



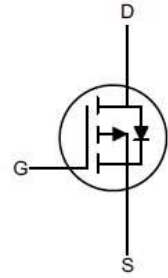
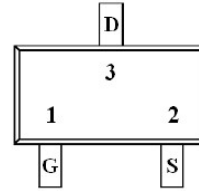
# SM2301IDS

## P-Channel Enhancement Mode Field Effect Transistor

### FEATURES

- $BV_{DSS} \geq -20V$ ,  $I_D \leq -2A$
- $R_{DS(ON)} \leq 120m\Omega @ V_{GS} = -4.5V$
- Suffix "H" indicates Halogen-free parts, ex. SM2301IDSH

### 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	$V_{GSS}$	$\pm 10$	V
Continuous Drain Current <sup>(1)</sup>	$I_D$	-2.0 -1.6	A
		$T_A = 25^\circ C$ $T_A = 70^\circ C$	
Pulsed Drain Current <sup>(2)</sup>	$I_{DM}$	-8	A
Thermal Maximum Junction to Ambient <sup>(1)</sup>	$R_{\theta JA}$	125	$^\circ C/W$
Thermal Maximum Junction to Case	$R_{\theta JC}$	80	$^\circ C/W$
Power Dissipation <sup>(3)</sup>	$P_D$	1 1.56	W
		$T_A = 25^\circ C$ $T_C = 25^\circ C$	
Operating and Storage Temperature Range	$T_j, T_{stg}$	- 55 to + 150	$^\circ C$

Note

1. The data tested by surface mounted on a 1 inch<sup>2</sup> 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
<b>Static</b>						
Drain Source Breakdown Voltage	$V_{GS}=0V, I_D=-250\mu A$	$V_{DSS}$	-20	-	-	V
Gate Threshold Voltage	$V_{DS}=V_{GS}, I_D=-250\mu A$	$V_{GS(th)}$	-0.40	-0.62	-1.00	V
Gate-Body Leakage Current	$V_{DS}=0V, V_{GS}=\pm 10V$	$I_{GSS}$	-	-	$\pm 100$	nA
Zero Gate Voltage Drain Current	$V_{DS}=-20, V_{GS}=0V, T_c=25^\circ\text{C}$	$I_{DSS}$	-	-	-1	$\mu A$
Static Drain Source On-Resistance <sup>(2)</sup>	$V_{GS}= -4.5V, I_D= -1.5A$	$R_{DS(ON)}$	-	90	120	m $\Omega$
	$V_{GS}= -2.5V, I_D= -1.5A$		-	115	150	
	$V_{GS}= -1.8V, I_D= -1A$		-	165	195	
<b>Dynamic<sup>(4)</sup></b>						
Total Gate Charge	$V_{DS}=-10V, I_D=-2A,$ $V_{GS}=-4.5V$	$Q_g$	-	3.9	-	nC
Gate-Source Charge		$Q_{gs}$	-	0.7	-	
Gate-Drain Charge		$Q_{gd}$	-	0.9	-	
Input Capacitance	$V_{DS}=-10V, f=1\text{MHz},$ $V_{GS}=0V$	$C_{iss}$	-	290	-	pF
Output Capacitance		$C_{oss}$	-	47	-	
Reverse Transfer Capacitance		$C_{rss}$	-	29	-	
Turn-On Delay Time	$V_{GS}=-4.5V, I_D=-1A,$ $V_{DD}=-10V, R_{GEN}=2.5\Omega$	$t_{d(on)}$	-	12	-	nS
Rise Time		$t_r$	-	54	-	
Turn-Off Delay Time		$t_{d(off)}$	-	15	-	
Fall Time		$t_f$	-	9	-	
<b>Drain-Source Body Diode</b>						
Diode Forward Voltage <sup>(2)</sup>	$V_{GS}=0V, I_S= -2A$	$V_{SD}$	-	-0.8	-1.2	V
Body Diode Continuous Current	-	$I_S$	-	-	-2.0	A

Note

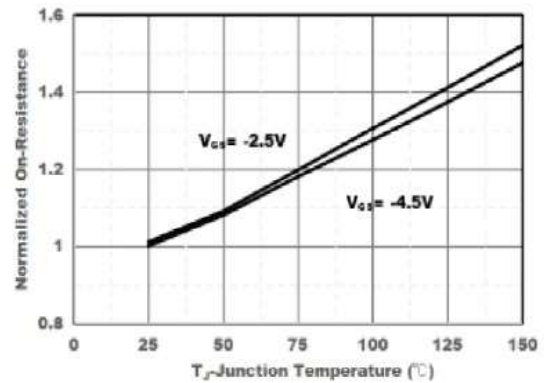
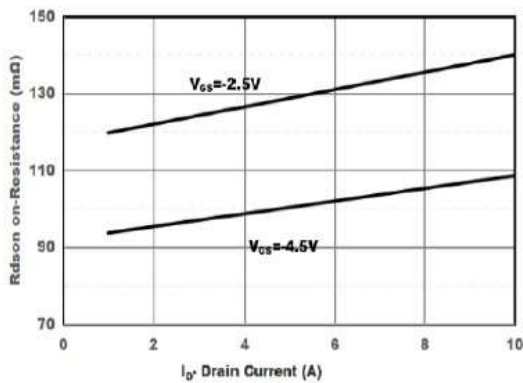
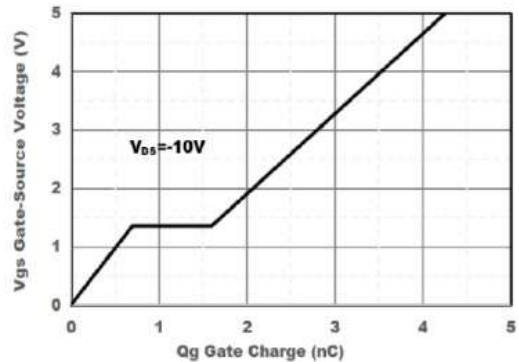
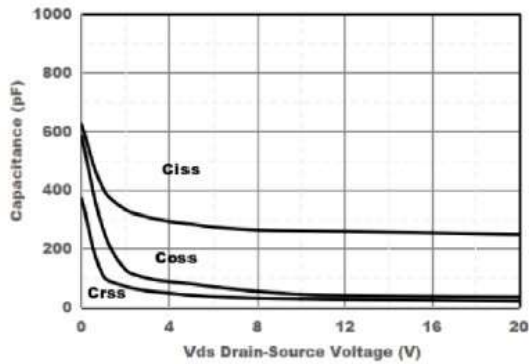
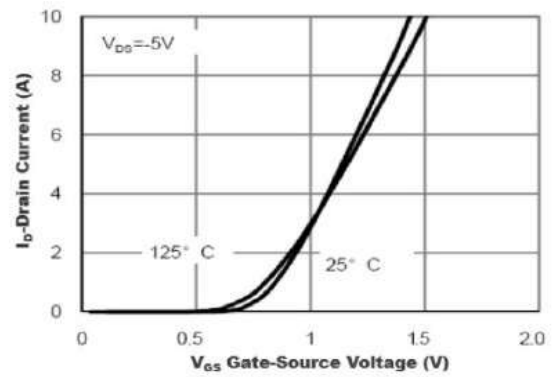
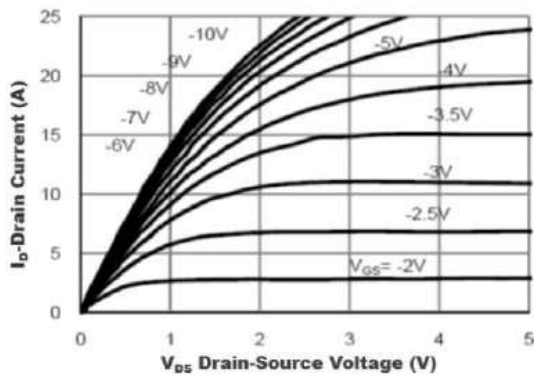
4. Guarantee by design, not test in mass production



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### RATINGS AND CHARACTERISTIC CURVES





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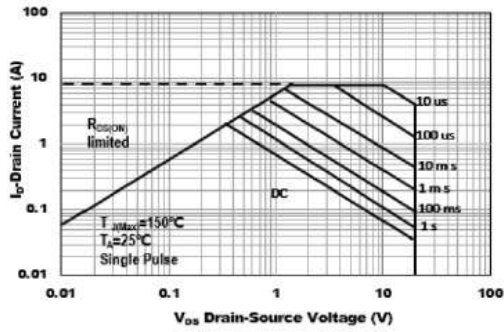


Fig.7 Safe Operating Area

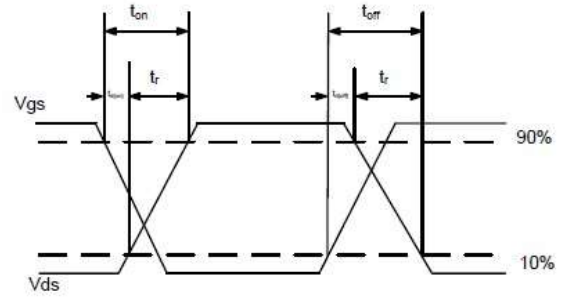


Fig.8 Switching wave

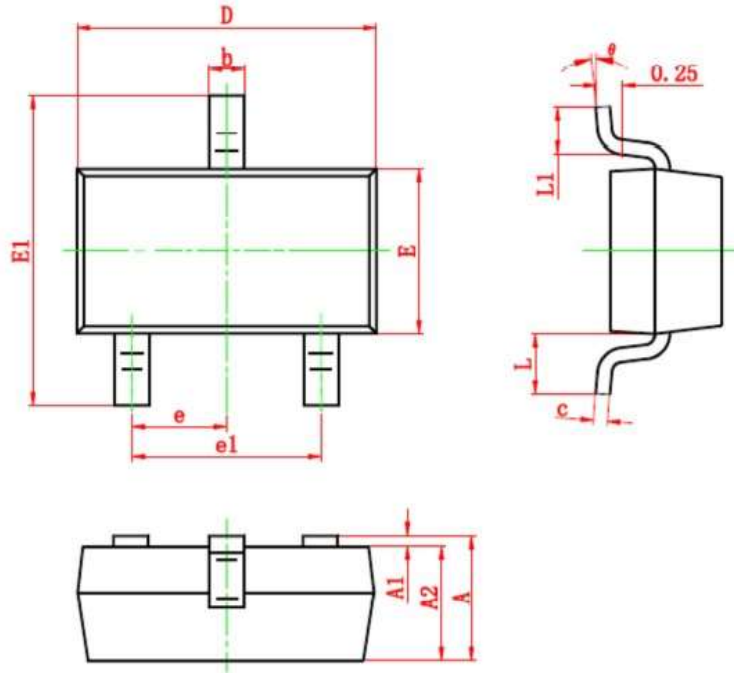


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### Package Dimension

### 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°