

General Description

IN2082 is a Flyback AC-DC PWM controller which uses Peak-Current Mode and proprietary Dual-Mode technology (CCM / Quasi-Resonant DCM). It's suitable for adapters of Datacom, Monitor, and Notebook due to the low standby power and high efficiency. The PWM Frequency Variation and Jittering are also included for EMI optimization and efficiency improvement.

IN2082 provides complete fault protections including over/under voltage protection, over load protection, short circuit protection, secondary rectifier short protection, short winding protection, and cycle by cycle current limit... etc.

To increase light-load efficiency, the burst mode is automatically activated to reduce the power loss. Under very light-load condition, the VDD holdup mode will be triggered to avoid V_{DD} drop to turn-off threshold by forcing PWM switching.

The package of IN2082 is available in standard SOT-23-6.

Applications

- Switching AC-DC Adapter
- Open Frame SMPS
- NB Adapter
- ATX Standby Power
- STB Power
- Monitor Power

Features

- Peak Current mode PWM controller
- CCM/DCM Dual-Mode Operation
- Quasi-Resonant in DCM
- Burst Mode at Light-Load
- VDD Holdup Mode at Very Light-Load
- Frequency Variation by the different AC_{IN} & I_{OUT}
- Frequency Jittering for EMI Reduction
- Low Supply Current
- Low No-load power consumption
- Internal Soft-Start
- Fault Protection

Output

- Over/Under Voltage Protection
- Over Load Protection
- Open Loop Protection
- Short Circuit Protection

Input

- Brown-In/Out
- VDD Under Voltage Lockout
- VDD Over Voltage Protection

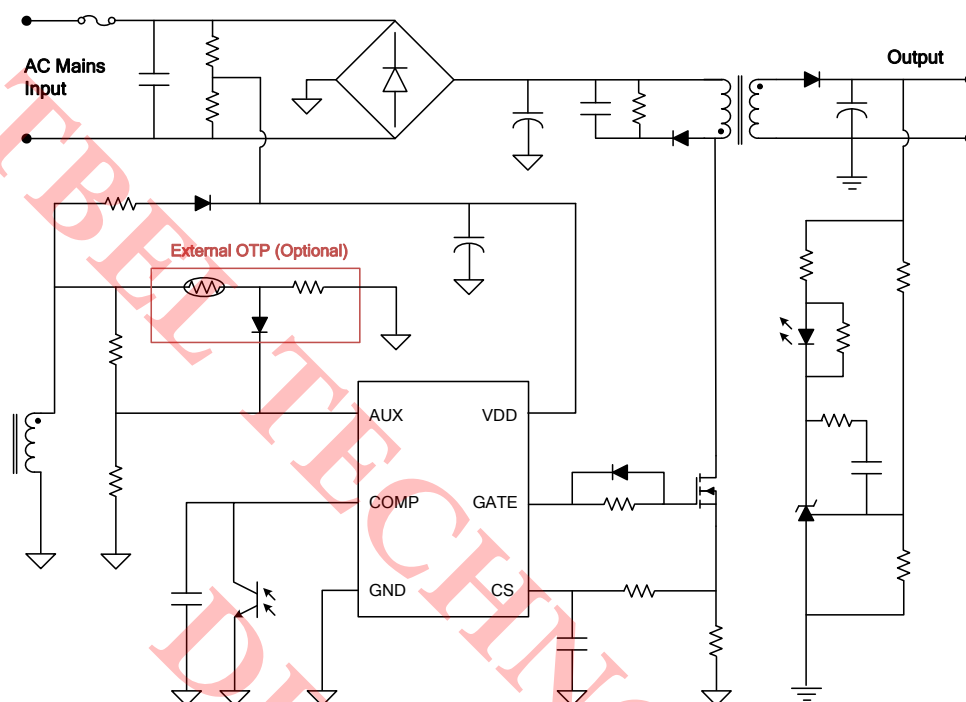
Primary Current

- Cycle by Cycle Peak Current Limit
- Over Current Protection

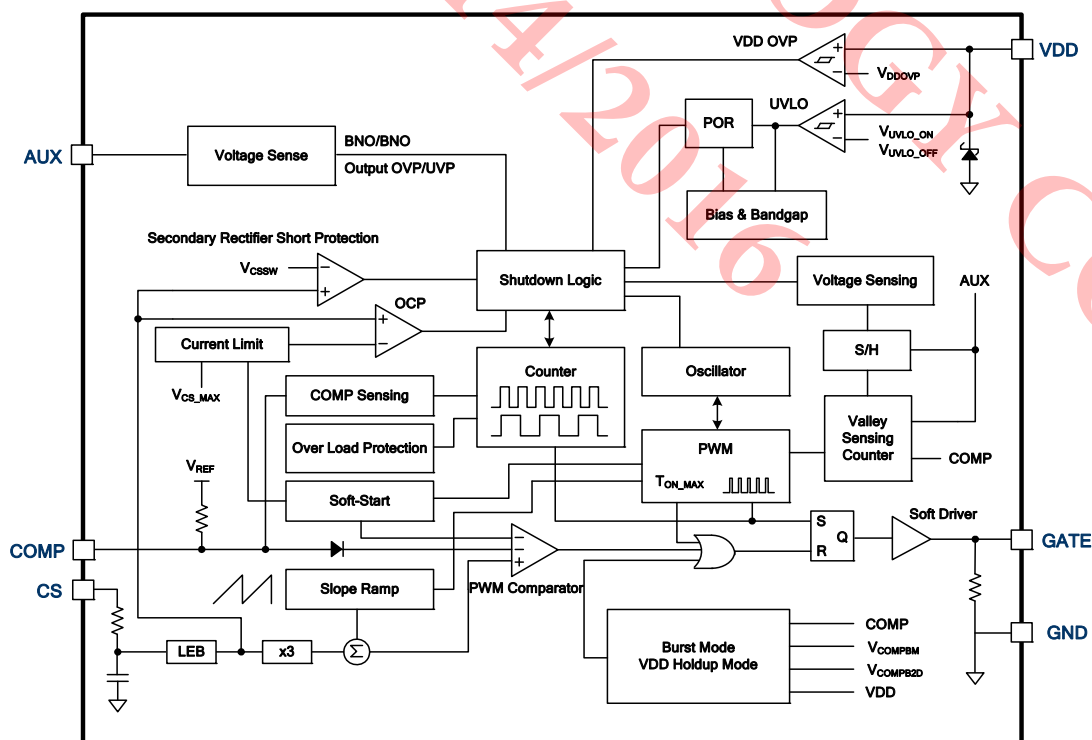
Others

- Short Winding Protection
- Secondary Rectifier Short Protection
- Over Temperature Protection
- Internal Slope Compensation
- No Audible Noise over Full Operating Range
- SOT-23-6 Package
- Meet RoHS Standard

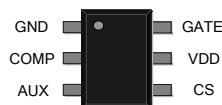
Typical Application



Functional Block Diagram



Pin Configurations



Pin Name	Pin Type	Description
GND	-	Ground. Connect this pin to the circuit ground.
COMP	AI	Feedback Voltage Input. Connect an Opto-Coupler to close the control loop and achieve output voltage regulation. The Open Loop Protection and Over Load Protection are also achieved by monitoring this pin.
AUX	AI	Input/Output Voltage Detection. Connect this pin to Auxiliary Winding with a resistive divider to achieve the brown-in, brown-out, output over/under voltage protection, and Zero Crossing Detection.
CS	AI	Current Sense Input. The current sense resistor between this pin and GND is used for cycle-by-cycle peak current control and limit.
VDD	-	Power Input of the Controller.
GATE	O	Gate drive output for external power MOSFET.

Absolute Maximum Ratings

Parameter	Rating
Supply Input Voltage, VDD	-0.3V ~ 30V
VDD Operating Current, IDD	8mA
GATE Voltage, V _{GATE}	-0.3V ~ 30V
COMP, ZCS, BND Voltage	-0.3V ~ 5.5V
Storage Temperature Range	-65°C ~ 150°C
Junction Temperature Range	-40°C ~ 150°C
Lead Soldering Temperature (10 sec)	260°C
ESD rating per JEDEC JESD22-A114	HBM 4KV
	MM 200V
Latch-up test per JEDEC 78	±200mA

Notes:

- (1). These are stress ratings only and functional operation is not implied. Exposure to absolute maximum ratings for prolonged time periods may affect device reliability.
- (2). All voltages are with respect to ground.
- (3). Devices are ESD sensitive. Handling precaution is recommended.

Recommended Operating Conditions

Parameter	Rating
Supply Input Voltage Range	12V ~ 25V
Junction Temperature Range	-40°C ~ 125°C

Notes:

- (1). These are conditions under which the device functions but the specifications might not be guaranteed.
- (2). For guaranteed specifications and test conditions, please see the [Electrical Specifications](#).

Package Information

Parameter	Package	Symbol	Rating
Thermal Resistance of Junction to Case	SOT-23-6	θ_{JC}	110 °C/W
Thermal Resistance of Junction to Ambient		θ_{JA}	250 °C/W

Electrical Specifications

VDD=16.5V, T_A=25°C, unless otherwise noted.

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Supply Section / VDD						
VDD Over Voltage Protection	V _{DDOVP}		26	27	28	V
Delay Time of V _{DDOVP}	T _{VDDOVP}			310		us
VDD Zener Clamp	V _Z	I _{DD} =5mA	28.2			V
VDD UVLO ON Threshold Voltage	V _{UVLO_ON}		15.5	16.2	17	V
VDD UVLO OFF Threshold Voltage	V _{UVLO_OFF}		7.4	7.9	8.4	V
VDD Holdup Mode Entry Point	V _{DD_ET}		8.2	8.7	9.2	V
VDD Holdup Mode Ending Point	V _{DD_ED}		8.5	9	9.5	V
Start-Up Current	I _{DD_ST}	VDD < V _{TH_ON} - 0.1V		2		μA
Supply Current in Normal Operation	I _{DD_OP}	V _{COMP} =1.5V GATE pin open		1		mA
Internal Reference Voltage	V _{REF}		4.3	4.4	4.5	V
PWM Section						
Maximum Operation PWM Frequency	F _{SW_MAX}	V _{AC} =90V	105	110	115	KHz
		V _{AC} =115V	60	65	70	
		V _{AC} =230V	60	65	70	
Minimum Operation PWM Frequency	F _{SW_MIN}		20.5	21.5	22.5	KHz
Maximum Duty Cycle	DC _{MAX}	CCM	70	75	80	%
Maximum Gate ON-Time	T _{ON_MAX}	DCM	13.5	15	16.5	us
Frequency Jittering Range	Δf _{JT}			12.5		%

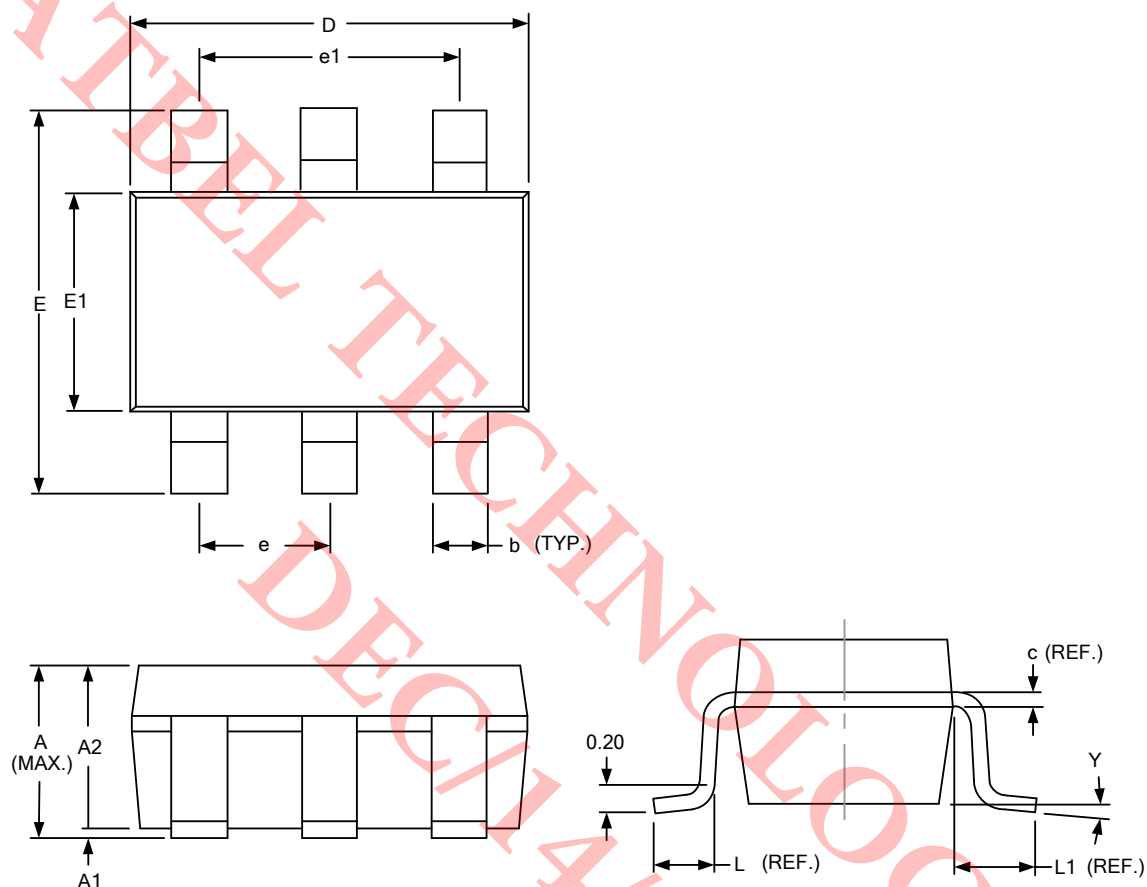
Frequency Variation Versus VDD Deviation	f _{DV}	VDD=9V to 23V		0.5	1	%
Current Sensing / CS						
Peak Current Limitation in Normal Operation	V _{CS_MAX}	V _{AC} =90V	0.52	0.55	0.58	V
		V _{AC} =115V	0.52	0.55	0.58	
		V _{AC} =230V	0.44	0.47	0.5	
Leading Edge Blanking	T _{LEB_CS}			500		ns
Internal Propagation Delay Time	T _{PD}			100		ns
Minimum Gate On Time	T _{ON_MIN}			250		ns
Threshold for Short Winding Protection	V _{CSSW}		1.6	1.7	1.8	V
Feedback Voltage Input / COMP						
Open Loop Voltage	V _{COMP_OP}	COMP pin open	4.2	4.3	4.4	V
Short Circuit Current of COMP	I _{ZERO}	V _{COMP} =0V		0.1		mA
Reduce frequency entry Voltage	V _{COMPET}	V _{AC} =90V, F=F _{SW_MAX}		2.03		V
		V _{AC} =115V, F=F _{SW_MAX}		2.17		
		V _{AC} =230V, F=F _{SW_MAX}		1.86		
Reduce frequency ending Voltage	V _{COMPED}	V _{AC} =90V, F=F _{SW_MIN}		1.11		V
		V _{AC} =115V, F=F _{SW_MIN}		1.11		
		V _{AC} =230V, F=F _{SW_MIN}		1.49		
Exit Burst mode COMP Voltage	V _{COMPB2D}	V _{AC} =90V & 115V		1.09		V
		V _{AC} =230V		1.47		
Burst Mode COMP Voltage	V _{COMPBM}			1.05		V
Over Load/Open Loop Protection Threshold at COMP Pin	V _{OLP}		3.3	3.4	3.5	V
Delay Time of Over Load/Open Loop Protection	T _{OLP}			62		ms
Soft Start						
Soft-Start Time	T _{SS}			2		ms
Input & Output Voltage Sense / AUX						
Brown-In Threshold Current	I _{BNI_TH}			93		uA

Brown-Out Threshold Current	I_{BNO_TH}			83		uA
De-bounce Time of Brown-Out	T_{D_BNO}			66		ms
DCM Zero Crossing Threshold Voltage	V_{ZC_TH}			150		mV
Threshold for Output Over Voltage Protection	$V_{O_OVP_TH}$		1.064	1.12	1.176	V
Blanking Time for Output Over Voltage Protection	T_{LEB_VOOVP}			2		us
Threshold for Output Under Voltage Protection	$V_{O_UVP_TH}$		0.475	0.5	0.525	V
Delay Time of Output Under Voltage Protection	T_{D_VOUVP}			20		ms
Gate Driver Output/ GATE						
Output Voltage at Logic Low	V_{GATE_LOW}	$I_{OUT}=20mA$		0.3	0.5	V
Output Voltage at Logic High	V_{GATE_HIGH}	$I_{OUT}=-20mA$	16	16.5		V
Rise Time	T_R	$C_{OUT}=1nF$		130		ns
Fall Time	T_F	$C_{OUT}=1nF$		40		ns
Over Temperature Protection						
On-Chip Over Temperature Protection	T_{OTP}			140		°C

Note: The specifications of leading edge blanking time and de-bounce time is guaranteed by design.

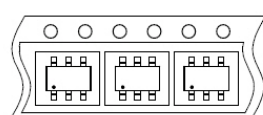
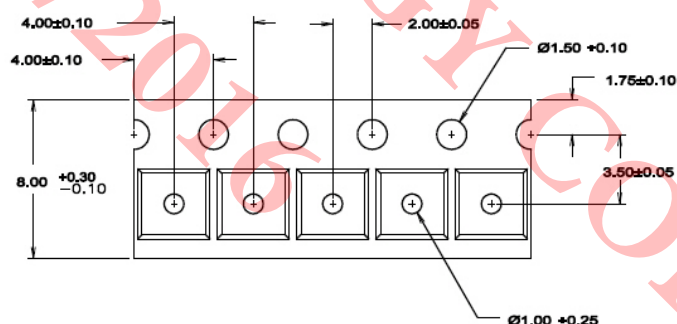
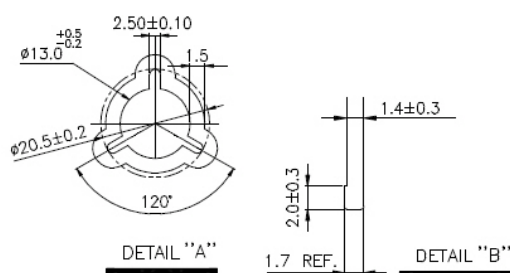
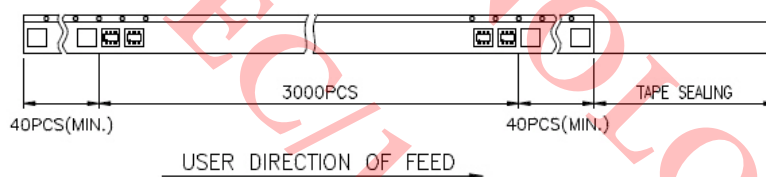
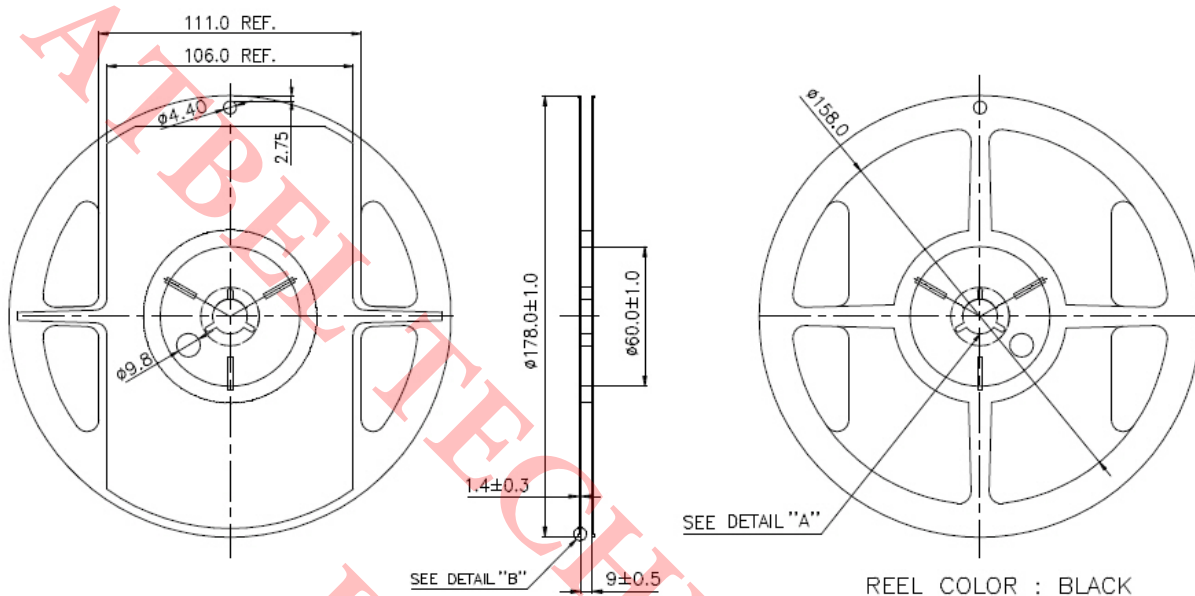
Package Outline

SOT-23-6

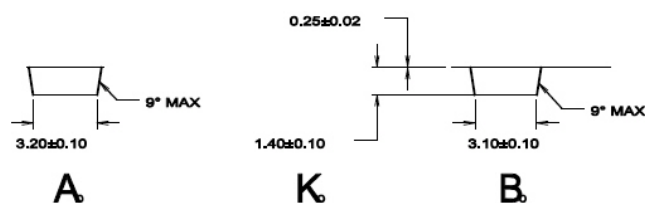


DIMENSIONS					
REF.	Millimeter		REF.	Millimeter	
	Min.	Max.		Min.	Max.
A	1.45 MAX.		L	0.37 REF.	
A1	0	0.10	L1	0.60 REF.	
A2	1.10	1.30	Y	0°	10°
c	0.12 REF.		b	0.30	0.50
D	2.70	3.10	e	0.95 REF.	
E	2.60	3.00	e1	1.90 REF.	
E1	1.40	1.80			

Tape and Reel Information



3000 EA/PER REEL



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