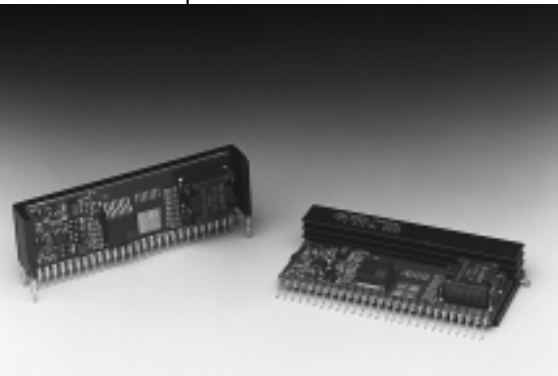


PT7600 Series

10 AMP PROGRAMMABLE INTEGRATED SWITCHING REGULATOR

Revised 5/15/98



Features

- Single-Device: +5V input
- 5-bit Programmable: 1.3V to 3.5V@10A
- High Efficiency
- Input Voltage Range: 4.5V to 5.5V
- Differential Remote Sense
- 27-pin SIP Package

The PT7600 is a new series of high-performance, 10 Amp Integrated Switching

Regulators (ISRs) housed in a 27-pin SIP package. The 10A capability allows easy integration of the latest high-speed, low-voltage μ Ps and bus drivers into existing 5V systems.

The output voltage of the PT7600 is easily programmed with a 5 bit input compatible with Intel's Pentium® II Processor from 1.3V to 3.5V. A differential remote sense is also provided which automatically compensates for any voltage drop from the ISR to the load.

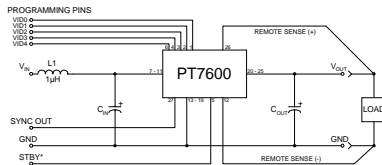
1200 μ F of output capacitance are required for proper operation.

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	VID4	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.

Standard Application



C_{in} = Required 1200 μ F electrolytic
 C_{out} = Required 1200 μ F electrolytic
 L1 = Optional 1 μ H input choke

Specifications

Characteristics (T _a = 25°C unless noted)	Symbols	Conditions	PT7600 SERIES			Units
			Min	Typ	Max	
Output Current	I _o	T _a = +60°C, 200 LFM, pkg N T _a = +25°C, natural convection	0.1*	—	10	A
Input Voltage Range	V _{in}	0.1A ≤ I _o ≤ 10A	4.5**	—	5.5	V
Output Voltage Tolerance	ΔV _o	V _{in} = +5V, I _o = 10A 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 = 10A	—	±10	—	mV
Load Regulation	Reg _{load}	V _{in} = +5V, 0.1 ≤ I _o ≤ 10A	—	±10	—	mV
V _o Ripple/Noise pk-pk	V _n	V _{in} = +5V, I _o = 10A	—	50	—	mV
Transient Response with C _{out} = 1200 μ F	t _{tr} V _{os}	I _o step between 5A and 10A V _o over/undershoot	— —	100 200	— —	μ Sec 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	80 78 75 69 65	— — — — —	% % % % %
Switching Frequency	f _o	4.5V ≤ V _{in} ≤ 5.5V 0.1A ≤ I _o ≤ 10A	650	700	750	kHz
Absolute Maximum Operating Temperature Range	T _a		0	—	+85	°C
Recommended Operating Temperature Range	T _a	Forced Air Flow = 200 LFM Over V _{in} and I _o Ranges	0	—	+65***	°C
Storage Temperature	T _s		-40	—	+125	°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 4.5V or V_{out}+1.2V, whichever is greater.

*** See SOA curves.

Output Capacitors: The PT7600 series requires a minimum output capacitance of 1200 μ F for proper operation. Do not use Oscon type capacitors. The maximum allowable output capacitance is 7,500 μ F. See Capacitor Application Note.

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 μ H. The input capacitance must be rated for a minimum of 1.0 Arms of ripple current. For transient or dynamic load applications, additional capacitance may be required.

PT7600 Series

Programming Information

VID3	VID2	VID1	VID0	VID4=1 Vout	VID4=0 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

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

Ordering Information

PT7601□ = 1.3 to 3.5 Volts

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

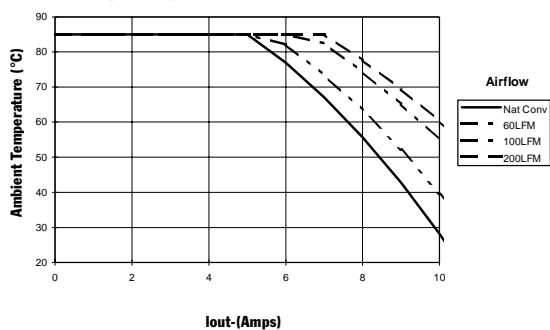
PT Series Suffix (PT1234X)

Case/Pin Configuration

Vertical Through-Hole	N
Horizontal Through-Hole	A
Horizontal Surface Mount	C

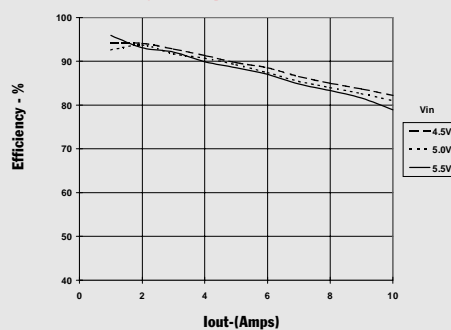
CHARACTERISTIC DATA

Safe Operating Area Curve (@V_{in}=+5V)

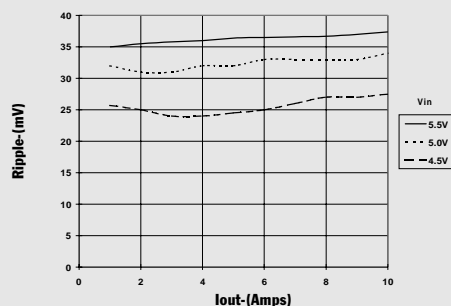


PT7601, 3.3 VDC See Note 1)

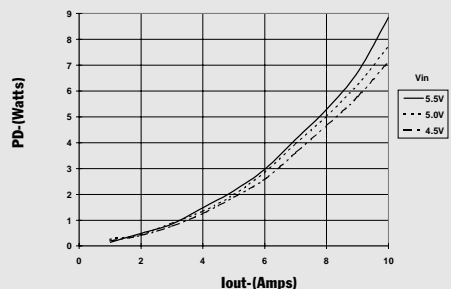
Efficiency vs Output Current



Ripple vs Output Current



Power Dissipation vs Output Current



Note 1: SOA curves represent operating conditions at which internal components are at or below manufacturer's maximum rated operating temperatures.

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