

SP-012 Service Manual

SP-012 Principle and Servicing

1. SP-012 working principle

Signals are inputted to input board through SC1. The left channel signal arrives at pin 3 of socket XS1 through R13, and then at power amplifier board through flat cable XP1 and then divides into two paths after arriving at power amplifier board: one path arrives at potentiometer S2 through R2 for bass adjustment (S2 is duplex potentiometer and can adjust left and right channels at the same time); the other path arrives at potentiometer S1 through C21 for tweeter adjustment (S1 is duplex potentiometer and can adjust left and right channels at the same time); after bass and tweeter adjustment, the two paths combines into one path through balance resistor R3, R5 and send to potentiometer S3 for volume adjustment (S3 is duplex potentiometer and can adjust left and right channels). After volume adjustment, signals are sent to pin 2 of U1LA4508 after R12 damping and C1 coupling for power amplifying (LA4508 a dual-channel power IC with fixed amplifying ratio), and outputted through pin 4 after amplifying; output signals are sent to speaker directly after DC filtering. Signal flow direction of right channel is the same as that of left channel/.

2. Introduction to LA4508:

- ◆ Output power: 22W×2
- ◆ Power supply voltage: 22V
- ◆ Pin 2, 13: signal input pin
- ◆ Pin 4, 11: signal output pin
- ◆ Pin 6, 9: bootstrap capacitor input pin

3. Troubleshooting flow

(1) Troubleshooting flow for “Left channel has no output” os shown as the following figure 3.1:

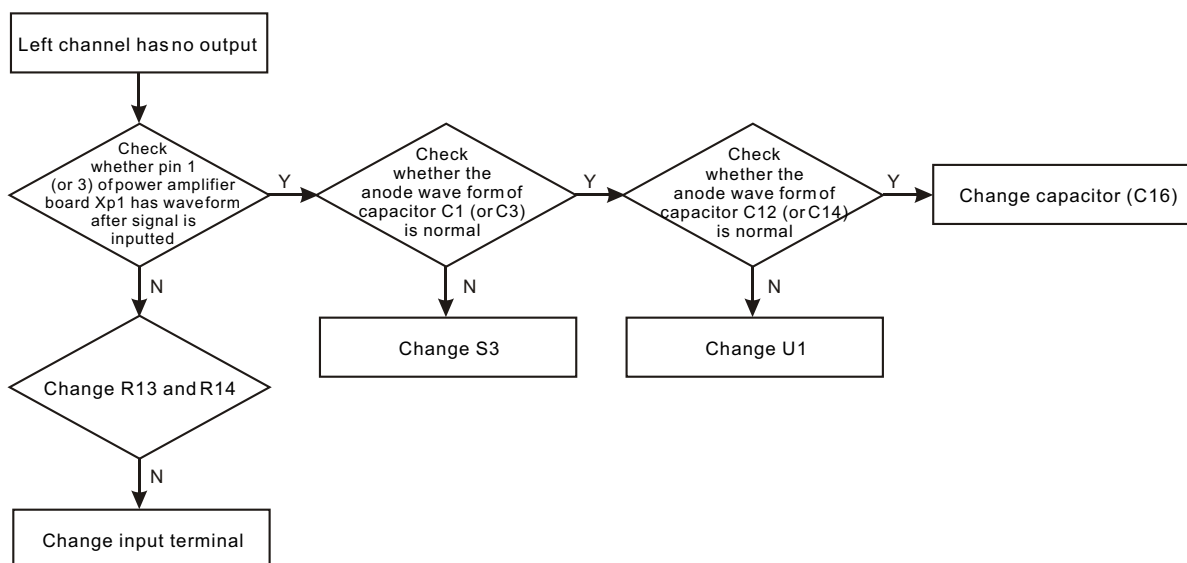


Figure 3.1 Troubleshooting flow for “Left channel has no output”

(2) Troubleshooting flow chart for "Power not on" is shown as the following figure 3.2:

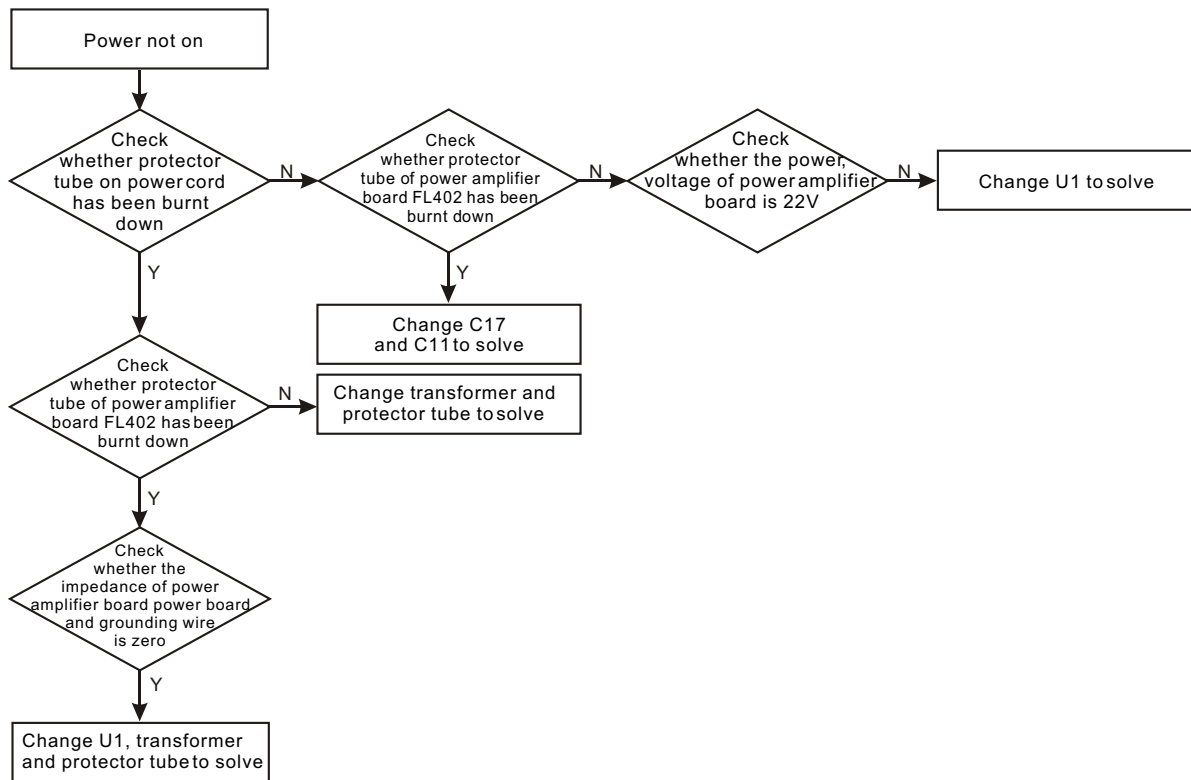
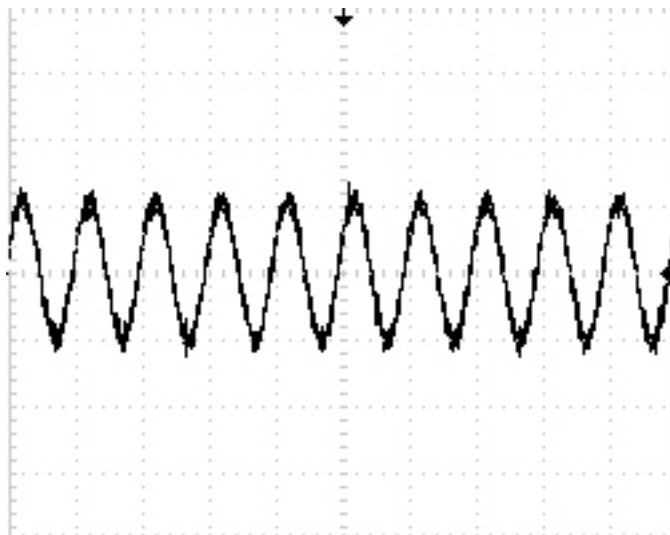


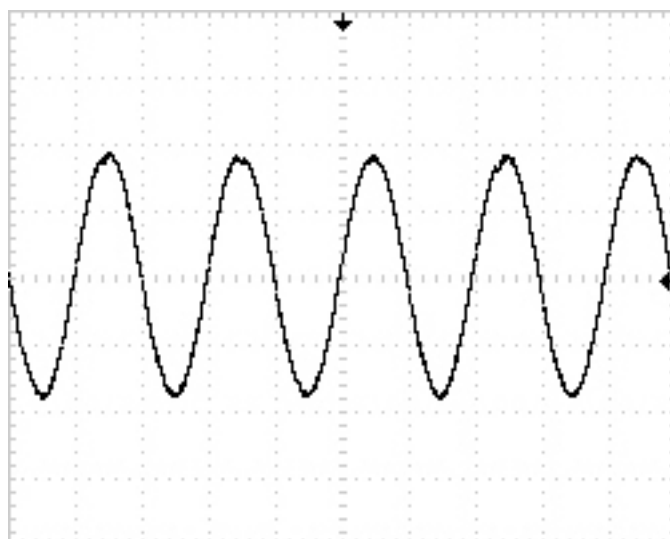
Figure 3.2 Troubleshooting flow chart for "Power not on"

4. Signal waveform diagram

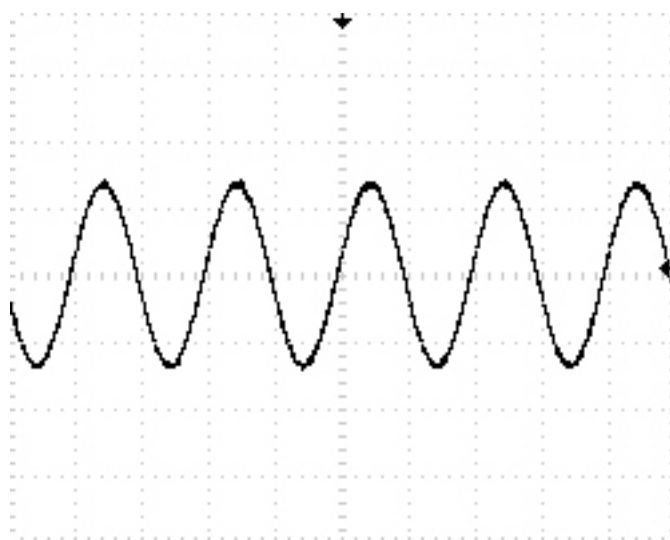
(1) Input waveform diagram of pin 2 of U1



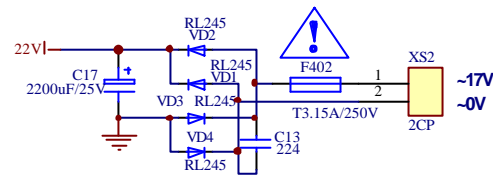
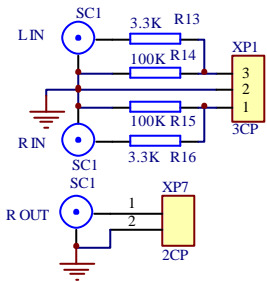
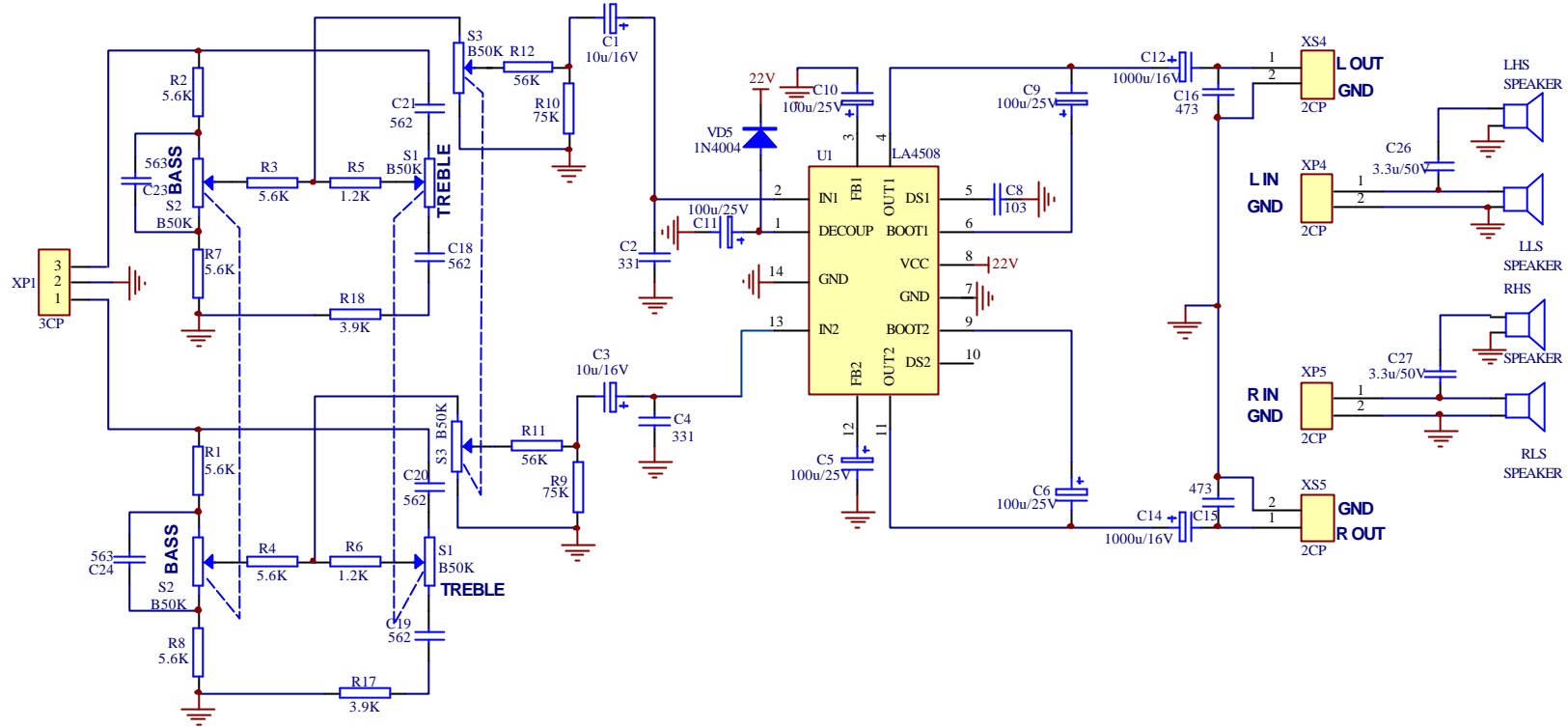
(2) XS4 output signal waveform diagram



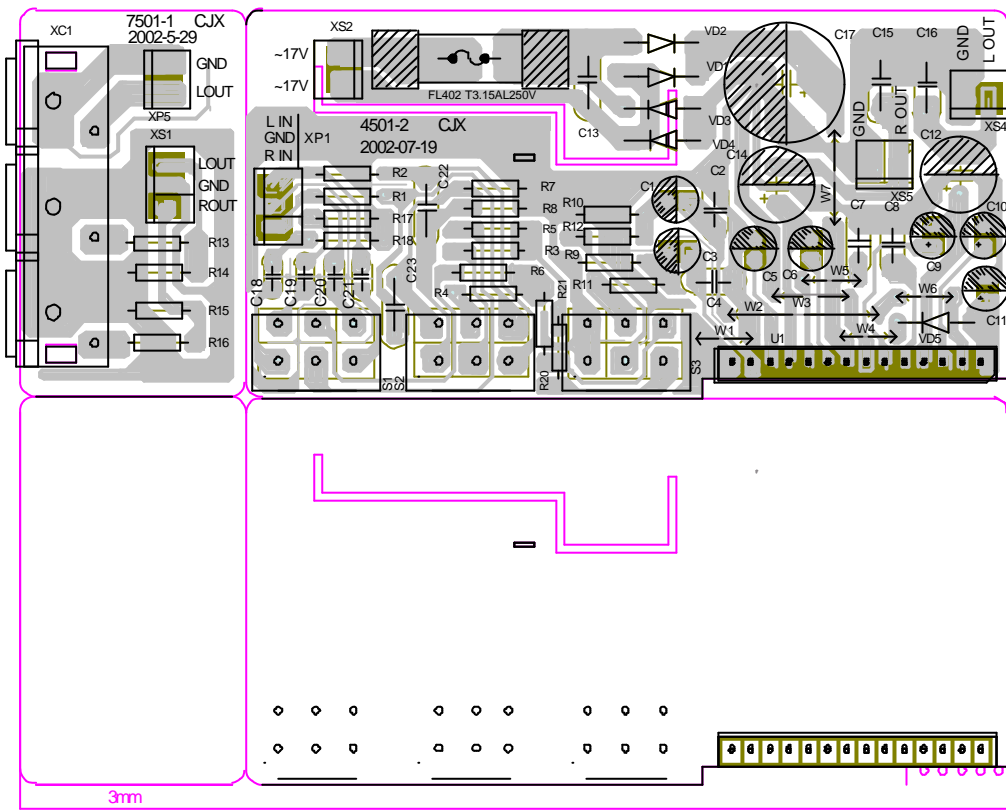
(3) External input signal waveform diagram



5. circuit diagram



6. PCB Board



7. BOM LIST

MATERIAL CODE	MATERIAL NAME	SPECIFICATIONS	LOCATION
AMPLIFIER BOARD			
2100003	CONNECTED CORDS	F0.6 SHAPED 7.5mm	W1,W5,W6
2100004	CONNECTED CORDS	F0.6 SHAPED 10mm	W3
2100006	CONNECTION CORDS	F0.6 SHAPED 12.5mm	W7
2100017	CONNECTED CORDS	F0.6 SHAPED 20mm	W2
0000229	CARBON FILM RESISTOR	1/4W43K±5%	R20,R21
0000288	CARBON FILM RESISTOR	1/4W3.9K±5% SHAPED 10	R17,R18
0000291	CARBON FILM RESISTOR	1/4W5.6K±5% SHAPED 10	R1,R2,R3,R4,R7,R8
0000281	CARBON FILM RESISTOR	1/4W6800±5% SHAPED 10	R11,R12
0000304	CARBON FILM RESISTOR	1/4W75K±5% SHAPED 10	R9,R10
0000361	CARBON FILM RESISTOR	1/4W1.2K±5% SHAPED 10	R5,R6
0210014	TERYLENE CAPACITOR	100V 103 ±10% 3.5mm	C7,C8
0210031	TERYLENE CAPACITOR	100V 224 ±10% 8mm	C13,C15,C16
0210056	TERYLENE CAPACITOR	50V 563 ±20% 6mm	C23,C22
0210065	TERYLENE CAPACITOR	100V 562 ±5% 3.5mm	C18,C19,C20,C21
0200111	PORCELAIN CAPACITOR	50V 331 ±10% 5mm	C2,C4
0260303	CD	CD11 16V2200u±20 %10x30 5	C12,C14
0260460	CD	CD11 16V2200U±20%12x25 5	C12,C14
0260036	CD	CD11 25V10U±20%5x11 2	C1,C3
0260041	CD	CD11 25V220U±20%8x12 3.5	C11
0260104	CD	CD110 25V 100UF ±20% 6x12 2.5	C5,C6,C9,C10
0260227	CD	CD11 25V2200U±20%16x18 7.5	C17
0260173	CD	CD11 25V2200U±20%16x25 7.5	C17
0880904	IC	LA4508 ZIP	U1
0570019	DIODE	RL254	VD1~VD4
0160035	ROTATED POTENTIOMETER	D161GOAX-V1B503-016	S1,S2
0160036	ROTATED POTENTIOMETER	D161GOAX-V1B503-017	S3
1940001	SOCKET	2P 2.5mm	XS2,XS4
2150106	FLAT CABLE	3P90 2.5 2 PIN, 2P SHIELD,WITH NEEDLE	XS1~XP1
2110322	DUAL-CORD	20# 280mm RED BLACK	XS5
2300004	FUSE	T3.15AL 250V	F402
3870057	FUSE HOLDER	0	F402

MATERIAL CODE	MATERIAL NAME	SPECIFICATIONS	LOCATION
1562078	PCB	4501 - 2	
INPUT OUTPUT BOARD			
0000287	CARBON FILM RESISTOR	1/4W3.3K±5% SHAPED 10	R13,R16
0000305	CARBON FILM RESISTOR	1/4W100K±5% SHAPED 10	R14,R15
2120622	FLAT CABLE	2P140 2.5 2 SOCKET WITH NEEDLE	XS4-XP4
1940002	SOCKET	3P 2.5mm	XS1
1910045	TERMINAL SOCKET	AV3-8.4-2	XC1
1562077	PCB	7501 - 1	

AMPLIFIER UNIT	MATERIAL NAME	SPECIFICATIONS
AMPLIFIER UNIT		
3871871	REAR BOARD	SP-012(RU)
200378	CERAMIC CAPACITOR	@400VAC 472 ±10% 10mm VDE
1350083	POWER SUPPLY SWITCH	@PS8-11-C-048B/BH VDE
460168	TRANSFORMER	SP-10
2140347	POWER SUPPLY CORD EUROPE SPECS	@2P 1.9m 2.5A MA-800S VDE
3580057	HEAT RADIATION BOARD	40x70x10.5 BSY01
4000216	SELF-TAPPING SCREW	PB 3x6H COLOR ZINC
4000221	SELF-TAPPING SCREW	PB 3x13H COLOR ZINC
4210019	MACHINE-TAPPING SCREW	PWM 4x12x9 COLOR ZINC
4400002	NUT	M4
4400028	NUT OF POTENTIOMETER	M7
3022122	ADJUST BUTTON	BSD02 BLACK
4660010	INVERTED TUBE	F31 xF34x65 2#
3540053	SCREEN-SHIELDED PIECE	SP501
4450032	ROUND PAD	F7x12x0.5
4450014	BOLT PAD	F4x10x0.8
4450015	BOLT PAD	F8x15x2
4450017	BOLT PAD	f 8x15x1.0
4490002	SPRING PAD	F4
5234967	PYROCONDENSATION SET DIPE	@F3 UL
5234966	PYROCONDENSATION SET DIPE	@F4 UL
5233838	PYROCONDENSATION SLEEVE	@F22 UL
5231427	UPRIGHT AIRPROOF STRIP	179.4x7x1.5 SPONGE
5231428	HORIZONTAL AIRPROOF STRIP	114.5x9x1.5 SPONGE
5231476	SOFT SPONGE SPACER	30x25x2 SINGLE-FACED,HARD
2300052	FUSE	@T315MAL 250V VDE
5230713	NYLON BANDAGE	80mm
5180145	NOT DMETAL OXIDE FILM RESISTOR GLUE LABELL	FUZE FL T315mAL 250V
5448090	PCB SEMI-FINISHED PRODUCT	4501-2 SP-012(RU)
5448091	PCB SEMI-FINISHED PRODUCT	7501-1 SP-012(RU)
SPEAKER BODY WITH FOAM		
3080497	SPEAKER BODY	SP-012(RU) MAIN, SHALLOW TIMBER GRAIN
3080498	SPEAKER BODY	SP-012(RU) SUBSIDIARY , SHALLOW TIMBER GRAIN

AMPLIFIER UNIT	MATERIAL NAME	SPECIFICATIONS
5041046	FOAM	FM-010122
4660007	INVERTED TUBE	F31 xF34x65
5233951	PVC PEEL	P21010-01
PANEL		
3060534	PVC SCUTCHEON	BBK SILVER FUNDUS,GREY FUNDUS 46x8
5234926	SOFT SPONGE SPACER	340x1.8x2 WHITE SINGLE-FACED SOFT
ASSEMBLY		
3004300	PANEL	SP-012(RU) WHITE
4710200	BACKBOARD	SP-012(RU) SUBSIDIARY , SHALLOW TIMBER GRAIN
5234927	FOOT	F20x7 SILICA GEL(HALF BALL/T4000 GLUE)
260531	NPCD	CD70 50V2.2U±10% DF 10% 8x17
1100603	LOUDHAILER	SD0421YF SP-012(RU)
1100604	LOUDHAILER	SG0153YF SP-012(RU)
2110233	DUAL-CORD	20# 170mm YELLOW BLACK
2110322	DUAL-CORD	20# 280mm RED BLACK
1910050	TERMINAL SOCKET	AV1-8.4-6
3080499	SPEAKER BODY WITH FOAM	SP-012(RU) SHALLOW TIMBER GRAIN
4000782	SELF-TAPPING SCREW	PWB 3x12x10H COLOR ZINC
4000783	SELF-TAPPING SCREW	PA 4x18H WHITE NICKEL
4000289	SELF-TAPPING SCREW	PWA 3x16x7 WHITE NICKEL
4000204	SELF-TAPPING SCREW	PWA 3x10x7 NICKEL
4000191	SELF-TAPPING SCREW	PA 4x15 BLACK
5462277	AMPLIFIER UNIT	SP-012(RU)
PACKAGE MATERIAL		
2160136	AV CORD	1.2M AUDIO FREQUENCY
2160013	AV CORD	1.5m AUDIO FREQUENCY, DUAL HEAD
2160017	AV CORD	1mAUDIO FREQUENCY,DUAL HEAD WITHF3.5 EARPHONE HEAD
5003004	CARTON BOX	633x390x316 SP-012(RU)
5013674	GIFT BOX	SP-012
5070046	HANDLED RING	AB001
5070048	HANDLED GASKET	AB001
5070680	SELF-SEALED GLUE BAG FOR ENVIRONMENTAL PROTECTION (WORNING)	180x250x0.05 PE
5071224	GLUE BAG FOR ENVIRONMENTAL PROTECTION (WITH HOLE)	380x400x0.05 PE ENGLISH

AMPLIFIER UNIT	MATERIAL NAME	SPECIFICATIONS
5142076	SN LABELL	CURRENCY FOR RUSSIA
5194612	USER MANUAL	SP-012 ENGLISH/RUSSIT
5210522	WARRANTY CARD	RUSSIA 210x295 RUSSIT
5780251	SPEAKER	SP-012(RU) SHALLOW TREE VEINS
SN LASEL		
5142067	SN LABELL	RUSSIA WITHOUT BAR CODE NUMBER
SUPPLEMENT MODULE		
5110002	ELECTRO WELDING WIRE	F1.0
5110018	ELECTRO WELDING WIRE	f 2.0
5110004	ADHESIVE TAPE	
5110003	ELECTRO WELDING WIRE	
5120096	PEANUT OIL	
5120001	THINNER	
5120004	SOLDERING FLUX	
5120011	WIPING WATER	
5120012	RED GLUEWATER	
5120332	SILICONE GREASE HEAT CONDUCT OIL	GB-304
5120067	GLUEWATER	502
5230021	SCOTCH TAPE	12mm
5230022	SEALING PAPER	COLORLESS
5231514	HIGH TEMPERATURE MASKING PAPER	LENGTH:15 YARD WIDTH:20mm
5231454	HIGH TEMPERATURE MASKING PAPER	LENGTH:15 YARD WIDTH:6mm
5231455	HIGH TEMPERATURE MASKING PAPER	LENGTH:15 YARD WIDTH:12mm
5231456	HIGH TEMPERATURE MASKING PAPER	LENGTH:15 YARD WIDTH:24mm
5120009	WHITE PRESSURE OIL	
5230020	MASKING PAPER	24mm
5280353	SILVER LACQUER PEN	SILVER WHITE
2100002	CONNECTION CORDS	F0.6