

**High speed, Low dropout, $\pm 2\%$ High output accuracy
with On/Off circuit CMOS Voltage Regulator**

Features

- Output voltage range: **0.8V~5.0V (selectable with a step of 0.05V)**
- Operating voltage range: **1.6V~6.0V**
- High accuracy output voltage: **$\pm 2\%$ ($V_{OUT} = 1.95V \sim 5.0V$) / $\pm 40mV$ ($V_{OUT} = 0.8V \sim 1.9V$)**
- Maximum output current: **300mA**
- Dropout voltage: **Typ. 90mV ($V_{OUT} = 3.0V, I_{OUT} = 100mA$)**
- Low current consumption: **Typ. 25 μ A**
- High ripple rejection: **Typ. 50dB at 1KHz**
- Low ESR capacitor: **1.0 μ F ceramic capacitor**
- Operating temperature range: **-40°C ~ +85°C**
- Built-in over-current protector: **300mA limited**
- Small package: SOT23-3L; SOT23-5L; SOT23-6L; SOT89-3L; DFN 1*1-4L
- C_L high-speed auto-discharge
- Built-in On/Off circuit
- Pb free & RoHS Compliant

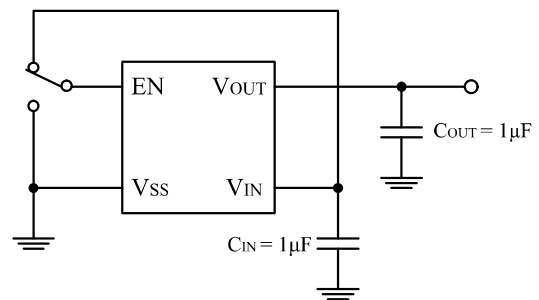
Description

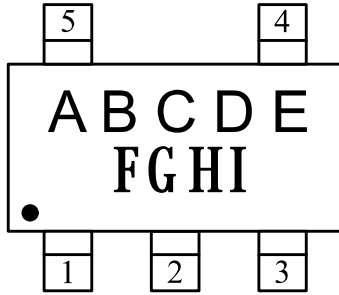
The JY1103 series are positive voltage regulators with high speed, low voltage dropout and high accuracy output achieved by low current consumption. The output voltage is guaranteed within $\pm 2\%$ within the given temperature range by V_{ref} controlling the temperature characteristic. It corresponds to the low ESR capacitor as an output stabilization capacitor. The charged ESR capacitor can be discharged with an internal switch by making the $EN=V_{SS}$, as a result the V_{OUT} quickly returns to the V_{SS} level. To make the current capacity of the output transistor not exceeded, the over-current protection circuit is built in.

Applications

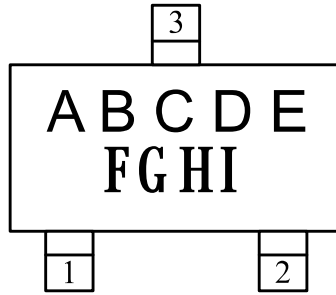
- Battery powered devices
- Cellular phone
- Digital / Video cameras
- Portable games
- Handheld instruments
- Wireless LANs
- Bluetooth Portable Radios
- GSM/GPRS/3G RF Transceiver

Typical Application Circuitry

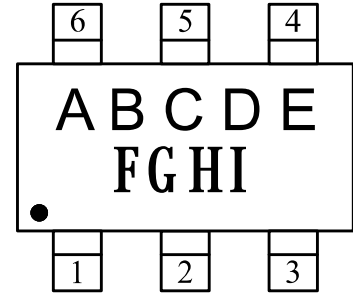


Pin Configuration & Marking Specification


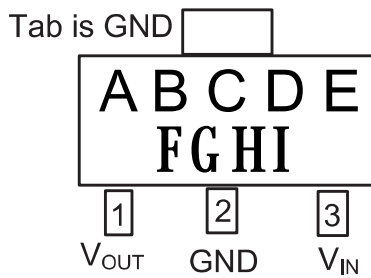
(SOT23-5L)



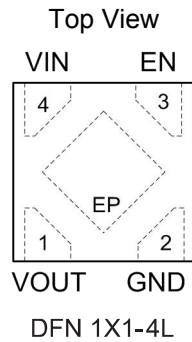
(SOT23-3L)



(SOT23-6L)



(SOT89-3L)



DFN 1X1-4L

● Pin Configuration

| SOT89-3L Pin No. | DFN 1X1 Pin No. | SOT23-3L Pin No. | SOT23-5L Pin No. | SOT23-6L Pin No. | Symbol | Description |
|---------------------|--------------------|---------------------|---------------------|---------------------|-----------|----------------|
| 3 | 4 | 3 | 1 | 1 | V_{IN} | Voltage input |
| 2 | 2 | 1 | 2 | 2 | GND | Power ground |
| | 3 | | 3 | 3 | EN | Chip enable |
| | | | | 4 | NC | Non connection |
| | | | | 5 | NC | Non connection |
| 1 | 1 | 2 | 5 | 6 | V_{OUT} | Output |

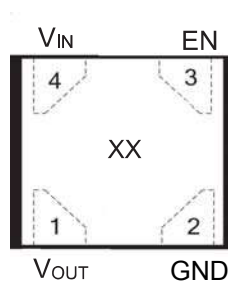
- **Marking Specification**

| Code | Marking | Contents |
|------|-----------|---------------------------------|
| A | H/L | Function specification |
| BCD | 090~500 | Output voltage |
| E | A/B/C/F | Package type |
| F G | Year Code | Assembly year (last two number) |
| H I | Week Code | Assembly week in a year |

(1)

| Code | Marking | Contents |
|-------|---------------|------------------------|
| A | H/L | Function specification |
| BCD | 090~500 | Output voltage |
| E | A/B/C/F | Package type |
| F G H | Wafer Code | Wafer's Lot No |
| I | Internal Code | Internal Code |

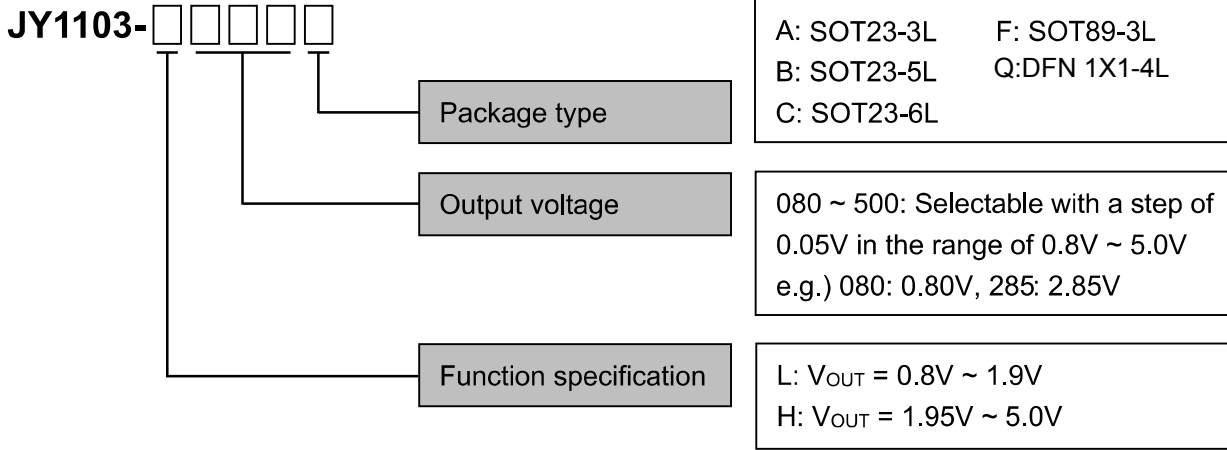
(2)



DFN1X1-4L

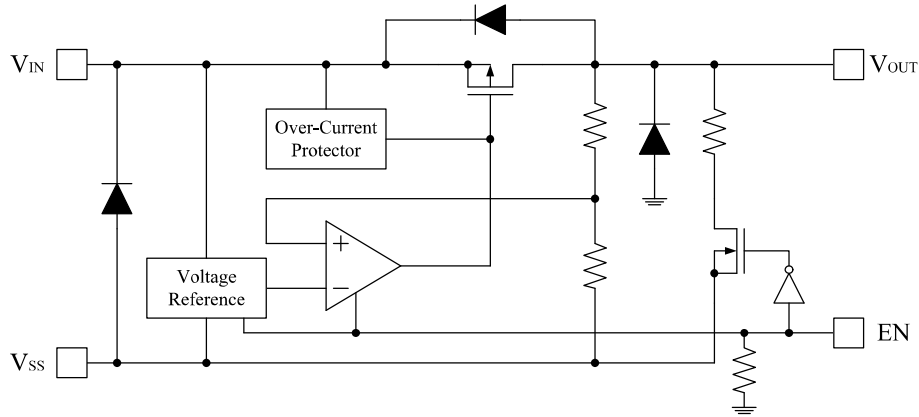
XX: 08-50 output voltage

08:0.8V,12:1.2V,18:1.8V,50:5.0V

Products Numbering Guide


| Part name | Packing | Quantity Per Reel |
|-----------|------------|-------------------|
| JY1103 | SOT23-3L | 3000 |
| | SOT89-3L | 3000 |
| | SOT23-5/6L | 3000 |
| | DFN 1X1-4L | 10000 |

Circuit Diagram



Absolute Maximum Rating

| Symbol | Parameter | Value | Unit |
|------------|--|----------------------------------|------|
| V_{IN} | Input Voltage | -0.3 ~ +7.0 | V |
| I_{OUT} | Output Current | 300 | mA |
| V_{OUT} | Output Voltage | $V_{SS} - 0.3 \sim V_{IN} + 0.3$ | V |
| P_D | Power Dissipation ⁽¹⁾ | 400 | mW |
| T_{Lead} | Lead Temperature(Soldering,10 Seconds) | 260 | °C |
| T_{OPT} | Operating Temperature | -40 ~ +85 | °C |
| T_{STG} | Storage Temperature | -55 ~ +125 | °C |

Note:

(1) Power dissipation depends on conditions of mounting on boards.

PCB dimension is 50mm×50mm×1.6mm.

Electrical Characteristics

(T=25°C, unless otherwise specified)

| Symbol | Parameter | Test Condition | | Min. | Typ. | Max. | Unit | Test Circuit |
|-------------------|-----------------|--|---------------------------------|-------------------------|------------------|-------------------------|------|--------------|
| V _{OUT} | Output voltage | V _{OUT} + 1.0V ≤ V _{IN} ≤ 6.0V I _{OUT} = 30mA T = -40°C ~ +80°C | V _{OUT} ≥ 1.95V | V _{OUT} × 0.99 | V _{OUT} | V _{OUT} × 1.01 | V | 1 |
| | | | V _{OUT} ≤ 1.90V | -20 | | +20 | mV | |
| I _{OUT} | Output current | V _{IN} ≥ V _{OUT} + 1.0V | 0.8V ≤ V _{OUT} ≤ 1.15V | | 300 | | mA | 1 |
| | | | 1.2V ≤ V _{OUT} ≤ 1.65V | | 300 | | mA | |
| | | | 1.7V ≤ V _{OUT} ≤ 2.25V | | 300 | | mA | |
| | | | 2.3V ≤ V _{OUT} ≤ 2.85V | | 300 | | mA | |
| | | | 2.9V ≤ V _{OUT} ≤ 3.45V | | 300 | | mA | |
| | | | 3.5V ≤ V _{OUT} ≤ 4.05V | | 300 | | mA | |
| | | | 4.0V ≤ V _{OUT} ≤ 5.00V | | 300 | | mA | |
| V _{DROP} | Dropout Voltage | I _{OUT} = 100mA | 0.8V ≤ V _{OUT} ≤ 1.15V | | 480 | 730 | mV | |
| | | | 1.2V ≤ V _{OUT} ≤ 1.65V | | 210 | 340 | mV | |
| | | | 1.7V ≤ V _{OUT} ≤ 2.25V | | 130 | 205 | mV | |
| | | | 2.3V ≤ V _{OUT} ≤ 2.85V | | 100 | 150 | mV | |
| | | | 2.9V ≤ V _{OUT} ≤ 3.45V | | 90 | 137 | mV | |
| | | | 3.5V ≤ V _{OUT} ≤ 4.05V | | 85 | 115 | mV | |
| | | | 4.0V ≤ V _{OUT} ≤ 5.00V | | 80 | 85 | mV | |

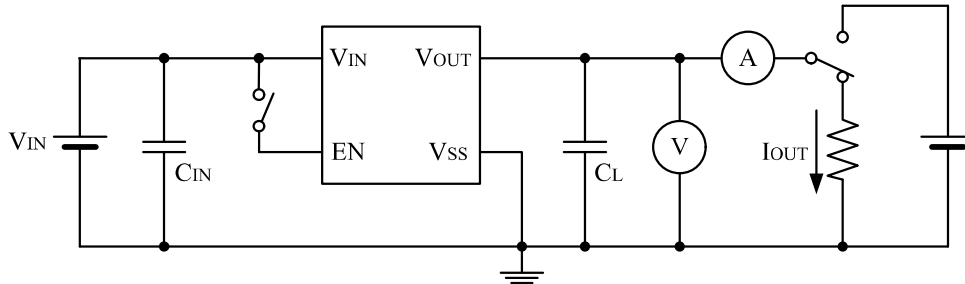
Electrical Characteristics (Continued)

(T=25°C, unless otherwise specified)

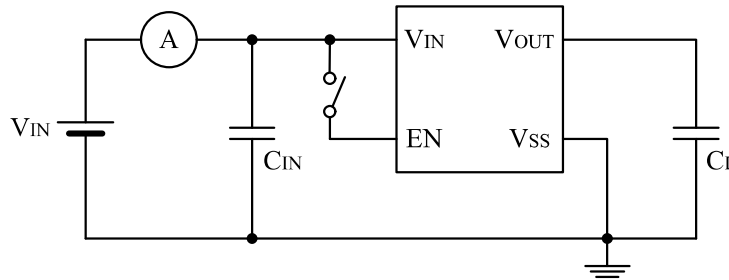
| Symbol | Parameter | Test Condition | Min. | Typ. | Max. | Unit | Test Circuit |
|--|--|---|------|------|------|--------|--------------|
| I _{DD} | Current consumption | V _{IN} = V _{OUT} + 1.0V, V _{OUT} = Open, I _{OUT} = 0mA | | 25 | 40 | μA | 2 |
| I _{STB} | Standby current | EN = V _{SS} | | 0.01 | 0.1 | μA | 2 |
| V _{IN} | Input voltage | | 1.6 | | 6.0 | V | 1 |
| ΔV _{OUT} | Load regulation | V _{IN} = V _{OUT} + 1.0V, I _{OUT} = 0.1mA ~ 100mA | | 10 | 40 | mV | 1 |
| $\frac{\Delta V_{OUT}}{\Delta V_{IN} \cdot V_{OUT}}$ | Line regulation | V _{OUT} + 1.0V ≤ V _{IN} ≤ 6.0V, I _{OUT} = 30mA | | 0.01 | 0.2 | %/V | 1 |
| R _r | Ripple rejection | V _{IN} = V _{OUT} + 1.0V, f = 1KHz, ΔV _{RIP} = 0.5V _{P-P} , I _{OUT} = 30mA | | 50 | | dB | 3 |
| I _{LIMIT} | Limit current | EN = V _{IN} | 300 | | | mA | 1 |
| I _{SHORT} | Short circuit current | V _{IN} = V _{OUT} + 1.0V, V _{OUT} = 0V | | 100 | | mA | 1 |
| $\frac{\Delta V_{OUT}}{\Delta T_a \cdot V_{OUT}}$ | Output voltage temperature coefficient | V _{EN} = V _{IN} , I _{OUT} = 300mA T _a = -40°C ~ +85°C | | ±20 | | ppm/°C | 1 |
| V _{ENH} | EN high level voltage | | 1.2 | | 6.0 | V | 4 |
| V _{ENL} | EN low level voltage | | | | 0.3 | V | 4 |
| I _{ENH} | EN high level current | V _{EN} = V _{IN} | -0.1 | | 0.1 | μA | 4 |
| I _{ENL} | EN low level current | V _{EN} = V _{SS} | -0.1 | | 0.1 | μA | 4 |
| R _{DIS} | C _L auto-discharge resistance | V _{IN} = 6.0V, V _{OUT} = 4.0V, V _{EN} = V _{SS} | | 160 | | Ω | 1 |

Test Circuits

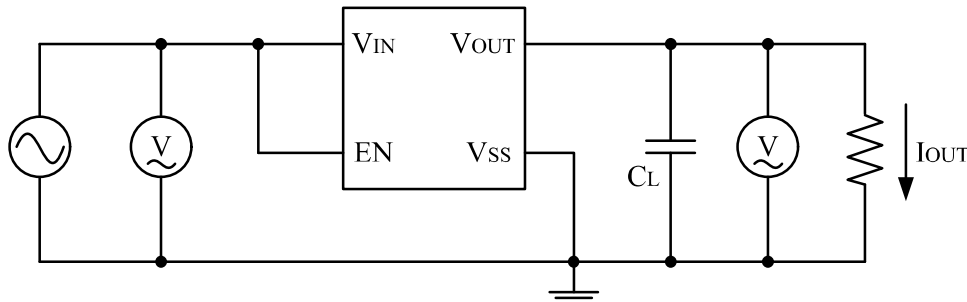
- **Circuit (1):** Output voltage, Output current, Dropout voltage, Input voltage, Load regulation, Line regulation, Limit current, Short circuit current, Output voltage temperature coefficient, CL auto-discharge resistance



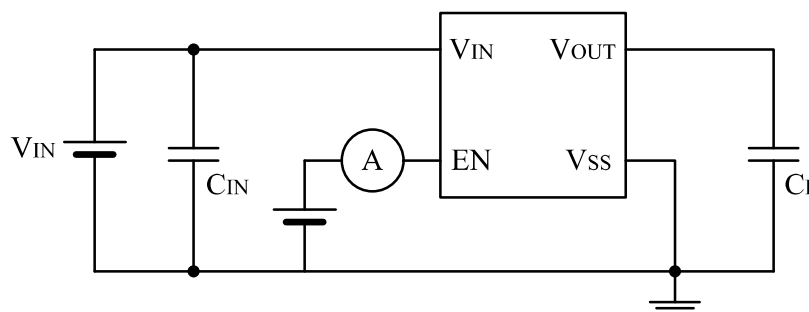
- **Circuit (2):** Output Current consumption, Standby current



- **Circuit (3):** Ripple rejection



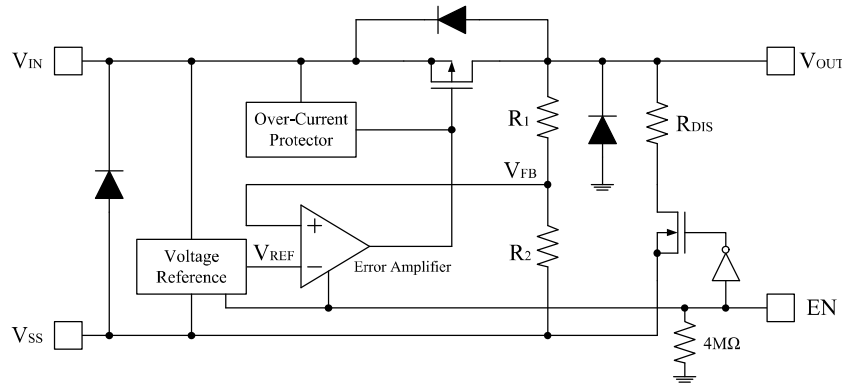
- **Circuit (4):** EN high level voltage, EN low level voltage, EN high level current, EN low level current



Description of Operation

- **General Operation**

In reference to following block diagram of the JY1103 series



By the error amplifier, the reference voltage (V_{REF}) is compared with V_{FB} , which is divided by feedback resistors R_1 and R_2 . It supplies the output transistor to keep a stabilized output voltage against with any fluctuation of input voltage by negative feedback system.

The JY1103 series has P-channel MOSFET which is connected to the V_{OUT} terminal as the output transistor. To prevent the JY1103 series from being damaged due to inverse current from V_{OUT} terminal to V_{IN} terminal through a parasitic diode, V_{OUT} should not be exceeded $V_{IN} + 0.3V$.

- **EN terminal (shutdown function) & C_L auto-discharge**

The JY1103 series can be shutdown through EN terminal. The P-channel MOSFET is turned off and operation of all internal circuits stops to reduce the current consumption when the signal of EN terminal is set to the shutdown level. In shutdown mode, the JY1103 series enables the electric charge at the C_L to be discharged via the auto-discharge resistance ($R_{DIS} = 160\Omega$), and the V_{OUT} terminal can be rapidly returned to the V_{SS} level as a result.

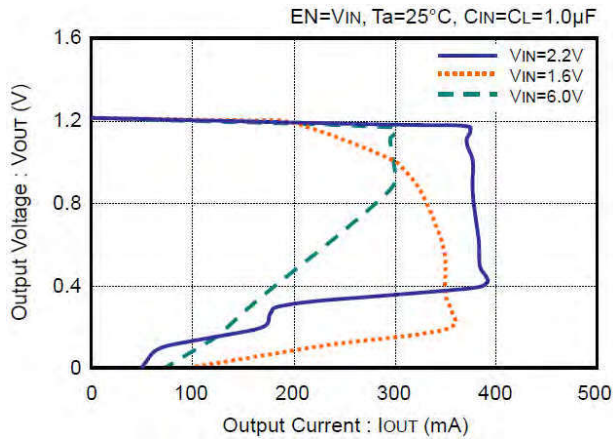
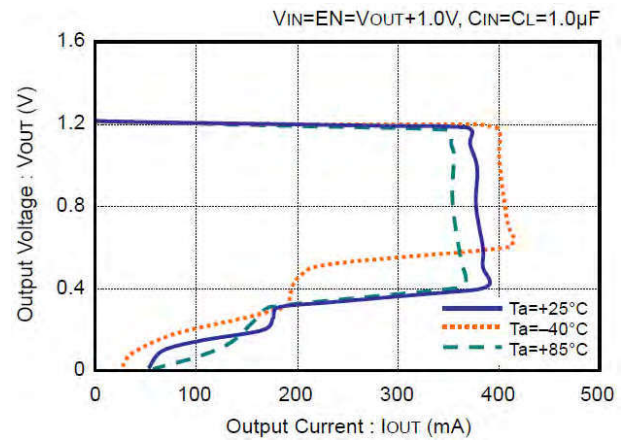
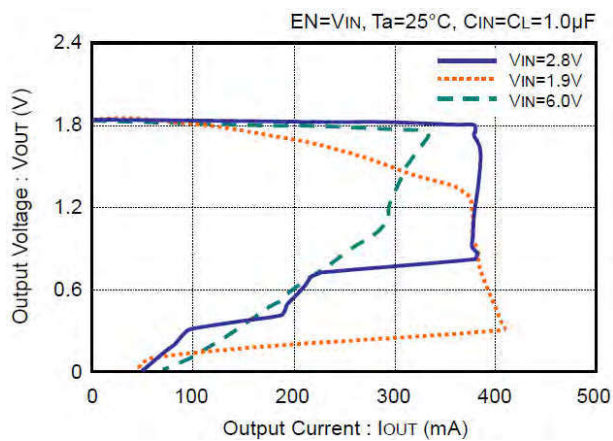
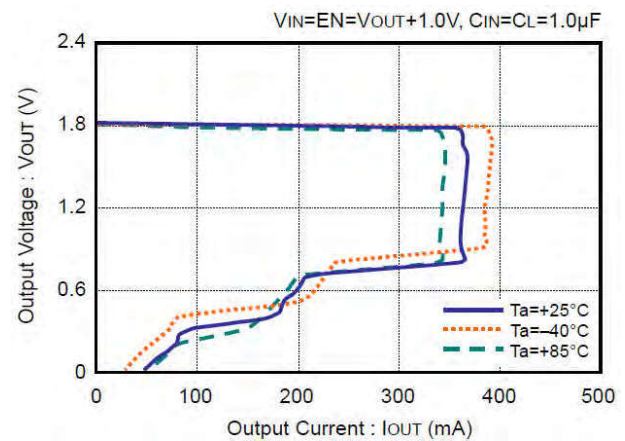
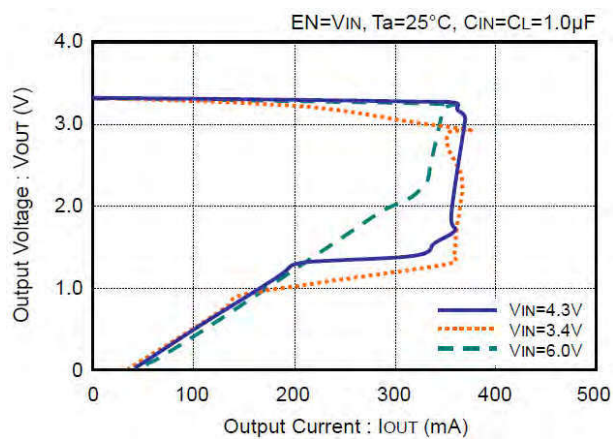
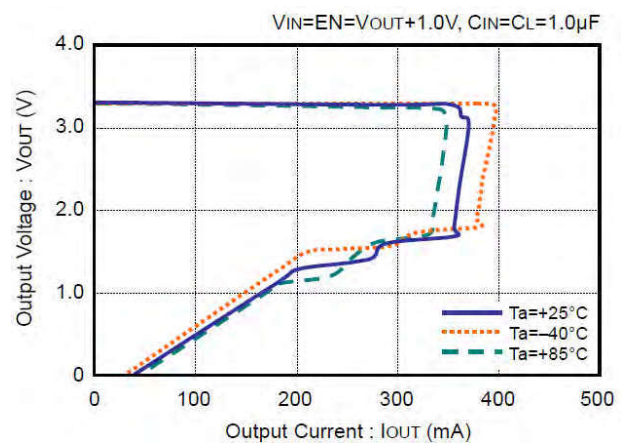
- **Output capacitor (C_L)**

For phase compensation, an output capacitor (C_L) is required to connected between V_{OUT} terminal and V_{SS} terminal as close as possible. A ceramic capacitor with capacitance value of at least $1.0\mu F$ is recommended. Of course, the suitable capacitance value should be different by the condition of each application. In addition, an input capacitor (C_{IN}) with capacitance value of at least $1.0\mu F$ is also recommended between V_{IN} terminal and V_{SS} terminal for stable input power.

- **Output capacitor (C_L) Over current protection and short circuit protection**

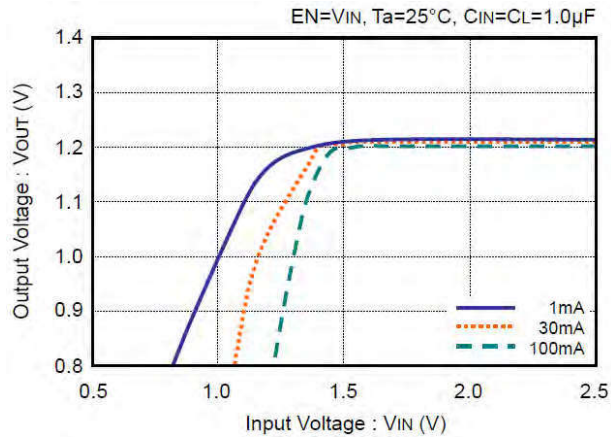
Built-in over current protection circuit performs circuit protection from over current as a current limiter. When the load current reaches the limit level, the output voltage drops and output current also decreases accordingly. A current of typical $40mA$ will flow when output terminal is shorted.

TYPICAL CHARACTERISTICS – Output Voltage vs. Output Current

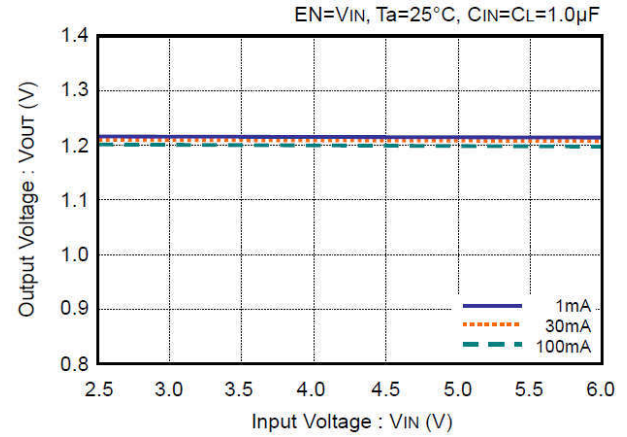
 ● JY1103-L120x ($V_{OUT} = 1.2V$)

 ● JY1103-L120x ($V_{OUT} = 1.2V$)

 ● JY1103-L180x ($V_{OUT} = 1.8V$)

 ● JY1103-L180x ($V_{OUT} = 1.8V$)

 ● JY1103-H330x ($V_{OUT} = 3.3V$)

 ● JY1103-H330x ($V_{OUT} = 3.3V$)


TYPICAL CHARACTERISTICS – Output Voltage vs. Input Voltage

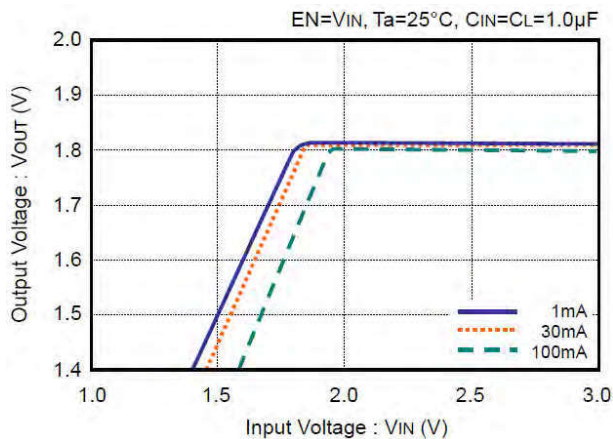
- JY1103-L120x ($V_{OUT} = 1.2V$)



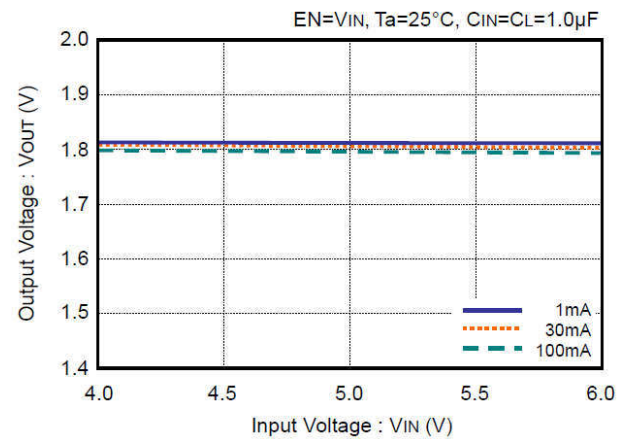
- JY1103-L120x ($V_{OUT} = 1.2V$)



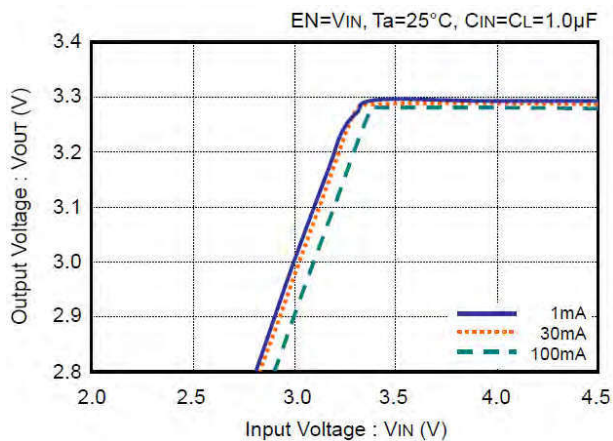
- JY1103-L180x ($V_{OUT} = 1.8V$)



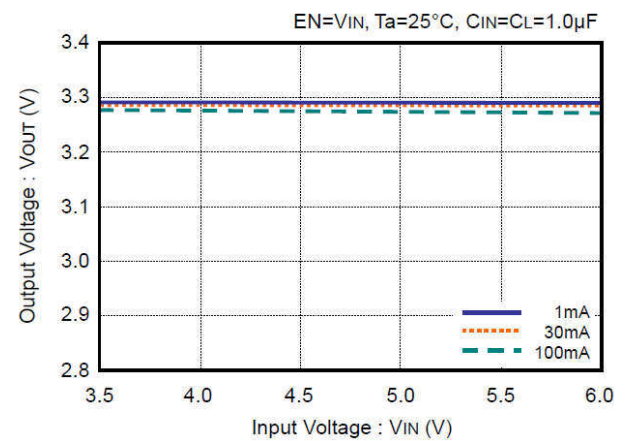
- JY1103-L180x ($V_{OUT} = 1.8V$)



- JY1103-H330x ($V_{OUT} = 3.3V$)

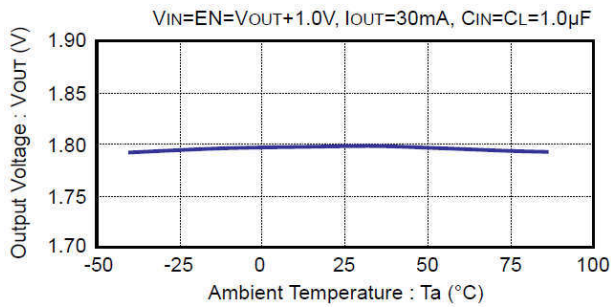


- JY1103-H330x ($V_{OUT} = 3.3V$)

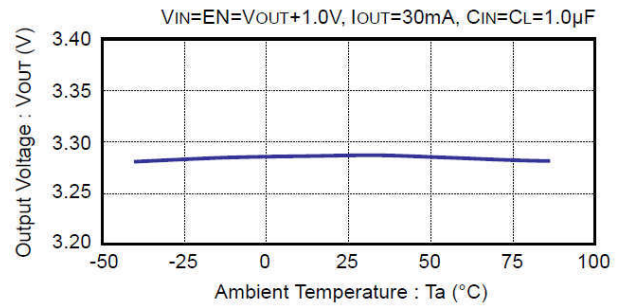
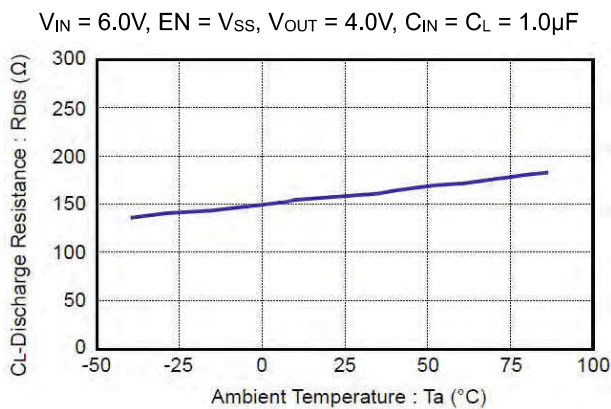


TYPICAL CHARACTERISTICS – Output Voltage vs. Ambient Temperature

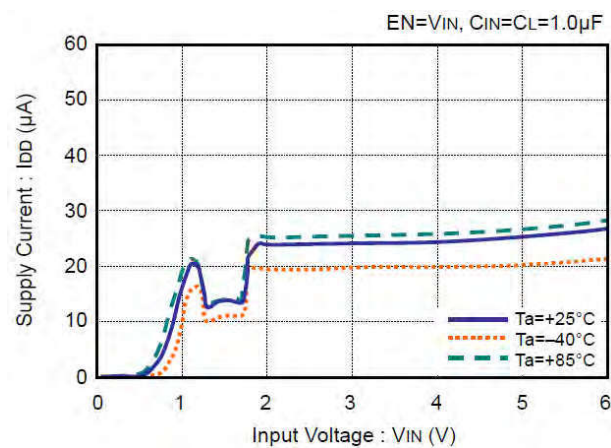
- JY1103-L180x ($V_{OUT} = 1.8V$)



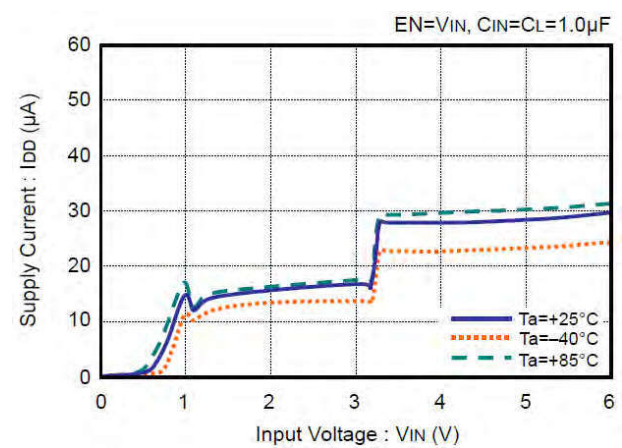
- JY1103-H330x ($V_{OUT} = 3.3V$)


TYPICAL CHARACTERISTICS – C_L Discharge Resistance vs. Ambient Temperature

TYPICAL CHARACTERISTICS – Supply Current vs. Input Voltage

- JY1103-L180x ($V_{OUT} = 1.8V$)

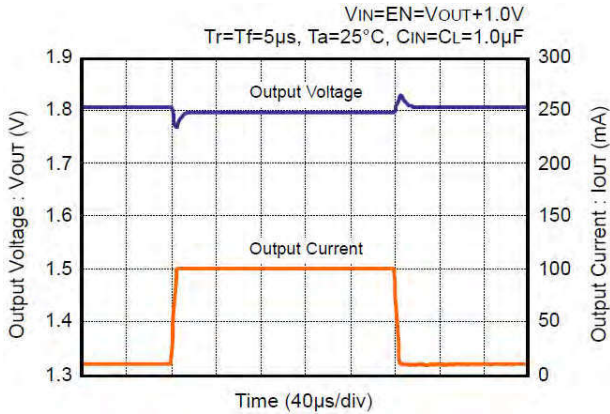


- JY1103-H330x ($V_{OUT} = 3.3V$)

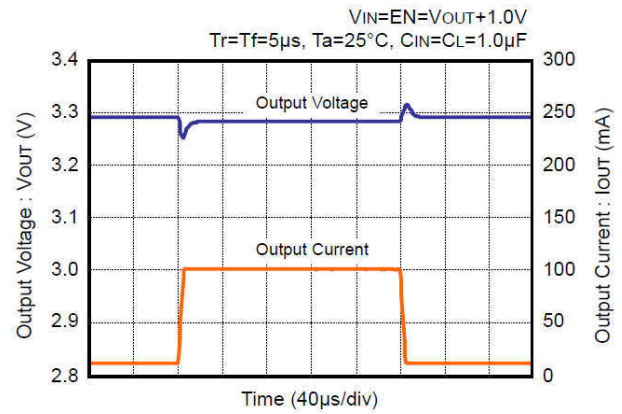


TYPICAL CHARACTERISTICS – Load Transient Response

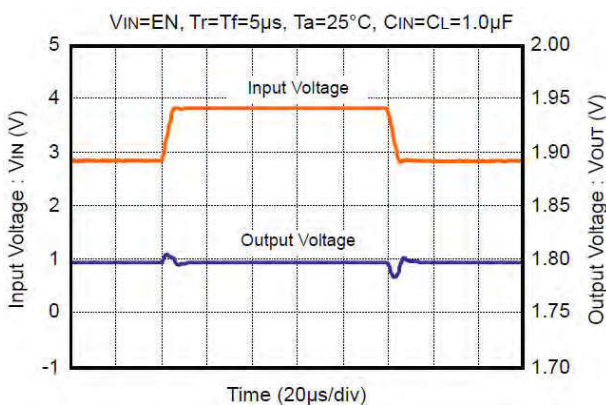
- JY1103-L180x ($V_{OUT} = 1.8V$)



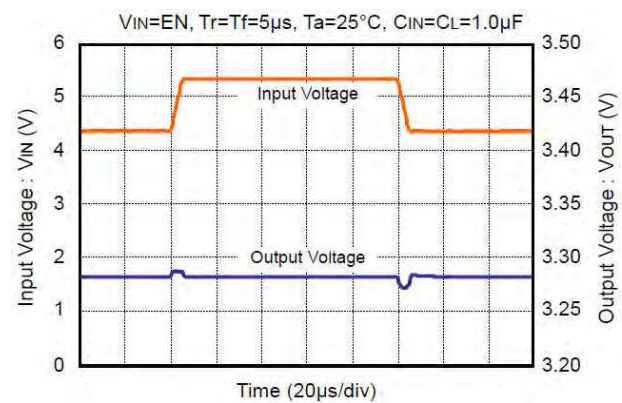
- JY1103-H330x ($V_{OUT} = 3.3V$)


TYPICAL CHARACTERISTICS – Input Transient Response ($I_{OUT} = 100mA$)

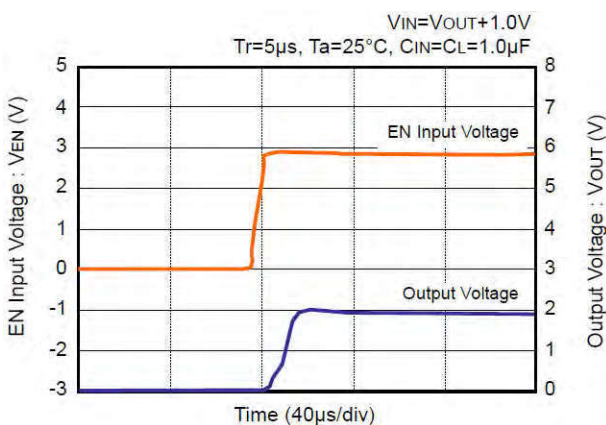
- JY1103-L180x ($V_{OUT} = 1.8V$)



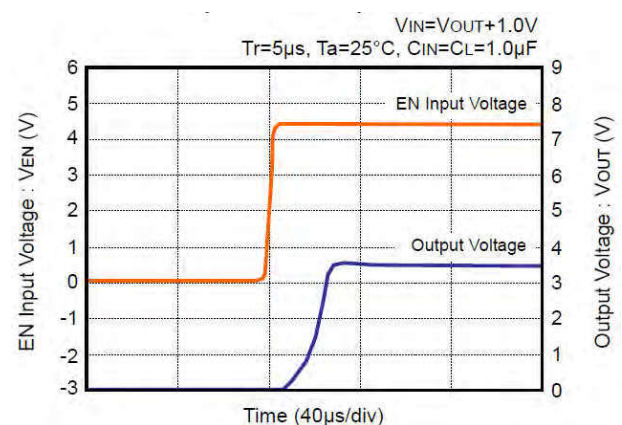
- JY1103-H330x ($V_{OUT} = 3.3V$)


TYPICAL CHARACTERISTICS – EN Rise Time ($I_{OUT} = 100mA$)

- JY1103-L180x ($V_{OUT} = 1.8V$)

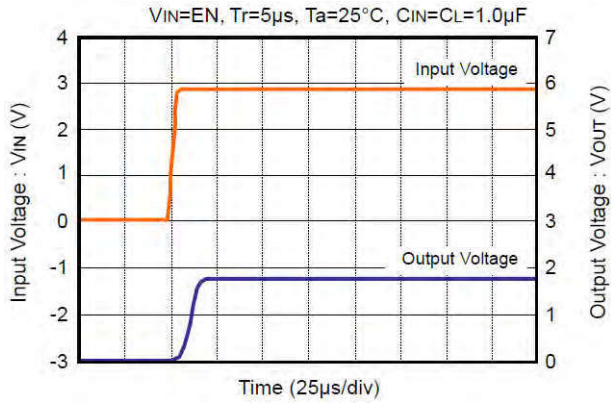


- JY1103-H330x ($V_{OUT} = 3.3V$)

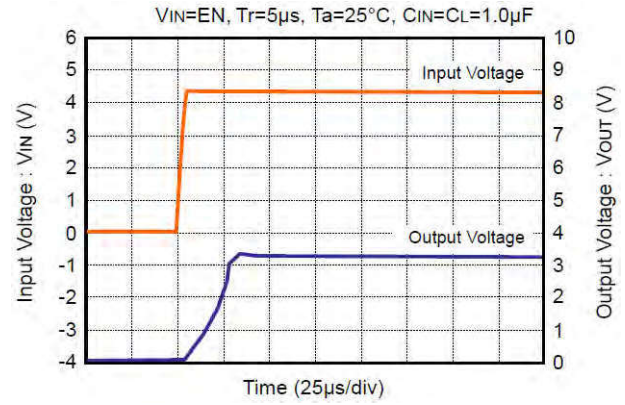


TYPICAL CHARACTERISTICS – Input Rise Time ($I_{OUT} = 100\text{mA}$)

- JY1103-L180x ($V_{OUT} = 1.8\text{V}$)

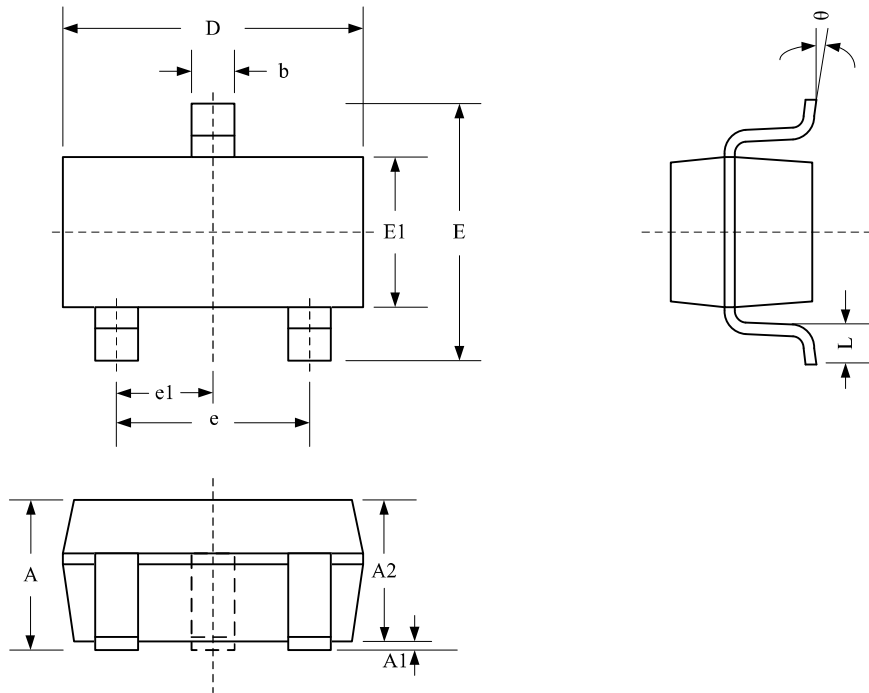


- JY1103-H330x ($V_{OUT} = 3.3\text{V}$)



PACKAGE DIMENSIONS (SOT23-3L)

MSL-3

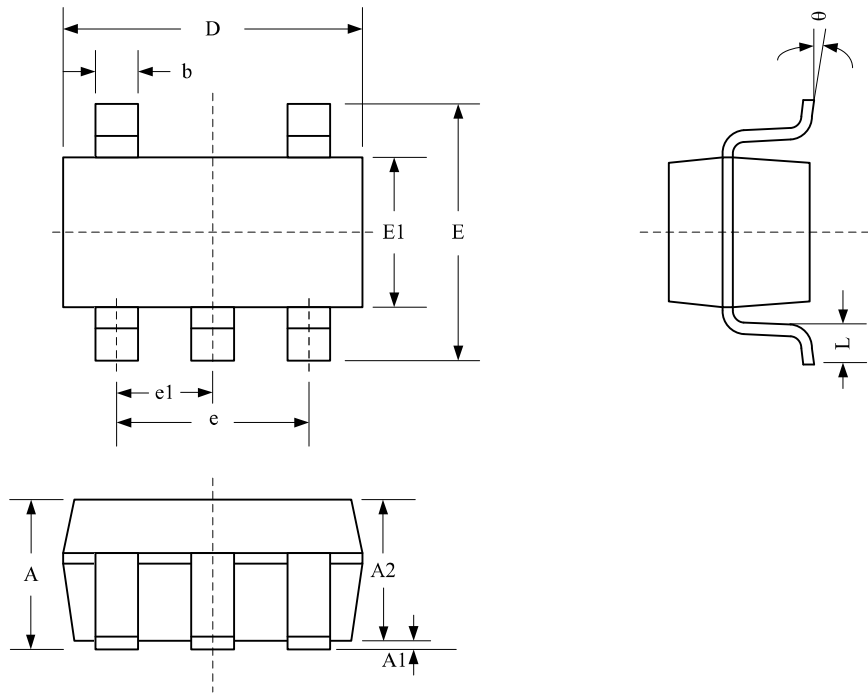


Package Dimensions (Controlling dimensions are in millimeters)

| Symbol | Dimensions (mm) | | | Dimensions (Inches) | | |
|----------|-----------------|---------|---------|---------------------|---------|---------|
| | Minimum | Typical | Maximum | Minimum | Typical | Maximum |
| A | — | — | 1.450 | — | — | 0.057 |
| A1 | 0.000 | — | 0.150 | 0.000 | — | 0.006 |
| A2 | — | — | 1.300 | — | — | 0.012 |
| b | 0.300 | — | 0.500 | 0.012 | — | 0.020 |
| D | 2.90 BSC | | | 0.114 BSC | | |
| e1 | 0.95 BSC | | | 0.037 BSC | | |
| e | 1.90 BSC | | | 0.075 BSC | | |
| E | 2.80 BSC | | | 0.110 BSC | | |
| E1 | 1.60 BSC | | | 0.063 BSC | | |
| L | 0.300 | 0.450 | 0.600 | 0.012 | 0.018 | 0.024 |
| θ | 0° | 4° | 8° | 0° | 4° | 8° |

PACKAGE DIMENSIONS (SOT23-5L)

MSL-3

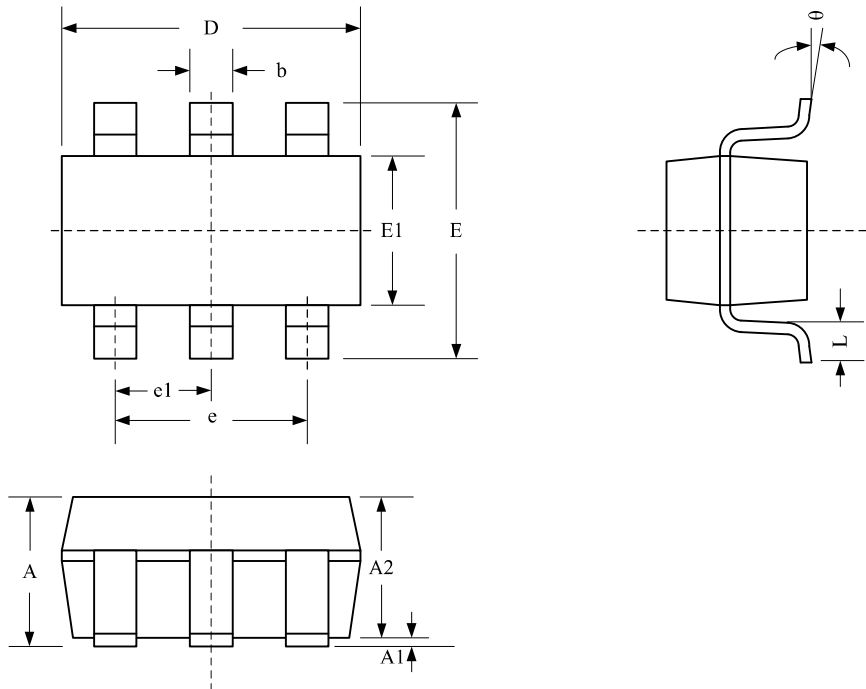


Package Dimensions (Controlling dimensions are in millimeters)

| Symbol | Dimensions (mm) | | | Dimensions (Inches) | | |
|----------|-----------------|---------|---------|---------------------|---------|---------|
| | Minimum | Typical | Maximum | Minimum | Typical | Maximum |
| A | — | — | 1.450 | — | — | 0.057 |
| A1 | 0.000 | — | 0.150 | 0.000 | — | 0.006 |
| A2 | — | — | 1.300 | — | — | 0.012 |
| b | 0.300 | — | 0.500 | 0.012 | — | 0.020 |
| D | 2.90 BSC | | | 0.114 BSC | | |
| e1 | 0.95 BSC | | | 0.037 BSC | | |
| e | 1.90 BSC | | | 0.075 BSC | | |
| E | 2.80 BSC | | | 0.110 BSC | | |
| E1 | 1.60 BSC | | | 0.063 BSC | | |
| L | 0.300 | 0.450 | 0.600 | 0.012 | 0.018 | 0.024 |
| θ | 0° | 4° | 8° | 0° | 4° | 8° |

PACKAGE DIMENSIONS (SOT23-6L)

MSL-3

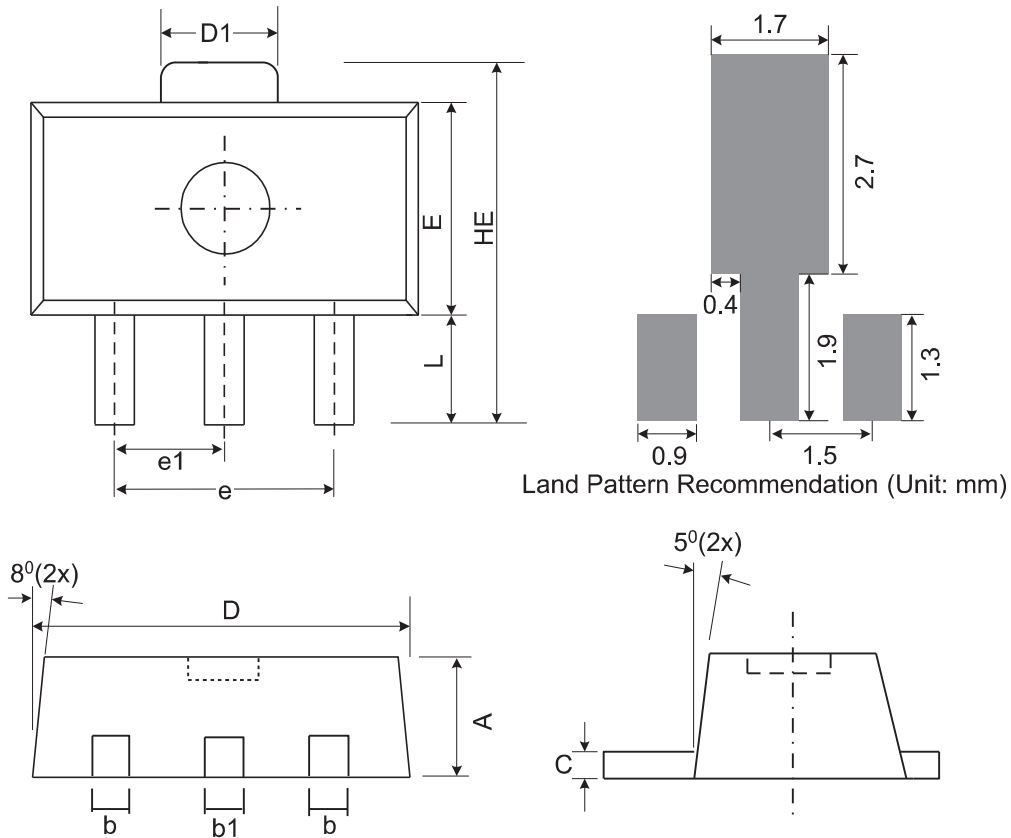


Package Dimensions (Controlling dimensions are in millimeters)

| Symbol | Dimensions (mm) | | | Dimensions (Inches) | | |
|----------|-----------------|---------|---------|---------------------|---------|---------|
| | Minimum | Typical | Maximum | Minimum | Typical | Maximum |
| A | — | — | 1.450 | — | — | 0.057 |
| A1 | 0.000 | — | 0.150 | 0.000 | — | 0.006 |
| A2 | — | — | 1.300 | — | — | 0.012 |
| b | 0.300 | — | 0.500 | 0.012 | — | 0.020 |
| D | 2.90 BSC | | | 0.114 BSC | | |
| e1 | 0.95 BSC | | | 0.037 BSC | | |
| e | 1.90 BSC | | | 0.075 BSC | | |
| E | 2.80 BSC | | | 0.110 BSC | | |
| E1 | 1.60 BSC | | | 0.063 BSC | | |
| L | 0.300 | 0.450 | 0.600 | 0.012 | 0.018 | 0.024 |
| θ | 0° | 4° | 8° | 0° | 4° | 8° |

PACKAGE DIMENSIONS (SOT89-3L)

MSL-3



| Symbol | Dimensions in Millimeters | | | Dimensions in Inches | | |
|--------|---------------------------|------|------|----------------------|-------|-------|
| | Min. | Nom. | Max. | Min. | Nom. | Max. |
| A | 1.40 | 1.50 | 1.60 | 0.055 | 0.059 | 0.063 |
| b | 0.36 | 0.42 | 0.48 | 0.014 | 0.017 | 0.019 |
| b1 | 0.44 | 0.50 | 0.56 | 0.017 | 0.02 | 0.022 |
| C | 0.35 | 0.40 | 0.44 | 0.014 | 0.016 | 0.017 |
| D | 4.40 | 4.50 | 4.60 | 0.173 | 0.177 | 0.181 |
| D1 | 1.35 | 1.59 | 1.83 | 0.053 | 0.063 | 0.072 |
| e | 3.0 BSC | | | 0.118 BSC | | |
| e1 | 1.5 BSC | | | 0.059 BSC | | |
| E | 2.29 | 2.45 | 2.60 | 0.09 | 0.097 | 0.102 |
| HE | 3.94 | 4.10 | 4.25 | 0.155 | 0.161 | 0.167 |
| L | 0.80 | 1.00 | 1.20 | 0.031 | 0.04 | 0.047 |

PACKAGE DIMENSIONS

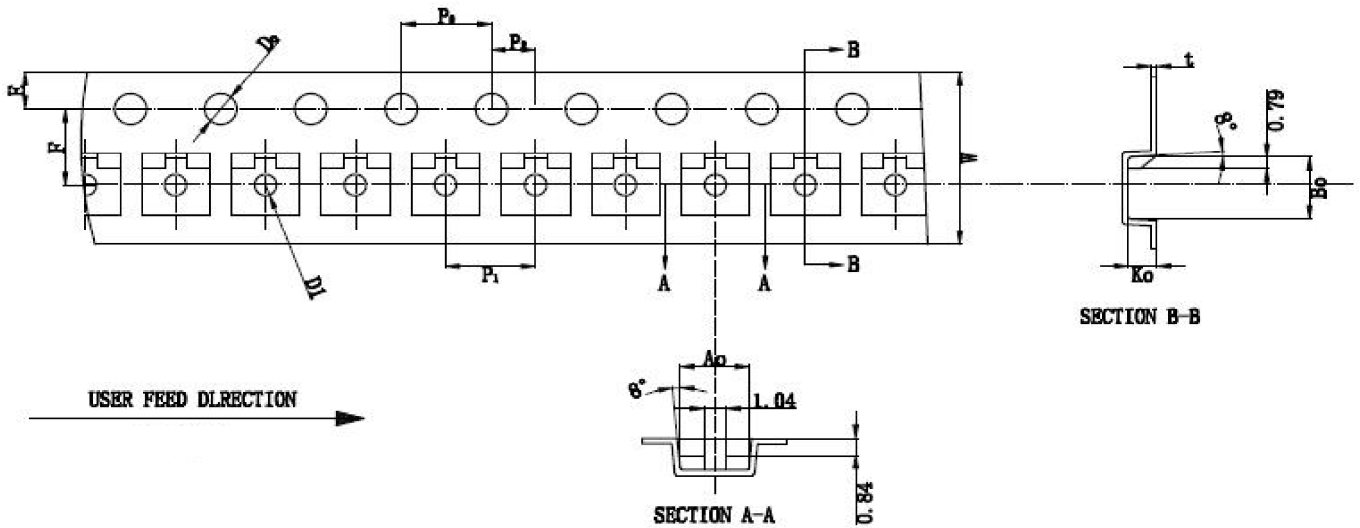
DFN 1X1-4L

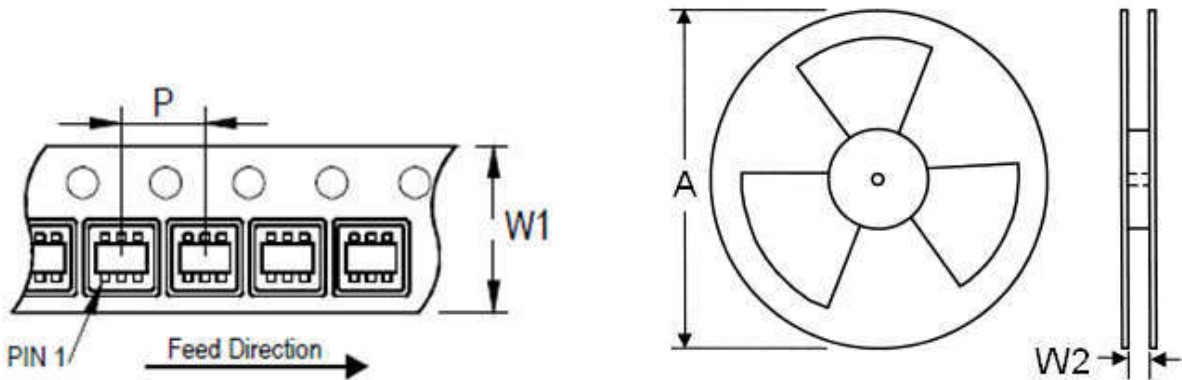
MSL-1

Carrier Dimensions
SOT23-3L

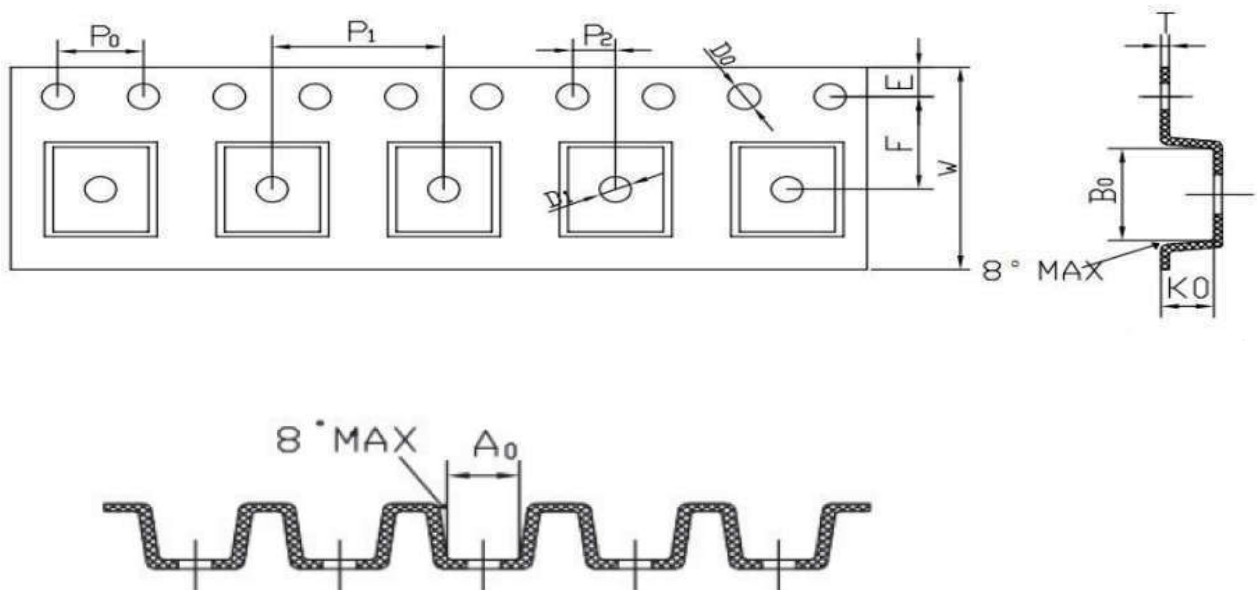
| PKG TYPE | W | P | E | F | D | D1 | Po |
|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| SOT-23 | 8.00 | 4.00 | 1.75 | 3.50 | 1.50 | 1.00 | 4.00 |
| Tolerance | +0.3/-0.1 | ± 0.1 | ± 0.1 | ± 0.1 | ± 0.1 | ± 0.1 | ± 0.1 |

| Po10 | P2 | A0 | B0 | K0 | T |
|-----------|------------|-----------|-----------|-----------|------------|
| 40.00 | 2.00 | 3.15 | 2.77 | 1.22 | 0.20 |
| ± 0.2 | ± 0.05 | ± 0.1 | ± 0.1 | ± 0.1 | ± 0.02 |



Carrier Dimensions
SOT23-5/6L


| Tape Size (W1) mm | Pocket Pitch (P) mm | Reel Size (A) | | Reel Width (W2) mm | Empty Cavity Length mm | Units per Reel |
|----------------------|------------------------|---------------|-----|-----------------------|---------------------------|----------------|
| | | in | mm | | | |
| 8 | 4 | 7 | 180 | 8.4 | 300~1000 | 3,000 |

Carrier Dimensions
SOT89-3L


| Symbol | Spec | Symbol | Spec |
|----------------------|------------------|----------------------|-----------|
| W | 12.00±0.10 | A₀ | 4.90±0.10 |
| E | 1.75±0.10 | B₀ | 4.50±0.10 |
| F | 5.50±0.05 | K₀ | 1.85±0.10 |
| D₀ | 1.50 (+0.10, -0) | | |
| D₁ | 1.50 (+0.10, -0) | | |
| P₀ | 4.00±0.10 | | |
| P₁ | 8.00±0.10 | | |
| P₂ | 2.00±0.05 | | |
| t | 0.25-0.28 | | |
| t₁ | 0.05 | | |

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