



STS3DNF30L

N - CHANNEL 30V - 0.055Ω - 3.5A - SO-8 PowerMESH™ MOSFET

PRELIMINARY DATA

TYPE	V _{DSS}	R _{DS(on)}	I _D
STS3DNF30L	30 V	< 0.065 Ω	3.5 A

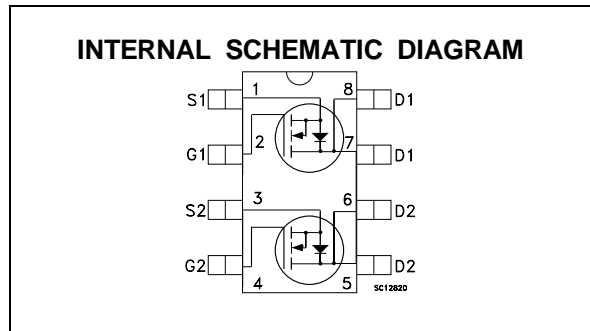
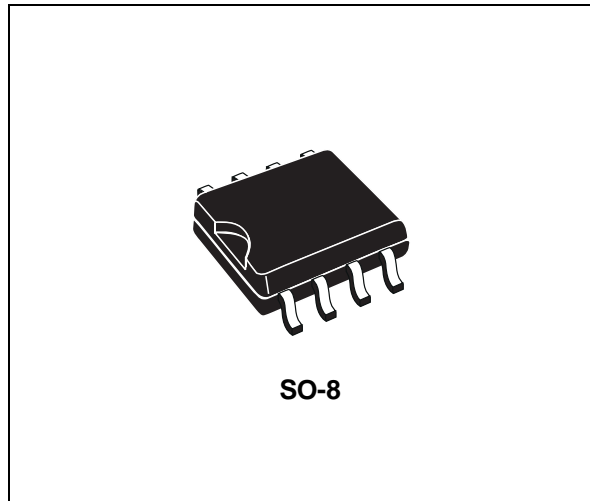
- TYPICAL R_{DS(on)} = 0.055 Ω
- STANDARD OUTLINE FOR EASY AUTOMATED SURFAC MOUNT ASSEMBLY
- LOW THRESHOLD DRIVE

DESCRIPTION

This Power MOSFET is the second generation of STMicroelectronics unique "Single Feature Size™" strip-based process. The resulting transistor shows extremely high packing density for low on-resistance, rugged avalanche characteristics and less critical alignment steps therefore a remarkable manufacturing reproducibility.

APPLICATIONS

- DC MOTOR DRIVE
- DC-DC CONVERTERS
- BATTERY MANAGEMENT IN NOMADIC EQUIPMENT
- POWER MANAGEMENT IN PORTABLE/DESKTOP PCs



ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value	Unit
V _{DS}	Drain-source Voltage (V _{GS} = 0)	30	V
V _{DGR}	Drain- gate Voltage (R _{GS} = 20 kΩ)	30	V
V _{GS}	Gate-source Voltage	± 20	V
I _D	Drain Current (continuous) at T _c = 25 °C Single Operation	3.5	A
	Drain Current (continuous) at T _c = 100 °C Single Operation	2.2	A
I _{DM} (●)	Drain Current (pulsed)	14	A
P _{tot}	Total Dissipation at T _c = 25 °C Dual Operation	2	W
	Total Dissipation at T _c = 25 °C Single Operation	1.6	W

(●) Pulse width limited by safe operating area

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THERMAL DATA

R _{thj-amb}	*Thermal Resistance Junction-ambient Single Operation Max	78	°C/W
T _J	Thermal Resistance Junction-ambient Dual Operation Max	62.5	°C/W
T _{stg}	Maximum Lead Temperature For Soldering Purpose	150	°C
	Storage Temperature	-55 to 150	°C

(*) Mounted on FR-4 board (t ≤ 10 sec)

ELECTRICAL CHARACTERISTICS (T_{case} = 25 °C unless otherwise specified)

OFF

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
V _{(BR)DSS}	Drain-source Breakdown Voltage	I _D = 250 μA V _{GS} = 0	30			V
I _{DSS}	Zero Gate Voltage Drain Current (V _{GS} = 0)	V _{DS} = Max Rating V _{DS} = Max Rating T _c = 125 °C			1 10	μA μA
I _{GSS}	Gate-Source Leakage Current (V _{DS} = 0)	V _{GS} = ± 20 V			±100	nA

ON (*)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
V _{GS(th)}	Gate Threshold Voltage	V _{DS} = V _{GS} I _D = 250 μA	1	1.7	2.5	V
R _{DS(on)}	Static Drain-source On Resistance	V _{GS} = 10 V I _D = 1.75 A V _{GS} = 4.5 V I _D = 1.75 A		0.055 0.06	0.065 0.09	Ω Ω
I _{D(on)}	On State Drain Current	V _{DS} > I _{D(on)} × R _{DS(on)max} V _{GS} = 10 V	3.5			A

DYNAMIC

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
g _{fs} (*)	Forward Transconductance	V _{DS} > I _{D(on)} × R _{DS(on)max} I _D = 6 A		6		S
C _{iss}	Input Capacitance	V _{DS} = 25 V f = 1 MHz V _{GS} = 0		420	550	pF
C _{oss}	Output Capacitance			62	80	pF
C _{rss}	Reverse Transfer Capacitance			20	30	pF

ELECTRICAL CHARACTERISTICS (continued)

SWITCHING ON

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
$t_{d(on)}$	Turn-on Time	$V_{DD} = 15\text{ V}$		13	17	ns
t_r	Rise Time	$R_G = 4.7\ \Omega$ $I_D = 2\text{ A}$ $V_{GS} = 4.5\text{ V}$		30	40	ns
Q_g	Total Gate Charge	$V_{DD} = 24\text{ V}$ $I_D = 4\text{ A}$ $V_{GS} = 4.5\text{ V}$		8	11	nC
Q_{gs}	Gate-Source Charge			3.2		nC
Q_{gd}	Gate-Drain Charge			2.6		nC

SWITCHING OFF

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
$t_{r(voff)}$	Off-voltage Rise Time	$V_{DD} = 24\text{ V}$ $I_D = 4\text{ A}$		5	7	ns
t_f	Fall Time	$R_G = 4.7\ \Omega$ $V_{GS} = 4.5\text{ V}$		9	12	ns
t_c	Cross-over Time			20	26	ns

SOURCE DRAIN DIODE

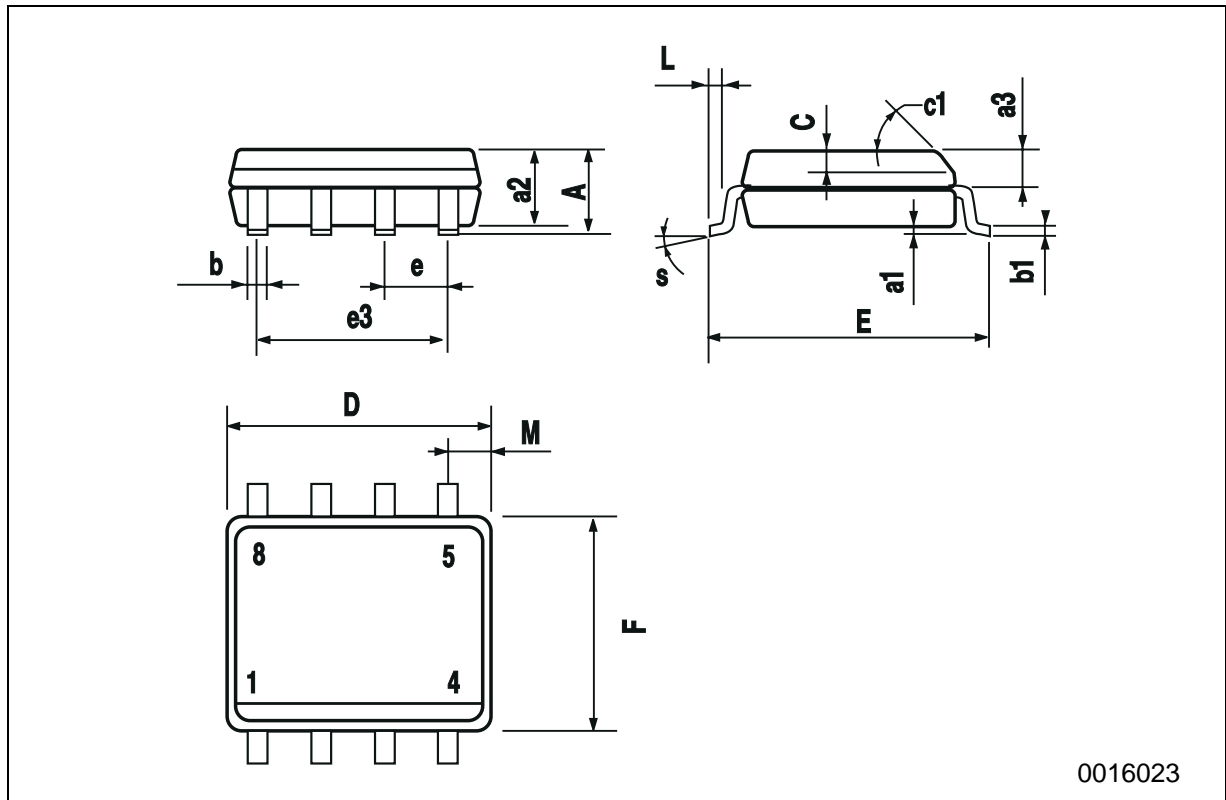
Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
I_{SD}	Source-drain Current				3.5	A
$I_{SDM(\bullet)}$	Source-drain Current (pulsed)				14	A
$V_{SD} (*)$	Forward On Voltage	$I_{SD} = 3.5\text{ A}$ $V_{GS} = 0$			1.2	V
t_{rr}	Reverse Recovery Time	$I_{SD} = 4\text{ A}$ $di/dt = 100\text{ A}/\mu\text{s}$ $V_{DD} = 15\text{ V}$ $T_j = 150\text{ }^\circ\text{C}$		23		ns
Q_{rr}	Reverse Recovery Charge			0.134		μC
I_{RRM}	Reverse Recovery Current			1.2		A

(*) Pulsed: Pulse duration = 300 μs , duty cycle 1.5 %

(\bullet) Pulse width limited by safe operating area

SO-8 MECHANICAL DATA

DIM.	mm			inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A			1.75			0.068
a1	0.1		0.25	0.003		0.009
a2			1.65			0.064
a3	0.65		0.85	0.025		0.033
b	0.35		0.48	0.013		0.018
b1	0.19		0.25	0.007		0.010
C	0.25		0.5	0.010		0.019
c1	45 (typ.)					
D	4.8		5.0	0.188		0.196
E	5.8		6.2	0.228		0.244
e		1.27			0.050	
e3		3.81			0.150	
F	3.8		4.0	0.14		0.157
L	0.4		1.27	0.015		0.050
M			0.6			0.023
S	8 (max.)					



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