

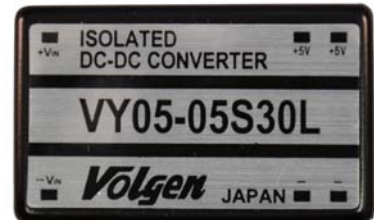


# Correspond to Analog Circuits, Ultra Low Noise 8mVp-p Small Size, Long-Life, Isolated Type DC-DC Converter **1.5 Watt VY-L Series**

VY-L series is a long-life, ultra low noise and isolated type DC-DC converter which is most suitable for analog circuits and analog-digital circuits. It has achieved low conducted emission and low radiated emission with the improved TCT circuit. The output noise is ultra low noise of 8mVp-p and has the ability to become the industry leader.

## <Features>

- Ultra Low Noise, 8mVp-p typ.
- 24pin DIP IC Size, 5-Side Metallic Shield Case
- Wide Operating Temp. Range -25°C to +71°C
- Possible to start-up from -30°C (No guarantee)
- No Electrolytic Capacitor, No Tantalum Capacitor
- MTBF 1,000,000Hrs, All aging
- High Reliability with the Latest SMD Structure
- Over-Heat Protection
- Over-Current protection
- Isolation Capacitance 100pF max.
- Isolated Type: DC500V
- Most Suitable for Analog and Digital Circuits
- High Reliability, Long-Life, High Performance
- New TCT Circuits (Patented)



## <Model, Rating>

Table 1

| Model             | Rating Input Voltage<br>Vdc | Input Voltage Range<br>Vdc-Vdc | Output Voltage<br>Vdc | Output I Current<br>mA | Line Reg<br>%(max.) | Load Reg<br>%(max.) | Noise<br>mVpp(typ.) | Efficiency<br>%(typ.) |
|-------------------|-----------------------------|--------------------------------|-----------------------|------------------------|---------------------|---------------------|---------------------|-----------------------|
| VY-L(1.5W) Series |                             |                                |                       |                        |                     |                     |                     |                       |
| VY05-05S30L       | 5                           | 4.75-6                         | 5                     | 0-300                  | 0.3                 | 0.3                 | 10                  | 60                    |
| VY05-09S16L       | 5                           | 4.75-6                         | 9                     | 0-160                  | 0.3                 | 0.3                 | 10                  | 60                    |
| VY05-12S12L       | 5                           | 4.75-6                         | 12                    | 0-120                  | 0.3                 | 0.3                 | 10                  | 60                    |
| VY05-15S10L       | 5                           | 4.75-6                         | 15                    | 0-100                  | 0.3                 | 0.3                 | 10                  | 60                    |
| VY05-05W08L       | 5                           | 4.75-6                         | ±5                    | ±0-80                  | 0.5                 | 0.5                 | 8                   | 45                    |
| VY05-12W06L       | 5                           | 4.75-6                         | ±12                   | ±0-65                  | 0.5                 | 0.5                 | 8                   | 60                    |
| VY05-15W05L       | 5                           | 4.75-6                         | ±15                   | ±0-53                  | 0.5                 | 0.5                 | 8                   | 60                    |

\* This model is compatible with the old VY series to be used for substitutions.

## <Specification>

Table 2

|                             |                                                                                                                                    |
|-----------------------------|------------------------------------------------------------------------------------------------------------------------------------|
| Input Voltage/ Range        | 5V±0.25V (Refer to the derating curve when input is 5.25-6.0V)                                                                     |
| Output Voltage              | Refer to Table 1                                                                                                                   |
| Line Regulation             | Refer to Table 1 (For the input voltage range of 5V±5%, at rating load)                                                            |
| Load Regulation             | Refer to Table 1 (For the load regulation of 0-100%, at rating input voltage)                                                      |
| Temperature Coefficient     | ±0.02%/°C typ. (When operating temperature changes between -20°C to +70°C)                                                         |
| Short Term Drift            | 50mV/ 8H max. (Except initial drift)                                                                                               |
| Ripple & Noise              | (1)VY-SL: 10mVp-p typ. 15mVp-p max. (2)VY-WL: 8mVp-p typ. 15mVp-p max. (20MHz bandwidth)                                           |
| Efficiency                  | 60% typ. (Rating input/ output, room temperature, refer to Table 1)                                                                |
| Over-Current Protection     | Operates at 105% or more rating load current, auto recovery type.                                                                  |
| Over-Voltage Protection     | None                                                                                                                               |
| Over-Heat Protection        | Built-in in the regulator part                                                                                                     |
| EMI Line Filter             | Built-in LC type line filter                                                                                                       |
| MTBF                        | 1,000,000Hr (EIAJ RCR-9102)                                                                                                        |
| Isolation Voltage           | Between primary and secondary DC500V: for 1min., between case and input/ output DC500V: for 1min.                                  |
| Isolation Resistance        | Between primary and secondary DC500V: 10M ohm or more, between case and input/output DC500V: 10M ohm or more.                      |
| Isolation Capacitance       | Between primary and secondary capacitance: 100pF max.                                                                              |
| Operating Temperature Range | -25°C to +71°C (Temperature derating required from +50°C)                                                                          |
| Storage Temperature Range   | -30°C to +85°C                                                                                                                     |
| Humidity Range              | 95%R. H. max.                                                                                                                      |
| Cooling Condition           | Natural convection                                                                                                                 |
| Vibration                   | 5-10Hz All amplitude 10mm (1hour in each of 3 directional axes),<br>10-55Hz acceleration 2G (1 hour in each of 3 directional axes) |
| Shock                       | Acceleration 20G (3 times in each of 3 directional axes), Shocking time 11±5ms                                                     |
| Weight                      | 14g typ.                                                                                                                           |
| Outline                     | W=20.42 L=32.6 H=10.3 (mm) (For detail dimensions refer to the outline.)                                                           |

\*The above specification is provided with rating value, unless otherwise specified.

### <Outline>

#### VY-SL Series

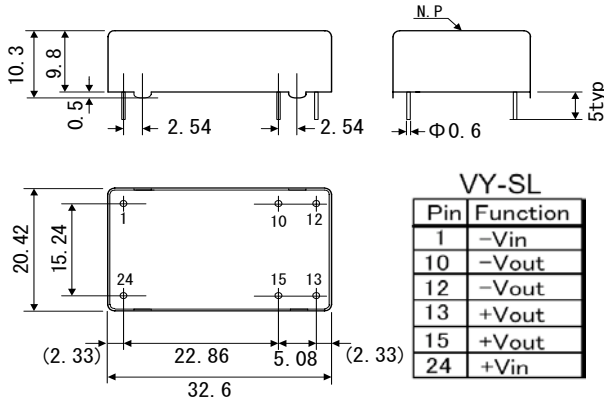


Figure 1

#### VY-WL Series

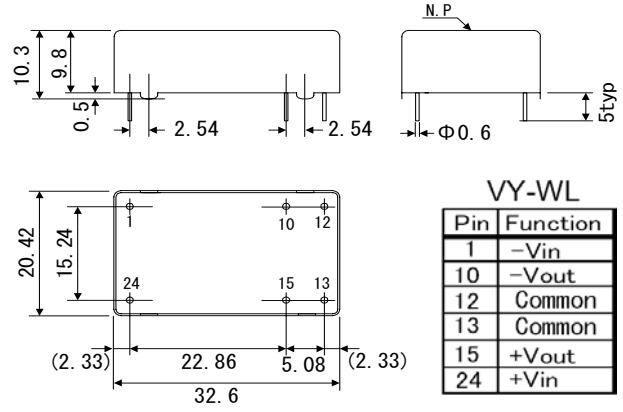


Figure 2

- Dimensions: mm, Weight: 14g typ.
- 5-Side Metallic Shield Case, black plating (with a standoff)
- Pin side is not shielded. It is recommended to set a pattern wider than the converter's bottom area right under the converter.

### <Standard Usage>

#### VY-SL Series (5V, 9V, 12V, 15V)

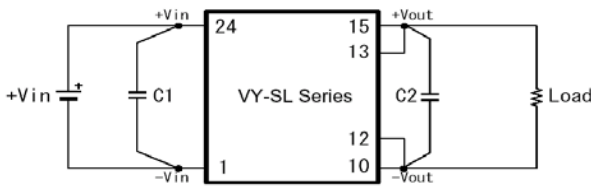


Figure 3

#### VY-WL Series ( $\pm 12V$ , $\pm 15V$ )

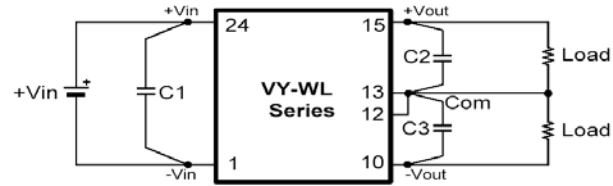


Figure 4

- Recommended capacitor  
C1=22 $\mu$ F -33 $\mu$ F (Electrolytic or multilayer ceramic capacitor)  
C2=0.47-10 $\mu$ F (Electrolytic or multilayer ceramic capacitor)
- Recommended capacitor  
C1=22 $\mu$ F -33 $\mu$ F (Electrolytic or multilayer ceramic capacitor)  
C2, C3=0.47-10 $\mu$ F (Electrolytic or multilayer ceramic capacitor)

- Basically, external capacitors are not required, but noise can be lowered by reducing power line impedance and load line impedance.
- High frequency and low impedance capacitors are recommended.
- Noise can also be lowered by designing the pattern with short lead and not to make a loop.

### <Block Diagram>

#### VY-SL Series

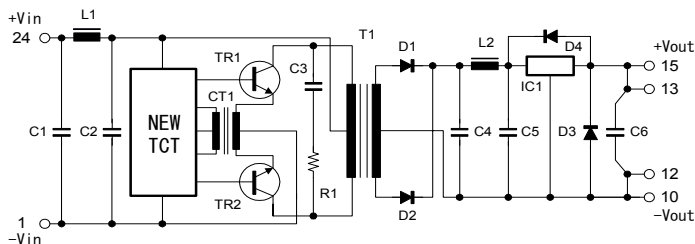


Figure 5

#### VY-WL Series

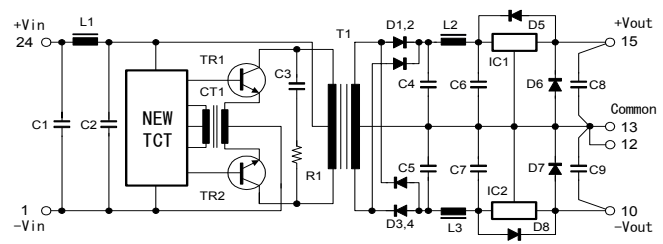


Figure 6