Fuji Electric

Innovating Energy Technology

FDC2AT10S65

www.fujielectric.com/products/semiconductor/

SiC-SBD

SiC Schottky Barrier Diode

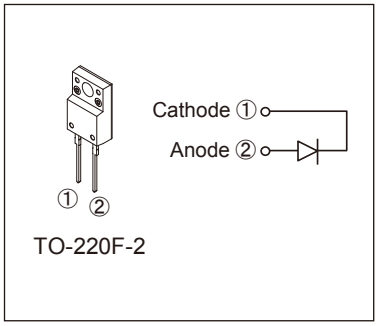
Features

- New 2nd Generation Technology
- Low forward voltage
- High surge current capability
- High speed switching
- Pb-free lead terminal; RoHS compliant
- Halogen-free molding compound

Applications

- Switch mode power supply
- Uninterruptible power supply
- PV Power Conditioner

Internal circuit chart



TO-220F-2

Maximum Ratings and Characteristics

● **Absolute Maximum Ratings at T_{vj} = 25°C(unless otherwise specified)**

Parameter	Symbol	Value	Unit	Remarks
Repetitive peak reverse voltage	V_{RRM}	650	V	
Continuous forward current	I_F	10	A	T_c < 115 °C, D = 1
Surge non-repetitive forward current (half sine wave)	I_{FSM}	82	A	T_c = 25 °C, t_p = 10 ms
		61.5	A	T_c = 150 °C, t_p = 10 ms
I^2t value	$\int I^2dt$	33.6	A^2s	T_c = 25 °C, t_p = 10 ms
		18.9	A^2s	T_c = 150 °C, t_p = 10 ms
Max. Power Dissipation	P_{tot}	54	W	T_c = 25 °C
Operating junction temperature	T_{vj}	175	°C	
Storage temperature	T_{stg}	-55 ~ +175	°C	
Isolation Voltage	V_{iso}	2	kVrms	t = 60sec, f = 60Hz

● **Electrical Characteristics at T_{vj} = 25°C(unless otherwise specified)**

Static characteristics

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
DC blocking voltage	V_{DC}	I_R = 1 mA	650	-	-	V
Forward voltage	V_F	I_F = 10A, T_{vj} = 25 °C	1.10	1.30	1.50	V
		I_F = 10 A, T_{vj} = 150 °C	-	1.48	1.99	V
Reverse current	I_R	V_R = 650 V, T_{vj} = 25 °C	-	0.4	50	μA
		V_R = 650 V, T_{vj} = 150 °C	-	2	200	μA

Dynamic characteristics

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Total Capacitive Charge	Q_C	V_R = 400 V, I_F = 10 A, -di/dt = 200 A/μs, T_{vj} = 150 °C	-	9.5	-	nC
Total Capacitance	C	V_R = 400 V, f = 1 MHz	-	44	-	pF

● **Thermal Resistance**

Parameter	Symbol	Min.	Typ.	Max.	Unit
Thermal Resistance, Junction –Ambient	$R_{th(j-a)}$	-	-	58	°C/W
Thermal Resistance, Junction –Case	$R_{th(j-c)}$	-	-	2.80	°C/W

Figure 1. Allowable power dissipation

$P_{tot} = f(T_c)$

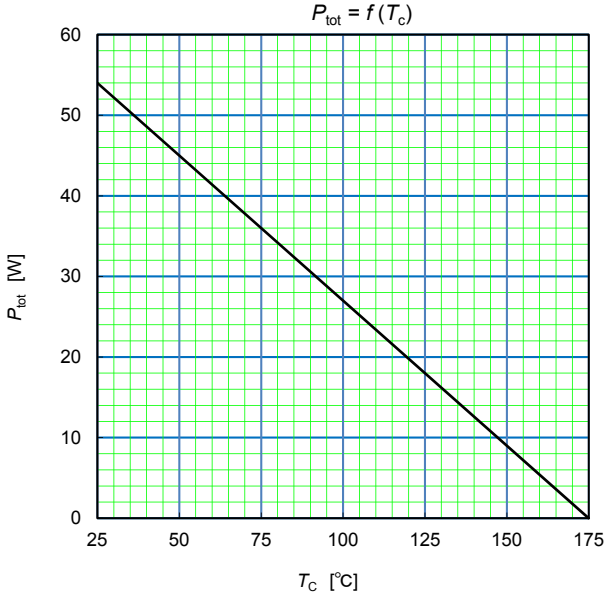


Figure 2. Peak forward current

$I_F = f(T_c)$: $T_{vj} \leq 175$ ℃, $R_{th(j\text{-}c)\ max.}$

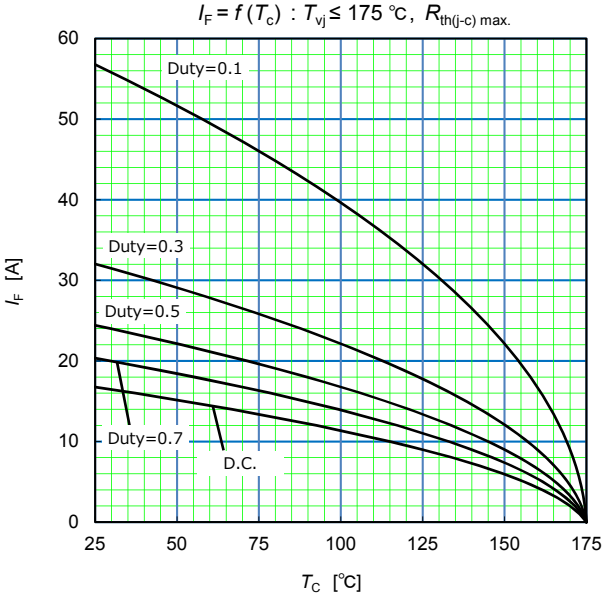


Figure 3. Typical forward characteristics

$I_F = f(V_F)$

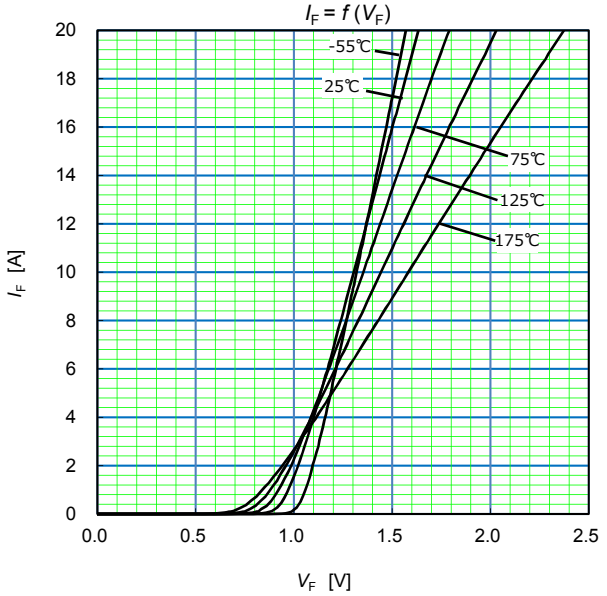


Figure 4. Typical forward characteristics

$I_F = f(V_F)$

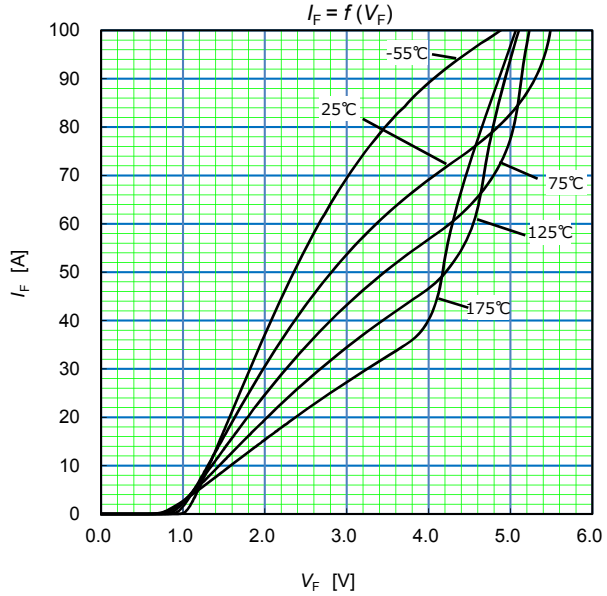


Figure 5. Typical reverse characteristics

$I_R = f(V_R)$

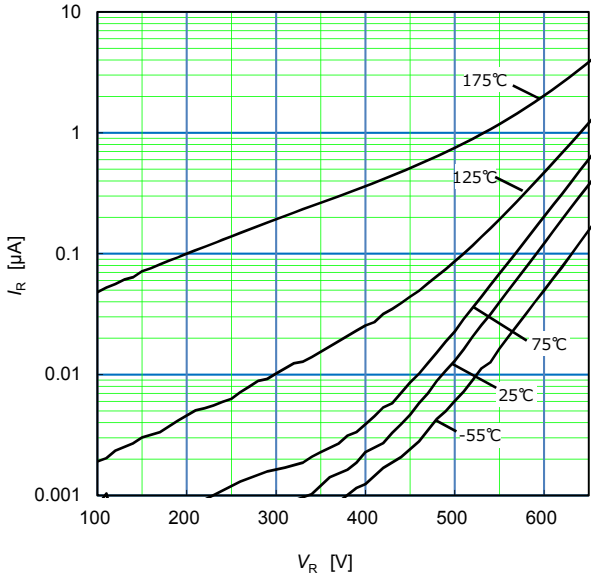


Figure 6. Typical capacitance

$C = f(V_R)$: $f = 1$ MHz

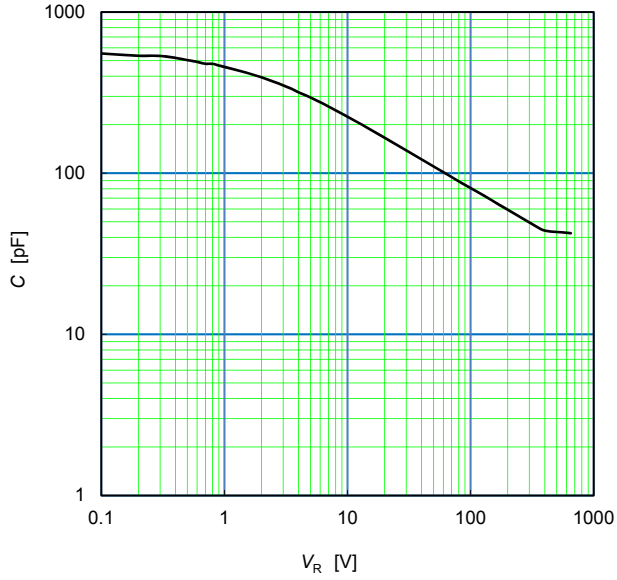


Figure 7. Typical capacitance stored energy

$E_C = f(V_R)$

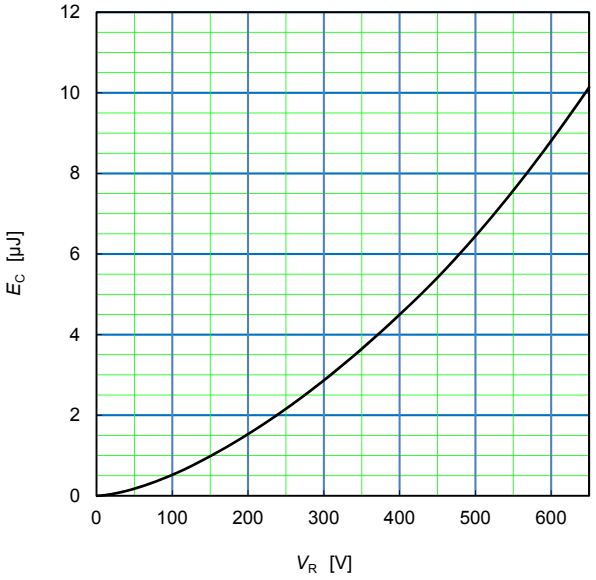
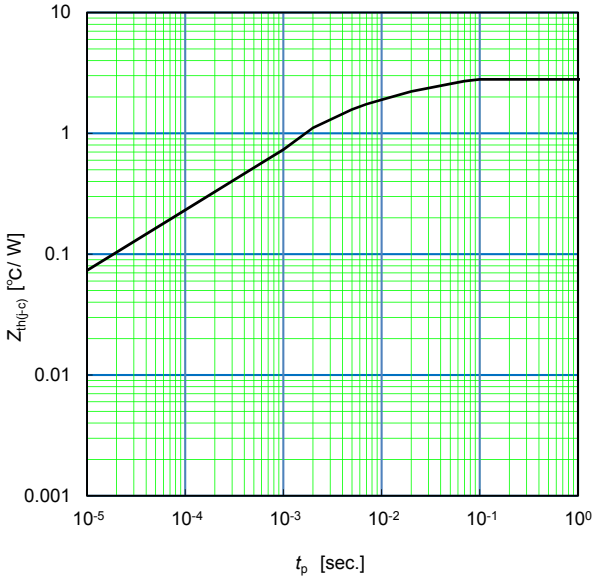
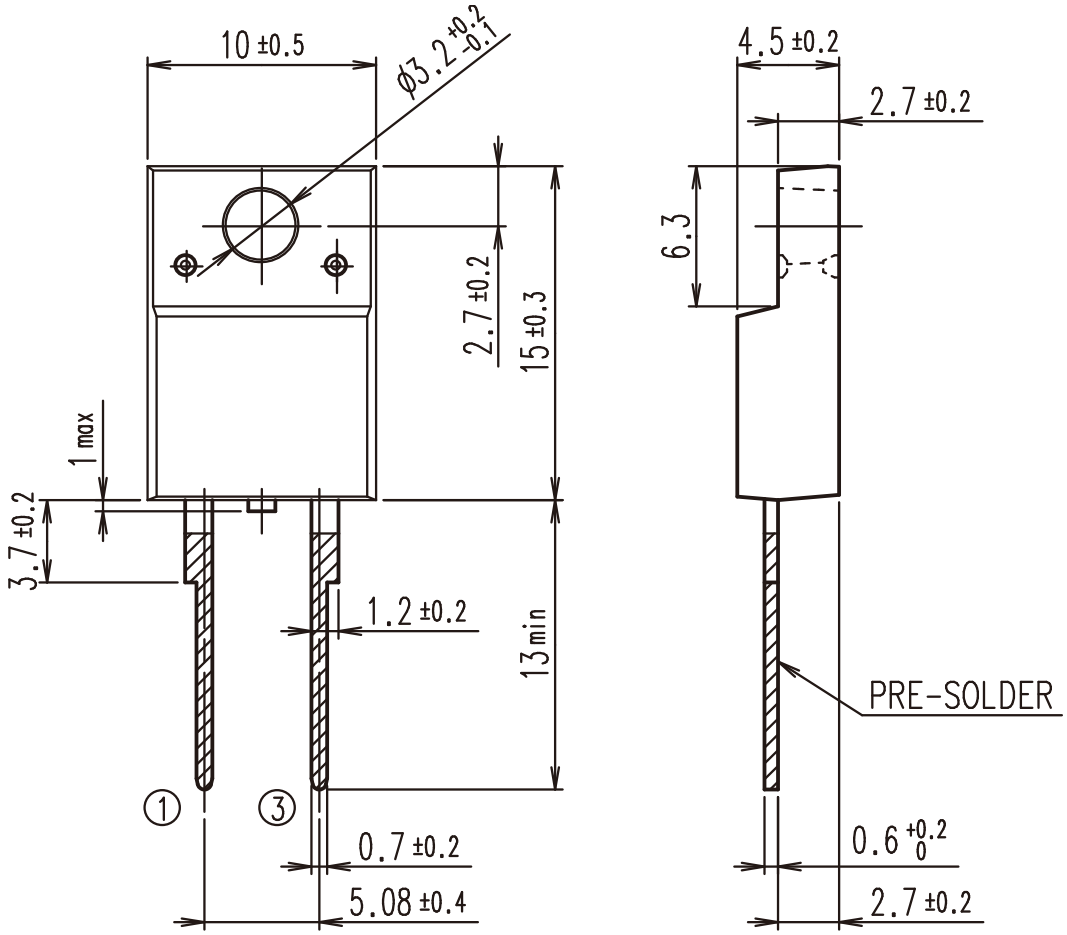


Figure 8. Transient Thermal Impedance

$Z_{th(j-c)} = f(t) : D = 0$

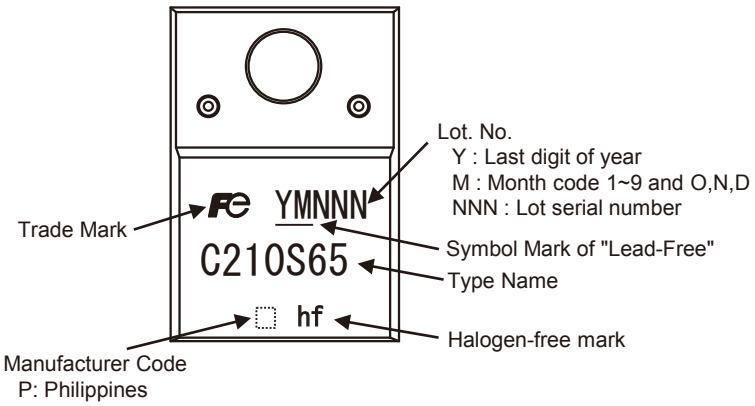


Outview: TO-220F-2 Package



CONNECTION
① Cathode
③ Anode
DIMENSIONS ARE IN MILLIMETERS

Marking



* The font (font type, size) and the trademark-size might be actually different.

WARNING

1. This Catalog contains the product specifications, characteristics, data, materials, and structures as of September 2021.
The contents are subject to change without notice for specification changes or other reasons. When using a product listed in this Catalog, be sure to obtain the latest specifications.

2. All applications described in this Catalog exemplify the use of Fuji's products for your reference only. No right or license, either express or implied, under any patent, copyright, trade secret or other intellectual property right owned by Fuji Electric Co., Ltd. is (or shall be deemed) granted. Fuji Electric Co., Ltd. makes no representation or warranty, whether express or implied, relating to the infringement or alleged infringement of other's intellectual property rights which may arise from the use of the applications described herein.

3. Although Fuji Electric Co., Ltd. is enhancing product quality and reliability, a small percentage of semiconductor products may become faulty. When using Fuji Electric semiconductor products in your equipment, you are requested to take adequate safety measures to prevent the equipment from causing a physical injury, fire, or other problem if any of the products become faulty. It is recommended to make your design failsafe, flame retardant, and free of malfunction.

4. The products introduced in this Catalog are intended for use in the following electronic and electrical equipment which has normal reliability requirements.
• Computers • OA equipment • Communications equipment (terminal devices) • Measurement equipment
• Machine tools • Audiovisual equipment • Electrical home appliances • Personal equipment • Industrial robots etc.

5. If you need to use a product in this Catalog for equipment requiring higher reliability than normal, such as for the equipment listed below, it is imperative to contact Fuji Electric Co., Ltd. to obtain prior approval. When using these products for such equipment, take adequate measures such as a backup system to prevent the equipment from malfunctioning even if a Fuji's product incorporated in the equipment becomes faulty.
• Transportation equipment (mounted on cars and ships) • Trunk communications equipment
• Traffic-signal control equipment • Gas leakage detectors with an auto-shut-off feature
• Emergency equipment for responding to disasters and anti-burglary devices • Safety devices
• Medical equipment

6. Do not use products in this Catalog for the equipment requiring strict reliability such as the following and equivalents to strategic equipment (without limitation).
• Space equipment • Aeronautic equipment • Nuclear control equipment
• Submarine repeater equipment

8. If you have any question about any portion in this Catalog, ask Fuji Electric Co., Ltd. or its sales agents before using the product.
Neither Fuji Electric Co., Ltd. nor its agents shall be liable for any injury caused by any use of the products not in accordance with instructions set forth herein.