

ELM86xxxxBxA CMOS Dual 400mA LDO Regulator

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■General description

ELM86xxxxBxA is dual CMOS Voltage Regulator which consists of 2 large current LDOs. With the chip enable function of each channel, it is possible to control on/off independently. This chip enable control is managed by positive logic. The standby current is designed to be Typ.0.1 μ A. ELM86 series is available only in SOT-26 PKG, while the output voltage is fixed within the range of 1.2 to 4.0V. The internal short protection function will limit output current when VOUT pin is in short condition; meanwhile, thermal protection circuit will shut off the output voltage and current when an unusual high chip temperature is detected.

■Features

- Output voltage range : 1.2V to 4.0V (by 0.1V)
- Input-output voltage difference : Typ.120mV(Vout=3.0V, Iout=100mA)
- Standby current consumption : Typ.0.1 μ A
- Current consumption : Typ.25 μ A
- Input stability : Typ.0.02%/V(Iout=40mA)
- Load stability : Typ.5mV(1mA $\leq$ Iout $\leq$ 100mA)
- Accuracy of output voltage : $\pm$ 2.0%(Vout>1.5V),
 $\pm$ 30mV(Vout $\leq$ 1.5V)
- Short circuit current limiter : Typ.40mA(Vout=0V)
- Thermal shutdown protection : Typ.165 $^{\circ}$ C
- Package : SOT-26

■Application

- Portable electronics
- Wireless devices
- Cell phones
- Battery-operated devices

■Maximum absolute ratings

Parameter	Symbol	Limit	Unit
Input voltage	Vin	Vss-0.3 to 10.0	V
CE1,CE2 Input voltage	Vce	Vss-0.3 to Vin+0.3	V
Vout1,Vout2 voltage	Vout	Vss-0.3 to Vin+0.3	V
Output current Iout1+Iout2	Iout	800	mA
Power dissipation	Pd	300	mW
Thermal resistance junction to ambient	R θ ja	400	$^{\circ}$ C/W
Operating Temperature	Top	-40 to +85	$^{\circ}$ C
Storage Temperature	Tstg	-55 to +125	$^{\circ}$ C

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■Selection guide

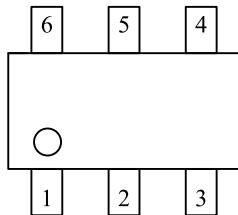
ELM86xxxxBxA-S

Symbol		
a, b	Output voltage1 (Vout1)	e.g. : 12: Vout=1.2V 18: Vout=1.8V 30: Vout=3.0V 33: Vout=3.3V
c, d	Output voltage2 (Vout2)	e.g. : 12: Vout=1.2V 18: Vout=1.8V 30: Vout=3.0V 33: Vout=3.3V
e	Package	B: SOT-26
f	Pin configuration type	1: Type1 2: Type2
g	Product version	A
h	Taping direction	S: Refer to PKG file

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 a b c d e f g h

■Pin configuration

SOT-26(TOP VIEW)



ELM86xxxxB1A

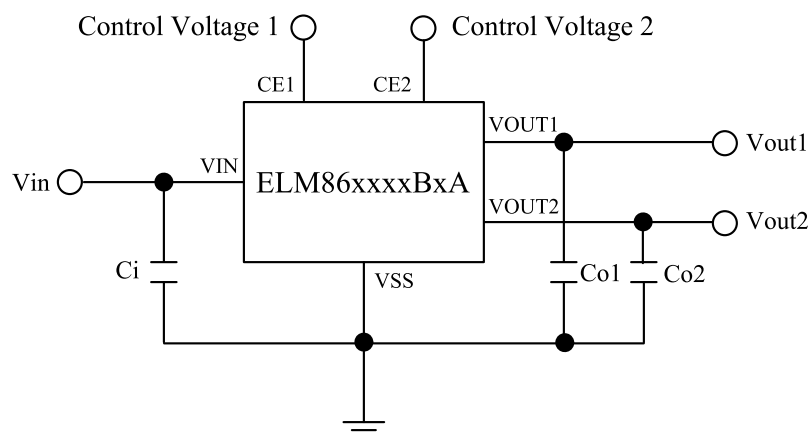
Pin No.	Pin name
1	VOUT2
2	VSS
3	CE2 *
4	CE1 *
5	VIN
6	VOUT1

ELM86xxxxB2A

Pin No.	Pin name
1	CE1 *
2	VIN
3	CE2 *
4	VOUT2
5	VSS
6	VOUT1

* CE1, CE2 : Active High

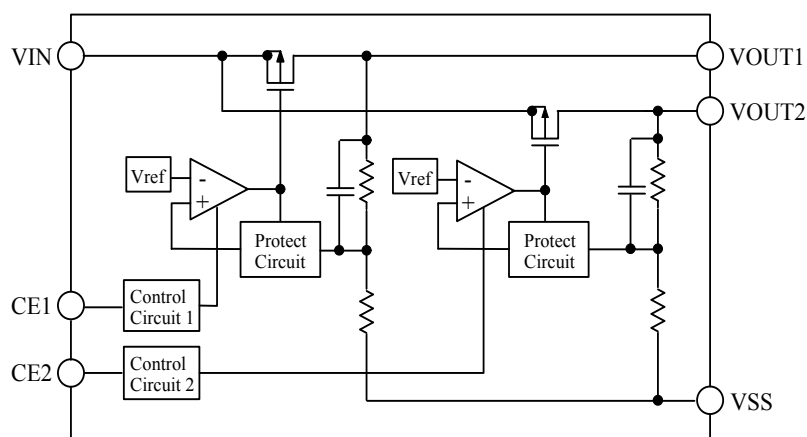
■Standard circuit



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■Block diagram



■Electrical characteristics

Vout1=Vout2=1.2V(ELM861212BxA)

Top=25°C

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Output voltage	Vout	Vin=2.2V, Iout=40mA	1.170	1.200	1.230	V
Output current	Iout	Vin=2.2V	240			mA
Input stability	$\Delta V_{out}/\Delta V_{in}$	Iout=40mA, 1.7V≤Vin≤6.0V		0.02	0.20	%/V
Load stability	$\Delta V_{out}/\Delta I_{out}$	1mA≤Iout≤100mA, Vin=2.2V		5	20	mV
Input-Output voltage differential	Vdif	Iout=100mA		380	620	mV
Current consumption	Iss	Vin=Vce=2.2V, No-load		15	50	μA
Standby current consumption	Istandby	Vin=2.2V, Vce=0V		0.1	0.5	μA
Input voltage	Vin		1.4		6.0	V
CE input voltage High	Vceh	Vin=6.0V	1.8		Vin	V
CE input voltage Low	Vcel	Vin=1.4V	0.00		0.25	V
CE input current High	Iceh	Vin=Vce=2.2V	-0.5	0.05	0.5	μA
CE input current Low	Icel	Vin=2.2V, Vce=0V	-0.5	0.0	0.5	μA
Output voltage temperature coefficient	$\Delta V_{out}/\Delta T_{op}$	-40°C≤Top≤+85°C, Iout=40mA, Vin=2.2V		±100		ppm/°C
Short circuit current	Ilim	Vout=0V		40		mA
Ripple rejection ratio	RR	f=1kHz, Iout=40mA		60		dB
Thermal shutdown temperature	Tsd			165		°C
Output noise	Vno	BW=10Hz to 100kHz		30		μVrms

* Electrical characteristics of both channels are identical while this table only represents those of one channel.

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Vout1=Vout2=1.8V(ELM861818BxA)

Top=25°C

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Output voltage	Vout	Vin=2.8V, Iout=40mA	1.764	1.800	1.836	V
Output current	Iout	Vin=2.8V	300			mA
Input stability	$\Delta V_{out}/\Delta V_{in}$	Iout=40mA, 2.3V≤Vin≤6.0V		0.02	0.20	%/V
Load stability	$\Delta V_{out}/\Delta I_{out}$	1mA≤Iout≤100mA, Vin=2.8V		5	20	mV
Input-Output voltage differential	Vdif	Iout=100mA		145	230	mV
Current consumption	Iss	Vin=Vce=2.8V, No-load		15	50	μA
Standby current consumption	Istandby	Vin=2.8V, Vce=0V		0.1	0.5	μA
Input voltage	Vin		1.4		6.0	V
CE input voltage High	Vceh	Vin=6.0V	1.8		Vin	V
CE input voltage Low	Vcel	Vin=1.4V	0.00		0.25	V
CE input current High	Iceh	Vin=Vce=2.8V	-0.5	0.05	0.5	μA
CE input current Low	Icel	Vin=2.8V, Vce=0V	-0.5	0.0	0.5	μA
Output voltage temperature coefficient	$\Delta V_{out}/\Delta T_{op}$	-40°C≤Top≤+85°C, Iout=40mA, Vin=2.8V		±100		ppm/°C
Short circuit current	Ilim	Vout=0V		40		mA
Ripple rejection ratio	RR	f=1kHz, Iout=40mA		60		dB
Thermal shutdown temperature	Tsd			165		°C
Output noise	Vno	BW=10Hz to 100kHz		30		μVrms

* Electrical characteristics of both channels are identical while this table only represents those of one channel.

Vout1=Vout2=3.0V(ELM863030BxA)

Top=25°C

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Output voltage	Vout	Vin=4.0V, Iout=40mA	2.940	3.000	3.060	V
Output current	Iout	Vin=4.0V	400			mA
Input stability	$\Delta V_{out}/\Delta V_{in}$	Iout=40mA, 3.5V≤Vin≤6.0V		0.02	0.20	%/V
Load stability	$\Delta V_{out}/\Delta I_{out}$	1mA≤Iout≤100mA, Vin=4.0V		5	20	mV
Input-Output voltage differential	Vdif	Iout=100mA		110	175	mV
Current consumption	Iss	Vin=Vce=4.0V, No-load		15	50	μA
Standby current consumption	Istandby	Vin=4.0V, Vce=0V		0.1	0.5	μA
Input voltage	Vin		1.4		6.0	V
CE input voltage High	Vceh	Vin=6.0V	1.8		Vin	V
CE input voltage Low	Vcel	Vin=1.4V	0.00		0.25	V
CE input current High	Iceh	Vin=Vce=4.0V	-0.5	0.05	0.5	μA
CE input current Low	Icel	Vin=4.0V, Vce=0V	-0.5	0.0	0.5	μA
Output voltage temperature coefficient	$\Delta V_{out}/\Delta T_{op}$	-40°C≤Top≤+85°C, Iout=40mA, Vin=4.0V		±100		ppm/°C
Short circuit current	Ilim	Vout=0V		40		mA
Ripple rejection ratio	RR	f=1kHz, Iout=40mA		60		dB
Thermal shutdown temperature	Tsd			165		°C
Output noise	Vno	BW=10Hz to 100kHz		30		μVrms

* Electrical characteristics of both channels are identical while this table only represents those of one channel.

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Vout1=Vout2=3.3V(ELM863333BxA)

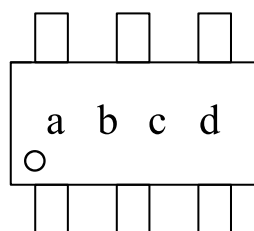
Top=25°C

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Output voltage	Vout	Vin=4.3V, Iout=40mA	3.234	3.300	3.366	V
Output current	Iout	Vin=4.3V	400			mA
Input stability	$\Delta V_{out}/\Delta V_{in}$	Iout=40mA, 3.8V≤Vin≤6.0V		0.02	0.20	%/V
Load stability	$\Delta V_{out}/\Delta I_{out}$	1mA≤Iout≤100mA, Vin=4.3V		5	20	mV
Input-Output voltage differential	Vdif	Iout=100mA		110	175	mV
Current consumption	Iss	Vin=Vce=4.3V, No-load		15	50	μA
Standby current consumption	Istandby	Vin=4.3V, Vce=0V		0.1	0.5	μA
Input voltage	Vin		1.4		6.0	V
CE input voltage High	Vceh	Vin=6.0V	1.8		Vin	V
CE input voltage Low	Vcel	Vin=1.4V	0.00		0.25	V
CE input current High	Iceh	Vin=Vce=4.3V	-0.5	0.05	0.5	μA
CE input current Low	Icel	Vin=4.3V, Vce=0V	-0.5	0.0	0.5	μA
Output voltage temperature coefficient	$\Delta V_{out}/\Delta T_{op}$	-40°C≤Top≤+85°C, Iout=40mA, Vin=4.3V		±100		ppm/°C
Short circuit current	Ilim	Vout=0V		40		mA
Ripple rejection ratio	RR	f=1kHz, Iout=40mA		60		dB
Thermal shutdown temperature	Tsd			165		°C
Output noise	Vno	BW=10Hz to 100kHz		30		μVrms

* Electrical characteristics of both channels are identical while this table only represents those of one channel.

■Marking

SOT-26



a to d : Assembly lot No. —

A to Z (I, O, X excepted) and 0 to 9

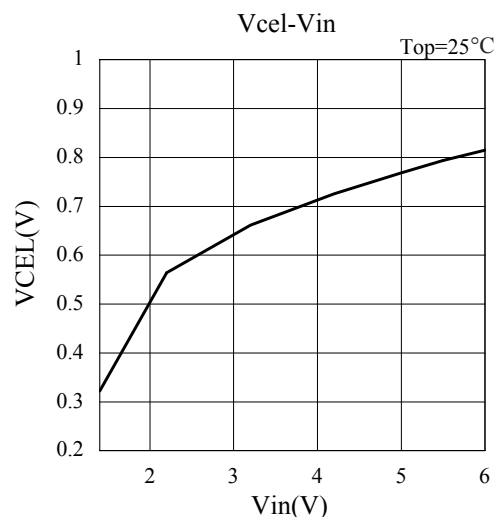
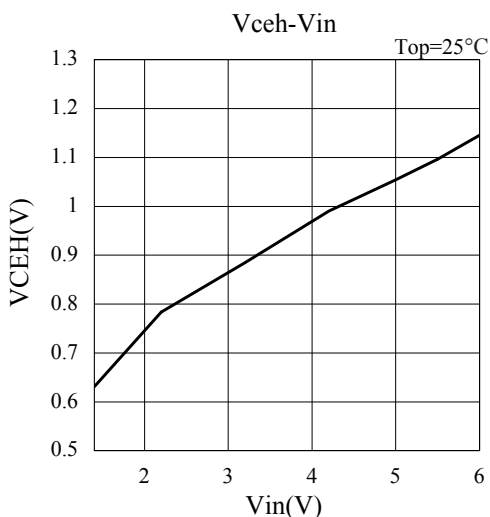
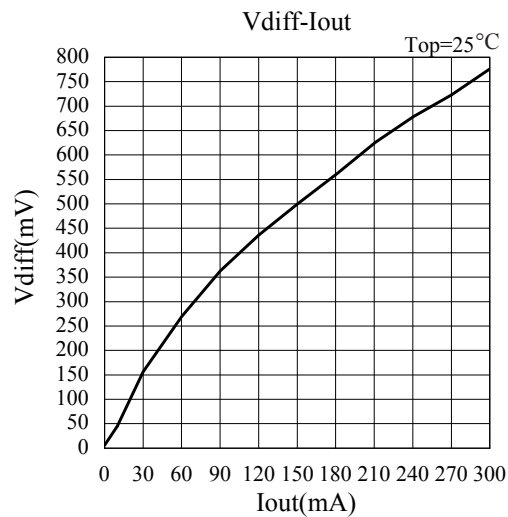
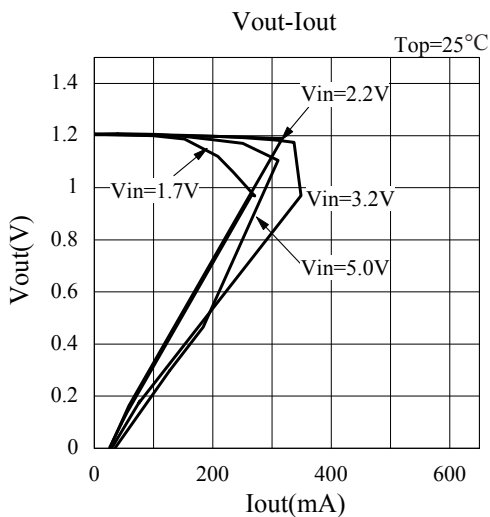
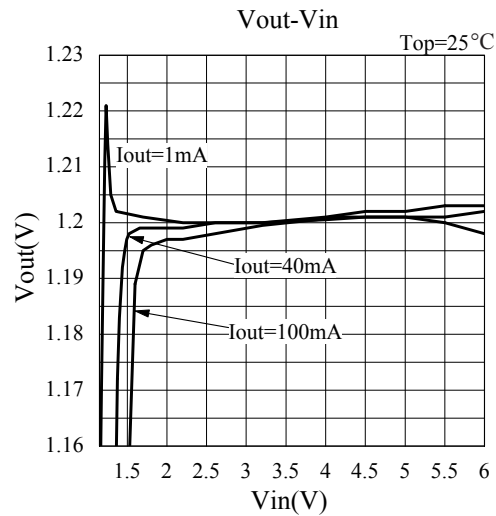
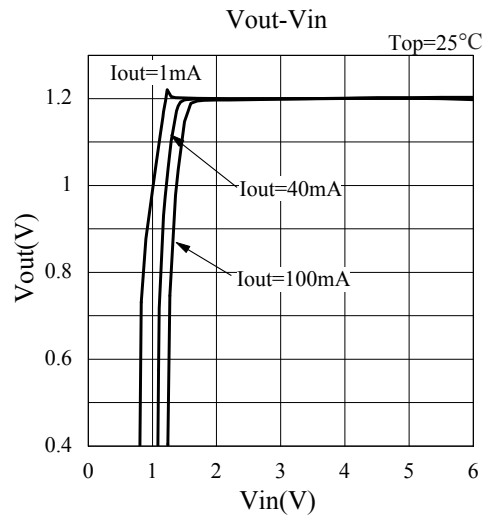
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■ Typical characteristics

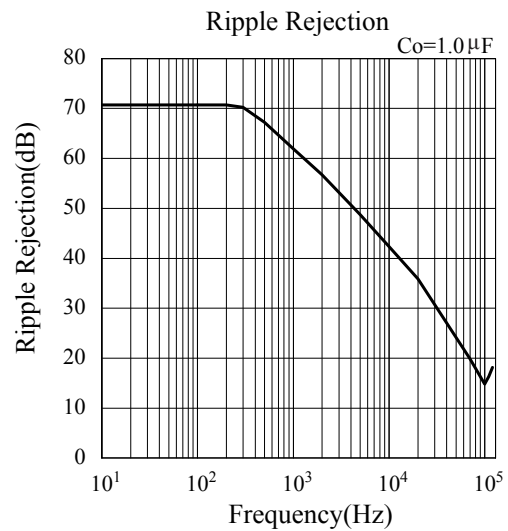
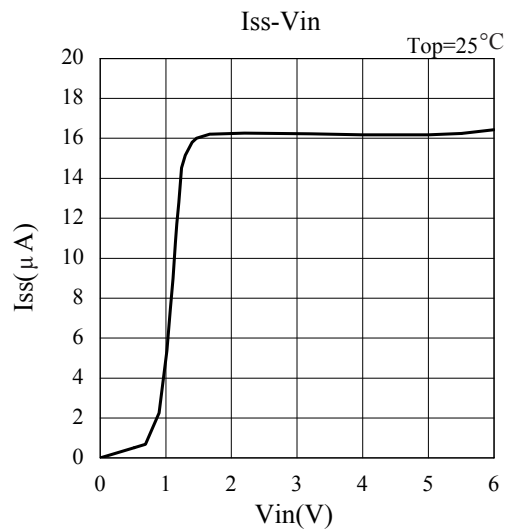
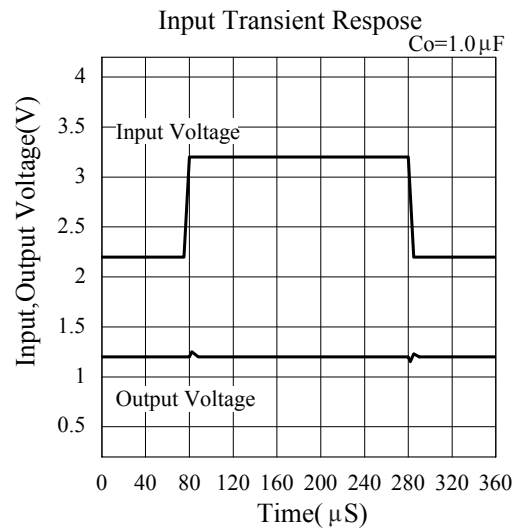
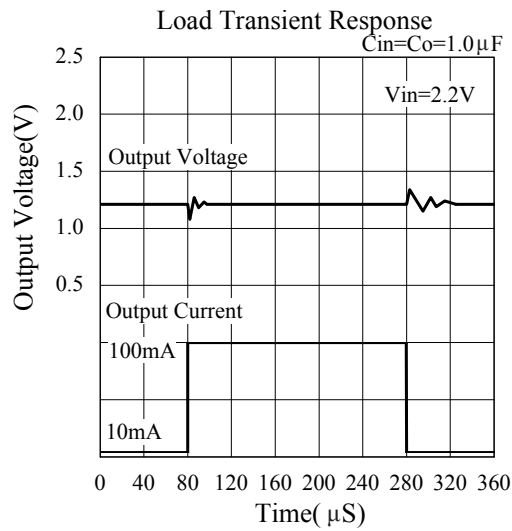
(Electrical characteristics of both channels are identical and the following graphs represent typical characteristics of one channel.)

- 1.2V Vout unit



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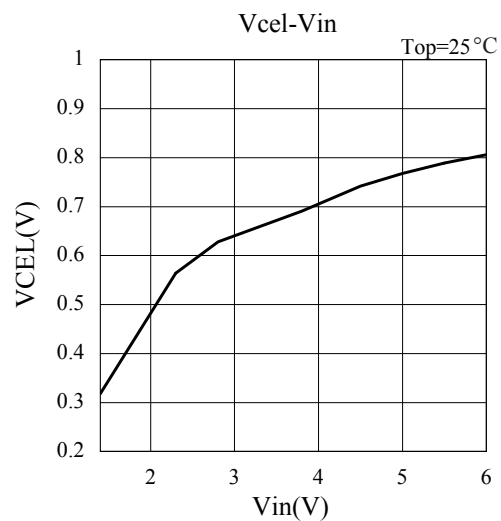
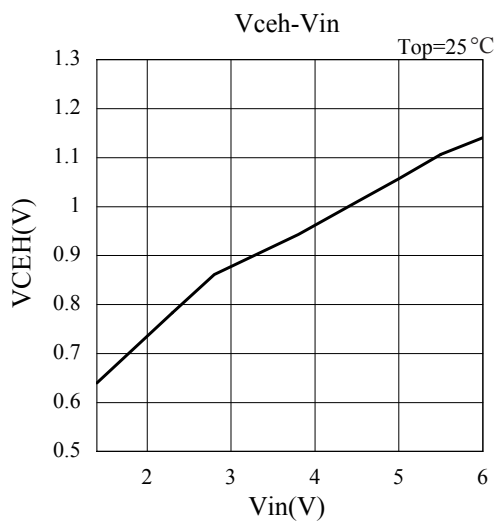
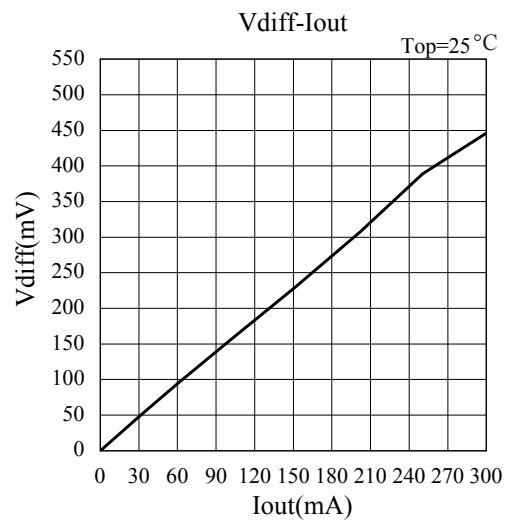
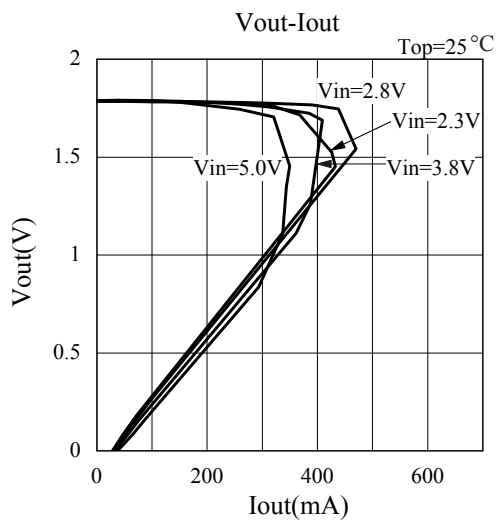
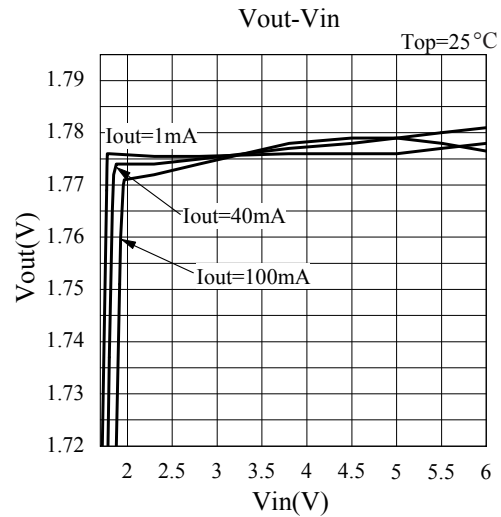
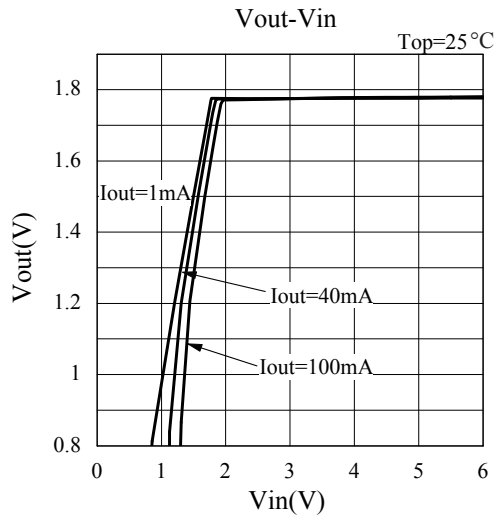
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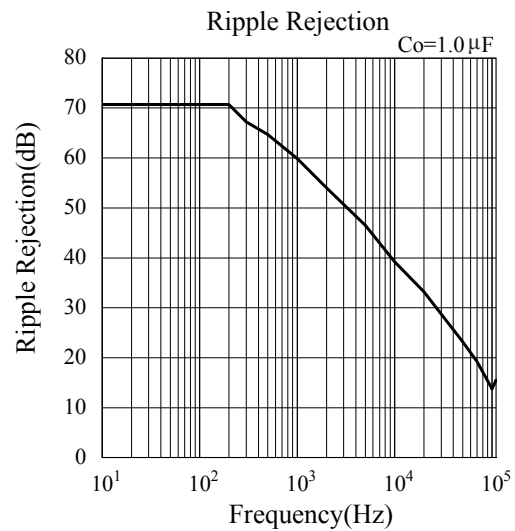
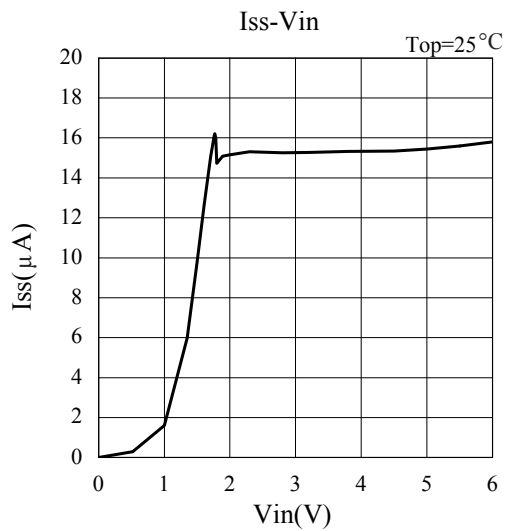
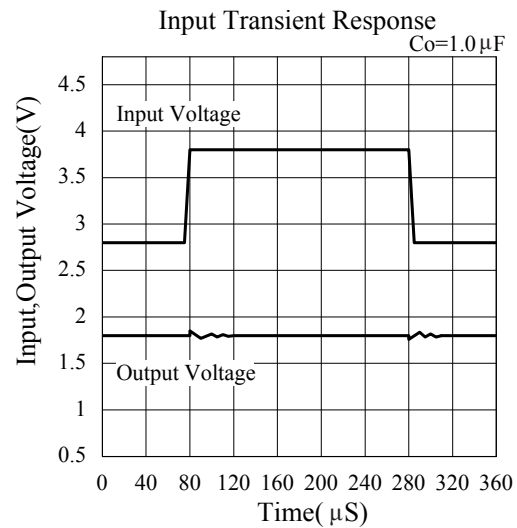
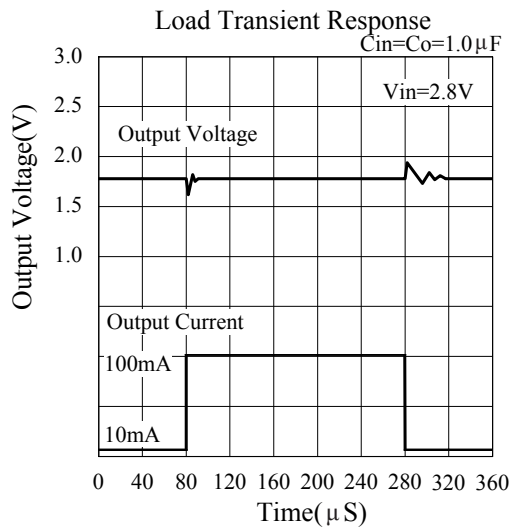
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- 1.8V Vout unit



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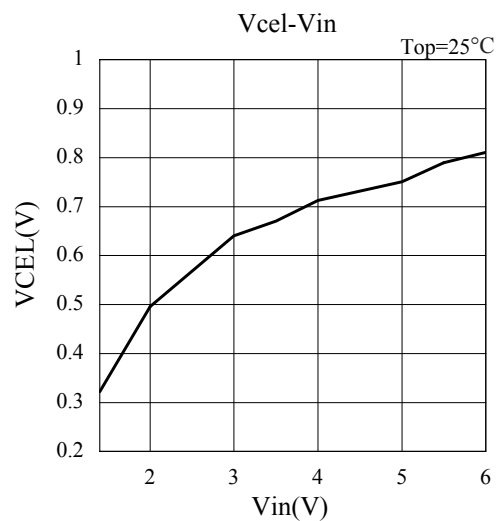
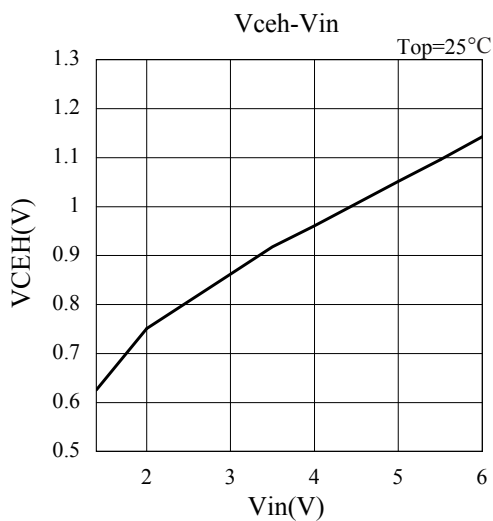
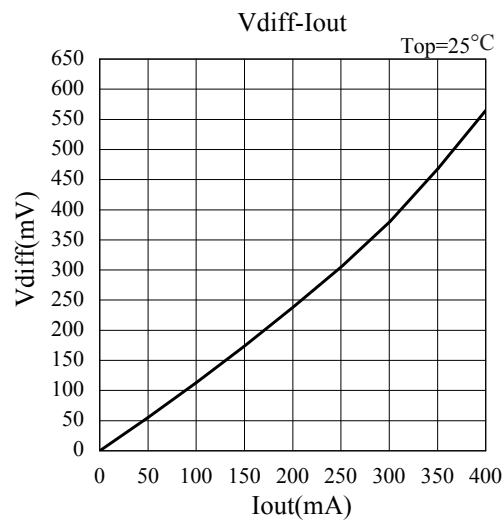
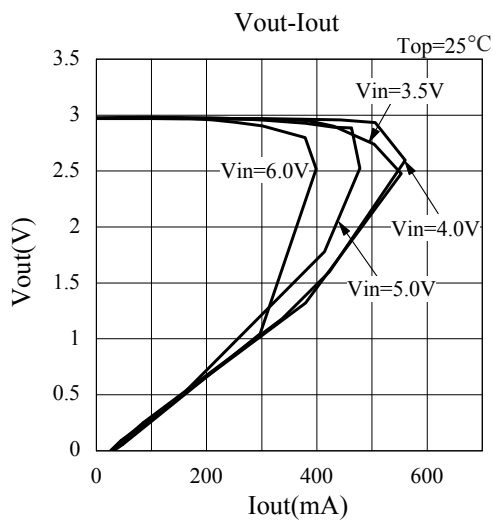
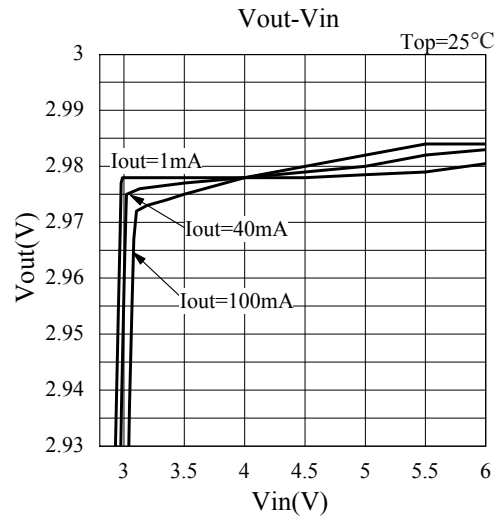
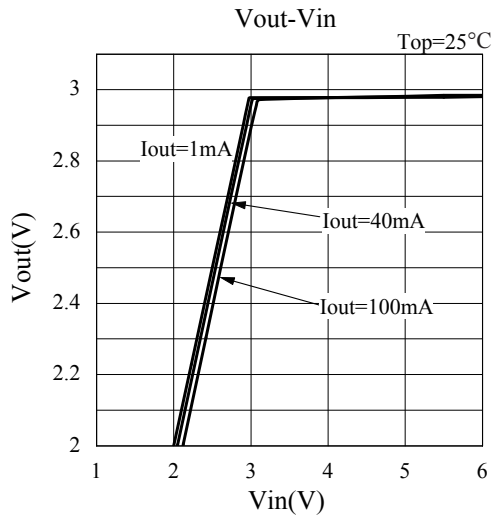
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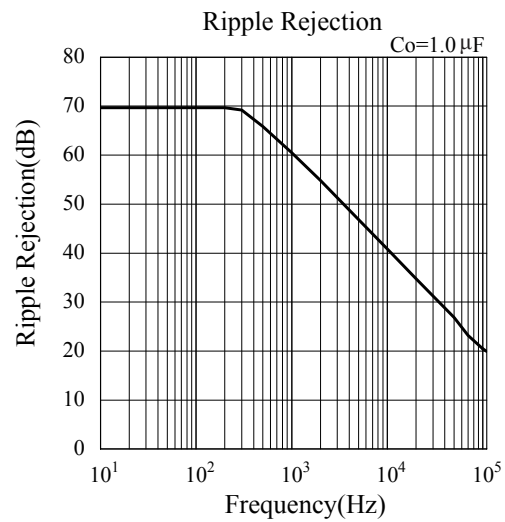
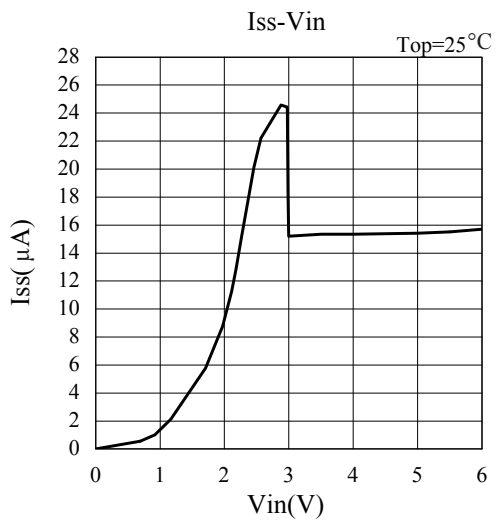
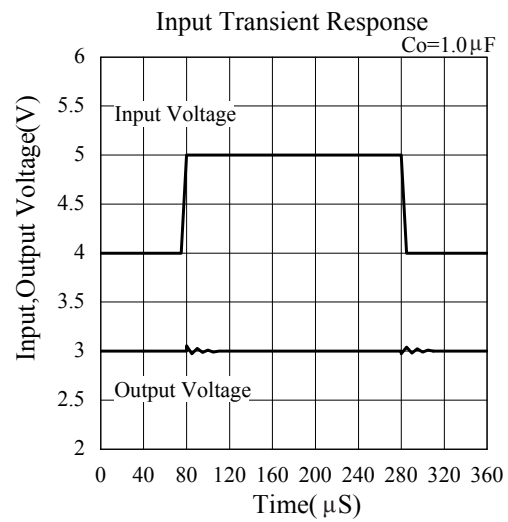
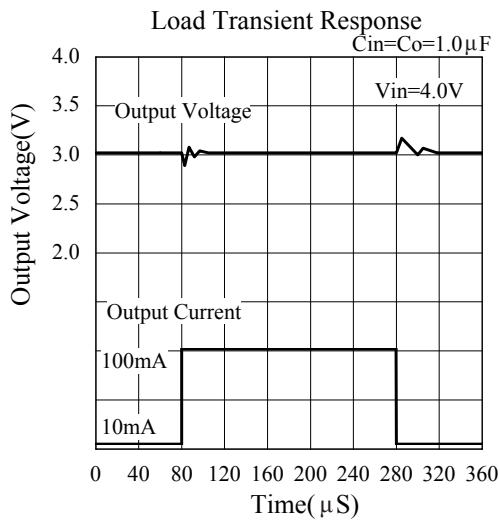
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• 3.0V Vout unit



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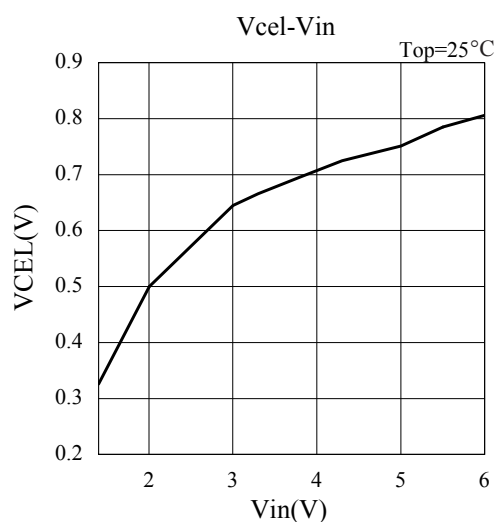
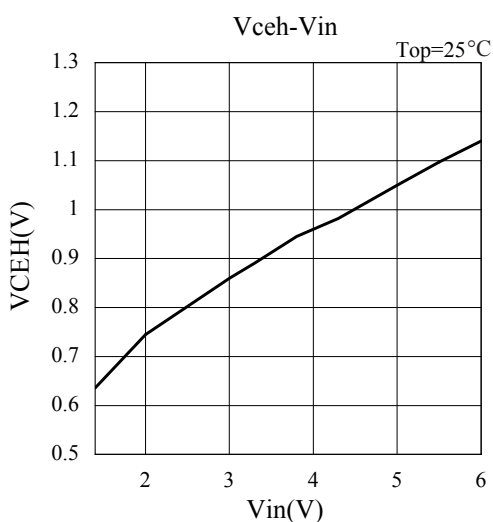
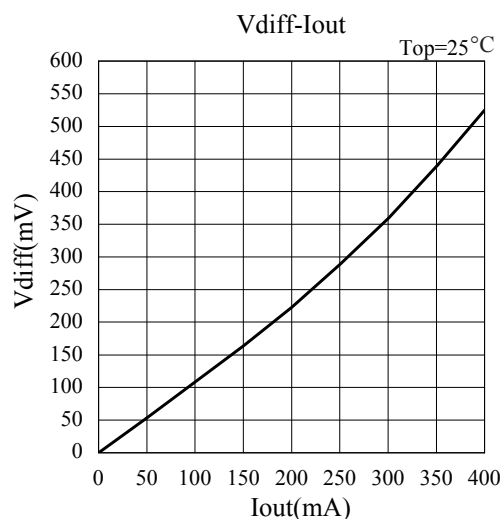
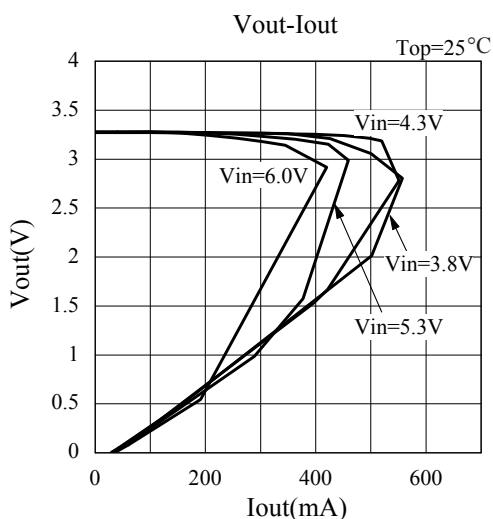
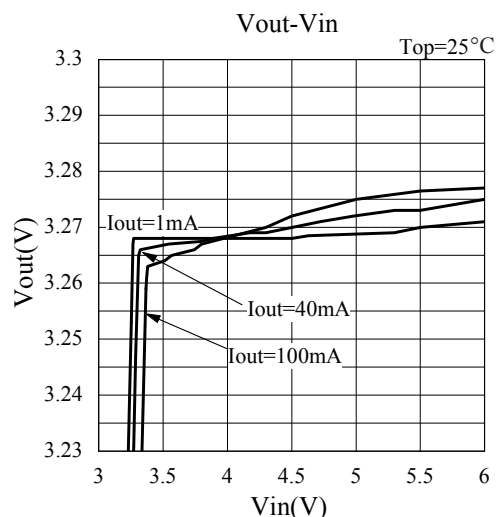
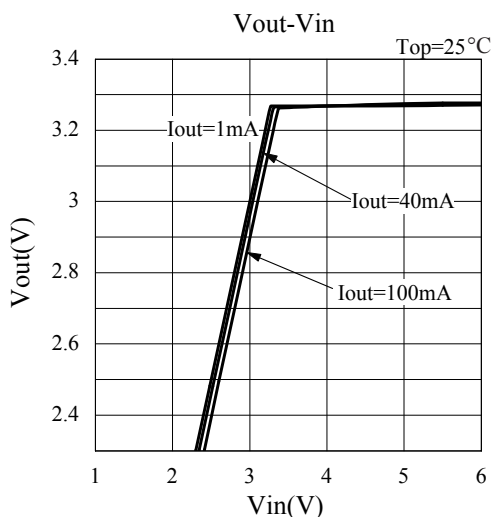
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• 3.3V Vout unit



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