

UNISONIC TECHNOLOGIES CO., LTD

# L2044

## LINEAR INTEGRATED CIRCUIT

# DUAL OUTPUT FLASHER

### DESCRIPTION

The UTC **L2044** is a dual output stages flasher designed as a relay driver for flashing light control in automotive applications. Both sides direction indicator input with only a small control current makes switch contacts for small loads possible. Each side of the vehicle is controlled separately.

The construction of the hazard switch could be simplified due to hazard warning input is separate. The flasher will dramatically increase the flash frequency by a typical ratio of 2:1 if lamp fault is detected. The UTC **L2044** can be directly connected to the battery due to extreme low current consumption

## FEATURES

- \* Temperature and Supply Voltage Compensated Flashing Frequency
- \* Frequency Doubling Indicates Lamp Fault.
- \* Two Relay Driver Outputs with High Current-carrying Capacity and Low Saturation Voltage
- \* Minimum Lamp Load for Flasher Operation: ≥ 1W
- \* Very Low Sensitivity to EMI
- \* Extremely Low Current Consumption<10µA ( at Switches Open)
- \* Reverse Polarity Protection
- \* Three Control Inputs: Left, Right and Hazard Warning



\*Pb-free plating product number: L2044L

#### PIN DESCRIPTION

PIN	PIN	FUNCTION
No.	NAME	FUNCTION
1	OSC	Oscillator
2	SIL	Start input left
3	SIR	Start input right
4		Start input hazard
4	SINV	warning
5	VS	Vcc
6	CR1	Control input relay 1
7	CR2	Control input relay 2
8	LD	Lamp failure detection
9	VS	V <sub>cc</sub>
10	GND	ground
11	OR1	Output relay 1
12	VS	V <sub>cc</sub>
13	OR2	Output relay 2
14	OSC	Oscillator

#### ORDERING INFORMATION

Order	Number	Daakaga	Packing	
Normal	Lead free	Гаскауе		
L2044-D14-T	L2044L-D14-T	DIP-14	Tube	
L2044-S14-R	L2044L-S14-R	SOP-14	Tape Reel	
L2044-S14-T	L2044L-S14-T	SOP-14	Tube	

# L2044

## PIN CONFIGURATION



## BLOCK DIAGRAM





## ■ ABSOLUATE MAXIUM RATINGS

PARAMETER		SYMBOL	RATINGS	UNIT
Supply Voltage, 1 min, pins 5, 9 and 12		V <sub>CC</sub>	24	V
Junction Temperature		TJ	+125	
Operating Temperature			0 ~70	
Storage Temperature		T <sub>STG</sub>	-40 ~ +150	
Thermal Desistance, Junction to Ambient	DIP-14		90	/W
	SOP-14	JA	120	

Note 1.Absolute maximum ratings are those values beyond which the device could be permanently damaged. Absolute maximum ratings are stress ratings only and functional device operation is not implied.

2. The device is guaranteed to meet performance specification within 0  $\sim$ 70 operating temperature range and assured by design from -20  $\sim$ 85.

### ■ ELECTRICAL CHARACTERISTICS (V<sub>CC</sub> = 12V, T<sub>a</sub>=25 , unless otherwise specified.)

PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Supply Voltage Range		Vcc	Pins 5, 9, 12	8		18	V
Saturation Voltage	V <sub>CC</sub> =8V	V <sub>OUT</sub>	R <sub>L</sub> =82Ω			1.0	V
	V <sub>CC</sub> =12V					1.2	
Clamping Voltage		V <sub>12</sub>	T <sub>a</sub> = -20 ~ 85	25.0	27.5	30.0	V
Relay output overvoltage detection (relay disabled)		V <sub>12</sub>	T <sub>a</sub> = -20 ~ 85	18	20	22	V
			V <sub>CC</sub> =9V		70.6		
Control signal threshold		V <sub>cc</sub>	V <sub>CC</sub> =13.5V		85.5		mV
			V <sub>CC</sub> =16V		93.0		
Output current for relay driver		I <sub>OUT</sub>	Pins 11, 13			300	mA
Relay output reverse current		I <sub>OUT</sub>	Pins 11, 13			0.1	mA
Supply current, switches open		Icc	Pins 5, 9, 12			10	μA
Relay coil resistance		$R_{L}$					Ω
Start delay		t <sub>on</sub>	First bright phase			10	ms
Tolerance of control signal threshold			V <sub>CC</sub> =9V~16V, Pin 8, T <sub>a</sub> = -20 ~ 85	-6		+6	%
Temperature coefficient of control signal Threshold		T <sub>c</sub> V <sub>o</sub>	V <sub>CC</sub> =13.5V, Pin 8		10		μV/K

### ■ TOLERANCES (V<sub>CC</sub> = 12V, T<sub>a</sub> =25 , unless otherwise specified.)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Frequency determining resistor	R <sub>1</sub>		6.8		510	kΩ
Frequency determining capacitor	C1				47	μF
Frequency tolerance	f <sub>1</sub>	Normal flashing, basic frequency $f_1$ excluding the tolerance of $R_1$ and $C_1$	-5		+5	%
Pright pariod	f <sub>1</sub>	Basic frequency f <sub>1</sub>	47		53	0/
f <sub>2</sub> Control frequency f <sub>2</sub> 37		37		45	70	
Frequency increase	f <sub>2</sub>	Lamp failure	2.15×f <sub>1</sub>		2.3×f <sub>1</sub>	Hz
Lamp load	PL		1			W

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