

General Description

The MP1010A is a Power IC that offers a complete solution for driving one or more Cold Cathode Fluorescent Lamps (CCFL). This Power IC converts unregulated DC voltage to a nearly pure sine-wave required to ignite and operate the CCFL. Based on proprietary power topology and control techniques (patents pending), it greatly increases the power conversion efficiency. The MP1010A supports both analog and burst mode dimming, and simplifies the module implementation. The MP1010A offers four distinct performance advantages:

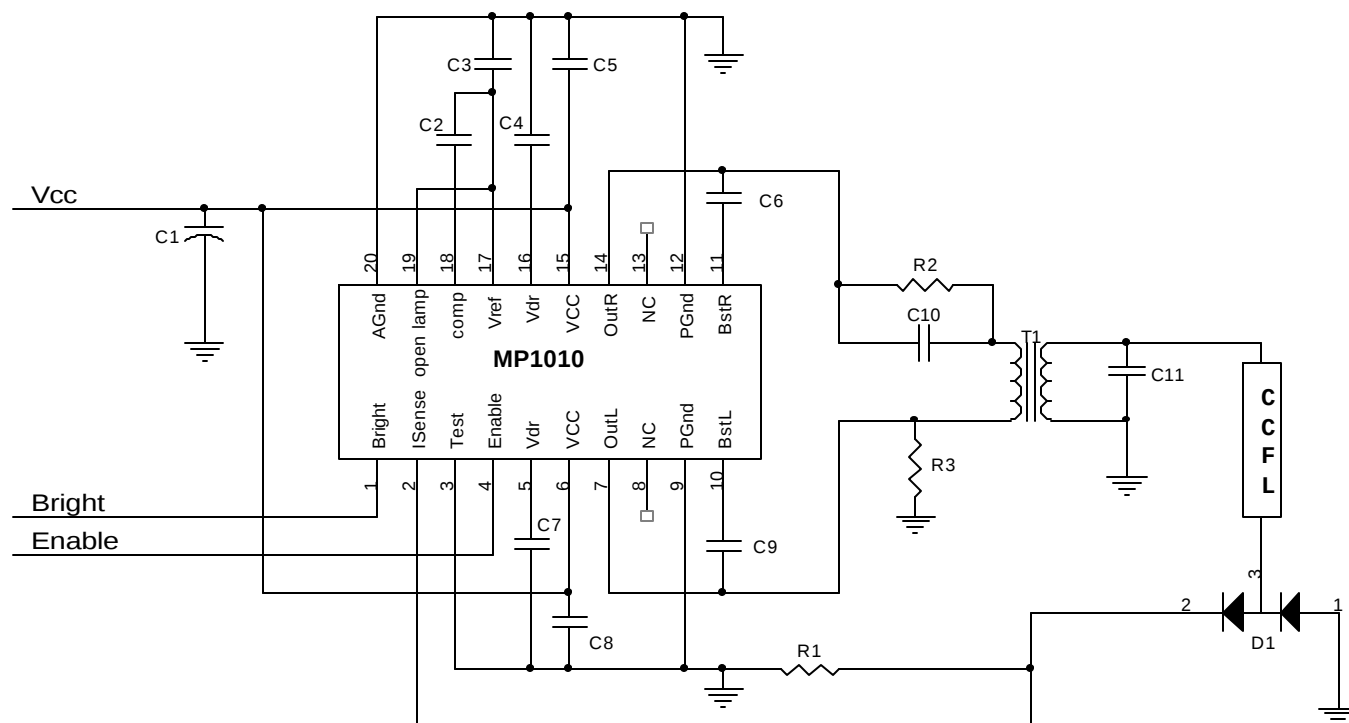
1. **More light for less power**
2. **Small board implementation**
3. **Low EMI emission**
4. **Low cost off the shelf components**

Ordering Information

Part Number *	Package	Temperature
MP1010EMA	TSSOP 20 pin	-20 to + 85°C

* For Tape & Reel use suffix - Z (e.g MP1010EMA-Z)

Typical Application Circuit



Features

- Integrated power switches
- 6.0 to 22v variable supply voltage with regulated lamp current.
- Rated 12W power output at 12V input
- Open lamp regulation
- Current and Voltage feedback control
- Logic Level burst mode control
- Thermal Shutdown
- Supports Open/Short Lamp protection
- Soft Start
- Output is short circuit protected
- Low lamp operating voltage for increasing transformer or using smaller transformer

Applications

LCD backlight inverter for large portable or desk top display.

Absolute Maximum Ratings

Vcc	25 V
Power Dissipation	1.0 W
Logic Inputs	-0.7 V to 6.8V
Thermal resistance	140°C/W
Junction Temperature	150°C
Lead Temperature (Solder)	260°C
Operating Frequency	150KHz
Storage Temperature	-55°C to 150°C

Recommended Operating Conditions

Input Voltage Vcc	6.0V to 22V
Brightness Voltage	0 to 2.0V
Enable	0 to 5.0 V
Operating Frequency	20Khz to 90Khz
Operating Temperature	-20°C to + 85°C

Electrical Characteristics (Unless otherwise specified Vcc=12v, Ta=25°C)

Parameters	Symbol	Condition	Min	Typ	Max	Units
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Reference Voltage

Output Voltage	Vref	Iref=3ma	4.85	5.1	5.35	V
Reference Current	Iref				3.0	mA
Line Regulation		6.5V < Vcc < 22 V			30	mV
Load Regulation		0 < Iref < 3.0 mA			30	mV

Voltage Supply

Supply Current (quiescent)	Icc (off)	Vcc = 22V			10	μA
Supply Current (operating)	Icc (on)	Vcc = 22V		1.8	2.5	mA
Operating Range	Vcc		6.0		22	V

Shutdown Logic

Thermal Shutdown				145		°C
Open Lamp Detect	Vol		1.0	1.2	1.4	V
Enable Voltage Low	Vil				0.6	V
Enable Voltage High	Vih		2.0			V

Output Drivers

On Resistance	Ron	(Note 1)	.085	0.12	0.15	Ω
Short Circuit Current	Isc			4		A
Operating Frequency			20	60	90	KHz
Zero-Crossing Current	Izcc		0	30	60	mA
Ton(min)		Vcomp = 0V, Vcc = 22V	500	650	750	nS

Brightness Control

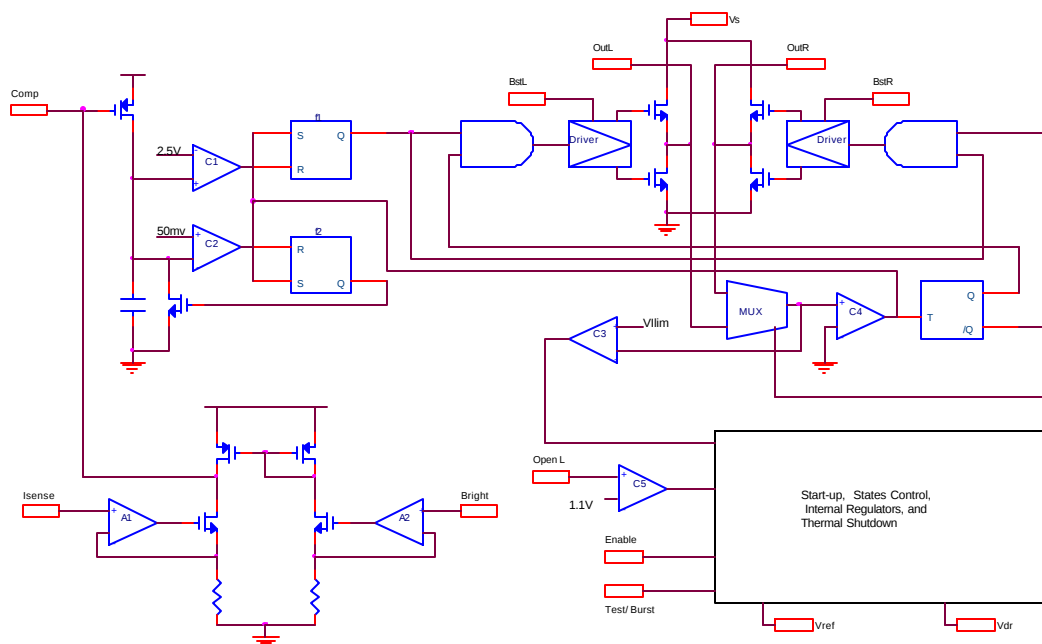
Sense Full Brightness	Vsense	Vbright= 2.0V	122	128	134	mV
Sense Full Dim	Vsense	Vbright= 0V	26	32	38	mV
Lamp Current Regulation		6.0v < Vcc < 22V		2	5	%

Note 1: This parameter is guaranteed by design.

Pin Description

Pin Name	Pin Name	Pin Function
1	Bright	Dimming Control: 0 volts is full Dim and 2V is full brightness
2	I sense	Lamp current feedback sense input, 0.125V DC is full current
3	Test/Burst	To use for burst mode, the pin is switched between 0V and 5V. When not using burst mode, then pin must be tied to ground.
4	Enable	The enable will turn the chip on/off. Do not float this pin.
5	Vdr	Internally generated MOSFET gate drive supply voltage
6	Vcc	Power Supply input
7	OutL	Output to Load (tank circuit)
8	NC	No Connect
9	PGND	Power Ground
10	BstL	Regulated output voltage for boost cap on phase L
11	BstR	Regulated output voltage for boost cap on phase R
12	PGND	Power Ground
13	NC	No Connect
14	OutR	Output to Load (tank circuit)
15	Vcc	Power Supply input
16	Vdr	Internally generated MOSFET gate drive supply voltage
17	Vref	Reference voltage output
18	Comp	Loop compensation cap
19	Open lamp	Latching shutdown for open lamp or low battery
20	AGND	Small signal ground

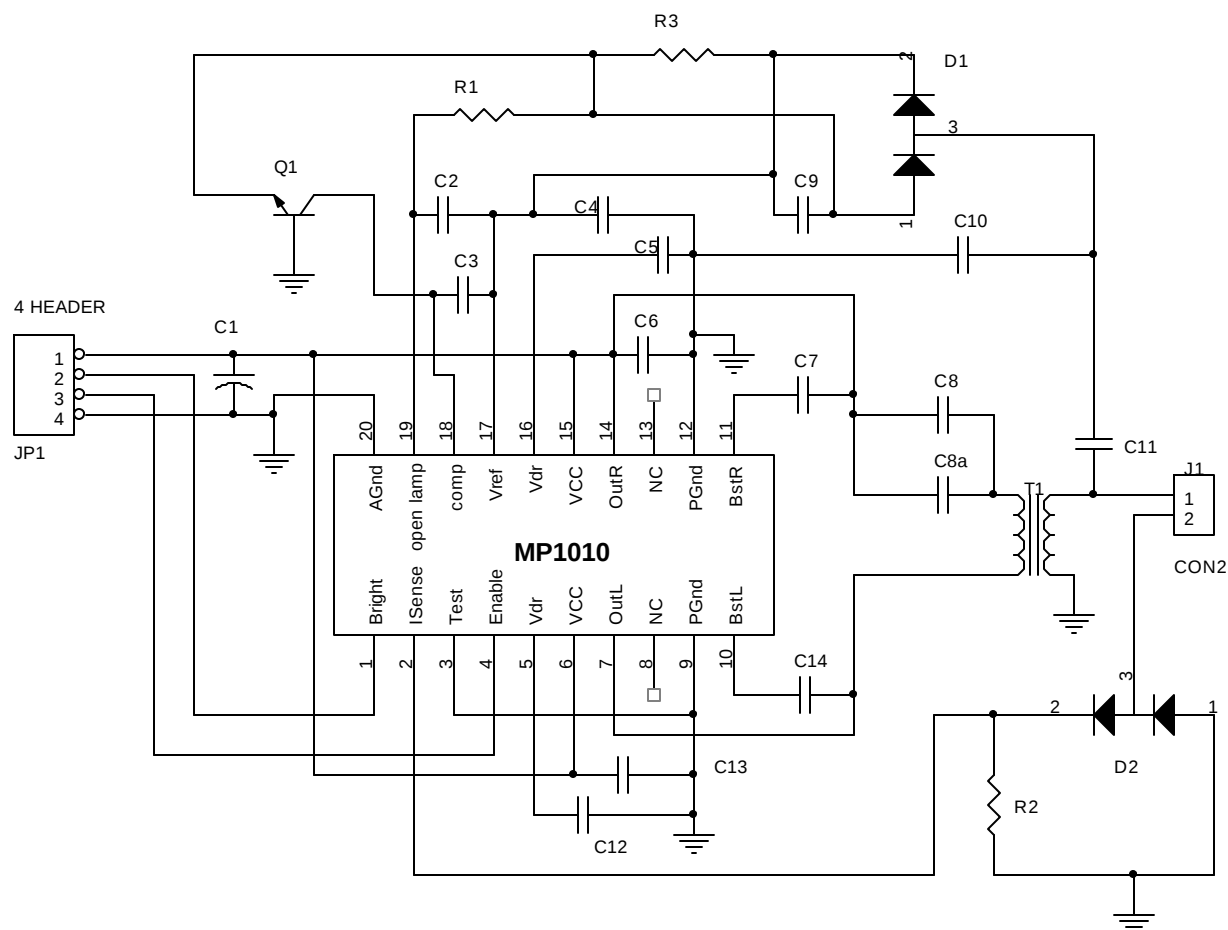
Functional Block Diagram



Truth Table

Enable	Test	Output L / R
L	X	High Z
H	H	0 volts (Standby)
L	X	High Z
H	L	Normal Operation

Reference Design for Open Lamp Regulation and Shutdown



Packaging Information

