Super low On resistance/ Low voltage LDO

R1173x SERIES

OUTLINE

The R1173x Series are CMOS-based positive voltage regulator ICs. The R1173x Series have features of super low dropout, 1A output current capability, and -3mV typical load regulation at 1A. Even the output voltage is set at 1.5V, on resistance of internal FET is typically 0.32Ω. Therefore, applications that require a large current at small dropout are suitable for the R1173x series. Low input voltage is acceptable and low output voltage can be set. The minimum input voltage is 1.4V, and the lowest set output voltage is 0.8V. Each of these ICs consists of a voltage reference unit, an error amplifier, resistor net for setting output voltage, a current limit circuit at over-current, a chip enable circuit, a thermal-shutdown circuit, and so on. A stand-by mode with ultra low consumption current can be realized with the chip enable pin. The output voltage types of R1173 are fixed one in the IC and adjustable one (R1173x001x).

Since the packages for these ICs are the SOT-89-5 package, HSON-6, or HSOP-6J, high density mounting of the ICs on boards is possible.

FEATURES

- Ultra-Low Supply Current..Typ. 60μA
- Good Load Regulation ....Typ. –2mV, Max. ±15mV at I_{OUT}=300mA
  ....Typ. –3mV at I_{OUT}=1000mA
- Low inrush current at turning-on ....Typ. 500mA
- Minimum Input Voltage...Min. 1.4V
- Low Standby Current...Typ. 0.1μA
- Output Current...Max. 1A
- Output Voltage ....Stepwise setting with a step of 0.1V in the range of 0.8V to 5.0V(Fixed output voltage type, except HSOP6J: only 0.8V to 3.5V type is available.) or adjustable. (R1173X001X)
- High Power Supply Ripple Rejection .... Typ. 70dB (V_{OUT}=3.0V)
- High Output Voltage Accuracy.....................................±2.0%
- Low Dropout Voltage ....Typ. 0.18V (V_{OUT}=3.0V, I_{OUT}=1A)
  ....Typ. 0.32V (V_{OUT}=1.5V/ I_{OUT}=1A)
- Line Regulation ....Typ. 0.05%/V
- Packages...SOT-89-5, HSON-6, High power-HSOP-6J
- Built-in Current Limit Circuit
- Built-in Thermal Shutdown Circuit
- Low Temperature-drift Coefficient of Output Voltage ... Typ. ±100ppm/°C
- Output capacitors ....C_{IN}=C_{OUT}=Tantalum 4.7μF(V_{OUT}<1.0V)
  ....C_{IN}=C_{OUT}=Ceramic 4.7μF(V_{OUT}≥1.0V)

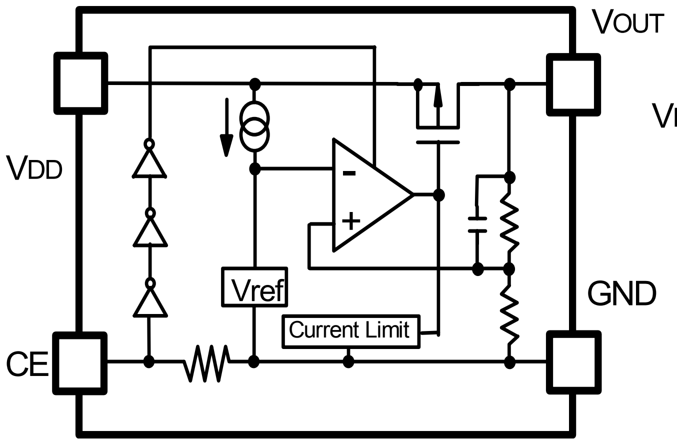
APPLICATIONS

- Local Power source for Notebook PC.
- Local Power source for portable communication equipments, cameras, and videos.

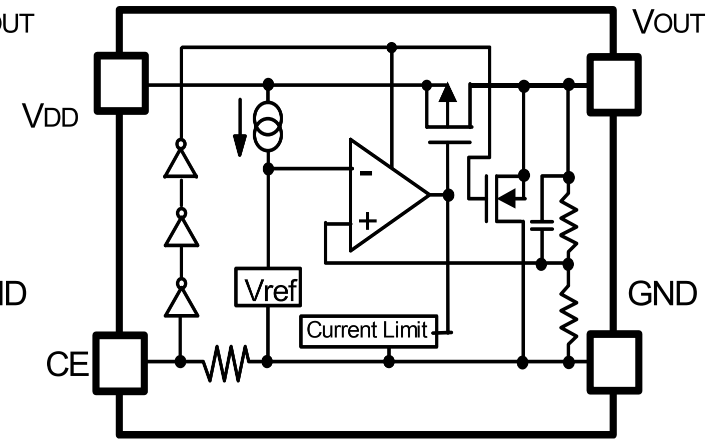
- Local Power source for home appliances.

BLOCK DIAGRAMS

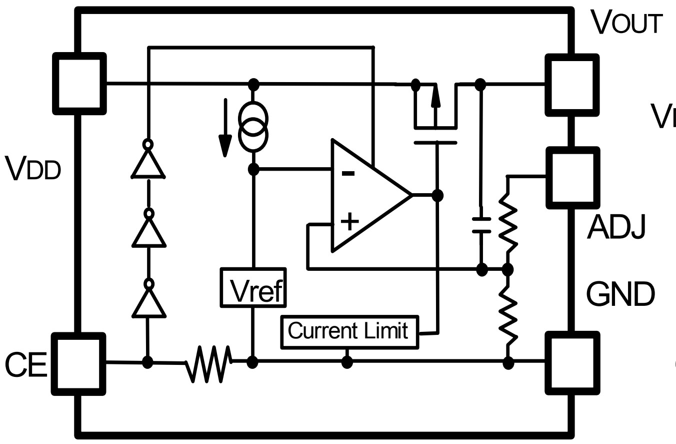
R1173xxx1B



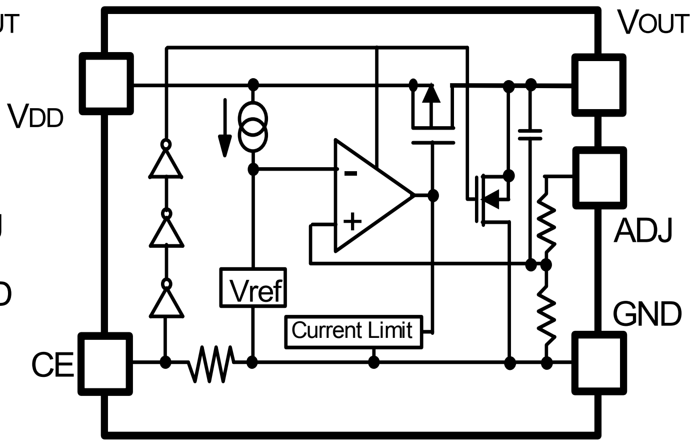
R1173xxx1D



R1173X001B



R1173x001D



SELECTION GUIDE

The output voltage, with/without auto-discharge function, the package type, etc. can be selected at the user's request.

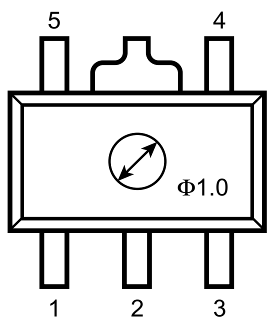
The selection can be made with the part number as follows;

R1173x xx1x-xx ←Part Number
↑ ↑ ↑ ↑
a b c d

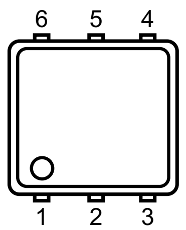
Code	Contents
a	Package Type; H: SOT-89-5, D: HSON-6, S: HSOP-6J
b	Designation of Output Voltage (V_{OUT}) External Setting Type: 00 Fixed Type: 08 to 50 Stepwise setting with 0.1V increment in the range from 0.8V to 5.0V, exceptions; 2.85V output: R1173x281x5-xx, 1.85V output: R1173x181x5-xx
c	Designation of option; B: Built-in Chip Enable Circuit, Active at "H", without auto-discharge D: Built-in Chip Enable Circuit, Active at "H", with auto-discharge
d	Designation of Taping Type; T1 or T2 (SOT-89-5), TR (HSON-6), E2 (HSOP-6J) (Refer to Taping Specifications)

PIN CONFIGURATION

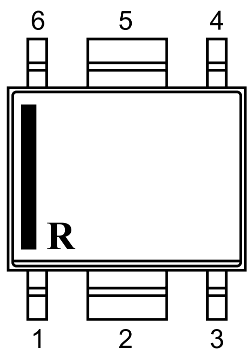
● SOT-89-5



● HSON-6



● HSOP-6J



PIN DESCRIPTION

● SOT-89-5

Pin No	Symbol
1	ADJ or NC
2	GND
3	CE
4	V_{DD}
5	V_{OUT}

● **HSON-6**

Pin No	Symbol
1	V_{OUT}
2	V_{OUT}
3	ADJ or NC
4	GND
5	CE
6	V_{DD}

*The back side tab and tab lead is GND level.
Connect Pin1 and Pin2 as short as possible.

● **HSOP-6J**

Pin No	Symbol
1	V_{OUT}
2	GND
3	ADJ or NC
4	CE
5	GND
6	V_{DD}

ABSOLUTE MAXIMUM RATINGS

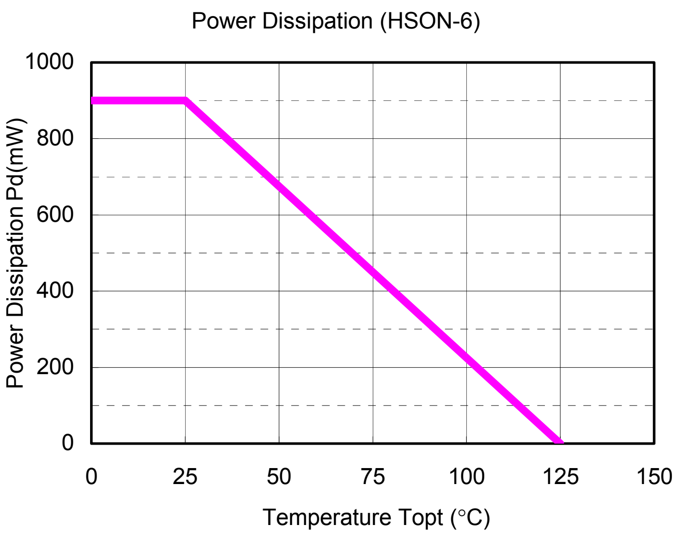
Symbol	Item	Rating	Unit
V_{IN}	Input Voltage	6.5	V
V_{CE}	Input Voltage (CE Input Pin)	−0.3 ~ 6.5	V
V_{OUT}	Output Voltage	−0.3 ~ V_{IN}+0.3	V
I_{OUT}	Output Current	1.4	A
P_D	Power Dissipation	Internally limited	
Topt	Operating Temperature	−40 ~ 85	°C
Tstg	Storage Temperature	−55 ~ 125	°C

Power Dissipation (HSON-6)

Power dissipation depends on mounting conditions, the data below is an example.

- Measurement Conditions

- Mounting on board: Wind velocity=0m/s
- Board Material: Glass Epoxy Resin (Double Layers)
- Board Dimensions: 40mm*40mm*1.6mm
- Wiring Ratio: 50%
- * Measurement Result:
- Power Dissipation: 900mW (Topt=25°C, Tjmax=125°C)
- Thermal Resistance 111°C/W



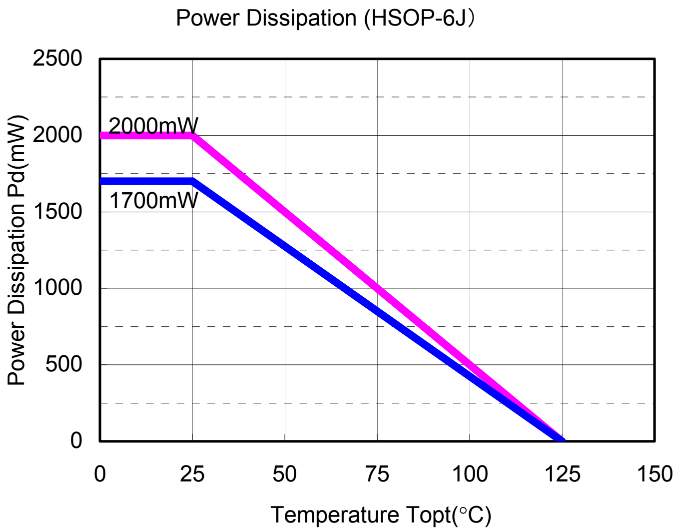
Power Dissipation (HSOP-6J)

• Measurement Conditions

	High PD Land Pattern	Standard Land Pattern
Environment	Mounting on Board (Wind velocity=0m/s)	Mounting on Board (Wind velocity=0m/s)
Board Material	Glass Epoxy Resin (Double Layer type)	Glass Epoxy Resin (Double Layer type)
Board Dimensions	50mm*50mm*1.6mm	50mm*50mm*1.6mm
Wiring Ratio	90%	50%
Thermal via hole	Diameter: 0.5mm*24pieces	Diameter: 0.5mm*24pieces

Measurement Results

	High PD Land Pattern	Standard Land Pattern
Power Dissipation	2000mW (Topt=25°C, Tjmax=125° C)	1700mW (Topt=25°C, Tjmax=125° C)
Thermal Resistance	50°C/W	59°C/W



ELECTRICAL CHARACTERISTICS

- **R1173xxxxB/D (Fixed Output Voltage Type)**

Topt=25°C

Symbol	Item	Conditions	Min.	Typ.	Max.	Unit
V_{IN}	Input Voltage		1.4		6.0	V
I_{SS1}	Supply Current1	$V_{IN}-V_{OUT}$=1.0V, V_{CE}= V_{IN}		60	100	µA
Istb	Standby Current	V_{IN}=6.0V, V_{CE}=0V		0.1	1.0	µA
V_{OUT}	Output voltage	$V_{IN}-V_{OUT}$=1.0V, I_{OUT}=100mA; V_{OUT}>1.5V	×0.98		×1.02	V
V_{OUT}	Output voltage	$V_{IN}-V_{OUT}$=1.0V, I_{OUT}=100mA; V_{OUT}≤1.5V	-30		+30	mV
I_{OUT1}	Output Current	$V_{IN}-V_{OUT}$=1.0V	1000			mA
$\Delta V_{OUT}/\Delta I_{OUT}$	Load regulation	$V_{IN}-V_{OUT}$=0.3V 1mA≤I_{OUT} ≦ 300mA If V_{OUT}≤1.1V, then V_{IN}=1.4V	-15	-2	15	mV
$\Delta V_{OUT}/\Delta I_{OUT}$	Load regulation	$V_{IN}-V_{OUT}$=0.3V 1mA ≦ I_{OUT} ≦ 1000mA If V_{OUT}≤1.1V, then V_{IN}=1.7V		-3		mV
V_{DIF}	Dropout Voltage	I_{OUT}=300mA	Refer to Dropout Voltage Table			
$\Delta V_{OUT}/\Delta V_{IN}$	Line regulation	I_{OUT}=100mA V_{OUT}+0.5V ≦ V_{IN} ≦ 6.0V If V_{OUT}≤0.9V 1.4V ≦ V_{IN} ≦ 6.0V		0.05	0.20	%/V
RR	Ripple Rejection	f=1kHz(V_{OUT}≤4.0V) V_{OUT}>4.0V Ripple 0.5Vp–p, I_{OUT}=100mA $V_{IN}-V_{OUT}$=1.0V If V_{OUT} ≦ 1.2V: $V_{IN}-V_{OUT}$=1.5V		70 60		dB
$\Delta V_{OUT}/\Delta T$	Output Voltage Temperature Coefficient	I_{OUT}=100mA –40°C ≦ Topt ≦ 85°C		±100		ppm/°C
I_{LIM}	Short Current Limit	V_{OUT}=0V		250		mA
R_{PD}	Pull-down resistance for CE pin		1.9	5.0	15.0	MΩ
V_{CEH}	CE Input Voltage "H"		1.0		6.0	V
V_{CEL}	CE Input Voltage "L"		0.0		0.4	V
T_{TSD}	Thermal Shutdown Detector Threshold Temperature	Junction Temperature		150		°C
T_{TSR}	Thermal Shutdown Released Temperature	Junction Temperature		120		°C
e_n	Output Noise	BW=10Hz to 100kHz		30		µVrms

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

Output Voltage V_{OUT} (V)	Dropout Voltage (V)		
	I_{OUT}=300mA		I_{OUT}=1000mA
	Typ.	Max.	Typ.
0.8≤V_{OUT}<0.9	0.33	0.57	0.72
0.9≤V_{OUT}<1.0	0.22	0.47	0.64
1.0≤V_{OUT}<1.5	0.18	0.32	0.56
1.5 ≦ V_{OUT}<2.6	0.10	0.15	0.32
2.6 ≦ V_{OUT}	0.05	0.10	0.18

- **R1173x001B/D (Adjustable Output Voltage Type)**

Topt=25°C

Symbol	Item	Conditions		Min.	Typ.	Max.	Unit
V_{IN}	Input Voltage			1.4		6.0	V
I_{SS}	Supply Current	V_{OUT}=V_{ADJ}, V_{IN}=2.0V, V_{CE}=V_{IN}			60	100	μA
Istb	Standby Current	V_{IN}=6.0V,V_{CE}= V_{IN}			0.1	1.0	μA
V_{OUT}	Reference Voltage for Adjustable Voltage Regulator	V_{OUT}=V_{ADJ}, V_{IN}=2.0V I_{OUT}=100mA		0.970	1.000	1.030	V
RVOUT	Output Voltage Range			1.0		V_{IN}	V
I_{OUT}	Output Current	V_{OUT}=V_{ADJ}, V_{IN}=2.0V		1000			mA
$\Delta V_{OUT}/\Delta I_{OUT}$	Load regulation	V_{IN}–V_{OUT}=0.3V 1mA ≦ I_{OUT} ≦ 300mA If V_{OUT}≤1.1V, then V_{IN}=1.4V		-15	-2	15	mV
V_{DIF}	Dropout Voltage	V_{OUT}=V_{ADJ}	I_{OUT}=300mA		0.18	0.37	V
			I_{OUT}=1000mA		0.51		
$\Delta V_{OUT}/\Delta V_{IN}$	Line regulation	V_{OUT}=V_{ADJ}, I_{OUT}=100mA 1.5V ≦ V_{IN} ≦ 6.0V			0.05	0.20	%/V
RR	Ripple Rejection	f=1kHz, Ripple 0.5Vp–p V_{OUT}=V_{ADJ}, V_{IN}=2.5V, I_{OUT}=100mA			70		dB
$\Delta V_{OUT}/\Delta T$	Output Voltage Temperature Coefficient	–40°C ≦ Topt ≦ 85°C, I_{OUT}=100mA			±100		ppm/°C
I_{LIM}	Short Current Limit	V_{OUT}=V_{ADJ}=0V			250		mA
R_{PD}	Pull-down resistance for CE pin			1.9	5.0	15.0	MΩ
V_{CEH}	CE Input Voltage "H"			1.0		6.0	V
V_{CEL}	CE Input Voltage "L"			0.0		0.4	V
T_{TSD}	Thermal Shutdown Detector Threshold Temperature	Junction Temperature			150		°C
T_{TSR}	Thermal Shutdown Released Temperature	Junction Temperature			120		°C
e_n	Output Noise	BW=10Hz to 100kHz			30		μVrms

Technical Notes on External Components and Typical Application

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 as much as a capacitor as C_L. Recommendation value is as follows:

Output Voltage	CL recommendation value	Components Recommendation
$V_{OUT}<1.0V$	Tantalum 4.7µF or more	
$1.0 \leq V_{OUT} \leq 3.3V$	Ceramic 4.7µF or more	Kyocera 4.7uF(1608) Part Number: CM105X5R475M06AB Murata 4.7uF(1608) Part Number: GRM188R60J475KE19B Murata 10uF(1608) Part Number: GRM188B30G106ME46B
$3.3V \leq V_{OUT}$	Ceramic 4.7µF or more	Kyocera 4.7uF(thin 2012) Part Number: CT21X5R475M06AB Murata 4.7uF(1608) Part Number: GRM188R60J475KE19B Murata 10uF(1608) Part Number: GRM188B30G106ME46B

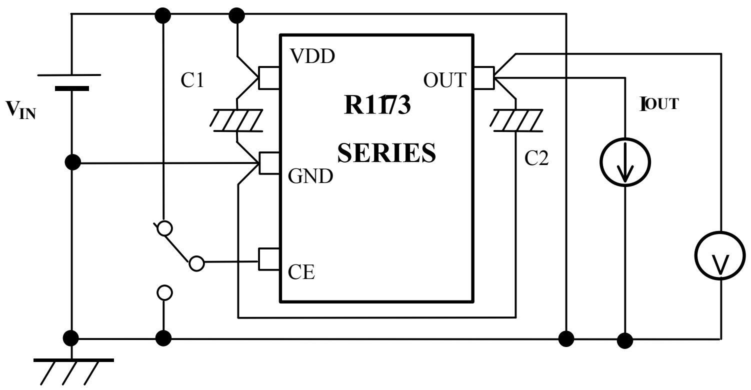
If you use a tantalum type capacitor and ESR value of the capacitor is large, output might be unstable. Evaluate your circuit with considering frequency characteristics.

Depending on the capacitor size, manufacturer, and part number, the bias characteristics and temperature characteristics are different. Evaluate the circuit with actual using capacitors.

Mounting on PCB

Make V_{DD} and GND lines sufficient. If their impedance is high, a current flows, the noise picked up or unstable operation may result. Further use a 4.7µF or more value capacitor between V_{DD} pin and GND pin as close as possible.

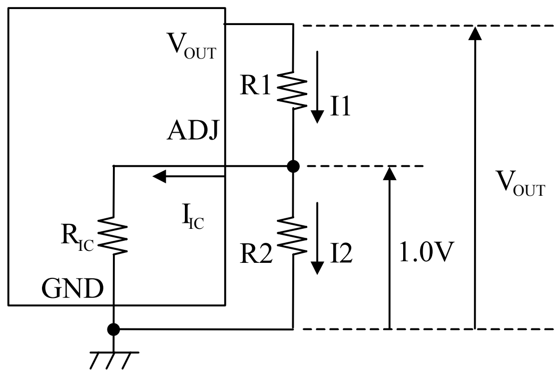
Set an Output capacitor between V_{OUT} pin and GND pin for phase compensation as close as possible.



(Refer to the example of typical application)

Example of the typical application of R1173xxxx (Fixed Output Type)

Technical Notes on Output Voltage Setting of Adjustable Output type (R1173x001x)



The Output Voltage may be adjustable for any output voltage between its 1.0V reference and its V_{DD} setting level. An external pair of resistors is required, as shown above.
The complete equation for the output voltage is described step by step as follows;

$I1=I_{IC}+I2$ ....(1)
$I2=1.0/R2$ ....(2)

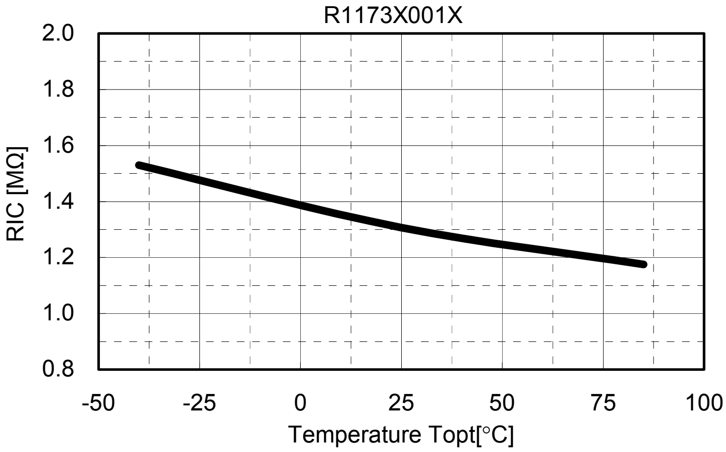
Thus,
$I1=I_{IC}+1.0/R2$ ....(3)

Therefore,
$V_{OUT}=1.0+R1*I1$ ....(4)

Put Equation (3) into Equation (4),then
$V_{OUT}=1.0+R1(I_{IC}+1.0/R2)$
$=1.0(1+R1/R2)+R1*I_{IC}$ ....(5)

In 2nd term, or $R1*I_{IC}$ will produce an error in V_{OUT}.
In Equation (5),
$I_{IC}=1.0/R_{IC}$ ....(6)
$R1*I_{IC}=R1*1.0/R_{IC}$
$=1.0*R1/R_{IC}$ ....(7)
For better accuracy, choosing R1 (<<R_{IC}) reduces this error.

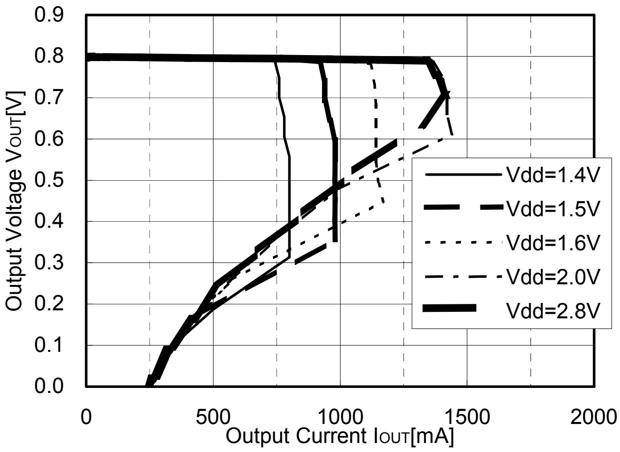
R_{IC} Temperature Characteristics Example



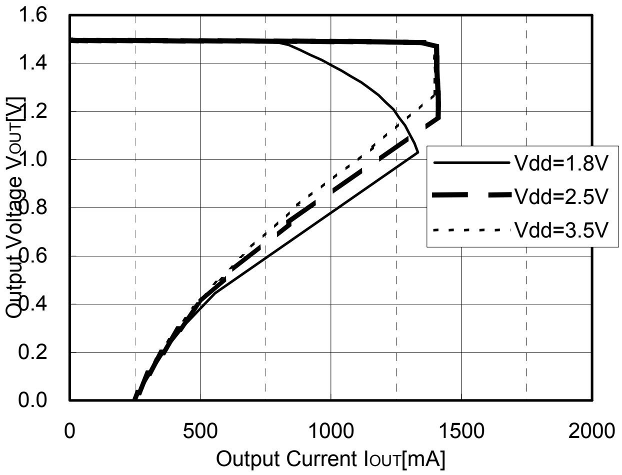
TYPICAL CHARACTERISTICS

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

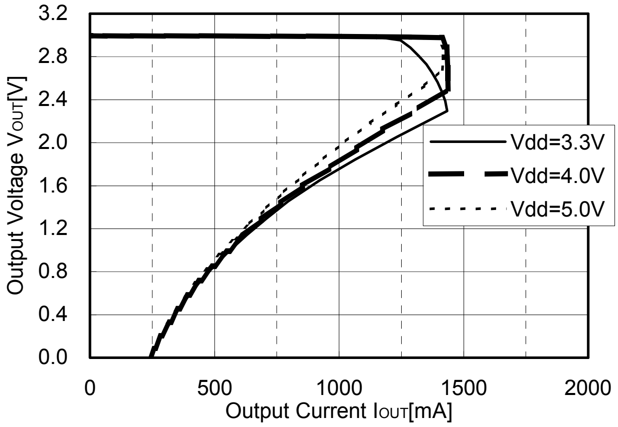
R1173X081X



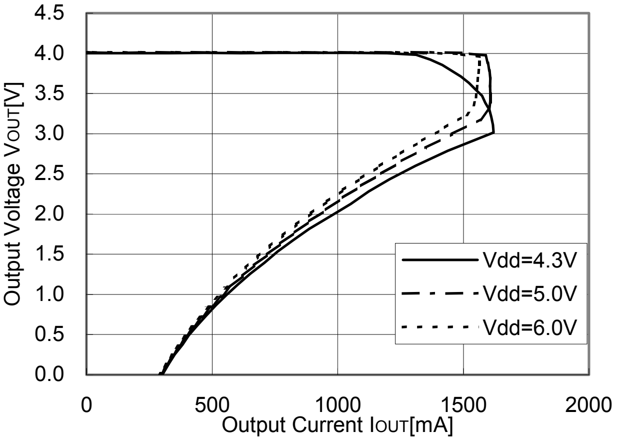
R1173X151X



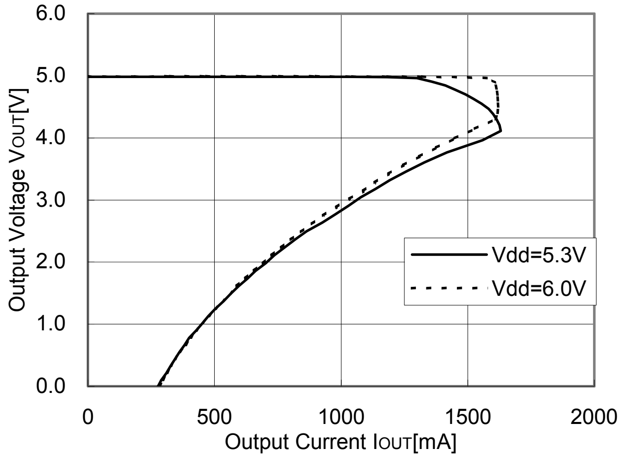
R1173X301X



R1173X401X

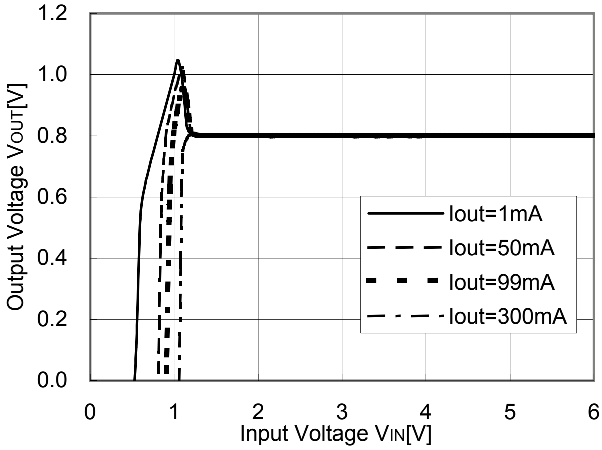


R1173X501X

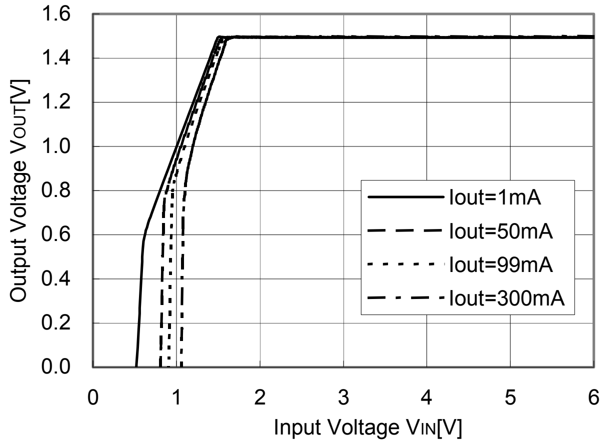


2) Output Voltage vs. Input Voltage (Topt=25°C)

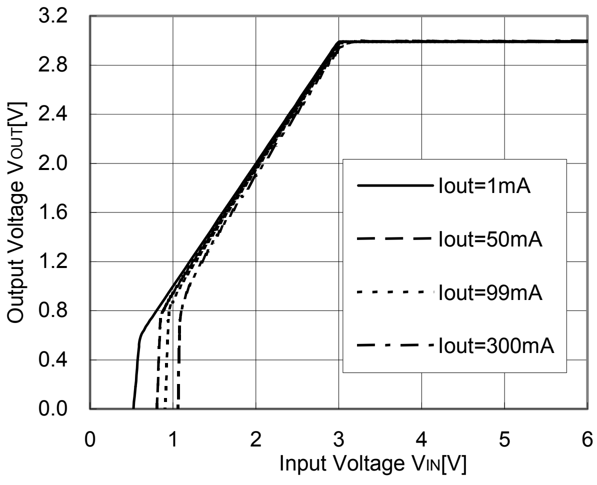
R1173X081X



R1173X151X



R1173X301X



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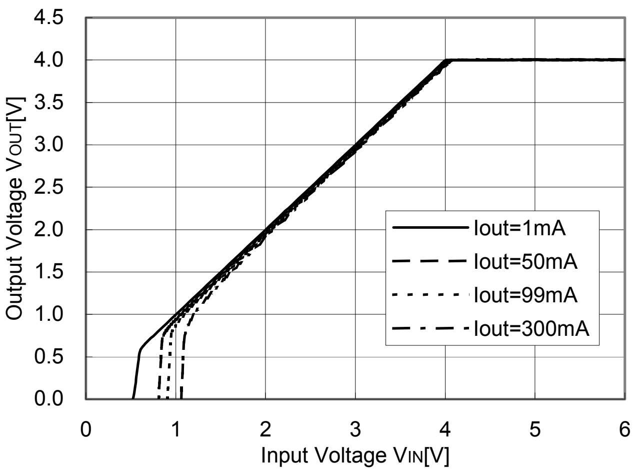
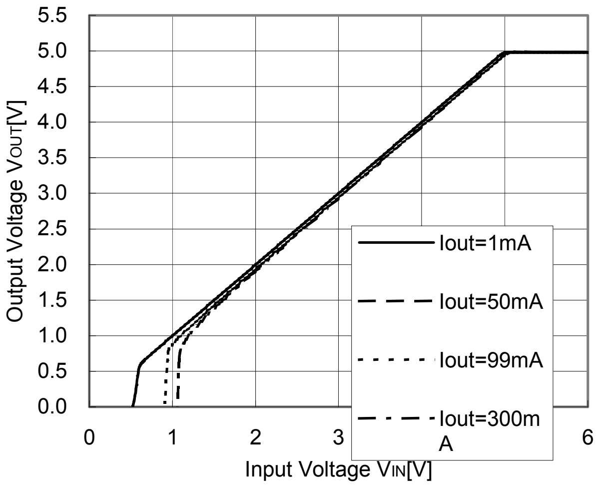
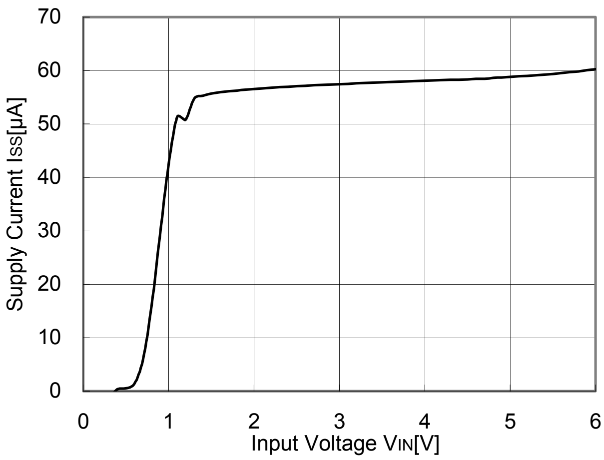


R1173X501X

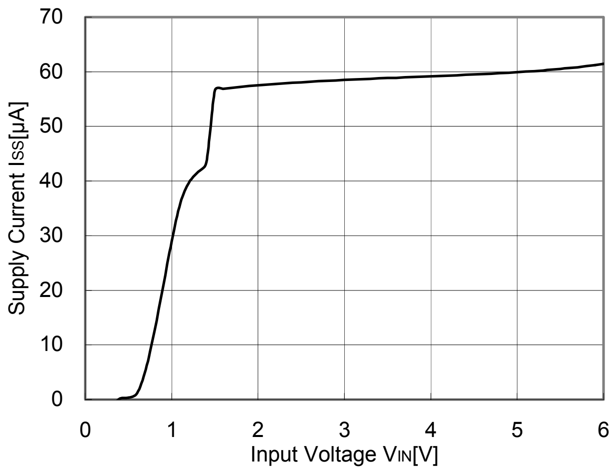


3) Dropout Voltage vs. Output Current (Topt=25°C)

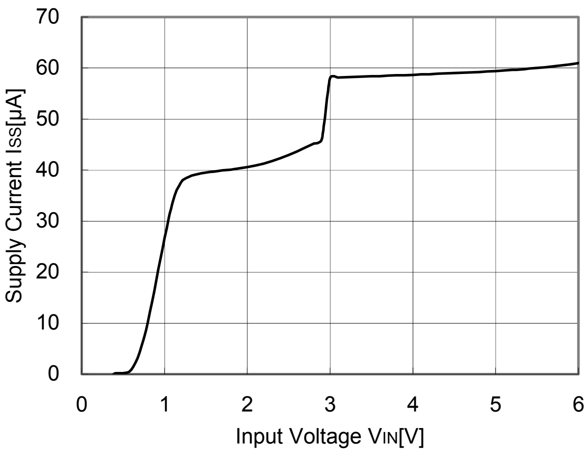
R1173X081X



R1173X151X



R1173X301X



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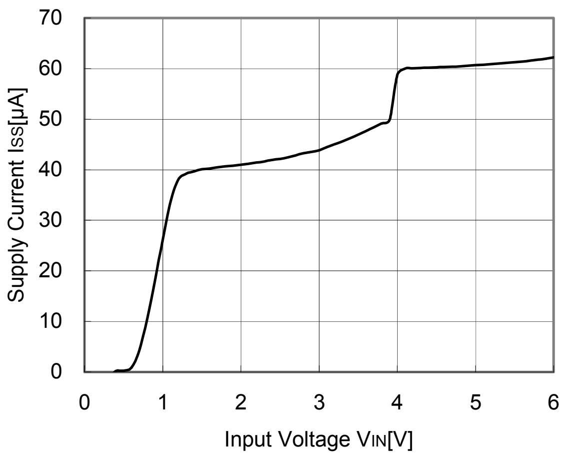
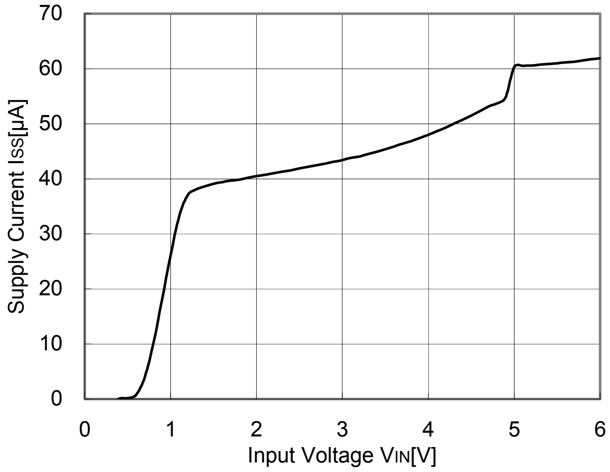
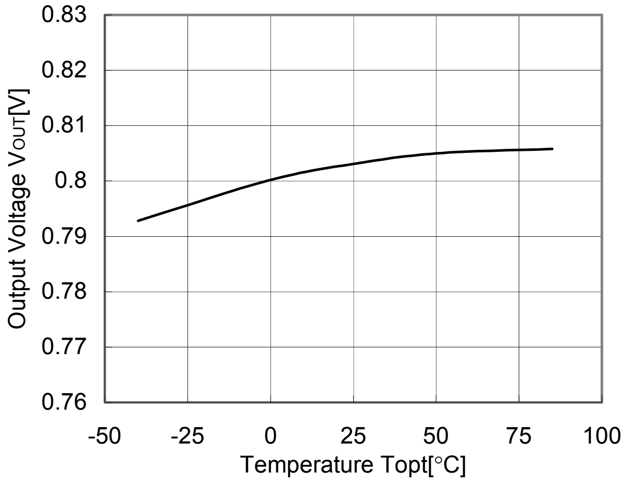


R1173X501X

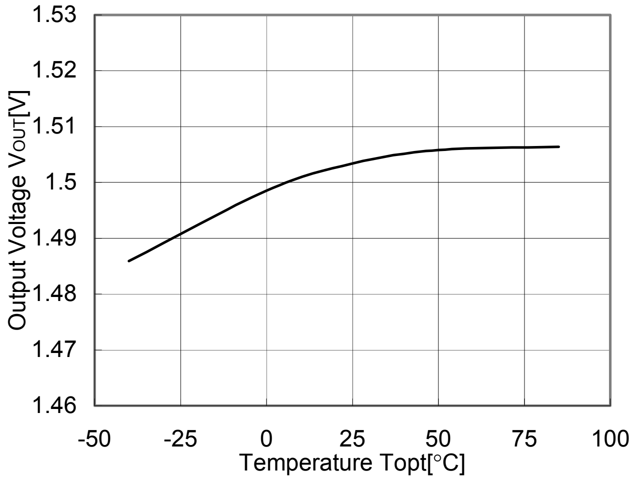


4) Output Voltage vs. Temperature (I_{OUT}=100mA)

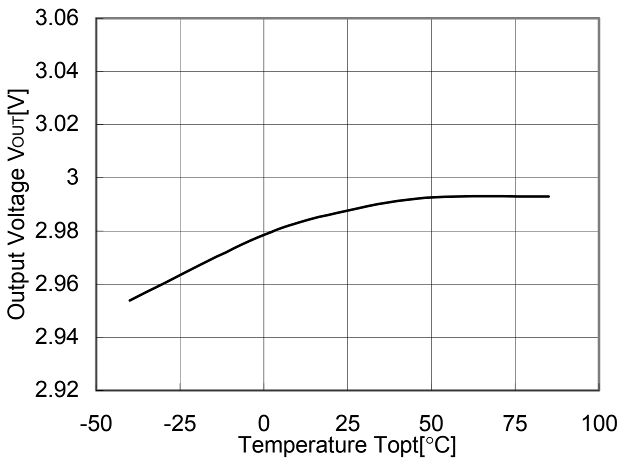
R1173X081X (V_{IN}=1.8V)



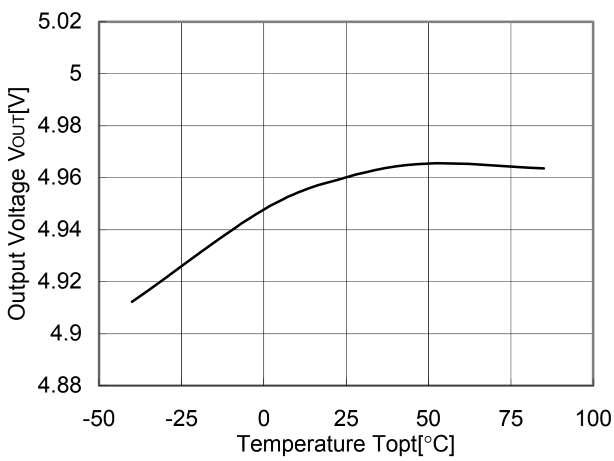
R1173X151X (V_{IN}=2.5V)



R1173X301X (V_{IN}=4.0V)

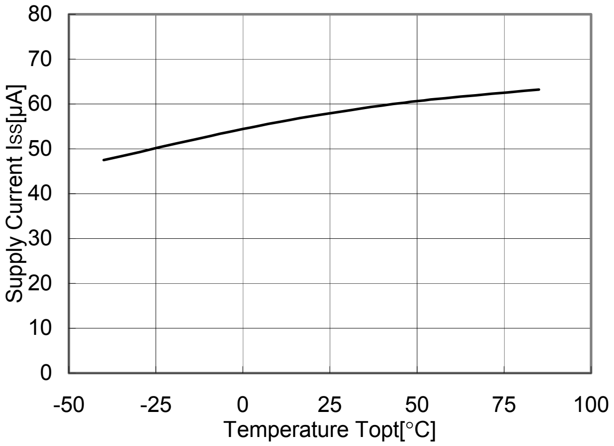


R1173X501X (V_{IN}=6.0V)

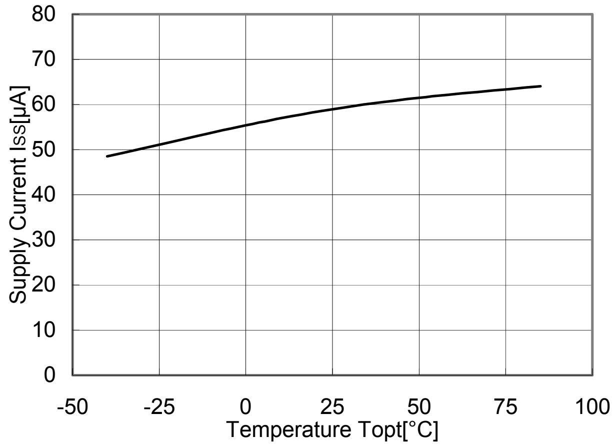


5) Supply Current vs. Temperature

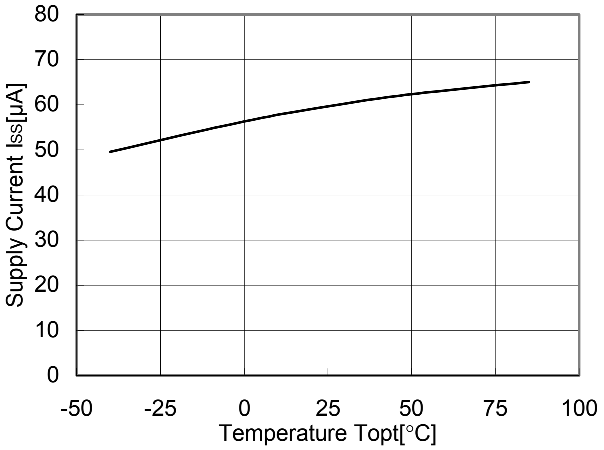
R1173X081X (VIN=1.8V)



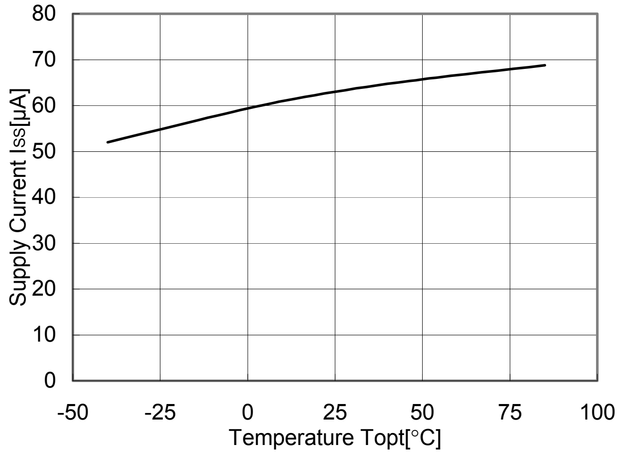
R1173X151X (VIN=2.5V)



R1173X301X (VIN=4.0V)

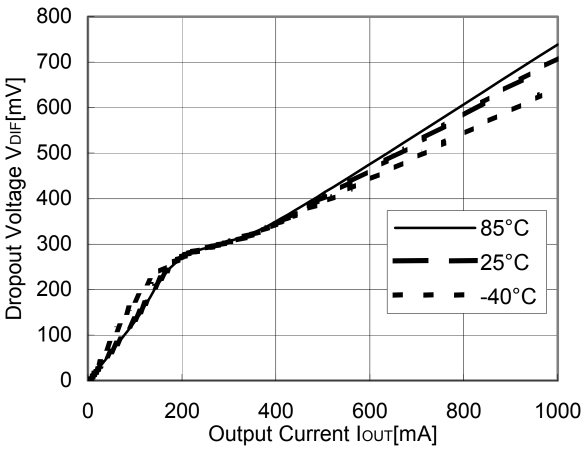


R1173X501X (VIN=6.0V)

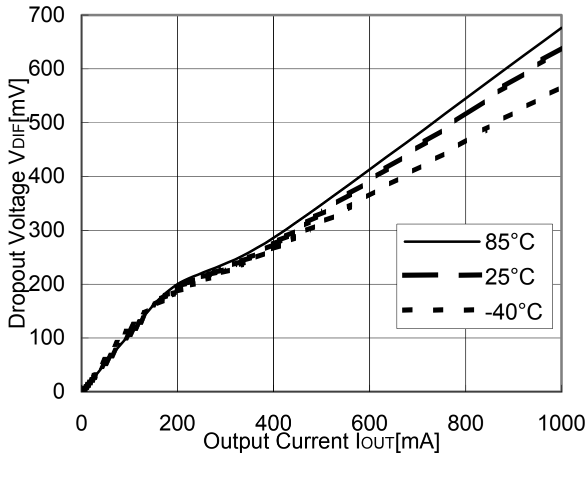


6) Dropout Voltage vs. Output Current

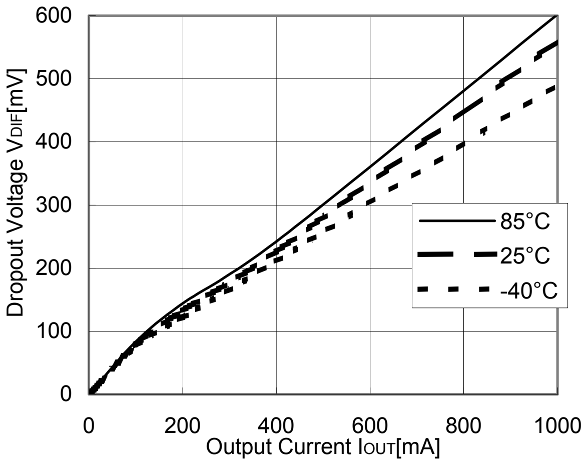
R1173X081X



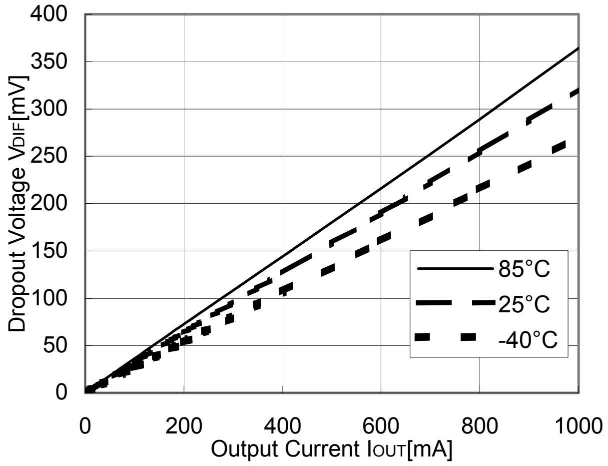
R1173X091X



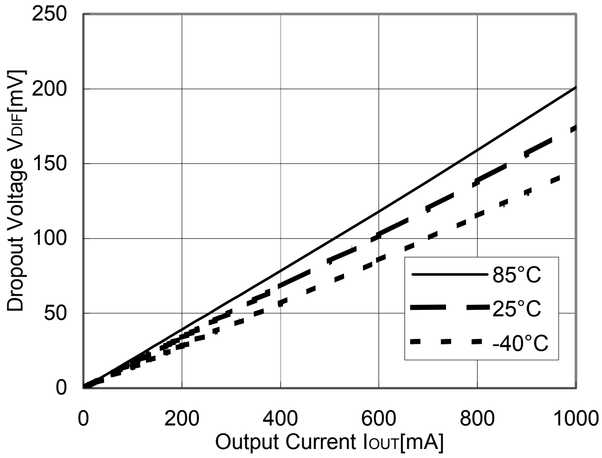
R1173X101X



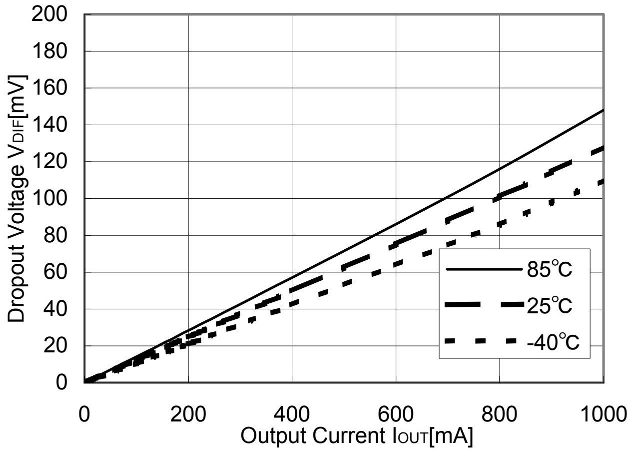
R1173X151X



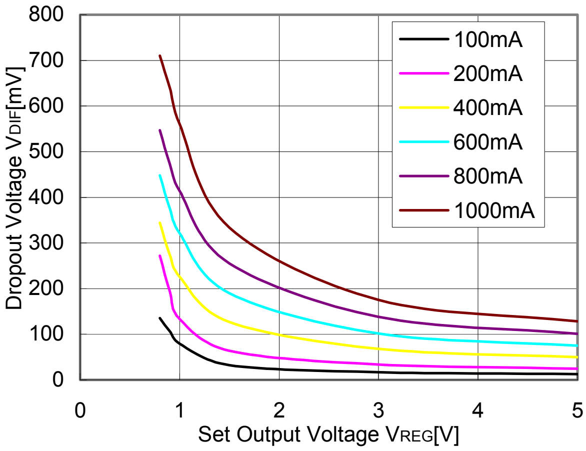
R1173X301X



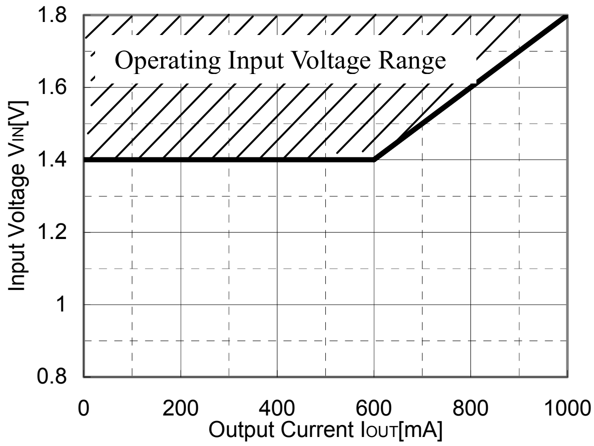
R1173X501X



7) Dropout Voltage vs. Set Output Voltage
R1173XXX1X



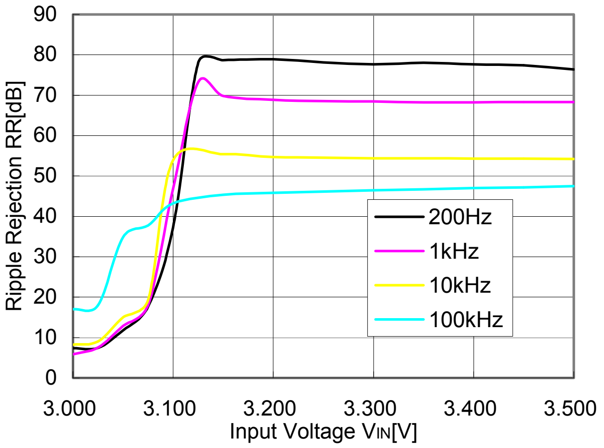
8) 0.8V Output type, Operating Input Voltage Range
R1173X081X



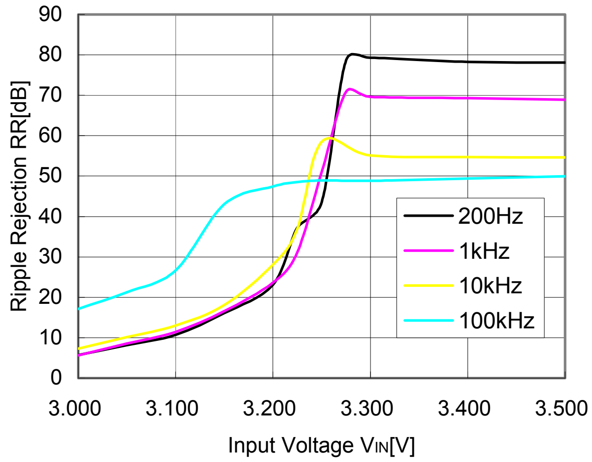
RICOH

9) Ripple Rejection vs. Input Bias

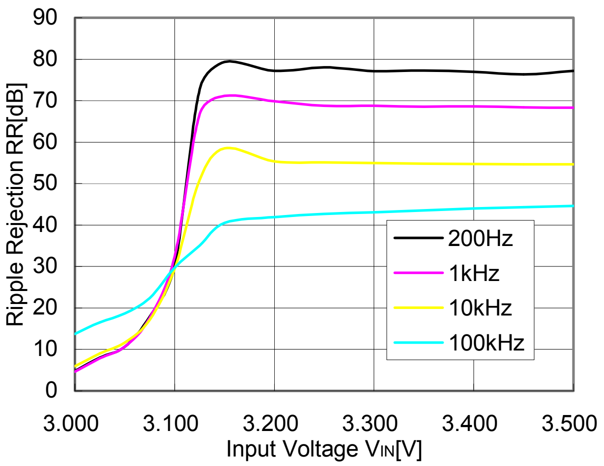
R1173X301X (V_{IN}=4.0V_{DC}+0.2Vp-p, I_{OUT}=1mA)



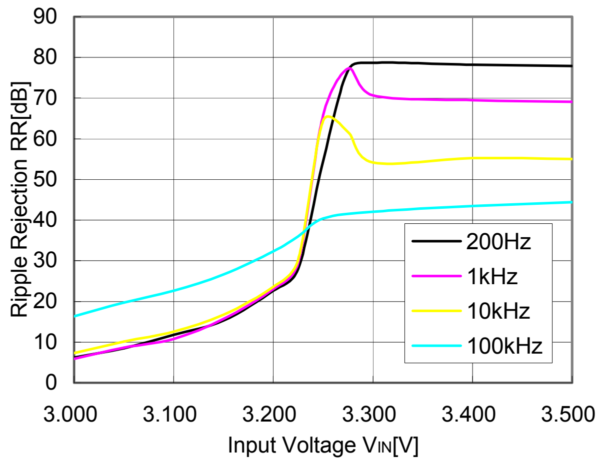
R1173X301X (V_{IN}=4.0V_{DC}+0.5Vp-p, I_{OUT}=1mA)



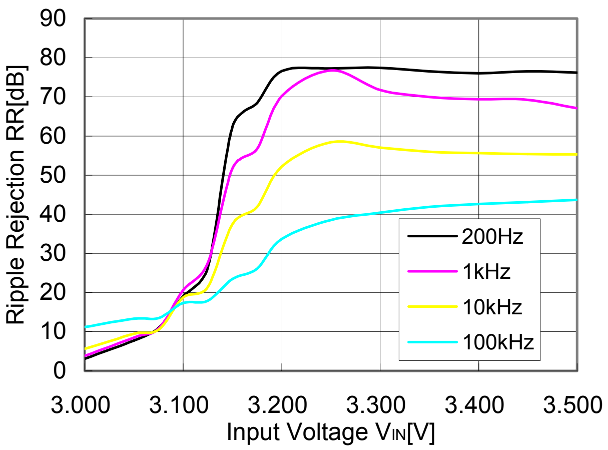
R1173X301X (V_{IN}=4.0V_{DC}+0.2Vp-p, I_{OUT}=10mA)



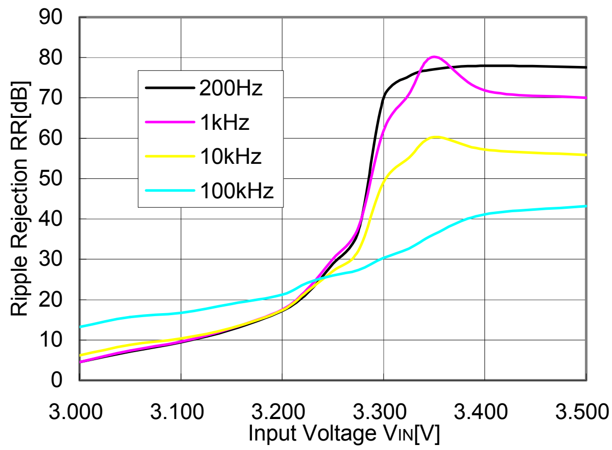
R1173X301X (V_{IN}=4.0V_{DC}+0.5Vp-p, I_{OUT}=10mA)



R1173X301X (V_{IN}=4.0V_{DC}+0.2Vp-p, I_{OUT}=100mA)

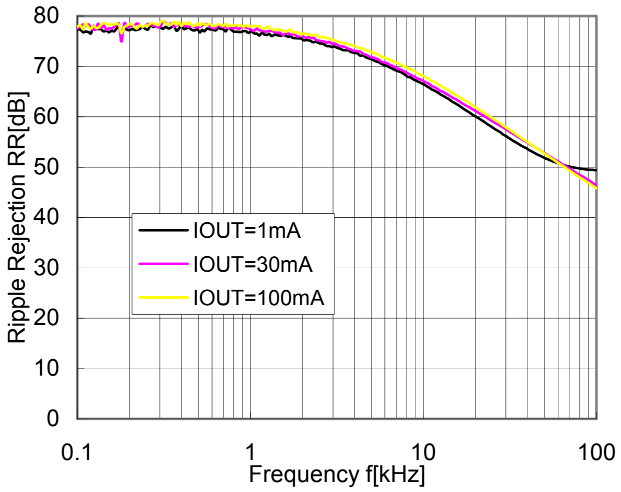


R1173X301X (V_{IN}=4.0V_{DC}+0.5Vp-p, I_{OUT}=100mA)

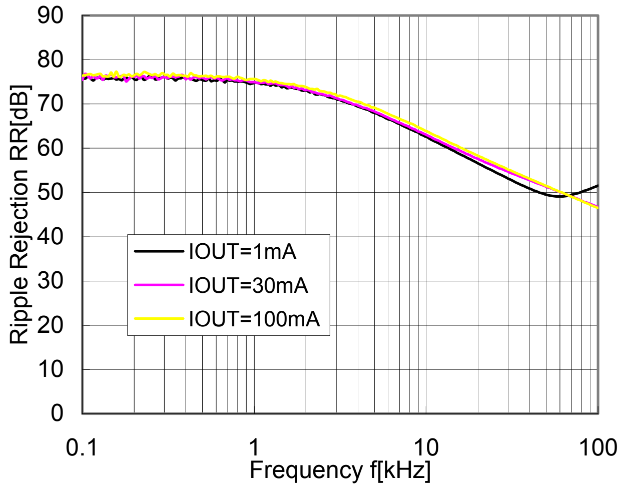


10) Ripple Rejection vs. Frequency

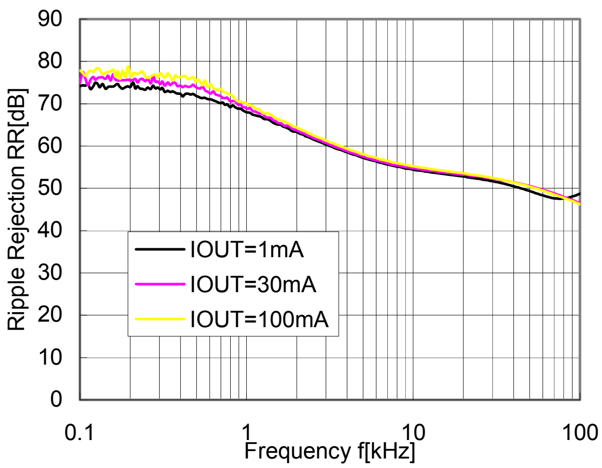
R1173X081X (VIN=1.8VDC+0.5Vp-p, COUT=Tantalum 4.7µF)



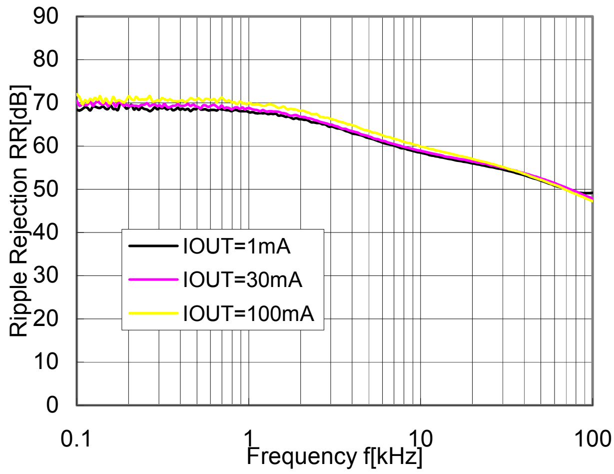
R1173X101X (VIN=2.0VDC+0.5Vp-p, COUT=Ceramic 4.7µF)



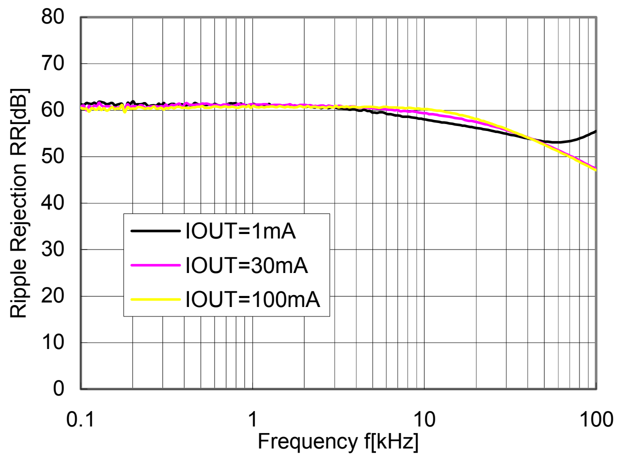
R1173X301X (VIN=4.0VDC+0.5Vp-p, COUT=Ceramic 4.7µF)



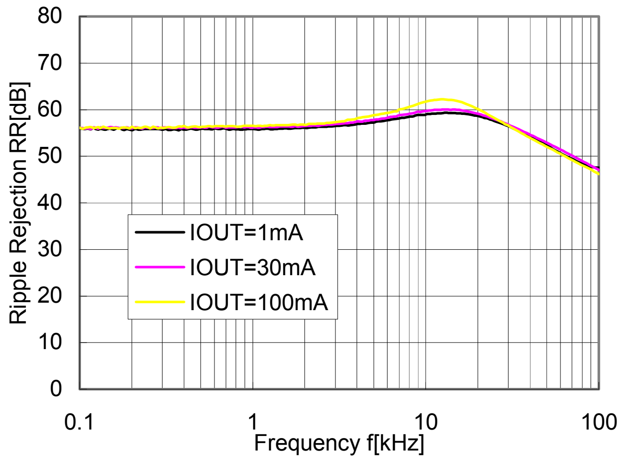
R1173X401X (VIN=5.0VDC+0.5Vp-p, COUT=Ceramic 4.7µF)



R1173X451X (VIN=5.5VDC+0.5Vp-p, COUT=Ceramic 4.7µF)

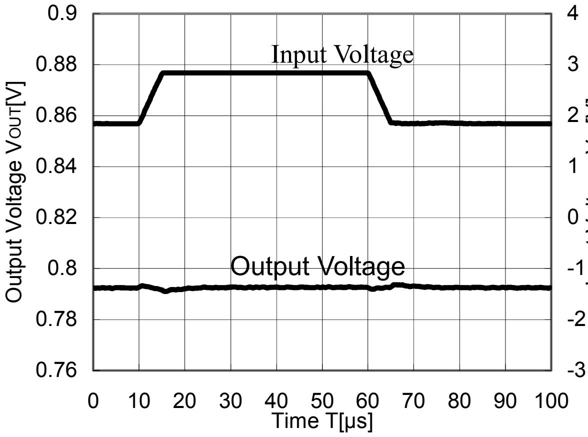


R1173X501X (VIN=6.0VDC+0.5Vp-p, COUT=Ceramic 4.7µF)

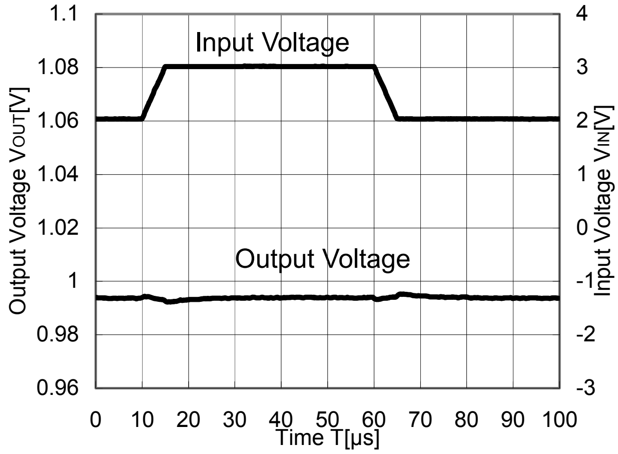


11) Line Transient Response (Tr = Tf =5μs, IOUT=100mA)

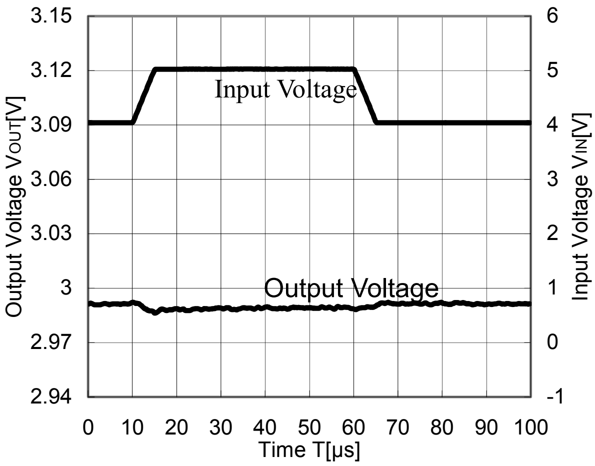
R1173X081X (COUT=Tantalum 4.7μF)



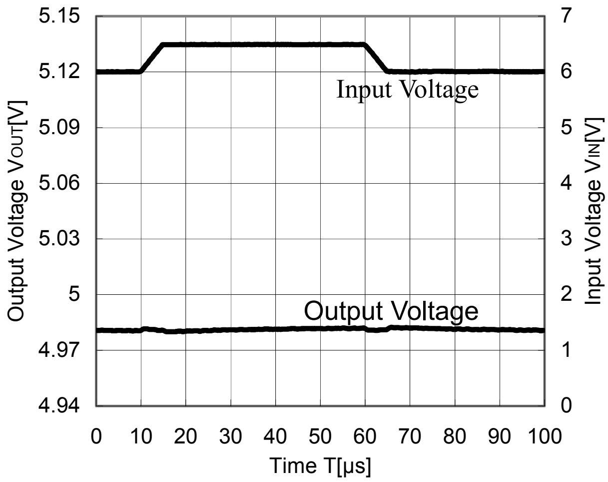
R1173X101X (COUT=Ceramic 4.7μF)



R1173X301X (COUT=Ceramic 4.7μF)

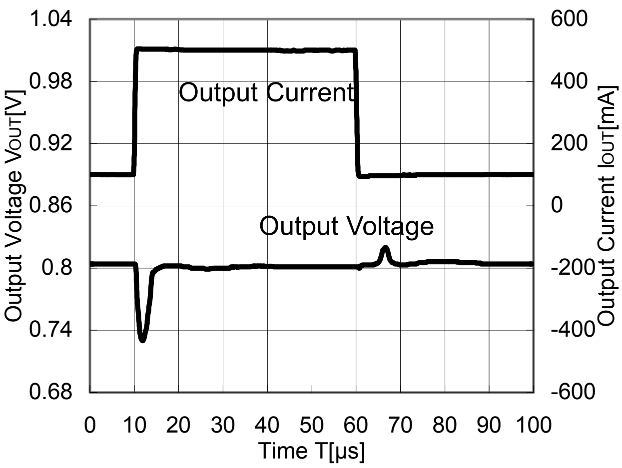


R1173X501X (COUT=Ceramic 4.7μF)

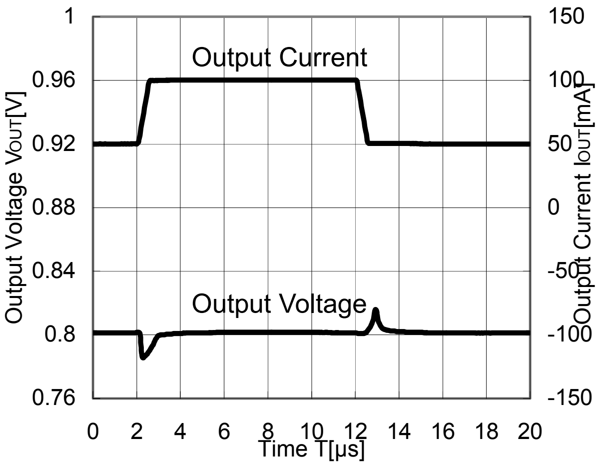


12) Load Transient Response (Tr=Tf=500ns)

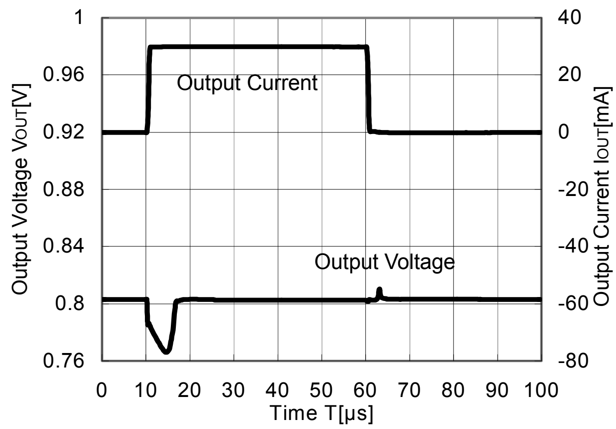
R1173X081X (VIN=1.8V, CIN=COUT=Tantalum 4.7μF)



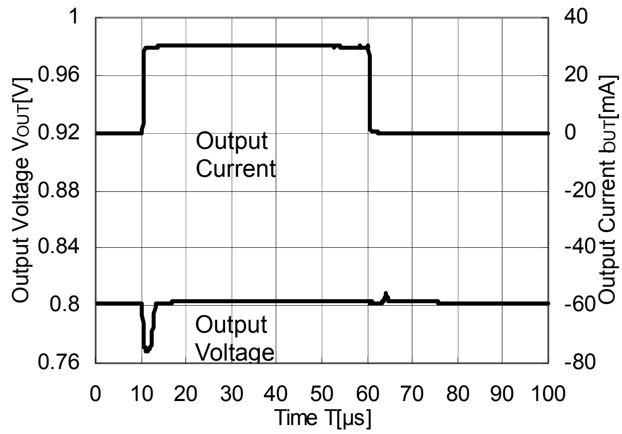
R1173X081X (VIN=1.8V, CIN=COUT=Tantalum 4.7μF)



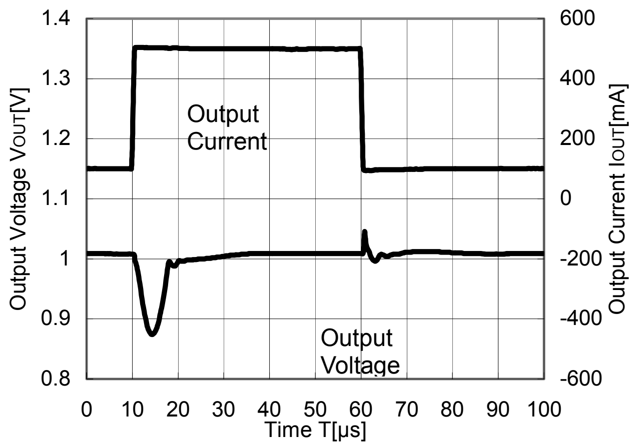
R1173X081X (VIN=1.8V, CIN=COUT=Tantalum 4.7µF)



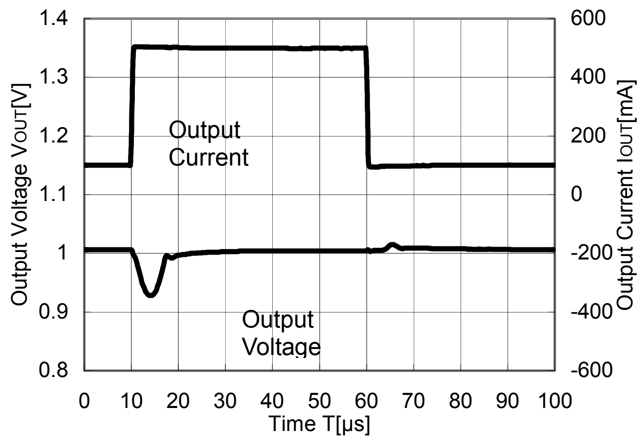
R1173X081X (VIN=1.8V,CIN=Tantalum4.7µF, COUT=Tantalum10µF)



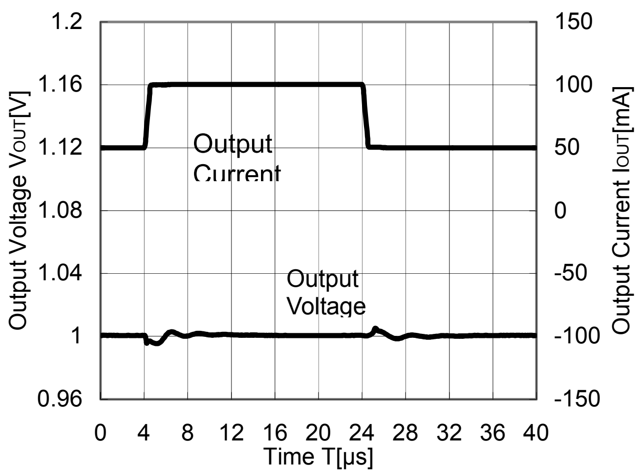
R1173X101X (VIN=2.0V, CIN=COUT=Ceramic 4.7µF)



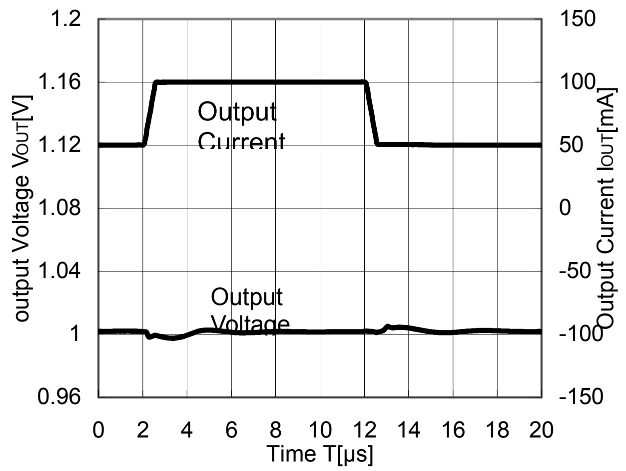
R1173X101X (VIN=2.0V, CIN=Ceramic 4.7µF, COUT = Ceramic 10µF)



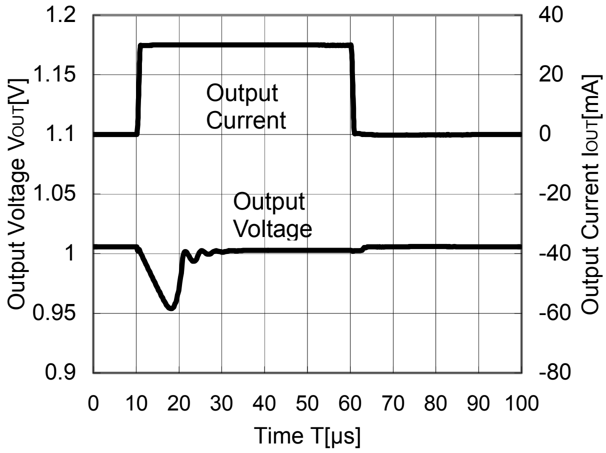
R1173X101X (VIN=2.0V, CIN=COUT=Ceramic 4.7µF)



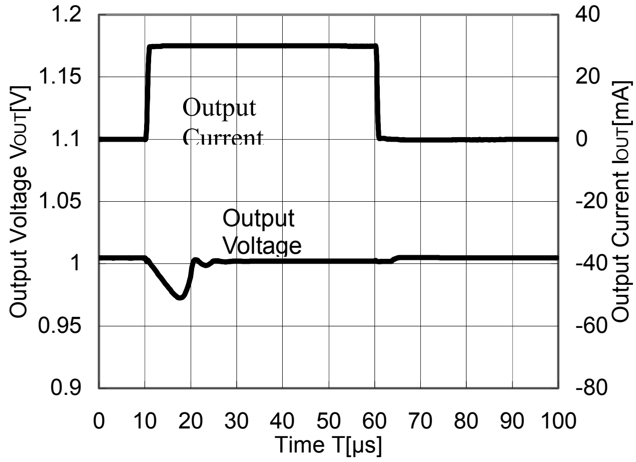
R1173X101X (VIN=2.0V, CIN=Ceramic 4.7µF, COUT = Ceramic 10µF)



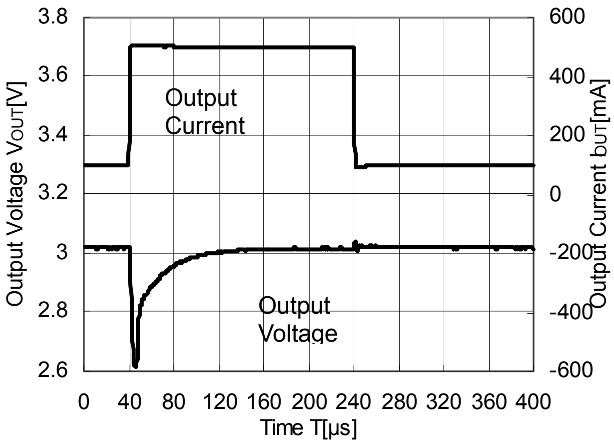
R1173X101X (VIN=2.0V, CIN=COUT=Ceramic 4.7µF)



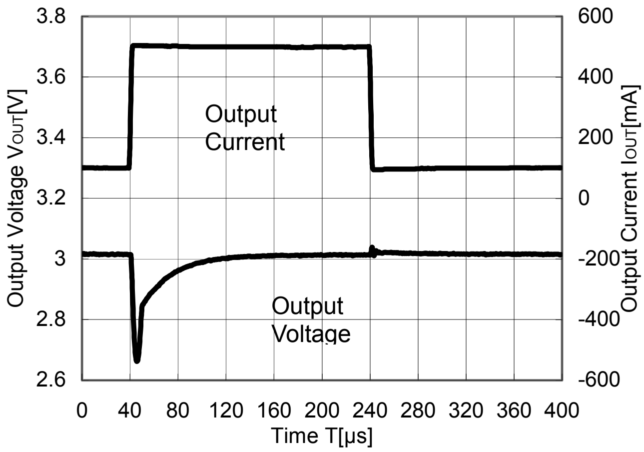
R1173X101X (VIN=2.0V, CIN=Ceramic 4.7µF, COUT = Ceramic 10µF)



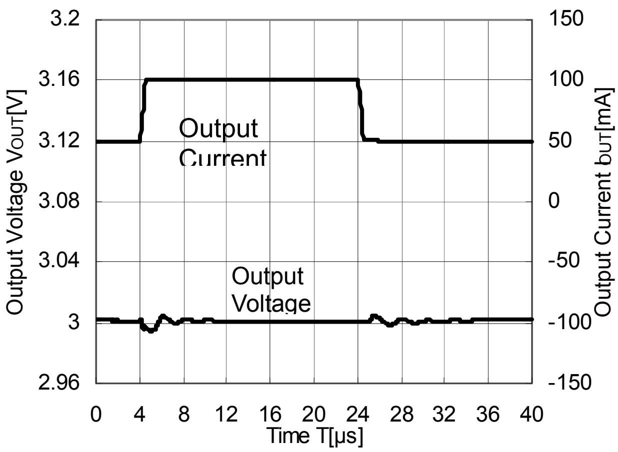
R1173X301X (VIN=4.0V, CIN=COUT=Ceramic 4.7µF)



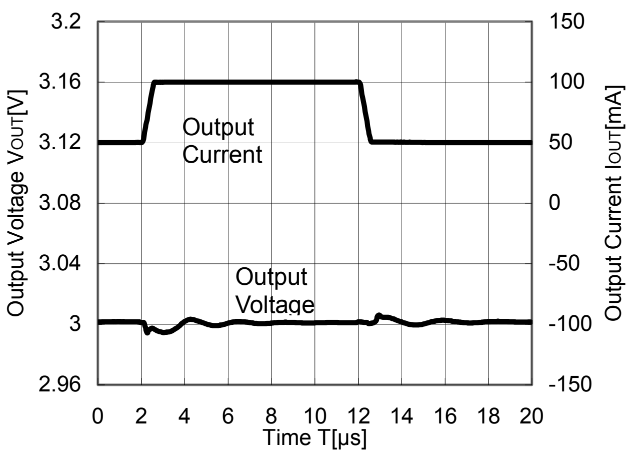
R1173X301X (VIN=4.0V, CIN=Ceramic 4.7µF, COUT = Ceramic 10µF)



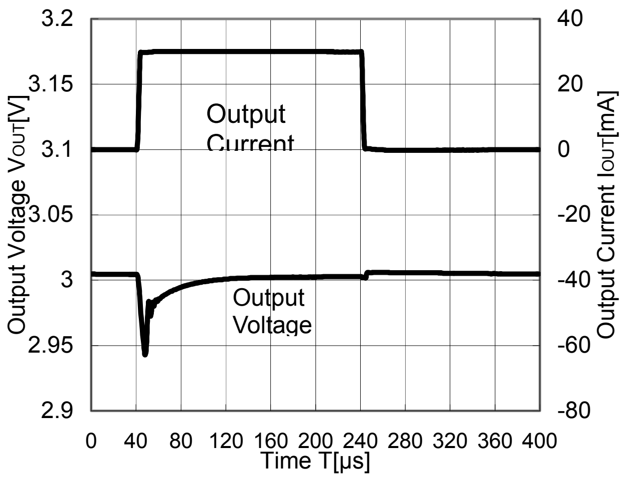
R1173X301X (VIN=4.0V, CIN=COUT=Ceramic 4.7µF)



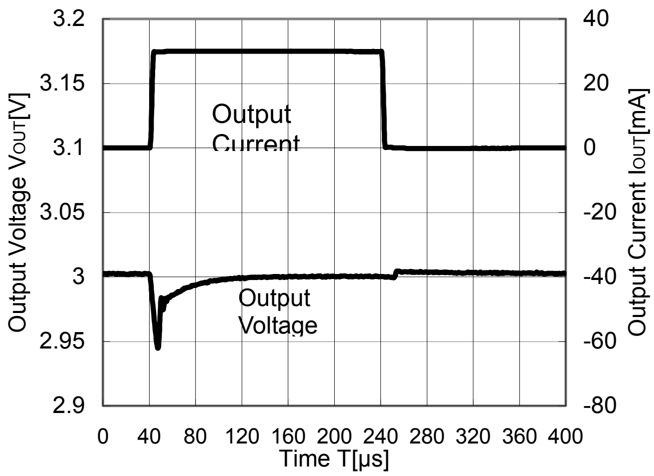
R1173X301X (VIN=4.0V, CIN=Ceramic 4.7µF, COUT = Ceramic 10µF)



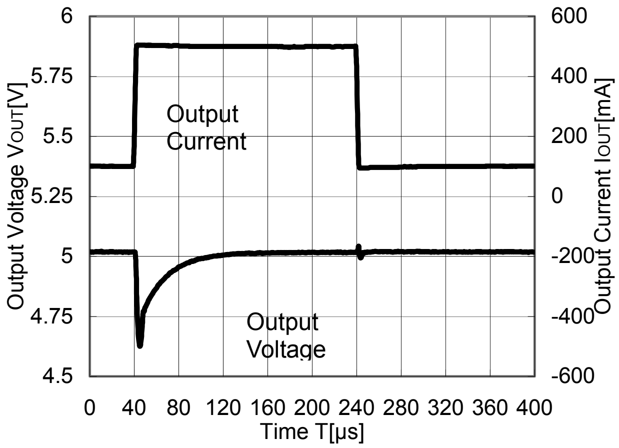
R1173X301X (VIN=4.0V, CIN=COUT=Ceramic 4.7µF)



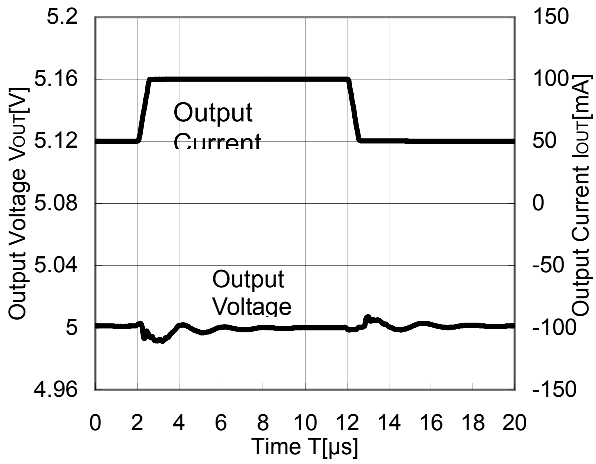
R1173X301X (VIN=4.0V, CIN=Ceramic 4.7µF, COUT = Ceramic 10µF)



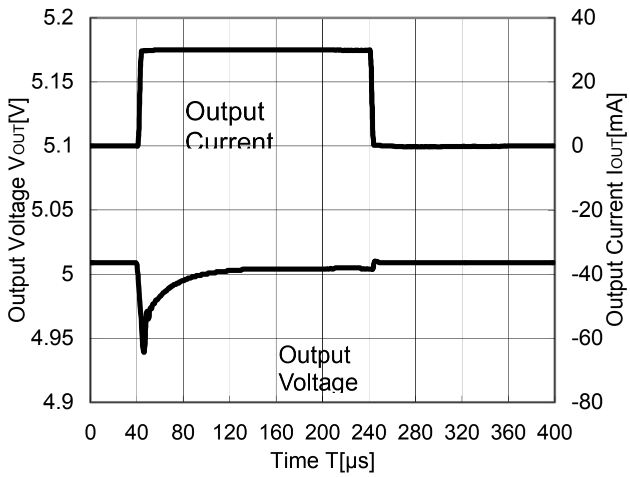
R1173X501X (VIN=6.0V, CIN=COUT=Ceramic 4.7µF)



R1173X501X (VIN=6.0V, CIN=COUT = Ceramic 4.7µF)

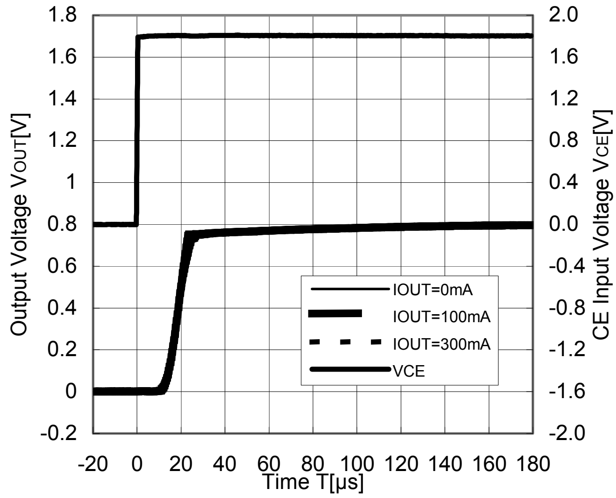


R1173X501X (VIN=6.0V, CIN=COUT=Ceramic 4.7µF)

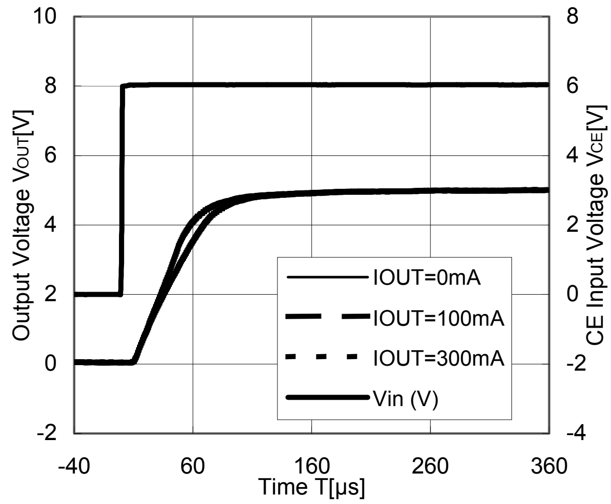


13) Turn-on speed with CE pin control

R1173X081X (VIN=1.8V, CIN=COUT=Tantalum 4.7μF)

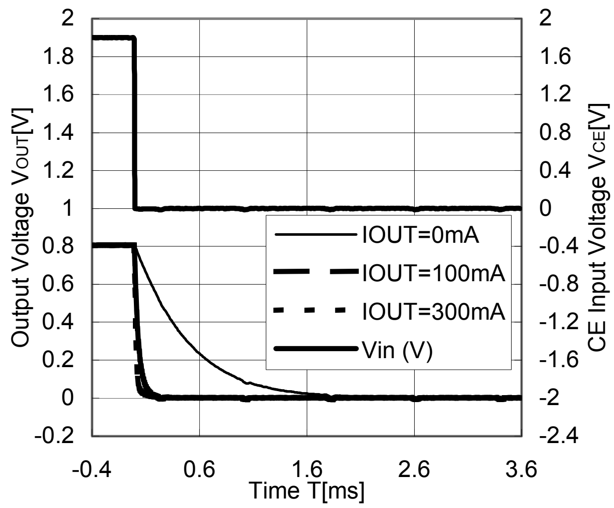


R1173X501X (VIN=6.0V, CIN=COUT=Ceramic 4.7μF)

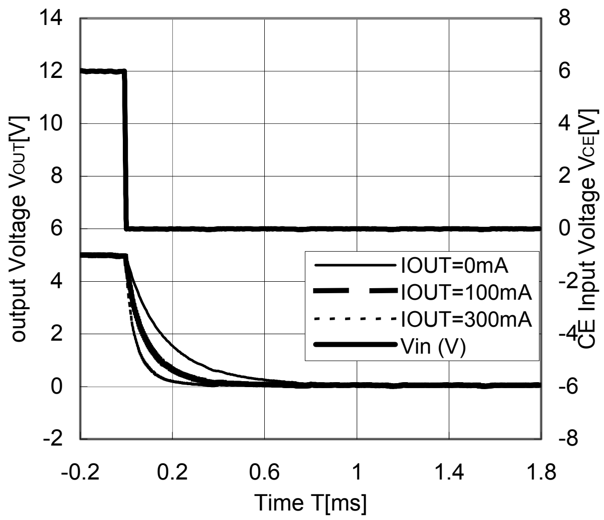


14) Turn-off speed with CE pin control

R1173X081D (VIN=1.8V, CIN=COUT=Tantalum 4.7μF)

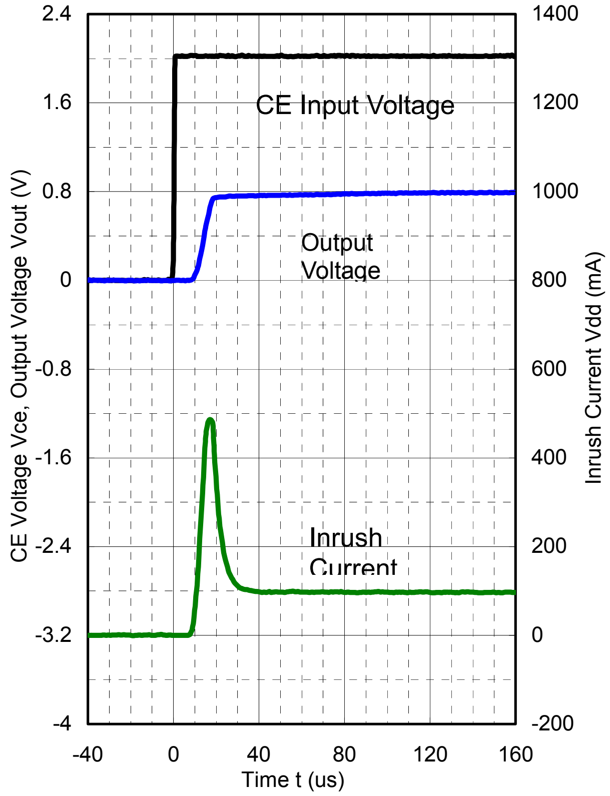


R1173X501D (VIN=6.0V, CIN=COUT=Ceramic 4.7μF)

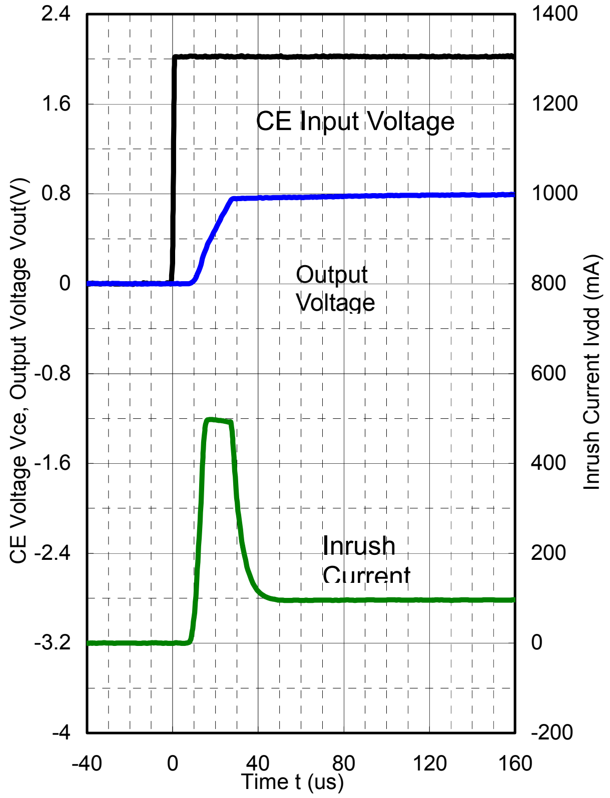


15) Inrush Current (IOUT=100mA, CIN=none)

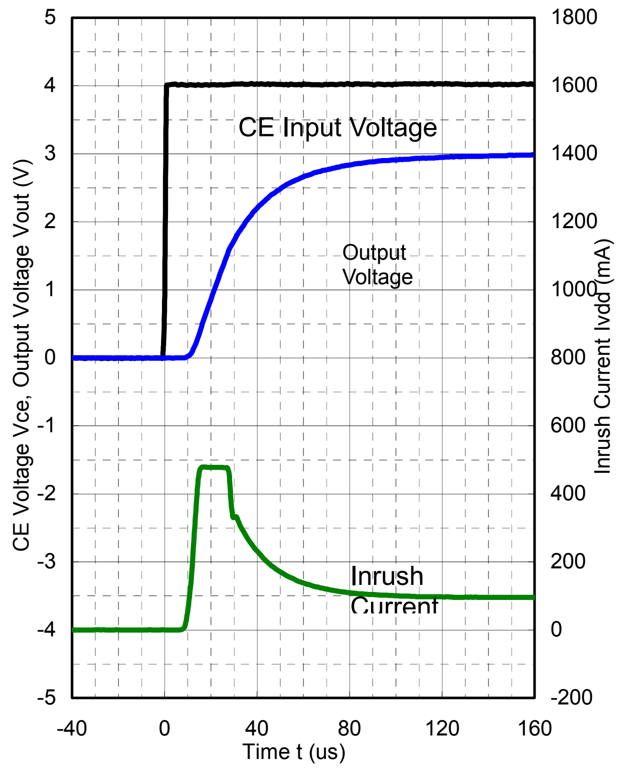
R1173X081X (VIN=2.0V, COUT=Tantalum 4.7µF)



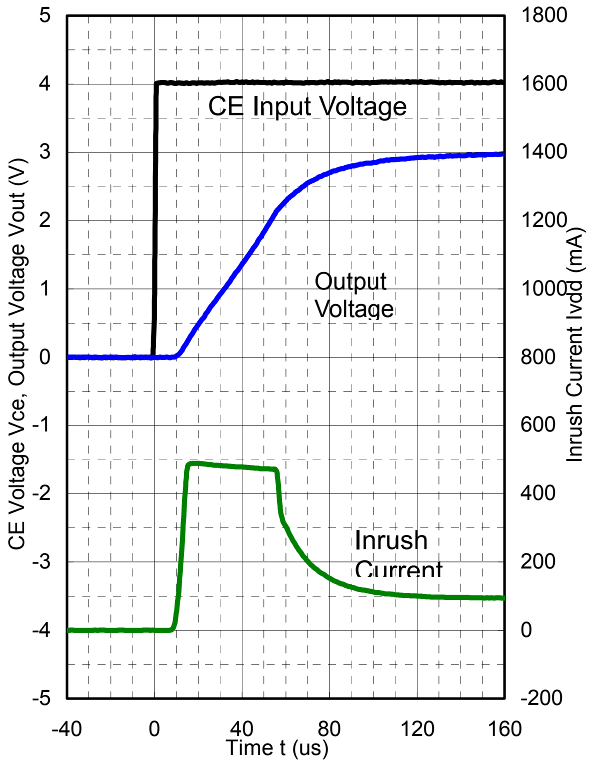
R1173X081X (VIN=2.0V, COUT=Tantalum 10µF)



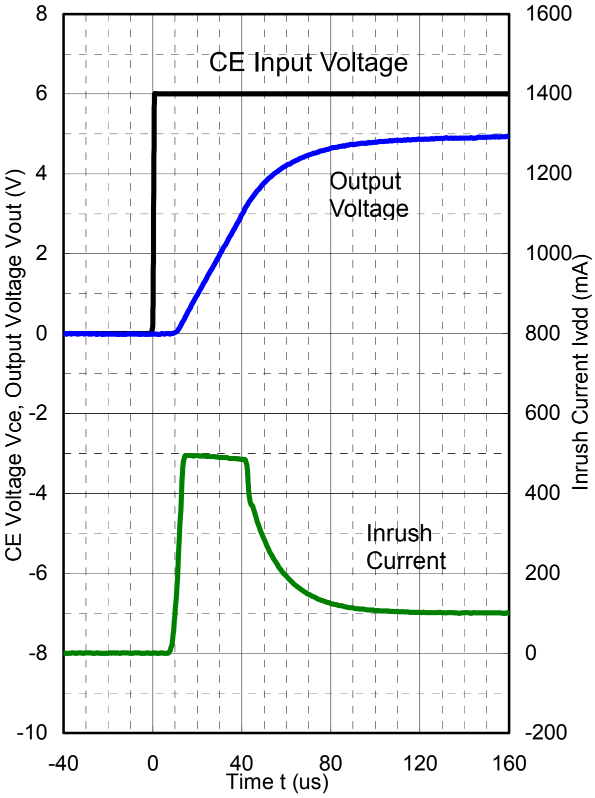
R1173X301X (VIN=4.0V, COUT=Ceramic 4.7µF)



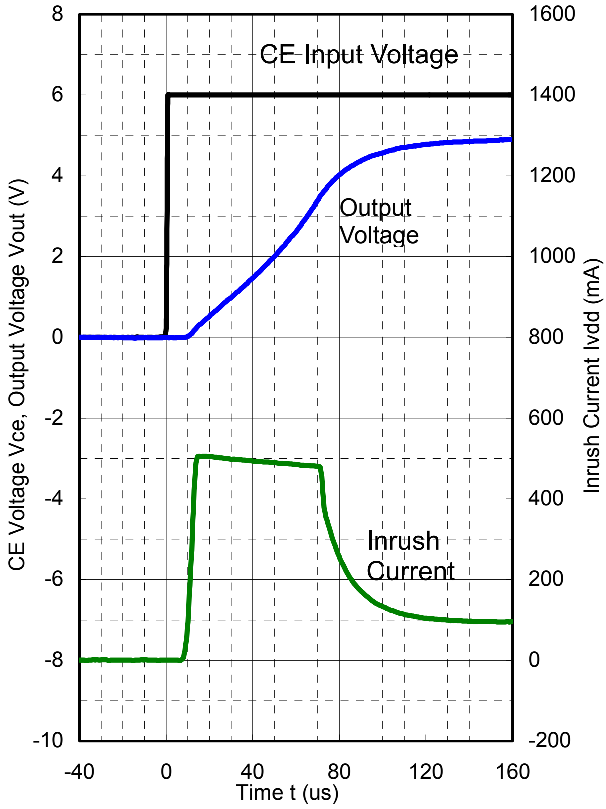
R1173X301X (VIN=4.0V, COUT=Ceramic 10µF)



R1173X501X (VIN=6.0V, COUT=Ceramic 4.7µF)



R1173X501X (VIN=6.0V, COUT=Ceramic 10µF)

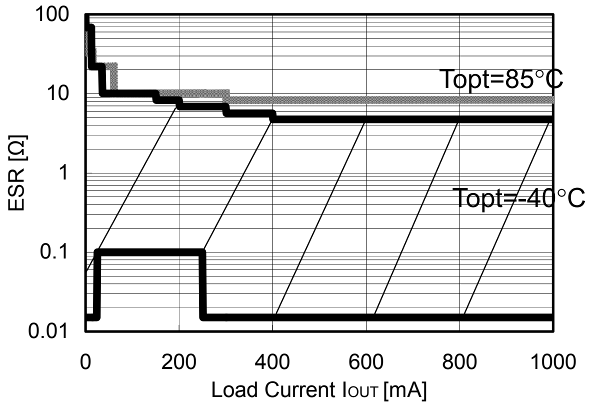


16) Stable Area: ESR limit vs. Load current (COUT:0.8V to 3.3V Output type: 4.7µF (Kyocera CM105X5R475M06AB)
5.0V Output type: 4.7µF(Kyocera CT21X5R475K06AB)

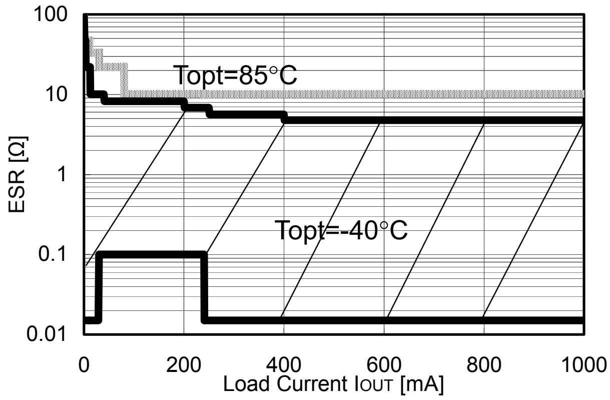
As an output capacitor for this IC, Ceramic capacitor is recommendable. However, other low ESR type capacitor can be used with this IC.

For your reference, noise level is tested, 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 five graphs, or ESR vs. Output Current. (Hatched area is the stable area.)

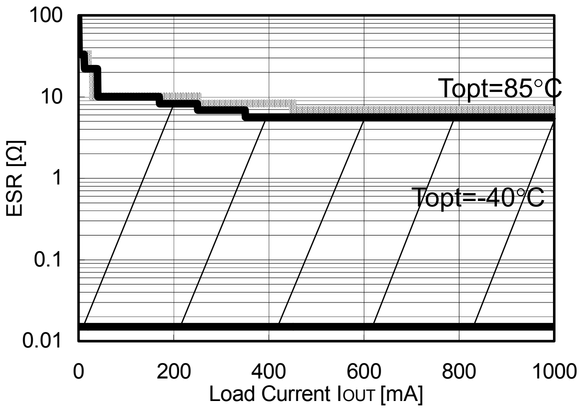
R1173X081X (VIN=1.4V to 6.0V, CIN = COUT = Ceramic 4.7µF)



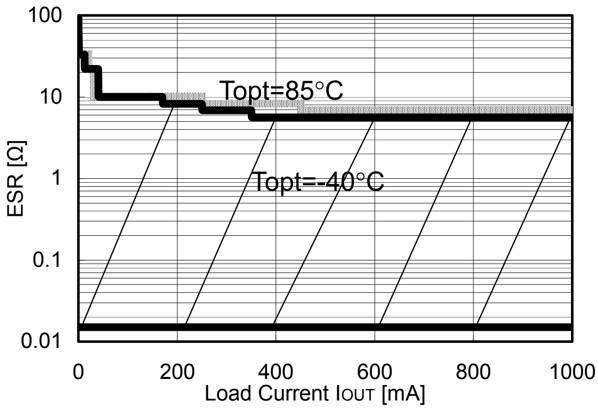
R1173X081X (V_{IN}=1.4V to 6.0V, C_{IN} = Ceramic 4.7µF, C_{OUT} = Ceramic 10µF)



R1173X101X (VIN=1.4V to 6.0V, CIN = COUT = Ceramic 4.7μF)



R1173X301X (VIN=3.1V to 6.0V, CIN = COUT = Ceramic 4.7μF)



R1173X501X (VIN=5.3V to 6.0V, CIN = COUT = Ceramic 4.7μF)