RF99 Wireless Thermometer
Feb 23, 1999

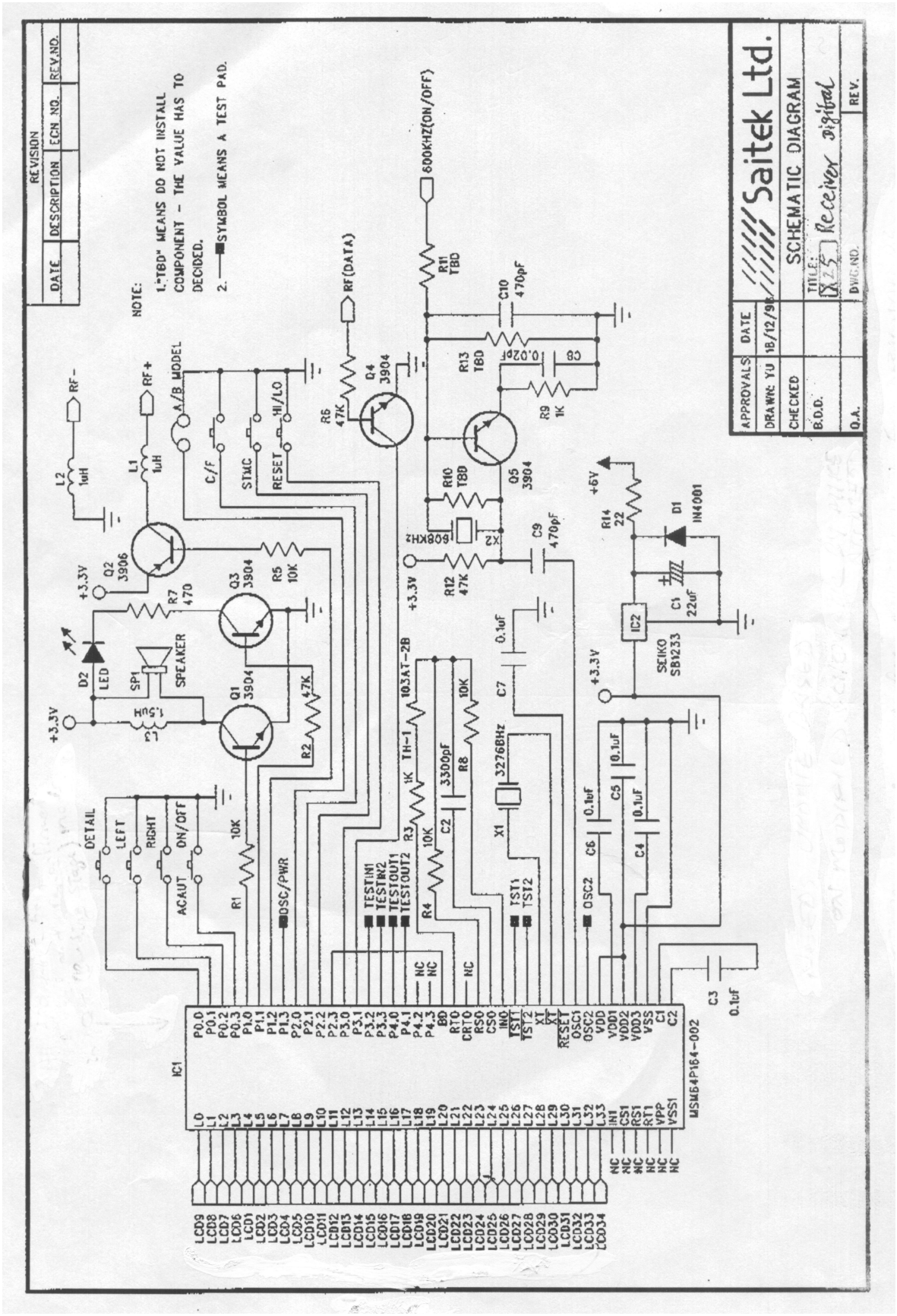
HEADWATERS
NEW PRODUCTS FOR WORLD MARKETS

Revision: 05

RECEIVER Component List

Quantity	Part Description
Rx - Mechanical:	
	See Mechanical Receiver Component Lists
Rx - Circuit Boards:	
1	Digital board, double sided FR4, 1.0 mm thick, 0.5 -1.0 ounce copper (62 x 80 mm)
1	RF board, double sided FR4, 1.0 mm thick, must be 1.0 ounce copper (26.2 x 41.7 mm)
Rx - Electro-Mechanical:	
1	LCD glass panel (66 x 70 mm glass size)
1	Piezo beeper plate (PZ-1)
7	Metal snap domes for keys, 185 gm normal force (SW1, SW2, SW3, SW4, SW5, SW6, SW7)
1	LCD elastomeric connector (approx 75mm long)
1+1+2	Battery contacts for 3 AA cells (+ve, -ve, 3 jumpers) plus two wires to digital board
1	3 wire ribbon cable connecting RF board to digital board
13	Screws for assembly
Rx - Digital Board Electrical:	
1	MSM64164C 3 volt, CMOS microcontroller (1C1)
1	S80233P(Seiko) 3.3V regulator (1C2)
1	32768 Hz quartz watch crystal (X1)
1	MMBT3904LT1 NPN transistor, thru hole or SMT (Q2)
1	608 KHz Ceramic resonator (murata) (X2)
4	MMBT3906LT1 PNP transistor, thru hole or SMT (Q1, Q3, Q4, Q5)
1	Korean supplied thermistor, equivalent to 103AT-2B thermistor(TH-1)
1	1 K-ohm 1% resistor, SMT or thru hole (R3)
1	10 K-ohm 1% resistor, SMT or thru hole (R4)
3	47 K-ohm 5% resistor, SMT (R2, R6, R12)
1	1 K-ohm 5% resistor, SMT or thru hole (R9)
1	470 ohm 5% resistor, SMT (R7)
1	22 microfarad, minimum 16 volt, aluminum electrolytic capacitor, radial lead (C1)
5	0.1 microfarad, minimum 16 volt, ceramic capacitor, SMT (C3,C4,C5,C6,C7)
1	0.02 microfarad, minimum 16 volt, ceramic capacitor, SMT (C8)
1	3300 picofarad NPO or COG ceramic capacitor, SMT (C2)
2	1 microhenry inductor, axial lead RF choke (L1, L2)
1	1.5 millihenry inductor, radial lead RF choke (L3)
1	LED, red (for Brookstone only)
1	LED, green backlight (for Brookstone only)
1	Do not Install (R10, R11, R13, C10)
1	IN4001 Diode (D1)
1	22 ohm 1watt resistor (R14)

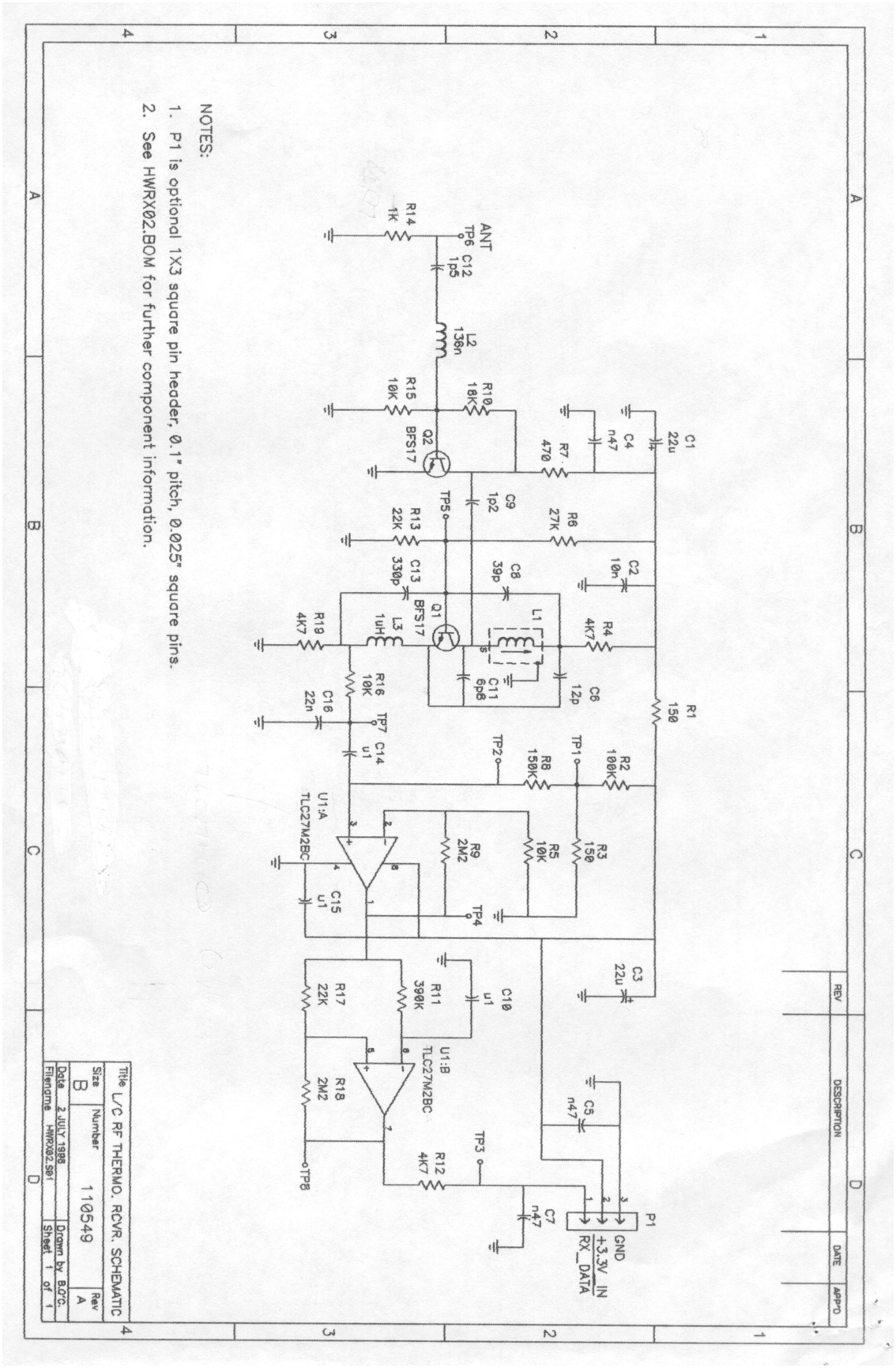
FCC APPROVAL BOM


REVISION
DATE
DESCRIPTION
ECN NO.
REV.NO.
NOTE:
1."TBD" MEANS DO NOT INSTALL COMPONENT - THE VALUE HAS TO DECIDED.
2. ■SYMBOL MEANS A TEST PAD.
Saitek Ltd.
SCHEMATIC DIAGRAM
Receiver Digital
APPROVALS
DRAWN: YU
CHECKED
B.D.D.
Q.A.
DATE
18/12/98
DWG.NO.
REV.
RF-
RF+
RF(DATA)
600KHZ(ON/OFF)
A/B MODEL
C/F
STMC
HI/LO
RESET
L1 1uH
L2 1uH
Q1 3904
Q2 3906
Q3 3904
Q4 3904
Q5 3904
R1 10K
R2 47K
R3 1K
R4 10K
R5 10K
R6 47K
R7 470
R8 10K
R9 1K
R10 TBD
R11 TBD
R12 47K
R13 TBD
R14 22
C1 22uF
C2 3300pF
C3 0.1uF
C4 0.1uF
C5 0.1uF
C6 0.1uF
C7 0.1uF
C8 0.02pF
C9 470pF
C10 470pF
D1 IN4001
D2 LED
SP1 SPEAKER
X1 32768Hz
X2 608KHz
TH-1 103AT-2B
IC1 WSM64P164-002
IC2 SEIKO SB1233
+3.3V
+6V
DETAIL
LEFT
RIGHT
ON/OFF
ACAUT
OSC/PWR
TESTIN1
TESTIN2
TESTOUT1
TESTOUT2
TST1
TST2
OSC2
NC

RECEIVER Component List (cont'd)

Quantity	Part Description
Rx - RF Board:	
1	OP AMP - dual, TLC27M7CD U1
1	32-41 nH Variable Inductor shielded 5mm, CoilCraft 164-03A06S L1
1	8.5 turn, air wound inductor L2 (Fig Rx-RF1)
1	1 uH inductor, 1008, 10%, (Matsuta as supplied Saitek SMT sample) L3
2	BFS17 NPN RF transistor Q1, Q2
2	22 microfarad, minimum 10 volt, aluminum electrolytic capacitor, radial lead C1, C3
1	1.2 picofarad, 0805, +/-0.25p NPO ceramic capacitor C9
1	1.8 picofarad, 0805, +/-0.25p NPO ceramic capacitor C12
1	6.8 picofarad, 0805, +/-0.25p NPO ceramic capacitor C11
1	12 picofarad, 0805, 5% 50V NPO, capacitor C6
1	39 picofarad, 0805, 5% 50V NPO, capacitor C8
1	330 picofarad, 0805, 5% 50V NPO, capacitor C13
3	470 picofarad, 0805, 5% 50V NPO, capacitor C4,C5,C7
1	10 nanofarad, 0805, 10% 50V X7R, capacitor C2
1	22 nanofarad, 0805, 10% 50V X7R, capacitor C16
3	100 nanofarad, 0805, 10% 50V Z5U, capacitor C10,C14,C15
2	150 ohm 5% resistor, 0805, 1/10th watt R1, R3
1	470 ohm 5% resistor, 0805, 1/10th watt R7
4	4.7 K-ohm 5% resistor, 0805, 1/10th watt R4, R12, R14, R19
3	10 K-ohm 5% resistor, 0805, 1/10th watt R5, R15, R16
1	18 K-ohm 5% resistor, 0805, 1/10th watt R10
2	22 K-ohm 5% resistor, 0805, 1/10th watt R13, R17
1	27 K-ohm 5% resistor, 0805, 1/10th watt R6 (subject to change between 22K to 33K)
1	100 K-ohm 5% resistor, 0805, 1/10th watt R2
1	150 K-ohm 5% resistor, 0805, 1/10th watt R8
1	390 K-ohm 5% resistor, 0805, 1/10th watt R11
2	2.2 Meg-ohm 5% resistor, 0805, 1/10th watt R9, R18
1	Antenna Wire, enamel coated, close wound, slides over a 2.1mm diam plastic core (Figure RF-Rx-50)

FCC APPROVED BOM


NOTES:
1. P1 is optional 1X3 square pin header, 0.1" pitch, 0.025" square pins.
2. See HWRX02.BOM for further component information.
ANT
TP6
C12 1p5
L2 136n
R14 1K
R15 10K
R10 18K
Q2 BFS17
C4 n47
C1 22u
R7 470
TP5
C9 1p2
R13 22K
R6 27K
C13 330p
C8 39p
C2 10n
Q1 BFS17
L3 1uH
L1
R19 4K7
R4 4K7
C11 6p8
C6 12p
R1 150
R16 10K
C16 22n
TP7
C14 u1
TP2
TP1
R8 150K
R2 100K
U1:A TLC27M2BC
R9 2M2
R5 10K
R3 150
TP4
C15 u1
C3 22u
C10 u1
R11 390K
R17 22K
U1:B TLC27M2BC
R18 2M2
TP8
C5 n47
TP3
R12 4K7
C7 n47
P1
GND
+3.3V_IN
RX_DATA
REV
DESCRIPTION
DATE
APP'D
Title L/C RF THERMO. RCVR. SCHEMATIC
Size B
Number 110549
Rev A
Date 2 JULY 1998
Filename HWRX02.sch
Drawn by BOC
Sheet 1 of 1