

RENCCHIP

GreenPOS™ LED Driver GP8000 Series AC Direct Drive Solution (GP8110Q)

v1.2
SPECIFICATION

REVISION HISTORY

Version	Date	Revision Contents
V1.0	August 2015	Release version
V1.1	September 2015	Revised application circuit parameter
V1.2	September 2015	Revised application table parameters

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GP8110Q

1 TAP DIRECT AC LINE LED DRIVER

GENERAL DESCRIPTION

The GP8110Q is 1 TAP Direct AC Line LED Driver. Output Current is designed to be max. 80mA by R(EXT) and is invariant to the output voltage variation, ambient temp. variation.

The GP8110Q can work as switch or current regulation, Therefore it is suitable for regulating the current with simple one terminal LED String which is very low cost.

It is also suitable for regulating the current with multi terminal LED String which is the good THD.

The PCB design of applications is also flexible to meet various requirements.

The GP8110Q is especially suitable for applications of low cost LED lighting which replaces bulb, tube lamp etc.

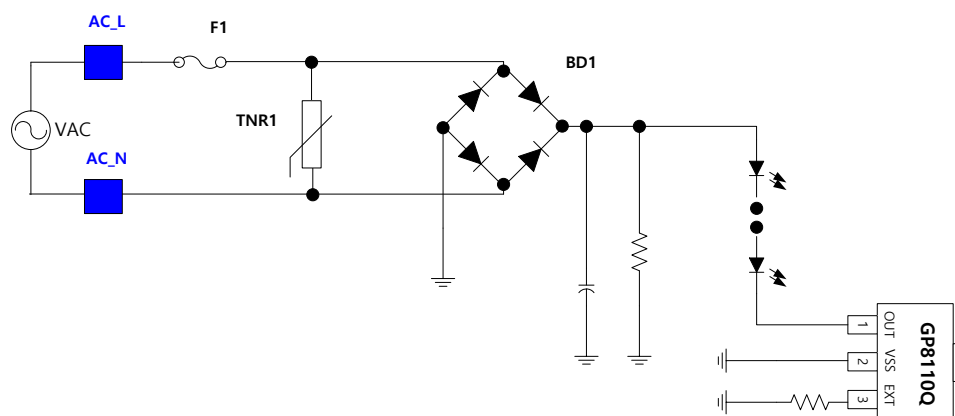
FEATURES

- Direct AC Line 1TAP LED Driver with max. 80mA constant current
- Precision of constant current : $< \pm 5\%$
- Wide input voltage range : max. AC 265V, DC 400V
- Minimum number of external components
- Simple circuit and low cost
- Excellent EMC performance
- High efficiency achieved
- High PF and Low THD using multi-terminal control method
- Excellent TRIAC dimming controller
- Available up to 12W
- Protection : Thermal Shutdown with hysteresis, Temp. compensation
- Operation temperature : $-40^{\circ}\text{C} \sim 125^{\circ}\text{C}$

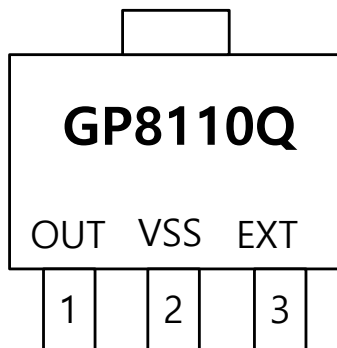
APPLICATIONS

- Direct AC Line LED Driver up to 12W
- LED Bulb lamp
- T5/T8 LED tube lamp
- LED Street lighting

Typical Application



PKG PIN Description / Marking SPEC



MARKING INFORMATION (SOT89-3L)

GP8110Q

YYWW

- GP8110Q : Device Code
- YY : Year Code / WW: Week Code

PIN Name	PIN No.	Description
OUT	1	Output Terminal
VSS	2	Ground
EXT	3	Output Current Setting Terminal

ABSOLUTE MAXIMUM RATINGS

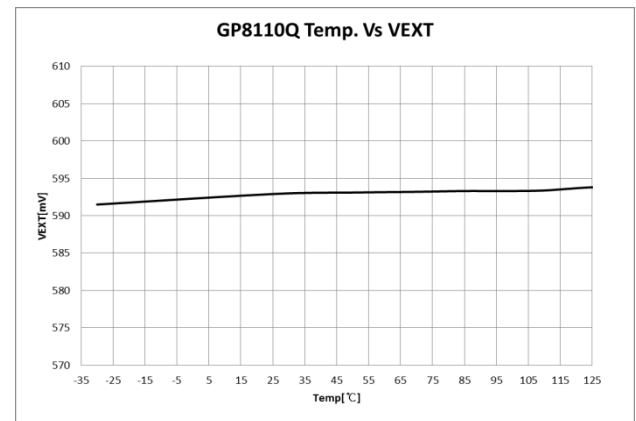
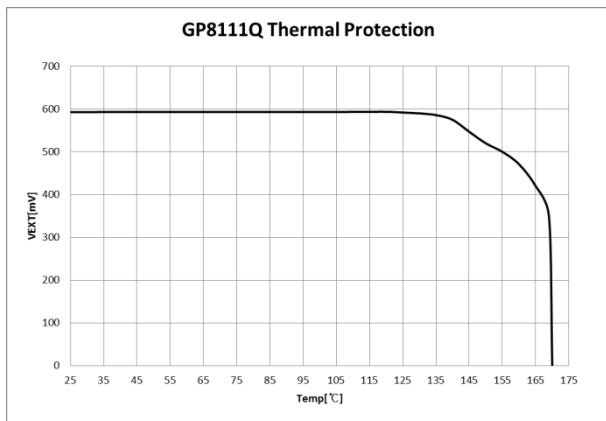
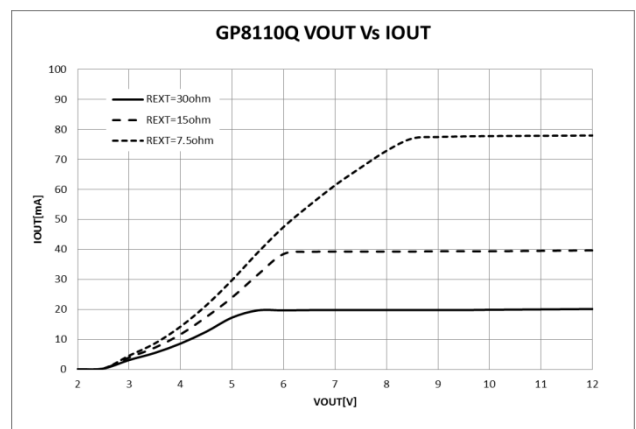
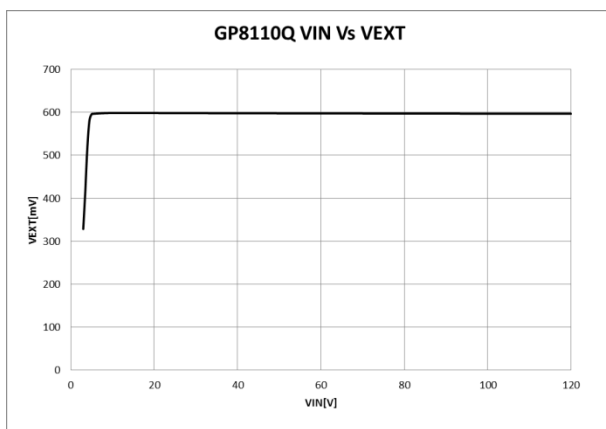
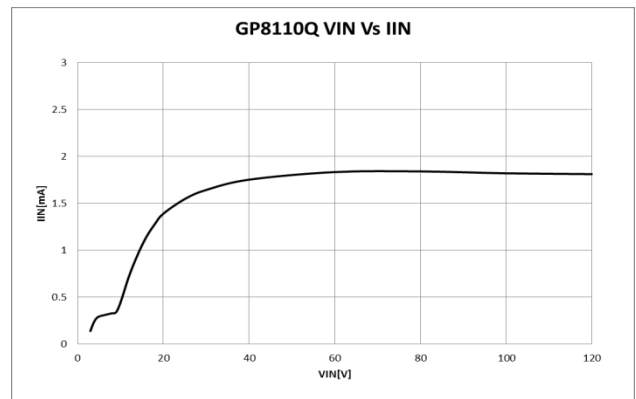
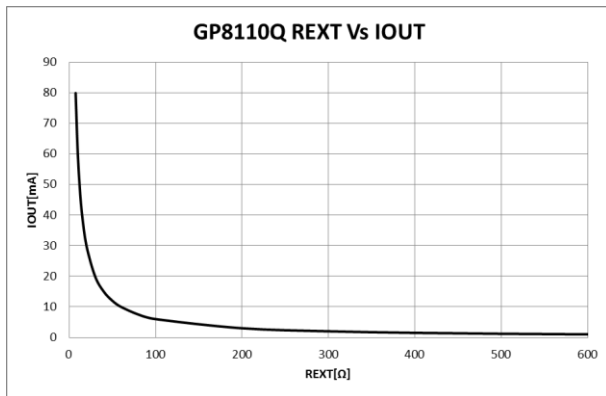
CHARACTERISTICS	Symbol	Value	Unit
Line Voltage	VIN	-0.3 ~ +450	V
Output Voltage	VOUT	-0.3 ~ +450	V
Output Current	IOUT	100	mA
External Voltage	VEXT	-0.3 ~ +6.5	V
Operating Temperature	Topr	-40 ~ +125	°C
Storage Temperature Range	Tstg	-50 ~ +150	°C
Junction Temperature	TJ	150	°C
Thermal resistance(SOT89)	ROJA	250	°C/W

DC ELECTRICAL CHARACTERISTICS

© Ta=25°C, VIN=VOUT=20V, REXT=6 kΩ unless otherwise specified

No	Characteristic	Symbol	Test Condition	Min.	Typ.	Max.	Unit
1	Max. Input Voltage	VIN_max	-	400	-	-	V
2	Min. Input Voltage	VIN_min	-	8	-	-	V
3	Max. Output Voltage	VOUT	-	400	-	-	V
4	Output on Resistance	Rout	VIN=10V	-	80	-	Ω
5	Output Current	IOUT	-	5	-	80	mA
6	Supply Current 1	IIN1	VIN=8V, REXT=Open	0.1	0.3	1.2	mA
7	Supply Current 2	IIN2	VIN=40V, REXT=Open	0.8	1.8	3.6	mA
8	Supply Current 3	IIN3	VIN=400V, REXT=Open	0.8	1.8	3.6	mA
9	EXT Voltage	VEXT	-	562	590	618	mV
10	Min. Dropout Voltage 1	VD1	IOUT=40mA	-	5.5	7.5	V
11	Thermal TRIP	Ttrip	-		130		°C
12	Thermal Shut Down	TSD	-		170		°C
13	Hysteresis temperature	Thys	-		20		°C

TYPICAL Performance Characteristics



Typical Application TABLE

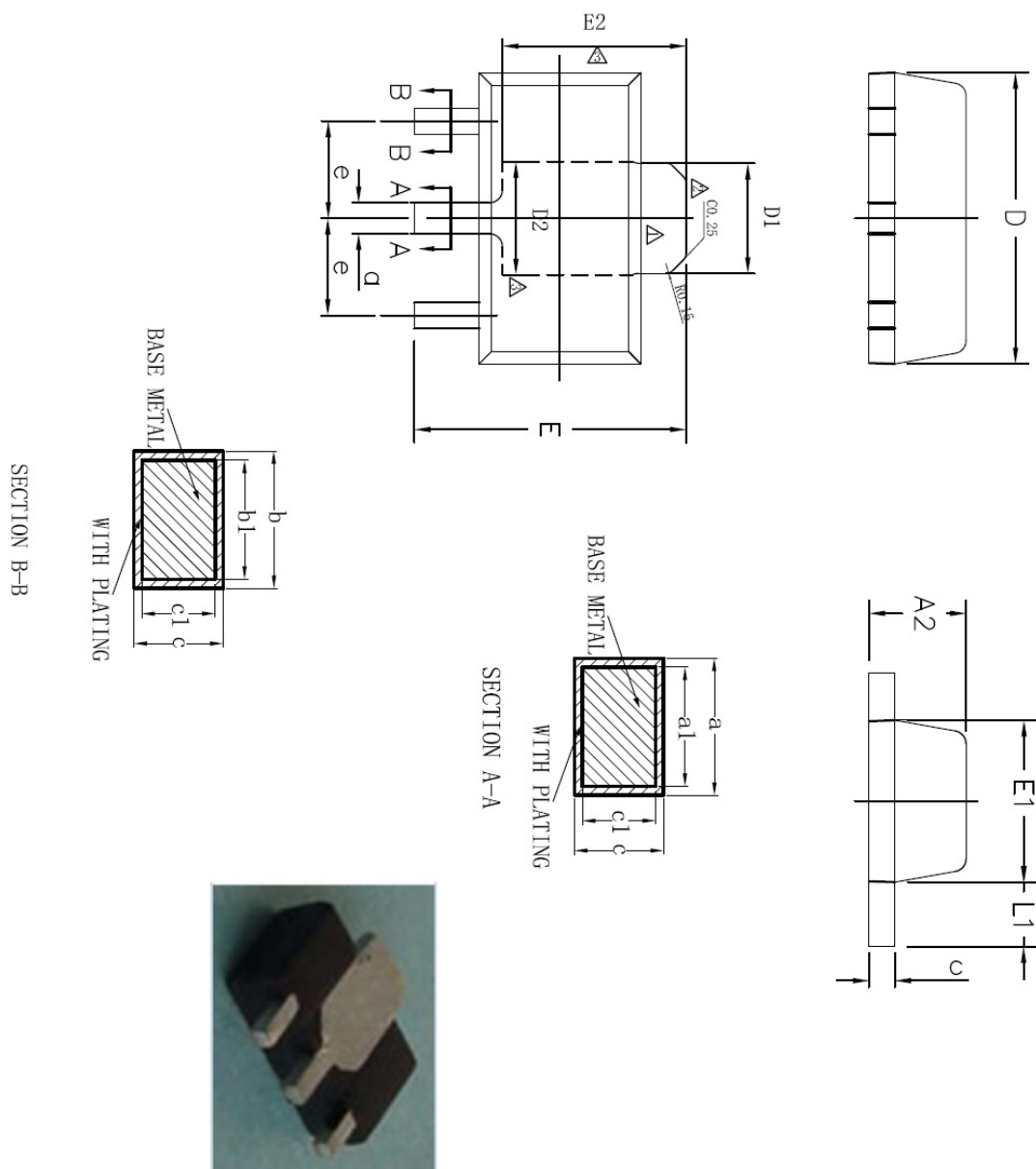
GP8110Q can be applied for various applications, cost effectiveness, characteristics etc.
Refer to the various application table below, could be chosen the optimal solution according to the project situation.

Related application note and demo board are available upon customer's requests.

◎Excellent ○Good △Not good

Driving Method	TAP	IC	Electrolytic Capacitor	COST	Power Eff.	PF	THD	Flicker (%Flicker)	TRIAC Dimming
Method 1 (GPAN042)	1	1	1	○	◎ (90% ↑)	△ (0.5 ↑)	△ (80% ↓)	Flicker Free	△
Method 2 (GPAN043)	1	1	0	◎	◎ (90% ↑)	○ (0.85 ↑)	△ (50% ↓)	100%	△
Method 3 (GPAN044)	2	2	0	○	○ (80% ↑)	○ (0.9 ↑)	○ (30% ↓)	30% ↓ w/ E CAP.	△
Method 4 (GPAN045)	3	3	0	△	◎ (85% ↑)	◎ (0.95 ↑)	◎ (20% ↓)	30% ↓ w/ E CAP.	△
Method 5 (GPAN046)	2	3	0	△	○ (80% ↑)	◎ (0.95 ↑)	◎ (20% ↓)	30% ↓ w/ E CAP.	◎

PKG Dimensions (SOT89-3L)



SYMBOL	MILLIMETER		
	MIN	NOM	MAX
A2	1.40	1.50	1.60
b	0.38	—	0.47
b1	0.37	0.40	0.43
c	0.36	—	0.46
c1	0.35	0.38	0.41
a	0.46	—	0.56
a1	0.45	0.48	0.51
d	0.36	—	0.46
d1	0.35	0.38	0.41
D	4.30	4.50	4.70
D1	1.70 REF		
D2	1.75 REF		
E	4.00	4.20	4.40
E1	2.30	2.50	2.70
E2	2.84 REF		
e	1.50 BSC		
L1	0.80	1.00	1.20