

SIZE 5000 Power Capacity 5 to 20kW

Description

The Payton **SIZE 5000** provides a planar solution for high power applications (such as traction, induction heating etc.) providing high efficiency, low EMI, excellent repeatability, low profile and weight with an operating temperature range of -40°C to $+130^{\circ}\text{C}$.



1. Transformer Application

POWER CAPACITY	DIMENSIONS (mm)	TYPICAL WEIGHT	DIELECTRIC ISOLATION	OPERATING VOLTAGE	OPERATING CURRENT (RMS)
5kW, forward at 50 kHz 20kW, full bridge at 100kHz	L = 180-230 W = 104-145 H = 20-60	2-3 kg.	500 V _{DC} - 4k V _{rms}	1000 V _{peak} max.	1000 A max.

Typical efficiency: 97-99%

Recommended frequency range: 20 kHz – 300 kHz.

Topologies:

Full bridge; Half bridge; Push-Pull; Forward;

Resonant topologies (in order of preference).

Mounting Options: a. Horizontal b. Vertical

2. Inductor Application

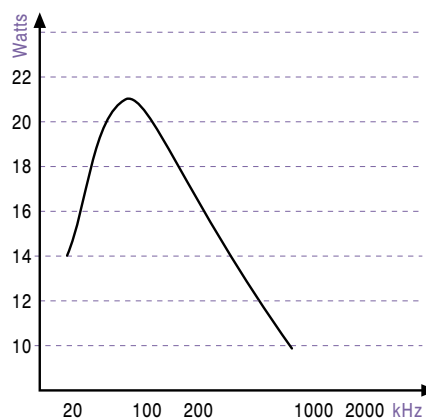
STANDARD A_L (nH/t ²)	1600	1000	630	400	315	250	160
TYPICAL VALUE OF MAX. Amper Turns	190	310	490	790	950	1202	1500

A_L values not listed are available upon request.

3. Typical Thermal Impedance For Different Cooling Conditions

NATURAL COOLING (Hot Spot - Air)	BLOWING AIR 3m/sec (Hot Spot - Air)	ONE SIDE HEATSINK (Hot Spot - Heatsink)	TWO SIDE HEATSINK (Hot Spot - Heatsink)
$1.7^{\circ}/\text{W}$	$1.3^{\circ}/\text{W}$	$1.6^{\circ}/\text{W}$	$0.8^{\circ}/\text{W}$

Power Capacity vs. Frequency*



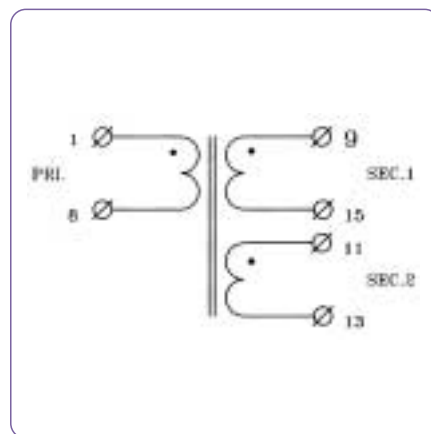
*For single output AC to DC full bridge power supply transformer with turns ratio of 6.

EXAMPLE

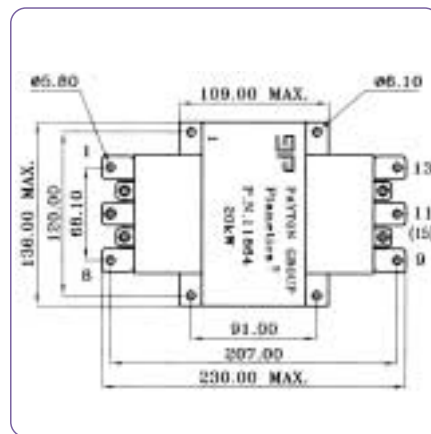
Transformer Type T5000 AC P.N. 11864

This T5000-16-6-6, super high power, high input voltage, high frequency, small dimensional planar transformer is developed for a high power density AC-DC converter and may be used in high power applications, providing the following specifications:

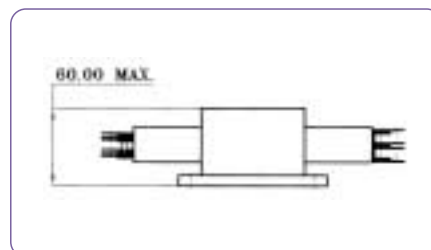
Transformer Specifications	
Total output power	20kW (590 Vdc@34 Adc)
Operating frequency	100 kHz
Input voltage range	815 - 900 Vdc
Topology	Full bridge, resonant
Max. Volt-Sec. product	8.15 V-msec
Duty cycle	2 x 0.5 max.
Primary current Secondary 1,2 output current	27 Arms max. 30 Arms max.
Primary to Sec. 1,2 ratio	16 : 6
Dielectric strength pri. to sec.1+sec.2+core sec.1, sec.2 to core	3750 Vrms 1500 Vrms
Ambient temperature	-20°C to +50°C
Total losses (With 45°C heat sink)	95W
Hotspot temperature (With 45 °C heatsink)	120°C max.
Weight	3000 gr.



ELECTRICAL DIAGRAM



TOP VIEW



SIDE VIEW

(All dimensions are given in mm.)