NPN Silicon High-Voltage Transistors

- Low collector-emitter saturation voltage
- Complementary types:
  SMBTA92 / MMBTA92(PNP)
- Pb-free (RoHS compliant) package
- Qualified according AEC Q101

AEC Qualified   **RoHS**
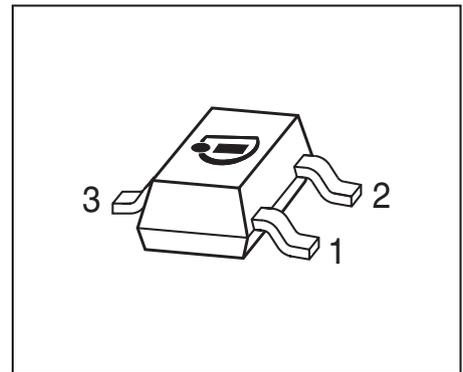
Type	Marking	Pin Configuration			Package
SMBTA42/MMBTA42	s1D	1=B	2=E	3=C	SOT23

Maximum Ratings

Parameter	Symbol	Value	Unit
Collector-emitter voltage	V_{CEO}	300	V
Collector-base voltage	V_{CBO}	300	
Emitter-base voltage	V_{EBO}	6	
Collector current	I_C	500	mA
Base current	I_B	100	
Total power dissipation- $T_S \leq 74\,°C$	P_{tot}	360	mW
Junction temperature	T_j	150	°C
Storage temperature	T_{stg}	-65 ... 150	

Thermal Resistance

Parameter	Symbol	Value	Unit
Junction - soldering point[1]	R_{thJS}	≤ 210	K/W

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

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

| Parameter	Symbol	Values			Unit
		min.	typ.	max.	
DC Characteristics					
Collector-emitter breakdown voltage I_C = 1 mA, I_B = 0	$V_{(BR)CEO}$	300	-	-	V
Collector-base breakdown voltage I_C = 100 µA, I_E = 0	$V_{(BR)CBO}$	300	-	-	
Emitter-base breakdown voltage I_E = 100 µA, I_C = 0	$V_{(BR)EBO}$	6	-	-	
Collector-base cutoff current V_{CB} = 200 V, I_E = 0 V_{CB} = 200 V, I_E = 0 , T_A = 150 °C	I_{CBO}	- -	- -	0.1 20	µA
Emitter-base cutoff current V_{EB} = 5 V, I_C = 0	I_{EBO}	-	-	100	nA
DC current gain[1) I_C = 1 mA, V_{CE} = 10 V I_C = 10 mA, V_{CE} = 10 V I_C = 30 mA, V_{CE} = 10 V	h_{FE}	25 40 40	- - -	- - -	-
Collector-emitter saturation voltage[1) I_C = 20 mA, I_B = 2 mA	V_{CEsat}	-	-	0.5	V
Base emitter saturation voltage[1) I_C = 20 mA, I_B = 2 mA	V_{BEsat}	-	-	0.9	
AC Characteristics					
Transition frequency I_C = 10 MHz, V_{CE} = 20 V, f = 100 MHz	f_T	50	70	-	MHz
Collector-base capacitance V_{CB} = 20 V, f = 1 MHz	C_{cb}	-	-	3	pF

[1]Pulse test: t < 300µs; D < 2%

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

$V_{CE} = 10$ V
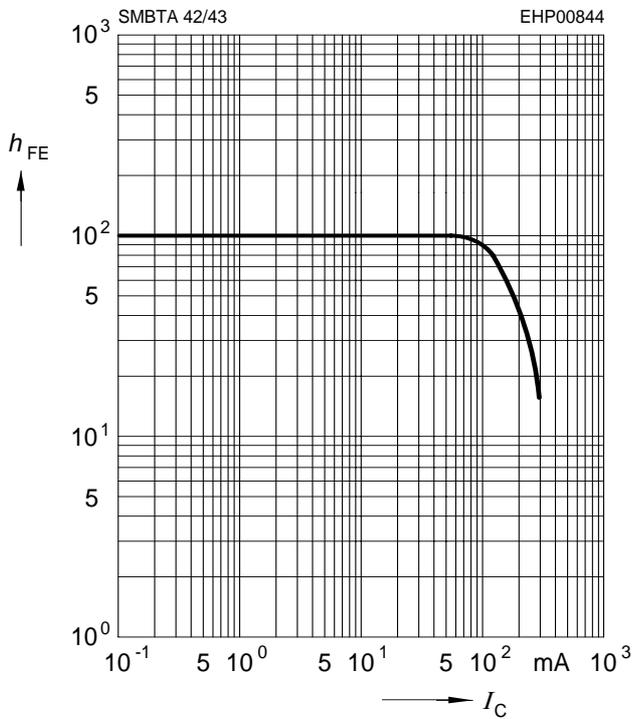
Operating range $I_C = f(V_{CEO})$

$T_A = 25°C, D = 0$
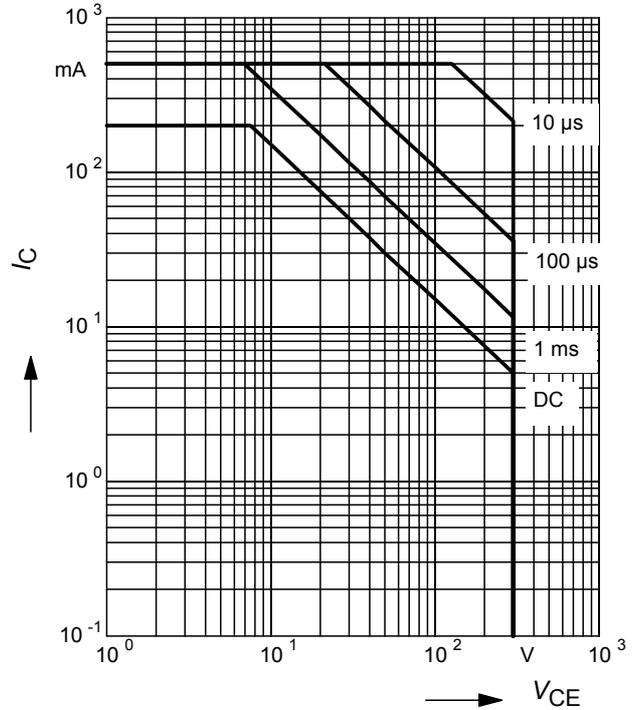
**Collector current** $I_C = f(V_{BE})$

$V_{CE} = 10V$
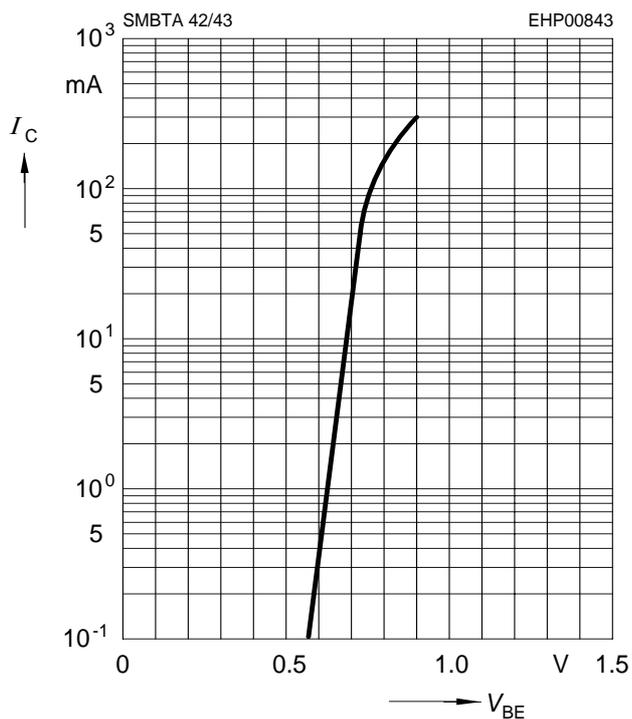
**Collector cutoff current** $I_{CBO} = f(T_A)$

$V_{CBO} = 160$ V

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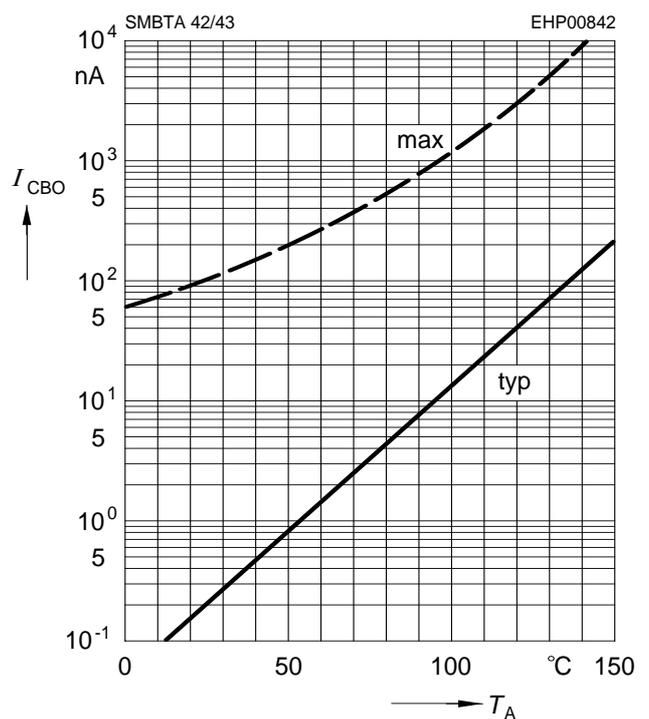
Transition frequency $f_\text{T} = f(I_\text{C})$

V_CE = 10 V, f = 100 MHz
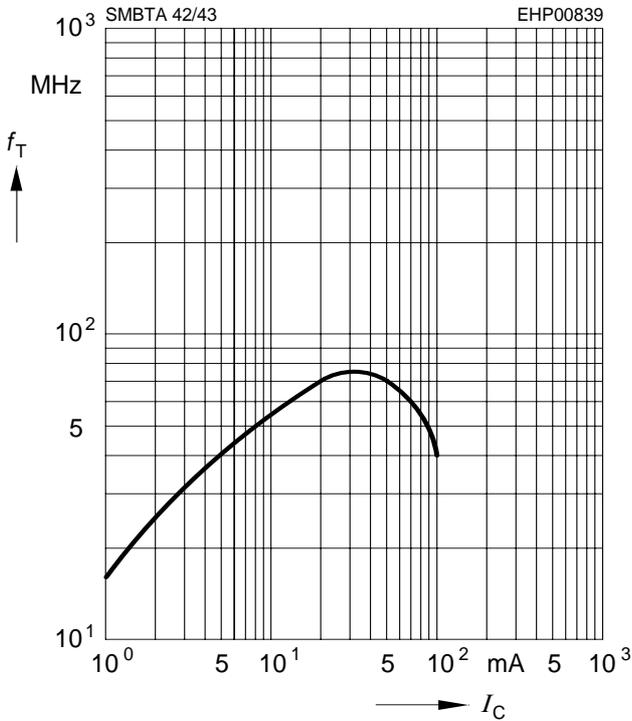
Collector-base capacitance $C_\text{cb} = f(V_\text{CB})$

Emitter-base capacitance $C_\text{eb} = f(V_\text{EB})$
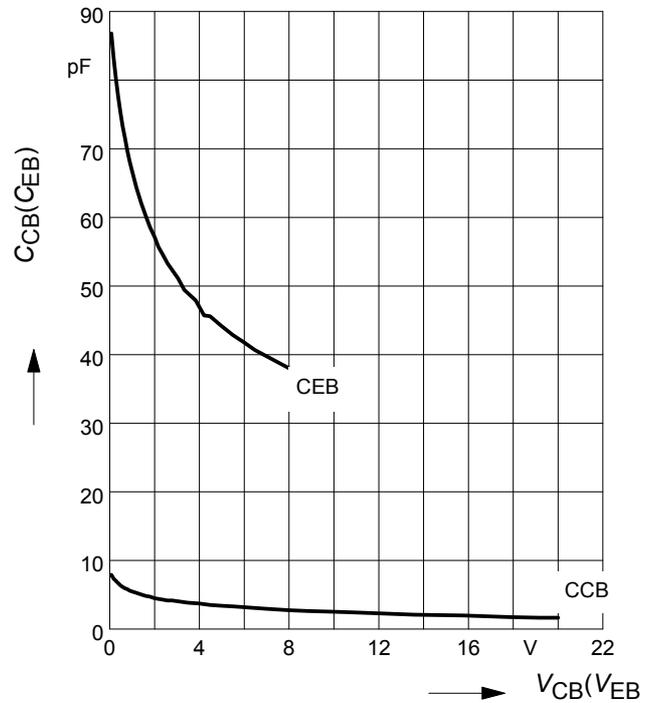
Total power dissipation $P_\text{tot} = f(T_\text{S})$

Permissible Pulse Load $R_\text{thJS} = f(t_\text{p})$

4   2011-12-19
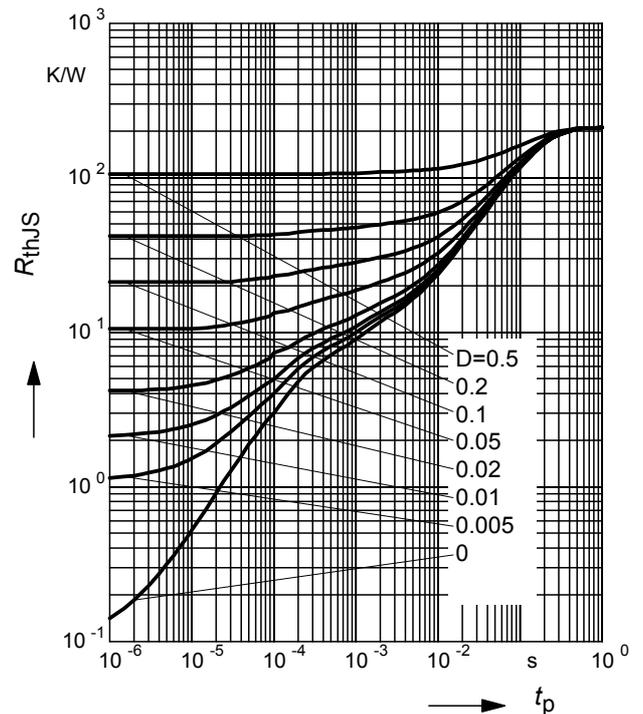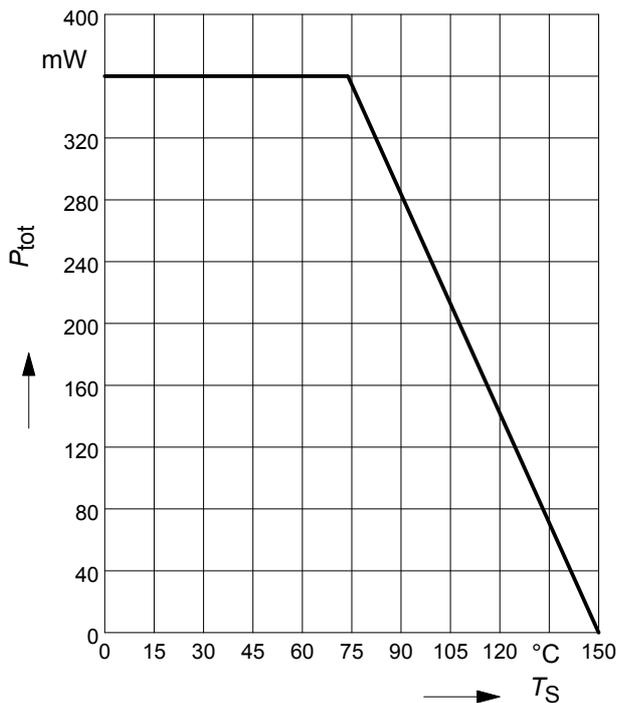
Permissible Pulse Load

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

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Package Outline

2.9 ±0.1 B

3

0.4 +0.1 -0.05 1)

C

0.95

1.9

⊕ 0.25 Ⓜ B C

1 ±0.1

0.1 MAX.

0.15 MIN.

2.4 ±0.15

10° MAX. 10° MAX.

1.3 ±0.1

A

0.08...0.15

0...8°

= 0.2 Ⓜ A
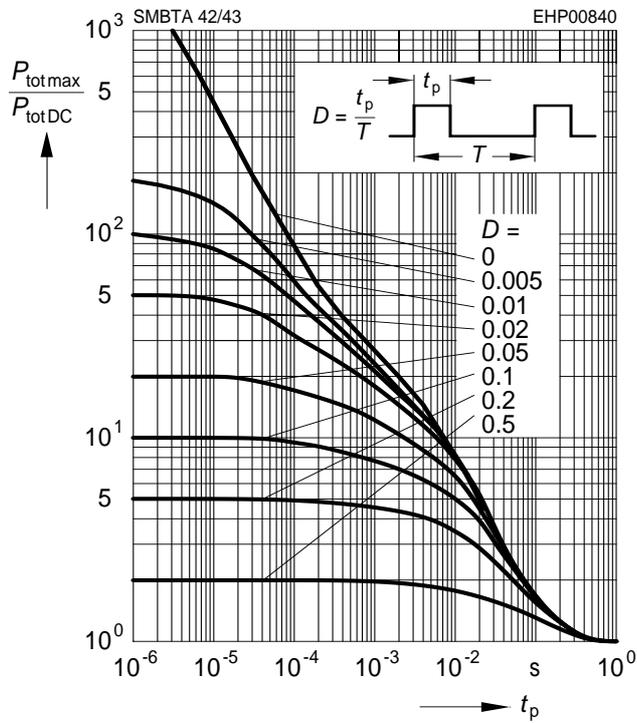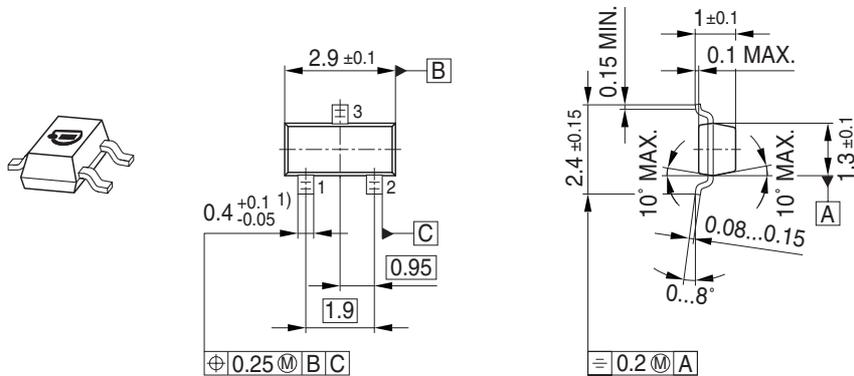
1) Lead width can be 0.6 max. in dambar area

Foot Print

0.8

0.9

1.3

0.8   1.2

0.9

Marking Layout (Example)

Infineon
Manufacturer

EH S 56

2005, June
Date code (YM)

Pin 1
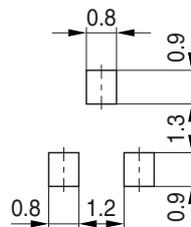
BCW66
Type code
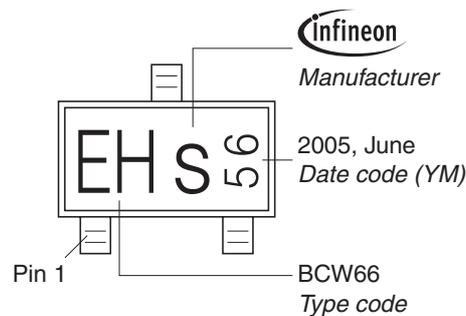
Standard Packing

Reel ø180 mm = 3.000 Pieces/Reel
Reel ø330 mm = 10.000 Pieces/Reel

4

0.9

0.2

2.13

2.65

8

Pin 1

3.15

1.15

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