

300mA SMALL DUAL LDO REGULATOR

NO. EA-202-141010

OUTLINE

The RP154x Series are CMOS-based voltage regulator ICs that provide high ripple rejection, low dropout voltage, high output voltage accuracy, and low supply current. The RP154x Series consist of a voltage reference unit, an error amplifier, resistors for setting output voltage, a short current limit circuit, and a chip enable circuit.

The RP154x Series are available in fixed output voltage options. Besides the low supply current by CMOS, the RP154x Series present a low dropout voltage by built-in low ON resistance $r_{DS(on)}$ and an extended battery life by a chip enable function. Compared with the existing CMOS-based regulator ICs, the RP154x Series are further improved in ripple rejection, line transient response, and load transient response. All these features allow the RP154x Series to become ideal power sources for hand-held communication equipments.

The RP154x Series are available in two types of packages: SOT-23-6 and DFN1216-8 package with 2 LDOs on board that achieves high-density mounting.

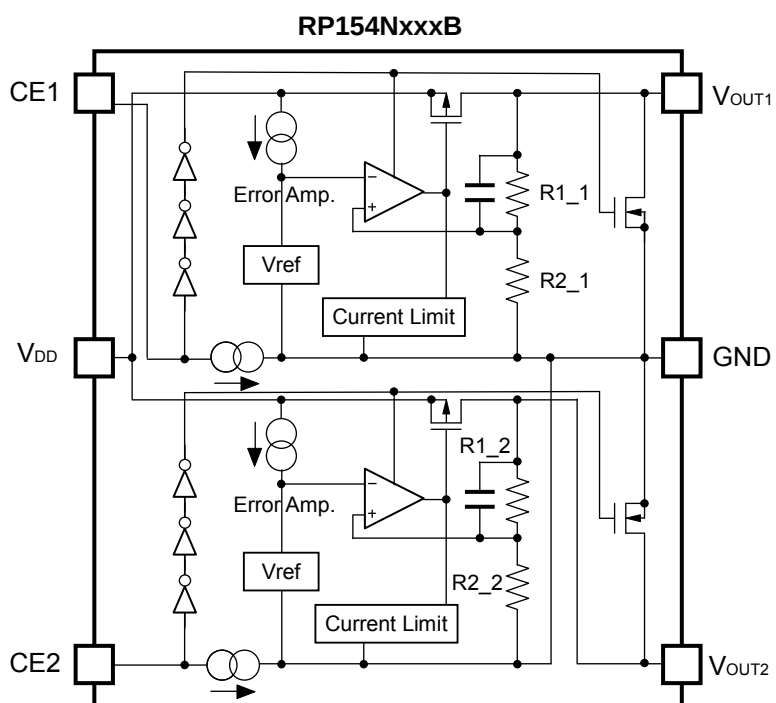
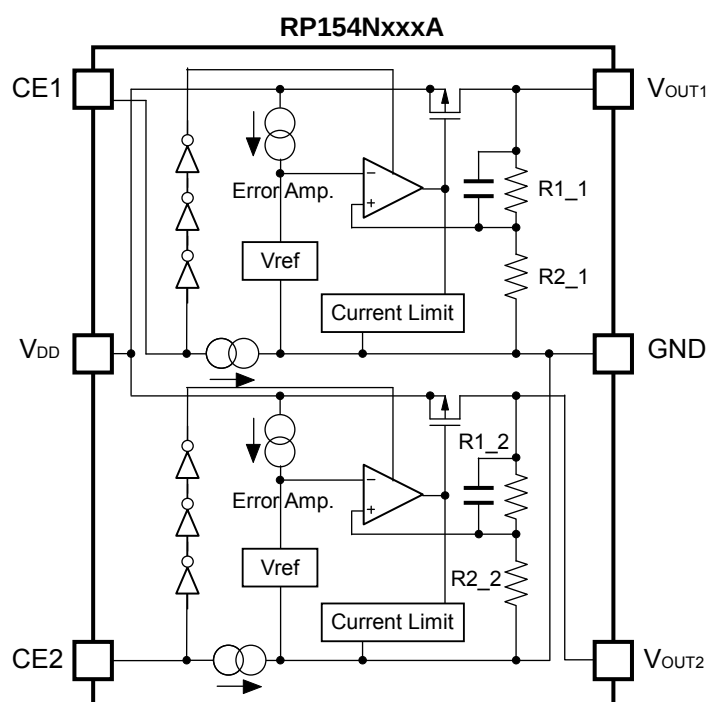
FEATURES

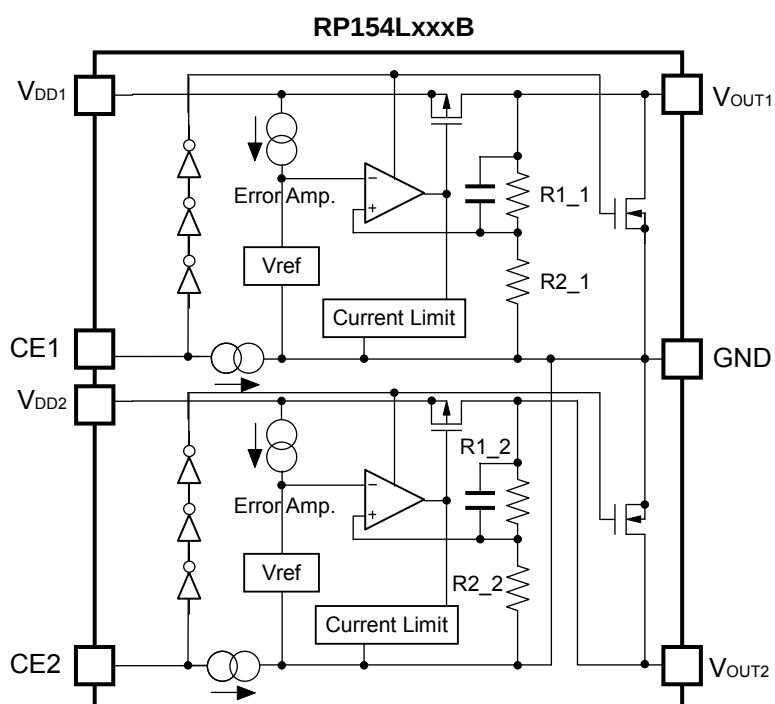
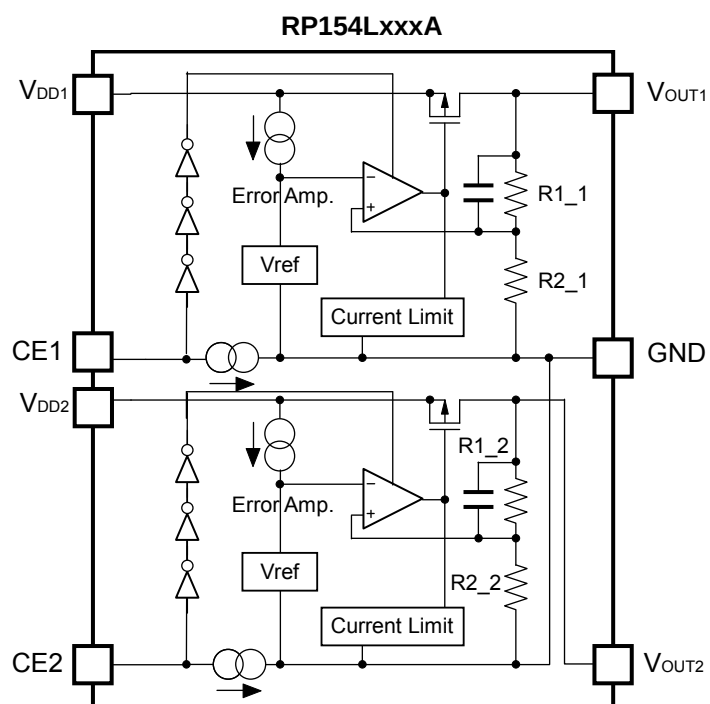
- Supply Current Typ. $50\mu\text{A} \times 2$ (V_{R1} & V_{R2})
- Standby Current Typ. $0.1\mu\text{A} \times 2$ (V_{R1} & V_{R2})
- Input Voltage Range 1.4V to 5.25V
- Output Voltage Range 0.8V to 3.7V (0.1V steps)
(For details, please refer to *MARK SPECIFICATION TABLE*)
- Output Voltage Accuracy $\pm 1.0\%$ ($V_{SET} > 2.0\text{V}$, $T_{opt} = 25^\circ\text{C}$)
- Temperature-Drift Coefficient of Output Voltage Typ. $\pm 80\text{ppm}/^\circ\text{C}$
- Dropout Voltage Typ. 0.25V ($I_{OUT} = 300\text{mA}$, $V_{SET} = 2.5\text{V}$)
- Ripple Rejection Typ. 75dB ($f = 1\text{kHz}$)
- Line Regulation Typ. 0.02%/V
- Packages DFN1216-8, SOT-23-6
- Built-in Fold Back Protection Circuit Typ. 60mA (Current at short mode)
- Ceramic capacitors are recommended to be used with this IC ... 1.0 μF or more

APPLICATIONS

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

BLOCK DIAGRAMS





SELECTION GUIDE

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

Product Name	Package	Quantity per Reel	Pb Free	Halogen Free
RP154Lxxx*-E2	DFN1216-8	5,000 pcs	Yes	Yes
RP154Nxxx*-TR-FE	SOT-23-6	3,000 pcs	Yes	Yes

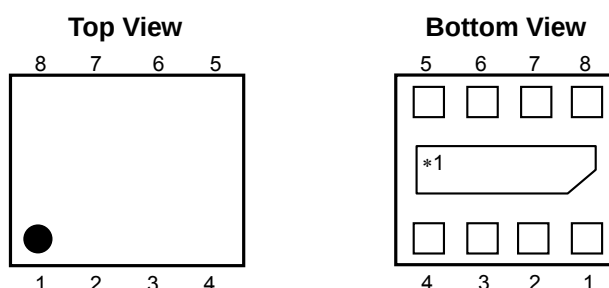
xxx: The combination of set output voltage for each channel can be designated by serial numbers (from 001).
The set output voltage for each channel can be set in the range from 0.8V to 3.7V in 0.1V steps.
(For details, please refer to *MARK SPECIFICATION TABLE*).

* : The auto discharge function at off state are options as follows.
(A) without auto-discharge function at off state, "H" Active
(B) with auto-discharge function at off state, "H" Active

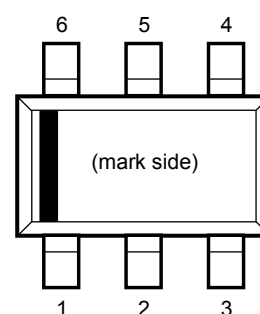
Auto-discharge function quickly lowers the output voltage to 0 V by releasing the electrical charge accumulated in the external capacitor when the chip enable signal is switched from the active mode to the standby mode.

PIN CONFIGURATIONS

• DFN1216-8



• SOT-23-6



PIN DESCRIPTIONS

• DFN1216-8

Pin No.	Symbol	Description
1	GND	Ground Pin*2
2	V_{OUT1}	Output Pin 1
3	V_{OUT2}	Output Pin 2
4	GND	Ground Pin*2
5	CE2	Chip Enable Pin 2 ("H" Active)
6	V_{DD2}	Input Pin
7	V_{DD1}	Input Pin
8	CE1	Chip Enable Pin 1 ("H" Active)

*1) Tab is GND level. (They are connected to the reverse side of this IC).

The tab is better to be connected to the GND, but leaving it open is also acceptable.

*2) The GND pin must be wired together when it is mounted on board.

• SOT-23-6

Pin No.	Symbol	Description
1	CE1	Chip Enable Pin 1 ("H" Active)
2	V_{DD}	Input Pin
3	CE2	Chip Enable Pin 2 ("H" Active)
4	V_{OUT2}	Output Pin 2
5	GND	Ground Pin
6	V_{OUT1}	Output Pin 1

ABSOLUTE MAXIMUM RATINGS

Symbol	Item	Rating	Unit
V_{IN}	Input Voltage	6.0	V
V_{CE}	Input Voltage (CE Pin)	-0.3 to 6.0	V
V_{OUT1}, V_{OUT2}	Output Voltage	-0.3 to $V_{IN}+0.3$	V
I_{OUT1}, I_{OUT2}	Output Current	400	mA
P_D	Power Dissipation (DFN1216-8)*	625	mW
	Power Dissipation (SOT-23-6)*	420	
T_{opt}	Operating Temperature Range	-40 to 85	°C
T_{stg}	Storage Temperature Range	-55 to 125	°C

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

ABSOLUTE MAXIMUM RATINGS

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

ELECTRICAL CHARACTERISTICS

• RP154x

$V_{IN}=V_{SET}+1.0V$ ($V_{SET} > 1.5V$), $V_{IN}=2.5V$ ($V_{SET} \leq 1.5V$), $I_{OUT}=1mA$, $C_{IN}=C_{OUT}=1.0\mu F$, unless otherwise noted.

V_{SET} is Set Output Voltage.

The specification in is checked and guaranteed by design engineering at $-40^{\circ}C \leq T_{opt} \leq 85^{\circ}C$.

VR1/VR2

$T_{opt}=25^{\circ}C$

Symbol	Item	Conditions	Min.	Typ.	Max.	Unit
V_{OUT}	Output Voltage	$T_{opt}=25^{\circ}C$	$V_{SET} > 2.0V$	$\times 0.99$	$\times 1.01$	V
			$V_{SET} \leq 2.0V$	-20	+20	mV
		$-40^{\circ}C \leq T_{opt} \leq 85^{\circ}C$	$V_{SET} > 2.0V$	$\times 0.97$	$\times 1.03$	V
			$V_{SET} \leq 2.0V$	-60	+60	mV
I_{OUT}	Output Current		300			mA
$\Delta V_{OUT}/\Delta I_{OUT}$	Load Regulation	$1mA \leq I_{OUT} \leq 300mA$		15	40	mV
V_{DIF}	Dropout Voltage	Refer to the following table.				
I_{SS}	Supply Current	$I_{OUT}=0mA$		50	75	μA
$I_{standby}$	Standby Current	$V_{CE}=0V$		0.1	1.0	μA
$\Delta V_{OUT}/\Delta V_{IN}$	Line Regulation	$V_{SET}+0.5V \leq V_{IN} \leq 5.25V$ ($V_{IN} \geq 1.4V$)		0.02	0.10	%/V
RR	Ripple Rejection	$f=1kHz$, Ripple 0.2Vp-p $V_{IN}=V_{SET}+1V$, $I_{OUT}=30mA$ (In case that $V_{SET} \leq 2.0V$, $V_{IN}=3V$)		75		dB
V_{IN}	Input Voltage*		1.40		5.25	V
$\Delta V_{OUT}/\Delta T_{opt}$	Output Voltage Temperature Coefficient	$-40^{\circ}C \leq T_{opt} \leq 85^{\circ}C$		± 80		ppm/ $^{\circ}C$
I_{SC}	Short Current Limit	$V_{OUT}=0V$		60		mA
I_{PD}	CE Pull-down Current			0.3	0.6	μA
V_{CEH}	CE Input Voltage "H"		1.0			V
V_{CEL}	CE Input Voltage "L"				0.4	V
en	Output Noise	BW=10Hz to 100kHz		75		μV_{rms}
R_{LOW}	Low Output Nch Tr. ON Resistance (of B version)	$V_{IN}=4.0V$, $V_{CE}=0V$		50		Ω

*) The maximum Input Voltage of the ELECTRICAL CHARACTERISTICS is 5.25V. In case of exceeding this specification, the IC must be operated on condition that the Input Voltage is up to 5.5V and the total operating time is within 500hrs.

All of unit are tested and specified under load conditions such that $T_j \approx T_{opt}=25^{\circ}C$ except for Output Noise, Ripple Rejection, Output Voltage Temperature Coefficient and Thermal Shutdown.

RECOMMENDED OPERATING CONDITIONS (ELECTRICAL CHARACTERISTICS)

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

Dropout Voltage by Set Output Voltage

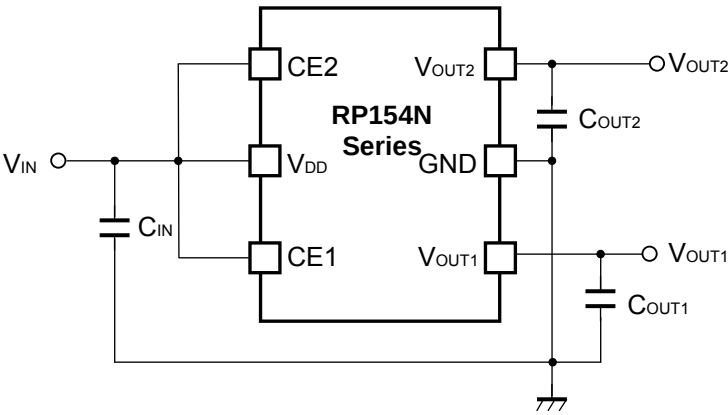
T_{opt}=25°C

Set Output Voltage V _{SET} (V)	Dropout Voltage V _{DIF} (V)		
	Condition	Typ.	Max.
V _{SET} =0.8	I _{OUT} =300mA	0.56	0.72
V _{SET} =0.9		0.51	0.65
1.0 ≤ V _{SET} < 1.2		0.46	0.59
1.2 ≤ V _{SET} < 1.4		0.39	0.50
1.4 ≤ V _{SET} < 1.7		0.35	0.44
1.7 ≤ V _{SET} < 2.1		0.30	0.39
2.1 ≤ V _{SET} < 2.5		0.26	0.34
2.5 ≤ V _{SET} < 3.0		0.25	0.30
3.0 ≤ V _{SET} ≤ 3.7		0.22	0.29

The specification in is checked and guaranteed by design engineering at -40°C ≤ T_{opt} ≤ 85°C.

TYPICAL APPLICATIONS

RP154NxxxA/B

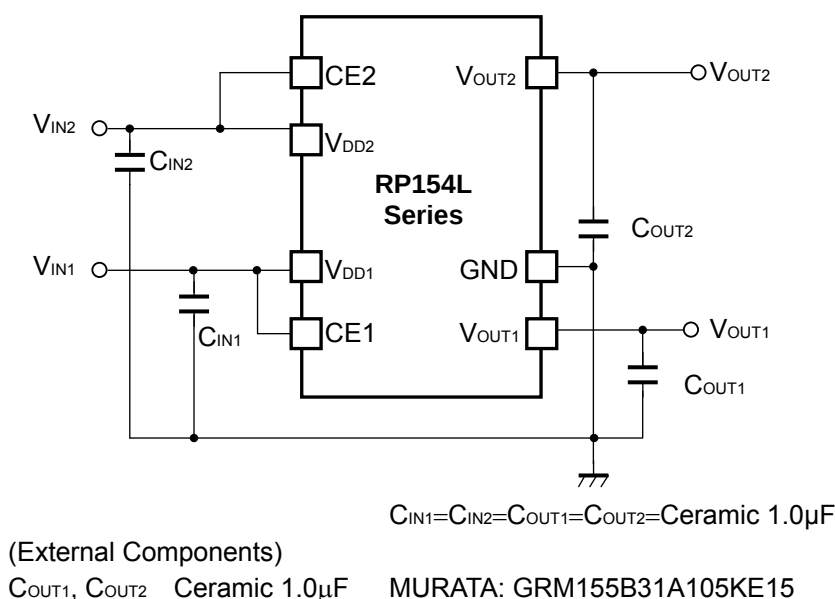


C_{IN}=C_{OUT1}=C_{OUT2}=Ceramic 1.0μF

(External Components)

C_{OUT1}, C_{OUT2} Ceramic 1.0μF MURATA: GRM155B31A105KE15

• RP154LxxxA/B



TECHNICAL NOTES

When using these ICs, consider the following points:

Phase Compensation

In these ICs, phase compensation is made for securing stable operation even if the load current is varied.

For this purpose, use capacitors (1.0 μ F or more) for C_{OUT1} and C_{OUT2} with good frequency characteristics and ESR (Equivalent Series Resistance).

Note: If additional ceramic capacitors are connected with parallel to the output pin with an output capacitor for phase compensation, the operation might be unstable. Because of this, test these ICs with as same external components as ones to be used on the PCB. If the tantalum capacitor is used and its ESR (equivalent series resistance) is too large, the output may be unstable, therefore, fully evaluation is necessary.

PCB Layout

Make V_{DD} and GND lines sufficient. If their impedance is high, noise pickup or unstable operation may result. Connect capacitors with a capacitance value as much as 1.0 μ F or more between V_{DD} and GND pin, and as close as possible to the pins (C_{IN1}/C_{IN2}).

Set external components, especially the output capacitors, as close as possible to the ICs, and make wiring as short as possible (C_{OUT1}/C_{OUT2}).

PACKAGE INFORMATION

Power Dissipation (DFN1216-8)

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:

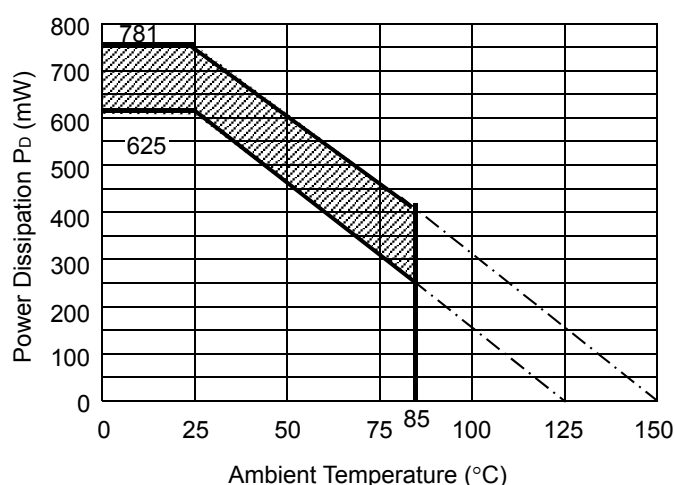
Measurement Conditions

	Standard Land Pattern
Environment	Mounting on Board (Wind velocity=0m/s)
Board Material	Glass cloth epoxy plastic (Double sided)
Board Dimensions	40mm × 40mm × 1.6mm
Copper Ratio	Top side : Approx. 50% , Back side : Approx. 50%
Through-holes	φ0.5mm × 28pcs

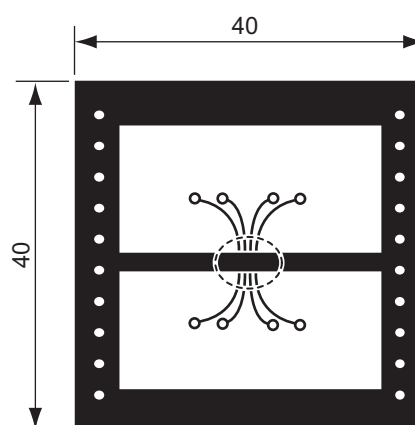
Measurement Results

 (T_{opt}=25°C, T_{jmax}=125°C)

	Standard Land Pattern
Power Dissipation	625mW
Thermal Resistance	$\theta_{ja} = (125 - 25^\circ\text{C}) / 0.625\text{W} = 160^\circ\text{C/W}$
Thermal Resistance	$\theta_{jc} = 26^\circ\text{C/W}$



Power Dissipation



Measurement Board Pattern

○ IC Mount Area (Unit: mm)

The above graph shows the Power Dissipation of the package based on T_{jmax}=125°C and T_{jmax}=150°C. Operating the IC in the shaded area in the graph might have an influence it's lifetime.

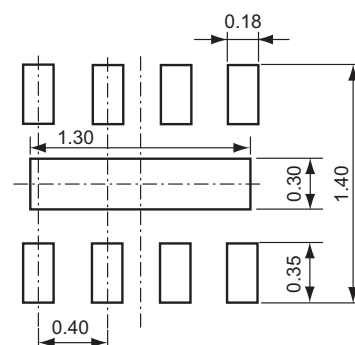
Operating time must be within the time limit described in the table below, in case of operating in the shaded area.

Operating time	Estimated years*
13,000hrs	9 years

*The volume is calculated on the supposition that operating four hours/day.

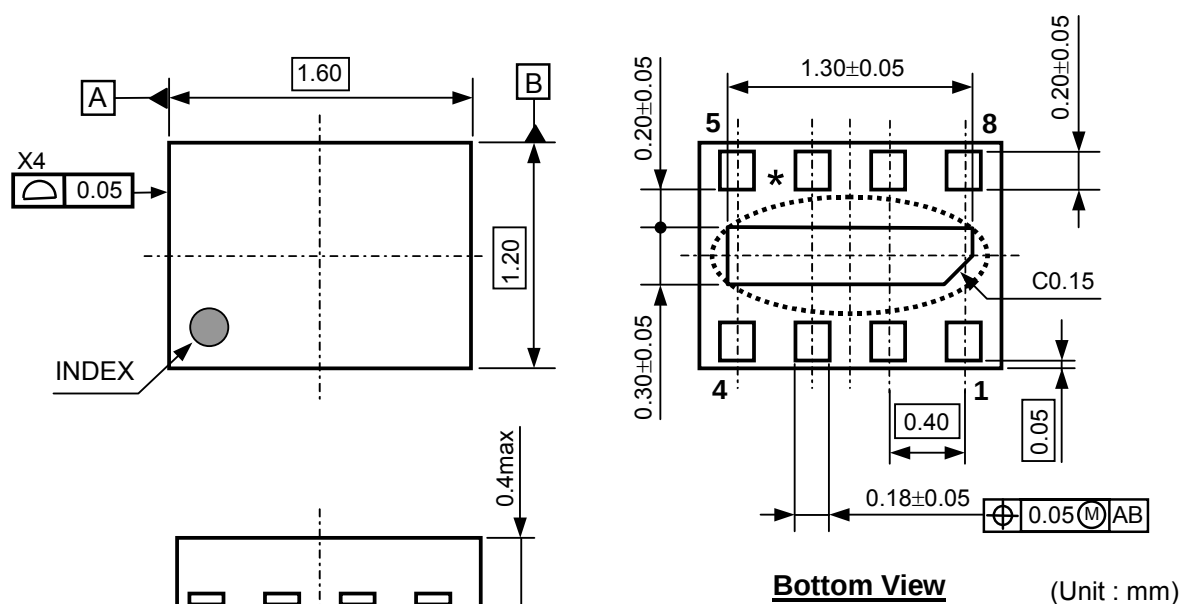
(Unit: mm)

RECOMMENDED LAND PATTERN



(Unit: mm)

PACKAGE DIMENSIONS (DFN1216-8)



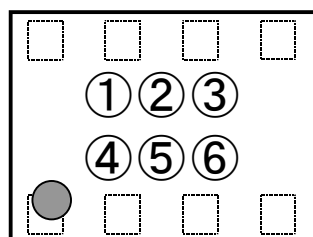
★ The exposed tab is substrate level (GND).
It is recommended that the exposed tab be connected to the ground plane on the board or otherwise be left open.
The GND pins must be wired together when mouting on the board.

DFN1216-8 Package Dimensions

MARK SPECIFICATION (DFN1216-8)

①②③④: Product Code ... Refer to MARK SPECIFICATION TABLE (DFN1216-8)

⑤⑥: Lot Number ... Alphanumeric Serial Number



DFN1216-8 Mark Specification

RP154x

NO. EA-202-141010

MARK SPECIFICATION TABLE (DFN1216-8)**RP154LxxxxA**

Product Name	①②③④	V _{SET}	
		VR1	VR2
RP154L001A	BM 01	2.8V	2.8V
RP154L002A	BM 02	1.8V	2.8V
RP154L003A	BM 03	1.5V	2.8V
RP154L004A	BM 04	1.2V	1.8V
RP154L005A	BM 05	3.3V	1.2V
RP154L006A	BM 06	3.3V	1.8V
RP154L007A	BM 07	2.85V	2.85V
RP154L008A	BM 08	2.85V	2.6V
RP154L009A	BM 09	3.0V	2.8V
RP154L010A	BM 10	3.0V	1.8V
RP154L011A	BM 11	1.8V	1.5V
RP154L012A	BM 12	2.8V	2.6V
RP154L013A	BM 13	3.3V	2.8V
RP154L014A	BM 14	3.3V	3.3V
RP154L015A	BM 15	1.5V	2.5V
RP154L016A	BM 16	1.5V	3.0V
RP154L017A	BM 17	2.5V	3.0V
RP154L018A	BM 18	1.8V	1.8V
RP154L019A	BM 19	1.5V	2.6V
RP154L020A	BM 20	2.8V	1.8V
RP154L021A	BM 21	1.2V	2.8V
RP154L022A	BM 22	2.8V	1.2V
RP154L023A	BM 23	2.5V	2.5V
RP154L024A	BM 24	3.3V	3.0V
RP154L025A	BM 25	3.0V	3.0V
RP154L026A	BM 26	2.8V	3.1V
RP154L027A	BM 27	2.3V	2.8V
RP154L028A	BM 28	2.8V	1.0V
RP154L029A	BM 29	1.5V	1.5V
RP154L030A	BM 30	1.2V	2.9V
RP154L031A	BM 31	2.65V	2.85V
RP154L032A	BM 32	3.3V	2.85V
RP154L033A	BM 33	1.8V	2.9V
RP154L034A	BM 34	3.1V	3.1V
RP154L035A	BM 35	2.8V	2.7V
RP154L036A	BM 36	1.0V	1.8V
RP154L037A	BM 37	1.2V	2.5V
RP154L038A	BM 38	1.7V	3.1V
RP154L039A	BM 39	1.8V	2.5V
RP154L040A	BM 40	1.5V	1.8V
RP154L041A	BM 41	1.8V	2.7V
RP154L042A	BM 42	2.7V	2.7V
RP154L043A	BM 43	2.9V	2.9V
RP154L044A	BM 44	1.7V	3.0V
RP154L045A	BM 45	1.75V	3.0V
RP154L046A	BM 46	3.0V	3.1V
RP154L047A	BM 47	1.75V	3.1V
RP154L048A	BM 48	1.8V	3.1V
RP154L049A	BM 49	2.5V	3.1V
RP154L050A	BM 50	3.1V	3.3V
RP154L051A	BM 51	3.6V	3.6V
RP154L052A	BM 52	1.8V	3.0V
RP154L053A	BM 53	2.85V	3.1V
RP154L054A	BM 54	1.2V	1.2V
RP154L055A	BM 55	3.7V	3.7V
RP154L056A	BM 56	1.1V	1.8V
RP154L057A	BM 57	1.1V	1.2V
RP154L058A	BM 58	1.0V	3.3V

RP154LxxxxB

Product Name	①②③④	V _{SET}	
		VR1	VR2
RP154L001B	BN 01	2.8V	2.8V
RP154L002B	BN 02	1.8V	2.8V
RP154L003B	BN 03	1.5V	2.8V
RP154L004B	BN 04	1.2V	1.8V
RP154L005B	BN 05	3.3V	1.2V
RP154L006B	BN 06	3.3V	1.8V
RP154L007B	BN 07	2.85V	2.85V
RP154L008B	BN 08	2.85V	2.6V
RP154L009B	BN 09	3.0V	2.8V
RP154L010B	BN 10	3.0V	1.8V
RP154L011B	BN 11	1.8V	1.5V
RP154L012B	BN 12	2.8V	2.6V
RP154L013B	BN 13	3.3V	2.8V
RP154L014B	BN 14	3.3V	3.3V
RP154L015B	BN 15	1.5V	2.5V
RP154L016B	BN 16	1.5V	3.0V
RP154L017B	BN 17	2.5V	3.0V
RP154L018B	BN 18	1.8V	1.8V
RP154L019B	BN 19	1.5V	2.6V
RP154L020B	BN 20	2.8V	1.8V
RP154L021B	BN 21	1.2V	2.8V
RP154L022B	BN 22	2.8V	1.2V
RP154L023B	BN 23	2.5V	2.5V
RP154L024B	BN 24	3.3V	3.0V
RP154L025B	BN 25	3.0V	3.0V
RP154L026B	BN 26	2.8V	3.1V
RP154L027B	BN 27	2.3V	2.8V
RP154L028B	BN 28	2.8V	1.0V
RP154L029B	BN 29	1.5V	1.5V
RP154L030B	BN 30	1.2V	2.9V
RP154L031B	BN 31	2.65V	2.85V
RP154L032B	BN 32	3.3V	2.85V
RP154L033B	BN 33	1.8V	2.9V
RP154L034B	BN 34	3.1V	3.1V
RP154L035B	BN 35	2.8V	2.7V
RP154L036B	BN 36	1.0V	1.8V
RP154L037B	BN 37	1.2V	2.5V
RP154L038B	BN 38	1.7V	3.1V
RP154L039B	BN 39	1.8V	2.5V
RP154L040B	BN 40	1.5V	1.8V
RP154L041B	BN 41	1.8V	2.7V
RP154L042B	BN 42	2.7V	2.7V
RP154L043B	BN 43	2.9V	2.9V
RP154L044B	BN 44	1.7V	3.0V
RP154L045B	BN 45	1.75V	3.0V
RP154L046B	BN 46	3.0V	3.1V
RP154L047B	BN 47	1.75V	3.1V
RP154L048B	BN 48	1.8V	3.1V
RP154L049B	BN 49	2.5V	3.1V
RP154L050B	BN 50	3.1V	3.3V
RP154L051B	BN 51	3.6V	3.6V
RP154L052B	BN 52	1.8V	3.0V
RP154L053B	BN 53	2.85V	3.1V
RP154L054B	BN 54	1.2V	1.2V
RP154L055B	BN 55	3.7V	3.7V
RP154L056B	BN 56	1.1V	1.8V
RP154L057B	BN 57	1.1V	1.2V
RP154L058B	BN 58	1.0V	3.3V

Power Dissipation (SOT-23-6)

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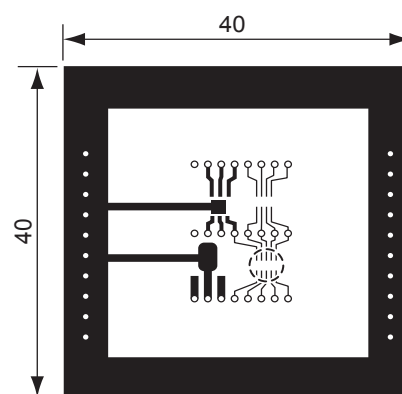
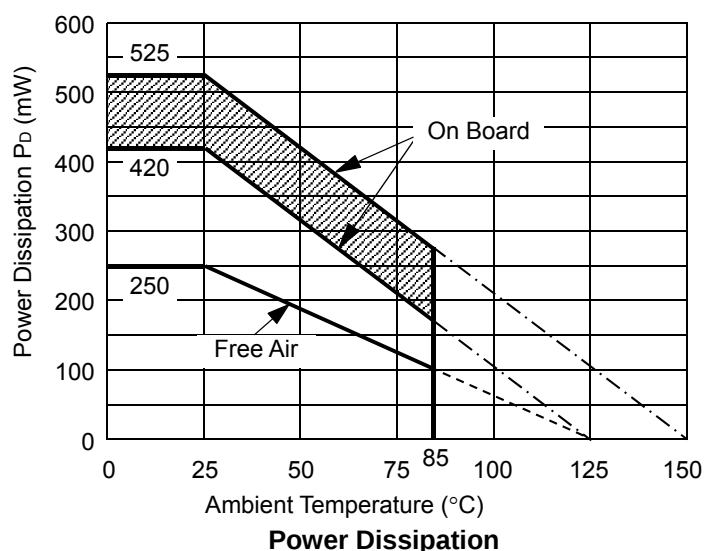
Measurement Conditions

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

Measurement Results

($T_{opt}=25^{\circ}\text{C}$, $T_{jmax}=125^{\circ}\text{C}$)

	Standard Land Pattern	Free Air
Power Dissipation	420mW	250mW
Thermal Resistance	$\theta_{ja}=(125-25^{\circ}\text{C})/0.42\text{W}=238^{\circ}\text{C/W}$	400 $^{\circ}\text{C/W}$



Measurement Board Pattern

○ IC Mount Area (Unit: mm)

The above graph shows the Power Dissipation of the package based on $T_{jmax}=125^{\circ}\text{C}$ and $T_{jmax}=150^{\circ}\text{C}$.

Operating the IC in the shaded area in the graph might have an influence its lifetime.

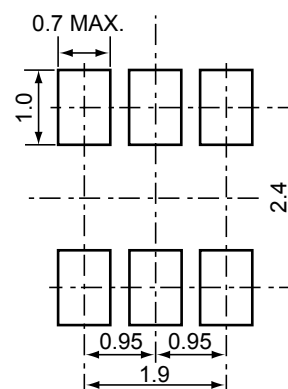
Operating time must be within the time limit described in the table below, in case of operating in the shaded area.

Operating time	Estimated years*
13,000hrs	9years

*The volume is calculated on the supposition that operating four hours/day.

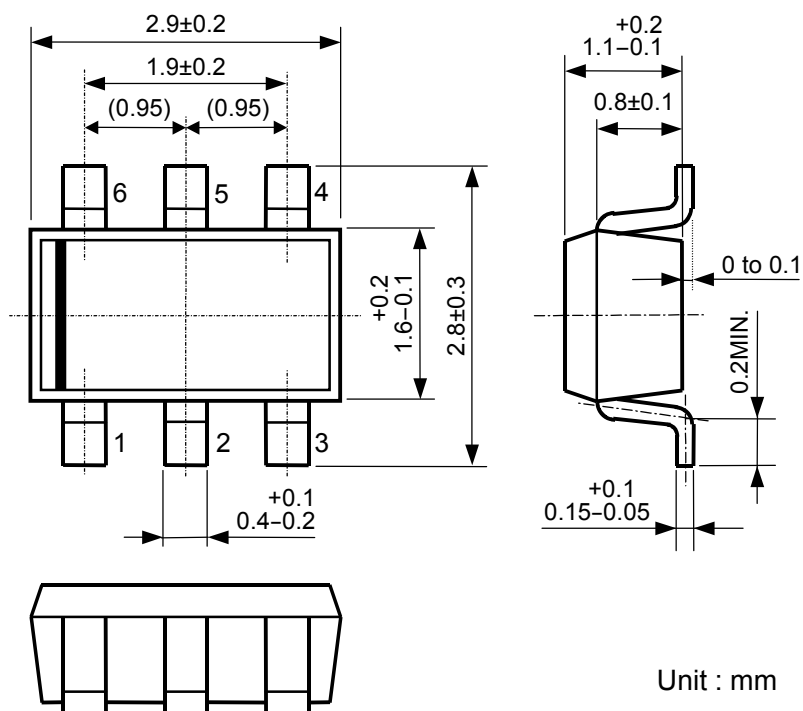
(Unit: mm)

RECOMMENDED LAND PATTERN



(Unit: mm)

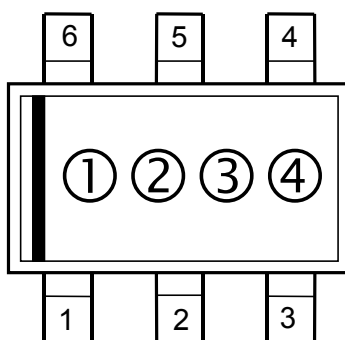
PACKAGE DIMENSIONS (SOT-23-6)



SOT-23-6 Package Dimensions

MARK SPECIFICATION (SOT-23-6)

- ①②: Product Code ... Refer to MARK SPECIFICATION TABLE (SOT-23-6)
- ③④: Lot Number ... Alphanumeric Serial Number



SOT-23-6 Mark Specification

MARK SPECIFICATION TABLE (SOT-23-6)
RP154NxxxxA

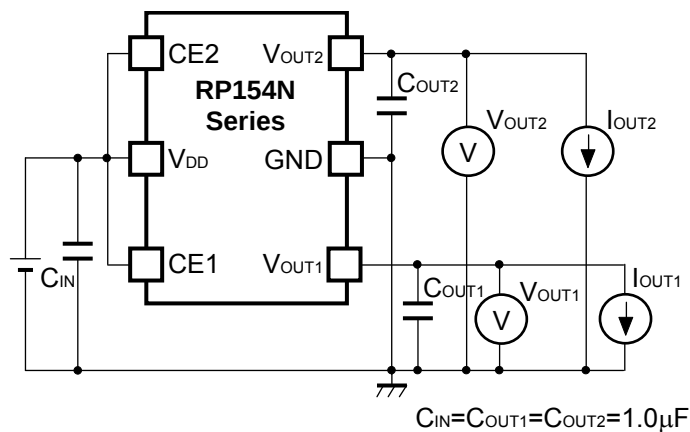
Product Name	①②	V _{SET}	
		VR1	VR2
RP154N001A	J A	2.8V	2.8V
RP154N002A	J B	1.8V	2.8V
RP154N003A	J C	1.5V	2.8V
RP154N004A	J D	1.2V	1.8V
RP154N005A	J E	3.3V	1.2V
RP154N006A	J F	3.3V	1.8V
RP154N007A	J G	2.85V	2.85V
RP154N008A	J H	2.85V	2.6V
RP154N009A	J J	3.0V	2.8V
RP154N010A	J K	3.0V	1.8V
RP154N011A	J L	1.8V	1.5V
RP154N012A	J M	2.8V	2.6V
RP154N013A	J N	3.3V	2.8V
RP154N014A	J P	3.3V	3.3V
RP154N015A	J Q	1.5V	2.5V
RP154N016A	J R	1.5V	3.0V
RP154N017A	J S	2.5V	3.0V
RP154N018A	J T	1.8V	1.8V
RP154N019A	J U	1.5V	2.6V
RP154N020A	J V	2.8V	1.8V
RP154N021A	J W	1.2V	2.8V
RP154N022A	J X	2.8V	1.2V
RP154N023A	J Y	2.5V	2.5V
RP154N024A	J Z	3.3V	3.0V
RP154N025A	K A	3.0V	3.0V
RP154N026A	K B	2.8V	3.1V
RP154N027A	K C	2.3V	2.8V
RP154N028A	K D	2.8V	1.0V
RP154N029A	K E	1.5V	1.5V
RP154N030A	K F	1.2V	2.9V
RP154N031A	K G	2.65V	2.85V
RP154N032A	K H	3.3V	2.85V
RP154N033A	K J	1.8V	2.9V
RP154N034A	K K	3.1V	3.1V
RP154N035A	K L	2.8V	2.7V
RP154N036A	K M	1.0V	1.8V
RP154N037A	K N	1.2V	2.5V
RP154N038A	K P	1.7V	3.1V
RP154N039A	K Q	1.8V	2.5V
RP154N040A	K R	1.5V	1.8V
RP154N041A	K S	1.8V	2.7V
RP154N042A	K T	2.7V	2.7V
RP154N043A	K U	2.9V	2.9V
RP154N044A	K V	1.7V	3.0V
RP154N045A	K W	1.75V	3.0V
RP154N046A	K X	3.0V	3.1V
RP154N047A	K Y	1.75V	3.1V
RP154N048A	K Z	1.8V	3.1V
RP154N049A	A 0	2.5V	3.1V
RP154N050A	A 1	3.1V	3.3V
RP154N051A	A 2	3.6V	3.6V
RP154N052A	A 3	1.8V	3.0V
RP154N053A	A 4	2.85V	3.1V
RP154N054A	A 5	1.2V	1.2V
RP154N055A	A 6	3.7V	3.7V
RP154N056A	A 7	1.1V	1.8V
RP154N057A	A 8	1.1V	1.2V

RP154NxxxxB

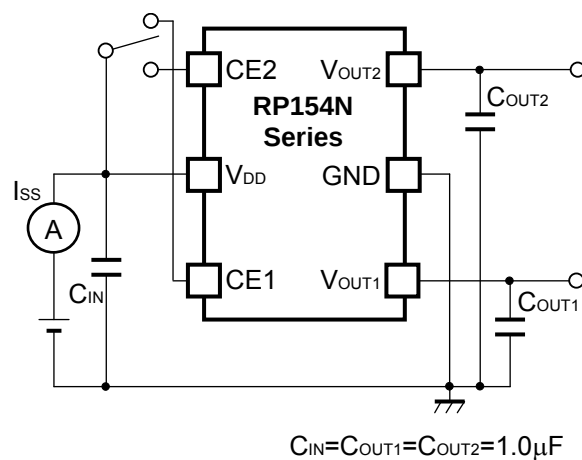
Product Name	①②	V _{SET}	
		VR1	VR2
RP154N001B	L A	2.8V	2.8V
RP154N002B	L B	1.8V	2.8V
RP154N003B	L C	1.5V	2.8V
RP154N004B	L D	1.2V	1.8V
RP154N005B	L E	3.3V	1.2V
RP154N006B	L F	3.3V	1.8V
RP154N007B	L G	2.85V	2.85V
RP154N008B	L H	2.85V	2.6V
RP154N009B	L J	3.0V	2.8V
RP154N010B	L K	3.0V	1.8V
RP154N011B	L L	1.8V	1.5V
RP154N012B	L M	2.8V	2.6V
RP154N013B	L N	3.3V	2.8V
RP154N014B	L P	3.3V	3.3V
RP154N015B	L Q	1.5V	2.5V
RP154N016B	L R	1.5V	3.0V
RP154N017B	L S	2.5V	3.0V
RP154N018B	L T	1.8V	1.8V
RP154N019B	L U	1.5V	2.6V
RP154N020B	L V	2.8V	1.8V
RP154N021B	L W	1.2V	2.8V
RP154N022B	L X	2.8V	1.2V
RP154N023B	L Y	2.5V	2.5V
RP154N024B	L Z	3.3V	3.0V
RP154N025B	M A	3.0V	3.0V
RP154N026B	M B	2.8V	3.1V
RP154N027B	M C	2.3V	2.8V
RP154N028B	M D	2.8V	1.0V
RP154N029B	M E	1.5V	1.5V
RP154N030B	M F	1.2V	2.9V
RP154N031B	M G	2.65V	2.85V
RP154N032B	M H	3.3V	2.85V
RP154N033B	M J	1.8V	2.9V
RP154N034B	M K	3.1V	3.1V
RP154N035B	M L	2.8V	2.7V
RP154N036B	M M	1.0V	1.8V
RP154N037B	M N	1.2V	2.5V
RP154N038B	M P	1.7V	3.1V
RP154N039B	M Q	1.8V	2.5V
RP154N040B	M R	1.5V	1.8V
RP154N041B	M S	1.8V	2.7V
RP154N042B	M T	2.7V	2.7V
RP154N043B	M U	2.9V	2.9V
RP154N044B	M V	1.7V	3.0V
RP154N045B	M W	1.75V	3.0V
RP154N046B	M X	3.0V	3.1V
RP154N047B	M Y	1.75V	3.1V
RP154N048B	M Z	1.8V	3.1V
RP154N049B	B 0	2.5V	3.1V
RP154N050B	B 1	3.1V	3.3V
RP154N051B	B 2	3.6V	3.6V
RP154N052B	B 3	1.8V	3.0V
RP154N053B	B 4	2.85V	3.1V
RP154N054B	B 5	1.2V	1.2V
RP154N055B	B 6	3.7V	3.7V
RP154N056B	B 7	1.1V	1.8V
RP154N057B	B 8	1.1V	1.2V

TEST CIRCUITS

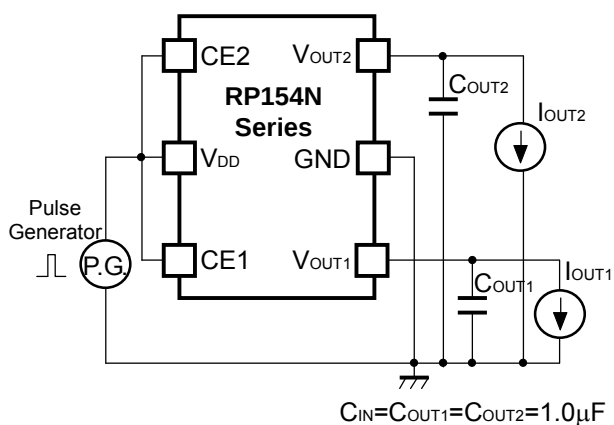
- **RP154NxxxA/B**



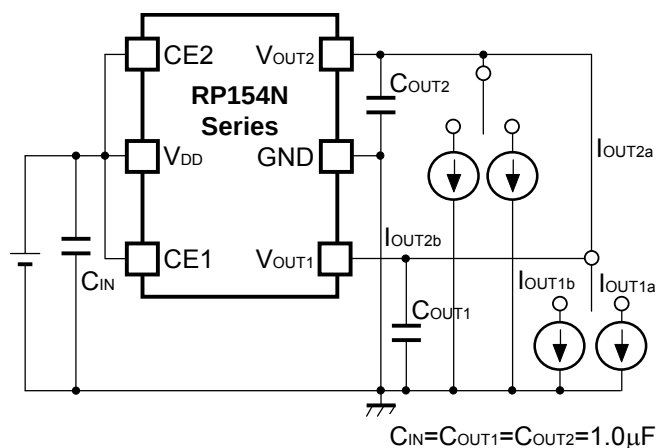
Basic Test Circuit



Supply Current Test Circuit

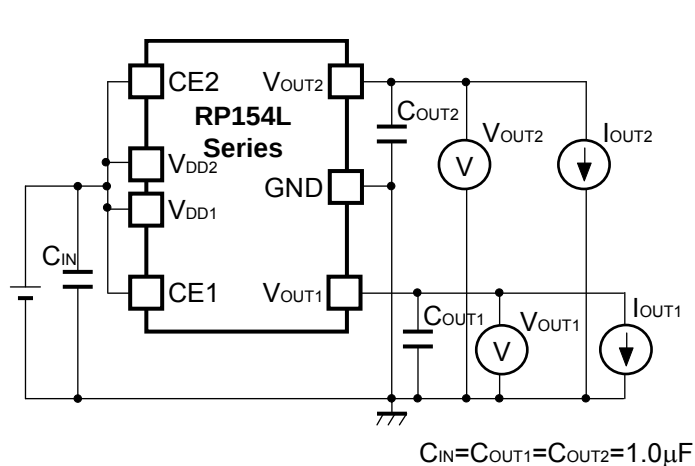


**Ripple Rejection & Line Transient Response
Test Circuit**

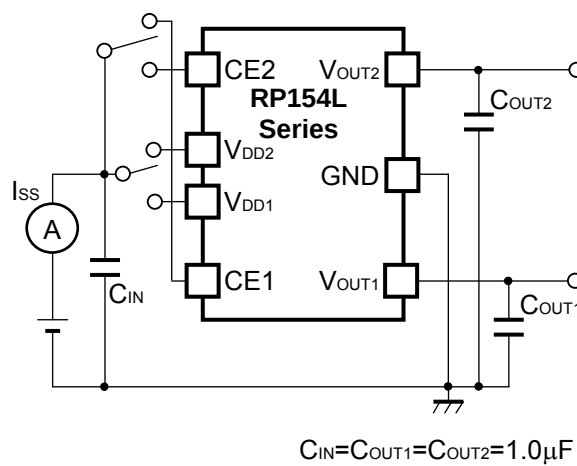


Load Transient Response Test Circuit

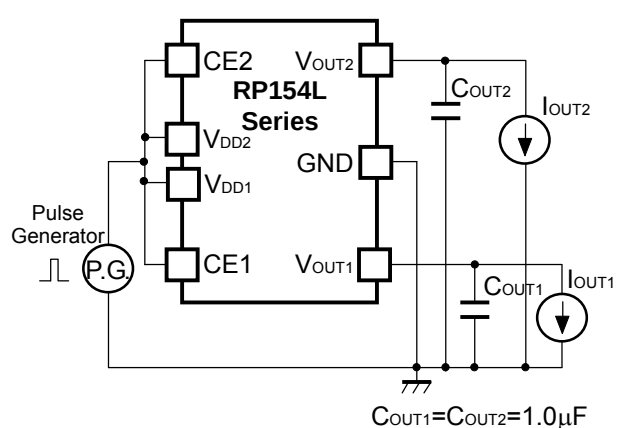
• RP154LxxxA/B



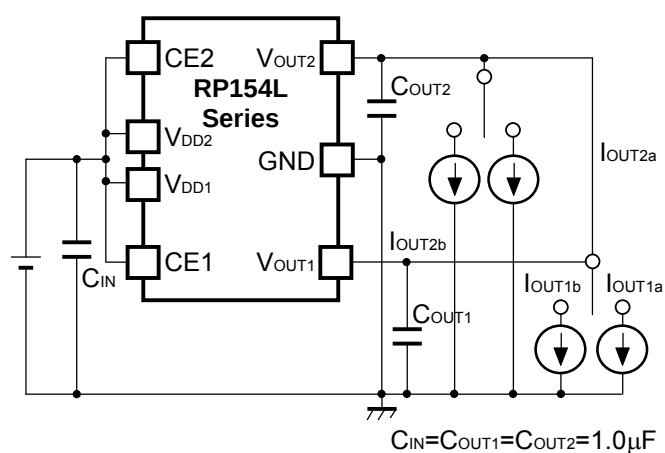
Basic Test Circuit



Supply Current Test Circuit



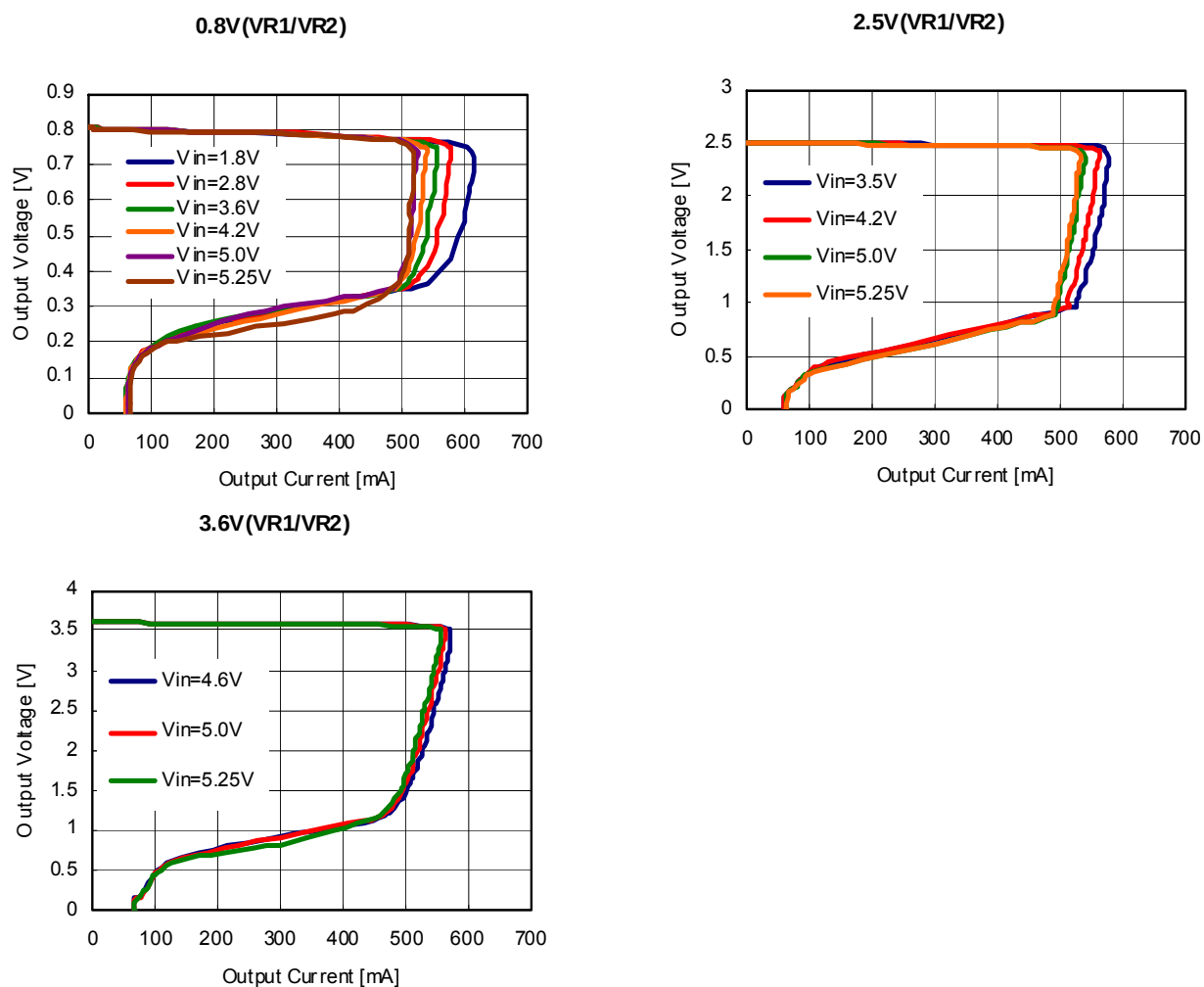
Ripple Rejection & Line Transient Response Test Circuit



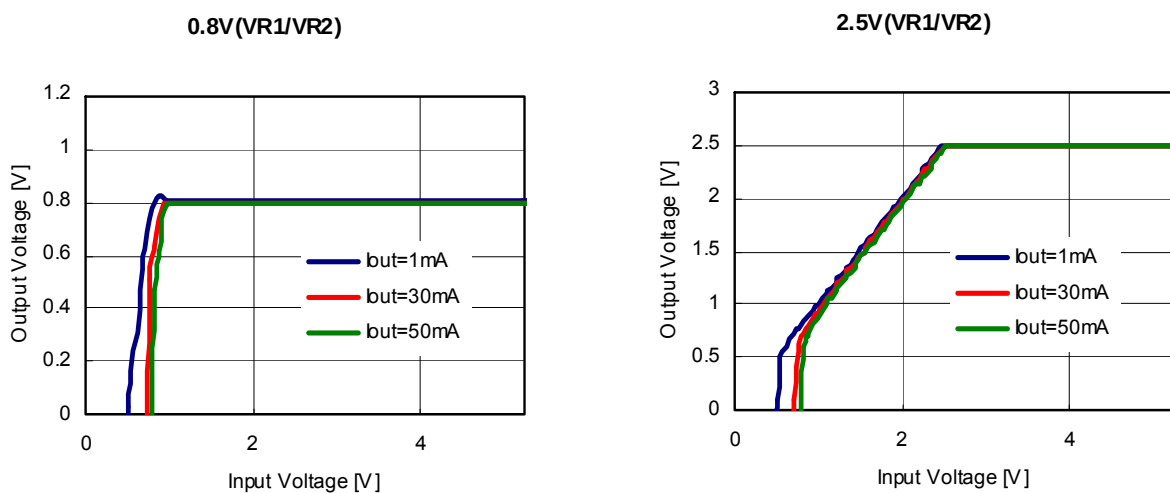
Load Transient Response Test Circuit

TYPICAL CHARACTERISTICS

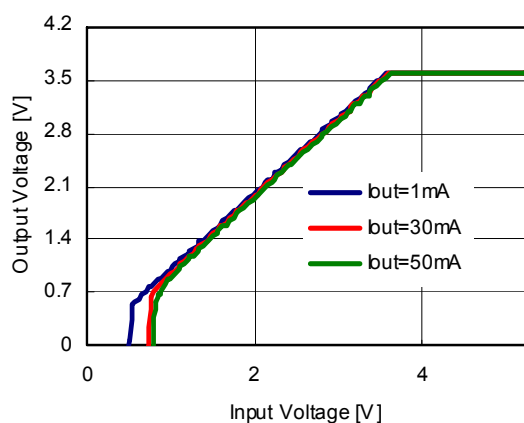
1) Output Voltage vs. Output Current ($C_{IN}=1.0\mu F$, $C_{OUT1}=C_{OUT2}=1.0\mu F$, $T_{opt}=25^{\circ}C$)



2) Output Voltage vs. Input Voltage ($C_{IN}=1.0\mu F$, $C_{OUT1}=C_{OUT2}=1.0\mu F$, $T_{opt}=25^{\circ}C$)

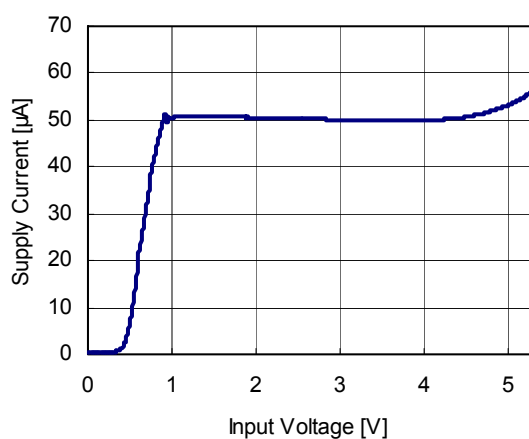


3.6V(VR1/VR2)

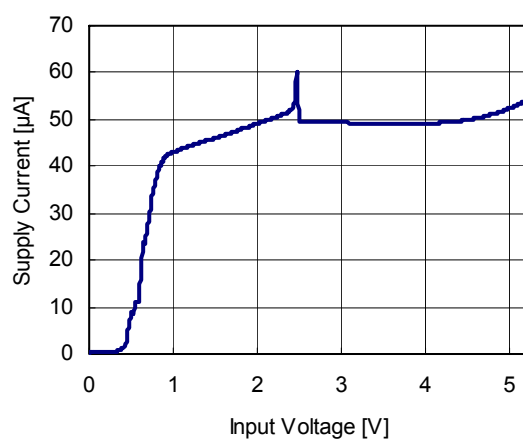


3) Supply Current vs. Input Voltage ($C_{IN}=1.0\mu F$, $C_{OUT1}=C_{OUT2}=1.0\mu F$, $T_{opt}=25^{\circ}C$)

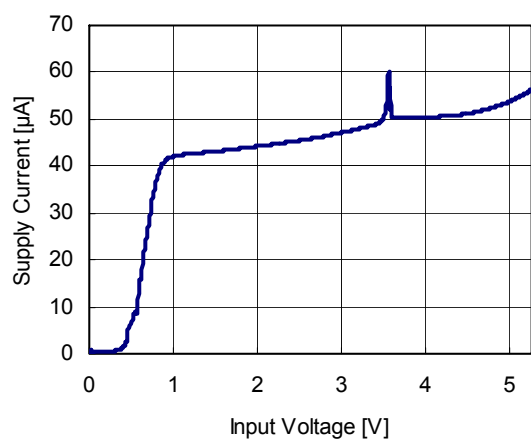
0.8V(VR1/VR2)



2.5V(VR1/VR2)

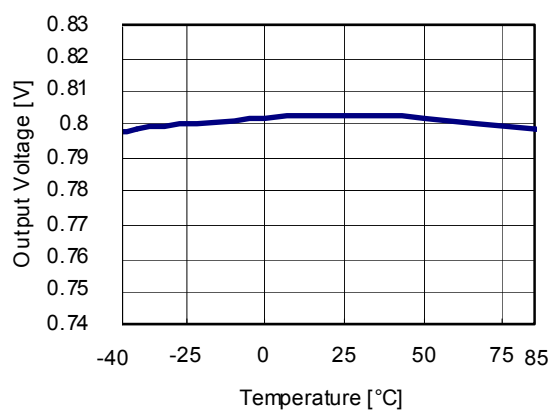


3.6V(VR1/VR2)

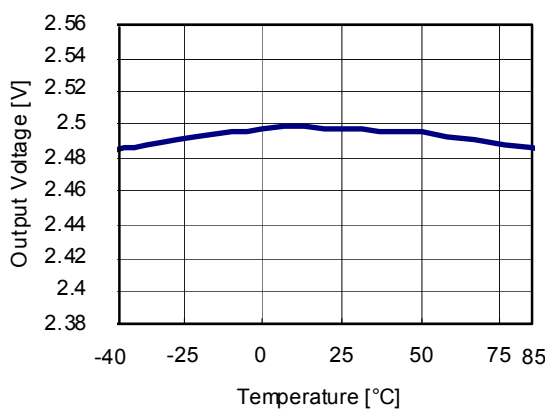


4) Output Voltage vs. Temperature ($C_{IN}=1.0\mu F$, $C_{OUT1}=C_{OUT2}=1.0\mu F$, $I_{OUT}=5mA$)

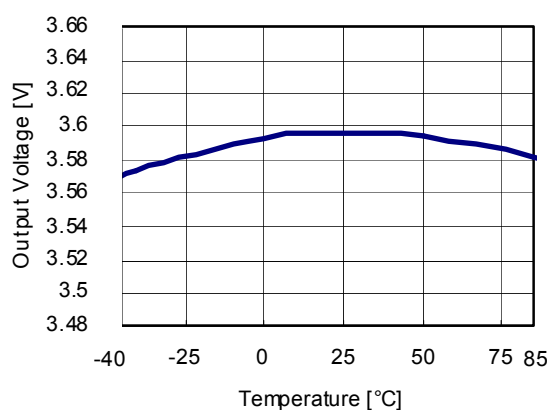
0.8V(VR1/VR2)



2.5V(VR1/VR2)

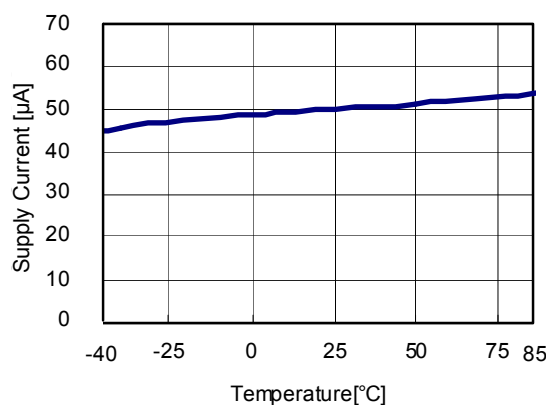


3.6V(VR1/VR2)

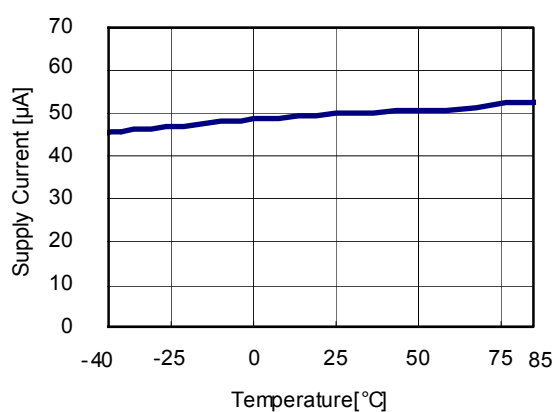


5) Supply Current vs. Temperature ($C_{IN}=1.0\mu F$, $C_{OUT1}=C_{OUT2}=1.0\mu F$)

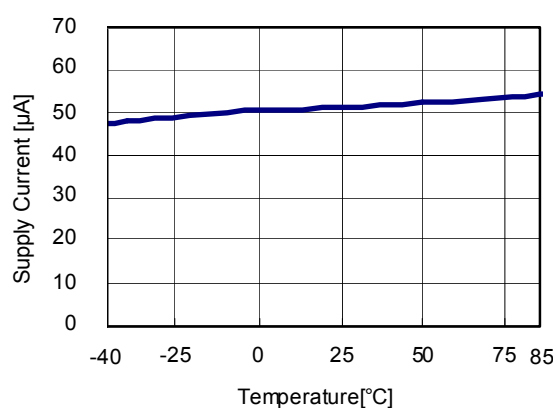
0.8V(VR1/VR2)



2.5V(VR1/VR2)

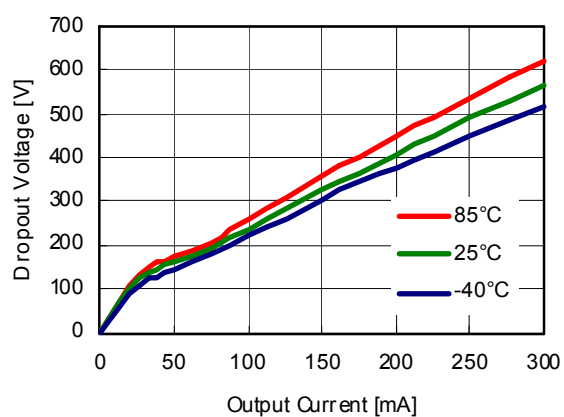


3.6V(VR1/VR2)

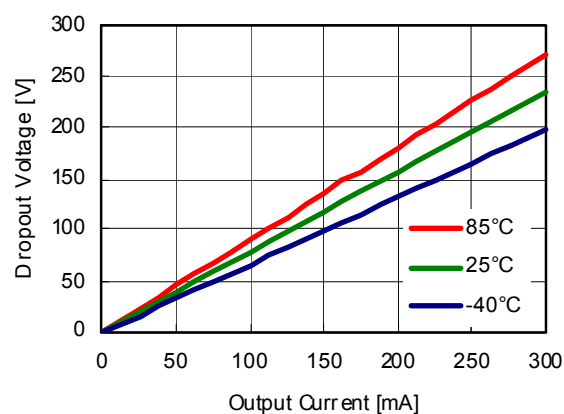


6) Dropout Voltage vs. Output Current ($C_{IN}=1.0\mu$ F, $C_{OUT1}=C_{OUT2}=1.0\mu$ F)

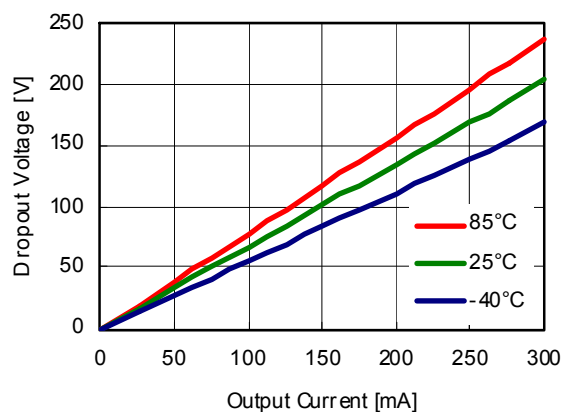
0.8V(VR1/VR2)



2.5V(VR1/VR2)

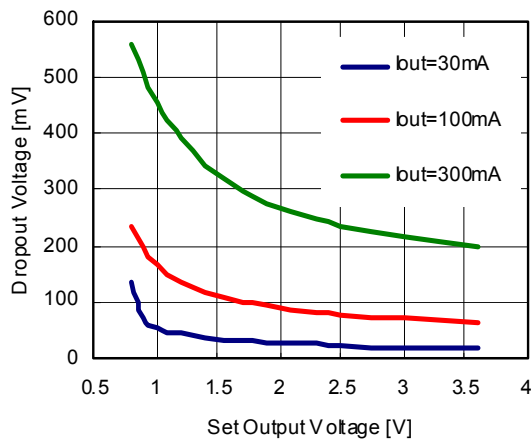


3.6V(VR1/VR2)



7) Dropout Voltage vs. Set Output Voltage

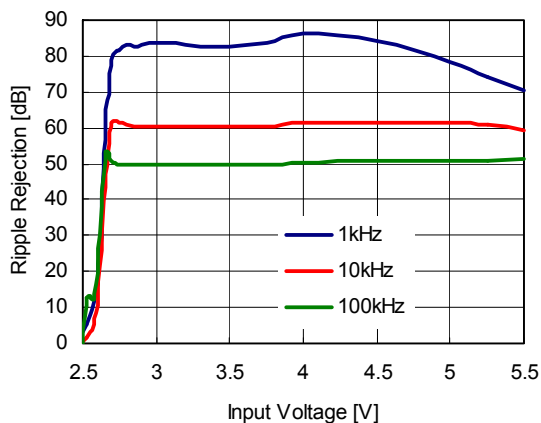
(VR1/VR2)



8) Ripple Rejection vs. Input Voltage ($C_{IN}=\text{none}$, $C_{OUT1}=C_{OUT2}=1.0\mu\text{F}$, Ripple=0.2Vp-p, $T_{opt}=25^\circ\text{C}$)

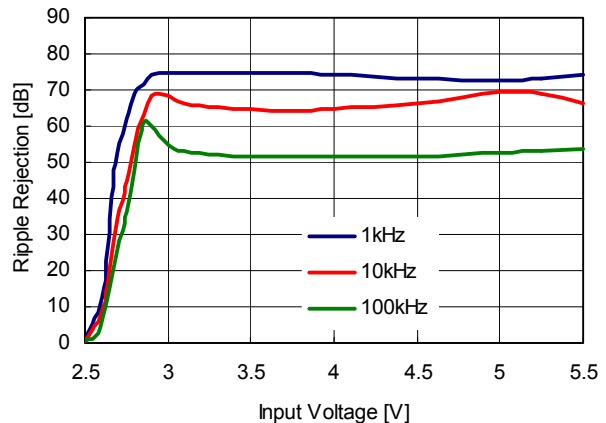
2.5V(VR1/VR2)

$I_{out}=1\text{mA}$



2.5V(VR1/VR2)

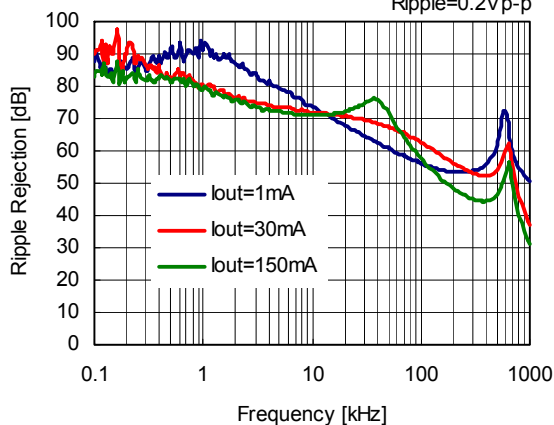
$I_{out}=30\text{mA}$



9) Ripple Rejection vs. Frequency ($C_{IN}=\text{none}$, $C_{OUT1}=C_{OUT2}=1.0\mu\text{F}$, $T_{opt}=25^\circ\text{C}$)

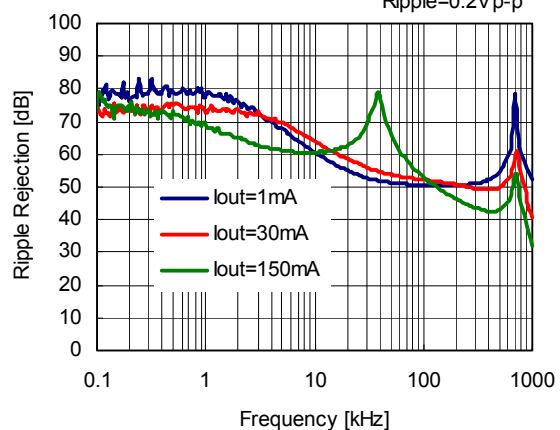
0.8V(VR1/VR2)

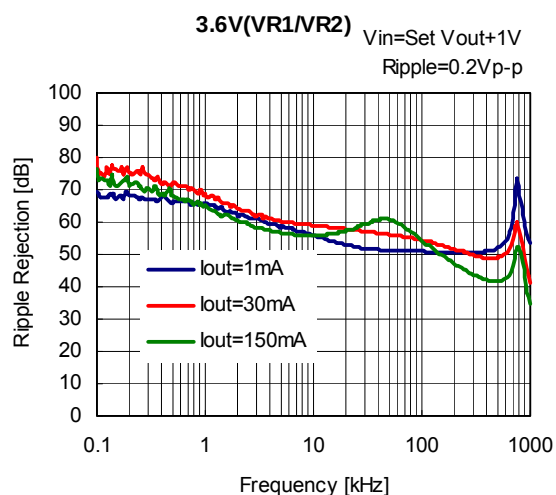
$V_{in}=3\text{V}$
 Ripple=0.2Vp-p



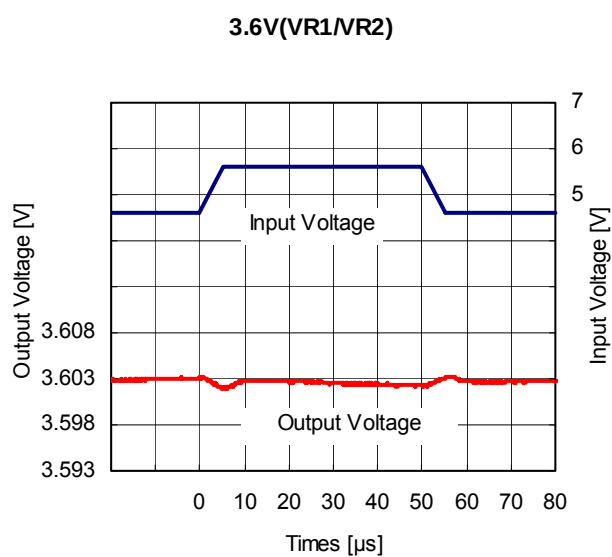
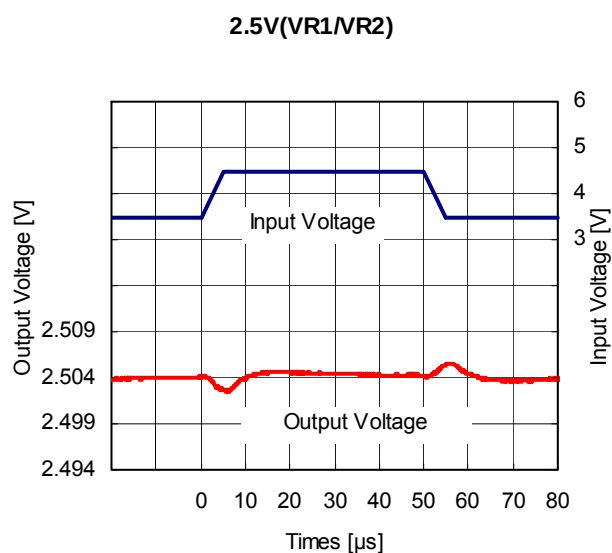
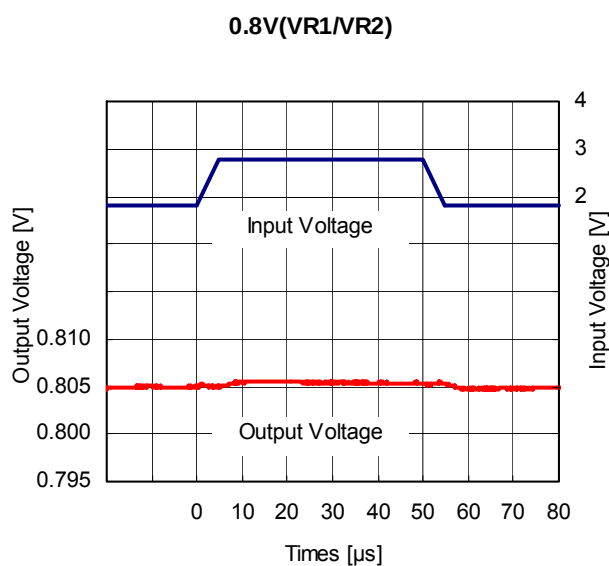
2.5V(VR1/VR2)

$V_{in}=\text{Set } V_{out}+1\text{V}$
 Ripple=0.2Vp-p

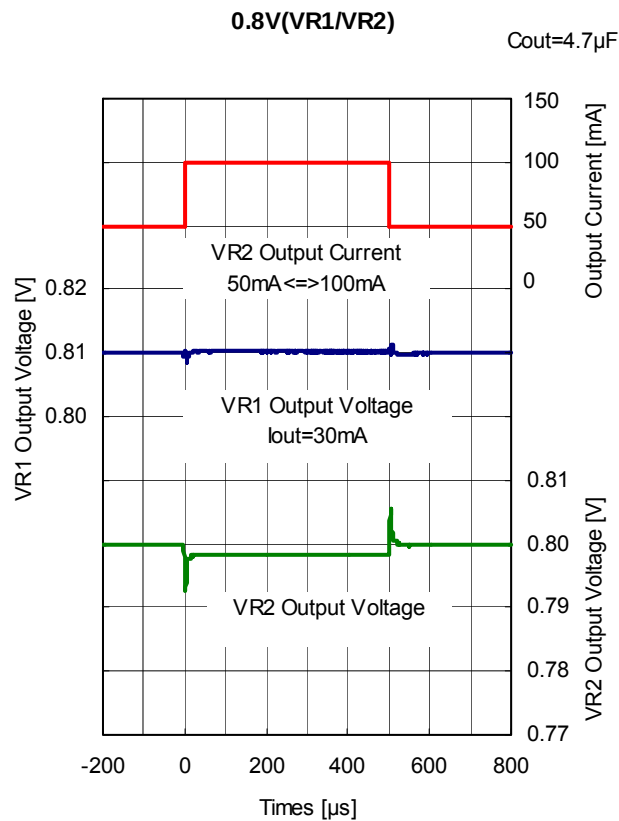
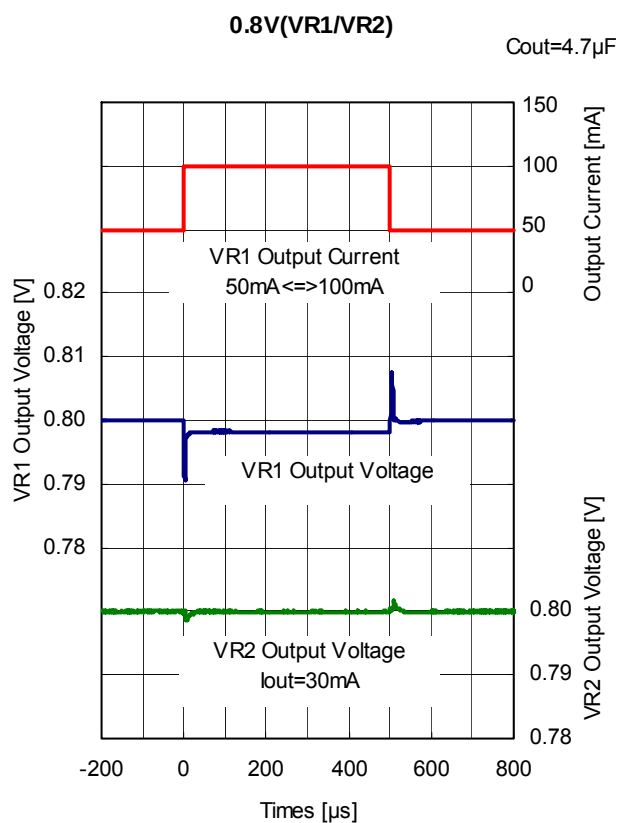
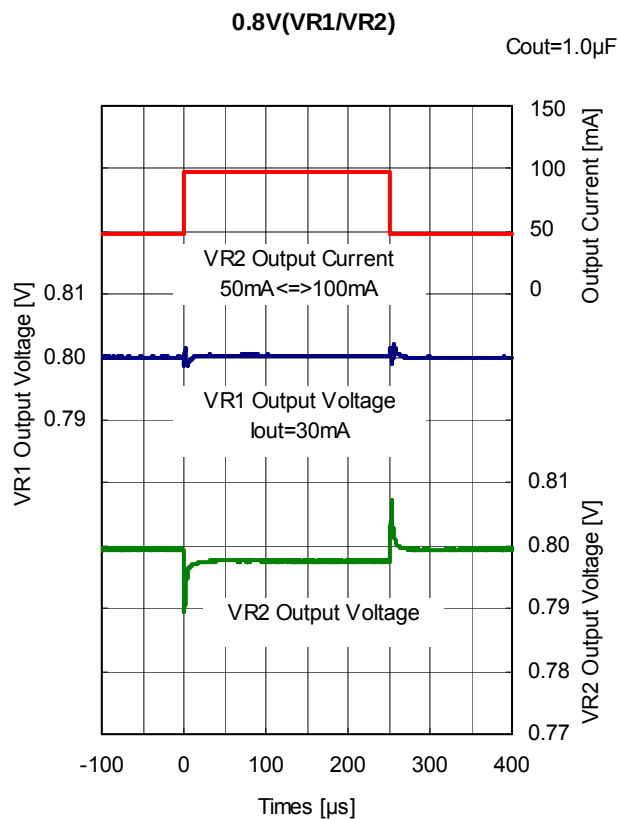
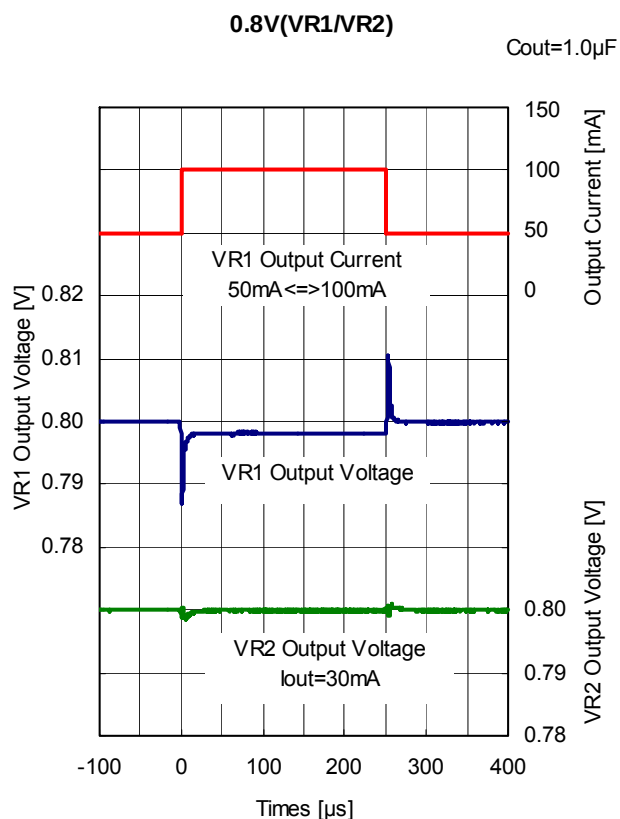


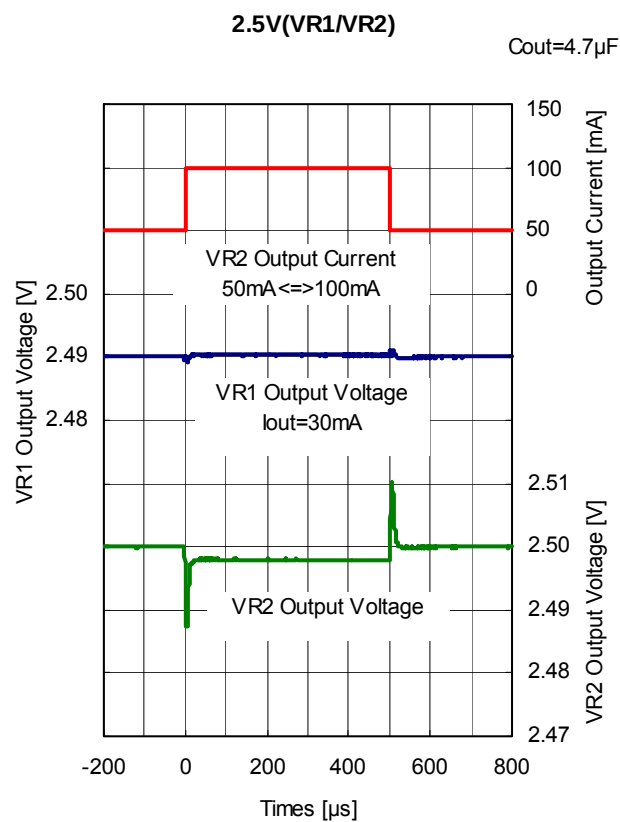
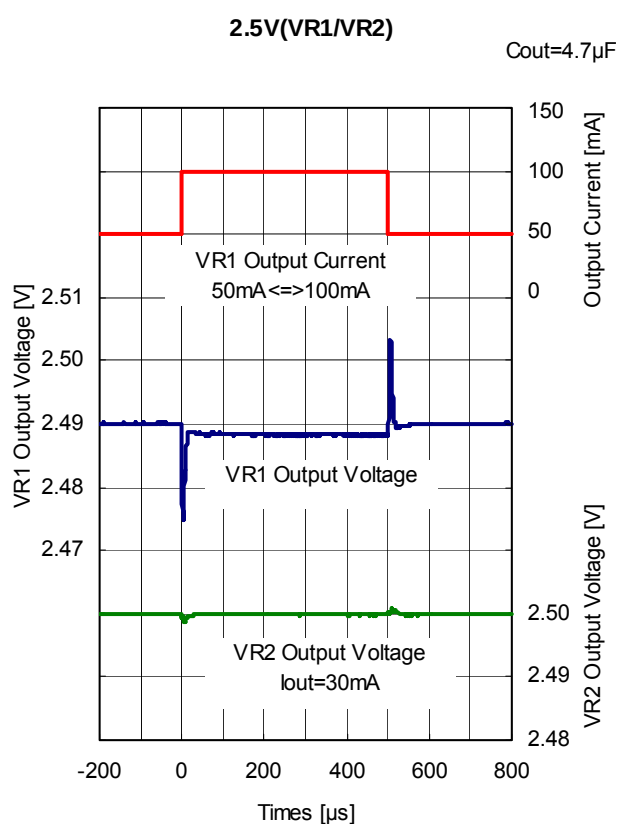
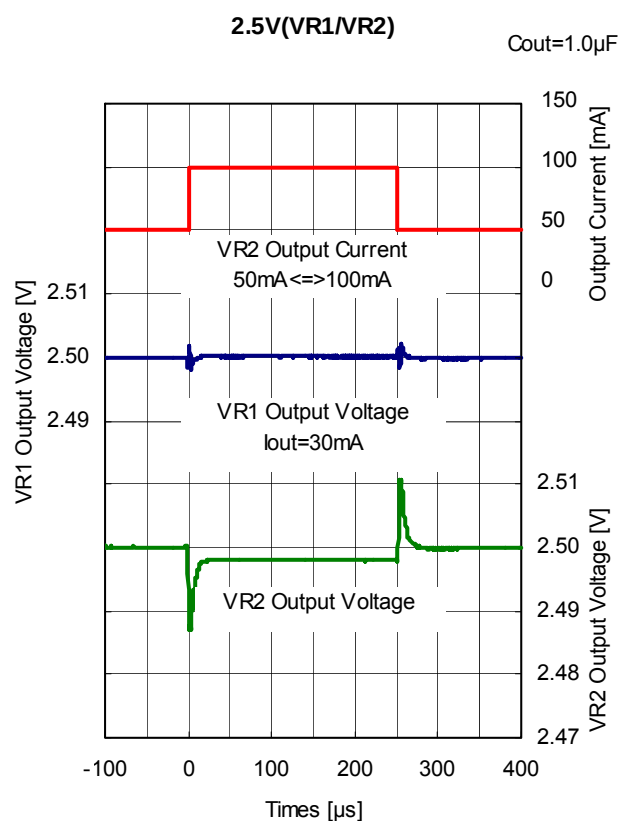
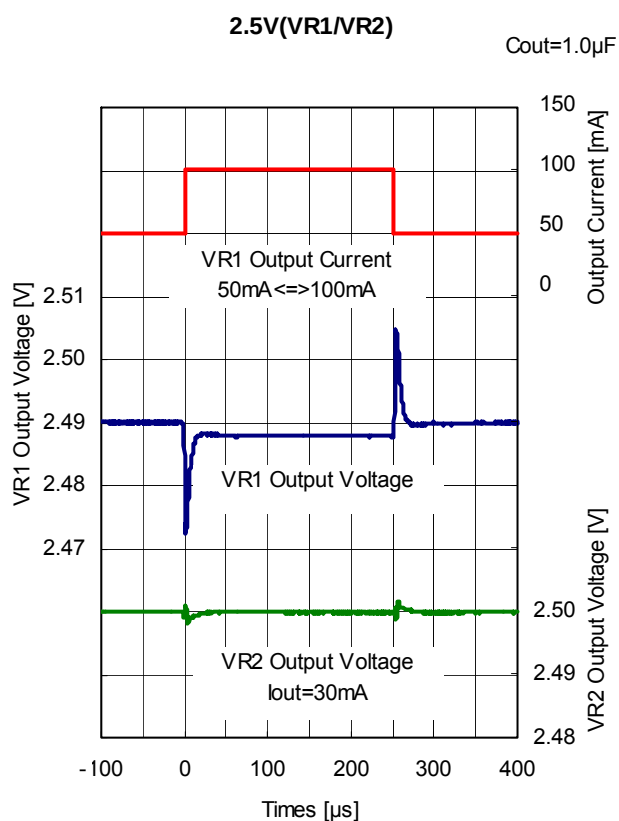


10) Input Transient Response ($C_{IN} = \text{none}$, $C_{OUT1} = C_{OUT2} = 1.0\mu F$, $t_r = t_f = 5\mu s$, $T_{opt} = 25^\circ C$)



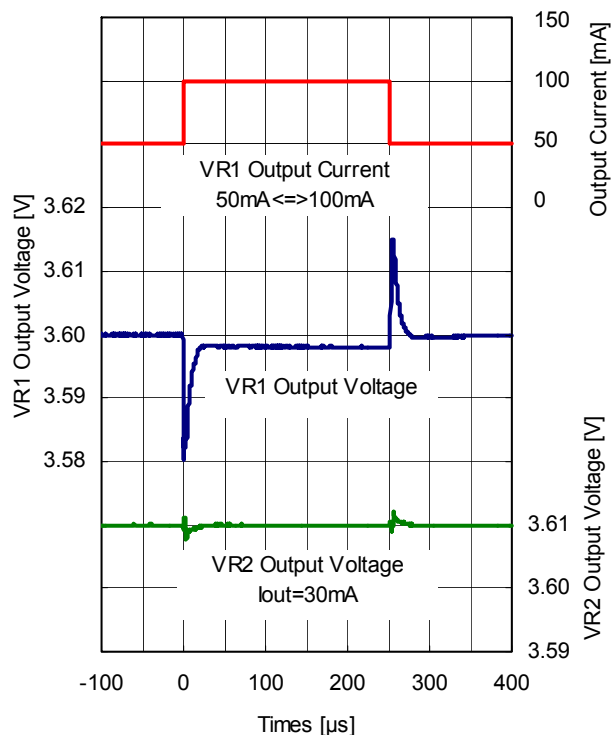
11) Load Transient Response ($C_{IN}=1.0\mu F$, $C_{OUT1}=C_{OUT2}=1.0\mu F$, $t_r=t_f=0.5\mu s$, $T_{opt}=25^\circ C$)





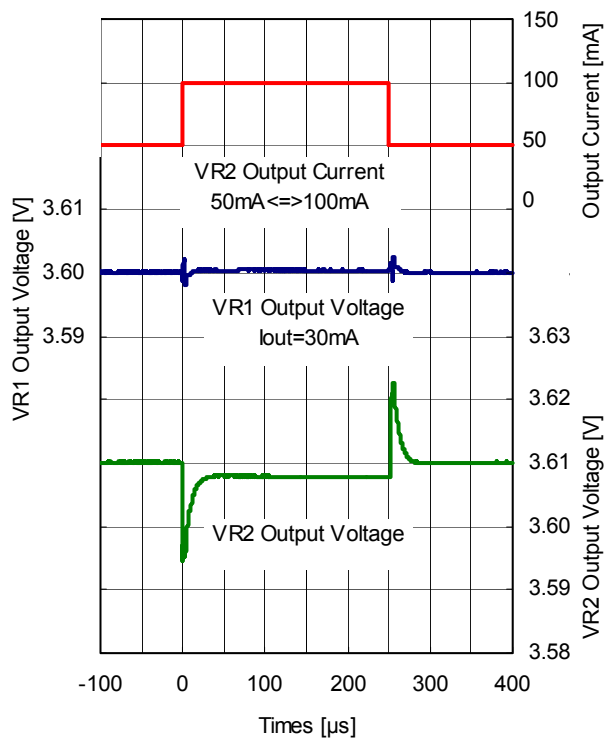
3.6V(VR1/VR2)

Cout=1.0 μ F



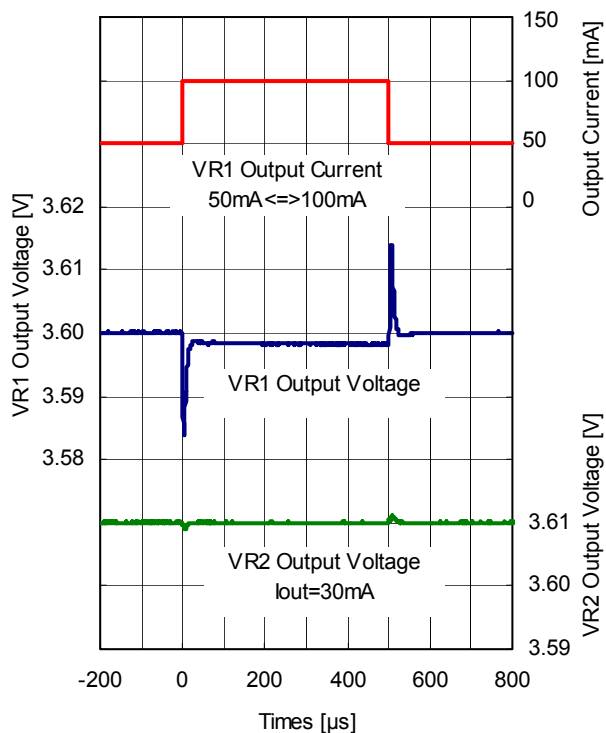
3.6V(VR1/VR2)

Cout=1.0 μ F



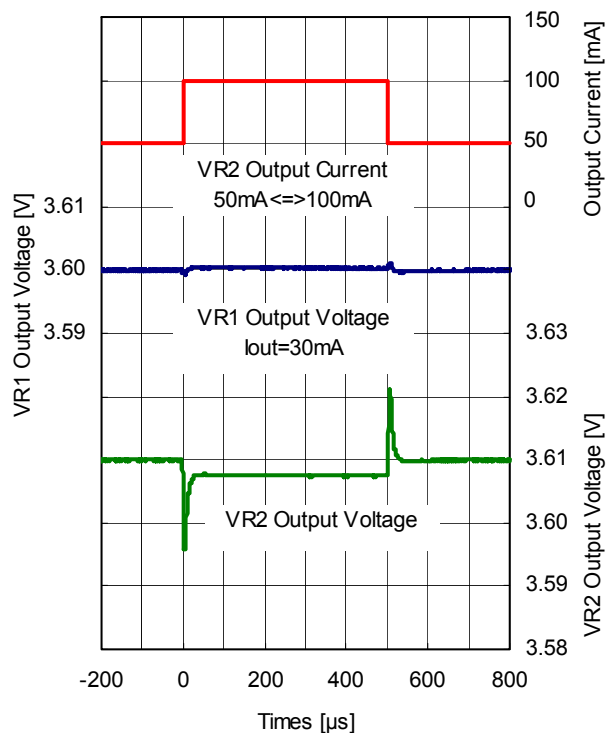
3.6V(VR1/VR2)

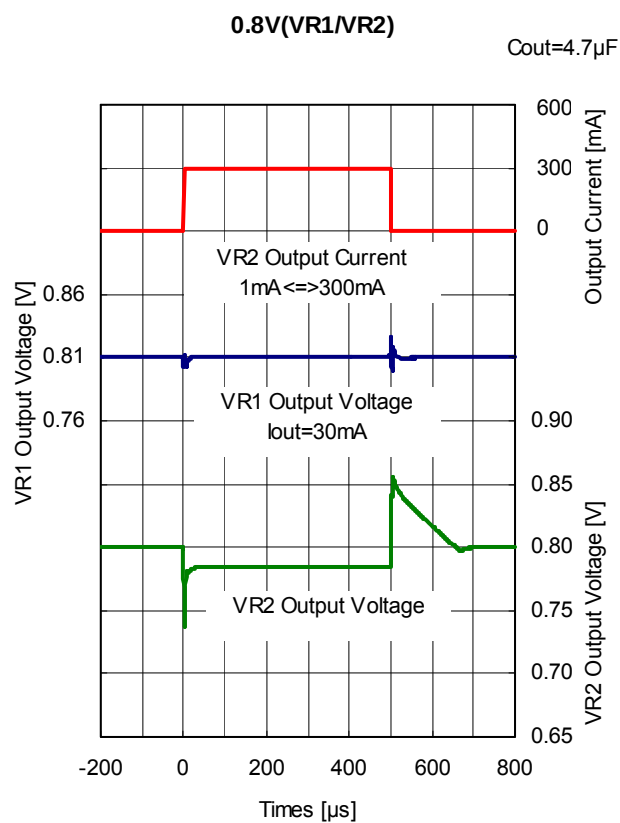
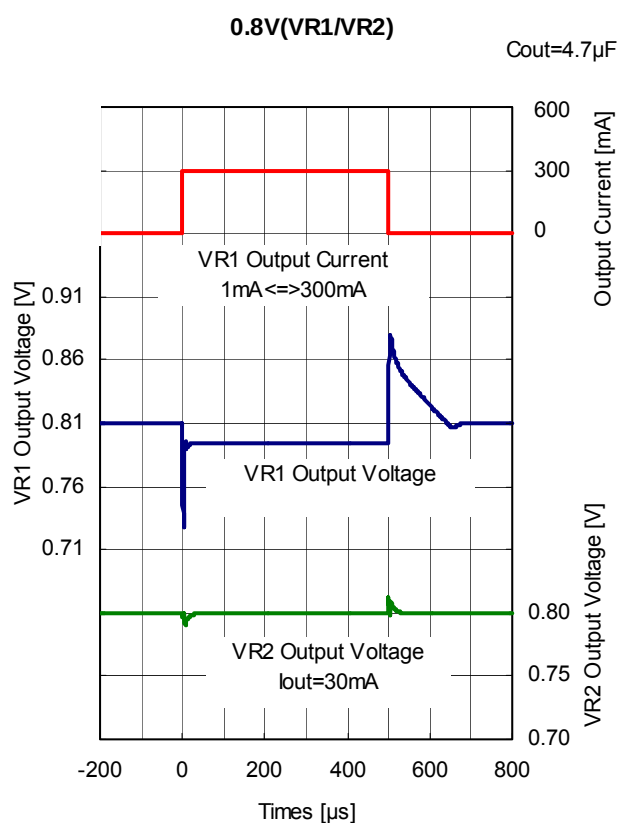
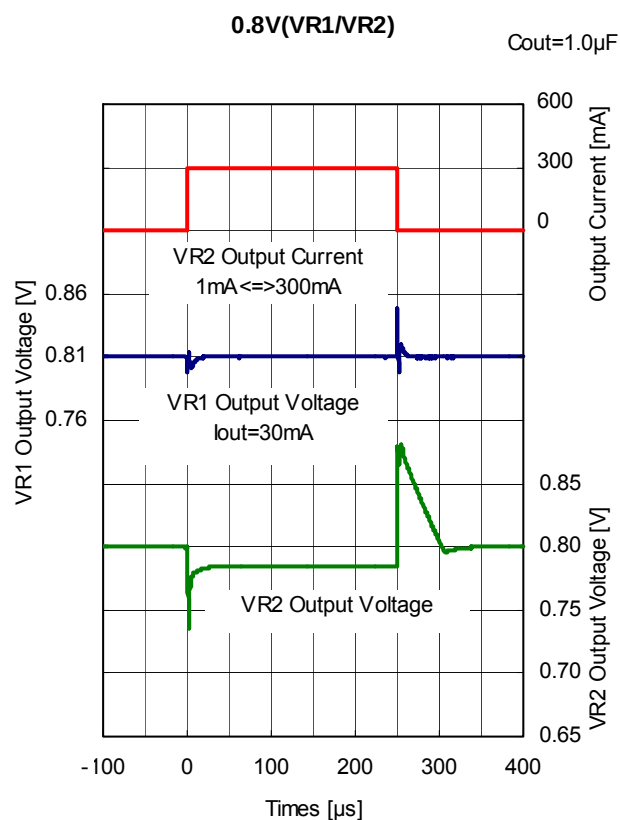
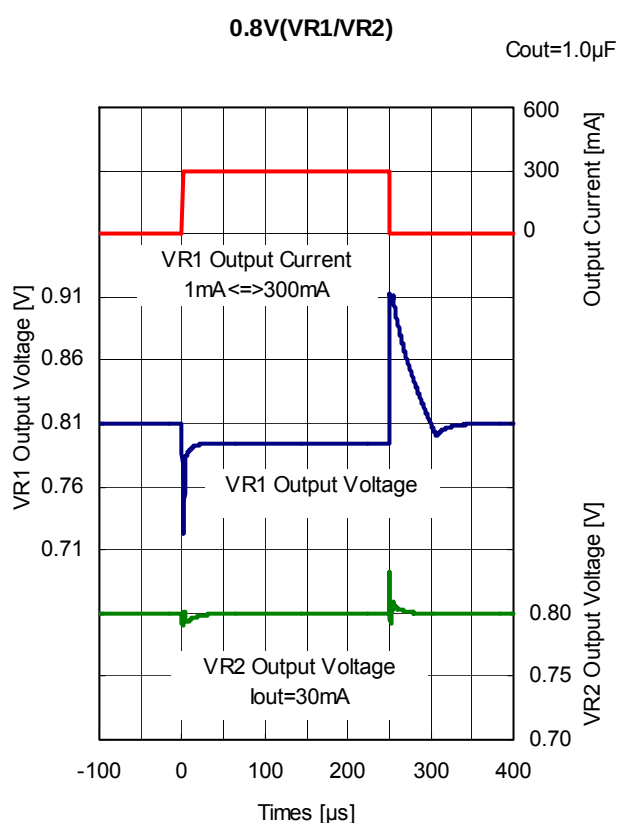
Cout=4.7 μ F



3.6V(VR1/VR2)

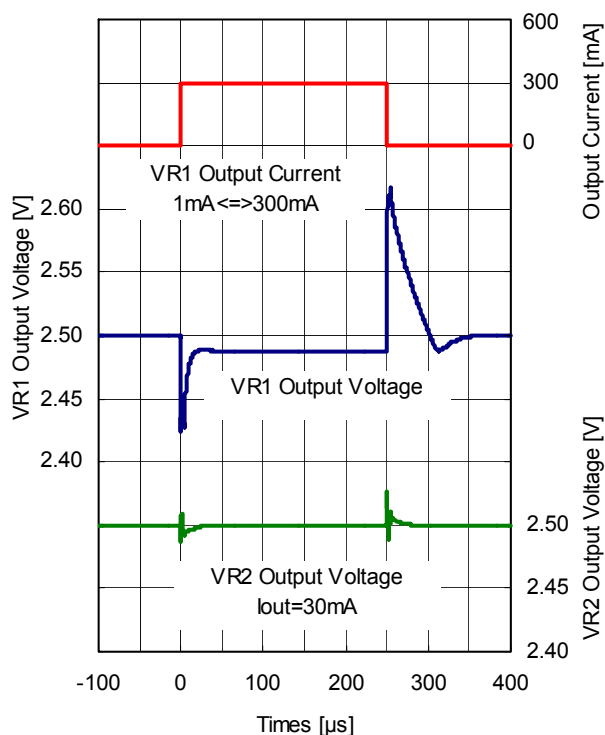
Cout=4.7 μ F





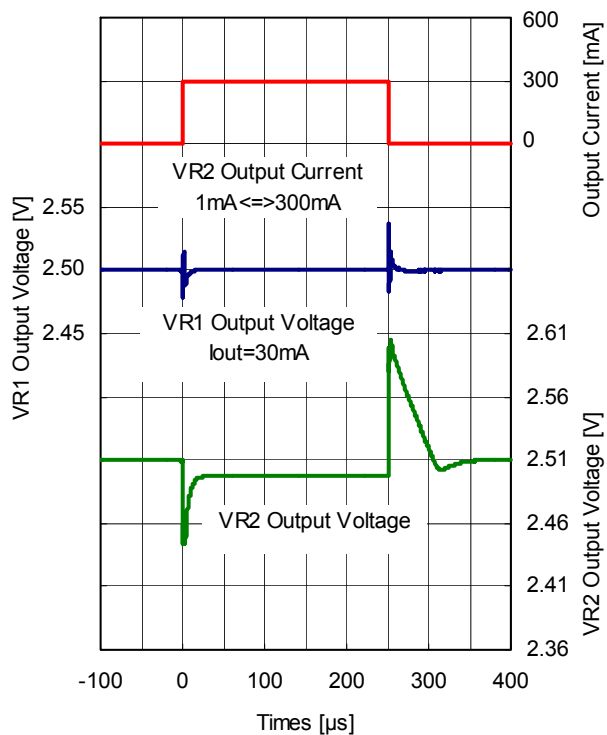
2.5V(VR1/VR2)

Cout=1.0 μ F



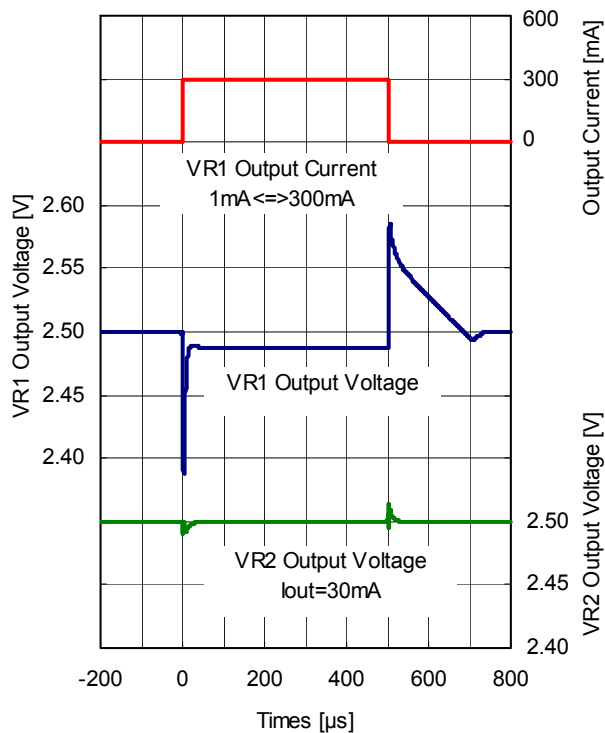
2.5V(VR1/VR2)

Cout=1.0 μ F



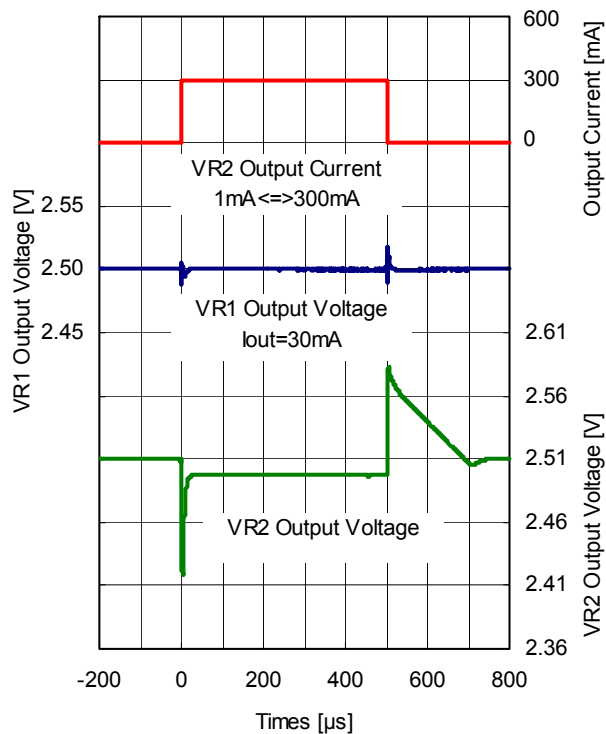
2.5V(VR1/VR2)

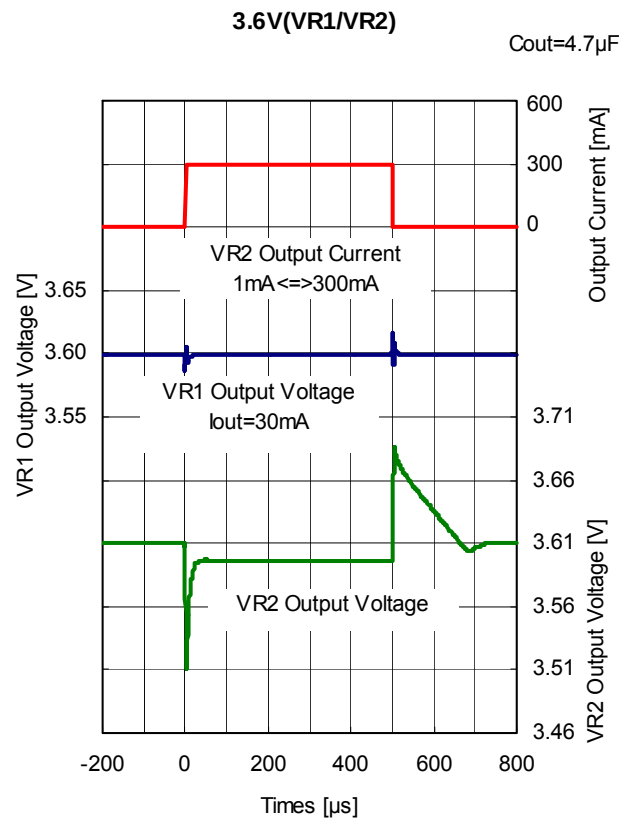
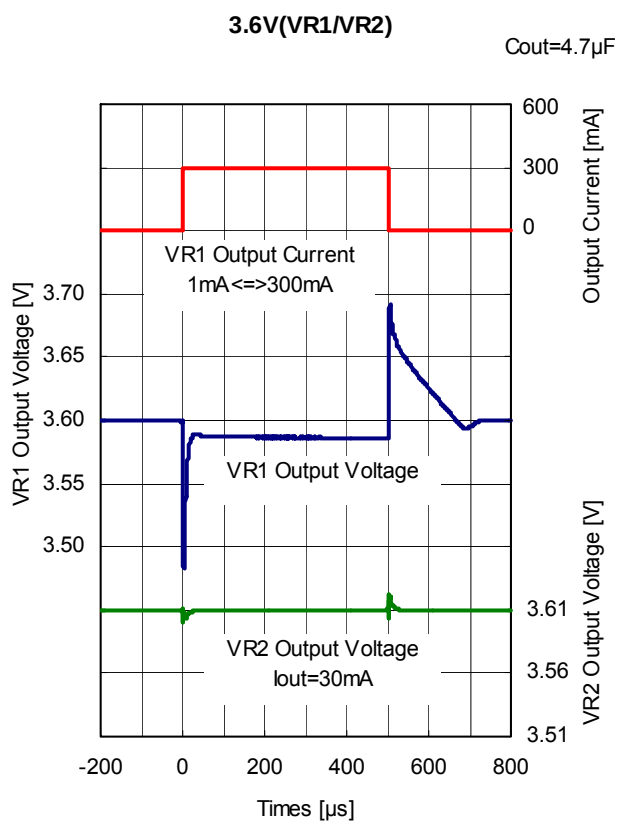
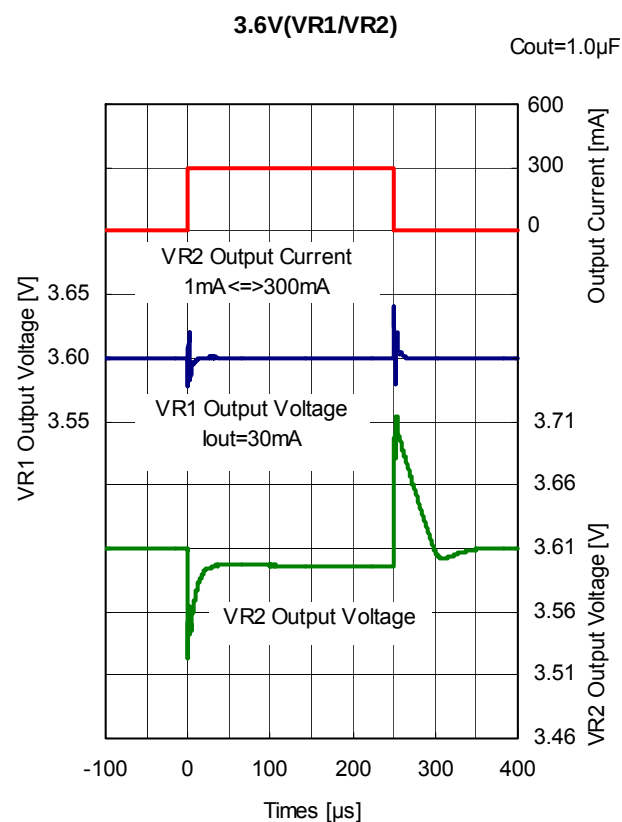
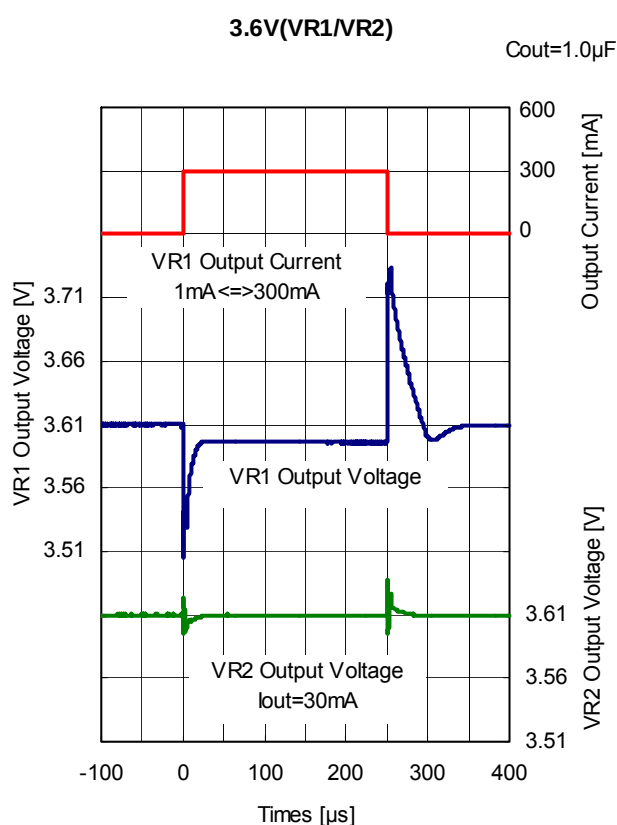
Cout=4.7 μ F



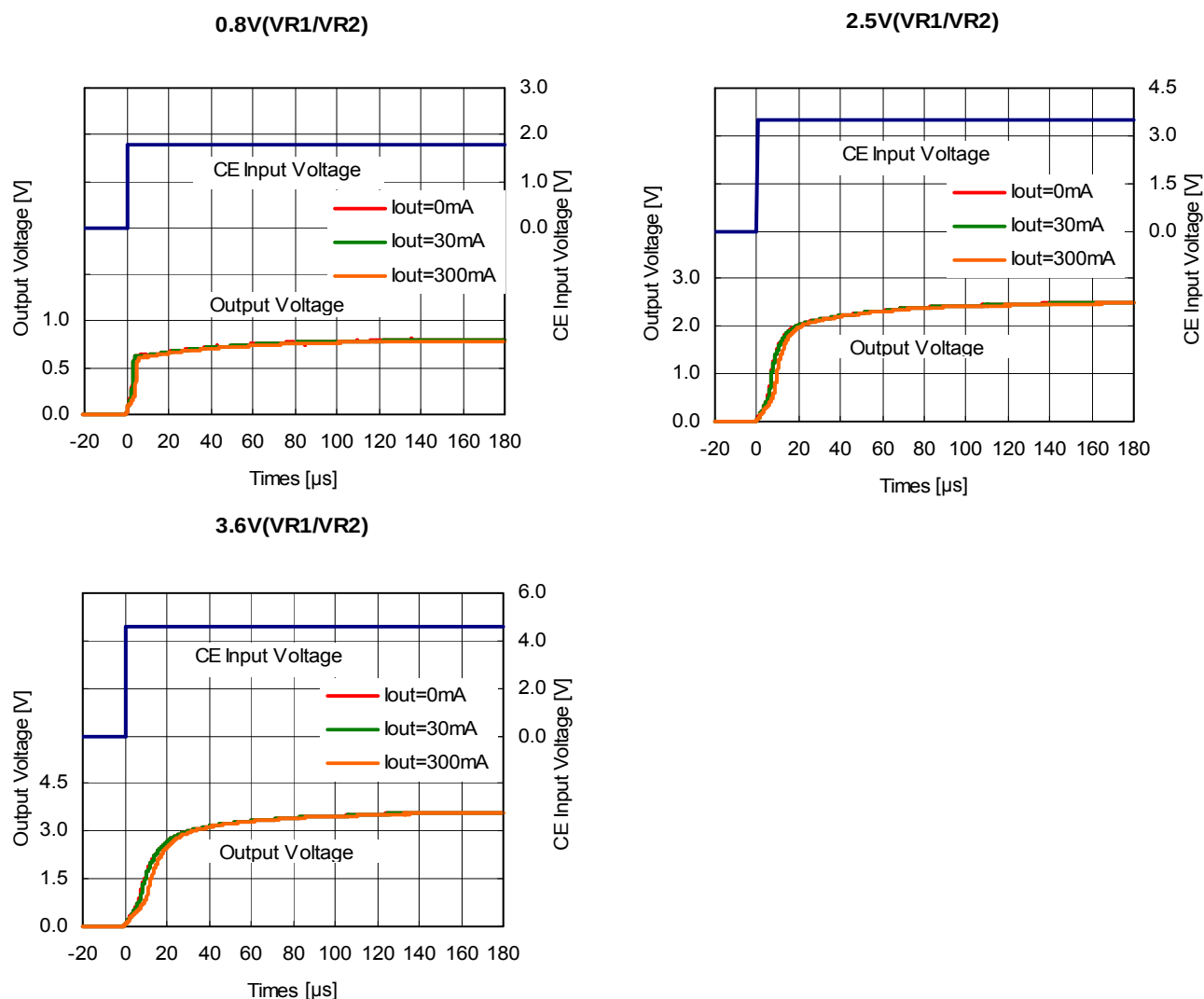
2.5V(VR1/VR2)

Cout=4.7 μ F

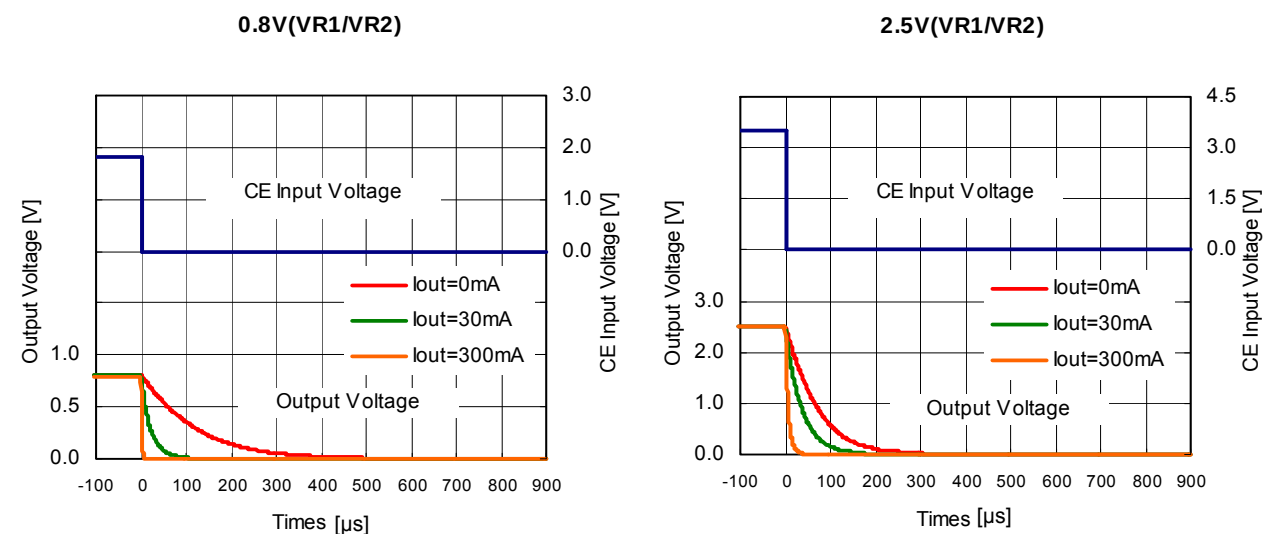




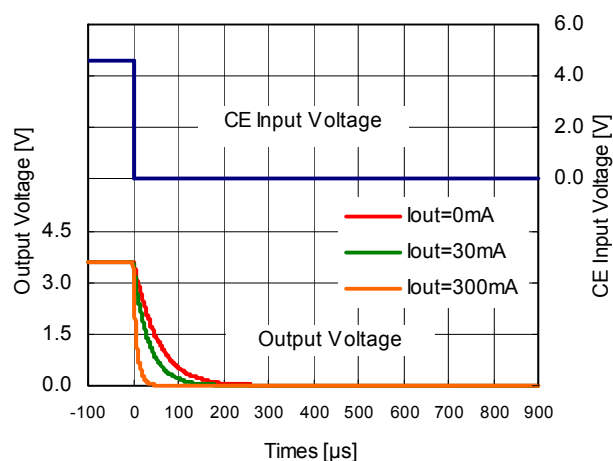
12) Turn On Speed with CE pin ($C_{IN}=1.0\mu F$, $C_{OUT1}=C_{OUT2}=1.0\mu F$, $T_{opt}=25^{\circ}C$)



13) Turn Off Speed with CE pin (B version) ($C_{IN}=1.0\mu F$, $C_{OUT1}=C_{OUT2}=1.0\mu F$, $T_{opt}=25^{\circ}C$)

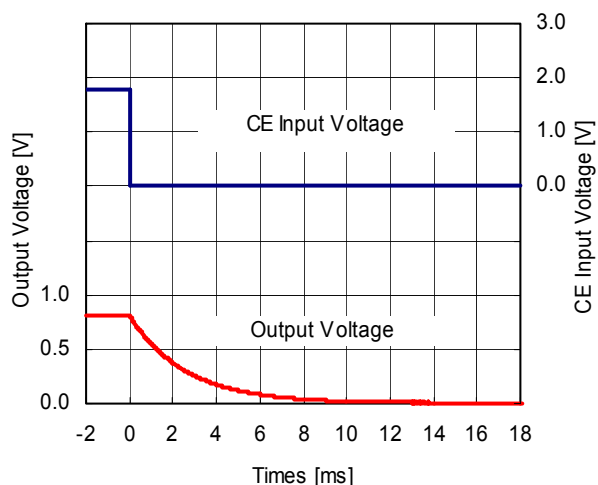


3.6V(VR1/VR2)

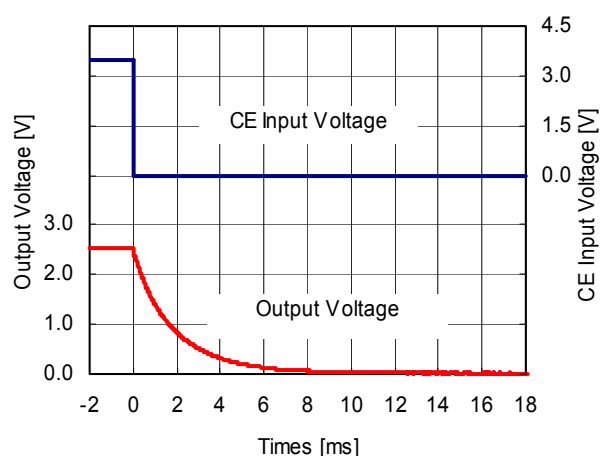


14) Turn Off Speed with CE pin (A version) ($C_{IN}=1.0\mu\text{F}$, $C_{OUT1}=C_{OUT2}=1.0\mu\text{F}$, $I_{out}=0\text{mA}$, $T_{opt}=25^\circ\text{C}$)

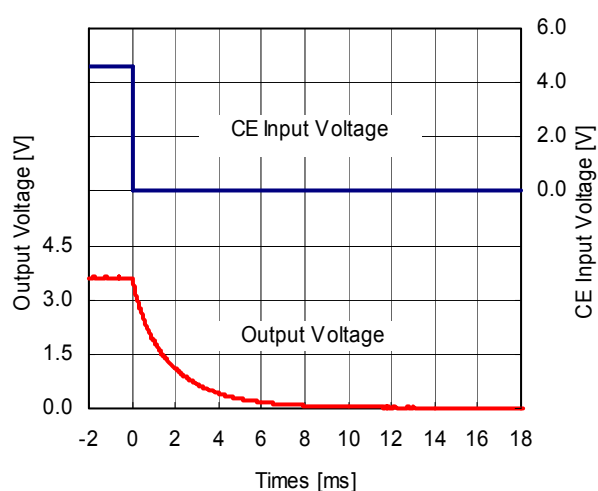
0.8V(VR1/VR2)



2.5V(VR1/VR2)



3.6V(VR1/VR2)



ESR vs. Output Current

When using these ICs, consider the following points:

The relations between I_{OUT} (Output Current) and ESR of an output capacitor are shown below.

The conditions when the white noise level is under $40\mu V$ (Avg.) are marked as the hatched area in the graph.

Measurement conditions

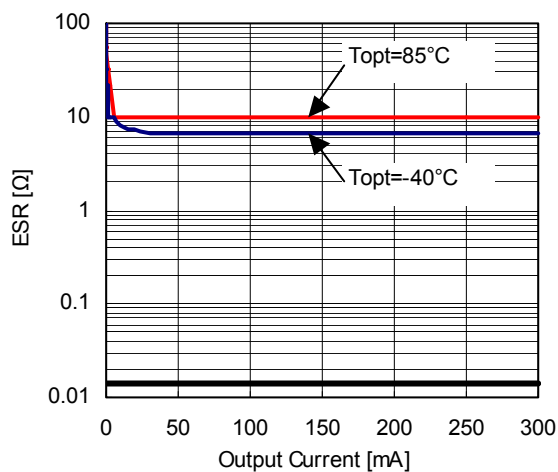
Frequency Band: 10Hz to 2MHz

Temperature : $-40^{\circ}C$ to $85^{\circ}C$

C_{IN} , C_{OUT1} , C_{OUT2} : $1.0\mu F$

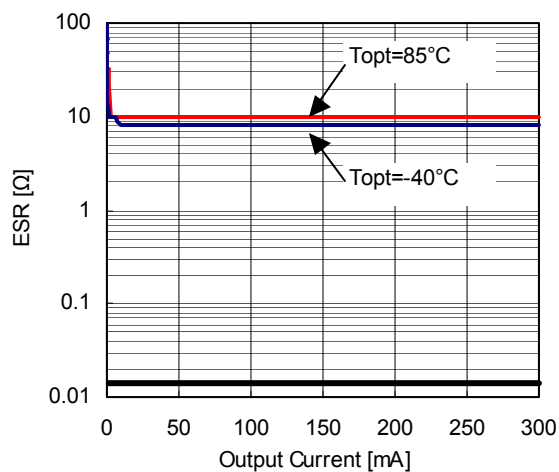
0.8V(VR1/VR2)

$V_{in}=0.8V$ to $5.25V$



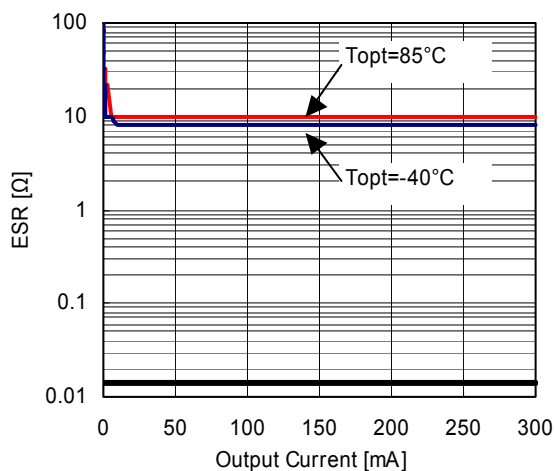
2.5V(VR1/VR2)

$V_{in}=2.5V$ to $5.25V$



3.6V(VR1/VR2)

$V_{in}=3.6V$ to $5.25V$





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