Chipsmall Limited consists of a professional team with an average of over 10 year of expertise in the distribution of electronic components. Based in Hongkong, we have already established firm and mutual-benefit business relationships with customers from,Europe,America and south Asia,supplying obsolete and hard-to-find components to meet their specific needs.

With the principle of “Quality Parts,Customers Priority,Honest Operation,and Considerate Service”,our business mainly focus on the distribution of electronic components. Line cards we deal with include Microchip,ALPS,ROHM,Xilinx,Pulse,ON,Everlight and Freescale. Main products comprise IC,Modules,Potentiometer,IC Socket,Relay,Connector.Our parts cover such applications as commercial,industrial, and automotives areas.

We are looking forward to setting up business relationship with you and hope to provide you with the best service and solution. Let us make a better world for our industry!

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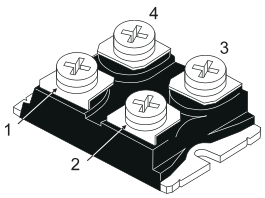
Address: A1208, Overseas Decoration Building, #122 Zhenhua RD., Futian, Shenzhen, China

STGE50NB60HD

N-CHANNEL 50A - 600V - ISOTOP
PowerMESH™ IGBT

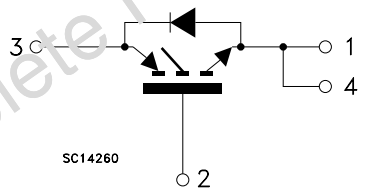
TYPE	V_{CES}	$V_{CE(sat)}$	I_C
STGY50NB60HD	600 V	< 2.8 V	50 A

- HIGH INPUT IMPEDANCE (VOLTAGE DRIVEN)
- LOW ON-VOLTAGE DROP (V_{cesat})
- OFF LOSSES INCLUDE TAIL CURRENT
- LOW GATE CHARGE
- HIGH CURRENT CAPABILITY
- VERY HIGH FREQUENCY OPERATION
- CO-PACKAGED WITH TURBOSWITCH™ ANTIPARALLEL DIODE



ISOTOP

INTERNAL SCHEMATIC DIAGRAM



DESCRIPTION

Using the latest high voltage technology based on a patented strip layout, STMicroelectronics has designed an advanced family of IGBTs, the PowerMESH™ IGBTs, with outstanding perfomances.

The suffix "H" identifies a family optimized for high frequen-cy applications (up to 120kHz)in order to achieve very high switching performances (reduced tfall) mantaining a low voltage drop.

APPLICATIONS

- HIGH FREQUENCY MOTOR CONTROLS
- SMPS AND PFC IN BOTH HARD SWITCH AND RESONANT TOPOLOGIES

ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value	Unit
V_{CES}	Collector-Emitter Voltage (V_{GS} = 0)	600	V
V_{GE}	Gate-Emitter Voltage	± 20	V
I_C	Collector Current (continuous) at T_C = 25°C	100	A
I_C	Collector Current (continuous) at T_C = 100°C	50	A
I_{CM} (▪)	Collector Current (pulsed)	400	A
P_{TOT}	Total Dissipation at T_C = 25°C	300	W
	Derating Factor	2.4	W/°C
T_{stg}	Storage Temperature	–65 to 150	°C
T_j	Max. Operating Junction Temperature	150	°C

(▪) PULSE WIDTH LIMITED BY SAFE OPERATING AREA

THERMAL DATA

Rthj-case	Thermal Resistance Junction-case Max	0.416	°C/W
Rthj-amb	Thermal Resistance Junction-ambient Max	30	°C/W
Rthc-h	Thermal Resistance Case-heatsink Typ	0.1	°C/W

ELECTRICAL CHARACTERISTICS (TCASE = 25 °C UNLESS OTHERWISE SPECIFIED)

OFF

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
$V_{BR(CES)}$	Collectro-Emitter Breakdown Voltage	I_C = 250 µA, V_{GE} = 0	600			V
I_{CES}	Collector cut-off (V_{GE} = 0)	V_{CE} = Max Rating, T_C = 25 °C			250	µA
		V_{CE} = Max Rating, T_C = 125 °C			1000	µA
I_{GES}	Gate-Emitter Leakage Current (V_{CE} = 0)	V_{GE} = ± 20V , V_{CE} = 0			± 100	nA

ON (1)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
$V_{GE(th)}$	Gate Threshold Voltage	V_{CE} = V_{GE}, I_C = 250µA	3		5	V
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage	V_{GE} = 15V, I_C = 50 A		2.3	2.8	V
		V_{GE} = 15V, I_C = 50 A, Tj =125°C		1.9		V

DYNAMIC

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
g_{fs}	Forward Transconductance	V_{CE} = 25 V , I_C = 50 A		22		S
C_{ies}	Input Capacitance	V_{CE} = 25V, f = 1 MHz, V_{GE} = 0		4500		pF
C_{oes}	Output Capacitance			450		pF
C_{res}	Reverse Transfer Capacitance			90		pF
Q_g	Total Gate Charge	V_{CE} = 480V, I_C = 50 A,		260		nC
Q_{ge}	Gate-Emitter Charge	V_{GE} = 15V		28		nC
Q_{gc}	Gate-Collector Charge			15		nC
I_{CL}	Latching Current	V_{clamp} = 480 V Tj = 150°C , R_G = 10 Ω	200			A

SWITCHING ON

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
$t_{d(on)}$	Turn-on Delay Time	V_{CC} = 480 V, I_C = 50 A R_G = 10Ω , V_{GE} = 15 V		20		ns
t_r	Rise Time			70		ns
$(di/dt)_{on}$	Turn-on Current Slope	V_{CC}= 480 V, I_C = 50 A, R_G=10Ω V_{GE} = 15 V, Tj = 125°C		350		A/µs
Eon	Turn-on Switching Losses			950		µJ

ELECTRICAL CHARACTERISTICS (CONTINUED)

SWITCHING OFF

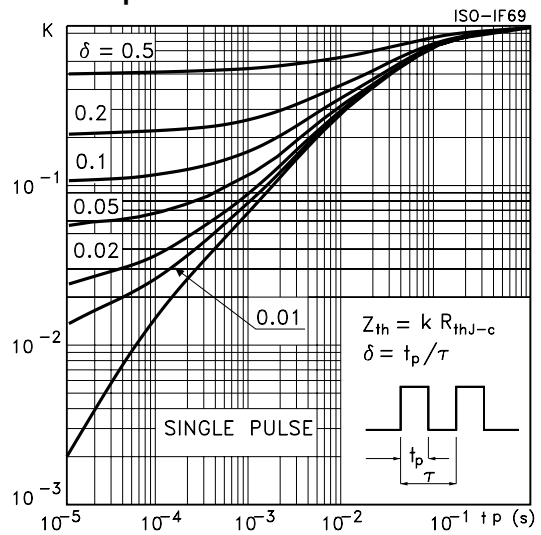
Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
t_c	Cross-over Time	V_{cc} = 480 V, I_C = 50 A, R_{GE} = 10 Ω , V_{GE} = 15 V		166		ns
$t_r(V_{off})$	Off Voltage Rise Time			48		ns
$t_{d(off)}$	Delay Time			326		ns
t_f	Fall Time			90		ns
E_{off}(**)	Turn-off Switching Loss			2.1		mJ
E_{ts}	Total Switching Loss			3		mJ
t_c	Cross-over Time	V_{cc} = 480 V, I_C = 50 A, R_{GE} = 10 Ω , V_{GE} = 15 V Tj = 125 °C		270		ns
$t_r(V_{off})$	Off Voltage Rise Time			75		ns
$t_{d(off)}$	Delay Time			340		ns
t_f	Fall Time			200		ns
E_{off}(**)	Turn-off Switching Loss			2.9		mJ
E_{ts}	Total Switching Loss			3.85		mJ

COLLECTOR-EMITTER DIODE

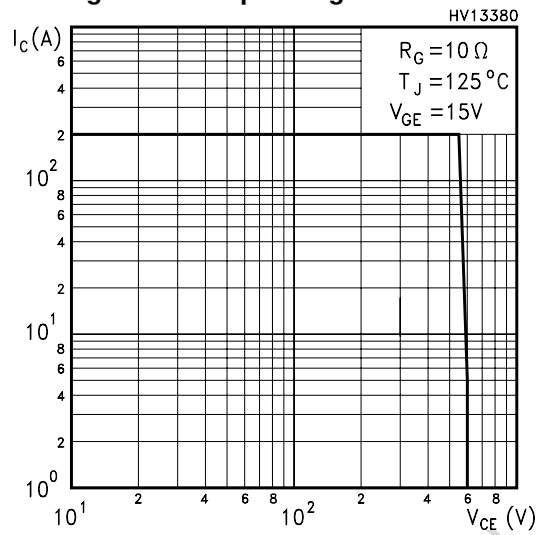
Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
I_f I_{fm}	Forward Current Forward Current pulsed				50 400	A A
V_f	Forward On-Voltage	I_f = 50 A I_f = 50 A , Tj = 125 °C		1.65 2	2	V V
t_{rr} Q_{rr} I_{rrm}	Reverse Recovery Time Reverse Recovery Charge Reverse Recovery Current	I_f = 50 A ,V_R = 100 V, Tj =125°C, di/dt = 100A/µs		135 500 7.5		ns nC A

Note: 1. Pulsed: Pulse duration = 300 µs, duty cycle 1.5 %.
2. Pulse width limited by max. junction temperature.
(**)Losses include Also the Tail (Jedec Standardization)

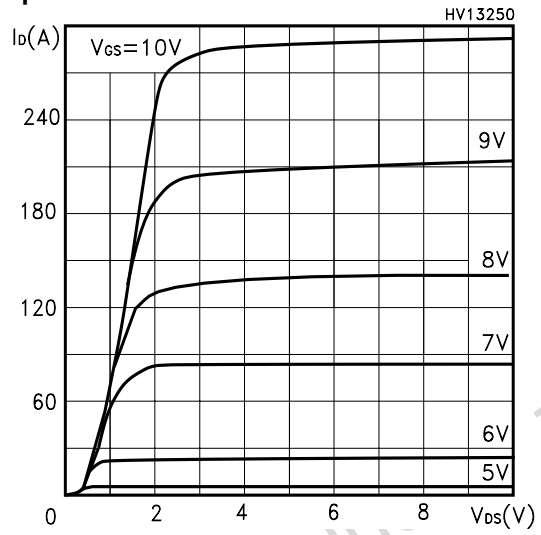
Thermal Impedance



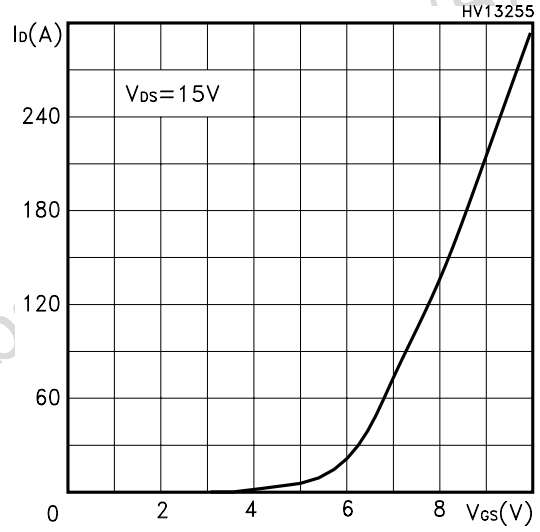
Switching Off Safe Operating Area



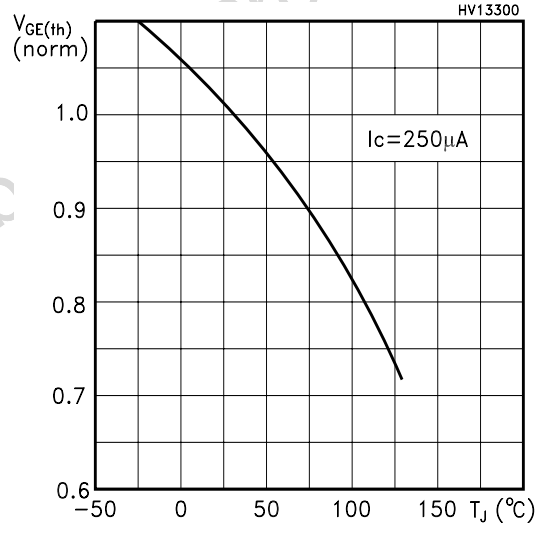
Output Characteristics



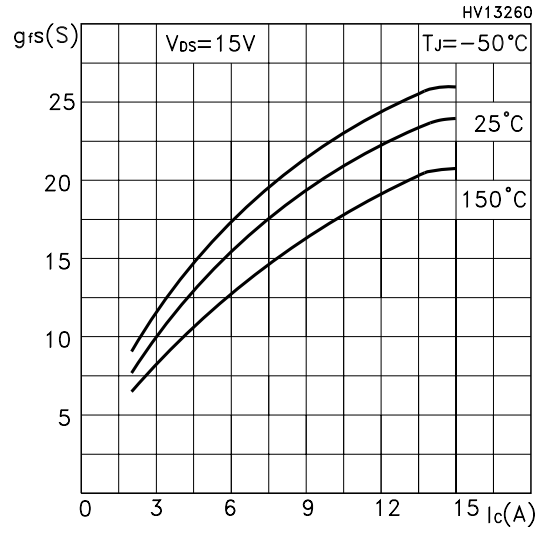
Transfer Characteristics



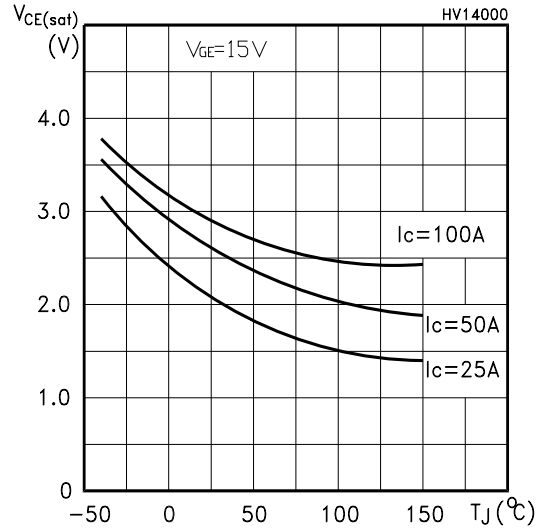
Normalized Gate Threshold Voltage vs Temp.



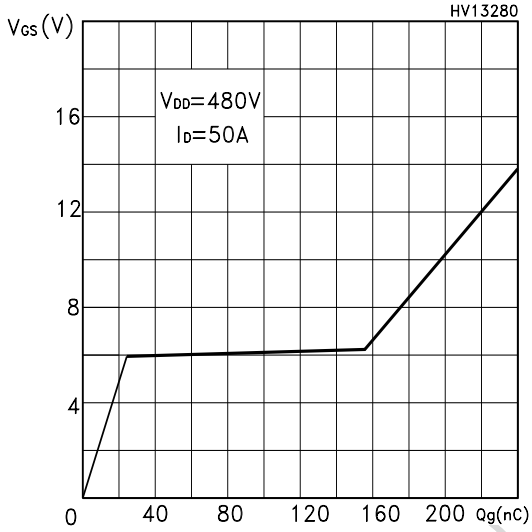
Transconductance



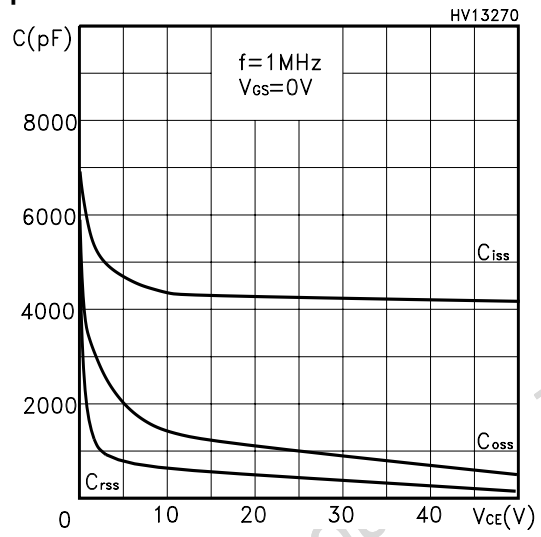
Collector-Emitter On Voltage vs Temperature



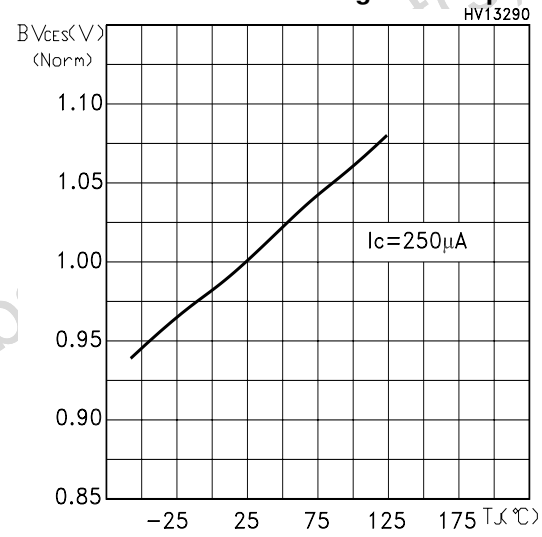
Gate-Charge vs Gate-Emitter Voltage



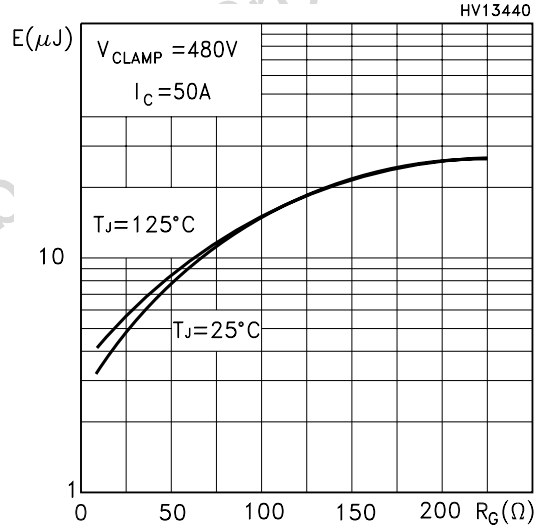
Capacitance Variations



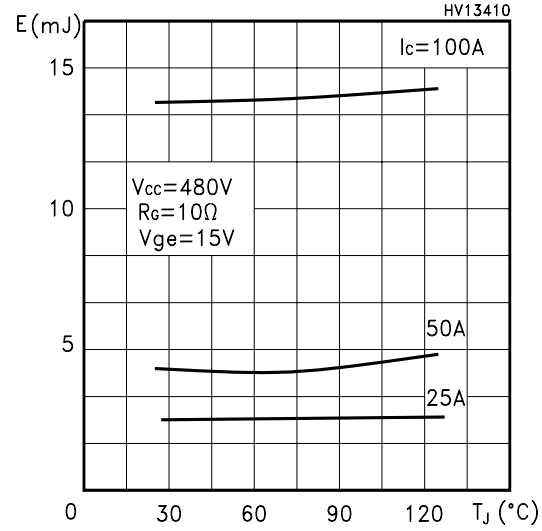
Normalized Break-down Voltage vs Temp.



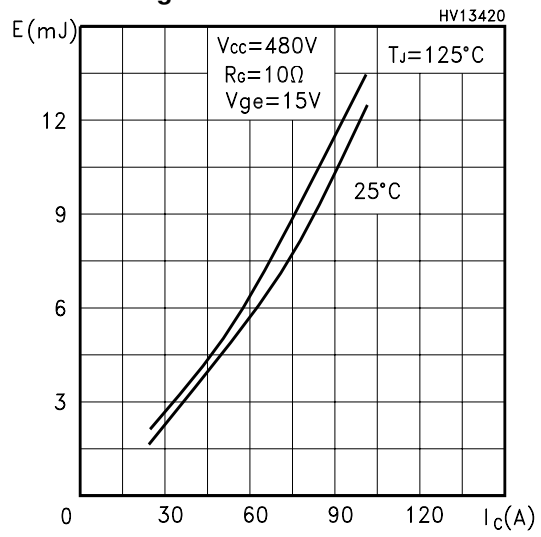
Total Switching losses vs Gate Resistance



Total Switching losses vs Temperature



Total Switching losses vs Ic



Diode Forward Voltage

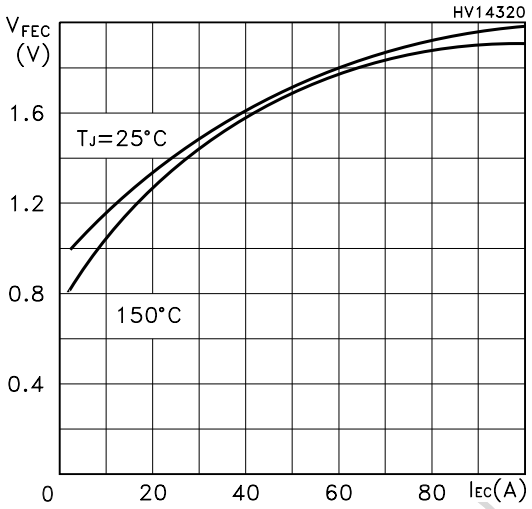


Fig. 1: Gate Charge test Circuit

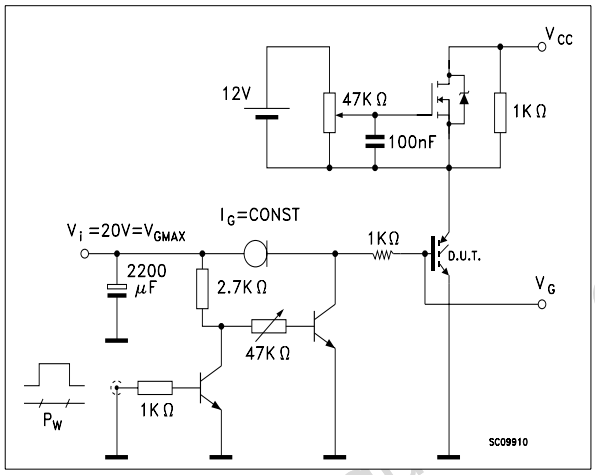
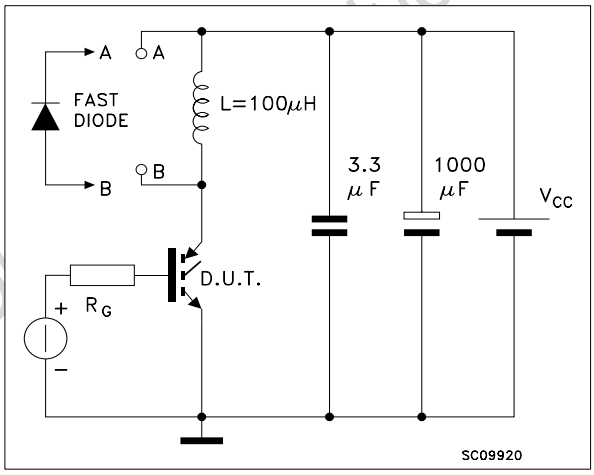
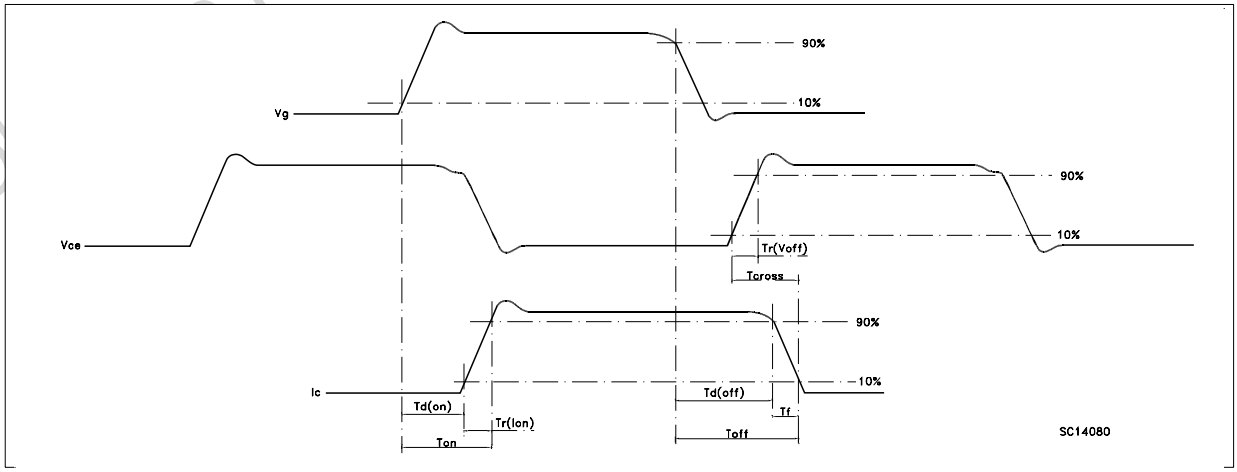


Fig. 2: Test Circuit For Inductive Load Switching





ISOTOP MECHANICAL DATA

DIM.	mm			inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A	11.8		12.2	0.466		0.480
B	8.9		9.1	0.350		0.358
C	1.95		2.05	0.076		0.080
D	0.75		0.85	0.029		0.033
E	12.6		12.8	0.496		0.503
F	25.15		25.5	0.990		1.003
G	31.5		31.7	1.240		1.248
H	4			0.157		
J	4.1		4.3	0.161		0.169
K	14.9		15.1	0.586		0.594
L	30.1		30.3	1.185		1.193
M	37.8		38.2	1.488		1.503
N	4			0.157		
O	7.8		8.2	0.307		0.322