The R5323x Series are CMOS-based voltage regulator ICs with high output voltage accuracy, low supply current, low dropout, and high ripple rejection. Each of these voltage regulator ICs consists of a voltage reference unit, an error amplifier, resistors for setting Output Voltage, a current limit circuit, and a chip enable circuit.

These ICs perform with low dropout voltage due to built-in transistor with low ON resistance, and a chip enable function prolongs the battery life of each system. The line transient response and load transient response of the R5323x 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 internally fixed with high accuracy. Since the packages for these ICs are SOT-23-6, DFN(PLP)1820-6 and WLCSP-6-P1 package, dual LDO regulators are included in each package, high density mounting of the ICs on boards is possible.

**FEATURES**

- Supply Current ......................................................... Typ. 90μA (VR1, VR2)
- Standby Mode .......................................................... Typ. 0.1μA (VR1, VR2)
- Dropout Voltage ....................................................... Typ. 0.22V (IOUT=150mA, VOUT=3.0V)
- Ripple Rejection ....................................................... Typ.75dB(VOUT ≤ 2.4V), Typ.70dB(VOUT ≥ 2.5V), (f=1kHz)
  Typ.65dB(VOUT ≤ 2.4V), Typ.60dB(VOUT ≥ 2.5V), (f=10kHz)
- Input Voltage Range ................................................ 2.0V to 6.0V
- Output Voltage Range .............................................. 1.5V to 4.0V (0.1V steps)
  (For details, please refer to MARK INFORMATIONS.)
- Output Voltage Accuracy......................................... ±2.0%
- Temperature-drift Coefficient of Output Voltage..... Typ. ±100ppm/°C
- Line Regulation .................................................. Typ.0.02%/V
- Built-in fold-back protection circuit..................... Typ. 40mA (Current at short mode)
- Packages ......................................................... WLCSP-6-P1, DFN(PLP)1820-6, SOT-23-6
- Ceramic Capacitor is recommended..................... 1.0μF or more
- Built-in chip enable circuit (A/B: active high)

**APPLICATIONS**

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

R5323xxxxA

CE1

Error Amp.

Vref

Current Limit

R1_1

R2_1

GND

VOUT1

R5323xxxxB

CE1

Error Amp.

Vref

Current Limit

R1_1

R2_1

GND

VOUT1

CE2

VDD

GND

VOUT2

CE2

VDD

GND

VOUT2

Limited Product
SELECTION GUIDE

The output voltage, auto discharge function, package, 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>R5323Zxxx+-TR-F</td>
<td>WLCSP-6-P1</td>
<td>3,000 pcs</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>R5323Kxxx+-TR</td>
<td>DFN(PLP)1820-6</td>
<td>3,000 pcs</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>R5323Nxxx+-TR-FE</td>
<td>SOT-23-6</td>
<td>3,000 pcs</td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>

xxx : The combination of output voltage for each channel can be designated by serial numbers. (from 001)
   The output voltage for each channel can be set in the range from 1.5V to 4.0V in 0.1V steps.
   (For details, please refer to MARK INFORMATIONS.)

*: The auto discharge function at off state are options as follows.
   (A) without auto discharge function at off state
   (B) with auto discharge function at off state
PIN CONFIGURATION

- WLCSP-6-P1
- DFN (PLP) 1820-6
- SOT-23-6

PIN DESCRIPTIONS

- WLCSP-6-P1

<table>
<thead>
<tr>
<th>Pin No</th>
<th>Symbol</th>
<th>Pin Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>VOUT1</td>
<td>Output Pin 1</td>
</tr>
<tr>
<td>2</td>
<td>VDD</td>
<td>Input Pin</td>
</tr>
<tr>
<td>3</td>
<td>VOUT2</td>
<td>Output Pin 2</td>
</tr>
<tr>
<td>4</td>
<td>CE2</td>
<td>Chip Enable Pin 2 (&quot;H&quot; Active)</td>
</tr>
<tr>
<td>5</td>
<td>GND</td>
<td>Ground Pin</td>
</tr>
<tr>
<td>6</td>
<td>CE1</td>
<td>Chip Enable Pin 1 (&quot;H&quot; Active)</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>VOUT2</td>
<td>Output Pin 2</td>
</tr>
<tr>
<td>2</td>
<td>VDD</td>
<td>Input Pin</td>
</tr>
<tr>
<td>3</td>
<td>VOUT1</td>
<td>Output Pin 1</td>
</tr>
<tr>
<td>4</td>
<td>GND</td>
<td>Ground Pin</td>
</tr>
<tr>
<td>5</td>
<td>CE1</td>
<td>Chip Enable Pin 1 (&quot;H&quot; Active)</td>
</tr>
<tr>
<td>6</td>
<td>CE2</td>
<td>Chip Enable Pin 2 (&quot;H&quot; Active)</td>
</tr>
</tbody>
</table>

*) パッケージ裏面のタブの電位は基板電位(GND)です。
GND端子と接続する(推奨)か、オープンとしてください。
SOT-23-6

<table>
<thead>
<tr>
<th>Pin No</th>
<th>Symbol</th>
<th>Pin Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>$V_{OUT1}$</td>
<td>Output Pin 1</td>
</tr>
<tr>
<td>2</td>
<td>$V_{DD}$</td>
<td>Input Pin</td>
</tr>
<tr>
<td>3</td>
<td>$V_{OUT2}$</td>
<td>Output Pin 2</td>
</tr>
<tr>
<td>4</td>
<td>CE2</td>
<td>Chip Enable Pin 2 (&quot;H&quot; Active)</td>
</tr>
<tr>
<td>5</td>
<td>GND</td>
<td>Ground Pin</td>
</tr>
<tr>
<td>6</td>
<td>CE1</td>
<td>Chip Enable Pin 1 (&quot;H&quot; Active)</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>$V_{IN}$</td>
<td>Input Voltage</td>
<td>6.5</td>
<td>V</td>
</tr>
<tr>
<td>$V_{CE}$</td>
<td>Input Voltage (CE Pin)</td>
<td>−0.3 to 6.5</td>
<td>V</td>
</tr>
<tr>
<td>$V_{OUT}$</td>
<td>Output Voltage</td>
<td>−0.3 to $V_{IN}$ + 0.3</td>
<td>V</td>
</tr>
<tr>
<td>$I_{OUT1}$</td>
<td>Output Current 1</td>
<td>200</td>
<td>mA</td>
</tr>
<tr>
<td>$I_{OUT2}$</td>
<td>Output Current 2</td>
<td>200</td>
<td>mA</td>
</tr>
<tr>
<td>$P_D$</td>
<td>Power Dissipation (WLCSP-6-P1)</td>
<td>633</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></td>
<td>Power Dissipation (SOT-23-6) *</td>
<td>420</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

- **R5323xxxxA/B**

<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_{OUT} )</td>
<td>Output voltage</td>
<td>( V_{IN}-V_{OUT}=1.0 ) V</td>
<td>( 1 ) mA ( \leq I_{OUT} \leq 30 ) mA</td>
<td>( \times 0.98 )</td>
<td>( \times 1.02 )</td>
<td>V</td>
</tr>
<tr>
<td>( I_{OUT} )</td>
<td>Output Current</td>
<td>( V_{IN}-V_{OUT}=1.0 ) V</td>
<td>150</td>
<td></td>
<td></td>
<td>mA</td>
</tr>
<tr>
<td>( \Delta V_{OUT}/\Delta I_{OUT} )</td>
<td>Load regulation</td>
<td>( V_{IN}=\text{Set} V_{OUT}+1 ) V</td>
<td>15</td>
<td>40</td>
<td></td>
<td>mV</td>
</tr>
<tr>
<td>( V_{DF} )</td>
<td>Dropout Voltage</td>
<td>( I_{OUT}=150 ) mA</td>
<td></td>
<td></td>
<td></td>
<td>V</td>
</tr>
<tr>
<td>( I_{SS} )</td>
<td>Supply Current</td>
<td>( V_{IN}-V_{OUT}=1.0 ) V</td>
<td>90</td>
<td>120</td>
<td></td>
<td>( \mu ) A</td>
</tr>
<tr>
<td>( I_{standby} )</td>
<td>Standby Current</td>
<td>( V_{IN}-V_{OUT}=1.0 ) V</td>
<td>0.1</td>
<td>1.0</td>
<td></td>
<td>( \mu ) A</td>
</tr>
<tr>
<td>( \Delta V_{OUT}/\Delta V_{IN} )</td>
<td>Line regulation</td>
<td>( \text{Set} V_{OUT}+0.5 ) V ( \leq V_{IN} \leq 6.0 ) V</td>
<td>0.02</td>
<td>0.10</td>
<td></td>
<td>%/V</td>
</tr>
<tr>
<td>( R_{RR} )</td>
<td>Ripple Rejection</td>
<td>Ripple ( 0.5 ) Vp-p</td>
<td></td>
<td></td>
<td></td>
<td>dB</td>
</tr>
<tr>
<td>( V_{IN} )</td>
<td>Input Voltage</td>
<td>( I_{OUT}=30 ) mA</td>
<td></td>
<td></td>
<td></td>
<td>V</td>
</tr>
<tr>
<td>( \Delta V_{OUT}/\Delta T_{opt} )</td>
<td>Output Voltage Temperature Coefficient</td>
<td>( I_{OUT}=30 ) mA</td>
<td></td>
<td></td>
<td>( \pm 100 )</td>
<td>ppm /°C</td>
</tr>
<tr>
<td>( I_{SC} )</td>
<td>Short Current Limit</td>
<td>( V_{OUT}=0 ) V</td>
<td>40</td>
<td></td>
<td></td>
<td>mA</td>
</tr>
<tr>
<td>( R_{PD} )</td>
<td>Pull-down resistance for CE pin</td>
<td>( V_{OUT}=0 ) V</td>
<td>0.7</td>
<td>2.0</td>
<td>8.0</td>
<td>MΩ</td>
</tr>
<tr>
<td>( V_{CEH} )</td>
<td>CE Input Voltage “H”</td>
<td></td>
<td>1.5</td>
<td>6.0</td>
<td></td>
<td>V</td>
</tr>
<tr>
<td>( V_{CEL} )</td>
<td>CE Input Voltage “L”</td>
<td></td>
<td>0</td>
<td>0.3</td>
<td></td>
<td>V</td>
</tr>
<tr>
<td>( \text{en} )</td>
<td>Output Noise</td>
<td>( BW=10 ) Hz to 100kHz</td>
<td>30</td>
<td></td>
<td></td>
<td>( \mu V_{rms} )</td>
</tr>
<tr>
<td>( R_{LOW} )</td>
<td>Low Output Nch Tr. ON Resistance</td>
<td>( V_{CE}=0 ) V</td>
<td>60</td>
<td></td>
<td></td>
<td>( \Omega )</td>
</tr>
</tbody>
</table>

- **Note1:** \( f=1 \) kHz, 70dB as to \( V_{OUT} \geq 2.5 \) V Output type.
- **Note2:** \( f=10 \) kHz, 60dB as to \( V_{OUT} \geq 2.5 \) V Output type.
TYPICAL APPLICATION

![Diagram showing R5323x Series with components IN, OUT1, OUT2, VDD, GND, C1, C2, C3, Vout1, Vout2, CE1, CE2, and a circuit with connections for typical application.]

C1=C2=C3=Ceramic 1.0μF

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 and C3 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 and C3, as close as possible to the ICs, and make wiring as short as possible.
TEST CIRCUIT

Fig.1 Standard test Circuit

C1=C2=C3=Ceramic 1.0μF

Fig.2 Supply Current Test Circuit

C1=C2=C3=Ceramic 1.0μF

Fig.3 Ripple Rejection, Line Transient Response Test Circuit

C2=C3=Ceramic 1.0μF

Fig.4 Load Transient Response Test Circuit

C1=C2=C3=Ceramic 1.0μF
TYPICAL CHARACTERISTICS

1) Output Voltage vs. Output Current (Topt=25°C)

**1.5V (VR1)**

- **VIN=1.8V**
- **VIN=2.0V**
- **VIN=2.5V**

**1.5V (VR2)**

- **VIN=1.8V**
- **VIN=2.0V**
- **VIN=2.5V**

**2.8V (VR1)**

- **VIN=3.1V**
- **VIN=4.8V**

**2.8V (VR2)**

- **VIN=3.1V**
- **VIN=4.8V**

**4.0V (VR1)**

- **VIN=4.3V**
- **VIN=6.0V**

**4.0V (VR2)**

- **VIN=4.3V**
- **VIN=6.0V**
2) Output Voltage vs. Input Voltage (Topt=25°C)

1.5V (VR1)

1.5V (VR2)

2.8V (VR1)

2.8V (VR2)

4.0V (VR1)

4.0V (VR2)
3) Dropout Voltage vs. Output Current

- **1.5V (VR1)**

- **1.5V (VR2)**

- **2.8V (VR1)**

- **2.8V (VR2)**

- **4.0V (VR1)**

- **4.0V (VR2)**

Output Current $I_{OUT}(mA)$ vs. Dropout Voltage $V_{DIF}(V)$ for different temperatures ($Topt=85^\circ C$, $25^\circ C$, $-40^\circ C$).
4) Output Voltage vs. Temperature

**1.5V (VR1)**

- $V_{IN}=2.5\text{V}$, $I_{OUT}=30\text{mA}$
- Output Voltage ($V_{OUT}$): 1.54, 1.53, 1.52, 1.51, 1.50, 1.49, 1.48, 1.47

**2.8V (VR1)**

- $V_{IN}=3.8\text{V}$, $I_{OUT}=30\text{mA}$
- Output Voltage ($V_{OUT}$): 2.86, 2.84, 2.82, 2.80, 2.78, 2.76, 2.74

**4.0V (VR1)**

- $V_{IN}=5.0\text{V}$, $I_{OUT}=30\text{mA}$
- Output Voltage ($V_{OUT}$): 4.08, 4.06, 4.04, 4.02, 4.00, 3.98, 3.96, 3.94

**1.5V (VR2)**

- $V_{IN}=2.5\text{V}$, $I_{OUT}=30\text{mA}$
- Output Voltage ($V_{OUT}$): 1.54, 1.53, 1.52, 1.51, 1.50, 1.49, 1.48, 1.47

**2.8V (VR2)**

- $V_{IN}=3.8\text{V}$, $I_{OUT}=30\text{mA}$
- Output Voltage ($V_{OUT}$): 2.86, 2.84, 2.82, 2.80, 2.78, 2.76, 2.74

**4.0V (VR2)**

- $V_{IN}=5.0\text{V}$, $I_{OUT}=30\text{mA}$
- Output Voltage ($V_{OUT}$): 4.08, 4.06, 4.04, 4.02, 4.00, 3.98, 3.96, 3.94
5) Supply Current vs. Input Voltage (Topt=25°C)

- **1.5V**
- **2.8V**
- **4.0V**

6) Supply Current vs. Temperature

- **1.5V (VR1)**
- **1.5V (VR2)**
7) Dropout Voltage vs. Set Output Voltage (Topt=25°C)

**VR1**

- **2.8V (VR1)**
  - $V_{IN}=3.8V$

- **4.0V (VR1)**
  - $V_{IN}=5.0V$

**VR2**

- **2.8V (VR2)**
  - $V_{IN}=3.8V$

- **4.0V (VR2)**
  - $V_{IN}=5.0V$
8) Ripple Rejection vs. Frequency (Topt=25°C)

**1.5V (VR1)**

Vin=2.5V+0.5Vp-p, COUT=Ceramic 1.0μF

**1.5V (VR2)**

Vin=2.5V+0.5Vp-p, COUT=Ceramic 1.0μF

**2.8V (VR1)**

Vin=3.8V+0.5Vp-p, COUT=Ceramic 1.0μF

**2.8V (VR2)**

Vin=3.8V+0.5Vp-p, COUT=Ceramic 1.0μF

VIN=2.5V+0.5Vp-p, COUT=Ceramic 2.2μF
2.8V (VR1)  
Vin=3.8V+0.5Vp-p, COUT=Ceramic 2.2μF

Ripple Rejection RR(dB)

Frequency f(kHz)

IOUT=1mA

IOUT=30mA

IOUT=150mA

4.0V (VR1)  
Vin=5.0V+0.5Vp-p, COUT=Ceramic 1.0μF

Ripple Rejection RR(dB)

Frequency f(kHz)

IOUT=1mA

IOUT=30mA

IOUT=150mA

2.8V (VR2)  
Vin=3.8V+0.5Vp-p, COUT=Ceramic 2.2μF

Ripple Rejection RR(dB)

Frequency f(kHz)

IOUT=1mA

IOUT=30mA

IOUT=150mA

4.0V (VR2)  
Vin=5.0V+0.5Vp-p, COUT=Ceramic 2.2μF

Ripple Rejection RR(dB)

Frequency f(kHz)

IOUT=1mA

IOUT=30mA

IOUT=150mA

Limited Product
9) Ripple Rejection vs. Input Voltage (DC bias) ($C_{OUT}=\text{Ceramic }1.0\mu F$, $T_{opt}=25^\circ C$)

2.8V (VR1)

- $I_{OUT}=1\text{mA}$
- $I_{OUT}=30\text{mA}$
- $I_{OUT}=50\text{mA}$

2.8V (VR2)

- $I_{OUT}=1\text{mA}$
- $I_{OUT}=30\text{mA}$
- $I_{OUT}=50\text{mA}$
10) Input Transient Response (I_{out}=30mA, \text{tr}=\text{tf}=5\mu s)

\text{R5323N001x(2.8V, VR1)}

\text{I_{out}=30mA, tr=\text{tf}=5\mu s, C_{out}=\text{Ceramic 1.0}\mu F}

\text{Topt=25}^\circ\text{C, C_{out}=\text{Ceramic 2.2}\mu F}

\text{Topt=25}^\circ\text{C, C_{out}=\text{Ceramic 4.4}\mu F}
R5323N001x(2.8V, VR2)

Topt=25°C, COUT=Ceramic 1.0μF

VIN

VOUT

Output Voltage VOUT(V)

Input Voltage VIN(V)

Time T(μs)

R5323N001x(2.8V, VR2)

Topt=25°C, COUT=Ceramic 2.2μF

VIN

VOUT

Output Voltage VOUT(V)

Input Voltage VIN(V)

Time T(μs)

R5323N001x(2.8V, VR2)

Topt=25°C, COUT=Ceramic 4.4μF

VIN

VOUT

Output Voltage VOUT(V)

Input Voltage VIN(V)

Time T(μs)
11) Load Transient Response

2.8V (VR1)

C<sub>IN</sub>=Ceramic 1.0µF, C<sub>OUT</sub>=Ceramic 1.0µF

Output Voltage V<sub>OUT1</sub> (V)

Output Current I<sub>OUT1</sub> (mA)

Time T(µs)

2.8V (VR1)

C<sub>IN</sub>=Ceramic 1.0µF, C<sub>OUT</sub>=Ceramic 2.2µF

Output Voltage V<sub>OUT1</sub> (V)

Output Current I<sub>OUT1</sub> (mA)

Time T(µs)

2.8V (VR1)

C<sub>IN</sub>=Ceramic 1.0µF, C<sub>OUT</sub>=Ceramic 4.4µF

Output Voltage V<sub>OUT1</sub> (V)

Output Current I<sub>OUT1</sub> (mA)

Time T(µs)

2.8V (VR2)

C<sub>IN</sub>=Ceramic 1.0µF, C<sub>OUT</sub>=Ceramic 1.0µF

Output Voltage V<sub>OUT1</sub> (V)

Output Current I<sub>OUT1</sub> (mA)

Time T(µs)

2.8V (VR2)

C<sub>IN</sub>=Ceramic 1.0µF, C<sub>OUT</sub>=Ceramic 2.2µF

Output Voltage V<sub>OUT1</sub> (V)

Output Current I<sub>OUT1</sub> (mA)

Time T(µs)

2.8V (VR2)

C<sub>IN</sub>=Ceramic 1.0µF, C<sub>OUT</sub>=Ceramic 4.4µF

Output Voltage V<sub>OUT1</sub> (V)

Output Current I<sub>OUT1</sub> (mA)

Time T(µs)
12) Minimum Operating Voltage

1.5V Minimum Operating Voltage Range

<table>
<thead>
<tr>
<th>VDD(V)</th>
<th>Output Current IOUT(mA)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.3</td>
<td></td>
</tr>
<tr>
<td>2.2</td>
<td></td>
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<tr>
<td>2.1</td>
<td></td>
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<tr>
<td>2.0</td>
<td></td>
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<tr>
<td>1.9</td>
<td></td>
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<tr>
<td>1.8</td>
<td></td>
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<tr>
<td>1.7</td>
<td></td>
</tr>
<tr>
<td>1.6</td>
<td></td>
</tr>
<tr>
<td>1.5</td>
<td></td>
</tr>
</tbody>
</table>

VIN(MIN) – VDD

Limited Product
ESR vs. Output Current

Ceramic type output capacitor is recommended for this series; however, the other output capacitors with low ESR also can be used. The relations between $I_{OUT}$ (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 (BW=30Hz)
- Temperature: 25°C
R5323Z 1.5V (VR1/VR2)  
VIN=2.5V  
CIN=COUT=Ceramic 1.0μF

R5323Z 2.8V (VR1/VR2)  
VIN=3.8V  
CIN=COUT=Ceramic 1.0μF

Output Current IOUT(mA)
0 100 50 150

ESR(Ω)
0.01 0.1 1 10 100

Output Current IOUT(mA)
0 100 50 150

ESR(Ω)
0.01 0.1 1 10 100

Limited Product
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