FTSD1A25170D

Silicon Carbide Schottky Diode

V_{RRM}	=	1700	V
I_F (T_C≤135℃)	=	26	A
Q_C	=	82	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-247-2

RoHS

PIN 1

PIN 2

CASE

Part Number	Package
FTSD1A25170D	TO-247-2

Maximum Ratings

Symbol	Parameter	Value	Unit	Test Conditions	Note
V_{RRM}	Repetitive Peak Reverse Voltage	1700	V	$T_C = 25℃$	
V_{RSM}	Surge Peak Reverse Voltage	1700	V	$T_C = 25℃$	
V_R	DC Blocking Voltage	1700	V	$T_C = 25℃$	
I_F	Forward Current	26	A	$T_C \le 135℃$	
I_{FSM}	Non-Repetitive Forward Surge Current	120	A	$T_C = 25℃$, $t_p = 8.3ms$, Half Sine Wave	
P_{tot}	Power Dissipation	375	W	$T_C = 25℃$	Fig.3
T_C	Maximum Case Temperature	135	℃		
T_J, T_{STG}	Operating Junction and Storage Temperature	-55 to 175	℃		
	TO-247 Mounting Torque	1	Nm	M3 Screw	

Electrical Characteristics

Symbol	Parameter	Typ.	Max.	Unit	Test Conditions	Note
V_F	Forward Voltage	1.6	1.8	V	$I_F = 25A$, $T_J = 25℃$	Fig.1
		2.6	4.0		$I_F = 25A$, $T_J = 175℃$	
I_R	Reverse Current	2	50	μA	$V_R = 1700V$, $T_J = 25℃$	Fig.2
		20	400		$V_R = 1700V$, $T_J = 175℃$	
C	Total Capacitance	1700	/	pF	$V_R = 0V$, $T_J = 25℃$, f = 1MHz	Fig.5
		95			$V_R = 800V$, $T_J = 25℃$, f = 1MHz	
Q_C	Total Capacitive Charge	82	/	nC	$V_R = 1200V$, $I_F = 25A$	Fig.4
					di/dt = 200A/μs, $T_J = 25℃$	

Thermal Characteristics

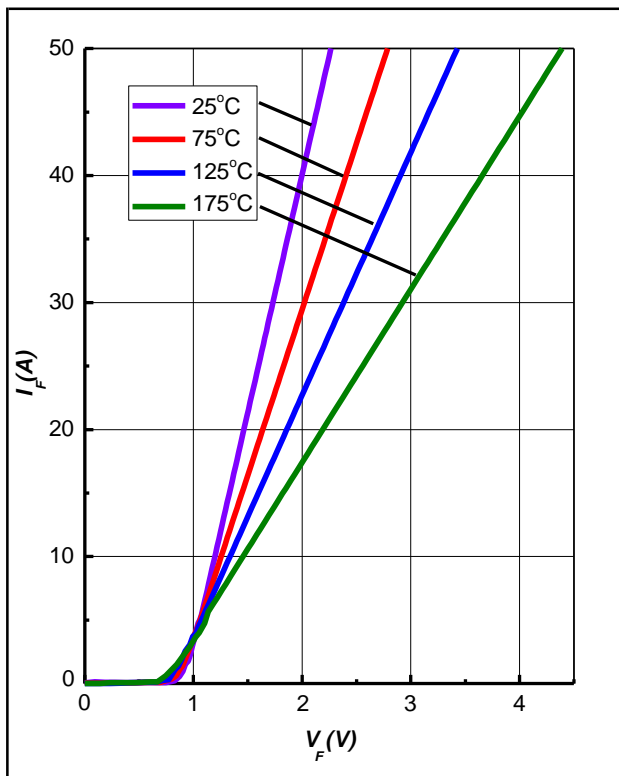| Symbol	Parameter	Typ.	Unit	Note
$R_{θJC}$	Thermal Resistance from Junction to Case	0.4	℃/W	Fig.6

Typical Performance

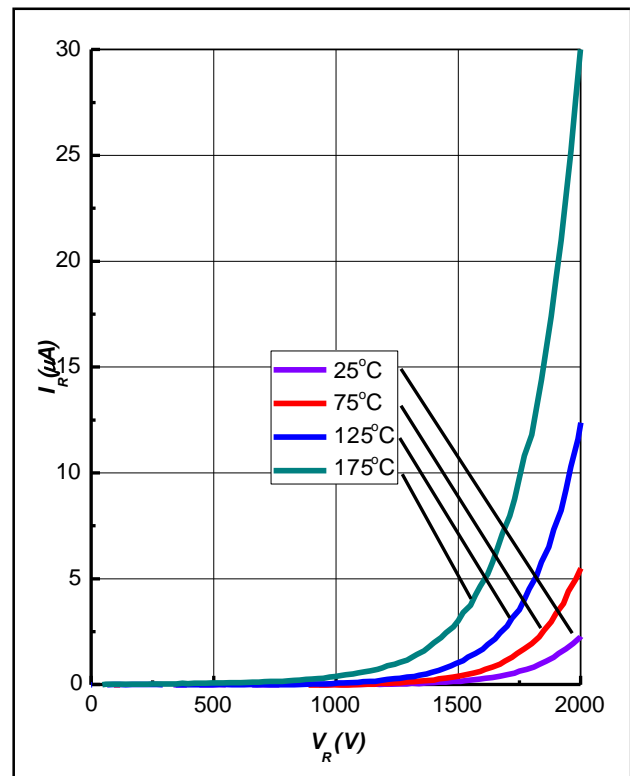
Figure 1. Forward Characteristics

Figure 2. Reverse Characteristics
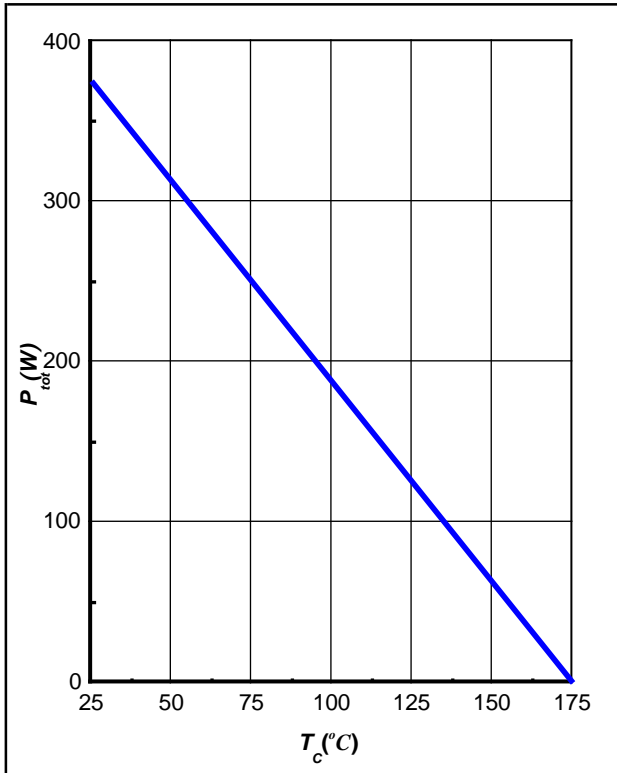
Typical Performance
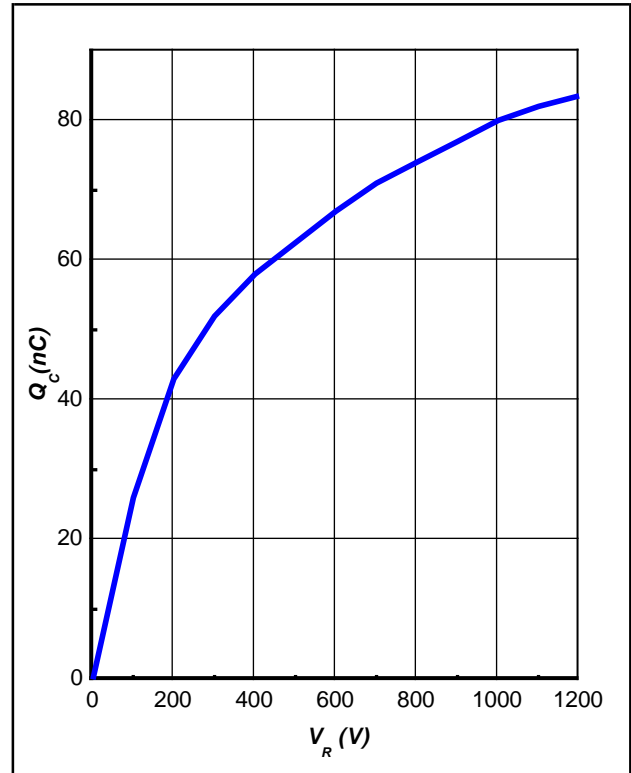

Figure 3. Power Derating

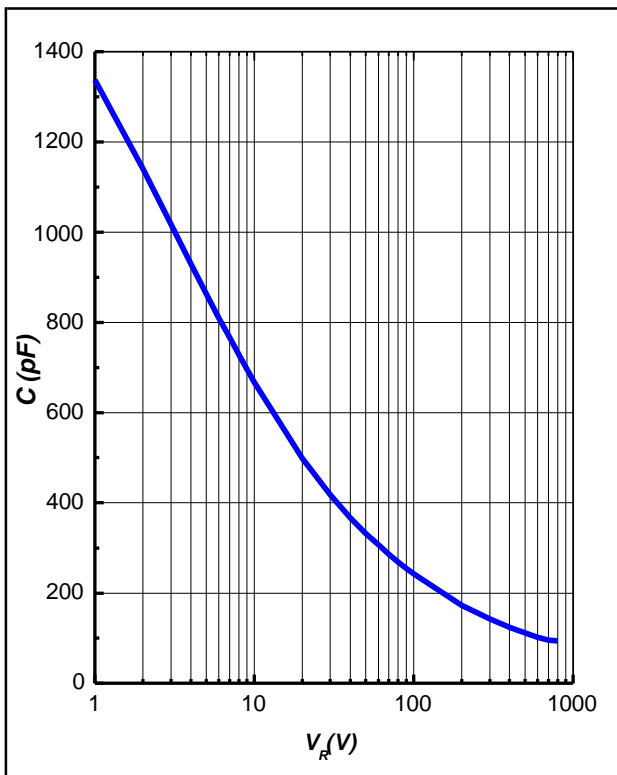Figure 4. Total Capacitive Charge vs. Reverse Voltage

Figure 5. Total Capacitance vs. Reverse Voltage

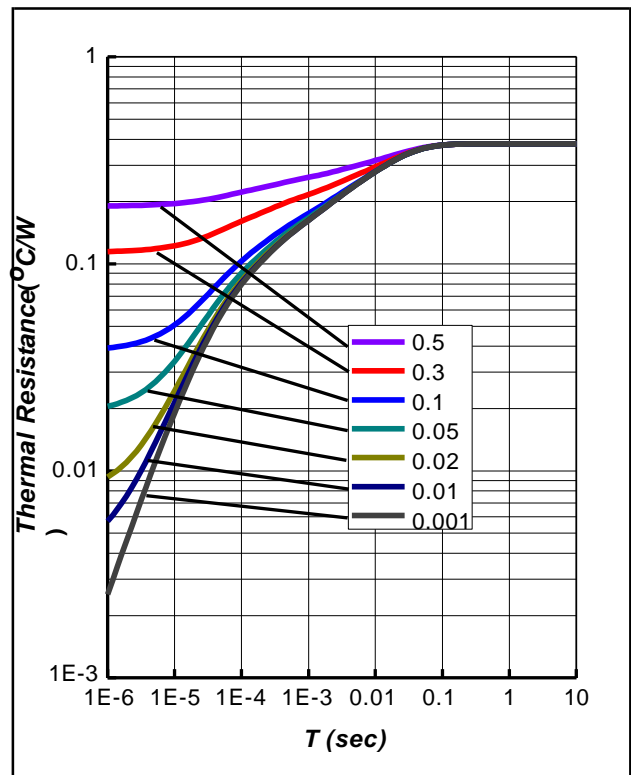Figure 6. Transient Thermal Impedance

Package Dimensions

Package TO-247-2

A

B

WTSD1A25170D

øD

G

E

F

C

PIN 1 ○

PIN 2 ○

○ CASE
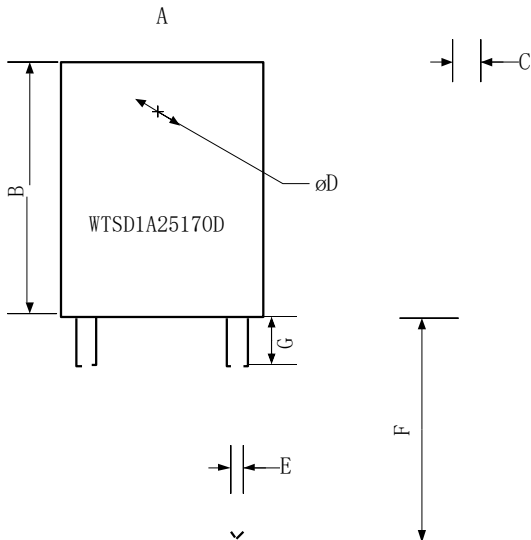
Symbol	Min. (mm)	Typ. (mm)	Max. (mm)
A	14.18	15.75	17.33
B	18.45	20.5	22.55
C	4.50	5.00	5.50
D	3.15	3.50	3.85
E	1.08	1.20	1.32
F	18.27	20.30	22.33
G	4.21	4.68	5.15

Simplified Diode Model

Equivalent IV Curve for Model

V_t
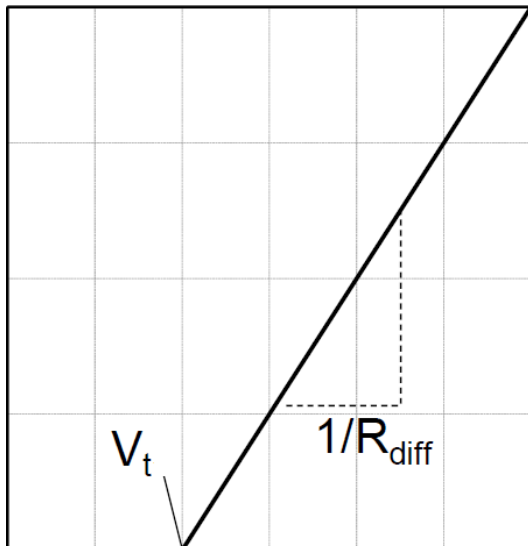
$1/R_{diff}$

Mathematical Equation

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

$$V_t = -0.0014 \times T_j + 0.9692 \, [V]$$
$$R_{diff} = 1 \times 10^{-6} \times T_j^2 + 1 \times 10^{-4} \times T_j + 0.0235 \, [\Omega]$$

Note:

    T_j = Diode Junction Temperature In Degrees Celsius,

    valid from 25°C to 175°C

    I_F = Forward Current

    Less than 50A