



# PHPT610030PK

PNP/PNP high power double bipolar transistor

30 September 2025

Product data sheet

## 1. General description

PNP/PNP high power double bipolar transistor in a SOT1205 (LFPAK56D) Surface-Mounted Device (SMD) power plastic package.

NPN/NPN complement: PHPT610030NK

NPN/PNP complement: PHPT610030NPK

## 2. Features and benefits

- High thermal power dissipation capability
- Suitable for high temperature applications up to 175 °C
- Reduced Printed-Circuit Board (PCB) requirements comparing to transistors in DPAK
- High energy efficiency due to less heat generation

## 3. Applications

- Motor control
- Power management
- Load switch
- Linear mode voltage regulator
- Backlighting applications
- Relay replacement

## 4. Quick reference data

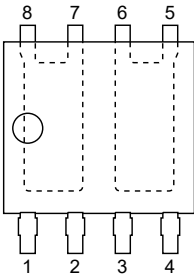
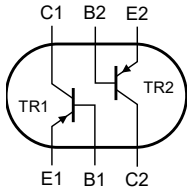
Table 1. Quick reference data

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
<b>Per transistor</b>						
$V_{CEO}$	collector-emitter voltage	open base	-	-	-100	V
$I_C$	collector current		-	-	-3	A
$R_{CEsat}$	collector-emitter saturation resistance	$I_C = -2\text{ A}$ ; $I_B = -0.2\text{ A}$ ; pulsed; $t_p \leq 300\text{ }\mu\text{s}$ ; $\delta \leq 0.02$ ; $T_{amb} = 25\text{ }^\circ\text{C}$	-	110	180	m $\Omega$



5. Pinning information

Table 2. Pinning information

Pin	Symbol	Description	Simplified outline	Graphic symbol
1	E1	emitter TR1	 <p>LPAK56D; Dual LPAK (SOT1205)</p>	 <p>sym138</p>
2	B1	base TR1		
3	E2	emitter TR2		
4	B2	base TR2		
5	C2	collector TR2		
6	C2	collector TR2		
7	C1	collector TR1		
8	C1	collector TR1		

6. Ordering information

Table 3. Ordering information

Type number	Package		
	Name	Description	Version
<a href="#">PHPT610030PK</a>	LPAK56D; Dual LPAK	plastic, single ended surface mounted package (LPAK56D); 8 leads	<a href="#">SOT1205</a>

7. Marking

Table 4. Marking codes

Type number	Marking code
PHPT610030PK	10030PK

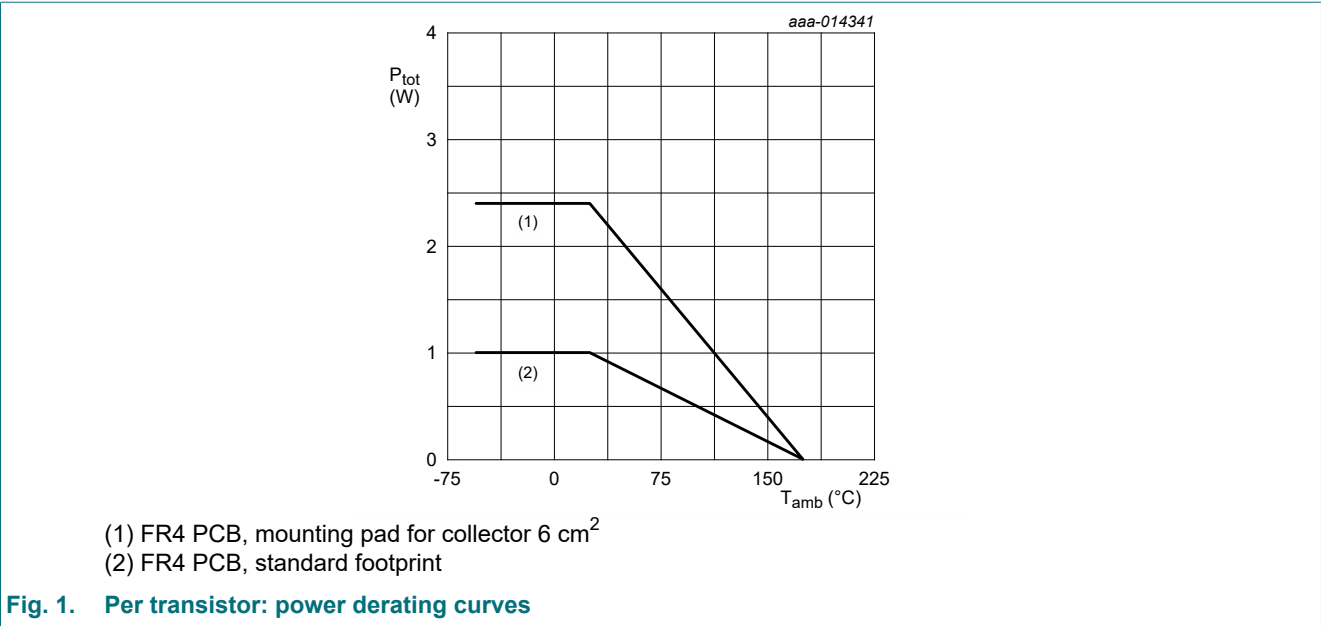


8. Limiting values

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

Symbol	Parameter	Conditions		Min	Max	Unit
Per transistor						
V <sub>CBO</sub>	collector-base voltage	open emitter		-	-100	V
V <sub>CEO</sub>	collector-emitter voltage	open base		-	-100	V
V <sub>EBO</sub>	emitter-base voltage	open collector		-	-8	V
I <sub>C</sub>	collector current			-	-3	A
I <sub>CM</sub>	peak collector current	single pulse; t <sub>p</sub> ≤ 1 ms		-	-8	A
I <sub>B</sub>	base current			-	-0.5	A
P <sub>tot</sub>	total power dissipation	T <sub>amb</sub> ≤ 25 °C	[1]	-	1	W
			[2]	-	2.4	W
			[3]	-	25	W
Per device						
P <sub>tot</sub>	total power dissipation	T <sub>amb</sub> ≤ 25 °C	[1]	-	1.25	W
			[2]	-	3	W
			[4]	-	5	W
T <sub>j</sub>	junction temperature			-	175	°C
T <sub>amb</sub>	ambient temperature			-55	175	°C
T <sub>stg</sub>	storage temperature			-65	175	°C

- [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, mounting pad for collector 6 cm<sup>2</sup>.
- [3] Power dissipation from junction to mounting base.
- [4] Device mounted on a ceramic PCB, Al<sub>2</sub>O<sub>3</sub>, standard footprint.



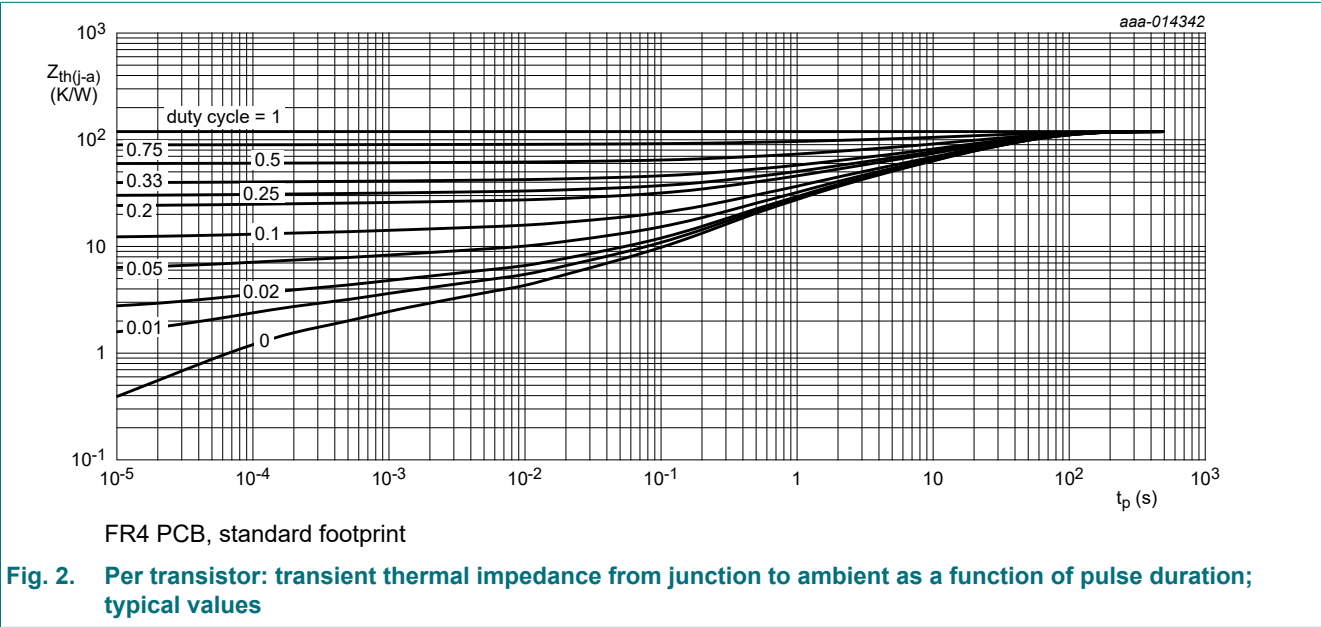


9. Thermal characteristics

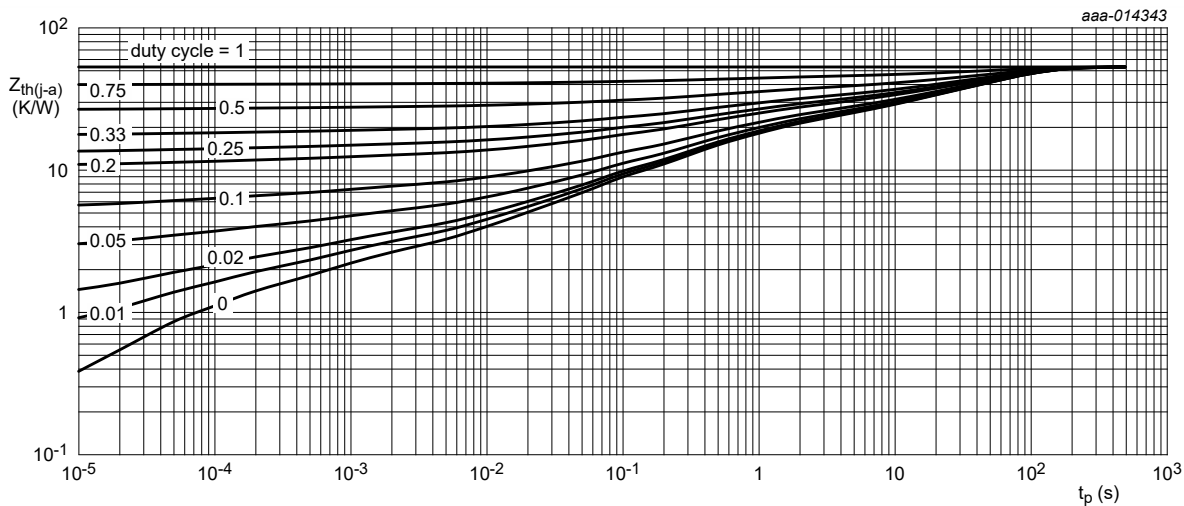
Table 6. Thermal characteristics

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
Per transistor							
R <sub>th(j-a)</sub>	thermal resistance from junction to ambient	in free air	[1]	-	-	150	K/W
			[2]	-	-	62.5	K/W
R <sub>th(j-sp)</sub>	thermal resistance from junction to solder point			-	-	6	K/W
Per device							
R <sub>th(j-a)</sub>	thermal resistance from junction to ambient	in free air	[1]	-	-	120	K/W
			[2]	-	-	50	K/W
			[3]	-	-	30	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, mounting pad for collector 6 cm<sup>2</sup>.  
[3] Device mounted on a ceramic PCB, Al<sub>2</sub>O<sub>3</sub>, standard footprint.







FR4 PCB, mounting pad for collector 6 cm<sup>2</sup>

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



10. Characteristics

Table 7. Characteristics

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
Per transistor							
I <sub>CBO</sub>	collector-base cut-off current	V <sub>CB</sub> = -80 V; I <sub>E</sub> = 0 A; T <sub>amb</sub> = 25 °C		-	-	-100	nA
		V <sub>CB</sub> = -80 V; I <sub>E</sub> = 0 A; T <sub>j</sub> = 150 °C		-	-	-50	µA
I <sub>CES</sub>	collector-emitter cut-off current	V <sub>CE</sub> = -80 V; V <sub>BE</sub> = 0 V; T <sub>amb</sub> = 25 °C		-	-	-100	nA
I <sub>EBO</sub>	emitter-base cut-off current	V <sub>EB</sub> = -7 V; I <sub>C</sub> = 0 A; T <sub>amb</sub> = 25 °C		-	-	-100	nA
h <sub>FE</sub>	DC current gain	V <sub>CE</sub> = -10 V; I <sub>C</sub> = -500 mA; T <sub>amb</sub> = 25 °C		150	220	-	
		V <sub>CE</sub> = -10 V; I <sub>C</sub> = -1 A; pulsed; t <sub>p</sub> ≤ 300 µs; δ ≤ 0.02; T <sub>amb</sub> = 25 °C		80	210	-	
		V <sub>CE</sub> = -10 V; I <sub>C</sub> = -2 A; pulsed; t <sub>p</sub> ≤ 300 µs; δ ≤ 0.02; T <sub>amb</sub> = 25 °C		20	100	-	
		V <sub>CE</sub> = -10 V; I <sub>C</sub> = -3 A; pulsed; t <sub>p</sub> ≤ 300 µs; δ ≤ 0.02; T <sub>amb</sub> = 25 °C		10	40	-	
V <sub>CEsat</sub>	collector-emitter saturation voltage	I <sub>C</sub> = -500 mA; I <sub>B</sub> = -50 mA; T <sub>amb</sub> = 25 °C		-	-70	-110	mV
		I <sub>C</sub> = -2 A; I <sub>B</sub> = -200 mA; pulsed; t <sub>p</sub> ≤ 300 µs; δ ≤ 0.02; T <sub>amb</sub> = 25 °C		-	-220	-360	mV
R <sub>CEsat</sub>	collector-emitter saturation resistance	I <sub>C</sub> = -2 A; I <sub>B</sub> = -0.2 A; pulsed; t <sub>p</sub> ≤ 300 µs; δ ≤ 0.02; T <sub>amb</sub> = 25 °C		-	110	180	mΩ
V <sub>BEsat</sub>	base-emitter saturation voltage	I <sub>C</sub> = -1 A; I <sub>B</sub> = -50 mA; pulsed; t <sub>p</sub> ≤ 300 µs; δ ≤ 0.02; T <sub>amb</sub> = 25 °C		-	-0.91	-1	V
		I <sub>C</sub> = -2 A; I <sub>B</sub> = -200 mA; pulsed; t <sub>p</sub> ≤ 300 µs; δ ≤ 0.02; T <sub>amb</sub> = 25 °C		-	-1.02	-1.2	V
V <sub>BEon</sub>	base-emitter turn-on voltage	V <sub>CE</sub> = -2 V; I <sub>C</sub> = -100 mA; pulsed; t <sub>p</sub> ≤ 300 µs; δ ≤ 0.02; T <sub>amb</sub> = 25 °C		-	-0.68	-0.9	V
t <sub>d</sub>	delay time	V <sub>CC</sub> = -12.5 V; I <sub>C</sub> = -1 A; I <sub>Bon</sub> = -50 mA; I <sub>Boff</sub> = 50 mA; T <sub>amb</sub> = 25 °C		-	20	-	ns
t <sub>r</sub>	rise time			-	180	-	ns
t <sub>on</sub>	turn-on time			-	200	-	ns
t <sub>s</sub>	storage time			-	350	-	ns
t <sub>f</sub>	fall time			-	220	-	ns
t <sub>off</sub>	turn-off time			-	570	-	ns
f <sub>T</sub>	transition frequency	V <sub>CE</sub> = -10 V; I <sub>C</sub> = -100 mA; f = 100 MHz; T <sub>amb</sub> = 25 °C		-	125	-	MHz
C <sub>c</sub>	collector capacitance	V <sub>CB</sub> = -10 V; I <sub>E</sub> = 0 A; i <sub>e</sub> = 0 A; f = 1 MHz; T <sub>amb</sub> = 25 °C		-	30	-	pF



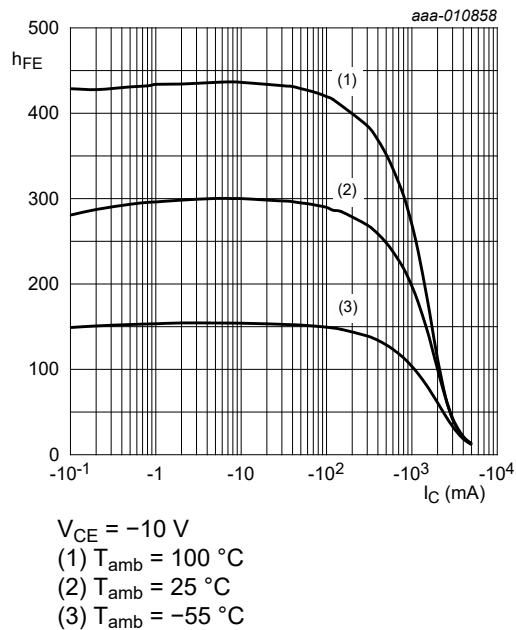


Fig. 4. DC current gain as a function of collector current; typical values

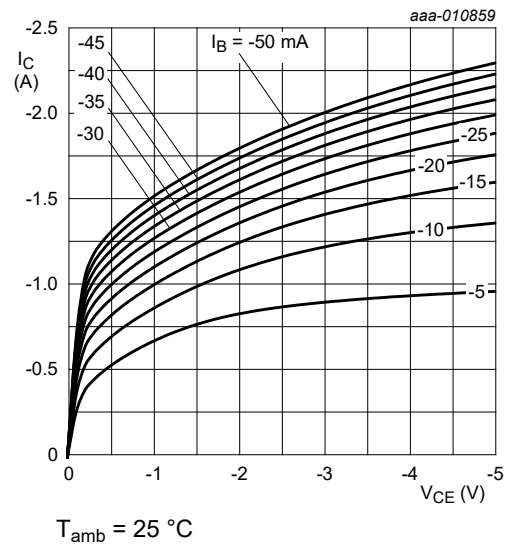


Fig. 5. Collector current as a function of collector-emitter voltage; typical values

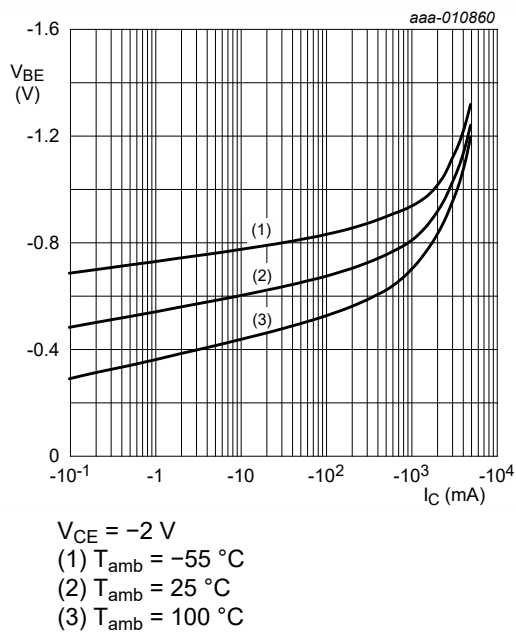


Fig. 6. Base-emitter voltage as a function of collector current; typical values

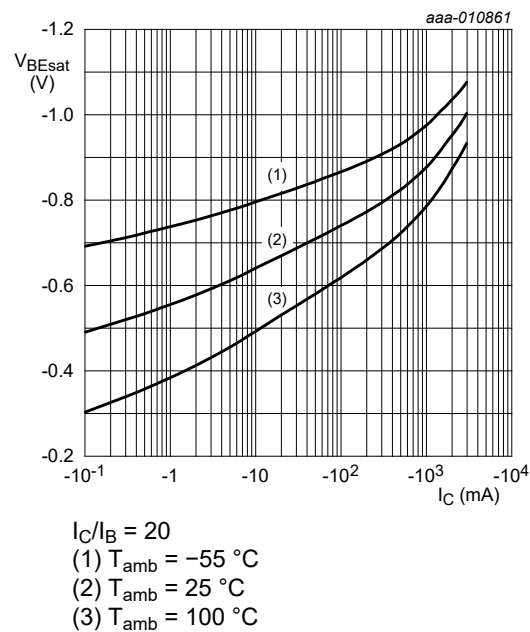


Fig. 7. Base-emitter saturation voltage as a function of collector current; typical values



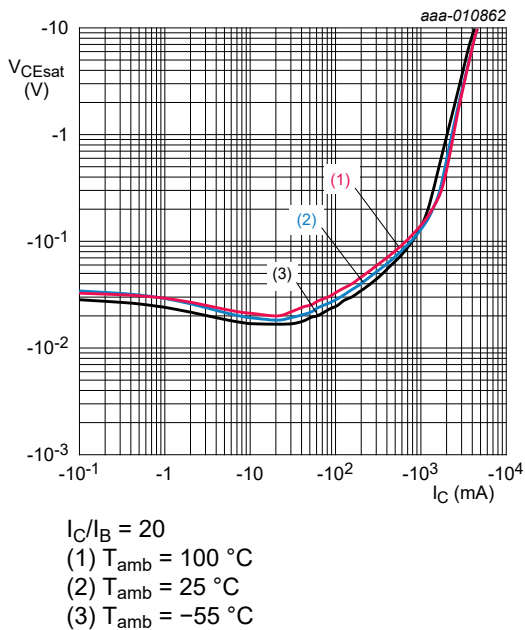


Fig. 8. Collector-emitter saturation voltage as a function of collector current; typical values

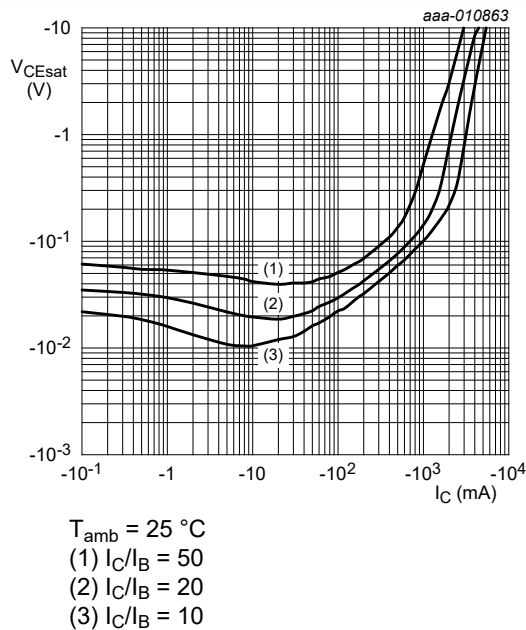


Fig. 9. Collector-emitter saturation voltage as a function of collector current; typical values

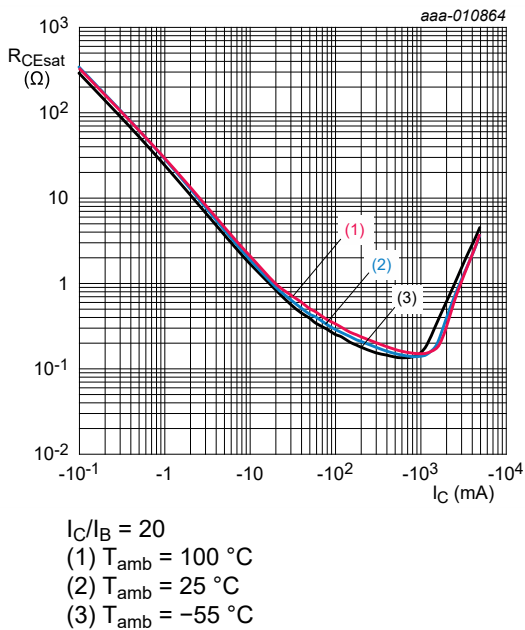


Fig. 10. Collector-emitter saturation resistance as a function of collector current; typical values

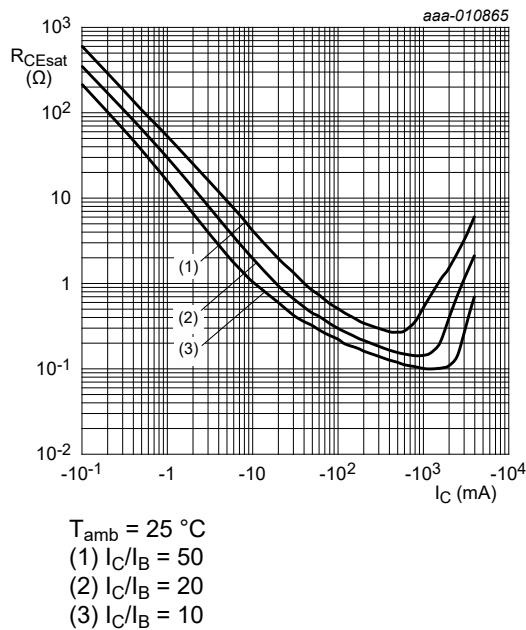


Fig. 11. Collector-emitter saturation resistance as a function of collector current; typical values



11. Test information

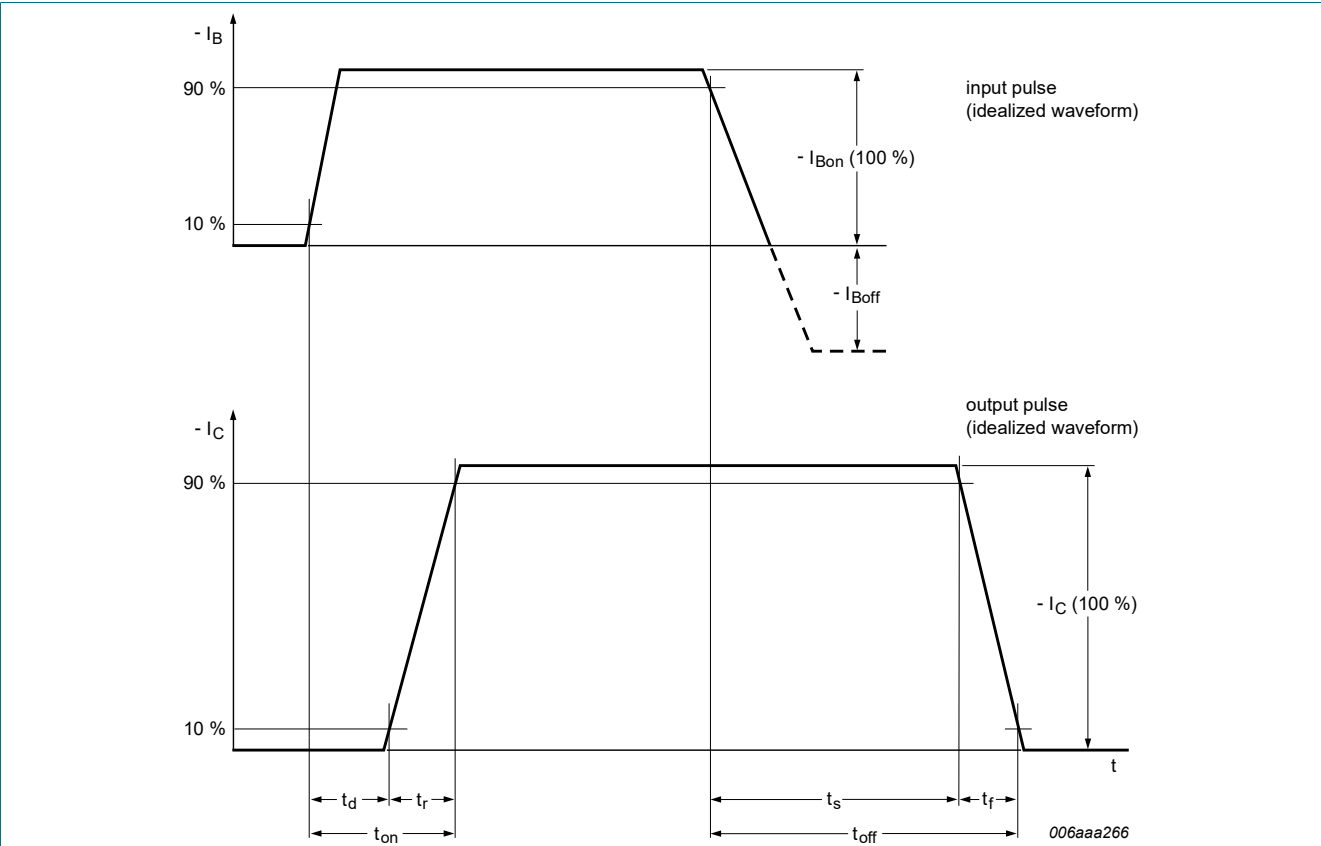


Fig. 12. Transistor switching time definition

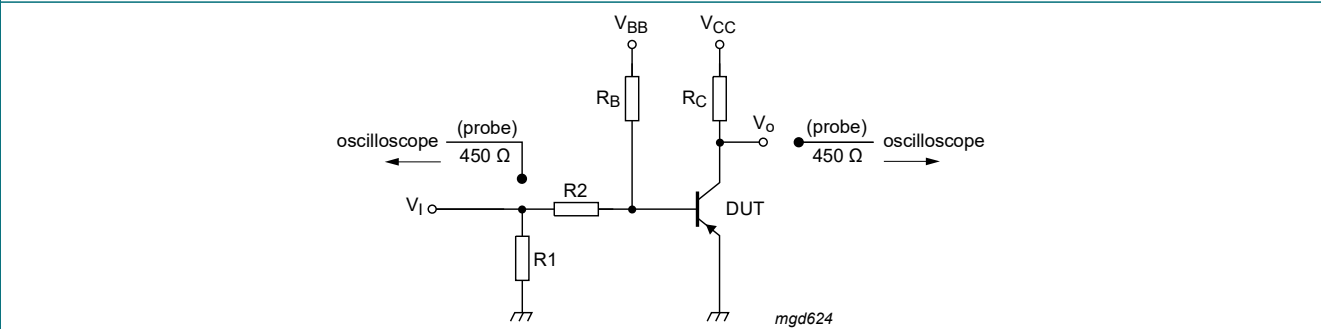


Fig. 13. Test circuit for switching times



12. Package outline

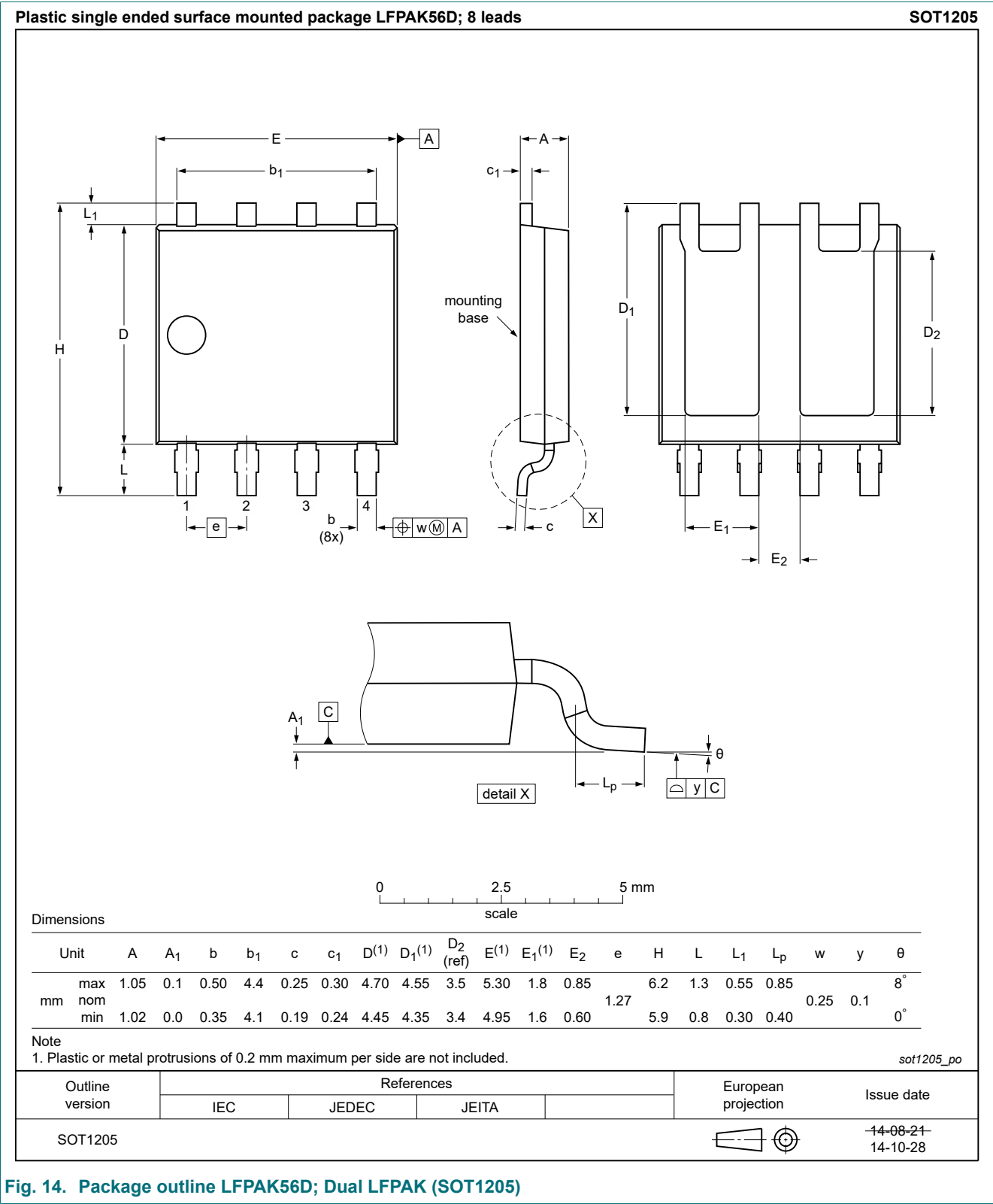
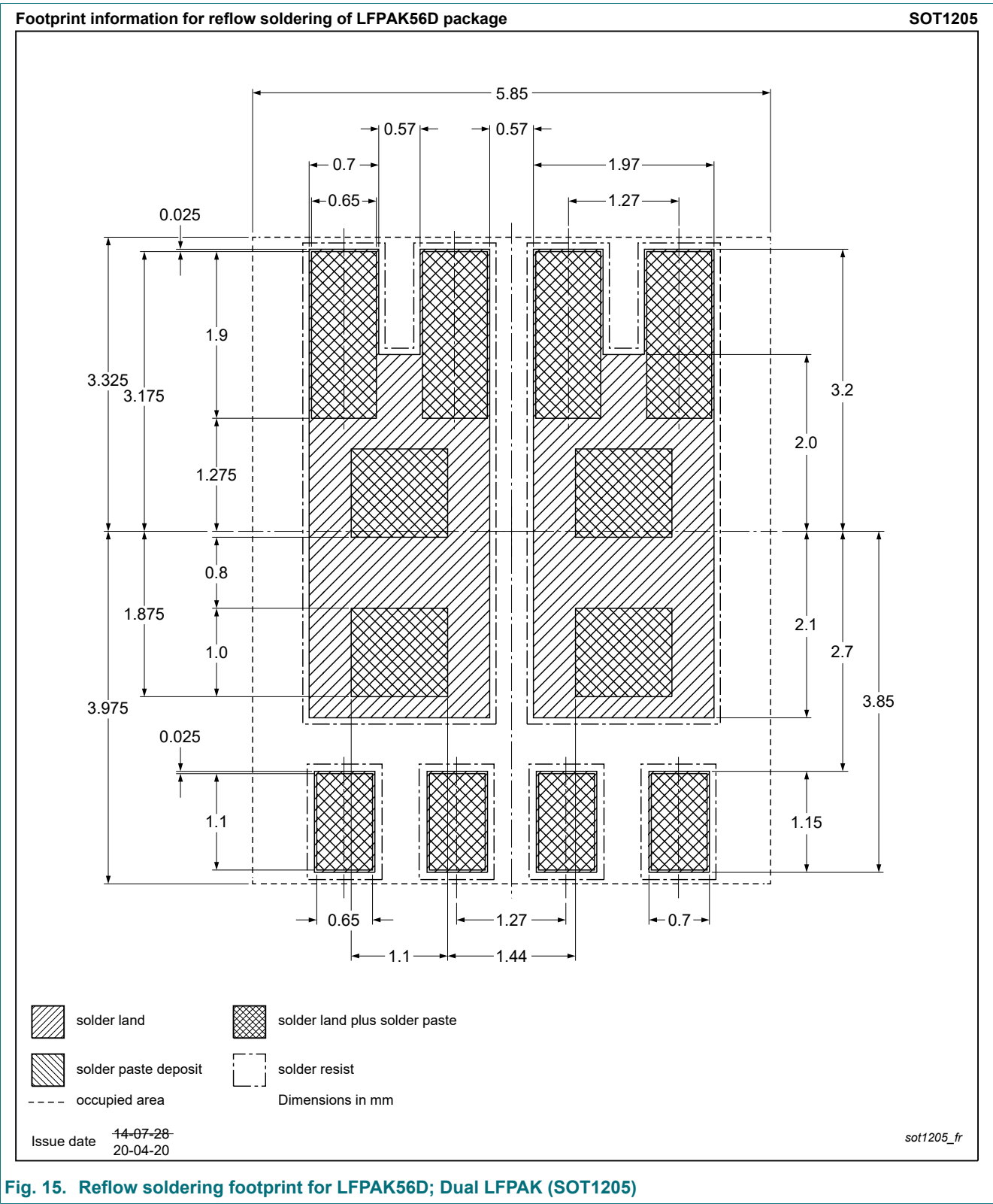


Fig. 14. Package outline LFPAK56D; Dual LPAK (SOT1205)



13. Soldering





14. Revision history

Table 8. Revision history

Data sheet ID	Release date	Data sheet status	Change notice	Supersedes
PHPT610030PK v.2	20250930	Product data sheet	-	PHPT610030PK v.1
Modifications:	<ul style="list-style-type: none"><li>Product(s) changed to non-automotive qualification. Please refer to nexperia.com for automotive (-Q) product alternative(s).</li></ul>			
PHPT610030PK v.1	20141022	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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