

ANTREX Electronics

Electronic Components Sourcing Information

Product Reference Information

Part Number: BC847QAPN147
Manufacturer: NXP USA Inc.
Package: 6-XFDFN Exposed Pad
Availability: Please confirm with sales

Product Page:

<https://antrexco.com/product/details/nxp-usa-inc/bc847qapn147.html>

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Note:

This PDF includes an ANTREX product reference cover page.

The original manufacturer datasheet follows from the next page.



BC847QAPN

45 V, 100 mA NPN/PNP general-purpose transistor

30 October 2018

Product data sheet

1. General description

NPN/PNP general-purpose transistor in a leadless ultra small DFN1010B-6 (SOT1216) Surface-Mounted Device (SMD) plastic package.

2. Features and benefits

- Reduces component count
- Reduces pick and place costs
- AEC-Q101 qualified
- Low package height of 0.37 mm

3. Applications

- General-purpose switching and amplification
- Mobile applications

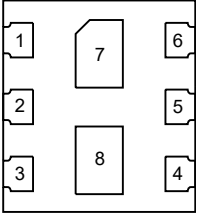
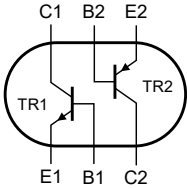
4. Quick reference data

Table 1. Quick reference data

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
Per transistor; for the PNP transistor with negative polarity						
V_{CE0}	collector-emitter voltage	open base	-	-	45	V
I_C	collector current		-	-	100	mA
h_{FE}	DC current gain	$V_{CE} = 5 \text{ V}$; $I_C = 2 \text{ mA}$; $T_{amb} = 25 \text{ }^{\circ}\text{C}$	200	-	450	

5. Pinning information

Table 2. Pinning information

Pin	Symbol	Description	Simplified outline	Graphic symbol
1	E1	emitter TR1	 Transparent top view DFN1010B-6 (SOT1216)	 sym139
2	B1	base TR1		
3	C2	collector TR2		
4	E2	emitter TR2		
5	B2	base TR2		
6	C1	collector TR1		
7	C1	collector TR1		
8	C2	collector TR2		

6. Ordering information

Table 3. Ordering information

Type number	Package		
	Name	Description	Version
BC847QAPN	DFN1010B-6	DFN1010B-6: plastic thermal enhanced ultra thin small outline package; no leads; 6 terminals	SOT1216

7. Marking

Table 4. Marking codes

Type number	Marking code
BC847QAPN	01 00 00

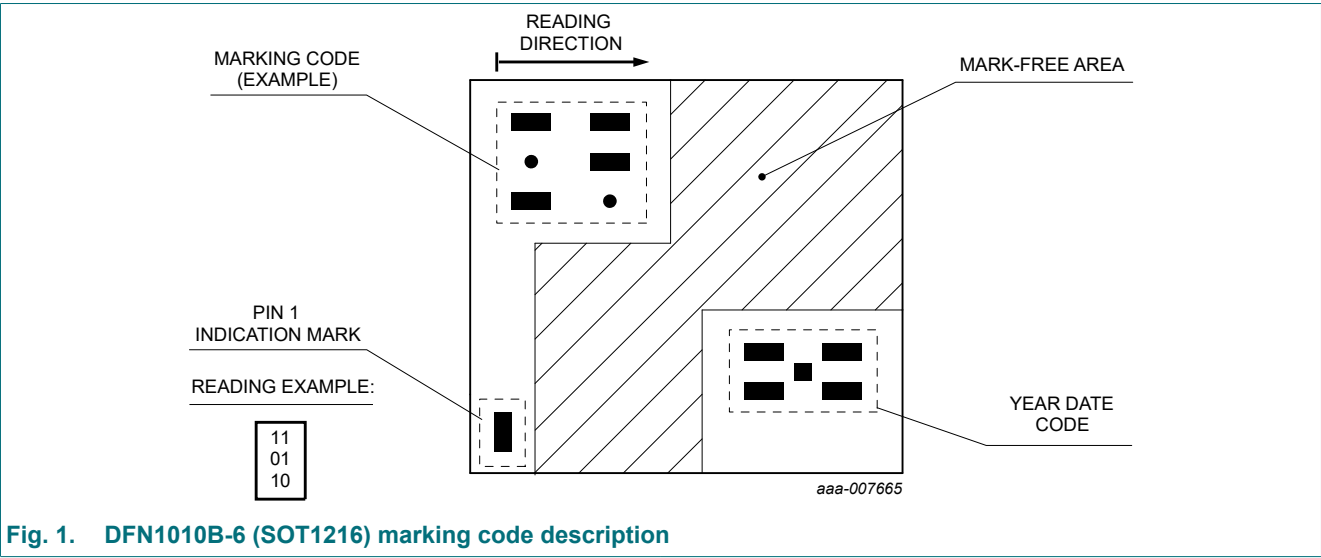


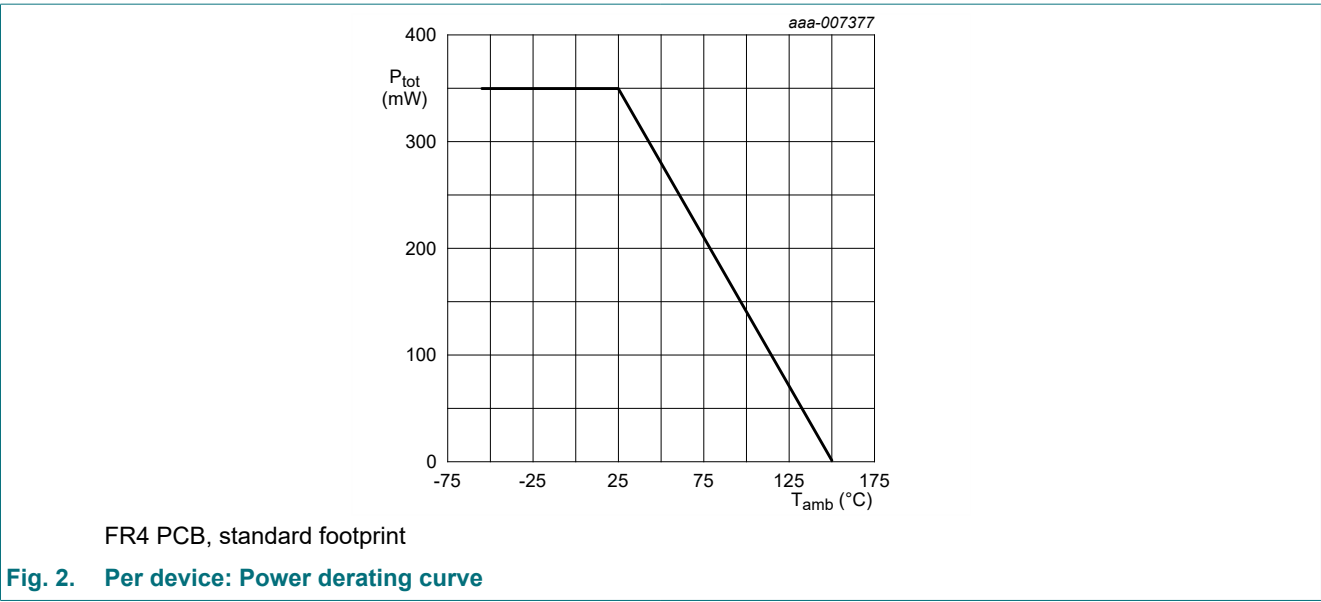
Fig. 1. DFN1010B-6 (SOT1216) marking code description

8. Limiting values

Table 5. Limiting values
In accordance with the Absolute Maximum Rating System (IEC 60134).

Symbol	Parameter	Conditions		Min	Max	Unit
Per transistor; for the PNP transistor with negative polarity						
V _{CBO}	collector-base voltage	open emitter		-	50	V
V _{CEO}	collector-emitter voltage	open base		-	45	V
V _{EBO}	emitter-base voltage	open collector		-	6	V
I _C	collector current			-	100	mA
I _{CM}	peak collector current	single pulse; t _p ≤ 1 ms		-	200	mA
I _{BM}	peak base current			-	100	mA
P _{tot}	total power dissipation	T _{amb} ≤ 25 °C	[1]	-	230	mW
Per device						
P _{tot}	total power dissipation	T _{amb} ≤ 25 °C	[1]	-	350	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 Printed-Circuit Board (PCB), single-sided copper, tin-plated and standard footprint.

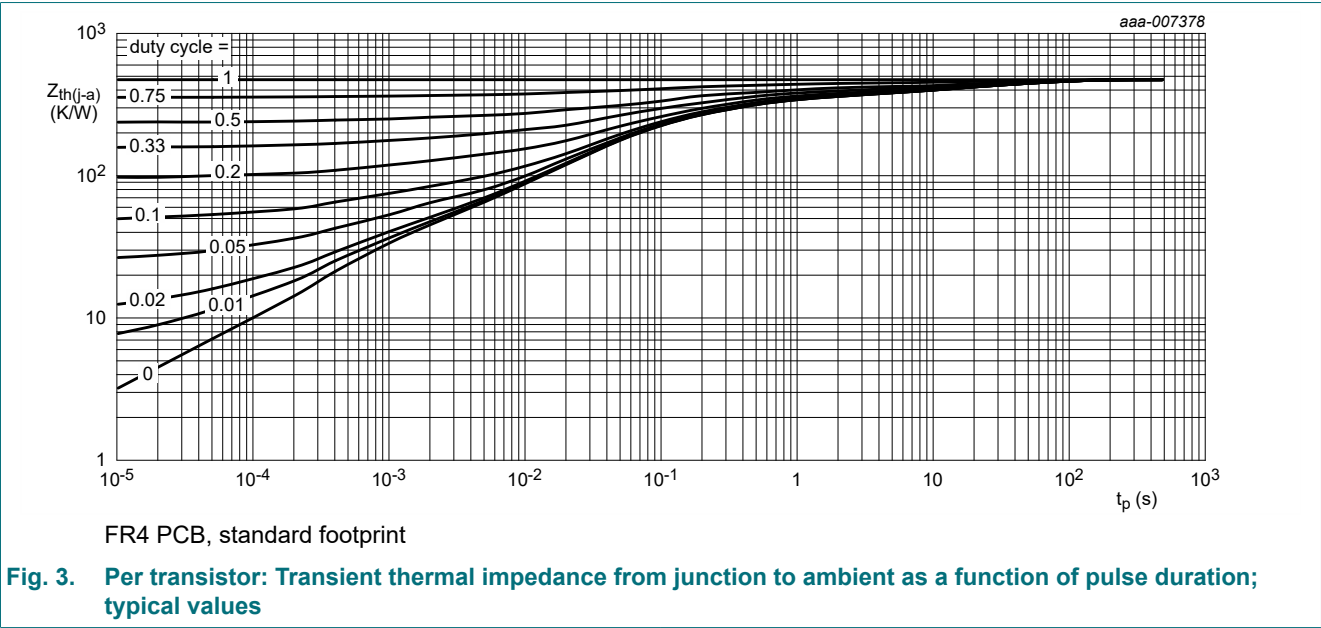


9. Thermal characteristics

Table 6. Thermal characteristics

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
Per transistor							
$R_{th(j-a)}$	thermal resistance from junction to ambient	in free air	[1]	-	-	543	K/W
Per device							
$R_{th(j-a)}$	thermal resistance from junction to ambient	in free air	[1]	-	-	357	K/W

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



10. Characteristics

Table 7. Characteristics

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
Per transistor; for the PNP transistor with negative polarity							
I_{CBO}	collector-base cut-off current	$V_{CB} = 30\text{ V}; I_E = 0\text{ A}; T_{amb} = 25\text{ °C}$		-	-	15	nA
		$V_{CB} = 30\text{ V}; I_E = 0\text{ A}; T_j = 150\text{ °C}$		-	-	5	μA
I_{EBO}	emitter-base cut-off current	$V_{EB} = 5\text{ V}; I_C = 0\text{ A}; T_{amb} = 25\text{ °C}$		-	-	100	nA
h_{FE}	DC current gain	$V_{CE} = 5\text{ V}; I_C = 2\text{ mA}; T_{amb} = 25\text{ °C}$		200	-	450	
V_{CEsat}	collector-emitter saturation voltage	$I_C = 10\text{ mA}; I_B = 0.5\text{ mA}; T_{amb} = 25\text{ °C}$		-	-	100	mV
		$I_C = 100\text{ mA}; I_B = 5\text{ mA}; \text{pulsed}; t_p \leq 300\text{ μs}; \delta \leq 0.02; T_{amb} = 25\text{ °C}$		-	-	300	mV
V_{BEsat}	base-emitter saturation voltage	$I_C = 10\text{ mA}; I_B = 0.5\text{ mA}; T_{amb} = 25\text{ °C}$		-	760	-	mV
		$I_C = 100\text{ mA}; I_B = 5\text{ mA}; \text{pulsed}; t_p \leq 300\text{ μs}; \delta \leq 0.02; T_{amb} = 25\text{ °C}$		-	900	-	mV
V_{BE}	base-emitter voltage	$V_{CE} = 5\text{ V}; I_C = 2\text{ mA}; T_{amb} = 25\text{ °C}$		600	660	725	mV
		$V_{CE} = 5\text{ V}; I_C = 10\text{ mA}; T_{amb} = 25\text{ °C}$		-	710	820	mV
C_c	collector capacitance	$V_{CB} = 10\text{ V}; I_E = 0\text{ A}; i_e = 0\text{ A}; f = 1\text{ MHz}; T_{amb} = 25\text{ °C}$		-	-	4	pF
f_T	transition frequency	$V_{CE} = 5\text{ V}; I_C = 10\text{ mA}; f = 100\text{ MHz}; T_{amb} = 25\text{ °C}$		100	-	-	MHz
NF	noise figure	$V_{CE} = 5\text{ V}; I_C = 0.2\text{ mA}; R_S = 2\text{ k}\Omega; f = 1\text{ MHz}; B = 200\text{ Hz}; T_{amb} = 25\text{ °C}$		-	-	10	dB
TR1 (NPN)							
C_e	emitter capacitance	$V_{EB} = 0.5\text{ V}; I_C = 0\text{ A}; i_c = 0\text{ A}; f = 1\text{ MHz}; T_{amb} = 25\text{ °C}$		-	11	-	pF
TR2 (PNP)							
C_e	emitter capacitance	$V_{EB} = -0.5\text{ V}; I_C = 0\text{ A}; i_c = 0\text{ A}; f = 1\text{ MHz}; T_{amb} = 25\text{ °C}$		-	10	-	pF

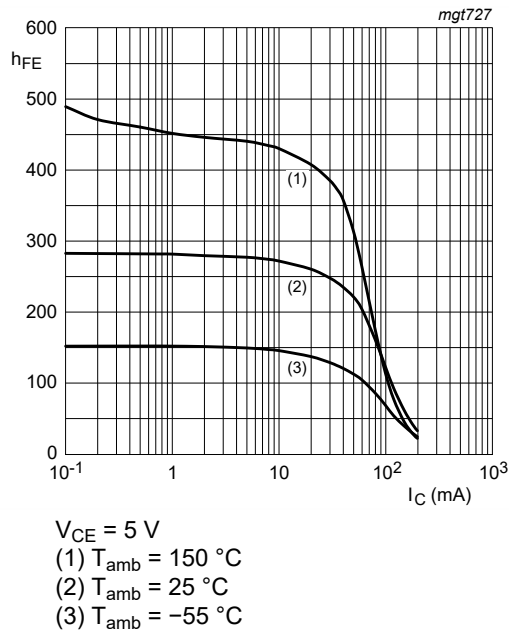


Fig. 4. NPN transistor: DC current gain as a function of collector current; typical values

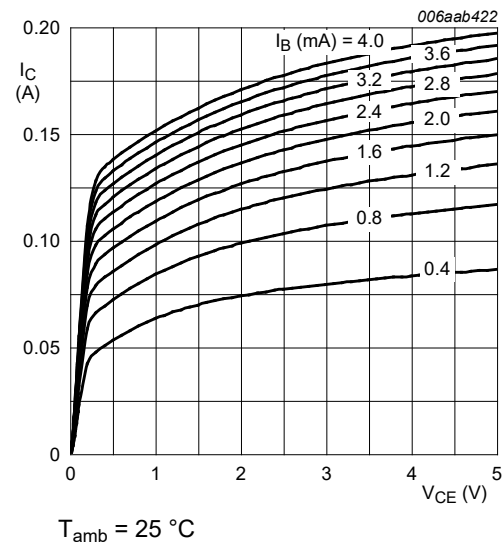


Fig. 5. NPN transistor: Collector current as a function of collector-emitter voltage; typical values

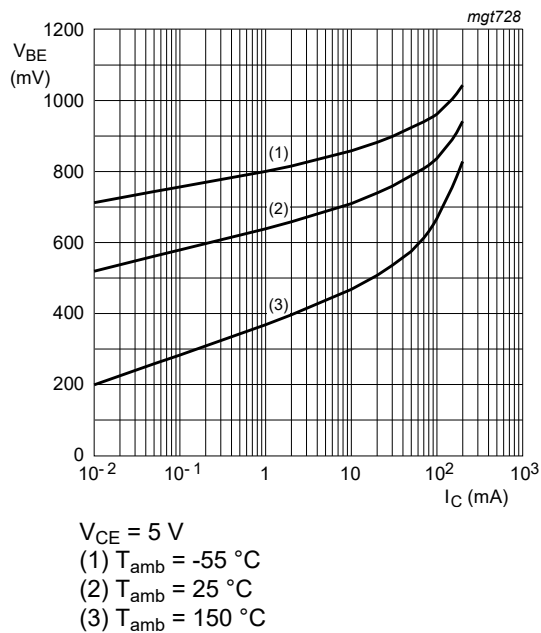


Fig. 6. NPN transistor: Base-emitter voltage as a function of collector current; typical values

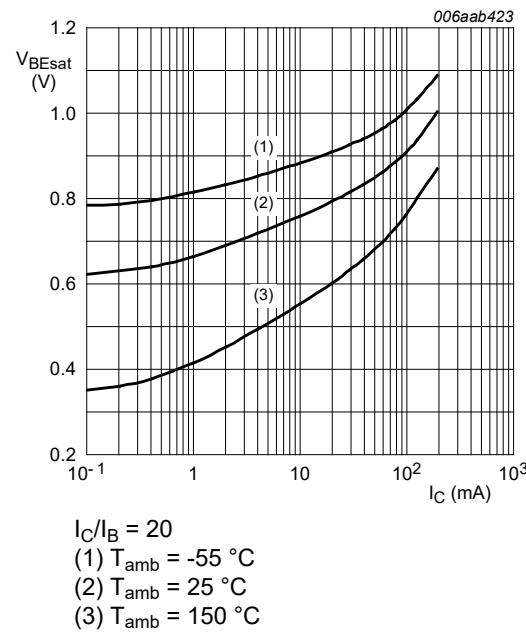


Fig. 7. NPN transistor: Base-emitter saturation voltage as a function of collector current; typical values

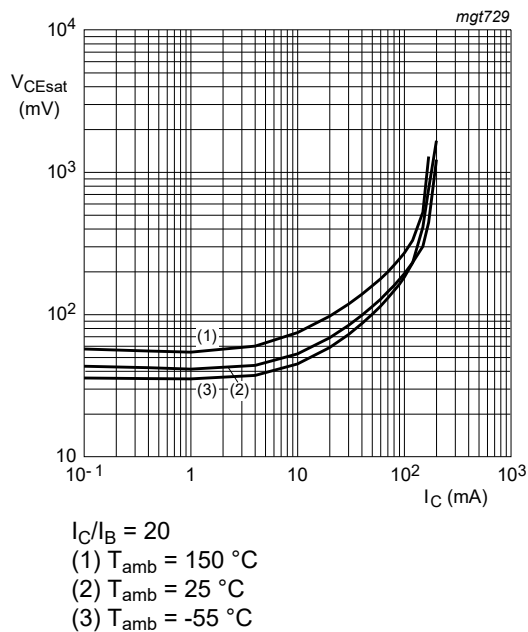


Fig. 8. NPN transistor: Collector-emitter saturation voltage as a function of collector current; typical values

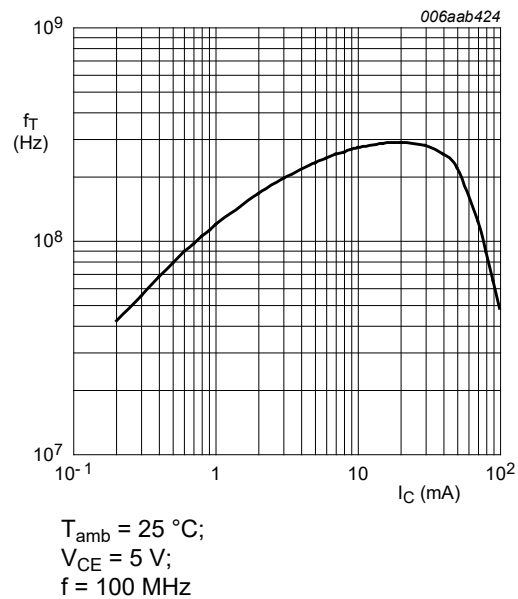


Fig. 9. NPN transistor: Transition frequency as a function of collector current; typical values

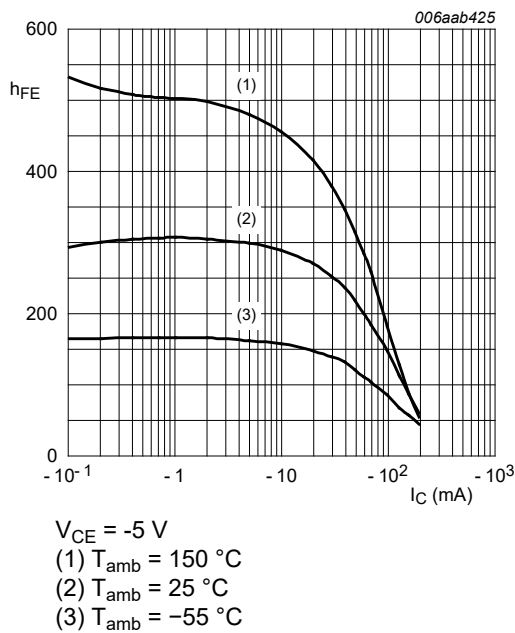


Fig. 10. PNP transistor: DC current gain as a function of collector current; typical values

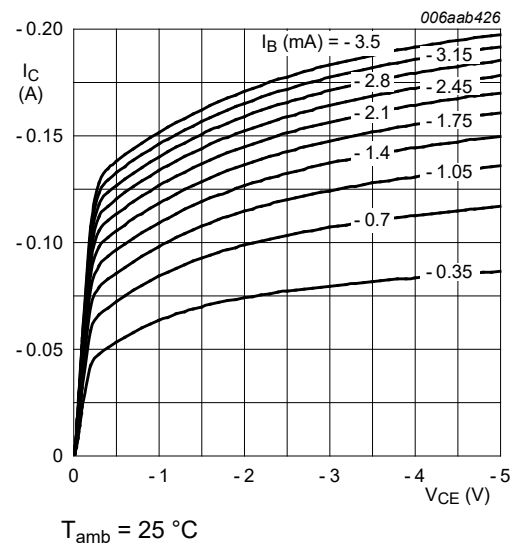


Fig. 11. PNP transistor: Collector current as a function of collector-emitter voltage; typical values

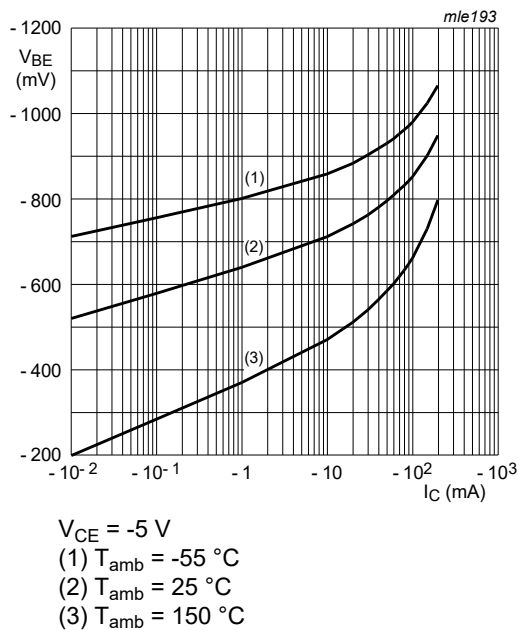


Fig. 12. PNP transistor: Base-emitter voltage as a function of collector current; typical values

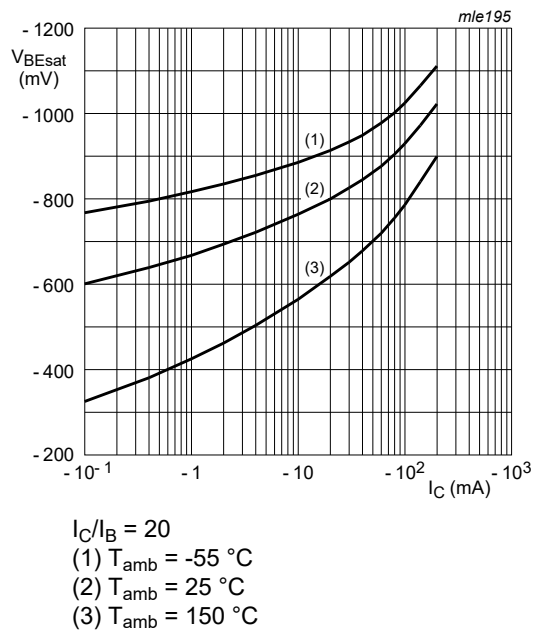


Fig. 13. PNP transistor: Base-emitter saturation voltage as a function of collector current; typical values

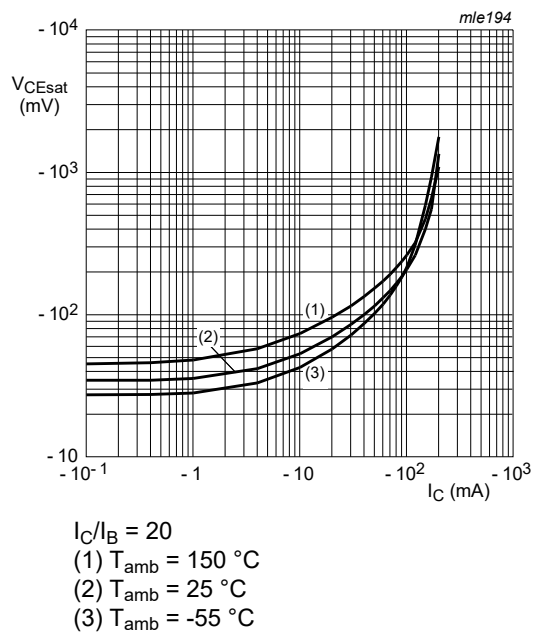


Fig. 14. PNP transistor: Collector-emitter saturation voltage as a function of collector current; typical values

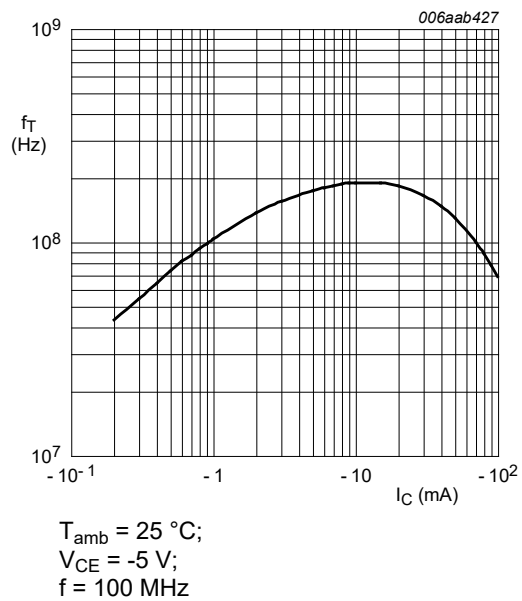


Fig. 15. PNP transistor: Transition frequency as a function of collector current; typical values

11. Test information

Quality information

This product has been qualified in accordance with the Automotive Electronics Council (AEC) standard Q101 - *Stress test qualification for discrete semiconductors*, and is suitable for use in automotive applications.

12. Package outline

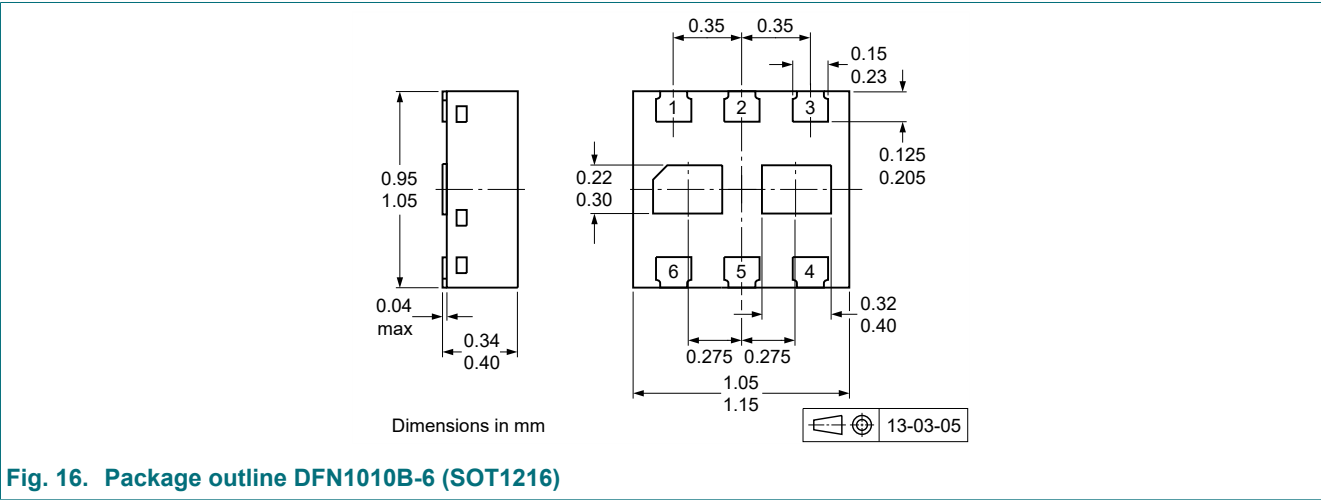


Fig. 16. Package outline DFN1010B-6 (SOT1216)

13. Soldering

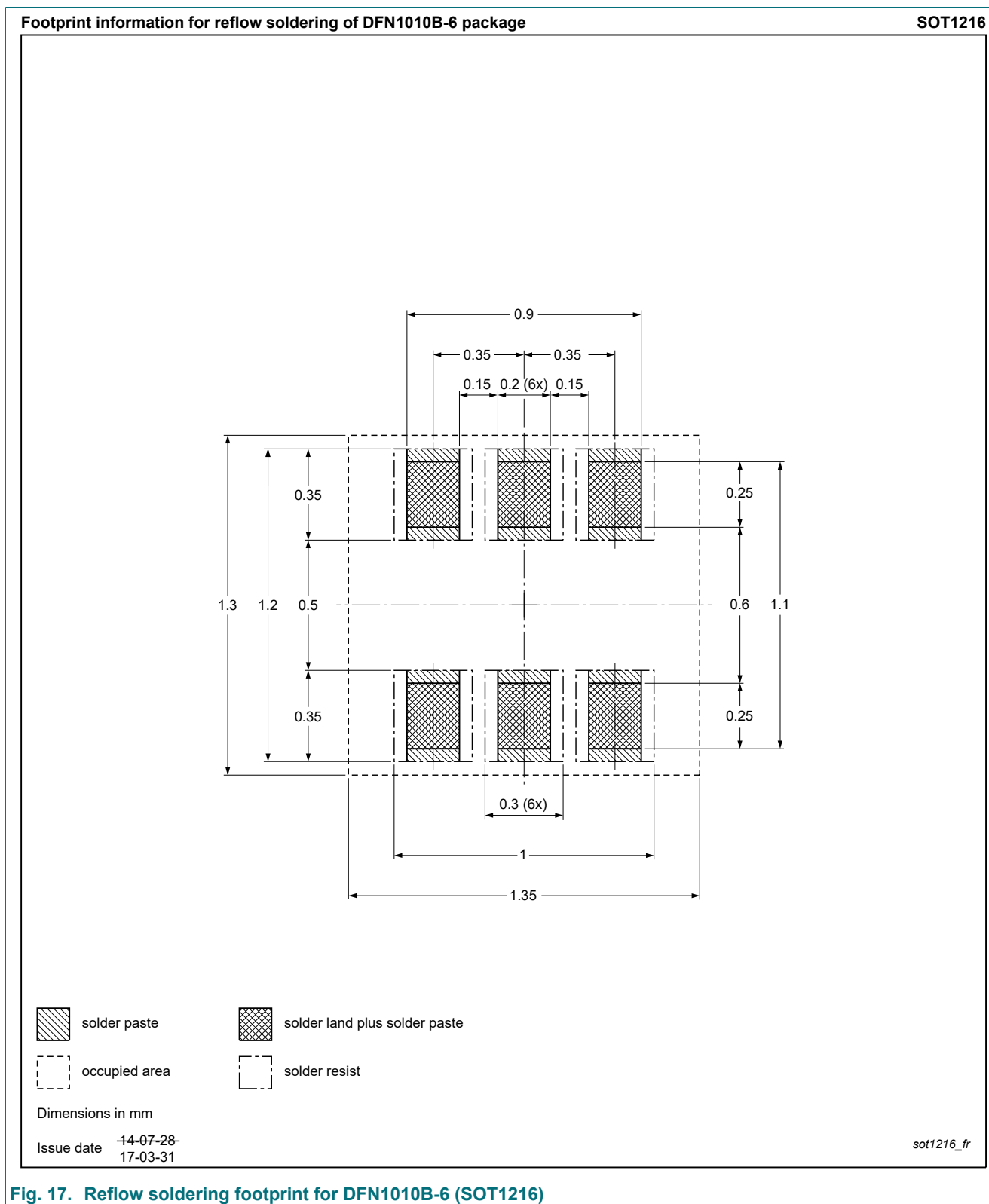


Fig. 17. Reflow soldering footprint for DFN1010B-6 (SOT1216)

14. Revision history

Table 8. Revision history

Data sheet ID	Release date	Data sheet status	Change notice	Supersedes
BC847QAPN v.3	20181030	Product data sheet	-	BC847QAPN v.2
Modification:	• Characteristics: Titles adjusted for figures 7, 9 and 13			
BC847QAPN v.2	20150708	Product data sheet	-	BC847QAPN v.1
BC847QAPN v.1	20130718	Product data sheet	-	-

15. 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".
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