



**THE DATASHEET OF  
PMST2907A,115**





# PMST2907A

60 V, 600 mA PNP switching transistor

12 August 2016

Product data sheet

## 1. General description

PNP switching transistor in a very small SOT323 (SC-70) Surface-Mounted Device (SMD) plastic package.

NPN complement: PMST2222A

## 2. Features and benefits

- General purpose switching transistor
- AEC-Q101 qualified

## 3. Applications

- Switching and linear amplification

## 4. Quick reference data

Table 1. Quick reference data

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
$V_{CEO}$	collector-emitter voltage	open base	-	-	-60	V
$I_C$	collector current		-	-	-600	mA
$h_{FE}$	DC current gain	$V_{CE} = -10\text{ V}$ ; $I_C = -150\text{ mA}$ ; pulsed; $t_p \leq 300\text{ }\mu\text{s}$ ; $\delta \leq 0.02$ ; $T_{amb} = 25\text{ }^\circ\text{C}$	100	-	300	

## 5. Pinning information

Table 2. Pinning information

Pin	Symbol	Description	Simplified outline	Graphic symbol
1	B	base	<p>SC-70 (SOT323)</p>	<p>sym132</p>
2	E	emitter		
3	C	collector		

## 6. Ordering information

Table 3. Ordering information

Type number	Package		
	Name	Description	Version
PMST2907A	SC-70	plastic surface-mounted package; 3 leads	SOT323

## 7. Marking

Table 4. Marking codes

Type number	Marking code <sup>[1]</sup>
PMST2907A	%2F

[1] % = placeholder for manufacturing site code

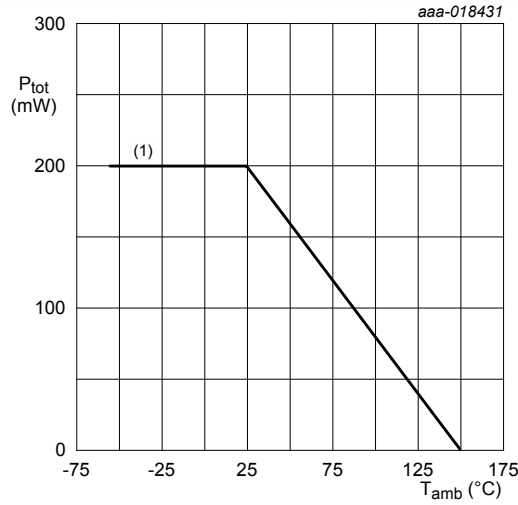
## 8. Limiting values

Table 5. 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	-	-60	V
$V_{CEO}$	collector-emitter voltage	open base	-	-60	V
$V_{EBO}$	emitter-base voltage	open collector	-	-5	V
$I_C$	collector current		-	-600	mA
$I_{CM}$	peak collector current	single pulse; $t_p \leq 1$ ms	-	-800	mA
$I_{BM}$	peak base current		-	-200	mA
$P_{tot}$	total power dissipation	$T_{amb} \leq 25$ °C	[1]	-	200 mW

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



(1) FR4 PCB; standard footprint

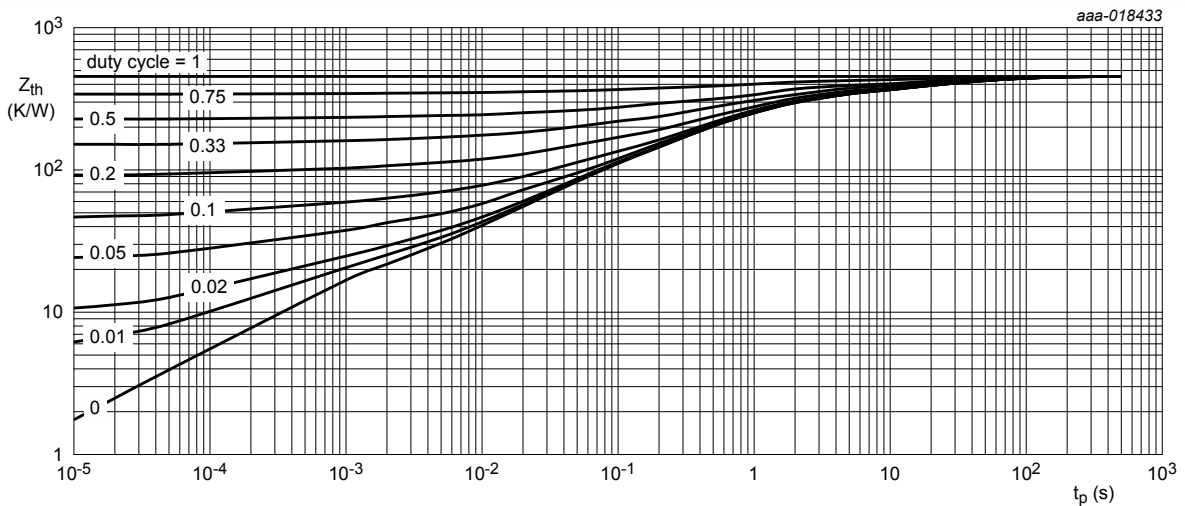
Fig. 1. Power derating curve

## 9. Thermal characteristics

Table 6. Thermal characteristics

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
R <sub>th(j-a)</sub>	thermal resistance from junction to ambient	in free air	[1]	-	-	625	K/W

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



Mounted on FR4 PCB; standard footprint

Fig. 2. Transient thermal impedance as a function of pulse time; typical values

## 10. Characteristics

Table 7. Characteristics

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
$I_{CBO}$	collector-base cut-off current	$V_{CB} = -50 \text{ V}; I_E = 0 \text{ A}; T_{amb} = 25 \text{ }^\circ\text{C}$	-	-	-10	nA
		$V_{CB} = -50 \text{ V}; I_E = 0 \text{ A}; T_j = 125 \text{ }^\circ\text{C}$	-	-	-10	$\mu\text{A}$
$I_{EBO}$	emitter-base cut-off current	$V_{EB} = -3 \text{ V}; I_C = 0 \text{ A}; T_{amb} = 25 \text{ }^\circ\text{C}$	-	-	-50	nA
$h_{FE}$	DC current gain	$V_{CE} = -10 \text{ V}; I_C = -0.1 \text{ mA}; T_{amb} = 25 \text{ }^\circ\text{C}$	75	-	-	
		$V_{CE} = -10 \text{ V}; I_C = -1 \text{ mA}; T_{amb} = 25 \text{ }^\circ\text{C}$	100	-	-	
		$V_{CE} = -10 \text{ V}; I_C = -10 \text{ mA};$ pulsed; $t_p \leq 300 \mu\text{s}; \delta \leq 0.02$ ; $T_{amb} = 25 \text{ }^\circ\text{C}$	100	-	-	
		$V_{CE} = -10 \text{ V}; I_C = -150 \text{ mA};$ pulsed; $t_p \leq 300 \mu\text{s}; \delta \leq 0.02$ ; $T_{amb} = 25 \text{ }^\circ\text{C}$	100	-	300	
		$V_{CE} = -10 \text{ V}; I_C = -500 \text{ mA};$ pulsed; $t_p \leq 300 \mu\text{s}; \delta \leq 0.02$ ; $T_{amb} = 25 \text{ }^\circ\text{C}$	50	-	-	
$V_{CEsat}$	collector-emitter saturation voltage	$I_C = -150 \text{ mA}; I_B = -15 \text{ mA};$ pulsed; $t_p \leq 300 \mu\text{s}; \delta \leq 0.02$ ; $T_{amb} = 25 \text{ }^\circ\text{C}$	-	-	-400	mV
		$I_C = -500 \text{ mA}; I_B = -50 \text{ mA};$ pulsed; $t_p \leq 300 \mu\text{s}; \delta \leq 0.02$ ; $T_{amb} = 25 \text{ }^\circ\text{C}$	-	-	-1.6	V
$V_{BEsat}$	base-emitter saturation voltage	$I_C = -150 \text{ mA}; I_B = -15 \text{ mA};$ pulsed; $t_p \leq 300 \mu\text{s}; \delta \leq 0.02$ ; $T_{amb} = 25 \text{ }^\circ\text{C}$	-	-	-1.3	V
		$I_C = -500 \text{ mA}; I_B = -50 \text{ mA};$ pulsed; $t_p \leq 300 \mu\text{s}; \delta \leq 0.02$ ; $T_{amb} = 25 \text{ }^\circ\text{C}$	-	-	-2.6	V
$t_d$	delay time	$I_C = -150 \text{ mA}; I_{B(on)} = -15 \text{ mA};$ $I_{B(off)} = 15 \text{ mA}; T_{amb} = 25 \text{ }^\circ\text{C}$	-	-	15	ns
$t_r$	rise time		-	-	35	ns
$t_{on}$	turn-on time		-	-	45	ns
$t_s$	storage time		-	-	250	ns
$t_f$	fall time		-	-	50	ns
$t_{off}$	turn-off time		-	-	300	ns
$C_C$	collector capacitance		$V_{CB} = -10 \text{ V}; I_E = 0 \text{ A}; i_e = 0 \text{ A};$ $f = 1 \text{ MHz}; T_{amb} = 25 \text{ }^\circ\text{C}$	-	-	8
$C_E$	emitter capacitance	$V_{EB} = -2 \text{ V}; I_C = 0 \text{ A}; i_c = 0 \text{ A}; f = 1 \text{ MHz};$ $T_{amb} = 25 \text{ }^\circ\text{C}$	-	-	30	pF
$f_T$	transition frequency	$V_{CE} = -20 \text{ V}; I_C = -50 \text{ mA}; f = 100 \text{ MHz};$ $T_{amb} = 25 \text{ }^\circ\text{C};$ Pulse test: $t_p \leq 300 \mu\text{s}; \delta \leq 0.02$	200	-	-	MHz

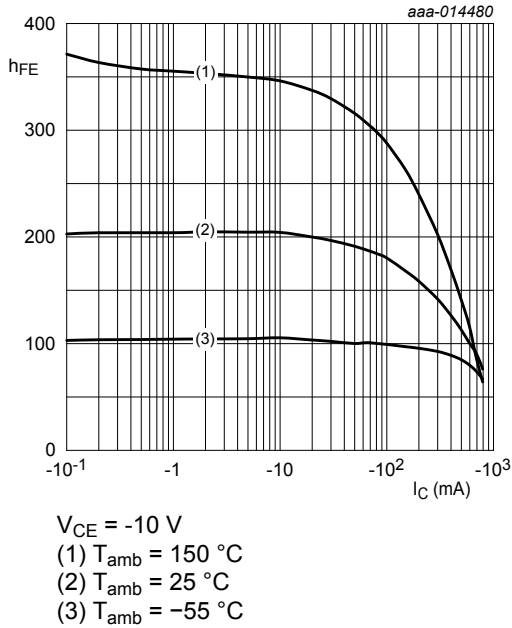


Fig. 3. DC current gain as a function of collector current; typical values

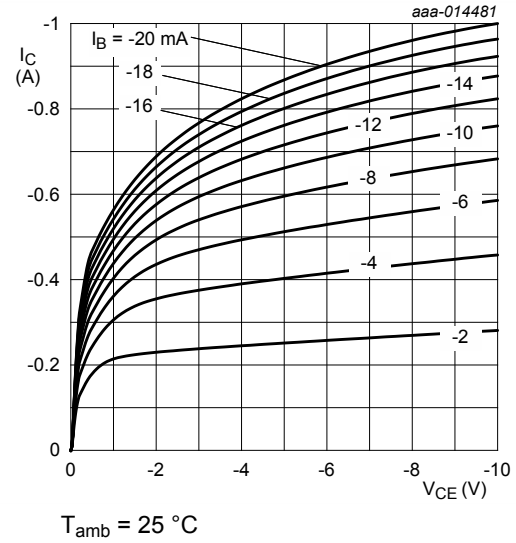


Fig. 4. Collector current as a function of collector-emitter voltage; typical values

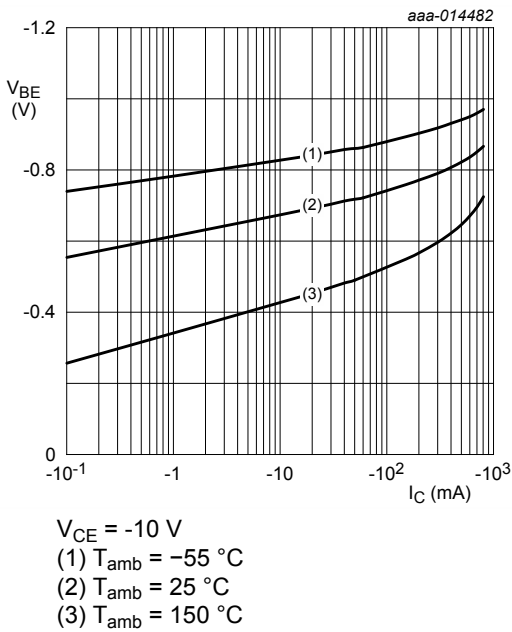


Fig. 5. Base-emitter voltage as a function of collector current; typical values

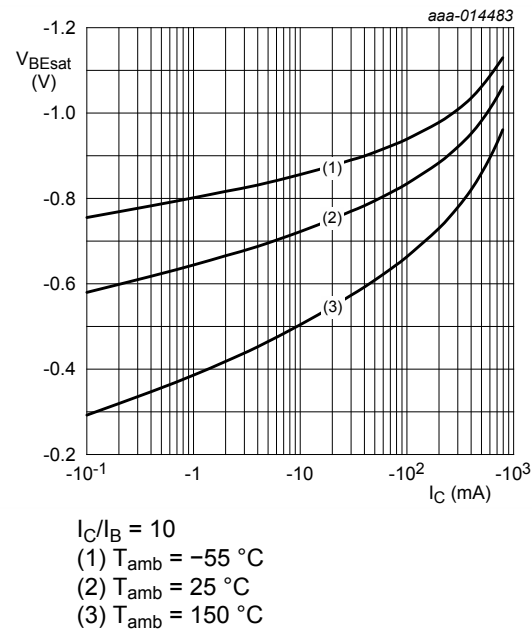
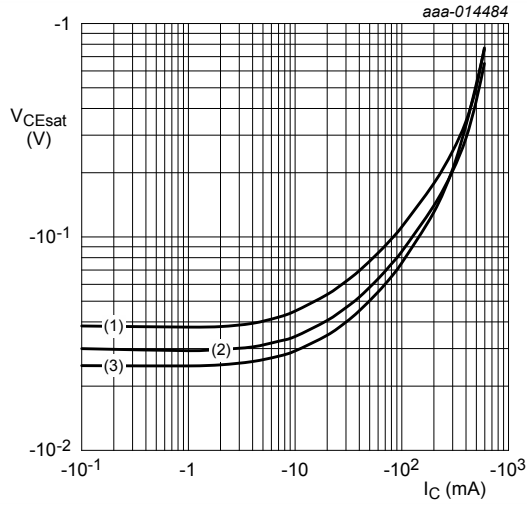
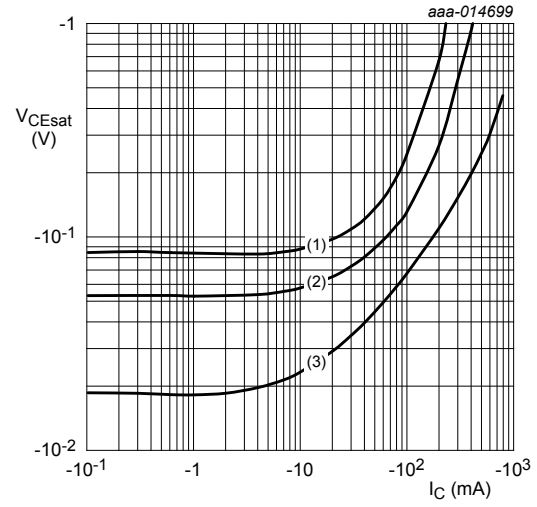


Fig. 6. Base-emitter saturation voltage as a function of collector current; typical values



$I_C/I_B = 20$   
 (1)  $T_{amb} = 150\text{ °C}$   
 (2)  $T_{amb} = 25\text{ °C}$   
 (3)  $T_{amb} = -55\text{ °C}$

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



$T_{amb} = 25\text{ °C}$   
 (1)  $I_C/I_B = 100$   
 (2)  $I_C/I_B = 50$   
 (3)  $I_C/I_B = 10$

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

### 11. Test information

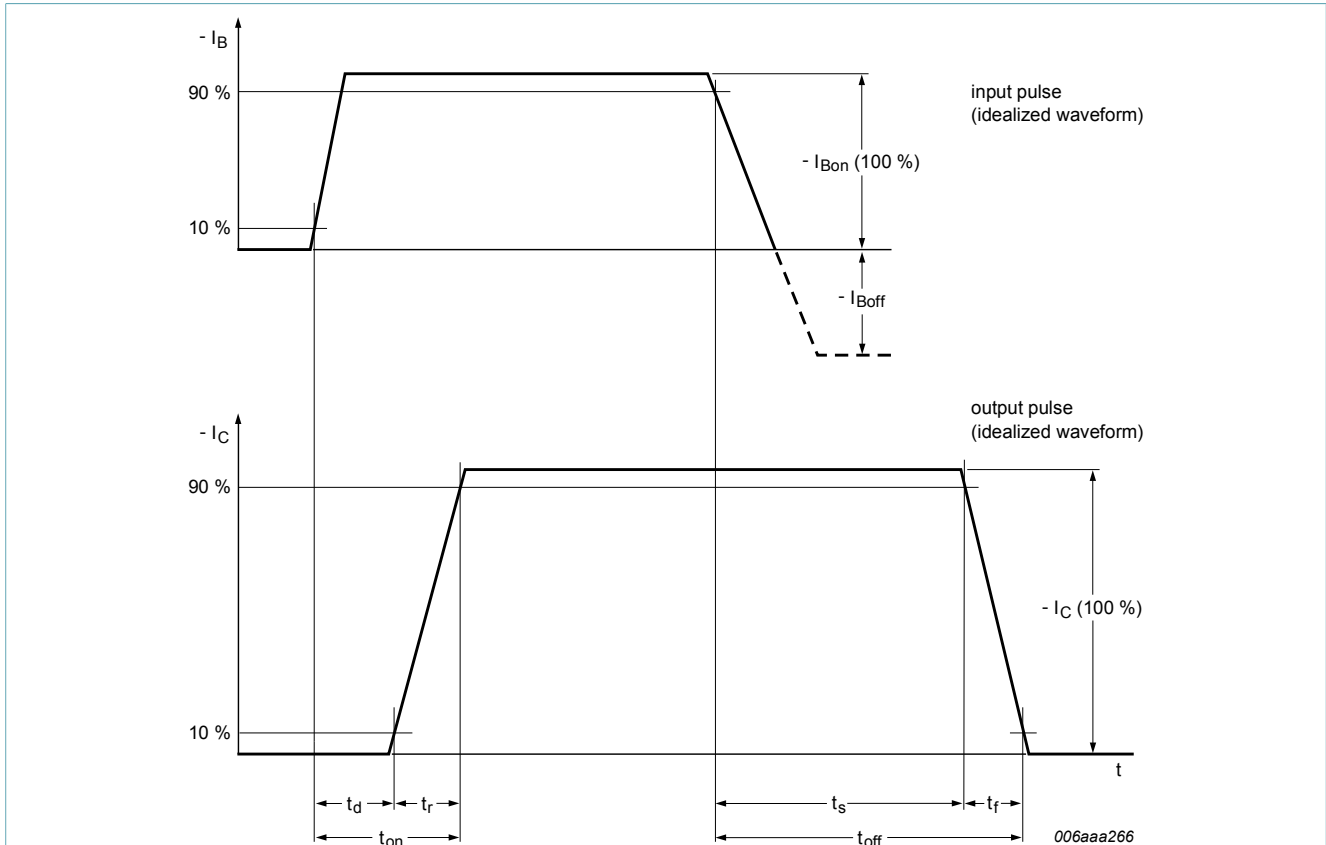


Fig. 9. Transistor switching time definition

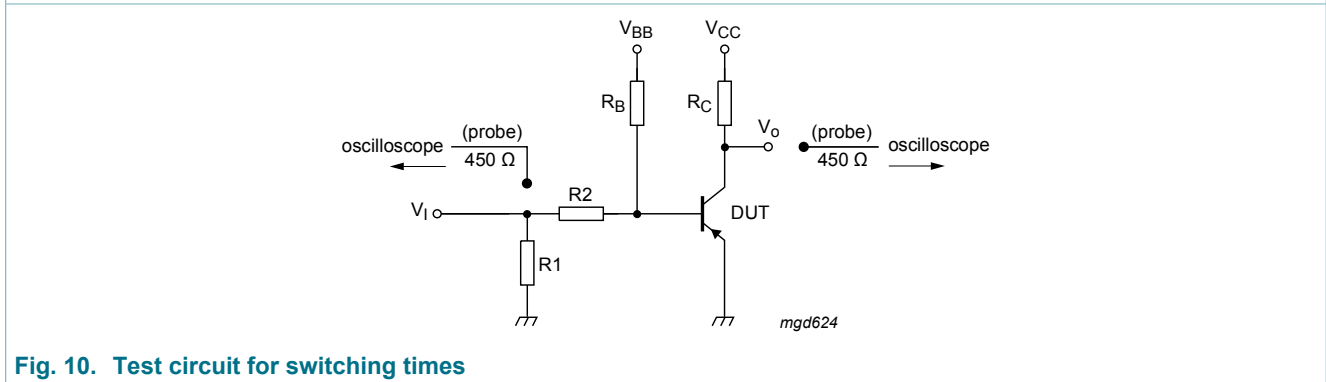


Fig. 10. Test circuit for switching times

### 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

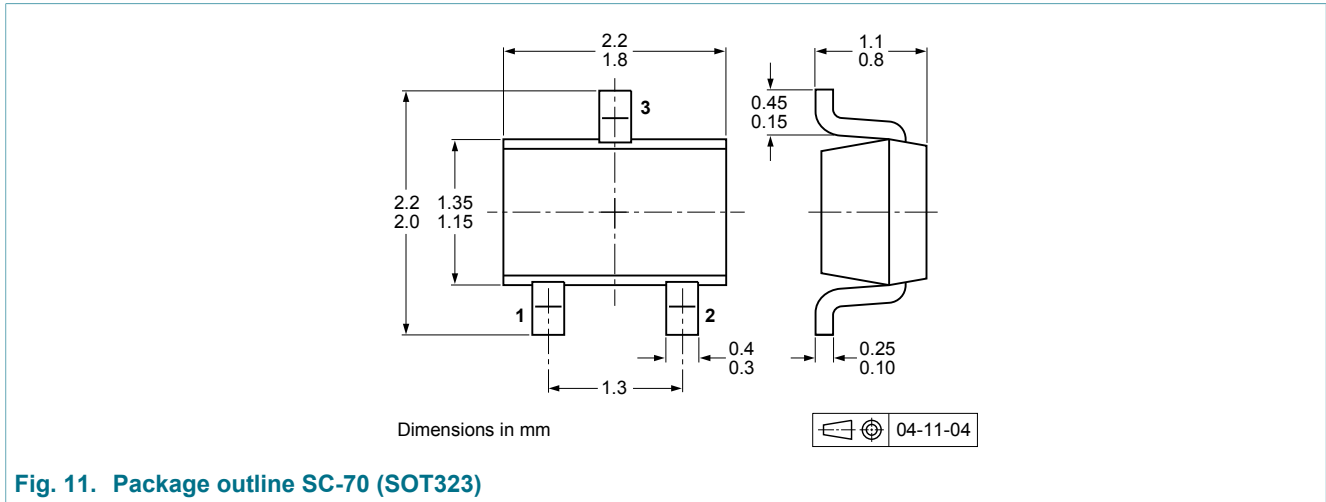


Fig. 11. Package outline SC-70 (SOT323)

## 13. Soldering

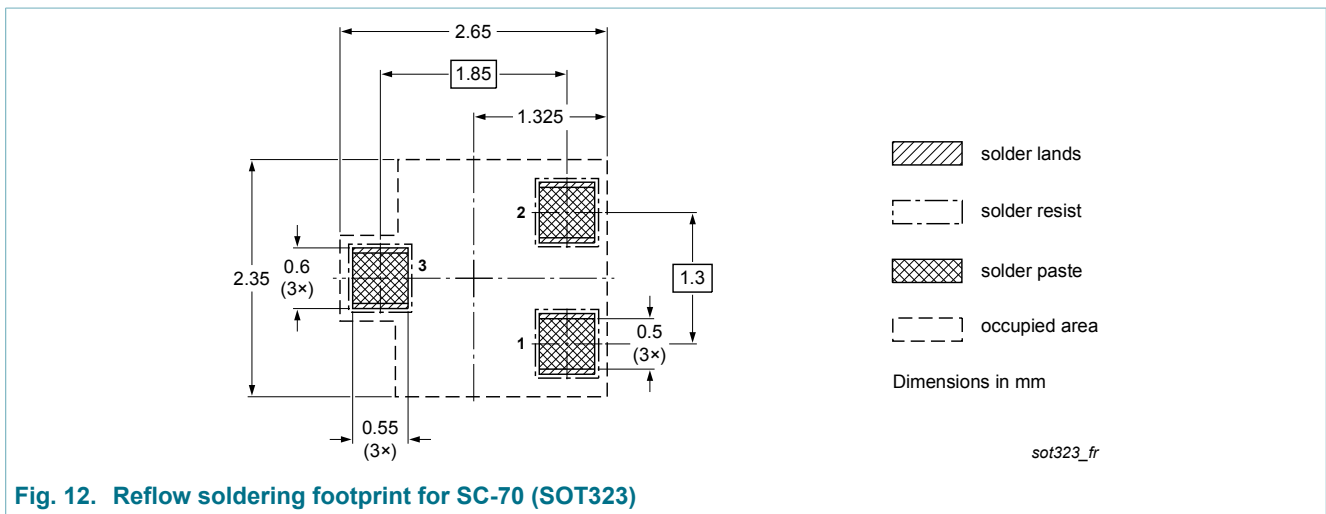
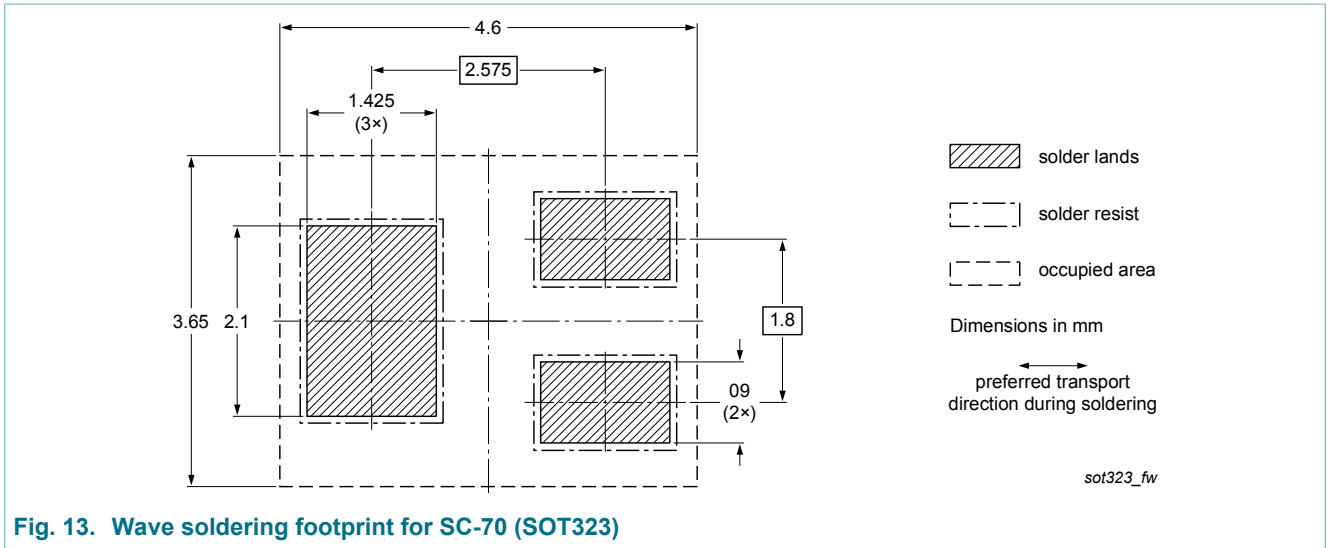


Fig. 12. Reflow soldering footprint for SC-70 (SOT323)



## 14. Revision history

Table 8. Revision history

Data sheet ID	Release date	Data sheet status	Change notice	Supersedes
PMST2907A v.4	20160812	Product data sheet	-	PMST2907A v.3
Modifications:	<ul style="list-style-type: none"> <li>The format of this data sheet has been redesigned to comply with the new identity guidelines of NXP Semiconductors.</li> <li>Legal texts have been adapted to the new company name where appropriate.</li> <li>Figures 1 to 8: added</li> <li>Section 11. Test information: added</li> <li>Package outline: updated</li> <li>Section 13. Soldering: added</li> <li>Section 15. Legal information: updated</li> </ul>			
PMST2907A v.3	20011119	Product data sheet	-	PMST2907A v.2
PMST2907A v.2	19990422	Product data sheet	-	PMST2907A v.1
PMST2907A v.1	19970708	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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