400V 1A 50ns Rectifier – MURC140

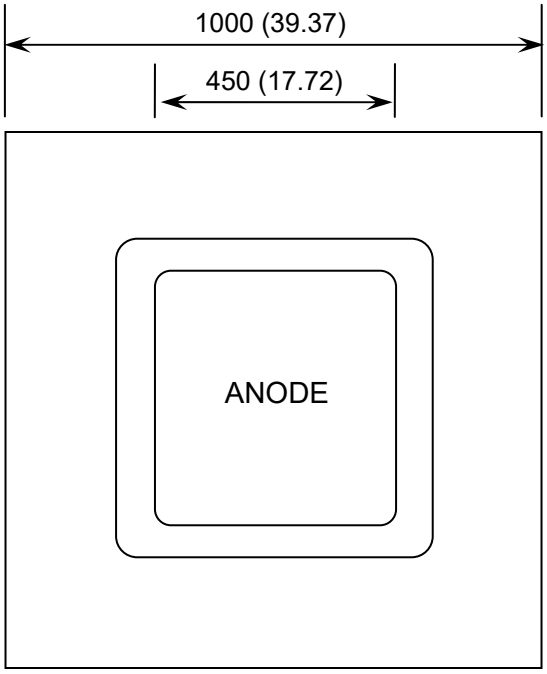
Rev 1.0
27/12/22

Ultra-Fast recovery rectifier diode in bare die form

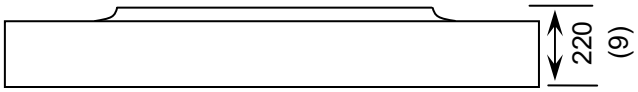
Features:

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

Die Dimensions in µm (mils)



CHIP BACKSIDE IS CATHODE



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

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 7.5µm	
Back Metal Composition	Ti/Ni/Ag	

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Absolute Maximum Ratings[1] T_J = 25°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	°C
Storage Temperature Range	T_{STG}	-65 to 175	°C

Electrical Characteristics T_J = 25°C unless otherwise stated

PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNIT
Maximum Instantaneous Forward Voltage[4]	V_F	I_F = 1A, T_J = 25°C	-	1.10	1.25	V
		I_F = 1A, T_J = 150°C	-	-	1.05	
Maximum Instantaneous Reverse Leakage Current[4]	I_{RM} @ V_{RRM}	V_{RRM} = 400V, T_J = 25°C	-	0.02	1	µA
		V_{RRM} = 400V, T_J = 150°C	-	-	150	
Reverse Recovery Time	t_{rr}	I_F = 0.5A, I_R = 1.0A, I_{rr} = 0.25A	-	-	50	ns
Junction Capacitance	C_J	V_R = 4V, f = 1.0MHz	-	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 = 600V, 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 ≤ 2.0%

Typical Characteristics T_J = 25°C unless otherwise stated

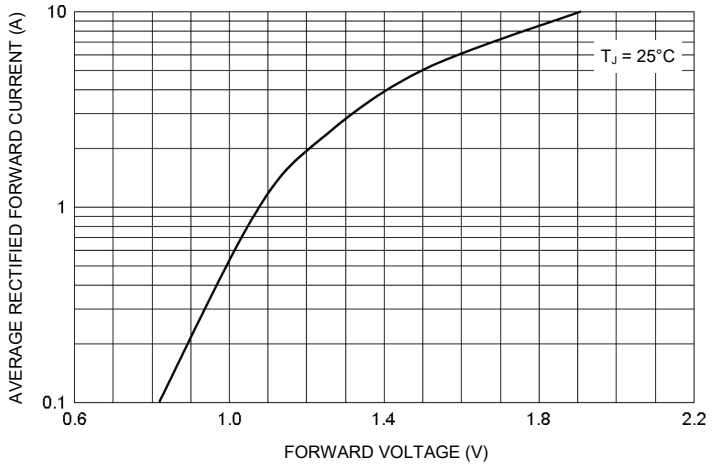

FIGURE 1. Forward Voltage Characteristics

Typical Characteristics Continued T_J = 25°C unless otherwise stated

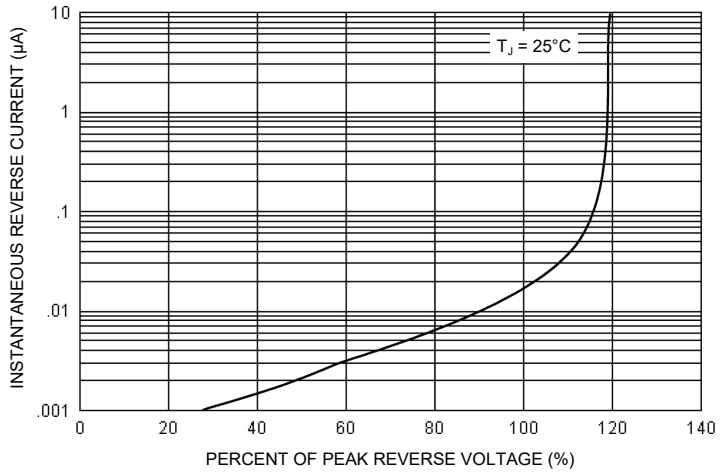

FIGURE 2. Reverse Current Versus Reverse Voltage

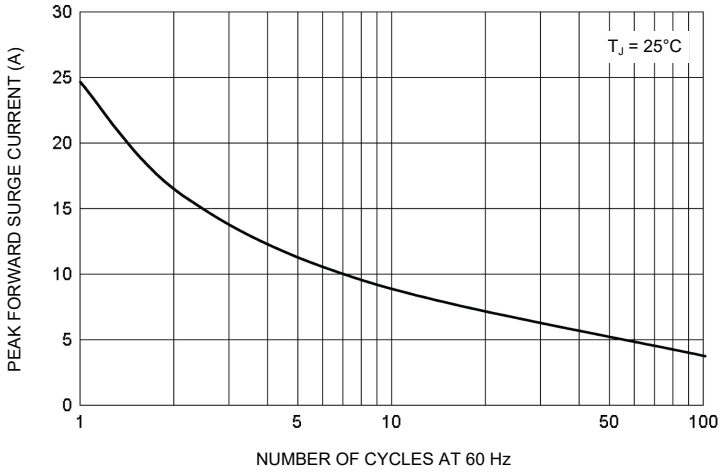

FIGURE 3. Peak Forward Surge Current Versus Cycles at 60 Hz

Typical Characteristics Continued T_J = 25°C unless otherwise stated

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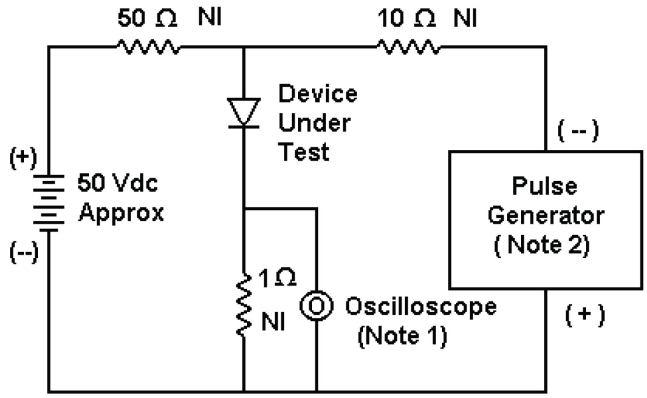

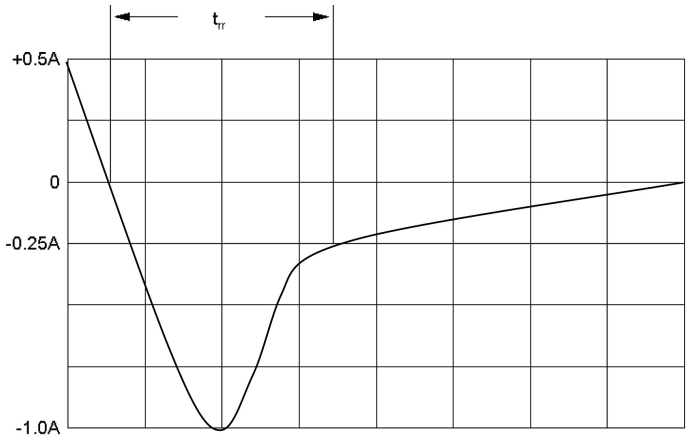

Notes:
1. Rise Time = 7 ns max. Input Impedance =1 M Ω , 22 pF
2. Rise Time = 10 ns max. Input Impedance = 50 Ω

Set time base for 10/20 ns/cm

FIGURE 4. Reverse Recovery Time Characteristics + Test Circuit

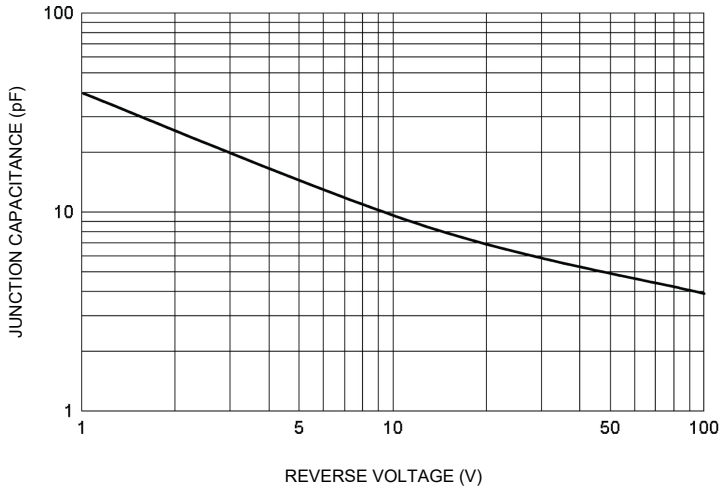

FIGURE 5. Typical Junction Capacitance