

UT30-50D12



SCR

VOLTAGE: 1200 Volts

CURRENT: 30 Amperes

Package: TO-263

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

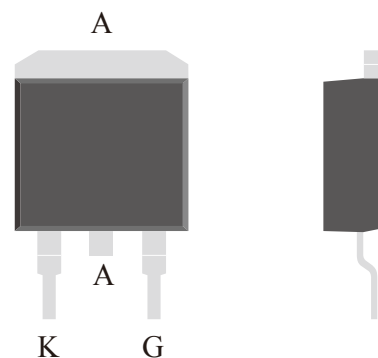
TYPICAL APPLICATIONS

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

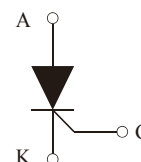
PRODUCT SUMMARY

Gear	Value	Unit
$I_{GT} \text{ Max.}$	50	mA
$V_{DRM}/V_{RRM} \text{ Min.}$	1200	V
$I_{T(RMS)}$	30	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}	1200	V
Repetitive Peak Reverse Voltage		V_{RRM}	1200	V
RMS On-State Current	$T_c \leq 93^\circ\text{C}$	$I_{T(RMS)}$	30	A
Average On-State Current	$T_c \leq 93^\circ\text{C}$	$I_{T(AV)}$	19	
Non Repetitive Surge Peak On-State Current	$F = 50 \text{ Hz}, T_p = 10 \text{ ms}$	I_{TSM}	300	A
	$F = 50 \text{ Hz}, T_p = 8.3 \text{ ms}$		329	
I^2T Value For Fusing	$T_p = 10 \text{ ms}$	I^2t	450	A
Critical Rate Of Rise Of On-State Current	$I_G = 2 \cdot I_{GT}, t_r \leq 100 \text{ ns}$ $F = 100 \text{ Hz}, T_j = 125^\circ\text{C}$	di/dt	200	A/ μs
Peak Gate Current	$T_p = 20 \mu\text{s}, T_j = 125^\circ\text{C}$	I_{GM}	10	A
Average Gate Power Dissipation	$T_j = 125^\circ\text{C}$	$P_{G(AV)}$	1	W
Peak Gate Power Dissipation		P_{GM}	20	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 $T_a = 25^\circ\text{C}$	$R_{\theta JA}$	48	$^\circ\text{C/W}$
Thermal Resistance Junction-Case With Steady-State	Device Mounted On 1 in2 FR-4 Board With 2oz. Copper	$R_{\theta JC}$	0.95	

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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}	-	-	50	mA
Max. Gate Trigger Voltage	$V_D=12V, R_L=33\Omega$	V_{GT}	-	-	1.3	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	-	-	120	mA
Latching Current	$I_G=1.2 \cdot I_{GT}$	I_L	-	-	180	mA
Rise Of Off- State Voltage	$V_D=2/3 V_{DRM}, T_j=125^\circ C, \text{Gate Open}$	dv/dt	1500	-	-	V/us

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

Parameter	Test Conditions	Symbol	Value	Unit
Peak On-State Voltage	$I_T=50\text{ A}, T_p=380\mu S, T_j=25^\circ C$	$V_{TM} M_{AX.}$	1.80	V
Threshold Voltage	$T_j=125^\circ C$	$V_{TO} M_{AX.}$	0.76	V
Dynamic resistance	$T_j=125^\circ C$	$R_D M_{AX.}$	15	mΩ
Peak Repetitive Forward Blocking Current	$V_D=V_{DRM}, T_j=25^\circ C$	$I_{DRM} M_{AX.}$	10	uA
Peak Repetitive Reverse Blocking Current	$V_R=V_{RRM}, T_j=125^\circ C$	$I_{RRM} M_{AX.}$	5	mA

Model and identification instructions

Product Type	UT	30	-	50	D	12
UT=SCR						
Insulation Spec.: A=Ins.=Insulation Empty=No Ins.=No Insulation						
$I_{T(RMS)}$ Spec.: 30=30A						
"-"=Connection Symbol Constant And Unchanging						
IGT Spec. 50=50mA						
Package Spec.: D=TO-263						
V_{DRM}/V_{RRM} Spec.: 12=1200V						
Temperature Spec.: Empty=Standard Temperature H=high temperature						

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Typical Characteristics Curves

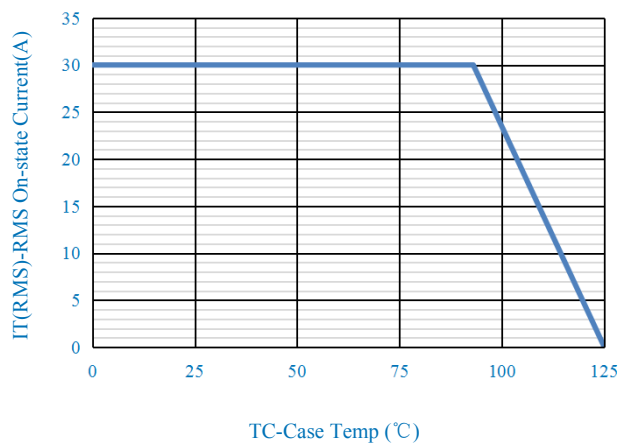


Fig.1-RMS on-state current vs. case temperature

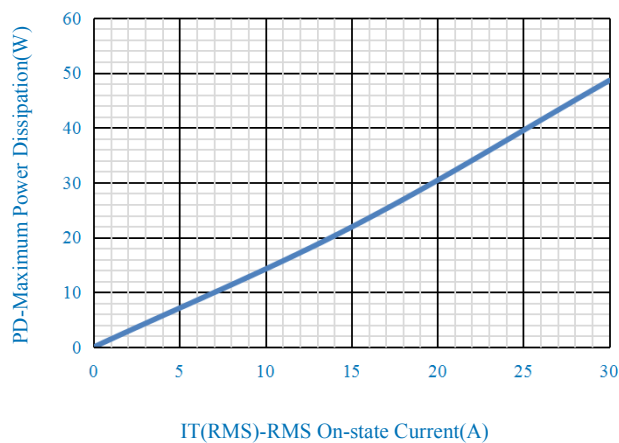


Fig.2- Maximum Power Dissipation Vs. on-state current

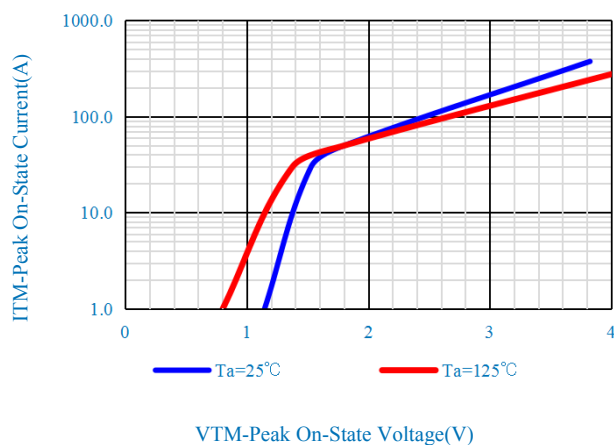


Fig.3-On-State Characteristics

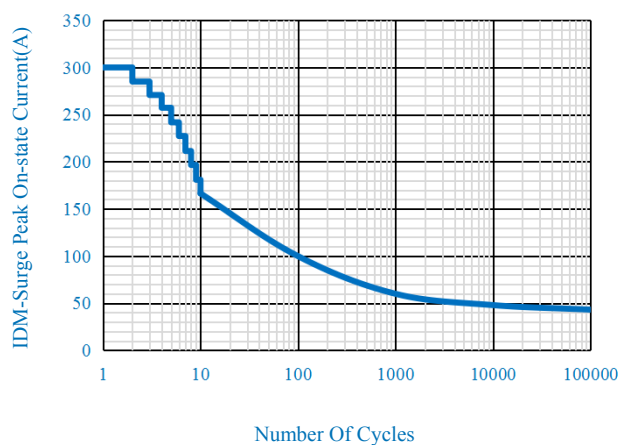


Fig.4- Surge Peak On-state Current Vs. Number Cycles

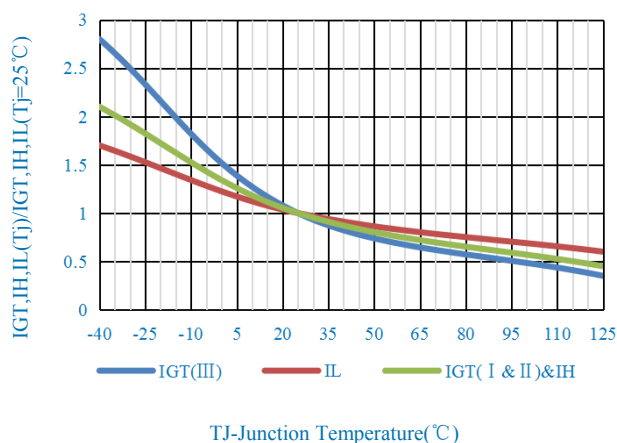


Fig.5- Relative Variation Of Gate Trigger Current , Holding Current And Latching Current Versus Junction Temperature (Typical Value)

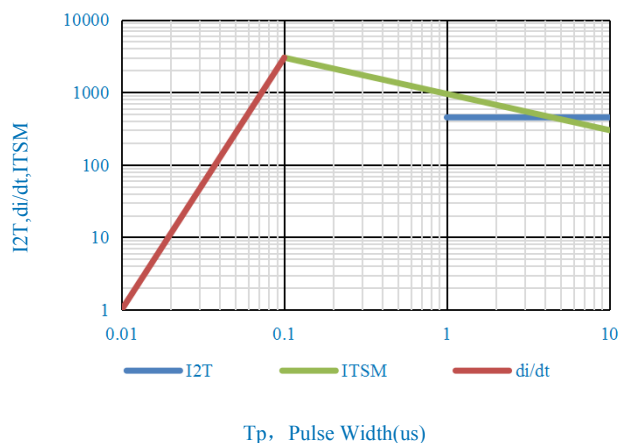
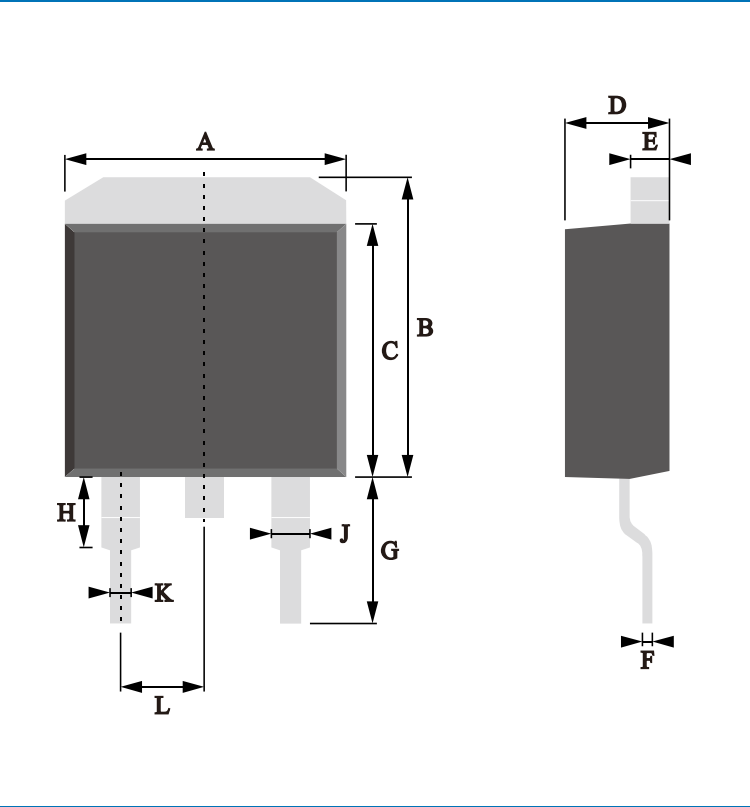


Fig.6- Non-repetitive surge peak on-state current for a sinusoidal pulse with width $t_p < 20\text{ms}$, and corresponding value of I_2t ($di/dt < 50\text{A}/\mu\text{s}$)

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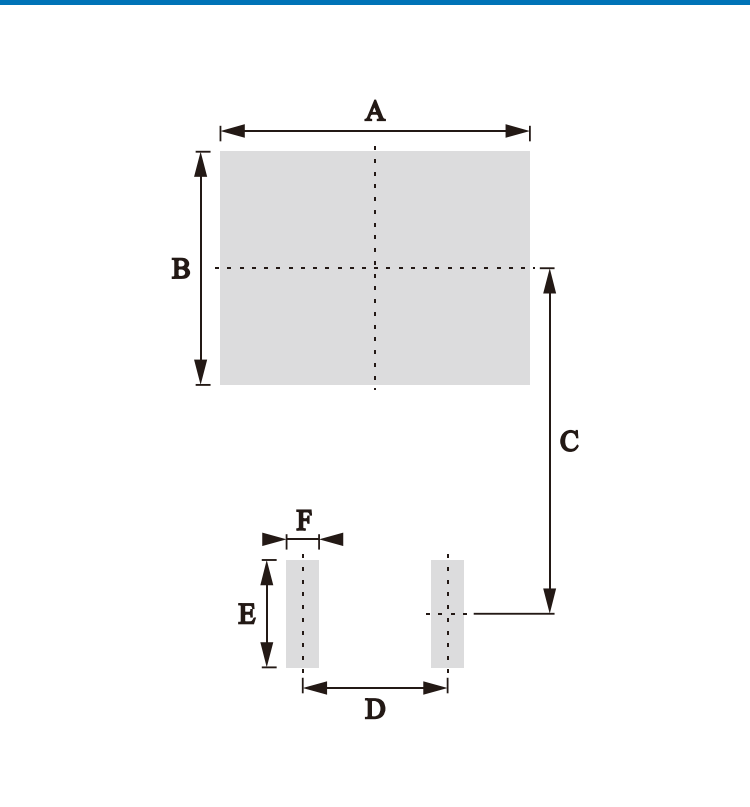
OUTLINE DRAWINGS



TO-263

OUTLINE DIMENSIONS						
Dim.	Milimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	9.30	-	10.50	0.3661	-	0.4134
B	9.60	-	11.60	0.3780	-	0.4567
C	8.20	-	9.50	0.3228	-	0.3740
D	4.00	-	5.00	0.1575	-	0.1969
E	1.00	-	1.70	0.0394	-	0.0669
F	0.20	-	0.70	0.0079	-	0.0276
G	4.45	-	5.25	0.1752	-	0.2067
H	1.25	-	1.85	0.0492	-	0.0728
J	1.00	-	1.60	0.0394	-	0.0630
K	0.60	-	1.00	0.0236	-	0.0394
L	2.25	-	2.80	0.0886	-	0.1102

RECOMMEDND LAYOUT DRAWINGS



TO-263

OUTLINE DIMENSIONS						
Dim.	Milimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	-	10.86	-	-	0.4276	-
B	-	7.86	-	-	0.3094	-
C	-	11.64	-	-	0.4583	-
D	-	5.08	-	-	0.2000	-
E	-	3.62	-	-	0.1425	-
F	-	1.14	-	-	0.0449	-

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MARKING INFORMATION



MARKING INSTRUCTIONS

NH=Niuhang Trademark
FF=Product Line Code,According To Actual Changes
YWW=Date Code,According To Actual Changes
LLWWF=Inernal Code,According To Actual Changes
UT30-50D12=Model

PACKING INFORMATION

Package Type	Package Code	Product Weight Approx(g/Pcs)	Package Method	Quantity (Pcs/Min. Pack.)	Quantity (Pcs/Inner Box)	Quantity (Pcs/Carton)
TO-263	P1	1.4331	13" Reel	800	800	4000
TO-263	P2	1.4331	13" Reel	800	800	4800

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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(ts min to ts 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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