RICOH

RP132x SERIES

Low on Resistance / Low Voltage 1A LDO

NO.EA-265-160426

OUTLINE

The RP132x Series are voltage-regulators with a built-in low ON-resistance transistor and output current is 1A capability. These ICs have two versions: fixed output voltage type and externally adjustable output voltage type. The minimum output voltage can be set from 1.4V. Otherwise, the load regulation of RP132x has much improved when compared with conventional regulators. It's Typ.5mV at I_{OUT}=0.1mA to 1A.

Each of these ICs consists of a voltage reference unit, an error amplifier, a resistor net for setting output voltage, current limit circuits to prevent over-current and a thermal-shutdown circuit. A standby mode with ultra low supply current can be realized with the chip enable function. Additionally, E/F Version with delay pin for inrush current limit time setting are also available.

The packages for these ICs are DFN(PLP)1820-6, SOT-89-5, HSOP-6J and TO-252-5-P2. DFN(PLP)1820-6 is suitable for high density mounting of the ICs on boards. SOT-89-5, HSOP-6J and TO-252-5-P2 are supporting high wattage.

FEATURES

- Output Current ..... Min. 1A
- Supply Current ..... Typ. 65μA
- Standby Current ..... Typ. 0.15μA
- Input Voltage Range ..... 1.4V to 6.5V
- Output Voltage Range ..... Fixed Output Voltage Type: 0.8V to 5.5V (0.1V steps)
  Adjustable Output Voltage Type: 0.8V to 5.5V
  (For other voltages, please refer to MARK INFORMATIONS.)
- Dropout Voltage ..... Typ. 0.52V (V_{OUT}=2.8V, I_{OUT}=1A)
- Ripple Rejection ..... Typ. 70dB (f=1kHz, V_{OUT}=2.8V)
- Output Voltage Accuracy ..... ±1.0%
- Output Voltage Temperature-Drift Coefficient ..... Typ. ±60ppm/°C
- Line Regulation ..... Typ. 0.052%/V
- Load Regulation ..... Typ. 3mV at I_{OUT}=300mA, Typ. 5mV at I_{OUT}=1A
- Packages ..... DFN(PLP)1820-6, SOT-89-5, HSOP-6J,TO-252-5-P2
- Inrush Current Limit Circuit ..... Typ. 500mA
  B/D version: Inrush current limit time is 500μs.
  E/F version: Inrush current limit time is adjustable.
- Fold-Back Protection Circuit ..... Typ. 250mA (Current at short mode)
- Thermal Shutdown Circuit ..... Thermal Shutdown Temperature: Typ. 165°C
  Released Temperature: Typ. 95°C
- Auto Discharge Function ..... D, F version
- Ceramic capacitors are recommended to be used with this IC .... 2.2μF or more ($V_{OUT} \leq 3.6V$)
  4.7μF or more ($V_{OUT} > 3.6V$)

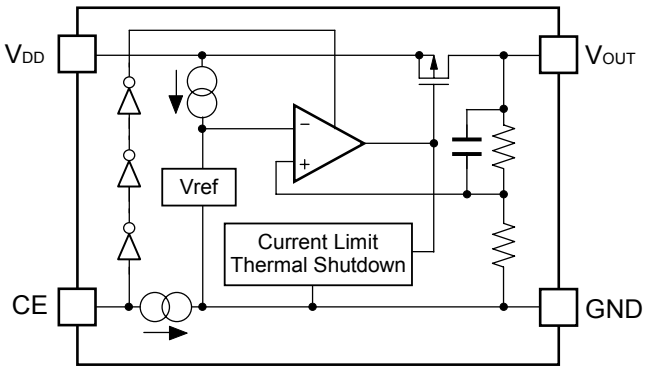
APPLICATIONS

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

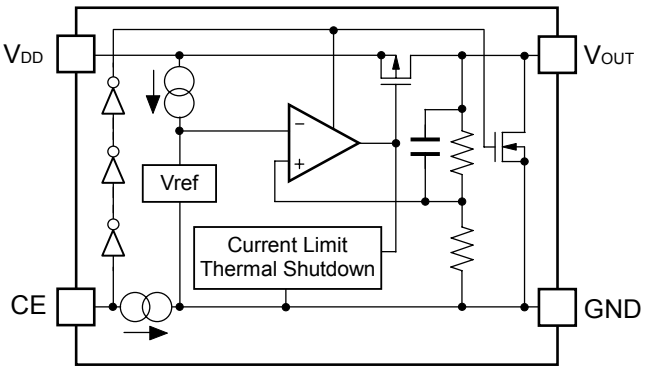
BLOCK DIAGRAMS

- **Fixed Output Voltage Type（HSOP-6J / SOT89-5）**

RP132Sxx1B / RP132Hxx1B

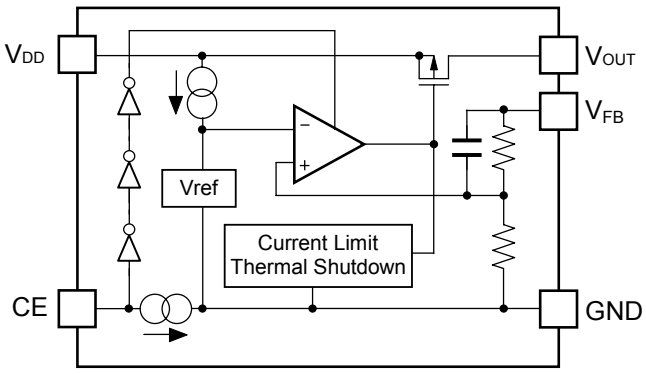


RP132Sxx1D / RP132Hxx1D

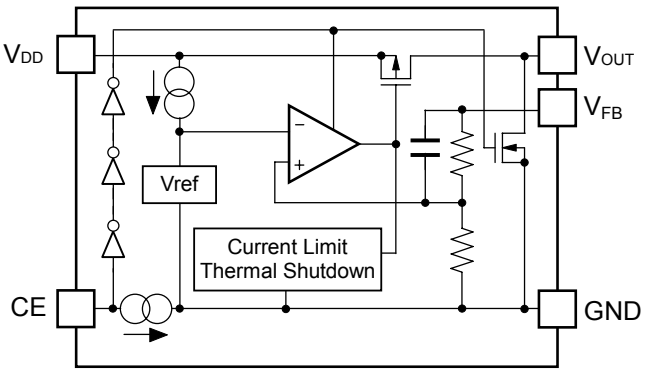


- **Fixed Output Voltage Type（TO-252-5-P2 / DFN(PLP)1820-6）**

RP132Jxx1B / RP132Kxx1B

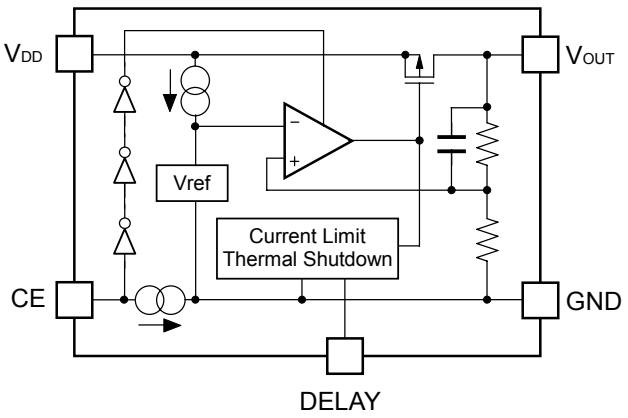


RP132Jxx1D / RP132Kxx1D

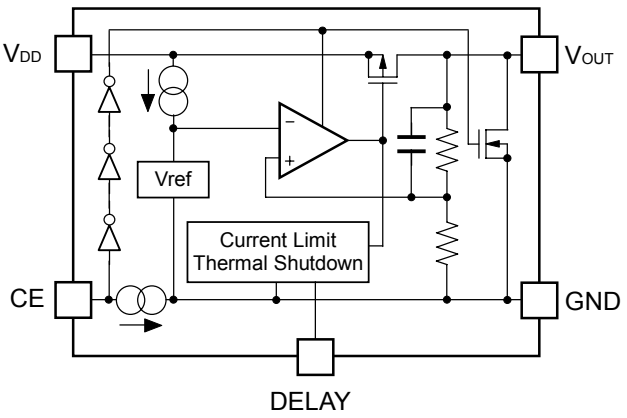


- **Fixed Output Voltage Type with DELAY pin（HSOP-6J）**

RP132Sxx1E

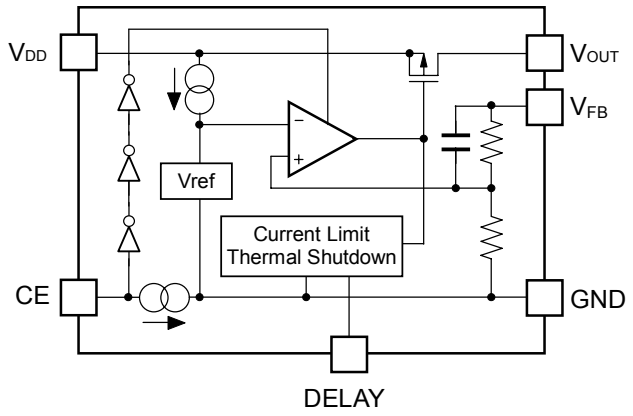


RP132Sxx1F

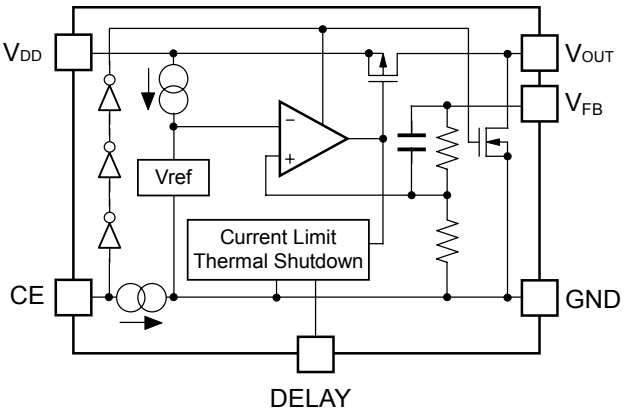


- **Fixed Output Voltage Type with DELAY pin（DFN(PLP)1820-6）**

RP132Kxx1E

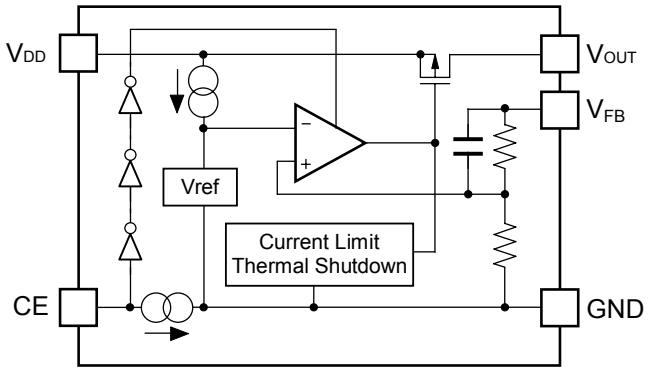


RP132Kxx1F

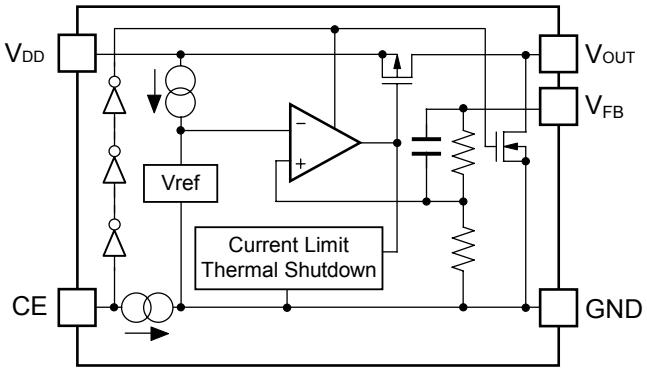


- **Adjustable Output Voltage Type（HSOP-6J / SOT-89-5 / TO-252-5-P2 /DFN(PLP)1820-6）**

RP132S001B / RP132H001B / RP132J001B / RP132K001B

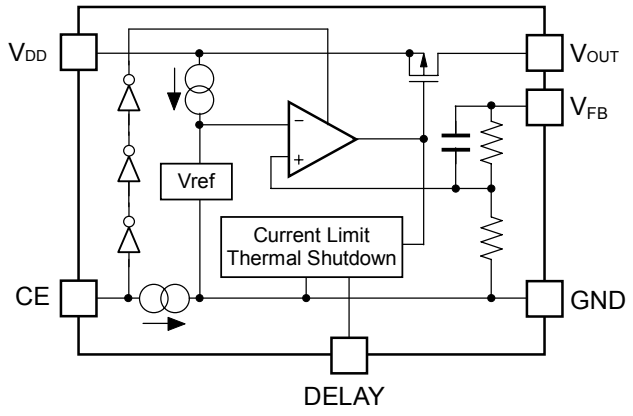


RP132S001D / RP132H001D / RP132J001D / RP132K001D

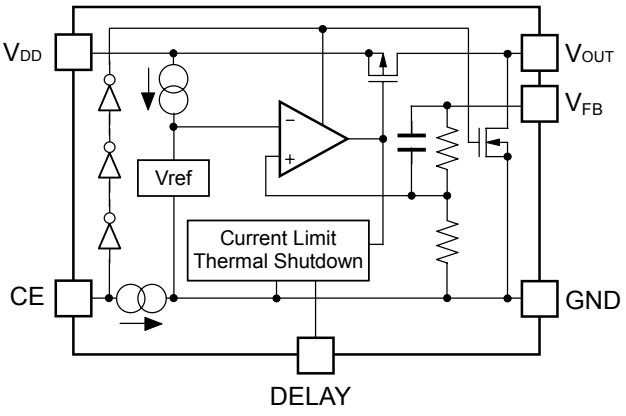


- **Adjustable Output Voltage Type with DELAY pin（DFN(PLP)1820-6）**

RP132K001E



RP132K001F



SELECTION GUIDE

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

Product Name	Package	Quantity per Reel	Pb Free	Halogen Free
RP132K001∗-TR	DFN(PLP)1820-6	5,000 pcs	Yes	Yes
RP132Kxx1∗-TR				
RP132H001#-T1-FE	SOT-89-5	1,000 pcs	Yes	Yes
RP132Hxx1#-T1-FE				
RP132S001#-E2-FE	HSOP-6J	1,000 pcs	Yes	Yes
RP132Sxx1∗-E2-FE				
RP132J001#-T1-FE	TO-252-5-P2	3,000 pcs	Yes	Yes
RP132Jxx1#-T1-FE				

RP132x001x is the adjustable output voltage type.
xx: The output voltage can be designated in the range from 0.8V(08) to 5.5V(55) in 0.1V step.

∗: The combination of the auto discharge function and delay pin (for setting inrush current limit time) are as follows.
- B: without auto discharge function
- D: with auto discharge function
- E: without auto discharge function, with delay pin (for setting inrush current limit time)
- F: with auto discharge function and delay pin (for setting inrush current limit time)

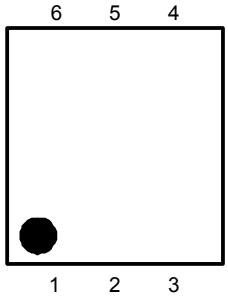
#: The auto discharge function at off state are options as follows.
- B: without auto discharge function at off state
- D: with auto discharge function at off state

Auto-discharge function quickly lowers the output voltage to 0V, when the chip enable signal is switched from the active mode to the standby mode, by releasing the electrical charge accumulated in the external capacitor.

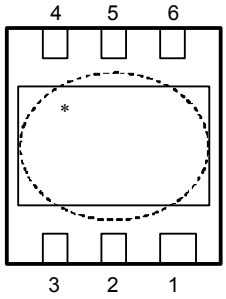
PIN CONFIGURATIONS

● **DFN(PLP)1820-6**

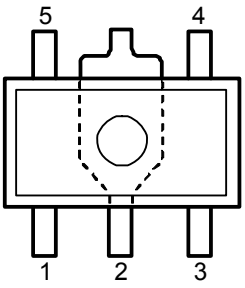
Top View



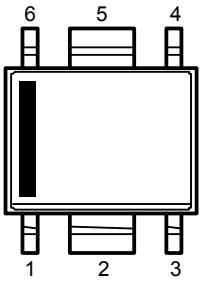
Bottom View



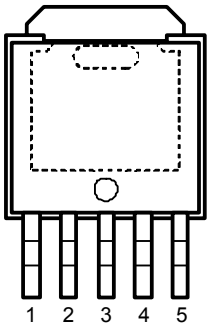
● **SOT-89-5**



● **HSOP-6J**



● **TO-252-5-P2**



PIN DESCRIPTIONS

● **DFN(PLP)1820-6**

Pin No.	Symbol	Pin Description
1	V_{OUT}	Output Pin
2	V_{FB}	Feed Back Pin
3	GND	Ground Pin
4	CE	Chip Enable Pin ("H" Active)
5	NC	No Connection (RP132K001B/D, RP132Kxx1B/D)
	DELAY	Delay Pin (for setting inrush current limit time) (RP132K001E/F, RP132Kxx1E/F)
6	V_{DD}	Input Pin

∗ 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.

・ When using Fixed Output Voltage Type(RP132Kxx1x), the V_{OUT} pin and the V_{FB} pin should be connected.

・ When using Adjstable Output Voltage Type (RP132K001x), please follow "Notes on the Adjustable Output Voltage Type Settings".

- **SOT-89-5**

Pin No.	Symbol	Pin Description
1	CE	Chip Enable Pin ("H" Active) (RP132Hxx1B/D)
	V_{FB}	Feed Back Pin (RP132H001B/D)
2	GND	Ground Pin
3	NC	No Connection (RP132Hxx1B/D)
	CE	Chip Enable Pin ("H" Active) (RP132H001B/D)
4	V_{DD}	Input Pin
5	V_{OUT}	Output Pin

・When using Adjstable Output Voltage Type (RP132H001x), please follow "Notes on Adjustable Output Voltage Type Settings".

- **HSOP-6J**

Pin No.	Symbol	Pin Description
1	V_{OUT}	Output Pin
2	GND	Ground Pin*1
3	NC	No Connection (RP132Sxx1B/D)
	V_{FB}	Feed Back Pin (RP132S001B/D)
	DELAY	Delay Pin (for setting inrush current limit time)(RP132Sxx1E/F)
4	CE	Chip Enable Pin ("H" Active)
5	GND	Ground Pin*1
6	V_{DD}	Input Pin

*1 No.2 pin and No.5 pin must be wired each other when mounted on boards.
・When using Adjstable Output Voltage Type (RP132S001x), please follow "Notes on Adjustable Output Voltage Type Settings".

- **TO-252-5-P2**

Pin No.	Symbol	Pin Description
1	CE	Chip Enable Pin ("H" Active)
2	V_{DD}	Input Pin
3	GND	Ground Pin
4	V_{OUT}	Output Pin
5	V_{FB}	Feed Back Pin

∗ 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.
・when using Fixed Output Voltage Type(RP132Jxx1x),V_{OUT} pin and V_{FB} pin should be connected.
・When using Adjstable Output Voltage Type (RP132J001x), please follow "Notes on the Adjustable Output Voltage Type Settings".

ABSOLUTE MAXIMUM RATINGS

Symbol	Item	Rating	Unit
V_{IN}	Input Voltage	7.0	V
V_{CE}	Input Voltage (CE Pin)	−0.3 to 7.0	V
V_{FB}	Input Voltage (V_{FB} Pin)	−0.3 to 7.0	V
V_{OUT}	Output Voltage	−0.3 to V_{IN}+0.3	V
P_D	Power Dissipation (DFN(PLP)1820-6)*	880	mV
	Power Dissipation (SOT-89-5)*	900	
	Power Dissipation (HSOP-6J)*	1700	
	Power Dissipation (TO-252-5-P2)*	1900	
Topt	Operating Temperature Range	−40 to 85	°C
Tstg	Storage Temperature Range	−55 to 125	°C

∗) 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.

ELECTRICAL CHARACTERISTICS

V_{IN}=Set V_{OUT}+1.0V, I_{OUT}=1mA,C_{IN}=2.2μF, C_{OUT}=2.2μF(V_{OUT} ≤ 3.6V), 4.7μF(V_{OUT}＞3.6V).

The specification in ☐ is checked and guaranteed by design engineering at −40°C ≤T_{opt}≤ 85°C, unless otherwise noted.

- **RP132xxx1B/D(Fixed Output Voltage Type)**
- **RP132S/Kxx1E/F(Fixed Output Voltage Type with DELAY pin)** Topt=25°C

Symbol	Item	Conditions		Min.	Typ.	Max.	Unit
V_{OUT}	Output Voltage	Topt=25°C	V_{OUT} > 1.5V	×0.99		×1.01	V
			V_{OUT} ≤ 1.5V	−15		15	mV
		−40°C ≤ Topt ≤ 85°C	V_{OUT} > 1.5V	☐×0.981		×1.019☐	V
			V_{OUT} ≤ 1.5V	☐−29		29☐	mV
I_{LIM}	Output Current Limit			☐1			A
ΔV_{OUT}/ ΔI_{OUT}	Load Regulation	0.1mA ≤ I_{OUT} ≤ 300mA			3	20☐	mV
		0.1mA ≤ I_{OUT} ≤ 1A			5	60☐	
V_{DIF}	Dropout Voltage	Refer to the following "Dropout Voltage"					
I_{SS}	Supply Current	I_{OUT}=0mA (V_{IN}=6.5V)			65	85☐	μA
Istandby	Standby Current	V_{CE}=0V, V_{IN}=6.5V			0.15	0.60	μA
ΔV_{OUT}/ ΔV_{IN}	Line Regulation	Set V_{OUT}+0.5V ≤ V_{IN} ≤ 6.5V ∗ However, V_{IN} ≥1.6V			0.05	0.10☐	%/V
RR	Ripple Rejection	f=1kHz Ripple 0.2Vp-p I_{OUT}=100mA	V_{OUT} ≤ 3.3V		70		dB
			V_{OUT} > 3.3V		60		
V_{IN}	Input Voltage			☐1.4		6.5☐	V
ΔV_{OUT}/ ΔT_{opt}	Output Voltage Temperature Coefficient	−40°C ≤ Topt ≤ 85°C			±60		ppm /°C
I_{SC}	Short Current Limit	V_{OUT}=0V			250		mA
I_{PD}	CE Pull-down Current				0.3	0.7☐	μA
V_{CEH}	CE Input Voltage "H"			☐1.0			V
V_{CEL}	CE Input Voltage "L"					0.4☐	V
en	Output Noise	BW=10Hz to 100kHz			70		μVrms
T_{TSD}	Thermal Shutdown Temperature	Junction Temperature			165		°C
T_{TSR}	Thermal Shutdown Released Temperature	Junction Temperature			95		°C
R_{LOW}	Low Output Nch Tr. ON Resistance (D/F version)	V_{IN}=4.0V, V_{CE}=0V			50		Ω
I_{DELAY}	DELAY pin Current (DELAY pin version)	V_{IN}=4.0V		☐0.7	1.2	1.7☐	μA

All test items listed under Electrical Characteristics are done under the pulse load condition (Tj≈Ta=25ºC) except Output Noise, Ripple Rejection, Output Voltage Temperature Coefficient, Dropout Voltage at 1A Output Current and Load Regulation and Thermal Shutdown.

- **Dropout Voltage**

Topt=25°C

Output Voltage V_{OUT} (V)	Dropout Voltage V_{DIF} (V)					
	Condition	Typ.	Max.	Condition	Typ.	Max.
0.8 ≤ V_{OUT} < 0.9	I_{OUT}=300mA	0.67	0.89	I_{OUT}=1A	1.20	1.54
0.9 ≤ V_{OUT} < 1.0		0.59	0.82		1.10	1.46
1.0 ≤ V_{OUT} < 1.1		0.51	0.73		1.05	1.39
1.1 ≤ V_{OUT} < 1.2		0.42	0.63		0.96	1.31
1.2 ≤ V_{OUT} < 1.5		0.36	0.54		0.90	1.23
1.5 ≤ V_{OUT} < 2.6		0.24	0.33		0.78	1.05
2.6 ≤ V_{OUT} < 3.3		0.15	0.21		0.52	0.72
3.3 ≤ V_{OUT} ≤ 5.5		0.13	0.18		0.46	0.68

The specification in ☐ is checked and guaranteed by design engineering at −40°C≤T_{opt}≤85°C, unless otherwise noted.
All test items listed under Electrical Characteristics are done under the pulse load condition (Tj≈Ta=25ºC) except Output Noise, Ripple Rejection, Output Voltage Temperature Coefficient, Dropout Voltage at 1A Output Current and Load Regulation and Thermal Shutdown.

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

V_{IN}=Set V_{OUT}+1.0V, I_{OUT}=1mA,C_{IN}=2.2μF, C_{OUT}=2.2μF(V_{OUT} ≤ 3.6V), 4.7μF(V_{OUT}＞3.6V).

The specification in ☐ is checked and guaranteed by design engineering at −40°C ≤T_{opt} ≤ 85°C, unless otherwise noted.

- **RP132x001B/D(Adjustable Output Voltage Type)**
- **RP132K001E/F(Adjustable Output Voltage Type with DELAY pin)**

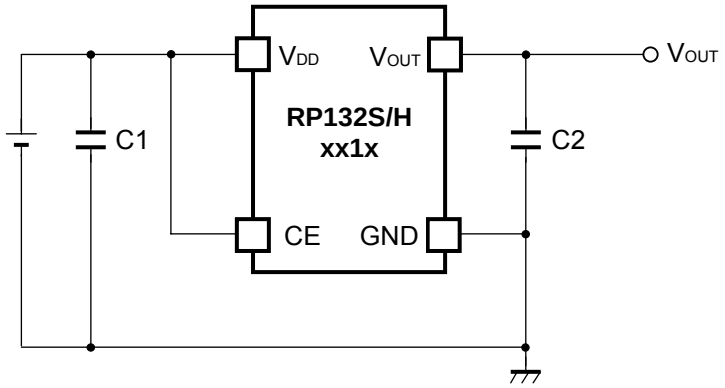
Topt=25°C

Symbol	Item	Conditions		Min.	Typ.	Max.	Unit
V_{FB}	Feedback Voltage	Topt=25°C	$V_{OUT}=V_{FB}$	0.785	0.800	0.815	V
		−40°C ≤ Topt ≤ 85°C		☐ 0.771		☐ 0.829	
V_{OUT}	Output Voltage Adjusting Range			0.8		5.5	V
I_{LIM}	Output Current Limit	$V_{OUT}=V_{FB}$		☐ 1			A
$\Delta V_{OUT}/\Delta I_{OUT}$	Load Regulation	0.1mA ≤ I_{OUT} ≤ 300mA			3	☐ 20	mV
		0.1mA ≤ I_{OUT} ≤ 1A			5	☐ 60	
V_{DIF}	Dropout Voltage	$V_{OUT}=V_{FB}$	I_{OUT}=300mA		0.67	☐ 0.89	V
			I_{OUT}=1A		1.20	☐ 1.54	
I_{SS}	Supply Current	$V_{OUT}=V_{FB}$, I_{OUT}=0mA (V_{IN}=6.5V)			65	☐ 85	μA
Istandby	Standby Current	V_{CE}=0V, V_{IN}=6.5V			0.15	0.60	μA
$\Delta V_{OUT}/\Delta V_{IN}$	Line Regulation	$V_{OUT}=V_{FB}$, 1.6V ≤ V_{IN} ≤ 6.5V			0.05	☐ 0.10	%/V
RR	Ripple Rejection	f=1kHz, Ripple 0.2Vp-p, I_{OUT}=100mA	$V_{OUT}=V_{FB}$		70		dB
V_{IN}	Input Voltage			☐ 1.4		☐ 6.5	V
$\Delta V_{OUT}/\Delta T_{opt}$	Output Voltage Temperature Coefficient	−40°C ≤ Topt ≤ 85°C			±60		ppm /°C
I_{SC}	Short Current Limit	$V_{OUT}=V_{FB}$=0V			250		mA
I_{PD}	CE Pull-down Current				0.3	☐ 0.7	μA
V_{CEH}	CE Input Voltage "H"			☐ 1.0			V
V_{CEL}	CE Input Voltage "L"					☐ 0.4	V
en	Output Noise	BW=10Hz to 100kHz			70		μVrms
T_{TSD}	Thermal Shutdown Temperature	Junction Temperature			165		°C
T_{TSR}	Thermal Shutdown Released Temperature	Junction Temperature			95		°C
R_{LOW}	Low Output Nch Tr. ON Resistance (D/F version)	V_{IN}=4.0V, V_{CE}=0V			50		Ω
I_{DELAY}	DELAY pin Current (DELAY pin version)	V_{IN}=4.0V		☐ 0.7	1.2	☐ 1.7	μA

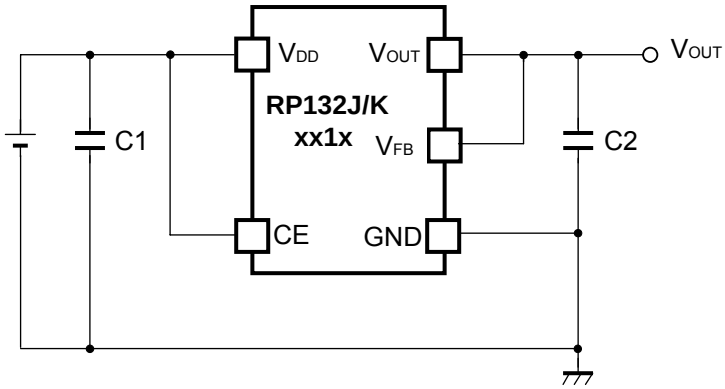
All of unit are tested and specified under load conditions such that Tj≈Topt=25°C except for Output Noise, Ripple Rejection, Output Voltage Temperature Coefficient, Dropout Voltage at 1A Output Current and Load Regulation and Thermal Shutdown.

TYPICAL APPLICATION

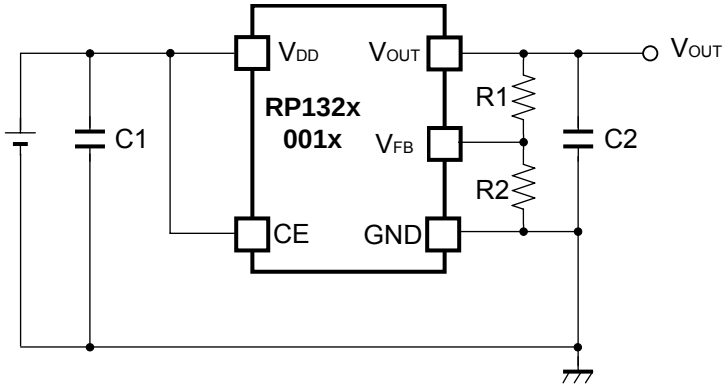
- **Fixed Output Voltage Type (HSOP-6J/ SOT89-5)**



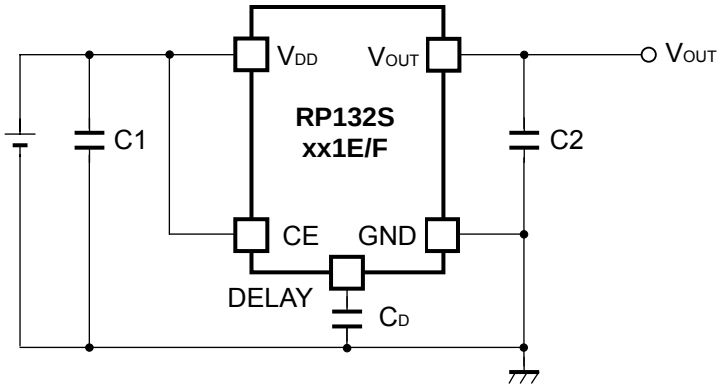
- **Fixed Output Voltage Type (TO-252-5-P2/ DFN(PLP)1820-6)**



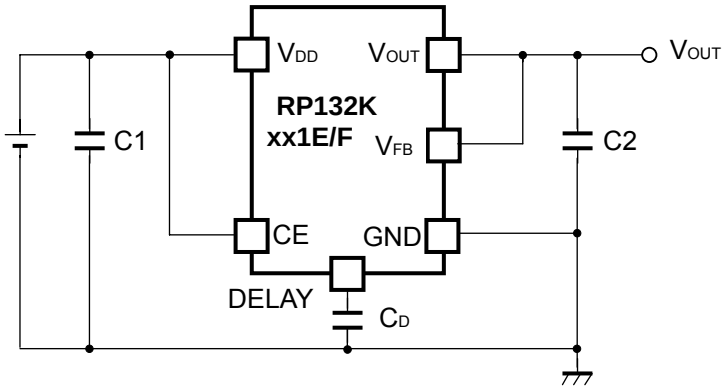
- **Adjustable Output Voltage Type (HSOP-6J / SOT89-5/ TO-252-5-P2 / DFN(PLP)1820-6）**



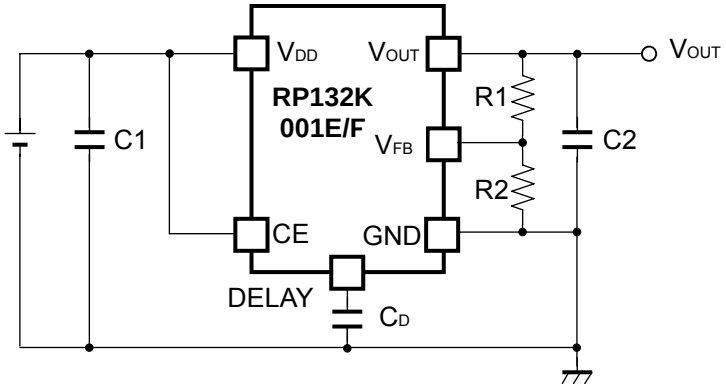
- **Fixed Output Voltage Type with DELAY pin (HSOP-6J)**



- **Fixed Output Voltage Type with DELAY pin (DFN(PLP)1820-6)**



- **Adjustable Output Voltage Type with DELAY pin (DFN(PLP)1820-6)**



Recommendation value of the external capacitors

V_{OUT}	Capacitors	
$V_{OUT} \leq 3.6V$	C1	Kyocera 2.2μF (size:1005) [CM05X5R225M06A]
	C2	Kyocera 2.2μF (size:1608) [CM105X5R225K06AB]
$V_{OUT} > 3.6V$	C1	Kyocera 2.2μF (size:1005) [CM05X5R225K06A]
	C2	Kyocera 4.7μF (size:1608) [CM105X5R475M06AB]

Please refer to "Technical Notes on Adjustable Output Voltage Type" when using R1 and R2 as output capacitors. Also refer to "Inrush Current Limit Time Settings" concerning with C_D.

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).

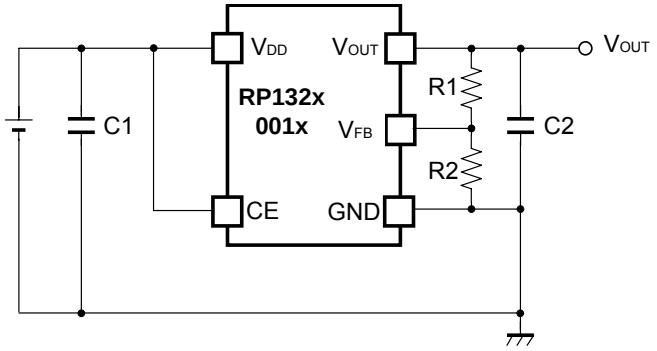
If a tantalum capacitor is used, and its ESR of C2 is large, the loop oscillation may result. Because of this, select C2 carefully considering its frequency characteristics.

PCB Layout

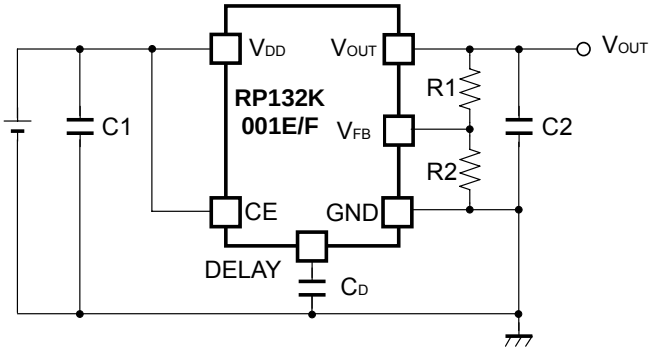
Make V_{DD} and GND lines sufficient. If their impedance is high, noise pickup or unstable operation may result. Connect a capacitor C1 between V_{DD} and GND pin with a capacitance value as "Recommendation value of the external capacitors" above or more, and as close as possible to the pins.

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

TECHNICAL NOTES on Adjustable Output Voltage Type



Typical Application for Adjustable Output Voltage Type （HSOP-6J / SOT89-5/ TO-252-5-P2 / DFN(PLP)1820-6）



Typical Application for Adjustable Output Voltage Type with DELAY pin（DFN(PLP)1820-6）

Recommendation value of the external capacitors

V_{OUT}	Capacitors	
$V_{OUT} \leq 3.6V$	C1	Kyocera 2.2μF (size:1005) [CM05X5R225M06A]
	C2	Kyocera 2.2μF (size:1608) [CM105X5R225K06AB]
$V_{OUT} > 3.6V$	C1	Kyocera 2.2μF (size:1005) [CM05X5R225K06A]
	C2	Kyocera 4.7μF (size:1608) [CM105X5R475M06AB]

Phase Compensation

Similar to the Fixed Output Voltage Type, Phase compensation is made for the Adjustable Output Voltage Type for securing stable operation even if the load current is varied. For this purpose, use a 4.7μF or more capacitor C2 between V_{OUT} pin and GND pin, and as close as possible to the pins.

PCB Layout

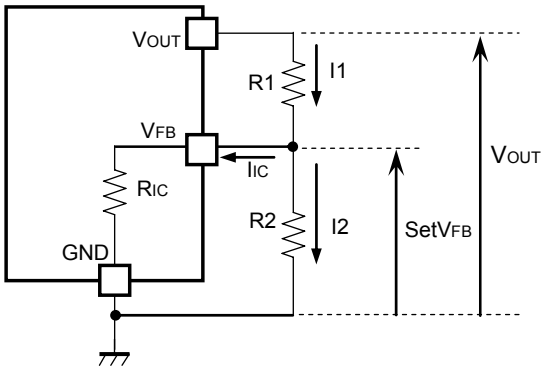
Make V_{DD} and GND lines sufficient. If their impedance is high, noise pickup or unstable operation may result. Connect a capacitor C1 with a capacitance value as much as 2.2μF or more between V_{DD} and GND pin, and as close as possible to the pins.

When using the Adjustable Output Voltage Type, the transient response could be affected by the external resistors. Evaluate the circuit taking the actual conditions of use into account.

Adjustable Output Voltage Type Settings

- **Output Voltage Setting Method**

RP132x081x can be adjusted the output voltage up to 5.5V by using the external divider resistors.
Also, please use 16kΩ or less for R2 resistor.
If the V_{FB} voltage is described as setV_{FB}, the output voltage can be set by using the following equations
SetV_{FB} is equal to 0.8V. The V_{OUT} pin of RP132x081x should be connected to the V_{FB} pin.



$I1 = I_{IC} + I2$ ..... (1)
$I2 = setV_{FB} / R2$ ..... (2)

Thus,

$I1 = I_{IC} + setV_{FB} / R2$ ..... (3)

Therefore,

$V_{OUT} = setV_{FB} \times R1 \times I1$ ..... (4)

Put Equation (3) into Equation (4), then

$V_{OUT} = setV_{FB} + R1(I_{IC} + setV_{FB} / R2)$
$= setV_{FB} \times (1+R1/ R2) + R1 \times I_{IC}$ ..... (5)

In Equation (5), R1x I_{IC} is the error-causing factor in V_{OUT}.

As for I_{IC},

$I_{IC} = setV_{FB} / R_{IC}$ ..... (6)

Therefore, the error-causing factor R1x I_{IC} can be described as follows.

$R1 \times I_{IC} = R1 \times setV_{FB} / R_{IC}$
$= setV_{FB} \times R1 / R_{IC}$ ..... (7)

For better accuracy, choosing R1 ($<<R_{IC}$) reduces this error.

Without the error-causing factor R1x I_{IC}, the output voltage can be calculated by the following equation

$V_{OUT} = setV_{FB} \times ((R1 + R2) / R2)$ ..... (8)

R_{IC} of RP132x is approximately Typ.1.3MΩ (T_{opt}=25°C, this value is guaranteed by design.).

The value could be affected by the temperature, therefore evaluate the circuit taking the actual conditions of use into account.

Inrush Current Limit Time Settings

The RP132xSeries include the circuit which can limit the inrush current at start-up to 500mA or less.
The current limit time of B/D version is fixed internally as approximately Typ.500μs.
On the other hand, the current limit times of E/F versions are adjustable by controlling the DELAY pin value, which is the capacitance value connected between DLEAY pin and GND pin.

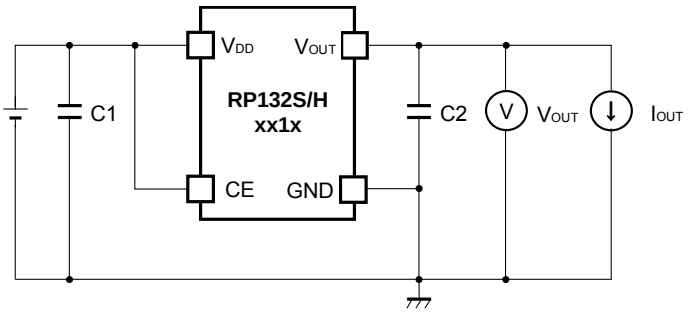
The relation between Inrush Current Limit Time (t_D[s]) and the DELAY pin capacitance (C_D[F]) can be described in the following equation.

$$t_D=(C_D+70\times10^{-12})\times0.525\times10^{6}$$

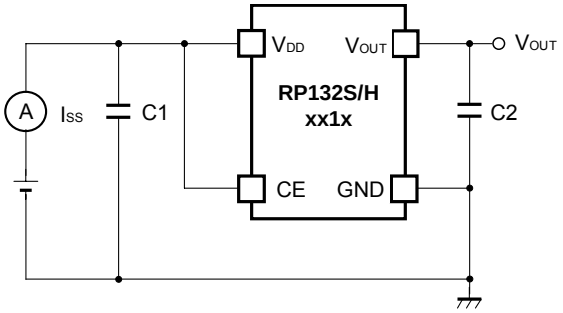
When not using C_D on E/F versions, DELAY pin should be open.
In this case, C_D=0 is applied to the above equation and as a result, 37μs can be obtained.
That means, when using C_D on E/F versions, the inrush current limit time will be more than 37μs.
Please note that during the inrush current limit time, the load current cannot be more than the limited current.

TEST CIRCUITS

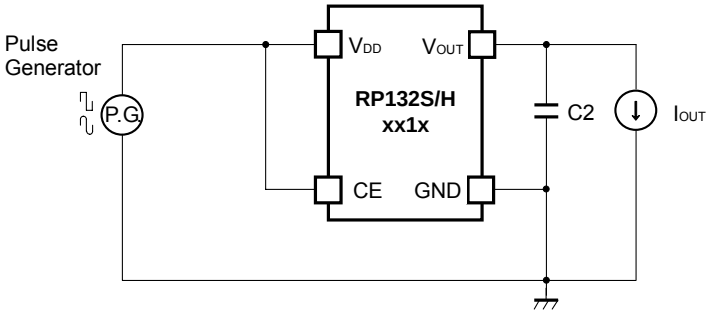
- **Fixed Output Voltage Type（HSOP-6J / SOT89-5）**



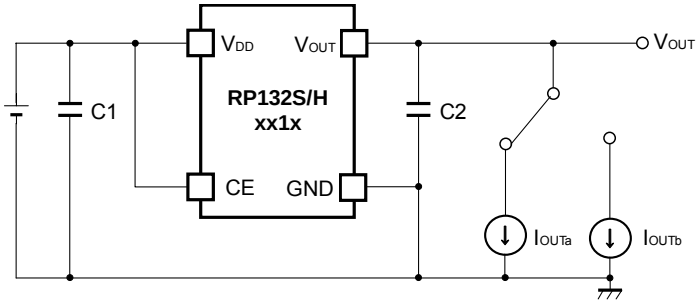
Basic Test Circuit



Test Circuit for Supply Current

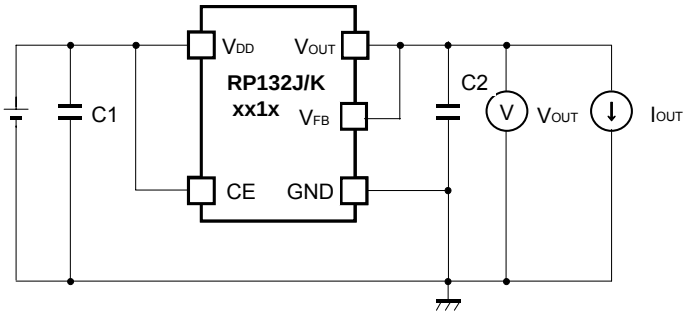


Test Circuit for Ripple Rejection

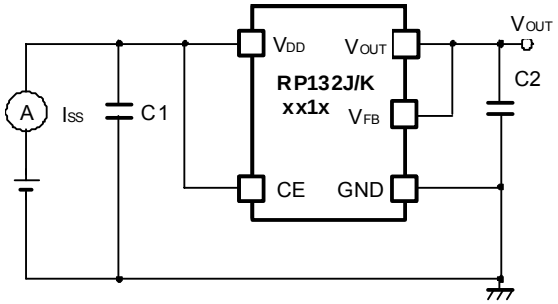


Test Circuit for Load Transient Response

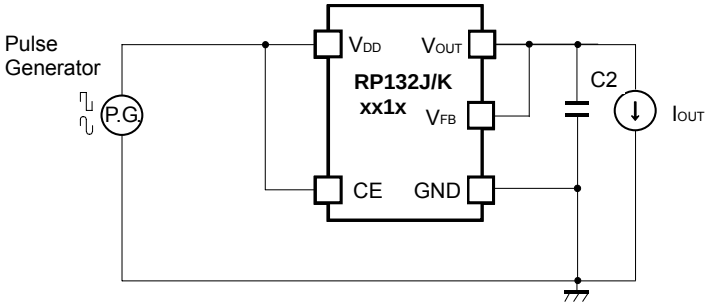
- **Fixed Output Voltage Type（TO-252-5-P2 / DFN(PLP)1820-6）**



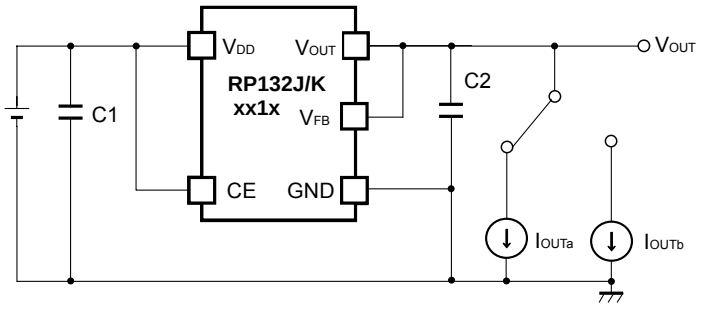
Basic Test Circuit



Test Circuit for Supply Current

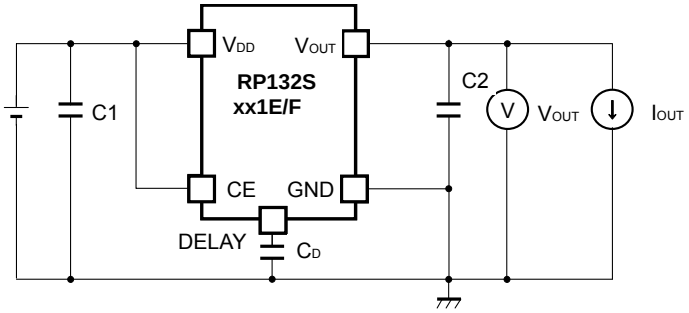


Test Circuit for Ripple Rejection

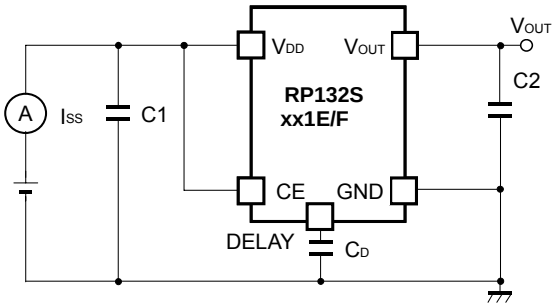


Test Circuit for Load Transient Response

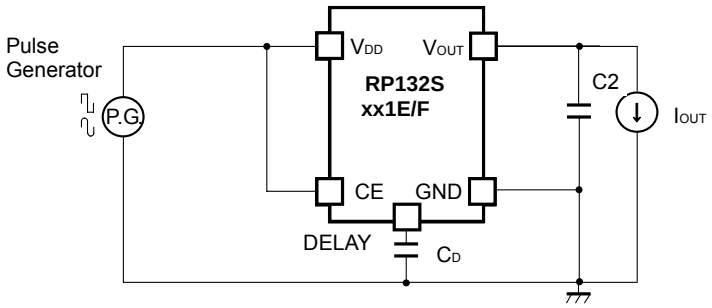
- **Fixed Output Voltage Type with DELAY pin (HSOP-6J)**



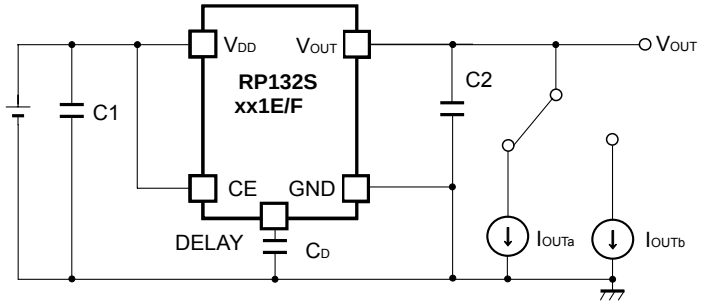
Basic Test Circuit



Test Circuit for Supply Current



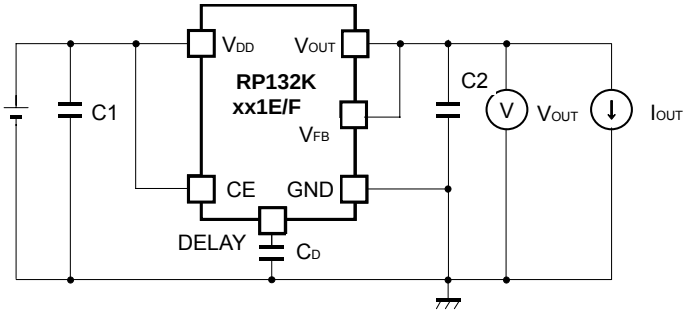
Test Circuit for Ripple Rejection



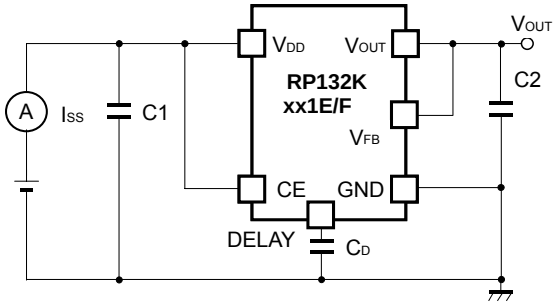
Test Circuit for Load Transient Response

Please refer to "Inrush Current Limit Time Settings" concerning with C_D.

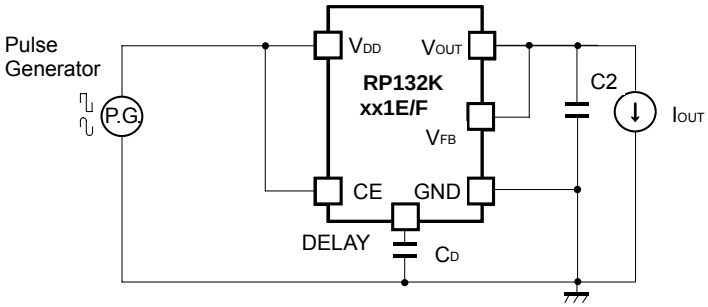
- **Fixed Output Voltage Type with DELAY pin (DFN(PLP)1820-6)**



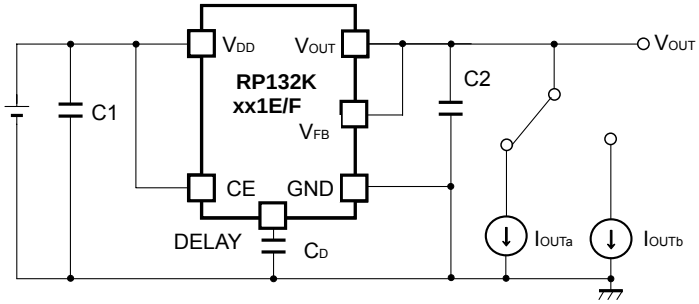
Basic Test Circuit



Test Circuit for Supply Current



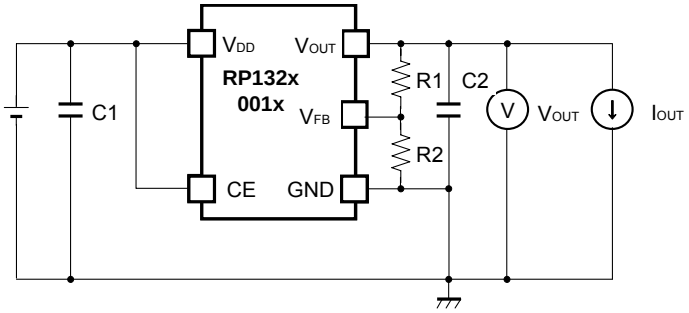
Test Circuit for Ripple Rejection



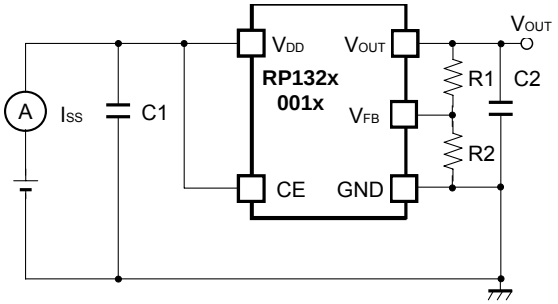
Test Circuit for Load Transient Response

Please refer to "Inrush Current Limit Time Settings" concerning with C_D.

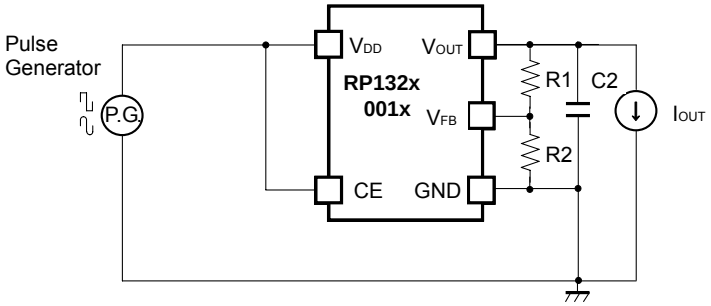
- **Adjustable Output Voltage Type（HSOP-6J / SOT89-5/ TO-252-5-P2 / DFN(PLP)1820-6）**



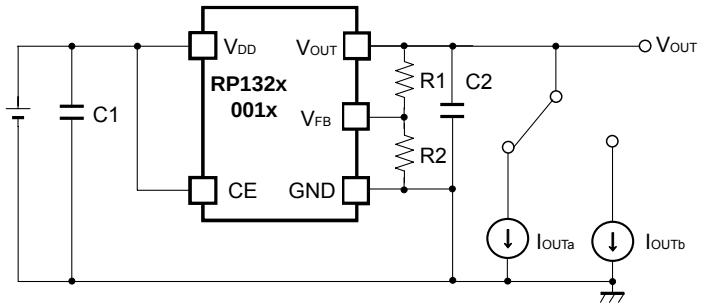
Basic Test Circuit



Test Circuit for Supply Current



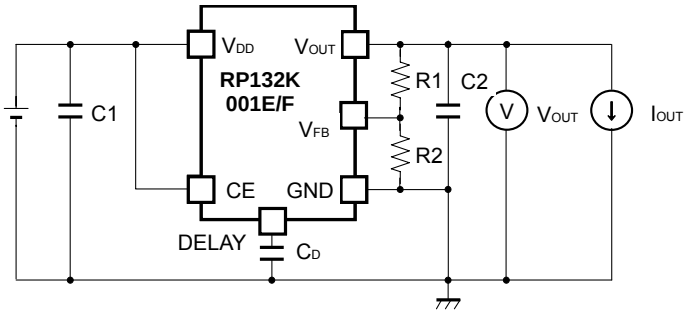
Test Circuit for Ripple Rejection



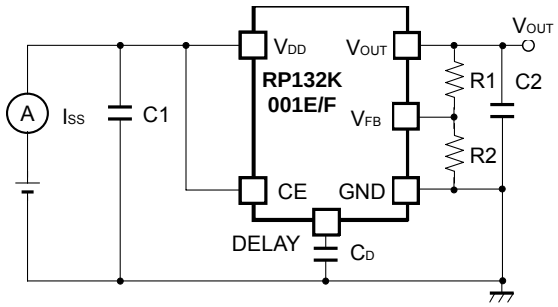
Test Circuit for Load Transient Response

Please refer to "Technical Notes on Adjustable Output Voltage Type" when using R1 and R2 as output capacitors.

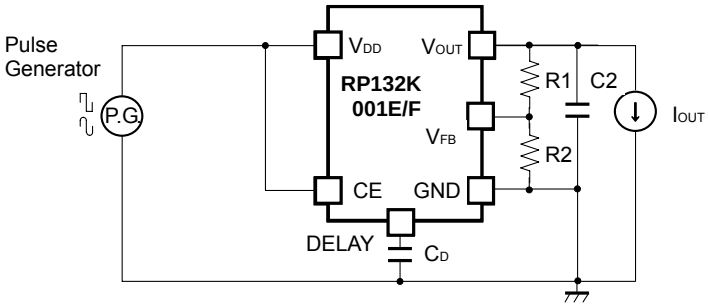
- **Adjustable Output Voltage Type with DELAY pin（DFN(PLP)1820-6）**



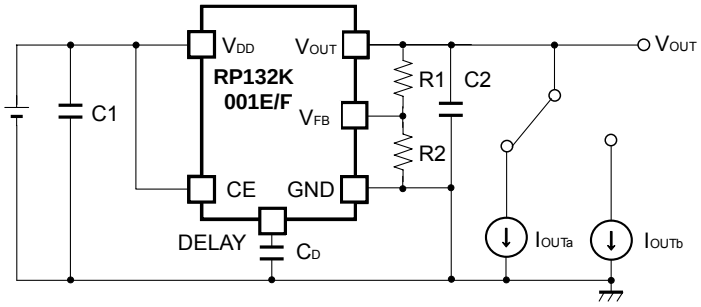
Basic Test Circuit



Test Circuit for Supply Current



Test Circuit for Ripple Rejection



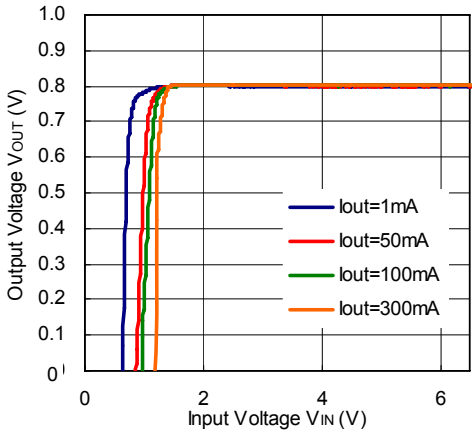
Test Circuit for Load Transient Response

Please refer to "Technical Notes on Adjustable Output Voltage Type" when using R1 and R2 as output capacitors. Also refer to "Inrush Current Limit Time Settings" concerning with C_D.

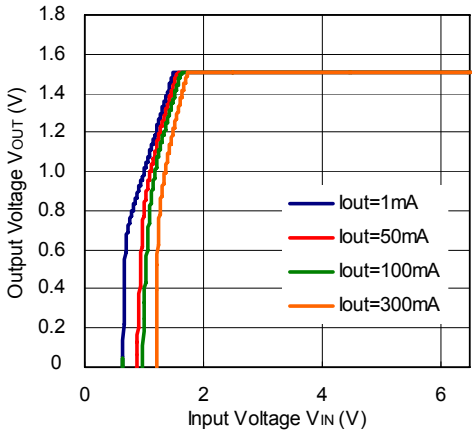
TYPICAL CHARACTERISTICS

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

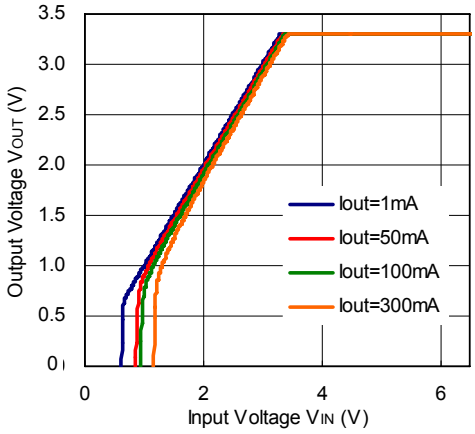
RP132x081x



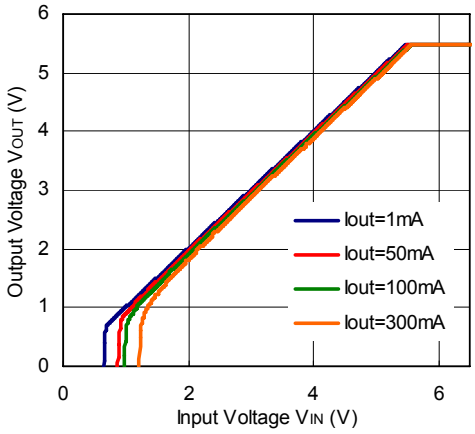
RP132x151x



RP132x331x

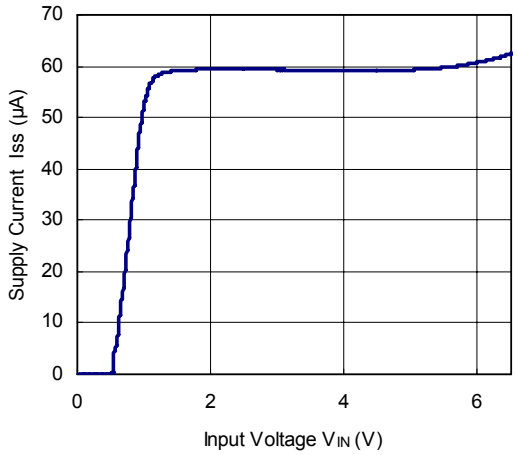


RP132x551x

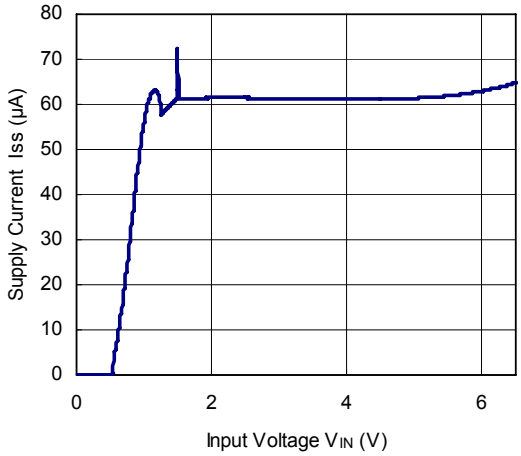


2) Supply Current vs. Input Voltage (Topt=25°C)

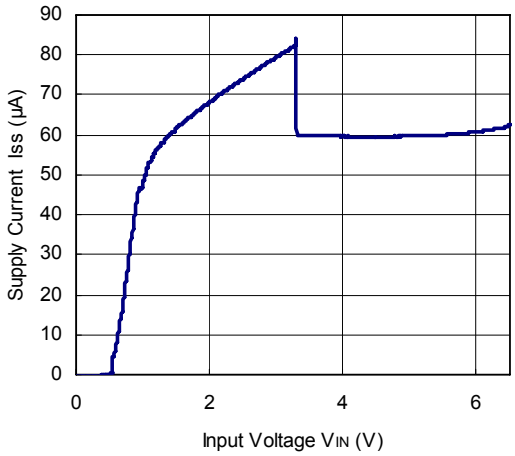
RP13x081x



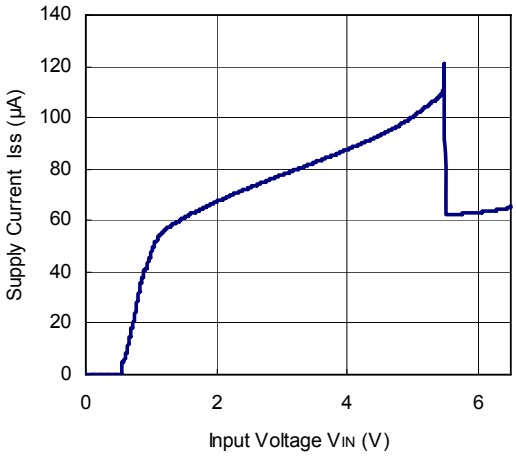
RP132x151x



RP132x331x

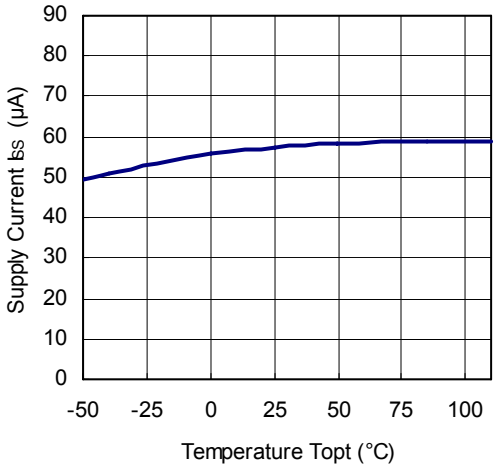


RP132x551x



3) Supply Current vs. Temperature

RP132x081x



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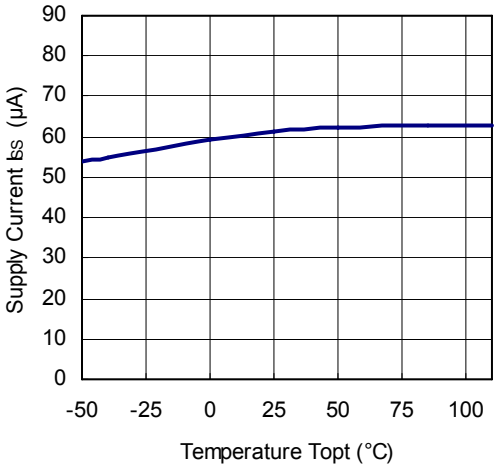

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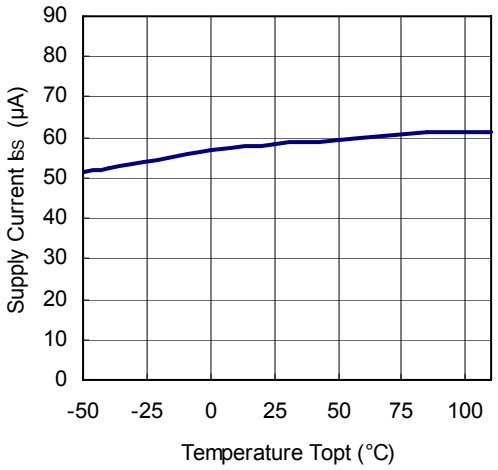

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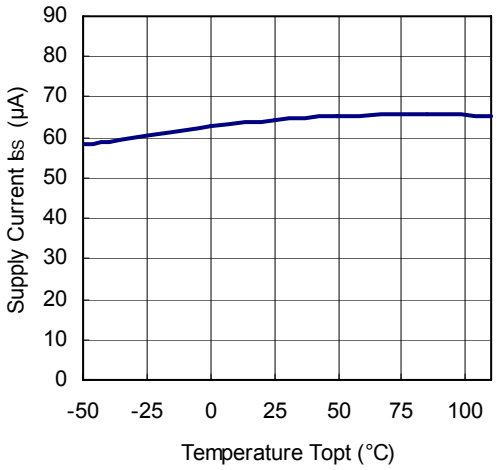
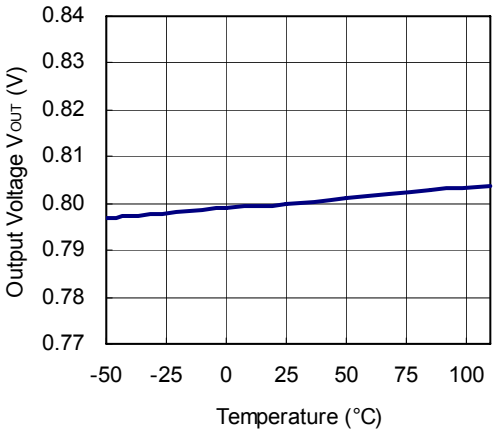


4) Output Voltage vs. Temperature

RP132x081x



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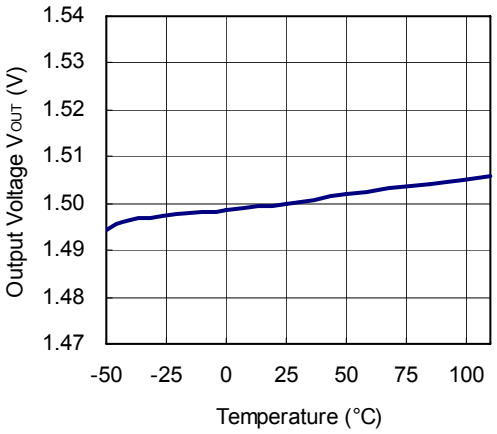

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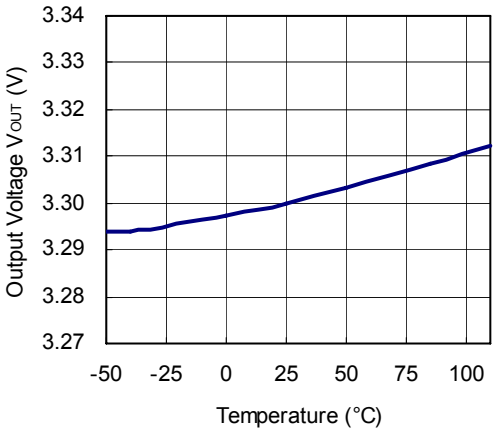

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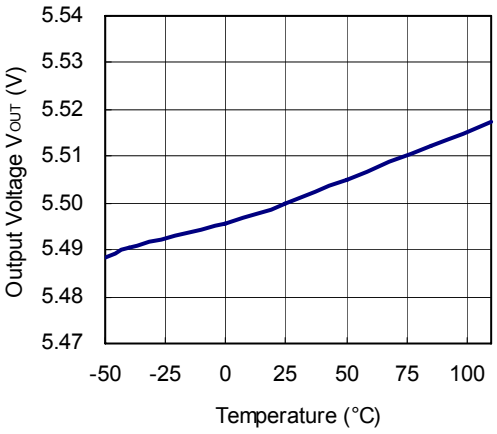
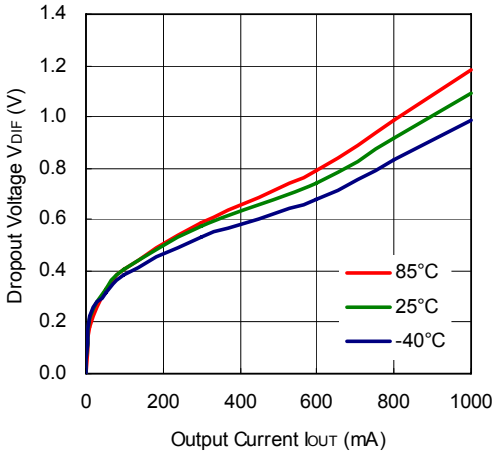


5) Dropout Voltage vs. Output Current

RP132x081x



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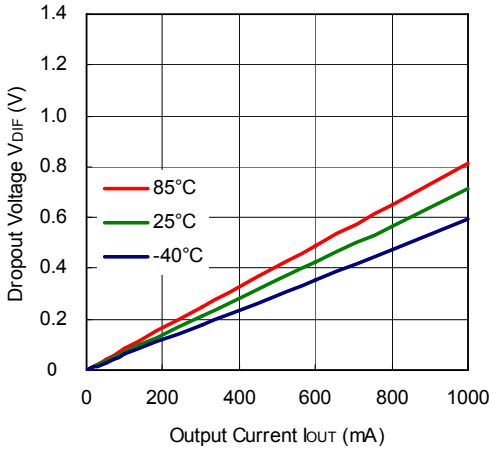

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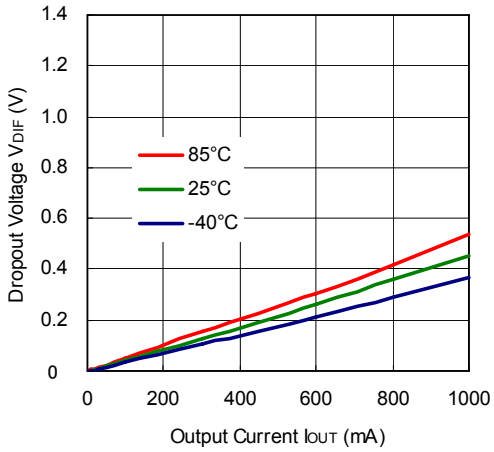

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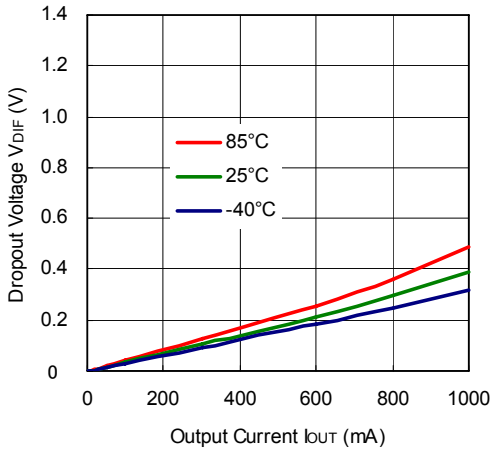
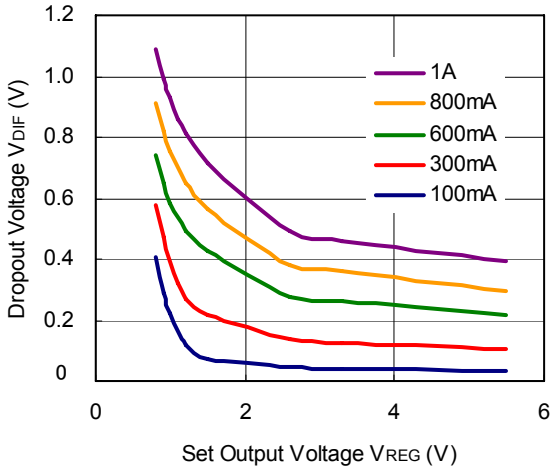
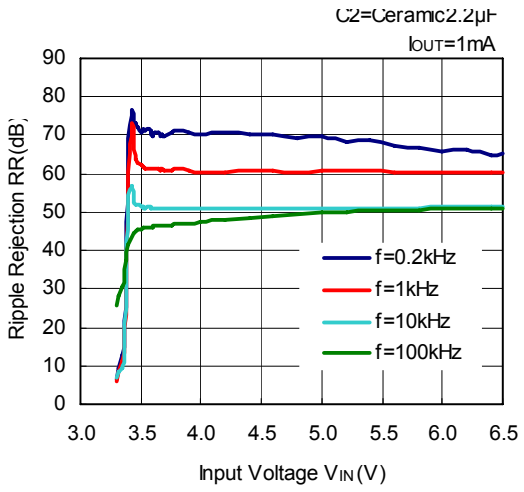


6) Dropout Voltage vs. Set Output Voltage



7) Ripple Rejection vs. Input Voltage (C1=none, Ripple=0.2Vp-p, Topt=25°C)

RP132x331x



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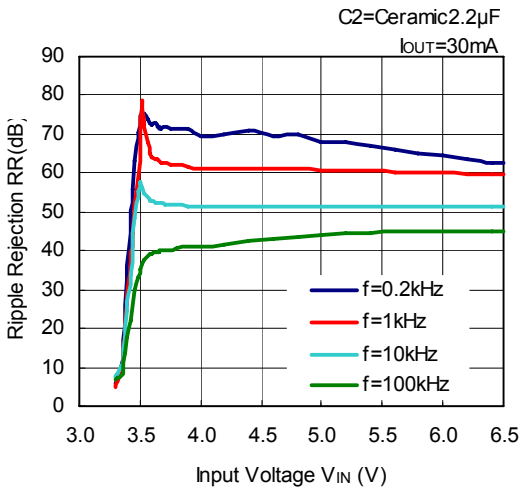

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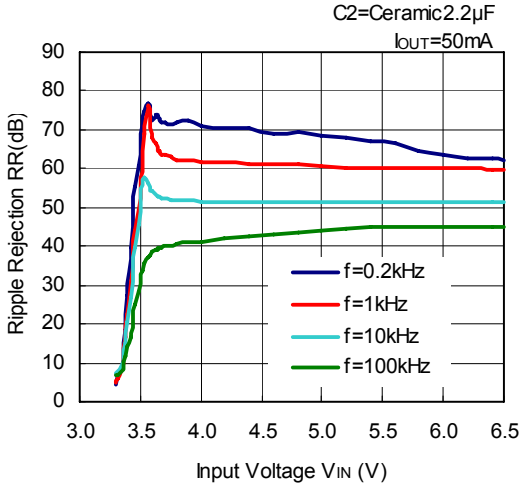

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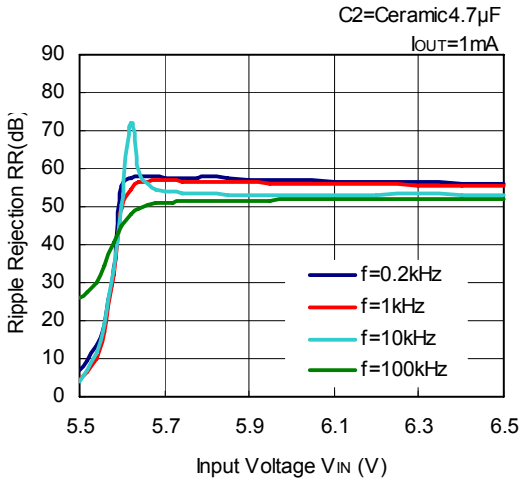

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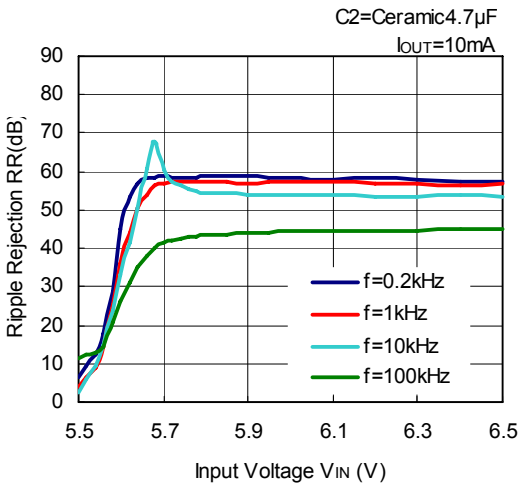

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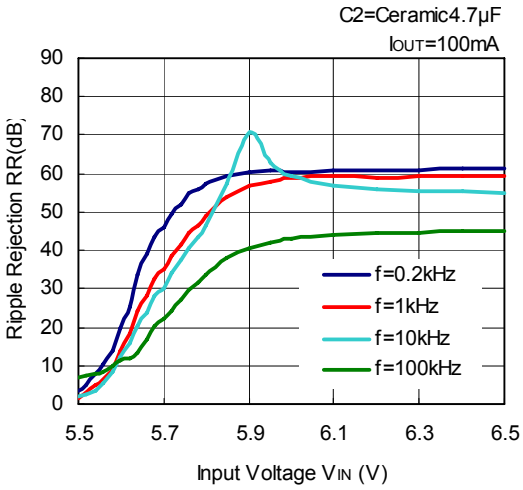
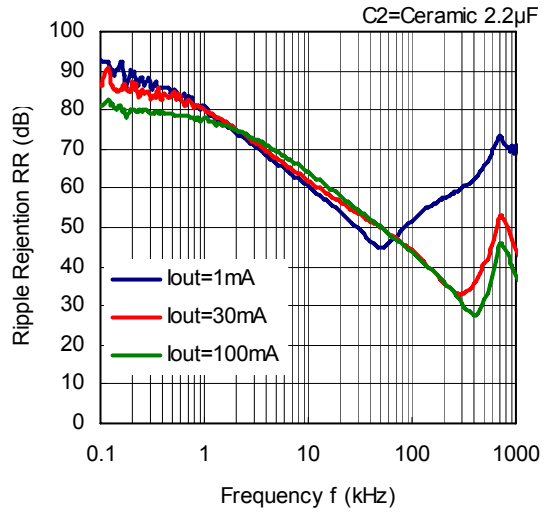
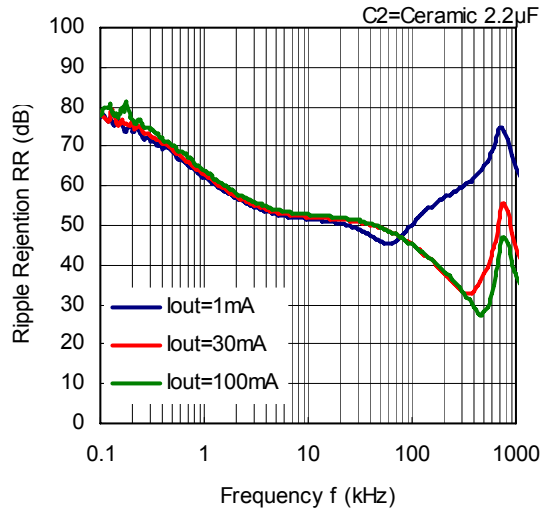


8) Ripple Rejection vs. Frequency (C1=none, Topt=25°C)

RP132x081x



RP132x331x



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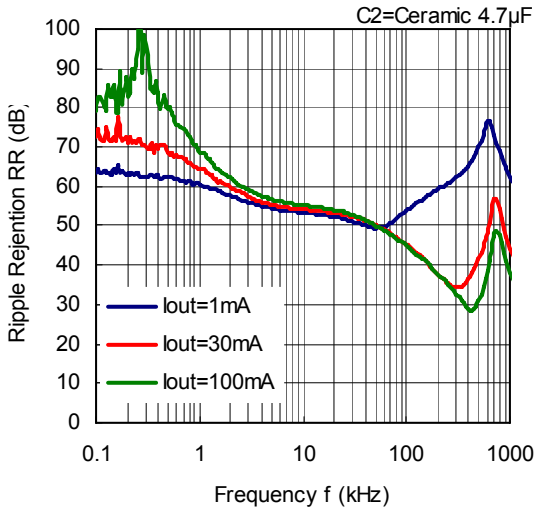
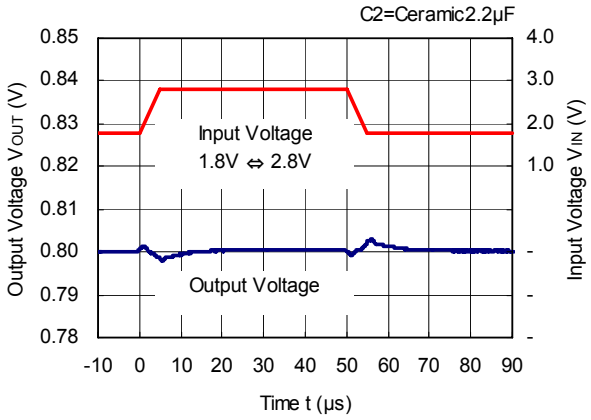


9) Input Transient Response (C1=none, I_{OUT}=100mA, tr=tf=5µs, Topt=25°C)

RP132x081x



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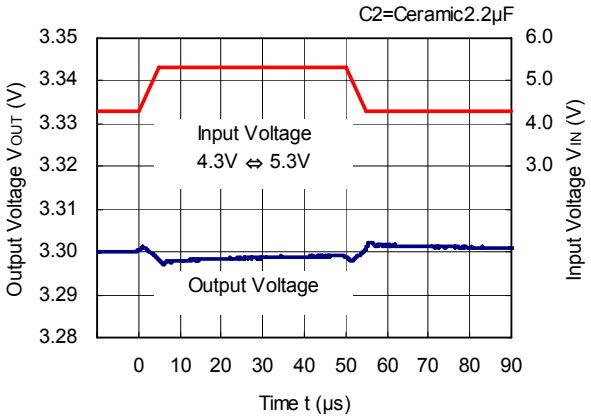

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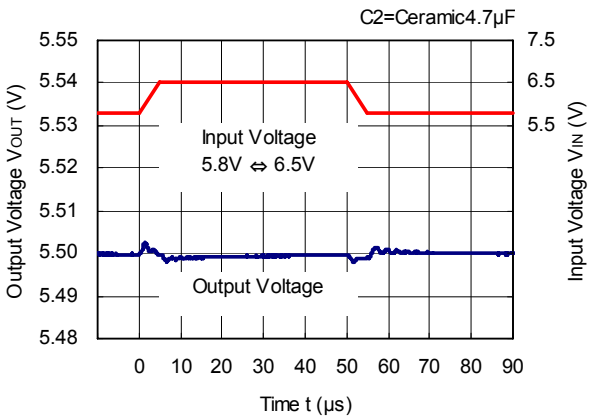
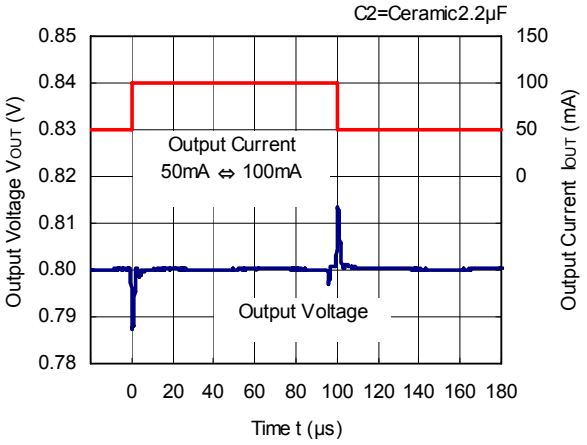


10) Load Transient Response (V_{IN}=V_{OUT}+1.0V, C1=Ceramic 2.2µF, tr=tf=0.5µs, Topt=25°C)

RP132x081x



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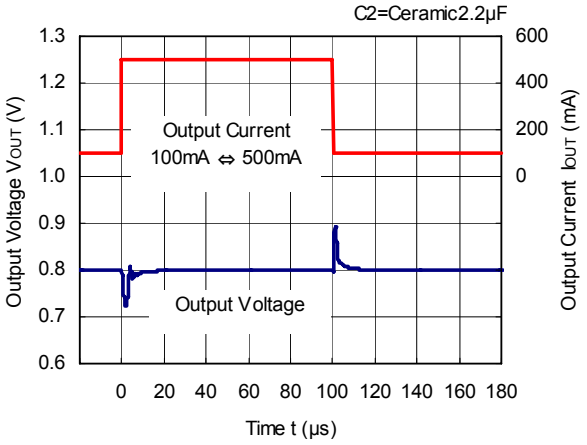

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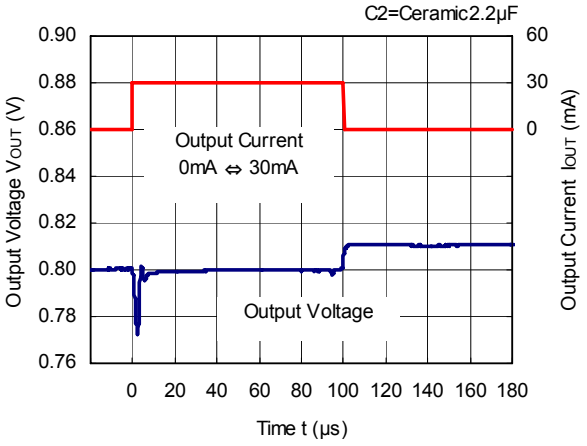

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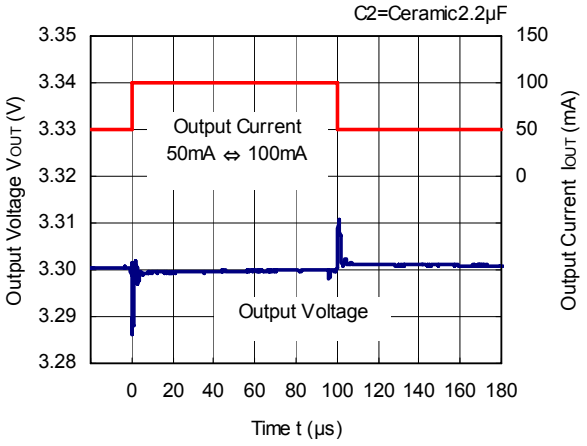

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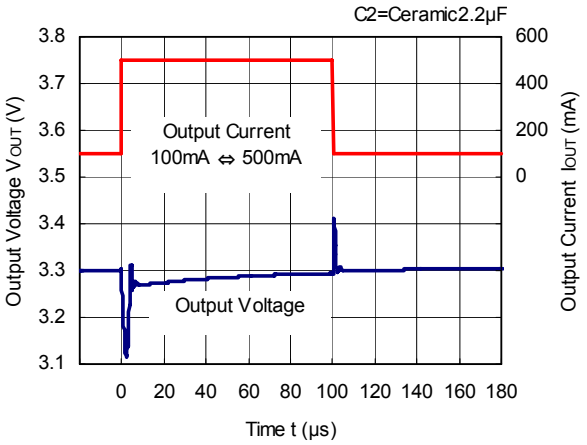

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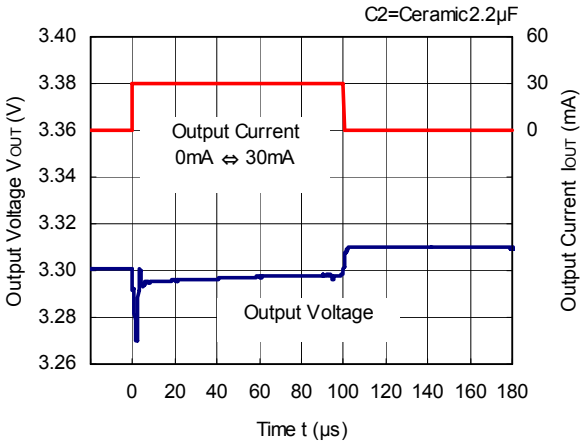

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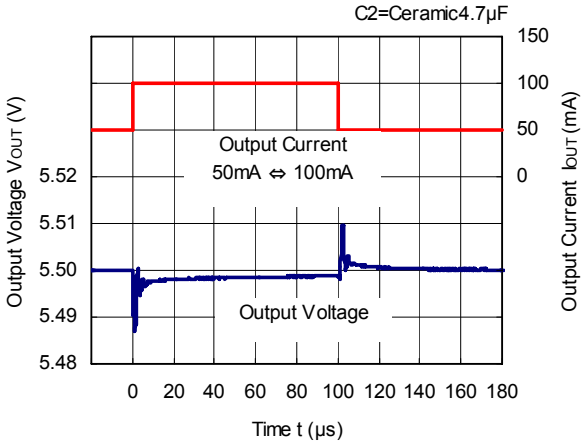

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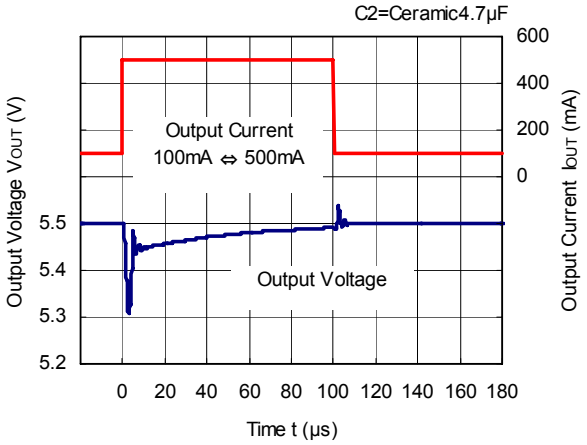

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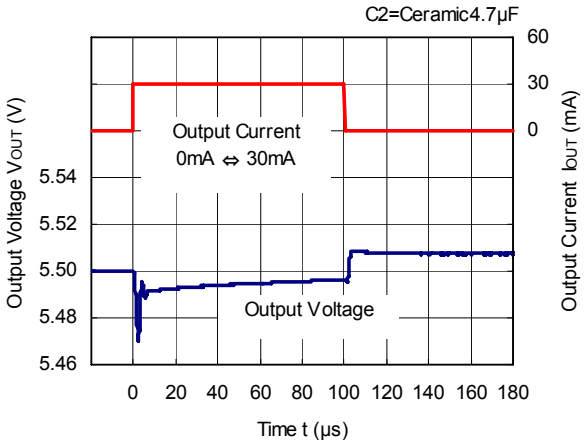
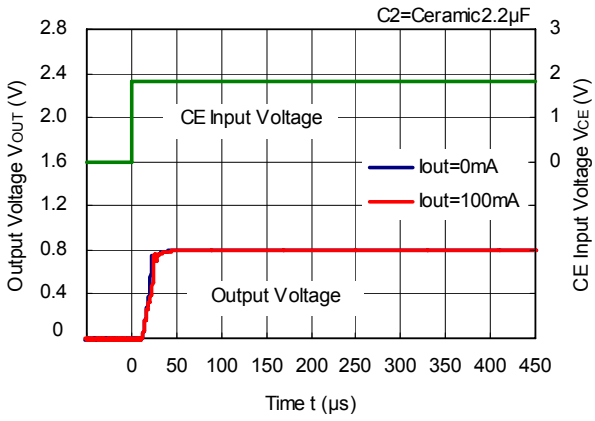


11) Turn on Speed with CE pin (C1=Ceramic 2.2µF, Topt=25°C)

RP132x081x



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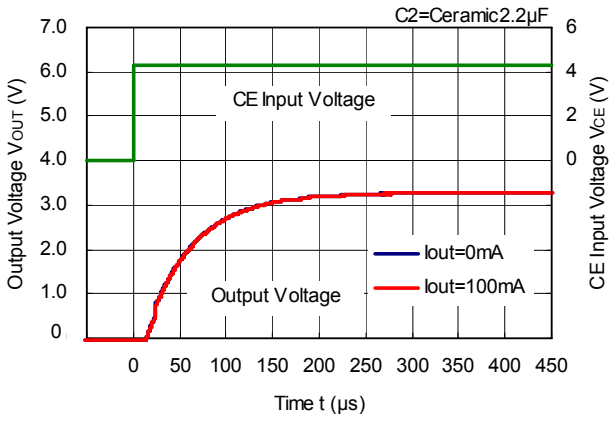

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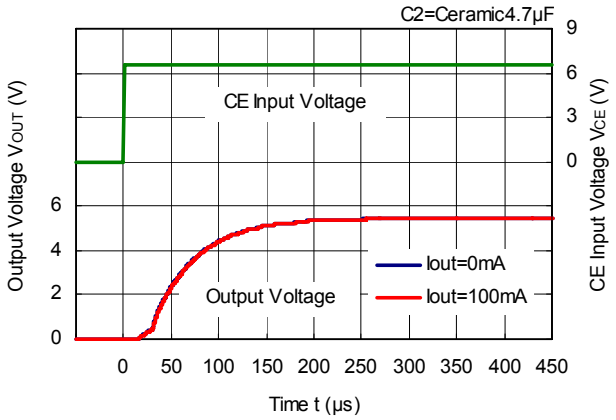
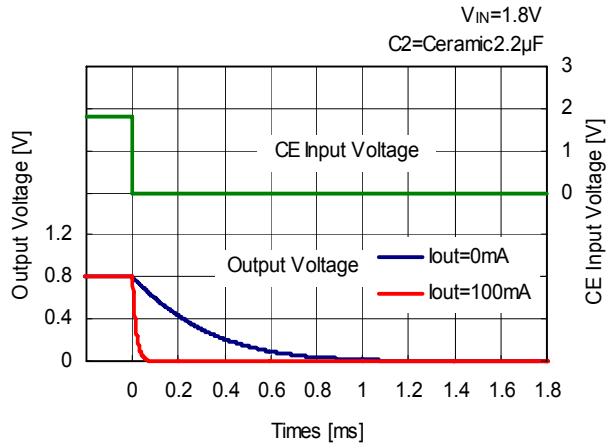


12) Turn off Speed with CE pin (D version) (C1=Ceramic 2.2µF, Topt=25°C)

RP132x081D



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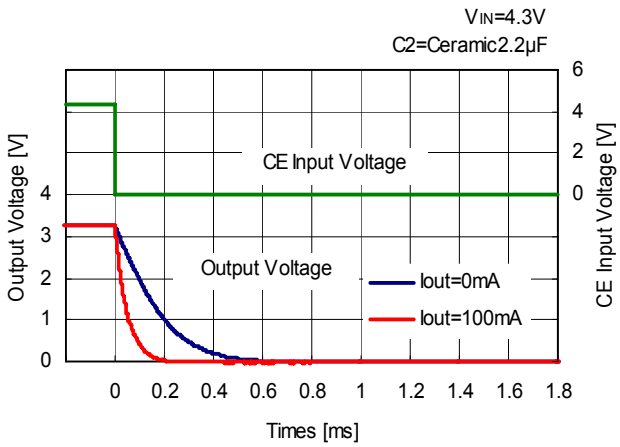

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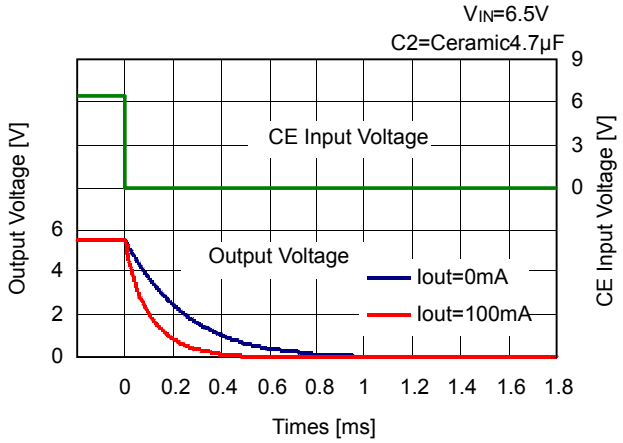
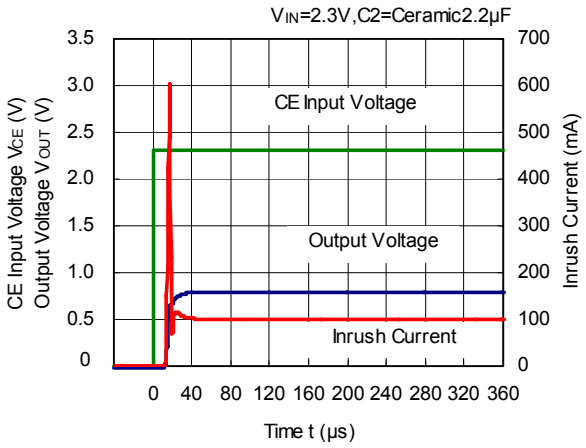


13) Inrush Current (C1=Ceramic 2.2µF, I_{OUT}=100mA, Topt=25°C)

RP132x081x



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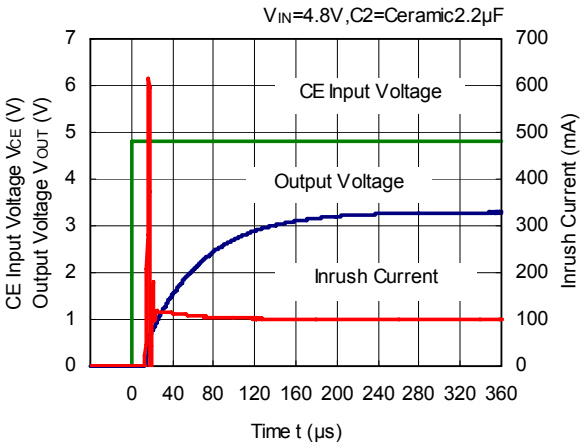

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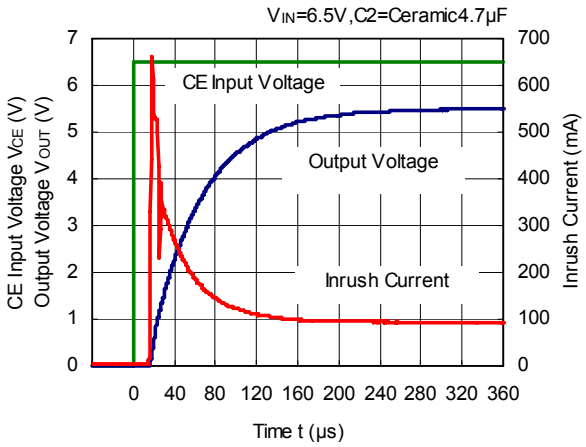
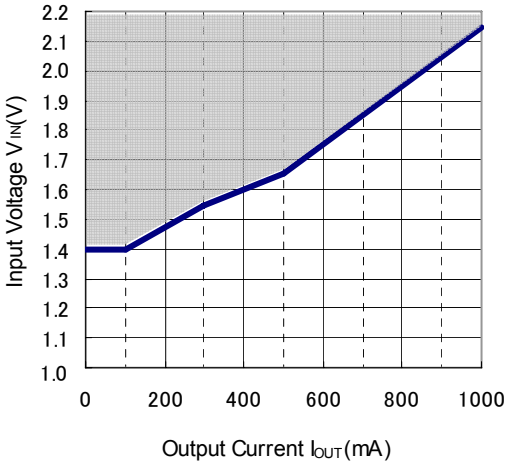


14) Minimum Operating Voltage

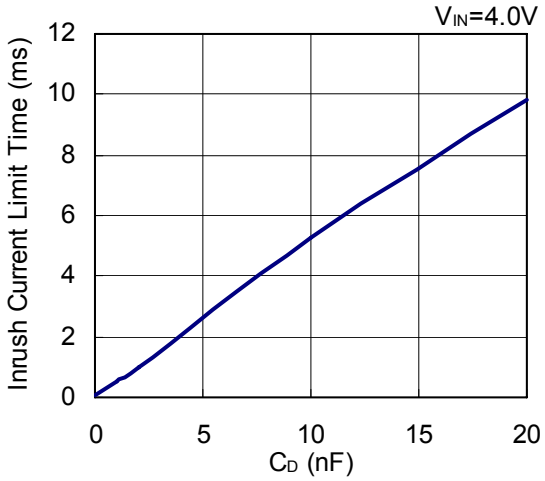
RP132x081x



The operation rage that can output 0.8V is shown by the hatched area in the graph.

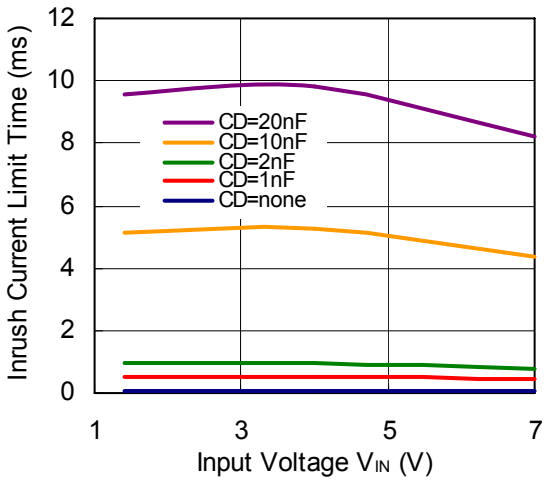
15) Inrush Current Limit Time vs. C_D Capacitance (E / F Version)

RP132x081x



16) Inrush Current Limit Time vs. Input Voltage (E / F Version)

RP132x081x



ESR vs. Output Current

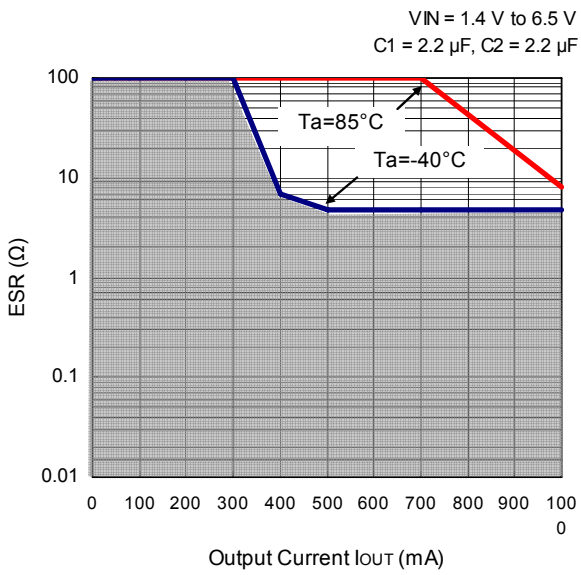
When using these ICs, consider the following points:

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.

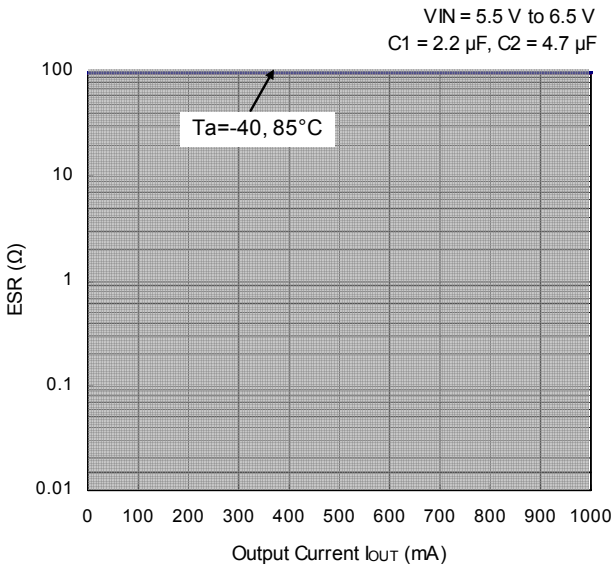
Measurement Conditions

Frequency Band : 10Hz to 2MHz
Temperature : −40°C to 85°C
Hatched Area : Noise level is under 40μVms (Avg.)
C_{IN} : 2.2μF (Kyocera CM05X5R225M06A)
C_{OUT} : 2.2μF (V_{OUT} = 0.8V, Kyocera CM105X5R225K06AB)
4.7μF (V_{OUT} = 5.5V, Kyocera CM105X5R475M06AB)

RP132x081x



RP132x551x



PACKAGE INFORMATION

Power Dissipation (DFN(PLP)1820-6)

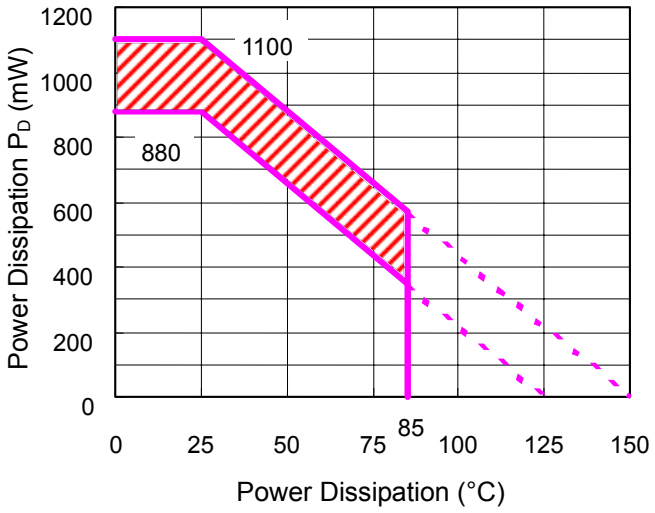
Power Dissipation (P_D) of the package is dependent on PCB material, layout, and environmental conditions. The following conditions are used in this measurement.

Measurement Conditions

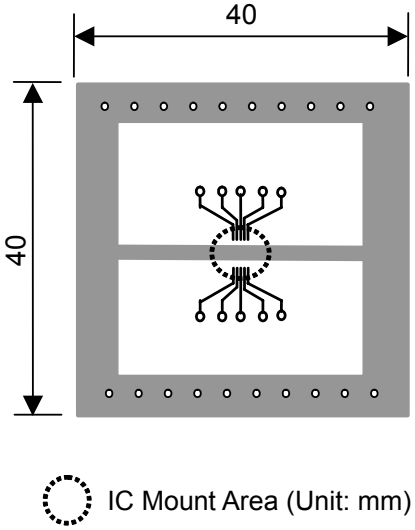
	Standard Test Land Pattern
Environment	Mounting on Board (Wind Velocity = 0 m/s)
Board Material	Glass Cloth Epoxy Plastic (Double-sided)
Board Dimensions	40 mm x 40 mm x 1.6 mm
Copper Ratio	Top side: Approx. 50%, Back side: Approx. 50%
Through-holes	ϕ: 0.54 mm x 30 pcs

Measurement Result (Ta = 25°C)

	Standard Test Land Pattern
Power Dissipation	880mW (Tjmax=125°C) 1100mW (Tjmax=150°C)
Thermal Resistance	θja = (125-25°C) / 0.88W = 114°C / W



Power Dissipation vs. Ambient Temperature

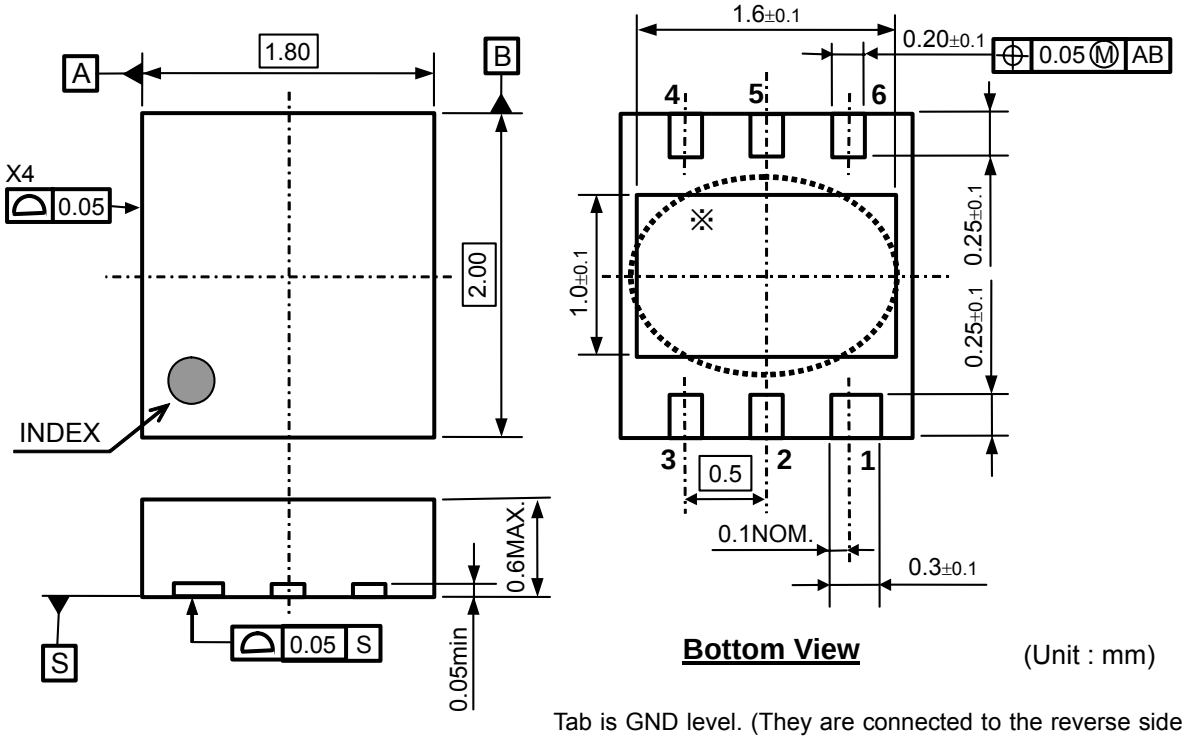


Measurement Board Pattern

Note: 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.

Operating Time	Estimated Years (Operating four hours/ day)
13,000 hours	9 years

Package Dimensions (DFN(PLP)1820-6)



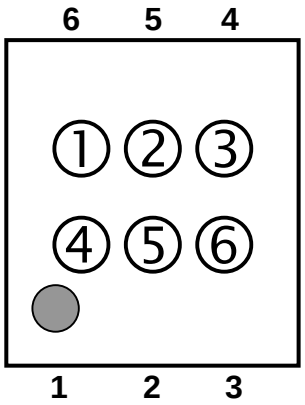
Bottom View (Unit : mm)

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.

Mark Specifications (DFN(PLP)1820-6)

①②③④: Product Code …Refer to RP132K Series Mark Specification Table.

⑤⑥: Lot Number … Alphanumeric Serial Number



RP132K Series Mark Specification Table

PKG: DFN(PLP)1820-6

● **RP132Kxx1B** ● **RP132Kxx1D** ● **RP132Kxx1E** ● **RP132Kxx1F**

製品名	①②③④	製品名	①②③④	製品名	①②③④	製品名	①②③④	設定電圧
RP132K081B	**CX08**	RP132K081D	**CY08**	RP132K081E	**DF08**	RP132K081F	**DG08**	0.8V
RP132K091B	**CX09**	RP132K091D	**CY09**	RP132K091E	**DF09**	RP132K091F	**DG09**	0.9V
RP132K101B	**CX10**	RP132K101D	**CY10**	RP132K101E	**DF10**	RP132K101F	**DG10**	1.0V
RP132K111B	**CX11**	RP132K111D	**CY11**	RP132K111E	**DF11**	RP132K111F	**DG11**	1.1V
RP132K121B	**CX12**	RP132K121D	**CY12**	RP132K121E	**DF12**	RP132K121F	**DG12**	1.2V
RP132K131B	**CX13**	RP132K131D	**CY13**	RP132K131E	**DF13**	RP132K131F	**DG13**	1.3V
RP132K141B	**CX14**	RP132K141D	**CY14**	RP132K141E	**DF14**	RP132K141F	**DG14**	1.4V
RP132K151B	**CX15**	RP132K151D	**CY15**	RP132K151E	**DF15**	RP132K151F	**DG15**	1.5V
RP132K161B	**CX16**	RP132K161D	**CY16**	RP132K161E	**DF16**	RP132K161F	**DG16**	1.6V
RP132K171B	**CX17**	RP132K171D	**CY17**	RP132K171E	**DF17**	RP132K171F	**DG17**	1.7V
RP132K181B	**CX18**	RP132K181D	**CY18**	RP132K181E	**DF18**	RP132K181F	**DG18**	1.8V
RP132K191B	**CX19**	RP132K191D	**CY19**	RP132K191E	**DF19**	RP132K191F	**DG19**	1.9V
RP132K201B	**CX20**	RP132K201D	**CY20**	RP132K201E	**DF20**	RP132K201F	**DG20**	2.0V
RP132K211B	**CX21**	RP132K211D	**CY21**	RP132K211E	**DF21**	RP132K211F	**DG21**	2.1V
RP132K221B	**CX22**	RP132K221D	**CY22**	RP132K221E	**DF22**	RP132K221F	**DG22**	2.2V
RP132K231B	**CX23**	RP132K231D	**CY23**	RP132K231E	**DF23**	RP132K231F	**DG23**	2.3V
RP132K241B	**CX24**	RP132K241D	**CY24**	RP132K241E	**DF24**	RP132K241F	**DG24**	2.4V
RP132K251B	**CX25**	RP132K251D	**CY25**	RP132K251E	**DF25**	RP132K251F	**DG25**	2.5V
RP132K261B	**CX26**	RP132K261D	**CY26**	RP132K261E	**DF26**	RP132K261F	**DG26**	2.6V
RP132K271B	**CX27**	RP132K271D	**CY27**	RP132K271E	**DF27**	RP132K271F	**DG27**	2.7V
RP132K281B	**CX28**	RP132K281D	**CY28**	RP132K281E	**DF28**	RP132K281F	**DG28**	2.8V
RP132K291B	**CX29**	RP132K291D	**CY29**	RP132K291E	**DF29**	RP132K291F	**DG29**	2.9V
RP132K301B	**CX30**	RP132K301D	**CY30**	RP132K301E	**DF30**	RP132K301F	**DG30**	3.0V
RP132K311B	**CX31**	RP132K311D	**CY31**	RP132K311E	**DF31**	RP132K311F	**DG31**	3.1V
RP132K321B	**CX32**	RP132K321D	**CY32**	RP132K321E	**DF32**	RP132K321F	**DG32**	3.2V
RP132K331B	**CX33**	RP132K331D	**CY33**	RP132K331E	**DF33**	RP132K331F	**DG33**	3.3V
RP132K341B	**CX34**	RP132K341D	**CY34**	RP132K341E	**DF34**	RP132K341F	**DG34**	3.4V
RP132K351B	**CX35**	RP132K351D	**CY35**	RP132K351E	**DF35**	RP132K351F	**DG35**	3.5V
RP132K361B	**CX36**	RP132K361D	**CY36**	RP132K361E	**DF36**	RP132K361F	**DG36**	3.6V
RP132K371B	**CX37**	RP132K371D	**CY37**	RP132K371E	**DF37**	RP132K371F	**DG37**	3.7V
RP132K381B	**CX38**	RP132K381D	**CY38**	RP132K381E	**DF38**	RP132K381F	**DG38**	3.8V
RP132K391B	**CX39**	RP132K391D	**CY39**	RP132K391E	**DF39**	RP132K391F	**DG39**	3.9V
RP132K401B	**CX40**	RP132K401D	**CY40**	RP132K401E	**DF40**	RP132K401F	**DG40**	4.0V
RP132K411B	**CX41**	RP132K411D	**CY41**	RP132K411E	**DF41**	RP132K411F	**DG41**	4.1V
RP132K421B	**CX42**	RP132K421D	**CY42**	RP132K421E	**DF42**	RP132K421F	**DG42**	4.2V
RP132K431B	**CX43**	RP132K431D	**CY43**	RP132K431E	**DF43**	RP132K431F	**DG43**	4.3V
RP132K441B	**CX44**	RP132K441D	**CY44**	RP132K441E	**DF44**	RP132K441F	**DG44**	4.4V
RP132K451B	**CX45**	RP132K451D	**CY45**	RP132K451E	**DF45**	RP132K451F	**DG45**	4.5V
RP132K461B	**CX46**	RP132K461D	**CY46**	RP132K461E	**DF46**	RP132K461F	**DG46**	4.6V
RP132K471B	**CX47**	RP132K471D	**CY47**	RP132K471E	**DF47**	RP132K471F	**DG47**	4.7V
RP132K481B	**CX48**	RP132K481D	**CY48**	RP132K481E	**DF48**	RP132K481F	**DG48**	4.8V
RP132K491B	**CX49**	RP132K491D	**CY49**	RP132K491E	**DF49**	RP132K491F	**DG49**	4.9V
RP132K501B	**CX50**	RP132K501D	**CY50**	RP132K501E	**DF50**	RP132K501F	**DG50**	5.0V
RP132K511B	**CX51**	RP132K511D	**CY51**	RP132K511E	**DF51**	RP132K511F	**DG51**	5.1V
RP132K521B	**CX52**	RP132K521D	**CY52**	RP132K521E	**DF52**	RP132K521F	**DG52**	5.2V
RP132K531B	**CX53**	RP132K531D	**CY53**	RP132K531E	**DF53**	RP132K531F	**DG53**	5.3V
RP132K541B	**CX54**	RP132K541D	**CY54**	RP132K541E	**DF54**	RP132K541F	**DG54**	5.4V
RP132K551B	**CX55**	RP132K551D	**CY55**	RP132K551E	**DF55**	RP132K551F	**DG55**	5.5V
RP132K121B5	**CX01**	RP132K121D5	**CY01**	RP132K121E5	**DF01**	RP132K121F5	**DG01**	1.25V
RP132K181B5	**CX02**	RP132K181D5	**CY02**	RP132K181E5	**DF02**	RP132K181F5	**DG02**	1.85V
RP132K281B5	**CX03**	RP132K281D5	**CY03**	RP132K281E5	**DF03**	RP132K281F5	**DG03**	2.85V
RP132K001B	**CX00**	RP132K001D	**CY00**	RP132K001E	**DF00**	RP132K001F	**DG00**	-

Power Dissipation (SOT-89-5)

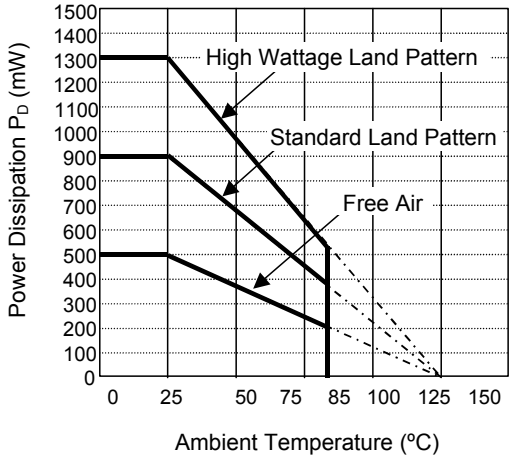
Power Dissipation (P_D) depends on conditions of mounting on board. This specification is based on the Measurement Conditions below.

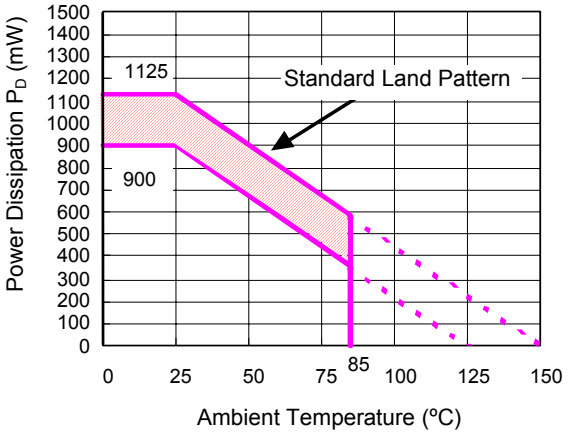
Measurement Conditions

	High Wattage Land Pattern	Standard Land Pattern
Environment	Mounting on Board (Wind Velocity=0m/s)	Mounting on Board (Wind Velocity=0m/s)
Board Material	Glass Cloth Epoxy Plastic (Double-sided)	Glass Cloth Epoxy Plastic (Double-sided)
Board Dimensions	30mm x 30mm x 1.6mm	50mm x 50mm x 1.6mm
Copper Ratio	Top-side: Approx. 20%, Back-side: Approx. 100%	Top-side: Approx. 10%, Back-side: Approx. 100%
Through-hole	ϕ0.85mm $\times$ 10pcs	-

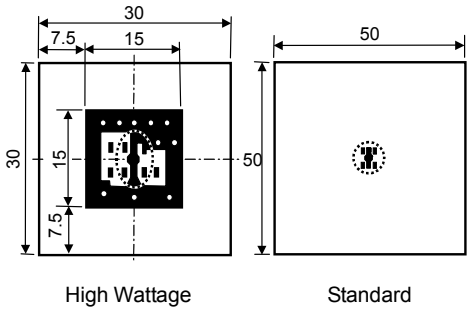
Measurement Result (Ta=25°C)

	High Wattage Land Pattern	Standard Land Pattern	Free Air
Power Dissipation	1300mW	900mW (Tjmax=125°C) 1125mW (Tjmax=150°C)	500mW
Thermal Resistance	77°C/W	111°C/W	200°C/W





Power Dissipation



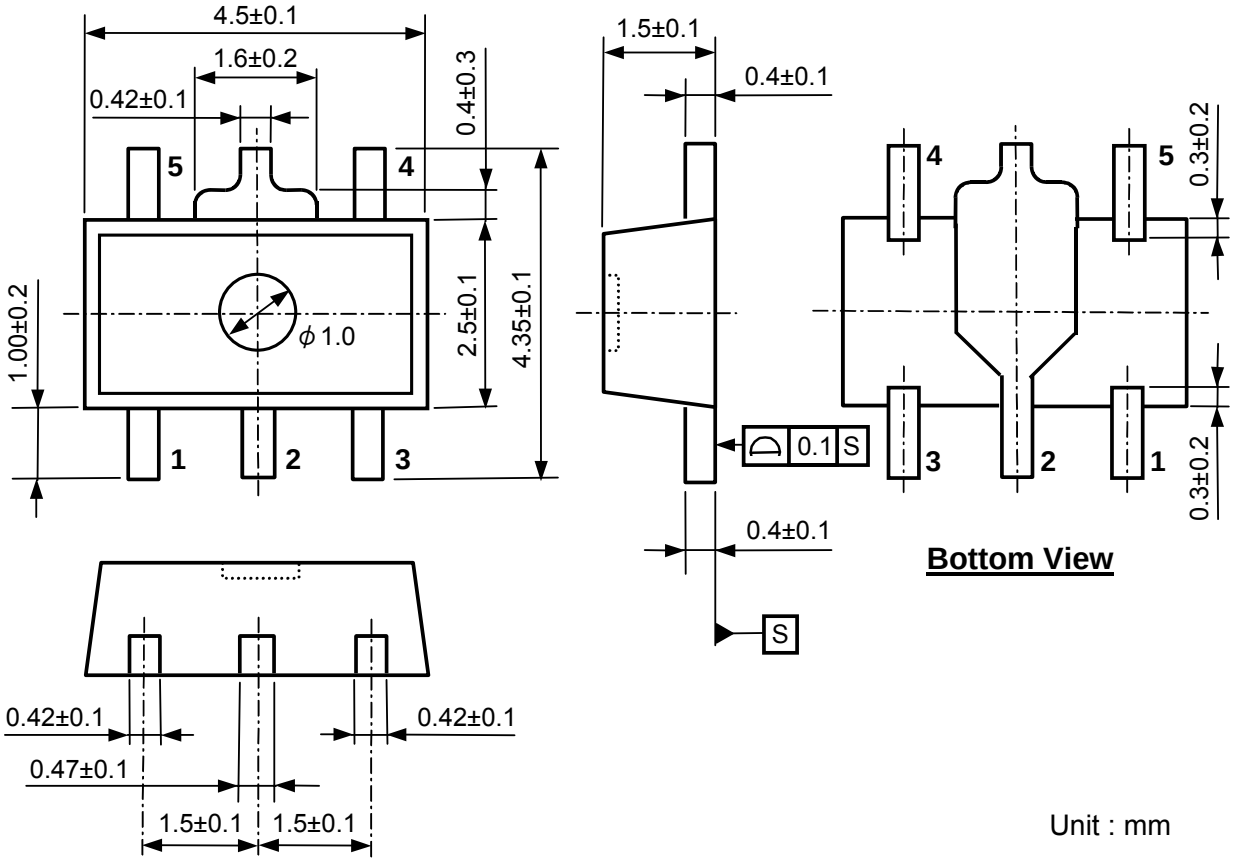
Measurement Board Pattern

IC Mount Area (Unit : mm)

Note: 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.

Operating Time	Estimated Years (Operating four hours/ day)
13,000 hours	9 years

Package Dimensions (SOT-89-5)

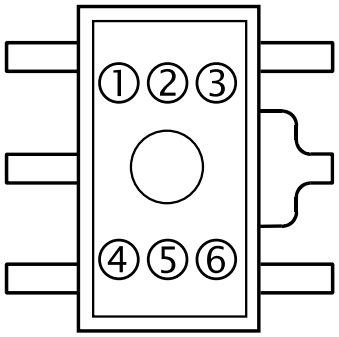


Unit : mm

Mark Specifications (SOT-89-5)

①②③④: Product Code …Refer to RP132H Series Mark Specification Table.

⑤⑥: Lot Number … Alphanumeric Serial Number



RP132H Series Mark Specification Table

PKG: SOT-89-5

● **RP132Hxx1B**

製品名	①②③④	設定電圧
RP132H081B	**C 0 8 B**	0.8V
RP132H091B	**C 0 9 B**	0.9V
RP132H101B	**C 1 0 B**	1.0V
RP132H111B	**C 1 1 B**	1.1V
RP132H121B	**C 1 2 B**	1.2V
RP132H131B	**C 1 3 B**	1.3V
RP132H141B	**C 1 4 B**	1.4V
RP132H151B	**C 1 5 B**	1.5V
RP132H161B	**C 1 6 B**	1.6V
RP132H171B	**C 1 7 B**	1.7V
RP132H181B	**C 1 8 B**	1.8V
RP132H191B	**C 1 9 B**	1.9V
RP132H201B	**C 2 0 B**	2.0V
RP132H211B	**C 2 1 B**	2.1V
RP132H221B	**C 2 2 B**	2.2V
RP132H231B	**C 2 3 B**	2.3V
RP132H241B	**C 2 4 B**	2.4V
RP132H251B	**C 2 5 B**	2.5V
RP132H261B	**C 2 6 B**	2.6V
RP132H271B	**C 2 7 B**	2.7V
RP132H281B	**C 2 8 B**	2.8V
RP132H291B	**C 2 9 B**	2.9V
RP132H301B	**C 3 0 B**	3.0V
RP132H311B	**C 3 1 B**	3.1V
RP132H321B	**C 3 2 B**	3.2V
RP132H331B	**C 3 3 B**	3.3V
RP132H341B	**C 3 4 B**	3.4V
RP132H351B	**C 3 5 B**	3.5V
RP132H361B	**C 3 6 B**	3.6V
RP132H371B	**C 3 7 B**	3.7V
RP132H381B	**C 3 8 B**	3.8V
RP132H391B	**C 3 9 B**	3.9V
RP132H401B	**C 4 0 B**	4.0V
RP132H411B	**C 4 1 B**	4.1V
RP132H421B	**C 4 2 B**	4.2V
RP132H431B	**C 4 3 B**	4.3V
RP132H441B	**C 4 4 B**	4.4V
RP132H451B	**C 4 5 B**	4.5V
RP132H461B	**C 4 6 B**	4.6V
RP132H471B	**C 4 7 B**	4.7V
RP132H481B	**C 4 8 B**	4.8V
RP132H491B	**C 4 9 B**	4.9V
RP132H501B	**C 5 0 B**	5.0V
RP132H511B	**C 5 1 B**	5.1V
RP132H521B	**C 5 2 B**	5.2V
RP132H531B	**C 5 3 B**	5.3V
RP132H541B	**C 5 4 B**	5.4V
RP132H551B	**C 5 5 B**	5.5V
RP132H121B5	**C 0 1 B**	1.25V
RP132H181B5	**C 0 2 B**	1.85V
RP132H281B5	**C 0 3 B**	2.85V
RP132H001B	**C 0 0 B**	-

● **RP132Hxx1D**

製品名	①②③④	設定電圧
RP132H081D	**C 0 8 D**	0.8V
RP132H091D	**C 0 9 D**	0.9V
RP132H101D	**C 1 0 D**	1.0V
RP132H111D	**C 1 1 D**	1.1V
RP132H121D	**C 1 2 D**	1.2V
RP132H131D	**C 1 3 D**	1.3V
RP132H141D	**C 1 4 D**	1.4V
RP132H151D	**C 1 5 D**	1.5V
RP132H161D	**C 1 6 D**	1.6V
RP132H171D	**C 1 7 D**	1.7V
RP132H181D	**C 1 8 D**	1.8V
RP132H191D	**C 1 9 D**	1.9V
RP132H201D	**C 2 0 D**	2.0V
RP132H211D	**C 2 1 D**	2.1V
RP132H221D	**C 2 2 D**	2.2V
RP132H231D	**C 2 3 D**	2.3V
RP132H241D	**C 2 4 D**	2.4V
RP132H251D	**C 2 5 D**	2.5V
RP132H261D	**C 2 6 D**	2.6V
RP132H271D	**C 2 7 D**	2.7V
RP132H281D	**C 2 8 D**	2.8V
RP132H291D	**C 2 9 D**	2.9V
RP132H301D	**C 3 0 D**	3.0V
RP132H311D	**C 3 1 D**	3.1V
RP132H321D	**C 3 2 D**	3.2V
RP132H331D	**C 3 3 D**	3.3V
RP132H341D	**C 3 4 D**	3.4V
RP132H351D	**C 3 5 D**	3.5V
RP132H361D	**C 3 6 D**	3.6V
RP132H371D	**C 3 7 D**	3.7V
RP132H381D	**C 3 8 D**	3.8V
RP132H391D	**C 3 9 D**	3.9V
RP132H401D	**C 4 0 D**	4.0V
RP132H411D	**C 4 1 D**	4.1V
RP132H421D	**C 4 2 D**	4.2V
RP132H431D	**C 4 3 D**	4.3V
RP132H441D	**C 4 4 D**	4.4V
RP132H451D	**C 4 5 D**	4.5V
RP132H461D	**C 4 6 D**	4.6V
RP132H471D	**C 4 7 D**	4.7V
RP132H481D	**C 4 8 D**	4.8V
RP132H491D	**C 4 9 D**	4.9V
RP132H501D	**C 5 0 D**	5.0V
RP132H511D	**C 5 1 D**	5.1V
RP132H521D	**C 5 2 D**	5.2V
RP132H531D	**C 5 3 D**	5.3V
RP132H541D	**C 5 4 D**	5.4V
RP132H551D	**C 5 5 D**	5.5V
RP132H121D5	**C 0 1 D**	1.25V
RP132H181D5	**C 0 2 D**	1.85V
RP132H281D5	**C 0 3 D**	2.85V
RP132H001D	**C 0 0 D**	-

Power Dissipation (HSOP-6J)

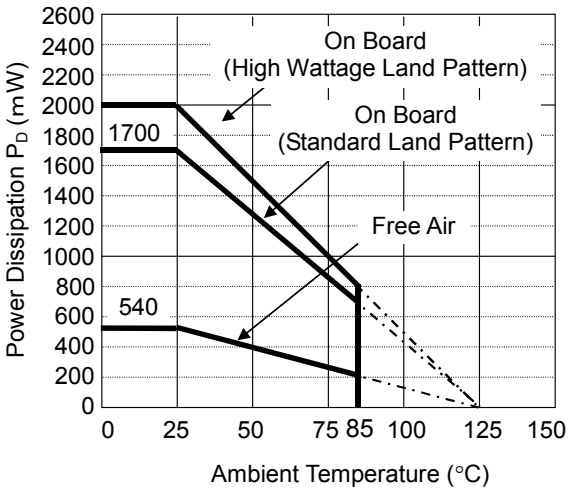
Power Dissipation (P_D) depends on conditions of mounting on board. This specification is based on the Measurement Conditions below.

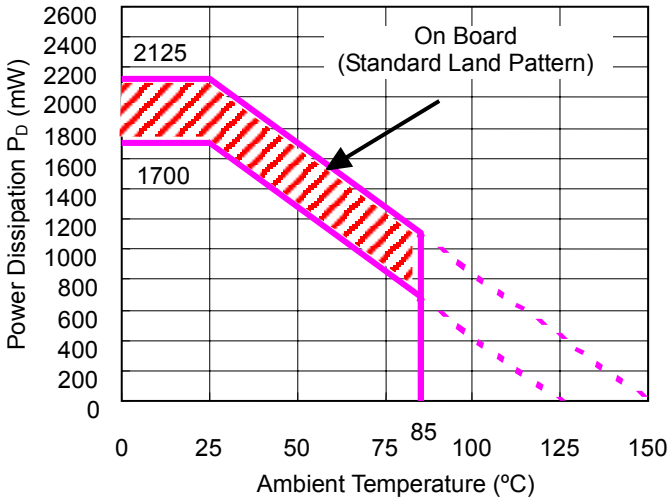
Measurement Conditions

	High Wattage Land Pattern	Standard Land Pattern
Environment	Mounting on Board (Wind Velocity=0m/s)	Mounting on Board (Wind Velocity=0m/s)
Board Material	Glass Cloth Epoxy Plastic (Double-sided)	Glass Cloth Epoxy Plastic (Double-sided)
Board Dimensions	50mm x 50mm x 1.6mm	50mm x 50mm x 1.6mm
Copper Ratio	90%	50%
Through-hole	ϕ 0.5mm x 24pcs	ϕ0.5mm x 24pcs

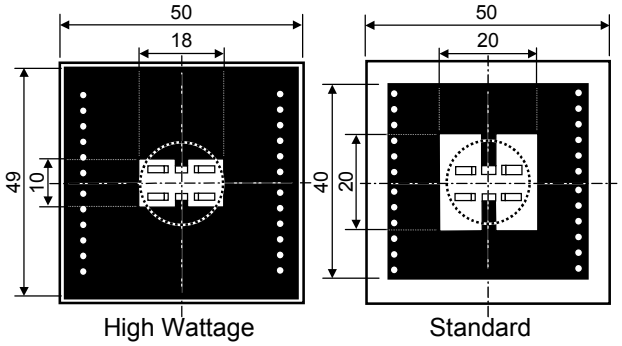
Measurement Result (Ta=25℃)

	High Wattage Land Pattern	Standard Land Pattern	Free Air
Power Dissipation	2000mW	1700mW (Tjmax=125°C) 2125mW (Tjmax=150°C)	540mW
Thermal Resistance	50°C/W	59°C/W	185°C/W





Power Dissipation

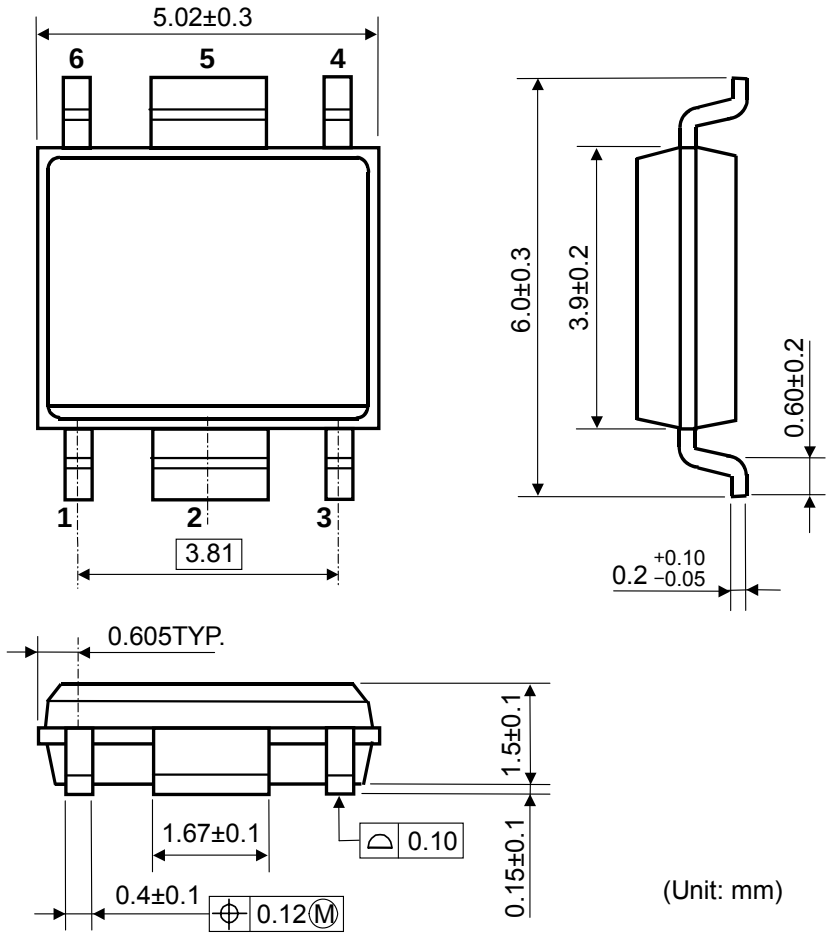


Measurement Board Pattern
IC Mount Area (Unit: mm)

Note: 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.

Operating Time	Estimated Years (Operating four hours/ day)
13,000 hours	9 years

Package Dimensions (HSOP-6J)

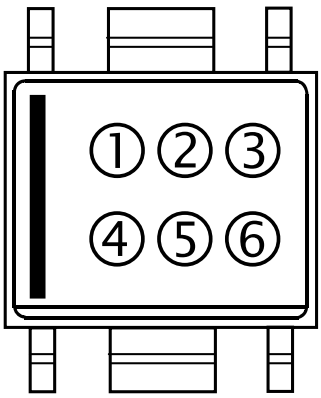


(Unit: mm)

Mark Specifications (HSOP-6J)

①②③④: Product Code …Refer to RP132S Series Mark Specification Table.

⑤⑥: Lot Number … Alphanumeric Serial Number



RP132S Series Mark Specification Table

PKG: HSOP-6J

● **RP132Sxx1B**

製品名	①②③④
RP132S081B	**Q 0 8 B**
RP132S091B	**Q 0 9 B**
RP132S101B	**Q 1 0 B**
RP132S111B	**Q 1 1 B**
RP132S121B	**Q 1 2 B**
RP132S131B	**Q 1 3 B**
RP132S141B	**Q 1 4 B**
RP132S151B	**Q 1 5 B**
RP132S161B	**Q 1 6 B**
RP132S171B	**Q 1 7 B**
RP132S181B	**Q 1 8 B**
RP132S191B	**Q 1 9 B**
RP132S201B	**Q 2 0 B**
RP132S211B	**Q 2 1 B**
RP132S221B	**Q 2 2 B**
RP132S231B	**Q 2 3 B**
RP132S241B	**Q 2 4 B**
RP132S251B	**Q 2 5 B**
RP132S261B	**Q 2 6 B**
RP132S271B	**Q 2 7 B**
RP132S281B	**Q 2 8 B**
RP132S291B	**Q 2 9 B**
RP132S301B	**Q 3 0 B**
RP132S311B	**Q 3 1 B**
RP132S321B	**Q 3 2 B**
RP132S331B	**Q 3 3 B**
RP132S341B	**Q 3 4 B**
RP132S351B	**Q 3 5 B**
RP132S361B	**Q 3 6 B**
RP132S371B	**Q 3 7 B**
RP132S381B	**Q 3 8 B**
RP132S391B	**Q 3 9 B**
RP132S401B	**Q 4 0 B**
RP132S411B	**Q 4 1 B**
RP132S421B	**Q 4 2 B**
RP132S431B	**Q 4 3 B**
RP132S441B	**Q 4 4 B**
RP132S451B	**Q 4 5 B**
RP132S461B	**Q 4 6 B**
RP132S471B	**Q 4 7 B**
RP132S481B	**Q 4 8 B**
RP132S491B	**Q 4 9 B**
RP132S501B	**Q 5 0 B**
RP132S511B	**Q 5 1 B**
RP132S521B	**Q 5 2 B**
RP132S531B	**Q 5 3 B**
RP132S541B	**Q 5 4 B**
RP132S551B	**Q 5 5 B**
RP132S121B5	**Q 0 1 B**
RP132S181B5	**Q 0 2 B**
RP132S281B5	**Q 0 3 B**
RP132S001B	**Q 0 0 B**

● **RP132Sxx1D**

製品名	①②③④
RP132S081D	**Q 0 8 D**
RP132S091D	**Q 0 9 D**
RP132S101D	**Q 1 0 D**
RP132S111D	**Q 1 1 D**
RP132S121D	**Q 1 2 D**
RP132S131D	**Q 1 3 D**
RP132S141D	**Q 1 4 D**
RP132S151D	**Q 1 5 D**
RP132S161D	**Q 1 6 D**
RP132S171D	**Q 1 7 D**
RP132S181D	**Q 1 8 D**
RP132S191D	**Q 1 9 D**
RP132S201D	**Q 2 0 D**
RP132S211D	**Q 2 1 D**
RP132S221D	**Q 2 2 D**
RP132S231D	**Q 2 3 D**
RP132S241D	**Q 2 4 D**
RP132S251D	**Q 2 5 D**
RP132S261D	**Q 2 6 D**
RP132S271D	**Q 2 7 D**
RP132S281D	**Q 2 8 D**
RP132S291D	**Q 2 9 D**
RP132S301D	**Q 3 0 D**
RP132S311D	**Q 3 1 D**
RP132S321D	**Q 3 2 D**
RP132S331D	**Q 3 3 D**
RP132S341D	**Q 3 4 D**
RP132S351D	**Q 3 5 D**
RP132S361D	**Q 3 6 D**
RP132S371D	**Q 3 7 D**
RP132S381D	**Q 3 8 D**
RP132S391D	**Q 3 9 D**
RP132S401D	**Q 4 0 D**
RP132S411D	**Q 4 1 D**
RP132S421D	**Q 4 2 D**
RP132S431D	**Q 4 3 D**
RP132S441D	**Q 4 4 D**
RP132S451D	**Q 4 5 D**
RP132S461D	**Q 4 6 D**
RP132S471D	**Q 4 7 D**
RP132S481D	**Q 4 8 D**
RP132S491D	**Q 4 9 D**
RP132S501D	**Q 5 0 D**
RP132S511D	**Q 5 1 D**
RP132S521D	**Q 5 2 D**
RP132S531D	**Q 5 3 D**
RP132S541D	**Q 5 4 D**
RP132S551D	**Q 5 5 D**
RP132S121D5	**Q 0 1 D**
RP132S181D5	**Q 0 2 D**
RP132S281D5	**Q 0 3 D**
RP132S001D	**Q 0 0 D**

● **RP132Sxx1E**

製品名	①②③④
RP132S081E	**Q 0 8 E**
RP132S091E	**Q 0 9 E**
RP132S101E	**Q 1 0 E**
RP132S111E	**Q 1 1 E**
RP132S121E	**Q 1 2 E**
RP132S131E	**Q 1 3 E**
RP132S141E	**Q 1 4 E**
RP132S151E	**Q 1 5 E**
RP132S161E	**Q 1 6 E**
RP132S171E	**Q 1 7 E**
RP132S181E	**Q 1 8 E**
RP132S191E	**Q 1 9 E**
RP132S201E	**Q 2 0 E**
RP132S211E	**Q 2 1 E**
RP132S221E	**Q 2 2 E**
RP132S231E	**Q 2 3 E**
RP132S241E	**Q 2 4 E**
RP132S251E	**Q 2 5 E**
RP132S261E	**Q 2 6 E**
RP132S271E	**Q 2 7 E**
RP132S281E	**Q 2 8 E**
RP132S291E	**Q 2 9 E**
RP132S301E	**Q 3 0 E**
RP132S311E	**Q 3 1 E**
RP132S321E	**Q 3 2 E**
RP132S331E	**Q 3 3 E**
RP132S341E	**Q 3 4 E**
RP132S351E	**Q 3 5 E**
RP132S361E	**Q 3 6 E**
RP132S371E	**Q 3 7 E**
RP132S381E	**Q 3 8 E**
RP132S391E	**Q 3 9 E**
RP132S401E	**Q 4 0 E**
RP132S411E	**Q 4 1 E**
RP132S421E	**Q 4 2 E**
RP132S431E	**Q 4 3 E**
RP132S441E	**Q 4 4 E**
RP132S451E	**Q 4 5 E**
RP132S461E	**Q 4 6 E**
RP132S471E	**Q 4 7 E**
RP132S481E	**Q 4 8 E**
RP132S491E	**Q 4 9 E**
RP132S501E	**Q 5 0 E**
RP132S511E	**Q 5 1 E**
RP132S521E	**Q 5 2 E**
RP132S531E	**Q 5 3 E**
RP132S541E	**Q 5 4 E**
RP132S551E	**Q 5 5 E**
RP132S121E5	**Q 0 1 E**
RP132S181E5	**Q 0 2 E**
RP132S281E5	**Q 0 3 E**
-	**-**

● **RP132Sxx1F**

製品名	①②③④	設定電圧
RP132S081F	**Q 0 8 F**	0.8V
RP132S091F	**Q 0 9 F**	0.9V
RP132S101F	**Q 1 0 F**	1.0V
RP132S111F	**Q 1 1 F**	1.1V
RP132S121F	**Q 1 2 F**	1.2V
RP132S131F	**Q 1 3 F**	1.3V
RP132S141F	**Q 1 4 F**	1.4V
RP132S151F	**Q 1 5 F**	1.5V
RP132S161F	**Q 1 6 F**	1.6V
RP132S171F	**Q 1 7 F**	1.7V
RP132S181F	**Q 1 8 F**	1.8V
RP132S191F	**Q 1 9 F**	1.9V
RP132S201F	**Q 2 0 F**	2.0V
RP132S211F	**Q 2 1 F**	2.1V
RP132S221F	**Q 2 2 F**	2.2V
RP132S231F	**Q 2 3 F**	2.3V
RP132S241F	**Q 2 4 F**	2.4V
RP132S251F	**Q 2 5 F**	2.5V
RP132S261F	**Q 2 6 F**	2.6V
RP132S271F	**Q 2 7 F**	2.7V
RP132S281F	**Q 2 8 F**	2.8V
RP132S291F	**Q 2 9 F**	2.9V
RP132S301F	**Q 3 0 F**	3.0V
RP132S311F	**Q 3 1 F**	3.1V
RP132S321F	**Q 3 2 F**	3.2V
RP132S331F	**Q 3 3 F**	3.3V
RP132S341F	**Q 3 4 F**	3.4V
RP132S351F	**Q 3 5 F**	3.5V
RP132S361F	**Q 3 6 F**	3.6V
RP132S371F	**Q 3 7 F**	3.7V
RP132S381F	**Q 3 8 F**	3.8V
RP132S391F	**Q 3 9 F**	3.9V
RP132S401F	**Q 4 0 F**	4.0V
RP132S411F	**Q 4 1 F**	4.1V
RP132S421F	**Q 4 2 F**	4.2V
RP132S431F	**Q 4 3 F**	4.3V
RP132S441F	**Q 4 4 F**	4.4V
RP132S451F	**Q 4 5 F**	4.5V
RP132S461F	**Q 4 6 F**	4.6V
RP132S471F	**Q 4 7 F**	4.7V
RP132S481F	**Q 4 8 F**	4.8V
RP132S491F	**Q 4 9 F**	4.9V
RP132S501F	**Q 5 0 F**	5.0V
RP132S511F	**Q 5 1 F**	5.1V
RP132S521F	**Q 5 2 F**	5.2V
RP132S531F	**Q 5 3 F**	5.3V
RP132S541F	**Q 5 4 F**	5.4V
RP132S551F	**Q 5 5 F**	5.5V
RP132S121F5	**Q 0 1 F**	1.25V
RP132S181F5	**Q 0 2 F**	1.85V
RP132S281F5	**Q 0 3 F**	2.85V
-	**-**	-

Power Dissipation (TO-252-5-P2)

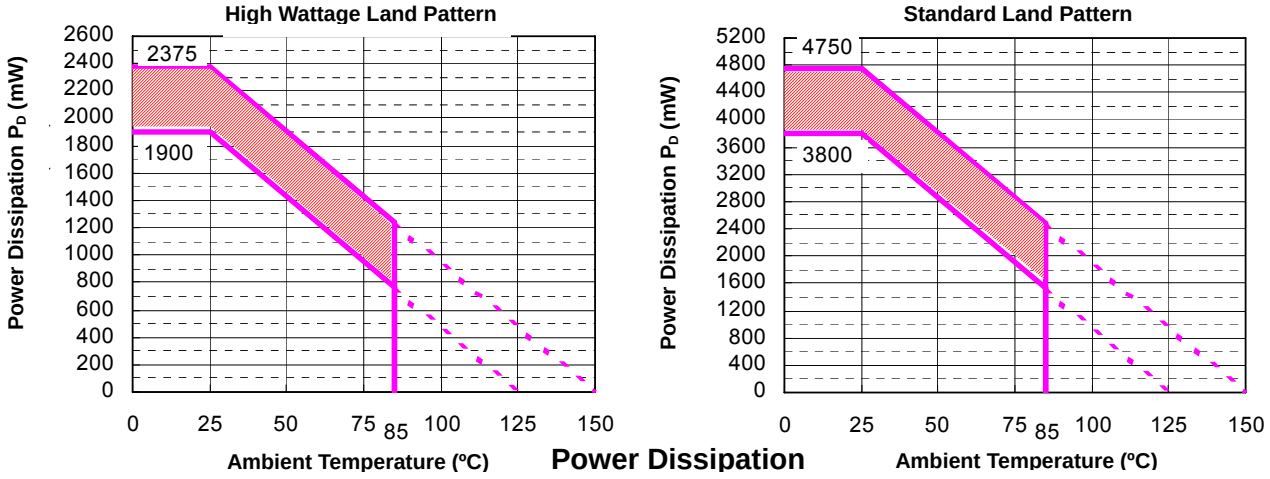
Power Dissipation (P_D) depends on conditions of mounting on board. This specification is based on the Measurement Conditions below.

Measurement conditions

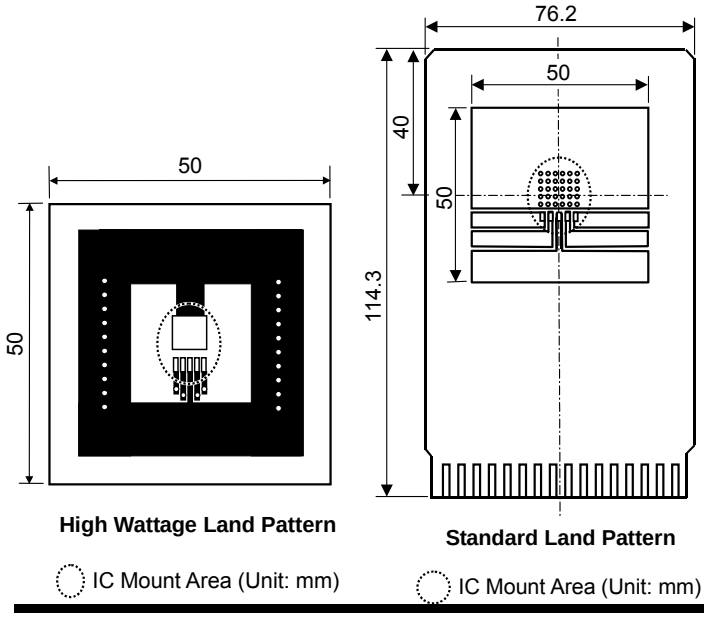
	High Wattage Land Pattern	Standard Land Pattern
Environment	Mounting on board (Wind velocity 0m/s)	Mounting on board (Wind velocity 0m/s)
Board Material	Glass cloth epoxy plastic (Double layers)	Glass cloth epoxy plastic (Four-layers)
Board Dimensions	50mm × 50mm × 1.6mm	76.2mm × 114.3mm × 0.8mm
Copper Ratio	Top side: Approx. 50%, Back side: Approx. 50%	Top, Back side: Approx. 96%, 2nd, 3rd: 100%
Through - hole	ϕ 0.5mm x 24pcs	ϕ 0.4mm x 30pcs

Measurement Results (Ta=25°C)

	High Wattage Land Pattern	Standard Land Pattern
Power Dissipation	1900mW (Tjmax=125°C) 2375mW (Tjmax=150°C)	3800mW (Tjmax=125°C) 4750mW (Tjmax=150°C)
Thermal Resistance	θja= (125-25°C)/1.9W = 53°C/W	θja= (125-25°C)/3.8W = 26°C/W
	θjc= 17°C/W	θjc= 7°C/W



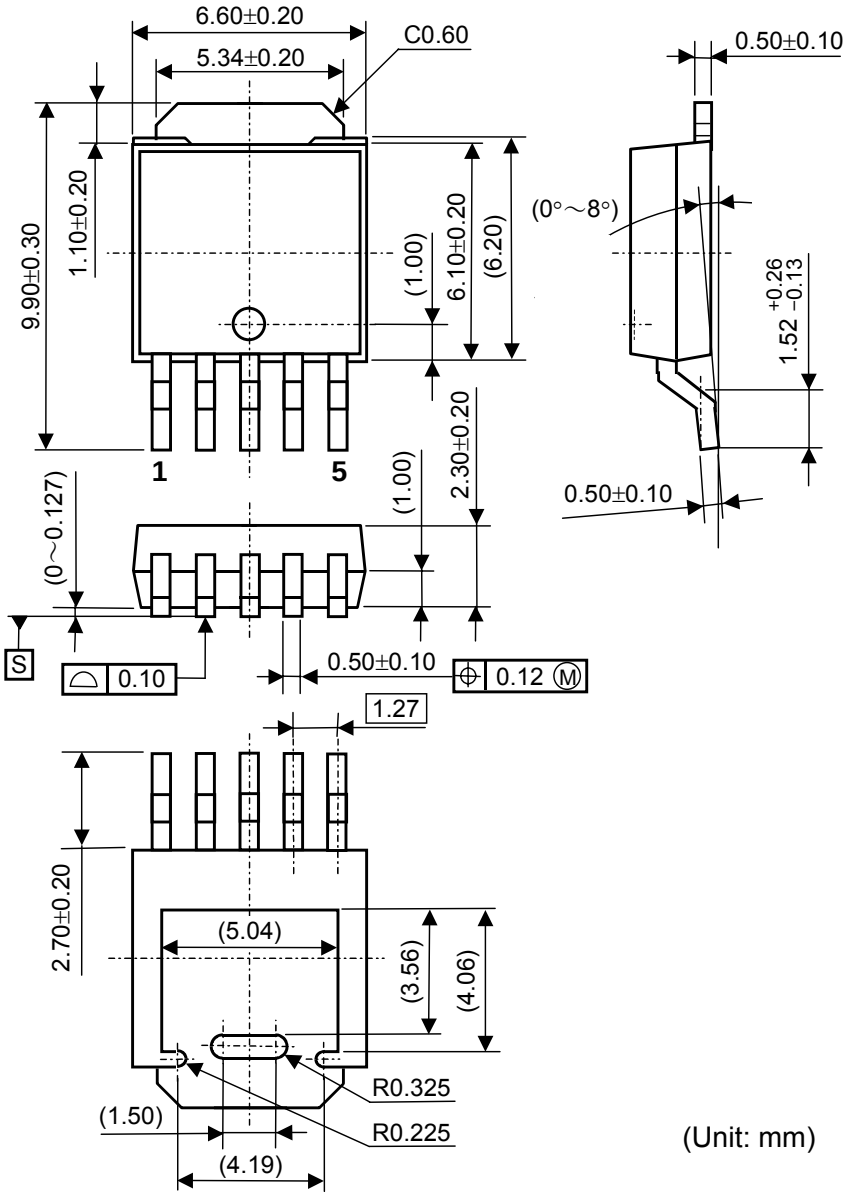
Power Dissipation



Note: 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.

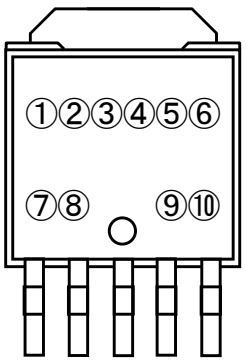
Operating Time	Estimated Years (Operating four hours/ day)
13,000 hours	9 years

Package Dimensions (TO-252-5-P2)



(Unit: mm)

Mark Specifications (TO-252-5-P2)



①②③④⑤⑥⑦⑧: Refer to RP132J Series Mark Specification Table.

⑨⑩: Lot Number … Alphanumeric Serial Number

RP132J Series Mark Specification Table

PKG: TO-252-5-P2

● **RP132Jxx1B**

製品名	①②③④⑤⑥⑦⑧	設定電圧
RP132J081B	**G 1 J 0 8 1 B**	0.8V
RP132J091B	**G 1 J 0 9 1 B**	0.9V
RP132J101B	**G 1 J 1 0 1 B**	1.0V
RP132J111B	**G 1 J 1 1 1 B**	1.1V
RP132J121B	**G 1 J 1 2 1 B**	1.2V
RP132J131B	**G 1 J 1 3 1 B**	1.3V
RP132J141B	**G 1 J 1 4 1 B**	1.4V
RP132J151B	**G 1 J 1 5 1 B**	1.5V
RP132J161B	**G 1 J 1 6 1 B**	1.6V
RP132J171B	**G 1 J 1 7 1 B**	1.7V
RP132J181B	**G 1 J 1 8 1 B**	1.8V
RP132J191B	**G 1 J 1 9 1 B**	1.9V
RP132J201B	**G 1 J 2 0 1 B**	2.0V
RP132J211B	**G 1 J 2 1 1 B**	2.1V
RP132J221B	**G 1 J 2 2 1 B**	2.2V
RP132J231B	**G 1 J 2 3 1 B**	2.3V
RP132J241B	**G 1 J 2 4 1 B**	2.4V
RP132J251B	**G 1 J 2 5 1 B**	2.5V
RP132J261B	**G 1 J 2 6 1 B**	2.6V
RP132J271B	**G 1 J 2 7 1 B**	2.7V
RP132J281B	**G 1 J 2 8 1 B**	2.8V
RP132J291B	**G 1 J 2 9 1 B**	2.9V
RP132J301B	**G 1 J 3 0 1 B**	3.0V
RP132J311B	**G 1 J 3 1 1 B**	3.1V
RP132J321B	**G 1 J 3 2 1 B**	3.2V
RP132J331B	**G 1 J 3 3 1 B**	3.3V
RP132J341B	**G 1 J 3 4 1 B**	3.4V
RP132J351B	**G 1 J 3 5 1 B**	3.5V
RP132J361B	**G 1 J 3 6 1 B**	3.6V
RP132J371B	**G 1 J 3 7 1 B**	3.7V
RP132J381B	**G 1 J 3 8 1 B**	3.8V
RP132J391B	**G 1 J 3 9 1 B**	3.9V
RP132J401B	**G 1 J 4 0 1 B**	4.0V
RP132J411B	**G 1 J 4 1 1 B**	4.1V
RP132J421B	**G 1 J 4 2 1 B**	4.2V
RP132J431B	**G 1 J 4 3 1 B**	4.3V
RP132J441B	**G 1 J 4 4 1 B**	4.4V
RP132J451B	**G 1 J 4 5 1 B**	4.5V
RP132J461B	**G 1 J 4 6 1 B**	4.6V
RP132J471B	**G 1 J 4 7 1 B**	4.7V
RP132J481B	**G 1 J 4 8 1 B**	4.8V
RP132J491B	**G 1 J 4 9 1 B**	4.9V
RP132J501B	**G 1 J 5 0 1 B**	5.0V
RP132J511B	**G 1 J 5 1 1 B**	5.1V
RP132J521B	**G 1 J 5 2 1 B**	5.2V
RP132J531B	**G 1 J 5 3 1 B**	5.3V
RP132J541B	**G 1 J 5 4 1 B**	5.4V
RP132J551B	**G 1 J 5 5 1 B**	5.5V
RP132J121B5	**G 1 J 1 2 1 B 5**	1.25V
RP132J181B5	**G 1 J 1 8 1 B 5**	1.85V
RP132J281B5	**G 1 J 2 8 1 B 5**	2.85V
RP132J001B	**G 1 J 0 0 1 B**	-

● **RP132Jxx1D**

製品名	①②③④⑤⑥⑦⑧	設定電圧
RP132J081D	**G 1 J 0 8 1 D**	0.8V
RP132J091D	**G 1 J 0 9 1 D**	0.9V
RP132J101D	**G 1 J 1 0 1 D**	1.0V
RP132J111D	**G 1 J 1 1 1 D**	1.1V
RP132J121D	**G 1 J 1 2 1 D**	1.2V
RP132J131D	**G 1 J 1 3 1 D**	1.3V
RP132J141D	**G 1 J 1 4 1 D**	1.4V
RP132J151D	**G 1 J 1 5 1 D**	1.5V
RP132J161D	**G 1 J 1 6 1 D**	1.6V
RP132J171D	**G 1 J 1 7 1 D**	1.7V
RP132J181D	**G 1 J 1 8 1 D**	1.8V
RP132J191D	**G 1 J 1 9 1 D**	1.9V
RP132J201D	**G 1 J 2 0 1 D**	2.0V
RP132J211D	**G 1 J 2 1 1 D**	2.1V
RP132J221D	**G 1 J 2 2 1 D**	2.2V
RP132J231D	**G 1 J 2 3 1 D**	2.3V
RP132J241D	**G 1 J 2 4 1 D**	2.4V
RP132J251D	**G 1 J 2 5 1 D**	2.5V
RP132J261D	**G 1 J 2 6 1 D**	2.6V
RP132J271D	**G 1 J 2 7 1 D**	2.7V
RP132J281D	**G 1 J 2 8 1 D**	2.8V
RP132J291D	**G 1 J 2 9 1 D**	2.9V
RP132J301D	**G 1 J 3 0 1 D**	3.0V
RP132J311D	**G 1 J 3 1 1 D**	3.1V
RP132J321D	**G 1 J 3 2 1 D**	3.2V
RP132J331D	**G 1 J 3 3 1 D**	3.3V
RP132J341D	**G 1 J 3 4 1 D**	3.4V
RP132J351D	**G 1 J 3 5 1 D**	3.5V
RP132J361D	**G 1 J 3 6 1 D**	3.6V
RP132J371D	**G 1 J 3 7 1 D**	3.7V
RP132J381D	**G 1 J 3 8 1 D**	3.8V
RP132J391D	**G 1 J 3 9 1 D**	3.9V
RP132J401D	**G 1 J 4 0 1 D**	4.0V
RP132J411D	**G 1 J 4 1 1 D**	4.1V
RP132J421D	**G 1 J 4 2 1 D**	4.2V
RP132J431D	**G 1 J 4 3 1 D**	4.3V
RP132J441D	**G 1 J 4 4 1 D**	4.4V
RP132J451D	**G 1 J 4 5 1 D**	4.5V
RP132J461D	**G 1 J 4 6 1 D**	4.6V
RP132J471D	**G 1 J 4 7 1 D**	4.7V
RP132J481D	**G 1 J 4 8 1 D**	4.8V
RP132J491D	**G 1 J 4 9 1 D**	4.9V
RP132J501D	**G 1 J 5 0 1 D**	5.0V
RP132J511D	**G 1 J 5 1 1 D**	5.1V
RP132J521D	**G 1 J 5 2 1 D**	5.2V
RP132J531D	**G 1 J 5 3 1 D**	5.3V
RP132J541D	**G 1 J 5 4 1 D**	5.4V
RP132J551D	**G 1 J 5 5 1 D**	5.5V
RP132J121D5	**G 1 J 1 2 1 D 5**	1.25V
RP132J181D5	**G 1 J 1 8 1 D 5**	1.85V
RP132J281D5	**G 1 J 2 8 1 D 5**	2.85V
RP132J001D	**G 1 J 0 0 1 D**	-

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Sales & Support Offices

RICOH ELECTRONIC DEVICES CO., LTD.
Higashi-Shinagawa Office (International Sales)
3-32-3, Higashi-Shinagawa, Shinagawa-ku, Tokyo 140-8655, Japan
Phone: +81-3-5479-2857 Fax: +81-3-5479-0502

RICOH EUROPE (NETHERLANDS) B.V.
Semiconductor Support Centre
Prof. W.H. Keesomlaan 1, 1183 DJ Amstelveen, The Netherlands
Phone: +31-20-5474-309

RICOH INTERNATIONAL B.V. - German Branch
Semiconductor Sales and Support Centre
Oberrather Strasse 6, 40472 Düsseldorf, Germany
Phone: +49-211-6546-0

RICOH ELECTRONIC DEVICES KOREA CO., LTD.
3F, Haesung Bldg, 504, Teheran-ro, Gangnam-gu, Seoul, 135-725, Korea
Phone: +82-2-2135-5700 Fax: +82-2-2051-5713

RICOH ELECTRONIC DEVICES SHANGHAI CO., LTD.
Room 403, No.2 Building, No.690 Bibo Road, Pu Dong New District, Shanghai 201203, People's Republic of China
Phone: +86-21-5027-3200 Fax: +86-21-5027-3299

RICOH ELECTRONIC DEVICES CO., LTD.
Taipei office
Room 109, 10F-1, No.51, Hengyang Rd., Taipei City, Taiwan (R.O.C.)
Phone: +886-2-2313-1621/1622 Fax: +886-2-2313-1623

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RP132K121D-TR RP132K331E-TR RP132S151F-E2-FE RP132H181B-T1-FE RP132K121B-TR RP132K181F-TR RP132K251D-TR RP132K251B-TR RP132K001E-TR RP132J551D-T1-FE RP132S181F-E2-FE RP132J331D-T1-FE RP132S001B-E2-FE RP132H101B-T1-FE RP132S121F-E2-FE RP132K181E-TR RP132K151B-TR RP132K501E-TR RP132S501B-E2-FE RP132K501B-TR RP132S101B-E2-FE RP132S151D-E2-FE RP132S181B-E2-FE RP132S251B-E2-FE RP132H001D-T1-FE RP132H251D-T1-FE RP132K331D-TR RP132S331F-E2-FE RP132H331B-T1-FE RP132K181B-TR RP132S331B-E2-FE RP132S501D-E2-FE RP132S331E-E2-FE RP132S121B-E2-FE RP132S121D-E2-FE RP132S151B-E2-FE RP132H251B-T1-FE RP132K181D-TR RP132H121B-T1-FE RP132H181D-T1-FE RP132S251D-E2-FE RP132H001B-T1-FE RP132K501F-TR RP132H151B-T1-FE RP132H501D-T1-FE RP132J001B-T1-FE RP132K151F-TR RP132H151D-T1-FE RP132J001D-T1-FE RP132H501B-T1-FE RP132K331B-TR RP132S331D-E2-FE RP132K331F-TR RP132K001F-TR RP132K001D-TR RP132S001D-E2-FE RP132H121D-T1-FE RP132S181D-E2-FE RP132K001B-TR RP132H331D-T1-FE RP132S241B-E2-FE RP132J501B-T1-FE RP132S321B-E2-FE RP132S301B-E2-FE RP132J341D-T1-FE RP132J191D-T1-FE RP132H121B5-T1-FE RP132H361D-T1-FE RP132J121D-T1-FE RP132J151B-T1-FE RP132J181B-T1-FE RP132J251B-T1-FE RP132S121B5-E2-FE RP132S121E-E2-FE RP132S181E-E2-FE RP132S251E-E2-FE RP132S501E-E2-FE RP132S501F-E2-FE RP132K311F-TR RP132K401B-TR RP132K401D-TR RP132K501D-TR RP132K511D-TR RP132K531B-TR RP132K101B-TR RP132K111D-TR RP132K121B5-TR RP132K121E-TR RP132K121F-TR RP132K191D-TR