QS50T45T: 50 AMP Schottky Barrier Rectifier

www.questsemi.com

Features

- The plastic package carries Underwriters Laboratory Flammability Classification 94V-0
- Construction utilizes void-free molded plastic technique
- Low reverse leakage
- High forward surge current capability
- High temperature soldering guaranteed:260°C, 10 seconds
- High temperature manual soldering guaranteed:380°C, 5 seconds
-with tin blocks

Applications

Solar Inverters
Uninterruptible Power Supplies (UPS)
Switched-Mode Power Supplies (SMPS)
Industrial Motor Drives
Renewable Energy Systems
High-Frequency Power Converters
Grid-Tied Energy Storage Systems

Key Values

PARAMETER	VALUE
REVERSE VOLTAGE	45V
FORWARD CURRENT	50A

Package

ROHS Compliant
REACH Compliant

Part Number

QS50T45T

Package

Plastic package, Module 09E

Marking

Q

QS50T45T: 50 AMP Schottky Barrier Rectifier

www.questsemi.com

ABSOLUTE MAXIMUM RATINGS (Ta = 25°C Unless otherwise specified)

Parameter	*Symbol*	*Value*	*Unit*
Maximum repetitive peak reverse voltage	V_{RRM}	45	V
Maximum RMS voltage	V_{RMS}	32	V
Maximum DC blocking voltage	V_{DC}	45	V
Maximum average forward rectified current	$I_{(AV)}$	50	A
Peak forward surge current 8.3ms single half sine − wave superimposed on rated load (JEDEC Method)	I_{FSM}	400	A
Maximum instantanious forward voltage at 30A	V_F	0.50	V
Maximum DC reverse current $T_A = 25℃$	I_R	80	
at rated DC blocking voltage $T_A = 100℃$		20	mA
Rating for Fusing $1ms \leq t < 8.3ms$	I^2t	664	A^2s
Typical thermal resistance	$R_{\theta JC}$	1.5	$℃/W$
Operating junction temperature range	T_J	$-55\ to\ +200$	℃
Storage temperature range	T_{STG}	$-55\ to\ +150$	℃

QS50T45T: 50 AMP Schottky Barrier Rectifier

www.questsemi.com

TYPICAL CHARACTERISTIC CURVES

Figure 1: Forward Current Derating curve

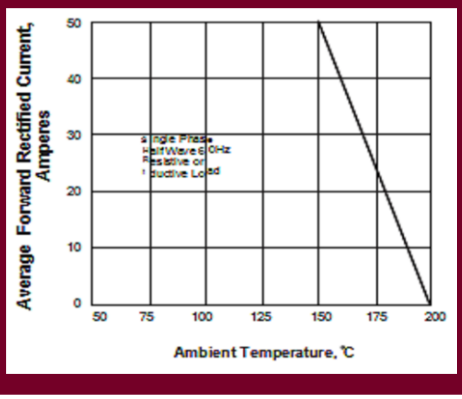


Figure 2: Typical Instantaneous Forward Characteristics

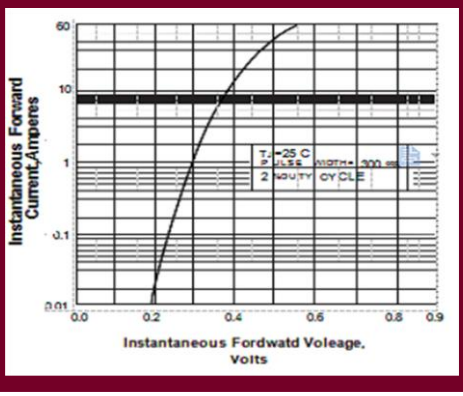


Figure 3: Maximum Non-repetitive Peak Forward Surge Current

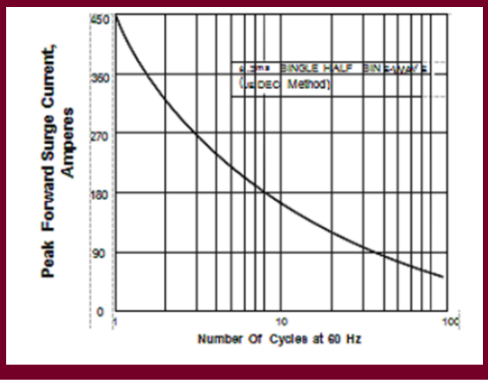
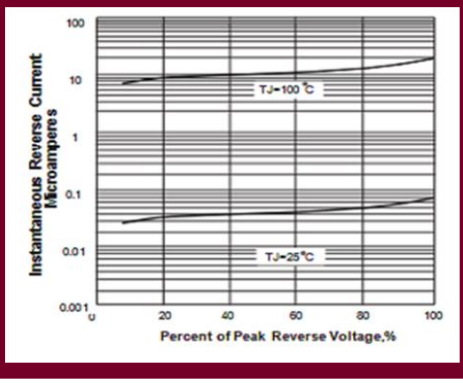
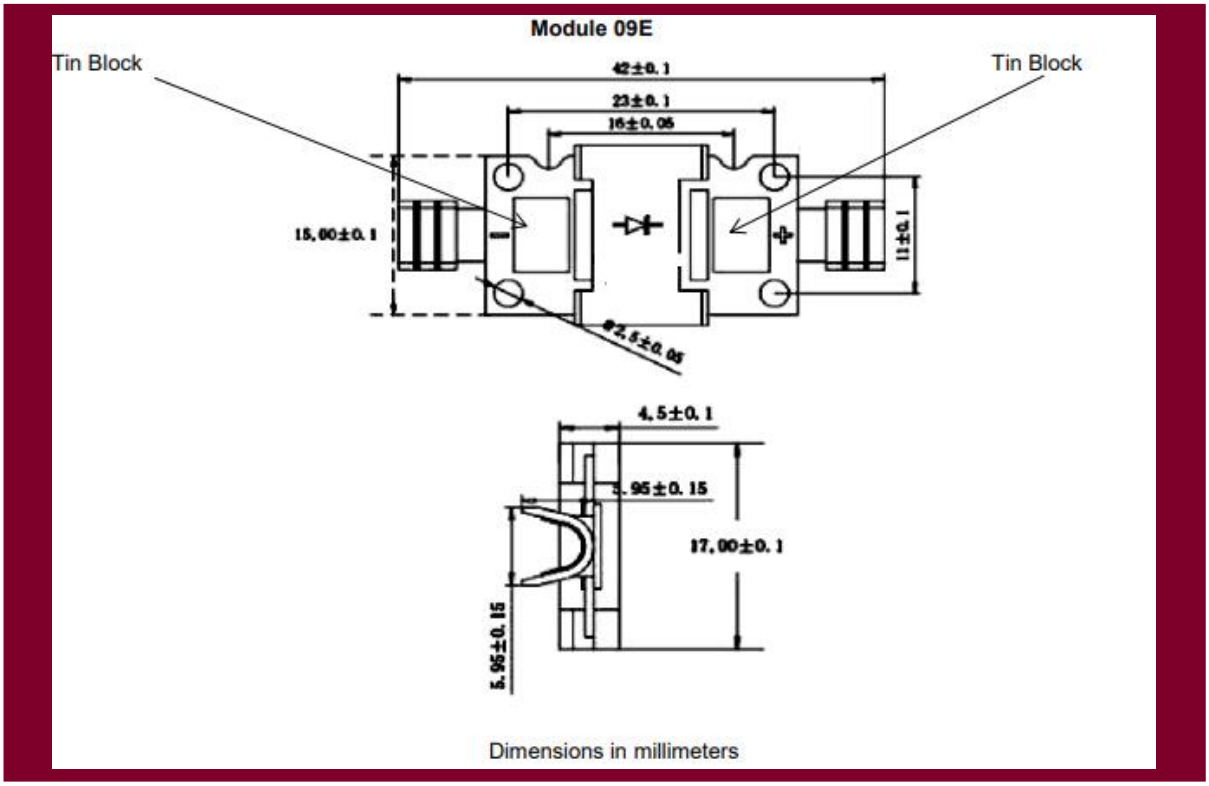


Figure 4: Typical Reverse Characteristics



QS50T45T: 50 AMP Schottky Barrier Rectifier

www.questsemi.com



Mechanical data:

Case: Module 09E moulded plastic body
Terminals: Leads solderable per MIL-STD-750, Method 2026
Polarity: As marked
Mounting Position: Any

QS50T45T: 50 AMP Schottky Barrier Rectifier

www.questsemi.com

Recommended Reflow Solder Profiles

Figure 1: Recommended solder profile for lead free terminal plating, and where lead free solder is used

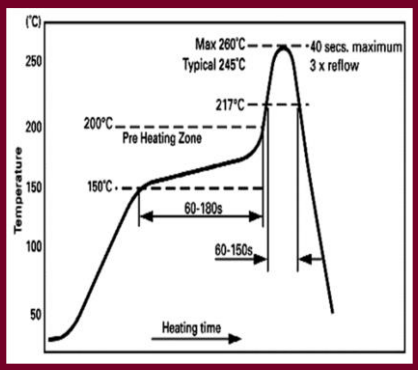
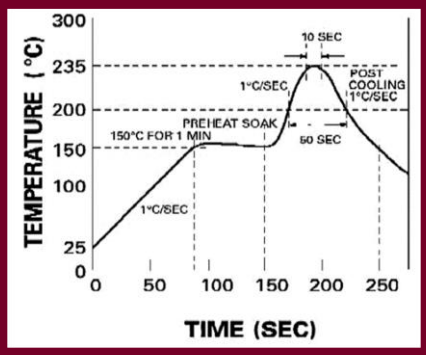


Figure 2: Recommended solder profile for devices with lead free terminal plating used with a leaded solder, or devices with a leaded terminal plating used with leaded solder



Profile Feature	*Sn – Pb System*	*Pb – Free System*
Average Ramp – Up Rate	~3°C/*second*	~3°C/*second*
Preheat –Temperature range –Time	 150 – 170°C 60 – 180 *seconds*	 150 – 200°C 60 – 180 *seconds*
Time maintained above: –Temperature –Time	 200°C 30 – 50 *seconds*	 217°C 60 – 150 *seconds*
Peak Temperature	235°C	260°C
Time within + 0 – 5°C of actual peak	10 *seconds*	40 *seconds*
Ramp – Down rate	3°C/*second max*	6°C/*second max*

QS50T45T: 50 AMP Schottky Barrier Rectifier

www.questsemi.com

Recommended Wave Solder Profiles

Figure 1: Recommended solder profile for lead free terminal plating, and where lead free solder is used

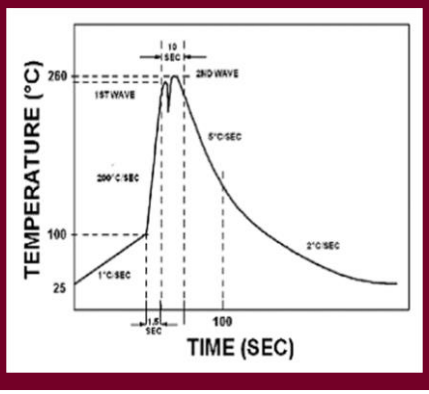
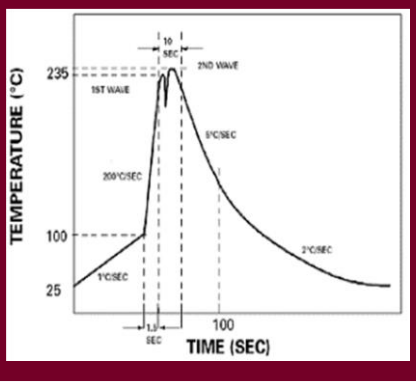


Figure 2: Recommended solder profile for devices with lead free terminal plating used with a leaded solder, or devices with a leaded terminal plating used with leaded solder



Profile Feature	*Sn – Pb System*	*Pb – Free System*
Average Ramp – Up Rate	~200°C/*second*	~200°C/*second*
Heating rate during preheat	*Typical* 1 – 2, *Max* 4°C/*sec*	*Typical* 1 – 2, *Max* 4°C/*Sec*
Final preheat temperature	*Within* 125°C *of solder temp*	*Within* 125°C *of solder temp*
Peak Temperature	235°C	260°C *max*
Time within + 0 – 5°C of actual peak	10 *seconds*	10 *seconds*
Ramp – Down rate	5°C/*second max*	5°C/*second max*

Disclaimer:

The products described in this datasheet are intended for general-purpose applications, and their specifications and performance characteristics have been established under standard operating conditions. They are not specifically designed or authorized for use in life-critical or life-support systems. Life-critical systems are those in which the failure of a semiconductor device could lead to loss of life, severe injury, or severe damage to property.

It is essential to note that the use of our products in life-critical systems is strictly prohibited without prior written consent and agreement with Quest Semi. Any such usage is at the sole risk of the customer, and Quest Semi disclaims any liability, damages, or loss arising from the use of our products in such applications.

If you are considering the use of our products in life-critical systems, please contact our sales and technical support teams to discuss the necessary measures, risk assessment, and product customization that may be required to ensure compliance with the stringent safety and reliability standards associated with these applications. Customers are strongly advised to conduct their own analysis and testing to confirm the suitability and reliability of our products for their intended application, especially in life-critical systems.

Quest Semi reserves the right to make changes to product specifications and discontinue products without notice. It is the responsibility of the customer to ensure that the latest versions of datasheets are consulted before finalizing system designs or orders.