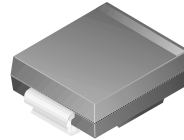


## Transient Voltage Suppressors SMCJ5V0(C)A - SMCJ170(C)A

### Features

- Glass passivated junction.
- 1500 W Peak Pulse Power capability on 10/1000  $\mu$ s waveform.
- Excellent clamping capability.
- Low incremental surge resistance.
- Fast response time; typically less than 1.0 ps from 0 volts to BV for unidirectional and 5.0 ns for bidirectional.
- Typical  $I_R$  less than 1.0  $\mu$ A above 10V.
- UL certified, UL #E210467.



**SMC/DO-214AB**  
COLOR BAND DENOTES CATHODE ON UNIDIRECTIONAL DEVICES ONLY. NO COLOR BAND ON BIDIRECTIONAL DEVICES.

### DEVICES FOR BIPOLAR APPLICATIONS

- Bidirectional types use CA suffix.
- Electrical Characteristics apply in both directions.

## 1500 Watt Transient Voltage Suppressors

### Absolute Maximum Ratings\* $T_A = 25^\circ\text{C}$ unless otherwise noted

| Symbol    | Parameter  | Value       | Units            |
|-----------|--|-------------|------------------|
| $P_{PPM}$ | Peak Pulse Power Dissipation on 10/1000 $\mu$ s waveform                                     | 1500        | W                |
| $I_{PPM}$ | Peak Pulse Current on 10/1000 $\mu$ s waveform   | see table   | A                |
| $I_{FSM}$ | Non-repetitive Peak Forward Surge Current superimposed on rated load (JEDEC method) (Note 1) | 200         | A                |
| $T_{stg}$ | Storage Temperature Range  | -55 to +150 | $^\circ\text{C}$ |
| $T_J$     | Operating Junction Temperature   | + 150       | $^\circ\text{C}$ |

\*These ratings are limiting values above which the serviceability of any semiconductor device may be impaired.

**Note 1:** Measured on 8.3 ms single half-sine wave or equivalent square wave; Duty cycle = 4 pulses per minute maximum.

# Transient Voltage Suppressors

(continued)

SMCJ5V0(C)A - SMCJ170(C)A

## Electrical Characteristics

$T_A = 25^\circ\text{C}$  unless otherwise noted

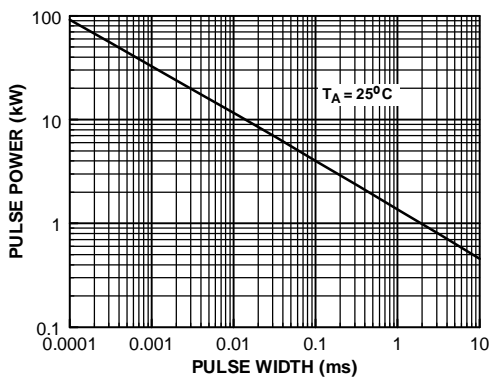
| Uni-directional<br>Bi-directional (C)<br>Device | Part<br>Marking* | Reverse<br>Stand-off<br>Voltage<br>$V_{RWM}$ (V) | Breakdown<br>Voltage<br>$V_{BR}$ (V) |       | Test<br>Current<br>$I_T$ (mA) | Clamping<br>Voltage<br>@ $I_{PPM}$<br>$V_C$ (V) | Peak Pulse<br>Current<br>$I_{PPM}$ (A) | Reverse<br>Leakage<br>@ $V_{RWM}$<br>$I_R$ (uA)** |
|---|------------------|--|--------------------------------------|-------|-------------------------------|---|--|---|
|   |                  |  | min                                  | max   |                               |   |  |   |
| SMCJ5V0(C)A                                     | GDE              | 5.0  | 6.40                                 | 7.0   | 10                            | 9.2   | 163.0                                  | 1000  |
| SMCJ6V0(C)A                                     | GDG              | 6.0  | 6.67                                 | 7.37  | 10                            | 10.3  | 145.6                                  | 1000  |
| SMCJ6V5(C)A                                     | GDK              | 6.5  | 7.22                                 | 7.98  | 10                            | 11.2  | 133.9                                  | 500   |
| SMCJ7V0(C)A                                     | GDM              | 7.0  | 7.78                                 | 8.60  | 10                            | 12.0  | 125.0                                  | 200   |
| SMCJ7V5(C)A                                     | GDP              | 7.5  | 8.33                                 | 9.21  | 1                             | 12.9  | 116.3                                  | 100   |
| SMCJ8V0(C)A                                     | GDR              | 8.0  | 8.89                                 | 9.83  | 1                             | 13.6  | 110.3                                  | 50  |
| SMCJ8V5(C)A                                     | GDT              | 8.5  | 9.44                                 | 10.4  | 1                             | 14.4  | 104.2                                  | 20  |
| SMCJ9V0(C)A                                     | GDV              | 9.0  | 10.0                                 | 11.1  | 1                             | 15.4  | 97.4                                   | 10  |
| SMCJ10(C)A                                      | GDY              | 10   | 11.1                                 | 12.3  | 1                             | 17.0  | 88.2                                   | 5   |
| SMCJ11(C)A                                      | GDZ              | 11   | 12.2                                 | 13.5  | 1                             | 18.2  | 82.4                                   | 5   |
| SMCJ12(C)A                                      | GEE              | 12   | 13.3                                 | 14.7  | 1                             | 19.9  | 75.3                                   | 5   |
| SMCJ13(C)A                                      | GEG              | 13   | 14.4                                 | 15.9  | 1                             | 21.5  | 69.8                                   | 5   |
| SMCJ14(C)A                                      | GEK              | 14   | 15.6                                 | 17.2  | 1                             | 23.2  | 64.7                                   | 5   |
| SMCJ15(C)A                                      | GEM              | 15   | 16.7                                 | 18.5  | 1                             | 24.4  | 61.5                                   | 5   |
| SMCJ16(C)A                                      | GEP              | 16   | 17.8                                 | 19.7  | 1                             | 26.0  | 57.7                                   | 5   |
| SMCJ17(C)A                                      | GER              | 17   | 18.9                                 | 20.9  | 1                             | 27.6  | 54.3                                   | 5   |
| SMCJ18(C)A                                      | GET              | 18   | 20.0                                 | 22.1  | 1                             | 29.2  | 51.4                                   | 5   |
| SMCJ20(C)A                                      | GEV              | 20   | 22.2                                 | 24.5  | 1                             | 32.4  | 46.3                                   | 5   |
| SMCJ22(C)A                                      | GEX              | 22   | 24.4                                 | 26.9  | 1                             | 35.5  | 42.3                                   | 5   |
| SMCJ24(C)A                                      | GEZ              | 24   | 26.7                                 | 29.5  | 1                             | 38.9  | 38.6                                   | 5   |
| SMCJ26(C)A                                      | GFE              | 26   | 28.9                                 | 31.9  | 1                             | 42.1  | 35.6                                   | 5   |
| SMCJ28(C)A                                      | GFG              | 28   | 31.1                                 | 34.4  | 1                             | 45.4  | 33.0                                   | 5   |
| SMCJ30(C)A                                      | GFK              | 30   | 33.3                                 | 36.8  | 1                             | 48.4  | 31.0                                   | 5   |
| SMCJ33(C)A                                      | GFM              | 33   | 36.7                                 | 40.6  | 1                             | 53.3  | 28.1                                   | 5   |
| SMCJ36(C)A                                      | GFP              | 36   | 40.0                                 | 44.2  | 1                             | 58.1  | 25.8                                   | 5   |
| SMCJ40(C)A                                      | GFR              | 40   | 44.4                                 | 49.1  | 1                             | 64.5  | 23.3                                   | 5   |
| SMCJ43(C)A                                      | GFT              | 43   | 47.8                                 | 52.8  | 1                             | 69.4  | 21.6                                   | 5   |
| SMCJ45(C)A                                      | GFV              | 45   | 50.0                                 | 55.3  | 1                             | 72.7  | 20.6                                   | 5   |
| SMCJ48(C)A                                      | GFX              | 48   | 53.3                                 | 58.9  | 1                             | 77.4  | 19.4                                   | 5   |
| SMCJ51(C)A                                      | GFZ              | 51   | 56.7                                 | 62.7  | 1                             | 82.4  | 18.2                                   | 5   |
| SMCJ54(C)A                                      | GGE              | 54   | 60.0                                 | 66.3  | 1                             | 87.1  | 17.2                                   | 5   |
| SMCJ58(C)A                                      | GGG              | 58   | 64.4                                 | 71.2  | 1                             | 93.6  | 16.0                                   | 5   |
| SMCJ60(C)A                                      | GGK              | 60   | 66.7                                 | 73.7  | 1                             | 96.8  | 15.5                                   | 5   |
| SMCJ64(C)A                                      | GGM              | 64   | 71.1                                 | 78.6  | 1                             | 103.0   | 14.6                                   | 5   |
| SMCJ70(C)A                                      | GGP              | 70   | 77.8                                 | 86.0  | 1                             | 113.0   | 13.3                                   | 5   |
| SMCJ75(C)A                                      | GGR              | 75   | 83.3                                 | 92.1  | 1                             | 121.0   | 12.4                                   | 5   |
| SMCJ78(C)A                                      | GGT              | 78   | 86.7                                 | 95.8  | 1                             | 126.0   | 11.9                                   | 5   |
| SMCJ85(C)A                                      | GGV              | 85   | 94.4                                 | 104.0 | 1                             | 137.0   | 10.9                                   | 5   |
| SMCJ90(C)A                                      | GGX              | 90   | 100.0                                | 111.0 | 1                             | 146.0   | 10.3                                   | 5   |
| SMCJ100(C)A                                     | GGZ              | 100  | 111.0                                | 123.0 | 1                             | 162.0   | 9.3                                    | 5   |
| SMCJ110(C)A                                     | GHE              | 110  | 122.0                                | 135.0 | 1                             | 177.0   | 8.5                                    | 5   |
| SMCJ120(C)A                                     | GHG              | 120  | 133.0                                | 147.0 | 1                             | 193.0   | 7.8                                    | 5   |
| SMCJ130(C)A                                     | GHK              | 130  | 144.0                                | 159.0 | 1                             | 209.0   | 7.2                                    | 5   |
| SMCJ150(C)A                                     | GHM              | 150  | 167.0                                | 185.0 | 1                             | 243.0   | 6.2                                    | 5   |
| SMCJ160(C)A                                     | GHP              | 160  | 178.0                                | 197.0 | 1                             | 259.0   | 5.8                                    | 5   |
| SMCJ170(C)A                                     | GHR              | 170  | 189.0                                | 209.0 | 1                             | 275.0   | 5.5                                    | 5   |

\* Color band denotes cathode on unidirectional devices only. No color band on bidirectional devices.

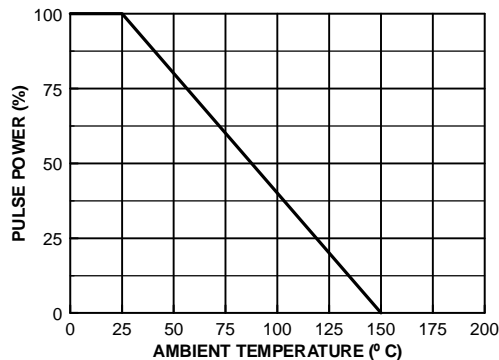
\*\* For bidirectional parts with  $V_{RWM} < 10V$ , the  $I_R$  max limit is doubled.

Typical Characteristics

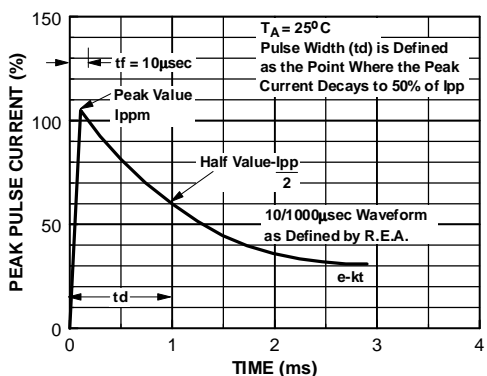
Peak Pulse Power Rating Curve



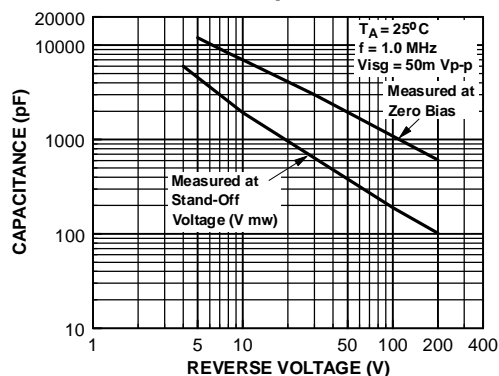
Pulse Derating Curve



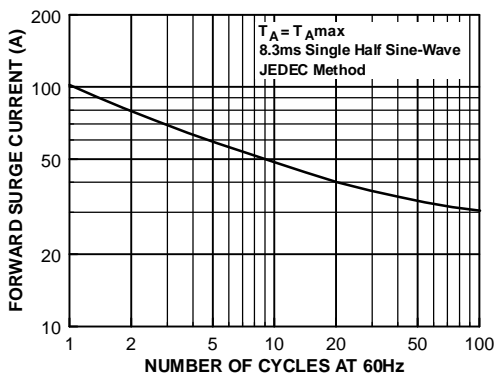
Pulse Waveform



Junction Capacitance



Non-Repetitive Surge Current



## TRADEMARKS

The following are registered and unregistered trademarks Fairchild Semiconductor owns or is authorized to use and is not intended to be an exhaustive list of all such trademarks.

|                                      |                     |                    |                     |                 |
|--------------------------------------|---------------------|--------------------|---------------------|-----------------|
| ACEx™                                | FACT™               | ImpliedDisconnect™ | PACMAN™             | SPM™            |
| ActiveArray™                         | FACT Quiet Series™  | ISOPLANAR™         | POP™                | Stealth™        |
| Bottomless™                          | FAST®               | LittleFET™         | Power247™           | SuperSOT™-3     |
| CoolFET™                             | FASTr™              | MicroFET™          | PowerTrench®        | SuperSOT™-6     |
| CROSSVOLT™                           | FRFET™              | MicroPak™          | QFET®               | SuperSOT™-8     |
| DOME™                                | GlobalOptoisolator™ | MICROWIRE™         | QS™                 | SyncFET™        |
| EcoSPARK™                            | GTO™                | MSX™               | QT Optoelectronics™ | TinyLogic®      |
| E <sup>2</sup> CMOS™                 | HiSeC™              | MSXPro™            | Quiet Series™       | TruTranslation™ |
| EnSigna™                             | µC™                 | OCX™               | RapidConfigure™     | UHC™            |
| Across the board. Around the world.™ |                     | OCXPro™            | RapidConnect™       | UltraFET®       |
| The Power Franchise™                 |                     | OPTOLOGIC®         | SILENT SWITCHER®    | VCX™            |
| Programmable Active Droop™           |                     | OPTOPLANAR™        | SMART START™        |                 |

## DISCLAIMER

FAIRCHILD SEMICONDUCTOR RESERVES THE RIGHT TO MAKE CHANGES WITHOUT FURTHER NOTICE TO ANY PRODUCTS HEREIN TO IMPROVE RELIABILITY, FUNCTION OR DESIGN. FAIRCHILD DOES NOT ASSUME ANY LIABILITY ARISING OUT OF THE APPLICATION OR USE OF ANY PRODUCT OR CIRCUIT DESCRIBED HEREIN; NEITHER DOES IT CONVEY ANY LICENSE UNDER ITS PATENT RIGHTS, NOR THE RIGHTS OF OTHERS.

## LIFE SUPPORT POLICY

FAIRCHILD'S PRODUCTS ARE NOT AUTHORIZED FOR USE AS CRITICAL COMPONENTS IN LIFE SUPPORT DEVICES OR SYSTEMS WITHOUT THE EXPRESS WRITTEN APPROVAL OF FAIRCHILD SEMICONDUCTOR CORPORATION. As used herein:

1. Life support devices or systems are devices or systems which, (a) are intended for surgical implant into the body, or (b) support or sustain life, or (c) whose failure to perform when properly used in accordance with instructions for use provided in the labeling, can be reasonably expected to result in significant injury to the user.
2. A critical component is any component of a life support device or system whose failure to perform can be reasonably expected to cause the failure of the life support device or system, or to affect its safety or effectiveness.

## PRODUCT STATUS DEFINITIONS

### Definition of Terms

| Datasheet Identification | Product Status         | Definition  |
|--------------------------|------------------------|---|
| Advance Information      | Formative or In Design | This datasheet contains the design specifications for product development. Specifications may change in any manner without notice.  |
| Preliminary              | First Production       | This datasheet contains preliminary data, and supplementary data will be published at a later date. Fairchild Semiconductor reserves the right to make changes at any time without notice in order to improve design. |
| No Identification Needed | Full Production        | This datasheet contains final specifications. Fairchild Semiconductor reserves the right to make changes at any time without notice in order to improve design.   |
| Obsolete                 | Not In Production      | This datasheet contains specifications on a product that has been discontinued by Fairchild semiconductor. The datasheet is printed for reference information only.   |