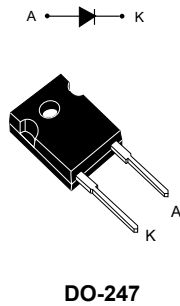## Automotive 800 V, 60 A bridge rectifier diode

A ▶ K

DO-247

Features

- AEC-Q101 qualified
- Ultra low conduction losses
- Ultra-low reverse losses
- High junction temperature capability (+175 °C)
- V_{RRM} guaranteed from -40 to +175 °C
- PPAP capable
- ECOPACK2 compliant

Applications

- On board charger (OBC)
- Charging stations
- Bridge function

Description

The high quality design of this diode has produced a device with consistently reproducible characteristics and intrinsic ruggedness. These characteristics make it ideal for heavy duty applications that demand long term reliability like automotive applications.

Thanks to its ultra-low conduction losses, the STBR6008-Y is especially suitable for use as input bridge diode in battery chargers and charging stations.

Product status link
STBR6008-Y

Product summary	
Symbol	**Value**
$I_{F(AV)}$	60 A
V_{RRM}	800 V
T_j	-40 to +175 °C
V_F (typ.)	1.00 V

DS13045 - **Rev 1** - June 2019
For further information contact your local STMicroelectronics sales office.

www.st.com

1 Characteristics

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

Symbol	Parameter		Value	Unit
V_{RRM}	Repetitive peak reverse voltage	T_j = -40 °C to +175 °C	800	V
V_{RSM}	Non-repetitive surge reverse voltage	t_p = 10 ms square	900	V
$I_{F(RMS)}$	Forward rms current		90	A
$I_{F(AV)}$	Average forward current	T_C = 160 °C, δ = 0.5 square wave	60	A
I_{FSM}	Surge non repetitive forward current	t_p = 10 ms sinusoidal	500	A
T_{stg}	Storage temperature range		-65 to +175	°C
T_j	Operating junction temperature		-40 to +175	°C

Table 2. Thermal parameters

Symbol	Parameter	Typ. value	Unit
$R_{th(j-c)}$	Junction to case	0.20	°C/W

For more information, please refer to the following application note :

- AN5088 : Rectifiers thermal management, handling and mounting recommendations

Table 3. Static electrical characteristics

Symbol	Parameter	Test conditions		Min.	Typ.	Max.	Unit
I_R	Reverse leakage current	T_j = 25 °C	V_R = V_{RRM}	-		5	µA
		T_j = 150 °C		-	25	250	
V_F	Forward voltage drop	T_j = 25 °C	I_F = 60 A	-	1.00	1.10	V
		T_j = 150 °C		-	0.88	0.97	

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:

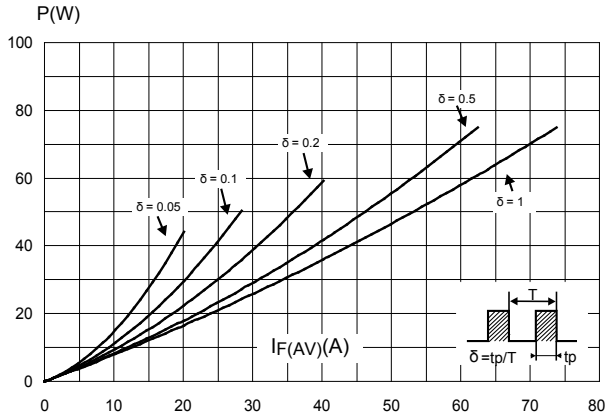P = 0.75 x $I_{F(AV)}$ + 0.0036 x $I_F^2{}_{(RMS)}$

For more information, please refer to the following application notes related to the power losses:

- AN604: Calculation of conduction losses in a power rectifier
- AN4021: Calculation of reverse losses in a power diode
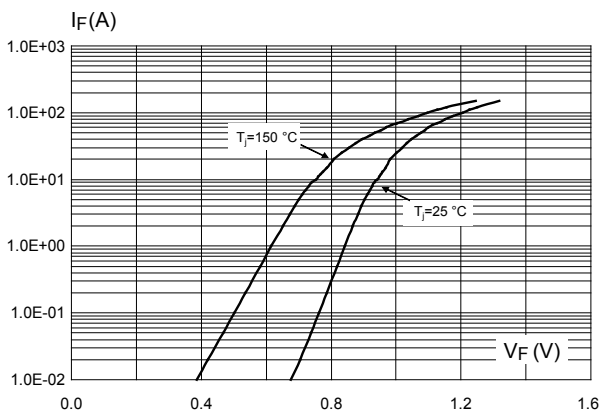
1.1 Characteristics (curves)

Figure 1. Average forward power dissipation versus average forward current
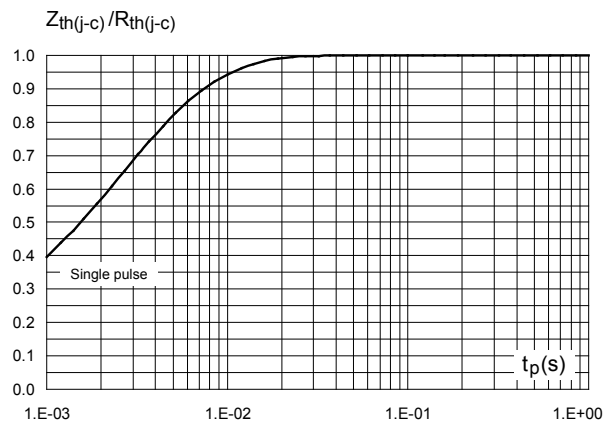

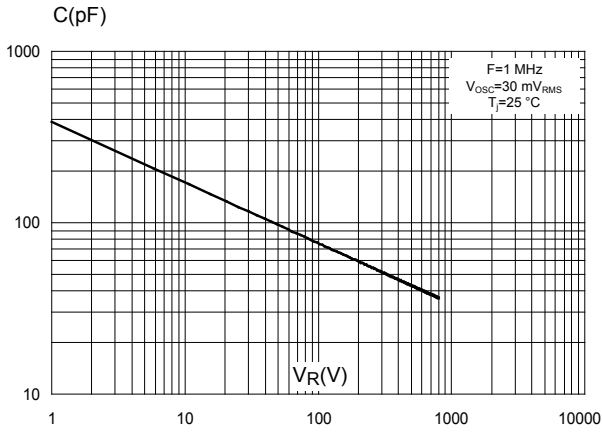**Figure 2. Forward voltage drop versus forward current (typical values)**
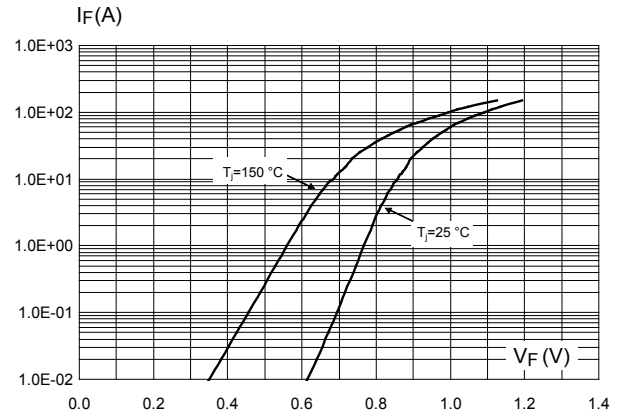
Figure 3. Forward voltage drop versus forward current (maximum values)
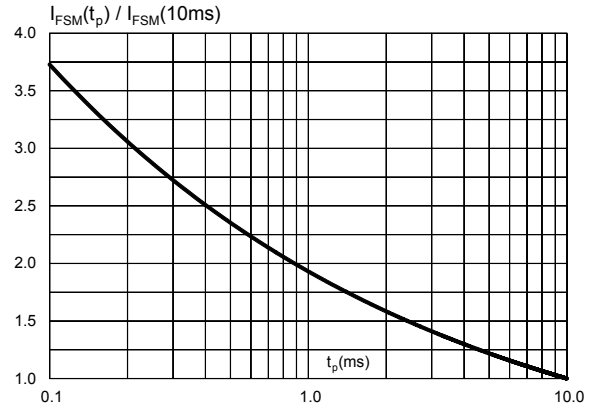

Figure 4. Relative variation of thermal impedance junction to case versus pulse duration
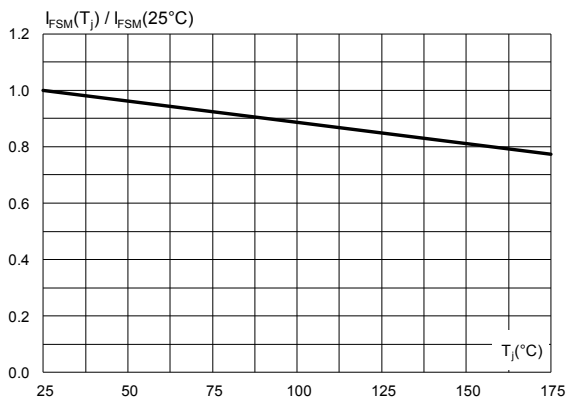
**Figure 5. Junction capacitance versus reverse voltage applied (typical values)**

Figure 6. Relative variation of non-repetitive peak surge forward current versus pulse duration (sinusoidal waveform)

Figure 7. Relative variation of non-repetitive peak surge forward current versus initial junction temperature (sinusoidal waveform)

Figure 8. Non repetitive surge peak forward current versus number of cycles
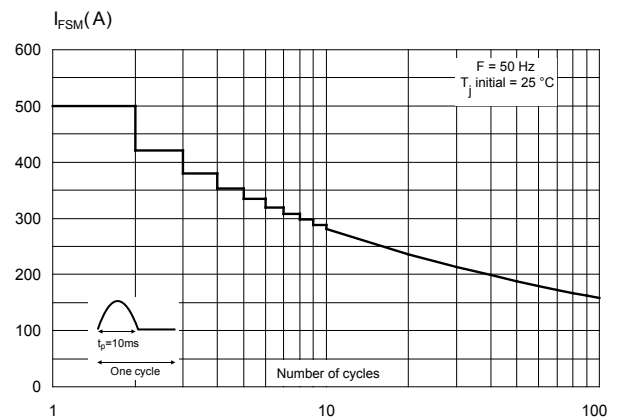
2 Package information

In order to meet environmental requirements, ST offers these devices in different grades of ECOPACK packages, depending on their level of environmental compliance. ECOPACK specifications, grade definitions and product status are available at: www.st.com. ECOPACK is an ST trademark.

2.1 DO-247 package information

- Epoxy meets UL94, V0
- Cooling method: by conduction (C)
- Recommended torque value: 0.8 N·m (DO-247)
- Maximum torque value: 1.0 N·m (DO-247)

Figure 9. DO-247 package outline
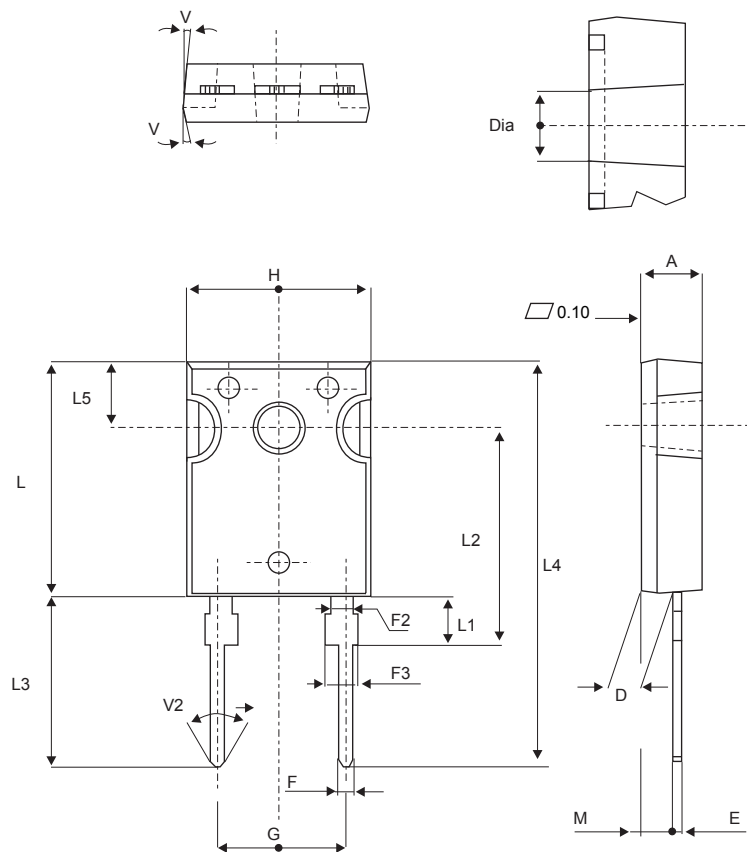
Table 4. DO-247 package mechanical data

Ref.	Dimensions			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	4.85	5.15	0.191	0.203
D	2.20	2.60	0.086	0.102
E	0.40	0.80	0.015	0.031
F	1.00	1.40	0.039	0.055
F2	2.00 typ.		0.078 typ.	
F3	2.00	2.40	0.078	0.094
G	10.90 typ.		0.429 typ.	
H	15.45	15.75	0.608	0.620
L	19.85	20.15	0.781	0.793
L1	3.70	4.30	0.145	0.169
L2	18.50 typ.		0.728 typ.	
L3	14.20	14.80	0.559	0.582
L4	34.60 typ.		1.362 typ.	
L5	5.50 typ.		0.216 typ.	
M	2.00	3.00	0.078	0.118
V	5°		5°	
V2	60°		60°	
Dia.	3.55	3.65	0.139	0.143

3 Ordering information

Table 5. Ordering information

Order code	Marking	Package	Weight	Base qty.	Delivery mode
STBR6008WY	STBR6008WY	DO-247	4.4 g	30	Tube

Revision history

Table 6. Document revision history

Date	Revision	Changes
10-Jun-2019	1	First issue.

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