

V_R	1200V
I_F	15 / 30A*
Q_C	47nC(Per leg)

(*Per leg/Both legs)

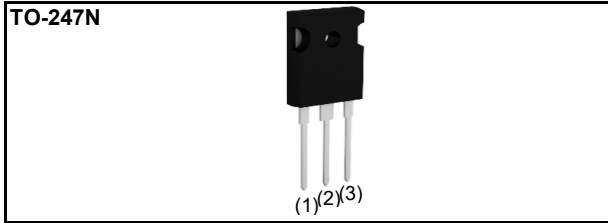
●Features

- 1) AEC-Q101 qualified
- 2) High surge current capability
- 3) Low leakage current
- 4) Reduced temperature dependence
- 5) High-speed switching possible

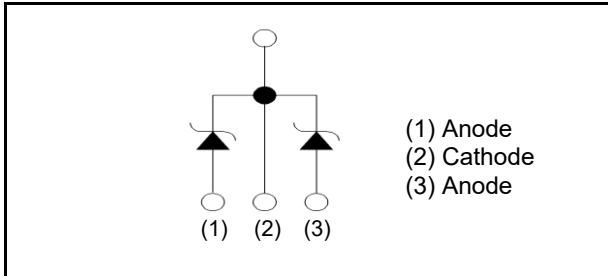
●Applications

- On Board Charger
- DC/DC Converter
- Wireless Charger
- EV Charger Station

●Outline



●Inner circuit



●Packaging specifications

Type	Packaging	Tube
	Reel size (mm)	-
	Tape width (mm)	-
	Basic ordering unit (pcs)	30
	Packing code	C11
	Marking	SCS330KE2

●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 ^{*4} ($T_c=140^{\circ}\text{C}$)	I_F	15 / 30 ^{*1}	A	
Surge non-repetitive forward current ^{*4}	I_{FSM}	PW=10ms sinusoidal, $T_{vj}=25^{\circ}\text{C}$	145 / 290	A
		PW=10ms sinusoidal, $T_{vj}=150^{\circ}\text{C}$	109 / 218	A
		PW=10ms square, $T_{vj}=25^{\circ}\text{C}$	570 / 1140	A
Repetitive peak forward current ^{*4}	I_{FRM}	68 / 136 ^{*2}	A	
i^2t value ^{*4}	$\int i^2 dt$	$1 \leq PW \leq 10\text{ms}$, $T_{vj}=25^{\circ}\text{C}$	105 / 420	A^2s
		$1 \leq PW \leq 10\text{ms}$, $T_{vj}=150^{\circ}\text{C}$	59 / 236	A^2s
Total power dissipation ^{*4}	P_D	164 / 328 ^{*3}	W	
Virtual junction temperature	T_{vj}	175	$^{\circ}\text{C}$	
Range of storage temperature	T_{stg}	-40 to +175	$^{\circ}\text{C}$	

*1 Limited by maximum T_{vj} and for Max. R_{thJC} . *2 $T_c=100^{\circ}\text{C}$, $T_{vj}=150^{\circ}\text{C}$, Duty cycle=10% *3 $T_c=25^{\circ}\text{C}$

*4 Per leg/Both legs

●Electrical characteristics (T_{vj}=25°C unless otherwise specified) (Per Leg)

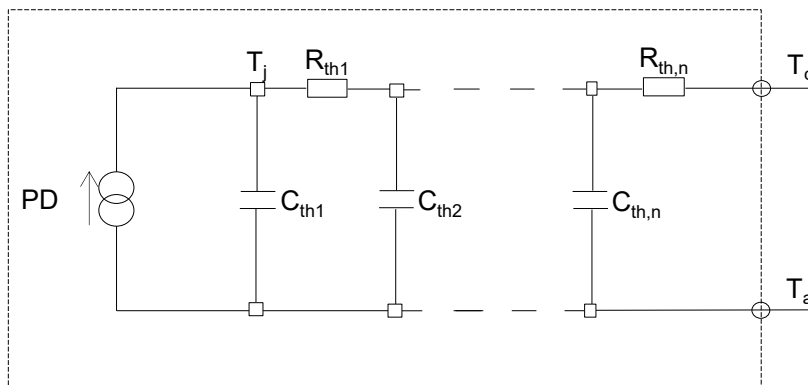
Parameter	Symbol	Conditions	Values			Unit
			Min.	Typ.	Max.	
DC blocking voltage	V _{DC}	I _R = 80μA	1200	-	-	V
Forward voltage	V _F	I _F = 15A T _{vj} = 25°C	-	1.4	1.6	V
		I _F = 15A T _{vj} = 150°C	-	1.8	-	V
		I _F = 15A T _{vj} = 175°C	-	2.0	-	V
Reverse current	I _R	V _R = 1200V, T _{vj} = 25°C	-	0.15	60	μA
		V _R = 1200V, T _{vj} = 150°C	-	10.5	150	μA
		V _R = 1200V, T _{vj} = 175°C	-	30	-	μA
Total capacitance	C	V _R = 1V, f = 1MHz	-	780	-	pF
		V _R = 800V, f = 1MHz	-	55	-	pF
Total capacitive charge	Q _C	V _R = 800V, di/dt = 500A/μs	-	47	-	nC
Switching time	t _C	V _R = 800V, di/dt = 500A/μs	-	22	-	ns

●Thermal characteristics

Parameter	Symbol	Conditions	Values			Unit
			Min.	Typ.	Max.	
Thermal resistance	R _{thJC}	Per Leg	-	0.68	0.91	K/W
		Both Legs	-	0.37	0.49	K/W

●Typical Transient Thermal Characteristics (Per Leg)

Symbol	Value	Unit	Symbol	Value	Unit
R _{th1}	3.3 × 10 ⁻¹	K/W	C _{th1}	3.9 × 10 ⁻³	Ws/K
R _{th2}	2.1 × 10 ⁻¹		C _{th2}	2.2 × 10 ⁻²	
R _{th3}	1.4 × 10 ⁻¹		C _{th3}	1.6 × 10 ⁻¹	



●Electrical characteristic curves (Per Leg)

Fig.1 $V_F - I_F$ Characteristics

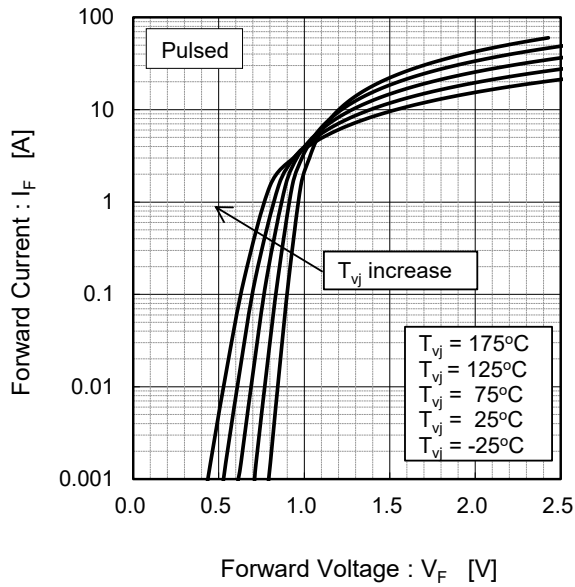


Fig.2 $V_F - I_F$ Characteristics

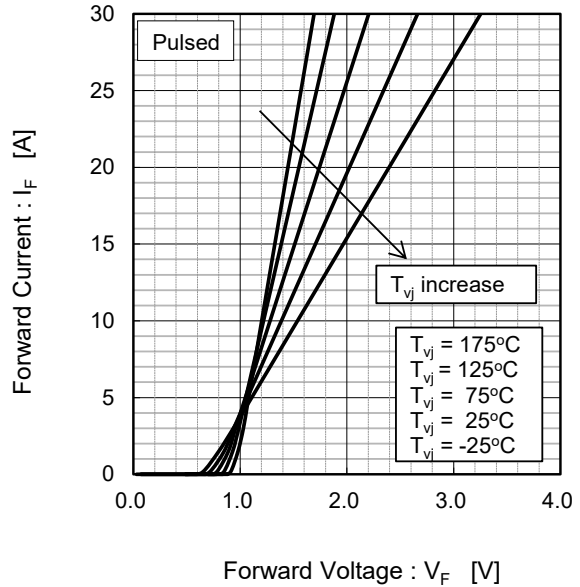


Fig.3 $V_R - I_R$ Characteristics

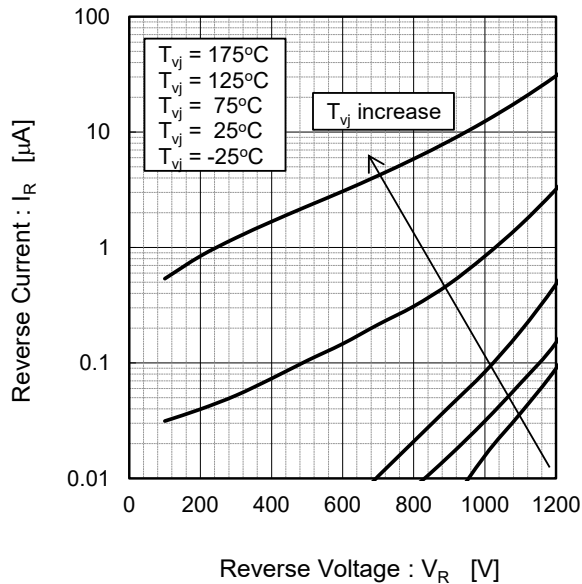
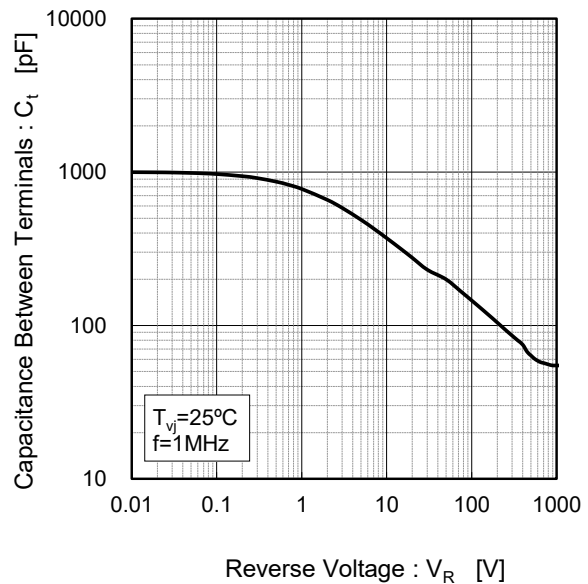


Fig.4 $V_R - C_t$ Characteristics



●Electrical characteristic curves (Per Leg)

Fig.5 Typical Transient Thermal Resistance vs. Pulse Width

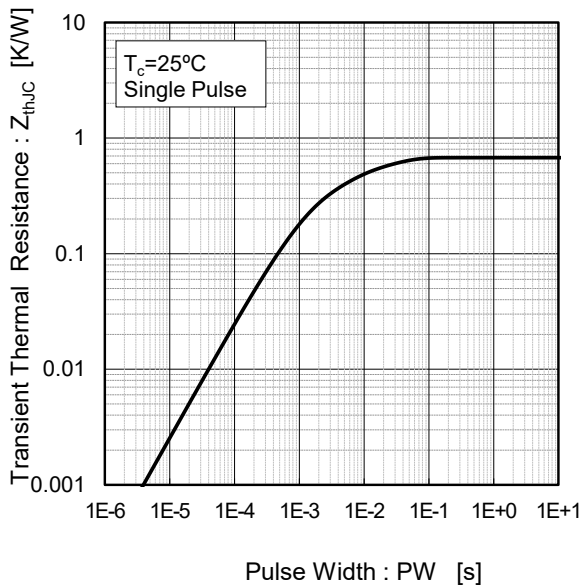


Fig.6 Power Dissipation

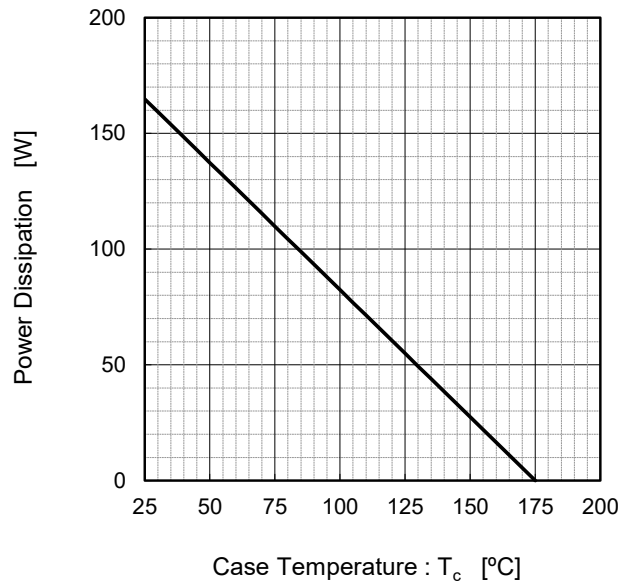
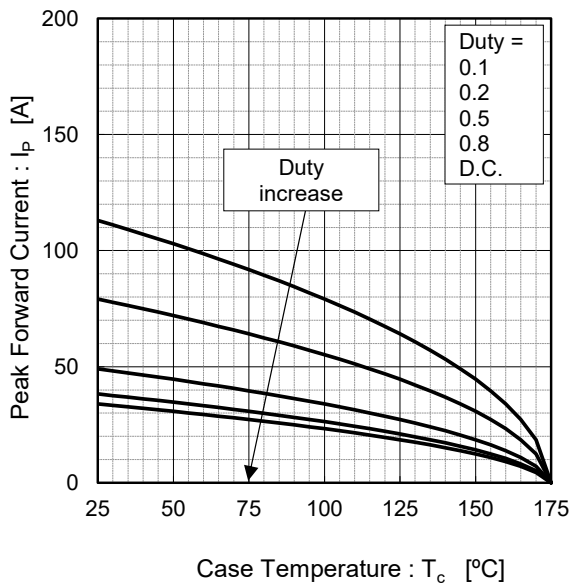
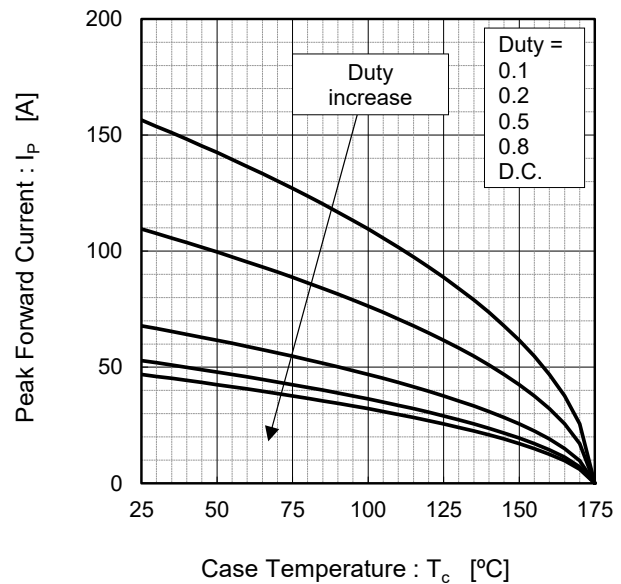


Fig.7*4 Maximum peak forward current derating curve $I_p - T_c$



*4 Based on max Vf, max R_{thJC}
Valid for switching of above 10kHz,
excluding D.C. curve.

Fig.8*5 Typical peak forward current derating curve $I_p - T_c$ (Not guaranteed)



*5 Based on typ Vf, typ R_{thJC}
Typical value, not guaranteed
Valid for switching of above 10kHz,
excluding D.C. curve

●Electrical characteristic curves (Per Leg)

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

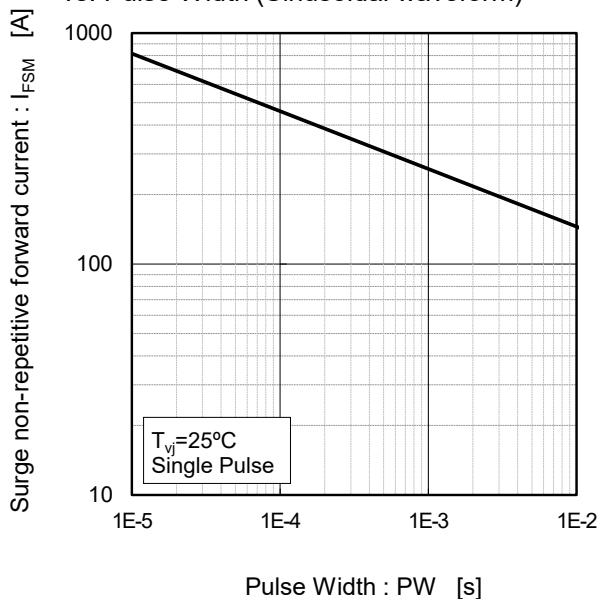
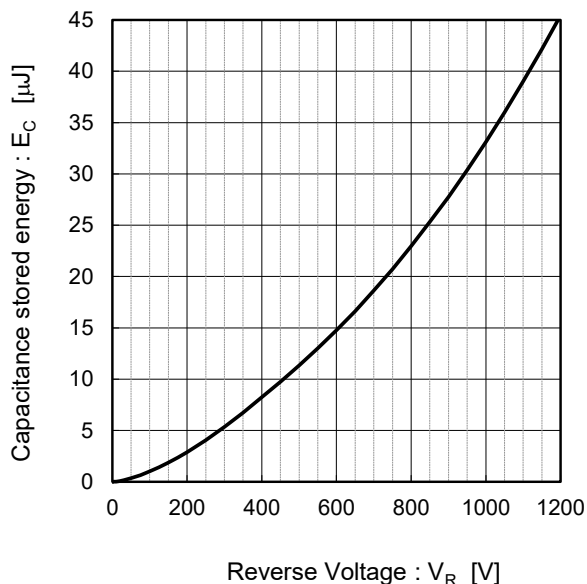
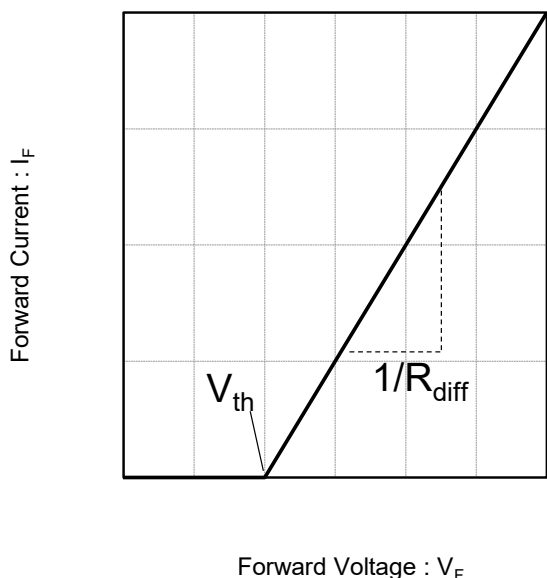


Fig.10 Typical capacitance store energy



●Simplified forward characteristic model (Per Leg)

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	28.27	mΩ
b_1	0.172	mΩ/°C
b_2	0.894	μΩ/°C ²

T_{vj} in °C; $-55\text{ °C} < T_{vj} < 175\text{ °C}$; $I_F < 30\text{ A}$

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