RICOH

R1171x SERIES

2.0A/1.5A LDO REGULATOR

NO. EA-125-061107

OUTLINE

The R1171x Series are CMOS-based positive voltage regulator ICs. The R1171x Series have features of low dropout voltage, high output voltage accuracy, low consumption current. Each of these ICs consists of a voltage reference unit, an error amplifier, resistor net for setting output voltage, a current limit circuit at short mode, a chip enable circuit, and thermal-shunt circuit. The output voltage of R1171 is fixed in the IC.

Low consumption current by the merit of CMOS process and built-in transistors with low ON-resistance make low dropout voltage and chip enable function prolongs the battery life. These regulators are remarkable improvement on the current regulators in terms of input transient response, and load transient response.

Thus, the R1171x Series are suitable for various power sources.

Since the packages for these ICs are high wattage HSOP-6J package, TO-252-5 (Under Development), high density mounting of the ICs on boards is possible.

FEATURES

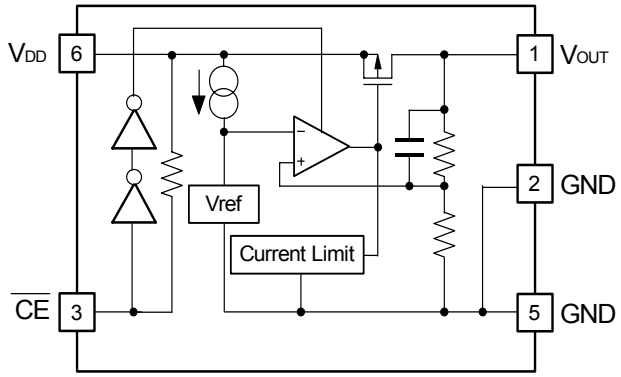
- Low Supply Current ..... Typ. 130μA
- Low Standby Current ..... Typ. 0.1μA
- Output Current ..... Min. 1.5A (V_{IN}=V_{OUT}+1.0V, R1171SxxxA/B)
  Min. 2.0A (V_{IN}=V_{OUT}+1.0V, R1171JxxxC/D)
  (Under Development)
- Input Voltage ..... 2.1V to 6.0V
- Output Voltage ..... 1.5V to 5.0V (R1171SxxxA/B)
  1.8V to 5.0V (R1171JxxxC/D)
- Output Voltage Accuracy..... ± 2.0%
- Low Dropout Voltage..... Typ. 0.09V (V_{OUT}=3.0V, I_{OUT}=300mA)
- Low Temperature-drift Coefficient of Output Voltage ... Typ. ± 100ppm/°C
- Line Regulation ..... Typ. 0.05%/V
- Packages ..... HSOP-6J, TO-252-5 (Under Development)
- Built-in Current Limit Circuit
- Built-in Thermal Shunt Circuit
- Ceramic capacitor for phase compensation ..... C_{IN}=C_{OUT}=Ceramic 10.0μF (V_{OUT}<1.8V)
  C_{IN}=C_{OUT}=Ceramic 4.7μF (V_{OUT} ≧ 1.8V)

APPLICATIONS

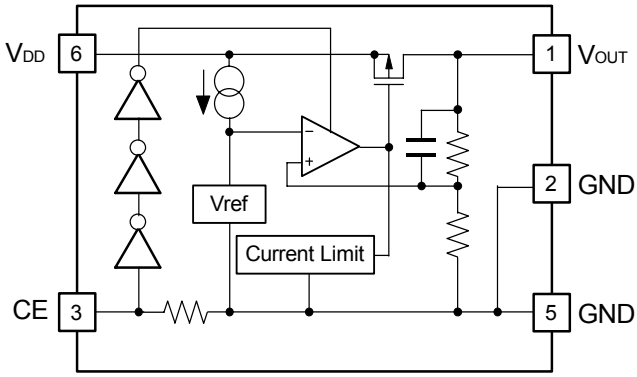
- Local Power source for Notebook PC.
- Local Power source for portable appliances, cameras, and videos.
- Local Power source for equipment of battery-use.
- Local Power source for home appliances.

BLOCK DIAGRAMS

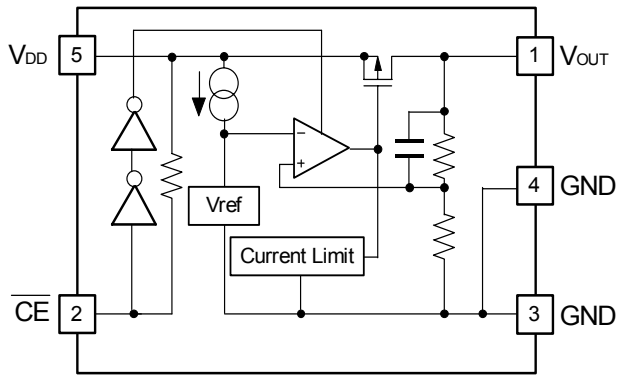
R1171SxxxA



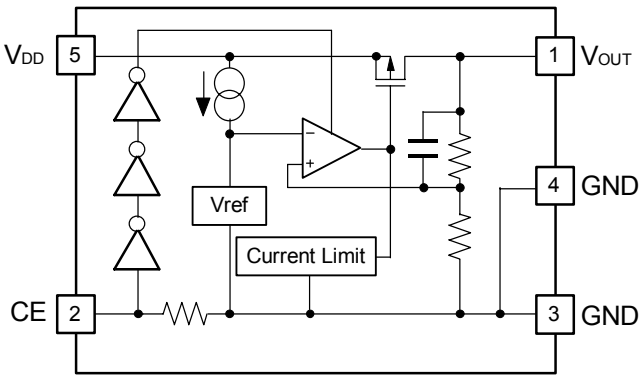
R1171SxxxB



R1171JxxxC (Under Development)



R1171JxxxD (Under Development)



SELECTION GUIDE

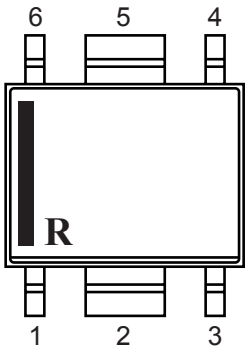
The output voltage, the chip-enable polarity, the taping type can be selected at the user's request.
The selection can be made with the part number as follows;

R1171x<u>xx</u>1x-<u>xx</u> ←Part Number
↑ ↑ ↑ ↑
a b c d

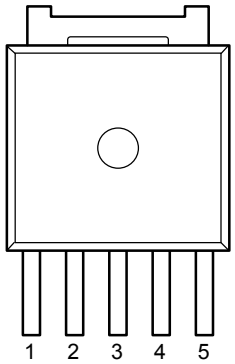
Code	Contents
a	Package Type; S: HSOP-6J J: TO-252-5 (Under Development)
b	Designation of Output Voltage (V_{OUT}) Stepwise setting with 0.1V increment in the range from 1.5V to 5.0V(A/B version), from 1.8V to 5.0V(C/D version: Under Development) “Exception” 2.85V type: R1171x281x5-xx, 1.85V Type: R1171x181x5
c	Designation of option; A: Built-in Chip Enable Circuit, Active at "L" (Output Current :Min.1.5A) B: Built-in Chip Enable Circuit, Active at "H" (Output Current :Min.1.5A) C: Built-in Chip Enable Circuit, Active at “L” (Output Current :Min.2.0A)*Under Development D: Built-in Chip Enable Circuit, Active at “H” (Output Current :Min.2.0A)*Under Development
d	Designation of Taping Type; E2 (HSOP-6J) (Refer to Taping Specifications) T1 (TO-252-5)

PIN CONFIGURATION

● **HSOP-6J**



● **TO-252-5 (Under Development)**



PIN DESCRIPTION

● **HSOP-6J**

Pin No	Symbol	Description
1	V_{OUT}	Voltage Regulator Output Pin
2	GND	Ground Pin
3	$\overline{CE}$ or CE	Chip Enable Pin
4	NC	No Connection
5	GND	Ground Pin
6	V_{DD}	Input Pin

● **TO-252-5 (Under Development)**

Pin No	Symbol	Description
1	V_{OUT}	Voltage Regulator Output Pin
2	$\overline{CE}$ or CE	Chip Enable Pin
3	GND	Ground Pin
4	GND	Ground Pin
5	V_{DD}	Input Pin

ABSOLUTE MAXIMUM RATINGS

Symbol	Item	Rating	Unit
V_{IN}	Input Voltage	7.0	V
V_{CE}	Input Voltage ($\overline{CE}$ or CE Input Pin)	−0.3 to V_{IN}+0.3	V
V_{OUT}	Output Voltage	−0.3 to V_{IN}+0.3	V
I_{OUT}	Output Current	3.5	A
P_D	Power Dissipation (HSOP-6J)*1	1700	mW
	Power Dissipation (TO-252-5)*1	1900	
Topt	Operating Temperature	−40 to 85	°C
Tstg	Storage Temperature	−55 to 125	°C

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

ELECTRICAL CHARACTERISTICS

- **R1171Sxx1A**

Topt=25°C

Symbol	Item	Conditions	Min.	Typ.	Max.	Unit
V_{OUT}	Output voltage	V_{IN}–V_{OUT}=1.0V I_{OUT}=200mA	×0.98		×1.02	V
I_{OUT}	Output Current	V_{IN}–V_{OUT}=1.0V	1.5			A
ΔV_{OUT}/ ΔI_{OUT}	Load regulation	V_{IN}–V_{OUT}=1.0V 1mA ≦ I_{OUT} ≦ 300mA		30	60	mV
V_{DIF}	Dropout Voltage	I_{OUT}=300mA	Refer to Electrical Characteristics by Output Voltage			
I_{SS}	Supply Current	V_{IN}–V_{OUT} = 1.0V V_{CE}=GND		130	320	μA
Istandby	Standby Current	V_{IN}–V_{OUT}=1.0V V_{IN}=V_{CE}		0.1	2.0	μA
ΔV_{OUT}/ ΔV_{IN}	Line regulation	I_{OUT}=200mA	Refer to Electrical Characteristics by Output Voltage			
RR	Ripple Rejection	f=1kHz, Ripple 0.5Vp-p				
V_{IN}	Input Voltage		2.1		6.0	V
ΔV_{OUT}/ ΔTopt	Output Voltage Temperature Coefficient	I_{OUT}=10mA –40°C ≦ Topt ≦ 85°C		±100		ppm/°C
Ilim	Short Current Limit	V_{OUT}=0V		200		mA
R_{PU}	Pull-up resistancefor $\overline{CE}$ pin		2.5	5.0	10.0	MΩ
V_{CEH}	$\overline{CE}$ Input Voltage "H"		1.2		V_{IN}	V
V_{CEL}	$\overline{CE}$ Input Voltage "L"		0.00		0.25	V
T_{TSD}	Thermal Shutdown Detector Threshold Temperature	Junction Temperature		150		°C
T_{TSR}	Thermal Shutdown Released Temperature	Junction Temperature		120		°C

- **R1171Sxx1B**

Topt=25°C

Symbol	Item	Conditions	Min.	Typ.	Max.	Unit
V_{OUT}	Reference Voltage for Adjustable Voltage Regulator	$V_{IN}-V_{OUT}$=1.0V I_{OUT}=200mA	×0.98		×1.02	V
I_{OUT}	Output Current	$V_{IN}-V_{OUT}$=1.0V	1.5			A
$\Delta V_{OUT}/\Delta I_{OUT}$	Load regulation	$V_{IN}-V_{OUT}$=1.0V 1mA ≦ I_{OUT} ≦ 300mA		30	60	mV
V_{DIF}	Dropout Voltage	I_{OUT}=300mA	Refer to Electrical Characteristics by Output Voltage Table			
I_{SS}	Supply Current	$V_{IN}-V_{OUT}$=1.0V $V_{CE}=V_{IN}$		130	320	μA
Istandby	Standby Current	$V_{IN}-V_{OUT}$=1.0V V_{CE}=GND		0.3	1.0	μA
$\Delta V_{OUT}/\Delta V_{IN}$	Line regulation	I_{OUT}=200mA	Refer to Electrical Characteristics by Output Voltage Table			
RR	Ripple Rejection	f=1kHz, Ripple 0.5Vp-p				
V_{IN}	Input Voltage		2.1		6.0	V
$\Delta V_{OUT}/\Delta$Topt	Output Voltage Temperature Coefficient	−40°C ≦ Topt ≦ 85°C		±100		ppm/°C
Ilim	Short Current Limit	V_{OUT}=0V		200		mA
R_{PD}	Pull-down resistance for CE pin		2.5	5.0	10.0	MΩ
V_{CEH}	CE Input Voltage "H"		1.2		V_{IN}	V
V_{CEL}	CE Input Voltage "L"		0.00		0.25	V
T_{TSD}	Thermal Shutdown Detector Threshold Temperature	Junction Temperature		150		°C
T_{TSR}	Thermal Shutdown Released Temperature	Junction Temperature		120		°C

- **R1171Jxx1C (Under Development)**

Topt=25°C

Symbol	Item	Conditions	Min.	Typ.	Max.	Unit
V_{OUT}	Output voltage	V_{IN}–V_{OUT}=1.0V I_{OUT}=200mA	×0.98		×1.02	V
I_{OUT}	Output Current	V_{IN}–V_{OUT}=1.0V	2.0			A
$\Delta V_{OUT}/\Delta I_{OUT}$	Load regulation	V_{IN}–V_{OUT}=1.0V 1mA ≦ I_{OUT} ≦ 300mA		30	60	mV
V_{DIF}	Dropout Voltage	I_{OUT}=300mA	Refer to Electrical Characteristics by Output Voltage			
I_{SS}	Supply Current	V_{IN}–V_{OUT}=1.0V V_{CE}=GND		130	320	μA
Istandby	Standby Current	V_{IN}–V_{OUT} = 1.0V V_{IN}=V_{CE}		0.1	2.0	μA
$\Delta V_{OUT}/\Delta V_{IN}$	Line regulation	I_{OUT}=200mA	Refer to Electrical Characteristics by Output Voltage			
RR	Ripple Rejection	f=1kHz,Ripple 0.5Vp-p				
V_{IN}	Input Voltage		2.1		6.0	V
$\Delta V_{OUT}/\Delta Topt$	Output Voltage Temperature Coefficient	I_{OUT}=10mA −40°C ≦ Topt ≦ 85°C		±100		ppm/°C
Ilim	Short Current Limit	V_{OUT}=0V		200		mA
R_{PU}	Pull-up resistancefor $\overline{CE}$ pin		2.5	5.0	10.0	MΩ
V_{CEH}	$\overline{CE}$ Input Voltage "H"		1.2		V_{IN}	V
V_{CEL}	$\overline{CE}$ Input Voltage "L"		0.00		0.25	V
T_{TSD}	Thermal Shutdown Detector Threshold Temperature	Junction Temperature		150		°C
T_{TSR}	Thermal Shutdown Released Temperature	Junction Temperature		120		°C

- **R1171Jxx1D (Under Development)**

Topt=25°C

Symbol	Item	Conditions	Min.	Typ.	Max.	Unit
V_{OUT}	Reference Voltage for Adjustable Voltage Regulator	$V_{IN}-V_{OUT}$=1.0V I_{OUT}=200mA	×0.98		×1.02	V
I_{OUT}	Output Current	$V_{IN}-V_{OUT}$=1.0V	2.0			A
$\Delta V_{OUT}/\Delta I_{OUT}$	Load regulation	$V_{IN}-V_{OUT}$=1.0V 1mA ≦ I_{OUT} ≦ 300mA		30	60	mV
V_{DIF}	Dropout Voltage	I_{OUT}=300mA	Refer to Electrical Characteristics by Output Voltage			
I_{SS}	Supply Current	$V_{IN}-V_{OUT}$=1.0V,V_{CE}=V_{IN}		130	320	μA
Istandby	Standby Current	$V_{IN}-V_{OUT}$=1.0V,V_{CE}=GND		0.1	2.0	μA
$\Delta V_{OUT}/\Delta V_{IN}$	Line regulation	I_{OUT}=200mA	Refer to Electrical Characteristics by Output Voltage			
RR	Ripple Rejection	f=1kHz, Ripple 0.5Vp-p				
V_{IN}	Input voltage		2.1		6.0	V
$\Delta V_{OUT}/\Delta Topt$	Output Voltage Temperature Coefficient	I_{OUT}=10mA −40°C ≦ Topt ≦ 85°C		±100		ppm/°C
Ilim	Short Current Limit	V_{OUT}=0V		200		mA
R_{PD}	Pull-down resistance for CE pin		2.5	5.0	10.0	MΩ
V_{CEH}	CE Input Voltage "H"		1.2		V_{IN}	V
V_{CEL}	CE Input Voltage "L"		0.00		0.25	V
T_{TSD}	Thermal Shutdown Detector Threshold Temperature	Junction Temperature		150		°C
T_{TSR}	Thermal Shutdown Released Temperature	Junction Temperature		120		°C

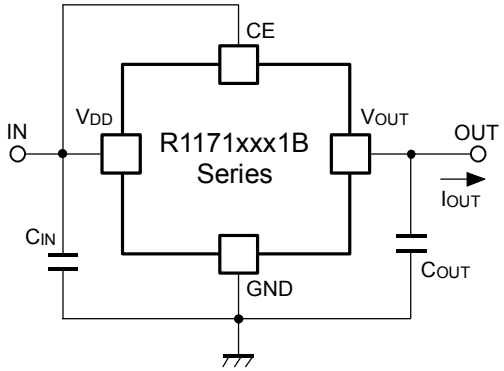
- **Electrical Characteristics by Output Voltage (Topt=25°C)**

Output Voltage V_{OUT} (V)	Dropout Voltage (V)	
	Typ.	Max.
1.5 ≦ V_{OUT}<1.6	0.16	0.35
1.6 ≦ V_{OUT}<1.7	0.14	0.32
1.7 ≦ V_{OUT}<1.8	0.13	0.28
1.8 ≦ V_{OUT}<2.0	0.12	0.24
2.0 ≦ V_{OUT}<2.5	0.10	0.21
2.5 ≦ V_{OUT} ≦ 5.0	0.09	0.18

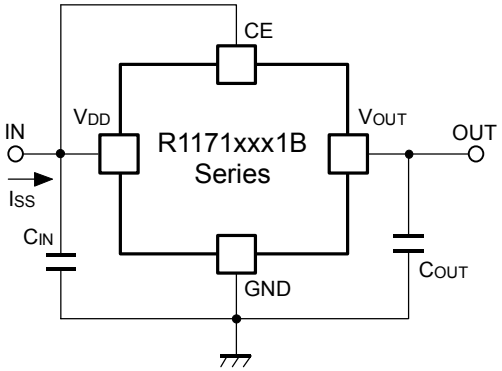
Output Voltage V_{OUT} (V)	Load regulation $\Delta V_{OUT}/\Delta V_{IN}$ (%/V)		
	Condition	Typ.	Max.
1.5 ≦ V_{OUT}<1.6	2.1 ≦ V_{OUT}<6.0	0.05	0.30
1.6 ≦ V_{OUT} ≦ 5.0	V_{OUT}+0.5V ≦ V_{IN} ≦ 6.0V		

Output Voltage V_{OUT} (V)	Ripple Rejection RR (dB)	
	Condition	Typ.
1.5 ≦ V_{OUT}<4.7	V_{IN}–V_{OUT}=1.0V	50
4.7 ≦ V_{OUT} ≦ 5.0	V_{IN}=5.75V	

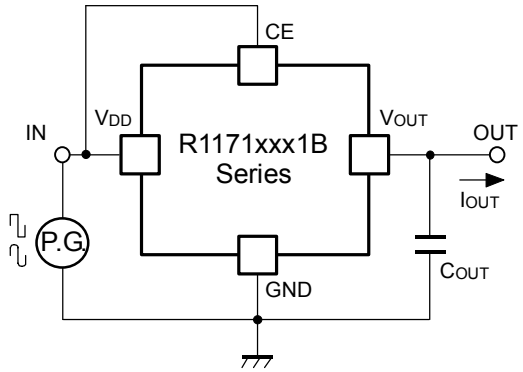
TEST CIRCUITS



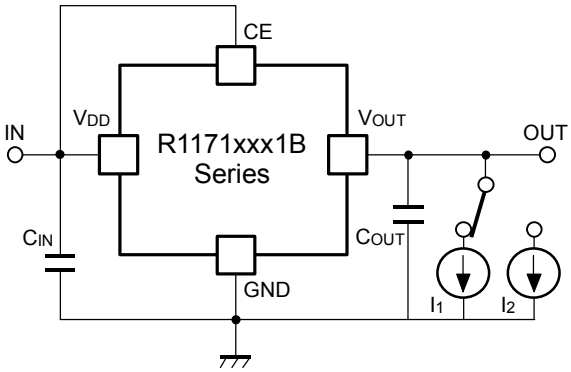
Standard Test Circuit



Supply Current Test Circuit



Test Circuit for Ripple Rejection,
Input Transient Response

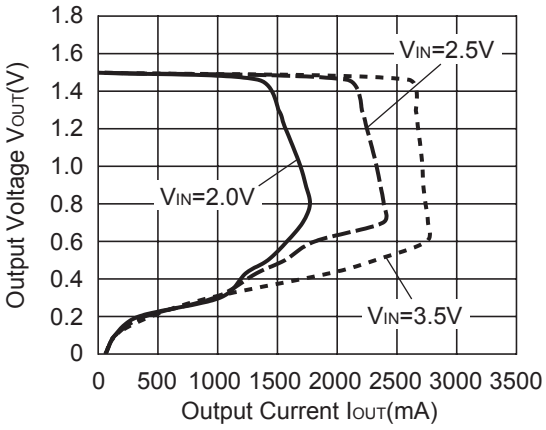


Test Circuit for Load Transient Response

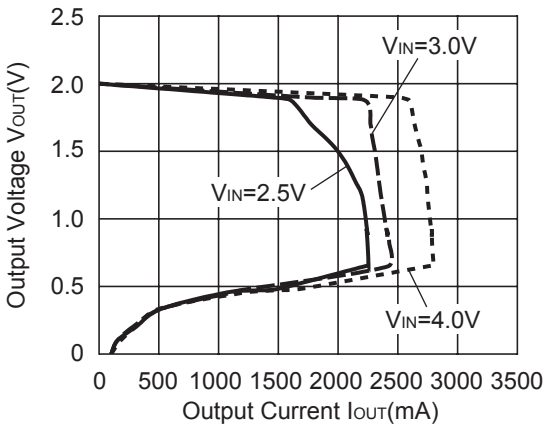
TYPICAL CHARACTERISTICS

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

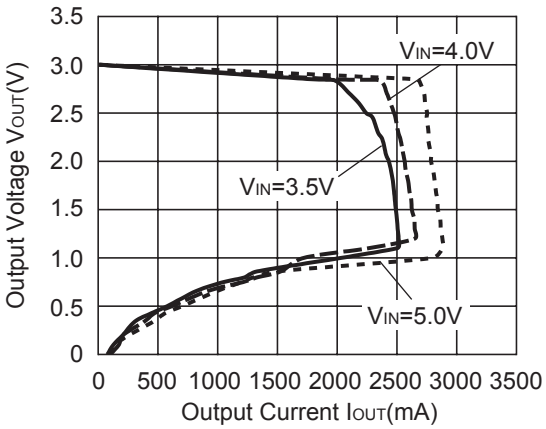
R1171S151x



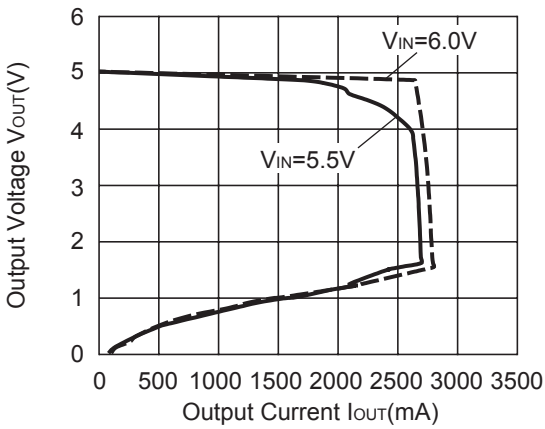
R1171S201x



R1171S301x

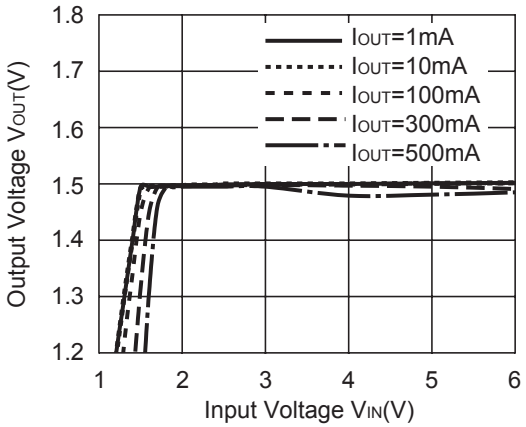


R1171S501x

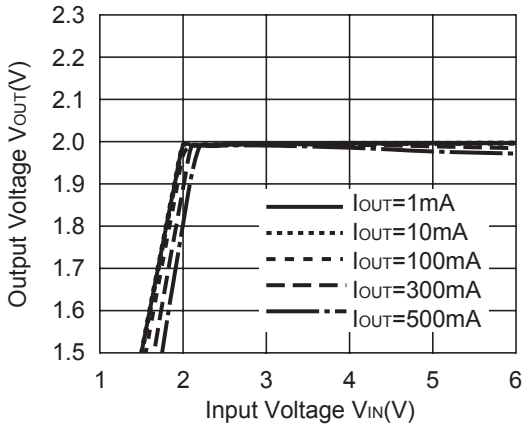


2) Output Voltage vs. Input Voltage (Topt=25°C)

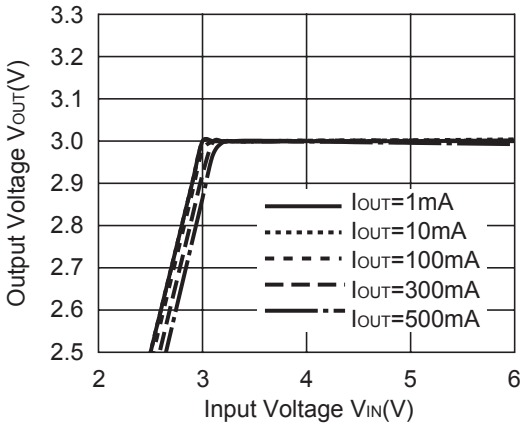
R1171x151B



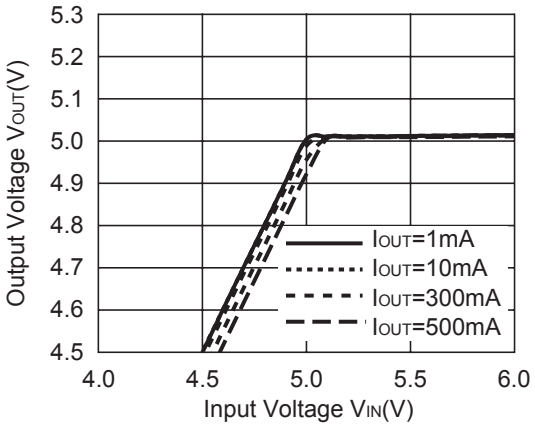
R1171x201B



R1171x301B

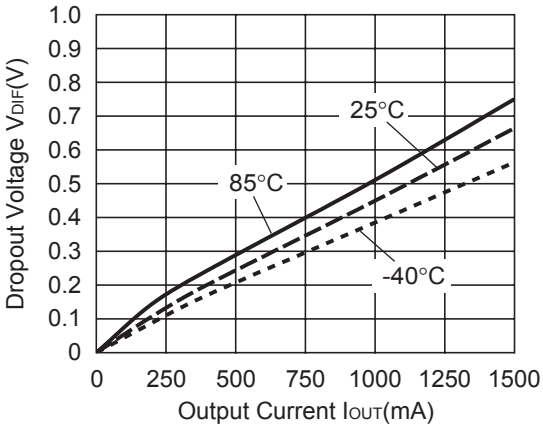


R1171x501B

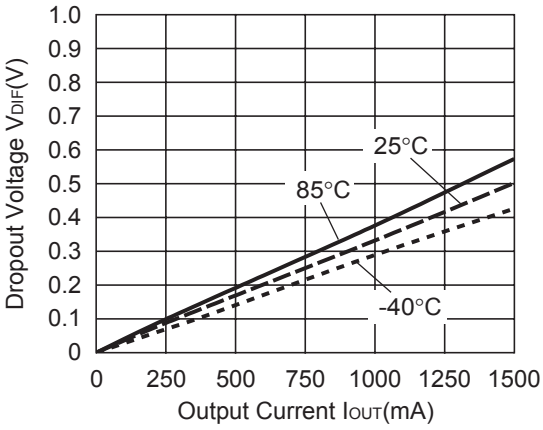


3)Dropout Voltage vs. Output Current

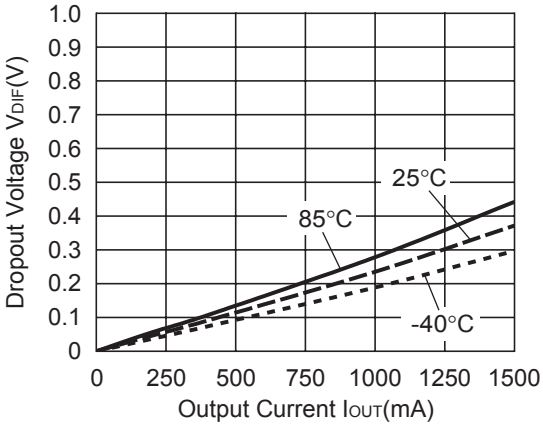
R1171S151x



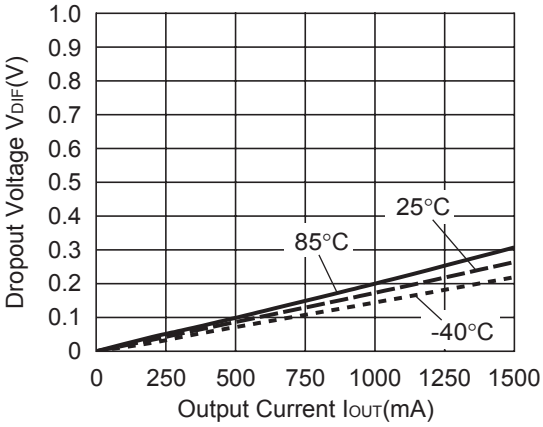
R1171S201x



R1171S301x

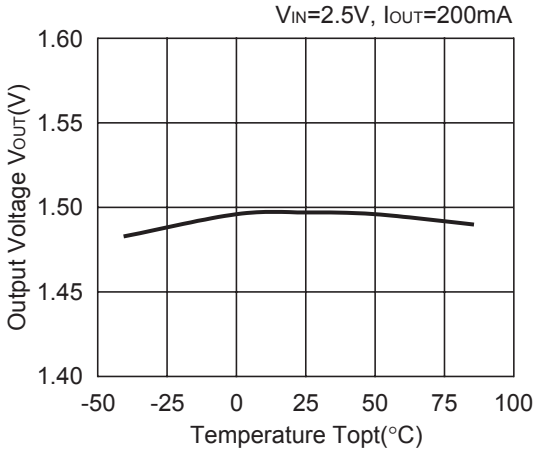


R1171S501x

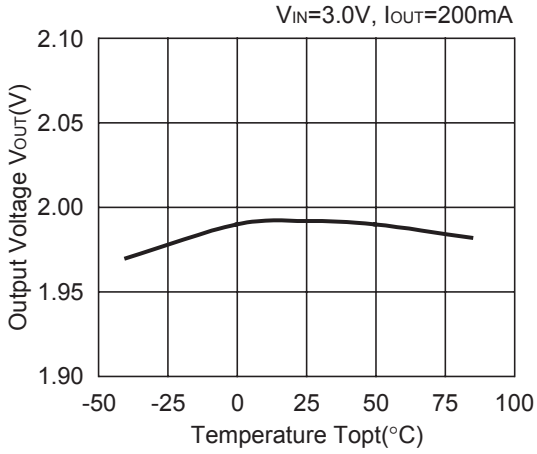


4) Output Voltage vs. Temperature

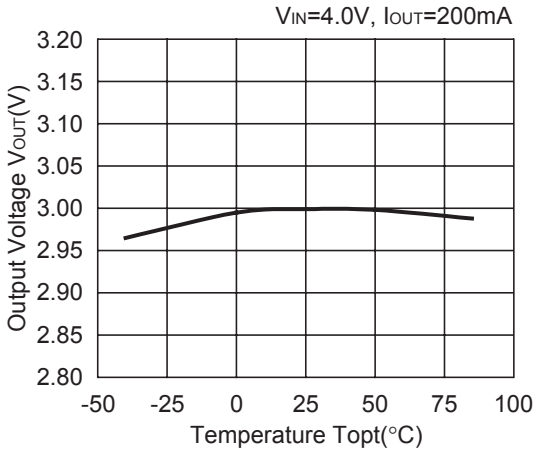
R1171x151B



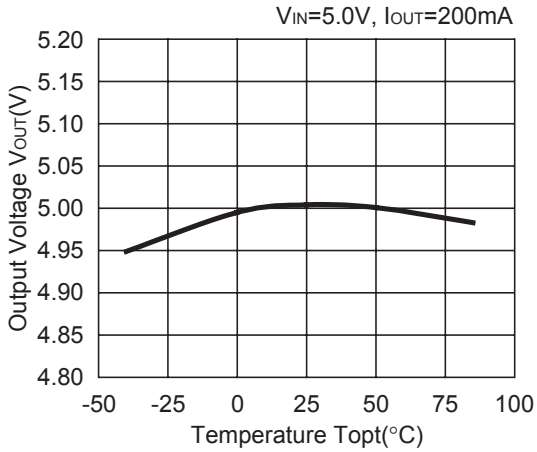
R1171x201B



R1171x301B

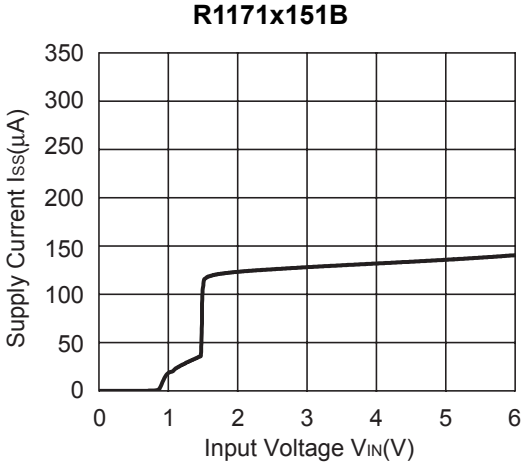


R1171x501B

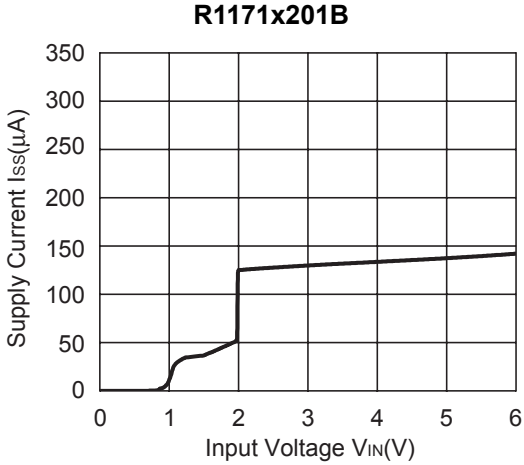


5) Supply Current vs. Input Voltage (Topt=25°C)

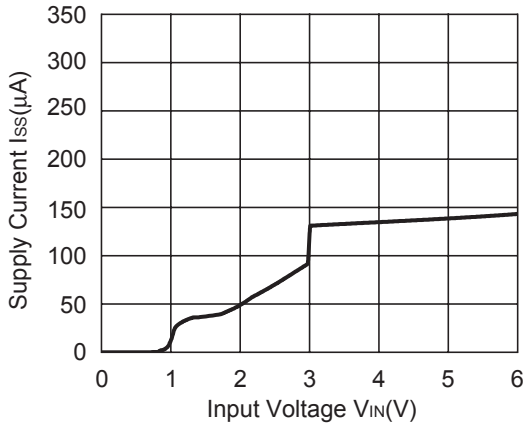
R1171x151B



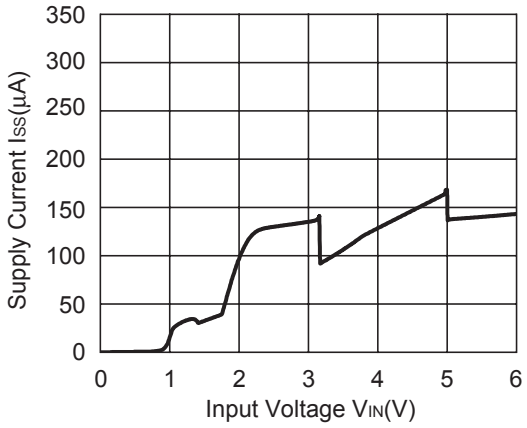
R1171x201B



R1171x301B

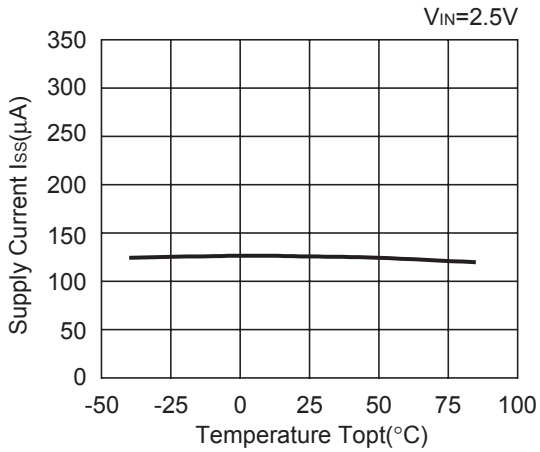


R1171x501B

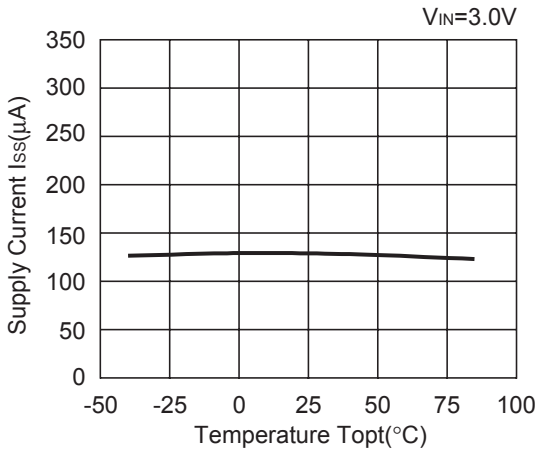


6) Supply Current vs. Temperature

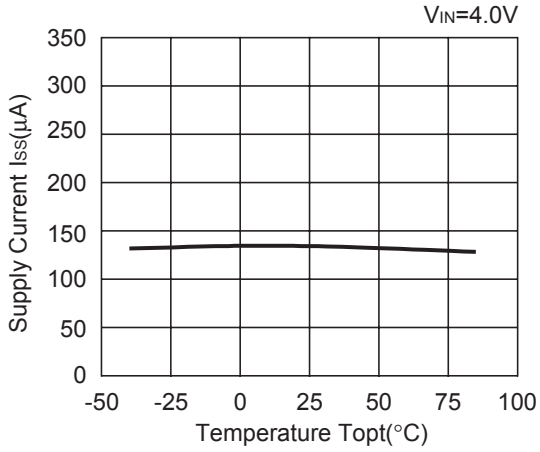
R1171x151B



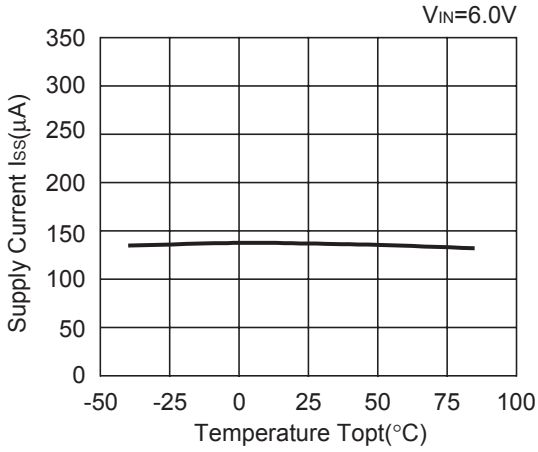
R1171x201B



R1171x301B

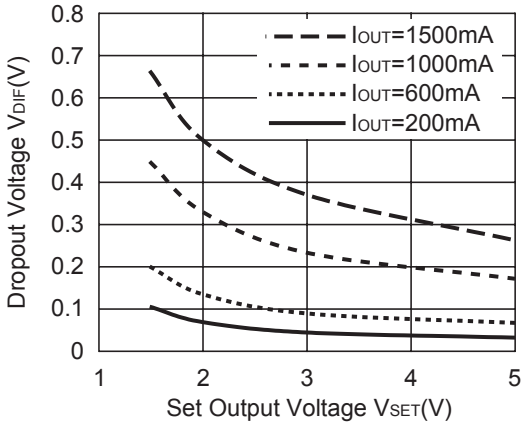


R1171x501B



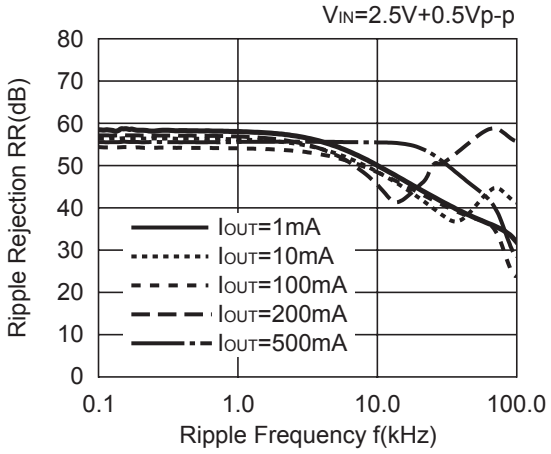
7) Dropout Voltage vs. Set Output Voltage (Topt=25°C)

R1171Sxx1x

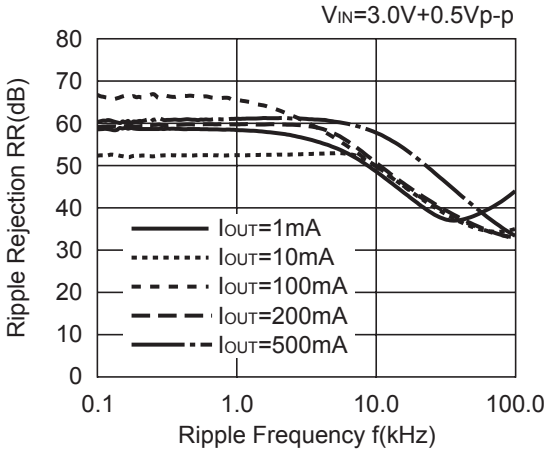


8) Ripple Rejection vs. Frequency

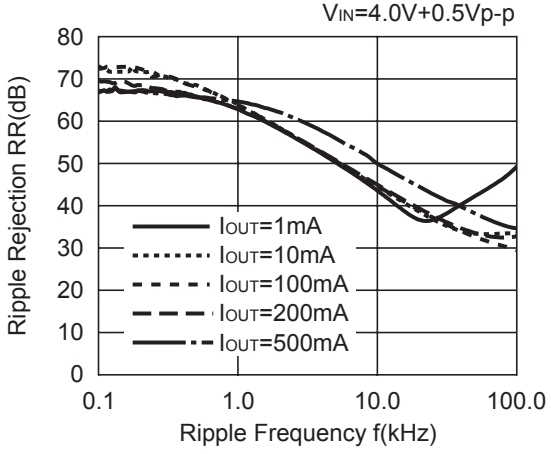
R1171x151B



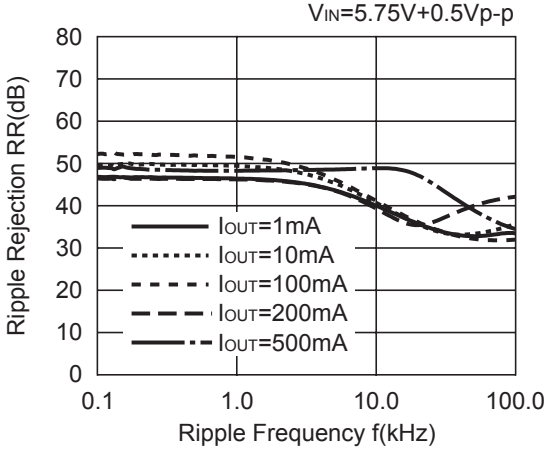
R1171x201B



R1171x301B

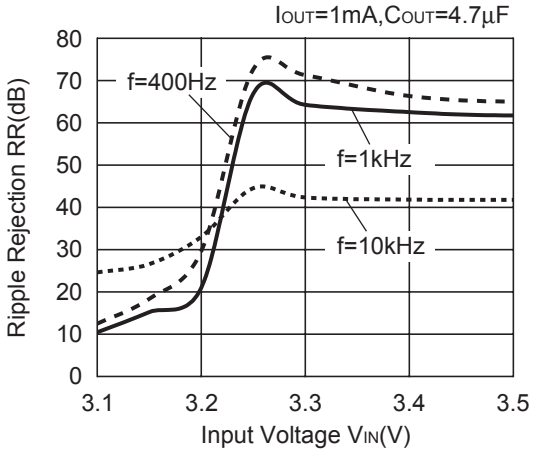


R1171x501B

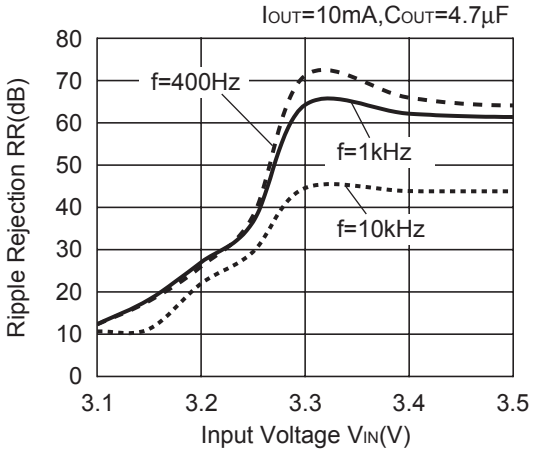


9) Ripple Rejection vs. Input Voltage

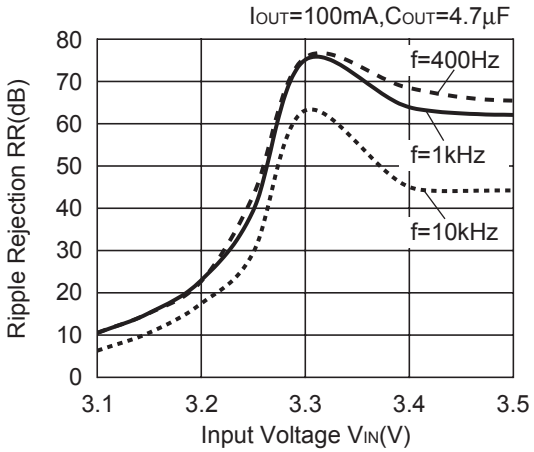
R1171x301x



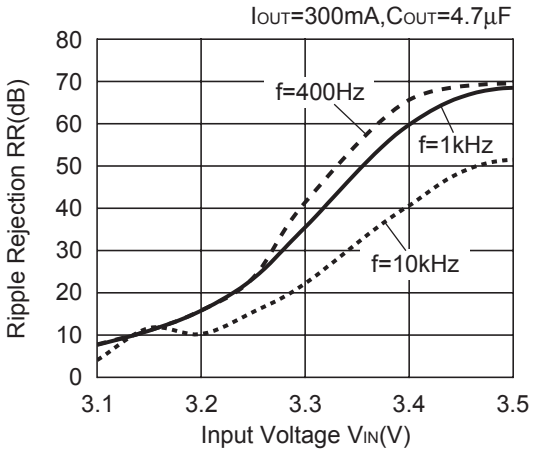
R1171x301x



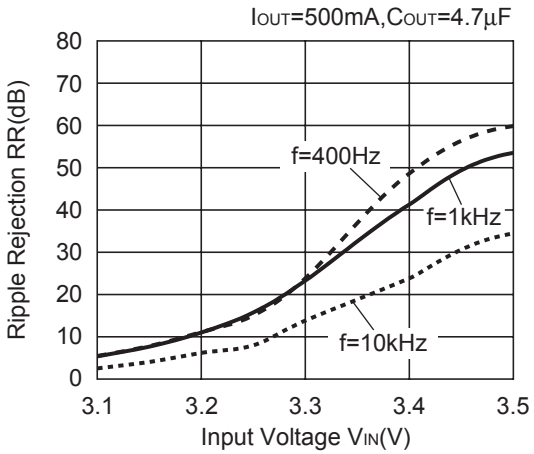
R1171x301x



R1171x301x

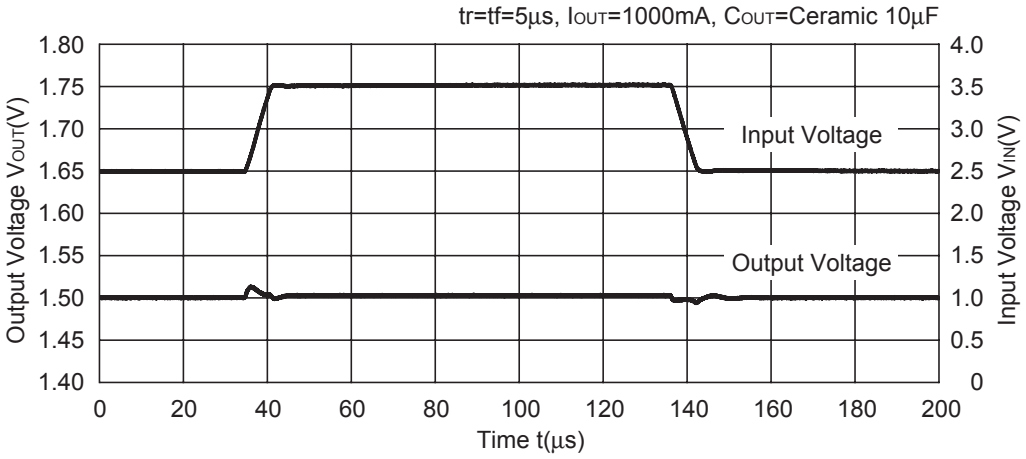


R1171x301x

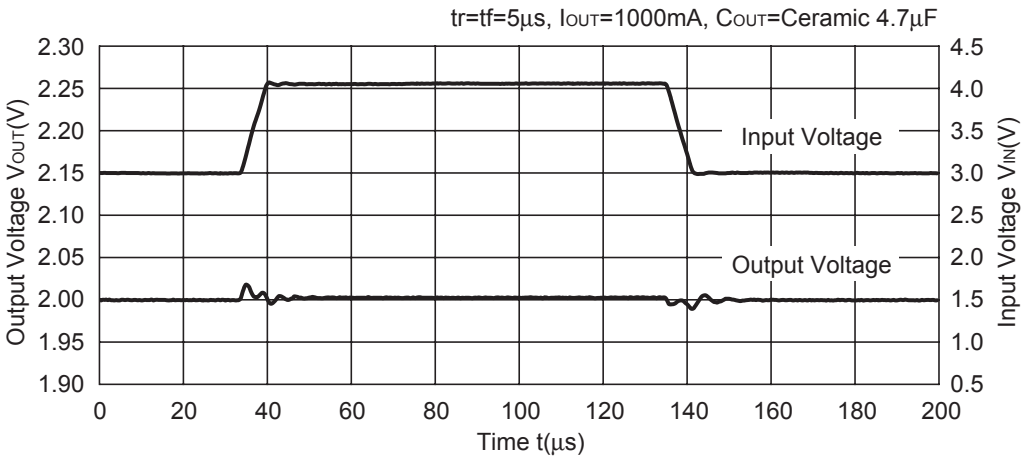


10) Input Transient Response (Topt=25°C)

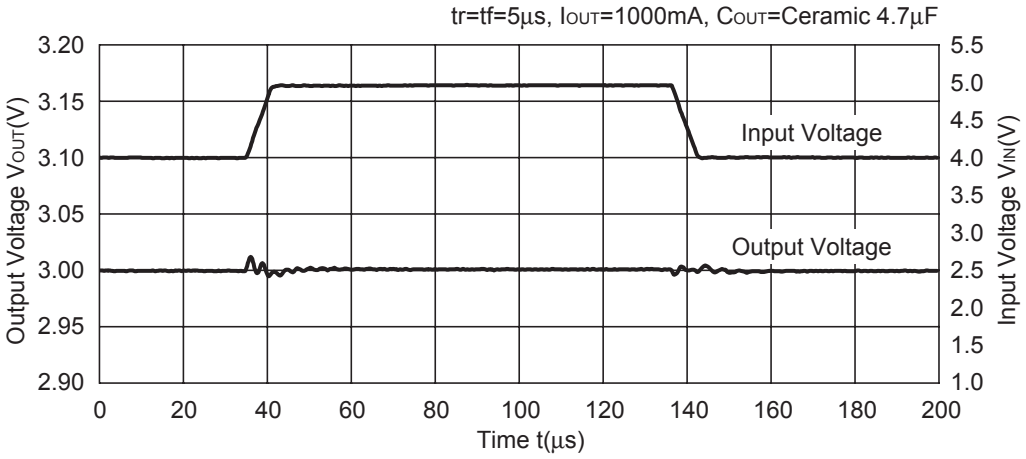
R1171x151B



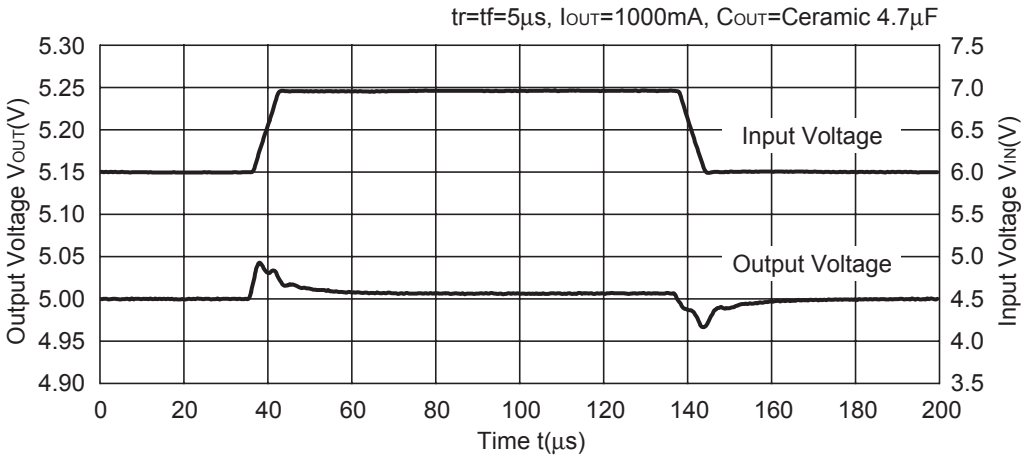
R1171x201B



R1171x301B

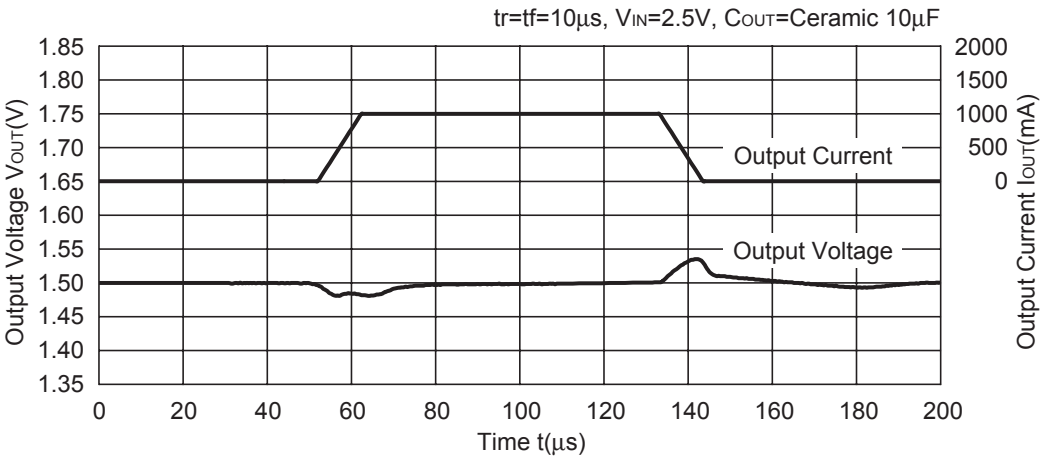


R1171x501B

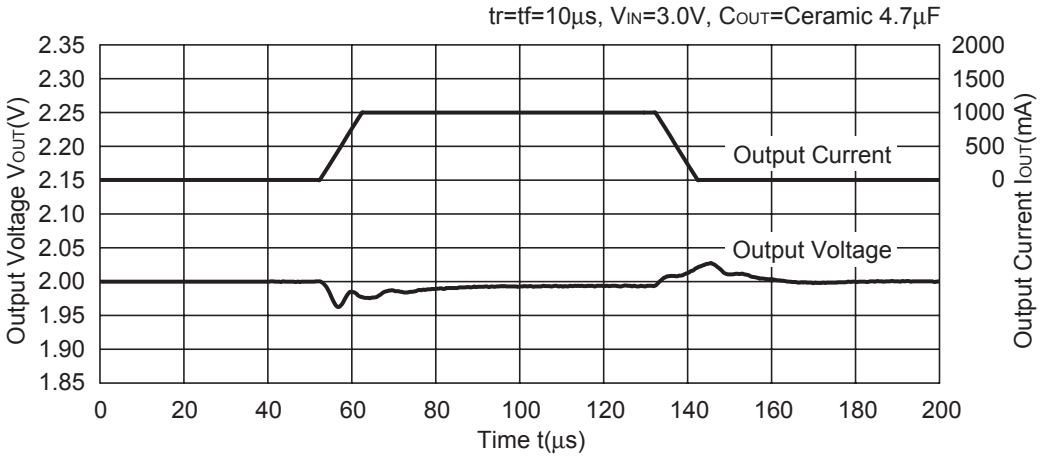


11) Load Transient Response (Topt=25°C)

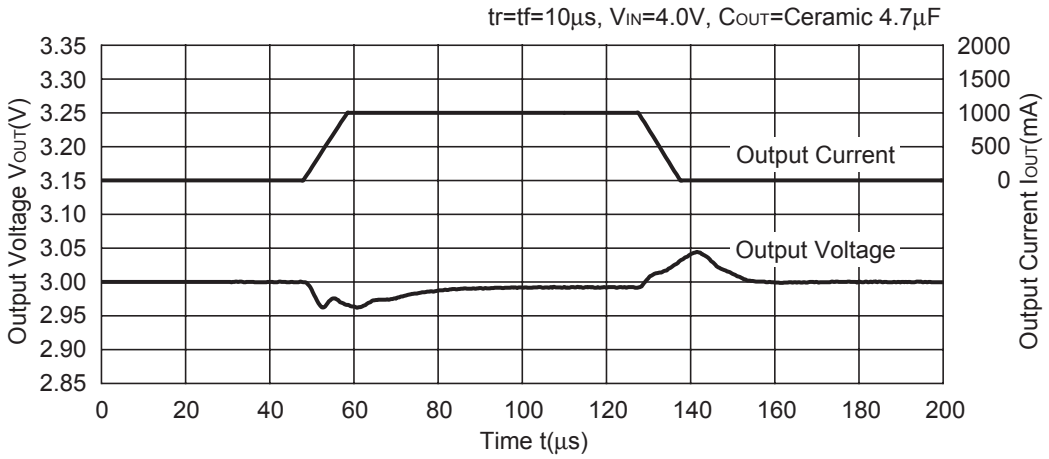
R1171x151B



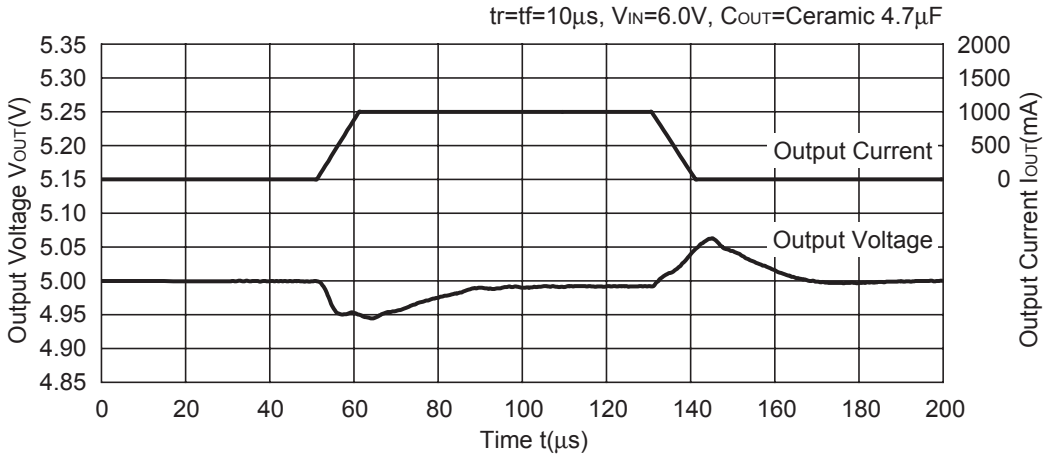
R1171x201B



R1171x301B



R1171x501B



Technical Notes on External Components and Typical Application

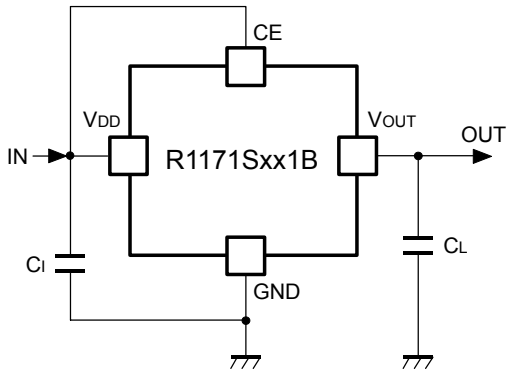
1. Phase Compensation

In these ICs, phase compensation is made with the output capacitor for securing stable operation even if the load current is varied. For this purpose, use a capacitor with the capacitance range from 4.7μF to 10.0μF, as C_L. In case that using a tantalum capacitor and the ESR of the tantalum capacitor is too large, unstable operation may result. Fully evaluation is necessary for the whole circuit with considering the frequency characteristic.

2. Mounting on PCB

Make V_{DD} and GND lines sufficient. If their impedance is high, large current may flow and the pick-up noise or unstable operation may result. Therefore use a capacitor with a capacitance range from 4.7μF to 10.0μF between V_{DD} pin and GND pin as close as possible.

Further, set an output capacitor between V_{OUT} pin and GND pin for phase compensation as close as possible. (Refer to the example of typical application)



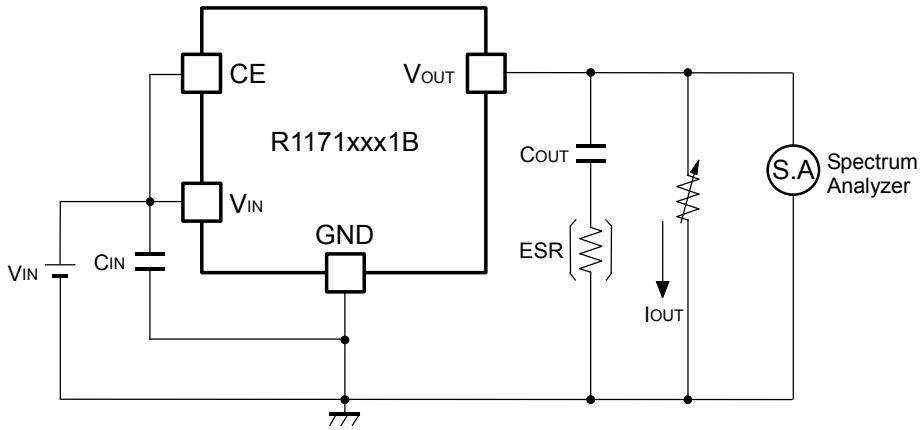
R1171Sxx1B Typical Application

1.5V ≦ V_{OUT}<1.8V : C_I=10μF (Ceramic),C_L=10μF (Ceramic)
1.8V ≦ V_{OUT} ≦ 5.0V : C_I=4.7μF (Ceramic),C_L=4.7μF (Ceramic)

3. Output Short Protection Function

In the R1171x Series, the output short protection function is built in, further, if the output is short to the GND or other voltage line, the chip inside is heating, as a result, in case that the junction temperature becomes equal or more than 150°C (Typ.), the built-in thermal shutdown circuit works. If the junction temperature becomes equal or more than 150°C (Typ.), the IC is protected by the output short protection circuit and the thermal shutdown circuit.

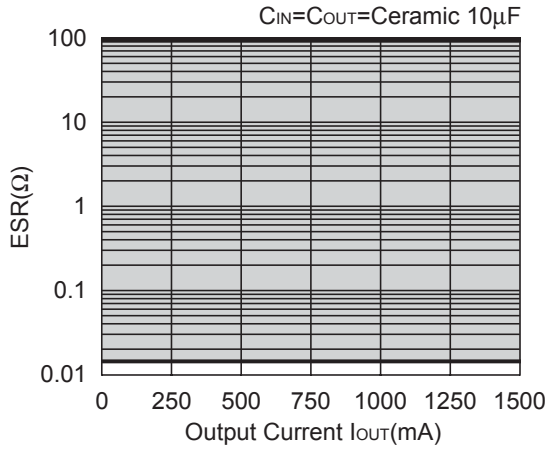
ESR vs. Output Current (Topt=25°C, V_{IN} = Set Output Voltage+1V, C_{IN} = Ceramic 10μF)



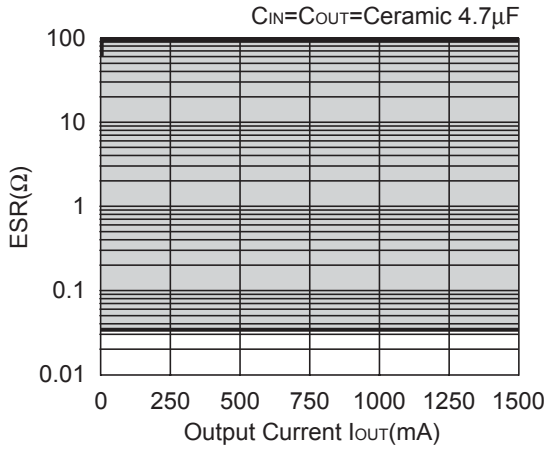
As an output capacitor for this IC, Ceramic capacitor is recommendable. However, other low ESR type capacitor can be used with this IC.

For your reference, noise level is tested with the circuit as shown above, and if the noise level is 40μV or less than 40μV, the ESR values are plotted as stable area. Upper limit is described in the next four graphs, or ESR vs. Output Current. (Hatched area is the stable area.)

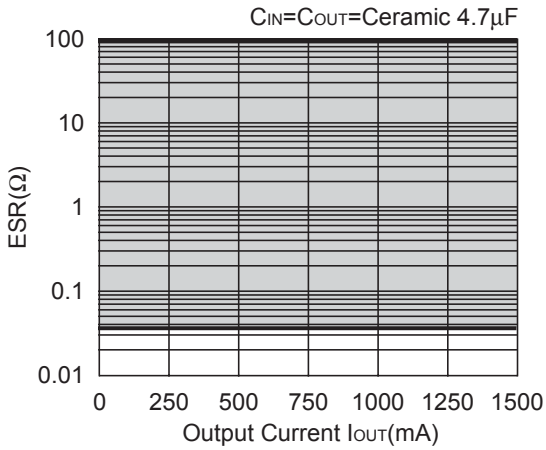
R1171S151x



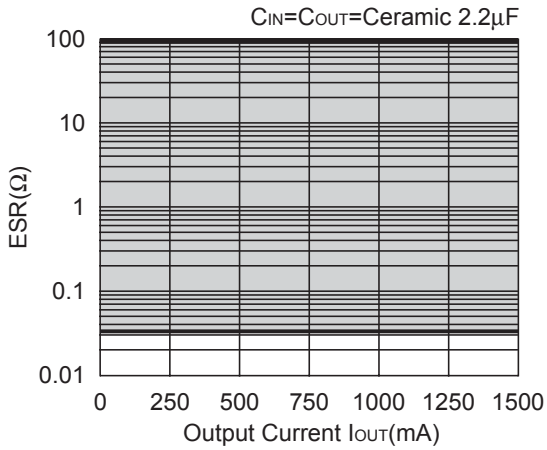
R1171S151x



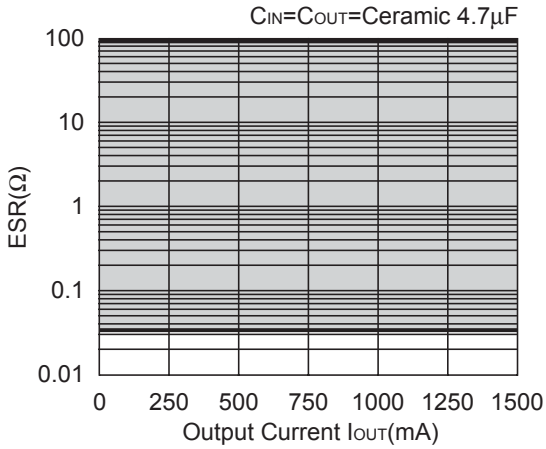
R1171S301x



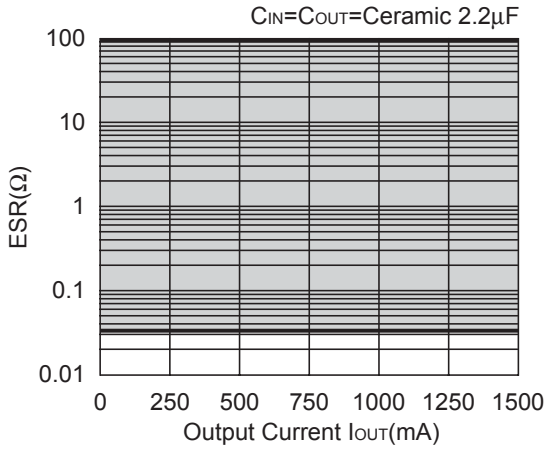
R1171S301x



R1171S501x



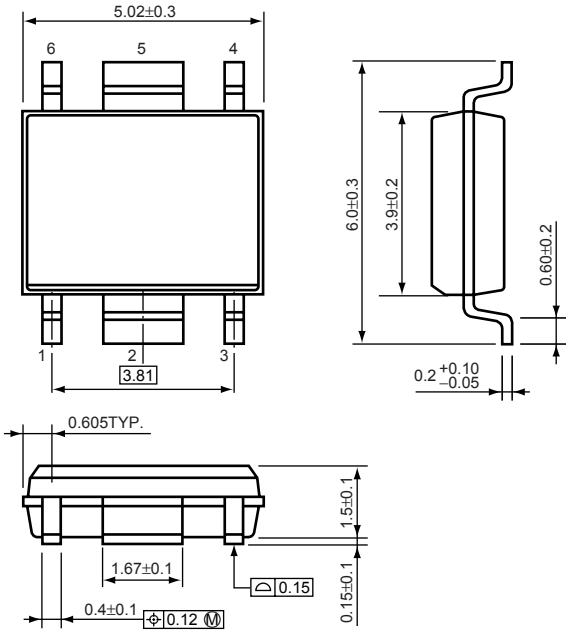
R1171S501x



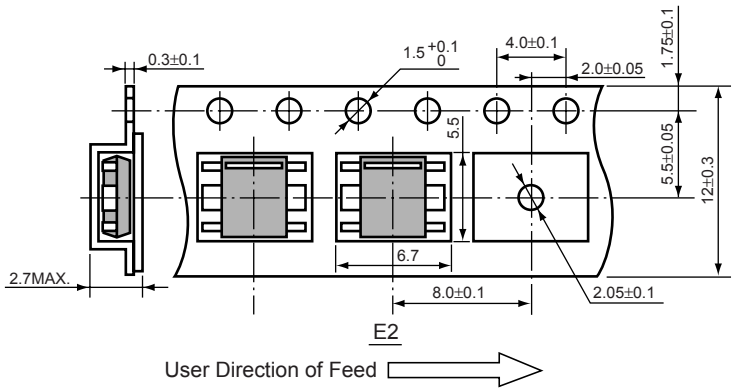
- **HSOP-6J**

Unit: mm

PACKAGE DIMENSIONS

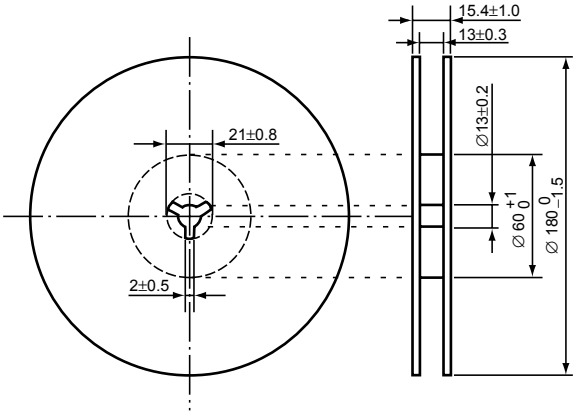


TAPING SPECIFICATION



TAPING REEL DIMENSIONS

(1reel=1000pcs)



POWER DISSIPATION (HSOP-6J)

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:

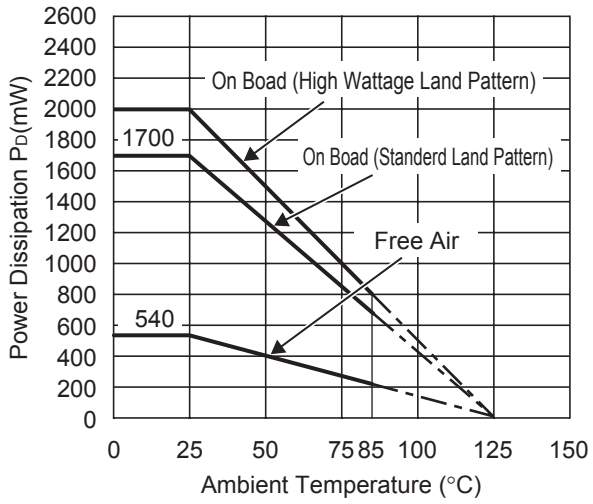
Measurement Conditions

	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 plactic (Double sided)	Glass cloth epoxy plactic (Double sided)
Board Dimensions	50mm × 50mm × 1.6mm	50mm × 50mm × 1.6mm
Copper Ratio	90%	50%
Through-hole	ϕ0.5mm × 44pcs	ϕ0.5mm × 44pcs

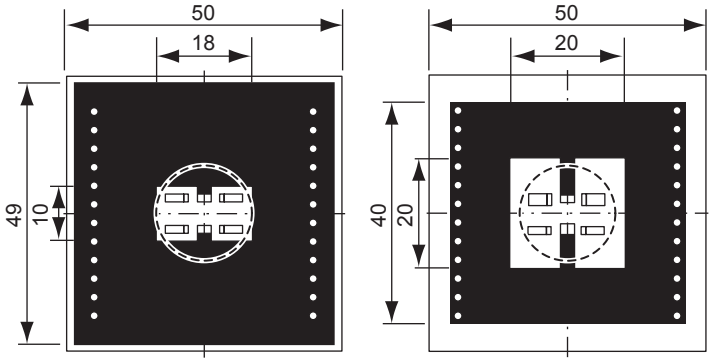
Measurement Result

(Topt=25°C,Tjmax=125°C)

	High Wattage Land Pattern	Standard Land Pattern	Free Air
Power Dissipation	2000mW	1700mW	540mW
Thermal Resistance	50°C/W	59°C/W	185°C/W



Power Dissipation

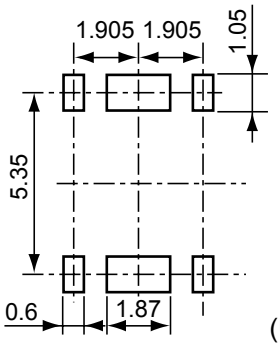


High Wattage **Standard**

Measurement Board Pattern

IC Mount Area Unit : mm

RECOMMENDED LAND PATTERN

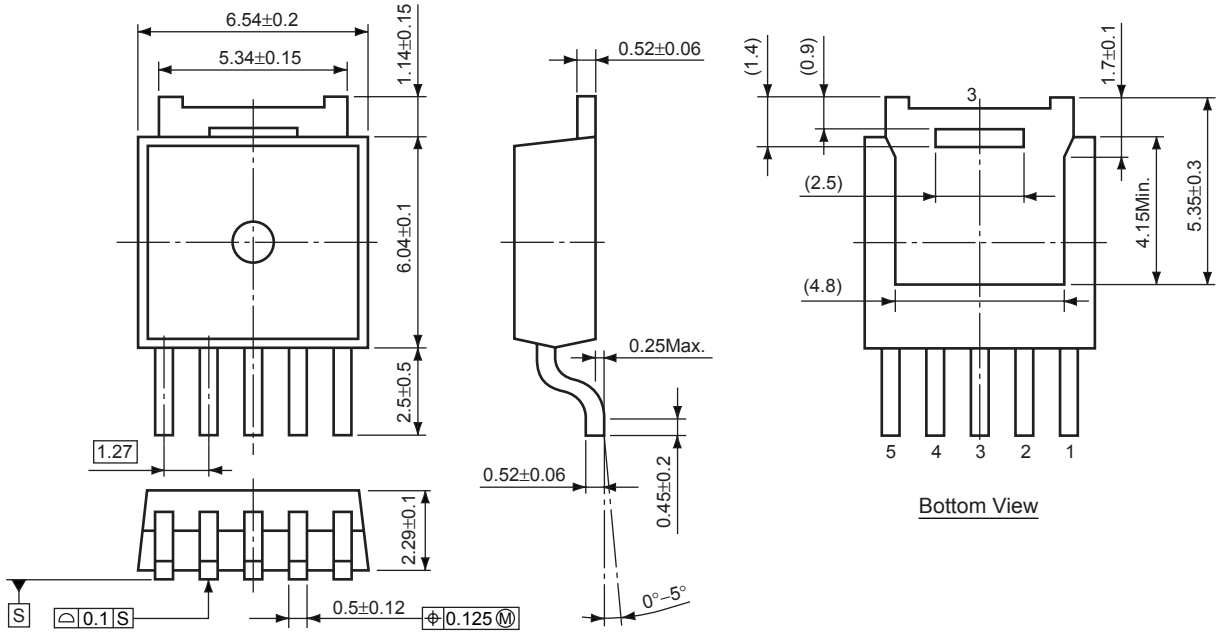


(Unit: mm)

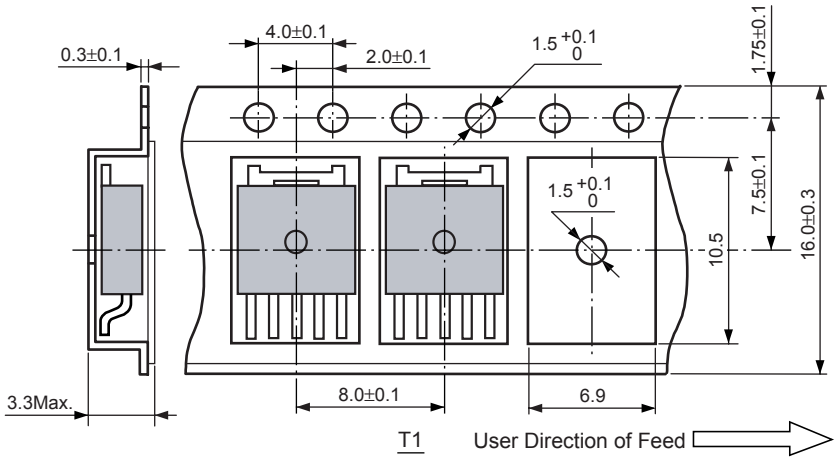
- **TO-252-5**

Unit: mm

PACKAGE DIMENSIONS

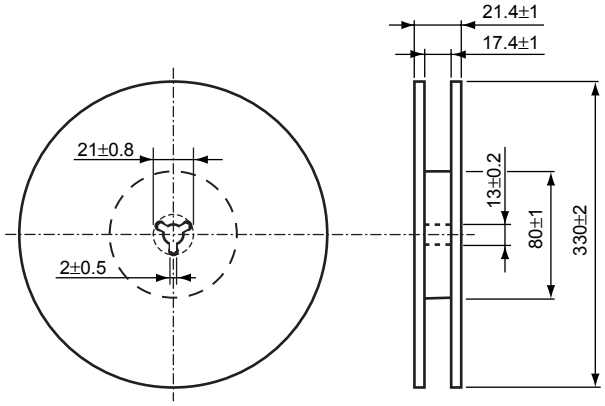


TAPING SPECIFICATION



TAPING REEL DIMENSIONS REUSE REEL (EIAJ-RRM-16Dc)

(1reel=3000pcs)



POWER DISSIPATION (TO-252-5)

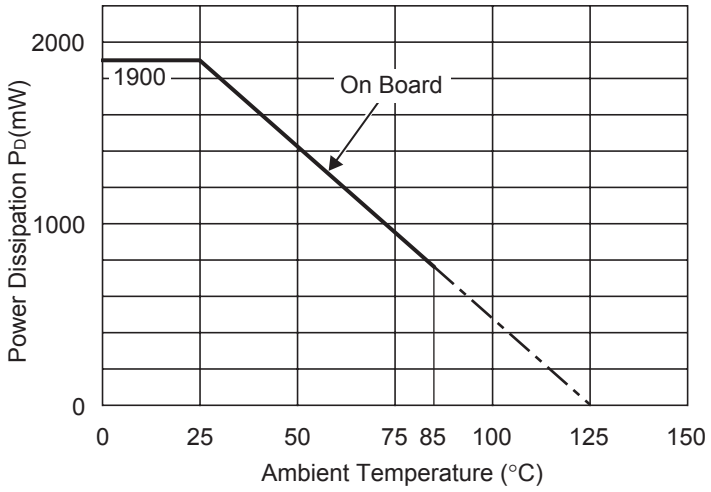
This specification is at mounted on board. Power Dissipation (P_D) depends on conditions of mounting on board. This specification is based on the measurement at the condition below:

Measurement Conditions

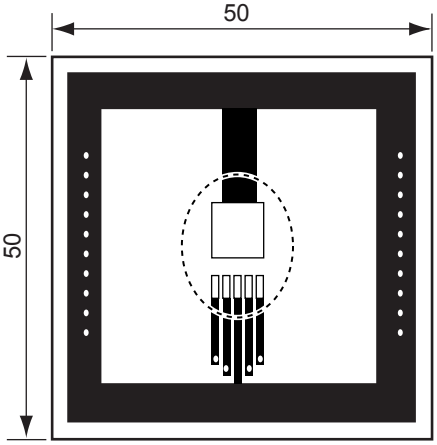
	Standard Land Pattern
Environment	Mounting on Board (Wind velocity=0m/s)
Board Material	Glass cloth epoxy plactic (Double sided)
Board Dimensions	50mm × 50mm × 1.6mm
Copper Ratio	Top side : Approx. 50% , Back side : Approx. 50%
Through-hole	ϕ0.5mm × 24pcs

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

	Standard Land Pattern
Power Dissipation	1900mW
Thermal Resistance	θja=(125−25°C)/1.9W=53°C/W



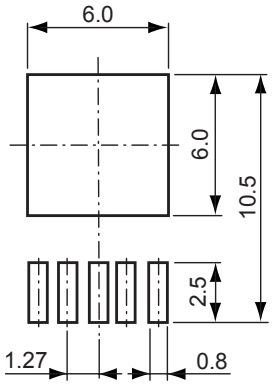
Power Dissipation



Measurement Board Pattern

IC Mount Area Unit : mm

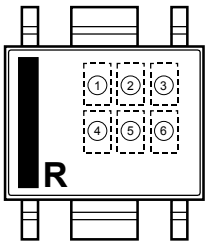
RECOMMENDED LAND PATTERN



(Unit: mm)

R1171S SERIES MARK SPECIFICATION

- **HSOP-6J**



① : D (fixed)
②, ③ : Setting Voltage } (refer to Part Number vs. Product Code)
④ : Type (A,B)
⑤, ⑥ : Lot Number

- **Part Number vs. Product Code**

Part Number	Product Code			
	①	②	③	④
R1171S151A	D	1	5	A
R1171S161A	D	1	6	A
R1171S171A	D	1	7	A
R1171S181A	D	1	8	A
R1171S191A	D	1	9	A
R1171S201A	D	2	0	A
R1171S211A	D	2	1	A
R1171S221A	D	2	2	A
R1171S231A	D	2	3	A
R1171S241A	D	2	4	A
R1171S251A	D	2	5	A
R1171S261A	D	2	6	A
R1171S271A	D	2	7	A
R1171S281A	D	2	8	A
R1171S291A	D	2	9	A
R1171S301A	D	3	0	A
R1171S311A	D	3	1	A
R1171S321A	D	3	2	A
R1171S331A	D	3	3	A

Part Number	Product Code			
	①	②	③	④
R1171S341A	D	3	4	A
R1171S351A	D	3	5	A
R1171S361A	D	3	6	A
R1171S371A	D	3	7	A
R1171S381A	D	3	8	A
R1171S391A	D	3	9	A
R1171S401A	D	4	0	A
R1171S411A	D	4	1	A
R1171S421A	D	4	2	A
R1171S431A	D	4	3	A
R1171S441A	D	4	4	A
R1171S451A	D	4	5	A
R1171S461A	D	4	6	A
R1171S471A	D	4	7	A
R1171S481A	D	4	8	A
R1171S491A	D	4	9	A
R1171S501A	D	5	0	A
R1171S181A5	D	0	1	A
R1171S281A5	D	0	2	A

Part Number	Product Code			
	①	②	③	④
R1171S151B	D	1	5	B
R1171S161B	D	1	6	B
R1171S171B	D	1	7	B
R1171S181B	D	1	8	B
R1171S191B	D	1	9	B
R1171S201B	D	2	0	B
R1171S211B	D	2	1	B
R1171S221B	D	2	2	B
R1171S231B	D	2	3	B
R1171S241B	D	2	4	B
R1171S251B	D	2	5	B
R1171S261B	D	2	6	B
R1171S271B	D	2	7	B
R1171S281B	D	2	8	B
R1171S291B	D	2	9	B
R1171S301B	D	3	0	B
R1171S311B	D	3	1	B
R1171S321B	D	3	2	B
R1171S331B	D	3	3	B

Part Number	Product Code			
	①	②	③	④
R1171S341B	D	3	4	B
R1171S351B	D	3	5	B
R1171S361B	D	3	6	B
R1171S371B	D	3	7	B
R1171S381B	D	3	8	B
R1171S391B	D	3	9	B
R1171S401B	D	4	0	B
R1171S411B	D	4	1	B
R1171S421B	D	4	2	B
R1171S431B	D	4	3	B
R1171S441B	D	4	4	B
R1171S451B	D	4	5	B
R1171S461B	D	4	6	B
R1171S471B	D	4	7	B
R1171S481B	D	4	8	B
R1171S491B	D	4	9	B
R1171S501B	D	5	0	B
R1171S181B5	D	0	1	B
R1171S281B5	D	0	2	B