TEM03-Series

- **PACKAGE, 1.12 x 0.81 x 0.33 INCH**
- **NO EXTERNAL INPUT AND OUTPUT CAPACITOR NEEDED**
- **2:1 WIDE INPUT VOLTAGE RANGE**
- **LOW RIPPLE & NOISE**
- **FIVE-SIDED SHIELD**
- **OVER CURRENT PROTECTION**
- **SHORT CIRCUIT PROTECTION**
- **LONG LIFE WITHOUT ELECTROLYTIC CAPACITOR**

The TEM03 series offer 3 watts of output power from a 1.12 x 0.81 x 0.33 inch package without derating to 50ºC and without external input/output capacitor. The TEM03 series with 2:1 wide input voltage of 4.5-9, 9-18, 18-36 and 36-75VDC and features 500VAC of isolation, short-circuit protection. The safety meets to EN60950-1 and UL60950-1. All models are particularly suited to telecommunications, industrial, mobile telecom and test equipment applications.

TECHNICAL SPECIFICATION

All specifications are typical at nominal input, full load and 25ºC otherwise noted

OUTPUT SPECIFICATIONS		
Maximum output power		3 Watts
Voltage accuracy	Full load and nominal Vin	± 1%
Minimum load		0%
Line regulation	LL to HL at Full Load	0.2%
Load regulation	10% to 100% FL	0.5%
Ripple and noise	50MHz bandwidth	75mVp-p, max
Maximum temperature drift		±0.02% / ºC
Transient response recovery time	25% load step change	500uS, typ
Short circuit protection		Continuous, automatics recovery
Over current protection		170%, typ.

INPUT SPECIFICATIONS		
Input voltage range	5V nominal input 12V nominal input 24V nominal input 48V nominal input	4.5 – 9VDC 9 – 18VDC 18 – 36VDC 36 – 75VDC
Input filter		L-C filter
Input surge voltage 100mS max	5V nominal input 12V nominal input 24V nominal input 48V nominal input	15VDC 36VDC 50VDC 100VDC

OUTPUT VOLTAGE ADJUSTMENT TERMINAL(Vset) (Note1)

Model number	Open	-Vout shorted	+Vout shorted
XXS33	3.3V	3.67V	2.84V
XXS05	5V	6V	4.3V
XXS12	12V	15V	-
XXD12	±12V	±15V	-

Model number	Open	-Vout connected with resistance (2)	+Vout connected with resistance (2)
XXS33	3.3V	3.3 to 3.67V (3-1)	3.3 to 2.84V (3-2)
XXS05	5V	5 to 6V (3-3)	5 to 4.3V (3-4)
XXS12	12V	12 to 15V (3-5)	-
XXD12	±12V	±12 to ±15V (3-6)	-

GENERAL SPECIFICATIONS			
Efficiency			See table
Isolation voltage	Input to Output Input to Case Output to Case		500 Vac
Isolation resistance	Input to Output Input to Case Output to Case	DC500V	50M ohms
Isolation capacitance			300 pF,max
Safety standard pending	IEC60950-1, J60950, UL60950-1, EN60950-1		
Switching frequency	Full load to No load		100 to 1500 KHz
Case material			Metal case
Base material			None
Weight			11.5g (0.41oz)
Dimension			1.12 x 0.81 x 0.33 Inch (28.5 x 20.5 x 8.5 mm)
MTBF (Note 4)			650Fit (1500000hrs, 100% Load)

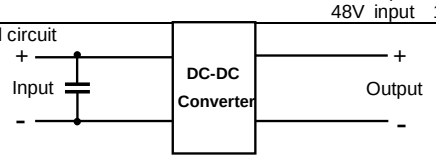
ENVIRONMENTAL SPECIFICATIONS	
Operating temperature range (with derating)	-20ºC to +70ºC
Storage temperature range	-40ºC to +85ºC
Cooling	Nature convection
Thermal shock	MIL-STD-810D
Vibration	At no operation, 10~55~10Hz (sweep for 15min.) amplitude 1.5mm constant (maximum 9G X, Y, Z 2hrs each)
Shock	100G
Operating humidity range	20% to 95% RH
Storage humidity range	20% to 95% RH

EMC CHARACTERISTICS

Meet EN55022 class A recommend circuit with external capacitor filter at input (Note 5)

5V input	220uF/16V
12V input	220uF/25V
24V input	100uF/50V
48V input	100uF/100V

EMC external circuit

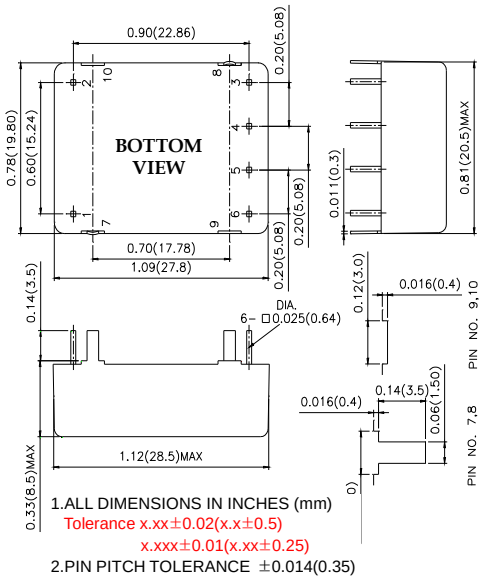


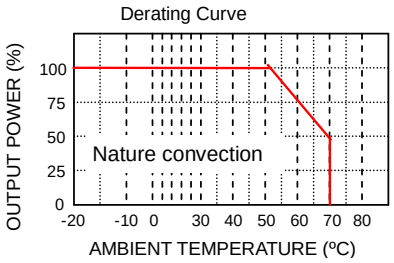
Model Number	Input Range	Output Voltage	Output Voltage Range	Output Current	Input Current (6)	Eff (7) (%)	Capacitor(8) Load max
TEM03-05S33	4.5 – 9 VDC	3.3 VDC	2.84 – 3.67 VDC	600 mA	591 mA	71	3300 uF
TEM03-05S05	4.5 – 9 VDC	5 VDC	4.3 – 6 VDC	600 mA	857 mA	74	1500 uF
TEM03-05S12	4.5 – 9 VDC	12 VDC	12 – 15 VDC	250 mA	811 mA	78	700 uF
TEM03-05D12	4.5 – 9 VDC	±12 VDC	±12 – ±15 VDC	±125 mA	779 mA	81	±250 uF
TEM03-12S33	9 – 18 VDC	3.3 VDC	2.84 – 3.67 VDC	600 mA	232 mA	75	3300 uF
TEM03-12S05	9 – 18 VDC	5 VDC	4.3 – 6 VDC	600 mA	333 mA	79	1500 uF
TEM03-12S12	9 – 18 VDC	12 VDC	12 – 15 VDC	250 mA	325 mA	81	700 uF
TEM03-12D12	9 – 18 VDC	±12 VDC	±12 – ±15 VDC	±125 mA	328 mA	80	±250 uF
TEM03-24S33	18 – 36 VDC	3.3 VDC	2.84 – 3.67 VDC	600 mA	116 mA	75	3300 uF
TEM03-24S05	18 – 36 VDC	5 VDC	4.3 – 6 VDC	600 mA	166 mA	79	1500 uF
TEM03-24S12	18 – 36 VDC	12 VDC	12 – 15 VDC	250 mA	162 mA	81	700 uF
TEM03-24D12	18 – 36 VDC	±12 VDC	±12 – ±15 VDC	±125 mA	160 mA	82	±250 uF
TEM03-48S33	36 – 75 VDC	3.3 VDC	2.84 – 3.67 VDC	600 mA	58 mA	75	3300 uF
TEM03-48S05	36 – 75 VDC	5 VDC	4.3 – 6 VDC	600 mA	83 mA	79	1500 uF
TEM03-48S12	36 – 75 VDC	12 VDC	12 – 15 VDC	250 mA	80 mA	82	700 uF
TEM03-48D12	36 – 75 VDC	±12 VDC	±12 – ±15 VDC	±125 mA	80 mA	82	±250 uF

Note

1. The following output voltage can be outputted by connecting this terminal to an output + or – terminal. Unless the output voltage is adjusted, this terminal should be open.
2. In addition, the voltage can be adjusted not by shorting these terminals, but by connecting them to resistances as shown below.
3. Arithmetic expression connected resistance: R (KΩ)
   3-1 Vo=(3.3*R+36.7)/(R+10) 3-2 Vo=(3.3*R+36.7)/(R+12.92)
   3-3 Vo=2.5*[2+2.7/(R+6.8)] 3-4 Vo=2.5*[2-2.7/(R+9.5)]
   3-5 Vo=2.5+9.5(R+10.9)/(R+8.2) 3-6 Vo=2.5+22*(R+12.7)/(R+10)
4. Bellcore TR-NWT-000332. Case 1:50% Stress, temperature at 40ºC. (Ground fixed and controlled environment)
5. The filter capacitor recommended use " CHEMICON " KMF series or equivalent impedance at 0.16 ~ 0.33Ω (100KHz 20℃)
6. Maximum value at nominal input voltage and full load.
7. Typical value at nominal input voltage and full load.
8. Test by minimum Vin and constant resistive load.

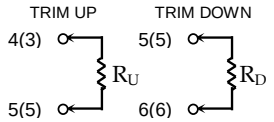
PIN CONNECTION		
PIN	SINGLE	DUAL
1	+ Vi	+ Vi
2	- Vi	- Vi
3	NC	- Vo
4	- Vo	COM
5	Vset	Vset
6	+ Vo	+ Vo





EXTERNAL OUTPUT TRIMMING

Output can be externally trimmed by using the method shown below.
( ) for dual output trim



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