SOT-223 Plastic-Encapsulate MOSFETS

Features

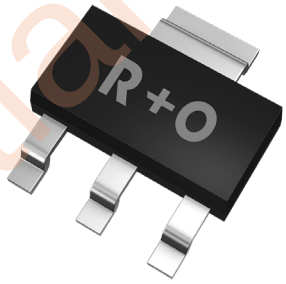
- V_{DS}=-100V
- I_D=-3.0A
- $R_{DS(on)}$@V_{GS}=-10V ＜ 210mΩ
- $R_{DS(on)}$@V_{GS}=-4.5V ＜ 280mΩ
- High power and current handing capability
- High density cell design for ultra low Rdson
- Excellent package for good heat dissipation

Drain-source Voltage
-100 V
Drain Current
-3.0 Ampere

Applications

- DC/DC converters
- Power switch
- Power management

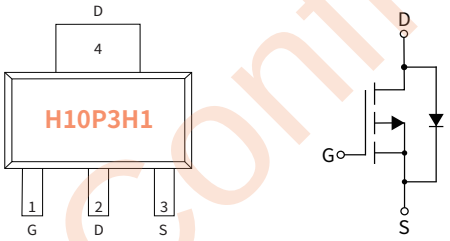
SOT-223



Mechanical Data

- Case: SOT-223
  Molding compound meets UL 94V-0 flammability rating, RoHS-compliant,halogen-free
- Terminals: Solder plated, solderable per MIL-STD-750,Method 2026

Function Diagram



Ordering Information

PACKAGE	PACKAGE CODE	UNIT WEIGHT(g)	REEL(pcs)	BOX(pcs)	CARTON(pcs)	DELIVERY MODE
SOT-223	R3	0.125	2500	5000	40000	13''

Maximum Ratings (Ta=25°C Unless otherwise specified)

PARAMETER	SYMBOL	UNIT	VALUE
Drain-source Voltage	V_{DS}	V	-100
Gate-source Voltage	V_{GS}	V	±20
Drain Current	I_D	A	-3
Pulsed Drain Current [1]	I_{DM}	A	-20
Single Pulse Avalanche Energy[2]	EAS	mJ	25
Total Power Dissipation	P_D	W	3.1
Junction temperature	T_J	°C	-55 ~+150
Storage temperature	T_{stg}	°C	-55 ~+150
Thermal Resistance Junction-to-Ambient @ Steady State	$R_{\theta JA}$	°C / W	40

Static Parameter Characteristics (Tj=25°C Unless otherwise specified)

PARAMETER	SYMBOL	Condition	UNIT	Min	Typ	Max
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}= 0V, I_D=-250μA	V	-100	—	—
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=-100V, V_{GS}=0V	μA	—	—	-1.0
Gate-Body Leakage Current	I_{GSS}	V_{GS}= ±20V, V_{DS}=0V	nA	—	—	±100
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}= V_{GS}, I_D=-250μA	V	-1.0	-1.8	-3.0
Static Drain-Source On-Resistance (3)	$R_{DS(ON)}$	V_{GS}= -10V, I_D=-3A	mΩ	—	180	210
		V_{GS}= -4.5V, I_D=-2A		—	200	280
Forward Transconductance	g_{FS}	V_{DS}=-5.0V, I_D=-3A	S	2	—	—

Dynamic Parameters

PARAMETER	SYMBOL	Condition	UNIT	Min	Typ	Max
Input Capacitance	C_{iss}	V_{DS}=-25V, V_{GS}=0V, f=1MHZ	pF	—	1250	—
Output Capacitance	C_{oss}			—	50	—
Reverse Transfer Capacitance	C_{rss}			—	40	—

Switching Parameters

PARAMETER	SYMBOL	Condition	UNIT	Min	Typ	Max
Turn-on Delay Time	$t_{D(on)}$	V_{GS}=-10V, V_{DD}=-50V, I_D=-3A ,R_{GEN}=9Ω	nS	—	14	—
Turn-on Rise Time	t_r		nS	—	18	—
Turn-off Delay Time	$t_{D(off)}$		nS	—	50	—
Turn-off fall Time	t_f		nS	—	18	—
Total Gate Charge	Q_g	V_{DS}=-50V, I_D=-3A V_{GS}=-10V	nC	—	25	—
Gate-Source Charge	Q_{gs}		nC	—	5	—
Gate-Drain Charge	Q_{gd}		nC	—	7	—

Drian-Source Diode Characteristics

PARAMETER	SYMBOL	Condition	UNIT	Min	Typ	Max
Diode Forward Voltage	V_{SD}	I_S=-3A, V_{GS}=0V	V	—	—	-1.2
Maximum Body-Diode Continuous Current	I_S	—	A	—	—	-3.0
Reverse Recovery Time	T_{rr}	Tj=25°C, I_F=-3A di/dt=-100A/μs(3)	nS	—	35	—
Reverse Recovery Charge	Q_{rr}		nC	—	46	—

Note :
(1)Repetitive Rating: Pulse width limited by maximum junction temperature.
(2)EAS condition : Tj=25°C ,VDD=-25V,VG=-10V,L=0.5mH,IAS=-10.2A.
(3)Pulse test: Pulse width ≤ 300us, duty cycle ≤ 2%.

Ratings And Characteristics Curves (Ta=25°C Unless otherwise specified)

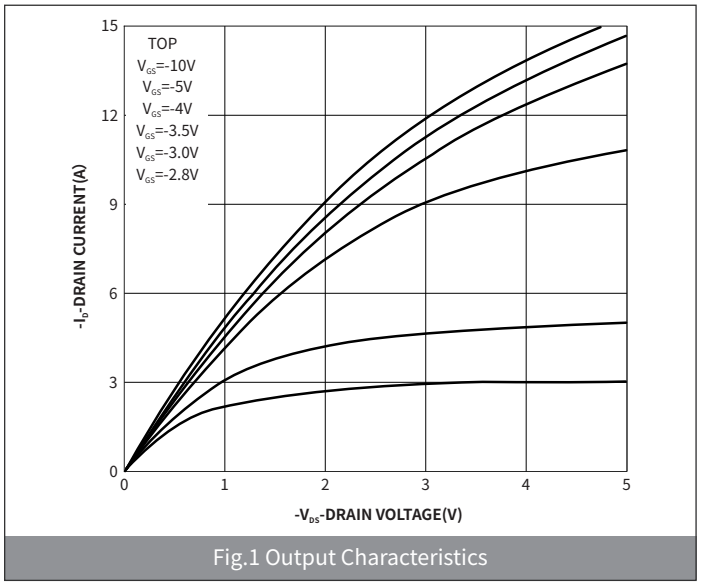


Fig.1 Output Characteristics

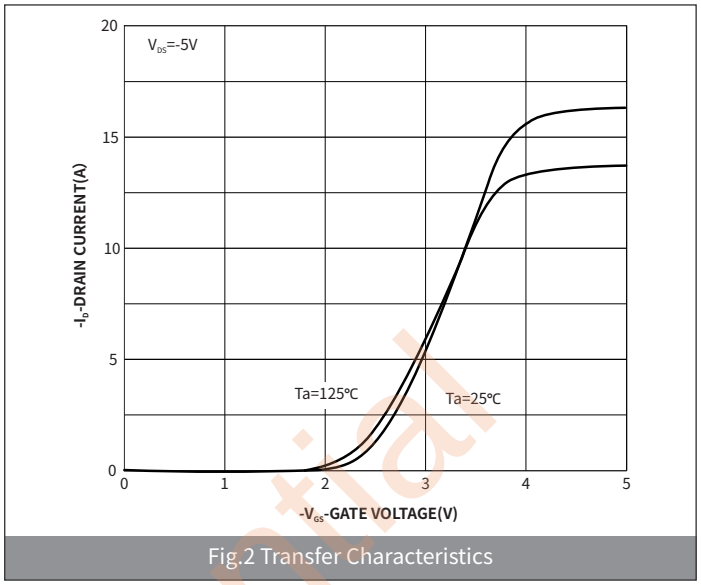


Fig.2 Transfer Characteristics

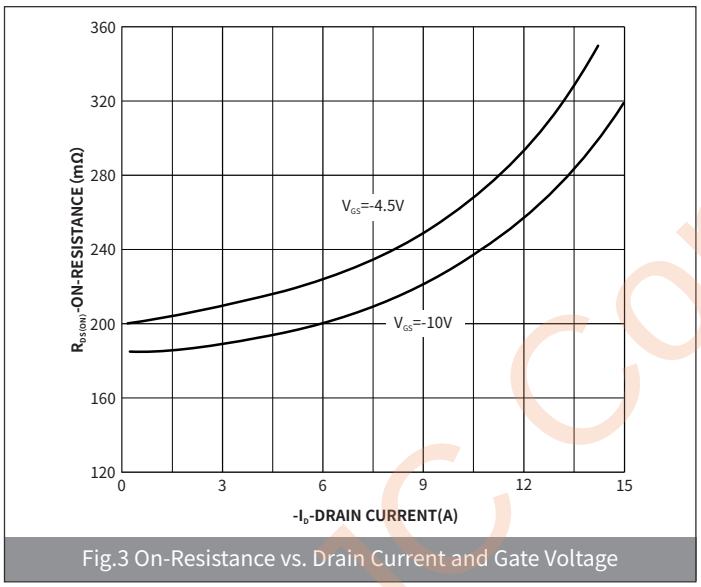


Fig.3 On-Resistance vs. Drain Current and Gate Voltage

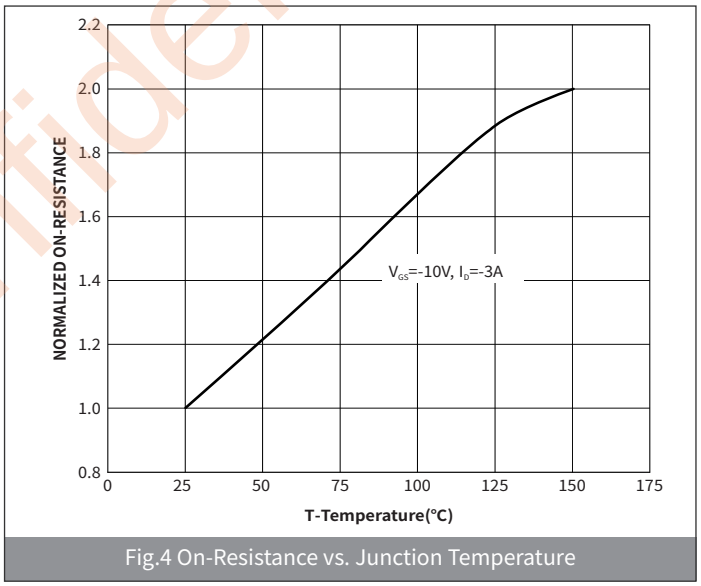


Fig.4 On-Resistance vs. Junction Temperature

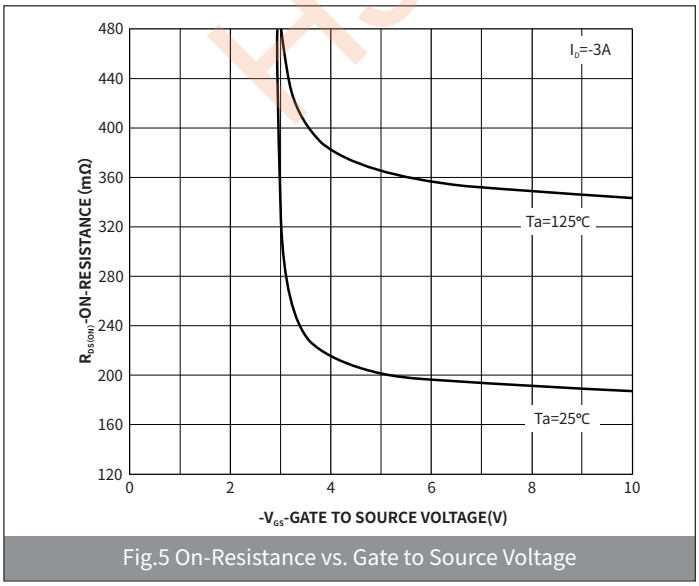


Fig.5 On-Resistance vs. Gate to Source Voltage

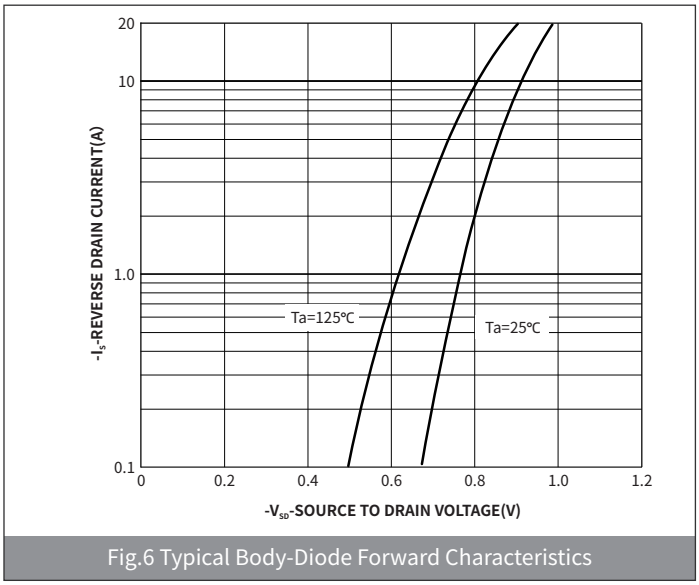


Fig.6 Typical Body-Diode Forward Characteristics

Ratings And Characteristics Curves (Ta=25°C Unless otherwise specified)

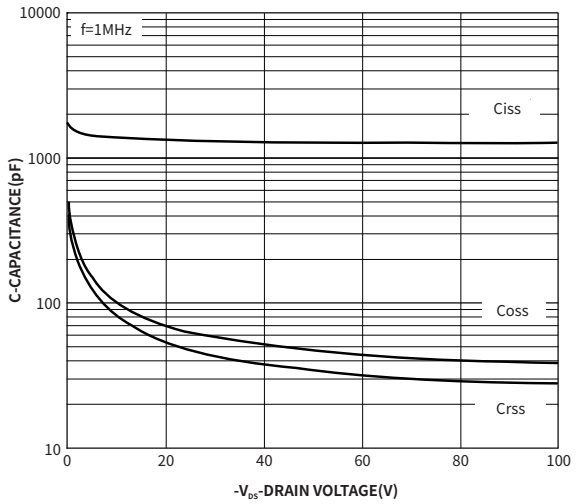


Fig.7 Capacitance Characteristics

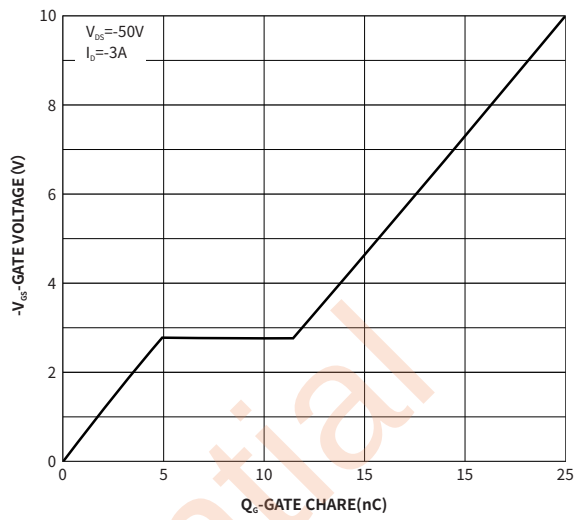


Fig.8 Gate Charge

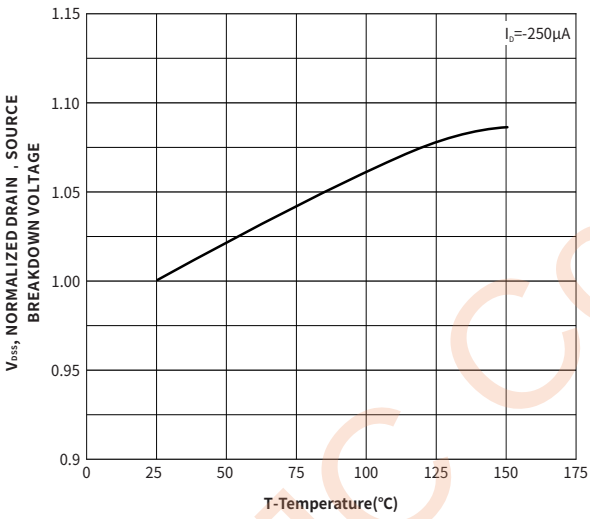


Fig.9 V(BR)DSS vs.Junction Temperature

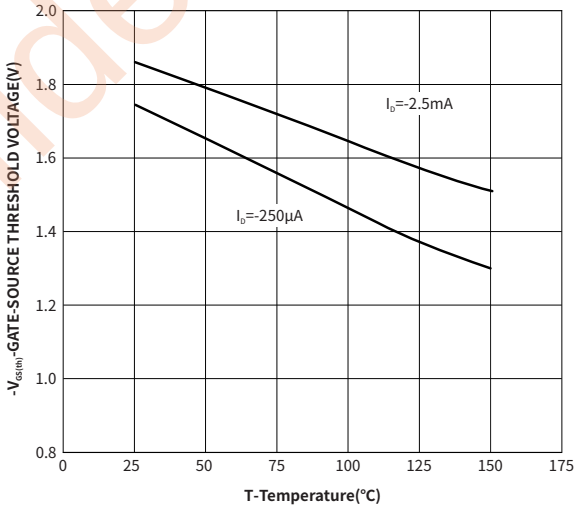


Fig.10 Gate Thresold Variation vs. Tj

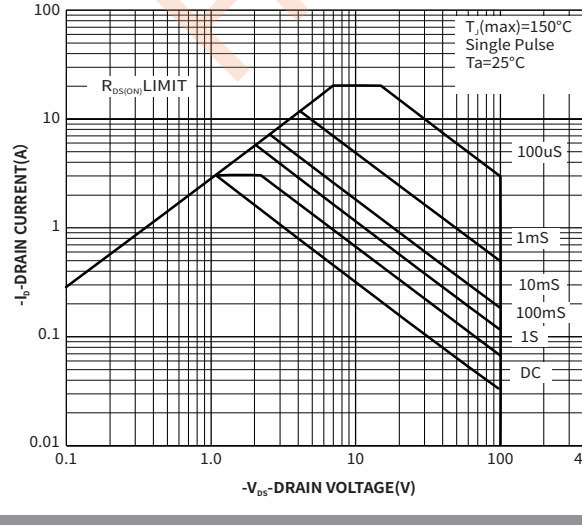


Fig.11 Safe Operation Area

Ratings And Characteristics Curves (Ta=25°C Unless otherwise specified)

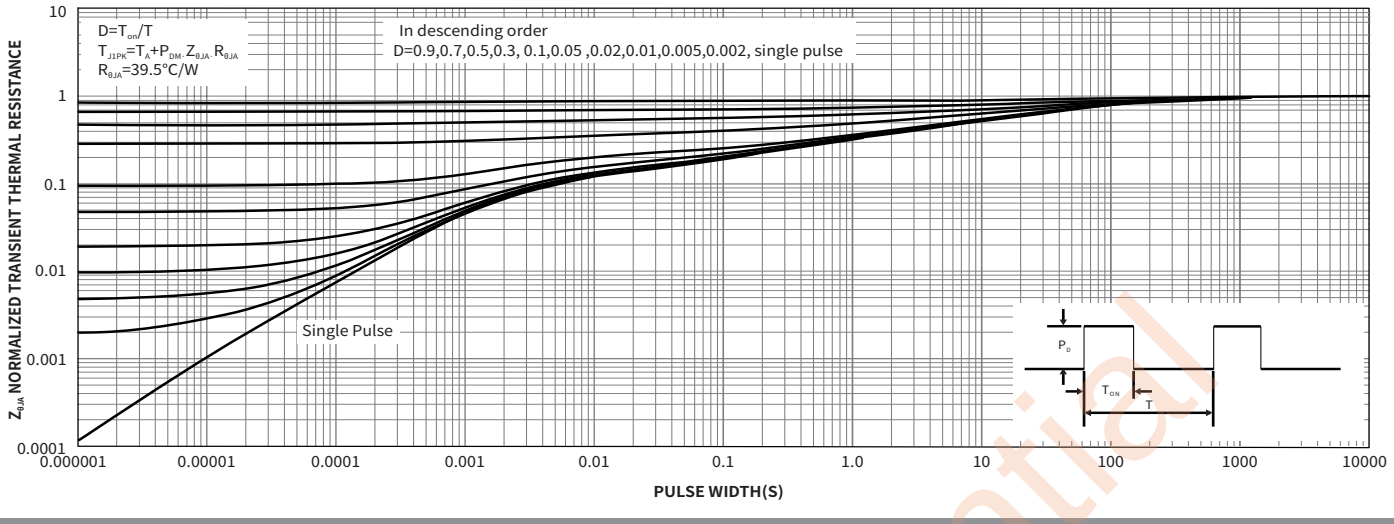
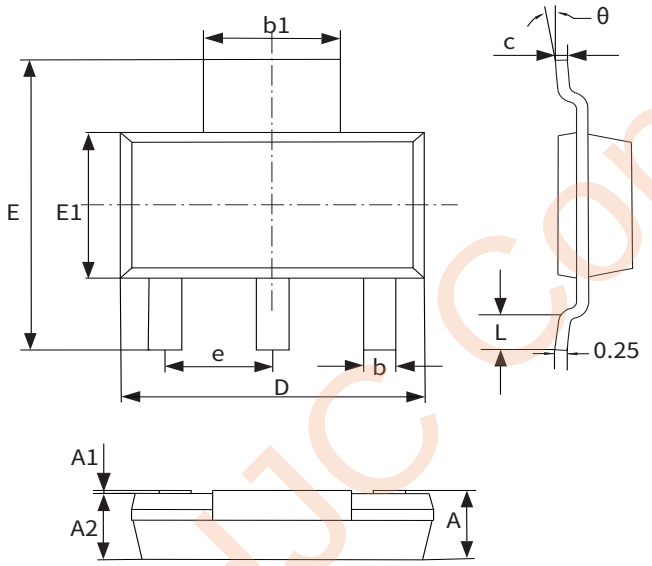


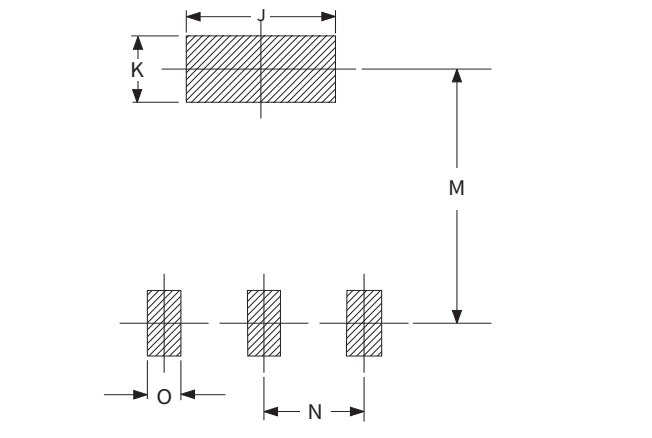
Fig.12 Normalized Maximum Transient Thermal Impedance

Package Outline Dimensions (SOT-223)



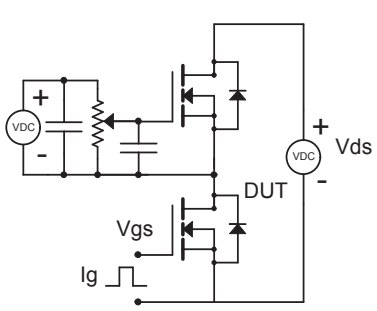
Symbol	Dimensions			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	-	1.8	-	0.071
A1	0.020	0.100	0.001	0.004
A2	1.50	1.700	0.059	0.067
b	0.660	0.840	0.026	0.033
b1	2.900	3.100	0.114	0.122
c	0.230	0.350	0.009	0.014
D	6.300	6.700	0.248	0.264
E	6.700	7.300	0.264	0.287
E1	3.300	3.700	0.130	0.146
e	2.300(BSC)		0.091TYP	
L	0.750	-	0.030	-
θ	0°	10°	0°	10°

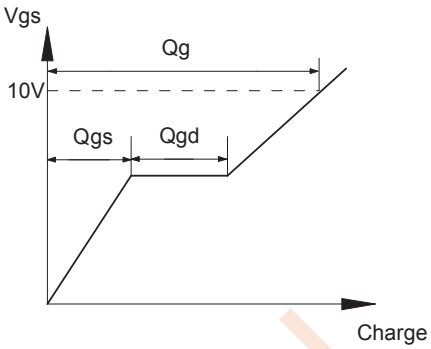
Suggested Pad Layout



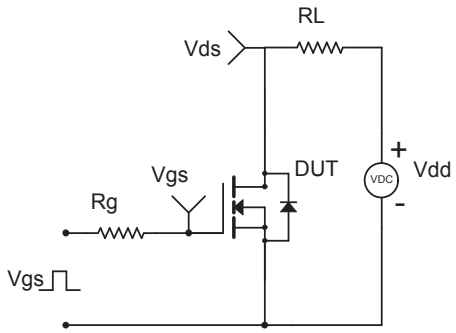
Symbol	Dimensions			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
J	3.20	3.60	0.126	0.142
K	1.40	1.80	0.055	0.071
M	5.90	6.30	0.23	0.25
N	2.15	2.45	0.085	0.096
O	0.60	0.85	0.024	0.033

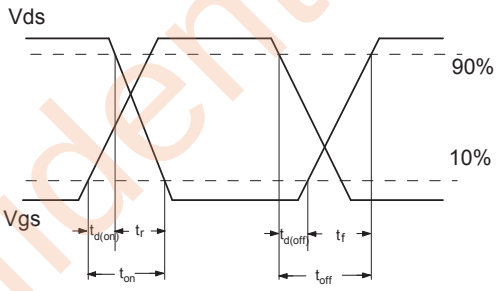
1.Gate Charge Test Circuit & Waveforms



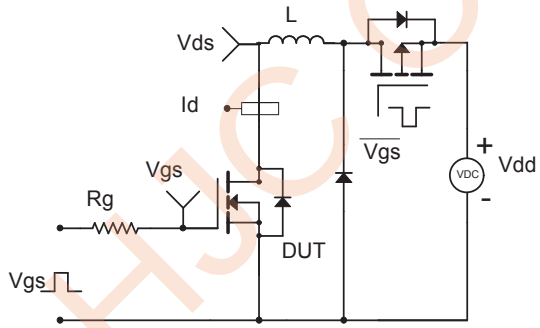


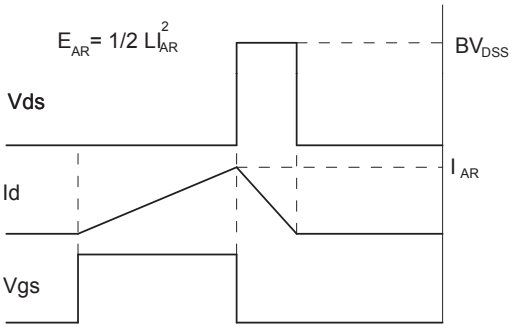
2. Resistive Switching Test Circuit & Waveforms





3.Unclamped Inductive Switching (UIS) Test Circuit & Waveforms





4.Diode Recovery Test Circuit & Waveforms