OUTLINE

The R3115Z Series are CMOS-based voltage detector ICs with high detector threshold accuracy and ultra-low supply current, which can be operated at an extremely low voltage and is used for system reset as an example.

Each of these ICs consists of a voltage reference unit, a comparator, resistor net for detector threshold setting, an output driver, a hysteresis circuit, and an output delay circuit. The detector threshold is fixed with high accuracy internally and does not require any adjustment. Two output types, Nch open drain type and CMOS type are available.

Since the package is WLCSP-4-P2, high density mounting on boards is possible.

FEATURES

- Built-in Output Delay Circuit ........................................... Typ. 100ms with an external capacitor: 0.022μF
- Supply Current ................................................................. Typ. 0.8μA (VDD=3.5V)
- Operating Voltage Range .................................................. 0.7 to 6.0V (Topt=25°C)
- Detector Threshold ...................................................... 0.9V to 5.0V
- Accuracy Detector Threshold ........................................... ±2.0%
- Temperature-Drift Coefficient of Detector Threshold ........ Typ. ±100ppm/°C
- Two Output Types ............................................................... Nch Open Drain and CMOS
- Package ........................................................................ NLCSP-4-P2

APPLICATIONS

- Micro controller and Logic Circuit Reset
- Battery Checker
- Window Comparator
- Wave Shaping Circuit
- Battery Back-up Circuit
- Power Failure Detector
SELECTION GUIDE

The detector threshold, the output type, and the taping type of R3115Z Series can be designated at the users' request by specifying the part number as follows:

\[ \text{R3115Zxx1x-xx-x} \leftarrow \text{Part Number} \]

\[ \begin{array}{c|c}
\text{Code} & \text{Contents} \\
\hline
a & \text{Designation of Package Type;} \\
& Z: \text{WLCSP-4-P2} \\
\hline
b & \text{Setting Detector Threshold } (-V_{DET}); \\
& \text{Stepwise setting with a step of } 0.1V \text{ in the range of } 0.9V \text{ to } 5.0V \text{ is possible.} \\
\hline
c & \text{Designation of Output Type;} \\
& A: \text{Nch Open Drain} \\
& C: \text{CMOS} \\
\hline
d & \text{Designation of Taping Type;} \\
& \text{TR is prescribed as standard directions. (Refer to Taping Specifications)} \\
\hline
e & \text{Designation of Composition of pin plating.} \\
& –F: \text{Lead free plating} \\
\end{array} \]
PIN CONFIGURATIONS

Mark Side

WLCSP-4-P2

Bump Side

PIN DESCRIPTIONS

<table>
<thead>
<tr>
<th>Pin No.</th>
<th>Symbol</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>GND</td>
<td>Ground Pin</td>
</tr>
<tr>
<td>2</td>
<td>Cd</td>
<td>Pin for External Capacitor (for setting output delay)</td>
</tr>
<tr>
<td>3</td>
<td>OUT</td>
<td>Output Pin (Output “L” at detector threshold, Output “H” at released voltage)</td>
</tr>
<tr>
<td>4</td>
<td>VDD</td>
<td>Supply Voltage Pin</td>
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ABSOLUTE MAXIMUM RATINGS

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Item</th>
<th>Rating</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>VDD</td>
<td>Supply Voltage</td>
<td>6.5</td>
<td>V</td>
</tr>
<tr>
<td>VOUT1</td>
<td>Output Voltage (CMOS)</td>
<td>Vss-0.3 to Vdd+0.3</td>
<td>V</td>
</tr>
<tr>
<td>VOUT2</td>
<td>Output Voltage (Nch)</td>
<td>Vss-0.3 to 6.5</td>
<td>V</td>
</tr>
<tr>
<td>IOUT</td>
<td>Output Current</td>
<td>20</td>
<td>mA</td>
</tr>
<tr>
<td>PD</td>
<td>Power Dissipation(WLCSP-4-P2)*1</td>
<td>530</td>
<td>mW</td>
</tr>
<tr>
<td>Topt</td>
<td>Operating Temperature Range</td>
<td>-40 to 85</td>
<td>°C</td>
</tr>
<tr>
<td>Tstg</td>
<td>Storage Temperature Range</td>
<td>-55 to 125</td>
<td>°C</td>
</tr>
</tbody>
</table>

1) For Power Dissipation, please refer to PACKAGE INFORMATION to be described.

ABSOLUTE MAXIMUM RATINGS

Absolute Maximum ratings are threshold limit values that must not be exceeded ever for an instant under any conditions. Moreover, such values for any two items must not be reached simultaneously. Operation above these absolute maximum ratings may cause degradation or permanent damage to the device. These are stress ratings only and do not necessarily imply functional operation below these limits.
## ELECTRICAL CHARACTERISTICS

### R3115Z091A/C

**Symbol** | **Item** | **Conditions** | **Min.** | **Typ.** | **Max.** | **Unit**  
---|---|---|---|---|---|---  
$-V_{DET}$ | Detector Threshold | | 0.882 | 0.900 | 0.918 | V  
$V_{THYS}$ | Detector Threshold Hysteresis | | 0.027 | 0.045 | 0.063 | V  
$IS_{S}$ | Supply Current | $V_{DD}=0.8V$ | 0.6 | 2.0 | | µA  
 | | $V_{DD}=1.9V$ | 0.5 | 2.0 | | µA  
$V_{DDH}$ | Maximum Operating Voltage | | | | 6.0 | V  
$V_{DDL}$ | Minimum Operating Voltage*Note1 | $Topt=25^\circ C$ | 0.7 | 0.8 | 0.9 | V  
 | | $-40^\circ C \leq Topt \leq 85^\circ C$ | | | | 0.8 | V  
$IO_{UT}$ | Output Current (Driver Output Pin) | Nch | $V_{DS}=0.05V, V_{DD}=0.70V$ | 10 | 120 | | µA  
 | | | $V_{DS}=0.50V, V_{DD}=0.85V$ | 0.05 | 0.90 | | mA  
 | | Pch | $V_{DS}=-2.1V, V_{DD}=4.5V$ | 1.0 | 3.5 | | mA  
$V_{TCD}$ | $C_D$ pin Threshold Voltage | $V_{DD}=2.6V$ | 0.396 | 0.495 | 0.594 | V  
$IC_{D}$ | $C_D$ pin Output Current | $V_{DS}=0.10V, V_{DD}=0.70V$ | 2 | 70 | | µA  
 | | $V_{DS}=0.50V, V_{DD}=0.85V$ | 10 | 400 | | mA  
$RD$ | Output Delay Resistance | | 3.25 | 6.50 | 13.00 | Ω  
$\Delta-V_{DET}/\Delta Topt$ | Detector Threshold Temperature Coefficient | $-40^\circ C \leq Topt \leq 85^\circ C$ | ±100 | | | ppm/°C  

*Note 1: Minimum Operating Voltage means the value of input voltage when output voltage maintains 0.1V or less. (In the case of Nch Open Drain Type, Output pin is pulled up with a resistance of 470kΩ to 5.0V.)

### R3115Z271A/C

**Symbol** | **Item** | **Conditions** | **Min.** | **Typ.** | **Max.** | **Unit**  
---|---|---|---|---|---|---  
$-V_{DET}$ | Detector Threshold | | 2.646 | 2.700 | 2.754 | V  
$V_{THYS}$ | Detector Threshold Hysteresis | | 0.081 | 0.135 | 0.189 | V  
$IS_{S}$ | Supply Current | $V_{DD}=2.6V$ | 1.0 | 3.0 | | µA  
 | | $V_{DD}=3.7V$ | 0.5 | 2.5 | | µA  
$V_{DDH}$ | Maximum Operating Voltage | | | | 6.0 | V  
$V_{DDL}$ | Minimum Operating Voltage*Note1 | $Topt=25^\circ C$ | 0.7 | 0.8 | 0.9 | V  
 | | $-40^\circ C \leq Topt \leq 85^\circ C$ | | | | 0.8 | V  
$IO_{UT}$ | Output Current (Driver Output Pin) | Nch | $V_{DS}=0.05V, V_{DD}=0.70V$ | 10 | 120 | | µA  
 | | | $V_{DS}=0.50V, V_{DD}=1.50V$ | 1.0 | 3.0 | | mA  
 | | Pch | $V_{DS}=-2.1V, V_{DD}=4.5V$ | 1.0 | 3.5 | | mA  
$V_{TCD}$ | $C_D$ pin Threshold Voltage | $V_{DD}=2.97V$ | 1.188 | 1.485 | 1.782 | V  
$IC_{D}$ | $C_D$ pin Output Current | $V_{DS}=0.1V, V_{DD}=0.7V$ | 2.0 | 70.0 | | µA  
 | | $V_{DS}=0.5V, V_{DD}=1.5V$ | 200 | 500 | | mA  
$RD$ | Output Delay Resistance | | 3.25 | 6.50 | 13.00 | Ω  
$\Delta-V_{DET}/\Delta Topt$ | Detector Threshold Temperature Coefficient | $-40^\circ C \leq Topt \leq 85^\circ C$ | ±100 | | | ppm/°C  

*Note 1: Minimum Operating Voltage means the value of input voltage when output voltage maintains 0.1V or less. (In the case of Nch Open Drain Type, Output pin is pulled up with a resistance of 470kΩ to 5.0V.)
### R3115Z501A/C

Topt=25°C

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Item</th>
<th>Conditions</th>
<th>Min.</th>
<th>Typ.</th>
<th>Max.</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>$-V_{DET}$</td>
<td>Detector Threshold</td>
<td></td>
<td>4.900</td>
<td>5.000</td>
<td>5.100</td>
<td>V</td>
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<tr>
<td>$V_{HYS}$</td>
<td>Detector Threshold Hysteresis</td>
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<td>0.150</td>
<td>0.250</td>
<td>0.350</td>
<td>V</td>
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<tr>
<td>$I_{SS}$</td>
<td>Supply Current</td>
<td>$V_{DD}=4.9V$</td>
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<td>3.0</td>
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<td>µA</td>
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<td></td>
<td></td>
<td>$V_{DD}=6.0V$</td>
<td>0.6</td>
<td>2.5</td>
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<tr>
<td>$V_{DDH}$</td>
<td>Maximum Operating Voltage</td>
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<td></td>
<td>6.0</td>
<td>V</td>
</tr>
<tr>
<td>$V_{DDL}$</td>
<td>Minimum Operating Voltage^Note1</td>
<td>Topt=25°C</td>
<td>0.7</td>
<td></td>
<td></td>
<td>V</td>
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<tr>
<td></td>
<td></td>
<td>$-40°C \leq Topt \leq 85°C$</td>
<td>0.8</td>
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<tr>
<td>$I_{OUT}$</td>
<td>Output Current (Driver Output Pin)</td>
<td>Nch</td>
<td>10</td>
<td>120</td>
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<td>µA</td>
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<tr>
<td></td>
<td></td>
<td>Pch</td>
<td>1.5</td>
<td>4.5</td>
<td></td>
<td>mA</td>
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<tr>
<td>$V_{TCD}$</td>
<td>C_D pin Threshold Voltage</td>
<td>$V_{DD}=5.50V$</td>
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<td>2.750</td>
<td>3.300</td>
<td>V</td>
</tr>
<tr>
<td>$I_{CD}$</td>
<td>C_D pin Output Current</td>
<td>$V_{DS}=0.1V, V_{DD}=0.7V$</td>
<td>2.0</td>
<td>70.0</td>
<td></td>
<td>µA</td>
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<tr>
<td></td>
<td></td>
<td>$V_{DS}=0.5V, V_{DD}=1.5V$</td>
<td>200</td>
<td>500</td>
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<td></td>
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<tr>
<td>$R_{D}$</td>
<td>Output Delay Resistance</td>
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<td>3.25</td>
<td>6.50</td>
<td>13.00</td>
<td>MΩ</td>
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<tr>
<td>$\Delta-V_{DET}/\Delta Topt$</td>
<td>Detector Threshold Temperature Coefficient</td>
<td>$-40°C \leq Topt \leq 85°C$</td>
<td>±100</td>
<td></td>
<td></td>
<td>ppm/°C</td>
</tr>
</tbody>
</table>

^Note 1: Minimum Operating Voltage means the value of input voltage when output voltage maintains 0.1V or less. (In the case of Nch Open Drain Type, Output pin is pulled up with a resistance of 470kΩ to 5.0V.)
## ELECTRICAL CHARACTERISTICS BY DETECTOR THRESHOLD

<table>
<thead>
<tr>
<th>Product Code</th>
<th>Detector Threshold</th>
<th>Hysteresis Range</th>
<th>Supply Current 1</th>
<th>Supply Current 2</th>
<th>Output Current 1</th>
<th>Output Current 2</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$-V_{DET}[V]$</td>
<td>$V_{HYS}[V]$</td>
<td>$I_{SS1}[\mu A]$</td>
<td>$I_{SS2}[\mu A]$</td>
<td>$I_{OUT1}[mA]$</td>
<td>$I_{OUT2}[mA]$</td>
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<tr>
<td>R3115Z091A/C</td>
<td>0.882</td>
<td>0.918</td>
<td>0.027</td>
<td>0.045</td>
<td>0.063</td>
<td></td>
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<tr>
<td>R3115Z101A/C</td>
<td>0.980</td>
<td>1.020</td>
<td>0.030</td>
<td>0.050</td>
<td>0.070</td>
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<td>R3115Z111A/C</td>
<td>1.087</td>
<td>1.122</td>
<td>0.033</td>
<td>0.056</td>
<td>0.077</td>
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<td>R3115Z121A/C</td>
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<td>1.224</td>
<td>0.036</td>
<td>0.060</td>
<td>0.084</td>
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<tr>
<td>R3115Z131A/C</td>
<td>1.274</td>
<td>1.328</td>
<td>0.039</td>
<td>0.065</td>
<td>0.091</td>
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<tr>
<td>R3115Z141A/C</td>
<td>1.372</td>
<td>1.428</td>
<td>0.042</td>
<td>0.070</td>
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<td>1.470</td>
<td>1.530</td>
<td>0.046</td>
<td>0.075</td>
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<tr>
<td>R3115Z161A/C</td>
<td>1.568</td>
<td>1.632</td>
<td>0.048</td>
<td>0.080</td>
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<tr>
<td>R3115Z171A/C</td>
<td>1.666</td>
<td>1.734</td>
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<td>0.085</td>
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<td>R3115Z181A/C</td>
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<td>2.040</td>
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<tr>
<td>R3115Z221A/C</td>
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<td>2.754</td>
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<td>4.386</td>
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<td>4.900</td>
<td>5.100</td>
<td>0.150</td>
<td>0.250</td>
<td>0.350</td>
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Discontinued

VDD = -VDET - 0.1V

VDD = -VDET + 0.1V

VDD = 0.05V

VDD = 0.7V

VDD = 0.5V

VDD = 1.5V

Nch

Discontinued
### Output Current 3

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<td>I_{OUT3}[mA]</td>
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<td>V_{DDL}[V]</td>
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<td>V_{TCE}[V]</td>
<td>I_{CD1}[μA]</td>
<td></td>
<td>I_{CD2}[μA]</td>
<td>R_{D}[MΩ]</td>
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<td>Δ-V_{DET}/ΔTopt</td>
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<td>V_{DS} = 0.5V</td>
<td>0.396</td>
<td>0.495</td>
<td>0.440</td>
<td>0.550</td>
<td>0.660</td>
<td>0.484</td>
<td>0.605</td>
<td>0.726</td>
<td>0.528</td>
<td>0.660</td>
<td>0.792</td>
</tr>
<tr>
<td>V_{DS} = 0.85V</td>
<td>0.572</td>
<td>0.715</td>
<td>0.616</td>
<td>0.770</td>
<td>0.924</td>
<td>0.660</td>
<td>0.825</td>
<td>0.990</td>
<td>0.704</td>
<td>0.880</td>
<td>1.056</td>
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<tr>
<td>V_{DS} = 1.1V</td>
<td>0.748</td>
<td>0.935</td>
<td>0.792</td>
<td>0.990</td>
<td>1.188</td>
<td>0.838</td>
<td>1.045</td>
<td>1.254</td>
<td>0.880</td>
<td>1.100</td>
<td>1.320</td>
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<tr>
<td>V_{DS} = 1.5V</td>
<td>1.056</td>
<td>1.320</td>
<td>1.100</td>
<td>1.375</td>
<td>1.660</td>
<td>1.144</td>
<td>1.430</td>
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<td>1.188</td>
<td>1.485</td>
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<tr>
<td>V_{DS} = 2.1V</td>
<td>1.232</td>
<td>1.540</td>
<td>1.276</td>
<td>1.595</td>
<td>1.914</td>
<td>1.320</td>
<td>1.650</td>
<td>1.980</td>
<td>1.364</td>
<td>1.705</td>
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<td>V_{DS} = 4.5V</td>
<td>1.408</td>
<td>1.760</td>
<td>1.452</td>
<td>1.815</td>
<td>2.178</td>
<td>1.496</td>
<td>1.870</td>
<td>2.244</td>
<td>1.540</td>
<td>1.925</td>
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<td>V_{DS} = 6.0V</td>
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<td>1.760</td>
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<td>2.640</td>
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### Minimum Operating Voltage

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<td>I_{OUT1}</td>
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<td>I_{OUT2}</td>
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<td>I_{OUT3}</td>
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<tr>
<td>Current 1</td>
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<td></td>
<td>Current 2</td>
<td></td>
<td></td>
<td>Current 3</td>
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<tr>
<td>CD pin</td>
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<tr>
<td>Threshold</td>
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<td>Voltage</td>
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### Resistance for Output Delay

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<tbody>
<tr>
<td>R_{D}[MΩ]</td>
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<td>R_{D}[MΩ]</td>
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### Detector Threshold Temperature Coefficient

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<tbody>
<tr>
<td>Δ-V_{DET}/ΔTopt [ppm/°C]</td>
<td></td>
<td></td>
<td>Δ-V_{DET}/ΔTopt [ppm/°C]</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Notes:****
- **V_{DS} = 0.5V**
- **V_{DD} = 0.85V**
- **V_{DS} = 0.85V**
- **V_{DD} = 1.5V**
OPERATION

Fig. 1 Block Diagram with an external capacitor

Fig. 2 Operation Diagram

1. Output voltage is equal to supply voltage. (As for Nch open drain type, equal to pull-up voltage.)
2. When the supply voltage is down to the detector threshold voltage level (Point A),
   \( V_{\text{ref}} = \frac{V_{\text{DD}} 	imes (R_b + R_c)}{(R_a + R_b + R_c)} \) is true, then output of the comparator is reversed from “L” to “H”, therefore
   output voltage becomes GND level.
3. When the supply voltage is lower than minimum operating voltage, the operation of output transistor is
   indefinite. In the case of Nch open drain type, output voltage is equal to pull-up voltage.
4. Output Voltage becomes GND level.
5. When the supply voltage is higher than released voltage (Point B), \( V_{\text{ref}} = \frac{V_{\text{DD}} 	imes R_b}{(R_a + R_b)} \) is true, then
   output of the comparator reaches the threshold level, and Output of Shmitt Trigger is reversed from “H” to
   “L”, then output voltage is equal to supply voltage. (As for Nch open drain type, equal to pull-up voltage.)

\( \ast \) The difference between released voltage and detector threshold voltage means hysteresis range voltage.
• Operation of Output Delay

When the supply voltage which is higher than released voltage is forced to VDD pin, charge to an external capacitor starts, then capacitor voltage increases. Until the capacitor voltage reaches to CD Pin threshold voltage, output voltage maintains "L". When the capacitor voltage becomes higher than CD pin threshold voltage, output voltage is reversed from "L" to "H". Where, the time interval between the rising edge of supply voltage and output voltage reverse point means output delay time.

• Output Delay Time

Output Delay Time (td) can be calculated with the next formula.

\[ td = 0.69 \times R_D \times C_D(s) \]

\( R_D \) is internal resistor and set at 6.5MΩ(Typ.) typically. \( C_D(F) \) describes the capacitance value of an external capacitor. Therefore,

\[ td = 0.69 \times 6.5 \times 10^6 \times C_D(s) \]
TEST CIRCUITS

*Pull-up circuit is not necessary for CMOS Output type, or R3115xxxxC.

Supply Current Test Circuit

Detector Threshold Test Circuit

Nch Driver Output Current Test Circuit

Pch Driver Output Current Test Circuit

*C* Pin Threshold Test Circuit

*C* Pin Output Current Test Circuit

Output Delay Time Test Circuit

Discontinued
TYPICAL CHARACTERISTICS

1) Supply Current vs. Input Voltage

**R3115Z091x**

- **Topt=85°C**
- **25°C**
- **-40°C**

**R3115Z131x**

- **Topt=85°C**
- **25°C**
- **-40°C**

**R3115Z271x**

- **Topt=85°C**
- **25°C**
- **-40°C**

**R3115Z451x**

- **Topt=85°C**
- **25°C**
- **-40°C**

**R3115Z501x**

- **Topt=85°C**
- **25°C**
- **-40°C**

*Discontinued*
2) Detector Threshold vs. Temperature

R3115Z091x

R3115Z131x

R3115Z271x

R3115Z451x

R3115Z501x
3) Output Voltage vs. Input Voltage

**R3115Z091x**
Nch Output Type: VDD pull up

**R3115Z091A**
5V pull up via 470kΩ

**R3115Z131x**
Nch Output Type: VDD pull up

**R3115Z131A**
5V pull up via 470kΩ

**R3115Z271x**
Nch Output Type: VDD pull up

**R3115Z271A**
5V pull up via 470kΩ

Discontinued
4) Nch Driver Output Current vs. V_DS

**R3115Z091x**

- **VDD=0.7V**
- **VDD=0.85V**
- **VDD=1.0V**

**R3115Z131x**

- **VDD=0.7V**
- **VDD=0.85V**
- **VDD=1.0V**

---

**R3115Z451x**

- **Nch Output Type: VDD pull up**

**R3115Z451A**

- **5V pull up via 470kΩ**

**R3115Z501x**

- **Nch Output Type: VDD pull up**

**R3115Z501A**

- **5V pull up via 470kΩ**
5) Nch Driver Output Current vs. Input Voltage

**R3115Z271x**

**R3115Z451x**

**R3115Z501x**

**R3115Z091x**

**R3115Z131x**
6) Pch Driver Output Current vs. Input Voltage

**R3115Z091C**

**R3115Z131C**
7) Co Pin Threshold Voltage vs. Temperature

R3115Z091x

\[ V_{DD} = 0.99 \text{V} \]

R3115Z131x

\[ V_{DD} = 1.43 \text{V} \]
**R3115Z**

**R3115Z271x**  
$V_{DD}=2.97V$

**R3115Z451x**  
$V_{DD}=4.95V$

**R3115Z501x**  
$V_{DD}=5.5V$

**8) CD Pin Output Current vs. Input Voltage**

**R3115Z091x**  
$V_{DS}=0.5V$

**R3115Z131x**  
$V_{DS}=0.5V$

Discontinued
9) Co Pin Output Current vs. Vos (Topt=25°C)

**R3115Z091x**

- VDD=0.85V
- VDD=0.7V

**R3115Z131x**

- VDD=1.0V
- VDD=0.85V
- VDD=0.7V
10) Output Delay Time vs. External Capacitance (Topt=25°C)
11) Delay Circuit Resistance vs. Temperature

R3115Zxx1x
TYPICAL APPLICATION

- R3115Zxx1A CPU Reset Circuit (Nch Open Drain Output)
  - Case 1: Input Voltage to R3115Zxx1A is equal to Input Voltage to CPU
  - Case 2: Input Voltage to R3115Zxx1A is unequal to Input Voltage to CPU

- R3115Zxx1C CPU Reset Circuit CMOS Output

- R3115Zxx1A Output Delay Time Circuit 1 (Nch Open Drain Output)
- R3115Zxx1A Output Delay Time Circuit 2 (Nch Open Drain Output)

- Memory Back-up Circuit

Discontinued
• Voltage level Indicator Circuit (lighted when the power runs out)  
(Nch Open Drain Output)

- Detector Threshold Adjustable Circuit  
(Nch Open Drain Output)

\[
\text{Adjusted Detector Threshold} = (-V_{DET}) \times \frac{(R_a + R_b)}{R_b}
\]
\[
\text{Hysteresis Voltage} = (V_{HYS}) \times \frac{(R_a + R_b)}{R_b}
\]

*) If the value of \( R_a \) is set excessively large, voltage drop may occur caused by the supply current of IC itself, and detector threshold may vary.

• Window Comparator Circuit  
(Nch Open Drain Output)

• Over-charge Preventing Circuit
When R3115Zxx1A (Nch Open Drain Output Type) is used in Figure A or Figure B, if impedance of Voltage Supply pIn, VDD and VDD of this IC is large, detector threshold level would shift by voltage dropdown caused by the consumption current of the IC itself. Released voltage may also shift and delay time for start-up might be generated by this usage.

When R3115Zxx1C (CMOS Output Type) is used in Figure A or Figure B, Output level could be unstable by cross conduction current which is generated at detector threshold level or at released voltage level, therefore, do not use R3115Zxx1C with the connection in Figure A or Figure B.

The connection in Figure C may cause the oscillation in both R3115Zxx1C (CMOS Output) and R3115Zxx1A (Nch Open Drain Output), therefore do not use R3115Zxx1x Series with the connection in Figure C.
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Ricoh completed the organization of the Lead-free production for all of our products. After Apr. 1, 2006, we will ship out the lead free products only. Thus, all products that will be shipped from now on comply with RoHS Directive.

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