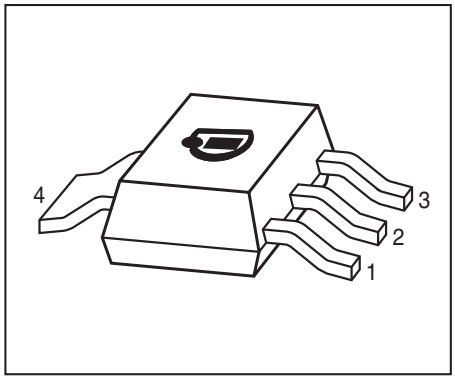
# THE DATASHEET OF

# BSP50H6327XTSA1

www.win-source.net 0086-755-83957316

## NPN Silicon Darlington Transistors




- High collector current
- Low collector-emitter saturation voltage
- Complementary types: BSP60 - BSP62 (PNP)
- Pb-free (RoHS compliant) package
- Qualified according AEC Q101

| Type | Marking | Pin Configuration | | | | | | Package |
|---|---|---|---|---|---|---|---|---|
| BSP50 | BSP50 | 1=B | 2=C | 3=E | 4=C | - | - | SOT223 |
| BSP51 | BSP51 | 1=B | 2=C | 3=E | 4=C | - | - | SOT223 |
| BSP52 | BSP52 | 1=B | 2=C | 3=E | 4=C | - | - | SOT223 |

### Maximum Ratings

| Parameter | Symbol | Value | Unit |
|---|---|---|---|
| Collector-emitter voltage | $V_{CEO}$ | | V |
| BSP50 | | 45 | |
| BSP51 | | 60 | |
| BSP52 | | 80 | |
| Collector-base voltage | $V_{CBO}$ | | |
| BSP50 | | 60 | |
| BSP51 | | 80 | |
| BSP52 | | 90 | |
| Emitter-base voltage | $V_{EBO}$ | 5 | |
| Collector current | $I_C$ | 1 | A |
| Peak collector current, $t_p \leq 10$ ms | $I_{CM}$ | 2 | |
| Base current | $I_B$ | 100 | mA |
| Total power dissipation- $T_S \leq 124$ °C | $P_{tot}$ | 1.5 | W |
| Junction temperature | $T_j$ | 150 | °C |
| Storage temperature | $T_{stg}$ | -65 ... 150 | |

**Thermal Resistance**

| Parameter | Symbol | Value | Unit |
|---|---|---|---|
| Junction - soldering point[1)] | $R_{thJS}$ | ≤ 17 | K/W |

**Electrical Characteristics** at $T_A$ = 25°C, unless otherwise specified

| Parameter | Symbol | Values | | | Unit |
|---|---|---|---|---|---|
| | | min. | typ. | max. | |
| **DC Characteristics** | | | | | |
| Collector-emitter breakdown voltage | $V_{(BR)CEO}$ | | | | V |
| $I_C$ = 10 mA, $I_B$ = 0 , BSP50 | | 45 | - | - | |
| $I_C$ = 10 mA, $I_B$ = 0 , BSP51 | | 60 | - | - | |
| $I_C$ = 10 mA, $I_B$ = 0 , BSP52 | | 80 | - | - | |
| Collector-base breakdown voltage | $V_{(BR)CBO}$ | | | | |
| $I_C$ = 100 µA, $I_E$ = 0 , BSP50 | | 60 | - | - | |
| $I_C$ = 100 µA, $I_E$ = 0 , BSP51 | | 80 | - | - | |
| $I_C$ = 100 µA, $I_E$ = 0 , BSP52 | | 90 | - | - | |
| Emitter-base breakdown voltage<br>$I_E$ = 100 µA, $I_C$ = 0 | $V_{(BR)EBO}$ | 5 | - | - | |
| Collector-emitter cutoff current<br>$V_{CE}$ = $V_{CE0max}$, $V_{BE}$ = 0 | $I_{CES}$ | - | - | 10 | µA |
| Emitter-base cutoff current<br>$V_{EB}$ = 4 V, $I_C$ = 0 | $I_{EBO}$ | - | - | 10 | µA |
| DC current gain[2)] | $h_{FE}$ | | | | - |
| $I_C$ = 150 mA, $V_{CE}$ = 10 V | | 1000 | - | - | |
| $I_C$ = 500 mA, $V_{CE}$ = 10 V | | 2000 | - | - | |
| Collector-emitter saturation voltage[2)] | $V_{CEsat}$ | | | | V |
| $I_C$ = 500 mA, $I_B$ = 0.5 mA | | - | - | 1.3 | |
| $I_C$ = 1 A, $I_B$ = 1 mA | | - | - | 1.8 | |
| Base emitter saturation voltage[2)] | $V_{BEsat}$ | | | | |
| $I_C$ = 500 mA, $I_B$ = 0.5 mA | | - | - | 1.9 | |
| $I_C$ = 1 mA, $I_B$ = 1 A | | - | - | 2.2 | |

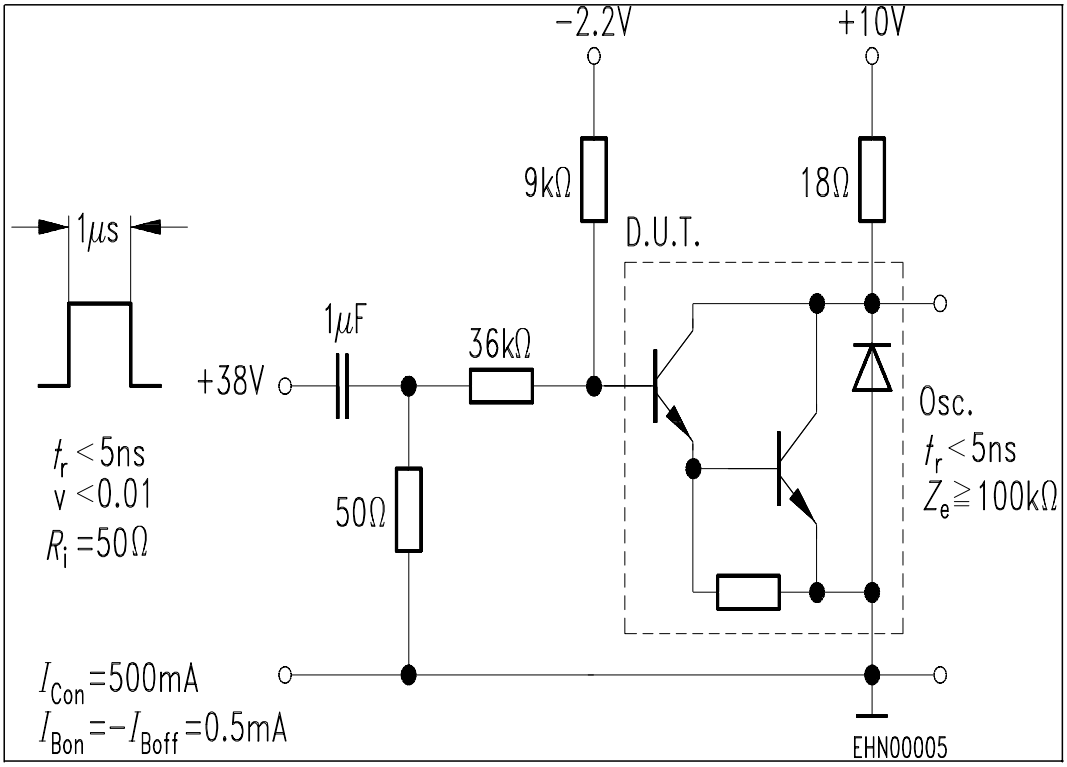
[1]For calculation of $R_{thJA}$ please refer to Application Note AN077 (Thermal Resistance Calculation)

[2]Pulse test: t < 300µs; D < 2%

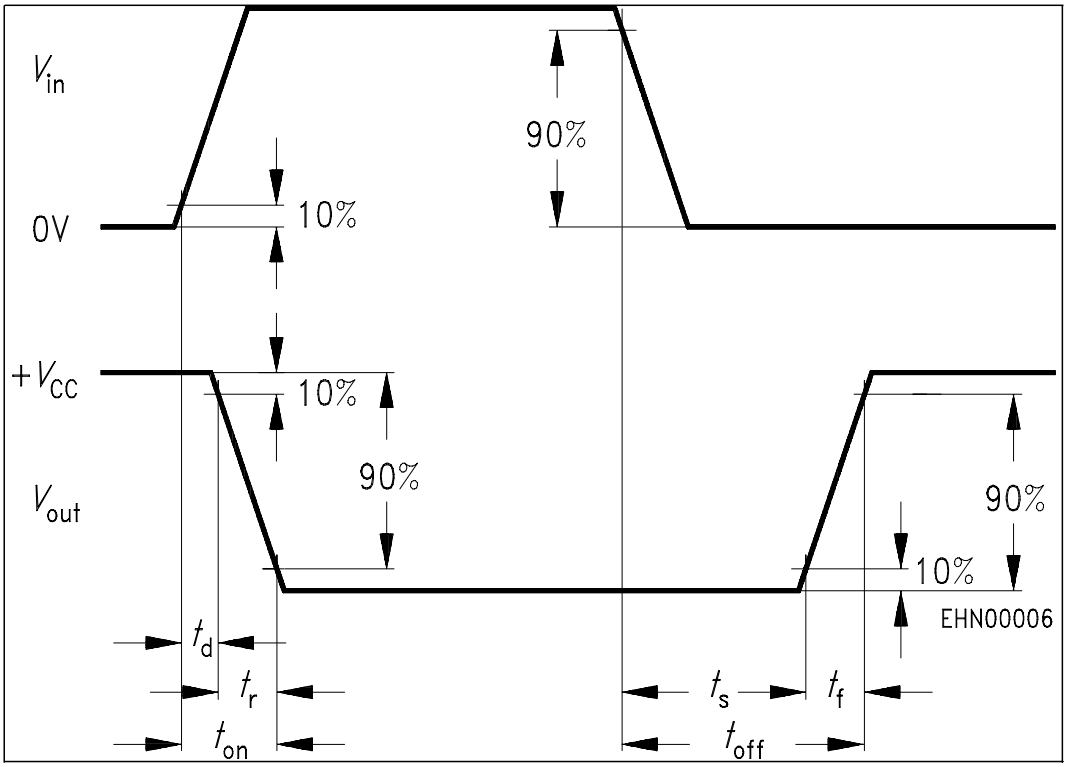
**Electrical Characteristics** at $T_A$ = 25°C, unless otherwise specified

| Parameter | Symbol | Values | | | Unit |
|---|---|---|---|---|---|
| | | min. | typ. | max. | |
| **AC Characteristics** | | | | | |
| Transition frequency<br>$I_C$ = 100 mA, $V_{CE}$ = 5 V, $f$ = 100 MHz | $f_T$ | - | 200 | - | MHz |
| Tum-on time<br>$I_C$ = 500 mA, $I_{B1}$ = $I_{B2}$ = 0.5 mA | $t_{(on)}$ | - | 400 | - | ns |
| Tum-off time<br>$I_C$ = 500 mA, $I_{B1}$ = $I_{B2}$ = 0.5 mA | $t_{(off)}$ | - | 1500 | - | |

**Switching time test circuit**

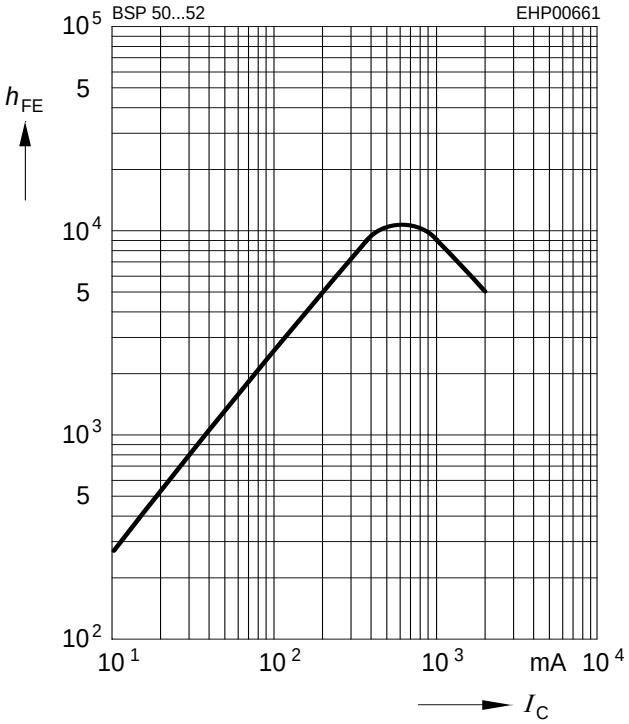



**Switching time waveform**



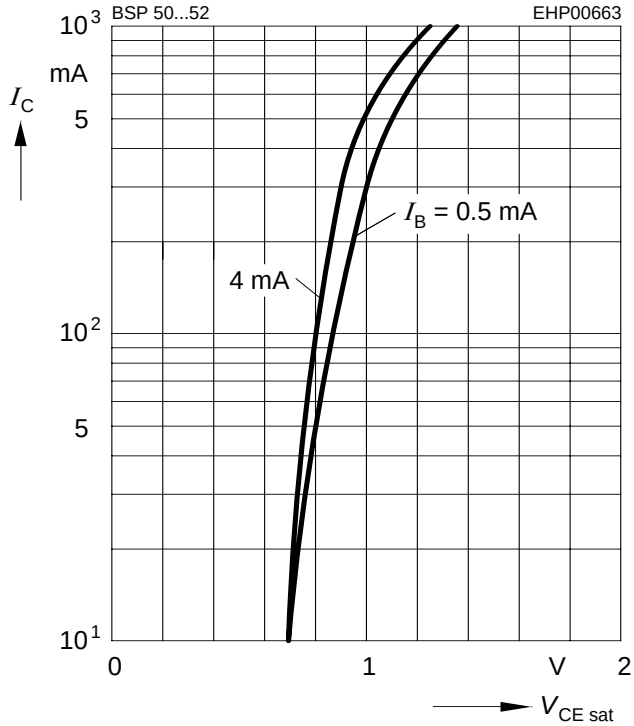
**DC current gain $h_{FE} = f(I_C)$**

$V_{CE}$ = 10 V



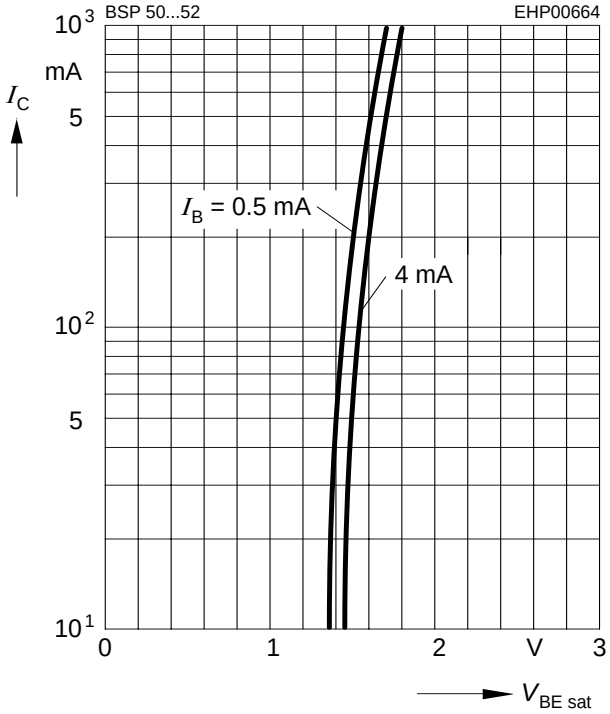

**Collector-emitter saturation voltage**

$I_C = f(V_{CEsat})$, $I_B$ = Parameter



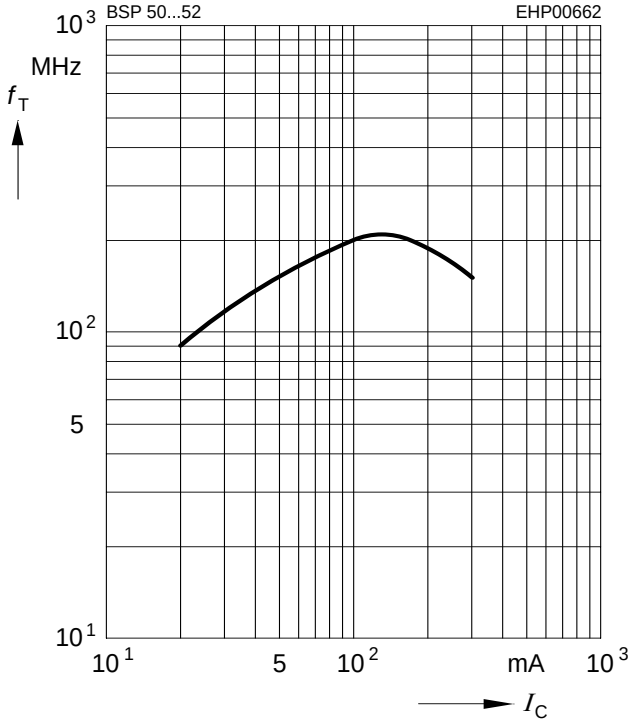

**Base-emitter saturation voltage**

$I_C = f(V_{BEsat})$, $I_B$ = Parameter

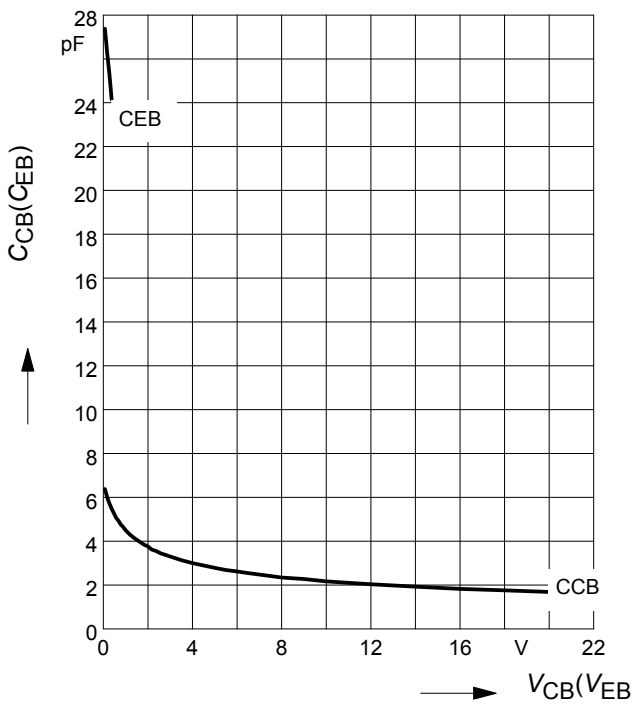



**Transition frequency $f_T = f(I_C)$**

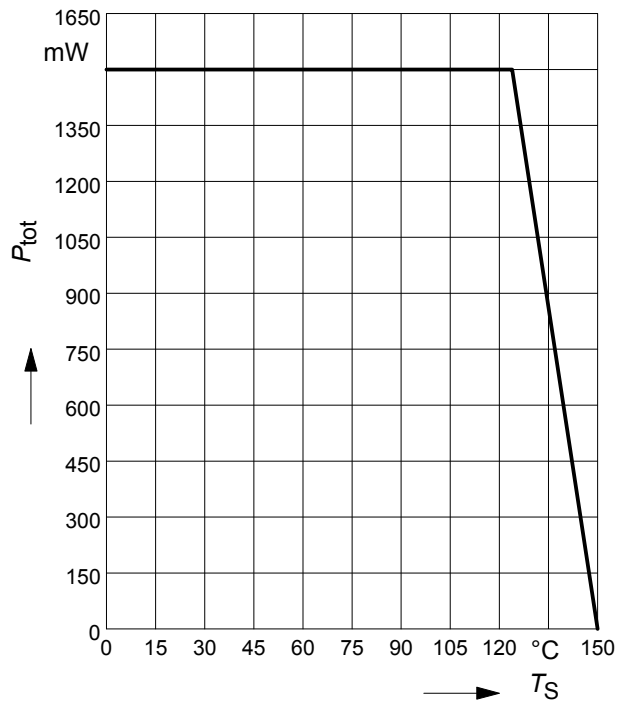
$V_{CE}$ = 5 V, $f$ = 100 MHz



**Collector-base capacitance** $C_{cb} = f(V_{CB})$
**Emitter-base capacitance** $C_{eb} = f(V_{EB})$

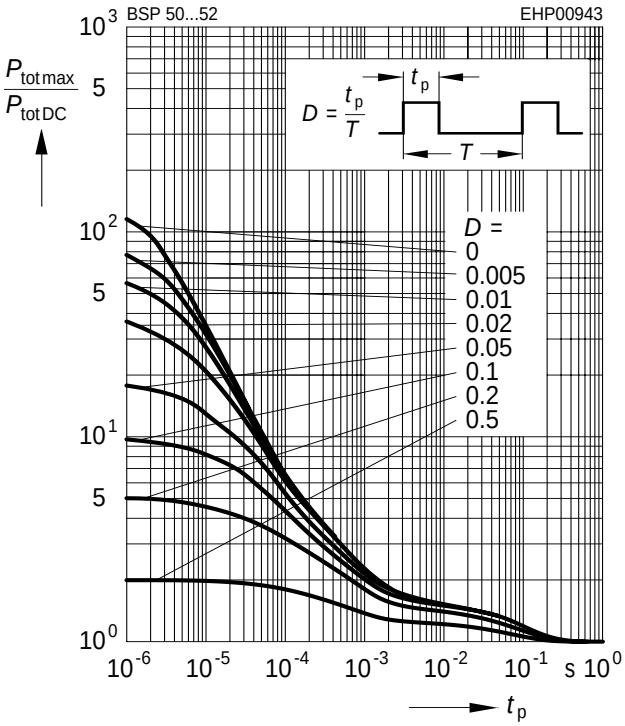



**Total power dissipation** $P_{tot} = f(T_S)$




**Permissible Pulse Load**

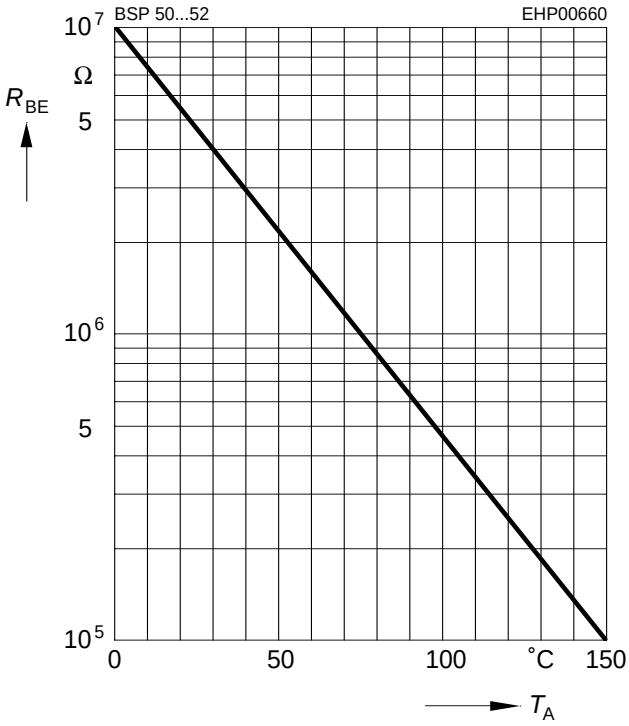
$P_{totmax}/P_{totDC} = f(t_p)$



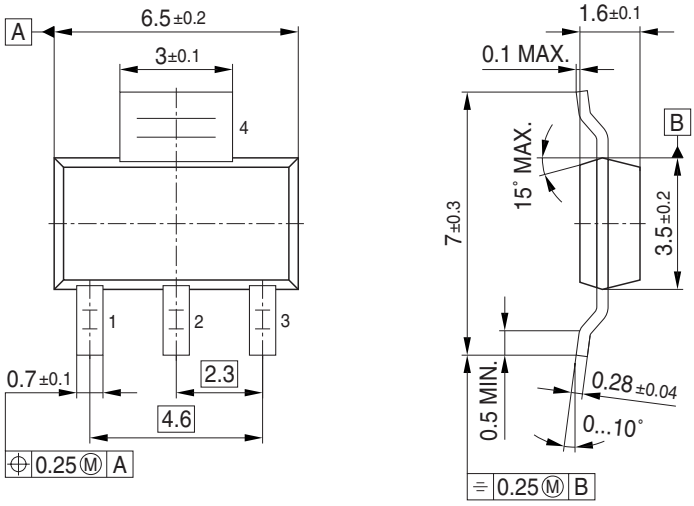

**External resistance** $R_{BE} = f(T_A)$**

$V_{CB} = V_{CEmax}$

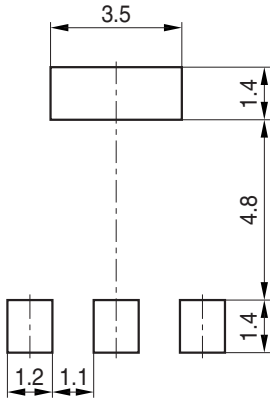
** $R_{BEmax}$ for thermal stability



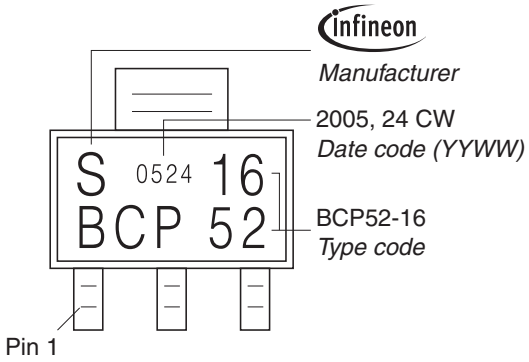
## Package Outline




## Foot Print

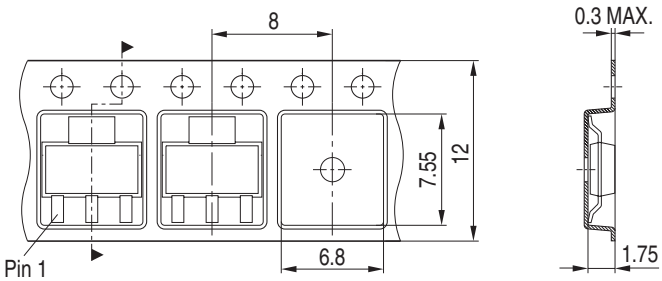



## Marking Layout (Example)




## Packing

Reel ø180 mm = 1.000 Pieces/Reel
Reel ø330 mm = 4.000 Pieces/Reel



**Edition 2009-11-16**

**Published by**
**Infineon Technologies AG**
**81726 Munich, Germany**

**© 2009 Infineon Technologies AG**
**All Rights Reserved.**

## Legal Disclaimer

The information given in this document shall in no event be regarded as a guarantee of conditions or characteristics. With respect to any examples or hints given herein, any typical values stated herein and/or any information regarding the application of the device, Infineon Technologies hereby disclaims any and all warranties and liabilities of any kind, including without limitation, warranties of non-infringement of intellectual property rights of any third party.

## Information

For further information on technology, delivery terms and conditions and prices, please contact the nearest Infineon Technologies Office (<www.infineon.com>).

## Warnings

Due to technical requirements, components may contain dangerous substances. For information on the types in question, please contact the nearest Infineon Technologies Office.
Infineon Technologies components may be used in life-support devices or systems only with the express written approval of Infineon Technologies, if a failure of such components can reasonably be expected to cause the failure of that life-support device or system or to affect the safety or effectiveness of that device or system. Life support devices or systems are intended to be implanted in the human body or to support and/or maintain and sustain and/or protect human life. If they fail, it is reasonable to assume that the health of the user or other persons may be endangered.

## Looking for pricing, stock, or lifecycle information?

Click below to explore more details on WIN SOURCE:

- View BSP50H6327XTSA1 on WIN SOURCE
- Infineon Technologies Information

## Optimize Your Supply Chain with WIN SOURCE Solutions

- Global Sourcing Solution
- Obsolete Management
- Cost Control Management
- Shortage Management
- Alternative Solution
- Excess Inventory Management