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With the principle of "Quality Parts, Customers Priority, Honest Operation, and Considerate Service", our business mainly focus on the distribution of electronic components. Line cards we deal with include Microchip, ALPS, ROHM, Xilinx, Pulse, ON, Everlight and Freescale. Main products comprise IC, Modules, Potentiometer, IC Socket, Relay, Connector. Our parts cover such applications as commercial, industrial, and automotives areas.

We are looking forward to setting up business relationship with you and hope to provide you with the best service and solution. Let us make a better world for our industry!



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CVFD20065ASilicon Carbide Schottky Diode Z-REC® RECTIFIER

V_{RRM} = 650 V $I_{F}(T_{c}=135^{\circ}C)$ = 26 A Q_{c} = 62 nC

Features

- 650-Volt Schottky Rectifier
- Reduced V_F for Improved Efficiency
- High Humidity Resistance
- Zero Forward and Reverse Recovery Voltage
- Temperature-Independent Switching Behavior
- Extremely Fast Switching
- Positive Temperature Coefficient on V_E

Package





Package

TO-220-2



Marking

CVFD20065

TO-220-2

Part Number

CVFD20065A

Benefits

- Replace Bipolar with Unipolar Rectifiers
- Essentially No Switching Losses
- Higher Efficiency
- Reduction of Heat Sink Requirements
- Parallel Devices Without Thermal Runaway

PIN 1 O CASE

Applications

- Power Inverters
- Motor Drives
- EV Chargers
- Power Factor Correction
- Server Power Supplies

Maximum Ratings (T_c = 25 °C unless otherwise specified)

Symbol	Parameter	Value	Unit	Test Conditions	Note
$V_{_{\mathrm{RRM}}}$	Repetitive Peak Reverse Voltage	650	V		
$V_{\scriptscriptstyle RSM}$	Surge Peak Reverse Voltage	650	V		
V _{DC}	DC Peak Blocking Voltage	650	V		
$I_{_{\rm F}}$	Continuous Forward Current	57 26 20	А	T _c =25°C T _c =135°C T _c =149°C	Fig. 3
$I_{\sf FRM}$	Repetitive Peak Forward Surge Current	91 61.5	А	T_c =25°C, t_p =10 ms, Half Sine Pulse T_c =110°C, t_p =10 ms, Half Sine Pulse	
$I_{\scriptscriptstyle{FSM}}$	Non-Repetitive Forward Surge Current	206 180	А	T_c =25°C, t_p =10 ms, Half Sine Pulse T_c =110°C, t_p =10 ms, Half Sine Pulse	Fig. 8
$I_{\text{F,Max}}$	Non-Repetitive Peak Forward Current	1400 1100	А	T_c =25°C, t_p =10 μ s, Pulse T_c =110°C, t_p =10 μ s, Pulse	Fig. 8
P _{tot}	Power Dissipation	187.5 81	W	T _c =25°C T _c =110°C	Fig. 4
∫i²dt	i²t value (Per Leg)	212 162	A²s	$T_c = 25$ °C, $t_p = 10$ ms $T_c = 110$ °C, $t_p = 10$ ms	
$T_{\scriptscriptstyle \mathrm{J}}$, $T_{\scriptscriptstyle \mathrm{stg}}$	Operating Junction and Storage Temperature	-55 to +175	°C		
	TO-220 Mounting Torque	1 8.8	Nm lbf-in	M3 Screw 6-32 Screw	



Electrical Characteristics

Symbol	Parameter	Тур.	Max.	Unit	Test Conditions	Note
V _F	Forward Voltage	1.35 1.65	1.45 1.80	V	$I_F = 20 \text{ A } T_J = 25^{\circ}\text{C}$ $I_F = 20 \text{ A } T_J = 175^{\circ}\text{C}$	Fig. 1
т.	Reverse Current	8 2	80	μA	$V_R = 650 \text{ V}, T_J = 25^{\circ}\text{C}$ $V_R = 400 \text{ V}, T_J = 25^{\circ}\text{C}$	Fig. 2
I _R	Reverse Current	30 5	300	μΑ	V _R = 650 V , T _J =175°C V _R = 400 V , T _J =175°C	Fig. 2
Q _c	Total Capacitive Charge	62		nC	$V_{R} = 400 \text{ V}$ $di/dt = 500 \text{ A/}\mu\text{s}$ $T_{J} = 25^{\circ}\text{C}$	Fig. 5
С	Total Capacitance	1100 113 108		pF	$V_R = 0 \text{ V, } T_J = 25^{\circ}\text{C, } f = 1 \text{ MHz}$ $V_R = 200 \text{ V, } T_J = 25^{\circ}\text{C, } f = 1 \text{ MHz}$ $V_R = 400 \text{ V, } T_J = 25^{\circ}\text{C, } f = 1 \text{ MHz}$	Fig. 6
E _c	Capacitance Stored Energy	9.5		μJ	V _R = 400 V	Fig. 7

Note: This is a majority carrier diode, so there is no reverse recovery charge.

Thermal Characteristics

Symbol	Parameter	Тур.	Unit
$R_{_{ heta JC}}$	Thermal Resistance from Junction to Case	0.8	°C/W

Typical Performance

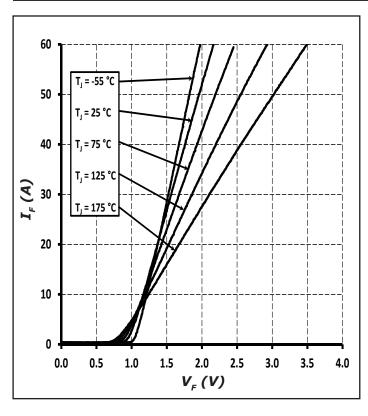


Figure 1. Forward Characteristics

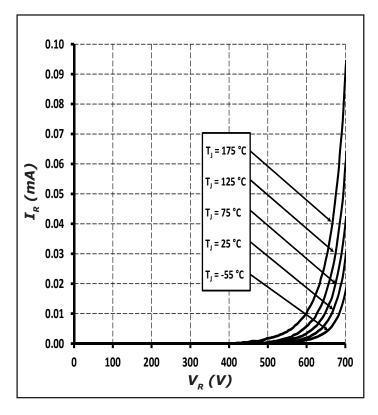
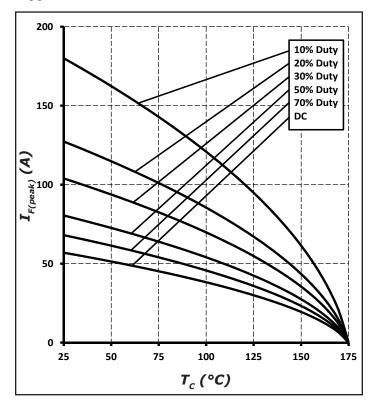


Figure 2. Reverse Characteristics



Typical Performance



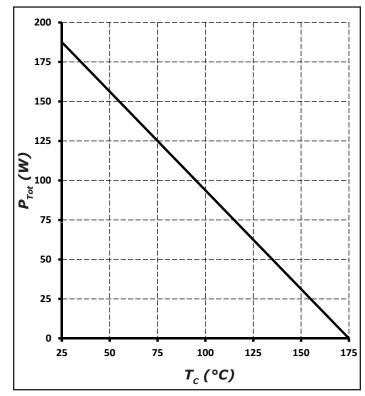


Figure 3. Current Derating

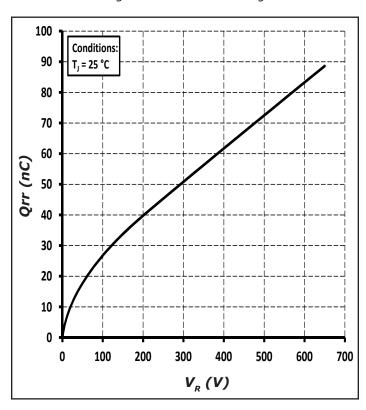
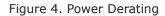


Figure 5. Recovery Charge vs. Reverse Voltage



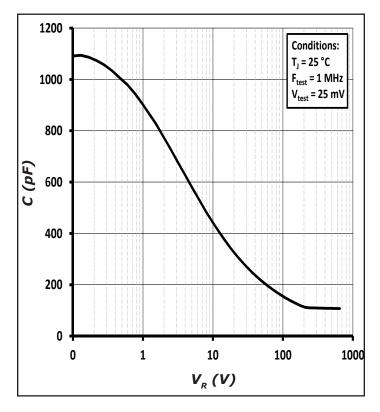


Figure 6. Capacitance vs. Reverse Voltage



Typical Performance

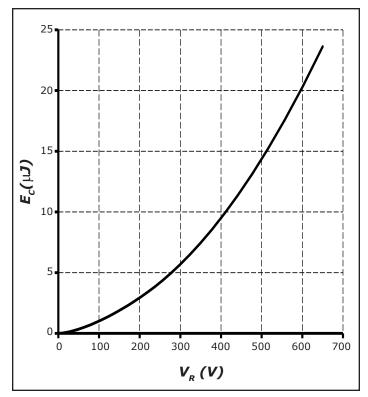


Figure 7. Typical Capacitance Stored Energy

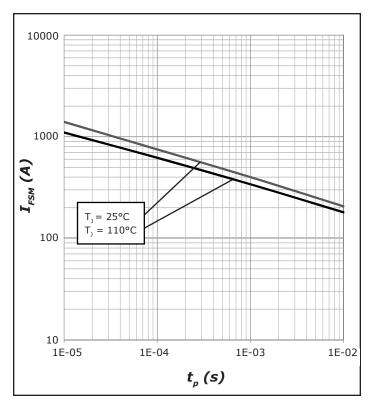


Figure 8. Non-Repetitive Peak Forward Surge Current versus Pulse Duration (sinusoidal waveform)

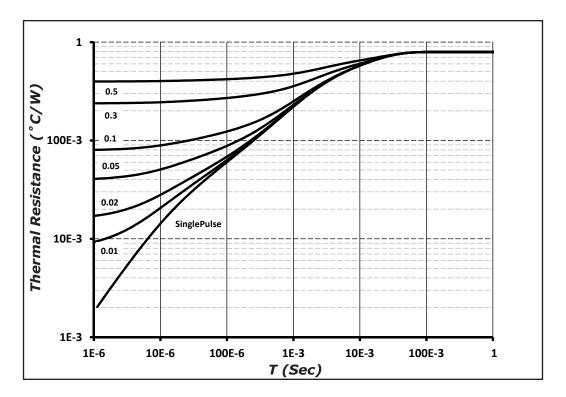
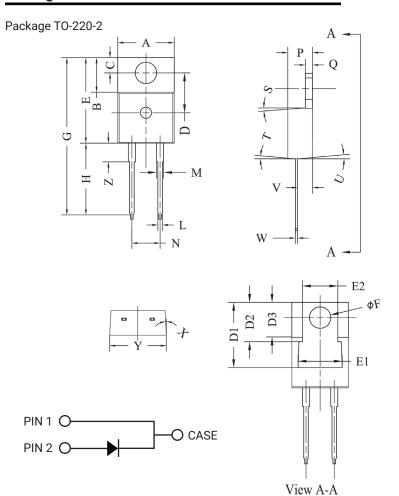


Figure 9. Transient Thermal Impedance



Package Dimensions

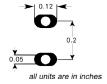


Doo	Inc	hes	Millimeters		
POS	Min	Max	Min	Max	
А	.381	.410	9.677	10.414	
В	.235	.255	5.969	6.477	
С	.100	.120	2.540	3.048	
D	.223	.337	5.664	8.560	
D1	.457-	490	11.60-12.45 typ		
D2	.277303 typ		7.04-7.70 typ		
D3	.244252 typ		6.22-6.4 typ		
Е	.590	.615	14.986	15.621	
E1	.302	.326	7.68	8.28	
E2	.227	251	5.77	6.37	
F	.143	.153	3.632	3.886	
G	1.105	1.147	28.067	29.134	
Н	.500	.550	12.700	13.970	
L	.025	.036	.635	.914	
М	.045	.055	1.143	1.550	
N	.195	.205	4.953	5.207	
Р	.165	.185	4.191	4.699	
Q	.048	.054	1.219	1.372	
S	3°	6°	3°	6°	
T	3°	6°	3°	6°	
U	3°	6°	3°	6°	
V	.094	.110	2.388	2.794	
W	.014	.025	.356	.635	
Х	3°	5.5°	3°	5.5°	
Υ	.385	.410	9.779	10.414	
Z	.130	.150	3.302	3.810	

NOTE:

1. Dimension L, M, W apply for Solder Dip Finish

Recommended Solder Pad Layout



TO-220-2

Part Number	Package	Marking	
CVFD20065A	TO-220-2	CVFD20065A	

Note: Recommended soldering profiles can be found in the applications note here: http://www.wolfspeed.com/power_app_notes/soldering





Diode Model

$$\begin{array}{c|c} - & & \\ \hline V_T & R_T \end{array}$$

$$V_{fT} = V_T + If * R_T$$

$$V_T = 1.0081 + (T_J^* - 1.6*10^{-3})$$

 $R_T = 0.0146 + (T_J^* 1.7*10^{-4})$

Note: T_j = Diode Junction Temperature In Degrees Celsius, valid from 25°C to 175°C

Notes

RoHS Compliance

The levels of RoHS restricted materials in this product are below the maximum concentration values (also referred to as the threshold limits) permitted for such substances, or are used in an exempted application, in accordance with EU Directive 2011/65/EC (RoHS2), as implemented January 2, 2013. RoHS Declarations for this product can be obtained from your Wolfpseed representative or from the Product Ecology section of our website at http://www.wolfspeed.com/Power/Tools-and-Support/Product-Ecology.

REACh Compliance

REACh substances of high concern (SVHCs) information is available for this product. Since the European Chemical Agency (ECHA) has published notice of their intent to frequently revise the SVHC listing for the foreseeable future, please contact a Cree representative to insure you get the most up-to-date REACh SVHC Declaration. REACh banned substance information (REACh Article 67) is also available upon request.

This product has not been designed or tested for use in, and is not intended for use in, applications implanted into
the human body nor in applications in which failure of the product could lead to death, personal injury or property
damage, including but not limited to equipment used in the operation of nuclear facilities, life-support machines,
cardiac defibrillators or similar emergency medical equipment, aircraft navigation or communication or control
systems, or air traffic control systems.

Related Links

- Cree SiC Schottky diode portfolio: http://www.wolfspeed.com/Power/Products#SiCSchottkyDiodes
- Schottky diode Spice models: http://www.wolfspeed.com/power/tools-and-support/DIODE-model-request2
- SiC MOSFET and diode reference designs: http://go.pardot.com/l/101562/2015-07-31/349i

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