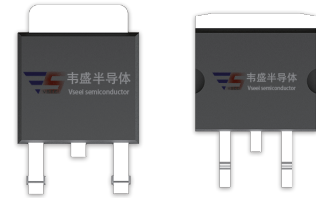


DESCRIPTION:

With high ability to withstand the shock loading of large current, BT151S-800R 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.

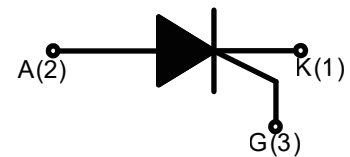


TO-252

TO-263

MAIN FEATURES

Symbol	Value	Symbol
V_{DRM}/V_{RRM}	650/800	V
$I_{T(RMS)}$	12	A
I_{GT}	≤ 15	mA



ABSOLUTE MAXIMUM RATINGS

Parameter		Symbol	Value	Unit
Storage junction temperature range		T_{stg}	-40 - 150	$^{\circ}\text{C}$
Operating junction temperature range		T_j	-40 - 150	$^{\circ}\text{C}$
Repetitive peak off-state voltage ($T_j=25^{\circ}\text{C}$)		V_{DRM}	650/800	V
Repetitive peak reverse voltage ($T_j=25^{\circ}\text{C}$)		V_{RRM}	650/800	V
RMS on-state current	TO-252 ($T_c=115^{\circ}\text{C}$)	$I_{T(RMS)}$	12	A
	TO-263 ($T_c=100^{\circ}\text{C}$)			
Non repetitive surge peak on-state current ($F=50\text{Hz}$ $t_p=10\text{ms}$)		I_{TSM}	120	A
Non repetitive surge peak on-state current ($F=60\text{Hz}$ $t_p=8.3\text{ms}$)		I_{TSM}	132	A
I^2t value for fusing ($t_p=10\text{ms}$)		I^2t	72	A^2s
Repetitive rate of rise of on-state current ($I_G=2 \times I_{GT}$)		dI_T/dt	50	$\text{A}/\mu\text{s}$
Peak gate current		I_{GM}	2	A

Peak gate power	P_{GM}	5	W
Average gate power dissipation	$P_{G(AV)}$	0.5	W

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

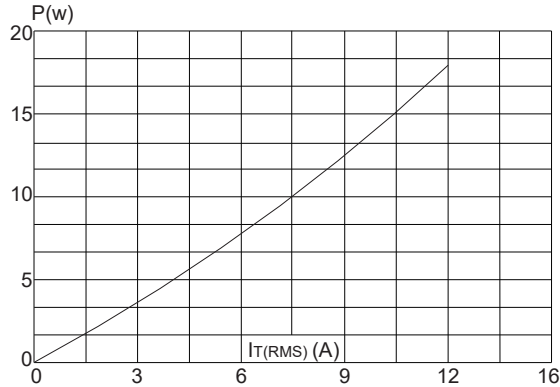
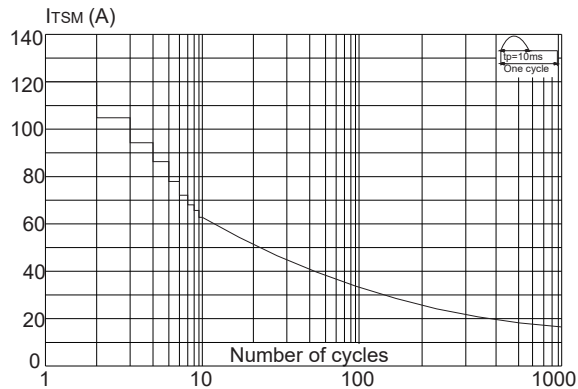
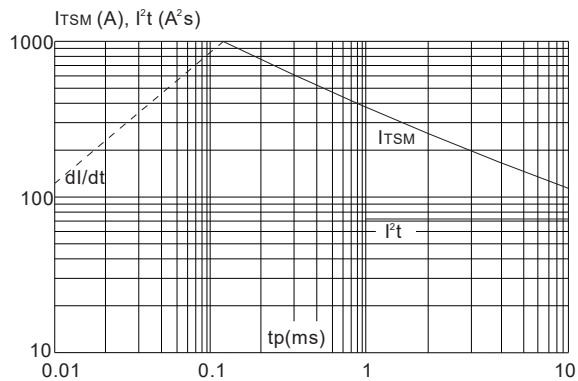
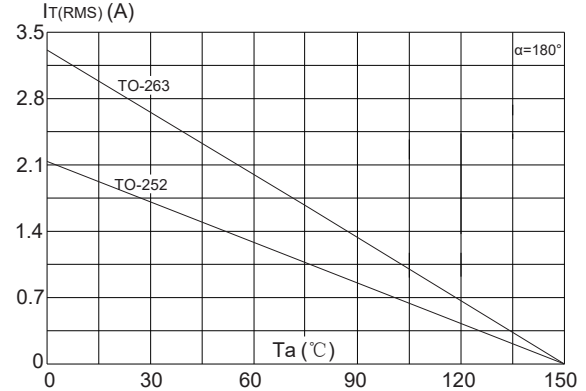
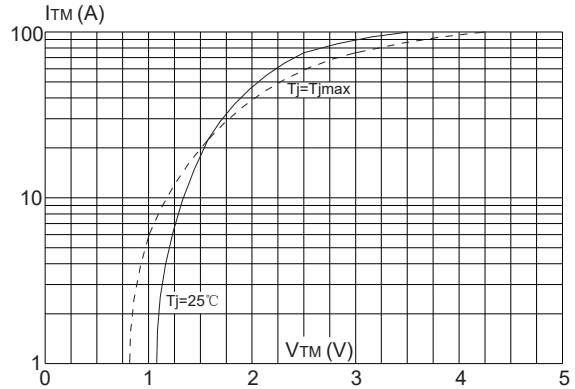
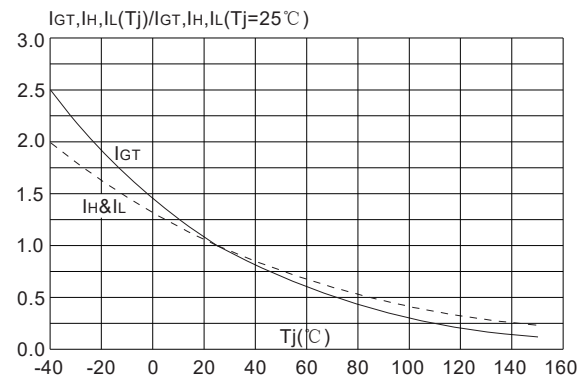
Symbol	Test Condition	Value			Unit
		MIN.	TYP.	MAX.	
I_{GT}	$V_D=12\text{V } R_L=33\Omega$	-	4	15	mA
V_{GT}		-	0.75	1.5	V
V_{GD}	$V_D=V_{DRM} T_j=150^{\circ}\text{C } R_L=3.3\text{K}\Omega$	0.2	-	-	V
I_L	$I_G=1.2I_{GT}$	-	12	40	mA
I_H	$I_T=500\text{mA}$	-	12	30	mA
dV/dt	$V_D=540\text{V}$ Gate Open $T_j=150^{\circ}\text{C}$	50	-	-	V/ μs
dV/dt	$V_D=436\text{V}$ Gate Open $T_j=150^{\circ}\text{C}$	80	-	-	V/ μs
t_{on}	$I_{GT}=20\text{mA } I_A=100\text{mA } I_R=10\text{mA}$ $T_j=25^{\circ}\text{C}$	-	2	-	μs
t_{off}		-	30	-	μs
R_d	Dynamic resistance $T_j=125^{\circ}\text{C}$	-	-	35	m Ω

STATIC CHARACTERISTICS

Symbol	Parameter		Value(MAX)	Unit
V_{TM}	$I_{TM}=23\text{A } t_p=380\mu\text{s}$	$T_j=25^{\circ}\text{C}$	1.6	V
I_{DRM}	$V_D=V_{DRM} V_R=V_{RRM}$	$T_j=25^{\circ}\text{C}$	10	μA
I_{RRM}		$T_j=150^{\circ}\text{C}$	1	mA

THERMAL RESISTANCES

Symbol	Parameter		Value	Unit
$R_{th(j-c)}$	Junction to case	TO-252 1.3		$^{\circ}\text{C/W}$
		TO-263	2.0	
$R_{th(j-a)}$	Junction to ambient	TO-252 70		
		TO-263	45	

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 $t_p < 10\text{ms}$, and corresponding value of I^2t ($di/dt < 50\text{A}/\mu\text{s}$)

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

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

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°C
	-Temperature Max($T_{s(max)}$)	+200°C
	-Time (Min to Max) (t_s)	60-180 secs.
Average ramp up rate (Liquidus Temp (T_L) to peak)		3°C/sec. Max
$T_{s(max)}$ to T_L - Ramp-up Rate		3°C/sec. Max
Reflow	-Temperature(T_L) (Liquidus)	+217°C
	-Temperature(t_L)	60-150 secs.
Peak Temp (T_p)		+260(+0/-5)°C
Time within 5°C of actual Peak Temp (t_p)		20-40secs.
Ramp-down Rate		6°C/sec. Max
Time 25°C to Peak Temp (T_p)		8 min. Max
Do not exceed		+260°C

