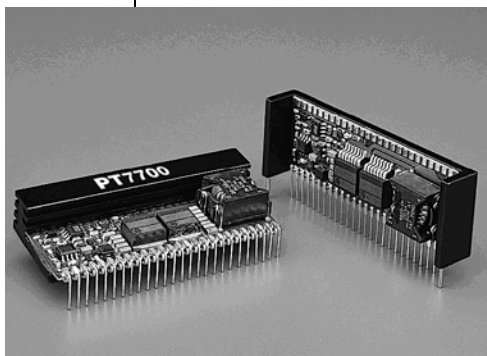


PT7700 Series

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 μ Ps 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.

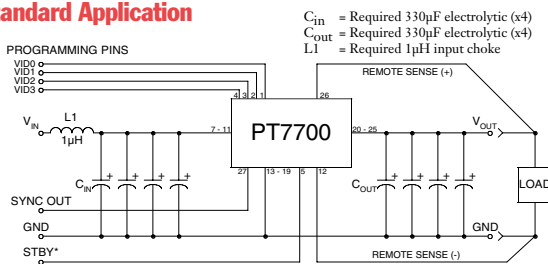
Two products are offered in the series with different output voltage ranges that are easily programmed with a 4 bit input compatible with Intel's Pentium® Pro Processor. A differential remote sense is also provided which automatically compensates for any voltage drop from the ISR to the load.

An input filter and 1200 μ F 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



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 V_{out}	PT7702 V_{out}
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 ($T_A = 25^\circ\text{C}$ unless noted)	Symbols	Conditions	PT7700 SERIES			
			Min	Typ	Max	Units
Output Current	I_o	$4.5V \leq V_{in} \leq 5.5V$	0.1 ⁽¹⁾	—	15 ⁽²⁾	ADC
Input Voltage Range	V_{in}	$0.1A \leq I_o \leq 15A$	4.5 ⁽³⁾	—	5.5	VDC
Static Voltage Tolerance	V_o	$V_{in} = +5V, I_o = 15A$ $0^\circ\text{C} \leq T_A \leq +55^\circ\text{C}$	$V_o - 0.05$	—	$V_o + 0.05$	VDC
Line Regulation	Reg_{line}	$4.5V \leq V_{in} \leq 5.5V, I_o = 15A$	—	± 10	—	mV
Load Regulation	Reg_{load}	$V_{in} = +5V, 0.1 \leq I_o \leq 15A$	—	± 10	—	mV
V_o Ripple/Noise pk-pk	V_n	$V_{in} = +5V, I_o = 15A$	—	50	—	mV
Transient Response with $C_{out} = 1200\mu\text{F}$	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	$4.5V \leq V_{in} \leq 5.5V$ $0.1A \leq I_o \leq 15A$	650	700	750	kHz
Operating Temperature	T_a	Forced Air Flow = 200 LFM Over V_{in} and I_o Ranges	0	—	+55	$^\circ\text{C}$
Storage Temperature	T_s	—	-40	—	+125	$^\circ\text{C}$
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 1200 μ F for proper operation. To reduce ESR, Power Trends recommends using four 330 μ F 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 1 μ H. 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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