



TO-247-2



Package Pin Definitions

- Pin1- Cathode
- Pin2- Anode

Part Number	Marking	Package
XCH40120T2AS	40120T2AS	TO-247-2

$$V_{RRM} = 1200 \text{ V}$$

$$I_F(T_C=150^\circ\text{C}) = 40\text{A}$$

$$V_F(T_J=25^\circ\text{C}) = 1.4\text{V}$$

Features

- Low reverse current
- Good surge current capability
- Low capacitive charge
- No reverse recovery current
- Halogen free, RoHs compliant

Benefits

- System efficiency improvement over Si diodes
- Higher switching frequency
- Increased power density
- Essentially no switching losses

Applications

- Switch mode power supplies (SMPS)
- Uninterruptible power supplies
- On Board Charger
- UPS

Maximum Ratings ($T_C=25^\circ\text{C}$ unless otherwise specified)

Symbol	Parameter	Test conditions	Value	Unit
V_{RRM}	Repetitive peak reverse voltage		1200	V
V_{RSM}	Non-repetitive peak reverse voltage		1200	V
I_F	Continuous forward current	$T_C=25^\circ\text{C}$ $T_C=135^\circ\text{C}$ $T_C=150^\circ\text{C}$	114 53 40	A
I_{FRM}	Repetitive forward surge current	$T_C=25^\circ\text{C}$, $t_p=10\text{ms}$, Half Sine Pulse $T_C=110^\circ\text{C}$, $t_p=10\text{ms}$, Half Sine Pulse	216 173	A
I_{FSM}	Non-Repetitive forward surge current	$T_C=25^\circ\text{C}$, $t_p=10\text{ms}$, Half Sine Pulse $T_C=110^\circ\text{C}$, $t_p=10\text{ms}$, Half Sine Pulse	360 310	A
$\int i^2 dt$	$i^2 t$ value	$T_C=25^\circ\text{C}$, $t_p=10\text{ms}$, Half Sine Pulse $T_C=110^\circ\text{C}$, $t_p=10\text{ms}$, Half Sine Pulse	648 480.5	A ² S
P_{tot}	Power dissipation	$T_C=25^\circ\text{C}$ $T_C=110^\circ\text{C}$	455 197	W
T_J	Operating junction temperature		-55~175	$^\circ\text{C}$
T_{stg}	Storage temperature		-55~175	$^\circ\text{C}$

Thermal Characteristics

Symbol	Parameter	Value			Unit
		Min.	Typ.	Max.	
$R_{th(jc)}$	Thermal resistance from junction to case		0.33		°C/W

Electrical Characteristics ($T_j=25^{\circ}\text{C}$ unless otherwise specified)

Static Characteristics

Symbol	Parameter	Test conditions	Value			Unit
			Min.	Typ.	Max.	
V_{DC}	DC blocking voltage	$T_j=25^{\circ}\text{C}$	1200			V
V_F	Diode forward voltage	$I_F=40\text{A } T_j=25^{\circ}\text{C}$ $I_F=40\text{A } T_j=175^{\circ}\text{C}$		1.4 1.9	1.6	V
I_R	Reverse current	$V_R=1200\text{V } T_j=25^{\circ}\text{C}$ $V_R=1200\text{V } T_j=175^{\circ}\text{C}$		3 20	10 50	μA

AC Characteristics ($T_j=25^{\circ}\text{C}$ unless otherwise specified)

Symbol	Parameter	Test conditions	Value			Unit
			Min.	Typ.	Max.	
Q_C	Total capacitive charge	$V_R=800\text{V } T_j=25^{\circ}\text{C}$ $Q_C = \int_0^{V_R} C(V)dV$		210		nC
C	Total capacitance	$V_R=0\text{V } f=1\text{MHz}$ $V_R=400\text{V } f=1\text{MHz}$ $V_R=800\text{V } f=1\text{MHz}$		3100 202 140		pF

Typical Performance

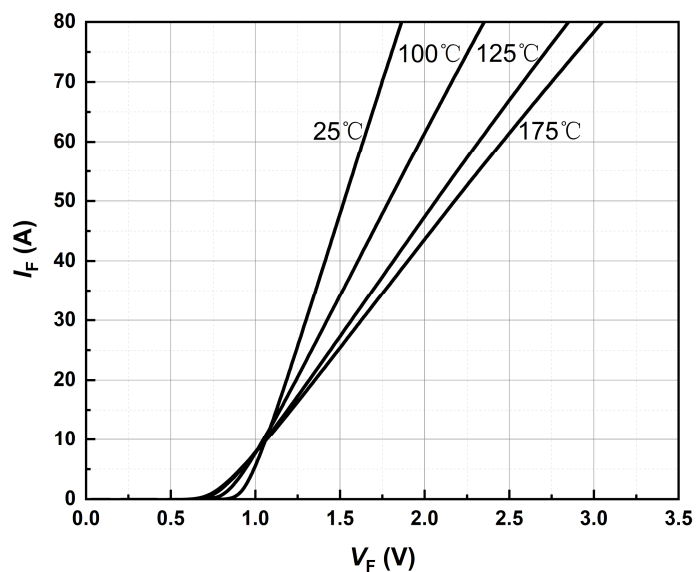


Figure 1. Typical forward characteristics

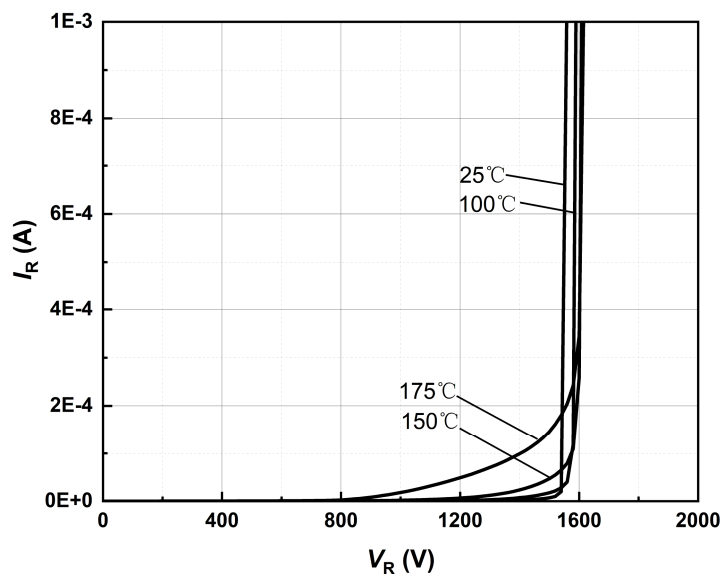


Figure 2. Typical reverse current as function of reverse voltage

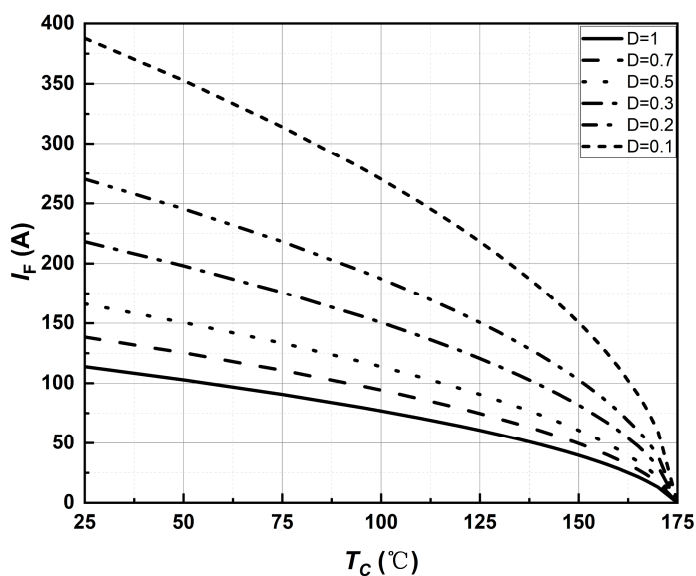


Figure 3. Diode forward current as function of temperature

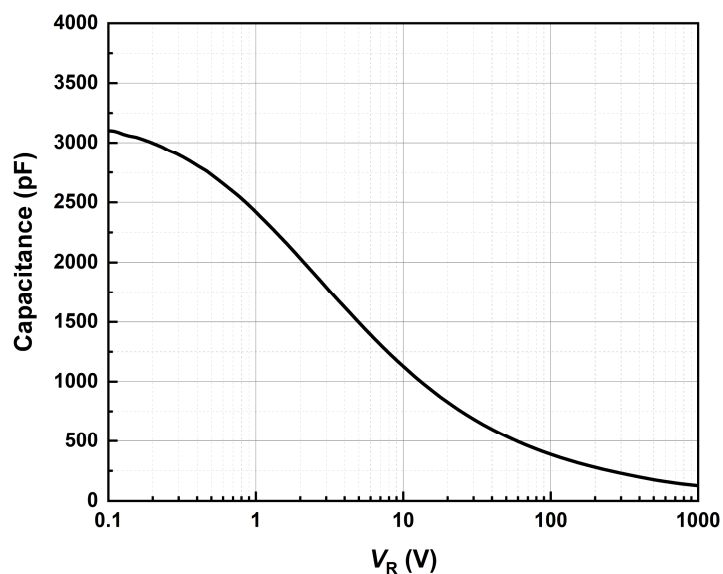


Figure 4. Typical capacitance as function of reverse voltage, $C=f(V_R)$; $T_J=25^\circ\text{C}$

Typical Performance

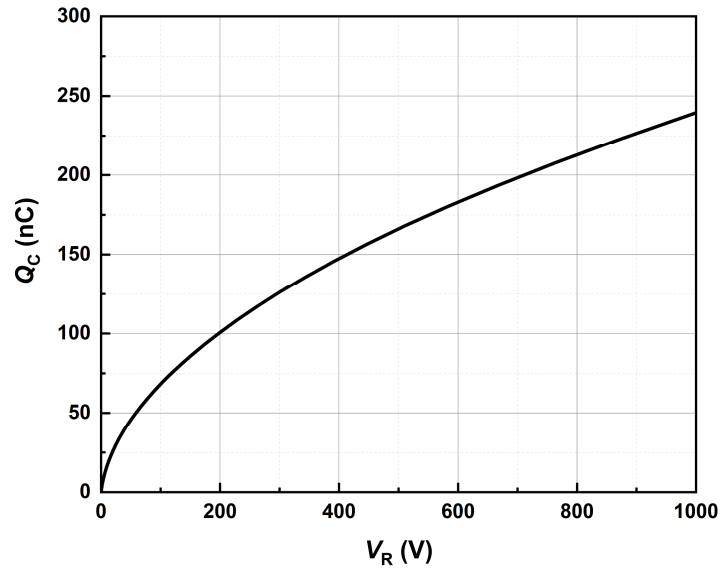


Figure 5. Typical reverse charge as function of reverse voltage

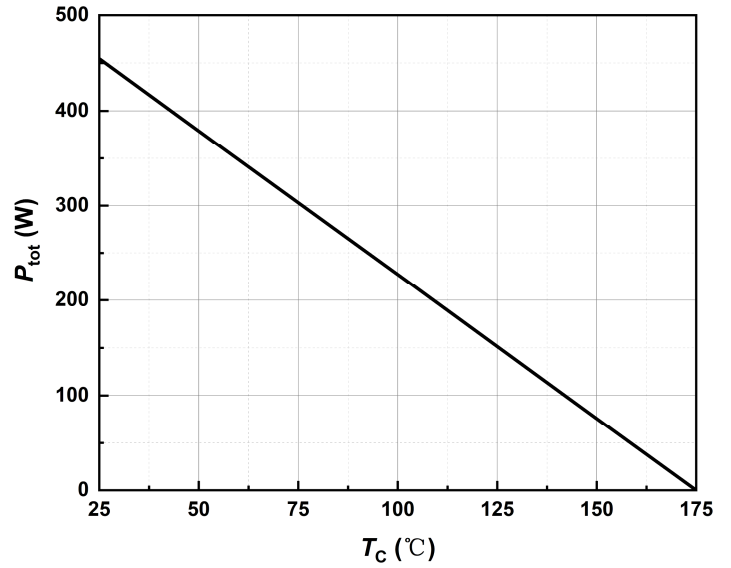


Figure 6. Power dissipation as function of case temperature

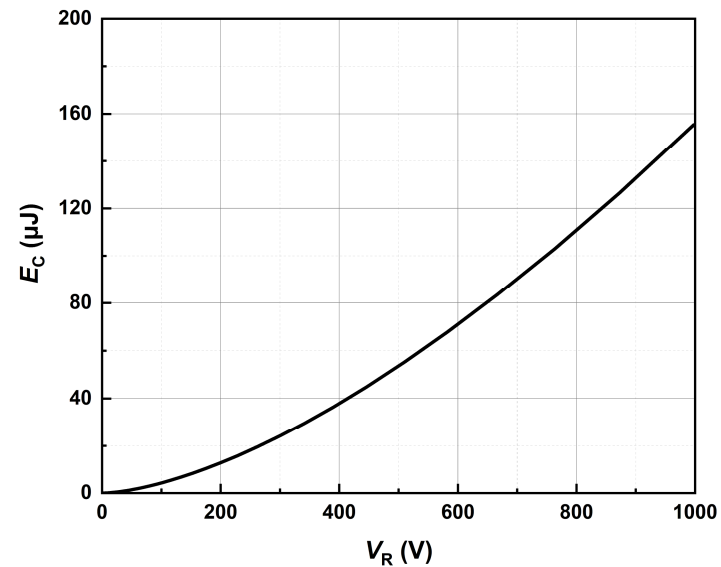


Figure 7. Capacitance stored energy

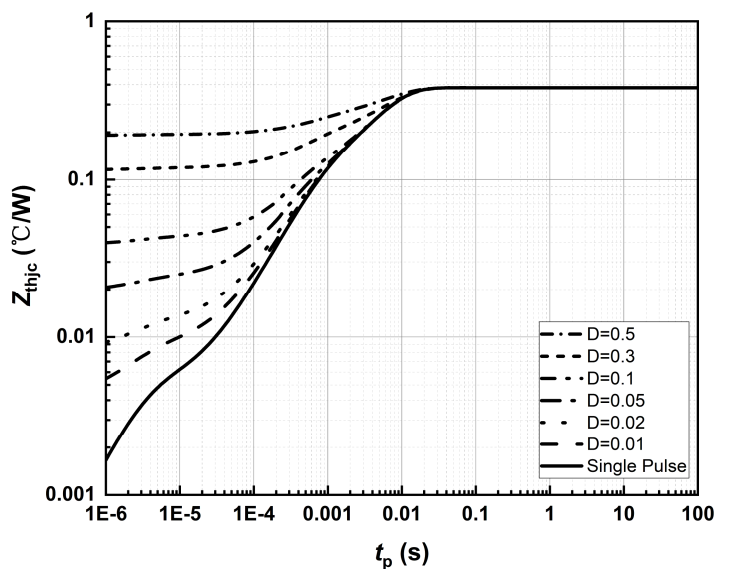


Figure 8. Max. transient thermal impedance

Technical drawing of a rectangular component with dimensions and tolerances. The drawing shows a top view of the component, which is a rectangular plate with a central rectangular area filled with a stippled pattern. The dimensions are given in millimeters (mm) with tolerances.

Dimensions and Tolerances:

- Overall width: 15.80 ± 0.15
- Overall height: 21.00 ± 0.20
- Distance from top edge to center of top hole: 5.80 ± 0.15
- Distance from top edge to center of bottom hole: 5.00 ± 0.15
- Distance from left edge to center of left hole: 6.15 ± 0.15
- Distance from right edge to center of right hole: 2.50 ± 0.15
- Distance from bottom edge to center of bottom hole: 4.12 ± 0.10
- Distance from bottom edge to center of top hole: $2.00^{+0.10}_{-0.05}$
- Distance from bottom edge to center of right hole: 2.10 ± 0.10 (2X)
- Distance from bottom edge to center of left hole: $1.20^{+0.10}_{-0.05}$ (3X)
- Distance from left edge to center of right hole: 10.88 ± 0.10

