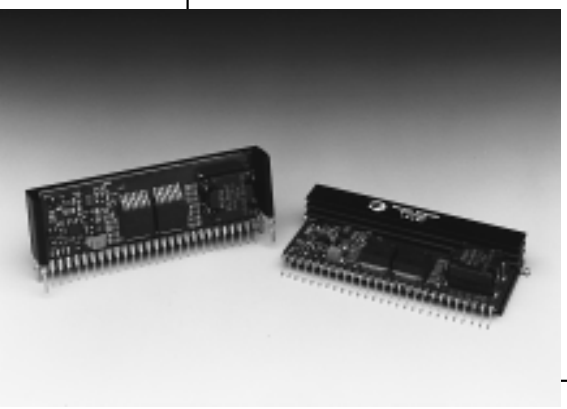
PT7706 Series

18 AMP "BIG-HAMMER" PROGRAMMABLE INTEGRATED SWITCHING REGULATOR

Application Notes
Mechanical Outline
Product Selector Guide



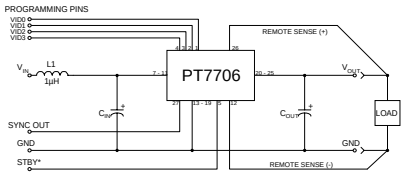
The PT7706 is a new series of high-performance, 18 Amp Integrated Switching Regulators (ISRs) housed in a 27-pin SIP package. The 18A capability allows easy integration of the latest high-speed, low-voltage µPs, DSPs, ASICs, and bus drivers into existing 3.3V systems.

The PT7706 series has been designed to work in parallel with one or more of the PT7749 - 18A current boosters for increased I_{out} in increments of 18A.

The output voltage of the PT7706 can be easily programmed with a 4 bit input compatible with Intel's Pentium® II Processor. A differential remote sense is also provided which automatically compensates for any voltage drop from the ISR to the load.

1200µF of output capacitance are required for proper operation.

Standard Application



C_{in} = Required 1200µF electrolytic
C_{out}= Required 1200µF electrolytic
L1 = Optional 1µH input choke

Pin-Out Information

Pin	Function	Pin	Function	Pin	Function
1	VID0	10	V_{in}	19	GND
2	VID1	11	V_{in}	20	V_{out}
3	VID2	12	Remote Sense Gnd	21	V_{out}
4	VID3	13	GND	22	V_{out}
5	STBY* - Stand-by	14	GND	23	V_{out}
6	Do not connect	15	GND	24	V_{out}
7	V_{in}	16	GND	25	V_{out}
8	V_{in}	17	GND	26	Remote Sense V_{out}
9	V_{in}	18	GND	27	Sync Out

For STBY* pin; open = output enabled; ground = output disabled.

Specifications

Characteristics (T_a = 25°C unless noted)	Symbols	Conditions	PT7706 SERIES Min	Typ	Max	Units
Output Current	I_o	T_a = +60°C, 200 LFM, pkg N T_a = +25°C, natural convection	0.1* 0.1*	— —	18** 15**	A A
Input Voltage Range	V_{in}	0.1A ≤ I_o ≤ 15A	3.1***	—	3.6	V
Output Voltage Tolerance	ΔV_o	V_{in} = +3.3V, I_o = 18A 0°C ≤ T_a ≤ +65°C	V_o-0.03	—	V_o+0.03	V
Line Regulation	Reg_{line}	3.1V ≤ V_{in} ≤ 3.6V, I_o = 18A	—	±10	—	mV
Load Regulation	Reg_{load}	V_{in} = +3.3V, 0.1 ≤ I_o ≤ 18A	—	±10	—	mV
V_o Ripple/Noise	V_n	V_{in} = +3.3V, I_o = 18A	—	50	—	mV
Transient Response with C_{out} = 1200µF	t_{tr} V_{os}	I_o step between 9A and 18A V_o over/undershoot	— —	100 200	— —	µSec mV
Efficiency	η	V_{in} = +3.3V, I_o = 10A V_o = 1.8V V_o = 1.5V	— —	79 77	— —	% %
Switching Frequency	f_o	3.1V ≤ V_{in} ≤ 3.6V 0.1A ≤ I_o ≤ 18A	650	700	750	kHz
Absolute Maximum Operating Temperature Range	T_a	—	0	—	+85	°C
Recommended Operating Temperature Range	T_a	Forced Air Flow = 200 LFM Over V_{in} and I_o Ranges	0	—	+65****	°C
Storage Temperature	T_s	—	-40	—	+125	°C
Mechanical Shock		Per Mil-STD-883D, Method 2002.3 1 msec, Half Sine, mounted to a fixture	—	500	—	G's
Mechanical Vibration		Per Mil-STD-883D, Method 2007.2, 20-2000 Hz, Soldered in a PC board	—	10	—	G's
Weight	—	Vertical/Horizontal	—	31/41	—	grams

* ISR-will operate down to no load with reduced specifications. Please note that this product is not short-circuit protected.
**The PT7706 series can be easily paralleled with one or more of the PT7749 Current Boosters to provide increased output current in increments of 18A.
*** The minimum input voltage is 3.1V or V_{out}+1.2V, whichever is greater. ****See SOA curves.

Output Capacitors: *The PT7706 series requires a minimum ouput capacitance of 1200µF for proper operation. Do not use Oscon type capacitors. The maximum allowable output capacitance is 15,000µF.*

Input Filter: *An input filter is optional for most applications. The input inductor must be sized to handle 18ADC with a typical value of 1µH. The input capacitance must be rated for a minimum of 1.3Arms of ripple current. For transient or dynamic load applications, additional capacitance may be required.*

Power Trends, Inc. 27715 Diehl Road, Warrenville, IL 60555 **(800) 531-5782** Fax: (630) 393-6902 **http://www.powertrends.com**

Features

- +3.3V input
- 4-bit Programmable: 1.3V to 2.05V@18A
- High Efficiency
- Input Voltage Range: 3.1V to 3.6V
- Differential Remote Sense
- 27-pin SIP Package
- Parallelable with PT7749 18A "Current Boosters"

Programming Information

VID3	VID2	VID1	VID0	Vout
1	1	1	1	1.30V
1	1	1	0	1.35V
1	1	0	1	1.40V
1	1	0	0	1.45V
1	0	1	1	1.50V
1	0	1	0	1.55V
1	0	0	1	1.60V
1	0	0	0	1.65V
0	1	1	1	1.70V
0	1	1	0	1.75V
0	1	0	1	1.80V
0	1	0	0	1.85V
0	0	1	1	1.90V
0	0	1	0	1.95V
0	0	0	1	2.00V

Logic 0 = Pin 12 potential (remote sense gnd)
Logic 1 = Open circuit (no pull-up resistors)
VID3 may not be changed while the unit is operating.

Ordering Information

PT7706❑ = 1.3 to 2.05 Volts

(For dimensions and PC board layout, see Package Styles 800 and 810.)

PT Series Suffix (PT1234X)

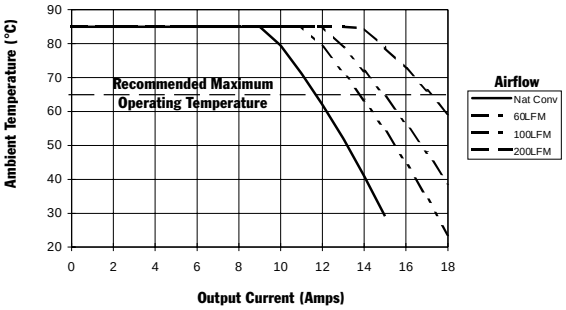
Case/Pin Configuration	
Vertical Through-Hole	**N**
Horizontal Through-Hole	**A**
Horizontal Surface Mount	**C**

CHARACTERISTIC DATA

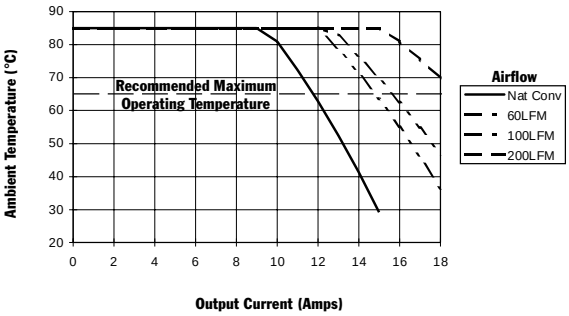
PT7706, V_o = 1.8 VDC (See Note 1)

Safe Operating Area Curves (@V_{in}=+3.3V)

PKG SUFFIX N

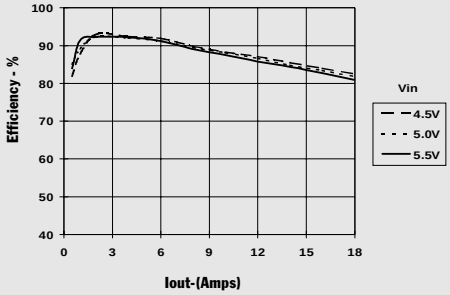


PKG SUFFIX A, C

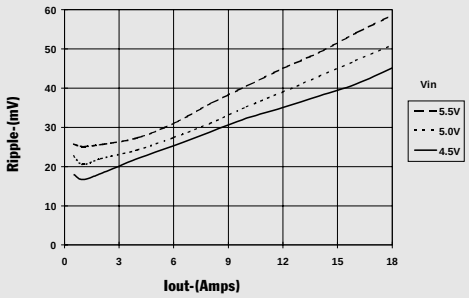


PT7706, V_o = 1.8 VDC (See Note 1)

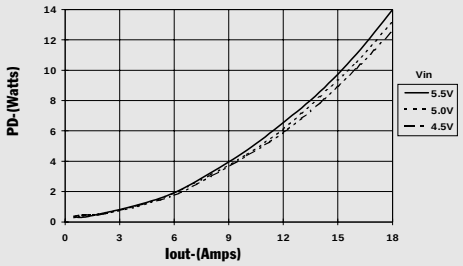
Efficiency vs Output Current



Ripple vs Output Current



Power Dissipation vs Output Current



Note 1: *All data listed in the above graphs has been developed from actual products tested at 25°C. This data is considered typical data for the ISR.*
Note 2: *SOA curves represent operating conditions at which internal components are at or below manufacturer's maximum rated operating temperatures.*

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