



**General Description**

ZT202 is RS232 type Europe market universal remote control IC. It can control 8 devices at most , includes TV, VCR, Satellite receiver, Cable TV converter, CD, VCD, DVD, HIFI, Tape....

**Features**

- Single chip 8-bit micro-controller
- Operating voltage:2.2V to 5.5V
- Operating current:1.0mA to 5.1mA
- Standby current: 1uA to 3uA
- Low power dissipation
- Ambient operating temperature:0 to +70
- Storage temperature:-55 to +150
- Total 56 keys design(P0.0-P0.7 x P1.0-P1.6)
- Resonator at 3.58M HZ
- For TV , VCR, Satellite receiver, Cable TV converter, VCD, CD, DVD, Tape, HiFi ...
- Serial RS232 protocol baudrate selecting options.
- TV has TV1 and TV2 two different data groups.
- VCR1 VCR2 same data device includes VCD and VCR
- CBL1 CBL2 same data device includes satellite receiver and cable TV converter.
- AUX1 AUX2 same data device includes CD, TAPE, DVD,HIFI.

**Pin Description**

| Pin  | Function                     |
|------|------------------------------|
| Vdd  | Positive power pin           |
| OSCO | Resonator pin(3.58M)         |
| OSCI | Resonator pin(3.58M)         |
| GND  | Ground pin                   |
| /RES | System reset pin(Low active) |
| TEST | For test mode only           |
| P0.0 | Write data by serial         |
| P0.1 |                              |
| P0.2 |                              |
| P0.3 |                              |
| P0.4 | Read data by serial          |
| P0.5 |                              |
| P0.6 |                              |
| P0.7 |                              |
| Pin  | Function                     |
| P1.0 | Baud rate setting bit0       |
| P1.1 | Baud rate setting bit1       |
| P1.2 | Baud rate setting bit2       |

|      |                              |
|------|------------------------------|
| P1.3 | Baud rate setting bit3       |
| P1.4 |                              |
| P1.5 |                              |
| P1.6 |                              |
| P1.7 | IR LED output pin            |
| AGND | Ground pin                   |
| SPK1 | DAC1 output(unused)          |
| AVdd | Positive power pin           |
| SPK2 | DAC2 output(LED display pin) |



### Absolute Maximum Rating

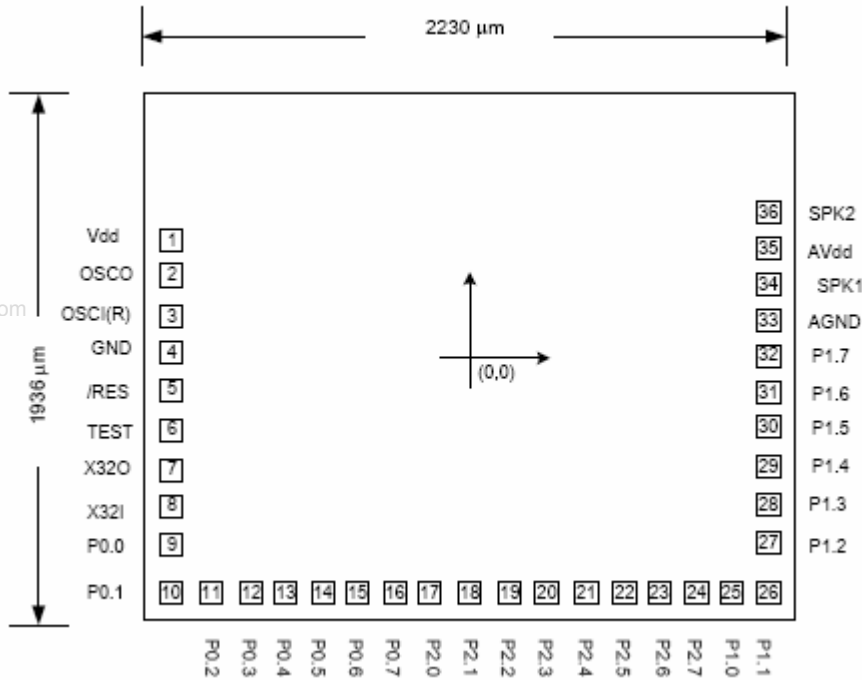
| PARAMETER                | RATING       | UNIT |
|--------------------------|--------------|------|
| Supply Voltage to Ground | -0.3 to +5.0 | V    |
| Applied Voltage          | -0.3 to +5.0 | V    |
| Power Dissipation        | 60           | mW   |
| Ambient OP Temperature   | 0 to +70     |      |
| Storage Temperature      | -55 to +150  |      |

### DC Characteristics

| Parameter          | Min.   | TYP. | Min.   | Unit |
|--------------------|--------|------|--------|------|
| OP.Voltage         | 2.4    |      | 5.5    | V    |
| OP.Current         |        | 1.3  | 5.1    | mA   |
| Standby Current    |        | 1    | 3      | uA   |
| DAC output current |        | 3.67 |        | mA   |
| Input High Voltage | 0.8Vdd |      | Vdd    |      |
| Input Low Voltage  | 0      |      | 0.2Vdd |      |

### AC Characteristics

| Parameter         | Min. | TYP. | Min. | Unit |
|-------------------|------|------|------|------|
| CPU op. Frequency |      | 3.58 |      | MHZ  |
| POR duration      | 10   | 15   | 50   | mS   |



**Note:**

- (1) Dice Format IC dimension: 2230um(W) x 1930um(H)
- (2) Substrate connect to ground(GND)
- (3) Bonding should start from GND pin

(Unit: μm)

| Pad | Name | X        | Y       | Pad | Name | X       | Y       |
|-----|------|----------|---------|-----|------|---------|---------|
| 1   | VDD  | -1005.00 | 323.35  | 21  | NC   | 375.00  | -858.00 |
| 2   | OSCO | -1005.00 | 198.35  | 22  | NC   | 500.00  | -858.00 |
| 3   | OSCI | -1005.00 | 73.35   | 23  | NC   | 625.00  | -858.00 |
| 4   | GND  | -1005.00 | -51.65  | 24  | NC   | 750.00  | -858.00 |
| 5   | /RES | -1005.00 | -176.65 | 25  | P1.0 | 875.00  | -858.00 |
| 6   | TEST | -1005.00 | -301.65 | 26  | P1.1 | 1005.00 | -858.00 |
| 7   | NC   | -1005.00 | -426.65 | 27  | P1.2 | 1005.00 | -697.85 |
| 8   | NC   | -1005.00 | -551.65 | 28  | P1.3 | 1005.00 | -572.85 |
| 9   | P0.0 | -1005.00 | -676.65 | 29  | P1.4 | 1005.00 | -447.85 |
| 10  | P0.1 | -1005.00 | -858.00 | 30  | P1.5 | 1005.00 | -322.85 |
| 11  | P0.2 | -875.00  | -858.00 | 31  | P1.6 | 1005.00 | -197.85 |
| 12  | P0.3 | -750.00  | -858.00 | 32  | P1.7 | 1005.00 | -72.85  |
| 13  | P0.4 | -625.00  | -858.00 | 33  | AGND | 1005.00 | 52.15   |
| 14  | P0.5 | -500.00  | -858.00 | 34  | SPK1 | 1005.00 | 177.15  |
| 15  | P0.6 | -375.00  | -858.00 | 35  | AVDD | 1005.00 | 317.00  |
| 16  | P0.7 | -250.00  | -858.00 | 36  | SPK2 | 1005.00 | 442.00  |
| 17  | NC   | -125.00  | -858.00 |     |      |         |         |
| 18  | NC   | 0.00     | -858.00 |     |      |         |         |
| 19  | NC   | 125.00   | -858.00 |     |      |         |         |
| 20  | NC   | 250.00   | -858.00 |     |      |         |         |

Note: 1. Substrate connected to ground (GND)

2. Bonding should start from GND pin

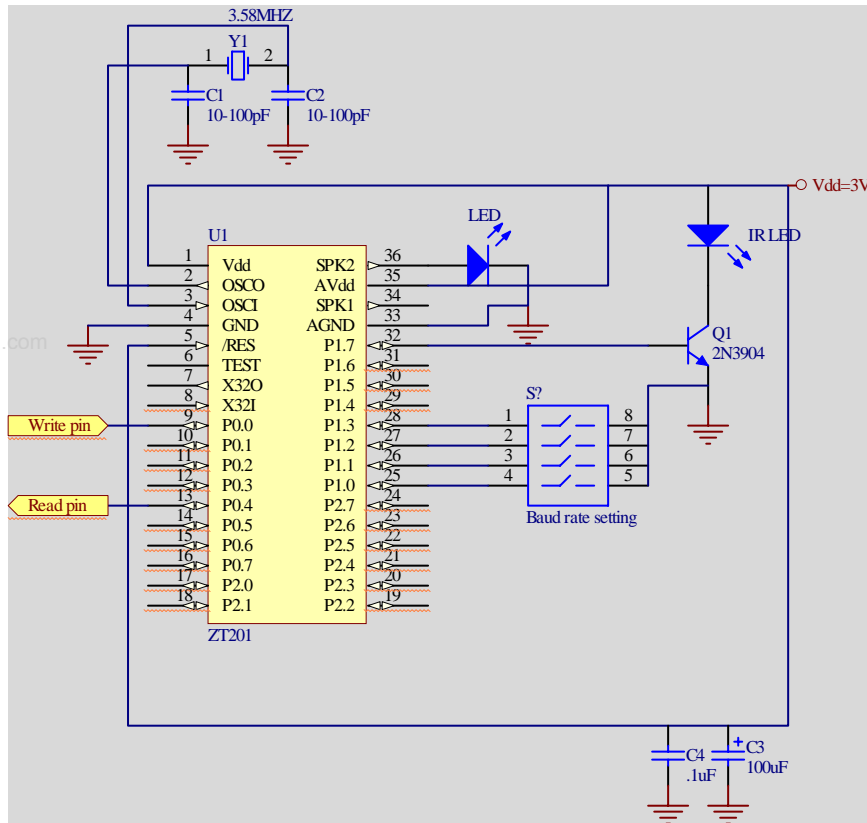
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**Universal Remote Control Application circuit**



**Baudrate setting by switch(all open=9600BPS)**




**Key functions:**

Device Key: ( Device Key No sending any IR signal)

| Key Name | Device Name | Max Code Number |
|----------|-------------|-----------------|
| 1        | TV1         | 255             |
| 2        | VCR1        | 197             |
| 3        | CBL1        | 153             |
| 4        | AUX1        | 246             |
| 5        | TV2         | 114             |
| 6        | VCR2        | 197             |
| 7        | CBL2        | 153             |
| 8        | AUX2        | 246             |

Key functions: (for TV and CBL)

| Key Name | TV(CBL)   | Function Description |
|----------|---|----------------------|
| 9        | POWER   | POWER                |
| 10       | CH+   | Channel Up           |
| 11       | CH-   | Channel Down         |
| 12       | 0/10  |                      |
| 13       | 1   |                      |
| 14       | 2   |                      |
| 15       | 3   |                      |
| 16       | 4   |                      |
| 17       | 5   |                      |
| 18       | 6   |                      |
| 19       | 7   |                      |
| 20       | 8   |                      |
| 21       | 9   |                      |
| 22       | → •   |                      |
| 23       | MUTE  |                      |
| 24       | VOL+  |                      |
| 25       | VOL-  |                      |
| 26       | CH*P/C  |                      |
| 27       | Pr<>  |                      |
| 28       | → • ←   |                      |
| 29       |  | TEXT Index           |
| 30       |  | TEXT ON              |



|    |       |                   |
|----|-------|-------------------|
| 31 |       | TEXT X            |
| 32 | Memo  |                   |
| 33 |       | TEXT Q            |
| 34 |       | TEXT OFF          |
| 35 |       | Red               |
| 36 |       | Green             |
| 37 |       | Yellow            |
| 38 |       | Blue              |
| 39 | 11/1- |                   |
| 40 | 12/2- |                   |
| 41 |       | TEXT Hold page    |
| 42 |       | TEXT TP           |
| 43 |       | Contrast +        |
| 44 |       | Contrast -        |
| 45 |       | Brightness +      |
| 46 |       | Brightness -      |
| 47 |       | Color +           |
| 48 |       | Color -           |
| 49 |       | Last Page         |
| 50 |       | Next Page         |
| 51 |       | Release Hold Page |

**Key functions: (for VCR and AUX)**





















| Key Name | VCR(AUX) | Function Description |
|----------|----------|----------------------|
| 9        | POWER    | POWER                |
| 10       | CH+      | Channel Up           |
| 11       | CH-      | Channel Down         |
| 12       | 0/10     |                      |
| 13       | 1        |                      |
| 14       | 2        |                      |
| 15       | 3        |                      |
| 16       | 4        |                      |
| 17       | 5        |                      |
| 18       | 6        |                      |
| 19       | 7        |                      |
| 20       | 8        |                      |

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|    |   |              |
|----|---|--------------|
| 21 | 9   |              |
| 22 | → ·   |              |
| 23 | MUTE  |              |
| 24 | VOL+  |              |
| 25 | VOL-  |              |
| 26 | CH*P/C  |              |
| 27 | Pr<>  |              |
| 28 | → · ←   |              |
| 29 |    |              |
| 30 |    | PAUSE        |
| 31 |    |              |
| 32 | Memo  |              |
| 33 |    | RECORD       |
| 34 |    | Fast Forward |
| 35 |    | Red          |
| 36 |   | Green        |
| 37 |  | Yellow       |
| 38 |  | Blue         |
| 39 | 11/1-   |              |
| 40 | 12/2-   |              |
| 41 |  | STOP         |
| 42 |  |              |
| 43 |  | Contrast +   |
| 44 |  | Contrast -   |
| 45 |  | Brightness + |
| 46 |  | Brightness - |
| 47 |  | Color +      |
| 48 |  | Color -      |
| 49 |  | Backward     |
| 50 |  | Forward      |
| 51 |  | PLAY         |



| Key Code(2 bytes) | SETUP functions         | Function                            |
|-------------------|-------------------------|-------------------------------------|
| 61 nnn            | SETUP TV1 nnn           | 3 digit number setting TV1          |
| 62 nnn            | SETUP VCR1 nnn          | 3 digit number setting VCR1         |
| 63 nnn            | SETUP CBL1 nnn          | 3 digit number setting CBL1         |
| 64 nnn            | SETUP AUX1 nnn          | 3 digit number setting AUX1         |
| 65 nnn            | SETUP TV2 nnn           | 3 digit number setting TV2          |
| 66 nnn            | SETUP VCR2 nnn          | 3 digit number setting VCR2         |
| 67 nnn            | SETUP CBL2 nnn          | 3 digit number setting CBL2         |
| 68 nnn            | SETUP AUX2 nnn          | 3 digit number setting AUX2         |
| 70 61(or 62...68) | 61(TV1)62(VCR1)63(CBL1) | AUTO SCAN TV1(61) VCR1(62)          |
| 71                | SETUP+1                 | Display 1 <sup>st</sup> code number |
| 72                | SETUP+2                 | Display 2 <sup>nd</sup> code number |
| 73                | SETUP+3                 | Display 3 <sup>rd</sup> code number |





### Handshaking Flowchart

