

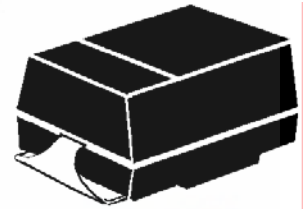


## LOW CAPACITANCE RECTIFIER

### DESCRIPTION

The HSMBJLCR60 low capacitance rectifier is used in parallel applications with a low-capacitance transient voltage suppressor (TVS) such as the HSMBJSAC5.0-50 series for unidirectional applications as shown in Figure 4. It is rated for 44 Amp forward surges to compliment this 500 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 30 pF when used in parallel to the HSMBJSAC series will result in a total capacitance of 60 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



**DO-214AA**  
See package notes

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

### FEATURES

- Suppresses transient in forward direction up to 500 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. MXHSMBJLCR60, MVHSMBJLCR60, etc.
- Also available in axial-leaded package with part number LCR60 (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 performance in low capacitance of 30 pF
- Low Capacitance for data-line protection to 10 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: 44 Amps @ 10/1000  $\mu$ s with repetition rate of 0.01% or less\*
- Steady State Power Dissipation\* at  $T_L = +75^\circ\text{C}$ : 2.5 Watts.
- Clamping Speed (0 volts to  $V_{(BR)}$  Min.) less than 5 nanoseconds.
- Operating and Storage Temperature: -65°C to +150°C.

### MECHANICAL AND PACKAGING

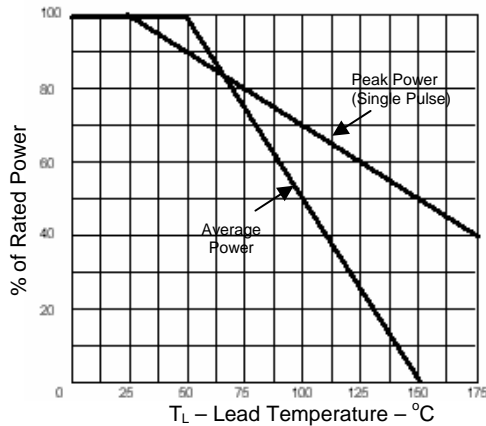
- CASE: Void Free Transfer Molded Thermosetting Plastic epoxy body meeting UL94V-0
- FINISH: Tin-lead or RoHS Compliant annealed matte-Tin plating readily solderable per MIL-STD-750, method 2026
- POLARITY: Cathode Marked with Band
- MARKING: Part number without HSMBJ prefix (e.g. LCR60 or LCR60e3)
- WEIGHT: 0.1 Grams (Approx.)

### ELECTRICAL CHARACTERISTICS @ 25°C

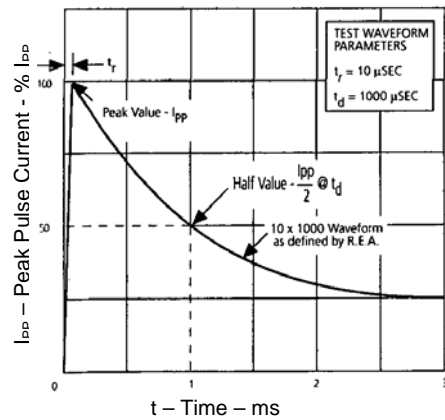
MICROSEMI PART NUMBER	WORKING PEAK REVERSE VOLTAGE $V_{RWM}$ Volts	REVERSE BREAKDOWN VOLTAGE @ $I_{(BR)}$ 1.0mA $V_{(BR)}$ Volts Min.	REVERSE CURRENT @ $V_{RWM}$ $I_R$ $\mu$ A	MAXIMUM FORWARD VOLTAGE @ $I_{PP}$ $V_F$ Volts	MAXIMUM PEAK PULSE CURRENT* RATING $I_{PP}$ Amps	CAPACITANCE @ 0 Volts pF
HSMBJLCR60 HSMBJLCR60e3	200	220	10	7.0	44	30



**GRAPHS**



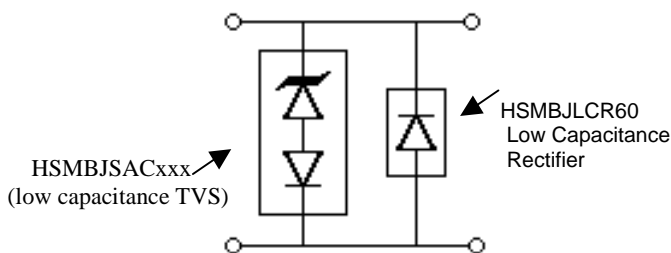
**FIGURE 2**



**FIGURE 3**

**SCHEMATIC APPLICATIONS**

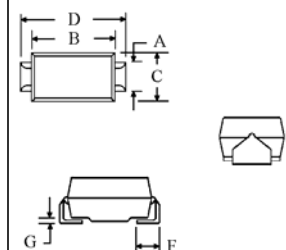
A typical low capacitance TVS device configuration is shown in Figure 4 when used with a separate rectifier to maintain low capacitance. As shown, an additional low capacitance rectifier diode is used in parallel in the same polarity direction as the TVS. In applications where random high voltage transients 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 HSMBJLCR60 is of similar low capacitance as the TVS and also has a higher reverse voltage rating than the TVS clamping voltage V<sub>C</sub>. The unidirectional configuration in Figure 4 will result in twice the capacitance of the HSMBJSACxxx series of low capacitance TVSs that are rated at 30 pF maximum. This results in a total of 60 pF maximum in this parallel configuration since the HSMBJLCR60 is also the same capacitance value of 30 pF.



**FIGURE 4**

Unidirectional configuration of Low Capacitance TVS (such as the HSMBJSAC5.0-50 series) and a separate HSMBJLCR60 rectifier in parallel)

**PACKAGE DIMENSIONS**



DIM	DIMENSIONS			
	INCHES		MILLIMETER	
	MIN	MAX	MIN	MAX
A	.073	.087	1.85	2.21
B	.160	.180	4.06	4.57
C	.130	.155	3.30	3.94
D	.205	.220	5.21	5.59
E	.075	.130	1.91	3.30
F	.030	.060	.76	1.52
G	.006	.016	.15	.41

NOTE: Dimension E exceeds the JEDEC outline in height as shown