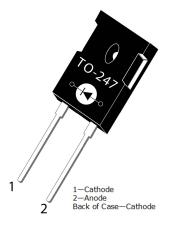


APT100S20BG High-Voltage Schottky Diode

1 Product Overview

This section outlines the product overview for the APT100S20BG device.



1.1 Features

The following are key features of the APT100S20BG device:

- Low forward voltage
- Low leakage current
- Ultrafast reverse recovery
- Avalanche energy rated
- RoHS compliant

1.2 Benefits

The following are benefits of the APT100S20BG device:

- High switching frequency
- Low switching losses
- Low noise (EMI) switching
- Higher reliability systems
- Increased system power density

1.3 Applications

The APT100S20BG device is designed for the following applications:

- Power supply and distribution
- Switch-mode power supply
- Inverter, converter, and industrial motor drivers
- High-speed rectifiers



2 Device Specifications

This section shows the device specifications for the APT100S20BG device.

2.1 Absolute Maximum Ratings

The following table shows the absolute maximum ratings for the APT100S20BG device. $T_1 = 25$ °C unless otherwise specified.

Table 1 • Absolute Maximum Ratings

Symbol	Parameter	Ratings	Unit
VR	Maximum DC reverse voltage	200	V
VRRM	Maximum peak repetitive reverse voltage		
Vrwm	Maximum working peak reverse voltage		
IF(AV)	Maximum average forward current (Tc = 125 °C, duty cycle = 0.5)	120	А
F(RMS)	RMS forward current	318	_
IFSM	Non-repetitive forward surge current (T _J = 45 °C, 8.3 ms)	1000	
Tı , Tstg	Operating and storage temperature range	–55 to 150	°C
Τι	Lead temperature for 10 seconds	300	

The following table shows the thermal and mechanical characteristics of the APT100S20BG device.

Table 2 • Thermal and Mechanical Characteristics

Symbol	Characteristic/Test Conditions	Min	Тур	Max	Unit
Rөлс	Junction-to-case thermal resistance			0.18	°C/W
Wt	Package weight		0.22		OZ
			6.2		g
	Maximum mounting torque, 6-32 or M3 screw			10	lbf-in
				1.1	N-m

2.2 Electrical Performance

_

The following table shows the static characteristics of the APT100S20BG device. T_J = 25 °C unless otherwise specified.

Table 3 • Static Characteristics

Symbol	Characteristic	Test Conditions	Min	Тур	Max	Unit
VF	Forward voltage	IF = 100 A		0.89	0.95	V
		IF = 200 A		1.06		- v
		IF = 100 A, TJ = 125 °C		0.76		-
Irm	Maximum reverse leakage current	V _R = 200 V			2	mA
		V _R = 200 V, T _J = 125 °C			40	-
C	Junction capacitance	V _R = 200 V		470		pF



The following table shows the dynamic characteristics of the APT100S20BG device.

Symbol	Characteristic	Test Conditions	Min	Тур	Max	Unit
trr	Reverse recovery time	IF = 100 A		70		ns
Qrr	Reverse recovery charge	dir/dt = -200 A/μs V _R = 133 V		230		nC
Irrm	Maximum reverse recovery current	T _J = 25 °C		6		А
trr	Reverse recovery time	IF = 100 A		110		ns
Qrr	Reverse recovery charge	di⊧/dt = −200 A/µs V _R = 133 V		690		nC
Irrm	Maximum reverse recovery current	TJ = 125 °C		11		А
trr	Reverse recovery time	IF = 100 A		95		ns
Qrr	Reverse recovery charge	di⊧/dt = −700 A/μs V _R = 133 V		1750		nC
IRRM	Maximum reverse recovery current	VR = 135 V TJ = 125 °C		32		А

Table 4 • Dynamic Characteristics

2.3 Typical Performance Curves

This section shows the typical performance curves for the APT100S20BG device.

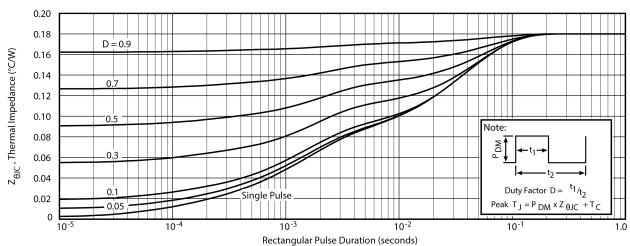
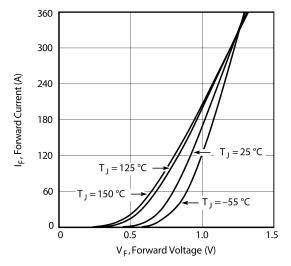


Figure 1 • Maximum Transient Thermal Impedance



Figure 2 • Forward Current vs. Forward Voltage (V)





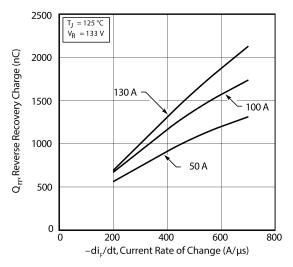


Figure 3 • RRT vs. Current Rate of Change

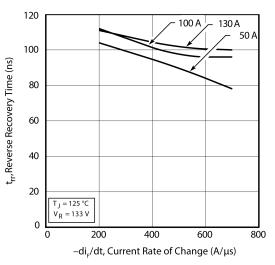


Figure 5 • Reverse Recovery Current vs. Current Rate of Change

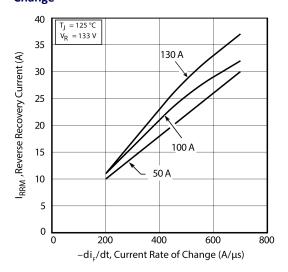
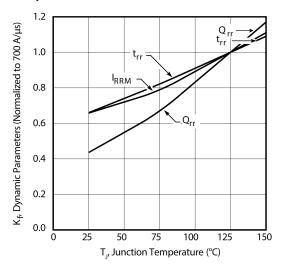
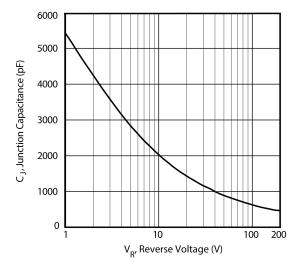




Figure 6 • Dynamic Parameters vs. Junction Temperature









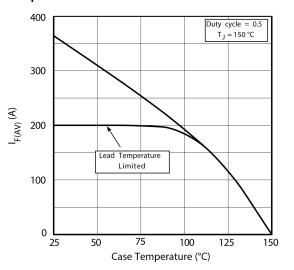
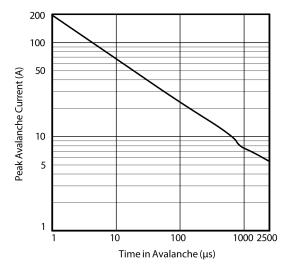


Figure 9 • Single Pulse UIS SOA

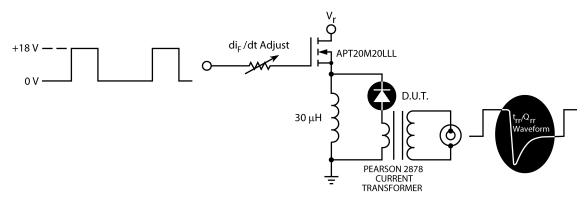




2.4 Reverse Recovery Overview

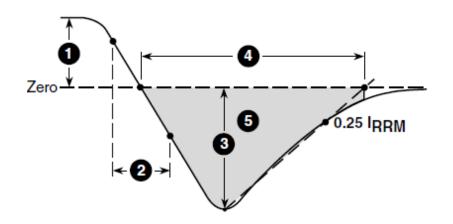
The following illustration shows the diode test circuit for the APT100S20BG device.

Figure 10 • Diode Test Circuit



The following illustration shows the diode reverse recovery waveform and definitions for the APT100S20BG device.

Figure 11 • Diode Reverse Recovery Waveform and Definitions



- 1. IF-Forward conduction current
- 2. di_F/dt—Rate of diode current change through zero crossing
- 3. IRRM—Maximum reverse recovery current
- 4. trr—Reverse recovery time, measured from zero crossing where diode current goes from positive to negative, to the point at which the straight line through IRRM and 0.25•IRRM passes through zero
- 5. Q_{rr} —Area under the curve defined by IRRM and t_{rr}



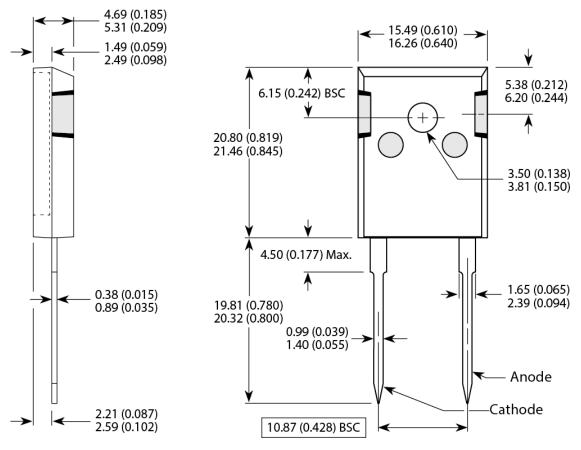
3 Package Specification

This section outlines the package specification for the APT100S20BG device.

3.1 Package Outline Drawing

The following figure shows the package outline drawing of the APT100S20BG device. Dimensions are in millimeters and (inches).









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