

JST12C-1000TW 12A TRIAC

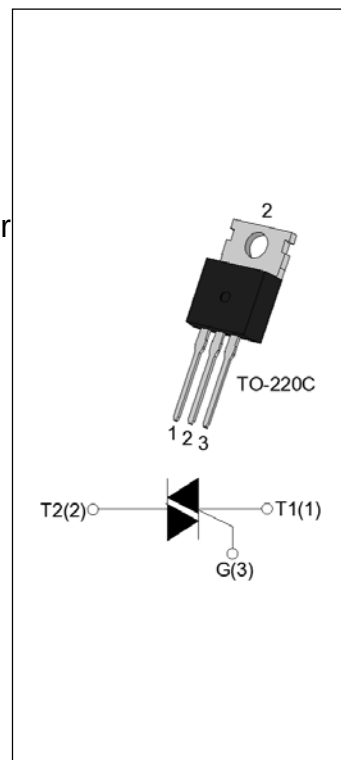
Rev.A.1.1

DESCRIPTION:

The JST12C-1000TW triac is suitable for general purpose AC switching. It can be used as an ON/OFF function in applications such as heating regulation, induction motor starting circuits, for phase control operation in light dimmers, motor speed controllers. JST12C-1000TW snubberless triac is especially recommended for use on inductive loads. It can be driven directly through the MCU I/O port. From T2 terminals to external heatsink. Package TO-220C is RoHS compliant.

MAIN FEATURES

Symbol	Value	Unit
$I_{T(RMS)}$	12	A
V_{DRM}/V_{RRM}	1000	V
$I_{GT\ I/II/III}$	5/5/5	mA


ABSOLUTE MAXIMUM RATINGS

Parameter	Symbol	Value	Unit
Storage junction temperature range	T_{stg}	-40-150	°C
Operating junction temperature range	T_j	-40-125	°C
Repetitive peak off-state voltage ($T_j=25^{\circ}C$)	V_{DRM}	1000	V
Repetitive peak reverse voltage ($T_j=25^{\circ}C$)	V_{RRM}	1000	V
RMS on-state current ($T_c \leq 103^{\circ}C$)	$I_{T(RMS)}$	12	A
Non repetitive surge peak on-state current (full cycle , $t_p=20ms$, $T_j=25^{\circ}C$)	I_{TSM}	120	A
Non repetitive surge peak on-state current (full cycle , $t_p=16.6ms$, $T_j=25^{\circ}C$)		132	
I^2t value for fusing ($t_p=10ms$, $T_j=25^{\circ}C$)	I^2t	72	A ² s
Critical rate of rise of on-state current ($I_G=2 \times I_{GT}$, $f=100Hz$, $T_j=125^{\circ}C$)	di/dt	50	A/ μs
Peak gate current ($t_p=20\mu s$, $T_j=125^{\circ}C$)	I_{GM}	4	A
Average gate power dissipation ($T_j=125^{\circ}C$)	$P_{G(AV)}$	0.5	W
Peak gate power	P_{GM}	10	W

Peak pulse voltage ($T_j=25^{\circ}\text{C}$; non-repetitive, off-state; FIG.7)	V_{pp}	3.5	kV
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ELECTRICAL CHARACTERISTICS ($T_j=25^{\circ}\text{C}$ unless otherwise specified)

Symbol	Test Condition	Quadrant	Value		Unit
I_{GT}	$V_D=12\text{V}$ $R_L=33\Omega$	I - II -III	MAX.	5	mA
V_{GT}		I - II -III	MAX.	1	V
V_{GD}	$V_D=V_{DRM}$ $T_j=125^{\circ}\text{C}$ $R_L=3.3\text{k}\Omega$	I - II -III	MIN.	0.2	V
I_L	$I_G=1.2I_{GT}$	I -III	MAX.	10	mA
		II		15	
I_H	$I_T=500\text{mA}$		MAX.	10	mA
dV/dt	$V_D=670\text{V}$ Gate Open $T_j=125^{\circ}\text{C}$		MIN.	50	V/ μs
$(dI/dt)_c$	$(dV/dt)_c=10\text{V}/\mu\text{s}$ $T_j=125^{\circ}\text{C}$		MIN.	1	A/ms
t_{on}	$I_G=10\text{mA}$ $I_A=200\text{mA}$ $I_R=20\text{mA}$ $T_j=25^{\circ}\text{C}$		TYP.	2	μs
t_{off}				20	

STATIC CHARACTERISTICS

Symbol	Parameter		Value(MAX.)	Unit
V_{TM}	$I_{TM}=17\text{A}$ $t_p=380\mu\text{s}$	$T_j=25^{\circ}\text{C}$	1.5	V
V_{TO}	Threshold voltage	$T_j=125^{\circ}\text{C}$	0.77	V
R_D	Dynamic resistance	$T_j=125^{\circ}\text{C}$	35	$\text{m}\Omega$
I_{DRM}	$V_D=V_{DRM}$ $V_R=V_{RRM}$	$T_j=25^{\circ}\text{C}$	8	μA
I_{RRM}		$T_j=125^{\circ}\text{C}$	1	mA

THERMAL RESISTANCES

Symbol	Parameter	Value	Unit
$R_{th(j-c)}$	junction to case (AC)	1.3	$^{\circ}\text{C}/\text{W}$
$R_{th(j-a)}$	junction to ambient (AC)	60	$^{\circ}\text{C}/\text{W}$

ORDERING INFORMATION

<u>J</u>	<u>ST</u>	<u>12</u>	<u>C</u>	<u>-1000</u>	<u>TW</u>
JieJie Microelectronics Co., Ltd.	Triacs				
	<u>IT(RMS):12A</u>				
		<u>C:TO-220C</u>			
					<u>TW:IGT1-3≤5mA</u>
				<u>1000:V_{DRM} /V_{RRM}≥1000V</u>	

MARKING

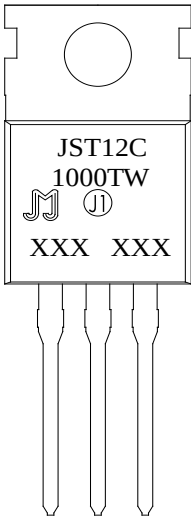
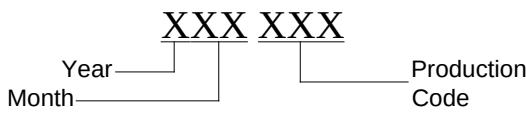
	
	Year Month
	Production Code

FIG.1: Maximum power dissipation versus RMS on-state current

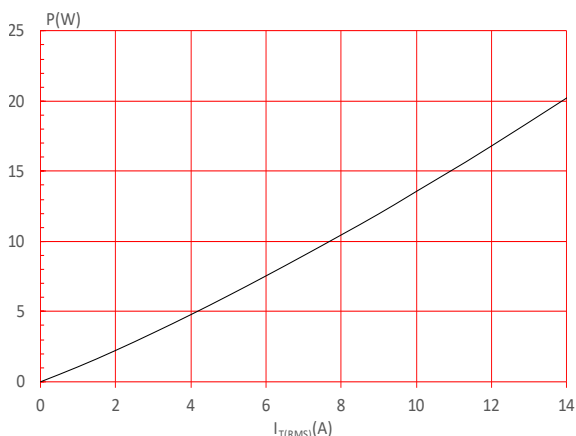


FIG.3: Surge peak on-state current versus number of cycles

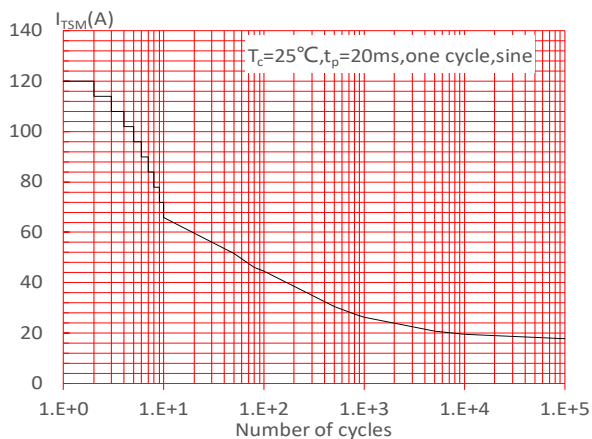


FIG.5: Non-repetitive surge peak on-state current for a sinusoidal pulse with width $t_p < 20\text{ms}$, and corresponding value of I^2t ($dI/dt < 50\text{A}/\mu\text{s}$)

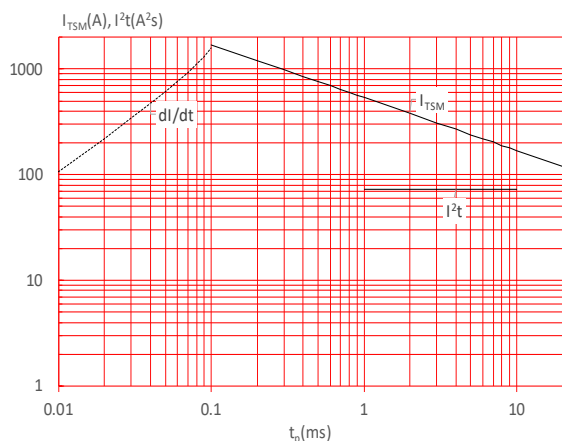


FIG.2: RMS on-state current versus case temperature

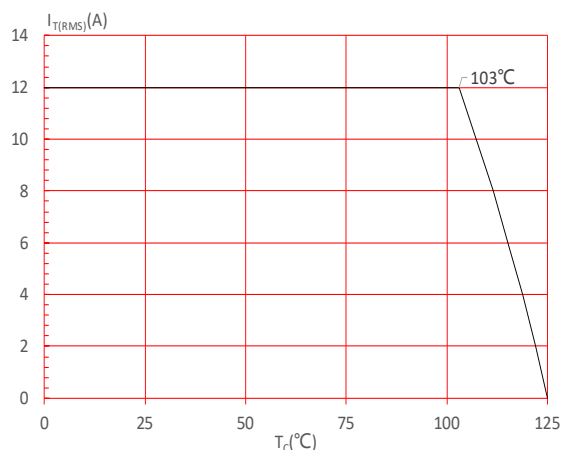


FIG.4: On-state characteristics

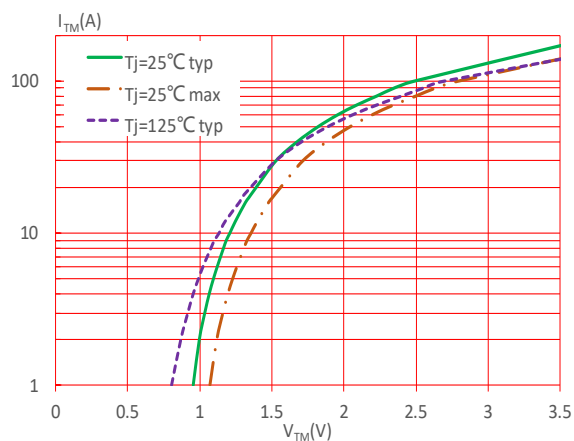


FIG.6: Relative variations of gate trigger current, holding current and latching current versus junction temperature

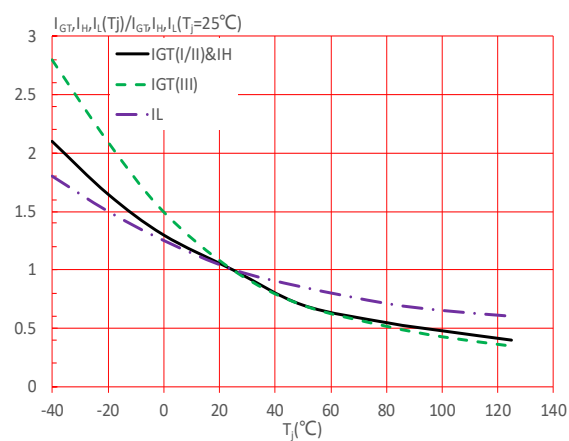
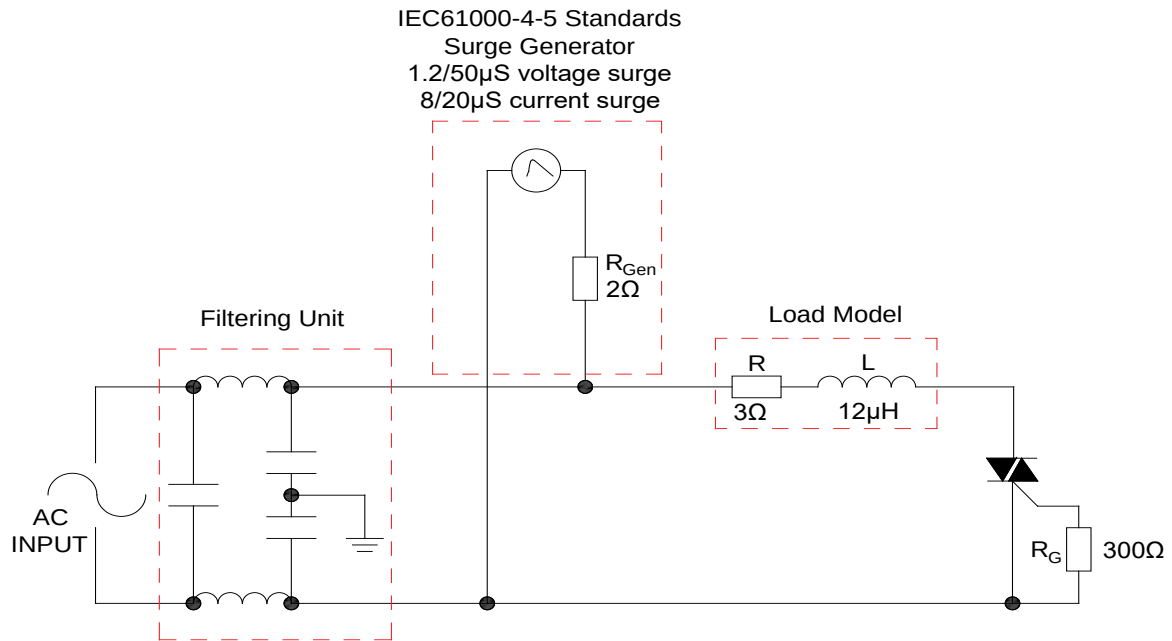


FIG.7: Test circuit for inductive and resistive loads to IEC-61000-4-5 standards

LEAD FORMING AND SOLDERING

Refer to the application note “Assembly Instructions for Thyristors in Through-hole Package” released by JieJie Microelectronics

ORDERING INFORMATION

Order code	Voltage $V_{\text{DRM}}/V_{\text{RRM}}$ (V)	IGT(mA)	Package	Base qty. (pcs)	Delivery mode
		I - II - III			
JST12C-1000TW	1000	5	TO-220C	50	Tube

Document Revision History

Date	Revision	Changes
Apr.11, 2023	A.1.0	Last updated
Oct.15, 2025	A.1.1	Revise PACKAGE MECHANICAL DATA

Technical drawing of a 3-pin plug, showing three views: front, side, and top. The drawing includes the following dimensions and labels:

- Front View (Top):** Shows the plug body with a circular hole. Dimensions include E (total width), L (hole diameter), $L3$ (height of the plug body), and H (total height). A note indicates the hole diameter is $\varnothing 3.45-3.65\text{mm}$.
- Side View (Right):** Shows the plug body with a circular hole. Dimensions include A (width of the plug body), $C2$ (height of the plug body), D (height of the plug body), $C3$ (height of the plug body), and C (width of the plug body).
- Top View (Bottom):** Shows the plug body with a circular hole. Dimensions include $E1$ (width of the plug body), $H1$ (height of the plug body), B (width of the plug body), G (width of the plug body), and M (width of the plug body).

Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	4.40		4.60	0.173		0.181
B	0.70		0.90	0.028		0.035
C	0.45		0.60	0.018		0.024
C2	1.25		1.35	0.049		0.053
C3	2.20		2.60	0.087		0.102
D	8.90		9.90	0.350		0.390
E	9.90		10.30	0.390		0.406
E1	0.80		1.20	0.031		0.047
F	6.30		6.90	0.248		0.272
G	2.40		2.70	0.094		0.106
H	28.00		29.80	1.102		1.173
H1	2.15		2.55	0.085		0.100
I	4.70		5.10	0.185		0.201
K	9.90		10.30	0.390		0.406
L1	2.70		3.30	0.106		0.130
L2	1.14		1.70	0.045		0.067
L3	2.65		2.95	0.104		0.116
M	4.80		5.20	0.189		0.205

Technical drawing of a 3D printed part, showing top, front, and side views with dimensions and a printing area.

Top View:

- Overall width: 520 ± 0.5
- Overall height: 530 ± 0.5
- Printing area: 80×55
- Distance from left edge to printing area: 5
- Distance from top edge to printing area: 3
- Distance from right edge to printing area: 5
- Distance from bottom edge to printing area: 5.5
- Distance from left edge to printing area: 520 ± 0.5
- Distance from bottom edge to printing area: 530 ± 0.5
- Distance from left edge to printing area: 520 ± 0.5
- Distance from bottom edge to printing area: 530 ± 0.5
- Distance from left edge to printing area: 520 ± 0.5
- Distance from bottom edge to printing area: 530 ± 0.5

Front View:

- Overall width: 520 ± 0.5
- Overall height: 530 ± 0.5
- Printing area: 80×55
- Distance from left edge to printing area: 5
- Distance from top edge to printing area: 3
- Distance from right edge to printing area: 5
- Distance from bottom edge to printing area: 5.5
- Distance from left edge to printing area: 520 ± 0.5
- Distance from bottom edge to printing area: 530 ± 0.5
- Distance from left edge to printing area: 520 ± 0.5
- Distance from bottom edge to printing area: 530 ± 0.5
- Distance from left edge to printing area: 520 ± 0.5
- Distance from bottom edge to printing area: 530 ± 0.5

Side View:

- Overall width: 7 ± 0.2
- Overall height: 33
- Printing area: 3.8×0.6
- Distance from left edge to printing area: 2.4
- Distance from top edge to printing area: 3.8
- Distance from right edge to printing area: 3.8
- Distance from bottom edge to printing area: 0.6
- Distance from left edge to printing area: 2.4
- Distance from top edge to printing area: 3.8
- Distance from right edge to printing area: 3.8
- Distance from bottom edge to printing area: 0.6

PACKAGE	OUTLINE	TUBE (PCS)	INNER BOX (PCS)	PER CARTON
TO-220C	TUBE	50	1,000	5,000

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