

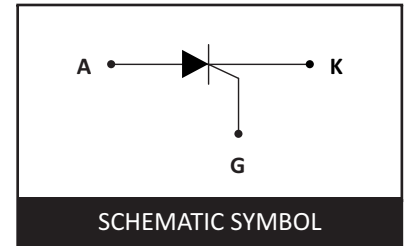
## 12A SERIES STANDARD SILICON CONTROLLED RECTIFIERS

### DESCRIPTION

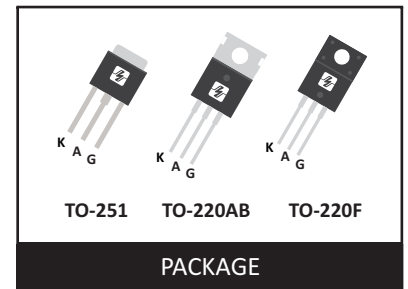
The BT151-650R SCR is suitable to fit modes of control found in applications such as voltage regulation circuits for motorbikes, over-voltage crowbar protection, motor control circuits in power tools and kitchen aids, inrush current limiting circuits, capacitive discharge ignition. The insulated fullpack package allows a back to back configuration.

### FEATURES

- Repetitive Peak Off-State Voltage : 650V
- R.M.S On-State Current (  $I_{T(RMS)} = 12\text{ A}$  )
- Low On-State Voltage (1.7V(Max.)@  $I_{TM}$ )
- RoHS Compliant



SCHEMATIC SYMBOL

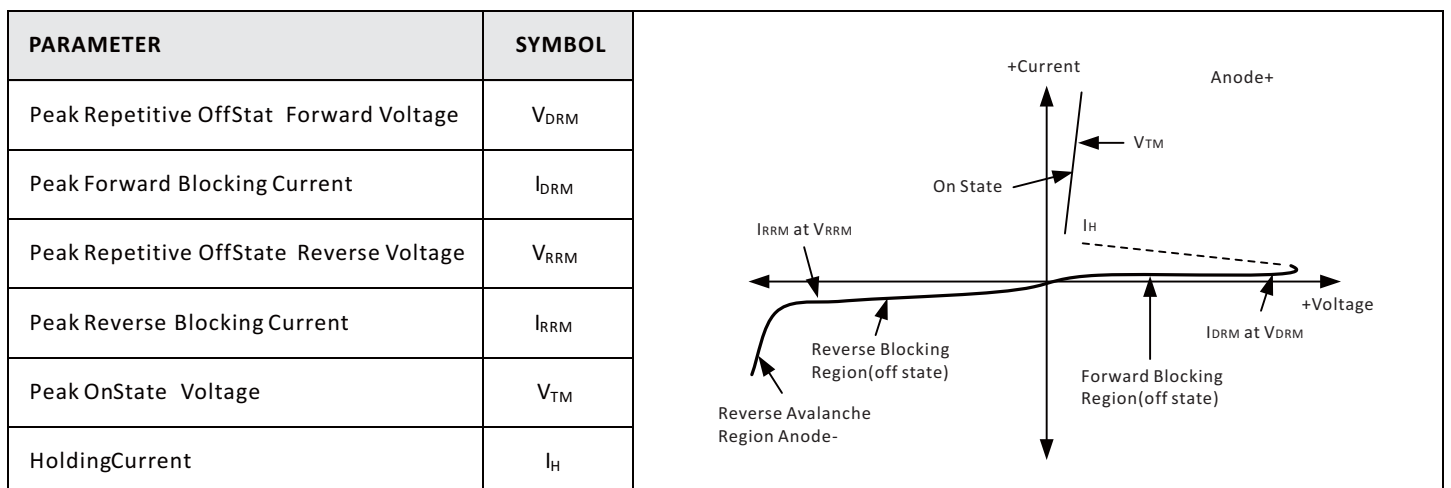


### ABSOLUTE MAXIMUM RATINGS ( $T_J = 25^\circ\text{C}$ UNLESS OTHERWISE SPECIFIED )

Symbol	Parameter		Value	Unit	
$V_{DRM}$	Repetitive Peak off -State Voltage		650	V	
$V_{RRM}$	Repetitive Peak Reverse Voltage		650	V	
$I_{T(RMS)}$	RMS on-state current	$T_c = 109^\circ\text{C}$	12	A	
$I_{T(AV)}$	Average on-state current		$T_c = 109^\circ\text{C}$	7.5	A
$I_{TSM}$	Non repetitive surge peak on-state current	$t_p = 8.3\text{ ms}$	$T_j = 25^\circ\text{C}$	132	A
		$t_p = 10\text{ ms}$		120	
$I^2t$	$I^2t$ Value for fusing	$t_p = 10\text{ ms}$	$T_j = 25^\circ\text{C}$	72	$\text{A}^2\text{S}$
$di/dt$	Critical rate of rise of on-state current $I_G = 2 \times I_{GT}$ , $t_r \leq 100\text{ns}$	$F = 60\text{ Hz}$	$T_j = 125^\circ\text{C}$	50	$\text{A}/\mu\text{s}$
$I_{GM}$	Peak gate current	$t_p = 20\ \mu\text{s}$	$T_j = 125^\circ\text{C}$	2	A
$P_{G(AV)}$	Average gate power dissipation		$T_j = 125^\circ\text{C}$	0.5	W
$T_{stg}$	Storage junction temperature range		- 40 to + 150	°C	
$T_j$	Operating junction temperature range		- 40 to + 125		
$V_{RGM}$	Maximum peak reverse gate voltage		5	V	

**ELECTRICAL CHARACTERISTICS (TC = 25 °C UNLESS OTHERWISE NOTED)**

Symbol	Test Conditions		Min.	Typ.	Max.	Unit
$I_{GT}$	$V_D = 12\text{ V } R_L = 140\text{ohm}$		-	3	15	mA
$V_{GT}$			-	0.6	1.5	V
$V_{GD}$	$V_D = V_{DRM} \quad R_L = 3.3\text{ kohm}$	$T_j = 125^\circ\text{C}$	-	-	0.2	V
$I_H$	$I_T = 500\text{ mA}$		-	8	30	mA
$I_L$	$I_G = 1.2 I_{GT}$		-	10	40	mA
$dv/dt$	$V_D = 67\% V_{DRM}$ Gate open	$T_j = 125^\circ\text{C}$	200	400	-	V/ $\mu\text{s}$
$V_{TM}$	$I_{TM} = 23\text{ A } t_p = 380\text{ }\mu\text{s}$	$T_j = 25^\circ\text{C}$	-	-	1.7	V
$I_{DRM}$	$V_D = V_{DRM} \quad V_R = V_{RRM}$		-	-	10	$\mu\text{A}$
$I_{RRM}$			$T_j = 125^\circ\text{C}$	-	-	0.5

**VOLTAGE CURRENT CHARACTERISTIC OF SCR**


**PACKAGE MECHANICAL DATA**
**TO-251(IPAK)**

Symbol	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	2.10	2.40	0.083	0.094
A1	0.89	1.50	0.035	0.059
b	0.50	0.70	0.020	0.028
b1	0.70	0.90	0.028	0.035
b2	5.20	5.40	0.205	0.213
C	0.46	0.61	0.018	0.024
C1	0.46	0.89	0.018	0.035
D	6.35	6.73	0.250	0.265
E	5.33	6.30	0.210	0.248
e	2.29TYP		0.09TYP	
L	6.50	7.90	0.256	0.311
L1	1.42	1.82	0.056	0.072
L2	1.35	1.65	0.053	0.065

**TO-220AB**

Symbol	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	3.56	4.83	0.140	0.190
A1	2.03	2.92	0.080	0.115
b	0.38	1.02	0.015	0.040
b1	1.14	1.78	0.045	0.070
C	0.51	1.40	0.020	0.055
C1	0.36	0.61	0.014	0.024
D	9.65	10.67	0.380	0.420
E	14.22	16.51	0.560	0.650
e	2.54BSC		0.10BSC	
F	2.54	3.05	0.100	0.120
G	3.53	3.90	0.139	0.154
H	12.70	14.73	0.500	0.580
L	5.84	6.86	0.230	0.270
L1	-	6.35	-	0.250

**TO-220F**

Symbol	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	4.40	4.60	0.173	0.181
A1	2.60	2.80	0.102	0.110
A2	2.45	2.55	0.096	0.100
b	0.50	0.75	0.020	0.030
b1	1.10	1.40	0.043	0.055
C	0.50	0.70	0.020	0.028
D	9.70	10.30	0.382	0.406
E	14.70	15.30	0.579	0.602
e	2.54TYP		0.10TYP	
e1	4.88	5.28	0.192	0.208
H	27.40	28.60	1.079	1.126
L	2.50	3.00	0.098	0.118
L1	6.70	6.90	0.264	0.272
L2	3.60	3.80	0.142	0.150

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