

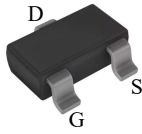


SMN0202KWTH

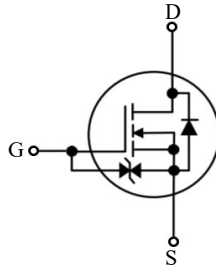
N-Channel Enhancement Mode Field Effect Transistor

FEATURES

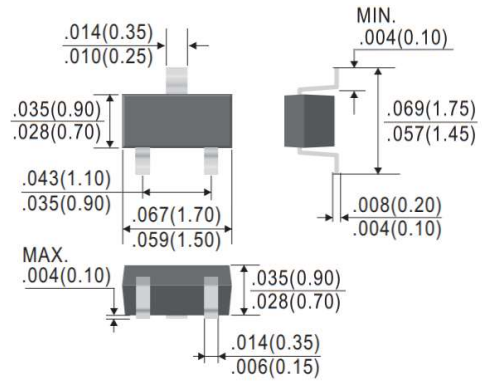
- ESD Protected
- Fast Switching Speed
- Suffix "H" indicates Halogen-free parts, ex. SMN0202KWTH



D	Drain
G	Gate
S	Source



SOT-523



Dimensions in inch and (millimeter)

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	200	mA
Pulsed Drain Current (Note 1)	I_{DM}	1.2	A
Power Dissipation (Note 2)	P_D	150	mW
Thermal Resistance from Junction to Ambient (Note 2)	$R_{\theta JA}$	833	$^\circ\text{C}/\text{W}$
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 $T_{J(\text{MAX})} = 150^\circ\text{C}$.
2. Device mounted on FR-4 substrate PC board, with minimum recommended pad layout.



SMN0202KWITH

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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	$I_D=1\text{mA}$	V_{DSS}	20	-	-	V
Gate Threshold Voltage	$V_{DS}=10\text{V}, I_D=1\text{mA}$	$V_{GS(th)}$	0.3	-	1.0	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}	-	-	± 10	μA
Drain-Source On-State Resistance	$V_{GS}=2.5\text{V}, I_D=0.2\text{A}$	$R_{DS(on)}$	-	-	1.2	Ω
	$V_{GS}=1.8\text{V}, I_D=0.2\text{A}$		-	-	1.4	
	$V_{GS}=1.5\text{V}, I_D=0.04\text{A}$		-	-	2.4	
	$V_{GS}=1.2\text{V}, I_D=0.02\text{A}$		-	-	4.8	
Dynamic						
Forward Transfer Admittance	$V_{DS}=10\text{V}, I_D=0.2\text{A}$	g_{fs}	-	1.0	-	S
Total Gate Charge	$V_{DS}=10\text{V}, I_D=1\text{A}, V_{GS}=2.5\text{V}$	Q_g	-	0.65	-	nC
			-	1.10	-	
Gate-Source Charge	$V_{DS}=10\text{V}, I_D=1\text{A}, V_{GS}=4.5\text{V}$	Q_{gs}	-	0.30	-	
Gate-Drain Charge		Q_{gd}	-	0.20	-	
Input Capacitance	$V_{DS}=10\text{V}, V_{GS}=0\text{V}, f=1\text{MHz}$	C_{iss}	-	72	-	pF
Output Capacitance		C_{oss}	-	15	-	
Reverse Transfer Capacitance		C_{rss}	-	12	-	
Turn-On Delay Time	$V_{GS}=4.5\text{V}, V_{DS}=10\text{V}, I_D=0.2\text{A}, R_g=10\Omega$	$t_{d(on)}$	-	12	-	ns
Turn-On Rise Time		t_r	-	6	-	
Turn-Off Delay Time		$t_{d(off)}$	-	13	-	
Turn-Off Fall Time		t_f	-	10	-	
Drain-Source Body Diode						
Drain-Source Diode Forward Voltage	$I_S=0.1\text{A}$	V_{SD}	-	-	1.2	V
Diode Continuous Source Current	-	I_S	-	-	0.2	A



RATINGS AND CHARACTERISTIC CURVES

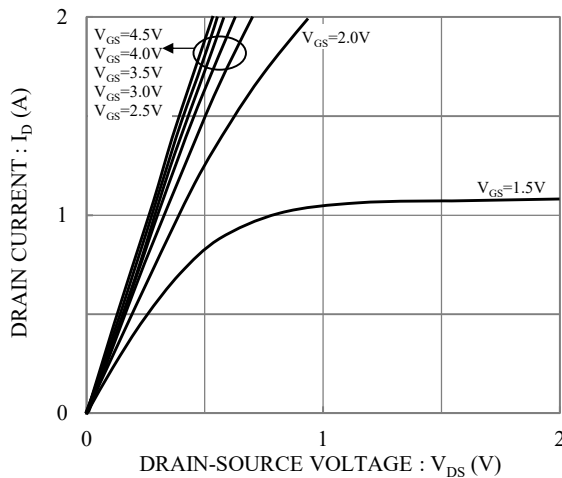


Fig.1 Typical Output Characteristics

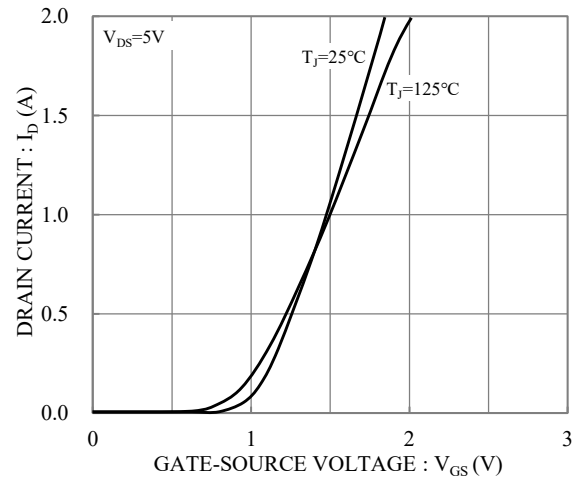


Fig.2 Typical Transfer Characteristics

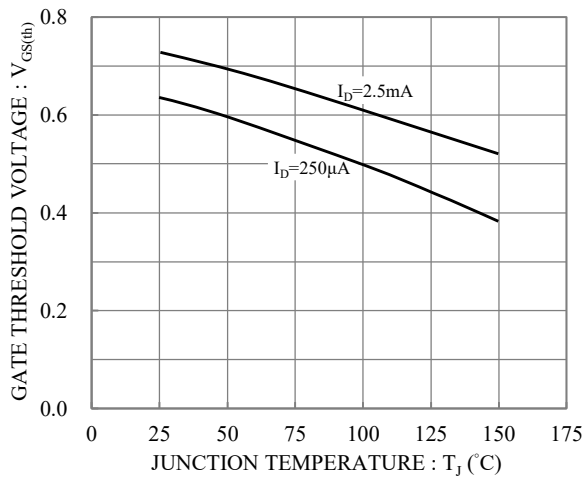


Fig.3 Gate Threshold Voltage vs. Junction Temperature

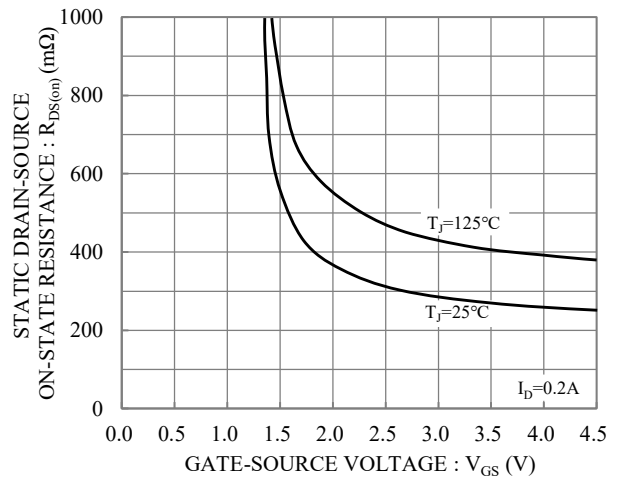


Fig.4 Static Drain-Source On-State Resistance vs. Gate-Source Voltage

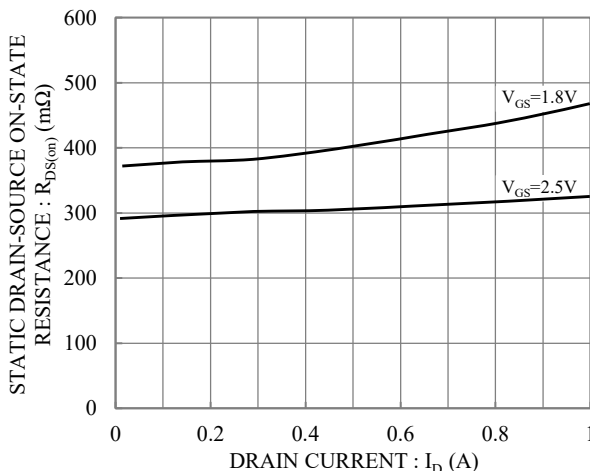


Fig.5 Static Drain-Source On-State Resistance vs. Drain Current

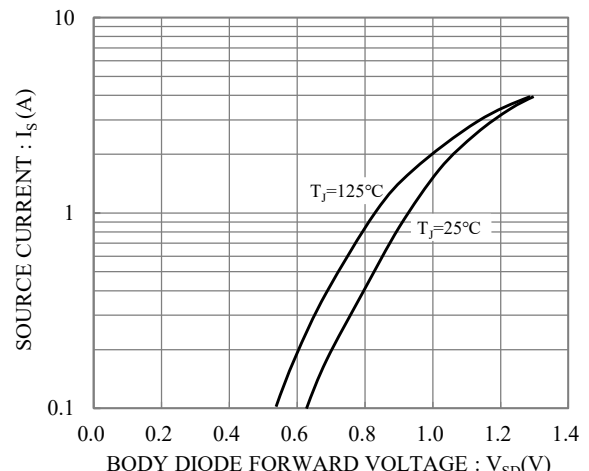


Fig.6 Body Diode Forward Voltage vs. Source Current

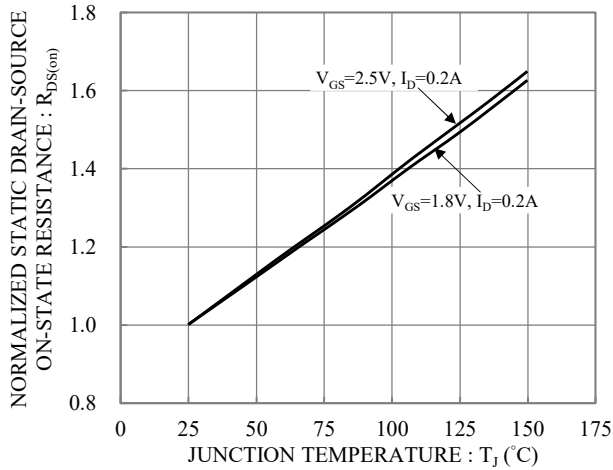


Fig.7 Drain-Source On-State Resistance vs Junction Temperature

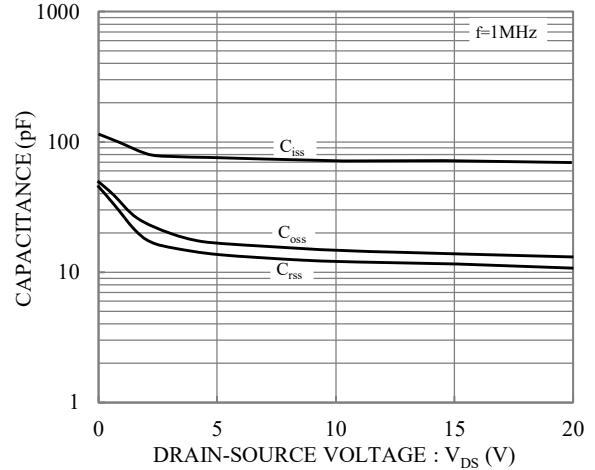


Fig.8 Capacitance vs Drain-Source Voltage

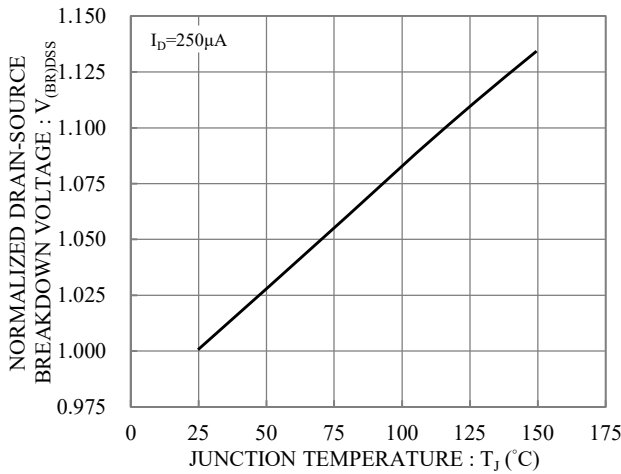


Fig.9 Breakdown Voltage vs Junction Temperature

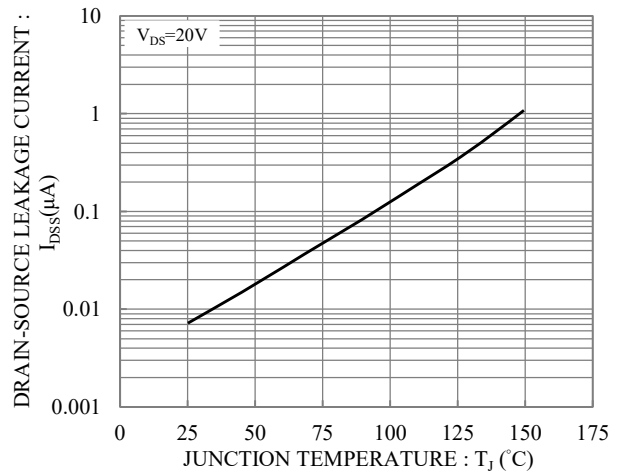


Fig.10 Drain-Source Leakage Current vs Junction Temperature

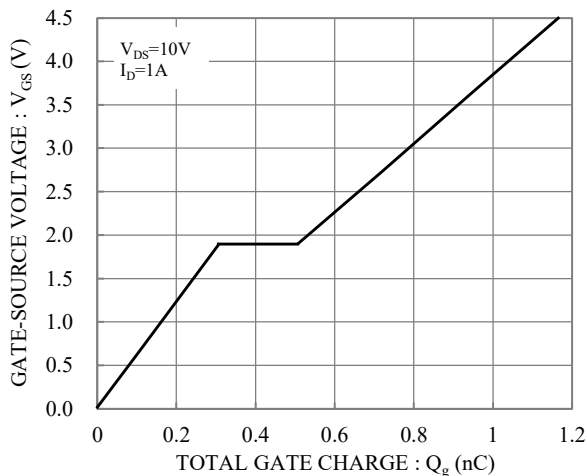


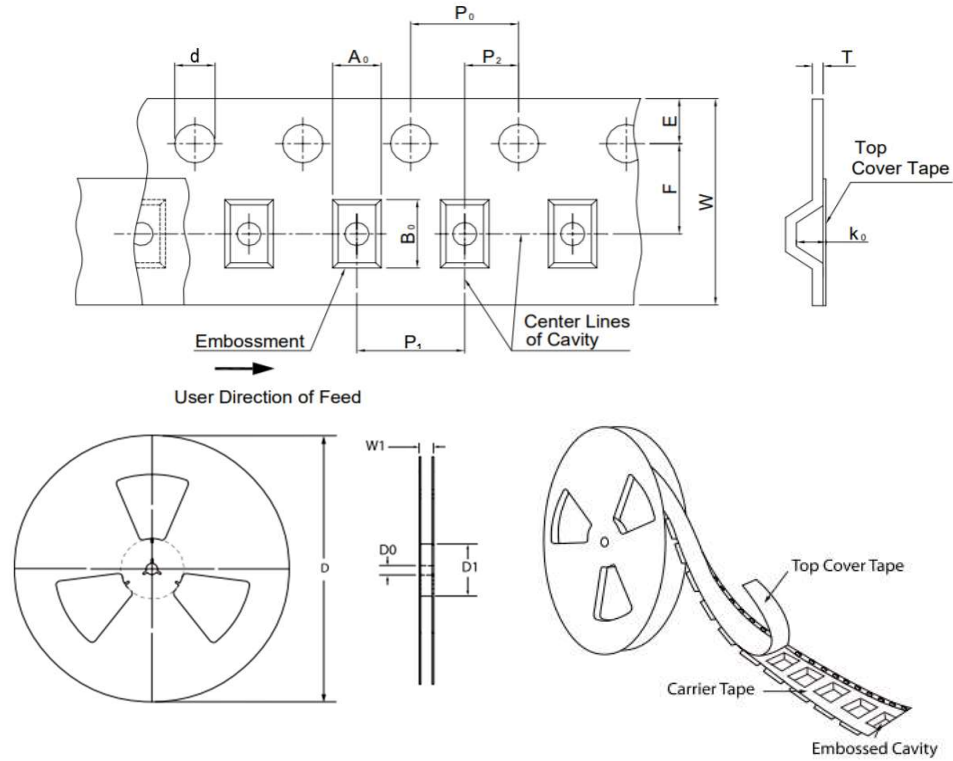
Fig.11 Gate Charge



SMN0202KWTH

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TAPE & REEL SPECIFICATION



Item	Symbol	SOT-523
Carrier width	A ₀	1.95 ± 0.10
Carrier length	B ₀	1.90 ± 0.10
Carrier depth	K ₀	1.20 ± 0.10
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	W1	MAX. 14.50

ORDER INFORMATION

Package	Reel Size	Quantity
SOT-523	7"	4,000

MARKING CODE

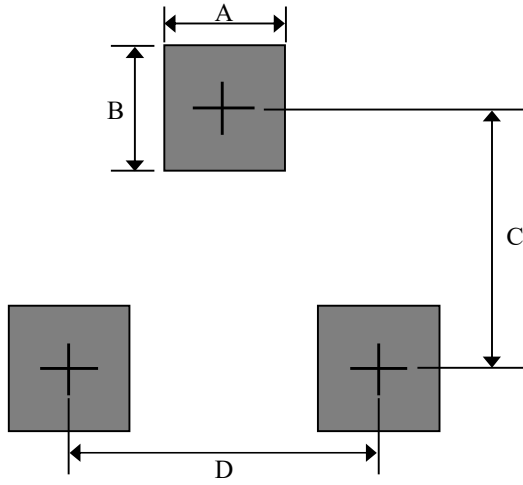
Part Number	Marking Code
SMN0202KWTH	MD



SMN0202KWITH

N-Channel Enhancement Mode Field Effect Transistor

SUGGESTED SOLDER PAD LAYOUT



Unit : mm

PACKAGE	A	B	C	D
SOT-523	0.70	0.70	1.30	1.00