

SOT-223 Plastic-Encapsulate MOSFETS

Features

- $V_{DS} = -60V$
- $I_D = -2A$
- $R_{DS(on)}@V_{GS} = -10V < 170m\Omega$
- $R_{DS(on)}@V_{GS} = -4.5V < 220m\Omega$
- High power and current handing capability
- High density cell design for ultra low Rdson
- Excellent package for good heat dissipation

Drain-source Voltage

-60 V

Drain Current

-2 Ampere

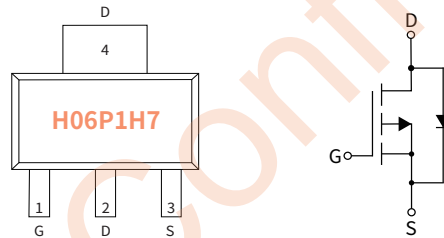
Applications

- Battery protection
- Load switch
- Power management

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	-60
Gate-source Voltage	V_{GS}	V	± 20
Drain Current	I_D	A	-2
Pulsed Drain Current ⁽¹⁾	I_{DM}	A	-8
Single Pulse Avalanche Energy ⁽²⁾	EAS	mJ	24
Total Power Dissipation	P_D	W	1.7
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	73.5

● Static Parameter Characteristics (T_j=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	-60	—	—
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =-60V, 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	-1.4	-2.0	-2.6
Static Drain-Source On-Resistance ⁽³⁾	R _{DS(on)}	V _{GS} = -10V, I _D =-2A	mΩ	—	92	170
		V _{GS} = -4.5V, I _D =-2A		—	102	220
Forward Transconductance	g _{FS}	V _{DS} =-5.0V, I _D =-2A	S	—	3	—

● Dynamic Parameters

PARAMETER	SYMBOL	Condition	UNIT	Min	Typ	Max
Input Capacitance	C _{iss}	V _{DS} =-30V, V _{GS} =0V, f=1MHZ	pF	—	1200	—
Output Capacitance	C _{oss}			—	63.5	—
Reverse Transfer Capacitance	C _{rss}			—	42	—

● Switching Parameters

PARAMETER	SYMBOL	Condition	UNIT	Min	Typ	Max
Turn-on Delay Time	t _{D(on)}	V _{GS} =-10V, V _{DD} =-30V, I _D =-2A, R _{GEN} =3Ω	nS	—	40	—
Turn-on Rise Time	t _r		nS	—	35	—
Turn-off Delay Time	t _{D(off)}		nS	—	15	—
Turn-off fall Time	t _f		nS	—	10	—
Total Gate Charge	Q _g	V _{DS} =-30V, I _D =-2A V _{GS} =-10V	nC	—	9.0	—
Gate-Source Charge	Q _{gs}		nC	—	1.6	—
Gate-Drain Charge	Q _{gd}		nC	—	1.9	—

● Drian-Source Diode Characteristics

PARAMETER	SYMBOL	Condition	UNIT	Min	Typ	Max
Diode Forward Voltage	V _{SD}	I _S =-2A, V _{GS} =0V	V	—	—	-1.2
Maximum Body-Diode Continuous Current	I _S	—	A	—	—	-2
Reverse Recovery Time	T _{rr}	T _j =25°C, I _F =-2A di/dt=-100A/μs ⁽³⁾	nS	—	25	—
Reverse Recovery Charge	Q _{rr}		nC	—	31	—

Note:

(1) Repetitive Rating: Pulse width limited by maximum junction temperature.

(2) EAS condition: T_j=25°C, V_{DD}=-25V, V_G=-10V, L=0.5mH, I_{AS}=-9.8A.

(3) Pulse test: Pulse width ≤ 300us, duty cycle ≤ 2%.

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

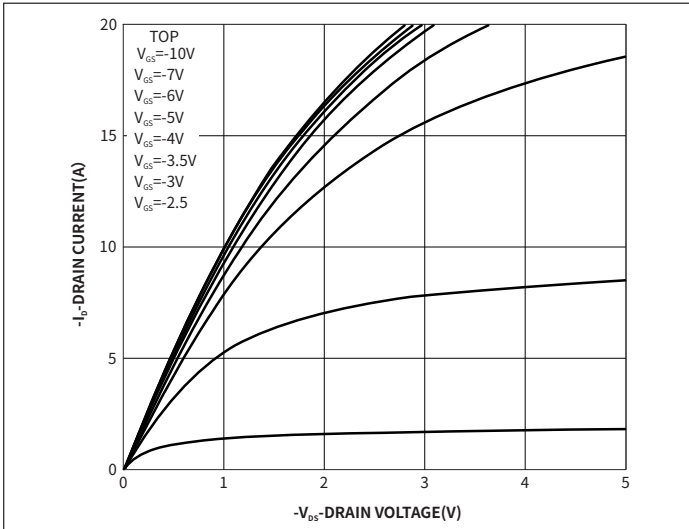


Fig.1 Output Characteristics

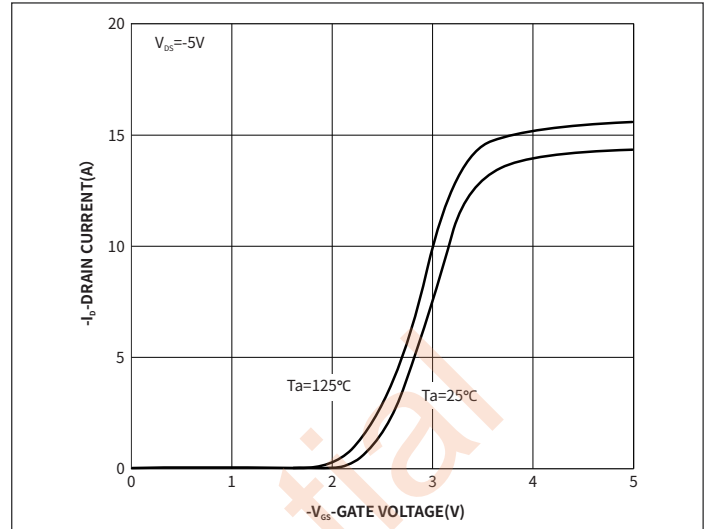


Fig.2 Transfer Characteristics

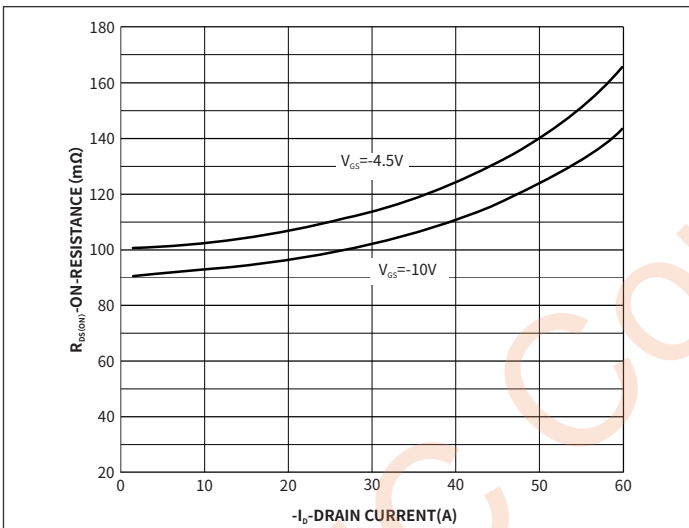


Fig.3 On-Resistance vs. Drain Current and Gate Voltage

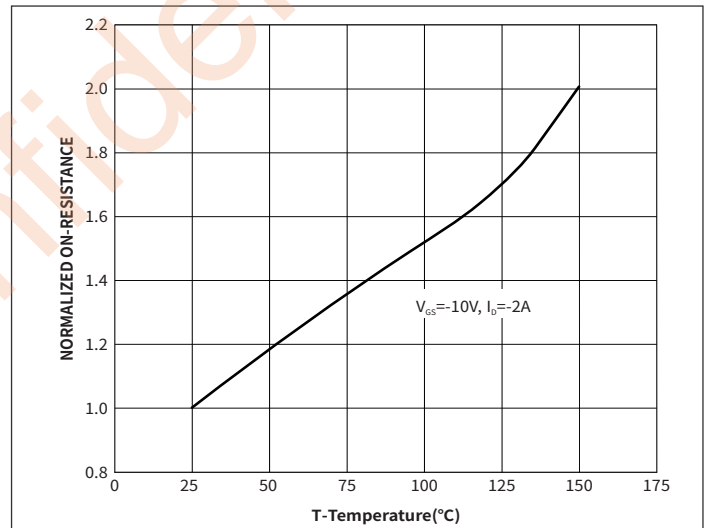


Fig.4 On-Resistance vs. Junction Temperature

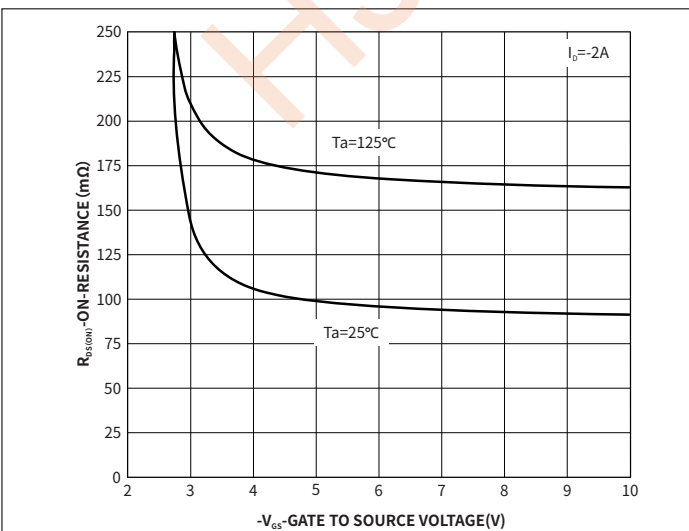


Fig.5 On-Resistance vs. Gate to Source Voltage

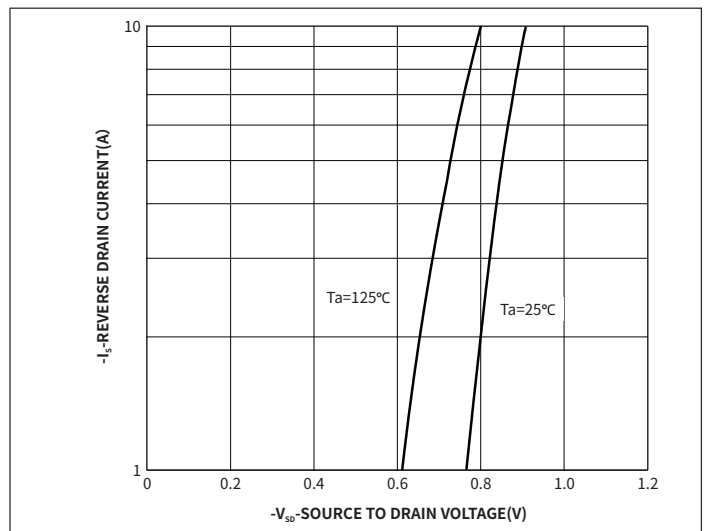
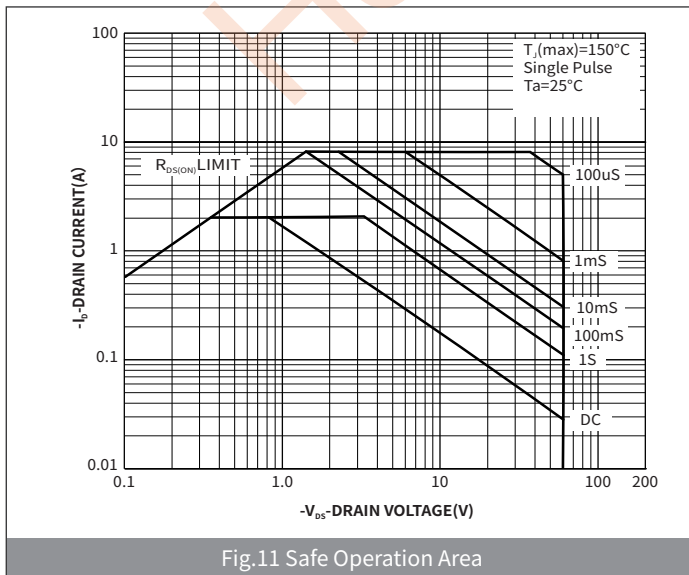
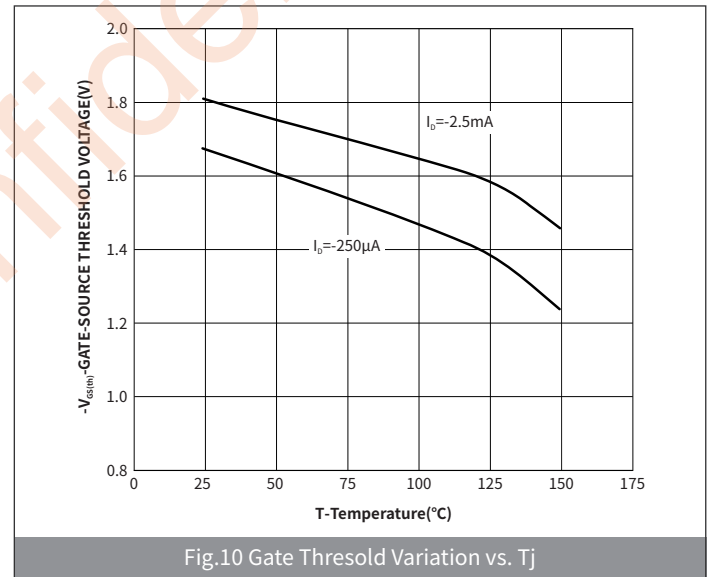
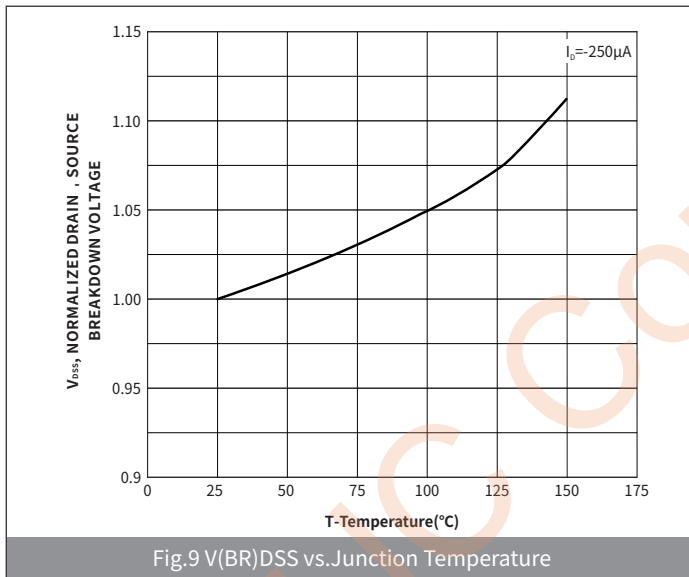
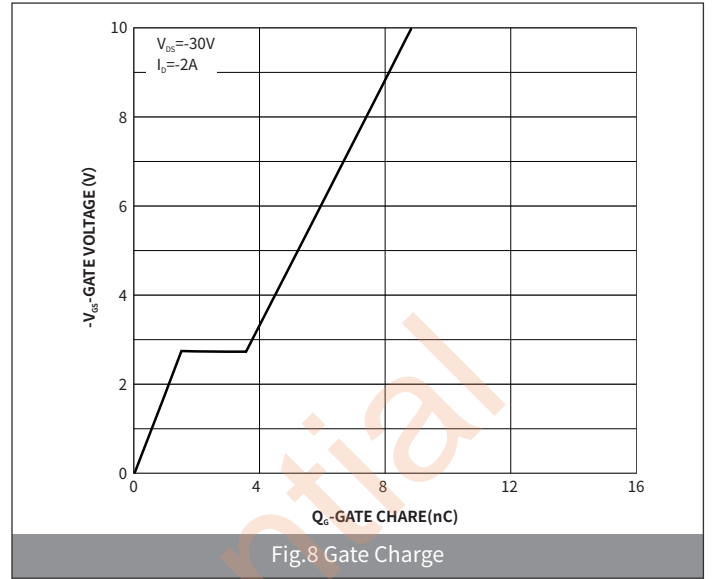
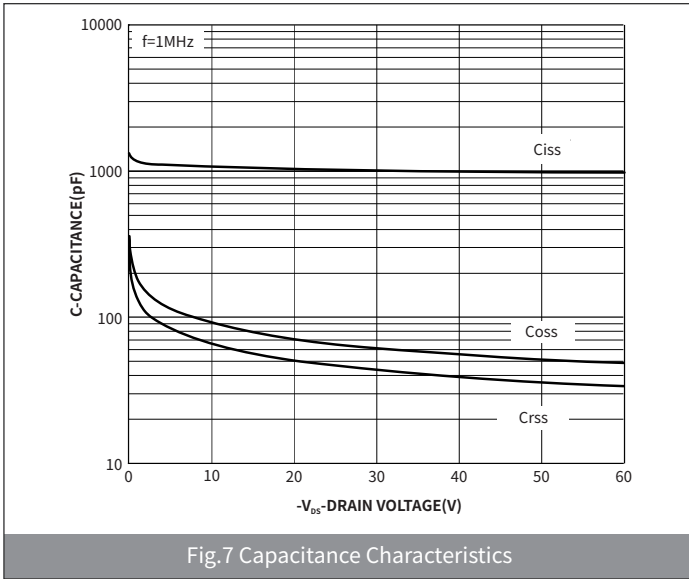


Fig.6 Typical Body-Diode Forward Characteristics

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



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

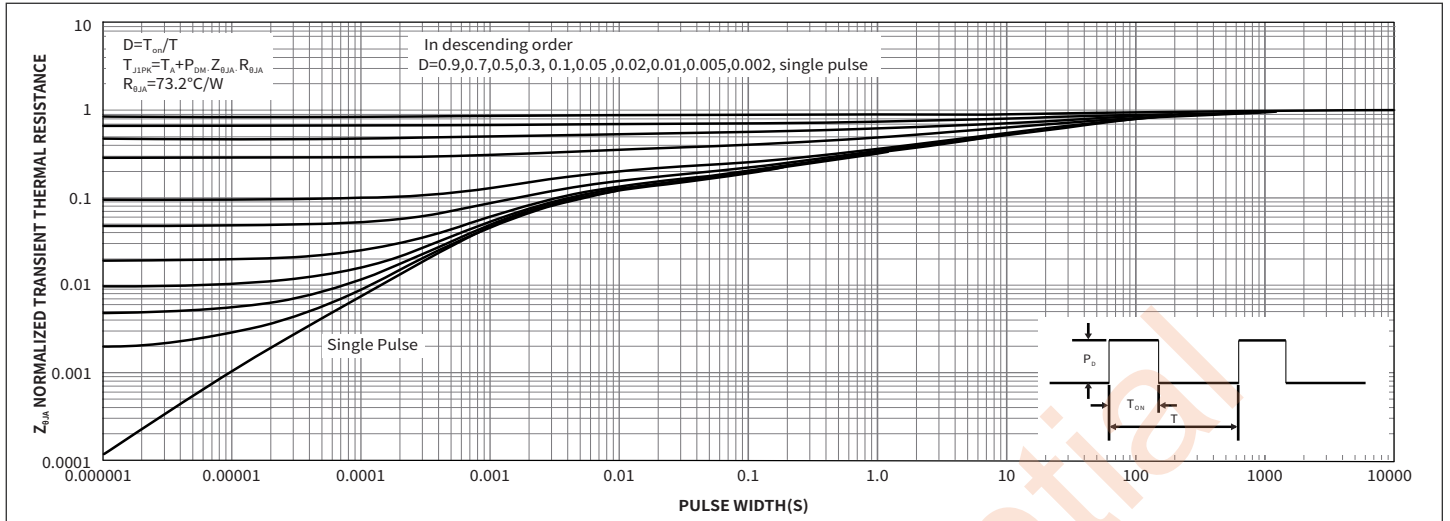
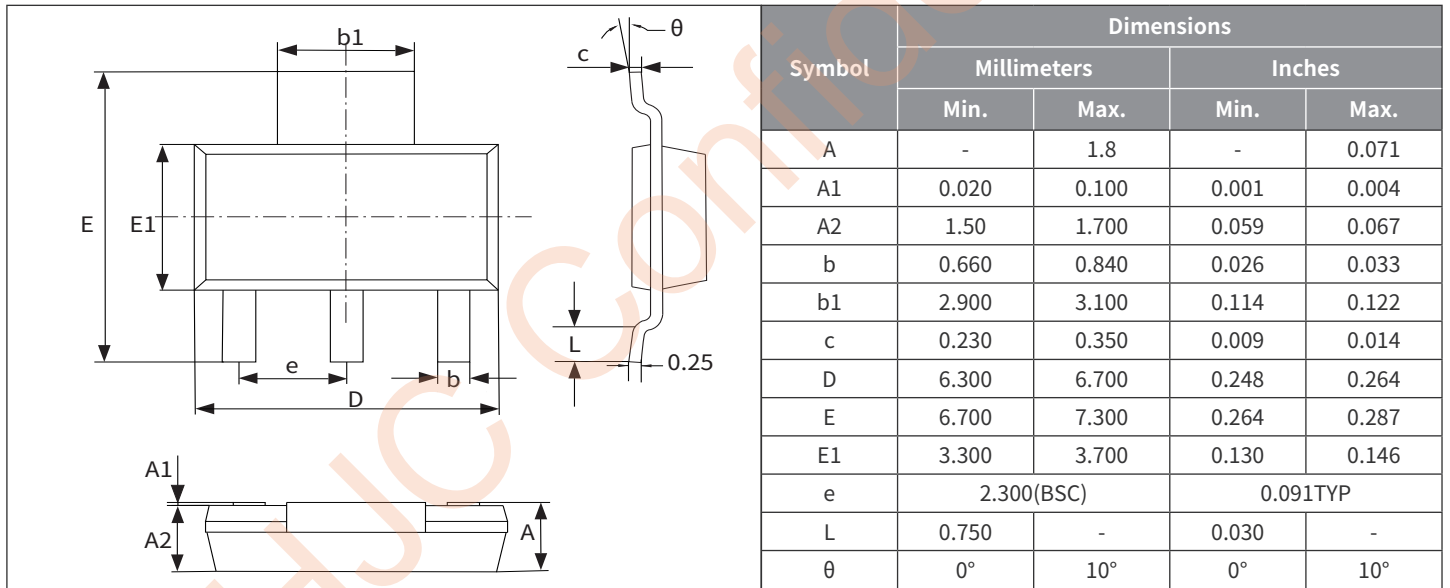
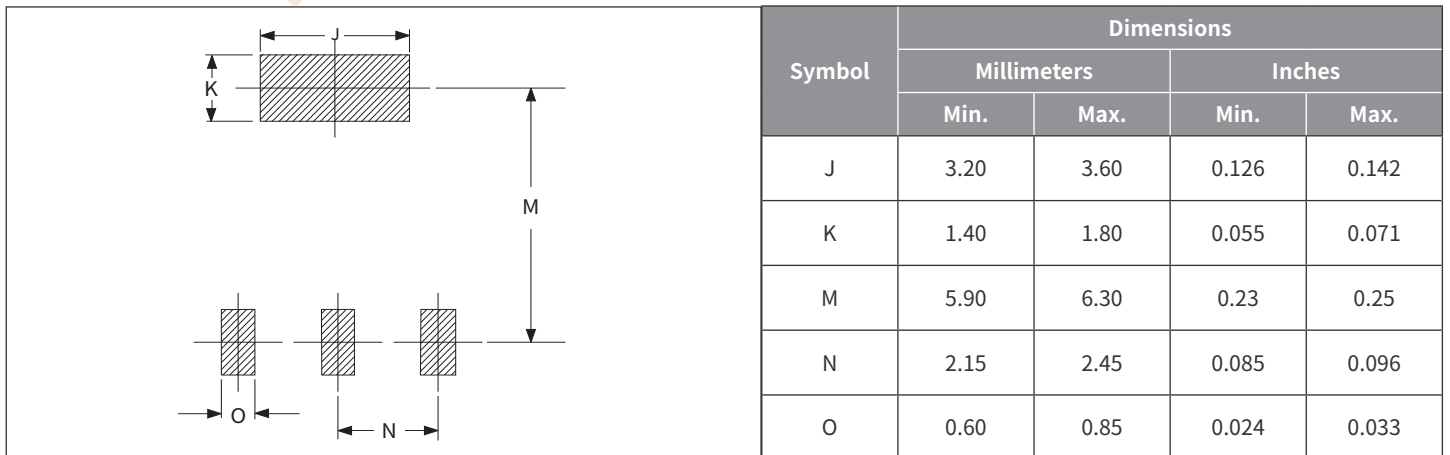


Fig.12 Normalized Maximum Transient Thermal Impedance

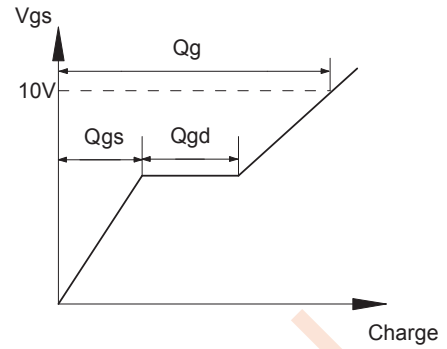
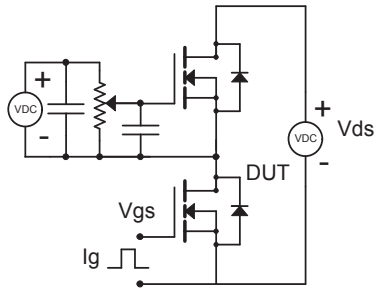
● Package Outline Dimensions (SOT-223)



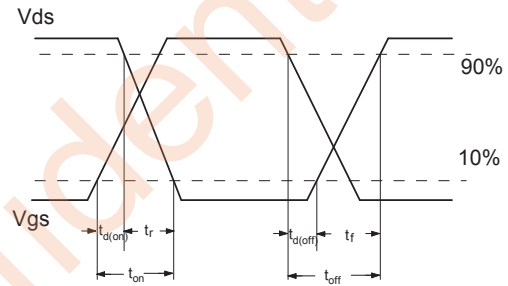
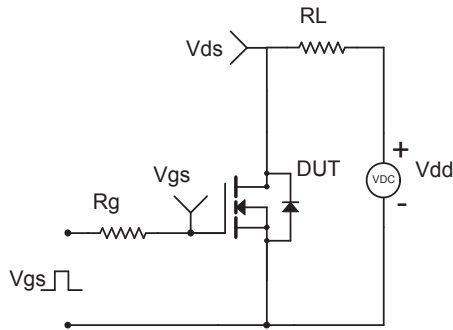
● Suggested Pad Layout



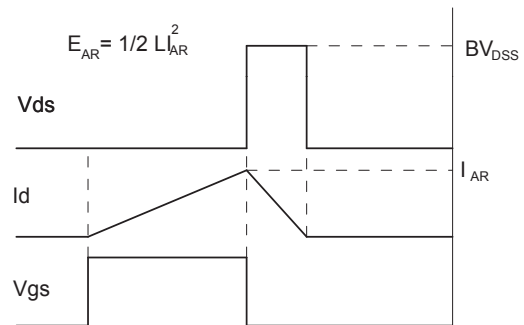
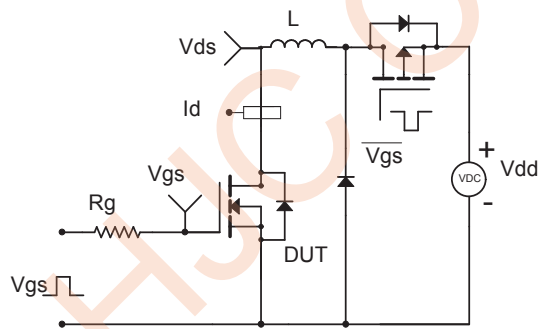
1. Gate Charge Test Circuit & Waveforms



2. Resistive Switching Test Circuit & Waveforms



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



4. Diode Recovery Test Circuit & Waveforms

