

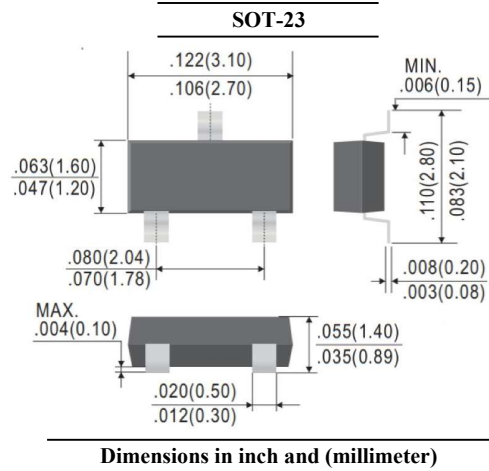
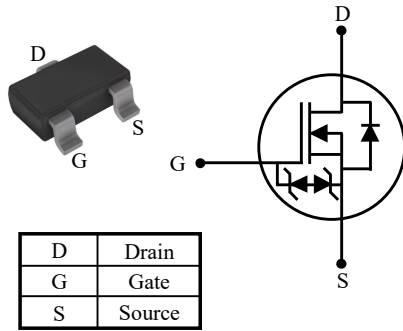


SMN501KDSH

N-Channel Depletion Mode Field Effect Transistor

FEATURES

- Built-in G-S protection diode.
- Suffix "H" indicates Halogen-free parts, ex. SMN501KDSH.



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

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	600	V
Gate-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current	I_D	30 24	mA
		$T_C = 25^\circ\text{C}$ $T_C = 70^\circ\text{C}$	
Pulsed Drain Current	I_{DM}	120	mA
		(Note 1)	
Gate-Source ESD (HBM-C=100pF, R=1.5K Ω)	$V_{ESD(G-S)}$	300	V
Power Dissipation	P_D	0.5	W
Thermal Resistance from Junction to Ambient	$R_{\theta JA}$	250	$^\circ\text{C}/\text{W}$
		(Note 2)	
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-inch² copper plate.



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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	$V_{GS} = -5V, I_D = 250\mu A$	$V_{(BR)DSS}$	600	-	-	V
Gate-Source Breakdown Voltage	$I_{GS} = \pm 1mA$ (Open Drain)	V_{GSO}	30	-	-	V
Gate Threshold Voltage	$V_{DS} = 3V, I_D = 8\mu A$	$V_{GS(th)}$	-2.7	-	-1.0	V
Zero Gate Voltage Drain Current	$V_{DS} = 600V, V_{GS} = -5V$	I_{DSS}	-	-	0.1	μA
Gate-Body Leakage Current	$V_{GS} = \pm 20V$	I_{GSS}	-	-	± 10	μA
Drain-Source On-State Resistance	$V_{GS} = 0V, I_D = 3mA$	$R_{DS(on)}$	-	-	500	Ω
	$V_{GS} = 10V, I_D = 16mA$		-	-	500	
Dynamic						
Total Gate Charge	$V_{DS} = 400V, I_D = 10mA, V_{GS} = -5 \sim -7V$	Q_g	-	2.80	-	nC
Gate-Source Charge		Q_{gs}	-	0.55	-	
Gate-Drain Charge		Q_{gd}	-	1.60	-	
Input Capacitance	$V_{DS} = 25V, V_{GS} = -5V, f = 1MHz$	C_{iss}	-	10.00	-	pF
Output Capacitance		C_{oss}	-	2.90	-	
Reverse Transfer Capacitance		C_{rss}	-	0.12	-	
Turn-On Delay Time	$V_{DD} = 300V, V_{GS} = -5 \sim -7V, I_D = 10mA, R_g = 6\Omega$	$t_{d(on)}$	-	12	-	ns
Turn-On Rise Time		t_r	-	60	-	
Turn-Off Delay Time		$t_{d(off)}$	-	25	-	
Turn-Off Fall Time		t_f	-	100	-	
Drain-Source Body Diode						
Drain-Source Diode Forward Voltage	$I_S = 16mA, V_{GS} = -5V$	V_{SD}	-	-	1.2	V
Reverse Recovery Time	$V_R = 300V, I_S = 10mA, di/dt = 100A/\mu s$	t_{rr}	-	-	367	ns
Reverse Recovery Charge		Q_{rr}	-	-	963	nC



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RATINGS AND CHARACTERISTIC CURVES

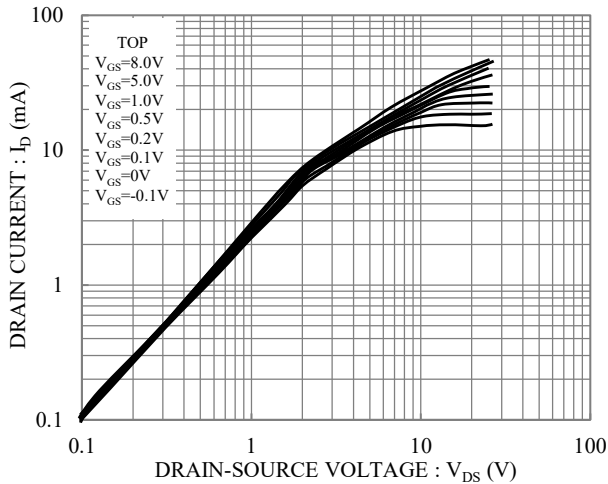


Fig.1 Typical Output Characteristics

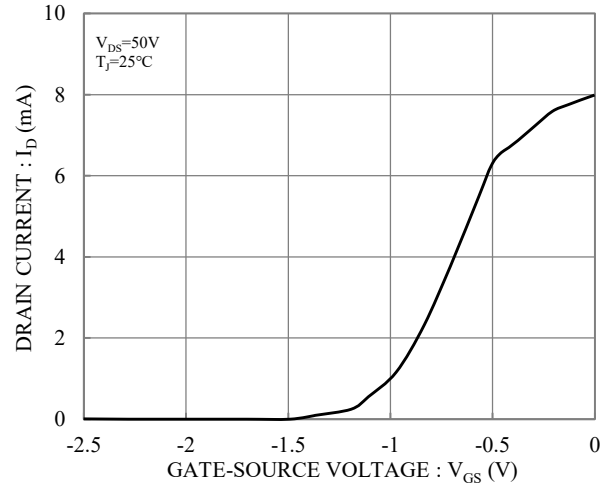


Fig.2 Typical Transfer Characteristics

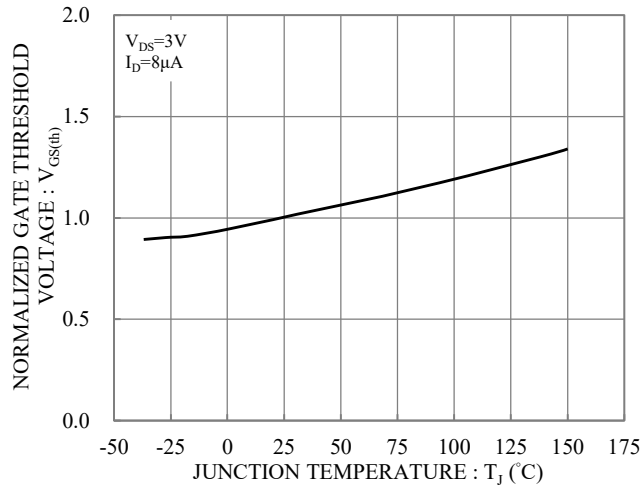


Fig.3 Gate Threshold Voltage vs. Junction Temperature

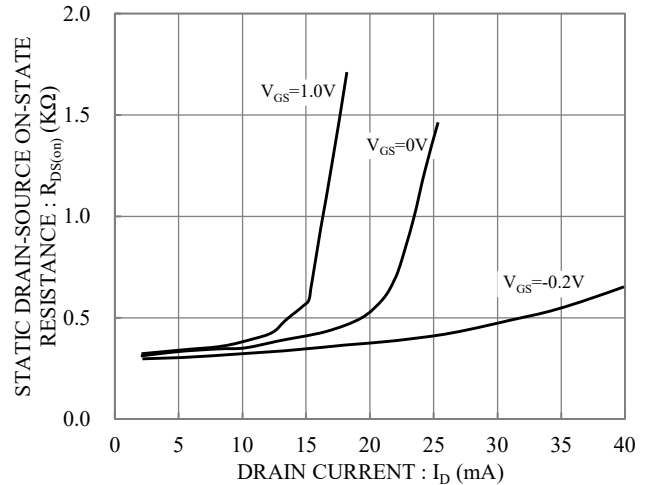


Fig.4 Static Drain-Source On-State Resistance vs. Drain Current

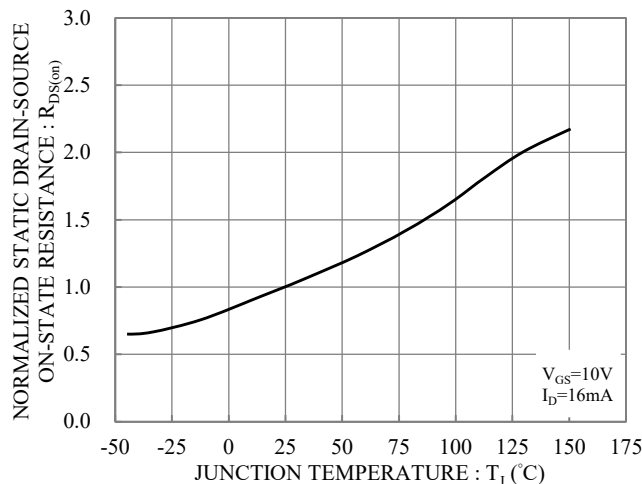


Fig.5 Drain-Source On-State Resistance vs. Junction Temperature

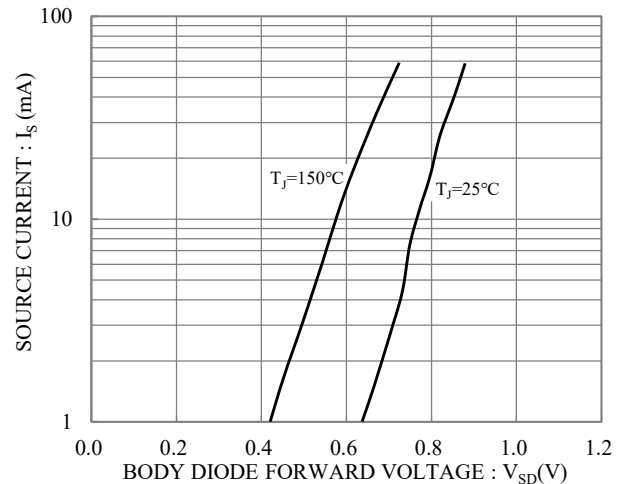


Fig.6 Body Diode Forward Voltage vs. Source Current



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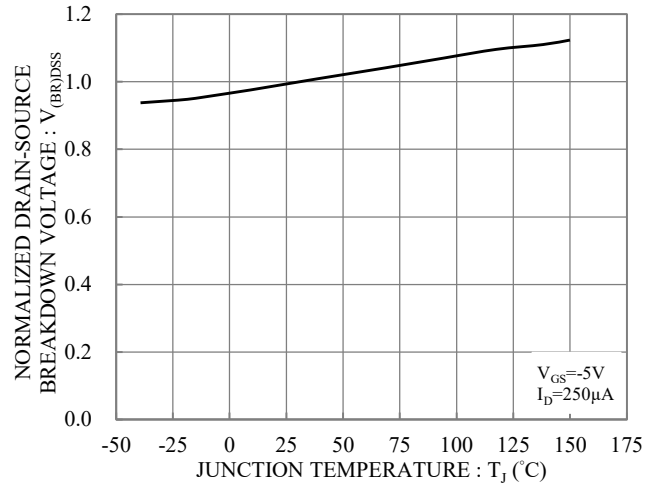


Fig.7 Breakdown Voltage vs. Junction Temperature

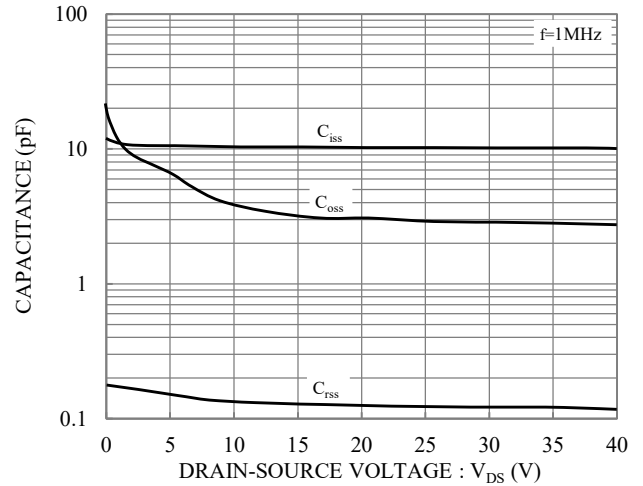


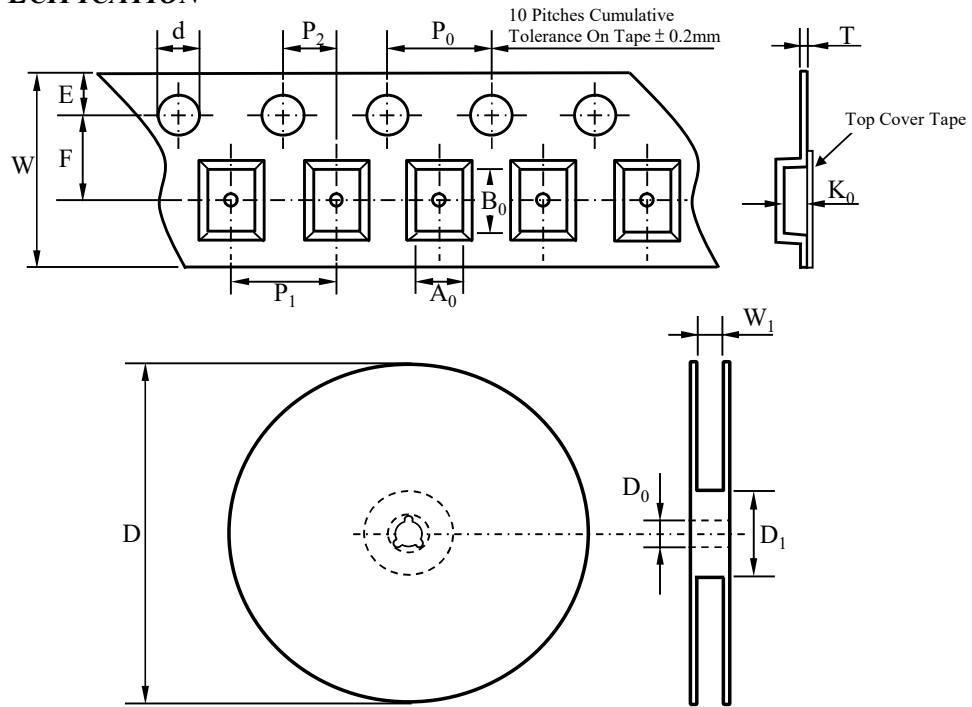
Fig.8 Capacitance vs. Drain-Source Voltage



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TAPE & REEL SPECIFICATION



Item	Symbol	SOT-23
Carrier width	A_0	*
Carrier length	B_0	
Carrier depth	K_0	
Sprocket hole	d	1.50 ± 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

Note *: A_0 , B_0 , and K_0 are determined by component size. The clearance between the components and the cavity must be within 0.05 mm min. to 0.5 mm max.

ORDER INFORMATION

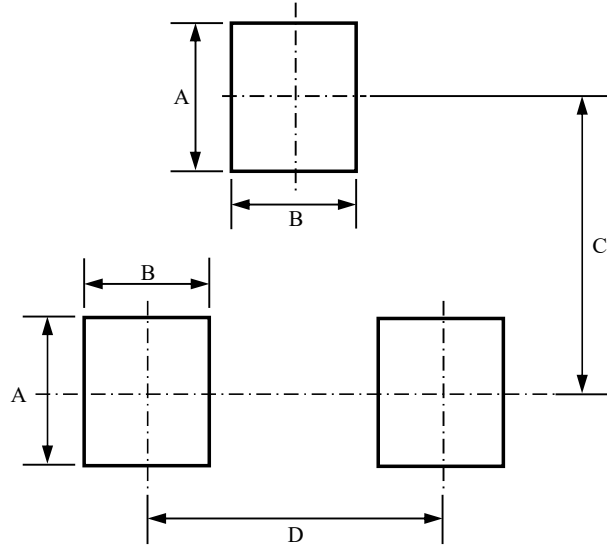
Part Number	Marking Code	Reel Size	Quantity
SMN501KDSH	5H	7"	3,000



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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