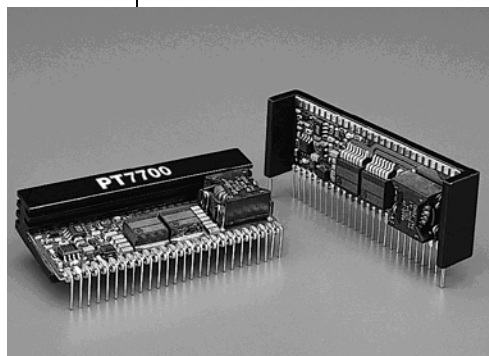


PT7700 Series

15 AMP HIGH-PERFORMANCE
"BIG HAMMER" PROGRAMMABLE ISRSLTS077
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.

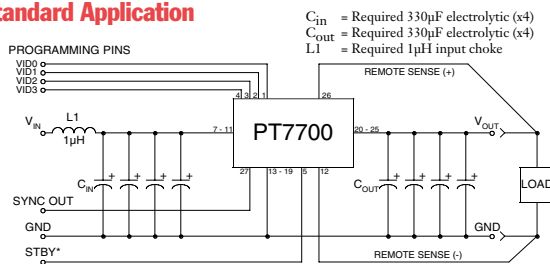
Two products are offered in the series with different output voltage ranges that are easily programmed with a 4 bit input compatible with Intel's Pentium® Pro Processor. A differential remote sense is also provided which automatically compensates for any voltage drop from the ISR to the load.

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:
 $V = 1.0''(H) \times 3''(L) \times 0.55''(W)$
 $H = 0.55''(H) \times 3''(L) \times 1.5''(W)$
- 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

□ = 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°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} = 1200 μ F	t _{tr} V _{os}	I _O step between 7.5A and 15A V _O over/undershoot	— —	100 200	—	μ Sec mV
Efficiency	η	V _{in} = +5V, I _O = 10A	V _O = 3.3V	—	89	—
			V _O = 2.9V	—	87	—
			V _O = 2.5V	—	85	—
			V _O = 1.8V	—	79	—
			V _O = 1.5V	—	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 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).

IMPORTANT NOTICE

Texas Instruments and its subsidiaries (TI) reserve the right to make changes to their products or to discontinue any product or service without notice, and advise customers to obtain the latest version of relevant information to verify, before placing orders, that information being relied on is current and complete. All products are sold subject to the terms and conditions of sale supplied at the time of order acknowledgment, including those pertaining to warranty, patent infringement, and limitation of liability.

TI warrants performance of its semiconductor products to the specifications applicable at the time of sale in accordance with TI's standard warranty. Testing and other quality control techniques are utilized to the extent TI deems necessary to support this warranty. Specific testing of all parameters of each device is not necessarily performed, except those mandated by government requirements.

Customers are responsible for their applications using TI components.

In order to minimize risks associated with the customer's applications, adequate design and operating safeguards must be provided by the customer to minimize inherent or procedural hazards.

TI assumes no liability for applications assistance or customer product design. TI does not warrant or represent that any license, either express or implied, is granted under any patent right, copyright, mask work right, or other intellectual property right of TI covering or relating to any combination, machine, or process in which such semiconductor products or services might be or are used. TI's publication of information regarding any third party's products or services does not constitute TI's approval, warranty or endorsement thereof.