



# PDTA143ZT

50 V, 100 mA PNP resistor-equipped transistor;  
R1 = 4.7 kΩ, R2 = 47 kΩ

1 October 2025

Product data sheet

## 1. General description

PNP Resistor-Equipped Transistor (RET) in a small SOT23 Surface-Mounted Device (SMD) plastic package.

NPN complement: PDTC143ZT

## 2. Features and benefits

- 100 mA output current capability
- Built-in bias resistors
- Simplifies circuit design
- Reduces component count
- Reduces pick and place costs

## 3. Applications

- Digital application in automotive and industrial segments
- Cost-saving alternative for BC847/857 series in digital applications
- Controlling IC inputs
- Switching loads

## 4. Quick reference data

Table 1. Quick reference data

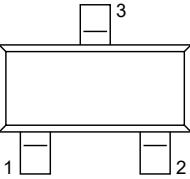
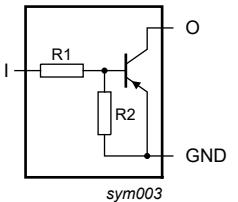
Symbol	Parameter	Conditions		Min	Typ	Max	Unit
V <sub>CEO</sub>	collector-emitter voltage	open base		-	-	-50	V
I <sub>O</sub>	output current			-	-	-100	mA
R1	bias resistor 1 (input)	T <sub>amb</sub> = 25 °C	[1]	3.3	4.7	6.1	kΩ
R2/R1	bias resistor ratio		[1]	8	10	12	

[1] See section "Test information" for resistor calculation and test conditions

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## 5. Pinning information

**Table 2. Pinning information**

Pin	Symbol	Description	Simplified outline	Graphic symbol
1	I	input (base)	 <b>SOT23</b>	
2	GND	ground (emitter)		
3	O	output (collector)		

## 6. Ordering information

**Table 3. Ordering information**

Type number	Package		
	Name	Description	Version
PDTA143ZT	SOT23	plastic, surface-mounted package; 3 terminals; 1.9 mm pitch; 2.9 mm x 1.3 mm x 1 mm body	<a href="#">SOT23</a>

## 7. Marking

**Table 4. Marking codes**

Type number	Marking code <sup>[1]</sup>
PDTA143ZT	%19

[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 <sub>CBO</sub>	collector-base voltage	open emitter		-	-50	V
V <sub>CEO</sub>	collector-emitter voltage	open base		-	-50	V
V <sub>EBO</sub>	emitter-base voltage	open collector		-	-5	V
V <sub>I</sub>	input voltage			-30	5	V
I <sub>O</sub>	output current			-	-100	mA
P <sub>tot</sub>	total power dissipation	T <sub>amb</sub> ≤ 25 °C	[1]	-	250	mW
T <sub>j</sub>	junction temperature			-	150	°C
T <sub>amb</sub>	ambient temperature			-65	150	°C
T <sub>stg</sub>	storage temperature			-65	150	°C

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

50 V, 100 mA PNP resistor-equipped transistor; R1 = 4.7 kΩ, R2 = 47 kΩ

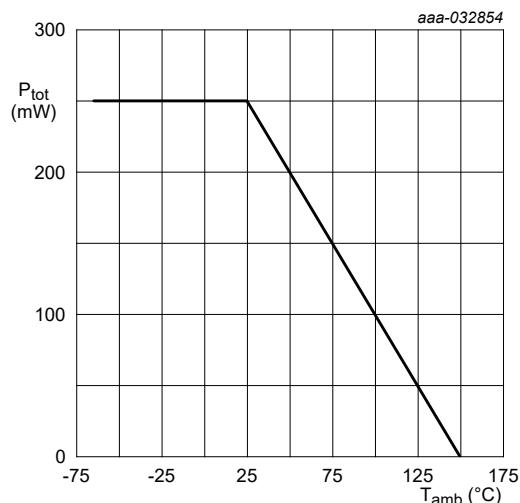


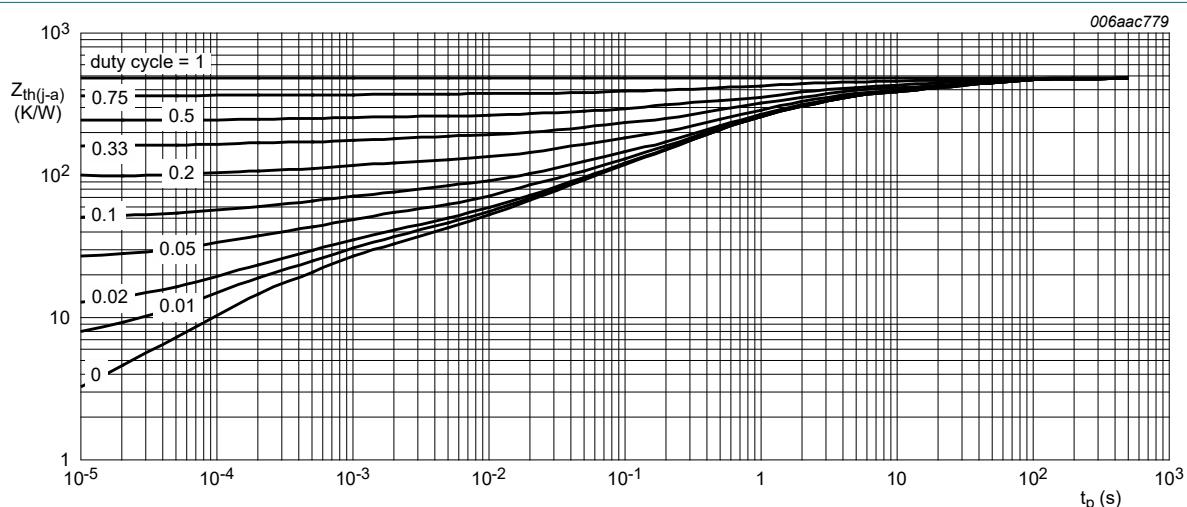
Fig. 1. Power derating curve

## 9. Thermal characteristics

Table 6. Thermal characteristics

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
$R_{th(j-a)}$	thermal resistance from junction to ambient		[1]	-	-	500	K/W

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



FR4 PCB, single-sided, 35 μm copper, tin-plated and standard footprint.

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

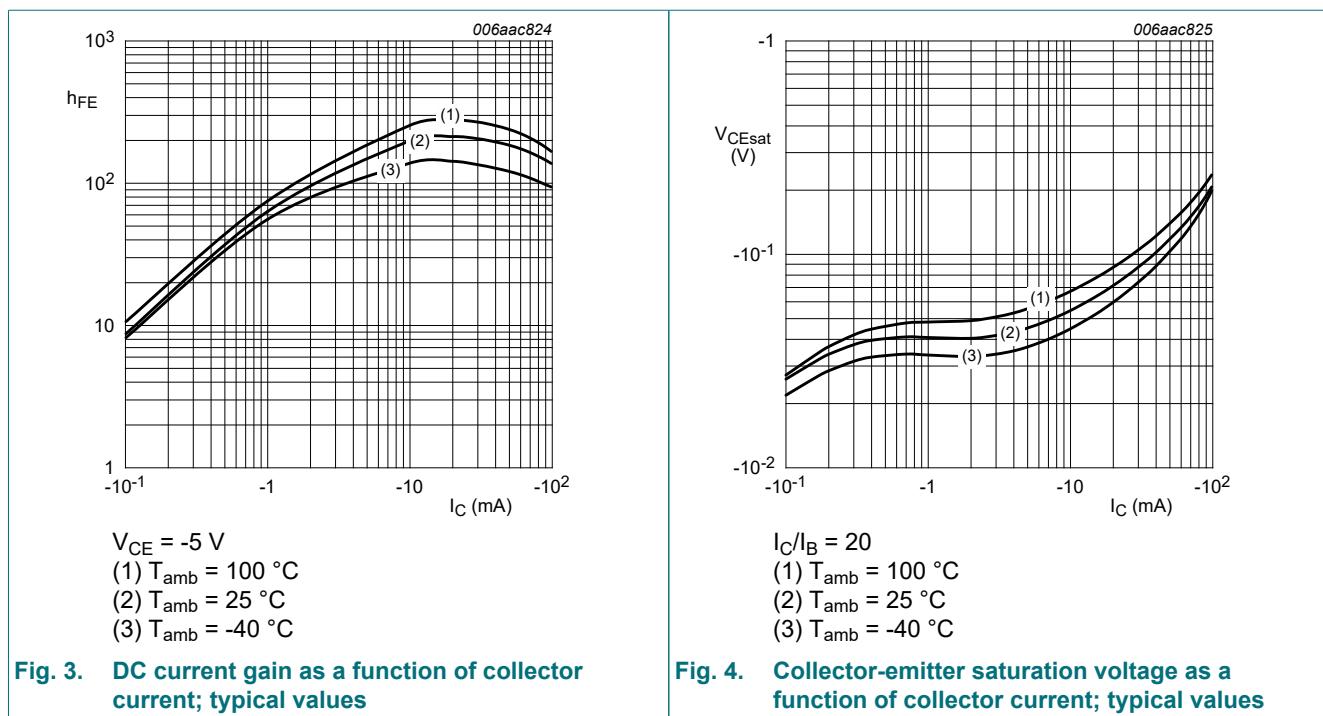
## 10. Characteristics

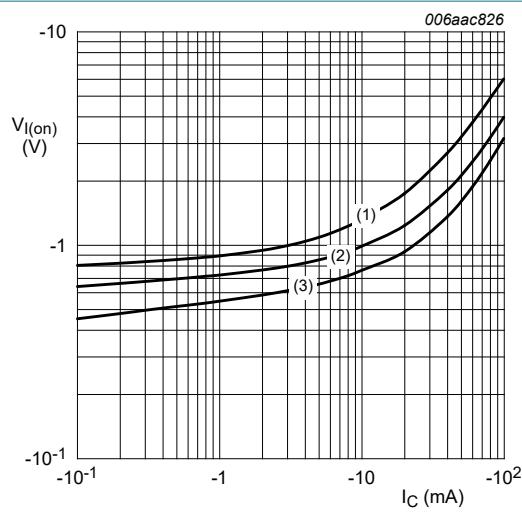
Table 7. Characteristics

Symbol	Parameter	Conditions	Min	Typ	Max	Unit	
$V_{(BR)CBO}$	collector-base breakdown voltage	$I_C = -100 \mu A; I_E = 0 A; T_{amb} = 25^\circ C$	-50	-	-	V	
$V_{(BR)CEO}$	collector-emitter breakdown voltage	$I_C = -2 mA; I_B = 0 A; T_{amb} = 25^\circ C$	-50	-	-	V	
$V_{(BR)EBO}$	emitter-base breakdown voltage	$I_C = 0 A; I_E = 100 \mu A; T_{amb} = 25^\circ C$	-5	-	-	V	
$I_{CBO}$	collector-base cut-off current	$V_{CB} = -50 V; I_E = 0 A; T_{amb} = 25^\circ C$	-	-	-100	nA	
$I_{CEO}$	collector-emitter cut-off current	$V_{CE} = -30 V; I_B = 0 A; T_{amb} = 25^\circ C$	-	-	-100	nA	
		$V_{CE} = -30 V; I_B = 0 A; T_j = 150^\circ C$	-	-	-5	μA	
$I_{EBO}$	emitter-base cut-off current	$V_{EB} = -5 V; I_C = 0 A; T_{amb} = 25^\circ C$	-	-	-170	μA	
$h_{FE}$	DC current gain	$V_{CE} = -5 V; I_C = -10 mA; T_{amb} = 25^\circ C$	100	-	-		
$V_{CEsat}$	collector-emitter saturation voltage	$I_C = -5 mA; I_B = -0.25 mA; T_{amb} = 25^\circ C$	-	-	-100	mV	
$V_{I(off)}$	off-state input voltage	$V_{CE} = -5 V; I_C = -100 \mu A; T_{amb} = 25^\circ C$	-	-0.6	-0.5	V	
$V_{I(on)}$	on-state input voltage	$V_{CE} = -0.3 V; I_C = -5 mA; T_{amb} = 25^\circ C$	-1.3	-0.9	-	V	
R1	bias resistor 1 (input)	$T_{amb} = 25^\circ C$	[1]	3.3	4.7	kΩ	
R2/R1	bias resistor ratio		[1]	8	10	12	
$C_c$	collector capacitance	$V_{CB} = -10 V; I_E = 0 A; I_e = 0 A; f = 1 MHz; T_{amb} = 25^\circ C$	-	-	3	pF	
$f_T$	transition frequency	$V_{CE} = -5 V; I_C = -10 mA; f = 100 MHz; T_{amb} = 25^\circ C$	[2]	-	180	-	MHz

[1] See section "Test information" for resistor calculation and test conditions

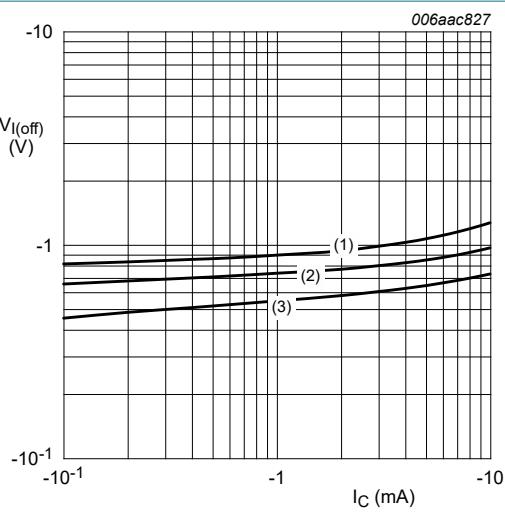
[2] Characteristics of built-in transistor





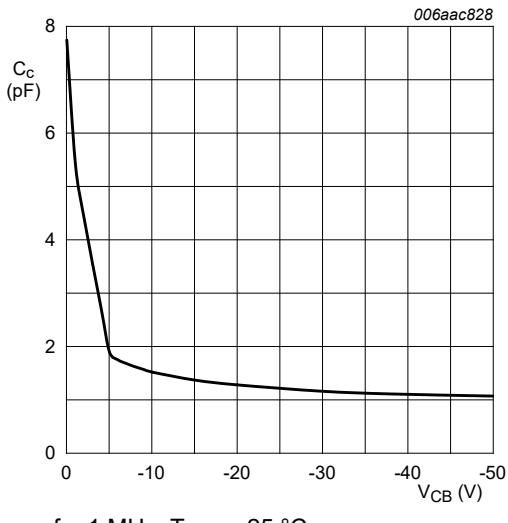
$V_{CE} = -0.3 \text{ V}$   
 (1)  $T_{amb} = -40 \text{ }^{\circ}\text{C}$   
 (2)  $T_{amb} = 25 \text{ }^{\circ}\text{C}$   
 (3)  $T_{amb} = 100 \text{ }^{\circ}\text{C}$

**Fig. 5. On-state input voltage as a function of collector current; typical values**



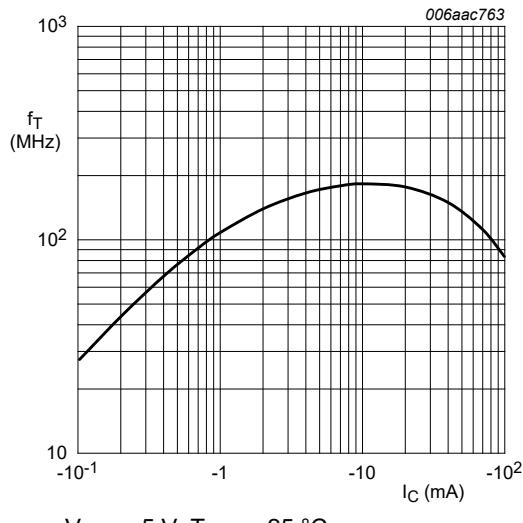
$V_{CE} = -5 \text{ V}$   
 (1)  $T_{amb} = -40 \text{ }^{\circ}\text{C}$   
 (2)  $T_{amb} = 25 \text{ }^{\circ}\text{C}$   
 (3)  $T_{amb} = 100 \text{ }^{\circ}\text{C}$

**Fig. 6. Off-state input voltage as a function of collector current; typical values**



$f = 1 \text{ MHz}; T_{amb} = 25 \text{ }^{\circ}\text{C}$

**Fig. 7. Collector capacitance as a function of collector-base voltage; typical values**



$V_{CE} = -5 \text{ V}; T_{amb} = 25 \text{ }^{\circ}\text{C}$

**Fig. 8. Transition frequency as a function of collector current; typical values of built-in transistor**

## 11. Test information

## Resistor calculation

- Calculation of bias resistor 1 (R1)

$$R_I = \frac{V(I_2) - V(I_1)}{I_2 - I_1}$$

- Calculation of bias resistor ratio ( $R_2/R_1$ )

$$\frac{R2}{R1} = \frac{V(I4) - V(I3)}{R1 \cdot (I4 - I3)} - 1$$

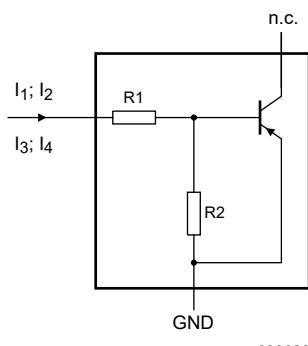


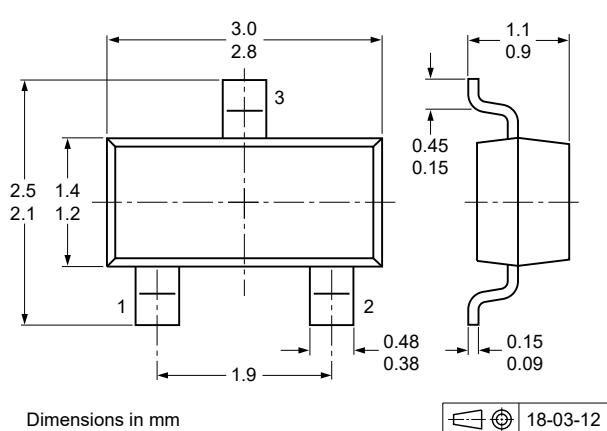
Fig. 9. PNP transistor: Resistor test circuit

## Resistor test conditions

**Table 8. Resistor test conditions**

Type number	R1 (kΩ)	R2 (kΩ)	Test conditions			
			I <sub>1</sub>	I <sub>2</sub>	I <sub>3</sub>	I <sub>4</sub>
PDTA143ZT	4.7	47	-90 µA	-140 µA	55 µA	105 µA

## 12. Package outline



**Fig. 10. Package outline SOT23**

## 13. Soldering

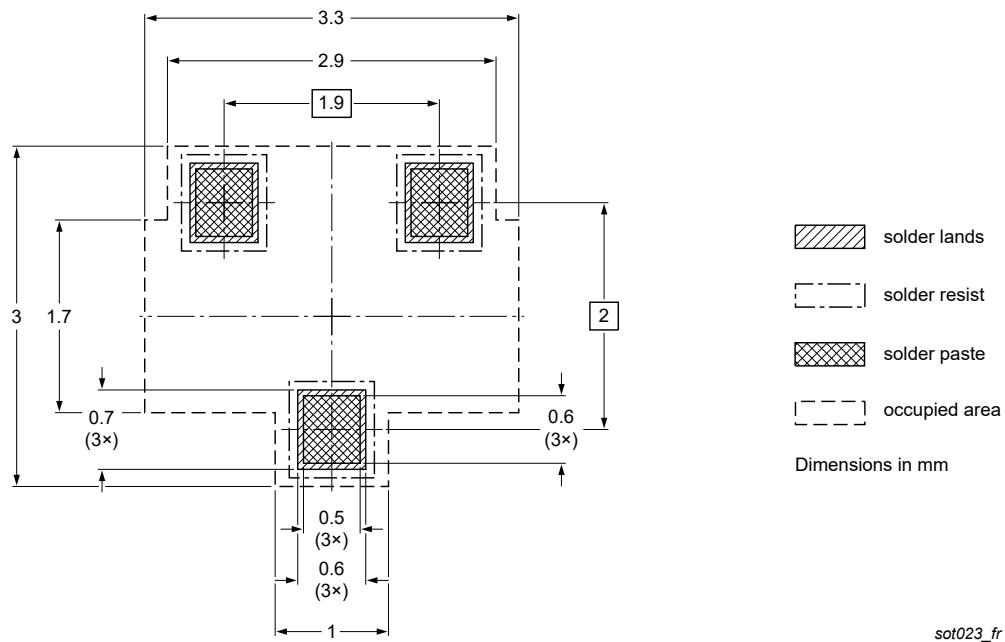


Fig. 11. Reflow soldering footprint for SOT23

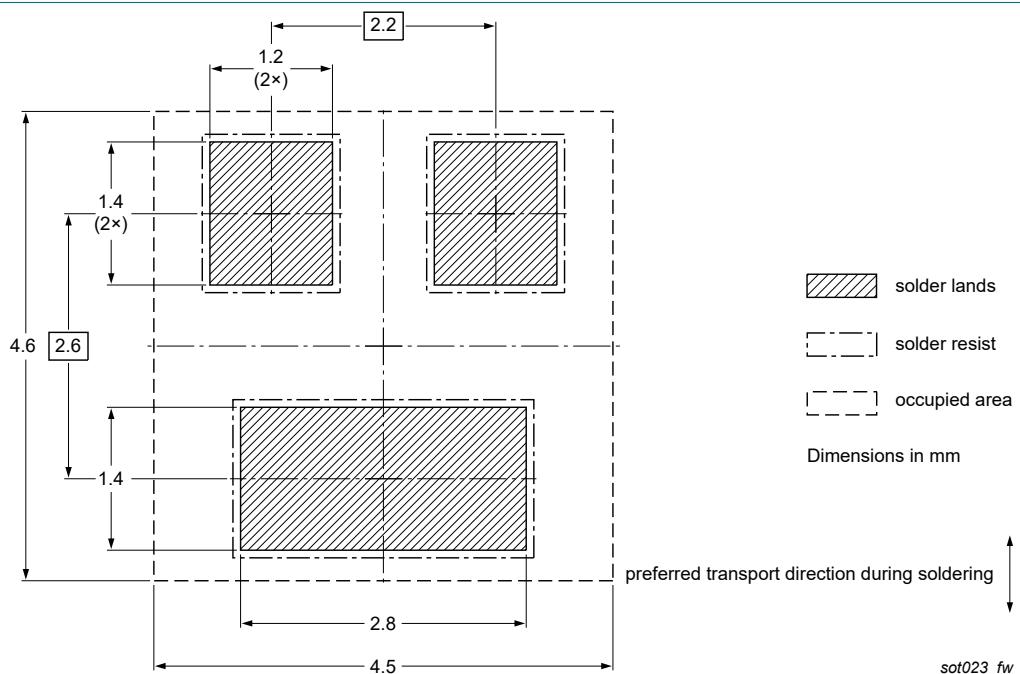


Fig. 12. Wave soldering footprint for SOT23

## 14. Revision history

**Table 9. Revision history**

Data sheet ID	Release date	Data sheet status	Change notice	Supersedes
PDTA143ZT v.10	20251001	Product data sheet	-	PDTA143ZT v.9
Modification:	<ul style="list-style-type: none"><li>Product(s) changed to non-automotive qualification. Please refer to <a href="http://nexperia.com">nexperia.com</a> for automotive (-Q) product alternative(s).</li></ul>			
PDTA143ZT v.9	20240307	Product data sheet	-	PDTA143Z_SER v.8
PDTA143ZT v.8	20240123	Product data sheet	-	PDTA143Z_SER v.7
PDTA143Z_SER v.7	20111205	Product data sheet	-	PDTA143Z_SERIES v.6
PDTA143Z_SERIES v.6	20040805	Product data sheet	-	PDTA143Z_SERIES v.5
PDTA143Z_SERIES v.5	20030908	Product specification	-	PDTA143Z_SERIES v.4
PDTA143Z_SERIES v.4	20030410	Product specification	-	-

## 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.

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Date of release: 1 October 2025

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