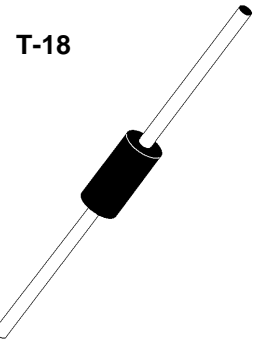


**DESCRIPTION**

The ELCR80 low capacitance rectifier is used in parallel with a low-capacitance transient voltage suppressor (TVS) such as the LCE6.5-170A series for unidirectional applications as shown in Figure 4. It is rated for 100 Amp forward surges to compliment this 1500 Watt TVS series and also provide a low capacitance and a low forward ( $V_F$ ) voltage with fast response time. The low capacitance rating of 100 pF when used in parallel to the LCE6.5-170A series will result in a total capacitance of 200 pF or less at zero volts for protecting higher frequency applications from inductive switching threats or electrical systems involving secondary lightning effects per IEC61000-4-5 as well as RTCA/DO-160D or ARINC 429 for airborne avionics. With their fast response time, they also provide ESD and EFT protection per IEC61000-4-2 and IEC61000-4-4 respectively.

**APPEARANCE**



**IMPORTANT:** For the most current data, consult MICROSEMI's website: <http://www.microsemi.com>

**FEATURES**

- Suppresses transient in forward direction up to 1500 Watts Peak Pulse Power @ 10/1000  $\mu$ s
- Economical small plastic surface mount with robust axial subassembly package
- Optional 100% **screening for avionics grade** is available by adding MA prefix to part number for added 100% temperature cycle -55°C to +125°C (10X) as well as surge (3X) and 24 hours HTRB with post test  $V_Z$  &  $I_R$
- Options for screening in accordance with MIL-PRF-19500 for JAN, JANTX, JANTXV, and JANS are also available by adding MQ, MX, MV, or MSP prefixes respectively to part number, e.g. MXELCR80, MVELCR80, etc.
- Also available in surface mount package with part number HSMBJLCR80 (see separate data sheet)
- RoHS Compliant devices available by adding "e3" suffix

**APPLICATIONS / BENEFITS**

- Low-capacitance Rectifier to compliment the low capacitance TVS series for unidirectional applications
- Improved protection of low capacitance TVS
- Low Capacitance for data-line protection to 1 MHz
- Protection for aircraft fast data rate lines per select level waveforms in RTCA/DO-160D & ARINC 429 with bit rates of 100 kb/s (per ARINC 429, Part 1, par. 2.4.1.1)
- ESD and EFT protection per IEC61000-4-2 and IEC61000-4-4 respectively
- Secondary lightning protection per IEC61000-4-5 with 42 Ohms source impedance in the forward direction for Class 1, 2, 3, and 4
- Secondary lightning protection per IEC61000-4-5 with 12 Ohms source impedance in the forward direction for Class 1, 2, and 3

**MAXIMUM RATINGS**

- Forward Peak Pulse Current at 25°C: 100 Amps @ 10/1000  $\mu$ s with repetition rate of 0.01% or less\*
- Steady State Power Dissipation: 5 Watts at  $T_L = 25^\circ\text{C}$  3/8 inch from body
- Clamping Speed (0 volts to  $V_{(BR)}$  Min.) less than 5 nanoseconds.
- Operating and Storage Temperature: -65°C to +150°C

**MECHANICAL AND PACKAGING**

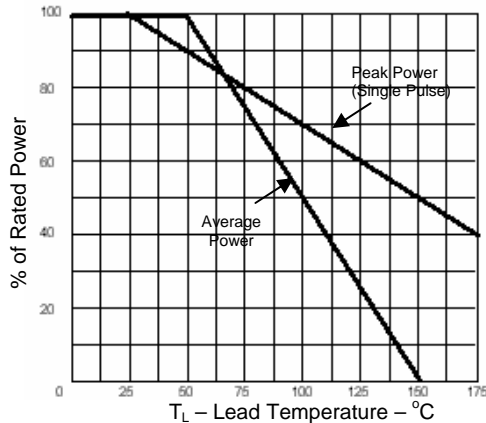
- CASE: Void Free Transfer Molded Thermosetting Plastic epoxy body meeting UL94V-0
- FINISH: Tin-Lead or RoHS Compliant annealed matte-Tin plating readily solderable per MIL-SD-750, method 2026
- POLARITY: Cathode Marked with Band
- MARKING: Part number ELCR80 or ELCRe3
- WEIGHT: 0.7 Grams (Approx.)

**ELECTRICAL CHARACTERISTICS @ 25°C**

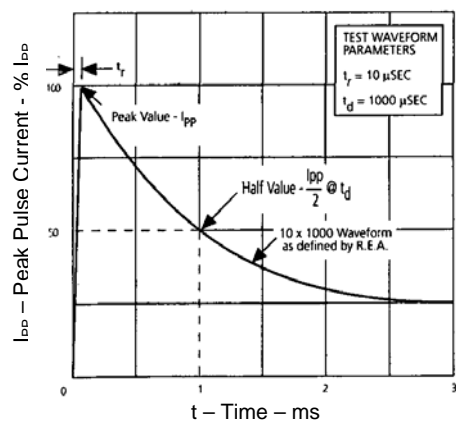
| MICROSEMI PART NUMBER | WORKING PEAK REVERSE VOLTAGE<br>$V_{RWM}$<br>Volts | REVERSE BREAKDOWN VOLTAGE @ $I_{(BR)} 1.0\text{mA}$<br>$V_{(BR)}$<br>Volts Min. | REVERSE CURRENT @ $V_{RWM}$<br>$I_R$<br>$\mu\text{A}$ | MAXIMUM FORWARD VOLTAGE @ $I_{PP}$<br>$V_F$<br>Volts | MAXIMUM PEAK PULSE CURRENT* RATING<br>$I_{PP}$<br>Amps | MAXIMUM CAPACITANCE @ 0 Volts |
|-----------------------|--|---|---|--|--|-------------------------------|
| ELCR80<br>ELCR80e3    | 200  | 220   | 10  | 7.0  | 100  | 100 pF                        |

\*See Figure 3

GRAPHS



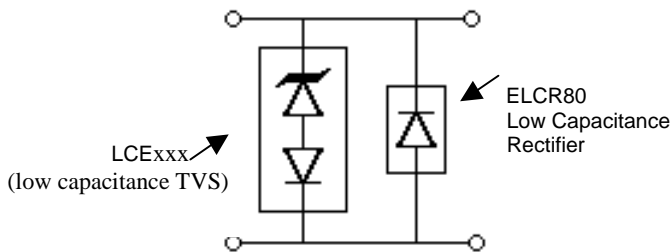
**FIGURE 2**



**FIGURE 3**

SCHMATIC APPLICATIONS

A typical low capacitance TVS device configuration is shown in Figure 4 when used with a separate rectifier to maintain low capacitance. As shown, an additional low capacitance rectifier diode is used in parallel in the same polarity direction as the TVS. In applications where random high voltage transients occur, this will prevent reverse transients from damaging the internal low capacitance rectifier diode within the TVS and also provide a low voltage conducting direction. This added rectifier diode such as the ELCR80 is of similar low capacitance as the TVS and also has a higher reverse voltage rating than the TVS clamping voltage  $V_C$ . The unidirectional configuration in Figure 4 will result in twice the capacitance of the LCE6.5 – 170A series of low capacitance TVSs that are rated at 100 pF maximum. This results in a total of 200 pF maximum in this parallel configuration since the ELCR80 is also the same capacitance value of 100 pF maximum.



**FIGURE 4**

Unidirectional configuration of Low Capacitance TVS (such as the LCE6.5-170A series) and a separate ELCR80 rectifier in parallel)

PACKAGE DIMENSIONS

