

AN8000/AN8000M Series

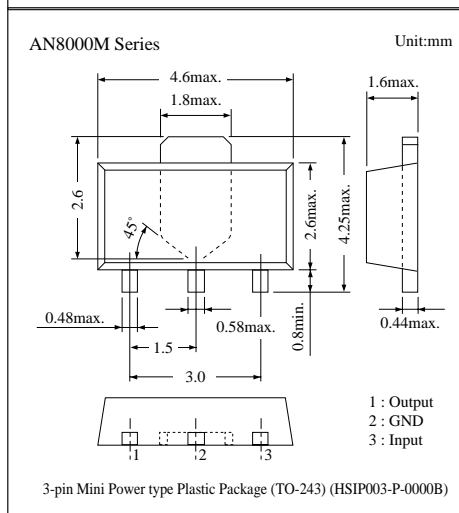
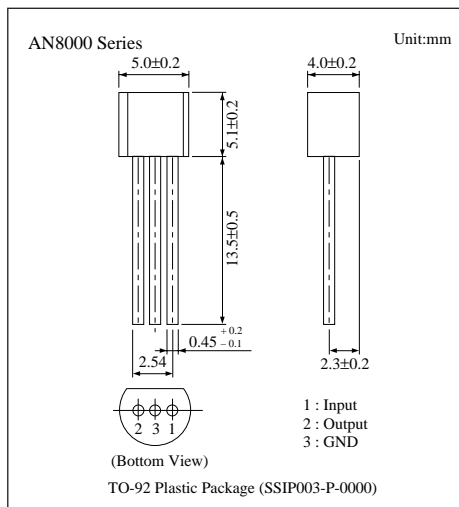
3-pin Positive Output Low Dropout Voltage Regulator (50mA Type)

■ Overview

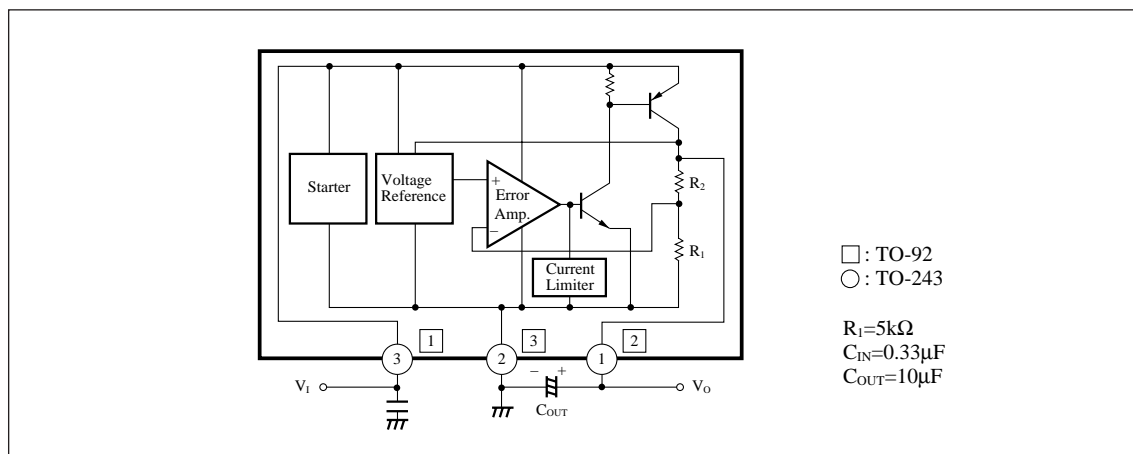
The AN8000 series is 3-pin low-dropout fixed positive output monolithic voltage regulators. Since their power consumption can be minimized, they are suitable for battery stabilizing power supply and reference voltage. Thirteen types of output voltage are available ; 2V, 2.5V, 3V, 3.5V (TO-92 only) , 4V, 4.5V, 5V, 6V, 7V, 8V, 8.5V, 9V, and 10V.

■ Features

- Input/output voltage difference : 0.3V (max.)
- Output current of up to 50mA
- Low bias current ; 0.6mA (typ.)
- Output voltage ; 2V, 2.5V, 3V, 3.5V (TO-92 only) , 4V, 4.5V, 5V, 6V, 7V, 8V, 8.5V, 9V, and 10V.
- Over-voltage protective circuit built-in.



■ Block Diagram



■ Absolute Maximum Ratings (Ta=25°C)

| Parameter | Symbol | Rating | Unit |
|-------------------------------|----------------|------------|------|
| Supply voltage | V_I | 20 | V |
| Supply current | I_{CC} | 100 | mA |
| Power dissipation | P_D | 650 * | mW |
| Operating ambient temperature | T_{opr} | -30 to+80 | °C |
| Storage temperature | AN8000 Series | -55 to+150 | °C |
| | AN8000M Series | -55 to+125 | |

* Mounting onto the PCB (20 × 20 × 1.7mm glass epoxy copper foil 1 cm² or more), for AN8000M Series.

■ Electrical Characteristics (Ta=25°C)

• AN8002/AN8002M (2V Type)

| Parameter | Symbol | Condition | min | typ | max | Unit |
|----------------------------------------|------------------|----------------------------------------------------------------|------|------|------|-------|
| Output voltage | V_O | $T_j=25^\circ\text{C}$ | 1.92 | 2 | 2.08 | V |
| Line regulation | REG_{IN} | $V_I=2.5$ to 8V, $T_j=25^\circ\text{C}$ | — | 2 | 40 | mV |
| Load regulation | REG_L | $I_O=1$ to 40mA, $T_j=25^\circ\text{C}$ | — | 7 | 20 | mV |
| | | $I_O=1$ to 50mA, $T_j=25^\circ\text{C}$ | — | 10 | 25 | mV |
| Minimum I/O voltage difference | $V_{DIF(min)}$ | $V_I=1.9\text{V}$, $I_O=20\text{mA}$, $T_j=25^\circ\text{C}$ | — | 0.06 | 0.2 | V |
| | | $V_I=1.9\text{V}$, $I_O=50\text{mA}$, $T_j=25^\circ\text{C}$ | — | 0.12 | 0.3 | V |
| Bias current | I_{bias} | $I_O=0\text{mA}$, $T_j=25^\circ\text{C}$ | — | 0.6 | 1 | mA |
| Ripple rejection ratio | RR | $V_I=3$ to 5V, $f=120\text{Hz}$ | 62 | 74 | — | dB |
| Output noise voltage | V_{no} | $f=10\text{Hz}$ to 100kHz | — | 60 | — | μV |
| Output voltage temperature coefficient | $\Delta V_O/T_a$ | $T_j=-30$ to+125°C | — | 0.1 | — | mV/°C |

Note1) The specified condition $T_j=25^\circ\text{C}$ means that the test should be conducted with each test time reduced (within 10ms) so that the drift in characteristic value due to a temperature rise at chip junction can be ignored.

Note2) Unless otherwise specified, $V_I=3\text{V}$, $I_O=20\text{mA}$, $C_O=10\mu\text{F}$

• AN8025/AN8025M (2.5V Type)

| Parameter | Symbol | Condition | min | typ | max | Unit |
|----------------------------------------|------------------|----------------------------------------------------------------|-----|------|-----|-------|
| Output voltage | V_O | $T_j=25^\circ\text{C}$ | 2.4 | 2.5 | 2.6 | V |
| Line regulation | REG_{IN} | $V_I=3$ to 8.5V, $T_j=25^\circ\text{C}$ | — | 2.5 | 50 | mV |
| Load regulation | REG_L | $I_O=1$ to 40mA, $T_j=25^\circ\text{C}$ | — | 8 | 20 | mV |
| | | $I_O=1$ to 50mA, $T_j=25^\circ\text{C}$ | — | 12.5 | 25 | mV |
| Minimum I/O voltage difference | $V_{DIF(min)}$ | $V_I=2.4\text{V}$, $I_O=20\text{mA}$, $T_j=25^\circ\text{C}$ | — | 0.07 | 0.2 | V |
| | | $V_I=2.4\text{V}$, $I_O=50\text{mA}$, $T_j=25^\circ\text{C}$ | — | 0.12 | 0.3 | V |
| Bias current | I_{bias} | $I_O=0\text{mA}$, $T_j=25^\circ\text{C}$ | — | 0.6 | 1 | mA |
| Ripple rejection ratio | RR | $V_I=3.5$ to 5.5V, $f=120\text{Hz}$ | 60 | 72 | — | dB |
| Output noise voltage | V_{no} | $f=10\text{Hz}$ to 100kHz | — | 65 | — | μV |
| Output voltage temperature coefficient | $\Delta V_O/T_a$ | $T_j=-30$ to+125°C | — | 0.13 | — | mV/°C |

Note1) The specified condition $T_j=25^\circ\text{C}$ means that the test should be conducted with each test time reduced (within 10ms) so that the drift in characteristic value due to a temperature rise at chip junction can be ignored.

Note2) Unless otherwise specified, $V_I=3.5\text{V}$, $I_O=20\text{mA}$, $C_O=10\mu\text{F}$

■ Electrical Characteristics (Ta=25°C)

• AN8003/AN8003M (3V Type)

| Parameter | Symbol | Condition | min | typ | max | Unit |
|----------------------------------------|-------------------------|------------------------------------------------------------------|------|------|------|-------|
| Output voltage | V _O | T _j =25°C | 2.88 | 3 | 3.12 | V |
| Line regulation | REG _{IN} | V _I =3.5 to 9V, T _j =25°C | — | 3 | 50 | mV |
| Load regulation | REG _L | I _O =1 to 40mA, T _j =25°C | — | 9 | 25 | mV |
| | | I _O =1 to 50mA, T _j =25°C | — | 15 | 30 | mV |
| Minimum I/O voltage difference | V _{DIF (min.)} | V _I =2.9V, I _O =20mA, T _j =25°C | — | 0.07 | 0.2 | V |
| | | V _I =2.9V, I _O =50mA, T _j =25°C | — | 0.12 | 0.3 | V |
| Bias current | I _{bias} | I _O =0mA, T _j =25°C | — | 0.6 | 1 | mA |
| Ripple rejection ratio | RR | V _I =4 to 6V, f=120Hz | 58 | 70 | — | dB |
| Output noise voltage | V _{no} | f=10Hz to 100kHz | — | 70 | — | μV |
| Output voltage temperature coefficient | ΔV _O /Ta | T _j =-30 to+125°C | — | 0.15 | — | mV/°C |

Note1) The specified condition T_j=25°C means that the test should be conducted with each test time reduced (within 10ms) so that the drift in characteristic value due to a temperature rise at chip junction can be ignored.

Note2) Unless otherwise specified, V_I=4V, I_O=20mA, C_O=10μF

• AN8035/AN8035M (3.5V Type)

| Parameter | Symbol | Condition | min | typ | max | Unit |
|----------------------------------------|-------------------------|------------------------------------------------------------------|------|------|------|-------|
| Output voltage | V _O | T _j =25°C | 3.36 | 3.5 | 3.64 | V |
| Line regulation | REG _{IN} | V _I =4 to 9.5V, T _j =25°C | — | 3.5 | 50 | mV |
| Load regulation | REG _L | I _O =1 to 40mA, T _j =25°C | — | 10 | 30 | mV |
| | | I _O =1 to 50mA, T _j =25°C | — | 20 | 40 | mV |
| Minimum I/O voltage difference | V _{DIF (min.)} | V _I =3.4V, I _O =20mA, T _j =25°C | — | 0.07 | 0.2 | V |
| | | V _I =3.4V, I _O =50mA, T _j =25°C | — | 0.12 | 0.3 | V |
| Bias current | I _{bias} | I _O =0mA, T _j =25°C | — | 0.6 | 1 | mA |
| Ripple rejection ratio | RR | V _I =4.5 to 6.5V, f=120Hz | 57 | 69 | — | dB |
| Output noise voltage | V _{no} | f=10Hz to 100kHz | — | 75 | — | μV |
| Output voltage temperature coefficient | ΔV _O /Ta | T _j =-30 to+125°C | — | 0.2 | — | mV/°C |

Note1) The specified condition T_j=25°C means that the test should be conducted with each test time reduced (within 10ms) so that the drift in characteristic value due to a temperature rise at chip junction can be ignored.

Note2) Unless otherwise specified, V_I=4.5V, I_O=20mA, C_O=10μF

• AN8004/AN8004M (4V Type)

| Parameter | Symbol | Condition | min | typ | max | Unit |
|----------------------------------------|-------------------------|------------------------------------------------------------------|------|------|------|-------|
| Output voltage | V _O | T _j =25°C | 3.84 | 4 | 4.16 | V |
| Line regulation | REG _{IN} | V _I =4.5 to 10V, T _j =25°C | — | 3.5 | 50 | mV |
| Load regulation | REG _L | I _O =1 to 40mA, T _j =25°C | — | 10 | 30 | mV |
| | | I _O =1 to 50mA, T _j =25°C | — | 20 | 40 | mV |
| Minimum I/O voltage difference | V _{DIF (min.)} | V _I =3.8V, I _O =20mA, T _j =25°C | — | 0.07 | 0.2 | V |
| | | V _I =3.8V, I _O =50mA, T _j =25°C | — | 0.12 | 0.3 | V |
| Bias current | I _{bias} | I _O =0mA, T _j =25°C | — | 0.6 | 1 | mA |
| Ripple rejection ratio | RR | V _I =5 to 7V, f=120Hz | 56 | 67 | — | dB |
| Output noise voltage | V _{no} | f=10Hz to 100kHz | — | 80 | — | μV |
| Output voltage temperature coefficient | ΔV _O /Ta | T _j =-30 to+125°C | — | 0.2 | — | mV/°C |

Note1) The specified condition T_j=25°C means that the test should be conducted with each test time reduced (within 10ms) so that the drift in characteristic value due to a temperature rise at chip junction can be ignored.

Note2) Unless otherwise specified, V_I=5V, I_O=20mA, C_O=10μF

■ Electrical Characteristics (Ta=25°C)

• AN8045/AN8045M (4.5V Type)

| Parameter | Symbol | Condition | min | typ | max | Unit |
|----------------------------------------|--------------------------|----------------------------------------------------------------|------|------|------|----------------------------|
| Output voltage | V_O | $T_j=25^\circ\text{C}$ | 4.32 | 4.5 | 4.68 | V |
| Line regulation | REG_{IN} | $V_I=5$ to 10.5V, $T_j=25^\circ\text{C}$ | — | 4 | 50 | mV |
| Load regulation | REG_{L} | $I_O=1$ to 40mA, $T_j=25^\circ\text{C}$ | — | 11 | 35 | mV |
| | | $I_O=1$ to 50mA, $T_j=25^\circ\text{C}$ | — | 23 | 45 | mV |
| Minimum I/O voltage difference | $V_{\text{DIF (min.)}}$ | $V_I=4.3\text{V}$, $I_O=20\text{mA}$, $T_j=25^\circ\text{C}$ | — | 0.07 | 0.2 | V |
| | | $V_I=4.3\text{V}$, $I_O=50\text{mA}$, $T_j=25^\circ\text{C}$ | — | 0.12 | 0.3 | V |
| Bias current | I_{bias} | $I_O=0\text{mA}$, $T_j=25^\circ\text{C}$ | — | 0.7 | 1 | mA |
| Ripple rejection ratio | RR | $V_I=5.5$ to 7.5V, $f=120\text{Hz}$ | 54 | 66 | — | dB |
| Output noise voltage | V_{no} | $f=10\text{Hz}$ to 100kHz | — | 85 | — | μV |
| Output voltage temperature coefficient | $\Delta V_O/T_a$ | $T_j=-30$ to $+125^\circ\text{C}$ | — | 0.23 | — | $\text{mV}/^\circ\text{C}$ |

Note1) The specified condition $T_j=25^\circ\text{C}$ means that the test should be conducted with each test time reduced (within 10ms) so that the drift in characteristic value due to a temperature rise at chip junction can be ignored.

Note2) Unless otherwise specified, $V_I=5.5\text{V}$, $I_O=20\text{mA}$, $C_O=10\mu\text{F}$

• AN8005/AN8005M (5V Type)

| Parameter | Symbol | Condition | min | typ | max | Unit |
|----------------------------------------|--------------------------|----------------------------------------------------------------|-----|------|-----|----------------------------|
| Output voltage | V_O | $T_j=25^\circ\text{C}$ | 4.8 | 5 | 5.2 | V |
| Line regulation | REG_{IN} | $V_I=5.5$ to 11V, $T_j=25^\circ\text{C}$ | — | 4.5 | 50 | mV |
| Load regulation | REG_{L} | $I_O=1$ to 40mA, $T_j=25^\circ\text{C}$ | — | 12 | 40 | mV |
| | | $I_O=1$ to 50mA, $T_j=25^\circ\text{C}$ | — | 25 | 50 | mV |
| Minimum I/O voltage difference | $V_{\text{DIF (min.)}}$ | $V_I=4.8\text{V}$, $I_O=20\text{mA}$, $T_j=25^\circ\text{C}$ | — | 0.07 | 0.2 | V |
| | | $V_I=4.8\text{V}$, $I_O=50\text{mA}$, $T_j=25^\circ\text{C}$ | — | 0.12 | 0.3 | V |
| Bias current | I_{bias} | $I_O=0\text{mA}$, $T_j=25^\circ\text{C}$ | — | 0.7 | 1 | mA |
| Ripple rejection ratio | RR | $V_I=6$ to 8V, $f=120\text{Hz}$ | 52 | 64 | — | dB |
| Output noise voltage | V_{no} | $f=10\text{Hz}$ to 100kHz | — | 95 | — | μV |
| Output voltage temperature coefficient | $\Delta V_O/T_a$ | $T_j=-30$ to $+125^\circ\text{C}$ | — | 0.25 | — | $\text{mV}/^\circ\text{C}$ |

Note1) The specified condition $T_j=25^\circ\text{C}$ means that the test should be conducted with each test time reduced (within 10ms) so that the drift in characteristic value due to a temperature rise at chip junction can be ignored.

Note2) Unless otherwise specified, $V_I=6\text{V}$, $I_O=20\text{mA}$, $C_O=10\mu\text{F}$

• AN8006/AN8006M (6V Type)

| Parameter | Symbol | Condition | min | typ | max | Unit |
|----------------------------------------|--------------------------|----------------------------------------------------------------|------|------|------|----------------------------|
| Output voltage | V_O | $T_j=25^\circ\text{C}$ | 5.76 | 6 | 6.24 | V |
| Line regulation | REG_{IN} | $V_I=6.5$ to 12V, $T_j=25^\circ\text{C}$ | — | 5.5 | 60 | mV |
| Load regulation | REG_{L} | $I_O=1$ to 40mA, $T_j=25^\circ\text{C}$ | — | 13 | 45 | mV |
| | | $I_O=1$ to 50mA, $T_j=25^\circ\text{C}$ | — | 28 | 55 | mV |
| Minimum I/O voltage difference | $V_{\text{DIF (min.)}}$ | $V_I=5.8\text{V}$, $I_O=20\text{mA}$, $T_j=25^\circ\text{C}$ | — | 0.07 | 0.2 | V |
| | | $V_I=5.8\text{V}$, $I_O=50\text{mA}$, $T_j=25^\circ\text{C}$ | — | 0.13 | 0.3 | V |
| Bias current | I_{bias} | $I_O=0\text{mA}$, $T_j=25^\circ\text{C}$ | — | 0.7 | 1.2 | mA |
| Ripple rejection ratio | RR | $V_I=7$ to 9V, $f=120\text{Hz}$ | 51 | 63 | — | dB |
| Output noise voltage | V_{no} | $f=10\text{Hz}$ to 100kHz | — | 105 | — | μV |
| Output voltage temperature coefficient | $\Delta V_O/T_a$ | $T_j=-30$ to $+125^\circ\text{C}$ | — | 0.3 | — | $\text{mV}/^\circ\text{C}$ |

Note1) The specified condition $T_j=25^\circ\text{C}$ means that the test should be conducted with each test time reduced (within 10ms) so that the drift in characteristic value due to a temperature rise at chip junction can be ignored.

Note2) Unless otherwise specified, $V_I=7\text{V}$, $I_O=20\text{mA}$, $C_O=10\mu\text{F}$

■ Electrical Characteristics (Ta=25°C)

• AN8007/AN8007M (7V Type)

| Parameter | Symbol | Condition | min | typ | max | Unit |
|----------------------------------------|--------------------------|----------------------------------------------------------------|------|------|------|----------------------------|
| Output voltage | V_O | $T_j=25^\circ\text{C}$ | 6.72 | 7 | 7.28 | V |
| Line regulation | REG_{IN} | $V_I=7.5$ to 13V, $T_j=25^\circ\text{C}$ | — | 6.5 | 70 | mV |
| Load regulation | REG_{L} | $I_O=1$ to 40mA, $T_j=25^\circ\text{C}$ | — | 14 | 50 | mV |
| | | $I_O=1$ to 50mA, $T_j=25^\circ\text{C}$ | — | 31 | 60 | mV |
| Minimum I/O voltage difference | $V_{\text{DIF (min.)}}$ | $V_I=6.8\text{V}$, $I_O=20\text{mA}$, $T_j=25^\circ\text{C}$ | — | 0.07 | 0.2 | V |
| | | $V_I=6.8\text{V}$, $I_O=50\text{mA}$, $T_j=25^\circ\text{C}$ | — | 0.13 | 0.3 | V |
| Bias current | I_{bias} | $I_O=0\text{mA}$, $T_j=25^\circ\text{C}$ | — | 0.7 | 1.3 | mA |
| Ripple rejection ratio | RR | $V_I=8$ to 10V, $f=120\text{Hz}$ | 50 | 62 | — | dB |
| Output noise voltage | V_{no} | $f=10\text{Hz}$ to 100kHz | — | 120 | — | μV |
| Output voltage temperature coefficient | $\Delta V_O/T_a$ | $T_j=-30$ to $+125^\circ\text{C}$ | — | 0.35 | — | $\text{mV}/^\circ\text{C}$ |

Note1) The specified condition $T_j=25^\circ\text{C}$ means that the test should be conducted with each test time reduced (within 10ms) so that the drift in characteristic value due to a temperature rise at chip junction can be ignored.

Note2) Unless otherwise specified, $V_I=8\text{V}$, $I_O=20\text{mA}$, $C_O=10\mu\text{F}$

• AN8008/AN8008M (8V Type)

| Parameter | Symbol | Condition | min | typ | max | Unit |
|----------------------------------------|--------------------------|----------------------------------------------------------------|------|------|------|----------------------------|
| Output voltage | V_O | $T_j=25^\circ\text{C}$ | 7.68 | 8 | 8.32 | V |
| Line regulation | REG_{IN} | $V_I=8.5$ to 14V, $T_j=25^\circ\text{C}$ | — | 7.5 | 80 | mV |
| Load regulation | REG_{L} | $I_O=1$ to 40mA, $T_j=25^\circ\text{C}$ | — | 15 | 55 | mV |
| | | $I_O=1$ to 50mA, $T_j=25^\circ\text{C}$ | — | 34 | 65 | mV |
| Minimum I/O voltage difference | $V_{\text{DIF (min.)}}$ | $V_I=7.8\text{V}$, $I_O=20\text{mA}$, $T_j=25^\circ\text{C}$ | — | 0.07 | 0.2 | V |
| | | $V_I=7.8\text{V}$, $I_O=50\text{mA}$, $T_j=25^\circ\text{C}$ | — | 0.14 | 0.3 | V |
| Bias current | I_{bias} | $I_O=0\text{mA}$, $T_j=25^\circ\text{C}$ | — | 0.7 | 1.3 | mA |
| Ripple rejection ratio | RR | $V_I=9$ to 11V, $f=120\text{Hz}$ | 49 | 61 | — | dB |
| Output noise voltage | V_{no} | $f=10\text{Hz}$ to 100kHz | — | 135 | — | μV |
| Output voltage temperature coefficient | $\Delta V_O/T_a$ | $T_j=-30$ to $+125^\circ\text{C}$ | — | 0.4 | — | $\text{mV}/^\circ\text{C}$ |

Note1) The specified condition $T_j=25^\circ\text{C}$ means that the test should be conducted with each test time reduced (within 10ms) so that the drift in characteristic value due to a temperature rise at chip junction can be ignored.

Note2) Unless otherwise specified, $V_I=9\text{V}$, $I_O=20\text{mA}$, $C_O=10\mu\text{F}$

• AN8085/AN8085M (8.5V Type)

| Parameter | Symbol | Condition | min | typ | max | Unit |
|----------------------------------------|--------------------------|----------------------------------------------------------------|------|------|------|----------------------------|
| Output voltage | V_O | $T_j=25^\circ\text{C}$ | 8.16 | 8.50 | 8.84 | V |
| Line regulation | REG_{IN} | $V_I=9$ to 14.5V, $T_j=25^\circ\text{C}$ | — | 8.3 | 90 | mV |
| Load regulation | REG_{L} | $I_O=1$ to 40mA, $T_j=25^\circ\text{C}$ | — | 16 | 60 | mV |
| | | $I_O=1$ to 50mA, $T_j=25^\circ\text{C}$ | — | 36 | 70 | mV |
| Minimum I/O voltage difference | $V_{\text{DIF (min.)}}$ | $V_I=8.3\text{V}$, $I_O=20\text{mA}$, $T_j=25^\circ\text{C}$ | — | 0.07 | 0.2 | V |
| | | $V_I=8.3\text{V}$, $I_O=50\text{mA}$, $T_j=25^\circ\text{C}$ | — | 0.14 | 0.3 | V |
| Bias current | I_{bias} | $I_O=0\text{mA}$, $T_j=25^\circ\text{C}$ | — | 0.8 | 1.4 | mA |
| Ripple rejection ratio | RR | $V_I=9.5$ to 11.5V, $f=120\text{Hz}$ | 48 | 60 | — | dB |
| Output noise voltage | V_{no} | $f=10\text{Hz}$ to 100kHz | — | 140 | — | μV |
| Output voltage temperature coefficient | $\Delta V_O/T_a$ | $T_j=-30$ to $+125^\circ\text{C}$ | — | 0.43 | — | $\text{mV}/^\circ\text{C}$ |

Note1) The specified condition $T_j=25^\circ\text{C}$ means that the test should be conducted with each test time reduced (within 10ms) so that the drift in characteristic value due to a temperature rise at chip junction can be ignored.

Note2) Unless otherwise specified, $V_I=9.5\text{V}$, $I_O=20\text{mA}$, $C_O=10\mu\text{F}$

■ Electrical Characteristics (Ta=25°C)

• AN8009/AN8009M (9V Type)

| Parameter | Symbol | Condition | min | typ | max | Unit |
|----------------------------------------|--------------------------|----------------------------------------------------------------|------|------|------|----------------------------|
| Output voltage | V_O | $T_j=25^\circ\text{C}$ | 8.64 | 9 | 9.36 | V |
| Line regulation | REG_{IN} | $V_I=9.5$ to 15V , $T_j=25^\circ\text{C}$ | — | 9 | 100 | mV |
| Load regulation | REG_{L} | $I_O=1$ to 40mA , $T_j=25^\circ\text{C}$ | — | 17 | 70 | mV |
| | | $I_O=1$ to 50mA , $T_j=25^\circ\text{C}$ | — | 37 | 75 | mV |
| Minimum I/O voltage difference | $V_{\text{DIF (min.)}}$ | $V_I=8.8\text{V}$, $I_O=20\text{mA}$, $T_j=25^\circ\text{C}$ | — | 0.07 | 0.2 | V |
| | | $V_I=8.8\text{V}$, $I_O=50\text{mA}$, $T_j=25^\circ\text{C}$ | — | 0.14 | 0.3 | V |
| Bias current | I_{bias} | $I_O=0\text{mA}$, $T_j=25^\circ\text{C}$ | — | 0.8 | 1.4 | mA |
| Ripple rejection ratio | RR | $V_I=10$ to 12V , $f=120\text{Hz}$ | 47 | 59 | — | dB |
| Output noise voltage | V_{no} | $f=10\text{Hz}$ to 100kHz | — | 150 | — | μV |
| Output voltage temperature coefficient | $\Delta V_O/T_a$ | $T_j=-30$ to $+125^\circ\text{C}$ | — | 0.45 | — | $\text{mV}/^\circ\text{C}$ |

Note1) The specified condition $T_j=25^\circ\text{C}$ means that the test should be conducted with each test time reduced (within 10ms) so that the drift in characteristic value due to a temperature rise at chip junction can be ignored.

Note2) Unless otherwise specified, $V_I=10\text{V}$, $I_O=20\text{mA}$, $C_O=10\mu\text{F}$

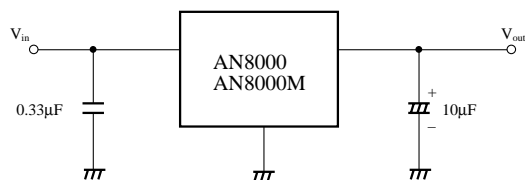
• AN8010/AN8010M (10V Type)

| Parameter | Symbol | Condition | min | typ | max | Unit |
|----------------------------------------|--------------------------|----------------------------------------------------------------|-----|------|------|----------------------------|
| Output voltage | V_O | $T_j=25^\circ\text{C}$ | 9.6 | 10 | 10.4 | V |
| Line regulation | REG_{IN} | $V_I=10.5$ to 16V , $T_j=25^\circ\text{C}$ | — | 10 | 100 | mV |
| Load regulation | REG_{L} | $I_O=1$ to 40mA , $T_j=25^\circ\text{C}$ | — | 18 | 75 | mV |
| | | $I_O=1$ to 50mA , $T_j=25^\circ\text{C}$ | — | 40 | 85 | mV |
| Minimum I/O voltage difference | $V_{\text{DIF (min.)}}$ | $V_I=9.8\text{V}$, $I_O=20\text{mA}$, $T_j=25^\circ\text{C}$ | — | 0.07 | 0.2 | V |
| | | $V_I=9.8\text{V}$, $I_O=50\text{mA}$, $T_j=25^\circ\text{C}$ | — | 0.14 | 0.3 | V |
| Bias current | I_{bias} | $I_O=0\text{mA}$, $T_j=25^\circ\text{C}$ | — | 0.8 | 1.4 | mA |
| Ripple rejection ratio | RR | $V_I=11$ to 13V , $f=120\text{Hz}$ | 46 | 58 | — | dB |
| Output noise voltage | V_{no} | $f=10\text{Hz}$ to 100kHz | — | 165 | — | μV |
| Output voltage temperature coefficient | $\Delta V_O/T_a$ | $T_j=-30$ to $+125^\circ\text{C}$ | — | 0.5 | — | $\text{mV}/^\circ\text{C}$ |

Note1) The specified condition $T_j=25^\circ\text{C}$ means that the test should be conducted with each test time reduced (within 10ms) so that the drift in characteristic value due to a temperature rise at chip junction can be ignored.

Note2) Unless otherwise specified, $V_I=11\text{V}$, $I_O=20\text{mA}$, $C_O=10\mu\text{F}$

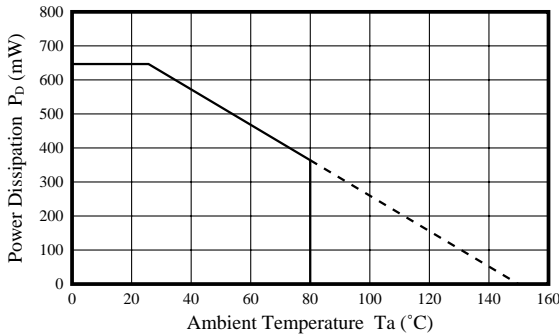
■ Application Circuit



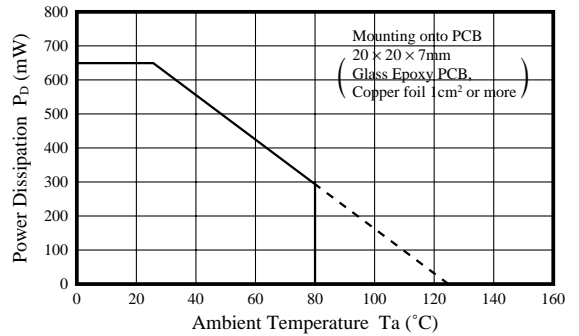
- The AN8000/AN8000M series has IC internal gain increased in order to improve performance. When the power line on the output side is long, use a capacitor of $10\mu\text{F}$.
For the capacitor on the output side, attach it as close to the IC as possible.
- When using at a low temperature, it is recommended to use the capacitors with low internal impedance (for example, tantalum capacitor) for output capacitors.

■ Characteristic Curve

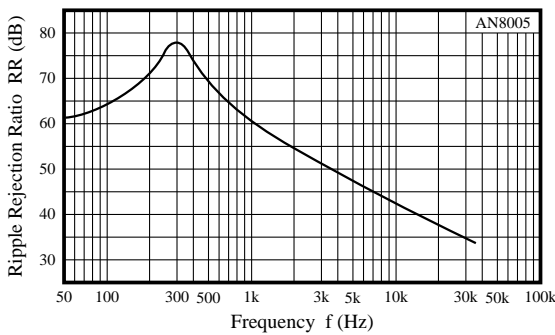
$P_D - T_a$ (AN8000 Series)



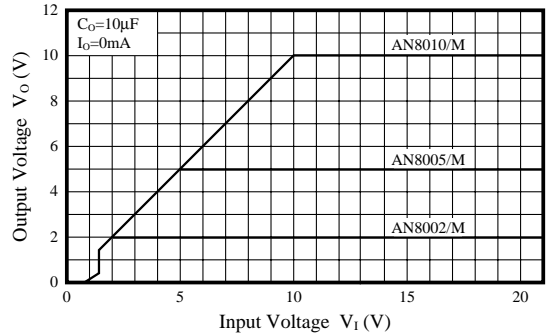
$P_D - T_a$ (AN8000M Series)



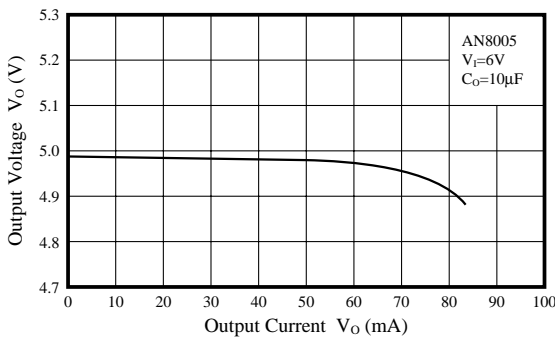
RR - f



$V_O - V_I$



$V_O - I_O$



$V_O - T_a$

