NCD8A65F

SILICON CARBIDE SCHOTTKY DIODE

Pb RoHS Pb-Free COMPLIANT

VOLTAGE:	650 Volts	CURRENT:	8 Amperes	Package:	TO-220F-2L	Marking And Polarity

FEATURES

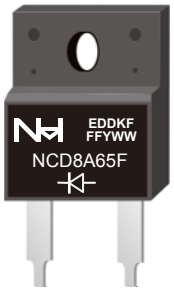
- Extremely Low Reverse Current
- Zero Reverse Recovery Current
- Positive Temperature Coefficient on VF
- Temperature-Independent Switching Behavior
- Low Capacitive Charge

DESCRIPTION

- Niuhang provides leading edge technology for the SiC Schottky barrier diodes with the advanced thin-wafer technology.The new family of products showing improved efficiency over all load conditions,attributed to its lower figure of merit(Q_C x V_F).

TYPICAL APPLICATIONS

- Switch Mode Power Supplies (SMPS)
- Power Factor Correction or DC/DC Stages
- Free Wheeling Diodes in Inverter Stages
- AC/DC Converters
- Uninterruptible Power Supplies



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Remark:

①. NH=niuhang trademark

②. FF=Product line code,According to actual changes

YWW=Date code,According to actual changes

EDDKF=Inernal code,According to actual changes

③. NCD8A65F=Model

Maximum Ratings (Ta=25℃ Unless otherwise specified)

Parameter	Test Conditions	Symbol	NCD8A65F	Unit
Maximum Repetitive Peak Reverse Voltage		V_{RRM}	650	V
Maximum DC Blocking Voltage		V_{DC}	650	V
Maximum Average Forward Rectified Current	@TC= 25 °C @TC= 150 °C	$I_{F(AV)}$	21 8	A
Peak Forward Surge Current	8.3ms Single Half Sine-wave Superimposed On Rate Load	I_{FSM}	33	A
Current Squared Time Per Diode	t<8.3ms	I^2t	4.5	A^2sec
Power Dissipation	@TC= 25 °C @TC= 110 °C	P_{tot}	54 23	W

Electrical Characteristcs (Ta=25℃ Unless otherwise specified)

Parameter	Test Conditions		Symbol	NCD8A65F			Unit
				Min.	Typ.	Max.	
Instaneous forward voltage per diode (note1)	Ta=25℃ Ta=175℃	I_F= 8 A	V_F	-- --	1.60 2.00	1.90 2.30	V
Maximum DC Reverse Current at Rated DC Blocking Voltage	Ta=25℃ Ta=175℃	V_R= V_{RRM} V_R= V_{RRM}	I_{RRM}	-- --	1 10	10 50	uA
Total Capacitive Charge	VR= 400 V,TJ= 25°C Qc= $\int_0^{VR}$ C(V)*DV		Q_C	--	15.0	--	nC
Total Capacitance	1 V,1MHz 300 V,1MHz 600 V,1MHz		C	-- -- --	268 30 23	-- -- --	pF
Capacitance Stored Energy	VR= 400 V		E_C	--	2	--	uJ

Thermal Characteristcs (Ta=25℃ Unless otherwise specified)

Parameter	Symbol	NCD8A65F	Unit
Operating Junction Temperature Range	T_J	-55 to 175	℃
Storage Temperature Range	T_{STD}	-55 to 175	℃
Typical thermal resistance	$R_{\theta JC}$	2.8	℃/W

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Typical Characteristics Curves

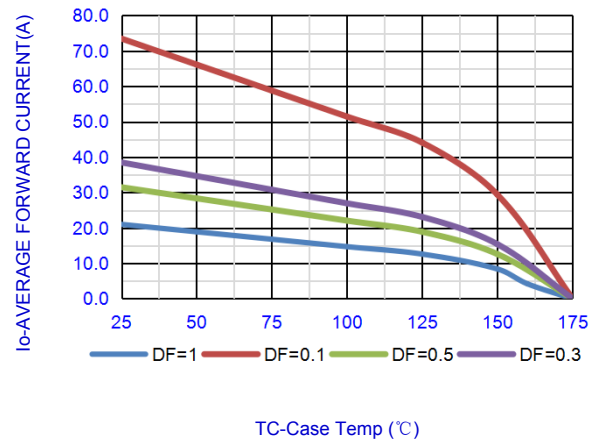

Fig.1-FORWARD CURRENT DERATING CURVE

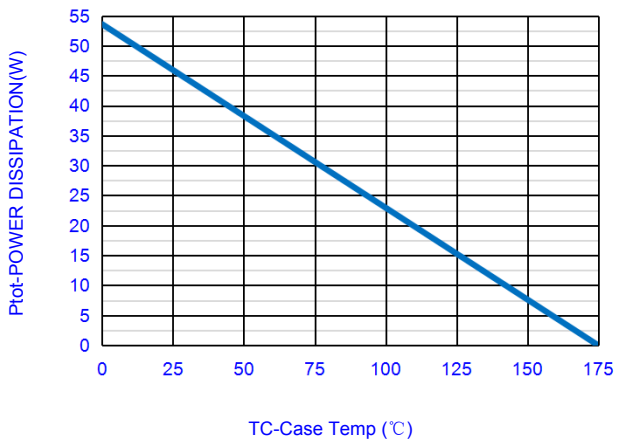

Fig.2-POWER DERATING CURVE

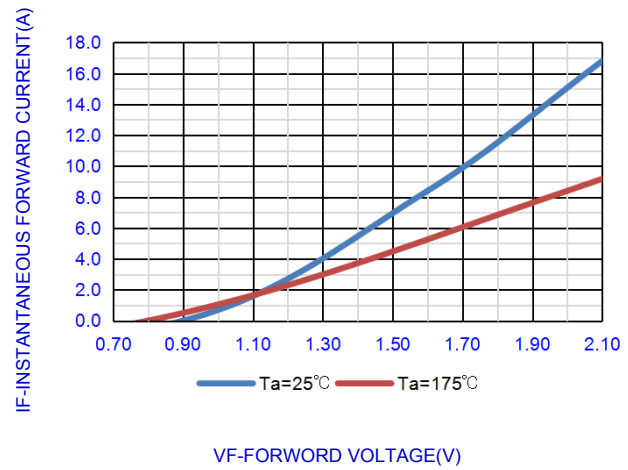

Fig.3- TYPICAL INSTANTANEOUS FORWARD

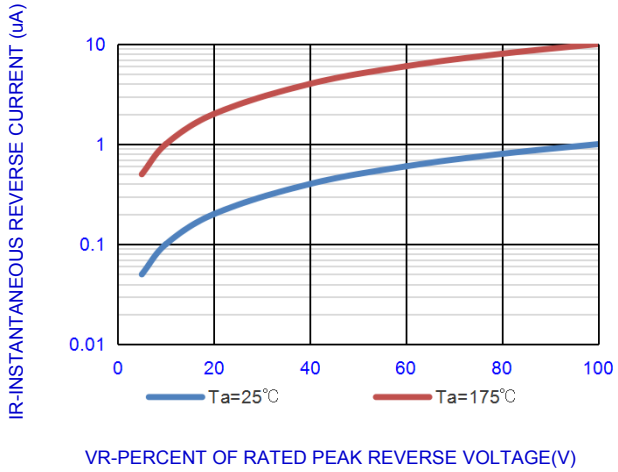

Fig.4- TYPICAL REVERSE CHARACTERISTICS

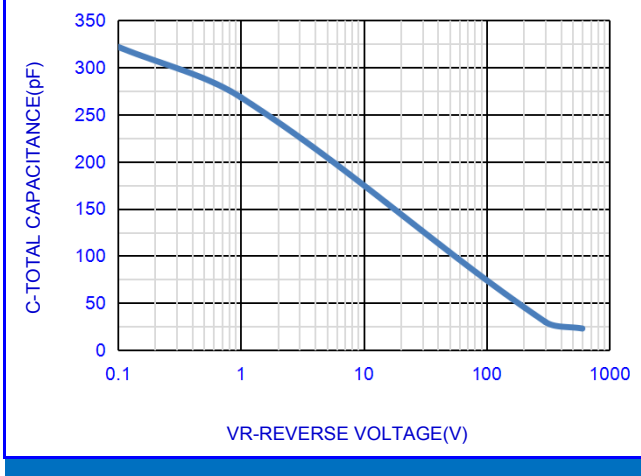

Fig.6-TOTAL CAPACITIVE CHARGE vs. REVERSE VOLTAGE

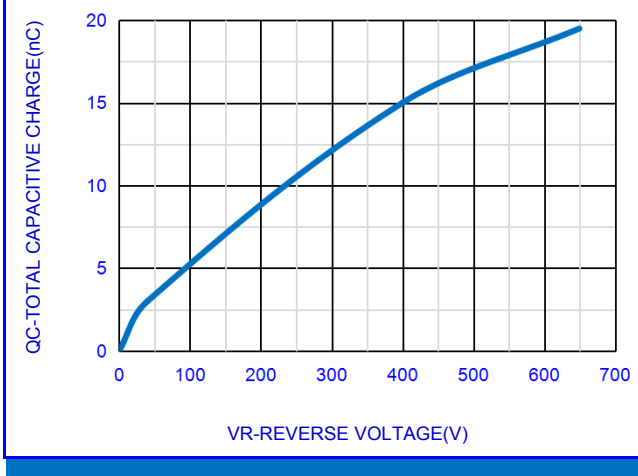

Fig.6-TOTAL CAPACITIVE CHARGE vs. REVERSE VOLTAGE

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Typical Characteristics Curves

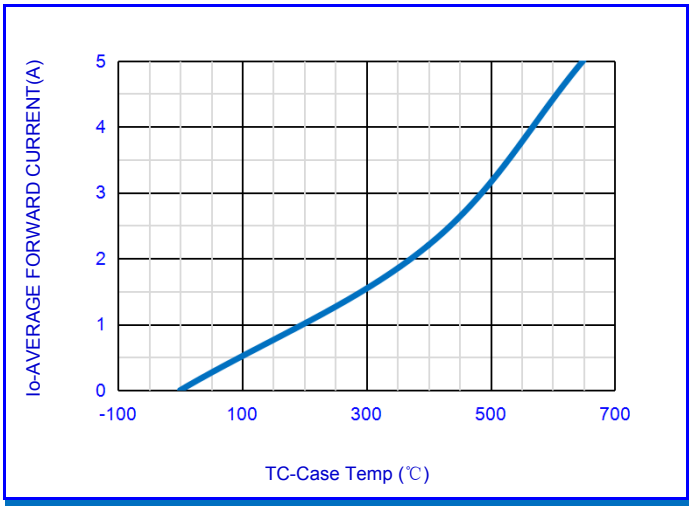

Fig.7-CAPACITANCE STORED ENERGY vs. REVERSE VOLTAGE

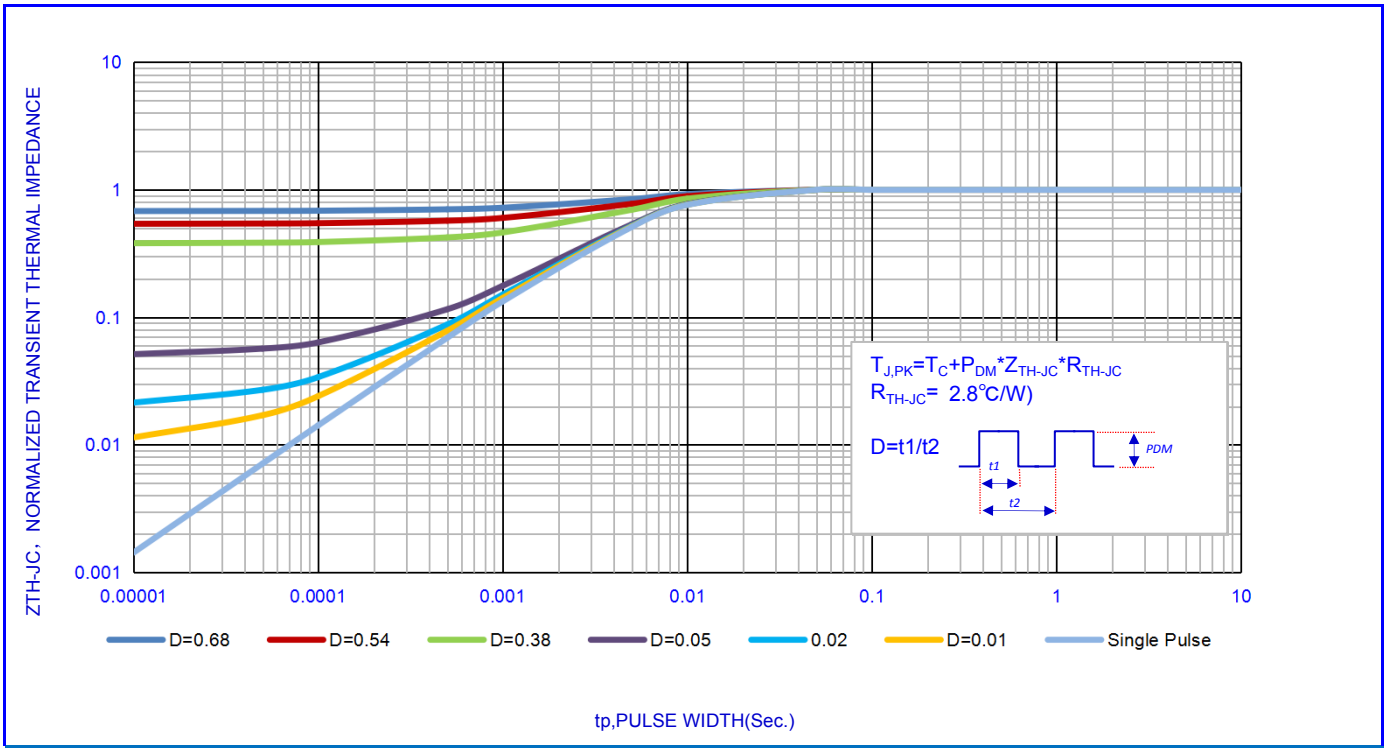

Fig.8- NORMALIZED MAXIMUM TRANSIENT THERMAL IMPEDANCE vs.PULSE WIDTH

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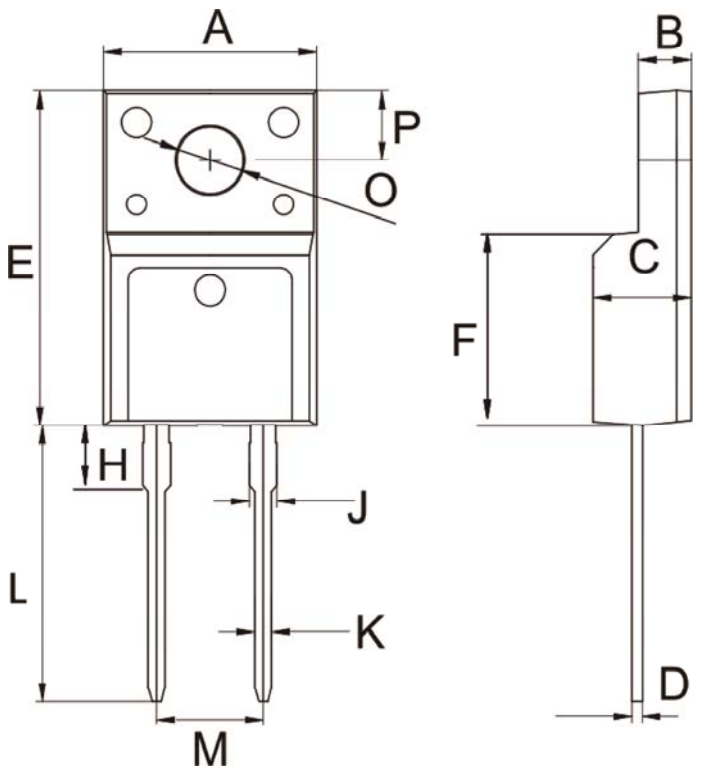
OUTLINE DRAWINGS

TO-220F-2L



OUTLINE DIMENSIONS

Dim.	Milimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	9.25	-	10.75	0.36	-	0.42
B	2.25	-	2.75	0.09	-	0.11
C	4.40	-	5.00	0.17	-	0.20
D	0.45	-	0.75	0.02	-	0.03
E	15.00	-	17.00	0.59	-	0.67
F	7.95	-	9.45	0.31	-	0.37
L	12.50	-	14.50	0.49	-	0.57
H	2.30	-	2.90	0.09	-	0.11
J	1.15	-	1.65	0.05	-	0.06
K	0.70	-	1.00	0.03	-	0.04
M	4.80	-	5.40	0.19	-	0.21
O	2.90	-	3.40	0.11	-	0.13
P	3.00	-	3.50	0.12	-	0.14

PACKING INFORMATION

Package Code	Package Method	Inner Box Size L×W×H(mm)	Quantity (Pcs/Inner Box)	Outer Carton Size L×W×H(mm)	Quantity (Pcs/Carton)
TO-220F-2L	T/P	560x155x55	1000	570×284×185	5000

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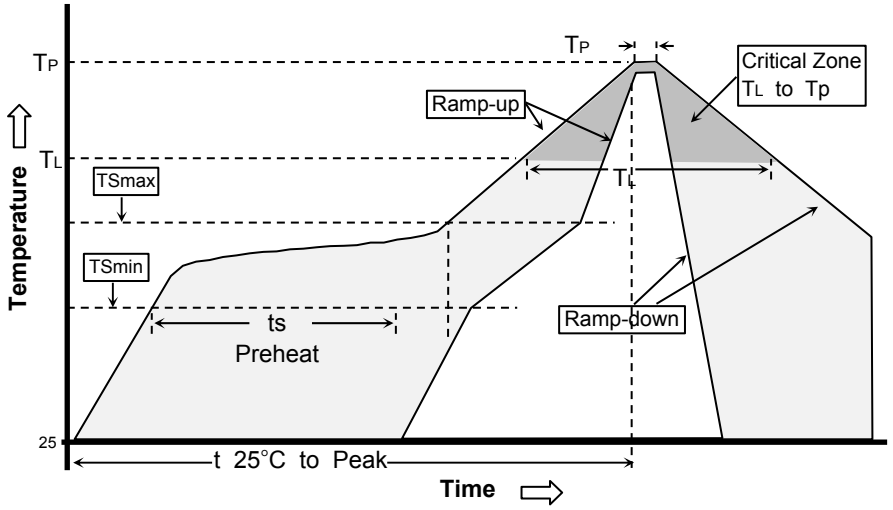
Recommended wave soldering condition

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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