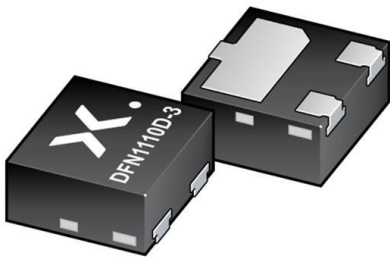


BC807-16QBZ Datasheet

www.digi-electronics.com



<https://www.DiGi-Electronics.com>

DiGi Electronics Part Number	BC807-16QBZ-DG
Manufacturer	Nexperia USA Inc.
Manufacturer Product Number	BC807-16QBZ
Description	TRANS 45V 0.5A DFN1110D-3
Detailed Description	Bipolar (BJT) Transistor 45 V 500 mA 80MHz 350 mW Surface Mount, Wettable Flank DFN1110D-3



Tel: +00 852-30501935

RFQ Email: Info@DiGi-Electronics.com

DiGi is a global authorized distributor of electronic components.

Purchase and inquiry

Manufacturer Product Number:

BC807-16QBZ

Series:

-

Current - Collector (Ic) (Max):

500 mA

Vce Saturation (Max) @ Ib, Ic:

700mV @ 50mA, 500mA

DC Current Gain (hFE) (Min) @ Ic, Vce:

100 @ 100mA, 1V

Frequency - Transition:

80MHz

Mounting Type:

Surface Mount, Wettable Flank

Supplier Device Package:

DFN1110D-3

Manufacturer:

Nexperia USA Inc.

Product Status:

Active

Voltage - Collector Emitter Breakdown (Max):

45 V

Current - Collector Cutoff (Max):

100nA (ICBO)

Power - Max:

350 mW

Operating Temperature:

150°C (TJ)

Package / Case:

3-XDFN Exposed Pad

Environmental & Export classification

RoHS Status:

ROHS3 Compliant

REACH Status:

REACH Unaffected

HTSUS:

8541.21.0095

Moisture Sensitivity Level (MSL):

1 (Unlimited)

ECCN:

EAR99



BC807QB series

45 V, 500 mA PNP general-purpose transistors

Rev. 2 — 1 July 2023

Product data sheet

1. General description

PNP general-purpose transistor in an ultra small DFN1110D-3 (SOT8015) leadless Surface-Mounted Device (SMD) plastic package with side-wettable flanks.

Table 1. Product overview

Type number	Package			NPN complement
	Name	JEDEC	Version	
BC807-16QB	DFN1110D-3	MO340-BA	SOT8015	BC817-16QB
BC807-25QB				BC817-25QB
BC807-40QB				BC817-40QB

2. Features and benefits

- High power dissipation capability
- High current
- Three current gain selections
- Suitable for Automatic Optical Inspection (AOI) of solder joint
- Smaller footprint compared to conventional leaded SMD packages
- Low package height of 0.5 mm

3. Applications

- General-purpose switching and amplification
- Space restricted applications

4. Quick reference data

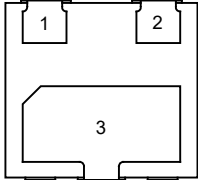
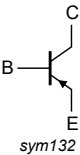
Table 2. Quick reference data

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
V_{CEO}	collector-emitter voltage	open base; $T_{amb} = 25\text{ °C}$	-	-	-45	V
I_C	collector current	$T_{amb} = 25\text{ °C}$	-	-	-500	mA
I_{CM}	peak collector current	single pulse; $t_p \leq 1\text{ ms}$; $T_{amb} = 25\text{ °C}$	-	-	-1	A
h_{FE}	DC current gain					
	BC807-16QB	$V_{CE} = -1\text{ V}$; $I_C = -100\text{ mA}$ $T_{amb} = 25\text{ °C}$	[1]	100	-	250
	BC807-25QB		[1]	160	-	400
	BC807-40QB		[1]	250	-	600

[1] pulsed; $t_p \leq 300\text{ }\mu\text{s}$; $\delta \leq 0.02$

5. Pinning information

Table 3. Pinning

Pin	Symbol	Description	Simplified outline	Graphic symbol
1	B	base	 <p>DFN1110D-3 (SOT8015)</p>	 <p>sym132</p>
2	E	emitter		
3	C	collector		

6. Ordering information

Table 4. Ordering information

Type number	Package		
	Name	Description	Version
BC807-16QB	DFN1110D-3	DFN1110D-3: plastic thermal enhanced ultra thin small outline package; no leads; 3 terminals; body: 1.1 x 1.0 x 0.5 mm	SOT8015 (MO340-BA)
BC807-25QB			
BC807-40QB			

7. Marking

Table 5. Marking

Type number	Marking code
BC807-16QB	A8
BC807-25QB	A9
BC807-40QB	B2

8. Limiting values

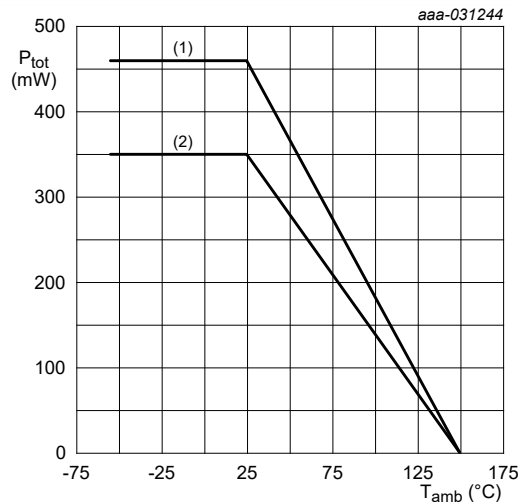
Table 6. Limiting values

In accordance with the Absolute Maximum Rating System (IEC 60134).

Symbol	Parameter	Conditions	Min	Max	Unit
V_{CBO}	collector-base voltage	open emitter; $T_{amb} = 25\text{ °C}$	-	-50	V
V_{CEO}	collector-emitter voltage	open base; $T_{amb} = 25\text{ °C}$	-	-45	V
V_{EBO}	emitter-base voltage	open collector; $T_{amb} = 25\text{ °C}$	-	-5	V
I_C	collector current	$T_{amb} = 25\text{ °C}$	-	-500	mA
I_{CM}	peak collector current	single pulse; $t_p \leq 1\text{ ms}$; $T_{amb} = 25\text{ °C}$	-	-1	A
I_{BM}	peak base current	single pulse; $t_p \leq 1\text{ ms}$; $T_{amb} = 25\text{ °C}$	-	-200	mA
P_{tot}	total power dissipation	$T_{amb} \leq 25\text{ °C}$	[1]	350	mW
			[2]	460	mW
T_j	junction temperature		-	150	°C
T_{amb}	ambient temperature		-55	150	°C
T_{stg}	storage temperature		-65	150	°C

[1] Device mounted on an FR4 PCB, single-sided 35 μm copper, tin-plated and standard footprint.

[2] Device mounted on an FR4 PCB, single-sided 70 μm copper, tin-plated and standard footprint.



(1) FR4 PCB; single-sided 70 μm copper, tin-plated and standard footprint

(2) FR4 PCB; single-sided 35 μm copper, tin-plated and standard footprint

Fig. 1. Power derating curves for SOT8015

9. Thermal characteristics

Table 7. Thermal characteristics

Symbol	Parameter	Conditions	Min	Typ	Max	Unit	
$R_{th(j-a)}$	thermal resistance from junction to ambient	in free air; $T_{amb} = 25\text{ °C}$	[1]	-	-	358	K/W
			[2]	-	-	272	K/W

[1] Device mounted on an FR4 PCB, single-sided 35 μm copper, tin-plated and standard footprint.

[2] Device mounted on an FR4 PCB, single-sided 70 μm copper, tin-plated and standard footprint.

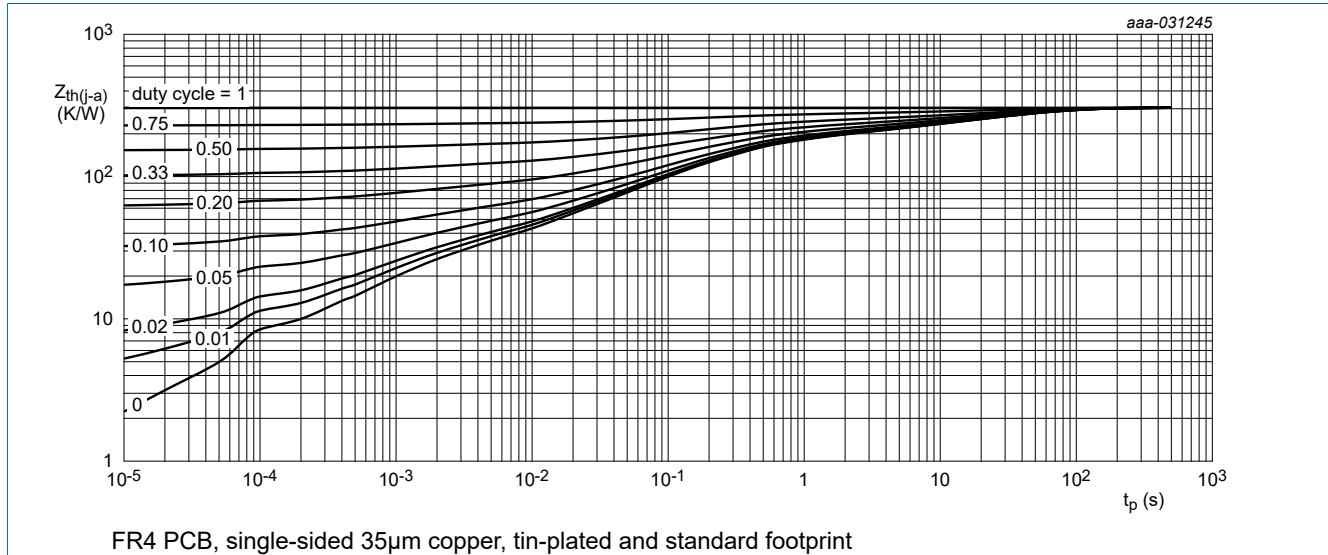


Fig. 2. Transient thermal impedance from junction to ambient as a function of pulse duration; typical values

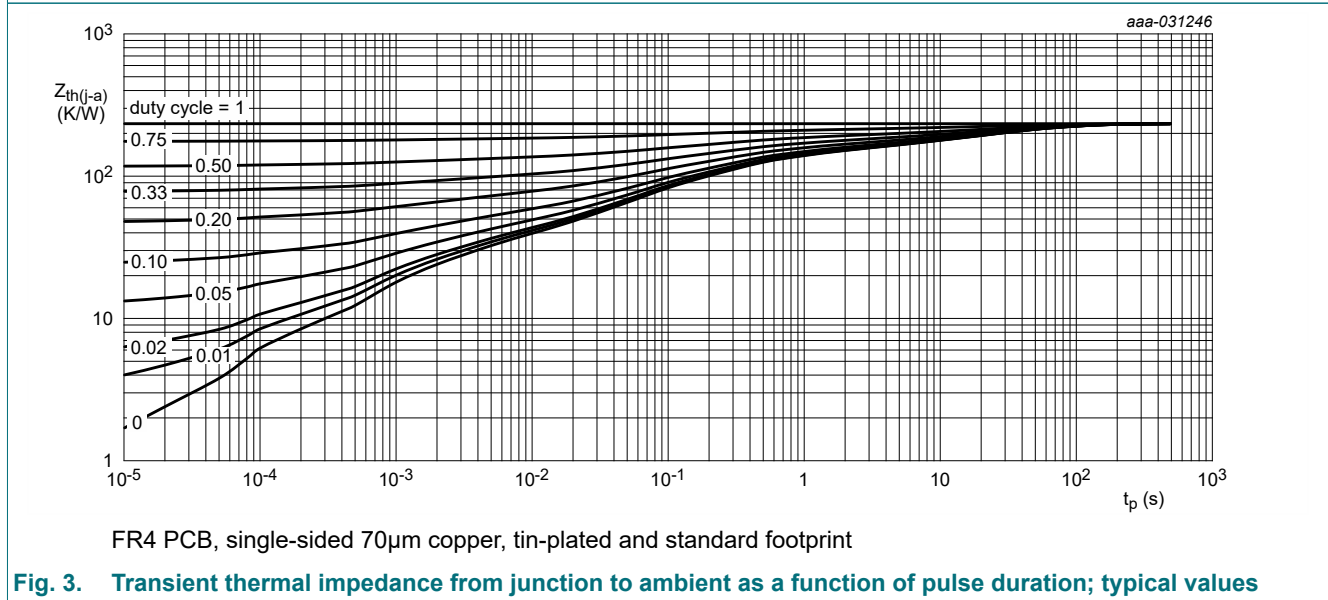


Fig. 3. Transient thermal impedance from junction to ambient as a function of pulse duration; typical values

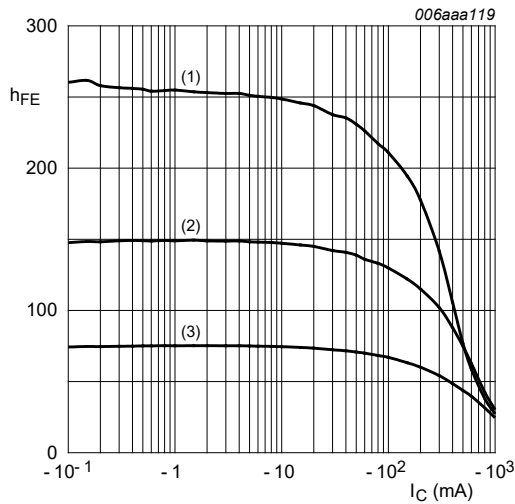
10. Characteristics

Table 8. Characteristics

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
$V_{(BR)CBO}$	collector-base breakdown voltage	$I_C = -100 \mu\text{A}; I_E = 0 \text{ A}; T_{\text{amb}} = 25 \text{ }^\circ\text{C}$	-50	-		V
$V_{(BR)CEO}$	collector-emitter breakdown voltage	$I_C = -10 \text{ mA}; I_E = 0 \text{ A}; T_{\text{amb}} = 25 \text{ }^\circ\text{C}$	-45	-		V
$V_{(BR)EBO}$	emitter-base breakdown voltage	$I_E = -100 \mu\text{A}; I_C = 0 \text{ A}; T_{\text{amb}} = 25 \text{ }^\circ\text{C}$	-5	-		V
I_{CBO}	collector-base cut-off current	$V_{CB} = -20 \text{ V}; I_E = 0 \text{ A}; T_{\text{amb}} = 25 \text{ }^\circ\text{C}$	-	-	-100	nA
		$V_{CB} = -20 \text{ V}; I_E = 0 \text{ A}; T_j = 150 \text{ }^\circ\text{C}$	-	-	-5	μA
I_{EBO}	emitter-base cut-off current	$V_{EB} = -5 \text{ V}; I_C = 0 \text{ A}; T_{\text{amb}} = 25 \text{ }^\circ\text{C}$	-	-	-100	nA
h_{FE}	DC current gain					
	BC807-16QB	$V_{CE} = -1 \text{ V}; I_C = -100 \text{ mA}; T_{\text{amb}} = 25 \text{ }^\circ\text{C}$	[1]	100	-	250
	BC807-25QB		[1]	160	-	400
	BC807-40QB		[1]	250	-	600
		$V_{CE} = -1 \text{ V}; I_C = -500 \text{ mA}; T_{\text{amb}} = 25 \text{ }^\circ\text{C}$	[1]	40	-	-
V_{CEsat}	collector-emitter saturation voltage	$I_C = -500 \text{ mA}; I_B = -50 \text{ mA}; T_{\text{amb}} = 25 \text{ }^\circ\text{C}$	[1]	-	-	-700 mV
V_{BE}	base-emitter voltage	$V_{CE} = -1 \text{ V}; I_C = -500 \text{ mA}; T_{\text{amb}} = 25 \text{ }^\circ\text{C}$	[1] [2]	-	-	-1.2 V
f_T	transition frequency	$V_{CE} = -5 \text{ V}; I_C = -10 \text{ mA}; f = 100 \text{ MHz}; T_{\text{amb}} = 25 \text{ }^\circ\text{C}$	80	-	-	MHz
C_c	collector capacitance	$V_{CB} = -10 \text{ V}; I_E = I_e = 0 \text{ A}; f = 1 \text{ MHz}; T_{\text{amb}} = 25 \text{ }^\circ\text{C}$	-	5	-	pF

[1] pulsed; $t_p \leq 300 \mu\text{s}$; $\delta \leq 0.02$

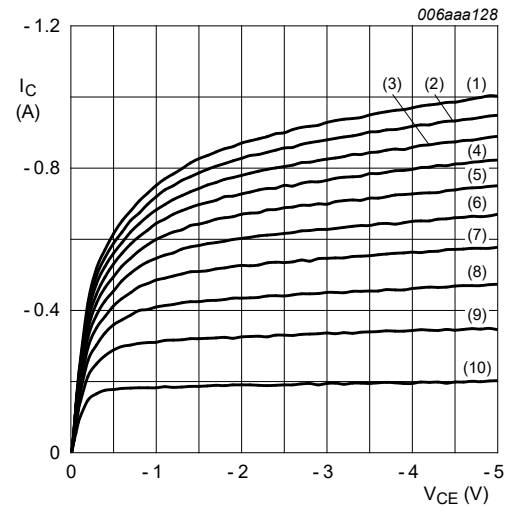
[2] V_{BE} decreases by about 2 mV/K with increasing temperature.



$$V_{CE} = -1 \text{ V}$$

- (1) $T_{amb} = 150 \text{ }^\circ\text{C}$
- (2) $T_{amb} = 25 \text{ }^\circ\text{C}$
- (3) $T_{amb} = -55 \text{ }^\circ\text{C}$

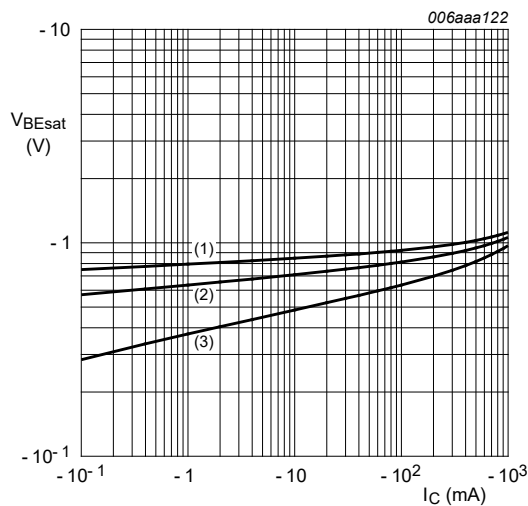
Fig. 4. BC807-16QB: DC current gain as a function of collector current; typical values



$$T_{amb} = 25 \text{ }^\circ\text{C}$$

- (1) $I_B = -16.0 \text{ mA}$
- (2) $I_B = -14.4 \text{ mA}$
- (3) $I_B = -12.8 \text{ mA}$
- (4) $I_B = -11.2 \text{ mA}$
- (5) $I_B = -9.6 \text{ mA}$
- (6) $I_B = -8.0 \text{ mA}$
- (7) $I_B = -6.4 \text{ mA}$
- (8) $I_B = -4.8 \text{ mA}$
- (9) $I_B = -3.2 \text{ mA}$
- (10) $I_B = -1.6 \text{ mA}$

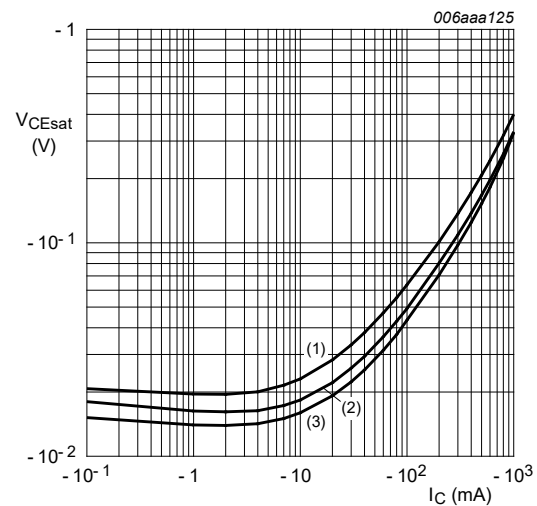
Fig. 5. BC807-16QB: Collector current as a function of collector-emitter voltage; typical values



$$I_C/I_B = 10$$

- (1) $T_{amb} = -55 \text{ }^\circ\text{C}$
- (2) $T_{amb} = 25 \text{ }^\circ\text{C}$
- (3) $T_{amb} = 150 \text{ }^\circ\text{C}$

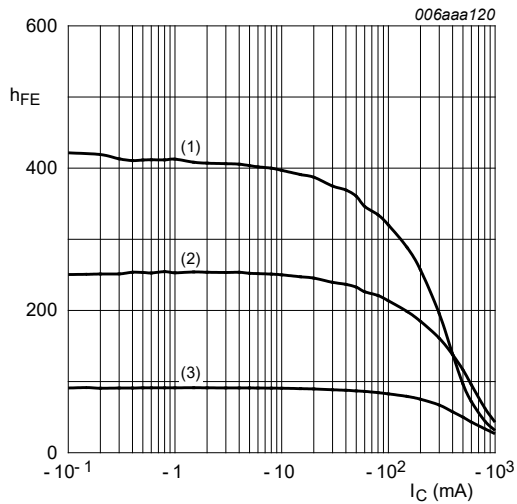
Fig. 6. BC807-16QB: Base-emitter saturation voltage as a function of collector current; typical values



$$I_C/I_B = 10$$

- (1) $T_{amb} = 150 \text{ }^\circ\text{C}$
- (2) $T_{amb} = 25 \text{ }^\circ\text{C}$
- (3) $T_{amb} = -55 \text{ }^\circ\text{C}$

Fig. 7. BC807-16QB: Collector-emitter saturation voltage as a function of collector current; typical values



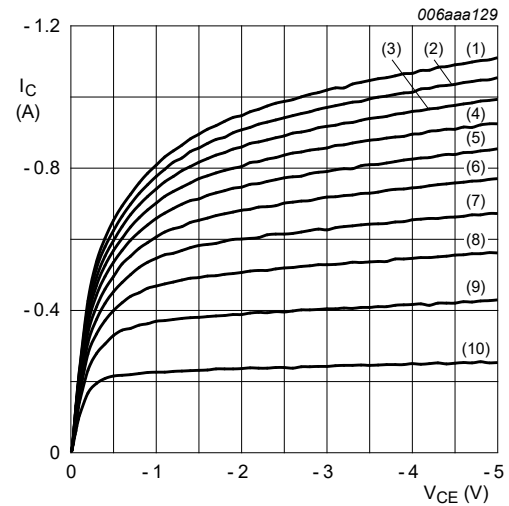
$$V_{CE} = -1 \text{ V}$$

(1) $T_{amb} = 150 \text{ }^\circ\text{C}$

(2) $T_{amb} = 25 \text{ }^\circ\text{C}$

(3) $T_{amb} = -55 \text{ }^\circ\text{C}$

Fig. 8. BC807-25QB: DC current gain as a function of collector current; typical values



$$T_{amb} = 25 \text{ }^\circ\text{C}$$

(1) $I_B = -13.0 \text{ mA}$

(2) $I_B = -11.7 \text{ mA}$

(3) $I_B = -10.4 \text{ mA}$

(4) $I_B = -9.1 \text{ mA}$

(5) $I_B = -7.8 \text{ mA}$

(6) $I_B = -6.5 \text{ mA}$

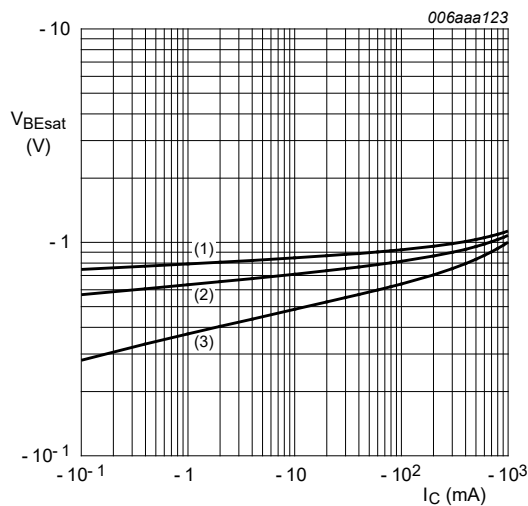
(7) $I_B = -5.2 \text{ mA}$

(8) $I_B = -3.9 \text{ mA}$

(9) $I_B = -2.6 \text{ mA}$

(10) $I_B = -1.3 \text{ mA}$

Fig. 9. BC807-25QB: Collector current as a function of collector-emitter voltage; typical values



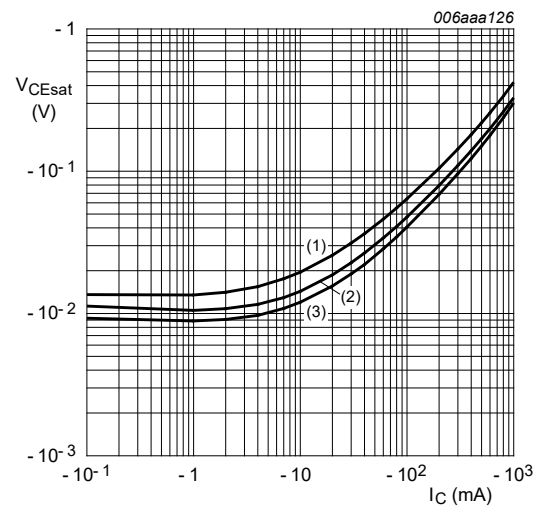
$$I_C/I_B = 10$$

(1) $T_{amb} = -55 \text{ }^\circ\text{C}$

(2) $T_{amb} = 25 \text{ }^\circ\text{C}$

(3) $T_{amb} = 150 \text{ }^\circ\text{C}$

Fig. 10. BC807-25QB: Base-emitter saturation voltage as a function of collector current; typical values



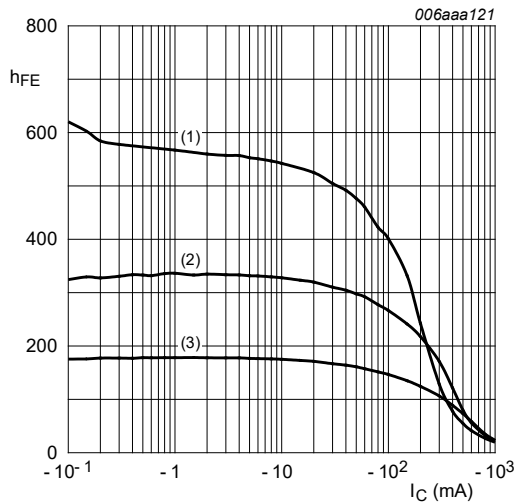
$$I_C/I_B = 10$$

(1) $T_{amb} = 150 \text{ }^\circ\text{C}$

(2) $T_{amb} = 25 \text{ }^\circ\text{C}$

(3) $T_{amb} = -55 \text{ }^\circ\text{C}$

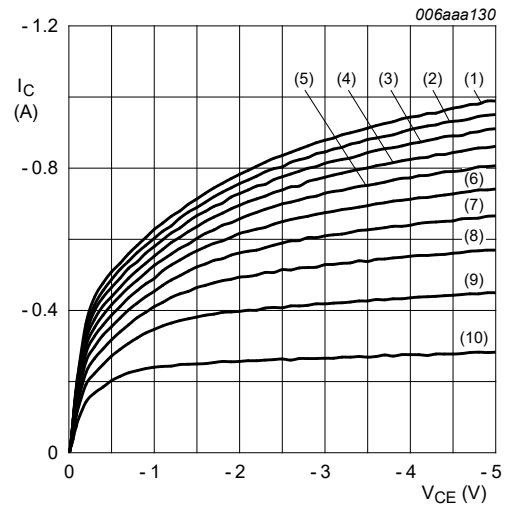
Fig. 11. BC807-25QB: Collector-emitter saturation voltage as a function of collector current; typical values



$V_{CE} = -1 \text{ V}$

- (1) $T_{amb} = 150 \text{ }^\circ\text{C}$
- (2) $T_{amb} = 25 \text{ }^\circ\text{C}$
- (3) $T_{amb} = -55 \text{ }^\circ\text{C}$

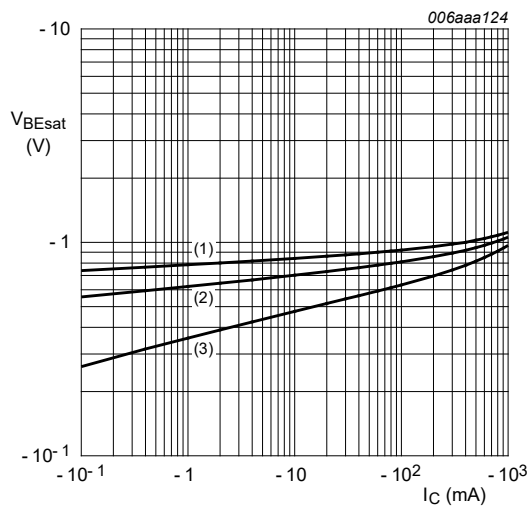
Fig. 12. BC807-40QB: DC current gain as a function of collector current; typical values



$T_{amb} = 25 \text{ }^\circ\text{C}$

- (1) $I_B = -12.0 \text{ mA}$
- (2) $I_B = -10.8 \text{ mA}$
- (3) $I_B = -9.6 \text{ mA}$
- (4) $I_B = -8.4 \text{ mA}$
- (5) $I_B = -7.2 \text{ mA}$
- (6) $I_B = -6.0 \text{ mA}$
- (7) $I_B = -4.8 \text{ mA}$
- (8) $I_B = -3.6 \text{ mA}$
- (9) $I_B = -2.4 \text{ mA}$
- (10) $I_B = -1.2 \text{ mA}$

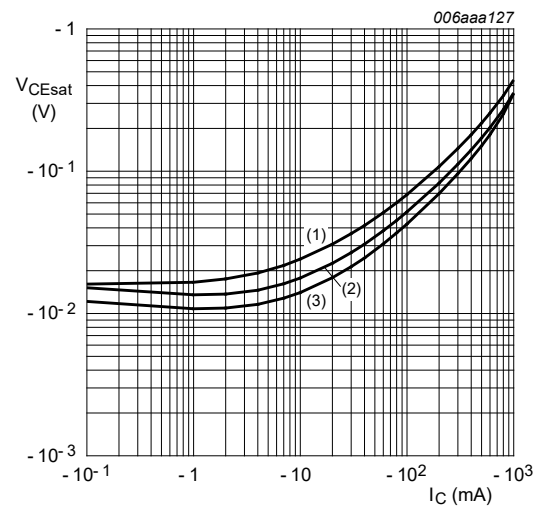
Fig. 13. BC807-40QB: Collector current as a function of collector-emitter voltage; typical values



$I_C/I_B = 10$

- (1) $T_{amb} = -55 \text{ }^\circ\text{C}$
- (2) $T_{amb} = 25 \text{ }^\circ\text{C}$
- (3) $T_{amb} = 150 \text{ }^\circ\text{C}$

Fig. 14. BC807-40QB: Base-emitter saturation voltage as a function of collector current; typical values



$I_C/I_B = 10$

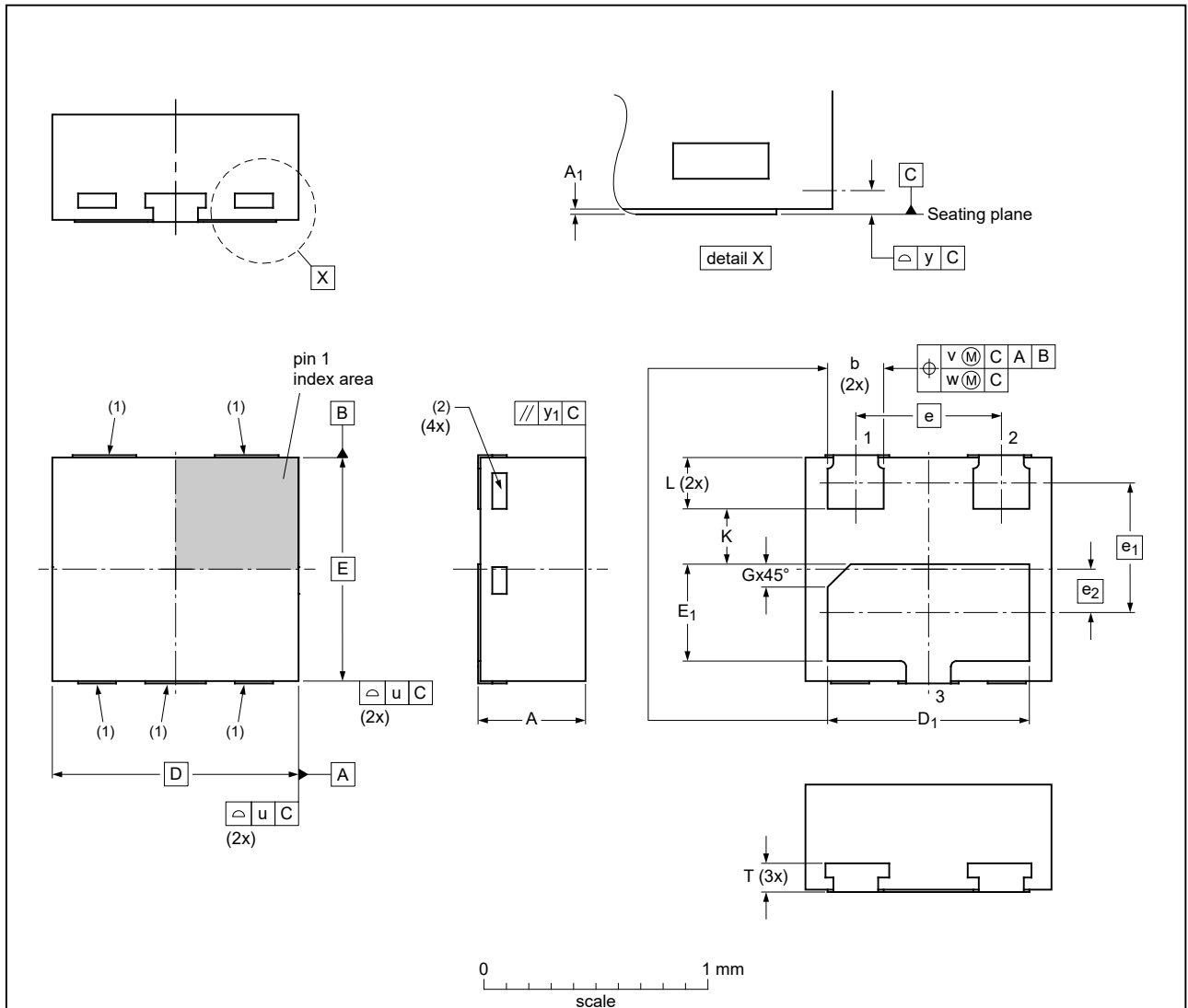
- (1) $T_{amb} = 150 \text{ }^\circ\text{C}$
- (2) $T_{amb} = 25 \text{ }^\circ\text{C}$
- (3) $T_{amb} = -55 \text{ }^\circ\text{C}$

Fig. 15. BC807-40QB: Collector-emitter saturation voltage as a function of collector current; typical values

11. Package outline

DFN1110D-3: plastic, leadless extremely thin small outline package with side-wettable flanks (SWF); 3 terminals; 0.65 mm pitch; 1.1 mm x 1 mm x 0.48 mm body

SOT8015



Dimensions (mm are the original dimensions)

Unit	A	A ₁	b	D	D ₁	E	E ₁	e	e ₁	e ₂	G	K	L	T	u	v	w	y	y ₁
max	0.50	0.040	0.30		0.95		0.48						0.27	0.22					
nom	0.47	0.020	0.25	1.1	0.90	1	0.43	0.65	0.58	0.19	0.09		0.23	0.16	0.05	0.1	0.05	0.05	0.05
min	0.44	0.005	0.22		0.87		0.40				(ref)	0.2	0.20	0.10					

Note

- Side Wettable Flank, protrusion max. 0.02 mm.
 - Visible depend upon used manufacturing technology.
- Dimension A and T are including plating thickness.

sot8015_po

Outline version	References				European projection	Issue date
	IEC	JEDEC	JEITA			
SOT8015		MO-340BA				19-12-02 19-12-04

Fig. 16. Package outline DFN1110D-3 (SOT8015)

12. Soldering

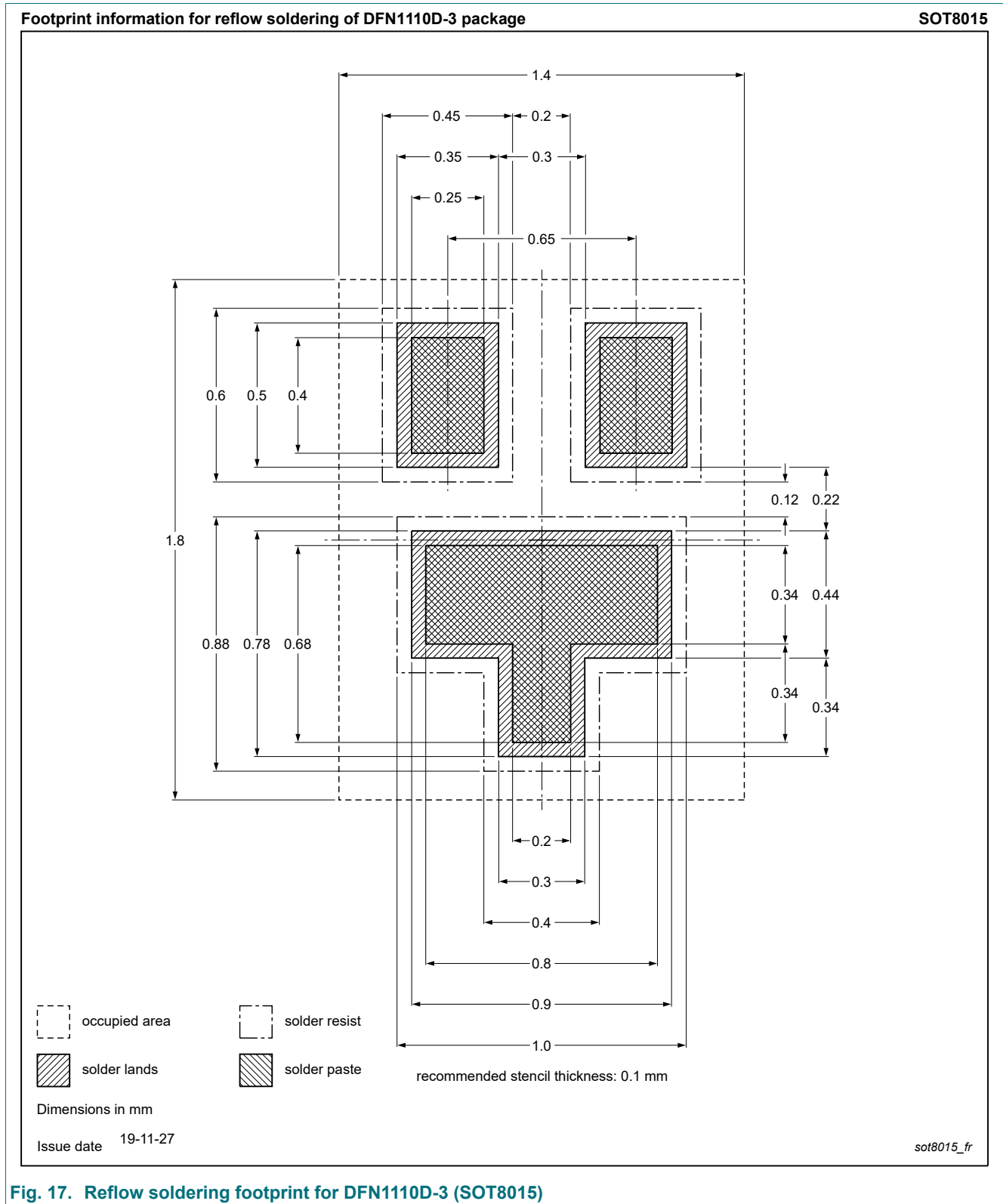


Fig. 17. Reflow soldering footprint for DFN1110D-3 (SOT8015)

13. Revision history

Table 9. Revision history

Data sheet ID	Release date	Data sheet status	Change notice	Supersedes
BC807QB_SER v.2	20230701	Product data sheet	-	BC807QB_SER v.1
Modifications:	<ul style="list-style-type: none">Product(s) changed to non-automotive qualification. Please refer to nexperia.com for automotive (-Q) product alternative(s).			
BC807QB_SER v.1	20201210	Product data sheet	-	-

14. Legal information

Data sheet status

Document status [1][2]	Product status [3]	Definition
Objective [short] data sheet	Development	This document contains data from the objective specification for product development.
Preliminary [short] data sheet	Qualification	This document contains data from the preliminary specification.
Product [short] data sheet	Production	This document contains the product specification.

- [1] Please consult the most recently issued document before initiating or completing a design.
- [2] The term 'short data sheet' is explained in section "Definitions".
- [3] The product status of device(s) described in this document may have changed since this document was published and may differ in case of multiple devices. The latest product status information is available on the internet at <https://www.nexperia.com>.

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