



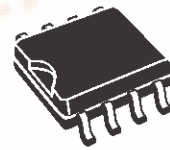
STS8NFS30L

N - CHANNEL 30V - 0.018Ω - 8A S0-8
STripFET™ MOSFET PLUS SCHOTTKY RECTIFIER

MAIN PRODUCT CHARACTERISTICS			
MOSFET	V_{DS}	$R_{DS(on)}$	I_D
	30 V	<0.022 Ω	8 A
SCHOTTKY	$I_{F(AV)}$	V_{RRM}	$V_{F(MAX)}$
	3 A	30 V	0.51 V

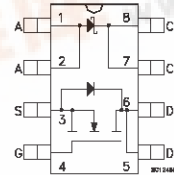
DESCRIPTION:

This product associates the latest low voltage StripFET™ in n-channel version to a low drop Schottky diode. Such configuration is extremely versatile in implementing, a large variety of DC-DC converters for printers, portable equipment, and cellular phones.



S0-8

INTERNAL SCHEMATIC DIAGRAM



MOSFET ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value	Unit
V_{DS}	Drain-source Voltage ($V_{GS} = 0$)	30	V
V_{DGR}	Drain- gate Voltage ($R_{GS} = 20 \text{ k}\Omega$)	30	V
V_{GS}	Gate-source Voltage	± 20	V
I_D	Drain Current (continuous) at $T_c = 25^\circ\text{C}$	8	A
I_D	Drain Current (continuous) at $T_c = 100^\circ\text{C}$	5	A
$I_{DM(\bullet)}$	Drain Current (pulsed)	32	A
P_{tot}	Total Dissipation at $T_c = 25^\circ\text{C}$	2.5	W

SCHOTTKY ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter		Value	Unit
V_{RRM}	Repetitive Peak Reverse Voltage		30	V
$I_{F(RMS)}$	RMS Forward Current		20	A
$I_{F(AV)}$	Average Forward Current	$T_L = 125^\circ\text{C}$ $\delta = 0.5$	3	A
I_{FSM}	Surge Non Repetitive Forward Current	$t_p = 10 \text{ ms}$ Sinusoidal	75	A
I_{RSM}	Non Repetitive Peak Reverse Current	$t_p = 100 \mu\text{s}$	1	A
dv/dt	Critical Rate Of Rise Of Reverse Voltage		10000	V/ μs

(●) Pulse width limited by safe operating area

STS8NFS30L

THERMAL DATA

$R_{thj-amb}$	(*) Thermal Resistance Junction-ambient MOSFET	50	$^{\circ}\text{C}/\text{W}$
$R_{thj-amb}$	(*) Thermal Resistance Junction-ambient SCHOTTKY	100	$^{\circ}\text{C}/\text{W}$
T_{stg}	Storage Temperature Range	-65 to 150	$^{\circ}\text{C}$
T_j	Junction Temperature	150	$^{\circ}\text{C}$
	(*) mounted on FR-4 board (steady state)		

MOSFET ELECTRICAL CHARACTERISTICS ($T_{case} = 25^{\circ}\text{C}$ unless otherwise specified)

OFF

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
$V_{(BR)DSS}$	Drain-source Breakdown Voltage	$I_D = 250\ \mu\text{A}$ $V_{GS} = 0$	30			V
I_{DSS}	Zero Gate Voltage Drain Current ($V_{GS} = 0$)	$V_{DS} = \text{Max Rating}$ $V_{DS} = \text{Max Rating}$ $T_c = 125^{\circ}\text{C}$			1 10	μA μA
I_{GSS}	Gate-body Leakage Current ($V_{DS} = 0$)	$V_{GS} = \pm 20\ \text{V}$			± 100	nA

ON (*)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS} = V_{GS}$ $I_D = 250\ \mu\text{A}$	1	1.6	2.5	V
$R_{DS(on)}$	Static Drain-source On Resistance	$V_{GS} = 10\text{V}$ $I_D = 4\ \text{A}$ $V_{GS} = 4.5\text{V}$ $I_D = 4\ \text{A}$		0.018 0.021	0.022 0.026	Ω Ω
$I_{D(on)}$	On State Drain Current	$V_{DS} > I_{D(on)} \times R_{DS(on)max}$ $V_{GS} = 10\ \text{V}$	8			A

DYNAMIC

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
g_{fs} (*)	Forward Transconductance	$V_{DS} > I_{D(on)} \times R_{DS(on)max}$ $I_D = 4\ \text{A}$		10		S
C_{iss}	Input Capacitance	$V_{DS} = 25\ \text{V}$ $f = 1\ \text{MHz}$ $V_{GS} = 0$		1050		pF
C_{oss}	Output Capacitance			250		pF
C_{rss}	Reverse Transfer Capacitance			85		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	$V_{DD} = 15\text{ V}$ $I_D = 4\text{ A}$ $R_G = 4.7\ \Omega$ $V_{GS} = 4.5\text{ V}$ (Resistive Load, see fig. 3)		22 60		ns ns
Q_g Q_{gs} Q_{gd}	Total Gate Charge Gate-Source Charge Gate-Drain Charge	$V_{DD} = 24\text{ V}$ $I_D = 8\text{ A}$ $V_{GS} = 4.5\text{ V}$		17.5 4 7	23	nC nC nC

SWITCHING OFF

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
$t_{d(off)}$ t_f	Turn-off Delay Time Fall Time	$V_{DD} = 15\text{ V}$ $I_D = 4\text{ A}$ $R_G = 4.7\ \Omega$ $V_{GS} = 4.5\text{ V}$ (Resistive Load, see fig. 3)		42 10		ns ns
$t_{r(voff)}$ t_f t_c	Off-voltage Rise Time Fall Time Cross-over Time	$V_{DD} = 24\text{ V}$ $I_D = 8\text{ A}$ $R_G = 4.7\ \Omega$ $V_{GS} = 4.5\text{ V}$ (Inductive Load, see fig. 5)		11 12 25		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)				8 32	A A
$V_{SD} (*)$	Forward On Voltage	$I_{SD} = 8\text{ A}$ $V_{GS} = 0$			2	V
t_{rr} Q_{rr} I_{RRM}	Reverse Recovery Time Reverse Recovery Charge Reverse Recovery Current	$I_{SD} = 8\text{ A}$ $di/dt = 100\text{ A}/\mu\text{s}$ $V_{DD} = 20\text{ V}$ $T_j = 150\text{ }^\circ\text{C}$ (see test circuit, figure 5)		50 40 1.6		ns nC A

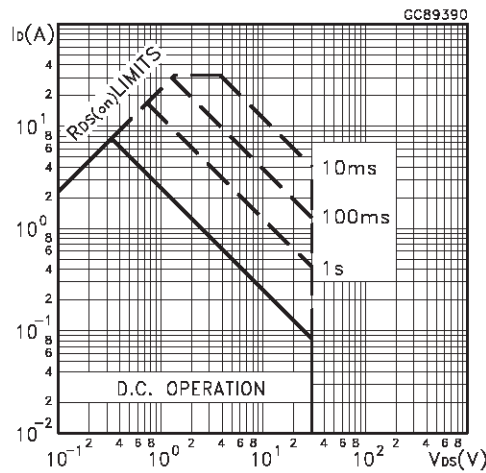
(*) Pulsed: Pulse duration = 300 μs , duty cycle 1.5 %

(\bullet) Pulse width limited by safe operating area

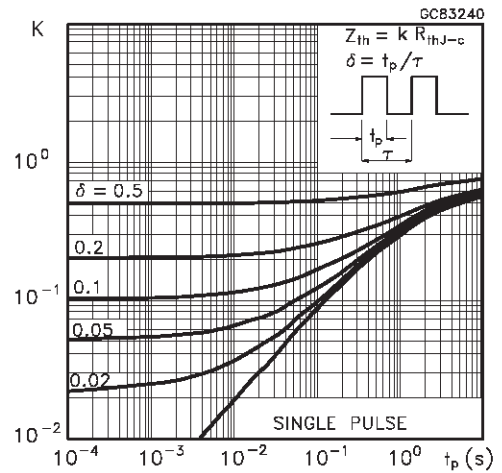
SCHOTTKY STATIC ELECTRICAL CHARACTERISTICS

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
$I_R (*)$	Reversed Leakage Current	$T_j = 25\text{ }^\circ\text{C}$ $V_R = 30\text{ V}$ $T_j = 125\text{ }^\circ\text{C}$ $V_R = 30\text{ V}$		0.03	0.2 100	mA mA
$V_F (*)$	Forward Voltage drop	$T_j = 25\text{ }^\circ\text{C}$ $I_F = 3\text{ A}$ $T_j = 125\text{ }^\circ\text{C}$ $I_F = 3\text{ A}$		0.38	0.51 0.46	V V

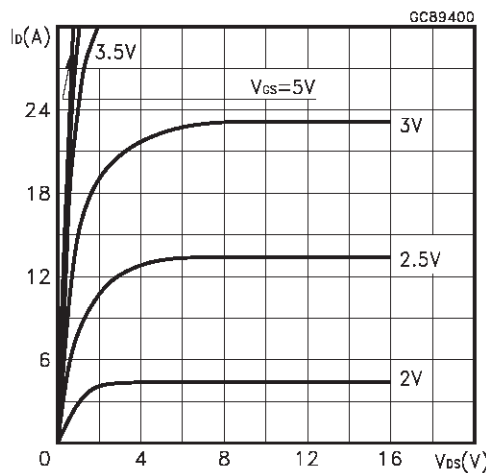
Safe Operating Area



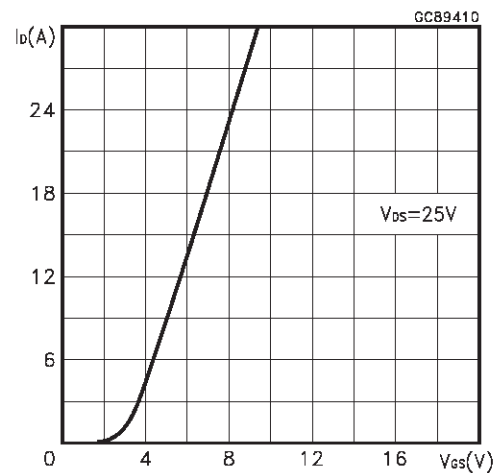
Thermal Impedance



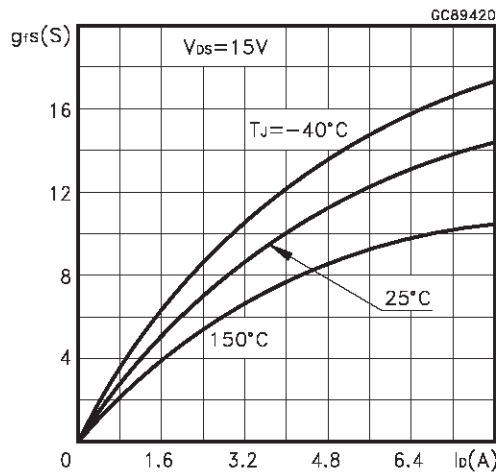
Output Characteristics



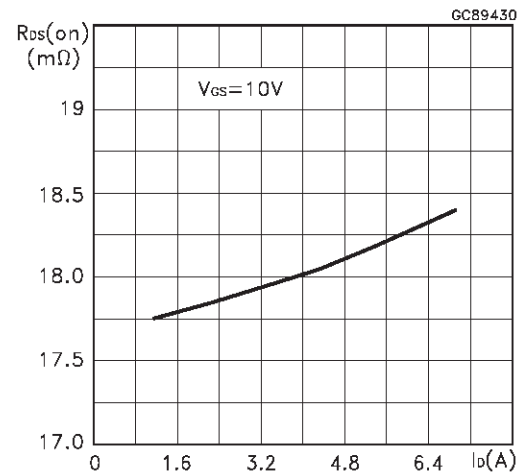
Transfer Characteristics



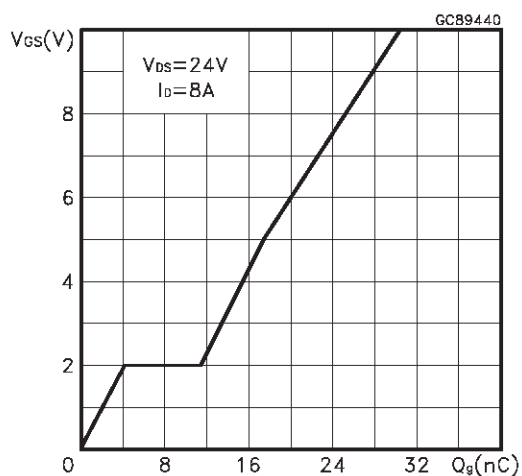
Transconductance



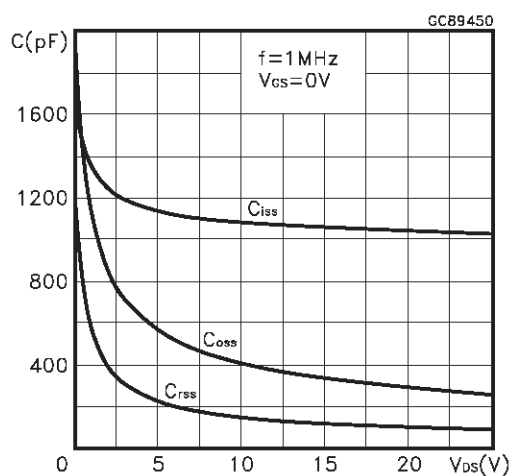
Static Drain-source On Resistance



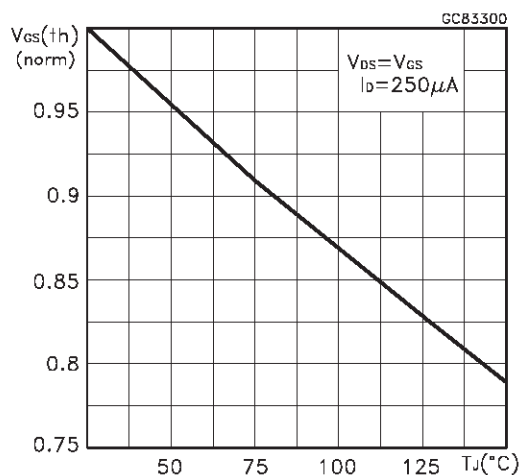
Gate Charge vs Gate-source Voltage



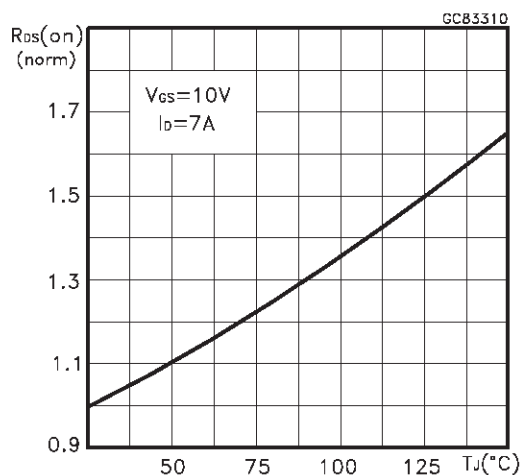
Capacitance Variations



Normalized Gate Threshold Voltage vs Temperature



Normalized On Resistance vs Temperature



Source-drain Diode Forward Characteristics

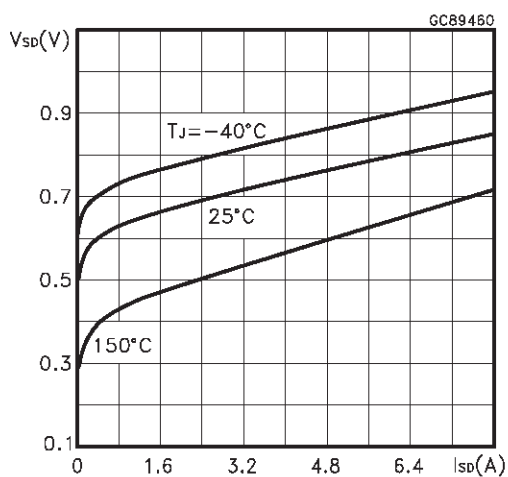


Fig. 2: Unclamped Inductive Waveform

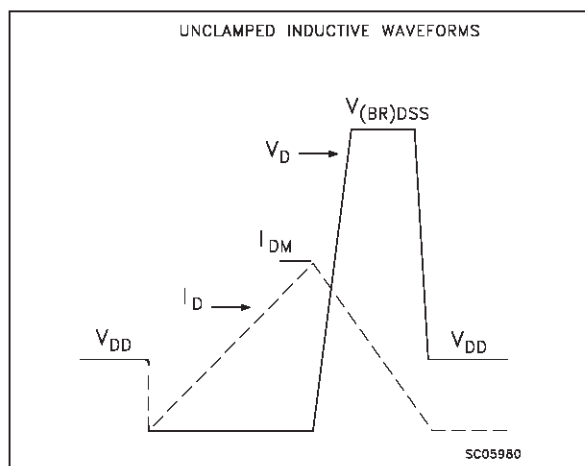
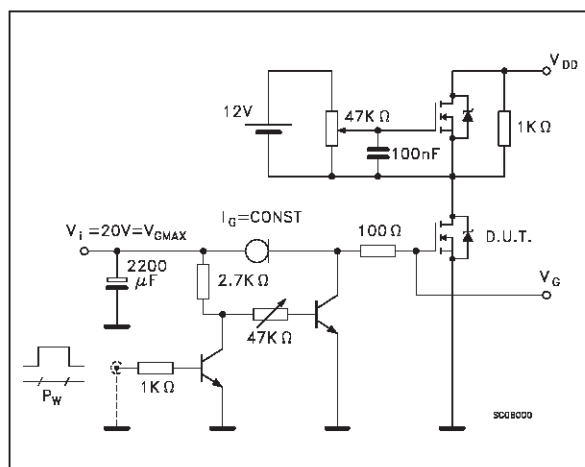
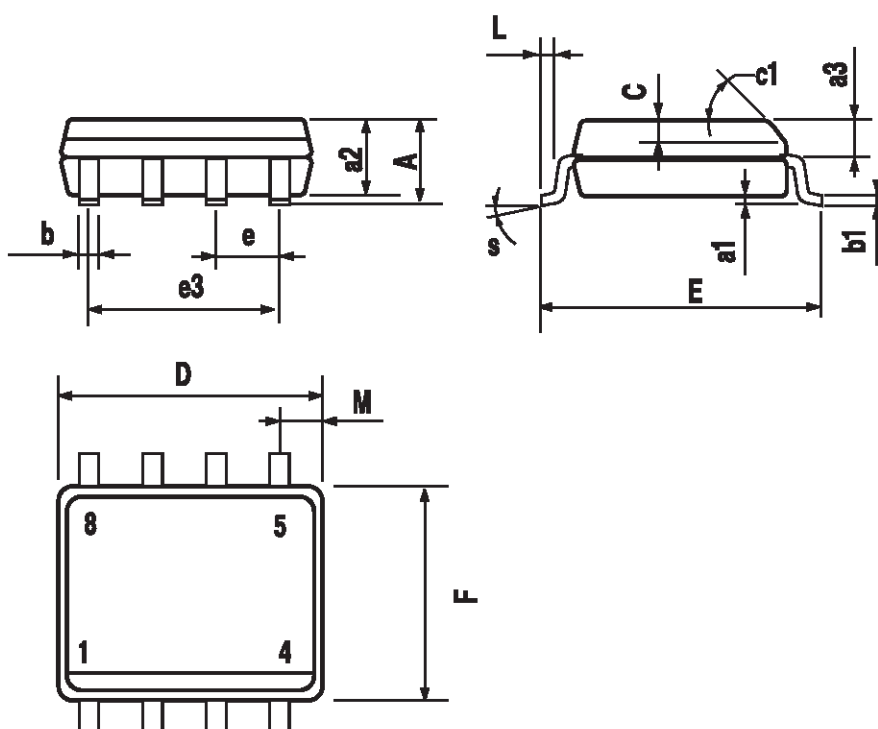


Fig. 4: Gate Charge test Circuit



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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