RICOH

RP104x SERIES

# 150mA ULTRA LOW SUPPLY CURRENT LDO REGULATOR

NO.EA-150-070727

## OUTLINE

The RP104x Series are CMOS-based voltage regulator ICs with high output voltage accuracy, extremely low supply current and low ON-resistance. Each of these ICs consists of a voltage reference unit, an error amplifier, resistor-net for voltage setting, a current limit circuit and a chip enable circuit.

These ICs perform with ultra low supply current (Typ.1.0μA), which prolong the battery life.

Since the packages for these ICs are PLP1010-4, SOT-23-5 and SC-82AB, therefore high density mounting of the ICs on boards is possible.

## FEATURES

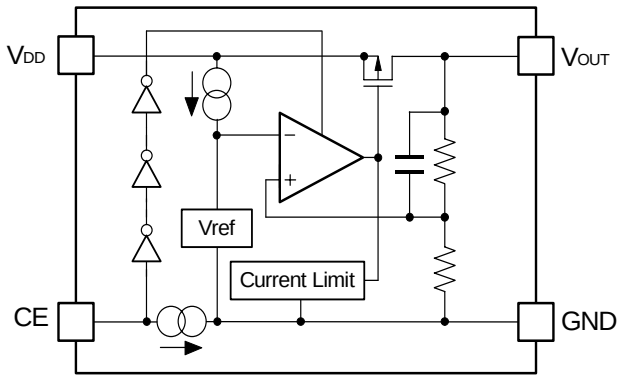
- Supply Current ..... Typ. 1.0μA
  (Except the current through CE pull down circuit)
- Standby Current ..... Typ. 0.1μA
- Dropout Voltage..... Typ. 0.24V ($I_{OUT}$=150mA, $V_{OUT}$=2.8V)
- Temperature-Drift Coefficient of Output Voltage ..... Typ. ±40ppm/°C
- Line Regulation ..... Typ. 0.02%/V
- Output Voltage Accuracy..... ±0.8%
- Packages..... PLP1010-4, SOT-23-5, SC-82AB
- Output Voltage..... 1.2V, 1.3V, 1.5V, 1.8V, 1.85V, 1.9V, 2.0V, 2.5V
  2.6V, 2.7V, 2.8V, 2.85V, 2.9V, 3.0V, 3.2V, 3.3V
- Built-in Fold Back Protection Circuit..... Typ. 40mA (Current at short mode)
- Ceramic capacitors are recommended to be used with this IC .... 0.1μF or more

## APPLICATIONS

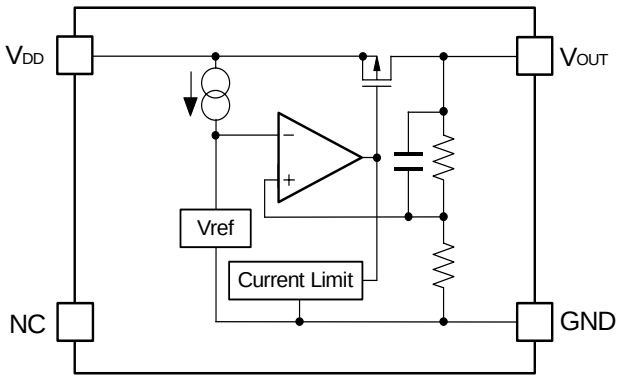
- Power source for portable communication equipment.
- Power source for electrical appliances such as cameras, VCRs and camcorders.
- Power source for battery-powered equipment.

# BLOCK DIAGRAMS

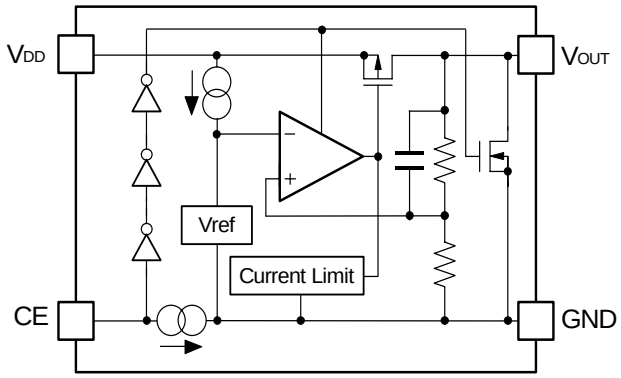
**RP104xxx1B**




**RP104xxx1C**




**RP104xxx1D**



# SELECTION GUIDE

The output voltage, chip enable circuit, auto discharge function*, and the taping type for the ICs can be selected at the user's request.

The selection can be made with designating the part number as shown below;

RP104xxx1x-xx-x ←Part Number
↑ ↑ ↑ ↑ ↑
a b c d e

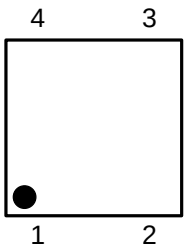
| Code | Contents |
|---|---|
| a | Designation of Package Type:<br>K: PLP1010-4<br>N: SOT-23-5<br>Q: SC-82AB |
| b | Setting Output Voltage ($V_{OUT}$):<br>The following 16 kinds of voltage are standard.<br>1.2V, 1.3V, 1.5V, 1.8V, 1.85V, 1.9V, 2.0V, 2.5V, 2.6V, 2.7V, 2.8V, 2.85V, 2.9V, 3.0V, 3.2V, 3.3V<br>Exceptions:1.85V=RP104x181x5-xx-x, 2.85V=RP104x281x5-xx-x |
| c | Designation of Mask Option<br>B: active high, without auto discharge function* at OFF state.<br>C: without chip enable circuit.<br>D: active high, with auto discharge function* at OFF state. |
| d | Designation of Taping Type:<br>Ex. TR (refer to Taping Specifications; TR type is the standard direction.) |
| e | Designation of composition of pin plating:<br>-F: Lead free plating (SOT-23-5, SC-82AB)<br>None: Au plating (PLP1010-4) |

*) When the mode is into standby with CE signal, auto discharge transistor turns on, and it makes the turn-off speed faster than normal type.

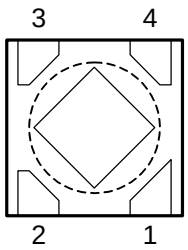
# PIN CONFIGURATIONS

● **PLP1010-4**

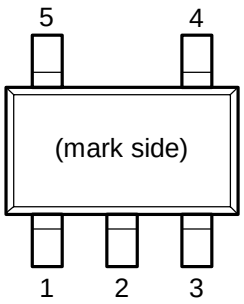
**Top View**



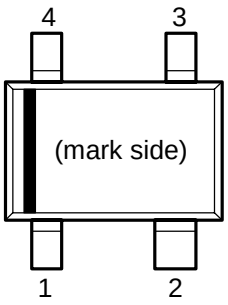

**Bottom View**




● **SOT-23-5**




● **SC-82AB**




# PIN DESCRIPTIONS

● **PLP1010-4***

| Pin No. | Symbol | Description |
|---|---|---|
| 1 | $V_{OUT}$ | Output Pin |
| 2 | GND | Ground Pin |
| 3 | CE / NC | Chip Enable Pin ("H" Active) or No Connection |
| 4 | $V_{DD}$ | Input Pin |

*) Tab in the ◌ parts have GND level.
(They are connected to the back side of this IC.)
Do not connect to other wires or land patterns.

● **SOT-23-5**

| Pin No. | Symbol | Description |
|---|---|---|
| 1 | $V_{DD}$ | Input Pin |
| 2 | GND | Ground Pin |
| 3 | CE / NC | Chip Enable Pin ("H" Active) or No Connection |
| 4 | NC | No Connection |
| 5 | $V_{OUT}$ | Output Pin |

● **SC-82AB**

| Pin No. | Symbol | Description |
|---|---|---|
| 1 | CE / NC | Chip Enable Pin ("H" Active) or No Connection |
| 2 | GND | Ground Pin |
| 3 | $V_{OUT}$ | Output Pin |
| 4 | $V_{DD}$ | Input Pin |

# ABSOLUTE MAXIMUM RATINGS

| Symbol | Item | Rating | Unit |
|---|---|---|---|
| $V_{IN}$ | Input Voltage | 6.0 | V |
| $V_{CE}$ | Input Voltage (CE Pin) | 6.0 | V |
| $V_{OUT}$ | Output Voltage | −0.3 to $V_{IN}$+0.3 | V |
| $I_{OUT}$ | Output Current | 200 | mA |
| $P_D$ | Power Dissipation (PLP1010-4)* | 400 | mW |
| | Power Dissipation (SOT-23-5)* | 420 | |
| | Power Dissipation (SC-82AB)* | 380 | |
| Topt | Operating Temperature Range | −40 to 85 | °C |
| Tstg | Storage Temperature Range | −55 to 125 | °C |

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

# ELECTRICAL CHARACTERISTICS

- **RP104xxx1B/C/D**

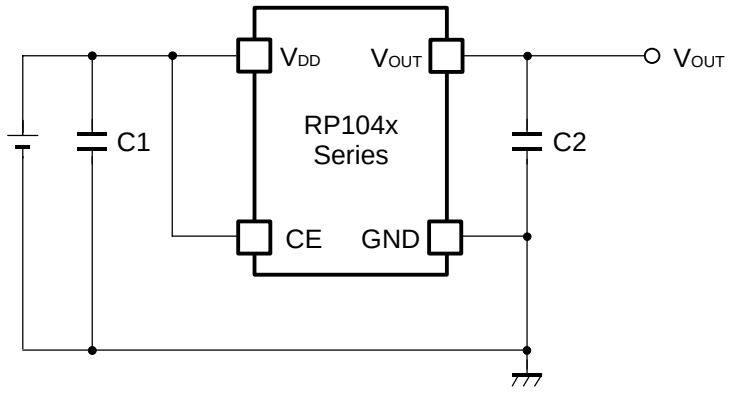
$V_{IN}$=Set $V_{OUT}$+1V for $V_{OUT}$ options greater than 1.5V. $V_{IN}$=2.5V for $V_{OUT}$ ≦ 1.5V.
$I_{OUT}$=1mA, $C_{IN}$=$C_{OUT}$=0.1μF, unless otherwise noted.
☐ values indicate −40°C ≦ Topt ≦ 85°C, unless otherwise noted.

Topt=25°C

| Symbol | Item | Conditions | | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|---|
| $V_{OUT}$ | Output Voltage | Topt=25°C | $V_{OUT}$ > 2.0V | ×0.992 | | ×1.008 | V |
| | | | $V_{OUT}$ ≦ 2.0V | −16 | | +16 | mV |
| | | −40°C ≦ Topt ≦ 85°C | $V_{OUT}$ > 2.0V | ☐×0.985 | | ☐×1.015 | V |
| | | | $V_{OUT}$ ≦ 2.0V | ☐−30 | | ☐+30 | mV |
| $I_{OUT}$ | Output Current | | | ☐150 | | | mA |
| $\Delta V_{OUT}/\Delta I_{OUT}$ | Load Regulation | 1mA ≦ $I_{OUT}$ ≦ 150mA | | | 10 | ☐20 | mV |
| $V_{DIF}$ | Dropout Voltage | $I_{OUT}$=150mA | 1.2V ≦ $V_{OUT}$ < 1.5V | | 0.76 | ☐1.05 | V |
| | | | 1.5V ≦ $V_{OUT}$ < 1.7V | | 0.53 | ☐0.80 | |
| | | | 1.7V ≦ $V_{OUT}$ < 2.0V | | 0.44 | ☐0.65 | |
| | | | 2.0V ≦ $V_{OUT}$ < 2.5V | | 0.34 | ☐0.50 | |
| | | | 2.5V ≦ $V_{OUT}$ < 2.8V | | 0.28 | ☐0.40 | |
| | | | 2.8V ≦ $V_{OUT}$ ≦ 3.3V | | 0.24 | ☐0.32 | |
| $I_{SS}$ | Supply Current | $I_{OUT}$=0mA | | | 1.0 | ☐1.5 | μA |
| Istandby | Standby Current | $V_{CE}$=0V | | | 0.1 | 1.0 | μA |
| $\Delta V_{OUT}/\Delta V_{IN}$ | Line Regulation | Set $V_{OUT}$+0.5V ≦ $V_{IN}$ ≦ 5.0V | | | 0.02 | ☐0.10 | %/V |
| $V_{IN}$ | Input Voltage* | | | ☐1.7 | | ☐5.25 | V |
| $\Delta V_{OUT}/\Delta Topt$ | Output Voltage Temperature Coefficient | −40°C ≦ Topt ≦ 85°C | | | ±40 | | ppm /°C |
| Ilim | Short Current Limit | $V_{OUT}$=0V | | | 40 | | mA |
| $I_{PD}$ | CE Pull-down Current | | | | 0.3 | | μA |
| $V_{CEH}$ | CE Input Voltage "H" | | | ☐1.5 | | | V |
| $V_{CEL}$ | CE Input Voltage "L" | | | | | ☐0.3 | V |
| $R_{LOW}$ | Low Output Nch Tr. ON Resistance (of D version) | $V_{IN}$=4.0V<br>$V_{CE}$=0V | | | 30 | | Ω |

*) When Input Voltage is 5.5V, the total operational time must be within 500hrs.

# TYPICAL APPLICATION




(External Components)
C2 0.1μF MURATA: GRM155B31C104KA87B

# TECHNICAL NOTES

When using these ICs, consider the following points:

**Phase Compensation**

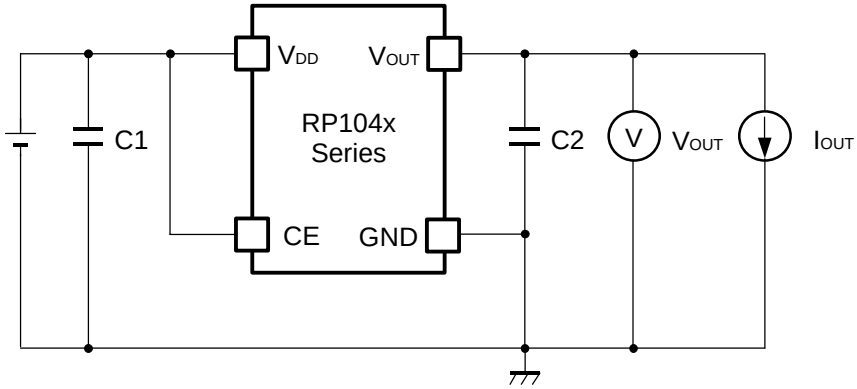
In these ICs, phase compensation is made for securing stable operation even if the load current is varied. For this purpose, use a capacitor C2 with good frequency characteristics and ESR (Equivalent Series Resistance).
(Note: If additional ceramic capacitors are connected with parallel to the output 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**

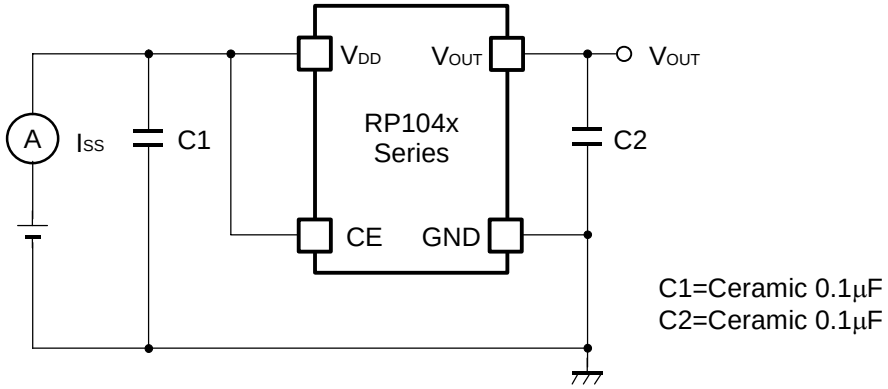
Make $V_{DD}$ and GND lines sufficient. If their impedance is high, noise pickup or unstable operation may result. Connect a capacitor C1 with a capacitance value as much as 0.1μF or more between $V_{DD}$ and GND pin, and as close as possible to the pins.

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

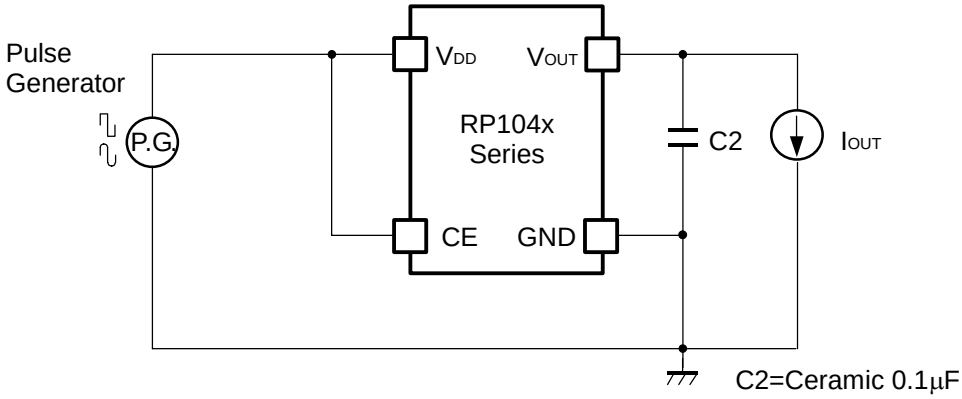
# TEST CIRCUITS



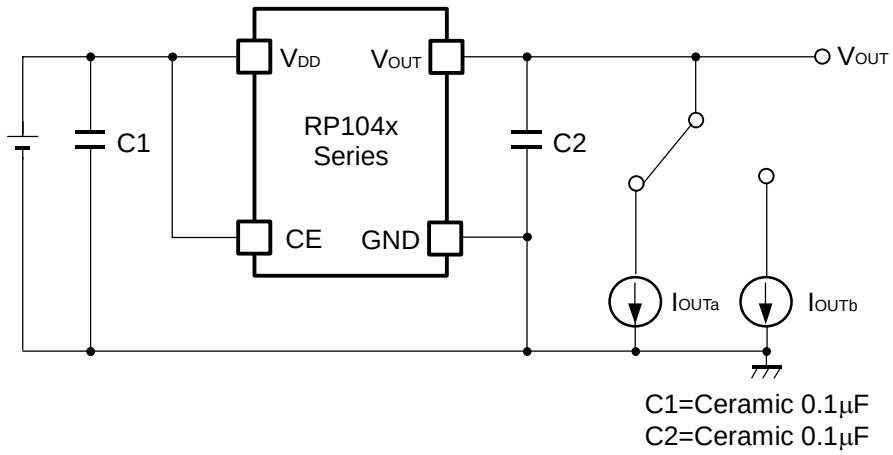

**Basic Test Circuit**




**Test Circuit for Supply Current**




**Test Circuit for Ripple Rejection**

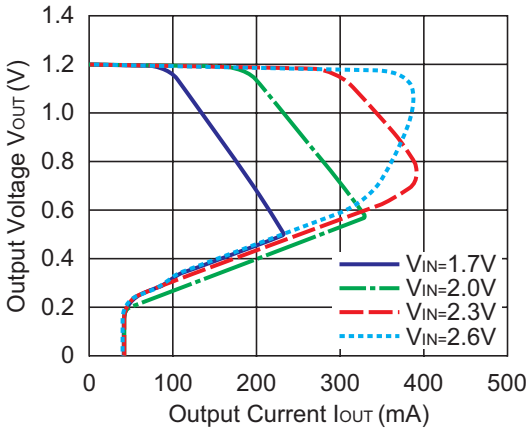



**Test Circuit for Load Transient Response**

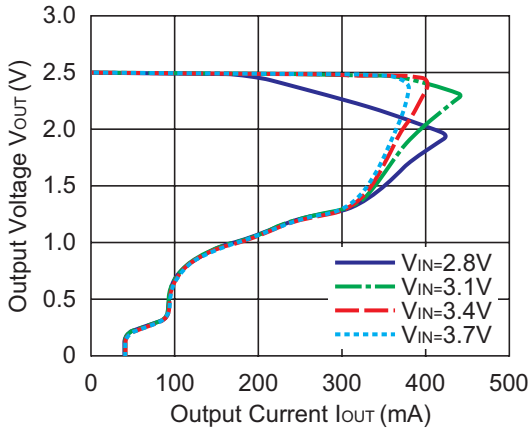
# TYPICAL CHARACTERISTICS

### 1) Output Voltage vs. Output Current (C1=Ceramic 0.1μF, C2=Ceramic 0.1μF, Topt=25°C)

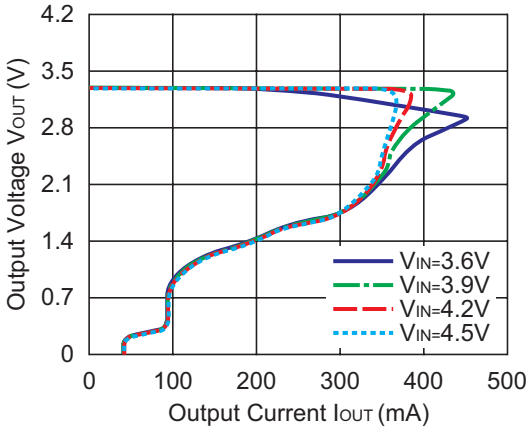
**RP104x121x**




**RP104x251x**

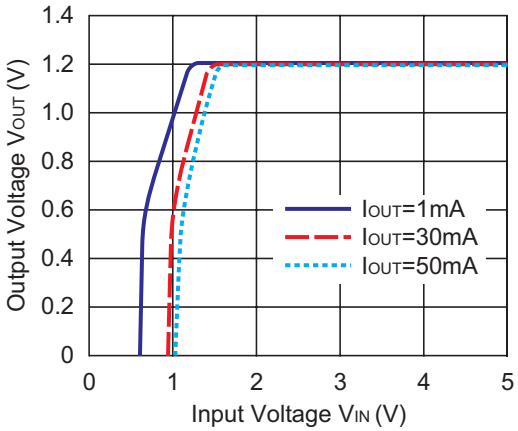



**RP104x331x**

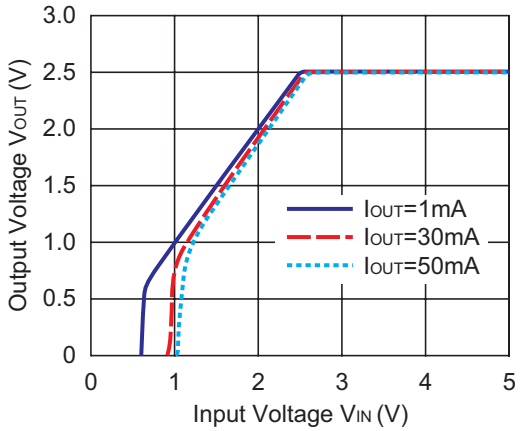



### 2) Output Voltage vs. Input Voltage (C1=Ceramic 0.1μF, C2=Ceramic 0.1μF, Topt=25°C)

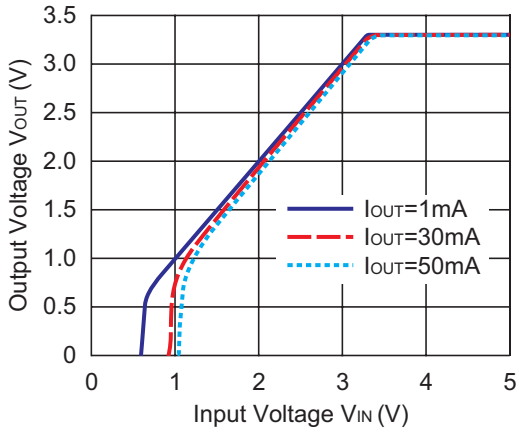
**RP104x121x**




**RP104x251x**

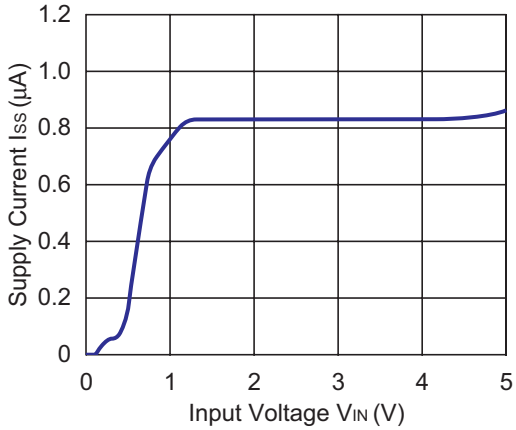


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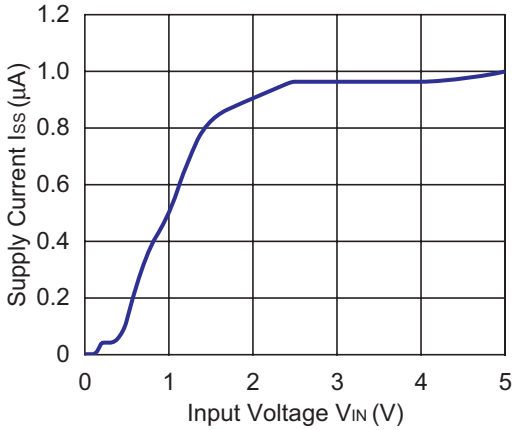



### 3) Supply Current vs. Input Voltage (C1=Ceramic 0.1μF, C2=Ceramic 0.1μF, Topt=25°C)

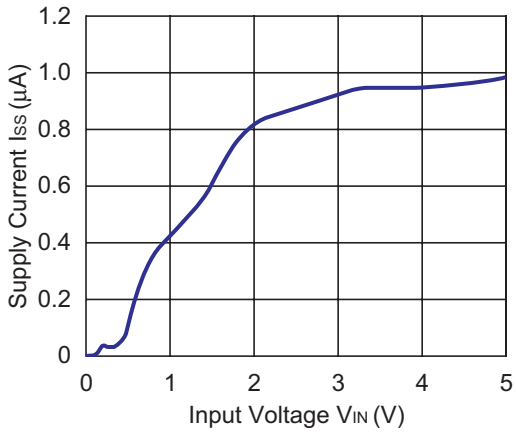
**RP104x121x**




**RP104x251x**

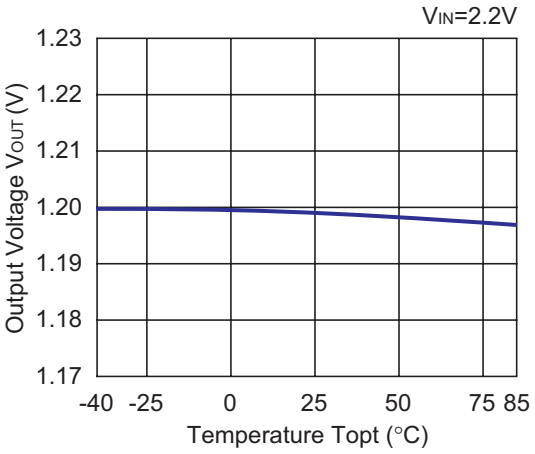



**RP104x331x**

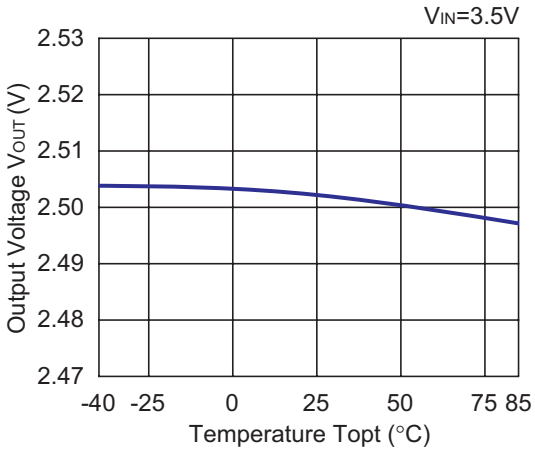


### 4) Output Voltage vs. Temperature (C1=Ceramic 0.1μF, C2=Ceramic 0.1μF, $I_{OUT}$=1mA)

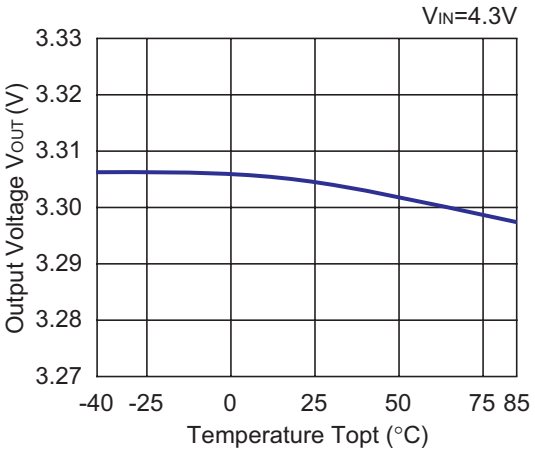
**RP104x121x**




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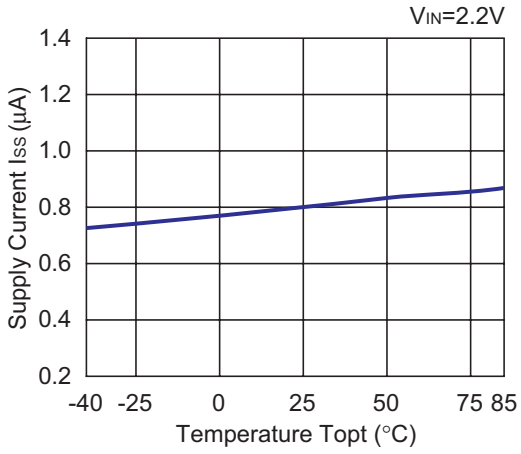



**RP104x331x**

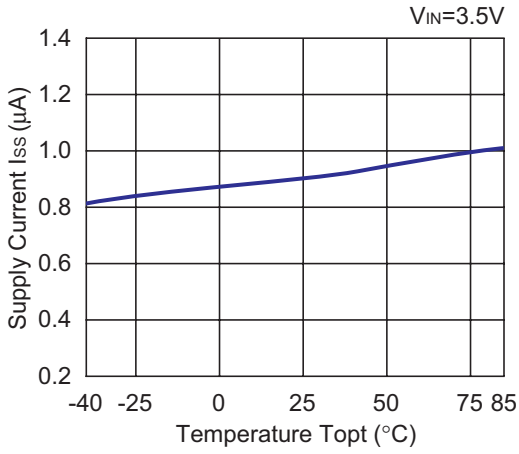



### 5) Supply Current vs. Temperature (C1=Ceramic 0.1μF, C2=Ceramic 0.1μF)

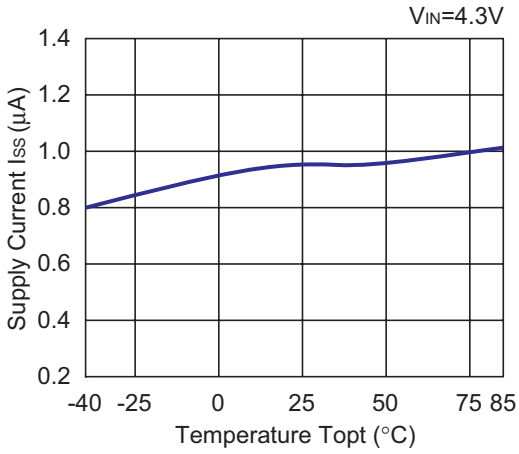
**RP104x121x**




**RP104x251x**

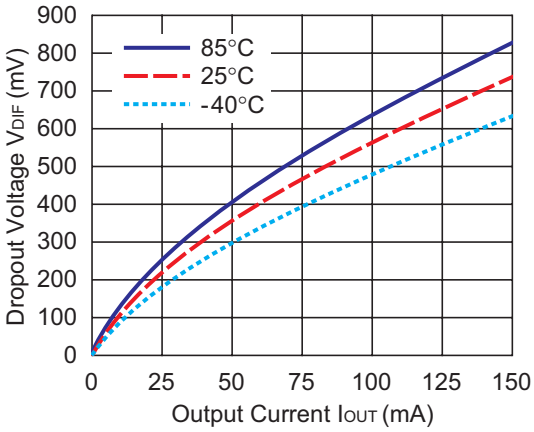


**RP104x331x**

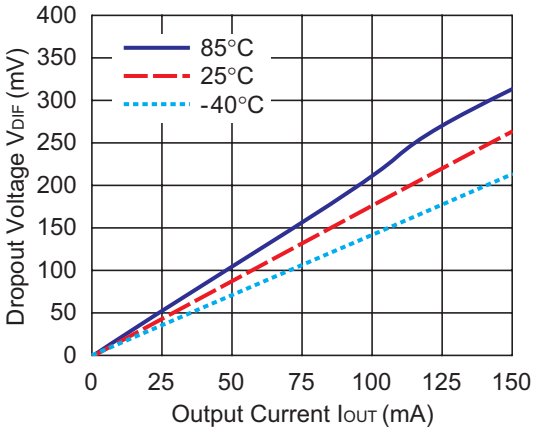



### 6) Dropout Voltage vs. Output Current (C1=Ceramic 0.1µF, C2=Ceramic 0.1µF, Topt=25°C)

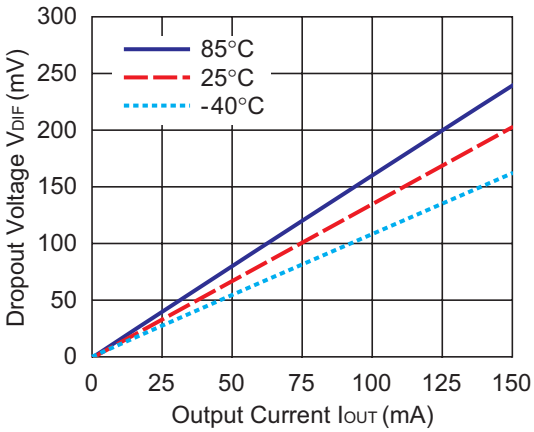
**RP104x121x**



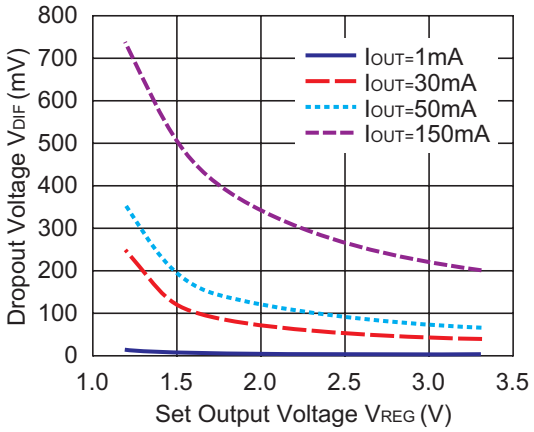

**RP104x251x**




**RP104x331x**

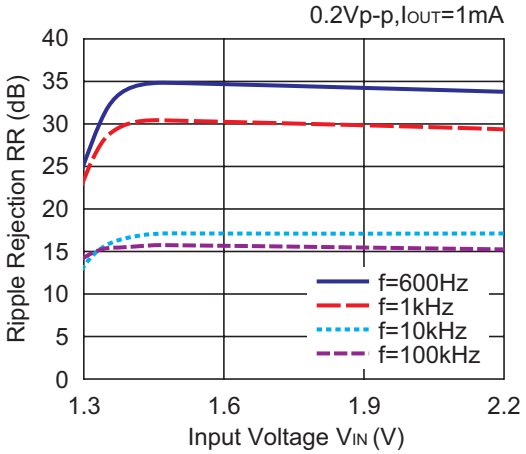


### 7) Dropout Voltage vs. Set Output Voltage (C1=Ceramic 0.1μF, C2=Ceramic 0.1μF, Topt=25°C)

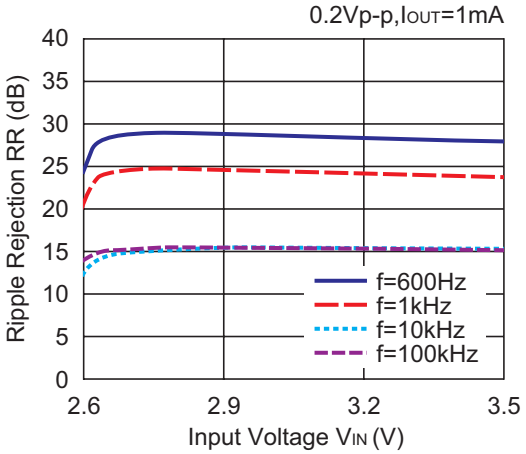



### 8) Ripple Rejection vs. Input Bias Voltage (C1=none, C2=Ceramic 0.1μF, Topt=25°C)

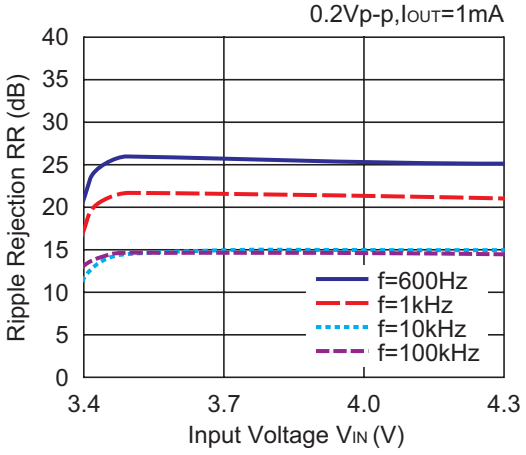
**RP104x121x**



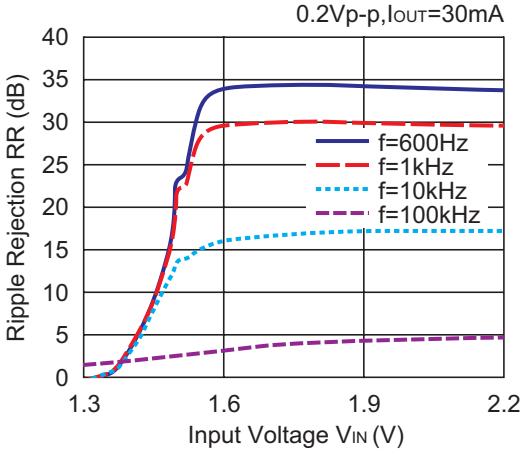

**RP104x251x**



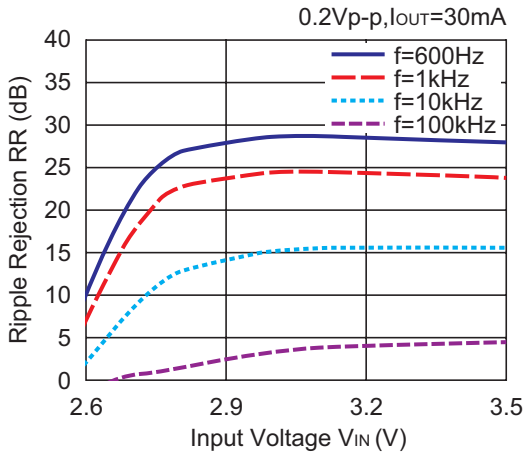

**RP104x331x**



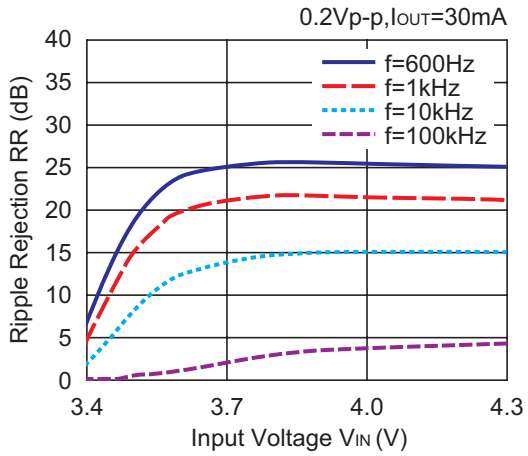

**RP104x121x**



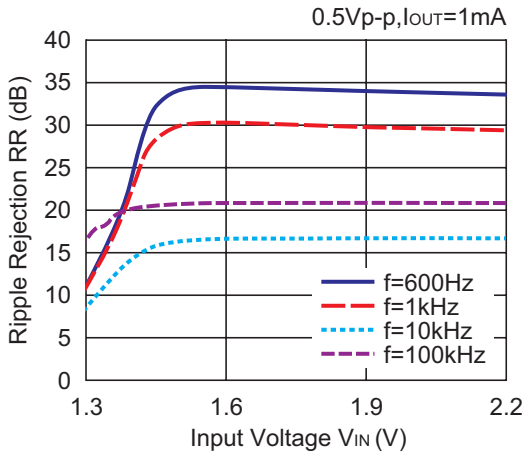
**RP104x251x**



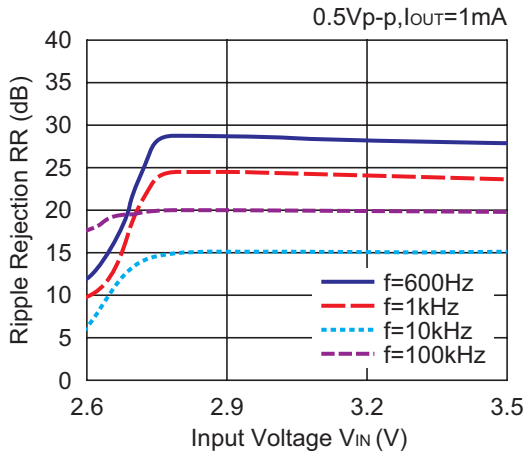

**RP104x331x**



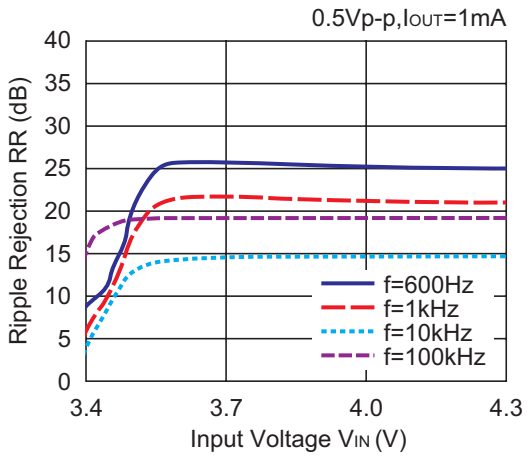

**RP104x121x**



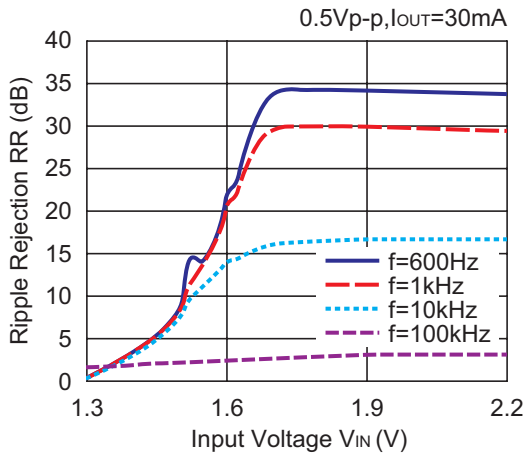

**RP104x251x**



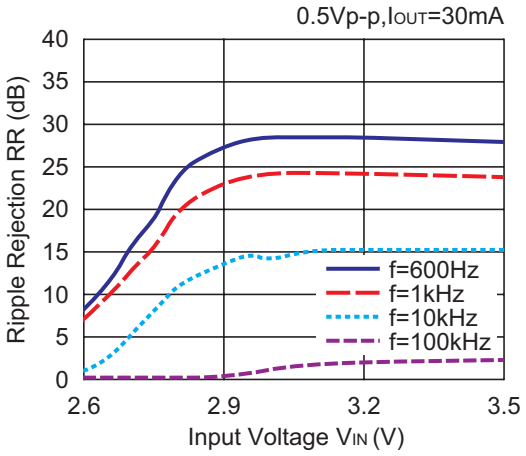

**RP104x331x**



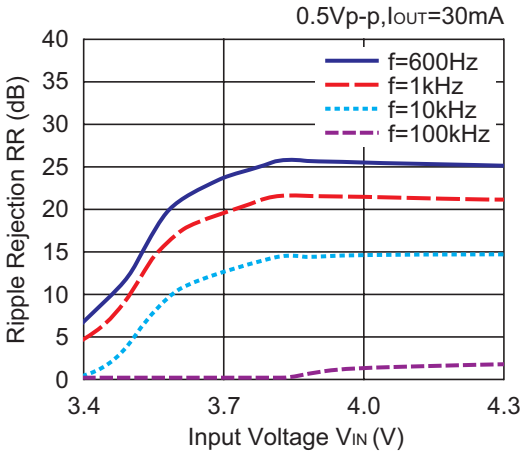

**RP104x121x**



**RP104x251x**

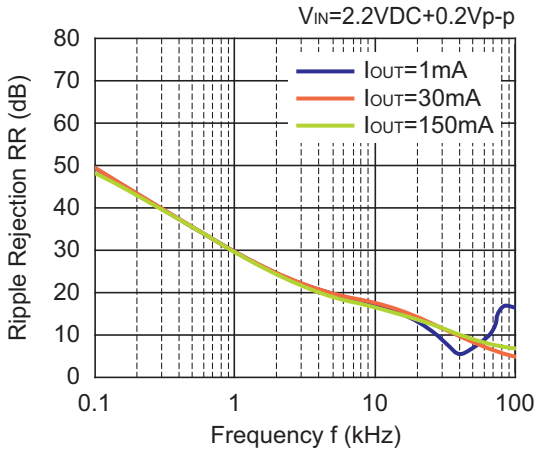



**RP104x331x**

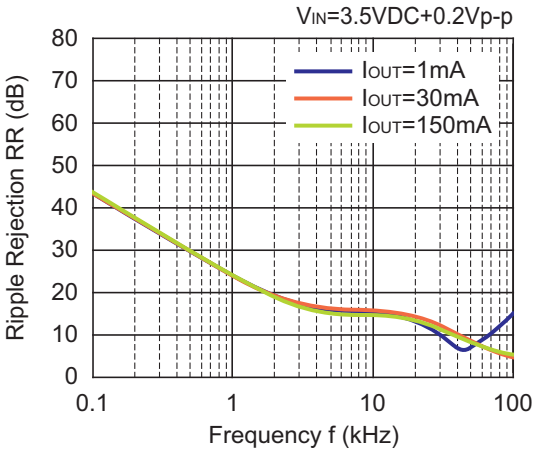



### 9) Ripple Rejection vs. Frequency (C1=none, C2=Ceramic 0.1μF, Topt=25°C)

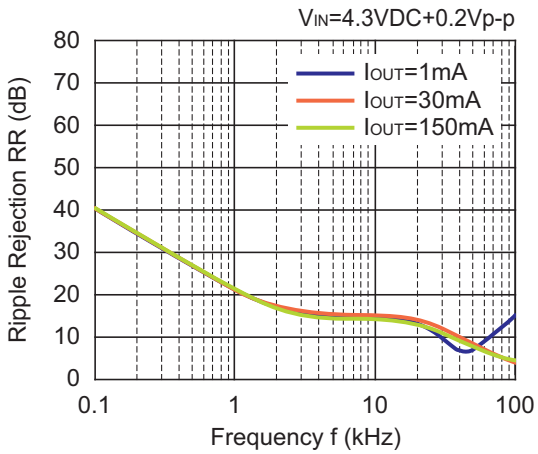
**RP104x121x**



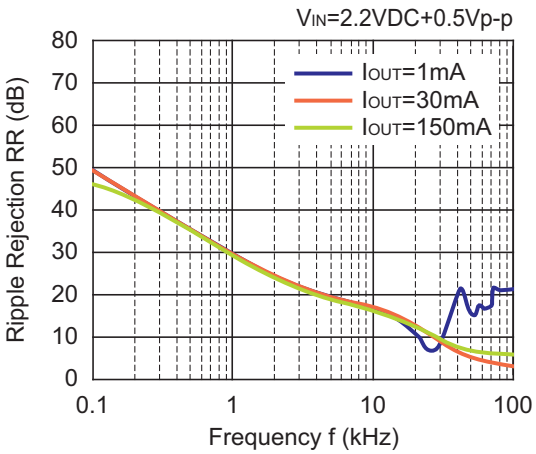

**RP104x251x**



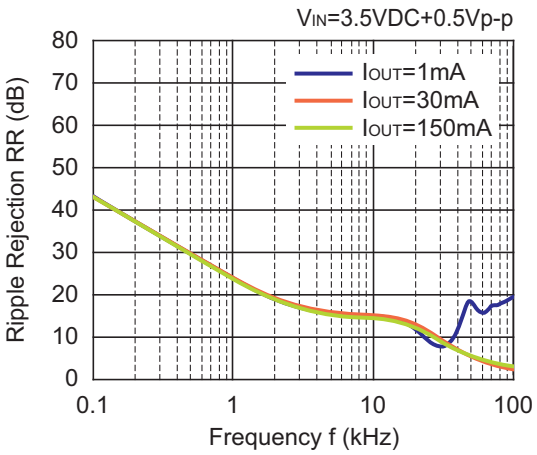

**RP104x331x**



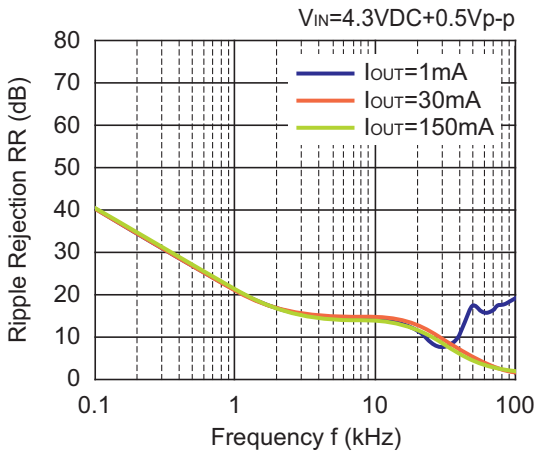

**RP104x121x**



**RP104x251x**

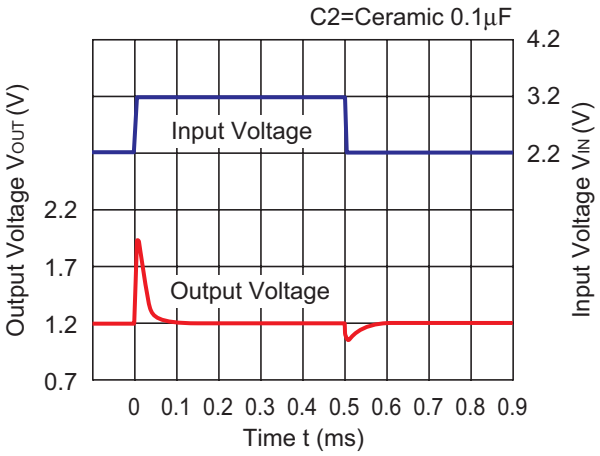



**RP104x331x**

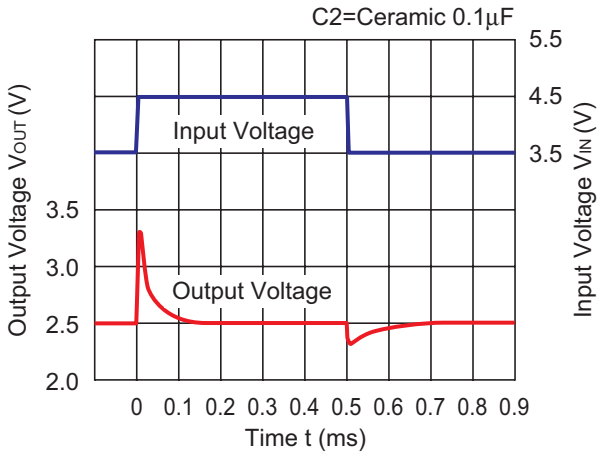



## 10) Input Transient Response (C1=none, $I_{OUT}$=30mA, Topt=25°C)

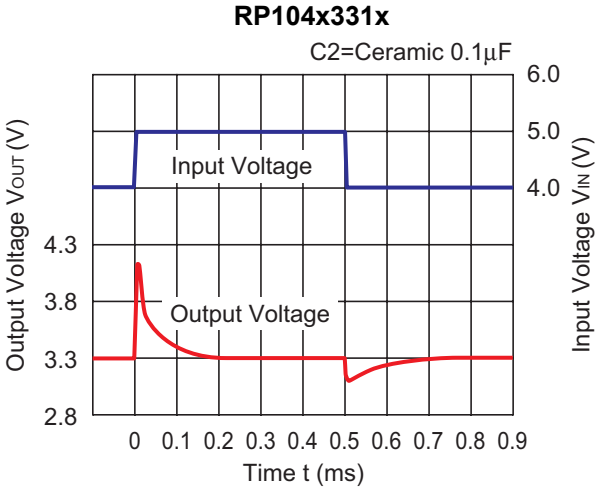
**RP104x121x**



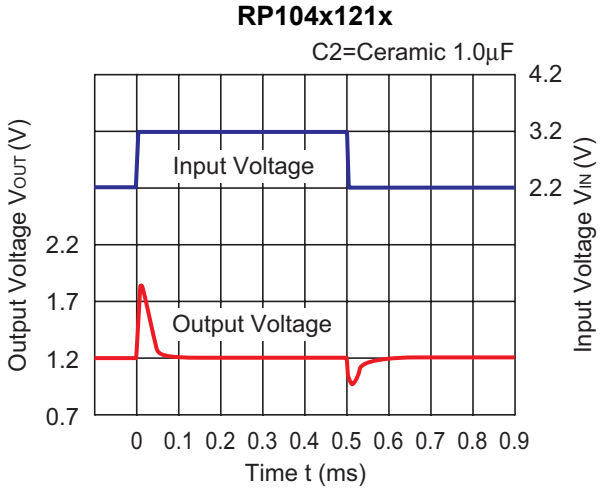

**RP104x251x**



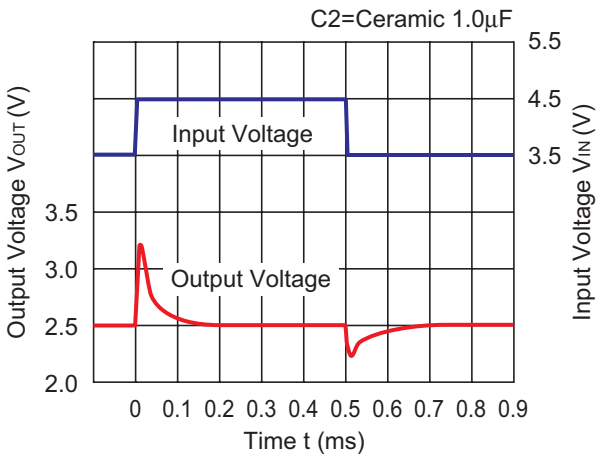

**RP104x331x**



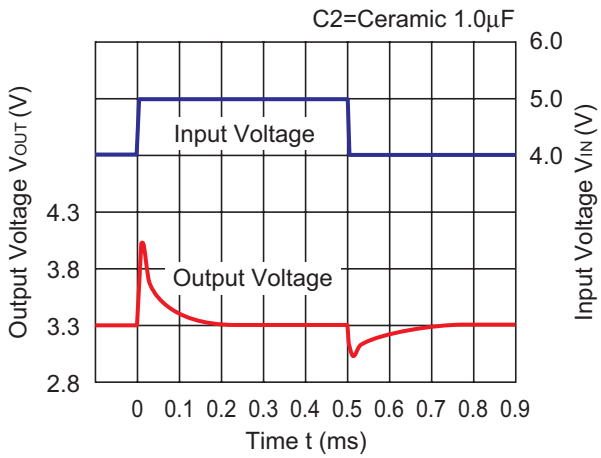

**RP104x121x**



**RP104x251x**

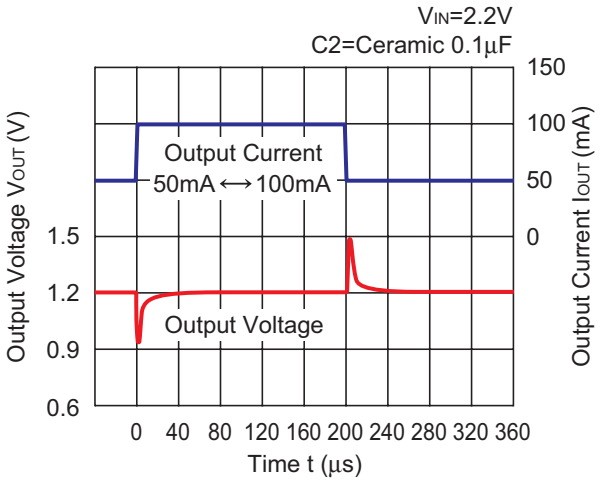



**RP104x331x**

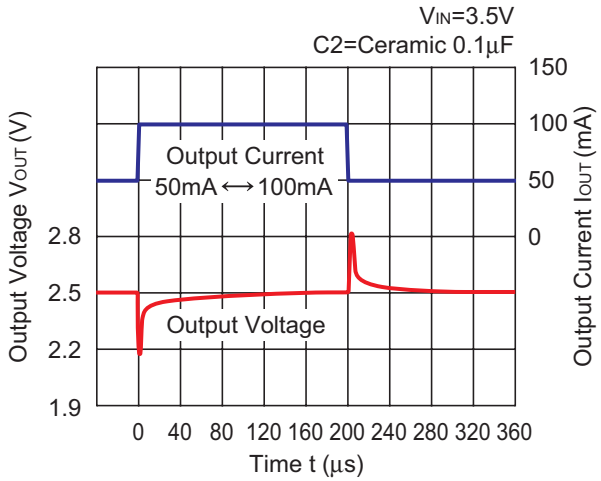



## 11) Load Transient Response (C1=Ceramic 0.1µF, Topt=25°C)

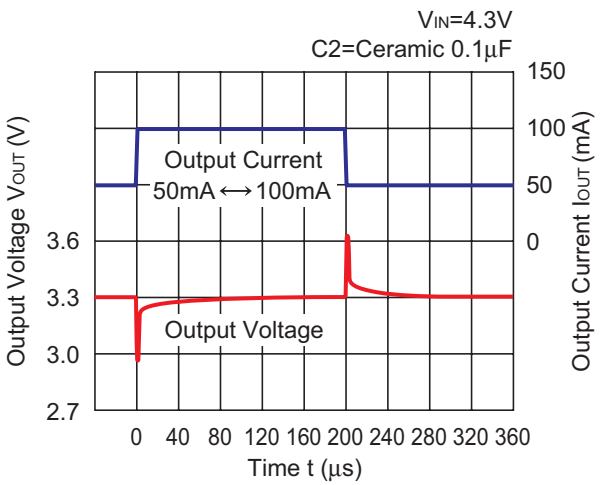
**RP104x121x**



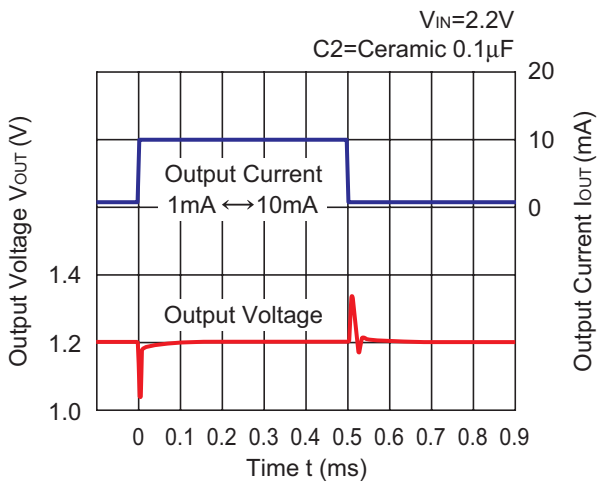

**RP104x251x**



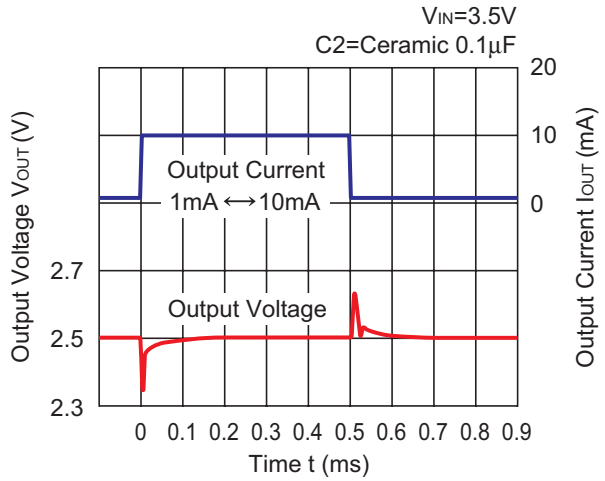

**RP104x331x**



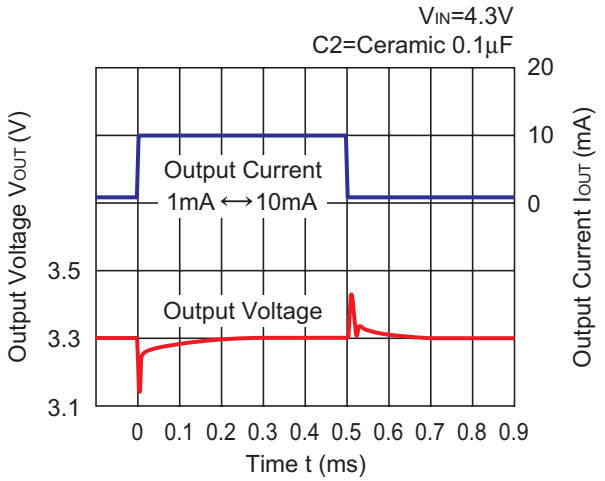

**RP104x121x**



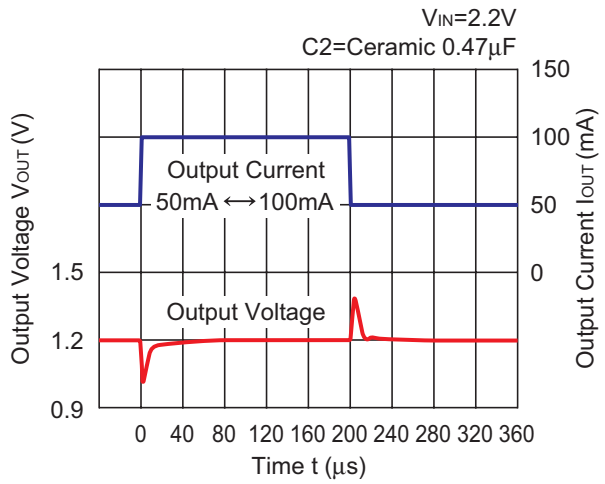
**RP104x251x**



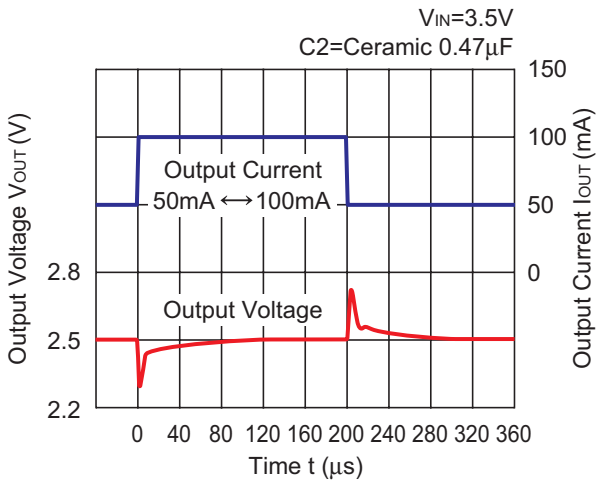

**RP104x331x**



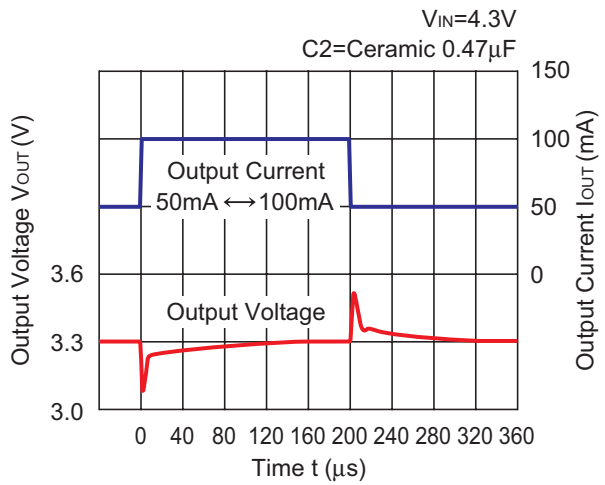

**RP104x121x**



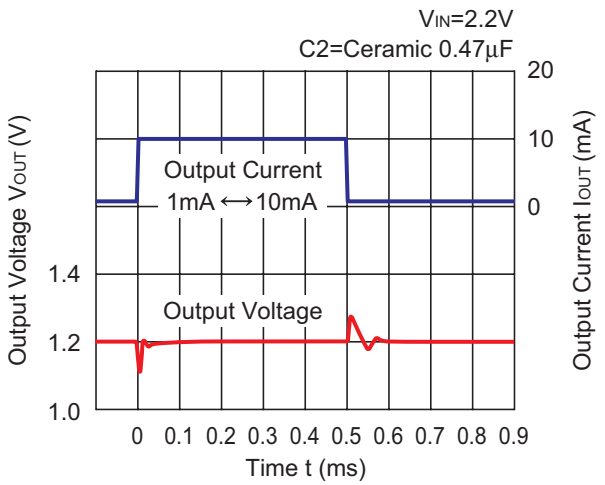

**RP104x251x**



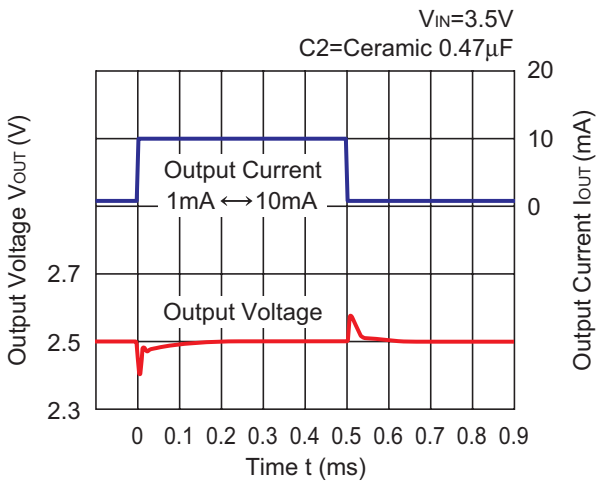

**RP104x331x**



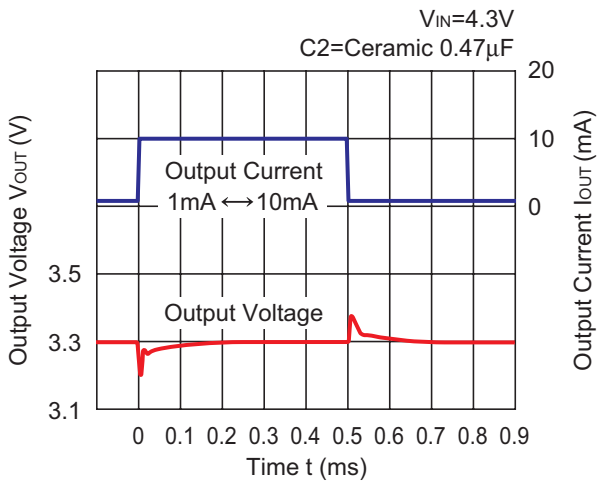

**RP104x121x**



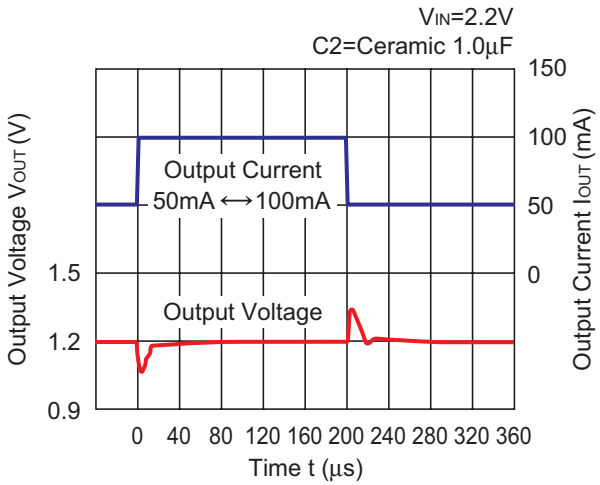
**RP104x251x**



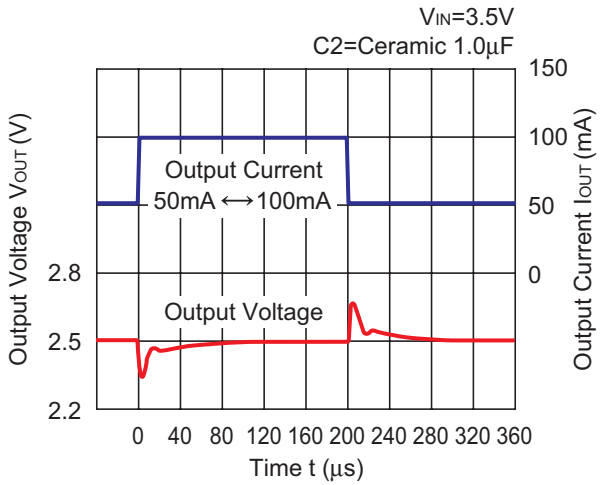

**RP104x331x**



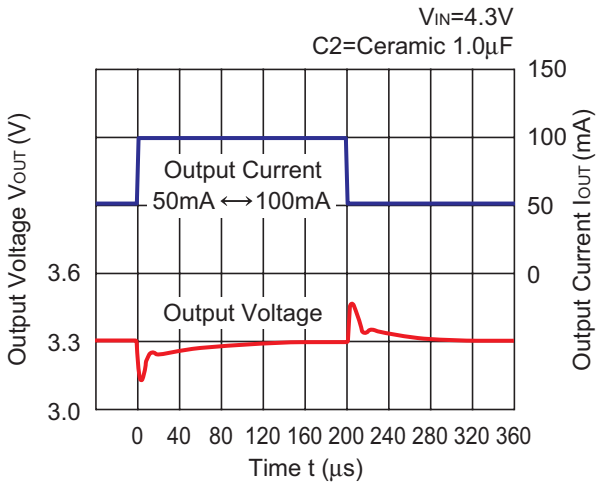

**RP104x121x**



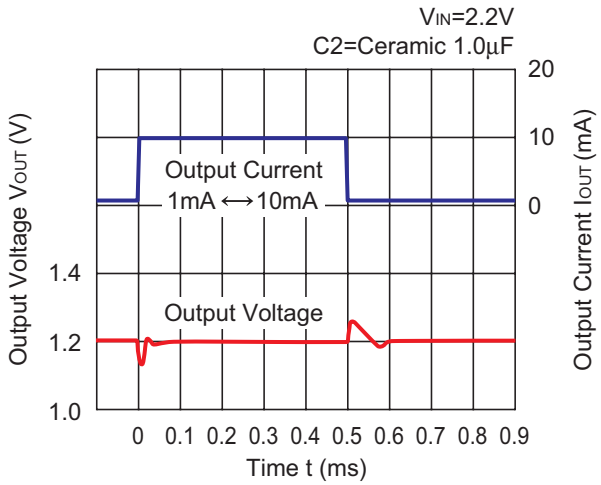

**RP104x251x**



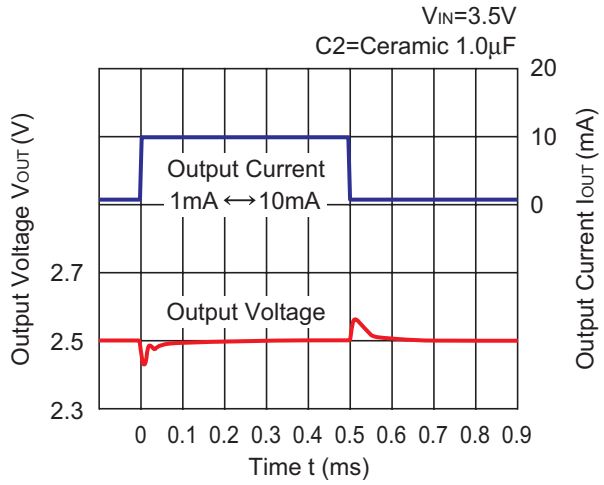

**RP104x331x**



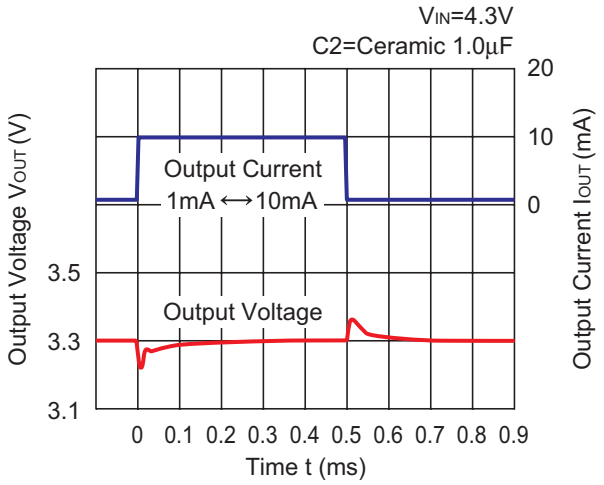

**RP104x121x**



**RP104x251x**

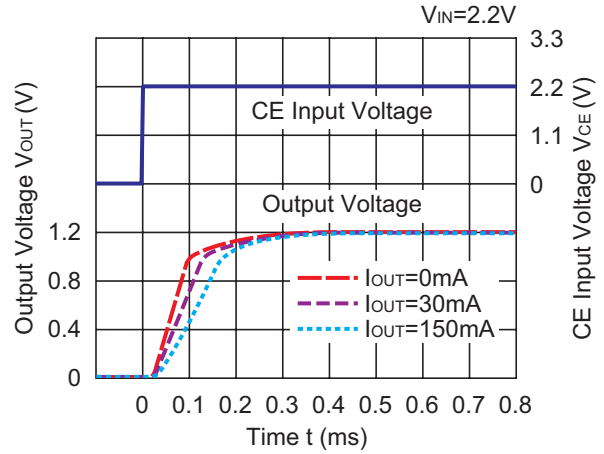



**RP104x331x**

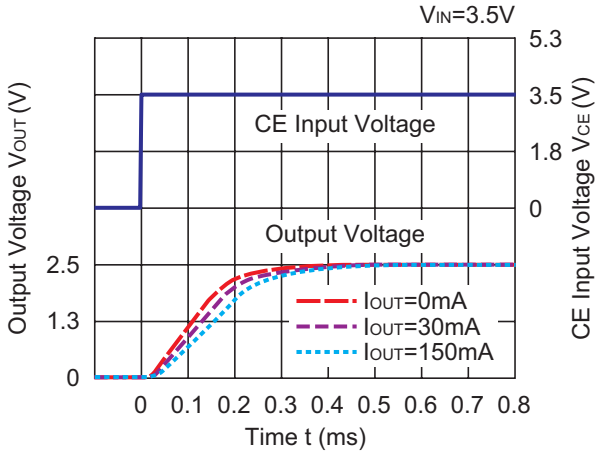



## 12) Turn On Speed with CE pin (C1=Ceramic 0.1µF, C2=Ceramic 0.1µF, Topt=25°C)

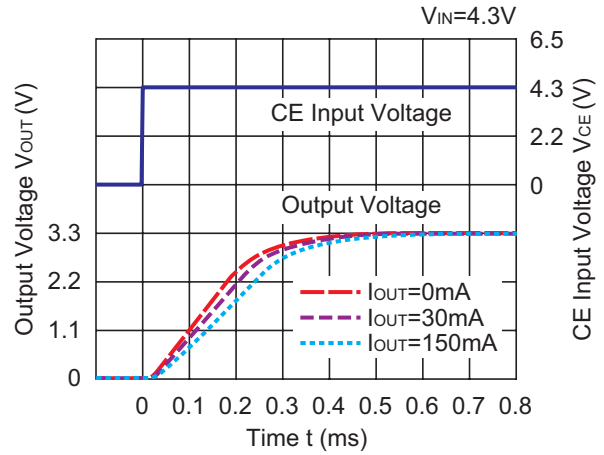
**RP104x121B/D**




**RP104x251B/D**

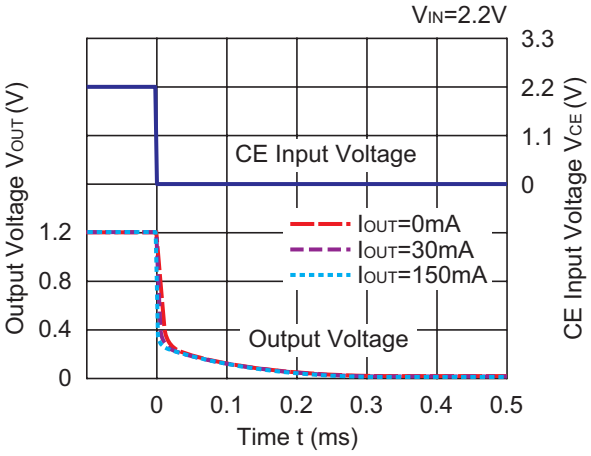



**RP104x331B/D**

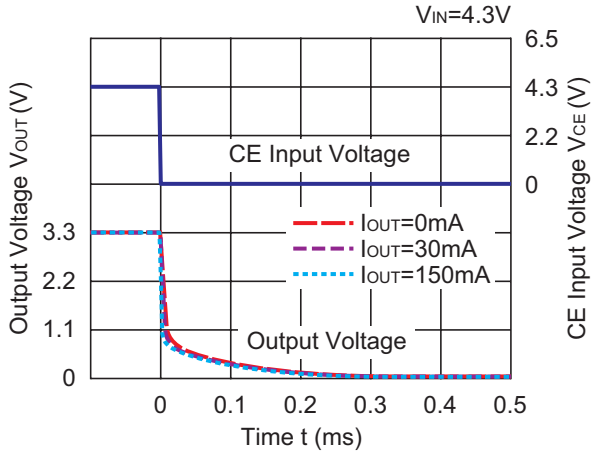


### 13) Turn Off Speed with CE pin (D Version) (C1=Ceramic 0.1μF, C2=Ceramic 0.1μF, Topt=25°C)

**RP104x121D**

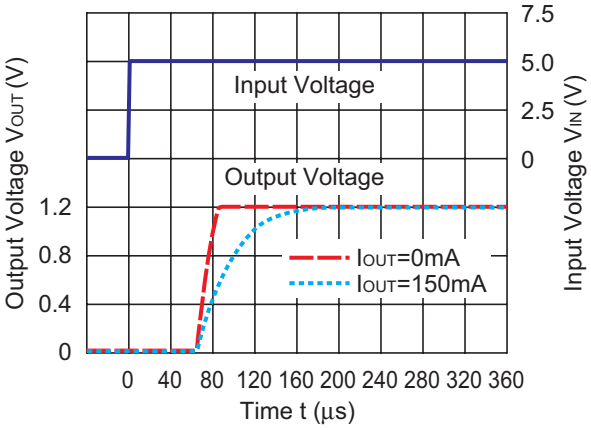



**RP104x331D**

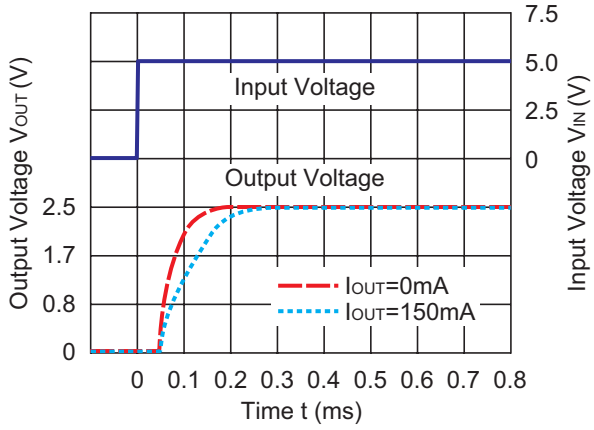



### 14) Turn On Speed of C Version (C1=Ceramic 0.1μF, C2=Ceramic 0.1μF, VIN=5.0V, Topt=25°C)

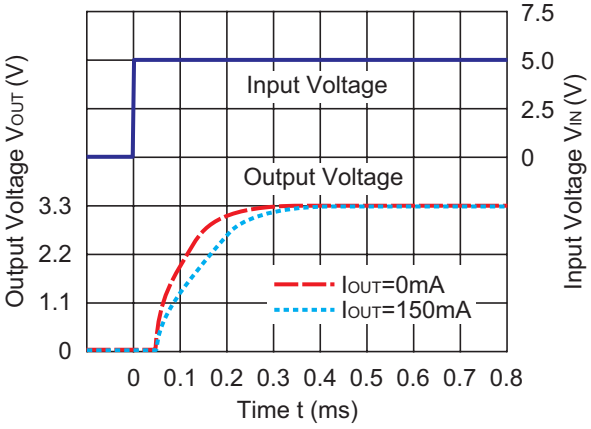
**RP104x121C**




**RP104x251C**




**RP104x331C**



# ESR vs. Output Current

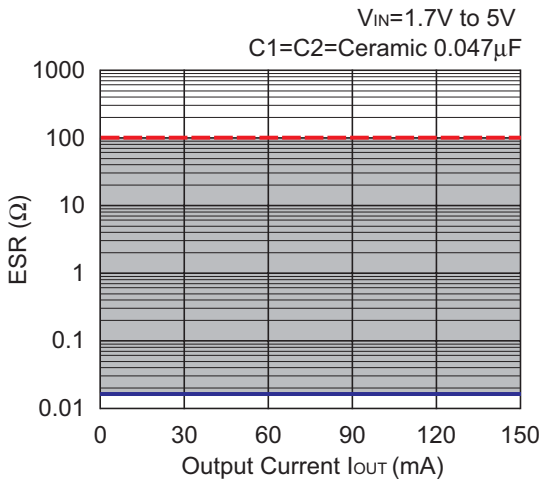
When using these ICs, consider the following points:

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 40μV (Avg.) are marked as the hatched area in the graph.

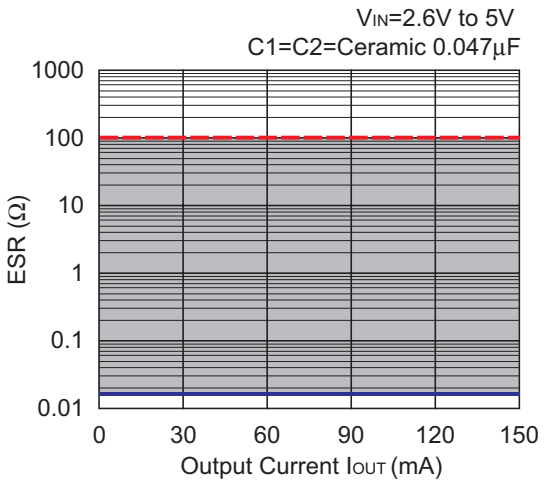
**Measurement conditions**

Frequency Band : 10Hz to 2MHz
Temperature : −40°C to 85°C

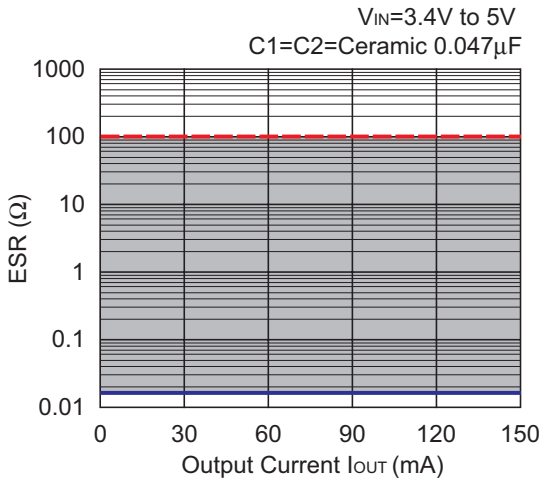
**RP104x121x**




**RP104x251x**



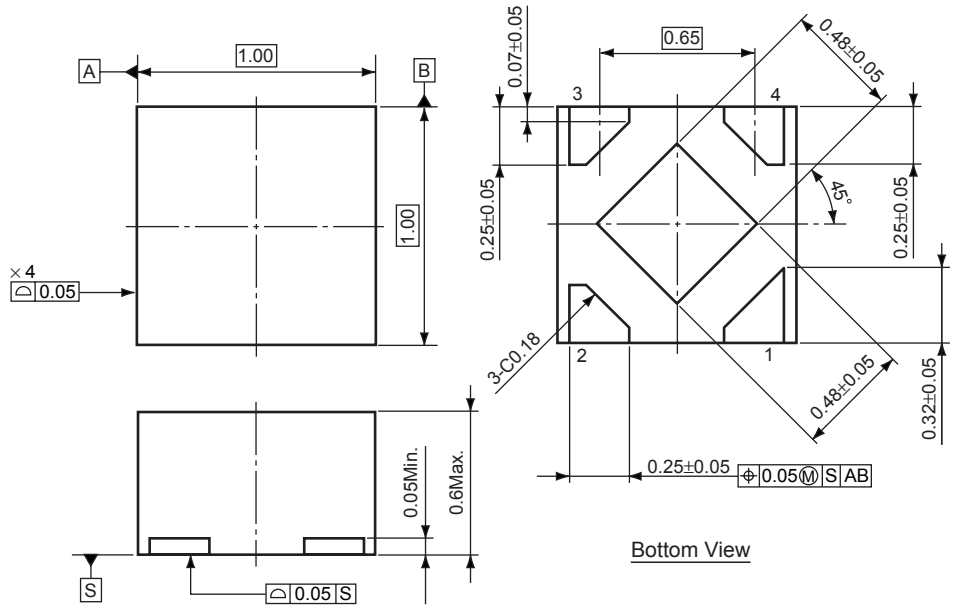

**RP104x331x**



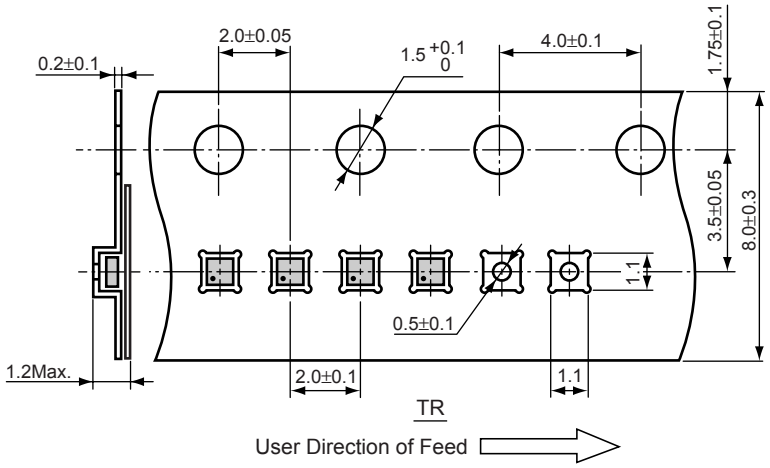
- **PLP1010-4**

Unit: mm

## PACKAGE DIMENSIONS

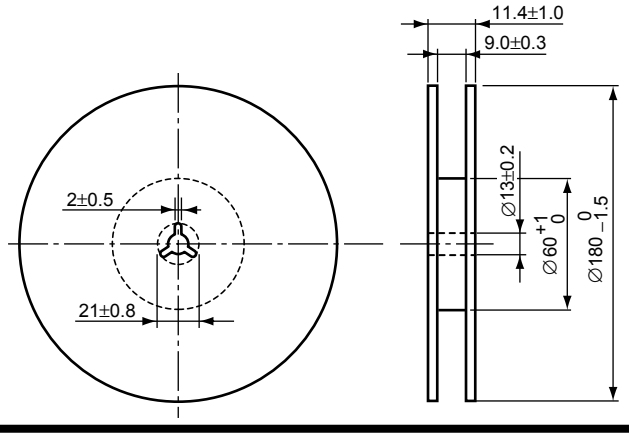



## TAPING SPECIFICATION




## TAPING REEL DIMENSIONS REUSE REEL (EIAJ-RRM-08Bc)

(1reel=10000pcs)



# POWER DISSIPATION (PLP1010-4)

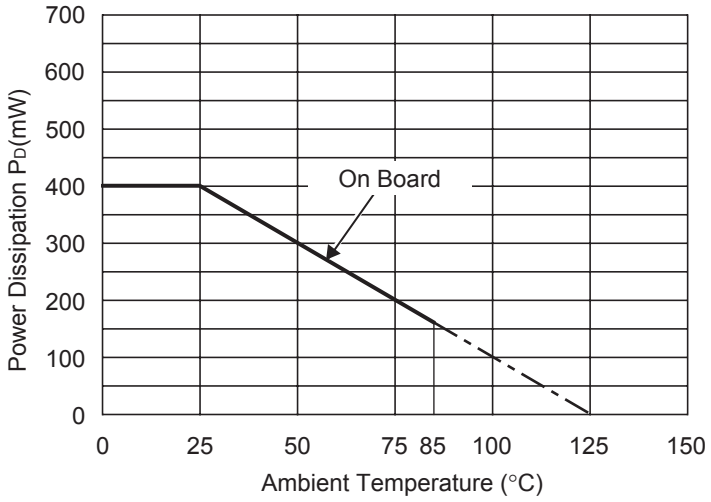
This specification is at mounted on board. Power Dissipation ($P_D$) depends on conditions of mounting on board. This specification is based on the measurement at the condition below:

Measurement Conditions

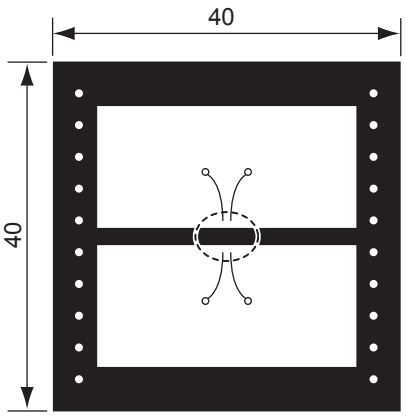
| | Standard Land Pattern |
|---|---|
| Environment | Mounting on Board (Wind velocity=0m/s) |
| Board Material | Glass cloth epoxy plactic (Double sided) |
| Board Dimensions | 40mm × 40mm × 1.6mm |
| Copper Ratio | Top side : Approx. 50% , Back side : Approx. 50% |
| Through-hole | ϕ0.54mm × 24pcs |

Measurement Result (Topt=25°C,Tjmax=125°C)

| | Standard Land Pattern |
|---|---|
| Power Dissipation | 400mW |
| Thermal Resistance | θja=(125−25°C)/0.4W=250°C/W |
| Thermal Resistance | θjc=67°C/W |



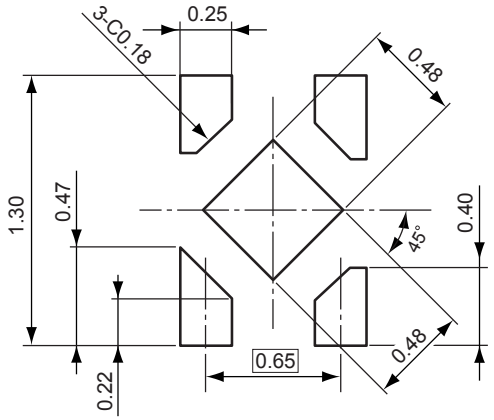

**Power Dissipation**




Measurement Board Pattern

IC Mount Area (Unit : mm)

# RECOMMENDED LAND PATTERN

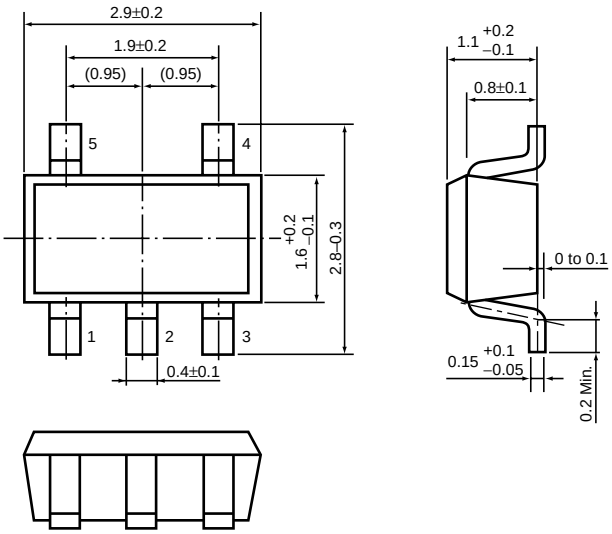



(Unit: mm)

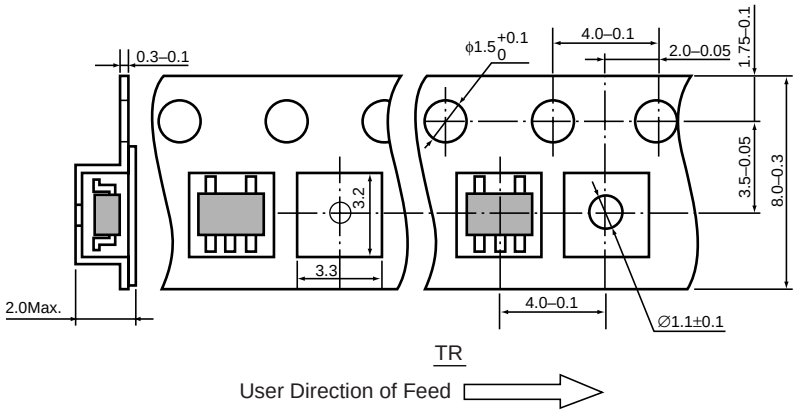
- **SOT-23-5 (SC-74A)**

Unit: mm

## PACKAGE DIMENSIONS

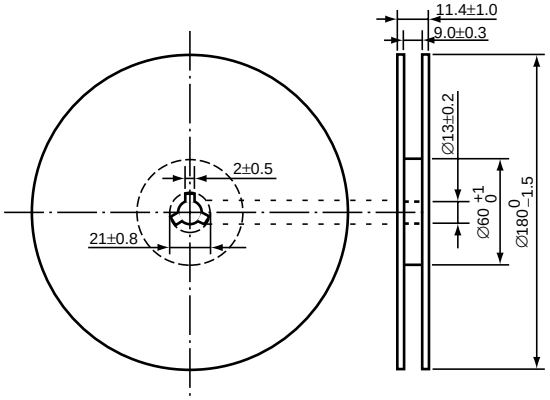



## TAPING SPECIFICATION




## TAPING REEL DIMENSIONS REUSE REEL (EIAJ-RRM-08Bc)

(1reel=3000pcs)



# POWER DISSIPATION (SOT-23-5)

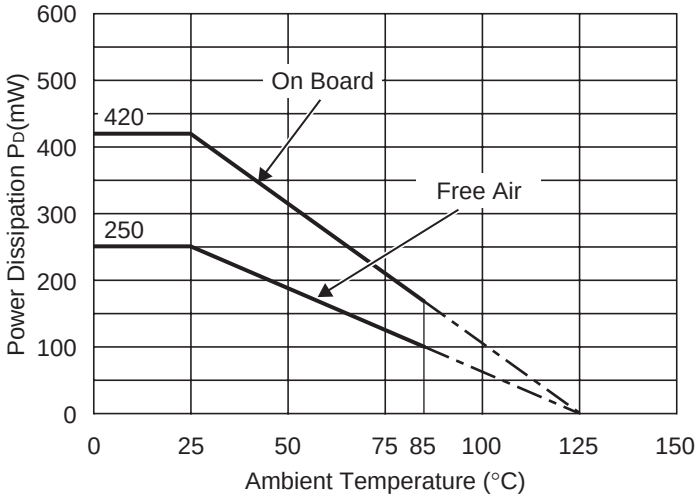
This specification is at mounted on board. Power Dissipation ($P_D$) depends on conditions of mounting on board. This specification is based on the measurement at the condition below:
(Power Dissipation (SOT-23-5) is substitution of SOT-23-6.)

Measurement Conditions

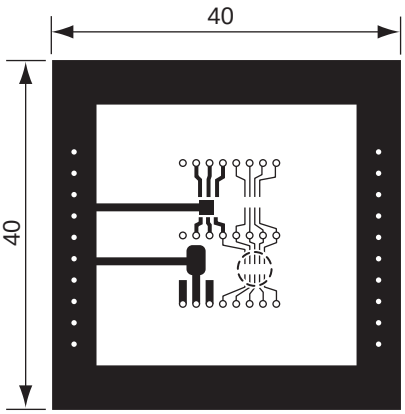
| | Standard Land Pattern |
|---|---|
| Environment | Mounting on Board (Wind velocity=0m/s) |
| Board Material | Glass cloth epoxy plactic (Double sided) |
| Board Dimensions | 40mm × 40mm × 1.6mm |
| Copper Ratio | Top side : Approx. 50% , Back side : Approx. 50% |
| Through-hole | ϕ0.5mm × 44pcs |

Measurement Result (Topt=25°C,Tjmax=125°C)

| | Standard Land Pattern | Free Air |
|---|---|---|
| Power Dissipation | 420mW | 250mW |
| Thermal Resistance | θja=(125−25°C)/0.42W=263°C/W | 400°C/W |



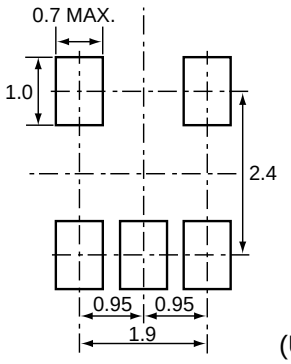

**Power Dissipation**




**Measurement Board Pattern**

IC Mount Area Unit : mm

# RECOMMENDED LAND PATTERN

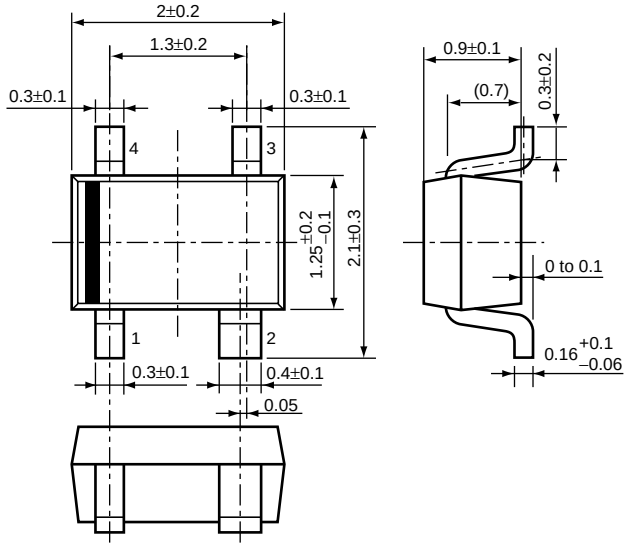



(Unit: mm)

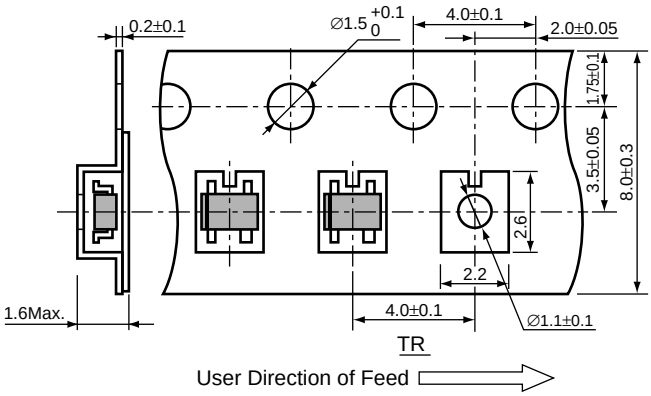
- **SC-82AB**

Unit: mm

# PACKAGE DIMENSIONS

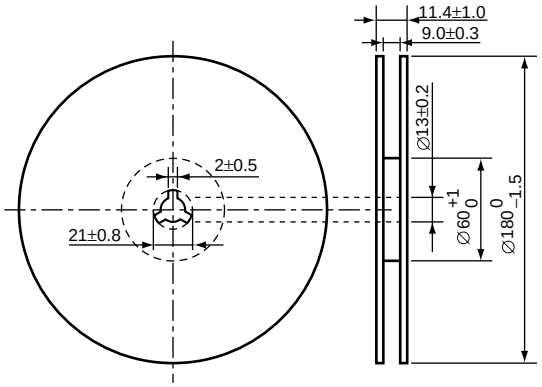



# TAPING SPECIFICATION




# TAPING REEL DIMENSIONS

(1reel=3000pcs)



# POWER DISSIPATION (SC-82AB)

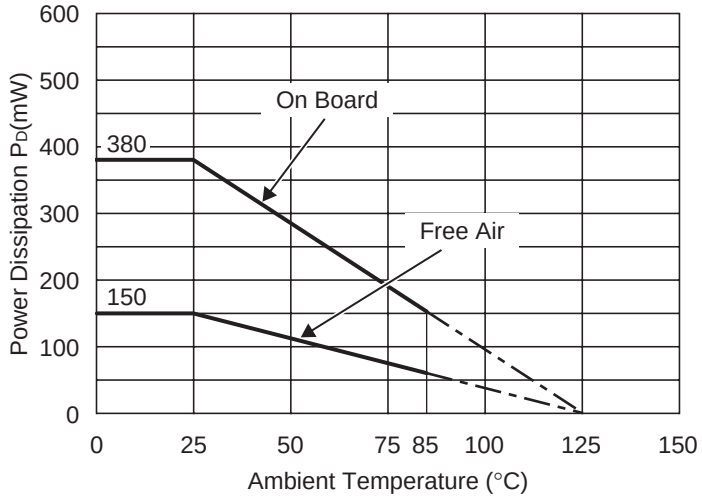
This specification is at mounted on board. Power Dissipation ($P_D$) depends on conditions of mounting on board. This specification is based on the measurement at the condition below:

Measurement Conditions

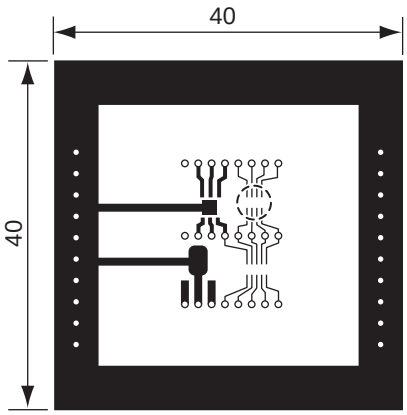
| | Standard Land Pattern |
|---|---|
| Environment | Mounting on Board (Wind velocity=0m/s) |
| Board Material | Glass cloth epoxy plactic (Double sided) |
| Board Dimensions | 40mm × 40mm × 1.6mm |
| Copper Ratio | Top side : Approx. 50% , Back side : Approx. 50% |
| Through-hole | ϕ0.5mm × 44pcs |

Measurement Result (Topt=25°C,Tjmax=125°C)

| | Standard Land Pattern | Free Air |
|---|---|---|
| Power Dissipation | 380mW | 150mW |
| Thermal Resistance | θja=(125−25°C)/0.38W=263°C/W | 667°C/W |



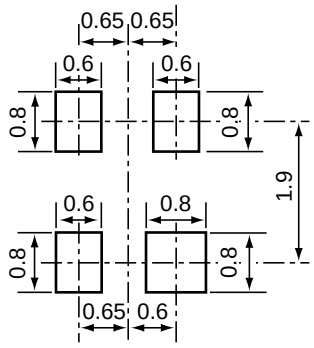

**Power Dissipation**




**Measurement Board Pattern**

IC Mount Area (Unit : mm)

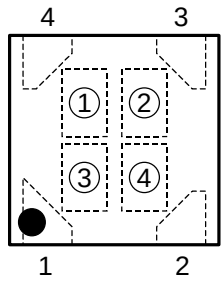
# RECOMMENDED LAND PATTERN




(Unit: mm)

# RP104K SERIES MARK SPECIFICATION

- **PLP1010-4**




①, ② : Product Code (Refer to Part Number vs. Product Code)

③, ④ : Lot Number

- **Part Number vs. Product Code**

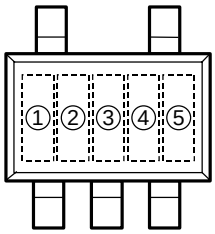
| Part Number | Product Code | |
|---|---|---|
| | ① | ② |
| RP104K121B | A | A |
| RP104K131B | A | B |
| RP104K151B | A | C |
| RP104K181B | A | D |
| RP104K181B5 | A | E |
| RP104K191B | A | F |
| RP104K201B | A | G |
| RP104K251B | A | H |
| RP104K261B | A | J |
| RP104K271B | A | K |
| RP104K281B | A | L |
| RP104K281B5 | A | M |
| RP104K291B | A | N |
| RP104K301B | A | P |
| RP104K321B | A | Q |
| RP104K331B | A | R |

| Part Number | Product Code | |
|---|---|---|
| | ① | ② |
| RP104K121C | B | A |
| RP104K131C | B | B |
| RP104K151C | B | C |
| RP104K181C | B | D |
| RP104K181C5 | B | E |
| RP104K191C | B | F |
| RP104K201C | B | G |
| RP104K251C | B | H |
| RP104K261C | B | J |
| RP104K271C | B | K |
| RP104K281C | B | L |
| RP104K281C5 | B | M |
| RP104K291C | B | N |
| RP104K301C | B | P |
| RP104K321C | B | Q |
| RP104K331C | B | R |

| Part Number | Product Code | |
|---|---|---|
| | ① | ② |
| RP104K121D | C | A |
| RP104K131D | C | B |
| RP104K151D | C | C |
| RP104K181D | C | D |
| RP104K181D5 | C | E |
| RP104K191D | C | F |
| RP104K201D | C | G |
| RP104K251D | C | H |
| RP104K261D | C | J |
| RP104K271D | C | K |
| RP104K281D | C | L |
| RP104K281D5 | C | M |
| RP104K291D | C | N |
| RP104K301D | C | P |
| RP104K321D | C | Q |
| RP104K331D | C | R |

# RP104N SERIES MARK SPECIFICATION

- **SOT-23-5**




①, ②, ③ : Product Code (Refer to Part Number vs. Product Code)

④, ⑤ : Lot Number

- **Part Number vs. Product Code**

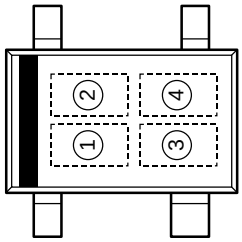
| Part Number | Product Code | | |
|---|---|---|---|
| | ① | ② | ③ |
| RP104N121B | 9 | 0 | A |
| RP104N131B | 9 | 0 | B |
| RP104N151B | 9 | 0 | C |
| RP104N181B | 9 | 0 | D |
| RP104N181B5 | 9 | 0 | E |
| RP104N191B | 9 | 0 | F |
| RP104N201B | 9 | 0 | G |
| RP104N251B | 9 | 0 | H |
| RP104N261B | 9 | 0 | J |
| RP104N271B | 9 | 0 | K |
| RP104N281B | 9 | 0 | L |
| RP104N281B5 | 9 | 0 | M |
| RP104N291B | 9 | 0 | N |
| RP104N301B | 9 | 0 | P |
| RP104N321B | 9 | 0 | Q |
| RP104N331B | 9 | 0 | R |

| Part Number | Product Code | | |
|---|---|---|---|
| | ① | ② | ③ |
| RP104N121C | 9 | 1 | A |
| RP104N131C | 9 | 1 | B |
| RP104N151C | 9 | 1 | C |
| RP104N181C | 9 | 1 | D |
| RP104N181C5 | 9 | 1 | E |
| RP104N191C | 9 | 1 | F |
| RP104N201C | 9 | 1 | G |
| RP104N251C | 9 | 1 | H |
| RP104N261C | 9 | 1 | J |
| RP104N271C | 9 | 1 | K |
| RP104N281C | 9 | 1 | L |
| RP104N281C5 | 9 | 1 | M |
| RP104N291C | 9 | 1 | N |
| RP104N301C | 9 | 1 | P |
| RP104N321C | 9 | 1 | Q |
| RP104N331C | 9 | 1 | R |

| Part Number | Product Code | | |
|---|---|---|---|
| | ① | ② | ③ |
| RP104N121D | 9 | 2 | A |
| RP104N131D | 9 | 2 | B |
| RP104N151D | 9 | 2 | C |
| RP104N181D | 9 | 2 | D |
| RP104N181D5 | 9 | 2 | E |
| RP104N191D | 9 | 2 | F |
| RP104N201D | 9 | 2 | G |
| RP104N251D | 9 | 2 | H |
| RP104N261D | 9 | 2 | J |
| RP104N271D | 9 | 2 | K |
| RP104N281D | 9 | 2 | L |
| RP104N281D5 | 9 | 2 | M |
| RP104N291D | 9 | 2 | N |
| RP104N301D | 9 | 2 | P |
| RP104N321D | 9 | 2 | Q |
| RP104N331D | 9 | 2 | R |

# RP104Q SERIES MARK SPECIFICATION

- **SC-82AB**




①, ② : Product Code (Refer to Part Number vs. Product Code)

③, ④ : Lot Number

- **Part Number vs. Product Code**

| Part Number | Product Code | |
|---|---|---|
| | ① | ② |
| RP104Q121B | L | 0 |
| RP104Q131B | L | 1 |
| RP104Q151B | L | 2 |
| RP104Q181B | L | 3 |
| RP104Q181B5 | L | 4 |
| RP104Q191B | L | 5 |
| RP104Q201B | L | 6 |
| RP104Q251B | L | 7 |
| RP104Q261B | L | 8 |
| RP104Q271B | L | 9 |
| RP104Q281B | M | 0 |
| RP104Q281B5 | M | 1 |
| RP104Q291B | M | 2 |
| RP104Q301B | M | 3 |
| RP104Q321B | M | 4 |
| RP104Q331B | M | 5 |

| Part Number | Product Code | |
|---|---|---|
| | ① | ② |
| RP104Q121C | N | 0 |
| RP104Q131C | N | 1 |
| RP104Q151C | N | 2 |
| RP104Q181C | N | 3 |
| RP104Q181C5 | N | 4 |
| RP104Q191C | N | 5 |
| RP104Q201C | N | 6 |
| RP104Q251C | N | 7 |
| RP104Q261C | N | 8 |
| RP104Q271C | N | 9 |
| RP104Q281C | P | 0 |
| RP104Q281C5 | P | 1 |
| RP104Q291C | P | 2 |
| RP104Q301C | P | 3 |
| RP104Q321C | P | 4 |
| RP104Q331C | P | 5 |

| Part Number | Product Code | |
|---|---|---|
| | ① | ② |
| RP104Q121D | R | 0 |
| RP104Q131D | R | 1 |
| RP104Q151D | R | 2 |
| RP104Q181D | R | 3 |
| RP104Q181D5 | R | 4 |
| RP104Q191D | R | 5 |
| RP104Q201D | R | 6 |
| RP104Q251D | R | 7 |
| RP104Q261D | R | 8 |
| RP104Q271D | R | 9 |
| RP104Q281D | S | 0 |
| RP104Q281D5 | S | 1 |
| RP104Q291D | S | 2 |
| RP104Q301D | S | 3 |
| RP104Q321D | S | 4 |
| RP104Q331D | S | 5 |