

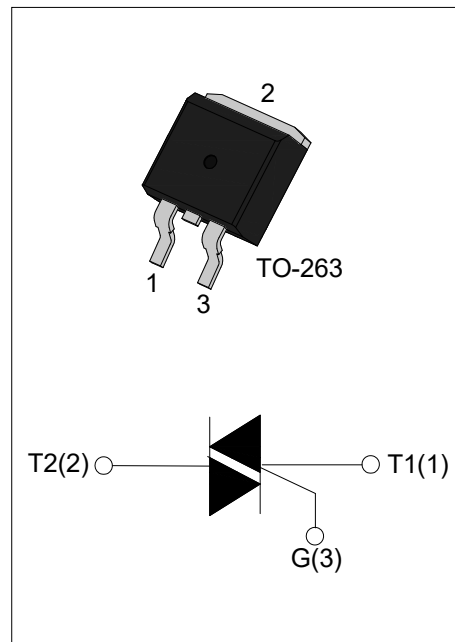


## JST12E 12A TRIACs

Rev.8.0

### DESCRIPTION:

With high ability to withstand the shock loading of large current, JST12E triacs provide high dv/dt rate with strong resistance to electromagnetic interference. With high commutation performances, 3 quadrants products especially recommended for use on inductive load. Package TO-263 is RoHS compliant. (2011/65/EU)



### MAIN FEATURES

Symbol	Value	Unit
$I_{T(RMS)}$	12	A
$V_{DRM}/V_{RRM}$	600/800/1000/1200	V

### 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 ( $T_j=25^\circ\text{C}$ )		$V_{DRM}$	600/800/1000/1200	V
Repetitive peak reverse voltage ( $T_j=25^\circ\text{C}$ )		$V_{RRM}$	600/800/1000/1200	V
Non repetitive surge peak Off-state voltage		$V_{DSM}$	$V_{DRM} + 100$	V
Non repetitive peak reverse voltage		$V_{RSM}$	$V_{RRM} + 100$	V
RMS on-state current	TO-263 ( $T_C=100^\circ\text{C}$ )	$I_{T(RMS)}$	12	A
Non repetitive surge peak on-state current (full cycle, F=50Hz)		$I_{TSM}$	120	A
$I^2t$ value for fusing ( $t_p=10\text{ms}$ )		$I^2t$	78	$\text{A}^2\text{s}$
Critical rate of rise of on-state current ( $I_G=2 \times I_{GT}$ )	I - II - III	$di/dt$	50	$\text{A}/\mu\text{s}$
Peak gate current		$I_{GM}$	4	A
Average gate power dissipation		$P_{G(AV)}$	1	W
Peak gate power		$P_{GM}$	5	W

**ELECTRICAL CHARACTERISTICS** ( $T_j=25^\circ\text{C}$  unless otherwise specified)

## 3 Quadrants

Symbol	Test Condition	Quadrant		Value				Unit
				BW	CW	SW	TW	
$I_{GT}$	$V_D=12\text{V } R_L=33\Omega$	I - II -III	MAX	50	35	10	5	mA
$V_{GT}$		I - II -III	MAX	1.3				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	80	50	30	20	mA
		II		90	60	40	30	
$I_H$	$I_T=100\text{mA}$		MAX	60	40	20	15	mA
dV/dt	$V_D=2/3V_{DRM}$ Gate Open $T_j=125^\circ\text{C}$		MIN	1000	500	200	100	V/ $\mu\text{s}$
(dI/dt) <sub>c</sub>	Without snubber $T_j=125^\circ\text{C}$		MIN	12	6.5	2.9	1	A/ms

## 4 Quadrants

Symbol	Test Condition	Quadrant		Value		Unit
				B	C	
$I_{GT}$	$V_D=12\text{V } R_L=33\Omega$	I - II -III	MAX	50	25	mA
		IV		70	50	
$V_{GT}$		ALL	MAX	1.3		V
$V_{GD}$	$V_D=V_{DRM} T_j=125^\circ\text{C}$ $R_L=3.3\text{K}\Omega$	ALL	MIN	0.2		V
$I_L$	$I_G=1.2I_{GT}$	I -III-IV	MAX	50	40	mA
		II		100	80	
$I_H$	$I_T=100\text{mA}$		MAX	50	25	mA
dV/dt	$V_D=2/3V_{DRM}$ Gate Open $T_j=125^\circ\text{C}$		MIN	500	200	V/ $\mu\text{s}$
(dV/dt) <sub>c</sub>	(dI/dt) <sub>c</sub> =5.3A/ms $T_j=125^\circ\text{C}$		MIN	10	5	V/ $\mu\text{s}$

**STATIC CHARACTERISTICS**

Symbol	Parameter		Value(MAX)	Unit
$V_{TM}$	$I_{TM} = 17A$ $t_p = 380\mu s$	$T_j = 25^\circ C$	1.5	V
$I_{DRM}$	$V_D = V_{DRM}$ $V_R = V_{RRM}$	$T_j = 25^\circ C$	5	$\mu A$
$I_{RRM}$		$T_j = 125^\circ C$	1	mA

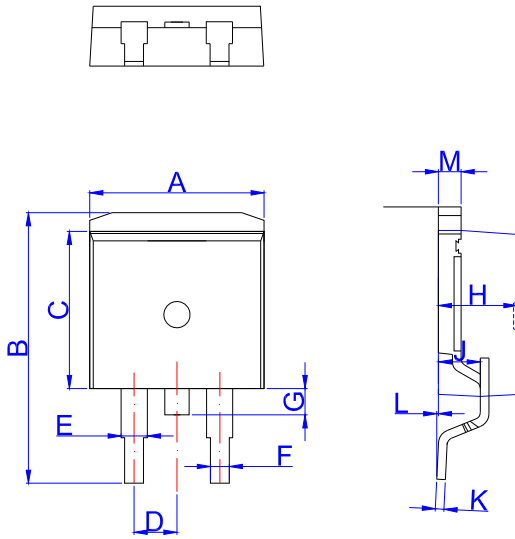
**THERMAL RESISTANCES**

Symbol	Parameter		Value	Unit
$R_{th(j-c)}$	junction to case(AC)	TO-263	1.4	$^\circ C/W$
$R_{th(j-a)}$	junction to ambient		45	

**ORDERING INFORMATION**

<p>JieJie Microelectronics Co.,Ltd</p>	<p><b>J</b></p> <p>Triacs</p> <p><math>I_{T(RMS)}: 12A</math></p> <p>E: TO-263 ETR: TO-263(Tape&amp;Reel)</p>	<p><b>ST</b></p> <p><b>12</b></p> <p><b>E</b></p>	<p><b>-600</b></p> <p>600: <math>V_{DRM} / V_{RRM} \geq 600V</math> 800: <math>V_{DRM} / V_{RRM} \geq 800V</math> 1000: <math>V_{DRM} / V_{RRM} \geq 1000V</math> 1200: <math>V_{DRM} / V_{RRM} \geq 1200V</math></p>	<p><b>BW</b></p> <p>BW: <math>I_{GT1-3} \leq 50mA</math> CW: <math>I_{GT1-3} \leq 35mA</math> SW: <math>I_{GT1-3} \leq 10mA</math> TW: <math>I_{GT1-3} \leq 5mA</math> B: <math>I_{GT1-3} \leq 50mA</math> <math>I_{GT4} \leq 70mA</math> C: <math>I_{GT1-3} \leq 25mA</math> <math>I_{GT4} \leq 50mA</math></p>
----------------------------------------	-------------------------------------------------------------------------------------------------------------------	---------------------------------------------------	-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

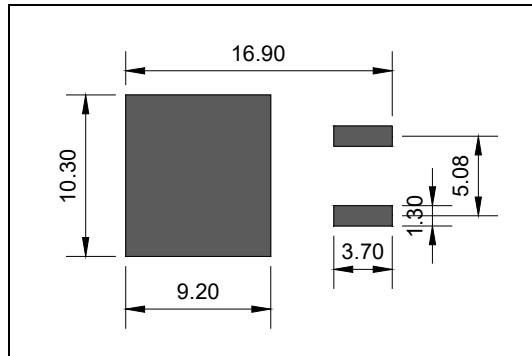
PACKAGE MECHANICAL DATA



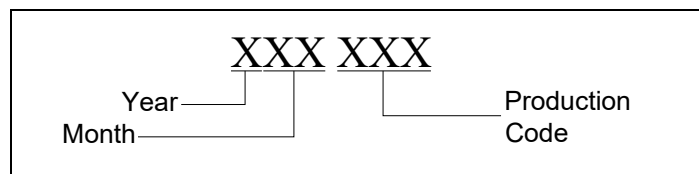
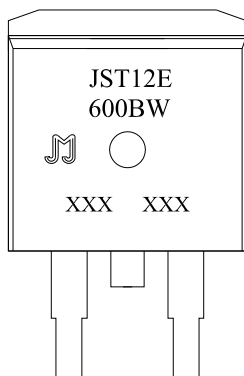
TO-263

Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	9.90		10.20	0.390		0.402
B	14.70		15.80	0.579		0.622
C	9.4		9.6	0.37		0.378
D		2.54			0.100	
E	1.20		1.40	0.047		0.055
F	0.75		0.85	0.029		0.033
G			1.75			0.069
H	4.40		4.70	0.173		0.185
J	2.30		2.70	0.091		0.106
K	0.38		0.55	0.015		0.022
L	0	0.10	0.25	0	0.004	0.010
M	1.25		1.35	0.049		0.053

FOOTPRINT-TO-263 (dimensions in mm)



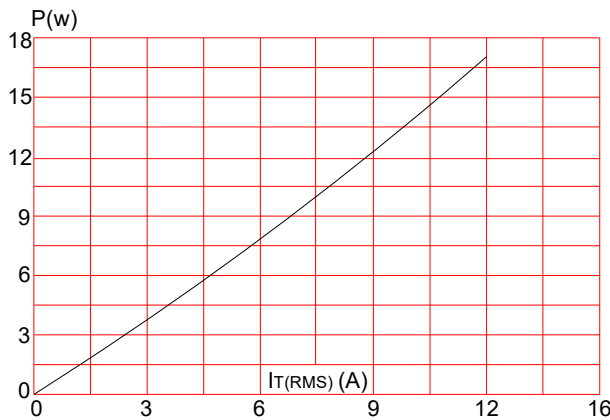
MARKING



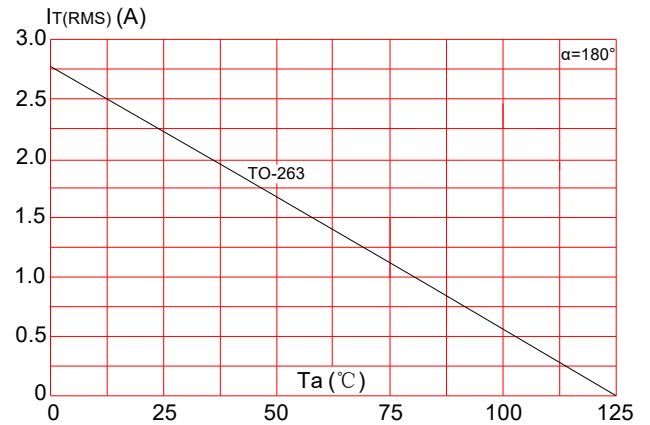
PACKAGE INFORMATION

PACKAGE	OUTLINE	TUBE (PCS)	INNER BOX (PCS)	PER CARTON
TO-263	TUBE	50	1,000	8,000
PACKAGE	OUTLINE	REEL (PCS)	PER CARTON (PCS)	TAPE & REEL
TO-263	TAPING	800	4,000	13 inch

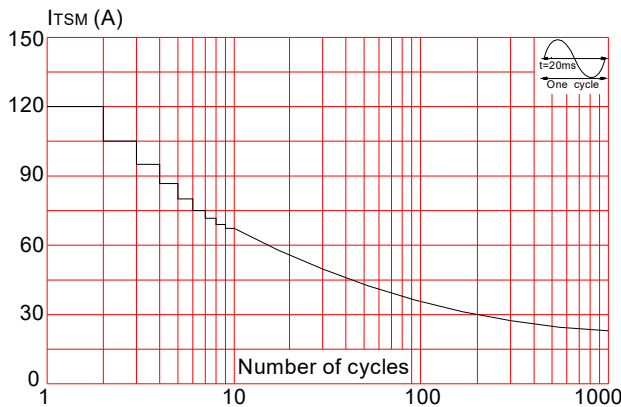
**FIG.1** Maximum power dissipation versus RMS on-state current



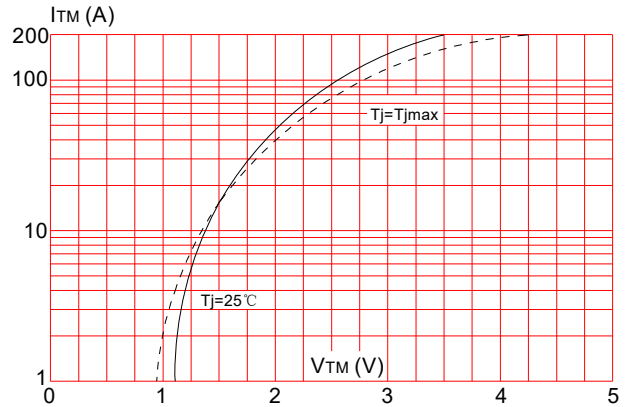
**FIG.2:** RMS on-state current versus ambient temperature (printed circuit board FR4, copper thickness: 35μm) (full cycle)



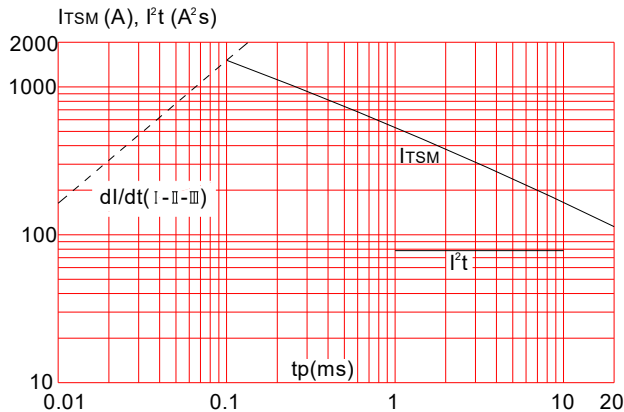
**FIG.3:** Surge peak on-state current versus number of cycles



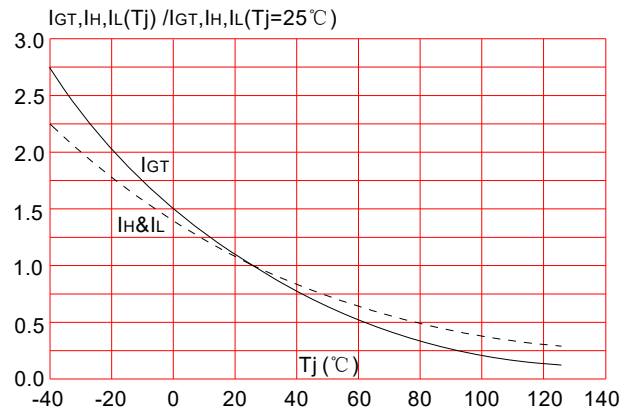
**FIG.4:** On-state characteristics (maximum values)



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

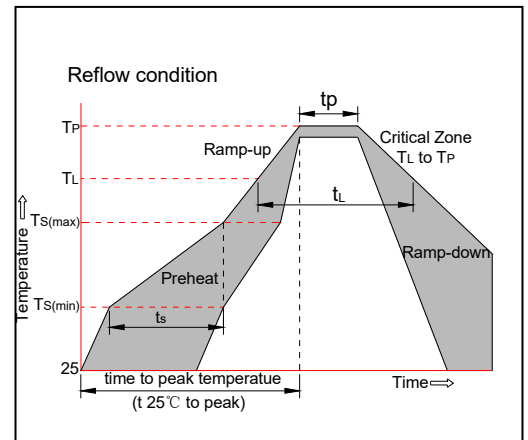


**FIG.6:** Relative variations of gate trigger current, holding current and latching current versus junction temperature



**SOLDERING PARAMETERS**

Reflow Condition		Pb-Free assembly (see figure at right)
Pre Heat	-Temperature Min ( $T_{s(\text{min})}$ )	+150 $^{\circ}\text{C}$
	-Temperature Max( $T_{s(\text{max})}$ )	+200 $^{\circ}\text{C}$
	-Time (Min to Max) (ts)	60-180 secs.
Average ramp up rate (Liquidus Temp ( $T_L$ ) to peak)		3 $^{\circ}\text{C}/\text{sec}$ . Max
$T_{s(\text{max})}$ to $T_L$ - Ramp-up Rate		3 $^{\circ}\text{C}/\text{sec}$ . Max
Reflow	-Temperature( $T_L$ ) (Liquidus)	+217 $^{\circ}\text{C}$
	-Temperature( $t_L$ )	60-150 secs.
Peak Temp ( $T_p$ )		+260(+0/-5) $^{\circ}\text{C}$
Time within 5 $^{\circ}\text{C}$ of actual Peak Temp ( $t_p$ )		20-40secs.
Ramp-down Rate		6 $^{\circ}\text{C}/\text{sec}$ . Max
Time 25 $^{\circ}\text{C}$ to Peak Temp ( $T_p$ )		8 min. Max
Do not exceed		+260 $^{\circ}\text{C}$




Information furnished in this document is believed to be accurate and reliable. However, Jiangsu JieJie Microelectronics Co.,Ltd assumes no responsibility for the consequences of use without consideration for such information nor use beyond it.

Information mentioned in this document is subject to change without notice, apart from that when an agreement is signed, Jiangsu JieJie complies with the agreement.

Products and information provided in this document have no infringement of patents. Jiangsu JieJie assumes no responsibility for any infringement of other rights of third parties which may result from the use of such products and information.

This document is the eighth version which is made in 1-Dec.-2018. This document supersedes and replaces all information previously supplied.

 is a registered trademark of Jiangsu JieJie Microelectronics Co.,Ltd.

Copyright ©2018 Jiangsu JieJie Microelectronics Co.,Ltd. Printed All rights reserved.