

NCD6A65

Silicon Carbide Schottky Diode



Voltage: 650 Volts

Current: 6 A

Package: TO-220AC

Features

- Zero Reverse Recovery
- Positive Temperature Coefficient On VF
- Extremely Fast Switching
- Extremely Low Leakage Current

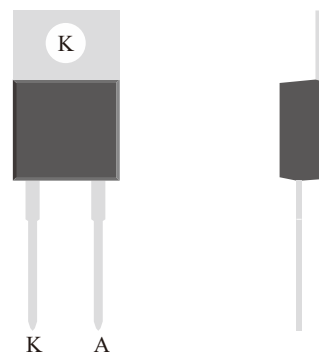
Mechanical Data

- **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

- Solar Inverter
- Uninterruptible Power Supply (UPS)
- Switch Mode Power Supply (SMPS)
- Power Factor Correction (PFC)

Diagram:



Polarity:



Maximum Ratings (Ta=25°C Unless Otherwise Specified)

Parameter	Test Conditions	Symbol	Ratings	Unit
Maximum Repetitive Peak Reverse Voltage		V_{RRM}	650	V
Maximum RMS Voltag		V_{RMS}	455	V
Maximum DC Blocking Voltage		V_{DC}	650	V
Max Average Forward RectifiedCurrent	$T_C=150^{\circ}C$	$I_{F(AV)}$	6	A
Non-Repetitive Peak Forward Surge Current Sine Half-Wave	$T_C=25^{\circ}C, T_p=10ms$	I_{FSM}	48	A
	$TC=110^{\circ}C, TP=10ms$		42	
Repetitive Peak Forward Surge Current Sine Half-Wave	$T_C=25^{\circ}C, T_p=10ms$	I_{FRM}	24	A
	$TC=110^{\circ}C, TP=10ms$		20	
Current Squared Time	$t < 8.3ms$	I^2t	10	A ² sec
Avalanche Current,Single Pulse (Note 1)	$L= 0.5 \text{ mH}$	I_{AS}	9	A
Single Pulse Avalanche Energy (Note 1)	$L= 0.5 \text{ mH}, I_{PK}= 8.5 \text{ A}$	E_{AS}	18	mJ
Test Circuit & Waveform See Fig.16	Starting $T_j=25^{\circ}C, V_{DD} = 50.0 \text{ V}$			

Electrical Characteristics (Ta=25°C Unless Otherwise Specified)

Parameter	Test Conditions	Symbol	Ratings			Unit
			Min.	Typ.	Max.	
Instaneous Forward Voltage Per Diode	$T_a=25^{\circ}C$	$I_F = 6.0 \text{ A}$	--	1.35	1.65	V
	$T_a=175^{\circ}C$		--	1.60	--	
Maximum DC Reverse Current at Rated DC Blocking Voltage	$T_a=25^{\circ}C \text{ } VR=V_{RRM}$	I_{RRM}	--	1	50	uA
	$T_a=175^{\circ}C \text{ } VR=80\%*V_{RRM}$		--	12	--	
Capacitance stored energy	$VR= 400.0 \text{ V}$	E_C	--	8.5	--	uJ
Total Capacitive Charge	$VR= 400.0 \text{ V}$	Q_C	--	57	-	nC
Typical Junction Capacitance Per Diode	1 V,1MHz	C_J	--	250	--	pF
	200 V,1MHz		--	40	--	
	400 V,1MHz		--	30	--	

Thermal Characteristics (Ta=25°C Unless Otherwise Specified)

Parameter	Test Conditions	Symbol	Ratings	Unit
Operating Junction Temperature Range		T_J	-55 to 175	°C
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.	$R_{\theta JC}$	1.45	°C/W

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Typical Characteristics Curves

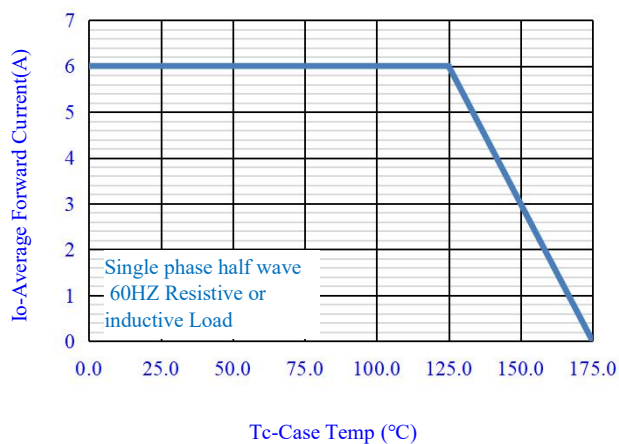


Fig.1-Forward Current Derating Curve

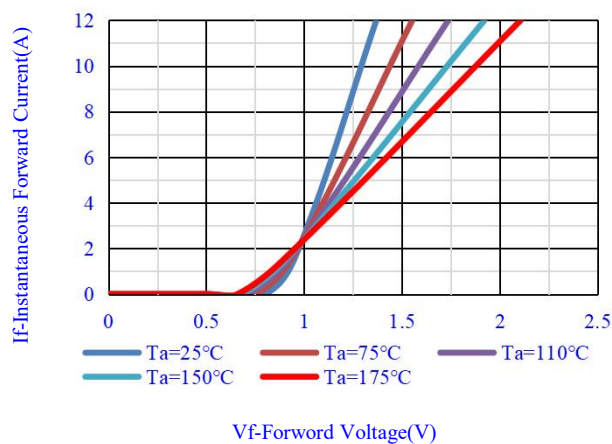


Fig.2-Typical Instantaneous Forward

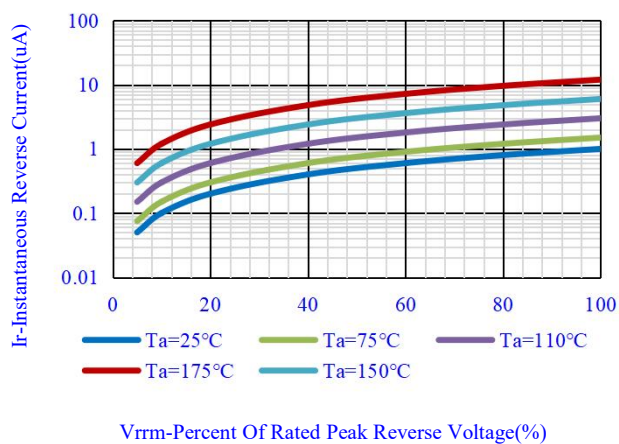


Fig.3-Typical Reverse Characteristics

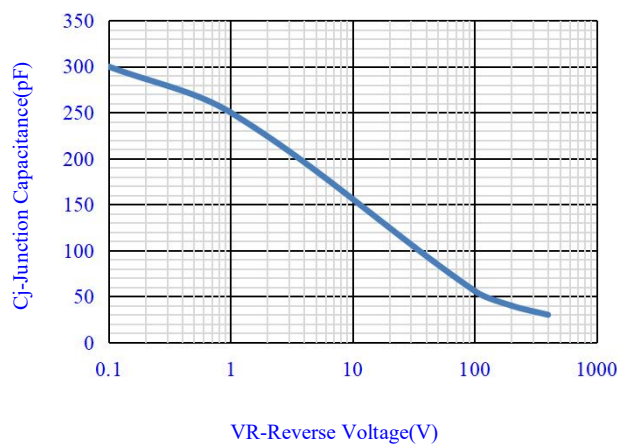


Fig.4-Typical Junction Capacitance

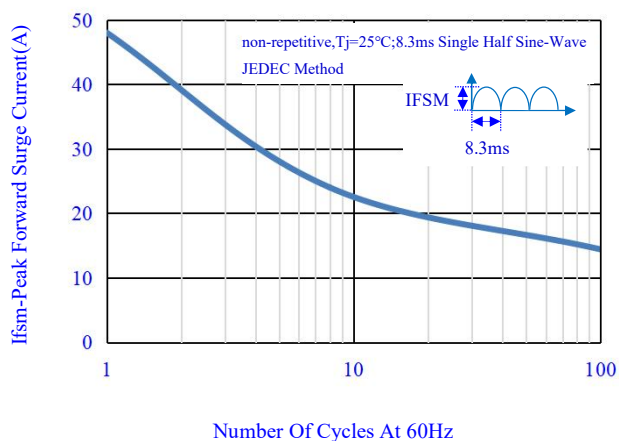


Fig.5-Max. Non-Repetitive Surge Current

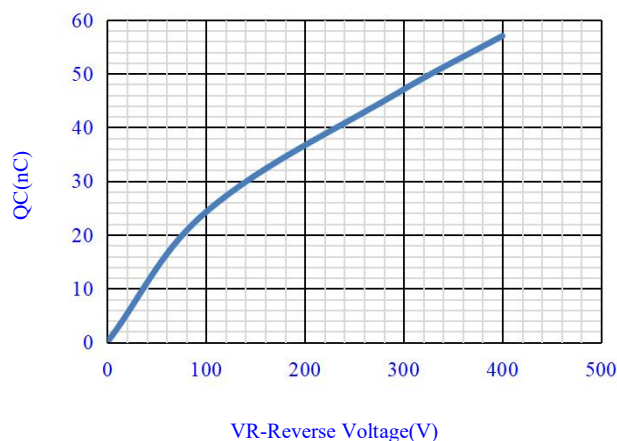


Fig.6-Total Capacitance Charge Characteristics vs. Reverse Voltage

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Typical Characteristics Curves

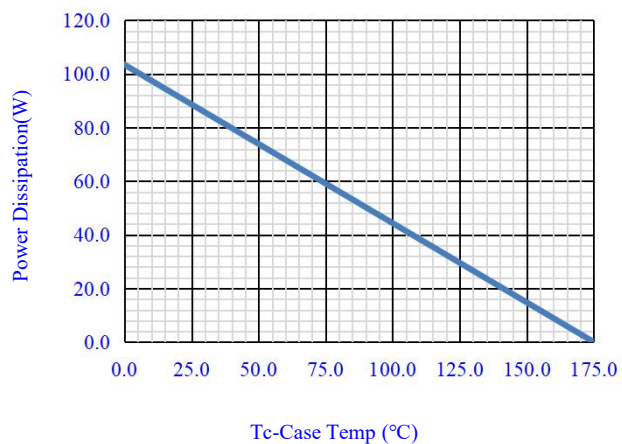


Fig.7-Power dissipation as function of case temperature

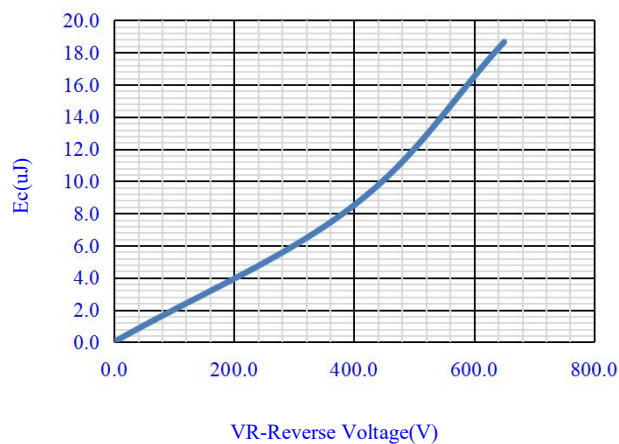


Fig.8-Capacitance Stored Energy

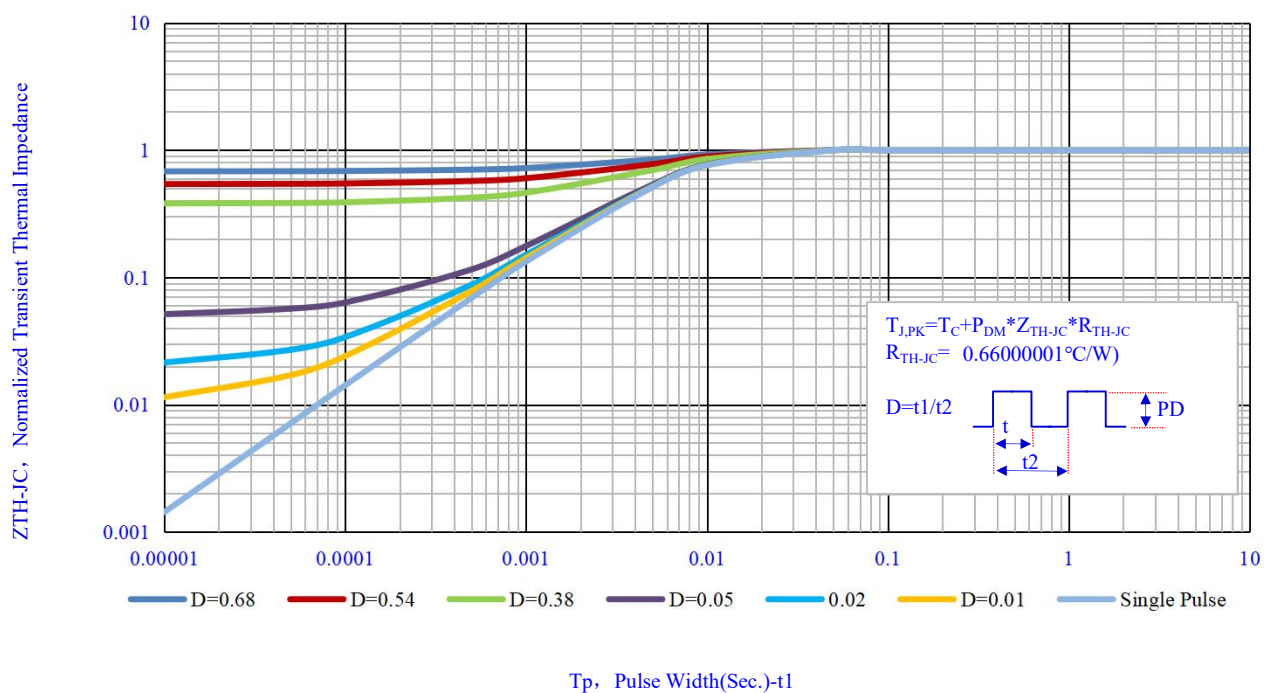


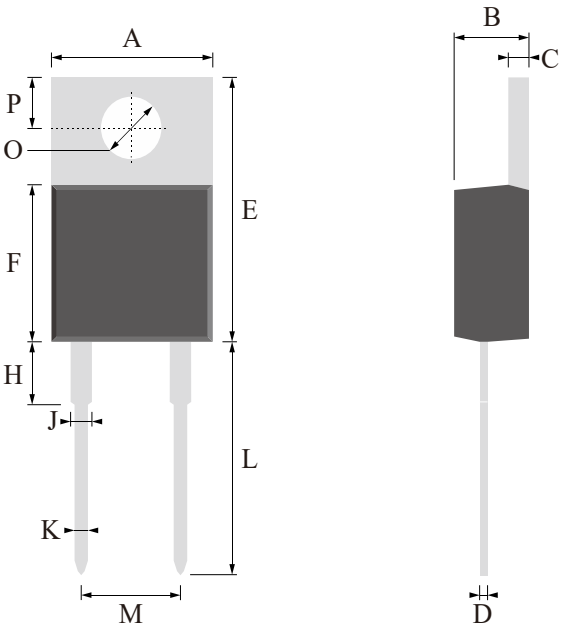
Fig.9- Normalized Maximum Transient Thermal Impedance Vs.Pulse Width

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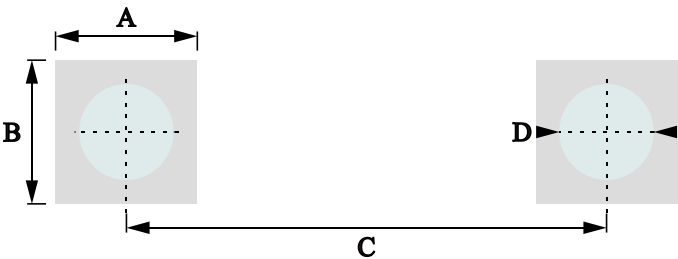
OUTLINE DRAWINGS



TO-220AC

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

RECOMMEDND LAYOUT DRAWINGS



TO-220AC

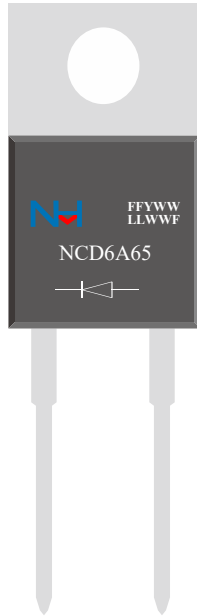
OUTLINE DIMENSIONS						
Dim.	Milimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	-	1.60	-	-	0.0630	-
B	-	1.60	-	-	0.0630	-
C	-	5.08	-	-	0.2000	-
D	-	1.00	-	-	0.0394	-

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MARKING



MARKING INSTRUCTION

NH=Niuhan Trademark
FF=Product Line Code,According To Actual Changes
YWW=Date Code,According To Actual Changes
LLWWF=Inernal Code,According To Actual Changes
NCD6A65=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-220AC	P1	1.834	Tube	50	1000	5000

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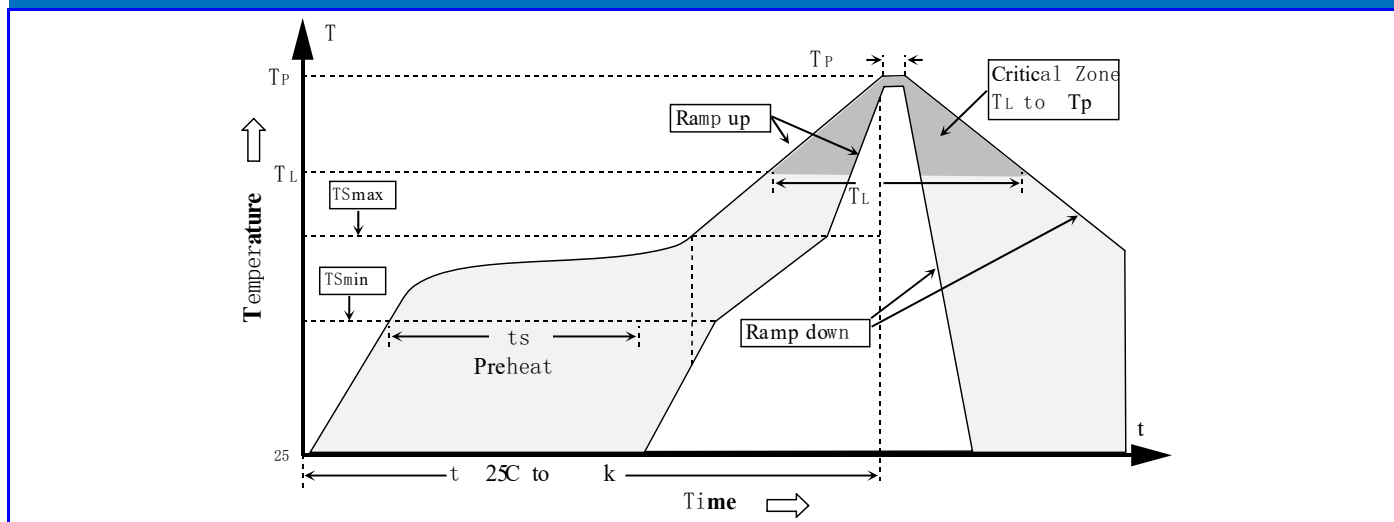
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Recommended wave soldering condition

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 (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.

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