

● Description

WD108xE is a highly integrated flyback controller suitable for designing high performance low cost off-line power converters. It fully integrates a 700V MOSFET in a TO220-6 package to provide simplified single stage AC-DC flyback converter.

To ensure low switching consumption and high efficiency, WD108xE adopt PWM/PFM control architecture, adjust the switching frequency according to the load condition, and enter burst mode under light load.

WD108xE implements several key protective features, such as externally adjustable cycle by cycle over-current protection(OCP), over power protection(OPP), over-voltage protection(OVP), short protection, under-voltage protection(UVP), over-temperature protection(OTP), soft start.

The device is available in a TO220-6 package

● Terminal function

● Feature

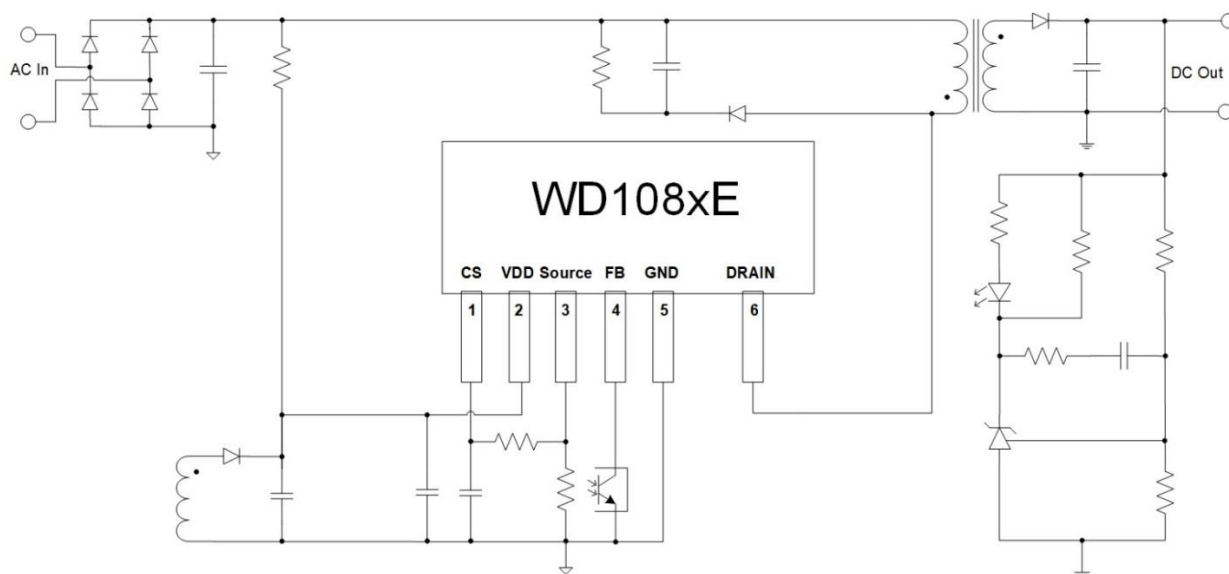
- Frequency Jittering for Reduced EMI Signature
- Hi-mode(65kHz PWM mode)
- Eco-mode(PFM mode)
- Low VDD current during startup and operation
- Lead edge blanking, output clamping
- Slope compensation for current loop
- Cycle by cycle over-current protection with line compensation
- VDD over-voltage protection, undervoltage protection
- Over load protection
- Auto restart (UVP,OVP,OLP,OTP)
- Over-temperature protection
- Integrated 700V High Power MOSFET

● Application

- Lead-Acid battery charger
- Lithium iron phosphate battery charger
- Power adapter
- Open-frame off-line power supply

Number	Name	Description
1	CS	Current sense
2	VDD	Power supply
3	Source	Source of integrated MOSFET
4	FB	Feedback
5	GND	Ground
6	DRAIN	Drain of integrated MOSFET

● Typical application circuit



PN	Package	700V MOSFET $R_{DS(on)}$ (Ω) Max
WD1082E-T60T	TO-220-6	1.0 ohm
WD1083E-T60T	TO-220-6	0.8 ohm
WD1084E-T60T	TO-220-6	0.65 ohm
WD1085E-T60T	TO-220-6	0.55 ohm

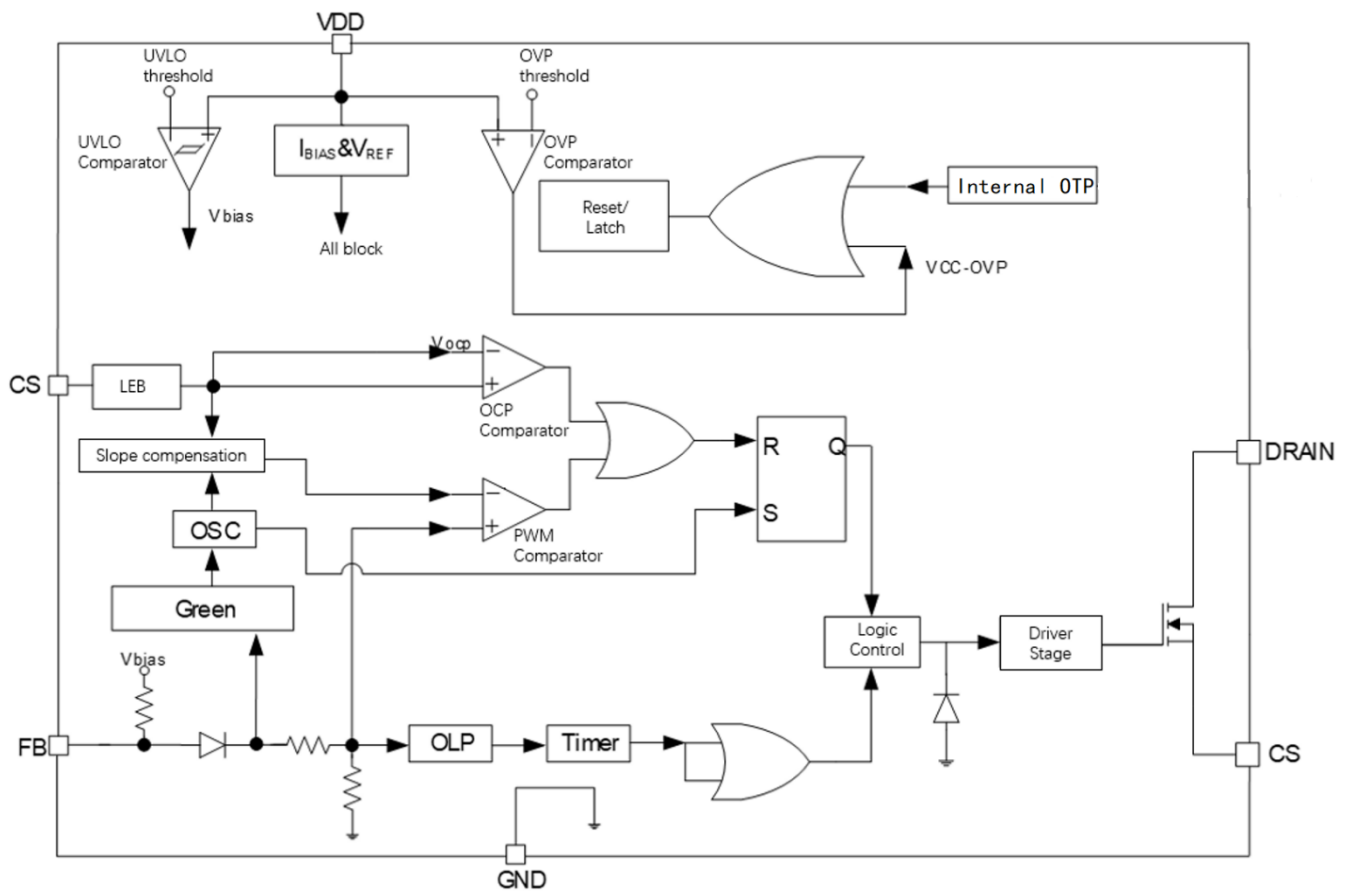
● Absolute Maximum Ratings

($T_{amb} = 25^{\circ}\text{C}$, unless otherwise noted)

Rating	Symbol	Value	Unit
Supply input voltage	V_{DD}	-0.3~26	V
CS input voltage	V_{CS}	-0.3~6	V
Source	V_{Source}	~1.2	V
FB input voltage	V_{FB}	-0.3~6	V
Operating Junction Temperature	T_J	-40~150	$^{\circ}\text{C}$
Operating environment Temperature	T_{amb}	-40~85	$^{\circ}\text{C}$
Storage Temperature Range	T_{stg}	-55~150	$^{\circ}\text{C}$
Lead Soldering Temperature/10secs		260	$^{\circ}\text{C}$
Thermal Resistance (Note 1)	$R_{\theta JA}$	54	$^{\circ}\text{C/W}$

Note 1: Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

● Functional block diagram



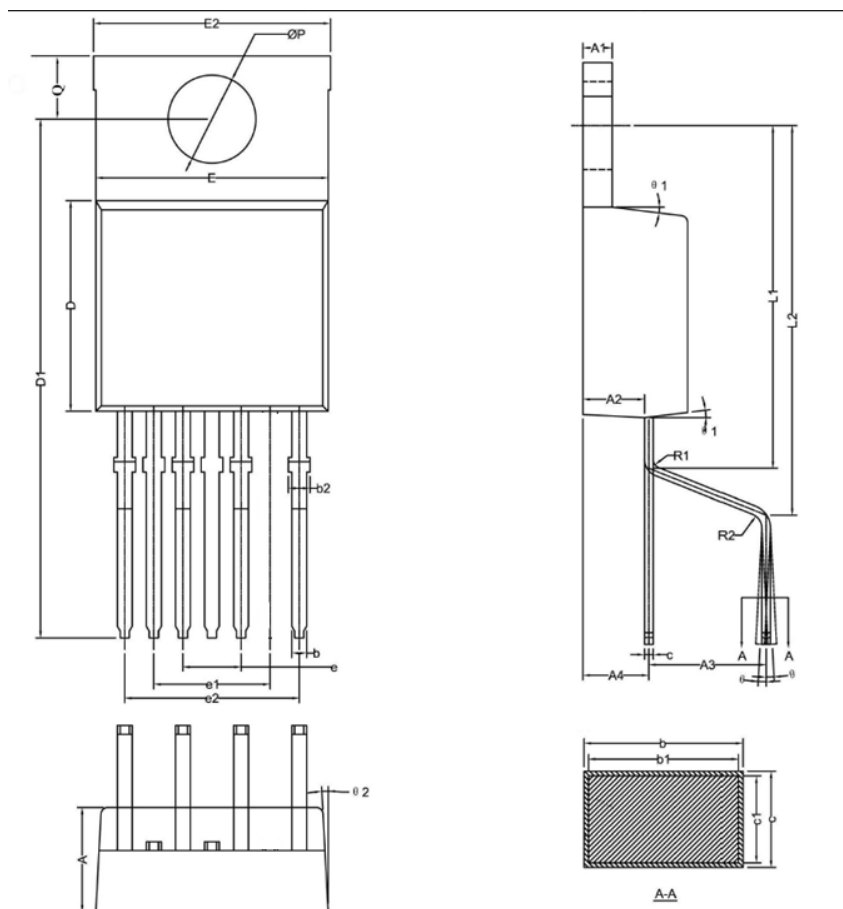
• Electrical characteristics

($V_{DD}=18V, T_A = 25^{\circ}C$ for typical values, unless otherwise noted)

symbol	Characteristics	Condition	Min	Typ	Max	Unit
Supply voltage (VDD)						
I_{DD_ST}	Start-up current	$V_{DD}=V_{UVLO(ON)}-0.1V$		3	20	μA
I_{DD_OP}	Operation current	$V_{DD}= 15V,$ $V_{FB}=2.5V$ $C_L= 1nF$		2.5		mA
I_{DD_BURST}	Burst current	$V_{DD}= 15V, V_{FB}= 0V$ $V_{CS}= 0V$		0.6		mA
V_{PULL_UP}	PMOS pull-up voltage			10		V
$V_{UVLO(ON)}$	UVLO on threshold	V_{DD} dropping	7.0	7.5	8.0	V
$V_{UVLO(OFF)}$	UVLO off threshold	V_{DD} rising	15.9	16.9	17.9	V
OVP	V_{DD} protection threshold	$V_{FB}= 3V, V_{CS}= 0V$ V_{DD} rising until Gate no output	26.5	28.0	29.5	V
Feedback (FB)						
A_{VCS}	PWM Gain	$\Delta V_{FB}/\Delta V_{CS}$		3.50		V/V
V_{FB_OPEN}	FB open pin voltage			5.1		V
I_{FB_SHORT}	FB pin short current	$FB=0V$		1		mA
V_{TH_GREEN}	Green mode threshold			2.1		V
V_{TH_PL}	OLP threshold		4.4	4.4	4.8	V
t_{D_PL}	Start-up blanking time triggered by OLP			60		ms
D_{MAX}	Maximum duty cycle	$V_{DD}= 18V, V_{FB}= 3V$ $V_{CS}= 0V$	77	80	83	%
Current sense (CS)						
t_{LEB}	Lead edge blanking time			300		ns
V_{TH_OC}	OCP threshold	Duty cycle=0		0.5		V
t_{D_OC}	time delay from sense to control	From $CS=TH$ to gate off		100		ns
Oscillator						
f_{NOM}	oscillation frequency	$V_{DD}= 18V, V_{FB}= 3V$ $V_{CS}= 0V$	60	65	70	kHz
F_{min}	Green mode minimal frequency			22		kHz
Internal OTP						

T_otp_enter				150		°C
T_otp_exit				120		°C
MOSFET						
BV _{DSS}	Drain-Source breakdown voltage		700			V
R _{DS(on)}	WD1082E-T60T	V _{GS} = 10V, I _{DS} =5A			1.0	Ω
R _{DS(on)}	WD1083E-T60T	V _{GS} = 10V, I _{DS} =6A			0.8	Ω
R _{DS(on)}	WD1084E-T60T	V _{GS} = 10V, I _{DS} =6.5A			0.65	Ω
R _{DS(on)}	WD1085E-T60T	V _{GS} = 10V, I _{DS} =7.5A			0.56	Ω

- **Package Outline: TO220-6**



Symbol	Min	Typ	Max	Symbol	Min	Typ	Max
A	4.15	4.30	4.45	E2	10.05		10.40
A1		1.30		e	2.44	2.54	2.64
A2	2.40	2.50	2.60	e1	4.98	5.08	5.18
A3	4.88	5.08	5.28	e2	7.52	7.62	7.72
A4	2.49	2.69	2.89	L1	14.62	14.92	15.22
b	0.61		0.74	L2	16.67	16.97	17.27
b1	0.60	0.65	0.70	Q	2.60	2.75	2.90
b2	0.61		0.90	θ	0°		6°
c		0.46		θ1	5°	7°	9°
D		0.45		θ2	1°	3°	5°
D1	8.50	8.60	8.70	P	3.79	3.84	3.89
E	10.06	10.16	10.26				

● **Poisonous and harmful substances or elements contained in products**

Part name	Poisonous and harmful substances or elements					
	Pb	Hg	Cd	Cr+6	PBB	PBDE
lead frame	○	○	○	○	○	○
Epoxy plastic	○	○	○	○	○	○
Chip	○	○	○	○	○	○
internal boding wire	○	○	○	○	○	○
DB adhesive	○	○	○	○	○	○
Note	○: under limit, Compliance GBT26572-2011。 ×: over limit, non-Compliance GBT26572-2011。					

● Ordering information

Part Number	Package	Shipping	Device making
WD1082-T60T	TO220-6	50/Tube	WD1082 XXXXYYWW
WD1083E-T60T	TO220-6	50/Tube	WD1083E XXXXYYWW
WD1084E-T60T	TO220-6	50/Tube	WD1084E XXXXYYWW
WD1085E-T60T	TO220-6	50/Tube	WD1085E XXXXYYWW

* XXXXYYWW is variable.

ESD Notice



Semiconductor devices are ESD sensitive and can be damaged by exposure to ESD events. Suitable ESD precautions should be taken when handling and transporting these devices.

Declaration

The Company shall not be liable for any damage caused by exceeding the rated value (such as maximum value, operating range, or other parameters) during the use of all specifications of Shanghai Wayon Semiconductor Co., LTD. The Company's products shall not be used in human life support equipment or systems whose failure or malfunction may result in personal injury. No reproduction in whole or in part shall be made without authorization. The Company reserves the right to change the prospectus without prior notice.

Contact Information

No.1001, Shiwan(7) Road, Pudong District, Shanghai, P.R.China.201202

Tel: 86-21-68960674 Fax: 86-21-50757680 Email: market@way-on.com

WAYON website: <http://www.way-on.com>

For additional information, please contact your local Sales Representative.

WAYON is registered trademark of Wayon Corporation.

Specifications are subject to change without notice.

The device characteristics and parameters in this data sheet can and do vary in different applications and actual device performance may vary over time.

Users should verify actual device performance in their specific applications.