



STS2DNE60

N - CHANNEL 60V - 0.180Ω - 2A SO-8 STripFET™ POWER MOSFET

PRELIMINARY DATA

TYPE	V _{DSS}	R _{DS(on)}	I _D
STS2DNE60	60 V	< 0.23 Ω	2 A

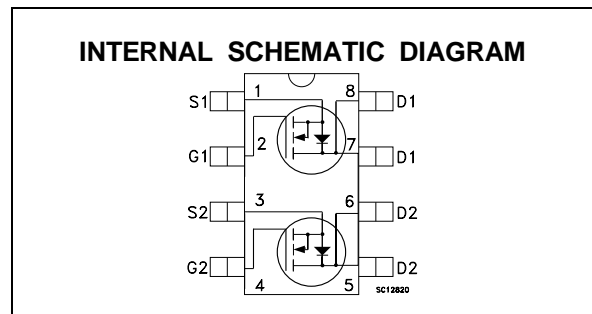
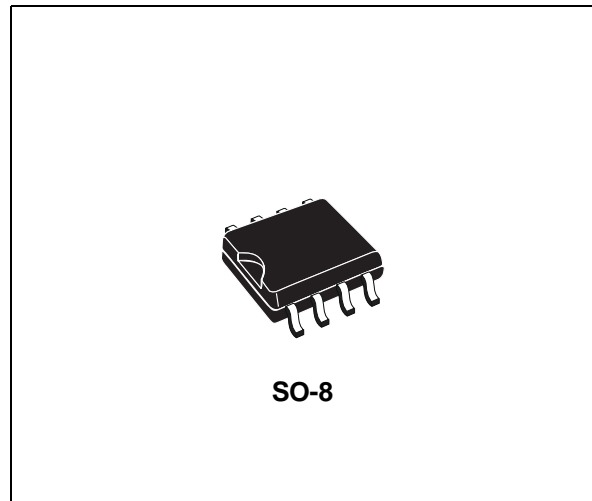
- TYPICAL R_{DS(on)} = 0.18 Ω
- STANDARD OUTLINE FOR EASY AUTOMATED SURFACE MOUNT ASSEMBLY
- LOW THRESHOLD DRIVE

DESCRIPTION

This Power MOSFET is the latest development 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 PC_s



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	2	A
	Drain Current (continuous) at T _c = 100 °C Single Operation	1.3	A
I _{DM} (•)	Drain Current (pulsed)	8	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

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THERMAL DATA

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

(*) Mounted on FR-4 board (t ≤ 10sec)

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	60			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-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	2	3.3	4	V
R _{DS(on)}	Static Drain-source On Resistance	V _{GS} = 10 V I _D = 1 A		0.180	0.23	Ω
I _{D(on)}	On State Drain Current	V _{DS} > I _{D(on)} × R _{DS(on)max} V _{GS} = 10 V	2			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 = 1 A		1.8		S
C _{iss}	Input Capacitance	V _{DS} = 25 V f = 1 MHz V _{GS} = 0 V		310		pF
C _{oss}	Output Capacitance			45		pF
C _{rss}	Reverse Transfer Capacitance			12		pF

ELECTRICAL CHARACTERISTICS (continued)

SWITCHING ON

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
$t_{d(on)}$ t_r	Turn-on Delay Time Rise Time	$V_{DD} = 30\text{ V}$ $I_D = 1\text{ A}$ $R_G = 4.7\ \Omega$ $V_{GS} = 10\text{ V}$ (Resistive Load, see fig. 3)		9 10		ns ns
Q_g Q_{gs} Q_{gd}	Total Gate Charge Gate-Source Charge Gate-Drain Charge	$V_{DD} = 24\text{ V}$ $I_D = 2\text{ A}$ $V_{GS} = 4.5\text{ V}$		12 5.1 2.7	16	nC nC nC

SWITCHING OFF

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
$t_{d(off)}$ t_f	Turn-off Delay Time Fall Time	$V_{DD} = 30\text{ V}$ $I_D = 1\text{ A}$ $R_G = 4.7\ \Omega$ $V_{GS} = 10\text{ V}$ (Resistive Load, see fig. 3)		25 5		ns ns
$t_{r(voff)}$ t_f t_c	Off-voltage Rise Time Fall Time Cross-over Time	$V_{clamp} = 48\text{ V}$ $I_D = 2\text{ A}$ $R_G = 4.7\ \Omega$ $V_{GS} = 10\text{ V}$ (Inductive Load, see fig. 5)		4.5 5 12		ns ns ns

SOURCE DRAIN DIODE

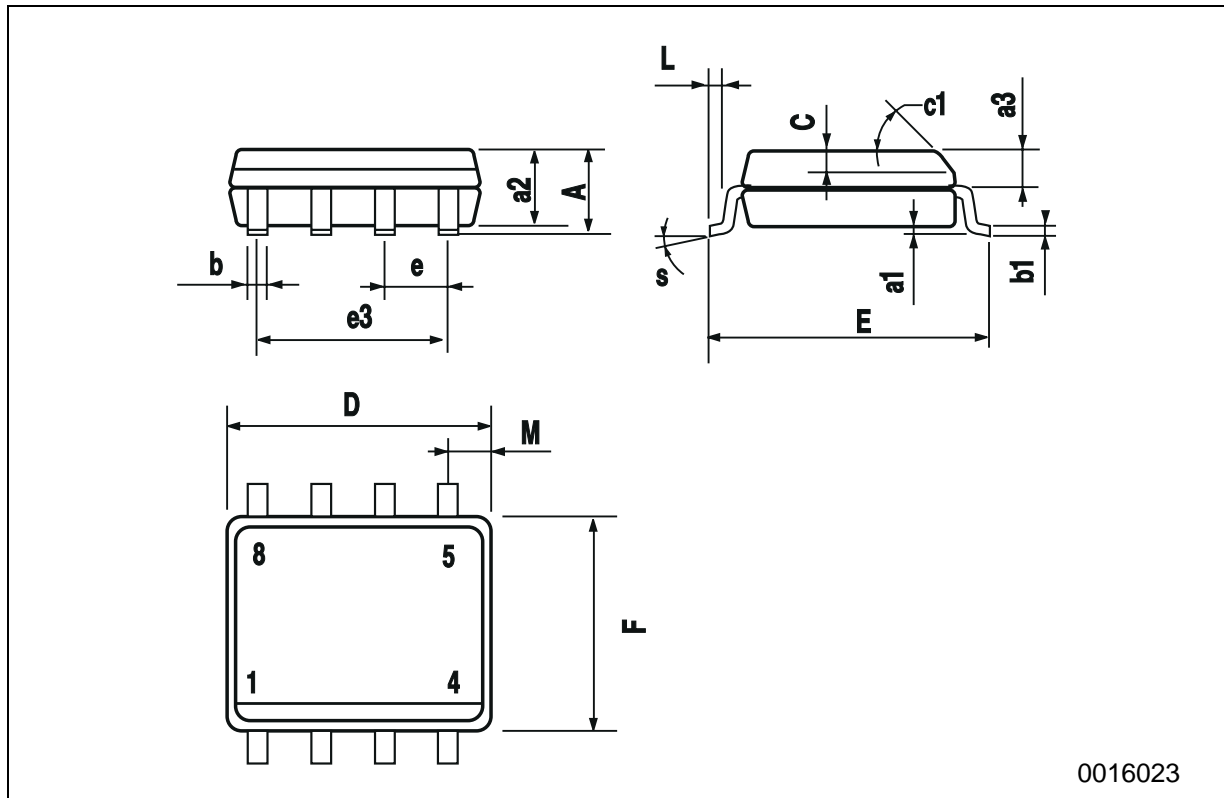
Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
I_{SD} $I_{SDM}(\bullet)$	Source-drain Current Source-drain Current (pulsed)				2 8	A A
$V_{SD} (*)$	Forward On Voltage	$I_{SD} = 2\text{ A}$ $V_{GS} = 0$			1.2	V
t_{rr} Q_{rr} I_{RRM}	Reverse Recovery Time Reverse Recovery Charge Reverse Recovery Current	$I_{SD} = 2\text{ A}$ $di/dt = 100\text{ A}/\mu\text{s}$ $V_{DD} = 25\text{ V}$ $T_j = 150\text{ }^\circ\text{C}$ (see test circuit, fig. 5)		40 50 2.5		ns nC 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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