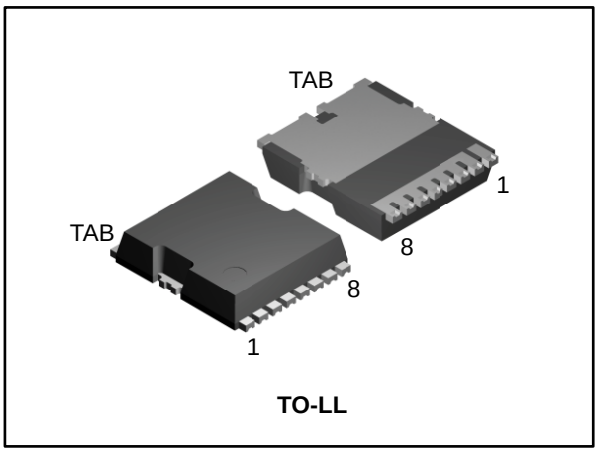
STO362N8F7AG

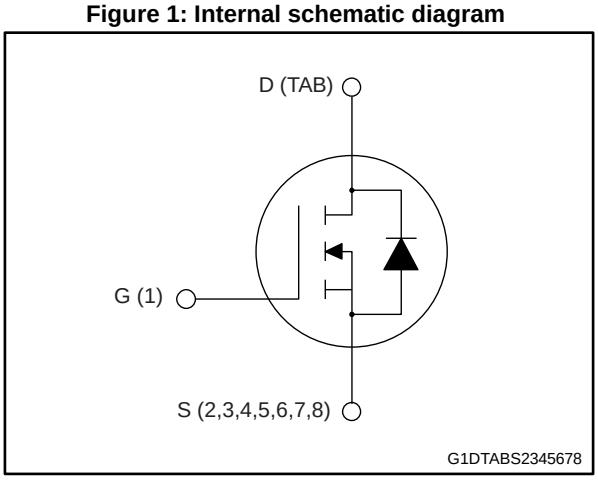
Automotive N-channel 80 V, 1.6 mΩ max., 300 A STripFET™ F7 Power MOSFET in a TO-LL package

Datasheet - preliminary data



TO-LL

Figure 1: Internal schematic diagram



Features

Order code	V_{DS}	$R_{DS(on)}$ max.	I_D
STO362N8F7AG	80 V	1.8 mΩ	300 A

- Designed for automotive applications
- Among the lowest $R_{DS(on)}$ on the market
- Excellent FoM (figure of merit)
- Low C_{rss}/C_{iss} ratio for EMI immunity
- High avalanche ruggedness
- Wettable flank package

Applications

- Switching applications

Description

This N-channel Power MOSFET utilizes STripFET™ F7 technology with an enhanced trench gate structure that results in very low on-state resistance, while also reducing internal capacitance and gate charge for faster and more efficient switching.

Table 1: Device summary

Order code	Marking	Package	Packing
STO362N8F7AG	362N8F7	TO-LL	Tape and reel

Contents

1 Electrical ratings

Table 2: Absolute maximum ratings

Symbol	Parameter	Value	Unit
V_{DS}	Drain-source voltage	80	V
V_{GS}	Gate-source voltage	±20	V
I_D(1)	Drain current (continuous) at T_C = 25 °C	300	A
I_D	Drain current (continuous) at T_C = 100 °C	257	A
I_{DM}(2)	Drain current (pulsed)	1200	A
P_{TOT}	Total dissipation at T_C = 25 °C	441	W
T_J	Operating junction temperature range	-55 to 175	°C
T_{stg}	Storage temperature range		

Notes:

(1)Limited by package.

(2)Pulse width limited by safe operating area

Table 3: Thermal data

Symbol	Parameter	Value	Unit
$R_{thj\text{-}case}$	Thermal resistance junction-case	0.34	°C/W

2 Electrical characteristics

(T_C= 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 V, I_D = 1 mA	80			V
I_{DSS}	Zero gate voltage drain current	V_{GS} = 0 V, V_{DS} = 80 V			1	µA
		V_{GS} = 0 V, V_{DS} = 80 V, Tj = 125 °C (1)			100	µA
I_{GSS}	Gate-body leakage current	V_{DS} = 0 V, V_{GS} = ±20 V			±100	nA
$V_{GS(th)}$	Gate threshold voltage	V_{DS} = V_{GS}, I_D = 250 µA	2.5		4.5	V
$R_{DS(on)}$	Static drain-source on-resistance	V_{GS} = 10 V, I_D = 150 A			1.6	mΩ

Notes:

(1)Defined by design, not subject to production test.

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 V	-	16500	-	pF
C_{oss}	Output capacitance		-	4200	-	pF
C_{rss}	Reverse transfer capacitance		-	290	-	pF
Q_g	Total gate charge	V_{DD} = 40 V, I_D = 300 A, V_{GS} = 0 to 10 V (see *Figure 3: "Test circuit for gate charge behavior"*)	-	240	-	nC
Q_{gs}	Gate-source charge		-	TBD	-	nC
Q_{gd}	Gate-drain charge		-	TBD	-	nC

3 Test circuits

Figure 2: Test circuit for resistive load switching times

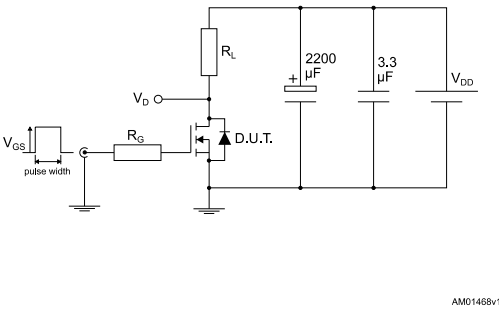


Figure 3: Test circuit for gate charge behavior

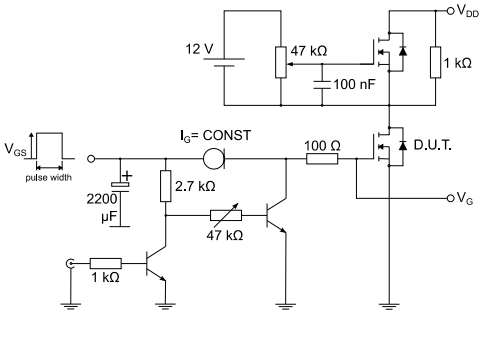


Figure 4: Test circuit for inductive load switching and diode recovery times

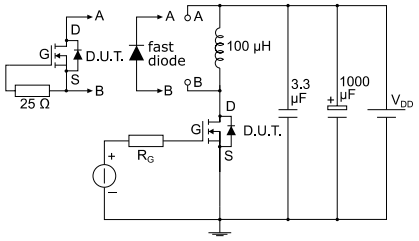


Figure 5: Unclamped inductive load test circuit

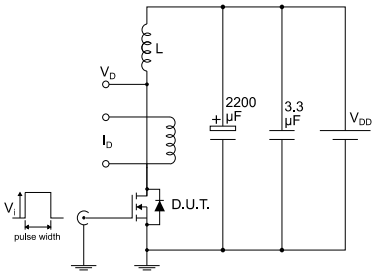


Figure 6: Unclamped inductive waveform

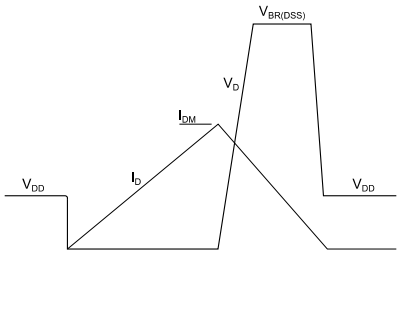
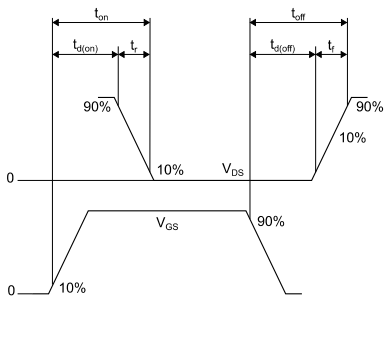


Figure 7: Switching time waveform



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 TO-LL package information

Figure 8: TO-LL package outline

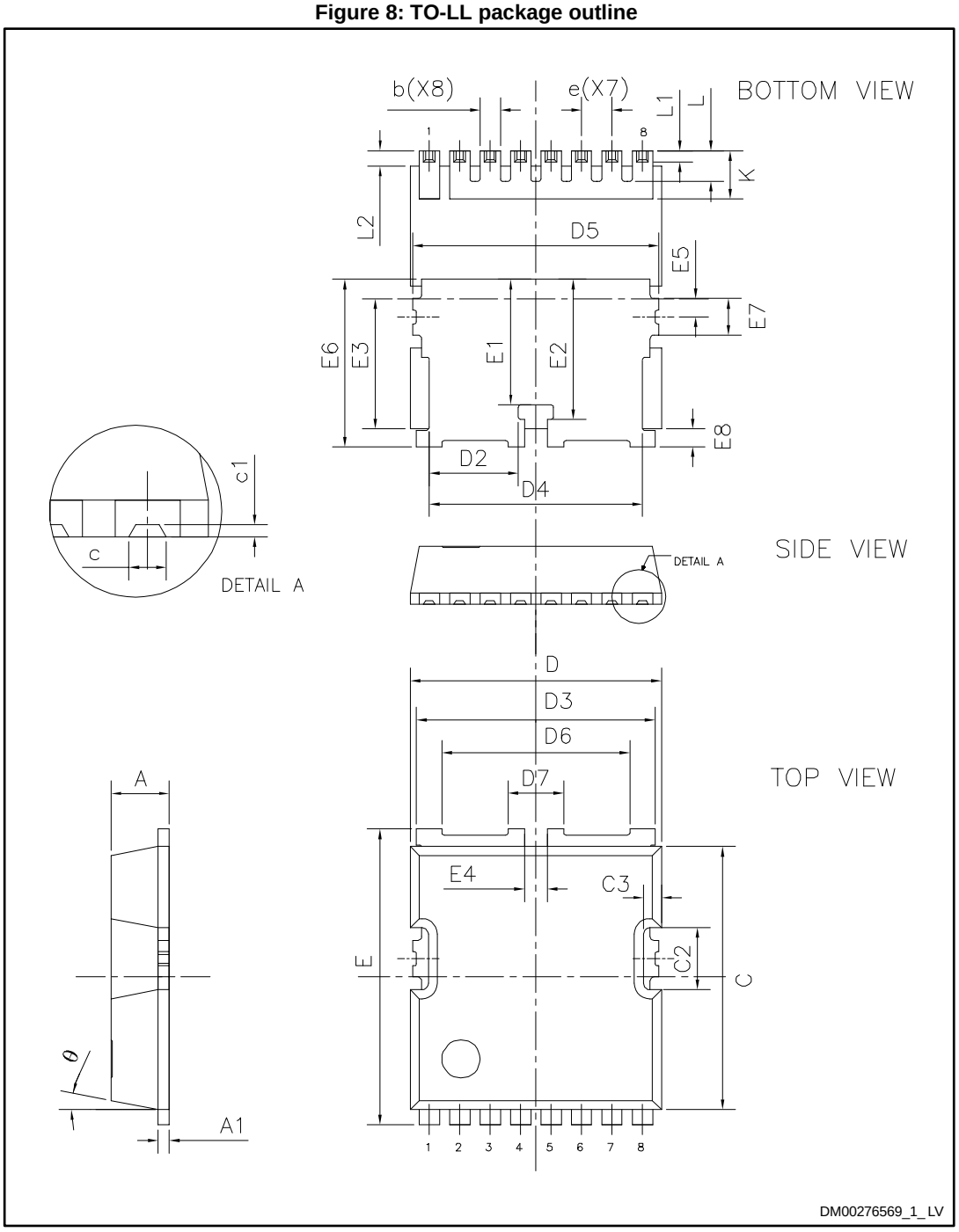
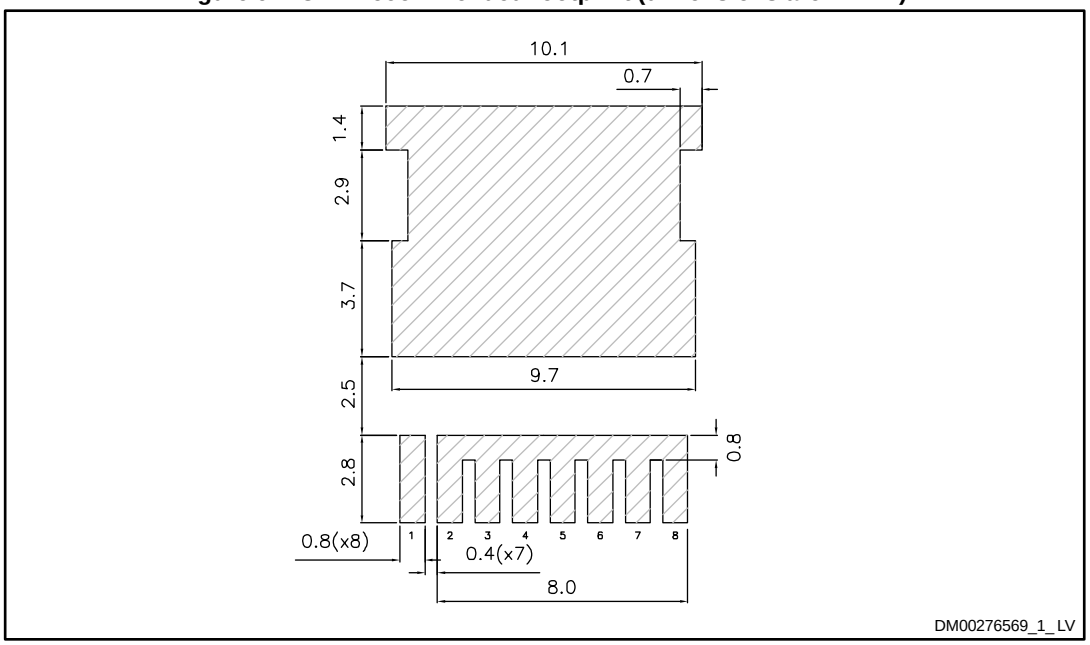


Table 6: TO-LL package mechanical data

Dim.	mm		
	Min.	Typ.	Max.
A	2.20	2.30	2.40
A1	0.40	0.48	0.60
b		0.80	
c		0.46	
c1		0.15	
C	10.28	10.38	10.48
C2	2.35	2.45	2.55
C3		0.71	
D	9.80	9.90	10.00
D2	3.30	3.50	3.70
D3	9.30	9.40	9.50
D4	8.20	8.40	8.6
D5	9.50	9.70	9.90
D6		7.40	
D7		2.20	
e		1.20	
E	11.48	11.68	11.88
E1		4.96	
E2		5.54	
E3		5.14	
E4		0.90	
E5		0.72	
E6	6.41	6.61	6.81
E7	0.50	0.70	0.90
K	1.70	1.90	2.10
L	1.05	1.20	1.35
L1	0.25	0.35	0.45
L2	0.40	0.60	0.80
θ		11°	

Figure 9: TO-LL recommended footprint (dimensions are in mm)



5 Revision history

Table 7: Document revision history

Date	Revision	Changes
01-Dec-2018	1	First release

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