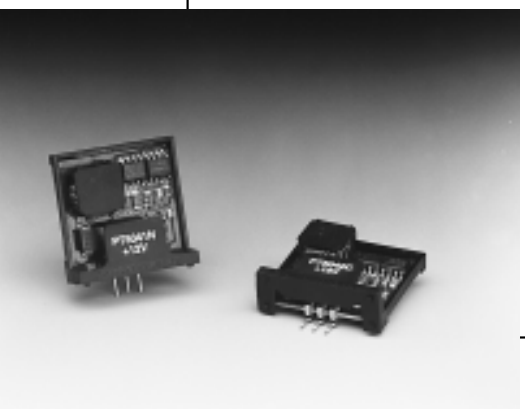
PT5040 Series

1 AMP STEP-UP INTEGRATED SWITCHING REGULATOR

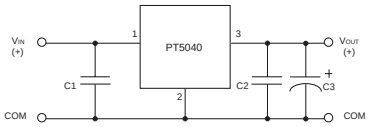
Revised 6/30/98



- 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.

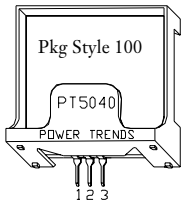
Standard Application



C_1 = Optional ceramic (1-5µF)
C_2 = Optional ceramic (1-5µF)
C_3 = Required Electrolytic (100µF)

Pin-Out Information

Pin	Function
1	V_{in}
2	GND
3	V_{out}



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

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

Specifications

Characteristics (T_a=25°C unless noted)	Symbols	Conditions		PT5040 SERIES Min	Typ	Max	Units
Output Current	I_o	Over V_{in} range	V_o=20V	0.1*	—	0.5	A
			V_o=18V	0.1*	—	0.6	A
			V_o=12V	0.1*	—	1.0	A
			V_o=15V	0.1*	—	0.75	A
			V_o=8V	0.1*	—	1.5	A
			V_o=9V	0.1*	—	1.25	A
Current Limit**	I_{cl}	V_{in} = +5V		—	1.5 $I_o$max	—	A
Inrush Current	I_{ir}	V_{in} = +5V @ max I_o		—	2.5	—	A
	t_{ir}	On start up		—	1	—	mSec
Input Voltage Range	V_{in}	I_o = 0.1 to $I_o$max		4.75	—	(V_o-1V)	V
			PT5047/5049	4.75	—	14	V
Output Voltage Tolerance	ΔV_o	Over V_{in} Range I_o = I_{max}, T_a= -20°C to shutdown		—	±1.5	±3.0	%V_o
Line Regulation	Reg_{line}	Over V_{in} range		—	±0.5	±1.0	%V_o
Load Regulation	Reg_{load}	0.1 ≤ I_o ≤ $I_o$max		—	±0.5	±1.0	%V_o
V_o Ripple/Noise	V_n	V_{in}= +5V, I_o=$I_o$max		—	±2	±5	%V_o
Transient Response	t_{tr}	25% load change		—	500	—	µSec
	V_{os}	V_o over/undershoot		—	3.0	5.0	%V_o
Efficiency	η	V_{in}= +5V, I_o=0.5A, V_o= +12V		—	85	—	%
Switching Frequency	f_o	Over V_{in} and I_o ranges	V_o<15V	500	650	800	kHz
			V_o≥15V	650	800	950	kHz
Absolute Maximum Operating Temperature Range	T_a	—		-20	—	+85	°C
Recommended Operating Temperature Range	T_a	Free Air Convection, (40-60LFM)	V_o<15V	-20	—	70***	°C
		Over V_{in} and I_o ranges	V_o≥15V	-20	—	55***	°C
Thermal Resistance	θ_{ja}	Free Air Convection (40-60LFM)		—	40	—	°C/W
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		—	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.

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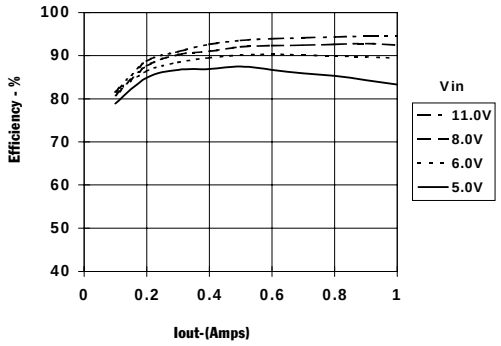
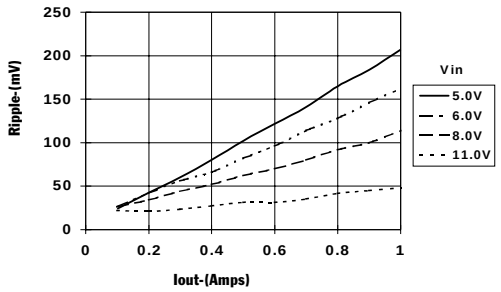
PT5041, +12.0 VDC (See Note 1)

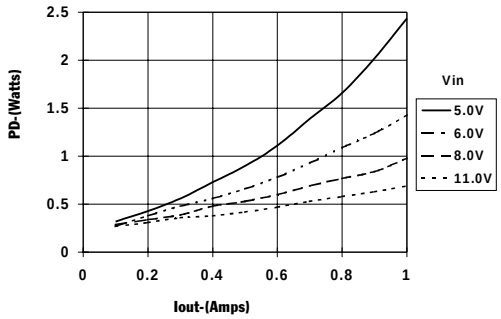
Efficiency vs Output Current



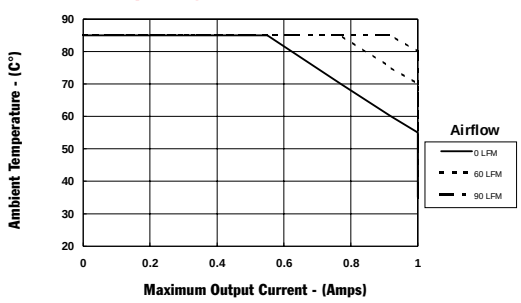
Ripple Voltage vs Output Current



Power Dissipation vs Output Current

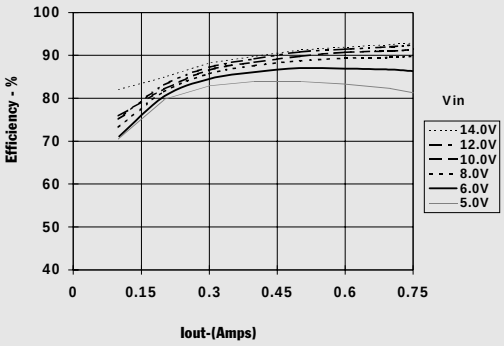


Safe Operating Area (V_{IN}=5V)

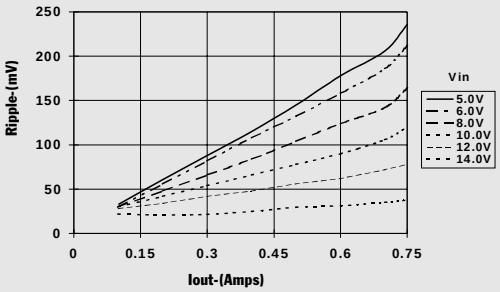


PT5042, +15.0 VDC (See Note 1)

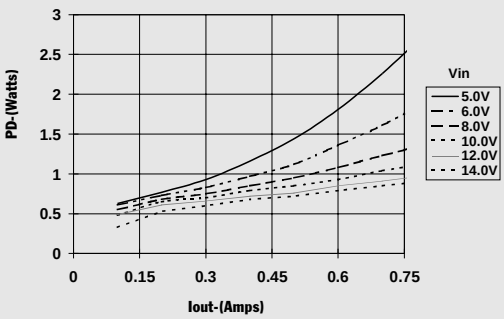
Efficiency vs Output Current



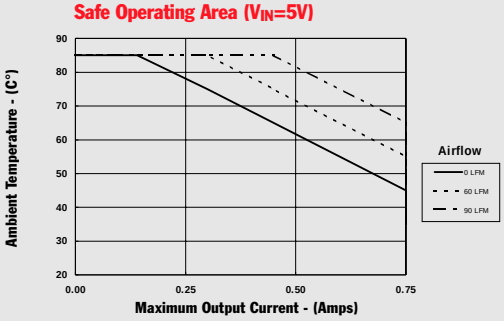
Ripple Voltage vs Output Current



Power Dissipation vs Output Current



Safe Operating Area (V_{IN}=5V)



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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