

### GENERAL DESCRIPTION

The PT2203 is a primary side constant current/current voltage regulator, targeted to applications in less than 5W AC-DC power suppliers. It is designed for the flyback topology, and regulates output current/voltage without the secondary feedback loop. In addition to providing the tight output regulation, the excellent low power control allows the PT2203 to meet all the global energy efficiency and standby power requirements.

The PT2203 provides accurate CV/CC regulation with built in compensation circuitry. Integrated line and primary inductance compensation ensures output current free of line voltage and primary inductance variations. More over, the integrated output cord resistance compensation further enhances output voltage accuracy.

A complete set of integrated protection functions allows the PT2203 to protect against all fault conditions including output short circuit, line under-voltage, and over temperature shut down.

The PT2203 is available in a SOP-8 package.

### FEATURES

- CC and CV Control Without Secondary Feed back
- Eliminates Compensation Network
- Built in 650V Power MOSFET
- Compensates Line Voltage Variation
- Compensates Inductor Variation in CC mode
- Compensates Output Cord Resistance
- Vaux Over Voltage Protection
- Short Circuit Protection
- Line Under Voltage Protection
- Cycle by Cycle Current Limit
- Over Temperature Protection

### APPLICATIONS

- LED Power Suppliers
- Power Adapters and Battery Chargers
- Standby and Auxiliary Suppliers

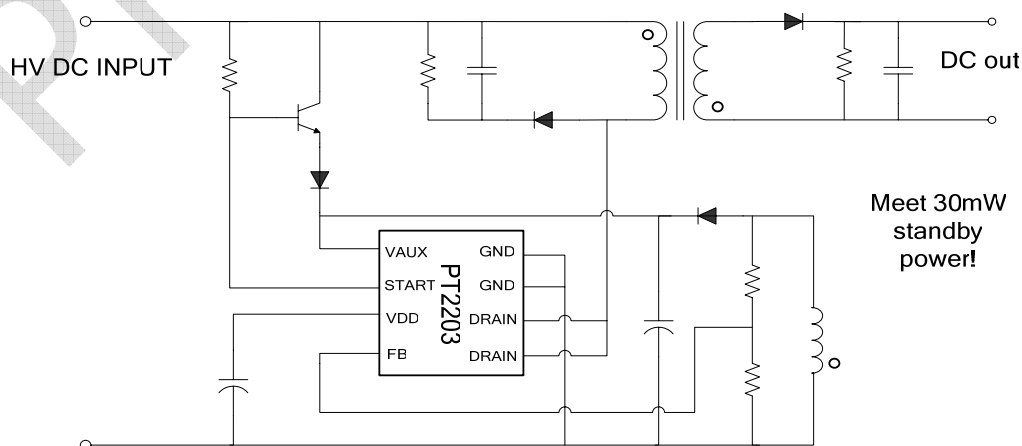
### ORDERING INFORMATION

PACKAGE	TEMPERATURE RANGE	ORDERING PART NUMBER	TRANSPORT MEDIA	MARKING
SOP-8	-40°C to 85°C	PT2203ESOH	Tape and Reel	PT2203 xxxxxX

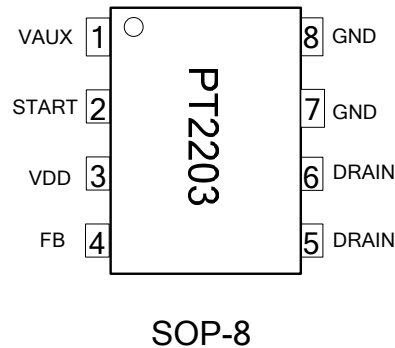
Note:



### TYPICAL APPLICATION CIRCUIT



### PIN ASSIGNMENT



### PIN DESCRIPTIONS

PIN No.	PIN NAMES	DESCRIPTION
1	VAUX	Auxiliary winding input, PT2203 is supplied by an auxiliary winding.
2	START	Start up control pin, connects to the base of the start up transistor
3	VDD	DC power supply pin.
4	FB	Feedback Winding Voltage Sense Input
5,6	DRAIN	Internal MOSFET DRAIN output, connect to the transformer primary winding
7,8	GND	Ground

### ABSOLUTE MAXIMUM RATINGS (note1)

SYM	PARAMETER	VALUE	UNIT
$V_{VAUX}$	VAUX DC Supply Voltage	40	V
$V_{START}$	START Input Voltage	-0.3-40	V
$V_{DD}$	VDD supply Voltage	5	V
$V_{FB}$	SENSE Input Voltage	-0.3-5	V
$V_{DRAIN}$	DRAIN Output Voltage	-0.3-650	V
$T_{opt}$	Operating Junction Temp. Range	-40 to 150	°C
$T_{stg}$	Storage Temp. Range	-55 to 150	°C
HBM	ESD Capability, HBM	3000	V
$R\theta JA$	SOP-8	100	°C/W

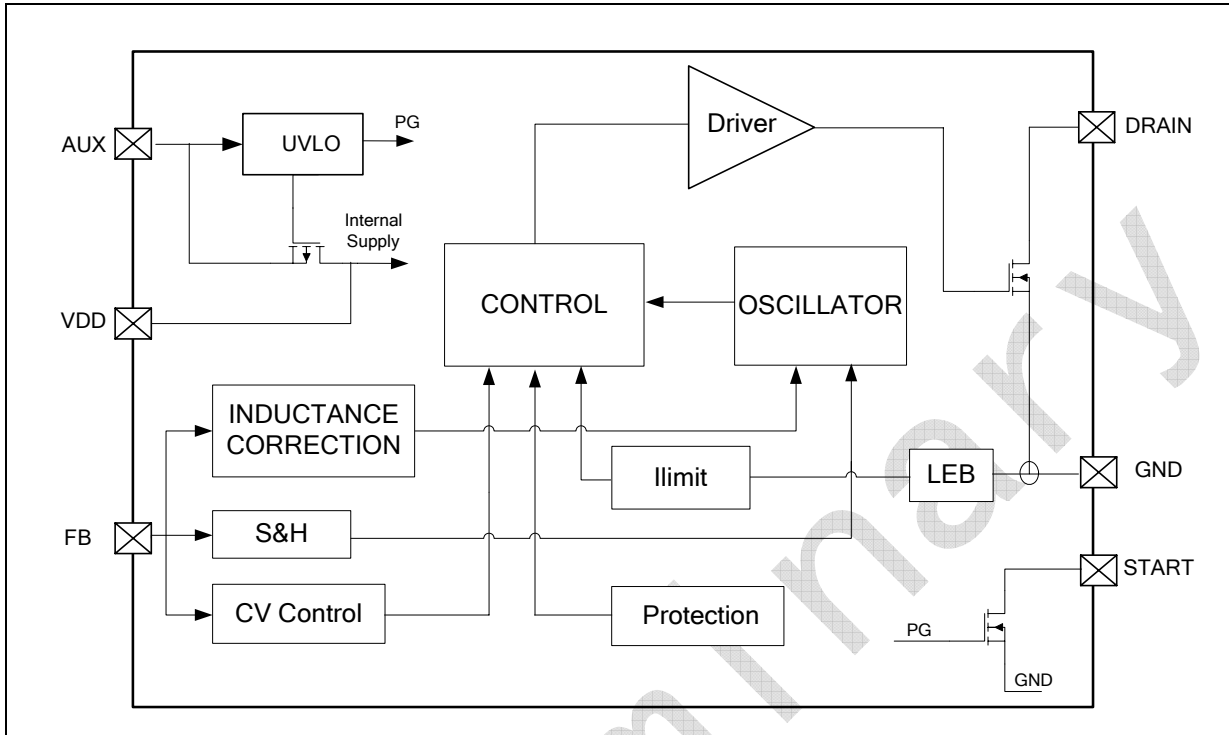
**Note 1:** Absolute Maximum Ratings indicate limits beyond which damage to the device may occur. Recommended Operating Range indicates conditions for which the device is functional, but do not guarantee specific performance limits. Electrical Characteristics state DC and AC electrical specifications under particular test conditions which guarantee specific performance limits. This assumes that the device is within the Operating Range. Specifications are not guaranteed for parameters where no limit is given, however, the typical value is a good indication of device performance.

**ELECTRICAL CHARACTERISTICS**

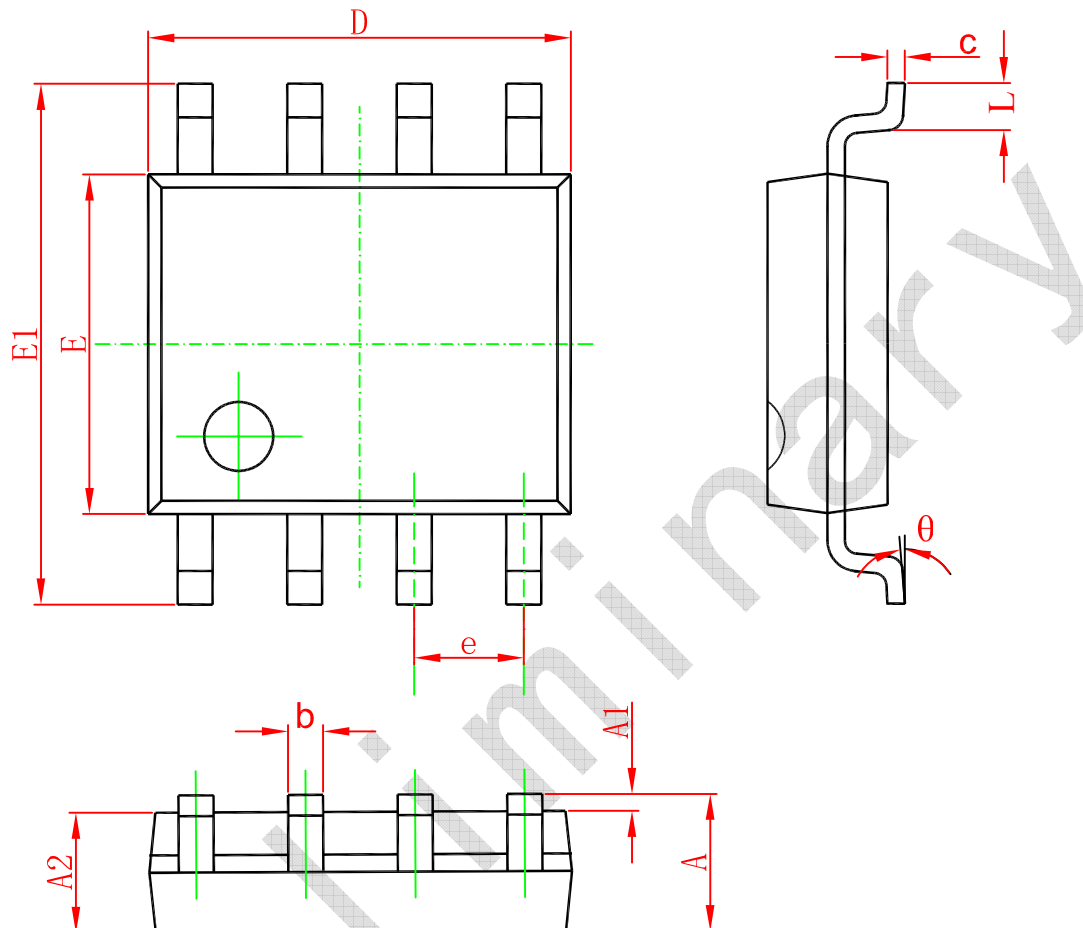
 (T<sub>A</sub>=25°C, V<sub>AUX</sub>=10V, unless specified otherwise)

SYMBOL	PARAMETER	TEST CONDITION	MIN	TYP	MAX	UNIT
<b>SUPPLY (VAUX)</b>						
V <sub>START</sub>	V <sub>AUX</sub> Start-up voltage	V <sub>AUX</sub> rising	14	15	16	V
V <sub>UVLO</sub>	V <sub>AUX</sub> minimum level	V <sub>AUX</sub> falling	6.5	7.5	8.5	V
I <sub>START</sub>	V <sub>AUX</sub> Start-up Current	V <sub>AUX</sub> =13.5V Measuring Current into V <sub>AUX</sub>		3	10	uA
I <sub>VDD_OPER</sub>	V <sub>DD</sub> Operating Current	Fosc=65KHz		1	1.5	mA
V <sub>AUXOV</sub>	V <sub>AUX</sub> Over Voltage Threshold	V <sub>AUX</sub> rising	28	30	32	V
<b>START and VDD</b>						
I <sub>START</sub>	Start pin current sink ability	Vstart=5V		10		mA
V <sub>VDD</sub>	Regulated Voltage on VDD		4.5	5	5.5	V
I <sub>VDD</sub>	Maximum VDD output current	VDD=0, measure current flow out from VDD		10		mA
<b>FEED BACK VOLTAGE SENSE PIN (FB)</b>						
V <sub>REF</sub>	VS Reference Voltage	V <sub>DD</sub> =10V	1.975	2.0	2.025	V
C <sub>FB</sub>	Output cord resistance compensation	Maximum output power		5		%
V <sub>SMIN</sub>	VS Minimum Voltage			0.50		V
I <sub>VS_OPEN</sub>	VS Open Loop Current			-100		uA
T <sub>SMP_DLY</sub>	VS Sample Delay time		2.25	2.5	2.75	uS
<b>OSCILLATOR (OSC)</b>						
F <sub>osc</sub>	Oscillator Frequency	V <sub>S</sub> =V <sub>REF</sub> , I <sub>FB</sub> ×Ton=2mA×uS	60	65	70	kHz
R <sub>RATIO_CC</sub>	CC Mode Frequency Ratio	Fosc At V <sub>FB</sub> =1.5V /Fosc At V <sub>cs</sub> =1.0V		1.5		
R <sub>RATIO_IND</sub>	Inductor correction Ratio	I <sub>FB</sub> ×Ton between 1.5mA×uS and 2mA×uS		1.3		
D <sub>MAX</sub>	Maximum Duty Cycle			60		%
T <sub>ON_MIN</sub>	Minimum Turn On Time			1		uS
<b>DRAIN OUTPUT</b>						
I <sub>LIMIT</sub>	Current Limit	di/dt=70mA/uS	288	310	332	V
BV <sub>DSS</sub>	DRAIN Breakdown voltage		650			V
I <sub>DSS</sub>	Leakage current	V <sub>DS</sub> =560			10	uA
R <sub>DSON</sub>	ON state resistance				12.5	Ω
<b>PROTECTION</b>						
T <sub>BLK</sub>	Current Sense Leading Edge Blanking time			200		nS
T <sub>SD</sub>	Thermal Shut Down Threshold			150		°C

## SIMPLIFIED BLOCK DIAGRAM



## PACKAGE INFORMATION

**SOP8**


SYMBOL	DIMENSIONS IN MILLIMETERS		DIMENSIONS IN INCH	
	MIN	MAX	MIN	MAX
A	1.350	1.750	0.053	0.069
A1	0.100	0.250	0.004	0.010
A2	1.350	1.550	0.053	0.061
b	0.330	0.510	0.013	0.020
c	0.170	0.250	0.006	0.010
D	4.700	5.100	0.185	0.200
E	3.800	4.000	0.150	0.157
E1	5.800	6.200	0.228	0.244
e	1.270(BSC)		0.050(BSC)	
L	0.400	1.270	0.016	0.050
θ	0°	8°	0°	8°