QS1600T603 60A TRIAC Homogeneous Current SiC Schottky Diode

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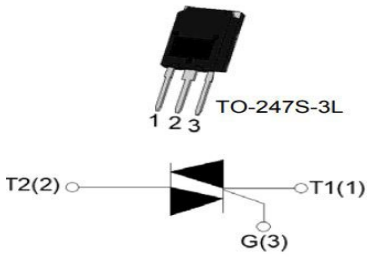
Description

The QS1600T603 triac is suitable for general purpose AC switching. It can be used as an ON/OFF function in applications such as heating regulation, induction motor starting circuits, for phase control operation in light dimmers, motor speed controllers. QS1600T603 snubberless triac is especially recommended for use on inductive loads. Package TO-247S-3L is RoHS compliant.

Package

TO-247S-3L



Main Features

Symbol	Value	Unit
IT(RMS)	60	A
VDRM /VRRM	1600	V
IGTI/II/III	50/50/50	mA

Feature / Advantages:

- Thyristor for line frequency
- Planar passivated chip
- Long term stability

Application:

- Line rectifying 50/60 Hz
- Softstart AC motor control
- DC Motor control
- Power converter
- Ac power control
- Lighting ad temperature control

Absolute Maximum Ratings

Parameter	Symbol	Value	Unit
Storage junction temperature range	Tstg	-40-150	°C
Operating junction temperature range	T_j	-40-125	°C
Repetitive peak off-state voltage (T_j=25°C)	VDRM	1600	V
Repetitive peak reverse voltage (T_j=25°C)	VRRM	1600	V
RMS on-state current (T_C≤92°C)	IT(RMS)	60	A
Non repetitive surge peak on-state current (full cycle , t_p=20ms , T_j=25°C)	ITSM	600	A
Non repetitive surge peak on-state current (full cycle , t_p=16.6ms , T_j=25°C)		660	
I^2t value for fusing (t_p=10ms , T_j=25°C)	I^2t	1800	A^2s
Critical rate of rise of on-state current (I_G=2×I_{GT} , f=100Hz , T_j=125°C)	dI/dt	100	A/μs
Peak gate current (t_p=20μs , T_j=125°C)	IGM	8	A
Average gate power dissipation (T_j=125°C)	PG(AV)	0.5	W
Peak gate power	PGM	10	W
Peak pulse voltage (Tj=25°C; non-repetitive,off-state;FIG.7)	Vpp	Vpp	kV

Electrical Characteristics (Tj=25°C unless otherwise specified

Symbol	Test Condition	Quadrant		Value	Unit
IGT	V_D =12V R_L =33Ω	I-II-III	MAX.	50	mA
VGT		I-II-III	MAX.	1.3	V
VGD	VD =VDRM Tj=125°C R_L =3.3KΩ	I-II-III	MIN.	0.2	V
IL	IG=1.2IGT	I-III	MAX.	120	mA
		II		120	
IH	I_T =1A		MAX.	80	mA
dV/dt	V_D=1070V Gate Open T_j=125°C		MIN.	1500	V/μs
(dI/dt)c	(dV/dt)c=20V/μs T_j=125°C		MIN.	28	A/ms
ton	I_G=80mA I_A=400mA I_R=40mA T_j=25°C		TYP.	7	μs
toff				70	

Static Characteristics

Symbol	Parameter	Value(MAX.)	Unit	
VTM	I_{TM} =80A t_p=380μs	T_j=25°C	1.7	V
VTO	Threshold voltage	T_j=125°C	0.75	V
RD	Dynamic resistance	T_j=125°C	24	mΩ
IDRM	VD=VDRMVR	T_j=25°C	15	μA
IRRM	=VRRM	T_j=125°C	10	mA

Thermal Resistances

Symbol	Parameter	Value	Unit
Rth(j-c)	junction to case (AC)	0.35	°C/W
Rth(j-a)	junction to ambient (AC)	45	°C/W

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

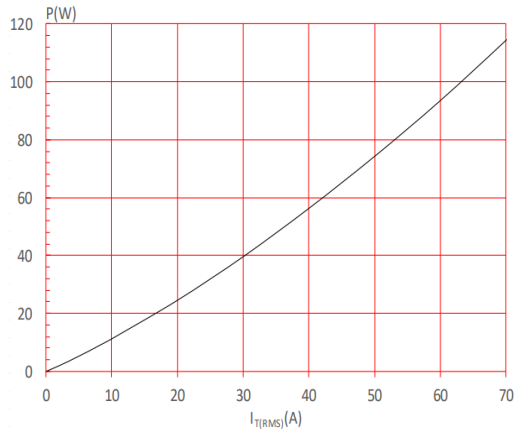


FIG.2: RMS on-state current versus case temperature

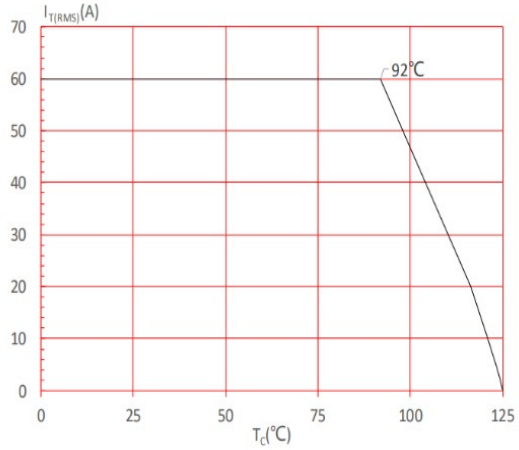


FIG.3: Surge peak on-state current versus number of cycles

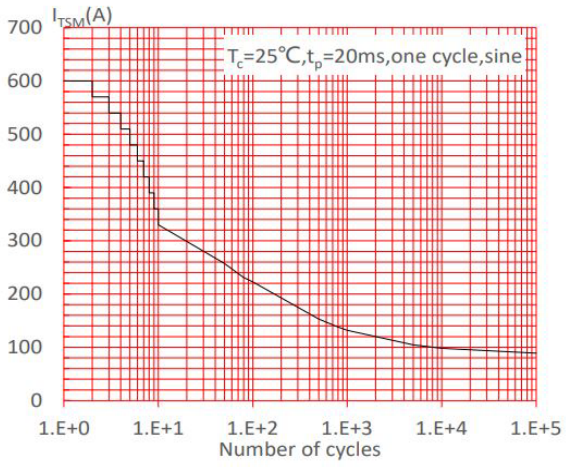


FIG.4: On-state characteristics

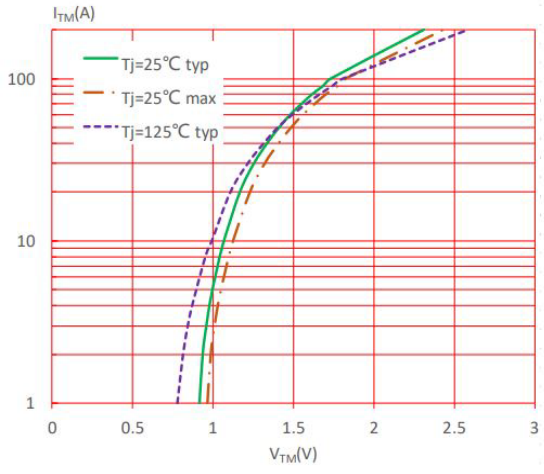


FIG.5: Non-repetitive surge peak on-state current for a sinusoidal pulse with width t_p <20ms,and corresponding value of I^2t (dI/dt<100A/µs)

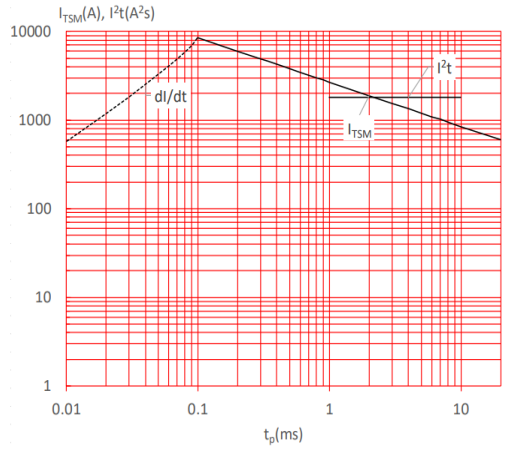


FIG.6: Relative variations of gate trigger current, holding current and latching current versus junction temperature

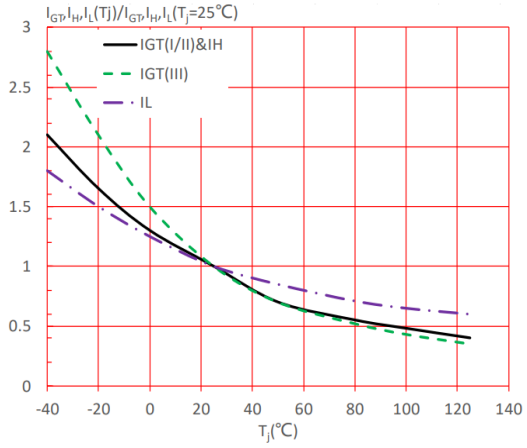
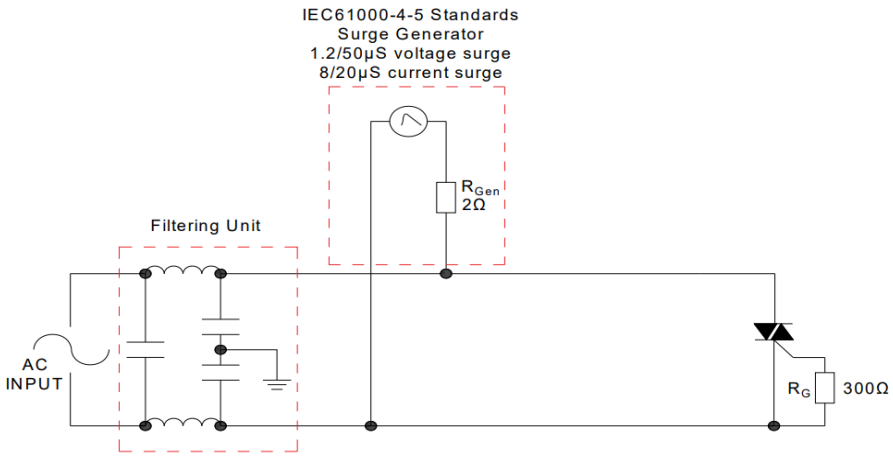
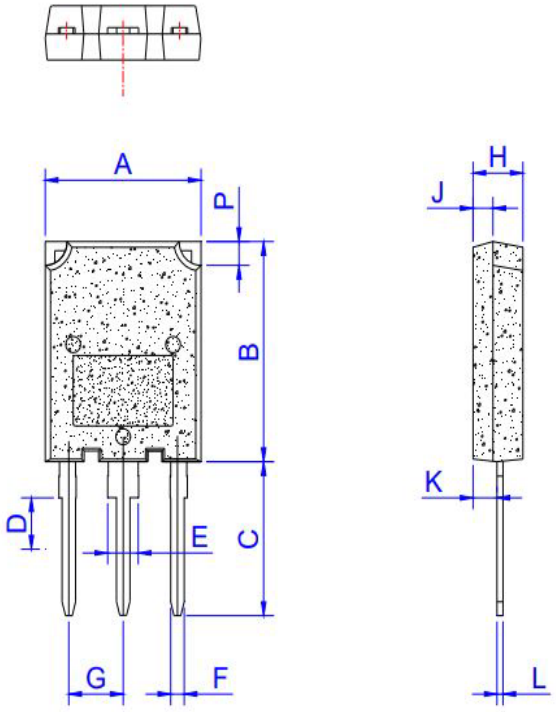


FIG.7 : Test circuit for inductive and resistive loads to IEC-61000-4-5 standards



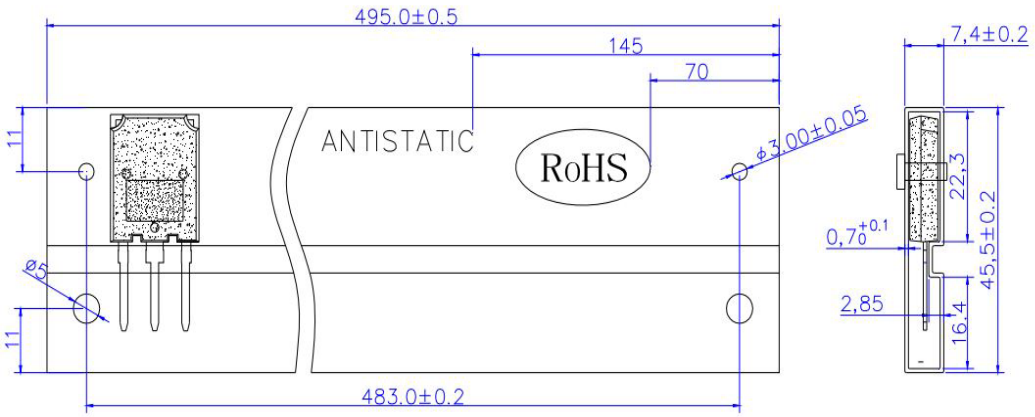
Order code	Voltage V_{DRM}/V_{RRM}(V)	IGT(mA) Ⅰ - Ⅱ - Ⅲ	Package	Base qty. (pcs)	Delivery mode
QS1600T603	1600	50	TO-247S-3L	30	Tube

Package Mechanical Data



Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	15.1		16.1	0.594		0.634
B	19.8		20.8	0.78		0.819
C	13.8		14.8	0.543		0.583
D	3.00		4.00	0.118		0.157
	2.75		3.35	0.108		0.132
F	1.30		1.50	0.051		0.059
G	5.10		5.80	0.201		0.228
H	4.50		5.50	0.177		0.217
J	1.45		2.15	0.057		0.085
K	1.90		2.80	0.075		0.110
L	0.55		0.80	0.022		0.031
P	2.00		2.40	0.079		0.094

Delivery Mode



Package	Outline	Tube (Pcs)	Inner Box (Pcs)	Per Carton
TO-247S-3L	TUBE	30	450	2,250