

PT7773

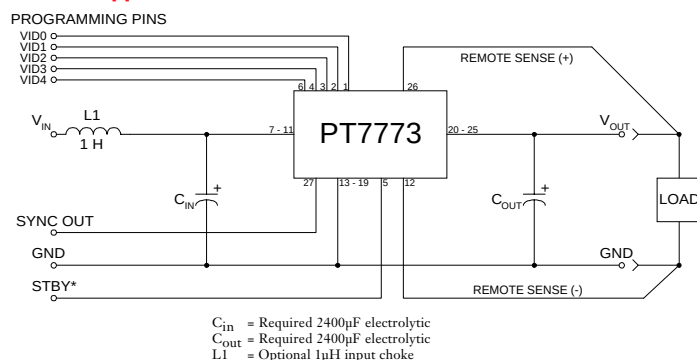
5V

32 AMP HIGH-PERFORMANCE
"SLEDGE HAMMER" PROGRAMMABLE ISRSLTS078
(Revised 5/31/2000)**Description**

The PT7773 is one of a 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 PT7773 is programmable over the low voltage range, 0.8V to 3.1V via a 5-bit input. A differential remote sense is also provided, which automatically compensates for any voltage drop between the ISR and load.

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

Standard Application**Specifications**

Characteristics (T _a = 25°C unless noted)	Symbols	Conditions	PT7773 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
Input Voltage Range	V _{in}	0.1A ≤ I _O ≤ 32A	4.5	—	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} = 2400 μ F	t _{rr} V _{os}	I _O step between 16A and 32A V _O over/undershoot	— —	100 200	— —	μ Sec mV
Efficiency	η	V _{in} = +5V, I _O = 20A, V _O = 2.5V	—	86	—	%
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	Over V _{in} Range	0	—	+85 ⁽²⁾	°C
Storage Temperature	T _s	—	-40	—	+125	°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) See SOA curves or consult the factory for the appropriate derating.

Output Capacitors: The PT7773 series 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.

PT7773**5 V****Features**

- +5V input
- 5-bit Programmable:
0.8V to 3.1V @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	1.6V	0.80V
1	1	1	0	1.7V	0.85V
1	1	0	1	1.8V	0.90V
1	1	0	0	1.9V	0.95V
1	0	1	1	2.0V	1.00V
1	0	1	0	2.1V	1.05V
1	0	0	1	2.2V	1.10V
1	0	0	0	2.3V	1.15V
0	1	1	1	2.4V	1.20V
0	1	1	0	2.5V	1.25V
0	1	0	1	2.6V	1.30V
0	1	0	0	2.7V	1.35V
0	0	1	1	2.8V	1.40V
0	0	1	0	2.9V	1.45V
0	0	0	1	3.0V	1.50V
0	0	0	0	3.1V	1.55V

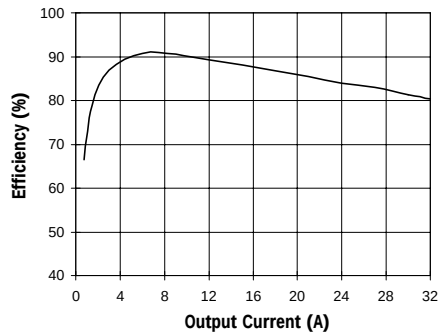
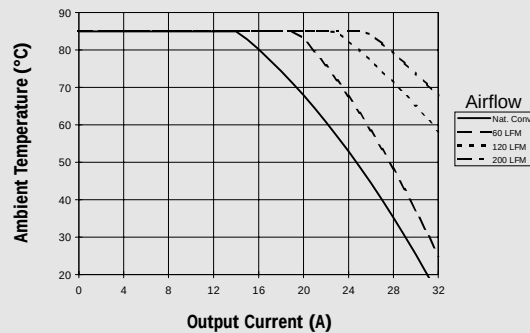
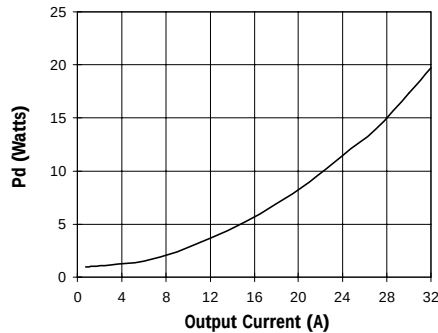
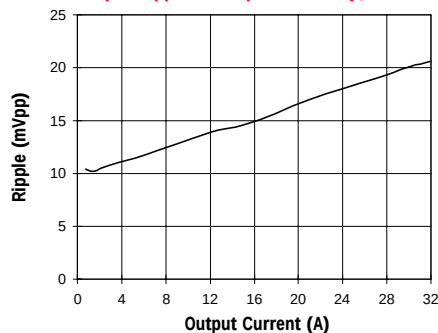
Logic 0 = Pin 12 potential (remote sense gnd)
 Logic 1 = Open circuit (no pull-up resistors)
 VID3 and VID4 may not be changed while the unit
 is operating.

Ordering Information**PT7773** = 0.8 to 3.1 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=+2.5V)** (See Note A)**Safe Operating Area (@Vin=+5V, Vout=+2.5V, Pkg N)** (See Note B)**Power Dissipation vs Output Current (@Vout=+2.5V)****Output Ripple vs Output Current (@Vout=+2.5V)**

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

IMPORTANT NOTICE

Texas Instruments Incorporated and its subsidiaries (TI) reserve the right to make corrections, modifications, enhancements, improvements, and other changes to its products and services at any time and to discontinue any product or service without notice. Customers should obtain the latest relevant information before placing orders and should verify that such information is current and complete. All products are sold subject to TI's terms and conditions of sale supplied at the time of order acknowledgment.

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

TI assumes no liability for applications assistance or customer product design. Customers are responsible for their products and applications using TI components. To minimize the risks associated with customer products and applications, customers should provide adequate design and operating safeguards.

TI does not warrant or represent that any license, either express or implied, is granted under any TI patent right, copyright, mask work right, or other TI intellectual property right relating to any combination, machine, or process in which TI products or services are used. Information published by TI regarding third-party products or services does not constitute a license from TI to use such products or services or a warranty or endorsement thereof. Use of such information may require a license from a third party under the patents or other intellectual property of the third party, or a license from TI under the patents or other intellectual property of TI.

Reproduction of TI information in TI data books or data sheets is permissible only if reproduction is without alteration and is accompanied by all associated warranties, conditions, limitations, and notices. Reproduction of this information with alteration is an unfair and deceptive business practice. TI is not responsible or liable for such altered documentation. Information of third parties may be subject to additional restrictions.

Resale of TI products or services with statements different from or beyond the parameters stated by TI for that product or service voids all express and any implied warranties for the associated TI product or service and is an unfair and deceptive business practice. TI is not responsible or liable for any such statements.

TI products are not authorized for use in safety-critical applications (such as life support) where a failure of the TI product would reasonably be expected to cause severe personal injury or death, unless officers of the parties have executed an agreement specifically governing such use. Buyers represent that they have all necessary expertise in the safety and regulatory ramifications of their applications, and acknowledge and agree that they are solely responsible for all legal, regulatory and safety-related requirements concerning their products and any use of TI products in such safety-critical applications, notwithstanding any applications-related information or support that may be provided by TI. Further, Buyers must fully indemnify TI and its representatives against any damages arising out of the use of TI products in such safety-critical applications.

TI products are neither designed nor intended for use in military/aerospace applications or environments unless the TI products are specifically designated by TI as military-grade or "enhanced plastic." Only products designated by TI as military-grade meet military specifications. Buyers acknowledge and agree that any such use of TI products which TI has not designated as military-grade is solely at the Buyer's risk, and that they are solely responsible for compliance with all legal and regulatory requirements in connection with such use.

TI products are neither designed nor intended for use in automotive applications or environments unless the specific TI products are designated by TI as compliant with ISO/TS 16949 requirements. Buyers acknowledge and agree that, if they use any non-designated products in automotive applications, TI will not be responsible for any failure to meet such requirements.

Following are URLs where you can obtain information on other Texas Instruments products and application solutions:

Products

Amplifiers	amplifier.ti.com
Data Converters	dataconverter.ti.com
DLP® Products	www.dlp.com
DSP	dsp.ti.com
Clocks and Timers	www.ti.com/clocks
Interface	interface.ti.com
Logic	logic.ti.com
Power Mgmt	power.ti.com
Microcontrollers	microcontroller.ti.com
RFID	www.ti-rfid.com
RF/IF and ZigBee® Solutions	www.ti.com/lprf

Applications

Audio	www.ti.com/audio
Automotive	www.ti.com/automotive
Broadband	www.ti.com/broadband
Digital Control	www.ti.com/digitalcontrol
Medical	www.ti.com/medical
Military	www.ti.com/military
Optical Networking	www.ti.com/opticalnetwork
Security	www.ti.com/security
Telephony	www.ti.com/telephony
Video & Imaging	www.ti.com/video
Wireless	www.ti.com/wireless

Mailing Address: Texas Instruments, Post Office Box 655303, Dallas, Texas 75265
Copyright © 2009, Texas Instruments Incorporated