

Features

- ◆ AC/DC power modules for PCB mounting
- ◆ Highest power density
- ◆ Fully encapsulated plastic case
- ◆ Universal input 90–264 VAC, 47–440 Hz
- ◆ High efficiency
- ◆ EMI meets EN 55022, class B and FCC, level B
- ◆ Low ripple and noise
- ◆ Short circuit and overload protection
- ◆ 3-year product warranty



The TMLM Series switching power supplies, offer highest power density in a fully encapsulated module which can be soldered directly on to PCBs. This feature makes these modules an ideal solution for all space critical applications in commercial and industrial electronic equipment. International safety approvals qualify the product for worldwide markets. SMD-technology and high efficiency guarantees a high reliability of these Power Supplies.

Models

Order Code	Output Power max.	Output 1	Output 2
TMLM 04103	4.0 Watt	3.3 VDC / 1200 mA	+3.3 VDC / 150 mA +5.0 VDC / 120 mA
TMLM 04105	4.0 Watt	5.0 VDC / 800 mA	
TMLM 04109	4.0 Watt	9.0 VDC / 444 mA	
TMLM 04112	4.0 Watt	12 VDC / 333 mA	
TMLM 04115	4.0 Watt	15 VDC / 267 mA	
TMLM 04124	4.0 Watt	24 VDC / 167 mA	
TMLM 04253	3.5 Watt	+5.0 VDC / 600 mA	
TMLM 04225	3.6 Watt	+12 VDC / 250 mA	
TMLM 05103	4.1 Watt	3.3 VDC / 1250 mA	
TMLM 05105	5 Watt	5.0 VDC / 1000 mA	
TMLM 05112	5 Watt	12 VDC / 420 mA	
TMLM 05115	5 Watt	15 VDC / 333 mA	
TMLM 05124	5.5 Watt	24 VDC / 230 mA	
TMLM 10103	8.2 Watt	3.3 VDC / 2500 mA	
TMLM 10105	10 Watt	5.0 VDC / 2000 mA	
TMLM 10112	10 Watt	12 VDC / 833 mA	
TMLM 10115	10 Watt	15 VDC / 667 mA	
TMLM 10124	10 Watt	24 VDC / 417 mA	
TMLM 20103	12 Watt	3.3 VDC / 3600 mA	
TMLM 20105	18 Watt	5.0 VDC / 3600 mA	
TMLM 20112	20 Watt	12 VDC / 1660 mA	
TMLM 20115	20 Watt	15 VDC / 1330 mA	
TMLM 20124	20 Watt	24 VDC / 833 mA	

Input Specifications

Input voltage	– Nominal	100 – 240 VAC
	– Range	90 – 264 VAC (universal input)
	– DC range (TMLM 04 & TMLM 05 models only)	120 – 370 VDC
Input frequency		47 – 440 Hz
Input current at full load (115 VAC / 230 VAC)	TMLM 04 models: TMLM 05 models: TMLM 10 models: TMLM 20 models:	75 mA / 55 mA typ. 110 mA / 70 mA typ. 220 mA / 150 mA typ. 385 mA / 280 mA typ.
Inrush current (<2 ms) (115 VAC / 230 VAC)	TMLM 04 models:	15 A max / 25 A max.
	TMLM 05 & TMLM 10 models:	10 A max / 20 A max.
	TMLM 20 models:	20 A max / 40 A max.
External input fuse required (recommended value)		1.5 A slow blow type

Output Specifications

Voltage set accuracy		±2 %
Regulation	– Input variation	0.3 % max. (0.5% max. for TMLM 20 models, 3.0 % max for output 2)
	– Load variation	TMLM 04; 3.3 – 9.0 VDC models: 1.0 % max. (0–100% load)
		TMLM 04 other models output 1: 0.5 % max. (0–100% load)
		TMLM 04 output 2: 5.0 % max. (1–100% load)
		TMLM 05 & TMLM 10 models: 0.5 % max. (5–100% load)
		TMLM 20 models: 1.0 % max. (5–100% load)
Minimum load	TMLM 04 models:	0 % (1% for output 2)
	other models:	5 %, operation at 0-load condition will not damage these power supplies, however, they may not meet all listed specifications.
Ripple and noise (20 MHz bandwidth)	3.3 – 9.0 VDC models:	<100 mV
	12 & 15 VDC models:	<150 mV
	24 VDC models:	<220 mV
Current limitation		120 – 180 % fold back
Short circuit protection		indefinite (automatic recovery)
Overvoltage protection by Zehner diode (main output only)		120 % of Vout typ.

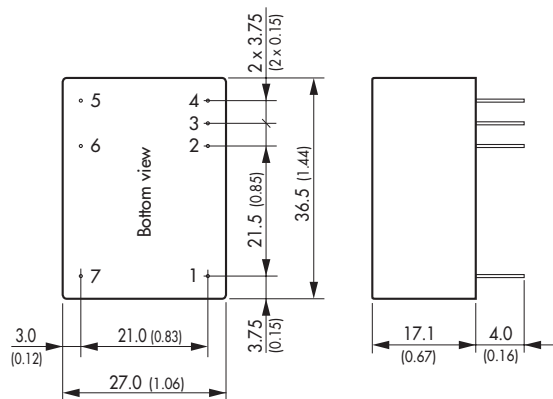
Max. capacitive load [µF]		Model series			
Output:		TMLM 04	TMLM 05	TMLM 10	TMLM 20
Single output models:	3.3 VDC	1200	23'000	23'000	3000
	5.0 VDC	800	tba	tba	2200
	9.0 VDC	440	-	-	-
	12 VDC	330	tba	tba	1200
	15 VDC	260	tba	tba	1000
	24 VDC	160	470	470	800
Dual output models:	5.0 VDC / 3.3 VDC	5600 / 4700	-	-	-
	12 VDC / 5.0 VDC	330 / 4700	-	-	-

General Specifications

Temperature ranges	– Operating – Storage (non operating)	–25°C to +60°C (–13°F to 140°F) –40°C to +85°C (–40°F to 185°F)
Derating		3.75 %/K above +50°C TMLM 20 models: 2.5 %/K above 40°C
Temperature coefficient		0.02 %/K
Humidity (non condensing)		95 % rel max.
Efficiency		75 % typ. (depending on model)
Switching frequency		130 kHz typ. (pulse width modulation PWM)
Hold-up time		15 ms min.
Isolation voltage (60 sec)	– Input/ Output	3'000 VAC
Leakage current	TMLM 04 models: TMLM 05 models: TMLM 10 models: TMLM 20 models:	0.30 mA max. 0.75 mA max. 0.25 mA max. 0.75 mA max.
Reliability /calculated MTTF (MIL-HDBK-217F, at +25°C, ground benign)		>330'000 h TMLM 20 models: >250'000 h
Electromagnetic compatibility (EMC), emissions		EN 55022, class B, FCC part 15, level B
Electromagnetic compatibility (EMC), immunity		EN 61000-6-2: 2005
Degree of protection		class II to IEC/EN 60536
Safety standards		UL 60950-1, IEC/EN 60950-1
Safety approval		cUL /UL File E188913 (TMLM 20 pending) www.ul.com -> certifications
Environment	– Vibration acc. IEC 60068-2-6; – Shock acc. IEC 60068-2-27	3 axes, sine sweep, 10-55Hz, 1g, 1oct/min 3 axes, 15g half sine, 11msShock 20 G (3 directions each 3 times)
Casing material		Plastic resin + fiberglass (flammability UL 94V-0 rated)

Outline Dimensions

TMLM 04 Models:



Pin-Out

Pin	Single	Dual
1	ntc	ntc
2	+Vout	Vout 1
3	–Vout	Common
4	ntc	Vout 2
5	AC (L)	AC (L)
6	AC (N)	AC (N)
7	ntc	ntc

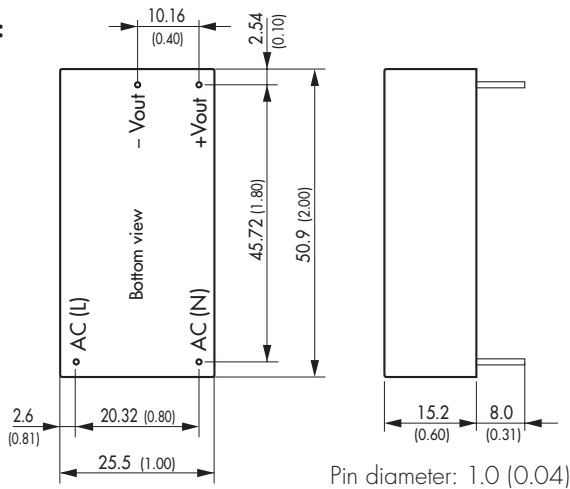
(ntc = not to connect)

Weight: 26 g (0.92 oz)

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

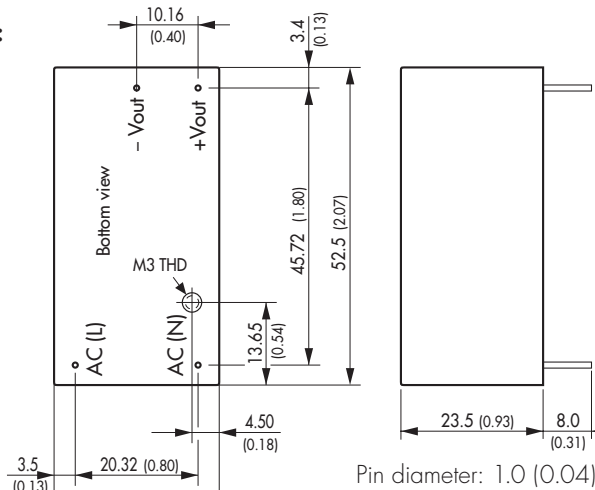
Outline Dimensions

TMLM 05 Models:



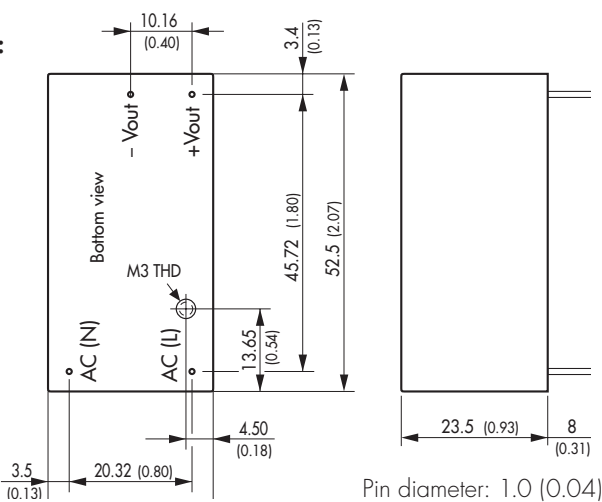
Weight: 30 g (1.06 oz)

TMLM 10 Models:



Weight: 54 g (1.91 oz)

TMLM 20 Models:



Weight: 59 g (2.08 oz)

Dimensions in [mm], () = Inch
 Tolerances: ± 0.5 (± 0.02)
 Pin pitch tolerance: ± 0.3 (± 0.012)
 Max mounting screw penetration: 3.0 mm (0.12)

Specifications can be changed any time without notice