

DATA SHEET

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| Part No. | AN8004M |
| Package Code No. | HSIP003-P-0000Q |

Maintenance/Discontinued includes following lifecycle stage.
planned maintenance type
maintenance type
planned discontinued type
discontinued type
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AN8004M

3-pin, positive output, low dropout voltage regulator (50 mA type)

■ Overview

The AN80xxM series are 3-pin, low dropout, fixed positive output type monolithic voltage regulators.

Since their power consumption can be minimized, they are suitable for battery-used power supply and reference voltage.

12 types of output voltage are available; 2 V, 2.5 V, 3 V, 4 V, 4.5 V, 5 V, 6 V, 7 V, 8 V, 8.5 V, 9 V, and 10 V.

■ Features

- Input/output voltage difference: 0.3 V max.
- Output current of up to 50 mA
- Low bias current: 0.6 mA typ.
- Output voltage: 4 V
- Built-in over current protection circuit

■ Applications

- 3-pin positive output voltage regulator (low drop 50 mA type)

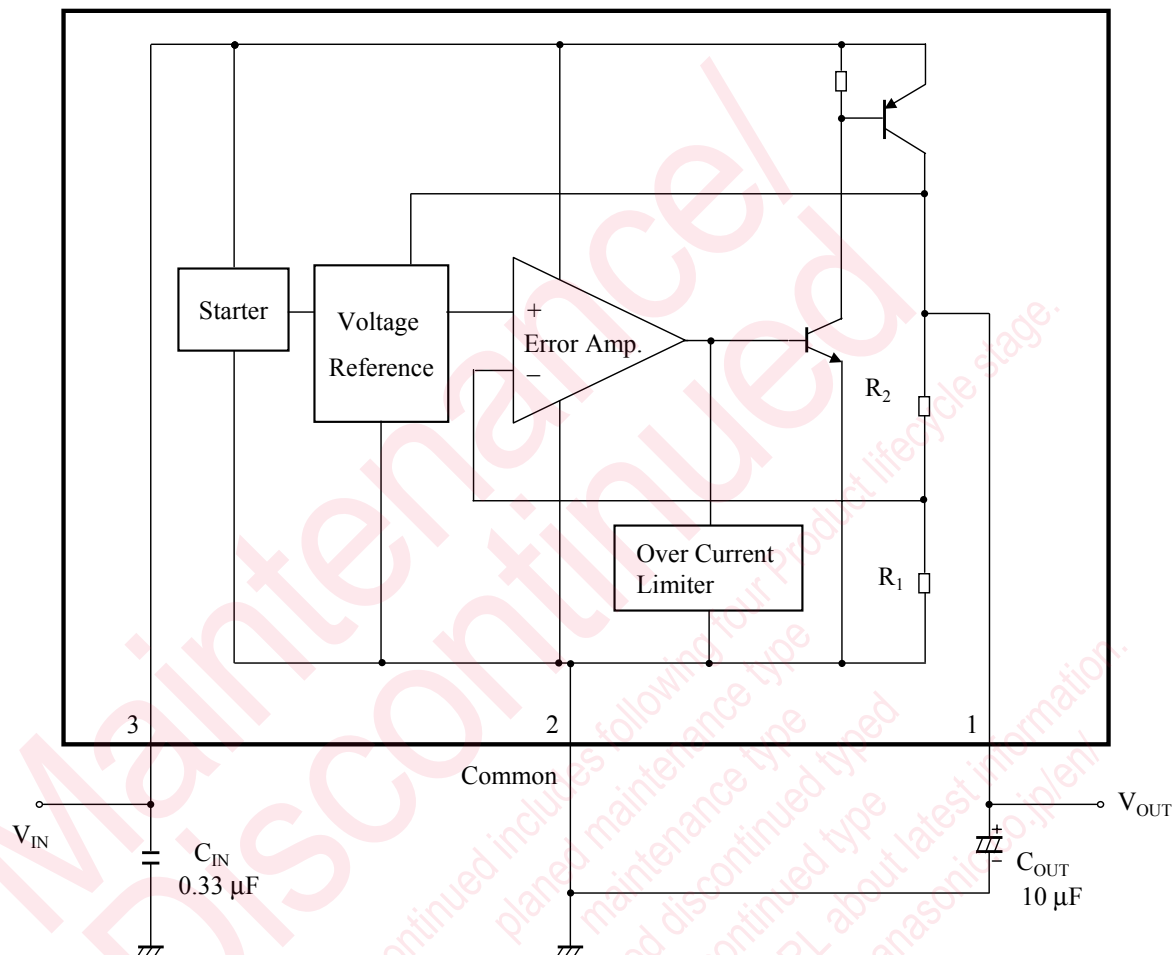
■ Package

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

■ Type

- Silicon monolithic bipolar IC

■ Block Diagram



C_{OUT} : AN80xxM series have their internal gain in order to improve performance. When the power line on the output side is long, use a capacitor of 10 μ F.

Also, the capacitor on the output side should be attached as close to the IC as possible.

When using at a low temperature, it is recommended to use the capacitors with low internal impedance (for example, tantalum capacitor) for output capacitors.

R_1 : 5 k Ω
 R_2 : 11 k Ω

■ Pin Descriptions

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

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■ Absolute Maximum Ratings

| A No. | Parameter | Symbol | Rating | Unit | Note |
|-------|-------------------------------|-----------|-------------|------|------|
| 1 | Supply voltage | V_{CC} | 20 | V | *1 |
| 2 | Supply current | I_{CC} | 100 | mA | *4 |
| 3 | Power dissipation | P_D | 270 | mW | *2 |
| 4 | Operating ambient temperature | T_{opr} | -30 to +80 | °C | *3 |
| 5 | Storage temperature | T_{stg} | -55 to +150 | °C | *3 |

Note) *1: The values under the condition not exceeding the above absolute maximum ratings and the power dissipation.

*2: The power dissipation shown is the value at $T_a = 80^\circ\text{C}$ for independent (unmounted) IC packaged.

When using this IC, refer to the $\bullet P_D - T_a$ 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 $T_a = 25^\circ\text{C}$.

*4: Built-in over current limit circuit, and the current will not go over the limit.

■ Operating supply voltage range

| Parameter | Symbol | Range | Unit | Note |
|----------------------|----------|-------------|------|------|
| Supply voltage range | V_{CC} | 4.5 to 10.0 | V | — |

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

■ Electrical Characteristics

Note) Unless otherwise specified, $T_a = 25^\circ\text{C} \pm 2^\circ\text{C}$, $V_{\text{IN}} = 5.0 \text{ V}$, $I_{\text{OUT}} = 20 \text{ mA}$, $C_{\text{IN}} = 0.33 \mu\text{F}$ and $C_{\text{OUT}} = 10 \mu\text{F}$ (ESR less than 5Ω).

| B No. | Parameter | Symbol | Conditions | Limits | | | Unit | Note |
|-------|---|---------------------------|--|--------|------|------|------|------|
| | | | | Min | Typ | Max | | |
| 1 | Output voltage | V_{OUT} | $T_j = 25^\circ\text{C}$ | 3.84 | 4.00 | 4.16 | V | — |
| 2 | Line regulation | REG_{LIN} | $T_j = 25^\circ\text{C}$ $4.5 \text{ V} \leq V_{\text{IN}} \leq 10.0 \text{ V}$ | — | 3.5 | 50 | mV | — |
| 3 | Load regulation | REG_{LOA} | $T_j = 25^\circ\text{C}$ $1 \text{ mA} \leq I_{\text{OUT}} \leq 40 \text{ mA}$ | — | 10 | 30 | mV | — |
| | | | $T_j = 25^\circ\text{C}$ $1 \text{ mA} \leq I_{\text{OUT}} \leq 50 \text{ mA}$ | — | 20 | 40 | | |
| 4 | Minimum input/output voltage difference | VD | $T_j = 25^\circ\text{C}$ $V_{\text{IN}} = 3.8 \text{ V}$, $I_{\text{OUT}} = 20 \text{ mA}$ | — | 0.07 | 0.2 | V | — |
| | | | $T_j = 25^\circ\text{C}$ $V_{\text{IN}} = 3.8 \text{ V}$, $I_{\text{OUT}} = 50 \text{ mA}$ | — | 0.12 | 0.3 | | |
| 5 | Bias current | I_{Q} | $T_j = 25^\circ\text{C}$ $I_{\text{OUT}} = 0 \text{ mA}$ | — | 0.6 | 1.0 | mA | — |

■ Electrical Characteristics (Reference values for design)

Note) Unless otherwise specified, $T_a = 25^\circ\text{C} \pm 2^\circ\text{C}$, $V_{\text{IN}} = 5.0\text{ V}$, $I_{\text{OUT}} = 20\text{ mA}$, $C_{\text{IN}} = 0.33\text{ }\mu\text{F}$ and $C_{\text{OUT}} = 10\text{ }\mu\text{F}$ (ESR less than $5\text{ }\Omega$).

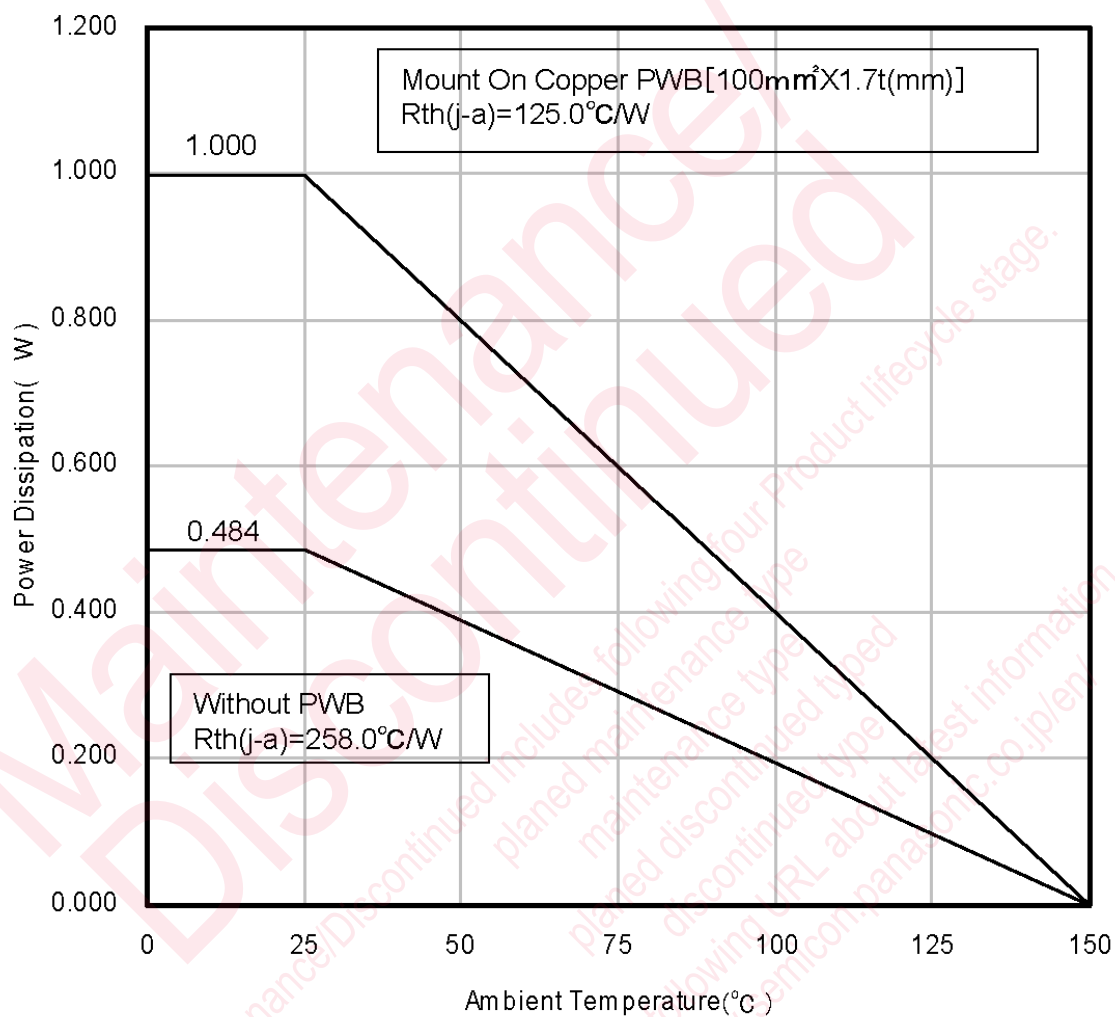
The characteristics listed below are reference values for design of the IC and are not guaranteed by inspection.

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 | | |
| 6 | Ripple rejection ratio | RR | $5.0\text{ V} \leq V_{\text{IN}} \leq 7.0\text{ V}$ $f = 120\text{ Hz}$ | 56 | 67 | — | dB | — |
| 7 | Output noise voltage | Vno | $10\text{ Hz} \leq f \leq 100\text{ kHz}$ | — | 80 | — | μV | — |
| 8 | Output voltage temperature coefficient | $\frac{\Delta V_{\text{OUT}}}{T_a}$ | $-30^\circ\text{C} \leq T_j \leq 125^\circ\text{C}$ | — | 0.2 | — | $\text{mV}/^\circ\text{C}$ | — |

■ Technical Data

- $P_D - T_a$ diagram



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