

FAN7314

LCD Backlight Inverter Drive IC

Features

- High-efficiency single-stage power conversion
- Wide input voltage range: 5V to 25.5V
- Back light lamp ballast and soft dimming
- Reduces number of required external components
- Precision voltage reference trimmed to 2%
- ZVS half-bridge topology
- Soft start
- PWM control at fixed frequency
- Analog and burst dimming function
- Programmable striking frequency
- Open lamp protection
- Open lamp regulation
- 20-Pin SOIC

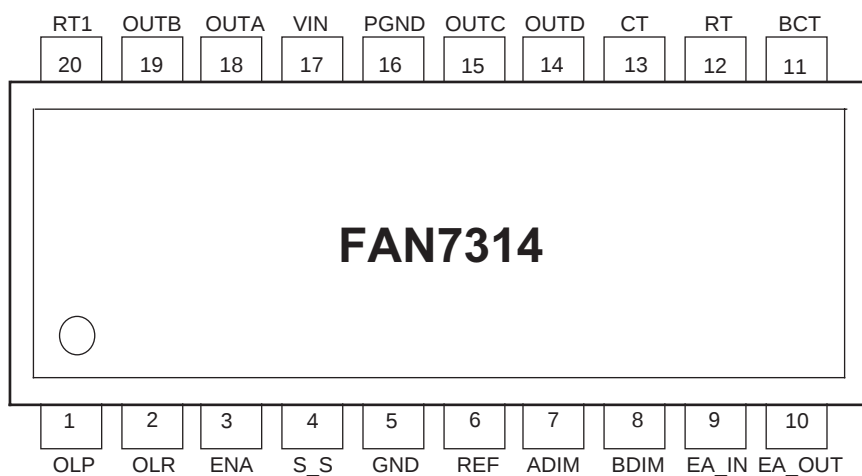
Description

The FAN7314 provides all the control functions for use as a series parallel resonant converter as well as a pulse width modulation (PWM) controller to develop a supply voltage. Typical operating frequency range is between 30kHz and 250kHz, depending on the CCFL and the transformer's characteristics.

Ordering Information

Product number	Package	Operating Temperature
FAN7314M	20-SOIC	-25°C to 85°C
FAN7314MX		

Pin Assignments



Pin Definitions

Pin Number	Pin Name	Pin Function Description
1	OLP	Open Lamp Protection
2	OLR	Open Lamp Regulation
3	ENA	Enable Input
4	S_S	Soft Start
5	GND	Analog Ground
6	REF	2.5V Reference Voltage
7	ADIM	Analog Dimming Input
8	BDIM	Burst Dimming Input
9	EA_IN	Error Amplifier Input
10	EA_OUT	Error Amplifier Output
11	BCT	Burst Dimming Timing Capacitor
12	RT	Timing Resistor
13	CT	Timing Capacitor
14	OUTD	NMOSFET Drive Output D
15	OUTC	PMOSFET Drive Output C
16	PGND	Power Ground
17	VIN	Supply Voltage
18	OUTA	PMOSFET Drive Output A
19	OUTB	NMOSFET Drive Output B
20	RT1	Striking Frequency Resistor

Absolute Maximum Ratings

For typical values $T_A = 25^\circ\text{C}$, $V_{CC} = 12\text{V}$ and for min/max values T_A is the operating ambient temperature range with $-25^\circ\text{C} \leq T_A \leq 85^\circ\text{C}$ and $5\text{V} \leq V_{CC} \leq 25.5\text{V}$, unless otherwise specified.

Symbol	Parameter	Value	Unit
V_{CC}	Supply Voltage	5 to 25.5	V
T_{opr}	Operating Temperature Range	-25 to 85	$^\circ\text{C}$
T_j	Junction Temperature	150	$^\circ\text{C}$
T_{stg}	Storage Temperature Range	-65 to 150	$^\circ\text{C}$
$R_{\theta JA}$	Thermal Resistance Junction-Air ^(1, 2)	70	$^\circ\text{C/W}$
P_d	Power Dissipation	1.8	W

Notes:

- Thermal resistance test board:
Size: 76.2mm x 114.3mm x 1.6mm(1S0P)
JEDEC standard: JESD51-2, JESD51-3
- Assume no ambient airflow.

ESD Level

Parameter	Pins	Conditions	Level	Unit
Human Body Model (HBM)	All pins	$R = 1.5\text{k}\Omega$, $C = 100\text{pF}$	2000	V
Machine Model (MM)	All pins except for BDIM	$C = 200\text{pF}$	300	
	BDIM		250	

Electrical Characteristics

For typical values $T_A = 25^\circ\text{C}$, $V_{CC} = 12\text{V}$ and for min/max values T_A is the operating ambient temperature range with $-25^\circ\text{C} \leq T_A \leq 85^\circ\text{C}$ and $5\text{V} \leq V_{CC} \leq 25.5\text{V}$, unless otherwise specified.

Symbol	Characteristics	Test Condition	Min.	Typ.	Max.	Unit
REFERENCE SECTION (Recommend X7R Capacitor)						
ΔV_{ref}	Line Regulation	$5 \leq V_{CC} \leq 25.5\text{V}$	–	2	25	mV
V_{25}	2.5V Regulation Voltage		2.45	2.5	2.55	V
OSCILLATOR SECTION (Main)						
fosc	Oscillation Frequency	$T_A = 25^\circ\text{C}$, $C_t = 270\text{pF}$ $R_t = 18\text{k}$	110.4	115	119.6	kHz
		$C_t = 270\text{pF}$, $R_t = 18\text{k}$	108	115	122	
V_{cth}	CT High Voltage		–	2.0	–	V
V_{ctl}	CT Low Voltage		–	0.5	–	V
OSCILLATOR SECTION (Burst)						
foscb	Oscillation Frequency	$T_A = 25^\circ\text{C}$, $C_{tb} = 10\text{nF}$, $R_t = 18\text{k}$	204.75	225	245.25	Hz
		$C_{tb} = 10\text{nF}$, $R_t = 18\text{k}$	201	225	248	
V_{bcth}	BCT High Voltage		–	2	–	V
V_{bctl}	BCT Low Voltage		–	0.5	–	V