

PMBT4401YS

40 V, 600 mA, double NPN switching transistor

16 July 2026 Product data sheet

1. General description

Double NPN switching transistor in a very small SOT363-3 (SC-88) Surface-Mounted Device (SMD) plastic package.

Double PNP complement: PMBT4403YS

2. Features and benefits

- Double general-purpose switching transistor
- High current (max. 600 mA)
- Voltage max. 40 V
- AEC-Q101 qualified

3. Applications

- Switching and linear amplification

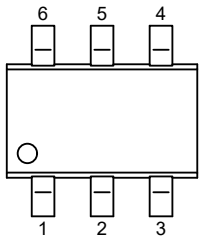
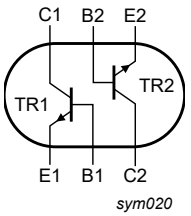
4. Quick reference data

Table 1. Quick reference data

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
Per transistor							
V_{CEO}	collector-emitter voltage	open base		-	-	40	V
I_C	collector current			-	-	600	mA
h_{FE}	DC current gain	V_{CE} = 1 V; I_C = 0.1 mA; T_{amb} = 25 °C		20	-	-	

5. Pinning information

Table 2. Pinning information

Pin	Symbol	Description	Simplified outline	Graphic symbol
1	E	emitter TR1	 Transparent top view **TSSOP6 (SOT363-3)**	
2	B	base TR1		
3	C	collector TR2		
4	E	emitter TR2		
5	B	base TR2		
6	C	collector TR1		

6. Ordering information

Table 3. Ordering information

Type number	Package		
	Name	Description	Version
PMBT4401YS	TSSOP6	Plastic surface-mounted package; 6 leads	SOT363-3

7. Marking

Table 4. Marking codes

Type number	Marking code[1]
PMBT4401YS	BG%

[1] % = placeholder for manufacturing site code

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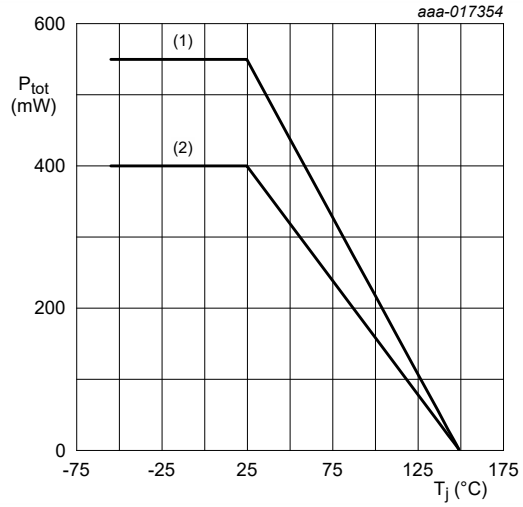
8. Limiting values

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		-	60	V
V_{CEO}	collector-emitter voltage	open base		-	40	V
V_{EBO}	emitter-base voltage	open collector		-	6	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]	-	250	mW
			[2]	-	300	mW
Per device						
P_{tot}	total power dissipation	$T_{amb} \leq 25$ °C	[1]	-	400	mW
			[2]	-	550	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.
[2] Device mounted on an FR4 PCB; single-sided copper; tin-plated and mounting pad for collector 1 cm^2.



(1) FR4 PCB; mounting pad for collector 1 cm^2
(2) FR4 PCB; standard footprint

Fig. 1. Per device: Power derating curves

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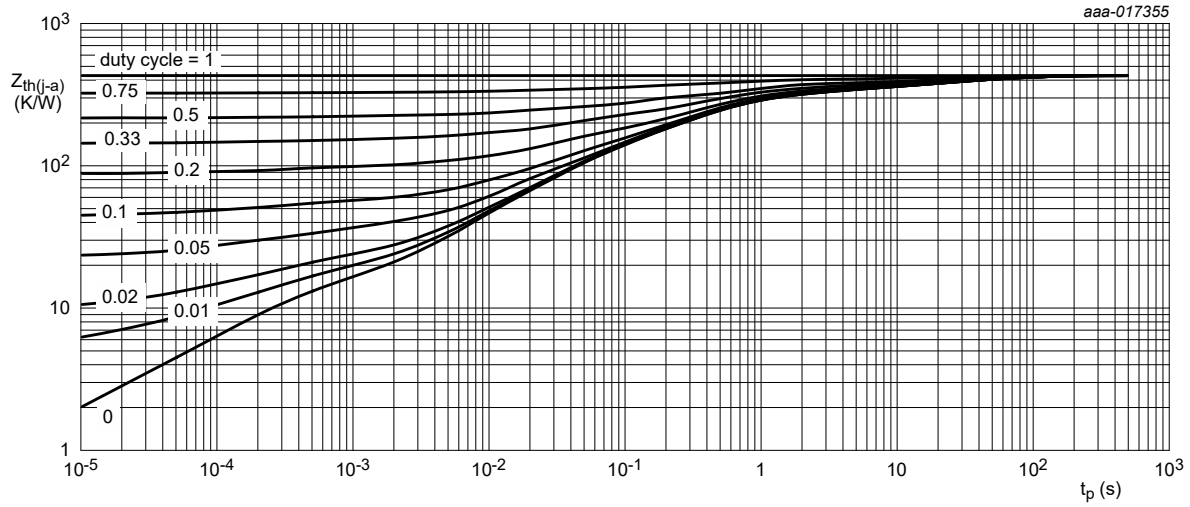
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9. Thermal characteristics

Table 6. Thermal characteristics

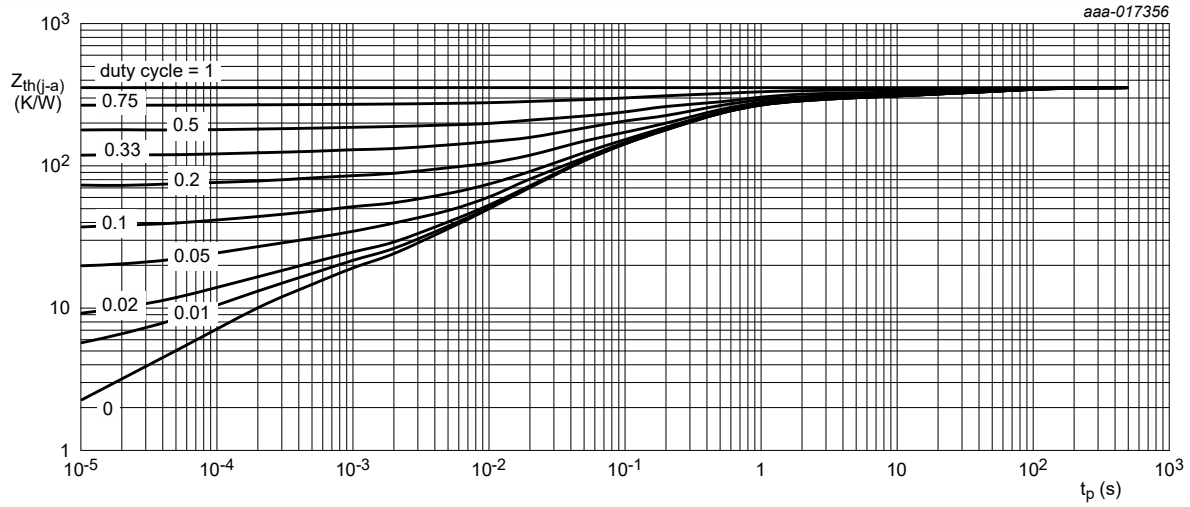
Symbol	Parameter	Conditions		Min	Typ	Max	Unit
Per transistor							
$R_{th(j-a)}$	thermal resistance from junction to ambient	in free air	[1]	-	-	500	K/W
			[2]	-	-	417	K/W
Per device							
$R_{th(j-a)}$	thermal resistance from junction to ambient	in free air	[1]	-	-	313	K/W
			[2]	-	-	227	K/W

[1] Device mounted on an FR4 PCB; single-sided copper; tin-plated and standard footprint.
[2] Device mounted on an FR4 PCB; single-sided copper; tin-plated and mounting pad for collector 1 cm^2.



FR4 PCB, standard footprint

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



FR4 PCB, mounting pad for collector 1 cm^2

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

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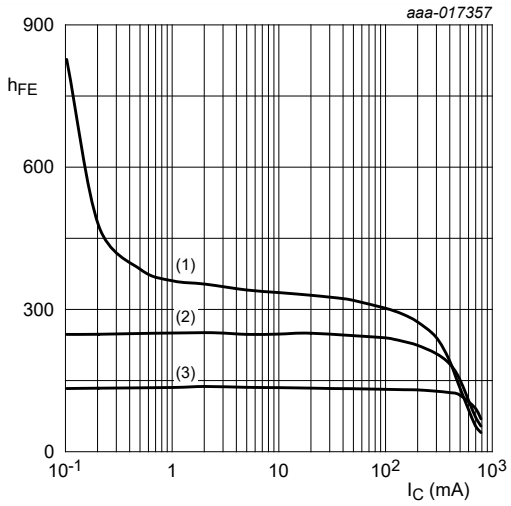
10. Characteristics

Table 7. Characteristics

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
Per transistor							
I_{CBO}	collector-base cut-off current	V_{CB} = 50 V; I_E = 0 A; T_{amb} = 25 °C		-	-	50	nA
		V_{CB} = 50 V; I_E = 0 A; T_j = 125 °C		-	-	10	µA
I_{EBO}	emitter-base cut-off current	V_{EB} = 6 V; I_C = 0 A; T_{amb} = 25 °C		-	-	50	nA
h_{FE}	DC current gain	V_{CE} = 1 V; I_C = 0.1 mA; T_{amb} = 25 °C		20	-	-	
		V_{CE} = 1 V; I_C = 1 mA; T_{amb} = 25 °C		40	-	-	
		V_{CE} = 1 V; I_C = 10 mA; T_{amb} = 25 °C		80	-	-	
		V_{CE} = 1 V; I_C = 150 mA; $t_p \leq$ 300 µs; $\delta \leq$ 0.02; T_{amb} = 25 °C		100	-	300	
		V_{CE} = 2 V; I_C = 500 mA; $t_p \leq$ 300 µs; $\delta \leq$ 0.02; T_{amb} = 25 °C		40	-	-	
V_{CEsat}	collector-emitter saturation voltage	I_C = 150 mA; I_B = 15 mA; $t_p \leq$ 300 µs; $\delta \leq$ 0.02; T_{amb} = 25 °C		-	-	400	mV
		I_C = 500 mA; I_B = 50 mA; $t_p \leq$ 300 µs; $\delta \leq$ 0.02; T_{amb} = 25 °C		-	-	750	mV
V_{BEsat}	base-emitter saturation voltage	I_C = 150 mA; I_B = 15 mA; $t_p \leq$ 300 µs; $\delta \leq$ 0.02; T_{amb} = 25 °C		-	-	950	mV
		I_C = 500 mA; I_B = 50 mA; $t_p \leq$ 300 µs; $\delta \leq$ 0.02; T_{amb} = 25 °C		-	-	1.2	V
t_d	delay time	I_C = 150 mA; I_{Bon} = 15 mA; I_{Boff} = -15 mA; T_{amb} = 25 °C		-	-	10	ns
t_r	rise time			-	-	25	ns
t_{on}	turn-on time			-	-	35	ns
t_s	storage time			-	-	200	ns
t_f	fall time			-	-	60	ns
t_{off}	turn-off time			-	-	250	ns
C_c	collector capacitance	V_{CB} = 10 V; I_E = 0 A; i_e = 0 A; f = 1 MHz; T_{amb} = 25 °C		-	-	8	pF
C_e	emitter capacitance	V_{EB} = 500 mV; I_C = 0 A; f = 1 MHz; T_{amb} = 25 °C		-	-	30	pF
f_T	transition frequency	V_{CE} = 20 V; I_C = 20 mA; f = 100 MHz; T_{amb} = 25 °C		250	-	-	MHz
NF	noise figure	V_{CE} = 5 V; I_C = 100 µA; R_S = 1 kΩ; f = 1 kHz		-	-	4	dB

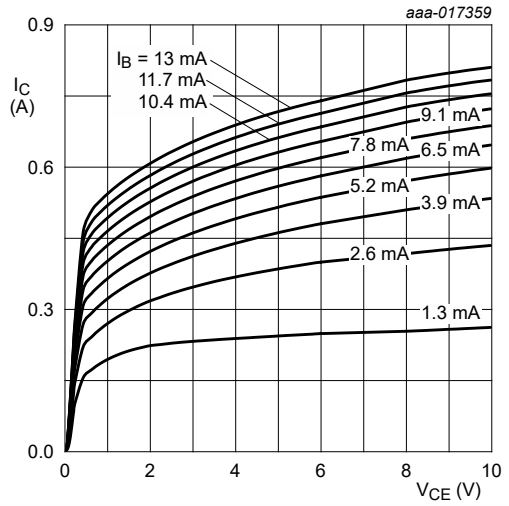
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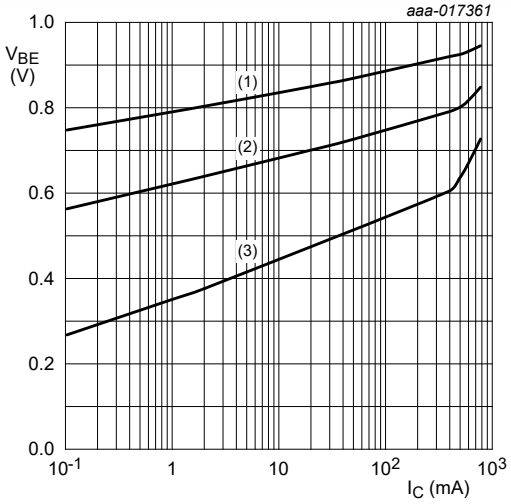
V_{CE} = 10 V
(1) T_{amb} = 100 °C
(2) T_{amb} = 25 °C
(3) T_{amb} = −55 °C

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



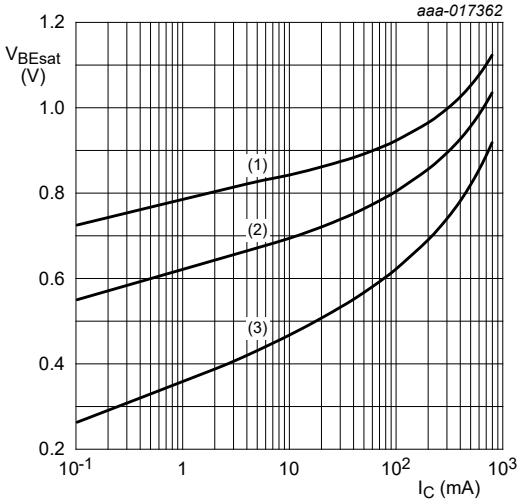
T_{amb} = 25 °C

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



V_{CE} = 10 V
(1) T_{amb} = −55 °C
(2) T_{amb} = 25 °C
(3) T_{amb} = 150 °C

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

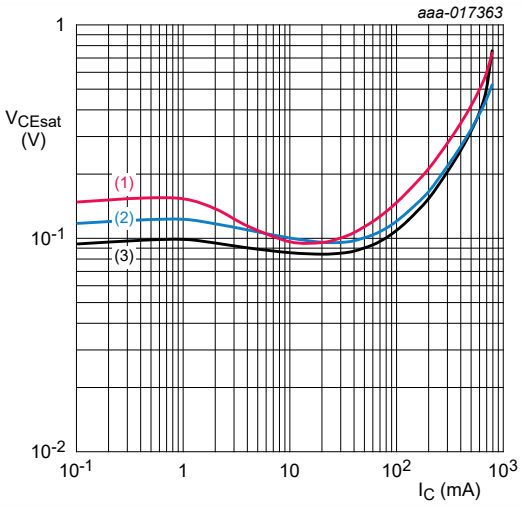


I_C/I_B = 10
(1) T_{amb} = −55 °C
(2) T_{amb} = 25 °C
(3) T_{amb} = 150 °C

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

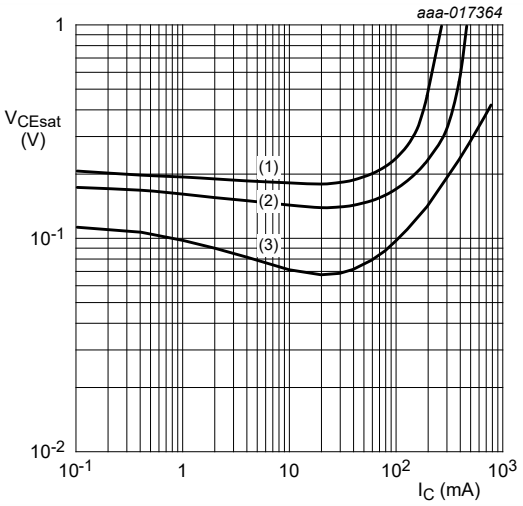
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I_C/I_B = 20
(1) T_{amb} = 150 °C
(2) T_{amb} = 25 °C
(3) T_{amb} = −55 °C

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



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

Fig. 9. Collector-emitter saturation voltage as a function of collector current; typical values

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11. Test information

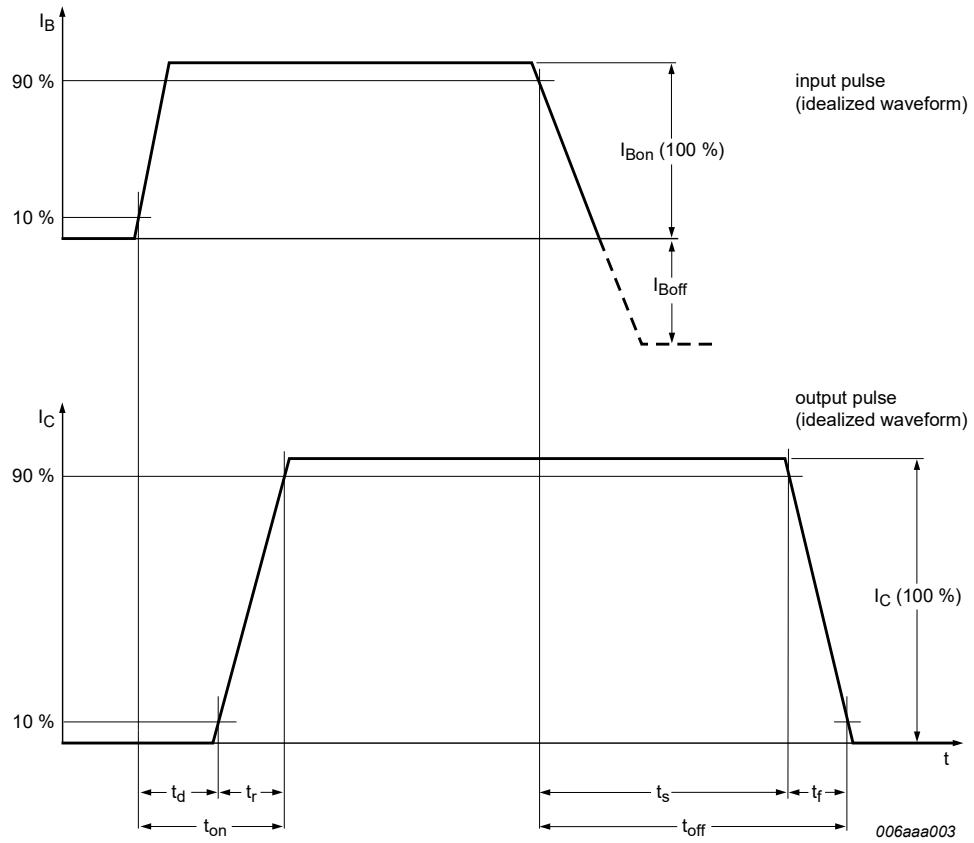


Fig. 10. Switching time definition

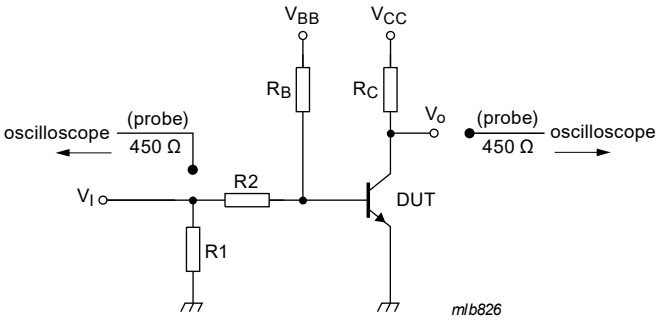


Fig. 11. Test circuit for switching times

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.

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12. Package outline

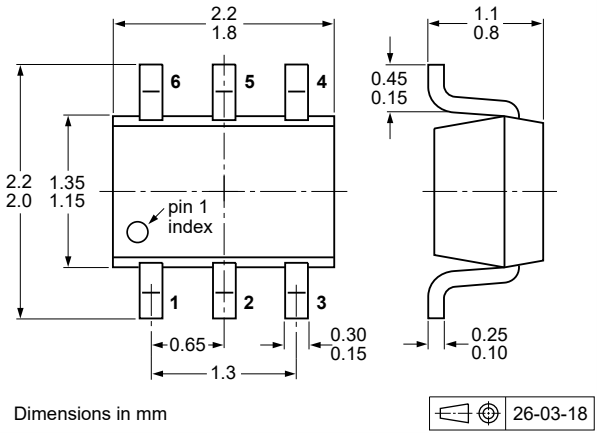


Fig. 12. Package outline TSSOP6 (SOT363-3)

13. Soldering

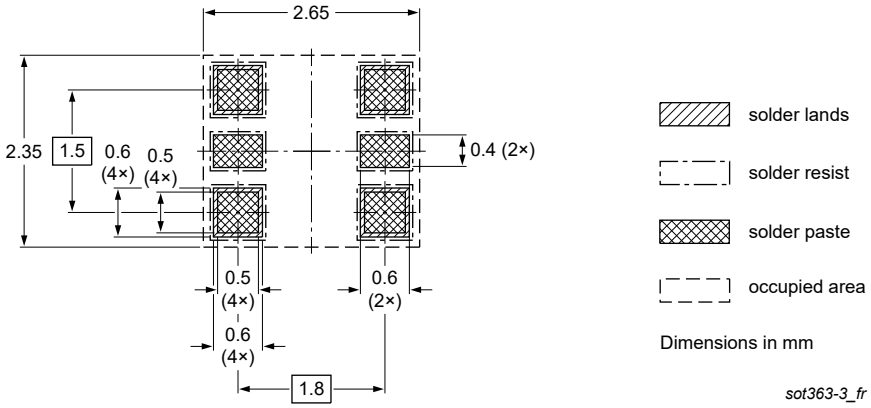


Fig. 13. Reflow soldering footprint for TSSOP6 (SOT363-3)

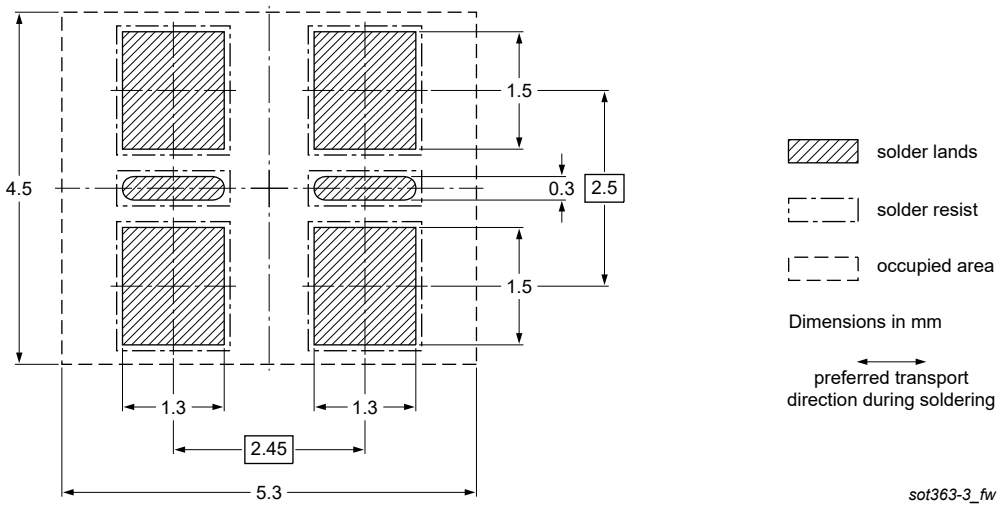


Fig. 14. Wave soldering footprint for TSSOP6 (SOT363-3)

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14. Revision history

Table 8. Revision history

Data sheet ID	Release date	Data sheet status	Change notice	Supersedes
PMBT4401YS v.2	20260716	Product data sheet	-	PMBT4401YS v.1
Modifications:	• Package changed from SOT363 to SOT363-3			
PMBT4401YS v.1	20150702	Product data sheet	-	-

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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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