

QS50T45TD: 50 AMP Schottky Barrier Rectifier



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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



Part Number

QS50T45TD

Package

Plastic package, Module 09E

Marking

Q

ROHS Compliant
REACH Compliant

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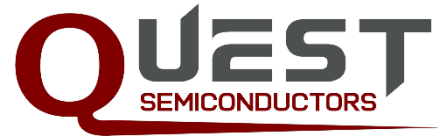


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ABSOLUTE MAXIMUM RATINGS ($T_a = 25^\circ\text{C}$ Unless otherwise specified)

<i>Parameter</i>	<i>Symbol</i>	<i>Value</i>	<i>Unit</i>
<i>Maximum repetitive peak reverse voltage</i>	V_{RRM}	45	V
<i>Maximum RMS voltage</i>	V_{RMS}	32	V
<i>Maximum DC blocking voltage</i>	V_{DC}	45	V
<i>Maximum average forward rectified current</i>	$I_{(AV)}$	50	A
<i>Peak forward surge current 8.3ms single half sine – wave superimposed on rated load (JEDEC Method)</i>	I_{FSM}	450	A
<i>Maximum instantaneous forward voltage at 30A</i>	V_F	0.47	V
<i>Maximum DC reverse current $T_A = 25^\circ\text{C}$</i>	I_R	80	
<i>at rated DC blocking voltage $T_A = 100^\circ\text{C}$</i>		20	mA
<i>Rating for Fusing $1\text{ms} \leq t < 8.3\text{ms}$</i>	I^2t	840	A^2s
<i>Typical thermal resistance</i>	$R_{\theta JC}$	1.5	$^\circ\text{C}/\text{W}$
<i>Operating junction temperature range</i>	T_J	-55 to + 200	$^\circ\text{C}$
<i>Storage temperature range</i>	T_{STG}	-55 to + 150	$^\circ\text{C}$

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TYPICAL CHARACTERISTIC CURVES

Figure 1: Forward Current Derating curve

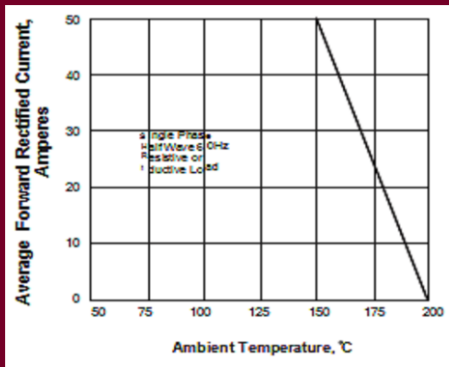


Figure 2: Typical Instantaneous Forward Characteristics

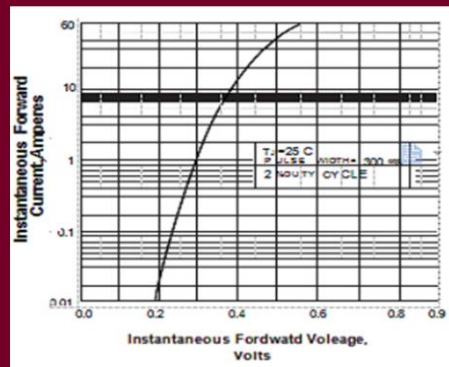


Figure 3: Maximum Non-repetitive Peak Forward Surge Current

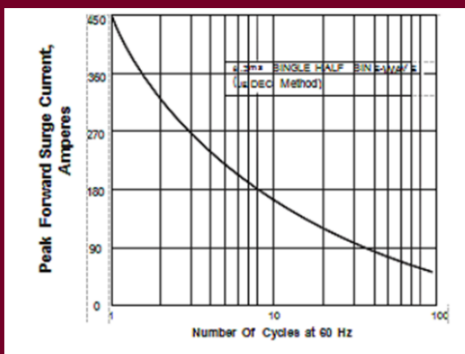
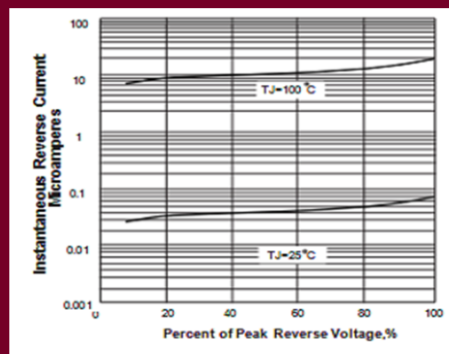


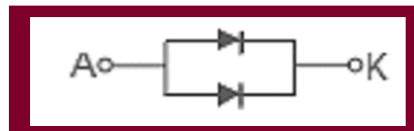
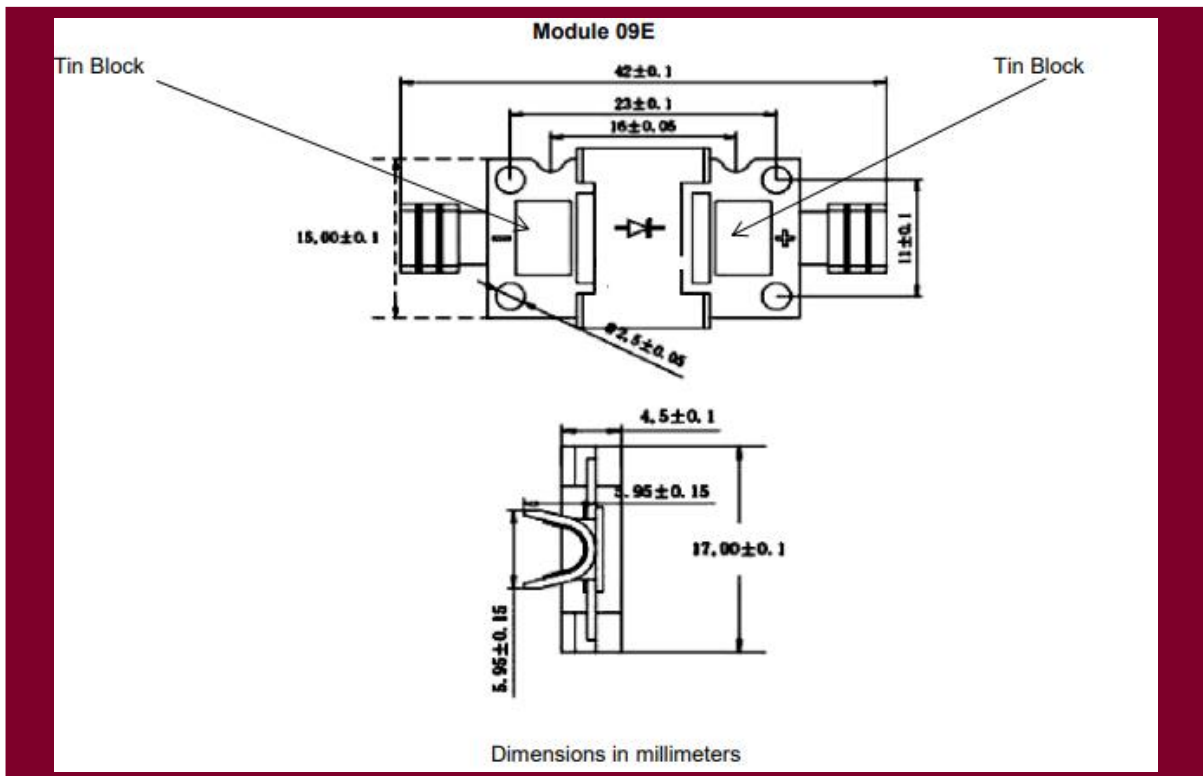
Figure 4: Typical Reverse Characteristics



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Mechanical data:

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

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Recommended Reflow Solder Profiles

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

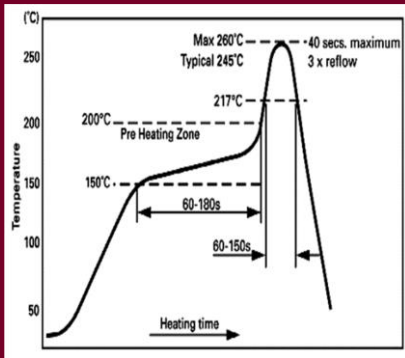
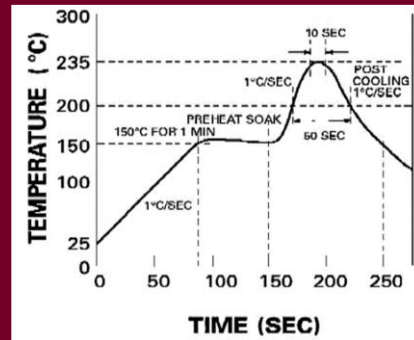


Figure 2: Recommended solder profile for devices with lead free terminal plating used with a leaded solder, or devices with a leaded terminal plating used with leaded solder



Profile Feature	Sn – Pb System	Pb – Free System
Average Ramp – Up Rate	~3°C/second	~3°C/second
Preheat		
–Temperature range	150 – 170°C	150 – 200°C
–Time	60 – 180 seconds	60 – 180 seconds
Time maintained above:		
–Temperature	200°C	217°C
–Time	30 – 50 seconds	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

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Recommended Wave Solder Profiles

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

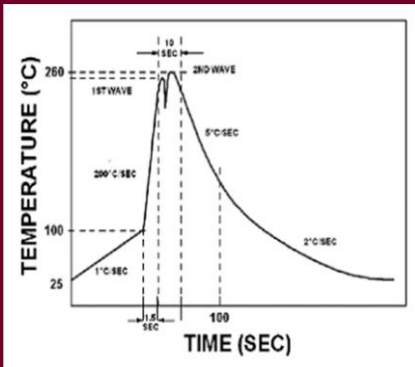
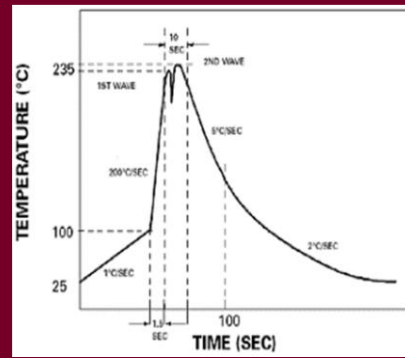


Figure 2: Recommended solder profile for devices with lead free terminal plating used with a leaded solder, or devices with a leaded terminal plating used with leaded solder



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

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