



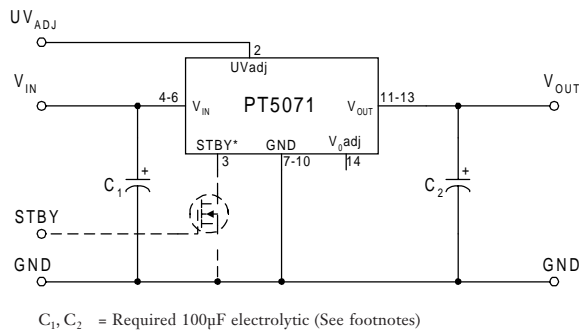
Features

- Single-Device:
+12V Output, 7-16V Input
- 84% Efficiency
- 14-Pin Excalibur™ Package
- Output Current Limit
- Adjustable Output Voltage
- Adjustable Undervoltage Lockout
- Solderable Copper Case

Description

The PT5071 is a 1.5-ampere rated step-up/step-down Integrated Switching Regulator (ISR) that provides a tightly regulated 12V output voltage from a 7V to 16V variable input source. This high-performance ISR has applications in systems where the input voltage straddles the desired 12V output. The regulator has an adjustable output voltage and input start-up threshold, and a standby function for power conservation.

Standard Application



Pin-Out Information

Pin	Function
1	N/C
2	UVLO Adj
3	STBY*
4	V_{in}
5	V_{in}
6	V_{in}
7	GND
8	GND
9	GND
10	GND
11	V_{out}
12	V_{out}
13	V_{out}
14	V_{out} Adjust

Ordering Information

PT5071□ = +12 Volts

PT Series Suffix (PT1234X)

Case/Pin Configuration

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

(For dimensions and PC board layout, see Package Styles 1360 and 1370.)

For Inhibit pin:
 Open = output enabled
 Ground = output disabled

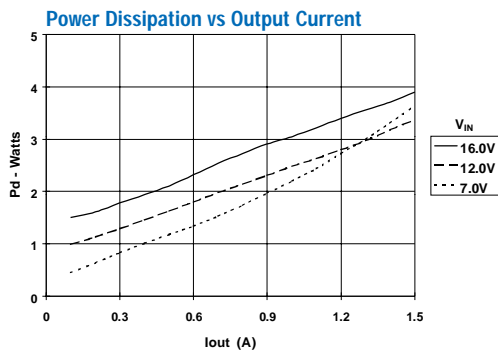
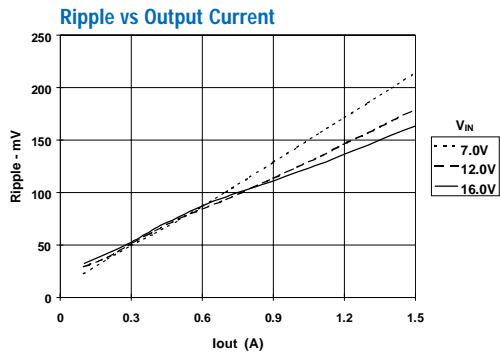
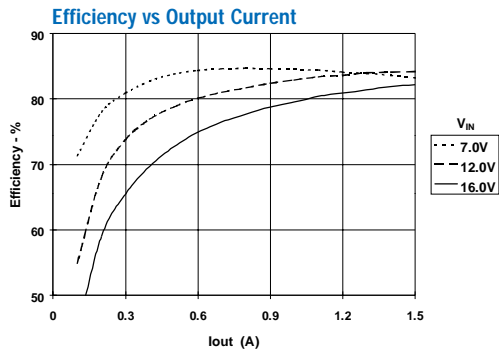
Specifications

Characteristics ($T_a = 25^\circ\text{C}$ unless noted)	Symbols	Conditions	PT5071			Units
			Min	Typ	Max	
Output Current	I_o	Over V_{in} Range	0.1 (1)	—	1.5	A
Current Limit	I_{lim}	$V_{in} = 12\text{V}$	—	4.0	—	A
Input Voltage Range	V_{in}	$0.1\text{A} \leq I_o \leq I_{o,max}$	7.0	—	16.0	V
Output Voltage Tolerance	ΔV_o	$V_{in} = 12\text{V}, I_o = I_{o,max}$ $-40^\circ\text{C} \leq T_a \leq +85^\circ\text{C}$	—	± 1.0	—	%
Output Voltage Adjust Range	$V_{o,adj}$		10	—	15	V
Line Regulation	Reg_{line}	Over V_{in} Range, $I_o = I_{o,max}$	—	± 0.5	—	%
Load Regulation	Reg_{load}	$V_{in} = 12\text{V}, 0.1 \leq I_o \leq I_{o,max}$	—	± 0.5	—	%
V_o Ripple/Noise	V_n	$V_{in} = 12\text{V}, I_o = I_{o,max}$	—	± 2.0	± 3.0	%
Transient Response with $C_2 = 100\mu\text{F}$	t_{tr} V_{os}	Load step from 50% to 100% $I_{o,max}$, $V_{in} = 12\text{V}$ V_o over/undershoot	—	200 1.0	—	μSec % V_o
Efficiency	η	$V_{in} = 12\text{V}, V_o = 12\text{V}, I_o = 1.5\text{A}$	—	83	—	%
Switching Frequency	f_o	Over V_{in} Range $0.1\text{A} \leq I_o \leq I_{o,max}$	—	550	—	kHz
Absolute Maximum Operating Temperature Range	T_a	Over V_{in} range	-40 (2)	—	$+85$ (3)	$^\circ\text{C}$
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	—	TBD	—	G's
Mechanical Vibration		Per Mil-STD-883D, Method 2007.2, 20-2000 Hz, Soldered in a PC board	—	TBD	—	G's
Weight	—	—	—	25	—	grams

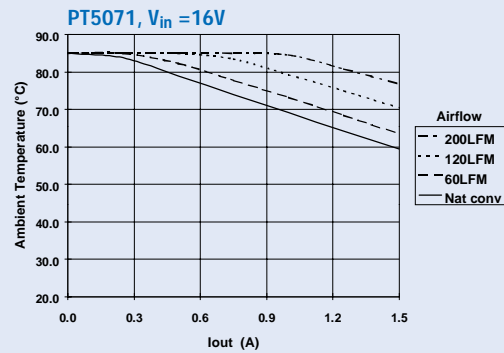
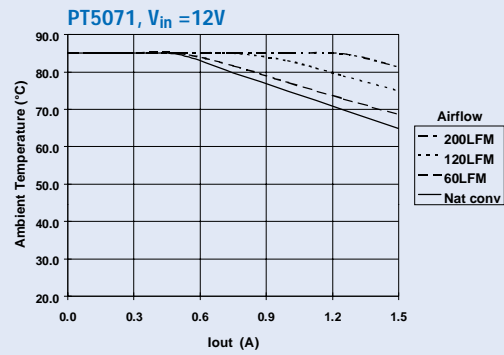
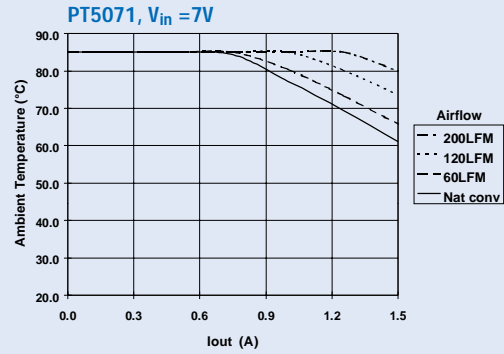
- Notes:**
1. The regulator will operate down to no load with reduced specifications.
 2. For operating temperatures below 0°C , it is recommended that tantalum capacitors be used at both the input and output.
 3. See SOA curves, or contact the factory for derating guidelines.

Input/Output Capacitors: The PT5071 regulator requires a 100 μF electrolytic capacitor at the input and output for proper operation in all applications. The ESR (equivalent series resistance) of both capacitors must be less than 250m Ω @100kHz. In addition, C_1 and C_2 must be rated to a minimum of 300mA rms ripple current.

PT5071 Performance, $V_o = 12V$ (See Note A)



Safe Operating Area Curves (See Note B)



Note A: All Characteristic data in the above graphs has been developed from actual products tested at 25°C. This data is considered typical data for the ISR.
 Note B: SOA curves represent operating conditions at which internal components are at or below manufacturer's maximum rated operating temperatures.

PACKAGING INFORMATION

Orderable Device	Status (1)	Package Type	Package Drawing	Pins	Package Qty	Eco Plan (2)	Lead/Ball Finish	MSL Peak Temp (3)	Samples (Requires Login)
PT5071A	LIFEBUY	SIP MODULE	EMF	14	10	Pb-Free (RoHS)	Call TI	N / A for Pkg Type	
PT5071N	OBSOLETE	SIP MODULE	EME	14		TBD	Call TI	Call TI	

(1) The marketing status values are defined as follows:

ACTIVE: Product device recommended for new designs.

LIFEBUY: TI has announced that the device will be discontinued, and a lifetime-buy period is in effect.

NRND: Not recommended for new designs. Device is in production to support existing customers, but TI does not recommend using this part in a new design.

PREVIEW: Device has been announced but is not in production. Samples may or may not be available.

OBSOLETE: TI has discontinued the production of the device.

(2) Eco Plan - The planned eco-friendly classification: Pb-Free (RoHS), Pb-Free (RoHS Exempt), or Green (RoHS & no Sb/Br) - please check <http://www.ti.com/productcontent> for the latest availability information and additional product content details.

TBD: The Pb-Free/Green conversion plan has not been defined.

Pb-Free (RoHS): TI's terms "Lead-Free" or "Pb-Free" mean semiconductor products that are compatible with the current RoHS requirements for all 6 substances, including the requirement that lead not exceed 0.1% by weight in homogeneous materials. Where designed to be soldered at high temperatures, TI Pb-Free products are suitable for use in specified lead-free processes.

Pb-Free (RoHS Exempt): This component has a RoHS exemption for either 1) lead-based flip-chip solder bumps used between the die and package, or 2) lead-based die adhesive used between the die and leadframe. The component is otherwise considered Pb-Free (RoHS compatible) as defined above.

Green (RoHS & no Sb/Br): TI defines "Green" to mean Pb-Free (RoHS compatible), and free of Bromine (Br) and Antimony (Sb) based flame retardants (Br or Sb do not exceed 0.1% by weight in homogeneous material)

(3) MSL, Peak Temp. -- The Moisture Sensitivity Level rating according to the JEDEC industry standard classifications, and peak solder temperature.

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