



## PSM Step-up DC/DC Converter

### Features

- 1~4 Cell Alkaline Battery Operating Range
- Output Voltage Range: 2.5V~5.0V in 0.1V Increments
- Minimum External Component (L, D, C)
- 100KHz Max. Oscillation Frequency
- 75% Duty Ratio
- Up to 80% Efficiency
- $\pm 2\%$  High Output Voltage Accuracy
- $< 100\text{ppm}/^\circ\text{C}$  Temperature Coefficient
- SOT-89 and SOT-23-5 Small Packages

### Applications

- Power Source for Portable Equipments
- Handheld Computers, Palmtops
- Digital Still Cameras, Camcorders
- Cellular Phones, Pagers
- Portable Multimedia Players

### General Description

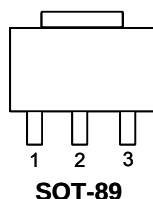
The G5130/G5131 boost converter is designed for use of main power source on portable equipments.

It consist of an oscillator, PSM control logic circuit, an embedded power MOS (LX switch), accurate voltage reference, error amplifier, feedback resistors, and LX protection circuit.

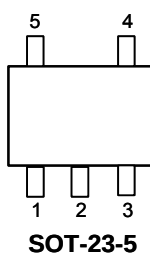
Only 3 external components (includes 1 inductor, 1 diode and 1 capacitor) are needed to construct the power application.

For larger output power application, G5131 can be used to drive an external NPN device for more input current.

### Pin Configuration

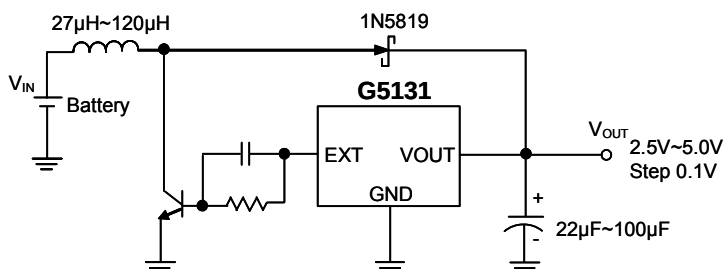
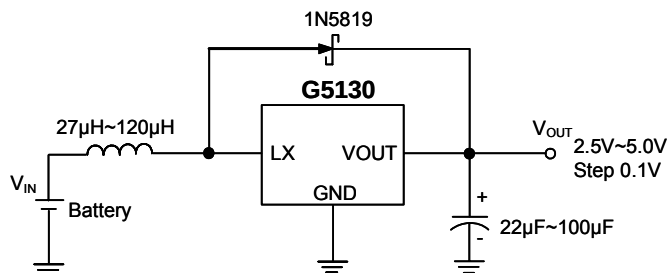


SOT-89



SOT-23-5

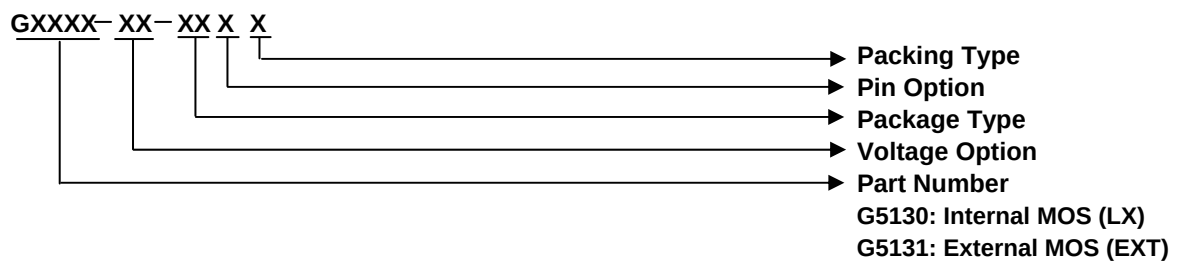
### Typical Application Circuit



**Ordering Information**

| ORDER NUMBER | ORDER NUMBER (Pb free) | MARKING | OUTPUT VOLTAGE (V) | TEMP. RANGE   | PACKAGE  |
|--------------|------------------------|---------|--------------------|---------------|----------|
| G5130-30T11U | G5130-30T11Uf          | EA30x   | 3.0                | -40°C ~ +85°C | SOT-23-5 |
| G5130-33T11U | G5130-33T11Uf          | EA33x   | 3.3                | -40°C ~ +85°C | SOT-23-5 |
| G5130-42T11U | G5130-42T11Uf          | EA42x   | 4.2                | -40°C ~ +85°C | SOT-23-5 |
| G5130-50T11U | G5130-50T11Uf          | EA50x   | 5.0                | -40°C ~ +85°C | SOT-23-5 |
| G5130-30T21U | G5130-30T21Uf          | 5130Fx  | 3.0                | -40°C ~ +85°C | SOT-89   |
| G5130-33T21U | G5130-33T21Uf          | 5130Ix  | 3.3                | -40°C ~ +85°C | SOT-89   |
| G5130-42T21U | G5130-42T21Uf          | 5130Rx  | 4.2                | -40°C ~ +85°C | SOT-89   |
| G5130-50T21U | G5130-50T21Uf          | 5130Zx  | 5.0                | -40°C ~ +85°C | SOT-89   |
| G5131-30T11U | G5131-30T11Uf          | EB30x   | 3.0                | -40°C ~ +85°C | SOT-23-5 |
| G5131-33T11U | G5131-33T11Uf          | EB33x   | 3.3                | -40°C ~ +85°C | SOT-23-5 |
| G5131-42T11U | G5131-42T11Uf          | EB42x   | 4.2                | -40°C ~ +85°C | SOT-23-5 |
| G5131-50T11U | G5131-50T11Uf          | EB50x   | 5.0                | -40°C ~ +85°C | SOT-23-5 |
| G5131-30T21U | G5131-30T21Uf          | 5131Fx  | 3.0                | -40°C ~ +85°C | SOT-89   |
| G5131-33T21U | G5131-33T21Uf          | 5131Ix  | 3.3                | -40°C ~ +85°C | SOT-89   |
| G5131-42T21U | G5131-42T21Uf          | 5131Rx  | 4.2                | -40°C ~ +85°C | SOT-89   |
| G5131-50T21U | G5131-50T21Uf          | 5131Zx  | 5.0                | -40°C ~ +85°C | SOT-89   |

For other output voltage, please contact us at sales@gmt.com.tw

**Order Number Identification****PACKAGE TYPE**

T1 : SOT-23-5

T2 : SOT-89

**PIN OPTION****SOT89**

|              | 1     | 2    | 3   |
|--------------|-------|------|-----|
| <b>G5130</b> | 1:GND | VOUT | LX  |
| <b>G5131</b> | 1:GND | VOUT | EXT |

**SOT23-5**

| 1     | 2    | 3  | 4   | 5   |
|-------|------|----|-----|-----|
| 1: CE | VOUT | NC | GND | LX  |
| 1: CE | VOUT | NC | GND | EXT |

**PACKING**

U & D: Tape & Reel Direction

**Selector Guide**

| ORDER NUMBER | ORDER NUMBER (Pb free) | OUTPUT VOLTAGE (V) | MARKING |
|--------------|------------------------|--------------------|---------|
| G5130-25T11U | G5130-25T11Uf          | 2.5                | EA25x   |
| G5130-26T11U | G5130-26T11Uf          | 2.6                | EA26x   |
| G5130-27T11U | G5130-27T11Uf          | 2.7                | EA27x   |
| G5130-28T11U | G5130-28T11Uf          | 2.8                | EA28x   |
| G5130-29T11U | G5130-29T11Uf          | 2.9                | EA29x   |
| G5130-30T11U | G5130-30T11Uf          | 3.0                | EA30x   |
| G5130-31T11U | G5130-31T11Uf          | 3.1                | EA31x   |
| G5130-32T11U | G5130-32T11Uf          | 3.2                | EA32x   |
| G5130-33T11U | G5130-33T11Uf          | 3.3                | EA33x   |
| G5130-34T11U | G5130-34T11Uf          | 3.4                | EA34x   |
| G5130-35T11U | G5130-35T11Uf          | 3.5                | EA35x   |
| G5130-36T11U | G5130-36T11Uf          | 3.6                | EA36x   |
| G5130-37T11U | G5130-37T11Uf          | 3.7                | EA37x   |
| G5130-38T11U | G5130-38T11Uf          | 3.8                | EA38x   |
| G5130-39T11U | G5130-39T11Uf          | 3.9                | EA39x   |
| G5130-40T11U | G5130-40T11Uf          | 4.0                | EA40x   |
| G5130-41T11U | G5130-41T11Uf          | 4.1                | EA41x   |
| G5130-42T11U | G5130-42T11Uf          | 4.2                | EA42x   |
| G5130-43T11U | G5130-43T11Uf          | 4.3                | EA43x   |
| G5130-44T11U | G5130-44T11Uf          | 4.4                | EA44x   |
| G5130-45T11U | G5130-45T11Uf          | 4.5                | EA45x   |
| G5130-46T11U | G5130-46T11Uf          | 4.6                | EA46x   |
| G5130-47T11U | G5130-47T11Uf          | 4.7                | EA47x   |
| G5130-48T11U | G5130-48T11Uf          | 4.8                | EA48x   |
| G5130-49T11U | G5130-49T11Uf          | 4.9                | EA49x   |
| G5130-50T11U | G5130-50T11Uf          | 5.0                | EA50x   |

**Note: T1: SOT-23-5****Selector Guide**

| ORDER NUMBER | ORDER NUMBER (Pb free) | OUTPUT VOLTAGE (V) | MARKING |
|--------------|------------------------|--------------------|---------|
| G5130-25T21U | G5130-25T21Uf          | 2.5                | 5130Ax  |
| G5130-26T21U | G5130-26T21Uf          | 2.6                | 5130Bx  |
| G5130-27T21U | G5130-27T21Uf          | 2.7                | 5130Cx  |
| G5130-28T21U | G5130-28T21Uf          | 2.8                | 5130Dx  |
| G5130-29T21U | G5130-29T21Uf          | 2.9                | 5130Ex  |
| G5130-30T21U | G5130-30T21Uf          | 3.0                | 5130Fx  |
| G5130-31T21U | G5130-31T21Uf          | 3.1                | 5130Gx  |
| G5130-32T21U | G5130-32T21Uf          | 3.2                | 5130Hx  |
| G5130-33T21U | G5130-33T21Uf          | 3.3                | 5130Ix  |
| G5130-34T21U | G5130-34T21Uf          | 3.4                | 5130Jx  |
| G5130-35T21U | G5130-35T21Uf          | 3.5                | 5130Kx  |
| G5130-36T21U | G5130-36T21Uf          | 3.6                | 5130Lx  |
| G5130-37T21U | G5130-37T21Uf          | 3.7                | 5130Mx  |
| G5130-38T21U | G5130-38T21Uf          | 3.8                | 5130Nx  |
| G5130-39T21U | G5130-39T21Uf          | 3.9                | 5130Ox  |
| G5130-40T21U | G5130-40T21Uf          | 4.0                | 5130Px  |
| G5130-41T21U | G5130-41T21Uf          | 4.1                | 5130Qx  |
| G5130-42T21U | G5130-42T21Uf          | 4.2                | 5130Rx  |
| G5130-43T21U | G5130-43T21Uf          | 4.3                | 5130Sx  |
| G5130-44T21U | G5130-44T21Uf          | 4.4                | 5130Tx  |
| G5130-45T21U | G5130-45T21Uf          | 4.5                | 5130Ux  |
| G5130-46T21U | G5130-46T21Uf          | 4.6                | 5130Vx  |
| G5130-47T21U | G5130-47T21Uf          | 4.7                | 5130Wx  |
| G5130-48T21U | G5130-48T21Uf          | 4.8                | 5130Xx  |
| G5130-49T21U | G5130-49T21Uf          | 4.9                | 5130Yx  |
| G5130-50T21U | G5130-50T21Uf          | 5.0                | 5130Zx  |

**Note: T2: SOT-89**

**Selector Guide**

| ORDER NUMBER | ORDER NUMBER (Pb free) | OUTPUT VOLTAGE (V) | MARKING |
|--------------|------------------------|--------------------|---------|
| G5131-25T11U | G5131-25T11Uf          | 2.5                | EB25x   |
| G5131-26T11U | G5131-26T11Uf          | 2.6                | EB26x   |
| G5131-27T11U | G5131-27T11Uf          | 2.7                | EB27x   |
| G5131-28T11U | G5131-28T11Uf          | 2.8                | EB28x   |
| G5131-29T11U | G5131-29T11Uf          | 2.9                | EB29x   |
| G5131-30T11U | G5131-30T11Uf          | 3.0                | EB30x   |
| G5131-31T11U | G5131-31T11Uf          | 3.1                | EB31x   |
| G5131-32T11U | G5131-32T11Uf          | 3.2                | EB32x   |
| G5131-33T11U | G5131-33T11Uf          | 3.3                | EB33x   |
| G5131-34T11U | G5131-34T11Uf          | 3.4                | EB34x   |
| G5131-35T11U | G5131-35T11Uf          | 3.5                | EB35x   |
| G5131-36T11U | G5131-36T11Uf          | 3.6                | EB36x   |
| G5131-37T11U | G5131-37T11Uf          | 3.7                | EB37x   |
| G5131-38T11U | G5131-38T11Uf          | 3.8                | EB38x   |
| G5131-39T11U | G5131-39T11Uf          | 3.9                | EB39x   |
| G5131-40T11U | G5131-40T11Uf          | 4.0                | EB40x   |
| G5131-41T11U | G5131-41T11Uf          | 4.1                | EB41x   |
| G5131-42T11U | G5131-42T11Uf          | 4.2                | EB42x   |
| G5131-43T11U | G5131-43T11Uf          | 4.3                | EB43x   |
| G5131-44T11U | G5131-44T11Uf          | 4.4                | EB44x   |
| G5131-45T11U | G5131-45T11Uf          | 4.5                | EB45x   |
| G5131-46T11U | G5131-46T11Uf          | 4.6                | EB46x   |
| G5131-47T11U | G5131-47T11Uf          | 4.7                | EB47x   |
| G5131-48T11U | G5131-48T11Uf          | 4.8                | EB48x   |
| G5131-49T11U | G5131-49T11Uf          | 4.9                | EB49x   |
| G5131-50T11U | G5131-50T11Uf          | 5.0                | EB50x   |

Note: T1: SOT-23-5

**Selector Guide**

| ORDER NUMBER | ORDER NUMBER (Pb free) | OUTPUT VOLTAGE (V) | MARKING |
|--------------|------------------------|--------------------|---------|
| G5131-25T21U | G5131-25T21Uf          | 2.5                | 5131Ax  |
| G5131-26T21U | G5131-26T21Uf          | 2.6                | 5131Bx  |
| G5131-27T21U | G5131-27T21Uf          | 2.7                | 5131Cx  |
| G5131-28T21U | G5131-28T21Uf          | 2.8                | 5131Dx  |
| G5131-29T21U | G5131-29T21Uf          | 2.9                | 5131Ex  |
| G5131-30T21U | G5131-30T21Uf          | 3.0                | 5131Fx  |
| G5131-31T21U | G5131-31T21Uf          | 3.1                | 5131Gx  |
| G5131-32T21U | G5131-32T21Uf          | 3.2                | 5131Hx  |
| G5131-33T21U | G5131-33T21Uf          | 3.3                | 5131Ix  |
| G5131-34T21U | G5131-34T21Uf          | 3.4                | 5131Jx  |
| G5131-35T21U | G5131-35T21Uf          | 3.5                | 5131Kx  |
| G5131-36T21U | G5131-36T21Uf          | 3.6                | 5131Lx  |
| G5131-37T21U | G5131-37T21Uf          | 3.7                | 5131Mx  |
| G5131-38T21U | G5131-38T21Uf          | 3.8                | 5131Nx  |
| G5131-39T21U | G5131-39T21Uf          | 3.9                | 5131Ox  |
| G5131-40T21U | G5131-40T21Uf          | 4.0                | 5131Px  |
| G5131-41T21U | G5131-41T21Uf          | 4.1                | 5131Qx  |
| G5131-42T21U | G5131-42T21Uf          | 4.2                | 5131Rx  |
| G5131-43T21U | G5131-43T21Uf          | 4.3                | 5131Sx  |
| G5131-44T21U | G5131-44T21Uf          | 4.4                | 5131Tx  |
| G5131-45T21U | G5131-45T21Uf          | 4.5                | 5131Ux  |
| G5131-46T21U | G5131-46T21Uf          | 4.6                | 5131Vx  |
| G5131-47T21U | G5131-47T21Uf          | 4.7                | 5131Wx  |
| G5131-48T21U | G5131-48T21Uf          | 4.8                | 5131Xx  |
| G5131-49T21U | G5131-49T21Uf          | 4.9                | 5131Yx  |
| G5131-50T21U | G5131-50T21Uf          | 5.0                | 5131Zx  |

Note: T2: SOT-89

**Absolute Maximum Ratings**

LX to GND.....-0.3V to +7V  
 CE to GND.....-0.3V to +7V  
 VOUT to GND.....-0.3V to +7V  
 Operating Temperature Range (Note 1).....-40°C to +85°C

Junction Temperature .....+125°C  
 Storage Temperature.....-65°C to +150°C  
 Reflow Temperature (soldering, 10 sec).....+260°C

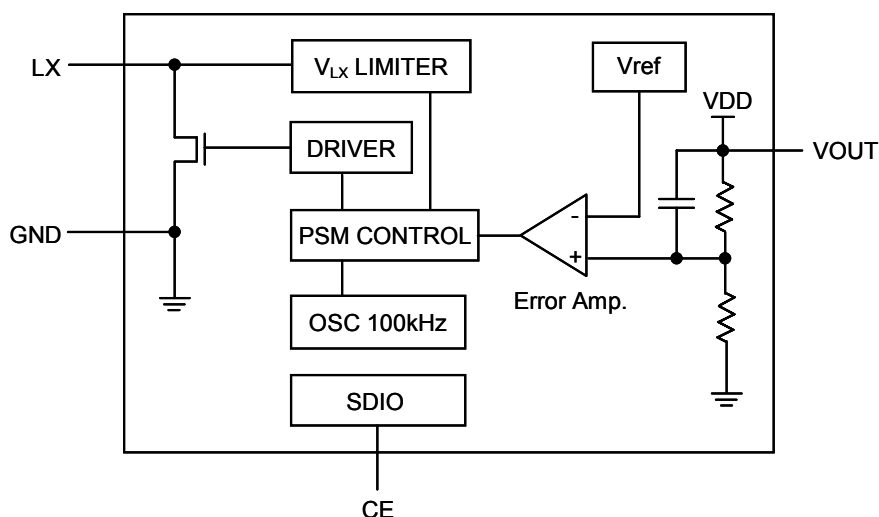
Stress beyond those listed under “Absolute Maximum Rating” may cause permanent damage to the device.

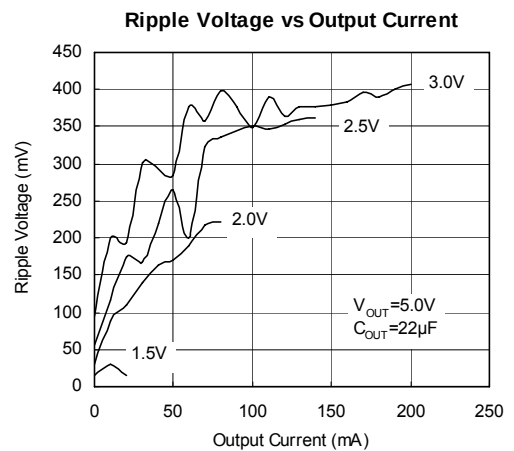
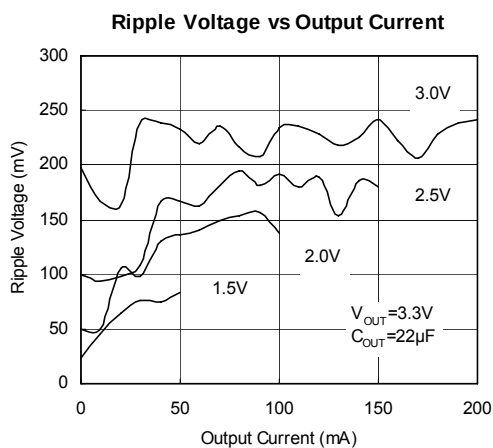
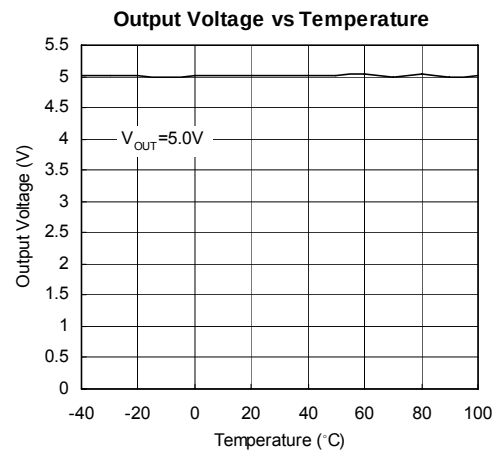
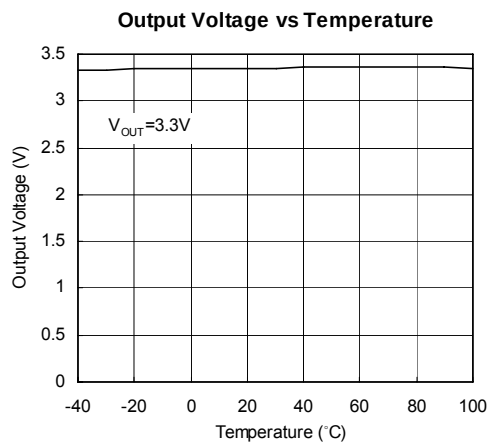
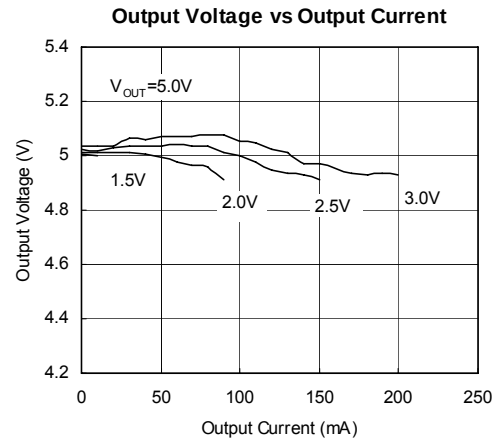
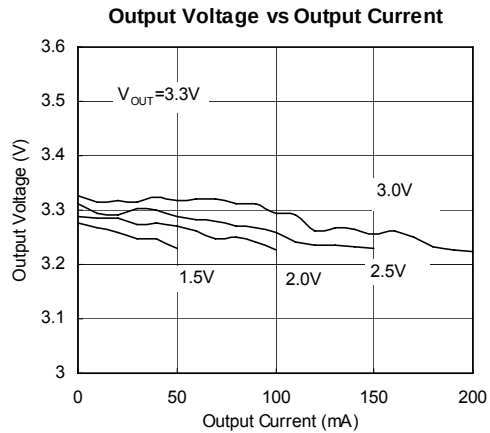
**Electrical Characteristics**

( $V_{OUT} = 3.3V$ ,  $V_{IN} = 1.8V$ ,  $T_A = 25^\circ C$ )

| PARAMETER                     | CONDITION                  | MIN | TYP | MAX | UNIT     |
|-------------------------------|----------------------------|-----|-----|-----|----------|
| Output Voltage Accuracy       |                            | -2  | --- | +2  | %        |
| Input Voltage Range           |                            | --- | --- | 6.5 | V        |
| Start-up Voltage              |                            | --- | 0.9 | --- | V        |
| Hold-on Voltage               |                            | --- | 0.5 | --- | V        |
| Input Current                 | No Switching ( $I_{DD2}$ ) | --- | 10  | 15  | $\mu A$  |
|                               | Switching ( $I_{DD1}$ )    | --- | 20  | --- | $\mu A$  |
|                               | No Load ( $I_{IN}$ )       | --- | 30  | --- | $\mu A$  |
| LX Switch On Resistance       | $V_{LX} = 0.4V$            | --- | 2   | 6   | $\Omega$ |
| LX Leakage Current            | $V_{LX} = 6.0V$            | --- | --- | 0.1 | $\mu A$  |
| Maximum Oscillation Frequency |                            | 70  | 100 | 130 | KHz      |
| Duty Cycle                    |                            | 65  | 75  | 85  | %        |
| $V_{LX}$ Voltage Limit        |                            | --- | 1   | --- | V        |
| Efficiency                    |                            | --- | 80  | --- | %        |

Note 1: The G5130 are guaranteed to meet performance specifications from 0°C to 85°C. Specifications over the -40°C to 85°C operating temperature range are assured by design, characterization and correlation with statistical process controls.

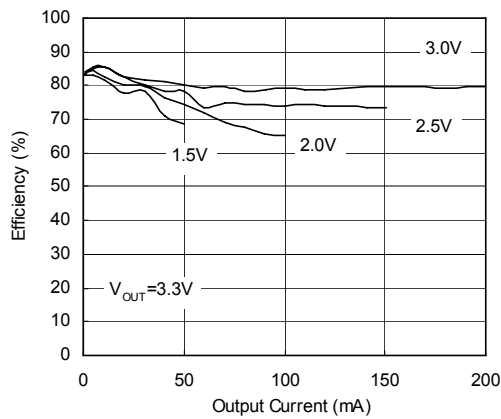
**Block Diagram**

**Typical Performance Characteristics** $(V_{IN} = +3.0V, L = 100\mu H, T_A = 25^\circ C, \text{ unless otherwise noted.})$ 

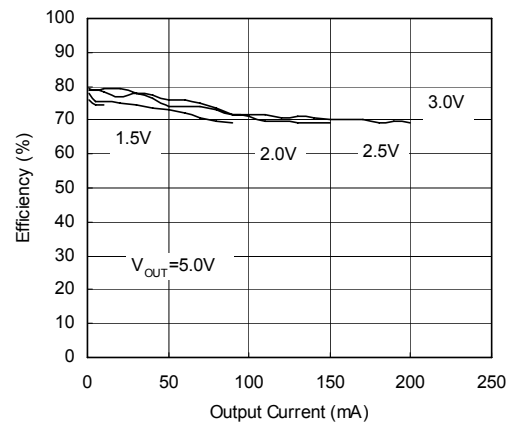


## Typical Performance Characteristics (continued)

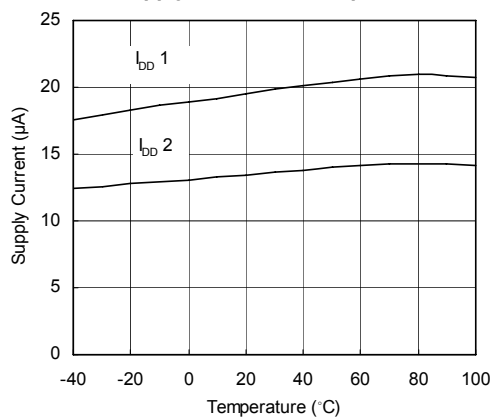
Efficiency vs. Output Current



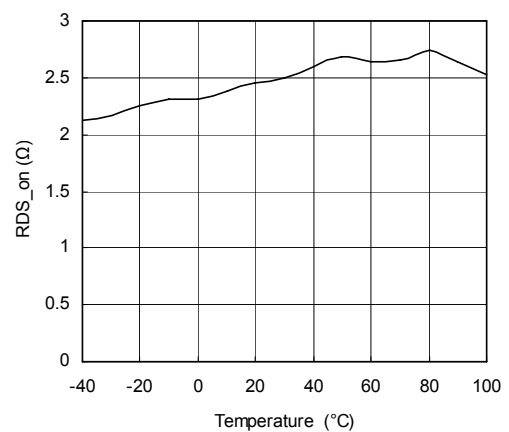
Efficiency vs. Output Current



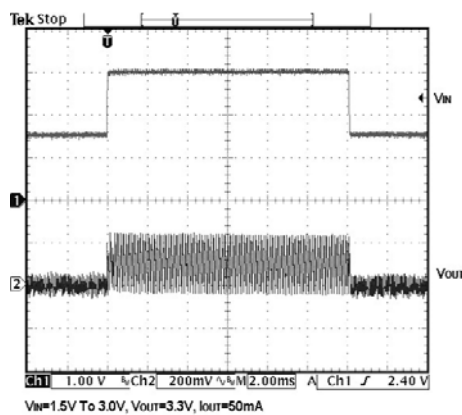
Supply Current vs Temperature



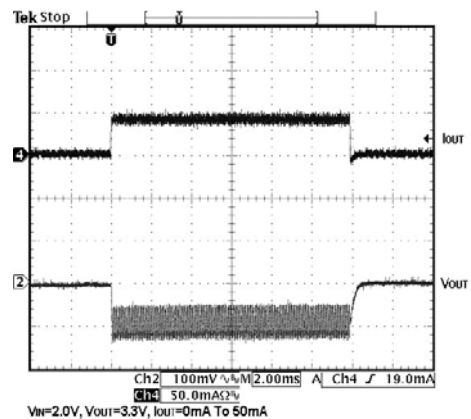
RDS\_on vs Temperature



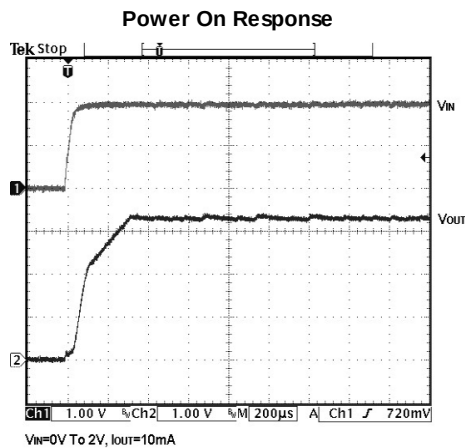
Line Transient



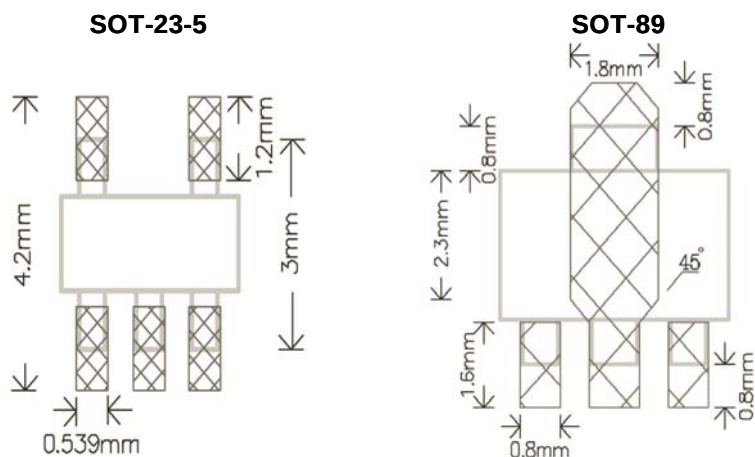
Load Transient



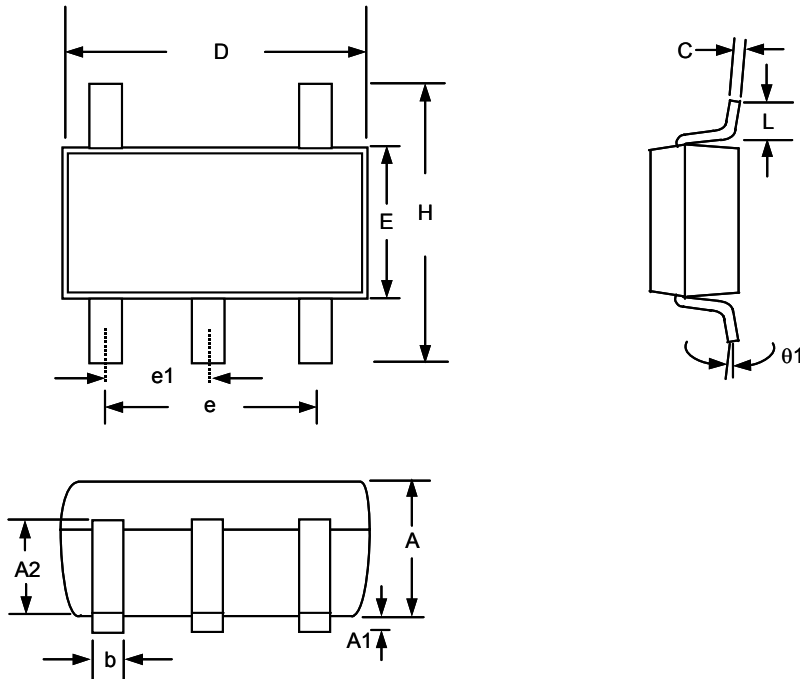
Typical Performance Characteristics (continued)



**Recommended Minimum Footprint**

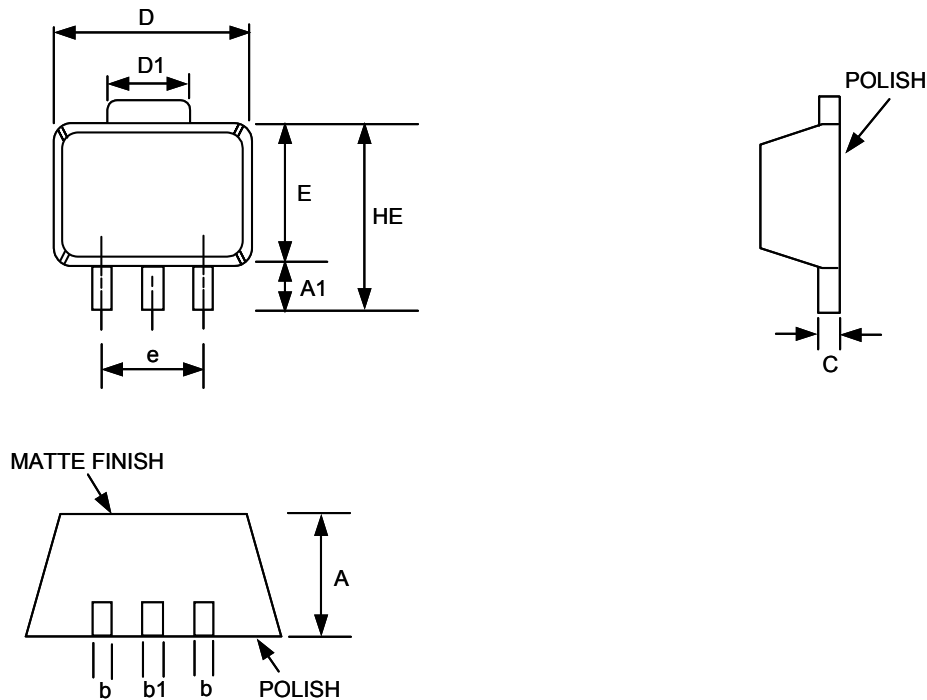




**Package Information****SOT-23-5 (T1) Package****Note:**

1. Package body sizes exclude mold flash protrusions or gate burrs
2. Tolerance  $\pm 0.1000$  mm (4mil) unless otherwise specified
3. Coplanarity: 0.1000mm
4. Dimension L is measured in gage plane

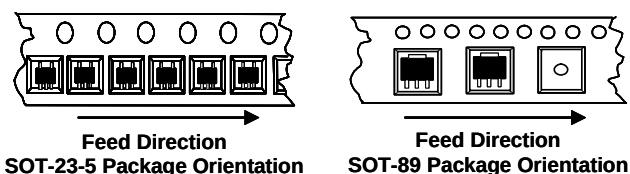
| SYMBOL     | DIMENSIONS IN MILLIMETER |           |       |
|------------|--------------------------|-----------|-------|
|            | MIN                      | NOM       | MAX   |
| A          | 1.00                     | 1.10      | 1.30  |
| A1         | 0.00                     | -----     | 0.10  |
| A2         | 0.70                     | 0.80      | 0.90  |
| b          | 0.35                     | 0.40      | 0.50  |
| C          | 0.10                     | 0.15      | 0.25  |
| D          | 2.70                     | 2.90      | 3.10  |
| E          | 1.40                     | 1.60      | 1.80  |
| e          | -----                    | 1.90(TYP) | ----- |
| e1         | -----                    | 0.95      | ----- |
| H          | 2.60                     | 2.80      | 3.00  |
| L          | 0.37                     | -----     | ----- |
| $\theta 1$ | 1°                       | 5°        | 9°    |



**SOT-89 (T2) Package**

| SYMBOL | DIMENSIONS IN MILLIMETER |       |       | DIMENSIONS IN INCH |       |       |
|--------|--------------------------|-------|-------|--------------------|-------|-------|
|        | MIN                      | NOM   | MAX   | MIN                | NOM   | MAX   |
| A      | 1.40                     | 1.50  | 1.60  | 0.055              | 0.059 | 0.063 |
| A1     | 0.80                     | 1.04  | ----- | 0.031              | 0.041 | ----- |
| b      | 0.36                     | 0.42  | 0.48  | 0.014              | 0.016 | 0.018 |
| b1     | 0.41                     | 0.47  | 0.53  | 0.016              | 0.018 | 0.020 |
| C      | 0.38                     | 0.40  | 0.43  | 0.014              | 0.015 | 0.017 |
| D      | 4.40                     | 4.50  | 4.60  | 0.173              | 0.177 | 0.181 |
| D1     | 1.40                     | 1.60  | 1.75  | 0.055              | 0.062 | 0.069 |
| HE     | -----                    | ----- | 4.25  | -----              | ----- | 0.167 |
| E      | 2.40                     | 2.50  | 2.60  | 0.094              | 0.098 | 0.102 |
| e      | 2.90                     | 3.00  | 3.10  | 0.114              | 0.118 | 0.122 |

## Taping Specification



| PACKAGE  | Q'TY/REEL |
|----------|-----------|
| SOT-23-5 | 3,000 ea  |
| SOT-89   | 1,000 ea  |

GMT Inc. does not assume any responsibility for use of any circuitry described, no circuit patent licenses are implied and GMT Inc. reserves the right at any time without notice to change said circuitry and specifications.

Компания «Life Electronics» занимается поставками электронных компонентов импортного и отечественного производства от производителей и со складов крупных дистрибьюторов Европы, Америки и Азии.

С конца 2013 года компания активно расширяет линейку поставок компонентов по направлению коаксиальный кабель, кварцевые генераторы и конденсаторы (керамические, пленочные, электролитические), за счёт заключения дистрибьюторских договоров

Мы предлагаем:

- Конкурентоспособные цены и скидки постоянным клиентам.
- Специальные условия для постоянных клиентов.
- Подбор аналогов.
- Поставку компонентов в любых объемах, удовлетворяющих вашим потребностям.
- Приемлемые сроки поставки, возможна ускоренная поставка.
- Доставку товара в любую точку России и стран СНГ.
- Комплексную поставку.
- Работу по проектам и поставку образцов.
- Формирование склада под заказчика.
- Сертификаты соответствия на поставляемую продукцию (по желанию клиента).
- Тестирование поставляемой продукции.
- Поставку компонентов, требующих военную и космическую приемку.
- Входной контроль качества.
- Наличие сертификата ISO.

В составе нашей компании организован Конструкторский отдел, призванный помогать разработчикам, и инженерам.

Конструкторский отдел помогает осуществить:

- Регистрацию проекта у производителя компонентов.
- Техническую поддержку проекта.
- Защиту от снятия компонента с производства.
- Оценку стоимости проекта по компонентам.
- Изготовление тестовой платы монтаж и пусконаладочные работы.



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