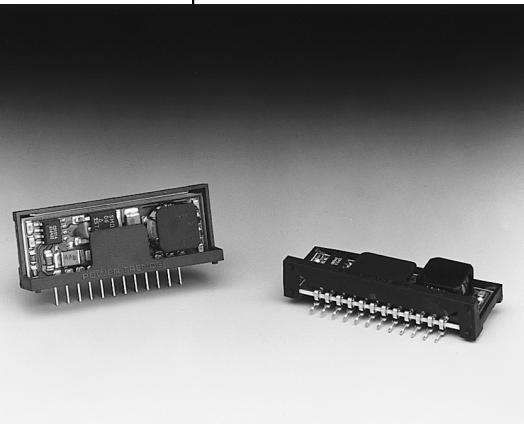


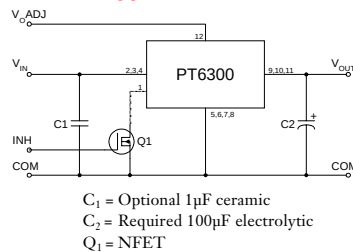
PT6310 Series**2 AMP ADJUSTABLE POSITIVE STEP-DOWN
INTEGRATED SWITCHING REGULATOR****SLTS076**
(Revised 8/17/99)

- 87% Efficiency
- Adjustable Output Voltage
- Internal Short Circuit Protection
- Over-Temperature Protection
- On/Off Control (Ground Off)
- Small SIP Footprint
- Wide Input Range

The PT6310 series is a High-Performance 2 Amp, 12-Pin SIP (Single In-line Package) Integrated

Switching Regulator (ISR) designed to meet the on-board power conversion needs of battery powered or other equipment requiring high efficiency and small size. This high performance ISR offers a unique combination of features combining 87% typical efficiency with open-collector on/off control and adjustable output voltage.

Quiescent current in the shutdown mode is typically less than 100µA.

Standard Application**Pin-Out Information**

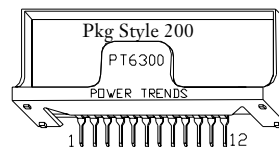
Pin	Function
1	Inhibit (30V max)
2	V_{in}
3	V_{in}
4	V_{in}
5	GND
6	GND
7	GND
8	GND
9	V_{out}
10	V_{out}
11	V_{out}
12	$V_{out Adj}$

Ordering Information

PT6310□ = +14.6 Volts
PT6311□ = +15.5 Volts
PT6312□ = +15.0 Volts
PT6313□ = +8.0 Volts

PT Series Suffix (PT1234X)

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

**Specifications**

Characteristics ($T_a = 25^\circ\text{C}$ unless noted)	Symbols	Conditions	PT6310 Series			
			Min	Typ	Max	Units
Output Current	I_o	Over V_{in} range	0.1*	—	2.0	A
Short Circuit Current	I_{sc}	$V_{in} = V_o + 5\text{V}$	—	5.0	—	Apk
Input Voltage Range	V_{in}	$0.1 \leq I_o \leq 2.0\text{ A}$	$V_o + 4$	—	38**	V
Output Voltage Tolerance	ΔV_o	Over V_{in} Range, $I_o = 2.0\text{ A}$ $T_a = 0^\circ\text{C}$ to $+60^\circ\text{C}$	—	± 1.0	± 2.0	% V_o
Line Regulation	Reg_{line}	Over V_{in} range	—	± 0.25	± 0.5	% V_o
Load Regulation	Reg_{load}	$0.1 \leq I_o \leq 2.0\text{ A}$	—	± 0.25	± 0.5	% V_o
V_o Ripple/Noise	V_n	$V_{in} = V_{in min}$, $I_o = 2.0\text{ A}$	—	± 2	—	% V_o
Transient Response with $C_o = 100\mu\text{F}$	t_{tr} V_{os}	50% load change V_o over/undershoot	— —	100 5.0	200 —	μSec % V_o
Efficiency	η	$V_{in} = 24\text{V}$, $I_o = 2.0\text{ A}$	—	87	—	%
Switching Frequency	f_o	Over V_{in} and I_o ranges	600 500	700 550	800 600	kHz kHz
Shutdown Current	I_{sc}	$V_{in} = 15\text{V}$	—	100	—	μA
Quiescent Current	I_{nl}	$I_o = 0\text{A}$, $V_{in} = 10\text{V}$	—	10	—	mA
Output Voltage Adjustment Range	V_o	Below V_o Above V_o	See Application Notes.			
Absolute Maximum Operating Temperature Range	T_a		-40	—	+85	$^\circ\text{C}$
Recommended Operating Temperature Range	T_a	Free Air Convection, (40-60LFM) At $V_{in} = 18\text{V}$, $I_o = 2.0\text{ A}$	-40	—	+70	$^\circ\text{C}$
Thermal Resistance	θ_{ja}	Free Air Convection (40-60LFM)	—	30	—	$^\circ\text{C}/\text{W}$
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	—	500	—	G's
Mechanical Vibration		Per Mil-STD-883D, Method 2007.2, 20-2000 Hz, Soldered in a PC board	—	10	—	G's
Weight	—	—	—	6.5	—	grams

* ISR will operate to no load with reduced specifications.

** Input voltage cannot exceed 30V when the inhibit function is used.

Note: The PT6310 requires a 100µF electrolytic or tantalum output capacitor for proper operation in all applications.

PACKAGING INFORMATION

Orderable Device	Status ⁽¹⁾	Package Type	Package Drawing	Pins	Package Qty	Eco Plan ⁽²⁾	Lead/Ball Finish	MSL Peak Temp ⁽³⁾
PT6311N	ACTIVE	SIP MOD ULE	EBD	12	12	TBD	Call TI	Level-1-215C-UNLIM
PT6312N	ACTIVE	SIP MOD ULE	EBD	12	12	TBD	Call TI	Level-1-215C-UNLIM
PT6312R	ACTIVE	SIP MOD ULE	EBE	12	12	TBD	Call TI	Level-1-215C-UNLIM
PT6313A	ACTIVE	SIP MOD ULE	EBA	12	12	Pb-Free (RoHS)	Call TI	N / A for Pkg Type

⁽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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Mailing Address: Texas Instruments, Post Office Box 655303, Dallas, Texas 75265
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