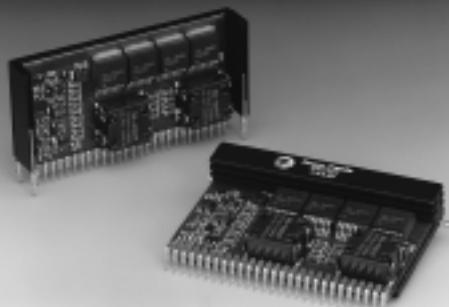


PT7777 Series

**32 AMP HIGH-PERFORMANCE
"SLEDGE HAMMER" PROGRAMMABLE ISR**

Revised 7/31/98

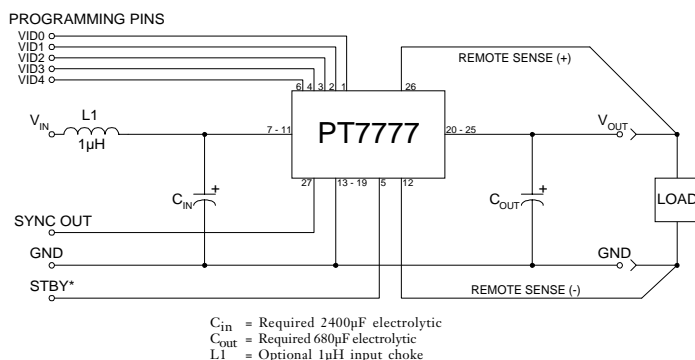


The PT7777 is a new series of high-performance, 32 Amp Integrated Switching Regulators (ISRs) housed in a 27-pin SIP package. The 32A capability allows easy integration of the latest high-speed, low-voltage μ Ps, ASICs, DSPs, and bus drivers into existing 5V systems. The output voltage of the PT7777

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.

680 μ F of output capacitance is required for proper operation.

Standard Application



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	PT7777 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} = 680 μ F	t _{rr}	I _o step between 16A and 32A V _o over/undershoot	—	100	—	μ Sec
	V _{os}		—	200	—	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 PT7777 series requires a minimum output capacitance of 680 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.

PT7777 Series

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

PT7777□ = 1.3 to 3.5 Volts
 For dimensions and PC board layout, see Package Style 1020 and 1030

PT Series Suffix (PT1234X)

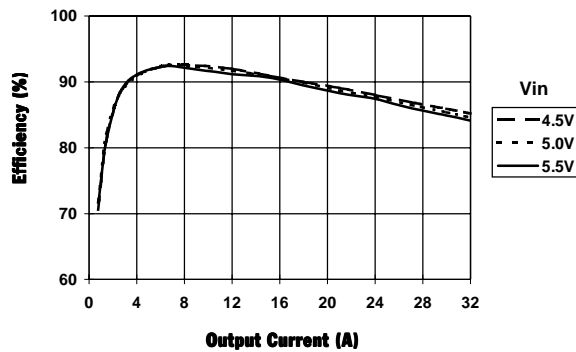
Case/Pin

Configuration

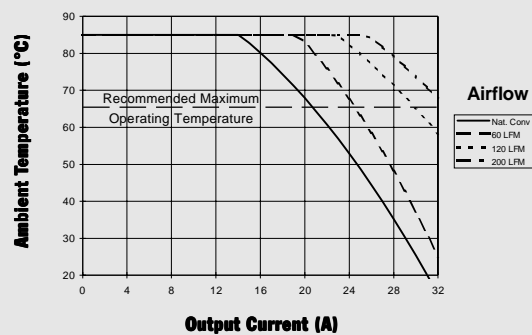
Vertical Through-Hole	N
Horizontal Through-Hole	A
Horizontal Surface Mount	C

CHARACTERISTIC DATA

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

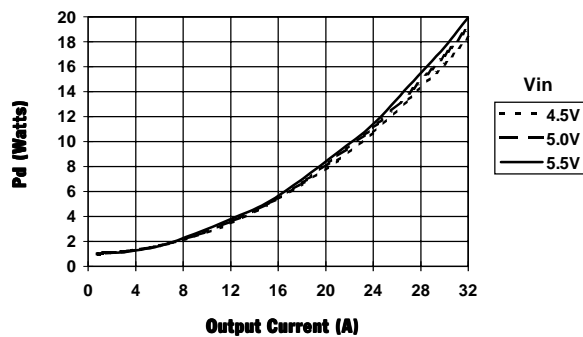


Safe Operating Area (@Vin=+5V, Vout=+3.3V, Pkg N)

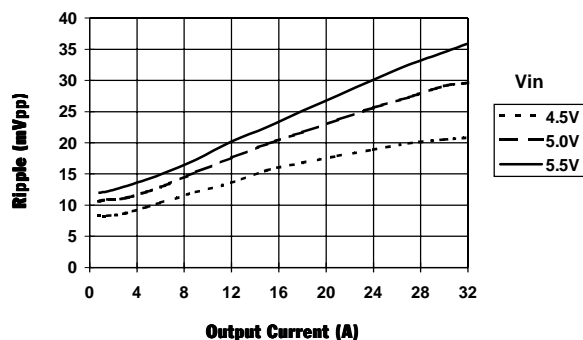


Note: SOA curves represent operating conditions at which internal components are at or below manufacturer's maximum rated operating temperatures.

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



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



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