



STT5NF30L

N-CHANNEL 30V - 0.039Ω - 4A SOT23-6L STripFET™II POWER MOSFET

TYPE	V _{DSS}	R _{DS(on)}	I _D
STT5NF30L	30 V	< 0.050 Ω (@ 10V)	4 A

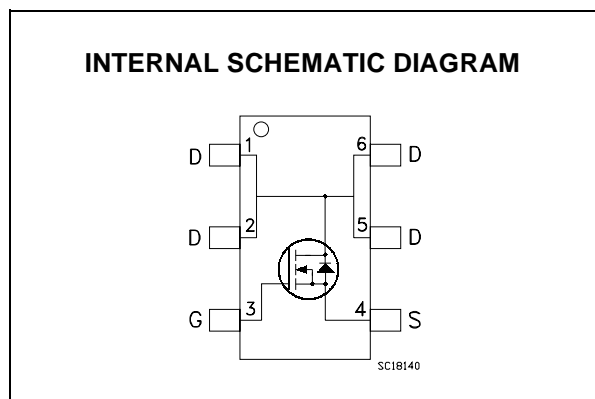
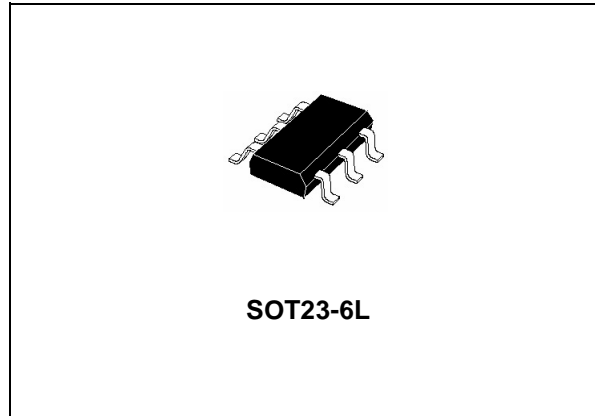
- TYPICAL R_{DS(on)} = 0.039Ω @10V
- LOW Q_g
- LOW THRESHOLD DRIVE

DESCRIPTION

This Power MOSFET is the second generation 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-DC CONVERTERS
- POWER MANAGEMENT IN PORTABLE/DESKTOP PCs
- SYNCHRONOUS RECTIFICATION
- DC MOTOR CONTROL (DISK DRIVERS, etc)



ORDERING INFORMATION

SALES TYPE	MARKING	PACKAGE	PACKAGING
STT5NF30L	STFN	SOT23-6L	TAPE & REEL

STT5NF30L

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	± 16	V
I _D	Drain Current (continuous) at T _C = 25°C	4	A
I _D	Drain Current (continuous) at T _C = 100°C	2.5	A
I _{DM} (•)	Drain Current (pulsed)	16	A
P _{TOT}	Total Dissipation at T _C = 25°C	1.6	W
E _{AS} (1)	Single Pulse Avalanche Energy	50	mJ

(•)Pulse width limited by safe operating area

(1) Starting T_J = 25°C, I_D = 2 A, V_{DD} = 15V.

THERMAL DATA

Symbol	Parameter	Max	Value	Unit
R _{thj-amb}	Thermal Resistance Junction-ambient		78	°C/W
T _I	Max. Operating Junction Temperature		- 55 to 150	°C
T _{stg}	Storage Temperature		- 55 to 150	°C

ON/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			1	μA
		V _{DS} = Max Rating, T _C = 125°C			10	μA
I _{GSS}	Gate-body Leakage Current (V _{DS} = 0)	V _{GS} = ± 16V			±100	μA
V _{GS(th)}	Gate Threshold Voltage	V _{DS} = V _{GS} , I _D = 250 μA	1			V
R _{DS(on)}	Static Drain-source On Resistance	V _{GS} = 10 V, I _D = 2 A		0.039	0.050	Ω
		V _{GS} = 5 V, I _D = 2 A		0.046	0.060	Ω

ELECTRICAL CHARACTERISTICS ($T_{CASE} = 25\text{ }^{\circ}\text{C}$ UNLESS OTHERWISE SPECIFIED)
DYNAMIC

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
g_{fs} (1)	Forward Transconductance	$V_{DS} = 10\text{ V}$, $I_D = 2\text{ A}$		3		S
C_{iss} C_{oss} C_{rss}	Input Capacitance Output Capacitance Reverse Transfer Capacitance	$V_{DS} = 25\text{ V}$, $f = 1\text{ MHz}$, $V_{GS} = 0$		330 90 40		pF pF pF

SWITCHING ON

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
$t_{d(on)}$ t_r	Turn-on Delay Time Rise Time	$V_{DD} = 15\text{ V}$, $I_D = 2\text{ A}$ $R_G = 4.7\Omega$, $V_{GS} = 4.5\text{ V}$ (see test circuit, Figure 3)		11 100		ns ns
Q_g Q_{gs} Q_{gd}	Total Gate Charge Gate-Source Charge Gate-Drain Charge	$V_{DD} = 24\text{ V}$, $I_D = 4\text{ A}$, $V_{GS} = 5\text{ V}$		6.5 3.6 2	9	nC nC nC

SWITCHING OFF

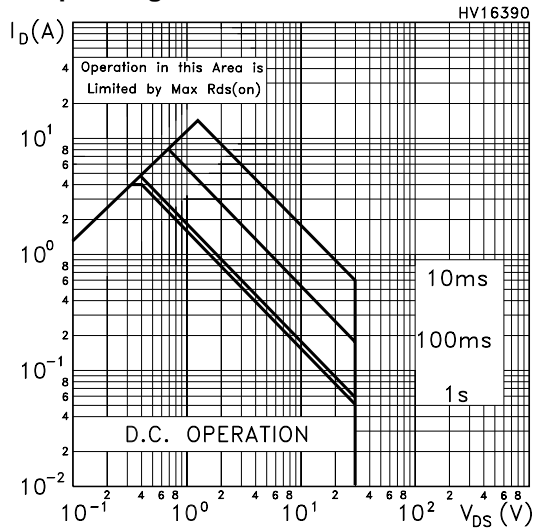
Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
$t_{d(off)}$ t_f	Turn-Off Delay Time Fall Time	$V_{DD} = 15\text{ V}$, $I_D = 2\text{ A}$, $R_G = 4.7\Omega$, $V_{GS} = 4.5\text{ V}$ (see test circuit, Figure 5)		25 22		ns ns

SOURCE DRAIN DIODE

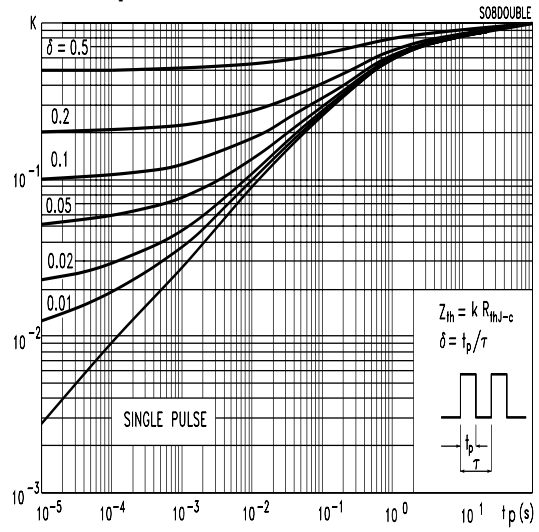
Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
I_{SD} I_{SDM} (2)	Source-drain Current Source-drain Current (pulsed)				4 16	A A
V_{SD} (1)	Forward On Voltage	$I_{SD} = 4\text{ A}$, $V_{GS} = 0$			1.2	V
t_{rr} Q_{rr} I_{RRM}	Reverse Recovery Time Reverse Recovery Charge Reverse Recovery Current	$I_{SD} = 4\text{ A}$, $di/dt = 100\text{ A}/\mu\text{s}$, $V_{DD} = 20\text{ V}$, $T_j = 150^{\circ}\text{C}$ (see test circuit, Figure 5)		35 25 14		ns nC A

Note: 1. Pulsed: Pulse duration = 300 μs , duty cycle 1.5 %.
 2. Pulse width limited by safe operating area.

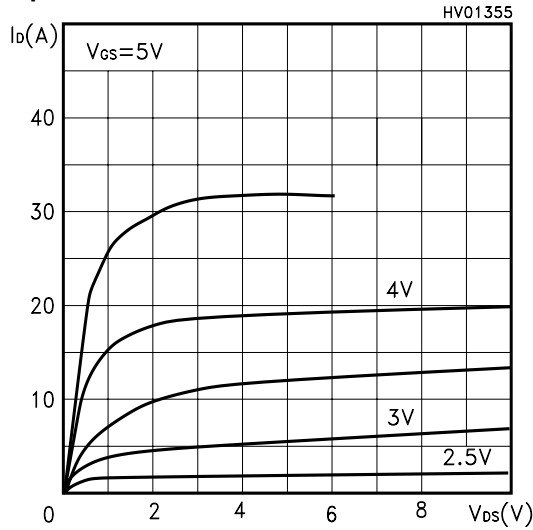
Safe Operating Area



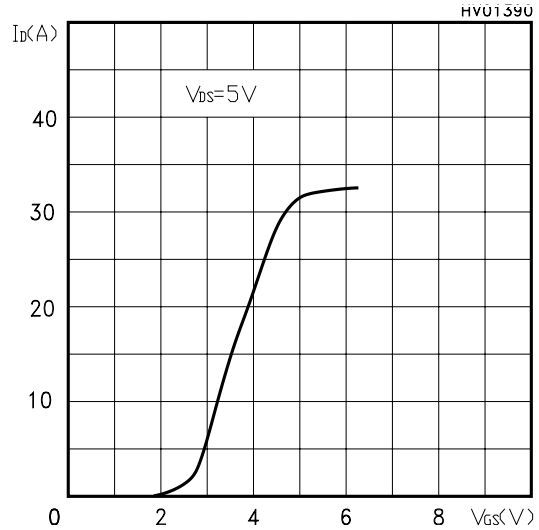
Thermal Impedance Junction-PCB



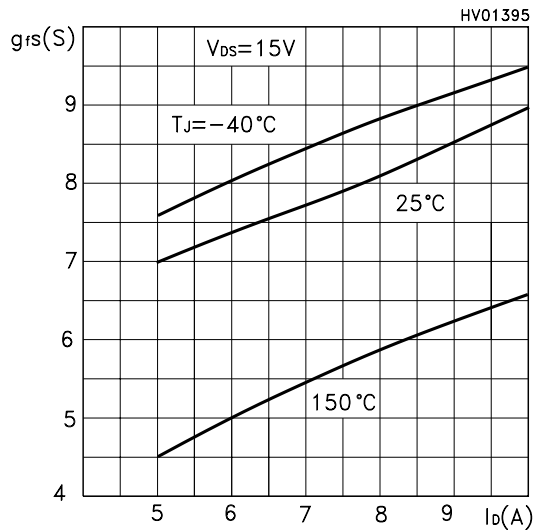
Output Characteristics



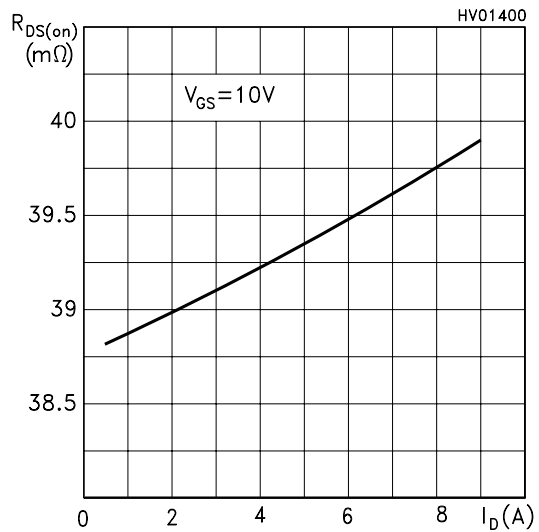
Transfer Characteristics



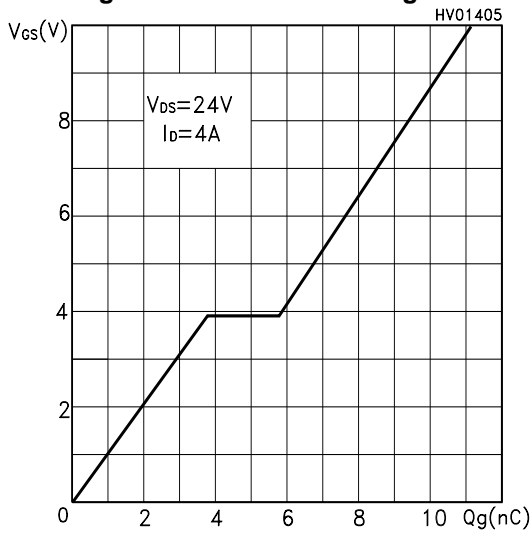
Transconductance



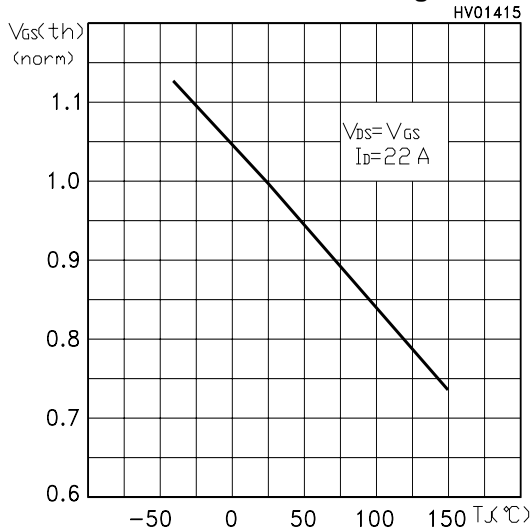
Static Drain-source On Resistance



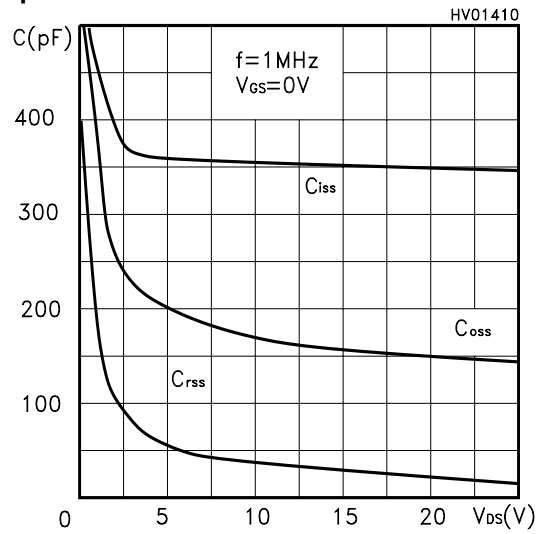
Gate Charge vs Gate-source Voltage



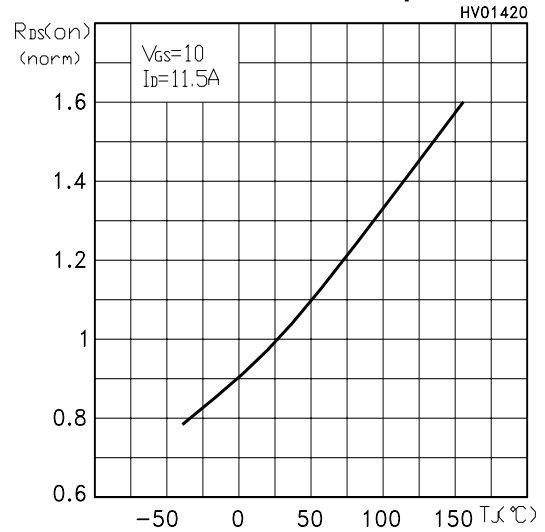
Normalized Gate Threshold Voltage vs Temp.



Capacitance Variations



Normalized On Resistance vs Temperature



Source-drain Diode Forward Characteristics

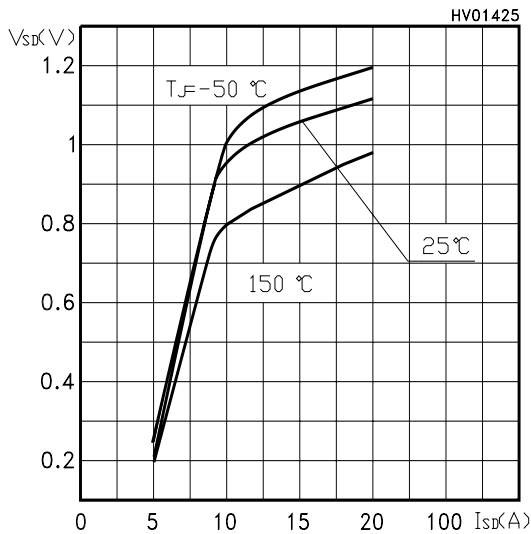


Fig. 1: Unclamped Inductive Load Test Circuit

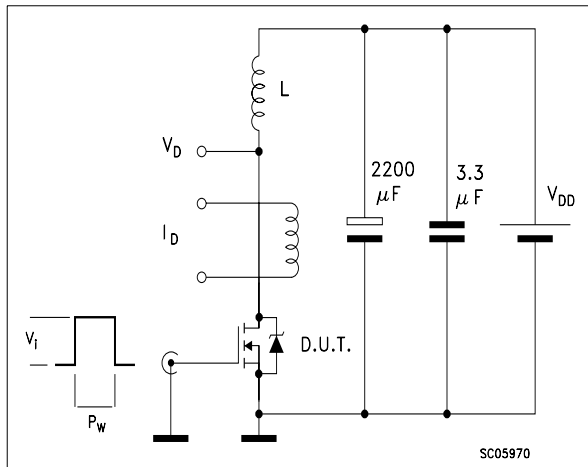


Fig. 2: Unclamped Inductive Waveform

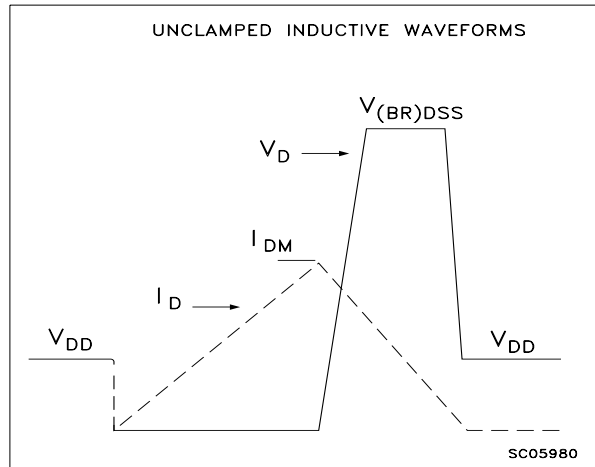


Fig. 3: Switching Times Test Circuit For Resistive Load

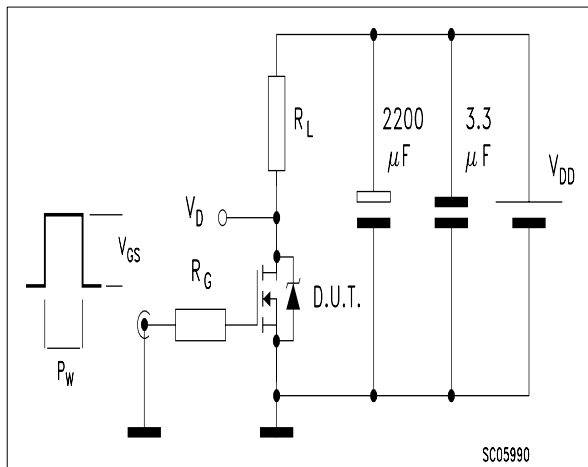


Fig. 4: Gate Charge test Circuit

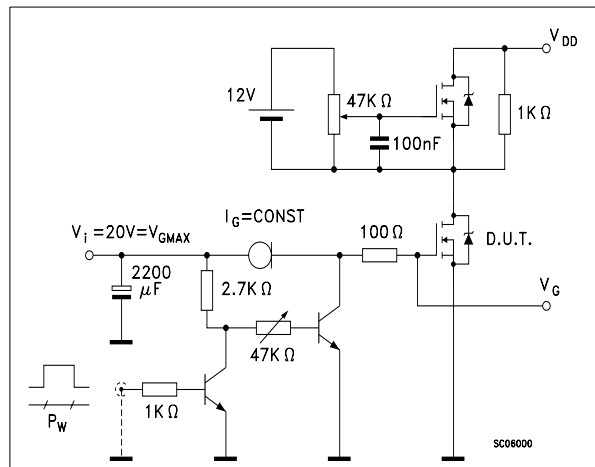
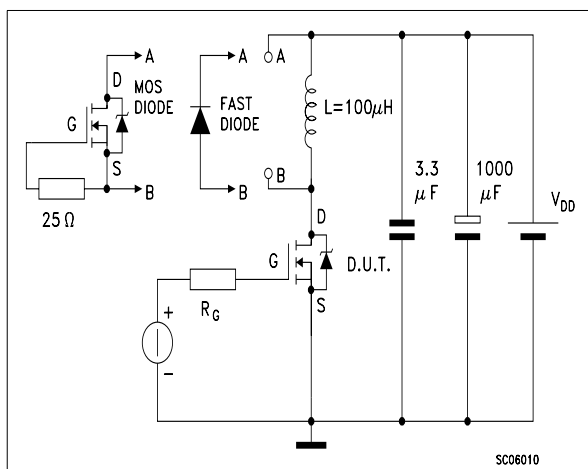
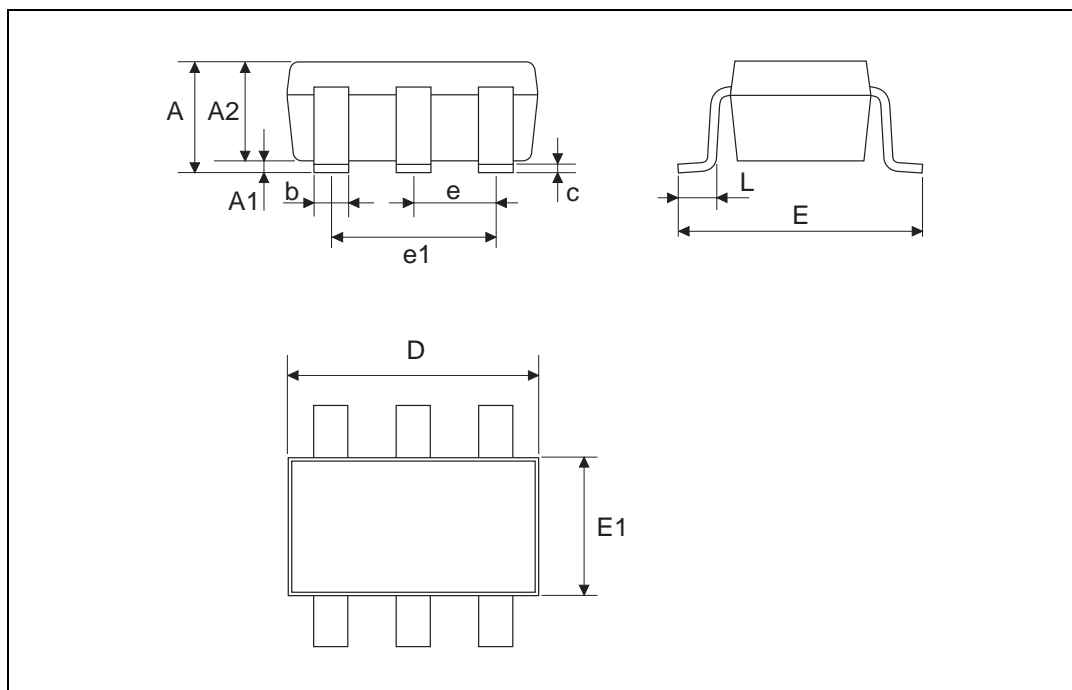


Fig. 5: Test Circuit For Inductive Load Switching And Diode Recovery Times



SOT23-6L MECHANICAL DATA

DIM.	mm			mils		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A	0.90		1.45	0.035		0.057
A1	0.00		0.15	0.000		0.006
A2	0.90		1.30	0.035		0.051
b	0.25		0.50	0.010		0.020
C	0.09		0.20	0.004		0.008
D	2.80		3.10	0.110		0.122
E	2.60		3.00	0.102		0.118
E1	1.50		1.75	0.059		0.069
L	0.35		0.55	0.014		0.022
e		0.95			0.037	
e1		1.90			0.075	



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