SOT-223 Plastic-Encapsulate MOSFETS

Features

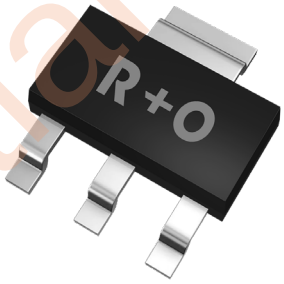
- V_{DS}=60V
- I_D=3A
- $R_{DS(on)}$@V_{GS}=10V ＜ 84mΩ
- $R_{DS(on)}$@V_{GS}=4.5V ＜ 104mΩ
- High power and current handing capability
- Voltage controlled small signal switch
- Fast Switching Speedze

Drain-source Voltage
60 V
Drain Current
3 Ampere

Applications

- Battery protection
- DC/DC converter

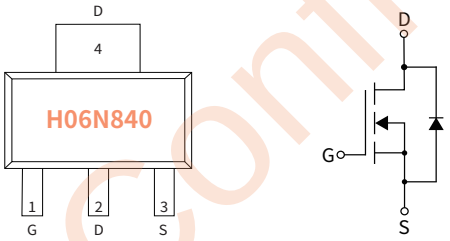
SOT-223



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	60
Gate-source Voltage	V_{GS}	V	±20
Drain Current	I_D	A	3
Pulsed Drain Current [1]	I_{DM}	A	12
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

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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	1.0	1.3	2.0
Static Drain-Source On-Resistance (2)	$R_{DS(ON)}$	V_{GS}=10V, I_D=3A	mΩ	—	73	84
		V_{GS}=4.5V, I_D=3A		—	85	104
Forward Transconductance	g_{FS}	V_{DS}=5V,I_D=3A	S	4	—	—

Dynamic Parameters

PARAMETER	SYMBOL	Condition	UNIT	Min	Typ	Max
Input Capacitance	C_{iss}	V_{DS}=30V, V_{GS}=0V, f=1MHZ	pF	—	310	—
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=3A ,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=3A 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=3A, V_{GS}=0V	V	—	—	1.2
Maximum Body-Diode Continuous Current	I_S	—	A	—	—	3

Note :
(1)Repetitive Rating: Pulse width limited by maximum junction temperature.
(2)Pulse test: Pulse width ⩽ 300us, duty cycle ⩽ 2%.

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

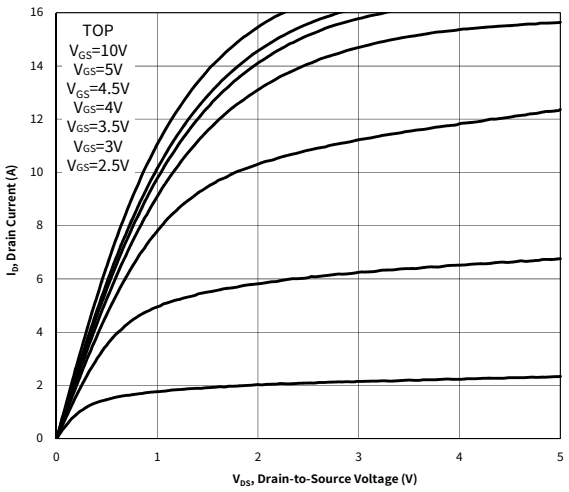


Fig.1 Output Characteristics

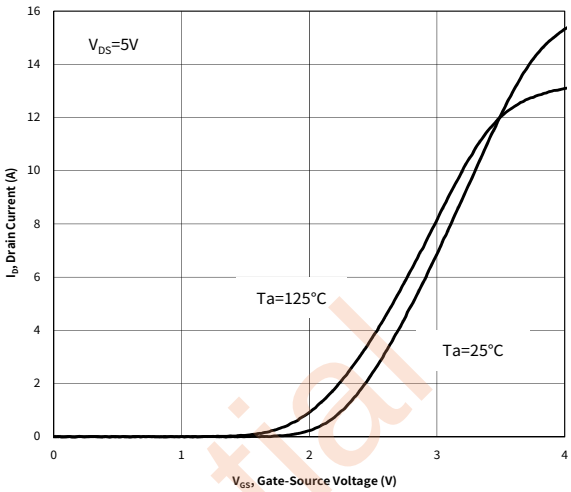


Fig.2 Transfer Characteristics

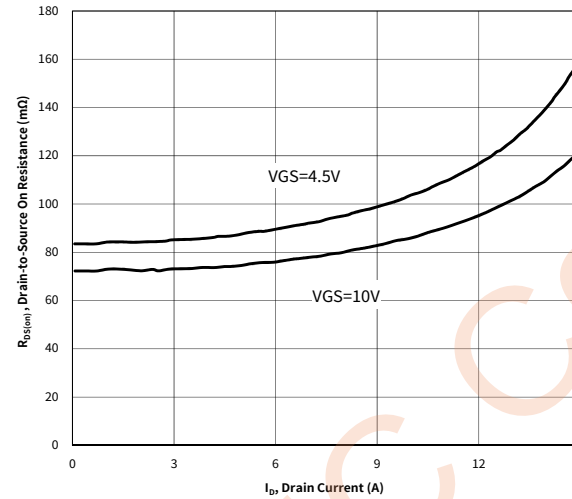


Fig.3 On-Resistance vs. Drain Current and Gate Voltage

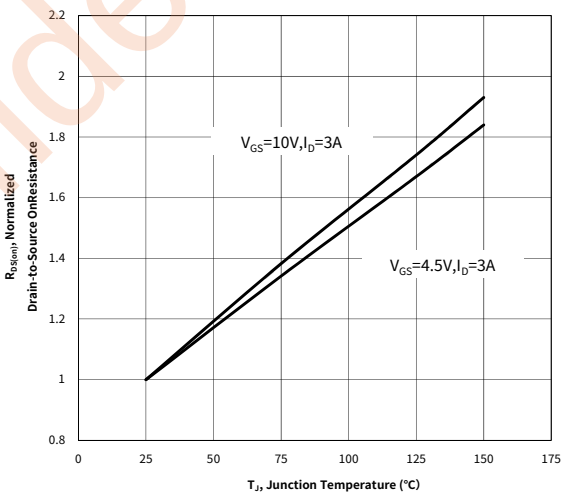


Fig.4 On-Resistance vs. Junction Temperature

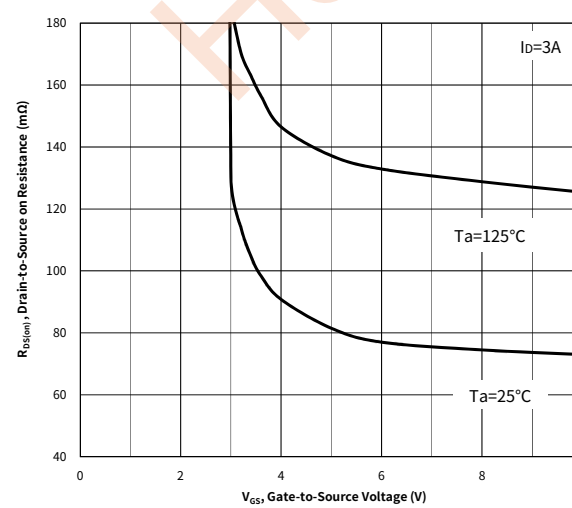


Fig.5 On-Resistance vs. Gate to Source Voltage

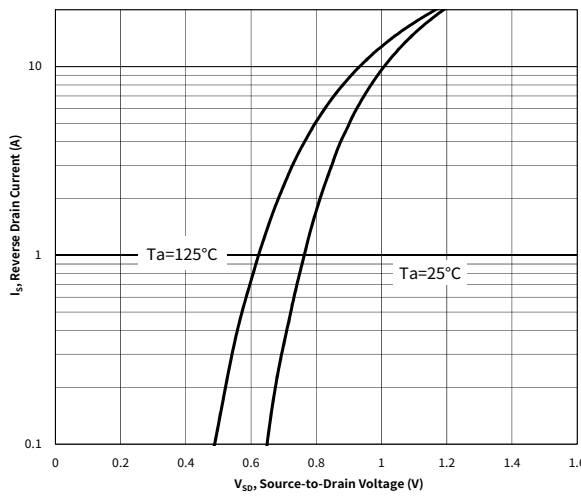


Fig.6 Typical Body-Diode Forward Characteristics

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

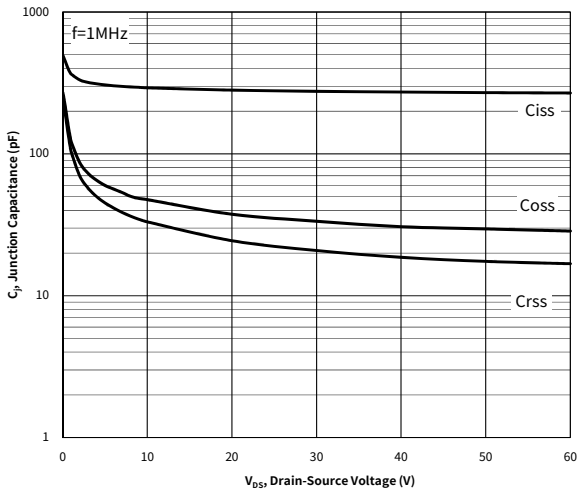


Fig.7 Capacitance Characteristics

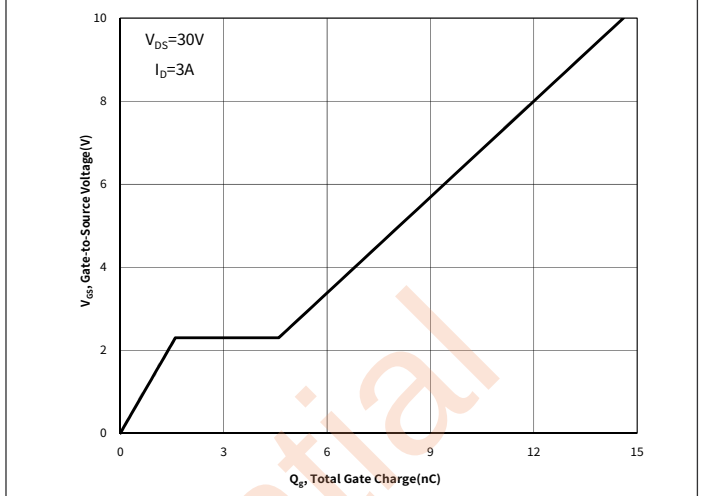


Fig.8 Gate Charge

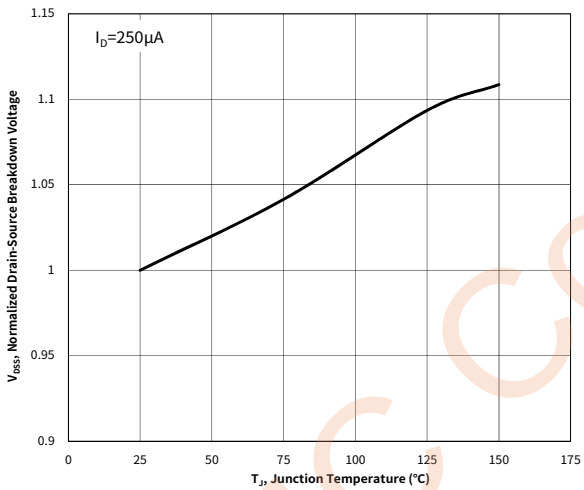


Fig.9 V(BR)DSS vs.Junction Temperature

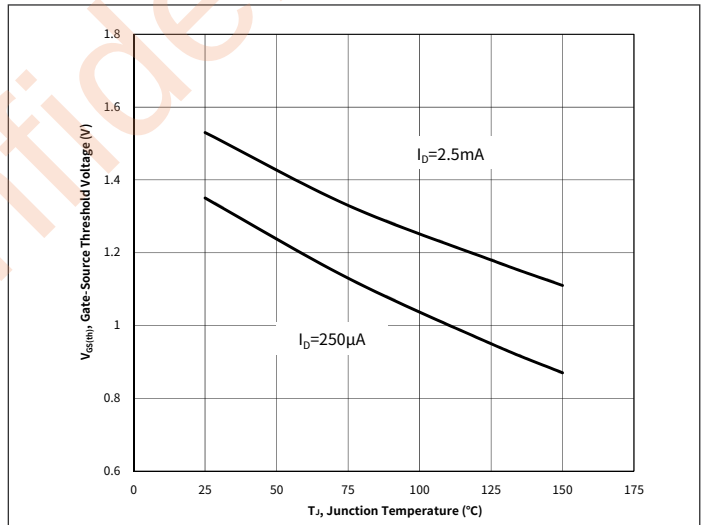


Fig.10 Gate Thresold Variation vs. Tj

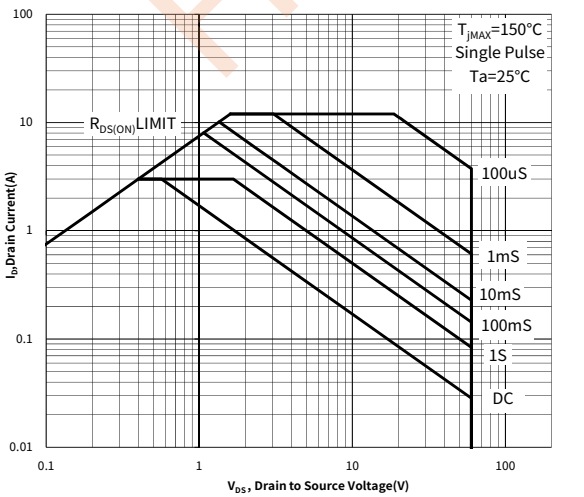


Fig.11 Safe Operation Area

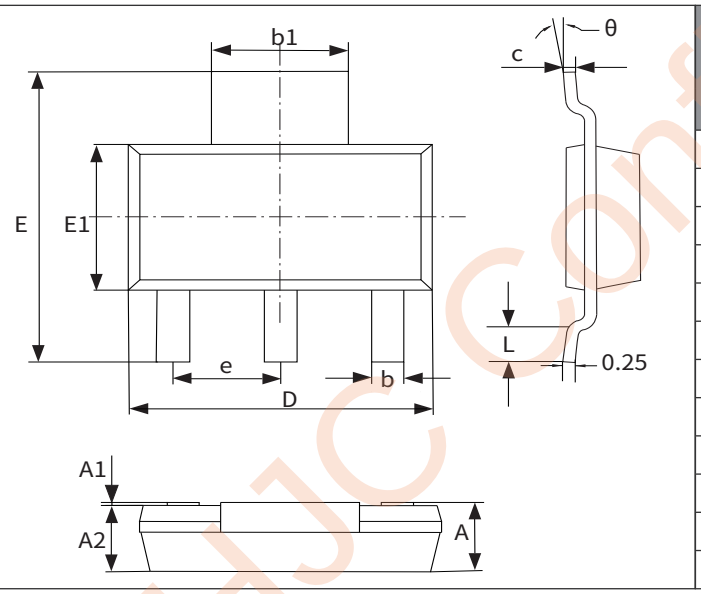
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Ratings And Characteristics Curves (Ta=25°C Unless otherwise specified)



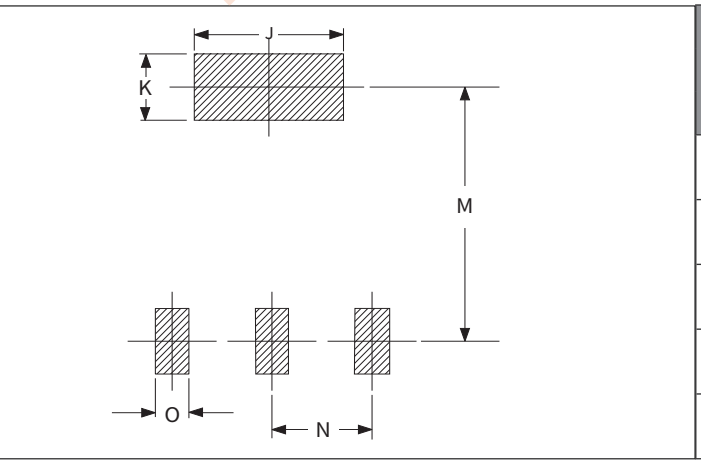
Fig.12 Normalized Maximum Transient Thermal Impedance

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°

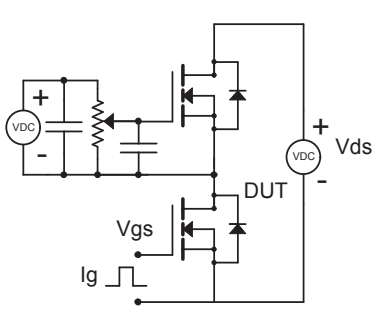
Suggested Pad Layout

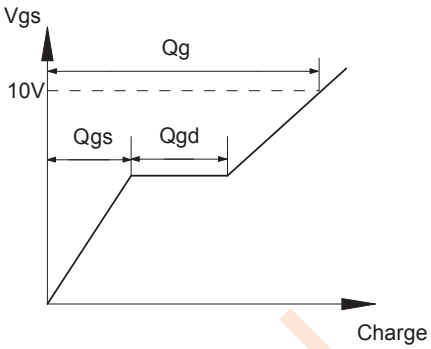


Symbol	Dimensions			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
J	3.20	3.60	0.126	0.142
K	1.40	1.80	0.055	0.071
M	5.90	6.30	0.23	0.25
N	2.15	2.45	0.085	0.096
O	0.60	0.85	0.024	0.033

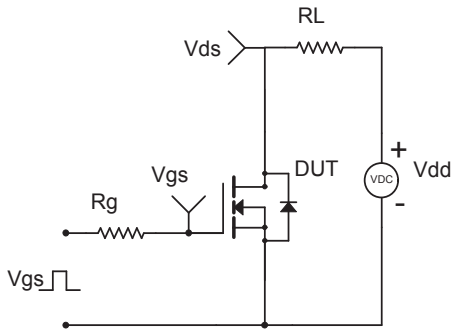
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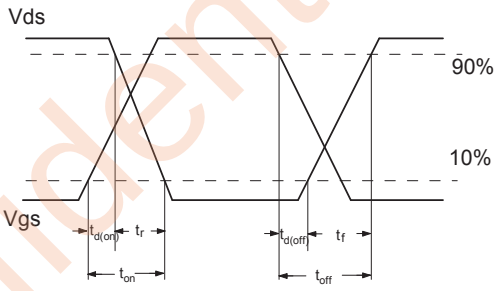
1.Gate Charge Test Circuit & Waveforms



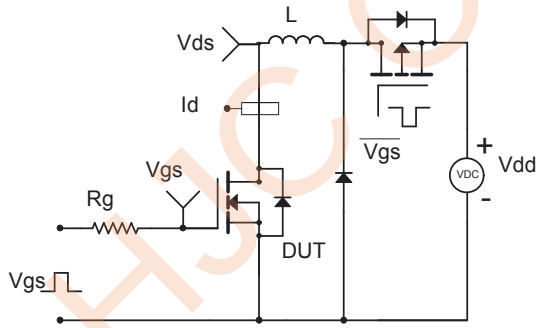


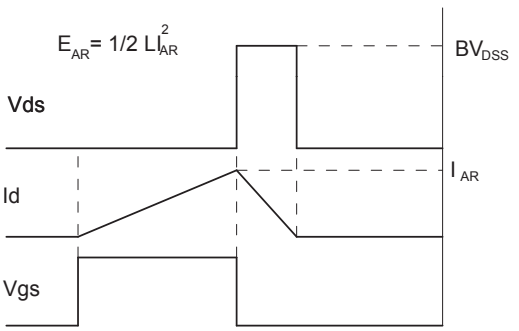
2. Resistive Switching Test Circuit & Waveforms



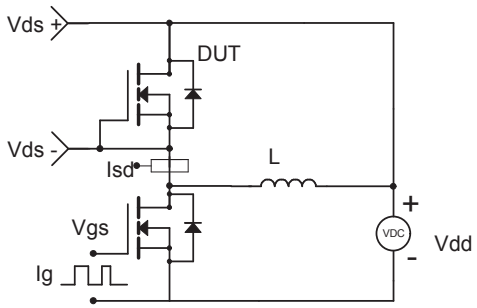


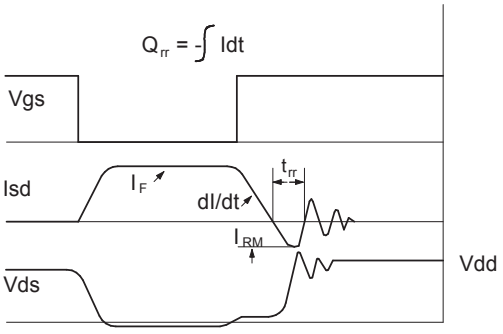
3.Unclamped Inductive Switching (UIS) Test Circuit & Waveforms





4.Diode Recovery Test Circuit & Waveforms





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