

## SILICON 25V HYPERABRUPT VARACTOR DIODES

ZC829, ZDC833, ZMV829, ZMDC830, ZV831 Series

### Device description

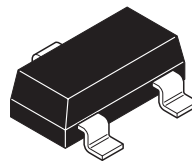
A range of silicon varactor diodes for use in frequency control and filtering. Featuring closely controlled CV characteristics and high Q. Low reverse current ensures very low phase noise performance. Available in single or dual common cathode format in a wide range of miniature surface mount packages.

### Features

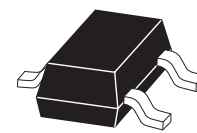
- Close tolerance C-V characteristics
- High tuning ratio
- Low  $I_R$  (typically 200pA)
- Excellent phase noise performance
- High Q
- Range of miniature surface mount packages

### Applications

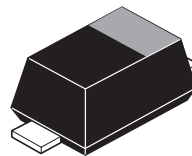
- VCXO and TCXO
- Wireless communications
- Pagers
- Mobile radio



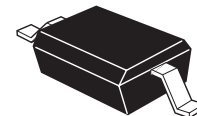
SOT23



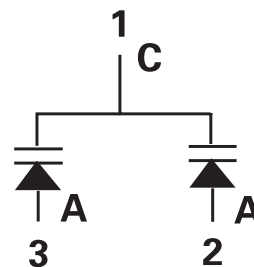
SOT323



SOD523



SOD323



\*Where steeper CV slopes are required there is the 12V hyperabrupt range.  
ZC930, ZMV930, ZV930, ZV931 Series

## 830 SERIES

### TUNING CHARACTERISTICS at Tamb = 25 °C

| PART | Capacitance (pF)<br>V <sub>R</sub> =2V, f=1MHz |       |       | Min Q<br>V <sub>R</sub> =3V<br>f=50MHz | Capacitance Ratio<br>C <sub>2</sub> / C <sub>20</sub><br>at f=1MHz |      |
|------|------------------------------------------------|-------|-------|----------------------------------------|--------------------------------------------------------------------|------|
|      | MIN.                                           | NOM.  | MAX.  |                                        | MIN.                                                               | MAX. |
| 829A | 7.38                                           | 8.2   | 9.02  | 250                                    | 4.3                                                                | 5.8  |
| 829B | 7.79                                           | 8.2   | 8.61  | 250                                    | 4.3                                                                | 5.8  |
| 830A | 9.0                                            | 10.0  | 11.0  | 300                                    | 4.5                                                                | 6.0  |
| 830B | 9.5                                            | 10.0  | 10.5  | 300                                    | 4.5                                                                | 6.0  |
| 831A | 13.5                                           | 15.0  | 16.5  | 300                                    | 4.5                                                                | 6.0  |
| 831B | 14.25                                          | 15.0  | 15.75 | 300                                    | 4.5                                                                | 6.0  |
| 832A | 19.8                                           | 22.0  | 24.2  | 200                                    | 5.0                                                                | 6.5  |
| 832B | 20.9                                           | 22.0  | 23.1  | 200                                    | 5.0                                                                | 6.5  |
| 833A | 29.7                                           | 33.0  | 36.3  | 200                                    | 5.0                                                                | 6.5  |
| 833B | 31.35                                          | 33.0  | 34.65 | 200                                    | 5.0                                                                | 6.5  |
| 834A | 42.3                                           | 47.0  | 51.7  | 200                                    | 5.0                                                                | 6.5  |
| 834B | 44.65                                          | 47.0  | 49.35 | 200                                    | 5.0                                                                | 6.5  |
| 835A | 61.2                                           | 68.0  | 74.8  | 100                                    | 5.0                                                                | 6.5  |
| 835B | 64.6                                           | 68.0  | 71.4  | 100                                    | 5.0                                                                | 6.5  |
| 836A | 90.0                                           | 100.0 | 110.0 | 100                                    | 5.0                                                                | 6.5  |

### ABSOLUTE MAXIMUM RATINGS

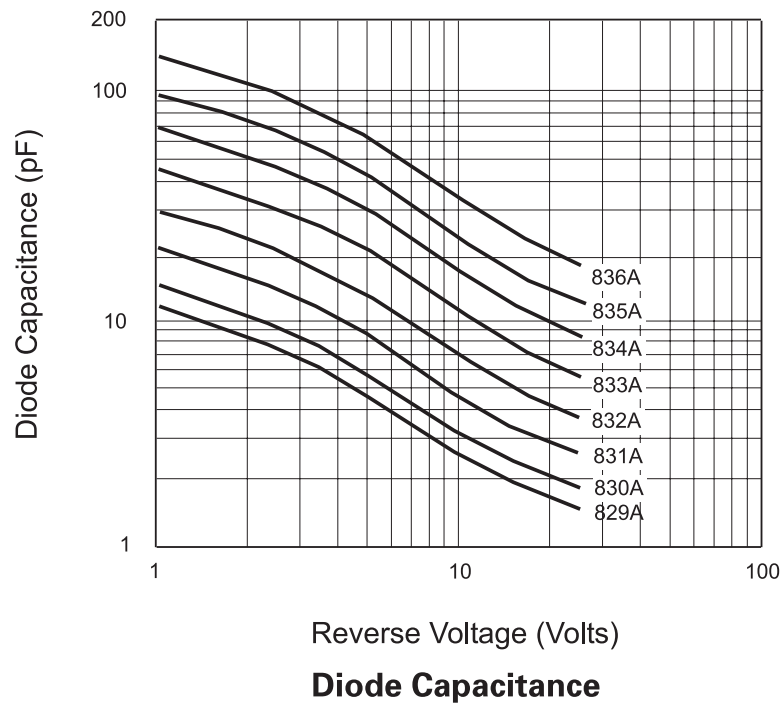
| PARAMETER                                           | SYMBOL           | MAX         | UNIT |
|-----------------------------------------------------|------------------|-------------|------|
| Forward current                                     | I <sub>F</sub>   | 200         | mA   |
| Power dissipation at T <sub>amb</sub> = 25°C SOT23  | P <sub>tot</sub> | 330         | mW   |
| Power dissipation at T <sub>amb</sub> = 25°C SOD323 | P <sub>tot</sub> | 330         | mW   |
| Power dissipation at T <sub>amb</sub> = 25°C SOD523 | P <sub>tot</sub> | 250         | mW   |
| Operating and storage temperature range             |                  | -55 to +150 | °C   |

### ELECTRICAL CHARACTERISTICS at Tamb = 25 °C

| PARAMETER                              | CONDITIONS                    | MIN. | TYP. | MAX. | UNIT    |
|----------------------------------------|-------------------------------|------|------|------|---------|
| Reverse breakdown voltage              | I <sub>R</sub> = 10uA         | 25   |      |      | V       |
| Reverse voltage leakage                | V <sub>R</sub> = 20V          |      | 0.2  | 20   | nA      |
| Temperature coefficient of capacitance | V <sub>R</sub> = 3V, f = 1MHz |      | 300  | 400  | ppCm/°C |

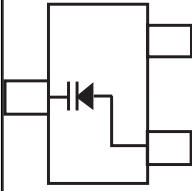
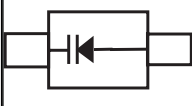
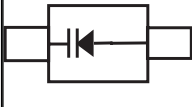
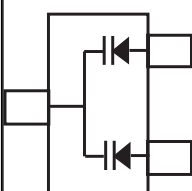
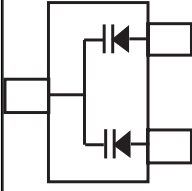
## 830 SERIES

### TYPICAL CHARACTERISTICS



# 830 SERIES

## ORDER CODES AND PART MARKING

| SOT23                                                                               |           |  | SOD323                                                                              |           |  | SOD523                                                                              |           |  | SOT23                                                                             |           |  | SOT323                                                                            |           |  |
|-------------------------------------------------------------------------------------|-----------|--|-------------------------------------------------------------------------------------|-----------|--|-------------------------------------------------------------------------------------|-----------|--|-----------------------------------------------------------------------------------|-----------|--|-----------------------------------------------------------------------------------|-----------|--|
|  |           |  |  |           |  |  |           |  |  |           |  |  |           |  |
| ORDER CODE                                                                          | PART MARK |  | ORDER CODE                                                                          | PART MARK |  | ORDER CODE                                                                          | PART MARK |  | ORDER CODE                                                                        | PART MARK |  | ORDER CODE                                                                        | PART MARK |  |
| ZC829ATA                                                                            | J9A       |  | ZMV829ATA                                                                           | AA        |  |                                                                                     |           |  |                                                                                   |           |  |                                                                                   |           |  |
| ZC829BTA                                                                            | J9B       |  | ZMV829BTA                                                                           | CA        |  |                                                                                     |           |  |                                                                                   |           |  |                                                                                   |           |  |
| ZC830ATA                                                                            | J1A       |  | ZMV830ATA                                                                           | AB        |  |                                                                                     |           |  |                                                                                   |           |  |                                                                                   |           |  |
| ZC830BTA                                                                            | J1B       |  | ZMV830BTA                                                                           | CB        |  |                                                                                     |           |  |                                                                                   |           |  |                                                                                   |           |  |
| ZC831ATA                                                                            | J3A       |  | ZMV831ATA                                                                           | AC        |  |                                                                                     |           |  |                                                                                   |           |  |                                                                                   |           |  |
| ZC831BTA                                                                            | J3B       |  | ZMV831BTA                                                                           | CC        |  | ZV831BV2TA                                                                          | 81        |  |                                                                                   |           |  | ZMDC831BTA                                                                        | CC        |  |
| ZC832ATA                                                                            | J4A       |  | ZMV832ATA                                                                           | AD        |  |                                                                                     |           |  |                                                                                   |           |  |                                                                                   |           |  |
| ZC832BTA                                                                            | J4B       |  | ZMV832BTA                                                                           | CD        |  | ZV832BV2TA                                                                          | 82        |  |                                                                                   |           |  | ZMDC832BTA                                                                        | CD        |  |
| ZC833ATA                                                                            | J2A       |  | ZMV833ATA                                                                           | AE        |  |                                                                                     |           |  | ZDC833ATA                                                                         | C2A       |  |                                                                                   |           |  |
| ZC833BTA                                                                            | J2B       |  | ZMV833BTA                                                                           | CE        |  |                                                                                     |           |  |                                                                                   |           |  |                                                                                   |           |  |
| ZC834ATA                                                                            | J5A       |  | ZMV834ATA                                                                           | AF        |  |                                                                                     |           |  | ZDC834ATA                                                                         | C5A       |  |                                                                                   |           |  |
| ZC834BTA                                                                            | J5B       |  | ZMV834BTA                                                                           | CF        |  |                                                                                     |           |  |                                                                                   |           |  |                                                                                   |           |  |
| ZC835ATA                                                                            | J6A       |  | ZMV835ATA                                                                           | AG        |  |                                                                                     |           |  |                                                                                   |           |  |                                                                                   |           |  |
| ZC835BTA                                                                            | J6B       |  | ZMV835BTA                                                                           | CG        |  |                                                                                     |           |  |                                                                                   |           |  |                                                                                   |           |  |

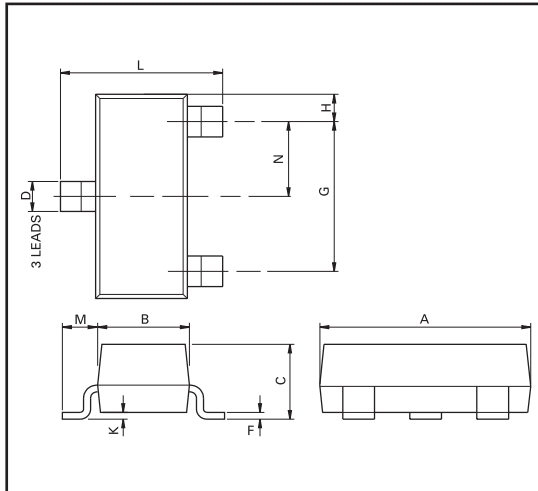
## TAPE AND REEL INFORMATION

The order codes are shown as TA which is for 7 inch reels. For 13 inch reels substitute TC in place of TA in the order code.

| REEL CODE | REEL SIZE       | TAPE WIDTH | QUANTITY PER REEL |
|-----------|-----------------|------------|-------------------|
| TA        | 7 inch (180mm)  | 8mm        | 3000              |
| TC        | 13 inch (330mm) | 8mm        | 10000             |

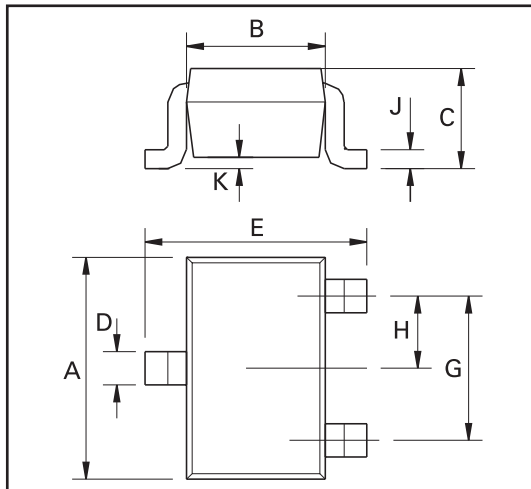
## 830 SERIES

### SOT23 PACKAGE DIMENSIONS



| DIM | Millimeters |      | Inches    |        |
|-----|-------------|------|-----------|--------|
|     | Min         | Max  | Min       | Max    |
| A   | 2.67        | 3.05 | 0.105     | 0.120  |
| B   | 1.20        | 1.40 | 0.047     | 0.055  |
| C   | –           | 1.10 | –         | 0.043  |
| D   | 0.37        | 0.53 | 0.0145    | 0.021  |
| F   | 0.085       | 0.15 | 0.0033    | 0.0059 |
| G   | NOM 1.9     |      | NOM 0.075 |        |
| K   | 0.01        | 0.10 | 0.0004    | 0.004  |
| L   | 2.10        | 2.50 | 0.0825    | 0.0985 |

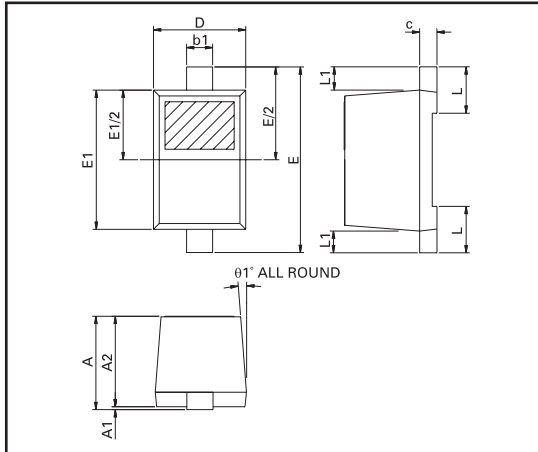
### SOT323 PACKAGE DIMENSIONS



| DIM | Millimeters |      | Inches |       |
|-----|-------------|------|--------|-------|
|     | Min         | Max  | Min    | Max   |
| A   | 0.91        | 1.16 | 0.036  | 0.046 |
| B   | 0.0         | 0.1  | 0.0    | 0.004 |
| D   | 0.33        | 0.4  | 0.013  | 0.016 |
| E   | 0.127       | 0.2  | 0.005  | 0.008 |
| F   | 1.52        | 1.77 | 0.060  | 0.070 |
| G   | 1.11        | 1.37 | 0.044  | 0.054 |

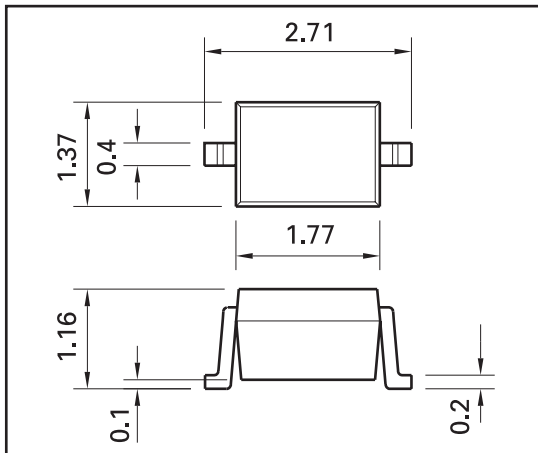
# 830 SERIES

## SOD523 PACKAGE DIMENSIONS



| DIM | Millimeters |       | Inches |        |
|-----|-------------|-------|--------|--------|
|     | Min         | Max   | Min    | Max    |
| A   | –           | 0.800 | –      | 0.0314 |
| A1  | 0.000       | 0.100 | 0.000  | 0.0039 |
| A2  | 0.600       | 0.800 | 0.0236 | 0.0314 |
| b1  | 0.160       | 0.300 | 0.0062 | 0.0118 |
| c   | 0.080       | 0.220 | 0.0031 | 0.0086 |
| D   | 0.700       | 0.900 | 0.0275 | 0.0354 |
| E   | 1.500       | 1.700 | 0.0590 | 0.0669 |
| E1  | 1.100       | 1.300 | 0.0433 | 0.0511 |
| L   | 0.200       | 0.400 | 0.0078 | 0.0157 |
| L1  | 0.170       | 0.230 | 0.0066 | 0.0090 |
| Θ1° | 4°          | 10°   | 4°     | 10°    |

## SOD323 PACKAGE DIMENSIONS



| DIM | Millimeters |      | Inches |       |
|-----|-------------|------|--------|-------|
|     | Min         | Max  | Min    | Max   |
| A   | 1.8         | 2.2  | 0.071  | 0.087 |
| B   | 1.15        | 1.35 | 0.045  | 0.053 |
| C   | 0.8         | 1.0  | 0.031  | 0.039 |
| D   | 0.2         | 0.4  | 0.008  | 0.016 |
| F   | 0.1         | 0.25 | 0.004  | 0.01  |
| G   | 1.2         | 1.4  | 0.047  | 0.055 |

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| Zetex GmbH<br>Streitfeldstraße 19<br>D-81673 München<br>Germany                                                                 | Zetex Inc<br>700 Veterans Memorial Hwy<br>Hauppauge, NY 11788<br>USA                                                 | Zetex (Asia) Ltd<br>3701-04 Metroplaza Tower 1<br>Hing Fong Road, Kwai Fong<br>Hong Kong                             | Zetex Semiconductors plc<br>Zetex Technology Park, Chadderton<br>Oldham, OL9 9LL<br>United Kingdom      |
| Telephone: (49) 89 45 49 49 0<br>Fax: (49) 89 45 49 49 49<br><a href="mailto:europa.sales@zetex.com">europa.sales@zetex.com</a> | Telephone: (1) 631 360 2222<br>Fax: (1) 631 360 8222<br><a href="mailto:usa.sales@zetex.com">usa.sales@zetex.com</a> | Telephone: (852) 26100 611<br>Fax: (852) 24250 494<br><a href="mailto:asia.sales@zetex.com">asia.sales@zetex.com</a> | Telephone (44) 161 622 4444<br>Fax: (44) 161 622 4446<br><a href="mailto:hq@zetex.com">hq@zetex.com</a> |

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