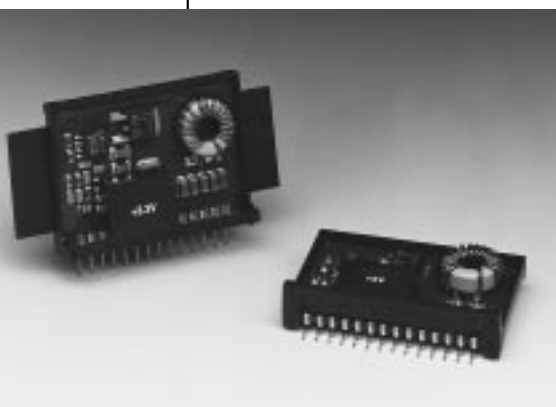


PT6610 Series

SLTS124

(Revised 1/21/2000)

9 AMP 5V STEP-DOWN INTEGRATED SWITCHING REGULATOR



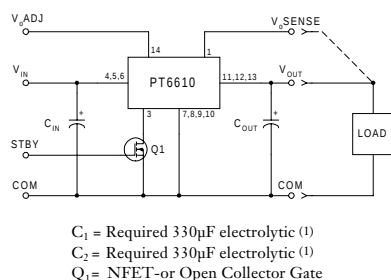
- Single Device 9A Output
- Input Voltage Range: 4.5V to 6.0V
- Adjustable Output Voltage
- 90% Efficiency
- Remote Sense Capability
- Standby Function
- Over-Temperature Protection

(Single In-line Package) Integrated Switching Regulators (ISRs), designed for stand alone operation in applications requiring as much as 9A of output current.

Only two external capacitors are required for proper operation. Please note that this product does not include short circuit protection.

The PT6610 series is a high performance +5V family of 14-Pin SIP

Standard Application



Pin-Out Information

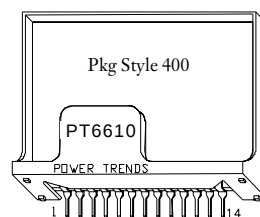
Pin	Function
1	Remote Sense
2	Do not connect
3	STBY*-Standby
4	V_{in}
5	V_{in}
6	V_{in}
7	GND
8	GND
9	GND
10	GND
11	V_{out}
12	V_{out}
13	V_{out}
14	V_{out} Adjust

Ordering Information

PT6611!	= +3.3 Volts
PT6613!	= +2.5 Volts

PT Series Suffix (PT1234X)

Case/Pin Configuration	Heat Spreader	Heat Spreader with Side Tabs
Vertical Through-Hole	P	R
Horizontal Through-Hole	D	G
Horizontal Surface Mount	E	B



Note: Back surface of product is conducting metal.

Specifications

Characteristics ($T_a = 25^\circ\text{C}$ unless noted)	Symbols	Conditions	PT6610 SERIES			Units
			Min	Typ	Max	
Output Current	I_o	$T_a = 60^\circ\text{C}$, 200 LFM, pkg P $T_a = 25^\circ\text{C}$, natural convection	0.1 (2) 0.1 (2)	—	9.0 7.0	A A
Input Voltage Range	V_{in}	$0.1A \leq I_o \leq 9.0A$ $V_o = +2.5/3.3V$	4.5	—	6.0	
Output Voltage Tolerance	ΔV_o	$V_{in} = +5V$, $I_o = 9.0A$ $T_a = 0^\circ\text{C}$ to 65°C	$V_o - 0.1$	—	$V_o + 0.1$	V
Output Voltage Adjust Range	V_{oadj}	Pin 14 to V_o or ground $V_{in\min} = +4.5V$ or $V_o + 1.2V$ (whichever is greater)	$V_o = +3.3V$: 2.25 $V_o = +2.5V$: 1.80	—	4.20 3.50	V
Line Regulation	Reg_{line}	$4.5V \leq V_{in} \leq 6.0V$, $I_o = 9.0A$ $4.5V \leq V_{in} \leq 6.0V$, $I_o = 9.0A$	$V_o = +3.3V$: — $V_o = +2.5V$: —	± 7 ± 7	± 17 ± 13	mV
Load Regulation	Reg_{load}	$V_{in} = +5V$, $0.1 \leq I_o \leq 9.0A$	$V_o = +3.3V$: — $V_o = +2.5V$: —	± 17 ± 13	± 33 ± 25	mV
V_o Ripple/Noise	V_n	$V_{in} = 5V$, $I_o = 9.0A$	—	50	—	mVpp
Transient Response with $C_2 = 330\mu F$	t_{tr} V_{os}	I_o step between 4.0A and 9.0A V_o over/undershoot	— —	100 150	— —	μSec mV
Efficiency	η	$V_{in} = +5V$, $I_o = 3.0A$	$V_o = +3.3V$: — $V_o = +2.5V$: —	90 88	— —	%
		$V_{in} = +5V$, $I_o = 9.0A$	$V_o = +3.3V$: — $V_o = +2.5V$: —	86 83	— —	%
Switching Frequency	f_o	$4.5V \leq V_{in} \leq 6.0V$ $0.1A \leq I_o \leq 9.0A$	475	600	725	kHz
Absolute Maximum Operating Temperature Range	T_a	Free Air Convection (40-60 LFM) Over V_{in} and I_o ranges with heat tab	-40 (3)	—	+85 (4)	$^\circ\text{C}$
Thermal Resistance	θ_{ja}	Free Air Convection (40-60 LFM)	—	25	—	$^\circ\text{C/W}$
Storage Temperature	T_s	—	-40	—	+125	$^\circ\text{C}$

Continued

PT6610 Series

Specifications (Continued)

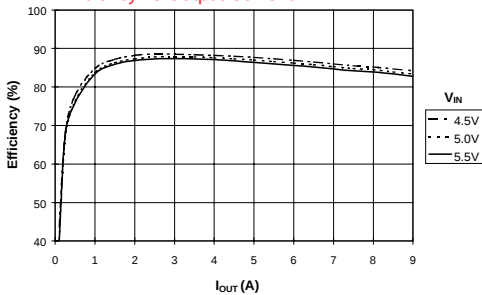
Characteristics ($T_a = 25^\circ\text{C}$ unless noted)	Symbols	Conditions	PT6610 SERIES			Units
			Min	Typ	Max	
Mechanical Shock	—	Per Mil-STD-883D, Method 2002.3	—	500	—	G's
Mechanical Vibration	—	Per Mil-STD-883D, Method 2007.2, 20-2000 Hz, soldered in a PC board	—	7.5	—	G's
Weight	—	—	—	14	—	grams

Notes: (1) The PT6610 Series requires two 330 μF electrolytic capacitors (input and output) for proper operation in all applications. The input capacitance must be rated for a minimum of 1.1Arms of ripple current. See the application note, PT6500/6600 Series Capacitor Recommendations.
 (2) ISR will operate down to no load with reduced specifications.
 (3) For operation below 0°C , use tantalum capacitors for C_{IN} and C_{OUT} .
 (4) See Safe Operating Curves, or contact the factory for the appropriate derating.

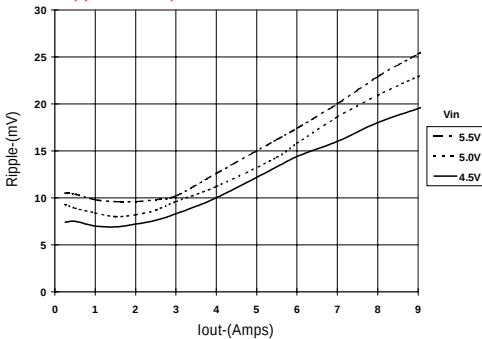
CHARACTERISTIC DATA

PT6613, 2.5 VDC (See Note A)

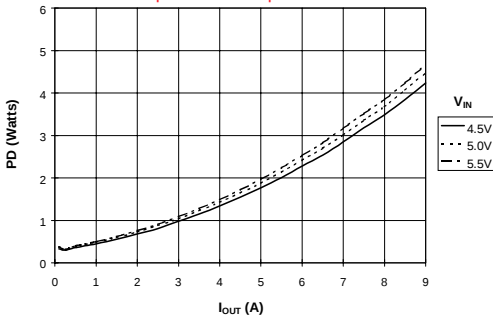
Efficiency vs Output Current



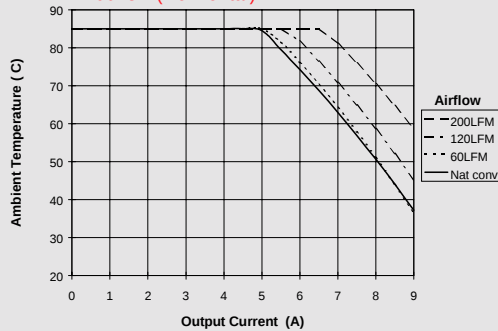
Ripple vs Output Current



Power Dissipation vs Output Current

Safe Operating Area Curves ($V_{in}=+5.0\text{V}$) (See Note B)

PT6613D (Horizontal)



Note A: 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.

Note B: SOA curves represent operating conditions at which internal components are at or below manufacturer's maximum rated operating temperatures.

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