



ULN2020

Preliminary

LINEAR INTEGRATED CIRCUIT

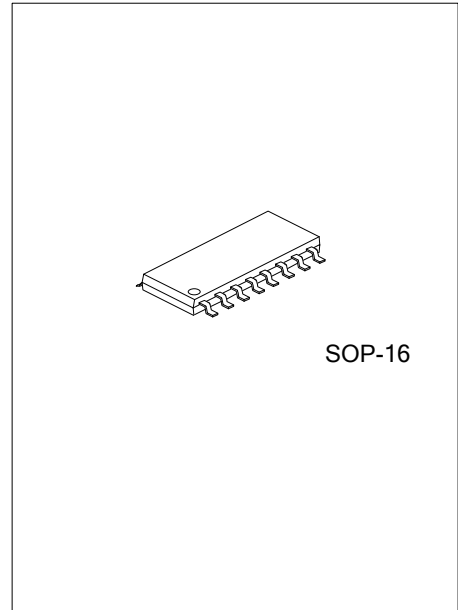
DRIVER CIRCUIT SPECIAL PURPOSE FOR MICROWAVE OVEN

DESCRIPTION

UTC **ULN2020** include 1ch condenser buzzer driver, 4ch relay driver, safety circuit and gate signal detection circuit. The 4ch relay driver include: 1ch main relay driver, 3ch 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.

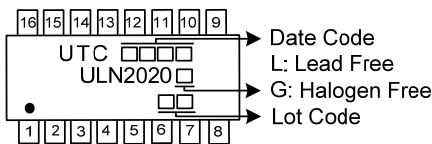


ORDERING INFORMATION

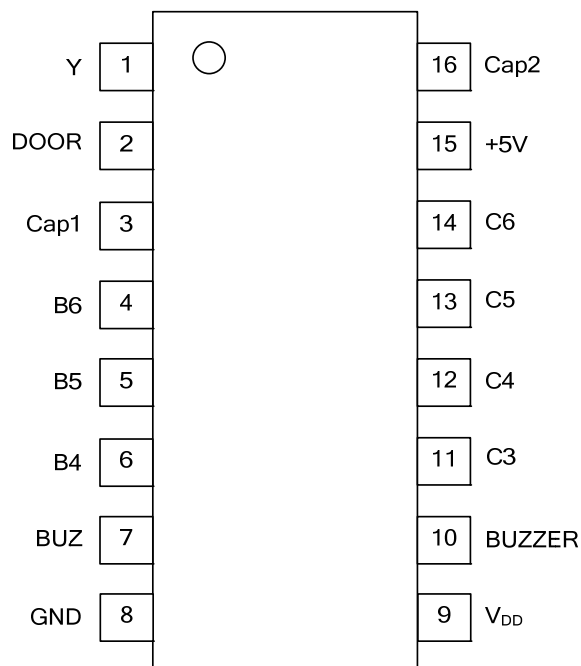
Ordering Number		Package	Packing
Lead Free	Halogen Free		
ULN2020L-S16-R	ULN2020G-S16-R	SOP-16	Tape Reel

<p>ULN2020G-S16-R</p> <ul style="list-style-type: none"> (1) Packing Type (2) Package Type (3) Green Package 	<ul style="list-style-type: none"> (1) R: Tape Reel (2) S16: SOP-16 (3) G: Halogen Free and Lead Free, L: Lead Free
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MARKING



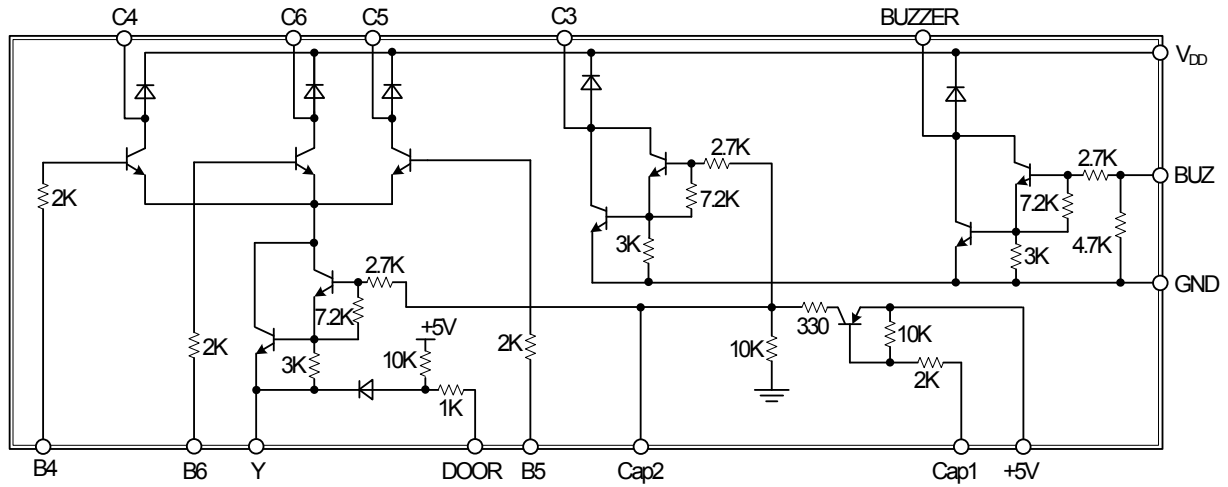
■ PIN CONFIGURATION



■ 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	B4	Relay drive Input 4
7	BUZ	Buzzer drive input
8	GND	Ground
9	V _{DD}	Supply power
10	BUZZER	Buzzer drive output
11	C3	Relay drive output 3
12	C4	Relay drive output 4
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)

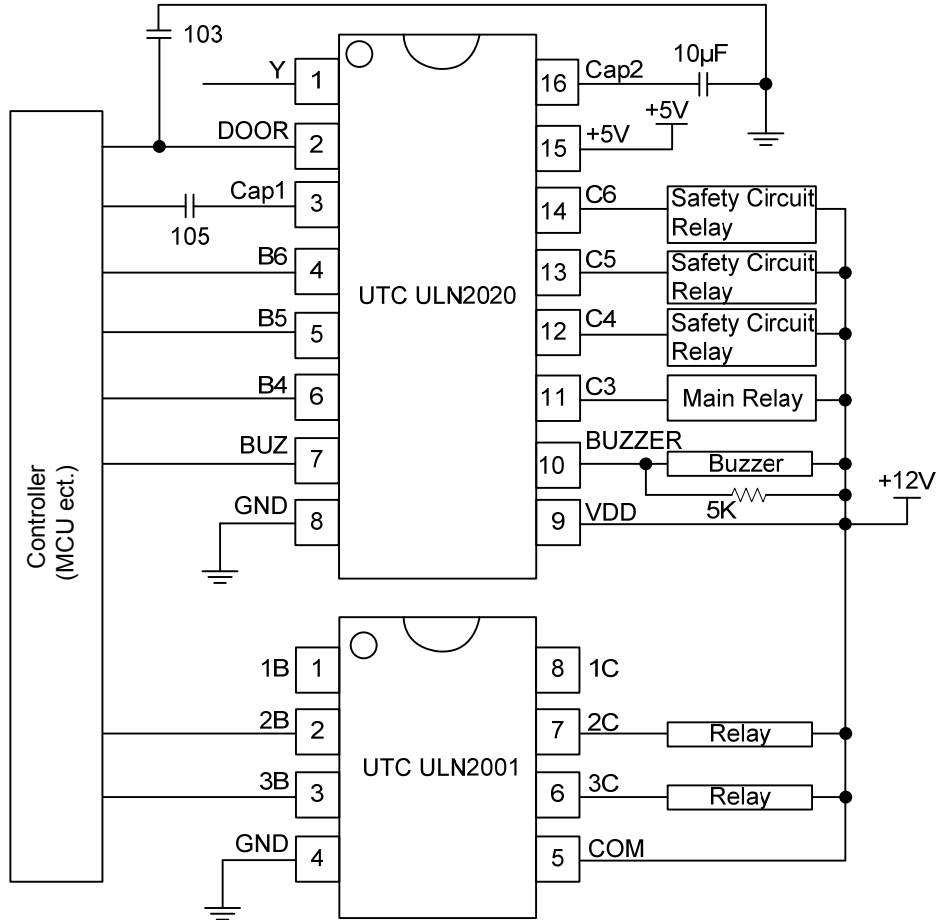
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Output Sustaining Voltage	$V_{CE(SUS)}$		0		50	V
Output Current	I_{OUT}	$T_A=85^{\circ}\text{C}$			100	mA/ch
Clamp Diode Reverse Voltage	V_R				50	V
Clamp Diode Forward Current	I_F				70	mA
Input Voltage	V_{IN}		0		12	V
Input Voltage (Output On)	$V_{IN(ON)}$	$I_{OUT}=100\text{mA}$	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	2.5	mA
				B4/B5/B6	1.9	
Collector-Emitter Saturation Voltage	$V_{CE(SAT)}$	$V_I=5\text{V}$, $I_C=100\text{mA}$		BUZZER	0.9	V
				C3	1.03	
				C4/C5/C6	1.3	
					1.7	
Clamp Diode Forward Voltage	V_F	$I_F=70\text{mA}$		1.0	1.4	V
Leak Current Of Collector (Off)	$I_{C(OFF)}$	$V_{CE}=50\text{V}$, $I_I=0$			50	μA
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	μA
Gate Signal Output High Level	V_{HDOOR}		4.5			V
Gate Signal Output Low Level	V_{LDOOR}				1.0	V
Cap2 Terminal Output Level	V_{Cap2}	Cap2: 10 μF cap to GND, Cap1: 2kHz, 50% duty square wave input Via 1 μF cap		2.5		V

■ TYPICAL APPLICATION CIRCUIT

Cooperate with UTC ULN2001 (Please refer to the spec in detail), it can realize 1ch condenser buzzer driver, 1ch main relay driver, 2ch independent Darlington Transistor driver, 3ch relay driver controlled by safety circuit.



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