



## JX020 Series Sensitive gate SCRs

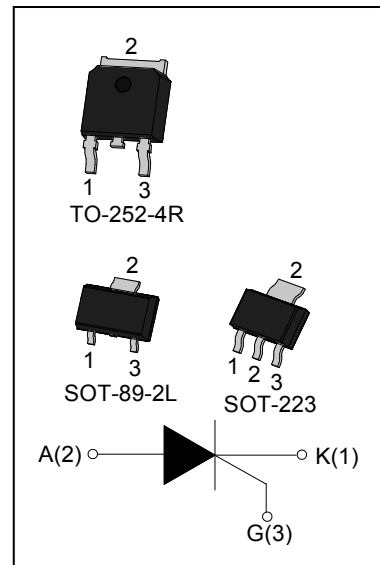
Rev.11.0

### DESCRIPTION:

The JX020 SCR series provide high dv/dt rate with strong resistance to electromagnetic interference. They are especially recommended for use on residual current circuit breaker, straight hair, igniter etc. All the packages above are RoHS compliant. (2011/65/EU)

### MAIN FEATURES

Symbol	Value	Unit
$I_{T(RMS)}$	2	A
$I_{GT}$	$\leq 200$	$\mu A$



### ABSOLUTE MAXIMUM RATINGS

Parameter		Symbol	Value	Unit
Storage junction temperature range		$T_{stg}$	-40-150	$^{\circ}C$
Operating junction temperature range		$T_j$	-40-125 <sup>①</sup>	$^{\circ}C$
Repetitive peak off-state voltage		$V_{DRM}$	600	V
Repetitive peak reverse voltage		$V_{RRM}$	600	V
RMS on-state current	SOT-89-2L ( $T_c=100^{\circ}C$ )	$I_{T(RMS)}$	2	A
	SOT-223/ TO-252-4R( $T_c=105^{\circ}C$ )			
Non repetitive surge peak on-state current (F=50Hz $t_p=10ms$ )		$I_{TSM}$	20	A
Non repetitive surge peak on-state current (F=60Hz $t_p=10ms$ )		$I_{TSM}$	22	A
$I^2t$ value for fusing ( $t_p=10ms$ )		$I^2t$	2	$A^2s$
Critical rate of rise of on-state current		$di/dt$	50	$A/\mu s$
Peak gate current ( $t_p=20\mu s$ , $T_j=125^{\circ}C$ )		$I_{GM}$	0.2	A
Peak gate power ( $t_p=20\mu s$ , $T_j=125^{\circ}C$ )		$P_{GM}$	0.5	W
Average gate power dissipation( $T_j=125^{\circ}C$ )		$P_{G(AV)}$	0.1	W

**NOTE 1:** When we parallel connect a  $\leq 1K\Omega$  resistor between Gate and Cathode, the  $T_j$  can reach  $125^{\circ}C$ ; if without this resistor, the  $T_j$  only can reach  $110^{\circ}C$ .

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

Symbol	Test Condition	Value			Unit
		MIN.	TYP.	MAX.	
$I_{GT}$	$V_D=12\text{V}$ $R_L=33\Omega$	-	50	200	$\mu\text{A}$
$V_{GT}$		-	0.6	0.8	V
$V_{GD}$	$V_D=V_{DRM}$ $T_j=125^{\circ}\text{C}$	0.2	-	-	V
$I_L$	$I_G=1.2 I_{GT}$	-	-	6	mA
$I_H$	$I_T=0.05\text{A}$	-	-	5	mA
dV/dt	$V_D=400\text{V}$ $T_j=125^{\circ}\text{C}$ $R_{GK}=1\text{K}\Omega$	60	-	-	V/ $\mu\text{s}$
	$V_D=400\text{V}$ $T_j=125^{\circ}\text{C}$ $R_{GK}=220\Omega$	500	-	-	
$R_d$	Dynamic Resistance $T_j=125^{\circ}\text{C}$	-	-	180	$\text{m}\Omega$

**STATIC CHARACTERISTICS**

Symbol	Parameter		Value(MAX)	Unit
$V_{TM}$	$I_T=4\text{A}$ $t_p=380\mu\text{s}$	$T_j=25^{\circ}\text{C}$	1.5	V
$I_{DRM}$	$V_D=V_{DRM}$ $V_R=V_{RRM}$	$T_j=25^{\circ}\text{C}$	5	$\mu\text{A}$
$I_{RRM}$		$T_j=125^{\circ}\text{C}$	100	$\mu\text{A}$

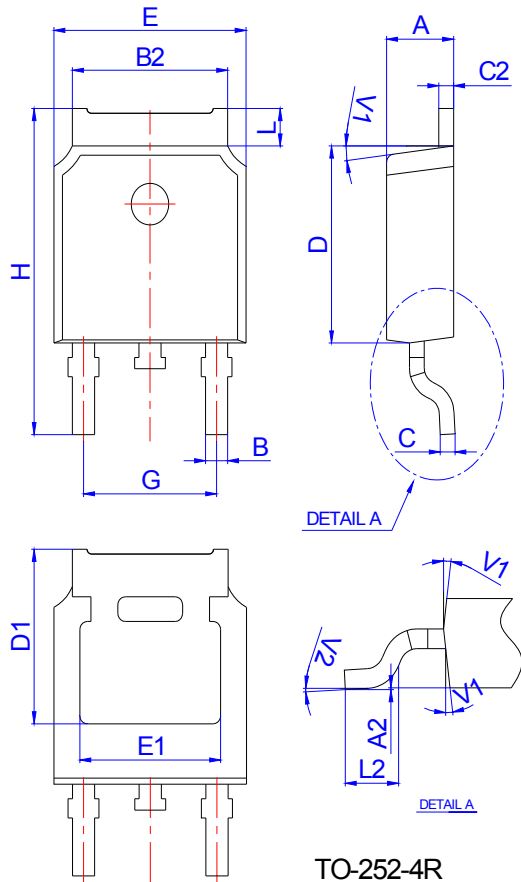
**THERMAL RESISTANCES**

Symbol	Parameter		Value	Unit
$R_{th(j-c)}$	junction to case	SOT-89-2L	8.3	$^{\circ}\text{C}/\text{W}$
		TO-252-4R	6.5	
		SOT-223	7.3	
$R_{th(j-a)}$	junction to ambient	SOT-89-2L	90	$^{\circ}\text{C}/\text{W}$
		TO-252-4R	70	
		SOT-223	60	

**ORDERING INFORMATION**

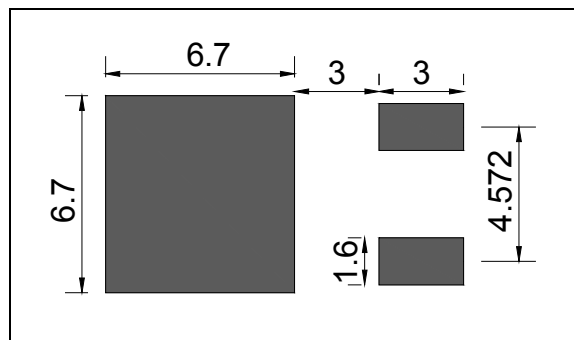
<p><b>J</b></p> <p>JieJie Microelectronics Co.,Ltd</p> <p>Sensitive gate SCRs</p>	<p><b>X</b></p>	<p><b>020</b></p> <p><math>I_{T(RMS)}:2A</math></p>	<p><b>N2</b></p> <p>V:SOT-223 K:TO-252-4R N2:SOT-89-2L KTR:TO-252-4R(Tape&amp;Reel)</p>
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**PACKAGE MECHANICAL DATA**

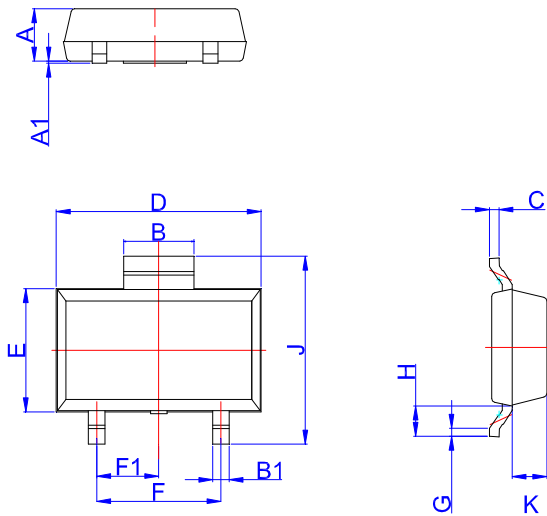


Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	2.10		2.50	0.083		0.098
A2	0		0.10	0		0.004
B	0.66		0.86	0.026		0.034
B2	5.18		5.48	0.202		0.216
C	0.40		0.60	0.016		0.024
C2	0.44		0.58	0.017		0.023
D	5.90		6.30	0.232		0.248
D1	5.30REF			0.209REF		
E	6.40		6.80	0.252		0.268
E1	4.63			0.182		
G	4.47		4.67	0.176		0.184
H	9.50		10.70	0.374		0.421
L	1.09		1.21	0.043		0.048
L2	1.35		1.65	0.053		0.065
V1		7°			7°	
V2	0°		6°	0°		6°

**FOOTPRINT-TO-252-4R (dimensions in mm)**



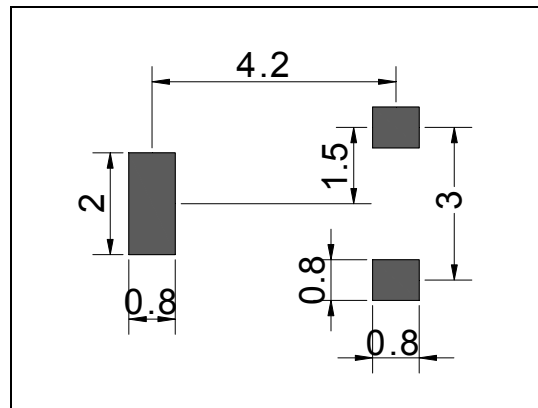
**PACKAGE MECHANICAL DATA**



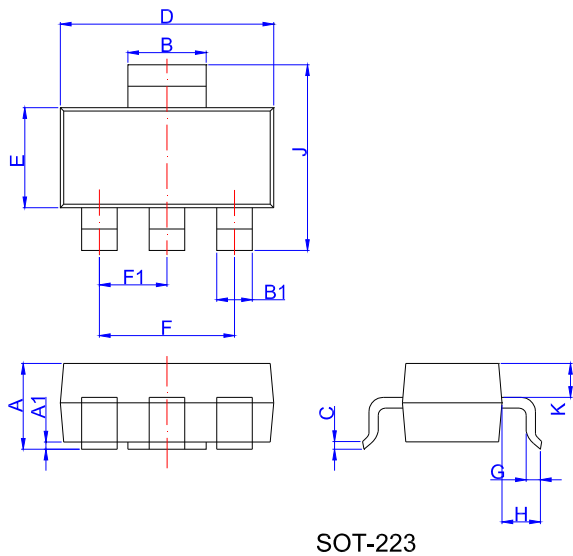
SOT-89-2L

Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	1.3	1.4	1.5	0.051	0.055	0.059
A1	0.01	0.06	0.10	0.001	0.002	0.004
B	1.6	1.7	1.8	0.063	0.067	0.071
B1	0.3	0.4	0.5	0.012	0.016	0.020
C	0.22	0.254	0.32	0.009	0.010	0.013
D	4.75	4.95	5.15	0.187	0.195	0.203
E	2.75	2.95	3.15	0.108	0.116	0.124
F		3.0			0.118	
F1		1.5			0.059	
G	0.2	0.3	0.4	0.008	0.012	0.016
H	0.58	0.78	0.98	0.023	0.031	0.039
J	4.3	4.5	4.7	0.169	0.177	0.185
K		0.88			0.035	

**FOOTPRINT-SOT-89-2L (dimensions in mm)**

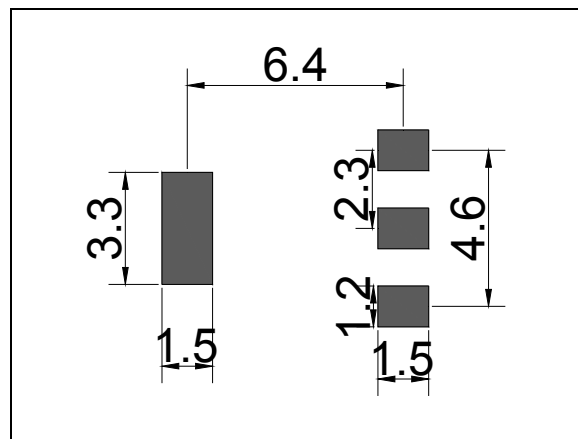


**PACKAGE MECHANICAL DATA**



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

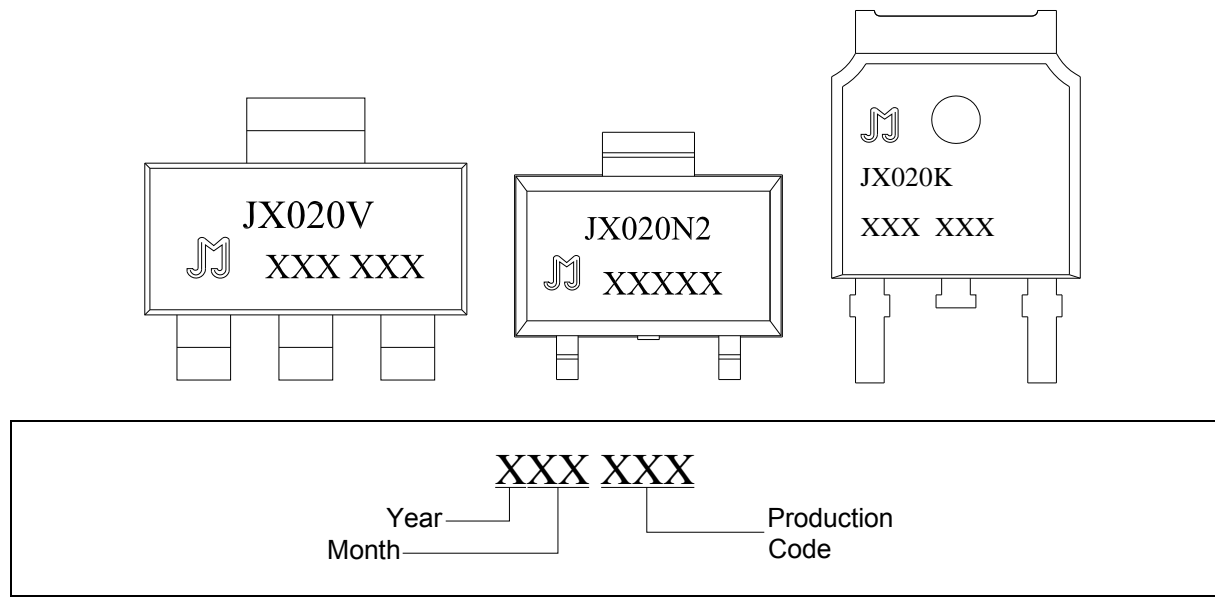
**FOOTPRINT-SOT-223 (dimensions in mm)**



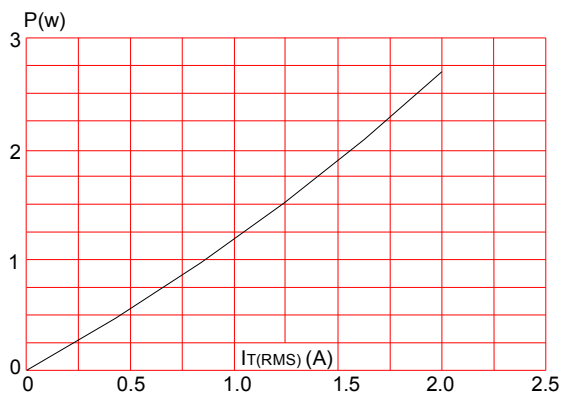
**PACKAGE INFORMATION**

PACKAGE	OUTLINE	TUBE (PCS)	INNER BOX (PCS)	PER CARTON
TO-252-4R	TUBE	80	4,000	20,000
PACKAGE	OUTLINE	REEL (PCS)	PER CARTON (PCS)	TAPE & REEL
SOT-223	TAPING	4,000	40,000	13 inch
TO-252-4R	TAPING	2,500	25,000	13 inch
SOT-89-2L	TAPING	4,000	40,000	13 inch

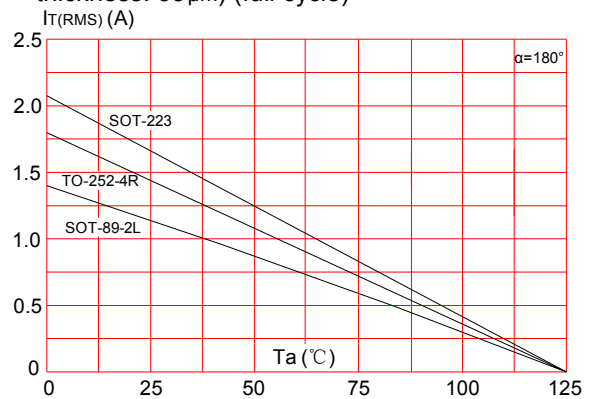
MARKING



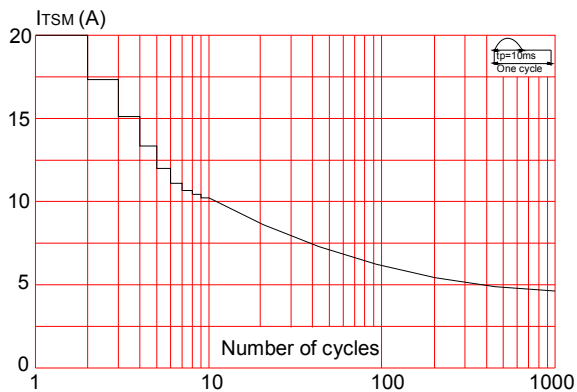
**FIG.1:** Maximum power dissipation versus RMS on-state current



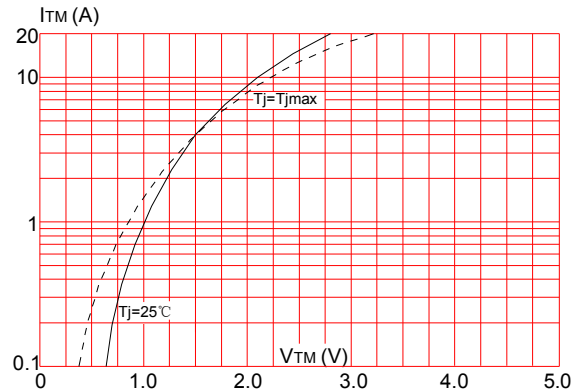
**FIG.2:** RMS on-state current versus ambient temperature (printed circuit board FR4, copper thickness: 35 $\mu$ m) (full cycle)



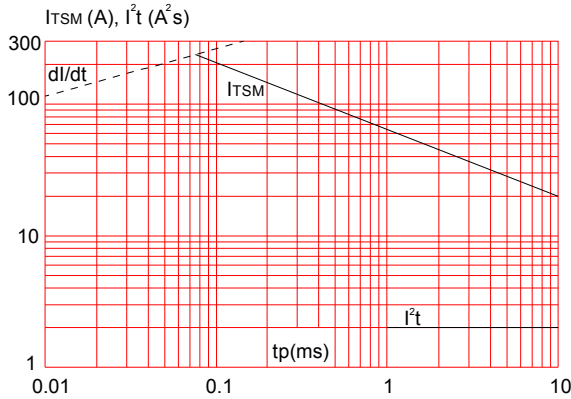
**FIG.3:** Surge peak on-state current versus number of cycles



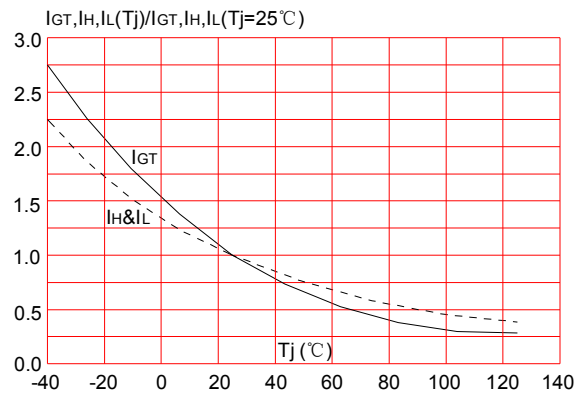
**FIG.4:** On-state characteristics (maximum values)



**FIG.5:** Non-repetitive surge peak on-state current for a sinusoidal pulse with width  $t_p < 10\text{ms}$ , and corresponding value of  $I^2t$  ( $di/dt < 50\text{A}/\mu\text{s}$ )

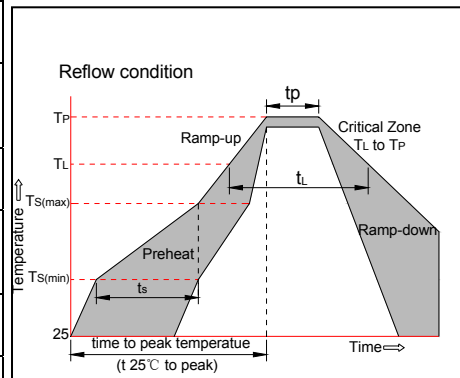


**FIG.6:** Relative variations of gate trigger current, holding current and latching current versus junction temperature




**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 $^\circ\text{C}$



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