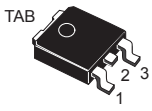
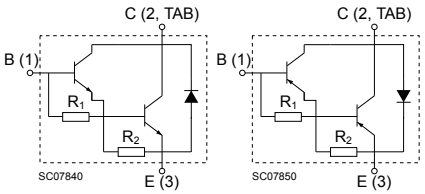
MJD112T4, MJD117T4

Datasheet

Complementary power Darlington transistors



DPAK



R_1 typ. = 15 kΩ

R_2 typ. = 100 Ω

STPOWER

Features

- Good h_{FE} linearity
- High f_T frequency
- Monolithic Darlington configuration with integrated antiparallel collector-emitter diode

Application

- Linear and switching industrial equipment

Description

These devices are manufactured in planar technology with “base island” layout and monolithic Darlington configuration.

Product status links
MJD112T4
MJD117T4

Product summary	
Order code	**MJD112T4**
Marking	MJD112
Polarity	NPN
Package	DPAK
Packing	Tape and reel
Order code	**MJD117T4**
Marking	MJD117
Polarity	PNP
Package	DPAK
Packing	Tape and reel

1 Electrical ratings

Table 1. Absolute maximum ratings

Symbol	Parameter	Value	Unit
V_{CEO}	Collector-emitter voltage (I_B = 0 A)	100	V
V_{CBO}	Collector-base voltage (I_E = 0 A)		V
V_{EBO}	Emitter-base voltage (I_C = 0 A)	5	V
I_C	Collector current	2	A
I_{CM}	Collector peak current	4	A
I_B	Base current	50	mA
P_{TOT}	Total power dissipation at T_C = 25 °C	20	W
T_{stg}	Storage temperature range	-65 to 150	°C
T_J	Operating junction temperature range		

Note: For PNP types voltage and current values are negative.

Table 2. Thermal data

Symbol	Parameter	Value	Unit
R_{thJC}	Thermal resistance, junction-to-case	6.25	°C/W

2 Electrical characteristics

T_C = 25°C unless otherwise specified.

Table 3. Electrical characteristics

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
I_{CEV}	Collector cut-off current	V_{CE} = 80 V, V_{BE} = -1.5 V		-	10	µA
		V_{CE} = 80 V, V_{BE} = -1.5 V, T_C = 125 °C(1)		-	500	
I_{CBO}	Collector cut-off current	V_{CB} = 80 V, I_E = 0 A		-	10	µA
		V_{CB} = 100 V, I_E = 0 A		-	20	
I_{CEO}	Collector cut-off current	V_{CE} = 50 V, I_B = 0 A		-	20	µA
I_{EBO}	Emitter cut-off current	V_{EB} = 5 V, I_C = 0 A		-	2	mA
$V_{CEO(sus)}$(2)	Collector-emitter sustaining voltage	I_C = 30 mA, I_B = 0 A	100	-		V
$V_{CE(sat)}$ (2)	Collector-emitter saturation voltage	I_C = 2 A, I_B = 8 mA		-	2	V
		I_C = 4 A, I_B = 40 mA		-	3	
$V_{BE(sat)}$ (2)	Base-emitter saturation voltage	I_C = 4 A, I_B = 40 mA		-	4	V
$V_{BE(on)}$	Base-emitter on voltage	I_C = 0.5 A, V_{CE} = 3 V		-	2.8	V
h_{FE} (2)	DC current gain	I_C = 0.5 A, V_{CE} = 3 V	500	-		
		I_C = 2 A, V_{CE} = 3 V	1000	-	12000	
		I_C = 4 A, V_{CE} = 3 V	200	-		
f_T	Transition frequency	I_C = 0.75 A, V_{CE} = 10 V, f = 1 MHz	25	-		MHz
C_{CBO}	Collector base capacitance	V_{CB} = 10 V, I_E = 0 A, f = 0.1 MHz for MJD112T4		-	100	pF
		V_{CB} = 10 V, I_E = 0 A, f = 0.1 MHz for MJD117T4		-	200	

1. *Specified by design, not tested in production.*
2. *Pulse test: pulse duration ≤ 300 µs, duty cycle ≤ 2 %.*

Note: For PNP types voltage and current values are negative.

2.1 Electrical characteristics (curves)

Figure 1. DC current gain (V_{CE} = 3 V NPN)

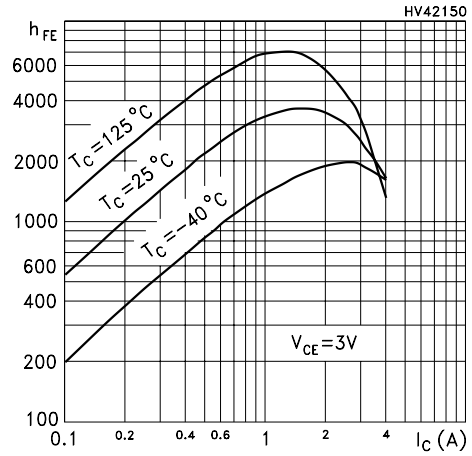


Figure 2. DC current gain (V_{CE} = - 3 V PNP)

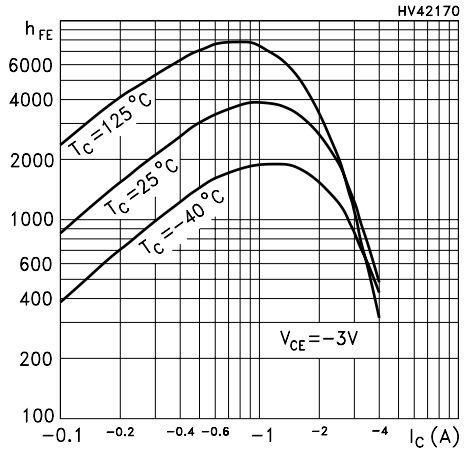


Figure 3. DC current gain (V_{CE} = 5 V NPN)

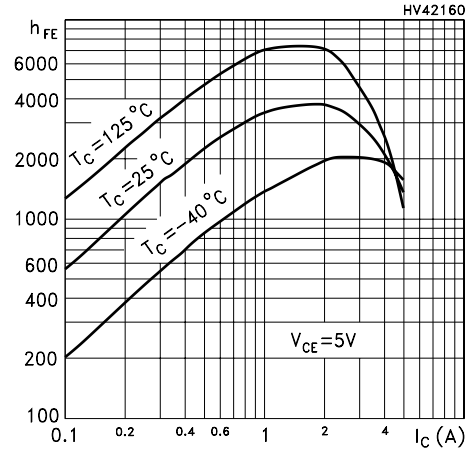


Figure 4. DC current gain (V_{CE} = -5 V PNP)

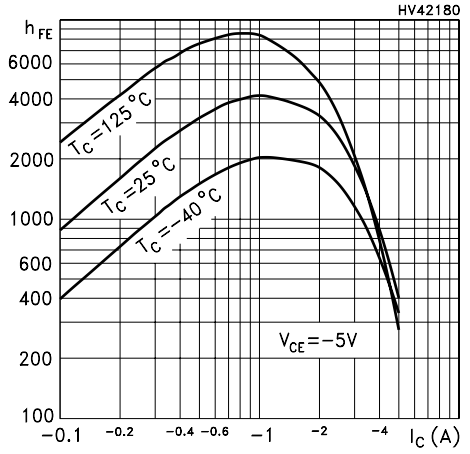


Figure 5. Collector-emitter saturation voltage (NPN)

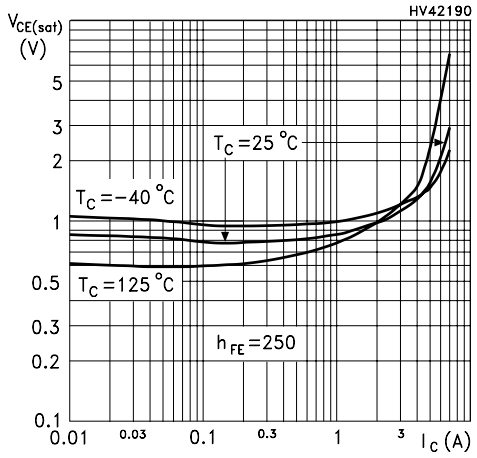


Figure 6. Collector-emitter saturation voltage (PNP)

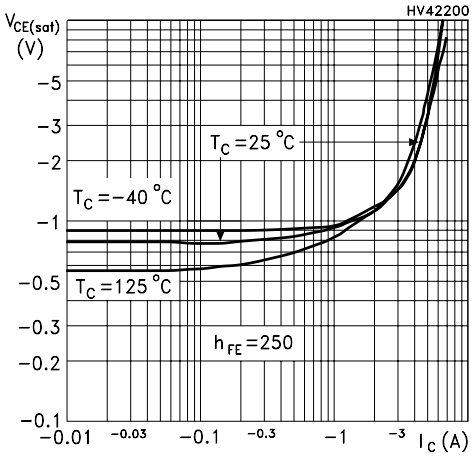


Figure 7. Base-emitter saturation voltage (NPN)

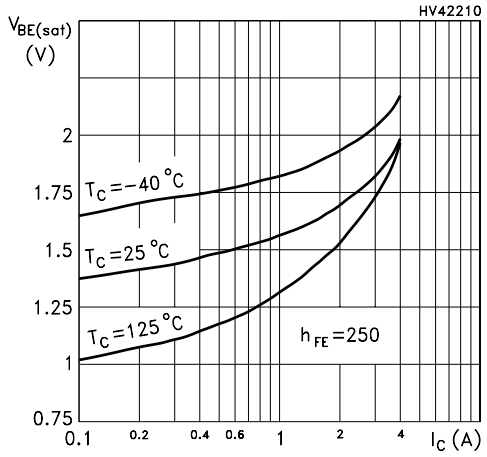


Figure 8. Base-emitter saturation voltage (PNP)

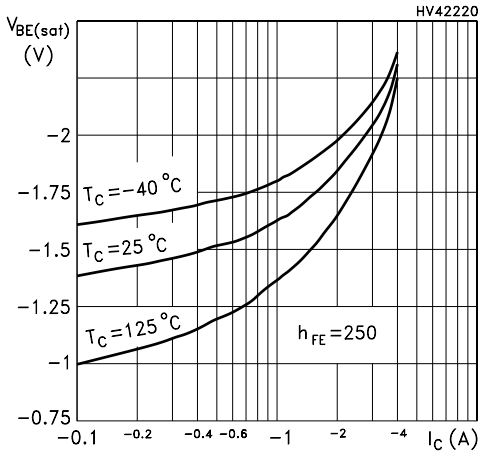


Figure 9. Base-emitter on voltage (NPN)

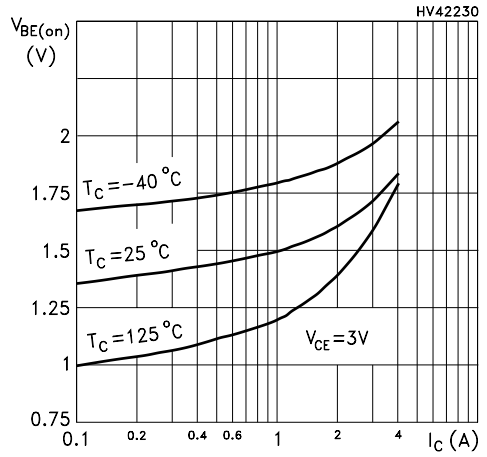


Figure 10. Base-emitter on voltage (PNP)

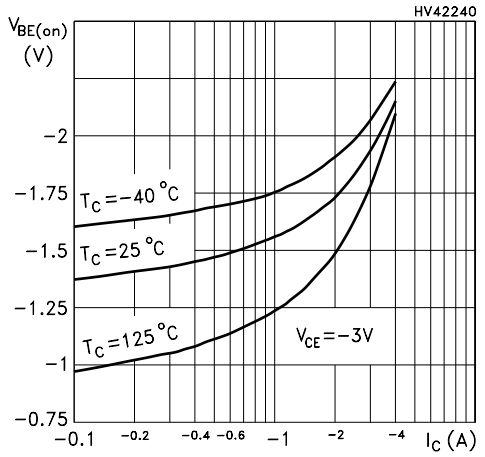


Figure 11. Resistive load switching time (NPN, on)

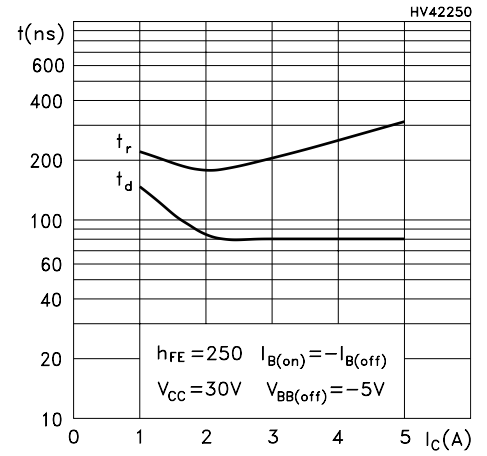


Figure 12. Resistive load switching time (PNP, on)

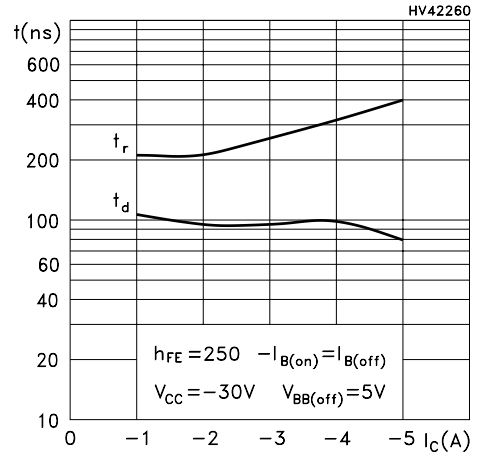


Figure 13. Resistive load switching time (NPN, off)

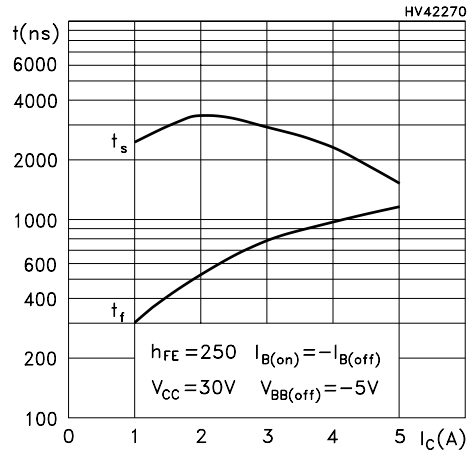
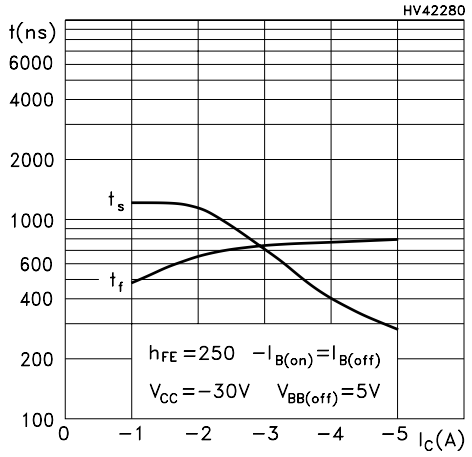


Figure 14. Resistive load switching time (PNP, off)

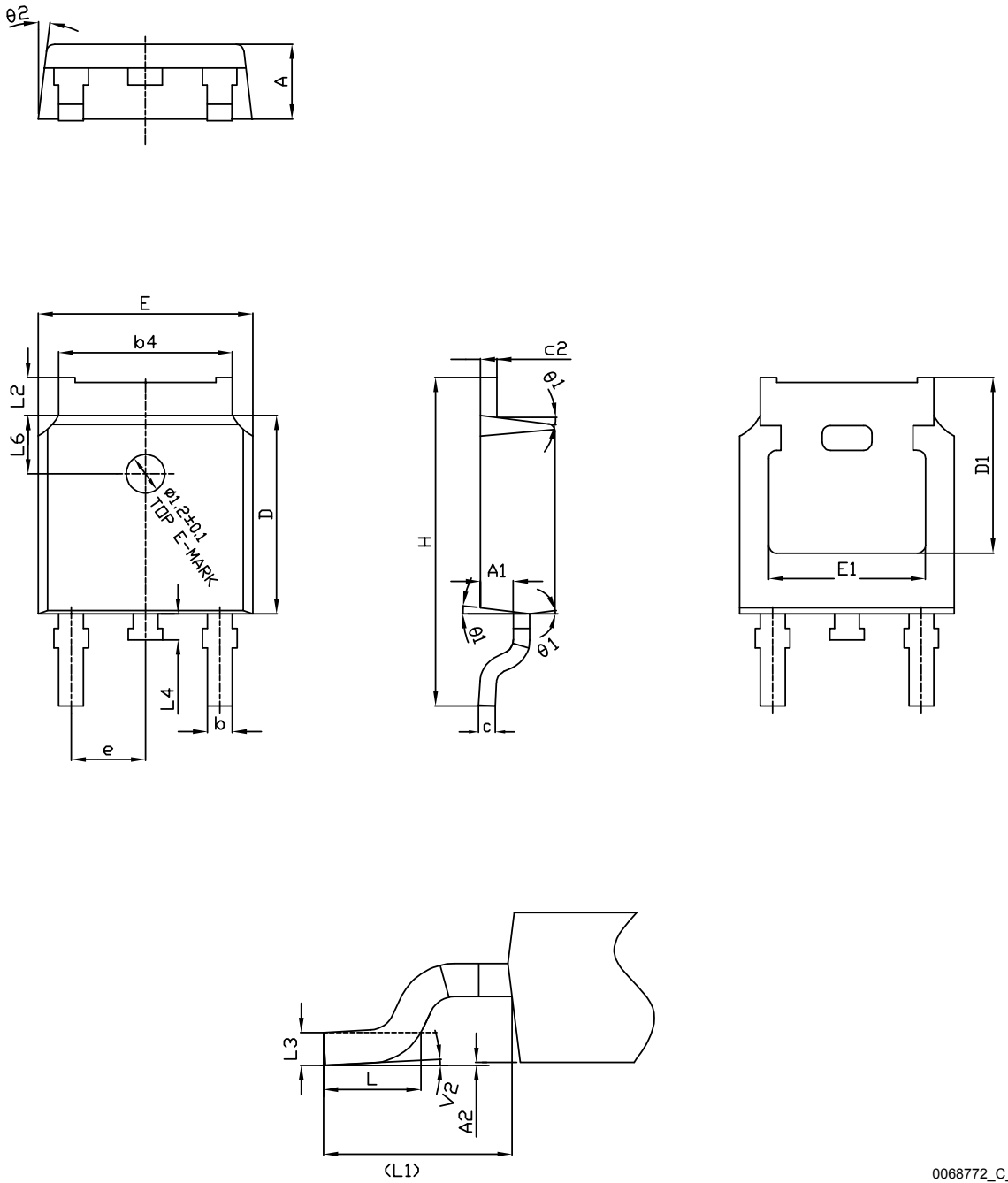


3 Package information

To meet environmental requirements, ST offers these devices in different grades of ECOPACK packages, depending on their level of environmental compliance. ECOPACK specifications, grade definitions, and product status are available at: www.st.com. ECOPACK is an ST trademark.

3.1 DPAK (TO-252) type C package information

Figure 15. DPAK (TO-252) type C package outline

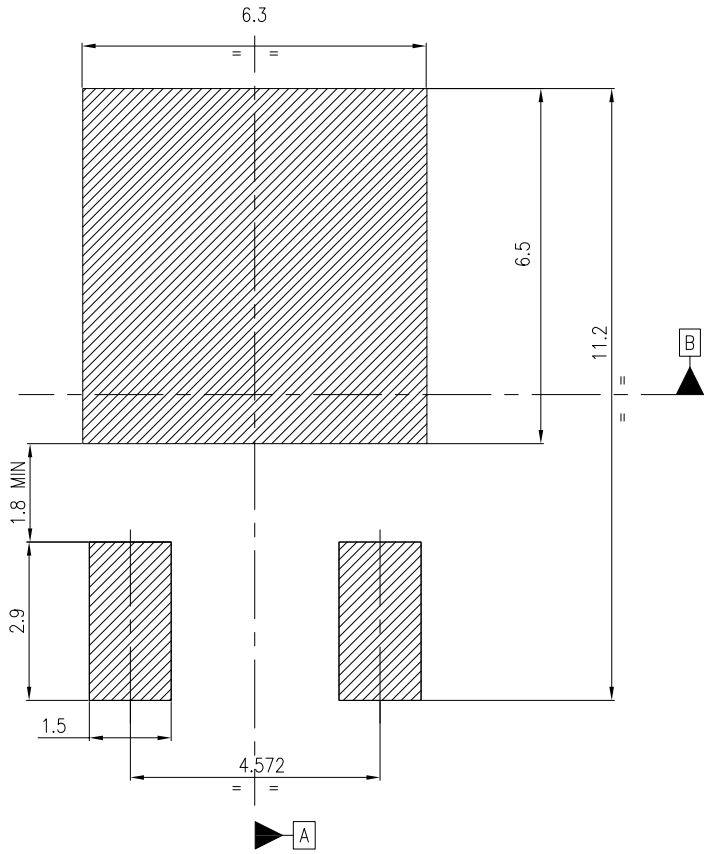


0068772_C_36

Table 4. **DPAK (TO-252) type C mechanical data**

Dim.	mm		
	Min.	Typ.	Max.
A	2.20	2.30	2.38
A1	0.90	1.01	1.10
A2	0.00		0.10
b	0.72		0.85
b4	5.13	5.33	5.46
c	0.47		0.60
c2	0.47		0.60
D	6.00	6.10	6.20
D1	5.15	5.40	5.65
E	6.50	6.60	6.70
E1	4.70	4.85	5.00
e	2.186	2.286	2.386
H	9.80	10.10	10.40
L	1.40	1.50	1.70
L1		2.90 REF	
L2	0.90		1.25
L3		0.51 BSC	
L4	0.60	0.80	1.00
L6		1.80 BSC	
θ1	5°	7°	9°
θ2	5°	7°	9°
V2	0°		8°

Figure 16. DPAK (TO-252) recommended footprint (dimensions are in mm)



Notes:

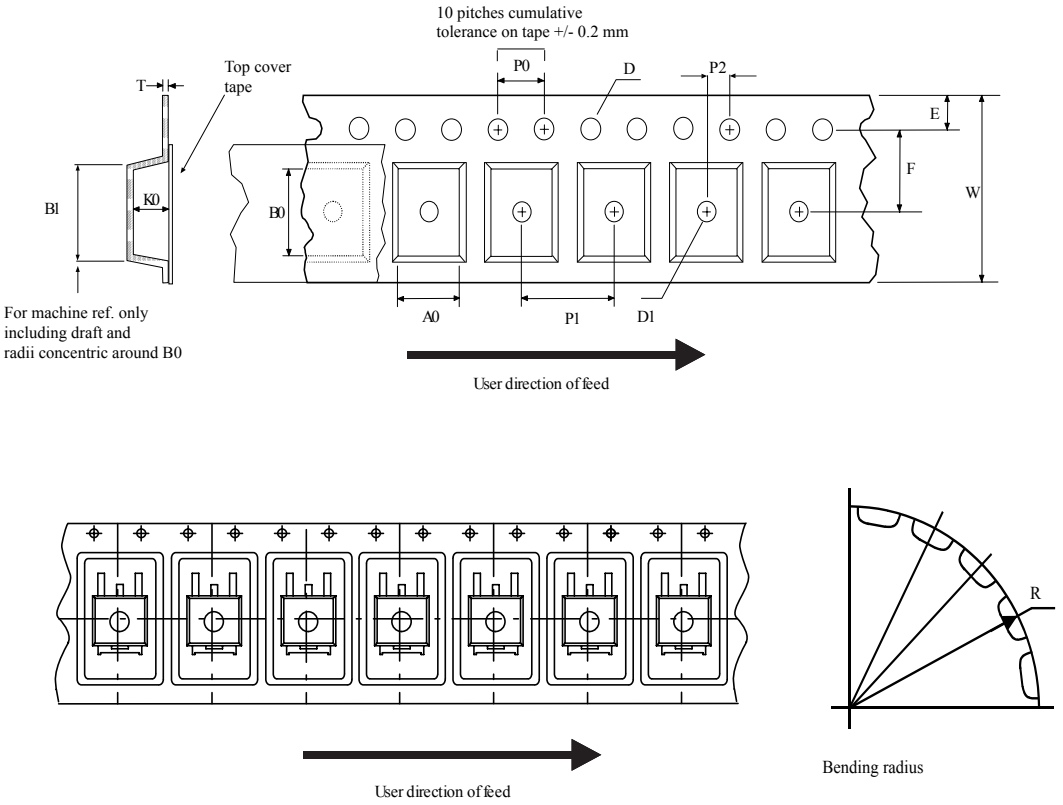
1) This footprint is able to ensure insulation up to 630 Vrms (according to CEI IEC 664−1)

2) The device must be positioned within ⌖ 0.05 A B

FP_0068772_36

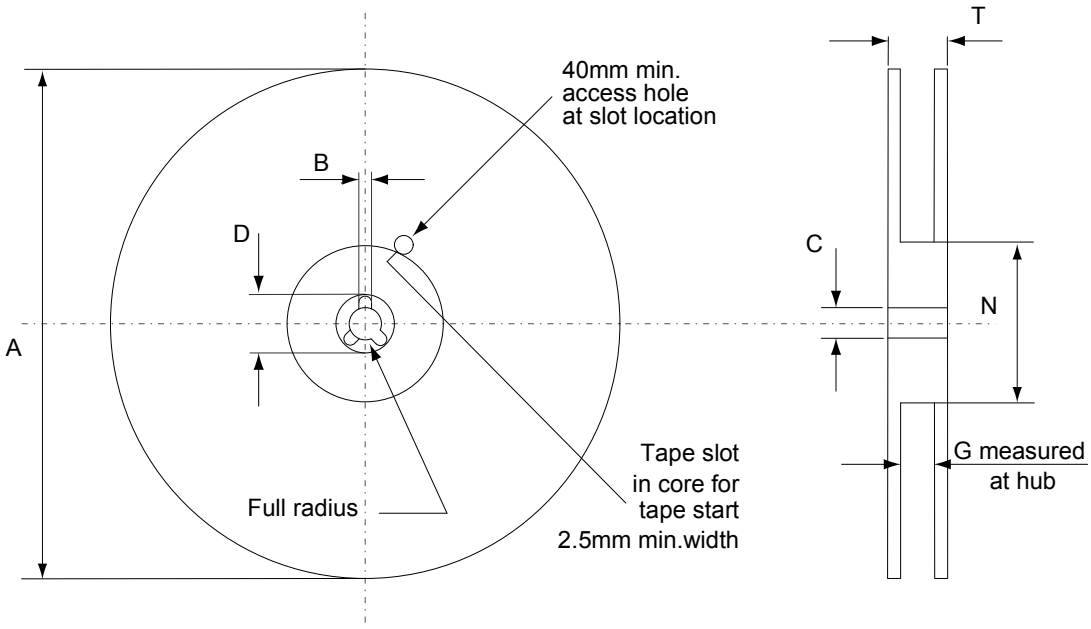
3.2 DPAK (TO-252) packing information

Figure 17. **DPAK (TO-252) tape outline**



AM08852v1

Figure 18. **DPAK (TO-252) reel outline**



AM06038v1

Table 5. **DPAK (TO-252) tape and reel mechanical data**

Tape			Reel		
Dim.	mm		Dim.	mm	
	Min.	Max.		Min.	Max.
A0	6.8	7	A		330
B0	10.4	10.6	B	1.5	
B1		12.1	C	12.8	13.2
D	1.5	1.6	D	20.2	
D1	1.5		G	16.4	18.4
E	1.65	1.85	N	50	
F	7.4	7.6	T		22.4
K0	2.55	2.75			
P0	3.9	4.1	Base qty.		2500
P1	7.9	8.1	Bulk qty.		2500
P2	1.9	2.1			
R	40				
T	0.25	0.35			
W	15.7	16.3			

Revision history

Table 6. **Document revision history**

Date	Revision	Changes
03-Apr-2025	1	First release.
28-Apr-2025	2	Updated *Table 3. Electrical characteristics*.
16-Jun-2025	3	Updated Table 3. Electrical characteristics. Updated Section 3.1: DPAK (TO-252) type C package information.

Contents

1 **Electrical ratings** 2
2 **Electrical characteristics** 3
2.1 Electrical characteristics (curves) 4
3 **Package information** 7
3.1 DPAK (TO-252) type C package information 7
3.2 DPAK (TO-252) packing information 10
Revision history 12

IMPORTANT NOTICE – READ CAREFULLY

STMicroelectronics NV and its subsidiaries (“ST”) reserve the right to make changes, corrections, enhancements, modifications, and improvements to ST products and/or to this document at any time without notice. Purchasers should obtain the latest relevant information on ST products before placing orders. ST products are sold pursuant to ST’s terms and conditions of sale in place at the time of order acknowledgment.

Purchasers are solely responsible for the choice, selection, and use of ST products and ST assumes no liability for application assistance or the design of purchasers’ products.

No license, express or implied, to any intellectual property right is granted by ST herein.

Resale of ST products with provisions different from the information set forth herein shall void any warranty granted by ST for such product.

ST and the ST logo are trademarks of ST. For additional information about ST trademarks, refer to www.st.com/trademarks. All other product or service names are the property of their respective owners.

Information in this document supersedes and replaces information previously supplied in any prior versions of this document.

© 2025 STMicroelectronics – All rights reserved