OUTLINE

The RP102x Series are CMOS-based voltage regulator ICs with high output voltage accuracy, extremely low supply current, low ON-resistance, and high ripple rejection. Each of these ICs consists of a voltage reference unit, an error amplifier, a resistor-net for voltage setting, a current limit circuit and a chip enable circuit.

These ICs perform with low dropout voltage and "chip enable" function. The line transient response and load transient response of the RP102x Series are excellent, thus these ICs are very suitable for the power supply for hand-held communication equipment.

The output voltage of these ICs is fixed with high accuracy. Since the packages for these ICs are SOT-23-5, DFN(PLP)1820-6, and WLCSP-4-P2, therefore high density mounting of the ICs on boards is possible.

FEATURES

- Supply Current ...................................................... Typ. 50μA
- Standby Mode .......................................................... Typ. 0.1μA
- Dropout Voltage ...................................................... Typ. 0.12V (IOUT=300mA, VOUT=2.8V)
- Ripple Rejection .................................................... Typ. 80dB (f=1kHz)
- Temperature-Drift Coefficient of Output Voltage... Typ. ±20ppm/°C
- Line Regulation ....................................................... Typ. 0.02%/V
- Output Voltage Accuracy........................................ Typ. ±0.8%
- Packages .............................................................. WLCSP-4-P2, DFN(PLP)1820-6, SOT-23-5
- Input Voltage Range ............................................. 1.7V to 5.25V
- Output Voltage Range............................................. 1.2V to 3.3V (0.1V steps)
  (For other voltages, please refer to MARK INFORMATIONS.)
- Built-in Fold Back Protection Circuit ................. Typ. 50mA (Current at short mode)
- Ceramic capacitors are recommended to be used with this IC ...... Cin=Cout=1μF or more

APPLICATIONS

- Power source for portable communication equipment.
- Power source for electrical appliances such as cameras, VCRs and camcorders.
- Power source for battery-powered equipment.
**BLOCK DIAGRAMS**

![RP102xxx1B Block Diagram](image1)

![RP102xxx1D Block Diagram](image2)

**SELECTION GUIDE**

The output voltage, auto discharge function, package, and the taping type, etc. for the ICs can be selected at the user’s request.

<table>
<thead>
<tr>
<th>Product Name</th>
<th>Package</th>
<th>Quantity per Reel</th>
<th>Pb Free</th>
<th>Halogen Free</th>
</tr>
</thead>
<tbody>
<tr>
<td>RP102Zxx1*-TR-F</td>
<td>WLCSP-4-P2</td>
<td>5,000 pcs</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>RP102Kxx1*-TR</td>
<td>DFN(PLP)1820-6</td>
<td>5,000 pcs</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>RP102Nxx1*-TR-FE</td>
<td>SOT-23-5</td>
<td>3,000 pcs</td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>

xx: The output voltage can be designated in the range from 1.2V(12) to 3.3V(33) in 0.1V steps.
(For other voltages, please refer to MARK INFORMATIONS.)

- CE pin polarity and auto discharge function at off state are options as follows.
  - (B) "H" active, without auto discharge function at off state
  - (D) "H" active, with auto discharge function at off state
PIN CONFIGURATIONS

- **WLCSP-4-P2**
  - Mark Side
  - Bump Side
  - Top View
  - Bottom View

- **DFN(PLP)1820-6**
  - Top View
  - Bottom View

- **SOT-23-5**

PIN DESCRIPTION

- **WLCSP-4-P2**

<table>
<thead>
<tr>
<th>Pin No</th>
<th>Symbol</th>
<th>Pin Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>A1</td>
<td>VDD</td>
<td>Input Pin</td>
</tr>
<tr>
<td>A2</td>
<td>VOUT</td>
<td>Output Pin</td>
</tr>
<tr>
<td>B1</td>
<td>CE</td>
<td>Chip Enable Pin (“H” Active)</td>
</tr>
<tr>
<td>B2</td>
<td>GND</td>
<td>Ground Pin</td>
</tr>
</tbody>
</table>

- **DFN(PLP)1820-6**

<table>
<thead>
<tr>
<th>Pin No</th>
<th>Symbol</th>
<th>Pin Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>VOUT</td>
<td>Output Pin (^*2)</td>
</tr>
<tr>
<td>2</td>
<td>VOUT</td>
<td>Output Pin (^*2)</td>
</tr>
<tr>
<td>3</td>
<td>GND</td>
<td>Ground Pin</td>
</tr>
<tr>
<td>4</td>
<td>CE</td>
<td>Chip Enable Pin (“H” Active)</td>
</tr>
<tr>
<td>5</td>
<td>VDD</td>
<td>Input Pin (^*2)</td>
</tr>
<tr>
<td>6</td>
<td>VDD</td>
<td>Input Pin (^*2)</td>
</tr>
</tbody>
</table>

\(^*1\) Tab is GND level. (They are connected to the reverse side of this IC.)

The tab is better to be connected to the GND, but leaving it open is also acceptable.

\(^*2\) No.1 pin and No.2 pin, No.5 pin and No.6 pin of DFN(PLP)1820-6 package must be wired when it is mounted on board.

- **SOT-23-5**

<table>
<thead>
<tr>
<th>Pin No</th>
<th>Symbol</th>
<th>Pin Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>VDD</td>
<td>Input Pin</td>
</tr>
<tr>
<td>2</td>
<td>GND</td>
<td>Ground Pin</td>
</tr>
<tr>
<td>3</td>
<td>CE</td>
<td>Chip Enable Pin (“H” Active)</td>
</tr>
<tr>
<td>4</td>
<td>NC</td>
<td>No Connection</td>
</tr>
<tr>
<td>5</td>
<td>VOUT</td>
<td>Output Pin</td>
</tr>
</tbody>
</table>
ABSOLUTE MAXIMUM RATINGS

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Item</th>
<th>Rating</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>VIN</td>
<td>Input Voltage</td>
<td>6.0</td>
<td>V</td>
</tr>
<tr>
<td>VCE</td>
<td>Input Voltage (CE Pin)</td>
<td>6.0</td>
<td>V</td>
</tr>
<tr>
<td>VOUT</td>
<td>Output Voltage</td>
<td>–0.3 to VIN+0.3</td>
<td>V</td>
</tr>
<tr>
<td>IOUT</td>
<td>Output Current</td>
<td>400</td>
<td>mA</td>
</tr>
<tr>
<td>PD</td>
<td>Power Dissipation (WLCSP-4-P2) *</td>
<td>530</td>
<td>mW</td>
</tr>
<tr>
<td></td>
<td>Power Dissipation (SOT-23-5) *</td>
<td>420</td>
<td>mW</td>
</tr>
<tr>
<td></td>
<td>Power Dissipation (DFN(PLP)1820-6) *</td>
<td>880</td>
<td>mW</td>
</tr>
<tr>
<td>T_{opt}</td>
<td>Operating Temperature Range</td>
<td>–40 to 85</td>
<td>°C</td>
</tr>
<tr>
<td>T_{stg}</td>
<td>Storage Temperature Range</td>
<td>–55 to 125</td>
<td>°C</td>
</tr>
</tbody>
</table>

*) For Power Dissipation, please refer to PACKAGE INFORMATION.

ABSOLUTE MAXIMUM RATINGS

Electronic and mechanical stress momentarily exceeded absolute maximum ratings may cause the permanent damages and may degrade the life time and safety for both device and system using the device in the field.
The functional operation at or over these absolute maximum ratings is not assured.

RECOMMENDED OPERATING CONDITIONS (ELECTRICAL CHARACTERISTICS)

All of electronic equipment should be designed that the mounted semiconductor devices operate within the recommended operating conditions. The semiconductor devices cannot operate normally over the recommended operating conditions, even if when they are used over such conditions by momentary electronic noise or surge.
And the semiconductor devices may receive serious damage when they continue to operate over the recommended operating conditions.
ELECTRICAL CHARACTERISTICS

- **RP102xxx1B/D**
  
  \( V_{\text{IN}} = \text{Set } V_{\text{OUT}} + 1\text{V for } V_{\text{OUT}} \text{ options greater than } 1.5\text{V. } V_{\text{IN}} = 2.5\text{V for } V_{\text{OUT}} \leq 1.5\text{V.} \)
  
  \( I_{\text{OUT}} = 1\text{mA, } C_{\text{IN}} = C_{\text{OUT}} = 1\mu\text{F, unless otherwise noted.} \)

- **Topt=25°C**

### Electrical Characteristics by Output Voltage

<table>
<thead>
<tr>
<th>Output Voltage ( V_{\text{OUT}} \text{ (V)} )</th>
<th>Dropout Voltage ( V_{\text{DIFF}} \text{ (V)} )</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.2V ( \leq V_{\text{OUT}} &lt; 1.5\text{V} )</td>
<td>0.145</td>
</tr>
<tr>
<td>1.5V ( \leq V_{\text{OUT}} &lt; 1.7\text{V} )</td>
<td>0.110</td>
</tr>
<tr>
<td>1.7V ( \leq V_{\text{OUT}} &lt; 2.0\text{V} )</td>
<td>0.100</td>
</tr>
<tr>
<td>2.0V ( \leq V_{\text{OUT}} &lt; 2.5\text{V} )</td>
<td>0.085</td>
</tr>
<tr>
<td>2.5V ( \leq V_{\text{OUT}} &lt; 2.8\text{V} )</td>
<td>0.070</td>
</tr>
<tr>
<td>2.8V ( \leq V_{\text{OUT}} \leq 3.3\text{V} )</td>
<td>0.060</td>
</tr>
</tbody>
</table>

**Note:** The maximum Input Voltage of the ELECTRICAL CHARACTERISTICS is 5.25V. In case of exceeding this specification, the IC must be operated on condition that the Input Voltage is up to 5.5V and the total operating time is within 500hrs.
TYPICAL APPLICATION

![Diagram of RP102x Series](image)

(External Components)

C2 1.0µF  MURATA: GRM155B31A105KE15

TECHNICAL NOTES

When using these ICs, consider the following points:

Phase Compensation

In these ICs, phase compensation is made for securing stable operation even if the load current is varied. For this purpose, use a capacitor C2 with good frequency characteristics and ESR (Equivalent Series Resistance). (Note: If additional ceramic capacitors are connected with parallel to the output pin with an output capacitor for phase compensation, the operation might be unstable. Because of this, test these ICs with as same external components as ones to be used on the PCB.)

PCB Layout

Make VDD and GND lines sufficient. If their impedance is high, noise pickup or unstable operation may result. Connect a capacitor C1 with a capacitance value as much as 1.0µF or more between VDD and GND pin, and as close as possible to the pins.

Set external components, especially the output capacitor C2, as close as possible to the ICs, and make wiring as short as possible.
TEST CIRCUITS

Basic Test Circuit

Test Circuit for Supply Current

Test Circuit for Ripple Rejection

Test Circuit for Load Transient Response
TYPICAL CHARACTERISTIC

1) Output Voltage vs. Output Current (C\text{IN}=1.0\mu F, C\text{OUT}=1.0\mu F, T\text{opt}=25^\circ C)

![Graph of Output Voltage vs. Output Current (C\text{IN}=1.0\mu F, C\text{OUT}=1.0\mu F, T\text{opt}=25^\circ C)]

2) Output Voltage vs. Input Voltage (C\text{IN}=1.0\mu F, C\text{OUT}=1.0\mu F, T\text{opt}=25^\circ C)

![Graph of Output Voltage vs. Input Voltage (C\text{IN}=1.0\mu F, C\text{OUT}=1.0\mu F, T\text{opt}=25^\circ C)]
3) Supply Current vs. Input Voltage ($C_{\text{IN}}=1.0\mu F$, $C_{\text{OUT}}=1.0\mu F$, $T_{\text{opt}}=25^\circ C$)

![Graph showing supply current vs. input voltage for RP102x331x, RP102x121x, and RP102x251x.]
4) Output Voltage vs. Temperature \( (C_{IN}=1.0 \mu F, C_{OUT}=1.0 \mu F, I_{OUT}=1mA) \)

**RP102x121x**

![Output Voltage vs. Temperature (VIN=2.2V)](image1)

**RP102x251x**

![Output Voltage vs. Temperature (VIN=3.5V)](image2)

**RP102x331x**

![Output Voltage vs. Temperature (VIN=4.3V)](image3)

5) Supply Current vs. Temperature \( (C_{IN}=1.0 \mu F, C_{OUT}=1.0 \mu F, I_{OUT}=0mA) \)

**RP102x121x**

![Supply Current vs. Temperature (VIN=2.2V)](image4)

**RP102x251x**

![Supply Current vs. Temperature (VIN=3.5V)](image5)
6) Dropout Voltage vs. Output Current (C_{in}=1.0\mu F, C_{out}=1.0\mu F)
7) Dropout Voltage vs Set Output Voltage ($C_{IN}=1.0\mu F$, $C_{OUT}=1.0\mu F$, $T_{opt}=25^\circ C$)

![Graph showing Dropout Voltage vs Set Output Voltage](image)

8) Ripple Rejection vs. Input Bias Voltage ($C_{IN}=\text{none}$, $C_{OUT}=1.0\mu F$, Ripple=0.2Vp-p, $T_{opt}=25^\circ C$)

RP102x121x

![Graph showing Ripple Rejection vs. Input Voltage](image)

RP102x281x

![Graph showing Ripple Rejection vs. Input Voltage](image)
9) Ripple Rejection vs. Frequency \( (C_{IN}=1.0\mu F, C_{OUT}=1.0\mu F, \text{Ripple}=0.2V_{p-p}) \)

**RP102x121x**

- \( V_{IN}=2.2V \)
- Ripple Rejection (dB)
- Frequency \( f \) (kHz)

**RP102x251x**

- \( V_{IN}=3.5V \)
- Ripple Rejection (dB)
- Frequency \( f \) (kHz)

**RP102x331x**

- \( V_{IN}=4.3V \)
- Ripple Rejection (dB)
- Frequency \( f \) (kHz)

**RP102x121x**

- \( V_{IN}=2.2V \)
- Ripple Rejection (dB)
- Frequency \( f \) (kHz)

**RP102x251x**

- \( V_{IN}=3.5V \)
- Ripple Rejection (dB)
- Frequency \( f \) (kHz)
10) Input Transient Response ($C_{in}=\text{none}$, $C_{out}=1.0\mu\text{F}$, $I_{out}=30\text{mA}$, $t_{r}=t_{f}=5\mu\text{s}$, $T_{opt}=25^\circ\text{C}$)

**RP102x121x**

**RP102x251x**

**RP102x331x**
11) Load Transient Response \((C_{\text{OUT}}=1.0\mu\text{F}, T_{\text{OPT}}=25^\circ\text{C})\)

**RP102x121x**

\begin{align*}
\text{Input Voltage} & = 2.2\text{V} \\
\text{Output Current} & = 50\text{mA} \rightarrow 100\text{mA} \\
\text{Output Voltage} & = 1.17 \rightarrow 1.20 \\
\text{Time} & = 0 \rightarrow 100 \mu\text{s}
\end{align*}

**RP102x251x**

\begin{align*}
\text{Input Voltage} & = 3.5\text{V} \\
\text{Output Current} & = 50\text{mA} \rightarrow 100\text{mA} \\
\text{Output Voltage} & = 2.47 \rightarrow 2.50 \\
\text{Time} & = 0 \rightarrow 100 \mu\text{s}
\end{align*}

**RP102x331x**

\begin{align*}
\text{Input Voltage} & = 3.5\text{V} \\
\text{Output Current} & = 50\text{mA} \rightarrow 100\text{mA} \\
\text{Output Voltage} & = 3.27 \rightarrow 3.30 \\
\text{Time} & = 0 \rightarrow 100 \mu\text{s}
\end{align*}

**RP102x121x**

\begin{align*}
\text{Input Voltage} & = 2.2\text{V} \\
\text{Output Current} & = 1\text{mA} \rightarrow 150\text{mA} \\
\text{Output Voltage} & = 1.10 \rightarrow 1.20 \\
\text{Time} & = 0 \rightarrow 100 \mu\text{s}
\end{align*}

**RP102x251x**

\begin{align*}
\text{Input Voltage} & = 3.5\text{V} \\
\text{Output Current} & = 1\text{mA} \rightarrow 150\text{mA} \\
\text{Output Voltage} & = 2.40 \rightarrow 2.50 \\
\text{Time} & = 0 \rightarrow 100 \mu\text{s}
\end{align*}
12) Turn On Speed with CE pin \((C_{IN}=1.0\mu F, C_{OUT}=1.0\mu F, T_{opt}=25^\circ C)\)

\begin{align*}
\text{RP102x121x} & \\
\text{RP102x121x} & \\
\text{RP102x121x}
\end{align*}
13) Turn OFF Speed with CE pin (D Version) ($C_{IN}=1.0 \mu F$, $C_{OUT}=1.0 \mu F$, $T_{opt}=25^\circ C$)
I\textsubscript{OUT}=300\text{mA}
ESR vs. Output Current

When using these ICs, consider the following points:

The relations between \( I_{\text{OUT}} \) (Output Current) and ESR of an output capacitor are shown below. The conditions when the white noise level is under 40\( \mu V \) (Avg.) are marked as the hatched area in the graph.

Measurement conditions
- Frequency Band: 10Hz to 2MHz
- Temperature: \(-40°C\) to \(85°C\)
PACKAGE INFORMATION

Power Dissipation (WLCSP-4-P2)

This specification is at mounted on board. Power Dissipation (Pd) depends on conditions of mounting on board. This specification is based on the measurement at the condition below:

### Measurement Conditions

<table>
<thead>
<tr>
<th>Standard Land Pattern</th>
<th>Environment</th>
<th>Mounting on Board (Wind velocity=0m/s)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Board Material</td>
<td>Glass cloth epoxy plastic (Double-sided)</td>
</tr>
<tr>
<td></td>
<td>Board Dimensions</td>
<td>40mm x 40mm x 1.6mm</td>
</tr>
<tr>
<td></td>
<td>Copper Ratio</td>
<td>Top side: Approx. 50%, Back side: Approx. 50%</td>
</tr>
<tr>
<td></td>
<td>Through-hole</td>
<td>φ0.5mm x 4pcs</td>
</tr>
</tbody>
</table>

### Measurement Result (Ta=25°C)

<table>
<thead>
<tr>
<th>Standard Land Pattern</th>
<th>Power Dissipation</th>
<th>Thermal Resistance</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>530mW (Tjmax=125°C)</td>
<td>$\theta_{ja}=(125-25°C)/0.53W=189^\circ C/W$</td>
</tr>
<tr>
<td></td>
<td>662mW (Tjmax=150°C)</td>
<td></td>
</tr>
</tbody>
</table>

The above graph shows the Power Dissipation of the package based on Tjmax=125°C and Tjmax=150°C. Operating the IC in the shaded area in the graph might have an influence on its lifetime. Operating time must be within the time limit described in the table below, in case of operating in the shaded area.

<table>
<thead>
<tr>
<th>Operating Time (Operating 4 hours/day)</th>
<th>Estimated years</th>
</tr>
</thead>
<tbody>
<tr>
<td>13,000 hours</td>
<td>9 years</td>
</tr>
</tbody>
</table>
Package Dimensions (WLCSP-4-P2)

Mark Specifications (WLCSP-4-P2)

①②: Lot Number … Alphanumeric Serial Number
**Power Dissipation (DFN(PLP)1820-6)**

This specification is at mounted on board. Power Dissipation (Pd) depends on conditions of mounting on board. This specification is based on the measurement at the condition below:

### Measurement Conditions

<table>
<thead>
<tr>
<th></th>
<th><strong>Standard Land Pattern</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Environment</td>
<td>Mounting on Board (Wind velocity=0m/s)</td>
</tr>
<tr>
<td>Board Material</td>
<td>Glass cloth epoxy plastic (Double-sided)</td>
</tr>
<tr>
<td>Board Dimensions</td>
<td>40mm x 40mm x 1.6mm</td>
</tr>
<tr>
<td>Copper Ratio</td>
<td>Top side: Approx. 50%, Back side: Approx. 50%</td>
</tr>
<tr>
<td>Through-hole</td>
<td>φ0.54mm x 30pcs</td>
</tr>
</tbody>
</table>

### Measurement Result (Ta=25°C)

<table>
<thead>
<tr>
<th></th>
<th><strong>Standard Land Pattern</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Power Dissipation</td>
<td>880mW(Tjmax=125°C)</td>
</tr>
<tr>
<td></td>
<td>1100mW(Tjmax=150°C)</td>
</tr>
<tr>
<td>Thermal Resistance</td>
<td>θja=(125-25°C)/0.88W=114°C/W</td>
</tr>
</tbody>
</table>

The above graph shows the Power Dissipation of the package based on Tjmax=125°C and Tjmax=150°C. Operating the IC in the shaded area in the graph might have an influence on its lifetime.

Operating time must be within the time limit described in the table below, in case of operating in the shaded area.

<table>
<thead>
<tr>
<th>Operating Time (Operating 4 hours/day)</th>
<th>Estimated years</th>
</tr>
</thead>
<tbody>
<tr>
<td>13,000 hours</td>
<td>9 years</td>
</tr>
</tbody>
</table>
Package Dimensions (DFN(PLP)1820-6)

Mark Specifications (DFN(PLP)1820-6)

①②③④: Product Code … Refer to “RP102K Series Mark Specification Table”.
⑤⑥: Lot Number … Alphanumeric Serial Number
## RP102K Series Mark Specification Table

PKG: DFN(PLP)1820-6

<table>
<thead>
<tr>
<th>Part Number</th>
<th>①</th>
<th>②</th>
<th>③</th>
<th>④</th>
<th>Vset</th>
</tr>
</thead>
<tbody>
<tr>
<td>RP102K121B</td>
<td>AC01</td>
<td>1.2V</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>RP102K131B</td>
<td>AC02</td>
<td>1.3V</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>RP102K151B</td>
<td>AC03</td>
<td>1.5V</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>RP102K181B</td>
<td>AC04</td>
<td>1.8V</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>RP102K251B</td>
<td>AC05</td>
<td>2.5V</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>RP102K261B</td>
<td>AC06</td>
<td>2.6V</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>RP102K281B</td>
<td>AC07</td>
<td>2.8V</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>RP102K291B5</td>
<td>AC08</td>
<td>2.85V</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>RP102K301B</td>
<td>AC10</td>
<td>3.0V</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>RP102K331B</td>
<td>AC11</td>
<td>3.3V</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>RP102K181B5</td>
<td>AC12</td>
<td>1.85V</td>
<td></td>
<td></td>
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Power Dissipation (SOT-23-5)

This specification is at mounted on board. Power Dissipation (P_D) depends on conditions of mounting on board. This specification is based on the measurement at the condition below:

(Power Dissipation (SOT-23-5) is substitution of SOT-23-6.)

Measurement Conditions

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<td>Copper Ratio</td>
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<td>Through-holes</td>
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Measurement Result (T_a=25°C)

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<th>Standard Test Land Pattern</th>
<th>Free Air</th>
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<tr>
<td>Power Dissipation</td>
<td>420mW(T_jmax=125°C)</td>
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<td>525mW(T_jmax=150°C)</td>
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<tr>
<td>Thermal Resistance</td>
<td>θja = (125-25°C)/0.42W = 263°C/W</td>
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The above graph shows the Power Dissipation of the package based on T_jmax=125°C and T_jmax=150°C. Operating the IC in the shaded area in the graph might have an influence it's lifetime. Operating time must be within the time limit described in the table below, in case of operating in the shaded area.

<table>
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<tr>
<th>Operating Time</th>
<th>Estimated years</th>
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<td>2,300 hours</td>
<td>1.5 years</td>
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RP102x
NO.EA-141-160705

Package Dimensions (SOT-23-5)

Mark Specifications (SOT-23-5)

①②③: Product Code … Refer to “RP102N Series Mark Specification Table”.
④⑤: Lot Number … Alphanumeric Serial Number
## RP102N Series Mark Specification Table

**PKG: SOT-23-5**

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