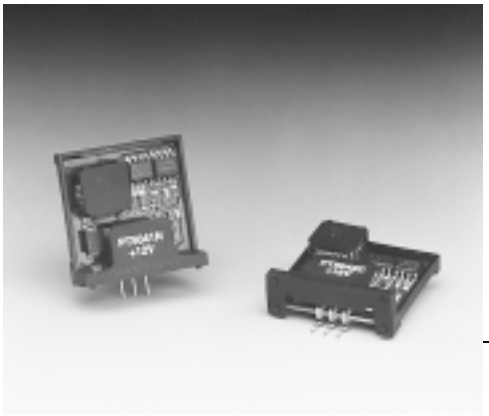
PT5040 Series

1-A Positive Step-up Integrated Switching Regulator

SLTS026B

(Revised 12/19/2001)



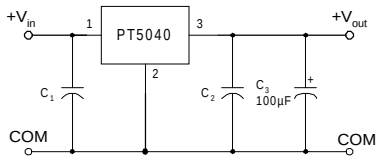
Features

- Wide Input Voltage Range
- 85% Efficiency
- Internal Over-Temperature Protection
- Laser-trimmed Output Voltage
- Soft Start
- 5-Pin Mount Option (Suffixes L & M)

Description

The PT5040 is a series of 3-pin boost-voltage Integrated Switching Regulators (ISRs). These ISRs are designed for use with +5V bus systems that require an additional regulated +8V to +20V with up to 1A of output current. These ISRs are packaged in the 3-pin, single in-line pin (SIP) package configuration.

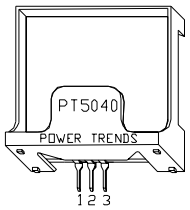
Standard Application



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	Order Suffix	Package Code *
Vertical	**N**	(EAD)
Horizontal	**A**	(EAA)
SMD	**C**	(EAC)
Horizontal, 2-pin Tab	**M**	(EAM)
SMD, 2-Pin Tab	**L**	(EAL)

** Previously known as package styles 100/110.*

(Reference the applicable package code drawing for the dimensions and PC board layout)

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

Specifications

(Unless otherwise stated, T_a =25°C, V_{in} =5V, I_o =$I_o$max, C_3 =100µF)

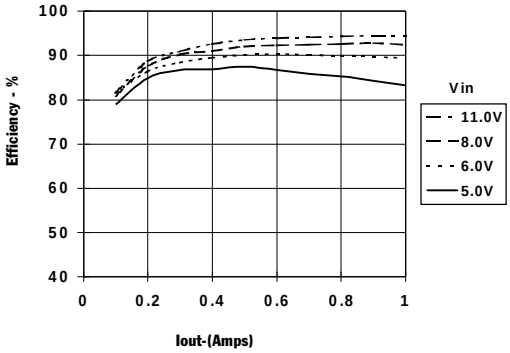
Characteristics	Symbol	Conditions		PT5040 SERIES Min	Typ	Max	Units
Output Current	I_o	Over V_{in} range	PT5049	0.1 (1)	—	0.5	A
			PT5047	0.1 (1)	—	0.6	
			PT5041/48	0.1 (1)	—	1.0	
			PT5042	0.1 (1)	—	0.75	
			PT5044	0.1 (1)	—	1.5	
			PT5045/46	0.1 (1)	—	1.2	
Input Voltage Range	V_{in}	Over Io range		4.75	—	(V_o-1)	V
			PT5047/5049	4.75	—	14	
Output Voltage Tolerance	ΔV_o	Over V_{in} Range T_a= -20°C to SOA derating limit (3)		—	±1.5	±3.0	%V_o
Line Regulation	Reg_{line}	Over V_{in} range		—	±0.5	±1.0	%V_o
Load Regulation	Reg_{load}	$I_o$min ≤ I_o ≤ $I_o$max		—	±0.5	±1.0	%V_o
Efficiency	η	I_o=0.5A		—	85	—	%
V_o Ripple (pk-pk)	V_r	20MHz bandwidth		—	±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
Current Limit	I_{lim}			—	150 (2)	—	%$I_o$max
Inrush Current	I_{ir}	On start up		—	5.5 (3)	—	A
	t_{ir}			—	1	—	mSec
Switching Frequency	f_s	Over V_{in} and I_o ranges	V_o<15V	500	650	800	kHz
			V_o≥15V	650	800	950	
Operating Temperature Range	T_a	—		-20	—	+85 (4)	°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, 20-2000 Hz		Suffixes N, A, & C		—	5	—	G's
		Suffixes L & M		—	20 (5)	—	
Weight		Suffixes N, A, & C		—	4.5	—	grams
		Suffixes L & M		—	6.5	—	

Notes: *(1) The ISR will operate at no load with reduced specifications.*
(2) Boost topology ISRs are not short circuit protected.
(3) The inrush current stated is above the normal input current for the associated output load.
(4) See Safe Operating Area curves or consult the factory for the appropriate derating
(5) The tab pins on the 5-pin mount package types (suffixes L & M) must be soldered. For more information see the applicable package outline drawing.

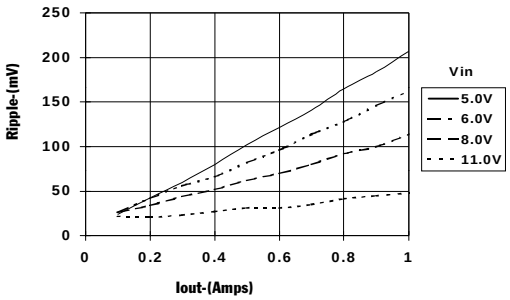
Typical Characteristics

PT5041, +12.0 VDC (See Note A)

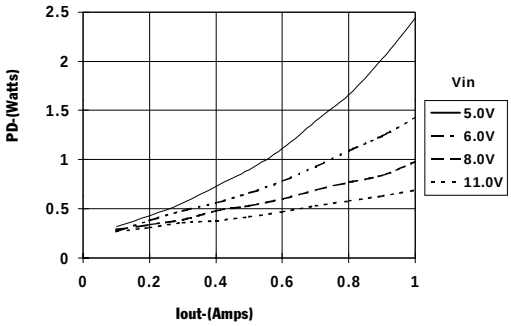
Efficiency vs Output Current



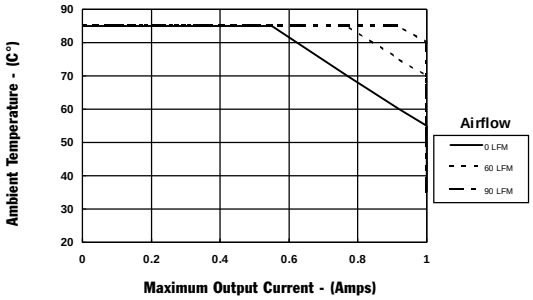
Ripple Voltage vs Output Current



Power Dissipation vs Output Current

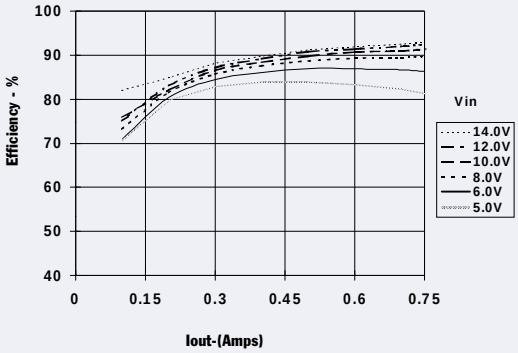


Safe Operating Area (V_{IN}=5V) (See Note B)

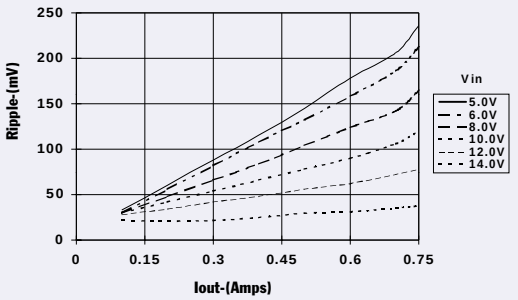


PT5042, +15.0 VDC (See Note A)

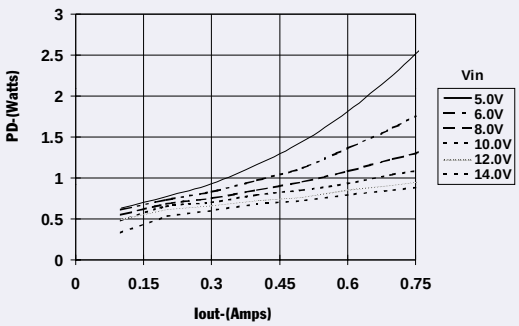
Efficiency vs Output Current



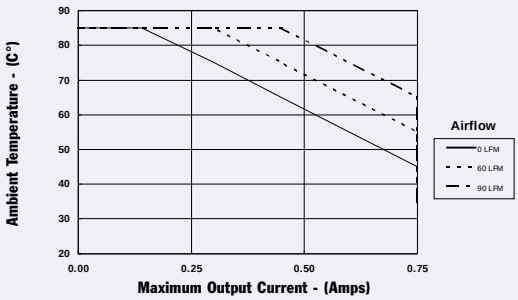
Ripple Voltage vs Output Current



Power Dissipation vs Output Current



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



Note A: *Characteristic data has been developed from actual products tested at 25°C. This data is considered typical data for the Converter.*
Note B: *Thermal derating graphs are developed in free-air convection cooling, which corresponds to approximately 40–60LFM of airflow.*

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