BM SEMI

BM0853

Green-Mode PWM Controller

DESCRIPTION

The BM0853 is a low cost , low startup current , current mode PWM controller with green-mode power-saving operation. The integrated functions include the leading-edge blanking of the current sensing, internal slope compensation. It would provide the users a superior DC/DC power application of higher efficiency, low external component counts, and lower cost solution for applications.

The BM0853 features more protections or functions for the following characteristics :

※Add OLP (Over Load Protection) function to provide better protection performance for fault conditions like short circuit or over load.

※Modify the OVP (Over Voltage Protection) mechanism from the cycle-by-cycle mode to the hiccup mode.

BM0853 is available by SOT-23-6L and DFN8L packages.

APPLICATIONS

- DC/DC Switching Power Adaptor
- Battery Charger
- PC 5V Standby Power.
- Open-Frame Switching Power Supply

BM0853A-升压控制器（非隔离）

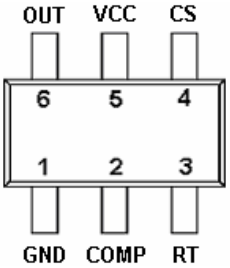
BM0853 S-降压控制器（隔　离）

FEATURES

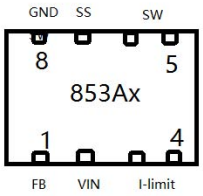
- High-Voltage BiCMOS Process
- Very Low Startup Current (<20μA)
- Under Voltage Lockout (UVLO)
- Current Mode Control
- Non-audible-noise Green Mode Control
- Current Limiting
- LEB (Leading-Edge Blanking) on CS Pin
- OLP (Over Load Protection)
- OVP (Over Voltage Protection) on Vcc Pin
- Leading-Edge Blanking
- Programmable Switching Frequency
- Internal Slope Compensation
- Green-Mode Control for Power Saving
- 300mA Driving Capability
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PIN CONFIGURATION

SOT-23-6L



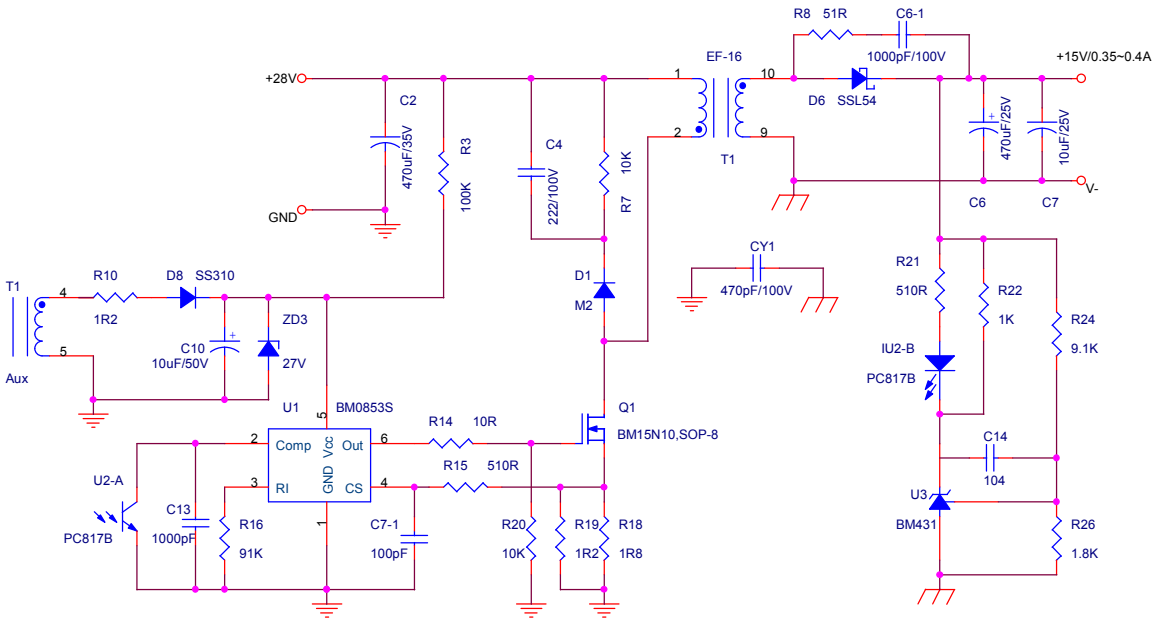
DFN8



型号PART NO	Function	Efficiency	INPUT	Describe	Replace
BM0853S	降压控制器	85%-max	12-100V输入	隔离的	昂宝
BM0853A	升压控制器	93%效率特高	+2.8V-28V输入	非隔离	XL6008、6009
型号PART NO	Package	OUTPUT 功率	OUTPUT Voltage	Describe	Support
BM0853S	SOT23-6	10W-max	12V或15V输出	隔离的	有隔离变压器设计样品
BM0853A	DFN8 3*3	50W-max	9V-80V输出	非隔离	有DEMO，大电流大功率输出

BM0853
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Typical Application



1.以上为BM0853S隔离降压的原理图,对应的板为BM600与BM700.

2.BM0853A的原理图,因为是非隔离电路,不需要变压器与431与光耦等,所以简单很多,对应的板为BM800.

Title	BM0853S_DC28V to 15V-0.5A Schematics		
Size	Document Number		Rev
	Custom<Doc>		BBM
Date:	Thursday, September 08, 2016	Sheet 1 of 1	

BM0853
Green-Mode PWM Controller

ORDERING INFORMATION

Part Number	Package	Part Marking
BM0853S	SOT-23-6L	0853S
BM0853A	DFN8 (3*3)	853Ax

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ABSOULTE MAXIMUM RATINGS (T_A=25℃, unless otherwise specified.)

The following ratings designate persistent limits beyond which damage to the device may occur.

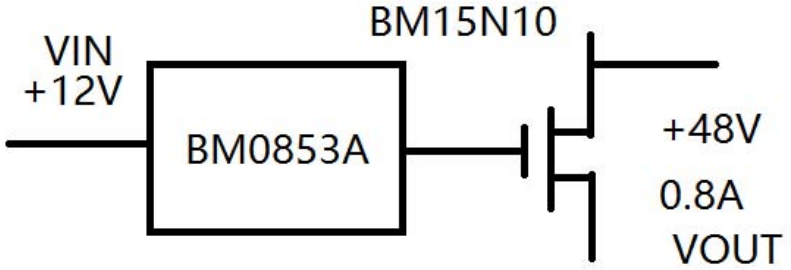
Symbol	Parameter		Value	Unit
V_{CC}	DC Supply Voltage		36	V
$V_{COMP\,/\,RT\,/\,CS}$	COMP / RT / CS Voltage		-0.3 ~ 7.0	V
P_D	Power Dissipation @ T_A=85℃ (*)		0.3	W
ESD	Human Body Model		4	KV
	Machine Model		300	V
T_{ope}	Operating Ambient Temperature		-40 ~ 85	℃
T_J	Operating Junction Temperature Range		-40 ~ 150	℃
T_{STG}	Storage Temperature Range		-40 ~ 150	℃
T_{LEAD}	Pb-Free Lead Soldering Temperature for 5 sec.		260	℃
$R_{\Theta JC}$	Thermal Resistance Junction – Case (*)	SOT-23-6L	210	℃/W

(*) The power dissipation and thermal resistance are evaluated under copper board mounted with free air conditions.

型号PART NO	PIN1	PIN2	PIN3	PIN4	PIN5, PIN6	PIN7	PIN8	DFN8, 3*3
BM0853A	FB	VIN	I-limit1	I-limit2	SW	SS	GND	bottom metal
BM0853A	1.25V基准	输入	限流点1	限流点2	SW输出驱动MOS	软启动	地	底部金属焊盘接地

输出电压Vout = 1.25*(1+R2/R3), R3 = 1K ~ 4.7k

Input peak current limit 输入峰值限流点 I = 0.3/R1



BM0853
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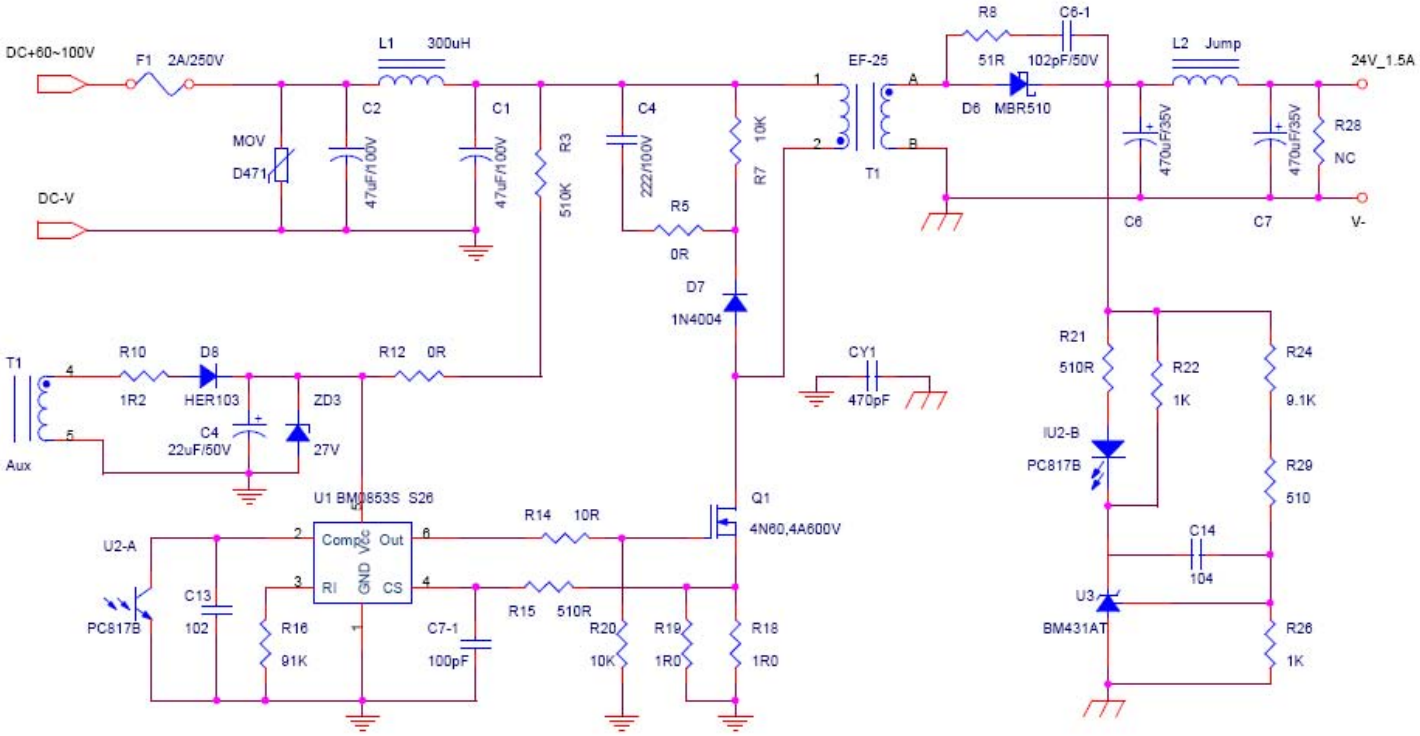
ELECTRICAL CHARACTERISTICS
(T_A=25℃, V_{CC}=15V, unless otherwise specified.)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
Supply Voltage (Vcc Pin)						
Istt	Startup Current			10	20	uA
Iop	Operating Current	VCOMP = 0V		2.7	4	mA
		VCOMP = 3V		2.4		mA
		Protection tripped (OLP, OVP)		1.0		mA
UVLO (off)	Min. Operating Voltage		9.0	10.0	11.0	V
UVLO (on)	Start Threshold Voltage		15.0	16.0	17.0	V
OVP Level	Over Voltage Protection		24	26	29.5	V
Voltage Feedback (Comp Pin)						
Isc	Short Circuit Current			1.25	2.2	mA
Vop	Open Loop Voltage			6		V
VTH(GM)	Green Mode Threshold VCOMP			2.35		V
Oscillator (RT Pin)						
FOSC	Frequency	RT=100KΩ	60.0	68.0	75.0	KHz
FOSC(GM)	Green Mode Frequency	Fs=65.0KHz		22		KHz
Fdt	Frequency Variation versus Temp. Deviation	(-40°C ~105°C)			3	%
Fdv	Frequency Variation versus VCC Deviation	(VCC=11V-25V)			1	%
Current Sensing (CS Pin)						
Vcs(off)	Maximum Input Voltage		0.8	0.85	0.9	V
TLEDD	Leading Edge Blanking Time			280		nS
Zcs	Input impedance		1			MΩ
TPD	Delay to Output			100		nS
Gate Driver Output (OUT Pin)						
DC (Max)	Maximum Duty Cycle		70	75	80	%
DC (Min)	Minimum Duty Cycle			0		%
VOL	Output Low Level	VCC=15V, Io=20mA			1	V
VOH	Output High Level	VCC=15V, Io=20mA	8			V
Tr	Rising Time	Load Cap=1000pF		50	200	nS
Tf	Falling Time	Load Cap=1000pF		30	120	nS
OLP (Over Load Protection)						
TLOLP	OLP Trip Level			5.0		V
TDOLP	OLP Delay Time (note)			60		mS

Note: The OLP delay time is proportional to the period of switching cycle. So that, the lower RT value will set the higher switching frequency and the shorter OLP delay time.

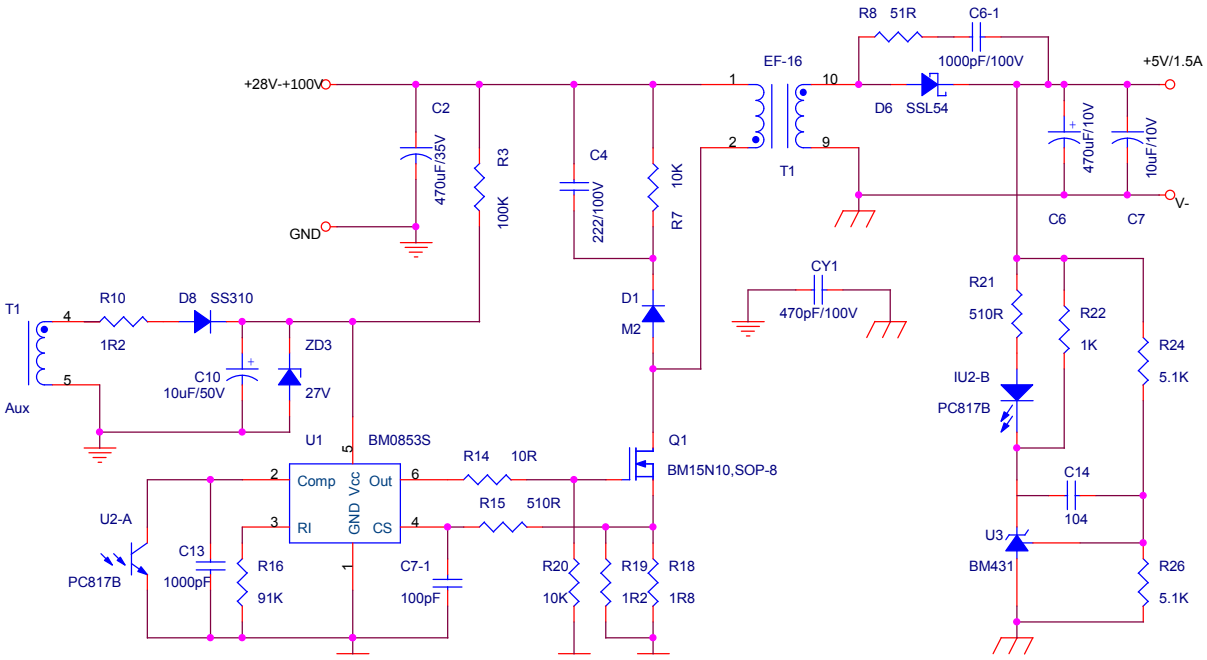
BM0853
Green-Mode PWM Controller

BM0853S TYPICAL APPLICATION



BM0853
Green-Mode PWM Controller

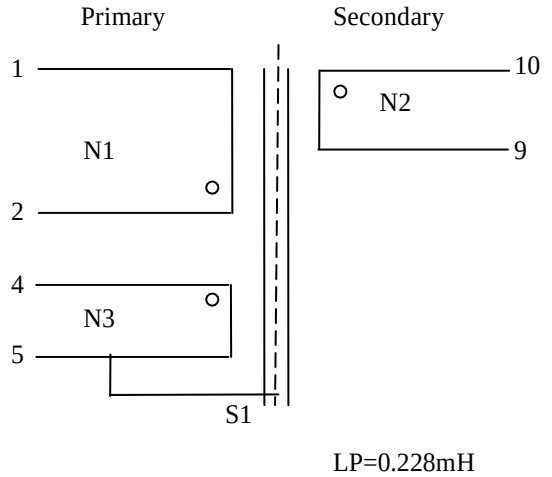
BM0853S Schematics



BM0853
Green-Mode PWM Controller

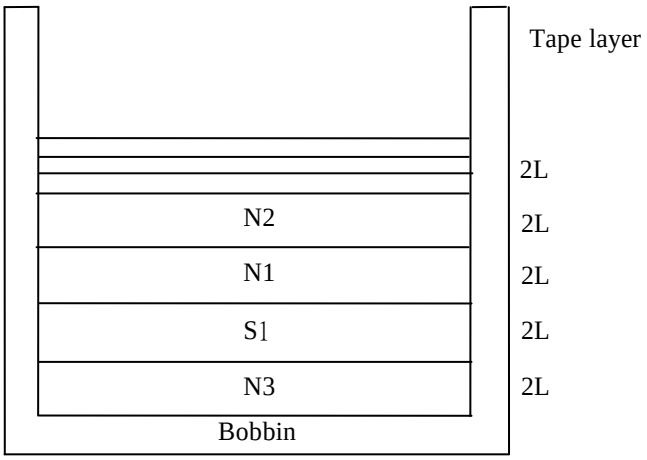
+5V-2A输出开关变压器参数

SCHEMATIC: (线路图)



LP=0.228mH

WINDING: (剖面图)



WINDING TABLE:

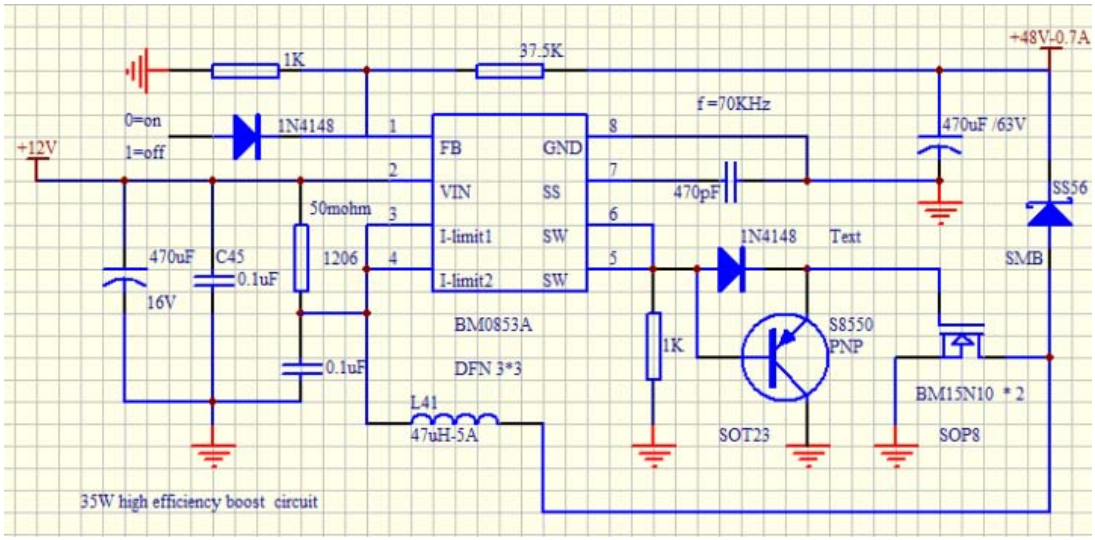
Winding No	Margin Tape	PIN	Wire &Wire Copper	Turns	Winding Tape	Tape Layer	Tube
N 3	0	4 ~ 5	0.19Φ*1P	28 Ts	中间密绕	2 L	
S 1	0	5 ~ X	0.05x 9.6mm	1.1Ts	背胶	2 L	
N 1	0	2 ~ 1	0.19Φ*1P	41 Ts	密绕	2 L	
N 2	0	10 ~ 9	0.6 § x 1P	9 Ts	密绕	2 L	

NOTE: 1. N2 为三层绝缘线。
2. S1 为内铜，头尾须绝缘相叠。
3. BOBBIN 为 EE-16，10pin CORE 请用PC40或同等级材质。
4. Pin 1~2初级测感量 :0.228mH±15%
5. 变压器请含浸。
6. 漏感量 Leakage inductance at 1KHz, 0.25Vrms (short Pin 4,5 ,10,9)
LK: (1-2) 80uH (max)
7. HI- POT =(60Hz/5mA/2 SET)

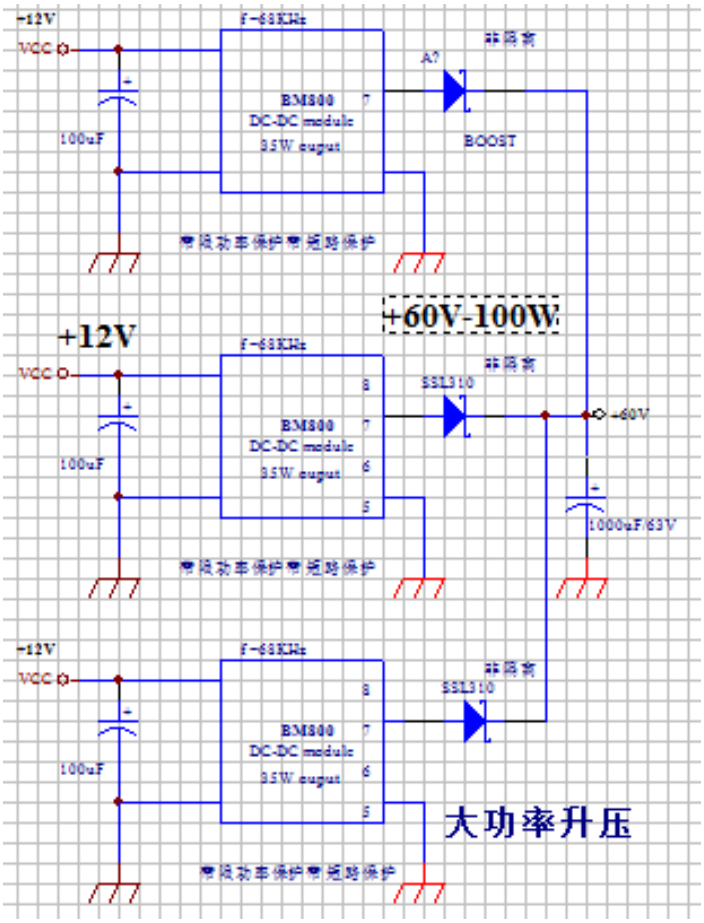
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BM0853A TYPICAL APPLICATION

如果低压输入，如3V转12V， 请选用低压MOS，如9926，效率更高。

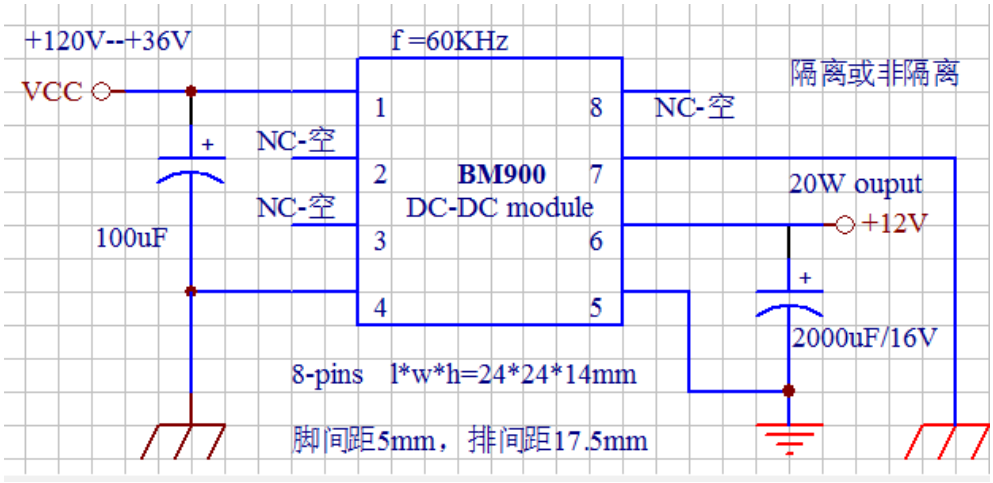


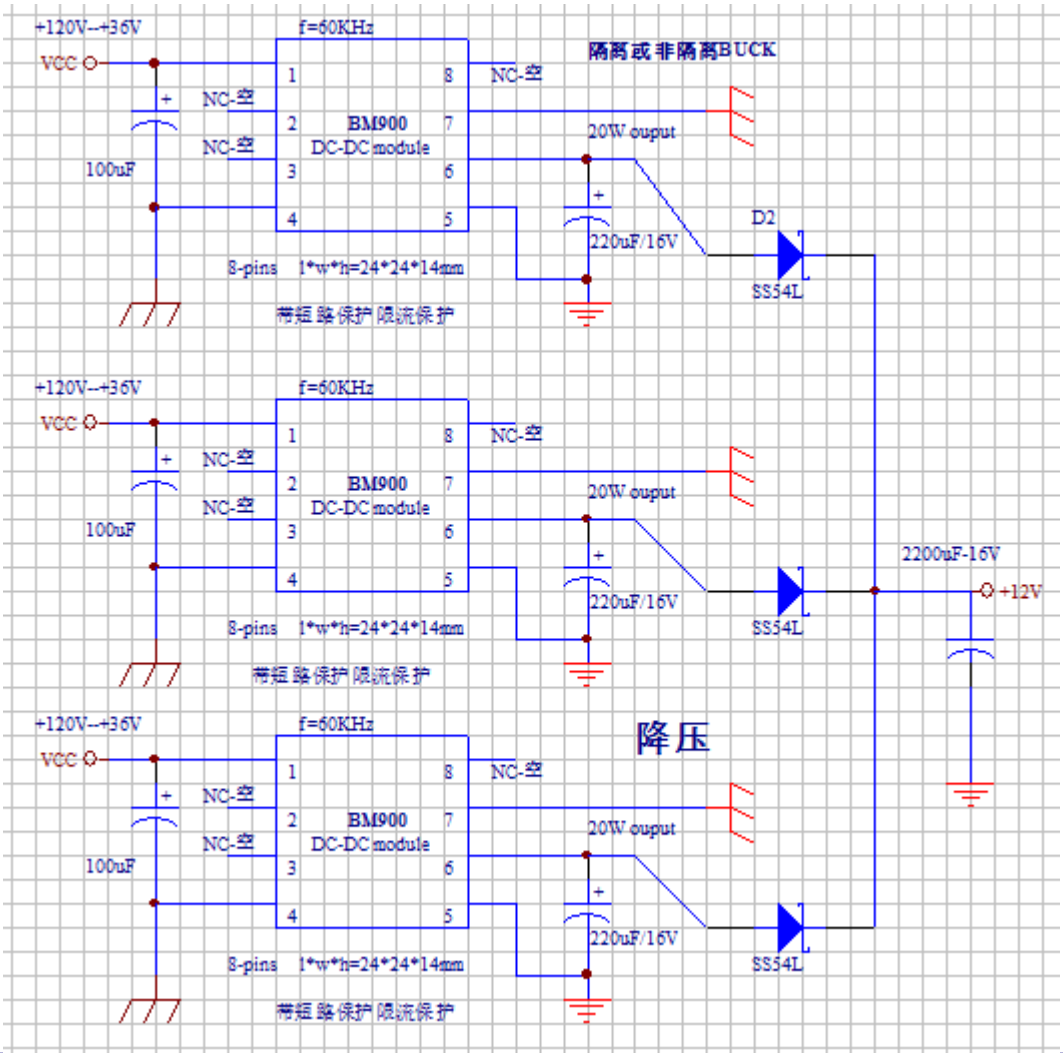
BM853A+2*BM15N10组成一个35W的升压单元（名称BM800）， 三个单元并联实现100W输出



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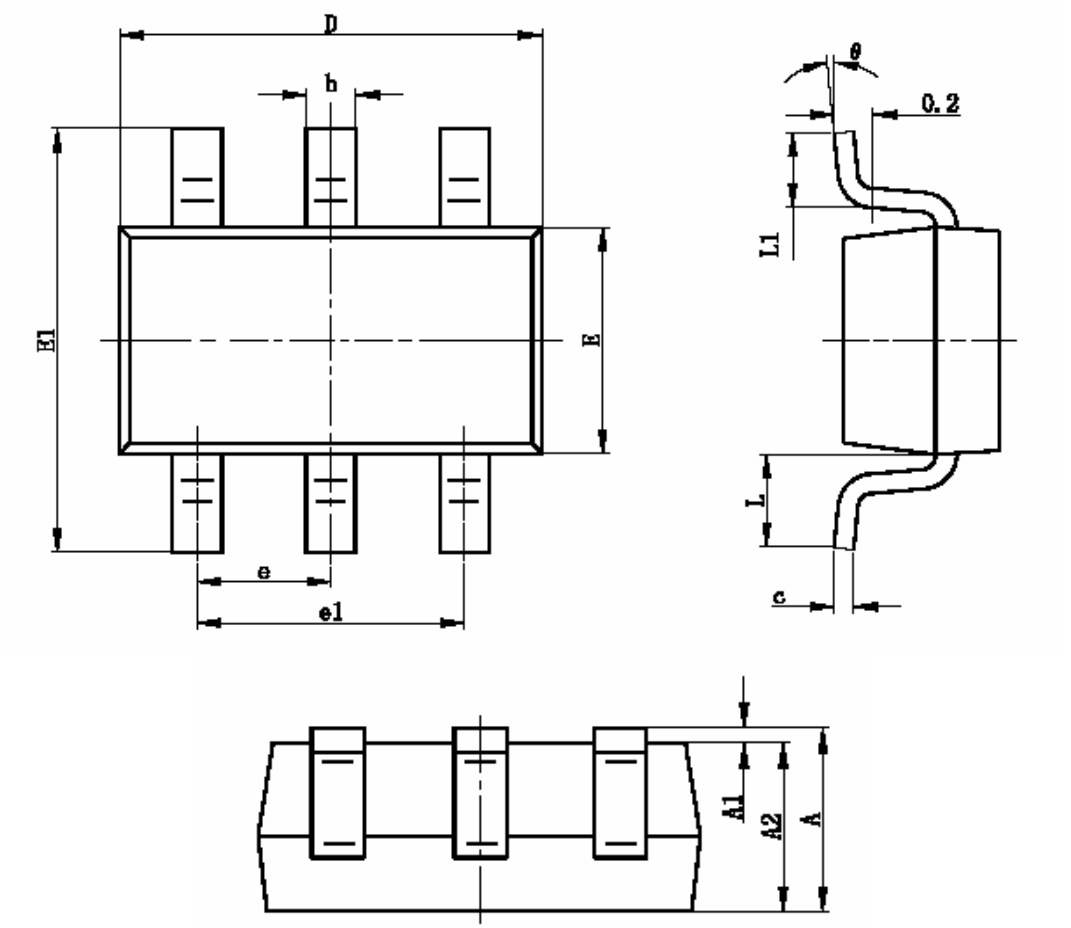
为了减轻客户设计负担与时间， BM设计了一个模块，名称BM900：
集成了MOS，BM0853S与电感，阻容。 可以实现非隔离， 实现120V转12V输出20W输出。
GND1与GND2在外面连起来就是非隔离，不连就是隔离。多个模组并联可以组成大功率50W。





BM0853
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SOT-23-6L PACKAGE OUTLINE

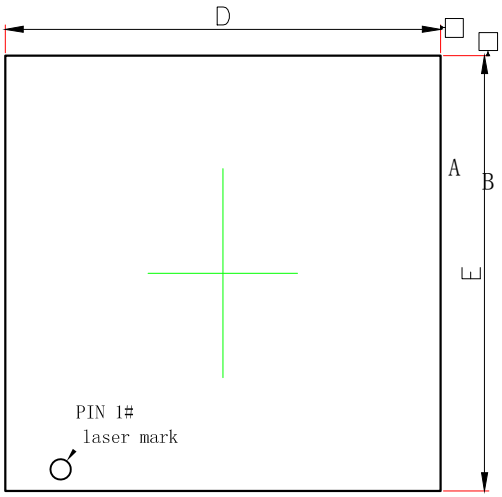


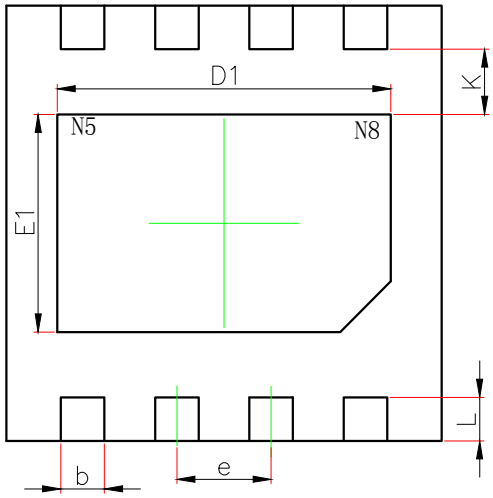
Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.050	1.250	0.041	0.049
A1	0.000	0.100	0.000	0.004
A2	1.050	1.150	0.041	0.045
b	0.300	0.400	0.012	0.016
c	0.100	0.200	0.004	0.008
D	2.820	3.020	0.111	0.119
E	1.500	1.700	0.059	0.067
E1	2.650	2.950	0.104	0.116
e	0.950TYP		0.037TYP	
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°

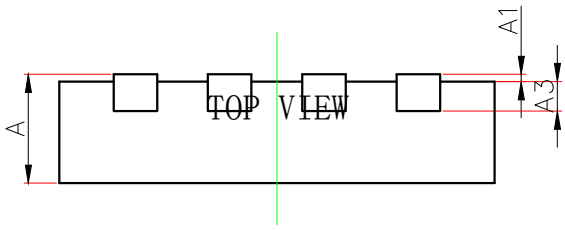
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Green-Mode PWM Controller

DFN3×3-8L-A(P0.65T0.75)

PACKAGE OUTLINE DIMENSIONS







N4 N1

BOTTOM VIEW

SIDE VIEW

Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.700	0.800	0.028	0.031
A1	0.000	0.050	0.000	0.002
A3	0.203REF.		0.008REF.	
D	3.000BSC.		0.118BSC.	
E	3.000BSC.		0.118BSC.	
D1	2.200	2.450	0.087	0.096
E1	1.400	1.600	0.055	0.063
k	0.250MIN.		0.010MIN.	
b	0.250	0.350	0.010	0.014
e	0.650TYP.		0.026TYP.	
L	0.250	0.450	0.01	0.018