

SOT-223 Plastic-Encapsulate MOSFETS

Features

- $V_{DS}=-60V$
- $I_D=-5A$
- $R_{DS(on)}@V_{GS}=-10V < 90m\Omega$
- $R_{DS(on)}@V_{GS}=-4.5V < 110m\Omega$
- High power and current handing capability
- Voltage controlled small signal switch
- Fast Switching Speedze

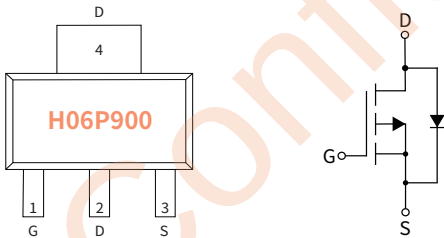
Applications

- Battery protection
- Load switch
- Power management

Mechanical Data

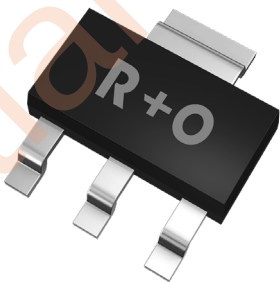
- Case: SOT-223
Molding compound meets UL 94V-0 flammability rating, RoHS-compliant,halogen-free
- Terminals: Solder plated, solderable per MIL-STD-750,Method 2026

Function Diagram



Drain-source Voltage
-60 V
Drain Current
-5 Ampere

SOT-223



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	-5
Pulsed Drain Current ⁽¹⁾	I_{DM}	A	-20
Single Pulse Avalanche Energy ⁽²⁾	EAS	mJ	27.56
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	40.3

● 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	-60	—	—
Zero Gate Voltage Drain Current	I _{DSS}	V _D =-60V, V _{GS} =0V	μA	—	—	-1.0
Gate-Body Leakage Current	I _{GSS}	V _{GS} = ±20V, V _D =0V	nA	—	—	±100
Gate Threshold Voltage	V _{GS(th)}	V _D = V _{GS} , I _D =-250μA	V	-1.0	-1.5	-2.0
Static Drain-Source On-Resistance ⁽³⁾	R _{DS(ON)}	V _{GS} = -10V, I _D =-5A	mΩ	—	53	90
		V _{GS} = -4.5V, I _D =-5A		—	62	110
Forward Transconductance	g _{FS}	V _D =-5.0V, I _D =-5A	S	—	10	—

● Dynamic Parameters

PARAMETER	SYMBOL	Condition	UNIT	Min	Typ	Max
Input Capacitance	C _{iss}	V _D =-30V, V _{GS} =0V, f=1MHZ	pF	—	1153	—
Output Capacitance	C _{oss}			—	93.7	—
Reverse Transfer Capacitance	C _{rss}			—	77.7	—

● Switching Parameters

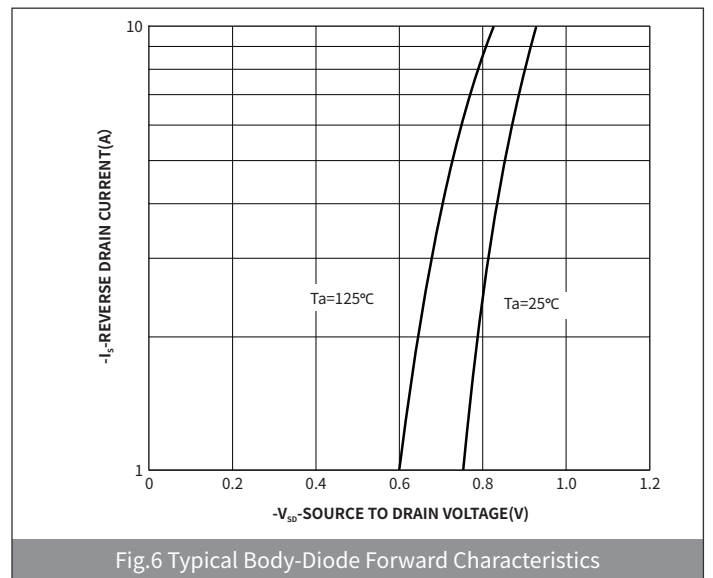
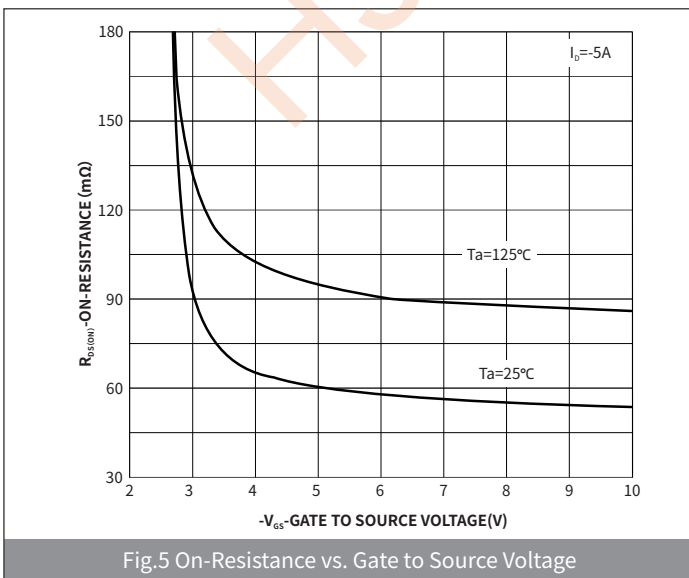
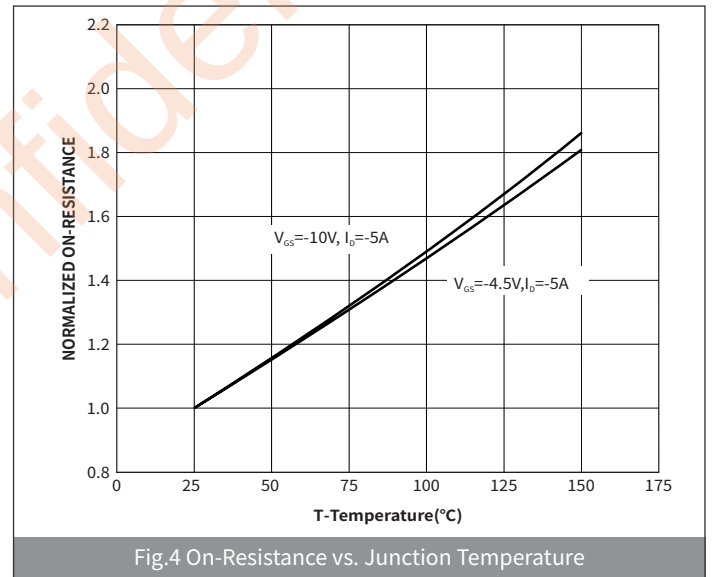
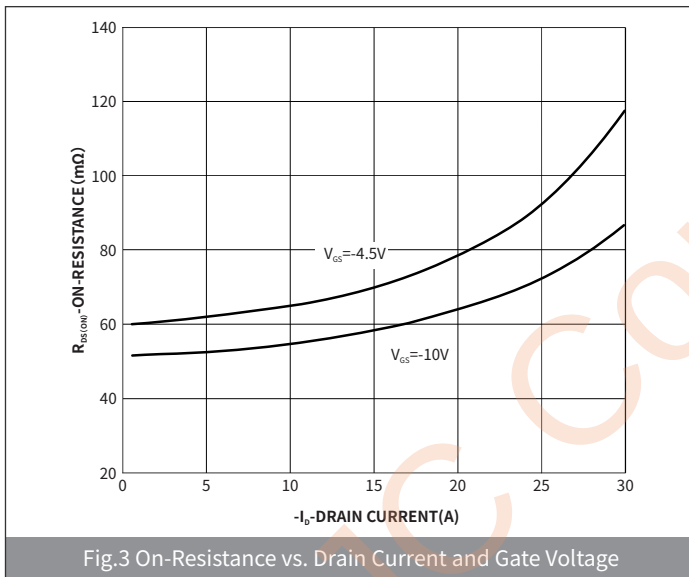
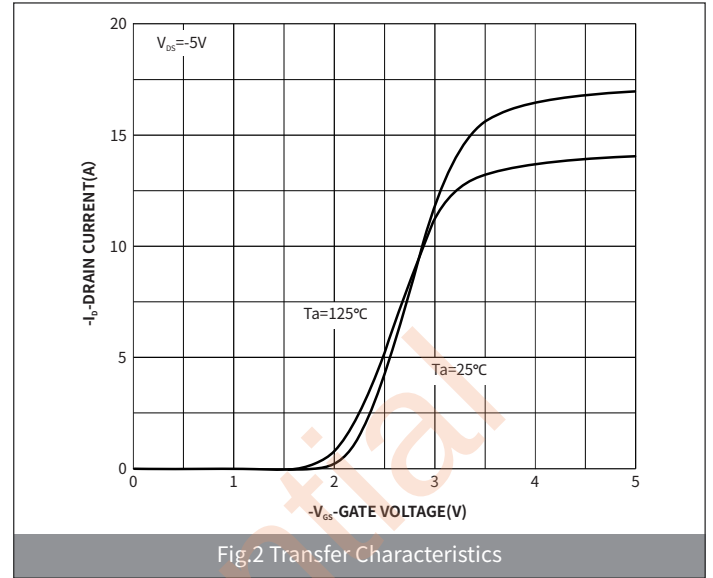
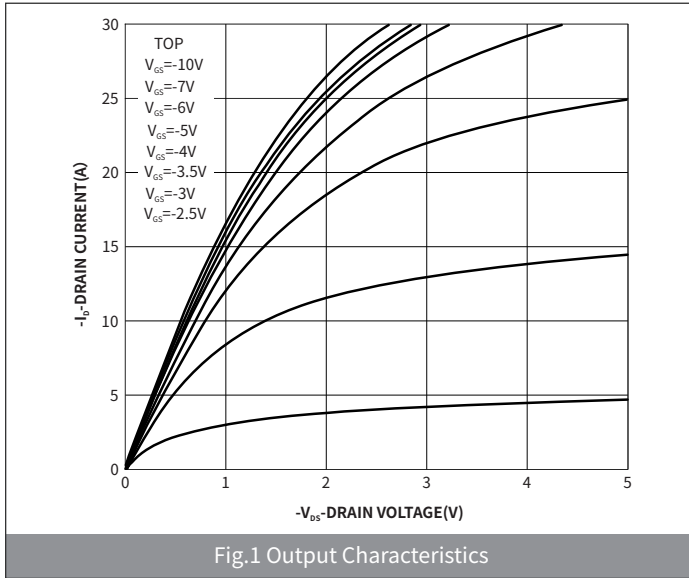
PARAMETER	SYMBOL	Condition	UNIT	Min	Typ	Max
Turn-on Delay Time	t _{D(on)}	V _{GS} =-10V, V _{DD} =-30V, I _D =-5A ,R _{GEN} =3Ω	nS	—	8	—
Turn-on Rise Time	t _r		nS	—	5	—
Turn-off Delay Time	t _{D(off)}		nS	—	32	—
Turn-off fall Time	t _f		nS	—	8	—
Total Gate Charge	Q _g	V _D =-30V, I _D =-5A V _{GS} =-10V	nC	—	15.8	—
Gate-Source Charge	Q _{gs}		nC	—	2.7	—
Gate-Drain Charge	Q _{gd}		nC	—	3.5	—

● Drian-Source Diode Characteristics

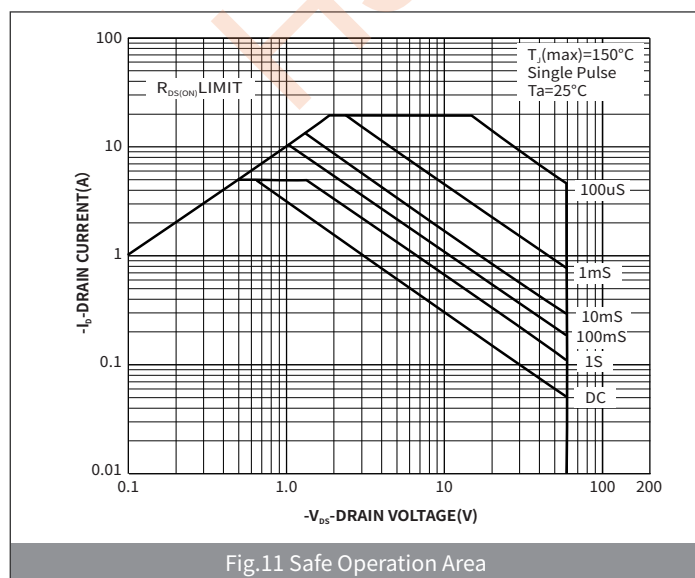
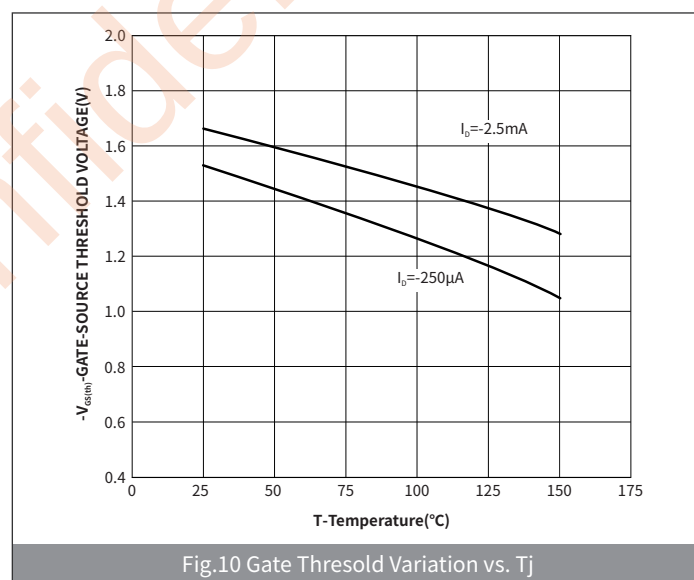
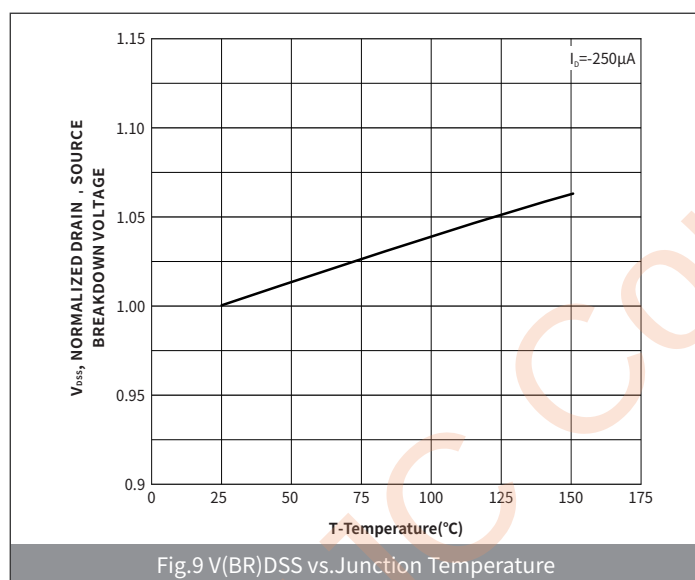
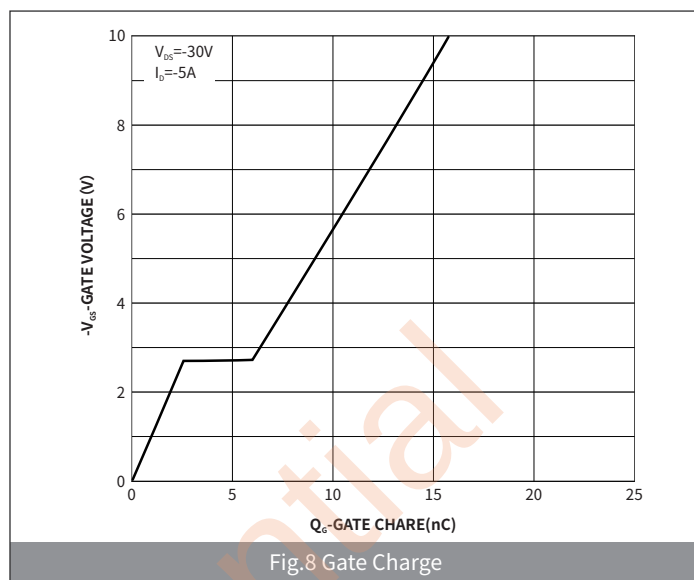
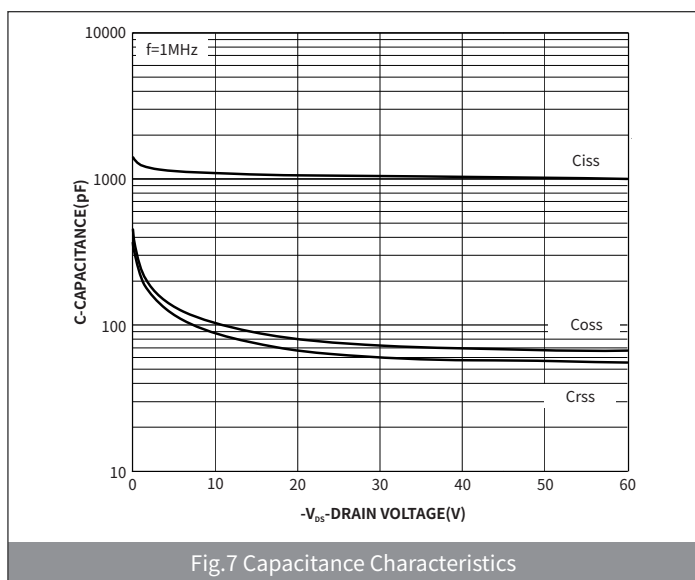
PARAMETER	SYMBOL	Condition	UNIT	Min	Typ	Max
Diode Forward Voltage	V _{SD}	I _S =-5A, V _{GS} =0V	V	—	—	-1.2
Maximum Body-Diode Continuous Current	I _S	—	A	—	—	-5
Reverse Recovery Time	T _{rr}	Tj=25°C, I _F =-5A di/dt=-100A/μs	nS	—	27	—
Reverse Recovery Charge	Q _{rr}		nC	—	32	—

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=-10.5A.
(3) Pulse test: Pulse width ≤ 300us, duty cycle ≤ 2%.

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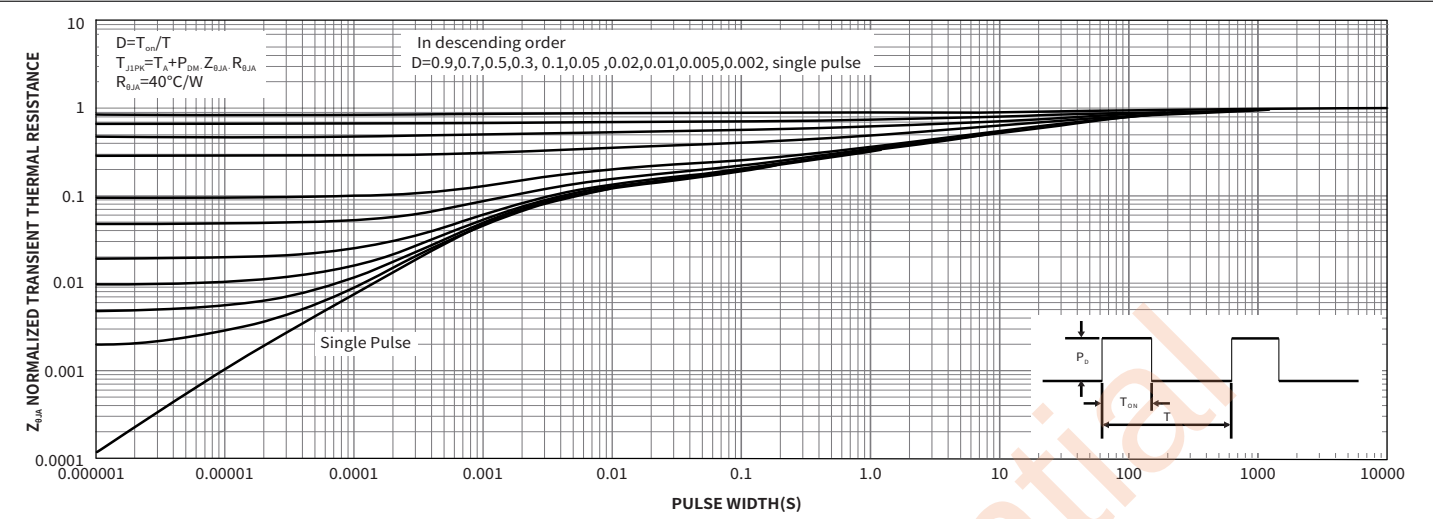
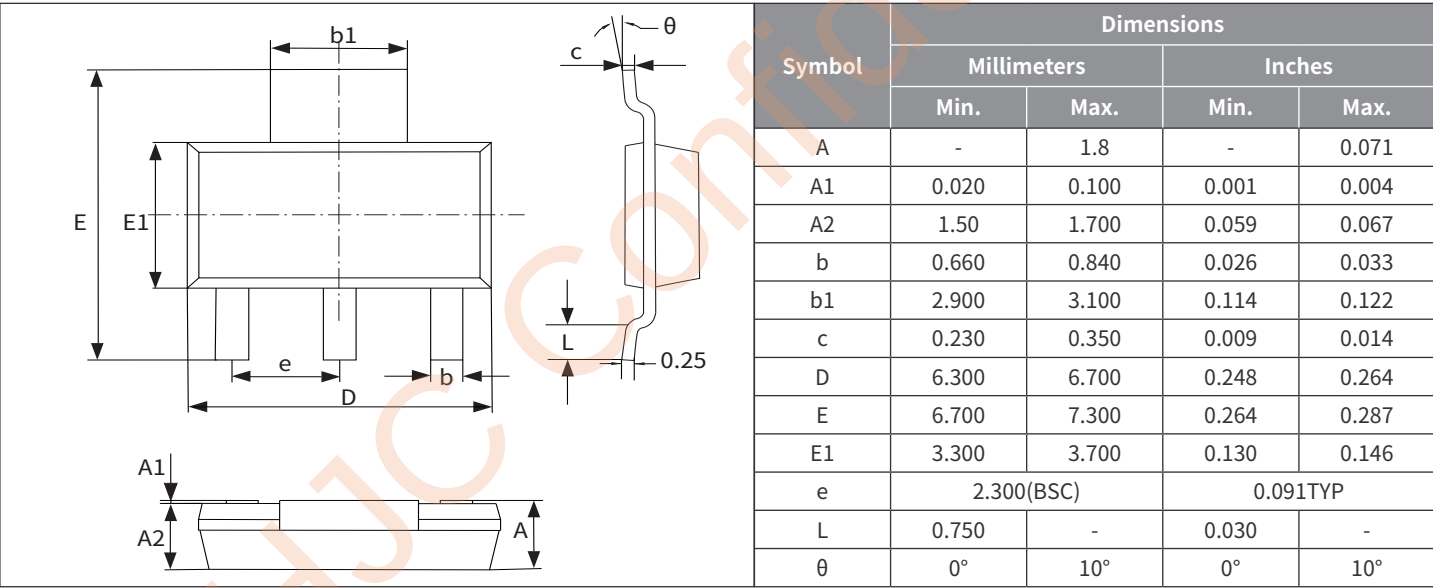
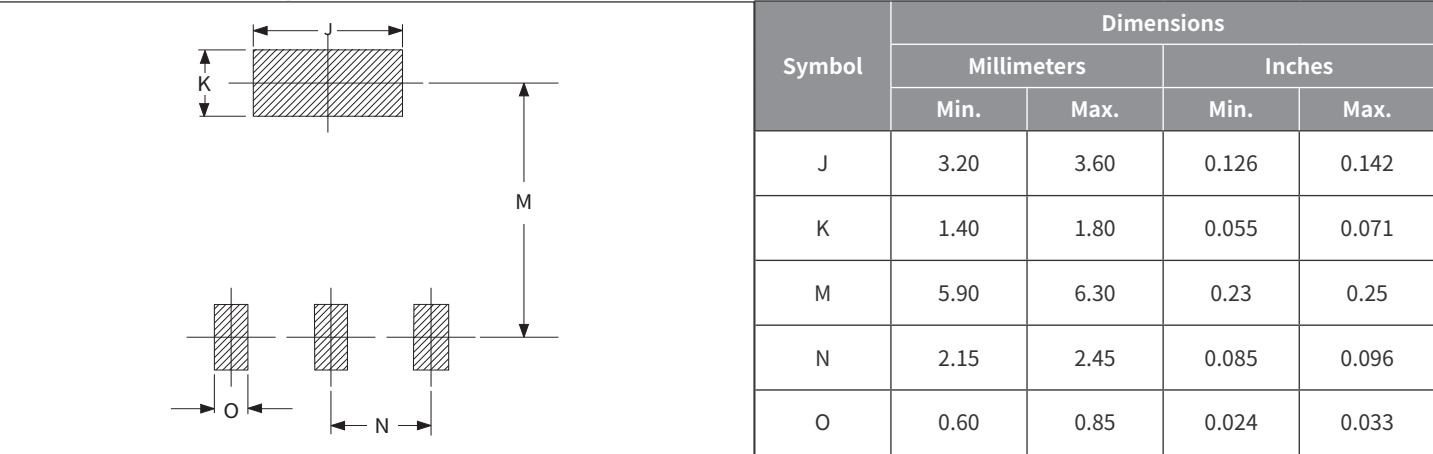


Fig.12 Normalized Maximum Transient Thermal Impedance

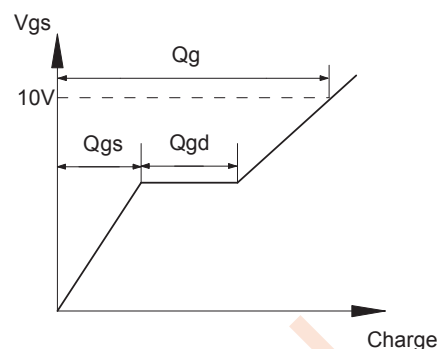
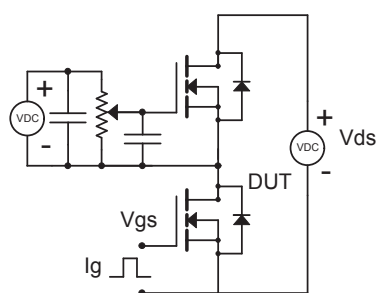
● Package Outline Dimensions (SOT-223)



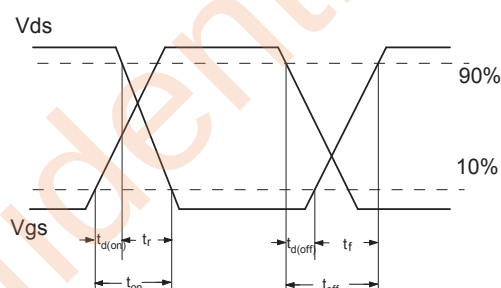
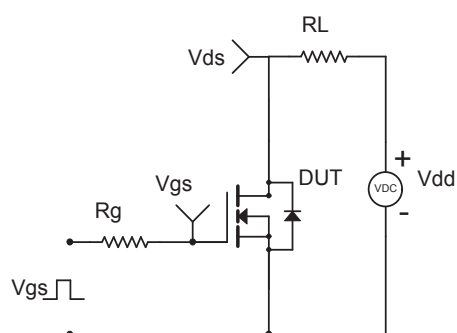
● Suggested Pad Layout



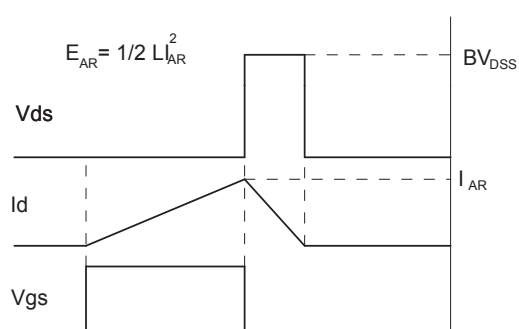
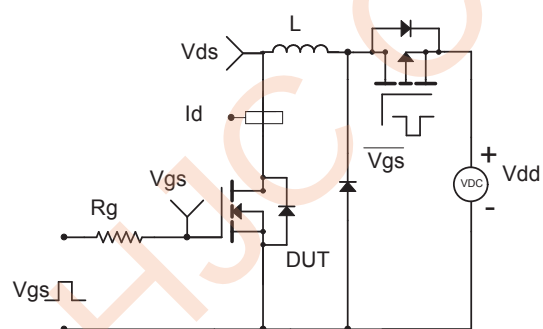
1. Gate Charge Test Circuit & Waveforms



2. Resistive Switching Test Circuit & Waveforms



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



4. Diode Recovery Test Circuit & Waveforms

