



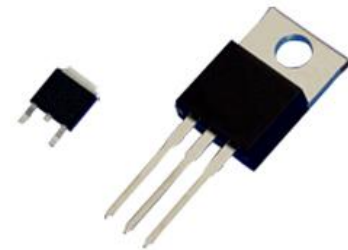
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LD1204

Motorbike Direction Indicator Driver IC

Type	R _{ds(on)}	I _{lim}	V _{CC}
LD1204	0.08Ω	12A	40V



TO252

TO220

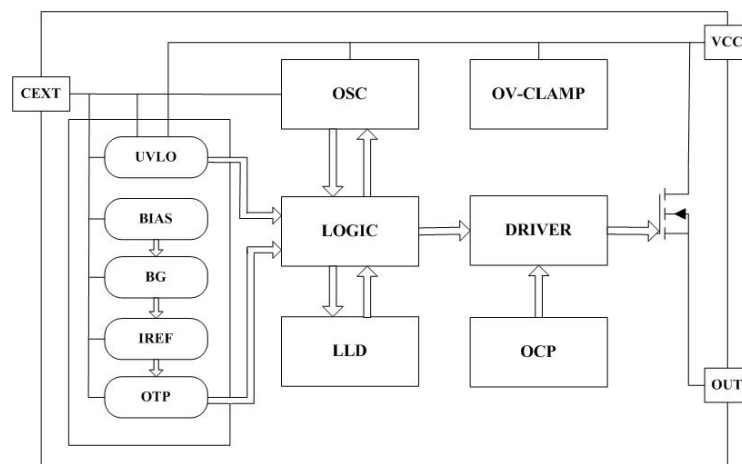
Features

- Built-in fixed frequency oscillator
External capacitor does not affect the flash frequency
- Double frequency flashing in low load conditions
- Cycle by cycle over temperature shutdown
- Battery reverse protection
- Cycle by cycle over current protection

Description

LD1204 is a driver ASIC that used in automotive and motorcycle direction indicator lamp unit. The IC has a frequency conversion function, when the load current is less than the internal set threshold, the flasher frequency doubling. At the same time it has multiple protection functions, such as over-current protection, over-temperature protection, high-voltage clamp, under-voltage protection and battery reverse protection, to ensure that in different circumstances the normal functions of the chip. Chip peripheral circuit is simple, just a external capacitor (220uF,10V) that connected with the CEXT pin and OUT pin, while Vcc pin is connected to the positive terminal of the battery, the OUT pin connected to a switch (which set between the OUT pin of chip and the direction indicator lamp). When the switch turn on, chip generates a duty ratio of about 50% for the direction indicator control signal.

Block diagram





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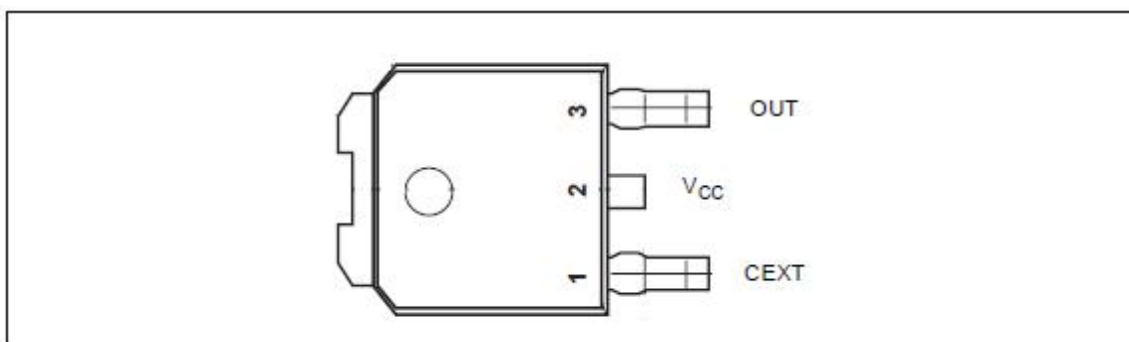
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Absolute Maximum Rating

Symbol	Parameter	Value	Units
Vcc	DC Supply Voltage	40	V
Vdd	CEXT capacitor voltage	6.5	V
Vesd	Human body model	4000	V
Ptot	Power dissipation Tc=25 °C	20	W
Tj	Junction temperature	Internally Limited	°C
Tstg	Storage temperature	-55 to 150	°C

Pin information





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Typical application

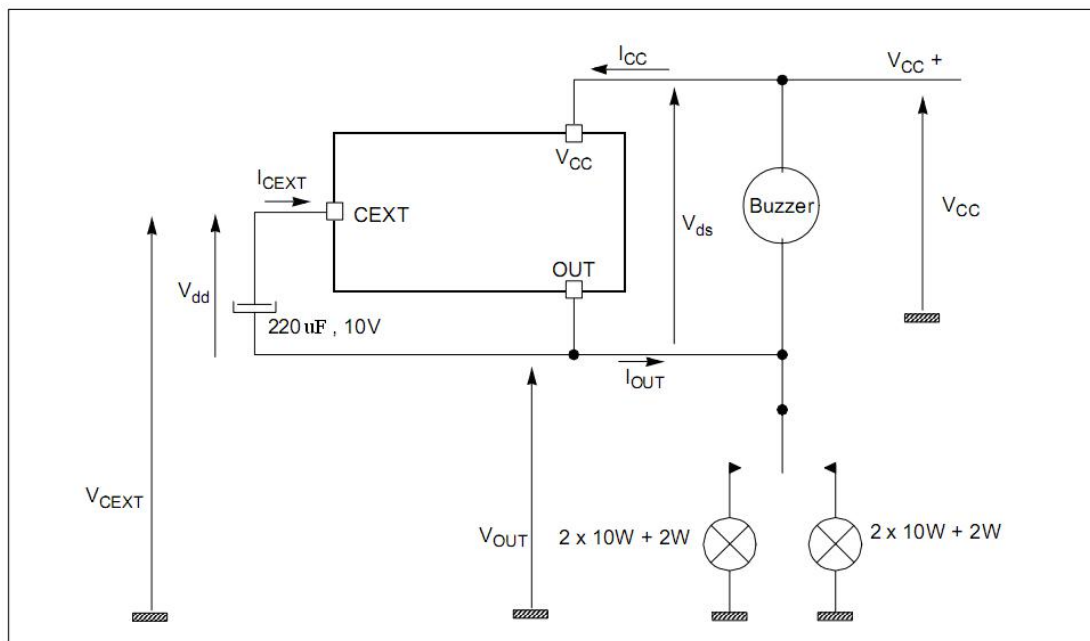


Fig 1. 12V typical application

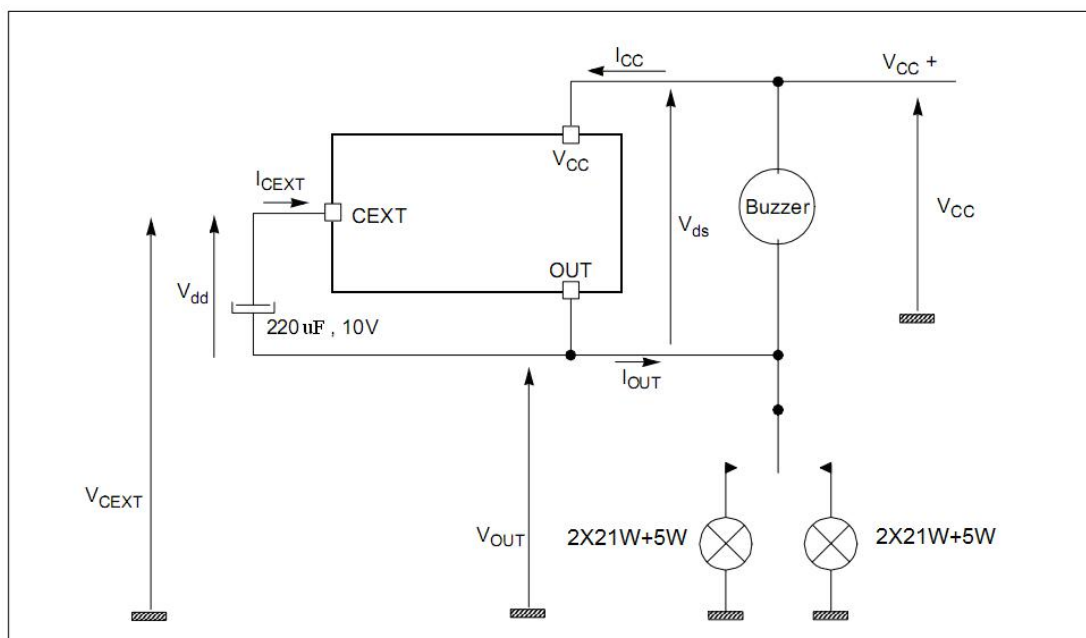


Fig-2. 24V typical application



Electrical parameters (9V<V_{cc}<16V; -20℃<T_j<85℃; unless otherwise specified)

● **Power Parameters**

Symbol	Parameter	Test conditions	Min	Typ	Max	Unit
ICEXT	CEXT pin discharge current	V _{ds} =0V; V _{dd} =5V		500		μA
V _{ddcl}	CEXT clamping voltage	ICEXT=2mA; V _{ds} =0V	TBD	7.2	TBD	V
V _{ddrcl}	CEXT reverse clamping voltage	ICEXT=-2mA; V _{ds} =0V	-1.0		-0.3	V
R _{on}	On-resistance	V _{dd} =5V; I _{out} =1.6A;		0.08		Ω

● **Dynamic Parameters**

Symbol	Parameter	Test conditions	Min	Typ	Max	Unit
fosc	Under normal conditions, turn on-off frequency of the power transistor	V _{cc} =13.5V; more than 100μF capacitor is placed between CEXT and OUT; R _{load} =8Ω	1.37	1.45	1.53	Hz
V _{ch}	High potential of the sawtooth, between CEXT and OUT	V _{cc} =13.5V		6		V

● **Protection Parameter**

Symbol	Parameter	Test conditions	Min	Typ	Max	Unit
I _{lim}	Drain current limit	V _{dd} =5V; V _{DS} =13.5V		5		A
T _{jsh}	Over temperature protection up-threshold			130		℃
T _{jrs}	Over temperature protection down-threshold			100		℃
I _{df1}	Frequency threshold	V _{CC} =9.5V (*)	816	940	1066	mA
I _{df2}	Frequency threshold	V _{CC} =15.5V (*)	1062	1240	1417	mA



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Functional description

• OSC module

When the normal load (power of direction indicator lamps is 20W) connected to OUT Pin under the action of the switch, the internal oscillator of the chip will work, and generating internal clock signal, the signal will be divided frequency, then generate a gate control signal to drive the turn-on-off of power transistor, then the duty ratio of frequency is closed to 50%.

• OCP module

The chip built-in OCP module, in order to limit the output current is less than 5A, to protect the chip. As long as the output current exceeds the over-current threshold, the OCP signal trigger, and the output current is limited at maximum current point of 2A.

• OTP module

When in normal work, if the temperature of chip exceeds the setting temperature threshold (130°C), OTP signal trigger, causing power transistor closed. Considering the interference on the OTP, the module exist hysteresis. When OTP signal is triggered, it will be shielded, after the chip drops down to lower than the OTP signal temperature ($<100^{\circ}\text{C}$). If in a cycle, the temperature returned to normal, then chip began normal operations in the next cycle.