



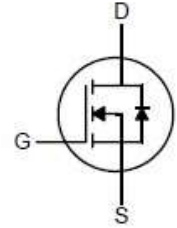
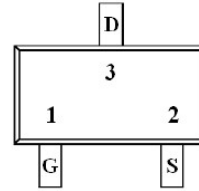
SM2302IDS

N-Channel Enhancement Mode Field Effect Transistor

FEATURES

- $BV_{DSS} \geq 20V$, $I_D \leq 3.2 A$
- $R_{DS(ON)} \leq 55m\Omega @ V_{GS}=4.5V$
- Suffix "H" indicates Halogen-free parts, ex. SM2302IDSH

PIN CONFIGURATION



Pin	Description
1	Gate
2	Source
3	Drain

Maximum Ratings ($T_A = 25^\circ C$ unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DSS}	20	V
Gate-Source Voltage	V_{GSS}	± 10	V
Continuous Drain Current ⁽¹⁾	I_D	$T_A = 25^\circ C$	3.2
		$T_A = 70^\circ C$	2.4
Pulsed Drain Current ⁽²⁾	I_{DM}	13.6	A
Thermal Resistance Junction to Ambient ⁽¹⁾	$R_{\theta JA}$	125	$^\circ C/W$
Thermal Resistance Junction to Case	$R_{\theta JC}$	80	$^\circ C/W$
Power Dissipation ⁽³⁾	P_D	$T_A = 25^\circ C$	1
		$T_C = 25^\circ C$	1.56
Operating Junction and Storage Temperature Range	T_j, T_{stg}	- 55 to + 150	$^\circ C$

Note

1. The data tested by surface mounted on a 1 inch² FR-4 board with 2OZ copper. $t \leq 10SEC$
2. The data tested by pulsed, pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$
3. Power dissipation is limited by 150 $^\circ C$ junction temperature



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Electrical Characteristics ($T_A = 25\text{ }^\circ\text{C}$ unless otherwise specified)

Parameter	Conditions	Symbol	Min.	Typ.	Max.	Unit
Static						
Drain Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	V_{DSS}	20	-	-	V
Gate Threshold Voltage	$V_{DS}=V_{GS}, I_D=250\mu A$	$V_{GS(th)}$	0.55	0.78	1.25	V
Gate-Body Leakage Current	$V_{DS}=0V, V_{GS}=\pm 10V$	I_{GSS}	-	-	± 100	nA
Zero Gate Voltage Drain Current	$V_{DS}=20V, V_{GS}=0V, T_C=25^\circ\text{C}$	I_{DSS}	-	-	1	nA
Static Drain Source On-Resistance ⁽²⁾	$V_{GS}=4.5V, I_D=3A$	$R_{DS(on)}$	-	45	55	m Ω
	$V_{GS}=2.5V, I_D=2A$		-	60	80	
Dynamic⁽⁴⁾						
Total Gate Charge	$V_{DS}=10V, I_D=3A,$ $V_{GS}=4.5V$	Q_g	-	2.9	-	nC
Gate-Source Charge		Q_{gs}	-	0.4	-	
Gate-Drain Charge		Q_{gd}	-	0.6	-	
Input Capacitance	$V_{DS}=10V, f=1\text{MHz},$ $V_{GS}=0V$	C_{iss}	-	280	-	pF
Output Capacitance		C_{oss}	-	46	-	
Reverse Transfer Capacitance		C_{rss}	-	29	-	
Turn-On Delay Time	$V_{GS}=4.5V, V_{DD}=10V,$ $R_L=1.5\Omega, R_{GEN}=3\Omega$	$t_{d(on)}$	-	13	-	nS
Rise Time		t_r	-	54	-	
Turn-Off Delay Time		$t_{d(off)}$	-	18	-	
Fall Time		t_f	-	11	-	
Drain-Source Body Diode						
Diode Forward Voltage	$V_{GS}=0V, I_S=3A$	V_{SD}	-	-	1.2	V
Body Diode Continuous Current	-	I_S	-	-	3.0	A

Note

4. Guarantee by design, not test in mass production



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RATINGS AND CHARACTERISTIC CURVES

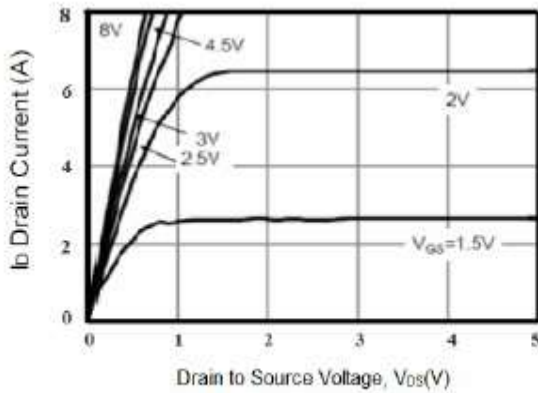


Fig.1 Output Characteristics

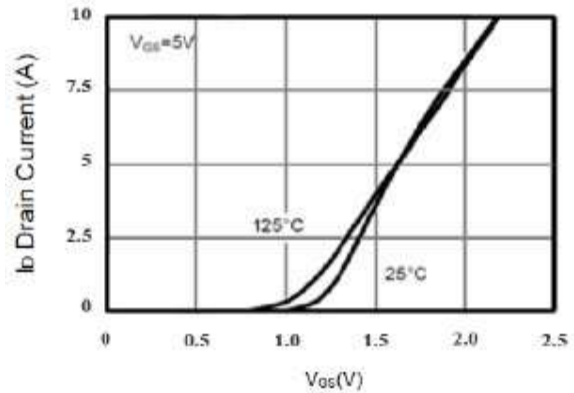


Fig.2 Transfer Characteristics

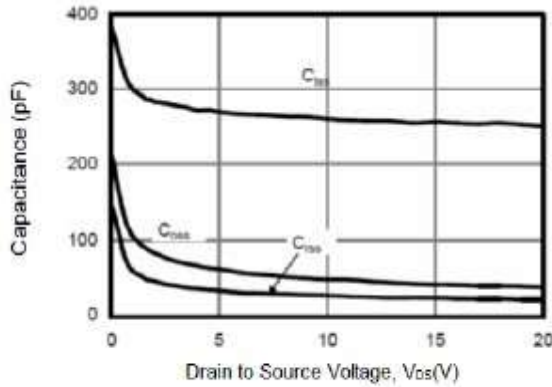


Fig.3 Capacitance Characteristics

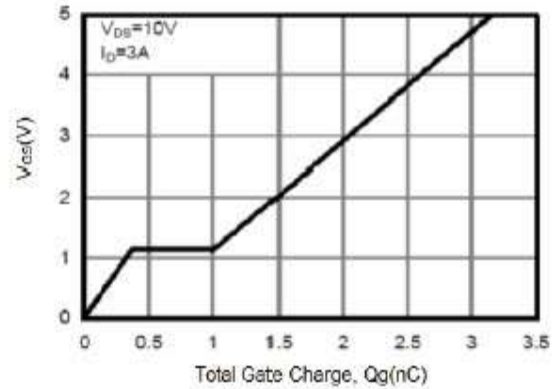


Fig.4 Gate Charge

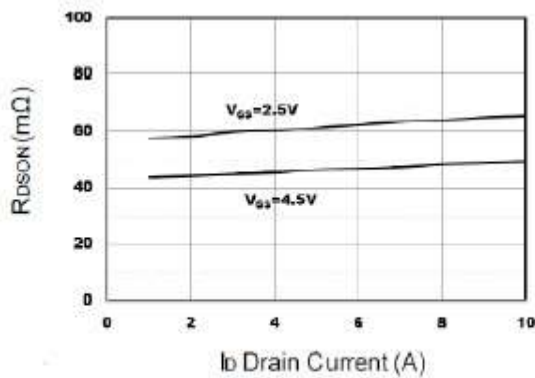


Fig.5 Drain-Source on Resistance

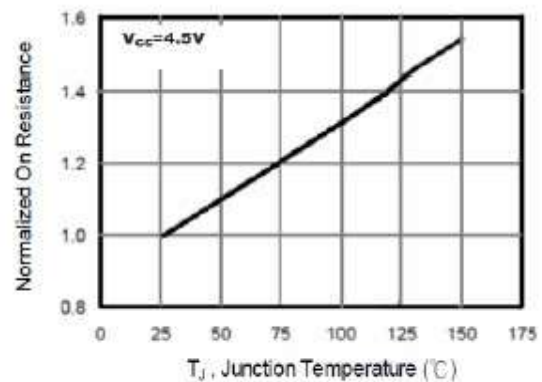


Fig.6 Drain-Source on Resistance



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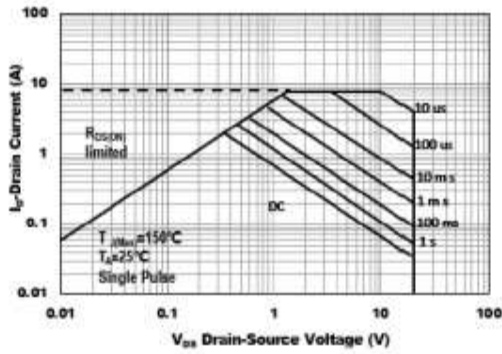


Fig.7 Safe Operating Area

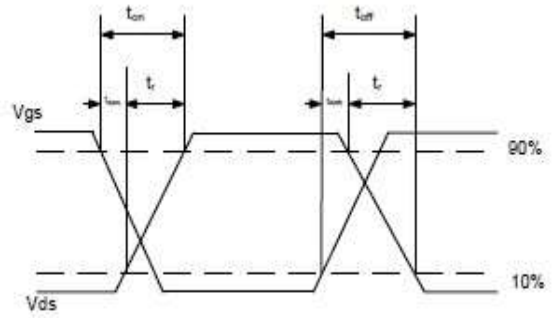


Fig.8 Switching wave

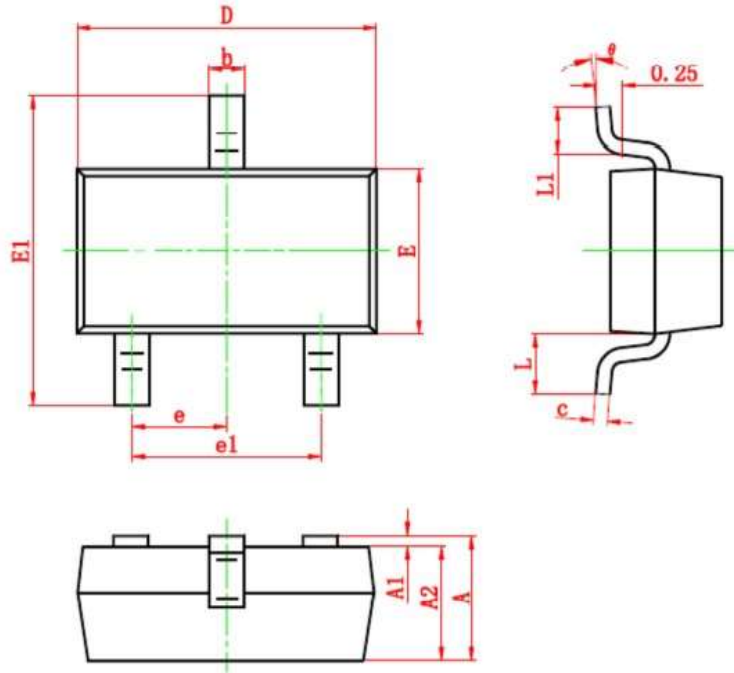


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Package Dimension

SOT-23



Symbol	Millimeters		Inches	
	Min	Max	Min	Max
A	0.90	1.15	0.035	0.045
A1	0.00	0.10	0.000	0.004
A2	0.90	1.05	0.035	0.041
b	0.30	0.50	0.012	0.020
c	0.08	0.15	0.003	0.006
D	2.80	3.00	0.110	0.118
E	1.20	1.40	0.047	0.055
E1	2.25	2.55	0.089	0.100
e	TYP 0.95		TYP 0.037	
e1	1.80	2.00	0.071	0.079
L	REF 0.55		REF 0.022	
L1	0.30	0.50	0.012	0.020
θ	0°	8°	0°	8°