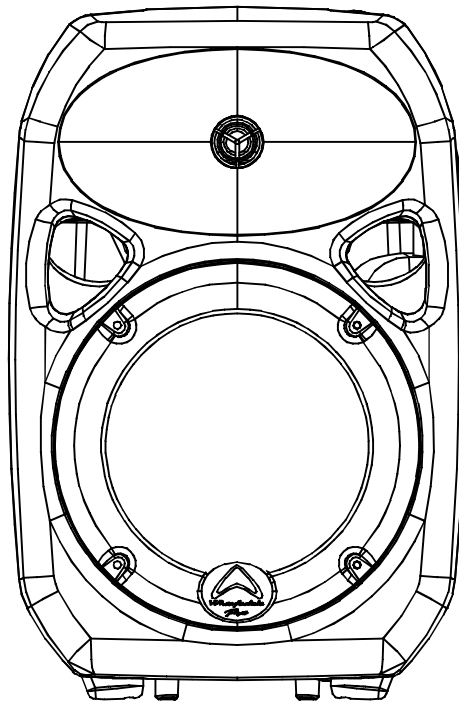


# Titan™ 15 ACTIVE

## Service Manual



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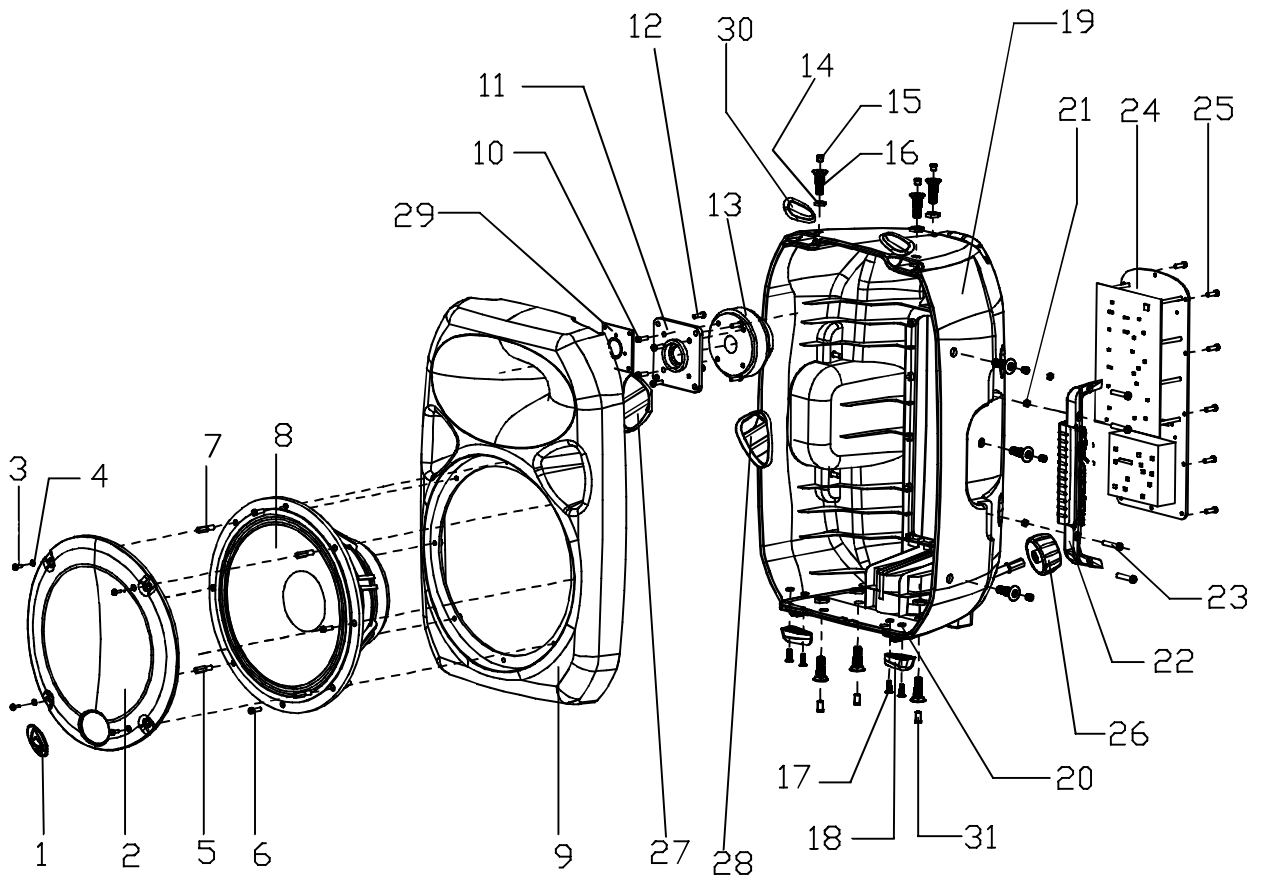
# 1. SPECIFICATIONS

System Type	Active 15 2-way Bi-Amplified system
Frequency Response (+/-3dB)	50-20kHz
Low Frequency Transducer	
Size (mm / inches)	381mm / 15 "
Coil Size (mm / inches)	75mm / 3.0 "
Impedance	4 $\Omega$
High Frequency Transducer	
Type	Compression Driver
Coil Size (mm / inches)	51mm / 2 "
Exit Size (mm / inches)	25mm / 1 "
Diaphragm Material	Titanium
Impedance	8 $\Omega$
High Frequency Coverage (H $\times$ V)	90° $\times$ 60°
Amplifiers	
Low-Frequency Power Amplifier (Class D)	Rated 350W RMS, 700W Peak
High-Frequency Power Amplifier (Class A/B)	Rated 70W RMS, 140W Peak
Electronic Crossover:	24dB per octave Linkwitz-Riley
Crossover Frequency	1.8kHz
Controls	High ( $\pm$ 10dB) 10kHz Shelving
Equalization:	Low ( $\pm$ 10dB) 100Hz Shelving
Bass Response Optimizer ("BRO \$ ) circuit	+5dB at 60Hz
Subsonic Filter	30Hz, Second-order filter
Amplifier Protection	
Power On Protection	Power switch on / off mute
Thermal Protection	Amplifier shutdown, auto reset
Low Line Voltage Shut Down	60% Nominal line voltage
Driver Protection	Independent LF and HF limiters
DC Protection	Yes
Short Protection	Yes
Clip Limiter:	Turns on approx 350W output
Limiter Indicator	Red LED
Power Indicator	Blue LED
Inputs	
Input A % type	Switchable balanced mic or line level input
Input Sensitivity	Mic: -36dBu (-38.2dBv or 12.28mVrms) Line: +4dBu (1.78dBv or 1.228Vrms)
Maximum Input Level	+22dBu
Input Connector	XLR / 1/4 " Combo jack
Input Impedance	Balanced: 20k $\Omega$ - Unbalanced: 10k $\Omega$
Maximum Input Level	+22dBu

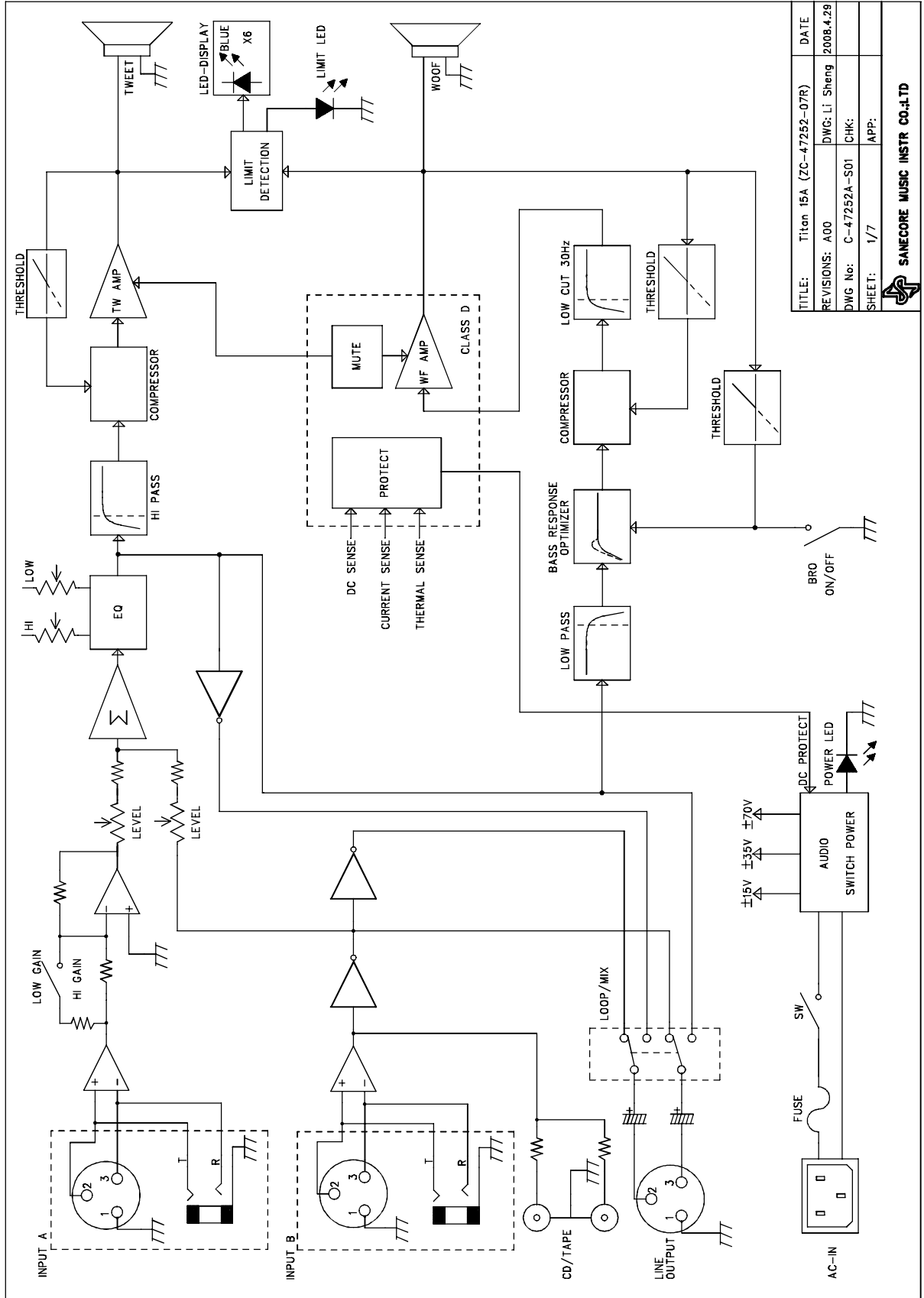
## 2. SPECIFICATIONS

Input B % type	Line level input
Input Sensitivity	XLR / 1/4 " Combo jack: 1.78dBv or 1.228Vrms RCA: 0dBu (-2.2dBv or 0.775Vrms)
Maximum Input Level	+22dBu
Input Connectors	Combo jack: 1/4 " - XLR / Summed dual RCA jacks
Line Output	
Line Output Connector	Switchable LOOP / MIX Balanced Male XLR Connector
Impedance Balanced:	Balanced: 1k $\Omega$ - Unbalanced: 500 $\Omega$
Sensitivity	+4dBu (1.78dBv or 1.228Vrms)
AC Power details	
Power Supply	High Efficiency Switching Mode Power Supply
AC Power Options	AC100~120V / 220~240V, 50 / 60Hz
Power On Indicator	LED
Rigging / Bracket / Mounting Options	10 M8 threaded inserts including 4 M8 threaded inserts on bottom in OmniMount 60.0-type footprint Pole-mount receptacle with lock screw 2 carry handles (one on each side) Optional wall-mount bracket
Enclosure	
Enclosure Material	Injection Moulded Polypropylene
Colour	Grey or white
Dimensions (mm / inches):	
H	708.3mm / 27.9 "
W	477.8mm / 18.8 "
D	401.77mm / 15.8 "
Weight	
Net Weight (kg / lbs)	23.94kg / 52.67lbs
Gross Weight (kg / lbs)	26.94kg / 59.27lbs

### 3.ASSEMBLY SKETCH



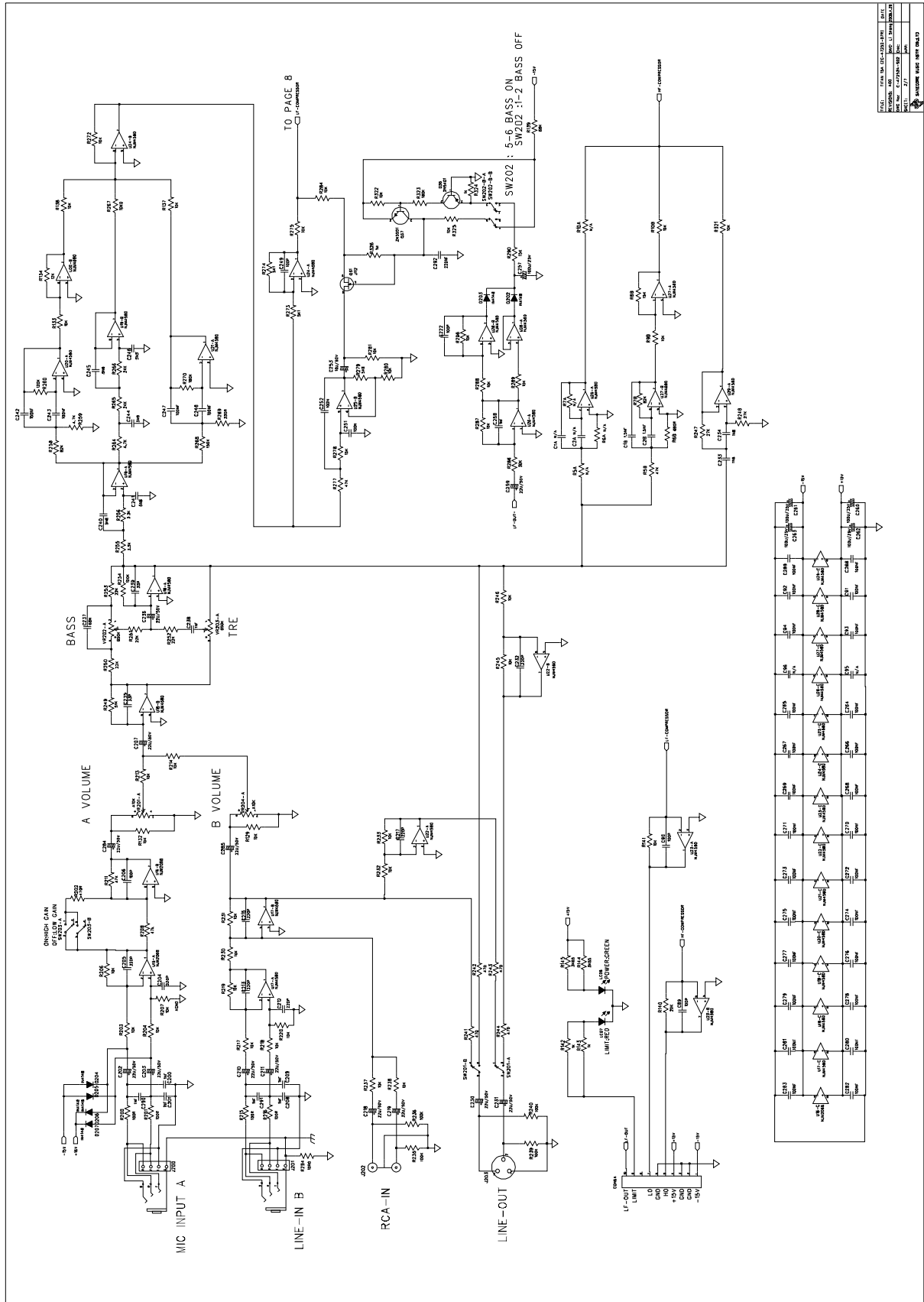
# 4. SCHEMATIC DIAGRAM



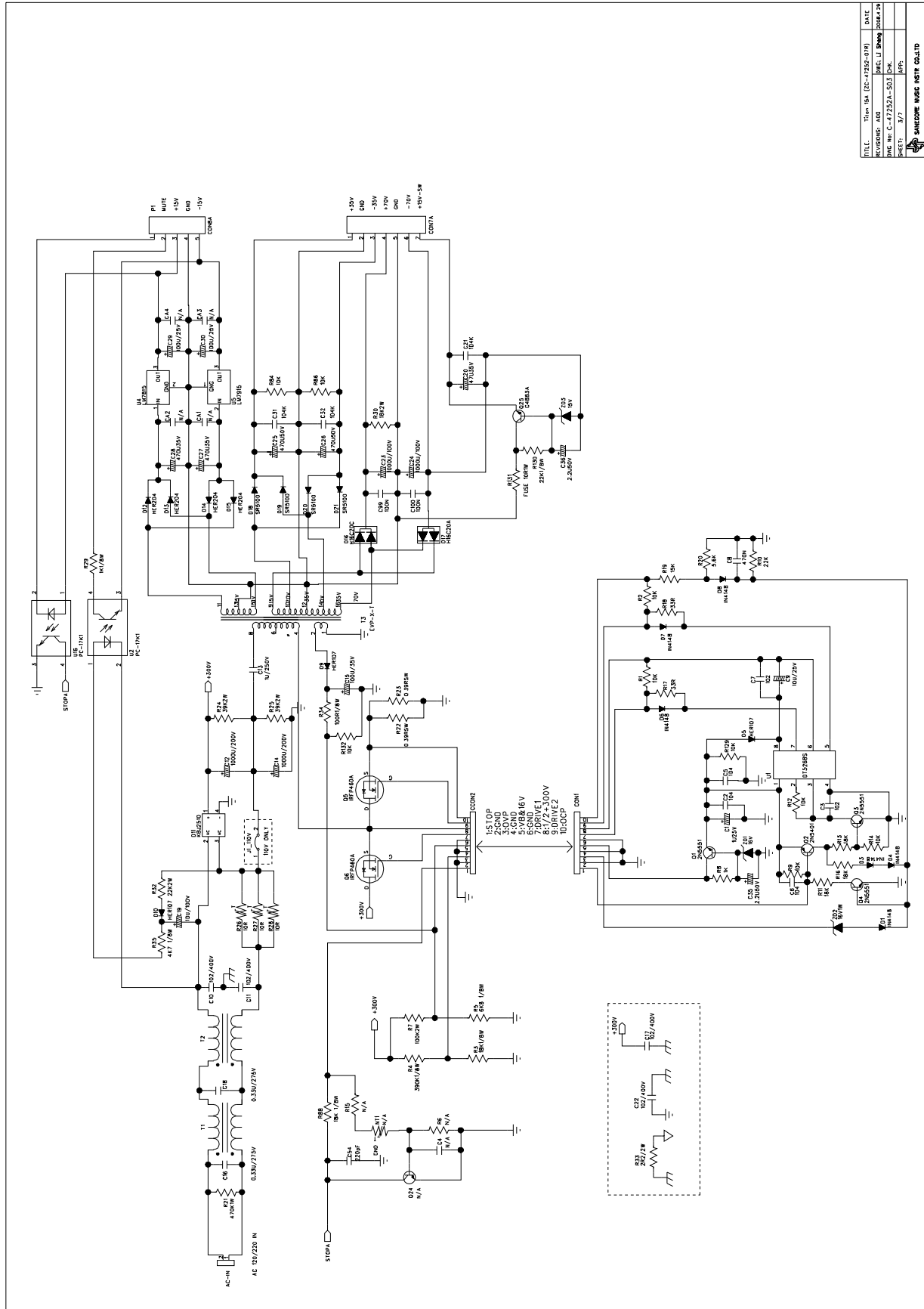
TITLE: Titan 15A (ZC-47252-07R)	DATE
REVISIONS: A00	DWG: Li Sheng   2008.4.29
DWG No: C-47252A-S01	CHK:
SHEET: 1/7	APP:



# 5. SCHEMATIC DIAGRAM



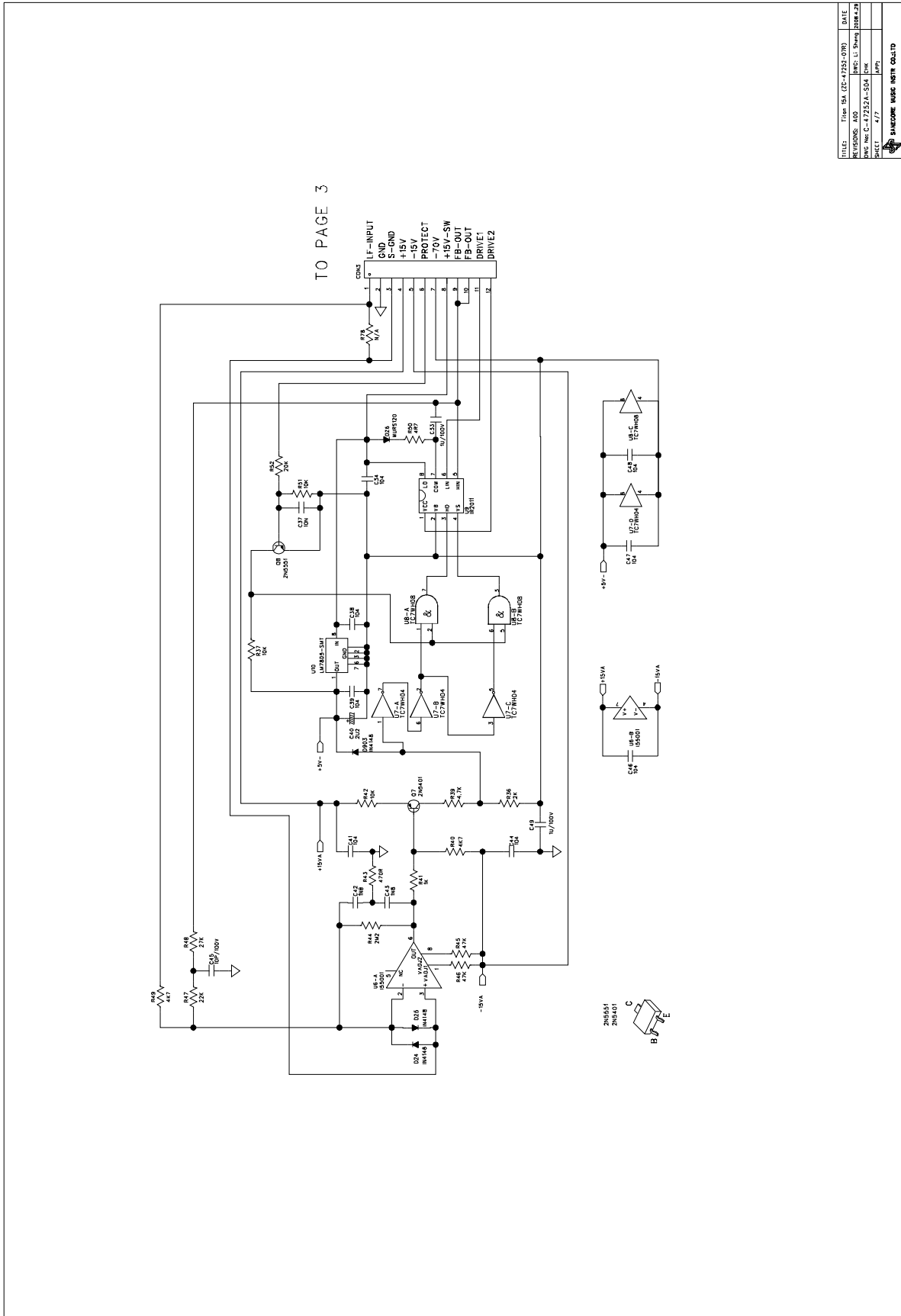
# 6. SCHEMATIC DIAGRAM



TITLE	Titan 15A (2-47252-019)	D.A.T.
REVISED	ADD	DATE
DESIGNER	LI BANG	2004.7.9
CHECKER	C.47252A-50.3	CHK.
SHEET	3/7	APP.

SAMSUNG WAREHOUSE CO., LTD.

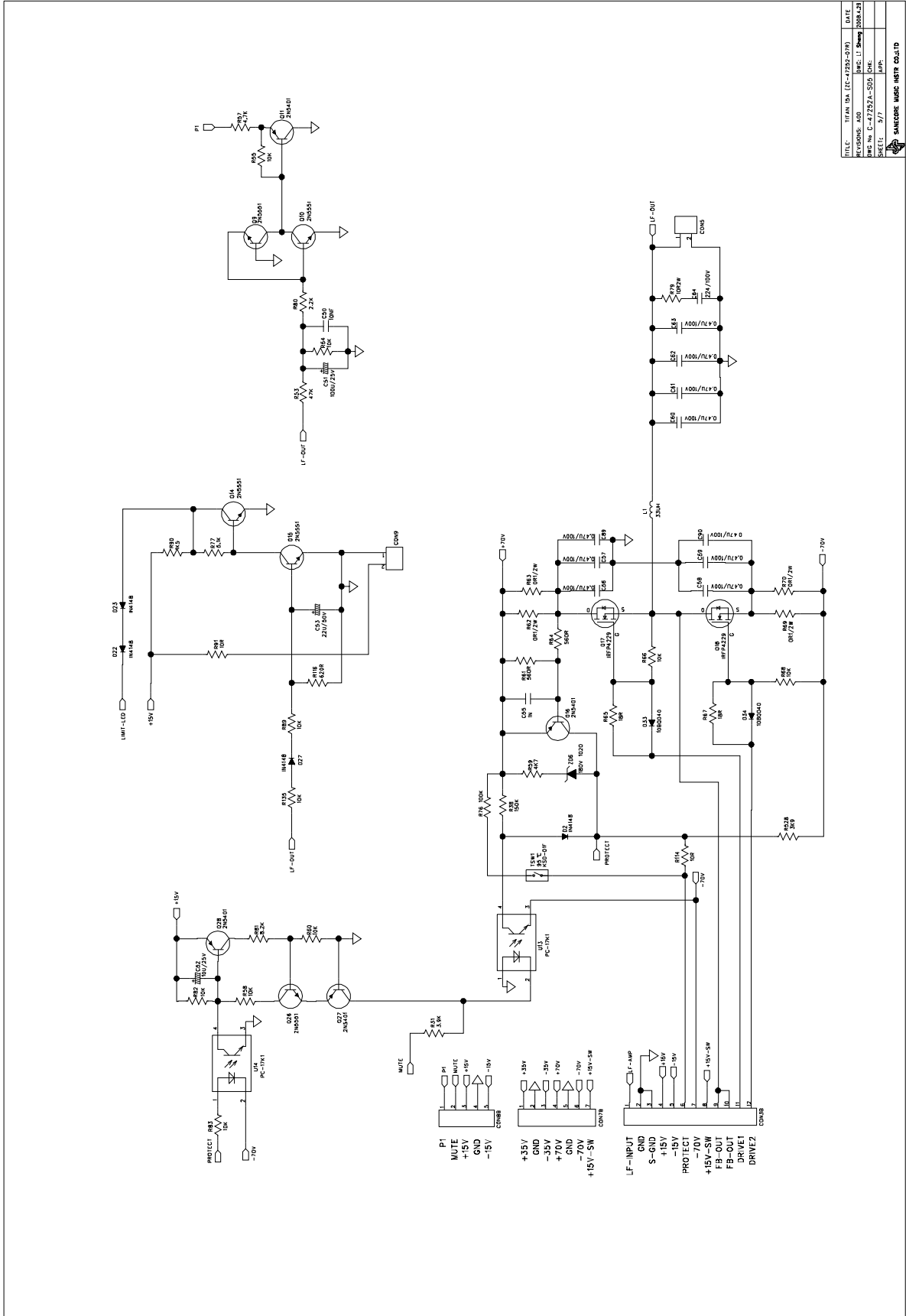
# 7. SCHEMATIC DIAGRAM



FILE:	Titon 15A (2C-1732-078)	DATE
REVISED:	103	PREC. L1 200403 2004.29
Part No:	C-4722A-S04	Proc
Rev:	477	10/03
SANGHVI MICRO INSTR. SOLTD		



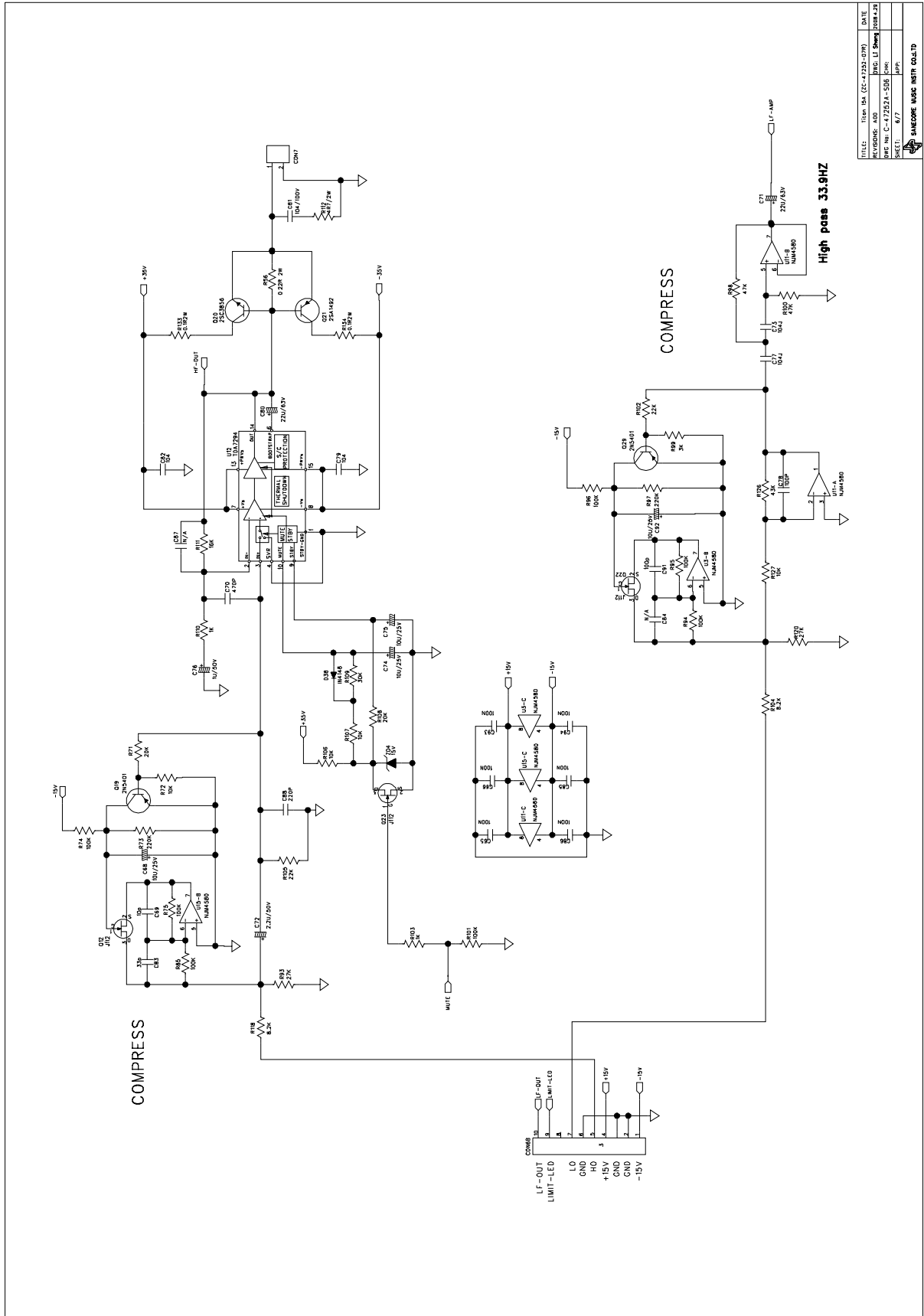
# 8. SCHEMATIC DIAGRAM



FILE: TITAN 15A (C-1725-27A)	DATE
WORKING: 10/01/2004	2004.10.01
DESIGNER: C-1725A-S05	APP.
SHEET: 5/7	

SAWICOR MADE IN THE CZECH REPUBLIC

# 9. SCHEMATIC DIAGRAM



TITLE:	Titan 15A (CC-4232-07W)	DATE:	
REVISED:	A00	ENG:	LI 5/99
REF NO:	C-4752A-S08	CHK:	
SHEET:	6/7	APP:	
SANEORP MUSC INSTR CO., LTD			



## 11.ASSEMBLY PARTS LIST

R/N	P/N	PART NAME	DESCRIPTION	QTY
1	313-2104900001R	LOGO		1
2	310-2104900000R	GRILLE		1
3	537-4001080801AR	SCREW	M4×8	4
4	513-4012130800AR	LEVEL		4
5	565-0534100000R	COPPER NUT	M5	2
6	537-5001250801AR	SCREW	M5×25	4
7	565-0537100000R	COPPER NUT	M5	2
8	ZD-70401-01R	WOOFER		1
9	200-2105000003R	BAFFLE		1
10	537-6001100801AR	SCREW	M6×10	4
11	249-2010490001R	PANEL		1
12	559-5001300071R	SCREW	M5*30	4
13	ZD-70100-01R	TWEETER		1
14	500-1200951100R	NUT		10
15	274-0400900786R	PLUG		6
16	321-4201202286R	NUT	M12×M8×42	10
17	537-5001200801AR	SCREW	M5×19.5	4
18	231-5000000222R	FOOT		2
19	201-2010490003R	HOUSING		1
20	500-5080400300AR	NUT	M5	4
21	500-8012600800AR	NUT	M8	8
22	243-2104900000R	HANDLE		2
23	537-8000135801AR	SCREW		8
24	ZC-47252-07R	AMPLIFIER		1
25	537-4001200801AR	SCREW	M4×20	12
26	293-2010470002R	KNOB		1
27	232-2105000001R	RIGHT ELBOW		1
28	232-2105000002R	LEFT ELBOW		1
29	053-1472511658R	LED PCB		1
30	292-2010470002R	STACK CUP		2
31	534-8001200803AR	SCREW	M8×20	4

## 12.ELECTRONIC PARTS LIST

R/N	P/N	PART NAME	DESCRIPTION	QTY	LOCATION
1	031-2200512121R	FUSE	50T040H	1	
2	042-1003005001R	POWER SWITCH	RF-1003TV-5AC250V	1	
3	044-2600000000R	POWER SOCKET	RF-2004	1	
4	055-0305006133R	RIBBON CABLE	5PIN 24AWG UL1007 L=60mm	1	
5	055-0310025133R	RIBBON CABLE	10PIN 24AWG UL1007 L=250mm	1	
6	055-0402032311R	RIBBON CABLE	2pin 18AWG UL1617 L=320mm	1	
7	055-0407005111R	RIBBON CABLE	7PIN 18AWG UL1015 L=50mm	1	
8	060-0180120300R	RIBBON CABLE	18# C-022-8 L=120MM	1	
9	060-0180151004R	RIBBON CABLE	C-022-6 L=150 18#	1	
10	060-4180140112R	WIRE	1617 AWG18 L=140mm	1	
11	071-1100000000R	CABLE TIES	100MM YJ-100	8	
	088-1472520000R	AMP BOARD		1	
1	001-0229308050R	RESISTOR	0.22 $\Omega$ 2W J	1	R56
2	001-0393108050R	RESISTOR	39K 2W 5%	2	R24.25
3	001-0398810050R	RESISTOR	0.39R 5W 5%	2	R22.23
4	001-0470308050R	RESISTOR	4.7 $\Omega$ 2W J	1	R112
5	001-1000207051R	RESISTOR	10R FMF 1W 5%	1	R131
6	001-1000308050R	RESISTOR	10 $\Omega$ 2W J	1	R79
7	001-1001105050R	RESISTOR	100 $\Omega$ 1/4W J	1	R34
8	001-1004208050R	RESISTOR	100K2W 5%	1	R7
9	001-1008708050R	RESISTOR	0.1 $\Omega$ 2W 5%	6	R62.63.69.70.133.134
10	001-1803308050R	RESISTOR	18K 2W 5% T66	1	R30
11	001-2203208010R	RESISTOR	22K 2W 1%	1	R32
12	001-2209308050QR	RESISTOR	2R2 2W 5%	1	R33
13	001-4703107050R	RESISTOR	470K 1W 5%	1	R21
14	004-3307000000R	RESISTOR	10D-20	3	R26.27.28
15	006-0104051143AR	CAPACITOR	1UF/50V 20%	1	C76
16	006-1004061194R	CAPACITOR	10uF/100V	1	C19
17	006-1006051243R	CAPACITOR	10UF/25V # 5*12	5	C52.68.74.75.92
18	006-1014061153AR	CAPACITOR	100UF/25V 6.3*11 20%	3	C29.30.51
19	006-1014081153AR	CAPACITOR	100UF/35V 8*11 20%	1	C15
20	006-1021174293R	CAPACITOR	1000U/100V/20%	2	C23.24
21	006-1024304109R	CAPACITOR	1000UF/200V 20% ECOSZDA102DA	2	C12.14
22	006-2201061173R	CAPACITOR	22uF/63V 20%	2	C71.80
23	006-2204051143AR	CAPACITOR	22UF/25V 20%	1	C53
24	006-2291051163R	CAPACITOR	2.2UF/50V 10%	2	C36.72
25	006-4700051251R	CAPACITOR	47uF 35V	1	C20
26	006-4714102053AR	CAPACITOR	470UF/35V 10*20 20%	2	C27.28
27	006-4714132063R	CAPACITOR	470UF/50V 20% 13*20	2	C25.26

## 13.ELECTRONIC PARTS LIST

28	008-1021040005R	CAPACITOR	102PF 400V M	4	C10.11.17.22
29	013-2240320503R	CAPACITOR	220NF100V 7.5*5.0*8.0 ±5%	1	C64
30	013-3304025005R	CAPACITOR	334/275V J	2	C16% 18
31	014-1040311028R	CAPACITOR	MKS2 100nF 100V 10%	6	C21.31.32.81.99.100
32	014-1050411006R	CAPACITOR	1UF/250V 10%	1	C13
33	016-4741112201R	CAPACITOR	0.47UF/100V P=15mm	10	C56& 63.89.90
34	017-0190000000R	IC	NJM7815FA TO-220F(JRC)	1	U4
35	017-1830000000R	IC	KIA7915 TO-220 KEC	1	U5
36	017-2700000000R	IC	TDA7294 ST	1	U12
37	018-0101492116R	TRANSISTOR	2SA1492 TO-3P	1	Q21
38	018-0303856116R	TRANSISTOR	2SC3856 TO-3P	1	Q20
39	018-0304883113R	TRANSISTOR	2SC4883A (SANKEN) TO-220F	1	Q25
40	018-2800112115R	FIELD EFFECT TRANSISTOR	J112G TO-92	3	Q12.22.23
41	018-4404229225R	FIELD EFFECT TRANSISTOR	IRFP4229 PBF TO-247AC	2	Q17.18
42	018-7000460125R	FIELD EFFECT TRANSISTOR	IRFP460A TO-247AC	2	Q5.6
43	022-1040041316R	TRANSFORMER	EC40	1	T3
44	026-3334000170R	INDUCTOR	33UH	1	L1
45	034-1119992508R	BRIDGE RECTIFIER	RBV2510	1	D11
46	056-0102224400R	JACK	JS3962-2P-WAFER	2	CON5.7
47	056-0103003300R	JACK	2PIN 3.96PH	1	AC-IN
48	056-4102220000R	JACK	JS-1001-02	1	CON9
49	056-4105221100R	JACK	DJ2802-05	2	CON8A .CON8B
50	056-4110000000R	JACK	10PIN 2.54	1	CON6A
51	056-6107004150R	JACK	7pin PH=3.96mm	2	CON7A .CON7B
52	066-0095010000R	SWITCH	TO-2P	1	TSW1
53	067-2200107000R	DIODE	HER107 JAL	2	D9.10
54	067-2200207000R	DIODE	HER204	4	D12.13.14.15
55	067-2201620000R	DIODE	F16C20C TO-220	1	D16
56	067-2201620001R	DIODE	F16C20A TO-220	1	D17
57	067-2205100000R	DIODE	SB/SR5100 DIP	4	D18.19.20.21
58	067-3304744000R	DIODE	IN4744A 15V-1W	1	ZD3
59	071-1100000000R	CABLE TIES	100MM YJ-100	1	
60	080-0210012016R	INDUCTOR	13.6MH 0.8MM 230V AC	2	T1.2
61	082-0100000000R	PHOTOCOUPLER	PC-17K1 KODENSHI	4	U2.13.14.16
	088-1472520001R	AMP BOARD		1	
1	002-1000022050R	RESISTOR	10 Ω 5% 1/10W 0805	1	R114
2	002-1001032050R	RESISTOR	100 Ω 0805 ±5% 1/8W	1	R91
3	002-1002032010R	RESISTOR	1K 1/8W 1% 0805	3	R29.103.110
4	002-1003032010R	RESISTOR	10K Ω 1/8W 1% 0805	14	R54.55.58.60.66.68.72.52 8.89.106.107.127.132. 135

## 14.ELECTRONIC PARTS LIST

5	002-1004032010R	RESISTOR	100K $\Omega$ 1/8W 1% 0805	8	R74.75.76.85.94.95.96.101
6	002-1502032050R	RESISTOR	1.5K 0805 $\pm$ 5% 1/8W	1	R90
7	002-1504032050R	RESISTOR	150K 0805 $\pm$ 5% 1/8W	1	R38
8	002-1603032050R	RESISTOR	16K 0805 $\pm$ 5% 1/8W	1	R111
9	002-1800042050R	RESISTOR	18R 0805 1/8W 1%	2	R65.67
10	002-1803032010R	RESISTOR	18K 1/8W 0805 1%	2	R3.88
11	002-2003032010R	RESISTOR	20K $\Omega$ 1/8W 1% 0805	2	R71.108
12	002-2202032010R	RESISTOR	2.2K 1/8W 1% 0805	1	R80
13	002-2203032010R	RESISTOR	22K 1/8W 1% 0805	3	R102.105.130
14	002-2204032050R	RESISTOR	220K 0805 \$ 5% 1/8W	2	R73.97
15	002-2703032010R	RESISTOR	27K 1/8W 1% 0805	2	R93.120
16	002-3003032010R	RESISTOR	30K $\Omega$ 1/8W 1% 0805	1	R109
17	002-3012032010R	RESISTOR	3K01 0805 1/8W 1%	1	R99
18	002-3902032010R	RESISTOR	3.9K $\Omega$ 1/8W 1% 0805	1	R31
19	002-4024022010R	RESISTOR	0805 390K 1/10W J	1	R4
20	002-4303032050R	RESISTOR	0805 43K 5% 1/8W	1	R126
21	002-4702032010R	RESISTOR	4.7K 1/8W 1% 0805	4	R35.57.59.83
22	002-4703032050R	RESISTOR	47K 0805 \$ 5% 1/8W	3	R53.98.100
23	002-5102032010R	RESISTOR	5.1K $\Omega$ 1/8W 1% 0805	2	R77.82
24	002-5601032010R	RESISTOR	560 $\Omega$ 1/8W 1% 0805	2	R61.64
25	002-6801032010R	RESISTOR	680 $\Omega$ 1/8W 1% 0805	1	R116
26	002-6802032050R	RESISTOR	6.8K 0805 \$ 5% 1/8W	1	R5
27	002-8202032010R	RESISTOR	8.2K 1/8W 1% 0805	3	R81.104.118
28	007-1001032060R	CAPACITOR	100PF 50V 5% 0805	2	C78.91
29	007-1001052093R	CAPACITOR	10PF 100V 5% 0805 COG	1	C69
30	007-1002062060R	CAPACITOR	1nF CP50V 10% 0805	1	C55
31	007-1003062090R	CAPACITOR	103/100V 0805 10%	1	C50
32	007-1004052060R	CAPACITOR	100nF 50V 5% 0805	10	C65.66.73.77.79.82.85.86.93.94
33	007-2201062060R	CAPACITOR	220PF CP50V 10% 0805	2	C88.54
34	007-3300052060R	CAPACITOR	33pF 50V NPO 5% 0805	1	C83
35	007-4701062060R	CAPACITOR	470PF CP50V 10% 0805	1	C70
36	017-5270000001R	IC	NJM4580M NJM-DMP8	3	U3.11.15
37	018-2905401227R	TRANSISTOR	2N5401S SOT-23 KEC	6	Q11.16.19.27.28.29
38	018-2905551227R	TRANSISTOR	2N5551S SOT-23 KEC	5	Q9.10.14.15.26
39	053-1472520400R	PCB		1	
40	067-2204148110R	DIODE	ST LL4148 SMD1206	5	D2.22.23.27.38
41	067-3300015114R	DIODE	15V ST	1	ZD4
42	067-3305279000R	DIODE	IN5279B	1	ZD6
43	067-6600040110R	DIODE	10BQ040 SMB	2	D33.34

## 15.ELECTRONIC PARTS LIST

	088-1472525000R	LED BOARD		1	
1	001-1002105050R	RESISTOR	1K 1/4W J	6	R113.115.117.119.121.123
2	019-0379132200R	POWER LED	φ3mm	6	LED1& 6
3	053-1472511658R	PCB	64*64mm 1.6T 10Z	1	
4	055-1302044444R	RIBBON CABLE	L=440MM ±10 UL1007#26	1	CON8& CON9
	088-1472525501R	AMP BOARD		1	
1	002-1002032010R	RESISTOR	1K 1/8W 1% 0805	1	R41
2	002-1003032010R	RESISTOR	10K Ω 1/8W 1% 0805	2	R37.42
3	002-2003032010R	RESISTOR	20K Ω 1/8W 1% 0805	1	R52
4	002-2003403010R	RESISTOR	2K 0805 1% 0.125W	1	R36
5	002-2203032010R	RESISTOR	22K 1/8W 1% 0805	1	R47
6	002-2205032010R	RESISTOR	2.2M 1/8W 1% 0805	1	R44
7	002-2703032010R	RESISTOR	27K 1/8W 1% 0805	1	R48
8	002-4701032010R	RESISTOR	470 Ω 1/8W 1% 0805	1	R43
9	002-4702032010R	RESISTOR	4.7K 1/8W 1% 0805	3	R39.40.49
10	002-4703032010R	RESISTOR	47K Ω 1/8W 1% 0805	2	R45.46
11	002-4709032010R	RESISTOR	4.7 Ω 1/8W 1% 0805	1	R50
12	002-6802032050R	RESISTOR	6.8K 0805 \$ 5% 1/8W	1	R51
13	007-1001052093R	CAPACITOR	10PF 100V 5% 0805 COG	1	C45
14	007-1003062090R	CAPACITOR	103/100V 0805 10%	1	C37
15	007-1004052060R	CAPACITOR	100nF 50V 5% 0805	8	C34.38.39.41.44.46.47.48
16	007-1014063090R	CAPACITOR	1U/100V 10% 1206	2	C33.49
17	007-1802052060R	CAPACITOR	1.8NF 50V 5% 0805 X7R	2	C42.43
18	010-2251602010R	CAPACITOR	T450A12251CMAP1	1	C40
19	017-5220000001R	IC	L78L05ABD SO-8 ST	1	U10
20	017-7070000000R	IC	IR2011S PBF 8PIN	1	U9
21	017-7110000000R	IC	ISL5001IBZ SO-8 intersil	1	U6
22	017-7120000000R	IC	TC7WH08FU(TE12LF) 8PIN SMD	1	U8
23	017-7130000000R	IC	TC7WH04FU 8PIN	1	U7
24	018-2905401227R	TRANSISTOR	2N5401S SOT-23 KEC	1	Q7
25	018-2905551227R	TRANSISTOR	2N5551S SOT-23 KEC	1	Q8
26	019-0012003103R	DIODE	MURS120T3 (Pk:SMB) ON	1	D26
27	053-1407001610R	PCB	FR-4 1.6 10Z 150*80	1	
28	067-2204148110R	DIODE	ST LL4148 SMD1206	3	D24.25.903
	088-1472527200R	POWER BOARD		1	
1	006-1001051163R	CAPACITOR	SM10uF 50V 10%	1	C253
2	006-1011061143R	CAPACITOR	SM 100uF 25V 10%	5	C257.260.261.262.263
3	006-2201051163R	CAPACITOR	SM 22uF 50V 10%	13	C202.203.207.210.211.218.219.230.231.236.259.284.285



## 16.ELECTRONIC PARTS LIST

4	017-1124000000R	IC	IR2153D DIP-8 IR	1	U1
5	018-2800112115R	FIELD EFFECT TRANSISTOR	J112G T0-92	1	Q31
6	019-0311122001R	POWER LED	204HD/E-A RED $\phi$ 3	1	LED7
7	019-0322122001R	POWER LED	LED 204GD/E-A GREEN $\phi$ 3	1	LED8
8	020-1032120325R	POTENTIOMETER	RD16K12D0094-10K15Ax2	2	VR201.204
9	020-5052119425R	POTENTIOMETER	RD 16K124A068-50KCBX2SII	2	VR-202.203
10	040-1400000000R	SWITCH	JPS2281EA	2	SW201.201
11	048-3000000000R	POWER SOCKET	NYS143 J3Y1 3pin	1	J203
12	049-2507222016R	JACK SOCKET	LA1113 7PIN	2	J200.201
13	051-0500000000R	POWER SOCKET	RCA JK0200560N	1	J202
14	056-4110000000R	JACK	10PIN 2.54	1	CON6A
15	057-2545011241R	JACK	24P	1	CON1
16	067-2200107000R	DIODE	HER107 JAL	1	D5
	088-1472527201R	POWER BOARD		1	
1	002-1000022050R	RESISTOR	10 $\Omega$ 5% 1/10W 0805	1	R294
2	002-1001032050R	RESISTOR	100 $\Omega$ 0805 $\pm$ 5% 1/8W	4	R200.201.215.216
3	002-1002032010R	RESISTOR	1K 1/8W 1% 0805	4	R8.142.143.324
4	002-1003032010R	RESISTOR	10K $\Omega$ 1/8W 1% 0805	44	R1.2.9.14.129.132.133.137.138.141.203.204.206.207.220.213.214.217.218.219.230.231.232.233.237.238.245.246.267.272.275.280.281.284.287.288.289.296.321.322.325.9B.10B
5	002-1004032010R	RESISTOR	100K $\Omega$ 1/8W 1% 0805	5	R235.236.239.240.254
6	002-1005022005R	RESISTOR	1M 0.1W 0.5% 25PPM 0805	1	R326
7	002-1203032010R	RESISTOR	12K 1/8W 1%	1	R134
8	002-1204032050R	RESISTOR	120K 0805 $\pm$ 5% 1/8W	1	R260
9	002-1503032010R	RESISTOR	15K 1/8W 1% 0805	4	R19.278.290.8B
10	002-1504032050R	RESISTOR	150K 0805 $\pm$ 5% 1/8W	1	R268
11	002-1803032010R	RESISTOR	18K 1/8W 0805 1%	3	R11.13.16
12	002-1804022010R	RESISTOR	0805 180K 1/10W 1%	2	R270.323
13	002-2003032010R	RESISTOR	20K $\Omega$ 1/8W 1% 0805	1	R140
14	002-2203032010R	RESISTOR	22K 1/8W 1% 0805	3	R10.251.252
15	002-2400032011R	RESISTOR	24K 1/8W 0805 1%	2	R265.266
16	002-2703032010R	RESISTOR	27K 1/8W 1% 0805	2	R247.248
17	002-3003032010R	RESISTOR	30K $\Omega$ 1/8W 1% 0805	1	R286
18	002-3300032050QR	RESISTOR	33R 1/8W 5%	2	R17.18
19	002-3301032010R	RESISTOR	330 $\Omega$ 1/8W 1% 0805	1	R269
20	002-3302032010R	RESISTOR	3.3K 1/8W 1% 0805	2	R255.256
21	002-3651012010R	RESISTOR	3.65K 1% 0805	2	R144.145
22	002-4701032010R	RESISTOR	470 $\Omega$ 1/8W 1% 0805	5	R202.241.242.243.244

## 17.ELECTRONIC PARTS LIST

23	002-4702032010QR	RESISTOR	4.7K 1/8W 1% 0805	2	R259.264
24	002-4703032010R	RESISTOR	47K $\Omega$ 1/8W 1% 0805	4	R208.211.277.5B
25	002-5102032010R	RESISTOR	5.1K $\Omega$ 1/8W 1% 0805	2	R273.274
26	002-5102032100R	RESISTOR	51K $\pm$ 5%1/8W 0805	1	R249
27	002-5602032010R	RESISTOR	5.6K $\Omega$ 1/8W 1% 0805	2	R20.279
28	002-6801032010R	RESISTOR	680 $\Omega$ 1/8W 1% 0805	1	R6B
29	002-6802032050R	RESISTOR	6.8K 0805 $\pm$ 5% 1/8W	2	R250.253
30	002-6803032010R	RESISTOR	68K 1/8W 1% 0805	1	R139
31	002-8203032050R	RESISTOR	82K 0805 $\pm$ 5% 1/8W	2	R258.7B
32	006-2250040561R	CAPACITOR	2.2UF/50V 4*5.5MM K	1	C35
33	007-1001062060R	CAPACITOR	100PF CP50V 10% 0805	5	C89.90.206.222.249
34	007-1002052060QR	CAPACITOR	SMD 1nF 50V 5% 0805	1	C3
35	007-1002062060R	CAPACITOR	1nF CP50V 10% 0805	9	C7.200.201.208.209.238.258.290.291
36	007-1004062060R	CAPACITOR	100nF CP50V 10% 0805	35	C2.5.6.91.93.94.242.243.247.248.251.252.264& 283.288.289.92
37	007-1004079040R	CAPACITOR	1U/50V,20%,4*5MM	1	C1
38	007-1005079040R	CAPACITOR	10UF 25V $\pm$ 20% 4*5.4mm	1	C9
39	007-1502052060QR	CAPACITOR	1N5/50V 5%	2	C1B.C2B
40	007-1802052060R	CAPACITOR	1.8NF 50V 5% 0805 X7R	2	C233.234
41	007-2201062060R	CAPACITOR	220PF CP50V 10% 0805	7	C204.205.212.213.215.217.232
42	007-2204062060R	CAPACITOR	220nF 50V 10% 0805	1	C292
43	007-3300052060R	CAPACITOR	33pF 50V NPO 5% 0805	2	C235.239
44	007-3302062060R	CAPACITOR	3.3NF/50V 0805 10%	1	C246
45	007-3902052060QR	CAPACITOR	3N9/50V 5%	1	C244
46	007-4704062070R	CAPACITOR	470NF/50V 0805 20%	1	C8
47	007-5602052060R	CAPACITOR	5.6NF 50V 5% 0805	3	C240.241.245
48	007-6803052060R	CAPACITOR	68NF 50V 10% 0805	1	C237
49	017-1370000000R	IC	NJM2068M SO-8B(JRC)	1	U16
50	017-5270000001R	IC	NJM4580M NJM-DMP8	12	U17& 25.27.28.29
51	018-2905401227R	TRANSISTOR	2N5401S SOT-23 KEC	2	Q2.37
52	018-2905551227R	TRANSISTOR	2N5551S SOT-23 KEC	4	Q1.3.4.36
53	053-1472521300R	PCB	141.8X142.8X1.6(mm)	1	
54	067-2204148110R	DIODE	ST LL4148 SMD1206	12	D1.3.4.6.7.8.202.203.204.205.206.207
55	067-3300016111R	DIODE	ZMM16 16V 0.5W LL34	2	ZD1.2
56	089-0500000012R	SWITCH	SS-22F20-G12	1	SW203
57	221-1472410000R	LED HOLDER	M5*22.5mm WHITE	2	D305.306