Primary Feedback PWM Controller for Flyback Application

Features

- Primary Feedback Control without Secondary Feedback Signal
- Constant-Voltage(CV) and Constant-Current(CC) Regulation
- Pulse by Pulse Current Limiting
- Low Start-Up Current (6uA)
- Fixed 40KHz Switching Frequency for Driving BJT
- Built-In Soft Start
- Wide VCC Operation Range
- VCC Over-Voltage Protection
- Output Over-Voltage Protection
- Cable Compensation for CV Regulation
- SOT-26 Package, with Few External Components Needed

Description

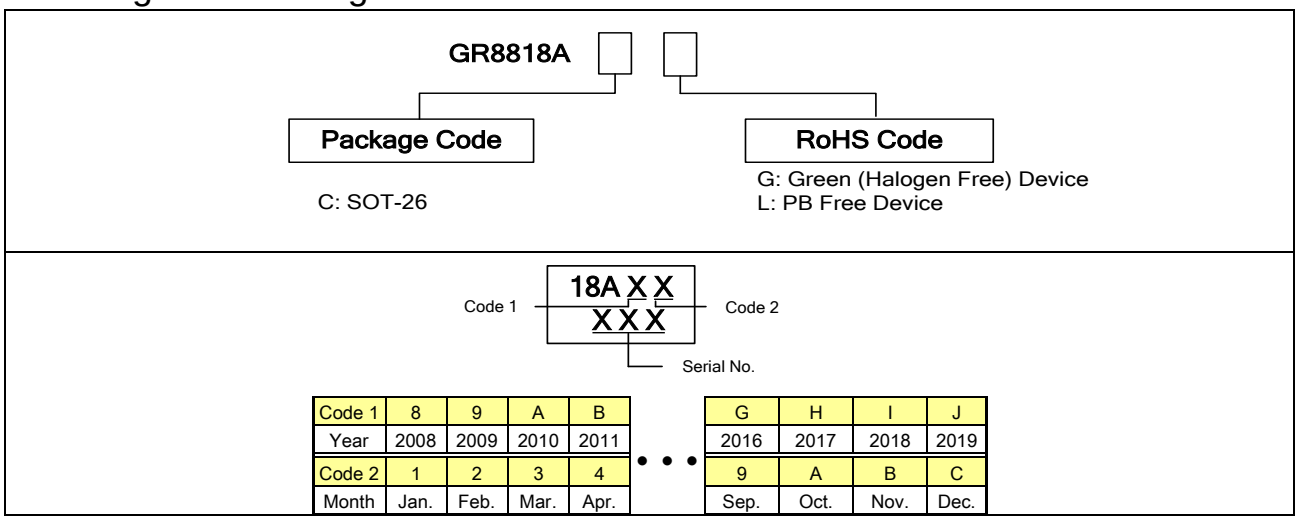
The GR8818A is an excellent primary side feedback controller. It's integrated constant voltage (CV) and constant current (CC) regulation functions. While it operates on CV mode, it's built-in the cable compensation to compensate the voltage drop of the DC output cable to improve the load regulation. It minimizes the components counts and is available in a tiny SOT-26 package. Those make it an ideal design for low cost applications.

It provides functions of low startup current, green-mode power-saving operation,. Also, the GR8818A is built-in the VCC over-voltage protection and FB pin to prevent the circuit being damaged from the abnormal conditions.

Application

- Low Power Adapter
- Cell Phone Charger
- Replacement for Linear Adapter

Ordering and Marking Information

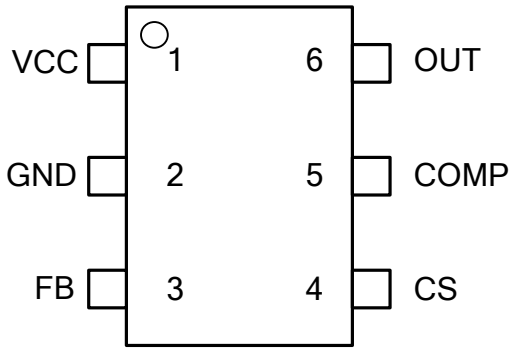


Code 1	8	9	A	B		G	H	I	J
Year	2008	2009	2010	2011		2016	2017	2018	2019
Code 2	1	2	3	4	• • •	9	A	B	C
Month	Jan.	Feb.	Mar.	Apr.		Sep.	Oct.	Nov.	Dec.

Grenergy OPTO Inc. reserves the right to make changes to improve reliability or manufacture ability without notice, and advise customers to obtain the latest version of relevant information to verify before placing orders.

Pin Configuration

TOP VIEW



Pin Description

Pin No.	Name	Function
1	VCC	Power supply pin
2	GND	Ground
3	FB	Connecting to a resistor divider from aux. winding to ground, the resistor divider ratio determines the aux. winding and secondary output voltage
4	CS	Current sense pin, connect to sense the power transistor current
5	COMP	Voltage loop Gm error amplifier output, by connecting an R series with C to GND to stabilize the control loop
6	OUT	The output driver for driving the external power transistor

Absolute Maximum Ratings

Supply Voltage VCC ---------- 28V

COMP, FB, CS ---------- -0.3 ~ 7V

OUT ---------- -0.3~4.0V

Junction temperature ---------- 150°C

Operating ambient temperature ---------- -20°C to 85°C

Storage temperature range ---------- -65°C to 150°C

Package thermal resistance (SOT-26) ---------- 250°C/W

Power dissipation (SOT-26, at ambient temperature = 85°C) ---------- 250mW

Lead temperature (Soldering, 10sec) ---------- 260°C

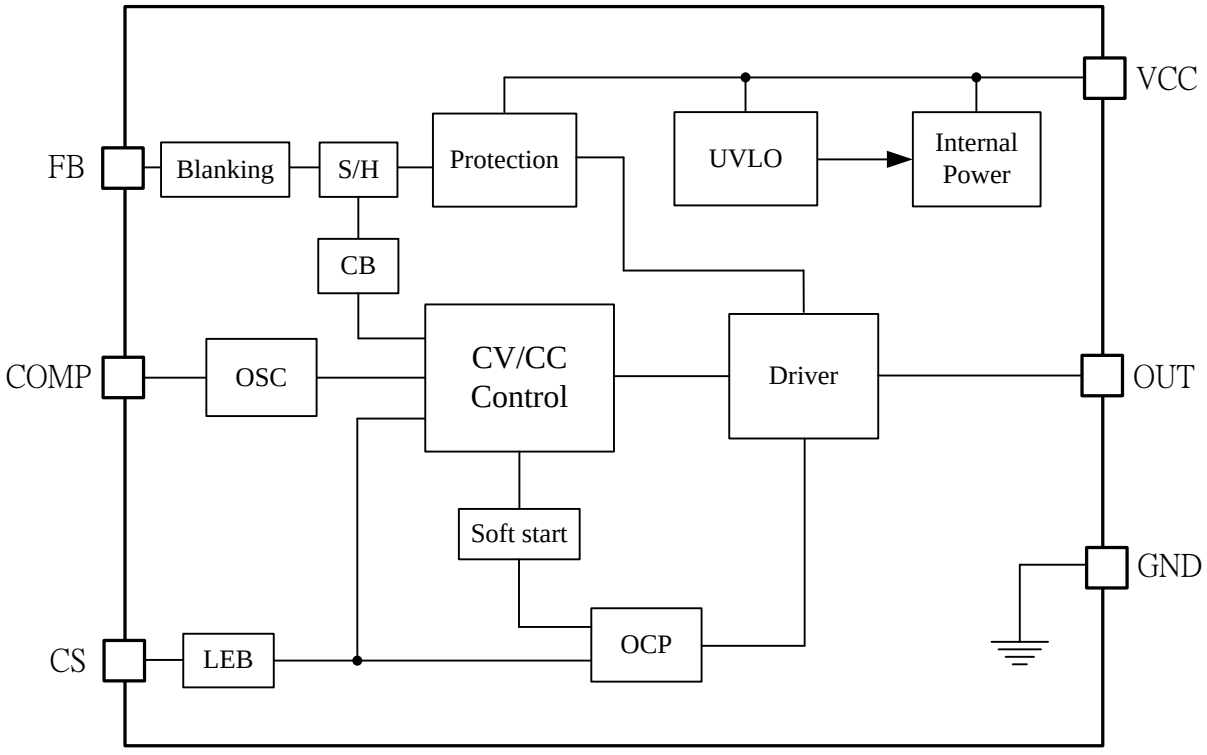
ESD voltage protection, human body model ---------- 3.0 KV

ESD voltage protection, machine model ---------- 300 V

Recommended Operating Conditions

Item	Min.	Max.	Unit
Supply Voltage VCC	7	20	V

Block Diagram



Electrical Characteristics (VCC = 15V, TA = 25°C, unless otherwise specified.)

Parameter	Test Conditions	Symbol	Min	Typ	Max	Unit
VCC SECTION						
Continuously Operating Voltage		V_{OP}			25	V
On Threshold Voltage		V_{TH-ON}	10.0	11.0	12.0	V
Off Threshold Voltage		V_{TH-OFF}	4.5	5.5	6.5	V
Start-Up Current	VCC = 9.5V before UVLO start	I_{cc-ST}	2	6	10	uA
Operating Supply Current	VCC = 15V, $F_S = F_{OSC}$, C_L = 1nF	I_{cc-OP}	0.8	1.5	2.0	mA
VCC OVP		V_{OVP}	27	28	29.5	V
OSCILLATOR SECTION						
Normal PWM Frequency		F_{OSC}	38	40	42	KHz
Minimum Frequency at No-Load		$F_{OSC-N-MIN}$		500		Hz
Jitter Range				+/-3		%
ERROR AMPLIFIER						
Output Source Current				40		uA
Output Sink Current				40		uA
Minimum Output Voltage				0.5		V
Green Mode Start Voltage	F_{OSC} -1KHz			1.8		V
CURRENT-SENSE SECTION						
Input Impedance		Z_{CS}	1			MΩ
Peak Current Limitation		V_{CSTH}	1.0	1.1	1.2	V
Propagation Delay				150		nS
Leading-edge blanking time				500		nS
FB PIN						
Feedback Input Voltage		V_{FB}	1.97	2	2.03	V
V_{FB} Variation versus VCC Deviation				1		%
Input Bias Current		I_{BVS}		-0.3	-2	uA
FB OVP		V_{FB-OVP}	2.4	2.5	2.6	V
OUT SECTION						
Minimum Base Driving Current		Ibmin		10		mA
Maximum Base Driving Current		Ibmax		30		mA
Rdson Pull Low	Isink=5mA	Rds		1		Ω
Soft Start		T_{SS}		4		mS

Application Information

The GR8818A is a primary feedback PWM controller for flyback converter application. It is suitable for low output wattage below 5W and small size AC/DC converter. It is required only very few external components to achieve application. The typical application circuit is shown in below Fig.1.

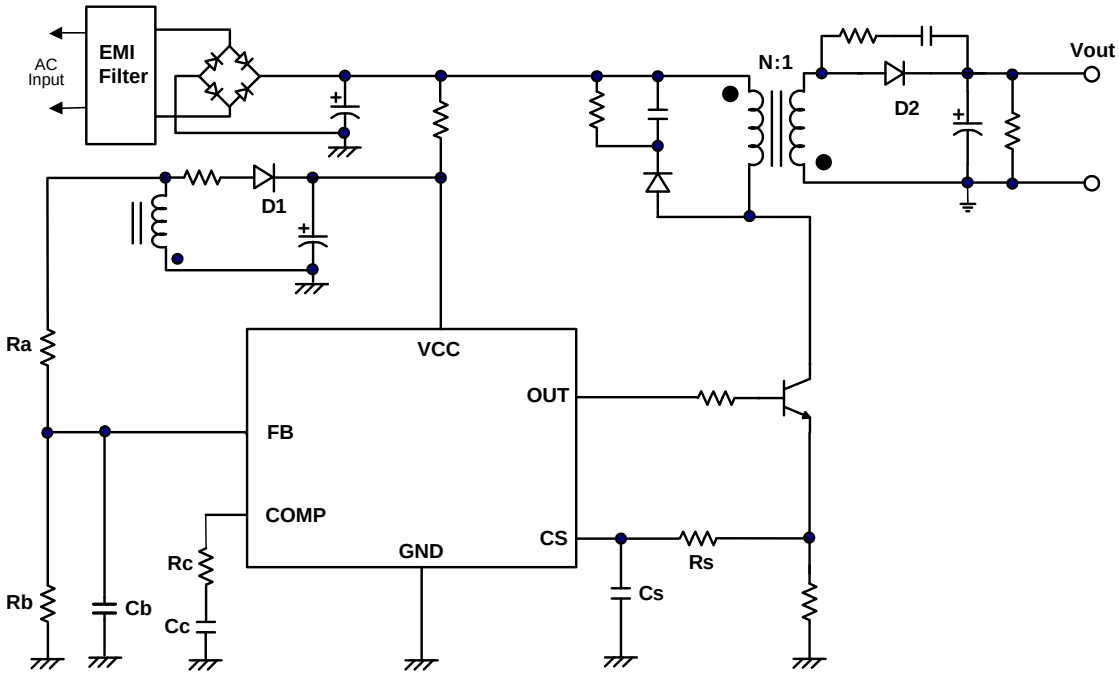
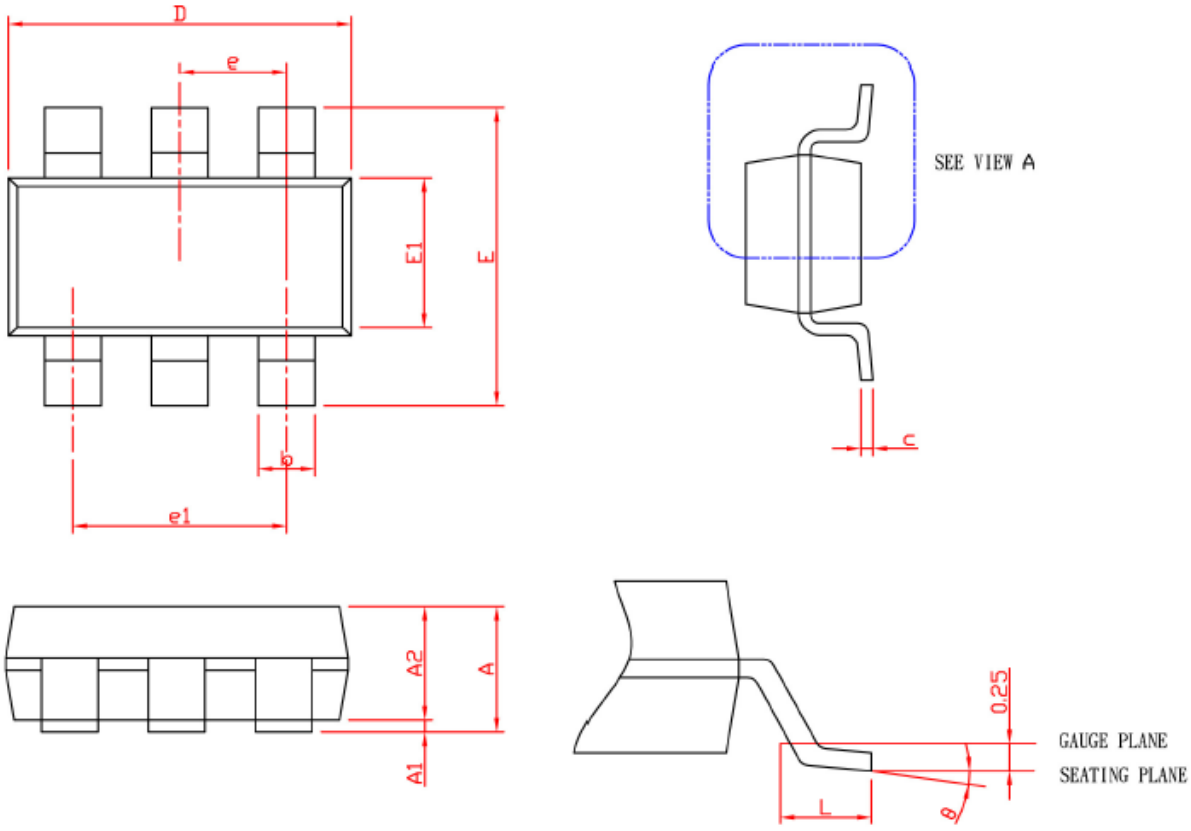


Fig.1.

Package Information

SOT-26



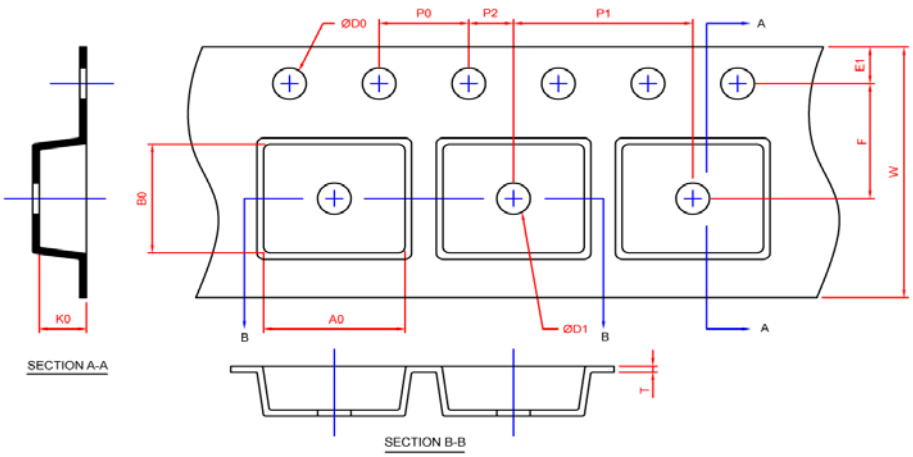
SYMBOL	SOT-26			
	MILLIMETERS		INCHES	
	MIN.	MAX.	MIN.	MAX.
A		1.45		0.057
A1	0.00	0.15	0.000	0.006
A2	0.90	1.30	0.035	0.051
b	0.30	0.50	0.012	0.020
c	0.08	0.22	0.003	0.009
D	2.70	3.10	0.106	0.122
E	2.60	3.00	0.102	0.118
E1	1.40	1.80	0.055	0.071
e	0.95 BSC		0.037 BSC	
e1	1.90 BSC		0.075 BSC	
L	0.30	0.60	0.012	0.024
θ	0^o	8^o	0^o	8^o

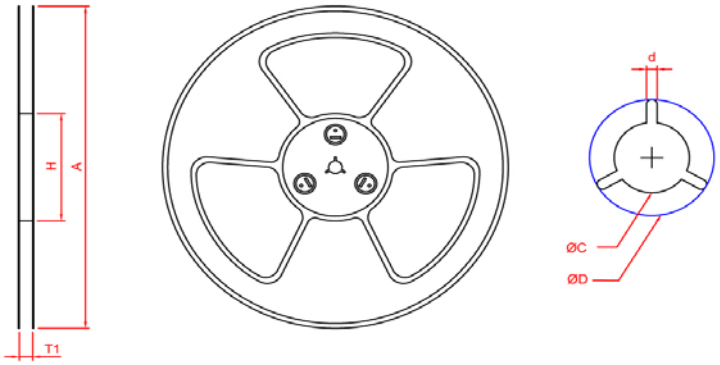
Note: 1. Followed from JEDEC TO-178 AB.

2. Dimension D and E1 do not include mold flash, protrusions or gate burrs. Mold flash, protrusions or gate burrs shall not exceed 10 mil per side

Carrier Tape & Reel Dimensions

SOT-26





Application	A	H	T1	C	d	D	W	E1	F
SOT-26	178.0±2.00	50 MIN.	8.4+2.00 -0.00	13.0+0.50 -0.20	1.5 MIN.	20.2 MIN.	8.0±0.30	1.75±0.10	3.5±0.05
	P0	**P1**	**P2**	**D0**	**D1**	**T**	**A0**	**B0**	**K0**
	4.0±0.10	4.0±0.10	2.0±0.05	1.5+0.10 -0.00	1.0 MIN.	0.6+0.00 -0.40	3.20±0.20	3.10±0.20	1.50±0.20

Application	Carrier Width	Cover Tape Width	Devices Per Reel
SOT -26	8	5.3	3000

Tape and Specification Reel

SOT 26