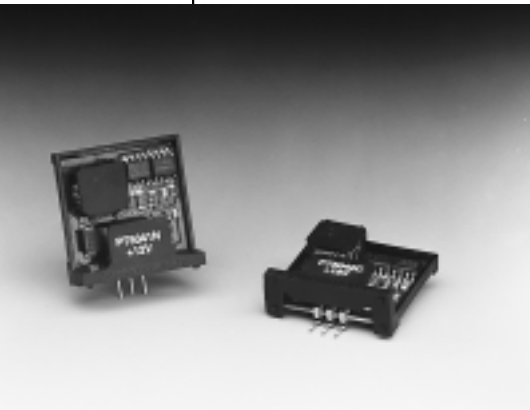


# PT5040 Series

## 1 AMP STEP-UP INTEGRATED SWITCHING REGULATOR

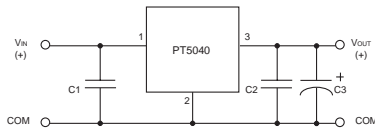
Revised 6/30/98



- Wide Input Voltage Range
- 85% Efficiency
- Internal Over-Temperature Protection
- Laser-trimmed Output Voltage
- Soft Start

The Power Trends' PT5040 Series is a 3-terminal Integrated Switching Regulator (ISR) designed for use with +5 volt systems that require an additional regulated +8 to +20 volts with up to 1A of output current. These ISRs are packaged in the 3 pin SIP configuration.

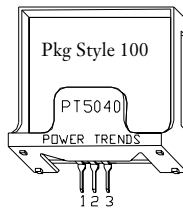
### Standard Application



C<sub>1</sub> = Optional ceramic (1-5µF)  
 C<sub>2</sub> = Optional ceramic (1-5µF)  
 C<sub>3</sub> = Required Electrolytic (100µF)

### Pin-Out Information

Pin	Function
1	V <sub>in</sub>
2	GND
3	V <sub>out</sub>



### Ordering Information

- PT5041□ = +12 Volts
- PT5042□ = +15 Volts
- PT5044□ = +8 Volts
- PT5045□ = +9 Volts
- PT5046□ = +10 Volts
- PT5047□ = +18 Volts
- PT5048□ = +12.6 Volts
- PT5049□ = +20 Volts

### PT Series Suffix (PT1234X)

Case/Pin Configuration	Suffix
Vertical Through-Hole	N
Horizontal Through-Hole	A
Horizontal Surface Mount	C

### Specifications

Characteristics (T <sub>a</sub> =25°C unless noted)	Symbols	Conditions	PT5040 SERIES			Units	
			Min	Typ	Max		
Output Current	I <sub>o</sub>	Over V <sub>in</sub> range	V <sub>o</sub> =20V 0.1*	—	0.5	A	
			V <sub>o</sub> =18V 0.1*	—	0.6	A	
			V <sub>o</sub> =12V 0.1*	—	1.0	A	
			V <sub>o</sub> =15V 0.1*	—	0.75	A	
			V <sub>o</sub> =8V 0.1*	—	1.5	A	
			V <sub>o</sub> =9V 0.1*	—	1.25	A	
Current Limit**	I <sub>cl</sub>	V <sub>in</sub> = +5V	—	1.5 I <sub>o,max</sub>	—	A	
Inrush Current	I <sub>ir</sub> t <sub>ir</sub>	V <sub>in</sub> = +5V @ max I <sub>o</sub> On start up	—	2.5 1	—	A mSec	
Input Voltage Range	V <sub>in</sub>	I <sub>o</sub> = 0.1 to I <sub>o,max</sub>	PT5047/5049 4.75	—	(V <sub>o</sub> -1V) 14	V	
Output Voltage Tolerance	ΔV <sub>o</sub>	Over V <sub>in</sub> Range I <sub>o</sub> = I <sub>o,max</sub> , T <sub>a</sub> = -20°C to shutdown	—	±1.5	±3.0	%V <sub>o</sub>	
Line Regulation	Reg <sub>line</sub>	Over V <sub>in</sub> range	—	±0.5	±1.0	%V <sub>o</sub>	
Load Regulation	Reg <sub>load</sub>	0.1 ≤ I <sub>o</sub> ≤ I <sub>o,max</sub>	—	±0.5	±1.0	%V <sub>o</sub>	
V <sub>o</sub> Ripple/Noise	V <sub>n</sub>	V <sub>in</sub> = +5V, I <sub>o</sub> =I <sub>o,max</sub>	—	±2	±5	%V <sub>o</sub>	
Transient Response	t <sub>tr</sub> V <sub>os</sub>	25% load change V <sub>o</sub> over/undershoot	—	500 3.0	— 5.0	µSec %V <sub>o</sub>	
Efficiency	η	V <sub>in</sub> = +5V, I <sub>o</sub> =0.5A, V <sub>o</sub> = +12V	—	85	—	%	
Switching Frequency	f <sub>o</sub>	Over V <sub>in</sub> and I <sub>o</sub> ranges	V <sub>o</sub> <15V V <sub>o</sub> ≥15V	500 650	650 800	800 950	kHz kHz
Absolute Maximum Operating Temperature Range	T <sub>a</sub>	—	-20	—	+85	°C	
Recommended Operating Temperature Range	T <sub>a</sub>	Free Air Convection, (40-60LFM) Over V <sub>in</sub> and I <sub>o</sub> ranges	V <sub>o</sub> <15V V <sub>o</sub> ≥15V	-20 -20	— —	70*** 55***	°C °C
Thermal Resistance	θ <sub>ja</sub>	Free Air Convection (40-60LFM)	—	40	—	°C/W	
Storage Temperature	T <sub>s</sub>	—	-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	—	5	—	G's	
Weight		—	—	4.5	—	grams	

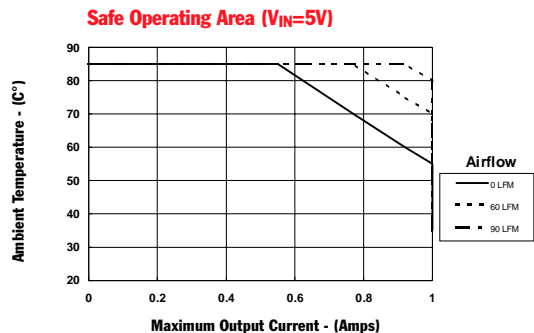
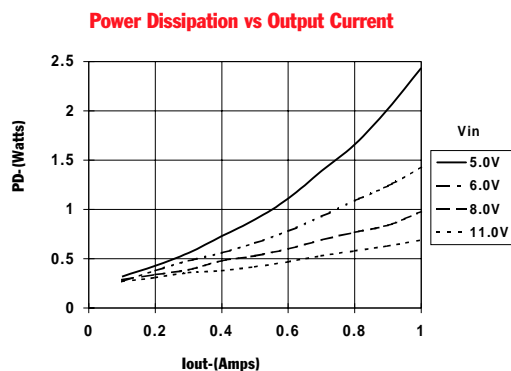
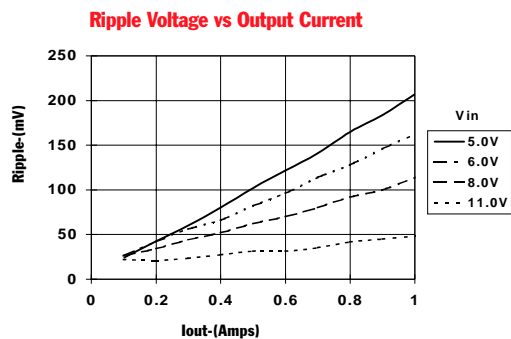
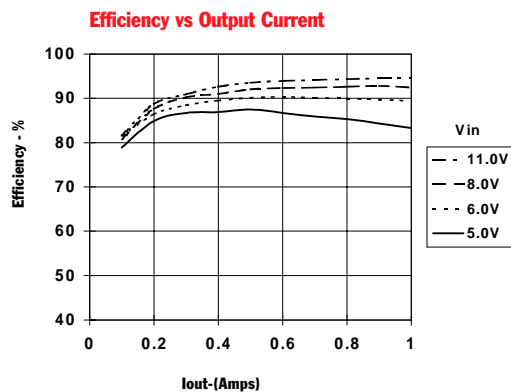
\* ISR will operate down to no load with reduced specifications.  
 \*\* Boost topology ISRs are not short circuit protected.  
 \*\*\* See SOA Curves.

NOTE: Boost Topology ISRs are not Short-Circuit Protected.

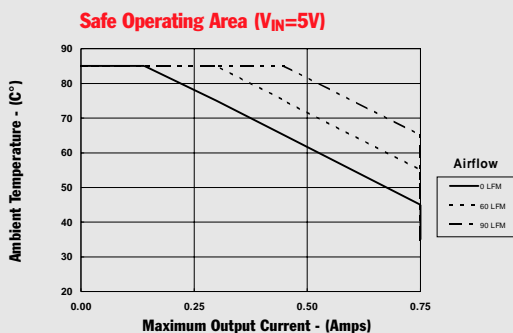
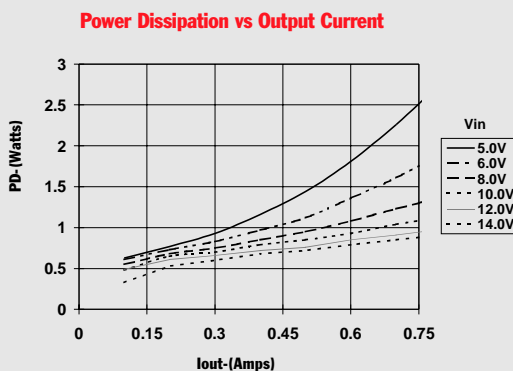
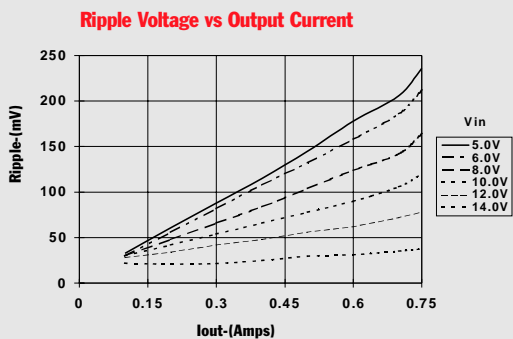
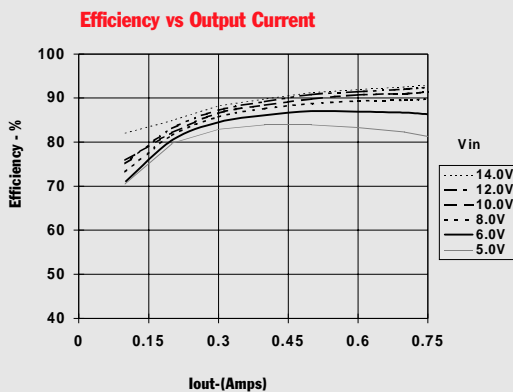
CHARACTERISTIC DATA

PT5040 Series

PT5041, +12.0 VDC (See Note 1)



PT5042, +15.0 VDC (See Note 1)



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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