

GENERAL DESCRIPTION

OB2283K is a highly integrated current mode PWM control IC optimized for high performance, low standby power and cost effective offline flyback converter applications.

PWM switching frequency at normal operation is internally fixed and is trimmed to tight range. At no load or light load condition, the IC operates in extended 'burst mode' to minimize switching loss. Lower standby power and higher conversion efficiency is thus achieved.

VCC low startup current and low operating current contribute to a reliable power on startup and low standby design with OB2283K.

OB2283K offers complete protection coverage with auto-recovery including Cycle-by-Cycle current limiting (OCP), over load protection (OLP), over temperature protection (OTP) and VCC under voltage lockout (UVLO). It also provides the protections with latched shut down including over voltage protection (OVP). Excellent EMI performance is achieved with On-Bright proprietary frequency shuffling technique.

The tone energy at below 20KHZ is minimized in the design and audio noise is eliminated during operation.

OB2283K is offered in SOT23-6 package.

FEATURES

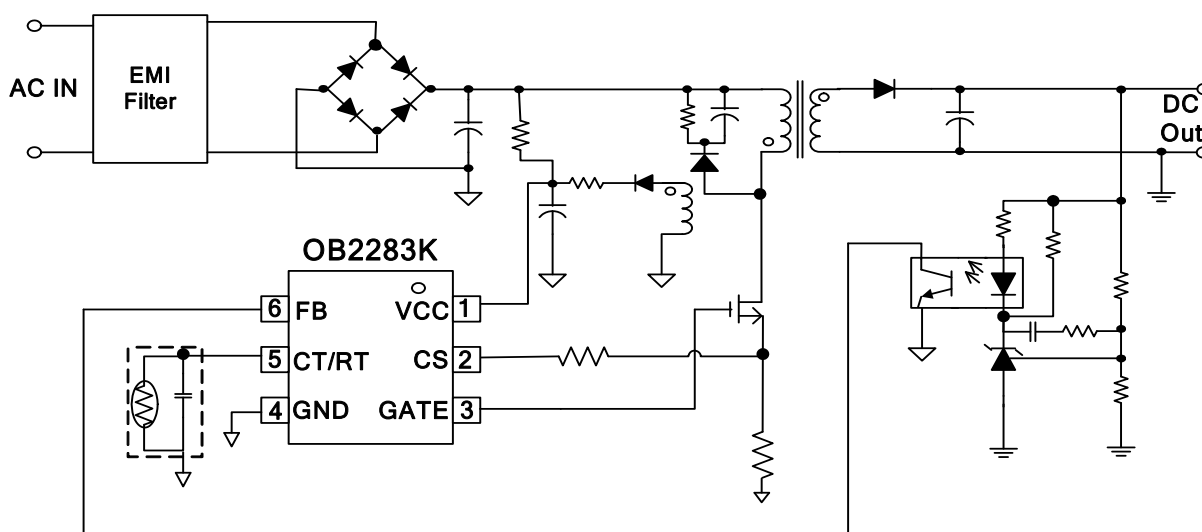
- Power on Soft Start Reducing MOSFET Vds Stress
- Frequency shuffling for EMI
- Extended Burst Mode Control For Improved Efficiency and Minimum Standby Power Design
- Ultra Low Operating Current at Light Load (0.6mA)
- Audio Noise Free Operation
- Normal 65KHz Switching Frequency
- Frequency Triple for peak load(195Khz)
- Adjustable Overload Protection (OLP) delay time
- Comprehensive Protection Coverage
 - o VCC Under Voltage Lockout with Hysteresis (UVLO)
 - o Cycle-by-cycle over current threshold setting for constant output power limiting over universal input voltage range
 - o Overload Protection (OLP) with auto-recovery
 - o External (if NTC resistor is connected at CT/RT pin) or internal (if capacitor is connected at CT/RT pin) Over Temperature Protection (OTP) with auto-recovery.
 - o VCC Over voltage Protection(OVP) with latch shut down

APPLICATIONS

Offline AC/DC flyback converter for

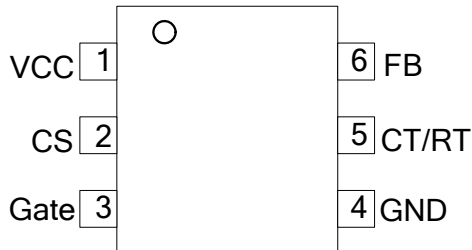
- Switching power supply with peak power
- Printer, Storage power supply
- Power Adapter

TYPICAL APPLICATION



GENERAL INFORMATION

Pin Configuration



The OB2283K is offered in SOT23-6 package, shown as below.

Ordering Information

Part Number	Description
OB2283KMP	SOT23-6, Pb-free in T&R

Package Dissipation Rating

Package	R θ JA(°C/W)
SOT23-6	200

Absolute Maximum Ratings

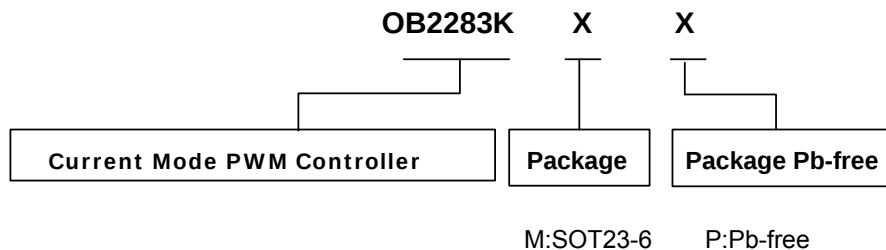
Parameter	Value
VCC DC Supply Voltage	V _{OVP} -1V
VCC DC Clamp Current	10 mA
FB Input Voltage	-0.3 to 7V
Sense Input Voltage	-0.3 to 7V
CT/RT Input Voltage	-0.3 to 7V
Min/Max Operating Junction Temperature T _J	-40 to 150 °C
Min/Max Storage Temperature T _{stg}	-55 to 150 °C
Lead Temperature (Soldering, 10secs)	260 °C

Note: VDD_Clamp has a nominal value of 32V.

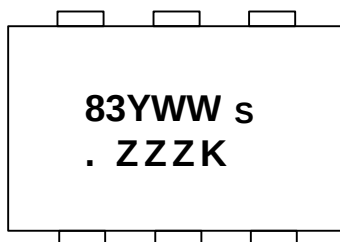
Stresses beyond those listed under "absolute maximum ratings" may cause permanent damage to the device. These are stress ratings only, functional operation of the device at these or any other conditions beyond those indicated under "recommended operating conditions" is not implied. Exposure to absolute maximum-rated conditions for extended periods may affect device reliability.

Recommended operating condition

Symbol	Parameter	Range
VCC	VCC Supply Voltage	12 to 28V
T _A	Operating Ambient Temperature	-20 to 85 °C



Marking Information



Y:Year Code
 WW:Week Code(01-52)
 s: Internal code
 ZZZ: Lot code
 K: Character code

TERMINAL ASSIGNMENTS

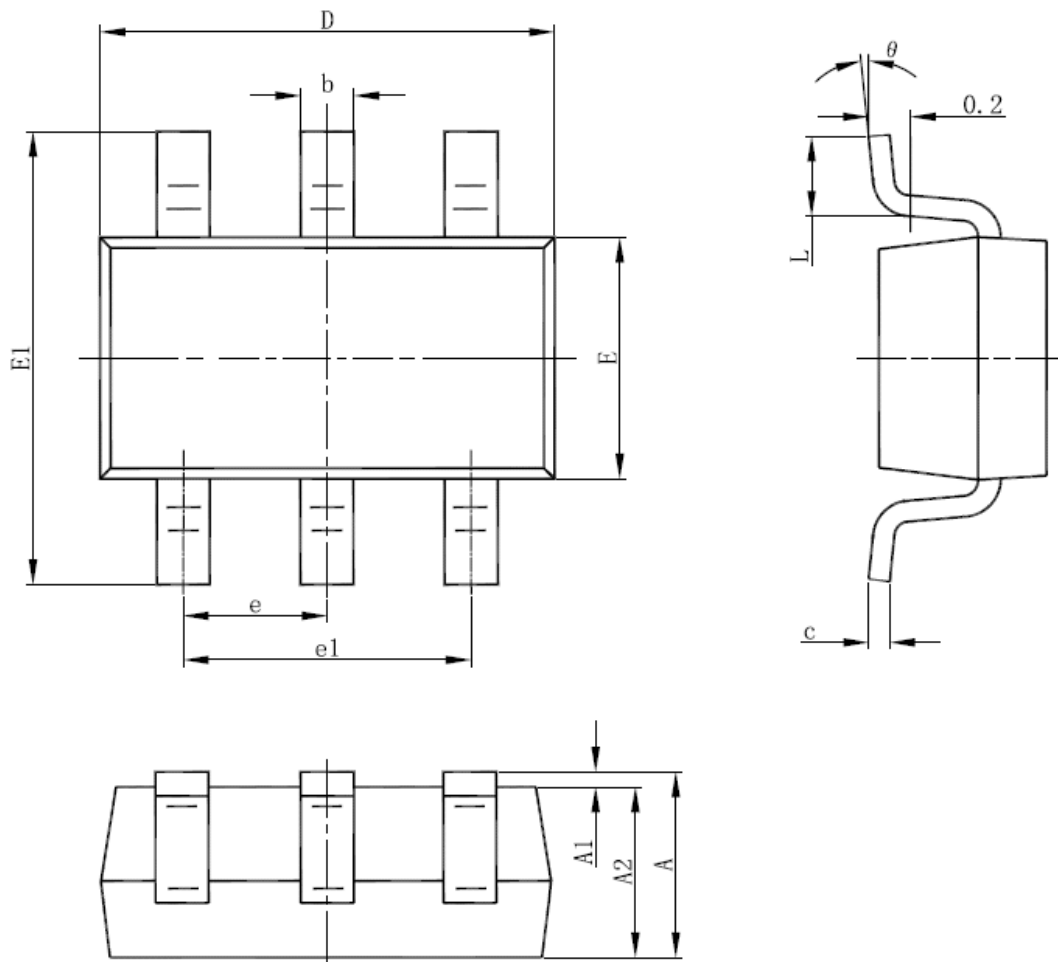
Pin Name	I/O	Description
VCC	P	Power Supply
CS	I	Current sense input
Gate	O	Totem-pole gate driver output for power MOSFET
GND	P	Ground
CT/RT	I	Dual functions pin. Connecting a NTC resistor to ground for over temperature control. Connecting a capacitor to ground sets OLP delay time
FB	I	Feedback input pin. The PWM duty cycle is determined by voltage level into this pin and the current-sense signal at Pin 4.

ELECTRICAL CHARACTERISTICS

(T_A = 25°C, VCC=18V, unless otherwise noted)

Symbol	Parameter	Test Conditions	Min	Typ	Max	Unit
Supply Voltage (VDD)						
I _{startup}	VCC Start up Current	VCC=UVLO(OFF)-1V, measure leakage current into VCC		5	20	uA
I _{VCC_Operation}	Operation Current	VDD=18V,CS=4V, FB=3.5V,measure I(VCC)		2.5	3	mA
I _{VCC_Burst}	Burst Current	CS=0V,FB=0.5V, measure I(VCC)		0.6		mA
UVLO(ON)	VCC Under Voltage Lockout Enter		7	8	9	V
UVLO(OFF)	VCC Under Voltage Lockout Exit (Recovery)		19	21	23	V
V _{pull-up}	Pull-up PMOS active			10		V
OVP	VCC Over Voltage Protection Enter	FB=3V,CS=0V. Slowly ramp VCC, until no Gate.	29	30	31	V
V _{latch_release}	Latch release voltage			5		V
Feedback Input Section(FB Pin)						
V _{FB_Open}	V _{FB} Open Loop Voltage		4.7	5		V
V _{195K}	Reach 195KHz Threshold Voltage			4		V
V _{start}	Frequency Begins Increasing Threshold Voltage			3.5		V
A _{vcs}	PWM input gain $\Delta V_{FB}/\Delta V_{CS}$			3.5		V/V
Maximum duty cycle	Max duty cycle @ VCC=18V,VFB=3V,VCS=0V		73	78	83	%
V _{ref_green}	The threshold enter green mode		1.65	1.85	2.05	V
V _{ref_burst_H}	The threshold exits burst mode		1.1	1.3	1.5	V
V _{ref_burst_L}	The threshold enters burst mode		1	1.2	1.4	V
I _{FB_Short}	FB pin short circuit current	Short FB pin to GND and measure current		0.3		mA
V _{TH_PK}	Peak load, FB Threshold Voltage			4.4		V
T _{D_PK}	Peak load, Debounce Time			90		mS
Z _{FB_IN}	Input Impedance			16.7		Kohm
Current Sense Input(CS Pin)						
SST_CS	Soft start time for CS peak			4		mS
T _{blanking}	Leading edge blanking time			250		nS
T _{D_OC}	Over Current Detection and Control Delay	From Over Current Occurs till the Gate driver output start to		90		nS

		turn off				
V _{TH_OC}	Internal Current Limiting Threshold Voltage with zero duty cycle			0.45		V
V _{ocp_clamping}	CS voltage clamping			0.8		V
CT/RT pin						
T _{d_OLP}	OLP debounce time	CT=100nF		1		S
T _{d_OLP_inner}		No Capacitor connected to CT/RT pin		10		S
IRT	Output current of RT pin		95	100	105	uA
VOTP	Threshold voltage for EX OTP		0.95	1	1.05	V
T _{d_OTP}	OTP debounce time			1.5		mS
Chip OTP						
OTP enter				150		°C
OTP exit				120		°C
Oscillator						
F _{OSC}	Normal Oscillation Frequency	VDD=18V,FB=3V, CS=0V	60	65	70	KHZ
F _{osc_PK}	Peak load frequency	VDD=18V,FB=4.5V, CS=0V		195		KHZ
SST_freq	Soft start time for frequency			12		mS
Δf _{OSC}	Frequency jittering			+/-7		%
F _{shuffling}	Shuffling frequency			32		Hz
Δf _{Temp}	Frequency Temperature Stability			1		%
Δf _{VCC}	Frequency Voltage Stability			1		%
F _{Burst}	Burst Mode Switch Frequency			25		KHZ
Gate driver						
V _{OL}	Output low level @ VDD=18V, I _o =5mA				1	V
V _{OH}	Output high level @ VCC=18V, I _o =20mA		6			V
V _{clamping}	Output clamp voltage			12		V
T _r	Output rising time 1.2V ~ 10.8V @ CL=1000pF			160		nS
T _f	Output falling time 10.8V ~ 1.2V @ CL=1000pF			50		nS

PACKAGE MECHANICAL DATA
SOT-23-6L PACKAGE OUTLINE DIMENSIONS


Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.000	1.450	0.039	0.057
A1	0.000	0.150	0.000	0.006
A2	0.900	1.300	0.035	0.051
b	0.300	0.500	0.012	0.020
c	0.080	0.220	0.003	0.009
D	2.800	3.020	0.110	0.119
E	1.500	1.726	0.059	0.068
E1	2.600	3.000	0.102	0.118
e	0.950 (BSC)		0.037 (BSC)	
e1	1.800	2.000	0.071	0.079
L	0.300	0.600	0.012	0.024
θ	0°	8°	0°	8°

IMPORTANT NOTICE

RIGHT TO MAKE CHANGES

On-Bright Electronics Corp. reserves the right to make corrections, modifications, enhancements, improvements and other changes to its products and services at any time and to discontinue any product or service without notice. Customers should obtain the latest relevant information before placing orders and should verify that such information is current and complete.

WARRANTY INFORMATION

On-Bright Electronics Corp. warrants performance of its hardware products to the specifications applicable at the time of sale in accordance with its standard warranty. Testing and other quality control techniques are used to the extent it deems necessary to support this warranty. Except where mandated by government requirements, testing of all parameters of each product is not necessarily performed.

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