

SOT-223 Plastic-Encapsulate MOSFETS

Features

- $V_{DS}=60V$
- $I_D=4A$
- $R_{DS(on)}@V_{GS}=10V < 78m\Omega$
- $R_{DS(on)}@V_{GS}=4.5V < 100m\Omega$
- High power and current handing capability
- Voltage controlled small signal switch
- Fast Switching Speedze

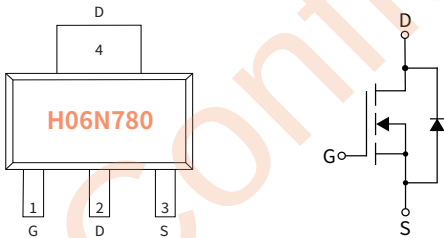
Applications

- 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



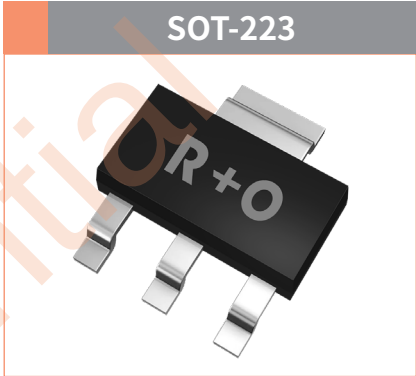
Ordering Information

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	4
Pulsed Drain Current ⁽¹⁾	I_{DM}	A	12
Single Pulse Avalanche Energy ⁽²⁾	EAS	mJ	19.3
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

Drain-source Voltage
60 V
Drain Current
4 Ampere



● 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 _{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	0.8	1.3	2.0
Static Drain-Source On-Resistance ⁽³⁾	R _{DS(ON)}	V _{GS} =10V, I _D =4A	mΩ	—	38	78
		V _{GS} =4.5V, I _D =4A		—	45	100
Forward Transconductance	G _{FS}	V _{DS} =5V, I _D =4A	S	4	—	—

● Dynamic Parameters

PARAMETER	SYMBOL	Condition	UNIT	Min	Typ	Max
Input Capacitance	C _{iss}	V _{DS} =30V, V _{GS} =0V, f=1MHZ	pF	—	510	—
Output Capacitance	C _{oss}			—	34	—
Reverse Transfer Capacitance	C _{rss}			—	26	—

● Switching Parameters

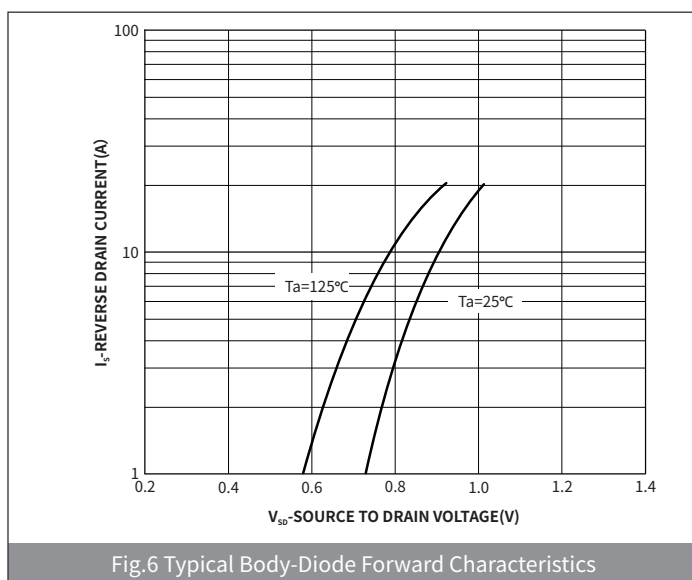
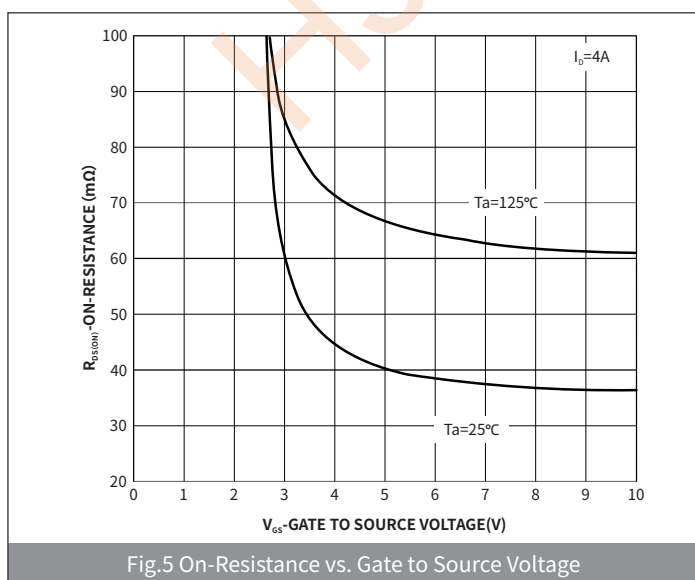
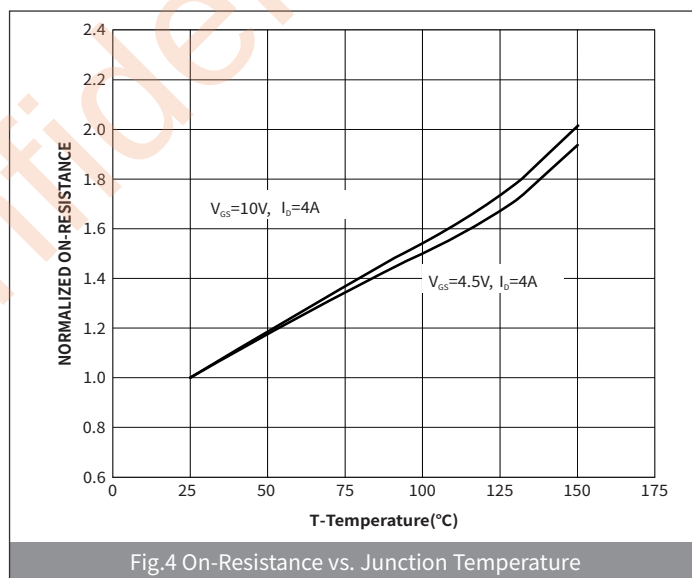
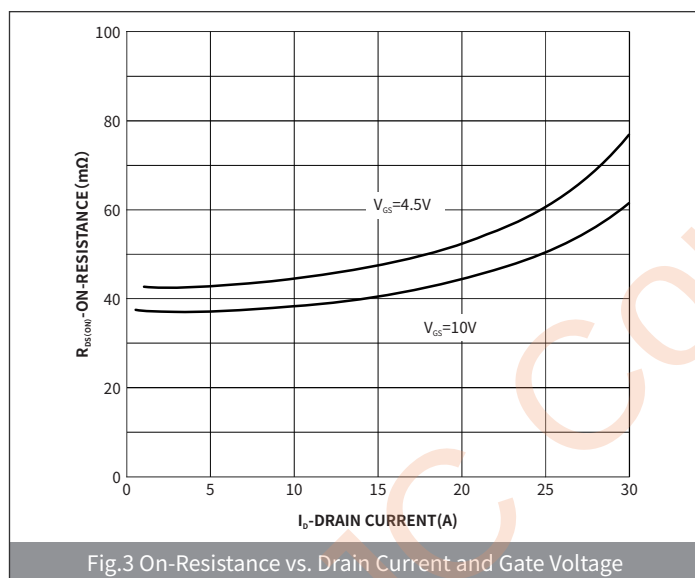
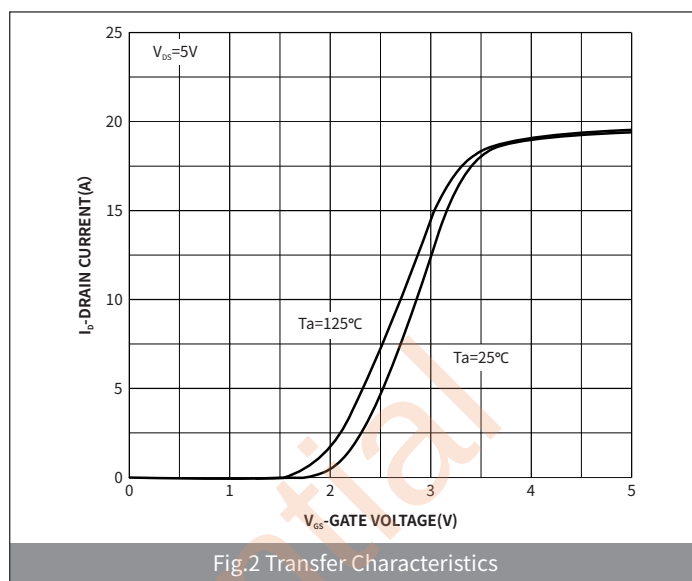
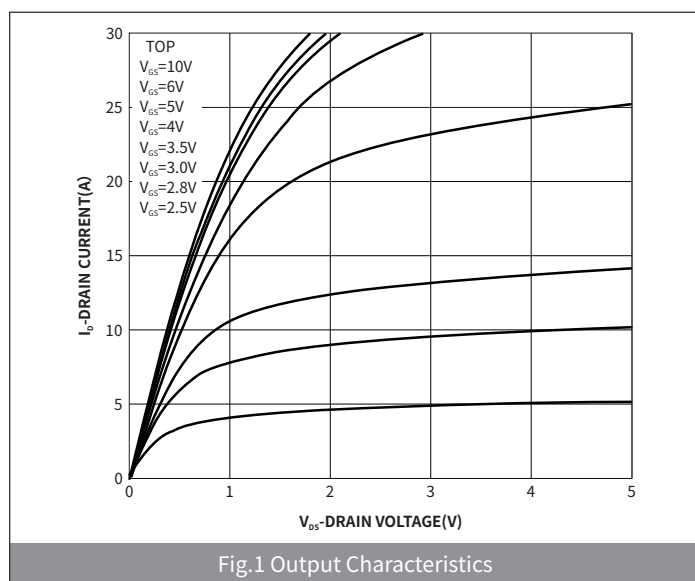
PARAMETER	SYMBOL	Condition	UNIT	Min	Typ	Max
Turn-on Delay Time	t _{D(on)}	V _{GS} =10V, V _{DD} =30V, I _D =4A ,R _{GEN} =1Ω	nS	—	6	—
Turn-on Rise Time	t _r		nS	—	15	—
Turn-off Delay Time	t _{D(off)}		nS	—	15	—
Turn-off fall Time	t _f		nS	—	10	—
Total Gate Charge	Q _g	V _{DS} =30V, I _D =4A V _{GS} =10V	nC	—	14.6	—
Gate-Source Charge	Q _{gs}		nC	—	1.6	—
Gate-Drain Charge	Q _{gd}		nC	—	3	—

● Drian-Source Diode Characteristics

PARAMETER	SYMBOL	Condition	UNIT	Min	Typ	Max
Diode Forward Voltage	V _{SD}	I _S =4A, V _{GS} =0V	V	—	—	1.2
Maximum Body-Diode Continuous Current	I _S	—	A	—	—	4

Note :
(1) Repetitive Rating: Pulse width limited by maximum junction temperature.
) EAS condition : Tj=25°C ,VDD=30V,VG=10V,L=0.5mH,IAS=8.8A.
(3) Pulse test: Pulse width ≤ 300us, duty cycle ≤ 2%.

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



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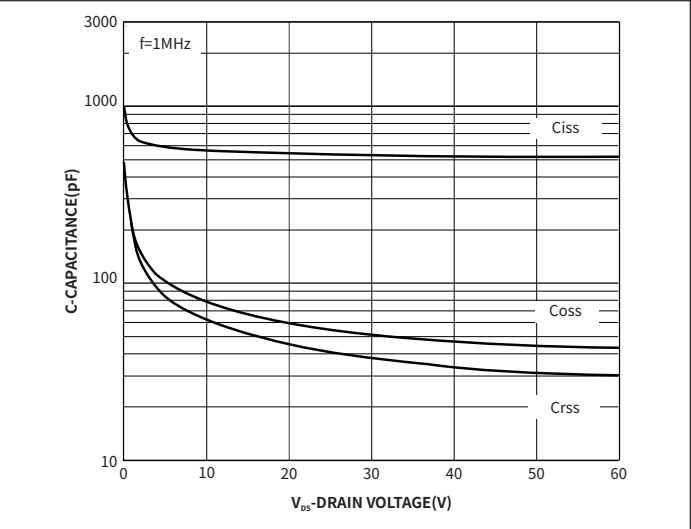


Fig.7 Capacitance Characteristics

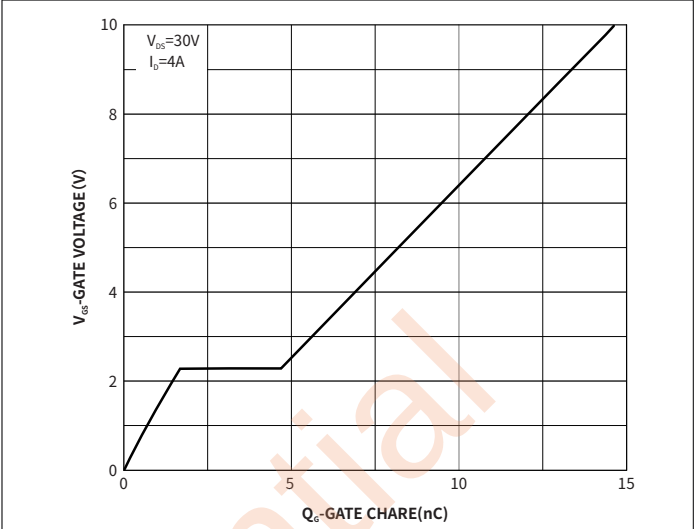


Fig.8 Gate Charge

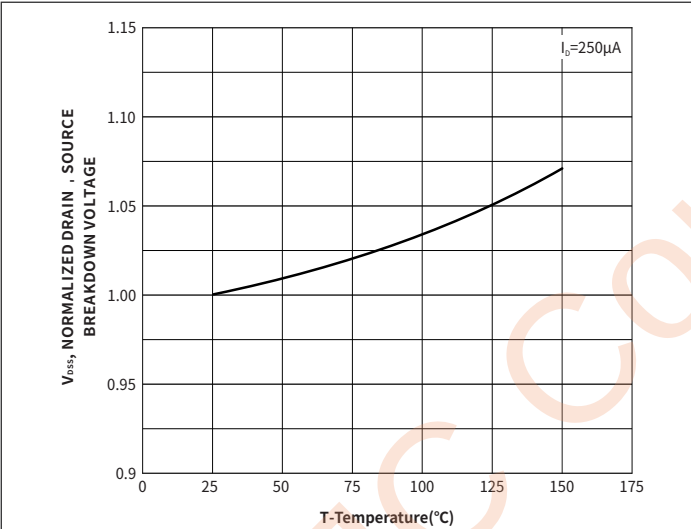


Fig.9 V(BR)DSS vs. Junction Temperature

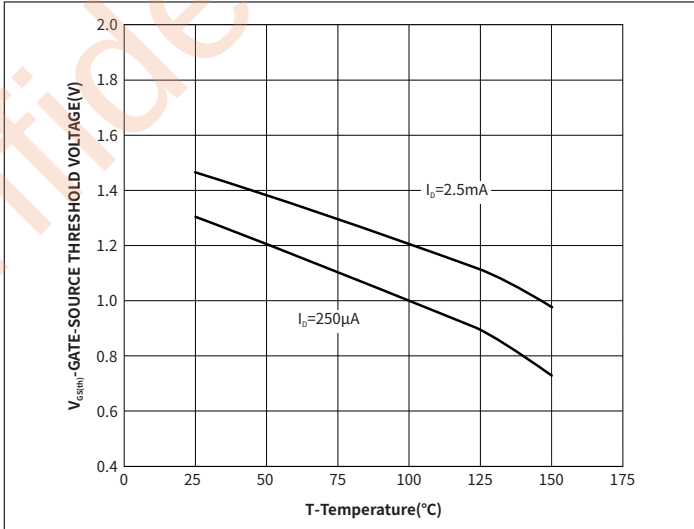


Fig.10 Gate Threshold Variation vs. T_J

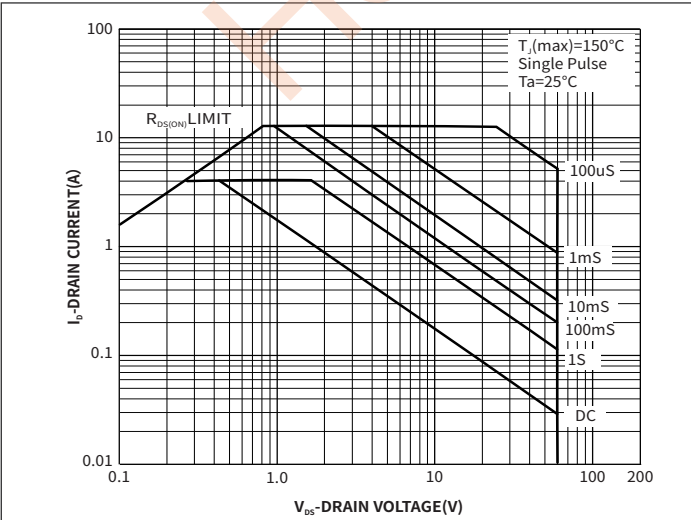
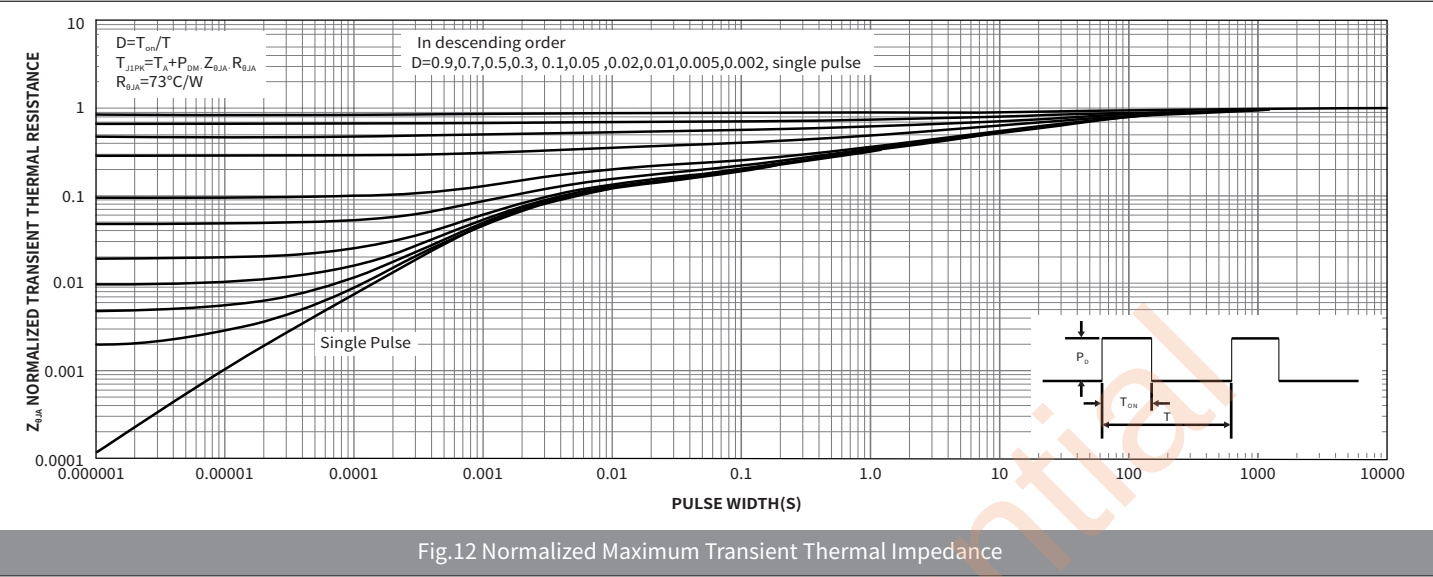
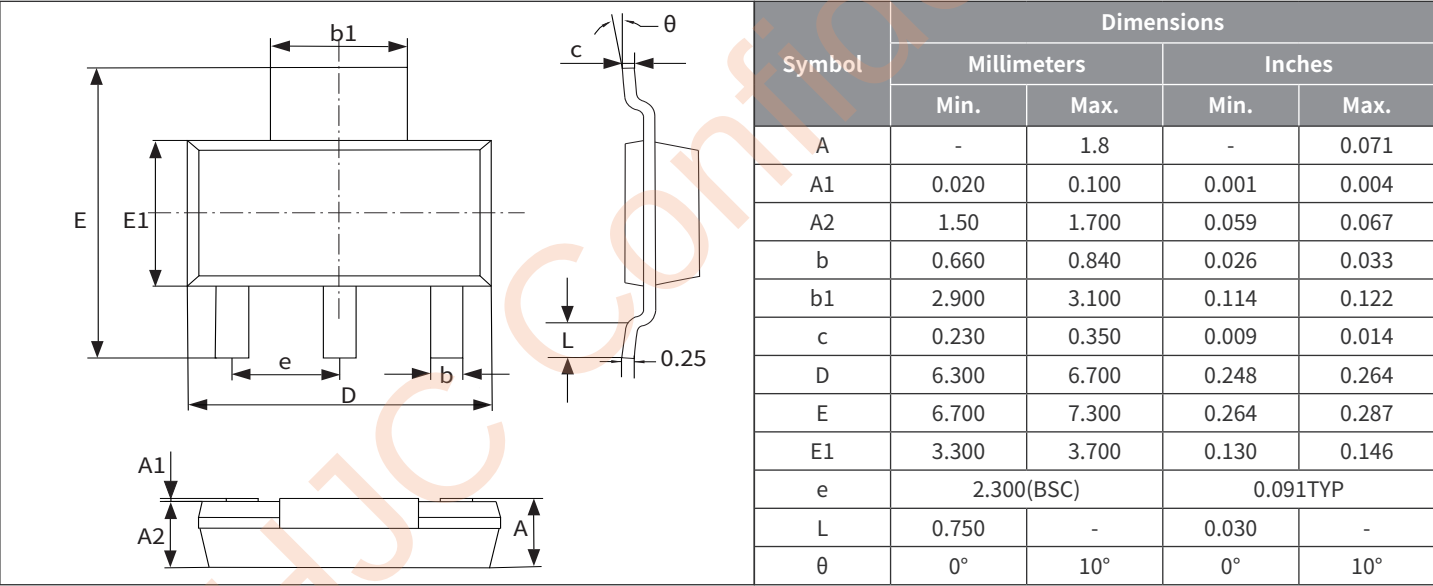


Fig.11 Safe Operation Area

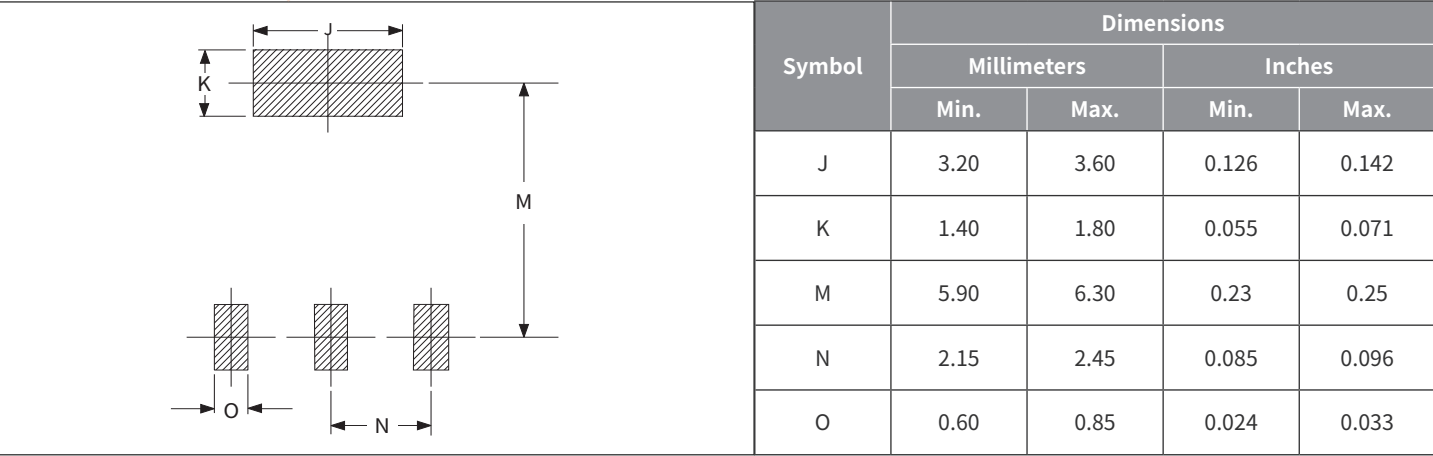
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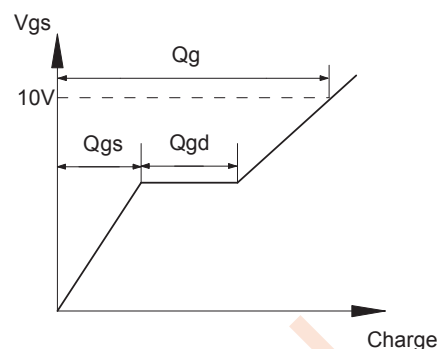
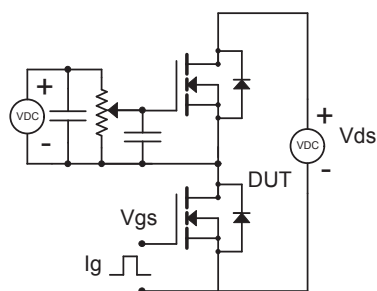
● Package Outline Dimensions (SOT-223)



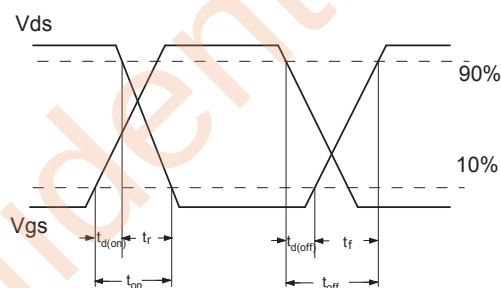
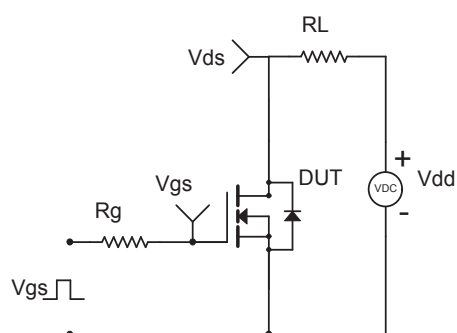
● Suggested Pad Layout



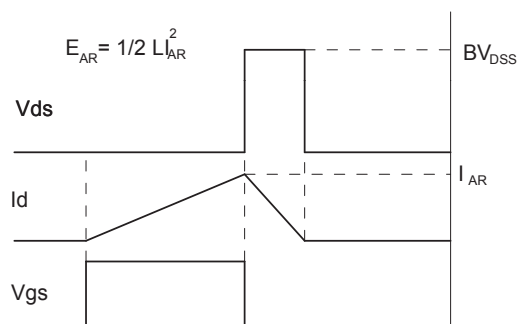
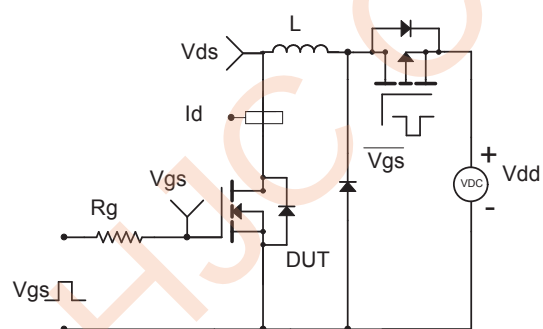
1. Gate Charge Test Circuit & Waveforms



2. Resistive Switching Test Circuit & Waveforms



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



4. Diode Recovery Test Circuit & Waveforms

