



## ULN2018

Preliminary

LINEAR INTEGRATED CIRCUIT

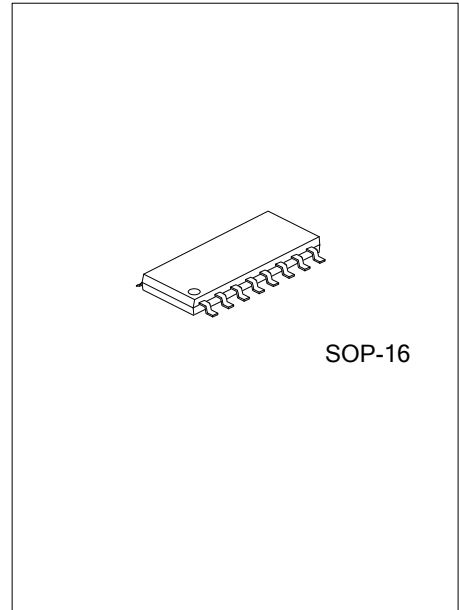
### DRIVER CIRCUIT SPECIAL PURPOSE FOR MICROWAVE OVEN

#### DESCRIPTION

UTC **ULN2018** include 1ch condenser buzzer driver, 4ch relay driver, safety circuit and gate signal detection circuit. The 4ch relay driver include: 1ch independent Darlington Transistor driver, 1ch main relay driver, 2ch relay driver controlled by safety circuit. Current capability of each channel driver is 100mA. Output clamp diode is inserted in each channel to drive inductive load.

#### FEATURES

- \* Output current (single output): 100mA (MAX.)
- \* High sustaining voltage output: 50V (MIN.)
- \* Output clamp diodes
- \* TTL/CMOS logic level is compatible.

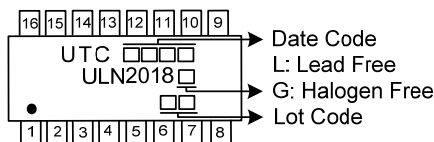


#### ORDERING INFORMATION

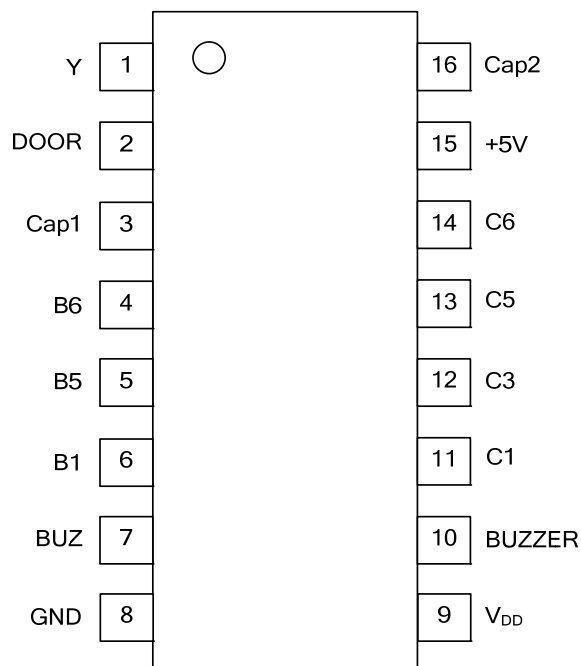
Ordering Number		Package	Packing
Lead Free	Halogen Free		
ULN2018L-S16-R	ULN2018G-S16-R	SOP-16	Tape Reel

<p>ULN2018G-S16-R</p> <p>(1)Packing Type</p> <p>(2)Package Type</p> <p>(3)Green Package</p>	<p>(1) R: Tape Reel</p> <p>(2) S16: SOP-16</p> <p>(3) G: Halogen Free and Lead Free, L: Lead Free</p>
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#### MARKING



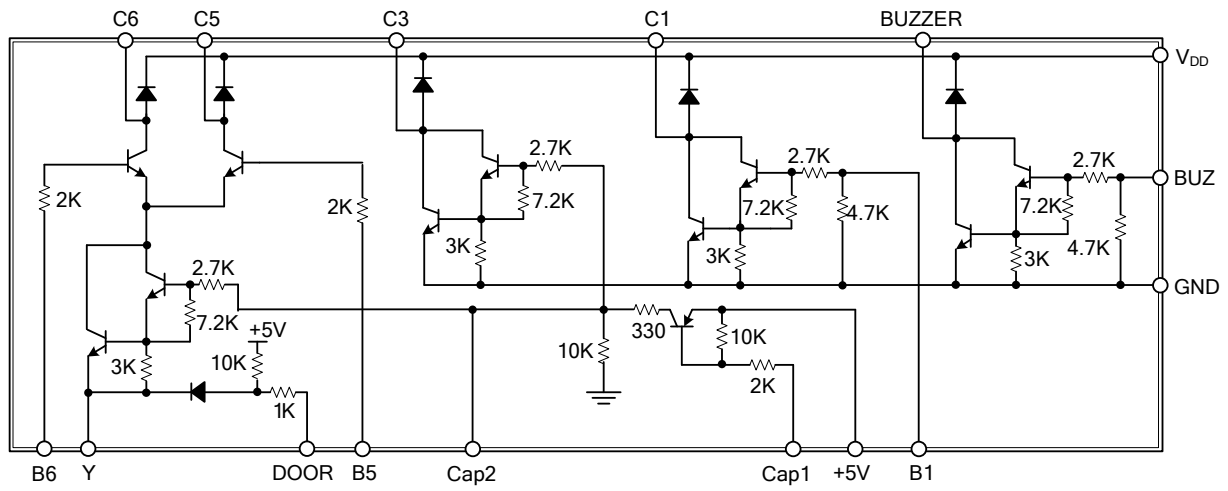
■ PIN CONFIGURATION



■ PIN DESCRIPTION

PIN NO.	PIN NAME	DESCRIPTION
1	Y	Switch of C4/C5/C6
2	DOOR	Signal of door
3	Cap1	Signal input terminal
4	B6	Relay drive Input 6
5	B5	Relay drive Input 5
6	B1	Relay drive Input 1
7	BUZ	Buzzer drive input
8	GND	Ground
9	V <sub>DD</sub>	Supply power
10	BUZZER	Buzzer drive output
11	C1	Relay drive output 1
12	C3	Relay drive output 3
13	C5	Relay drive output 5
14	C6	Relay drive output 6
15	+5V	5V power supply
16	Cap2	Connect capacitor for signal rectification

■ BLOCK DIAGRAM



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■ ABSOLUTE MAXIMUM RATING ( $T_A=25^\circ\text{C}$ , unless otherwise specified.)

PARAMETER	SYMBOL	RATINGS	UNIT	
$V_{DD}$ Supply	$V_{DD}$	50	V	
Input Terminal Voltage	$V_I$	30	V	
Driver Output Sustaining Voltage	$V_{CE}$	50	V	
Peak Current Of Each Collector Output	$I_{CP}$	100	mA	
Clamp Diode Forward Peak Current	$I_{OK}$	100	mA	
Power Dissipation	$P_D$	$T_A=25^\circ\text{C}$	1.5	W
		$T_A=85^\circ\text{C}$	0.8	W
Operating Junction Temperature	$T_J$	+150	$^\circ\text{C}$	
Storage Temperature	$T_{STG}$	-65 ~ +150	$^\circ\text{C}$	

Note: 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.

■ RECOMMENDED OPERATING CONDITIONS ( $T_A=25^\circ\text{C}$ , unless otherwise specified)

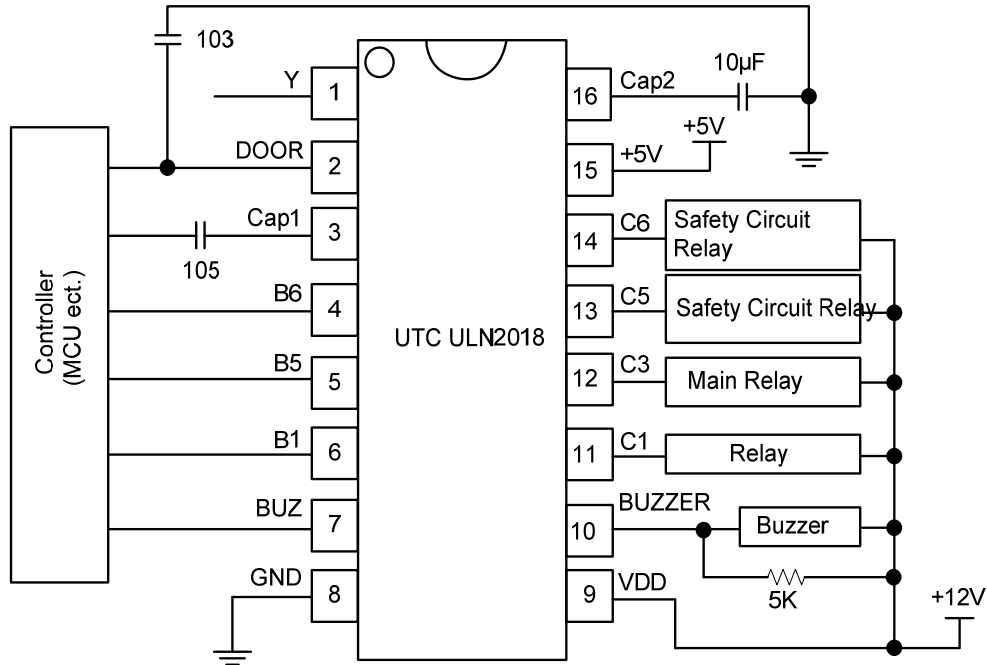
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Output Sustaining Voltage	$V_{CE(SUS)}$		0		50	V
Output Current	$I_{OUT}$	$T_A=+85^\circ\text{C}$			100	mA/ch
Clamp Diode Reverse Voltage	$V_R$				50	V
Clamp Diode Forward Current	$I_F$				70	mA
Input Voltage	$V_{IN}$		0		12	V
Input Voltage (Output On)	$V_{IN(ON)}$	$I_{OUT}=100\text{mA}$	5		12	V
Input Voltage (Output Off)	$V_{IN(OFF)}$		0		0.7	V
Operating Thermal Range	$T_A$		-40		+85	$^\circ\text{C}$
Junction Temperature	$T_J$		-40		+125	$^\circ\text{C}$

■ ELECTRICAL CHARACTERISTICS ( $T_A=25^\circ\text{C}$ , unless otherwise specified.)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT	
Input Current	$I_I$	$V_I=5\text{V}$ , $I_C=60\text{mA}$	BUZ/B1		2.5	mA	
			B5/B6		1.9		
Collector-Emitter Saturation Voltage	$V_{CE(SAT)}$	$V_I=5\text{V}$ , $I_C=100\text{mA}$	BUZZER/C1		0.9	V	
			C3		1.03		
			C5/C6	$V_I=5\text{V}$ , $I_C=80\text{mA}$			1.2
				$V_I=5\text{V}$ , $I_C=100\text{mA}$			1.7
Clamp Diode Forward Voltage	$V_F$	$I_F=70\text{mA}$		1.1	1.4	V	
Leak Current Of Collector (Off)	$I_{C\_OFF}$	$V_{CE}=50\text{V}$ , $I_I=0$			50	$\mu\text{A}$	
Output Sustaining Voltage	$V_{CE}$	$V_{CE}=50\text{V}$ , $I_I=0$	50			V	
Clamp Diode Reverse Voltage	$I_R$	$V_R=50\text{V}$	50			V	
Clamp Diode Reverse Current	$I_R$	$V_R=50\text{V}$			50	$\mu\text{A}$	
Gate Signal Output High Level	$V_{H\_DOOR}$		4.5			V	
Gate Signal Output Low Level	$V_{L\_DOOR}$				1.0	V	
Cap2 Terminal Output Level	$V_{Cap2}$	Cap2: 10 $\mu\text{F}$ cap to GND, Cap1: 2kHz, 50% duty square wave input Via 1 $\mu\text{F}$ cap		2.5		V	

■ TYPICAL APPLICATION CIRCUIT

To realize 1ch condenser buzzer driver, 1ch main relay driver, 1ch independent Darlington Transistor driver, 2ch relay driver controlled by safety circuit.



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