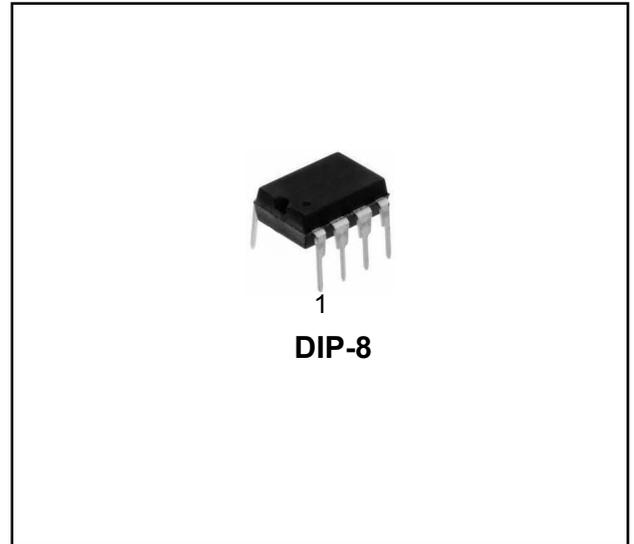


**24W HIGH PERFORMANCE OFF-LINE  
PWM SWITCHING POWER CONVERTER**

**FEATURES**

- Built-in 700V High Power BJT
- Input Full Voltage Range 85V<sub>AC</sub> ~ 265V<sub>AC</sub>
- Built-in Over Load, Over Temperature, Output Open/Short Circuit Protection Function
- Current Mode Pulse Width Modulation Control, Pulse-by-Pulse Current Limit Detection
- Built-in Ramp Drive Circuit
- Built-in Current Limit Resistor with Temperature Compensation
- Internal Integrated Start-up Resistance, Few Peripheral Devices
- Frequency Modulation Function and Good EMI Compatibility
- No-load Power Consumption < 0.3W and When V<sub>IN</sub> =220V<sub>AC</sub>, Power Consumption < 0.2W



**DESCRIPTION**

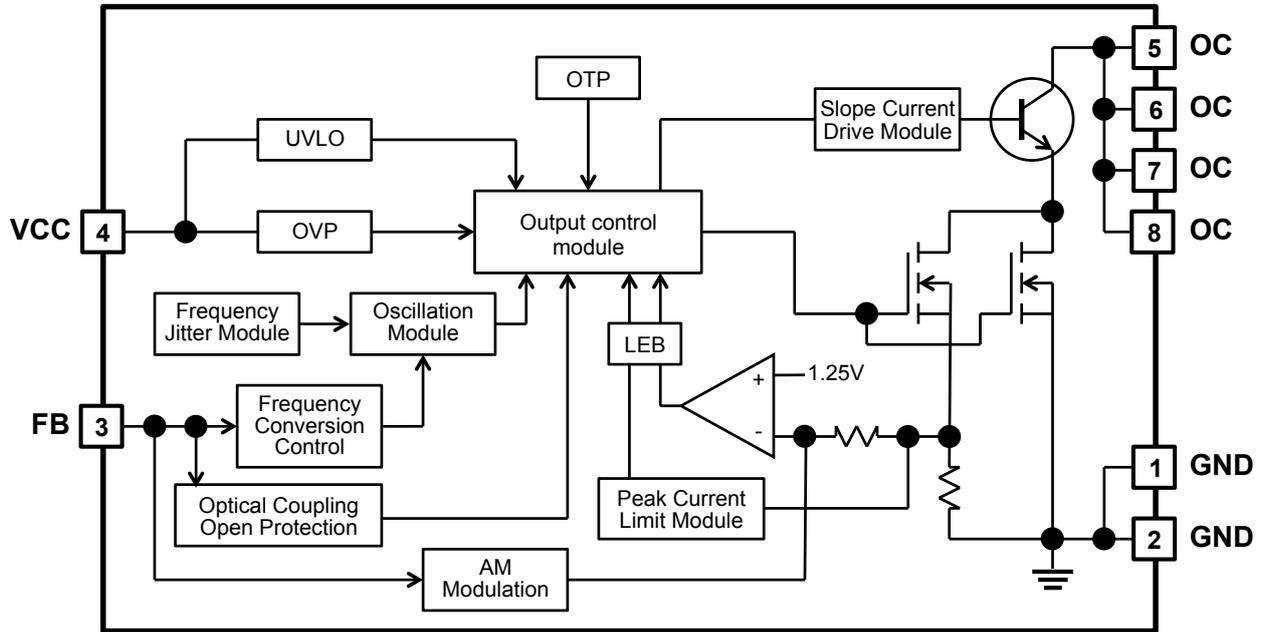
The **STComponent** ST7224 is a high performance current mode Pulse Width Modulated (PWM) switching power converter, which meets the Green Environmental standards. It is widely used in economical switching power supply, such as Set-Top Box, DVD, fax machine, printer and LCD display, etc. It is suitable for 18W in full voltage range and 24W in single voltage range.

**DEVICE SUMMARY**

Ordering Code	Package Type	Output Power	Marking <sup>(1)</sup>	Shipping
ST7224A	DIP-8	18W/24W	<div style="border: 1px solid black; padding: 5px; display: inline-block;"> <b>7224 YM</b> </div>	Tube

Note 1: **Y**: Year code;  
**M**: Month code.

**INTERNAL SCHEMATIC DIAGRAM**



**PIN DESCRIPTION**

DIP-8	PIN NAME	Description
1	GND	Ground Terminal.
2	GND	
3	FB	Feedback Terminal.
4	VCC	Power Supply Input Pad.
5	OC	Collector Terminal of Power BJT. It is output pad, connected to transformer.
6	OC	
7	OC	
8	OC	

**ABSOLUTE MAXIMUM RATINGS<sup>(2)</sup>**

T<sub>A</sub> = 25°C, unless otherwise specified.

PARAMETER	SYMBOL	RATINGS	UNIT
VCC Supply Voltage	V <sub>CC</sub>	8	V
Start-up Input Voltage	V <sub>start</sub>	8	V
Terminal Input Voltage	V <sub>PIN</sub>	V <sub>CC</sub> + 0.3	V
OC Pin Collector Voltage	V <sub>OC</sub>	-0.3 ~ +700	V
Thermal Resistance, Junction-to-Ambient	R <sub>θJA</sub>	85	°C/W
Junction Operating Ambient Temperature	T <sub>J</sub>	0 ~ +125	°C
Storage Temperature Range	T <sub>stg</sub>	-55 ~ +150	°C
Soldering Temperature (10 Seconds)	T <sub>solder</sub>	+260	°C

Note 2: Absolute Maximum Ratings are those values beyond which the device could be permanently damaged. Exposure to absolute-maximum-rated conditions for extended periods may affect device reliability.

**ELECTRICAL CHARACTERISTICS**

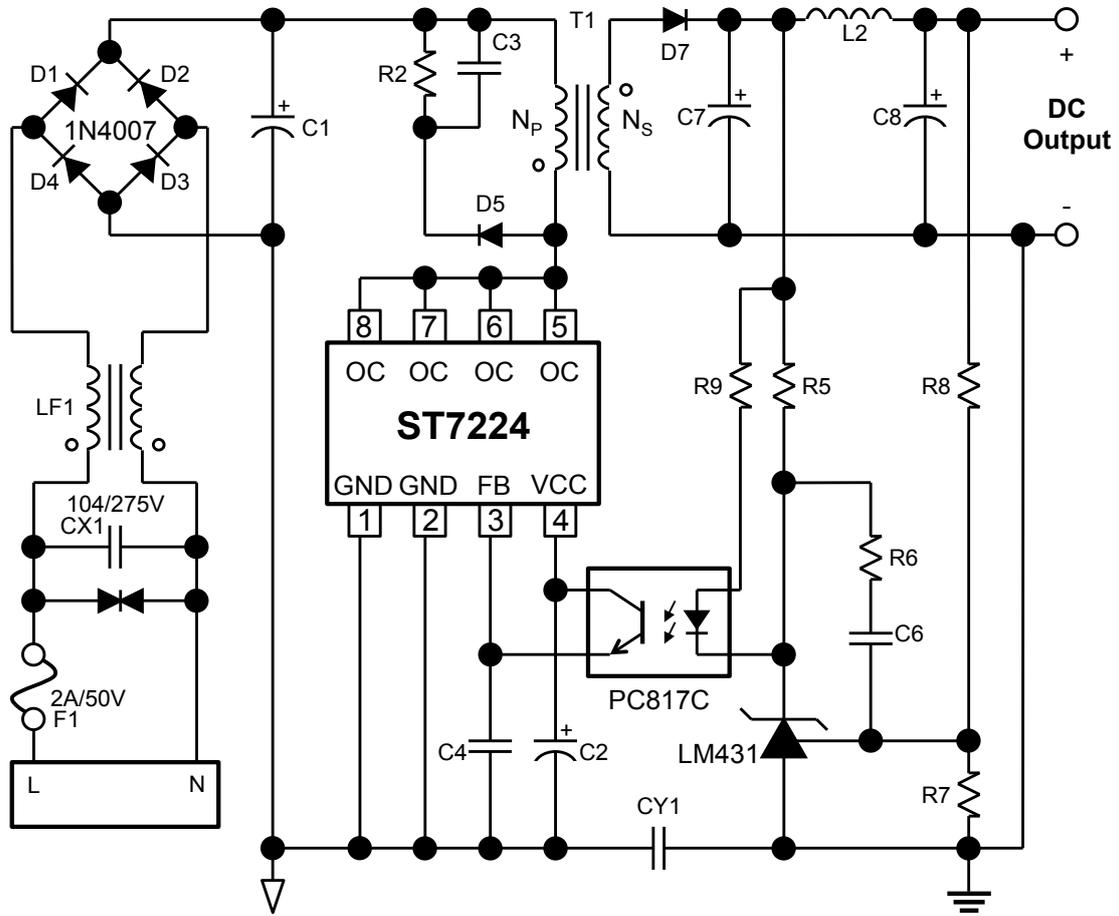
T<sub>A</sub> = 25°C, unless otherwise noted.

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
<b>VCC Power Section</b>						
Working Power Supply Range	V <sub>CC</sub>		4.0	4.7	5.5	V
VCC Start Threshold Voltage	V <sub>CC_ON</sub>		4.6	4.9	5.2	V
VCC Under-voltage Protection Threshold Voltage	V <sub>CC_OFF</sub>		3.2	3.5	3.8	V
VCC Overvoltage Protection Voltage	V <sub>CC_OVP</sub>		5.6	5.9	6.2	V
VCC Start Charging Current	I <sub>HV</sub>	V <sub>IN</sub> = 85V <sub>AC</sub> ~ 265V <sub>AC</sub>	0.4	0.7	1.3	mA
Start-up Working Current	I <sub>START</sub>	V <sub>CC</sub> = V <sub>CC_ON</sub> - 1V		95		µA
Working Supply Current	I <sub>CC</sub>	V <sub>CC</sub> = V <sub>CC_ON</sub> + 1V, V <sub>FB</sub> = 2.2V		30	45	mA

$T_A = 25^\circ\text{C}$ , unless otherwise noted.

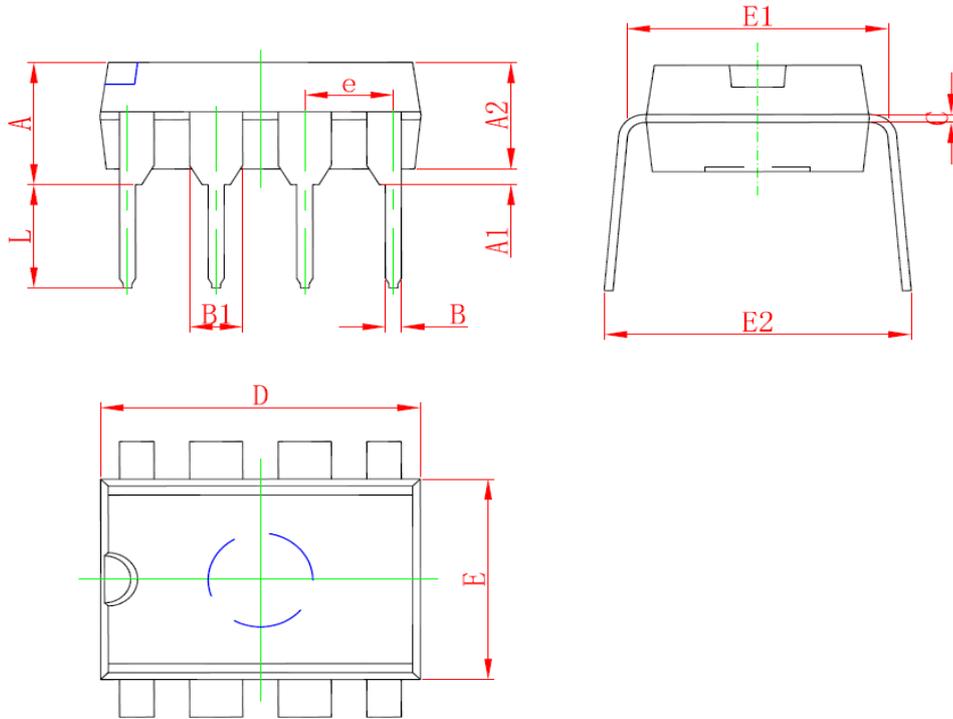
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
<b>Power BJT Section</b>						
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C = 1\text{A}, I_B = 0.25\text{A}$		0.25	0.8	V
Collector-Base Voltage	$V_{CBO}$	$I_C = 0.1\text{mA}$	700			V
Collector DC Current	$I_{CE}$		1.8			A
<b>Current Detection Section</b>						
Output Limited Current	$I_S$		1150	1350	1550	mA
<b>FB Detection Section</b>						
Short Circuit Protection Threshold Voltage	$V_{FB\_SP}$		1.15	1.33	1.50	V
Frequency Conversion Threshold Voltage	$V_{FB\_PFM}$		2.3	2.5	2.7	V
Standby Threshold Voltage	$V_{FB\_START}$		2.6	2.8	3.0	V
<b>Oscillator Section</b>						
Oscillator Frequency	$f_{OSC}$	$V_{FB} = 1.5\text{V} \sim 2.5\text{V}$	59	65	71	kHz
		$V_{FB} = 2.5\text{V} \sim 2.8\text{V}$	21	23	25	kHz
<b>PWM Section</b>						
Maximum Duty Cycle	$D_{MAX}$				70	%
Minimum Duty Cycle	$D_{MIN}$		5			%
Leading Edge Blanking Time	$T_{LEB}$			300		ns
Minimum Opening Time	$T_{ONMIN}$			800		ns
<b>Temperature</b>						
Thermal Shutdown	$T_{SD}$			140		$^\circ\text{C}$

**TYPICAL APPLICATION CIRCUIT**



**PACKAGE DIMENSION**

**DIP-8**



SYMBOL	Dimensions in Millimeters		Dimensions in Inches	
	MIN	MAX	MIN	MAX
A	3.600	4.310	0.142	0.170
A1	0.380		0.015	
A2	3.000	3.600	0.118	0.142
B	0.380	0.570	0.015	0.022
B1	1.520 (BSC)		0.060 (BSC)	
C	0.200	0.360	0.008	0.014
D	9.000	9.450	0.354	0.372
E	6.200	6.600	0.244	0.260
E1	7.320	7.920	0.288	0.312
e	2.540 (BSC)		0.100 (BSC)	
L	3.000		0.118	
E2	7.620	9.000	0.300	0.354

**NOTICE**

Information furnished by **STComponent** is believed to be accurate and reliable. However, no responsibility is assumed for its use. Customers are responsible for their products and applications using **STComponent** components. To minimize the risks associated with customer products and applications, customers should provide adequate design and operating safeguards. **STComponent** reserves the right to make changes to their products or specification without notice. Customers are advised to obtain the latest version of relevant information to verify, before placing orders, that information being relied on is current and complete.