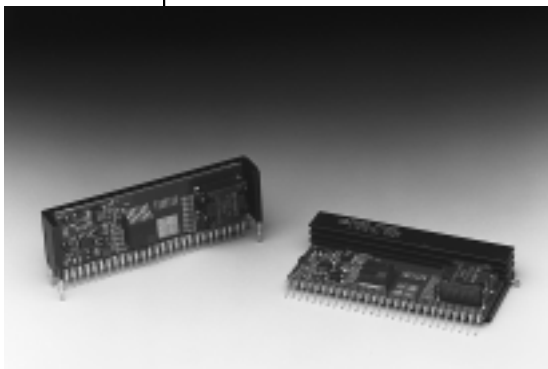


# PT7602 Series

## 3.3V INPUT 10A PROGRAMMABLE INTEGRATED SWITCHING REGULATOR

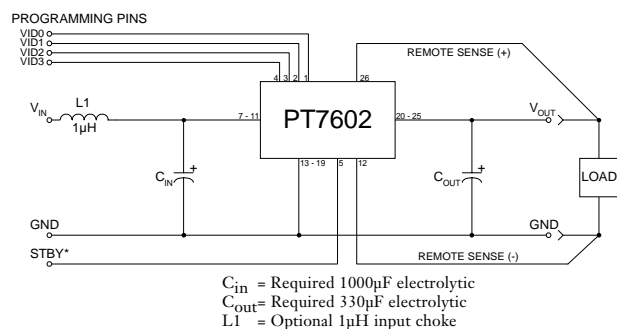
Revised 11/10/98



The PT7602 is a new series of high-performance, 10A Integrated Switching Regulators (ISRs) housed in a 27-pin SIP package. The 10A capability allows easy integration of the latest high-speed, low-voltage  $\mu$ Ps, DSPs, ASICs, and bus drivers into existing 3.3V systems.

The output voltage of the PT7602 can be easily programmed with a 4 bit input compatible with Intel's Pentium® II Processor. A differential remote sense is also provided which automatically compensates for any voltage drop from the ISR to the load.

### 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	Do not connect	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	Do not connect

For STBY\* pin; open = output enabled; ground = output disabled.

### Specifications

Characteristics ( $T_a = 25^\circ\text{C}$ unless noted)	Symbols	Conditions	PT7602 SERIES			
			Min	Typ	Max	Units
Output Current	$I_o$	$T_a = +60^\circ\text{C}$ , 200 LFM, pkg N $T_a = +25^\circ\text{C}$ , natural convection	0.1* 0.1*	—	10 10	A A
Input Voltage Range	$V_{in}$	$0.1\text{A} \leq I_o \leq 10\text{A}$	3.1**	—	3.6	V
Output Voltage Tolerance	$\Delta V_o$	$V_{in} = +3.3\text{V}$ , $I_o = 10\text{A}$ $0^\circ\text{C} \leq T_a \leq +65^\circ\text{C}$	$V_o - 0.03$	—	$V_o + 0.03$	V
Line Regulation	$\text{Reg}_{line}$	$3.1\text{V} \leq V_{in} \leq 3.6\text{V}$ , $I_o = 10\text{A}$	—	$\pm 10$	—	mV
Load Regulation	$\text{Reg}_{load}$	$V_{in} = +3.3\text{V}$ , $0.1 \leq I_o \leq 10\text{A}$	—	$\pm 10$	—	mV
$V_o$ Ripple/Noise	$V_n$	$V_{in} = +3.3\text{V}$ , $I_o = 10\text{A}$	—	50	—	mV
Transient Response with $C_{out} = 330\mu\text{F}$	$t_{rr}$ $V_{os}$	$I_o$ step between 5A and 10A $V_o$ over/undershoot	—	100 200	—	$\mu\text{Sec}$ mV
Efficiency	$\eta$	$V_{in} = +3.3\text{V}$ , $I_o = 7\text{A}$	$V_o = 1.8\text{V}$ $V_o = 1.5\text{V}$	78 76	—	% %
Switching Frequency	$f_o$	$3.1\text{V} \leq V_{in} \leq 3.6\text{V}$ $0.1\text{A} \leq I_o \leq 10\text{A}$	650	700	750	kHz
Absolute Maximum Operating Temperature Range	$T_a$	—	0	—	+85	$^\circ\text{C}$
Recommended Operating Temperature Range	$T_a$	Forced Air Flow = 200 LFM Over $V_{in}$ and $I_o$ Ranges	0	—	+65	$^\circ\text{C}$
Storage Temperature	$T_s$	—	-40	—	+125	$^\circ\text{C}$
Mechanical Shock		Per Mil-STD-883D, Method 2002.3 1 msec, Half Sine, mounted to a fixture	—	500	—	G's
Mechanical Vibration		Per Mil-STD-883D, Method 2007.2, 20-2000 Hz, Soldered in a PC board	—	10	—	G's
Weight	—	Vertical/Horizontal	—	31/41	—	grams

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

\*\* The minimum input voltage is 3.1V or  $V_{out} + 1.2\text{V}$ , whichever is greater.

**Output Capacitors:** The PT7602 series requires a minimum output capacitance of 330 $\mu\text{F}$  for proper operation. Do not use Oscon type capacitors. The maximum allowable output capacitance is 7,500 $\mu\text{F}$ .

**Input Filter:** An input filter is optional for most applications. The input inductor must be sized to handle 10ADC with a typical value of 1 $\mu\text{H}$ . The input capacitance must be rated for a minimum of 1.0Arms of ripple current. For transient or dynamic load applications, additional capacitance may be required.

# PT7602 Series

## Features

- +3.3V input
- 4-bit Programmable:  
1.3V to 2.05V@10A
- High Efficiency
- Input Voltage Range:  
3.1V to 3.6V
- Differential Remote Sense
- 27-pin SIP Package

## Programming Information

VID3	VID2	VID1	VID0	Vout
1	1	1	1	1.30V
1	1	1	0	1.35V
1	1	0	1	1.40V
1	1	0	0	1.45V
1	0	1	1	1.50V
1	0	1	0	1.55V
1	0	0	1	1.60V
1	0	0	0	1.65V
0	1	1	1	1.70V
0	1	1	0	1.75V
0	1	0	1	1.80V
0	1	0	0	1.85V
0	0	1	1	1.90V
0	0	1	0	1.95V
0	0	0	1	2.00V

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

## Ordering Information

PT7602□ = 1.3 to 2.05 Volts

(For dimensions and PC board layout, see Package Styles 800 and 810.)

## PT Series Suffix (PT1234X)

### Case/Pin

### Configuration

Vertical Through-Hole	<b>N</b>
Horizontal Through-Hole	<b>A</b>
Horizontal Surface Mount	<b>C</b>

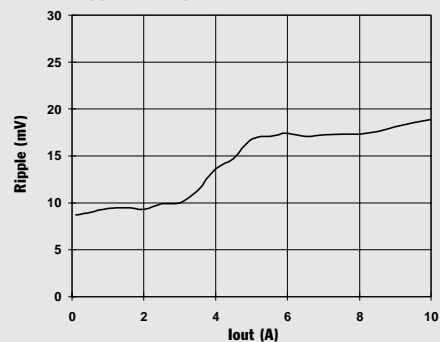
## CHARACTERISTIC DATA

### PT7602, $V_o = 1.8$ VDC (See Note 1)

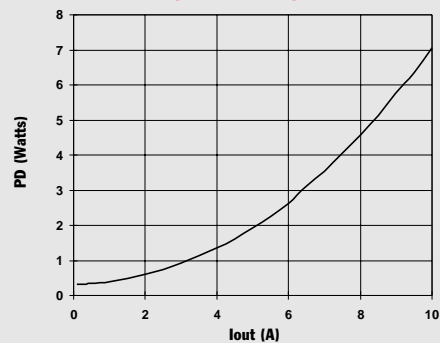
#### Efficiency vs Output Current



#### Ripple vs Output Current



#### Power Dissipation vs Output Current



**Note 1:** All data listed in the above graphs has been developed from actual products tested at 25°C. This data is considered typical data for the ISR.

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