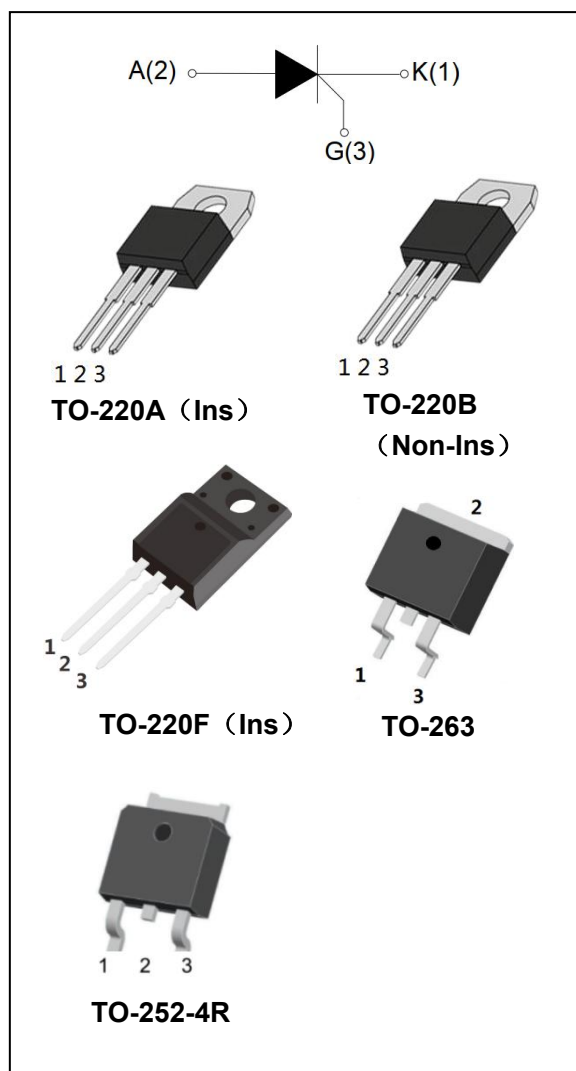




## BT152 Series 20A SCRs

### DESCRIPTION:

With high ability to withstand the shock loading of large current, BT152 series of silicon controlled rectifiers provide high dv/dt rate with strong resistance to electromagnetic interference. They are especially recommended for use on solid state relay, motorcycle, power charger, T-tools etc.



### MAIN FEATURES:

symbol	value	unit
$I_{T(RMS)}$	20	A
$V_{DRM}/V_{RRM}$	600/800	V
$I_{GT}$	25	mA

### 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	V
Repetitive peak reverse voltage ( $T_j=25^\circ\text{C}$ )	$V_{RRM}$	600/800	V
RMS on-state current	$I_{T(RMS)}$	20	A
Non repetitive surge peak on-state current (full cycle, $F=50\text{Hz}$ )	$I_{TSM}$	200	A
$I^2t$ value for fusing ( $t_p=10\text{ms}$ )	$I^2t$	312.5	$\text{A}^2\text{s}$



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### BT152 Series 20A SCRs

Critical rate of rise of on-state current( $I_G=2 \times I_{GT}$ )	$di/dt$	50	A/ $\mu$ 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)

Parameter	Test Condition	MIN	TYPE	MAX	Unit
$I_{GT}$	$V_D=12\text{V}, R_L=33\Omega$	-	5	25	mA
$V_{GT}$		-	0.8	1.5	V
$V_{GD}$	$V_D=V_{DRM}, T_j=110^\circ\text{C}$	0.2	-	-	V
$I_H$	$I_T=500\text{mA}$	-	-	60	mA
$I_L$	$I_G=1.2I_{GT}$	-	-	70	mA
$dV/dt$	$V_D=2/3 \times V_{DRM}, T_j=125^\circ\text{C}$ Gate open	200	-	-	V/ $\mu$ s

#### STATIC CHARACTERISTICS

Symbol	Test Condition			Value	Unit
$V_{TM}$	$I_{TM}=40\text{A}$	$t_p=380\mu\text{s}$	$T_j=25^\circ\text{C}$	MAX	1.55 V
$I_{DRM}$ $I_{RRM}$	$V_D=V_{DRM}=V_{RRM}$		$T_j=25^\circ\text{C}$	MAX	5 $\mu\text{A}$
			$T_j=110^\circ\text{C}$		1 mA

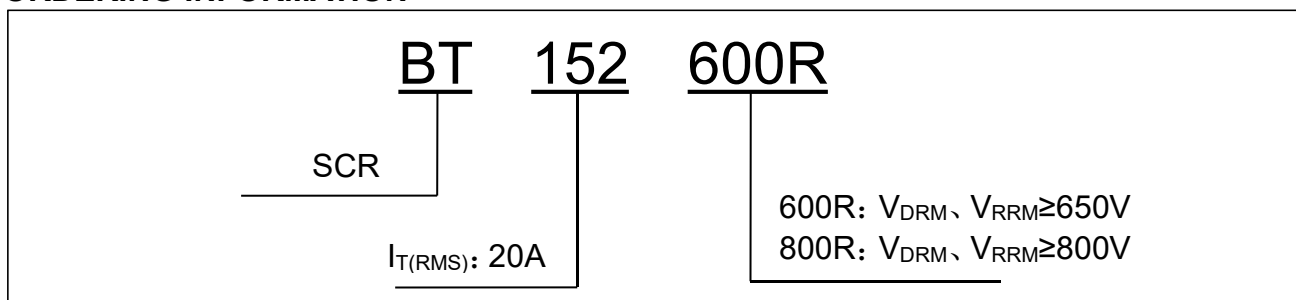
#### THERMAL RESISTANCES

Symbol	Test Condition		Value	Unit
$R_{th(j-c)}$	junction to case(AC)	TO-220(Ins)	2.1	$^\circ\text{C/W}$
		TO-220B(Non-Ins)	1.1	
		TO-220F	2.3	
		TO-263	2.5	
		TO-252	2.6	

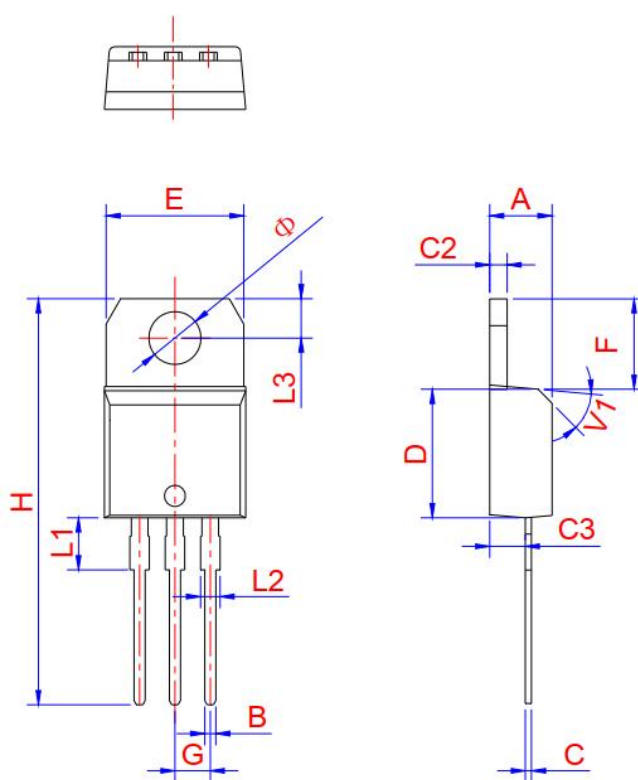


**BT152 Series 20A SCRs**

**ORDERING INFORMATION**



**PACKAGE MECHANICAL DATA**



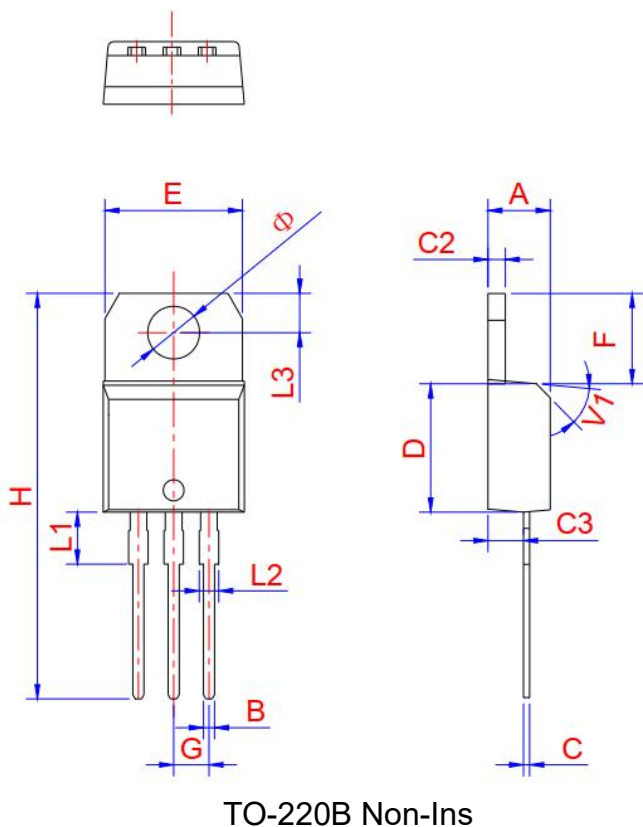
TO-220A Ins

Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	4.4	4.47	4.6	0.173	0.176	0.181
B	0.61		0.88	0.024		0.035
C	0.46	0.50	0.7	0.018	0.02	0.028
C2	1.21	1.27	1.32	0.048	0.050	0.052
C3	2.4		2.72	0.094		0.107
D	8.6		9.7	0.339		0.382
E	9.8		10.4	0.386		0.409
F	6.55		6.95	0.258		0.274
G		2.54			0.1	
H	28		29.8	1.102		1.173
L1		3.75			0.148	
L2	1.14		1.7	0.045		0.067
L3	2.65		2.95	0.104		0.116
V1		45°			45°	
Φ	3.7	3.75	3.8	0.145	0.147	0.149

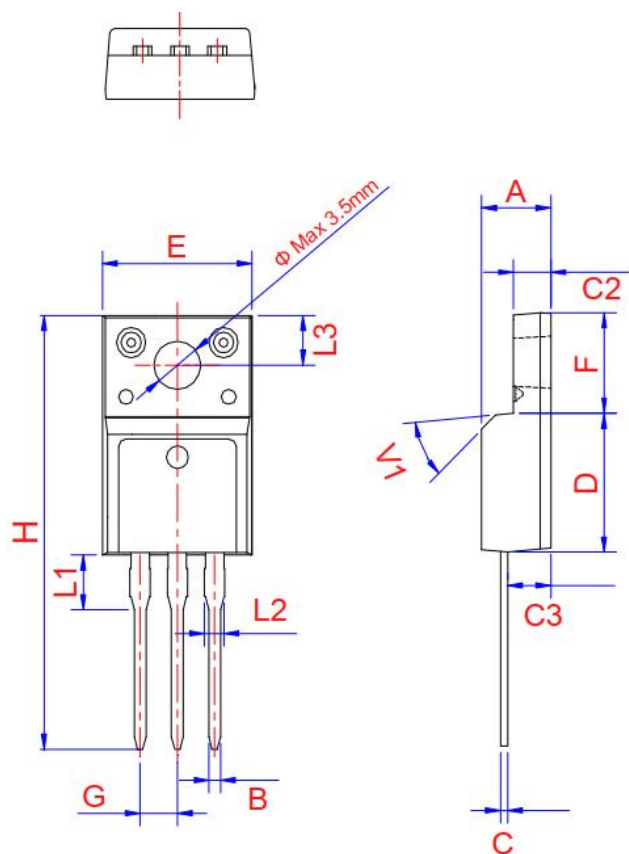


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## BT152 Series 20A SCRs



Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	4.4	4.47	4.6	0.173	0.176	0.181
B	0.61		0.88	0.024		0.035
C	0.46	0.50	0.7	0.018	0.02	0.028
C2	1.21	1.27	1.32	0.048	0.050	0.052
C3	2.4		2.72	0.094		0.107
D	8.6		9.7	0.339		0.382
E	9.8		10.4	0.386		0.409
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G		2.54			0.1	
H	28		29.8	1.102		1.173
L1		3.75			0.148	
L2	1.14		1.7	0.045		0.067
L3	2.65		2.95	0.104		0.116
V1		45°			45°	
Φ	3.7	3.75	3.8	0.145	0.147	0.149

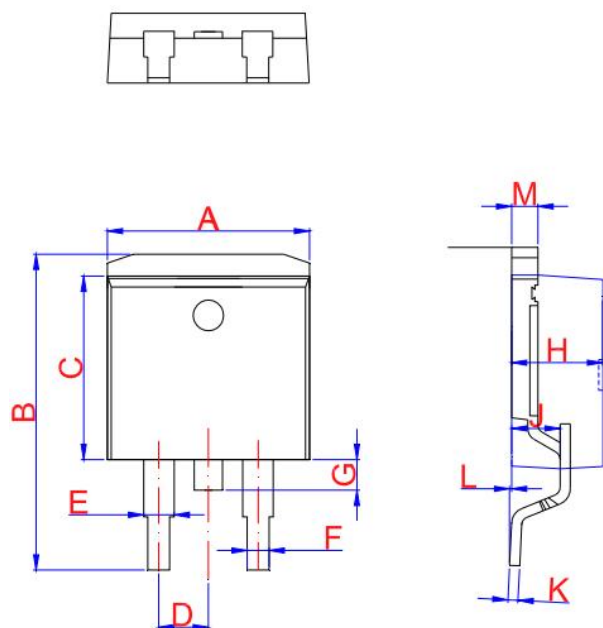


Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	4.5		4.9	0.177		0.193
B	0.74	0.8	0.83	0.029	0.031	0.033
C	0.47		0.65	0.019		0.026
C2	2.45		2.75	0.096		0.108
C3	2.6		3	0.102		0.118
D	8.8		9.3	0.346		0.366
E	9.8		10.4	0.386		0.41
F	6.4		6.8	0.252		0.268
G		2.54			0.1	
H	28		29.8	1.102		1.173
L1		3.63			0.148	
L2	1.14		1.7	0.045		0.067
L3	2.65	3.3	0		0.13	0.116
V1		45°			45°	



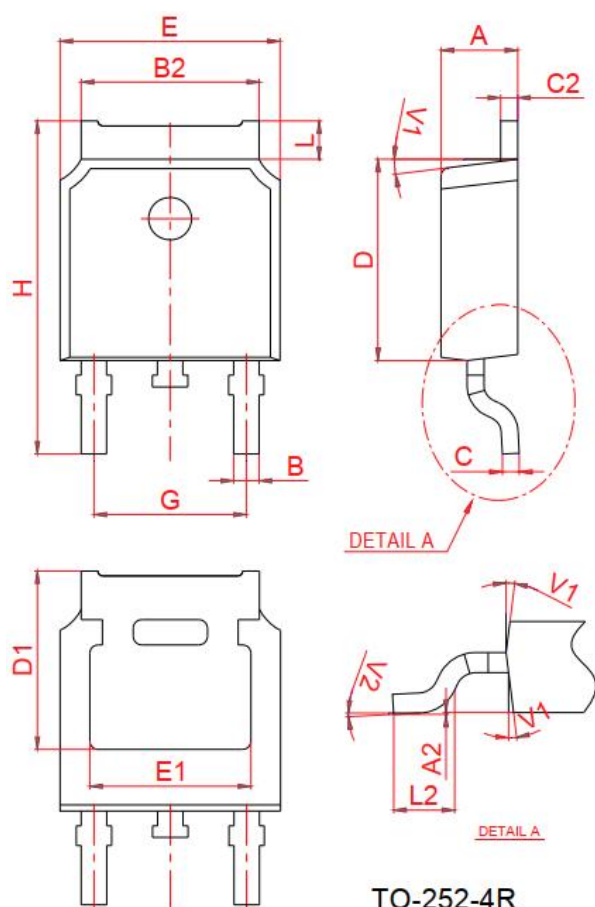
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## BT152 Series 20A SCRs



TO-263

Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	9.9		10.3	0.390		0.406
B	14.7		15.8	0.579		0.622
C	8.5		8.9	0.370		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	4.60	4.80	0.173	0.181	0.189
J	2.40	2.60	2.80	0.094	0.102	0.110
L	0	0.1	0.25	0	0.004	0.010
M	1.17	1.27	1.37	0.046	0.05	0.054



TO-252-4R

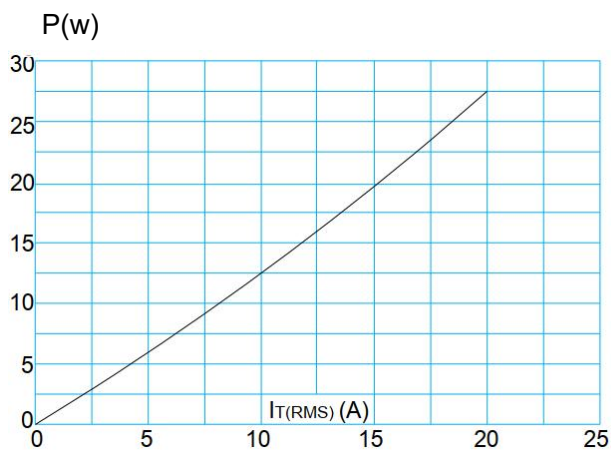
Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	2.2		2.4	0.087		0.094
A2	0		0.1	0		0.004
B	0.66		0.86	0.026		0.034
B2	5.1		5.46	0.201		0.215
C	0.46		0.58	0.018		0.023
C2	0.44		0.58	0.017		0.023
D	5.9		6.3	0.232		0.248
D1	5.30REF			0.211REF		
E	6.4		6.8	0.252		0.268
E1	4.63			0.182		
G	4.372		4.772	0.172		0.188
H	9.8		10.4	0.386		0.409
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°



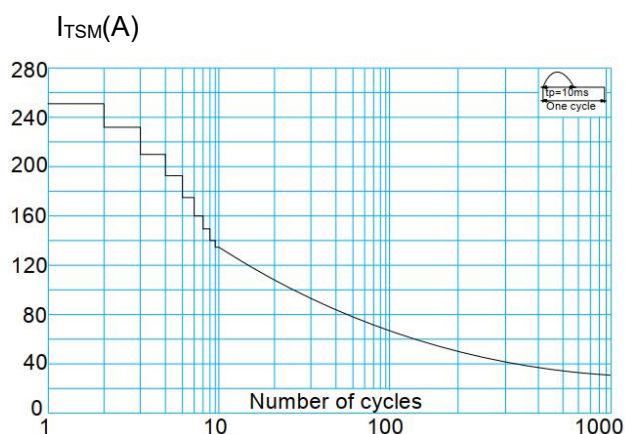
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## BT152 Series 20A SCRs

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



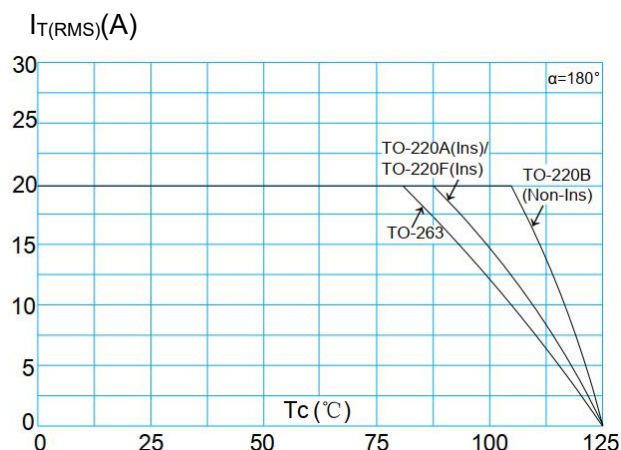
**FIG.3:** Surge peak on-state current versus number of cycles



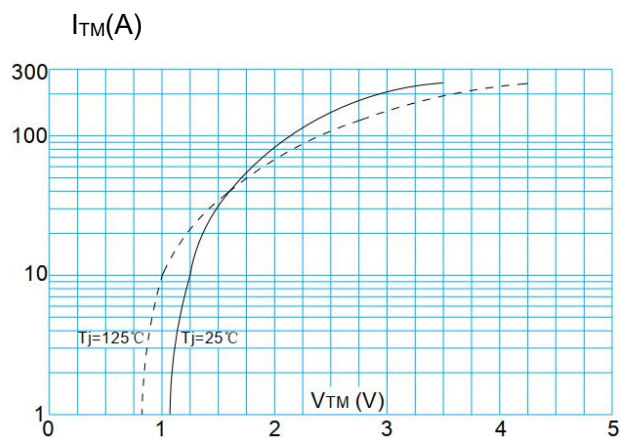
**FIG.5:** Non-repetitive surge peak on-state current for a sinusoidal pulse with width  $t_p < 20ms$ , and corresponding value of  $I^2t$  ( I - II - III:  $di/dt < 50A/\mu s$ ; IV:  $di/dt < 10A/\mu s$ )

$$I_{TSM}(A), I^2t (A^2s)$$

**FIG.2:** RMS on-state current versus case temperature



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

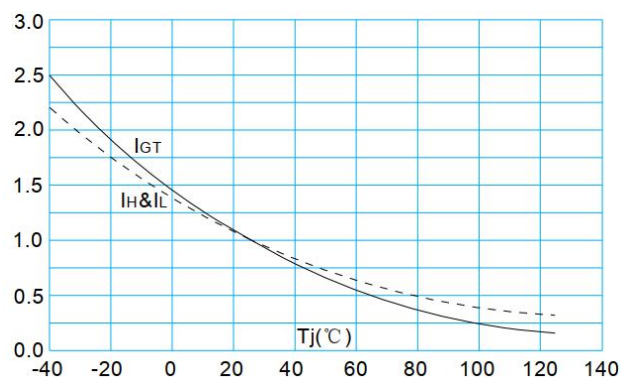
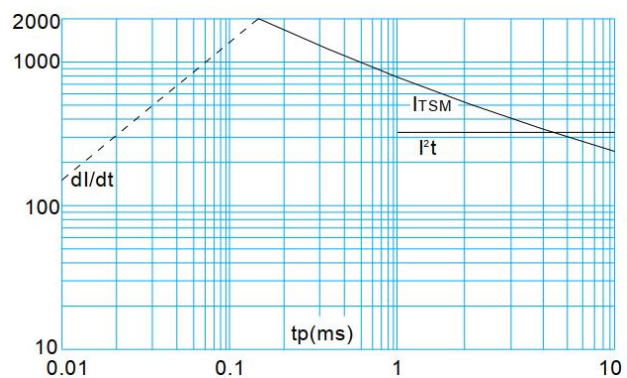


**FIG.6:** Relative variations of gate trigger current, holding current and latching current versus junction temperature

$$I_{GT}, I_H, I_L(T_j) / I_{GT}, I_H, I_L(T_j=25^\circ C)$$



# BT152 Series 20A SCRs





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### **BT152 Series 20A SCRs**

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