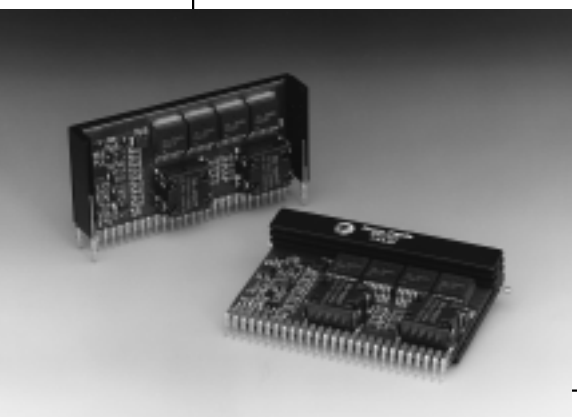
PT7770 Series

32 AMP HIGH-PERFORMANCE "SLEDGE HAMMER" PROGRAMMABLE ISR

Revised 5/15/98

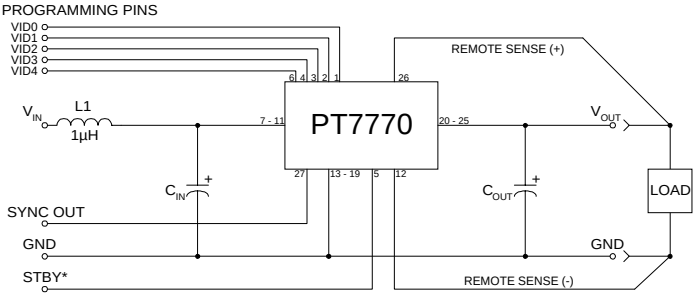


The PT7770 is a new series of high-performance, 32 Amp Integrated Switching Regulators (ISRs) housed in a 27-pin SIP package. The 32A capability allows easy integration of the latest high-speed, low-voltage µPs, ASICs, DSPs, and bus drivers into existing 5V systems.

The output voltage of the PT7770 can be easily programmed from 1.3V to 3.5V with a 5 bit input compatible with Intel's Pentium® Pro Processor. A differential remote sense is also provided which automatically compensates for any voltage drop from the ISR to the load.

2400µF of output capacitance are required for proper operation.

Standard Application



C_{in} = Required 2400µF electrolytic
C_{out} = Required 2400µF electrolytic
L1 = Optional 1µH input choke

Pin-Out Information

Pin	Function	Pin	Function
1	VID0	14	GND
2	VID1	15	GND
3	VID2	16	GND
4	VID3	17	GND
5	STBY*- Stand-by	18	GND
6	VID4	19	GND
7	V_{in}	20	V_{out}
8	V_{in}	21	V_{out}
9	V_{in}	22	V_{out}
10	V_{in}	23	V_{out}
11	V_{in}	24	V_{out}
12	Remote Sense Gnd	25	V_{out}
13	GND	26	Remote Sense V_{out}
		27	Sync Out

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

Specifications

Characteristics (T_a = 25°C unless noted)	Symbols	Conditions	PT7770 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 (1) 0.1 (1)	— —	32 26	A A
Input Voltage Range	V_{in}	0.1A ≤ I_o ≤ 32A	4.5 (2)	—	5.5	V
Output Voltage Tolerance	ΔV_o	V_{in} = +5V, I_o = 32A 0°C ≤ T_a ≤ +55°C	V_o-0.03	—	V_o+0.03	V
Line Regulation	Reg_{line}	4.5V ≤ V_{in} ≤ 5.5V, I_o = 32A	—	±10	—	mV
Load Regulation	Reg_{load}	V_{in} = +5V, 0.1 ≤ I_o ≤ 32A	—	±10	—	mV
V_o Ripple/Noise pk-pk	V_n	V_{in} = +5V, I_o = 32A	—	50	—	mV
Transient Response with C_{out} = 2400µF	t_{tr} V_{os}	I_o step between 16A and 32A V_o over/undershoot	— —	100 200	— —	µSec mV
Efficiency	η	V_{in} = +5V, I_o = 20A, V_o = 3.3V	—	90	—	%
Switching Frequency	f_o	4.5V ≤ V_{in} ≤ 5.5V 0.1A ≤ I_o ≤ 32A	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
Weight	—	Vertical/Horizontal	—	53/66	—	grams

(1) ISR-will operate down to no load with reduced specifications. Please note that this product is not short-circuit protected.

(2) The minimum input voltage is 4.5V or V_{out}+1.2V, whichever is greater.

Output Capacitors: *The PT7770 series requires a minimum output capacitance of 2400µF for proper operation. Do not use Oscon type capacitors. The maximum allowable output capacitance is 30,000µF.*

Input Filter: *An input filter is optional for most applications. The input inductor must be sized to handle 32ADC with a typical value of 1µH. The input capacitance must be rated for a minimum of 2.6Arms 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

- +5V input
- 5-bit Programmable: 1.3V to 3.5V@32A
- High Efficiency
- Input Voltage Range: 4.5V to 5.5V
- Differential Remote Sense
- 27-pin SIP Package

Programming Information

VID3	VID2	VID1	VID0	VID4=1 Vout	VID4=0 Vout
1	1	1	1	2.0V	1.30V
1	1	1	0	2.1V	1.35V
1	1	0	1	2.2V	1.40V
1	1	0	0	2.3V	1.45V
1	0	1	1	2.4V	1.50V
1	0	1	0	2.5V	1.55V
1	0	0	1	2.6V	1.60V
1	0	0	0	2.7V	1.65V
0	1	1	1	2.8V	1.70V
0	1	1	0	2.9V	1.75V
0	1	0	1	3.0V	1.80V
0	1	0	0	3.1V	1.85V
0	0	1	1	3.2V	1.90V
0	0	1	0	3.3V	1.95V
0	0	0	1	3.4V	2.00V
0	0	0	0	3.5V	2.05V

Logic 0 = Pin 12 potential (remote sense gnd)
Logic 1 = Open circuit (no pull-up resistors)
VID3 and VID4 may not be changed while the unit is operating.

Ordering Information

PT7771❑ = 1.3 to 3.5 Volts

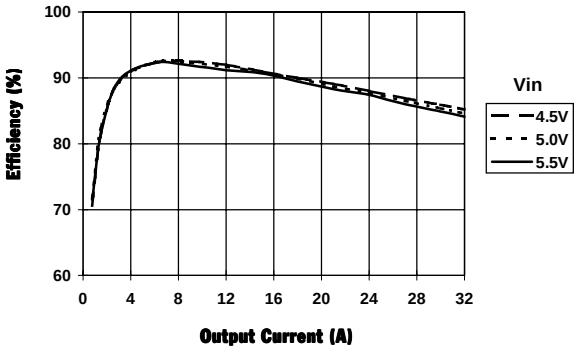
For dimensions and PC board layout, see Package Style 1020 and 1030

PT Series Suffix (PT1234X)

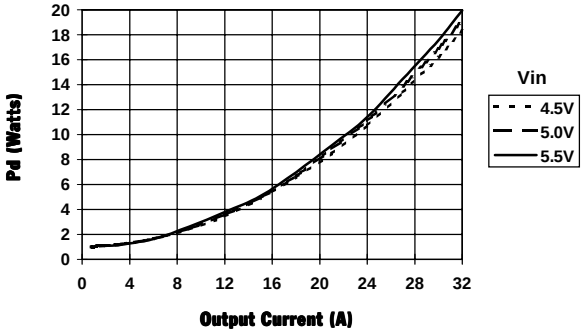
Case/Pin Configuration	
Vertical Through-Hole	**N**
Horizontal Through-Hole	**A**
Horizontal Surface Mount	**C**

CHARACTERISTIC DATA

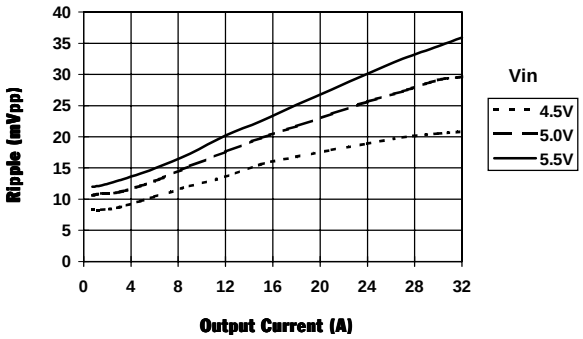
Efficiency vs Output Current (@Vout=+3.3V)



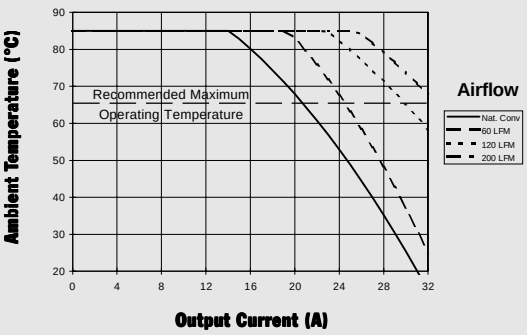
Power Dissipation vs Output Current (@Vout=+3.3V)



Output Ripple vs Output Current (@Vout=+3.3V)



Safe Operating Area (@Vin=+5V, Vout=+3.3V, Pkg N)



Note: SOA curves represent operating conditions at which internal components are at or below manufacturer's maximum rated operating temperatures.

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