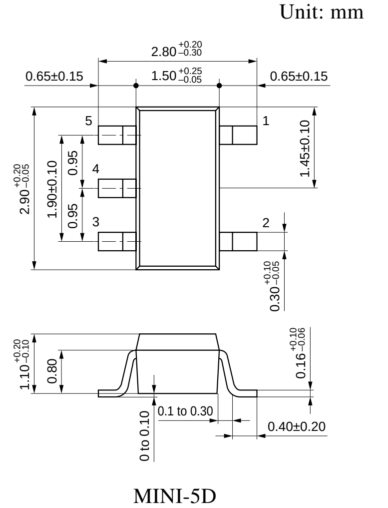
AN80LxxRMS Series

Positive output, low dropout voltage regulator (150 mA type)

■ Overview

The AN80LxxRMS series is a 0.15 A, low dropout, positive voltage regulator with reset function. 20 classifications of output voltages, 1.8 V, 1.9 V, 2.0 V, 2.1 V, 2.2 V, 2.5 V, 2.8 V, 2.9 V, 3.0 V, 3.1 V, 3.2 V, 3.3 V, 3.4 V, 3.5 V, 3.6 V, 4.8 V, 4.9 V, 5.0 V, 5.1 V and 5.2 V are available. In addition, it is adopting the surface mounting type package, so that it is most suited for miniaturization and weight reduction of set equipment.



On marking, see page 2

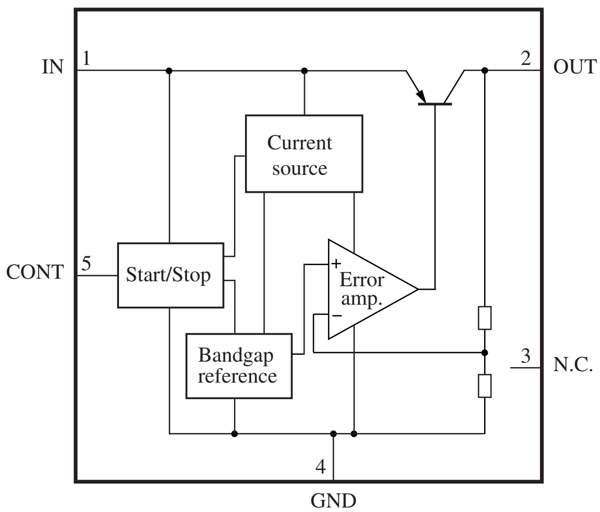
■ Features

- Minimum input and output voltage difference: 0.4 V max.
- High accuracy output voltage: (allowance: ±3%)
- Built-in reset function terminal (high: active)
- Built-in overcurrent limit circuit
- Built-in rush current prevention circuit at input voltage rise
- Output voltage: 1.8 V to 5.2 V

■ Applications

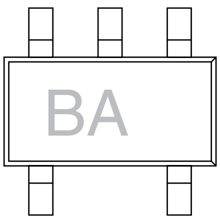
- Cellular phone, PHS, analog cordless phone, other small sized portable equipment

■ Block Diagram



■ Output Voltage Characteristics at I_{OUT} = 50 mA, T_a = 25°C

Type No.	Output V	Conditions	Min	Type	Max	Unit	Marking
AN80L18RMS	1.8	V_{IN} = 2.8 V	1.746	1.8	1.854	V	BA
AN80L19RMS	1.9	2.9	1.843	1.9	1.957	V	BB
AN80L20RMS	2.0	3.0	1.940	2.0	2.060	V	BC
AN80L21RMS	2.1	3.1	2.037	2.1	2.163	V	BD
AN80L22RMS	2.2	3.2	2.134	2.2	2.266	V	BE
AN80L25RMS	2.5	3.5	2.425	2.5	2.575	V	BW
AN80L28RMS	2.8	3.8	2.716	2.8	2.884	V	BF
AN80L29RMS	2.9	3.9	2.813	2.9	2.987	V	BG
AN80L30RMS	3.0	4.0	2.910	3.0	3.090	V	BH
AN80L31RMS	3.1	4.1	3.007	3.1	3.193	V	BJ
AN80L32RMS	3.2	4.2	3.104	3.2	3.296	V	BK
AN80L33RMS	3.3	4.3	3.201	3.3	3.399	V	BL
AN80L34RMS	3.4	4.4	3.298	3.4	3.502	V	BM
AN80L35RMS	3.5	4.5	3.395	3.5	3.605	V	BN
AN80L36RMS	3.6	4.6	3.492	3.6	3.708	V	BP
AN80L48RMS	4.8	5.8	4.656	4.8	4.944	V	BQ
AN80L49RMS	4.9	5.9	4.753	4.9	5.047	V	BR
AN80L50RMS	5.0	6.0	4.850	5.0	5.150	V	BS
AN80L51RMS	5.1	6.1	4.947	5.1	5.253	V	BT
AN80L52RMS	5.2	6.2	5.044	5.2	5.356	V	BU



(Marking example: AN80L18RMS)

■ Pin Descriptions

Pin No.	Description
1	Input voltage pin
2	Output voltage pin
3	N.C. pin
4	Grounding pin
5	Control pin (High → operation, Low → stop)

■ Absolute Maximum Ratings

Parameter	Symbol	Rating	Unit
Supply voltage *1	V_{CC}	14.6	V
Supply current	I_{CC}	300	mA
Power dissipation *3	P_D	78	mW
Operating ambient temperature *2	T_{opr}	−30 to +85	°C
Storage temperature *2	T_{stg}	−55 to +150	°C

Note) *1: There may be a case of the device destruction when the output (V_{OUT}) and the grounding (GND), or the output (V_{OUT}) and input (V_{IN}) are short-circuited.

*2: Except for the operating ambient temperature and storage temperature, all ratings are for T_a = 25°C.

*3: T_{opr} = Power dissipation for IC alone without heat sink at +85°C.

■ Recommended Operating Conditions

Part No.	Output voltage	Operating supply voltage range (V_{CC})	Unit
AN80L18RMS	1.8	2.2 to 14.5	V
AN80L19RMS	1.9	2.3 to 14.5	V
AN80L20RMS	2.0	2.4 to 14.5	V
AN80L21RMS	2.1	2.5 to 14.5	V
AN80L22RMS	2.2	2.6 to 14.5	V
AN80L25RMS	2.5	2.9 to 14.5	V
AN80L28RMS	2.8	3.2 to 14.5	V
AN80L29RMS	2.9	3.3 to 14.5	V
AN80L30RMS	3.0	3.4 to 14.5	V
AN80L31RMS	3.1	3.5 to 14.5	V
AN80L32RMS	3.2	3.6 to 14.5	V
AN80L33RMS	3.3	3.7 to 14.5	V
AN80L34RMS	3.4	3.8 to 14.5	V
AN80L35RMS	3.5	3.9 to 14.5	V
AN80L36RMS	3.6	4.0 to 14.5	V
AN80L48RMS	4.8	5.2 to 14.5	V
AN80L49RMS	4.9	5.3 to 14.5	V
AN80L50RMS	5.0	5.4 to 14.5	V
AN80L51RMS	5.1	5.5 to 14.5	V
AN80L52RMS	5.2	5.6 to 14.5	V

■ Electrical Characteristics at T_a = 25°C

• AN80L18RMS (1.8 V type)

Unless otherwise specially provided, shorten each test time (within 10 ms) so that the test is conducted under the condition that the drift due to the temperature increase in the chip junction part can be neglected. C_{IN} = 0.1 μF, C_{OUT} = 10 μF

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Output voltage	V_{OUT}	V_{IN} = 2.8 V, I_{OUT} = 50 mA	1.746	1.8	1.854	V
Line regulation 1	REG_{IN1}	V_{IN} = 2.8 V → 14.5 V, I_{OUT} = 50 mA	—	10	50	mV
Line regulation 2	REG_{IN2}	V_{IN} = 2.8 V → 9 V, I_{OUT} = 50 mA	—	5	20	mV
Load regulation *1	REG_{LOA}	V_{IN} = 2.8 V, I_{OUT} = 0 mA → 150 mA	—	50	150	mV
Peak output current *2	I_{PEAK}	V_{IN} = 2.8 V, The output current value when V_{OUT} decreases by 5% from its value at I_{OUT} = 50 mA.	180	240	—	mA
Bias current under no load	I_{BIAS}	V_{IN} = 2.8 V, I_{OUT} = 0 mA	—	—	350	μA
Bias current fluctuation to load	ΔI_{BIAS}	V_{IN} = 2.8 V, I_{OUT} = 0 mA → 150 mA	—	—	5	mA
Standby consumption current	I_{STB}	V_{IN} = 10 V, V_{CONT} = 0 V	—	—	0.1	μA
Bias current before starting regulation	I_{RUSH}	V_{IN} = 1.5 V, I_{OUT} = 0 mA	—	1.5	5	mA
Ripple rejection ratio	RR	1 V[rms], f = 120 Hz, I_{OUT} = 10 mA	62	70	—	dB
Minimum input/ output voltage difference 1	$V_{DIF(min)1}$	V_{IN} = 1.5 V, I_{OUT} = 0 mA	—	0.1	0.2	V
Minimum input/ output voltage difference 2	$V_{DIF(min)2}$	V_{IN} = 2.1 V, I_{OUT} = 150 mA	—	—	0.4	V
Control terminal threshold high voltage	V_{CONTH}	V_{IN} = 2.8 V, I_{OUT} = 50 mA	—	—	1.50	V
Control terminal threshold low voltage	V_{CONTL}	V_{IN} = 2.8 V, I_{OUT} = 50 mA	0.30	—	—	V
Control terminal current	I_{CONT}	V_{IN} = 2.8 V, I_{OUT} = 50 mA V_{CONT} = 1.8 V	—	—	30	μA

Note) *1: 1.0 Ω

*2: Peak output current: The output current when the output voltage has been decreased by 5% from the value at the time when the output current is 50 mA due to the overcurrent protection.

• Design reference data

Note) The following values are typical and not guaranteed values.

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Output noise voltage	V_{NO}	10 Hz ≤ f ≤ 100 kHz, I_{OUT} = 10 mA	—	38	—	μV
Output voltage temperature coefficient	$\frac{1}{V_{OUT}} \cdot \frac{dV_{OUT}}{dT}$	V_{IN} = 2.8 V, I_{OUT} = 0 mA −30°C ≤ T_a ≤ +85°C	—	90	—	ppm/°C
Output rise time *	t_{ON}	V_{IN} = 2.8 V, I_{OUT} = 50 mA V_{CONT} = 0 V → 1.8 V, C_{IN} = 0.1 μF C_{OUT} = 10 μF, V_{OUT} = 90%	—	0.10	—	ms

Note) *: Refer to "■ Application Notes 3. Output rise-time characteristics".

■ Electrical Characteristics at T_a = 25°C (continued)

• AN80L19RMS (1.9 V type)

Unless otherwise specially provided, shorten each test time (within 10 ms) so that the test is conducted under the condition that the drift due to the temperature increase in the chip junction part can be neglected. C_{IN} = 0.1 µF, C_{OUT} = 10 µF

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Output voltage	V_{OUT}	V_{IN} = 2.9 V, I_{OUT} = 50 mA	1.843	1.9	1.957	V
Line regulation 1	REG_{IN1}	V_{IN} = 2.9 V → 14.5 V, I_{OUT} = 50 mA	—	10	50	mV
Line regulation 2	REG_{IN2}	V_{IN} = 2.9 V → 9 V, I_{OUT} = 50 mA	—	5	20	mV
Load regulation *1	REG_{LOA}	V_{IN} = 2.9 V, I_{OUT} = 0 mA → 150 mA	—	50	150	mV
Peak output current *2	I_{PEAK}	V_{IN} = 2.9 V, The output current value when V_{OUT} decreases by 5% from its value at I_{OUT} = 50 mA.	180	240	—	mA
Bias current under no load	I_{BIAS}	V_{IN} = 2.9 V, I_{OUT} = 0 mA	—	—	350	µA
Bias current fluctuation to load	ΔI_{BIAS}	V_{IN} = 2.9 V, I_{OUT} = 0 mA → 150 mA	—	—	5	mA
Standby consumption current	I_{STB}	V_{IN} = 10 V, V_{CONT} = 0 V	—	—	0.1	µA
Bias current before starting regulation	I_{RUSH}	V_{IN} = 1.6 V, I_{OUT} = 0 mA	—	1.5	5	mA
Ripple rejection ratio	RR	1 V[rms], f = 120 Hz, I_{OUT} = 10 mA	62	70	—	dB
Minimum input/ output voltage difference 1	$V_{DIF(min)1}$	V_{IN} = 1.6 V, I_{OUT} = 0 mA	—	0.1	0.2	V
Minimum input/ output voltage difference 2	$V_{DIF(min)2}$	V_{IN} = 2.2 V, I_{OUT} = 150 mA	—	—	0.4	V
Control terminal threshold high voltage	V_{CONTH}	V_{IN} = 2.9 V, I_{OUT} = 50 mA	—	—	1.50	V
Control terminal threshold low voltage	V_{CONTL}	V_{IN} = 2.9 V, I_{OUT} = 50 mA	0.30	—	—	V
Control terminal current	I_{CONT}	V_{IN} = 2.9 V, I_{OUT} = 50 mA V_{CONT} = 1.8 V	—	—	30	µA

Note) *1: 1.0 Ω

*2: Peak output current: The output current when the output voltage has been decreased by 5% from the value at the time when the output current is 50 mA due to the overcurrent protection.

• Design reference data

Note) The following values are typical and not guaranteed values.

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Output noise voltage	V_{NO}	10 Hz ≤ f ≤ 100 kHz, I_{OUT} = 10 mA	—	40	—	µV
Output voltage temperature coefficient	$\frac{1}{V_{OUT}} \cdot \frac{dV_{OUT}}{dT}$	V_{IN} = 2.9 V, I_{OUT} = 0 mA −30°C ≤ T_a ≤ +85°C	—	90	—	ppm/°C
Output rise time *	t_{ON}	V_{IN} = 2.9 V, I_{OUT} = 50 mA V_{CONT} = 0 V → 1.8 V, C_{IN} = 0.1 µF C_{OUT} = 10 µF, V_{OUT} = 90%	—	0.10	—	ms

Note) *: Refer to "■ Application Notes 3. Output rise-time characteristics".

■ Electrical Characteristics at T_a = 25°C (continued)

• AN80L20RMS (2.0 V type)

Unless otherwise specially provided, shorten each test time (within 10 ms) so that the test is conducted under the condition that the drift due to the temperature increase in the chip junction part can be neglected. C_{IN} = 0.1 µF, C_{OUT} = 10 µF

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Output voltage	V_{OUT}	V_{IN} = 3.0 V, I_{OUT} = 50 mA	1.940	2.0	2.060	V
Line regulation 1	REG_{IN1}	V_{IN} = 3.0 V → 14.5 V, I_{OUT} = 50 mA	—	10	50	mV
Line regulation 2	REG_{IN2}	V_{IN} = 3.0 V → 9 V, I_{OUT} = 50 mA	—	5	20	mV
Load regulation *1	REG_{LOA}	V_{IN} = 3.0 V, I_{OUT} = 0 mA → 150 mA	—	50	150	mV
Peak output current *2	I_{PEAK}	V_{IN} = 3.0 V, The output current value when V_{OUT} decreases by 5% from its value at I_{OUT} = 50 mA.	180	240	—	mA
Bias current under no load	I_{BIAS}	V_{IN} = 3.0 V, I_{OUT} = 0 mA	—	—	350	µA
Bias current fluctuation to load	ΔI_{BIAS}	V_{IN} = 3.0 V, I_{OUT} = 0 mA → 150 mA	—	—	5	mA
Standby consumption current	I_{STB}	V_{IN} = 10 V, V_{CONT} = 0 V	—	—	0.1	µA
Bias current before starting regulation	I_{RUSH}	V_{IN} = 1.7 V, I_{OUT} = 0 mA	—	1.5	5	mA
Ripple rejection ratio	RR	1 V[rms], f = 120 Hz, I_{OUT} = 10 mA	62	70	—	dB
Minimum input/ output voltage difference 1	$V_{DIF(min)1}$	V_{IN} = 1.7 V, I_{OUT} = 0 mA	—	0.1	0.2	V
Minimum input/ output voltage difference 2	$V_{DIF(min)2}$	V_{IN} = 2.3 V, I_{OUT} = 150 mA	—	—	0.4	V
Control terminal threshold high voltage	V_{CONTH}	V_{IN} = 3.0 V, I_{OUT} = 50 mA	—	—	1.50	V
Control terminal threshold low voltage	V_{CONTL}	V_{IN} = 3.0 V, I_{OUT} = 50 mA	0.30	—	—	V
Control terminal current	I_{CONT}	V_{IN} = 3.0 V, I_{OUT} = 50 mA V_{CONT} = 1.8 V	—	—	30	µA

Note) *1: 1.0 Ω

*2: Peak output current: The output current when the output voltage has been decreased by 5% from the value at the time when the output current is 50 mA due to the overcurrent protection.

• Design reference data

Note) The following values are typical and not guaranteed values.

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Output noise voltage	V_{NO}	10 Hz ≤ f ≤ 100 kHz, I_{OUT} = 10 mA	—	42	—	µV
Output voltage temperature coefficient	$\frac{1}{V_{OUT}} \cdot \frac{dV_{OUT}}{dT}$	V_{IN} = 3.0 V, I_{OUT} = 0 mA −30°C ≤ T_a ≤ +85°C	—	90	—	ppm/°C
Output rise time *	t_{ON}	V_{IN} = 3.0 V, I_{OUT} = 50 mA V_{CONT} = 0 V → 1.8 V, C_{IN} = 0.1 µF C_{OUT} = 10 µF, V_{OUT} = 90%	—	0.10	—	ms

Note) *: Refer to "■ Application Notes 3. Output rise-time characteristics".

■ Electrical Characteristics at T_a = 25°C (continued)

• AN80L21RMS (2.1 V type)

Unless otherwise specially provided, shorten each test time (within 10 ms) so that the test is conducted under the condition that the drift due to the temperature increase in the chip junction part can be neglected. C_{IN} = 0.1 µF, C_{OUT} = 10 µF

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Output voltage	V_{OUT}	V_{IN} = 3.1 V, I_{OUT} = 50 mA	2.037	2.1	2.163	V
Line regulation 1	REG_{IN1}	V_{IN} = 3.1 V → 14.5 V, I_{OUT} = 50 mA	—	10	50	mV
Line regulation 2	REG_{IN2}	V_{IN} = 3.1 V → 9 V, I_{OUT} = 50 mA	—	5	20	mV
Load regulation *1	REG_{LOA}	V_{IN} = 3.1 V, I_{OUT} = 0 mA → 150 mA	—	50	150	mV
Peak output current *2	I_{PEAK}	V_{IN} = 3.1 V, The output current value when V_{OUT} decreases by 5% from its value at I_{OUT} = 50 mA.	180	240	—	mA
Bias current under no load	I_{BIAS}	V_{IN} = 3.1 V, I_{OUT} = 0 mA	—	—	350	µA
Bias current fluctuation to load	ΔI_{BIAS}	V_{IN} = 3.1 V, I_{OUT} = 0 mA → 150 mA	—	—	5	mA
Standby consumption current	I_{STB}	V_{IN} = 10 V, V_{CONT} = 0 V	—	—	0.1	µA
Bias current before starting regulation	I_{RUSH}	V_{IN} = 1.8 V, I_{OUT} = 0 mA	—	1.5	5	mA
Ripple rejection ratio	RR	1 V[rms], f = 120 Hz, I_{OUT} = 10 mA	61	69	—	dB
Minimum input/ output voltage difference 1	$V_{DIF(min)1}$	V_{IN} = 1.8 V, I_{OUT} = 0 mA	—	0.1	0.2	V
Minimum input/ output voltage difference 2	$V_{DIF(min)2}$	V_{IN} = 2.4 V, I_{OUT} = 150 mA	—	—	0.4	V
Control terminal threshold high voltage	V_{CONTH}	V_{IN} = 3.1 V, I_{OUT} = 50 mA	—	—	1.50	V
Control terminal threshold low voltage	V_{CONTL}	V_{IN} = 3.1 V, I_{OUT} = 50 mA	0.30	—	—	V
Control terminal current	I_{CONT}	V_{IN} = 3.1 V, I_{OUT} = 50 mA V_{CONT} = 1.8 V	—	—	30	µA

Note) ∗1: 1.0 Ω

∗2: Peak output current: The output current when the output voltage has been decreased by 5% from the value at the time when the output current is 50 mA due to the overcurrent protection.

• Design reference data

Note) The following values are typical and not guaranteed values.

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Output noise voltage	V_{NO}	10 Hz ≤ f ≤ 100 kHz, I_{OUT} = 10 mA	—	44	—	µV
Output voltage temperature coefficient	$\frac{1}{V_{OUT}} \cdot \frac{dV_{OUT}}{dT}$	V_{IN} = 3.1 V, I_{OUT} = 0 mA −30°C ≤ T_a ≤ +85°C	—	90	—	ppm/°C
Output rise time *	t_{ON}	V_{IN} = 3.1 V, I_{OUT} = 50 mA V_{CONT} = 0 V → 1.8 V, C_{IN} = 0.1 µF C_{OUT} = 10 µF, V_{OUT} = 90%	—	0.10	—	ms

Note) ∗: Refer to "■ Application Notes 3. Output rise-time characteristics".

■ Electrical Characteristics at T_a = 25°C (continued)

• AN80L22RMS (2.2 V type)

Unless otherwise specially provided, shorten each test time (within 10 ms) so that the test is conducted under the condition that the drift due to the temperature increase in the chip junction part can be neglected. C_{IN} = 0.1 μF, C_{OUT} = 10 μF

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Output voltage	V_{OUT}	V_{IN} = 3.2 V, I_{OUT} = 50 mA	2.134	2.2	2.266	V
Line regulation 1	REG_{IN1}	V_{IN} = 3.2 V → 14.5 V, I_{OUT} = 50 mA	—	10	50	mV
Line regulation 2	REG_{IN2}	V_{IN} = 3.2 V → 9 V, I_{OUT} = 50 mA	—	5	20	mV
Load regulation *1	REG_{LOA}	V_{IN} = 3.2 V, I_{OUT} = 0 mA → 150 mA	—	50	150	mV
Peak output current *2	I_{PEAK}	V_{IN} = 3.2 V, The output current value when V_{OUT} decreases by 5% from its value at I_{OUT} = 50 mA.	180	240	—	mA
Bias current under no load	I_{BIAS}	V_{IN} = 3.2 V, I_{OUT} = 0 mA	—	—	350	μA
Bias current fluctuation to load	ΔI_{BIAS}	V_{IN} = 3.2 V, I_{OUT} = 0 mA → 150 mA	—	—	5	mA
Standby consumption current	I_{STB}	V_{IN} = 10 V, V_{CONT} = 0 V	—	—	0.1	μA
Bias current before starting regulation	I_{RUSH}	V_{IN} = 1.9 V, I_{OUT} = 0 mA	—	1.5	5	mA
Ripple rejection ratio	RR	1 V[rms], f = 120 Hz, I_{OUT} = 10 mA	61	69	—	dB
Minimum input/ output voltage difference 1	$V_{DIF(min)1}$	V_{IN} = 1.9 V, I_{OUT} = 0 mA	—	0.1	0.2	V
Minimum input/ output voltage difference 2	$V_{DIF(min)2}$	V_{IN} = 2.4 V, I_{OUT} = 150 mA	—	—	0.4	V
Control terminal threshold high voltage	V_{CONTH}	V_{IN} = 3.2 V, I_{OUT} = 50 mA	—	—	1.50	V
Control terminal threshold low voltage	V_{CONTL}	V_{IN} = 3.2 V, I_{OUT} = 50 mA	0.30	—	—	V
Control terminal current	I_{CONT}	V_{IN} = 3.2 V, I_{OUT} = 50 mA V_{CONT} = 1.8 V	—	—	30	μA

Note) ∗1: 1.0 Ω

∗2: Peak output current: The output current when the output voltage has been decreased by 5% from the value at the time when the output current is 50 mA due to the overcurrent protection.

• Design reference data

Note) The following values are typical and not guaranteed values.

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Output noise voltage	V_{NO}	10 Hz ≤ f ≤ 100 kHz, I_{OUT} = 10 mA	—	46	—	μV
Output voltage temperature coefficient	$\frac{1}{V_{OUT}} \cdot \frac{dV_{OUT}}{dT}$	V_{IN} = 3.2 V, I_{OUT} = 0 mA −30°C ≤ T_a ≤ +85°C	—	90	—	ppm/°C
Output rise time *	t_{ON}	V_{IN} = 3.2 V, I_{OUT} = 50 mA V_{CONT} = 0 V → 1.8 V, C_{IN} = 0.1 μF C_{OUT} = 10 μF, V_{OUT} = 90%	—	0.10	—	ms

Note) ∗: Refer to "■ Application Notes 3. Output rise-time characteristics".

■ Electrical Characteristics at T_a = 25°C (continued)

• AN80L25RMS (2.5 V type)

Unless otherwise specially provided, shorten each test time (within 10 ms) so that the test is conducted under the condition that the drift due to the temperature increase in the chip junction part can be neglected. C_{IN} = 0.1 μF, C_{OUT} = 10 μF

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Output voltage	V_{OUT}	V_{IN} = 3.5 V, I_{OUT} = 50 mA	2.425	2.5	2.575	V
Line regulation 1	REG_{IN1}	V_{IN} = 3.5 V → 14.5 V, I_{OUT} = 50 mA	—	10	50	mV
Line regulation 2	REG_{IN2}	V_{IN} = 3.5 V → 9 V, I_{OUT} = 50 mA	—	5	20	mV
Load regulation *1	REG_{LOA}	V_{IN} = 3.5 V, I_{OUT} = 0 mA → 150 mA	—	50	150	mV
Peak output current *2	I_{PEAK}	V_{IN} = 3.5 V, The output current value when V_{OUT} decreases by 5% from its value at I_{OUT} = 50 mA.	180	240	—	mA
Bias current under no load	I_{BIAS}	V_{IN} = 3.5 V, I_{OUT} = 0 mA	—	—	350	μA
Bias current fluctuation to load	ΔI_{BIAS}	V_{IN} = 3.5 V, I_{OUT} = 0 mA → 150 mA	—	—	5	mA
Standby consumption current	I_{STB}	V_{IN} = 10 V, V_{CONT} = 0 V	—	—	0.1	μA
Bias current before starting regulation	I_{RUSH}	V_{IN} = 2.2 V, I_{OUT} = 0 mA	—	1.5	5	mA
Ripple rejection ratio	RR	1 V[rms], f = 120 Hz, I_{OUT} = 10 mA	60	68	—	dB
Minimum input/ output voltage difference 1	$V_{DIF(min)1}$	V_{IN} = 2.2 V, I_{OUT} = 0 mA	—	0.1	0.2	V
Minimum input/ output voltage difference 2	$V_{DIF(min)2}$	V_{IN} = 2.6 V, I_{OUT} = 150 mA	—	—	0.4	V
Control terminal threshold high voltage	V_{CONTH}	V_{IN} = 3.5 V, I_{OUT} = 50 mA	—	—	1.50	V
Control terminal threshold low voltage	V_{CONTL}	V_{IN} = 3.5 V, I_{OUT} = 50 mA	0.30	—	—	V
Control terminal current	I_{CONT}	V_{IN} = 3.5 V, I_{OUT} = 50 mA V_{CONT} = 1.8 V	—	—	30	μA

Note) ∗1: 1.0 Ω

∗2: Peak output current: The output current when the output voltage has been decreased by 5% from the value at the time when the output current is 50 mA due to the overcurrent protection.

• Design reference data

Note) The following values are typical and not guaranteed values.

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Output noise voltage	V_{NO}	10 Hz ≤ f ≤ 100 kHz, I_{OUT} = 10 mA	—	58	—	μV
Output voltage temperature coefficient	$\frac{1}{V_{OUT}} \cdot \frac{dV_{OUT}}{dT}$	V_{IN} = 3.5 V, I_{OUT} = 0 mA −30°C ≤ T_a ≤ +85°C	—	90	—	ppm/°C
Output rise time *	t_{ON}	V_{IN} = 3.15 V, I_{OUT} = 50 mA V_{CONT} = 0 V → 1.8 V, C_{IN} = 0.1 μF C_{OUT} = 10 μF, V_{OUT} = 90%	—	0.10	—	ms

Note) ∗: Refer to "■ Application Notes 3. Output rise-time characteristics".

■ Electrical Characteristics at T_a = 25°C (continued)

• AN80L28RMS (2.8 V type)

Unless otherwise specially provided, shorten each test time (within 10 ms) so that the test is conducted under the condition that the drift due to the temperature increase in the chip junction part can be neglected. C_{IN} = 0.1 µF, C_{OUT} = 10 µF

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Output voltage	V_{OUT}	V_{IN} = 3.8 V, I_{OUT} = 50 mA	2.716	2.8	2.884	V
Line regulation 1	REG_{IN1}	V_{IN} = 3.8 V → 14.5 V, I_{OUT} = 50 mA	—	10	50	mV
Line regulation 2	REG_{IN2}	V_{IN} = 3.8 V → 9 V, I_{OUT} = 50 mA	—	5	20	mV
Load regulation *1	REG_{LOA}	V_{IN} = 3.8 V, I_{OUT} = 0 mA → 150 mA	—	50	150	mV
Peak output current *2	I_{PEAK}	V_{IN} = 3.8 V, The output current value when V_{OUT} decreases by 5% from its value at I_{OUT} = 50 mA.	180	240	—	mA
Bias current under no load	I_{BIAS}	V_{IN} = 3.8 V, I_{OUT} = 0 mA	—	—	350	µA
Bias current fluctuation to load	ΔI_{BIAS}	V_{IN} = 3.8 V, I_{OUT} = 0 mA → 150 mA	—	—	5	mA
Standby consumption current	I_{STB}	V_{IN} = 10 V, V_{CONT} = 0 V	—	—	0.1	µA
Bias current before starting regulation	I_{RUSH}	V_{IN} = 2.5 V, I_{OUT} = 0 mA	—	1.5	5	mA
Ripple rejection ratio	RR	1 V[rms], f = 120 Hz, I_{OUT} = 10 mA	60	68	—	dB
Minimum input/ output voltage difference 1	$V_{DIF(min)1}$	V_{IN} = 2.5 V, I_{OUT} = 0 mA	—	0.1	0.2	V
Minimum input/ output voltage difference 2	$V_{DIF(min)2}$	V_{IN} = 2.9 V, I_{OUT} = 150 mA	—	—	0.4	V
Control terminal threshold high voltage	V_{CONTH}	V_{IN} = 3.8 V, I_{OUT} = 50 mA	—	—	1.50	V
Control terminal threshold low voltage	V_{CONTL}	V_{IN} = 3.8 V, I_{OUT} = 50 mA	0.30	—	—	V
Control terminal current	I_{CONT}	V_{IN} = 3.8 V, I_{OUT} = 50 mA V_{CONT} = 1.8 V	—	—	30	µA

Note) ∗1: 1.0 Ω

∗2: Peak output current: The output current when the output voltage has been decreased by 5% from the value at the time when the output current is 50 mA due to the overcurrent protection.

• Design reference data

Note) The following values are typical and not guaranteed values.

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Output noise voltage	V_{NO}	10 Hz ≤ f ≤ 100 kHz, I_{OUT} = 10 mA	—	58	—	µV
Output voltage temperature coefficient	$\frac{1}{V_{OUT}} \cdot \frac{dV_{OUT}}{dT}$	V_{IN} = 3.8 V, I_{OUT} = 0 mA −30°C ≤ T_a ≤ +85°C	—	90	—	ppm/°C
Output rise time *	t_{ON}	V_{IN} = 3.8 V, I_{OUT} = 50 mA V_{CONT} = 0 V → 1.8 V, C_{IN} = 0.1 µF C_{OUT} = 10 µF, V_{OUT} = 90%	—	0.10	—	ms

Note) ∗: Refer to "■ Application Notes 3. Output rise-time characteristics".

■ Electrical Characteristics at T_a = 25°C (continued)

• AN80L29RMS (2.9 V type)

Unless otherwise specially provided, shorten each test time (within 10 ms) so that the test is conducted under the condition that the drift due to the temperature increase in the chip junction part can be neglected. C_{IN} = 0.1 μF, C_{OUT} = 10 μF

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Output voltage	V_{OUT}	V_{IN} = 3.9 V, I_{OUT} = 50 mA	2.813	2.9	2.987	V
Line regulation 1	REG_{IN1}	V_{IN} = 3.9 V → 14.5 V, I_{OUT} = 50 mA	—	10	50	mV
Line regulation 2	REG_{IN2}	V_{IN} = 3.9 V → 9 V, I_{OUT} = 50 mA	—	5	20	mV
Load regulation *1	REG_{LOA}	V_{IN} = 3.9 V, I_{OUT} = 0 mA → 150 mA	—	50	150	mV
Peak output current *2	I_{PEAK}	V_{IN} = 3.9 V, The output current value when V_{OUT} decreases by 5% from its value at I_{OUT} = 50 mA.	180	240	—	mA
Bias current under no load	I_{BIAS}	V_{IN} = 3.9 V, I_{OUT} = 0 mA	—	—	350	μA
Bias current fluctuation to load	ΔI_{BIAS}	V_{IN} = 3.9 V, I_{OUT} = 0 mA → 150 mA	—	—	5	mA
Standby consumption current	I_{STB}	V_{IN} = 10 V, V_{CONT} = 0 V	—	—	0.1	μA
Bias current before starting regulation	I_{RUSH}	V_{IN} = 2.6 V, I_{OUT} = 0 mA	—	1.5	5	mA
Ripple rejection ratio	RR	1 V[rms], f = 120 Hz, I_{OUT} = 10 mA	60	68	—	dB
Minimum input/ output voltage difference 1	$V_{DIF(min)1}$	V_{IN} = 2.6 V, I_{OUT} = 0 mA	—	0.1	0.2	V
Minimum input/ output voltage difference 2	$V_{DIF(min)2}$	V_{IN} = 3.0 V, I_{OUT} = 150 mA	—	—	0.4	V
Control terminal threshold high voltage	V_{CONTH}	V_{IN} = 3.9 V, I_{OUT} = 50 mA	—	—	1.50	V
Control terminal threshold low voltage	V_{CONTL}	V_{IN} = 3.9 V, I_{OUT} = 50 mA	0.30	—	—	V
Control terminal current	I_{CONT}	V_{IN} = 3.9 V, I_{OUT} = 50 mA V_{CONT} = 1.8 V	—	—	30	μA

Note) ∗1: 1.0 Ω

∗2: Peak output current: The output current when the output voltage has been decreased by 5% from the value at the time when the output current is 50 mA due to the overcurrent protection.

• Design reference data

Note) The following values are typical and not guaranteed values.

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Output noise voltage	V_{NO}	10 Hz ≤ f ≤ 100 kHz, I_{OUT} = 10 mA	—	60	—	μV
Output voltage temperature coefficient	$\frac{1}{V_{OUT}} \cdot \frac{dV_{OUT}}{dT}$	V_{IN} = 3.9 V, I_{OUT} = 0 mA −30°C ≤ T_a ≤ +85°C	—	90	—	ppm/°C
Output rise time *	t_{ON}	V_{IN} = 3.9 V, I_{OUT} = 50 mA V_{CONT} = 0 V → 1.8 V, C_{IN} = 0.1 μF C_{OUT} = 10 μF, V_{OUT} = 90%	—	0.12	—	ms

Note) ∗: Refer to "■ Application Notes 3. Output rise-time characteristics".

■ Electrical Characteristics at T_a = 25°C (continued)

• AN80L30RMS (3.0 V type)

Unless otherwise specially provided, shorten each test time (within 10 ms) so that the test is conducted under the condition that the drift due to the temperature increase in the chip junction part can be neglected. C_{IN} = 0.1 µF, C_{OUT} = 10 µF

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Output voltage	V_{OUT}	V_{IN} = 4.0 V, I_{OUT} = 50 mA	2.910	3.0	3.090	V
Line regulation 1	REG_{IN1}	V_{IN} = 4.0 V → 14.5 V, I_{OUT} = 50 mA	—	10	50	mV
Line regulation 2	REG_{IN2}	V_{IN} = 4.0 V → 9 V, I_{OUT} = 50 mA	—	5	20	mV
Load regulation *1	REG_{LOA}	V_{IN} = 4.0 V, I_{OUT} = 0 mA → 150 mA	—	50	150	mV
Peak output current *2	I_{PEAK}	V_{IN} = 4.0 V, The output current value when V_{OUT} decreases by 5% from its value at I_{OUT} = 50 mA.	180	240	—	mA
Bias current under no load	I_{BIAS}	V_{IN} = 4.0 V, I_{OUT} = 0 mA	—	—	350	µA
Bias current fluctuation to load	ΔI_{BIAS}	V_{IN} = 4.0 V, I_{OUT} = 0 mA → 150 mA	—	—	5	mA
Standby consumption current	I_{STB}	V_{IN} = 10 V, V_{CONT} = 0 V	—	—	0.1	µA
Bias current before starting regulation	I_{RUSH}	V_{IN} = 2.7 V, I_{OUT} = 0 mA	—	1.5	5	mA
Ripple rejection ratio	RR	1 V[rms], f = 120 Hz, I_{OUT} = 10 mA	60	68	—	dB
Minimum input/ output voltage difference 1	$V_{DIF(min)1}$	V_{IN} = 2.7 V, I_{OUT} = 0 mA	—	0.1	0.2	V
Minimum input/ output voltage difference 2	$V_{DIF(min)2}$	V_{IN} = 3.1 V, I_{OUT} = 150 mA	—	—	0.4	V
Control terminal threshold high voltage	V_{CONTH}	V_{IN} = 4.0 V, I_{OUT} = 50 mA	—	—	1.50	V
Control terminal threshold low voltage	V_{CONTL}	V_{IN} = 4.0 V, I_{OUT} = 50 mA	0.30	—	—	V
Control terminal current	I_{CONT}	V_{IN} = 4.0 V, I_{OUT} = 50 mA V_{CONT} = 1.8 V	—	—	30	µA

Note) *1: 1.0 Ω

*2: Peak output current: The output current when the output voltage has been decreased by 5% from the value at the time when the output current is 50 mA due to the overcurrent protection.

• Design reference data

Note) The following values are typical and not guaranteed values.

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Output noise voltage	V_{NO}	10 Hz ≤ f ≤ 100 kHz, I_{OUT} = 10 mA	—	62	—	µV
Output voltage temperature coefficient	$\frac{1}{V_{OUT}} \cdot \frac{dV_{OUT}}{dT}$	V_{IN} = 4.0 V, I_{OUT} = 0 mA −30°C ≤ T_a ≤ +85°C	—	90	—	ppm/°C
Output rise time *	t_{ON}	V_{IN} = 4.0 V, I_{OUT} = 50 mA V_{CONT} = 0 V → 1.8 V, C_{IN} = 0.1 µF C_{OUT} = 10 µF, V_{OUT} = 90%	—	0.12	—	ms

Note) *: Refer to "■ Application Notes 3. Output rise-time characteristics".

■ Electrical Characteristics at T_a = 25°C (continued)

• AN80L31RMS (3.1 V type)

Unless otherwise specially provided, shorten each test time (within 10 ms) so that the test is conducted under the condition that the drift due to the temperature increase in the chip junction part can be neglected. C_{IN} = 0.1 µF, C_{OUT} = 10 µF

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Output voltage	V_{OUT}	V_{IN} = 4.1 V, I_{OUT} = 50 mA	3.007	3.1	3.193	V
Line regulation 1	REG_{IN1}	V_{IN} = 4.1 V → 14.5 V, I_{OUT} = 50 mA	—	10	50	mV
Line regulation 2	REG_{IN2}	V_{IN} = 4.1 V → 9 V, I_{OUT} = 50 mA	—	5	20	mV
Load regulation *1	REG_{LOA}	V_{IN} = 4.1 V, I_{OUT} = 0 mA → 150 mA	—	50	150	mV
Peak output current *2	I_{PEAK}	V_{IN} = 4.1 V, The output current value when V_{OUT} decreases by 5% from its value at I_{OUT} = 50 mA.	180	240	—	mA
Bias current under no load	I_{BIAS}	V_{IN} = 4.1 V, I_{OUT} = 0 mA	—	—	350	µA
Bias current fluctuation to load	ΔI_{BIAS}	V_{IN} = 4.1 V, I_{OUT} = 0 mA → 150 mA	—	—	5	mA
Standby consumption current	I_{STB}	V_{IN} = 10 V, V_{CONT} = 0 V	—	—	0.1	µA
Bias current before starting regulation	I_{RUSH}	V_{IN} = 2.8 V, I_{OUT} = 0 mA	—	1.5	5	mA
Ripple rejection ratio	RR	1 V[rms], f = 120 Hz, I_{OUT} = 10 mA	59	67	—	dB
Minimum input/ output voltage difference 1	$V_{DIF(min)1}$	V_{IN} = 2.8 V, I_{OUT} = 0 mA	—	0.1	0.2	V
Minimum input/ output voltage difference 2	$V_{DIF(min)2}$	V_{IN} = 3.2 V, I_{OUT} = 150 mA	—	—	0.4	V
Control terminal threshold high voltage	V_{CONTH}	V_{IN} = 4.1 V, I_{OUT} = 50 mA	—	—	1.50	V
Control terminal threshold low voltage	V_{CONTL}	V_{IN} = 4.1 V, I_{OUT} = 50 mA	0.30	—	—	V
Control terminal current	I_{CONT}	V_{IN} = 4.1 V, I_{OUT} = 50 mA V_{CONT} = 1.8 V	—	—	30	µA

Note) *1: 1.0 Ω

*2: Peak output current: The output current when the output voltage has been decreased by 5% from the value at the time when the output current is 50 mA due to the overcurrent protection.

• Design reference data

Note) The following values are typical and not guaranteed values.

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Output noise voltage	V_{NO}	10 Hz ≤ f ≤ 100 kHz, I_{OUT} = 10 mA	—	64	—	µV
Output voltage temperature coefficient	$\frac{1}{V_{OUT}} \cdot \frac{dV_{OUT}}{dT}$	V_{IN} = 4.1 V, I_{OUT} = 0 mA −30°C ≤ T_a ≤ +85°C	—	90	—	ppm/°C
Output rise time *	t_{ON}	V_{IN} = 4.1 V, I_{OUT} = 50 mA V_{CONT} = 0 V → 1.8 V, C_{IN} = 0.1 µF C_{OUT} = 10 µF, V_{OUT} = 90%	—	0.12	—	ms

Note) *: Refer to "■ Application Notes 3. Output rise-time characteristics".

■ Electrical Characteristics at T_a = 25°C (continued)

• AN80L32RMS (3.2 V type)

Unless otherwise specially provided, shorten each test time (within 10 ms) so that the test is conducted under the condition that the drift due to the temperature increase in the chip junction part can be neglected. C_{IN} = 0.1 μF, C_{OUT} = 10 μF

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Output voltage	V_{OUT}	V_{IN} = 4.2 V, I_{OUT} = 50 mA	3.104	3.2	3.296	V
Line regulation 1	REG_{IN1}	V_{IN} = 4.2 V → 14.5 V, I_{OUT} = 50 mA	—	10	50	mV
Line regulation 2	REG_{IN2}	V_{IN} = 4.2 V → 9 V, I_{OUT} = 50 mA	—	5	20	mV
Load regulation *1	REG_{LOA}	V_{IN} = 4.2 V, I_{OUT} = 0 mA → 150 mA	—	50	150	mV
Peak output current *2	I_{PEAK}	V_{IN} = 4.2 V, The output current value when V_{OUT} decreases by 5% from its value at I_{OUT} = 50 mA.	180	240	—	mA
Bias current under no load	I_{BIAS}	V_{IN} = 4.2 V, I_{OUT} = 0 mA	—	—	350	μA
Bias current fluctuation to load	ΔI_{BIAS}	V_{IN} = 4.2 V, I_{OUT} = 0 mA → 150 mA	—	—	5	mA
Standby consumption current	I_{STB}	V_{IN} = 10 V, V_{CONT} = 0 V	—	—	0.1	μA
Bias current before starting regulation	I_{RUSH}	V_{IN} = 2.9 V, I_{OUT} = 0 mA	—	1.5	5	mA
Ripple rejection ratio	RR	1 V[rms], f = 120 Hz, I_{OUT} = 10 mA	59	67	—	dB
Minimum input/ output voltage difference 1	$V_{DIF(min)1}$	V_{IN} = 2.9 V, I_{OUT} = 0 mA	—	0.1	0.2	V
Minimum input/ output voltage difference 2	$V_{DIF(min)2}$	V_{IN} = 3.3 V, I_{OUT} = 150 mA	—	—	0.4	V
Control terminal threshold high voltage	V_{CONTH}	V_{IN} = 4.2 V, I_{OUT} = 50 mA	—	—	1.50	V
Control terminal threshold low voltage	V_{CONTL}	V_{IN} = 4.2 V, I_{OUT} = 50 mA	0.30	—	—	V
Control terminal current	I_{CONT}	V_{IN} = 4.2 V, I_{OUT} = 50 mA V_{CONT} = 1.8 V	—	—	30	μA

Note) *1: 1.0 Ω

*2: Peak output current: The output current when the output voltage has been decreased by 5% from the value at the time when the output current is 50 mA due to the overcurrent protection.

• Design reference data

Note) The following values are typical and not guaranteed values.

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Output noise voltage	V_{NO}	10 Hz ≤ f ≤ 100 kHz, I_{OUT} = 10 mA	—	66	—	μV
Output voltage temperature coefficient	$\frac{1}{V_{OUT}} \cdot \frac{dV_{OUT}}{dT}$	V_{IN} = 4.2 V, I_{OUT} = 0 mA −30°C ≤ T_a ≤ +85°C	—	90	—	ppm/°C
Output rise time *	t_{ON}	V_{IN} = 4.2 V, I_{OUT} = 50 mA V_{CONT} = 0 V → 1.8 V, C_{IN} = 0.1 μF C_{OUT} = 10 μF, V_{OUT} = 90%	—	0.12	—	ms

Note) *: Refer to "■ Application Notes 3. Output rise-time characteristics".

■ Electrical Characteristics at T_a = 25°C (continued)

• AN80L33RMS (3.3 V type)

Unless otherwise specially provided, shorten each test time (within 10 ms) so that the test is conducted under the condition that the drift due to the temperature increase in the chip junction part can be neglected. C_{IN} = 0.1 μF, C_{OUT} = 10 μF

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Output voltage	V_{OUT}	V_{IN} = 4.3 V, I_{OUT} = 50 mA	3.201	3.3	3.399	V
Line regulation 1	REG_{IN1}	V_{IN} = 4.3 V → 14.5 V, I_{OUT} = 50 mA	—	10	50	mV
Line regulation 2	REG_{IN2}	V_{IN} = 4.3 V → 9 V, I_{OUT} = 50 mA	—	5	20	mV
Load regulation *1	REG_{LOA}	V_{IN} = 4.3 V, I_{OUT} = 0 mA → 150 mA	—	50	150	mV
Peak output current *2	I_{PEAK}	V_{IN} = 4.3 V, The output current value when V_{OUT} decreases by 5% from its value at I_{OUT} = 50 mA.	180	240	—	mA
Bias current under no load	I_{BIAS}	V_{IN} = 4.3 V, I_{OUT} = 0 mA	—	—	350	μA
Bias current fluctuation to load	ΔI_{BIAS}	V_{IN} = 4.3 V, I_{OUT} = 0 mA → 150 mA	—	—	5	mA
Standby consumption current	I_{STB}	V_{IN} = 10 V, V_{CONT} = 0 V	—	—	0.1	μA
Bias current before starting regulation	I_{RUSH}	V_{IN} = 3.0 V, I_{OUT} = 0 mA	—	1.5	5	mA
Ripple rejection ratio	RR	1 V[rms], f = 120 Hz, I_{OUT} = 10 mA	59	67	—	dB
Minimum input/ output voltage difference 1	$V_{DIF(min)1}$	V_{IN} = 3.0 V, I_{OUT} = 0 mA	—	0.1	0.2	V
Minimum input/ output voltage difference 2	$V_{DIF(min)2}$	V_{IN} = 3.4 V, I_{OUT} = 150 mA	—	—	0.4	V
Control terminal threshold high voltage	V_{CONTH}	V_{IN} = 4.3 V, I_{OUT} = 50 mA	—	—	1.50	V
Control terminal threshold low voltage	V_{CONTL}	V_{IN} = 4.3 V, I_{OUT} = 50 mA	0.30	—	—	V
Control terminal current	I_{CONT}	V_{IN} = 4.3 V, I_{OUT} = 50 mA V_{CONT} = 1.8 V	—	—	30	μA

Note) *1: 1.0 Ω

*2: Peak output current: The output current when the output voltage has been decreased by 5% from the value at the time when the output current is 50 mA due to the overcurrent protection.

• Design reference data

Note) The following values are typical and not guaranteed values.

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Output noise voltage	V_{NO}	10 Hz ≤ f ≤ 100 kHz, I_{OUT} = 10 mA	—	68	—	μV
Output voltage temperature coefficient	$\frac{1}{V_{OUT}} \cdot \frac{dV_{OUT}}{dT}$	V_{IN} = 4.3 V, I_{OUT} = 0 mA −30°C ≤ T_a ≤ +85°C	—	90	—	ppm/°C
Output rise time *	t_{ON}	V_{IN} = 4.3 V, I_{OUT} = 50 mA V_{CONT} = 0 V → 1.8 V, C_{IN} = 0.1 μF C_{OUT} = 10 μF, V_{OUT} = 90%	—	0.12	—	ms

Note) *: Refer to "■ Application Notes 3. Output rise-time characteristics".

■ Electrical Characteristics at T_a = 25°C (continued)

• AN80L34RMS (3.4 V type)

Unless otherwise specially provided, shorten each test time (within 10 ms) so that the test is conducted under the condition that the drift due to the temperature increase in the chip junction part can be neglected. C_{IN} = 0.1 μF, C_{OUT} = 10 μF

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Output voltage	V_{OUT}	V_{IN} = 4.4 V, I_{OUT} = 50 mA	3.298	3.4	3.502	V
Line regulation 1	REG_{IN1}	V_{IN} = 4.4 V → 14.5 V, I_{OUT} = 50 mA	—	10	50	mV
Line regulation 2	REG_{IN2}	V_{IN} = 4.4 V → 9 V, I_{OUT} = 50 mA	—	5	20	mV
Load regulation *1	REG_{LOA}	V_{IN} = 4.4 V, I_{OUT} = 0 mA → 150 mA	—	50	150	mV
Peak output current *2	I_{PEAK}	V_{IN} = 4.4 V, The output current value when V_{OUT} decreases by 5% from its value at I_{OUT} = 50 mA.	180	240	—	mA
Bias current under no load	I_{BIAS}	V_{IN} = 4.4 V, I_{OUT} = 0 mA	—	—	350	μA
Bias current fluctuation to load	ΔI_{BIAS}	V_{IN} = 4.4 V, I_{OUT} = 0 mA → 150 mA	—	—	5	mA
Standby consumption current	I_{STB}	V_{IN} = 10 V, V_{CONT} = 0 V	—	—	0.1	μA
Bias current before starting regulation	I_{RUSH}	V_{IN} = 3.1 V, I_{OUT} = 0 mA	—	1.5	5	mA
Ripple rejection ratio	RR	1 V[rms], f = 120 Hz, I_{OUT} = 10 mA	58	66	—	dB
Minimum input/ output voltage difference 1	$V_{DIF(min)1}$	V_{IN} = 3.1 V, I_{OUT} = 0 mA	—	0.1	0.2	V
Minimum input/ output voltage difference 2	$V_{DIF(min)2}$	V_{IN} = 3.5 V, I_{OUT} = 150 mA	—	—	0.4	V
Control terminal threshold high voltage	V_{CONTH}	V_{IN} = 4.4 V, I_{OUT} = 50 mA	—	—	1.50	V
Control terminal threshold low voltage	V_{CONTL}	V_{IN} = 4.4 V, I_{OUT} = 50 mA	0.30	—	—	V
Control terminal current	I_{CONT}	V_{IN} = 4.4 V, I_{OUT} = 50 mA V_{CONT} = 1.8 V	—	—	30	μA

Note) ∗1: 1.0 Ω

∗2: Peak output current: The output current when the output voltage has been decreased by 5% from the value at the time when the output current is 50 mA due to the overcurrent protection.

• Design reference data

Note) The following values are typical and not guaranteed values.

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Output noise voltage	V_{NO}	10 Hz ≤ f ≤ 100 kHz, I_{OUT} = 10 mA	—	70	—	μV
Output voltage temperature coefficient	$\frac{1}{V_{OUT}} \cdot \frac{dV_{OUT}}{dT}$	V_{IN} = 4.4 V, I_{OUT} = 0 mA −30°C ≤ T_a ≤ +85°C	—	90	—	ppm/°C
Output rise time *	t_{ON}	V_{IN} = 4.4 V, I_{OUT} = 50 mA V_{CONT} = 0 V → 1.8 V, C_{IN} = 0.1 μF C_{OUT} = 10 μF, V_{OUT} = 90%	—	0.12	—	ms

Note) ∗: Refer to "■ Application Notes 3. Output rise-time characteristics".

■ Electrical Characteristics at T_a = 25°C (continued)

• AN80L35RMS (3.5 V type)

Unless otherwise specially provided, shorten each test time (within 10 ms) so that the test is conducted under the condition that the drift due to the temperature increase in the chip junction part can be neglected. C_{IN} = 0.1 μF, C_{OUT} = 10 μF

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Output voltage	V_{OUT}	V_{IN} = 4.5 V, I_{OUT} = 50 mA	3.395	3.5	3.605	V
Line regulation 1	REG_{IN1}	V_{IN} = 4.5 V → 14.5 V, I_{OUT} = 50 mA	—	10	50	mV
Line regulation 2	REG_{IN2}	V_{IN} = 4.5 V → 9 V, I_{OUT} = 50 mA	—	5	20	mV
Load regulation *1	REG_{LOA}	V_{IN} = 4.5 V, I_{OUT} = 0 mA → 150 mA	—	50	150	mV
Peak output current *2	I_{PEAK}	V_{IN} = 4.5 V, The output current value when V_{OUT} decreases by 5% from its value at I_{OUT} = 50 mA.	180	240	—	mA
Bias current under no load	I_{BIAS}	V_{IN} = 4.5 V, I_{OUT} = 0 mA	—	—	350	μA
Bias current fluctuation to load	ΔI_{BIAS}	V_{IN} = 4.5 V, I_{OUT} = 0 mA → 150 mA	—	—	5	mA
Standby consumption current	I_{STB}	V_{IN} = 10 V, V_{CONT} = 0 V	—	—	0.1	μA
Bias current before starting regulation	I_{RUSH}	V_{IN} = 3.2 V, I_{OUT} = 0 mA	—	1.5	5	mA
Ripple rejection ratio	RR	1 V[rms], f = 120 Hz, I_{OUT} = 10 mA	58	66	—	dB
Minimum input/ output voltage difference 1	$V_{DIF(min)1}$	V_{IN} = 3.2 V, I_{OUT} = 0 mA	—	0.1	0.2	V
Minimum input/ output voltage difference 2	$V_{DIF(min)2}$	V_{IN} = 3.6 V, I_{OUT} = 150 mA	—	—	0.4	V
Control terminal threshold high voltage	V_{CONTH}	V_{IN} = 4.5 V, I_{OUT} = 50 mA	—	—	1.50	V
Control terminal threshold low voltage	V_{CONTL}	V_{IN} = 4.5 V, I_{OUT} = 50 mA	0.30	—	—	V
Control terminal current	I_{CONT}	V_{IN} = 4.5 V, I_{OUT} = 50 mA V_{CONT} = 1.8 V	—	—	30	μA

Note) *1: 1.0 Ω

*2: Peak output current: The output current when the output voltage has been decreased by 5% from the value at the time when the output current is 50 mA due to the overcurrent protection.

• Design reference data

Note) The following values are typical and not guaranteed values.

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Output noise voltage	V_{NO}	10 Hz ≤ f ≤ 100 kHz, I_{OUT} = 10 mA	—	72	—	μV
Output voltage temperature coefficient	$\frac{1}{V_{OUT}} \cdot \frac{dV_{OUT}}{dT}$	V_{IN} = 4.5 V, I_{OUT} = 0 mA −30°C ≤ T_a ≤ +85°C	—	90	—	ppm/°C
Output rise time *	t_{ON}	V_{IN} = 4.5 V, I_{OUT} = 50 mA V_{CONT} = 0 V → 1.8 V, C_{IN} = 0.1 μF C_{OUT} = 10 μF, V_{OUT} = 90%	—	0.12	—	ms

Note) *: Refer to "■ Application Notes 3. Output rise-time characteristics".

■ Electrical Characteristics at T_a = 25°C (continued)

• AN80L36RMS (3.6 V type)

Unless otherwise specially provided, shorten each test time (within 10 ms) so that the test is conducted under the condition that the drift due to the temperature increase in the chip junction part can be neglected. C_{IN} = 0.1 µF, C_{OUT} = 10 µF

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Output voltage	V_{OUT}	V_{IN} = 4.6 V, I_{OUT} = 50 mA	3.492	3.6	3.708	V
Line regulation 1	REG_{IN1}	V_{IN} = 4.6 V → 14.5 V, I_{OUT} = 50 mA	—	10	50	mV
Line regulation 2	REG_{IN2}	V_{IN} = 4.6 V → 9 V, I_{OUT} = 50 mA	—	5	20	mV
Load regulation *1	REG_{LOA}	V_{IN} = 4.6 V, I_{OUT} = 0 mA → 150 mA	—	50	150	mV
Peak output current *2	I_{PEAK}	V_{IN} = 4.6 V, The output current value when V_{OUT} decreases by 5% from its value at I_{OUT} = 50 mA.	180	240	—	mA
Bias current under no load	I_{BIAS}	V_{IN} = 4.6 V, I_{OUT} = 0 mA	—	—	350	µA
Bias current fluctuation to load	ΔI_{BIAS}	V_{IN} = 4.6 V, I_{OUT} = 0 mA → 150 mA	—	—	5	mA
Standby consumption current	I_{STB}	V_{IN} = 10 V, V_{CONT} = 0 V	—	—	0.1	µA
Bias current before starting regulation	I_{RUSH}	V_{IN} = 3.3 V, I_{OUT} = 0 mA	—	1.5	5	mA
Ripple rejection ratio	RR	1 V[rms], f = 120 Hz, I_{OUT} = 10 mA	58	66	—	dB
Minimum input/ output voltage difference 1	$V_{DIF(min)1}$	V_{IN} = 3.3 V, I_{OUT} = 0 mA	—	0.1	0.2	V
Minimum input/ output voltage difference 2	$V_{DIF(min)2}$	V_{IN} = 3.7 V, I_{OUT} = 150 mA	—	—	0.4	V
Control terminal threshold high voltage	V_{CONTH}	V_{IN} = 4.6 V, I_{OUT} = 50 mA	—	—	1.50	V
Control terminal threshold low voltage	V_{CONTL}	V_{IN} = 4.6 V, I_{OUT} = 50 mA	0.30	—	—	V
Control terminal current	I_{CONT}	V_{IN} = 4.6 V, I_{OUT} = 50 mA V_{CONT} = 1.8 V	—	—	30	µA

Note) ∗1: 1.0 Ω

∗2: Peak output current: The output current when the output voltage has been decreased by 5% from the value at the time when the output current is 50 mA due to the overcurrent protection.

• Design reference data

Note) The following values are typical and not guaranteed values.

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Output noise voltage	V_{NO}	10 Hz ≤ f ≤ 100 kHz, I_{OUT} = 10 mA	—	74	—	µV
Output voltage temperature coefficient	$\frac{1}{V_{OUT}} \cdot \frac{dV_{OUT}}{dT}$	V_{IN} = 4.6 V, I_{OUT} = 0 mA −30°C ≤ T_a ≤ +85°C	—	90	—	ppm/°C
Output rise time *	t_{ON}	V_{IN} = 4.6 V, I_{OUT} = 50 mA V_{CONT} = 0 V → 1.8 V, C_{IN} = 0.1 µF C_{OUT} = 10 µF, V_{OUT} = 90%	—	0.12	—	ms

Note) ∗: Refer to "■ Application Notes 3. Output rise-time characteristics".

■ Electrical Characteristics at T_a = 25°C (continued)

• AN80L48RMS (4.8 V type)

Unless otherwise specially provided, shorten each test time (within 10 ms) so that the test is conducted under the condition that the drift due to the temperature increase in the chip junction part can be neglected. C_{IN} = 0.1 μF, C_{OUT} = 10 μF

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Output voltage	V_{OUT}	V_{IN} = 5.8 V, I_{OUT} = 50 mA	4.656	4.8	4.944	V
Line regulation 1	REG_{IN1}	V_{IN} = 5.8 V → 14.5 V, I_{OUT} = 50 mA	—	10	50	mV
Line regulation 2	REG_{IN2}	V_{IN} = 5.8 V → 9 V, I_{OUT} = 50 mA	—	5	20	mV
Load regulation *1	REG_{LOA}	V_{IN} = 5.8 V, I_{OUT} = 0 mA → 150 mA	—	50	150	mV
Peak output current *2	I_{PEAK}	V_{IN} = 5.8 V, The output current value when V_{OUT} decreases by 5% from its value at I_{OUT} = 50 mA.	180	240	—	mA
Bias current under no load	I_{BIAS}	V_{IN} = 5.8 V, I_{OUT} = 0 mA	—	—	350	μA
Bias current fluctuation to load	ΔI_{BIAS}	V_{IN} = 5.8 V, I_{OUT} = 0 mA → 150 mA	—	—	5	mA
Standby consumption current	I_{STB}	V_{IN} = 10 V, V_{CONT} = 0 V	—	—	0.1	μA
Bias current before starting regulation	I_{RUSH}	V_{IN} = 4.5 V, I_{OUT} = 0 mA	—	1.5	5	mA
Ripple rejection ratio	RR	1 V[rms], f = 120 Hz, I_{OUT} = 10 mA	57	65	—	dB
Minimum input/ output voltage difference 1	$V_{DIF(min)1}$	V_{IN} = 4.5 V, I_{OUT} = 0 mA	—	0.1	0.2	V
Minimum input/ output voltage difference 2	$V_{DIF(min)2}$	V_{IN} = 4.9 V, I_{OUT} = 150 mA	—	—	0.4	V
Control terminal threshold high voltage	V_{CONTH}	V_{IN} = 5.8 V, I_{OUT} = 50 mA	—	—	1.50	V
Control terminal threshold low voltage	V_{CONTL}	V_{IN} = 5.8 V, I_{OUT} = 50 mA	0.30	—	—	V
Control terminal current	I_{CONT}	V_{IN} = 5.8 V, I_{OUT} = 50 mA V_{CONT} = 1.8 V	—	—	30	μA

Note) *1: 1.0 Ω

*2: Peak output current: The output current when the output voltage has been decreased by 5% from the value at the time when the output current is 50 mA due to the overcurrent protection.

• Design reference data

Note) The following values are typical and not guaranteed values.

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Output noise voltage	V_{NO}	10 Hz ≤ f ≤ 100 kHz, I_{OUT} = 10 mA	—	100	—	μV
Output voltage temperature coefficient	$\frac{1}{V_{OUT}} \cdot \frac{dV_{OUT}}{dT}$	V_{IN} = 5.8 V, I_{OUT} = 0 mA −30°C ≤ T_a ≤ +85°C	—	90	—	ppm/°C
Output rise time *	t_{ON}	V_{IN} = 5.8 V, I_{OUT} = 50 mA V_{CONT} = 0 V → 1.8 V, C_{IN} = 0.1 μF C_{OUT} = 10 μF, V_{OUT} = 90%	—	0.20	—	ms

Note) *: Refer to "■ Application Notes 3. Output rise-time characteristics".

■ Electrical Characteristics at T_a = 25°C (continued)

• AN80L49RMS (4.9 V type)

Unless otherwise specially provided, shorten each test time (within 10 ms) so that the test is conducted under the condition that the drift due to the temperature increase in the chip junction part can be neglected. C_{IN} = 0.1 µF, C_{OUT} = 10 µF

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Output voltage	V_{OUT}	V_{IN} = 5.9 V, I_{OUT} = 50 mA	4.753	4.9	5.047	V
Line regulation 1	REG_{IN1}	V_{IN} = 5.9 V → 14.5 V, I_{OUT} = 50 mA	—	10	50	mV
Line regulation 2	REG_{IN2}	V_{IN} = 5.9 V → 9 V, I_{OUT} = 50 mA	—	5	20	mV
Load regulation *1	REG_{LOA}	V_{IN} = 5.9 V, I_{OUT} = 0 mA → 150 mA	—	50	150	mV
Peak output current *2	I_{PEAK}	V_{IN} = 5.9 V, The output current value when V_{OUT} decreases by 5% from its value at I_{OUT} = 50 mA.	180	240	—	mA
Bias current under no load	I_{BIAS}	V_{IN} = 5.9 V, I_{OUT} = 0 mA	—	—	350	µA
Bias current fluctuation to load	ΔI_{BIAS}	V_{IN} = 5.9 V, I_{OUT} = 0 mA → 150 mA	—	—	5	mA
Standby consumption current	I_{STB}	V_{IN} = 10 V, V_{CONT} = 0 V	—	—	0.1	µA
Bias current before starting regulation	I_{RUSH}	V_{IN} = 4.6 V, I_{OUT} = 0 mA	—	1.5	5	mA
Ripple rejection ratio	RR	1 V[rms], f = 120 Hz, I_{OUT} = 10 mA	57	65	—	dB
Minimum input/ output voltage difference 1	$V_{DIF(min)1}$	V_{IN} = 4.6 V, I_{OUT} = 0 mA	—	0.1	0.2	V
Minimum input/ output voltage difference 2	$V_{DIF(min)2}$	V_{IN} = 5.0 V, I_{OUT} = 150 mA	—	—	0.4	V
Control terminal threshold high voltage	V_{CONTH}	V_{IN} = 5.9 V, I_{OUT} = 50 mA	—	—	1.50	V
Control terminal threshold low voltage	V_{CONTL}	V_{IN} = 5.9 V, I_{OUT} = 50 mA	0.30	—	—	V
Control terminal current	I_{CONT}	V_{IN} = 5.9 V, I_{OUT} = 50 mA V_{CONT} = 1.8 V	—	—	30	µA

Note) *1: 1.0 Ω

*2: Peak output current: The output current when the output voltage has been decreased by 5% from the value at the time when the output current is 50 mA due to the overcurrent protection.

• Design reference data

Note) The following values are typical and not guaranteed values.

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Output noise voltage	V_{NO}	10 Hz ≤ f ≤ 100 kHz, I_{OUT} = 10 mA	—	102	—	µV
Output voltage temperature coefficient	$\frac{1}{V_{OUT}} \cdot \frac{dV_{OUT}}{dT}$	V_{IN} = 5.9 V, I_{OUT} = 0 mA −30°C ≤ T_a ≤ +85°C	—	90	—	ppm/°C
Output rise time *	t_{ON}	V_{IN} = 5.9 V, I_{OUT} = 50 mA V_{CONT} = 0 V → 1.8 V, C_{IN} = 0.1 µF C_{OUT} = 10 µF, V_{OUT} = 90%	—	0.20	—	ms

Note) *: Refer to "■ Application Notes 3. Output rise-time characteristics".

■ Electrical Characteristics at T_a = 25°C (continued)

• AN80L50RMS (5.0 V type)

Unless otherwise specially provided, shorten each test time (within 10 ms) so that the test is conducted under the condition that the drift due to the temperature increase in the chip junction part can be neglected. C_{IN} = 0.1 μF, C_{OUT} = 10 μF

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Output voltage	V_{OUT}	V_{IN} = 6.0 V, I_{OUT} = 50 mA	4.850	5.0	5.150	V
Line regulation 1	REG_{IN1}	V_{IN} = 6.0 V → 14.5 V, I_{OUT} = 50 mA	—	10	50	mV
Line regulation 2	REG_{IN2}	V_{IN} = 6.0 V → 9 V, I_{OUT} = 50 mA	—	5	20	mV
Load regulation *1	REG_{LOA}	V_{IN} = 6.0 V, I_{OUT} = 0 mA → 150 mA	—	50	150	mV
Peak output current *2	I_{PEAK}	V_{IN} = 6.0 V, The output current value when V_{OUT} decreases by 5% from its value at I_{OUT} = 50 mA.	180	240	—	mA
Bias current under no load	I_{BIAS}	V_{IN} = 6.0 V, I_{OUT} = 0 mA	—	—	350	μA
Bias current fluctuation to load	ΔI_{BIAS}	V_{IN} = 6.0 V, I_{OUT} = 0 mA → 150 mA	—	—	5	mA
Standby consumption current	I_{STB}	V_{IN} = 10 V, V_{CONT} = 0 V	—	—	0.1	μA
Bias current before starting regulation	I_{RUSH}	V_{IN} = 4.7 V, I_{OUT} = 0 mA	—	1.5	5	mA
Ripple rejection ratio	RR	1 V[rms], f = 120 Hz, I_{OUT} = 10 mA	56	64	—	dB
Minimum input/ output voltage difference 1	$V_{DIF(min)1}$	V_{IN} = 4.7 V, I_{OUT} = 0 mA	—	0.1	0.2	V
Minimum input/ output voltage difference 2	$V_{DIF(min)2}$	V_{IN} = 5.1 V, I_{OUT} = 150 mA	—	—	0.4	V
Control terminal threshold high voltage	V_{CONTH}	V_{IN} = 6.0 V, I_{OUT} = 50 mA	—	—	1.50	V
Control terminal threshold low voltage	V_{CONTL}	V_{IN} = 6.0 V, I_{OUT} = 50 mA	0.30	—	—	V
Control terminal current	I_{CONT}	V_{IN} = 6.0 V, I_{OUT} = 50 mA V_{CONT} = 1.8 V	—	—	30	μA

Note) *1: 1.0 Ω

*2: Peak output current: The output current when the output voltage has been decreased by 5% from the value at the time when the output current is 50 mA due to the overcurrent protection.

• Design reference data

Note) The following values are typical and not guaranteed values.

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Output noise voltage	V_{NO}	10 Hz ≤ f ≤ 100 kHz, I_{OUT} = 10 mA	—	104	—	μV
Output voltage temperature coefficient	$\frac{1}{V_{OUT}} \cdot \frac{dV_{OUT}}{dT}$	V_{IN} = 6.0 V, I_{OUT} = 0 mA −30°C ≤ T_a ≤ +85°C	—	90	—	ppm/°C
Output rise time *	t_{ON}	V_{IN} = 6.0 V, I_{OUT} = 50 mA V_{CONT} = 0 V → 1.8 V, C_{IN} = 0.1 μF C_{OUT} = 10 μF, V_{OUT} = 90%	—	0.20	—	ms

Note) *: Refer to "■ Application Notes 3. Output rise-time characteristics".

■ Electrical Characteristics at T_a = 25°C (continued)

• AN80L51RMS (5.1 V type)

Unless otherwise specially provided, shorten each test time (within 10 ms) so that the test is conducted under the condition that the drift due to the temperature increase in the chip junction part can be neglected. C_{IN} = 0.1 µF, C_{OUT} = 10 µF

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Output voltage	V_{OUT}	V_{IN} = 6.1 V, I_{OUT} = 50 mA	4.947	5.1	5.253	V
Line regulation 1	REG_{IN1}	V_{IN} = 6.1 V → 14.5 V, I_{OUT} = 50 mA	—	10	50	mV
Line regulation 2	REG_{IN2}	V_{IN} = 6.1 V → 9 V, I_{OUT} = 50 mA	—	5	20	mV
Load regulation *1	REG_{LOA}	V_{IN} = 6.1 V, I_{OUT} = 0 mA → 150 mA	—	50	150	mV
Peak output current *2	I_{PEAK}	V_{IN} = 6.1 V, The output current value when V_{OUT} decreases by 5% from its value at I_{OUT} = 50 mA.	180	240	—	mA
Bias current under no load	I_{BIAS}	V_{IN} = 6.1 V, I_{OUT} = 0 mA	—	—	350	µA
Bias current fluctuation to load	ΔI_{BIAS}	V_{IN} = 6.1 V, I_{OUT} = 0 mA → 150 mA	—	—	5	mA
Standby consumption current	I_{STB}	V_{IN} = 10 V, V_{CONT} = 0 V	—	—	0.1	µA
Bias current before starting regulation	I_{RUSH}	V_{IN} = 4.8 V, I_{OUT} = 0 mA	—	1.5	5	mA
Ripple rejection ratio	RR	1 V[rms], f = 120 Hz, I_{OUT} = 10 mA	56	64	—	dB
Minimum input/ output voltage difference 1	$V_{DIF(min)1}$	V_{IN} = 4.8 V, I_{OUT} = 0 mA	—	0.1	0.2	V
Minimum input/ output voltage difference 2	$V_{DIF(min)2}$	V_{IN} = 5.2 V, I_{OUT} = 150 mA	—	—	0.4	V
Control terminal threshold high voltage	V_{CONTH}	V_{IN} = 6.1 V, I_{OUT} = 50 mA	—	—	1.50	V
Control terminal threshold low voltage	V_{CONTL}	V_{IN} = 6.1 V, I_{OUT} = 50 mA	0.30	—	—	V
Control terminal current	I_{CONT}	V_{IN} = 6.1 V, I_{OUT} = 50 mA V_{CONT} = 1.8 V	—	—	30	µA

Note) *1: 1.0 Ω

*2: Peak output current: The output current when the output voltage has been decreased by 5% from the value at the time when the output current is 50 mA due to the overcurrent protection.

• Design reference data

Note) The following values are typical and not guaranteed values.

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Output noise voltage	V_{NO}	10 Hz ≤ f ≤ 100 kHz, I_{OUT} = 10 mA	—	106	—	µV
Output voltage temperature coefficient	$\frac{1}{V_{OUT}} \cdot \frac{dV_{OUT}}{dT}$	V_{IN} = 6.1 V, I_{OUT} = 0 mA −30°C ≤ T_a ≤ +85°C	—	90	—	ppm/°C
Output rise time *	t_{ON}	V_{IN} = 6.1 V, I_{OUT} = 50 mA V_{CONT} = 0 V → 1.8 V, C_{IN} = 0.1 µF C_{OUT} = 10 µF, V_{OUT} = 90%	—	0.20	—	ms

Note) *: Refer to "■ Application Notes 3. Output rise-time characteristics".

■ Electrical Characteristics at T_a = 25°C (continued)

• AN80L52RMS (5.2 V type)

Unless otherwise specially provided, shorten each test time (within 10 ms) so that the test is conducted under the condition that the drift due to the temperature increase in the chip junction part can be neglected. C_{IN} = 0.1 μF, C_{OUT} = 10 μF

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Output voltage	V_{OUT}	V_{IN} = 6.2 V, I_{OUT} = 50 mA	5.044	5.2	5.356	V
Line regulation 1	REG_{IN1}	V_{IN} = 6.2 V → 14.5 V, I_{OUT} = 50 mA	—	10	50	mV
Line regulation 2	REG_{IN2}	V_{IN} = 6.2 V → 9 V, I_{OUT} = 50 mA	—	5	20	mV
Load regulation *1	REG_{LOA}	V_{IN} = 6.2 V, I_{OUT} = 0 mA → 150 mA	—	50	150	mV
Peak output current *2	I_{PEAK}	V_{IN} = 6.2 V, The output current value when V_{OUT} decreases by 5% from its value at I_{OUT} = 50 mA.	180	240	—	mA
Bias current under no load	I_{BIAS}	V_{IN} = 6.2 V, I_{OUT} = 0 mA	—	—	350	μA
Bias current fluctuation to load	ΔI_{BIAS}	V_{IN} = 6.2 V, I_{OUT} = 0 mA → 150 mA	—	—	5	mA
Standby consumption current	I_{STB}	V_{IN} = 10 V, V_{CONT} = 0 V	—	—	0.1	μA
Bias current before starting regulation	I_{RUSH}	V_{IN} = 4.9 V, I_{OUT} = 0 mA	—	1.5	5	mA
Ripple rejection ratio	RR	1 V[rms], f = 120 Hz, I_{OUT} = 10 mA	56	64	—	dB
Minimum input/ output voltage difference 1	$V_{DIF(min)1}$	V_{IN} = 4.9 V, I_{OUT} = 0 mA	—	0.1	0.2	V
Minimum input/ output voltage difference 2	$V_{DIF(min)2}$	V_{IN} = 5.3 V, I_{OUT} = 150 mA	—	—	0.4	V
Control terminal threshold high voltage	V_{CONTH}	V_{IN} = 6.2 V, I_{OUT} = 50 mA	—	—	1.50	V
Control terminal threshold low voltage	V_{CONTL}	V_{IN} = 6.2 V, I_{OUT} = 50 mA	0.30	—	—	V
Control terminal current	I_{CONT}	V_{IN} = 6.2 V, I_{OUT} = 50 mA V_{CONT} = 1.8 V	—	—	30	μA

Note) *1: 1.0 Ω

*2: Peak output current: The output current when the output voltage has been decreased by 5% from the value at the time when the output current is 50 mA due to the overcurrent protection.

• Design reference data

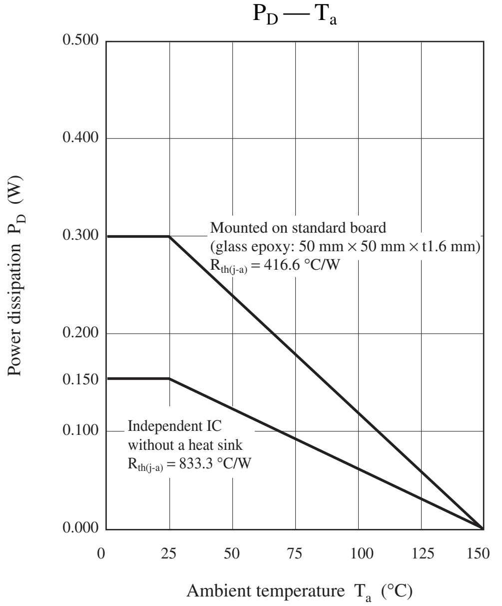
Note) The following values are typical and not guaranteed values.

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Output noise voltage	V_{NO}	10 Hz ≤ f ≤ 100 kHz, I_{OUT} = 10 mA	—	108	—	μV
Output voltage temperature coefficient	$\frac{1}{V_{OUT}} \cdot \frac{dV_{OUT}}{dT}$	V_{IN} = 6.2 V, I_{OUT} = 0 mA −30°C ≤ T_a ≤ +85°C	—	90	—	ppm/°C
Output rise time *	t_{ON}	V_{IN} = 6.2 V, I_{OUT} = 50 mA V_{CONT} = 0 V → 1.8 V, C_{IN} = 0.1 μF C_{OUT} = 10 μF, V_{OUT} = 90%	—	0.20	—	ms

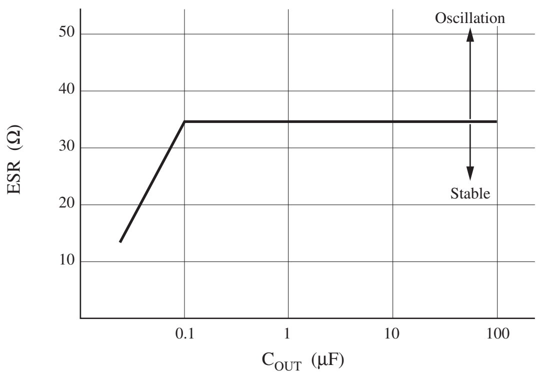
Note) *: Refer to "■ Application Notes 3. Output rise-time characteristics".

■ Application Notes

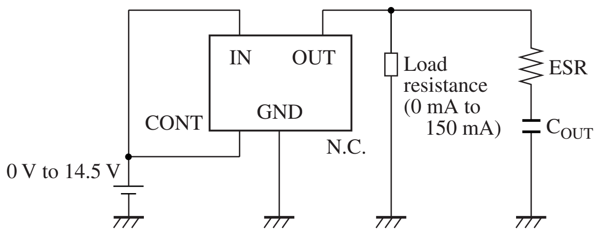
1. P_D — T_a curves of MINI-5D package



2. ESR characteristics



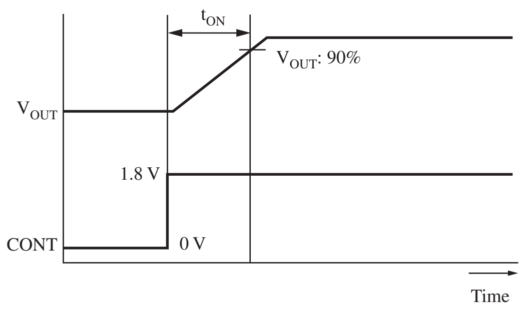
• Test circuit



Note) 1. Not guaranteed values.
2. The capacitance value used for C_{OUT} must be 0.22 µF or more and 100 µF or less. The recommended value is 10 µF.
3. Use a capacitor having ESR (equivalent series resistance of capacitor) of 35 Ω or less (at T_a = −30°C to +85°C).

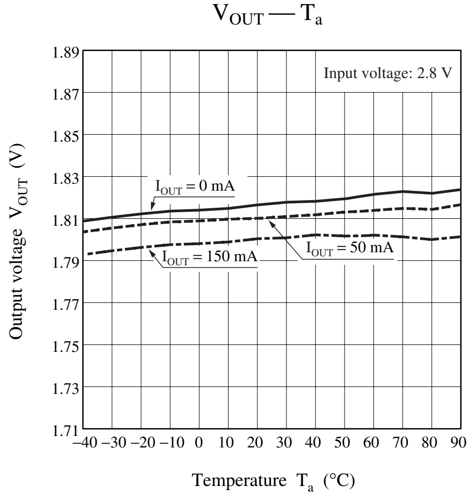
■ Application Notes (continued)

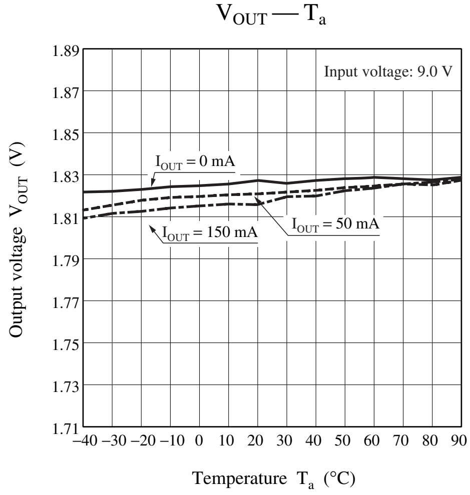
3. Output rise-time characteristics



4. Main characteristics

• AN80L18RMS





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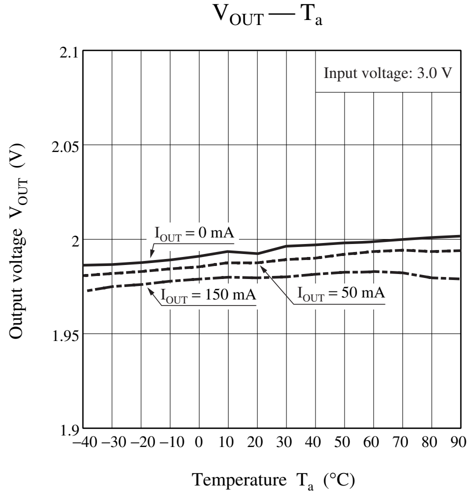
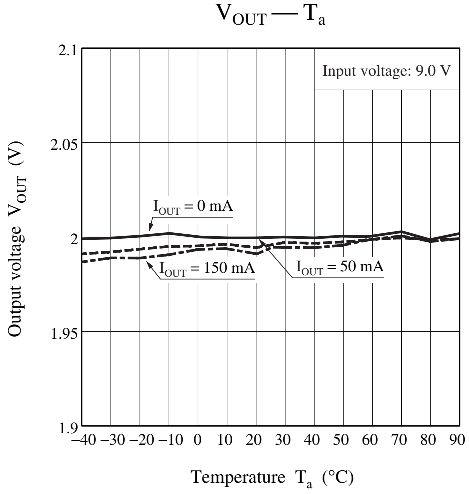
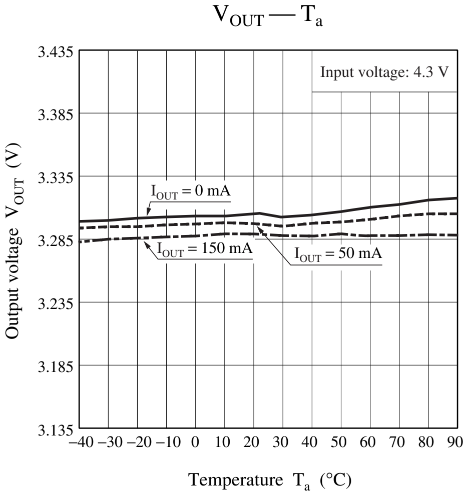


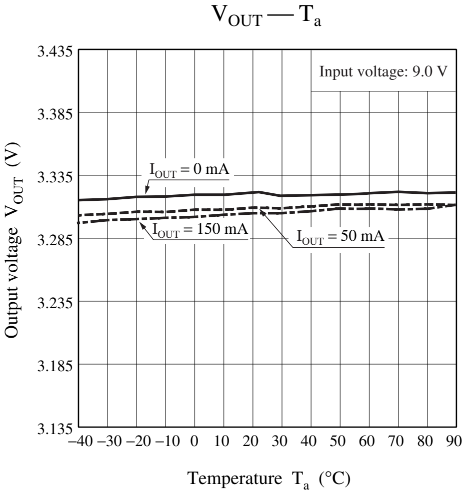


■ Application Notes (continued)

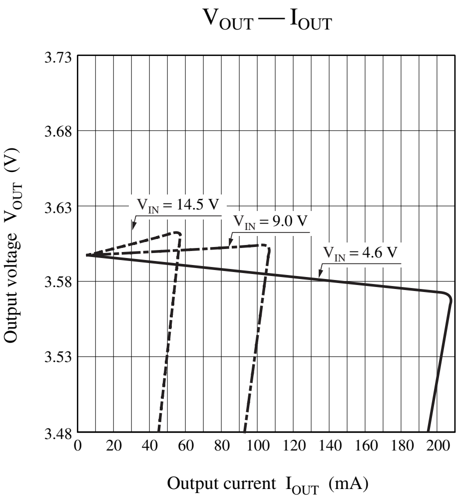
4. Main characteristics (continued)

- AN80L33RMS

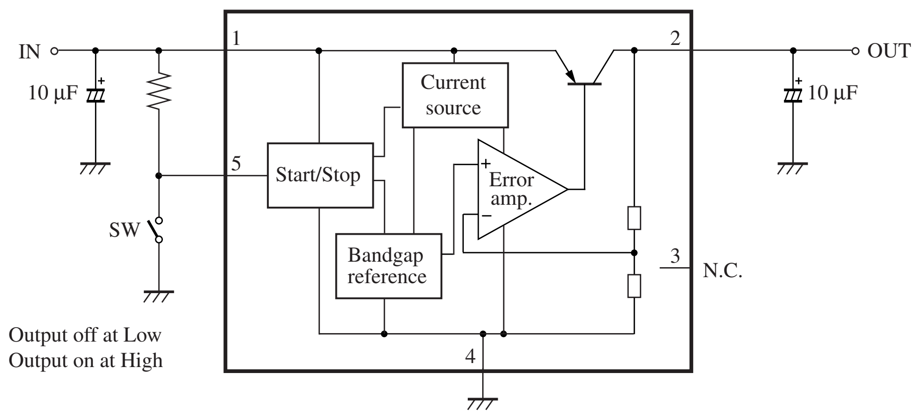




- AN80L36RMS



■ Application Circuit Example



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