

SOT-223 Plastic-Encapsulate MOSFETS

Features

- $V_{DS}=-20V$
- $I_D=-16A$
- $R_{DS(on)}@V_{GS}=-4.5V < 13m\Omega$
- $R_{DS(on)}@V_{GS}=-2.5V < 16m\Omega$
- High power and current handing capability
- Voltage controlled small signal switch
- Fast Switching Speedze

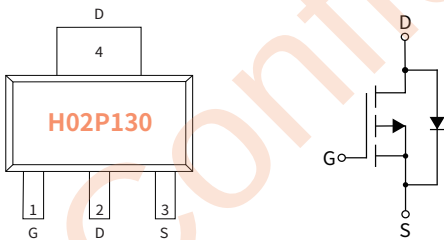
Applications

- 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



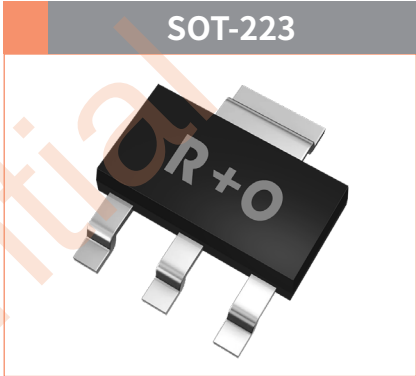
Ordering Information

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	-20
Gate-source Voltage	V_{GS}	V	± 10
Drain Current	I_D	A	-16
Pulsed Drain Current ⁽¹⁾	I_{DM}	A	-64
Single Pulse Avalanche Energy ⁽²⁾	EAS	mJ	28.3
Total Power Dissipation	P_D	W	6.5
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	19.2

Drain-source Voltage
-20 V
Drain Current
-16 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	-20	—	—
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =-20V, V _{GS} =0V	μA	—	—	-1.0
Gate-Body Leakage Current	I _{GSS}	V _{GS} = ±10V, V _{DS} =0V	nA	—	—	±100
Gate Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D =-250μA	V	-0.4	-0.65	-1.0
Static Drain-Source On-Resistance ⁽³⁾	R _{DS(ON)}	V _{GS} = -4.5V, I _D =-10A	mΩ	—	11	13
		V _{GS} = -2.5V, I _D =-6.5A		—	14	16

● Dynamic Parameters

PARAMETER	SYMBOL	Condition	UNIT	Min	Typ	Max
Input Capacitance	C _{iss}	V _{DS} =-10V, V _{GS} =0V, f=1MHZ	pF	—	2108	—
Output Capacitance	C _{oss}			—	275	—
Reverse Transfer Capacitance	C _{rss}			—	236	—

● Switching Parameters

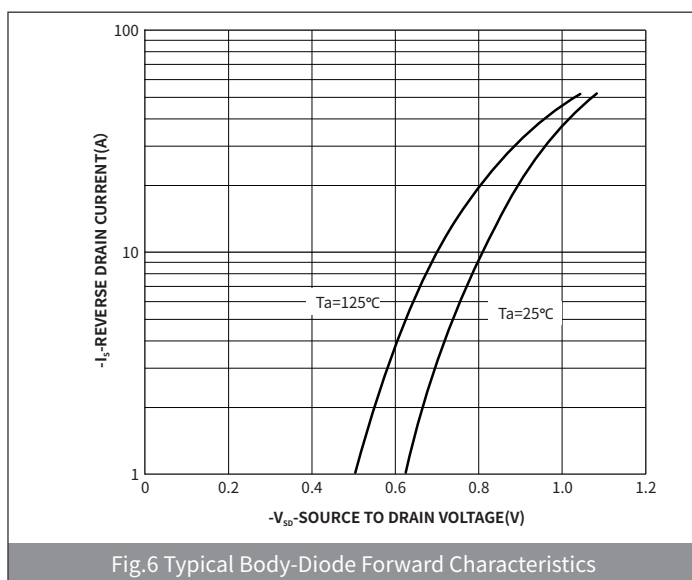
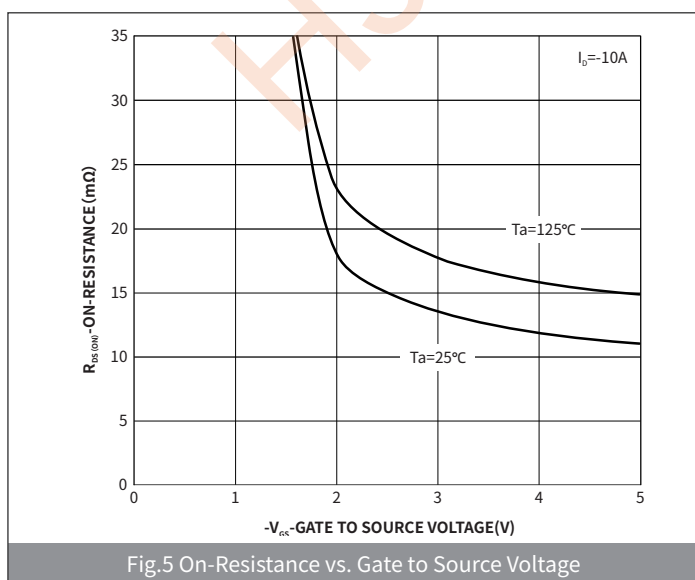
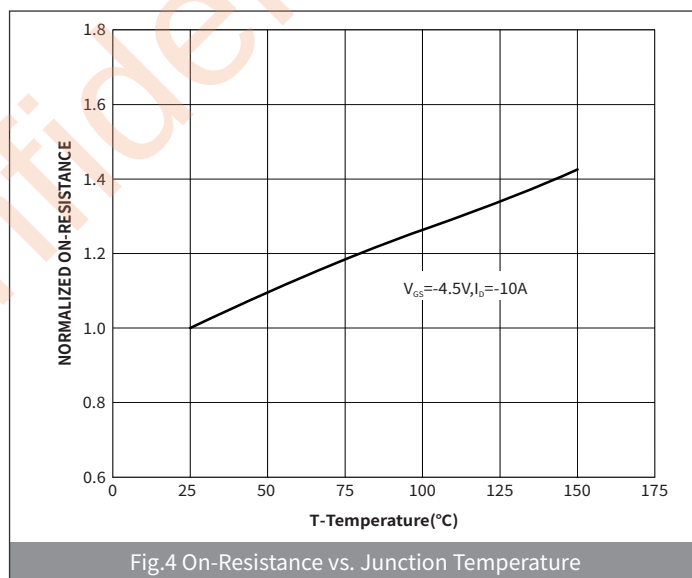
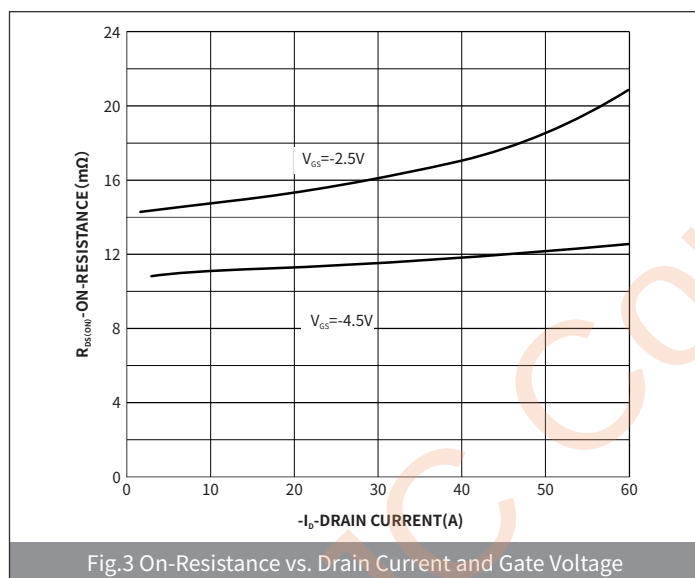
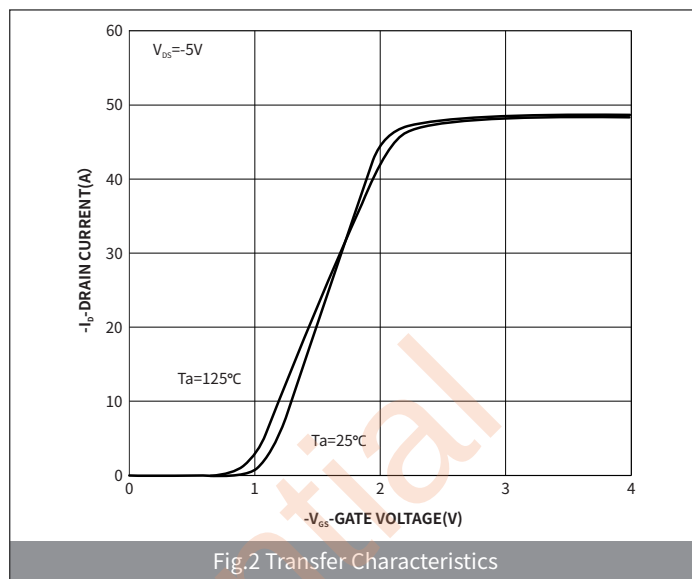
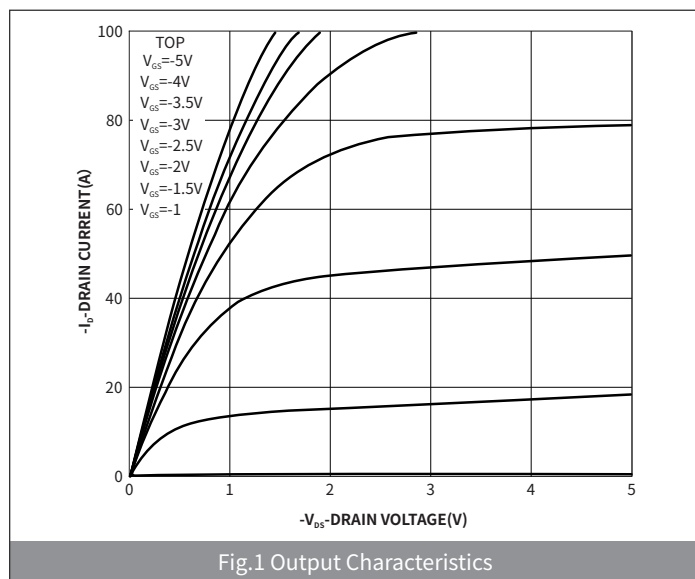
PARAMETER	SYMBOL	Condition	UNIT	Min	Typ	Max
Turn-on Delay Time	t _{D(on)}	V _{GS} =-4.5V, V _{DD} =-10V, I _D =-10A ,R _{GEN} =3Ω	nS	—	9.5	—
Turn-on Rise Time	t _r		nS	—	15	—
Turn-off Delay Time	t _{D(off)}		nS	—	40	—
Turn-off fall Time	t _f		nS	—	35	—
Total Gate Charge	Q _g	V _{DS} =-10V, I _D =-10A V _{GS} =-4.5V	nC	—	28	—
Gate-Source Charge	Q _{gs}		nC	—	4	—
Gate-Drain Charge	Q _{gd}		nC	—	7	—

● Drian-Source Diode Characteristics

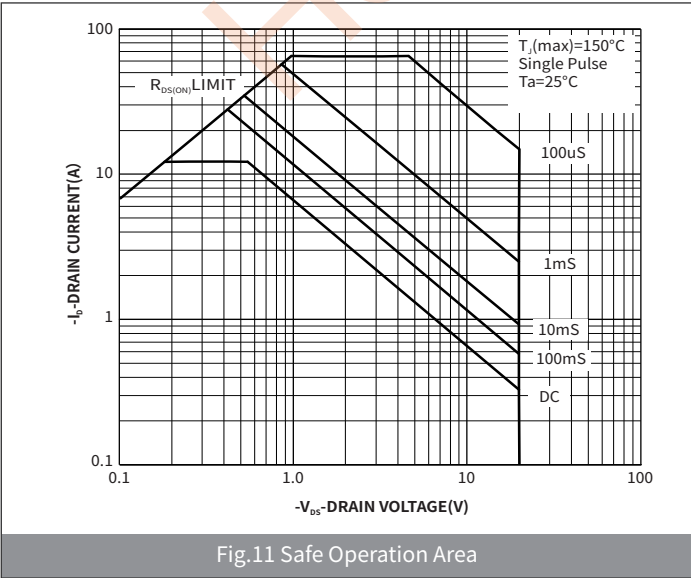
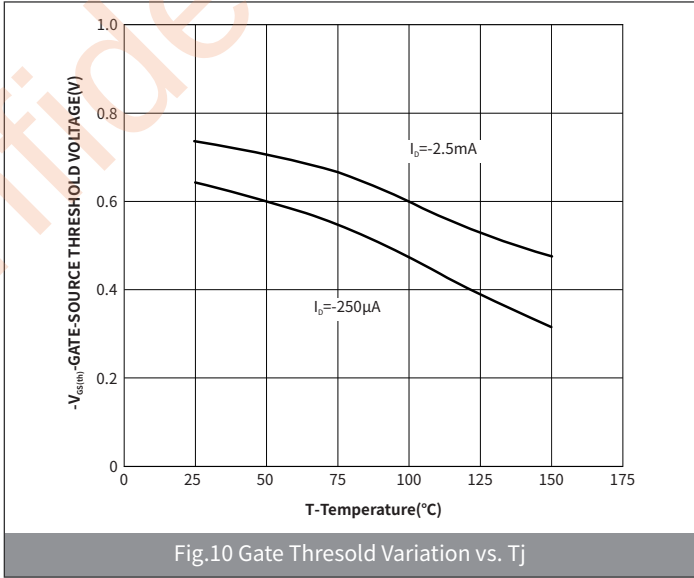
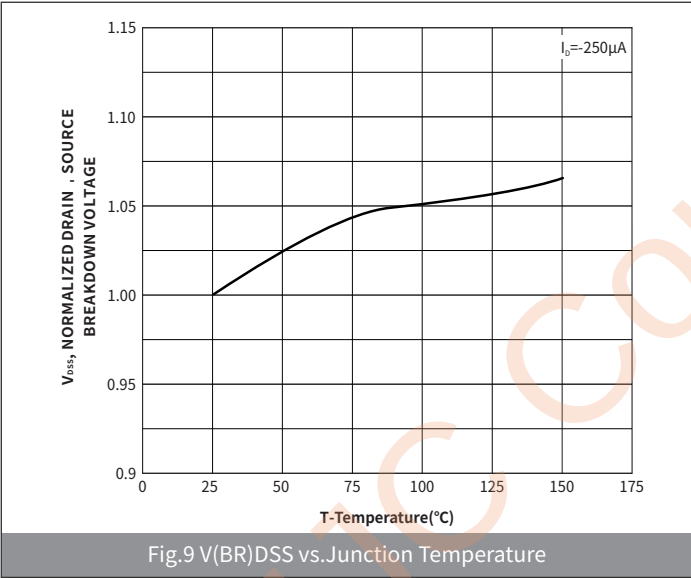
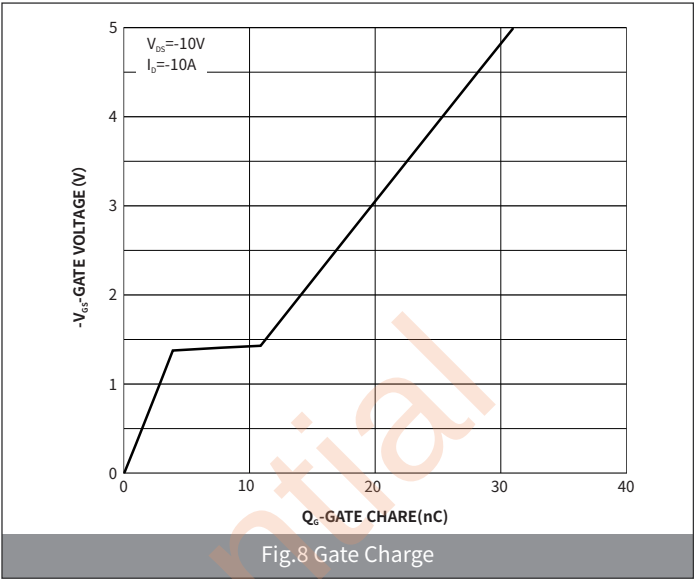
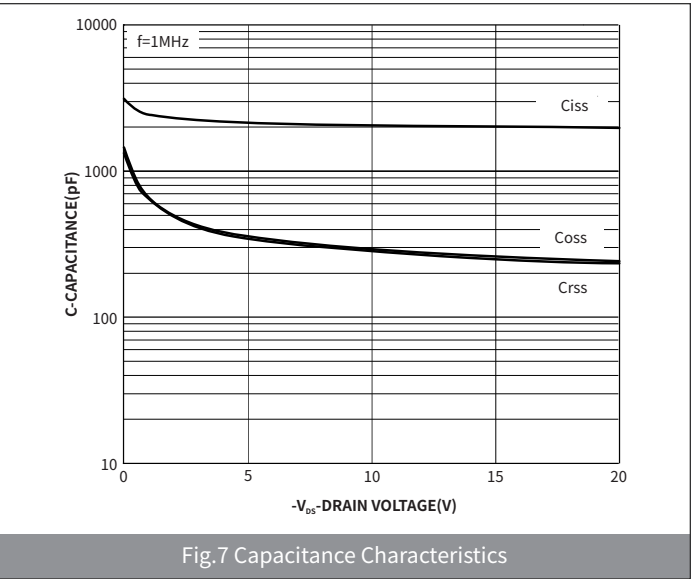
PARAMETER	SYMBOL	Condition	UNIT	Min	Typ	Max
Diode Forward Voltage	V _{SD}	I _S =-1A, V _{GS} =0V	V	—	—	-1.2
Maximum Body-Diode Continuous Current	I _S	—	A	—	—	-16

Note :
(1) Repetitive Rating: Pulse width limited by maximum junction temperature.
(2) EAS condition : Tj=25°C ,VDD=-20V,VG=-10V,L=0.1mH,IAS=-23.8A,Rg=25Ω.
(3) Pulse test: Pulse width ≤ 300us, duty cycle ≤ 2%.

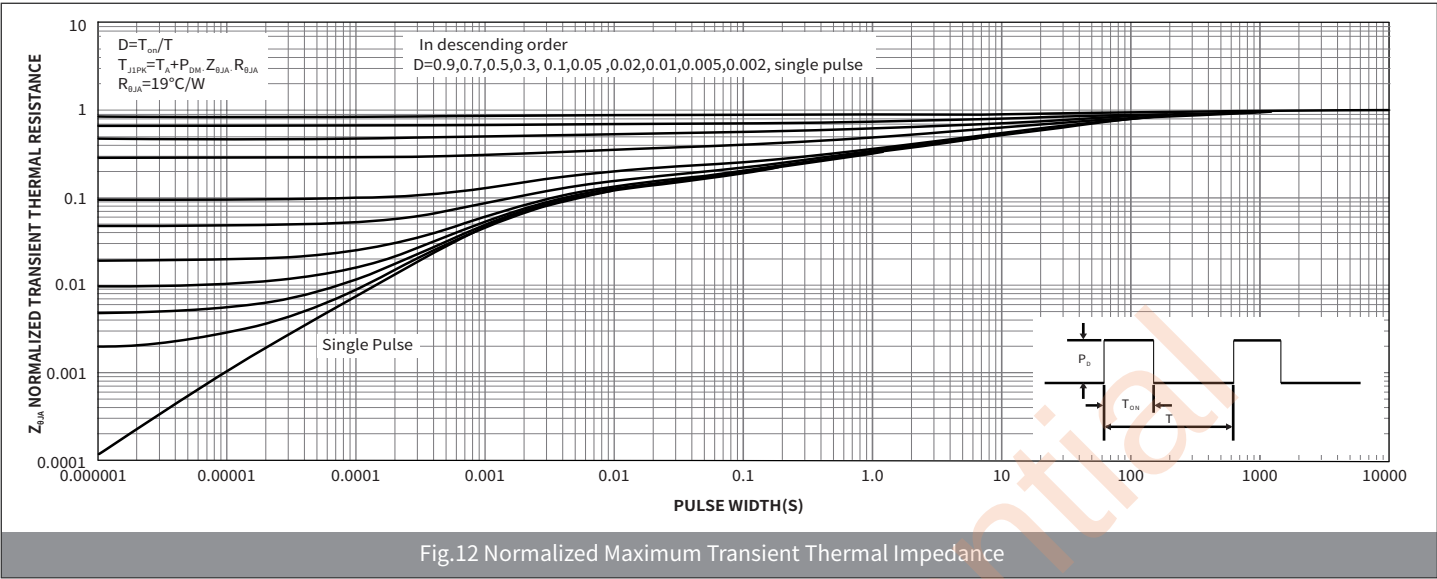
● Ratings And Characteristics Curves ($T_a=25^\circ\text{C}$ Unless otherwise specified)



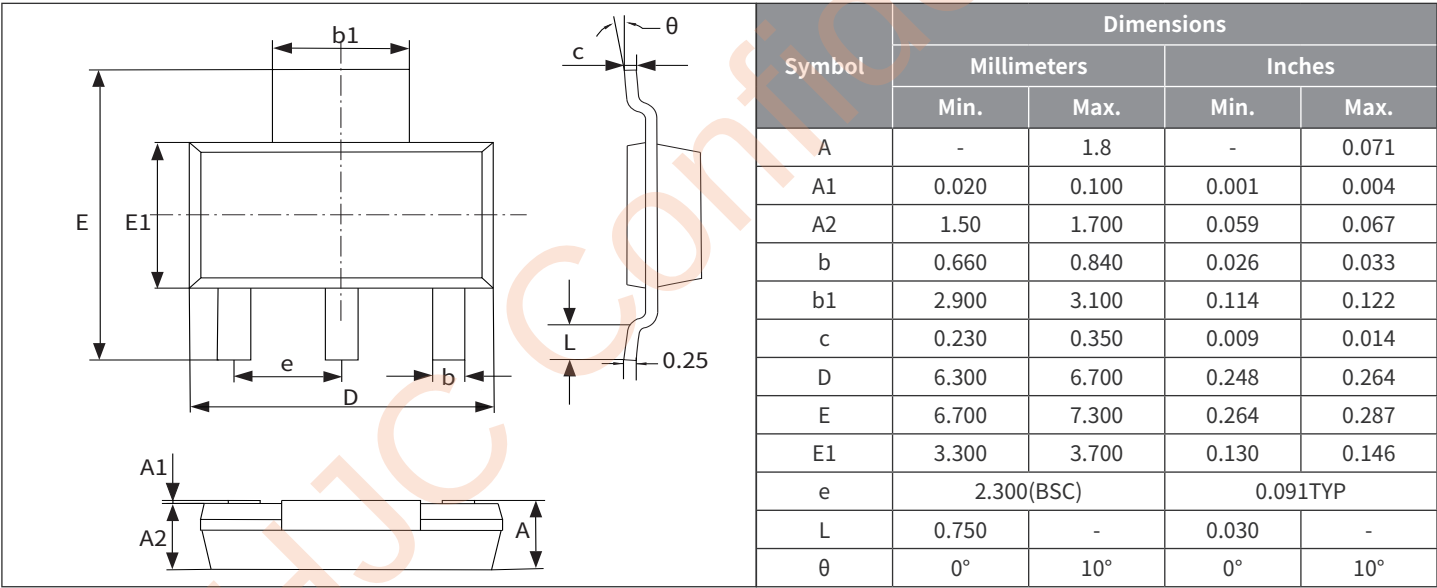
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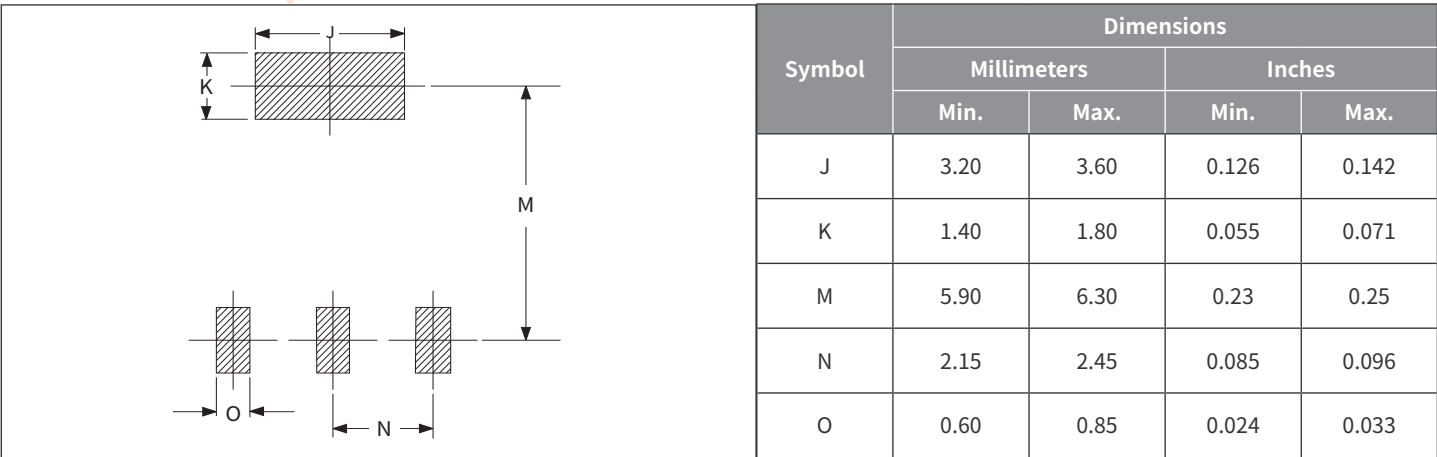
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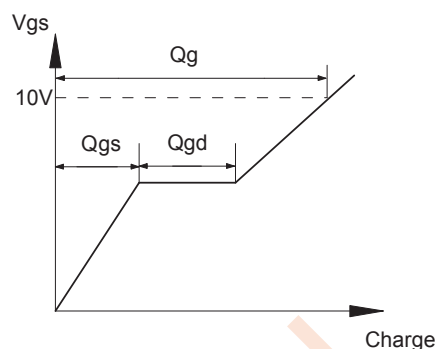
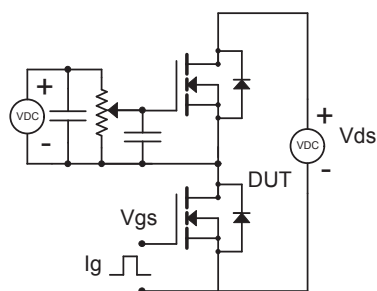
● Package Outline Dimensions (SOT-223)



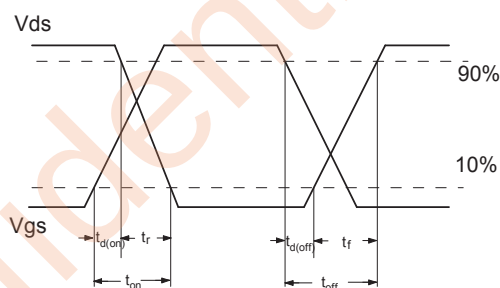
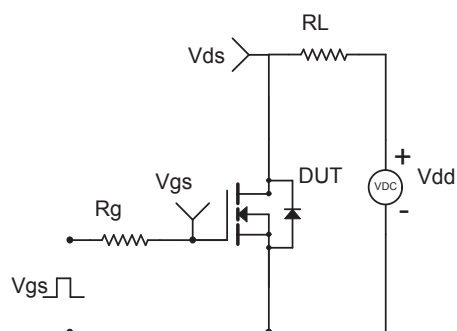
● Suggested Pad Layout



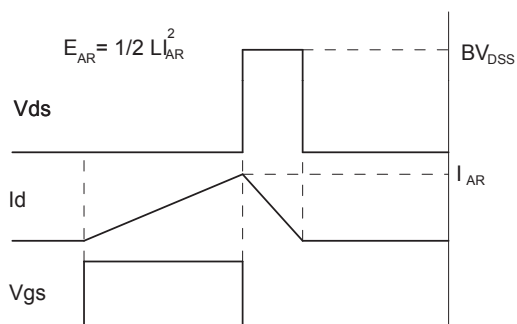
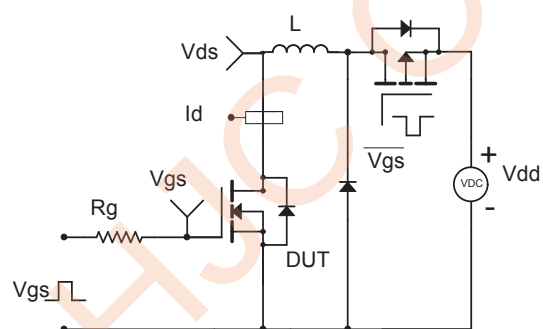
1. Gate Charge Test Circuit & Waveforms



2. Resistive Switching Test Circuit & Waveforms



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



4. Diode Recovery Test Circuit & Waveforms

