HE HOEN *Dongguan Hoen Semiconductor Co.,LTD*

CH3D06065A

Silicon Carbide Schottky Diode

V_{RRM}	=	650	V
I_F ($T_C \leq 135°C$)	=	9	A
Q_C	=	18	nC

Features

- Zero Reverse Recovery Current
- Zero Forward Recovery Voltage
- Positive Temperature Coefficient on V_F
- Temperature-independent Switching
- 175°C Operating Junction Temperature

Benefits

- Replace Bipolar with Unipolar Device
- Reduction of Heat Sink Size
- Parallel Devices Without Thermal Runaway
- Essentially No Switching Losses

Applications

- Switch Mode Power Supplies
- Power Factor Correction
- Motor drive, PV Inverter, Wind Power Station

Package

TO-220-2

RoHS

Part Number	Package	Marking
CH3D06065A	TO-220-2	CH3D06065A

Maximum Ratings

Symbol	Parameter	Value	Unit	Test Conditions	Note
V_{RRM}	Repetitive Peak Reverse Voltage	650	V	T_C = 25°C	
V_{RSM}	Surge Peak Reverse Voltage	650	V	T_C = 25°C	
V_R	DC Blocking Voltage	650	V	T_C = 25°C	
I_F	Forward Current	19 9 6	A	$T_C \leq 25°C$ $T_C \leq 135°C$ $T_C \leq 155°C$	
I_{FSM}	Non-Repetitive Forward Surge Current	60	A	T_C = 25°C, t_p = 8.3ms, Half Sine Wave	
P_{tot}	Power Dissipation	93	W	T_C = 25°C	Fig.3
T_C	Maximum Case Temperature	155	°C		
T_J, T_{STG}	Operating Junction and Storage Temperature	-55 to 175	°C		
	TO-220 Mounting Torque	1	Nm	M3 Screw	

HOEN

Dongguan Hoen Semiconductor Co.,LTD

Electrical Characteristics

Symbol	Parameter	Typ.	Max.	Unit	Test Conditions	Note
V_F	Forward Voltage	1.4	1.65	V	$I_F = 6A$, $T_J = 25°C$	Fig.1
		1.75	2.3		$I_F = 6A$, $T_J = 175°C$	
I_R	Reverse Current	1	20	μA	$V_R = 650V$, $T_J = 25°C$	Fig.2
		5	100		$V_R = 650V$, $T_J = 175°C$	
C	Total Capacitance	300		pF	$V_R = 0V$, $T_J = 25°C$, $f = 1MHz$	Fig.5
		34	/		$V_R = 200V$, $T_J = 25°C$, $f = 1MHz$	
		30			$V_R = 400V$, $T_J = 25°C$, $f = 1MHz$	
Q_C	Total Capacitive Charge	18	/	nC	$V_R = 650V$, $I_F = 6A$ $di/dt = 200A/μs$, $T_J = 25°C$	Fig.4

Thermal Characteristics

Symbol	Parameter	Typ.	Unit	Note
$R_{θJC}$	Thermal Resistance from Junction to Case	1.6	°C/W	Fig.6
$R_{θJA}$	Thermal Resistance from Junction to Ambient	80	°C/W	
T_{sold}	Soldering Temperature	260	°C	

Typical Performance

HOEN   Dongguan Hoen Semiconductor Co.,LTD
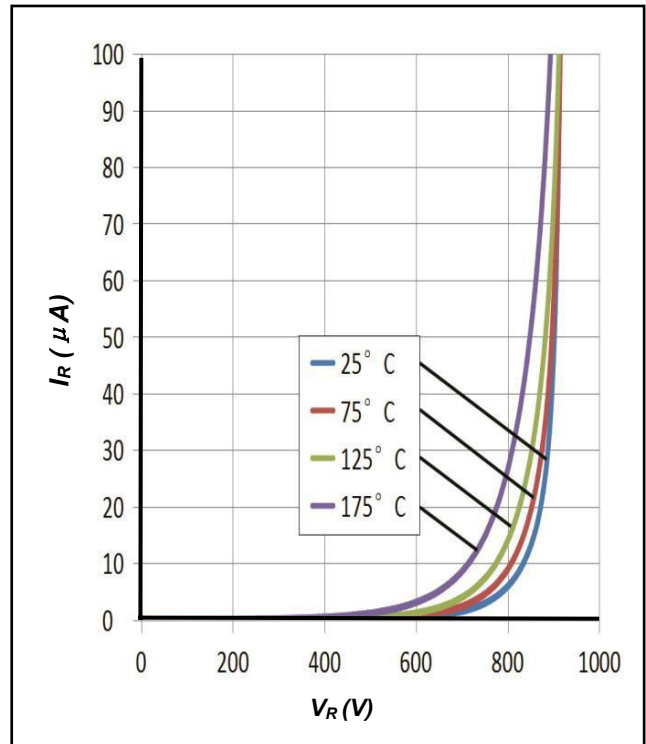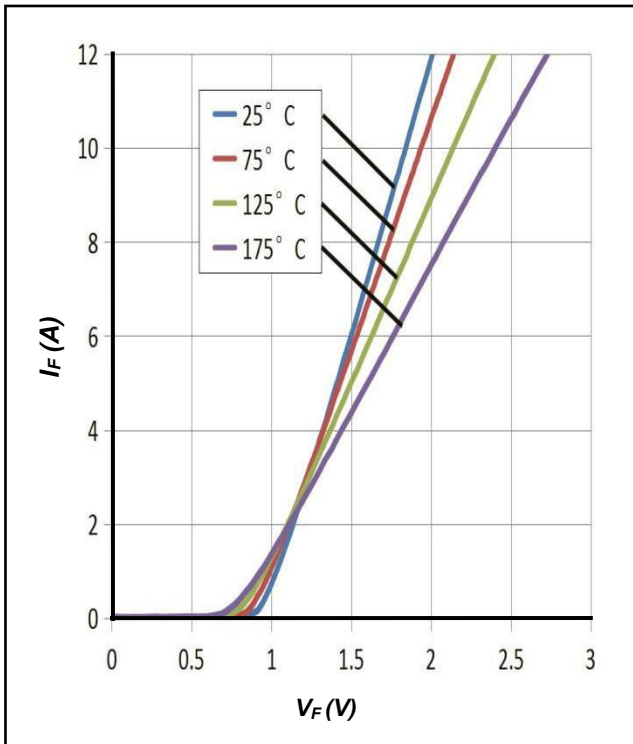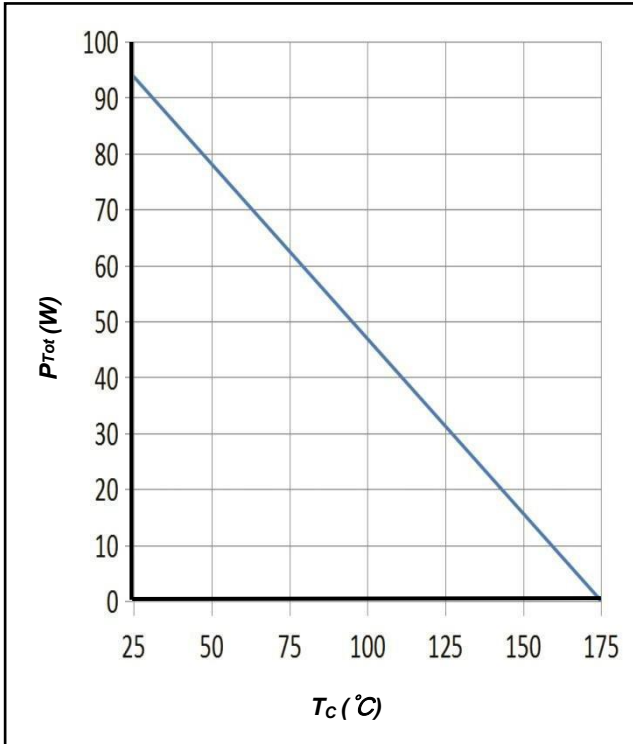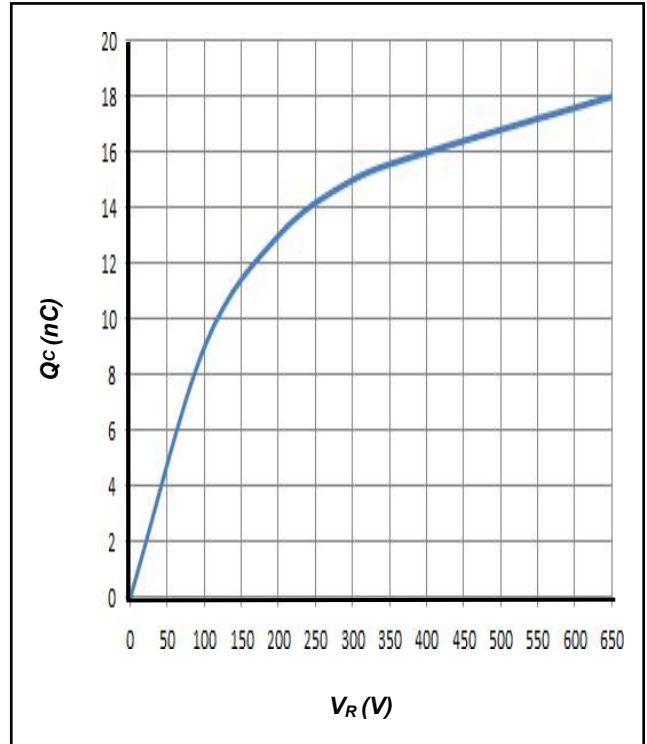
Typical Performance

Figure 3. Power Derating

Figure 4. Total Capacitive Charge vs. Reverse Voltage
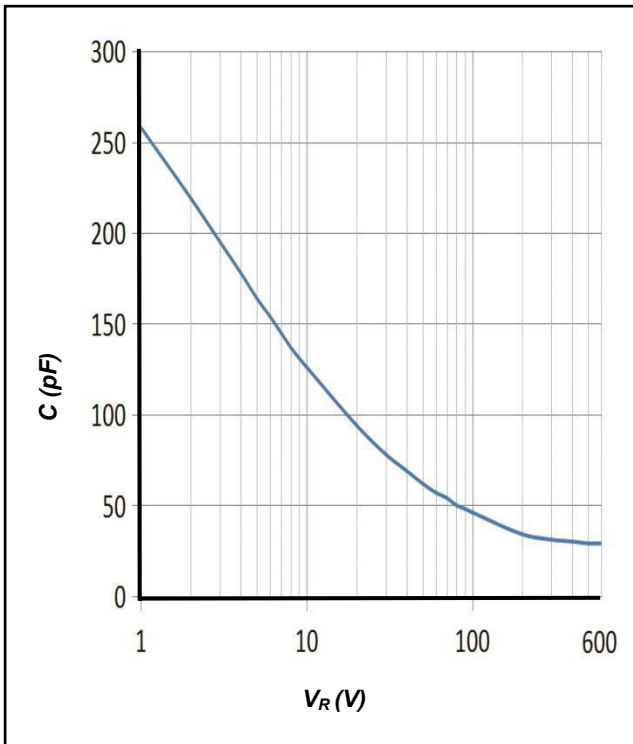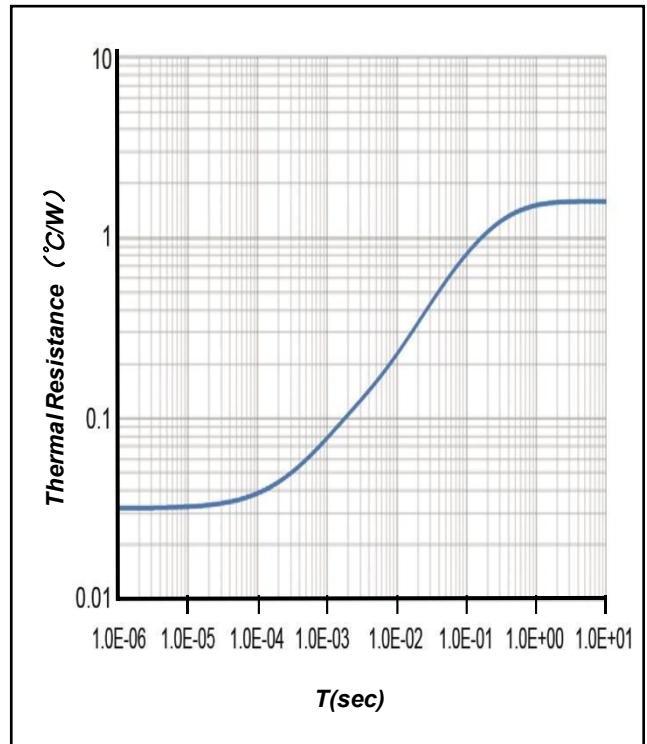

Figure 5. Total Capacitance vs. Reverse Voltage

Figure 6. Transient Thermal Impedance

![HOEN logo] **HOEN** *Dongguan Hoen Semiconductor Co.,LTD*

Package Dimensions

Package TO-220-2
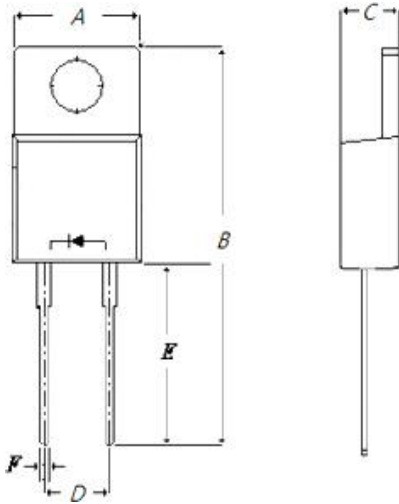
Symbol	Min. (mm)	Typ. (mm)	Max. (mm)
A	9.17	10.08	10.91
B	27.00	28.58	30.00
C	3.89	4.50	5.00
D	4.20	5.10	5.80
E	11.70	13.30	14.97
F	0.50	0.80	1.21

Simplified Diode Model

Equivalent IV Curve for Model

$I_F = f(V_F)$

V_t $1/R_{diff}$
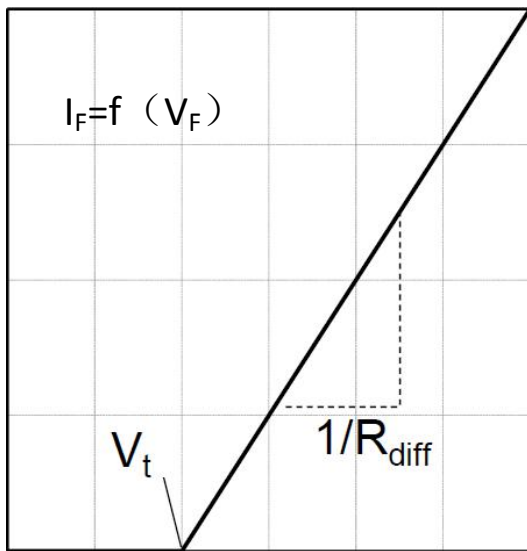
Mathematical Equation

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

$V_t = -0.0017 \times T_j + 1.0298$ [V]

$R_{diff} = 2 \times 10^{-6} \times T_j^2 + 2 \times 10^{-4} \times T_j + 0.0802$ [Ω]

Note:

Tj = Diode Junction Temperature In Degrees Celsius, valid from 25°C to 175°C

I_F = Forward Current

Less than 12A