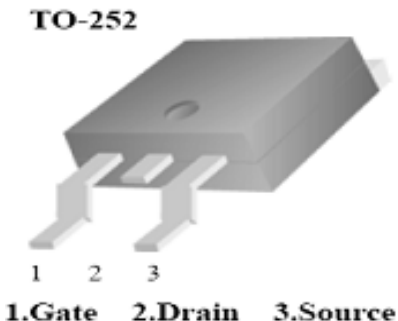
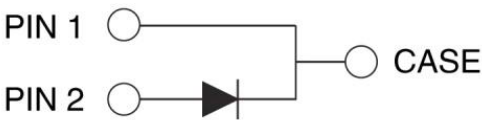


1. Descriptions

TO-252
 <p>TO-252</p> <p>1 2 3</p> <p>1.Gate 2.Drain 3.Source</p>
SiC Schottky Diode
 <p>PIN 1</p> <p>PIN 2</p> <p>CASE</p>

Key Performance Parameters

Parameters	Value	Unit
V_{DC}	650	V
$I_F (T_C \leq 135^\circ\text{C})$	19	A
Q_C	25	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
HMC10N65K	TO-252	HMC10N65K YYWW	See Appendix A

2. Maximum Ratings

Table 1. Maximum Ratings

Symbol	Parameter	Values			Unit	Test Condition
		Min.	Typ.	Max.		
V_{RRM}	Repetitive Peak Reverse Voltage	650	-	-	V	$T_C=25^{\circ}\text{C}$
I_F	Forward Current	-	-	38	A	$T_C \leq 25^{\circ}\text{C}$
		-	-	19		$T_C \leq 135^{\circ}\text{C}$
		-	-	10		$T_C \leq 158^{\circ}\text{C}$
I_{FSM}	Non-Repetitive Forward Surge Current	-	-	86	A	$T_C=25^{\circ}\text{C}$, $t_P=8.3\text{ms}$, Half Sine Wave
P_{tot}	Power Dissipation	-	-	150	W	$T_C=25^{\circ}\text{C}$
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	-	1	-	$^{\circ}\text{C/W}$	$T_C = 25^{\circ}\text{C}$
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	-	1.27	1.5	V	$I_F=10\text{A}$, $T_J=25^{\circ}\text{C}$
		-	1.38	1.6		$I_F=10\text{A}$, $T_J=175^{\circ}\text{C}$
I_R	Reverse Current	-	6	50	μA	$V_R=650\text{V}$, $T_J=25^{\circ}\text{C}$
		-	25	200		$V_R=650\text{V}$, $T_J=175^{\circ}\text{C}$
C	Total Capacitance	-	640	-	pF	$V_R=0\text{V}$, $T_J=25^{\circ}\text{C}$, $f=1\text{MHz}$
		-	66	-		$V_R=200\text{V}$, $T_J=25^{\circ}\text{C}$, $f=1\text{MHz}$
		-	48	-		$V_R=400\text{V}$, $T_J=25^{\circ}\text{C}$, $f=1\text{MHz}$
Q_C	Total Capacitive Charge	-	25	-	nC	$V_R=400\text{V}$, $I_F=10\text{A}$ $di/dt=200\text{A}/\mu\text{s}$, $T_J=25^{\circ}\text{C}$

5. Electrical Characteristics Diagrams

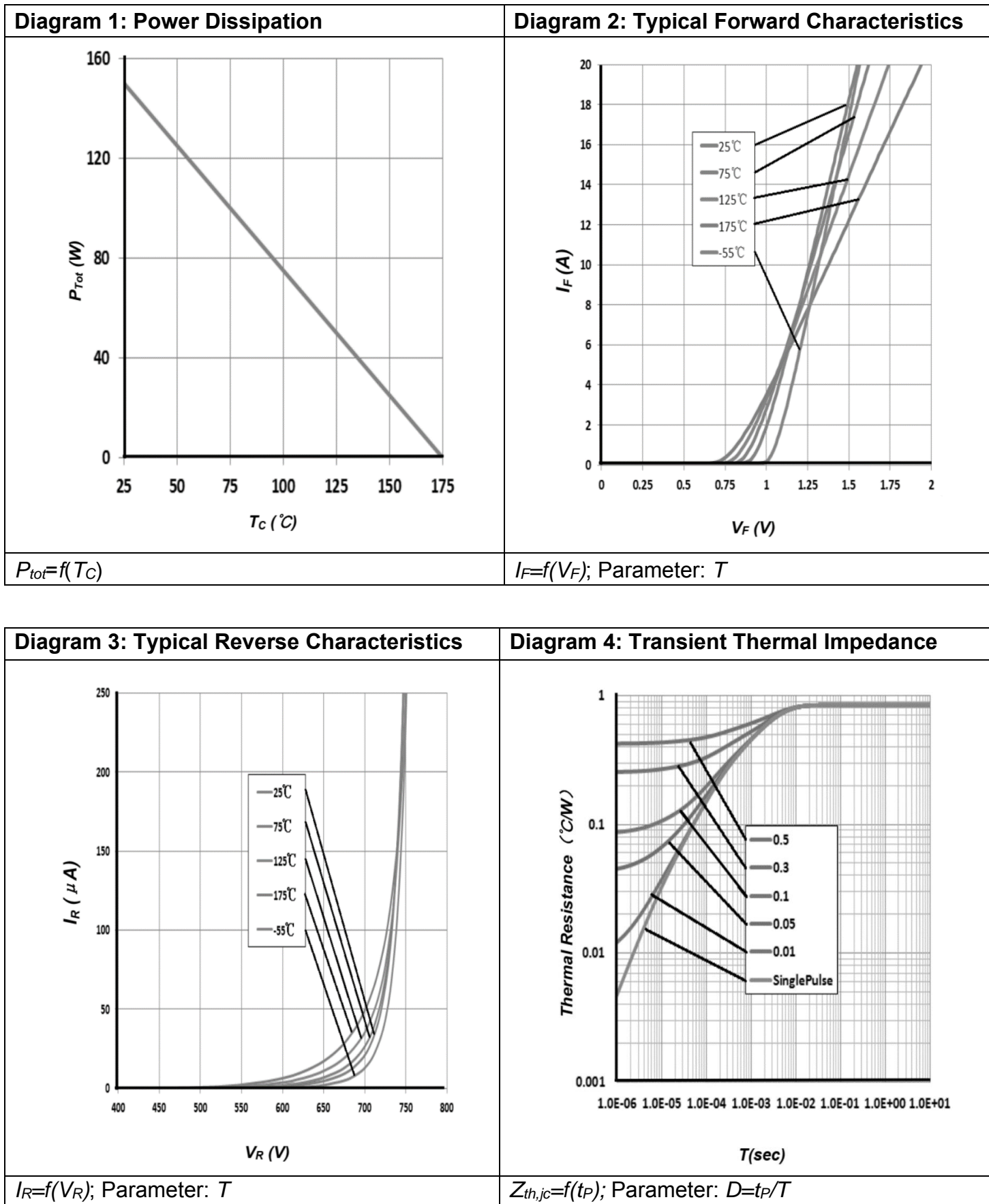
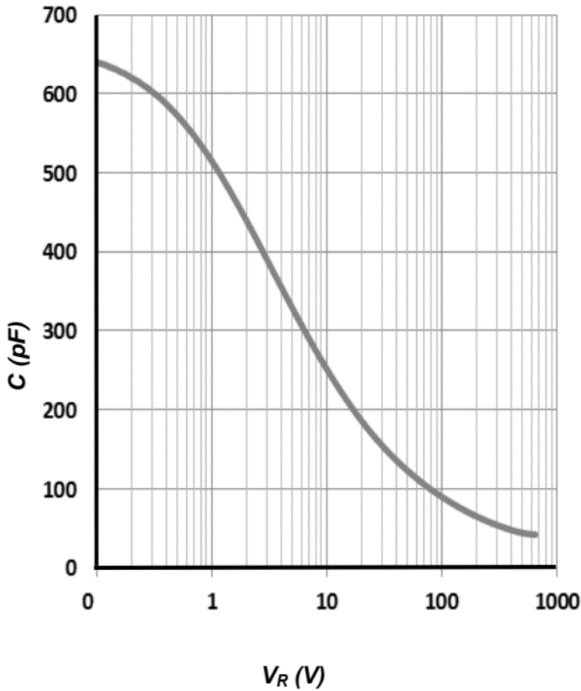
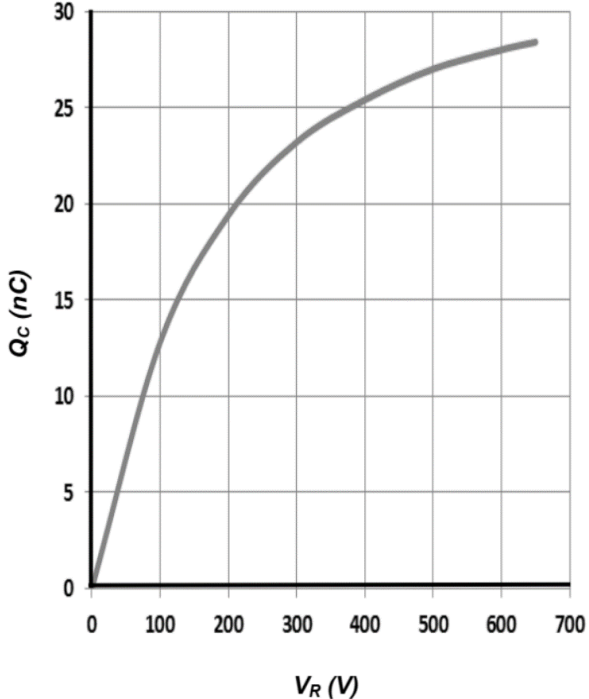
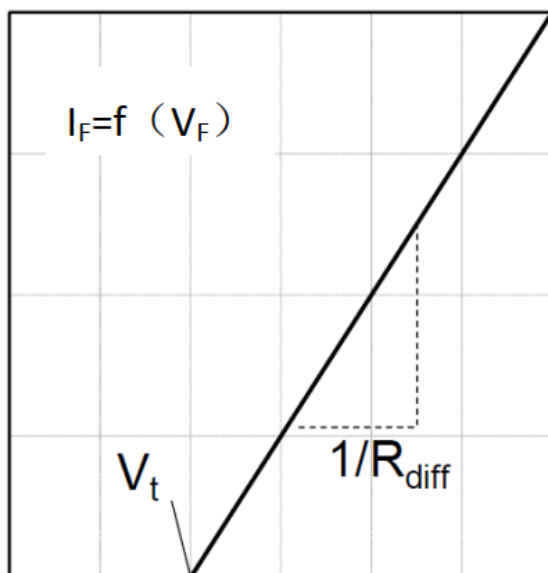


Diagram 5: Total Capacitance	Diagram 6: Total Capacitive Charge
 <p>$C=f(V_R); T_J=25^{\circ}\text{C}; f=1\text{ MHz}$</p>	 <p>$Q_C=f(V_R);$</p>

6. Simplified Forward Characteristics Model

Equivalent IV Curve for Model



Mathematical Equation

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

$$V_t = -0.001 \times T_J + 0.99 \text{ [V]}$$

$$R_{\text{diff}} = 6.9 \times 10^{-7} \times T_J^2 + 4.3 \times 10^{-5} \times T_J + 0.28 \text{ [\Omega]}$$

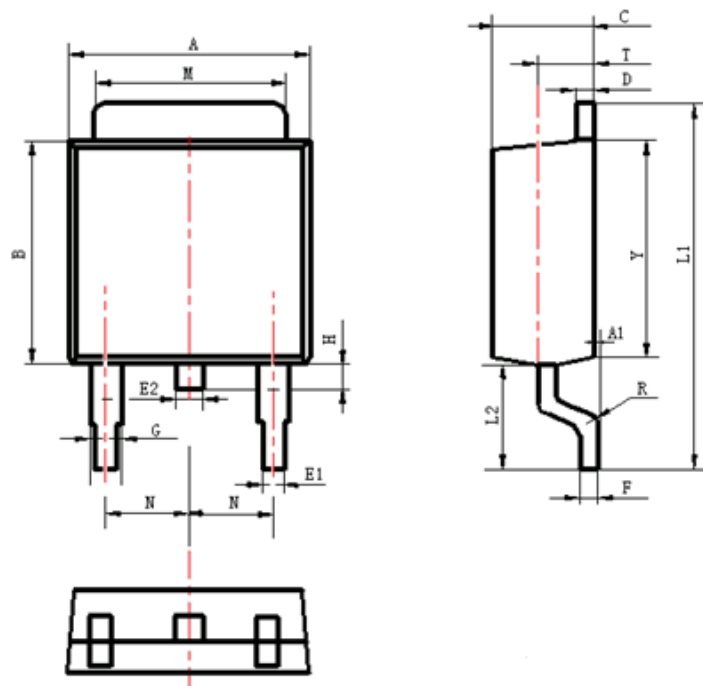
Note:

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

I_F = Forward Current

Less than 20A

7. Package Outlines



Items	Values(mm)	
	MIN	MAX
A	6.30	6.90
A1	0	0.13
B	5.70	6.30
C	2.10	2.50
D	0.30	0.60
E1	0.60	0.90
E2	0.70	1.00
F	0.30	0.60
G	0.70	1.00
L1	9.60	10.30
L2	2.70	3.10
H	0.60	1.00
M	5.10	5.50
N	2.09	2.49
R	0.3	
T	1.40	1.60
Y	5.10	6.30

TO-252 Package