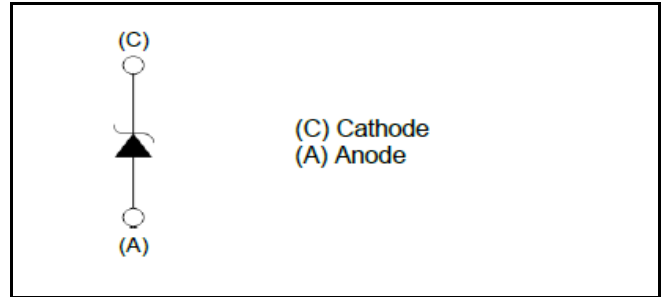


V_R	1200V
I_F	20A ^{*1}
Q_C	63nC

●Features

- 1) Low forward voltage
- 2) Negligible recovery time/current
- 3) Temperature independent switching behavior
- 4) High surge current capability

●Inner circuit



●Applications

- Switch Mode Power Supply
- Uninterruptible Power Supply
- Solar Inverter
- Motor Drive
- Air Conditioner
- EV Charger

●Absolute maximum ratings ($T_{vj} = 25^\circ\text{C}$ unless otherwise specified)

Parameter		Symbol	Value	Unit
Reverse voltage (repetitive peak)		V_{RM}	1200	V
Reverse voltage (DC)		V_R	1200	V
Continuous forward current		I_F	20 ^{*1}	A
Surge non-repetitive forward current	PW=10ms sinusoidal, $T_{vj}=25^\circ\text{C}$	I_{FSM} ^{*2}	190	A
	PW=10ms sinusoidal, $T_{vj}=150^\circ\text{C}$		143	A
	PW=10 μs square, $T_{vj}=25^\circ\text{C}$		750	A
i^2t value	PW=10ms, $T_{vj}=25^\circ\text{C}$	$\int i^2 dt$ ^{*2}	180	A ² s
	PW=10ms, $T_{vj}=150^\circ\text{C}$		102	A ² s
Virtual junction temperature		T_{vj}	175	$^\circ\text{C}$
Range of storage temperature		T_{stg}	-55 to +175	$^\circ\text{C}$

^{*1} Limited by maximum T_{vj} ^{*2} In case of TO-220AC package using two aluminum wires 500 μm in diameter and Z_{thJC} of 0.42 $^\circ\text{C}/\text{W}$ or less (PW = 10ms).

●Electrical characteristics ($T_{vj} = 25^{\circ}\text{C}$ unless otherwise specified)

Parameter	Symbol	Conditions	Values			Unit
			Min.	Typ.	Max.	
DC blocking voltage	V_{DC}	$I_R = 40\mu\text{A}$	1200	-	-	V
Forward voltage	V_F	$I_F = 20\text{A}, T_{vj} = 25^{\circ}\text{C}$	-	1.4	1.6	V
		$I_F = 20\text{A}, T_{vj} = 150^{\circ}\text{C}$	-	1.8	-	V
		$I_F = 20\text{A}, T_{vj} = 175^{\circ}\text{C}$	-	2.0	-	V
Reverse current	I_R	$V_R = 1200\text{V}, T_{vj} = 25^{\circ}\text{C}$	-	0.2	80	μA
		$V_R = 1200\text{V}, T_{vj} = 150^{\circ}\text{C}$	-	14	-	μA
		$V_R = 1200\text{V}, T_{vj} = 175^{\circ}\text{C}$	-	40	-	μA
Total capacitance	C	$V_R = 1\text{V}, f = 1\text{MHz}$	-	1030	-	pF
		$V_R = 1200\text{V}, f = 1\text{MHz}$	-	73	-	pF
Total capacitive charge	Q_C	$V_R = 800\text{V}, di/dt = 500\text{A}/\mu\text{s}$	-	63	-	nC
Switching time	t_C	$V_R = 800\text{V}, di/dt = 500\text{A}/\mu\text{s}$	-	23	-	ns
Non-repetitive Avaranche Energy	E_{ava}	$L = 1\text{mH}$	-	400	-	mJ

●Electrical characteristic curves

Fig.1 $V_F - I_F$ Characteristics

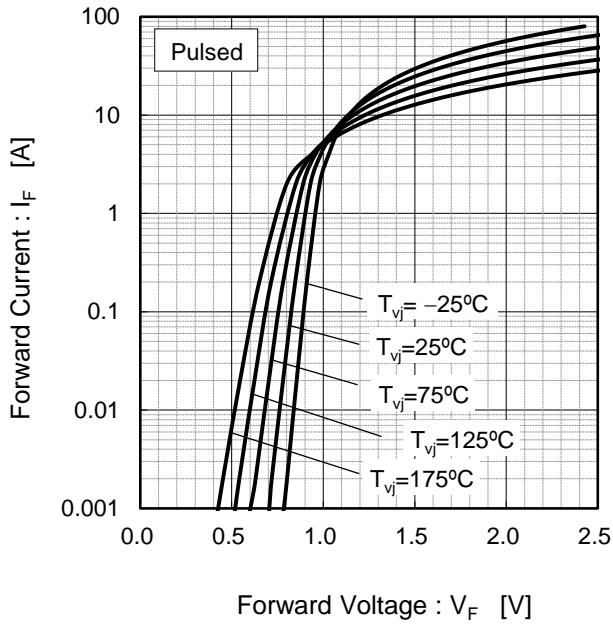


Fig.2 $V_F - I_F$ Characteristics

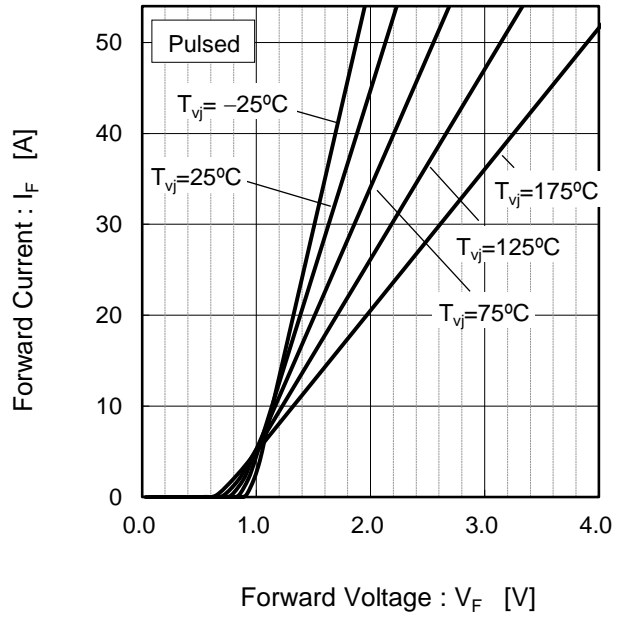


Fig.3 $V_R - I_R$ Characteristics

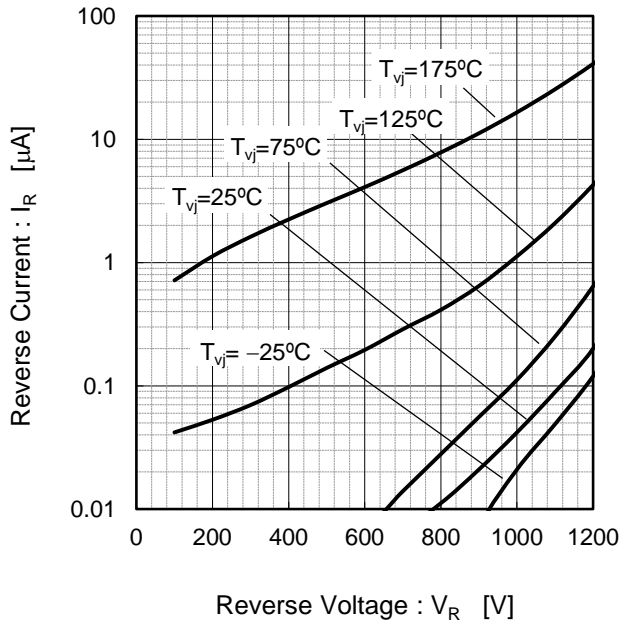
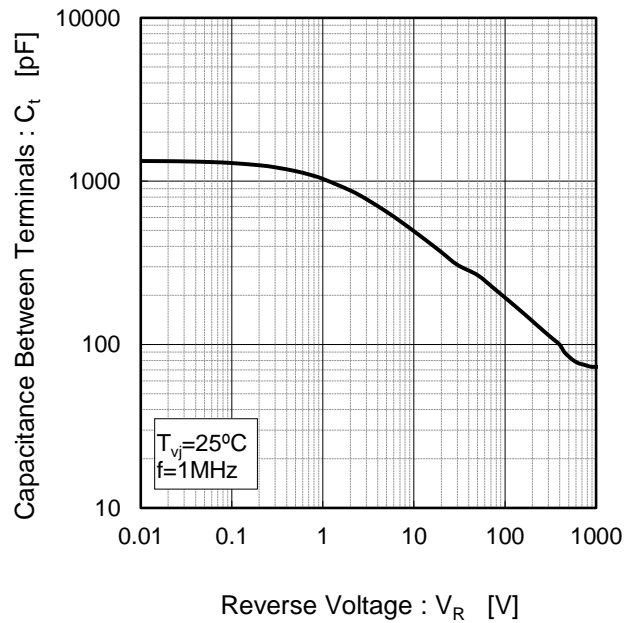
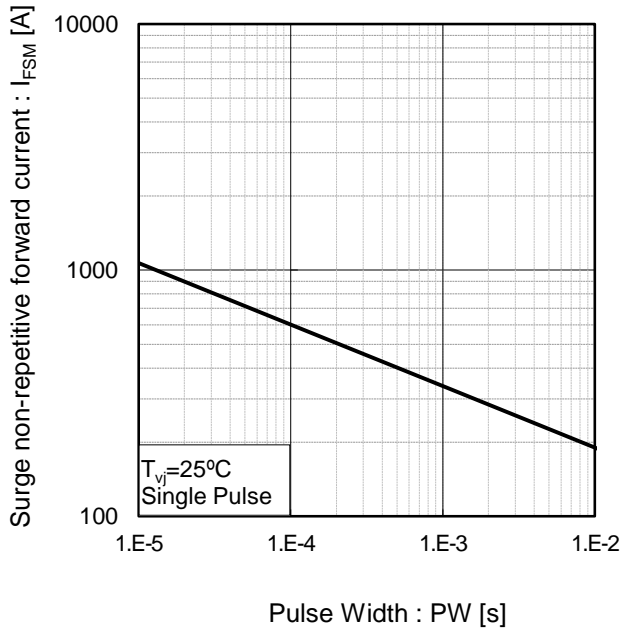


Fig.4 $V_R - C_t$ Characteristics



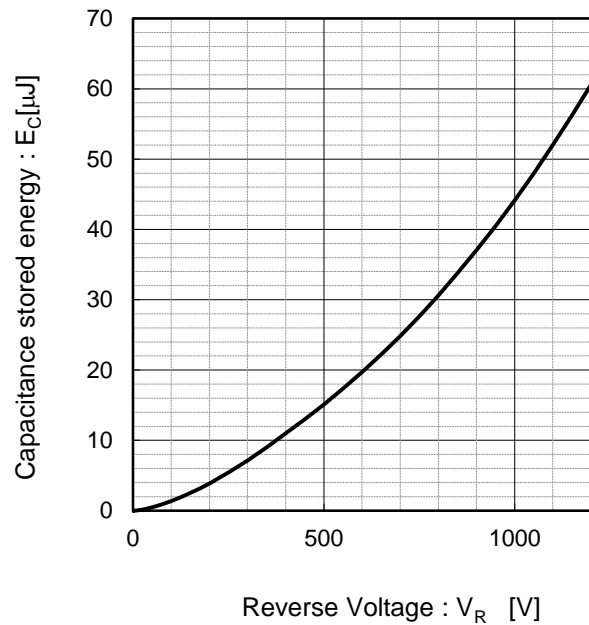
●Electrical characteristic curves

Fig.9 Surge non-repetitive forward current vs. Pulse width (Sinusoidal waveform)*



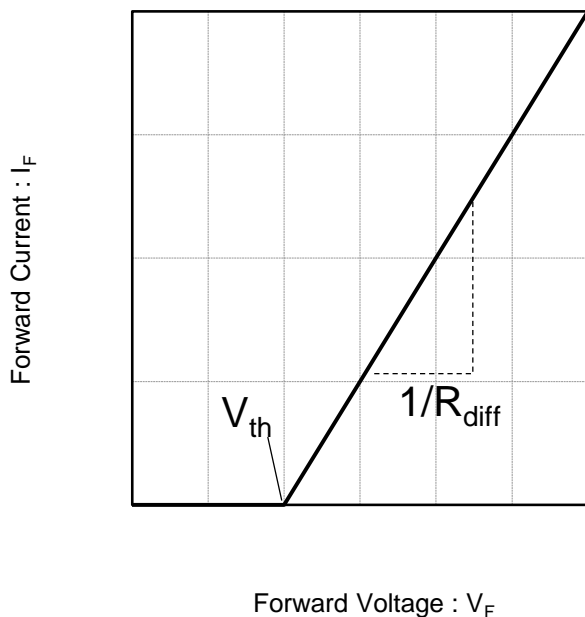
* Assumes Z_{thJC} of 0.42 °C/W or less.
(Pulse Width = 10ms)

Fig.10 Typical capacitance store energy



●Simplified forward characteristic model

Fig.11 Equivalent forward current curve



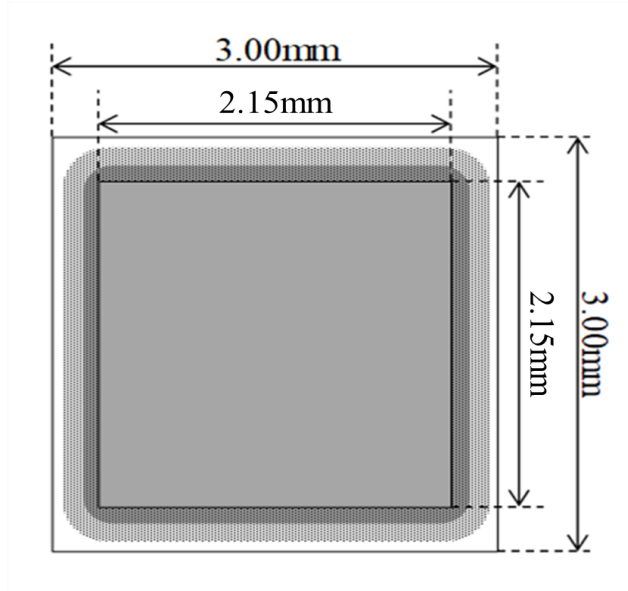
$$V_F = V_{th} + R_{diff} I_F$$

$$V_{th} (T_{vj}) = a_0 + a_1 T_{vj}$$

$$R_{diff} (T_{vj}) = b_0 + b_1 T_{vj} + b_2 T_{vj}^2$$

Symbol	Typical Value	Unit
a_0	0.922	V
a_1	-1.388	mV/°C
b_0	21.20	mΩ
b_1	0.129	mΩ/°C
b_2	0.671	μΩ/°C ²

T_{vj} in °C; -55 °C < T_{vj} < 175 °C ; I_F < 40 A



●Mechanical Parameters

S6604MTFCZ

Die Size	3.00mm × 3.00mm (Including Scribe Width)
Thickness	235 ± 35 μm
Anode Pad Size	2.15mm × 2.15mm

Wafer Size	150mm
Topside Metallization	AlCu
Backside Metallization	Ti-Ni(1.2μm)-Au(70nm)
Passivation	Polyimide

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