

JST12X-1000CW 12A TRIAC

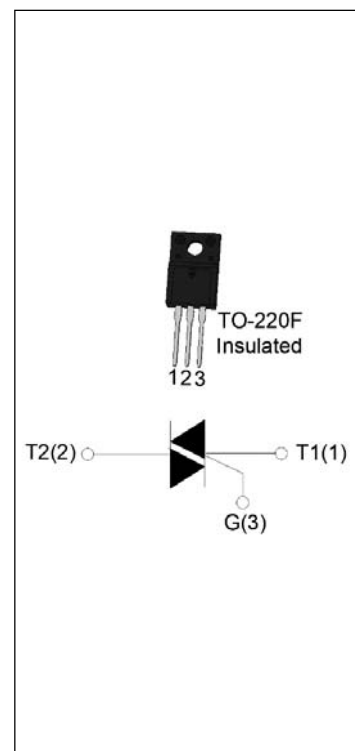
Rev.A.1.1

DESCRIPTION:

The JST12X-1000CW triac is suitable for general purpose AC switching. It is more suitable for the switch functions of washing machines' water valve, positive inversion of motor, heat pump...JST12X-1000CW snubberless triac is especially recommended for use on inductive loads. By using an external plastic package, JST12X-1000CW provides a rated insulation voltage of 2000 VRMS, complying with UL standards (File ref: E252906). Package TO-220F is RoHS compliant.

MAIN FEATURES

Symbol	Value	Unit
$I_{T(RMS)}$	12	A
V_{DRM}/V_{RRM}	1000	V
$I_{GT\ I/II/III}$	35/35/35	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 ($T_c \leq 85^{\circ}C$)	$I_{T(RMS)}$	12	A
Non repetitive surge peak on-state current (full cycle , $t_p=20ms$, $T_j=25^{\circ}C$)	I_{TSM}	130	A
Non repetitive surge peak on-state current (full cycle , $t_p=16.6ms$, $T_j=25^{\circ}C$)		140	
I^2t value for fusing ($t_p=10ms$, $T_j=25^{\circ}C$)	I^2t	84.5	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	100	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}	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.	35	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.	50	mA
		II		60	
I_H	$I_T=500\text{mA}$		MAX.	40	mA
dV/dt	$V_D=670\text{V}$ Gate Open $T_j=125^{\circ}\text{C}$		MIN.	1000	V/ μs
$(dI/dt)_c$	$(dV/dt)_c=20\text{V}/\mu\text{s}$ $T_j=125^{\circ}\text{C}$		MIN.	12	A/ms
t_{on}	$I_G=40\text{mA}$ $I_A=200\text{mA}$ $I_R=20\text{mA}$ $T_j=25^{\circ}\text{C}$		TYP.	3	μs
t_{off}				30	

STATIC CHARACTERISTICS

Symbol	Parameter		Value(MAX.)	Unit
V_{TM}	$I_{TM}=18\text{A}$ $t_p=380\mu\text{s}$	$T_j=25^{\circ}\text{C}$	1.5	V
V_{TO}	Threshold voltage	$T_j=125^{\circ}\text{C}$	0.77	V
R_D	Dynamic resistance	$T_j=125^{\circ}\text{C}$	36	$\text{m}\Omega$
I_{DRM}	$V_D=V_{DRM}$ $V_R=V_{RRM}$	$T_j=25^{\circ}\text{C}$	5	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)	2.4	$^{\circ}\text{C}/\text{W}$
$R_{th(j-a)}$	junction to ambient (AC)	60	$^{\circ}\text{C}/\text{W}$

ORDERING INFORMATION

J	ST	12	X	-1000	CW
JieJie Microelectronics Co., Ltd.	Triacs	$I_{T(RMS)}: 12A$	X: TO-220F(Ins)	1000: $V_{DRM}/V_{RRM} \geq 1000V$	CW: $I_{GT1-3} \leq 35mA$

MARKING

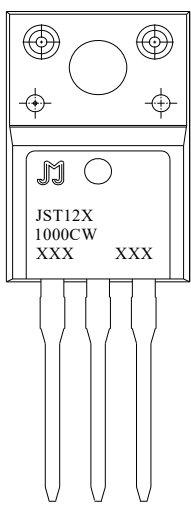
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FIG.1: Maximum power dissipation versus RMS on-state current

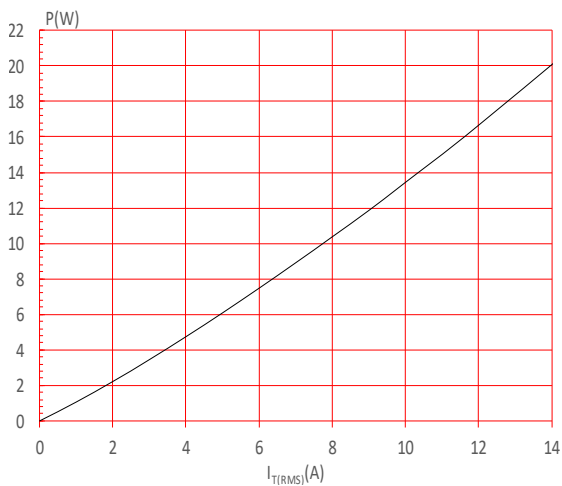


FIG.3: Surge peak on-state current versus number of cycles

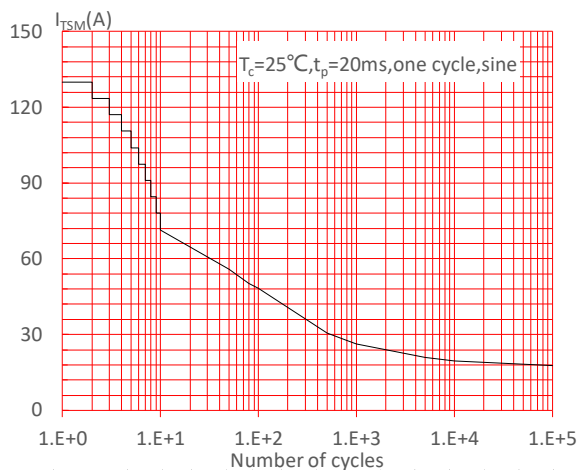


FIG.5: Non-repetitive surge peak on-state current for a sinusoidal pulse with width $t_p < 20ms$, and corresponding value of I^2t ($di/dt < 100A/\mu s$)

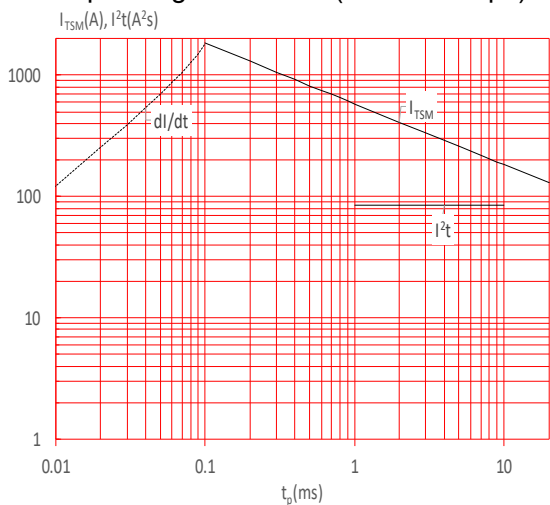


FIG.2: RMS on-state current versus case temperature

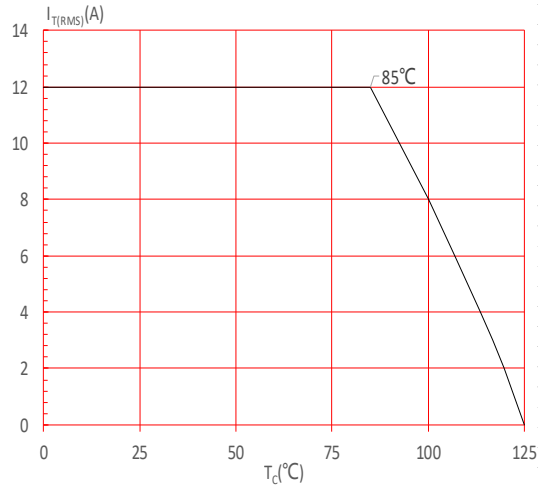


FIG.4: On-state characteristics

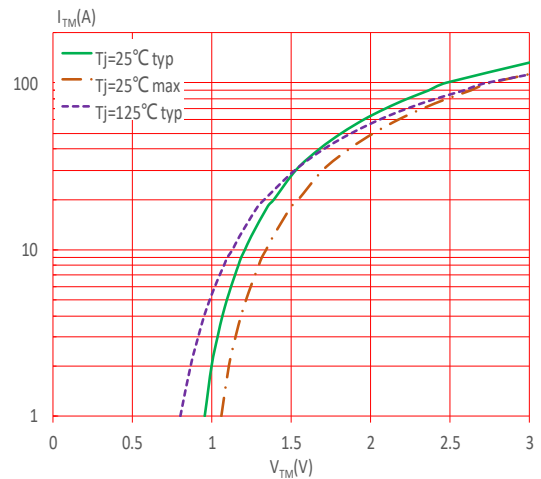


FIG.6: Relative variations of gate trigger current, holding current and latching current versus junction temperature

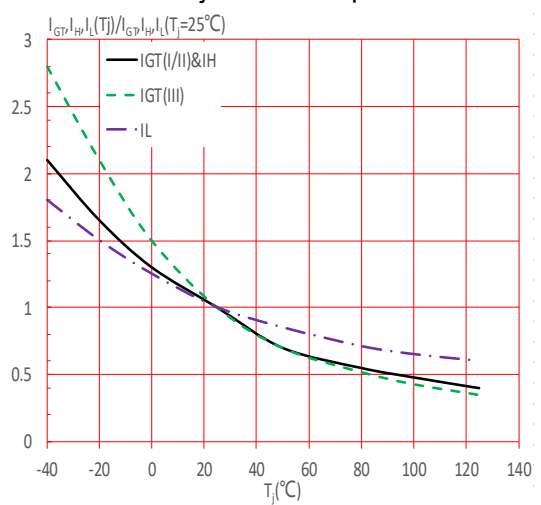
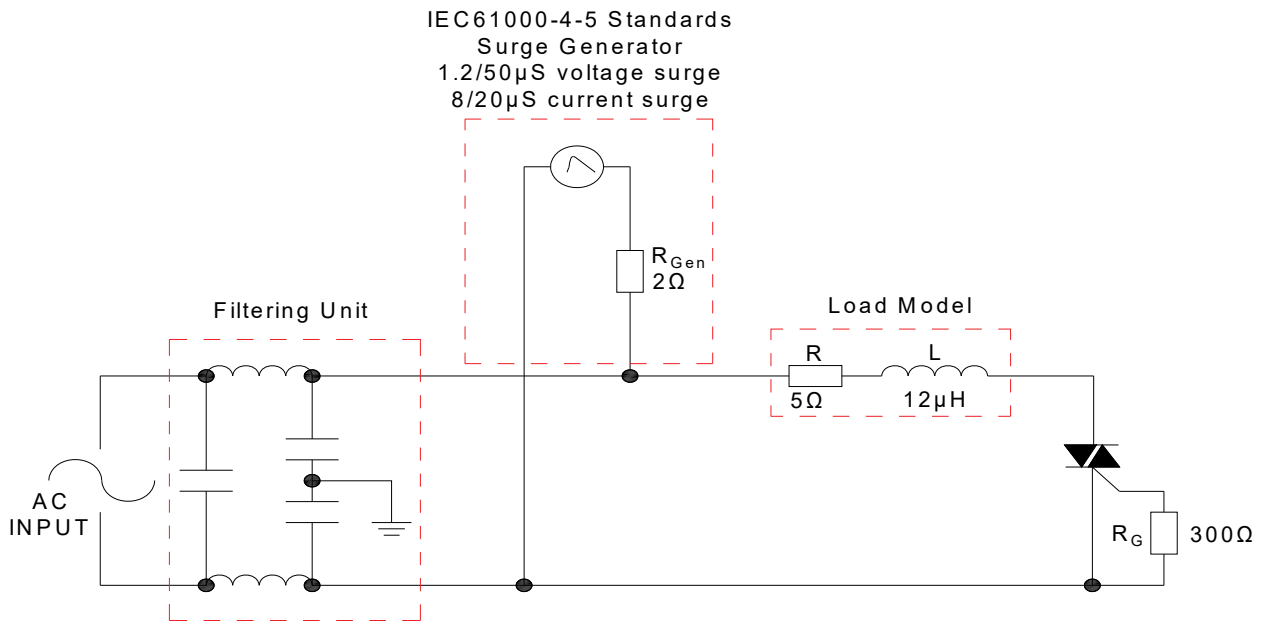


FIG.7: Test circuit for inductive and resistive loads to IEC-61000-4-5 standards



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			
JST12X-1000CW	1000	35	TO-220F(Ins)	50	Tube

Document Revision History

Date	Revision	Changes
Apr.10, 2023	A.1.0	Last updated
Oct.15, 2025	A.1.1	Revise PACKAGE MECHANICAL DATA

Technical drawing of a 3-pin plug, showing front and side views with dimensions and labels.

Front View Dimensions:

- E:** Total width of the plug body.
- I:** Distance from the left edge to the center of the top hole.
- L3:** Distance from the top edge to the center of the top hole.
- L1:** Distance from the top edge to the start of the pin insulation.
- L2:** Distance from the start of the pin insulation to the bottom edge.
- L:** Total length of the plug body.
- H:** Total height of the plug body.
- K:** Height of the top section.
- G:** Distance from the left edge to the center of the bottom hole.
- M:** Distance between the centers of the two bottom holes.
- B:** Distance from the right edge to the center of the bottom hole.
- J:** Total height of the pin insulation.

Side View Dimensions:

- A:** Total height of the plug body.
- C2:** Distance from the top edge to the start of the pin insulation.
- F:** Height of the top section.
- D:** Height of the bottom section.
- C3:** Distance from the bottom edge to the start of the pin insulation.
- C:** Total height of the pin insulation.

Other Labels:

- Ø 3 05-3.25mm:** Diameter of the pin insulation.
- 3:** Number of pins.

Technical drawing of a 3D-printed part showing three views: front, top, and side. The front view shows a rectangular part with a central slot and a "printing area" label. The top view shows a rectangular part with a central slot and a "printing area" label. The side view shows a rectangular part with a central slot and a "printing area" label. Dimensions are provided in millimeters.

Front View Dimensions:

- Overall width: 520 ± 0.5
- Overall height: 5.5
- Slot width: 80
- Slot depth: 5
- Slot radius: $R3$
- Slot position offset: 3
- Slot diameter: $\phi 4.5$
- Slot diameter: $\phi 3.0 \pm 0.05$

Top View Dimensions:

- Overall width: 530 ± 0.5
- Overall height: 5.5
- Slot width: 80
- Slot depth: 5
- Slot radius: $R3$
- Slot position offset: 3
- Slot diameter: $\phi 4.5$
- Slot diameter: $\phi 3.0 \pm 0.05$

Side View Dimensions:

- Overall width: 7.0 ± 0.2
- Overall height: 33
- Slot width: 2.4
- Slot depth: 3.8
- Slot radius: $R3$
- Slot position offset: 3.8
- Slot diameter: $\phi 4.5$
- Slot diameter: $\phi 3.0 \pm 0.05$

<http://www.jjwdz.com>

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