

NCD6A65P5

Silicon Carbide Schottky Diode



Voltage: 650 Volts

Current: 6 A

Package: PDFN5*6

Features

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

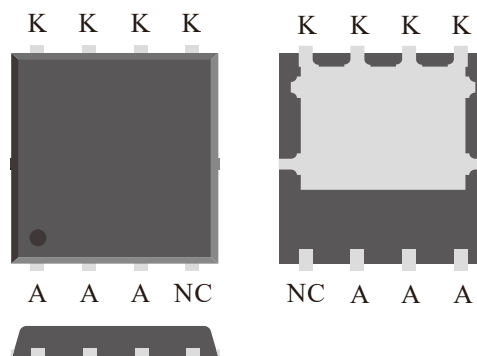
Mechanical Data

- **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	$T_C=25^{\circ}C, T_P=10ms$	I_{FSM}	48	A
Sine Half-Wave	$TC=110^{\circ}C, TP=10ms$	I_{FRM}	42	
Repetitive Peak Forward Surge Current	$T_C=25^{\circ}C, T_P=10ms$	I_{FRM}	24	
Sine Half-Wave	$TC=110^{\circ}C, TP=10ms$		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	$T_a=25^{\circ}C$ $T_a=175^{\circ}C$ $I_F= 6.0 \text{ A}$	V_F	--	1.35 1.6	1.65 --	V
Maximum DC Reverse Current at Rated DC Blocking Voltage	$T_a=25^{\circ}C$ $VR=V_{RRM}$ $T_a=175^{\circ}C$ $VR=80\%*V_{RRM}$	I_{RRM}	--	1 12	50 --	uA
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 1 in2 FR-4 Board With 2oz. Copper	$R_{\theta JC}$	1.5	°C/W

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Typical Characteristics Curves

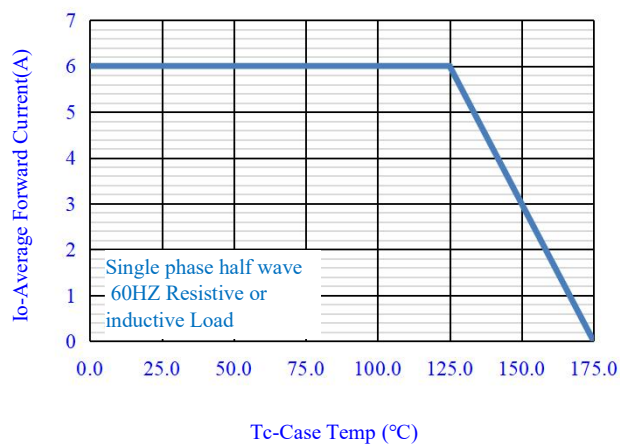


Fig.1-Forward Current Derating Curve

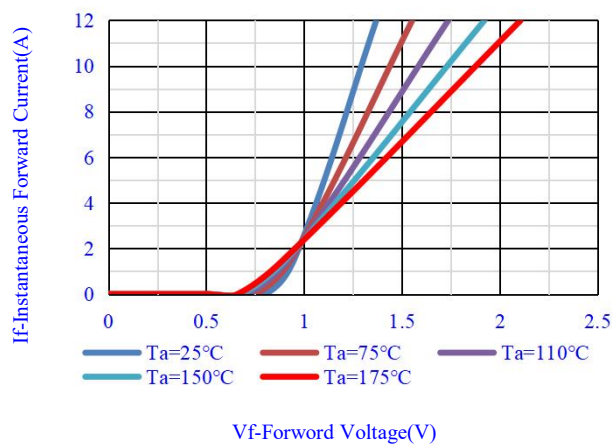


Fig.2-Typical Instantaneous Forward

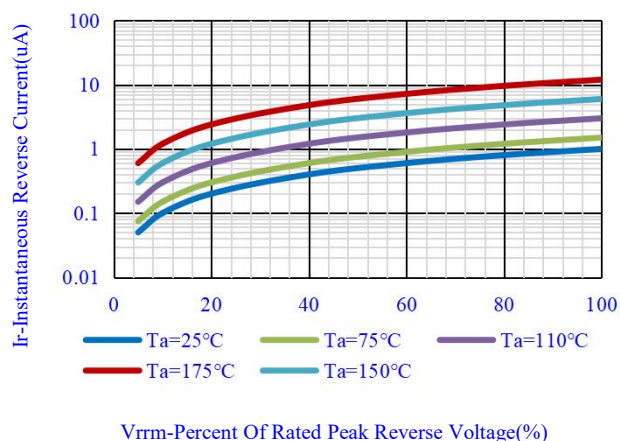


Fig.3-Typical Reverse Characteristics

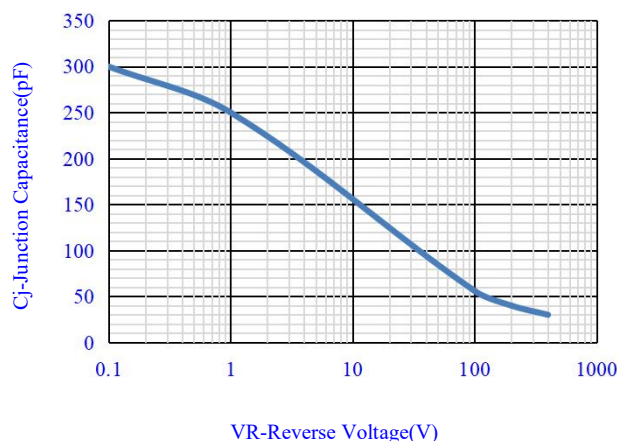


Fig.4-Typical Junction Capacitance

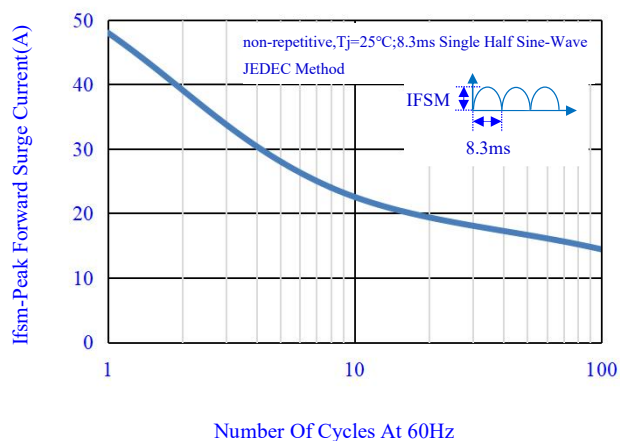


Fig.5-Max. Non-Repetitive Surge Current

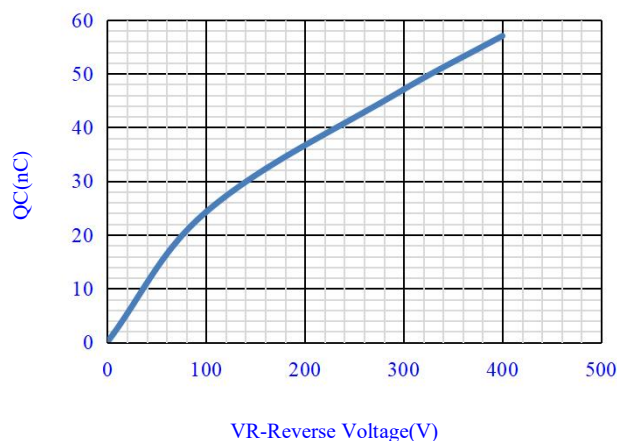


Fig.6-Total Capacitance Charge Characteristics vs. Reverse Voltage

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Typical Characteristics Curves

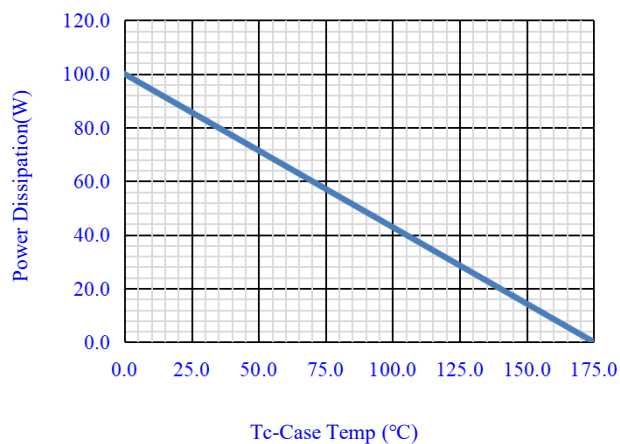


Fig.7-Power dissipation as function of case temperature

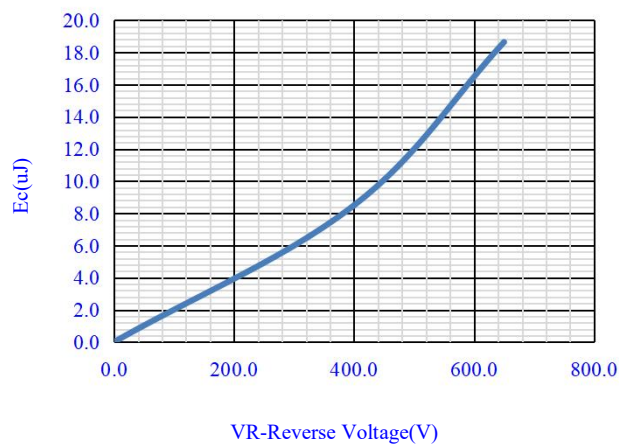


Fig.8-Capacitance Stored Energy

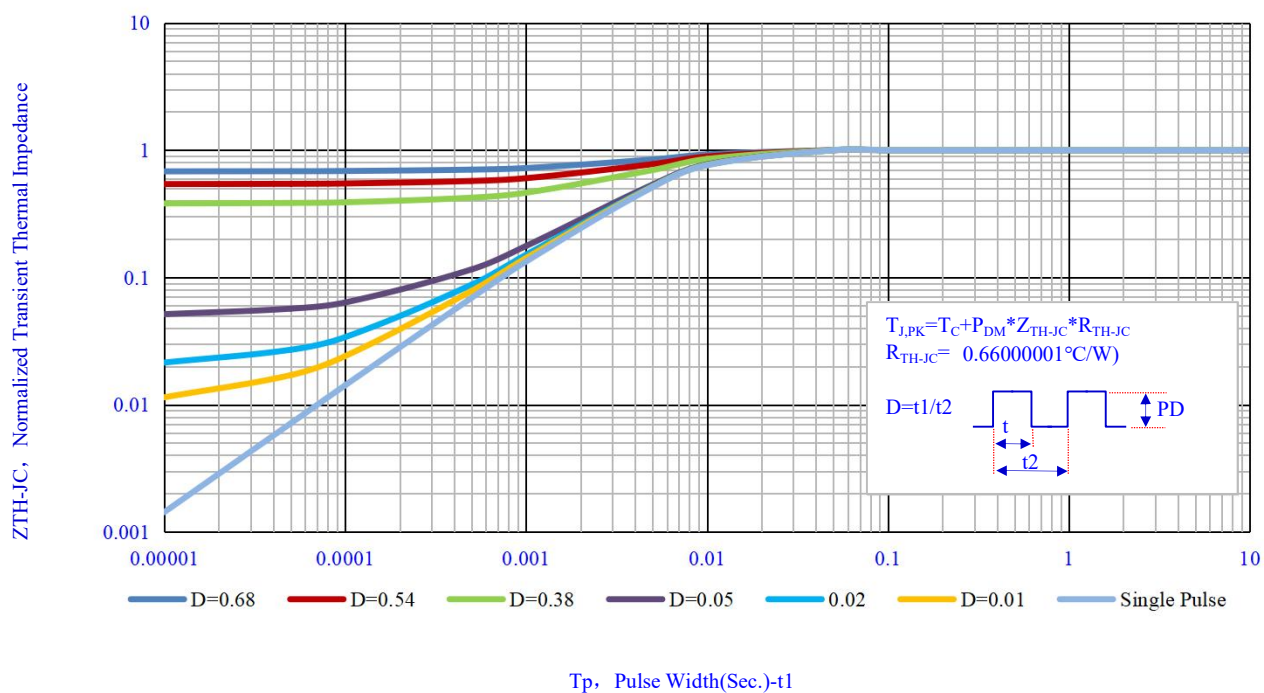


Fig.9- Normalized Maximum Transient Thermal Impedance Vs.Pulse Width

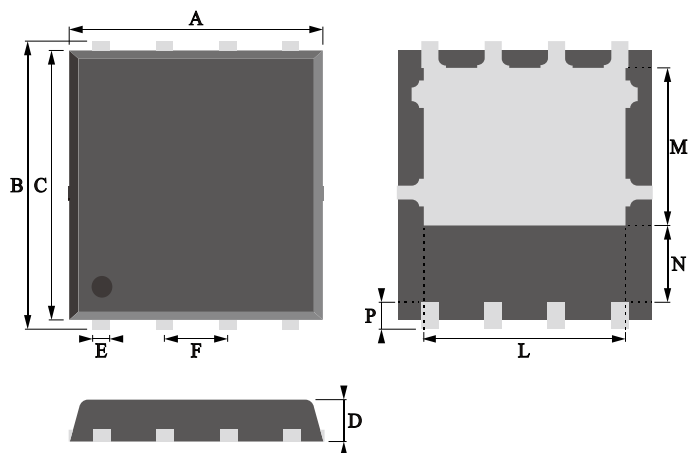
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OUTLINE DRAWINGS

PDFN5*6

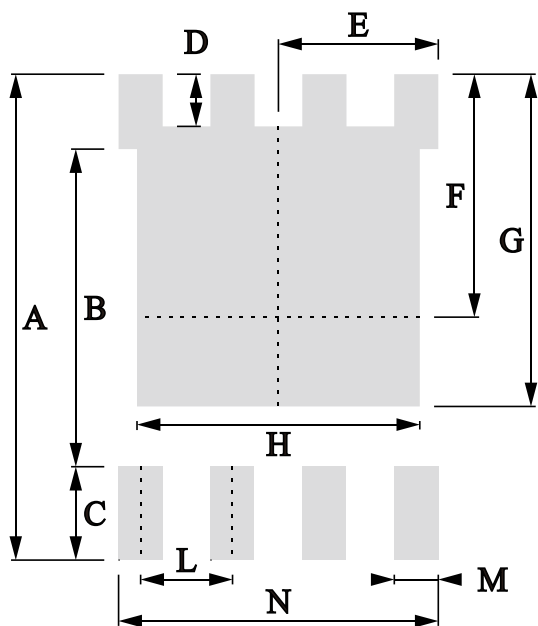


OUTLINE DIMENSIONS

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	3.50	-	4.00	0.1378	-	0.1575
N	1.00	-	1.60	0.0394	-	0.0630
P	0.25	-	0.75	0.0098	-	0.0295

RECOMMENDED 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

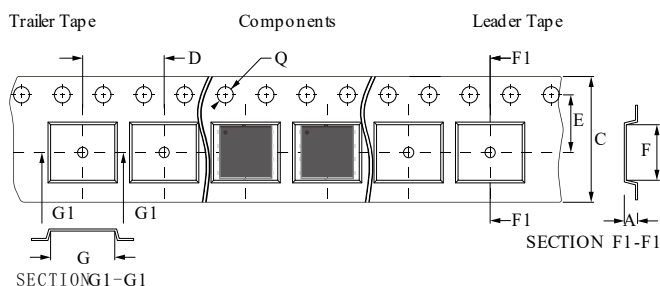


MARKING INSTRUCTION

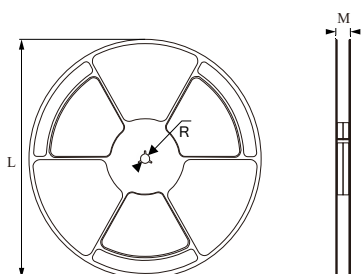
NH=Niuhan Trademark
FF=Product Line Code,According To Actual Changes
YW=Date Code,According To Actual Changes
LLWW=Internal Code,According To Actual Changes
NCD6A65P5=Model

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	Product 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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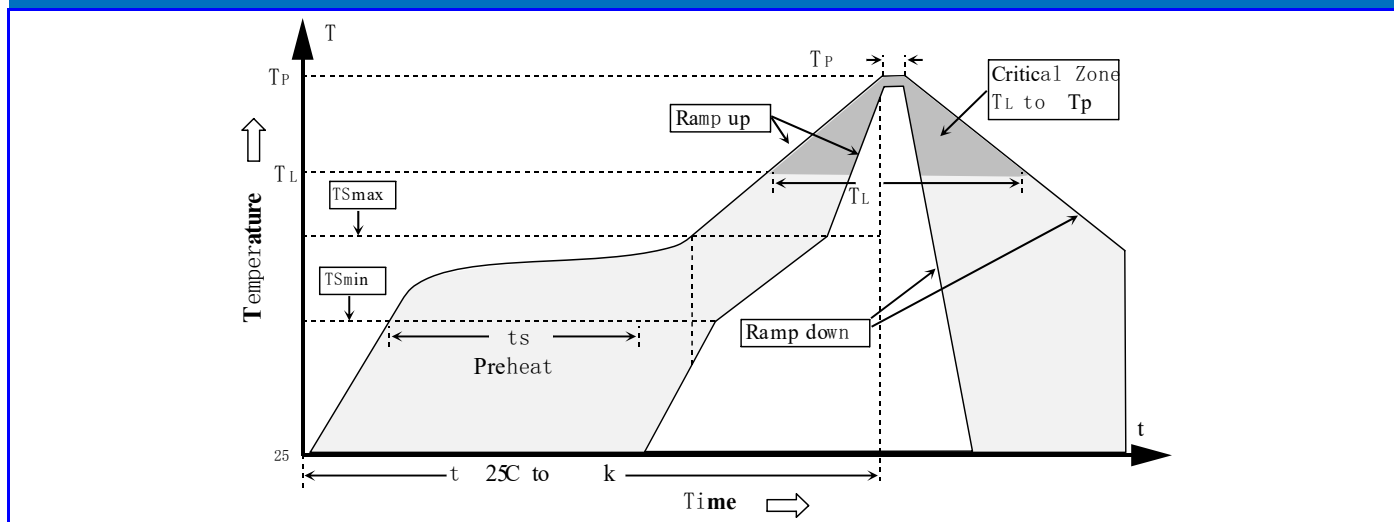
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Recommended wave soldering condition

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 (T _{smax} to T _p)	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 (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(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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