



Microsemi Corp.

The diode experts

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40SL SERIES

4 AMP AXIAL-LEAD FAST RECOVERY RECTIFIER DIODES

DESCRIPTION/FEATURES

- ECONOMICAL 4 AMP I_O MOLDED DEVICE OFFERS CAPABILITY OF STUD-MOUNTED RECTIFIERS
- 150 AMPS SURGE PROVIDES HIGH IN-RUSH CURRENT CAPABILITY
- WIDE VOLTAGE RANGE AVAILABLE: 50 TO 1000 VOLTS V_{RRM}

MAJOR RATINGS AND CHARACTERISTICS

	40 SL	
$I_{F(AV)}$	4	A
at Max. T_L	62	°C
I_{FSM} at 50Hz	143	A
I_{FSM} at 60Hz	150	A
I^2t at 50Hz	103	A ² s
I^2t at 60Hz	94	A ² s
T_J	-40 to 150	°C
V_{RRM} Range	50 - 1000	V
t_{rr}	200	ns

VOLTAGE RATINGS

Part Number	Working V_{RRM} Peak Reverse Voltage	V_R (V) Max. Direct Reverse Voltage
	$T_J = -40^\circ\text{C}$ to 200°C	$T_J = -40^\circ\text{C}$ to 200°C
40SL05	50	50
40SL1	100	100
40SL2	200	200
40SL4	400	400
40SL5	500	500
40SL6	600	600
40SL8	800	800
40SL10	1000	1000

ELECTRICAL SPECIFICATIONS

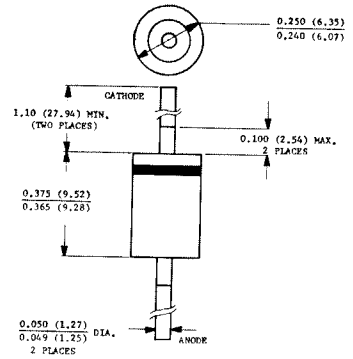
	40SL	Units	Conditions
$I_{F(AV)}$ Max. average forward current	4	A	1-phase operation, 180° conduction, $T_L = 95^\circ\text{C}$, $\ell = 9.5$ mm (0.375 in.)
I_{FSM} Max. peak one-cycle non-repetitive surge current	143	A	Half cycle 50Hz sine wave or 6ms rectangular pulse Following any rated load condition and with V_{RRM} applied.
	150		Half cycle 60Hz sine wave or 5ms rectangular pulse
	170		Half cycle 50Hz sine wave or 6ms rectangular pulse Following any rated load condition and with V_{RRM} applied following surge = 0.
	178		Half cycle 60Hz sine wave or 5ms rectangular pulse
I^2t Max. I^2t for fusing	103	A ² s	$t = 10$ ms With rated V_{RRM} applied following surge, initial $T_J = 175^\circ\text{C}$.
	94		$t = 8.3$ ms
	145		$t = 10$ ms With $V_{RRM} = 0$ following surge, initial $T_J = 175^\circ\text{C}$.
	132		$t = 8.3$ ms
$I^2\sqrt{t}$ Max. $I^2\sqrt{t}$ for individual device fusing (Note 1.)	1450	A ² \sqrt{s}	$t = 0.1$ to 10ms, $V_{RRM} = 0$ following surge.
V_{FM} Max. peak forward voltage	1.40	V	$I_{F(AV)} = 4$ A (12.6 A peak), $T_J = 25^\circ\text{C}$
$I_{R(AV)}$ Max. average reverse current	5	mA	$T_L = 62^\circ\text{C}$, $V_{RRM} =$ rated V_{RRM} , $I_{F(AV)} =$ rated $I_{F(AV)}$, 1 phase operation.
I_R Max. dc reverse current	3	mA	$T_L = 100^\circ\text{C}$ — $V_R =$ Rated V_R .
	25	μA	$T_L = 25^\circ\text{C}$
t_{rr} Max. reverse recovery time	200	ns	$T_L = 25^\circ\text{C}$, $I_F = 1$ A, $V_R = 30$ V
			$di/dt = 25$ A/ μs
$I_{RM(REC)}$ Max. peak reverse recovery current	5	A	$T_L = 25^\circ\text{C}$, $I_{FM} = 12.5$ A, $t_p \approx 1.6$ μs , $di/dt = 25$ A/ μs

THERMAL MECHANICAL SPECIFICATIONS

T_J	Max. operating junction temperature range	-40°C to 150	°C
T_{stg}	Max. storage temperature range	-40°C to 175	°C
R_{thJC}	Max. internal thermal resistance, junction-to-leads	--	deg C/W (Note 2.)
	Length of leads (ℓ) (1/8") 3.2 mm	11.0	deg C/W $\pm 10\%$
	Length of leads (ℓ) (3/8") 9.5 mm	14.7	
	Length of leads (ℓ) (3/4") 19 mm	20.0	
wt	Approximate weight	1.5 (0.053)	g (oz)

Note 1. I^2t for time $t_x = I^2t / I^2 \sqrt{t_x}$

Note 2. DC operation, double side cooled, measured 9.5 mm (0.375 in.) from body.



All Dimensions in Inches and (Millimeters)

MECHANICAL CHARACTERISTICS

CASE: Molded plastic use Flame Retardant Epoxy.

TERMINALS: Axial leads, solderable per MIL-STD-202, Method 208.

POLARITY: Color band denotes cathode.

MOUNTING POSITION: Any.

40SL Series

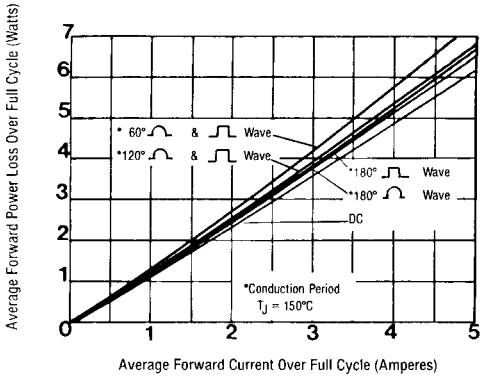


FIGURE 1
MAXIMUM LOW-LEVEL AVERAGE FORWARD POWER LOSS VS. AVERAGE FORWARD CURRENT

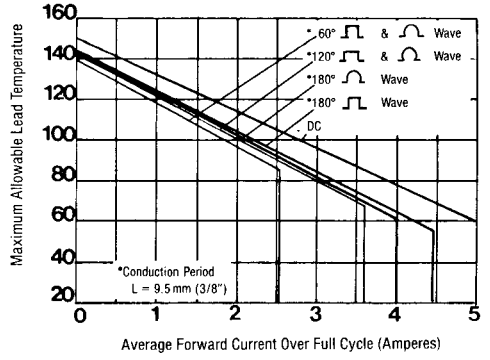


FIGURE 2
AVERAGE FORWARD CURRENT VS. LEAD TEMPERATURE

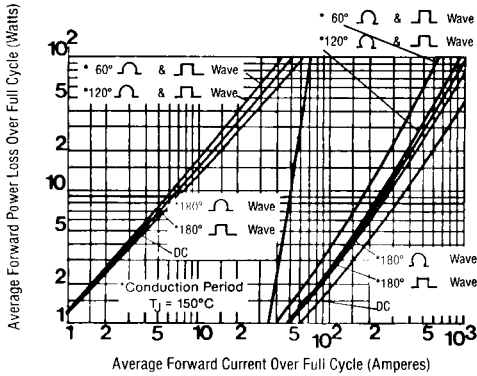


FIGURE 3
MAXIMUM HIGH-LEVEL FORWARD POWER LOSS VS. AVERAGE FORWARD CURRENT

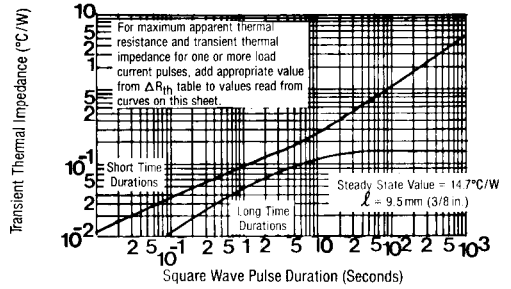


FIGURE 4
MAXIMUM TRANSIENT THERMAL IMPEDANCE JUNCTION TO LEAD VS. PULSE DURATION

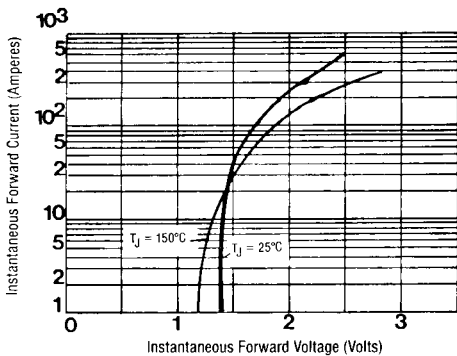


FIGURE 5
MAXIMUM FORWARD VOLTAGE VS. FORWARD CURRENT

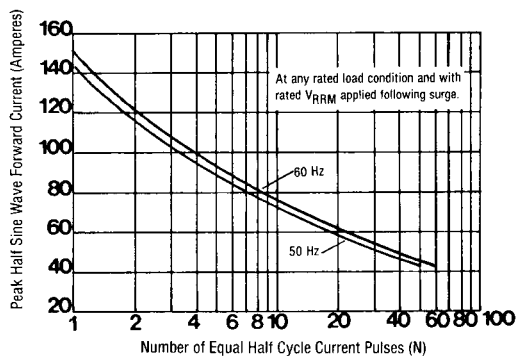


FIGURE 6
MAXIMUM NON-REPETITIVE SURGE CURRENT VS. NUMBER OF CURRENT PULSES