STD80N6F6

N-channel 60 V, 80 A STripFET™ VI DeepGATE™ Power MOSFET in DPAK package

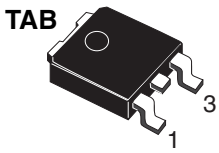
Datasheet – preliminary data

Features

Order codes	V_{DSS}	$R_{DS(on)}$ max	I_D
STD80N6F6	60 V	6.5 mΩ	80 A(1)

1. Current limited by package

- Low gate charge
- Very low on-resistance
- High avalanche ruggedness



DPAK

Applications

- Switching applications

Description

This device is an N-channel Power MOSFET developed using the 6th generation of STripFET™ DeepGATE™ technology, with a new gate structure. The resulting Power MOSFET exhibits the lowest RDS(on) in all packages.

Figure 1. Internal schematic diagram

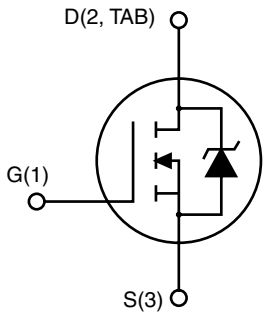


Table 1. Device summary

Order codes	Marking	Package	Packaging
STD80N6F6	80N6F6	DPAK	Tape and reel

Contents

1 Electrical ratings

Table 2. Absolute maximum ratings

Symbol	Parameter	Value	Unit
V_{DS}	Drain-source voltage	60	V
V_{GS}	Gate-source voltage	± 20	V
I_D (1)	Drain current (continuous) at T_C = 25 °C	80	A
I_D (1)	Drain current (continuous) at T_C = 100 °C	80	A
I_{DM} (1)	Drain current (pulsed)	320	A
P_{TOT}	Total dissipation at T_C = 25 °C	120	W
	Derating factor	2	W/°C
T_{stg}	Storage temperature	- 55 to 175	°C
T_j	Operating junction temperature		

1. Current limited by package

Table 3. Thermal data

Symbol	Parameter	Value	Unit
$R_{thj\text{-}case}$	Thermal resistance junction-case max	1.25	°C/W
$R_{thj\text{-}pcb}$ (1)	Thermal resistance junction - PCB max	50	°C/W

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

2 Electrical characteristics

(T_{CASE} = 25 °C unless otherwise specified)

Table 4. On/off states

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
$V_{(BR)DSS}$	Drain-source breakdown voltage (V_{GS} = 0)	I_D = 250 µA	60			V
I_{DSS}	Zero gate voltage Drain current (V_{GS} = 0)	V_{DS} = 60 V V_{DS} = 60 V, T_C=125 °C			1 100	µA µA
I_{GSS}	Gate-body leakage current (V_{DS} = 0)	V_{GS} = ± 20 V			± 100	nA
$V_{GS(th)}$	Gate threshold voltage	V_{DS} = V_{GS}, I_D = 250 µA	3		4.5	V
$R_{DS(on)}$	Static drain-source on-resistance	V_{GS} = 10 V, I_D = 40 A		TBD	6.5	mΩ

Table 5. Dynamic

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
C_{iss}	Input capacitance	V_{DS} = 25 V, f = 1 MHz, V_{GS} = 0	-	7480	-	pF
C_{oss}	Output capacitance			450		pF
C_{rss}	Reverse transfer capacitance			310		pF
Q_g	Total gate charge	V_{DD} = 30 V, I_D = 80 A, V_{GS} = 10 V	-	122	-	nC
Q_{gs}	Gate-source charge			TBD		nC
Q_{gd}	Gate-drain charge			TBD		nC

Table 6. Switching times

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
$t_{d(on)}$ t_r	Turn-on delay time Rise time	V_{DD} = 30 V, I_D = 40 A R_G = 4.7 Ω V_{GS} = 10 V	-	TBD	-	ns ns
$t_{d(off)}$ t_f	Turn-off-delay time Fall time		-	TBD	-	ns ns

Table 7. Source drain diode

Symbol	Parameter	Test conditions	Min.	Typ.	Max	Unit
I_{SD}	Source-drain current		-		80	A
I_{SDM} (1)	Source-drain current (pulsed)		-		320	A
V_{SD} (2)	Forward on voltage	I_{SD} = 80 A, V_{GS} = 0	-		1.1	V
t_{rr} Q_{rr} I_{RRM}	Reverse recovery time Reverse recovery charge Reverse recovery current	I_{SD} = 80 A, V_{DD} = 48 V di/dt = 100 A/µs, T_j = 150 °C	-	TBD		ns nC A

1. Current limited by package
2. Pulsed: pulse duration = 300 µs, duty cycle 1.5%

3 Package mechanical data

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Table 8. DPAK (TO-252) 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		5.10	
E	6.40		6.60
E1		4.70	
e		2.28	
e1	4.40		4.60
H	9.35		10.10
L	1		
L1		2.80	
L2		0.80	
L4	0.60		1
R		0.20	
V2	0°		8°

Figure 2. DPAK (TO-252) drawing

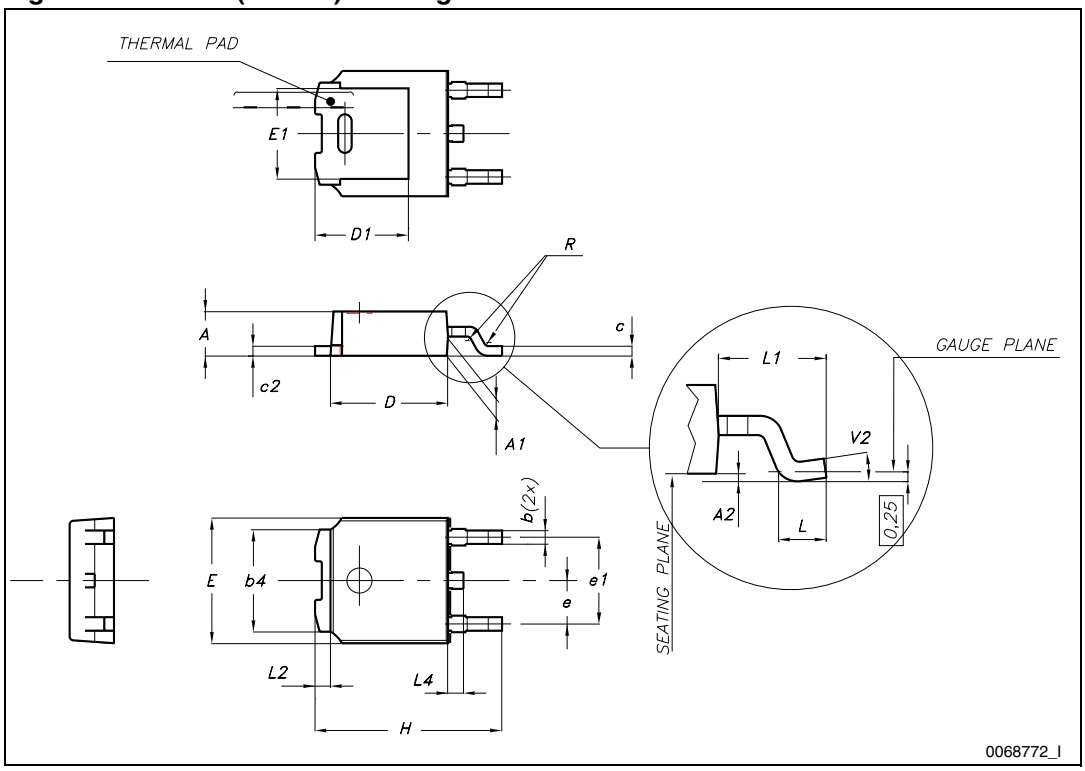
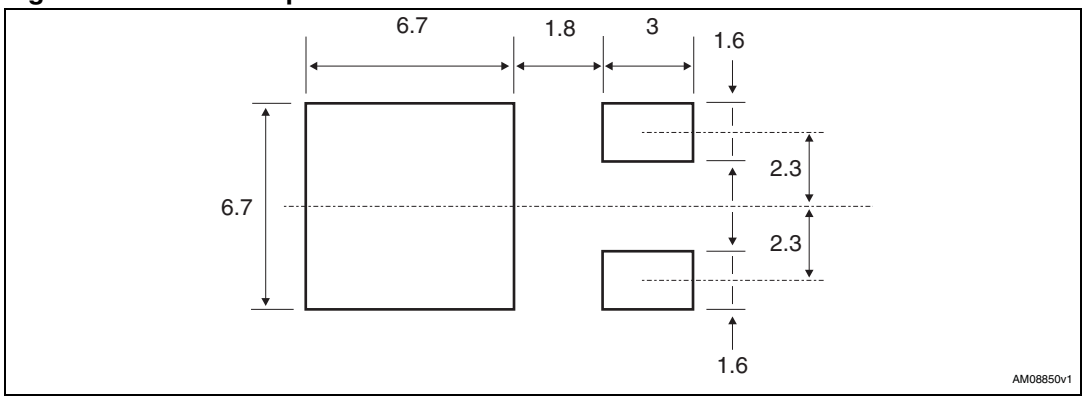


Figure 3. DPAK footprint[a]



a. All dimensions are in millimeters.

4 Packaging mechanical data

Table 9. 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			

Figure 4. Tape for DPAK (TO-252)

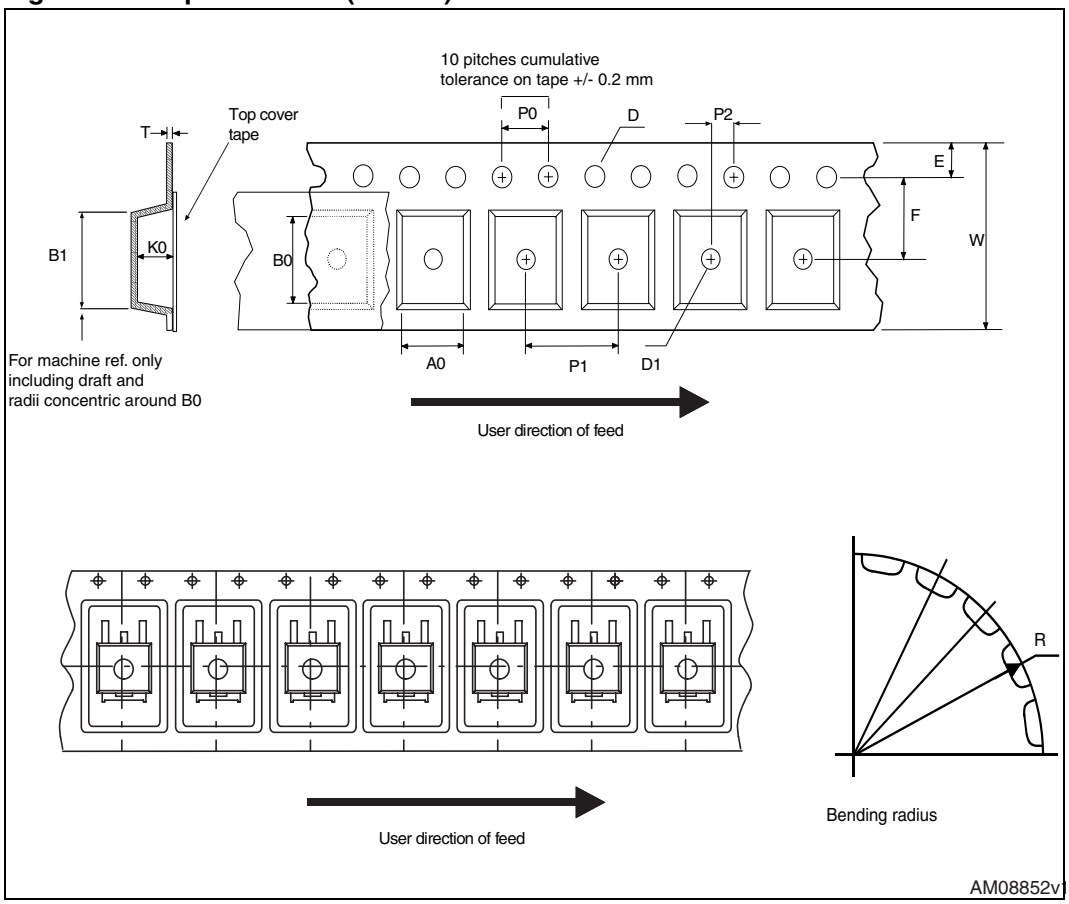
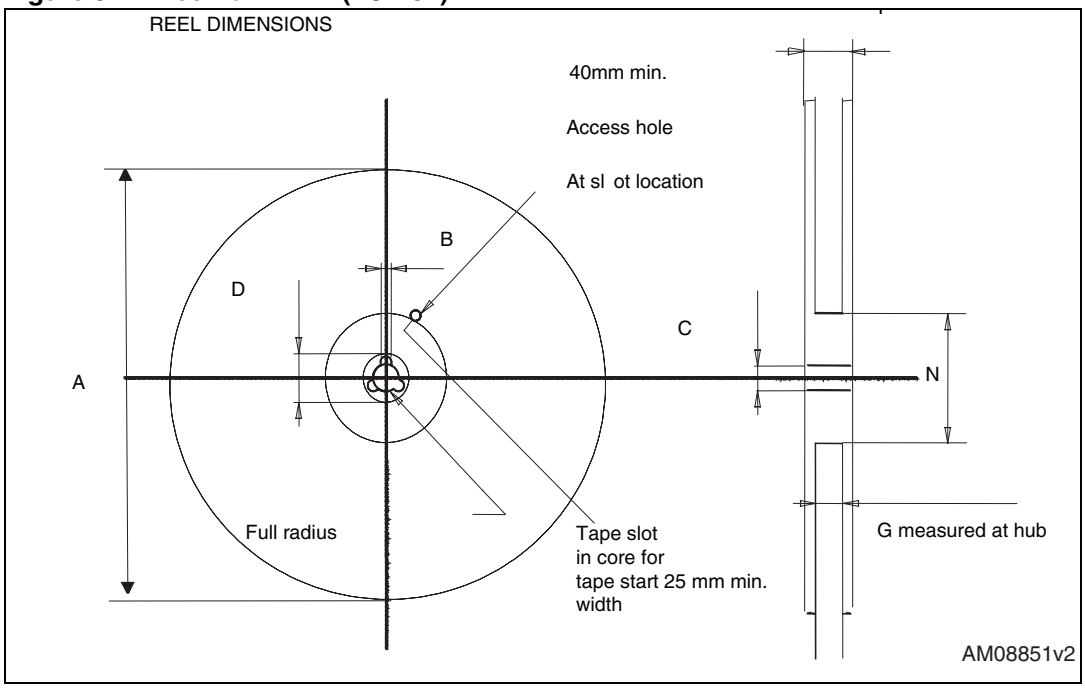


Figure 5. Reel for DPAK (TO-252)



5 Revision history

Table 10. Document revision history

Date	Revision	Changes
08-Aug-2012	1	Initial release.

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