



東莞廣隆電子有限公司.

APPROVAL SHEET

適用機種(APPLICATION) : @3A-301 機種
供應廠商(SUPPLIER) : LITEON
零件品名(PART NAME) : OB2262AP DIP-8 ON-BRIGHT 低鉛
日期 DATE : 2006.05.04

附註(NOTE) :

1. _____
2. _____
3. _____
4. _____

材料編(MATERIALSNUMBER)	@I10-0B2262-000
圖號(NUMBER)	
圖面編號(NUMBER)	AK 266

APPROVED	CHECKED	SAFETY ENGINEER
	黃宇濤	

RD/EE ENGINEER	CAML ENGINEER	PREPARED
黃宇濤 2006.5.4	黃宇濤 2006.5.4	黃宇濤

正式承認章
暫時限量承認章

材料承認申請單

申請單號: 0604146

<input checked="" type="checkbox"/> 新使用材料		<input type="checkbox"/> 舊材料設變		<input type="checkbox"/> 舊材料尋新供應商		申請日期	06.4.20
機種	@3A-301DA08-023	製造商	LITEON		代理商	敦南	
材料名稱	IC	品名規格	OB2262MP		樣品數	10 pcs	
天心料號		需求期限	06.4.22				
品管確認環境負荷包物是否 OK <input checked="" type="checkbox"/> NG <input type="checkbox"/>							
說明: 新材料承認							
申請人: ^曹 曹ob.4/2 品管確認: ^王 王ob.4/2 工程部簽收: ^陳 陳ob.4/2							
材料測試報告: 06.4.21							
測試項目	規格要求	測試值			結果		
測試說明: 裝機press		判定					
測試人員: ^林 林ob.4/2		<input checked="" type="checkbox"/> 允收	<input type="checkbox"/> 試用	<input type="checkbox"/> 拒收			
新增料號申請 0604-5							
名稱		主單位				大類	
品名規格							
料號 @ 10-0B3702-000							
料號編寫人: ^林 林ob.4/2				申請人: ^曹 曹ob.4/2			
審核: ^林 林ob.4/2	備註: 06.5/10						
核准: ^曹 曹ob.4/2							

GENERAL DESCRIPTION

OB2262 is a highly integrated current mode PWM control IC optimized for high performance, low standby power and cost effective offline flyback converter applications in sub 30W range.

PWM switching frequency at normal operation is externally programmable and 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.

VDD low startup current and low operating current contribute to a reliable power on startup design with OB2262. A large value resistor could thus be used in the startup circuit to minimize the standby power.

The internal slope compensation improves system large signal stability and reduces the possible sub-harmonic oscillation at high PWM duty cycle output. Leading-edge blanking on current sense (CS) input removes the signal glitch due to snubber circuit diode reverse recovery and thus greatly reduces the external component count and system cost in the design.

OB2262 offers complete protection coverage with automatic self-recovery feature including Cycle-by-Cycle current limiting (OCP), over load protection (OLP), VDD over voltage clamp and under voltage lockout (UVLO). The Gate-drive output is clamped to maximum 18V to protect the power MOSFET.

Excellent EMI performance is achieved soft switching control at the totem pole gate drive output.

The tone energy at below 20KHZ is minimized in the design and audio noise is eliminated during operation. OB2262 is offered in SOT23-6, SOP-8 and DIP-8 packages.

FEATURES

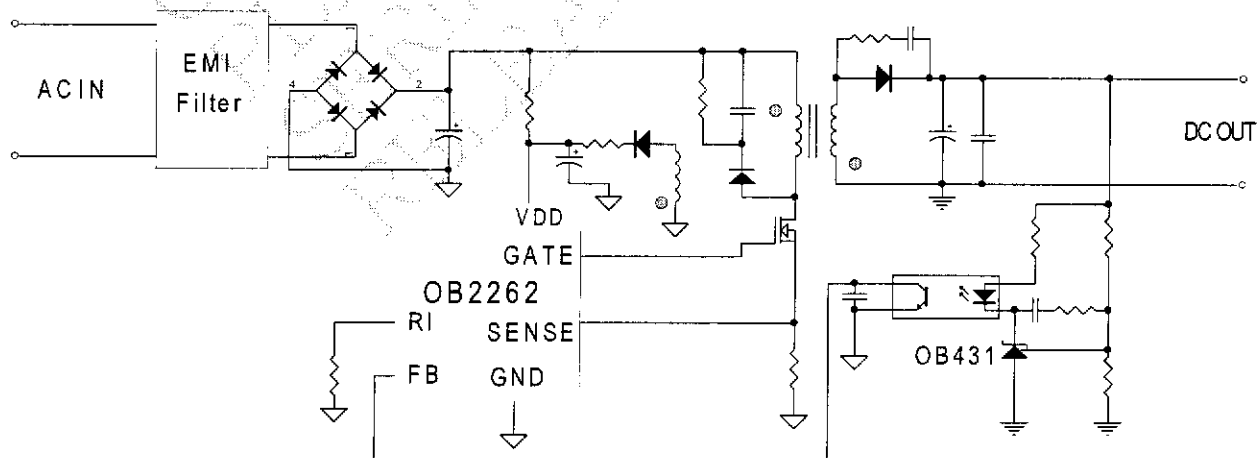
- Extended Burst Mode Control For Improved Efficiency and Minimum Standby Power Design
- Audio Noise Free Operation
- External Programmable PWM Switching Frequency
- Internal Synchronized Slope Compensation
- Low VDD Startup Current and Low Operating Current (1.4mA)
- Leading Edge Blanking on Current Sense Input
- Good Protection Coverage With Auto Self-Recovery
 - VDD Over Voltage Clamp and Under Voltage Lockout with Hysteresis (UVLO)
 - Gate Output Maximum Voltage Clamp (18V)
 - On-Bright Proprietary Line Input Compensated Cycle-by-Cycle Over-current Threshold Setting For Constant Output Power Limiting Over Universal Input Voltage Range.
 - Overload Protection (OLP).

APPLICATIONS

Offline AC/DC flyback converter for

- Battery Charger
- Power Adaptor
- Set-Top Box Power Supplies
- Open-frame SMPS

TYPICAL APPLICATION

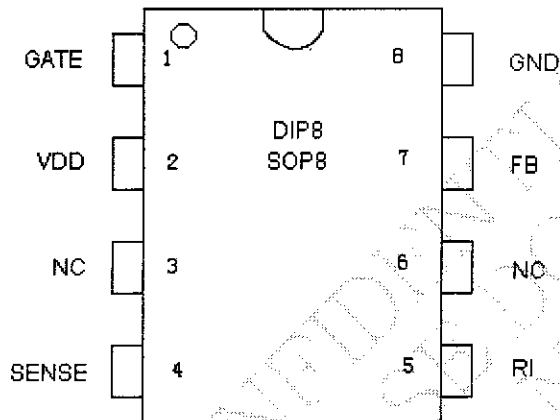
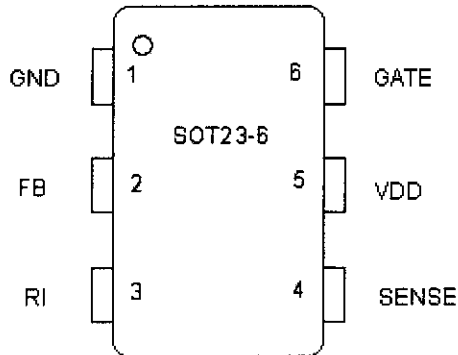


Current Mode PWM Controller

GENERAL INFORMATION

Pin Configuration

The OB2262 is offered in SOT23-6, DIP8 and SOP8 packages, shown as below.



Part Number	Description
OB2262MP	SOT23-6, Pb-free
OB2262AP	DIP8, Pb-free
OB2262CP	SOP8, Pb-free

Package Dissipation Rating

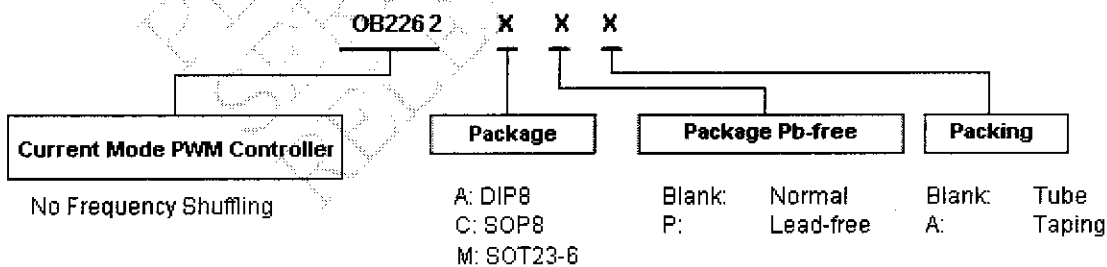
Package	R θ JA (°C/W)
DIP8	90
SOP8	150
SOT23-6	200

Absolute Maximum Ratings

Parameter	Value
VDD DC Supply Voltage	30 V
VDD Clamp Voltage	34V
VDD DC Clamp Current	10 mA
V _{FB} Input Voltage	-0.3 to 7V
V _{SENSE} Input Voltage to Sense Pin	-0.3 to 7V
V _{RI} Input Voltage to RI Pin	-0.3 to 7V
Min/Max Operating Junction Temperature T _J	-20 to 150 °C
Min/Max Storage Temperature T _{stg}	-55 to 160 °C

Note: 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.

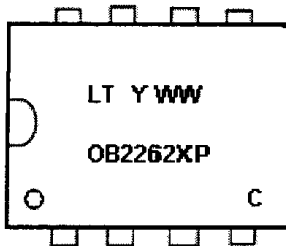
Ordering Information



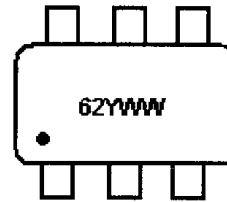
Current Mode PWM Controller

Marking Information

DIP8
SOP8



SOT23-6



X: A for DIP 8
C for SOP 8
P: Pb-free Package
Y: Year Code(0-9)
WW: Week Code(1-52)
C: Optional Internal Code

Y: Year Code(0-9)
WW: Week Code(1-52)

TERMINAL ASSIGNMENTS

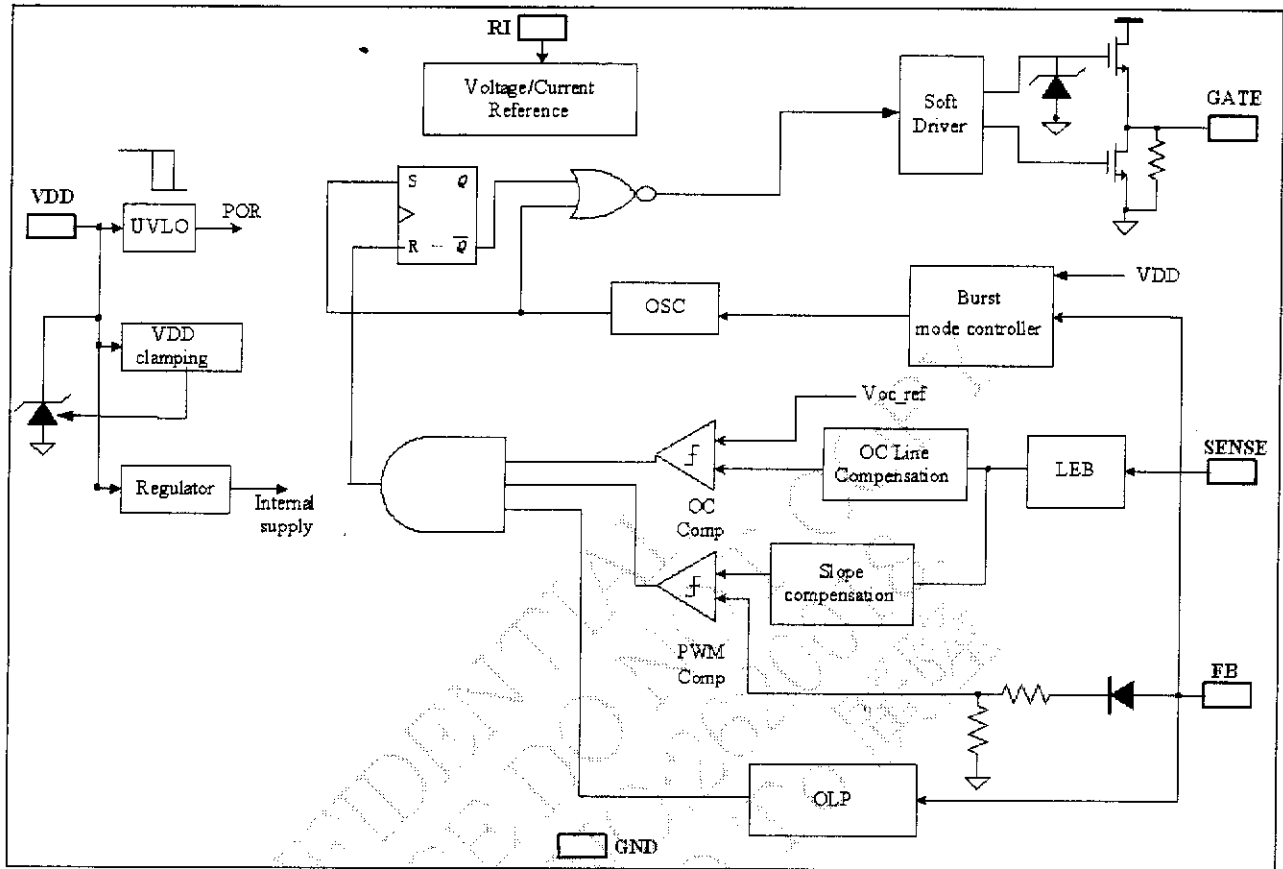
Pin Name	I/O	Description
GND	P	Ground
FB	I	Feedback input pin. The PWM duty cycle is determined by voltage level into this pin and the current-sense signal at Pin 6.
RI	I	Internal Oscillator frequency setting pin. A resistor connected between RI and GND sets the PWM frequency.
SENSE	I	Current sense input pin. Connected to MOSFET current sensing resistor node.
VDD	P	Chip DC power supply pin.
GATE	O	Totem-pole gate drive output for the power MOSFET.

RECOMMENDED OPERATING CONDITION

Symbol	Parameter	Min Max	Unit
VDD	VDD Supply Voltage	10 to 30	V
RI	RI Resistor Value	100	Kohm
T _A	Operating Ambient Temperature	-20 to 85	°C

Current Mode PWM Controller

BLOCK DIAGRAM



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Current Mode PWM Controller
ESD INFORMATION

Symbol	Parameter	Test Conditions	Min	Typ	Max	Unit
HBM	Human Body Model	MIL-STD		3		KV
MM	Machine Model	JEDEC-STD		150		V

ELECTRICAL CHARACTERISTICS

 (T_A = 25°C if not otherwise noted)

Symbol	Parameter	Test Conditions	Min	Typ	Max	Unit
Supply Voltage (VDD)						
I _{VDD_Stup}	VDD Start up Current	VDD=12.5V, RI=100K Measure Leakage current into VDD		3	20	uA
I _{VDD_Ops}	Operation Current	VDD=16V, RI=100Kohm, V _{FB} =3V		1.4		mA
UVLO(ON)	VDD Under Voltage Lockout Enter		7.8	8.8	9.8	V
UVLO(OFF)	VDD Under Voltage Lockout Exit (Recovery)		13	14	15	V
VDD_Clamp	VDD Zener Clamp Voltage	I _{VDD} = 10 mA		34		V
Feedback Input Section (FB Pin)						
A _{VCS}	PWM Input Gain	$\Delta V_{FB} / \Delta V_{cs}$		2.0		V/V
V _{FB_Open}	V _{FB} Open Loop Voltage			4.8		V
I _{FB_Short}	FB pin short circuit current	Short FB pin to GND and measure current		0.8		mA
V _{TH_0D}	Zero Duty Cycle FB Threshold Voltage	VDD = 16V, RI=100Kohm			0.75	V
V _{TH_PL}	Power Limiting FB Threshold Voltage			3.7		V
T _{D_PL}	Power limiting Debounce Time			35		mSec
Z _{FB_IN}	Input Impedance			6		Kohm
DC_MAX	Maximum Duty Cycle	VDD=18V, RI=100Kohm, FB=3V, CS=0		75		%
Current Sense Input (Sense Pin)						
T _{blanking}	Leading edge blanking time	RI = 100 Kohm		300		ns
Z _{SENSE_IN}	Input Impedance			40		Kohm
T _{D_OC}	Over Current Detection and Control Delay	VDD = 16V, CS>V _{TH_OC} , FB=3.3V		75		nSec
V _{TH_OC}	Over-Current Threshold Voltage or Equivalent maximum input voltage at SENSE	FB=3.3V, RI=100 Kohm	0.70	0.75	0.80	V
Oscillator						
F _{osc}	Normal Oscillation Frequency	RI = 100 Kohm	60	65	70	KHZ
Δf_Temp	Frequency Temperature Stability	VDD = 16V, RI=100Kohm, T _A -20°C		5		%

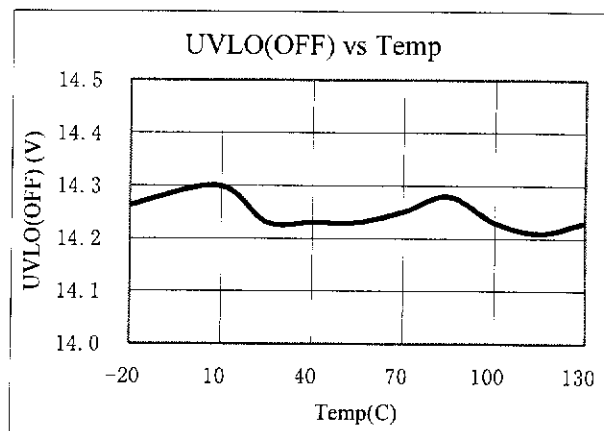
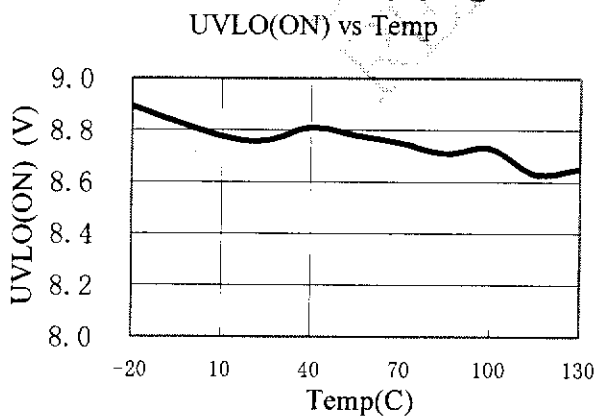
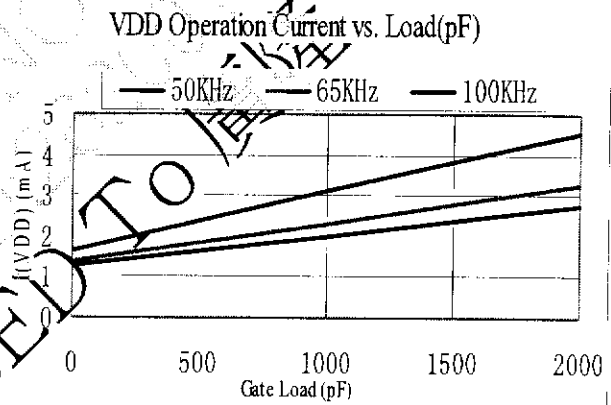
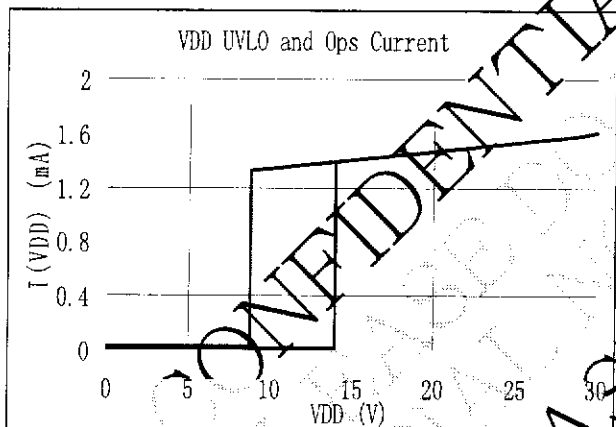
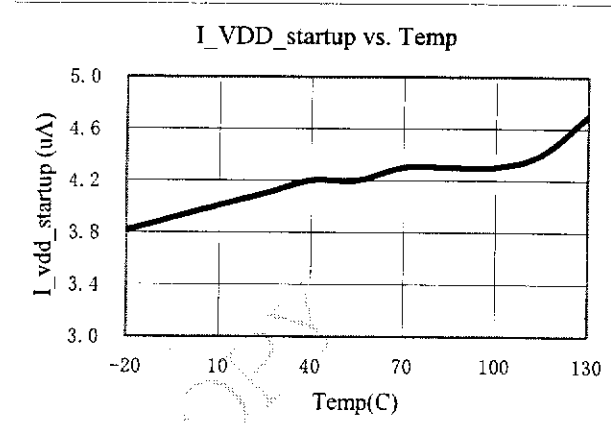
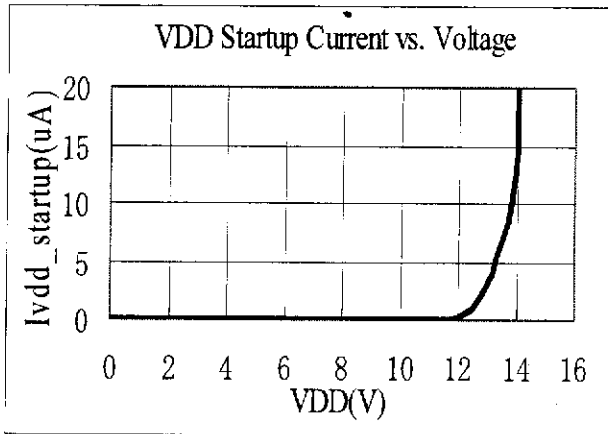
Current Mode PWM Controller

		to 100 °C				
Δf_{VDD}	Frequency Voltage Stability	VDD = 12-25V, RI=100Kohm		5		%
RI range	Operating RI Range		50	100	150	Kohm
V _{RI open}	RI open load voltage			2		V
F _{osc_BM}	Burst Mode*Base Frequency	VDD = 16V, RI = 100Kohm		22		KHZ
Gate Drive Output						
VOL	Output Low Level	VDD = 16V, I _o = -20 mA			0.8	V
VOH	Output High Level	VDD = 16V, I _o = 20 mA	10			V
V _{Clamp}	Output Clamp Voltage Level			18		V
T _r	Output Rising Time	VDD = 16V, CL = 1nf		220		nSec
T _f	Output Falling Time	VDD = 16V, CL = 1nf		70		nSec

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CHARACTERIZATION PLOTS

VDD = 16V, RI = 100 Kohm, TA = 25°C condition applies if not otherwise noted.



Current Mode PWM Controller**OPERATION DESCRIPTION**

The OB2262 is a highly integrated PWM controller IC optimized for offline flyback converter applications in sub 30W power range. The extended burst mode control greatly reduces the standby power consumption and helps the design easily meet the international power conservation requirements.

• Startup Current and Start up Control

Startup current of OB2262 is designed to be very low so that VDD could be charged up above UVLO threshold level and device starts up quickly. A large value startup resistor can therefore be used to minimize the power loss yet provides reliable startup in application. For AC/DC adaptor with universal input range design, a 2 M Ω , 1/8 W startup resistor could be used together with a VDD capacitor to provide a fast startup and low power dissipation solution.

• Operating Current

The Operating current of OB2262 is low at 1.4mA. Good efficiency is achieved with OB2262 low operating current together with extended burst mode control features.

• Extended Burst Mode Operation

At zero load or light load condition, majority of the power dissipation in a switching mode power supply is from switching loss on the MOSFET transistor, the core loss of the transformer and the loss on the snubber circuit. The magnitude of power loss is in proportion to the number of switching events within a fixed period of time. Reducing switching events leads to the reduction on the power loss and thus conserves the energy. OB2262 self adjusts the switching mode according to the loading condition. At from no load to light/medium load condition, the FB input drops below burst mode threshold level. Device enters Burst Mode control. The Gate drive output switches only when VDD voltage drops below a preset level and FB input is active to output an on state. Otherwise the gate drive remains at off state to minimize the switching loss and reduces the standby power consumption to the greatest extend. The frequency control also eliminates the audio noise at any loading conditions.

• Oscillator Operation

A resistor connected between RI and GND sets the constant current source to charge/discharge the internal cap and thus the PWM oscillator frequency

is determined. The relationship between RI and switching frequency follows the below equation within the specified RI in Kohm range at nominal loading operational condition.

$$F_{osc} = \frac{6500}{RI(Kohm)} (Khz)$$

• Current Sensing and Leading Edge Blanking

Cycle-by-Cycle current limiting is offered in OB2262 current mode PWM control. The switch current is detected by a sense resistor into the sense pin. An internal leading edge blanking circuit chops off the sense voltage spike at initial MOSFET on state due to Snubber diode reverse recovery so that the external RC filtering on sense input is no longer required. The current limit comparator is disabled and thus cannot turn off the external MOSFET during the blanking period. PWM duty cycle is determined by the current sense input voltage and the FB input voltage.

• Internal Synchronized Slope Compensation

Built-in slope compensation circuit adds voltage ramp onto the current sense input voltage for PWM generation. This greatly improves the close loop stability at CCM and prevents the sub-harmonic oscillation and thus reduces the output ripple voltage.

• Gate Drive

OB2262 Gate is connected to an external MOSFET gate for power switch control. Too weak the gate drive strength results in higher conduction and switch loss of MOSFET while too strong gate drive output compromises the EMI.

A good tradeoff is achieved through the built-in totem pole gate design with right output strength and dead time control. The low idle loss and good EMI system design is easier to achieve with this dedicated control scheme. An internal 18V clamp is added for MOSFET gate protection at higher than expected VDD input.

• Protection Controls

Good power supply system reliability is achieved with its rich protection features including Cycle-by-Cycle current limiting (OCP), Over Load Protection (OLP) and over voltage clamp, Under Voltage Lockout on VDD (UVLO).

With On-Bright Proprietary technology, the OCP threshold tracks PWM Duty cycles and is line voltage compensated to achieve constant output

Current Mode PWM Controller

power limit over the universal input voltage range with recommended reference design.

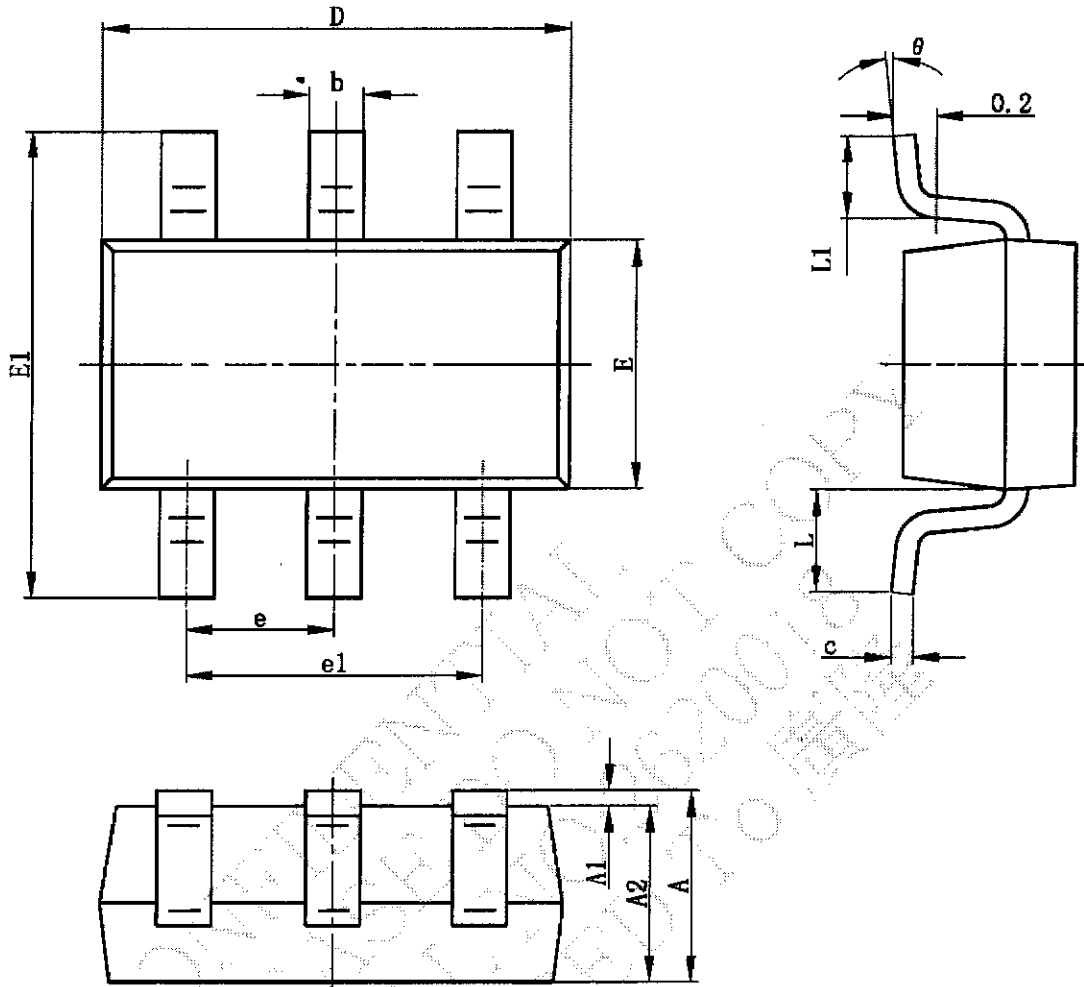
At overload condition when FB input voltage exceeds power limit threshold value for more than TD_PL, control circuit reacts to shut down the output power MOSFET. Device restarts when VDD voltage drops below UVLO limit.

VDD is supplied by transformer auxiliary winding output. It is clamped when VDD is higher than threshold value. The power MOSFET is shut down when VDD drops below UVLO limit and device enters power on start-up sequence thereafter.

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PACKAGE MECHANICAL DATA

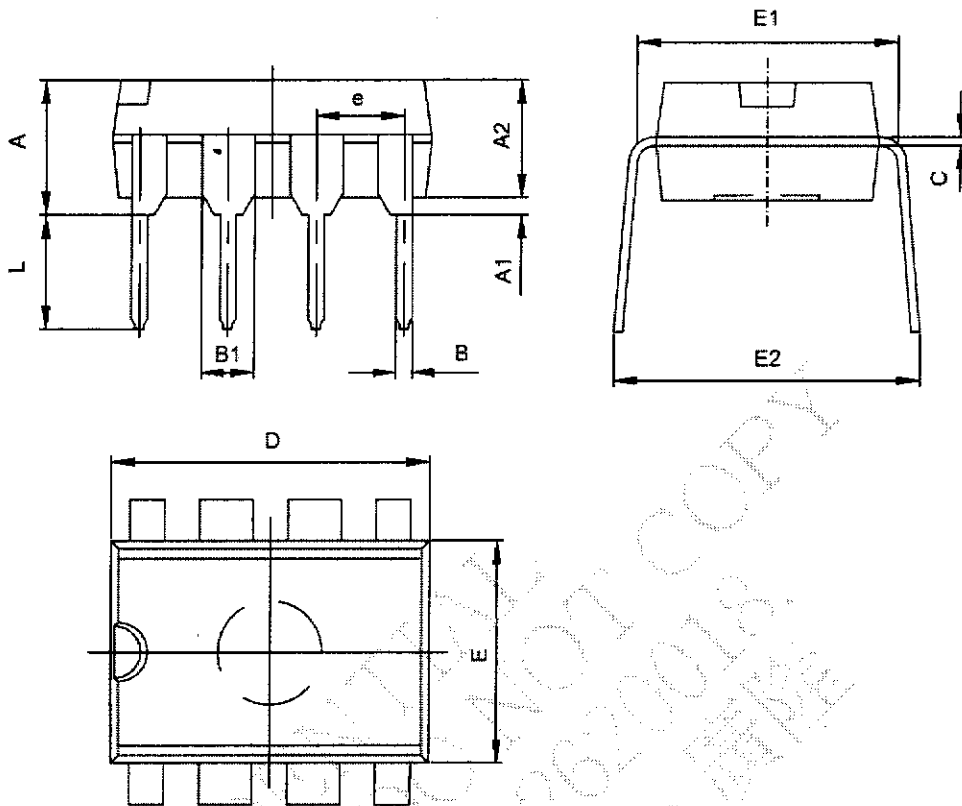
SOT23-6



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.050	1.250	0.041	0.049
A1	0.000	0.100	0.000	0.004
A2	1.050	1.150	0.041	0.045
b	0.300	0.400	0.012	0.016
c	0.100	0.200	0.004	0.008
D	2.820	3.020	0.111	0.119
E	1.500	1.700	0.059	0.067
E1	2.650	2.950	0.104	0.116
e	0.950TYP		0.037TYP	
e1	1.800	2.000	0.071	0.079
L	0.700REF		0.028REF	
L1	0.300	0.600	0.012	0.024
θ	0°	8°	0°	8°

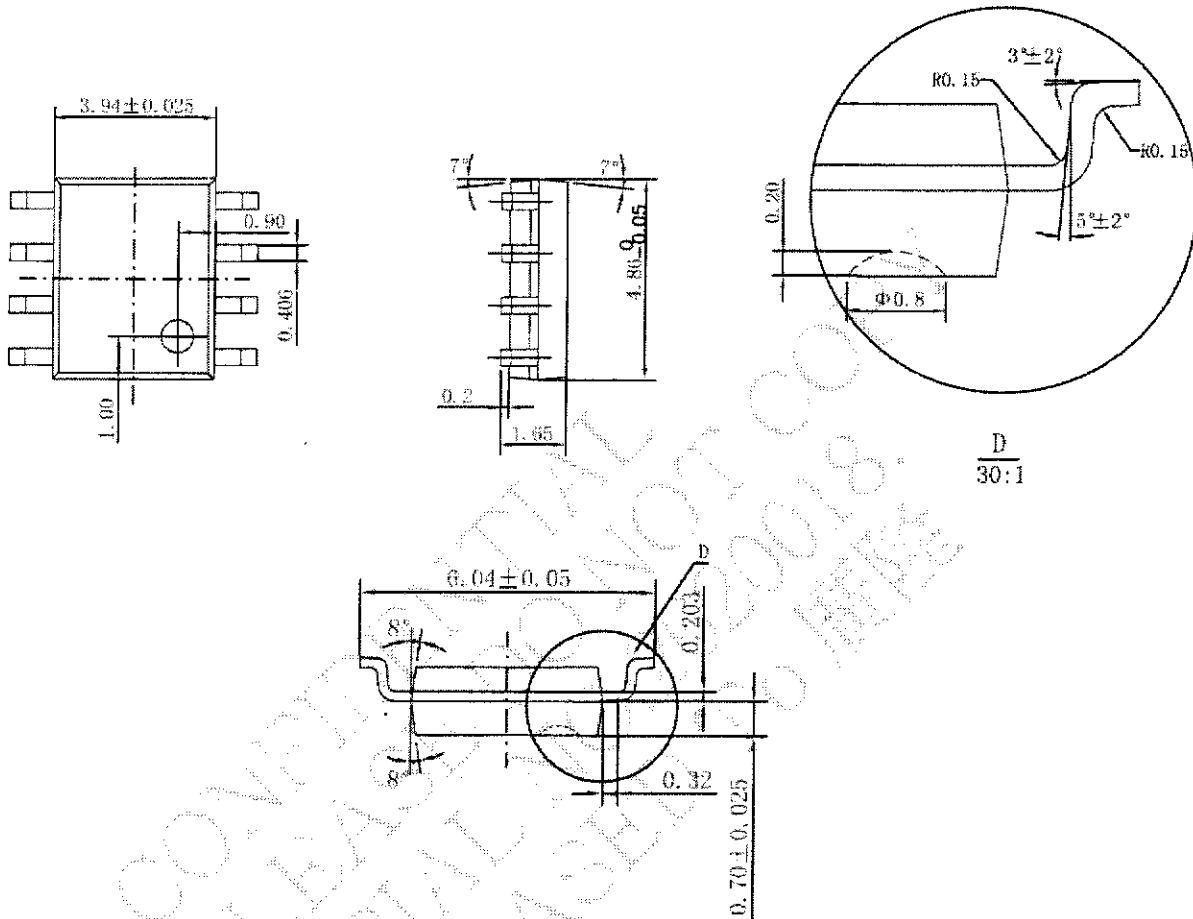
Current Mode PWM Controller

8-Pin Plastic DIP



Symbol	Dimensions in Millimeters		Dimensions in Inches	
	Min	Max	Min	Max
A	3.710	4.310	0.146	0.170
A1	0.510		0.020	
A2	3.200	3.600	0.126	0.142
B	0.360	0.560	0.014	0.022
B1	1.524(TYP)		0.060(TYP)	
C	0.204	0.360	0.008	0.014
D	9.000	9.400	0.354	0.370
E	6.200	6.600	0.244	0.260
E1	7.620(TYP)		0.300(TYP)	
e	2.540(TYP)		0.100(TYP)	
L	3.000	3.600	0.118	0.142
E2	8.200	9.400	0.323	0.370

8-Pin Plastic SOP



IMPORTANT NOTICE

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