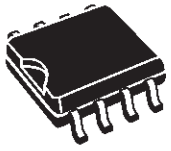
STS8NFS30L

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

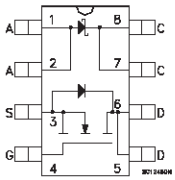
MAIN PRODUCT CHARACTERISTICS			
MOSFET	V_{DSS}	$R_{DS(on)}$	I_D
	30 V	<0.022 Ω	8 A
SCHOTTKY	$I_{F(AV)}$	V_{RRM}	$V_{F(MAX)}$
	3 A	30 V	0.51 V



SO-8

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.

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 kΩ)	30	V
V_{GS}	Gate-source Voltage	± 20	V
I_D	Drain Current (continuous) at T_c = 25 °C	8	A
I_D	Drain Current (continuous) at T_c = 100 °C	5	A
I_{DM}(•)	Drain Current (pulsed)	32	A
P_{tot}	Total Dissipation at T_c = 25 °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 °C δ =0.5	3	A
I_{FSM}	Surge Non Repetitive Forward Current	tp= 10 ms Sinusoidal	75	A
I_{RSM}	Non Repetitive Peak Reverse Current	tp=100 µs	1	A
dv/dt	Critical Rate Of Rise Of Reverse Voltage		10000	V/µs

(•) Pulse width limited by safe operating area

THERMAL DATA

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

MOSFET 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-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	1.6	2.5	V
$R_{DS(on)}$	Static Drain-source On Resistance	V_{GS} = 10V I_D = 4 A V_{GS} = 4.5V I_D = 4 A		0.018 0.021	0.022 0.026	Ω Ω
$I_{D(on)}$	On State Drain Current	V_{DS} > $I_{D(on)}$ x $R_{DS(on)max}$ V_{GS} = 10 V	8			A

DYNAMIC

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
g_{fs} (*)	Forward Transconductance	V_{DS} > $I_{D(on)}$ x $R_{DS(on)max}$ I_D =4 A		10		S
C_{iss} C_{oss} C_{rss}	Input Capacitance Output Capacitance Reverse Transfer Capacitance	V_{DS} = 25 V f = 1 MHz V_{GS} = 0		1050 250 85		pF pF 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 V I_D = 4 A R_G = 4.7 Ω V_{GS} = 4.5 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 V I_D = 8 A V_{GS} = 4.5 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 V I_D = 4 A R_G = 4.7 Ω V_{GS} = 4.5 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 V I_D = 8 A R_G = 4.7 Ω V_{GS} = 4.5 V (Inductive Load, see fig. 5)		11 12 25		ns ns ns

SOURCE DRAIN DIODE

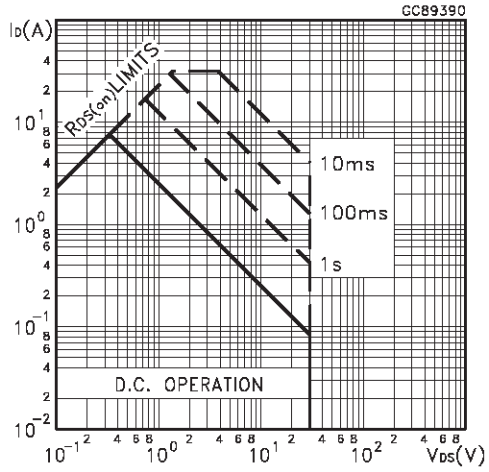
Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
I_{SD} I_{SDM}(•)	Source-drain Current Source-drain Current (pulsed)				8 32	A A
V_{SD} (*)	Forward On Voltage	I_{SD} = 8 A V_{GS} = 0			2	V
t_{rr} Q_{rr} I_{RRM}	Reverse Recovery Time Reverse Recovery Charge Reverse Recovery Current	I_{SD} = 8 A di/dt = 100 A/µs V_{DD} = 20 V T_j = 150 °C (see test circuit, figure 5)		50 40 1.6		ns nC A

(*) Pulsed: Pulse duration = 300 µs, duty cycle 1.5 %
(•) Pulse width limited by safe operating area

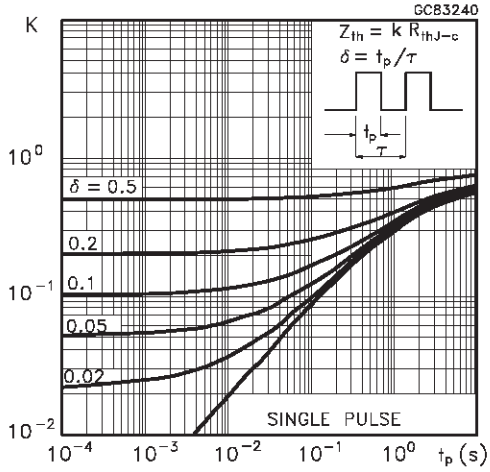
SCHOTTCKY STATIC ELETTRICAL CHARACTERISTICS

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
I_R(*)	Reversed Leakage Current	T_J= 25 °C V_R=30V T_J= 125 °C V_R=30V		 0.03	0.2 100	mA mA
V_F(*)	Forward Voltage drop	T_J= 25 °C I_F=3A T_J= 125 °C I_F=3A		 0.38	0.51 0.46	V V

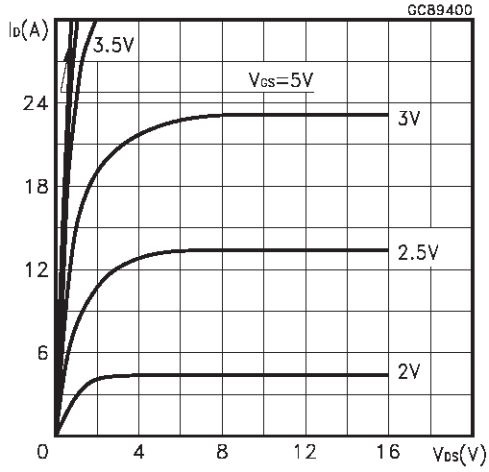
Safe Operating Area



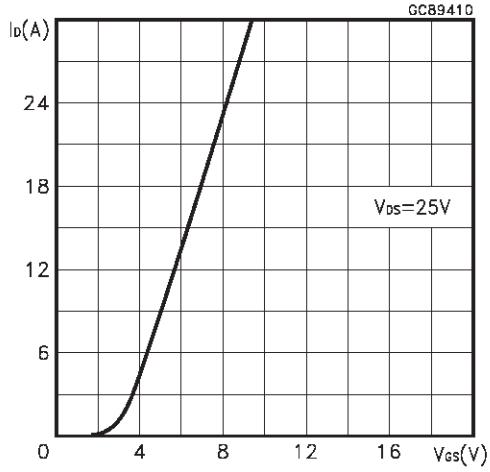
Thermal Impedance



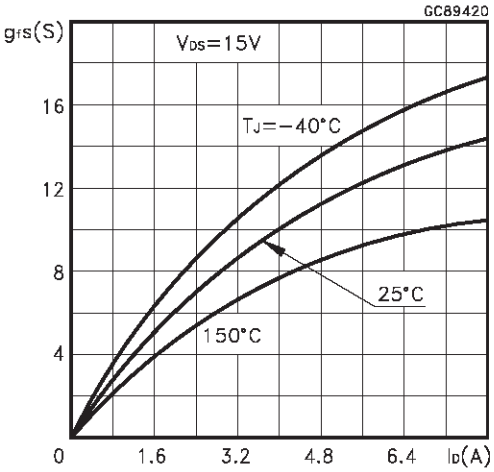
Output Characteristics



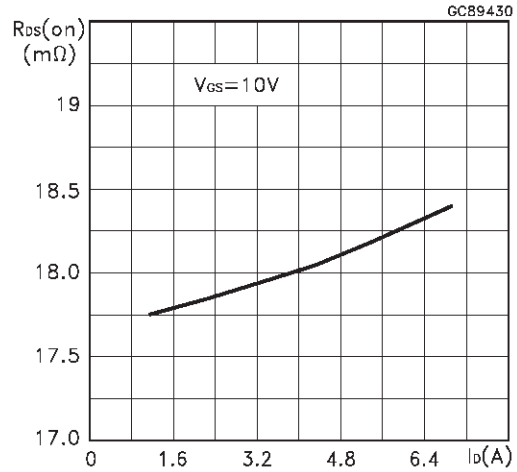
Transfer Characteristics



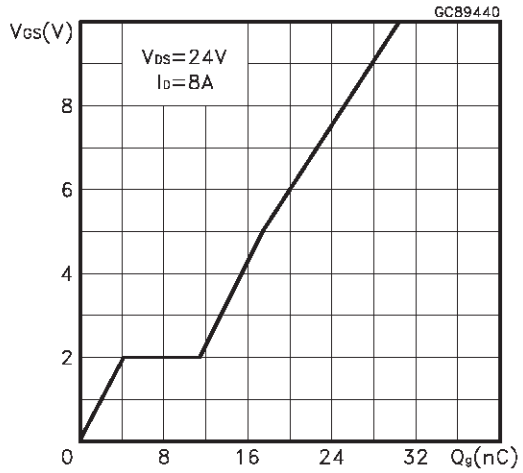
Transconductance



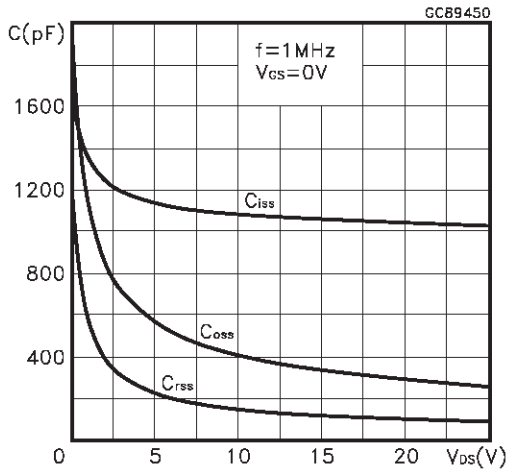
Static Drain-source On Resistance



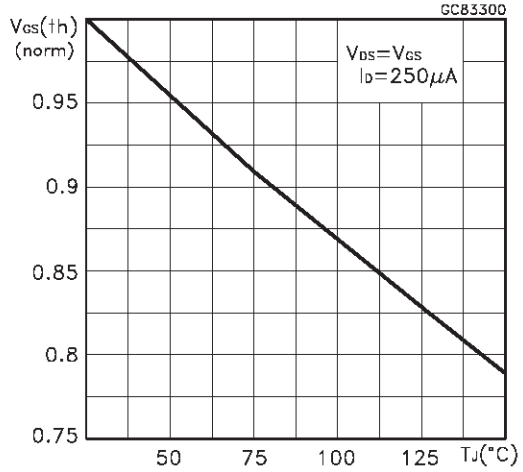
Gate Charge vs Gate-source Voltage



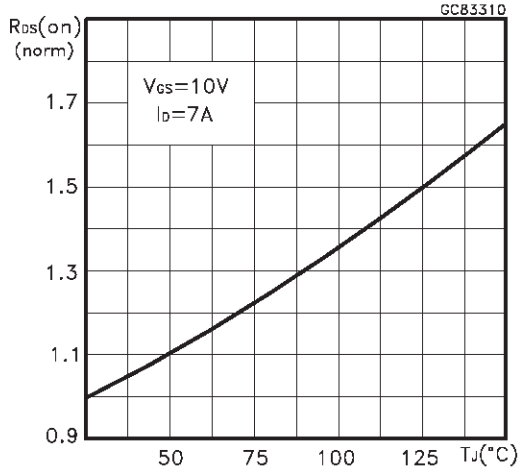
Capacitance Variations



Normalized Gate Threshold Voltage vs Temperature



Normalized On Resistance vs Temperature



Source-drain Diode Forward Characteristics

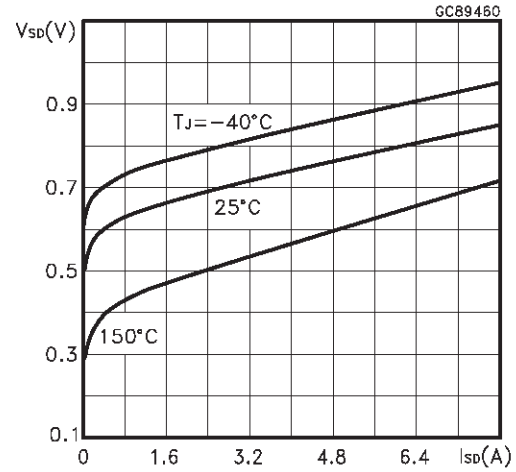


Fig. 1: Unclamped Inductive Load Test Circuit

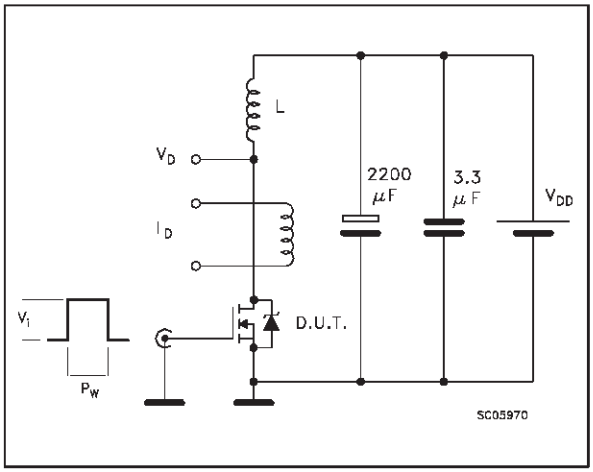


Fig. 2: Unclamped Inductive Waveform

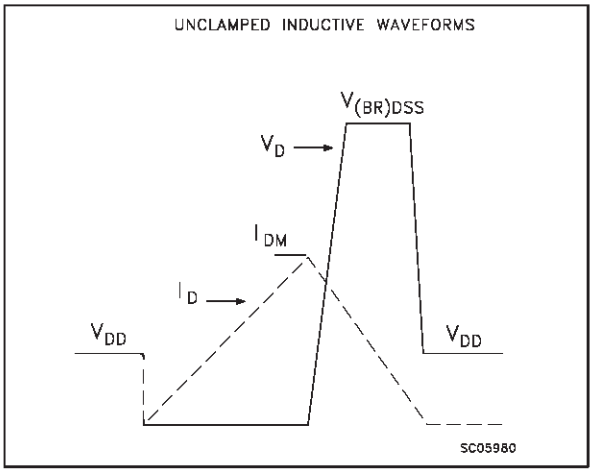


Fig. 3: Switching Times Test Circuits For Resistive Load

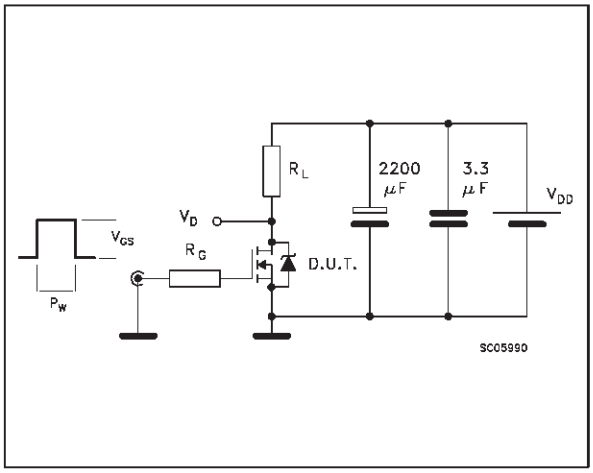


Fig. 4: Gate Charge test Circuit

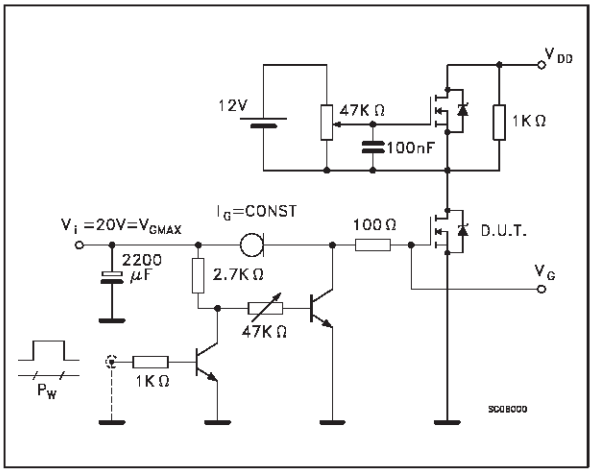
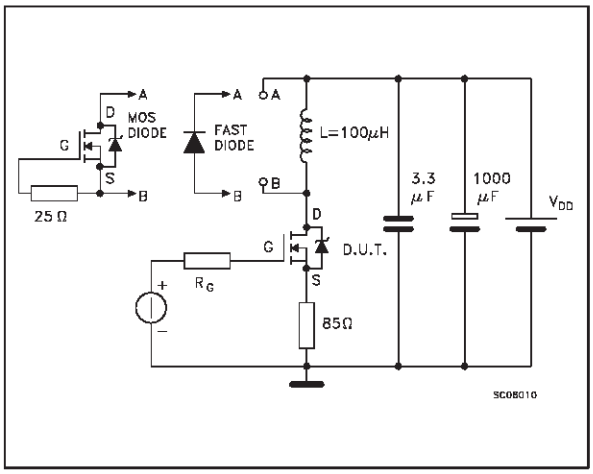
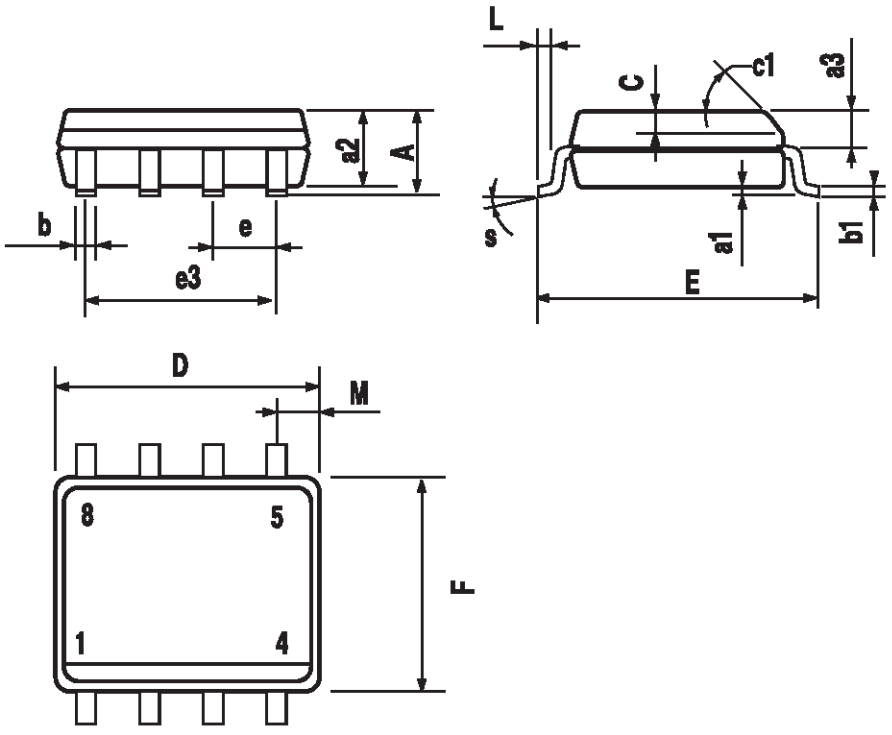


Fig. 5: Test Circuit For Inductive Load Switching And Diode Recovery Times



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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