# MV1012SC

## IC for LED Lighting

### Feature

- Critical conduction mode
- Gate output stop function
- Linear / PWM Dimming
- Deep dimming (1% or less)
- Vcc over voltage protection (latch)
- LED short-circuit protection (auto reset)
- Pb free
- RoHS:Yes

### Outline

**House Name:** SOP8J

## 1 絶対最大定格(Ta=25℃)
## 1 Absolute Maximum Ratings (at Ta=25℃)
### 1-1 熱規格
### 1-1 Thermal Ratings

| 項目<br>Item | 記 号<br>Symbol | 規 格 値<br>Ratings | 単位<br>Unit |
|---|---|---|---|
| 保存温度<br>Storage temperature | Tstg | −55～150 | ℃ |
| 接合部温度<br>Junction temperature | Tj | −40～150 | ℃ |
| 許容損失<br>Total power dissipation | Pt | 1.5 | W |

### 1-2 電気的規格
### 1-2 Electrical Ratings

| 項目<br>Item | 記 号<br>Symbol | 規 格 値<br>Ratings | 単位<br>Unit |
|---|---|---|---|
| Vcc端子最大印加電圧<br>Vcc maximum applied voltage | Vcc | 22 | V |
| Vcc端子逆バイアス電圧<br>Vcc reverse bias voltage | ----- | −0.5 | V |
| Svout, Svin, CS, REF端子最大印加電圧<br>Svout, Svin, CS, REF maximum applied voltage | Vsvout, Vsvin, Vcs, Vref, | 5.5 | V |
| Svin, CS, REF端子逆バイアス電圧<br>Svin, CS, REF reverse bias voltage | ----- | −0.5 | V |
| Svout 端子最大電流<br>Svout maximum current | Isvout | −2 | mA |

注意 ：本仕様書に記載されていない項目、使用条件、論理の組み合わせでの使用は保証していません。
記載されている以外の条件で使用する場合は必ず事前に当社担当営業部門までご相談下さい。
記載内容は改良などのためにお断り無しに変更することがあります。

Notes ：Using with parameters, condition of use and logic controls that are not specified in the specifications are not assured.
When used with the conditions that are not specified, please consult us in advance.
The contents described herein are subject to change without notice.

## 2 推奨動作条件
## 2 Recommended Operation Conditions

| 項目<br>Item | 記 号<br>Symbol | 推 奨 値<br>Recommended value | | | 単位<br>Unit |
|---|---|---|---|---|---|
| | | min | typ | max | |
| 動作温度<br>Operating temperature | Top | −30 | --- | 125 | ℃ |
| Vcc端子印加電圧<br>Vcc applied voltage | Vcc | 9 | --- | 16 | V |

注意 ：上記の規格範囲内においても、製品寿命に関しましてはお客様の使用環境により異なりますので、長寿命を期待される製品にご使用される場合には、Tj=100℃以下でご使用頂く事を推奨致します。

Notes ：The product life depends on the condition of use even within the above operating conditions.
Using at Tj = 100℃ or less is recommended for the equipment where a long life is expected.

## 3 電気的・熱的特性 (Ta=25℃)
## 3 Electrical/Thermal Characteristics (at Ta=25℃)

| 項目 Item | 記号 Symbol | 条件 Condition | 規格値 Ratings min | typ | max | 単位 Unit |
|---|---|---|---|---|---|---|
| **Vcc端子 (Vcc Terminal)** | | | | | | |
| 動作開始電圧 Start up supply voltage | Vcc_start | | 6.6 | 7.2 | 7.8 | V |
| ヒステリシス電圧 Hysteresis voltage | Vcc_hys | | 0.8 | 0.9 | 1.0 | V |
| Vcc電流(動作時1) Vcc current (active mode1) | Icc_act1 | Vcc=9V、Gate=OPEN | 0.6 | 1.1 | 1.6 | mA |
| Vcc電流(動作時2) Vcc current (active mode2) | Icc_act2 | Vcc=9V、Gate=1000pF、50kHz | 1.2 | 1.7 | 2.2 | mA |
| Vcc電流(起動前) Vcc current (stand-by) | Icc_stby | Vcc=Vcc_start-0.5V | 1.6 | 2.0 | 2.4 | mA |
| Vcc過電圧保護電圧 Vcc over voltage threshold | VccOVP | | 19.7 | 20.7 | 21.7 | V |
| **Gate端子 (Gate Terminal)** | | | | | | |
| Gate High電圧 Gate voltage (high level) | VG_H | | Vcc-0.2 | --- | --- | V |
| Gate Low電圧 Gate voltage (low level) | VG_L | | --- | --- | 0.2 | V |
| ソース電流 Sourcing current | IG_source | Vcc=9V、Gate=0V | -50 | -40 | -30 | mA |
| シンク電流 Sinking current | IG_sink | Vcc=9V、Gate=9V | 350 | 425 | 500 | mA |
| **Svin、Svout端子 (Svin,Svout Terminal)** | | | | | | |
| Svin端子内部プルダウン抵抗 Internal pull-down resistance at Svin | R_Svin | | 22.5 | 25.0 | 27.5 | kΩ |
| Svout端子内部プルダウン抵抗 Internal pull-down resistance at Svout | R_Svout | | 22.5 | 25.0 | 27.5 | kΩ |
| 内部プルダウン抵抗相対精度 Relative accuracy of internal pull-down resistance | R_Svratio | R_Svin / R_Svout | 0.98 | 1.00 | 1.02 | - |
| 応答遅れ時間 *1 Delay time from Sv-detection to GATE-on | $Td_{on}$ | Gate=OPEN | --- | 100 | --- | ns |

*1 設計保証
*1 This parameter is not tested during production,by design it is guaranteed.

| 項目<br>Item | 記 号<br>Symbol | 条 件<br>Condition | 規 格 値<br>Ratings | | | 単位<br>Unit |
|---|---|---|---|---|---|---|
| | | | min | typ | max | |
| **CS端子 (CS Terminal)** | | | | | | |
| 電流検出しきい値(REF=4V)<br>Current sense threshold voltage | Vth_CS | Vcc=9V、REF=4V | 0.465 | 0.495 | 0.525 | V |
| 電流検出しきい値(REF=2.4V)<br>Current sense threshold voltage | Vth_CS_2_4 | Vcc=9V、REF=2.4V | 0.450 | 0.480 | 0.510 | V |
| 電流検出しきい値(REF=1.0V)<br>Current sense threshold voltage | Vth_CS_1_0 | Vcc=9V、REF=1.0V | 0.170 | 0.200 | 0.230 | V |
| 応答遅れ時間 *1<br>Delay time from CS-detection to GATE-off | $Td_{off}$ | Gate=OPEN | --- | 100 | --- | ns |
| リーディングエッジブランク時間<br>*1 Leading Edge Blanking time | T_LEB | | --- | 200 | --- | ns |
| **REF端子 (REF Terminal)** | | | | | | |
| REF入力電圧(最大出力電流)<br>REF input voltage(maximum output current) | Vref_H | | 2.6 | --- | --- | V |
| 発振停止REF端子しきい値電圧<br>GATE-off REF threshold voltage | Vth_REF_sp | | 0.15 | 0.185 | 0.22 | V |
| REF端子プルアップ電流<br>REF pull-up current | I_ref | REF=0V | -42 | -32 | -22 | μA |
| 最大オフ時間<br>Maximum off time | Toff_max | REF=Vth_REF_sp+10mV | 48 | 60 | 72 | μs |
| 最小オフ時間<br>Minimum off time | Toff_min | REF=4V | 1.8 | 2.4 | 3.0 | μs |
| 最大オン時間<br>Maximum on time | Ton_max | | 21 | 27 | 33 | μs |
| 最小オン時間 *1<br>Minimum on time | Ton_min | | --- | 250 | 500 | ns |
| **PWM調光_入力信号 (PWM Dimming_input signal)** | | | | | | |
| PWM信号最大周波数<br>PWM signal maximum frequency | f_PWM | | --- | --- | 1 | kHz |
| PWM信号最小ON_DUTY<br>PWM signal minimum On-Duty | Duty_PWM | | 1 | --- | --- | % |

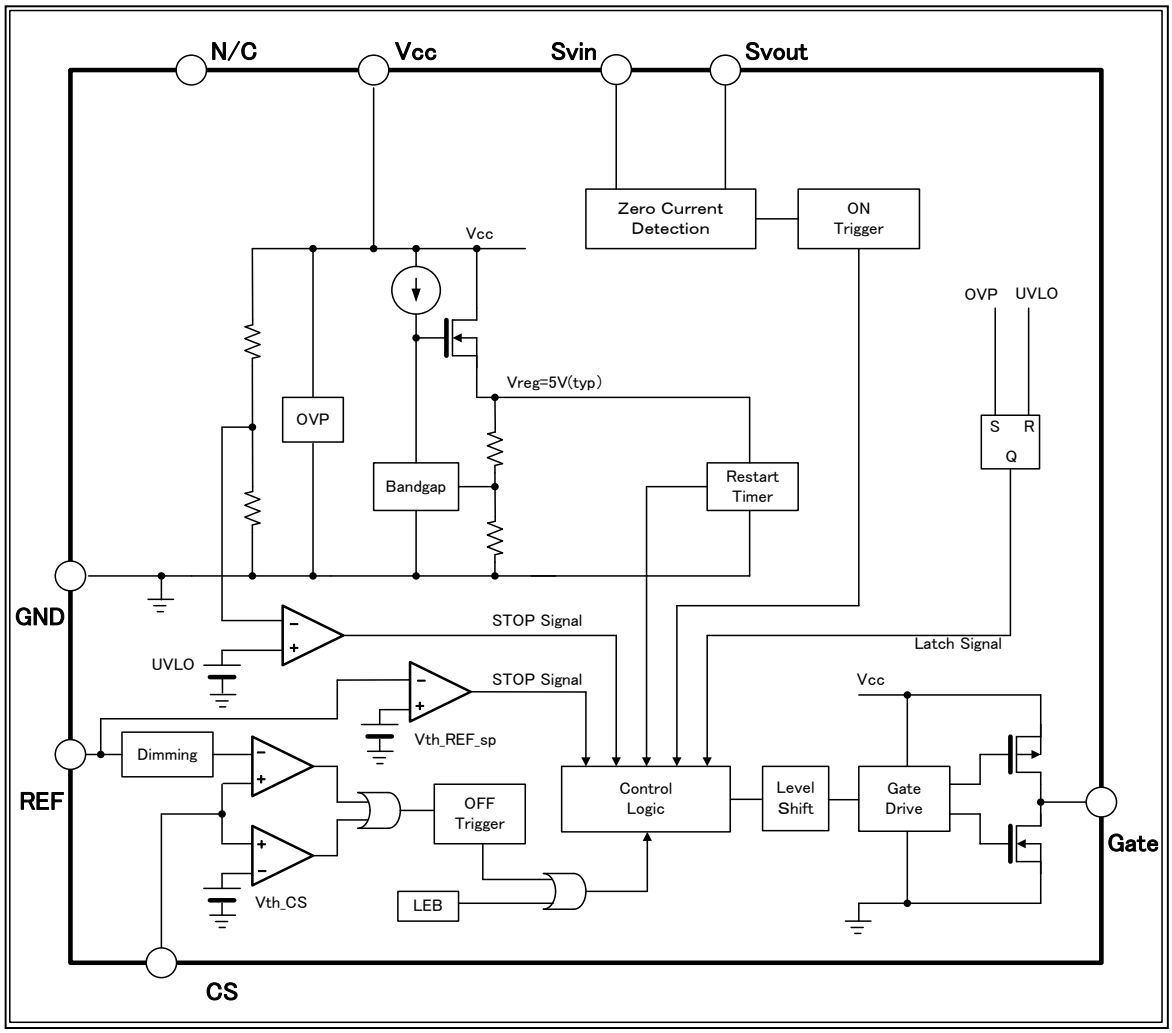
*1 設計保証

*1 This parameter is not tested during production,by design it is guaranteed.

**その他 (others)**

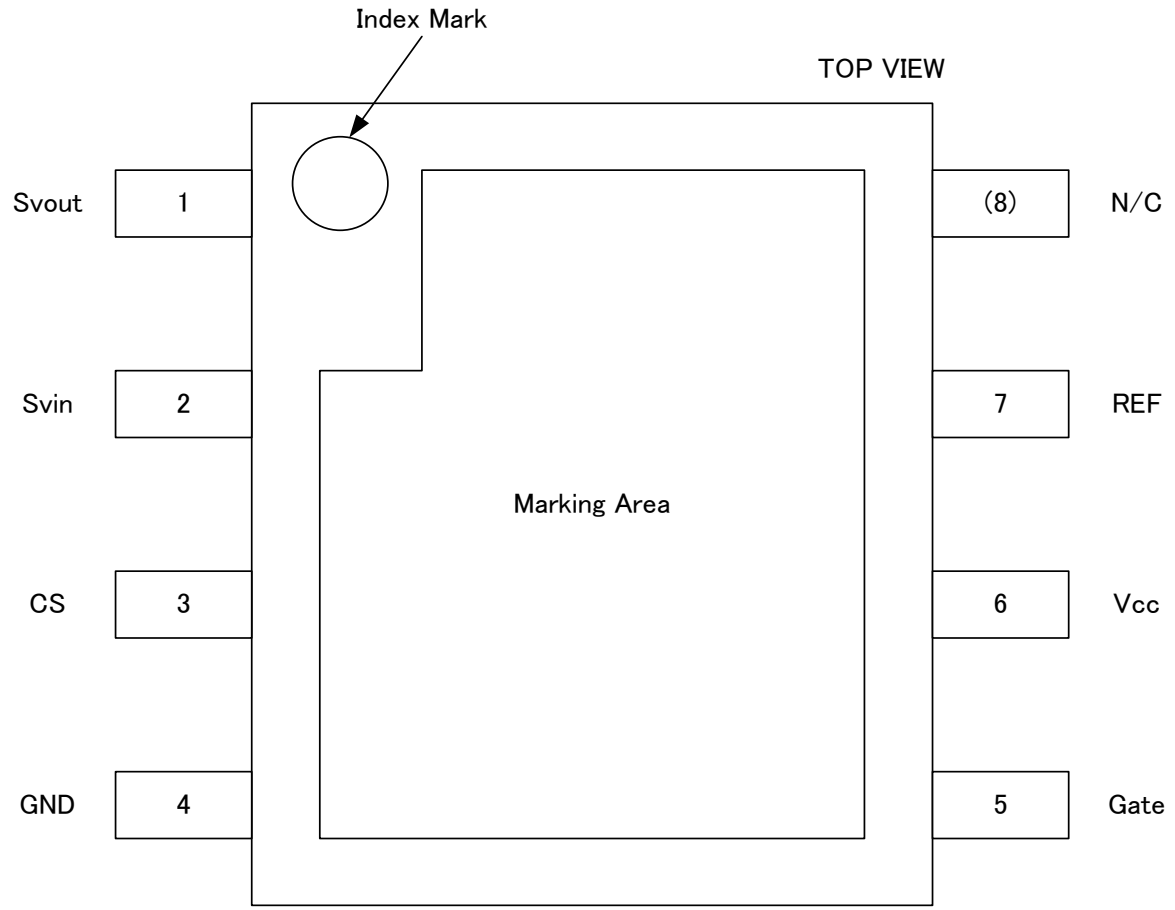
| | | | | | | |
|---|---|---|---|---|---|---|
| 熱抵抗<br>Thermal resistance | θ jc | ガラエポ基板:114.3mm×76.2mm, 厚さ:1.6mm ,<br>内面銅箔サイズ 74.2mm×74.2mm , 厚さ:35μ m<br>Glass-Epoxy Board :114.3mm×76.2mm , Thickness:1.6mm<br>inside copper foil 74.2mm×74.2mm , Thickness:35μ m | --- | --- | 13 | ℃/W |
| | θ ja | | --- | --- | 83.3 | ℃/W |

## 4 ブロック図
## 4 Block Diagram



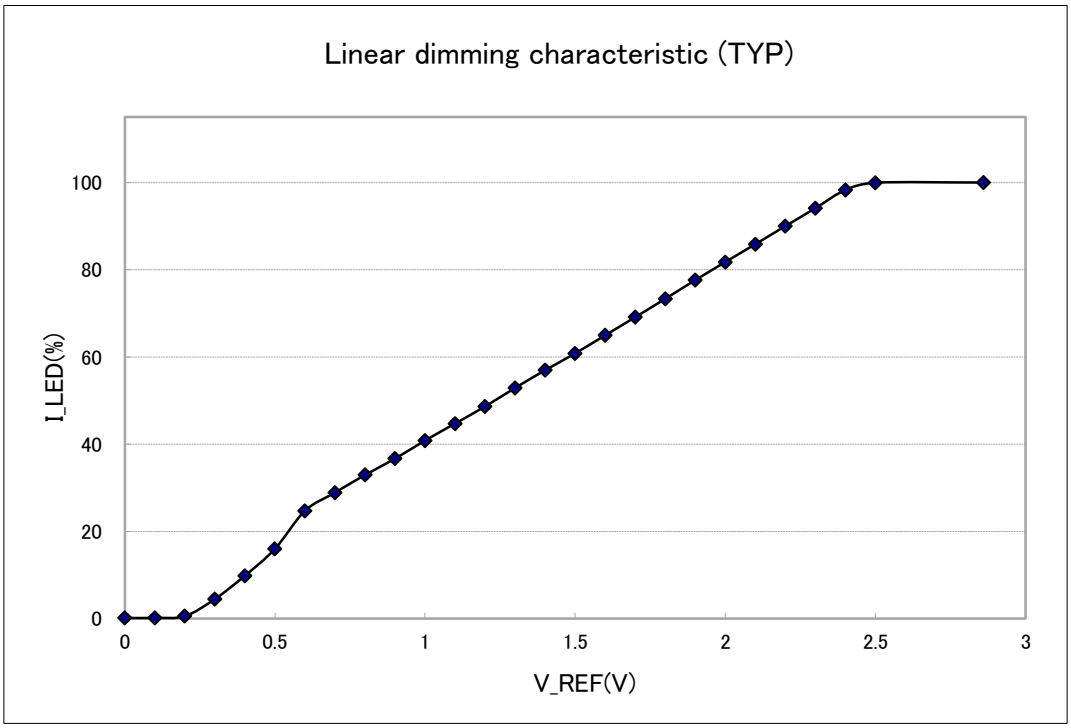

| 端子番号<br>No. | 記号<br>symbol | 端子名<br>terminal name |
|---|---|---|
| 1 | Svout | ゼロ電流検出端子<br>zero current detection terminal |
| 2 | Svin | ゼロ電流基準端子<br>zero current reference terminal |
| 3 | CS | 電流検出端子<br>current sense terminal |
| 4 | GND | グランド端子<br>GND terminal |
| 5 | Gate | 主スイッチ用MOSFET駆動端子<br>the output terminal for a MOSFET drive |
| 6 | Vcc | IC電源端子<br>power supply terminal |
| 7 | REF | 調光端子<br>dimming terminal |
| 8 | N/C | N/C端子<br>no connection terminal |

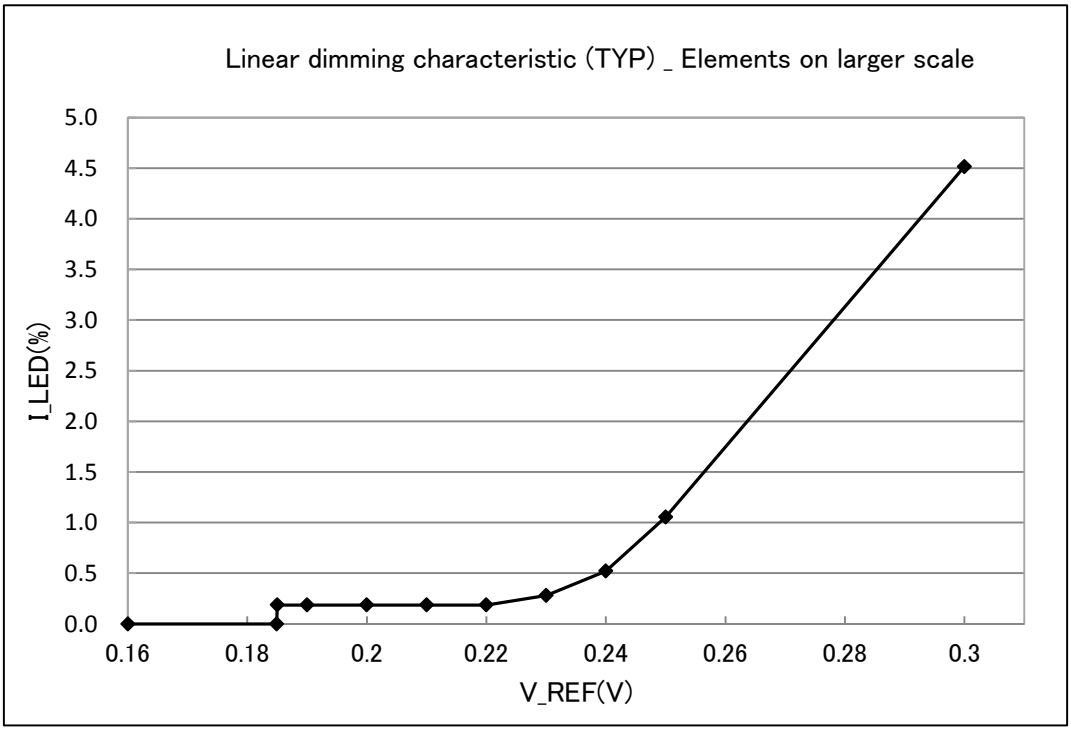
**5 端子配列**
**5 Pin Assignment**



■REF電圧-出力電流特性 （Ta=25℃）
REF voltage-Output current characteristic (at Ta=25℃)

Vin=250Vdc
Vo=140V



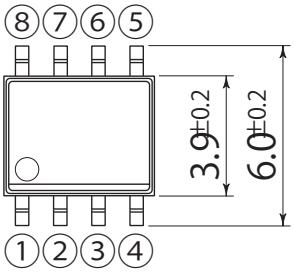



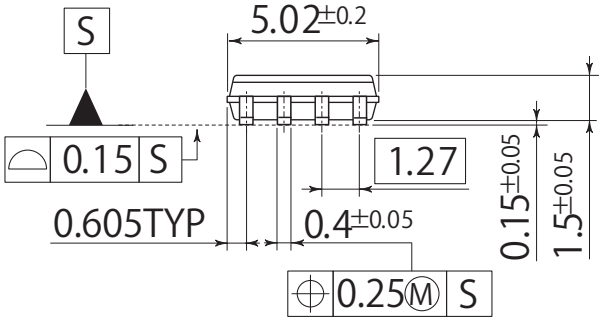
# Package Outline-Dimensions

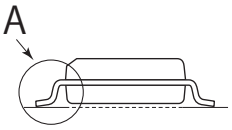
unit : mm
scale: 4/1

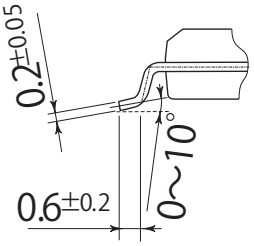
L2

| | |
|---|---|
| JEDEC Code | – |
| JEITA Code | – |
| House Name | SOP8J |

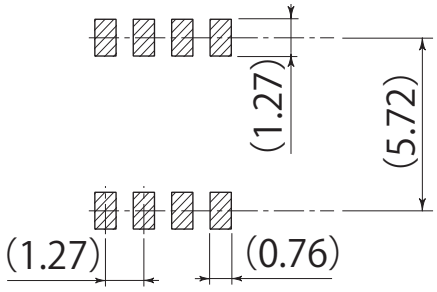



Detail A




Referential Soldering Pad

・量産時には、適正化を図って下さい
・Optimize soldering pad to the board design and soldering condition.

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