



**Microsemi Corp.**

The diode experts

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# 40SL SERIES

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

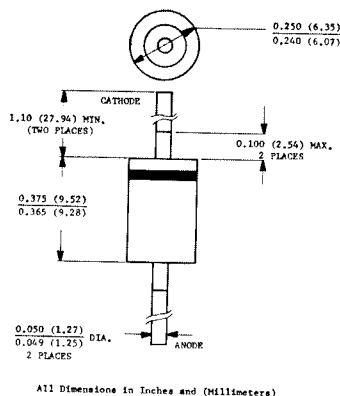
## THERMAL MECHANICAL SPECIFICATIONS

$T_J$	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.)
$\ell$	Length of leads ( $\ell$ ) (1/8") 3.2 mm	11.0	deg C/W $\pm 10\%$
	Length of leads ( $\ell$ ) (3/8") 9.5 mm	14.7	
	Length of leads ( $\ell$ ) (3/4") 19 mm	20.0	
wt	Approximate weight	1.5 (0.053)	g (oz)

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

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

## 4 AMP AXIAL-LEAD FAST RECOVERY RECTIFIER DIODES



All Dimensions in Inches and (Millimeters)

## MECHANICAL CHARACTERISTICS

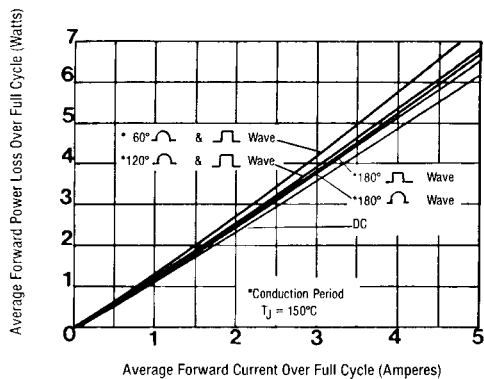
CASE: Molded plastic use Flame Retardant Epoxy.

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

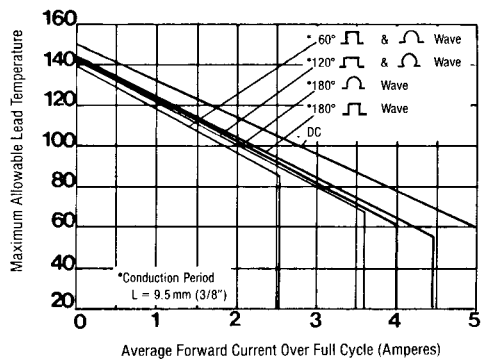
POLARITY: Color band denotes cathode.

MOUNTING POSITION: Any.

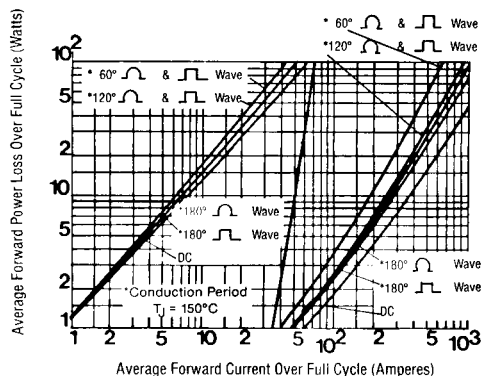
# 40SL Series



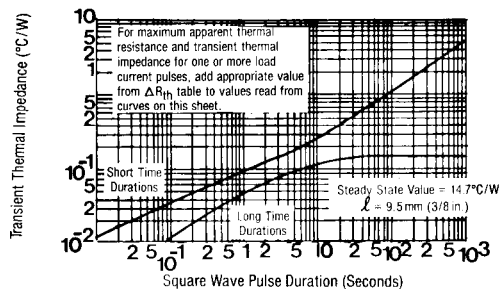
**FIGURE 1**  
MAXIMUM LOW-LEVEL AVERAGE  
FORWARD POWER LOSS VS.  
AVERAGE FORWARD CURRENT



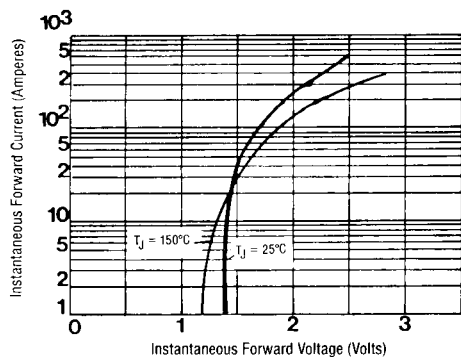
**FIGURE 2**  
AVERAGE FORWARD CURRENT  
VS. LEAD TEMPERATURE



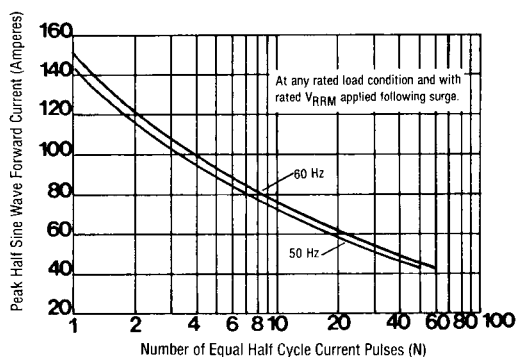
**FIGURE 3**  
MAXIMUM HIGH-LEVEL FORWARD  
POWER LOSS VS. AVERAGE  
FORWARD CURRENT



**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