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**150mA 36V Input LDO Regulator for Automotive Applications**

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NO.EC-222-180510

**OUTLINE**

The R8150SxxxB Series are CMOS-based high-voltage resistant and low supply current LDO regulators that provide the minimum 150mA of output voltage. Internally, the R8150SxxxB consists of a fold-back protection circuit and a thermal shutdown circuit in addition to the basic regulator circuits. The operating temperature range is between -40°C to 125°C, and the maximum input voltage is 36V. All these features allow the R8150SxxxB to become an ideal power source for electric home appliances.

The R8150SxxxB is available in fixed output voltage options between 2.0V and 12.0V in 0.1V steps. The output voltage accuracy is ±4%.

The R8150SxxxB is available in a HSOP-6J package for high wattage. The R8150SxxxB is designed specifically for the vital automotive security parts, which is also suitable for the vehicle electrical accessories. Design Engineering guarantees the reliable operation of the ICs within the temperature range of -40°C to 110°C.

**FEATURES**

- Input Voltage Range (Maximum Rating) ..... 4V to 36V (50V)
- Supply Current ..... Typ. 9µA
- Standby Current ..... Typ. 0.1µA
- Output Current ..... Min. 150mA ( $V_{IN}=V_{SET}+3V$ , R8150S050B)
- Line Regulation ..... Typ. 0.05%/V
- Output Voltage Accuracy ..... ±4% ( $T_a \approx T_j = -40^\circ\text{C}$  to  $110^\circ\text{C}$ )
- Packages ..... HSOP-6J
- Output Voltage Range ..... 2.0V to 12.0V (0.1V steps)
- Fold-back Protection Circuit ..... Current limit Typ. 50mA
- Thermal Shutdown Circuit ..... Stops at Typ. 160°C
- Operating Temperature Range ..... -40 to 125°C

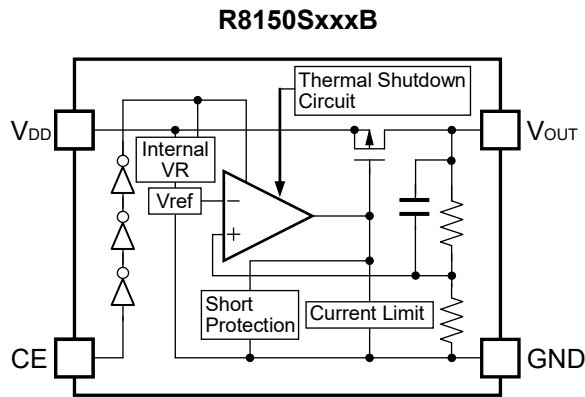
**APPLICATIONS**

- Power supply for electronic control units such as EV inverter and battery charge control unit.

# R8150SxxxB

NO.EC-222-180510

## BLOCK DIAGRAMS



## SELECTION GUIDE

The output voltage for the regulators is a user selectable option.

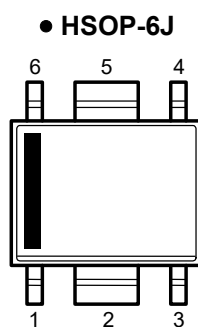
Product Name	Package	Quantity per Reel	Pb Free	Halogen Free
R8150SxxxB-E2-FE	HSOP-6J	1,000 pcs	Yes	Yes

xxx : The set output voltage can be designated in the range of 2.0V (020) to 12.0V (120) in 0.1V steps.

R8 Automotive Class Code

Operating Temperature Range	Guaranteed Specs Temperature Range	Screening
-40°C to 125°C	-40°C to 110°C	High and Low Temperature

## PIN DESCRIPTIONS



### HSOP-6J

Pin No.	Symbol	Description
1	$V_{OUT}$	Output Pin
2	GND <sup>*1</sup>	Ground Pin
3	CE	Chip Enable Pin ("H" Active)
4	GND <sup>*1</sup>	Ground Pin
5	GND <sup>*1</sup>	Ground Pin
6	$V_{DD}$	Input Pin

<sup>\*1</sup> The GND pins must be interconnected each other when they are mounted on board.

**ABSOLUTE MAXIMUM RATINGS**

Symbol	Item	Rating	Unit
V <sub>IN</sub>	Input Voltage	-0.3 to 50	V
V <sub>IN</sub>	Peak Input Voltage* <sup>1</sup>	60	V
V <sub>CE</sub>	Input Voltage (CE Pin)	-0.3 to V <sub>IN</sub> +0.3 ≤ 50	V
V <sub>OUT</sub>	Output Voltage	-0.3 to V <sub>IN</sub> +0.3 ≤ 50	V
I <sub>OUT</sub>	Output Current	250	mA
P <sub>D</sub>	Power Dissipation (Ultra High Wattage Land Pattern)* <sup>2</sup>	3400	mW
T <sub>j</sub>	Junction Temperature	-40 to 150	°C
T <sub>stg</sub>	Storage Temperature Range	-55 to 150	°C

\*<sup>1</sup> Duration time: 200ms\*<sup>2</sup> Refer to *PACKAGE INFORMATION* for detailed information.**ABSOLUTE MAXIMUM RATINGS**

Electronic and mechanical stress momentarily exceeded absolute maximum ratings may cause the permanent damages and may degrade the lifetime and safety for both device and system using the device in the field. The functional operation at or over these absolute maximum ratings is not assured.

**RECOMMENDED OPERATING RATINGS**

Symbol	Item	Rating	Unit
V <sub>IN</sub>	Input Voltage	4 to 36	V
T <sub>a</sub>	Operating Temperature Range	-40 to 125	°C

**RECOMMENDED OPERATING RATINGS**

All of electronic equipment should be designed that the mounted semiconductor devices operate within the recommended operating ratings. The semiconductor devices cannot operate normally over the recommended operating ratings, even if when they are used over such ratings by momentary electronic noise or surge. And the semiconductor devices may receive serious damage when they continue to operate over the recommended operating ratings.

## ELECTRICAL CHARACTERISTICS

## R8150SxxxB

(Ta≈Tj=-40°C to 110°C)

Symbol	Item	Conditions	Min.	Typ.	Max.	Unit
I <sub>SS</sub>	Supply Current	V <sub>IN</sub> =V <sub>SET</sub> *1 +3.0V, I <sub>OUT</sub> =0mA		9	20	μA
I <sub>standby</sub>	Standby Current	V <sub>IN</sub> =36V, V <sub>CE</sub> =0V		0.1	1.0	μA
V <sub>OUT</sub>	Output Voltage	V <sub>IN</sub> =V <sub>SET</sub> +3.0V, I <sub>OUT</sub> =1mA	x0.96		x1.04	V
I <sub>OUT</sub>	Output Current	V <sub>IN</sub> =V <sub>SET</sub> +3.0V	Refer to <i>Product-specific Electrical Characteristics</i>			
ΔV <sub>OUT</sub> /ΔI <sub>OUT</sub>	Load Regulation	V <sub>IN</sub> =V <sub>SET</sub> +3.0V, 1mA ≤ I <sub>OUT</sub> ≤ 40mA				
ΔV <sub>OUT</sub> /ΔV <sub>IN</sub>	Line Regulation	I <sub>OUT</sub> =1mA		0.05	0.20	%/V
		V <sub>SET</sub> + 0.5V ≤ V <sub>IN</sub> ≤ 36V (V <sub>SET</sub> + 0.5 ≥ 4.0V)				
		4.0V ≤ V <sub>IN</sub> ≤ 36V (V <sub>SET</sub> + 0.5 < 4.0V)				
V <sub>DIF</sub>	Dropout Voltage	I <sub>OUT</sub> =40mA	Refer to <i>Product-specific Electrical Characteristics</i>			
I <sub>SC</sub>	Short Current Limit	V <sub>OUT</sub> =0V		50		mA
V <sub>CEH</sub>	CE Input Voltage "H"		1.5		V <sub>IN</sub>	V
V <sub>CEL</sub>	CE Input Voltage "L"		0		0.35	V
T <sub>TSD</sub>	Thermal Shutdown Temperature	Junction Temperature	150	160		°C
T <sub>TSR</sub>	Thermal Shutdown Released Temperature	Junction Temperature	110	130		°C

All test items listed under Electrical Characteristics are done under the pulse load condition (Ta≈Tj=-40°C to 110°C).

\*1 V<sub>SET</sub> = Set Output Voltage

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## Product-specific Electrical Characteristics

(Ta=Tj)=-40°C to 110°C

Product Name	V <sub>OUT</sub> [V]			I <sub>OUT</sub> [mA]	ΔV <sub>OUT</sub> /ΔI <sub>OUT</sub> [mV]		V <sub>DIF</sub> [V]				
	MIN.	TYP.	MAX.		TYP.	MAX.	TYP.	MAX.			
R8150S020B	1.920	2.000	2.080	90				2.00			
R8150S021B	2.016	2.100	2.184					1.90			
R8150S022B	2.112	2.200	2.288					1.80			
R8150S023B	2.208	2.300	2.392					1.70			
R8150S024B	2.304	2.400	2.496					1.60			
R8150S025B	2.400	2.500	2.600					1.50			
R8150S026B	2.496	2.600	2.704					-			1.47
R8150S027B	2.592	2.700	2.808								
R8150S028B	2.688	2.800	2.912								
R8150S029B	2.784	2.900	3.016								
R8150S030B	2.880	3.000	3.120	120	10	27	0.60	1.17			
R8150S031B	2.976	3.100	3.224								
R8150S032B	3.072	3.200	3.328								
R8150S033B	3.168	3.300	3.432								
R8150S034B	3.264	3.400	3.536								
R8150S035B	3.360	3.500	3.640								
R8150S036B	3.456	3.600	3.744								
R8150S037B	3.552	3.700	3.848								
R8150S038B	3.648	3.800	3.952								
R8150S039B	3.744	3.900	4.056								
R8150S040B	3.840	4.000	4.160	150	20	39	0.32	0.58			
R8150S041B	3.936	4.100	4.264								
R8150S042B	4.032	4.200	4.368								
R8150S043B	4.128	4.300	4.472								
R8150S044B	4.224	4.400	4.576								
R8150S045B	4.320	4.500	4.680								
R8150S046B	4.416	4.600	4.784								
R8150S047B	4.512	4.700	4.888								
R8150S048B	4.608	4.800	4.992								
R8150S049B	4.704	4.900	5.096								
R8150S050B	4.800	5.000	5.200								
R8150S051B	4.896	5.100	5.304								
R8150S052B	4.992	5.200	5.408								
R8150S053B	5.088	5.300	5.512								
R8150S054B	5.184	5.400	5.616								
R8150S055B	5.280	5.500	5.720								
R8150S056B	5.376	5.600	5.824								
R8150S057B	5.472	5.700	5.928								
R8150S058B	5.568	5.800	6.032								
R8150S059B	5.664	5.900	6.136								

(Ta=Tj)=-40°C to 110°C)

Product Name	V <sub>OUT</sub> [V]			I <sub>OUT</sub> [mA]	ΔV <sub>OUT</sub> /ΔI <sub>OUT</sub> [mV]		V <sub>DIF</sub> [V]	
	MIN.	TYP.	MAX.		TYP.	MAX.	TYP.	MAX.
R8150S060B	5.760	6.000	6.240	150	20	39	0.32	0.58
R8150S061B	5.856	6.100	6.344					
R8150S062B	5.952	6.200	6.448					
R8150S063B	6.048	6.300	6.552					
R8150S064B	6.144	6.400	6.656					
R8150S065B	6.240	6.500	6.760					
R8150S066B	6.336	6.600	6.864					
R8150S067B	6.432	6.700	6.968					
R8150S068B	6.528	6.800	7.072					
R8150S069B	6.624	6.900	7.176					
R8150S070B	6.720	7.000	7.280					
R8150S071B	6.816	7.100	7.384					
R8150S072B	6.912	7.200	7.488					
R8150S073B	7.008	7.300	7.592					
R8150S074B	7.104	7.400	7.696					
R8150S075B	7.200	7.500	7.800					
R8150S076B	7.296	7.600	7.904					
R8150S077B	7.392	7.700	8.008					
R8150S078B	7.488	7.800	8.112					
R8150S079B	7.584	7.900	8.216					
R8150S080B	7.680	8.000	8.320					
R8150S081B	7.776	8.100	8.424					
R8150S082B	7.872	8.200	8.528					
R8150S083B	7.968	8.300	8.632					
R8150S084B	8.064	8.400	8.736					
R8150S085B	8.160	8.500	8.840					
R8150S086B	8.256	8.600	8.944					
R8150S087B	8.352	8.700	9.048					
R8150S088B	8.448	8.800	9.152					
R8150S089B	8.544	8.900	9.256					
R8150S090B	8.640	9.000	9.360					
R8150S091B	8.736	9.100	9.464					
R8150S092B	8.832	9.200	9.568					
R8150S093B	8.928	9.300	9.672					
R8150S094B	9.024	9.400	9.776					
R8150S095B	9.120	9.500	9.880					
R8150S096B	9.216	9.600	9.984					
R8150S097B	9.312	9.700	10.088					
R8150S098B	9.408	9.800	10.192					
R8150S099B	9.504	9.900	10.296					

**R8150SxxxB**

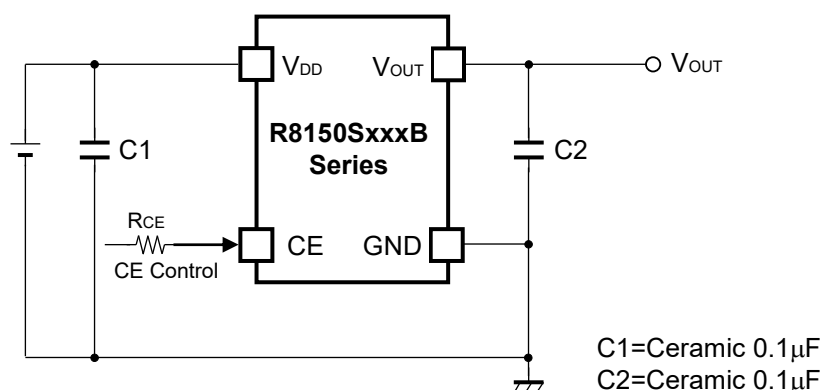
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(Ta=Tj=-40°C to 110°C)

Product Name	V <sub>OUT</sub> [V]			I <sub>OUT</sub> [mA]	ΔV <sub>OUT</sub> /ΔI <sub>OUT</sub> [mV]		V <sub>DIF</sub> [V]	
	MIN.	TYP.	MAX.		TYP.	MAX.	TYP.	MAX.
R8150S100B	9.600	10.000	10.400	150	20	39	0.32	0.58
R8150S101B	9.696	10.100	10.504					
R8150S102B	9.792	10.200	10.608					
R8150S103B	9.888	10.300	10.712					
R8150S104B	9.984	10.400	10.816					
R8150S105B	10.080	10.500	10.920					
R8150S106B	10.176	10.600	11.024					
R8150S107B	10.272	10.700	11.128					
R8150S108B	10.368	10.800	11.232					
R8150S109B	10.464	10.900	11.336					
R8150S110B	10.560	11.000	11.440					
R8150S111B	10.656	11.100	11.544					
R8150S112B	10.752	11.200	11.648					
R8150S113B	10.848	11.300	11.752					
R8150S114B	10.944	11.400	11.856					
R8150S115B	11.040	11.500	11.960					
R8150S116B	11.136	11.600	12.064					
R8150S117B	11.232	11.700	12.168					
R8150S118B	11.328	11.800	12.272					
R8150S119B	11.424	11.900	12.376					
R8150S120B	11.520	12.000	12.480					



## TYPICAL APPLICATION



## TECHNICAL NOTES

When using the R8150SxxxB, please consider the following points.

### Phase Compensation

The R8150SxxxB provides the constant-voltage without using C1 and C2 capacitors. However, if the input line is too long, C1 capacitor should be connected. To minimize the input voltage fluctuation and the transient output voltage fluctuation that is caused by the load fluctuation, C2 capacitor size should be increased. Please refer to the Basic Test Circuit below when connecting a 0.1µF to 20µF C1 capacitor between V<sub>DD</sub> and GND, and also connecting a 0.1µF to 20µF C2 capacitor between V<sub>OUT</sub> and GND. C1 and C2 capacitors, V<sub>DD</sub>, GND and V<sub>OUT</sub> should be connected as close as possible to each other.

### GND Wiring on Boards

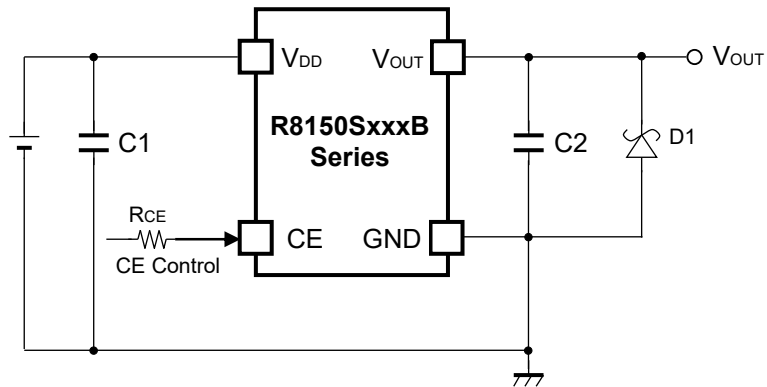
Please connect the No.2 pin, the No.4 pin and the No.5 pin to the ground plane on the board.

### Thermal Shutdown

The Thermal Shutdown Circuit detects overheating of the regulator if the V<sub>OUT</sub> pin is shorted to the GND pin etc. and stops regulator operation to protect it from damage. For example, the Thermal Shutdown Circuit stops regulator operation if the junction temperature of the R8150SxxxB becomes higher than 160°C (Typ.). Additionally, if the junction temperature after the regulator being stopped decreases to a level below 130°C (Typ.), it restarts regulator operation. As a result, the operation of the Thermal Shutdown Circuit causes the regulator repeatedly to turn off and on until the causes of overheating are removed. As a consequence a pulse shaped output voltage occurs. Please prevent this situation.

### Chip Enable (CE) Circuit

The electrical potential level of chip enable (CE) pin should not be set in between V<sub>CEH</sub> and V<sub>CEL</sub>. Using the electrical potentials in between V<sub>CEH</sub> and V<sub>CEL</sub> may cause the increase of supply current and may result in unstable output.

**TYPICAL APPLICATION FOR IC CHIP BREAKDOWN PREVENTION**

C1 = Ceramic 0.1  $\mu$ F  
C2 = Ceramic 0.1  $\mu$ F

When a sudden surge of electrical current travels along the  $V_{OUT}$  pin and GND due to a short-circuit, electrical resonance of a circuit involving an output capacitor (C2) and a short circuit inductor generates a negative voltage and may damage the device or the load devices. Connecting a schottky diode (D1) between the  $V_{OUT}$  pin and GND has the effect of preventing damage to them.

## PACKAGE INFORMATION

### POWER DISSIPATION (HSOP-6J)

The power dissipation of the package is dependent on PCB material, layout, and environmental conditions. The following conditions are used in this measurement.

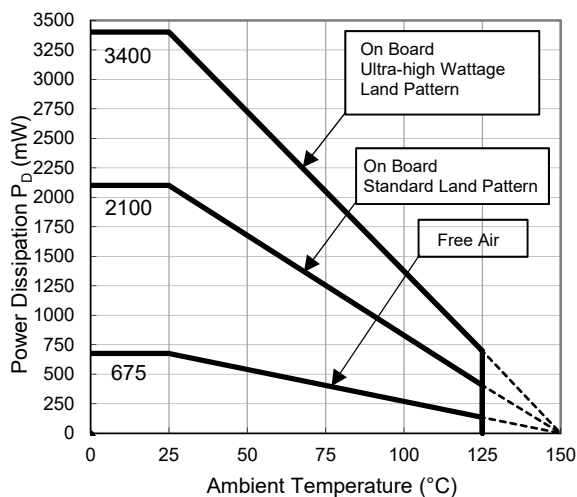
#### Measurement Conditions

	Ultra-high Wattage Land Pattern	Standard Land Pattern
Environment	Mounting on Board (Wind Velocity = 0 m/s)	Mounting on Board (Wind Velocity = 0 m/s)
Board Material	Glass Cloth Epoxy Plastic (Four-layer Board)	Glass Cloth Epoxy Plastic (Double-sided Board)
Board Dimensions	76.2 mm × 114.3 mm × 0.8 mm	50 mm × 50 mm × 1.6 mm
Copper Ratio	96%	50%
Through-holes	φ 0.3 mm × 28 pcs	φ 0.5 mm × 24 pcs

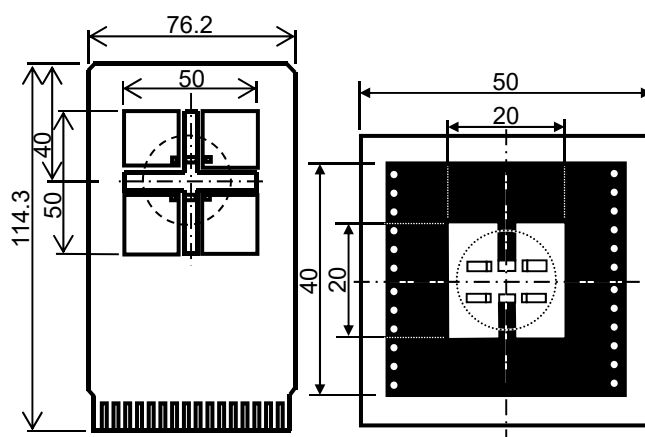
#### Measurement Result

( $T_a = 25^\circ\text{C}$ ,  $T_{j\text{max}} = 150^\circ\text{C}$ )

	Ultra-high Wattage Land Pattern	Standard Land Pattern	Free Air
Power Dissipation	3400 mW	2100 mW	675 mW
Thermal Resistance	37°C/W	59°C/W	185°C/W



Power Dissipation vs. Ambient Temperature



Ultra-high Wattage

Standard

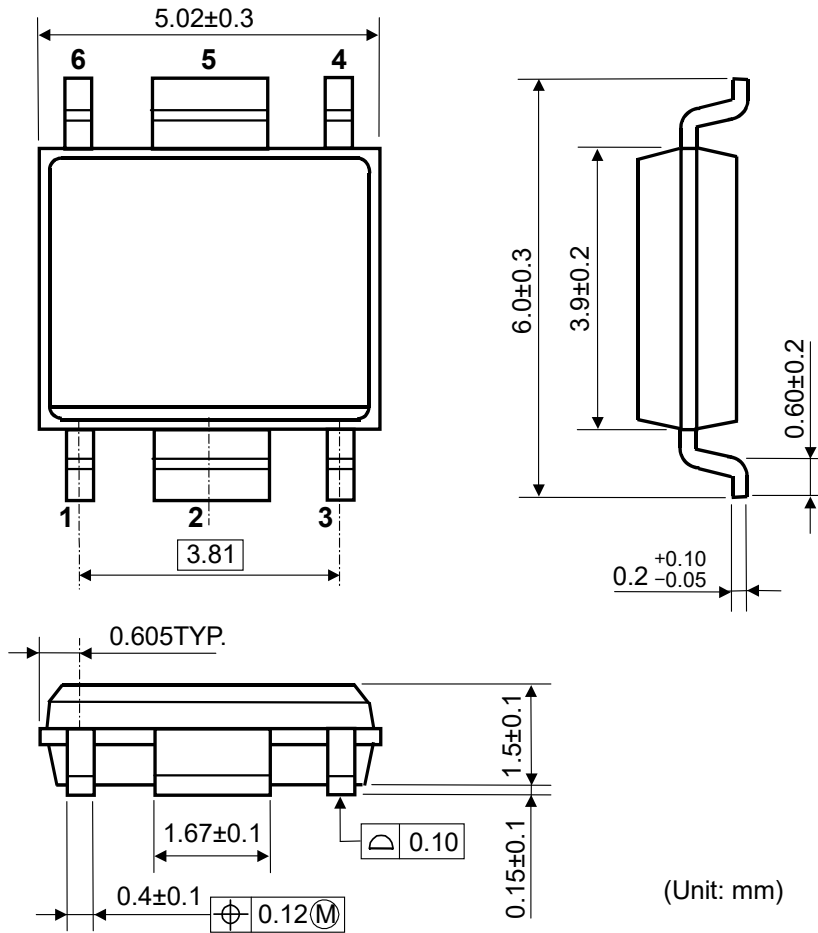
○ IC Mount Area (mm)

Measurement Board Pattern

**R8150SxxxB**

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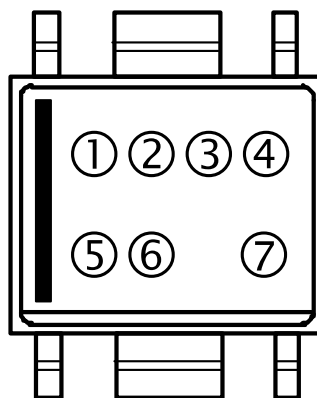
**PACKAGE DIMENSIONS (HSOP-6J)**



**HSOP-6J Package Dimensions**

**MARK SPECIFICATION (HSOP-6J)**

- ①②③④: Product Code ... **Refer to R8150S MARK SPECIFICATION TABLE**
- ⑤⑥: Lot Number ... Alphanumeric Serial Number
- ⑦: Lot Sub Number ... Alphanumeric Serial Number



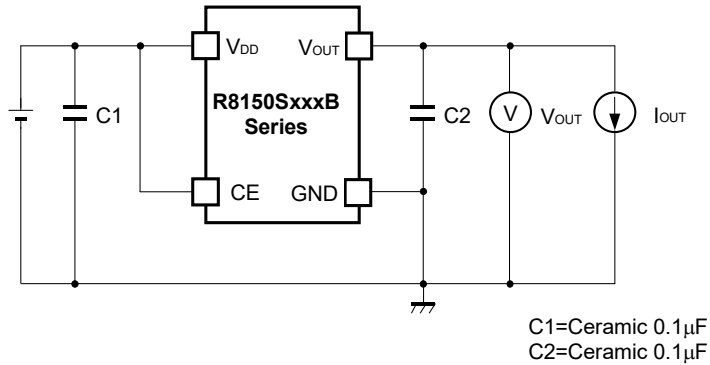
**HSOP-6J Mark Specification**

## R8150S MARK SPECIFICATION TABLE (HSOP-6J)

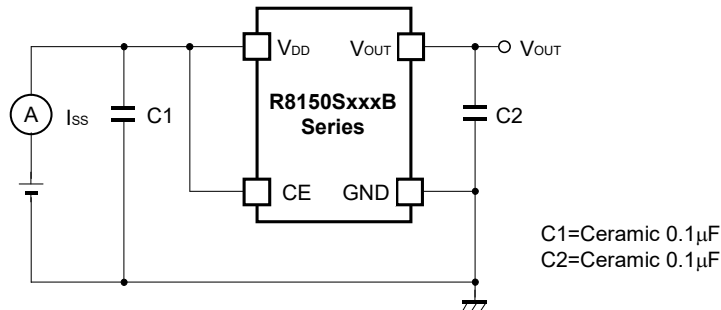
## R8150SxxxB

Product Name	① ② ③ ④	V <sub>SET</sub>	Product Name	① ② ③ ④	V <sub>SET</sub>
R8150S020B	J 0 2 0	2.0 V	R8150S070B	J 0 7 0	7.0 V
R8150S021B	J 0 2 1	2.1 V	R8150S071B	J 0 7 1	7.1 V
R8150S022B	J 0 2 2	2.2 V	R8150S072B	J 0 7 2	7.2 V
R8150S023B	J 0 2 3	2.3 V	R8150S073B	J 0 7 3	7.3 V
R8150S024B	J 0 2 4	2.4 V	R8150S074B	J 0 7 4	7.4 V
R8150S025B	J 0 2 5	2.5 V	R8150S075B	J 0 7 5	7.5 V
R8150S026B	J 0 2 6	2.6 V	R8150S076B	J 0 7 6	7.6 V
R8150S027B	J 0 2 7	2.7 V	R8150S077B	J 0 7 7	7.7 V
R8150S028B	J 0 2 8	2.8 V	R8150S078B	J 0 7 8	7.8 V
R8150S029B	J 0 2 9	2.9 V	R8150S079B	J 0 7 9	7.9 V
R8150S030B	J 0 3 0	3.0 V	R8150S080B	J 0 8 0	8.0 V
R8150S031B	J 0 3 1	3.1 V	R8150S081B	J 0 8 1	8.1 V
R8150S032B	J 0 3 2	3.2 V	R8150S082B	J 0 8 2	8.2 V
R8150S033B	J 0 3 3	3.3 V	R8150S083B	J 0 8 3	8.3 V
R8150S034B	J 0 3 4	3.4 V	R8150S084B	J 0 8 4	8.4 V
R8150S035B	J 0 3 5	3.5 V	R8150S085B	J 0 8 5	8.5 V
R8150S036B	J 0 3 6	3.6 V	R8150S086B	J 0 8 6	8.6 V
R8150S037B	J 0 3 7	3.7 V	R8150S087B	J 0 8 7	8.7 V
R8150S038B	J 0 3 8	3.8 V	R8150S088B	J 0 8 8	8.8 V
R8150S039B	J 0 3 9	3.9 V	R8150S089B	J 0 8 9	8.9 V
R8150S040B	J 0 4 0	4.0 V	R8150S090B	J 0 9 0	9.0 V
R8150S041B	J 0 4 1	4.1 V	R8150S091B	J 0 9 1	9.1 V
R8150S042B	J 0 4 2	4.2 V	R8150S092B	J 0 9 2	9.2 V
R8150S043B	J 0 4 3	4.3 V	R8150S093B	J 0 9 3	9.3 V
R8150S044B	J 0 4 4	4.4 V	R8150S094B	J 0 9 4	9.4 V
R8150S045B	J 0 4 5	4.5 V	R8150S095B	J 0 9 5	9.5 V
R8150S046B	J 0 4 6	4.6 V	R8150S096B	J 0 9 6	9.6 V
R8150S047B	J 0 4 7	4.7 V	R8150S097B	J 0 9 7	9.7 V
R8150S048B	J 0 4 8	4.8 V	R8150S098B	J 0 9 8	9.8 V
R8150S049B	J 0 4 9	4.9 V	R8150S099B	J 0 9 9	9.9 V
R8150S050B	J 0 5 0	5.0 V	R8150S100B	J 1 0 0	10.0 V
R8150S051B	J 0 5 1	5.1 V	R8150S101B	J 1 0 1	10.1 V
R8150S052B	J 0 5 2	5.2 V	R8150S102B	J 1 0 2	10.2 V
R8150S053B	J 0 5 3	5.3 V	R8150S103B	J 1 0 3	10.3 V
R8150S054B	J 0 5 4	5.4 V	R8150S104B	J 1 0 4	10.4 V
R8150S055B	J 0 5 5	5.5 V	R8150S105B	J 1 0 5	10.5 V
R8150S056B	J 0 5 6	5.6 V	R8150S106B	J 1 0 6	10.6 V
R8150S057B	J 0 5 7	5.7 V	R8150S107B	J 1 0 7	10.7 V
R8150S058B	J 0 5 8	5.8 V	R8150S108B	J 1 0 8	10.8 V
R8150S059B	J 0 5 9	5.9 V	R8150S109B	J 1 0 9	10.9 V
R8150S060B	J 0 6 0	6.0 V	R8150S110B	J 1 1 0	11.0 V
R8150S061B	J 0 6 1	6.1 V	R8150S111B	J 1 1 1	11.1 V
R8150S062B	J 0 6 2	6.2 V	R8150S112B	J 1 1 2	11.2 V
R8150S063B	J 0 6 3	6.3 V	R8150S113B	J 1 1 3	11.3 V
R8150S064B	J 0 6 4	6.4 V	R8150S114B	J 1 1 4	11.4 V
R8150S065B	J 0 6 5	6.5 V	R8150S115B	J 1 1 5	11.5 V
R8150S066B	J 0 6 6	6.6 V	R8150S116B	J 1 1 6	11.6 V
R8150S067B	J 0 6 7	6.7 V	R8150S117B	J 1 1 7	11.7 V
R8150S068B	J 0 6 8	6.8 V	R8150S118B	J 1 1 8	11.8 V
R8150S069B	J 0 6 9	6.9 V	R8150S119B	J 1 1 9	11.9 V
			R8150S120B	J 1 2 0	12.0 V

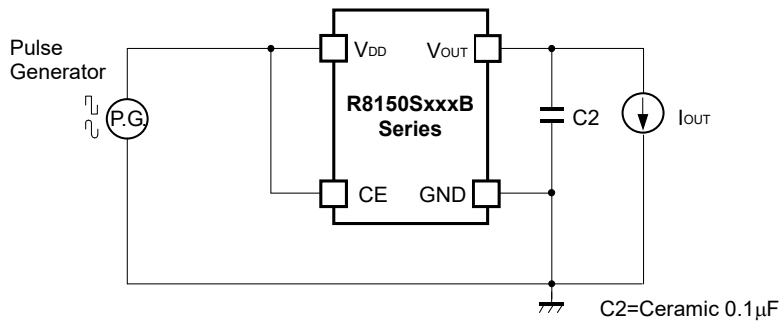
TEST CIRCUITS



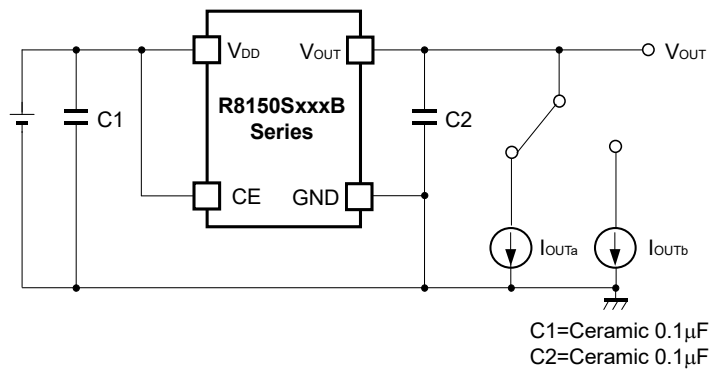
Basic Test Circuit



Test Circuit for Supply Current



Test Circuit for Line Transient Response



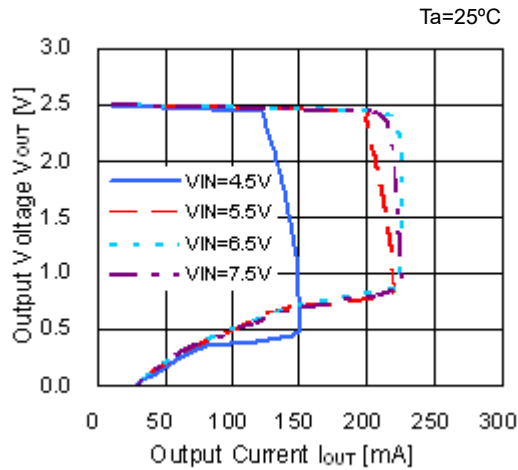
Test Circuit for Load Transient Response

## TYPICAL CHARACTERISTICS

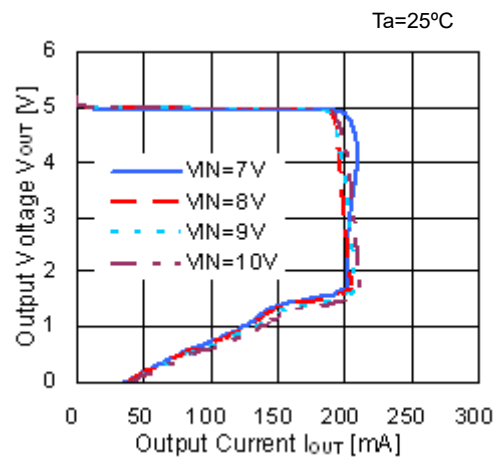
Note: Typical Characteristics are intended to be used as reference data; they are not guaranteed.

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

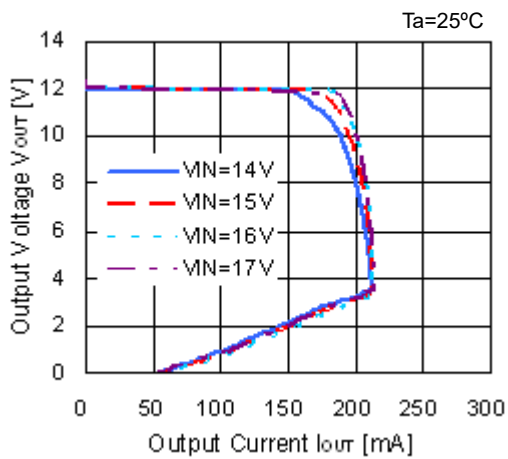
R8150S025B



R8150S050B

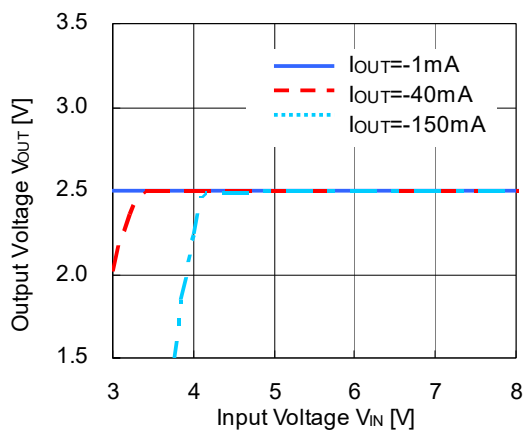


R8150S120B

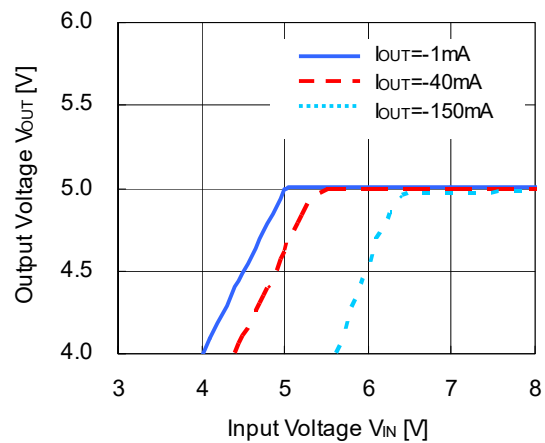


### 2) Output Voltage vs. Input Voltage (Ta=25°C)

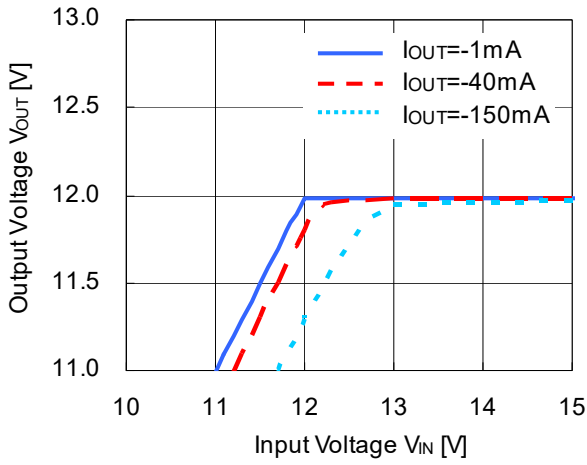
R8150S025B



R8150S050B

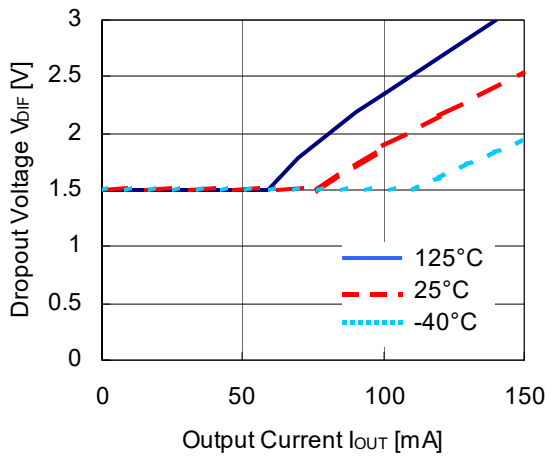


**R8150S120B**

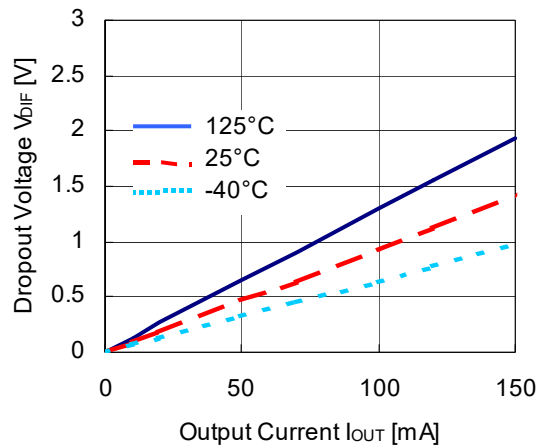


**3) Dropout Voltage vs. Output Current**

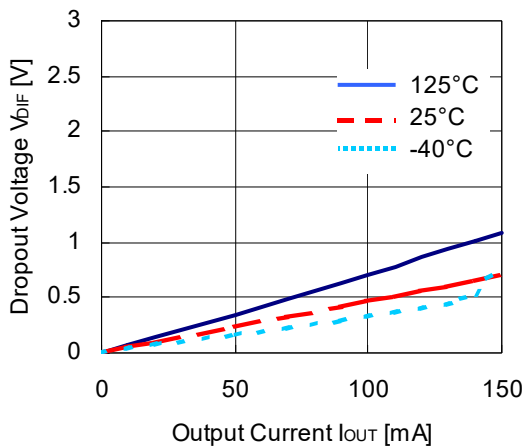
**R8150S025B**



**R8150S050B**



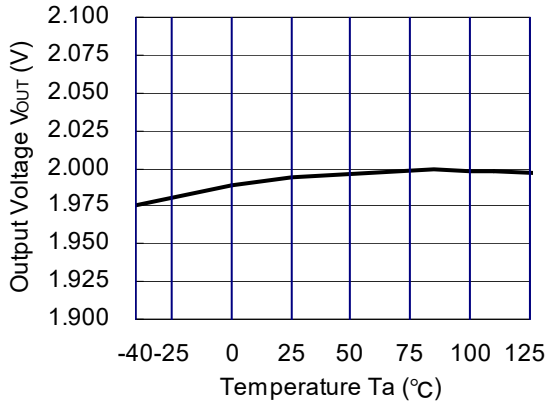
**R8150S120B**



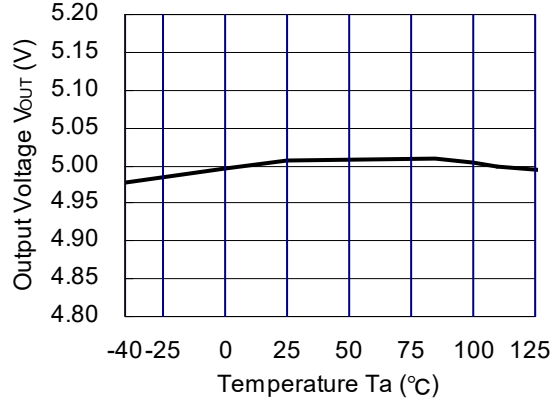


4) Output Voltage vs. Ambient Temperature

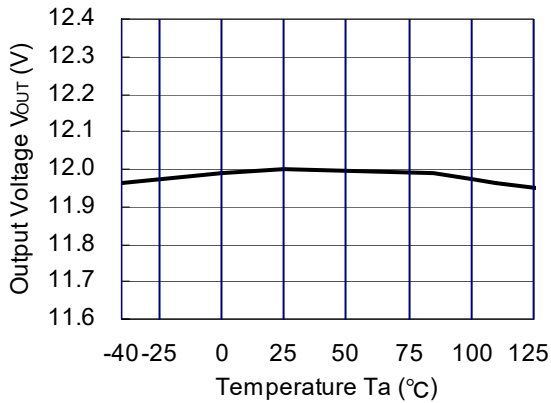
R8150S020B



R8150S050B

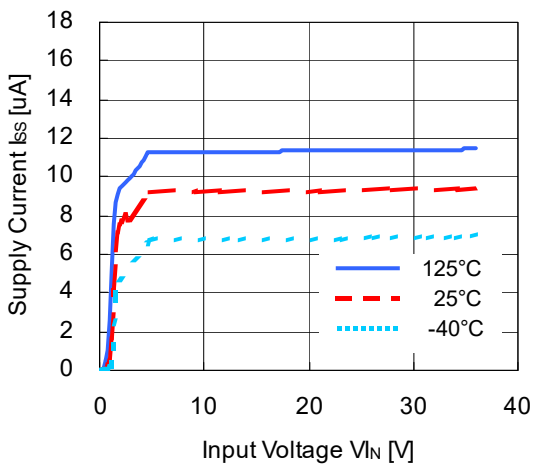


R8150S120B

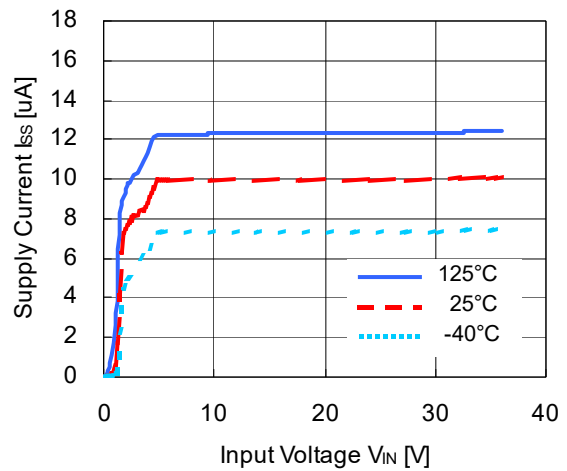


5) Supply Current vs. Input Voltage (Ta=25°C)

R8150S025B



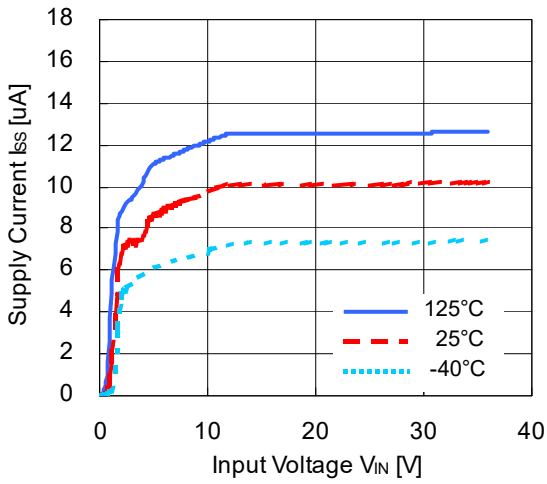
R8150S050B



# R8150SxxxB

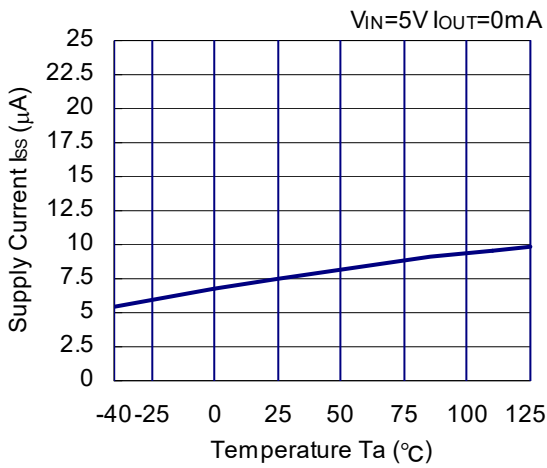
NO.EC-222-180510

## R8150S120B

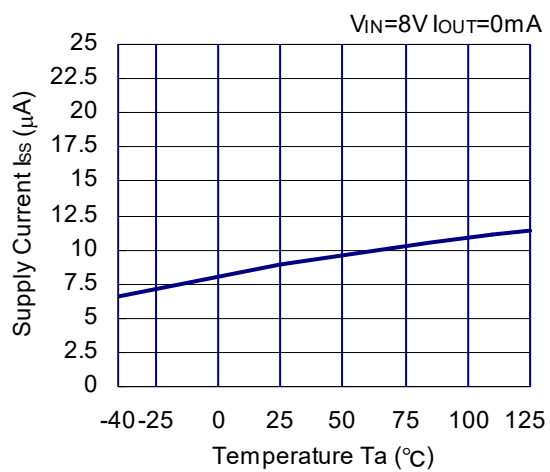


## 6) Supply Current vs. Ambient Temperature

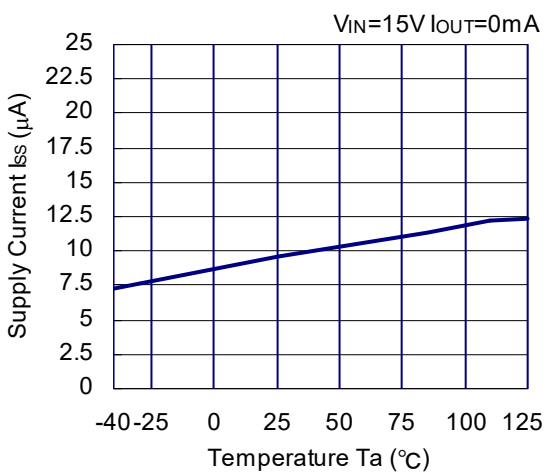
### R8150S020B



### R8150S050B

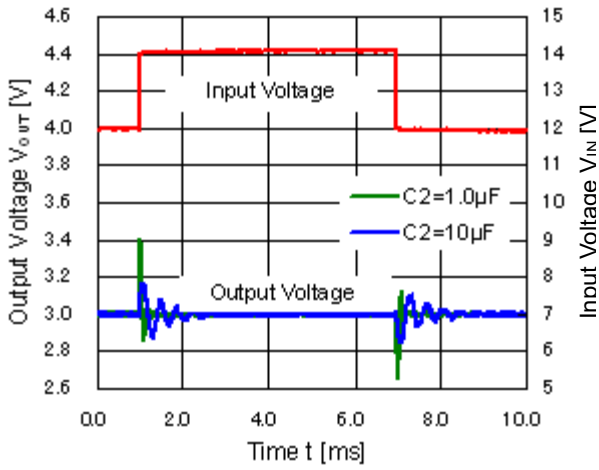


### R8150S120B

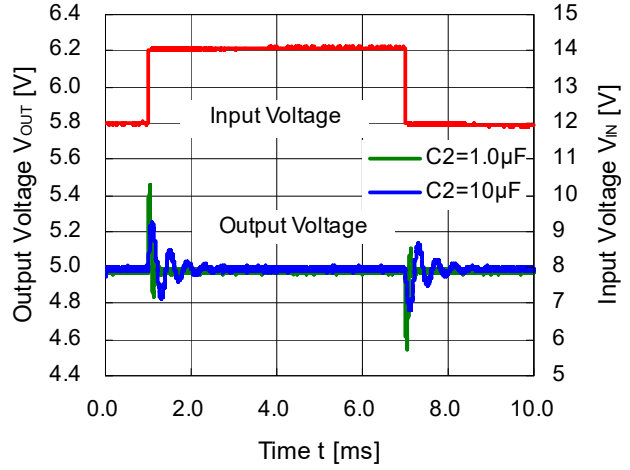


7) Input Transient Response

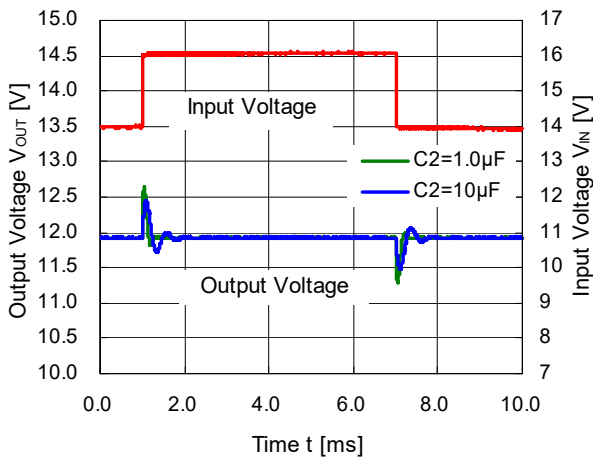
R8150S030B



R8150S050B

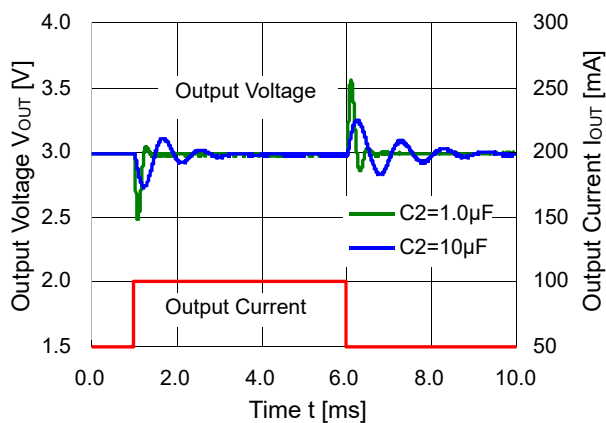


R8150S120B

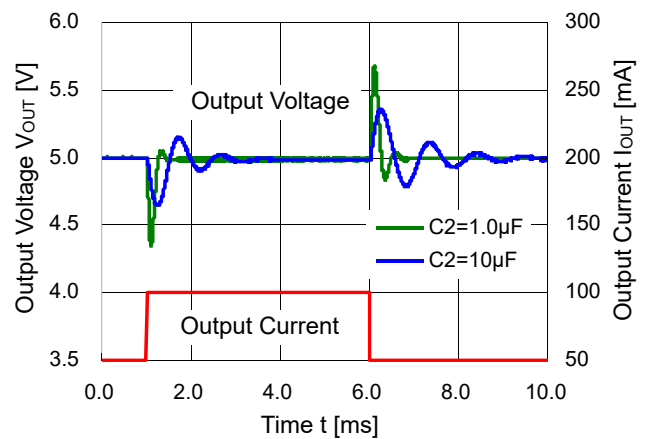


8) Load Transient Response ( $V_{IN}=14V$ ,  $T_a=25^{\circ}C$ )

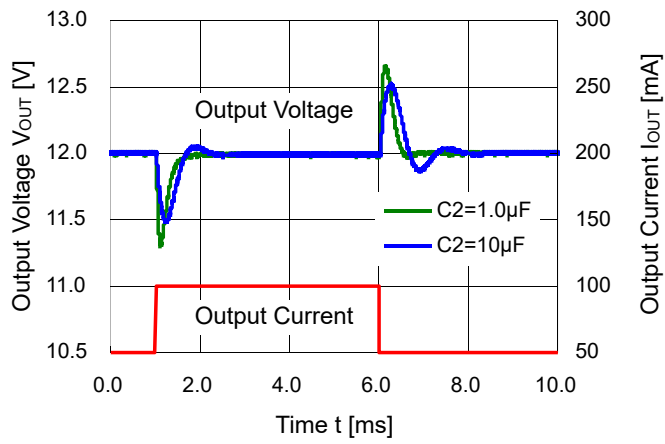
R8150S030B



R8150S050B



R8150S120B





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