



ZLP32300100KIT

**Crimzon RC
Development Platform**

Z i L O G
Crimzon™

PUG002002-0704

Product User Guide

Overview

Thank you for purchasing the ZiLOG ZLP32300100KIT Crimzon™ RC Development Platform. The Crimzon™ RC Development Platform (Figure 1) provides a universal remote control development platform for ZiLOG's ZLP32300 family of IR microcontrollers. Powered by two 1.5V AAA batteries, the kit is self-contained, provides a prototyping area, and uses ZiLOG's Universal IR database.

The ZLP32300 IR microcontroller provides two counter/timers with an enhanced counter/timer architecture that automates pulse generation and reception. It also includes 237 Bytes of general-purpose RAM that can be used as data RAM or executable RAM. Its register-based RAM includes four I/O port registers, 16 control and status registers, and 237 general-purpose registers. An extended register file provides two additional register groups.

The sample code provided on the kit's ZDS II CD-ROM shows how to set up the development platform as a universal remote control. Refer to the *ZiLOG ZLP32300100KIT Crimzon™ RC Development Platform Quick Start Guide*, QS0036, for details on setting up the development platform and installing ZDS II.

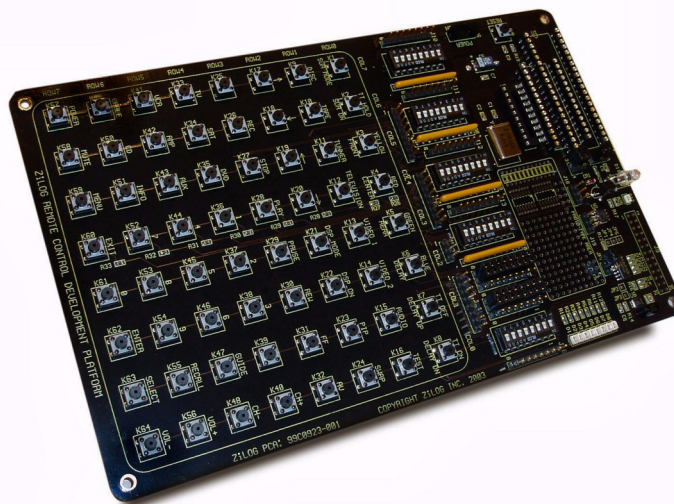


Figure 1. The ZiLOG Crimzon™ RC Development Platform

Devices Supported

Supported ZLP32300 devices are listed in Table 1.

Table 1. Supported ZLP32300 Devices

| Package | Device |
|------------|---------------|
| 40-pin DIP | ZLP32300P40xx |
| 28-pin DIP | ZLP32300P28xx |
| 20-pin DIP | ZLP32300P20xx |

Operation

Use the following procedures to enable a universal remote control:

1. Changing a device (device can be TV, VCR, CABLE, SAT and so forth)
Press and release any device key (for example, a TV, VCR, CABLE or AUX1).
2. Changing a code (CODE is the three-digit number for the code selected)
 - a. Press and hold the device key for three seconds. The LED stays ON for three seconds and then turns off.
 - b. Release the device key. The LED is ON.
 - c. Press and release the three digit keys one by one. The LED stays OFF when pressing a key and ON when the key is released.
 - d. The LED turns OFF if the three-digit code is accepted. If the number is rejected or is invalid, the LED blinks quickly eight times. Try reentering the code number.

A list of IR device codes is available in “Codesets” on page 6.

Key Matrix

The Crimzon™ RC Development Platform key matrix has eight rows and columns with two alternate configurations. The default configuration uses the eight port 2 (input) pins as column signals for key press detection and the eight port 0 (output) pins as row signals for the key scanning signal. This configuration provides 64 keys.

The key matrix is shown in Table 2. See Figures 1 and 2 for key locations.

Table 2. ZiLOG Crimzon™ RC Development Platform Key Matrix

| | | | | | | | |
|-----------------|-------------------------|-----------------------|-----------------------|---------------------|---------------------|--------------------------|-------------------------|
| K1 SUR MODE | K2 TT HOLD SUR ON | K3 YELLOW FRONT | K4 RED CENTER | K5 GREEN REAR | K6 BLUE DELAY | K7 TT OFF DELAY UP | K8 TT ON DELAY DN |
| K9 DISC | K10 TAPE | K11 TUNER | K12 TELEVISION | K13 VIDEO 1 | K14 VIDEO 2 | K15 AUDIO | K16 TEST |
| K17 UP ARROW | K18 DOWN ARROW | K19 LEFT ARROW | K20 RIGHT ARROW | K21 DSP_MODE | K22 DSP_ON | K23 PIP | K24 SWAP |
| K25 | K26 REC | K27 STOP | K28 PLAY | K29 PAUSE | K30 REW | K31 FF | K32 AV |
| K33 TV | K34 SAT | K35 DVD | K36 1 | K37 2 | K38 3 | K39 | K30 CH+ |
| K41 VCR | K42 AMP | K43 AUX | K44 4 | K45 5 | K46 6 | K47 GUIDE | K48 CH- |
| K49 CABLE | K50 CD | K51 INFO | K52 7 | K53 8 | K54 9 | K55 RECALL | K56 VOL+ |
| K57 POWER | K58 MUTE | K59 MENU | K60 EXIT | K61 0 | K62 ENTER | K63 SELECT | K64 VOL- |

Switches

There are five eight-position DIP switches on the development platform. Switch settings are described in Table 3. Refer to the schematic at the end of this document for specific information on ports and port settings.

Table 3. ZiLOG Crimzon™ RC Development Platform DIP Switch Settings

| Switch | Description |
|--------|--|
| SW1 | Controls the connection of eight LEDs to port 0 when it is configured as output. |
| SW2 | Controls the pull-up resistors for Port 0. |
| SW3 | Controls the pull-up resistors for Port 1. |
| SW4 | Controls the pull-up resistors for Port 2. |
| SW5 | Controls the pull-up resistors for Port 3. |

Switch SW8 is a pushbutton device reset switch used only on the 40-pin package. Switch SW6 is a Power On/Off slide switch.

Jumpers

Jumpers are set as follows:

- Jumper U4: 1-2 Off, 3-4 Off
 - Serial EEPROM is not connected
- Jumper JP7: 1-2 Off
 - Infrared receiver is not connected
- Jumper J8: 2 and 3 IN
 - IR LED is driven by resistor connection.
 - If 1 and 2 are IN, the IR LED is driven by a capacitor coupling.
- Jumpers J2 and J3: All In
 - Port 2 is connected to key matrix columns. P20 through P27 connect to Columns 0 through 7, respectively.
- Jumpers J5 and J6: All In
 - Port 0 is connected to key matrix rows. P00 through P07 connect to Rows 0 through 7, respectively.

When using the 20-pin ZLP32300P20xx, setting jumpers J3 and J4 IN and J6 and J7 IN provide the maximum 7x6 key matrix for the 20-pin configuration with Stop Mode Recovery supported.

Learning Circuit

The learning circuit on the LP32300 IR development platform consists of four major components (refer to the schematic starting on page 18):

- Photo detector D10
- Operational amplifier U6A
- Low-pass filter U6B
- Schmidt trigger U7A

The photo current of photo detector D10 is summed with the feedback current of operational amplifier U6A. The output signal is brought up to the TTL-compatible level by low-pass filter U6B, and the resulting signal is delivered to the IR_IN (P31) of U1 and U2. The circuit has been tested for $1.8V = V_{bat} = 3.6V$, and for frequencies $40KHz = F = 2MHz$. The learning circuit is available only for 28- and 40-pin parts.

Board Layout

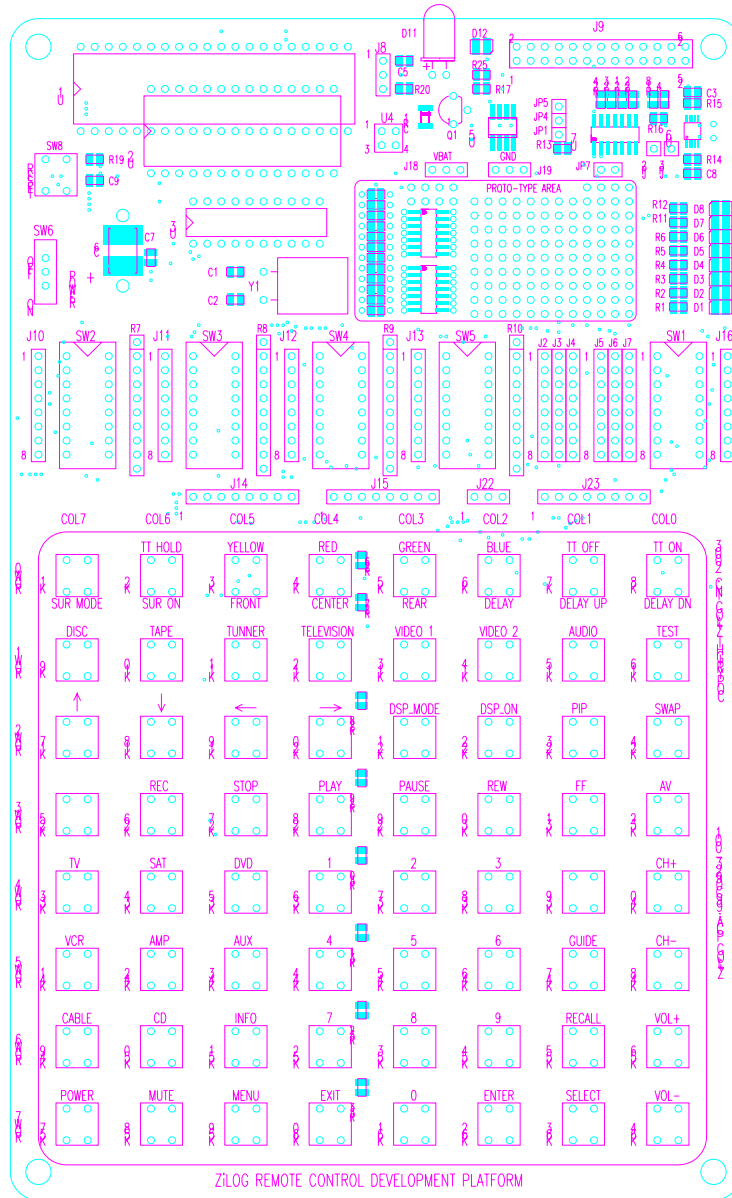


Figure 2. ZiLOG Crimzon™ RC Development Platform Board Layout

Codesets

Table 4. Television Brands

| Brand | Zilog Code Numbers | | | | | | | | | | | | | | | |
|---------------|---------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Admiral | 116 | 234 | | | | | | | | | | | | | | |
| Adventura | 235 | | | | | | | | | | | | | | | |
| Aiko | 126 | | | | | | | | | | | | | | | |
| Akai | 63 | 91 | 117 | | | | | | | | | | | | | |
| Alba | 33 | | | | | | | | | | | | | | | |
| Alleron | 151 | | | | | | | | | | | | | | | |
| A-Mark | 29 | | | | | | | | | | | | | | | |
| Amstrad | 90 | | | | | | | | | | | | | | | |
| Amtron | 145 | | | | | | | | | | | | | | | |
| Anam | 28 | 29 | 83 | 105 | 145 | | | | | | | | | | | |
| Anam National | 248 | 249 | 269 | | | | | | | | | | | | | |
| AOC | 14 | 29 | 99 | 108 | 109 | 118 | 119 | 120 | 251 | | | | | | | |
| Archer | 29 | | | | | | | | | | | | | | | |
| Audiovox | 29 | 145 | | | | | | | | | | | | | | |
| Bauer | 35 | | | | | | | | | | | | | | | |
| Belcor | 118 | | | | | | | | | | | | | | | |
| Bell & Howell | 116 | 183 | 230 | | | | | | | | | | | | | |
| Bradford | 145 | | | | | | | | | | | | | | | |
| Brockwood | 14 | 118 | | | | | | | | | | | | | | |
| Candle | 14 | 95 | 97 | 98 | 108 | 118 | 120 | 121 | 235 | | | | | | | |
| Capehart | 14 | | | | | | | | | | | | | | | |
| Celebrity | 117 | | | | | | | | | | | | | | | |
| Circuit City | 14 | | | | | | | | | | | | | | | |
| Citizen | 18 | 94 | 95 | 96 | 97 | 98 | 101 | 108 | 118 | 120 | 121 | 126 | 145 | 199 | 235 | 236 |
| Colortyme | 14 | 118 | 120 | 122 | 254 | | | | | | | | | | | |
| Concerto | 97 | 118 | 120 | | | | | | | | | | | | | |
| Contec | 49 | 83 | | | | | | | | | | | | | | |
| Contec/Cony | 123 | 124 | 145 | | | | | | | | | | | | | |
| Craig | 15 | 83 | 145 | | | | | | | | | | | | | |
| Crown | 94 | 145 | | | | | | | | | | | | | | |
| Curtis Mathes | 94 | 101 | 108 | 115 | 118 | 120 | 125 | 199 | 230 | | | | | | | |
| CXC | 83 | 145 | | | | | | | | | | | | | | |

Table 4. Television Brands

| Brand | Zilog Code Numbers | | | | | | | | | | | | | | | | |
|----------------|---------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Daewoo | 2 | 91 | 92 | 94 | 109 | 118 | 119 | 120 | 126 | 127 | 213 | 214 | 256 | | | | |
| Daytron | 14 | 118 | 120 | | | | | | | | | | | | | | |
| Dimensia | 115 | | | | | | | | | | | | | | | | |
| Dixi | 29 | 52 | 91 | | | | | | | | | | | | | | |
| Dumont | 14 | 118 | | | | | | | | | | | | | | | |
| Electroband | 117 | | | | | | | | | | | | | | | | |
| Electrohome | 3 | 5 | 94 | 118 | 120 | 128 | 129 | 130 | 269 | | | | | | | | |
| Elta | 91 | | | | | | | | | | | | | | | | |
| Emerson | 1 | 12 | 14 | 83 | 84 | 85 | 86 | 87 | 88 | 89 | 90 | 94 | 118 | 120 | 123 | 131 | 132 |
| | 133 | 134 | 135 | 136 | 137 | 138 | 139 | 140 | 141 | 142 | 143 | 144 | 145 | 146 | 147 | 148 | 149 |
| | 150 | 151 | 152 | 211 | 230 | 236 | 237 | 260 | 270 | | | | | | | | |
| Envision | 108 | 118 | 120 | | | | | | | | | | | | | | |
| Etron | 91 | | | | | | | | | | | | | | | | |
| Fisher | 50 | 82 | 153 | 154 | 155 | 230 | | | | | | | | | | | |
| Formenti | 35 | | | | | | | | | | | | | | | | |
| Fortress | 39 | | | | | | | | | | | | | | | | |
| Fujitsu | 15 | 89 | 151 | | | | | | | | | | | | | | |
| Funai | 15 | 83 | 89 | 145 | 151 | | | | | | | | | | | | |
| Futuretec | 145 | | | | | | | | | | | | | | | | |
| Futuretech | 15 | 83 | | | | | | | | | | | | | | | |
| GE | 14 | 20 | 80 | 81 | 84 | 102 | 105 | 106 | 111 | 115 | 118 | 120 | 130 | 156 | 187 | 231 | 232 |
| | 239 | 269 | | | | | | | | | | | | | | | |
| Genexxa | 33 | | | | | | | | | | | | | | | | |
| Gibraltar | 118 | | | | | | | | | | | | | | | | |
| Goldstar | 14 | 52 | 78 | 79 | 94 | 97 | 109 | 118 | 119 | 120 | 123 | 128 | 129 | 159 | 160 | 161 | 228 |
| Granada | 3 | 14 | | | | | | | | | | | | | | | |
| Grand | 14 | | | | | | | | | | | | | | | | |
| Grandiente | 3 | | | | | | | | | | | | | | | | |
| Grundy | 145 | 151 | | | | | | | | | | | | | | | |
| Hallmark | 14 | 118 | 120 | | | | | | | | | | | | | | |
| Harvard | 145 | | | | | | | | | | | | | | | | |
| Hinari | 89 | | | | | | | | | | | | | | | | |
| Hitachi | 3 | 10 | 24 | 71 | 72 | 73 | 74 | 75 | 76 | 77 | 94 | 97 | 118 | 120 | 123 | 124 | 163 |
| | 164 | 218 | 221 | 222 | 223 | 224 | 237 | 253 | | | | | | | | | |
| Hitachi Pay TV | 273 | | | | | | | | | | | | | | | | |
| IMA | 145 | | | | | | | | | | | | | | | | |

Table 4. Television Brands

| Brand | Zilog Code Numbers | | | | | | | | | | | | | | | | |
|----------------|---------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Infinity | 64 | 165 | | | | | | | | | | | | | | | |
| Janeil | 235 | | | | | | | | | | | | | | | | |
| JBL | 64 | 165 | | | | | | | | | | | | | | | |
| JC Penney | 46 | 81 | 94 | 101 | 108 | 109 | 111 | 115 | 118 | 119 | 120 | 121 | 130 | 156 | 161 | 166 | 167 |
| | 174 | 187 | 199 | 239 | 255 | | | | | | | | | | | | |
| JCB | 117 | | | | | | | | | | | | | | | | |
| Jensen | 70 | 118 | 120 | | | | | | | | | | | | | | |
| JVC | 66 | 67 | 68 | 69 | 123 | 124 | 163 | 168 | 169 | 229 | 240 | | | | | | |
| Kawasho | 65 | 117 | 118 | 120 | | | | | | | | | | | | | |
| Kenwood | 108 | 118 | 120 | 128 | 129 | | | | | | | | | | | | |
| Kloss | 36 | 98 | 235 | | | | | | | | | | | | | | |
| Kloss Novabeam | 170 | 171 | 241 | | | | | | | | | | | | | | |
| KTV | 83 | 84 | 85 | 94 | 145 | 172 | 236 | | | | | | | | | | |
| Lloyds | 14 | | | | | | | | | | | | | | | | |
| Loewe | 165 | | | | | | | | | | | | | | | | |
| Logik | 183 | 266 | | | | | | | | | | | | | | | |
| Luxman | 97 | 118 | 120 | | | | | | | | | | | | | | |
| LXI | 25 | 30 | 47 | 50 | 64 | 111 | 115 | 120 | 153 | 165 | 173 | 174 | 175 | 230 | 239 | | |
| Magnavox | 4 | 36 | 64 | 95 | 99 | 108 | 118 | 120 | 121 | 128 | 165 | 170 | 171 | 176 | 177 | 178 | 184 |
| | 188 | 215 | 216 | 217 | 241 | 267 | | | | | | | | | | | |
| Majestic | 183 | | | | | | | | | | | | | | | | |
| Marants | 165 | 52 | 64 | 108 | 118 | 120 | 165 | 179 | | | | | | | | | |
| Matsui | 91 | | | | | | | | | | | | | | | | |
| Megatron | 14 | 120 | | | | | | | | | | | | | | | |
| Memorex | 14 | 50 | 91 | 116 | 120 | 182 | 183 | 230 | 266 | | | | | | | | |
| MGA | 14 | 62 | 108 | 109 | 110 | 118 | 119 | 120 | 128 | 129 | 130 | 155 | 180 | 182 | | | |
| Midland | 239 | | | | | | | | | | | | | | | | |
| Minutz | 156 | | | | | | | | | | | | | | | | |
| Mitsubishi | 7 | 14 | 27 | 61 | 62 | 63 | 109 | 110 | 118 | 119 | 120 | 128 | 129 | 130 | 155 | 180 | 181 |
| | 182 | 212 | | | | | | | | | | | | | | | |
| Motorola | 234 | 269 | | | | | | | | | | | | | | | |
| MTC | 14 | 97 | 101 | 108 | 109 | 118 | 119 | 120 | 199 | | | | | | | | |
| Multitech | 145 | | | | | | | | | | | | | | | | |

Table 4. Television Brands

| Brand | Zilog Code Numbers | | | | | | | | | | | | | | | | |
|--------------|---------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| NAD | 14 | 30 | 112 | 120 | 173 | 174 | 243 | | | | | | | | | | |
| National | 13 | 105 | 13 | | | | | | | | | | | | | | |
| NEC | 23 | 97 | 100 | 107 | 108 | 109 | 118 | 119 | 120 | 129 | 185 | 254 | 269 | | | | |
| Nikkai | 33 | 34 | | | | | | | | | | | | | | | |
| Nikko | 14 | 120 | 126 | | | | | | | | | | | | | | |
| Normande | 0 | | | | | | | | | | | | | | | | |
| NTC | 126 | | | | | | | | | | | | | | | | |
| Onwa | 83 | 145 | | | | | | | | | | | | | | | |
| Optimus | 243 | | | | | | | | | | | | | | | | |
| Optonica | 37 | 39 | 192 | 234 | | | | | | | | | | | | | |
| Orion | 15 | 142 | 260 | | | | | | | | | | | | | | |
| Osaki | 34 | | | | | | | | | | | | | | | | |
| Panasonic | 6 | 11 | 12 | 13 | 60 | 64 | 104 | 105 | 106 | 165 | 263 | 265 | 269 | | | | |
| Philco | 36 | 95 | 108 | 109 | 118 | 119 | 120 | 121 | 123 | 128 | 165 | 170 | 171 | 176 | 178 | 184 | 241 |
| | | 267 | 269 | | | | | | | | | | | | | | |
| Philips | 52 | 64 | 118 | 121 | 123 | 128 | 165 | 170 | 171 | 177 | 186 | 187 | 188 | 269 | 176 | | |
| Pilot | 118 | | | | | | | | | | | | | | | | |
| Pioneer | 59 | 77 | 112 | 118 | 120 | 189 | 190 | 237 | 243 | 264 | | | | | | | |
| Portland | 94 | 109 | 118 | 119 | 120 | 126 | | | | | | | | | | | |
| Price Club | 199 | | | | | | | | | | | | | | | | |
| Proscan | 111 | 115 | 239 | | | | | | | | | | | | | | |
| Proton | 14 | 26 | 94 | 103 | 120 | 123 | 191 | 244 | 118 | | | | | | | | |
| Pulsar | 113 | 118 | | | | | | | | | | | | | | | |
| Quasar | 11 | 105 | 106 | 172 | 263 | 269 | | | | | | | | | | | |
| Radio Shack | 34 | 37 | 83 | 94 | 115 | 118 | 120 | 123 | 145 | 153 | 192 | 230 | | | | | |
| RCA | 16 | 17 | 25 | 53 | 54 | 55 | 56 | 57 | 58 | 77 | 102 | 109 | 111 | 115 | 118 | 119 | 120 |
| | | 128 | 193 | 194 | 196 | 197 | 239 | 245 | 256 | 269 | 273 | 274 | | | | | |
| Realistic | 50 | 118 | 120 | 123 | 145 | 153 | 192 | 230 | | | | | | | | | |
| Saisho | 90 | 91 | | | | | | | | | | | | | | | |
| Sampo | 108 | 118 | 120 | | | | | | | | | | | | | | |
| Samsung | 0 | 8 | 14 | 34 | 52 | 91 | 94 | 97 | 101 | 108 | 109 | 118 | 119 | 120 | 123 | 125 | 127 |
| | | 128 | 129 | 198 | 255 | | | | | | | | | | | | |
| Sansui | 260 | | | | | | | | | | | | | | | | |
| Sansung | 199 | | | | | | | | | | | | | | | | |

Table 4. Television Brands

| Brand | Zilog Code Numbers | | | | | | | | | | | | | | | | |
|--------------|---------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Sanyo | 49 | 50 | 51 | 82 | 118 | 153 | 154 | 180 | 200 | 230 | | | | | | | |
| SBR | 52 | | | | | | | | | | | | | | | | |
| Schneider | 52 | | | | | | | | | | | | | | | | |
| Scotch | 120 | | | | | | | | | | | | | | | | |
| Scott | 83 | 87 | 89 | 94 | 118 | 120 | 123 | 132 | 142 | 145 | 151 | | | | | | |
| Sears | 9 | 14 | 30 | 40 | 41 | 42 | 43 | 44 | 45 | 46 | 47 | 50 | 51 | 82 | 89 | 97 | 111 |
| | 118 | 120 | 124 | 128 | 129 | 151 | 153 | 154 | 155 | 169 | 173 | 174 | 201 | 202 | 230 | 239 | |
| Seimitsu | 14 | | | | | | | | | | | | | | | | |
| Sharp | 21 | 22 | 37 | 38 | 39 | 49 | 94 | 118 | 120 | 123 | 137 | 192 | 203 | 205 | 210 | 234 | |
| Shogun | 118 | | | | | | | | | | | | | | | | |
| Siemens | 49 | | | | | | | | | | | | | | | | |
| Signature | 116 | 183 | 266 | | | | | | | | | | | | | | |
| Simpson | 121 | | | | | | | | | | | | | | | | |
| Sony | 114 | 117 | 259 | 268 | 272 | | | | | | | | | | | | |
| Soundesign | 14 | 83 | 95 | 118 | 120 | 121 | 145 | 151 | | | | | | | | | |
| Spectricon | 29 | 99 | | | | | | | | | | | | | | | |
| Squareview | 15 | | | | | | | | | | | | | | | | |
| SSS | 83 | 109 | 118 | 145 | | | | | | | | | | | | | |
| Starlite | 145 | | | | | | | | | | | | | | | | |
| Supra | 97 | | | | | | | | | | | | | | | | |
| Supre-Macy | 98 | 235 | | | | | | | | | | | | | | | |
| Supreme | 117 | | | | | | | | | | | | | | | | |
| Sylvania | 35 | 36 | 64 | 95 | 108 | 118 | 120 | 121 | 128 | 165 | 170 | 171 | 176 | 177 | 178 | 188 | 207 |
| | 241 | 267 | 184 | | | | | | | | | | | | | | |
| Symphonic | 15 | 145 | 270 | | | | | | | | | | | | | | |
| Tandy | 33 | 39 | 234 | | | | | | | | | | | | | | |
| Tatung | 105 | 237 | 269 | | | | | | | | | | | | | | |
| Technics | 106 | | | | | | | | | | | | | | | | |
| Techwood | 97 | 118 | 120 | 157 | | | | | | | | | | | | | |
| Teknika | 31 | 32 | 83 | 89 | 94 | 95 | 96 | 97 | 98 | 101 | 109 | 110 | 118 | 119 | 120 | 121 | 123 |
| | 124 | 126 | 145 | 151 | 177 | 182 | 183 | 199 | 266 | | | | | | | | |
| Teletech | 91 | | | | | | | | | | | | | | | | |
| Tera | 103 | 244 | | | | | | | | | | | | | | | |
| Thomas | 14 | | | | | | | | | | | | | | | | |
| Thompson | 5 | | | | | | | | | | | | | | | | |
| TMK | 14 | 97 | 118 | 120 | | | | | | | | | | | | | |

Table 5. VCR Brands

| Brand | Zilog Code Numbers | | | | | | | | | | | | | | | | | |
|-----------------|---------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Candle | 17 | 160 | 161 | 162 | 163 | | | | | | | | | | | | | |
| Canon | 108 | 117 | | | | | | | | | | | | | | | | |
| Capehart | 115 | 116 | | | | | | | | | | | | | | | | |
| Capeheart | 74 | 164 | | | | | | | | | | | | | | | | |
| Carver | 36 | | | | | | | | | | | | | | | | | |
| CCE | 35 | 169 | | | | | | | | | | | | | | | | |
| Citizen | 17 | 18 | 160 | 161 | 162 | 163 | 169 | | | | | | | | | | | |
| Colt | 35 | | | | | | | | | | | | | | | | | |
| Craig | 5 | 18 | 35 | 160 | 161 | 165 | | | | | | | | | | | | |
| Curtis Mathes | 8 | 17 | 78 | 108 | 153 | 163 | 166 | 160 | | | | | | | | | | |
| Cybernex | 160 | | | | | | | | | | | | | | | | | |
| Daewoo | 74 | 114 | 115 | 123 | 167 | 169 | 170 | 162 | | | | | | | | | | |
| Daytron | 74 | 115 | | | | | | | | | | | | | | | | |
| DBX | 12 | 158 | | | | | | | | | | | | | | | | |
| Dumont | 112 | | | | | | | | | | | | | | | | | |
| Dynatech | 21 | | | | | | | | | | | | | | | | | |
| Electrohome | 4 | 161 | 171 | | | | | | | | | | | | | | | |
| Electroponic | 161 | | | | | | | | | | | | | | | | | |
| Emerson | 4 | 19 | 21 | 23 | 38 | 77 | 79 | 142 | 143 | 144 | 145 | 146 | 147 | 159 | 161 | 162 | 166 | 167 |
| | | 171 | 173 | 174 | 175 | 176 | 177 | 178 | 179 | 180 | | | | | | | | |
| Fisher | 3 | 5 | 21 | 25 | 26 | 28 | 29 | 80 | 86 | 112 | 113 | 165 | | | | | | |
| GE | 8 | 18 | 30 | 52 | 78 | 108 | 109 | 110 | 111 | 153 | 160 | | | | | | | |
| Go Video | 106 | 107 | | | | | | | | | | | | | | | | |
| Goldstar | 2 | 17 | 31 | 126 | 161 | | | | | | | | | | | | | |
| Goodmans | 20 | | | | | | | | | | | | | | | | | |
| Gradiente | 168 | | | | | | | | | | | | | | | | | |
| Grundig | 101 | | | | | | | | | | | | | | | | | |
| Harley Davidson | 168 | | | | | | | | | | | | | | | | | |
| Harman Kardon | 98 | 126 | | | | | | | | | | | | | | | | |
| Harwood | 35 | | | | | | | | | | | | | | | | | |
| Hinari | 20 | | | | | | | | | | | | | | | | | |
| Hi-Q | 165 | | | | | | | | | | | | | | | | | |
| Hitachi | 15 | 16 | 21 | 32 | 33 | 72 | 75 | 118 | 119 | 120 | 121 | 122 | | | | | | |
| JC Penney | 11 | 12 | 18 | 72 | 80 | 108 | 126 | 158 | 160 | 161 | | | | | | | | |
| Jensen | 32 | 75 | | | | | | | | | | | | | | | | |
| JVC | 11 | 12 | 17 | 75 | 82 | 102 | 103 | 104 | 105 | 158 | | | | | | | | |

Table 5. VCR Brands

| Brand | Zilog Code Numbers | | | | | | | | | | | | | | | | | | | |
|----------------|---------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|----|----|-----|--|--|
| Kenwood | 11 | 12 | 17 | 75 | 82 | 89 | 104 | 158 | 163 | | | | | | | | | | | |
| KLH | 35 | | | | | | | | | | | | | | | | | | | |
| Kodak | 161 | | | | | | | | | | | | | | | | | | | |
| Lloyd | 21 | 168 | | | | | | | | | | | | | | | | | | |
| Logik | 20 | 35 | | | | | | | | | | | | | | | | | | |
| LXI | 161 | | | | | | | | | | | | | | | | | | | |
| M. Wards | 4 | 5 | 6 | 18 | 19 | 20 | 21 | 108 | 129 | | | | | | | | | | | |
| Magnavox | 36 | 37 | 101 | 108 | 129 | | | | | | | | | | | | | | | |
| Magnin | 160 | | | | | | | | | | | | | | | | | | | |
| Marantz | 10 | 11 | 12 | 17 | 36 | 101 | 108 | 158 | 163 | | | | | | | | | | | |
| Marta | 161 | | | | | | | | | | | | | | | | | | | |
| MEI | 108 | | | | | | | | | | | | | | | | | | | |
| Memorex | 5 | 21 | 89 | 100 | 108 | 112 | 124 | 154 | 160 | 161 | 165 | 168 | | | | | | | | |
| MGA | 4 | 38 | 77 | 99 | 171 | | | | | | | | | | | | | | | |
| MGN Technology | 160 | | | | | | | | | | | | | | | | | | | |
| Midland | 30 | | | | | | | | | | | | | | | | | | | |
| Minolta | 32 | 72 | | | | | | | | | | | | | | | | | | |
| Mitsubishi | 4 | 32 | 38 | 39 | 40 | 41 | 42 | 44 | 45 | 46 | 47 | 71 | 77 | 82 | 97 | 98 | 99 | 104 | | |
| | 171 | | | | | | | | | | | | | | | | | | | |
| Motorola | 154 | | | | | | | | | | | | | | | | | | | |
| MTC | 21 | 160 | 168 | | | | | | | | | | | | | | | | | |
| Mukltitech | 160 | | | | | | | | | | | | | | | | | | | |
| Multitech | 30 | 35 | 163 | 168 | 18 | 20 | 21 | | | | | | | | | | | | | |
| NAD | 96 | | | | | | | | | | | | | | | | | | | |
| NEC | 9 | 10 | 11 | 12 | 13 | 17 | 49 | 50 | 51 | 75 | 82 | 104 | 125 | 126 | 158 | | | | | |
| Nikko | 161 | | | | | | | | | | | | | | | | | | | |
| Noblex | 160 | | | | | | | | | | | | | | | | | | | |
| Optimus | 154 | 161 | | | | | | | | | | | | | | | | | | |
| Optonica | 65 | | | | | | | | | | | | | | | | | | | |
| Panasonic | 1 | 14 | 73 | 108 | 130 | 132 | 133 | 134 | 135 | | | | | | | | | | | |
| Pentax | 17 | 32 | 72 | 121 | 163 | | | | | | | | | | | | | | | |
| Perdio | 21 | | | | | | | | | | | | | | | | | | | |
| Philco | 36 | 37 | 108 | | | | | | | | | | | | | | | | | |
| Philips | 65 | 101 | 108 | 181 | 36 | | | | | | | | | | | | | | | |
| Pilot | 161 | | | | | | | | | | | | | | | | | | | |
| Pioneer | 12 | 32 | 52 | 53 | 82 | 93 | 94 | 95 | 96 | 104 | 158 | | | | | | | | | |

Table 5. VCR Brands

| Brand | Zilog Code Numbers | | | | | | | | | | | | | | | | | |
|--------------|---------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|----|-----|-----|-----|
| Portland | 74 | 115 | 163 | | | | | | | | | | | | | | | |
| Proscan | 8 | 52 | 129 | 153 | | | | | | | | | | | | | | |
| Protec | 35 | | | | | | | | | | | | | | | | | |
| Pulsar | 124 | | | | | | | | | | | | | | | | | |
| Quartz | 89 | | | | | | | | | | | | | | | | | |
| Quasar | 91 | 92 | 108 | | | | | | | | | | | | | | | |
| Radio Shack | 3 | 4 | 5 | 6 | 26 | 65 | 154 | 160 | 161 | 165 | 168 | 171 | | | | | | |
| Radix | 161 | | | | | | | | | | | | | | | | | |
| Randex | 161 | | | | | | | | | | | | | | | | | |
| RCA | 0 | 7 | 8 | 18 | 32 | 52 | 54 | 55 | 56 | 57 | 60 | 61 | 62 | 72 | 78 | 121 | 127 | 128 |
| | 129 | 130 | 131 | 153 | 155 | 160 | | | | | | | | | | | | |
| Realistic | 21 | 26 | 65 | 86 | 89 | 108 | 112 | 154 | 160 | 161 | 165 | 168 | 171 | | | | | |
| Ricoh | 150 | | | | | | | | | | | | | | | | | |
| Saisho | 145 | 146 | | | | | | | | | | | | | | | | |
| Salora | 89 | 99 | | | | | | | | | | | | | | | | |
| Samsung | 18 | 30 | 76 | 90 | 110 | 123 | 138 | 156 | 160 | 162 | 174 | | | | | | | |
| Sanky | 154 | | | | | | | | | | | | | | | | | |
| Sansui | 12 | 63 | 75 | 82 | 104 | 125 | 158 | | | | | | | | | | | |
| Sanyo | 5 | 87 | 88 | 89 | 112 | 160 | 165 | | | | | | | | | | | |
| SBR | 101 | | | | | | | | | | | | | | | | | |
| Schneider | 20 | | | | | | | | | | | | | | | | | |
| Scott | 19 | 38 | 64 | 144 | 159 | 162 | 167 | 173 | | | | | | | | | | |
| Sears | 3 | 5 | 25 | 26 | 28 | 32 | 72 | 80 | 86 | 89 | 112 | 113 | 161 | 165 | | | | |
| Sentra | 115 | | | | | | | | | | | | | | | | | |
| Sharp | 4 | 6 | 65 | 65 | 171 | | | | | | | | | | | | | |
| Shintom | 20 | 35 | | | | | | | | | | | | | | | | |
| Shogun | 160 | | | | | | | | | | | | | | | | | |
| Singer | 35 | | | | | | | | | | | | | | | | | |
| Sony | 148 | 149 | 150 | 151 | 152 | | | | | | | | | | | | | |
| STS | 72 | | | | | | | | | | | | | | | | | |
| Sylvania | 21 | 36 | 37 | 38 | 99 | 108 | 168 | | | | | | | | | | | |
| Symphonic | 21 | 168 | | | | | | | | | | | | | | | | |
| Tandy | 21 | | | | | | | | | | | | | | | | | |
| Tashiko | 21 | 161 | | | | | | | | | | | | | | | | |
| Tatung | 11 | 75 | 85 | | | | | | | | | | | | | | | |
| Teac | 11 | 21 | 56 | 75 | 168 | | | | | | | | | | | | | |

Table 5. VCR Brands

| Brand | Zilog Code Numbers | | | | | | | | | | | | | | |
|-----------------|---------------------------|-----|-----|-----|-----|-----|----|-----|-----|-----|-----|-----|-----|-----|-----|
| Technics | 73 | 108 | | | | | | | | | | | | | |
| Teknika | 21 | 22 | 67 | 108 | 161 | 168 | | | | | | | | | |
| TMK | 146 | 160 | 166 | | | | | | | | | | | | |
| Toshiba | 19 | 26 | 28 | 32 | 38 | 64 | 99 | 123 | 162 | | | | | | |
| Totevision | 18 | 160 | 161 | | | | | | | | | | | | |
| Unitech | 160 | | | | | | | | | | | | | | |
| Vector Research | 12 | 126 | 158 | 162 | 163 | | | | | | | | | | |
| Victor | 12 | 104 | 105 | 158 | | | | | | | | | | | |
| Video Concepts | 12 | 77 | 158 | 162 | 163 | | | | | | | | | | |
| Videosonic | 18 | 160 | | | | | | | | | | | | | |
| Wards | 32 | 35 | 48 | 65 | 68 | 69 | 70 | 72 | 154 | 160 | 161 | 162 | 165 | 168 | 171 |
| XR-1000 | 35 | 168 | | | | | | | | | | | | | |
| Yamaha | 11 | 12 | 17 | 75 | 126 | 158 | | | | | | | | | |
| Zenith | 124 | 151 | 152 | | | | | | | | | | | | |

Table 6. Cable Brands

| Brand | Zilog Code Numbers | | | | |
|--------------|---------------------------|----|----|----|------|
| ABC | 7 | 8 | 9 | 10 | |
| Archer | 11 | 12 | | | |
| Century | 12 | | | | |
| Citizen | 12 | | | | |
| Colour Voice | 13 | 14 | | | |
| Comtronic | 15 | | | | |
| Eastern | 16 | | | | |
| Garrard | 12 | | | | |
| Hytex | 7 | | | | |
| Jasco | 12 | | | | |
| Jerrold | 5 | 17 | 18 | 30 | 9 10 |
| Magnavox | 19 | | | | |
| Movie Time | 20 | | | | |
| NSC | 20 | | | | |
| Oak | 0 | 21 | 7 | | |
| Panasonic | 1 | 6 | | | |
| Philips | 24 | 12 | 13 | 14 | 19 |



Table 6. Cable Brands

| Brand | Zilog Code Numbers | | | |
|--------------------|---------------------------|----|----|----|
| Pioneer | 2 | 3 | 25 | |
| RCA | 34 | | | |
| Regency | 16 | | | |
| Samsung | 26 | 15 | | |
| Scientific Atlanta | 3 | 4 | 27 | 28 |
| Signal | 15 | | | |
| SL Marx | 15 | | | |
| Starcom | 10 | | | |
| Stargate | 15 | | | |
| Teleview | 15 | | | |
| Tocom | 8 | 17 | | |
| TV86 | 20 | | | |
| Unika | 12 | | | |
| United Artists | 7 | | | |
| Universal | 12 | 11 | | |
| Viewstar | 20 | 19 | | |
| Zenith | 3 | 32 | 33 | |

Table 7 Satellite Brands

| Brand | Zilog Code Numbers | | | |
|---------------------|---------------------------|----|----|--|
| Alphastar | 19 | | | |
| Chaparral | 0 | 1 | | |
| Cheyenne | 1 | | | |
| Dishnet | 18 | | | |
| Drake | 2 | | | |
| Drake | 3 | | | |
| Echostar Dish | 27 | | | |
| GE | 13 | 20 | 21 | |
| General Instruments | 4 | 5 | 6 | |
| Hitachi | 23 | 24 | | |
| Hughes Network | 17 | 28 | | |
| JVC | 22 | | | |
| Magnavox | 25 | | | |



Table 7 Satellite Brands

| Brand | Zilog Code Numbers | | | |
|--------------|---------------------------|----|----|----|
| Philips | 25 | | | |
| Primestar | 16 | | | |
| Proscan | 20 | 21 | 13 | |
| RCA | 13 | 20 | 21 | |
| Realistic | 7 | | | |
| Sierra | 1 | | | |
| Sony | 14 | | | |
| STS | 8 | 9 | 10 | 11 |
| Toshiba | 12 | 15 | | |
| Uniden | 26 | | | |

Schematic

Figures 3 through Figure 5 provide schematics of the Crimzon™ RC Development Platform.

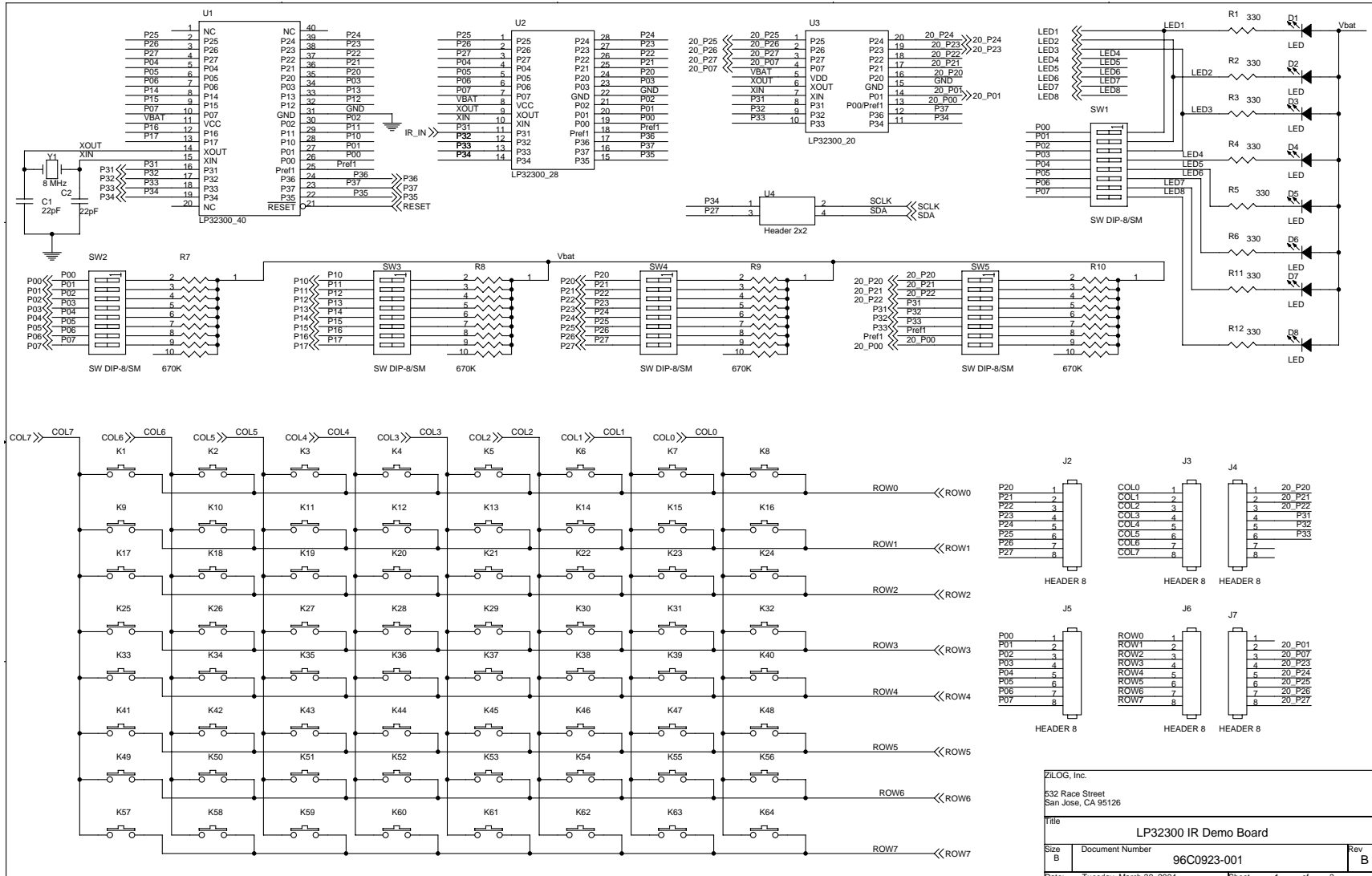


Figure 3. Crimzon™ RC Development Platform Schematic

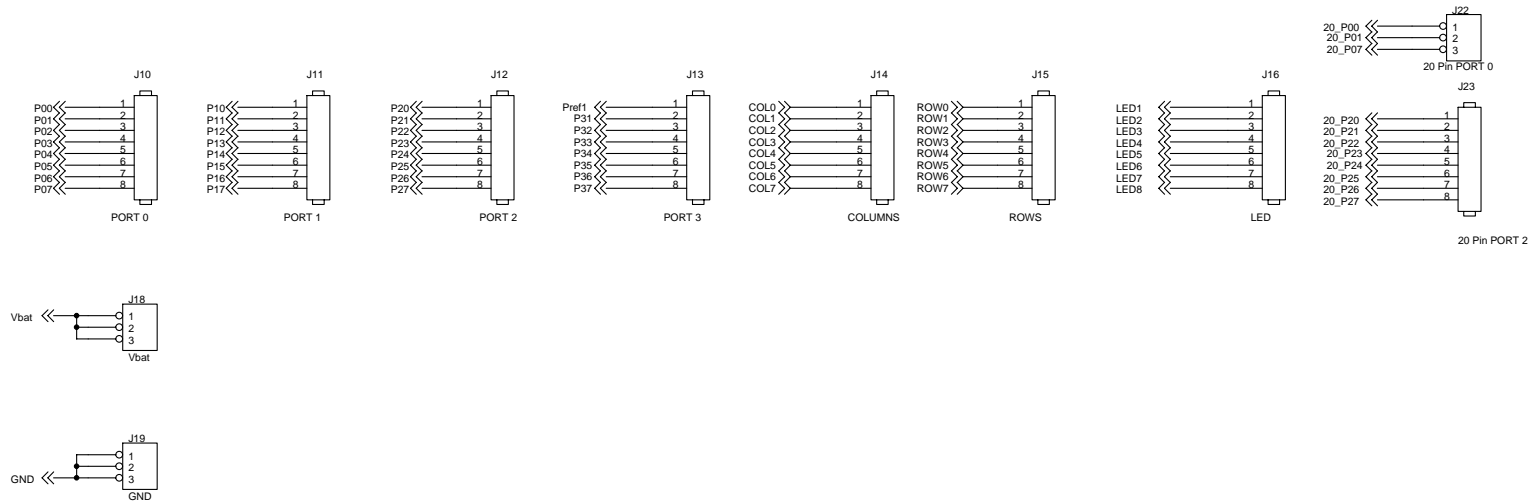


Figure 4. Crimzon™ RC Development Platform Schematic

| | | |
|--|--------------------------------|----------|
| ZILOG, Inc. 532 Race Street San Jose, CA 95126 | | |
| Title LP32300 IR Demo Board | | |
| Size B | Document Number 96C0923-001 | Rev B |
| Date: Tuesday, March 30, 2004 | Sheet 2 of 3 | |



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