

## TO-263K Plastic-Encapsulate Thyristors

### CT312Q 3Q TRIACs

#### MAIN CHARACTERISTICS

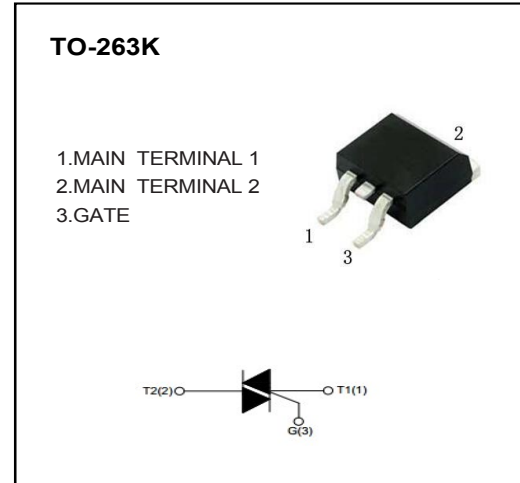
$I_{T(RMS)}$		12A
$V_{DRM}/V_{RRM}$	CT312Q-600S/C/B	600V
	CT312Q-800S/C/B	800V
$V_{TM}$		1.55V

#### FEATURES

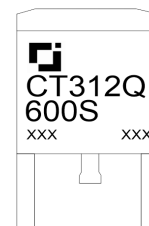
- NPNPN 5-layer Structure TRIACs
- Mesa Glass Passivated Technology
- Multi Layers Metal Electrodes
- High Junction Temperature
- Good Commutation Performance
- High  $dV/dt$  and  $dI/dt$

#### APPLICATIONS

- Heater Control
- Motor Speed Controller
- Mixer



#### MARKING



CT312Q:Series Code  
600S:Depends on  $V_{DRM}$   
and  $I_{GT}$   
XXX:Internal Code

#### ABSOLUTE RATINGS ( $T_a=25^\circ\text{C}$ unless otherwise noted )

Symbol	Parameter	Test condition	Value	Unit	
$V_{DRM}/V_{RRM}$	Repetitive peak off-state voltage	$T_j=25^\circ\text{C}$	CT312Q-600S/C/B	600	V
			CT312Q-800S/C/B	800	V
$I_{T(RMS)}$	RMS on-state current	TO-263K( $T_c \leq 105^\circ\text{C}$ ), Fig. 1,2	12	A	
$I_{TSM}$	Non repetitive surge peak on-state current	Full sine wave , $T_j(\text{init})=25^\circ\text{C}$ , $t_p=20\text{ms}$ ; Fig. 3,5	120	A	
$I^2t$	$I^2t$ value	$t_p=10\text{ms}$	78	$\text{A}^2\text{s}$	
$dI_T/dt$	Critical rate of rise of on-state current	$I_G=2 \cdot I_{GT}$ , $t_r \leq 10\text{ns}$ , $F=120\text{Hz}$ , $T_j=125^\circ\text{C}$	I - II -III	50	$\text{A}/\mu\text{s}$
			IV	n/a	
$I_{GM}$	Peak gate current	$t_p=20\mu\text{s}$ , $T_j=125^\circ\text{C}$	4	A	
$P_{G(AV)}$	Average gate power	$T_j=125^\circ\text{C}$	1	W	
$T_{STG}$	Storage temperature		-40~+150	$^\circ\text{C}$	
$T_j$	Operating junction temperature		-40~+125		

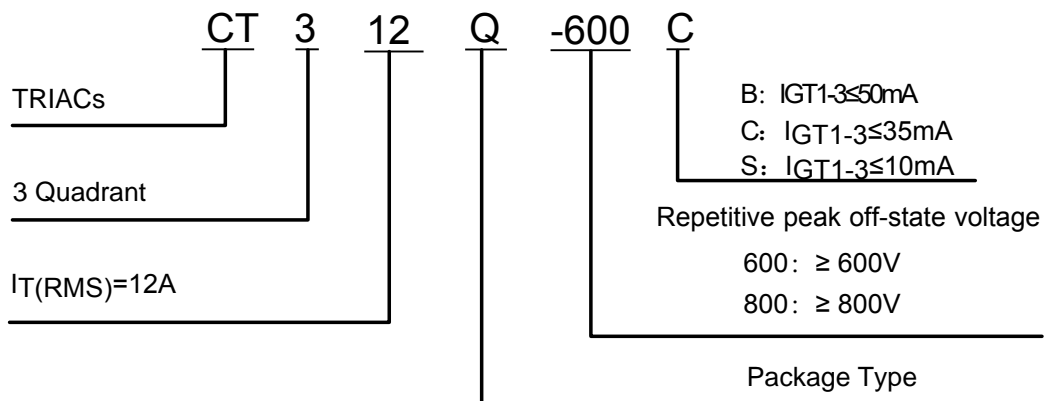
## ELECTRICAL CHARACTERISTICS (T<sub>a</sub>=25°C unless otherwise specified)

Symbol	Parameter	Test condition	Value			Unit	
			S	C	B		
I <sub>GT</sub>	Gate trigger current	V <sub>D</sub> =12V, R <sub>L</sub> =30Ω, T <sub>j</sub> =25°C, Fig. 6	I - II -III	≤10	≤35	≤50	mA
			IV	n/a	n/a	n/a	
V <sub>GT</sub>	Gate trigger voltage	T <sub>j</sub> =25°C, Fig. 6	I - II -III	≤1.3			V
V <sub>GD</sub>	Non-triggering gate voltage	V <sub>D</sub> =V <sub>DRM</sub> , R <sub>L</sub> =3.3kΩ, T <sub>j</sub> =125°C		≥0.2			V
I <sub>H</sub>	Holding current	I <sub>T</sub> =500mA, Fig. 6		≤15	≤35	≤50	mA
I <sub>L</sub>	Latching current	I <sub>G</sub> =1.2I <sub>GT</sub> , Fig. 6	I - III	≤25	≤50	≤70	mA
			II	≤30	≤60	≤80	mA
dV <sub>D</sub> /dt	Critical rate of rise of off-state	V <sub>D</sub> =67%V <sub>DRM</sub> , Gate Open T <sub>j</sub> =125°C		≥40	≥500	≥1000	V/μs
V <sub>TM</sub>	On-state Voltage	I <sub>TM</sub> =17A, tp=380μs, Fig. 4		≤1.55			V
I <sub>DRM</sub> / I <sub>RPM</sub>	Repetitive peak off-state current	V <sub>D</sub> =V <sub>DRM</sub> /V <sub>RPM</sub> , T <sub>j</sub> =25°C		≤5	≤5	≤5	μA
		V <sub>D</sub> =V <sub>DRM</sub> /V <sub>RPM</sub> , T <sub>j</sub> =125°C		≤1	≤1	≤1	mA

## THERMAL RESISTANCES

Symbol	Parameter	Value	Unit
R <sub>th</sub> (j-c)	Junction to case (AC)	TO-263K	1.4 °C/W
R <sub>th</sub> (j-a)	Junction to ambient	TO-263K	45 °C/W

## PART NUMBER



# CHARACTERISTICS CURVES

FIG.1: Maximum power dissipation versus RMS on-state current (full cycle)

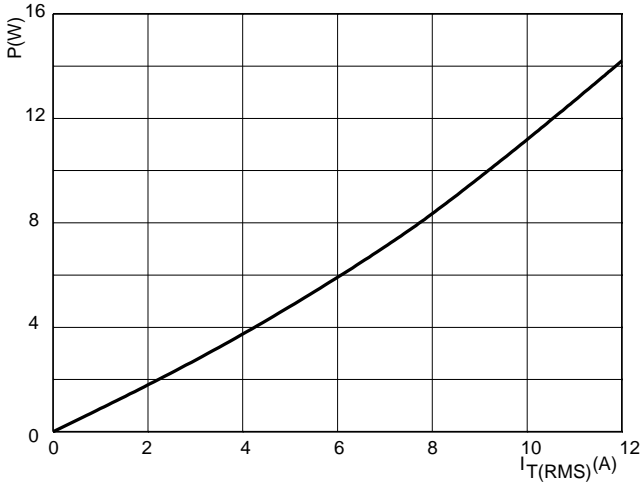


FIG.2: RMS on-state current versus case temperature (full cycle)

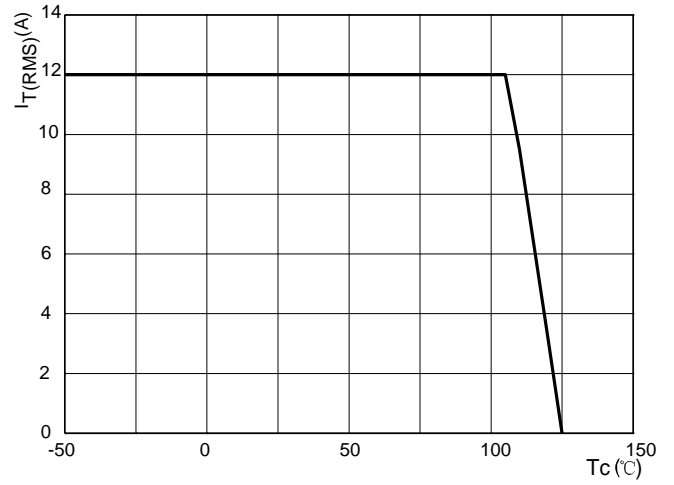


FIG.3: Surge peak on-state current versus number of cycles

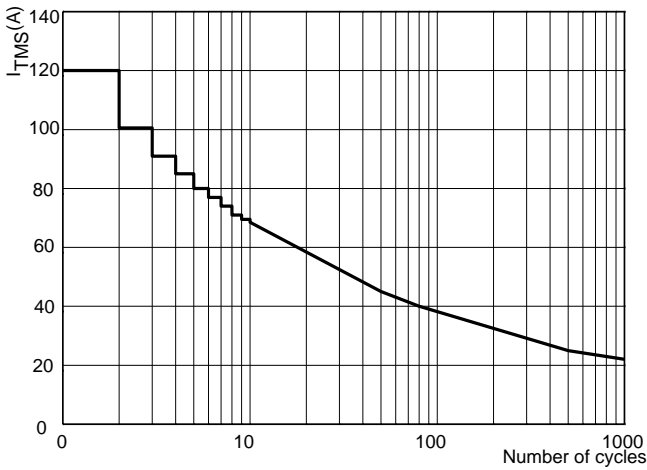


FIG.4: On-state characteristics (maximum values)

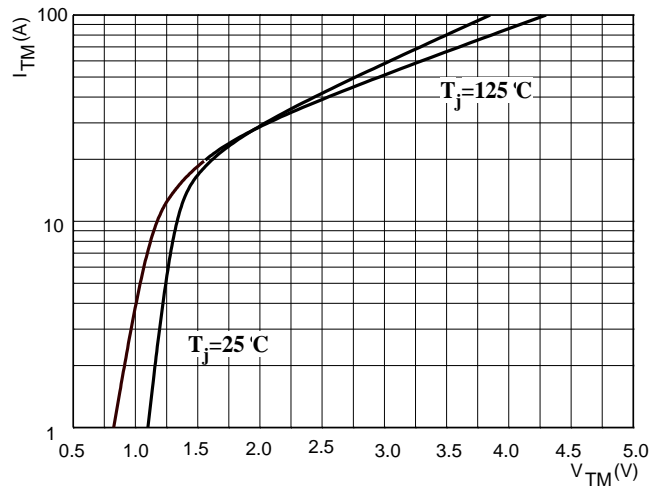


FIG.5: Non-repetitive surge peak on-state current for a sinusoidal pulse with width  $t_p < 10\text{ms}$

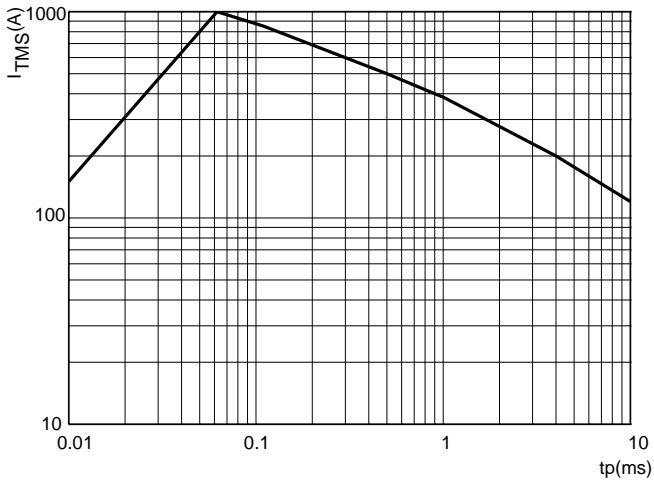
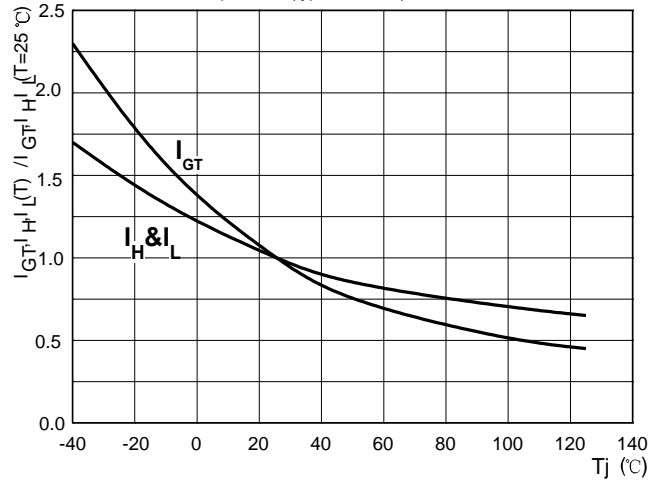
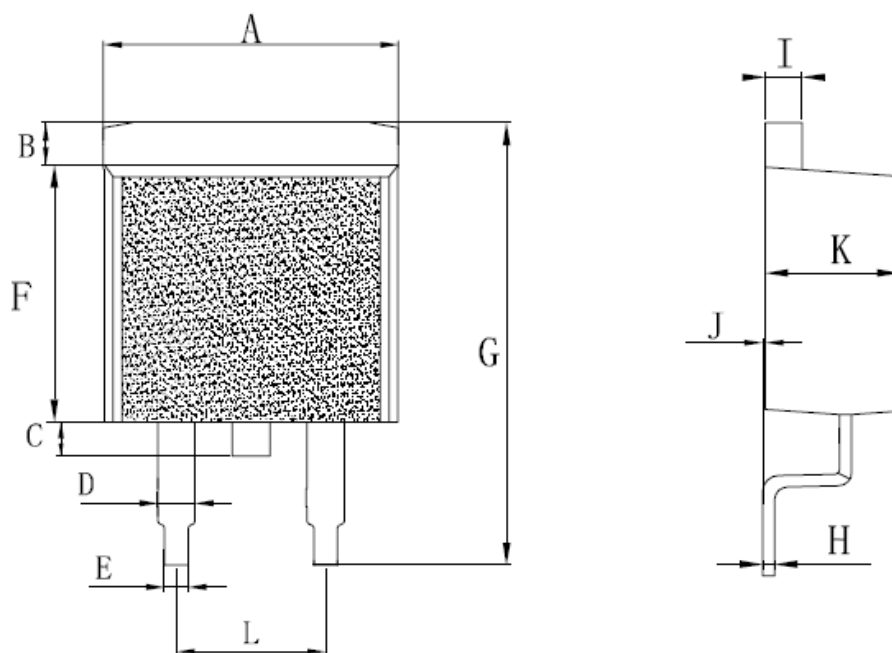


FIG.6: Relative variations of gate trigger current, holding current and latching current versus junction temperature (typical values)



## TO-263K PACKAGE OUTLINE DIMENSIONS



DIM.	Unit(mm)		Unit(inch)	
	Min	Max	Min	Max
<b>A</b>	9.7	10.4	0.381	0.409
<b>B</b>	1.31	1.62	0.051	0.063
<b>C</b>	0.65	1.22	0.025	0.048
<b>D</b>	1.15	1.36	0.045	0.053
<b>E</b>	0.62	0.95	0.024	0.037
<b>F</b>	8.75	9.32	0.344	0.366
<b>G</b>	14.75	15.8	0.580	0.622
<b>H</b>	0.32	0.48	0.012	0.018
<b>I</b>	1.18	1.36	0.046	0.053
<b>J</b>	0	0.15	0	0.005
<b>K</b>	4.38	4.86	0.172	0.191
<b>L</b>	4.85	5.23	0.190	0.205