NCD16A65

Silicon Carbide Schottky Diode

Pb-Free RoHS COMPLIANT

Voltage:	650	Volts	Current:	16	A	Package:	TO-220AC

Features

- NH'S Advanced Silicon Carbide Schottky Technology
- Zero Reverse Recovery
- Positive Temperature Coefficient On VF
- Extremely Fast Switching And Extremely Low Leakage Current

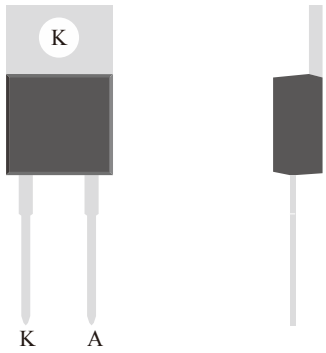
Mechanical Data

- **Case:** Molded With UL-94 ClassV-0 Recognized, RoHS-Compliant
- **Polarity:** Look At The Diagram And Polarity On The Right
- **Terminals:** Tin Plated Leads,Solderable Per J-STD-002 And JESD22-B102

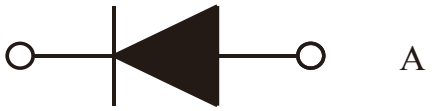
Typical Applications

- Power Factor Correction (PFC)
- Unterruptible Power Supply (UPS)
- Switch Mode Power Supply (SMPS)

Diagram:



Polarity:



Maximum Ratings (Ta=25℃ Unless Otherwise Specified)

Parameter	Test Conditions	Symbol	Ratings	Unit
Maximum Repetitive Peak Reverse Voltage		V_{RRM}	650	V
Maximum DC Blocking Voltage		V_{DC}	650	V
Max Average Forward RectifiedCurrent	T_C= 25 ℃ T_C= 110 ℃ T_C= 150 ℃	$I_{F(AV)}$	42 24 16	A
Non-Repetitive Peak Forward Surge Current Sine Half-Wave	T_c=25°C,T_P=10ms Tc=110°C,T_P=10ms	I_{FSM}	93 86	A
Repetitive Peak Forward Surge Current Sine Half-Wave	T_C=25°C,T_P=10ms Tc=110°C,TP=10ms	I_{FRM}	81 75	A
Maximum Power Dissipation Power Dissipation Derating Factor Above 25℃	Tc= 25 ℃ Tc= 100 ℃	P_{tot}	136 68	W
Current Squared Time	t< 8.3ms	I^2t	35.9	A^2sec
Avalanche Current,Single Pulse (Note 1)	L= 0.5 mH	I_{AS}	7	A
Single Pulse Avalanche Energy (Note 1) Test Circuit & Waveform See Fig.16	L= 0.5 mH,I_{PK}= 6.5 A Starting Tj=25 ℃,VDD = 50.0 V	E_{AS}	11	mJ

Electrical Characteristcs (Ta=25℃ Unless Otherwise Specified)

Parameter	Test Conditions	Symbol	Ratings			Unit
			Min.	Typ.	Max.	
Instaneous Forward Voltage Per Diode	Ta=25℃ I_F= 16.0 A Ta=175℃	V_F	-- --	1.34 1.62	1.6 --	V
Maximum DC Reverse Current at Rated DC Blocking Voltage	Ta=25℃ VR=VRRM Ta=175℃ VR=80%*VRRM	I_{RRM}	-- --	1.0 8.5	50.0 --	uA
Capacitance stored energy	VR= 400 V	E_C	--	6.5	--	uJ
Total Capacitive Charge	$Qc=\int_0^{VR} C*dV$ VR= 400 V	Q_C	--	43	-	nC
Typical Junction Capacitance Per Diode	1 V,1MHz 200 V,1MHz 400 V,1MHz	C_J	-- -- --	581 84 62	-- -- --	pF

Thermal Characteristcs (Ta=25℃ Unless Otherwise Specified)

Parameter	Test Conditions	Symbol	Ratings	Unit
Operating Junction Temperature Range		T_J	-55 to 175	℃
Storage Temperature Range		T_{STD}	-55 to 175	℃
Max Thermal Resistance Junction-Case With Steady-State	Device Mounted On 75mm x 45mm x 2.5mm Alu. Heat.	$R_{\theta JC}$	1.10	℃/W

NCD16A65

Silicon Carbide Schottky Diode

Pb-Free RoHS COMPLIANT

Typical Characteristics Curves

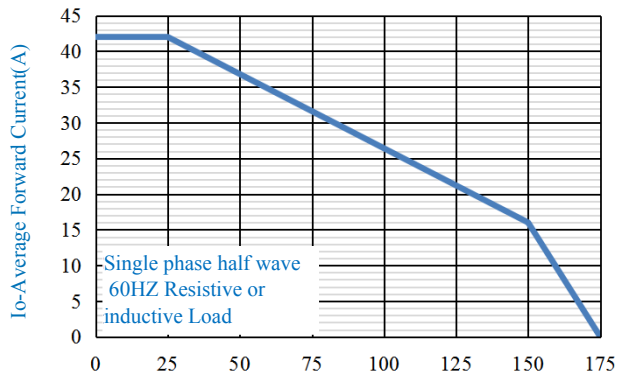


Fig.1-Forward Current Derating Curve

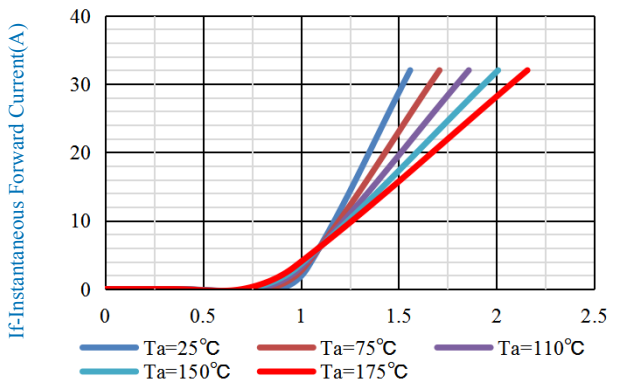


Fig.2-Typical Instantaneous Forward

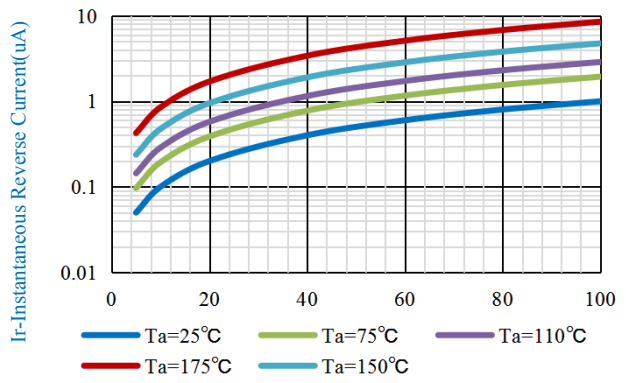


Fig.3-Typical Reverse Characteristics

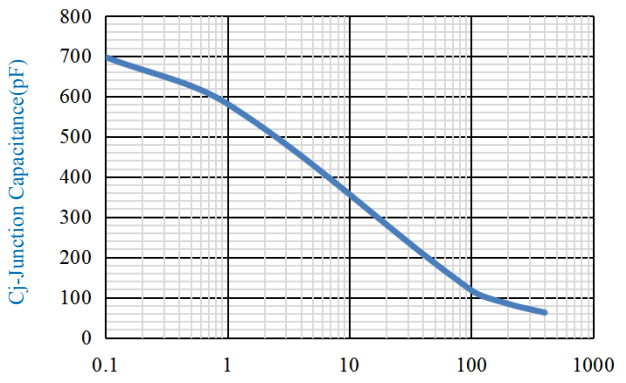


Fig.4-Typical Junction Capacitance

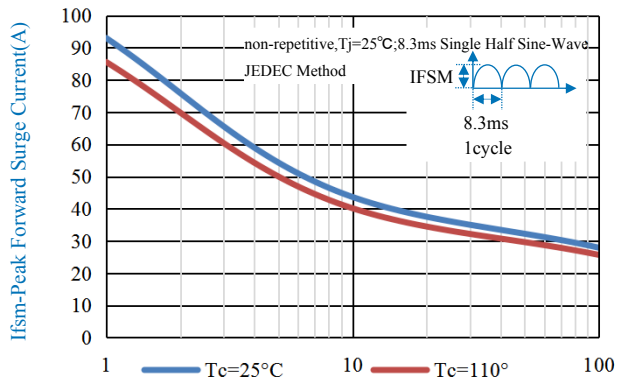


Fig.5-Max. Non-Repetitive Surge Current

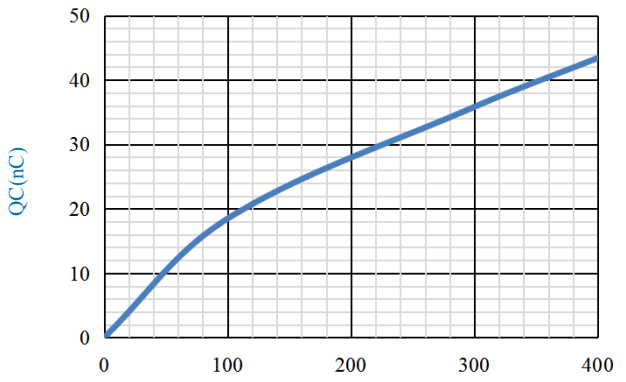


Fig.6-Total Capacitance Charge Characteristics vs. ReverseVoltage

NCD16A65

Silicon Carbide Schottky Diode

Pb Pb-Free RoHS COMPLIANT

Typical Characteristics Curves

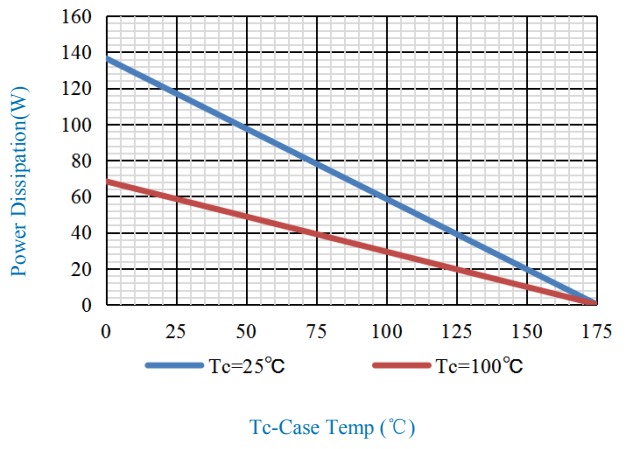


Fig.7-Power dissipation as function of case temperature

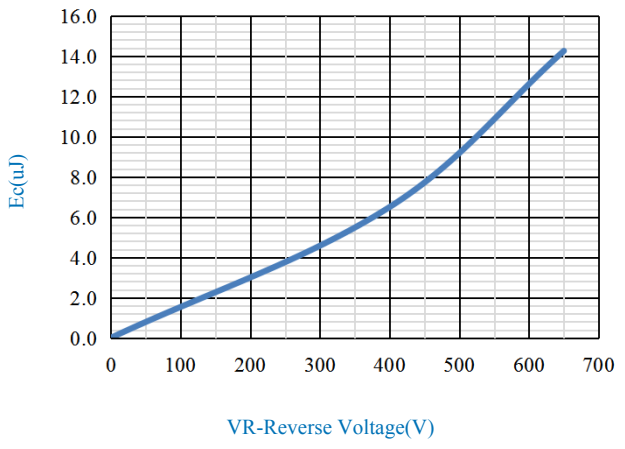


Fig.8-Capacitance Stored Energy

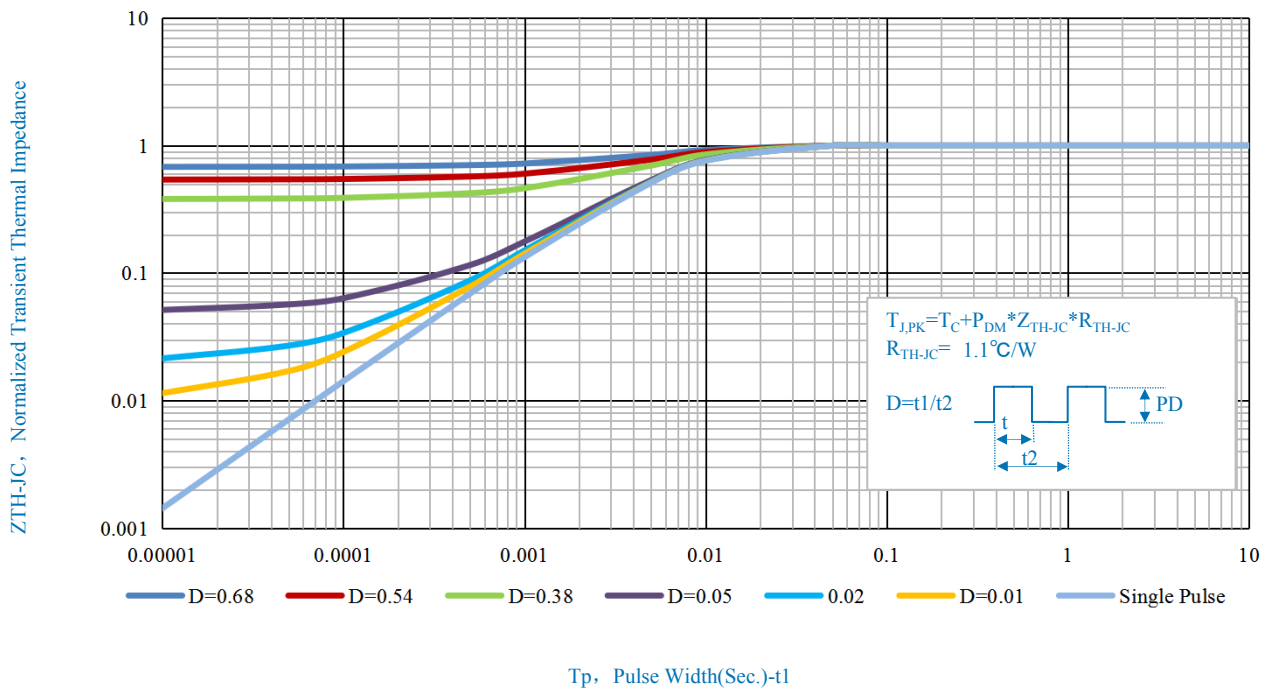


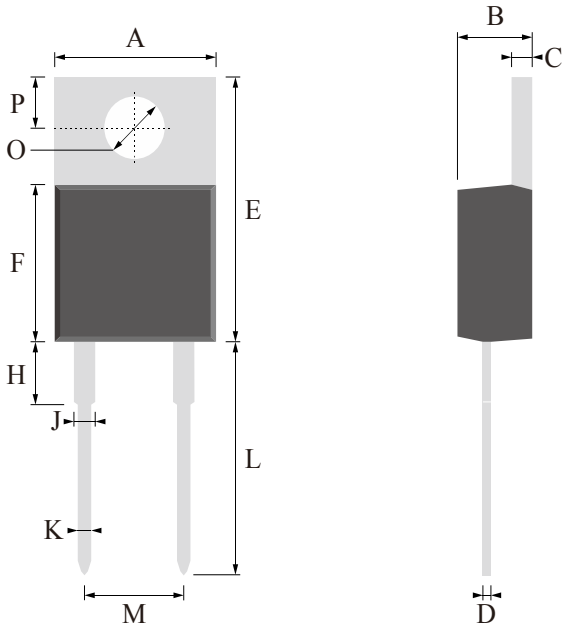
Fig.9- Normalized Maximum Transient Thermal Impedance Vs.Pulse Width

NCD16A65

Silicon Carbide Schottky Diode

Pb-Free RoHS COMPLIANT

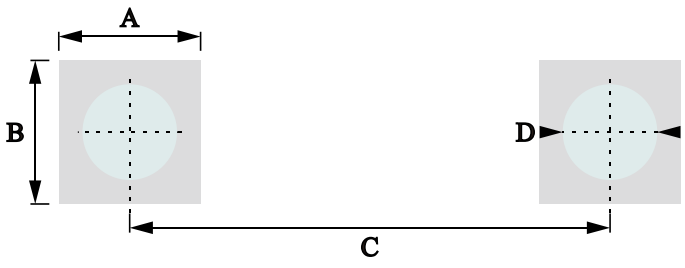
OUTLINE DRAWINGS



NCD16A65

OUTLINE DIMENSIONS						
Dim.	Milimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	9.25	-	10.75	0.3642	-	0.4232
B	4.15	-	4.75	0.1634	-	0.1870
C	1.10	-	1.50	0.0433	-	0.0591
D	0.30	-	0.50	0.0118	-	0.0197
E	14.20	-	16.20	0.5591	-	0.6378
F	8.00	-	9.50	0.3150	-	0.3740
L	12.10	-	14.10	0.4764	-	0.5551
H	2.20	-	2.80	0.0866	-	0.1102
J	1.15	-	1.55	0.0453	-	0.0610
K	0.70	-	1.00	0.0276	-	0.0394
M	4.70	-	5.20	0.1850	-	0.2047
O	3.45	-	4.15	0.1358	-	0.1634
P	2.40	-	3.40	0.0945	-	0.1339

RECOMMEDNED LAYOUT DRAWINGS



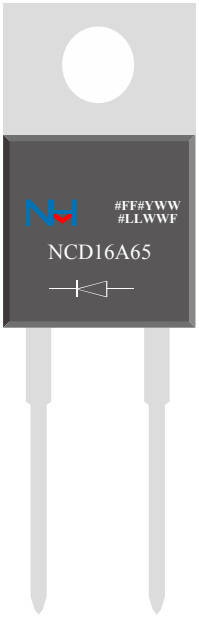
NCD16A65

OUTLINE DIMENSIONS						
Dim.	Milimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	-	1.60	-	-	0.0630	-
B	-	1.60	-	-	0.0630	-
C	-	5.08	-	-	0.2000	-
D	-	1.00	-	-	0.0394	-

NCD16A65

Silicon Carbide Schottky Diode

Pb-Free RoHS COMPLIANT

MARKING	MARKING INSTRUCTION
	~~#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~~ **NCD16A65=Model**

PACKING INFORMATION

Package Type	Package Code	Productor Weight Approx(g/Pcs)	Package Method	Quantity (Pcs/Min. Pack.)	Quantity (Pcs/Inner Box)	Quantity (Pcs/Carton)
TO-220AC	~~#P1~~	1.834	~~#Tube~~	~~#50~~	~~#1000~~	~~#5000~~

NCD16A65

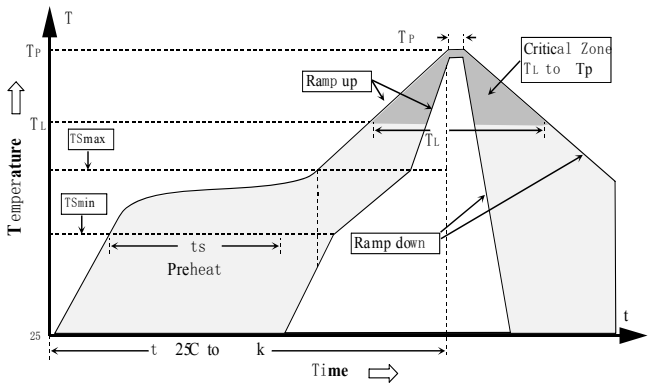
Silicon Carbide Schottky Diode

Pb Pb-Free RoHS COMPLIANT

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 (Tsmax to Tp)	3°C/second max.	3°C/second max.
Preheat−Temperature Min (TS min) −Temperature Max (TS 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 (TL) − Time (tL)	183°C 60-150 seconds	217°C 60-150 seconds
Peak Temperature(TP)	240 +0/-5 °C	260 +0/-5 °C
Time within 5°C of actual peak temperature (tp)	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.

Disclaimer

- Reproducing and modifying informatiom of the document is prohibited without permission from Niuhang Electronics Technology Co., LTD
- Niuhang Electronics Technology Co., LTD. reserves the rights to make changes of the content herein the document anytime without notification.
- Niuhang Electronics Technology Co., LTD. disclaims any and all liability arising out of the application or use of any product including damages incidentally and consequentially occurred.
- Niuhang Electronics Technology Co., LTD. does not assume any and all implied warranties,including warranties of fitness for particular purpose,non-infringement and merchantability.
- Applications shown on the herein document are examples of standard use and operation.Customers are responsible in comprehending the suitable use in particular applications.Niuhang Electronics Technology Co., LTD.makes no representation or warranty that such applications will be suitable for the specified use without further testing or modification.
- The products shown herein are not designed and authorized for equipments requiring high level of reliability or relating to human life and for any applications concerning life-saving or life-sustaining,such as medical instruments.transportation equipment,aerospae machinery et cetera.Customers usin or selling these products for use in such applications do so at their own rish and agree to fully indemnify Niuhang Electronics Technology Co., LTD.for any damages resulting resulting from such improper use or sale.
- When the appearance of the product and chip size does not change, in order to product the customer. quality, change the internal structure and the production process Niuhang can not notify

NCD16A65

Silicon Carbide Schottky Diode

Pb-Free RoHS COMPLIANT

Specification Revision History

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

Blank Below