

## Features

- SMD package with industry standard pinout
- Operating temperature range -40 ~ +90°C
- Comply to EN55032 radiated Class B without additional components
- High efficiency up to 84%
- Protection: Short circuit
- 1.5KVDC I/O isolation
- Low cost
- Optional reel packing
- 3 years warranty

## Applications

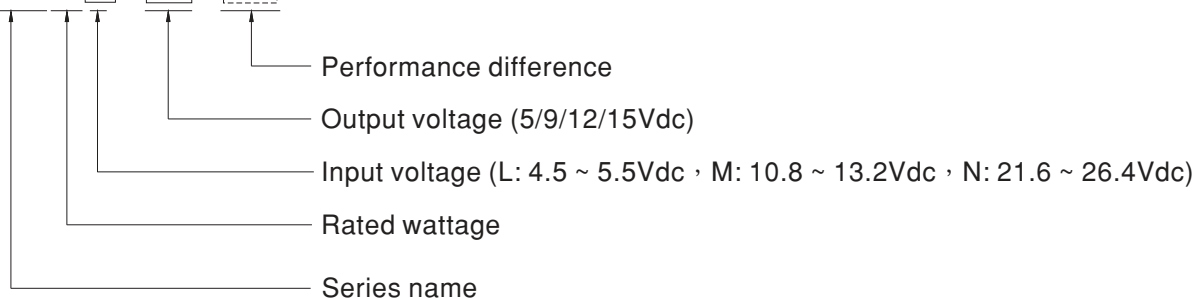
- Telecom/datacom system
- Wireless network
- Industrial control facility
- Instrument
- Analyzer
- Detector
- Data switch

## Description

SBTN01 series is 1W isolated and unregulated module type DC-DC converter with SMD package. It features international standard pins, a high efficiency up to 84%, wide working temperature range -40~+90°C, 1.5KVDC I/P-O/P isolation voltage, compliance to EN55032 radiated Class B without additional components, short circuit protection, etc. The models account for different input voltage 5V/12V/24V±10%, and various output voltage, 5V/9V/12V/15V for single output which are suitable for all kinds of systems, Such as industrial control, telecommunication field, distributed power architecture, and so on.

## Model Encoding

SBTN01L-12-SC



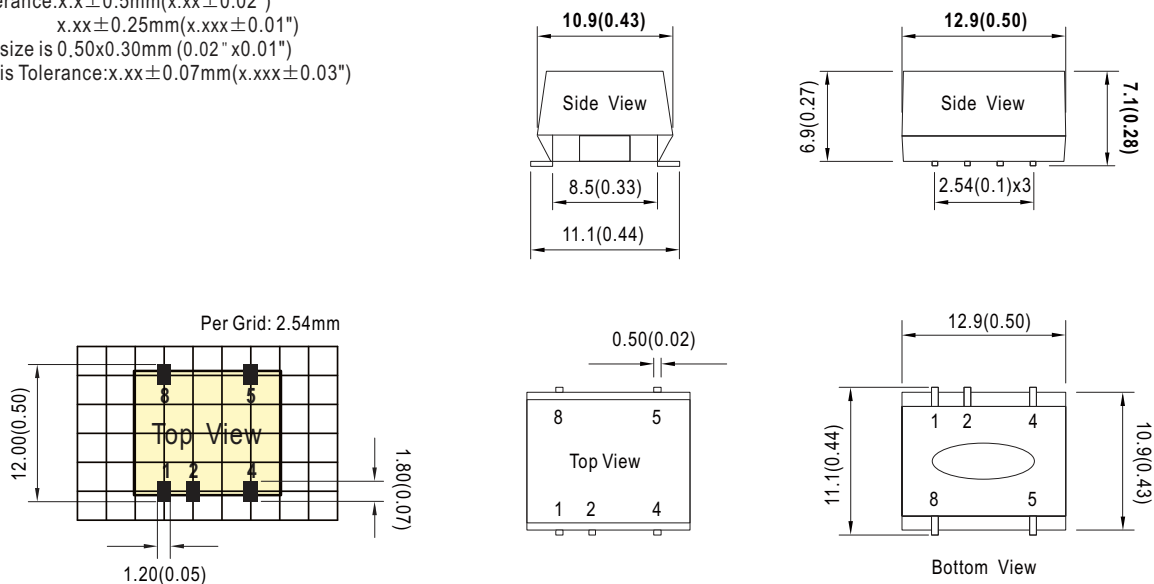
| Type  | Description                                                       | Note     |
|-------|-------------------------------------------------------------------|----------|
| Blank | -40~+90°C working temperature with max. 1 second short protection | In Stock |
| SC    | -40~+105°C working temperature with continuous short protection   | Optional |

| MODEL SELECTION TABLE |                          |               |           |                   |                   |                      |                          |
|-----------------------|--------------------------|---------------|-----------|-------------------|-------------------|----------------------|--------------------------|
| ORDER NO.             | INPUT                    |               |           | OUTPUT            |                   | EFFICIENCY<br>(TYP.) | CAPACITOR LOAD<br>(MAX.) |
|                       | INPUT VOLTAGE<br>(RANGE) | INPUT CURRENT |           | OUTPUT<br>VOLTAGE | OUTPUT<br>CURRENT |                      |                          |
|                       |                          | NO LOAD       | FULL LOAD |                   |                   |                      |                          |
| SBTN01L-05            | 5V<br>(4.5 ~ 5.5V)       | 30mA          | 270mA     | 5V                | 20 ~ 200mA        | 78%                  | 220μF                    |
| SBTN01L-09            |                          | 35mA          | 260mA     | 9V                | 11.1 ~ 111mA      | 77%                  | 220μF                    |
| SBTN01L-12            |                          | 30mA          | 257mA     | 12V               | 8.4 ~ 84mA        | 80%                  | 220μF                    |
| SBTN01L-15            |                          | 30mA          | 253mA     | 15V               | 6.7 ~ 67mA        | 79%                  | 220μF                    |
| SBTN01M-05            | 12V<br>(10.8 ~ 13.2V)    | 12mA          | 112mA     | 5V                | 20 ~ 200mA        | 79%                  | 220μF                    |
| SBTN01M-09            |                          | 14mA          | 107mA     | 9V                | 11.1 ~ 111mA      | 78%                  | 220μF                    |
| SBTN01M-12            |                          | 12mA          | 102mA     | 12V               | 8.4 ~ 84mA        | 84%                  | 220μF                    |
| SBTN01M-15            |                          | 12mA          | 102mA     | 15V               | 6.7 ~ 67mA        | 83%                  | 220μF                    |
| SBTN01N-05            | 24V<br>(21.6 ~ 26.4V)    | 11mA          | 54mA      | 5V                | 20 ~ 200mA        | 77%                  | 220μF                    |
| SBTN01N-09            |                          | 11mA          | 55mA      | 9V                | 11.1 ~ 111mA      | 76%                  | 220μF                    |
| SBTN01N-12            |                          | 11mA          | 54mA      | 12V               | 8.4 ~ 84mA        | 79%                  | 220μF                    |
| SBTN01N-15            |                          | 11mA          | 54mA      | 15V               | 6.7 ~ 67mA        | 78%                  | 220μF                    |

| SPECIFICATION             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                             |                  |                                           |
|---------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------|------------------|-------------------------------------------|
| INPUT                     | VOLTAGE RANGE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | L: 4.5 ~ 5.5Vdc , M: 10.8 ~ 13.2Vdc , N: 21.6 ~ 26.4Vdc                                                                     |                  |                                           |
|                           | SURGE VOLTAGE (100ms max.)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 5Vin models : 9Vdc ; 12Vin models : 16Vdc ; 24Vin models : 30Vdc                                                            |                  |                                           |
|                           | FILTER                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Internal capacitor                                                                                                          |                  |                                           |
|                           | PROTECTION                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Fuse recommended. 5Vin models: 750mA Slow-Blow Type, 12Vin models: 300mA Slow-Blow Type, 24Vin models: 150mA Slow-Blow Type |                  |                                           |
|                           | INTERNAL POWER DISSIPATION                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 500mW                                                                                                                       |                  |                                           |
| OUTPUT                    | VOLTAGE ACCURACY                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | ±2.0%                                                                                                                       |                  |                                           |
|                           | RATED POWER                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 1W                                                                                                                          |                  |                                           |
|                           | RIPPLE & NOISE   Note.2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 75mVp-p                                                                                                                     |                  |                                           |
|                           | LINE REGULATION   Note.3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 1.2% for 1% input variation                                                                                                 |                  |                                           |
|                           | LOAD REGULATION   Note.4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | ±8%                                                                                                                         |                  |                                           |
|                           | SWITCHING FREQUENCY (Typ.)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 100KHz                                                                                                                      |                  |                                           |
| PROTECTION                | SHORT CIRCUIT                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Standard model: 0.5 second max. Optional models (SC-suffix): Continuous                                                     |                  |                                           |
| ENVIRONMENT               | COOLING                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Free-air convection                                                                                                         |                  |                                           |
|                           | WORKING TEMP.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Standard model: -40 ~ +90℃ (Refer to "Derating Curve") ; Optional models (SC-suffix): -40 ~ +105℃                           |                  |                                           |
|                           | CASE TEMPERATURE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | +100℃ max.                                                                                                                  |                  |                                           |
|                           | WORKING HUMIDITY                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 20% ~ 90% RH non-condensing                                                                                                 |                  |                                           |
|                           | STORAGE TEMP., HUMIDITY                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | -55 ~ +125℃, 10 ~ 95% RH non-condensing                                                                                     |                  |                                           |
|                           | TEMP. COEFFICIENT                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 0.03% / °C (0 ~ 85℃)                                                                                                        |                  |                                           |
|                           | SOLDERING TEMPERATURE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 1.5mm from case of 1 ~ 10sec./240℃ max.                                                                                     |                  |                                           |
|                           | VIBRATION                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 10 ~ 500Hz, 2G 10min./1cycle, period for 60min. each along X, Y, Z axes                                                     |                  |                                           |
| SAFETY & EMC<br>( Note.5) | SAFETY STANDARDS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | UL62368-1(Except for 9V output models), EAC TP TC 004 approved                                                              |                  |                                           |
|                           | WITHSTAND VOLTAGE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | I/P-O/P:1.5KVDC                                                                                                             |                  |                                           |
|                           | ISOLATION RESISTANCE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | I/P-O/P:100M Ohms / 500VDC / 25℃ / 70% RH                                                                                   |                  |                                           |
|                           | ISOLATION CAPACITANCE (Typ.)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 80pF                                                                                                                        |                  |                                           |
|                           | EMC EMISSION                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Parameter                                                                                                                   | Standard         | Test Level / Note( Note.6)                |
|                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Conducted                                                                                                                   | EN55032(CISPR32) | N/A                                       |
|                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Radiated                                                                                                                    | EN55032(CISPR32) | Class B                                   |
|                           | EMC IMMUNITY                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Parameter                                                                                                                   | Standard         | Test Level / Note                         |
|                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | ESD                                                                                                                         | EN61000-4-2      | Level 3, ±8KV air ; Level 2, ±4KV contact |
|                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Radiated Susceptibility                                                                                                     | EN61000-4-3      | Level 2, 3V/m                             |
|                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | EFT/Burest                                                                                                                  | EN61000-4-4      | Level 1, 0.5KV at power                   |
|                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Surge                                                                                                                       | EN61000-4-5      | Level 2, 0.5KV Line-Line                  |
|                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Conducted                                                                                                                   | EN61000-4-6      | Level 2, 3V(e.m.f.)                       |
| Magnetic Field            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | EN61000-4-8                                                                                                                 | Level 1, 1A/m    |                                           |
|                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                             |                  |                                           |
| OTHERS                    | MTBF                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 880Khrs min.   MIL-HDBK-217F(25℃)                                                                                           |                  |                                           |
|                           | DIMENSION (L*W*H)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 12.9*10.9*7.1mm (0.50*0.43*0.28 inch)                                                                                       |                  |                                           |
|                           | CASE MATERIAL                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Non-Conductive black plastic (UL 94V-0 rated)                                                                               |                  |                                           |
|                           | PACKING                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 1.1g                                                                                                                        |                  |                                           |
| NOTE                      | 1.All parameters are specified at normal input(L:5Vdc, M:12Vdc, N:24Vdc), rated load, 25℃ 70% RH ambient.<br>2.Ripple & noise are measured at 20MHz by using a 12" twisted pair terminated with a 0.1µf & 47µf capacitor.<br>3.Line regulation is measured from low line to high line at rated load.<br>4.Load regulation is measured from 10% to 100% rated load.<br>5.The final equipment must be re-confirm that it still meet EMC directives. For guidance on how to perform these EMC tests, please refer to “EMI testing of component power supplies.”(as available on http://www.meanwell.com)<br>6.An external input filter capacitor is required if the module has to meet EN61000-4-4, EN61000-4-5.<br>The filter capacitor Power Mate suggest: 220uF/100V. |                                                                                                                             |                  |                                           |

### Mechanical Specification

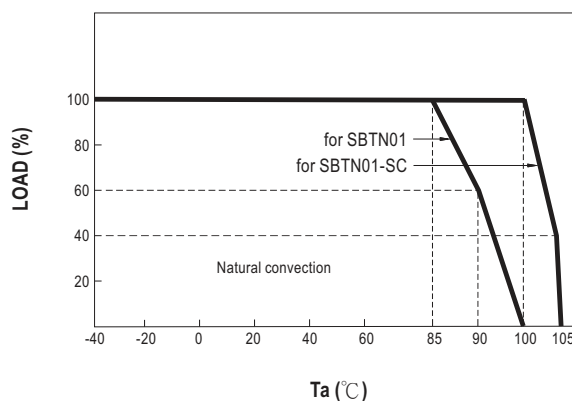
- All dimensions in mm(inch)
- Tolerance:  $x.xx \pm 0.5\text{mm}$  ( $x.xx \pm 0.02"$ )  
 $x.xx \pm 0.25\text{mm}$  ( $x.xxx \pm 0.01"$ )
- Pin size is  $0.50 \times 0.30\text{mm}$  ( $0.02" \times 0.01"$ )
- Pin is Tolerance:  $x.xx \pm 0.07\text{mm}$  ( $x.xxx \pm 0.03"$ )



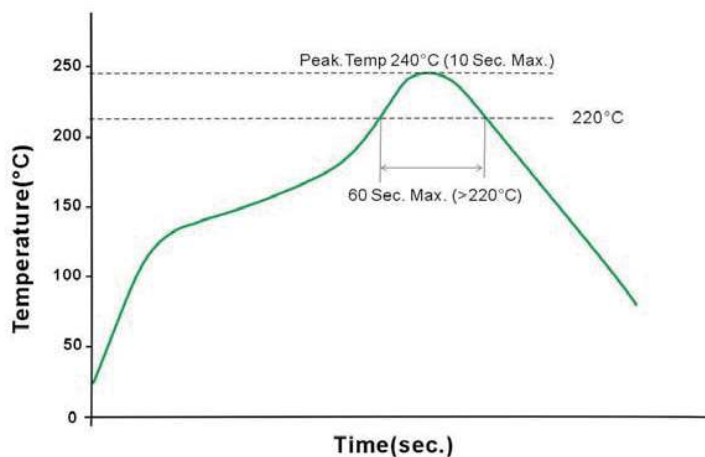
### Plug Assignment

| Pin No. | Pin-Out |
|---------|---------|
| 1       | -Vin    |
| 2       | +Vin    |
| 4       | -Vout   |
| 5       | +Vout   |
| 8       | N.C.    |

### Derating Curve



### Reflow Soldering Curve



Remark: The curve applies only to the hot air reflow soldering.

