

## 1W 1KV Isolated Miniature Dual Output DC/DC Converters

### DESCRIPTION

The TKA miniature series is the smallest dual output DC-DC converters and industrial temperature range DC/DC converters are the standard building blocks for on-board distributed power systems. The series offers smaller size, improved efficiency, lower output ripple and 3kVDC isolation. Recommend for providing dual rail supplies.

### FEATURES

|                           |                              |   |
|---------------------------|------------------------------|---|
| RoHS compliant            | Efficiency up to 83%         | Wide temperature performance at full 1 Watt load, -40°C to 85°C |
| UL 94V-0 package material | Internal SMD construction    | Industry standard pinout  |
| Power sharing on output   | Input voltage 3.3V, 5V & 12V | output voltage 3.3V, 5V, 9V, 12V, 15V                           |

### SELECTION GUIDE

| Order Code | Nominal Input Voltage | Output Voltage | Output Current | Input Current at Rated Load | Efficiency | Isolation Capacitance | Package Style |
|------------|-----------------------|----------------|----------------|-----------------------------|------------|-----------------------|---------------|
|            | V                     | V              | mA             | mA                          | %          | pF                    |               |
| TKA0303D   | 3.3                   | ±3.3           | ±151           | 406                         | 75         | 22                    | DIP           |
| TKA0305D   | 3.3                   | ±5             | ±100           | 381                         | 80         | 23                    |               |
| TKA0309D   | 3.3                   | ±9             | ±55            | 400                         | 74         | 29                    |               |
| TKA0312D   | 3.3                   | ±12            | ±43            | 391                         | 79         | 34                    |               |
| TKA0315D   | 3.3                   | ±15            | ±34            | 382                         | 80         | 35                    |               |
| TKA0303S   | 3.3                   | ±3.3           | ±151           | 405                         | 73         | 22                    | SIP           |
| TKA0305S   | 3.3                   | ±5             | ±100           | 381                         | 80         | 23                    |               |
| TKA0309S   | 3.3                   | ±9             | ±55            | 400                         | 76         | 33                    |               |
| TKA0312S   | 3.3                   | ±12            | ±43            | 391                         | 77         | 34                    |               |
| TKA0315S   | 3.3                   | ±15            | ±34            | 381                         | 80         | 33                    |               |
| TKA0503D   | 5                     | ±3.3           | ±151           | 260                         | 78         | 25                    | DIP           |
| TKA0505D   | 5                     | ±5             | ±100           | 282                         | 72         | 24                    |               |
| TKA0509D   | 5                     | ±9             | ±55            | 261                         | 75         | 26                    |               |
| TKA0512D   | 5                     | ±12            | ±43            | 256                         | 77         | 29                    |               |
| TKA0515D   | 5                     | ±15            | ±34            | 251                         | 79         | 28                    |               |
| TKA0503S   | 5                     | ±3.3           | ±151           | 260                         | 78         | 25                    | SIP           |
| TKA0505S   | 5                     | ±5             | ±100           | 282                         | 72         | 22                    |               |
| TKA0509S   | 5                     | ±9             | ±55            | 261                         | 77         | 26                    |               |
| TKA0512S   | 5                     | ±12            | ±43            | 253                         | 78         | 30                    |               |
| TKA0515S   | 5                     | ±15            | ±34            | 254                         | 79         | 30                    |               |
| TKA1205D   | 12                    | ±5             | ±100           | 111                         | 75         | 35                    | DIP           |
| TKA1209D   | 12                    | ±9             | ±55            | 102                         | 79         | 50                    |               |
| TKA1212D   | 12                    | ±12            | ±43            | 104                         | 82         | 56                    |               |
| TKA1215D   | 12                    | ±15            | ±34            | 101                         | 82         | 63                    |               |
| TKA1205S   | 12                    | ±5             | ±100           | 110                         | 73         | 36                    | SIP           |
| TKA1209S   | 12                    | ±9             | ±55            | 107                         | 79         | 49                    |               |
| TKA1212S   | 12                    | ±12            | ±43            | 105                         | 81         | 58                    |               |
| TKA1215S   | 12                    | ±15            | ±34            | 100                         | 81         | 64                    |               |

**INPUT CHARACTERISTICS**

| Parameter                | Conditions          | Min. | Typ. | Max. | Units  |
|--------------------------|---------------------|------|------|------|--------|
| Voltage range            | 3.3V input variants | 2.9  | 3.3  | 3.6  | V      |
|                          | 5V input variants   | 4.5  | 5    | 5.6  |        |
|                          | 12V input variants  | 10.7 | 12   | 13.1 |        |
| Reflected ripple current | 3.3V input          |      | 30   | 60   | mA p-p |
|                          | All other           |      | 25   | 37   |        |

**ABSOLUTE MAXIMUM RATINGS**

|   |          |
|---|----------|
| Short-circuit protection                        | 1 second |
| Lead temperature 1.5mm from case for 12 seconds | 290°C    |
| Internal power dissipation                      | 540mW    |
| Input voltage VIN, TKA03                        | 5.5V     |
| Input voltage VIN, TKA05                        | 7V       |
| Input voltage VIN, TKA12                        | 15V      |

All specifications typical at TA=25°C, nominal input voltage and rated output current unless otherwise specified.

**ISOLATION CHARACTERISTICS**

| Parameter              | Conditions                | Min. | Typ. | Max. | Units |
|------------------------|---------------------------|------|------|------|-------|
| Isolation test voltage | Flash tested for 1 second | 3000 |      |      | VDC   |
| Resistance             | Viso= 1000VDC             |      | 10   |      | GΩ    |

All specifications typical at TA=25°C, nominal input voltage and rated output current unless otherwise specified.

**GENERAL CHARACTERISTICS**

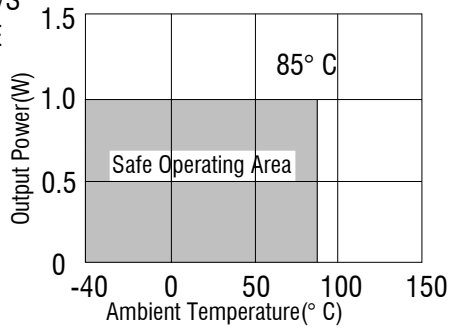
| Parameter           | Conditions        | Min. | Typ. | Max. | Units |
|---------------------|-------------------|------|------|------|-------|
| Switching frequency | 3V input and 0503 |      | 95   |      | kHz   |
|                     | All other types   |      | 120  |      |       |

**TEMPERATURE CHARACTERISTICS**

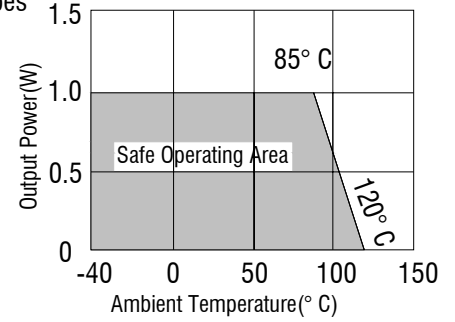
| Parameter                           | Conditions          | Min. | Typ. | Max. | Units |
|-------------------------------------|---------------------|------|------|------|-------|
| Specification                       | All series          | -40  |      | 85   | °C    |
| Storage                             |                     | -50  |      | 130  |       |
| Case temperature rise above ambient | 5V output types     |      | 30   |      |       |
|                                     | All other types     |      | 21   |      |       |
| Cooling                             | Free air convection |      |      |      |       |

### TEMPERATURE DERATING GRAPHS

TKA0303D/S,0305D/S  
0309D/S,0505DE/SE  
types only

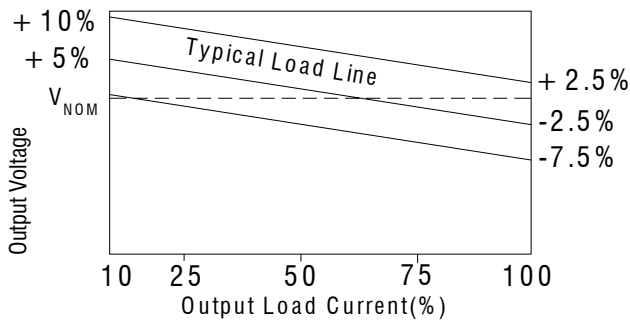


All other types

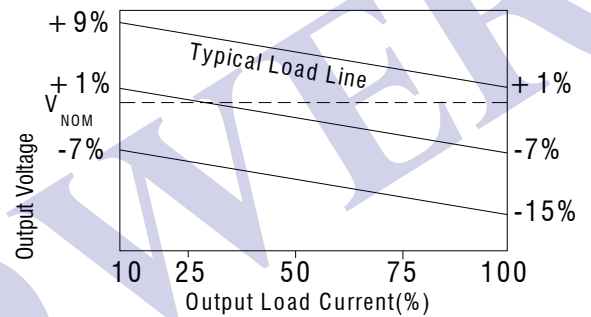


### TOLERANCE ENVELOPES

All other types

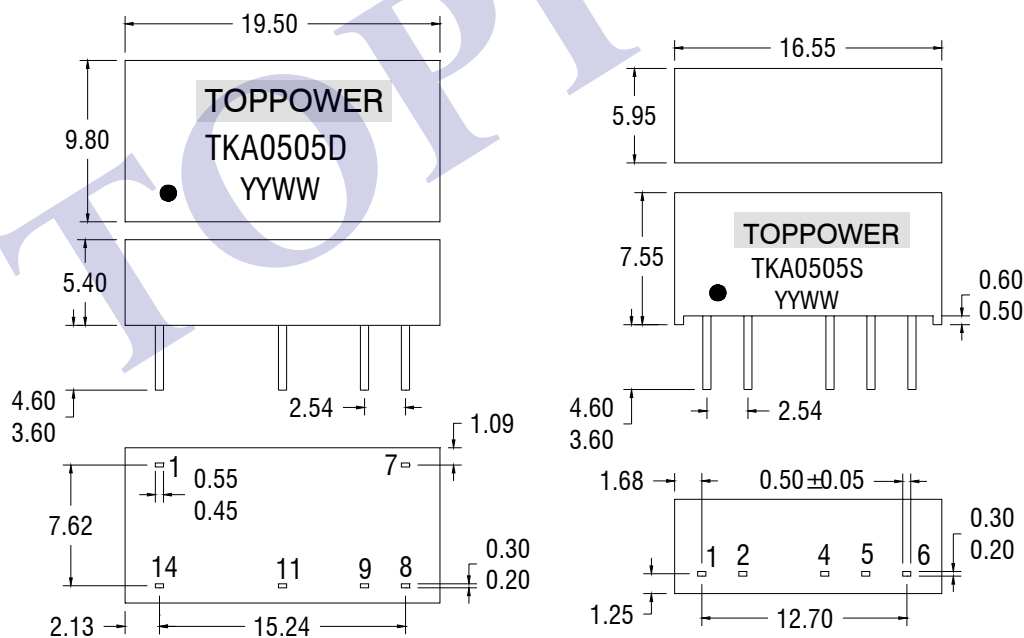


3.3V output types



### PACKAGE SPECIFICATIONS

#### MECHANICAL DIMENSIONS



#### PIN CONNECTIONS-14 PIN DIP

| Pin | Function |
|-----|----------|
| 1   | -Vin     |
| 7   | NC       |
| 8   | OV       |
| 9   | +Vout    |
| 11  | -Vout    |
| 14  | +Vin     |

#### PIN CONNECTIONS-6 PIN DIP

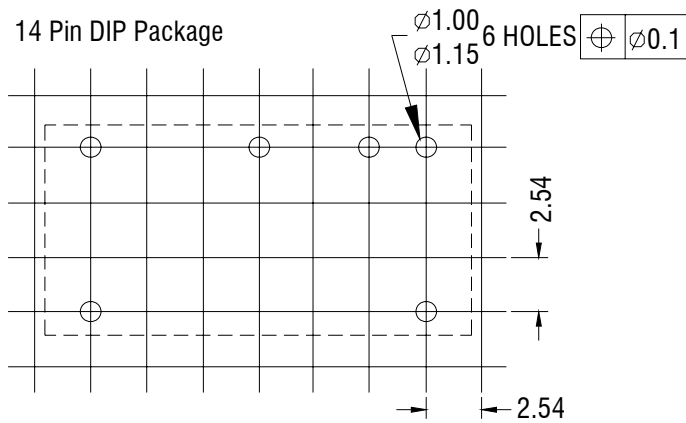
| Pin | Function |
|-----|----------|
| 1   | +Vin     |
| 2   | -Vin     |
| 4   | -Vout    |
| 5   | OV       |
| 6   | +Vout    |

All dimensions in  $\pm 0.25\text{mm}$  All pins on a 2.54 mm pitch and within  $\pm 0.25$  of true position  
weight: 1.4g(SIP) 1.9g(DIP)

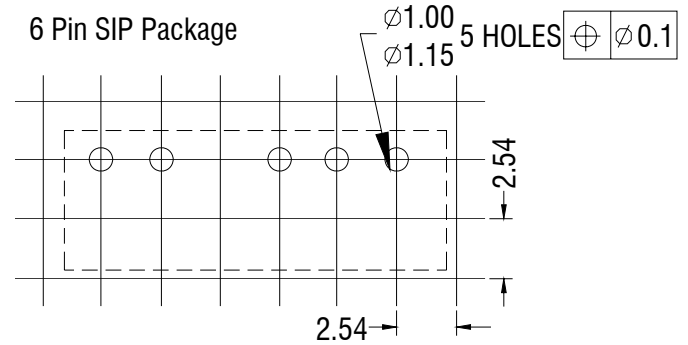
**PACKAGE SPECIFICATIONS (continued)**

**RECOMMENDED FOOTPRINT DETAILS**

14 Pin DIP Package

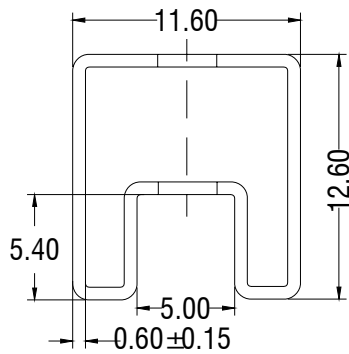


6 Pin SIP Package

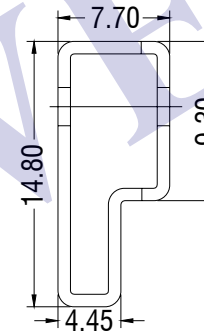


**TUBE OUTLINE DIMENSIONS**

14 Pin DIP Tube



6 Pin SIP Tube



Unless otherwise stated all dimensions in mm  $\pm 0.5$ mm

Tube length(14 Pin DIP): 520mm  $\pm 2$ mm

Tube length(6 Pin SIP): 525mm  $\pm 2$ mm

DIP Tube Quantity:25

SIP Tube Quantity:30

**RoHS COMPLIANCE INFORMATION**

This series is compatible with RoHS soldering systems with a peak wave solder temperature of 300°C for 10 seconds. Both types in this series are backward compatible with Sn/Pb soldering systems.