

# Zener diode



## Features

1. Small surface mounting type
2. High reliability

## Applications

Voltage stabilization

## Construction

Silicon epitaxial planar

## Absolute Maximum Ratings

$T_j=25^\circ\text{C}$

| Parameter                 | Test Conditions     | Type | Symbol    | Value     | Unit |
|---------------------------|---------------------|------|-----------|-----------|------|
| Power dissipation         | $R_{thJA}$ ? 300K/W |      | $P_V$     | 500       | mW   |
| Z-current                 |                     |      | $I_Z$     | $P_V/V_Z$ | mA   |
| Junction temperature      |                     |      | $T_j$     | 175       | °C   |
| Storage temperature range |                     |      | $T_{stg}$ | -65~+175  | °C   |

## Maximum Thermal Resistance

$T_j=25^\circ\text{C}$

| Parameter        | Test Conditions               | Symbol     | Value | Unit |
|------------------|-------------------------------|------------|-------|------|
| Junction ambient | on PC board 50mm× 50mm× 1.6mm | $R_{thJA}$ | 500   | K/W  |

## Electrical Characteristics

$T_j=25^\circ\text{C}$

| Parameter       | Test Conditions    | Type | Symbol | Min | Typ | Max | Unit |
|-----------------|--------------------|------|--------|-----|-----|-----|------|
| Forward voltage | $I_F=200\text{mA}$ |      | $V_F$  |     |     | 1.5 | V    |

| Type   | $V_{Znom}$ | $I_{ZT}$ | for $V_{ZT}$ and | $I_{IT}$ | $r_{ZK}$ at | $I_{K}$ | $I_R$ and | $I_K$ at   | $V_R$ | $TK_{VZ}$   |
|--------|------------|----------|------------------|----------|-------------|---------|-----------|------------|-------|-------------|
| LL55C. | V          | mA       | $V^{1)}$         | 0        | 0           | mA      | $\mu A$   | ? $A^{2)}$ | V     | %/K         |
| 2V4    | 2.4        | 5        | 2.28~2.56        | <85      | <600        | 1       | <50       | <100       | 1     | -0.09~-0.06 |
| 2V7    | 2.7        | 5        | 2.5~2.9          | <85      | <600        | 1       | <10       | <50        | 1     | -0.09~-0.06 |
| 3V0    | 3.0        | 5        | 2.8~3.2          | <90      | <600        | 1       | <4        | <40        | 1     | -0.08~-0.05 |
| 3V3    | 3.3        | 5        | 3.1~3.5          | <90      | <600        | 1       | <2        | <40        | 1     | -0.08~-0.05 |
| 3V6    | 3.6        | 5        | 3.4~3.8          | <90      | <600        | 1       | <2        | <40        | 1     | -0.08~-0.05 |
| 3V9    | 3.9        | 5        | 3.7~4.1          | <90      | <600        | 1       | <2        | <40        | 1     | -0.08~-0.05 |
| 4V3    | 4.3        | 5        | 4.0~4.6          | <90      | <600        | 1       | <1        | <20        | 1     | -0.06~-0.03 |
| 4V7    | 4.7        | 5        | 4.4~5.0          | <80      | <600        | 1       | <0.5      | <10        | 1     | -0.05~+0.02 |
| 5V1    | 5.1        | 5        | 4.8~5.4          | <60      | <550        | 1       | <0.1      | <2         | 1     | -0.02~+0.02 |
| 5V6    | 5.6        | 5        | 5.2~6.0          | <40      | <450        | 1       | <0.1      | <2         | 1     | -0.05~+0.05 |
| 6V2    | 6.2        | 5        | 5.8~6.6          | <10      | <200        | 1       | <0.1      | <2         | 2     | 0.03~0.06   |
| 6V8    | 6.8        | 5        | 6.4~7.2          | <8       | <150        | 1       | <0.1      | <2         | 3     | 0.03~0.07   |
| 7V5    | 7.5        | 5        | 7.0~7.9          | <7       | <50         | 1       | <0.1      | <2         | 5     | 0.03~0.07   |
| 8V2    | 8.2        | 5        | 7.7~8.7          | <7       | <50         | 1       | <0.1      | <2         | 6.2   | 0.03~0.08   |
| 9V1    | 9.1        | 5        | 8.5~9.6          | <10      | <50         | 1       | <0.1      | <2         | 6.8   | 0.03~0.09   |
| 10     | 10         | 5        | 9.4~10.6         | <15      | <70         | 1       | <0.1      | <2         | 7.5   | 0.03~0.1    |
| 11     | 11         | 5        | 10.4~11.6        | <20      | <70         | 1       | <0.1      | <2         | 8.2   | 0.03~0.11   |
| 12     | 12         | 5        | 11.4~12.7        | <20      | <90         | 1       | <0.1      | <2         | 9.1   | 0.03~0.11   |
| 13     | 13         | 5        | 12.4~14.1        | <26      | <110        | 1       | <0.1      | <2         | 10    | 0.03~0.11   |
| 15     | 15         | 5        | 13.8~15.6        | <30      | <110        | 1       | <0.1      | <2         | 11    | 0.03~0.11   |
| 16     | 16         | 5        | 15.3~17.1        | <40      | <170        | 1       | <0.1      | <2         | 12    | 0.03~0.11   |
| 18     | 18         | 5        | 16.8~19.1        | <50      | <170        | 1       | <0.1      | <2         | 13    | 0.03~0.11   |
| 20     | 20         | 5        | 18.8~21.2        | <55      | <220        | 1       | <0.1      | <2         | 15    | 0.03~0.11   |
| 22     | 22         | 5        | 20.8~23.3        | <55      | <220        | 1       | <0.1      | <2         | 16    | 0.04~0.12   |
| 24     | 24         | 5        | 22.8~25.6        | <80      | <220        | 1       | <0.1      | <2         | 18    | 0.04~0.12   |
| 27     | 27         | 5        | 25.1~28.9        | <80      | <220        | 1       | <0.1      | <2         | 20    | 0.04~0.12   |
| 30     | 30         | 5        | 28~32            | <80      | <220        | 1       | <0.1      | <2         | 22    | 0.04~0.12   |
| 33     | 33         | 5        | 31~35            | <80      | <220        | 1       | <0.1      | <2         | 24    | 0.04~0.12   |
| 36     | 36         | 5        | 34~38            | <80      | <220        | 1       | <0.1      | <2         | 27    | 0.04~0.12   |
| 39     | 39         | 2.5      | 37~41            | <90      | <500        | 0.5     | <0.1      | <5         | 30    | 0.04~0.12   |
| 43     | 43         | 2.5      | 40~46            | <90      | <600        | 0.5     | <0.1      | <5         | 33    | 0.04~0.12   |
| 47     | 47         | 2.5      | 44~50            | <110     | <700        | 0.5     | <0.1      | <5         | 36    | 0.04~0.12   |
| 51     | 51         | 2.5      | 48~54            | <125     | <700        | 0.5     | <0.1      | <10        | 39    | 0.04~0.12   |
| 56     | 56         | 2.5      | 52~60            | <135     | <1000       | 0.5     | <0.1      | <10        | 43    | 0.04~0.12   |
| 62     | 62         | 2.5      | 58~66            | <150     | <1000       | 0.5     | <0.1      | <10        | 47    | 0.04~0.12   |
| 68     | 68         | 2.5      | 64~72            | <200     | <1000       | 0.5     | <0.1      | <10        | 51    | 0.04~0.12   |
| 75     | 75         | 2.5      | 70~79            | <250     | <1500       | 0.5     | <0.1      | <10        | 56    | 0.04~0.12   |

<sup>1)</sup> Tighter tolerances available request:

LL55A...  $\pm 1\%$  of  $V_{Znom}$

LL55B...  $\pm 2\%$  of  $V_{Znom}$

LL55F...  $\pm 3\%$  of  $V_{Znom}$

<sup>2)</sup> at  $T_j=150^\circ$

# Characteristics ( $T_j=25^\circ\text{C}$ unless otherwise specified)

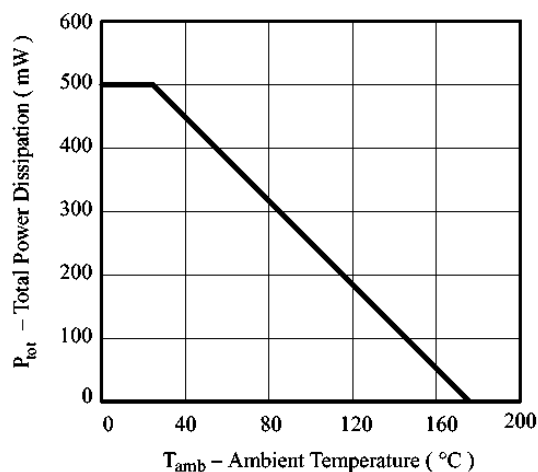


Figure 1. Total Power Dissipation vs. Ambient Temperature

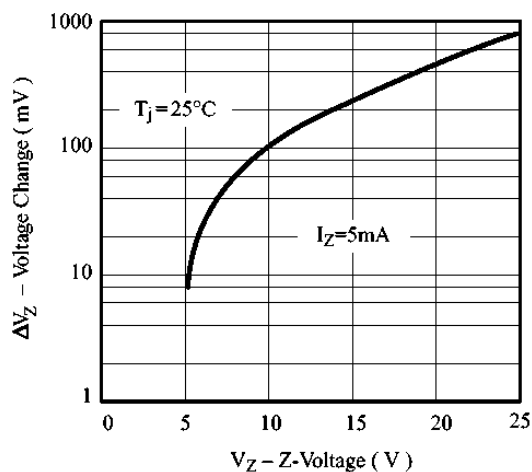


Figure 2. Typical Change of Working Voltage under Operating Conditions at  $T_{\text{amb}}=25^\circ\text{C}$

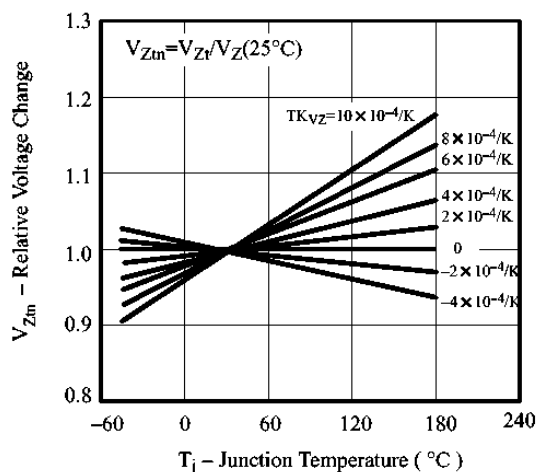


Figure 3. Typical Change of Working Voltage vs. Junction Temperature

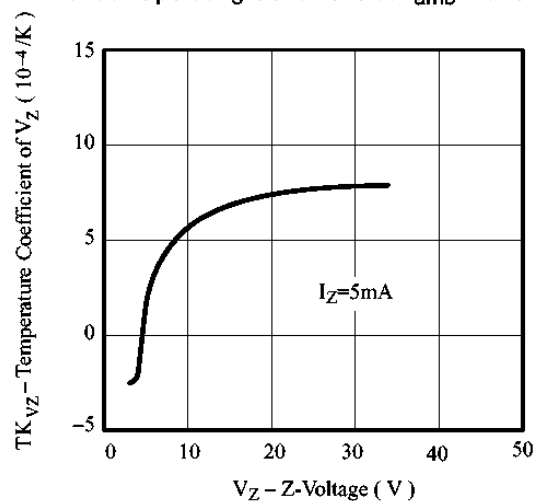


Figure 4. Temperature Coefficient of  $V_Z$  vs. Z-Voltage

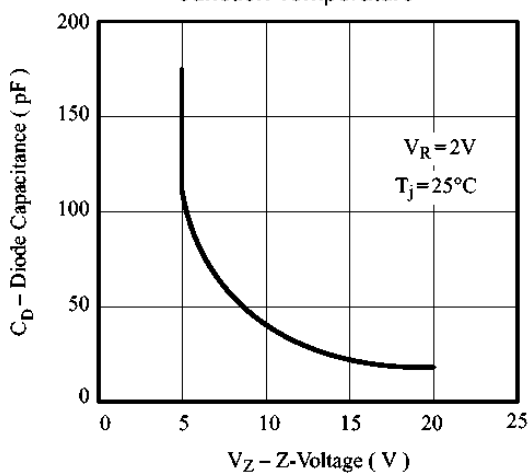


Figure 5. Diode Capacitance vs. Z-Voltage

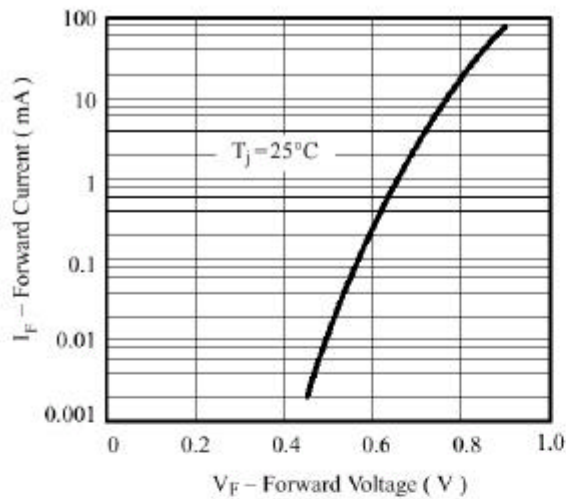


Figure 6. Forward Current vs. Forward Voltage

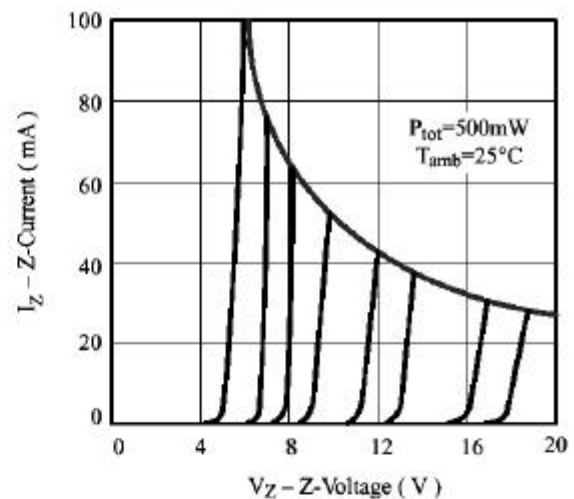


Figure 7. Z-Current vs. Z-Voltage

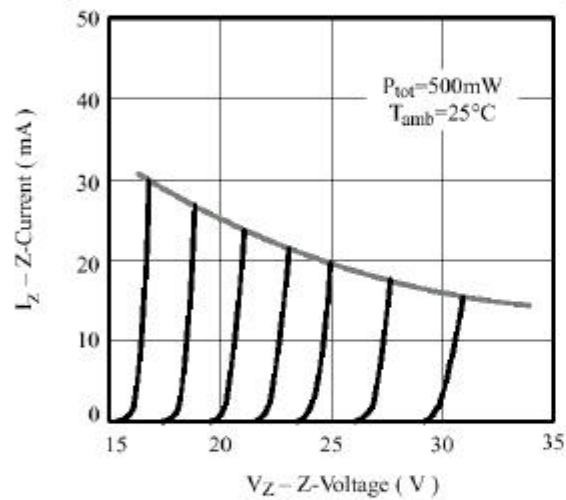


Figure 8. Z-Current vs. Z-Voltage

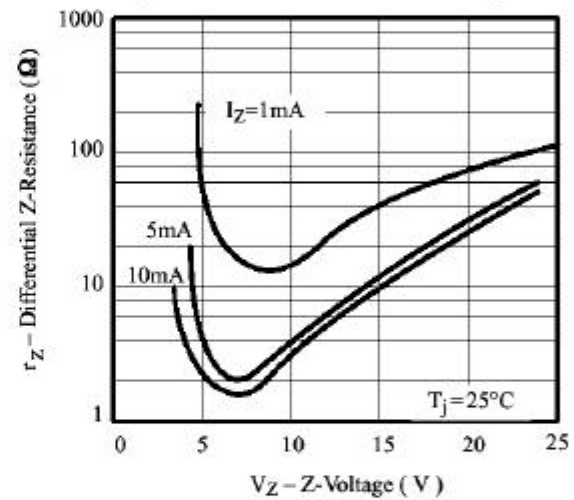


Figure 9. Differential Z-Resistance vs. Z-Voltage

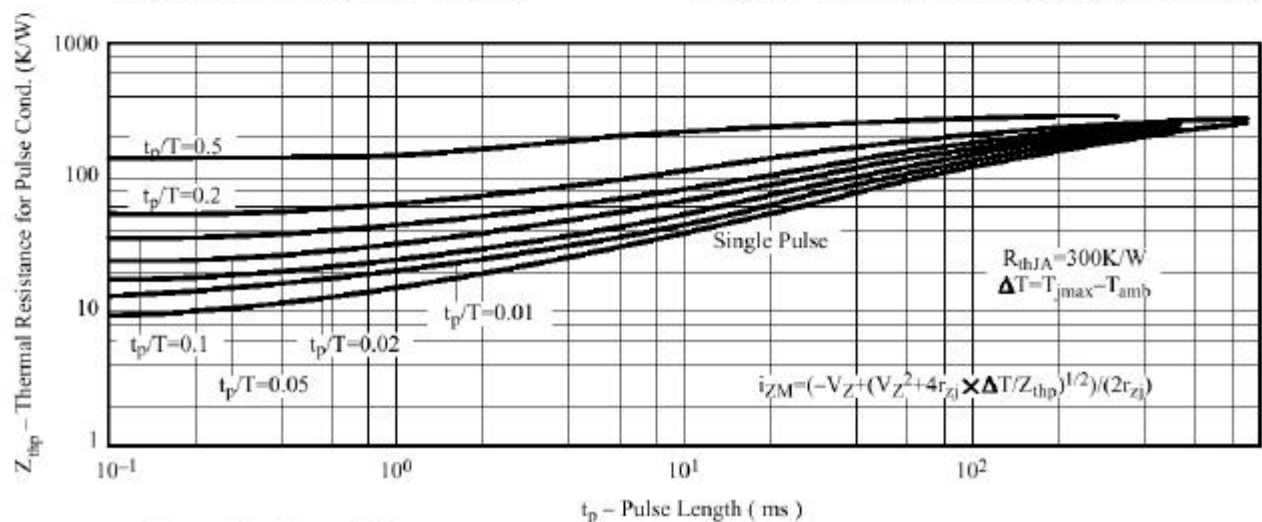


Figure 10. Thermal Response

Dimensions in mm

