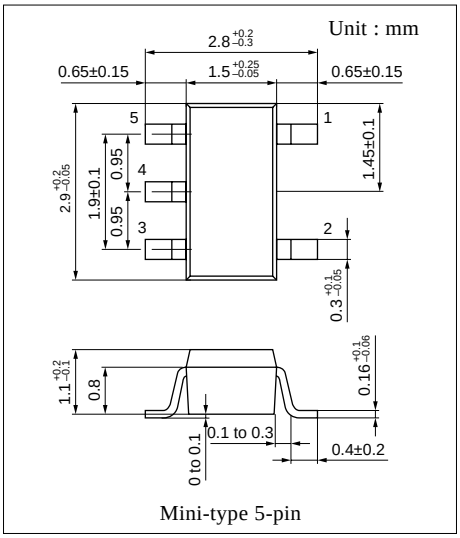
AN80LXXRMS Series

Low-drop type positive output voltage regulator IC

■ Overview

The AN80LXXRMS series is 0.15 A output low-drop output type positive voltage regulator IC with resetting 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 (Mini 5-pin plastic package), so that it is most suited for miniaturization and weight reduction of set equipment.



Mini-type 5-pin

Type name indication symbol : XX

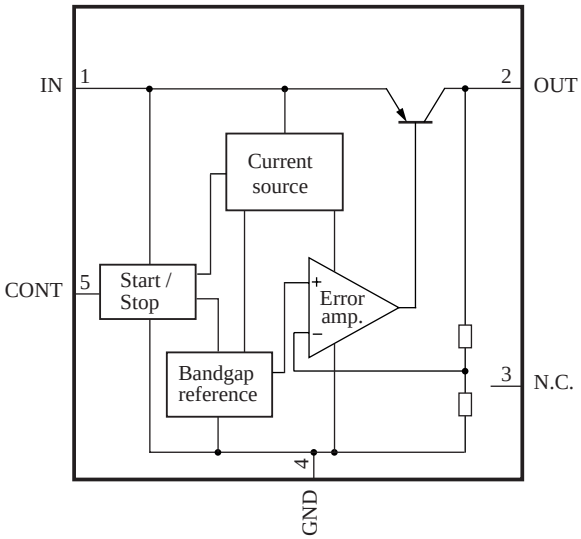
■ Features

- Minimum input and output voltage difference : 0.4 V max.
- High precision output voltage : (allowance : ± 3%)
- Built-in reset function terminal (High : Active)
- Built-in overcurrent limiting circuit
- Built-in circuit for limiting rush current at input voltage rising time
- Output voltage : 1.8 V to 5.2 V

■ Applications

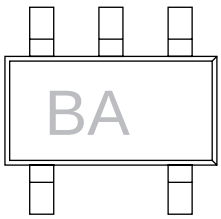
- Cellular phone, PHS, analog cordless phone, other small sized potable equipment

■ Block diagram



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

Type No.	Output V	Conditions	min.	typ.	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		BB
AN80L20RMS	2.0	3.0	1.940	2.0	2.060		BC
AN80L21RMS	2.1	3.1	2.037	2.1	2.163		BD
AN80L22RMS	2.2	3.2	2.134	2.2	2.266		BE
AN80L25RMS	2.5	3.5	2.452	2.5	2.575		BW
AN80L28RMS	2.8	3.8	2.716	2.8	2.884		BF
AN80L29RMS	2.9	3.9	2.813	2.9	2.987		BG
AN80L30RMS	3.0	4.0	2.910	3.0	3.090		BH
AN80L31RMS	3.1	4.1	3.007	3.1	3.193		BJ
AN80L32RMS	3.2	4.2	3.104	3.2	3.296		BK
AN80L33RMS	3.3	4.3	3.201	3.3	3.399		BL
AN80L34RMS	3.4	4.4	3.298	3.4	3.502		BM
AN80L35RMS	3.5	4.5	3.395	3.5	3.605		BN
AN80L36RMS	3.6	4.6	3.492	3.6	3.708		BP
AN80L48RMS	4.8	5.8	4.656	4.8	4.944		BQ
AN80L49RMS	4.9	5.9	4.753	4.9	5.047		BR
AN80L50RMS	5.0	6.0	4.850	5.0	5.150		BS
AN80L51RMS	5.1	6.1	4.947	5.1	5.253		BT
AN80L52RMS	5.2	6.2	5.044	5.2	5.356		BU



(Marking example : AN80L18RMS)

Common to the AN80LXXRMS Series

■ 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 : All items are at T_a = 25°C, except for the parameter of operating ambient temperature and storage temperature.

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

AN80L18RMS (1.8 V)

■ Recommended Operating Range

Parameter	Symbol	Range	Unit
Supply voltage	V_{CC}	2.2 to 14.5	V

■ Electrical Characteristics at T_a = 25°C

Note) 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
Input stability 1	REG_{IN1}	V_{IN} = 2.8 V → 14.5 V, I_{OUT} = 50 mA	—	10	50	mV
Input stability 2	REG_{IN2}	V_{IN} = 2.8 V → 9 V, I_{OUT} = 50 mA	—	5	20	mV
Load stability *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 decreases by 5% from the value when V_{OUT} is at I_{OUT} = 50 mA.	180	240	—	mA
Bias current without load	I_{BIAS}	V_{IN} = 2.8 V, I_{OUT} = 0 mA	—	—	350	µA
Bias current fluctuation with 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	R.R.	1 V_{rms}, f = 120 Hz, I_{OUT} = 10 mA	62	70	—	dB
Minimum input and output voltage difference 1	$V_{DIF(min)1}$	V_{IN} = 1.5 V, I_{OUT} = 0 mA	—	0.1	0.2	V
Minimum input and 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 of 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}	10Hz ≤ f ≤ 100kHz, 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) ∗1 : Refer to ■ Technical Information " • Output rise time characteristics".

AN80L19RMS (1.9 V)

■ Recommended Operating Range

Parameter	Symbol	Range	Unit
Supply voltage	V_{CC}	2.3 to 14.5	V

■ Electrical Characteristics at T_a = 25°C

Note) 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
Input stability 1	REG_{IN1}	V_{IN} = 2.9 V → 14.5 V, I_{OUT} = 50 mA	—	10	50	mV
Input stability 2	REG_{IN2}	V_{IN} = 2.9 V → 9 V, I_{OUT} = 50 mA	—	5	20	mV
Load stability *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 decreases by 5% from the value when V_{OUT} is at I_{OUT} = 50 mA.	180	240	—	mA
Bias current without load	I_{BIAS}	V_{IN} = 2.9 V, I_{OUT} = 0 mA	—	—	350	µA
Bias current fluctuation with 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	R.R.	1 V_{rms}, f = 120 Hz, I_{OUT} = 10 mA	62	70	—	dB
Minimum input and output voltage difference 1	$V_{DIF(min)1}$	V_{IN} = 1.6 V, I_{OUT} = 0 mA	—	0.1	0.2	V
Minimum input and 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 high voltage	V_{CONTH}	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 of 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}	10Hz ≤ f ≤ 100kHz, 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) ∗1 : Refer to ■ Technical Information " • Output rise time characteristics".

AN80L20RMS (2.0 V)

■ Recommended Operating Range

Parameter	Symbol	Range	Unit
Supply voltage	V_{CC}	2.4 to 14.5	V

■ Electrical Characteristics at T_a = 25°C

Note) 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
Input stability 1	REG_{IN1}	V_{IN} = 3.0 V → 14.5 V, I_{OUT} = 50 mA	—	10	50	mV
Input stability 2	REG_{IN2}	V_{IN} = 3.0 V → 9 V, I_{OUT} = 50 mA	—	5	20	mV
Load stability *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 decreases by 5% from the value when V_{OUT} is at I_{OUT} = 50 mA.	180	240	—	mA
Bias current without load	I_{BIAS}	V_{IN} = 3.0 V, I_{OUT} = 0 mA	—	—	350	µA
Bias current fluctuation with 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	R.R.	1 V_{rms}, f = 120 Hz, I_{OUT} = 10 mA	62	70	—	dB
Minimum input and output voltage difference 1	$V_{DIF(min)1}$	V_{IN} = 1.7 V, I_{OUT} = 0 mA	—	0.1	0.2	V
Minimum input and 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 high voltage	V_{CONTH}	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 of 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}	10Hz ≤ f ≤ 100kHz, 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) ∗1 : Refer to ■ Technical Information " • Output rise time characteristics".

AN80L21RMS (2.1 V)

■ Recommended Operating Range

Parameter	Symbol	Range	Unit
Supply voltage	V_{CC}	2.5 to 14.5	V

■ Electrical Characteristics at T_a = 25°C

Note) 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
Input stability 1	REG_{IN1}	V_{IN} = 3.1 V → 14.5 V, I_{OUT} = 50 mA	—	10	50	mV
Input stability 2	REG_{IN2}	V_{IN} = 3.1 V → 9 V, I_{OUT} = 50 mA	—	5	20	mV
Load stability *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 decreases by 5% from the value when V_{OUT} is at I_{OUT} = 50 mA.	180	240	—	mA
Bias current without load	I_{BIAS}	V_{IN} = 3.1 V, I_{OUT} = 0 mA	—	—	350	µA
Bias current fluctuation with 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	R.R.	1 V_{rms}, f = 120 Hz, I_{OUT} = 10 mA	61	69	—	dB
Minimum input and output voltage difference 1	$V_{DIF(min)1}$	V_{IN} = 1.8 V, I_{OUT} = 0 mA	—	0.1	0.2	V
Minimum input and 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 high voltage	V_{CONTH}	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 of 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}	10Hz ≤ f ≤ 100kHz, 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) ∗1 : Refer to ■ Technical Information " • Output rise time characteristics".

AN80L22RMS (2.2 V)

■ Recommended Operating Range

Parameter	Symbol	Range	Unit
Supply voltage	V_{CC}	2.6 to 14.5	V

■ Electrical Characteristics at T_a = 25°C

Note) 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
Input stability 1	REG_{IN1}	V_{IN} = 3.2 V → 14.5 V, I_{OUT} = 50 mA	—	10	50	mV
Input stability 2	REG_{IN2}	V_{IN} = 3.2 V → 9 V, I_{OUT} = 50 mA	—	5	20	mV
Load stability *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 decreases by 5% from the value when V_{OUT} is at I_{OUT} = 50 mA.	180	240	—	mA
Bias current without load	I_{BIAS}	V_{IN} = 3.2 V, I_{OUT} = 0 mA	—	—	350	µA
Bias current fluctuation with 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	R.R.	1 V_{rms}, f = 120 Hz, I_{OUT} = 10 mA	61	69	—	dB
Minimum input and output voltage difference 1	$V_{DIF(min)1}$	V_{IN} = 1.9 V, I_{OUT} = 0 mA	—	0.1	0.2	V
Minimum input and 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 high voltage	V_{CONTH}	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 of 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}	10Hz ≤ f ≤ 100kHz, 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) ∗1 : Refer to ■ Technical Information " • Output rise time characteristics".

AN80L25RMS (2.5 V)

■ Recommended Operating Range

Parameter	Symbol	Range	Unit
Supply voltage	V_{CC}	2.9 to 14.5	V

■ Electrical Characteristics at T_a = 25°C

Note) 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
Input stability 1	REG_{IN1}	V_{IN} = 3.5 V → 14.5 V, I_{OUT} = 50 mA	—	10	50	mV
Input stability 2	REG_{IN2}	V_{IN} = 3.5 V → 9 V, I_{OUT} = 50 mA	—	5	20	mV
Load stability *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 decreases by 5% from the value when V_{OUT} is at I_{OUT} = 50 mA.	180	240	—	mA
Bias current without load	I_{BIAS}	V_{IN} = 3.5 V, I_{OUT} = 0 mA	—	—	350	µA
Bias current fluctuation with 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	R.R.	1 V_{rms}, f = 120 Hz, I_{OUT} = 10 mA	60	68	—	dB
Minimum input and output voltage difference 1	$V_{DIF(min)1}$	V_{IN} = 2.2 V, I_{OUT} = 0 mA	—	0.1	0.2	V
Minimum input and 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 high voltage	V_{CONTH}	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 of 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}	10Hz ≤ f ≤ 100kHz, 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) ∗1 : Refer to ■ Technical Information " • Output rise time characteristics".

AN80L28RMS (2.8 V)

■ Recommended Operating Range

Parameter	Symbol	Range	Unit
Supply voltage	V_{CC}	3.2 to 14.5	V

■ Electrical Characteristics at T_a = 25°C

Note) 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
Input stability 1	REG_{IN1}	V_{IN} = 3.8 V → 14.5 V, I_{OUT} = 50 mA	—	10	50	mV
Input stability 2	REG_{IN2}	V_{IN} = 3.8 V → 9 V, I_{OUT} = 50 mA	—	5	20	mV
Load stability *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 decreases by 5% from the value when V_{OUT} is at I_{OUT} = 50 mA.	180	240	—	mA
Bias current without load	I_{BIAS}	V_{IN} = 3.8 V, I_{OUT} = 0 mA	—	—	350	µA
Bias current fluctuation with 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	R.R.	1 V_{rms}, f = 120 Hz, I_{OUT} = 10 mA	60	68	—	dB
Minimum input and output voltage difference 1	$V_{DIF(min)1}$	V_{IN} = 2.5 V, I_{OUT} = 0 mA	—	0.1	0.2	V
Minimum input and 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 high voltage	V_{CONTH}	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 of 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}	10Hz ≤ f ≤ 100kHz, 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) ∗1 : Refer to ■ Technical Information " • Output rise time characteristics".

AN80L29RMS (2.9 V)

■ Recommended Operating Range

Parameter	Symbol	Range	Unit
Supply voltage	V_{CC}	3.3 to 14.5	V

■ Electrical Characteristics at T_a = 25°C

Note) 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
Input stability 1	REG_{IN1}	V_{IN} = 3.9 V → 14.5 V, I_{OUT} = 50 mA	—	10	50	mV
Input stability 2	REG_{IN2}	V_{IN} = 3.9 V → 9 V, I_{OUT} = 50 mA	—	5	20	mV
Load stability *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 decreases by 5% from the value when V_{OUT} is at I_{OUT} = 50 mA.	180	240	—	mA
Bias current without load	I_{BIAS}	V_{IN} = 3.9 V, I_{OUT} = 0 mA	—	—	350	µA
Bias current fluctuation with 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	R.R.	1 V_{rms}, f = 120 Hz, I_{OUT} = 10 mA	60	68	—	dB
Minimum input and output voltage difference 1	$V_{DIF(min)1}$	V_{IN} = 2.6 V, I_{OUT} = 0 mA	—	0.1	0.2	V
Minimum input and 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 high voltage	V_{CONTH}	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 of 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}	10Hz ≤ f ≤ 100kHz, 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) ∗1 : Refer to ■ Technical Information " • Output rise time characteristics".

AN80L30RMS (3.0 V)

■ Recommended Operating Range

Parameter	Symbol	Range	Unit
Supply voltage	V_{CC}	3.4 to 14.5	V

■ Electrical Characteristics at T_a = 25°C

Note) 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
Input stability 1	REG_{IN1}	V_{IN} = 4.0 V → 14.5 V, I_{OUT} = 50 mA	—	10	50	mV
Input stability 2	REG_{IN2}	V_{IN} = 4.0 V → 9 V, I_{OUT} = 50 mA	—	5	20	mV
Load stability *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 decreases by 5% from the value when V_{OUT} is at I_{OUT} = 50 mA.	180	240	—	mA
Bias current without load	I_{BIAS}	V_{IN} = 4.0 V, I_{OUT} = 0 mA	—	—	350	µA
Bias current fluctuation with 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	R.R.	1 V_{rms}, f = 120 Hz, I_{OUT} = 10 mA	60	68	—	dB
Minimum input and output voltage difference 1	$V_{DIF(min)1}$	V_{IN} = 2.7 V, I_{OUT} = 0 mA	—	0.1	0.2	V
Minimum input and 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 high voltage	V_{CONTH}	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 of 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}	10Hz ≤ f ≤ 100kHz, 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) ∗1 : Refer to ■ Technical Information " • Output rise time characteristics".

AN80L31RMS (3.1 V)

■ Recommended Operating Range

Parameter	Symbol	Range	Unit
Supply voltage	V_{CC}	3.5 to 14.5	V

■ Electrical Characteristics at T_a = 25°C

Note) 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
Input stability 1	REG_{IN1}	V_{IN} = 4.1 V → 14.5 V, I_{OUT} = 50 mA	—	10	50	mV
Input stability 2	REG_{IN2}	V_{IN} = 4.1 V → 9 V, I_{OUT} = 50 mA	—	5	20	mV
Load stability *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 decreases by 5% from the value when V_{OUT} is at I_{OUT} = 50 mA.	180	240	—	mA
Bias current without load	I_{BIAS}	V_{IN} = 4.1 V, I_{OUT} = 0 mA	—	—	350	µA
Bias current fluctuation with 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	R.R.	1 V_{rms}, f = 120 Hz, I_{OUT} = 10 mA	59	67	—	dB
Minimum input and output voltage difference 1	$V_{DIF(min)1}$	V_{IN} = 2.8 V, I_{OUT} = 0 mA	—	0.1	0.2	V
Minimum input and 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 high voltage	V_{CONTH}	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 of 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}	10Hz ≤ f ≤ 100kHz, 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) ∗1 : Refer to ■ Technical Information " • Output rise time characteristics".

AN80L32RMS (3.2 V)

■ Recommended Operating Range

Parameter	Symbol	Range	Unit
Supply voltage	V_{CC}	3.6 to 14.5	V

■ Electrical Characteristics at T_a = 25°C

Note) 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
Input stability 1	REG_{IN1}	V_{IN} = 4.2 V → 14.5 V, I_{OUT} = 50 mA	—	10	50	mV
Input stability 2	REG_{IN2}	V_{IN} = 4.2 V → 9 V, I_{OUT} = 50 mA	—	5	20	mV
Load stability *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 decreases by 5% from the value when V_{OUT} is at I_{OUT} = 50 mA.	180	240	—	mA
Bias current without load	I_{BIAS}	V_{IN} = 4.2 V, I_{OUT} = 0 mA	—	—	350	µA
Bias current fluctuation with 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	R.R.	1 V_{rms}, f = 120 Hz, I_{OUT} = 10 mA	59	67	—	dB
Minimum input and output voltage difference 1	$V_{DIF(min)1}$	V_{IN} = 2.9 V, I_{OUT} = 0 mA	—	0.1	0.2	V
Minimum input and 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 high voltage	V_{CONTH}	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 of 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}	10Hz ≤ f ≤ 100kHz, 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) ∗1 : Refer to ■ Technical Information " • Output rise time characteristics".

AN80L33RMS (3.3 V)

■ Recommended Operating Range

Parameter	Symbol	Range	Unit
Supply voltage	V_{CC}	3.7 to 14.5	V

■ Electrical Characteristics at T_a = 25°C

Note) 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
Input stability 1	REG_{IN1}	V_{IN} = 4.3 V → 14.5 V, I_{OUT} = 50 mA	—	10	50	mV
Input stability 2	REG_{IN2}	V_{IN} = 4.3 V → 9 V, I_{OUT} = 50 mA	—	5	20	mV
Load stability *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 decreases by 5% from the value when V_{OUT} is at I_{OUT} = 50 mA.	180	240	—	mA
Bias current without load	I_{BIAS}	V_{IN} = 4.3 V, I_{OUT} = 0 mA	—	—	350	µA
Bias current fluctuation with 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	R.R.	1 V_{rms}, f = 120 Hz, I_{OUT} = 10 mA	59	67	—	dB
Minimum input and output voltage difference 1	$V_{DIF(min)1}$	V_{IN} = 3.0 V, I_{OUT} = 0 mA	—	0.1	0.2	V
Minimum input and 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 high voltage	V_{CONTH}	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 of 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}	10Hz ≤ f ≤ 100kHz, 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) ∗1 : Refer to ■ Technical Information " • Output rise time characteristics".

AN80L34RMS (3.4 V)

■ Recommended Operating Range

Parameter	Symbol	Range	Unit
Supply voltage	V_{CC}	3.8 to 14.5	V

■ Electrical Characteristics at T_a = 25°C

Note) 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
Input stability 1	REG_{IN1}	V_{IN} = 4.4 V → 14.5 V, I_{OUT} = 50 mA	—	10	50	mV
Input stability 2	REG_{IN2}	V_{IN} = 4.4 V → 9 V, I_{OUT} = 50 mA	—	5	20	mV
Load stability *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 decreases by 5% from the value when V_{OUT} is at I_{OUT} = 50 mA.	180	240	—	mA
Bias current without load	I_{BIAS}	V_{IN} = 4.4 V, I_{OUT} = 0 mA	—	—	350	µA
Bias current fluctuation with 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	R.R.	1 V_{rms}, f = 120 Hz, I_{OUT} = 10 mA	58	66	—	dB
Minimum input and output voltage difference 1	$V_{DIF(min)1}$	V_{IN} = 3.1 V, I_{OUT} = 0 mA	—	0.1	0.2	V
Minimum input and 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 high voltage	V_{CONTH}	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 of 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}	10Hz ≤ f ≤ 100kHz, 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) ∗1 : Refer to ■ Technical Information " • Output rise time characteristics".

AN80L35RMS (3.5 V)

■ Recommended Operating Range

Parameter	Symbol	Range	Unit
Supply voltage	V_{CC}	3.9 to 14.5	V

■ Electrical Characteristics at T_a = 25°C

Note) 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
Input stability 1	REG_{IN1}	V_{IN} = 4.5 V → 14.5 V, I_{OUT} = 50 mA	—	10	50	mV
Input stability 2	REG_{IN2}	V_{IN} = 4.5 V → 9 V, I_{OUT} = 50 mA	—	5	20	mV
Load stability *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 decreases by 5% from the value when V_{OUT} is at I_{OUT} = 50 mA.	180	240	—	mA
Bias current without load	I_{BIAS}	V_{IN} = 4.5 V, I_{OUT} = 0 mA	—	—	350	µA
Bias current fluctuation with 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	R.R.	1 V_{rms}, f = 120 Hz, I_{OUT} = 10 mA	58	66	—	dB
Minimum input and output voltage difference 1	$V_{DIF(min)1}$	V_{IN} = 3.2 V, I_{OUT} = 0 mA	—	0.1	0.2	V
Minimum input and 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 high voltage	V_{CONTH}	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 of 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}	10Hz ≤ f ≤ 100kHz, 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) ∗1 : Refer to ■ Technical Information " • Output rise time characteristics".

AN80L36RMS (3.6 V)

■ Recommended Operating Range

Parameter	Symbol	Range	Unit
Supply voltage	V_{CC}	4.0 to 14.5	V

■ Electrical Characteristics at T_a = 25°C

Note) 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
Input stability 1	REG_{IN1}	V_{IN} = 4.6 V → 14.5 V, I_{OUT} = 50 mA	—	10	50	mV
Input stability 2	REG_{IN2}	V_{IN} = 4.6 V → 9 V, I_{OUT} = 50 mA	—	5	20	mV
Load stability *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 decreases by 5% from the value when V_{OUT} is at I_{OUT} = 50 mA.	180	240	—	mA
Bias current without load	I_{BIAS}	V_{IN} = 4.6 V, I_{OUT} = 0 mA	—	—	350	µA
Bias current fluctuation with 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	R.R.	1 V_{rms}, f = 120 Hz, I_{OUT} = 10 mA	58	66	—	dB
Minimum input and output voltage difference 1	$V_{DIF(min)1}$	V_{IN} = 3.3 V, I_{OUT} = 0 mA	—	0.1	0.2	V
Minimum input and 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 high voltage	V_{CONTH}	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 of 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}	10Hz ≤ f ≤ 100kHz, 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) ∗1 : Refer to ■ Technical Information " • Output rise time characteristics".

AN80L48RMS (4.8 V)

■ Recommended Operating Range

Parameter	Symbol	Range	Unit
Supply voltage	V_{CC}	5.2 to 14.5	V

■ Electrical Characteristics at T_a = 25°C

Note) 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
Input stability 1	REG_{IN1}	V_{IN} = 5.8 V → 14.5 V, I_{OUT} = 50 mA	—	10	50	mV
Input stability 2	REG_{IN2}	V_{IN} = 5.8 V → 9 V, I_{OUT} = 50 mA	—	5	20	mV
Load stability *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 decreases by 5% from the value when V_{OUT} is at I_{OUT} = 50 mA.	180	240	—	mA
Bias current without load	I_{BIAS}	V_{IN} = 5.8 V, I_{OUT} = 0 mA	—	—	350	µA
Bias current fluctuation with 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	R.R.	1 V_{rms}, f = 120 Hz, I_{OUT} = 10 mA	57	65	—	dB
Minimum input and output voltage difference 1	$V_{DIF(min)1}$	V_{IN} = 4.5 V, I_{OUT} = 0 mA	—	0.1	0.2	V
Minimum input and 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 high voltage	V_{CONTH}	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 of 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}	10Hz ≤ f ≤ 100kHz, 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) ∗1 : Refer to ■ Technical Information " • Output rise time characteristics".

AN80L49RMS (4.9 V)

■ Recommended Operating Range

Parameter	Symbol	Range	Unit
Supply voltage	V_{CC}	5.3 to 14.5	V

■ Electrical Characteristics at T_a = 25°C

Note) 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
Input stability 1	REG_{IN1}	V_{IN} = 5.9 V → 14.5 V, I_{OUT} = 50 mA	—	10	50	mV
Input stability 2	REG_{IN2}	V_{IN} = 5.9 V → 9 V, I_{OUT} = 50 mA	—	5	20	mV
Load stability *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 decreases by 5% from the value when V_{OUT} is at I_{OUT} = 50 mA.	180	240	—	mA
Bias current without load	I_{BIAS}	V_{IN} = 5.9 V, I_{OUT} = 0 mA	—	—	350	µA
Bias current fluctuation with 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	R.R.	1 V_{rms}, f = 120 Hz, I_{OUT} = 10 mA	57	65	—	dB
Minimum input and output voltage difference 1	$V_{DIF(min)1}$	V_{IN} = 4.6 V, I_{OUT} = 0 mA	—	0.1	0.2	V
Minimum input and 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 high voltage	V_{CONTH}	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 of 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}	10Hz ≤ f ≤ 100kHz, 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) ∗1 : Refer to ■ Technical Information " • Output rise time characteristics".

AN80L50RMS (5.0 V)

■ Recommended Operating Range

Parameter	Symbol	Range	Unit
Supply voltage	V_{CC}	5.4 to 14.5	V

■ Electrical Characteristics at T_a = 25°C

Note) 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
Input stability 1	REG_{IN1}	V_{IN} = 6.0 V → 14.5 V, I_{OUT} = 50 mA	—	10	50	mV
Input stability 2	REG_{IN2}	V_{IN} = 6.0 V → 9 V, I_{OUT} = 50 mA	—	5	20	mV
Load stability *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 decreases by 5% from the value when V_{OUT} is at I_{OUT} = 50 mA.	180	240	—	mA
Bias current without load	I_{BIAS}	V_{IN} = 6.0 V, I_{OUT} = 0 mA	—	—	350	µA
Bias current fluctuation with 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	R.R.	1 V_{rms}, f = 120 Hz, I_{OUT} = 10 mA	56	64	—	dB
Minimum input and output voltage difference 1	$V_{DIF(min)1}$	V_{IN} = 4.7 V, I_{OUT} = 0 mA	—	0.1	0.2	V
Minimum input and 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 high voltage	V_{CONTH}	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 of 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}	10Hz ≤ f ≤ 100kHz, 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) ∗1 : Refer to ■ Technical Information " • Output rise time characteristics".

AN80L51RMS (5.1 V)

■ Recommended Operating Range

Parameter	Symbol	Range	Unit
Supply voltage	V_{CC}	5.5 to 14.5	V

■ Electrical Characteristics at T_a = 25°C

Note) 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
Input stability 1	REG_{IN1}	V_{IN} = 6.1 V → 14.5 V, I_{OUT} = 50 mA	—	10	50	mV
Input stability 2	REG_{IN2}	V_{IN} = 6.1 V → 9 V, I_{OUT} = 50 mA	—	5	20	mV
Load stability *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 decreases by 5% from the value when V_{OUT} is at I_{OUT} = 50 mA.	180	240	—	mA
Bias current without load	I_{BIAS}	V_{IN} = 6.1 V, I_{OUT} = 0 mA	—	—	350	µA
Bias current fluctuation with 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	R.R.	1 V_{rms}, f = 120 Hz, I_{OUT} = 10 mA	56	64	—	dB
Minimum input and output voltage difference 1	$V_{DIF(min)1}$	V_{IN} = 4.8 V, I_{OUT} = 0 mA	—	0.1	0.2	V
Minimum input and 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 high voltage	V_{CONTH}	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 of 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}	10Hz ≤ f ≤ 100kHz, 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} = 6.1panpa 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) ∗1 : Refer to ■ Technical Information " • Output rise time characteristics".

AN80L52RMS (5.2 V)

■ Recommended Operating Range

Parameter	Symbol	Range	Unit
Supply voltage	V_{CC}	5.6 to 14.5	V

■ Electrical Characteristics at T_a = 25°C

Note) 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
Input stability 1	REG_{IN1}	V_{IN} = 6.2 V → 14.5 V, I_{OUT} = 50 mA	—	10	50	mV
Input stability 2	REG_{IN2}	V_{IN} = 6.2 V → 9 V, I_{OUT} = 50 mA	—	5	20	mV
Load stability *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 decreases by 5% from the value when V_{OUT} is at I_{OUT} = 50 mA.	180	240	—	mA
Bias current without load	I_{BIAS}	V_{IN} = 6.2 V, I_{OUT} = 0 mA	—	—	350	µA
Bias current fluctuation with 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	R.R.	1 V_{rms}, f = 120 Hz, I_{OUT} = 10 mA	56	64	—	dB
Minimum input and output voltage difference 1	$V_{DIF(min)1}$	V_{IN} = 4.9 V, I_{OUT} = 0 mA	—	0.1	0.2	V
Minimum input and 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 high voltage	V_{CONTH}	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 of the output current is 50 mA due to the overcurrent protection.

- Design reference data

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

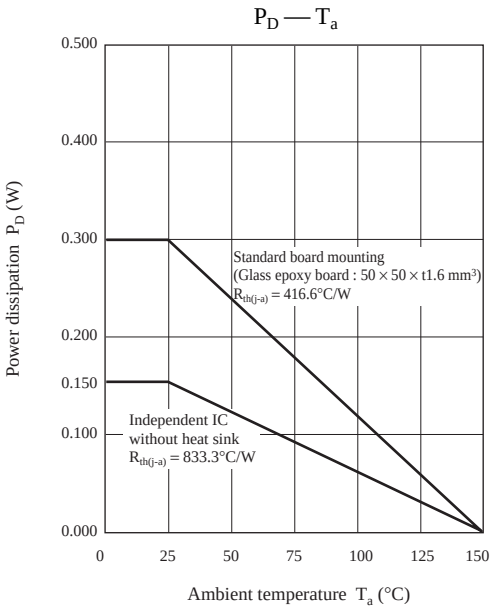
Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Output noise voltage	V_{NO}	10Hz ≤ f ≤ 100kHz, I_{OUT} = 10 mA	—	108	—	µV
Output voltage temperature coefficient	$\frac{1}{V_{OUT}} \cdot \frac{dV_{OUT}}{dT}$	V_{IN} = 6.2 V, I_{OUT} = 0 mA − 30°C ≤ T_a ≤ + 85°C	—	90	—	ppm/°C
Output rise time	t_{ON}	V_{IN} = 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) ∗1 : Refer to ■ Technical Information " • Output rise time characteristics".

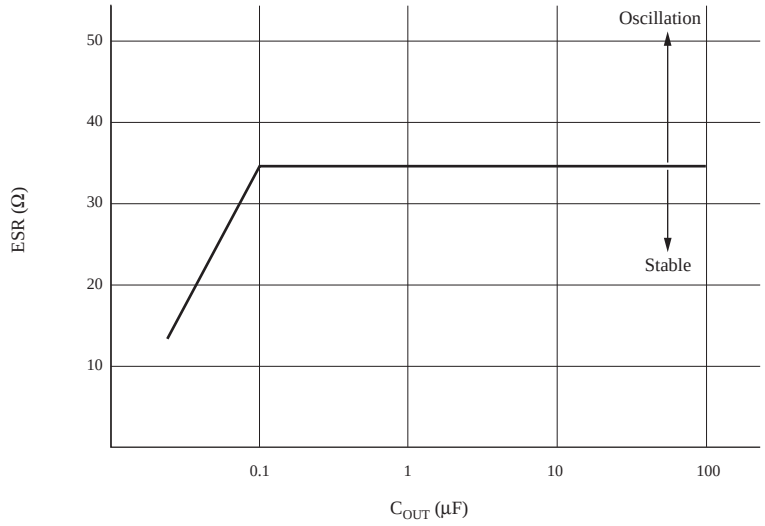
AN80LXXRMS series Technical Information and etc.

■ Technical Information

- P_D — T_a curves of Mini-type 5-pin package (Common to AN80LXXRMS series)



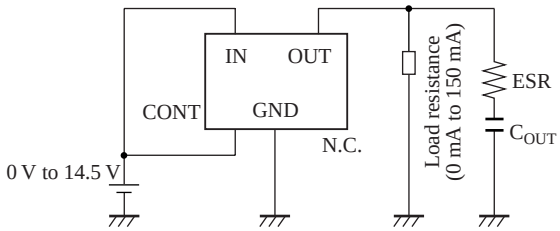
- ESR characteristics (Common to AN80LXXRMS series)



■ Technical Information (continued)

- ESR characteristics (Common to AN80LXXRMS series)

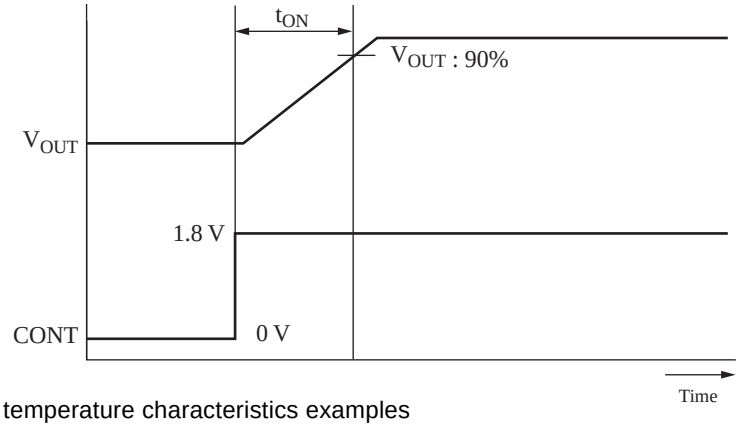
Test circuit



Note) 1. Not guaranteed values

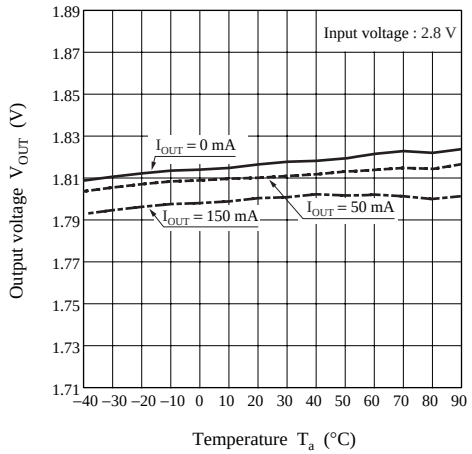
2. The capacitance value used for C_{OUT} must be 0.22 µF or more and 100 µF or less. The recommended value is 10 µF.
3. Use a capacitor having ESR (equivalent series resistance of capacitor) of 35 Ω or less (at T_a = − 30°C to + 85°C).

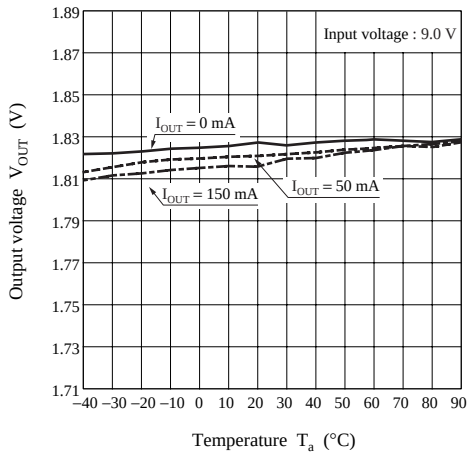
- Output rise-time characteristics (Common to AN80LXXRMS series)



- Output voltage - temperature characteristics examples

<AN80L18RMS>

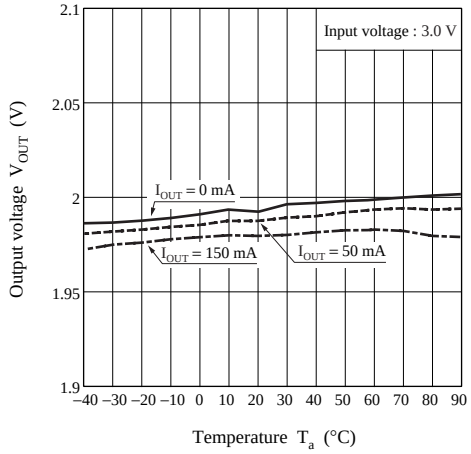


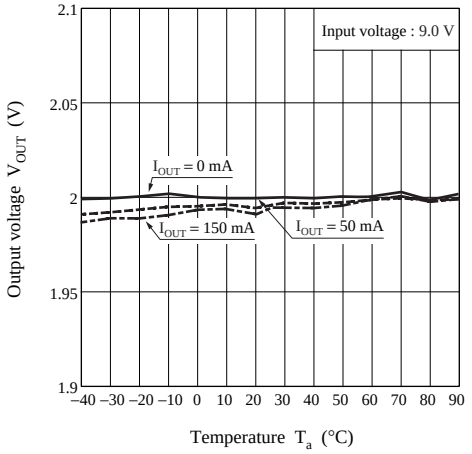


■ Technical Information (continued)

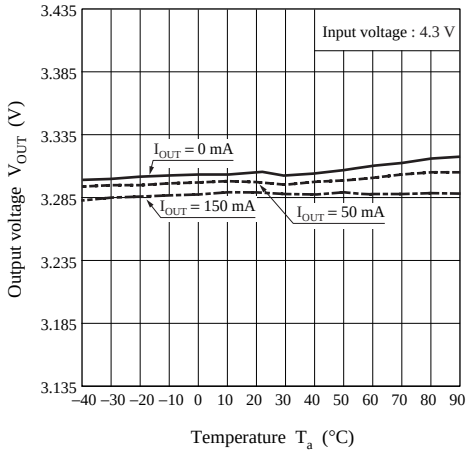
• Output voltage - temperature characteristics examples (continued)

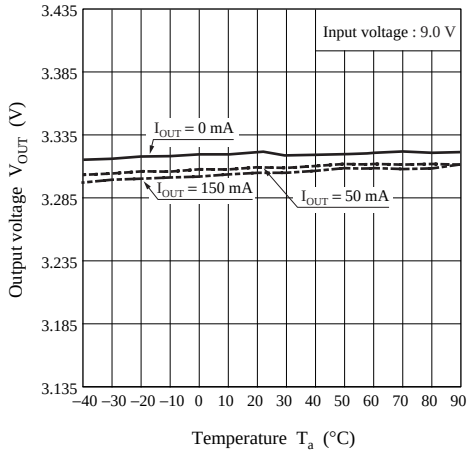
<AN80L20RMS>



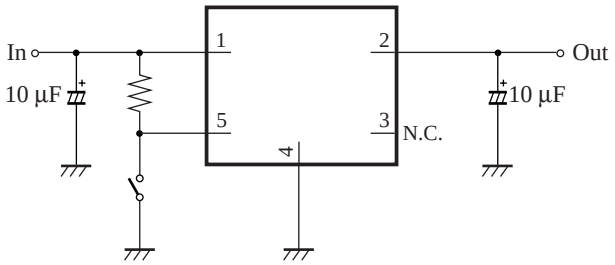


<AN80L33RMS>





■ Application Circuit Example (Common to AN80LXXRMS Series)



Output off when Low
Output on when High