

UT169G

SCR



VOLTAGE: 600 Volts

CURRENT: 0.8 Amperes

Package: SOT-223

FEATURES

- Highly dv/dt For High Reliability
- Low Thermal Resistance Increases Carrying Capacity
- Strong resistance To Electromagnetic Interference.
- With High Ability To Withstand The Shock Loading Of Large Current

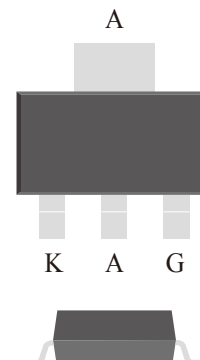
TYPICAL APPLICATIONS

- Phase Control Operation Of Light Dimmers And Motor Speed Controllers
- ON/OFF Control Operation Of Heating Regulation And Induction Motor

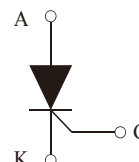
PRODUCT SUMMARY

Gear	Value	Unit
$I_{GT} \text{ Max.}$	200	mA
$V_{DRM}/V_{RRM} \text{ Min.}$	600	V
$I_{T(RMS)}$	0.8	A

Diagram:



Polarity:



Absolute Maximum Ratings (Ta=25°C Unless otherwise specified)

Parameter	Test Conditions	Symbol	Ratings	Unit
Repetitive Peak Off-State Voltage		V_{DRM}	600	V
Repetitive Peak Reverse Voltage		V_{RRM}	600	V
RMS On-State Current	$T_c \leq 91^\circ\text{C}$	$I_{T(RMS)}$	0.8	A
Average On-State Current	$T_c \leq 91^\circ\text{C}$	$I_{T(AV)}$	0.5	A
Non Repetitive Surge Peak On-State Current	F= 50 Hz, $T_p = 10 \text{ ms}$	I_{TSM}	9	A
	F= 60 Hz, $T_p = 8.3 \text{ ms}$		10	
I^2t Value For Fusing	$T_p = 5 \text{ ms}$	I^2t	0.2	A
Critical Rate Of Rise Of On-State Current	$IG = 2 * IGT, tr \leq 100 \text{ ns}$	di/dt	50	A/ μs
	F= 100 Hz, $T_j = 125^\circ\text{C}$			
Peak Gate Current	$T_p = 20 \mu\text{s}, T_j = 125^\circ\text{C}$	I_{GM}	0.5	A
Average Gate Power Dissipation	$T_j = 125^\circ\text{C}$	$P_{G(AV)}$	0.1	W
Peak Gate Power Dissipation		P_{GM}	2.0	W

Thermal Characteristics (Ta=25°C Unless otherwise specified)

Parameter	Test Conditions	Symbol	Typ.	Unit
Operating Junction Temperature Range		T_J	-40 to 125	$^\circ\text{C}$
Storage Temperature Range		T_{STD}	-40 to 150	
Thermal Resistance Junction To Ambient With Steady-State	Still Air Environment With $T_a = 25^\circ\text{C}$	$R_{\theta JA}$	100.0	$^\circ\text{C/W}$
Thermal Resistance Junction-Case With Steady-State	Device Mounted On 1 in2 FR-4 Board With 2oz. Copper	$R_{\theta JC}$	45.00	

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Electrical Characteristics (Ta=25°C Unless otherwise specified)

Parameter	Test Conditions	Symbol	Value			Unit
			Min.	Typ.	Max.	
Gate Trigger Current	$V_D=12V, R_L=33\Omega$	I_{GT}	10.0	40.0	200.0	mA
Max. Gate Trigger Voltage	$V_D=12V, R_L=33\Omega$	V_{GT}	-	-	1.0	V
Min. Gate Trigger Voltage	$V_D=V_{DRM}, T_j=125^\circ C, R_L=3.3K\Omega$	V_{GD}	0.2	-	-	V
Holding Current	$I_T=50\text{ mA}$	I_H	-	-	5.0	mA
Latching Current	$I_G=1.2*I_{GT}$	I_L	-	-	6.0	mA
Rise Of Off- State Voltage	$V_D=V_{DRM}, T_j=125^\circ C, \text{Gate Open}$	dv/dt	50.0	-	-	V/us

Static Characteristics (Ta=25°C Unless otherwise specified)

Parameter	Test Conditions	Symbol	Value	Unit
Peak On-State Voltage	$I_T=2\text{ A}, T_p=380\mu S, T_j=25^\circ C$	$V_{TM} M_{AX.}$	1.6	V
Threshold Voltage	$T_j=125^\circ C$	$V_{TO} M_{AX.}$	0.9	V
Dynamic resistance	$T_j=125^\circ C$	$R_D M_{AX.}$	344	mΩ
Peak Repetitive Forward Blocking Current	$V_D=V_{DRM}, T_j=25^\circ C$	$I_{DRM} M_{AX.}$	5.0	uA
	$V_R=V_{RRM}, T_j=125^\circ C$	$I_{RRM} M_{AX.}$	0.5	mA

Model and identification instructions

	UT	169	G
Product Type			
UT=SCR			
IT(RMS) Spec.:			
169=8A			
Package Spec.:			
G=SOT-223			

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Typical Characteristics Curves

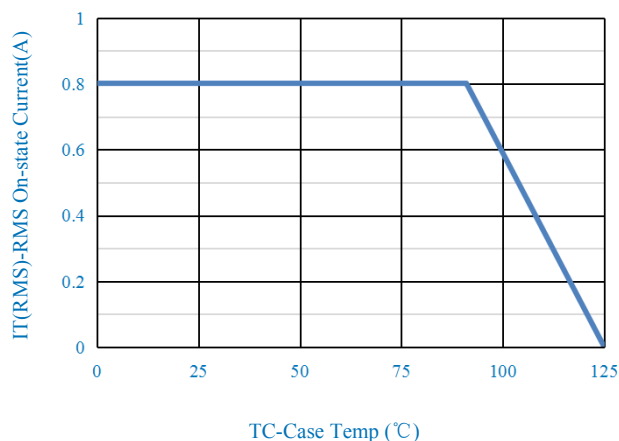


Fig.1-RMS on-state current vs. case temperature

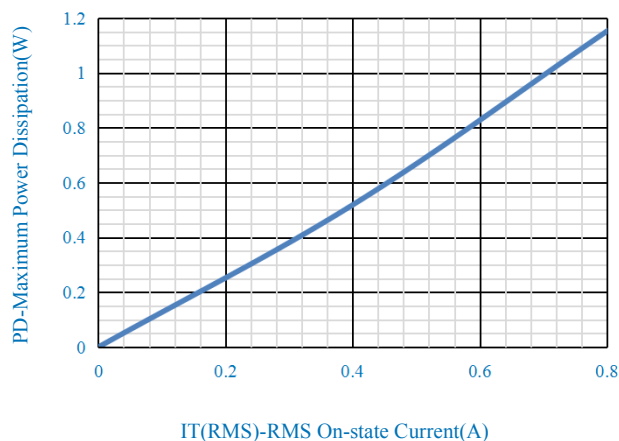


Fig.2- Maximum Power Dissipation Vs. on-state current

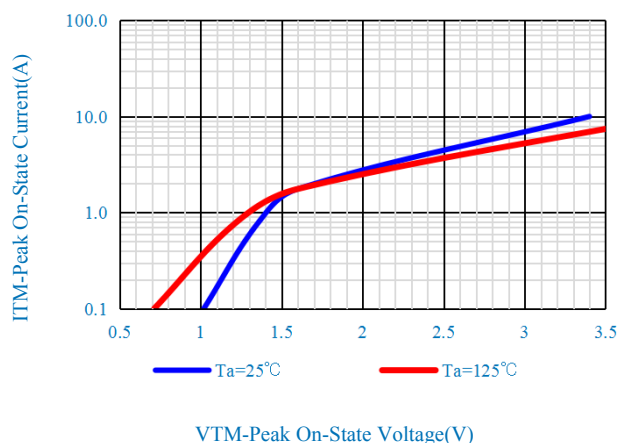


Fig.3-On-State Characteristics

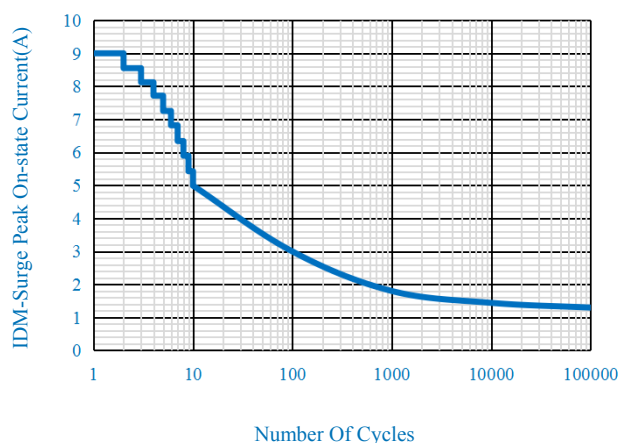


Fig.4- Surge Peak On-state Current Vs. Number Cycles

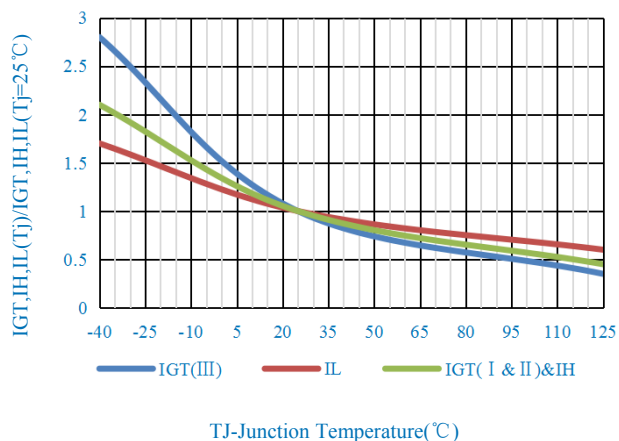


Fig.5- Relative Variation Of Gate Trigger Current, Holding Current And Latching Current Versus Junction Temperature (Typical Value)

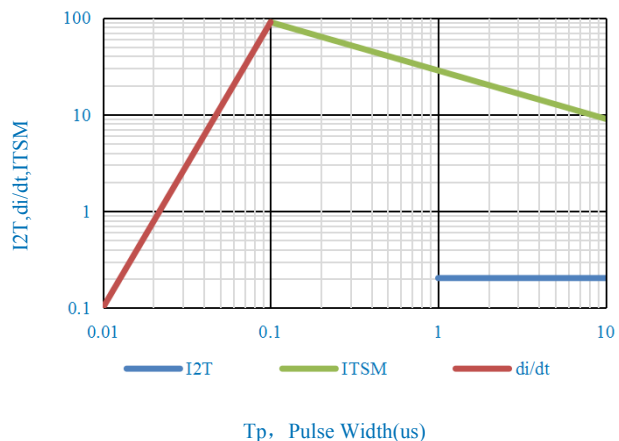
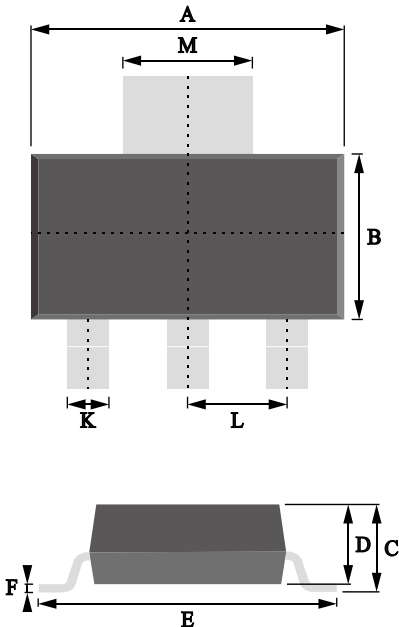


Fig.6- Non-repetitive surge peak on-state current for a sinusoidal pulse with width $t_p < 20\text{ms}$, and corresponding value of I_2t ($di/dt < 50\text{A}/\mu\text{s}$)

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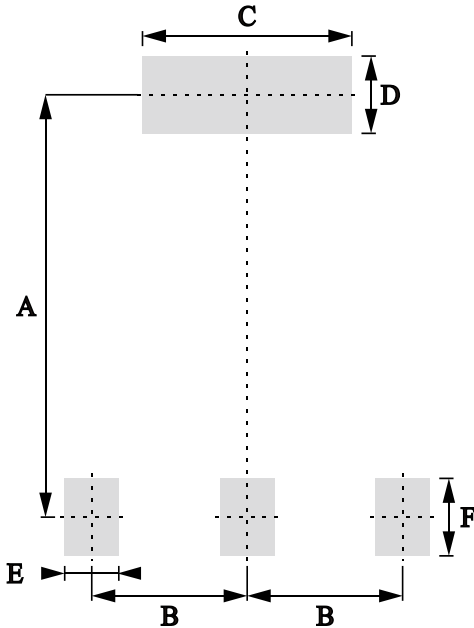
OUTLINE DRAWINGS



SOT-223

OUTLINE DIMENSIONS						
Dim.	Milimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	6.05	-	6.60	0.2382	-	0.2598
B	3.30	-	3.70	0.1299	-	0.1457
C	1.45	-	1.85	0.0571	-	0.0728
D	1.40	-	1.80	0.0551	-	0.0709
E	6.70	-	7.20	0.2638	-	0.2835
F	0.20	-	0.40	0.0079	-	0.0157
K	0.55	-	0.85	0.0217	-	0.0335
L	2.10	-	2.50	0.0827	-	0.0984
M	2.85	-	3.25	0.1122	-	0.1280

RECOMMEDND LAYOUT DRAWINGS



SOT-223

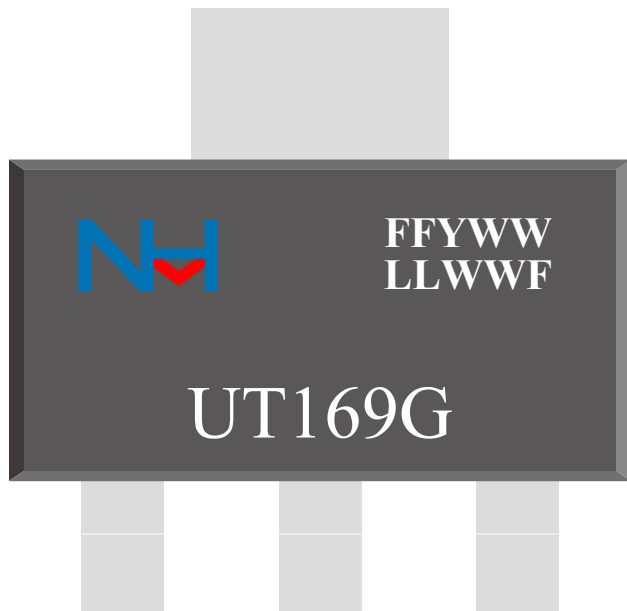
OUTLINE DIMENSIONS						
Dim.	Milimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	-	6.00	-	-	0.0000	-
B	-	2.30	-	-	0.0906	-
C	-	3.10	-	-	0.1220	-
D	-	1.10	-	-	0.0433	-
E	-	0.80	-	-	0.0315	-
F	-	1.10	-	-	0.0433	-

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MARKING INFORMATION



MARKING INSTRUCTIONS

NH=Niuhan Trademark

FF=Product Line Code,According To Actual Changes

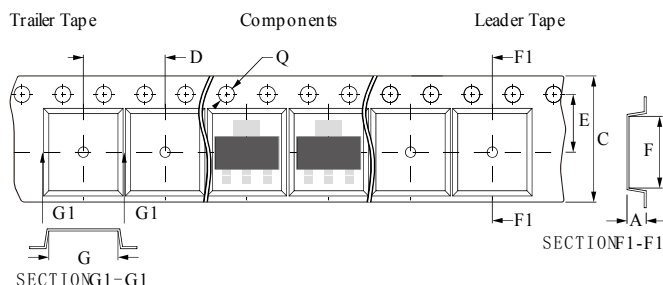
YWW=Date Code,According To Actual Changes

LLWWF=Internal Code,According To Actual Changes

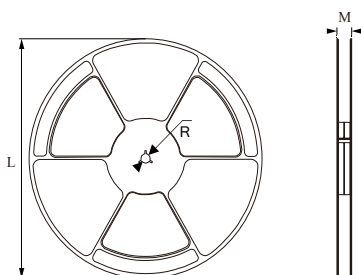
UT169G=Model

PACKAGING

TAPE



REEL



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OUTLINE DIMENSIONS

Dim.	Milimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
TAPE						
A	1.78	-	1.98	0.0701	-	0.0780
C	11.70	-	12.30	0.4606	-	0.4843
D	7.70	-	8.30	0.3031	-	0.3268
E	5.30	-	5.70	0.2087	-	0.2244
F	7.13	-	7.53	0.2807	-	0.2965
G	6.56	-	6.96	0.2583	-	0.2740
Q Φ	1.40	-	1.60	0.0551	-	0.0630
REEL						
L	328.00	-	332.00	12.913	-	13.071
R	12.00	-	14.00	0.4724	-	0.5512
M	16.50	-	18.50	0.6496	-	0.7283

PACKING INFORMATION

Package Type	Package Code	Product Weight Approx(g/Pcs)	Package Method	Quantity (Pcs/Min. Pack.)	Quantity (Pcs/Inner Box)	Quantity (Pcs/Carton)
SOT-223	P1	0.19	13" Reel	2500	5000	50000

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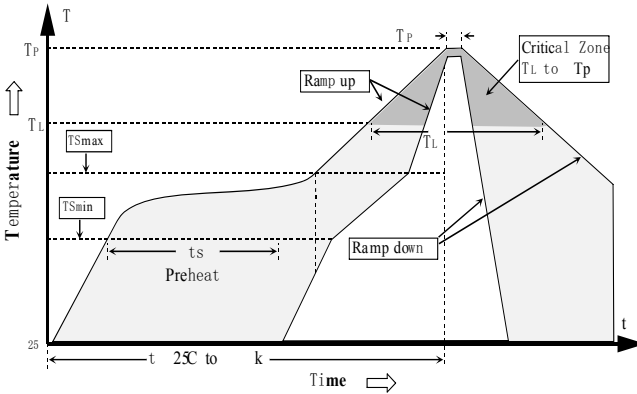
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Recommended wave soldering condition

Product	Peak Temperature	Soldering Time
Pb-free devices	260 +0/-5 °C	5 +1/-1 seconds

Recommended temperature profile for IR reflow

	Profile feature	Sn-Pb eutectic Assembly	Pb-free Assembly
	Average ramp-up rate (T _{smax} to T _p)	3°C/second max.	3°C/second max.
	Preheat-Temperature Min (T _{S min}) -Temperature Max (T _{S max}) -Time(t _{s min} to t _{s max})	100°C 150°C 60-120 seconds	150°C 200°C 60-180 seconds
	Time maintained above: -Temperature (T _L) - Time (t _L)	183°C 60-150 seconds	217°C 60-150 seconds
	Peak Temperature(T _P)	240 +0/-5 °C	260 +0/-5 °C
	Time within 5°C of actual peak temperature (t _p)	10-30 seconds	20-40 seconds
	Ramp down rate	6°C/second max.	6°C/second max.
	Time 25 °C to peak temperature	6 minutes max.	8 minutes max.

Note : All temperatures refer to topside of the package, measured on the package body surface.

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Specification Revision History

Rev.	Date	Changed Items	Pre-Changed Content	Changed Content
A/1	2014-10-20	First Issue		
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