NCD6A65P5

Silicon Carbide Schottky Diode

Pb-Free RoHS COMPLIANT

Voltage:	650 Volts	**Current:**	6 A	**Package:**	PDFN5*6

Features

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

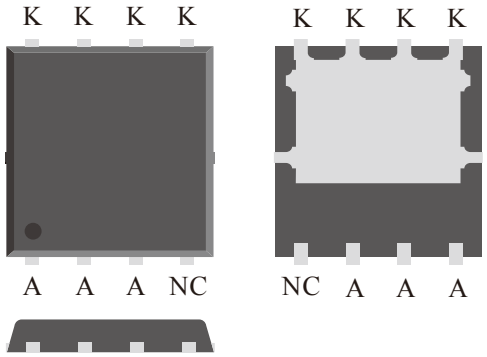
Mechanical Data

- **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 ℃	$I_{F(AV)}$	18 11 6	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}	48 43	A
Repetitive Peak Forward Surge Current Sine Half-Wave	T_C=25°C,T_P=10ms	I_{FRM}	24	A
Maximum Power Dissipation Power Dissipation Derating Factor Above 25℃	Tc= 25 ℃ Tc= 100 ℃	P_{tot}	63 31	W
Current Squared Time	t< 8.3ms	I^2t	9.6	A^2sec
Avalanche Current,Single Pulse (Note 1)	L= 0.5 mH	I_{AS}	8.5	A
Single Pulse Avalanche Energy (Note 1) Test Circuit & Waveform See Fig.16	L= 0.5 mH,I_{PK}= 8.5 A Starting Tj=25 ℃,VDD = 50.0 V	E_{AS}	18	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= 6.0 A Ta=175℃	V_F	-- --	1.34 1.62	1.61 --	V
Maximum DC Reverse Current at Rated DC Blocking Voltage	Ta=25℃ VR=VRRM Ta=175℃ VR=80%*VRRM	I_{RRM}	-- --	0.6 3.4	13.0 --	uA
Capacitance stored energy	VR= 400 V	E_C	--	3.0	--	uJ
Total Capacitive Charge	$Qc=\int_0^{VR} C*dV$ VR= 400 V	Q_C	--	20	-	nC
Typical Junction Capacitance Per Diode	1 V,1MHz 200 V,1MHz 400 V,1MHz	C_J	-- -- --	255 40 30	-- -- --	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 1 in2 FR-4 Board With 2oz. Copper	$R_{\theta JC}$	2.40	℃/W

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Typical Characteristics Curves

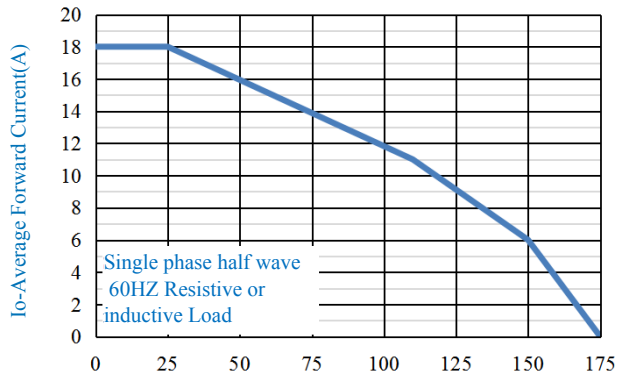


Fig.1-Forward Current Derating Curve

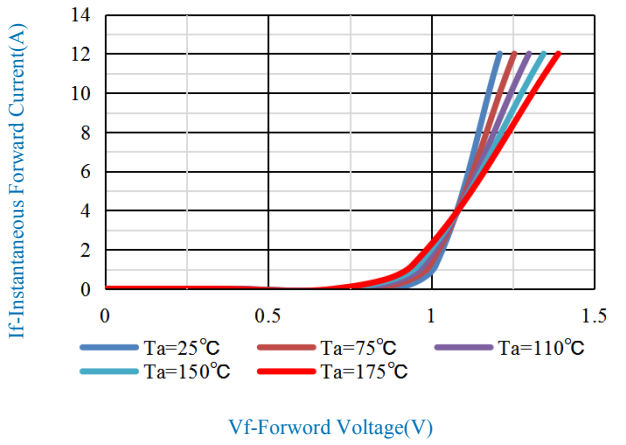


Fig.2-Typical Instantaneous Forward

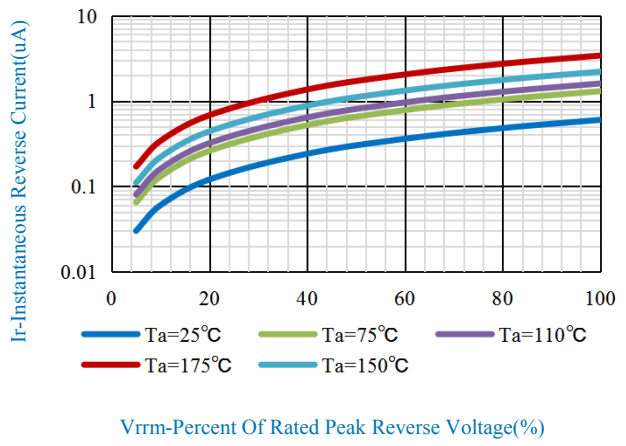


Fig.3-Typical Reverse Characteristics

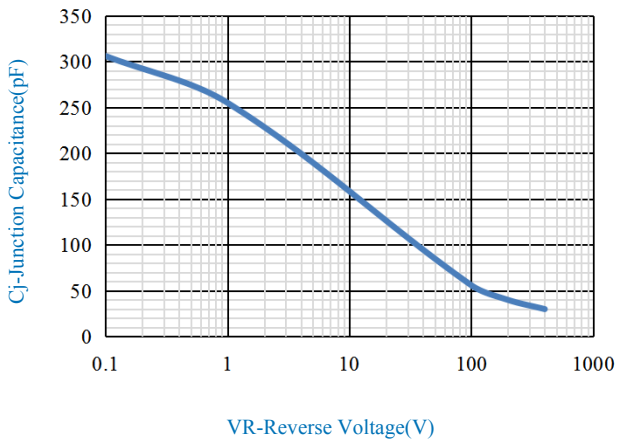


Fig.4-Typical Junction Capacitance

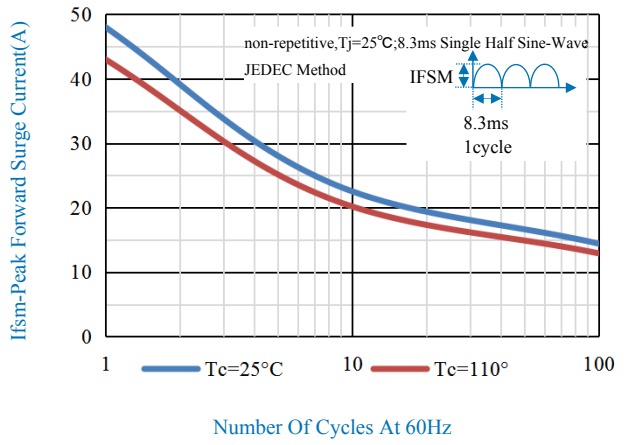


Fig.5-Max. Non-Repetitive Surge Current

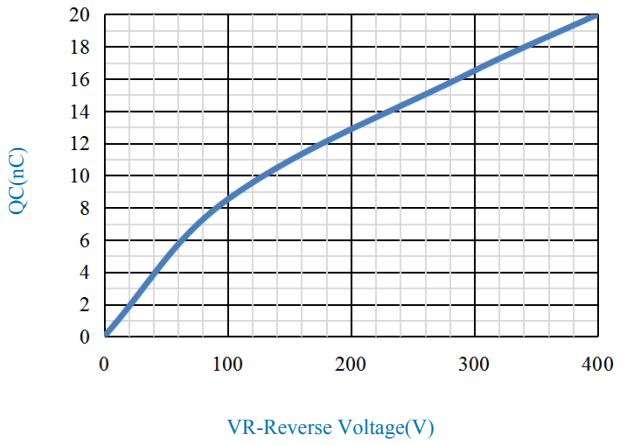


Fig.6-Total Capacitance Charge Characteristics vs. ReverseVoltage

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Typical Characteristics Curves

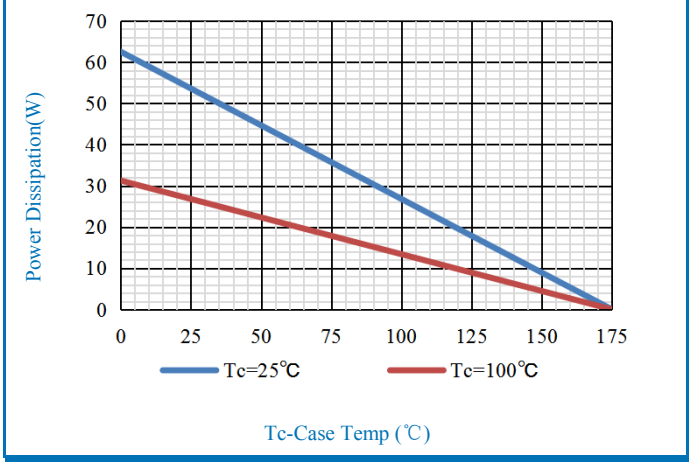


Fig.7-Power dissipation as function of case temperature

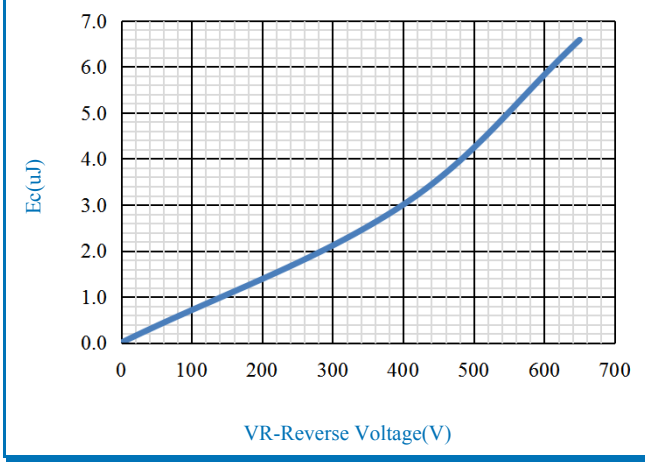


Fig.8-Capacitance Stored Energy

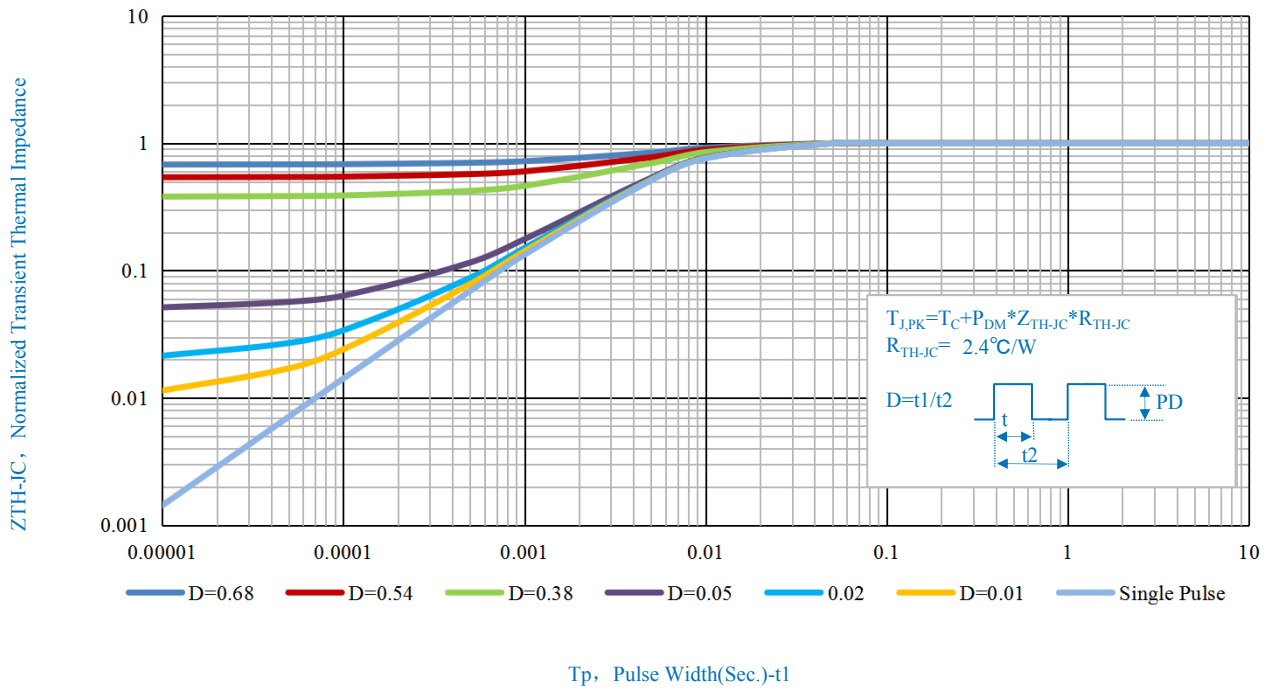


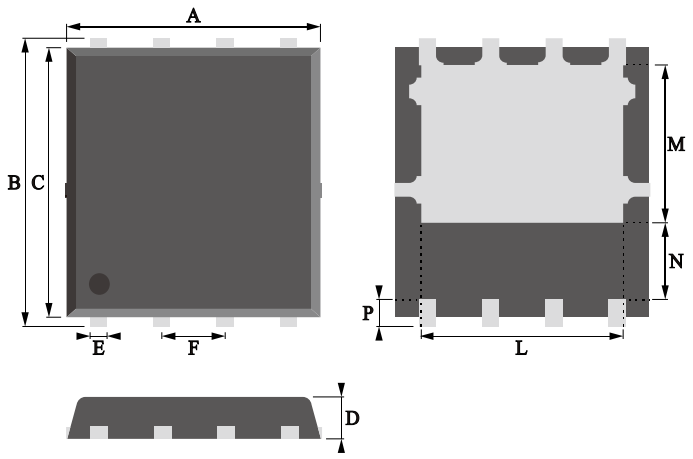
Fig.9- Normalized Maximum Transient Thermal Impedance Vs.Pulse Width

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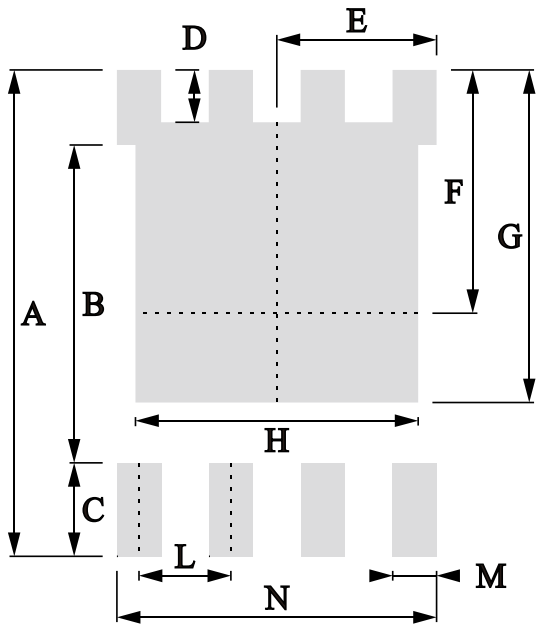
OUTLINE DRAWINGS



PDFN5*6

OUTLINE DIMENSIONS						
Dim.	Milimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	4.70	-	5.70	0.1850	-	0.2244
B	5.60	-	6.60	0.2205	-	0.2598
C	5.10	-	6.10	0.2008	-	0.2402
D	0.70	-	1.20	0.0276	-	0.0472
E	0.15	-	0.45	0.0059	-	0.0177
F	1.30	-	1.90	0.0512	-	0.0748
M	3.10	-	3.90	0.1220	-	0.1535
L	3.45	-	4.05	0.1358	-	0.1594
N	1.00	-	1.60	0.0394	-	0.0630
P	0.25	-	0.75	0.0098	-	0.0295

RECOMMEDNED LAYOUT DRAWINGS



PDFN5*6

OUTLINE DIMENSIONS						
Dim.	Milimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	-	6.61	-	-	0.2602	-
B	-	4.32	-	-	0.1701	-
C	-	1.27	-	-	0.0500	-
D	-	0.71	-	-	0.0280	-
E	-	2.21	-	-	0.0870	-
F	-	3.31	-	-	0.1301	-
G	-	4.52	-	-	0.1780	-
H	-	3.91	-	-	0.1539	-
L	-	1.27	-	-	0.0500	-
M	-	0.61	-	-	0.0240	-
N	-	4.42	-	-	0.1740	-

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MARKING



MARKING INSTRUCTION

NH=Niuhang Trademark

FF=Product Line Code,According To Actual Changes

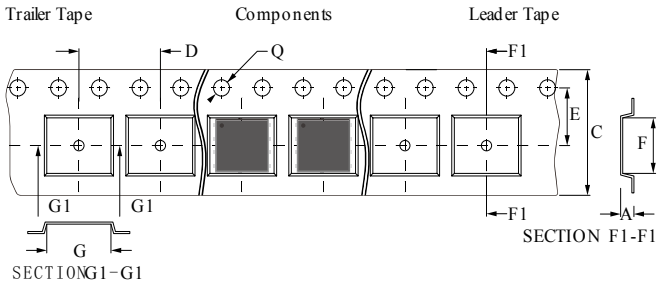
YWW=Date Code,According To Actual Changes

LLWWF=Inernal Code,According To Actual Changes

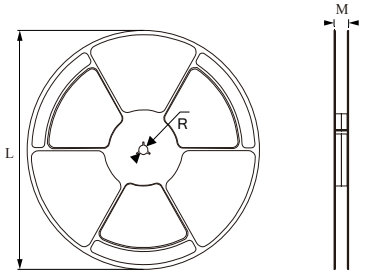
NCD6A65P5=Model

PACKAGING

TAPE



REEL



PDFN5*6

OUTLINE DIMENSIONS						
Dim.	Milimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
TAPE						
A	1.00	-	1.20	0.0394	-	0.0472
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	5.10	-	5.50	0.2008	-	0.2165
G	6.10	-	6.50	0.2402	-	0.2559
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	Productor Weight Approx(g/Pcs)	Package Method	Quantity (Pcs/Min. Pack.)	Quantity (Pcs/Inner Box)	Quantity (Pcs/Carton)
PDFN5*6	P1	0.087	13" Reel	5000	10000	50000

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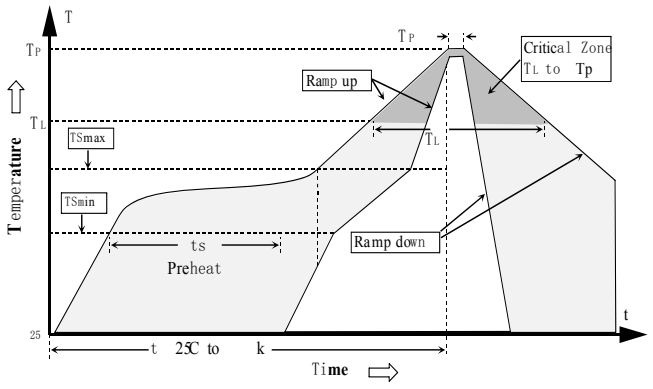
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Recommended wave soldering condition

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 (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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Specification Revision History

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

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