

HERTZ

- SERVICE MANUAL -

HP 1 D

Issued in May 2008

HERTZ

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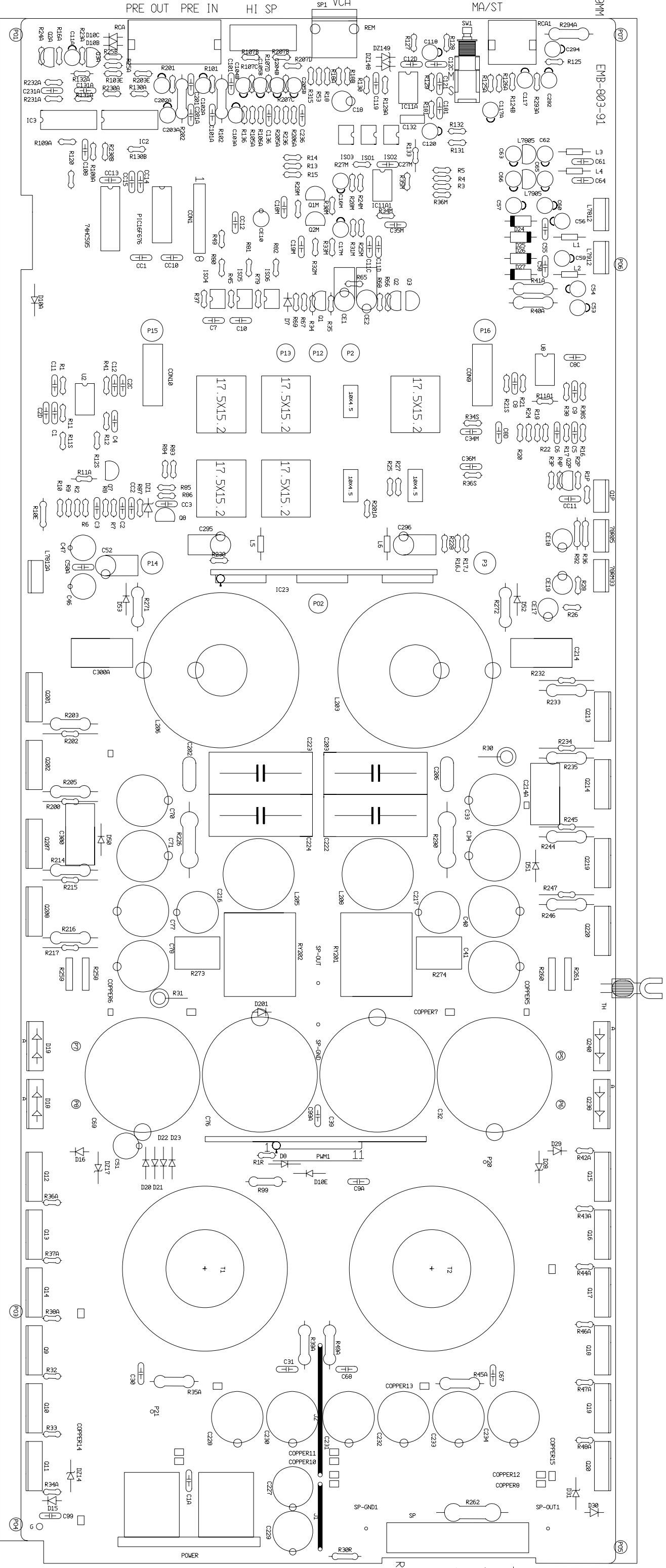
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sheet 1 to 1
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PART 1: ELECTRONIC PART

Section A: PCB REV01

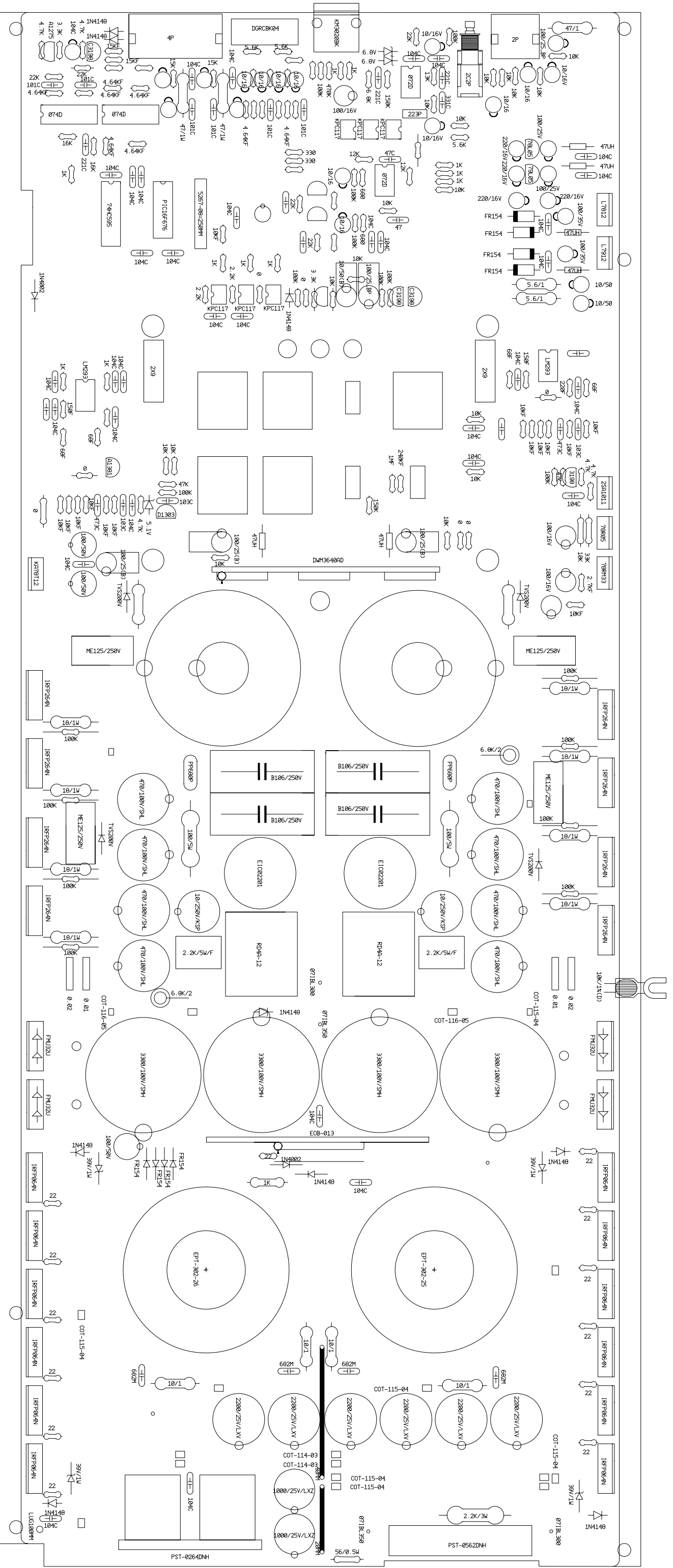
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COMPONENTS LAYOUT DIAGRAM



REV 5	REV 4	REV 3	REV 2	REV 1	REV 0				
BASIC : SA-2211601 BUYER : HP 1 D						DWG.No : AAMA653-01 FILE No. : A-22-24			
DRAWING						CHECK		CHECK	
S. S. B									

COMPONENTS LAYOUT DIAGRAM



REV 5	REV 4	REV 3	REV 2	REV 1	REV 0				

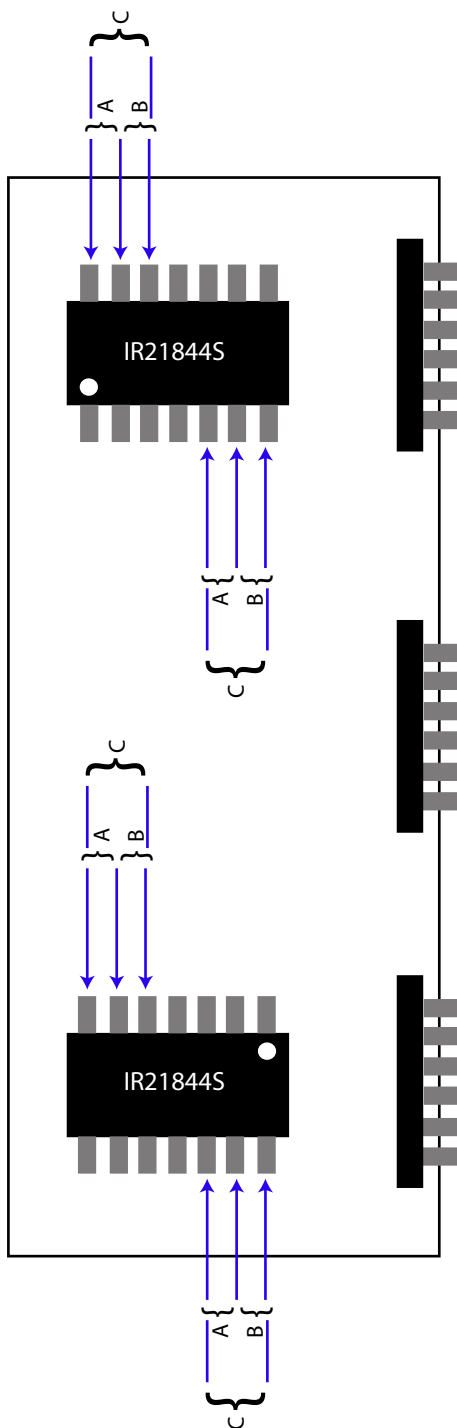
BASIC : SA-2211601 DWG.No : AAMA653-01

BUYER : HP 1 D FILE No. : A-22-24

DRAWING CHECK CHECK APPROVAL

S. S. B

M2 MODULE CHECKPOINTS



Measure resistance of A, B and C points, usual values are between 270kohms - 3 Mohms range.
Resistance must be, in any case, higher than 10kohm.
If lower than 10Kohms the module must be replaced with a new one.

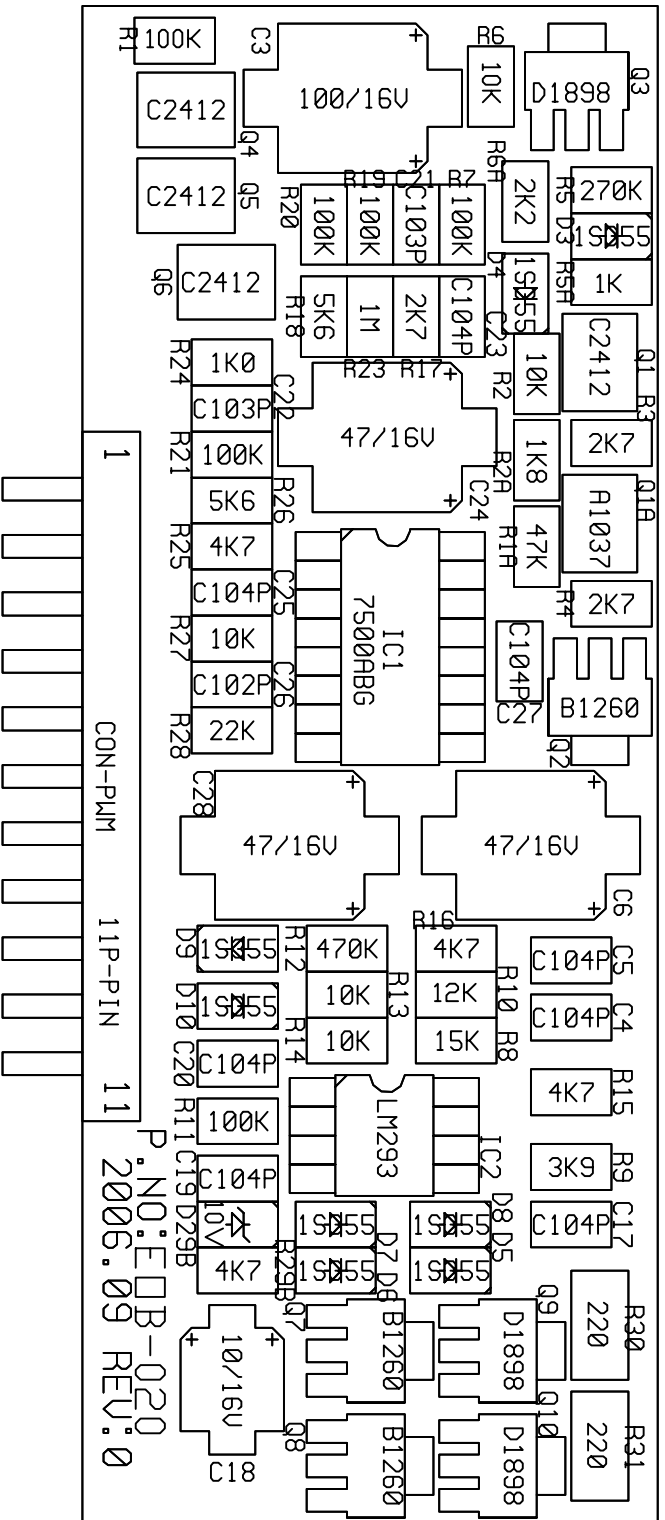
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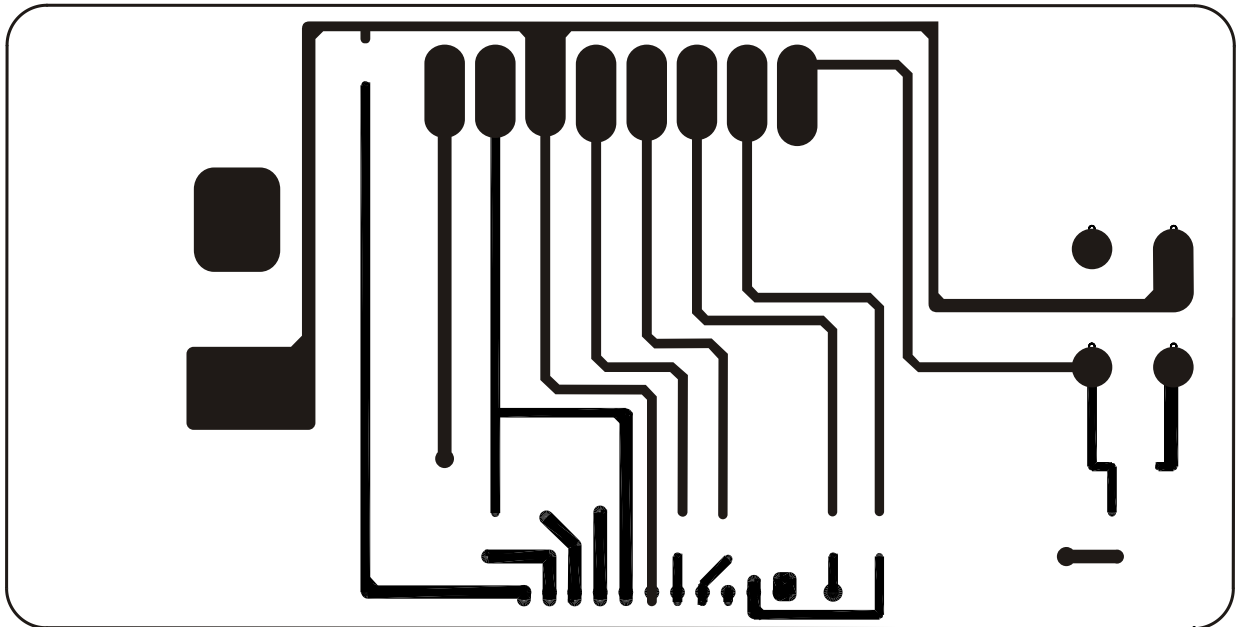
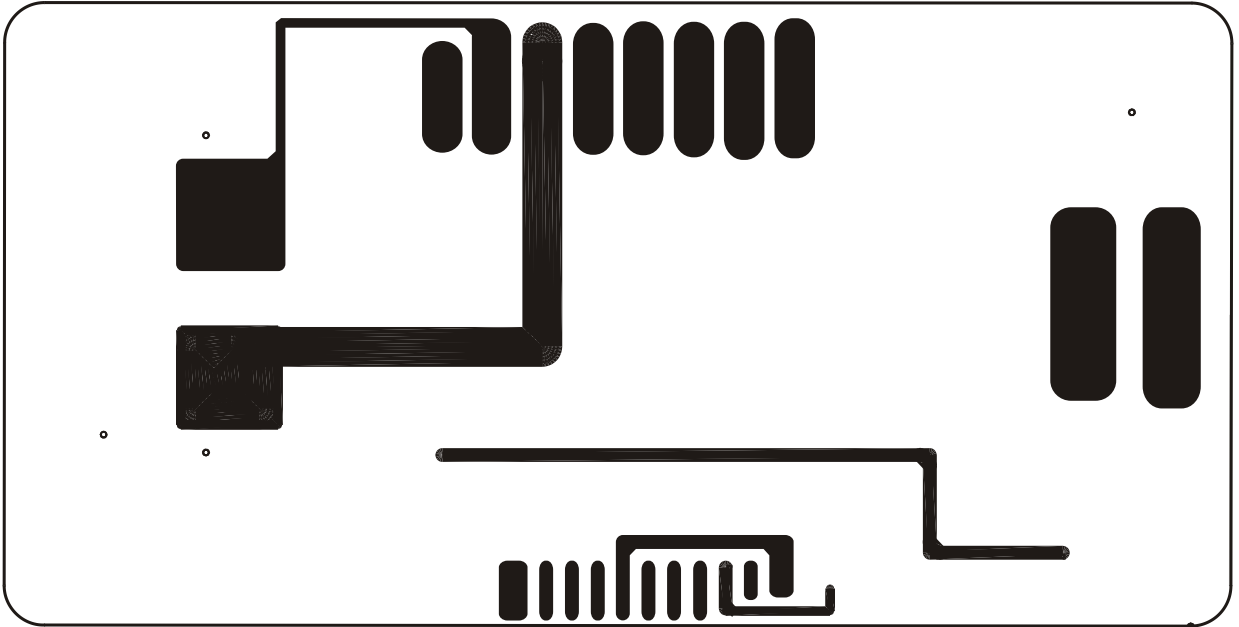
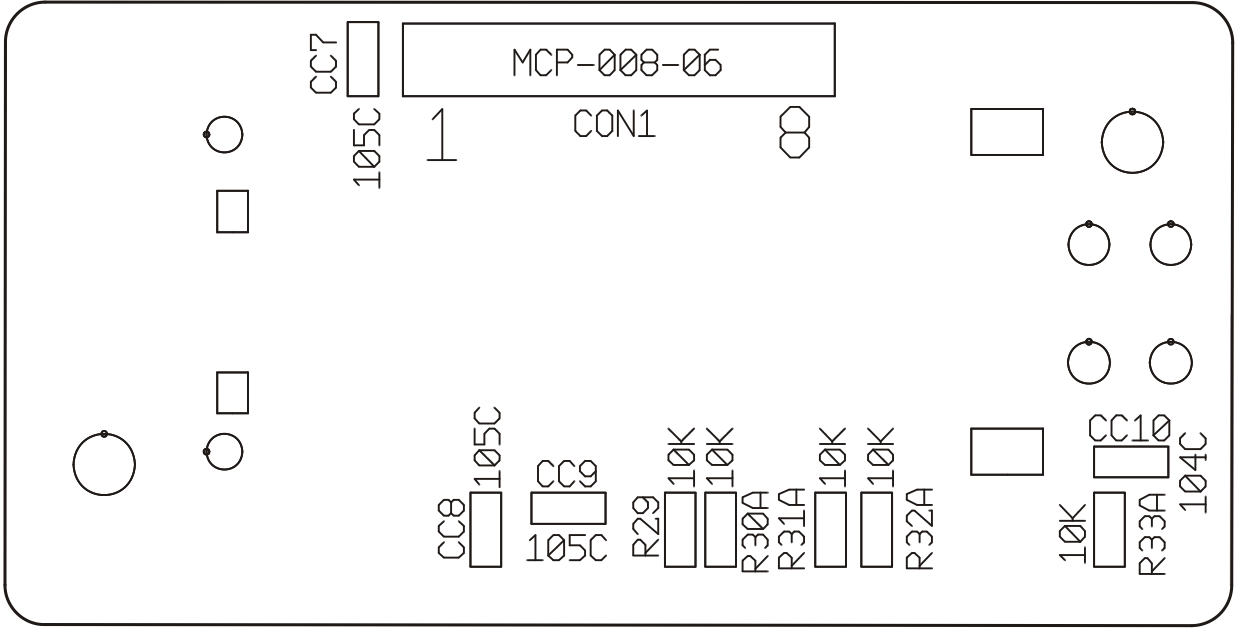
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 S. Regina Km. 3,500 - Marignano - 62018 Potenza Picena (MC) - Italy
 Tel. 0733.870870 Fax 0733.870880

General tol.	Scale	Code	Description	Tech. spec.	Rev.
-	-	-	M2 MODULE CHECK POINTS	FFA001	A
Validity	Size in	Use	Tooling	Code	Sheet
Quotation	-	-	-		
Final sample	General tol.	First issuing date	Current issuing date	25 January 2008	
Pre-series		25 January 2008	Project	Issued	Approval
<input checked="" type="checkbox"/> Production					

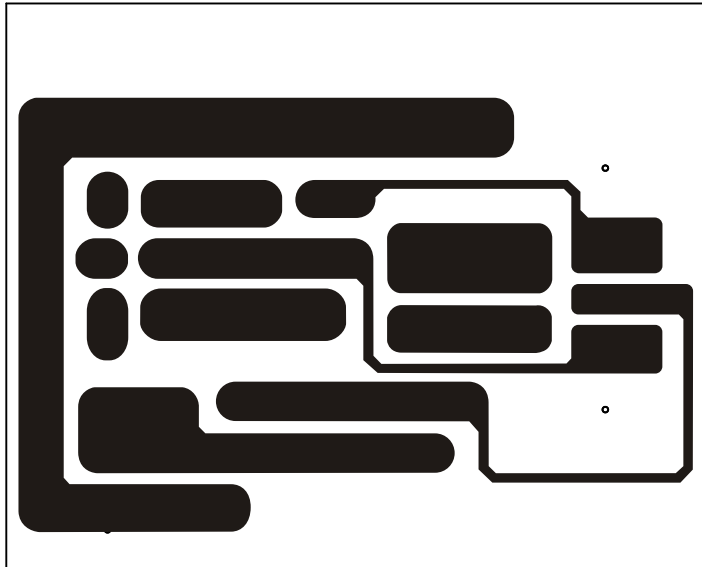
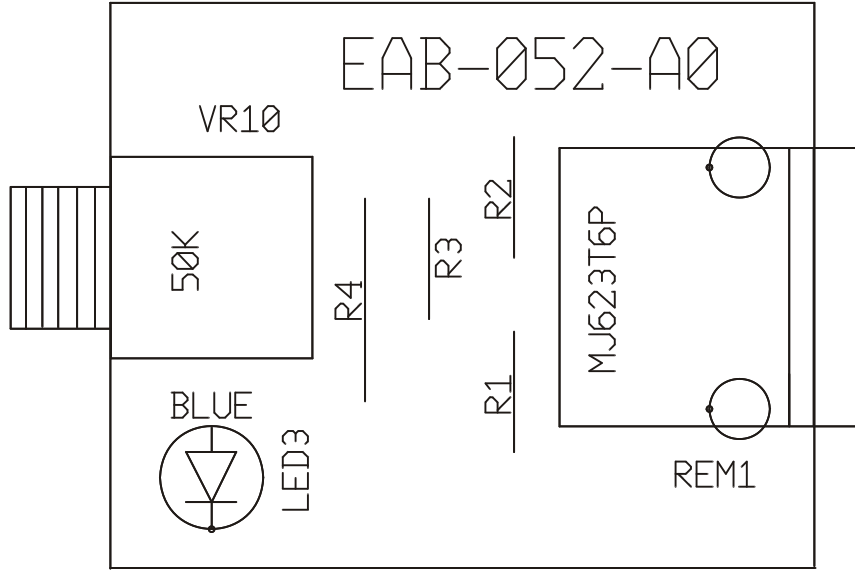
COMPONENTS LAYOUT DIAGRAM



REV 5	REV 4	REV 3	REV 2	REV 1	REV 0		
BUYER : HP 1 D						DWC/NO : AADP005-03	
DRAWING						CHECK	
S. S. B						CHECK	
						APPROVAL	



COMPONENTS LAYOUT DIAGRAM



DESCRIPTION	Q.TY	REF.NO	DESCRIPTION	Q.TY	REF.NO
HP 1 D MAIN BOARD PARTS LIST					
CONNECTORS AND FUSE					
2mm 9P	2	CON9,CON10	1/5W 5% 470Kohm	1	R18
5267-08	1	CON1	1/5W 5% 47K ohm	2	R4P,R85
HEAD/5.08mm PITCH 4 POS	1		1/5W 5% 5.1Kohm	1	R133
PLUG/5.08mm PITCH 4 POS	1	SP1	1/5W 5% 5.6Kohm	3	R107B,R207B,R131
32V 300A	2	FUSE	1/5W 5% 6.8Kohm	1	R130
DIP-14PIN IC SOCKET	1		1/5W 5% 680 ohm	2	R24M,R25M
ICS					
74HC595	1	74HC595	5W 10% 2.2K ohm	2	R273,R274
PC817A	6	ISO1,ISO2,ISO3,ISO4,ISO5,ISO6	1W 5% MINI 10 ohm	4	R35A,R39A,R45A,R49A
LM293	2	U2,U8	1W 5% MINI 18 ohm	8	R203,R205,R214,R216,R233,R235,R244,R246
PIC16F676	1	PIC16F676	1W 5% MINI 3.3 ohm	2	R271,R272
PIC16F676M	1		1W 5% MINI 47 ohm	3	R102,R202,R294A
DWM3640AD	1	IC23	1W 5% MINI 5.6 ohm	2	R40A,R41A
TL072D	2	IC11A,IC11A1	2W 5% 6.8K ohm	2	R30,R31
NJM074D	2	IC2,IC3	3W 5% 2.2K ohm	1	R262
78R05	1	78R05	5W 5% / FORMING 0.01ohm	2	R258,R260
78RM33	1	78RM33	5W 5% / FORMING 0.02ohm	2	R259,R261
KA 7812	1	L7812	WIRE WOUND 5% 5W 100 ohm	2	R226,R290
KA 78T12	1	L7812A	CABLE TIES		
KA7912	1	L7912	BLACK / 200mm	2	
KIA78L05BP	1	L7805	NON COLOR / 100mm	2	
KIA79L05BP	1	L7905	CAPACITORS		
JUMPERS					
7:7 / 0.12x665*7 BL 300mm	1	SP-OUT~SP-OUT1	CER 100V 330pF	1	C181
7:7 / 0.12x665*7 BL 350mm	1	SP-GND~SP-GND1	CER 50V 4700pF	2	R103E,R203E
7:LUG/0.18x20 *3 BK 100mm	1	G	CER 50V 0.1uF	2	D8(— -> 1'st GND⊕),PIC16F676(PIN3-14)
COPPER 20m/m	1	J1	CER 50V 47pF	2	C27M,C35M
COPPER 40m/m	1	J2	CER 50V 0.1uF	36	C1,C1A,C2C,C4,C7,C8,C9,C9A,C10,
30mm	3		CER 50V 100pF	6	C101A,C131A,C136,C201A,C231A,C236
40mm	2		CER 50V 220pF	3	C108,C119,C121
90mm	2		CER 50V 0.047uF	2	C3,C6
DIODES					
1N4002	2	D8,D10A	CER 50V 0.01uF	3	C2,C5,CC3
FR154	8	D20,D21,D22,D23,D24,D25,D26,D27	ELC 25V 2200uF	6	C228,C230,C231,C232,C233,C234
1N4148	9	D7,D10B,D10E,D10C,D15,D16,D29,D30,D201	ELC 16V 100uF	3	C18,CE18,CE19
1N4754A	4	D28,D31,DZ14,DZ17	ELC 16V 220uF	11	C16M,C17M,C104B,C105B,C117,C117A,
1N5231	1	DZ1	ELC 25V 100uF	4	C57,C60,C63,C66
MTZ 6.8B	2	DZ148,DZ149	ELC 25V 1000uF	3	C52,C295,C296
AL02TB470K	6	L1,L2,L3,L4,L5,L6	ELC 25V 100uF	2	C227,C229
FMU-32U	4	D18,D19,Q238,Q240	ELC 25V 100uF	2	C62,C65
RESISTORS					
1/2W 5% 56 ohm	1	R30R	ELC 35V 100uF	2	C56,C59
1/4W 5% 0 ohm	1	R10E	ELC 50V 10uF	1	CE1
1/4W 5% 10K ohm	1	R92	ELC 50V 10uF	2	C53,C54
1/4W 5% 1K ohm	1	R99	ELC 50V 100uF	3	C46,C47,C51
1/4W 5% 33K ohm	1	R36	ELC SHL 100V 470uF	8	C33,C34,C40,C41,C70,C71,C77,C78
1/5W 1% 220 ohm	2	R12,R38	ELC SMH 100V 3300uF	4	C32,C39,C69,C76
1/5W 1% 4.64Kohm	8	R130A,R130B,R131A,R136,R230A,R230B,	MET 250V 1.2uF	4	C214,C214A,C300,C300A
1/5W 1% 150ohm	2	R11,R21	MPF 100V 0.022uF	1	C132
1/5W 1% 1M ohm	1	R25	MPF 250V 10uF	4	C203,C222,C223,C224
1/5W 1% 10.0Kohm	14	R2,R6,R7,R8,R9,R10,R16,R17,R19, R20,R22,	MYL100V 6800uF	4	C30,C31,C67,C68
1/5W 1% 15.0Kohm	2	R25A,R25B	PROPYLENE 250V 680pF	2	C202,C206
1/5W 1% 2.70Kohm	1	R28	RND 250V 10uF	2	C216,C217
1/5W 1% 22.0Kohm	4	R105A,R106A,R205A,R206A	RND 25V 100uF	2	C294,CE2
1/5W 1% 240Kohm	1	R27	TERMINALS		
1/5W 1% 68.0ohm	4	R11S,R12S,R21S,R38S	TER-2	1	POWER
1/5W 5% 0 ohm	10	R11A,R16J,R17J,R67,R79,R11A1,C102A,C103A,C2 02A,C203A	TER-5	1	SP
1/5W 5% 100Kohm	17	R3P,R28M,R31M,R53,R66, R68,R69,R86,R128,R202, R200,R215,R217,R232,R234,R245,R247	TRACES		
1/5W 5% 10K ohm	17	R34M,R34S,R35,R36M,R36S,R65,R83, R84,R124B,R125,R125A,R126A,R132, R181,R228,R230,R293A	COT-114-03	2	COPPER10,11
1/5W 5% 12K ohm	2	R27M,R35M	COT-115-04	6	COPPER5,8,12,13,14,15
1/5W 5% 13K ohm	1	R129	COT-116-05	2	COPPER6,7
1/5W 5% 150 Kohm	2	R129A,R201A	COILS		
1/5W 5% 15K ohm	2	R101,R201	EIC02201	2	L205,L208
1/5W 5% 16K ohm	2	R108A,R109A	*49 *0.8-60-4T *0.8-14-24T	1	T2
1/5W 5% 1K ohm	11	R1,R3,R4,R5,R18A,R18B, R41,R80,R81,R82,R120	*49 *0.8-60-4T*0.8-14-24T*0.8-1-4T	1	T1
1/5W 5% 2.2K ohm	2	R37,R45	*40 *0.8-8P-41T (77uH)	2	L203,L206
1/5W 5% 22 ohm	13	R1R,R32,R33,R34A,R36A,R37A,R38A, R42A,R43A,R44A,R46A,R47A,R48A	TRANSISTORS		
1/5W 5% 22K ohm	5	R29M,R32M,R127,R132A,R232A	KTC3198Y	4	Q2,Q2P,Q3,Q3A
1/5W 5% 24K ohm	1	R315	2SA1011	1	Q1P
1/5W 5% 3.3Kohm	2	R16A,R34	KSA-1381	1	Q7
1/5W 5% 330 ohm	2	R13,R14	KTA-1275Y	2	Q1,Q2A
1/5W 5% 4.7Kohm	5	R1P,R2P,R23A,R24A,R87	KTD-1303	1	Q8
			MODULAR		
			JACK KM30206P	1	REM
			PLUG PLG6P5MO 5M	1	ACC'Y

DESCRIPTION	Q.TY	REF.NO
FETS		
IRFP064N	12	Q9,Q10,Q11,Q12,Q13,Q14,Q15,Q16,Q17,Q18,Q19,Q20
IRFP264N	8	Q201,Q202,Q207,Q208,Q213,Q214,Q219,
RCA JACK		
JE020059BN	1	RCA1
4C-8PIN BK/NIKEL	1	RCA
THERMISTOR		
NTC 10% 10Kohm	1	TH
RELAY		
RD4A-12	2	RY201,RY202
SWITCH		
KMP201	1	SW1
TRANSIENT VOLTAGE SUPPRESSORS		
200V	4	D50,D51,D52,D53

HP 1 D FRONT BOARD PARTS LIST

CAPACITORS		
CER 50V 0.1uF	9	C1C,C1D,C10E,C20E,C102C,C102D,
CER 50V 0.18uF	4	C237,C238,C110A1,C111A1
CER 50V 220pF	1	C115
CER 50V 33nF	2	C106,C108A
CER 50V 0.047uF	4	C110,C110A,C111,C111A
CER 50V 0.068uF	2	C107A,C109
MPF 100V 0.039uF	2	C195,C197
RESISTORS		
1/10W 5% 1K ohm	1	R192
1/10W 5% 10K ohm	5	R110A,R120A,R121A,R115A1,R115C1
1/10W 5% 100K ohm	1	R119
1/10W 5% 12K ohm	1	R194
1/10W 5% 13K ohm	1	R111
1/10W 5% 18K ohm	2	R116,R116A
1/10W 5% 20Kohm	1	R310
1/10W 5% 220ohm	1	R122
1/10W 5% 27K ohm	1	R193
1/10W 5% 3.0K ohm	1	R121
1/10W 5% 43K ohm	1	R116A1
1/10W 5% 470ohm	3	R71,R72,R73
1/10W 5% 5.6Kohm	2	R112,R114
1/10W 5% 56K ohm	6	R115A,R115B,R115C,R115D,R115B1,R115D1
1/10W 5% 68K ohm	2	R196,R197
1/10W 5% 8.2K ohm	1	R113
1/10W 5% 0.00ohm	1	R122A

ICS		
TL072CD	6	IC1,IC102,IC103,IC105,IC106,IC107
DS1808	1	U13
SWITCH		
KSA-2240	3	SW8,SW102,SW103
VOLUMES		
V123 HC0 20RS A50Kx2	1	VR7
V123 HC0 20RS C500Kx2	1	VR10
V124 HC0 20RS C50Kx4	1	VR5
V124 HC0 20RS C100Kx4	2	VR6,VR8
LEDS		
304S60D	1	LED1
308H183BD	1	LED3
304S2AD	1	LED2
CONNECTOR		
2.0mm DOUBLE ROW 2x9	2	CON7,CON8
HOLDER		
LED HOLDER(13mm)	3	

HP 1 D OSC BOARD PARTS LIST

CAPACITORS		
CER 50V 1000pF	1	C26
CER 50V 0.01uF	2	C21,C22
CER 50V 0.1uF	8	C4,C5,C17,C19,C20,C23,C25,C27
ELE 16V 10uF	1	C18
ELE 16V 47uF	3	C6,C24,C28
ELE 16V 100uF	1	C3

DESCRIPTION	Q.TY	REF.NO
RESISTORS		
1/10W 1% 1.0 Kohm	2	R24,R5A
1/10W 1% 10.0 Kohm	5	R2,R13,R14,R27,R6
1/10W 1% 100 Kohm	6	R1,R7,R11,R19,R20,R21
1/10W 1% 1M ohm	1	R23
1/10W 1% 15.0K ohm	1	R8
1/10W 1% 2.20K ohm	1	R6A
1/10W 1% 22.0K ohm	1	R28
1/10W 1% 2.70K ohm	3	R3,R4,R17
1/10W 1% 270K ohm	1	R5
1/10W 1% 3.90K ohm	1	R9
1/10W 1% 4.70K ohm	4	R15,R16,R25,R29B
1/10W 1% 470K ohm	1	R12
1/10W 1% 5.60K ohm	2	R18,R26
1/10W 1% 220 ohm	2	R30,R31
1/10W 1% 12.0K ohm	1	R10
1/10W 1% 47.0K ohm	1	R1A
1/10W 1% 1.80K ohm	1	R2A

DIODES		
1SS355	8	D3,D4,D5,D6,D7,D8,D9,D10
KDZ10V USC	1	D29B
ICS		
KA 7500BD	1	IC1
LM293MA	1	IC2
TRANSISTORS		
2SB 1260	3	Q2,Q7,Q8
2SC 2412K	4	Q1,Q4,Q5,Q6
2SD 1898	3	Q3,Q9,Q10
2SA 1037K	1	Q1A
CONNECTOR		
2.5mm PIN SINGLE 1x11	1	CON-PWM1

HP 1 D REMOTE BOARD PARTS LIST

RESISTORS		
1/5W 5%/ 0 ohm	2	R1,R4
JUMPERS		
COPPER WIRE/*0.7	2	R2,R3
VOLUME		
V9M 15B50Kx2 CENTER-CL	1	VR10
MODULARS		
JACK KM30206P	1	
LEDS		
30ASACAB2	1	LED3

HP 1 D LCD BOARD PARTS LIST

CAPACITORS		
CER 50V 1uF	3	CC7,CC8,CC9
CER 50V 0.1uF	1	CC10
RESISTORS		
1/10W 5% 10K ohm	5	R29,R30A,R31A,R32A,R33A
CONNECTOR		
2.5mm LOCK MINI CONN 250mm	1	CON1
SWITCH		
TS-1150F	1	
LCD		
JY06A12	1	

HP 1 D - Service Manual - REV01

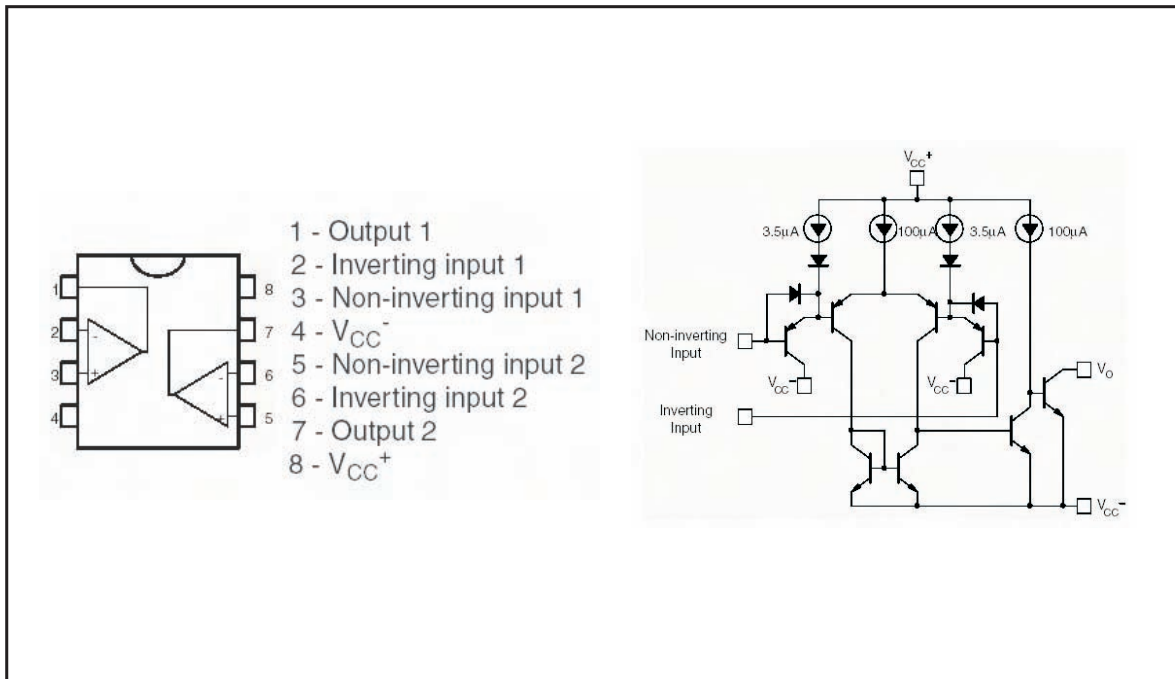
PART 1: ELECTRONIC PART

Section B: HP 1 D COMPONENTS

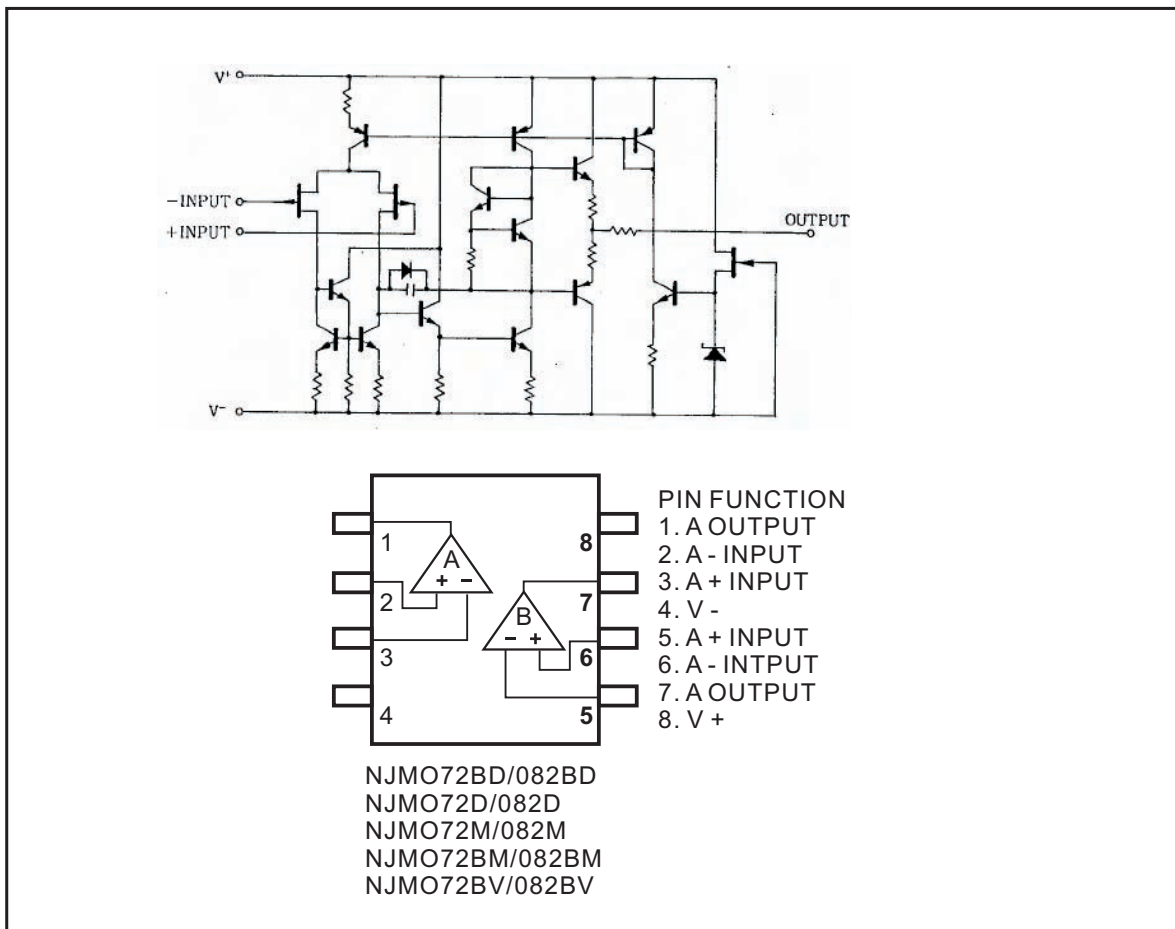
Components diagram

sheet 1 to 11

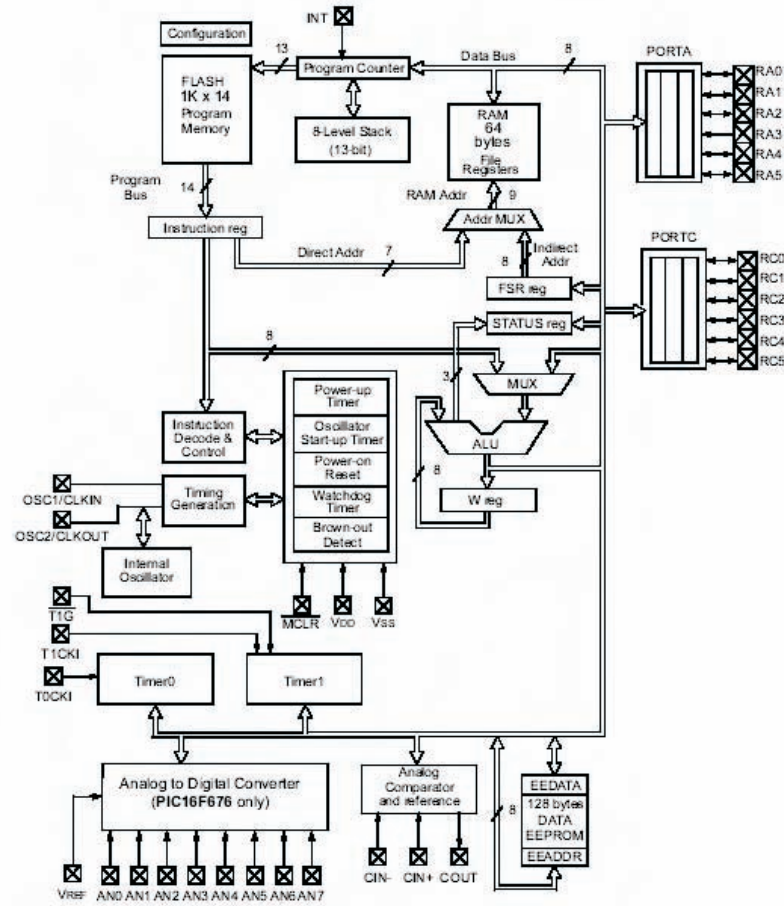
LM293



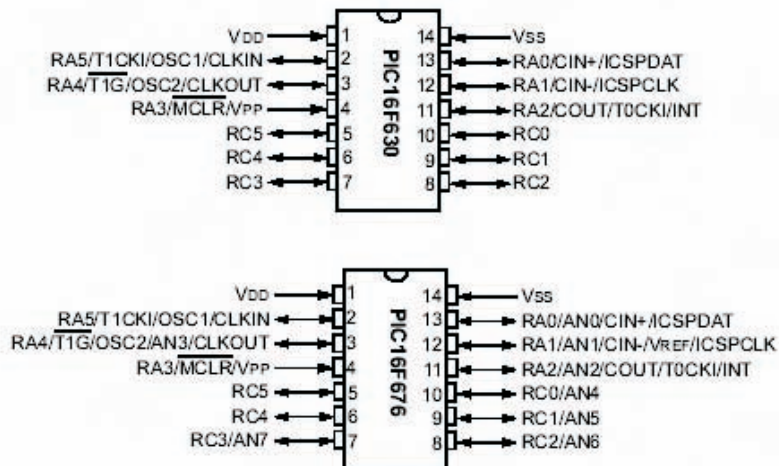
NJM072D



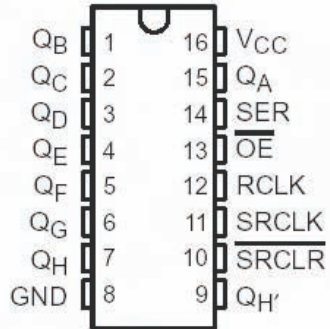
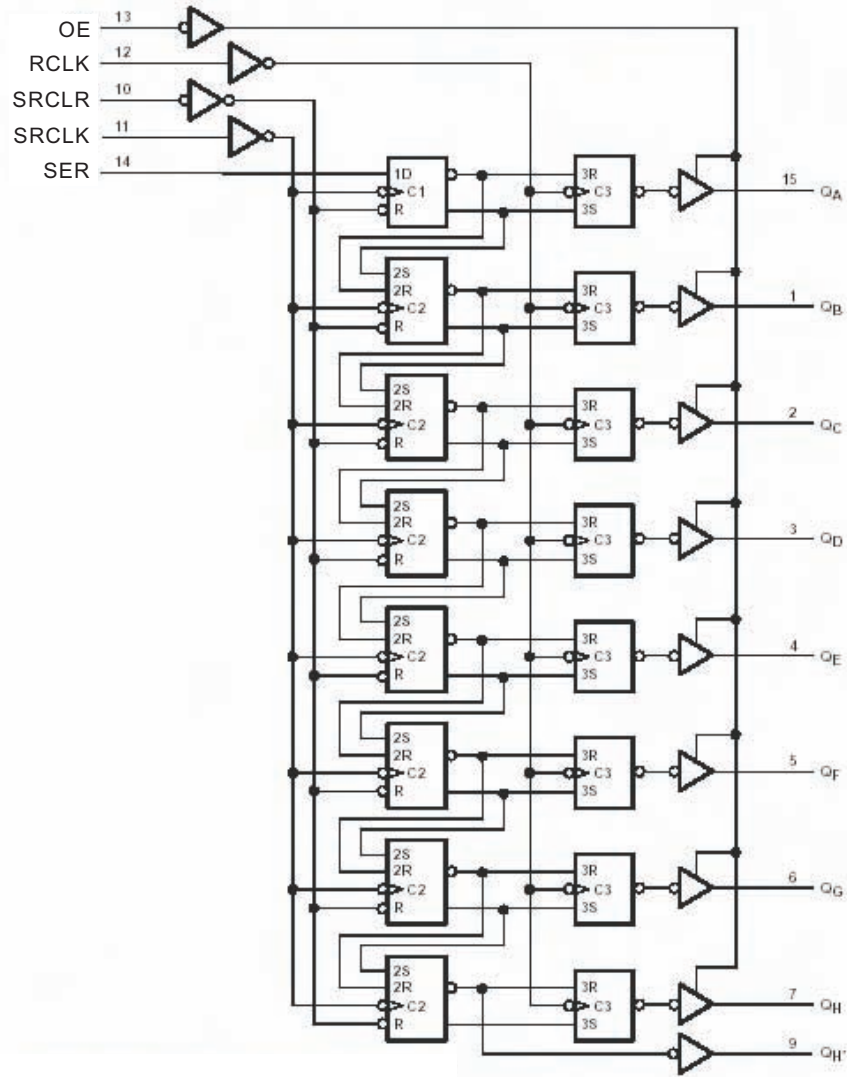
PIC16F676



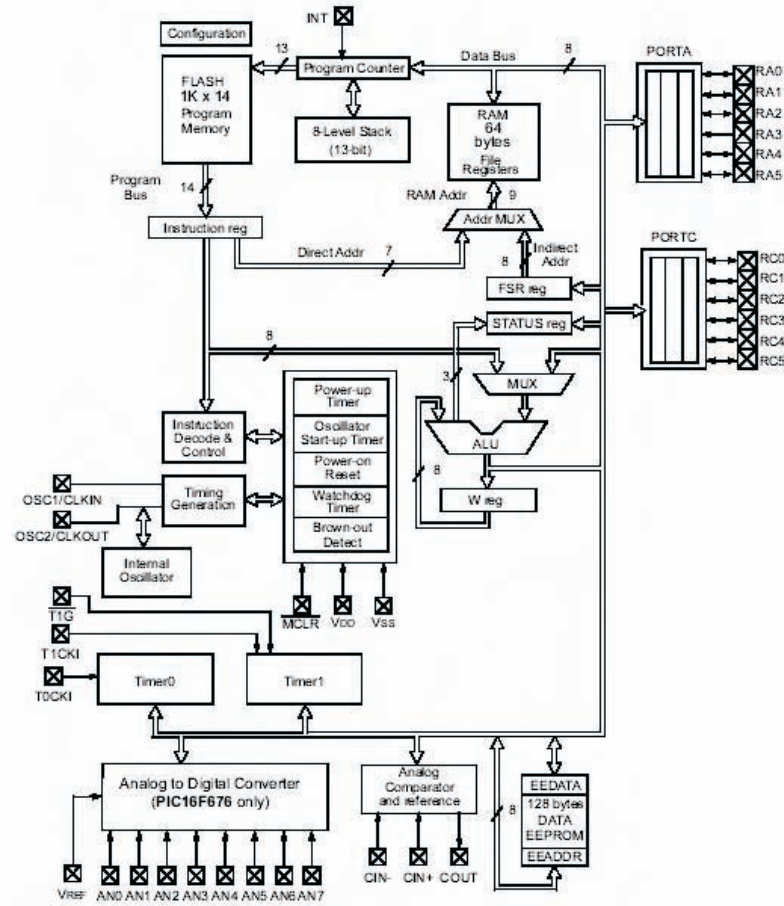
14-pin PDIP, SOIC, TSSOP



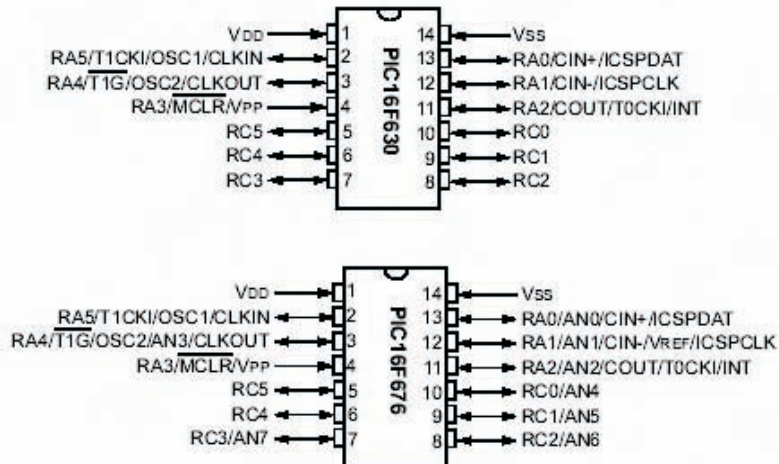
SN74HC595N



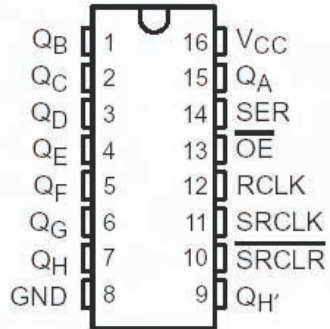
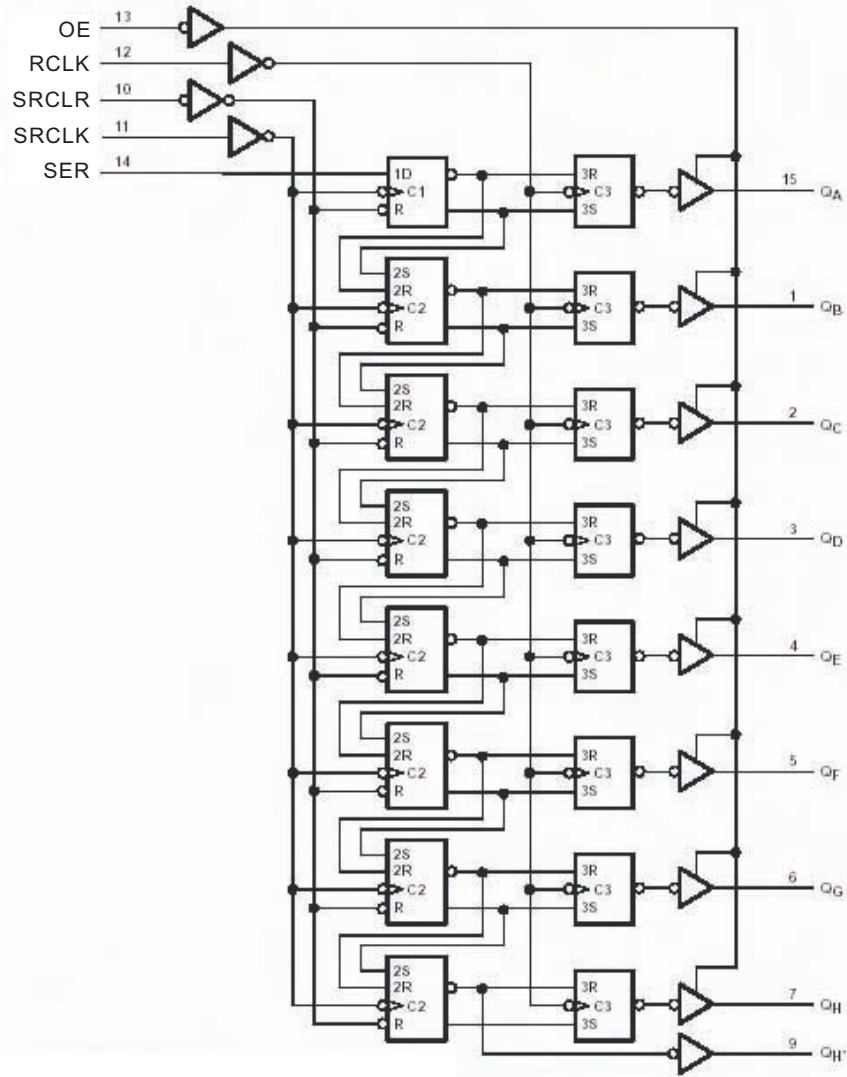
PIC16F676



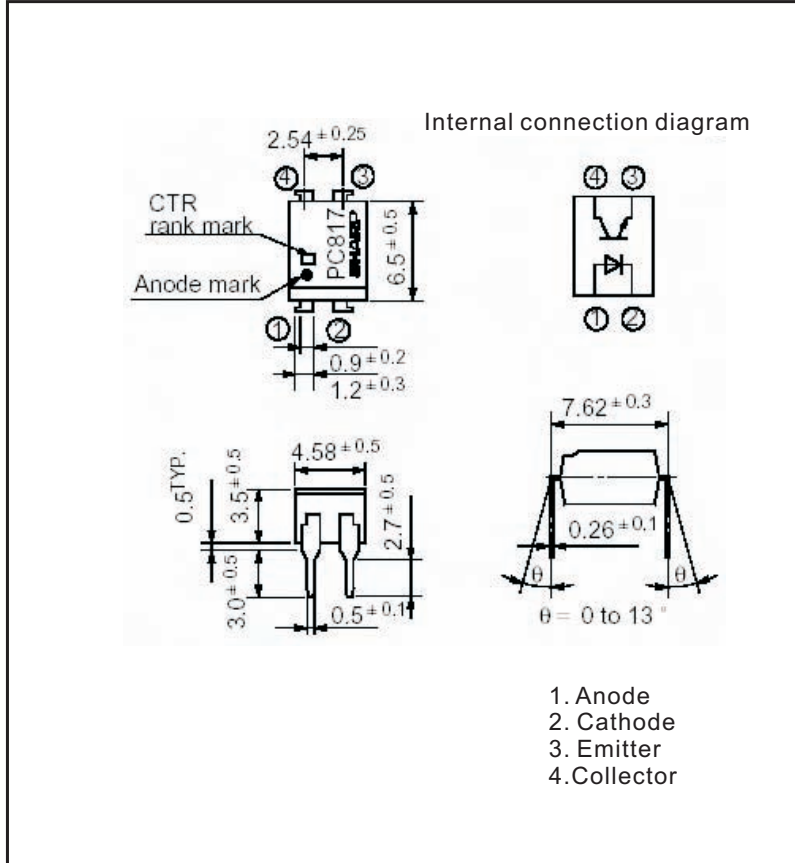
14-pin PDIP, SOIC, TSSOP



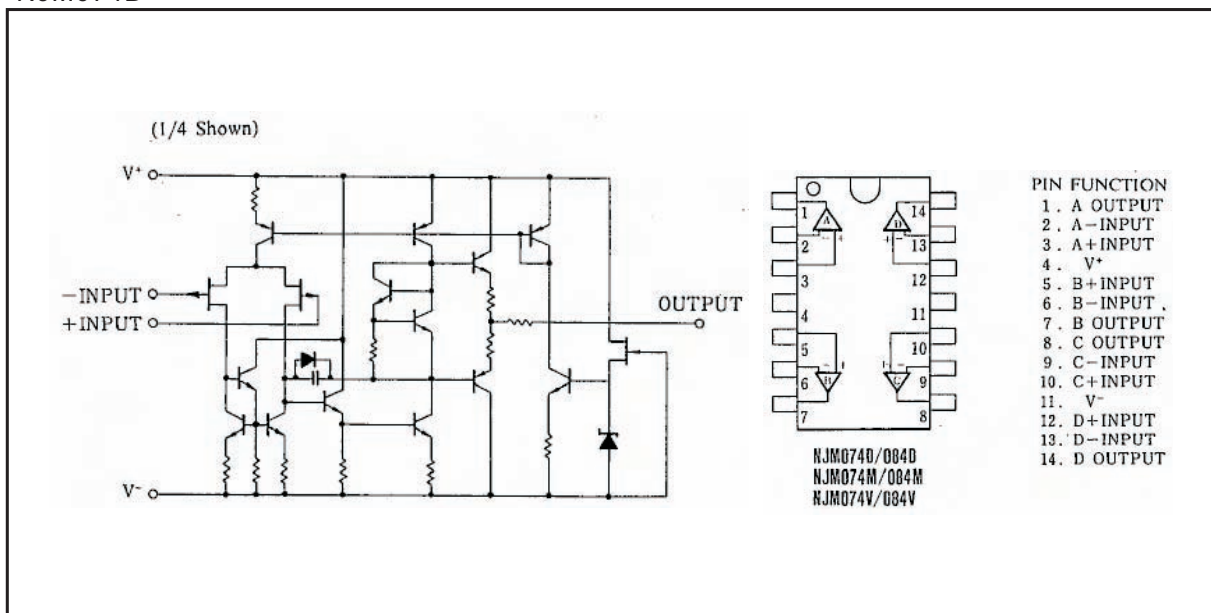
SN74HC595N



PC817



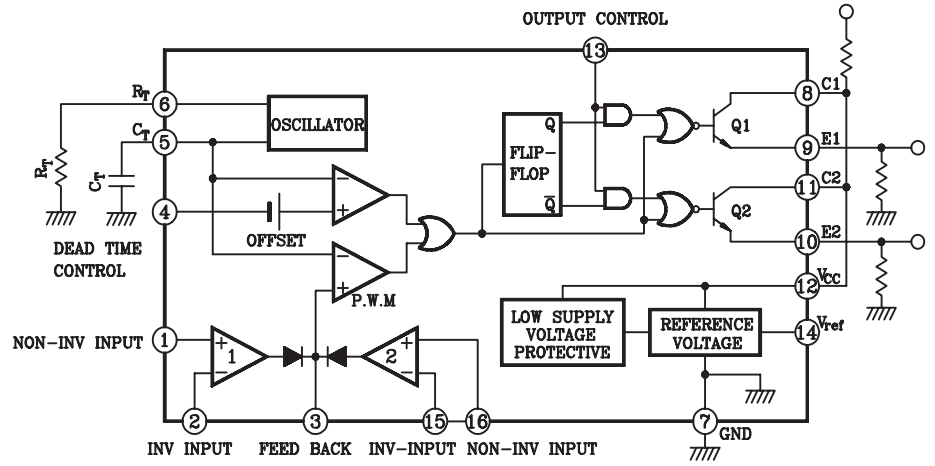
NJM074D



KA7500

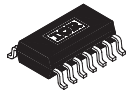


16-SOP

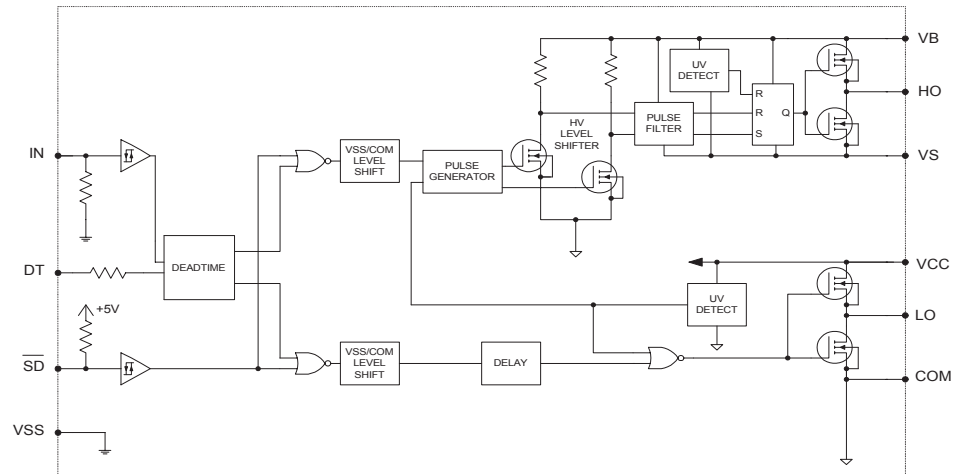


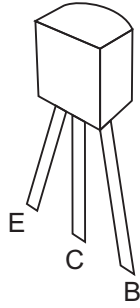
(Note) PIN 13 BECOMES SINGLE MODE AT "L" AND PUSH-PULL MODE AT "H"

IR21844S

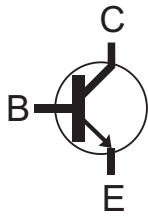


14-Lead SOIC
IR21844S





KTC3198Y
Q2, Q2P, Q3, Q3A



KTD1303
Q8



KIA78L05

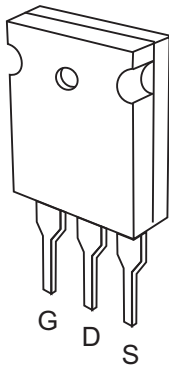
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2 : COMMON
3 : INPUT

L7805

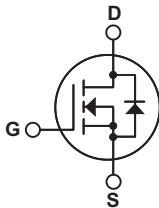
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2 : COMMON
3 : INPUT

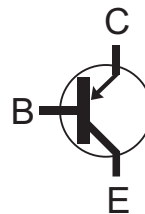
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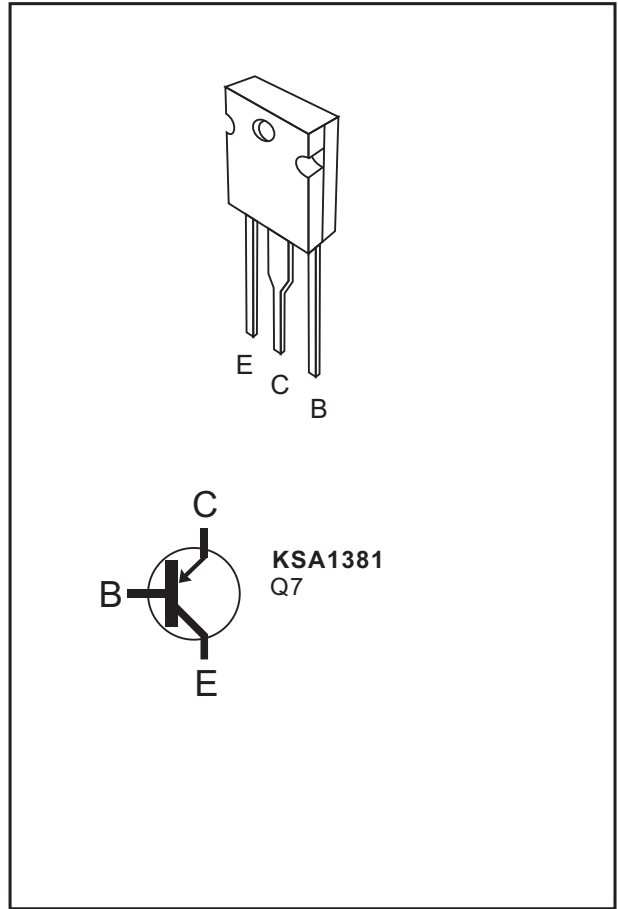
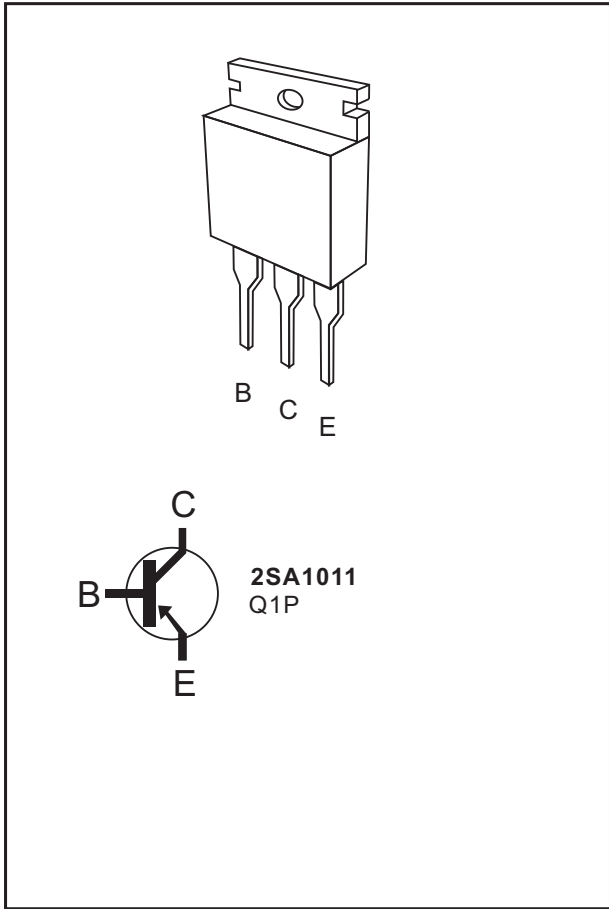
IRFP064N
Q9, Q10, Q11, Q12, Q13
Q14, Q15, Q16, Q17, Q18
Q19, Q20



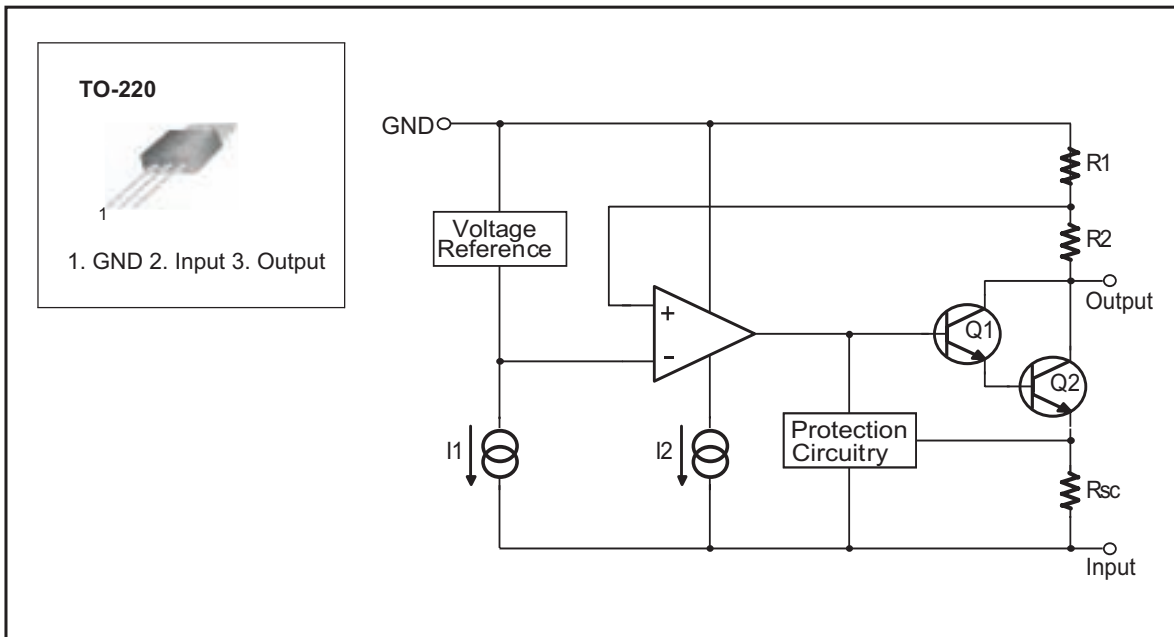
IRFP264N
Q201, Q202, Q207, Q208
Q213, Q214, Q219, Q220



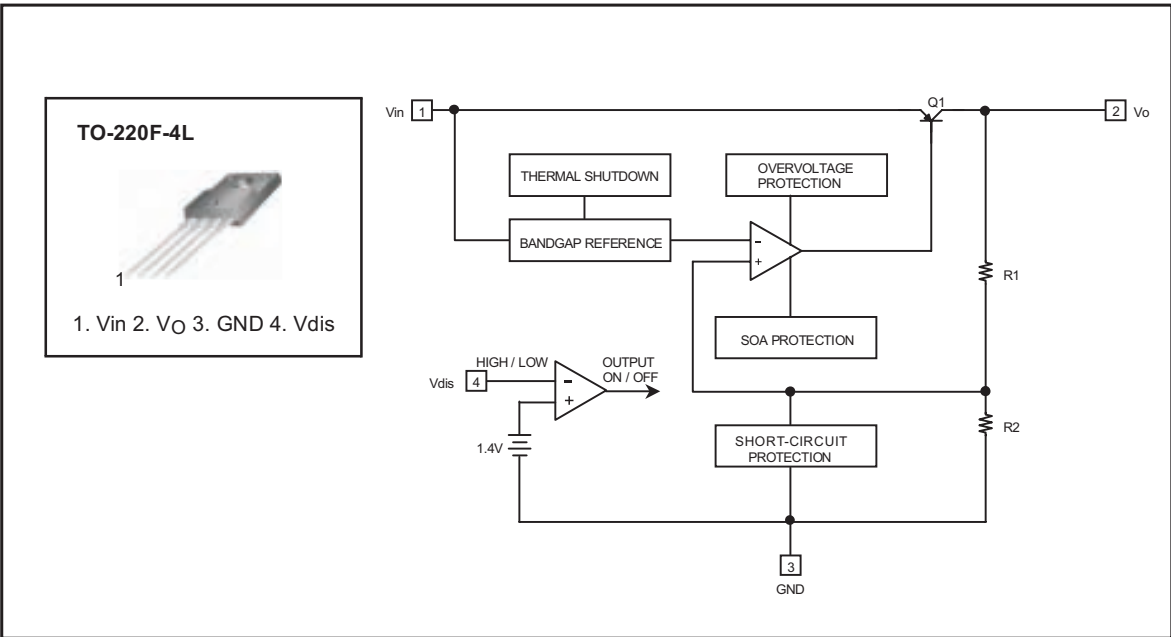
KTA1275Y
Q1, Q2A



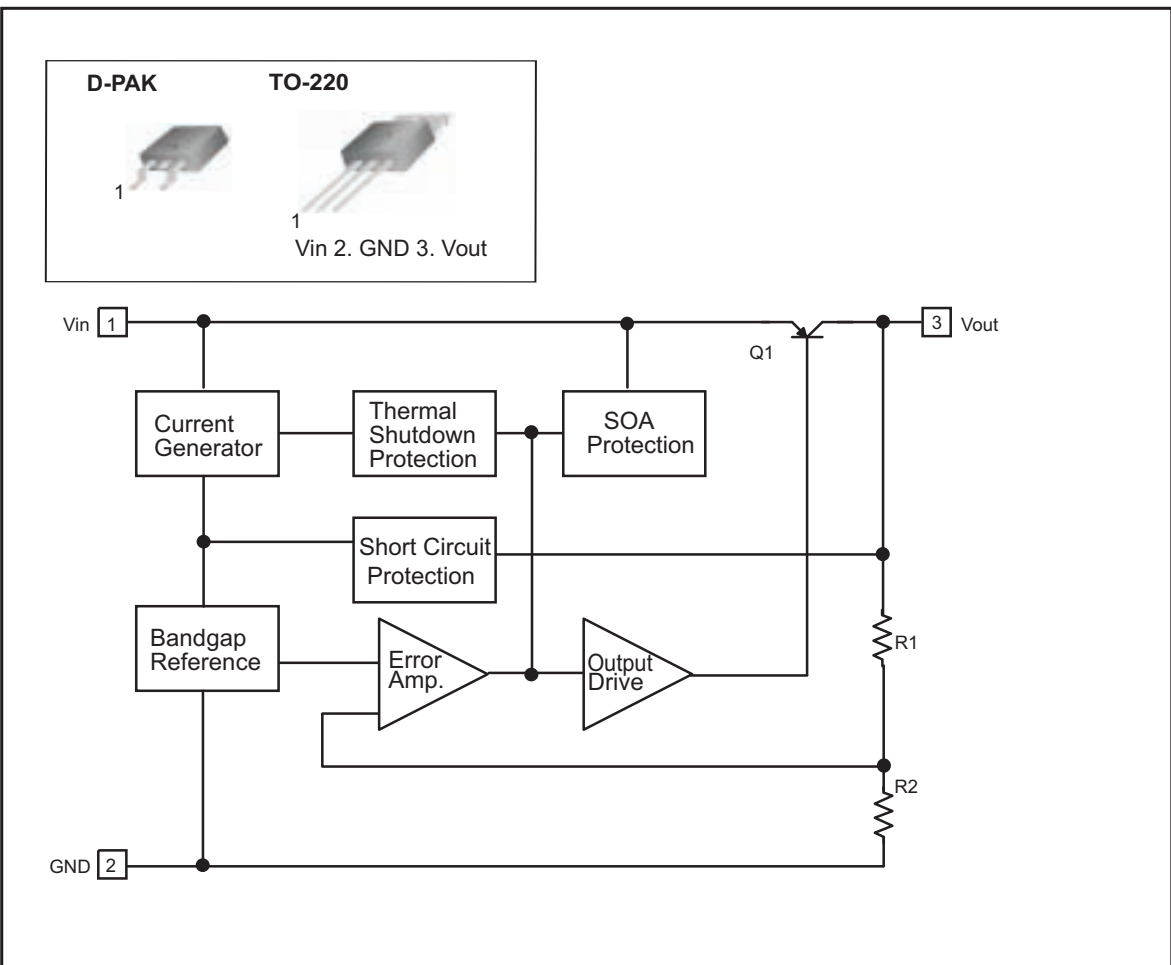
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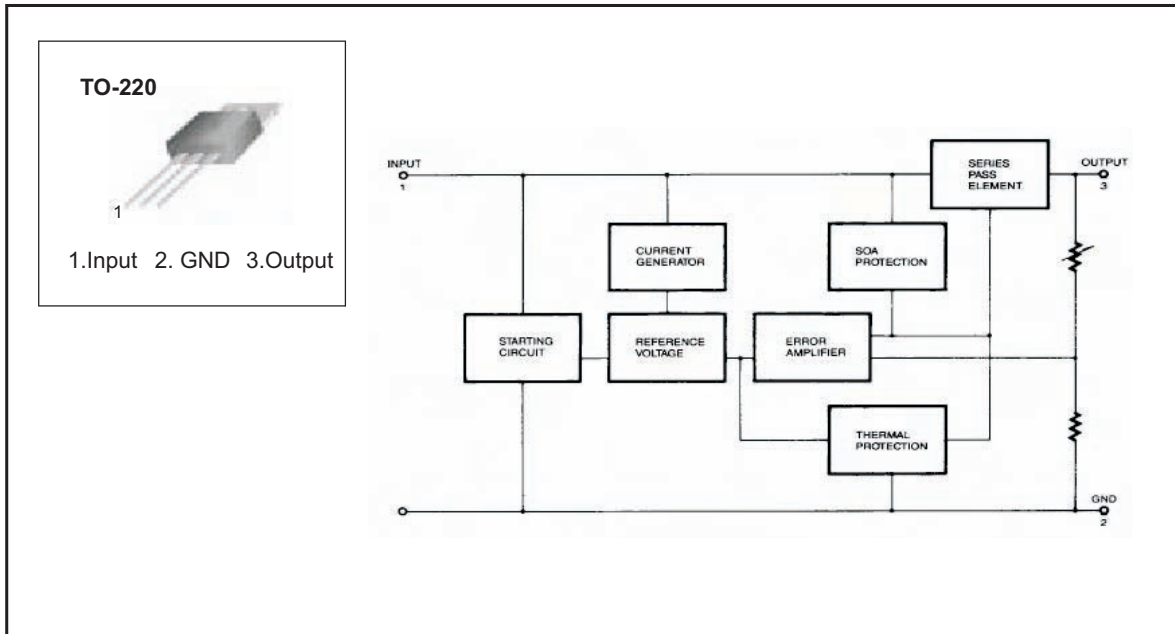
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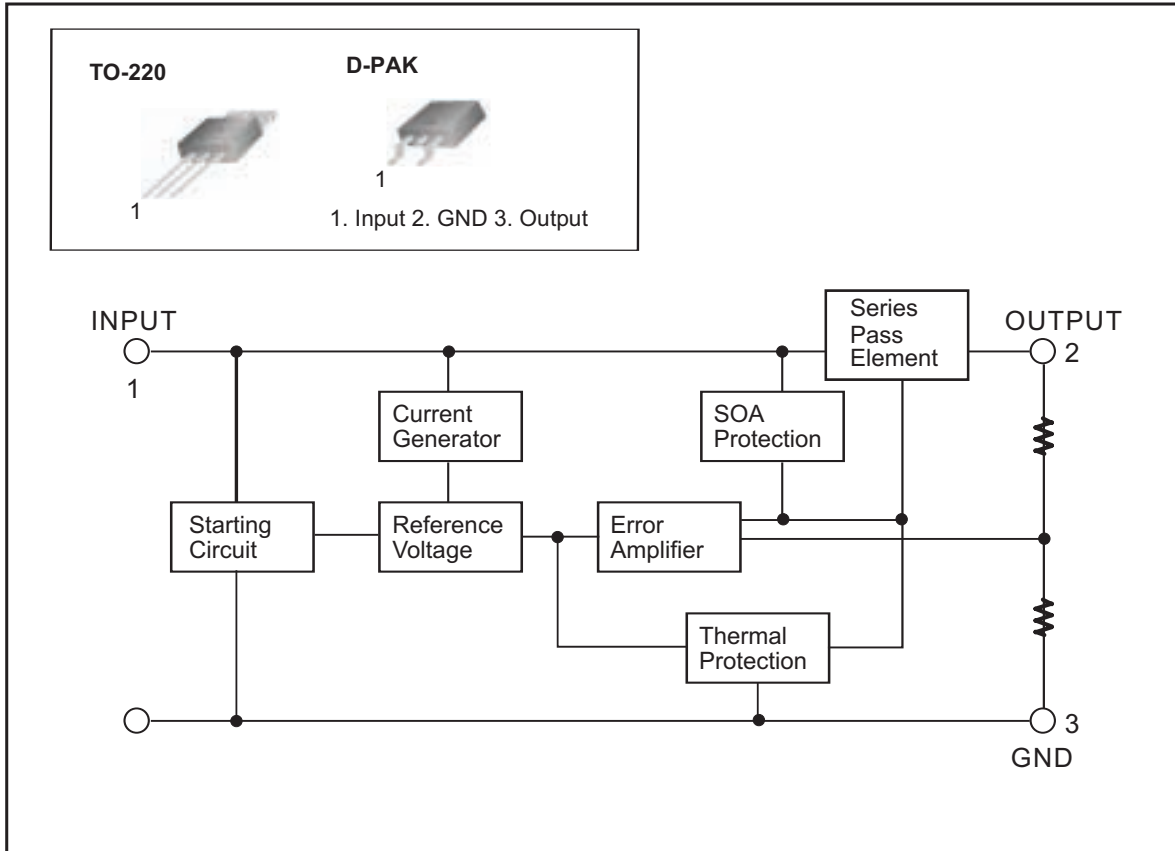
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KA78T12



KA7812

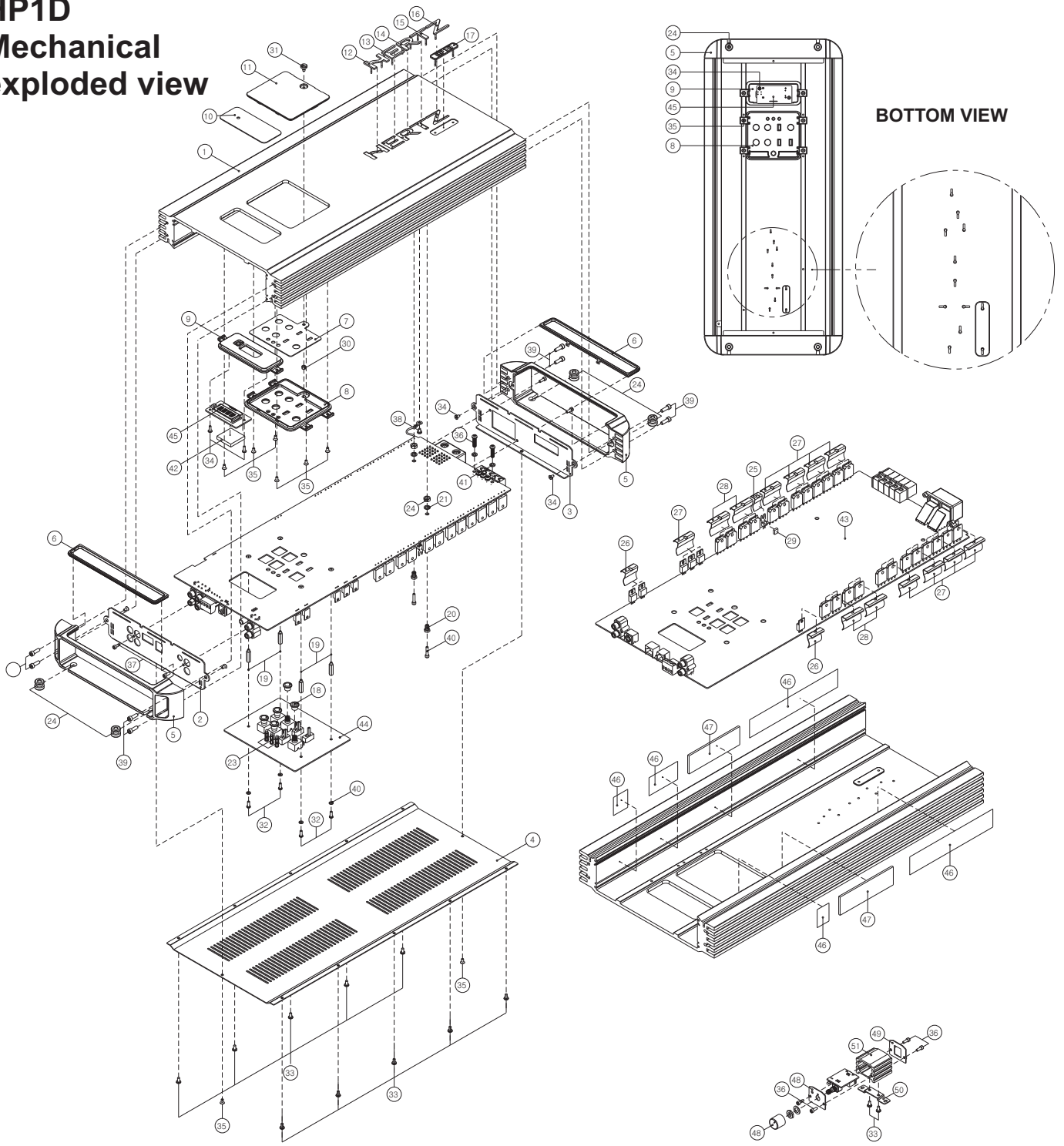


PART 2: MECHANICAL PART

Exploded views and parts list rev. A

- | | |
|-----------------------------|--------------|
| 1. Mechanical Exploded view | sheet 1 to 1 |
| 2. Package Exploded view | sheet 1 to 1 |
| 3. Amplifier parts list | page 1 to 1 |

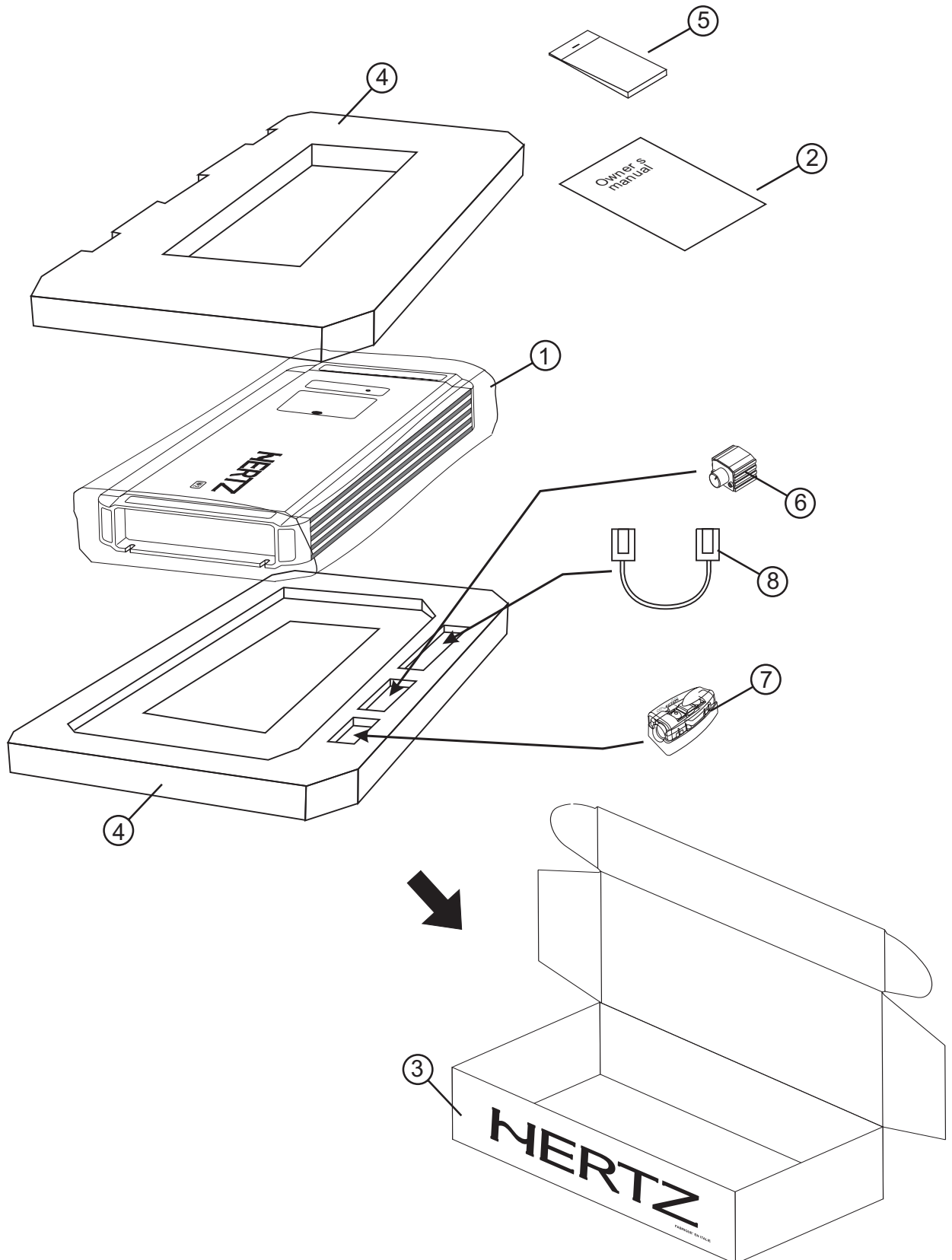
HP1D Mechanical exploded view



<HP1DASSEMBLED AMPLIFIER PART LIST>

15	BADGE" T"	1	30	POSTL=3.5mm	1	45	DISPLAY	1			
14	BADGE" R"	1	29	RUBBERSPONGE8x8x3t	1	44	TOPCONTROLPCB	1			
13	BADGE" E"	1	28	SPRINGBRACKET" G"	4	43	MAINPCB	1			
12	BADGE" H"	1	27	SPRINGBRACKET" A"	9	42	RUBBERSPONGE20x20x4t	1			
11	FUNCTIONWINDOW" A"	1	26	SPRINGBRACKET" B"	2	41	SPRINGWASHER ϕ 4	5			
10	DISPLAYWINDOW	1	25	SPRINGBRACKET" 11mm"	1	40	SPRINGWASHER ϕ 3	4			
9	DISPLAYCOVER	1	24	RUBBERGROMMET	4	39	SCREW/W.H.T4x12	8			
8	FUNCTIONCOVER" A"	1	23	L.E.DHOLDER	3	38	SCREW/B.H.T3x4	1			
7	FUNCTIONPLATE	1	22	HEXNUTM5	2	37	SCREW/W.H.T3x8	8			
6	TERMINALPROTECTOR" A"	2	21	SPRINGWASHER ϕ 5	2	36	SCREW/P.H.M4x16	5	51	REMOTEMTGBRACKET	1
5	ENDCAP" A"	2	20	PCBSUPPORTL=7.3mm	2	35	SCREW/F.H.T3x6	12	50	REMOTEREARPANEL	1
4	BOTTOMCOVER	1	19	POSTL=17mm	4	34	SCREW/B.H.T2.6x8	2	49	REMOTEFRONTPANEL	1
3	REARPANEL	1	18	VOLUMEKNOB	5	33	SCREW/B.H.T3x6	12	48	VOLUMEKNOB	1
2	FRONTPANEL	1	17	MODELBADGE	1	32	SCREW/P.H.M3x8	4	47	GAPPAD24x90x0.5t	2
1	MAINHEATSINK	1	16	BADGE" Z"	1	31	WINDOWSCREW3.5x6.5	1	46	SILICONPAD	1
NO	PARTS NAME	QTY	NO	PARTS NAME	QTY	NO	PARTS NAME	QTY	NO	PARTS NAME	QTY

Package exploded view Rev. A



HP 1D PACKAGE PARTS LIST

Rev.A

NO	DESCRIPTION	Q.TY
1	HIGH DENSITY POLYETHYLENE BAG	1
2	OWNERS MANUAL	1
3	HP 1 D GIFTBOX	1
4	SET PAD	2
5	ACCESSORIES KIT	1
6	HP RVC (REMOTE)	1
7	FUSE	1
8	HP RVC CABLE (4m.)	1

HP 1D ASSEMBLED PCB

NO	DESCRIPTION	Q,TY
-	MAIN BOARD	1
-	SUB MODULE	1

EXPENDABLE MATERIALS

REF. NO	DESCRIPTION
GREASE	50g THERMO CONDUCTIVE GREASE