

PT7771—5V

32 Amp "Sledge Hammer"
Programmable ISR



SLTS054A

(Revised 6/30/2000)

The PT7771 is a high-output Integrated Switching Regulator (ISR) housed in a 27-pin SIP package. The PT7771 operates off a standard 5V bus to provide a 32 amp low-voltage power source for the industry's latest high-speed μ Ps, ASICs, DSPs.

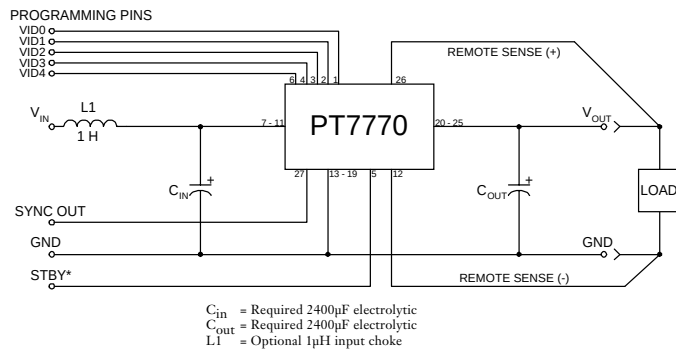
The PT7771 has been designed to work in parallel with one or more of the PT7746 -32A current boosters to increase the load current capability in increments of 32A.

The output voltage is programmable from 1.3V to 3.5V via a 5-bit input, compatible with Intel's Pentium[®] Pro Processor. A differential remote sense is also provided to compensate for voltage drop between the ISR and load.

An output capacitance of 2400 μ F is required for proper operation.

Note that this product does not include short circuit protection.

Standard Application



Specifications

Characteristics ($T_a = 25^\circ\text{C}$ unless noted)	Symbols	Conditions	PT7771			Units
			Min	Typ	Max	
Output Current	I_o	$T_a = +60^\circ\text{C}$, 200 LFM, pkg N $T_a = +25^\circ\text{C}$, natural convection	0.1 (1) 0.1 (1)	— —	32 26	A A
Input Voltage Range	V_{in}	$0.1\text{A} \leq I_o \leq 32\text{A}$	4.5 (2)	—	5.5	V
Output Voltage Tolerance	ΔV_o	$V_{in} = +5\text{V}$, $I_o = 32\text{A}$ $0^\circ\text{C} \leq T_a \leq +55^\circ\text{C}$	$V_o - 0.03$	—	$V_o + 0.03$	V
Line Regulation	Reg_{line}	$4.5\text{V} \leq V_{in} \leq 5.5\text{V}$, $I_o = 32\text{A}$	—	± 10	—	mV
Load Regulation	Reg_{load}	$V_{in} = +5\text{V}$, $0.1 \leq I_o \leq 32\text{A}$	—	± 10	—	mV
V_o Ripple/Noise pk-pk	V_n	$V_{in} = +5\text{V}$, $I_o = 32\text{A}$	—	50	—	mV
Transient Response with $C_{out} = 2400\mu\text{F}$	t_{tr} V_{os}	I_o step between 16A and 32A V_o over/undershoot	— —	100 200	— —	μSec mV
Efficiency	η	$V_{in} = +5\text{V}$, $I_o = 20\text{A}$, $V_o = 3.3\text{V}$	—	90	—	%
Switching Frequency	f_o	$4.5\text{V} \leq V_{in} \leq 5.5\text{V}$ $0.1\text{A} \leq I_o \leq 32\text{A}$	650	700	750	kHz
Absolute Maximum Operating Temperature Range	T_a	Over V_{in} Range	0	—	+85 (3)	$^\circ\text{C}$
Storage Temperature	T_s	—	-40	—	+125	$^\circ\text{C}$
Weight	—	Vertical/Horizontal	—	53/66	—	grams

Notes: (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 $V_{out} + 1.2\text{V}$, whichever is greater.
 (3) Consult the SOA curves or contact the factory for the appropriate derating.

Output Capacitors: The PT7771 regulator requires a minimum output capacitance of 2400 μ F for proper operation. Do not use Oscon type capacitors. The maximum allowable output capacitance is 30,000 μ F.

Input Filter: An input filter is optional for most applications. The input inductor must be sized to handle 32ADC with a typical value of 1 μ H. 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.

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.

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Features

- +5V input
- 5-bit Programmable:
1.3V to 3.5V@32A
- High Efficiency
- Differential Remote Sense
- Parallelable with PT7746
32A “Current Booster”
- 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)

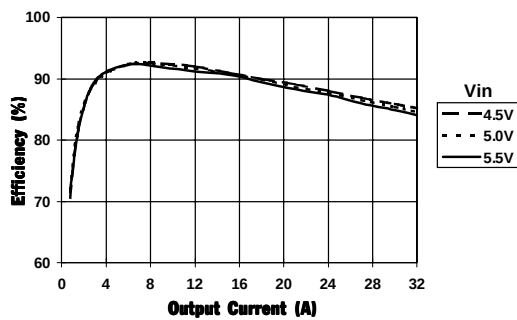
Case/Pin Configuration

Vertical Through-Hole	N
Horizontal Through-Hole	A
Horizontal Surface Mount	C

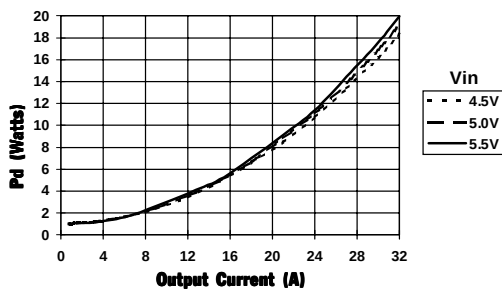
TYPICAL CHARACTERISTICS

PT7771 @V_{in} = +5V, V_{out} = 3.3V (See Note A)

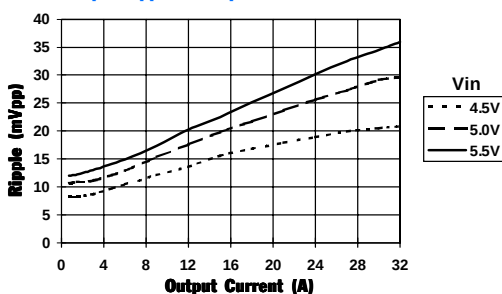
Efficiency vs Output Current



Power Dissipation vs Output Current

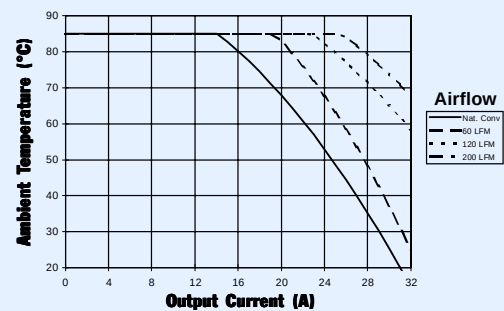


Output Ripple vs Output Current



Safe Operating Area Curves (See Note B)

PT7771 @V_{in} = +5V, V_{out} = 3.3V, Pkg N



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

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