

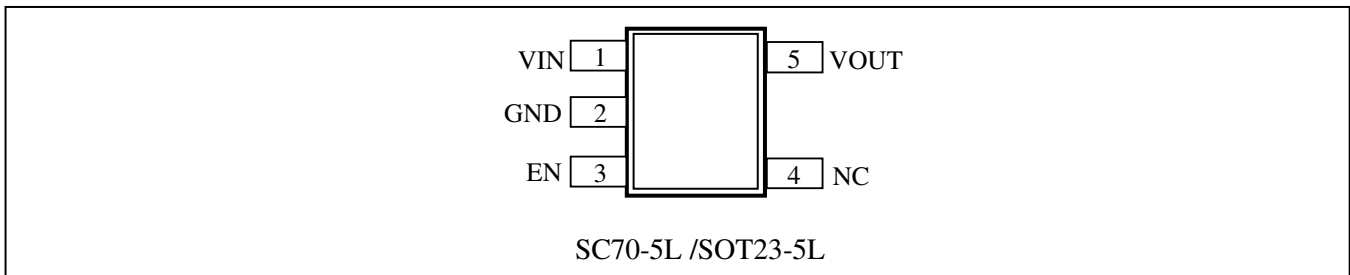
**Features**

- Input Voltage Range: 1.7V to 5.5V
- 300mA Guaranteed Output Current
- Stable with 0.47µF Ceramic Output Capacitors
- Low Dropout Voltage 150mV@150mA (Vout=2.8V)
- Low Quiescent Current 36µA
- High PSRR 75dB@1kHz
- Auto Output Discharge
- High Output Accuracy ±2% Initial Accuracy
- Thermal Shutdown and Current Limit Protection
- Operating Temperature Range: -40°C to +85°C
- Package: SC70-5L and SOT23-5L

**Applications**

- Cell Phones
- Mobile Phones (PDC, GSM, CDMA, IMT2000 etc.)
- Cordless Phones and Radio Communication
- Digital Still Cameras and Video Cameras
- PDA
- MP3 Players
- Portable Devices

**Pin Assignment**



**Pin Description**

| Pin No | I/O | Pin Name | Description  |
|--------|-----|----------|--|
| 1      | I   | VIN      | Regulator Supply Input. Supply voltage can range from 1.7V to 5.5V. Bypass with a 0.47µF ceramic capacitor (X5R/X7R) to GND. |
| 2      | P   | GND      | Ground.  |
| 3      | I   | EN       | ON/OFF Control of Regulator. High active.  |
| 4      | -   | NC       | This pin is better to be connected to the GND, but leaving it open is also acceptable  |
| 5      | O   | VOUT     | Output of Regulator. Bypass with a 0.47µF ceramic capacitor (X5R/X7R) to GND.  |

**300mA, High PSRR, LDO Regulator Description**

PT7M8218 is a high accurate, low dropout voltage regulator with low noise, high ripple rejection and low current consumption.

PT7M8218 includes a reference voltage source, an error amplifier, a driver transistor, a current limit protection, a thermal protection and an internal phase compensator.

The output voltage for the regulator is set by factory trimming within a range of 0.9V to 3.3V in 100mV step includes 2.85V. PT7M8218 is stable with low ESR ceramic capacitors.

PT7M8218 is available in SC70-5L and SOT23-5L packages. It operates over a temperature range of -40 to +85°C.

### Maximum Ratings

|   |                               |
|---|-------------------------------|
| Storage Temperature.....                    | -55°C to +125°C               |
| Ambient Temperature with Power Applied..... | -40°C to 85°C                 |
| Input Voltage .....                         | +6.0V                         |
| Output Voltage .....                        | -0.3 to V <sub>CC</sub> +0.3V |
| EN pin Voltage .....                        | +6.0V                         |
| DC Input/Output Current .....               | 700mA                         |
| Power Dissipation.....                      | SC70/300mW<br>SOT23/400mW     |

**Note:**

Stresses greater than those listed under MAXIMUM RATINGS may cause permanent damage to the device. This is a stress rating only and functional operation of the device at these or any other conditions above those indicated in the operational sections of this specification is not implied. Exposure to absolute maximum rating conditions for extended periods may affect reliability.

### Recommended Operating Conditions

| Symbol          | Parameter             | Conditions | Min. | Typ. | Max. | Unit |
|-----------------|-----------------------|------------|------|------|------|------|
| V <sub>IN</sub> | Operating Voltage     | -          | 1.7  | -    | 5.5  | V    |
| V <sub>EN</sub> | Control Input Voltage | -          | 0    | -    | 5.5  | V    |
| T <sub>A</sub>  | Operating Temperature | -          | -40  | 25   | 85   | °C   |

### DC Electrical Characteristics

(T<sub>A</sub> = 25°C, V<sub>IN</sub> = V<sub>OUT</sub> + 1V for V<sub>OUT</sub> options greater than 1.5V. V<sub>IN</sub> = 2.5V for V<sub>OUT</sub> ≤ 1.5V, unless otherwise noted.)

| Parameter                                 | Symbol  | Conditions  | Min.                          | Typ.                | Max.                          | Unit   |    |
|---|---|---|-------------------------------|---------------------|-------------------------------|--------|----|
| Output Voltage                            | V <sub>OUT(E)</sub> *                             | V <sub>IN</sub> =V <sub>OUT(S)</sub> *+1.0V, I <sub>OUT</sub> =30mA   | V <sub>OUT(S)</sub> *<br>0.98 | V <sub>OUT(S)</sub> | V <sub>OUT(S)</sub> *<br>1.02 | V      |    |
| Input Voltage                             | V <sub>IN</sub>                                   | -   | 1.7                           | -                   | 5.5                           | V      |    |
| Maximum Output Current                    | I <sub>OUTMAX</sub>                               | V <sub>IN</sub> =V <sub>OUT(S)</sub> +1.0V  | 300                           | -                   | -                             | mA     |    |
| Dropout Voltage                           | V <sub>DIF</sub> *                                | I <sub>OUT</sub> = 150mA  | 2.8V ≤ V <sub>OUT(S)</sub>    | -                   | 150                           | -      | mV |
|   |   |   | V <sub>OUT(S)</sub> ≤ 2.7V    | -                   | 180                           | -      |    |
| Supply Current                            | I <sub>SS</sub>                                   | V <sub>IN</sub> = V <sub>OUT(S)</sub> + 1.0V, no load   | -                             | 36                  | 50                            | µA     |    |
| Standby Current                           | I <sub>STB</sub>                                  | V <sub>IN</sub> = V <sub>OUT(S)</sub> + 1.0V, EN=GND  | -                             | 0.05                | 1                             | µA     |    |
| Line Regulation                           | $\frac{\Delta V_{OUT}}{\Delta V_{IN}} * V_{OUT}$  | V <sub>OUT(S)</sub> +1.0V ≤ V <sub>IN</sub> ≤ 5.5V, I <sub>OUT</sub> =30mA  | -                             | 0.02                | 0.2                           | %/V    |    |
| Load Regulation                           | ΔV <sub>OUT2</sub>                                | V <sub>IN</sub> = V <sub>OUT(S)</sub> +1.0V,<br>1.0mA ≤ I <sub>OUT</sub> ≤ 150mA  | -                             | 10                  | -                             | mV     |    |
| Output Voltage Temperature Characteristic | $\frac{\Delta V_{OUT}}{\Delta T_{opr}} * V_{OUT}$ | I <sub>OUT</sub> =30mA, -40°C ≤ T <sub>opr</sub> ≤ 85°C   | -                             | +/-100              | -                             | ppm/°C |    |
| Ripple Rejection                          | PSRR  | V <sub>IN</sub> =[V <sub>OUT(S)</sub> +1.0]V <sub>DC</sub> +0.2Vp-p AC<br>I <sub>OUT</sub> =30mA, f=1kHz<br>(In case that V <sub>out</sub> ≤ 2.0V, V <sub>IN</sub> =3.0V) | -                             | 75                  | -                             | dB     |    |
| Current Limit                             | I <sub>LIM</sub>                                  | V <sub>OUT</sub> = V <sub>OUT(S)</sub> *0.9   | -                             | 400                 | -                             | mA     |    |
| Short Current Limit                       | I <sub>SC</sub>                                   | V <sub>out</sub> =0V  | -                             | 40                  | -                             | mA     |    |
| Thermal Shutdown                          | TSD   | -   | -                             | 170                 | -                             | °C     |    |
| Thermal Shutdown Hysteresis               | ΔTSD  | -   | -                             | 20                  | -                             |        |    |
| EN "High" Voltage                         | V <sub>ENH</sub>                                  | -   | 1.2                           | -                   | -                             | V      |    |
| EN "Low" Voltage                          | V <sub>ENL</sub>                                  | -   | -                             | -                   | 0.3                           |        |    |
| EN "High" Current                         | I <sub>ENH</sub>                                  | V <sub>IN</sub> =V <sub>OUT(S)</sub> +1.0V  | -0.10                         | -                   | 0.10                          | µA     |    |
| EN "Low" Current                          | I <sub>ENL</sub>                                  | V <sub>IN</sub> = V <sub>OUT(S)</sub> +1.0V, EN=OFF   | -0.10                         | -                   | 0.10                          |        |    |
| Output Discharge Resistance               | R <sub>dis</sub>                                  | V <sub>IN</sub> = 4.0V, EN=OFF  | -                             | 50                  | -                             | Ω      |    |
| Output Voltage Noise                      | V <sub>N</sub>                                    | C <sub>OUT</sub> =0.47µF, 10Hz to 100kHz  | -                             | 60                  | -                             | µVrms  |    |

**Note:**

\*1: V<sub>OUT(S)</sub>=Specified output voltage

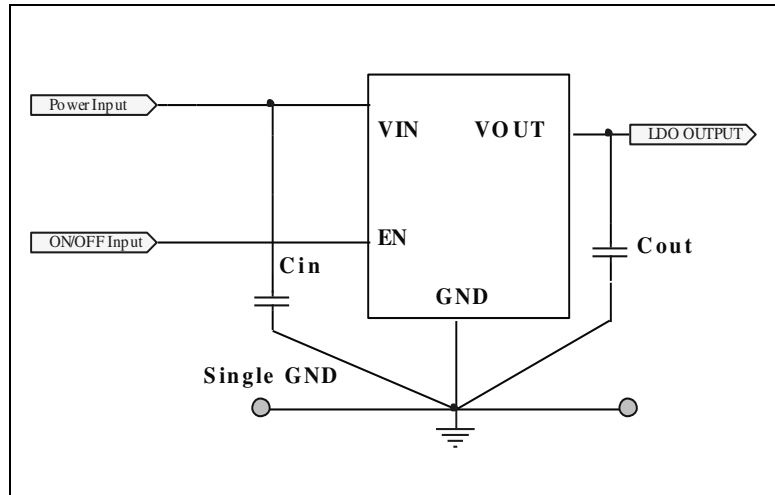
\*2: V<sub>OUT(E)</sub>=Effective output voltage

(I.e. the output voltage when "V<sub>OUT(S)</sub>+1.0V" is provided at the V<sub>IN</sub> pin while maintaining a certain I<sub>OUT</sub> value).

\*3: V<sub>DIF</sub>={V<sub>IN1</sub>(\*)5 - V<sub>OUT1</sub>(\*)4}

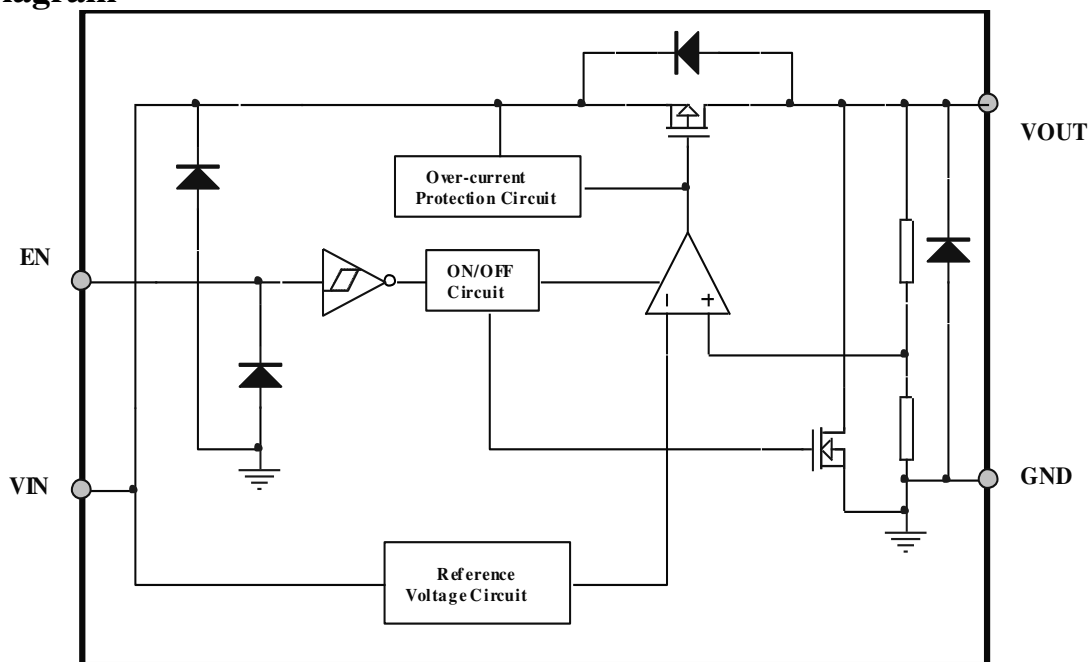
- \*4:  $V_{OUT1}$ =A voltage equal to 98% of the output voltage whenever an amply stabilized  $I_{OUT}$  ( $V_{OUT(S)}+1.0V$ ) is input.
- \*5:  $V_{IN1}$ =The input voltage when  $V_{OUT1}$  appears as input voltage is gradually decreased.
- \*6: Unless otherwise stated,  $V_{IN}=V_{OUT(S)} +1.0V$

### Application Circuits



**Note:** Cin and Cout are 0.47 $\mu$ F low ESR ceramic capacitors

## Block Diagram



## Functional Description (Refer to Block Diagram)

### Output Voltage

The divided output voltage is compared with the internal reference voltage by the error amplifier with internal phase compensator. The output of the error amplifier then drives the P-channel MOSFET to maintain a stable and constant output voltage.

### Low ESR Capacitors

The internal phase compensator maintains the stable output voltage with low ESR ceramic input and output capacitors. 0.47 $\mu$ F low ESR (X5R/X7R) ceramic capacitor located as close as possible to the IC's pins is recommended.

### Current Limit and Thermal Shutdown Protections

Current limit protection is used to limit the output current when an overload condition occurs. As a result, the output voltage will drop. Thermal shutdown protection will turn off the output to reduce the power dissipation when the operation junction temperature exceeds 170°C.

### EN Pin

The output of the regulator in PT7M8218 can be controlled with EN pin. The EN pin should be connected to a "VIN" or a "GND" voltage as a floating input applied to inverter input of the enable circuitry will increase the current consumption.

### NOTE ON USE

Please use this IC within the stated absolute maximum ratings.

Where wiring impedance is high, operations may become unstable due to noise and/or phase lag depending on output current.

Please keep the resistance low between VIN and GND wiring in particular.

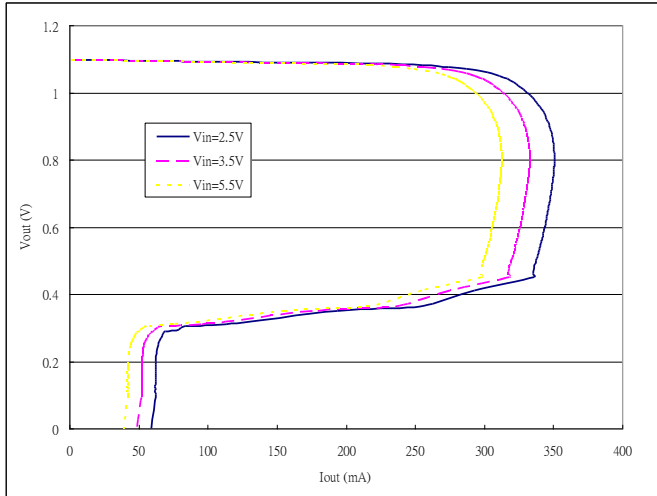
Please wire the input capacitor (C<sub>in</sub>) and the output capacitor (C<sub>out</sub>) as close to the IC as possible.

## Typical Performance Characteristics

### 1. Output Voltage vs. Output Current

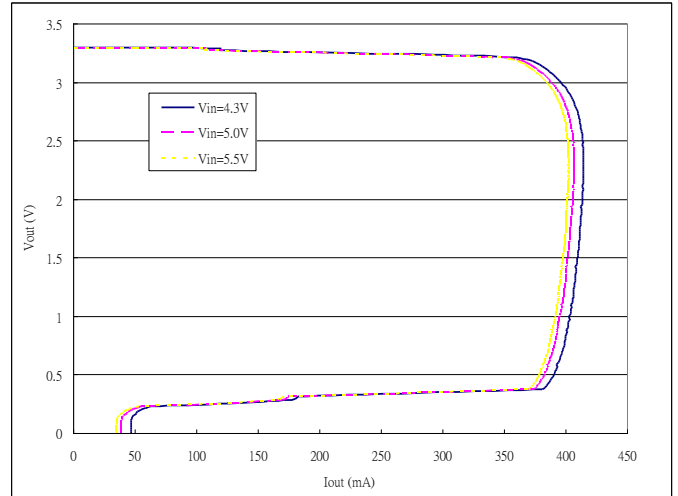
(Vout=1.1V)

Cin=0.47μF(Ceramics), Cout=0.47μF(Ceramics), TA=25°C



(Vout=3.3V)

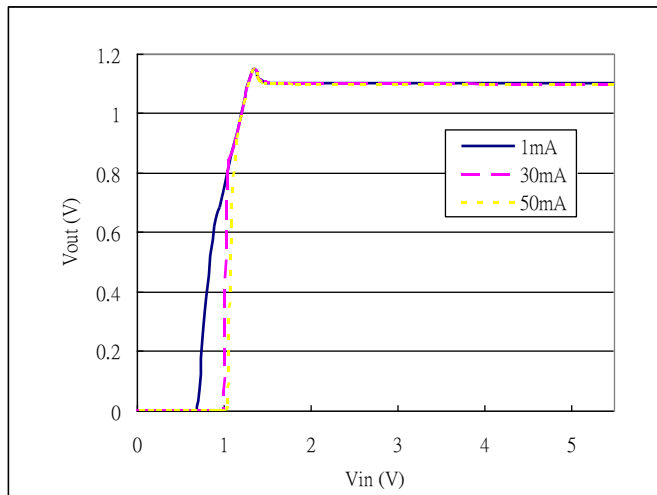
Cin=0.47μF(Ceramics), Cout=0.47μF(Ceramics), TA=25°C



### 2. Output Voltage vs. Input Voltage

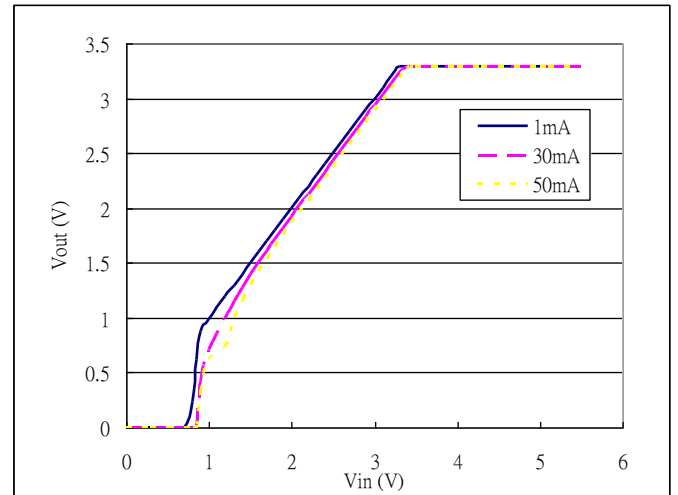
(Vout=1.1V)

Cin=0.47μF(Ceramics), Cout=0.47μF(Ceramics), TA=25°C



(Vout=3.3V)

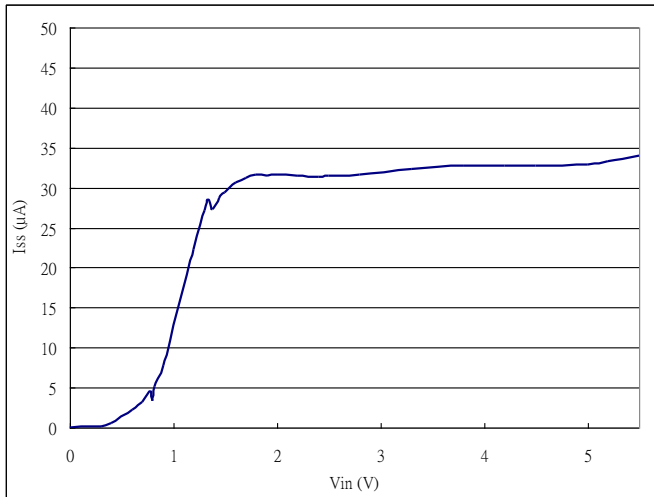
Cin=0.47μF(Ceramics), Cout=0.47μF(Ceramics), TA=25°C



**3. Supply Current vs. Input Voltage**

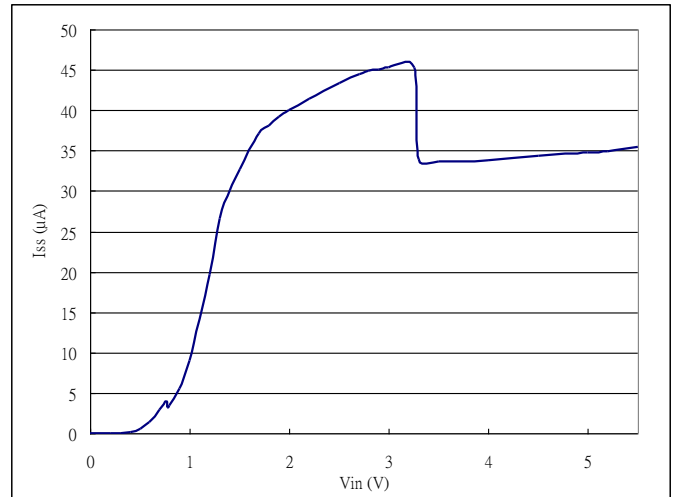
**(Vout=1.1V)**  
 Vin=2.5V

Cin=0.47μF(Ceramics), Cout=0.47μF(Ceramics), TA=25°C



**(Vout=3.3V)**  
 Vin=4.3V

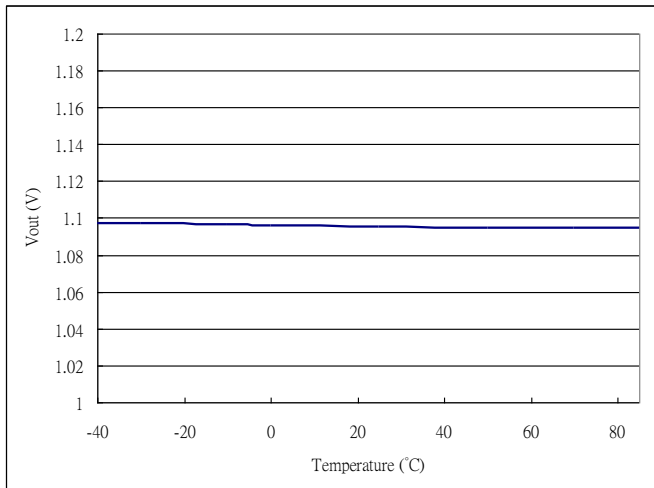
Cin=0.47μF(Ceramics), Cout=0.47μF(Ceramics), TA=25°C


**4. Output Voltage vs. Ambient Temperature**

**(Vout=1.1V)**

Vin=2.5V, IOUT=30mA

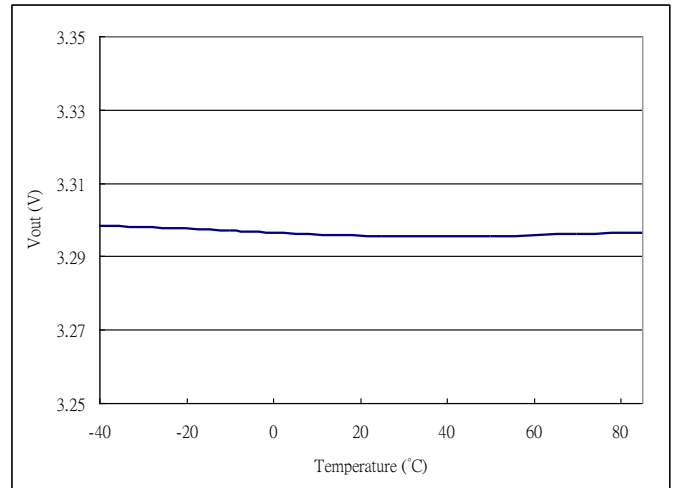
Cin=0.47μF(Ceramics), Cout=0.47μF(Ceramics), TA=25°C



**(Vout=3.3V)**

Vin=4.3V, IOUT=30mA

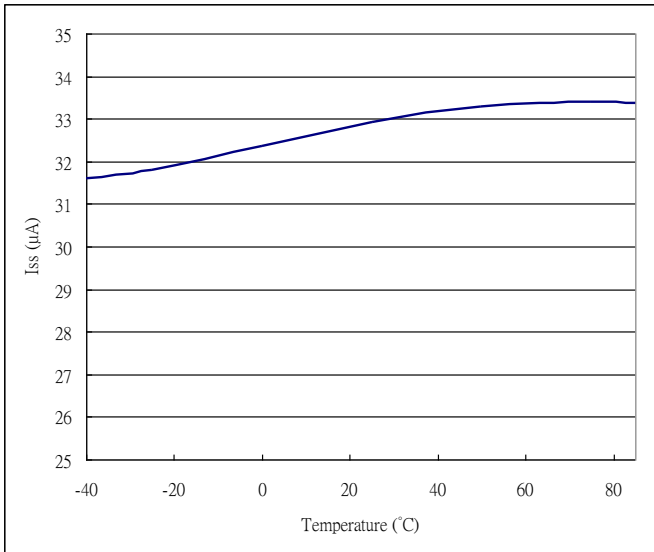
Cin=0.47μF(Ceramics), Cout=0.47μF(Ceramics), TA=25°C



**5. Supply Current vs. Ambient Temperature**

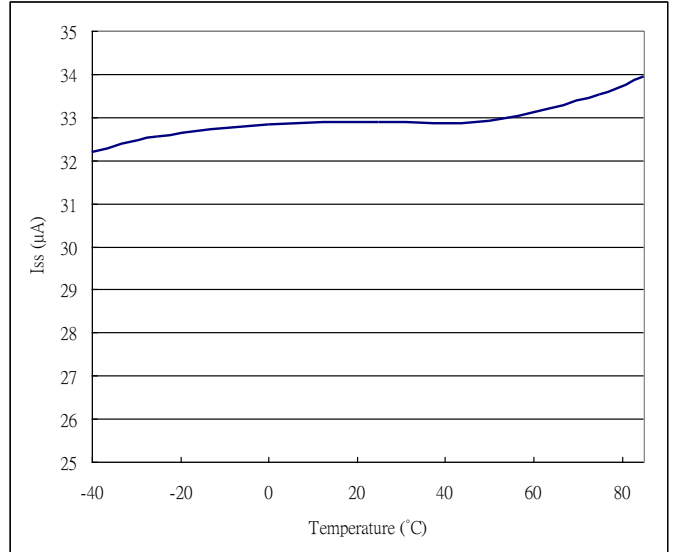
**(Vout=1.1V)**  
Vin=2.5V

Cin=0.47μF(Ceramics), Cout=0.47μF(Ceramics), TA=25°C



**(Vout=3.3V)**  
Vin=4.3V

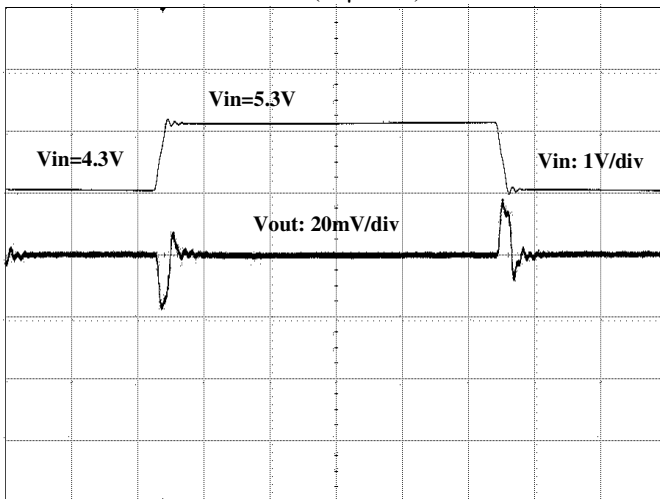
Cin=0.47μF(Ceramics), Cout=0.47μF(Ceramics), TA=25°C



**6. Line Transient Response**

**(Vout=3.3V)**

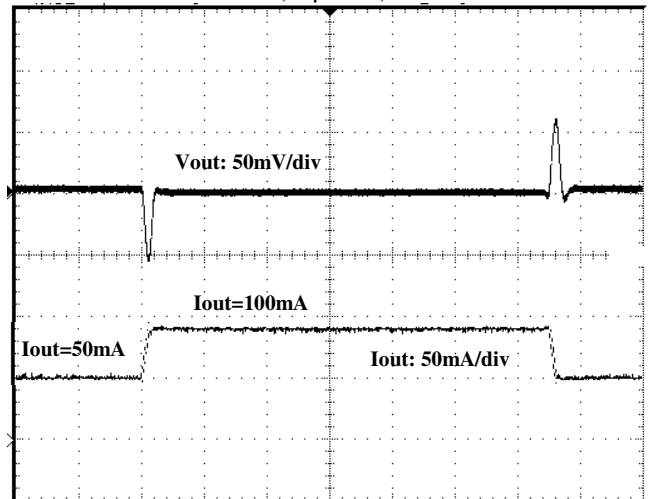
Cin=0.47μF(Ceramics), Cout=0.47μF(Ceramics), TA=25°C  
Time (50μs/div)



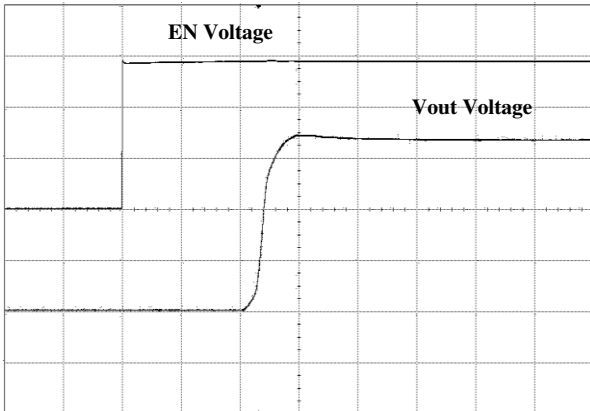
**7. Load Transient Response**

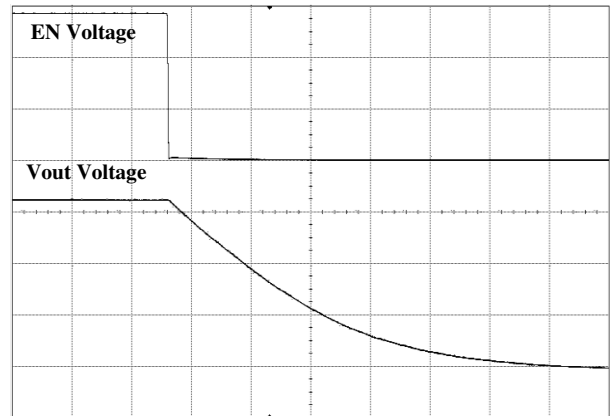
**(Vout=3.3V)**

Cin=0.47μF(Ceramics), Cout=0.47μF(Ceramics), TA=25°C  
Time (40μs/div)



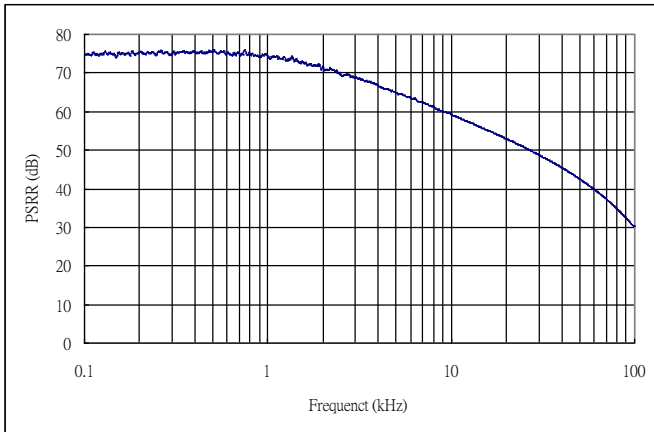
**8. Turn On Speed with EN pin**
**(Vout=3.3V)**

 Cin=0.47μF(Ceramics), Cout=0.47μF(Ceramics), TA=25°C  
 Time (20μs/div)

**9. Turn Off Speed with EN pin**
**(Vout=3.3V)**

 Cin=0.47μF(Ceramics), Cout=0.47μF(Ceramics), TA=25°C  
 Time (20μs/div)

**10. PSRR**
**(Vout=0.9V)**

Vin=3.0V DC+0.2Vp-pAC

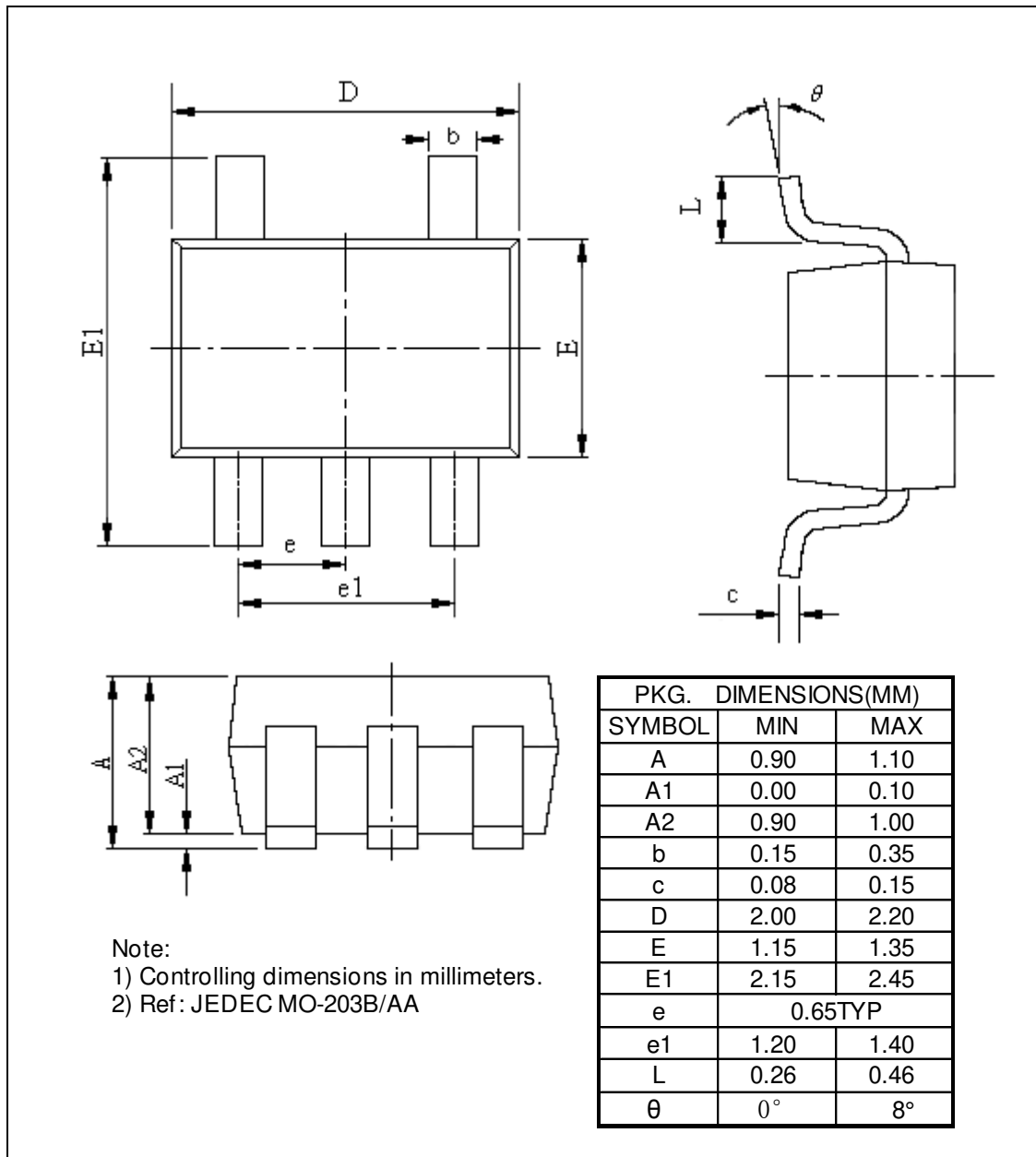
Cout=0.47uF(Ceramics), Iout=30mA



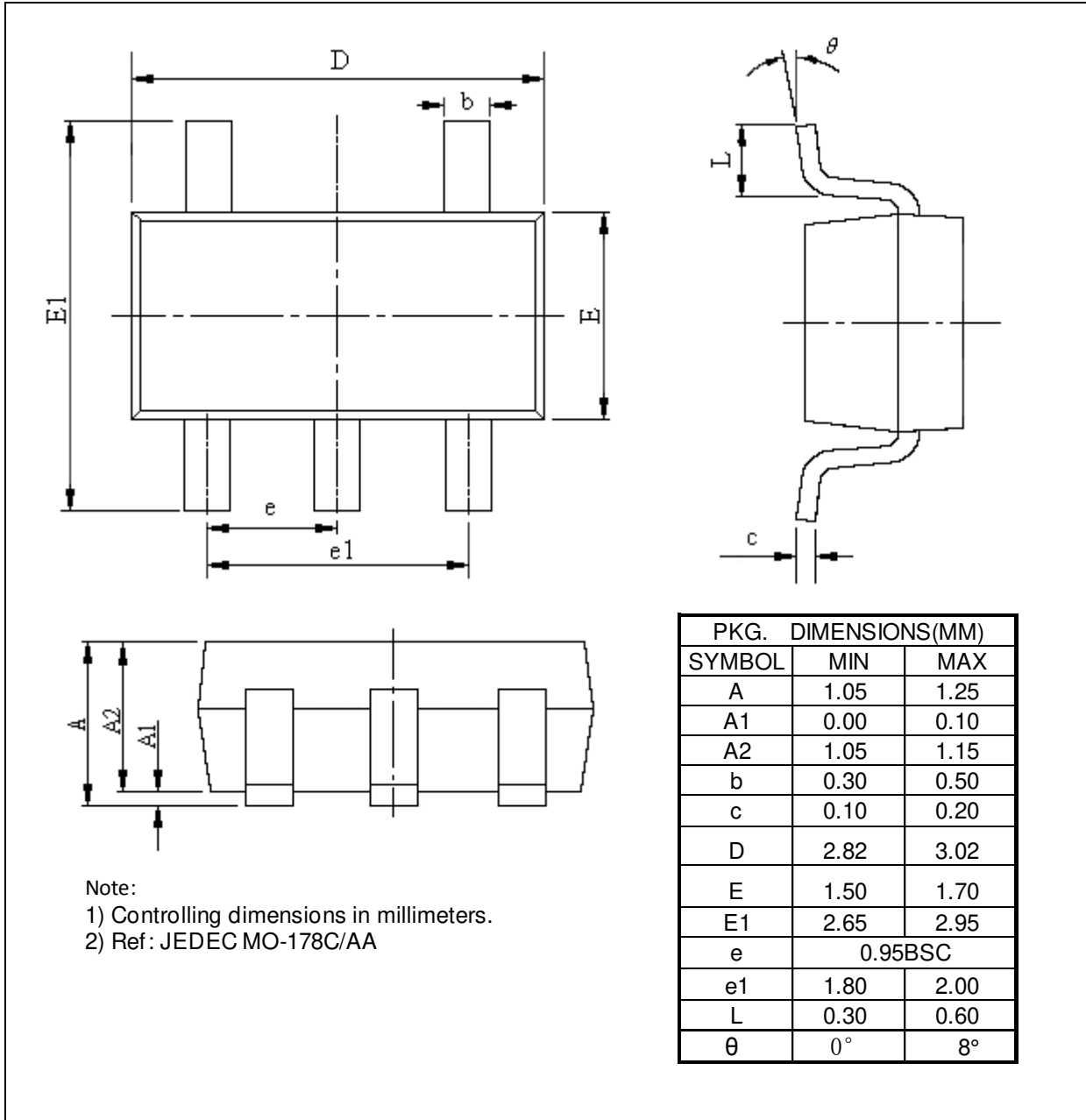


**Mechanical Information**

SC70-5L



SOT23-5L



### Ordering Information

| Part Number    | Package Code | Package                      | Top Marking      |
|----------------|--------------|------------------------------|------------------|
| PT7M8218B①②TAE | TA           | Lead Free and Green SOT23-5L | See below Table1 |
| PT7M8218B①②CE  | C            | Lead Free and Green SC70-5L  | See below Table1 |

**Notes:**

- E = Pb-free and Green
- Adding X Suffix= Tape/Reel
- “B” of PT7M8218B①② means high active for control pin “EN”
- “①②” refer to different output voltage. See below Table1
- Contact Pericom for availability.

**Table1 Sequential Number Description**

| Designator<br>①② | VOUT (V) | Top Marking | Designator<br>①② | VOUT (V) | Top Marking |
|------------------|----------|-------------|------------------|----------|-------------|
| 09               | 0.9      | j           | 22               | 2.2      | -           |
| 10               | 1.0      | -           | 23               | 2.3      | -           |
| 11               | 1.1      | k           | 24               | 2.4      | -           |
| 12               | 1.2      | m           | 25               | 2.5      | -           |
| 13               | 1.3      | -           | 26               | 2.6      | -           |
| 14               | 1.4      | -           | 27               | 2.7      | -           |
| 15               | 1.5      | -           | 28               | 2.8      | n           |
| 16               | 1.6      | -           | 29               | 2.9      | -           |
| 17               | 1.7      | -           | 30               | 3.0      | p           |
| 18               | 1.8      | -           | 31               | 3.1      | -           |
| 19               | 1.9      | -           | 32               | 3.2      | -           |
| 20               | 2.0      | -           | 33               | 3.3      | q           |
| 21               | 2.1      | -           | 2A               | 2.85     | -           |

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