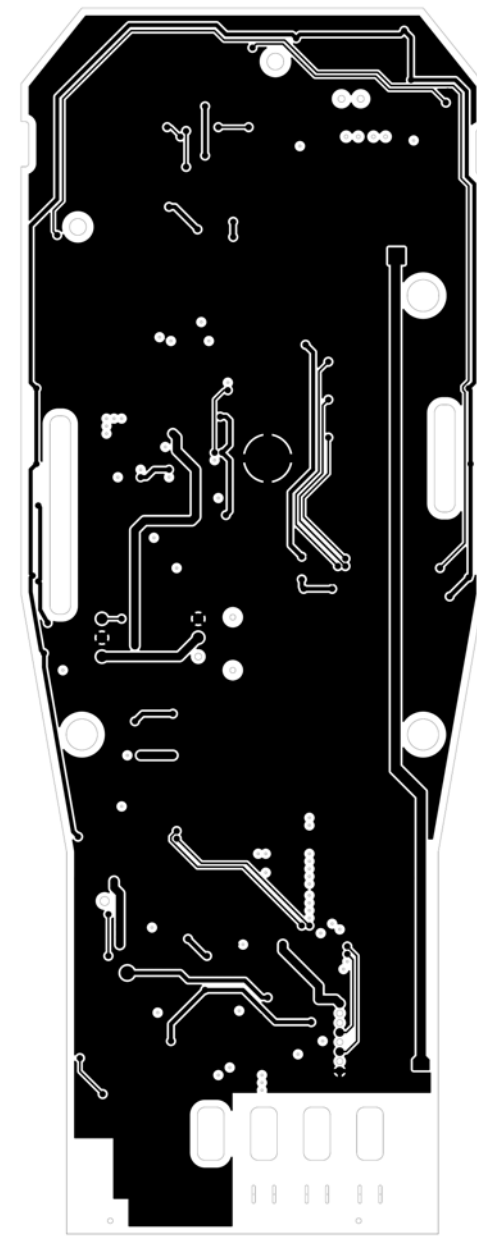
Mark of drawing	Kind of parts	Rating/Model of parts	Remarks
L1,2,4	Chip multilayer inductor	10uH / 30% (2520)	m
L7	Chip multilayer inductor	4.7uH / 30% (2520)	m
PT1	Photo transistor	PS1192HB	m
PS1	Pressure sensor	P-2000-101G	m
X1	Crystal	DSX321, 14.7456MHz	m
NF1,2	Noise filter	BLM18AG151	m
NF3-8	Noise filter	BLM15HD182	m
BAT	Silver oxide battery	SR616SW / Sony Vmax = 1.65V , Vtyp = 1.55V	*
LCD	LCD Module	BTD-128160B-FBWB / YEEBO	D
MOT	Vibration motor	A3BE-MT4 / SICOH	D
NOTE	* marked parts are for safety. m marked parts are mounted or not. D marked parts, refer to datasheet ( ) Parts size code		
REV.	0	NAME	PARTS LIST OF MAIN PCB
DATE	2014.7.14	DWG.No.	PLT-6991-5372-80 (4/4)
RIKEN KEIKI CO., LTD.			



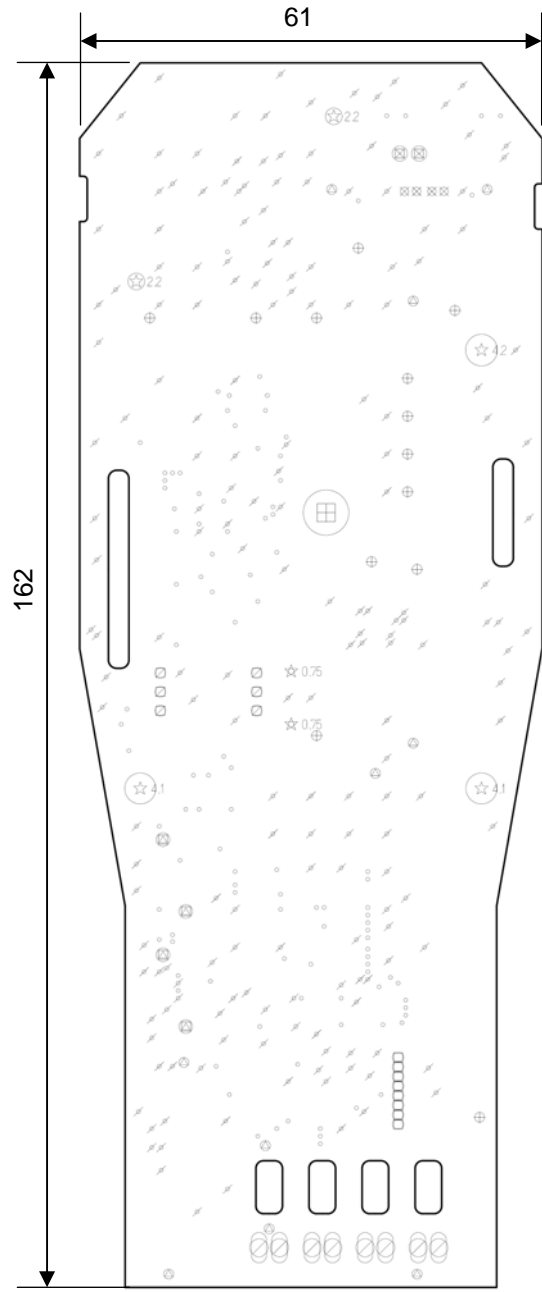
SILK PRINT FOR PARTS SIDE



PARTS SIDE



INNER LAYER(2 LAYER)



VIA HOLES FOR PARTS SIDE

SPECIFICATION FOR PCB

- PCB No. : RKP-91950P
- Material : Glass epoxy
- Thickness : 1.6mm
- Layer number : 4  
(2+2 BVH , Between layer#2 and #3 is 0.6mm.)
- Thickness copper film  
Surface : 35um , Inner : 35um
- Copper thickness of the via's : 35um above.
- Minimum conductor width : 0.2mm
- CTI : 100 above

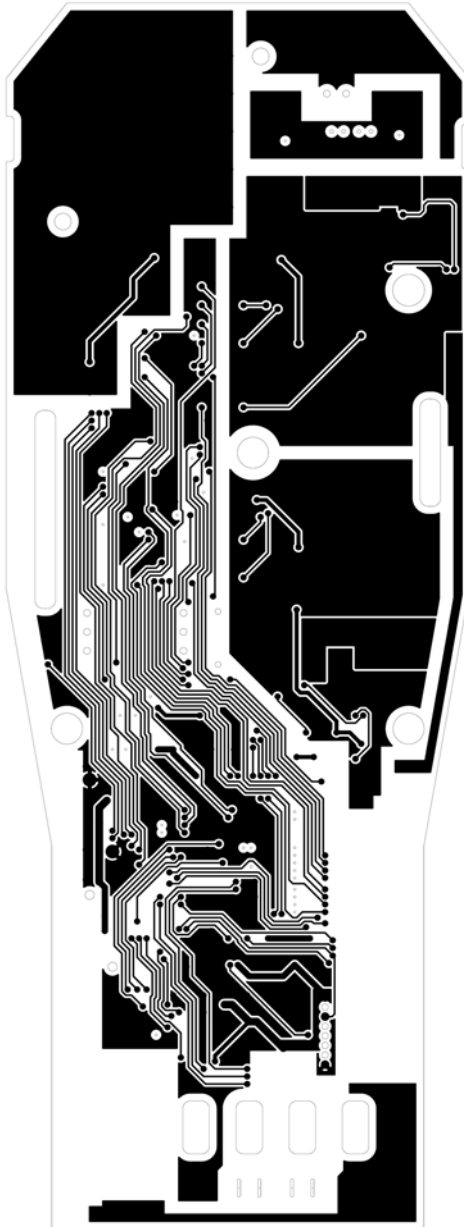
All drawings are view of parts side

SCALE 1:1

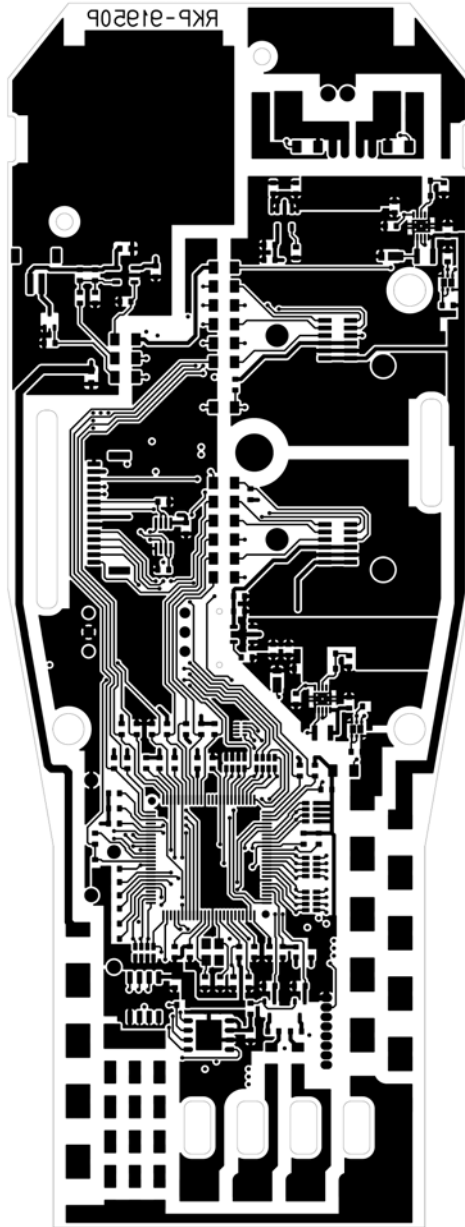
MARK	DIAGRAM	HOLE
○	φ 0.3	1-4VIA
/	φ 0.3	1-2VIA
×	φ 0.5	1-4VIA
△	φ 0.7	1-4VIA
+	φ 0.7	1-2VIA
□	φ 0.85	1-4VIA
▣	φ 0.9	1-4VIA
▤	φ 0.9	1-4VIA
▥	φ 1.2	1-4VIA
▧	φ 4.1	1-4VIA
⊗	φ 0.4×2.4	1-4VIA
☆0.75	φ 0.75	NTH
☆2.2	φ 2.2	NTH
☆4.1	φ 4.1	NTH
☆4.2	φ 4.2	NTH

注 記 NOTES		改版担当者 REV. BY	改版日 REVISED	名 称 NAME <b>MAIN PCB</b> <b>FOR MODEL GX-6000</b>
改版回数 REV.	0	総頁数 PAGES	2	
承認 APPROVED	検 討 CHECKED	製 図 DRAWN	作成日 DATE	図 番 DWG. NO.
石橋勝	北村正英	小野圭	2014.7.14	E 3 - 6 9 9 1 - 5 3 7 2 - 8 0 - 0 1 A
RIKEN KEIKI 理研計器株式会社 機密情報 / CONFIDENTIAL				

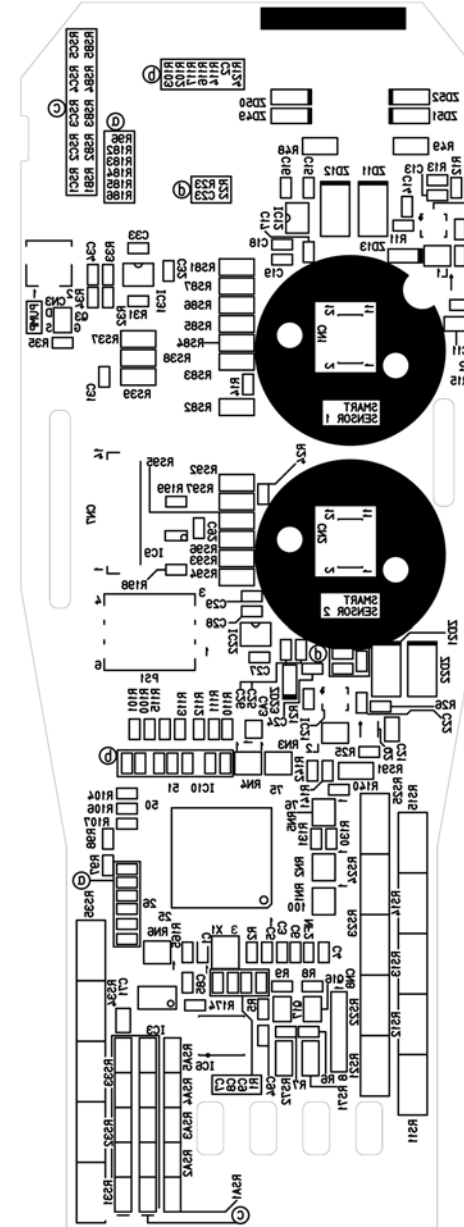




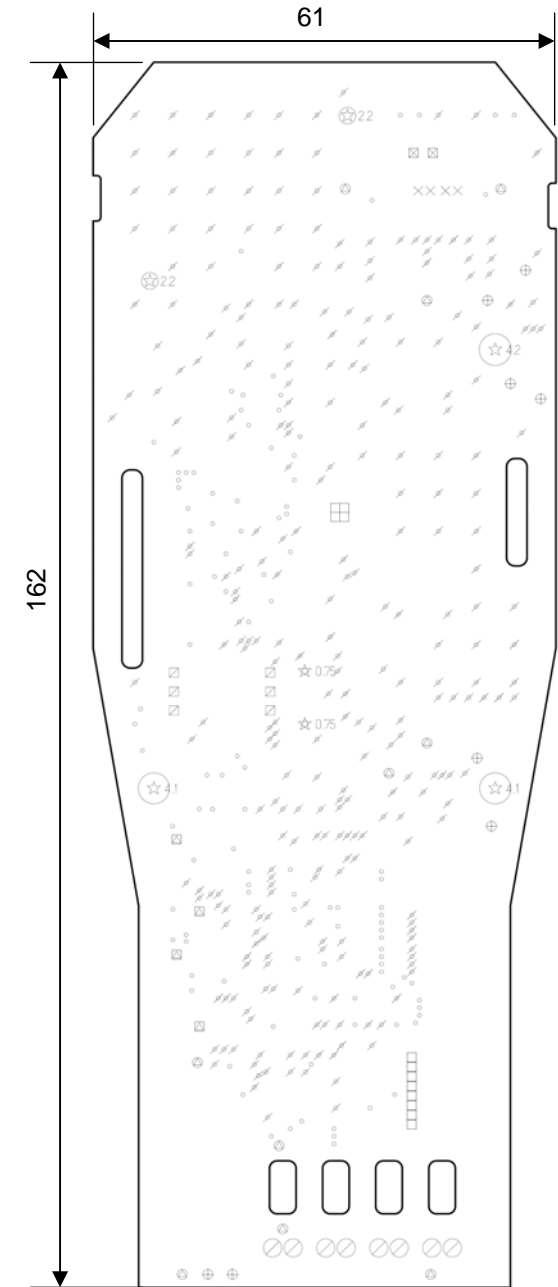
INNER LAYER(3 LAYER)



SOLDERING SIDE



SILK PRINT FOR SOLDERING SIDE



VIA HOLES FOR SOLDERING SIDE

SPECIFICATION FOR PCB

- PCB No. : RKP-91950P
- Material : Glass epoxy
- Thickness : 1.6mm
- Layer number : 4  
(2+2 BVH , Between layer#2 and #3 is 0.6mm.)
- Thickness copper film  
Surface : 35um , Inner : 35um
- Copper thickness of the via's : 35um above.
- Minimum conductor width : 0.2mm
- CTI : 100 above

All drawings are view of parts side

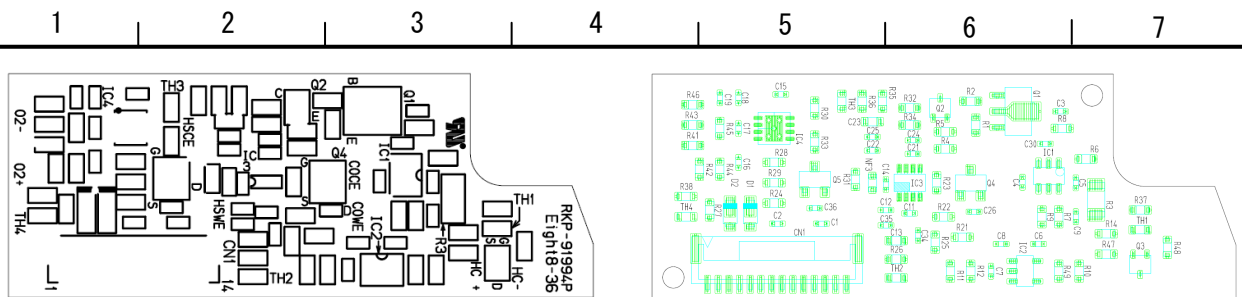
SCALE 1:1

MARK	DIAGRAM	HOLE
○	φ 0.3	1-4VIA
／	φ 0.3	3-4VIA
×	φ 0.5	1-4VIA
△	φ 0.7	1-4VIA
+	φ 0.7	3-4VIA
□	φ 0.85	1-4VIA
▣	φ 0.9	1-4VIA
⊠	φ 0.9	1-4VIA
⊞	φ 1.2	1-4VIA
⊞	φ 4.1	1-4VIA
⊞	φ 0.4×2.4	1-4VIA
☆0.75	φ 0.75	NTH
☆2.2	φ 2.2	NTH
☆4.1	φ 4.1	NTH
☆4.2	φ 4.2	NTH

注 記 NOTES		改版担当者 REV. BY	改版日 REVISED	名 称 NAME
改版回数 REV.	0	総頁数 PAGES	1	MAIN PCB FOR MODEL GX-6000
承認 APPROVED	石橋勝	検討 CHECKED	北村正英	
製 図 DRAWN	小野圭	作成日 DATE	2014.7.14	図 番 DWG. NO.
E 3 - 6 9 9 1 - 5 3 7 2 - 8 0 - 0 2 A				

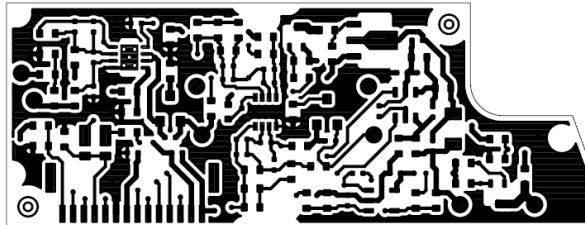


Mark of drawing	Kind of parts	Rating/Model of parts	Remarks
IC1	IC (A/D Converter)	ADS1110A0IDBV	m
IC2	IC (OPAMP)	OPA333AIDBV	m
IC3	IC (OPAMP)	OPA2379AIDCN	m
IC4	IC (OPAMP)	OPA2333AIDR	m
Q1	PNP Transistor	2SB1115	m
Q2	NPN Transistor	2SD2700	m
Q3	N-ch FET	SSM3K123TU	m
Q4,5	N-ch J-FET	2SK209	m
D1,2	Schottky barrier diode	RB160VA-40	m
R1,2,4-12,14,22-30, R32-38,41-47, TH1,2,3,4	Chip fixed resistor or Chip jumper or Chip thermistor	3.3 ohm-10M ohm / 1%, 0.1W or 50m ohm max, 1A or (1608) Rt25 = 470 ohm -100 k ohm / 5%, B=3000K-5000K (1608)	m
R3	Chip fixed resistor	1 ohm - 100 ohm / 1%, 0.25W (3216)	m
NF3,R21,R31	Noise filter	BLM18AG151	m
C1,2,3	Chip multilayer capacitor	1uF / 10%, 10V	m
C4-8,14-16,19	Chip multilayer capacitor	0.1uF / 10%, 25V	m
C9,11,12,17,18,21,22 C24,25,26,34,35,36	Chip multilayer capacitor	10pF-1000pF / 10%, 50V	m
C13,23	Chip multilayer capacitor	4.7uF / 10%, 10V	m
C30	Chip multilayer capacitor	0.01uF / 10%, 25V	m
NOTE	* marked parts are for safety. m marked parts are mounted or not. ( ) Parts size code		
REV.	2	NAME	PARTS LIST OF SENSOR PCB
DATE	2014.12.16	DWG.No.	PLT-6991-5373-50 (1/1)
RIKEN KEIKI CO., LTD.			

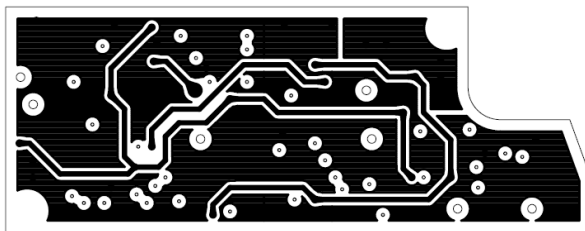


SILK PRINT FOR PARTS SIDE

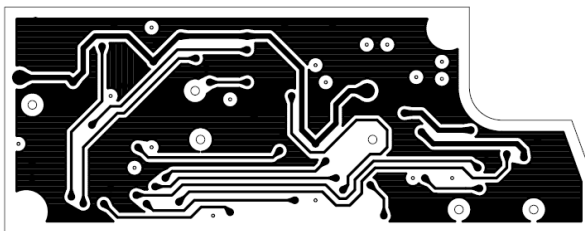
PARTS REFERENCE



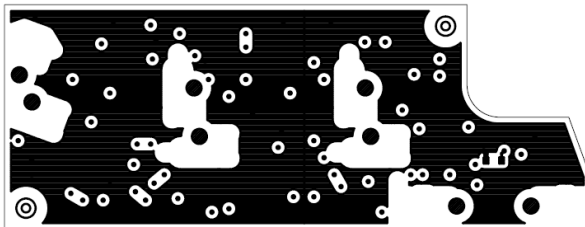
PARTS SIDE



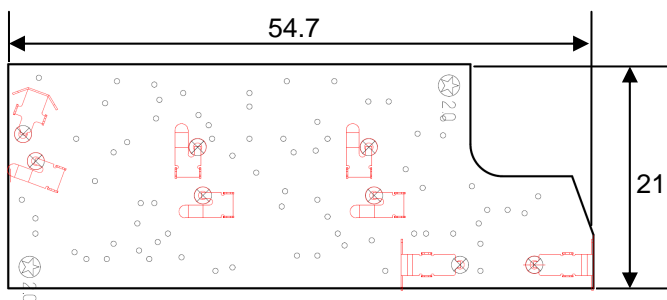
INNER LAYER(2 LAYER)



INNER LAYER(3 LAYER)



SOLDERING SIDE



VIA HOLES FOR SOLDERING SIDE

#### SPECIFICATION FOR PCB

- PCB No. : RKP-91994P
- Material : Glass epoxy
- Thickness : 1.0mm
- Layer number : 4
- Thickness copper film  
Surface : 35um , Inner : 35um
- Copper thickness of the via's : 35um above.
- Minimum conductor width : 0.2mm
- CTI : 100 above

MARK	DIAGRAM	HOLE
○	φ 0.3	1-4VIA
×	φ 0.8	1-4VIA
☆2.0	φ 2.0	NTH

All drawings are view of parts side  
SCALE =  $\sqrt{2} : 1$

注 記 NOTES		改版担当者 REV. BY	改版日 REVISED	名 称 NAME
Add C26,C30,C36		小野圭	2014.11.5	<b>SENSOR PCB</b>
改版回数 REV.	総頁数 PAGES	1	1	<b>FOR MODEL GX-6000</b>
承認 APPROVED	検 討 CHECKED	製 図 DRAWN	作成日 DATE	図 番 DWG. NO.
石橋勝	北村正英	小野圭	2014.7.14	E 4 - 6 9 9 1 - 5 3 7 3 - 5 0 - 0 1 A

1 2 3 4 5 6 7

A

B

C

D

E

F

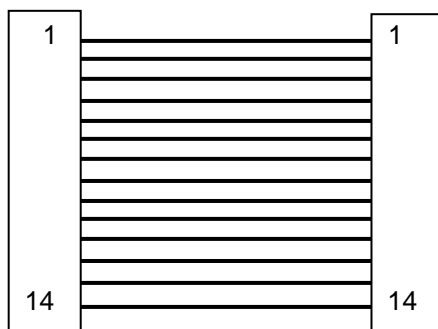
G

H

I

CN1  
CONNECTOR  
Model : NSHR-14V-S  
Manufacturer : JST

CN2  
CONNECTOR  
Model : NSHR-14V-S  
Manufacturer : JST



Wire : UL1571 AWG30  
Maximum wire length : 40mm

注 記 NOTES		改版担当者 REV. BY	改版日 REVISED	名 称 NAME
改版回数 REV.	0			<b>SENSOR to MAIN WIRE</b> <b>FOR MODEL GX-6000</b>
総頁数 PAGES	1	製 図 DRAWN	作成日 DATE	図 番 DWG. NO.
承認 APPROVED	検 討 CHECKED			E 4 - 6 9 9 1 - 5 3 8 2 - 7 0 - 0 1 K
石橋勝	北村正英	小野圭	2014.7.14	



1 2 3 4 5 6 7

A

B

C

D

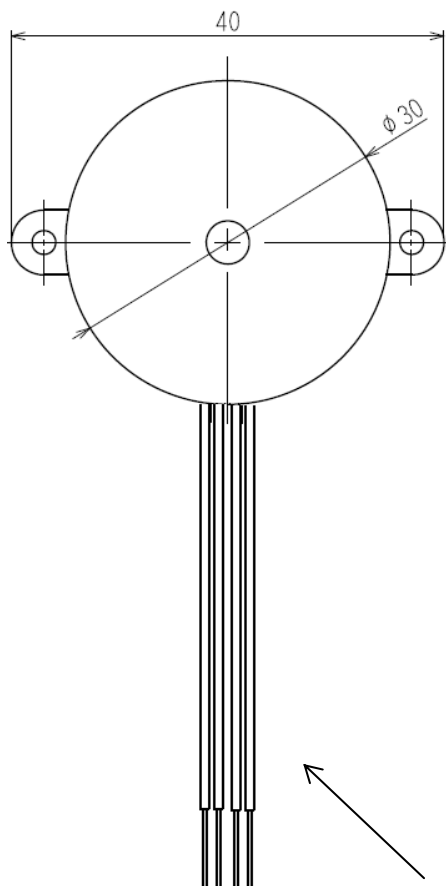
E

F

G

H

I



Cable: UL1571 , AWG32  
Maximum length : 45mm

Piezo elements : M274C4  
Manufacturer : NIHON CERATEC  
Capacitance : 22 nF / 30%

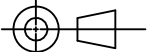
SCALE  $\sqrt{2}$ :1

注 記 NOTES		改版担当者 REV.BY	改版日 REVISED	名 称 NAME
改版回数 REV.	0			Buzzer
総頁数 PAGES	1			BZ-9K
承認 APPROVED	検討 CHECKED	製 図 DRAWN	作成日 DATE	図 番 DWG.NO.
石橋勝	北村正英	小暮晋祐	2011.02.28	E 4 - 6 9 9 1 - 5 0 0 8 - 7 0 - 0 1 K



K

L

表面処理 TREAT.	許容差 TOL.	尺 度 SCALE	投影法 PROJECTION	名 称 NAME
材 質 MAT.		2 : 1		COMBUSTIBLE GAS SENSOR △ NC SENSOR
承 認 APPROVED	検 討 CHECKED	製 図 DRAWN	作成日 DATE	図 番 DWG. NO.
田島秀二	青良治	中村幸男	2007. 3. 16	M3-4462-64-05K
理研計器株式会社			RIKEN KEIKI CO.,LTD.	

[illegible]

寸法	精細 0.1	中級 0.2	粗級 0.4	18以上50未満 0.15 0.3 0.6	50以上120未満 0.2 0.4 0.8	120以上260未満 0.3 0.6 1.2	260以上500未満 0.4 0.8 1.6	500以上1000未満 0.5 1.0 2.0	1000以上 0.7 1.2 2.5
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CAP(-)  
MATERIAL: STAINLESS STEEL

Ø 15

6.8

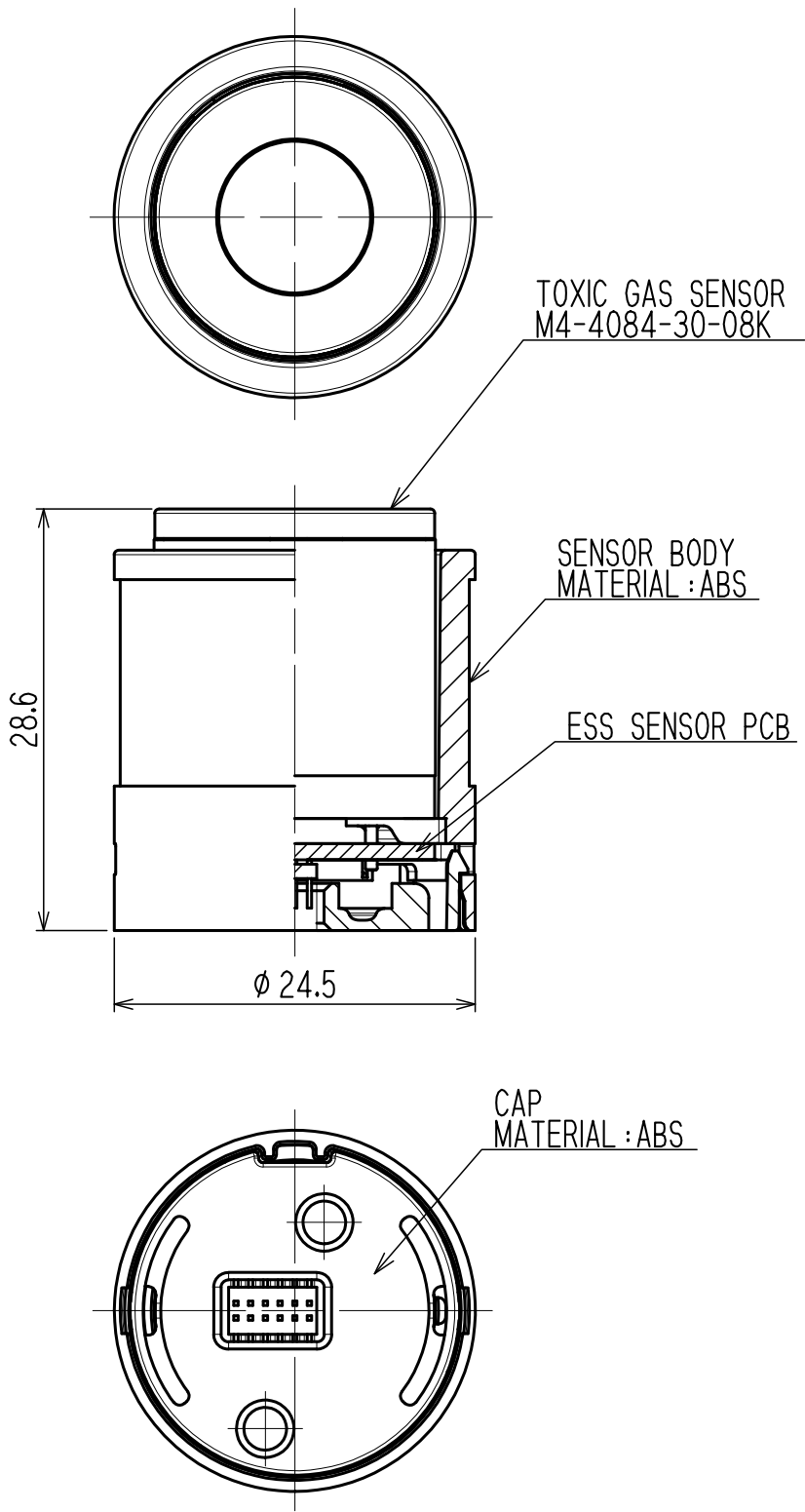
BOTTOM CAP(+)  
MATERIAL: COPPER ALLOY

Output specification  
 ・Open circuit voltage : 0.5V(max)  
 ・Short circuit current : 0.1mA(max)

CAPACITANCE ≒ 0

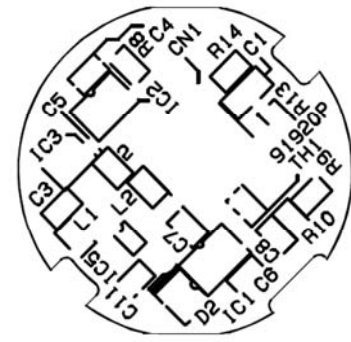
△		記 事		年 月 日	訂 正 者
表面処理 TREAT.		許容差 TOL.	尺 度 SCALE	投影法 PROJECTION	名 称 NAME
材 質 MAT.		2 : 1	2 : 1		OXYGEN SENSOR
承認 APPROVED	検 討 CHECKED				製 図 DRAWN
青良治	近藤晴彦	海野裕作	2014. 7. 30	M4-4080-82-07K	
RIKEN KEIKI		理研計測株式会社		機密情報 / CONFIDENTIAL	

寸法	18未満	18以上50未満	50以上120未満	120以上260未満	260以上500未満	500以上1000未満	1000以上
許容差	精 0.1 中 0.2 粗 0.4	0.15 0.3 0.6	0.2 0.4 0.8	0.3 0.6 1.2	0.4 0.8 1.6	0.5 1.0 2.0	0.7 1.2 2.5

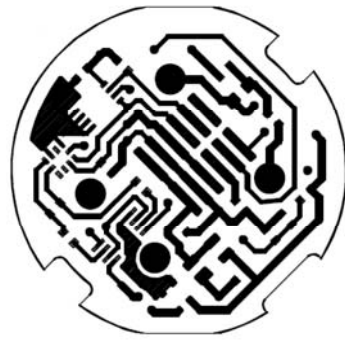


表面処理 TREAT.		許容差 TOL.	尺 度 SCALE	投影法 PROJECTION	△	記 事	年 月 日	訂 正 者
材 質 MAT.					名 称 NAME			
			2 : 1		SMART SENSOR Type-ESS			
承認 APPROVED	検 討 CHECKED	製 図 DRAWN	作成日 DATE	図 番 DWG. NO.				
青良治	近藤晴彦	武井康典	2014. 7. 30	M4-4486-01-01K				
RIKEN KEIKI			理研計測株式会社		機密情報 / CONFIDENTIAL			





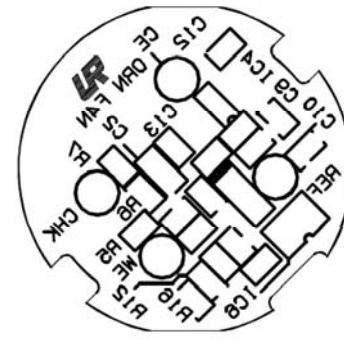
SILK PRINT FOR PARTS SIDE



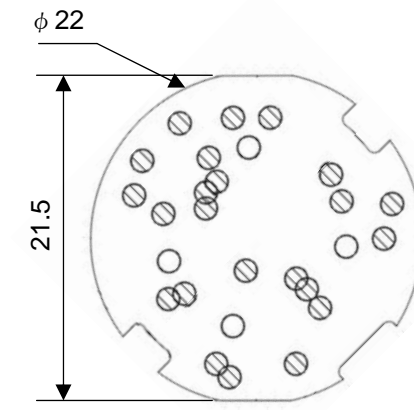
PARTS SIDE



SOLDERING SIDE



SILK PRINT FOR SOLDERING SIDE



THROUGH HOLE DATA

MARK	DIAGRAM	HOLE
①	φ 0.3	TH
○	φ 1.0	TH

SPECIFICATION FOR PCB

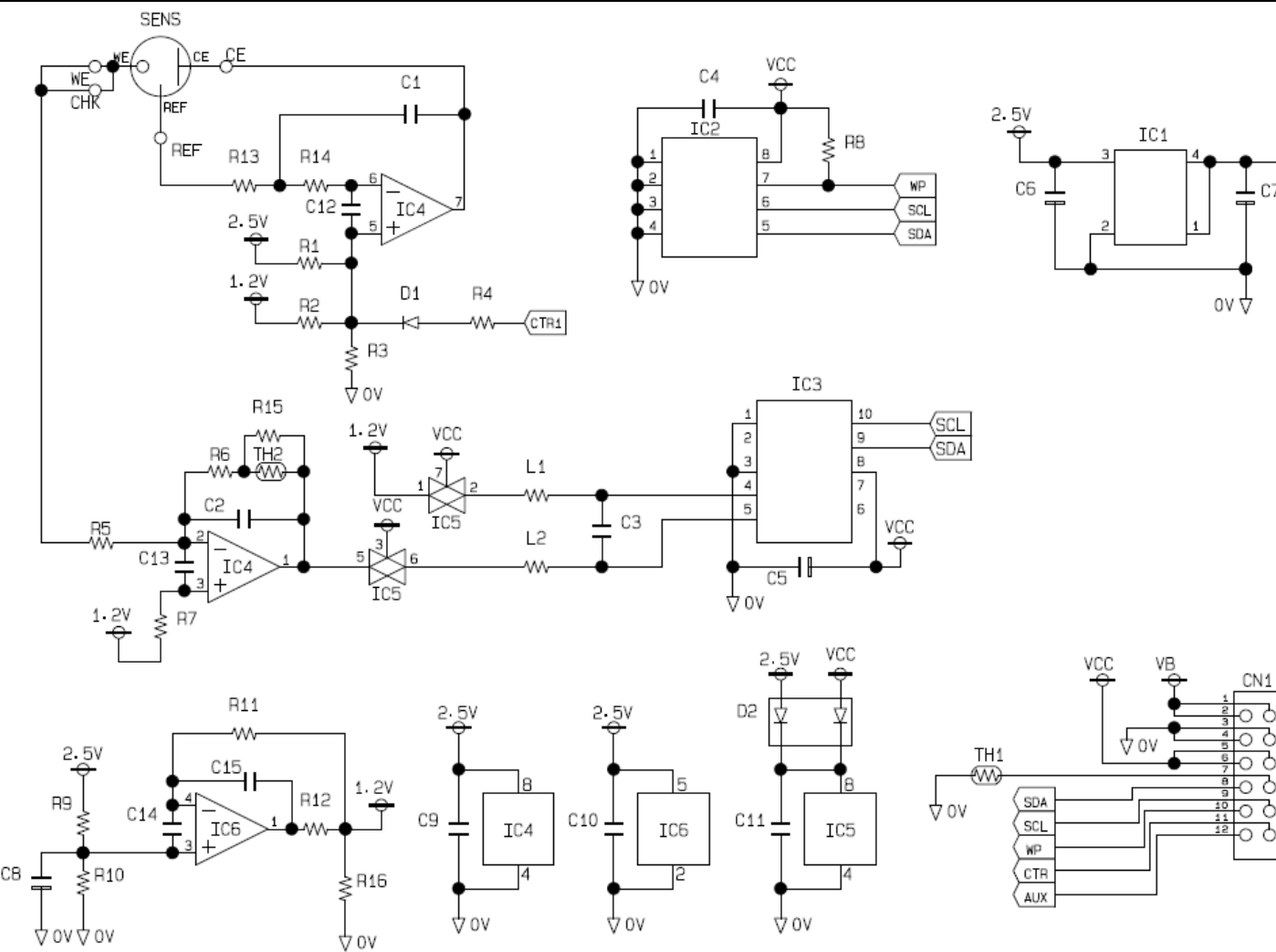
- PCB No. : RKP-91920P
- Material : Glass epoxy
- Thickness : 1.2mm
- Layer number : 2
- Thickness copper film : 18um
- Minimum conductor width : 0.2mm
- CTI : 100 above

All drawings are view of parts side  
SCALE 2:1

PARTS LIST

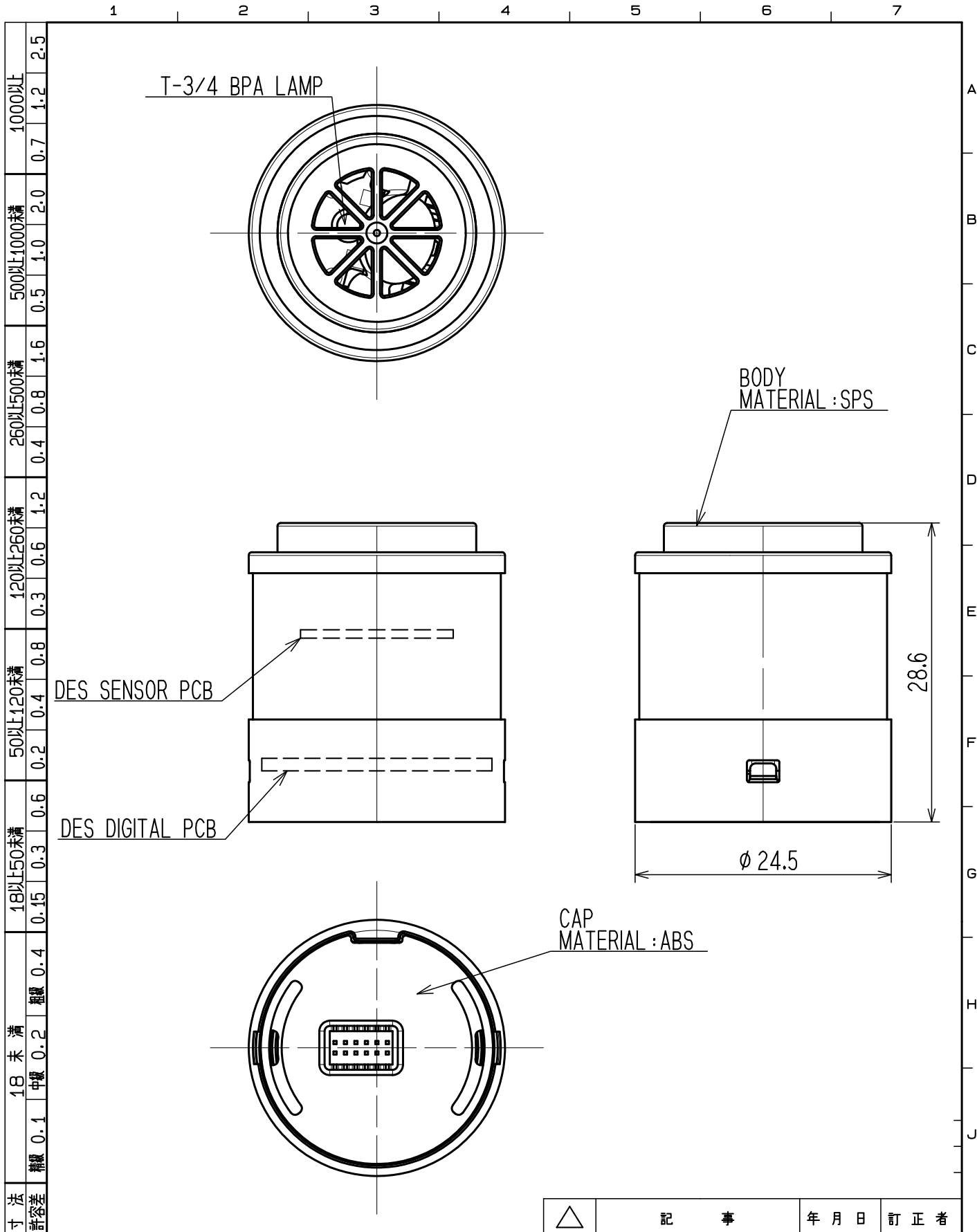
Mark of drawing	Kind of parts	Rating / Model of parts	Remarks
IC1	IC (Voltage regulator)	S-1313D25-N4T1	m
IC2	IC (EEPROM)	S-24C16CI-I8T1	m
IC3	IC (A/D Converter)	ADS1114IRU	m
IC4	IC (OPAMP)	LT6004CMS8	m
IC5	IC (Logic)	HD74ALVC2G66	m
IC6	IC (OPAMP)	AD8500AKS	m
D1	Diode	1SS355	m
D2	Diode array	RB480Y (2elements)	m
TH1	Chip thermistor	Rt25 = 470 ohm -100 k ohm / 5%, B=3000K-5000K (1005)	m
R1-16	Chip fixed resistor or Chip jumper	10 ohm - 1M ohm / 1%, 0.063W or 50m ohm max,1A (1005 )	m
C1,2	Chip multilayer capacitor	10uF / 10%, 6.3V	m
C4,5,6,7,9,10,11	Chip multilayer capacitor	0.1uF / 10%, 16V	m
C3,8,12,13,14	Chip multilayer capacitor	10pF-1000pF / 10%, 50V	m
C15	Chip multilayer capacitor	1uF / 10%, 10V	m
L1,2	Chip fixed resistor or Chip jumper or Noise filter	10 ohm - 1M ohm / 1%, 0.063W or 50m ohm max,1A (1005 ) or BLM15HD182	m

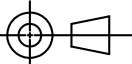
m marked parts are mounted or not



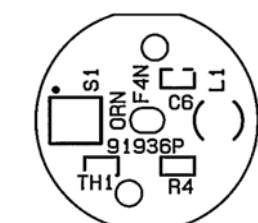
SCHEMATIC

注 記 NOTES		改版担当者 REV. BY	改版日 REVISED	名称 NAME <b>ESS SENSOR PCB</b>
改版回数 REV.	0	総頁数 PAGES	1	
承認 APPROVED	検 討 CHECKED	製 図 DRAWN	作成日 DATE	図 番 DWG. NO.
石橋勝	北村正英	小野圭	2014.7.14	<b>E 3 - 6 9 9 1 - 5 3 8 4 - 1 0 - 0 1 K</b>

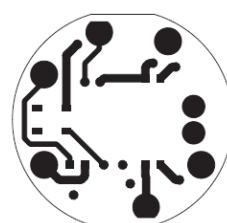


表面処理 TREAT.		許容差 TOL.	尺 度 SCALE	投影法 PROJECTION	名 称 NAME
材 質 MAT.					
			2 : 1		SMART SENSOR Type-DES
承認 APPROVED	検 討 CHECKED	製 図 DRAWN	作成日 DATE	図 番 DWG. NO.	
青良治	武井康典	近藤晴彦	2014. 7. 24	M4-4630-20-01K	
RIKEN KEIKI		理研計測株式会社		機密情報 / CONFIDENTIAL	





SILK PRINT  
FOR PARTS SIDE



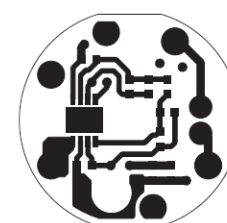
PARTS SIDE



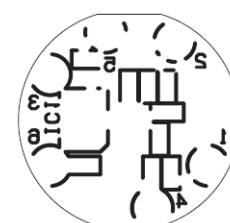
Lay.2



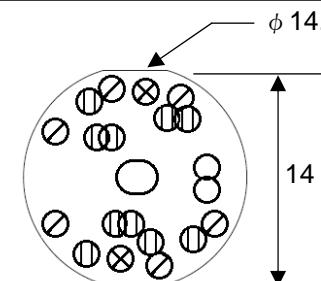
Lay.3



SOLDERING SIDE



SILK PRINT FOR  
SOLDERING SIDE

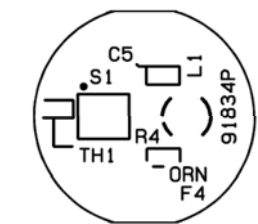


THROUGH HOLE  
DATA

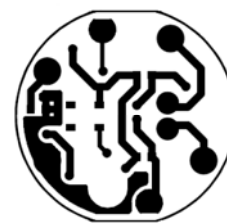
MARK	DIAGRAM	HOLE
⊙	φ 0.3	TH
○	φ 0.5	TH
⊗	φ 0.8	TH
⊗	φ 1.7	NTH

**SPECIFICATION FOR PCB**

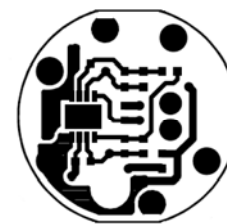
- PCB No. : RKP-91936P
- Material : Glass epoxy
- Thickness : 0.8mm
- Layer number : 4
- Thickness copper film : 18um
- Minimum conductor width : 0.2mm
- CTI : 100 above



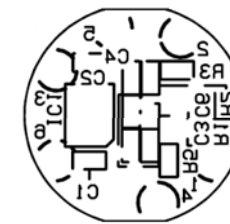
SILK PRINT  
FOR PARTS SIDE



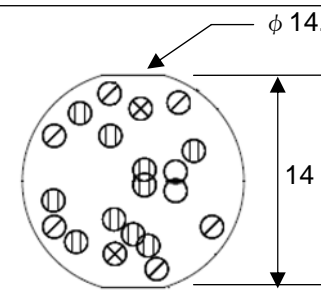
PARTS SIDE



SOLDERING SIDE



SILK PRINT FOR  
SOLDERING SIDE



THROUGH HOLE  
DATA

MARK	DIAGRAM	HOLE
⊙	φ 0.3	TH
○	φ 0.5	TH
⊗	φ 0.8	TH
⊗	φ 1.7	NTH

**SPECIFICATION FOR PCB**

- PCB No. : RKP-91834P
- Material : Glass epoxy
- Thickness : 0.8mm
- Layer number : 2
- Thickness copper film : 18um
- Minimum conductor width : 0.2mm
- CTI : 100 above

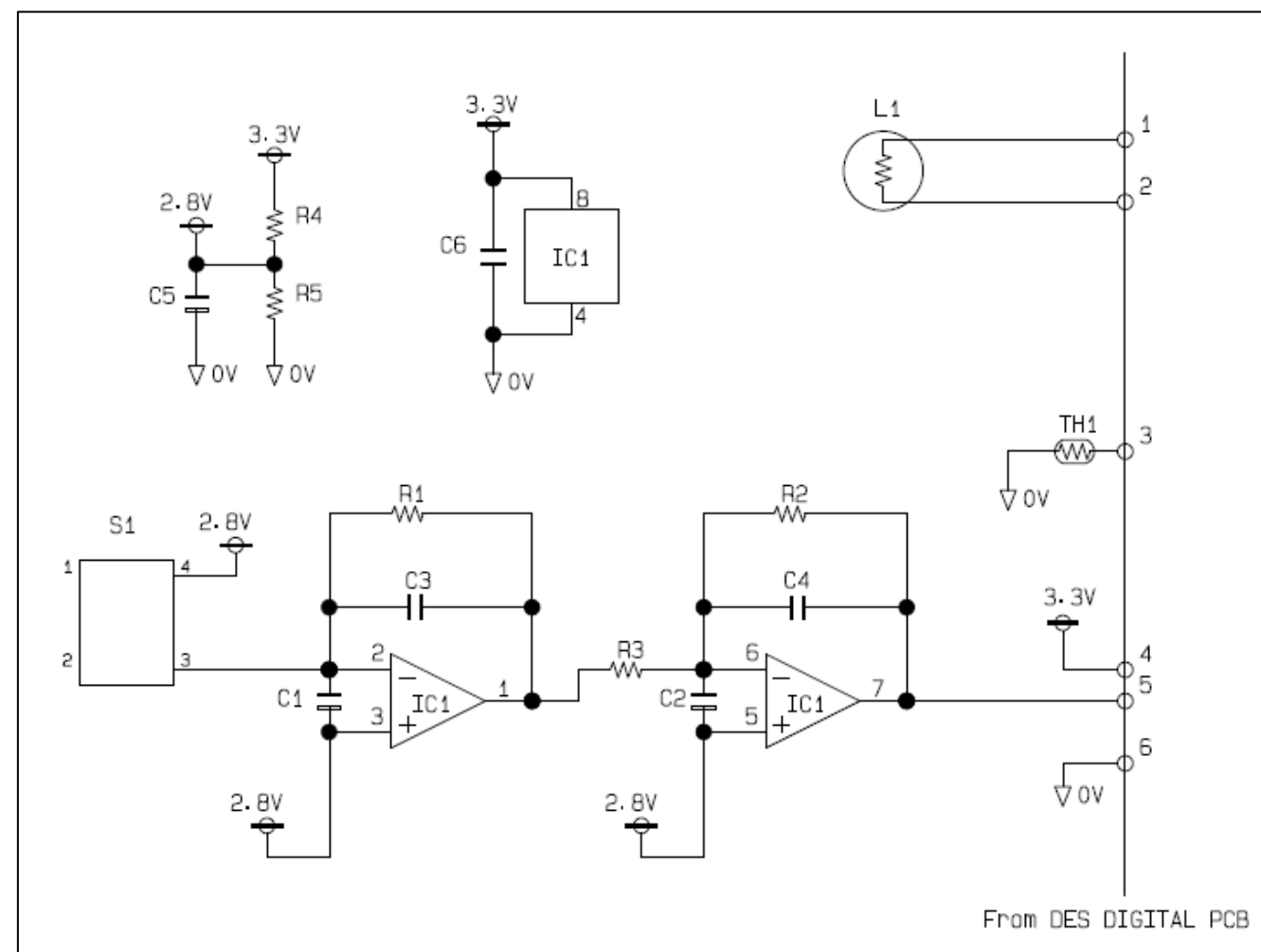
All drawings are view of parts side

SCALE 2:1

**PARTS LIST**

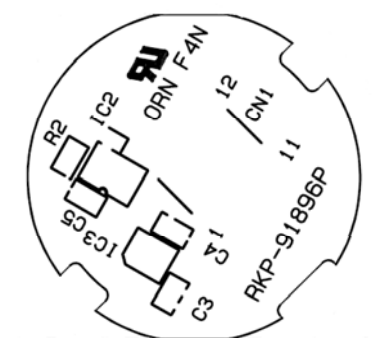
Mark of drawing	Kind of parts	Rating / Model of parts	Remarks
S1	IR Sensor	IR1011	
IC1	IC (OPAMP)	LTC2055HDD	m
TH1	Chip thermistor	Rt25 = 470 ohm -100 k ohm / 5%, B=3000K-5000K (1005)	m
R1,2,3,4,5	Chip fixed resistor or Chip jumper	10 ohm - 1M ohm / 1%, 0.063W or 50m ohm max,1A (1005)	m
C1,2	Chip multilayer capacitor	10pF-1000pF / 10%, 50V	m
C3	Chip multilayer capacitor	0.01uF / 10%, 25V	m
C4,5,6	Chip multilayer capacitor	0.1uF / 10%, 25V	m
L1	T-3/4 BPA LAMP	OL-8270BPA refer to E4-6991-5129-60-01K	

m marked parts are mounted or not



SCHEMATIC

注記 NOTES		改版担当者 REV. BY		改版日 REVISED DATE	
Add RKP-91936P		小野圭		2015.5.25	
改版回数 REV.	1	総頁数 PAGES	1	DES SENSOR PCB	
承認 APPROVED	石橋勝	検討 CHECKED	北村正英	製図 DRAWN	小野圭
		作成日 DATE		図番 DWG. NO.	
		2014.7.14		E3-6991-5385-90-01K	



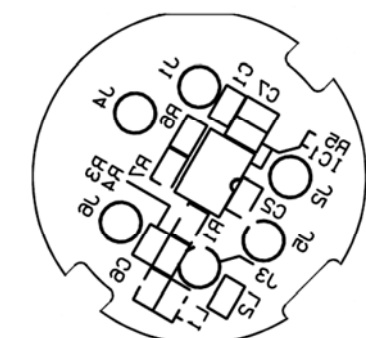
SILK PRINT FOR PARTS SIDE



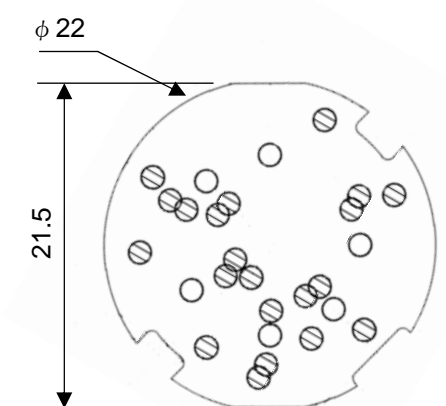
PARTS SIDE



SOLDERING SIDE



SILK PRINT FOR SOLDERING SIDE



THROUGH HOLE DATA

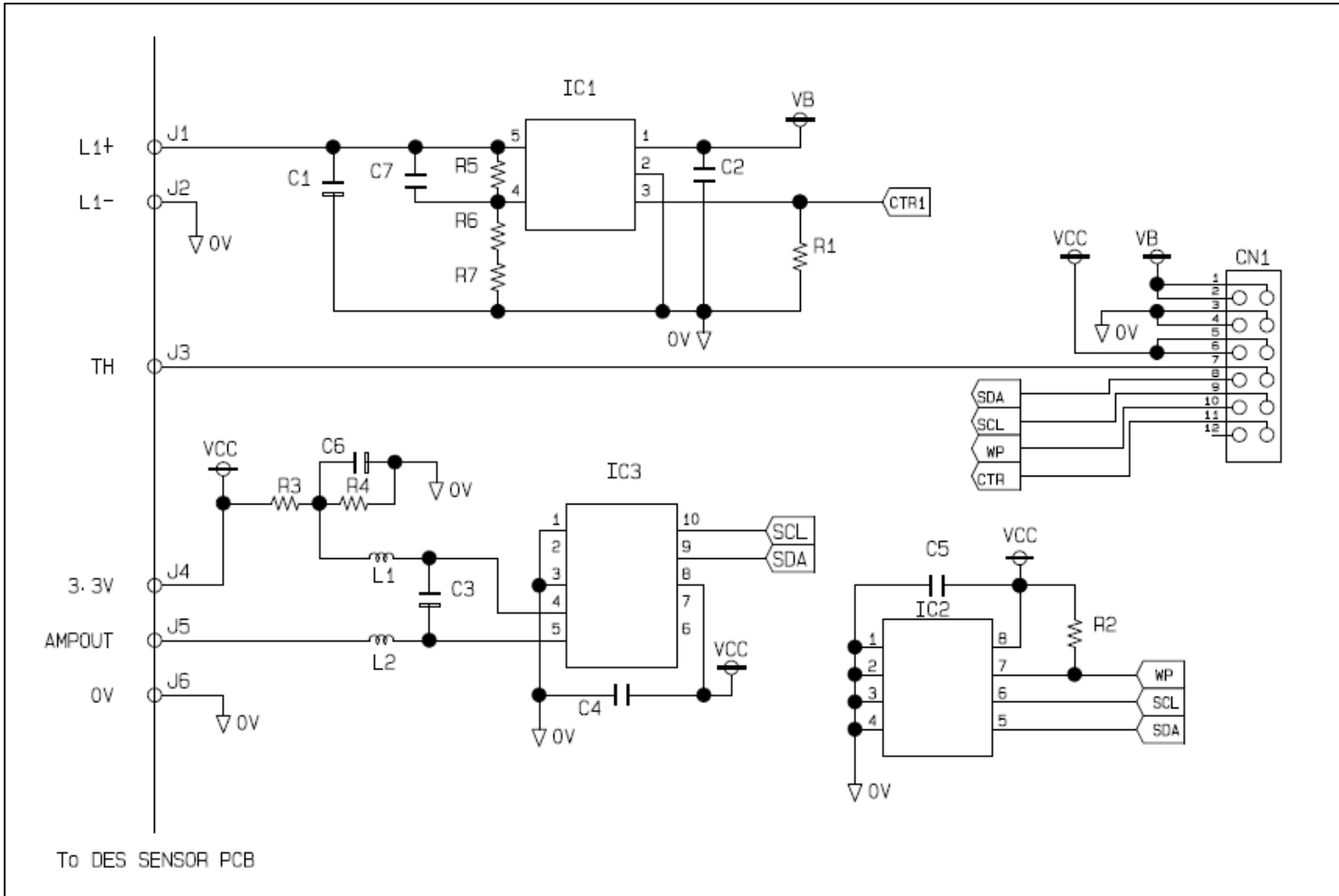
MARK	DIAGRAM	HOLE
⊙	φ 0.3	TH
○	φ 0.9	TH

SPECIFICATION FOR PCB

- ・PCB No. : RKP-91896P
- ・Material : Glass epoxy
- ・Thickness : 1.2mm
- ・Layer number : 2
- ・Thickness copper film : 35um
- ・Minimum conductor width : 0.3mm
- ・CTI : 100 above

All drawings are view of parts side

SCALE 2:1



SCHEMATIC

PARTS LIST

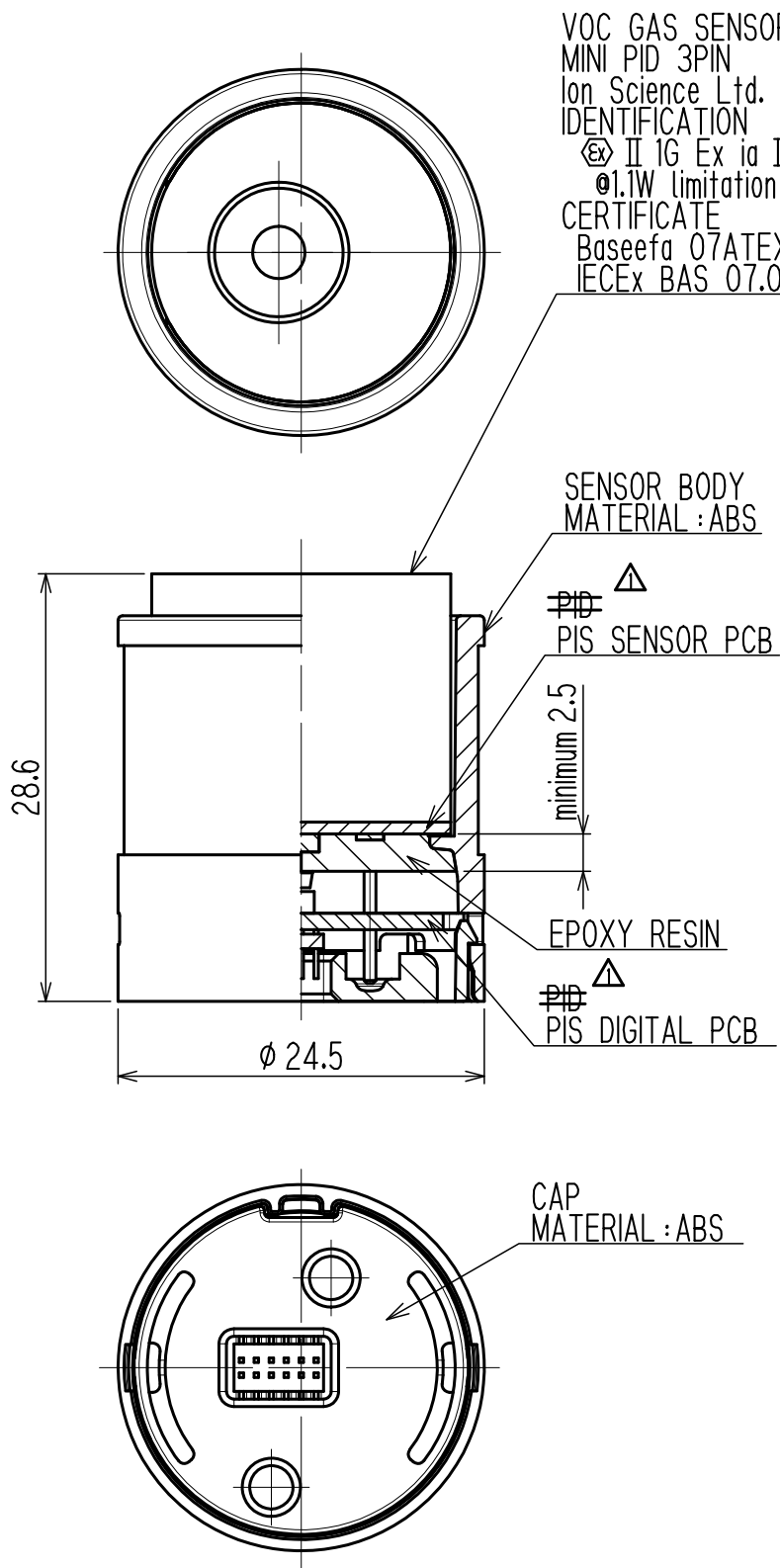
Mark of drawing	Kind of parts	Rating / Model of parts	Remarks
IC1	IC (Voltage regulator)	TPS73201DBV	m
IC2	IC (EEPROM)	S-24C16CI-I8T1	m
IC3	IC (A/D Converter)	ADS1114IRU	m
R1,2,3,4,5,6,7	Chip fixed resistor or Chip jumper	10 ohm – 1M ohm / 1%, 0.063W or 50m ohm max,1A (1005 )	m
C1,2	Chip multilayer capacitor	4.7uF / 20%, 6.3V	m
C3,4,5,6	Chip multilayer capacitor	0.1uF / 10%, 25V	m
C7	Chip multilayer capacitor	1uF / 10%, 10V	m
L1,2	Chip fixed resistor or Chip jumper or Noise filter	10 ohm – 1M ohm / 1%, 0.063W or 50m ohm max,1A (1005 ) or BLM15HD182	m

m marked parts are mounted or not

注 記 NOTES	C1、C2 change	改版担当者 REV. BY	改版日 REVISED	名称 NAME
改版回数 REV.	1	小野圭	2015.2.24	DES DIGITAL PCB
承認 APPROVED	検討 CHECKED	製図 DRAWN	作成日 DATE	図番 DWG. NO.
石橋勝	北村正英	小野圭	2014.7.14	E3-6991-5386-60-01K

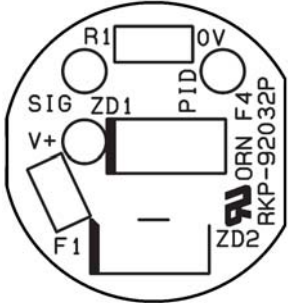


寸法	18未満	18以上50未満	50以上120未満	120以上260未満	260以上500未満	500以上1000未満	1000以上
許容差	精細 0.1 中級 0.2 粗級 0.4	精細 0.15 中級 0.3 粗級 0.6	精細 0.2 中級 0.4 粗級 0.8	精細 0.3 中級 0.6 粗級 1.2	精細 0.4 中級 0.8 粗級 1.6	精細 0.5 中級 1.0 粗級 2.0	精細 0.7 中級 1.2 粗級 2.5




△	REVISION	2015.3.25	武井康典
△	記 事	年 月 日	訂 正 者

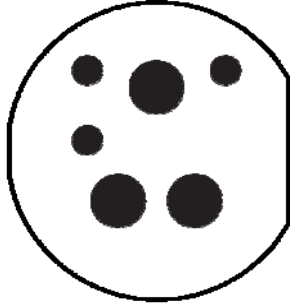
表面処理 TREAT.	許容差 TOL.	尺 度 SCALE	投影法 PROJECTION	名 称 NAME
材 質 MAT.		2 : 1		SMART SENSOR △ Type-PIS <del>Type=PID</del>
承認 APPROVED	検討 CHECKED	製 図 DRAWN	作成日 DATE	図 番 DWG. NO.
青良治	近藤晴彦	武井康典	2014. 7. 30	M4-4830-01-01K
RIKEN KEIKI		理研計測株式会社		機密情報 / CONFIDENTIAL



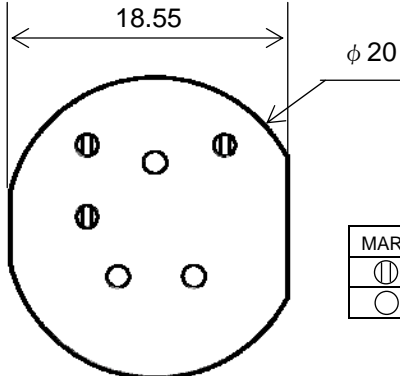
SILK PRINT FOR PARTS SIDE



PARTS SIDE



SOLDERING SIDE



THROUGH HOLE DATA

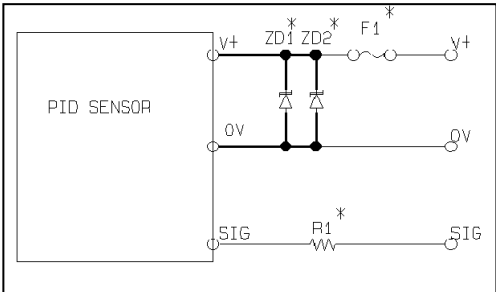
MARK	DIAGRAM	HOLE
⊕	φ 0.6	TH
○	φ 1.8	TH

All drawings are view of parts side

SCALE 2:1

**SPECIFICATION FOR PCB**

- PCB No. : RKP-92032P
- Material : Glass epoxy
- Thickness : 0.8mm
- Layer number : 2
- Thickness copper film : 35um
- Minimum conductor width : 1.0mm
- CTI : 100 above



SCHEMATIC

**PARTS LIST**

Mark of drawing	Kind of parts	Rating / Model of parts	Remarks
PID SENSOR	VOC GAS SENSOR	MINI PID 3PIN, Ion Science Ltd. IECEX BAS 07.0030U	Ex comp.
F1	Fuse	MCF2 125mAR08B4, SOC In=250mA, DC72V	Safety comp.
ZD1,ZD2	Zener diode	1SMB5917B,ON Semiconductor Vz = 4.46 – 4.94 V, 3W	Safety comp.
R1	Chip fixed resistor	1k ohm / 1%, 0.25W (3216)	Safety comp.

注 記 NOTES

PID=>PIS

改版回数 REV. 2

総頁数 PAGES 1

改版担当者 REV. BY 小野圭

改版日 REVISED 2015.3.25

名称 NAME

PIS SENSOR PCB

承認 APPROVED 石橋勝

検討 CHECKED 北村正英

製図 DRAWN 小野圭

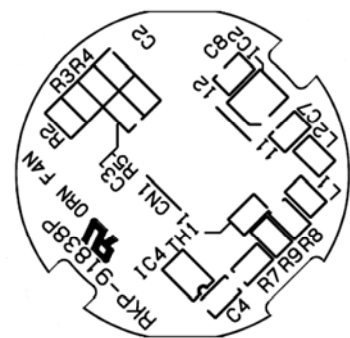
作成日 DATE 2014.7.14

図番 DWG. NO. E4-6991-5387-30-01K

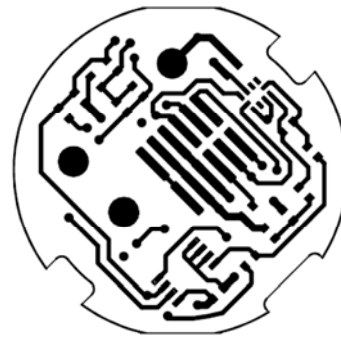
RIKEN KEIKI

理研計器株式会社

機密情報 / CONFIDENTIAL



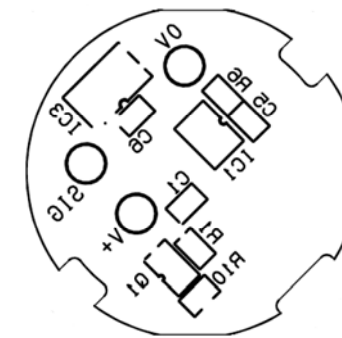
SILK PRINT FOR PARTS SIDE



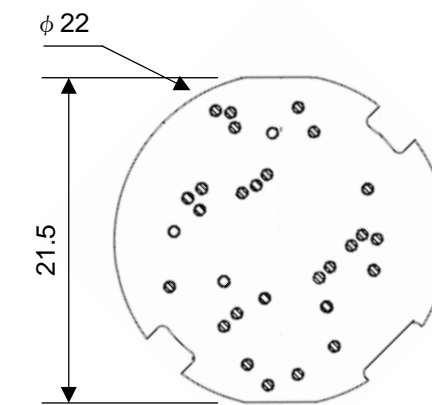
PARTS SIDE





SOLDERING SIDE



SILK PRINT FOR SOLDERING SIDE



THROUGH HOLE DATA

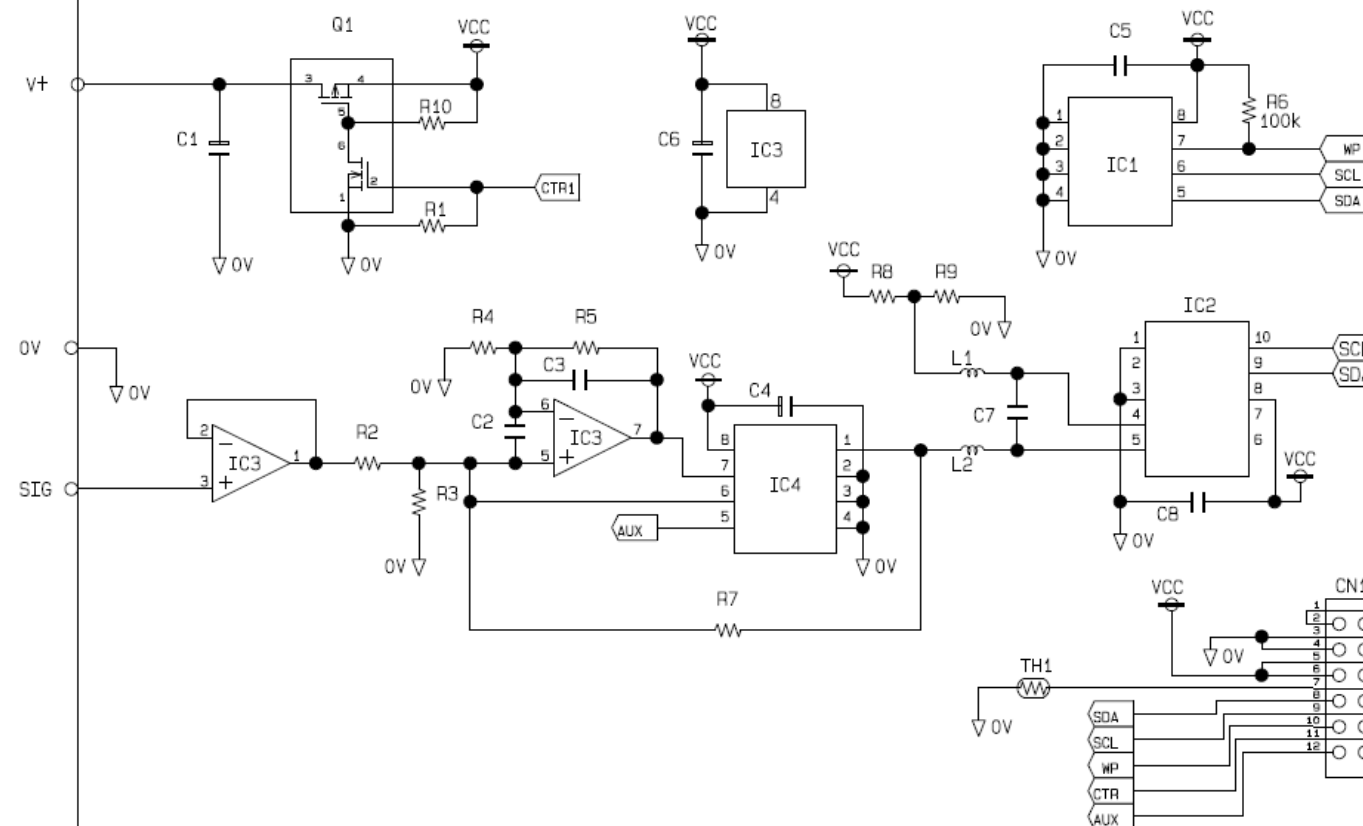
MARK	DIAGRAM	HOLE
	$\phi$ 0.3	TH
	$\phi$ 1.0	TH

## SPECIFICATION FOR PCB

- PCB No. : RKP-91838P
- Material : Glass epoxy
- Thickness : 1.2mm
- Layer number : 2
- Thickness copper film : 18um
- Minimum conductor width : 0.3mm
- CTI : 100 above

All drawings are view of parts side

SCALE 2:1




SCHEMATIC

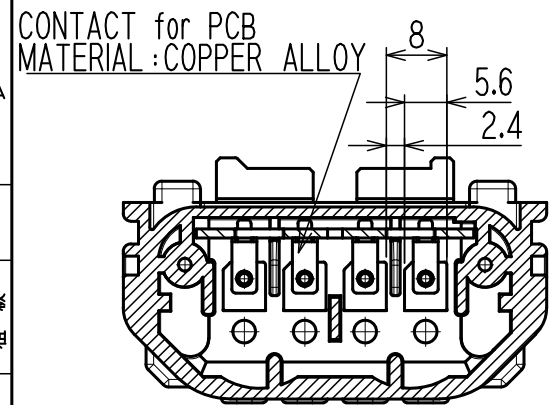
## PARTS LIST

Mark of drawing	Kind of parts	Rating / Model of parts	Remarks
IC1	IC (EEPROM)	S-24C16CI-I8T1	m
IC2	IC (A/D Converter)	ADS1114IRU	m
IC3	IC(OPAMP)	OPA2378AIDCN	m
Q1	N+P-ch FET	EM6M2	m
TH1	Chip thermistor	Rt25 = 470 ohm -100 k ohm / 5%, B=3000K-5000K (1005)	m
R1-10	Chip fixed resistor or Chip jumper	10 ohm – 1M ohm / 1%, 0.063W or 50m ohm max, 1A (1005 )	m
C1,2,4,5,6,7,8	Chip multilayer capacitor	0.1uF / 10%, 16V	m
C3	Chip multilayer capacitor	10pF-1000pF / 10%, 50V	m
L1,2	Chip fixed resistor or Chip jumper or Noise filter	10 ohm – 1M ohm / 1%, 0.063W or 50m ohm max, 1A (1005 ) or BLM15HD182	m

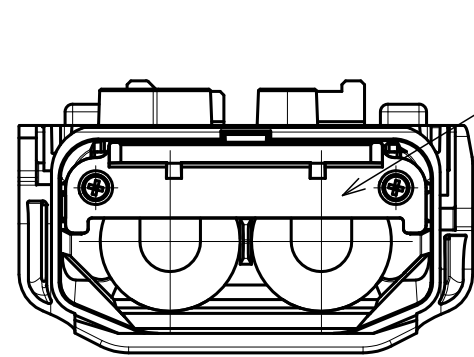
m marked parts are mounted or not

注 記 NOTES		改版担当者 REV. BY	改版日 REVISED	名 称 NAME
PID=>PIS		小野圭	2015.3.25	PIS DIGITAL PCB
改版回数 REV.	総頁数 PAGES			
0	1			
承認 APPROVED	検討 CHECKED	製 図 DRAWN	作成日 DATE	図 番 DWG. NO.
石橋勝	北村正英	小野圭	2014.7.14	E 3 - 6 9 9 1 - 5 3 8 8 - 1 0 - 0 1 K
 <b>理研計器株式会社</b> <span style="float: right;">機密情報 / CONFIDENTIAL</span>				

寸法	精度	中級	粗級
1000以上	0.7	1.2	2.5
500以上1000未満	0.5	1.0	2.0
260以上500未満	0.4	0.8	1.6
120以上260未満	0.3	0.6	1.2
50以上120未満	0.2	0.4	0.8
18以上50未満	0.15	0.3	0.6
1日未満	0.1	0.2	0.4



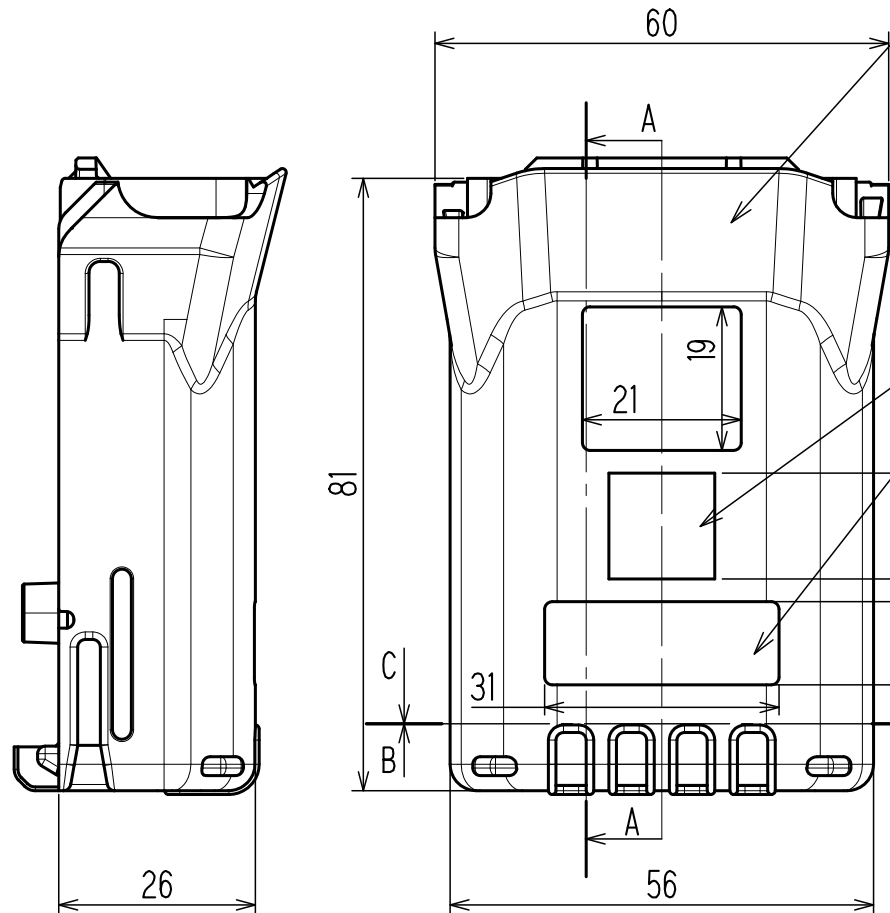
Section C-C



LID  
MATERIAL: PC

CASE  
ABS/PC ESC9448N  
RESISTANCE LESS THAN 1[GΩ]  
RIKEN TECHNOS CORP

BATTERY  
・INR18650PB1 MAXELL  
or  
・INR18650-15M SDI  
or  
・US18650VT3 SONY



1.5 : MIN

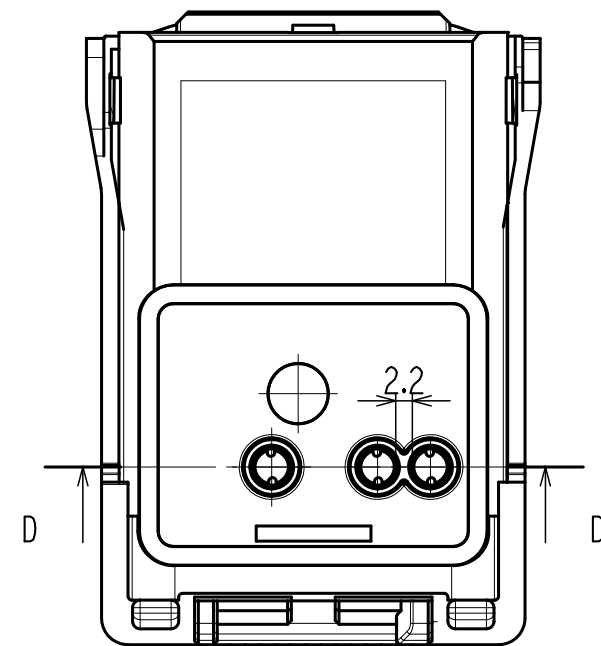
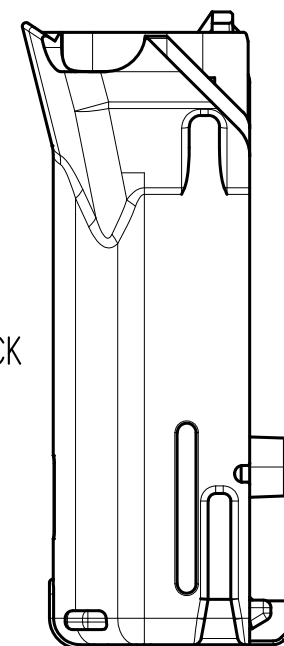
LABEL D

LABEL B

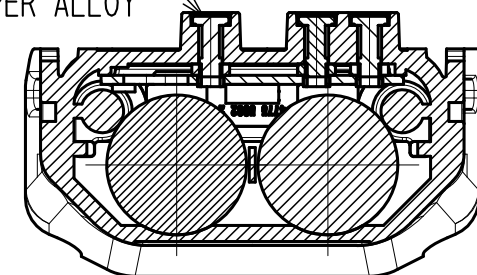
FILLING OF  
EPOXY RESIN  
DP-270 BLACK  
3M

Section A-A

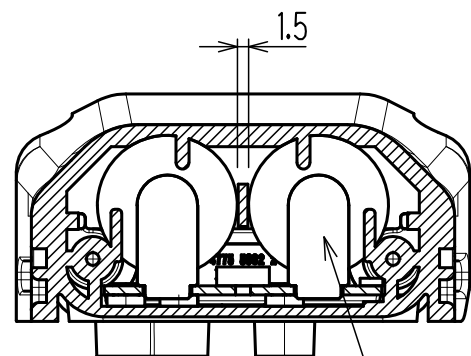
BUL PCB



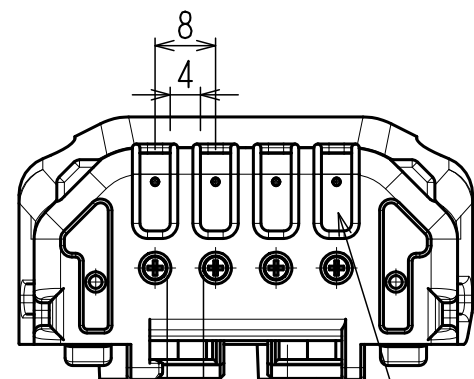
CONTACT for GX-6000  
MATERIAL: COPPER ALLOY



Section D-D



Section B-B

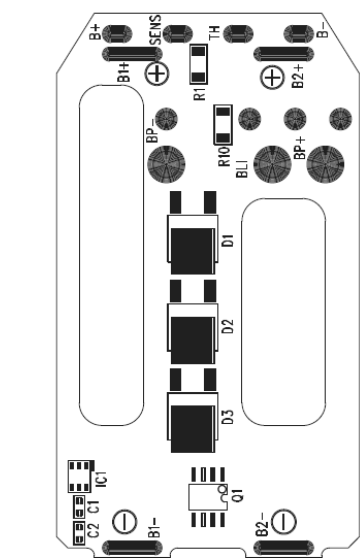


CONTACT for CHARGER  
MATERIAL: COPPER ALLOY

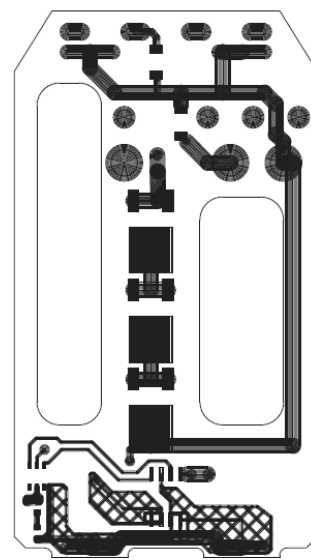
表面处理 TREAT. 材質 MAT.	許容差 TOL.	尺 度 SCALE 1 : 1	投影法 PROJECTION 	名 称 NAME BUL-6000
承認 APPROVED 青良治	検 討 CHECKED 武井康典	製 図 DRAWN 近藤晴彦	作成日 DATE 2014. 7. 28	図 番 DWG. NO. M3-4777-03-01K

△	記 事	年 月 日	訂 正 者	RIKEN KEIKI	理研計器株式会社	機密情報 / CONFIDENTIAL
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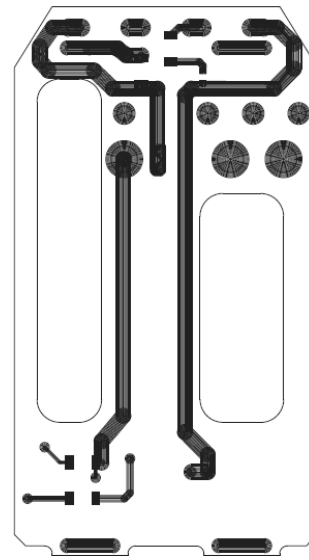




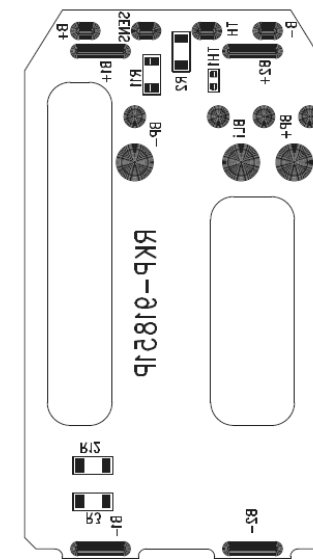
SILK PRINT FOR PARTS SIDE



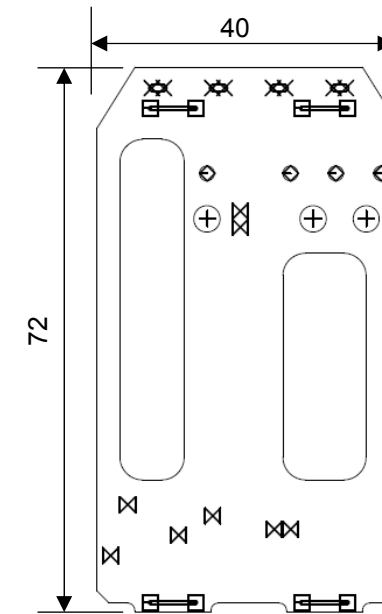
PARTS SIDE



SOLDERING SIDE








SILK PRINT FOR SOLDERING SIDE



THROUGH HOLE DATA

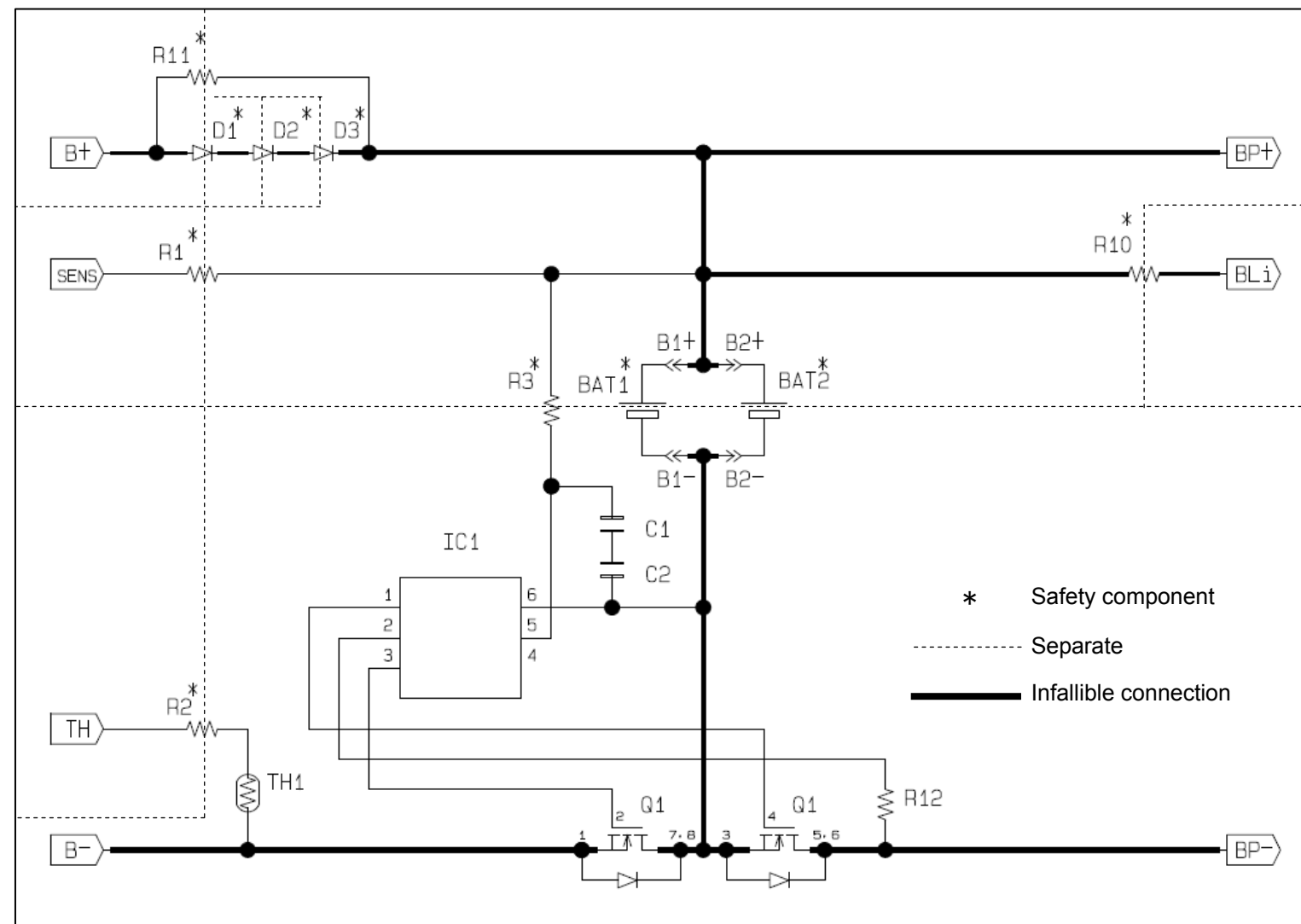
### SPECIFICATION FOR PCB

- PCB No. : RKP-91851P
- Material : Glass epoxy
- Thickness : 1.6mm
- Layer number : 2
- Thickness copper film : 35um
- Minimum conductor width : 0.3mm
- CTI : 100 above

MARK	DIAGRAM	HOLE
	3.5	TH
	0.8×6.5	TH
	0.5×6.5	TH
	2	TH
	0.8	TH

All drawings are view of parts side

SCALE 1:1




### SCHEMATIC

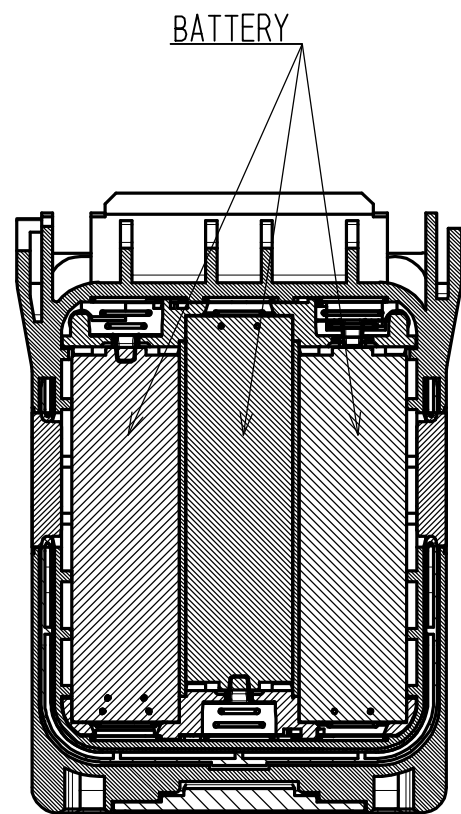
## PARTS LIST

Mark of drawing	Kind of parts	Rating / Model of parts	Remarks
IC1	IC (Protection IC)	S-8261	
Q1	FET	FDS6961A	
D1,2,3	Schottky barrier diode	MBRD1045, On semiconductor Vr = 45V, If = 10A	*
R1,2	Chip fixed resistor	MCR18EZP_2000, ROHM or RK73H2BT_2000, KOA 200ohm / 1% , 0.25W	*
R3	Chip fixed resistor	MCR18EZP_4700, ROHM or RK73H2BT_4700, KOA 470ohm / 1% , 0.25W	*
R10	Chip fixed resistor	MCR18EZP_1002, ROHM or RK73H2BT_1002, KOA 10k ohm / 1% , 0.25W	*
R11	Chip fixed resistor	MCR18EZP_1002, ROHM or RK73H2BT_1002, KOA 2.2k ohm / 1% , 0.25W	*
R12	Chip fixed resistor	200Ω-10kΩ / 1% , 0.25W (3216)	
C1,2	Chip multilayer capacitor	0.1uF / 10%, 50V	m
TH1	Chip thermistor	Rt25 = 470 ohm -100 k ohm / 5%, B=3000K-5000K (1005)	

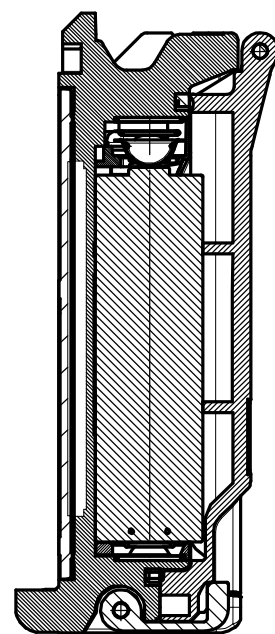
m marked parts are mounted or not

注 記 NOTES		改版担当者 REV. BY	改版日 REVISED	名 称 NAME  <b>BUL PCB</b>
改版回数 REV.	1	総頁数 PAGES	1	小野圭 2014.9.5
承認 APPROVED	検討 CHECKED	製 図 DRAWN	作成日 DATE	図 番 DWG. NO.
石橋勝	北村正英	小野圭	2014.7.14	E 3 - 6 9 9 1 - 5 3 8 9 - 8 0 - 0 1 K
 <b>理研計器株式会社</b> <span style="float: right;">機密情報 / CONFIDENTIAL</span>				

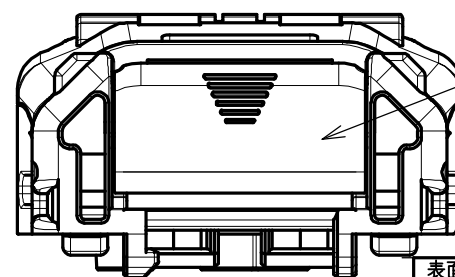
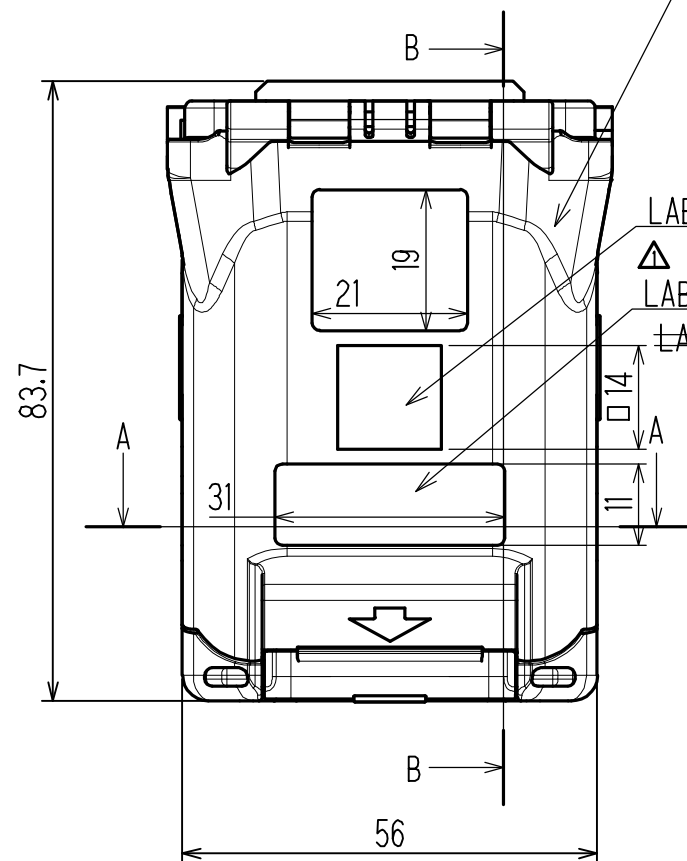
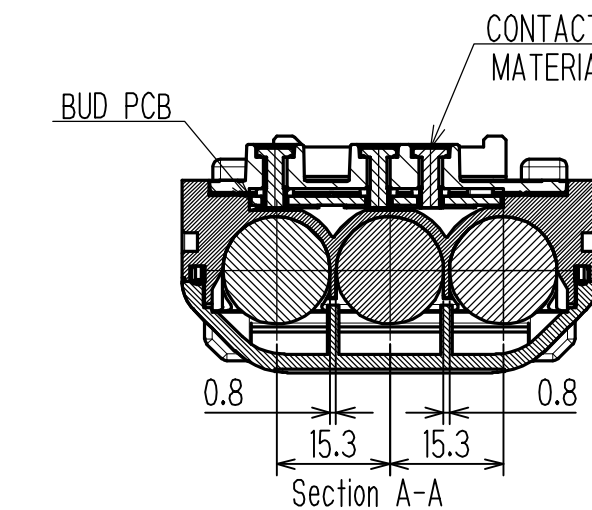
寸法	精度	中級	粗級
1000以上	0.7	1.2	2.5
500以上1000未満	0.5	1.0	2.0
260以上500未満	0.4	0.8	1.6
120以上260未満	0.3	0.6	1.2
50以上120未満	0.2	0.4	0.8
18以上50未満	0.15	0.3	0.6
18未満	0.1	0.2	0.4
寸法	精度	中級	粗級



Section C-C



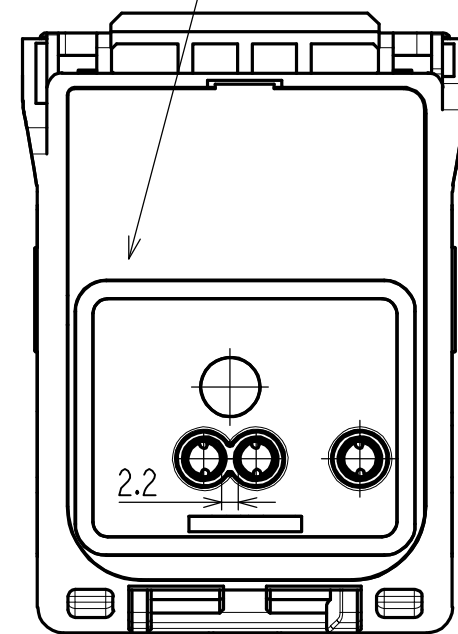
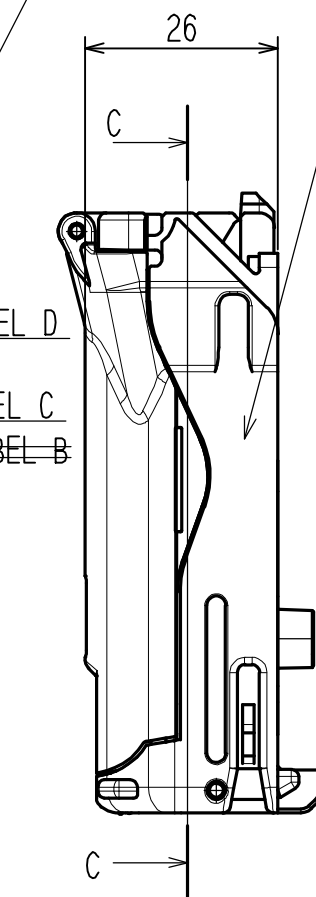
Section B-B



LID  
ABS/PC ESC9448N  
RESISTANCE LESS THAN 1[GΩ]  
RIKEN TECHNOS CORP

CASE  
ABS/PC ESC9448N  
RESISTANCE LESS THAN 1[GΩ]  
RIKEN TECHNOS CORP

LID  
MATERIAL: PC



LOCK PLATE  
ABS/PC ESC9448N  
RESISTANCE LESS THAN 1[GΩ]  
RIKEN TECHNOS CORP

表面処理 TREAT.	許容差 TOL.	尺度 SCALE	投影法 PROJECTION	名称 NAME
材質 MAT.		1 : 1		BUD-6000
承認 APPROVED	検討 CHECKED	製図 DRAWN	作成日 DATE	図番 DWG. NO.
青良治	武井康典	近藤晴彦	2014. 7. 28	M3-4777-04-0.1K

△ REVISION E9	2015.3.6	海野裕作
△ 記事	年月日	訂正者

RIKEN KEIKI

理研計測株式会社

機密情報 / CONFIDENTIAL

1

2

3

4

5

6

7

SILK PRINT FOR PARTS SIDE

PARTS SIDE

SOLDERING SIDE

THROUGH HOLE DATA

④ All drawings are view of parts side  
SCALE 1:1

MARK	DIAGRAM	HOLE
/	φ 0.8	TH
×	φ 3.7	TH
☆22	φ 2.2	NTH

SPECIFICATION FOR PCB

- ・PCB No. : RKP-91954P
- ・Material : Glass epoxy
- ・Thickness : 1.2mm
- ・Layer number : 2
- ・Thickness copper film : 35um
- ・Minimum conductor width : 1.6mm
- ・CTI : 100 above

SCHEMATIC

PARTS LIST

Mark of drawing	Kind of parts	Rating / Model of parts	Remarks
R1	Chip fixed resistor	MCR18EZP_1002, ROHM or RK73H2BT_1002, KOA 10k ohm / 1% , 0.25W	Safety comp.

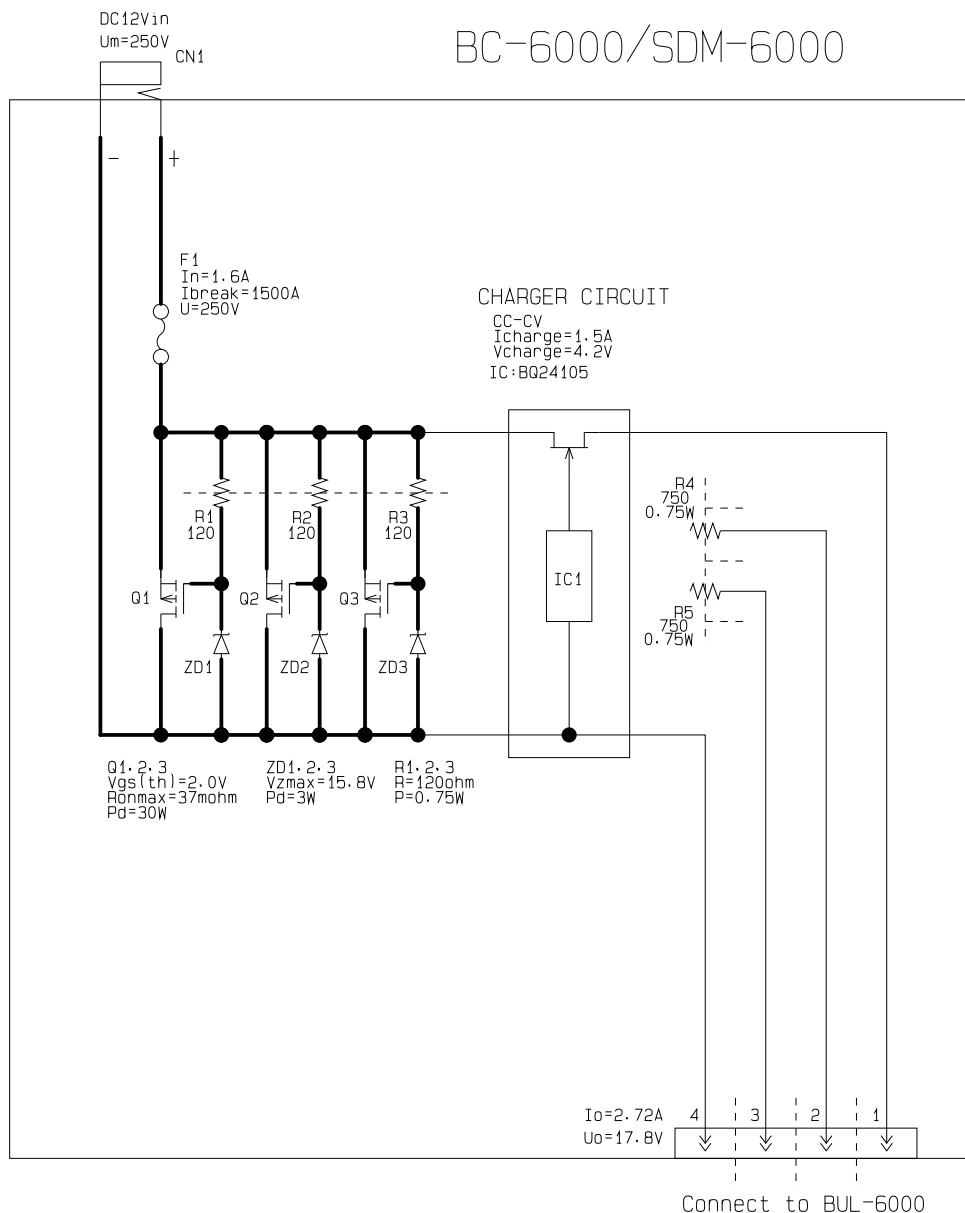
注 記 NOTES		改版担当者 REV. BY	改版日 REVISED	名 称 NAME
改版回数 REV.	1	小野圭	2014.9.5	BUD PCB
承認 APPROVED	検 討 CHECKED	製 図 DRAWN	作成日 DATE	図 番 DWG. NO.
石橋勝	北村正英	小野圭	2014.7.14	E 4 - 6 9 9 1 - 5 3 9 0 - 5 0 - 0 1 K

理研計器株式会社

機密情報／CONFIDENTIAL

# BATTERY CHARGER

## BC-6000/SDM-6000



(MEMO)

1. - - - - marks means SEPARATE

2. ——— marks means INFALLIBLE CONNECTION

注 記 NOTES		改版担当者 REV. BY 小野圭	改版日 REVISED 2014. 9. 5	名 称 NAME DIAGRAM FOR I. S. KEEP FOR MODEL BC-6000/SDM-6000
改版回数 REV.	1			
総頁数 PAGES	1	製 図 DRAWN 小野圭	作成日 DATE 2014. 7. 30	図 番 DWG. NO. E4-6991-5395-80-01K
承認 APPROVED 石橋勝	検討 CHECKED 北村正英			

1000以上

500以上1000未満

250以上500未満

120以上250未満

50以上120未満

18以上50未満

18未満

2.5

2.0

1.6

1.2

0.8

0.4

0.2

0.15

0.1

0.05

0.025

0.0125

0.00625

0.003125

0.0015625

0.00078125

0.000390625

0.0001953125

0.00009765625

0.000048828125

0.0000244140625

0.00001220703125

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GX-6000(LABEL A)

MODEL GX-6000

INST.No.

RIKEN KEIKI Co., Ltd.

2-7-6, Azusawa, Itabashi-ku, Tokyo, 174-8744, Japan

BUL-6000(LABEL B)

MODEL BUL-6000

INST.No.

RIKEN KEIKI Co., Ltd./2-7-6, Azusawa, Itabashi-ku, Tokyo, 174-8744, Japan

WARNING

Do not charge battery in haz.loc.

BUD-6000(LABEL C)

MODEL BUD-6000

INST.No.

RIKEN KEIKI Co., Ltd./2-7-6, Azusawa, Itabashi-ku, Tokyo, 174-8744, Japan

WARNING

Use only battery types:LR6 TOSHIBA

GX-6000,BUL-6000,BUD-6000(LABEL D)

CE

2460

II 1GExia IIC/II B T4/T3Ga

Presafe15ATEX6171X

IECEX PRE 15.0011

-20℃≤Ta≤+50℃

WARNING

Read manual for safety info.

Do not open in haz.loc.

CE

Presafe15ATEX6171X

II 1GExia IIC/II B T4/T3Ga

Presafe15ATEX6171X

II 1GExia IIC/II B T4/T3Ga

REVISION

2021.4.23

武田直樹

REVISION

2021.4.7

武田直樹

REVISION

2020.3.31

本間慶太

REVISION

2019.9.30

後上敦史

REVISION

2015.3.18

海野裕作

REVISION

2015.3.6

海野裕作

記事

年月日

訂正者

表面処理 TREAT.

材質 MAT.

承認 APPROVED

青良治

許容差 TOL.

検 討 CHECKED

近藤晴彦

尺 度 SCALE

4 : 1

製 図 DRAWN

海野裕作

投影法 PROJECTION

作成日 DATE

2014. 7. 25

名 称 NAME

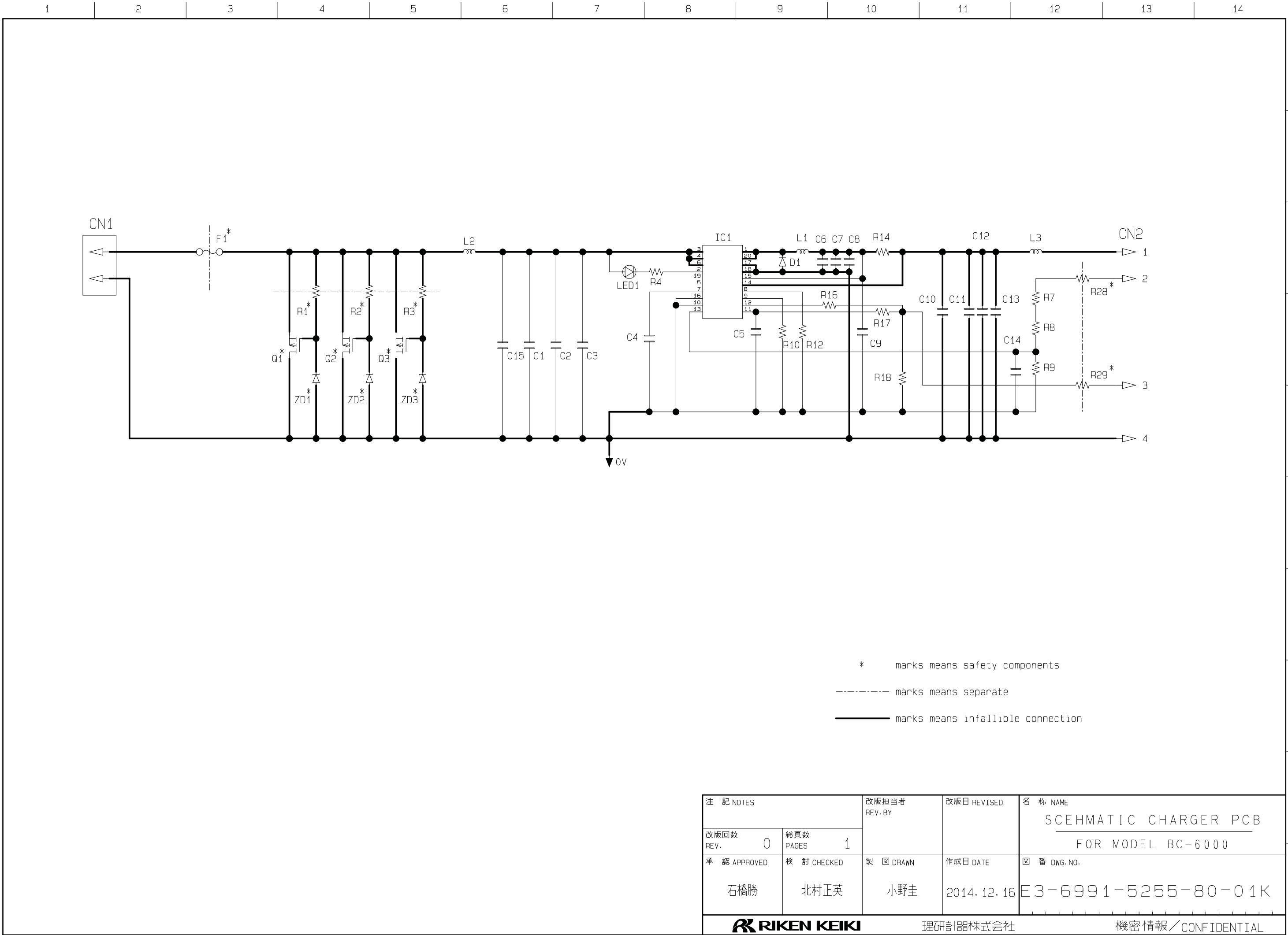
LARFI

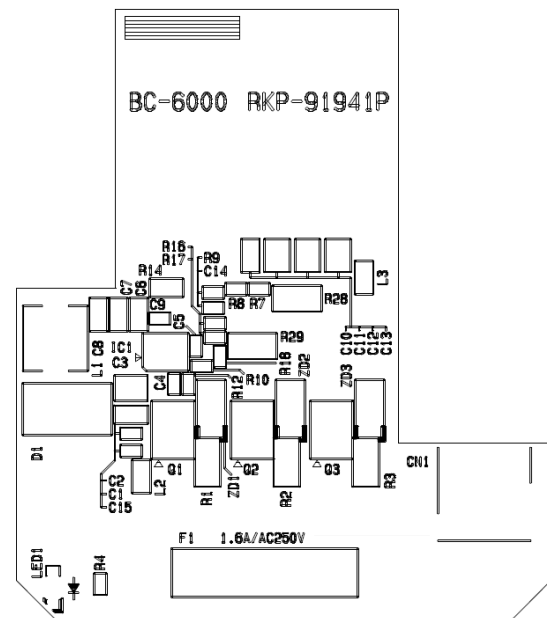
図 番 DWG. NO.

M4-4777-01-01K1

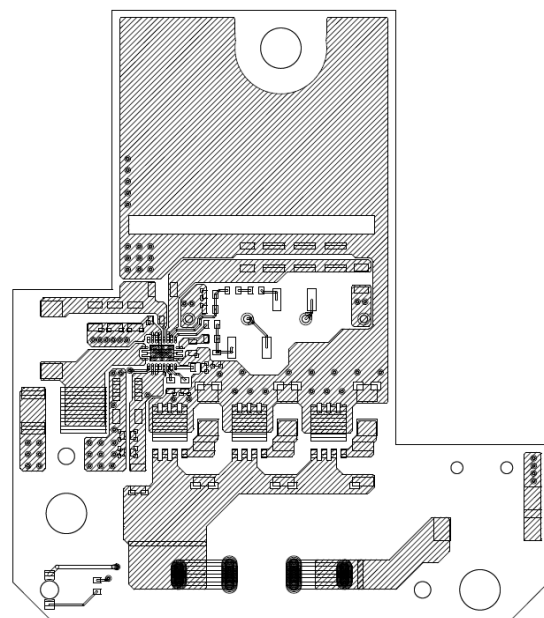
機密情報 / CONFIDENTIAL

	1	2	3	4	5	6	7																									
寸法 許容差	1000以上	500以上1000未満	260以上500未満	120以上260未満	50以上120未満	18以上50未満	18未満																									
	1.2	2.0	1.6	1.2	0.8	0.6	0.2																									
	0.7	1.0	0.8	0.6	0.4	0.3	0.1																									
	1.2	2.0	1.6	1.2	0.8	0.6	0.2																									
	0.7	1.0	0.8	0.6	0.4	0.3	0.1																									
	1.2	2.0	1.6	1.2	0.8	0.6	0.2																									
	0.7	1.0	0.8	0.6	0.4	0.3	0.1																									
	1.2	2.0	1.6	1.2	0.8	0.6	0.2																									
	0.7	1.0	0.8	0.6	0.4	0.3	0.1																									
	2.5																															
<div><div>60</div><div>25</div><div><div><div>警告 WARNING</div><div><div>・本来の使用目的以外の使用はしないでください。 ・Do not use for any purpose other than original intended use. ・落下や水は故障の原因となります。 ・Protect from impact and moisture. ・充電は非危険場所にて行なってください。 ・Not for use in hazardous area. ・指定のACアダプタを使用してください。 ・Use only with exclusive AC adaptor.</div></div><div><div>注意 CAUTION</div><div><div>・ご使用前に取扱説明書を必ずお読みください。 ・Read and understand operation manual before use.</div></div></div></div></div><div><div>40</div><div>20</div><div><div>MODEL _____ INST. No. _____ DATE _____ CE DC INPUT : 12V --- 0.8A DC OUTPUT : 6V --- 1.6A RIKEN KEIKI Co., Ltd. JAPAN</div><div>“BC-6000” or “SDM-6000”</div></div></div></div>																																
<table><tr><td>△</td><td>記 事</td><td>年 月 日</td><td>訂 正 者</td></tr><tr><td colspan="4">名 称 NAME LABEL BC-6000/SDM-6000</td></tr><tr><td colspan="2">承 認 APPROVED 青良治</td><td>検 討 CHECKED 武井康典</td><td>製 図 DRAWN 近藤晴彦</td></tr><tr><td colspan="2">材 質 MAT.</td><td>許容差 TOL.</td><td>尺 度 SCALE 1 : 1</td></tr><tr><td colspan="2">表面処理 TREAT.</td><td>投影法 PROJECTION</td><td>作成日 DATE 2014. 7. 28</td></tr><tr><td colspan="2">図 番 DWG. NO. M4-4777-01-02K</td><td colspan="2"></td></tr></table>									△	記 事	年 月 日	訂 正 者	名 称 NAME LABEL BC-6000/SDM-6000				承 認 APPROVED 青良治		検 討 CHECKED 武井康典	製 図 DRAWN 近藤晴彦	材 質 MAT.		許容差 TOL.	尺 度 SCALE 1 : 1	表面処理 TREAT.		投影法 PROJECTION	作成日 DATE 2014. 7. 28	図 番 DWG. NO. M4-4777-01-02K			
△	記 事	年 月 日	訂 正 者																													
名 称 NAME LABEL BC-6000/SDM-6000																																
承 認 APPROVED 青良治		検 討 CHECKED 武井康典	製 図 DRAWN 近藤晴彦																													
材 質 MAT.		許容差 TOL.	尺 度 SCALE 1 : 1																													
表面処理 TREAT.		投影法 PROJECTION	作成日 DATE 2014. 7. 28																													
図 番 DWG. NO. M4-4777-01-02K																																
<div><div>RIKEN KEIKI</div><div>理研計測株式会社</div><div>機密情報 / CONFIDENTIAL</div></div>																																

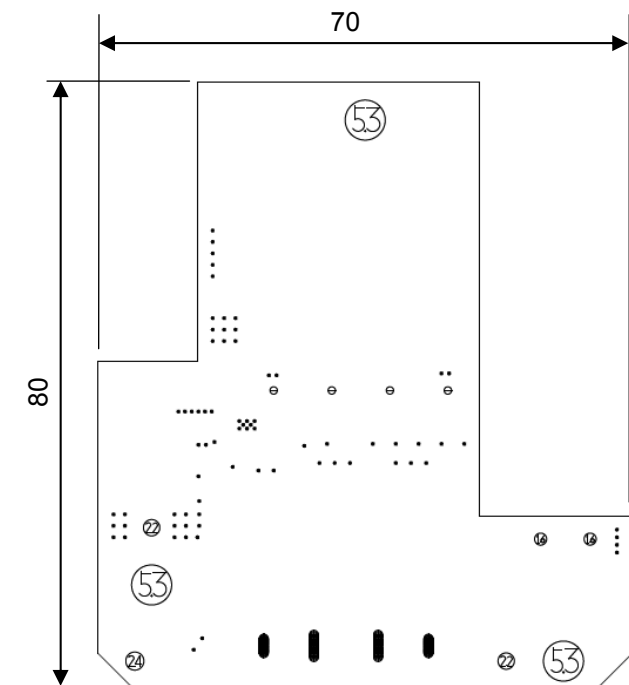




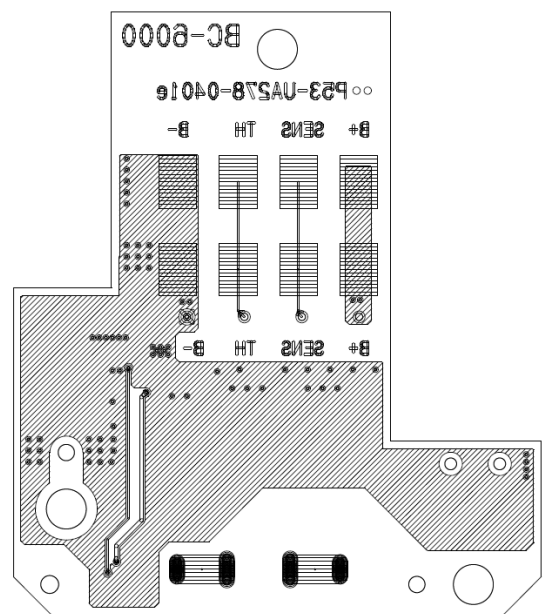
SILK PRINT FOR PARTS SIDE



PARTS SIDE



VIA HOLES



SOLDERING SIDE

All drawings are view of parts side  
SCALE 1:1

MARK	DIAGRAM	HOLE
⊗	Φ0.3	TH
⊖	Φ1.0	TH
⊕	Φ1.2	TH
⑬	Φ1.6	NTH
⑳	Φ2.2	NTH
㉔	Φ2.4	NTH
㉟	Φ5.3	NTH

SPECIFICATION FOR PCB

- PCB No. : RKP-91941P
- Material : Glass epoxy
- Thickness : 1.6mm
- Layer number : 2
- Thickness copper film : 35um
- Copper thickness of the via's : 35um above.
- Minimum conductor width : 0.3mm
- CTI : 175 above

PARTS LIST

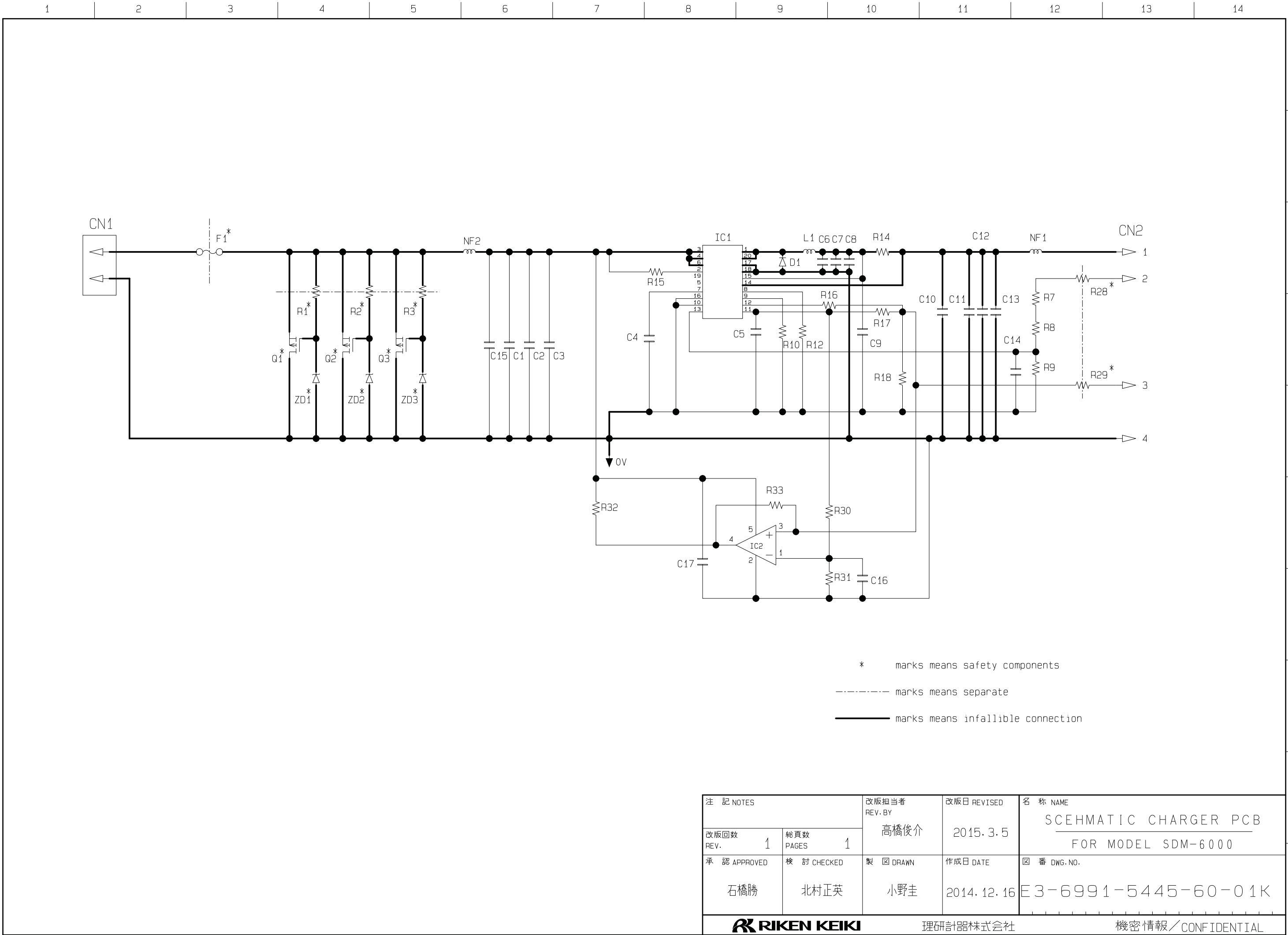
Mark of drawing	Kind of parts	Rating / Model of parts	Remarks
IC1	IC (Battery charger)	BQ24105RHLR	
D1	Schottky barrier diode	MBRD1045	
F1	Fuse	021601.6P Littelfuse In=1.6A, Ibreak=1500A@250Vac	*
Q1,Q2,Q3	P-ch MOSFET	TPCA8507-H TOSHIBA Ron_max=37mΩ , Pd=30W	*
ZD1,ZD2,ZD3	1SMB5929B	1SMB5929B ON Semiconductor Vz= 14.25V -15.75V ,Pd=3W	*
R1,R2,R3	Chip fixed resistor	RK73HW2H_1200F KOA 120Ω/1% ,0.75W	*
R4,R7,R8,R9,R10, R12,R16,R17,R18	Chip fixed resistor or Chip jumper	100Ω - 1MΩ/1% , 0.1W (1608) or 50mΩ max ,1A	m
R14	Chip fixed resistor	0.068Ω - 0.2Ω/1% , 0.25W (3216)	
R28,R29	Chip fixed resistor	RK73HW2H_7500F KOA 750Ω/1% ,0.75W	*
C1	Chip multilayer capacitor	1uF / 10% , 50V	m
C2,C6,C7,C8,C10	Chip multilayer capacitor	10uF / 10% , 25V	m
C3	Chip multilayer capacitor	22uF / 10% , 25V	m
C4	Chip multilayer capacitor	0.068uF / 10% , 50V	m
C5,C9,C15	Chip multilayer capacitor	0.1uF / 10% , 50V	m
C1,C12,C13	Chip multilayer capacitor	47uF / 10% , 16V	m
C14	OPEN	OPEN	
L1	Inductor	10uH / 20%	
L2,L3	Chip ferrite beads	BLM31PG391	m
LED1	LED Lamp	SML-811U	m

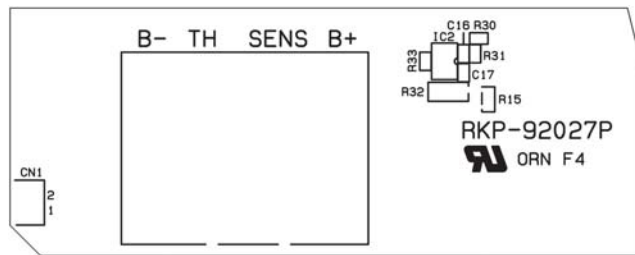
\* marked parts are for safety

m marked parts are mounted or not

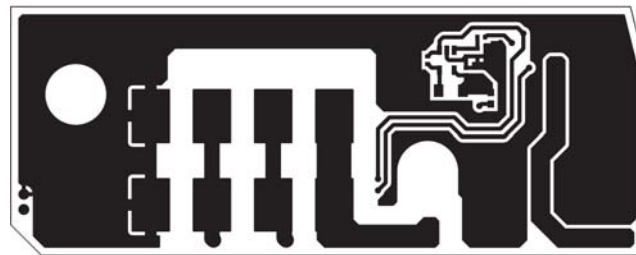
注 記 NOTES		改版担当者 REV. BY	改版日 REVISED	名 称 NAME <b>CHARGER PCB</b> <b>FOR MODEL BC-6000</b>
改版回数 REV.	0	総頁数 PAGES	1	
承認 APPROVED	検 討 CHECKED	製 図 DRAWN	作成日 DATE	図 番 DWG. NO.
石橋勝	北村正英	小野圭	2014.12.16	E 3 - 6 9 9 1 - 5 2 5 5 - 8 0 - 0 1 A



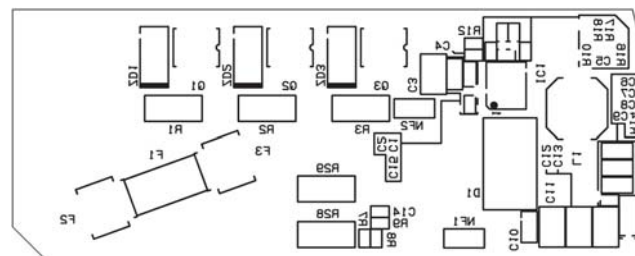




SILK PRINT FOR SOLDERING SIDE



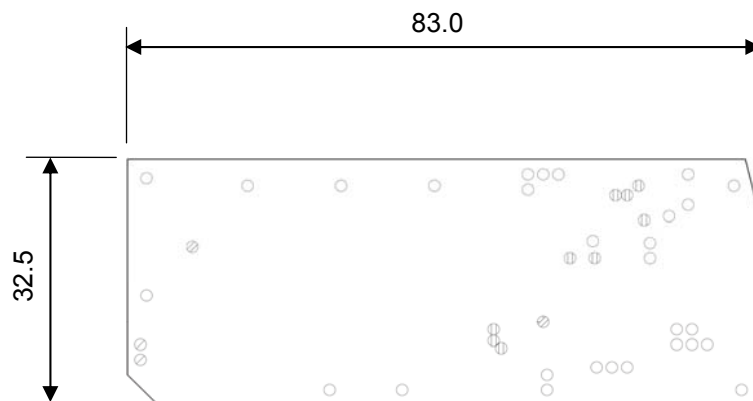
SOLDERING SIDE



SILK PRINT FOR PARTS SIDE



PARTS SIDE



All drawings are view of soldering side

SCALE 1:1

VIA HOLES

MARK	DIAGRAM	HOLE
⊙	Φ0.4	TH
○	Φ0.7	TH
⊗	Φ0.8	TH
⊘	Φ5.6	NTH

SPECIFICATION FOR PCB

- PCB No. :RKP-92027P
- Material : Glass epoxy
- Thickness : 1.6mm
- Layer number : 2
- Thickness copper film : 35um
- Copper thickness of the via's : 35um above.
- Minimum conductor width : 0.3mm
- CTI : 175 above

PARTS LIST

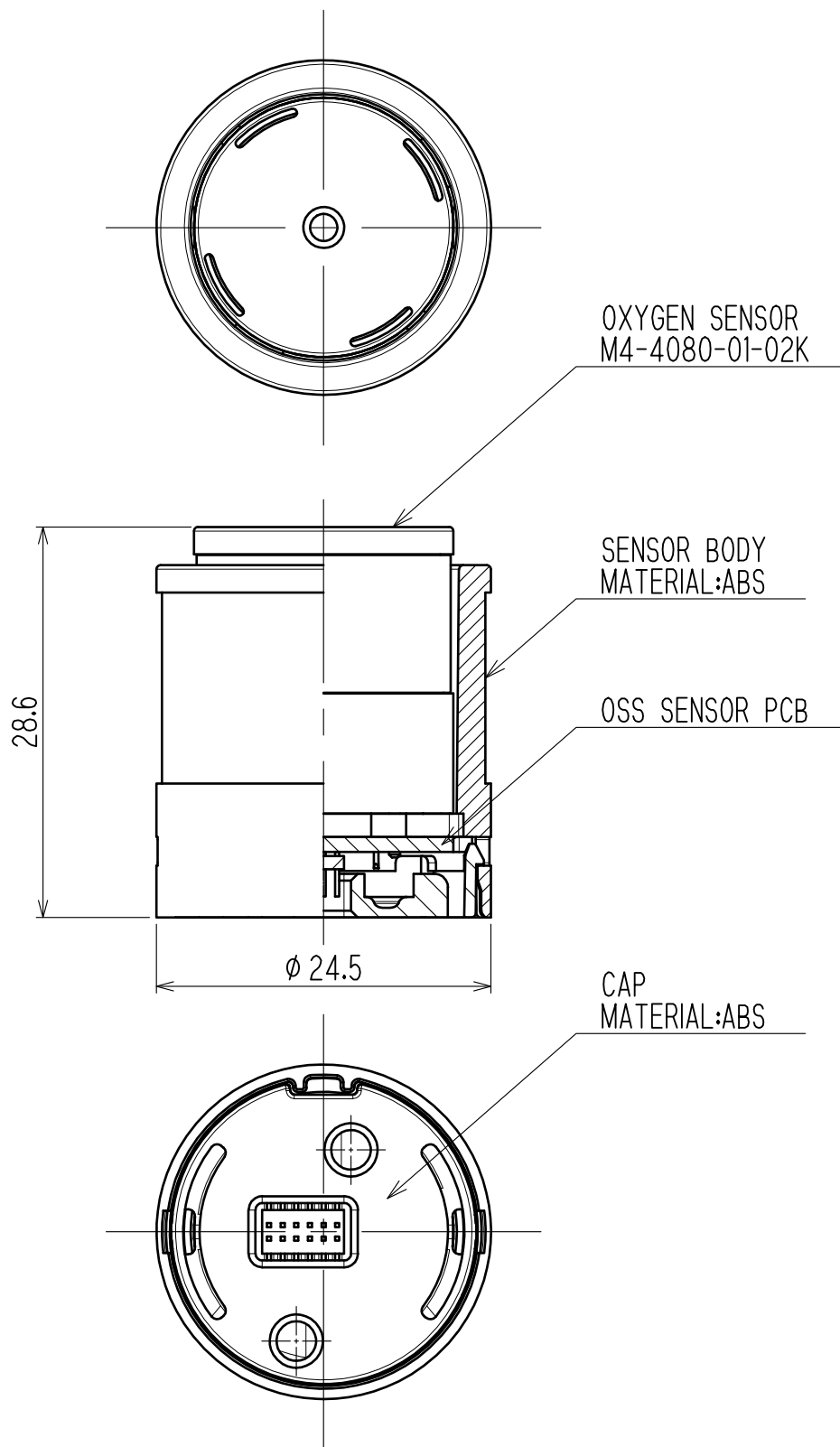
Mark of drawing	Kind of parts	Rating / Model of parts	Remarks
IC1	IC (Battery charger)	BQ24105RHLR	
IC2	IC(Comparator)	TL331	
D1	Schottky barrier diode	MBRD1045	
F1	Fuse	021601.6P Littelfuse In=1.6A, Ibreak=1500A@250Vac	*
Q1,Q2,Q3	P-ch MOSFET	TPCA8507-H TOSHIBA Ron_max=37mΩ , Pd=30W	*
ZD1,ZD2,ZD3	1SMB5929B	1SMB5929B ON Semiconductor Vz= 14.25V -15.75V ,Pd=3W	*
R1,R2,R3	Chip fixed resistor	RK73HW2H_1200F KOA 120Ω /1% ,0.75W	*
R7,R8,R9,R10,R12, R16,R17,R18,R30, R31,R33	Chip fixed resistor or Chip jumper	100Ω - 4.7MΩ /1% , 0.063W (1005) or 50mΩ max ,1A	m
R14	Chip fixed resistor	0.068Ω - 0.2Ω /1% , 0.25W (3216)	
R15	Chip fixed resistor or Chip jumper	100Ω - 1MΩ /1% , 0.1W (1608) or 50mΩ max ,1A	m
R28,R29	Chip fixed resistor	RK73HW2H_7500F KOA 750Ω /1% ,0.75W	*
R32,	Chip fixed resistor or Chip jumper	100Ω - 1MΩ /1% , 0.125W (3216) or 50mΩ max ,1A	m
C1,	Chip multilayer capacitor	1uF / 10%,25V	m
C3,	Chip multilayer capacitor	22uF / 10% 25V	m
C11,C12,C13	Chip multilayer capacitor	47uF / 10%,16V	m
C5,C9, C14,C15, C16,C17	Chip multilayer capacitor	0.1uF / 10%, 25V	m
C2,C6,C7,C8,C10	Chip multilayer capacitor	10uF / 10%, 16V	m
C4,	Chip multilayer capacitor	0.22uF / 10%, 10V	m
L1	Inductor	10uH / 20%	
NF1,NF2	Chip ferrite beads	BLM31PG391	m

\* marked parts are for safety


m marked parts are mounted or not

注 記 NOTES		改版担当者 REV. BY		改版日 REVISION	名義人 Ogawa 097-067 401 mva
C4,C14		小野圭		2015.6.12	
改版回数 REV.	2	総頁数 PAGES	1		
承認 APPROVED	検 討 CHECKED	製 図 DRAWN	作成日 DATE	図 番 DWG. NO.	
石橋勝	北村正英	小野圭	2014.12.15	E 3 - 6 9 9 1 - 5 4 4 5 - 6 0 - 0 1 A	

寸 法																								
18 未 満			18以上50未満			50以上120未満			120以上260未満			260以上500未満			500以上1000未満			1000以上						
許容差	精級	0.1	中級	0.2	粗級	0.4	0.15	0.3	0.6	0.2	0.4	0.8	0.3	0.6	1.2	0.4	0.8	1.6	0.5	1.0	2.0	0.7	1.2	2.5

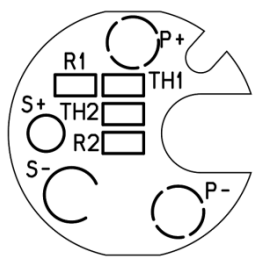


表面処理 TREAT.		許公差 TOL.	尺 度 SCALE	投影法 PROJECTION	名 称 NAME
材 質 MAT.					
承認 APPROVED		検 討 CHECKED	製 図 DRAWN	作成日 DATE	図 番 DWG. NO.
青良治		武井康典	武田直樹	2015. 2. 24	M4-4080-01-01K

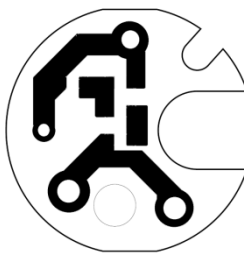
 **RIKEN KEIKI**

**理研計測株式会社**

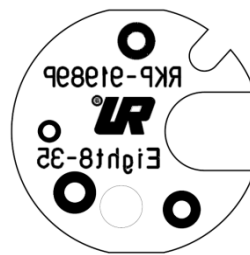
**機密情報 / CONFIDENTIAL**



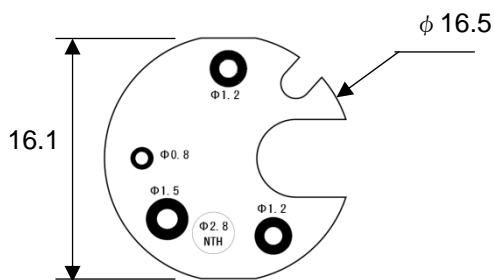
SILK PRINT FOR PARTS SIDE



PARTS SIDE



SOLDERING SIDE



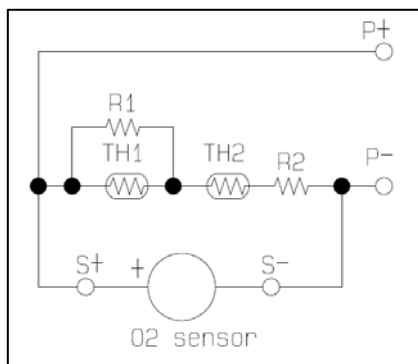
THROUGH HOLE DATA

SPECIFICATION FOR PCB

- PCB No. : RKP-91989P
- Material : Glass epoxy
- Thickness : 0.8mm
- Layer number : 2
- Thickness copper film : 35um
- Minimum conductor width : 0.5mm
- CTI : 100 above

All drawings are view of parts side

SCALE 2:1



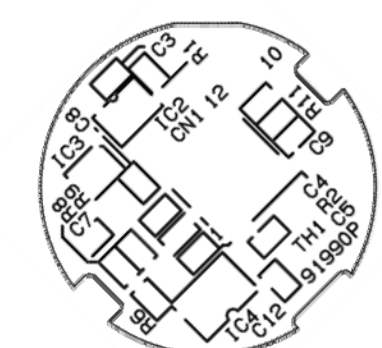
SCHEMATIC

PARTS LIST

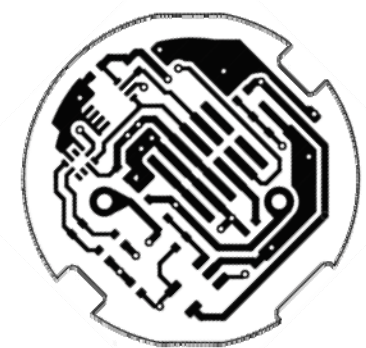
Mark of drawing	Kind of parts	Rating / Model of parts	Remarks
O2 SENSOR	OXYGEN SENSOR	Refer to M4-4080-01-01K	
R1,2	Chip fixed resistor or Chip jumper	10 ohm – 1M ohm / 1%, 0.1W or 50m ohm max,1A (1608 )	m
TH1,2	Chip thermistor	Rt25 = 470 ohm -100 k ohm / 5%, B=3000K-5000K (1608)	m

m marked parts are mounted or not

注 記 NOTES		改版担当者 REV. BY	改版日 REVISED	名 称 NAME <b>OSS SENSOR PCB</b>
改版回数 REV.	0			
総頁数 PAGES	1	製 図 DRAWN	作成日 DATE	図 番 DWG. NO. <b>E 4 - 6 9 9 1 - 5 4 5 7 - 0 0 - 0 1 K</b>
承認 APPROVED	検 討 CHECKED			
石橋勝	北村正英	小野圭	2015.2.24	



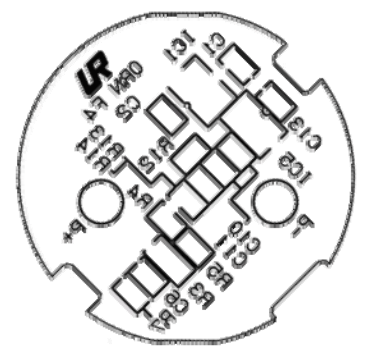
SILK PRINT FOR PARTS SIDE



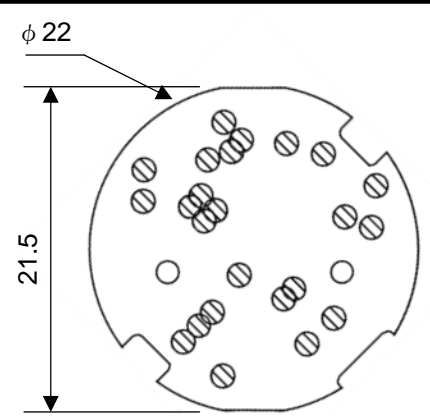
PARTS SIDE



SOLDERING SIDE



SILK PRINT FOR SOLDERING SIDE



THROUGH HOLE DATA

MARK	DIAGRAM	HOLE
⊙	φ 0.3	TH
○	φ 1.0	TH

SPECIFICATION FOR PCB

- PCB No. : RKP-91990P
- Material : Glass epoxy
- Thickness : 1.2mm
- Layer number : 2
- Thickness copper film : 18um
- Minimum conductor width : 0.3mm
- CTI : 100 above

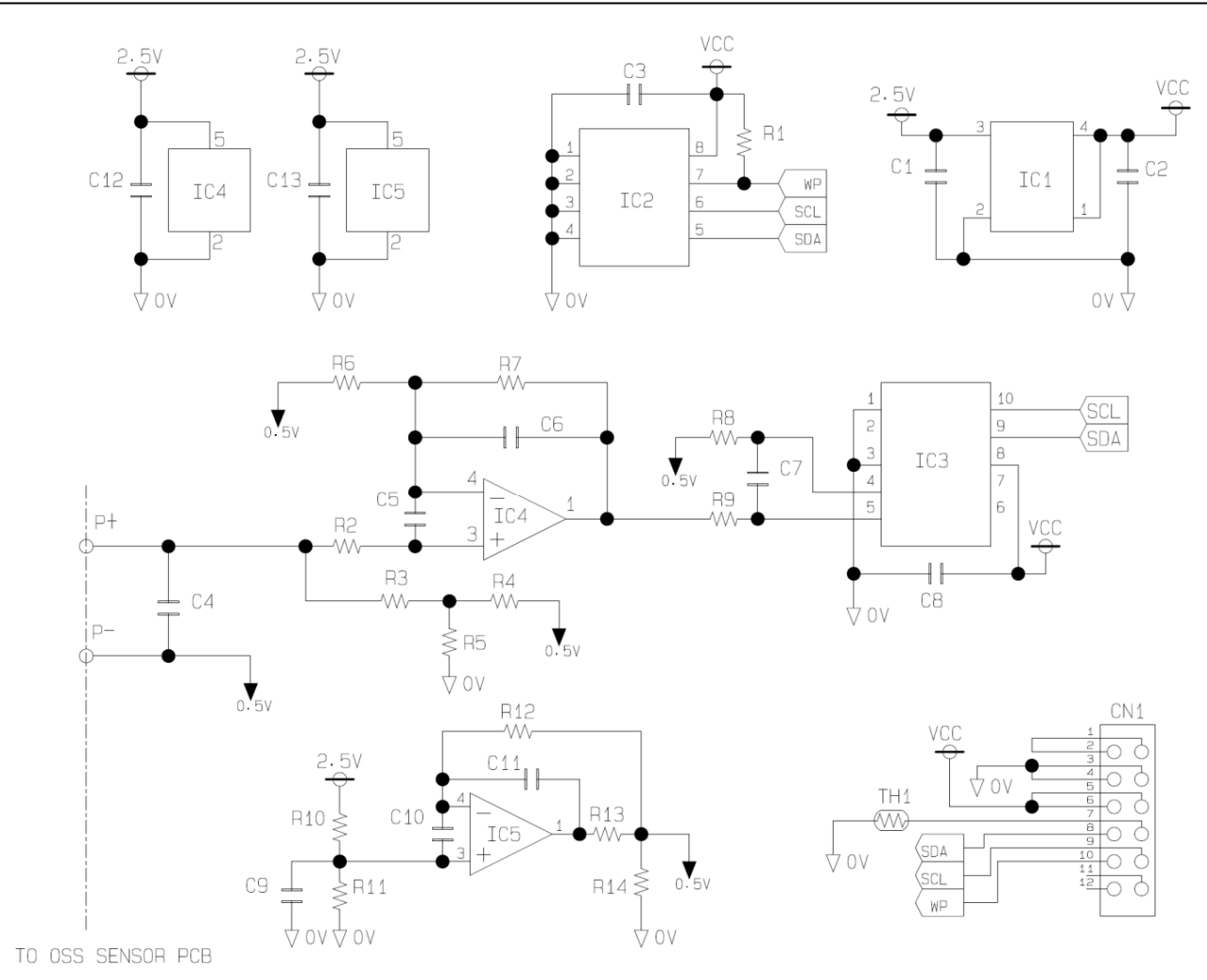
All drawings are view of parts side

SCALE 2:1

PARTS LIST

Mark of drawing	Kind of parts	Rating / Model of parts	Remarks
IC1	IC (Voltage regulator)	S-1313D25-N4T1	m
IC2	IC (EEPROM)	S-24C16CI-I8T1	m
IC3	IC (A/D Converter)	ADS1114IRU	m
IC4	IC(OPAMP)	OPA333AIDBV	m
IC5	IC(OPAMP)	AD8500AKS	m
TH1	Chip thermistor	Rt25 = 470 ohm -100 k ohm / 5%, B=3000K-5000K (1005)	m
R1-14	Chip fixed resistor or Chip jumper	10 ohm – 1M ohm / 1%, 0.063W or 50m ohm max,1A (1005 )	m
C1,2,3,8,12,13,	Chip multilayer capacitor	0.1uF / 10%, 25V	m
C4	Chip multilayer capacitor	0.01uF / 10%, 25V	m
C5,7,10	Chip multilayer capacitor	10pF-1000pF / 10%, 50V	m
C6,11	Chip multilayer capacitor	1uF / 10%, 10V	m
C9	Chip multilayer capacitor	100pF-6800pF / 10%, 50V	m

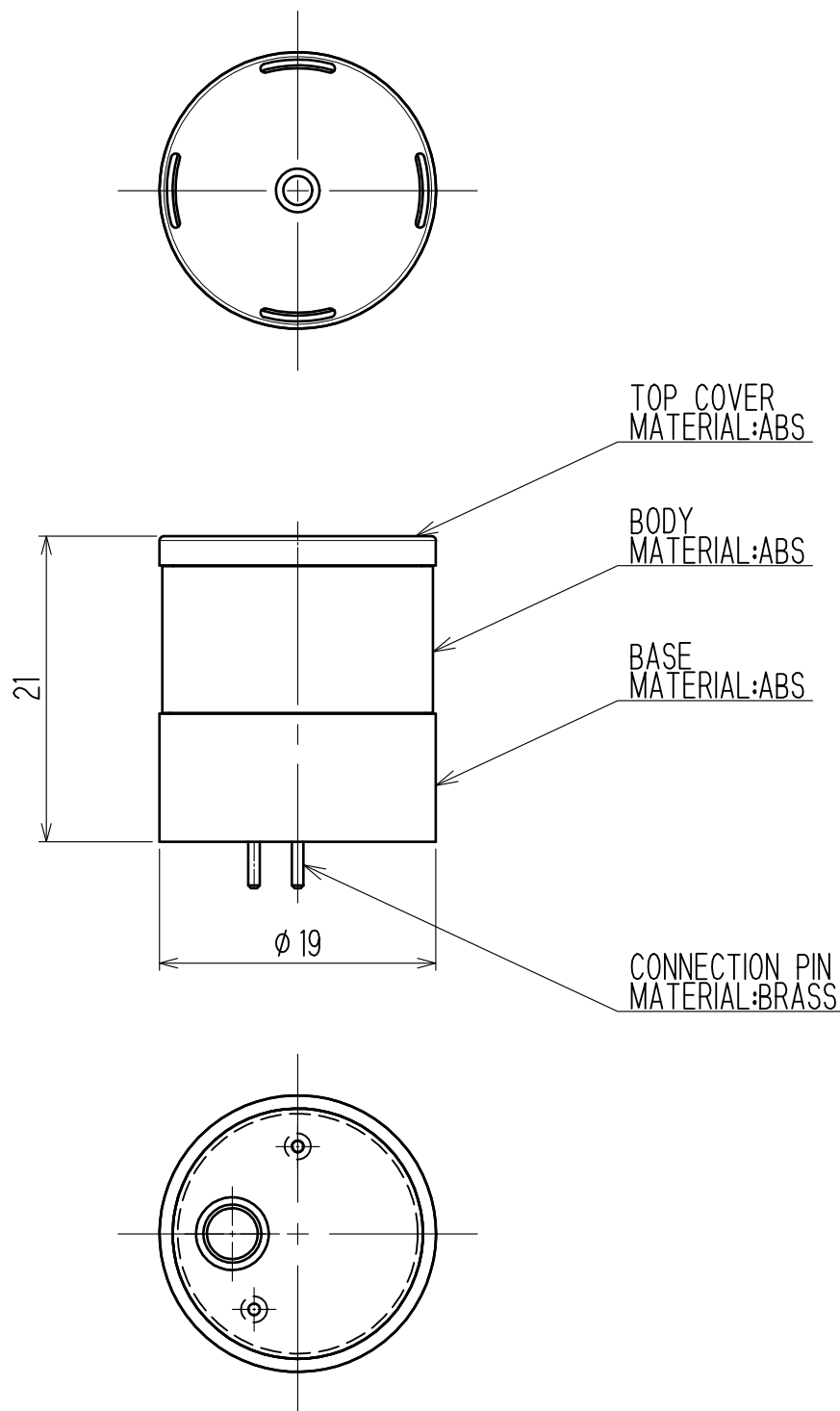
m marked parts are mounted or not



SCHEMATIC

注 記 NOTES		改版担当者 REV. BY	改版日 REVISED	名 称 NAME <b>OSS DIGITAL PCB</b>
改版回数 REV.	0	総頁数 PAGES	1	
承認 APPROVED	検 討 CHECKED	製 図 DRAWN	作成日 DATE	図 番 DWG. NO.
石橋勝	北村正英	小野圭	2015.2.24	<b>E 3 - 6 9 9 1 - 5 4 5 8 - 7 0 - 0 1 K</b>
RIKEN KEIKI		理研計器株式会社		機密情報 / CONFIDENTIAL

		寸 法																							
		18 未 満		18以上50未満		50以上120未満		120以上260未満		260以上500未満		500以上1000未満		1000以上											
許容差	精級	0.1	中級	0.2	粗級	0.4	0.15	0.3	0.6	0.2	0.4	0.8	1.2	0.3	0.6	1.2	0.4	0.8	1.6	0.5	1.0	2.0	0.7	1.2	2.5

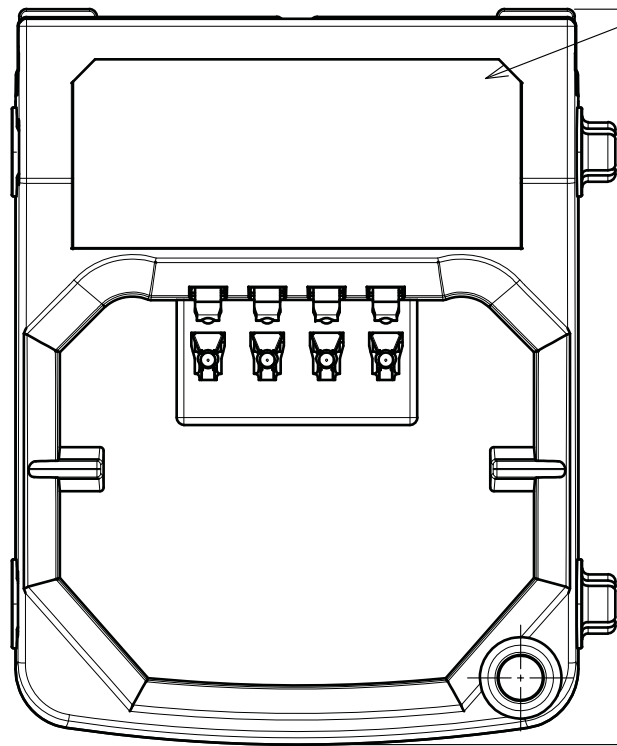


Output specification

- Open circuit voltage : 0.5V(max)
- Short circuit current : 0.1mA(max)

				△	記 事	年 月 日	訂 正 者
表面処理 TREAT.		許容差 TOL.	尺 度 SCALE	投影法 PROJECTION	名 称 NAME OXYGEN SENSOR		
材 質 MAT.							
承認 APPROVED	検 討 CHECKED	製 図 DRAWN	作成日 DATE	図 番 DWG. NO.			
青良治	武井康典	武田直樹	2015. 2. 24	M4-4080-01-02K			
RIKEN KEIKI		理研計測株式会社		機密情報 / CONFIDENTIAL			

寸法	精度	中級	粗級
1000以上	0.7	1.2	2.5
500以上1000未満	0.5	1.0	2.0
260以上500未満	0.4	0.8	1.6
120以上260未満	0.3	0.6	1.2
50以上120未満	0.2	0.4	0.8
18以上50未満	0.15	0.3	0.6
18未満	0.1	0.2	0.4
寸法	精度	中級	粗級

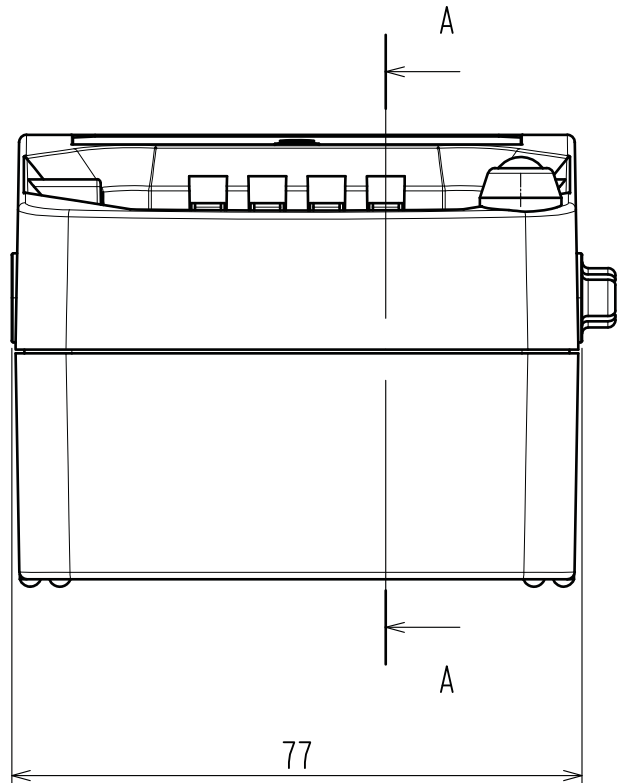


△ LABEL

WARNING

- ・Not for use in hazardous area.
  - ・Use only with exclusive AC adaptor.
- Um=250V

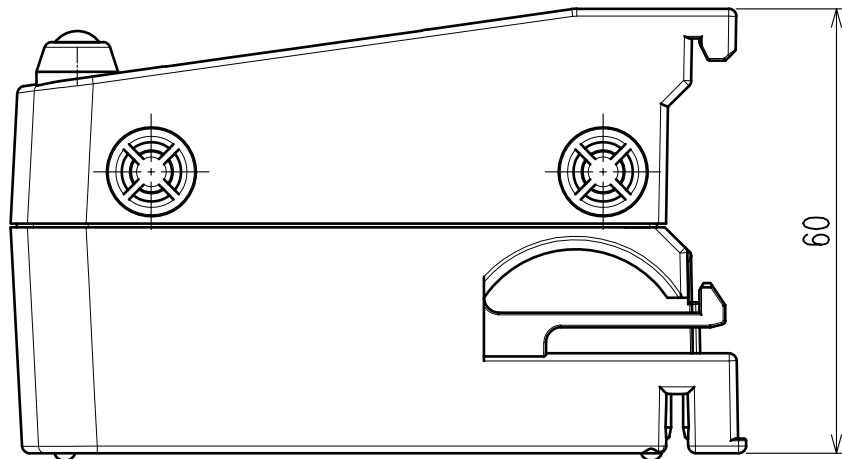
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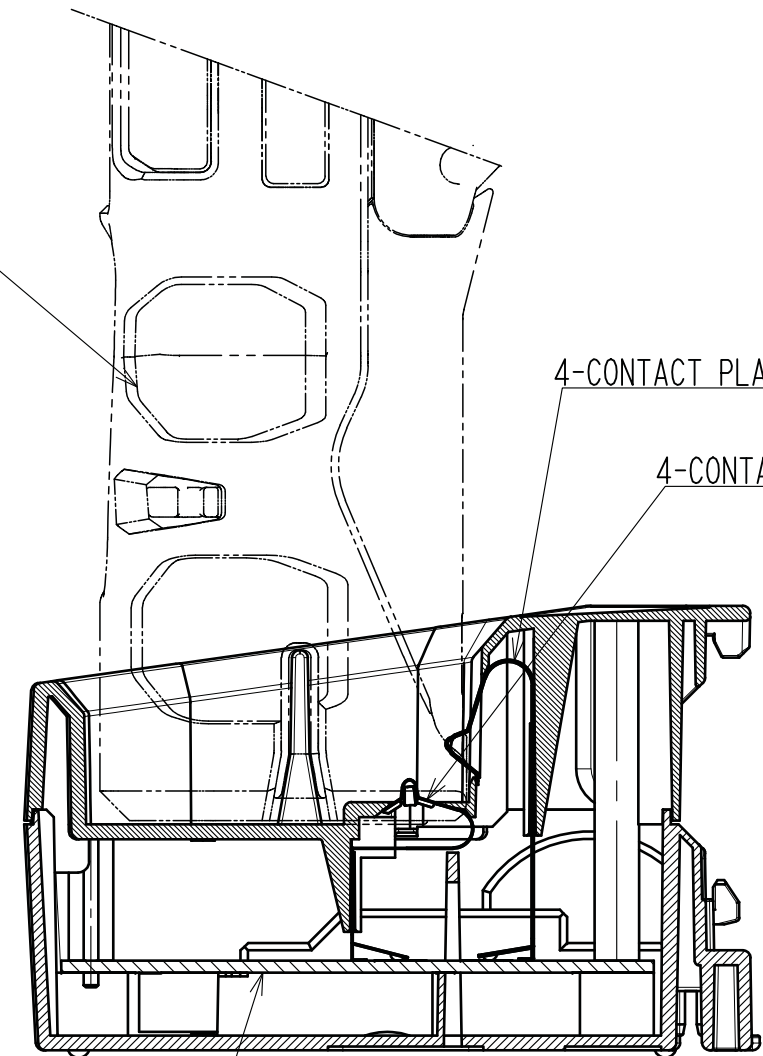


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GX-6000

4-CONTACT PLATE(B)

4-CONTACT PLATE(A)



CHARGER PCB

断面 A-A

表面处理 TREAT.	許容差 TOL.	尺 度 SCALE	投影法 PROJECTION	名 称 NAME
材 質 MAT.		1 : 1		BC-6000
承認 APPROVED	検 討 CHECKED	製 図 DRAWN	作成日 DATE	図 番 DWG. NO.
青良治	海野裕作	近藤晴彦	2015. 3. 24	M3-4777-02-01K

△ ADD LABEL	2015.3.27	近藤晴彦
△ 記 事	年 月 日	訂 正 者

RIKEN KEIKI

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