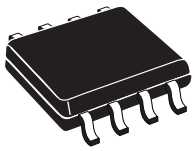
STS2DPFS20V

P-CHANNEL 20V - 0.14 Ω - 2.5A SO-8
2.7V-DRIVE STripFET™ II MOSFET PLUS SCHOTTKY DIODE

MAIN PRODUCT CHARACTERISTICS			
MOSFET	V_{DSS}	$R_{DS(on)}$	I_D
	20 V	< 0.20Ω (@4.5V) < 0.25Ω (@2.7V)	2.5 A
SCHOTTKY	$I_{F(AV)}$	V_{RRM}	$V_{F(MAX)}$
	3 A	30 V	0.51 V

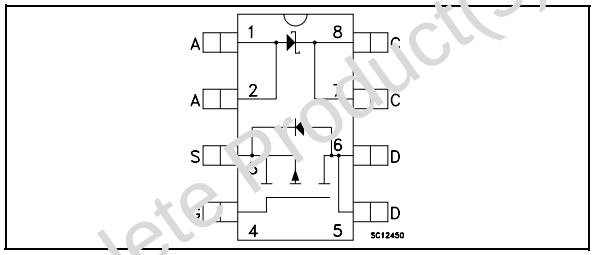


SO-8

DESCRIPTION

This product associates the latest low voltage 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.

INTERNAL SCHEMATIC DIAGRAM



Obsolete Product(s) - Obsolete Product(s)

MOSFET ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value	Unit
V_{DS}	Dain-source Voltage (V_{GS} = 0)	20	V
V_{DGR}	Drain-gate Voltage (R_{GS} = 20 kW)	20	V
V_{GS}	Gate- source Voltage	± 12	V
I_D	Drain Current (continuous) at T_C = 25°C	2.5	A
I_D	Drain Current (continuous) at T_C = 100°C	1.58	A
I_{DM}(•)	Drain Current (pulsed)	10	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		30	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_{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

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

TERMAL DATA

Rthj-amb	(*)Thermal Resistance Junction-ambient MOSFET	62.5	°C/W
Rthj-amb	(*)Thermal Resistance Junction-ambient SCHOTTKY MAX	100	°C/W
T_{stg}	Storage Temperature Range	-55 to 150	°C
T_j	Maximum Lead Temperature For Soldering Purpose	150	°C

(*) When Mounted on 1 inch² FR-4 board, 2 oz of Cu and t ≤ 10 sec

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	20			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} = ± 12 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	0.6			V
$R_{DS(on)}$	Static Drain-source On Resistance	V_{GS} = 4.5 V I_D = 1 A V_{GS} = 2.7 V I_D = 1 A		0.14 0.20	0.20 0.25	Ω Ω

SCHOTTCKY STATIC ELECTRICAL CHARACTERISTICS

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
I_R(*)	Reversed Leakage Current	T_J= 25 °C V_R= 30 V T_J= 125 °C V_R= 30 V		 30	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		 0.40	0.51 0.46	mA mA

DYNAMIC

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
g_{fs} (*)	Forward Transconductance	V_{DS}= 15 V I_D=1 A		4		S
C_{iss} C_{oss} C_{rss}	Input Capacitance Output Capacitance Reverse Transfer Capacitance	V_{DS} = 15V, f = 1 MHz, V_{GS} = 0		315 87 17		pF pF pF

Obsolete Product(s) Obsolete Product(s)

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} = 10 V I_D = 1 A R_G = 4.7 Ω V_{GS} = 4.5 V (Resistive Load, Figure 3)		38 30		ns ns
Q_g Q_{gs} Q_{gd}	Total Gate Charge Gate-Source Charge Gate-Drain Charge	V_{DD}= 10V I_D= 2A V_{GS}=4.5V		3.5 0.34 0.8	4.7	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} = 10 V I_D = 1 A R_G = 4.7Ω, V_{GS} = 4.5 V (Resistive Load, Figure 3)		45 11		ns ns

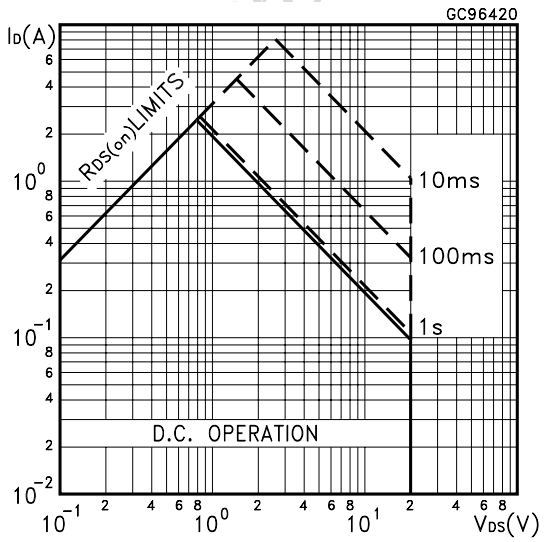
SOURCE DRAIN DIODE

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
I_{SD} I_{SDM} (•)	Source-drain Current Source-drain Current (pulsed)				2 10	A A
V_{SD} (*)	Forward On Voltage	I_{SD} = 2 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 A di/dt = 100A/µs V_{DD} = 10 V T_j = 150°C (see test circuit, Figure 5)		15 7.5 1		ns nC A

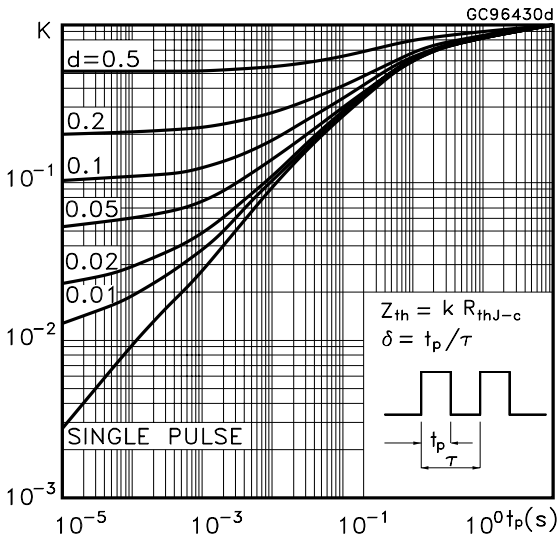
(*)Pulsed: Pulse duration = 300 µs, duty cycle 1.5 %.
(•)Pulse width limited by safe operating area.

Obsolete Product(s) - Obsolete Product(s)

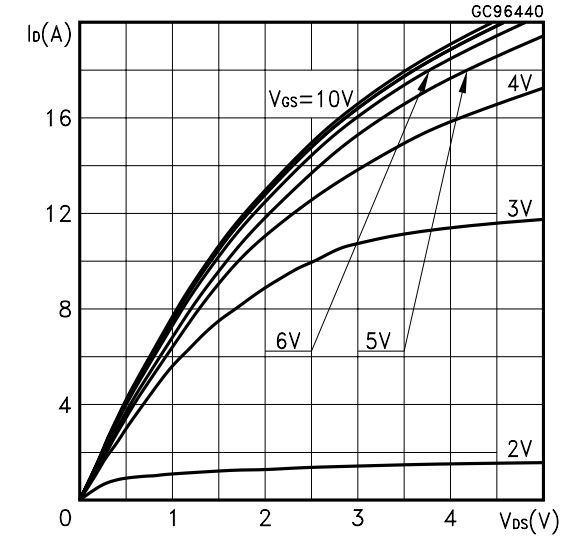
Safe Operating Area



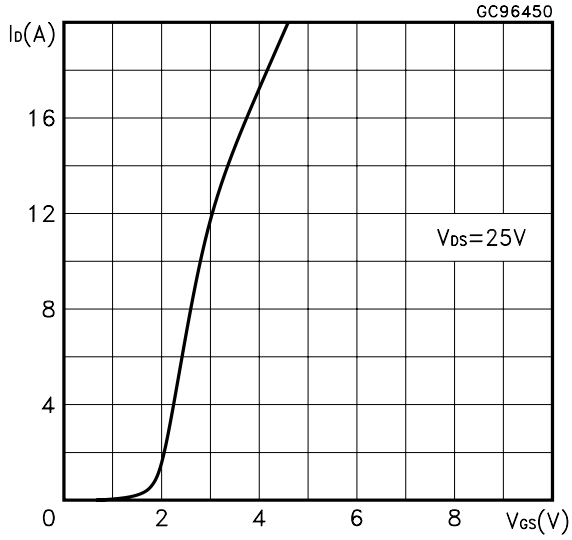
Thermal Impedance



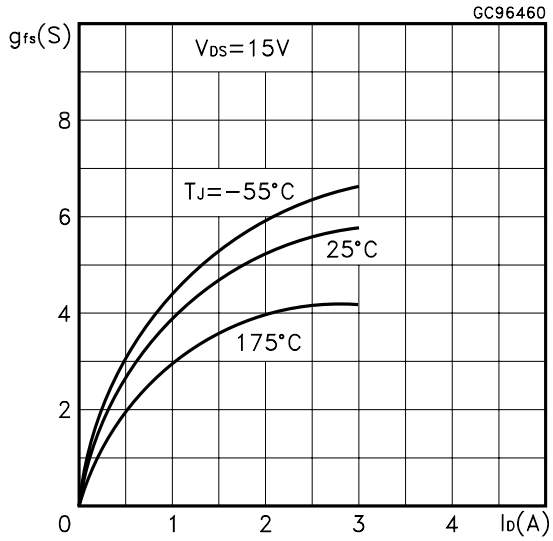
Output Characteristics



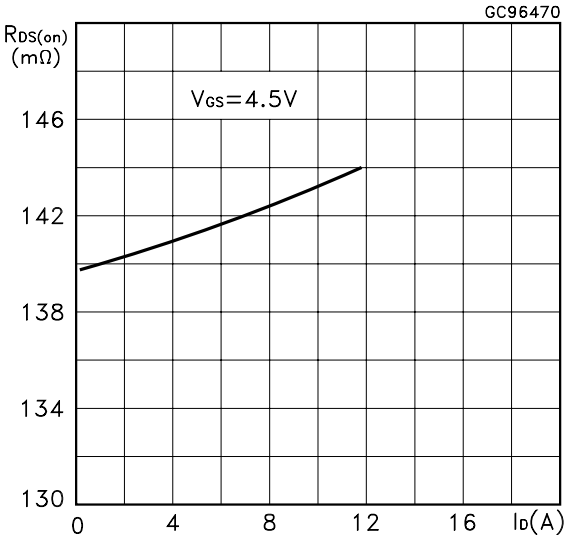
Transfer Characteristics



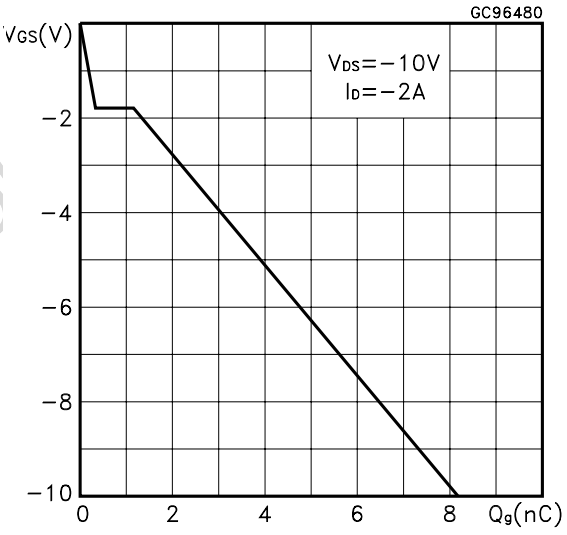
Transconductance



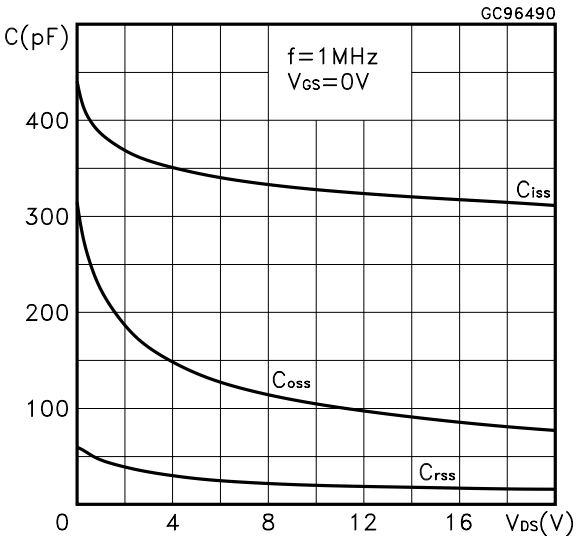
Static Drain-source On Resistance



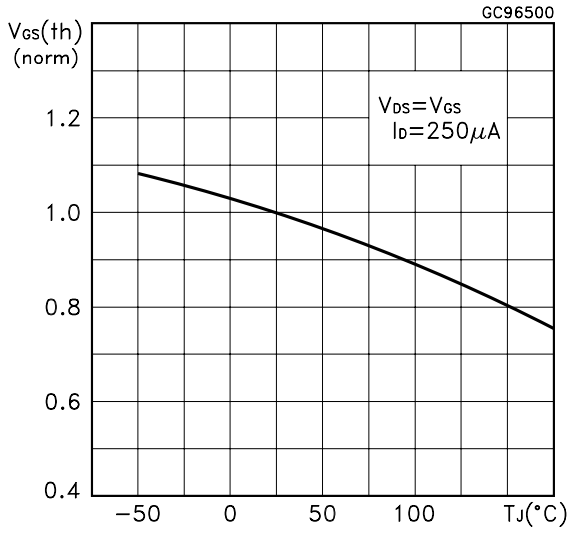
Gate Charge vs Gate-source Voltage



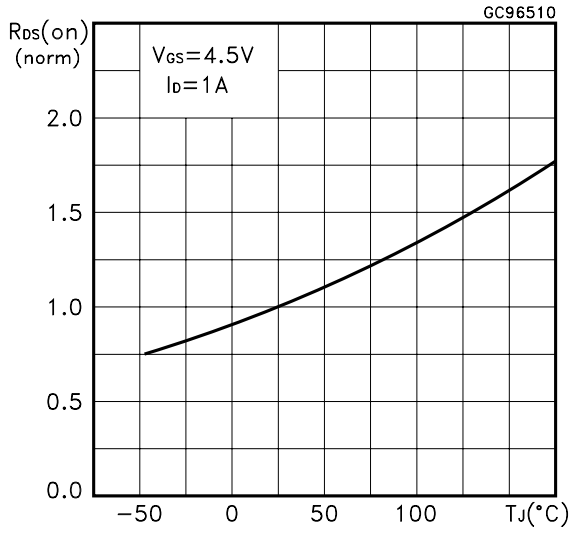
Capacitance Variations



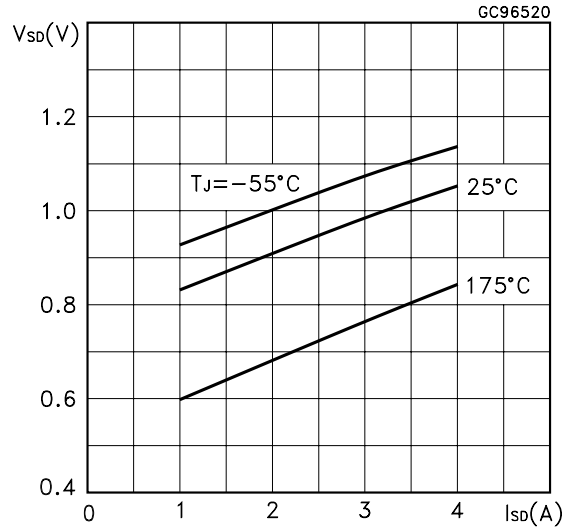
Normalized Gate Threshold Voltage vs Temperature



Normalized on Resistance vs Temperature



Source-drain Diode Forward Characteristics



Normalized Breakdown Voltage vs Temperature.

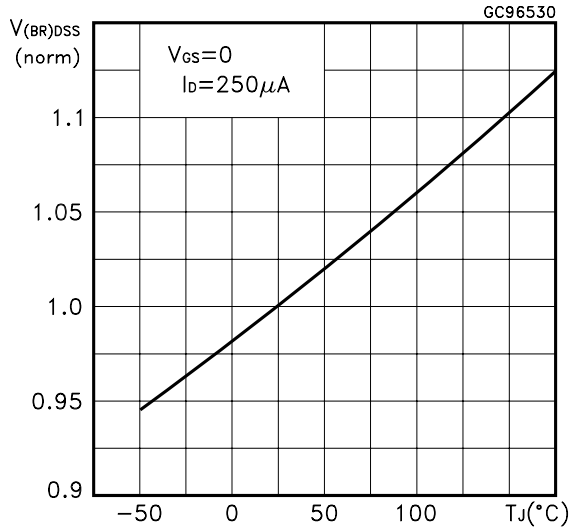


Fig. 1: Unclamped Inductive Load Test Circuit

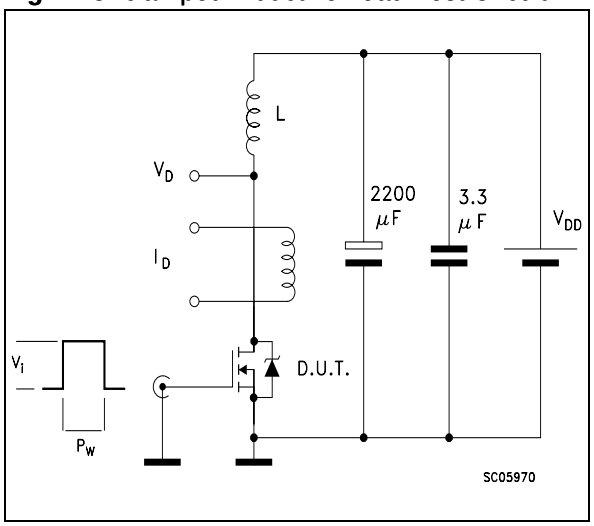


Fig. 2: Unclamped Inductive Waveform

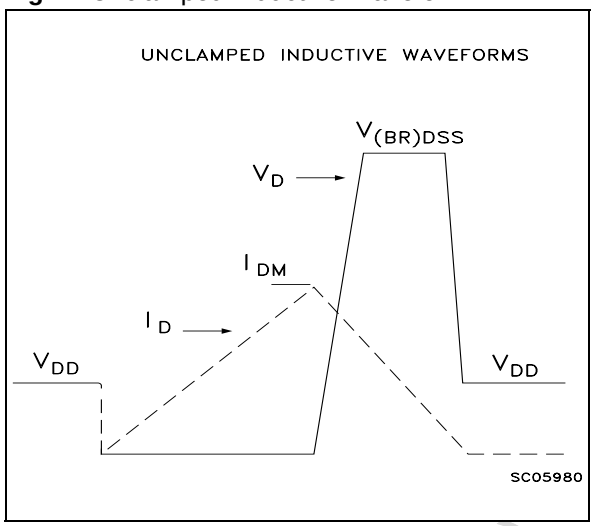


Fig. 3: Switching Times Test Circuits For Resistive Load

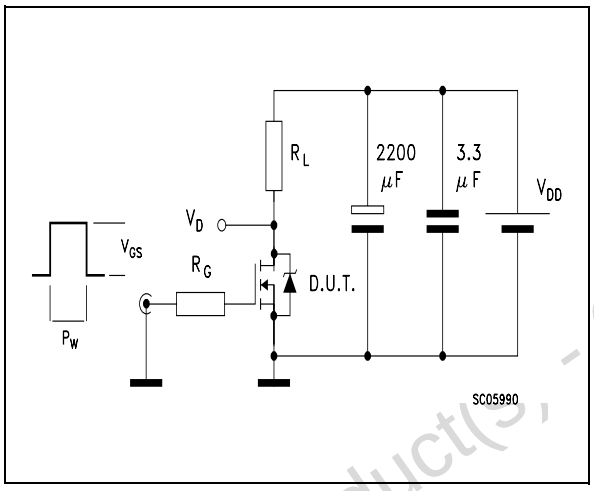


Fig. 4: Gate Charge test Circuit

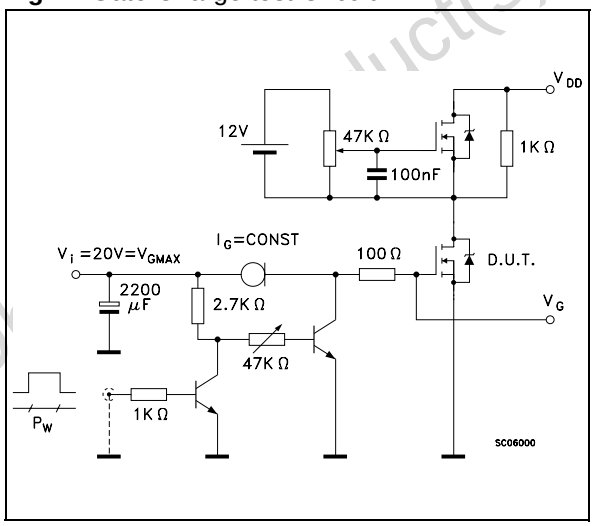
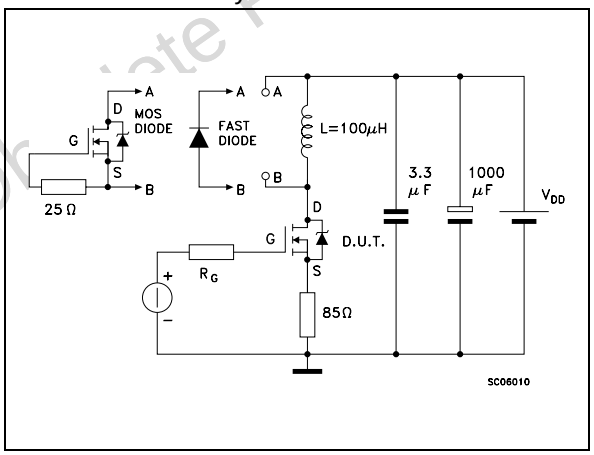


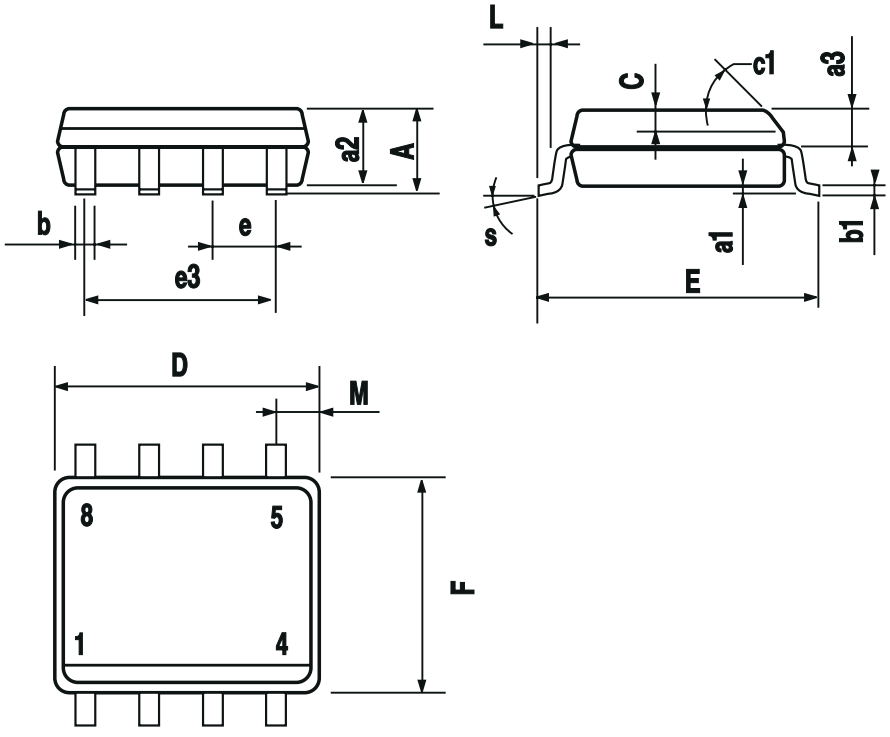
Fig. 5: Test Circuit For Inductive Load Switching And Diode Recovery Times



Obsolete Product(s) - Obsolete Product(s)

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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