

Ideal Diode V-Diode™ **MF2003SV**

**Reverse connection protection
and Reverse current prevention circuits**

| | |
|----------------|-------|
| Input Voltage | DC12V |
| Output Current | 5A |

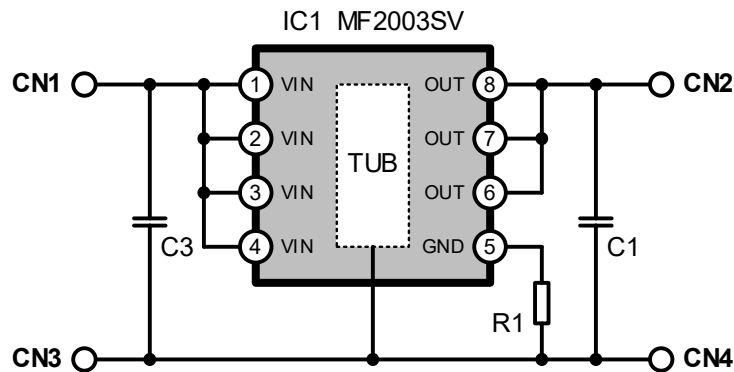
Substrate conditions

| | |
|-----------------------|------------------------|
| Board size | 25mm×25mm |
| Number of layers | 2layers (double-sided) |
| Copper foil thickness | 35 μm |
| Substrate thickness | 1.6 mm |
| Material | Tg180 FR-4 |

Notes on the use of this document

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2. The reference power supplies in this document are for understanding the performance of our products, and do not guarantee output, temperature, and any other characteristics, nor do they guarantee characteristics or safety specified by public authorities.
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Reference circuit diagram

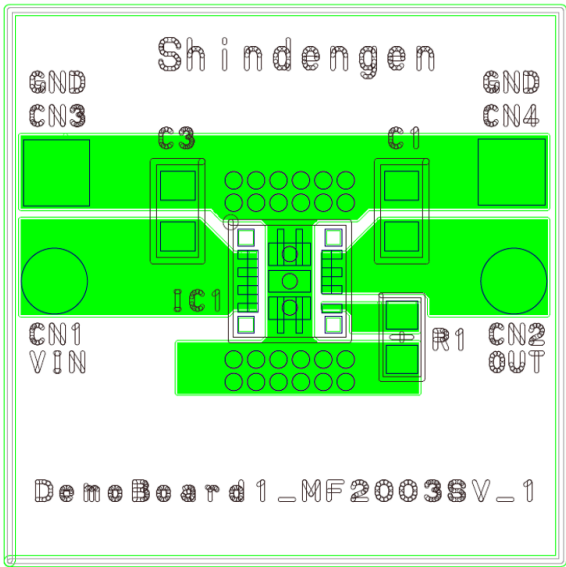


Bill Of Material

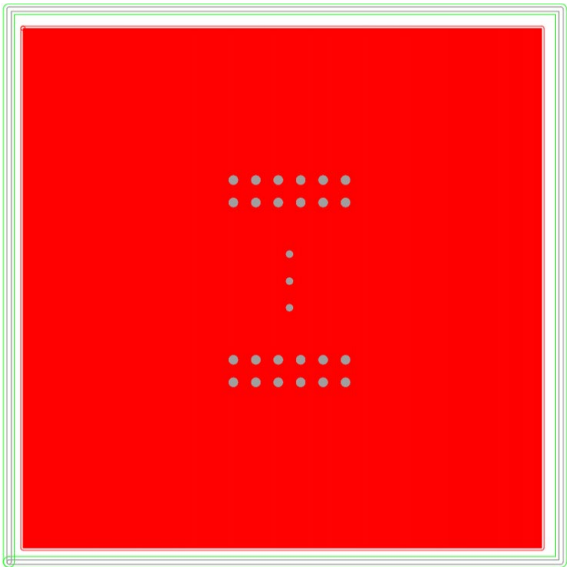
| No. | Type | Qt'y | Spec | | Model Name | Vendor | Remarks |
|-----|----------------|------|-------|-------|------------|------------|---------|
| IC | Ideal Diode IC | 1 | - | - | MF2003SV | SHINDENGEN | - |
| C1 | MLCC | 1 | 50V | 1uF | - | TDK | - |
| C3 | MLCC | - | - | - | - | - | - |
| R1 | Chip Resistor | 1 | 1/8 W | 10 kΩ | - | KOA | - |

Board pattern

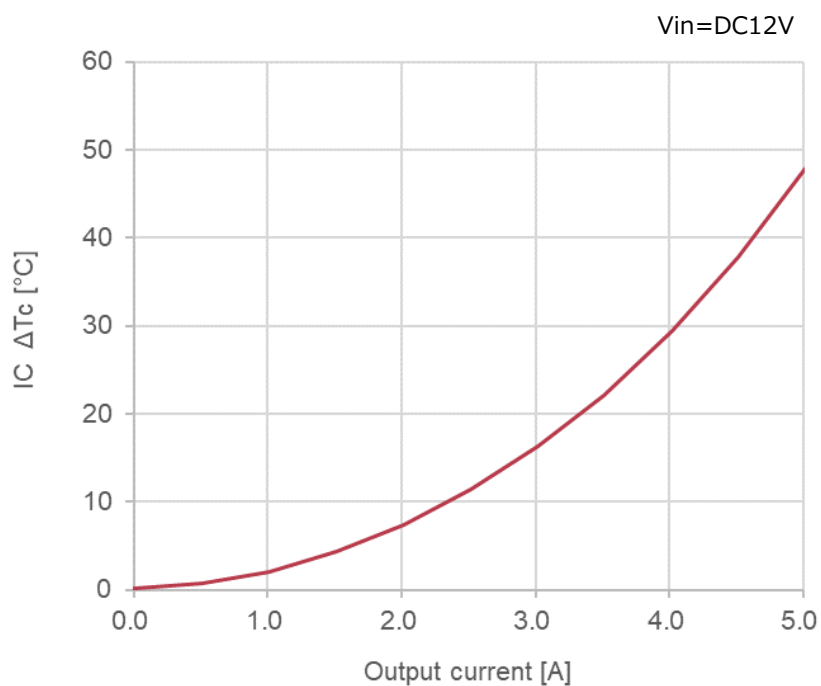
Side A



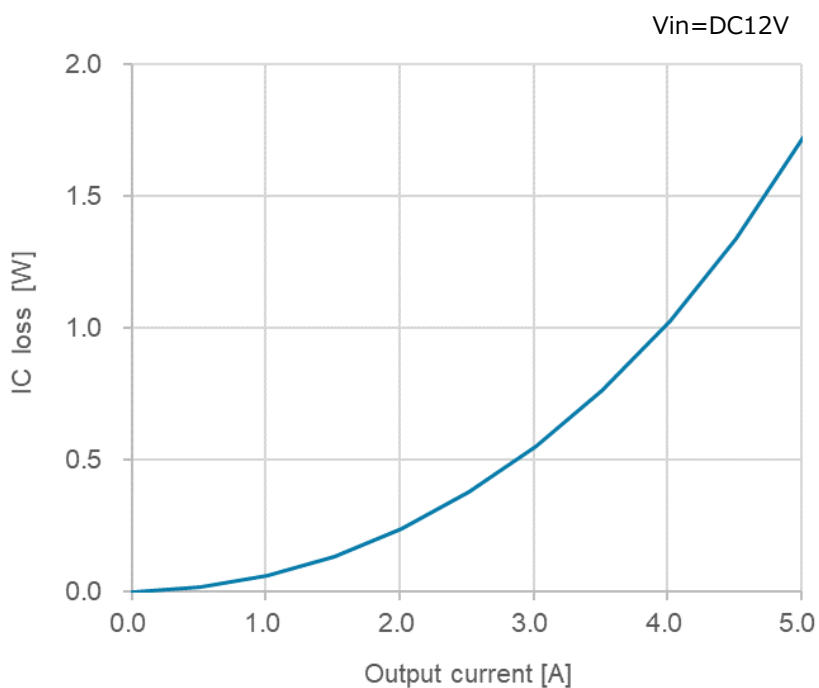
Side B



Temperature



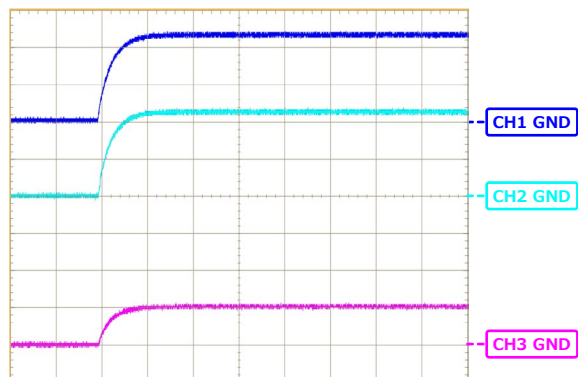
IC loss



Operation waveform

Photo.1 Startup

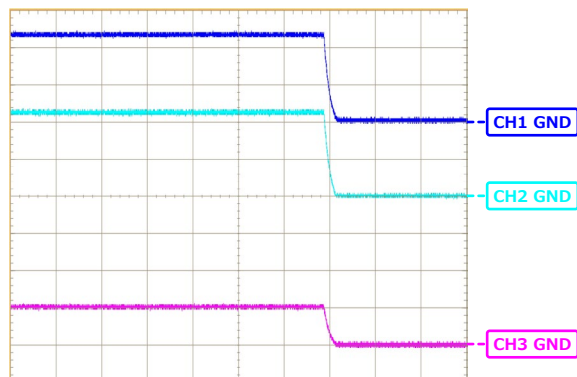
$V_{in}=12V$ $I_{out}=5A$



CH1 : V_{IN} terminal 5V/div
CH2 : OUT terminal 5V/div
CH3 : Input Current I_{in} 5A/div
Time : 20ms/div

Photo.2 Shutdown

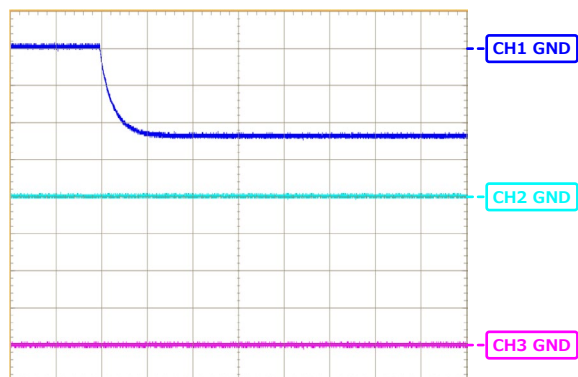
$V_{in}=12V$ $I_{out}=5A$



CH1 : V_{IN} terminal 5V/div
CH2 : OUT terminal 5V/div
CH3 : Input Current I_{in} 5A/div
Time : 20ms/div

Photo.3 Input reverse connection

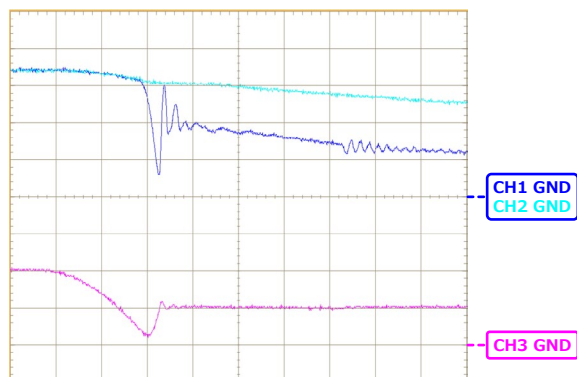
$V_{in}=-12V$ $I_{out}=0A$ Negative voltage applied



CH1 : V_{IN} terminal 5V/div
CH2 : OUT terminal 5V/div
CH3 : Input Current I_{in} 5A/div
Time : 20ms/div

Photo.4 Reverse current blocking

$V_{in}=12V \rightarrow 0V$ $I_{out}=1A$



CH1 : V_{IN} terminal 5V/div
CH2 : OUT terminal 5V/div
CH3 : Input Current I_{in} 1A/div
Time : 1μs/div