

**CAL PROCEDURE FOR: EPC0902ME REV E**

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Original Release 6-24-99  
Revised 12-21-00 Revised test procedure.

## **TEST PROCEDURE FOR REV E EVISCERATOR**

### **SPECIAL INSTRUCTIONS:**

For 6 volt units change U2 form EIC7805MS to EIC1129RS

**WARNING!** *To prevent ESD, always wear ground straps when handling radios.*

## **SCOPE:**

This document describes the procedure to be used for the electrical test of Terminator (board number EPC0902ME) modems.

## **PROCEDURE:**

### **EQUIPMENT SETUP**

1. Turn on the power supply and set it to 9.5 volts.
2. Turn on the oscilloscope, press <SETUP>, and twist the unmarked knob until the scope says 6 (on screen). Press <RECALL> (on screen).
3. Turn on the frequency counter, make sure the frequency counter display reads "Ext.Ref" in the right bottom corner.
4. Connect the antenna and RS-232 connectors.
5. Make sure that CAPS LOCK is on.
6. If the computer screen shows "C:\>", then type CD EVIS, <ENTER>, EVIS.
7. Otherwise type Q.
8. **Anytime that you are making electrical changes to the board, you must power down the board, make the change, and power the board back up. If the current test requires you to type anything you will probably have to retype the characters.**

### **LOADING FIRMWARE (only if the radio does not have the serial number assigned to it at the Boot Load Station)**

1. Type 1.
2. Make sure that the serial number is correct and hit enter. If the serial number is incorrect type the correct one (no dashes, spaces, etc.) and hit enter twice.
3. Put a 4 pin jumper in TP10, 11, 12, and 13 (it doesn't matter what direction) holding the top of the jumpers towards the bottom of the board.
4. Now apply power and hit enter.
5. Wait for the lights to go green, then the jumper can be removed from the board.
6. Write the serial number on the back of the board at the top of the RF section and start a birth certificate.
7. Check the board as being programmed in the board test log.
8. When the program says "Hit any key...", power down the unit and power it back up, then hit enter again.

## **TESTING**

### **1. SET FREQUENCY**

- A. Type 2 on the keyboard.
- B. Apply the probe of the frequency counter to TP8.
  - I. The display should read 3.686400. If the frequency is between 3.686381 and 3.686419 type U to increase the frequency and D to decrease the frequency until the counter reads between 3.686396 and 3.686404.

- II. If the reading is 3.686420 or above subtract 400 from the last 3 digits on the counter and find the resulting number in the chart at the end of this procedure. Add a capacitor with a value closest to this number at C99. For example if the frequency was 3.686440 subtract 400 from the last 3 digits to get 40. Find the number 40 in the chart and choose the value of capacitor closest to it which is 1.5pF. Add a 1.5pF cap at C99.
- III. Now type U or D to obtain a frequency between 3.686396 and 3.686404.
- IV. Check the number in the blue bar on screen labeled "Xtal=". This number must be between \$30 and \$50. The \$ indicates this is a Hexadecimal (base 16) number which means they count up as follows: 37, 38, 39, 3A, 3B, 3C, 3D, 3E, 3F, 40, 41 etc.
- V. If the xtal number is lower than \$30 decrease the value of capacitor added for C99 by .5pF. If the number is above \$50 then increase C99 by .5pF. As you type in U to increase the frequency the xtal number gets smaller and vice versa.
- VI. After the frequency is set type W to write the xtal number to permanent memory. Make sure that the TX and CTS LEDs turn off.

## 2. TUNE COILS

- A. Hit F1 to set the input signal attenuation to 0dB.
- B. Check the carrier detect (CD) led D7. It must be green (this indicates the board has linked to the reference unit) before the coils can be tuned. If it is not type L five times and wait 4 seconds, if it still isn't green type L 5 more times and wait 4 more seconds. If this doesn't work type H 15 times and wait 4 more seconds. If the led still doesn't turn green write "won't link" on a yellow post it note and tape it to the back of the board. Set the board aside to trouble shoot later.
- C. Apply the scope probe to TP7. Tune the slug in the coils, bottom one first, until the line is a high as it will go.

## 3. SLICER SETTING

- A. Check the blue bar on screen labled "best slicer level \$."
- B. Type H or L to obtain the desired slicer level.
- C. Now type W. Make sure that the TX and CTS LEDs turn off.
- D. If there was much of a change in their tuning you need to redo step A, B, and C. Check the slave "Data Decode" number in the blue bar. This number must be above \$6C.

## 4. VCO

- A. Put the scope probe on the right side of R49 (the end connected to C72). Check the scope trace to verify it is between 2.0 and 3.0 volts. It should be flat and jumping slightly with faint spikes.

## 5. MODULATION

- A. Change the scope setup to 7 (<SETUP>, 7, <RECALL>). If the unit is under modulated then add .5p to 2.2p to C111. Put the scope back in setup 6 by twisting the unmarked knob until the screen says 6 and press <RECALL>.

## 6. LOW SPEED SENSITIVITY

- A. Type F2, this changes the attenuation number on screen to the following:
  - I. Station 1 – 38 dB
  - II. Station 2 – 37 dB

- III. Station 3 – 35 dB
- IV. Station 4 – 37 dB
- B. Check the slave “Data Decode” number. Type L once and see if the number comes up. If it does type L again. Keep going until the number goes down and type H until the number is the highest. If the first L makes the number worse then try the same procedure with H. Find the highest average number and press W. Make sure that the TX and CTS LEDs turn off.
- C. The “Data Decode” number must be above \$30. This is the low speed sensitivity reading. Write it in the serial number log and on the birth certificate in the sensitivity box.
- D. If the “Data Decode” number is lower than \$30, set the radio aside for letter troubleshooting and label it with a “poor LS sensitivity” yellow post it note.

## 7. HIGH SPEED SENSITIVITY

- A. Next reset the board and type 3 4 2 <esc>, <esc>. This changes the RF data rate to 2.
- B. Type F3, this changes the attenuation number on screen to the following:
  - I. Station 1 – 34 dB
  - II. Station 2 – 32 dB
  - III. Station 3 – 31 dB
  - IV. Station 4 – 32 dB
- C. Check the slave “Data Decode” number. It must be above \$30. This is the high speed sensitivity. If it fails, set the radio aside for letter troubleshooting and label it with a “poor HS sensitivity” yellow post it note.

## 8. 100% RECEIVE RATE TEST

- A. Type F4, this changes the attenuation to
  - I. Station 1 – 24 dB
  - II. Station 2 – 22 dB
  - III. Station 3 – 21 dB
  - IV. Station 4 – 22 dB
- B. Check the number in the blue bar on screen labeled “RxRate” to assure that it reads 100%. If it is not, set the radio aside for letter troubleshooting and label it with a “no 100% RxRate” yellow post it note.

## 9. POWER OUTPUT

- A. Press the reset button. Verify all leds are green.
- B. Type 4 then T. Watch the wattmeter and note what reading the meter goes to initially. The meter will read higher for a second or so and then drop down to a slightly lower value. The initial higher value is the correct reading. The reading must be between 80 and 95 on the bottom scale (80 corresponds to 800 mW, 95 corresponds to 980 mW). Record this number on the birth certificate if the radio is 12V model (RS232 or TTL). For 6 volt radios after you verified the power output at 9.5 volts, reduce the power supply voltage to 6.5 volts and check the output power again. The lower limit for these radios is 500 mW (50 on the meter). Record the last power meter readings in the radio’s birth certificate. If the radio (12V or 6V) does not have required power output level, set the radio aside for letter troubleshooting and label it with a “low power output” yellow post it note.

- C. Check the current (shown in the right window of the power supply). It must be under .7 amps.

#### 10. FINISHING

- A. Press the reset button and type 7 J H W C and look at the values for D83 and D84. These values are the crystal and the slicer levels. Write these numbers on the back of the board under the receiver sensitivity number.
- B. Type <esc> and 1 1. This sets the baud rate to 115.2kBaud.
- C. Stamp the back of the board with your test stamp and repeat the process with the next board.
- D. If you finished testing a 6V radio (TTL or RS232), set the power supply voltage back to 9.5V.
- E. Type Q. Go to program.

## FREQUENCY TUNING CHART

Frequency Offset	C99 Cap Value		Frequency Offset	C99 Cap Value
20	.5p		72	
22			74	
24			76	
26			78	
28	1.0p		80	3.3p
30			82	
32			84	
34			86	
36	1.5p		88	
38			90	
40			92	
42			94	
44			96	
46			98	
48			100	
50			102	
52			104	
54	2.2p		106	
56			108	
58			110	
60			112	
62			114	
64			116	
66			118	
68			120	4.7p
70				

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Ref	Qty.	Component	Value	Part #	Details1	Part Type	PCB Decal
C39	1	Capacitor	1p	ECA0010CT	5% 100V COG Mono	ECA0010CT	0805
C8	1	Capacitor	1.2p	ECA0012CT	5% 100V COG Mono	ECA0012CT	0805
C43 C63 C80 C127	4	Capacitor	1.5p	ECA0015CT	5% 100V COG Mono	ECA0015CT	0805
C12 C91 C94	3	Capacitor	2.2p	ECA0022CT	5% 100V COG Mono	ECA0022CT	0805
C26 C76	2	Capacitor	2.2p	ECA0022CT	5% 100V COG Mono	ECA0022CT	0805
C27 C75	2	Capacitor	3.3p	ECA0033CT	5% 100V COG Mono	ECA0033CT	0805
C53 C85	2	Capacitor	3.3p	ECA0033CT	5% 100V COG Mono	ECA0033CT	0805
C3-4	2	Capacitor	4.7p	ECA0047CT	5% 100V COG Mono	ECA0047CT	0805
C9 C46-47	3	Capacitor	4.7p	ECA0047CT	5% 100V COG Mono	ECA0047CT	0805
C111	1	Capacitor	6.8p	ECA0068CT	5% 100V COG Mono	ECA0068CT	0805
C30	1	Capacitor	8.2p	ECA0082CT	5% 100V COG Mono	ECA0082CT	0805
C13 C31-32 C49 C89-90	6	Capacitor	10p	ECA0100CT	5% 100V COG Mono	ECA0100CT	0805
C11 C33 C54 C59 C98 C142	6	Capacitor	100p	ECA0101CT	5% 100V COG Mono	ECA0101CT	0805
C110	1	Capacitor	100p	ECA0101CT	5% 100V COG Mono	ECA0101CT	0805
C2 C14 C16 C42 C60 C66 C78-79	12	Capacitor	10n	ECA0103XS	10% 50V X7R Mono	ECA0103XS	1206
C82 C84 C132 C199							
C48 C50 C57-58 C70 C88 C95-97	25	Capacitor	100n	ECA0104XS	10% 50V X7R Mono	ECA0104XS	1206
C106-107 C109 C114 C119-124							
C126 C134-136 C138 C141							
C116	1	Capacitor	100n	ECA0104XS	10% 50V X7R Mono	ECA0104XS	1206
C28 C129-130 C140	4	Capacitor	1u	ECA0105XS	10% 16V X5R Mono	ECA0105XS	1206
C1	1	Capacitor	10u	ECA0106TS	20% 25V	ECA0106TS	SCEIAD
C61 C67 C77 C87 C100-101	10	Capacitor	1.2n	ECA0122CS	5% 50V COG Mono	ECA0122CS	1206
C104-105 C133 C139							
C17	1	Capacitor	15p	ECA0150CT	5% 100V COG Mono	ECA0150CT	0805
C71	1	Capacitor	220u	ECA0227TS	20% 6 Volts	ECA0227TS	SCEIAD
C5-6 C19-20 C22-23 C25 C29	25	Capacitor	27p	ECA0270CT	5% 100V COG Mono	ECA0270CT	0805
C36-37 C41 C44-45 C51-52 C62							
C64 C68 C73-74 C83 C86 C92-93							
C125							
C34 C24	2	Capacitor	27p	ECA0270CT	5% 100V COG Mono	ECA0270CT	0805
C65	1	Capacitor	2.7n	ECA0272XS	10% 50V X7R Mono	ECA0272XS	1206
C10 C15 C21 C38 C81 C108 C118	7	Capacitor	330p	ECA0331CT	5% 100V COG Mono	ECA0331CT	0805
C55	1	Capacitor	39p	ECA0390CT	5% 100V COG Mono	ECA0390CT	0805
C128	1	Capacitor	39p	ECA0390CT	5% 100V COG Mono	ECA0390CT	0805
C69 C117	2	Capacitor	47p	ECA0470CT	5% 100V COG Mono	ECA0470CT	0805
C72 C103 C113 C131	4	Capacitor	470p	ECA0471CT	5% 100V COG Mono	ECA0471CT	0805
C40	1	Capacitor	470p	ECA0471NT	5% 100V N750 Mono	ECA0471NT	0805
C56	1	Capacitor	47n	ECA0473XS	10% 100V COG Mono	ECA0473XS	1206
C112	1	Capacitor	68p	ECA0680CT	5% 100V COG Mono	ECA0680CT	0805
C102	1	Capacitor	6.8n	ECA0682XS	10% 50V X7R Mono	ECA0682XS	1206
C115 C137	2	Capacitor	6.8u	ECA0685TS	20% 6.3V	ECA0685TS	1206+
C7	1	Capacitor	TBD	ECATBDCT	5% 100V COG Mono	ECATBDCT	0805
C35 C99	2	Capacitor	TBD	ECATBDCT	5% 100V COG Mono	ECATBDCT	0805
C144	1	Capacitor	TBD	ECATBDXS	10% 50V X7R Mono	ECATBDXS	1206
J2	1	Connector	10 Pin	ECN1010ML	.025 Posts w/Locking Ramp	ECN1010ML	ECN1010ML
J1	1	Connector	SMA	ECN2002FR	End of PCB Female	ECN2002FR	SMAPC90
D1	1	Diode	MMBD352L	EDI0352HS	Hot Carrier (Schottky)	EDI0352HS	SOT23
D6	1	Diode	1213-004	EDI1213VS	Varicap diode	EDI1213VS	SOT23
D2-3	2	Diode	MMBV3401	EDI3401SS	PIN	EDI3401SS	SOT23D
D8	1	Diode	1299-004	EDI4199VS	Varicap diode	EDI4199VS	SOT23
L11 L14 L16 L19 L21	5	Ferrite	25 Ohms @ 100MHz	EFI0250FS	Ferrite	EFI0250FS	1206
F1	1	Filter SAW	900 MHz	EFI0900SS	SAW Filter	EFI0900SS	SAW
U5 U20	2	IC	74HC02	EIC0002HS	Quad Nor Gate	EIC0002HS	DIP14\SO
U16	1	IC	MC68HC11K1	EIC0011US	uProcessor	EIC0011US	PLCC84S PLCC84
U3	1	IC	MC12022A	EIC0022CS	Prescaler	EIC0022CS	DIP8\SO
U11	1	IC	74HC74	EIC0074HS	Dual D Flip Flop	EIC0074HS	DIP14\SO
U23	1	IC	MAX213	EIC0213SS	8L RS232 Buffer	EIC0213SS	75LBC187
U6	1	IC	LM393	EIC0393LS	Dual Comparator	EIC0393LS	DIP8\SO
U12	1	IC	MAX522	EIC0522LS	Serial DAC	EIC0522LS	DIP8\SO
U18	1	IC	74HC573	EIC0573HT	Octal Latch	EIC0573HT	TSSOP20
U15	1	IC	74HC597	EIC0597HS	Latched Shift Register	EIC0597HS	DIP16\SO
U1	1	IC	NE615D	EIC0615CS	FM IF System	EIC0615CS	DIP20\SOL
U7-8 U10 U21	4	IC	TLC2272	EIC2272LS	Dual Op-Amp Rail to Rail	EIC2272LS	DIP8\SO
U17	1	IC	AM29F010	EIC2910CS	128 x 8 Flash Memory	EIC2910CS	PLCC32
U13	1	IC	74HC4040	EIC4040HS	12 Bit Counter	EIC4040HS	DIP16\SO
U19	1	IC	4050	EIC4050CS	Hex Buffer	EIC4050CS	DIP16\SO
U4	1	IC	MC34064D	EIC4064LD	Undervoltage Sensor	EIC4064LD	DIP8\SO
U22	1	IC	145158-2	EIC5158CS	PLL Synthesizer	EIC5158CS	DIP16\SOL
U14	1	IC	6406C	EIC6406MS	32K x 8 SRAM	EIC6406MS	DIP28\SOJ
U9	1	IC	HC4053	EIC7453HS	Triple Analog Mux	EIC7453HS	DIP16\SO
U2	1	IC	78M05	EIC7805MS	5V 4% Regulator	EIC7805MS	DPKAW
L13	1	Inductor	100n	EIN0101FS		EIN0101FS	1210
L1 L10	2	Inductor	1u	EIN0102FS	2.5 MHz, Q=30	EIN0102FS	1209
L20	1	Inductor	1u	EIN0102FS	2.5 MHz, Q=30	EIN0102FS	1206
L2-3 L6	3	Inductor	18.5n	EIN0180FS	Air Core SMD	EIN0180FS	SLA18.5
L7 L9	2	Inductor	18n	EIN0180FT	NL Series	EIN0180FT	1210
L22	1	Inductor	220u	EIN0224FS	800 KHz, Q=18	EIN0224FS	1209
L17-18	2	Inductor	27u	EIN0273FS	2.5 MHz, Q=30	EIN0273FS	1209
L12	1	Inductor	330n	EIN0331FS	2.5 Mhz Q=30	EIN0331FS	1209
L15	1	Inductor	330u	EIN0334FS	796KHz Q=50	EIN0334FS	1812IN



L4-5 L8	3	Inductor	4.5 Turns	EIN1504LI	Coil Craft 150 Series	EIN1504LI	L150
D4-5 D7	3	LED	7011X1/5	EOP7011RG	Red / Green LED	EOP7011RG	SLED7011
M17 M48-49	3	LED Light Pipe		EOP7510LP	Right Angle Adaptor	EOP7510LP	EOP7510LP
R14 R16 R27-29	5	Resistor	10	ERE0100FT	5% 1/10W	ERE0100FT	0805
R13 R32 R41	3	Resistor	100	ERE0101FT	5% 1/10W	ERE0101FT	0805
R1 R4-5 R63 R73 R103 R105	7	Resistor	1K	ERE0102FT	5% 1/10W	ERE0102FT	0805
R2 R6 R10 R12 R15 R49 R53 R69	27	Resistor	10K	ERE0103FT	5% 1/10W	ERE0103FT	0805
R77 R84 R87 R89-90 R95 R97-99							
R102 R104 R106-107 R112 R114							
R116-118 R121							
R46 R23 R85 R35 R55 R45 R93	7	Resistor	10K	ERE0103FT	5% 1/10W	ERE0103FT	0805
R58 R67 R108-109 R111	5	Resistor	100K	ERE0104FT	5% 1/10W	ERE0104FT	0805
R47 R65 R122-124	5	Resistor	1M	ERE0105FT	5% 1/10W	ERE0105FT	0805
R9 R51 R60 R80	4	Resistor	220	ERE0221FT	5% 1/10W	ERE0221FT	0805
R25	1	Resistor	220	ERE0221FT	5% 1/10W	ERE0221FT	0805
R17 R24 R26 R30 R37 R39 R43	9	Resistor	2.2K	ERE0222FT	5% 1/10W	ERE0222FT	0805
R57 R92							
R11 R91 R94 R199	4	Resistor	22K	ERE0223FT	5% 1/10W	ERE0223FT	0805
R100 R64	2	Resistor	22K	ERE0223FT	5% 1/10W	ERE0223FT	0805
R83 R126	2	Resistor	220K	ERE0224FT	5% 1/10W	ERE0224FT	0805
R52 R79 R125	3	Resistor	2.2M	ERE0225FT	5% 1/10W	ERE0225FT	0805
R38	1	Resistor	330	ERE0331FT	5% 1/10W	ERE0331FT	0805
R7 R19 R22 R36 R40	5	Resistor	33K	ERE0333FT	5% 1/10W	ERE0333FT	0805
R3 R20 R62	3	Resistor	47	ERE0470FT	5% 1/10W	ERE0470FT	0805
R18	1	Resistor	47	ERE0470FT	5% 1/10W	ERE0470FT	0805
R8 R48 R74 R78 R115 R119-120	7	Resistor	470	ERE0471FT	5% 1/10W	ERE0471FT	0805
R21 R31 R44 R50 R59 R66 R68	15	Resistor	4.7K	ERE0472FT	5% 1/10W	ERE0472FT	0805
R70-71 R76 R81-82 R88 R96 R110							
R101 R113	2	Resistor	4.7K	ERE0472FT	5% 1/10W	ERE0472FT	0805
R33 R56 R75 R86	4	Resistor	47K	ERE0473FT	5% 1/10W	ERE0473FT	0805
R34 R42 R54	3	Resistor	470K	ERE0474FT	5% 1/10W	ERE0474FT	0805
R72	1	Resistor	TBD	ERETBDFT	5% 1/10W	ERETBDFT	0805
TH1-2	2	Thermistor	25K@25C	ETH0253TS	-4.4%/DegC	ETH0253TS	0805
Q14	1	Transistor	MJD117	EXS0117PS	PNP Darlington	EXS0117PS	DPAK
Q5 Q11	2	Transistor	MMBR571	EXS0571NS	NPN RF	EXS0571NS	SOT23
Q6-7	2	Transistor	CF739	EXS0739MS	Dual Gate N-MOSFET	EXS0739MS	SOT143
Q8-10	3	Transistor	MMBR901L	EXS0901NS	NPN RF	EXS0901NS	SOT23
Q3	1	Transistor	MMBT3640	EXS3640PS	PNP High Speed Switch	EXS3640PS	SOT23
Q15-16 Q19-21	5	Transistor	MMBT3904	EXS3904NS	NPN General Purpose	EXS3904NS	SOT23
Q18	1	Transistor	MMBT3906	EXS3906PS	PNP General Purpose	EXS3906PS	SOT23
Q12-13	2	Transistor	MMBT4403	EXS4403PS	PNP Switching	EXS4403PS	SOT23
Q2	1	Transistor	MMBF4416	EXS4416JS	N JFET Low Noise	EXS4416JS	SOT23
Q1	1	Transistor	MRF9242	EXS9242NS	MOSFET Amp	EXS9242NS	PLD1
Y2	1	Resonator	1025 MHz	EXT1027RS	Ceramic Resonator	EXT1027RS	RESONATOR
Y1	1	Crystal	14.7456MHz	EXT1474SX	20pF	EXT1474SX	MA506
M6	1	Shield	2.0" x 2.3"	MST0022AA	CRS .015" Thick	MST0022AA	MST0022AA
M28-31 M50 M61	6	Mounting Pad		MTH140	.140 Diameter Hole	MTH140	MTH140
MTH5 MTH7	2			MTH125NP		MTH125NP	MTH125NP
TP1 TP4-15	13	Test Point		STP	PCB Via	STP	STP
TP2-3	2	Test Point		TPS	Via on PCB	TPS	TPS
M1-5 M7-16 M18-27 M34-47	87			VIA		VIA	VIA
M51-60 M62-99							

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Ref	Component	Value	Part #	Details1	Part Type	PCB Decal
C1	Capacitor	10u	ECA0106TS	20% 25V	ECA0106TS	SCEIAD
C2	Capacitor	10n	ECA0103XS	10% 50V X7R Mono	ECA0103XS	1206
C3	Capacitor	4.7p	ECA0047CT	5% 100V COG Mono	ECA0047CT	0805
C4	Capacitor	4.7p	ECA0047CT	5% 100V COG Mono	ECA0047CT	0805
C5	Capacitor	27p	ECA0270CT	5% 100V COG Mono	ECA0270CT	0805
C6	Capacitor	27p	ECA0270CT	5% 100V COG Mono	ECA0270CT	0805
C7	Capacitor	TBD	ECATBDCT	5% 100V COG Mono	ECATBDCT	0805
C8	Capacitor	1.2p	ECA0012CT	5% 100V COG Mono	ECA0012CT	0805
C9	Capacitor	4.7p	ECA0047CT	5% 100V COG Mono	ECA0047CT	0805
C10	Capacitor	330p	ECA0331CT	5% 100V COG Mono	ECA0331CT	0805
C11	Capacitor	100p	ECA0101CT	5% 100V COG Mono	ECA0101CT	0805
C12	Capacitor	2.2p	ECA0022CT	5% 100V COG Mono	ECA0022CT	0805
C13	Capacitor	10p	ECA0100CT	5% 100V COG Mono	ECA0100CT	0805
C14	Capacitor	10n	ECA0103XS	10% 50V X7R Mono	ECA0103XS	1206
C15	Capacitor	330p	ECA0331CT	5% 100V COG Mono	ECA0331CT	0805
C16	Capacitor	10n	ECA0103XS	10% 50V X7R Mono	ECA0103XS	1206
C17	Capacitor	15p	ECA0150CT	5% 100V COG Mono	ECA0150CT	0805
C19	Capacitor	27p	ECA0270CT	5% 100V COG Mono	ECA0270CT	0805
C20	Capacitor	27p	ECA0270CT	5% 100V COG Mono	ECA0270CT	0805
C21	Capacitor	330p	ECA0331CT	5% 100V COG Mono	ECA0331CT	0805
C22	Capacitor	27p	ECA0270CT	5% 100V COG Mono	ECA0270CT	0805
C23	Capacitor	27p	ECA0270CT	5% 100V COG Mono	ECA0270CT	0805
C24	Capacitor	27p	ECA0270CT	5% 100V COG Mono	ECA0270CT	0805
C25	Capacitor	27p	ECA0270CT	5% 100V COG Mono	ECA0270CT	0805
C26	Capacitor	2.2p	ECA0022CT	5% 100V COG Mono	ECA0022CT	0805
C27	Capacitor	3.3p	ECA0033CT	5% 100V COG Mono	ECA0033CT	0805
C28	Capacitor	1u	ECA0105XS	10% 16V X5R Mono	ECA0105XS	1206
C29	Capacitor	27p	ECA0270CT	5% 100V COG Mono	ECA0270CT	0805
C30	Capacitor	8.2p	ECA0082CT	5% 100V COG Mono	ECA0082CT	0805
C31	Capacitor	10p	ECA0100CT	5% 100V COG Mono	ECA0100CT	0805
C32	Capacitor	10p	ECA0100CT	5% 100V COG Mono	ECA0100CT	0805
C33	Capacitor	100p	ECA0101CT	5% 100V COG Mono	ECA0101CT	0805
C34	Capacitor	27p	ECA0270CT	5% 100V COG Mono	ECA0270CT	0805
C35	Capacitor	TBD	ECATBDCT	5% 100V COG Mono	ECATBDCT	0805
C36	Capacitor	27p	ECA0270CT	5% 100V COG Mono	ECA0270CT	0805
C37	Capacitor	27p	ECA0270CT	5% 100V COG Mono	ECA0270CT	0805
C38	Capacitor	330p	ECA0331CT	5% 100V COG Mono	ECA0331CT	0805
C39	Capacitor	1p	ECA0010CT	5% 100V COG Mono	ECA0010CT	0805
C40	Capacitor	470p	ECA0471NT	5% 100V N750 Mono	ECA0471NT	0805
C41	Capacitor	27p	ECA0270CT	5% 100V COG Mono	ECA0270CT	0805
C42	Capacitor	10n	ECA0103XS	10% 50V X7R Mono	ECA0103XS	1206
C43	Capacitor	1.5p	ECA0015CT	5% 100V COG Mono	ECA0015CT	0805
C44	Capacitor	27p	ECA0270CT	5% 100V COG Mono	ECA0270CT	0805
C45	Capacitor	27p	ECA0270CT	5% 100V COG Mono	ECA0270CT	0805
C46	Capacitor	4.7p	ECA0047CT	5% 100V COG Mono	ECA0047CT	0805
C47	Capacitor	4.7p	ECA0047CT	5% 100V COG Mono	ECA0047CT	0805
C48	Capacitor	100n	ECA0104XS	10% 50V X7R Mono	ECA0104XS	1206
C49	Capacitor	10p	ECA0100CT	5% 100V COG Mono	ECA0100CT	0805
C50	Capacitor	100n	ECA0104XS	10% 50V X7R Mono	ECA0104XS	1206
C51	Capacitor	27p	ECA0270CT	5% 100V COG Mono	ECA0270CT	0805
C52	Capacitor	27p	ECA0270CT	5% 100V COG Mono	ECA0270CT	0805
C53	Capacitor	3.3p	ECA0033CT	5% 100V COG Mono	ECA0033CT	0805
C54	Capacitor	100p	ECA0101CT	5% 100V COG Mono	ECA0101CT	0805
C55	Capacitor	39p	ECA0390CT	5% 100V COG Mono	ECA0390CT	0805
C56	Capacitor	47n	ECA0473XS	10% 100V COG Mono	ECA0473XS	1206
C57	Capacitor	100n	ECA0104XS	10% 50V X7R Mono	ECA0104XS	1206
C58	Capacitor	100n	ECA0104XS	10% 50V X7R Mono	ECA0104XS	1206
C59	Capacitor	100p	ECA0101CT	5% 100V COG Mono	ECA0101CT	0805
C60	Capacitor	10n	ECA0103XS	10% 50V X7R Mono	ECA0103XS	1206
C61	Capacitor	1.2n	ECA0122CS	5% 50V COG Mono	ECA0122CS	1206

C62	Capacitor	27p	ECA0270CT	5% 100V COG Mono	ECA0270CT	0805
C63	Capacitor	1.5p	ECA0015CT	5% 100V COG Mono	ECA0015CT	0805
C64	Capacitor	27p	ECA0270CT	5% 100V COG Mono	ECA0270CT	0805
C65	Capacitor	2.7n	ECA0272XS	10% 50V X7R Mono	ECA0272XS	1206
C66	Capacitor	10n	ECA0103XS	10% 50V X7R Mono	ECA0103XS	1206
C67	Capacitor	1.2n	ECA0122CS	5% 50V COG Mono	ECA0122CS	1206
C68	Capacitor	27p	ECA0270CT	5% 100V COG Mono	ECA0270CT	0805
C69	Capacitor	47p	ECA0470CT	5% 100V COG Mono	ECA0470CT	0805
C70	Capacitor	100n	ECA0104XS	10% 50V X7R Mono	ECA0104XS	1206
C71	Capacitor	220u	ECA0227TS	20% 6 Volts	ECA0227TS	SCEIAD
C72	Capacitor	470p	ECA0471CT	5% 100V COG Mono	ECA0471CT	0805
C73	Capacitor	27p	ECA0270CT	5% 100V COG Mono	ECA0270CT	0805
C74	Capacitor	27p	ECA0270CT	5% 100V COG Mono	ECA0270CT	0805
C75	Capacitor	3.3p	ECA0033CT	5% 100V COG Mono	ECA0033CT	0805
C76	Capacitor	2.2p	ECA0022CT	5% 100V COG Mono	ECA0022CT	0805
C77	Capacitor	1.2n	ECA0122CS	5% 50V COG Mono	ECA0122CS	1206
C78	Capacitor	10n	ECA0103XS	10% 50V X7R Mono	ECA0103XS	1206
C79	Capacitor	10n	ECA0103XS	10% 50V X7R Mono	ECA0103XS	1206
C80	Capacitor	1.5p	ECA0015CT	5% 100V COG Mono	ECA0015CT	0805
C81	Capacitor	330p	ECA0331CT	5% 100V COG Mono	ECA0331CT	0805
C82	Capacitor	10n	ECA0103XS	10% 50V X7R Mono	ECA0103XS	1206
C83	Capacitor	27p	ECA0270CT	5% 100V COG Mono	ECA0270CT	0805
C84	Capacitor	10n	ECA0103XS	10% 50V X7R Mono	ECA0103XS	1206
C85	Capacitor	3.3p	ECA0033CT	5% 100V COG Mono	ECA0033CT	0805
C86	Capacitor	27p	ECA0270CT	5% 100V COG Mono	ECA0270CT	0805
C87	Capacitor	1.2n	ECA0122CS	5% 50V COG Mono	ECA0122CS	1206
C88	Capacitor	100n	ECA0104XS	10% 50V X7R Mono	ECA0104XS	1206
C89	Capacitor	10p	ECA0100CT	5% 100V COG Mono	ECA0100CT	0805
C90	Capacitor	10p	ECA0100CT	5% 100V COG Mono	ECA0100CT	0805
C91	Capacitor	2.2p	ECA0022CT	5% 100V COG Mono	ECA0022CT	0805
C92	Capacitor	27p	ECA0270CT	5% 100V COG Mono	ECA0270CT	0805
C93	Capacitor	27p	ECA0270CT	5% 100V COG Mono	ECA0270CT	0805
C94	Capacitor	2.2p	ECA0022CT	5% 100V COG Mono	ECA0022CT	0805
C95	Capacitor	100n	ECA0104XS	10% 50V X7R Mono	ECA0104XS	1206
C96	Capacitor	100n	ECA0104XS	10% 50V X7R Mono	ECA0104XS	1206
C97	Capacitor	100n	ECA0104XS	10% 50V X7R Mono	ECA0104XS	1206
C98	Capacitor	100p	ECA0101CT	5% 100V COG Mono	ECA0101CT	0805
C99	Capacitor	TBD	ECATBDCT	5% 100V COG Mono	ECATBDCT	0805
C100	Capacitor	1.2n	ECA0122CS	5% 50V COG Mono	ECA0122CS	1206
C101	Capacitor	1.2n	ECA0122CS	5% 50V COG Mono	ECA0122CS	1206
C102	Capacitor	6.8n	ECA0682XS	10% 50V X7R Mono	ECA0682XS	1206
C103	Capacitor	470p	ECA0471CT	5% 100V COG Mono	ECA0471CT	0805
C104	Capacitor	1.2n	ECA0122CS	5% 50V COG Mono	ECA0122CS	1206
C105	Capacitor	1.2n	ECA0122CS	5% 50V COG Mono	ECA0122CS	1206
C106	Capacitor	100n	ECA0104XS	10% 50V X7R Mono	ECA0104XS	1206
C107	Capacitor	100n	ECA0104XS	10% 50V X7R Mono	ECA0104XS	1206
C108	Capacitor	330p	ECA0331CT	5% 100V COG Mono	ECA0331CT	0805
C109	Capacitor	100n	ECA0104XS	10% 50V X7R Mono	ECA0104XS	1206
C110	Capacitor	100p	ECA0101CT	5% 100V COG Mono	ECA0101CT	0805
C111	Capacitor	6.8p	ECA0068CT	5% 100V COG Mono	ECA0068CT	0805
C112	Capacitor	68p	ECA0680CT	5% 100V COG Mono	ECA0680CT	0805
C113	Capacitor	470p	ECA0471CT	5% 100V COG Mono	ECA0471CT	0805
C114	Capacitor	100n	ECA0104XS	10% 50V X7R Mono	ECA0104XS	1206
C115	Capacitor	6.8u	ECA0685TS	20% 6.3V	ECA0685TS	1206+
C116	Capacitor	100n	ECA0104XS	10% 50V X7R Mono	ECA0104XS	1206
C117	Capacitor	47p	ECA0470CT	5% 100V COG Mono	ECA0470CT	0805
C118	Capacitor	330p	ECA0331CT	5% 100V COG Mono	ECA0331CT	0805
C119	Capacitor	100n	ECA0104XS	10% 50V X7R Mono	ECA0104XS	1206
C120	Capacitor	100n	ECA0104XS	10% 50V X7R Mono	ECA0104XS	1206
C121	Capacitor	100n	ECA0104XS	10% 50V X7R Mono	ECA0104XS	1206
C122	Capacitor	100n	ECA0104XS	10% 50V X7R Mono	ECA0104XS	1206
C123	Capacitor	100n	ECA0104XS	10% 50V X7R Mono	ECA0104XS	1206
C124	Capacitor	100n	ECA0104XS	10% 50V X7R Mono	ECA0104XS	1206
C125	Capacitor	27p	ECA0270CT	5% 100V COG Mono	ECA0270CT	0805
C126	Capacitor	100n	ECA0104XS	10% 50V X7R Mono	ECA0104XS	1206

C127	Capacitor	1.5p	ECA0015CT	5% 100V COG Mono	ECA0015CT	0805
C128	Capacitor	39p	ECA0390CT	5% 100V COG Mono	ECA0390CT	0805
C129	Capacitor	1u	ECA0105XS	10% 16V X5R Mono	ECA0105XS	1206
C130	Capacitor	1u	ECA0105XS	10% 16V X5R Mono	ECA0105XS	1206
C131	Capacitor	470p	ECA0471CT	5% 100V COG Mono	ECA0471CT	0805
C132	Capacitor	10n	ECA0103XS	10% 50V X7R Mono	ECA0103XS	1206
C133	Capacitor	1.2n	ECA0122CS	5% 50V COG Mono	ECA0122CS	1206
C134	Capacitor	100n	ECA0104XS	10% 50V X7R Mono	ECA0104XS	1206
C135	Capacitor	100n	ECA0104XS	10% 50V X7R Mono	ECA0104XS	1206
C136	Capacitor	100n	ECA0104XS	10% 50V X7R Mono	ECA0104XS	1206
C137	Capacitor	6.8u	ECA0685TS	20% 6.3V	ECA0685TS	1206+
C138	Capacitor	100n	ECA0104XS	10% 50V X7R Mono	ECA0104XS	1206
C139	Capacitor	1.2n	ECA0122CS	5% 50V COG Mono	ECA0122CS	1206
C140	Capacitor	1u	ECA0105XS	10% 16V X5R Mono	ECA0105XS	1206
C141	Capacitor	100n	ECA0104XS	10% 50V X7R Mono	ECA0104XS	1206
C142	Capacitor	100p	ECA0101CT	5% 100V COG Mono	ECA0101CT	0805
C144	Capacitor	TBD	ECATBDXS	10% 50V X7R Mono	ECATBDXS	1206
C199	Capacitor	10n	ECA0103XS	10% 50V X7R Mono	ECA0103XS	1206
D1	Diode	MMBD352L	EDI0352HS	Hot Carrier (Schottky)	EDI0352HS	SOT23
D2	Diode	MMBV3401	EDI3401SS	PIN	EDI3401SS	SOT23D
D3	Diode	MMBV3401	EDI3401SS	PIN	EDI3401SS	SOT23D
D4	LED	7011X1/5	EOP7011RG	Red / Green LED	EOP7011RG	SLED7011
D5	LED	7011X1/5	EOP7011RG	Red / Green LED	EOP7011RG	SLED7011
D6	Diode	1213-004	EDI1213VS	Varicap diode	EDI1213VS	SOT23
D7	LED	7011X1/5	EOP7011RG	Red / Green LED	EOP7011RG	SLED7011
D8	Diode	1299-004	EDI4199VS	Varicap diode	EDI4199VS	SOT23
F1	Filter SAW	900 MHz	EFI0900SS	SAW Filter	EFI0900SS	SAW
J1	Connector	SMA	ECN2002FR	End of PCB Female	ECN2002FR	SMAPC90
J2	Connector	10 Pin	ECN1010ML	.025 Posts w/Locking Ramp	ECN1010ML	ECN1010ML
L1	Inductor	1u	EIN0102FS	2.5 MHz, Q=30	EIN0102FS	1209
L2	Inductor	18.5n	EIN0180FS	Air Core SMD	EIN0180FS	SLA18.5
L3	Inductor	18.5n	EIN0180FS	Air Core SMD	EIN0180FS	SLA18.5
L4	Inductor	4.5 Turns	EIN1504LI	Coil Craft 150 Series	EIN1504LI	L150
L5	Inductor	4.5 Turns	EIN1504LI	Coil Craft 150 Series	EIN1504LI	L150
L6	Inductor	18.5n	EIN0180FS	Air Core SMD	EIN0180FS	SLA18.5
L7	Inductor	18n	EIN0180FT	NL Series	EIN0180FT	1210
L8	Inductor	4.5 Turns	EIN1504LI	Coil Craft 150 Series	EIN1504LI	L150
L9	Inductor	18n	EIN0180FT	NL Series	EIN0180FT	1210
L10	Inductor	1u	EIN0102FS	2.5 MHz, Q=30	EIN0102FS	1209
L11	Ferrite	25 Ohms @ 100MHz	EFI0250FS	Ferrite	EFI0250FS	1206
L12	Inductor	330n	EIN0331FS	2.5 Mhz Q=30	EIN0331FS	1209
L13	Inductor	100n	EIN0101FS		EIN0101FS	1210
L14	Ferrite	25 Ohms @ 100MHz	EFI0250FS	Ferrite	EFI0250FS	1206
L15	Inductor	330u	EIN0334FS	796KHz Q=50	EIN0334FS	1812IN
L16	Ferrite	25 Ohms @ 100MHz	EFI0250FS	Ferrite	EFI0250FS	1206
L17	Inductor	27u	EIN0273FS	2.5 MHz, Q=30	EIN0273FS	1209
L18	Inductor	27u	EIN0273FS	2.5 MHz, Q=30	EIN0273FS	1209
L19	Ferrite	25 Ohms @ 100MHz	EFI0250FS	Ferrite	EFI0250FS	1206
L20	Inductor	1u	EIN0102FS	2.5 MHz, Q=30	EIN0102FS	1206
L21	Ferrite	25 Ohms @ 100MHz	EFI0250FS	Ferrite	EFI0250FS	1206
L22	Inductor	220u	EIN0224FS	800 KHz, Q=18	EIN0224FS	1209
M6	Shield	2.0" x 2.3"	MST0022AA	CRS .015" Thick	MST0022AA	MST0022AA
M17	LED Light Pipe		EOP7510LP	Right Angle Adaptor	EOP7510LP	EOP7510LP
M48	LED Light Pipe		EOP7510LP	Right Angle Adaptor	EOP7510LP	EOP7510LP
M49	LED Light Pipe		EOP7510LP	Right Angle Adaptor	EOP7510LP	EOP7510LP
Q1	Transistor	MRF9242	EXS9242NS	MOSFET Amp	EXS9242NS	PLD1
Q2	Transistor	MMBF4416	EXS4416JS	N JFET Low Noise	EXS4416JS	SOT23
Q3	Transistor	MMBT3640	EXS3640PS	PNP High Speed Switch	EXS3640PS	SOT23
Q5	Transistor	MMBR571	EXS0571NS	NPN RF	EXS0571NS	SOT23
Q6	Transistor	CF739	EXS0739MS	Dual Gate N-MOSFET	EXS0739MS	SOT143
Q7	Transistor	CF739	EXS0739MS	Dual Gate N-MOSFET	EXS0739MS	SOT143
Q8	Transistor	MMBR901L	EXS0901NS	NPN RF	EXS0901NS	SOT23

Q9	Transistor	MMBR901L	EXS0901NS	NPN RF	EXS0901NS	SOT23
Q10	Transistor	MMBR901L	EXS0901NS	NPN RF	EXS0901NS	SOT23
Q11	Transistor	MMBR571	EXS0571NS	NPN RF	EXS0571NS	SOT23
Q12	Transistor	MMBT4403	EXS4403PS	PNP Switching	EXS4403PS	SOT23
Q13	Transistor	MMBT4403	EXS4403PS	PNP Switching	EXS4403PS	SOT23
Q14	Transistor	MJD117	EXS0117PS	PNP Darlington	EXS0117PS	DPAK
Q15	Transistor	MMBT3904	EXS3904NS	NPN General Purpose	EXS3904NS	SOT23
Q16	Transistor	MMBT3904	EXS3904NS	NPN General Purpose	EXS3904NS	SOT23
Q18	Transistor	MMBT3906	EXS3906PS	PNP General Purpose	EXS3906PS	SOT23
Q19	Transistor	MMBT3904	EXS3904NS	NPN General Purpose	EXS3904NS	SOT23
Q20	Transistor	MMBT3904	EXS3904NS	NPN General Purpose	EXS3904NS	SOT23
Q21	Transistor	MMBT3904	EXS3904NS	NPN General Purpose	EXS3904NS	SOT23
R1	Resistor	1K	ERE0102FT	5% 1/10W	ERE0102FT	0805
R2	Resistor	10K	ERE0103FT	5% 1/10W	ERE0103FT	0805
R3	Resistor	47	ERE0470FT	5% 1/10W	ERE0470FT	0805
R4	Resistor	1K	ERE0102FT	5% 1/10W	ERE0102FT	0805
R5	Resistor	1K	ERE0102FT	5% 1/10W	ERE0102FT	0805
R6	Resistor	10K	ERE0103FT	5% 1/10W	ERE0103FT	0805
R7	Resistor	33K	ERE0333FT	5% 1/10W	ERE0333FT	0805
R8	Resistor	470	ERE0471FT	5% 1/10W	ERE0471FT	0805
R9	Resistor	220	ERE0221FT	5% 1/10W	ERE0221FT	0805
R10	Resistor	10K	ERE0103FT	5% 1/10W	ERE0103FT	0805
R11	Resistor	22K	ERE0223FT	5% 1/10W	ERE0223FT	0805
R12	Resistor	10K	ERE0103FT	5% 1/10W	ERE0103FT	0805
R13	Resistor	100	ERE0101FT	5% 1/10W	ERE0101FT	0805
R14	Resistor	10	ERE0100FT	5% 1/10W	ERE0100FT	0805
R15	Resistor	10K	ERE0103FT	5% 1/10W	ERE0103FT	0805
R16	Resistor	10	ERE0100FT	5% 1/10W	ERE0100FT	0805
R17	Resistor	2.2K	ERE0222FT	5% 1/10W	ERE0222FT	0805
R18	Resistor	47	ERE0470FT	5% 1/10W	ERE0470FT	0805
R19	Resistor	33K	ERE0333FT	5% 1/10W	ERE0333FT	0805
R20	Resistor	47	ERE0470FT	5% 1/10W	ERE0470FT	0805
R21	Resistor	4.7K	ERE0472FT	5% 1/10W	ERE0472FT	0805
R22	Resistor	33K	ERE0333FT	5% 1/10W	ERE0333FT	0805
R23	Resistor	10K	ERE0103FT	5% 1/10W	ERE0103FT	0805
R24	Resistor	2.2K	ERE0222FT	5% 1/10W	ERE0222FT	0805
R25	Resistor	220	ERE0221FT	5% 1/10W	ERE0221FT	0805
R26	Resistor	2.2K	ERE0222FT	5% 1/10W	ERE0222FT	0805
R27	Resistor	10	ERE0100FT	5% 1/10W	ERE0100FT	0805
R28	Resistor	10	ERE0100FT	5% 1/10W	ERE0100FT	0805
R29	Resistor	10	ERE0100FT	5% 1/10W	ERE0100FT	0805
R30	Resistor	2.2K	ERE0222FT	5% 1/10W	ERE0222FT	0805
R31	Resistor	4.7K	ERE0472FT	5% 1/10W	ERE0472FT	0805
R32	Resistor	100	ERE0101FT	5% 1/10W	ERE0101FT	0805
R33	Resistor	47K	ERE0473FT	5% 1/10W	ERE0473FT	0805
R34	Resistor	470K	ERE0474FT	5% 1/10W	ERE0474FT	0805
R35	Resistor	10K	ERE0103FT	5% 1/10W	ERE0103FT	0805
R36	Resistor	33K	ERE0333FT	5% 1/10W	ERE0333FT	0805
R37	Resistor	2.2K	ERE0222FT	5% 1/10W	ERE0222FT	0805
R38	Resistor	330	ERE0331FT	5% 1/10W	ERE0331FT	0805
R39	Resistor	2.2K	ERE0222FT	5% 1/10W	ERE0222FT	0805
R40	Resistor	33K	ERE0333FT	5% 1/10W	ERE0333FT	0805
R41	Resistor	100	ERE0101FT	5% 1/10W	ERE0101FT	0805
R42	Resistor	470K	ERE0474FT	5% 1/10W	ERE0474FT	0805
R43	Resistor	2.2K	ERE0222FT	5% 1/10W	ERE0222FT	0805
R44	Resistor	4.7K	ERE0472FT	5% 1/10W	ERE0472FT	0805
R45	Resistor	10K	ERE0103FT	5% 1/10W	ERE0103FT	0805
R46	Resistor	10K	ERE0103FT	5% 1/10W	ERE0103FT	0805
R47	Resistor	1M	ERE0105FT	5% 1/10W	ERE0105FT	0805
R48	Resistor	470	ERE0471FT	5% 1/10W	ERE0471FT	0805
R49	Resistor	10K	ERE0103FT	5% 1/10W	ERE0103FT	0805
R50	Resistor	4.7K	ERE0472FT	5% 1/10W	ERE0472FT	0805
R51	Resistor	220	ERE0221FT	5% 1/10W	ERE0221FT	0805
R52	Resistor	2.2M	ERE0225FT	5% 1/10W	ERE0225FT	0805
R53	Resistor	10K	ERE0103FT	5% 1/10W	ERE0103FT	0805

R54	Resistor	470K	ERE0474FT	5%	1/10W	ERE0474FT	0805
R55	Resistor	10K	ERE0103FT	5%	1/10W	ERE0103FT	0805
R56	Resistor	47K	ERE0473FT	5%	1/10W	ERE0473FT	0805
R57	Resistor	2.2K	ERE0222FT	5%	1/10W	ERE0222FT	0805
R58	Resistor	100K	ERE0104FT	5%	1/10W	ERE0104FT	0805
R59	Resistor	4.7K	ERE0472FT	5%	1/10W	ERE0472FT	0805
R60	Resistor	220	ERE0221FT	5%	1/10W	ERE0221FT	0805
R62	Resistor	47	ERE0470FT	5%	1/10W	ERE0470FT	0805
R63	Resistor	1K	ERE0102FT	5%	1/10W	ERE0102FT	0805
R64	Resistor	22K	ERE0223FT	5%	1/10W	ERE0223FT	0805
R65	Resistor	1M	ERE0105FT	5%	1/10W	ERE0105FT	0805
R66	Resistor	4.7K	ERE0472FT	5%	1/10W	ERE0472FT	0805
R67	Resistor	100K	ERE0104FT	5%	1/10W	ERE0104FT	0805
R68	Resistor	4.7K	ERE0472FT	5%	1/10W	ERE0472FT	0805
R69	Resistor	10K	ERE0103FT	5%	1/10W	ERE0103FT	0805
R70	Resistor	4.7K	ERE0472FT	5%	1/10W	ERE0472FT	0805
R71	Resistor	4.7K	ERE0472FT	5%	1/10W	ERE0472FT	0805
R72	Resistor	TBD	ERETBDFT	5%	1/10W	ERETBDFT	0805
R73	Resistor	1K	ERE0102FT	5%	1/10W	ERE0102FT	0805
R74	Resistor	470	ERE0471FT	5%	1/10W	ERE0471FT	0805
R75	Resistor	47K	ERE0473FT	5%	1/10W	ERE0473FT	0805
R76	Resistor	4.7K	ERE0472FT	5%	1/10W	ERE0472FT	0805
R77	Resistor	10K	ERE0103FT	5%	1/10W	ERE0103FT	0805
R78	Resistor	470	ERE0471FT	5%	1/10W	ERE0471FT	0805
R79	Resistor	2.2M	ERE0225FT	5%	1/10W	ERE0225FT	0805
R80	Resistor	220	ERE0221FT	5%	1/10W	ERE0221FT	0805
R81	Resistor	4.7K	ERE0472FT	5%	1/10W	ERE0472FT	0805
R82	Resistor	4.7K	ERE0472FT	5%	1/10W	ERE0472FT	0805
R83	Resistor	220K	ERE0224FT	5%	1/10W	ERE0224FT	0805
R84	Resistor	10K	ERE0103FT	5%	1/10W	ERE0103FT	0805
R85	Resistor	10K	ERE0103FT	5%	1/10W	ERE0103FT	0805
R86	Resistor	47K	ERE0473FT	5%	1/10W	ERE0473FT	0805
R87	Resistor	10K	ERE0103FT	5%	1/10W	ERE0103FT	0805
R88	Resistor	4.7K	ERE0472FT	5%	1/10W	ERE0472FT	0805
R89	Resistor	10K	ERE0103FT	5%	1/10W	ERE0103FT	0805
R90	Resistor	10K	ERE0103FT	5%	1/10W	ERE0103FT	0805
R91	Resistor	22K	ERE0223FT	5%	1/10W	ERE0223FT	0805
R92	Resistor	2.2K	ERE0222FT	5%	1/10W	ERE0222FT	0805
R93	Resistor	10K	ERE0103FT	5%	1/10W	ERE0103FT	0805
R94	Resistor	22K	ERE0223FT	5%	1/10W	ERE0223FT	0805
R95	Resistor	10K	ERE0103FT	5%	1/10W	ERE0103FT	0805
R96	Resistor	4.7K	ERE0472FT	5%	1/10W	ERE0472FT	0805
R97	Resistor	10K	ERE0103FT	5%	1/10W	ERE0103FT	0805
R98	Resistor	10K	ERE0103FT	5%	1/10W	ERE0103FT	0805
R99	Resistor	10K	ERE0103FT	5%	1/10W	ERE0103FT	0805
R100	Resistor	22K	ERE0223FT	5%	1/10W	ERE0223FT	0805
R101	Resistor	4.7K	ERE0472FT	5%	1/10W	ERE0472FT	0805
R102	Resistor	10K	ERE0103FT	5%	1/10W	ERE0103FT	0805
R103	Resistor	1K	ERE0102FT	5%	1/10W	ERE0102FT	0805
R104	Resistor	10K	ERE0103FT	5%	1/10W	ERE0103FT	0805
R105	Resistor	1K	ERE0102FT	5%	1/10W	ERE0102FT	0805
R106	Resistor	10K	ERE0103FT	5%	1/10W	ERE0103FT	0805
R107	Resistor	10K	ERE0103FT	5%	1/10W	ERE0103FT	0805
R108	Resistor	100K	ERE0104FT	5%	1/10W	ERE0104FT	0805
R109	Resistor	100K	ERE0104FT	5%	1/10W	ERE0104FT	0805
R110	Resistor	4.7K	ERE0472FT	5%	1/10W	ERE0472FT	0805
R111	Resistor	100K	ERE0104FT	5%	1/10W	ERE0104FT	0805
R112	Resistor	10K	ERE0103FT	5%	1/10W	ERE0103FT	0805
R113	Resistor	4.7K	ERE0472FT	5%	1/10W	ERE0472FT	0805
R114	Resistor	10K	ERE0103FT	5%	1/10W	ERE0103FT	0805
R115	Resistor	470	ERE0471FT	5%	1/10W	ERE0471FT	0805
R116	Resistor	10K	ERE0103FT	5%	1/10W	ERE0103FT	0805
R117	Resistor	10K	ERE0103FT	5%	1/10W	ERE0103FT	0805
R118	Resistor	10K	ERE0103FT	5%	1/10W	ERE0103FT	0805
R119	Resistor	470	ERE0471FT	5%	1/10W	ERE0471FT	0805

R120	Resistor	470	ERE0471FT	5% 1/10W	ERE0471FT	0805
R121	Resistor	10K	ERE0103FT	5% 1/10W	ERE0103FT	0805
R122	Resistor	1M	ERE0105FT	5% 1/10W	ERE0105FT	0805
R123	Resistor	1M	ERE0105FT	5% 1/10W	ERE0105FT	0805
R124	Resistor	1M	ERE0105FT	5% 1/10W	ERE0105FT	0805
R125	Resistor	2.2M	ERE0225FT	5% 1/10W	ERE0225FT	0805
R126	Resistor	220K	ERE0224FT	5% 1/10W	ERE0224FT	0805
R199	Resistor	22K	ERE0223FT	5% 1/10W	ERE0223FT	0805
TH1	Thermistor	25K@25C	ETH0253TS	-4.4%/DegC	ETH0253TS	0805
TH2	Thermistor	25K@25C	ETH0253TS	-4.4%/DegC	ETH0253TS	0805
TP1	Test Point		STP	PCB Via	STP	STP
TP2	Test Point		TPS	Via on PCB	TPS	TPS
TP3	Test Point		TPS	Via on PCB	TPS	TPS
TP4	Test Point		STP	PCB Via	STP	STP
TP5	Test Point		STP	PCB Via	STP	STP
TP6	Test Point		STP	PCB Via	STP	STP
TP7	Test Point		STP	PCB Via	STP	STP
TP8	Test Point		STP	PCB Via	STP	STP
TP9	Test Point		STP	PCB Via	STP	STP
TP10	Test Point		STP	PCB Via	STP	STP
TP11	Test Point		STP	PCB Via	STP	STP
TP12	Test Point		STP	PCB Via	STP	STP
TP13	Test Point		STP	PCB Via	STP	STP
TP14	Test Point		STP	PCB Via	STP	STP
TP15	Test Point		STP	PCB Via	STP	STP
U1	IC	NE615D	EIC0615CS	FM IF System	EIC0615CS	DIP20\SOL
U2	IC	78M05	EIC7805MS	5V 4% Regulator	EIC7805MS	DPAKW
U3	IC	MC12022A	EIC0022CS	Prescaler	EIC0022CS	DIP8\SO
U4	IC	MC34064D	EIC4064LD	Undervoltage Sensor	EIC4064LD	DIP8\SO
U5	IC	74HC02	EIC0002HS	Quad Nor Gate	EIC0002HS	DIP14\SO
U6	IC	LM393	EIC0393LS	Dual Comparator	EIC0393LS	DIP8\SO
U7	IC	TLC2272	EIC2272LS	Dual Op-Amp Rail to Rail	EIC2272LS	DIP8\SO
U8	IC	TLC2272	EIC2272LS	Dual Op-Amp Rail to Rail	EIC2272LS	DIP8\SO
U9	IC	HC4053	EIC7453HS	Triple Analog Mux	EIC7453HS	DIP16\SO
U10	IC	TLC2272	EIC2272LS	Dual Op-Amp Rail to Rail	EIC2272LS	DIP8\SO
U11	IC	74HC74	EIC0074HS	Dual D Flip Flop	EIC0074HS	DIP14\SO
U12	IC	MAX522	EIC0522LS	Serial DAC	EIC0522LS	DIP8\SO
U13	IC	74HC4040	EIC4040HS	12 Bit Counter	EIC4040HS	DIP16\SO
U14	IC	6406C	EIC6406MS	32K x 8 SRAM	EIC6406MS	DIP28\SOJ
U15	IC	74HC597	EIC0597HS	Latched Shift Register	EIC0597HS	DIP16\SO
U16	IC	MC68HC11K1	EIC0011US	uProcessor	EIC0011US	PLCC84S PLCC84
U17	IC	AM29F010	EIC2910CS	128 x 8 Flash Memory	EIC2910CS	PLCC32
U18	IC	74HC573	EIC0573HT	Octal Latch	EIC0573HT	TSSOP20
U19	IC	4050	EIC4050CS	Hex Buffer	EIC4050CS	DIP16\SO
U20	IC	74HC02	EIC0002HS	Quad Nor Gate	EIC0002HS	DIP14\SO
U21	IC	TLC2272	EIC2272LS	Dual Op-Amp Rail to Rail	EIC2272LS	DIP8\SO
U22	IC	145158-2	EIC5158CS	PLL Synthesizer	EIC5158CS	DIP16\SOL
U23	IC	MAX213	EIC0213SS	8L RS232 Buffer	EIC0213SS	75LBC187
Y1	Crystal	14.7456MHz	EXT1474SX	20pF	EXT1474SX	MA506
Y2	Resonator	1025 MHz	EXT1027RS	Ceramic Resonator	EXT1027RS	RESONATOR