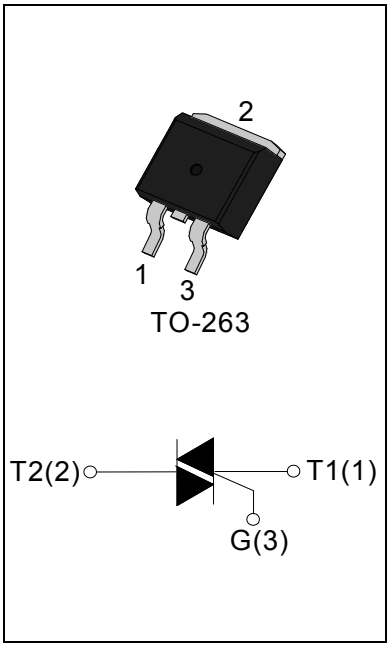
JST30 Series 30A TRIACs

Rev.3.0

DESCRIPTION:

With high ability to withstand the shock loading of large current, it provides high dv/dt rate with strong resistance to electromagnetic interface. JST30 Series are snubberless triac (3 quadrants) product, which are especially recommended focus on inductive load for its high commutation performances. TO-263 is RoHS compliant (2011/65/EU).



MAIN FEATURES

Symbol	Value	Unit
$I_{T(RMS)}$	30	A
V_{DRM} /V_{RRM}	600/800/1200/1600	V

ABSOLUTE MAXIMUM RATINGS

Parameter		Symbol	Value	Unit
Storage junction temperature range		T_{stg}	-40-150	℃
Operating junction temperature range		T_j	-40-125	℃
Repetitive peak off-state voltage (T_j=25℃)		V_{DRM}	600/800/1200/1600	V
Repetitive peak reverse voltage (T_j=25℃)		V_{RRM}	600/800/1200/1600	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=48℃)	$I_{T(RMS)}$	30	A
Non repetitive surge peak on-state current (full cycle, F=50Hz)		I_{TSM}	300	A
I^2t value for fusing (tp=10ms)		I^2t	450	A^2s
Critical rate of rise of on-state current (I_G =2×I_{GT})		dI/dt	50	A/μs
Peak gate current		I_{GM}	4	A
Average gate power dissipation		$P_{G(AV)}$	1	W
Peak gate power		P_{GM}	10	W

ELECTRICAL CHARACTERISTICS (T_j=25℃ unless otherwise specified)

3 Quadrants：Voltage class in this form--V_{DRM} (Repetitive peak off-state voltage) and V_{RRM} (Repetitive peak reverse voltage) are both 600V or 800V.

Symbol	Test Condition	Quadrant		Value		Unit
				BW	CW	
I_{GT}	V_D =12V R_L =33Ω	Ⅰ-Ⅱ-Ⅲ	MAX	50	35	mA
V_{GT}		Ⅰ-Ⅱ-Ⅲ	MAX	1.3		V
V_{GD}	V_D =V_{DRM} T_j =125℃ R_L =3.3KΩ	Ⅰ-Ⅱ-Ⅲ	MIN	0.2		V
I_L	I_G =1.2I_{GT}	Ⅰ-Ⅲ	MAX	80	70	mA
		Ⅱ		100	80	
I_H	I_T =100mA		MAX	75	50	mA
dV/dt	V_D=2/3V_{DRM} Gate Open T_j =125℃		MIN	1000	500	V/μs

3 Quadrants：Voltage class in this form--V_{DRM} (Repetitive peak off-state voltage) and V_{RRM} (Repetitive peak reverse voltage) are both 1200V or 1600V.

Symbol	Test Condition	Quadrant		Value		Unit
				BW	CW	
I_{GT}	V_D =12V R_L=33Ω	Ⅰ-Ⅱ-Ⅲ	MAX	50	35	mA
V_{GT}		Ⅰ-Ⅱ-Ⅲ	MAX	1.5		V
V_{GD}	V_D =V_{DRM} T_j =125℃ R_L =3.3KΩ	Ⅰ-Ⅱ-Ⅲ	MIN	0.2		V
I_L	I_G =1.2I_{GT}	Ⅰ-Ⅲ	MAX	90	70	mA
		Ⅱ		100	80	
I_H	I_T =100mA		MAX	80	60	mA
dV/dt	V_D=2/3V_{DRM} Gate Open T_j=125℃		MIN	1500	1000	V/μs

4 Quadrants：Voltage class in this form--V_{DRM} (Repetitive peak off-state voltage) and V_{RRM} (Repetitive peak reverse voltage) are both 600V or 800V.

Symbol	Test Condition	Quadrant		Value		Unit
				B	C	
I_{GT}	V_D =12V R_L =33Ω	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℃ R_L =3.3KΩ	ALL	MIN	0.2		V
I_L	I_G =1.2I_{GT}	Ⅰ -Ⅲ-Ⅳ	MAX	80	70	mA
		Ⅱ		100	90	
I_H	I_T =100mA		MAX	75	60	mA
dV/dt	V_D=2/3V_{DRM} Gate Open T_j =125℃		MIN	500	200	V/μs

STATIC CHARACTERISTICS

Symbol	Parameter		Value(MAX)	Unit
V_{TM}	I_{TM} =35A tp=380μs	T_j=25℃	1.5	V
V_{TO}	Threshold voltage	Tj=125℃	0.95	V
R_d	Dynamic resistance	Tj=125℃	12	mΩ
I_{DRM}	V_D =V_{DRM} V_R =V_{RRM}	T_j=25℃	5	μA
I_{RRM}		T_j=125℃	3	mA

THERMAL RESISTANCES

Symbol	Parameter		Value	Unit
$R_{th(j-c)}$	junction to case(AC)	TO-263	1.9	℃/W
$R_{th(j-a)}$	junction to ambient		45	

ORDERING INFORMATION

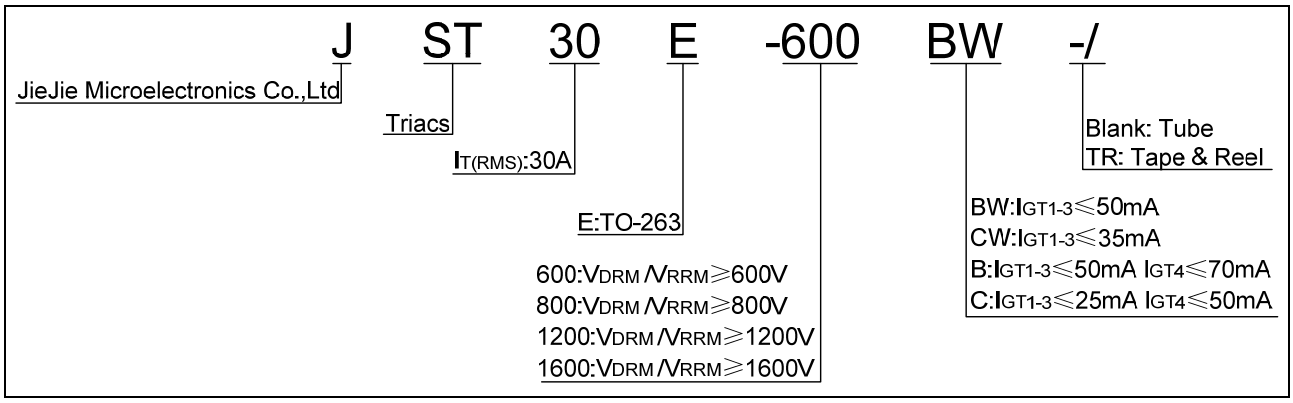


FIG.1: Maximum power dissipation versus RMS on-state current

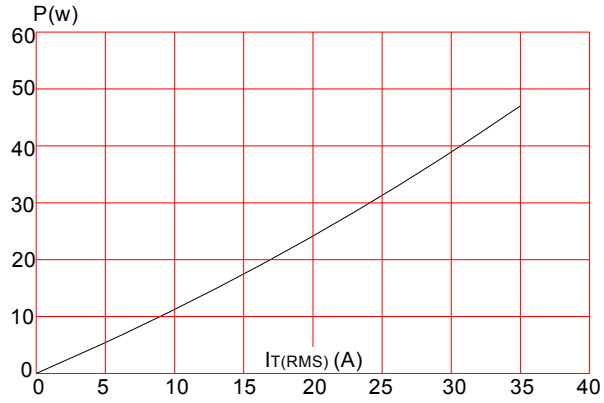


FIG.2: RMS on-state current versus ambient temperature (printed circuit board FR4, copper thickness:35μm) (full cycle)

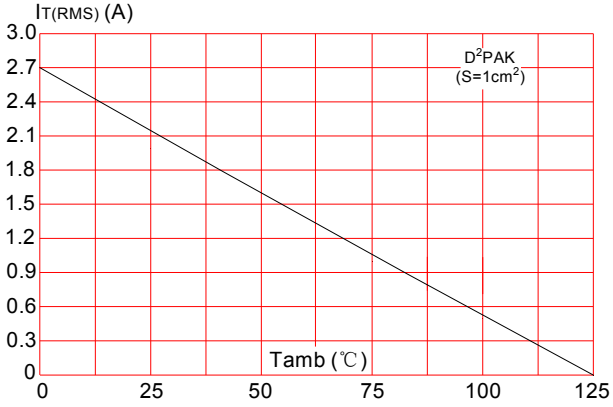


FIG.3: Surge peak on-state current versus number of cycles

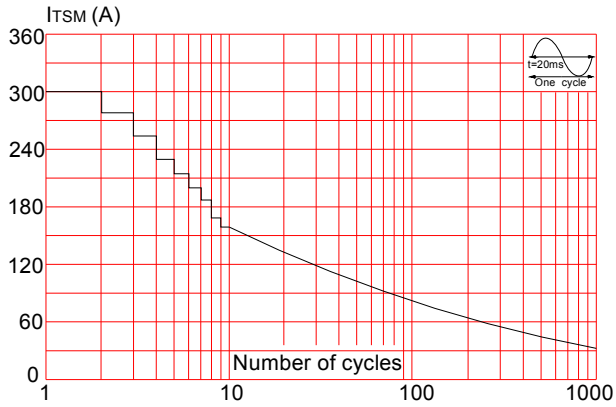


FIG.4: On-state characteristics (maximum values)

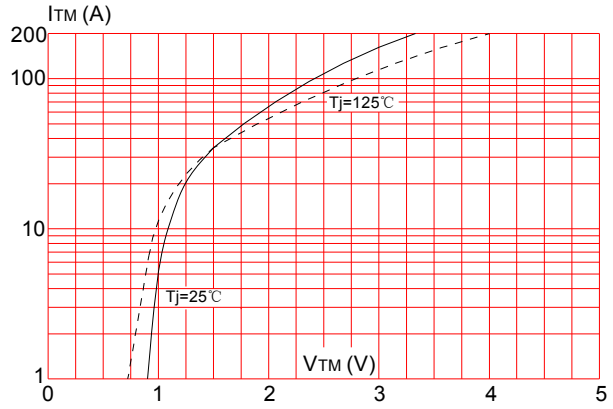


FIG.5: Non-repetitive surge peak on-state current for a sinusoidal pulse with width tp<20ms, and corresponging value of I^2t (dI/dt < 50A/μs)

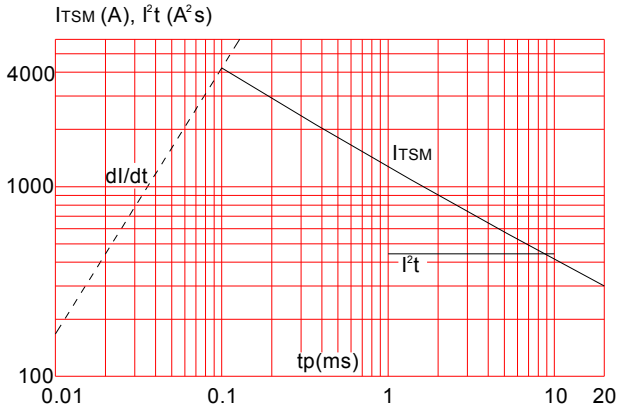
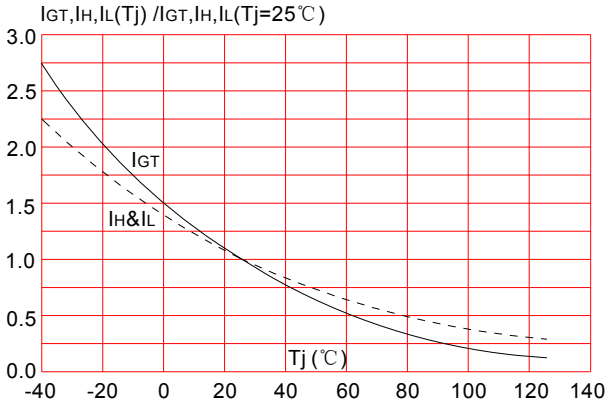
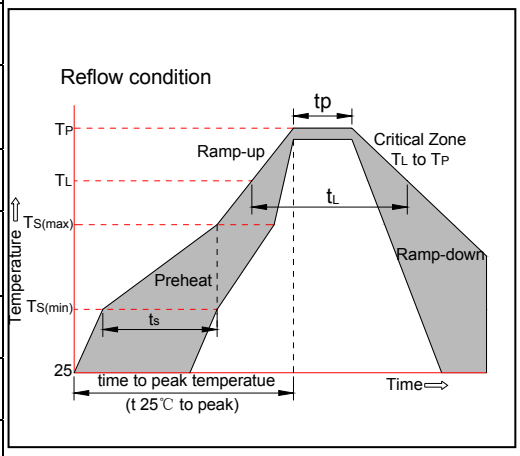


FIG.6: Relative variations of gate trigger current, holding current and latching current versus junction temperature



SOLDERING PARAMETERS

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



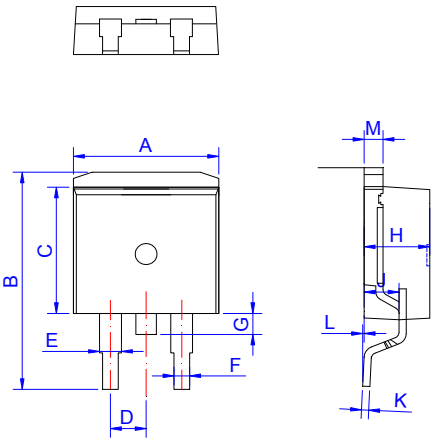
ORDERING INFORMATION

Order code	Voltage V_{DRM}/V_{RRM} (V)	IGT(mA)		Package	Base qty. (pcs)	Delivery mode
		Ⅰ-Ⅱ-Ⅲ	Ⅳ			
JST30E-600/800/1200/1600B	600/800/	50	70	TO-263	50	Tube
JST30E-600/800/1200/1600C	1200/1600	25	50		800	Tape & Reel
Order code	**Voltage V_{DRM}/V_{RRM} (V)**	**IGT(mA)**		**Package**	**Base qty. (pcs)**	**Delivery mode**
JST30E-600/800/1200/1600BW	600/800/	50		TO-263	50	Tube
JST30E-600/800/1200/1600CW	1200/1600	35			800	Tape & Reel

Document Revision History

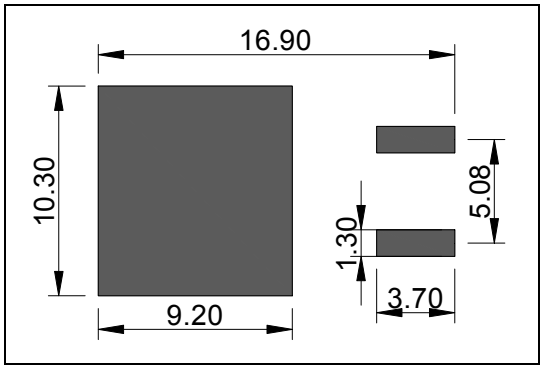
Date	Revision	Changes
Oct 15, 2018	2	Last update
Dec 30, 2021	3	Renew VTO & Rd

PACKAGE MECHANICAL DATA

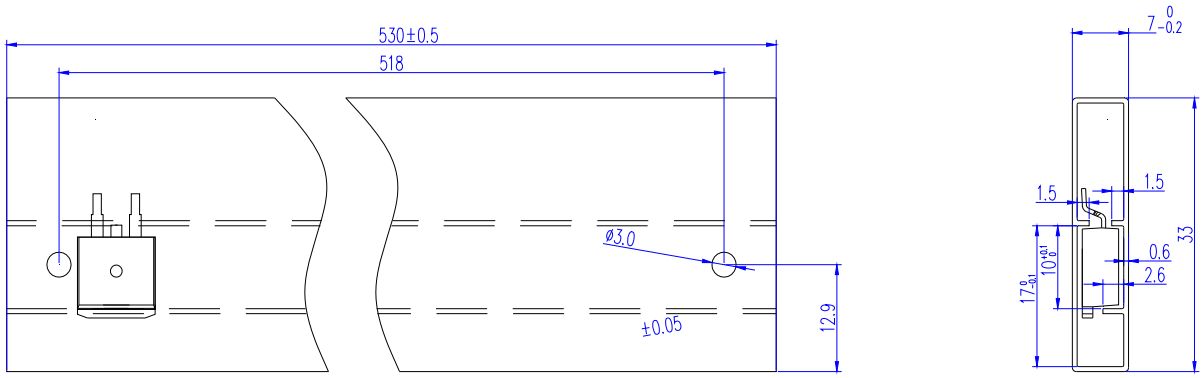


Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	9.90		10.20	0.390		0.402
B	14.70		15.80	0.579		0.622
C	9.4		9.6	0.37		0.378
D		2.54			0.100	
E	1.20		1.40	0.047		0.055
F	0.75		0.85	0.029		0.033
G			1.75			0.069
H	4.40		4.70	0.173		0.185
J	2.30		2.70	0.091		0.106
K	0.38		0.55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

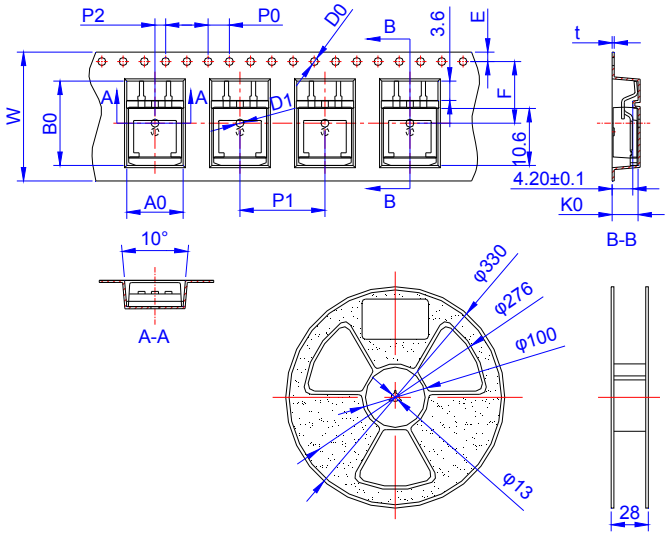
FOOTPRINT-TO-263 (dimensions in mm)



DELIVERY MODE



PACKAGE	OUTLINE	TUBE (PCS)	INNER BOX (PCS)	PER CARTON
TO-263	TUBE	50	1,000	5,000



Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
W	23.70	24.00	24.30	0.933	0.945	0.957
E	1.65	1.75	1.85	0.065	0.069	0.073
F	11.40	11.50	11.60	0.449	0.453	0.457
D0	-	1.50	1.60	-	0.059	0.063
D1	-	1.50	1.60	-	0.059	0.063
P0	3.90	4.00	4.10	0.154	0.157	0.161
P1	15.90	16.00	16.10	0.626	0.630	0.634
P2	1.90	2.00	2.10	0.075	0.079	0.083
A0	10.80	10.90	11.00	0.425	0.429	0.433
B0	16.20	16.30	16.40	0.638	0.642	0.646
K0	4.80	4.90	5.00	0.189	0.193	0.197
t	0.35	0.40	0.45	0.014	0.016	0.018

PACKAGE	OUTLINE	REEL (PCS)	PER CARTON (PCS)	TAPE & REEL
TO-263	TAPING	800	4,000	13 inch