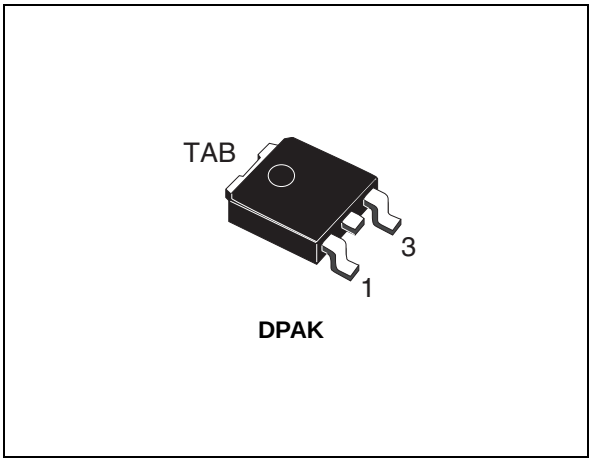
MJD32CT4-A

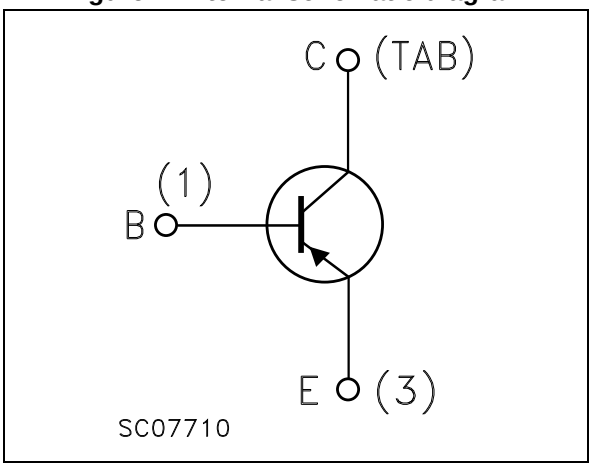
Automotive-grade low voltage PNP power transistor

Datasheet - production data



DPAK

Figure 1. Internal schematic diagram



Features

- AEC-Q101 qualified
- Surface-mounting TO-252 power package in tape and reel
- Complementary to the NPN type MJD31CT4-A

Applications

- General purpose linear and switching equipment

Description

The device is manufactured in planar technology with “base island” layout. The resulting transistor shows exceptional high gain performance coupled with very low saturation voltage.

Table 1. Device summary

Order code	Marking	Package	Packing
MJD32CT4-A	MJD32C	DPAK	Tape and reel

Contents

1 Electrical ratings

Table 2. Absolute maximum ratings

Symbol	Parameter	Value	Unit
V_{CBO}	Collector-base voltage (I_E = 0)	-100	V
V_{CEO}	Collector-emitter voltage (I_B = 0)	-100	V
V_{EBO}	Emitter-base voltage (I_C = 0)	-5	V
I_C	Collector current	-3	A
I_{CM}	Collector peak current	-5	A
I_B	Base current	-1	A
P_{TOT}	Total dissipation at T_c = 25 °C	15	W
T_{stg}	Storage temperature range	-65 to 150	°C
T_j	Operating junction temperature range		

Table 3. Thermal data

Symbol	Parameter	Value	Unit
$R_{thj\text{-}case}$	Thermal resistance junction-case	8.3	°C/W
$R_{thj\text{-}pcb}$ (1)	Thermal resistance junction-pcb	50	°C/W

1. When mounted on a 1-inch² FR-4 board, 2oz Cu

2 Electrical characteristics

T_{case}=25 °C unless otherwise specified.

Table 4. On/off states

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
I_{CES}	Collector cut-off current (V_{BE} = 0)	V_{CE} = - 100 V		-	-20	µA
I_{CEO}	Collector cut-off current (I_B = 0)	V_{CB} = - 60 V		-	-50	µA
I_{EBO}	Emitter cut-off current (I_C = 0)	V_{EB} = - 5 V		-	-0.1	mA
$V_{CEO(sus)}$	Collector-emitter sustaining voltage (I_B = 0)	I_C = - 30 mA	-100	-		V
$V_{CE(sat)}$ (1)	Collector-emitter saturation voltage	I_C = - 3 A, I_B = - 375 mA		-	-1.2	V
$V_{BE(on)}$	Base-emitter on voltage	I_C = - 3 A, V_{CE} = - 4 V		-	-1.8	V
h_{FE}	DC current gain	I_C = - 1 A, V_{CE} = - 4 V	25	-		
		I_C = - 3 A, V_{CE} = - 4 V	10	-	50	

1. Pulse test: pulse duration ≤ 300 µs, duty cycle ≤ 2%

2.1 Electrical characteristics (curves)

Figure 2. Safe operating area

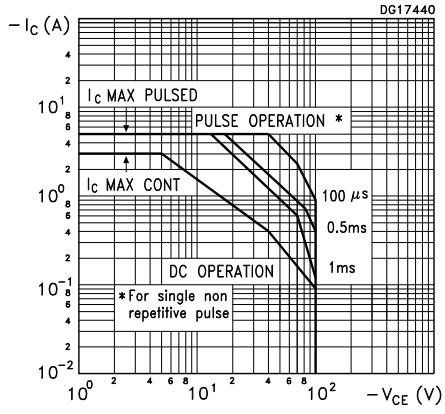


Figure 3. Derating curve

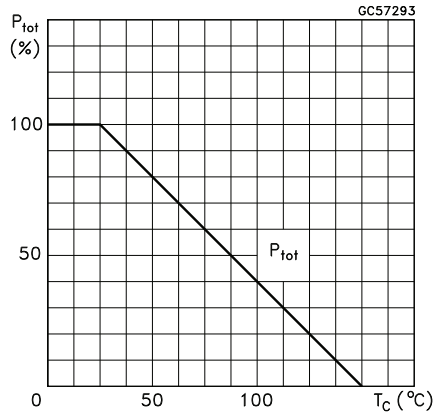


Figure 4. DC current gain (V_{CE} = - 2 V)

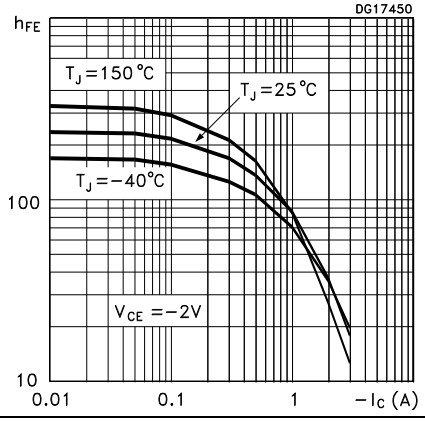


Figure 5. DC current gain (V_{CE} = - 4 V)

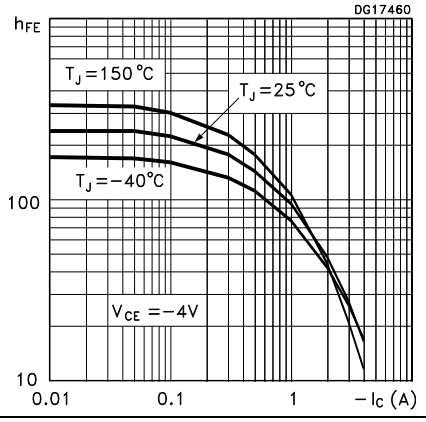


Figure 6. Collector-emitter saturation voltage

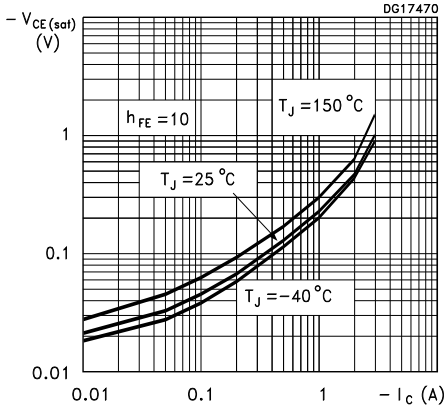


Figure 7. Base-emitter saturation voltage

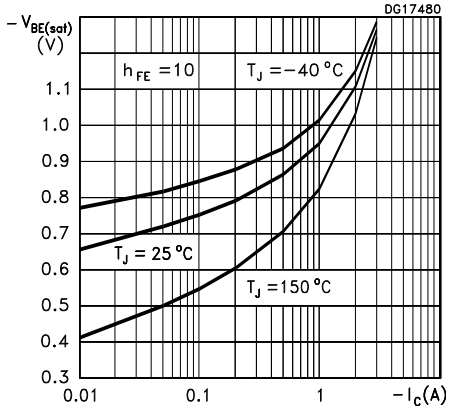


Figure 8. Base-emitter on voltage

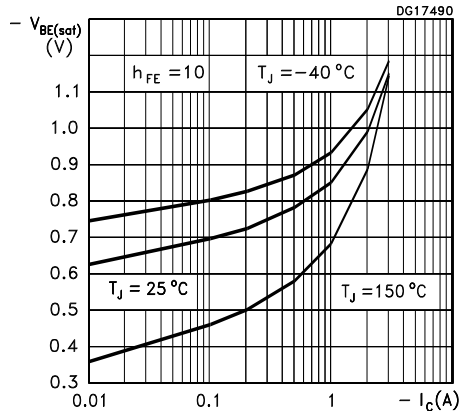


Figure 9. Resistive load switching time (on)

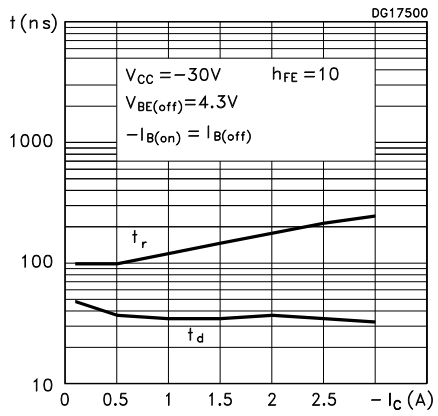
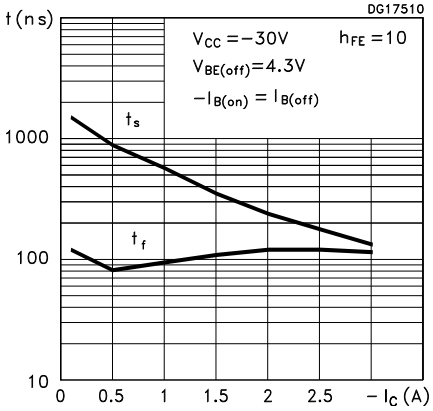
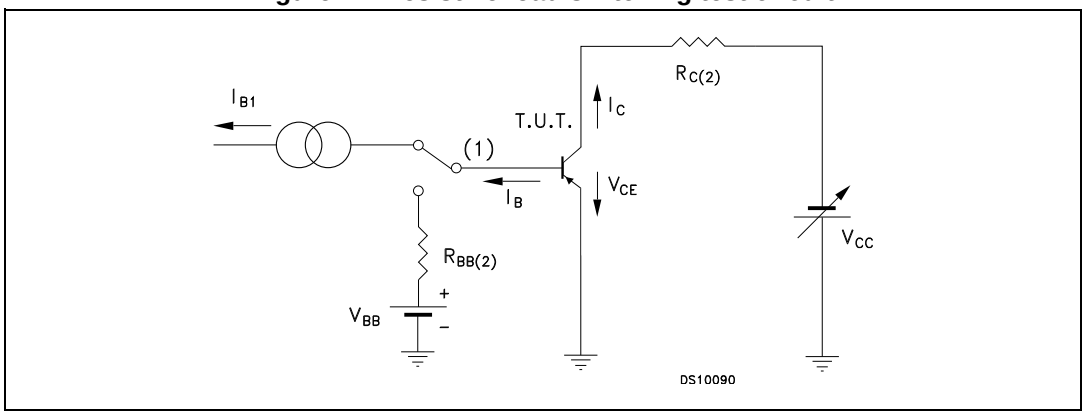


Figure 10. Resistive load switching time (off)



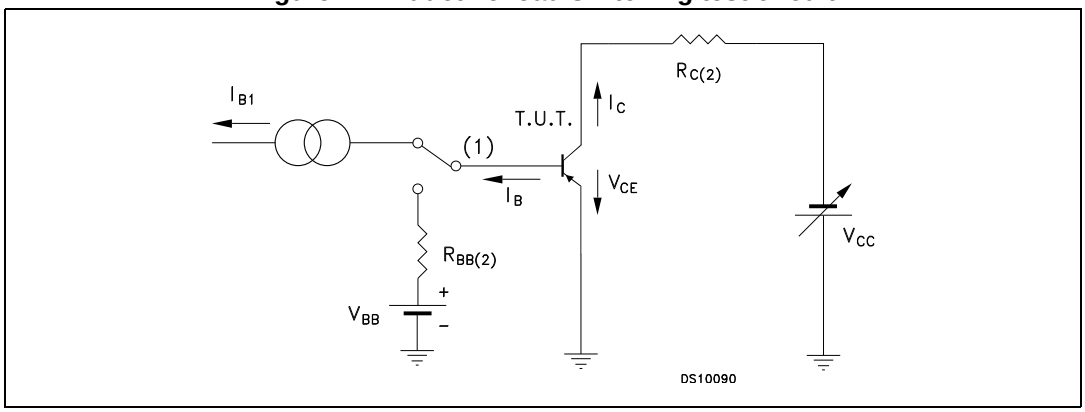
3 Test circuits

Figure 11. Resistive load switching test circuit



1. Fast electronic switch
2. Non-inductive resistor

Figure 12. Inductive load switching test circuit



1. Fast electronic switch
2. Non-inductive resistor
3. Fast recovery rectifier

4 Package information

In order 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.

4.1 DPAK (TO-252) type A package information

Figure 13. DPAK (TO-252) type A package outline

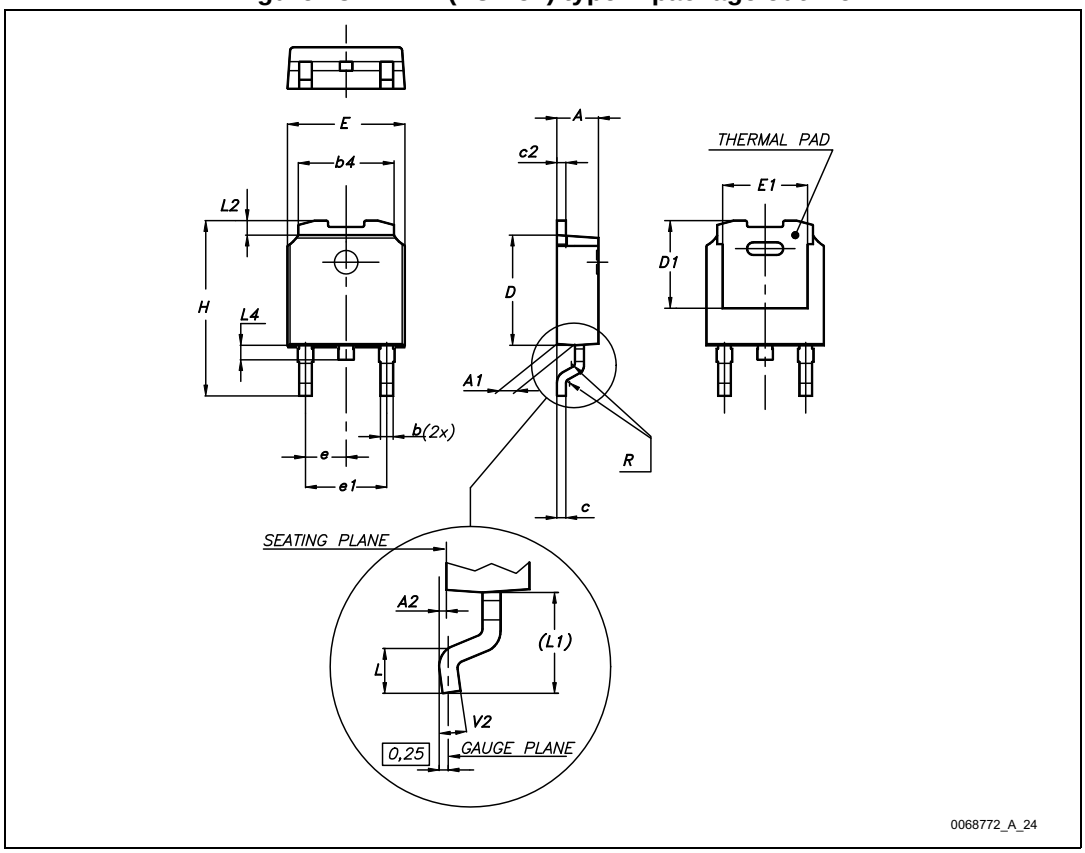
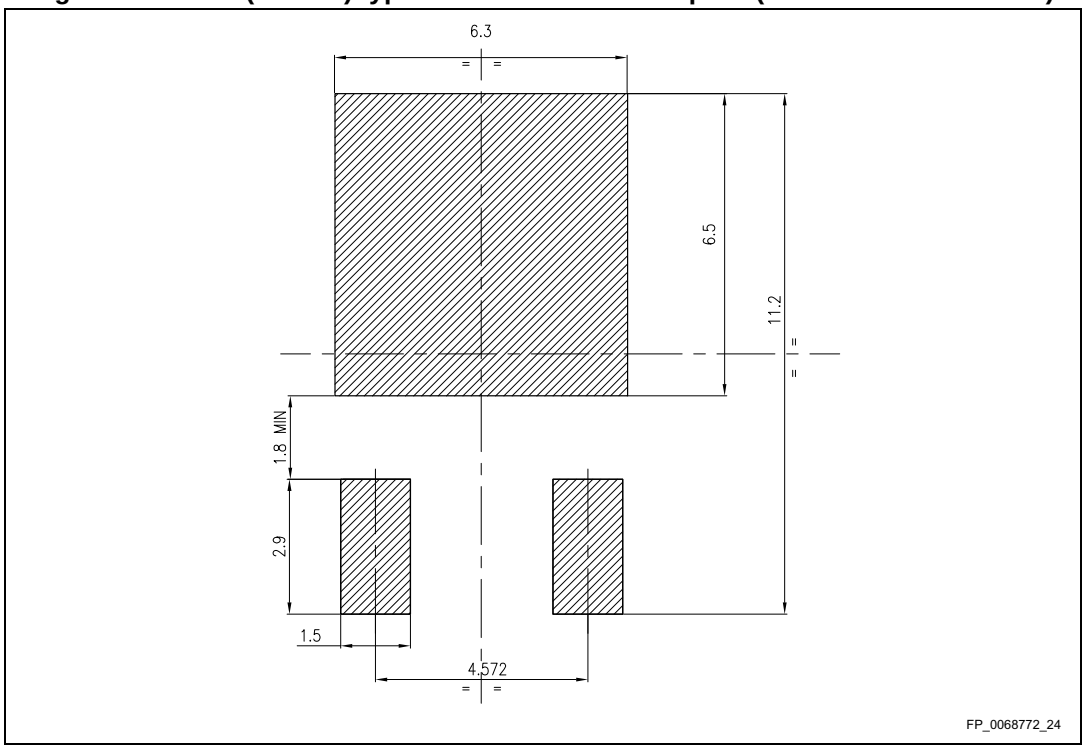


Table 5. DPAK (TO-252) type A mechanical data

Dim.	mm		
	Min.	Typ.	Max.
A	2.20		2.40
A1	0.90		1.10
A2	0.03		0.23
b	0.64		0.90
b4	5.20		5.40
c	0.45		0.60
c2	0.48		0.60
D	6.00		6.20
D1	4.95	5.10	5.25
E	6.40		6.60
E1	4.60	4.70	4.80
e	2.16	2.28	2.40
e1	4.40		4.60
H	9.35		10.10
L	1.00		1.50
(L1)	2.60	2.80	3.00
L2	0.65	0.80	0.95
L4	0.60		1.00
R		0.20	
V2	0°		8°

Figure 14. DPAK (TO-252) type A recommended footprint (dimensions are in mm)



4.2 DPAK (TO-252) packing information

Figure 15. DPAK (TO-252) tape outline

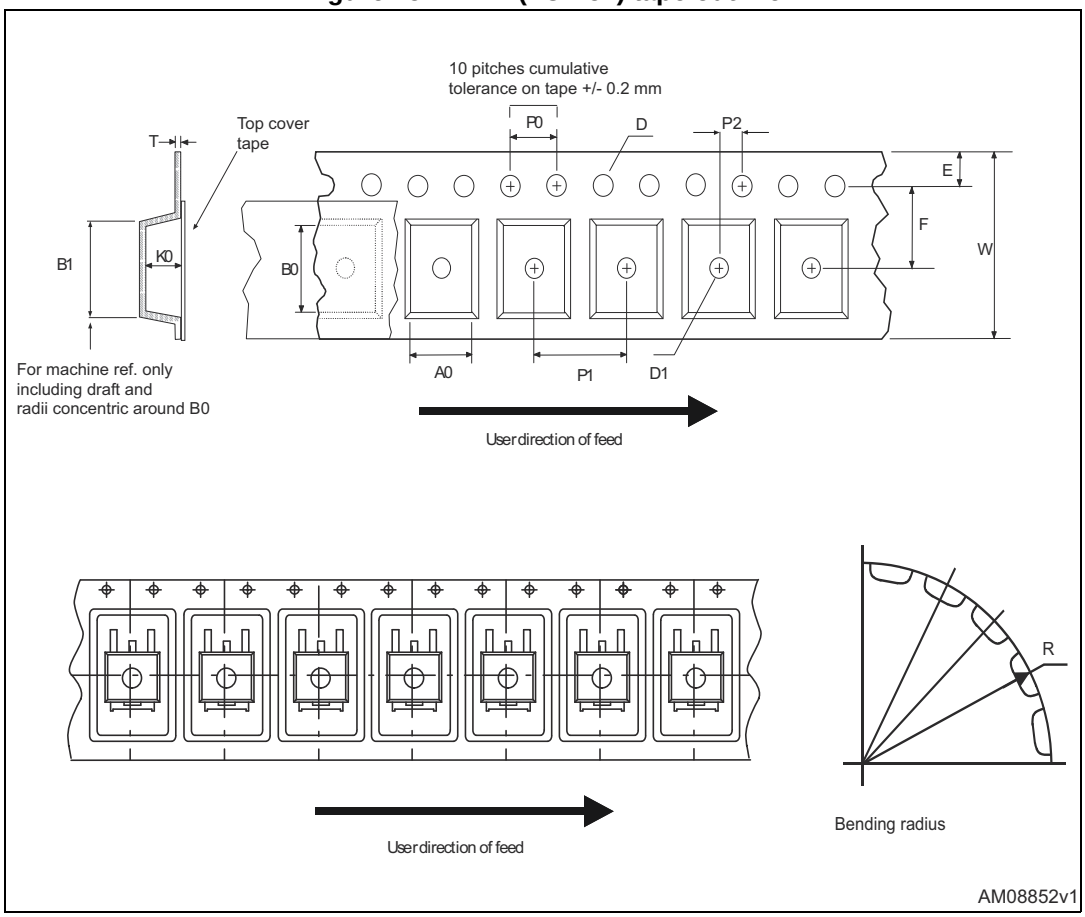


Figure 16. DPAK (TO-252) reel outline

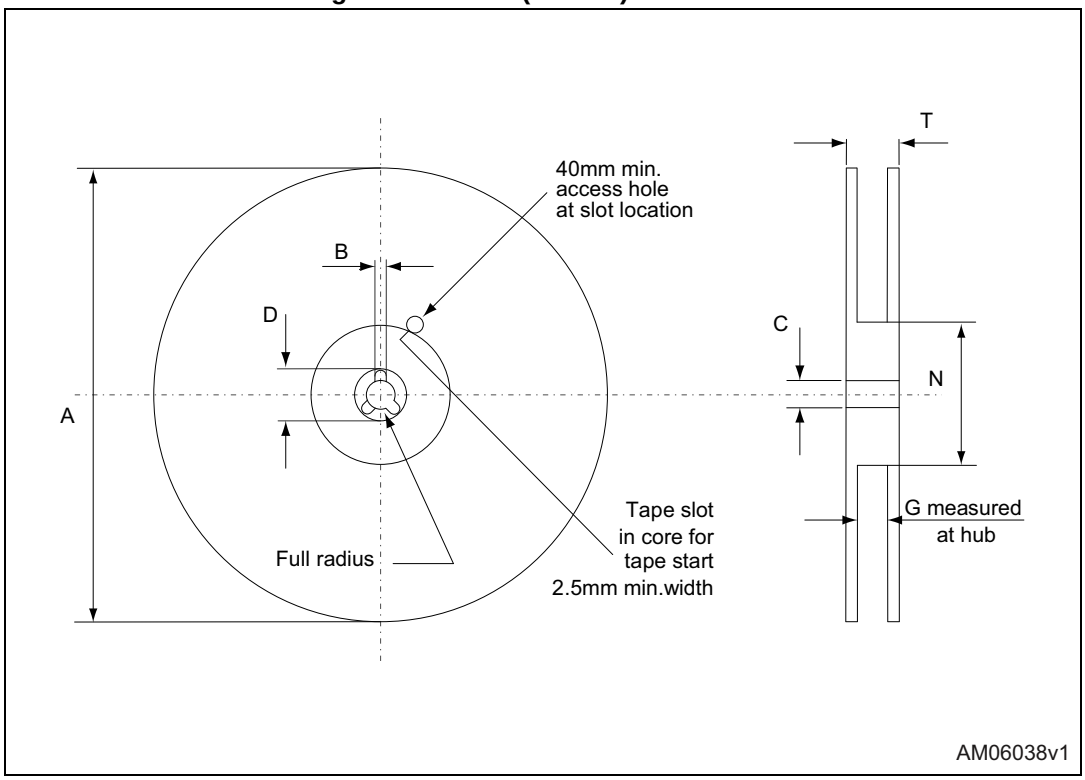


Table 6. DPAK (TO-252) tape and reel mechanical data

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			

5 Revision history

Table 7. Document revision history

Date	Revision	Changes
01-Jun-2007	1	First release
09-Nov-2009	2	Updated package mechanical data.
14-Jan-2010	3	Modified *Table 3 on page 2*.
19-Jun-2012	4	Modified: mechanical data updated
24-Jan-2018	5	Modified title. Modified features on cover page. Updated *Section 4: Package information*. Minor text changes.