



STS4DNF60L

N - CHANNEL 60V - 0.045Ω - 4A SO-8 STripFET™ POWER MOSFET

PRELIMINARY DATA

TYPE	V _{DSS}	R _{DS(on)}	I _D
STS4DNF60L	60 V	< 0.055 Ω	4 A

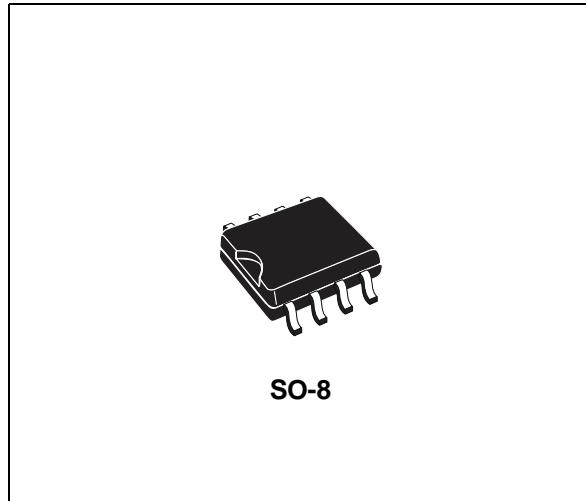
- TYPICAL R_{DS(on)} = 0.045 Ω
- STANDARD OUTLINE FOR EASY AUTOMATED SURFACE MOUNT ASSEMBLY
- LOW THRESHOLD DRIVE

DESCRIPTION

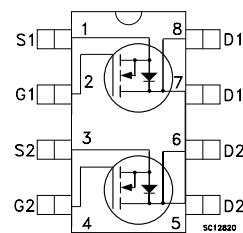
This Power MOSFET is the second generation of STMicroelectronics unique " Single Feature Size™ " strip-based process. The resulting transistor shows extremely high packing density for low on-resistance, rugged avalanche characteristics and less critical alignment steps therefore a remarkable manufacturing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

APPLICATIONS

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



INTERNAL SCHEMATIC DIAGRAM



ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value	Unit
V _{DS}	Drain-source Voltage (V _{GS} = 0)	60	V
V _{DGR}	Drain-gate Voltage (R _{GS} = 20 kΩ)	60	V
V _{GS}	Gate-source Voltage	± 20	V
I _D	Drain Current (continuous) at T _c = 25 °C Single Operation	4	A
	Drain Current (continuous) at T _c = 100 °C Single Operation	2.5	A
I _{DM(•)}	Drain Current (pulsed)	16	A
P _{tot}	Total Dissipation at T _c = 25 °C Dual Operation Total Dissipation at T _c = 25 °C Single Operation	2 1.6	W W

(•) Pulse width limited by safe operating area

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THERMAL DATA

R _{thj-amb}	*Thermal Resistance Junction-ambient Single Operation Dual Operation	78 62.5 150 -55 to 150	°C/W °C/W °C °C
T _j T _{stg}	Maximum Operating Junction Temperature Storage Temperature		

(*) Mounted on FR-4 board ($t \leq 10\text{ sec}$)

ELECTRICAL CHARACTERISTICS ($T_{\text{case}} = 25\text{ }^{\circ}\text{C}$ 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	60			V
I _{DSS}	Zero Gate Voltage Drain Current (V _{GS} = 0)	V _{DS} = Max Rating V _{DS} = Max Rating T _c = 125 $^{\circ}\text{C}$			1 10	μA μA
I _{GSS}	Gate-body 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 _{D(on)}	Static Drain-source On Resistance	V _{GS} = 10 V I _D = 2 A V _{GS} = 4.5 V I _D = 2 A		0.045 0.05	0.055 0.065	Ω Ω
I _{D(on)}	On State Drain Current	V _{DS} > I _{D(on)} x R _{D(on)max} V _{GS} = 10 V	20			A

DYNAMIC

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
g _{fs} (*)	Forward Transconductance	V _{DS} > I _{D(on)} x R _{D(on)max} I _D = 2 A		7		S
C _{iss} C _{oss} C _{rss}	Input Capacitance Output Capacitance Reverse Transfer Capacitance	V _{DS} = 25 V f = 1 MHz V _{GS} = 0 V		1250 130 26		pF pF pF

ELECTRICAL CHARACTERISTICS (continued)

SWITCHING ON

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
$t_{d(on)}$ t_r	Turn-on Time Rise Time	$V_{DD} = 15 \text{ V}$ $I_D = 2 \text{ A}$ $R_G = 4.7 \Omega$ $V_{GS} = 4.5 \text{ V}$		TBD	TBD	ns ns
Q_g Q_{gs} Q_{gd}	Total Gate Charge Gate-Source Charge Gate-Drain Charge	$V_{DD} = 48 \text{ V}$ $I_D = 4 \text{ A}$ $V_{GS} = 4.5 \text{ V}$		15 4 4	25	nC nC nC

SWITCHING OFF

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
$t_{r(V_{off})}$ t_f t_c	Off-voltage Rise Time Fall Time Cross-over Time	$V_{DD} = 48 \text{ V}$ $I_D = 4 \text{ A}$ $R_G = 4.7 \Omega$ $V_{GS} = 4.5 \text{ V}$		TBD		ns ns ns

SOURCE DRAIN DIODE

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
I_{SD} $I_{SDM}(\bullet)$	Source-drain Current Source-drain Current (pulsed)				4 16	A A
$V_{SD} (\ast)$	Forward On Voltage	$I_{SD} = 4 \text{ A}$ $V_{GS} = 0$			1.2	V
t_{rr} Q_{rr} I_{RRM}	Reverse Recovery Time Reverse Recovery Charge Reverse Recovery Current	$I_{SD} = 4 \text{ A}$ $di/dt = 100 \text{ A}/\mu\text{s}$ $V_r = 20 \text{ V}$ $T_j = 150 \text{ }^\circ\text{C}$		TBD	TBD	ns nC A

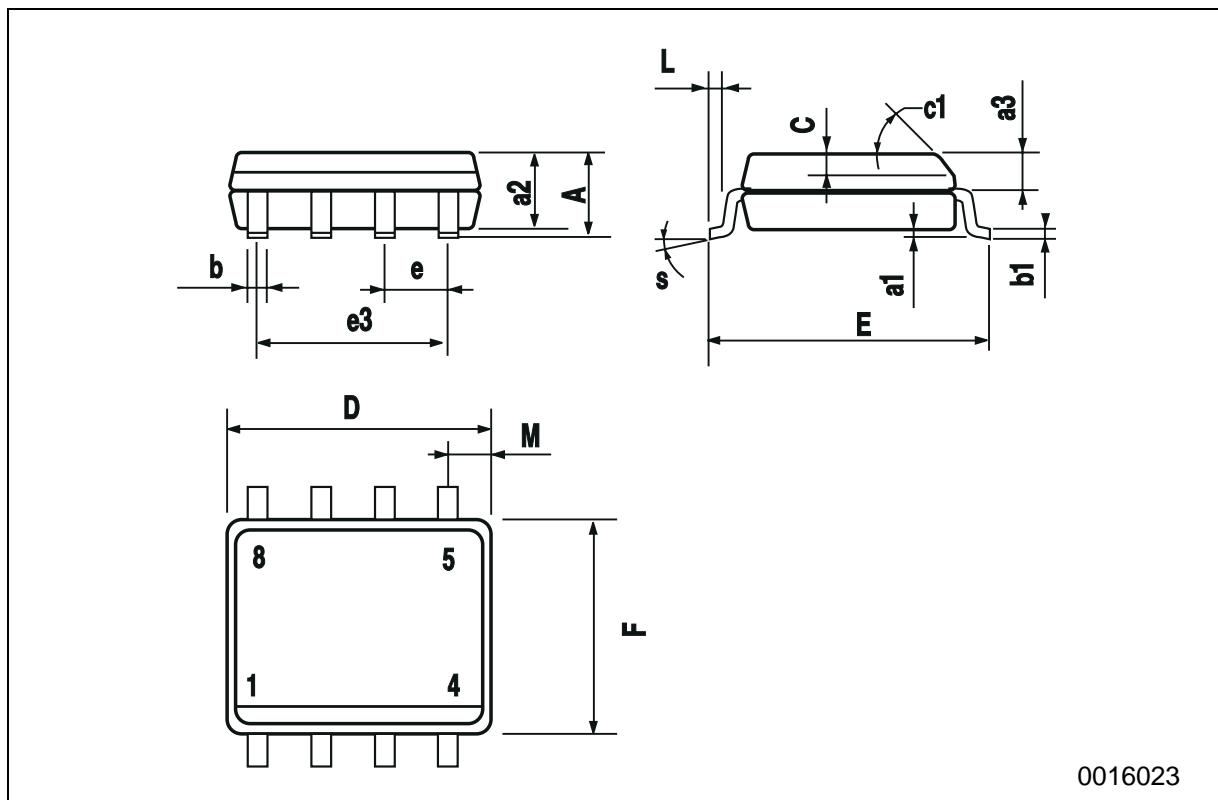
(*) Pulsed: Pulse duration = 300 μs , duty cycle 1.5 %

• Pulse width limited by safe operating area

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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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