

**DESCRIPTION:** 1W 1.5KVDC and 3KVDC Isolated Miniature Single Output DC/DC Converters

The PKE series are miniature, isolated 1W DC/DC converters in a SIP and DIP package. They offer the ideal solution in many space critical applications for board level power distribution. The internal SMD construction makes it possible to offer a product with high performance at low cost. The series offers smaller size, improved efficiency.

### FEATURES

|  |                                       |  |
|--|---------------------------------------|--|
| RoHS compliant                         | Sub-Miniature SIP & DIP styles        | DIP: 3KVDC isolation, SIP: 1.5KVDC isolation |
| UL 94V-0 package material              | Operating temperature: -40°C to 105°C | Power density 2.09W/cm <sup>3</sup>          |
| Footprint at 0.69cm <sup>2</sup>       | Industry standard pinout              | Input voltage: 3.3V, 5V, 12V                 |
| Output voltage: 3.3V, 5V, 9V, 12V, 15V | Custom solutions available            | CE certification                             |

### SELECTION GUIDE

| Part Number | Nominal Input Voltage | Output Voltage | Output Current (Max./Min) | Efficiency | Package Style |
|-------------|-----------------------|----------------|---------------------------|------------|---------------|
|             | V                     | V              | mA                        | %          |               |
| PKE0303D    | 3.3                   | 3.3            | 303/30.3                  | 71         | DIP           |
| PKE0305D    | 3.3                   | 5              | 200/20                    | 74         | DIP           |
| PKE0309D    | 3.3                   | 9              | 111/11.1                  | 75         | DIP           |
| PKE0303S    | 3.3                   | 3.3            | 303/30.3                  | 71         | SIP           |
| PKE0305S    | 3.3                   | 5              | 200/20                    | 75         | SIP           |
| PKE0309S    | 3.3                   | 9              | 111/11.1                  | 74         | SIP           |
| PKE0503D    | 5                     | 3.3            | 303/30.3                  | 74         | DIP           |
| PKE0505D    | 5                     | 5              | 200/20                    | 69         | DIP           |
| PKE0509D    | 5                     | 9              | 111/11.1                  | 74         | DIP           |
| PKE0512D    | 5                     | 12             | 83/8.3                    | 78         | DIP           |
| PKE0515D    | 5                     | 15             | 67/6.7                    | 78         | DIP           |
| PKE0503S    | 5                     | 3.3            | 303/30.3                  | 74         | SIP           |
| PKE0505S    | 5                     | 5              | 200/20                    | 69         | SIP           |
| PKE0509S    | 5                     | 9              | 111/11.1                  | 75         | SIP           |
| PKE0512S    | 5                     | 12             | 83/8.3                    | 78         | SIP           |
| PKE0515S    | 5                     | 15             | 67/6.7                    | 78         | SIP           |
| PKE1205D    | 12                    | 5              | 200/20                    | 72         | DIP           |
| PKE1209D    | 12                    | 9              | 111/11.1                  | 78         | DIP           |
| PKE1212D    | 12                    | 12             | 83/8.3                    | 80         | DIP           |
| PKE1215D    | 12                    | 15             | 67/6.7                    | 81         | DIP           |
| PKE1205S    | 12                    | 5              | 200/20                    | 72         | SIP           |
| PKE1209S    | 12                    | 9              | 111/11.1                  | 78         | SIP           |
| PKE1212S    | 12                    | 12             | 83/8.3                    | 80         | SIP           |
| PKE1215S    | 12                    | 15             | 67/6.7                    | 81         | SIP           |

Add suffix "P" for continuous short circuit protection, for example PKE0505SP.

**INPUT CHARACTERISTICS**

| Parameter     | Conditions | Min. | Typ. | Max. | Units |
|---------------|------------|------|------|------|-------|
| Voltage range | 3.3V input | 2.9  | 3.3  | 3.6  | V     |
| Voltage range | 5V input   | 4.5  | 5.0  | 5.5  | V     |
| Voltage range | 12V input  | 11   | 12.0 | 13.3 | V     |

**ABSOLUTE MAXIMUM RATINGS**

|   |          |
|---|----------|
| Short-circuit protection                        | 1 second |
| Lead temperature 1.5mm from case for 10 seconds | 300°C    |
| Internal power dissipation                      | 520mW    |
| Input voltage Vin, PKE03                        | 5.5V     |
| Input voltage Vin, PKE05                        | 7V       |
| Input voltage Vin, PKE12                        | 15V      |

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

**ISOLATION CHARACTERISTICS**

| Parameter                               | Conditions                                    | Min. | Max. | Units |
|---|---|------|------|-------|
| Rated Power                             | TA= -40°C to 85°C, see derating graphs        |      | 1.0  | W     |
| Voltage Set Point Accuracy              | See tolerance envelope                        |      |      |       |
| Line regulation                         | High VIN to low VIN (voltage variation +/-5%) |      | 1.2  | %/%   |
| Load Regulation(10% load to rated load) | 3.3V output types & 0309                      |      | 15   | %     |
| Load Regulation(10% load to rated load) | 5V output types                               |      | 15   | %     |
| Load Regulation(10% load to rated load) | 9V output types                               |      | 10   | %     |
| Load Regulation(10% load to rated load) | 12V output types                              |      | 10   | %     |
| Load Regulation(10% load to rated load) | 15V output types                              |      | 9    | %     |

**ISOLATION CHARACTERISTICS**

| Parameter                          | Conditions          | Min. | Typ. | Max. | Units |
|------------------------------------|---------------------|------|------|------|-------|
| Isolation test voltage DIP package | tested for 1 second | 3000 |      |      | VDC   |
| Isolation test voltage SIP package | tested for 1 second | 1500 |      |      | VDC   |
| Resistance                         | Viso= 1000VDC       | 1    |      |      | GΩ    |

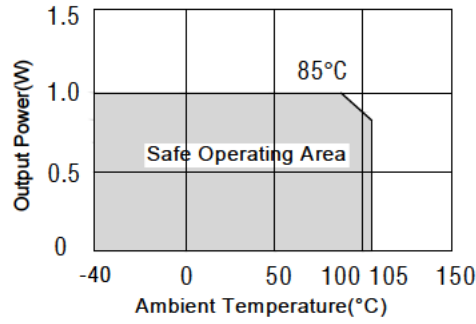
**GENERAL CHARACTERISTICS**

| Parameter           | Conditions       | Min. | Typ. | Max. | Units |
|---------------------|------------------|------|------|------|-------|
| Switching frequency | All output types |      | 120  |      | kHz   |

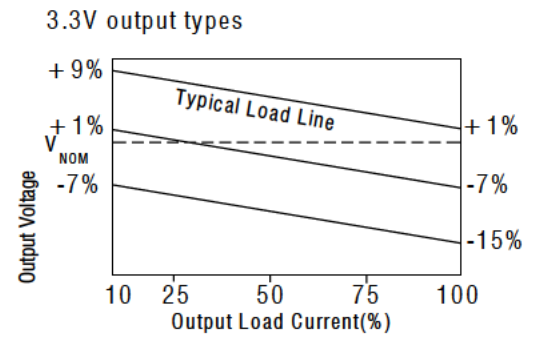
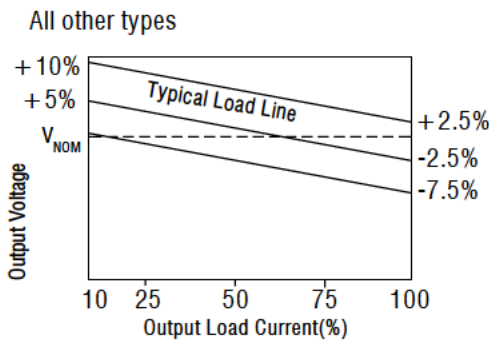
**TEMPERATURE CHARACTERISTICS**

| Specification                       | Conditions                        | Min. | Typ. | Max. | Units |
|-------------------------------------|-----------------------------------|------|------|------|-------|
| Specification                       | Derating if the temperature ≥85°C | -40  |      | 105  | °C    |
| Storage                             |                                   | -50  |      | 130  | °C    |
| Case temperature rise above ambient | 0505D/S, 1205D/S                  |      |      | 35   | °C    |
| Case temperature rise above ambient | All other output types            |      |      |      |       |
| Cooling                             | Free air convection               |      |      |      |       |

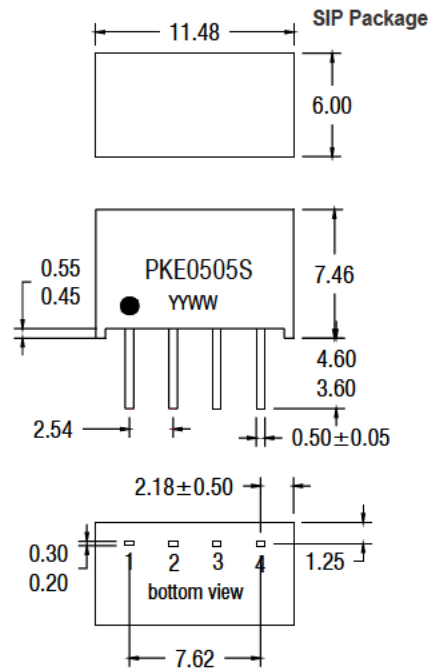
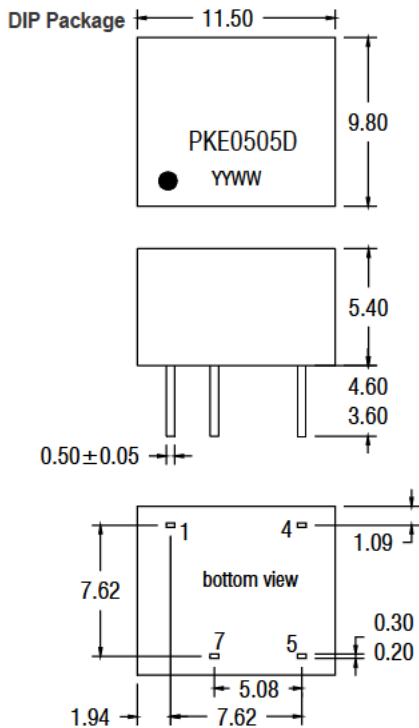
### TEMPERATURE DERATING GRAPHS



### TOLERANCE ENVELOPES



### MECHANICAL DIMENSIONS



All dimensions in mm ±0.25mm. All pins on a 2.54mm pitch and within ±0.25mm of true position.  
Weight: 1.09g(SIP) 1.25g(DIP)

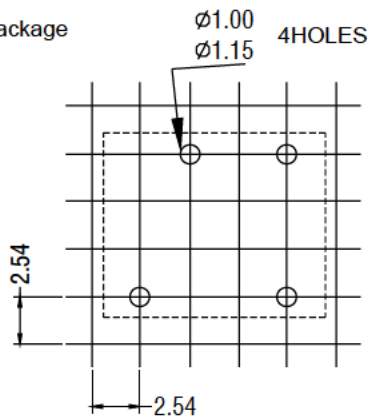
### PIN CONNECTIONS

| 8 PIN DIP |          |
|-----------|----------|
| Pin       | Function |
| 1         | -Vin     |
| 4         | +Vin     |
| 5         | +Vout    |
| 7         | -Vout    |

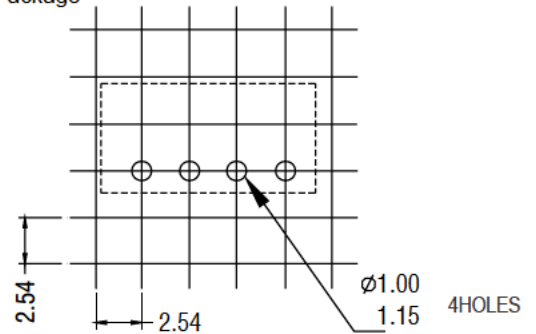
| 4 PIN SIP |          |
|-----------|----------|
| Pin       | Function |
| 1         | -Vin     |
| 2         | +Vin     |
| 3         | -Vout    |
| 4         | +Vout    |

### RECOMMENDED FOOTPRINT DETAILS

8 Pin DIP Package

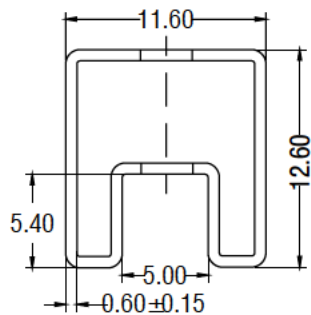


4 Pin SIP Package

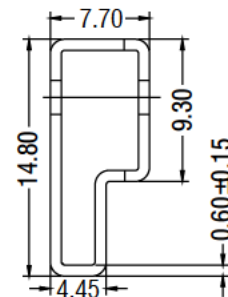


### TUBE OUTLINE DIMENSIONS

8 Pin DIP Tube



4 Pin SIP Tube



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

Tube length(8 Pin DIP):520mm  $\pm 2$ mm

Tube length(4 Pin SIP):525mm  $\pm 2$ mm

Tube Quantity:40PCS

### SOLDERING INFORMATION

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