

GENERAL DESCRIPTION

The PT4225 is primary side constant current regulator, which is designed for high performance and cost-effective LED lighting applications. With Powtech's proprietary constant current compensation technique accurate output current regulation is achieved without the need of a secondary feedback circuitry. Integrated primary inductance compensation circuitry provides accurate constant current operation despite variations in primary inductance. Excellent EMI performance is achieved with frequency jittering function together with soft driving control at totem pole gate drive output.

The device integrates a high voltage power switch, an oscillator, a current sense circuit, CC control circuit. It also features a complete set of integrated protection functions to protect against all fault conditions including output open/short circuit, line under-voltage, and over temperature shut down.

The PT4225 is available in an SOP-7 package.

FEATURES

- CC Without Secondary Feedback
- Integrates 600V Power Switch
- Inductance Compensation
- Low Startup Current (<math><10\mu\text{A}</math>)
- Adjustable Primary Side Current limit
- VCC/FB Over Voltage Protection
- VCC/FB UVLO
- Feedback Loop Open Circuit Protection
- Over Temperature Protection

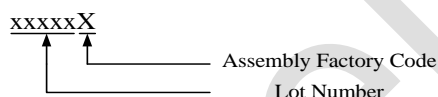
APPLICATIONS

- Sub 5W LED lighting applications

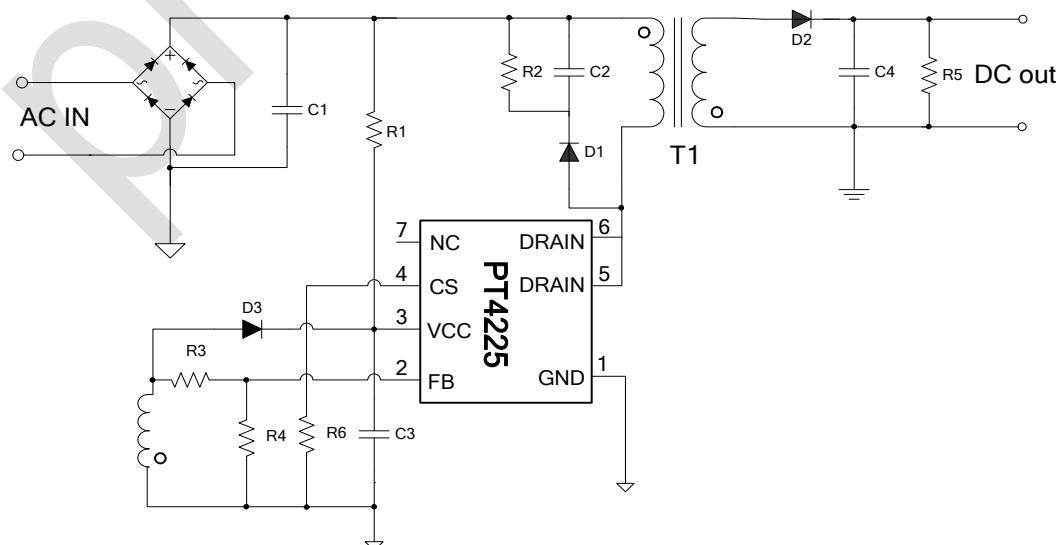
ORDERING INFORMATION

PACKAGE	TEMPERATURE RANGE	ORDERING PART NUMBER	TRANSPORT MEDIA	MARKING
SOP-7, Pb free	-40°C to 85°C	PT4225ESOG	2500/Tape and Reel	PT4225 xxxxxX

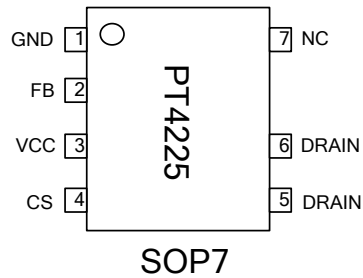
Note:



TYPICAL APPLICATION CIRCUIT



PIN ASSIGNMENT



PIN DESCRIPTIONS

PIN No. SOP7	PIN NAMES	DESCRIPTION
7	NC	Not connected
4	CS	Primary Side Current Sense Input
3	VCC	Power supply, the device is supplied by an auxiliary winding.
2	FB	Feedback Winding Voltage Sense Input
1	GND	Ground
5,6	DRAIN	Internal power switch output, drive primary winding

ABSOLUTE MAXIMUM RATINGS (note1)

SYM	PARAMETER	VALUE	UNIT
VCC	VCC pin Voltage	-0.3~35	V
V_{FB}, V_{CS}	FB, CS pin Input Voltage	-0.3~5	V
V_{DRAIN}	DRAIN pin Voltage	-0.3~600	V
T_{opt}	Operating Junction Temp. Range	-40 to 150	°C
T_{stg}	Storage Temp. Range	-55 to 150	°C
ESD	HBM	2000	V
$R_{\theta JA}$	SOP-7	120	°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.

RECOMMENDED OPERATING RANGE

SYM	PARAMETER	VALUE	UNIT
VCC	VCC pin Operating Voltage	9.5~26	V
T_A	Operating Ambient Temperature	-20~85	°C

ELECTRICAL CHARACTERISTICS

($T_A=25^{\circ}\text{C}$, $V_{CC}=16\text{V}$, unless specified otherwise)

SYMBOL	PARAMETER	TEST CONDITION	MIN	TYP	MAX	UNIT
SUPPLY VOLTAGE (VCC)						
I_{START}	Start up current	$V_{CC}=13.0\text{V}$		1	10	μA
V_{VCC_ON}	VCC turn on threshold	VCC Rising	13.5	15	16.5	V
V_{VCC_OFF}	VCC minimum operating voltage	VCC Falling	8.0	9.0	10.0	V
V_{VCC_Clamp}	VCC Clamp Voltage	$I_{cc}=10\text{mA}$		33		V
V_{VCC_OVP}	VCC Over Voltage Protection Threshold		26	27.5	29	V
I_{VCCQ}	VCC Supply Current	No switching		350	700	μA
FEED BACK VOLTAGE SENSE PIN (FB)						
V_{FBMAX}	FB Over Voltage Protection		2.4	2.5	2.6	V
V_{FBMIN}	FB Minimum Voltage			0.8		V
I_{FB_OPEN}	FB Open Loop Current			-85		μA
CURRENT SENSE INPUT PIN (CS)						
VCS	Current Limit Threshold	$I_{fb}=0$	490	500	510	mV
T_{LEB}	Current sense Leading Edge Blanking Time			250		ns
Driver output (DRAIN)						
$R_{DS(ON)}$	On state resistance	$V_{CC}=16\text{V}$		8	15	Ω
I_{DS}	Off state leak current	$V_{CC}=0, V_{DS}=600\text{V}$			1	μA
BV_{DS}	DRAIN breakdown voltage	$V_{CC}=0, I_{DRAIN}=250\mu\text{A}$	600			V
PROTECTION						
T_{SD}	Thermal Shut Down Threshold			150		$^{\circ}\text{C}$