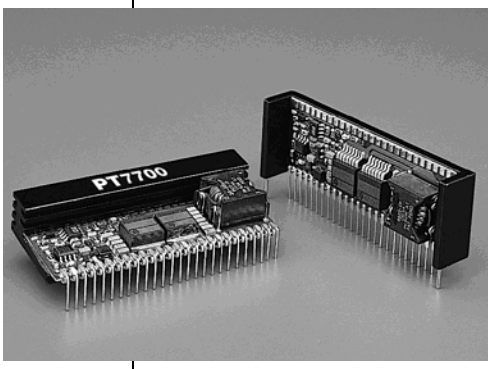
PT7700 Series

15 AMP HIGH-PERFORMANCE "BIG HAMMER" PROGRAMMABLE ISR

SLTS077
Revised 5/31/00



The PT7700 is a new series of high-performance, 15 Amp Integrated Switching Regulators (ISRs) housed in a 27-pin SIP package. The 15A capability allows easy integration of the latest high-speed, low-voltage µPs and bus drivers into existing 5V systems.

The PT7700 series has been designed to work in parallel with one or more of the PT7749 - 15A current boosters for increased I_{out} in increments of 15A.

Two products are offered in the series with different output voltage ranges that are easily programmed with a 4 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.

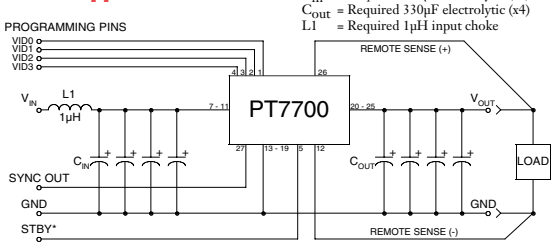
An input filter and 1200µF of output capacitance are required for proper operation.

Features

- Single-Device: +5V input
- 4-bit Programmable:
  2V to 3.5V@15A or
  1.3V to 2V @ 15A output
- High Efficiency
- Input Voltage Range:
  4.5V to 5.5V
- Differential Remote Sense
- 27-pin SIP Package:
  V = 1.0"(H) x 3"(L) x 0.55"(W)
  H = 0.55"(H) x 3"(L) x 1.5"(W)
- Parallelable with PT7749
  15A "Current Boosters"

Standard Application

C_{in} = Required 330µF electrolytic (x4)
C_{out} = Required 330µF electrolytic (x4)
L1 = Required 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	V_{in}	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.

Ordering Information

PT7701❑ = 2 to 3.5 Volts
PT7702❑ = 1.3 to 2 Volts

N = Vertical through-hole
A = Horizontal through-hole
C = Horizontal surface-mount

Programming Information

VID3	VID2	VID1	VID0	PT7701 Vout	PT7702 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

Note: Logic 0 = Pin 12 (remote sense gnd) potential
Logic 1 = Open circuit (no pull-up resistors)

Specifications

Characteristics (T_A = 25°C unless noted)	Symbols	Conditions		PT7700 SERIES Min	Typ	Max	Units
Output Current	I_o	4.5V ≤ V_{in} ≤ 5.5V		0.1 (1)	—	15 (2)	ADC
Input Voltage Range	V_{in}	0.1A ≤ I_o ≤ 15A		4.5 (3)	—	5.5	VDC
Static Voltage Tolerance	V_o	V_{in} = +5V, I_o = 15A 0°C ≤ T_a ≤ +55°C		V_o-0.05	—	V_o+0.05	VDC
Line Regulation	Reg_{line}	4.5V ≤ V_{in} ≤ 5.5V, I_o = 15A		—	±10	—	mV
Load Regulation	Reg_{load}	V_{in} = +5V, 0.1 ≤ I_o ≤ 15A		—	±10	—	mV
V_o Ripple/Noise pk-pk	V_n	V_{in} = +5V, I_o = 15A		—	50	—	mV
Transient Response with C_{out} = 1200µF	t_{tr} V_{os}	I_o step between 7.5A and 15A V_o over/undershoot		— —	100 200	— —	µSec mV
Efficiency	η	V_{in} = +5V, I_o = 10A	V_o = 3.3V V_o = 2.9V V_o = 2.5V V_o = 1.8V V_o = 1.5V	— — — — —	89 87 85 79 77	— — — — —	% % % % %
Switching Frequency	f_o	4.5V ≤ V_{in} ≤ 5.5V 0.1A ≤ I_o ≤ 15A		650	700	750	kHz
Operating Temperature	T_a	Forced Air Flow = 200 LFM Over V_{in} and I_o Ranges		0	—	+55	°C
Storage Temperature	T_s	—		-40	—	+125	°C
Weight	—	—		—	TBD	—	grams
Relative Humidity	—	Non-condensing		0	—	95	%

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

(2) The PT7700 series can be easily paralleled with one or more of the PT7749 slave modules to provide increased output current in increments of 15A. Please contact Power Trends for the appropriate application note.

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

Output Capacitors: *The PT7700 series requires A minimum output capacitance of 1200µF for proper operation. To reduce ESR, Power Trends recommends using four 330µF electrolytic capacitors in parallel.*

Input Filter: *An input filter is required for all applications. The input inductor must be sized to handle 15ADC with a typical value of 1µH. The input capacitance must be rated for 14Arms of ripple current. Power Trends recommends using four Sanyo OSCON style capacitors with a 3.5Arms ripple current rating in parallel (p/n 6SA330M).*

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