



BC857QAS

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

25 July 2014

Product data sheet

1. General description

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

NPN/NPN complement: BC847QAS.

NPN/PNP complement: BC847QAPN.

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

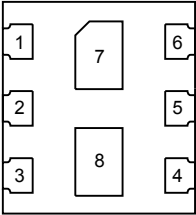
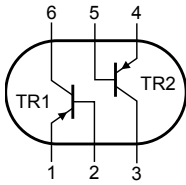
Table 1. Quick reference data

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
Per transistor						
V_{CEO}	collector-emitter voltage	open base	-	-	-45	V
I_C	collector current		-	-	-100	mA
Per transistor						
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	 <p>Transparent top view DFN1010B-6 (SOT1216)</p>	 <p><i>sym018</i></p>
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
BC857QAS	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
BC857QAS	10 01 00

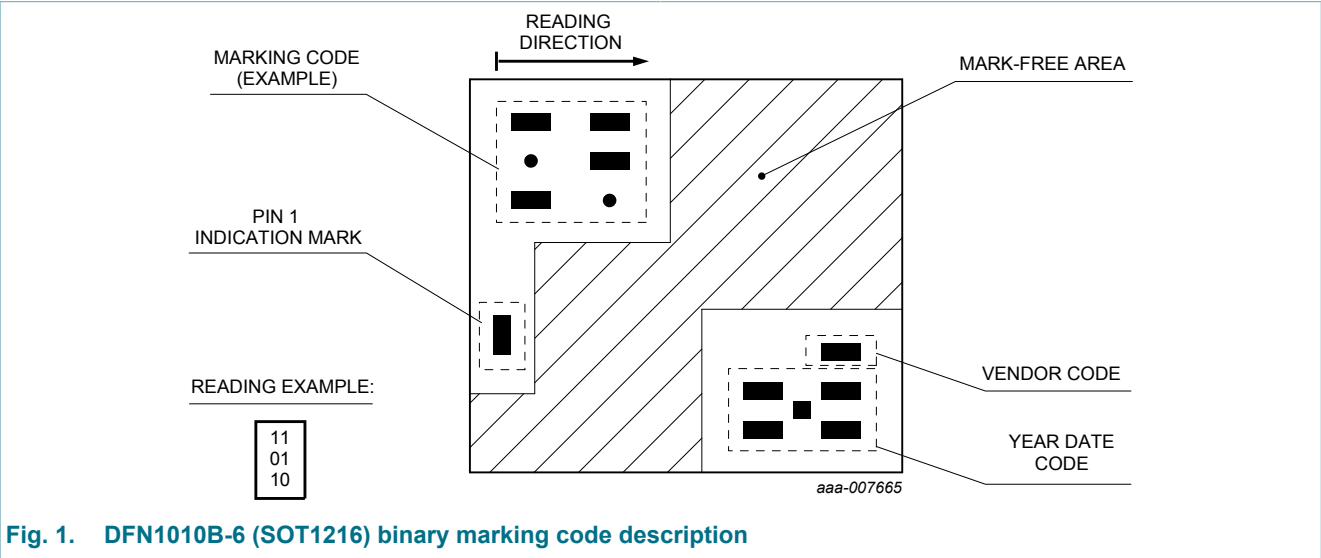


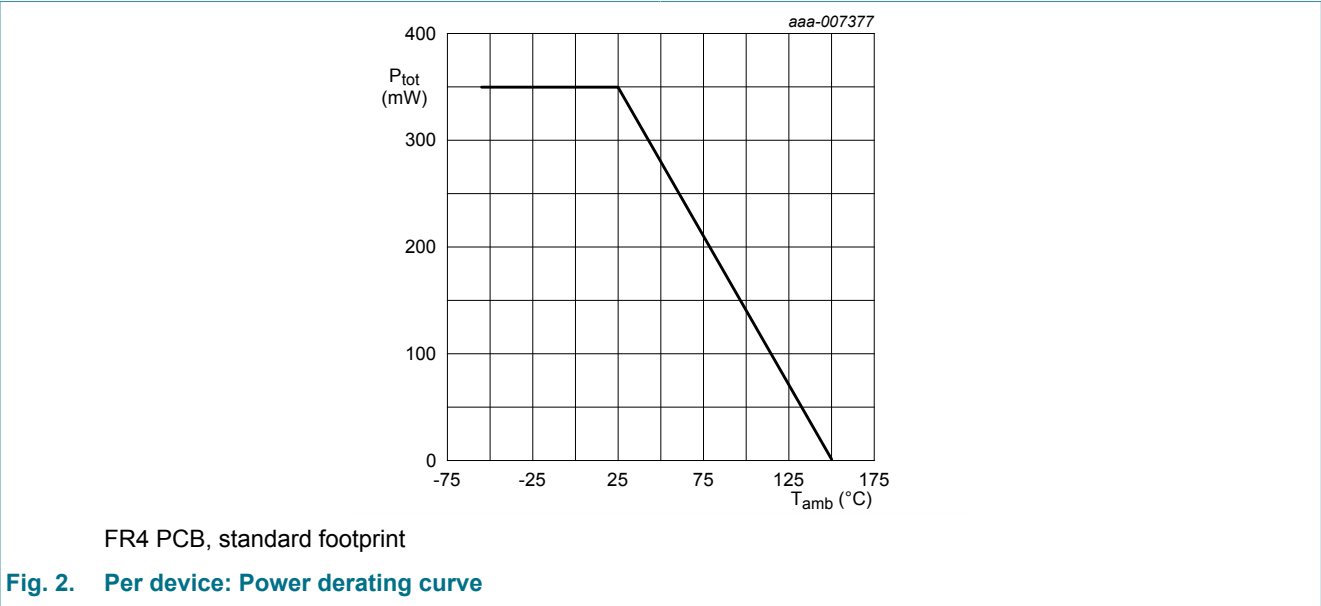
Fig. 1. DFN1010B-6 (SOT1216) binary marking code description

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						
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	single pulse; t _p ≤ 1 ms		-	-100	mA
I _{CM}	peak collector current			-	-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.

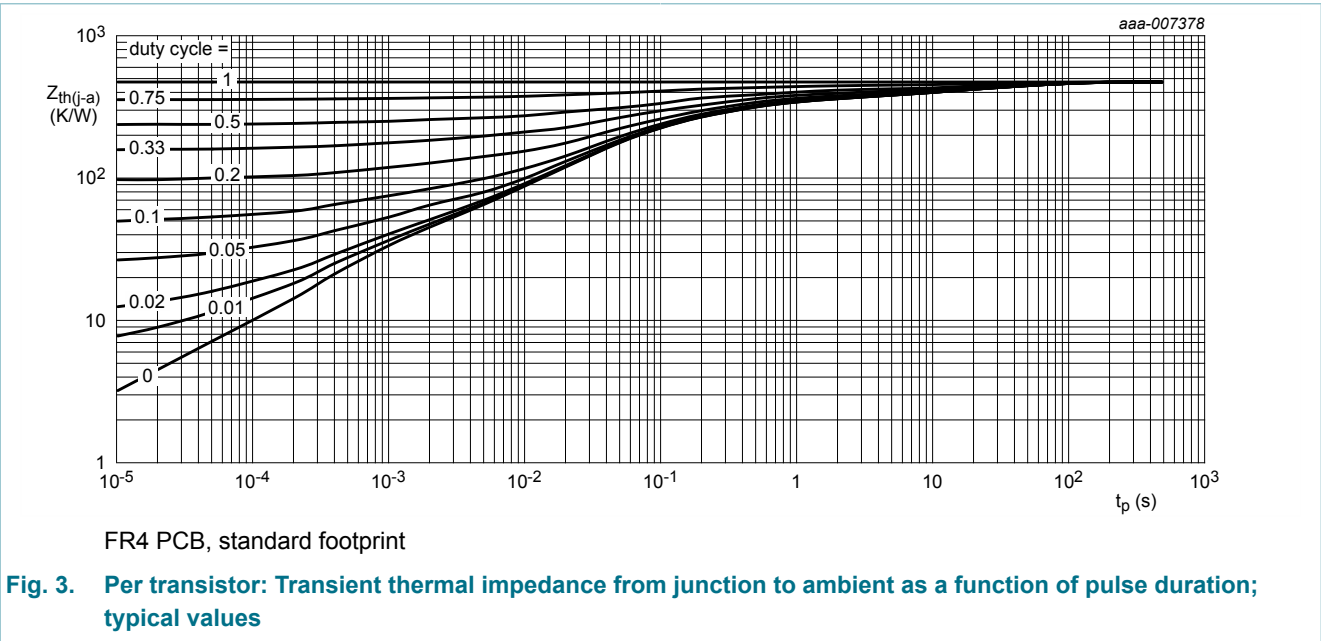


9. Thermal characteristics

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							
I_{CBO}	collector-base cut-off current	$V_{CB} = -30\text{ V}; I_E = 0\text{ A}; T_j = 150\text{ }^\circ\text{C}$		-	-	-5	μA
		$V_{CB} = -30\text{ V}; I_E = 0\text{ A}; T_{amb} = 25\text{ }^\circ\text{C}$		-	-	-15	nA
I_{EBO}	emitter-base cut-off current	$V_{EB} = -5\text{ V}; I_C = 0\text{ A}; T_{amb} = 25\text{ }^\circ\text{C}$		-	-	-100	nA
h_{FE}	DC current gain	$V_{CE} = -5\text{ V}; I_C = -2\text{ mA}; T_{amb} = 25\text{ }^\circ\text{C}$		200	-	450	
V_{CEsat}	collector-emitter saturation voltage	$I_C = -10\text{ mA}; I_B = -0.5\text{ mA}; T_{amb} = 25\text{ }^\circ\text{C}$		-	-	-100	mV
		$I_C = -100\text{ mA}; I_B = -5\text{ mA}; \text{pulsed}; t_p \leq 300\text{ }\mu\text{s}; \delta \leq 0.02; T_{amb} = 25\text{ }^\circ\text{C}$		-	-	-300	mV
V_{BEsat}	base-emitter saturation voltage	$I_C = -10\text{ mA}; I_B = -0.5\text{ mA}; T_{amb} = 25\text{ }^\circ\text{C}$		-	-760	-	mV
V_{BEsat}	base-emitter saturation voltage	$I_C = -100\text{ mA}; I_B = -5\text{ mA}; \text{pulsed}; t_p \leq 300\text{ }\mu\text{s}; \delta \leq 0.02; T_{amb} = 25\text{ }^\circ\text{C}$		-	-900	-	mV
V_{BE}	base-emitter voltage	$V_{CE} = -5\text{ V}; I_C = -2\text{ mA}; T_{amb} = 25\text{ }^\circ\text{C}$		-600	-660	-725	mV
V_{BE}	base-emitter voltage	$V_{CE} = -5\text{ V}; I_C = -10\text{ mA}; T_{amb} = 25\text{ }^\circ\text{C}$		-	-710	-820	mV
C_C	collector capacitance	$V_{CB} = -10\text{ V}; I_E = 0\text{ A}; i_e = 0\text{ A}; f = 1\text{ MHz}; T_{amb} = 25\text{ }^\circ\text{C}$		-	-	4	pF
C_E	emitter capacitance	$V_{EB} = -0.5\text{ V}; I_C = 0\text{ A}; f = 1\text{ MHz}; T_{amb} = 25\text{ }^\circ\text{C}$		-	10	-	pF
f_T	transition frequency	$V_{CE} = -5\text{ V}; I_C = -10\text{ mA}; f = 100\text{ MHz}; T_{amb} = 25\text{ }^\circ\text{C}$		100	-	-	MHz
NF	noise figure	$V_{CE} = -5\text{ V}; I_C = 0.2\text{ mA}; R_S = 2\text{ k}\Omega; f = 1\text{ MHz}; B = 200\text{ Hz}; T_{amb} = 25\text{ }^\circ\text{C}$		-	-	10	dB

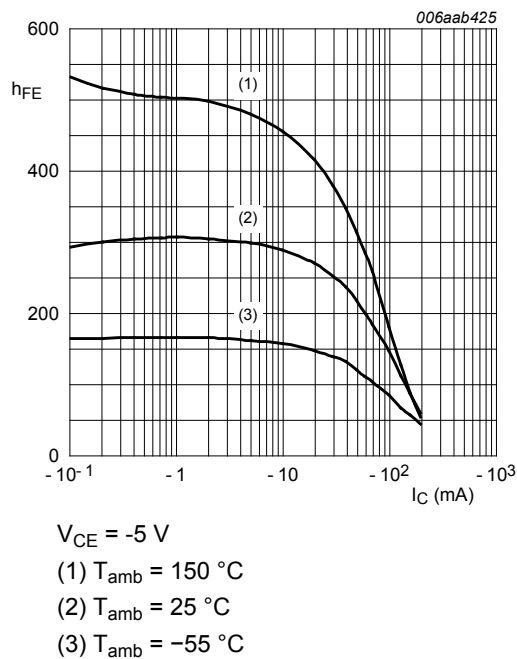


Fig. 4. DC current gain as a function of collector current; typical values

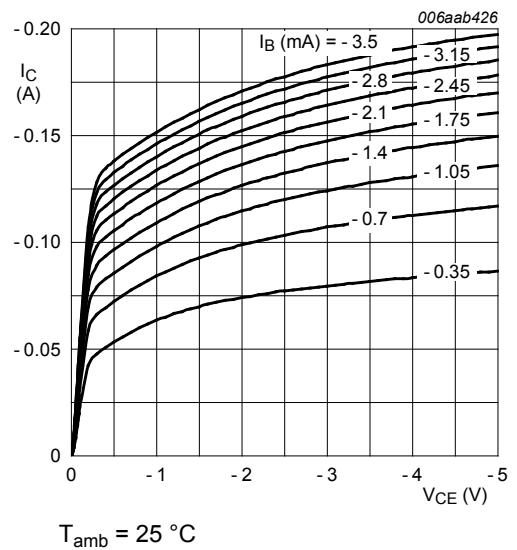


Fig. 5. Collector current as a function of collector-emitter voltage; typical values

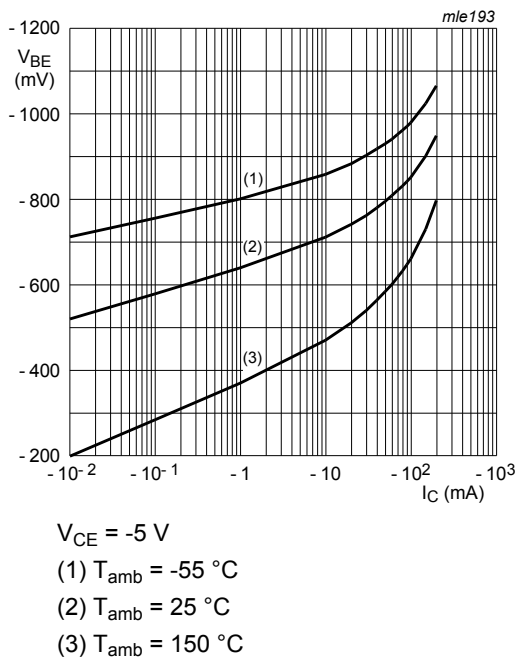


Fig. 6. Base-emitter voltage as a function of collector current; typical values

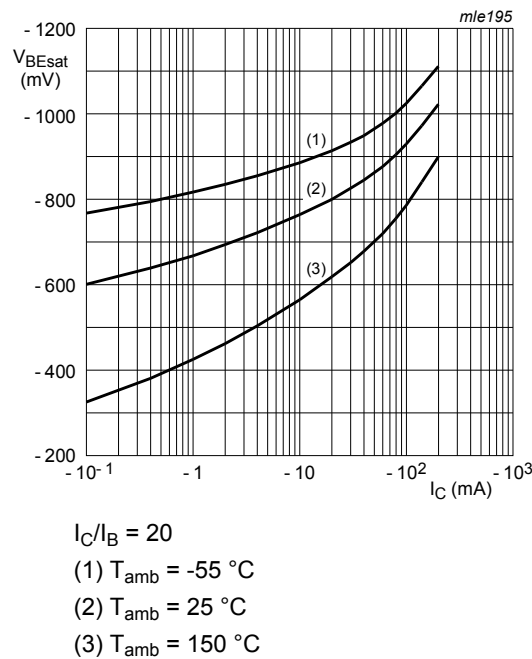
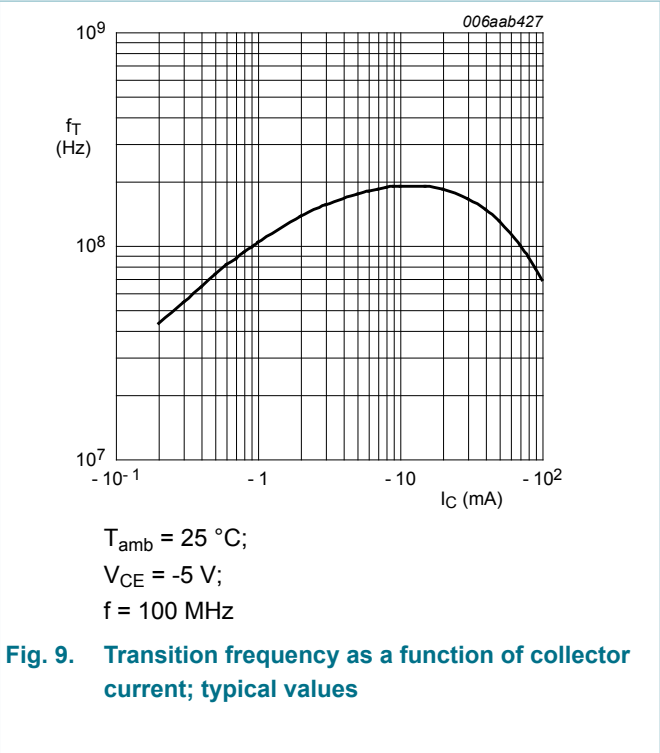
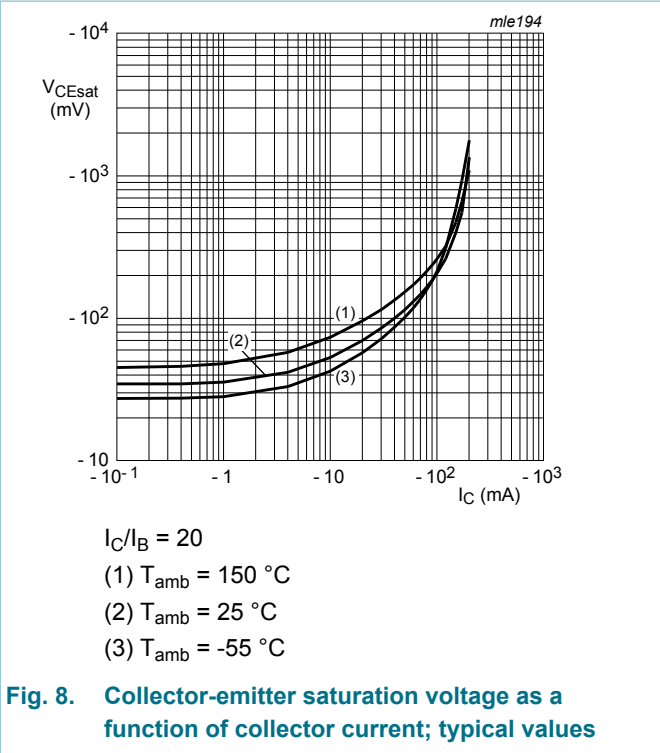


Fig. 7. Base-emitter saturation voltage as a function of collector current; typical values



11. Test information

11.1 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

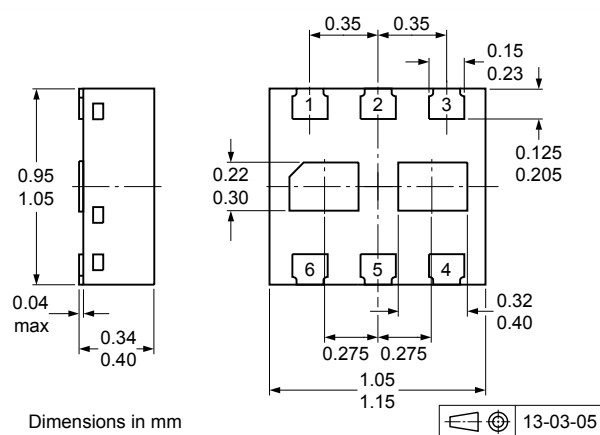


Fig. 10. Package outline DFN1010B-6 (SOT1216)

13. Soldering

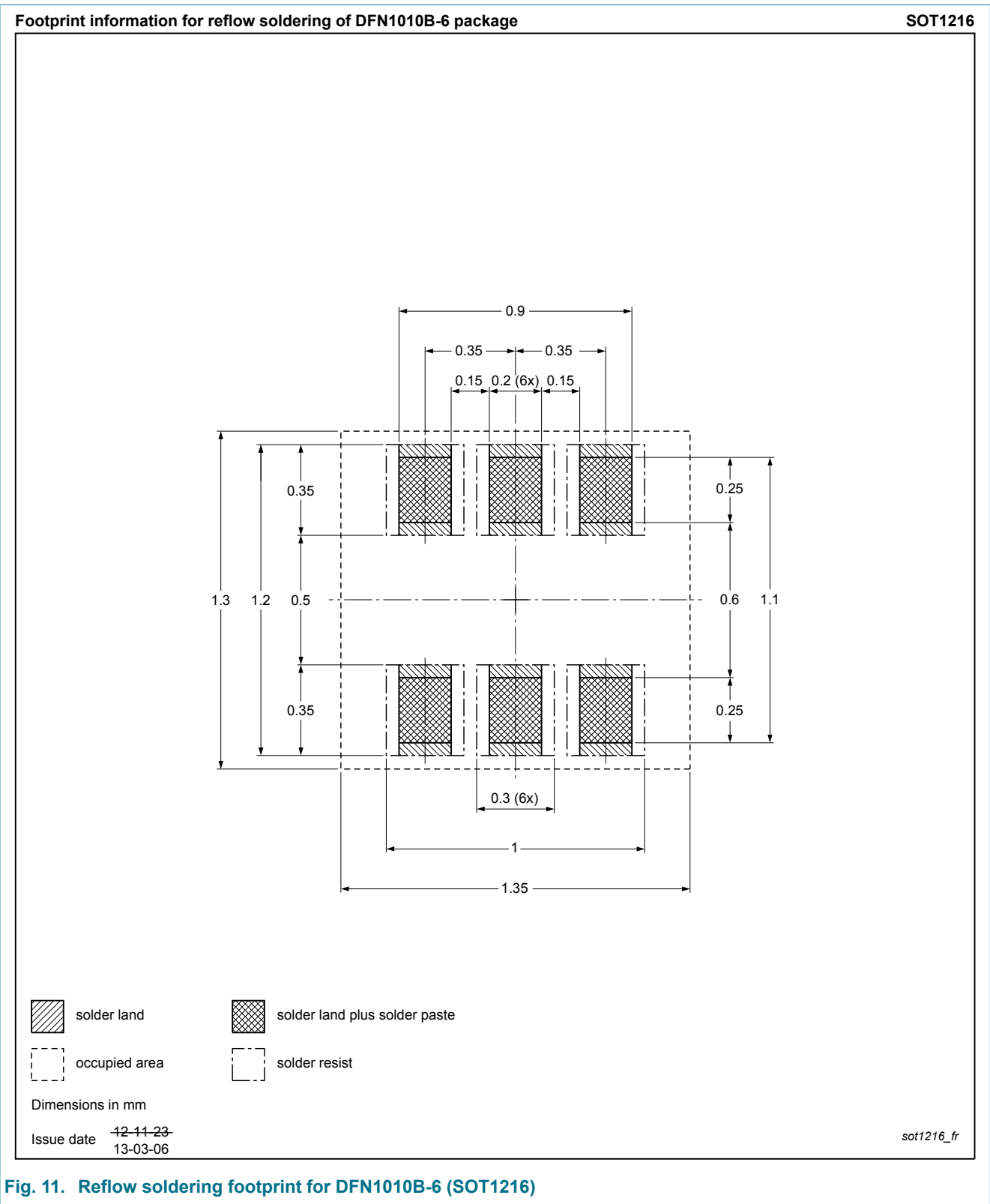


Fig. 11. Reflow soldering footprint for DFN1010B-6 (SOT1216)

14. Revision history

Table 8. Revision history

Data sheet ID	Release date	Data sheet status	Change notice	Supersedes
BC857QAS v.1	20140725	Product data sheet	-	-

15. Legal information

15.1 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.

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