DATA SHEET

Part No.	AN78L12M
Package Code No.	HSIP003-P-0000Q

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AN78L12M

3-pin positive output voltage regulator (100 mA type)

■ Overview

The AN78LxxM series are 3-pin, fixed positive output type monolithic voltage regulators.
Stabilized fixed output voltage is obtained from unstable DC input voltage without using any external components.
12 types of fixed output voltage are available; 4 V, 5 V, 6 V, 7 V, 8 V, 9 V, 10 V, 12 V, 15 V, 18 V, 20 V and 24 V.
They can be used widely in power circuits with current capacity of up to 100 mA.
The AN78L12M is the 12 V output voltage type in these series.

■ Features

- No external components
- Output voltage: 12 V
- Built-in overcurrent limit circuit
- Built-in thermal overload protection circuit

■ Applications

- 3-pin positive output voltage regulator (100 mA type)

■ Package

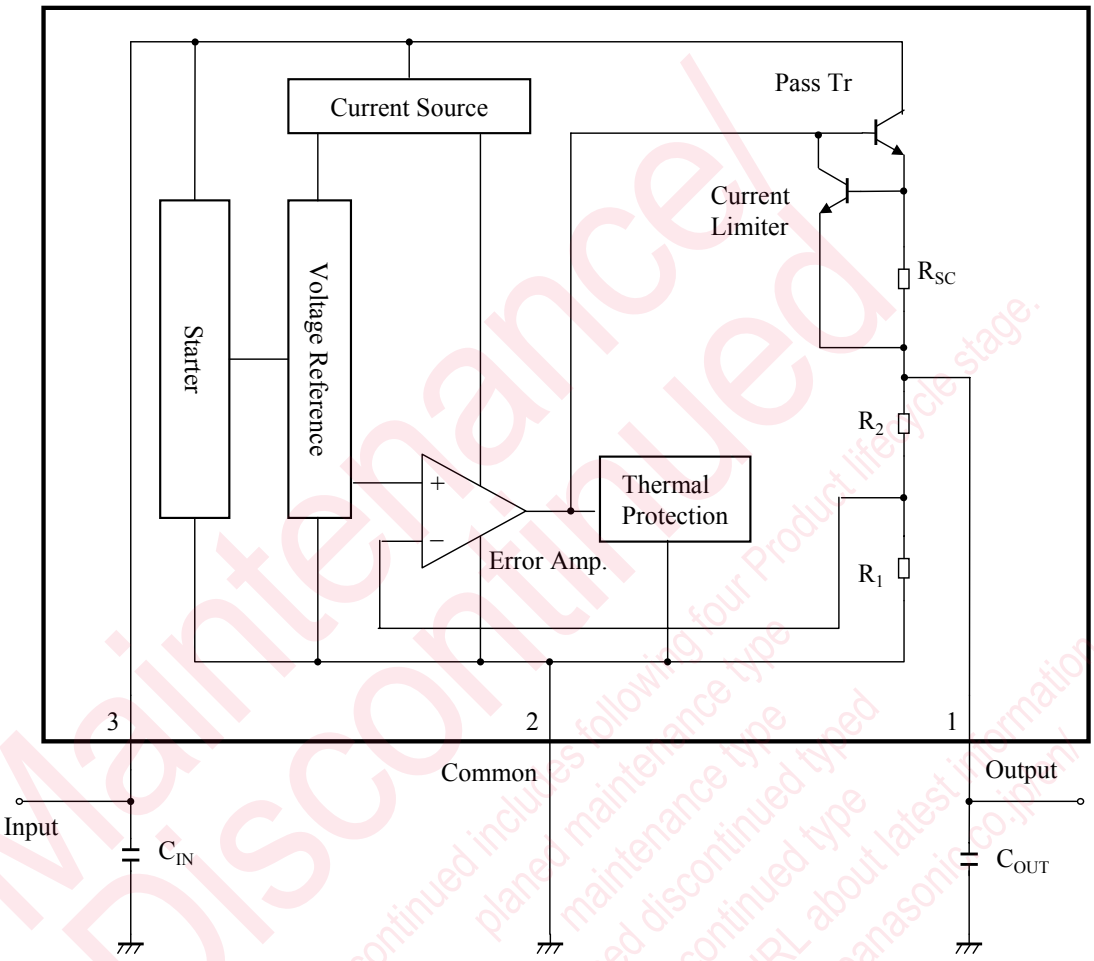
- 3-pin plastic single inline package with heat sink (SIP type)

■ Type

- Silicon monolithic bipolar IC

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■ Block Diagram



C_{IN} : 0.33 µF
C_{OUT} : 0.1 µF
R_1 : 4 kΩ
R_2 : 8 kΩ

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■ Pin Descriptions

Pin No.	Pin name	Type	Description
1	Output	Output	Regulated power output
2	Common	GND	Ground
3	Input	Input	Input supplies power to the internal circuitry

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■ Absolute Maximum Ratings

A No.	Parameter	Symbol	Rating	Unit	Note
1	Input voltage	V_{IN}	35	V	*1
2	Supply current	I_{CC}	200	mA	*2
3	Power dissipation	P_D	270	mW	*3
4	Operating ambient temperature	T_{opr}	−30 to + 80	°C	*4
5	Storage temperature	T_{stg}	−55 to +150	°C	*4

Note) *1: The values under the condition not exceeding the above absolute maximum ratings and the power dissipation.
*2: Since current limiting circuit is built in, current value never exceeds the limit.
*3: The power dissipation shown is the value at T_a = 80°C.
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.
When T_j exceeds 150°C, the internal circuit cuts off the output.
*4: Except for the power dissipation, operating ambient temperature, and storage temperature, all ratings are for T_a = 25°C.

■ Operating supply voltage range

Parameter	Symbol	Range	Unit	Note
Supply voltage range	V_{CC}	14.5 to 27	V	—

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

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■ Electrical Characteristics

Note) Unless otherwise specified, T_a = 25°C±2°C, V_{IN} = 19 V, I_{OUT} = 40 mA, C_{IN} = 0.33 µF and C_{OUT} = 0.1 µF, T_j = 0°C to 125°C

B No.	Parameter	Symbol	Conditions	Limits			Unit	Note
				Min	Typ	Max		
1	Output voltage	V_{OUT}	T_j = 25°C	11.5	12.0	12.5	V	*1
2	Output voltage tolerance	V_{OUT}	V_{IN} = 14.5 V to 27 V, I_{OUT} = 1 mA to 70 mA	11.4	—	12.6	V	*1
3	Line regulation	REG_{IN}	V_{IN} = 14.5 V to 27 V, T_j = 25°C	—	120	250	mV	*1
			V_{IN} = 15 V to 27 V, T_j = 25°C	—	100	200		
4	Load regulation	REG_L	I_{OUT} = 1 mA to 100 mA, T_j = 25°C	—	20	100	mV	*1
			I_{OUT} = 1 mA to 40 mA, T_j = 25°C	—	10	50		
5	Bias current	I_{Bias}	T_j = 25°C	—	2.0	3.5	mA	*1
6	Bias current fluctuation to input	$\Delta I_{Bias(IN)}$	V_{IN} = 15 V to 27 V, T_j = 25°C	—	—	1.0	mA	*1
7	Bias current fluctuation to load	$\Delta I_{Bias(L)}$	I_{OUT} = 1 mA to 40 mA, T_j = 25°C	—	—	0.1	mA	*1
8	Ripple rejection ratio	RR	V_{IN} = 15 V to 25 V, I_{OUT} = 40 mA, f = 120 Hz	40	50	—	dB	—

Note) *1: The specified condition T_j = 25°C means that the test should be carried out within so short a test time (within 10ms) that the characteristic value drift due to the chip junction temperature rise can be ignored.

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■ Electrical Characteristics (Reference values for design)

Note) Unless otherwise specified, T_a = 25°C±2°C, V_{IN} = 19 V, I_{OUT} = 40 mA, C_{IN} = 0.33 µF and C_{OUT} = 0.1 µF, T_j = 0°C to 125°C
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, Panasonic will respond in good faith to user concerns.

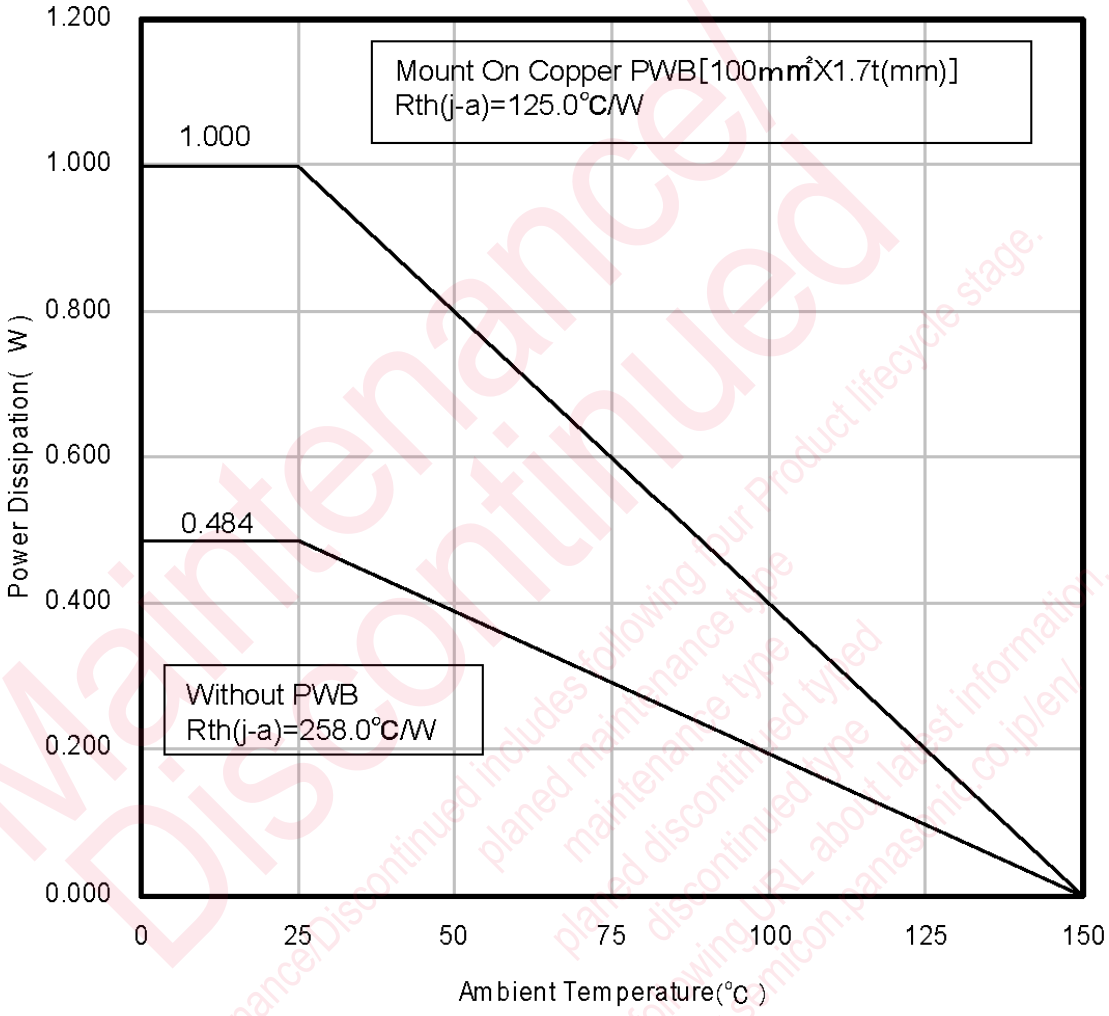
B No.	Parameter	Symbol	Conditions	Reference values			Unit	Note
				Min	Typ	Max		
1	Output noise voltage	Vno	f = 10 Hz to 100 kHz	—	80	—	µV	—
2	Minimum input/output voltage difference	$V_{DIF(min)}$	T_j = 25°C	—	1.7	—	V	*1
3	Output short-circuit current	$I_{O(Short)}$	T_j = 25°C	—	140	—	mA	*1
4	Output voltage temperature coefficient	$\frac{\Delta V_{OUT}}{T_a}$	I_{OUT} = 5 mA, T_j = 0°C to 125°C	—	– 1.0	—	mV/°C	—

Note) *1: The specified condition T_j = 25°C means that the test should be carried out within so short a test time (within 10ms) that the characteristic value drift due to the chip junction temperature rise can be ignored.

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■ Technical Data

• P_D — T_a diagram



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