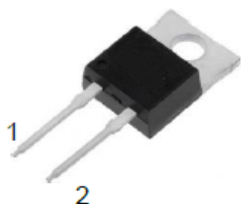


1. Descriptions

TO-220-2



SiC Schottky Diode



Key Performance Parameters

Parameters	Value	Unit
V_{DC}	1200	V
$I_F (T_C \leq 135^\circ C)$	25	A
Q_C	51	nC

Features

- Zero Reverse Recovery Current
- Zero Forward Recovery Voltage
- Positive Temperature Coefficient on V_F
- Temperature Independent Switching Behavior
- 175°C Operating junction temperature

Applications

- Switch Mode Power Supply
- Power Factor Correction
- Motor Drive, PV Inverter, Wind Power Station

Type/Ordering Code	Package	Marking	Related Links
CDH20G120D1	TO-220-2	CDH20G120D1	See Appendix A

Contents

1. Descriptions 1

2. Maximum Ratings..... 3

3. Thermal Characteristics 3

4. Electrical Characteristics 3

5. Electrical Characteristics Diagrams 4

6. Simplified Forward Characteristics Model 5

7. Package Outlines 6

8. Appendix 6

2. Maximum Ratings

Table 1. Maximum Ratings

Symbol	Parameter	Values			Unit	Test Condition
		Min.	Typ.	Max.		
V_{RRM}	Repetitive Peak Reverse Voltage	1200	-	-	V	$T_C=25^{\circ}\text{C}$
I_F	Forward Current	-	-	54 25 20	A	$T_C \leq 25^{\circ}\text{C}$ $T_C \leq 135^{\circ}\text{C}$ $T_C \leq 148^{\circ}\text{C}$
I_{FSM}	Non-Repetitive Forward Surge Current	-	-	180	A	$T_C=25^{\circ}\text{C}$, $t_P=8.3\text{ms}$, Half Sine Wave
P_{tot}	Power Dissipation	-	-	242	W	$T_C=25^{\circ}\text{C}$
T_C	Maximum Case Temperature	-	-	148	$^{\circ}\text{C}$	-
T_J, T_{stg}	Operating and Storage Temperature	-55	-	175	$^{\circ}\text{C}$	-
	TO-220-2 Mounting Torque			1	Nm	M3 Screw

3. Thermal Characteristics

Table 2. Thermal Characteristics

Symbol	Parameter	Values			Unit	Test Condition
		Min.	Typ.	Max.		
R_{thJC}	Thermal Resistance, Junction - Case	-	0.62	-	$^{\circ}\text{C/W}$	$T_C = 25^{\circ}\text{C}$
R_{thJA}	Thermal Resistance, Junction - Ambient	-	80	-	$^{\circ}\text{C/W}$	$T_C = 25^{\circ}\text{C}$
T_{sold}	Soldering Temperature, Wavesoldering Only Allowed at Leads	-	260	-	$^{\circ}\text{C}$	Soldering, 10 sec

4. Electrical Characteristics

At $T_J = 25^{\circ}\text{C}$, unless otherwise specified

Table 3. Static Characteristics

Symbol	Parameter	Values			Unit	Test Condition
		Min.	Typ.	Max.		
V_F	Forward Voltage	-	1.55 2.2	1.8 2.5	V	$I_F=20\text{A}$, $T_J=25^{\circ}\text{C}$ $I_F=20\text{A}$, $T_J=175^{\circ}\text{C}$
I_R	Reverse Current	-	5 30	20 200	μA	$V_R=1200\text{V}$, $T_J=25^{\circ}\text{C}$ $V_R=1200\text{V}$, $T_J=175^{\circ}\text{C}$
C	Total Capacitance	-	1280 95 77	-	pF	$V_R=0\text{V}$, $T_J=25^{\circ}\text{C}$, $f=1\text{MHz}$ $V_R=400\text{V}$, $T_J=25^{\circ}\text{C}$, $f=1\text{MHz}$ $V_R=800\text{V}$, $T_J=25^{\circ}\text{C}$, $f=1\text{MHz}$
Q_C	Total Capacitive Charge	-	51	-	nC	$V_R=800\text{V}$, $I_F=20\text{A}$ $di/dt=200\text{A}/\mu\text{s}$, $T_J=25^{\circ}\text{C}$

5. Electrical Characteristics Diagrams

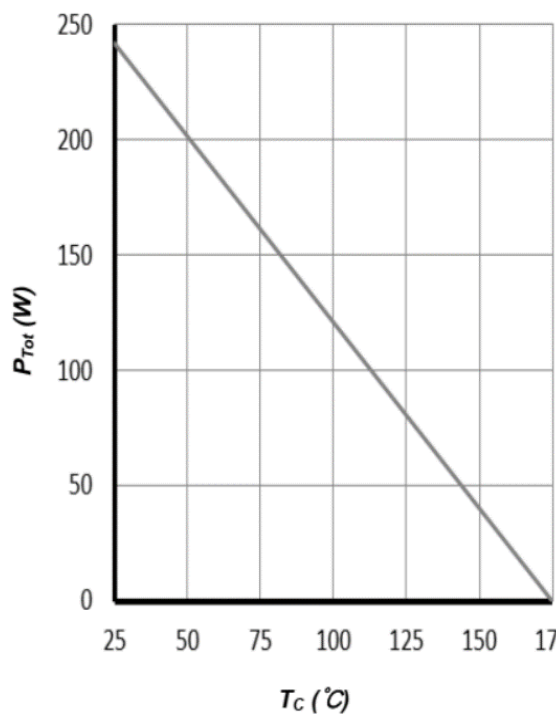
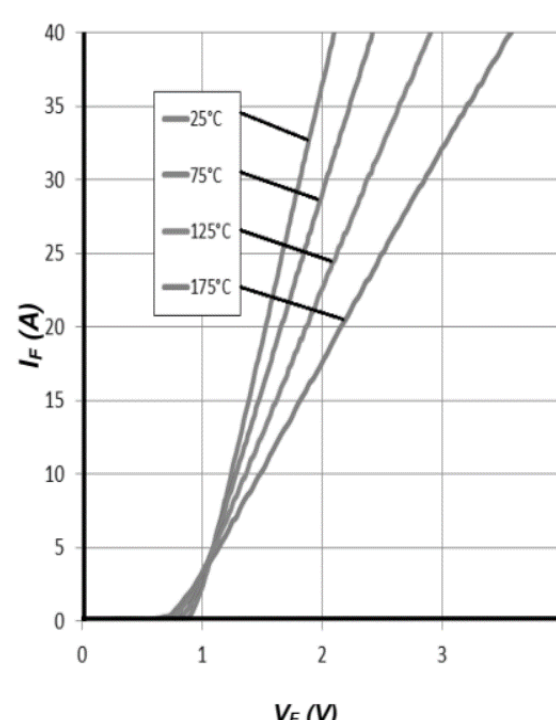
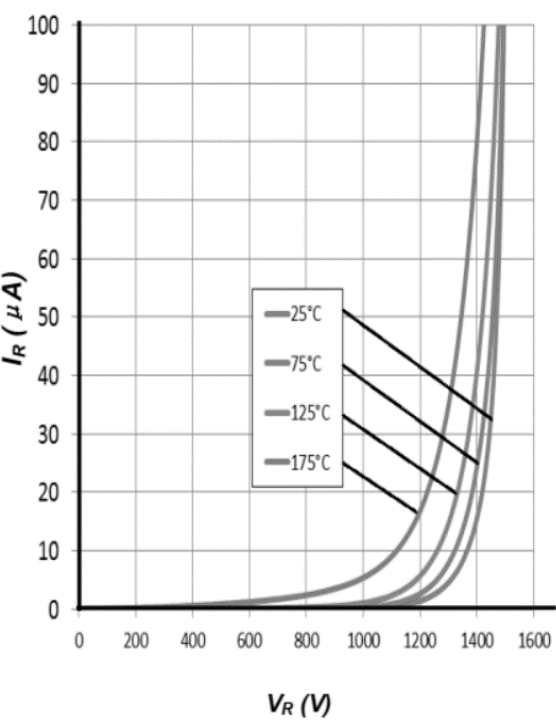
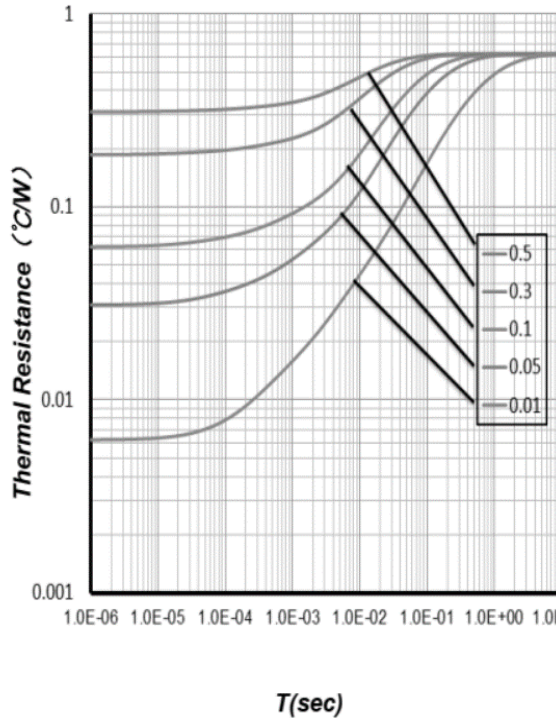
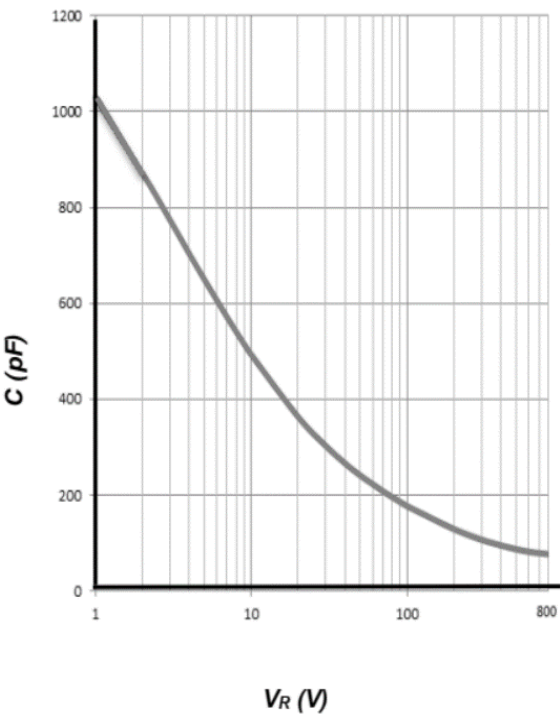
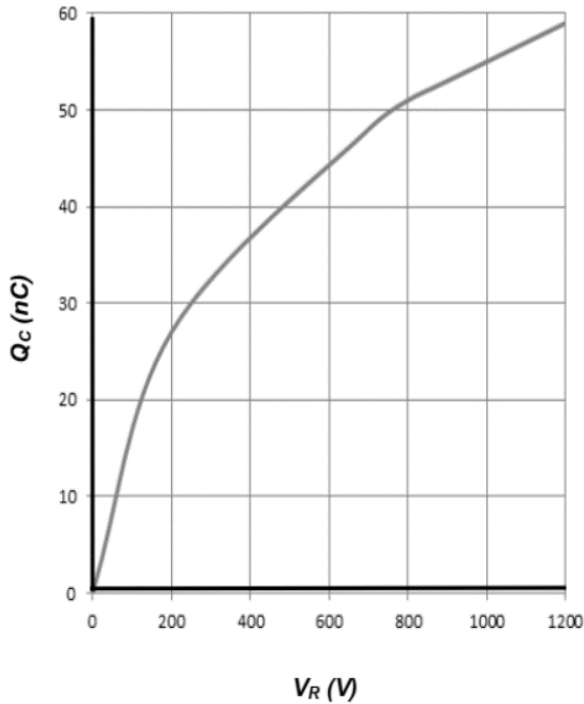
Diagram 1: Power Dissipation  $P_{Tot}=f(T_C)$	Diagram 2: Typical Forward Characteristics  $I_F=f(V_F)$; Parameter: T
Diagram 3: Typical Reverse Characteristics  $I_R=f(V_R)$; Parameter: T	Diagram 4: Transient Thermal Impedance  $Z_{th,jc}=f(t_P)$; Parameter: $D=t_P/T$

Diagram 5: Total Capacitance



$C=f(V_R); T_J=25^{\circ}\text{C}; f=1\text{ MHz}$

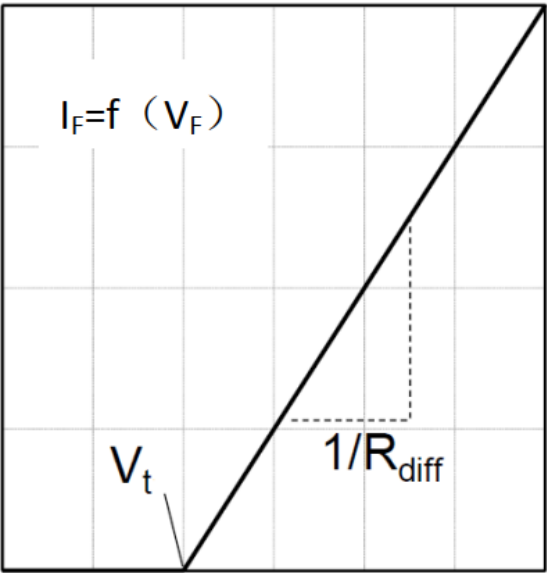
Diagram 6: Total Capacitive Charge



$Q_C=f(V_R);$

6. Simplified Forward Characteristics Model

Equivalent IV Curve for Model



Mathematical Equation

$V_F=V_t+ I_F\times R_{diff}$

$V_t=-0.0012\times T_J+0.99\text{ [V]}$

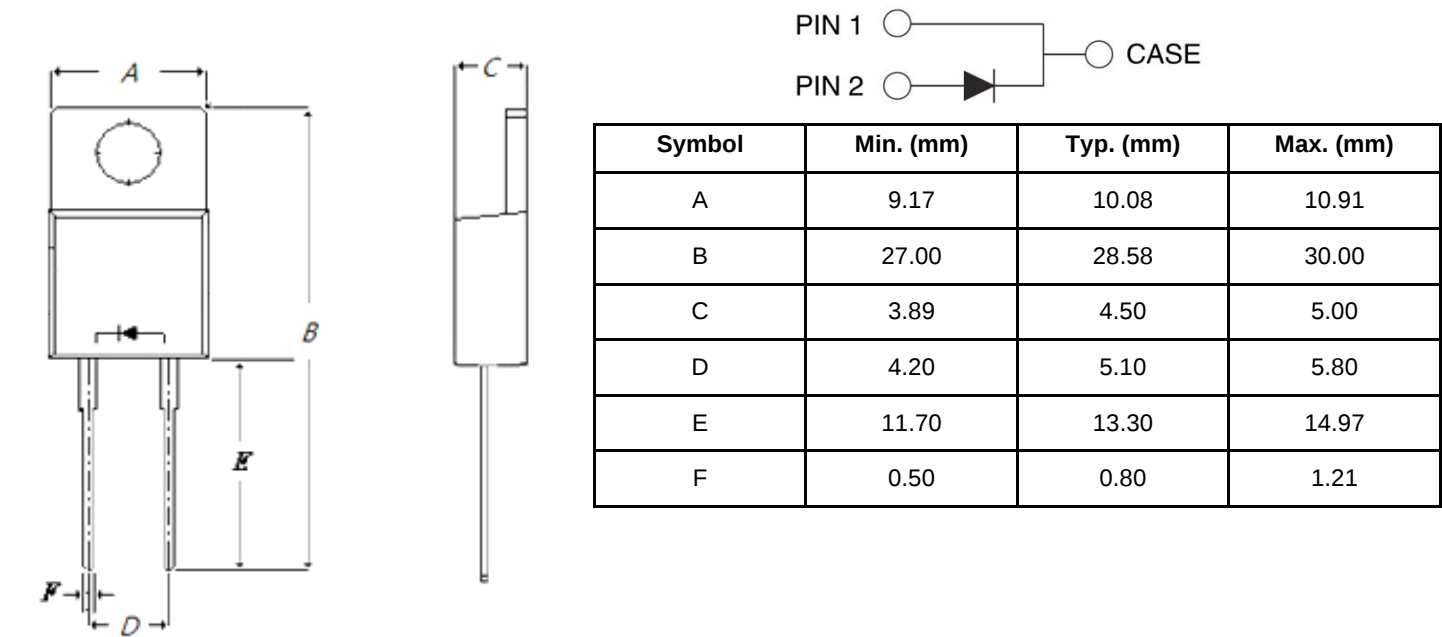
$R_{diff}=9.03\times 10^{-7}\times T_J^2+9.16\times 10^{-5}\times T_J+0.026\text{ [}\Omega\text{]}$

Note:

T_J = Diode Junction Temperature In Degrees Celsius,
valid from 25°C to 175°C
 I_F = Forward Current
Less than 40A

7. Package Outlines

Figure 1 Outline TO-220-2 Dimensions in mm



8. Appendix

CoolSemi CoolinSiC Webpage: www.coolsemi.com.