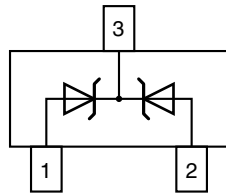


## Small Signal Zener Diodes, Dual


**DESIGN SUPPORT TOOLS**
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**3D**  
Models  
Available

| PRIMARY CHARACTERISTICS |                     |      |
|-------------------------|---------------------|------|
| PARAMETER               | VALUE               | UNIT |
| $V_Z$ range nom.        | 2.7 to 51           | V    |
| Test current $I_{ZT}$   | 5                   | mA   |
| $V_Z$ specification     | Pulse current       |      |
| Circuit configuration   | Dual common cathode |      |

**FEATURES**

- Dual silicon planar Zener diodes, common cathode
- The Zener voltages are graded according to the international E24 standard. Standard Zener voltage tolerance is  $\pm 5\%$ .
- The parameters are valid for both diodes in one case.  $\Delta V_Z$  and  $\Delta R_{zj}$  of the two diodes in one case is  $\leq 5\%$
- AEC-Q101 qualified
- ESD capability according to AEC-Q101:  
Human body model > 8 kV  
Machine model > 800 V
- Base P/N-G3 - green, commercial grade
- Material categorization: for definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)


**RoHS**  
COMPLIANT  
HALOGEN  
**FREE**  
**GREEN**  
(5-2008)

| ORDERING INFORMATION |                                 |                                |                        |
|----------------------|---------------------------------|--------------------------------|------------------------|
| DEVICE NAME          | ORDERING CODE                   | TAPED UNITS PER REEL           | MINIMUM ORDER QUANTITY |
| DZ23-G-Series        | DZ23C2V7-G3-08 to DZ23C51-G3-08 | 3000 (8 mm tape on 7" reel)    | 10 000                 |
|                      | DZ23C2V7-G3-18 to DZ23C51-G3-18 | 10 000 (8 mm tape on 13" reel) | 15 000                 |

| PACKAGE      |        |                                      |                                      |                          |
|--------------|--------|--------------------------------------|--------------------------------------|--------------------------|
| PACKAGE NAME | WEIGHT | MOLDING COMPOUND FLAMMABILITY RATING | MOISTURE SENSITIVITY LEVEL           | SOLDERING CONDITIONS     |
| SOT-23       | 8.1 mg | UL 94 V-0                            | MSL level 1<br>(according J-STD-020) | 260 °C/10 s at terminals |

| ABSOLUTE MAXIMUM RATINGS ( $T_{amb} = 25\text{ °C}$ , unless otherwise specified) |  |            |               |      |
|---|--|------------|---------------|------|
| PARAMETER   | TEST CONDITION                                       | SYMBOL     | VALUE         | UNIT |
| Power dissipation   | Device on fiberglass substrate, see layout on page 6 | $P_{tot}$  | 300           | mW   |
| Thermal resistance, junction to ambient air                                       | Device on fiberglass substrate, see layout on page 6 | $R_{thJA}$ | 420           | K/W  |
| Junction temperature  |  | $T_j$      | 150           | °C   |
| Storage temperature range   |  | $T_{stg}$  | -65 to +150   | °C   |
| Operating temperature range   |  | $T_{op}$   | -55 to +150   | °C   |
| Zener current   |  | $I_Z$      | $P_{tot}/V_Z$ | mA   |





| ELECTRICAL CHARACTERISTICS ( $T_{amb} = 25\text{ }^{\circ}\text{C}$ , unless otherwise specified) |              |                                    |      |      |              |           |                 |     |                                       |                       |  |      |
|---|--------------|------------------------------------|------|------|--------------|-----------|-----------------|-----|---------------------------------------|-----------------------|--|------|
| PART NUMBER   | MARKING CODE | ZENER VOLTAGE RANGE <sup>(1)</sup> |      |      | TEST CURRENT |           | REVERSE VOLTAGE |     | DYNAMIC RESISTANCE $f = 1\text{ kHz}$ |                       | TEMPERATURE COEFFICIENT OF ZENER VOLTAGE |      |
|   |              | $V_Z$ at $I_{ZT1}$                 |      |      | $I_{ZT1}$    | $I_{ZT2}$ | $V_R$ at $I_R$  |     | $Z_Z$ at $I_{ZT1}$                    | $Z_{ZK}$ at $I_{ZT2}$ | $\alpha_{VZ}$ at $I_{ZT1}$               |      |
|   |              | V                                  |      |      | mA           |           | V               | nA  | $\Omega$                              |                       | $10^{-4}/^{\circ}\text{C}$               |      |
|   |              | MIN.                               | NOM. | MAX. |              |           | MAX.            |     | MAX.                                  | MAX.                  | MIN.                                     | MAX. |
| DZ23C2V7-G  | V41          | 2.5                                | 2.7  | 2.9  | 5            | 1         | -               | -   | 75 (< 83)                             | < 500                 | -9                                       | -4   |
| DZ23C3V0-G  | V42          | 2.8                                | 3.0  | 3.2  | 5            | 1         | -               | -   | 80 (< 95)                             | < 500                 | -9                                       | -3   |
| DZ23C3V3-G  | V43          | 3.1                                | 3.3  | 3.5  | 5            | 1         | -               | -   | 80 (< 95)                             | < 500                 | -8                                       | -3   |
| DZ23C3V6-G  | V44          | 3.4                                | 3.6  | 3.8  | 5            | 1         | -               | -   | 80 (< 95)                             | < 500                 | -8                                       | -3   |
| DZ23C3V9-G  | V45          | 3.7                                | 3.9  | 4.1  | 5            | 1         | -               | -   | 80 (< 95)                             | < 500                 | -7                                       | -3   |
| DZ23C4V3-G  | V46          | 4                                  | 4.3  | 4.6  | 5            | 1         | -               | -   | 80 (< 95)                             | < 500                 | -6                                       | -1   |
| DZ23C4V7-G  | V47          | 4.4                                | 4.7  | 5    | 5            | 1         | -               | -   | 70 (< 78)                             | < 500                 | -5                                       | 2    |
| DZ23C5V1-G  | V48          | 4.8                                | 5.1  | 5.4  | 5            | 1         | > 0.8           | 100 | 30 (< 60)                             | < 480                 | -3                                       | 4    |
| DZ23C5V6-G  | V49          | 5.2                                | 5.6  | 6    | 5            | 1         | > 1             | 100 | 10 (< 40)                             | < 400                 | -2                                       | 6    |
| DZ23C6V2-G  | V50          | 5.8                                | 6.2  | 6.6  | 5            | 1         | > 2             | 100 | 4.8 (< 10)                            | < 200                 | -1                                       | 7    |
| DZ23C6V8-G  | V51          | 6.4                                | 6.8  | 7.2  | 5            | 1         | > 3             | 100 | 4.5 (< 8)                             | < 150                 | 2  | 7    |
| DZ23C7V5-G  | V52          | 7                                  | 7.5  | 7.9  | 5            | 1         | > 5             | 100 | 4 (< 7)                               | < 50                  | 3  | 7    |
| DZ23C8V2-G  | V53          | 7.7                                | 8.2  | 8.7  | 5            | 1         | > 6             | 100 | 4.5 (< 7)                             | < 50                  | 4  | 7    |
| DZ23C9V1-G  | V54          | 8.5                                | 9.1  | 9.6  | 5            | 1         | > 7             | 100 | 4.8 (< 10)                            | < 50                  | 5  | 8    |
| DZ23C10-G   | V55          | 9.4                                | 10   | 10.6 | 5            | 1         | > 7.5           | 100 | 5.2 (< 15)                            | < 70                  | 5  | 8    |
| DZ23C11-G   | V56          | 10.4                               | 11   | 11.6 | 5            | 1         | > 8.5           | 100 | 6 (< 20)                              | < 70                  | 5  | 9    |
| DZ23C12-G   | V57          | 11.4                               | 12   | 12.7 | 5            | 1         | > 9             | 100 | 7 (< 20)                              | < 90                  | 6  | 9    |
| DZ23C13-G   | V58          | 12.4                               | 13   | 14.1 | 5            | 1         | > 10            | 100 | 9 (< 25)                              | < 110                 | 7  | 9    |
| DZ23C15-G   | V59          | 13.8                               | 15   | 15.6 | 5            | 1         | > 11            | 100 | 11 (< 30)                             | < 110                 | 7  | 9    |
| DZ23C16-G   | V60          | 15.3                               | 16   | 17.1 | 5            | 1         | > 12            | 100 | 13 (< 40)                             | < 170                 | 8  | 9.5  |
| DZ23C18-G   | V61          | 16.8                               | 18   | 19.1 | 5            | 1         | > 14            | 100 | 18 (< 50)                             | < 170                 | 8  | 9.5  |
| DZ23C20-G   | V62          | 18.8                               | 20   | 21.2 | 5            | 1         | > 15            | 100 | 20 (< 50)                             | < 220                 | 8  | 10   |
| DZ23C22-G   | V63          | 20.8                               | 22   | 23.3 | 5            | 1         | > 17            | 100 | 25 (< 55)                             | < 220                 | 8  | 10   |
| DZ23C24-G   | V64          | 22.8                               | 24   | 25.6 | 5            | 1         | > 18            | 100 | 28 (< 80)                             | < 220                 | 8  | 10   |
| DZ23C27-G   | V65          | 25.1                               | 27   | 28.9 | 5            | 1         | > 20            | 100 | 30 (< 80)                             | < 250                 | 8  | 10   |
| DZ23C30-G   | V66          | 28                                 | 30   | 32   | 5            | 1         | > 22.5          | 100 | 35 (< 80)                             | < 250                 | 8  | 10   |
| DZ23C33-G   | V67          | 31                                 | 33   | 35   | 5            | 1         | > 25            | 100 | 40 (< 80)                             | < 250                 | 8  | 10   |
| DZ23C36-G   | V68          | 34                                 | 36   | 38   | 5            | 1         | > 27            | 100 | 40 (< 90)                             | < 250                 | 8  | 10   |
| DZ23C39-G   | V69          | 37                                 | 39   | 41   | 5            | 1         | > 29            | 100 | 50 (< 90)                             | < 300                 | 10                                       | 12   |
| DZ23C43-G   | V70          | 40                                 | 43   | 46   | 5            | 1         | > 32            | 100 | 60 (< 100)                            | < 700                 | 10                                       | 12   |
| DZ23C47-G   | V71          | 44                                 | 47   | 50   | 5            | 1         | > 35            | 100 | 70 (< 100)                            | < 750                 | 10                                       | 12   |
| DZ23C51-G   | V72          | 48                                 | 51   | 54   | 5            | 1         | > 38            | 100 | 70 (< 100)                            | < 750                 | 10                                       | 12   |

**Note**

(1) Tested with pulses  $t_p = 5\text{ ms}$

**TYPICAL CHARACTERISTICS** ( $T_{amb} = 25\text{ }^{\circ}\text{C}$ , unless otherwise specified)

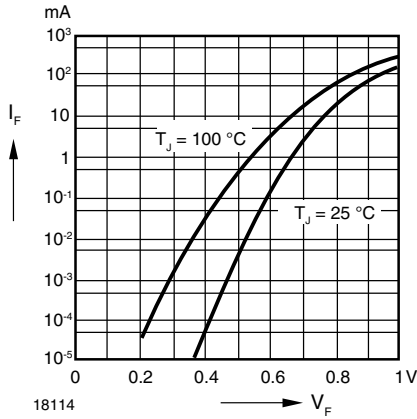


Fig. 1 - Forward Characteristics

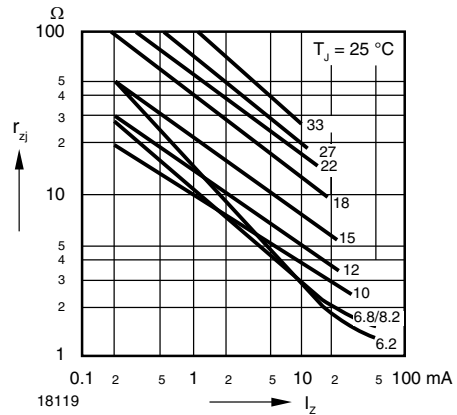


Fig. 4 - Dynamic Resistance vs. Zener Current

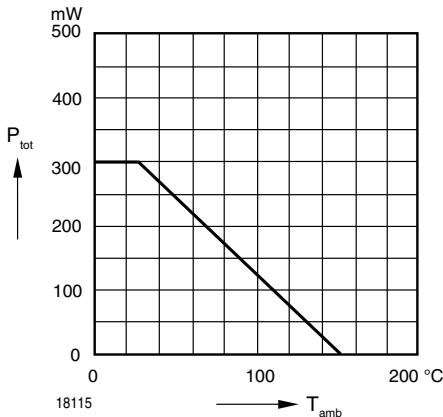


Fig. 2 - Admissible Power Dissipation vs. Ambient Temperature

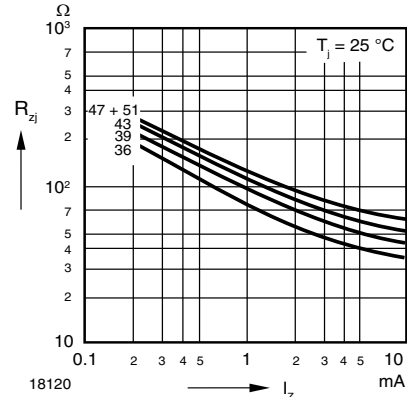


Fig. 5 - Dynamic Resistance vs. Zener Current

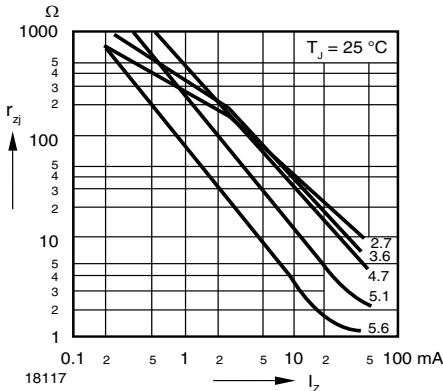


Fig. 3 - Dynamic Resistance vs. Zener Current

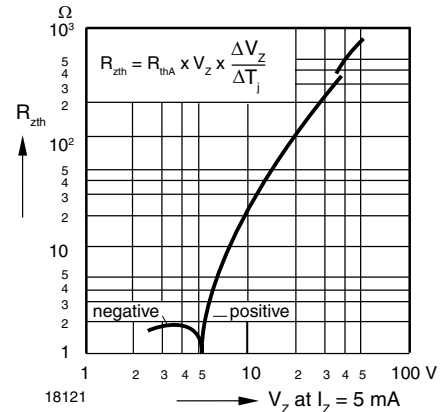


Fig. 6 - Thermal Differential Resistance vs. Zener Voltage

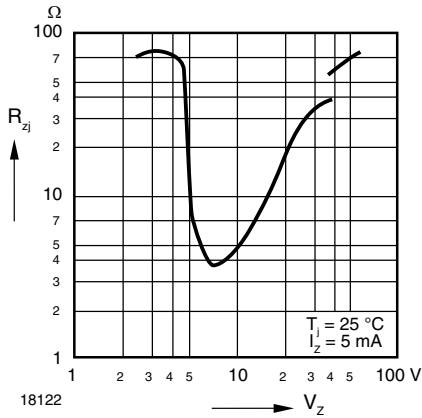


Fig. 7 - Dynamic Resistance vs. Zener Voltage

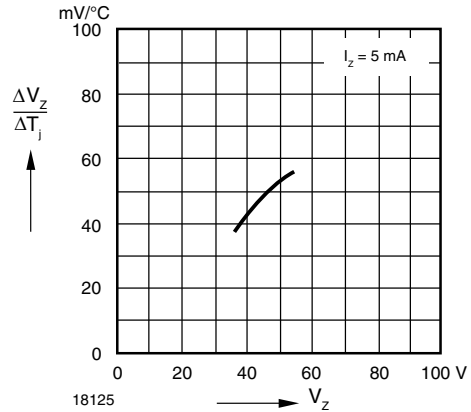


Fig. 10 - Temperature Dependence of Zener Voltage vs. Zener Voltage

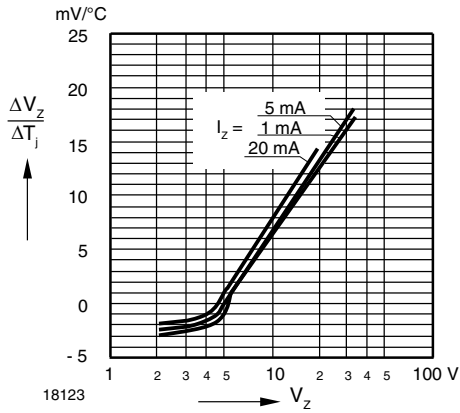


Fig. 8 - Temperature Dependence of Zener Voltage vs. Zener Voltage

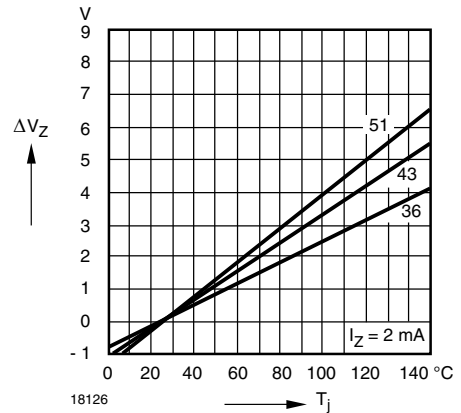


Fig. 11 - Change of Zener Voltage vs. Junction Temperature

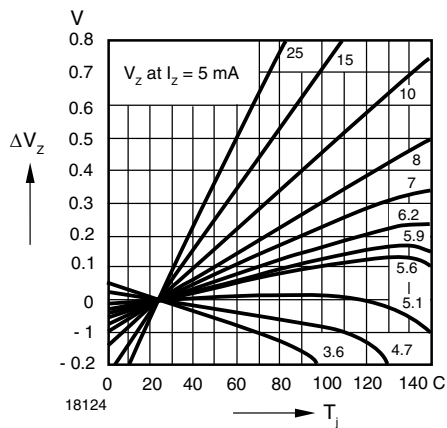


Fig. 9 - Change of Zener Voltage vs. Junction Temperature

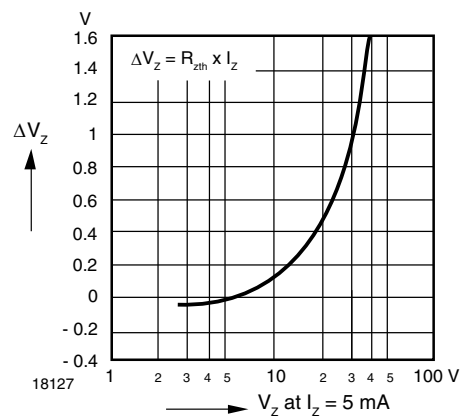


Fig. 12 - Change of Zener Voltage from Turn-on up to the Point of Thermal Equilibrium vs. Zener voltage

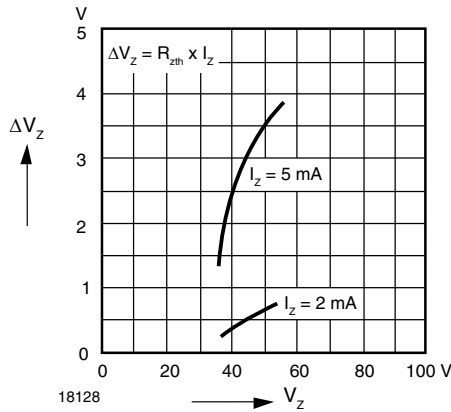


Fig. 13 - Change of Zener Voltage from Turn-on up to the Point of Thermal Equilibrium vs. Zener voltage

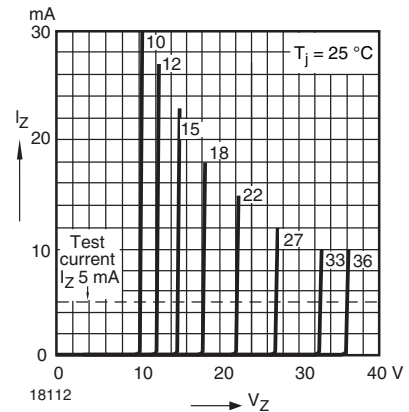


Fig. 15 - Breakdown Characteristics

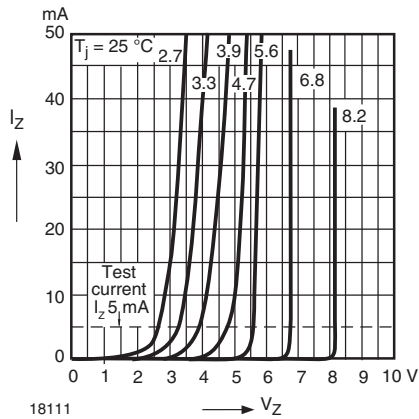


Fig. 14 - Breakdown Characteristics

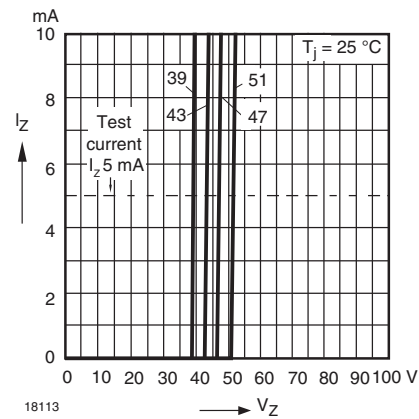
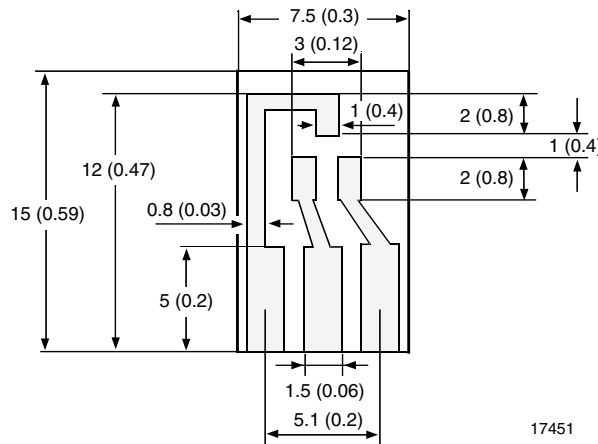


Fig. 16 - Breakdown Characteristics

**LAYOUT FOR R<sub>thJA</sub> TEST**

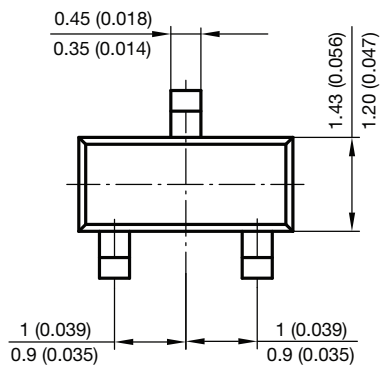
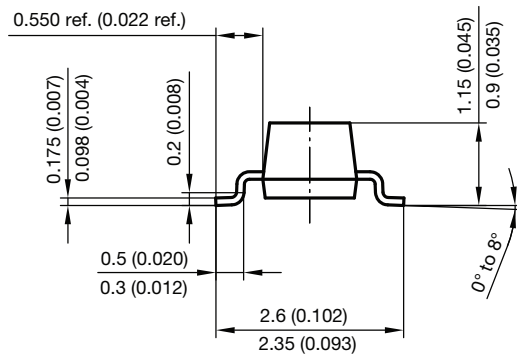
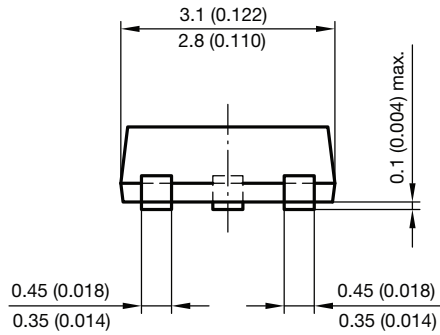
Thickness: fiberglass 0.059" (1.5 mm)  
Copper leads 0.012" (0.3 mm)



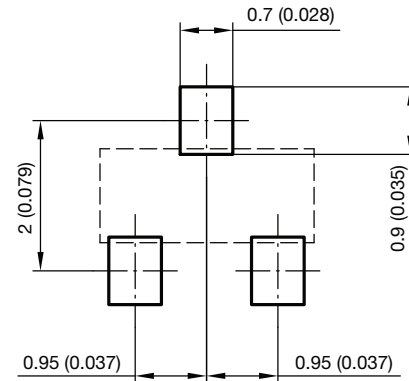
17451



### PACKAGE DIMENSIONS in millimeters (inches): SOT-23



Foot print recommendation:



Document no.: 6.541-5014.01-4  
 Rev. 8 - Date: 23. Sep. 2009  
 17418



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