

DATA SHEET

Part No.	AN80L20RMS
Package Code No.	MINI-5DA (Exclusive use for AN80LxxRMS)

Contents

■ Overview	3
■ Features	3
■ Applications	3
■ Package	3
■ Type	3
■ Block Diagram	4
■ Pin Descriptions	5
■ Absolute Maximum Ratings	6
■ Operating Supply Voltage Range	6
■ Electrical Characteristics	7
■ Electrical Characteristics (Reference values for design)	8
■ Technical Data	9
• ESR characteristics	9
• $P_D - T_a$ diagram	10
■ Package Dimensions	11

AN80L20RMS

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

■ Overview

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.

■ Features

- Minimum input and output voltage difference: 0.4 V max.
- High accuracy output voltage: (allowance: $\pm 3\%$)
- Built-in reset function terminal (high: active)
- Built-in overcurrent limit circuit
- Built-in rush current prevention circuit at input voltage rise.
- Output voltage: 2.0 V

■ Applications

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

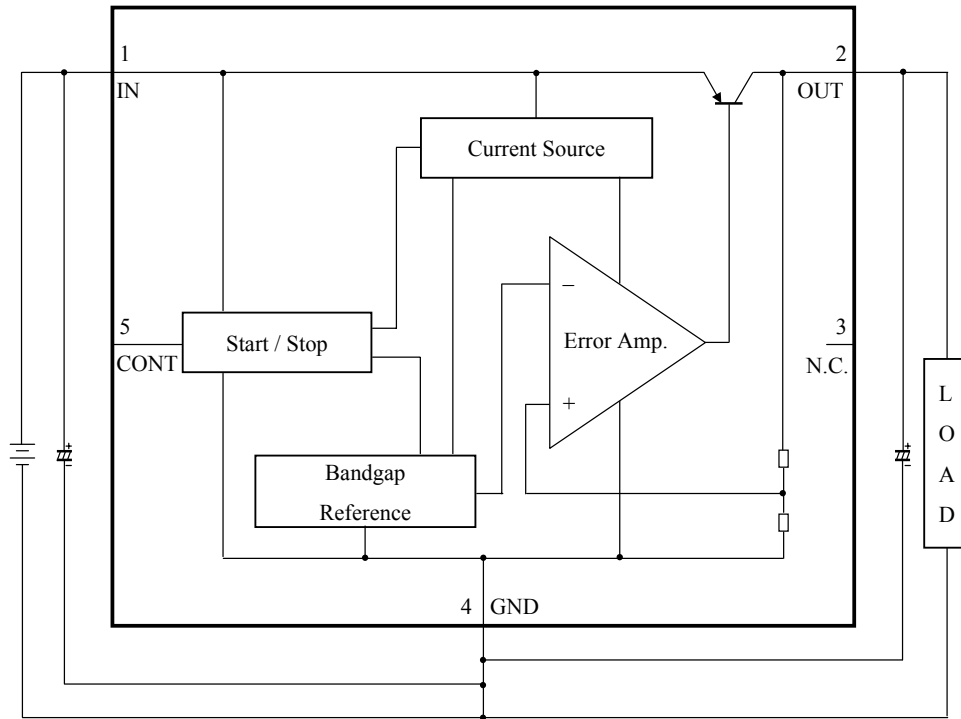
■ Package

- 5-pin Plastic Surface Mount Small Package (MINI type)

■ Type

- Silicon monolithic bipolar IC.

■ Block Diagram



■ Pin Descriptions

Pin No.	Pin name	Type	Description
1	IN	Input	Input voltage
2	OUT	Output	Output voltage
3	N.C.	—	Non connected
4	GND	Ground	Ground
5	CONT	Input	Control (H→ start, L → stop)

■ Absolute Maximum Ratings

No.	Parameter	Symbol	Rating	Unit	Note
1	Supply voltage	V_{CC}	14.6	V	*1
2	Supply current	I_{CC}	300	mA	—
3	Power dissipation	P_D	78	mW	*2
4	Operating ambient temperature	T_{opr}	-30 to +85	°C	*3
5	Storage temperature	T_{stg}	-55 to +150	°C	*3

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: The power dissipation shown is the value at $T_a = 85^\circ\text{C}$ for the independent (unmounted) IC package without a heat sink.

When using this IC, refer to the • P_D - T_a diagram in the ■ Technical Data and use under the condition not exceeding the allowable value.

*3: Except for the power dissipation, operating ambient temperature, and storage temperature, all ratings are for $T_a = 25^\circ\text{C}$.

■ Operating supply voltage range

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

Note) *: The values under the condition not exceeding the above absolute maximum ratings and the power dissipation.

■ Electrical Characteristics

Note) Unless otherwise specified, $T_a = 25^\circ\text{C} \pm 2^\circ\text{C}$, $C_{\text{IN}} = 0.1 \mu\text{F}$ and $C_{\text{OUT}} = 10 \mu\text{F}$

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.

No.	Parameter	Symbol	Conditions	Limits			Unit	Note
				Min	Typ	Max		
1	Output voltage	V_{OUT}	$V_{\text{IN}} = 3.0 \text{ V}$ $I_{\text{OUT}} = 50 \text{ mA}$	1.940	2.0	2.060	V	—
2	Line regulation 1	REG_{IN1}	$V_{\text{IN}} = 3.0 \text{ V} \rightarrow 14.5 \text{ V}$ $I_{\text{OUT}} = 50 \text{ mA}$	—	10	50	mV	—
3	Line regulation 2	REG_{IN2}	$V_{\text{IN}} = 3.0 \text{ V} \rightarrow 9 \text{ V}$ $I_{\text{OUT}} = 50 \text{ mA}$	—	5	20	mV	—
4	Load regulation	REG_{LOA}	$V_{\text{IN}} = 3.0 \text{ V}$ $I_{\text{OUT}} = 0 \text{ mA} \rightarrow 150 \text{ mA}$	—	50	150	mV	—
5	Peak output current	I_{peak}	$V_{\text{IN}} = 3.0 \text{ V}$, The output current value when V_{OUT} decreases by 5% from its value at $I_{\text{OUT}} = 50 \text{ mA}$.	180	240	—	mA	*1
6	Bias current at no load	I_{Bias}	$V_{\text{IN}} = 3.0 \text{ V}$ $I_{\text{OUT}} = 0 \text{ mA}$	—	—	350	μA	—
7	Bias current change with load	ΔI_{Bias}	$V_{\text{IN}} = 3.0 \text{ V}$ $I_{\text{OUT}} = 0 \text{ mA} \rightarrow 150 \text{ mA}$	—	—	5	mA	—
8	Current consumption in standby mode	I_{STB}	$V_{\text{IN}} = 10 \text{ V}$ $V_{\text{CONT}} = 0 \text{ V}$	—	—	0.1	μA	—
9	Bias current before regulation	I_{rush}	$V_{\text{IN}} = 1.7 \text{ V}$ $I_{\text{OUT}} = 0 \text{ mA}$	—	1.5	5	mA	—
10	Ripple rejection ratio	R.R.	1 V[rms], $f = 120 \text{ Hz}$ $I_{\text{OUT}} = 10 \text{ mA}$	62	70	—	dB	—
11	Minimum difference between input and output voltage 1	$V_{\text{DIF(min)1}}$	$V_{\text{IN}} = 1.7 \text{ V}$ $I_{\text{OUT}} = 0 \text{ mA}$	—	0.1	0.2	V	—
12	Minimum difference between input and output voltage 2	$V_{\text{DIF(min)2}}$	$V_{\text{IN}} = 2.3 \text{ V}$ $I_{\text{OUT}} = 150 \text{ mA}$	—	—	0.4	V	—
13	Control pin threshold voltage high level	V_{CONTH}	$V_{\text{IN}} = 3.0 \text{ V}$ $I_{\text{OUT}} = 50 \text{ mA}$	—	—	1.50	V	—
14	Control pin threshold voltage low level	V_{CONTL}	$V_{\text{IN}} = 3.0 \text{ V}$ $I_{\text{OUT}} = 50 \text{ mA}$	0.30	—	—	V	—
15	Control pin current	V_{CONT}	$V_{\text{IN}} = 3.0 \text{ V}$ $I_{\text{OUT}} = 50 \text{ mA}$, $V_{\text{CONT}} = 1.8 \text{ V}$	—	—	30	μA	—

Note) *1 : 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.

■ Electrical Characteristics (Reference values for design)

Note) Unless otherwise specified, $T_a = 25^\circ\text{C} \pm 2^\circ\text{C}$, $C_{IN} = 0.1 \mu\text{F}$ and $C_{OUT} = 10 \mu\text{F}$

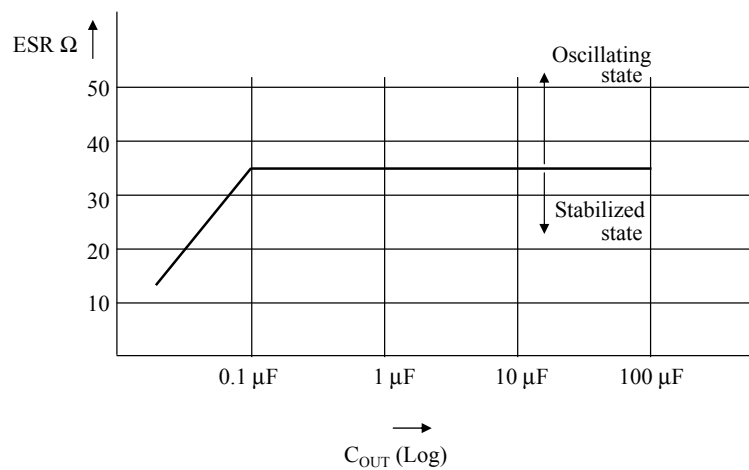
Unless otherwise specially provided, shorten each test time (within 10 ms) so that the test is conducted under the condition that the drift due to the temperature increase in the chip junction part can be neglected.

The characteristics listed below are reference values for design of the IC and are not guaranteed by inspection.

If a problem does occur related to these characteristics, Matsushita will respond in good faith to user concerns.

No.	Parameter	Symbol	Conditions	Reference values			Unit	Note
				Min	Typ	Max		
1	Output noise voltage	V_{no}	$10\text{Hz} \leq f \leq 100 \text{kHz}$ $I_{OUT} = 10 \text{mA}$	—	42	—	μV	—
2	Temperature coefficient of output voltage	$\frac{1}{V_{OUT}} \cdot \frac{dV_{OUT}}{dT}$	$V_{IN} = 3.0 \text{V}$ $I_{OUT} = 0 \text{mA}$ $-30^\circ\text{C} \leq T_a \leq +85^\circ\text{C}$	—	90	—	ppm/ $^\circ\text{C}$	—
3	Output rise time	t_{ON}	$V_{IN} = 3.0 \text{V}$ $I_{OUT} = 50 \text{mA}$ $V_{CONT} = 0 \text{V} \rightarrow 1.8 \text{V}$	—	0.10	—	ms	—

- Technical Data
 - ESR characteristics

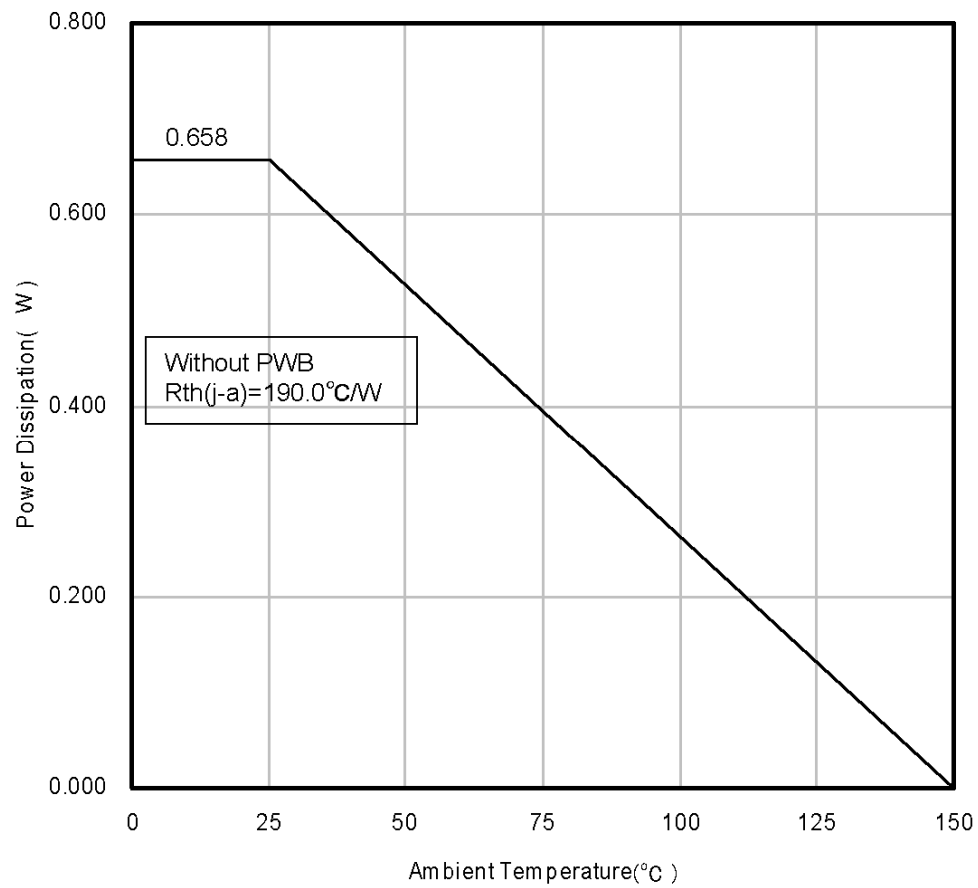


Note) 1. The value are not the once guaranteed through inspection.

2. Select the value of C_{OUT} capacitor in the range from 0.22 μF to 100 μF. Recommended value is 10 μF.

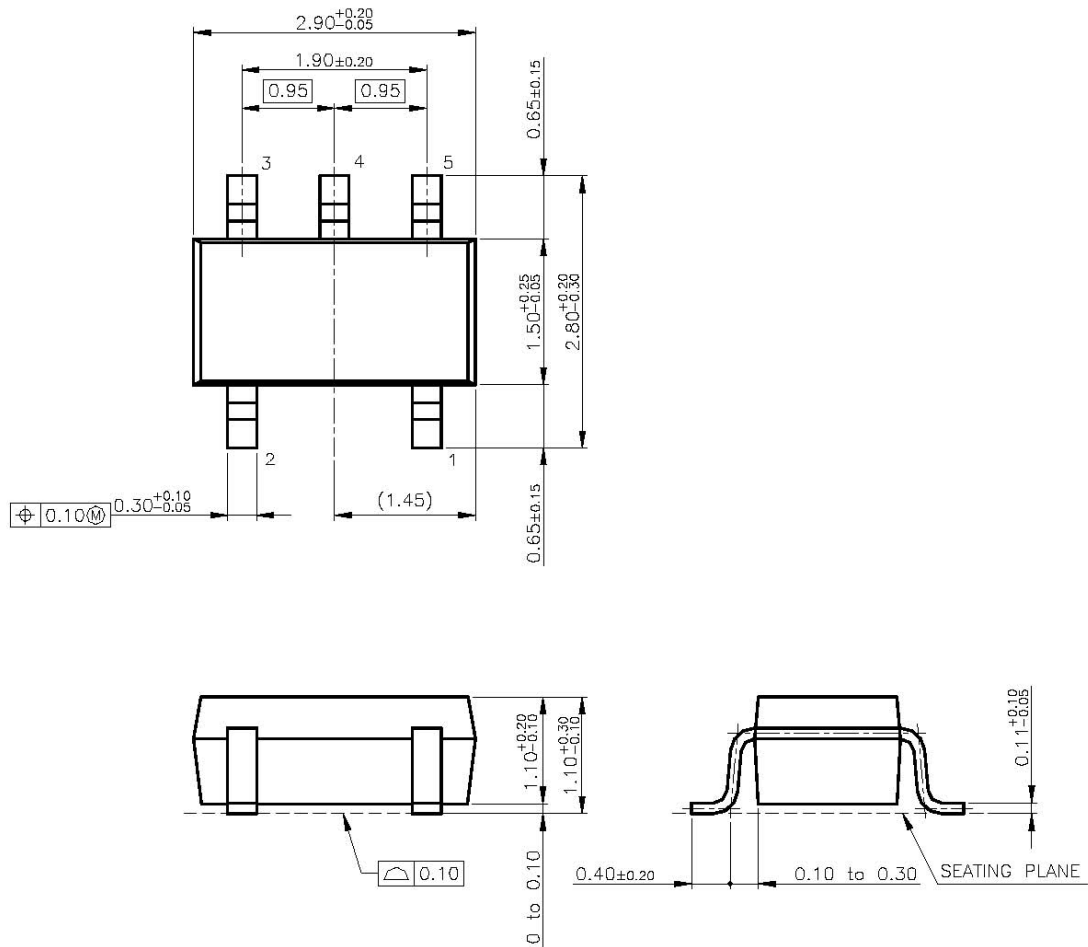
3. Select a capacitor so that ESR (equivalent series resistance of the capacitor) is 35 Ω or less at T_a = -30°C to +85°C.

- Technical Data (Continued)
- $P_D - T_a$ diagram



■ Package Dimensions (Unit: mm)

- MINI-5DA (Exclusive use for AN80LxxRMS)



Request for your special attention and precautions in using the technical information and semiconductors described in this book

- (1) If any of the products or technical information described in this book is to be exported or provided to non-residents, the laws and regulations of the exporting country, especially, those with regard to security export control, must be observed.
- (2) The technical information described in this book is intended only to show the main characteristics and application circuit examples of the products, and no license is granted under any intellectual property right or other right owned by our company or any other company. Therefore, no responsibility is assumed by our company as to the infringement upon any such right owned by any other company which may arise as a result of the use of technical information described in this book.
- (3) The products described in this book are intended to be used for standard applications or general electronic equipment (such as office equipment, communications equipment, measuring instruments and household appliances).
Consult our sales staff in advance for information on the following applications:
 - Special applications (such as for airplanes, aerospace, automobiles, traffic control equipment, combustion equipment, life support systems and safety devices) in which exceptional quality and reliability are required, or if the failure or malfunction of the products may directly jeopardize life or harm the human body.
 - Any applications other than the standard applications intended.
- (4) The products and product specifications described in this book are subject to change without notice for modification and/or improvement. At the final stage of your design, purchasing, or use of the products, therefore, ask for the most up-to-date Product Standards in advance to make sure that the latest specifications satisfy your requirements.
- (5) When designing your equipment, comply with the range of absolute maximum rating and the guaranteed operating conditions (operating power supply voltage and operating environment etc.). Especially, please be careful not to exceed the range of absolute maximum rating on the transient state, such as power-on, power-off and mode-switching. Otherwise, we will not be liable for any defect which may arise later in your equipment.
 - Even when the products are used within the guaranteed values, take into the consideration of incidence of break down and failure mode, possible to occur to semiconductor products. Measures on the systems such as redundant design, arresting the spread of fire or preventing glitch are recommended in order to prevent physical injury, fire, social damages, for example, by using the products.
- (6) Comply with the instructions for use in order to prevent breakdown and characteristics change due to external factors (ESD, EOS, thermal stress and mechanical stress) at the time of handling, mounting or at customer's process. When using products for which damp-proof packing is required, satisfy the conditions, such as shelf life and the elapsed time since first opening the packages.
- (7) This book may be not reprinted or reproduced whether wholly or partially, without the prior written permission of Matsushita Electric Industrial Co., Ltd.