

# UNISONIC TECHNOLOGIES CO., LTD

# **USS120**

# Preliminary

# **AC LINE SWITCH**

# DESCRIPTION

The UTC **USS120** high performance switch circuit is able to control a load up to 2A.

The UTC **USS120** switch embeds a high voltage clamping structure to absorb the inductive turn off energy and a gate level shifter driver to separate the digital controller from the main switch. It is triggered with a negative gate current flowing out of the gate pin.

## FEATURES

- \* Blocking voltage: V<sub>DRM</sub> / V<sub>RRM</sub> = +/-700V
- \* Switch integrated driver
- \* High noise immunity: static dV/dt >500V/µs
- \* Enables equipment to meet IEC 61000-4-5 Standard

## SYMBOL



#### ORDERING INFORMATION

Ordering Number		Deekege	Pin Assignment			Deaking	
Lead Free	Halogen Free	Fackage	1	2	3	Facking	
USS120L-TF3-T	USS120G-TF3-T	TO-220F	С	0	G	Tube	

USS120G-TF3-T (1)Packing Type (2)Package Type (3)Green Package	(1) T: Tube (2) TF3: TO-220F (3) G: Halogen Free and Lead Free, L: Lead Free
(3)Green Package	

#### MARKING





# ■ PIN DESCRIPTION

PIN No.	PIN NAME	Description
1	COM	Common drive reference to connect to the power line neutral
2	G	Switch Gate input to connect to the digital controller
3	OUT	Switch Output to connect to the load



# ■ ABSOLUTE MAXIMUM RATINGS

PARAMETER	SYMBOL	RATINGS	UNIT	
Peak Repetitive Off-State Voltage	V <sub>DRM</sub> ,V <sub>RRM</sub>	700	V	
RMS on-state current full cycle sine wave 50 to $(T_J = -10^{\circ}C)$	I <sub>T(RMS)</sub>	2	А	
Peak Non-Repetitive Surge Current	t <sub>P</sub> =20ms		20	А
(T <sub>J</sub> initial = 25°C, full cycle sine wave)	t <sub>P</sub> =16.7ms	ITSM	21	А
Circuit Fusing Considerations t <sub>P</sub> =10ms		l <sup>2</sup> t	2.6	A <sup>2</sup> s
Non repetitive on-state current critical rate of ris $I_G = 10mA$ (tr < 100ns) (F=120Hz) (T <sub>J</sub> = 125°C)	dl/dt	50	A/s	
Non repetitive line peak pulse voltage	V <sub>PP</sub>	2	kV	
Operating Junction Temperature Range (Rated V <sub>RRM</sub> and V <sub>DRM</sub> )	TJ	-40 ~ +125	°C	
Storage Temperature Range	T <sub>STG</sub>	-40 ~ +150	°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.

## ■ GATE CHARACTERISTICS

PARAMETER	SYMBOL	RATINGS	UNIT
Average gate power dissipation	P <sub>G(AV)</sub>	0.1	W
Peak gate power dissipation (tp = 20µs)	$V_{GM}$	5	W
Peak gate current (in respect to pin COM)	I <sub>GM</sub>	1	А

#### THERMAL DATA

PARAMETER	SYMBOL	RATINGS	UNIT	
Junction to Ambient	$\theta_{JA}$	60	°C/W	
Junction to Case	θ <sub>JC</sub>	3.5	°C/W	

# ■ ELECTRICAL CHARACTERISTICS (T<sub>J</sub>=25°C, unless otherwise stated)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT	
OFF CHARACTERISTICS							
Peak Forward or Reverse Blocking	T <sub>C</sub> =25°C					2	μA
Current	T <sub>C</sub> =125°C	IDRM, IRRM	V <sub>OUT</sub> -700V			200	μA
ON CHARACTERISTICS		-					
Peak Forward On-State Voltage	V <sub>TM</sub>	I <sub>OUT</sub> =2.8A, t <sub>P</sub> =380μs			1.3	V	
On state characteristic threshold voltage		V				0.95	V
(T <sub>C</sub> =125°C)		V TO				0.05	v
Gate Trigger Current (Continuous DC) II-III		I <sub>GT</sub>	V <sub>OUT</sub> =12V(DC), R <sub>L</sub> =140Ω			10	mA
Holding Current		I <sub>H</sub>	I <sub>OUT</sub> =100mA Gate Open			45	mA
Latch Current		١L	I <sub>G</sub> =20mA			65	mA
Non triggering voltage (T <sub>C</sub> =125°C)		$V_{GD}$	$V_{OUT}=V_{DRM}, R_{L}=3.3k\Omega$			0.15	V
Gate Trigger Voltage (continuous dc) II-III		V <sub>GT</sub>	V <sub>OUT</sub> =12V(DC), R <sub>L</sub> =140Ω			1	V
On state characteristic dynamic resistance		R <sub>D</sub>				200	mO
(T <sub>C</sub> =125°C)						200	11152
DYNAMIC CHARACTERISTICS							
Critical Rate of Rise of Off-State Voltage		d./dt		500			V/ue
(T <sub>C</sub> =110°C)		uy/ui		500			v/µs
Critical Rate of Rise of On-State Current		(di/dt)c	Without snubber	1			A/me
(T <sub>C</sub> =125°C)							AVITIS



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