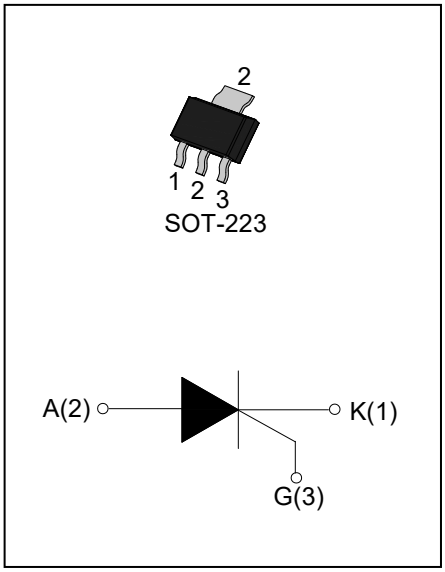
JX020V Sensitive gate SCRs

Rev.1

DESCRIPTION:

The JX020V SCR provide high dv/dt rate with strong resistance to electromagnetic interface. They are especially recommended for use on residual current circuit breaker, straight hair, igniter etc. Package SOT-223 is RoHS compliant. (2011/65/EU)



MAIN FEATURES

Symbol	Value	Unit
$I_{T(RMS)}$	2	A
I_{GT}	< 200	μA

ABSOLUTE MAXIMUM RATINGS

Parameter		Symbol	Value	Unit
Storage junction temperature range		T_{stg}	-40-150	℃
Operating junction temperature range		T_j	-40-125①	℃
Repetitive peak off-state voltage		V_{DRM}	600	V
Repetitive peak reverse voltage		V_{RRM}	600	V
RMS on-state current	SOT-223 (T_C=105℃)	$I_{T(RMS)}$	2	A
Non repetitive surge peak on-state current (F=50Hz tp=10ms)		I_{TSM}	20	A
Non repetitive surge peak on-state current (F=60Hz tp=10ms)		I_{TSM}	22	A
I^2t value for fusing (tp=10ms)		I^2t	2	A^2s
Critical rate of rise of on-state current		dI/dt	50	A/μs
Peak gate current (tp=20μs, T_j=125℃)		I_{GM}	0.2	A
Peak gate power (tp=20μs, T_j=125℃)		P_{GM}	0.5	W
Average gate power dissipation(T_j=125℃)		$P_{G(AV)}$	0.1	W

NOTE 1: When we parallel connect a ≤1KΩ resistor between Gate and Cathode, the Tj can reach 125℃; if without this resistor, the Tj only can reach 110℃.

ELECTRICAL CHARACTERISTICS (T_j=25℃ unless otherwise specified)

Symbol	Test Condition	Value			Unit
		MIN.	TYP.	MAX.	
I_{GT}	V_D=12V R_L=33Ω	-	50	200	μA
V_{GT}		-	0.6	0.8	V
V_{GD}	V_D=V_{DRM} T_j=125℃	0.2	-	-	V
I_L	I_G=1.2 I_{GT}	-	-	6	mA
I_H	I_T=0.05A	-	-	5	mA
dv/dt	V_D=400V T_j=125℃ R_{GK}=1KΩ	60	-	-	V/μs
	V_D=400V T_j=125℃ R_{GK}=220Ω	500	-	-	

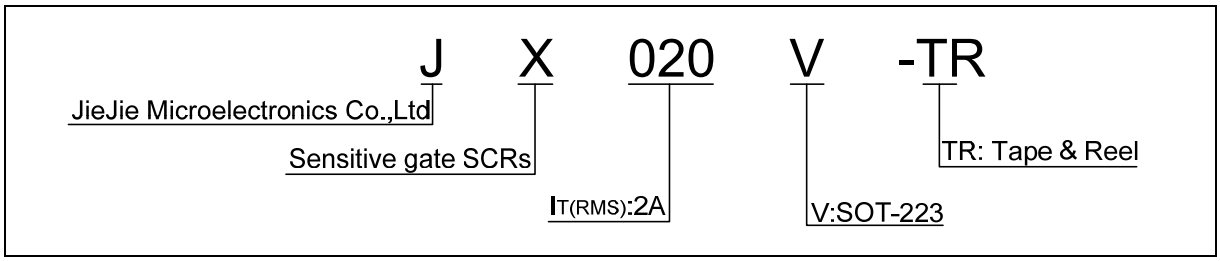
STATIC CHARACTERISTICS

Symbol	Parameter		Value(MAX)	Unit
V_{TM}	I_T=4A tp=380μs	T_j=25℃	1.5	V
I_{DRM}	V_D=V_{DRM} V_R=V_{RRM}	T_j=25℃	5	μA
I_{RRM}		T_j=125℃	100	μA

THERMAL RESISTANCES

Symbol	Parameter		Value	Unit
$R_{th(j-c)}$	junction to case	SOT-223	7.3	℃/W
$R_{th(j-a)}$	junction to ambient		60	

ORDERING INFORMATION



MARKING

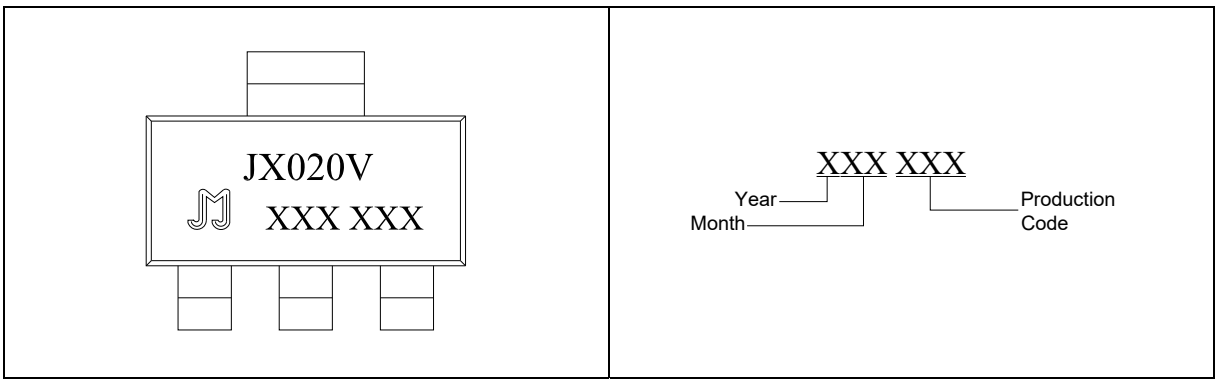


FIG.1: Maximum power dissipation versus RMS on-state current

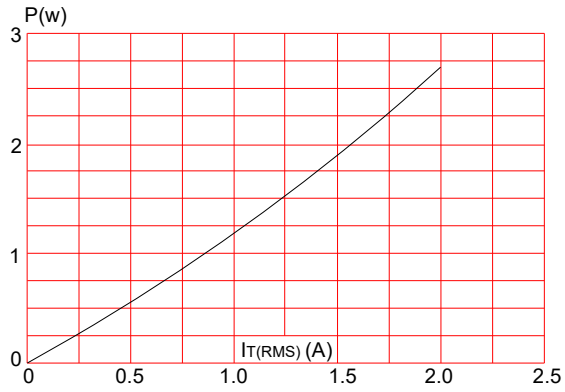


FIG.2: RMS on-state current versus ambient temperature (printed circuit board FR4, copper thickness: 35μm) (full cycle)

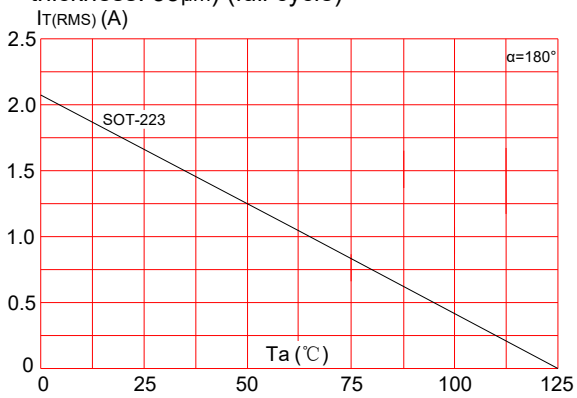


FIG.3: Surge peak on-state current versus number of cycles

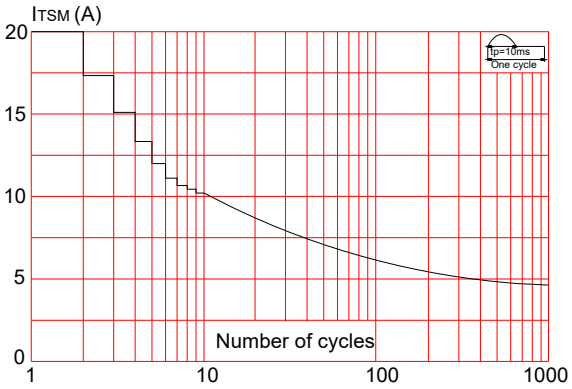


FIG.4: On-state characteristics (maximum values)

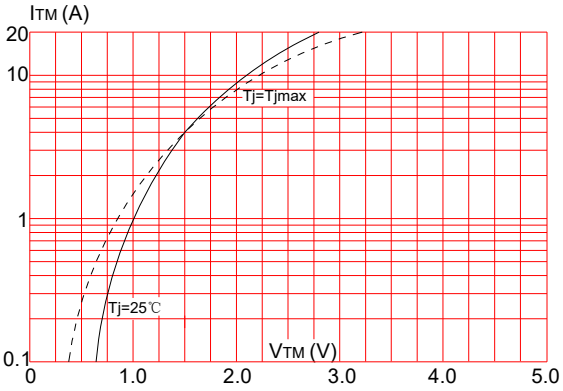


FIG.5: Non-repetitive surge peak on-state current for a sinusoidal pulse with width tp<10ms, and corresponging value of I^2t (dI/dt < 50A/μs)

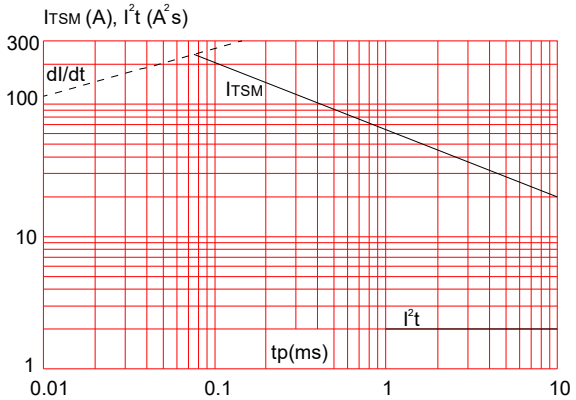
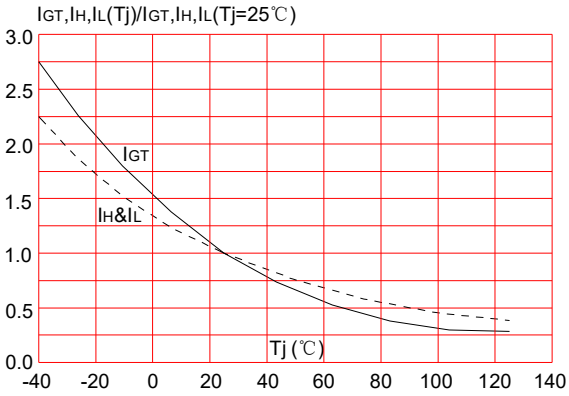
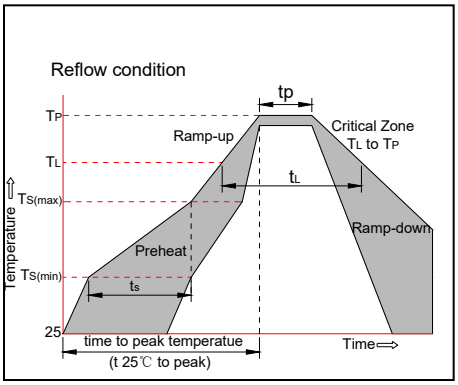


FIG.6: Relative variations of gate trigger current, holding current and latching current versus junction temperature



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℃



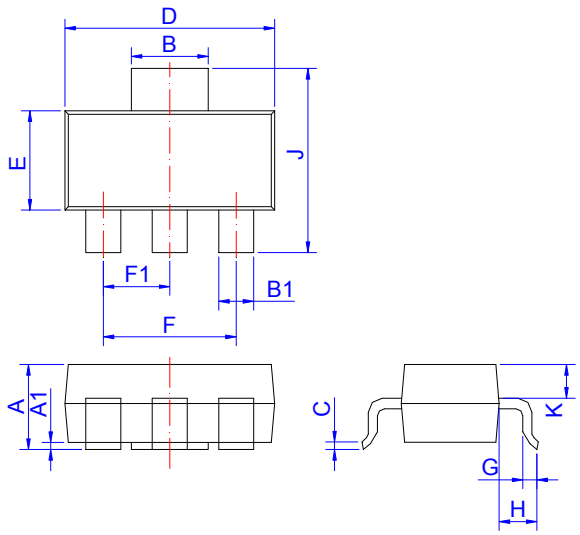
ORDERING INFORMATION

Order code	Voltage V_{DRM}/V_{RRM} (V)	IGT(μA)	Package	Base qty. (pcs)	Delivery mode
JX020V	600	< 200	SOT-223	4,000	Tape & Reel

Document Revision History

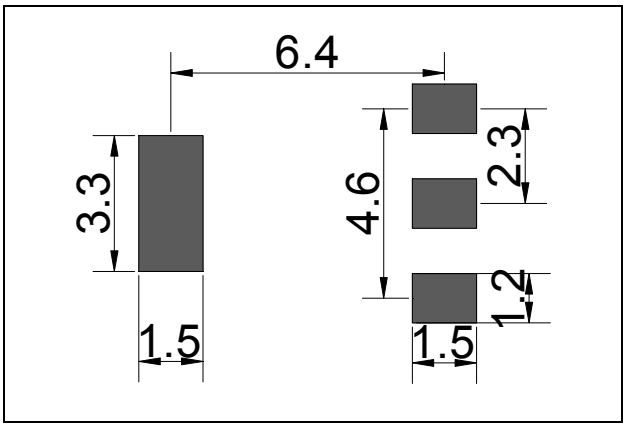
Date	Revision	Changes
Mar 16, 2022	1	Last update

PACKAGE MECHANICAL DATA

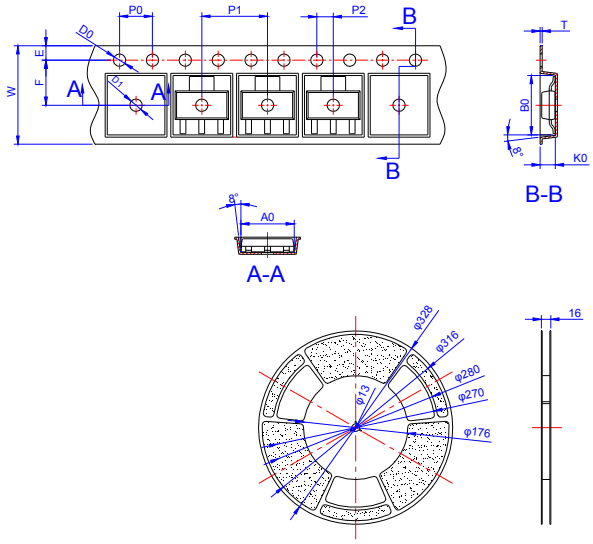


Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	1.5	1.6	1.8	0.059	0.063	0.071
A1	0.01	0.06	0.10	0.001	0.002	0.004
B	2.9	3.0	3.1	0.114	0.118	0.122
B1	0.6	0.7	0.8	0.024	0.028	0.031
C	0.22	0.26	0.32	0.009	0.010	0.013
D	6.3	6.5	6.7	0.248	0.256	0.264
E	3.3	3.5	3.7	0.130	0.138	0.146
F		4.6			0.181	
F1		2.3			0.091	
G	0.7	0.9	1.1	0.028	0.035	0.043
H	1.5	1.75	2.0	0.059	0.069	0.079
J	6.7	7.0	7.3	0.264	0.276	0.287
K	0.8	0.9	1.0	0.031	0.035	0.039

FOOTPRINT-SOT-223 (dimensions in mm)



DELIVERY MODE



Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
W	-	12.00	12.20	-	0.472	0.480
E	1.65	1.75	1.85	0.065	0.069	0.073
F	5.45	5.50	5.55	0.215	0.217	0.219
D0	-	1.50	1.60	-	0.059	0.063
D1	-	1.55	1.80	-	0.061	0.071
P0	3.90	4.00	4.10	0.154	0.157	0.161
P1	7.90	8.00	8.10	0.311	0.315	0.319
P2	1.95	2.00	2.05	0.077	0.079	0.081
10P0	39.80	40.00	40.20	1.567	1.575	1.583
A0	6.73	6.83	6.93	0.265	0.269	0.273
B0	7.30	7.40	7.50	0.287	0.291	0.295
K0	1.78	1.88	1.98	0.070	0.074	0.078
T	0.25	0.30	0.35	0.010	0.012	0.014

PACKAGE	OUTLINE	REEL (PCS)	PER CARTON (PCS)	TAPE & REEL
SOT-223	TAPING	4,000	40,000	13 inch