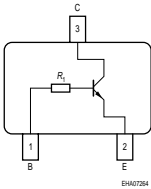


**NPN Silicon Digital Transistor**

- Switching circuit, inverter, interface circuit, driver circuit
- Built in bias resistor ( $R_1=22\text{ k}\Omega$ )


**BCR139F/L3**  
**BCR139T**


Type	Marking	Pin Configuration						Package
		1=B	2=E	3=C	-	-	-	
BCR139F	WYs	1=B	2=E	3=C	-	-	-	TSFP-3
BCR139L3	WY	1=B	2=E	3=C	-	-	-	TSLP-3-4
BCR139T	WY	1=B	2=E	3=C	-	-	-	SC75

**Maximum Ratings**

Parameter	Symbol	Value	Unit
Collector-emitter voltage	$V_{CEO}$	50	V
Collector-base voltage	$V_{CBO}$	50	
Input forward voltage	$V_{i(fwd)}$	60	
Input reverse voltage	$V_{i(rev)}$	5	
Collector current	$I_C$	100	mA
Total power dissipation-	$P_{tot}$	250	mW
BCR139F, $T_S \leq 128^\circ\text{C}$			
BCR139L3, $T_S \leq 135^\circ\text{C}$			
BCR139T, $T_S \leq 109^\circ\text{C}$		250	
Junction temperature	$T_j$	150	$^\circ\text{C}$
Storage temperature	$T_{stg}$	-65 ... 150	

**Thermal Resistance**

Parameter	Symbol	Value	Unit
Junction - soldering point <sup>1)</sup>	$R_{thJS}$		K/W
BCR139F		≤ 90	
BCR139L3		≤ 60	
BCR139T		≤ 165	

**Electrical Characteristics at  $T_A = 25^\circ\text{C}$ , unless otherwise specified**

Parameter	Symbol	Values			Unit
		min.	typ.	max.	

**DC Characteristics**

Collector-emitter breakdown voltage $I_C = 100 \mu\text{A}, I_B = 0$	$V_{(BR)CEO}$	50	-	-	V
Collector-base breakdown voltage $I_C = 10 \mu\text{A}, I_E = 0$	$V_{(BR)CBO}$	50	-	-	
Collector-base cutoff current $V_{CB} = 40 \text{V}, I_E = 0$	$I_{CBO}$	-	-	100	nA
Emitter-base cutoff current $V_{EB} = 5 \text{V}, I_C = 0$	$I_{EBO}$	-	-	100	nA
DC current gain <sup>2)</sup> $I_C = 5 \text{mA}, V_{CE} = 5 \text{V}$	$h_{FE}$	120	-	630	-
Collector-emitter saturation voltage <sup>2)</sup> $I_C = 10 \text{mA}, I_B = 0.5 \text{mA}$	$V_{CEsat}$	-	-	0.3	V
Input off voltage $I_C = 100 \mu\text{A}, V_{CE} = 5 \text{V}$	$V_{i(off)}$	0.4	-	0.8	
Input on voltage $I_C = 2 \text{mA}, V_{CE} = 0.3 \text{V}$	$V_{i(on)}$	0.5	-	1.1	
Input resistor	$R_1$	15	22	29	k $\Omega$

**AC Characteristics**

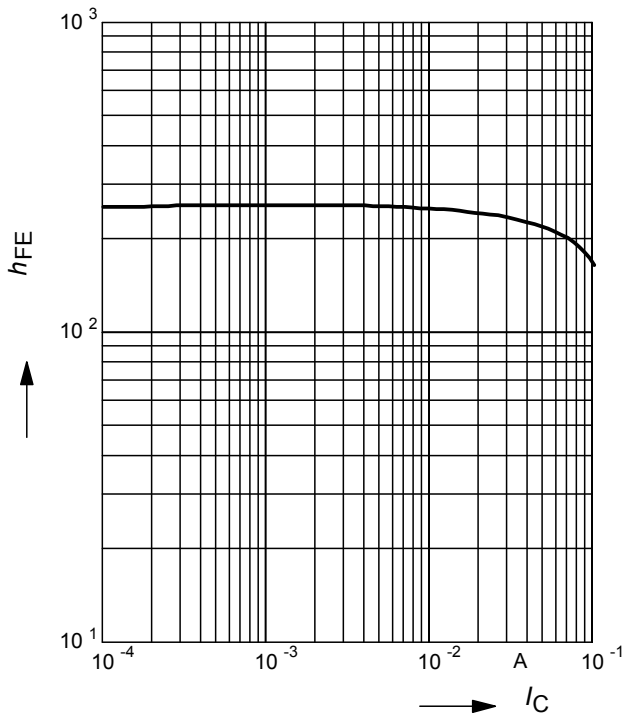
Transition frequency $I_C = 10 \text{mA}, V_{CE} = 5 \text{V}, f = 100 \text{MHz}$	$f_T$	-	150	-	MHz
Collector-base capacitance $V_{CB} = 10 \text{V}, f = 1 \text{MHz}$	$C_{cb}$	-	3	-	pF

<sup>1</sup>For calculation of  $R_{thJA}$  please refer to Application Note Thermal Resistance

<sup>2</sup>Pulse test:  $t < 300 \mu\text{s}; D < 2\%$

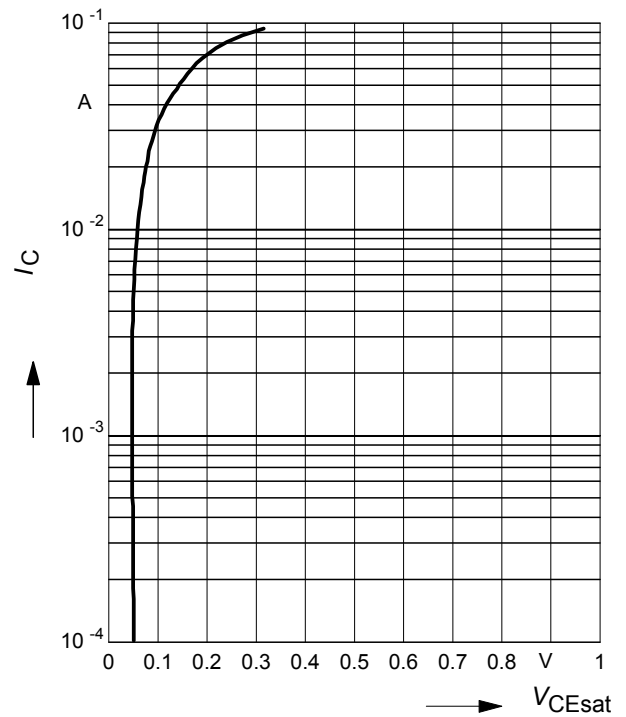
**DC current gain  $h_{FE} = f(I_C)$**

$V_{CE} = 5V$  (common emitter configuration)



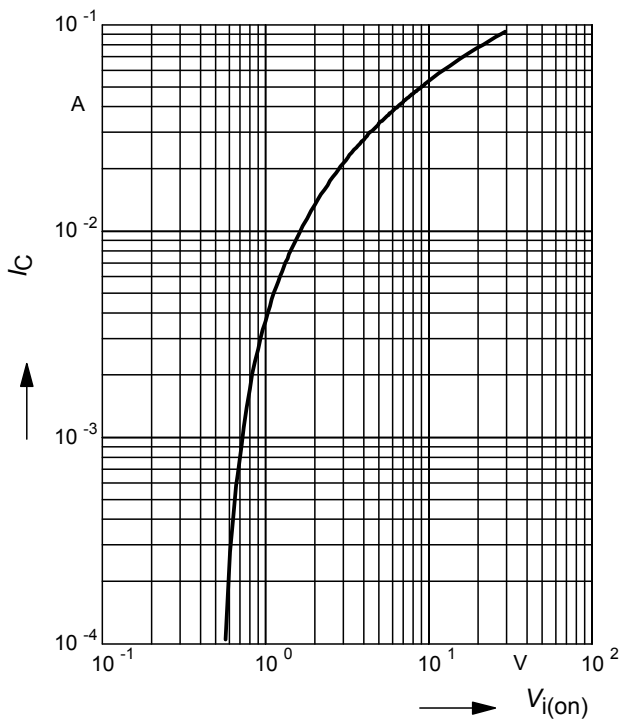
**Collector-emitter saturation voltage**

$V_{CEsat} = f(I_C), h_{FE} = 20$



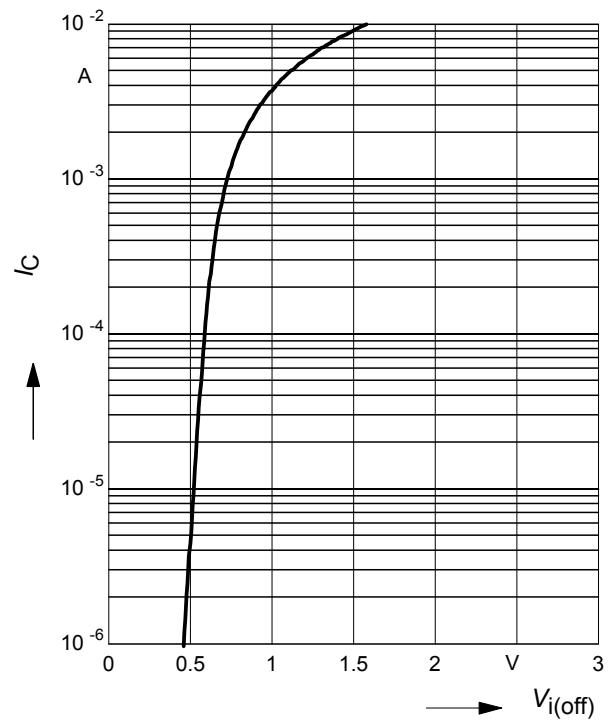
**Input on Voltage  $V_{i(on)} = f(I_C)$**

$V_{CE} = 0.3V$  (common emitter configuration)



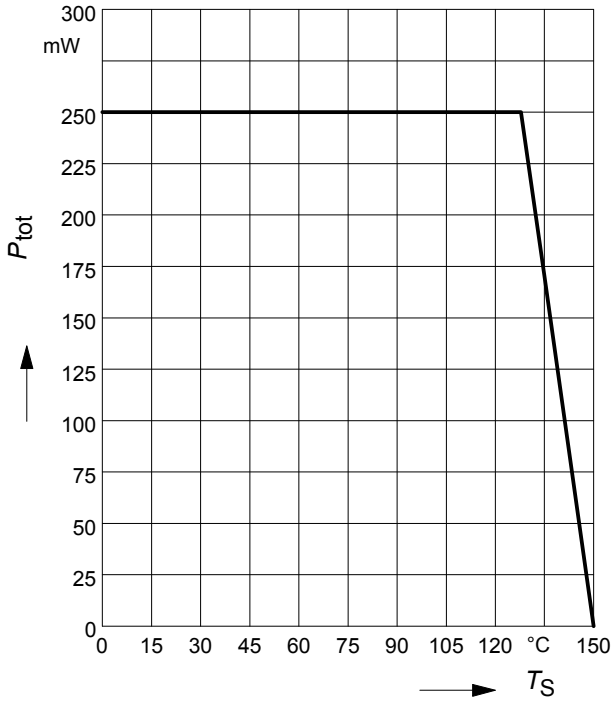
**Input off voltage  $V_{i(off)} = f(I_C)$**

$V_{CE} = 5V$  (common emitter configuration)



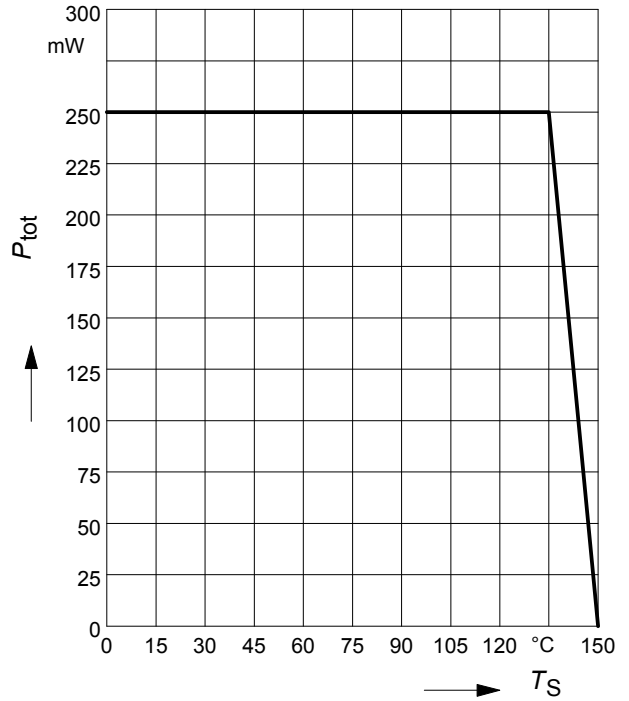
Total power dissipation  $P_{tot} = f(T_S)$

BCR139F



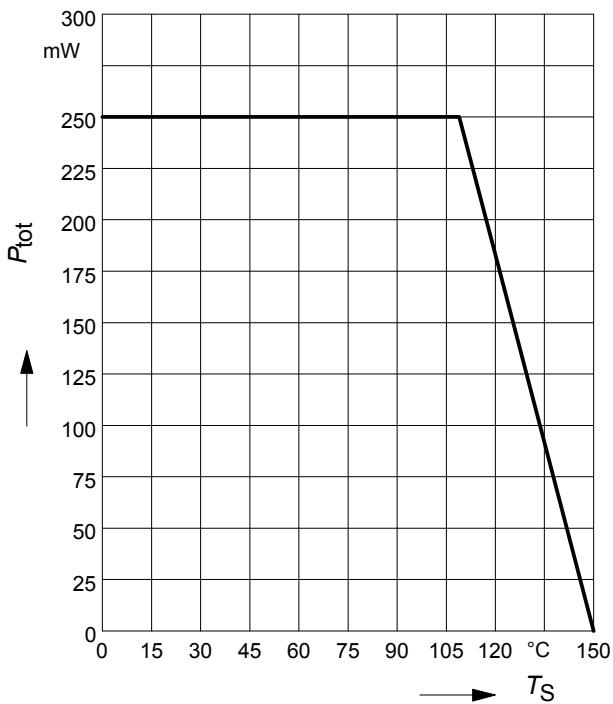
Total power dissipation  $P_{tot} = f(T_S)$

BCR139L3



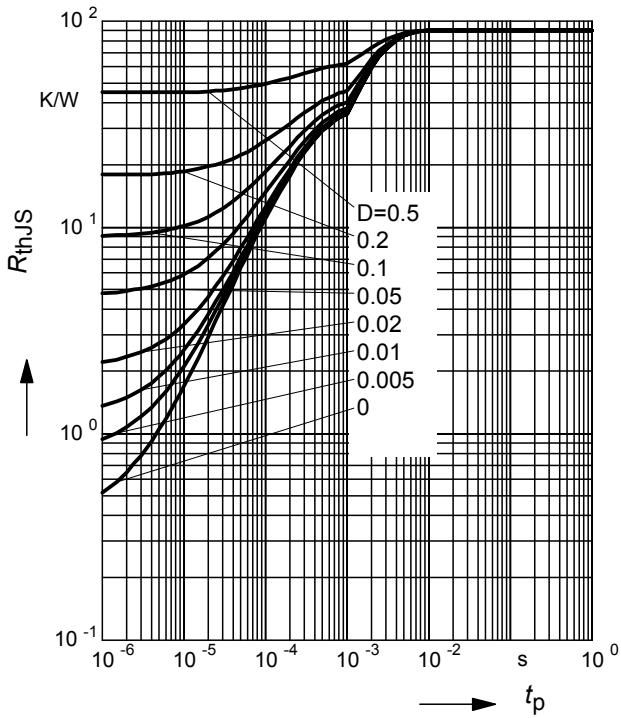
Total power dissipation  $P_{tot} = f(T_S)$

BCR139T



**Permissible Puls Load  $R_{thJS} = f(t_p)$**

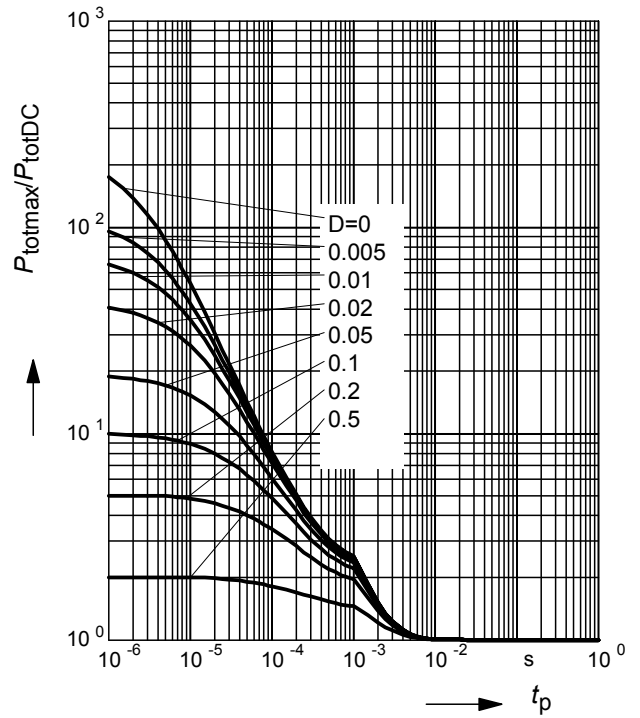
BCR139F



**Permissible Pulse Load**

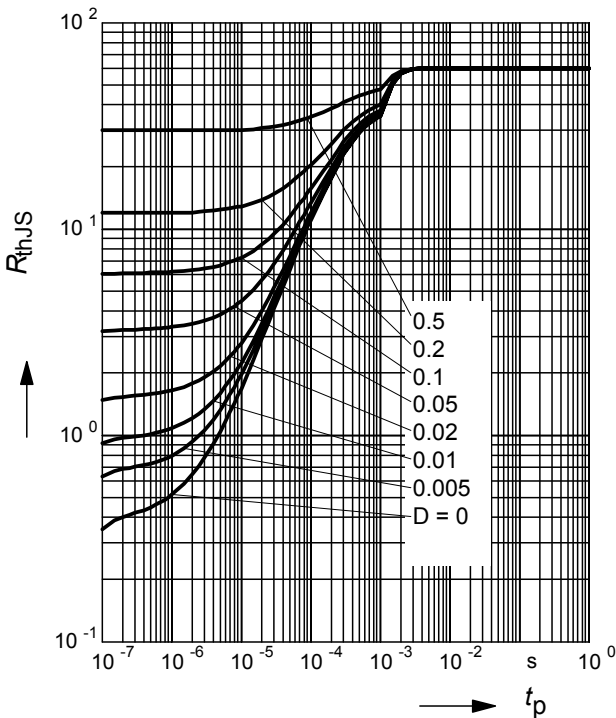
$P_{totmax}/P_{totDC} = f(t_p)$

BCR139F



**Permissible Puls Load  $R_{thJS} = f(t_p)$**

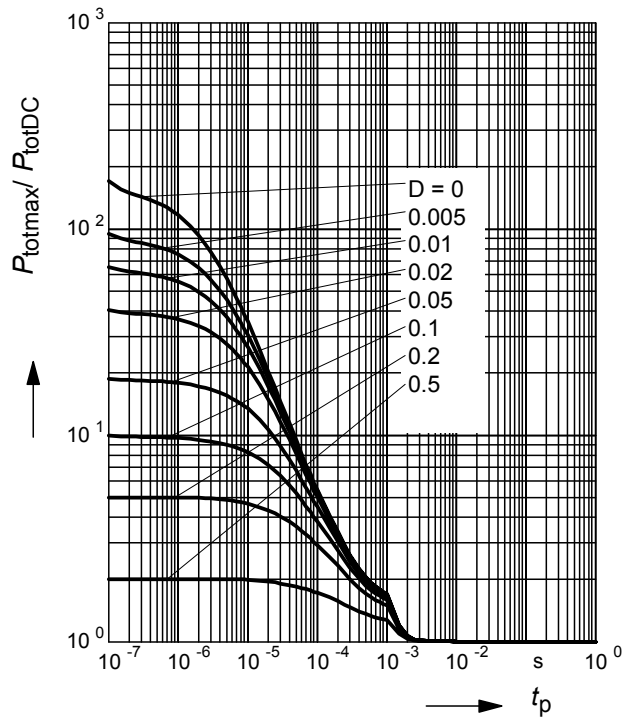
BCR139L3



**Permissible Pulse Load**

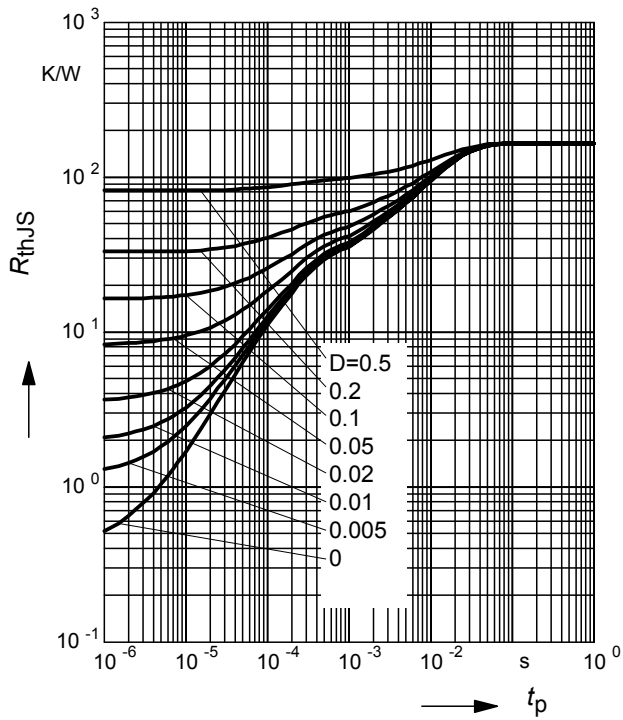
$P_{totmax}/P_{totDC} = f(t_p)$

BCR139L3



**Permissible Puls Load  $R_{thJS} = f(t_p)$**

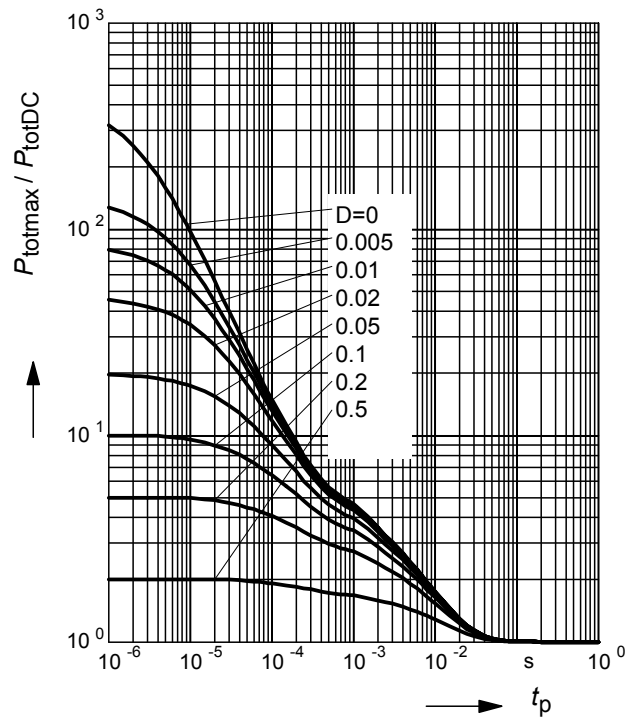
BCR139T



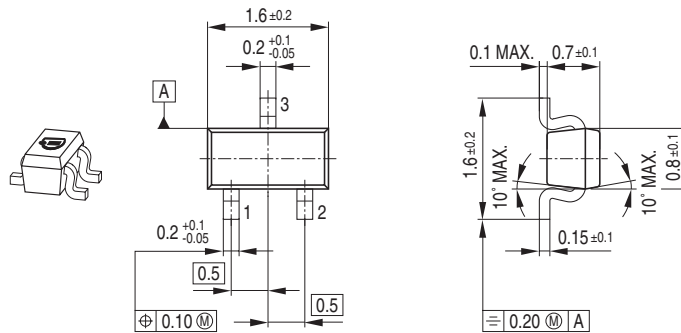
**Permissible Pulse Load**

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

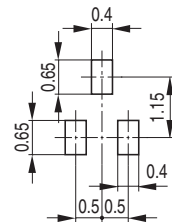
BCR139T



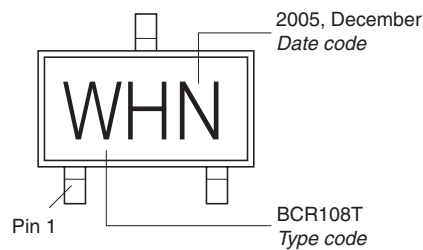
Package Outline



Foot Print

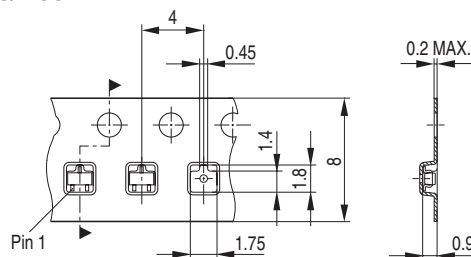


Marking Layout (Example)



Standard Packing

Reel  $\varnothing$ 180 mm = 3.000 Pieces/Reel  
 Reel  $\varnothing$ 330 mm = 10.000 Pieces/Reel



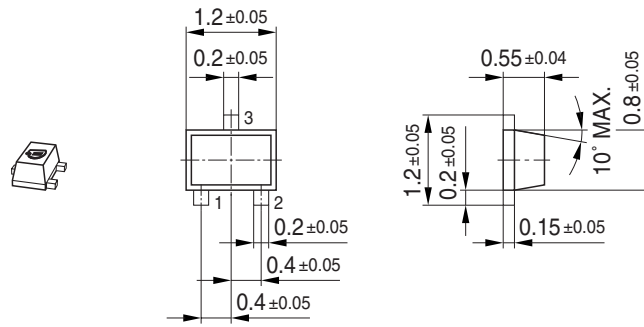
Date Code marking for discrete packages with one digit (SCD80, SC79, SC75<sup>1)</sup>) CES-Code

Month	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
01	a	p	A	P	a	p	A	P	a	p	A	P
02	b	q	B	Q	b	q	B	Q	b	q	B	Q
03	c	r	C	R	c	r	C	R	c	r	C	R
04	d	s	D	S	d	s	D	S	d	s	D	S
05	e	t	E	T	e	t	E	T	e	t	E	T
06	f	u	F	U	f	u	F	U	f	u	F	U
07	g	v	G	V	g	v	G	V	g	v	G	V
08	h	x	H	X	h	x	H	X	h	x	H	X
09	j	y	J	Y	j	y	J	Y	j	y	J	Y
10	k	z	K	Z	k	z	K	Z	k	z	K	Z
11	l	2	L	4	l	2	L	4	l	2	L	4
12	n	3	N	5	n	3	N	5	n	3	N	5

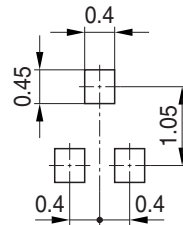
1) New Marking Layout for SC75, implemented at October 2005.



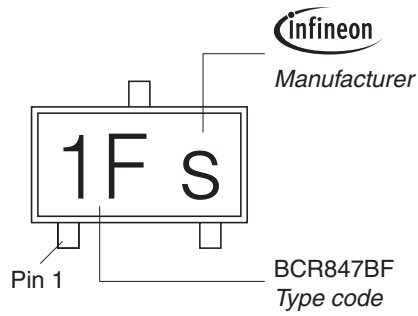
Package Outline



Foot Print

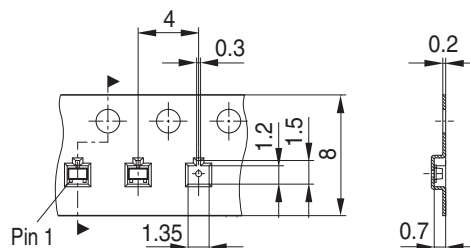


Marking Layout (Example)

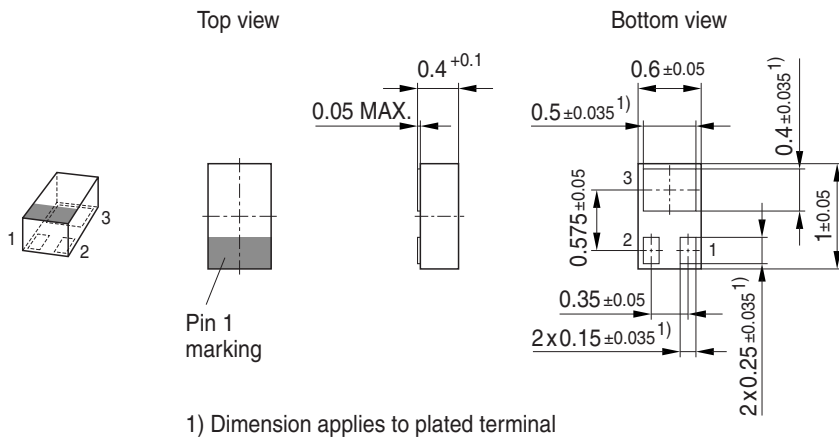


Standard Packing

Reel  $\varnothing$ 180 mm = 3.000 Pieces/Reel  
 Reel  $\varnothing$ 330 mm = 10.000 Pieces/Reel

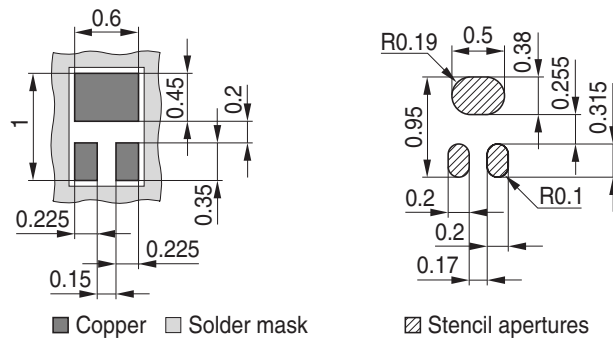


### Package Outline

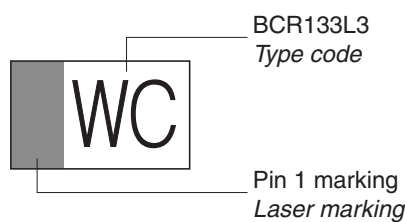


### Foot Print

For board assembly information please refer to Infineon website "Packages"

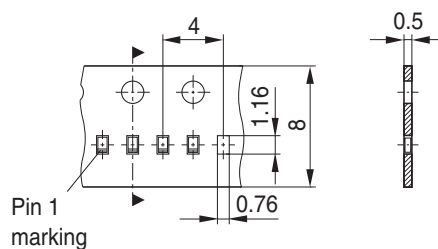


### Marking Layout



### Standard Packing

Reel ø180 mm = 15.000 Pieces/Reel



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