

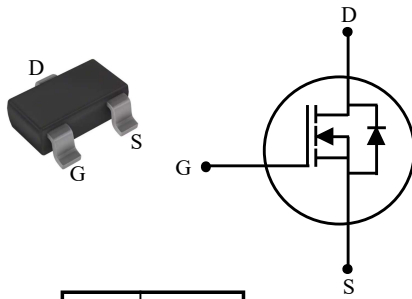


SM2302ATDSH

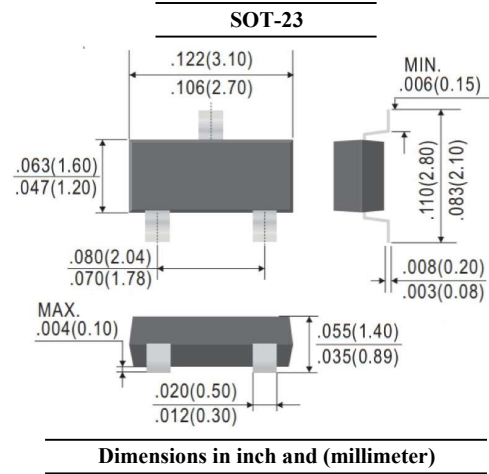
N-Channel Enhancement Mode Field Effect Transistor

FEATURES

· Suffix "H" indicates Halogen-free parts, ex. SM2302ATDSH



D	Drain
G	Gate
S	Source



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

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	20	V
Gate-Source Voltage	V_{GS}	± 8	V
Drain Current	I_D	$T_A = 25^\circ\text{C}$	2.8
		$T_A = 70^\circ\text{C}$	2.2
Pulsed Drain Current (Note 1)	I_{DM}	10	A
Power Dissipation (Note 2)	P_{tot}	$T_A = 25^\circ\text{C}$	1.25
		$T_A = 70^\circ\text{C}$	0.80
Thermal Resistance from Junction to Ambient (Note 1)	$R_{\theta JA}$	$t \leq 10\text{s}$	77
		Steady state	105
Operating and Storage Temperature Range	T_J, T_{stg}	- 55 to + 150	$^\circ\text{C}$

Note :

1. Pulse test: Pulse width $\leq 100\mu\text{s}$, Duty cycle $\leq 2\%$, Repetitive rating, pulse width limited by junction temperature $T_{J(MAX)} = 150^\circ\text{C}$.
2. Device mounted on FR-4 substrate PC board, 2oz copper, with 1-inch square copper plate.



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

Parameter	Conditions	Symbol	Min.	Typ.	Max.	Unit
Static						
Drain Source Breakdown Voltage	$I_D = 250\mu\text{A}$	V_{DSS}	20	-	-	V
Gate Threshold Voltage	$V_{GS} = V_{DS}, I_D = 250\mu\text{A}$	$V_{GS(th)}$	0.5	-	1.2	V
Zero Gate Voltage Drain Current	$V_{DS} = 20\text{V}$	I_{DSS}	-	-	1	μA
Gate-Body Leakage Current	$V_{GS} = \pm 8\text{V}$	I_{GSS}	-	-	± 0.1	μA
Drain-Source On-State Resistance	$V_{GS} = 4.5\text{V}, I_D = 2.8\text{A}$	$R_{DS(on)}$	-	-	85	m Ω
	$V_{GS} = 2.5\text{V}, I_D = 2.5\text{A}$		-	-	115	
Dynamic						
Total Gate Charge	$V_{GS} = 4.5\text{V}, V_{DS} = 10\text{V}, I_D = 1\text{A}$	Q_g	-	7.6	-	nC
Gate-Source Charge		Q_{gs}	-	1.3	-	
Gate-Drain Charge		Q_{gd}	-	2.0	-	
Input Capacitance	$V_{DS} = 10\text{V}, V_{GS} = 0\text{V}, f = 1\text{MHz}$	C_{iss}	-	481	-	pF
Output Capacitance		C_{oss}	-	85	-	
Reverse Transfer Capacitance		C_{rss}	-	63	-	
Turn-On Delay Time	$V_{DD} = 10\text{V}, I_D = 1\text{A}, V_{GS} = 4.5\text{V}, R_G = 4.7\Omega$	$t_{d(on)}$	-	11.3	-	ns
Turn-On Rise Time		t_r	-	5.3	-	
Turn-Off Delay Time		$t_{d(off)}$	-	14.0	-	
Turn-Off Fall Time		t_f	-	2.9	-	
Drain-Source Body Diode						
Drain-Source Diode Forward Voltage	$I_S = 1\text{A}, V_{GS} = 0\text{V}$	V_{SD}	-	-	1.2	V
Reverse Recovery Time	$I_S = 1\text{A}, di/dt = 100\text{A}/\mu\text{s}$	t_{rr}	-	7.4	-	ns
Reverse Recovery Charge		Q_{rr}	-	2	-	nC



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RATINGS AND CHARACTERISTIC CURVES

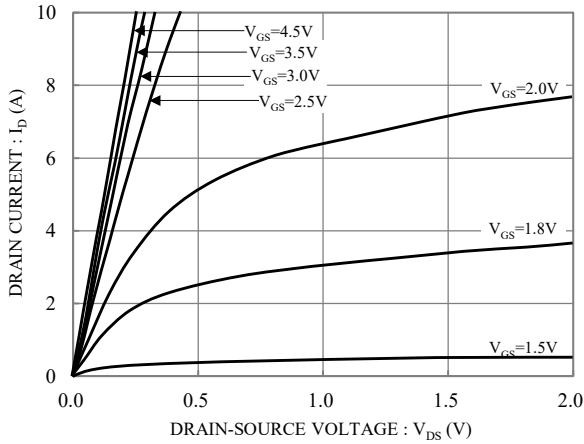


Fig.1 Typical Output Characteristics

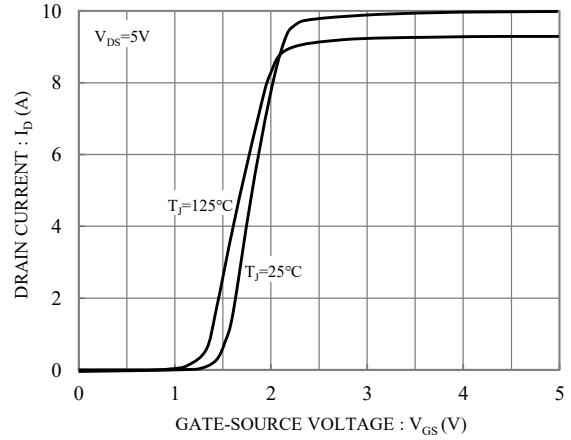


Fig.2 Typical Transfer Characteristics

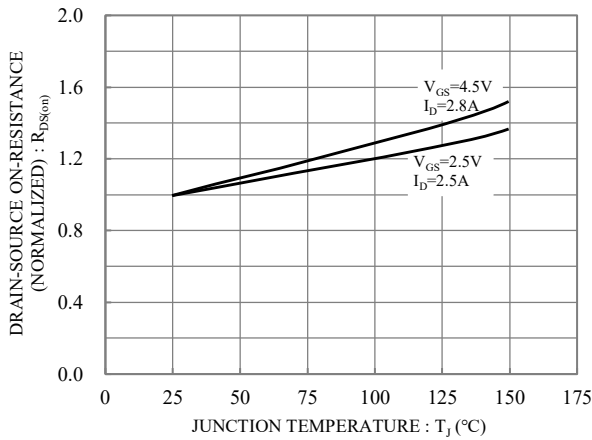


Fig.3 On-Resistance vs. Junction Temperature

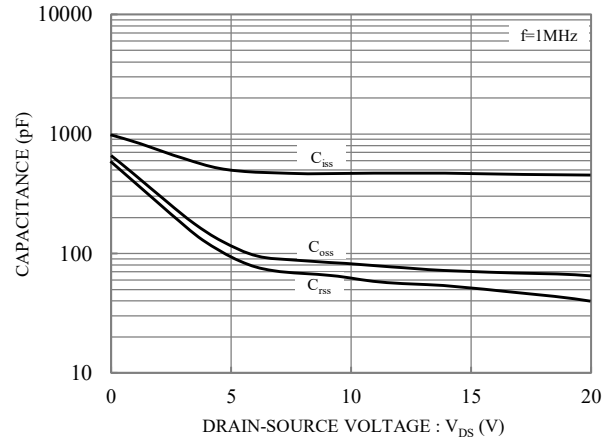


Fig.4 Capacitance vs. Drain-Source Voltage

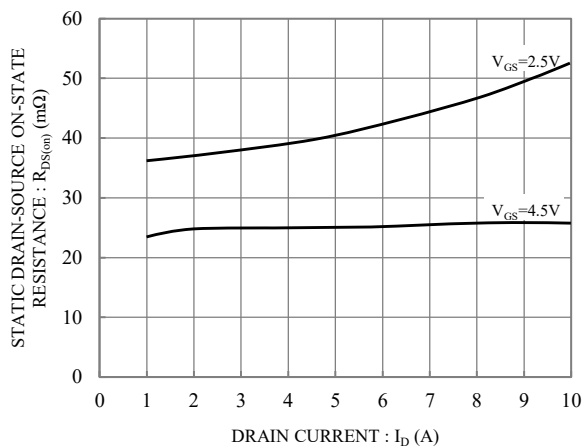


Fig.5 Static Drain-Source On-State Resistance vs. Drain current

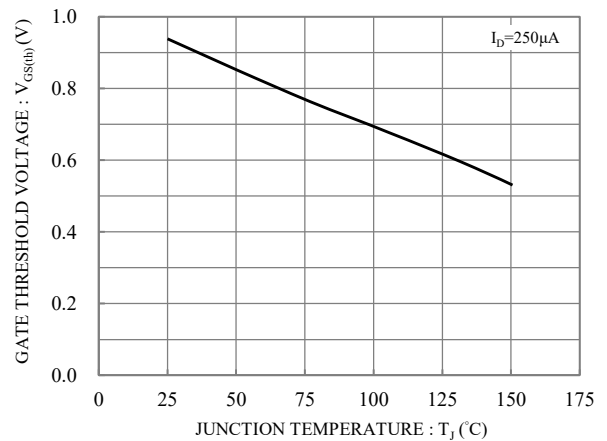


Fig.6 Gate Threshold Voltage vs. Junction Temperature



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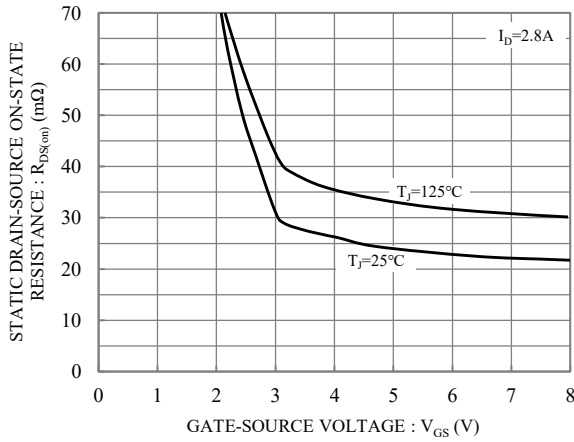


Fig.7 Static Drain-Source On-State Resistance vs. Gate-Source Voltage

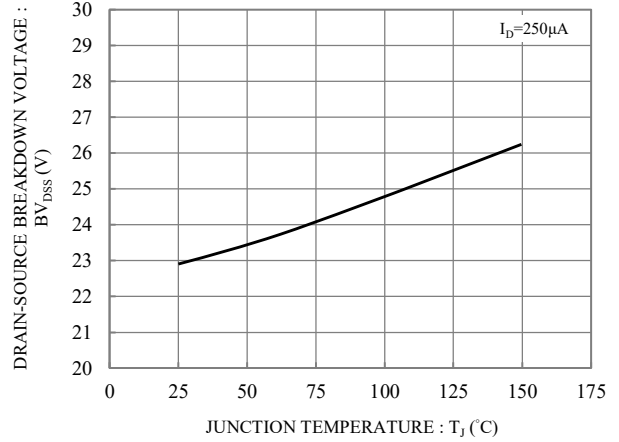


Fig.8 Breakdown Voltage vs. Junction Temperature

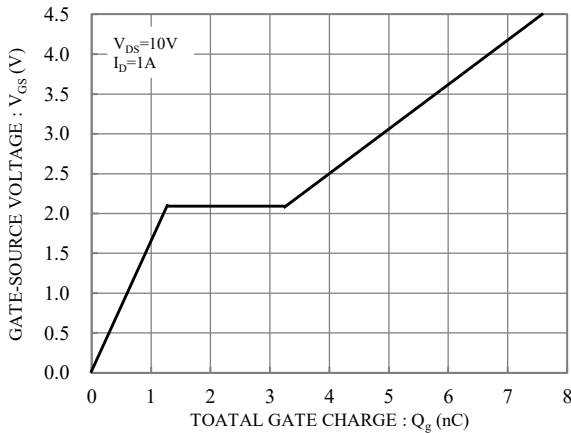


Fig.9 Gate Charge

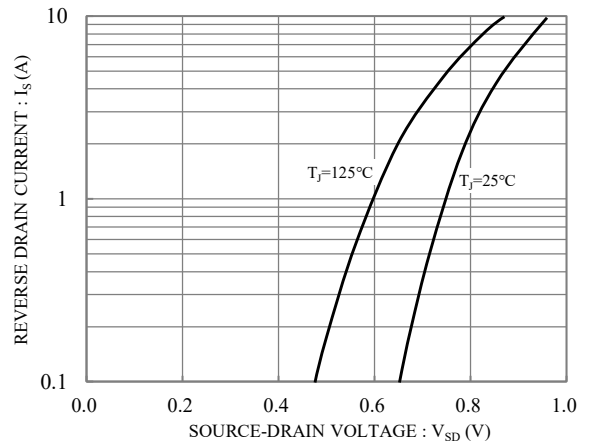


Fig.10 Typical Forward Characteristic

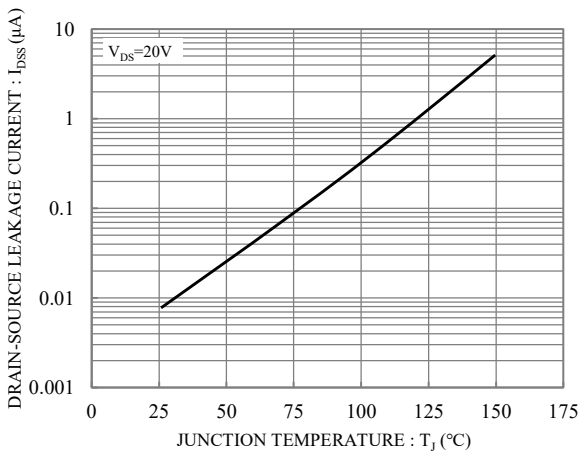


Fig.11 Drain-Source Leakage Current vs. Junction Temperature

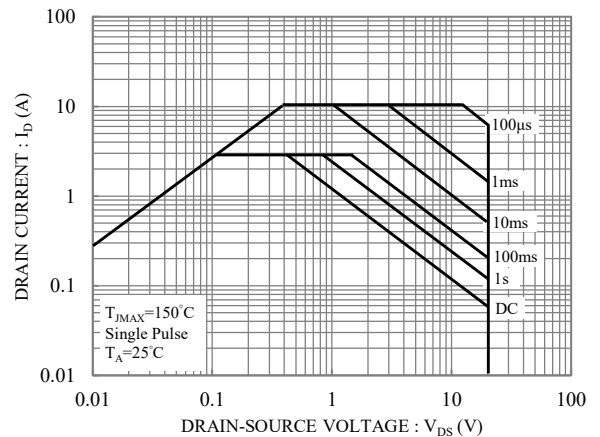


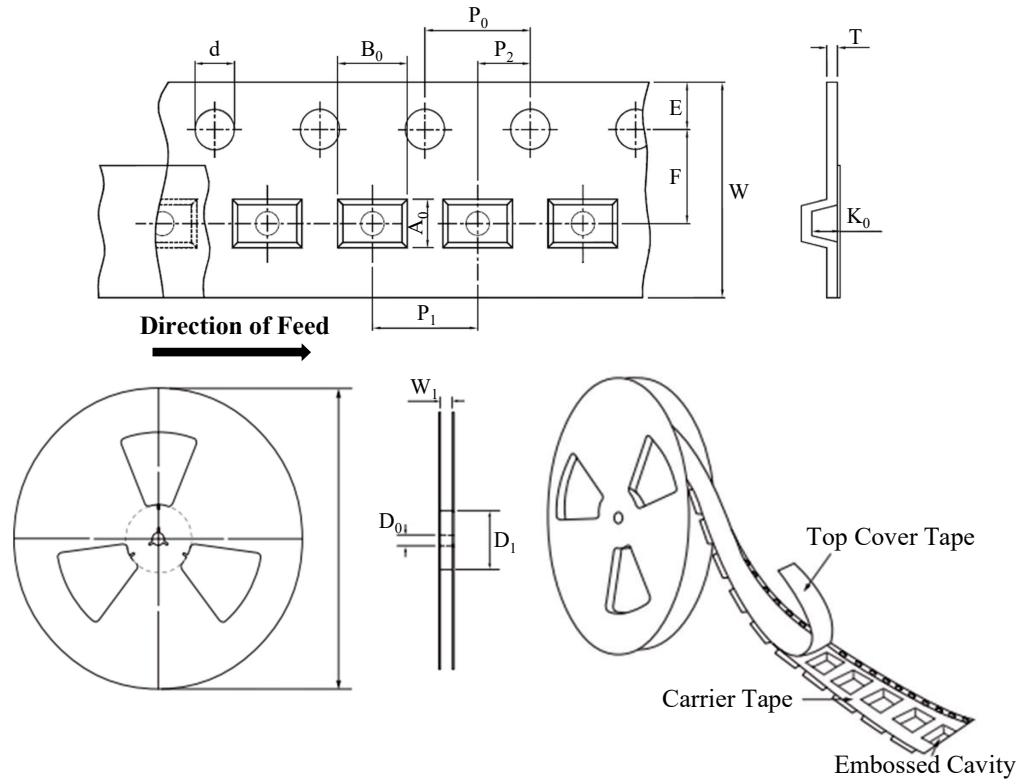
Fig.12 Safe Operation Area



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TAPE & REEL SPECIFICATION



Item	Symbol	SOT-23
Carrier width	A_0	3.30 ± 0.10
Carrier length	B_0	3.00 ± 0.10
Carrier depth	K_0	1.70 ± 0.10
Sprocket hole	d	1.60 ± 0.10
Reel outside diameter	D	178.00 ± 2.00
Feed hole width	D_0	13.00 ± 0.50
Reel inner diameter	D_1	MIN. 50.00
Sprocket hole position	E	1.75 ± 0.10
Punch hole position	F	3.50 ± 0.10
Sprocket hole pitch	P_0	4.00 ± 0.10
Punch hole pitch	P_1	4.00 ± 0.10
Embossment center	P_2	2.00 ± 0.10
Overall tape thickness	T	0.20 ± 0.05
Tape width	W	8.00 ± 0.20
Reel width	W_1	MAX. 14.50

ORDER INFORMATION

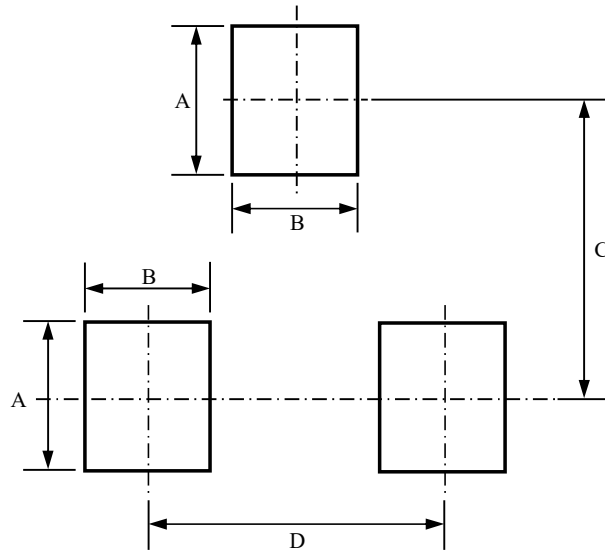
Part Number	Marking Code	Reel Size	Quantity
SM2302ATDSH	M22	7"	3,000



SM2302ATDSH

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SUGGESTED SOLDER PAD LAYOUT



Unit :mm

PACKAGE	A	B	C	D
SOT-23	1.00	0.80	2.00	1.90