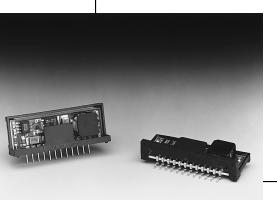
PT6310

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

Pin-Out Information

Inhibit

(30V max)

 $\underline{V_{in}}$ V_{in} **GND**

GND

GND

GND

 V_{out}

Vout Adj

Function

Pin

6

7

8

9

10

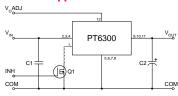
11

12

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



C1 = Optional 1µF ceramic C2 = Required 100µF electrolytic

 $Q_1 = NFET$

Ordering Information

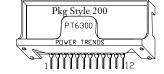
PT6310□ = +14.6 Volts **PT6311** = +15.5 Volts **PT6312**□ = +15.0 Volts

PT6313□ = +8.0 Volts

PT Series Suffix (PT1234X)

Case/Pin Configuration

Vertical Through-Hole	N	
Horizontal Through-Hole	Α	
Horizontal Surface Mount	С	



Specifications

Characteristics		PT6310 Series					
(T _a = 25°C unless noted)	Symbols	Conditions	Min Typ		Max	Units	
Output Current	I_{o}	Over V _{in} range	0.1*	_	2.0	A	
Short Circuit Current	I_{sc}	$V_{\rm in} = V_{\rm o} + 5V$	_	5.0	_	Apk	
Input Voltage Range	V_{in}	$0.1 \le I_o \le 2.0 \text{ A}$	$V_o + 4$	_	38**	V	
Output Voltage Tolerance	$\Delta { m V_o}$	Over V_{in} Range, I_{o} = 2.0 A T_{a} = 0°C to +60°C	_	±1.0	±2.0	$%V_{o}$	
Line Regulation	Regline	Over V _{in} range	_	±0.25	±0.5	$%V_{o}$	
Load Regulation	Reg _{load}	$0.1 \le I_o \le 2.0 \text{ A}$	_	±0.25	±0.5	$%V_{o}$	
Vo Ripple/Noise	V_n	$V_{in} = V_{in} \min$, $I_o = 2.0A$	_	±2	_	$%V_{o}$	
Transient Response with $C_o = 100 \mu F$	$egin{array}{c} oldsymbol{t_{tr}} \ oldsymbol{V_{os}} \end{array}$	50% load change $ m V_o$ over/undershoot	=	100 5.0	<u>200</u>	μSec %V _o	
Efficiency	η	V_{in} =24V, I_o = 2.0 A	_	87	_	%	
Switching Frequency	$f_{ m o}$	Over V_{in} and I_o ranges PT6312 only	600 500	700 550	800 600	kHz kHz	
Shutdown Current	I_{sc}	$V_{\rm in} = 15 V$	_	100	_	μA	
Quiescent Current	I_{nl}	$I_o = 0A$, $V_{in} = 10V$	_	10	_	mA	
Output Voltage Adjustment Range	V_{o}	$egin{array}{l} ext{Below V_o} \ ext{Above V_o} \end{array}$	See Application Notes.				
Absolute Maximum Operating Temperature Range	T_a		-40	_	+85	°C	
Recommendated Operating Temperature Range	T_a	Free Air Convection, (40-60LFM) At $V_{\rm in}$ = 18V, $I_{\rm o}$ = 2.0A	-40	_	+70	°C	
Thermal Resistance	θ_{ja}	Free Air Convection (40-60LFM)	_	30	_	°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	_	10	_	G's	
Weight	_	_	_	6.5	_	grams	

^{*} ISR will operate to no load with reduced specifications.

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

 $^{^{\}star\star}$ Input voltage cannot exceed 30V when the inhibit function is used.

PACKAGE OPTION ADDENDUM

www.ti.com 3-Jul-2009

PACKAGING INFORMATION

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