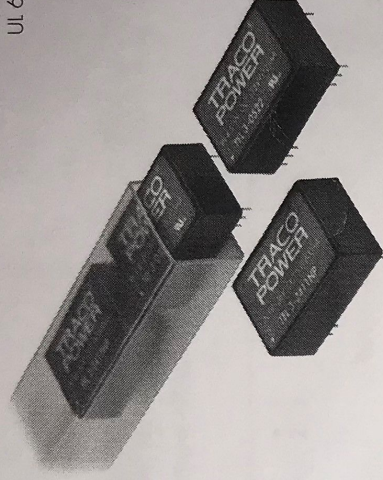




UL 60950-1

Features

- ◆ Wide 2:1 and 3:1 Input Range
- ◆ High Efficiency up to 81%
- ◆ DIL-24 Plastic Package
- ◆ Indefinite Short-Circuit Protection
- ◆ I/O Isolation 1500 VDC
- ◆ Available with Industry Standard Pinout (NP)
- ◆ Operating Temp. Range -25°C to +75°C
- ◆ 3 Year Product Warranty



The TEL 3 series is a range of isolated 3 Watt converters in DIL-24 package offering wide 2:1 and 3:1 input voltage ranges. Further features are high efficiency which allows operation temperature up to 75°C at full load and low output noise. This product series provides an economical solution for many cost critical applications in industrial and consumer electronics.

Models

Ordercode	Input voltage range	Output voltage	Output current max.	Efficiency typ.
* TEL 3-0511 (NP)	4.5 – 9.0 VDC	5 VDC	600 mA	70 %
* TEL 3-0512 (NP)		12 VDC	250 mA	74 %
TEL 3-0513		15 VDC	200 mA	74 %
* TEL 3-0522 (NP)		±12 VDC	± 125 mA	74 %
* TEL 3-0523 (NP)		±15 VDC	± 100 mA	74 %
* TEL 3-1211 (NP)	9 – 18 VDC	5 VDC	600 mA	76 %
* TEL 3-1212 (NP)		12 VDC	250 mA	80 %
TEL 3-1213		15 VDC	200 mA	80 %
* TEL 3-1222 (NP)	10 – 30 VDC	±12 VDC	± 125 mA	80 %
* TEL 3-1223 (NP)		±15 VDC	± 100 mA	80 %
TEL 3-2011		5 VDC	600 mA	76 %
TEL 3-2012		12 VDC	250 mA	80 %
TEL 3-2013		15 VDC	200 mA	80 %
TEL 3-2022	18 – 36 VDC	±12 VDC	± 125 mA	80 %
TEL 3-2023		±15 VDC	± 100 mA	80 %
* TEL 3-2411 (NP)		5 VDC	600 mA	77 %
* TEL 3-2412 (NP)	36 – 75 VDC	12 VDC	250 mA	81 %
TEL 3-2413		15 VDC	200 mA	81 %
* TEL 3-2422 (NP)		±12 VDC	± 125 mA	81 %
* TEL 3-2423 (NP)		±15 VDC	± 100 mA	81 %
TEL 3-4811		5 VDC	600 mA	77 %
TEL 3-4812	12 VDC	250 mA	81 %	
TEL 3-4813	15 VDC	200 mA	81 %	
TEL 3-4822	±12 VDC	± 125 mA	81 %	
TEL 3-4823	±15 VDC	± 100 mA	81 %	

* suffix NP (Example: TEL 3-2411NP): models available with Industry Standard Pinout

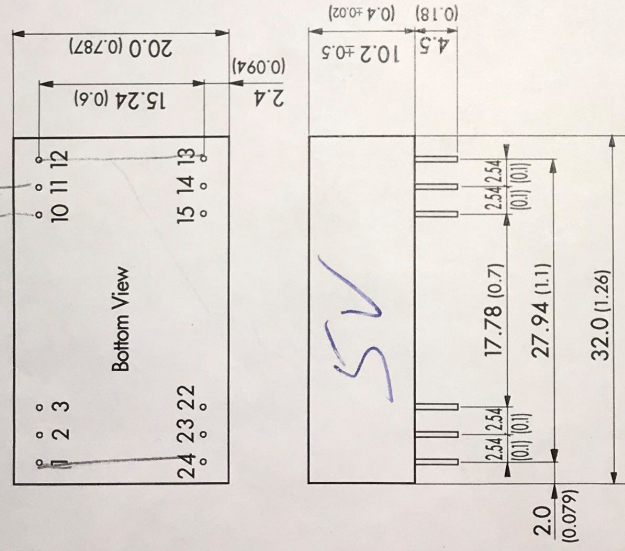
Physical Specifications

Case material	non conductive black plastic
Potting material	epoxy (UL94V-0 rated)
Weight	12 g [0.42 oz]
Soldering temperature	max. 265 °C / 10 sec.

Outline Dimensions mm (inches)

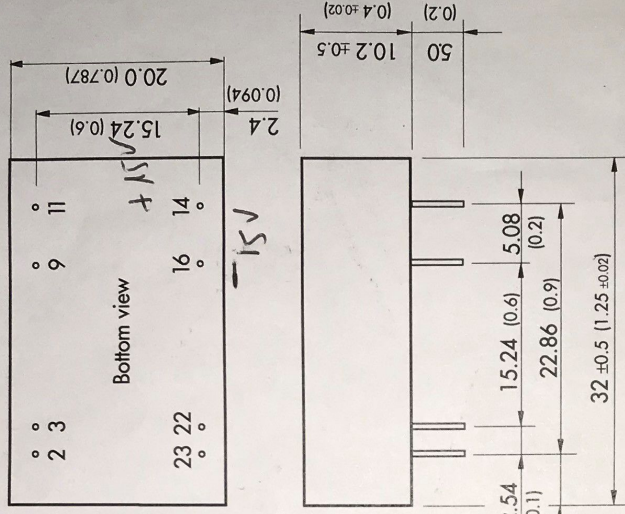
Standard Pinout:

compatible with TED / TEM-3 Series)



Pin-Out		
Pin	Single	Dual
1	+Vin (Vcc)	+Vin (Vcc)
2	No con.	-Vout
3	No con.	Common
10	-Vout	Common
11	+Vout	+Vout
12	-Vin (GND)	-Vin (GND)
13	-Vin (GND)	-Vin (GND)
14	+Vout	+Vout
15	-Vout	Common
22	No con.	Common
23	No con.	-Vout
24	+Vin (Vcc)	+Vin (Vcc)

Pinout NP Version:



Pin diameter $\varnothing 0.5 \pm 0.05$ (0.02) ± 0.002
Tolerances ± 0.5 (0.02)

Pin-Out		
Pin	Single	Dual
2	-Vin (GND)	-Vin (GND)
3	-Vin (GND)	-Vin (GND)
9	No pin	Common
11	No con.	-Vout
14	+Vout	+Vout
16	-Vout	Common
22	+Vin (Vcc)	+Vin (Vcc)
23	+Vin (Vcc)	+Vin (Vcc)

Specifications can be changed any time without notice

Input Specifications

Input current (no load)

5 Vin models	40 mA typ.
12 Vin models	20 mA typ.
20 Vin models	15 mA typ.
24 Vin models	5 mA typ.
48 Vin models	3 mA typ.

Input current (full load)

5 Vin models	820 mA typ.
12 Vin models	320 mA typ.
20 Vin models	190 mA typ.
24 Vin models	155 mA typ.
48 Vin models	80 mA typ.

Surge voltage (1 sec. max.)

5 Vin models	11 VDC
12 Vin models	25 VDC
20 Vin models	50 VDC
24 Vin models	50 VDC
48 Vin models	100 VDC

Reverse voltage protection

1.0 A max.

Output Specifications

Voltage set accuracy

± 1 %

Regulation

- Input variation Vin min. to Vin max.
- Load variation 10 – 100 %

Ripple and noise (20 MHz Bandwidth)

single output models	0.5 % max.
dual output models balanced load	1.0 % max.
dual output models unbalanced load	2.0 % max.

<60 mVpk-pk typ.

Temperature coefficient

± 0.02 %/°K

Output current limitation

> 110% Iout max., constant current

Short circuit protection

indefinite (automatic recovery)

Capacitive load

single output models	2000 µF max.
dual output models	1000 µF max.

General Specifications

Temperature ranges

- Operating
- Case
- Storage

- 25 °C ... + 75 °C
+ 95 °C max.
- 40 °C ... + 125 °C

Humidity (non condensing)

95 % rel H max.

Reliability, calculated MTBF (MIL-HDBK217E ground benign)

> 1 Mio. h @ + 25 °C

Isolation voltage (60 sec)

1500 VDC

Isolation capacity

500 pF typ

Isolation resistance

- Input/Output (500 VDC)

Switching frequency

> 1'000 M Ohm

Safety standards

300 kHz typ. (Pulse frequency modulation PFM)

UL 60950-1, EN 60950-1, IEC 60950-1
Compliance up to 60 VDC input voltage (SELV limit)

Safety approvals

CSA File No. 226037 (NIP models pending)
<http://directories.csa-international.org>

All specifications valid at nominal input voltage, full load and +25°C after warm-up time unless otherwise stated.