



STS3DPFS45

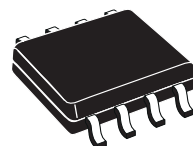
P-CHANNEL 45V - 0.080 Ω - 3A SO-8 STripFET™ MOSFET PLUS SCHOTTKY RECTIFIER

MAIN PRODUCT CHARACTERISTICS

MOSFET	V _{DSS}	R _{DS(on)}	I _D
	45 V	< 0.11 Ω	3 A
SCHOTTKY	I _{F(AV)}	V _{RRM}	V _{F(MAX)}
	3 A	45 V	0.51 V

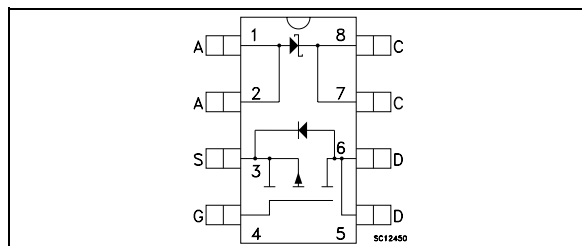
DESCRIPTION

This product associates the latest low voltage StripFETœ in p-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.



SO-8

INTERNAL SCHEMATIC DIAGRAM



MOSFET ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value	Unit
V _{DS}	Dain-source Voltage (V _{GS} = 0)	45	V
V _{DGR}	Drain-gate Voltage (R _{GS} = 20 k Ω)	45	V
V _{GS}	Gate- source Voltage	± 16	V
I _D	Drain Current (continuos) at T _C = 25°C	3	A
I _D	Drain Current (continuos) at T _C = 100°C	1.9	A
I _{DM} (•)	Drain Current (pulsed)	12	A
P _{tot}	Total Dissipation at T _C = 25°C	2	W

SCHOTTKY ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter		Value	Unit
V _{RRM}	Repetitive Peak Reverse Voltage		45	V
I _{F(RMS)}	RMS Forward Curren		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 _{RRM}	Repetitive Peak Reverse Current	tp=2 μ s F=1 kHz	1	A
I _{RSM}	Non Repetitive Peak Reverse Current	tp=100 μ s	1	A
dv/dt	Critical Rate Of Rise Of Reverse Voltage		10000	V/ μ s

(•) Pulse width limited by safe operating area

Note: For the P-CHANNEL MOSFET actual polarity of voltages and current has to be reversed

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TERMAL DATA

Rthj-amb	Thermal Resistance Junction-ambient MOSFET	62.5	°C/W
Rthj-amb	Thermal Resistance Junction-ambient SCHOTTKY	100	°C/W
T _{stg}	Storage Temperature Range	-65 to 150	°C
T _j	Maximum Lead Temperature For Soldering Purpose	150	°C

(*) Mounted on Fr-4 board (Steady State)

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	45			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} = ± 16 V			±100	nA

ON (1)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
V _{GS(th)}	Gate Threshold Voltage	V _{DS} = V _{GS} I _D = 250 µA	2	3	4	V
R _{DS(on)}	Static Drain-source On Resistance	V _{GS} = 10 V I _D = 1.5 A		0.080	0.11	Ω
I _{D(on)}	On State Drain Current	V _{GS} = 10 V	3			A

SCHOTTKY STATIC ELECTRICAL CHARACTERISTICS

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
I _R (*)	Reversed Leakage Current	T _J = 25 °C V _R = 45 V T _J = 125 °C V _R = 45 V		0.03	0.2 100	mA mA
V _F (*)	Forward Voltage drop	T _J = 25 °C I _F = 3 A T _J = 125 °C I _F = 3 A		0.42	0.51 0.46	mA mA

DYNAMIC

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
g _{fs} (*)	Forward Transconductance	V _{DS} > I _{D(on)} × R _{DS(on)} max I _D = 1.5A		4		S
C _{iss}	Input Capacitance	V _{DS} = 25V, f = 1 MHz, V _{GS} = 0		1190		pF
C _{oss}	Output Capacitance			200		pF
C _{rss}	Reverse Transfer Capacitance			56		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	$V_{DD} = 20\text{ V}$ $I_D = 1.5\text{ A}$ $R_G = 4.7\ \Omega$ $V_{GS} = 10\text{ V}$ (Resistive Load, Figure 3)		20 25		ns ns
Q_g Q_{gs} Q_{gd}	Total Gate Charge Gate-Source Charge Gate-Drain Charge	$V_{DD} = 20\text{ V}$ $I_D = 3\text{ A}$ $V_{GS} = 10\text{ V}$		24.5 4 5.5	33	nC nC nC

SWITCHING OFF

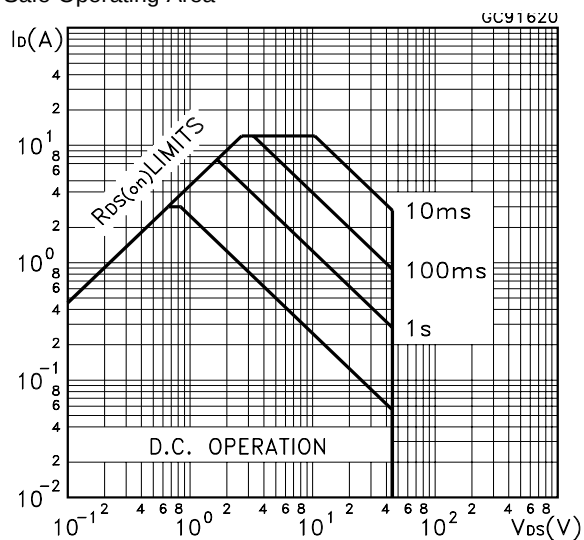
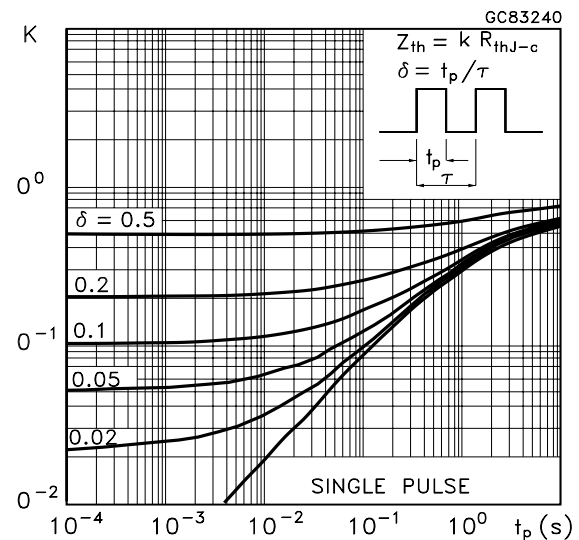
Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
$t_{d(off)}$ t_f	Turn-off Delay Time Fall Time	$V_{DD} = 20\text{ V}$ $I_D = 1.5\text{ A}$ $R_G = 4.7\ \Omega$, $V_{GS} = 10\text{ V}$ (Resistive Load, Figure 3)		100 22		ns ns
$t_{d(off)}$ t_f t_c	Turn-off Delay Time Fall Time Cross-over Time	$V_{clamp} = 32\text{ V}$ $I_D = 3\text{ A}$ $R_G = 4.7\ \Omega$, $V_{GS} = 10\text{ V}$		95 11 35		ns ns ns

SOURCE DRAIN DIODE

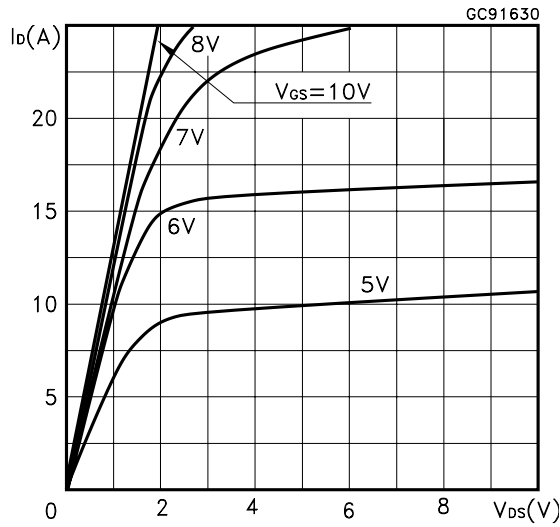
Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
I_{SD} $I_{SDM}(\bullet)$	Source-drain Current Source-drain Current (pulsed)				3 12	A A
V_{SD}^*	Forward On Voltage	$I_{SD} = 3\text{ A}$ $V_{GS} = 0$			2	V
t_{rr} Q_{rr} I_{RRM}	Reverse Recovery Time Reverse Recovery Charge Reverse Recovery Current	$I_{SD} = 3\text{ A}$ $di/dt = 100\text{ A}/\mu\text{s}$ $V_{DD} = 15\text{ V}$ $T_j = 150^\circ\text{C}$ (see test circuit, Figure 5)		40 85 3.8		ns nC A

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

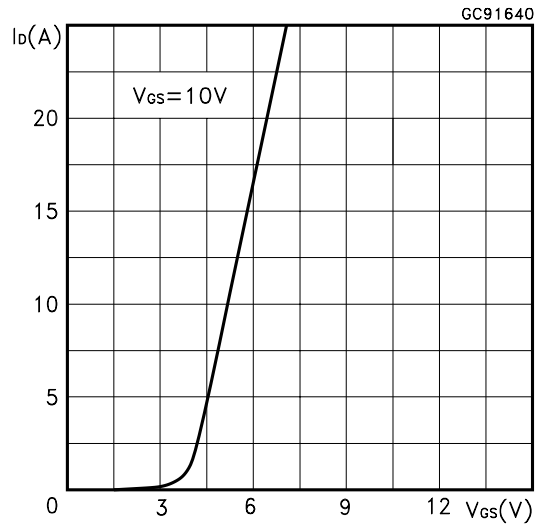
(•)Pulse width limited by safe operating area.

Safe Operating Area**Thermal Impedance**

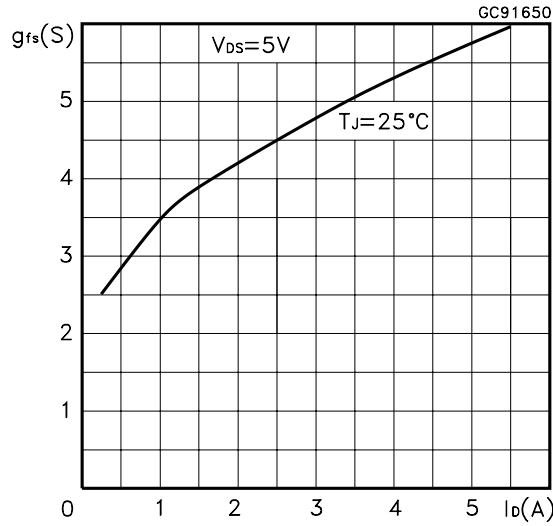
Output Characteristics



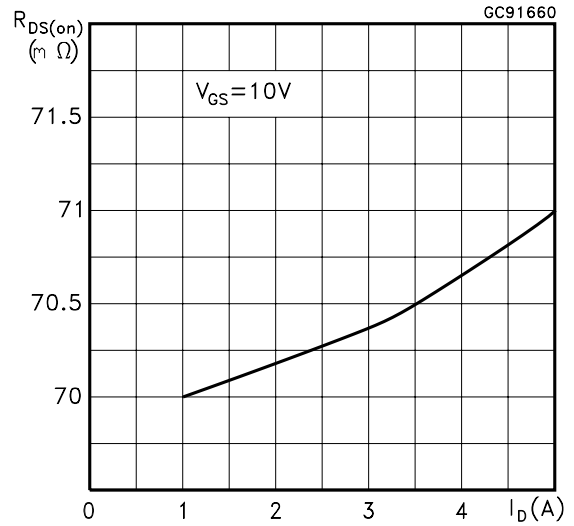
Transfer Characteristics



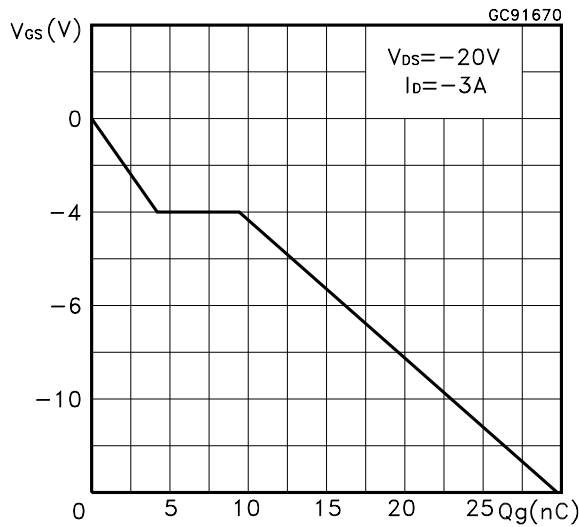
Transconductance



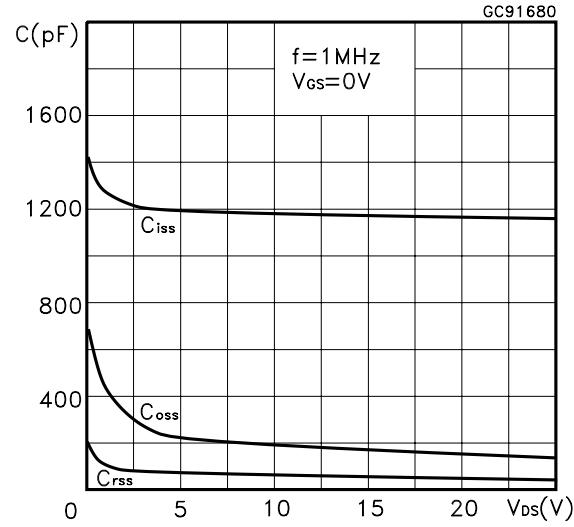
Static Drain-source On Resistance



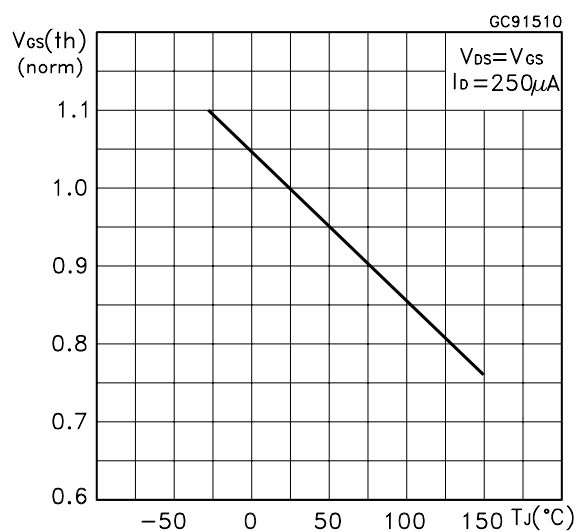
Gate Charge vs Gate-source Voltage



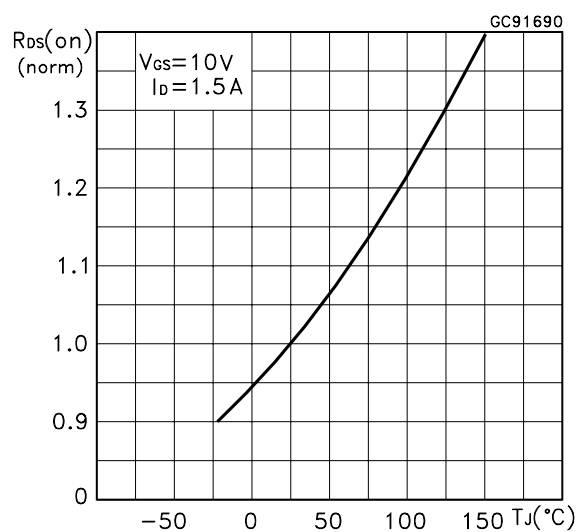
Capacitance Variations



Normalized Gate Threshold Voltage vs Temperature



Normalized on Resistance vs Temperature



Source-drain Diode Forward Characteristics

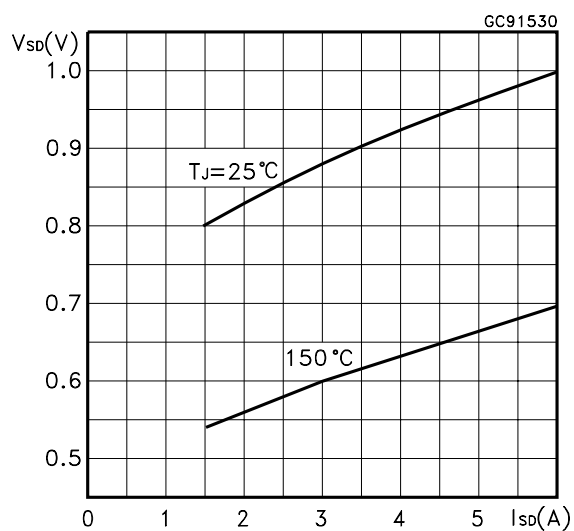


Fig. 1: Unclamped Inductive Load Test Circuit

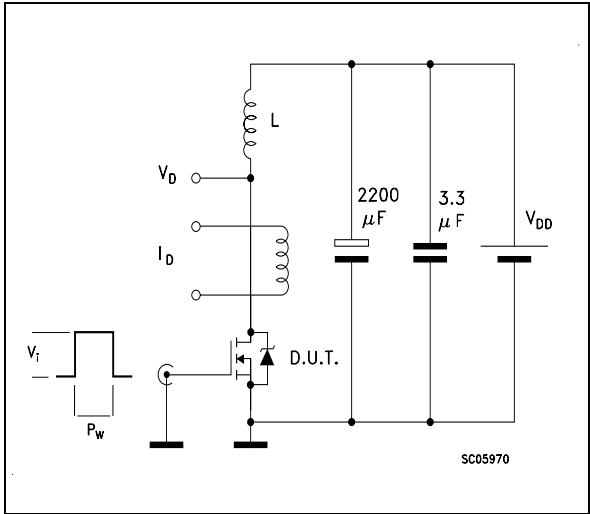


Fig. 2: Unclamped Inductive Waveform

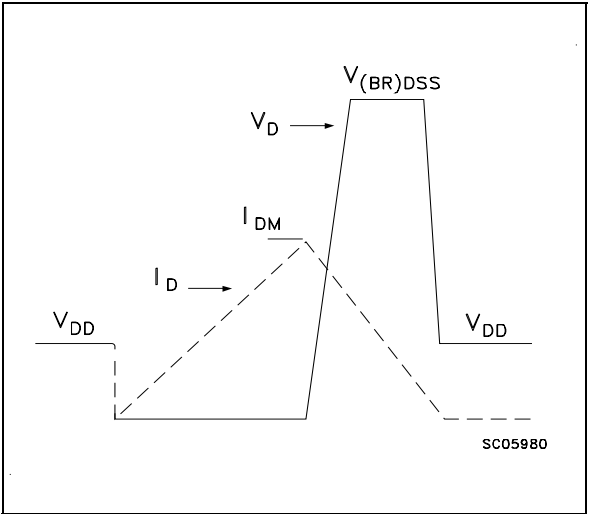


Fig. 3: Switching Times Test Circuits For Resistive Load

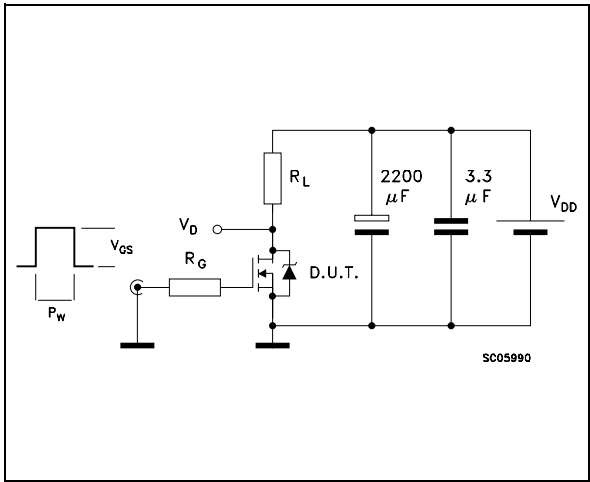


Fig. 4: Gate Charge test Circuit

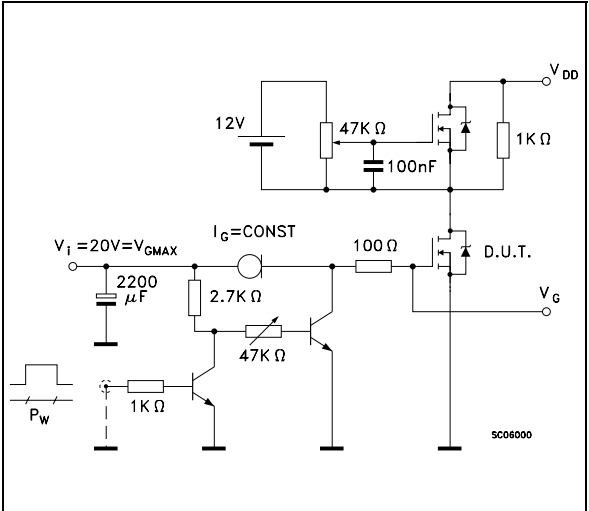
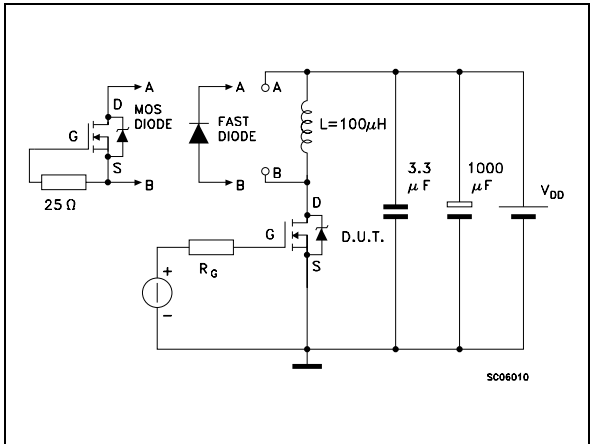
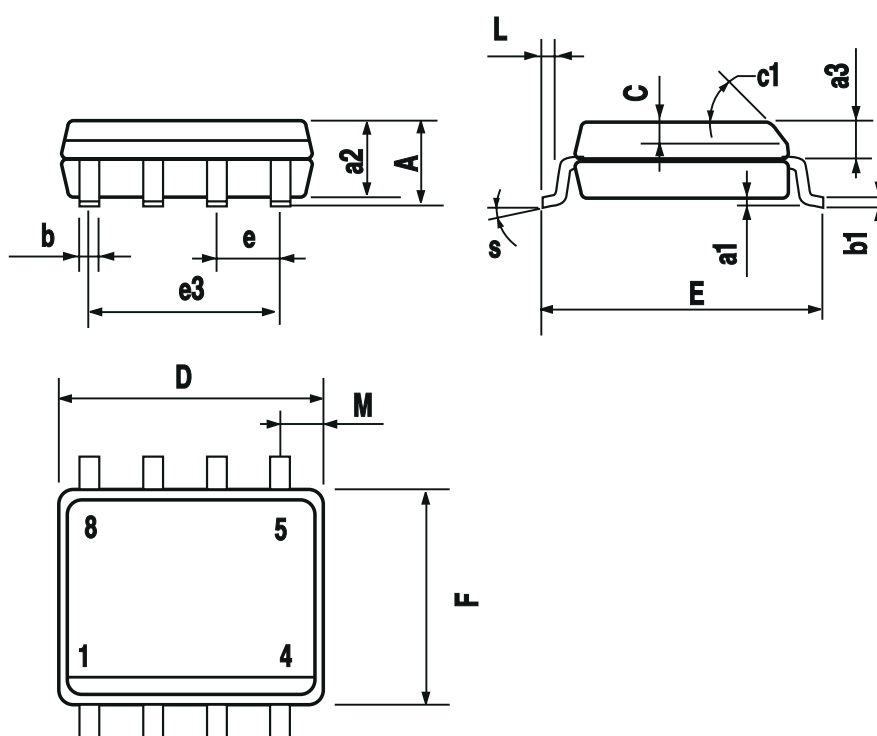


Fig. 5: Test Circuit For Inductive Load Switching And Diode Recovery Times



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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