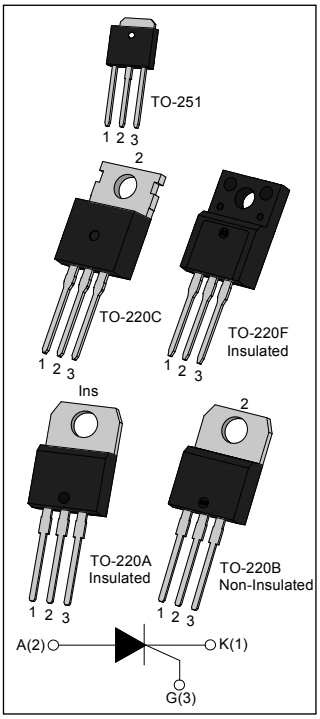
## JCTx16 Series 16A SCRs

Rev.8.0

### DESCRIPTION:

With high ability to withstand the shock loading of large current, JCTx16 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.

From all three terminals to external heatsink, JCTx16A provides a rated insulation voltage of 2500 $V_{RMS}$, and JCTx16F provides a rated insulation voltage of 2000 $V_{RMS}$, complying with UL standards (File ref: E252906). All the packages mentioned are RoHS compliant. (2011/65/EU)




### MAIN FEATURES

| Symbol | JCT616 | JCT816 |
|---|---|---|
| $V_{DRM}$/ $V_{RRM}$ | 600V | 800V |
| $I_{T(RMS)}$ | 16A | |
| $I_{GT}$ | ≤15mA | |

### ABSOLUTE MAXIMUM RATINGS

| Parameter | | Symbol | Value | Unit |
|---|---|---|---|---|
| Storage junction temperature range | | $T_{stg}$ | -40-150 | ℃ |
| Operating junction temperature range | | $T_j$ | -40-150 | ℃ |
| Repetitive peak off-state voltage($T_j$=25℃) | | $V_{DRM}$ | 600/800 | V |
| Repetitive peak reverse voltage($T_j$=25℃) | | $V_{RRM}$ | 600/800 | V |
| RMS on-state current | TO-220A(Ins) / TO-220F(Ins) ($T_C$=100℃) | $I_{T(RMS)}$ | 16 | A |
| | TO-251/ TO-220C TO-220B(Non-Ins) ($T_C$=120℃) | | | |

| | | | |
|---|---|---|---|
| Non repetitive surge peak on-state current (tp=10ms) | $I_{TSM}$ | 180 | A |
| $I^2t$ value for fusing (tp=10ms) | $I^2t$ | 162 | $A^2s$ |
| Critical rate of rise of on-state current ($I_G$=2×$I_{GT}$) | dI/dt | 50 | A/μs |
| 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℃ unless otherwise specified)

| Symbol | Test Condition | Value | | | Unit |
|---|---|---|---|---|---|
| | | MIN. | TYP. | MAX. | |
| $I_{GT}$ | $V_D$=12V $R_L$=33Ω | - | - | 15 | mA |
| $V_{GT}$ | | - | - | 1.3 | V |
| $V_{GD}$ | $V_D$=$V_{DRM}$ $T_j$=150℃ $R_L$=3.3KΩ | 0.2 | - | - | V |
| $I_L$ | $I_G$=1.2$I_{GT}$ | - | - | 60 | mA |
| $I_H$ | $I_T$=500mA | - | - | 50 | mA |
| dV/dt | $V_D$=2/3$V_{DRM}$ Gate Open $T_j$=150℃ | 200 | - | - | V/μs |

**STATIC CHARACTERISTICS**

| Symbol | Parameter | | Value(MAX) | Unit |
|---|---|---|---|---|
| $V_{TM}$ | $I_{TM}$=32A tp=380μs | $T_j$=25℃ | 1.55 | V |
| $I_{DRM}$ | $V_D$=$V_{DRM}$ $V_R$=$V_{RRM}$ | $T_j$=25℃ | 5 | μA |
| $I_{RRM}$ | | $T_j$=150℃ | 2 | mA |

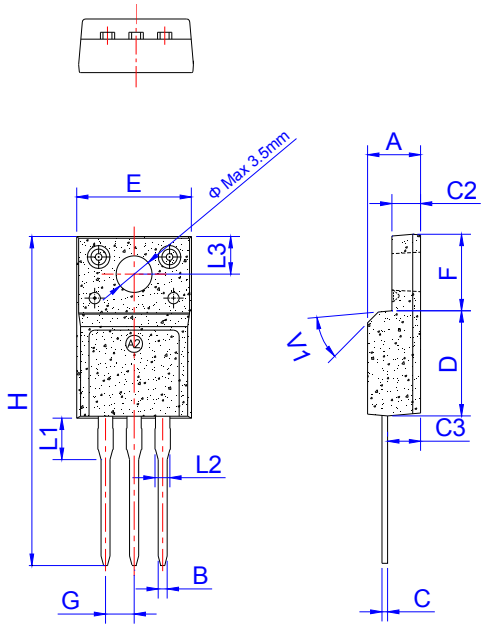
**THERMAL RESISTANCES**

| Symbol | Parameter | | Value | Unit |
|---|---|---|---|---|
| $R_{th(j-c)}$ | junction to case(AC) | TO-220A(Ins)/ TO-220F(Ins) | 2.4 | ℃/W |
| | | TO-220B(Non-Ins) TO-220C | 1.1 | |
| | | TO-251 | 1.4 | |

## ORDERING INFORMATION

| J | CT | 6 | 16 | B |
|---|---|---|---|---|
| JieJie Microelectronics Co.,Ltd | SCRs | 6:$V_{DRM}$ /$V_{RRM}$ ≥600V<br>8:$V_{DRM}$ /$V_{RRM}$ ≥800V | $I_{T(RMS)}$:16A | A:TO-220A(Ins)<br>F:TO-220F(Ins)<br>B:TO-220B(Non-Ins)<br>C:TO-220C H:TO-251 |

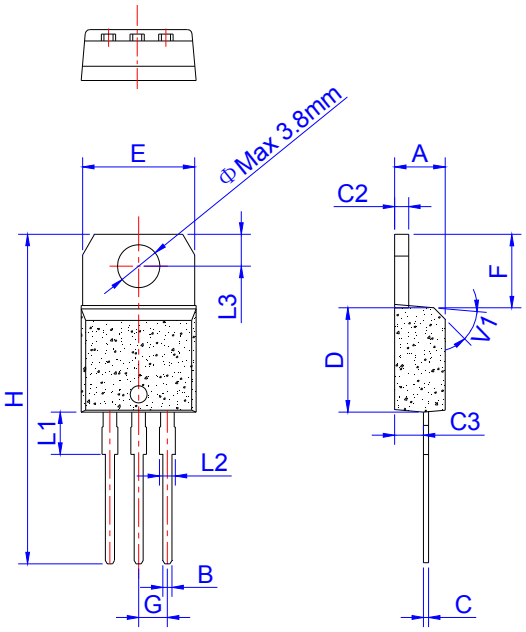
## PACKAGE MECHANICAL DATA




TO-220F Ins

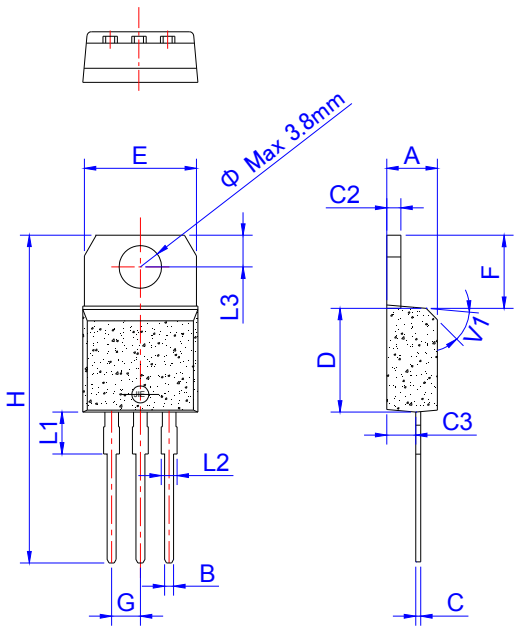
| Ref. | Dimensions | | | | | |
|---|---|---|---|---|---|---|
| | Millimeters | | | Inches | | |
| | Min. | Typ. | Max. | Min. | Typ. | Max. |
| A | 4.50 | | 4.90 | 0.177 | | 0.193 |
| B | 0.74 | 0.80 | 0.83 | 0.029 | 0.031 | 0.033 |
| C | 0.47 | | 0.65 | 0.019 | | 0.026 |
| C2 | 2.45 | | 2.75 | 0.096 | | 0.108 |
| C3 | 2.60 | | 3.00 | 0.102 | | 0.118 |
| D | 8.80 | | 9.30 | 0.346 | | 0.366 |
| E | 9.80 | | 10.4 | 0.386 | | 0.410 |
| F | 6.40 | | 6.80 | 0.252 | | 0.268 |
| G | | 2.54 | | | 0.1 | |
| H | 28.0 | | 29.8 | 1.102 | | 1.173 |
| L1 | | 3.63 | | | 0.143 | |
| L2 | 1.14 | | 1.70 | 0.045 | | 0.067 |
| L3 | | 3.30 | | | 0.130 | |
| V1 | | 45° | | | 45° | |

## PACKAGE MECHANICAL DATA




TO-220A Ins

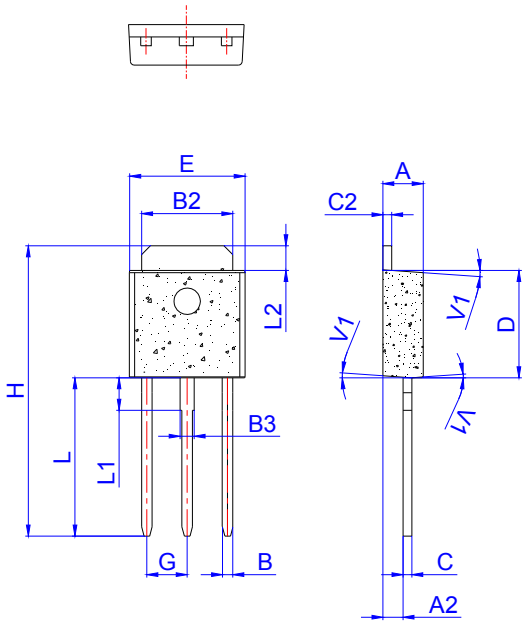
| Ref. | Dimensions | | | | | |
|---|---|---|---|---|---|---|
| | Millimeters | | | Inches | | |
| | Min. | Typ. | Max. | Min. | Typ. | Max. |
| A | 4.40 | | 4.60 | 0.173 | | 0.181 |
| B | 0.61 | | 0.88 | 0.024 | | 0.035 |
| C | 0.46 | | 0.70 | 0.018 | | 0.028 |
| C2 | 1.21 | | 1.32 | 0.048 | | 0.052 |
| C3 | 2.40 | | 2.72 | 0.094 | | 0.107 |
| D | 8.60 | | 9.70 | 0.339 | | 0.382 |
| E | 9.80 | | 10.4 | 0.386 | | 0.409 |
| F | 6.55 | | 6.95 | 0.258 | | 0.274 |
| G | | 2.54 | | | 0.1 | |
| H | 28.0 | | 29.8 | 1.102 | | 1.173 |
| L1 | | 3.75 | | | 0.148 | |
| L2 | 1.14 | | 1.70 | 0.045 | | 0.067 |
| L3 | 2.65 | | 2.95 | 0.104 | | 0.116 |
| V1 | | 45° | | | 45° | |




TO-220B Non-Ins

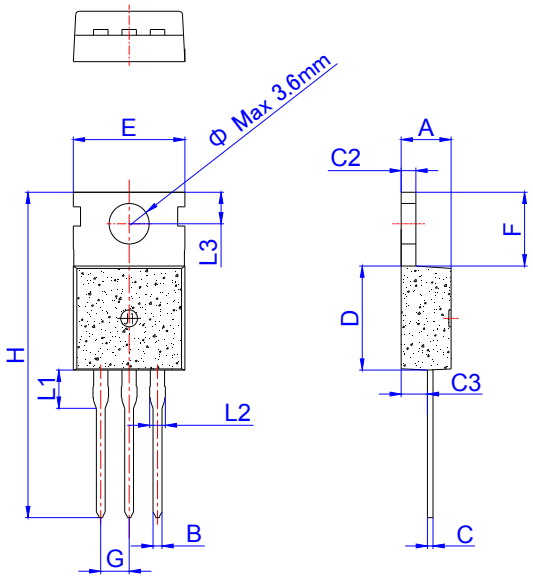
| Ref. | Dimensions | | | | | |
|---|---|---|---|---|---|---|
| | Millimeters | | | Inches | | |
| | Min. | Typ. | Max. | Min. | Typ. | Max. |
| A | 4.40 | | 4.60 | 0.173 | | 0.181 |
| B | 0.61 | | 0.88 | 0.024 | | 0.035 |
| C | 0.46 | | 0.70 | 0.018 | | 0.028 |
| C2 | 1.21 | | 1.32 | 0.048 | | 0.052 |
| C3 | 2.40 | | 2.72 | 0.094 | | 0.107 |
| D | 8.60 | | 9.70 | 0.339 | | 0.382 |
| E | 9.60 | | 10.4 | 0.378 | | 0.409 |
| F | 6.20 | | 6.60 | 0.244 | | 0.260 |
| G | | 2.54 | | | 0.1 | |
| H | 28.0 | | 29.8 | 1.102 | | 1.173 |
| L1 | | 3.75 | | | 0.148 | |
| L2 | 1.14 | | 1.70 | 0.045 | | 0.067 |
| L3 | 2.65 | | 2.95 | 0.104 | | 0.116 |
| V1 | | 45° | | | 45° | |

## PACKAGE MECHANICAL DATA




TO-251

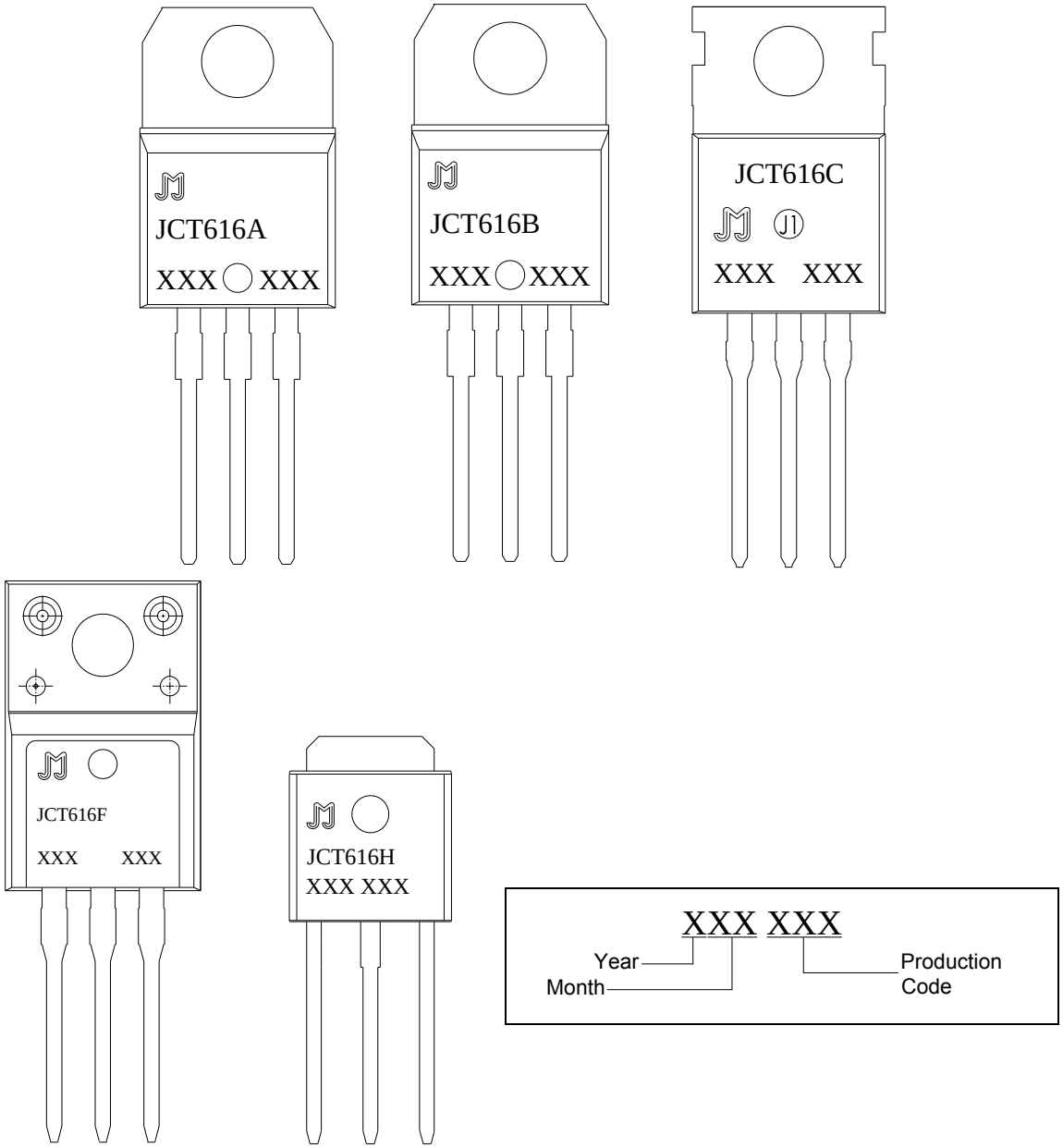
| Ref. | Dimensions | | | | | |
|---|---|---|---|---|---|---|
| | Millimeters | | | Inches | | |
| | Min. | Typ. | Max. | Min. | Typ. | Max. |
| A | 2.20 | | 2.40 | 0.086 | | 0.095 |
| A2 | 0.90 | | 1.20 | 0.035 | | 0.047 |
| B | 0.55 | | 0.65 | 0.022 | | 0.026 |
| B2 | 5.10 | | 5.40 | 0.200 | | 0.213 |
| B3 | 0.76 | | 0.85 | 0.030 | | 0.033 |
| C | 0.45 | | 0.62 | 0.018 | | 0.024 |
| C2 | 0.48 | | 0.62 | 0.019 | | 0.024 |
| D | 6.00 | | 6.20 | 0.236 | | 0.244 |
| E | 6.40 | | 6.70 | 0.252 | | 0.264 |
| G | | 2.30 | | | 0.091 | |
| H | 16.0 | | 17.0 | 0.630 | | 0.669 |
| L | 8.90 | | 9.40 | 0.350 | | 0.370 |
| L1 | 1.80 | | 1.90 | 0.071 | | 0.075 |
| L2 | 1.37 | | 1.50 | 0.054 | | 0.059 |
| V1 | | 4° | | | 4° | |




TO-220C

| Ref. | Dimensions | | | | | |
|---|---|---|---|---|---|---|
| | Millimeters | | | Inches | | |
| | Min. | Typ. | Max. | Min. | Typ. | Max. |
| A | 4.40 | | 4.60 | 0.173 | | 0.181 |
| B | 0.70 | | 0.90 | 0.028 | | 0.035 |
| C | 0.45 | | 0.60 | 0.018 | | 0.024 |
| C2 | 1.23 | | 1.32 | 0.048 | | 0.052 |
| C3 | 2.20 | | 2.60 | 0.087 | | 0.102 |
| D | 8.90 | | 9.90 | 0.350 | | 0.390 |
| E | 9.90 | | 10.3 | 0.390 | | 0.406 |
| F | 6.30 | | 6.90 | 0.248 | | 0.272 |
| G | | 2.54 | | | 0.1 | |
| H | 28.0 | | 29.8 | 1.102 | | 1.173 |
| L1 | | 3.39 | | | 0.133 | |
| L2 | 1.14 | | 1.70 | 0.045 | | 0.067 |
| L3 | 2.65 | | 2.95 | 0.104 | | 0.116 |
| Φ | | 3.6 | | | 0.142 | |

## MARKING




## PACKAGE INFORMATION

| PACKAGE | OUTLINE | TUBE (PCS) | INNER BOX (PCS) | PER CARTON |
|---|---|---|---|---|
| TO-220A | TUBE | 50 | 1,000 | 8,000 |
| TO-220B | TUBE | 50 | 1,000 | 8,000 |
| TO-220C | TUBE | 50 | 1,000 | 8,000 |
| TO-220F | TUBE | 50 | 1,000 | 8,000 |
| TO-251 | TUBE | 80 | 4,000 | 32,000 |

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

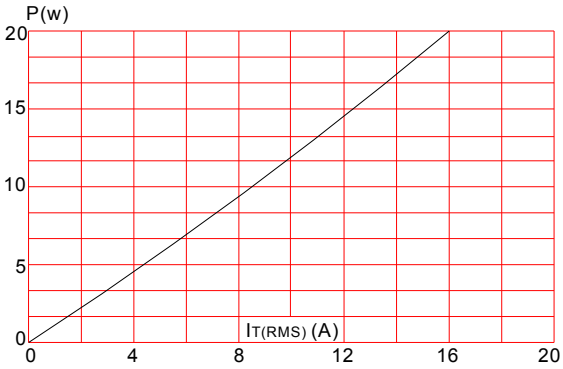



**FIG.2:** RMS on-state current versus case temperature

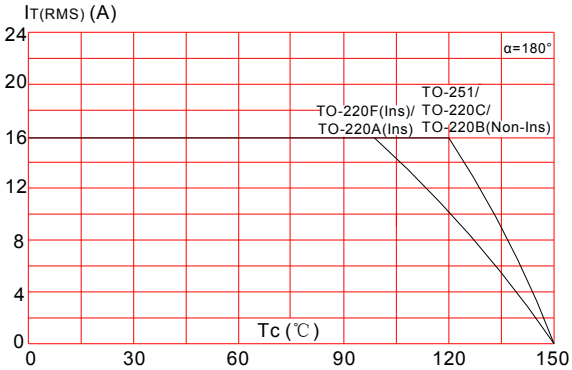



**FIG.3:** Surge peak on-state current versus number of cycles

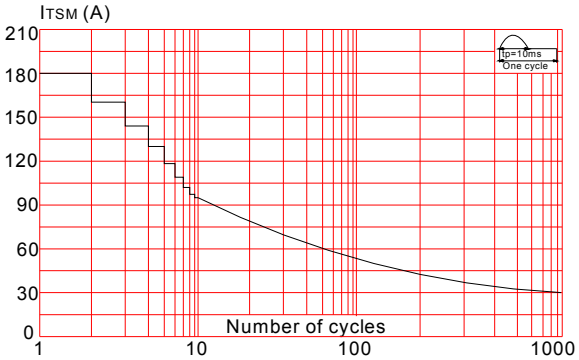



**FIG.4:** On-state characteristics (maximum values)

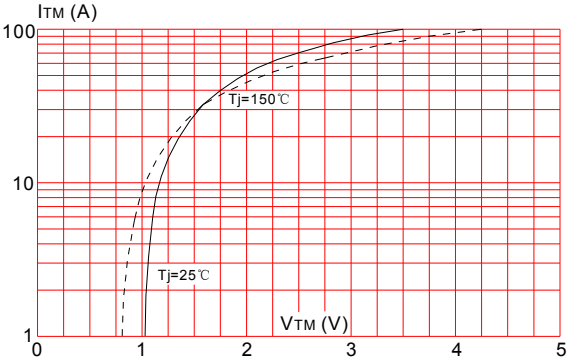



**FIG.5:** Non-repetitive surge peak on-state current for a sinusoidal pulse with width tp<10ms, and corresponging value of $I^2t$ (dI/dt<50A/μs)

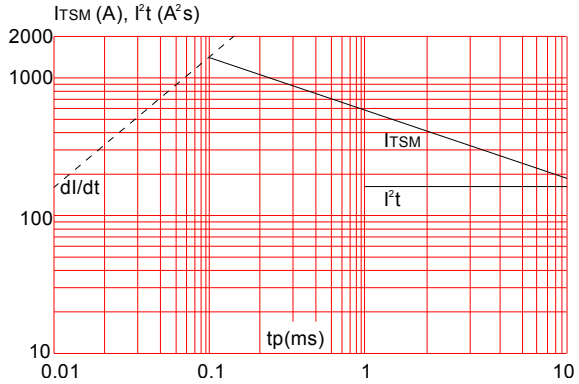
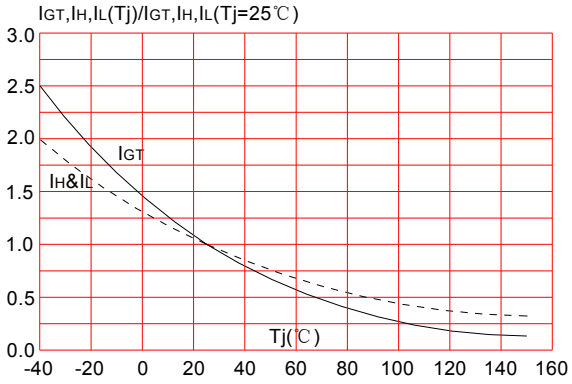



**FIG.6:** Relative variations of gate trigger current, holding current and latching current versus junction temperature

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