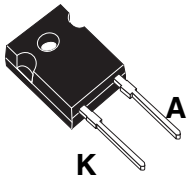
STTH6012

Ultrafast recovery - 1200 V diode

Main product characteristics

$I_{F(AV)}$	60 A
V_{RRM}	1200 V
T_j	175° C
V_F (typ)	1.30 V
t_{rr} (typ)	50 ns



DO-247
STTH6012W

Features and benefits

- Ultrafast, soft recovery
- Very low conduction and switching losses
- High frequency and/or high pulsed current operation
- High reverse voltage capability
- High junction temperature

Description

The high quality design of this diode has produced a device with low leakage current, regularly reproducible characteristics and intrinsic ruggedness. These characteristics make it ideal for heavy duty applications that demand long term reliability.

Such demanding applications include industrial power supplies, motor control, and similar mission-critical systems that require rectification and freewheeling. These diodes also fit into auxiliary functions such as snubber, bootstrap, and demagnetization applications.

The improved performance in low leakage current, and therefore thermal runaway guard band, is an immediate competitive advantage for this device.

Order codes

Part Number	Marking
STTH6012W	STTH6012W

1 Characteristics

Table 1. Absolute ratings (limiting values at 25° C, unless otherwise specified)

Symbol	Parameter			Value	Unit
V_{RRM}	Repetitive peak reverse voltage			1200	V
$I_{F(RMS)}$	RMS forward current			80	A
$I_{F(AV)}$	Average forward current, δ = 0.5		T_c = 90° C	60	A
I_{FRM}	Repetitive peak forward current	t_p = 5 µs, F = 5 kHz square		500	A
I_{FSM}	Surge non repetitive forward current	t_p = 10 ms Sinusoidal		400	A
T_{stg}	Storage temperature range			-65 to + 175	°C
T_j	Maximum operating junction temperature			175	°C

Table 2. Thermal parameter

Symbol	Parameter	Value	Unit
$R_{th(j-c)}$	Junction to case	0.6	°C/W

Table 3. Static electrical characteristics

Symbol	Parameter	Test conditions		Min.	Typ	Max.	Unit
I_R(1)	Reverse leakage current	T_j = 25° C	$V_R = V_{RRM}$			30	µA
		T_j = 125° C			30	300	
V_F(2)	Forward voltage drop	T_j = 25° C	I_F = 60 A			2.25	V
		T_j = 125° C			1.35	2.05	
		T_j = 150° C			1.30	1.95	

1. Pulse test: t_p = 5 ms, δ < 2 %
2. Pulse test: t_p = 380 µs, δ < 2 %

To evaluate the conduction losses use the following equation:
$P = 1.50 \times I_{F(AV)} + 0.0075\ I_F{}^2{}_{(RMS)}$

Table 4. Dynamic characteristics

Symbol	Parameter	Test conditions	Min.	Typ	Max.	Unit
t_{rr}	Reverse recovery time	I_F = 1 A, dI_F/dt = -50 A/µs, V_R = 30 V, T_j = 25° C			125	ns
		I_F = 1 A, dI_F/dt = -100 A/µs, V_R = 30 V, T_j = 25° C		63	85	
		I_F = 1 A, dI_F/dt = -200 A/µs, V_R = 30 V, T_j = 25° C		50	70	
I_{RM}	Reverse recovery current	I_F = 60 A, dI_F/dt = -200 A/µs, V_R = 600 V, T_j = 125° C		32	45	A
S	Softness factor	I_F = 60 A, dI_F/dt = -200 A/µs, V_R = 600 V, T_j = 125° C		1		
t_{fr}	Forward recovery time	I_F = 60 A dI_F/dt = 100 A/µs V_{FR} = 1.5 x V_{Fmax}, T_j = 25° C			750	ns
V_{FP}	Forward recovery voltage	I_F = 60 A, dI_F/dt = 100 A/µs, T_j = 25° C		4.5		V

Figure 1. Conduction losses versus average current

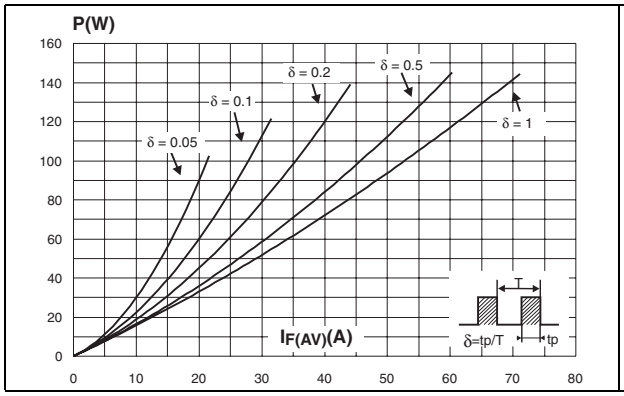


Figure 2. Forward voltage drop versus forward current