



400V 1A 50ns Rectifier – MURC140

Rev 1.0
27/12/22

Ultra-Fast recovery rectifier diode in bare die form

Features:

- Low leakage current
- High forward surge current capability
- Low forward voltage drop
- Robust construction
- High reliability tested grades.

Ordering Information

The following part suffixes apply:

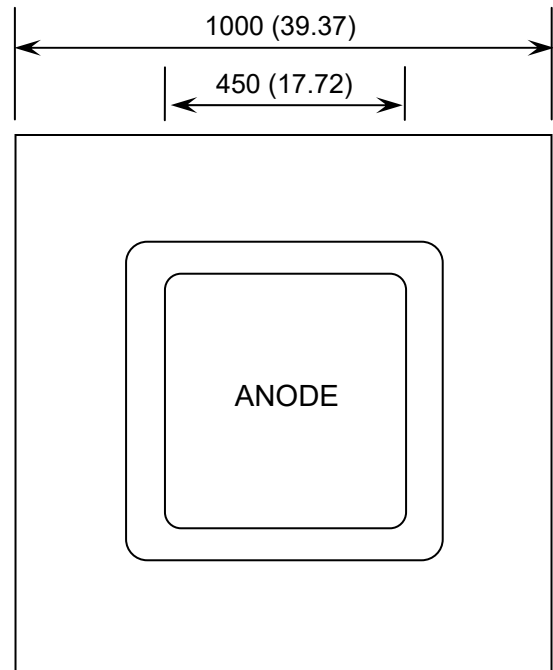
- No suffix - MIL-STD-750 /2073 Visual Inspection
- “H” - MIL-STD-750 /2073 Visual Inspection
+ MIL-PRF-38534 Class H LAT
- “K” - MIL-STD-750 /2073 Visual Inspection
+ MIL-PRF-38534 Class K LAT

LAT = Lot Acceptance Test.

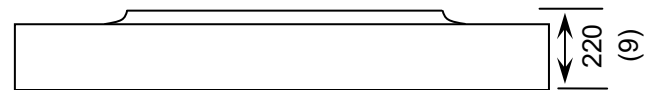
For further information on LAT process flows see below.

www.siliconsupplies.com/quality/bare-die-lot-qualification

Die Dimensions in μm (mils)



CHIP BACKSIDE IS CATHODE



Supply Formats:

- Default – Die in Waffle Pack (100 per tray capacity)
- Sawn Wafer on Tape – By specific request
- Unsawn Wafer – By specific request
- With additional electrical selection – By specific request

Mechanical Specification

Die Size (Unsawn)	1000 x 1000 39.37 x 39.37	μm mils
Anode Pad Size	450 x 450 17.72 x 17.72	μm mils
Die Thickness	220 (± 20) 8.66 (± 0.79)	μm mils
Top Metal Composition	Al 7.5 μm	
Back Metal Composition	Ti/Ni/Ag	





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Absolute Maximum Ratings¹ $T_J = 25^\circ\text{C}$ unless otherwise stated

PARAMETER	SYMBOL	VALUE	UNIT
Peak Repetitive Reverse Voltage	V_{RRM}	400	V
Working Peak Repetitive Reverse Voltage	V_{RWM}		
DC Blocking Voltage	V_R		
RMS Reverse Voltage	$V_{R(RMS)}$	283	V
Average Forward Rectified Current,	$I_{F(AV)}$	1	A
Non-Repetitive Peak Forward Surge Current ³	I_{FSM}	35	A
Operating Junction temperature	T_J	-65 to 175	$^\circ\text{C}$
Storage Temperature Range	T_{STG}	-65 to 175	$^\circ\text{C}$

Electrical Characteristics $T_J = 25^\circ\text{C}$ unless otherwise stated

PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNIT
Maximum Instantaneous Forward Voltage ⁴	V_F	$I_F = 1\text{A}, T_J = 25^\circ\text{C}$	-	1.10	1.25	V
		$I_F = 1\text{A}, T_J = 150^\circ\text{C}$	-	-	1.05	
Maximum Instantaneous Reverse Leakage Current ⁴	$I_{RM} @ V_{RRM}$	$V_{RRM} = 400\text{V}, T_J = 25^\circ\text{C}$	-	0.02	1	μA
		$V_{RRM} = 400\text{V}, T_J = 150^\circ\text{C}$	-	-	150	
Reverse Recovery Time	t_{rr}	$I_F = 0.5\text{A}, I_R = 1.0\text{A}, I_{rr} = 0.25\text{A}$	-	-	50	ns
Junction Capacitance	C_J	$V_R = 4\text{V}, f = 1.0\text{MHz}$	-	15	-	pF

1. Operation above the absolute maximum rating may cause device failure. Operation at the absolute maximum ratings, for extended periods, may reduce device reliability. 2. $V_R = 600\text{V}$, Square Wave, 20kHz Pulse Width = 3.8ms 3. Assembled in SOD-123F, surge applied at rated load conditions halfwave, single phase, 60Hz, die form requires heat sinking 4. Pulse Test: Pulse Width = 300s, Duty Cycle $\leq 2.0\%$

Typical Characteristics $T_J = 25^\circ\text{C}$ unless otherwise stated

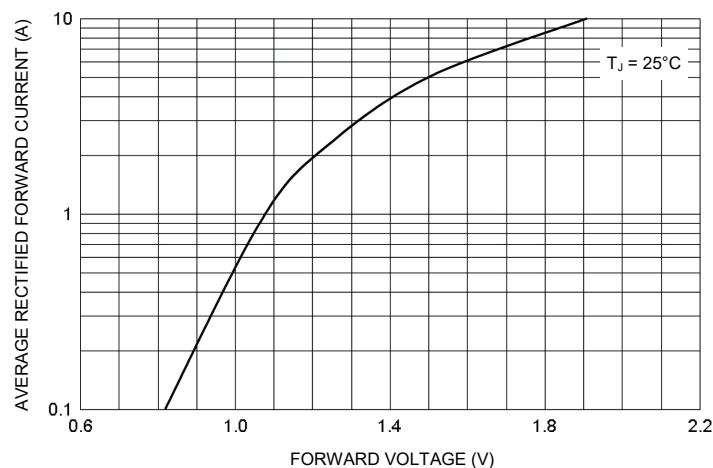


FIGURE 1. Forward Voltage Characteristics





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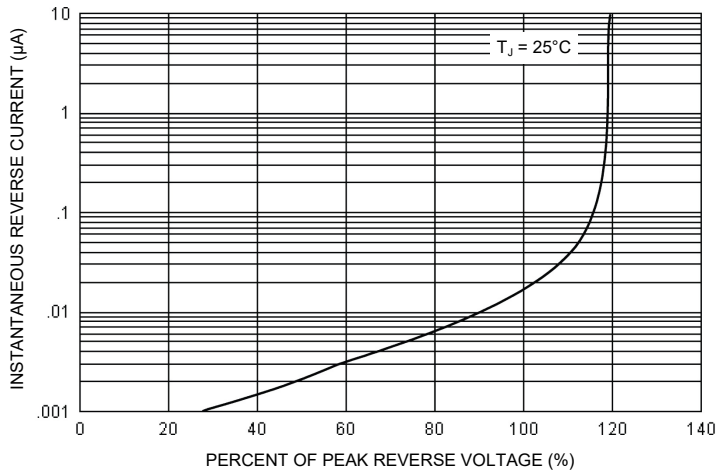


FIGURE 2. Reverse Current Versus Reverse Voltage

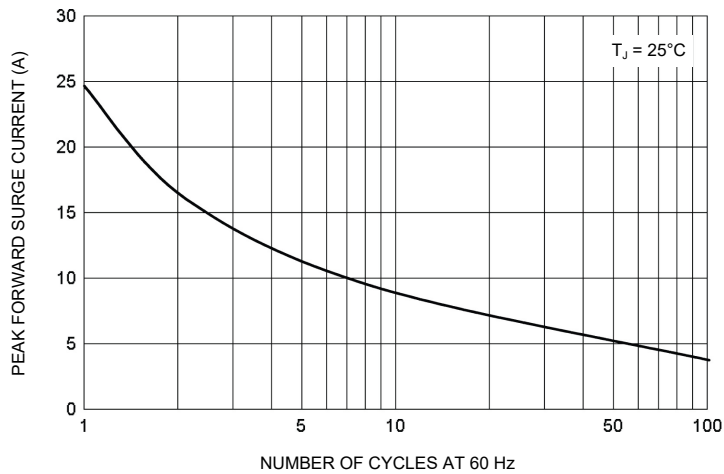


FIGURE 3. Peak Forward Surge Current Versus Cycles at 60 Hz

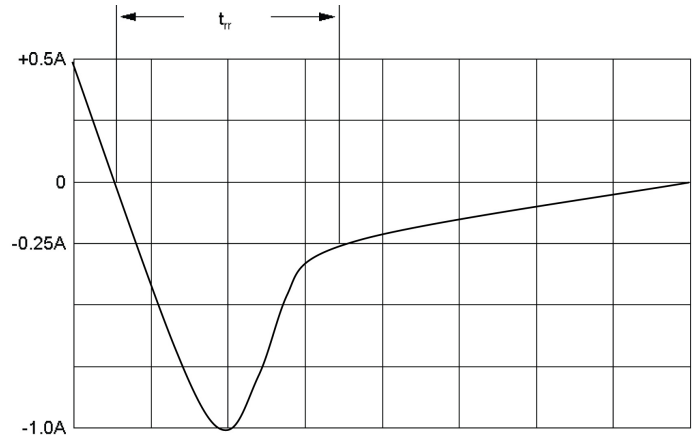
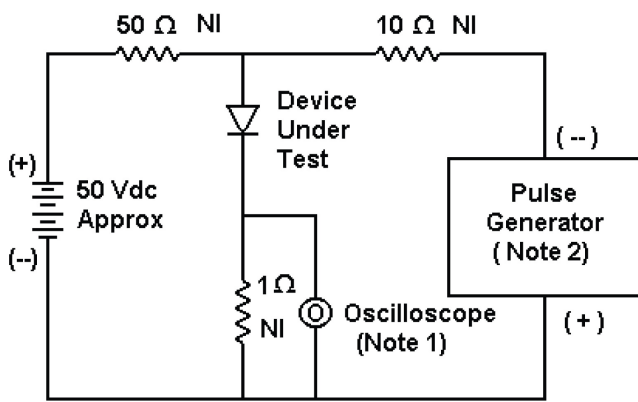




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Typical Characteristics Continued $T_J = 25^\circ\text{C}$ unless otherwise stated



Set time base for 10/20 ns/cm

Notes:

- 1. Rise Time = 7 ns max. Input Impedance = 1 M Ω , 22 pF
- 2. Rise Time = 10 ns max. Input Impedance = 50 Ω

FIGURE 4. Reverse Recovery Time Characteristics + Test Circuit

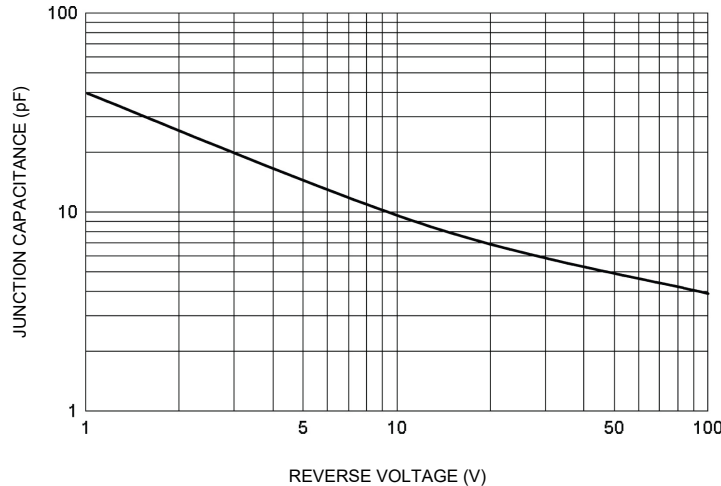


FIGURE 5. Typical Junction Capacitance

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