Primary Feedback PWM Controller for Flyback Application

Features

- Primary Sensing for Constant-Voltage(CV) and Constant-Current(CC) Regulation
- Pulse by Pulse Current Limiting (OCP)
- Low Start-Up Current (6uA)
- Fixed Frequency for Driving Power MOS
- VCC Over-Voltage Protection
- Output Over-Voltage Protection
- Cable Compensation for CV regulation - (GL8258AN only)
- SOT-26 Package with Few External Components Needed

Application

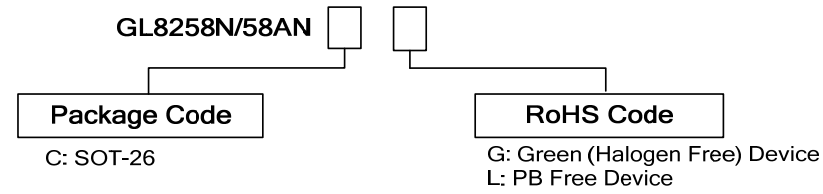
- LED Lighting

Description

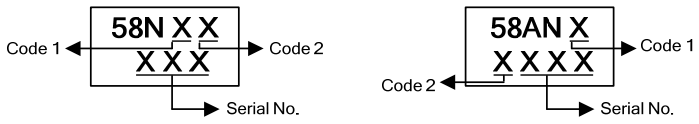
The GL8258N/58AN is an excellent primary side feedback control PWM IC. It's integrated constant voltage (CV) and constant current (CC) regulation functions. While it operates on CV mode, it acts as a voltage source. While it operates on CC mode, it acts as a current source. It minimizes the components counts and is available in a tiny SOT-26 package. Those make it an ideal design for low cost application.

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

Ordering and Marking Information



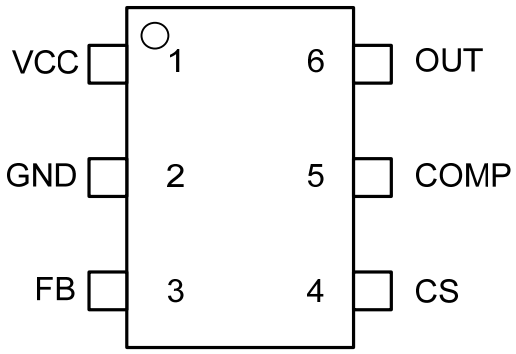
SOT-26



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.

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 MOS 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 MOS

Absolute Maximum Ratings

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

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

OUT ---------- -0.3~13V

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

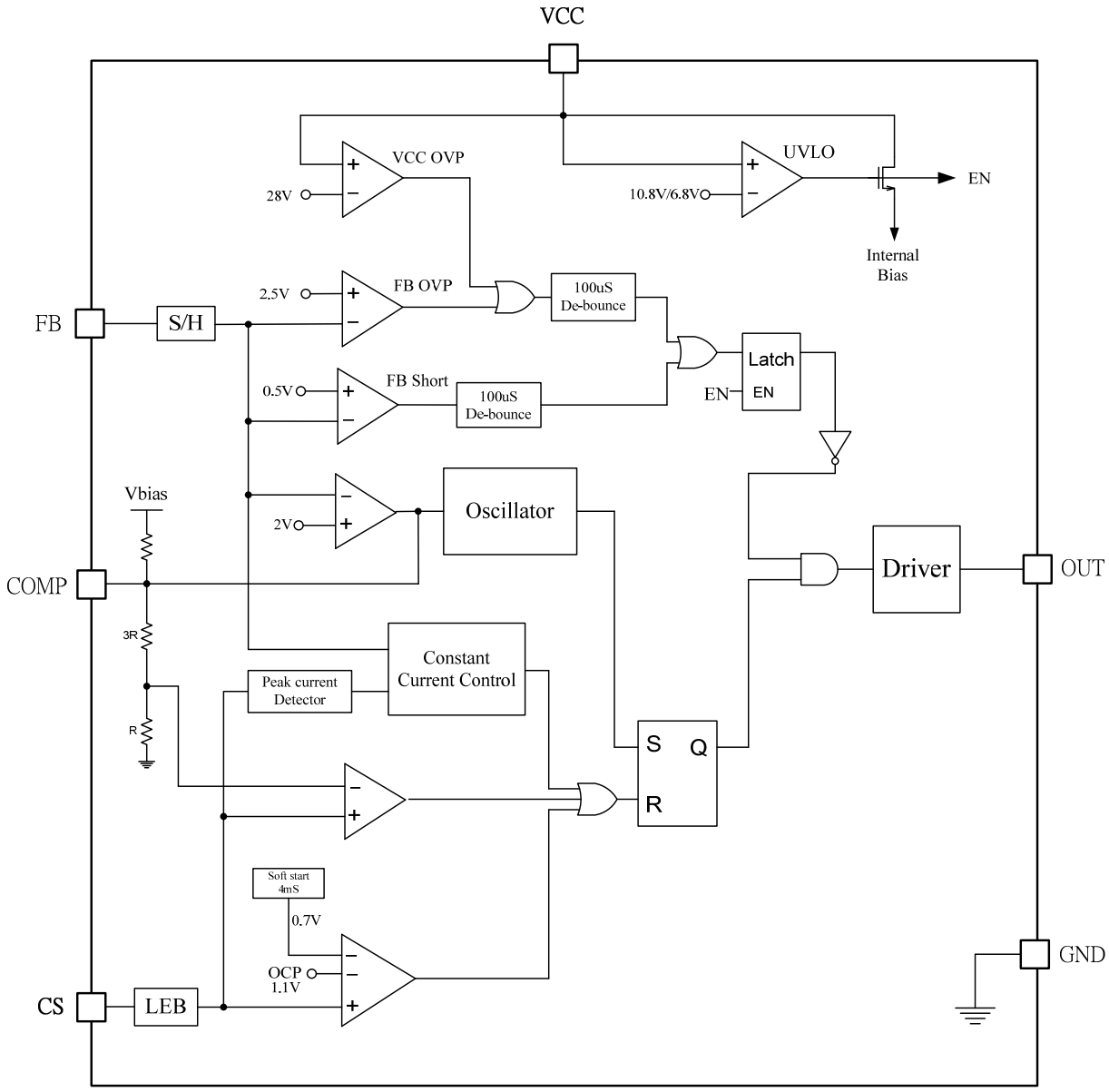
ESD Voltage Protection, Human Body Model ---------- 2.0 KV

ESD Voltage Protection, Machine Model ---------- 200 V

Recommended Operating Conditions

Item	Min	Max	Unit
Supply voltage VCC	7	25	V
VCC capacitor	2.2	10	uF
COMP pin capacitor	0.1	2.2	uF
COMP pin resistor	0	100K	ohms

Block Diagram



Electrical Characteristics (VCC = 15V & TA = 25℃, unless otherwise specified.)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
VCC SECTION						
Continuously Operating Voltage	V_{OP}				25	V
On Threshold Voltage	V_{TH-ON}		9.5	10.8	12	V
Off Threshold Voltage	V_{TH-OFF}		6.3	7.0	8.0	V
Start-Up Current	I_{CC-ST}	VCC = 9V		6	10	μA
Operating Supply Current	I_{CC-OP}			1.5		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_{MIN}			500		Hz
ERROR AMPLIFIER						
Output Source Current	I_{EAOUT}			40		μA
Output Sink Current	I_{EAIN}			40		μA
Minimum Output Voltage	V_{EAMIN}			0.5		V
Green Mode Start Voltage	$V_{EAGREEN}$			1.7		V
CURRENT-SENSE SECTION						
Input Impedance	Zcs		1			MΩ
Peak Current Limitation	V_{OCP}		1.0	1.1	1.2	V
Propagation Delay	T_{PD}			150		ns
FB PIN						
Feedback Input Voltage	V_{REF}		1.96	2	2.04	V
V_{FB} Variation versus VCC Deviation	ΔV_{REF}			1		%
Input Bias Current	I_{BVS}			-0.3	-2	μA
FB OVP	V_{OVP}		2.4	2.5	2.6	V
OUT SECTION						
Output Low Level	V_{OL}	VCC = 15V, I_o = 20Ma			1	V
Output High Level	V_{OH}	VCC = 15V, I_o = 20Ma	8			V
Rising Time	T_R	Load Capacitance = 1000Pf		250		ns
Falling Time	T_F	Load Capacitance = 1000Pf		70		ns
Clamp Voltage	V_{CLAMP}	VCC = 25V, C_{Load} = 1000Pf		13		V
OTHERS						
Soft Start	T_{SS}			4		ms

Note: GL8258AN with cable compensation function.

Application Information

The GR8258N/58AN is a primary feedback PWM controller for flyback converter application. It is suitable for low output wattage below 15W and small size AC/DC converter. It is required only very few external components to achieve the application. The typical application circuit is shown as below Fig.1.

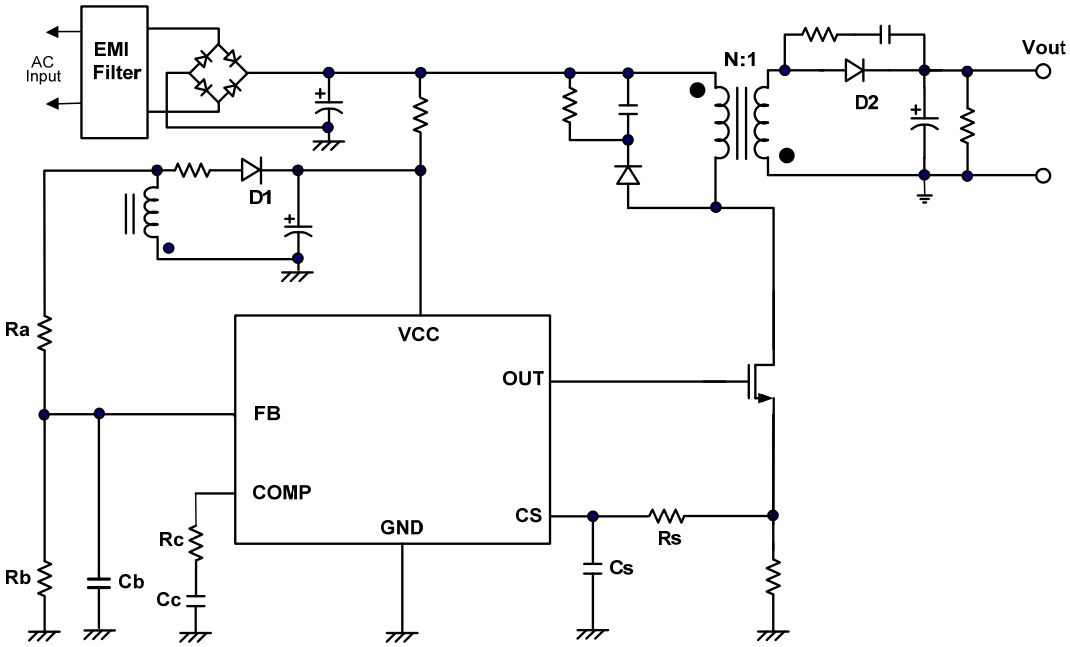
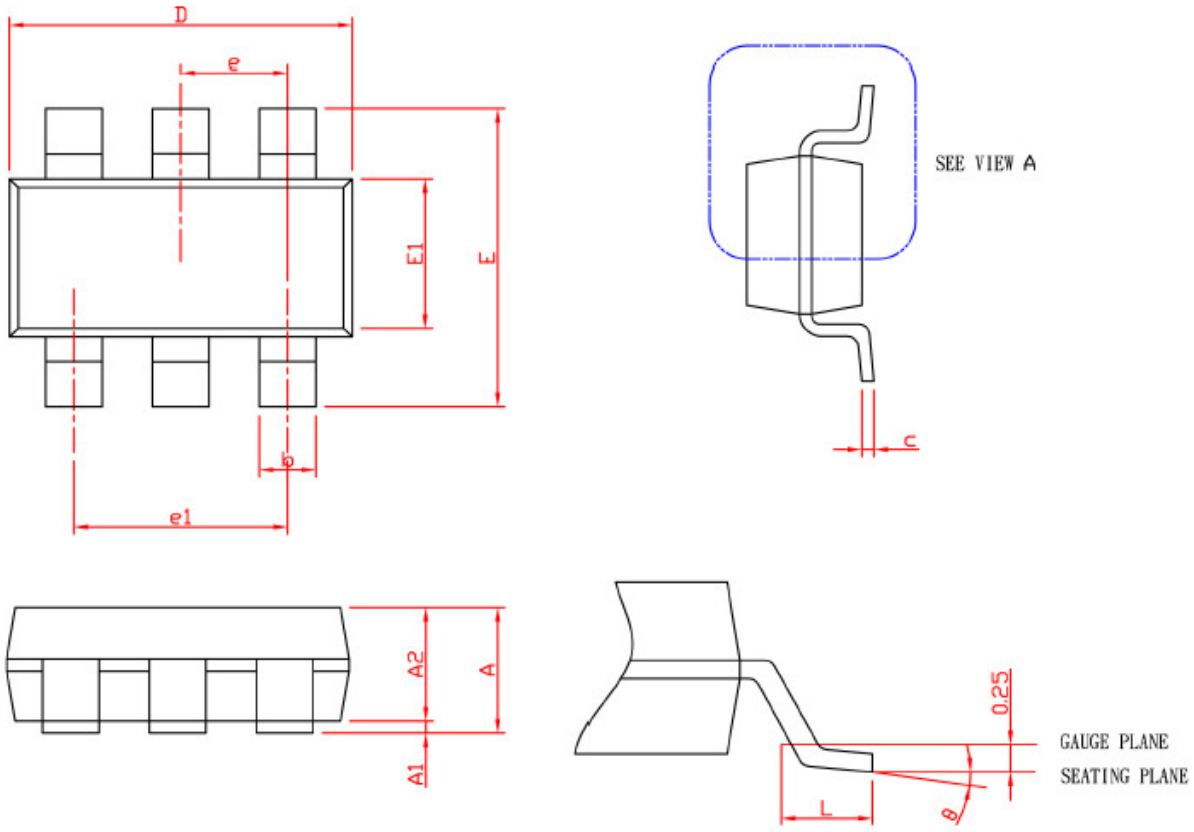


Fig.1

Package Information

SOT-26



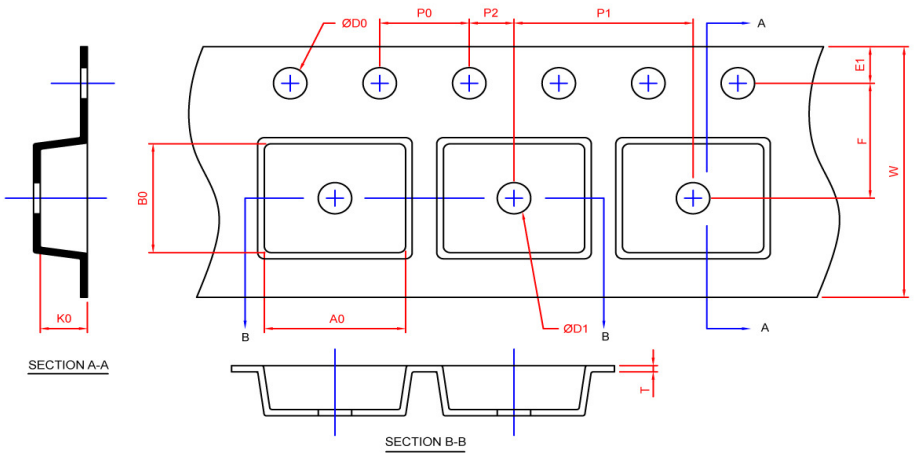
SYMBOL	SOT-26			
	MILLIMETERS		INCHES	
	MIN.	MAX.	MIN.	MAX.
A		1.45		0.057
A1	0.00	0.15	0.000	0.006
A2	0.90	1.30	0.035	0.051
b	0.30	0.50	0.012	0.020
c	0.08	0.22	0.003	0.009
D	2.70	3.10	0.106	0.122
E	2.60	3.00	0.102	0.118
E1	1.40	1.80	0.055	0.071
e	0.95 BSC		0.037 BSC	
e1	1.90 BSC		0.075 BSC	
L	0.30	0.60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

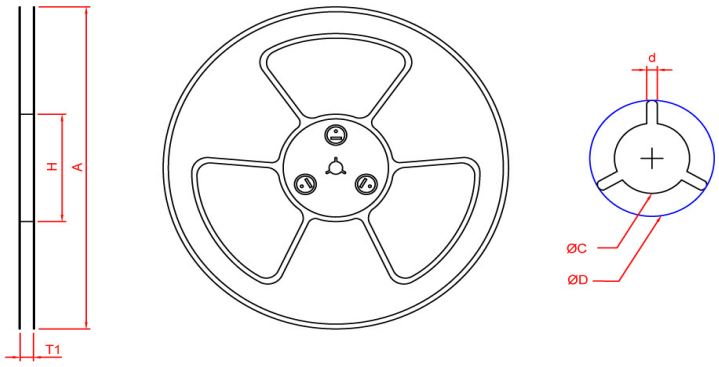
Note: 1. Followed from JEDEC TO-178 AB.

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