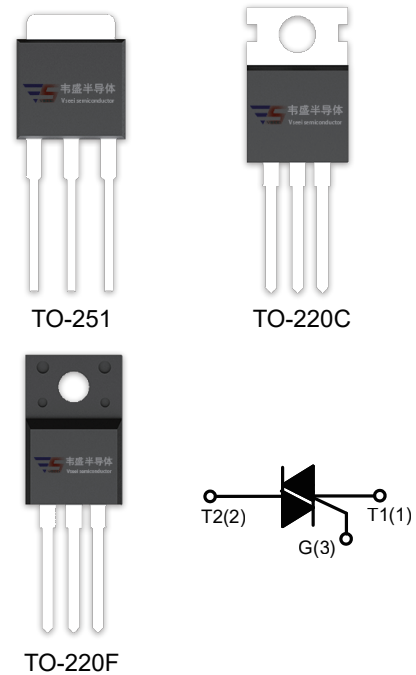


DESCRIPTION:

The BT138X-600F SCR series with the parallel resistor between Gate and Cathode are especially recommended for use on straight hair, igniter, anion generator, etc.


MAIN FEATURES

| Symbol | Value | Unit |
|-------------------|---------|------|
| $I_{T(RMS)}$ | 12 | A |
| V_{DRM}/V_{RRM} | 600/800 | V |

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 |
| Non repetitive surge peak Off-state voltage | | V_{DSM} | $V_{DRM} + 100$ | V |
| Non repetitive peak reverse voltage | | V_{RSM} | $V_{RRM} + 100$ | V |
| RMS on-state current | TO-251/ TO-220C($T_c=95^\circ\text{C}$) | $I_{T(RMS)}$ | 12 | A |
| | TO-220F(Ins) ($T_c=80^\circ\text{C}$) | | | |
| Non repetitive surge peak on-state current (full cycle, F=50Hz) | | I_{TSM} | 95 | A |
| I^2t value for fusing ($t_p=10\text{ms}$) | | I^2t | 45 | A^2s |

| | | | | |
|--|-------------|-------------|-----|------------|
| Critical rate of rise of on-state current($I_G=2 \times I_{GT}$) | I - II -III | di/dt | 50 | A/ μ s |
| | IV | | 10 | |
| Peak gate current | | I_{GM} | 2 | A |
| Average gate power dissipation | | $P_{G(AV)}$ | 0.5 | W |
| Peak gate power | | P_{GM} | 5 | W |

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

| Symbol | Test Condition | Quadrant | | Value | | | Unit |
|----------|--|-------------|-----|-------|----|----|------------|
| | | | | D | E | F | |
| I_{GT} | $V_D=12\text{V } R_L=33\Omega$ | I - II -III | MAX | 5 | 10 | 25 | mA |
| | | IV | | 10 | 25 | 70 | |
| V_{GT} | | ALL | MAX | 1.5 | | | V |
| V_{GD} | $V_D=V_{DRM} T_j=125^\circ\text{C}$ $R_L=3.3\text{K}\Omega$ | ALL | MIN | 0.2 | | | V |
| I_L | $I_G=1.2I_{GT}$ | I - III | MAX | 15 | 30 | 40 | mA |
| | | II - IV | | 20 | 40 | 80 | |
| I_H | $I_T=100\text{mA}$ | | MAX | 10 | 25 | 30 | mA |
| dV/dt | $V_D=2/3V_{DRM}$ Gate Open $T_j=125^\circ\text{C}$ | | MIN | 20 | 50 | 50 | V/ μ s |

STATIC CHARACTERISTICS

| Symbol | Parameter | | Value(MAX) | Unit |
|-----------|---|-------------------------|------------|---------------|
| V_{TM} | $I_{TM}=15\text{A } t_p=380\mu\text{s}$ | $T_j=25^\circ\text{C}$ | 1.6 | V |
| I_{DRM} | $V_D=V_{DRM} V_R=V_{RRM}$ | $T_j=25^\circ\text{C}$ | 5 | μA |
| I_{RRM} | | $T_j=125^\circ\text{C}$ | 1 | mA |

THERMAL RESISTANCES

| Symbol | Parameter | | Value | Unit |
|---------------|----------------------|--------------|-------|--------------------|
| $R_{th(j-c)}$ | junction to case(AC) | TO-220C | 1.4 | $^\circ\text{C/W}$ |
| | | TO-220F(Ins) | 2.5 | |
| | | TO-251 | 1.7 | |

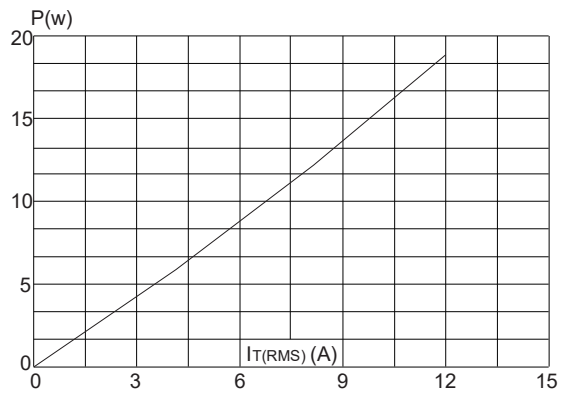
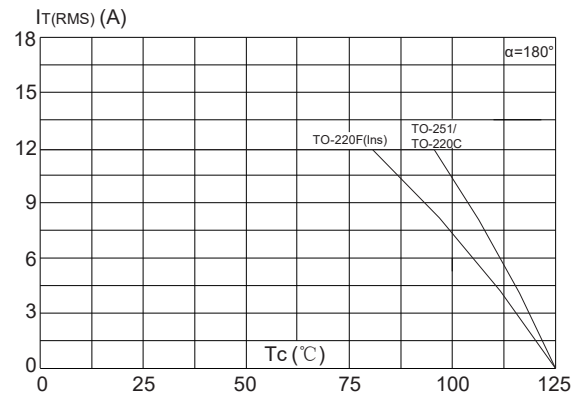
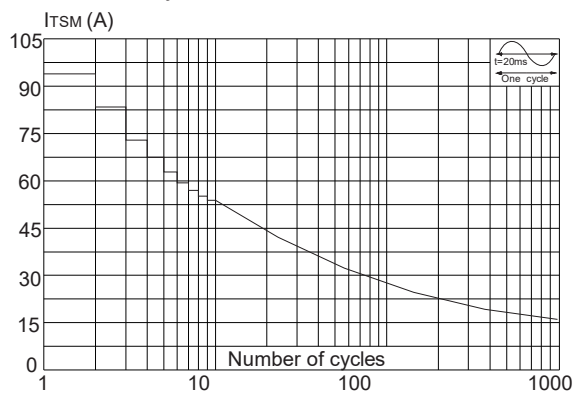
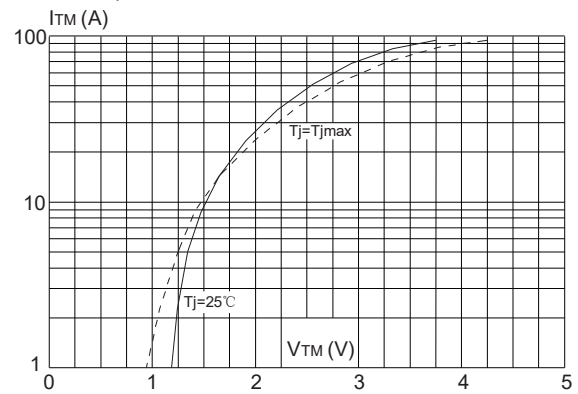
FIG.1: Maximum power dissipation versus RMS on-state current

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

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 $t_p < 20\text{ms}$, and corresponding value of I^2t (I - II - III: $dI/dt < 50\text{A}/\mu\text{s}$; IV: $dI/dt < 10\text{A}/\mu\text{s}$)

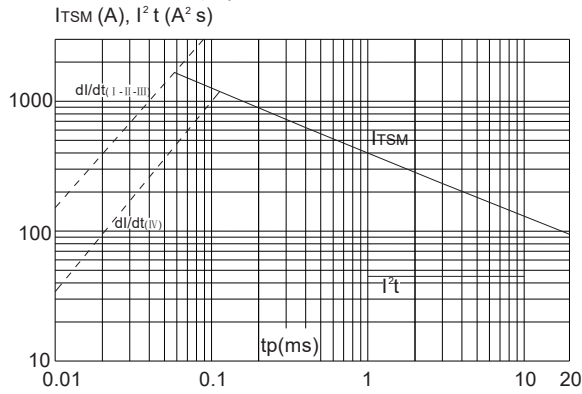


FIG.6: Relative variations of gate trigger current versus junction temperature

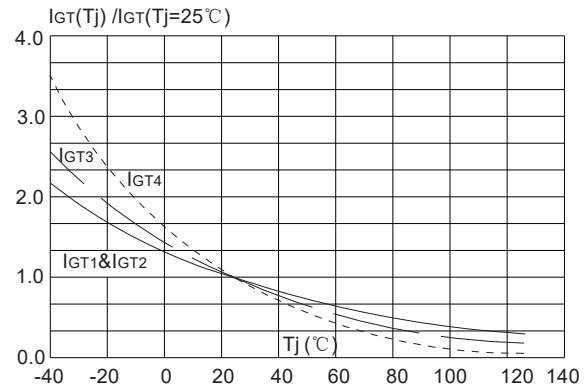


FIG.7: Relative variations of holding current versus junction temperature

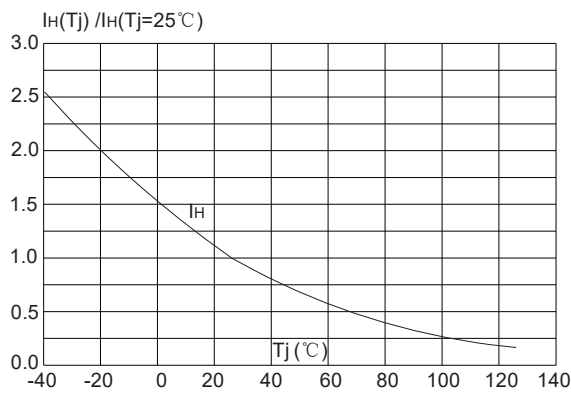


FIG.8: Relative variations of latching current versus junction temperature

