

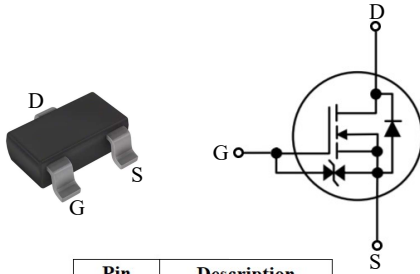


SM620KTDS

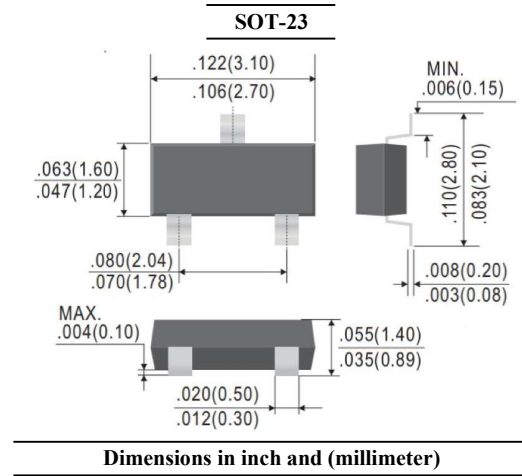
N-Channel Enhancement Mode Field Effect Transistor

FEATURES

- Extremely Low Threshold Voltage
- ESD protected up to 1.5KV
- Suffix "H" indicates Halogen-free parts, ex. SM620KTDSH



Pin	Description
G	Gate
S	Source
D	Drain



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

Parameter	Symbol	$t < 5s$		Steady State	Unit
Drain-Source Voltage	V_{DS}	60			V
Gate-Source Voltage	V_{GS}	± 20			V
Drain Current at $V_{GS}=4.5V$ (Note 1)	I_D	$T_A=25^\circ\text{C}$	430	380	mA
		$T_A=70^\circ\text{C}$	340	300	
Pulsed Drain Current (Note 1, Note 3)	I_{DM}	1.2			A
Total Power Dissipation	P_{tot}	(Note 1)	590		mW
		(Note 2)	380		
Thermal Resistance Junction to Ambient	$R_{\theta JA}$	(Note 1)	117	216	$^\circ\text{C}/\text{W}$
		(Note 2)	292	338	
Operating and Storage Temperature Range	T_J, T_{stg}	- 55 to + 150			$^\circ\text{C}$

Note :

1. Device mounted on 1" x 1" FR-4 PCB with high coverage 2oz. Copper, single sided.
2. Device mounted on FR-4 PCB, with minimum recommended pad layout.
3. 10 μ s Pulse, Duty cycle=1%



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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	$I_D = 10\mu\text{A}$	V_{DSS}	60	-	-	V
Gate Threshold Voltage	$V_{DS} = 10\text{V}$, $I_D = 250\mu\text{A}$	$V_{GS(th)}$	0.5	-	1.0	V
Zero Gate Voltage Drain Current	$V_{DS} = 60\text{V}$, $V_{GS} = 0\text{V}$	I_{DSS}	-	-	1	μA
Gate-Body Leakage Current	$V_{GS} = \pm 20\text{V}$	I_{GSS}	-	-	± 10	μA
Drain-Source On-State Resistance	$V_{GS} = 10\text{V}$, $I_D = 500\text{mA}$	$R_{DS(ON)}$	-	-	1.8	Ω
	$V_{GS} = 4.5\text{V}$, $I_D = 100\text{mA}$		-	-	2.0	
	$V_{GS} = 2.5\text{V}$, $I_D = 50\text{mA}$		-	-	2.5	
	$V_{GS} = 1.8\text{V}$, $I_D = 50\text{mA}$		-	-	3.0	
Forward Transconductance	$V_{DS} = 5\text{V}$, $I_D = 400\text{mA}$	g_{FS}	-	760	-	mS
Dynamic						
Gate Resistance	$V_{DS} = 0$, $f = 1\text{MHz}$	R_g	-	38	-	Ω
Total Gate Charge	$V_{GS} = 4.5\text{V}$, $V_{DS} = 10\text{V}$, $I_D = 0.5\text{A}$	Q_g	-	280	-	pC
Gate-Source Charge		Q_{gs}	-	82	-	
Gate-Drain Charge		Q_{gd}	-	201	-	
Input Capacitance	$V_{DS} = 10\text{V}$, $V_{GS} = 0\text{V}$, $f = 1\text{MHz}$	C_{iss}	-	51	-	pF
Output Capacitance		C_{oss}	-	11	-	
Reverse Transfer Capacitance		C_{rss}	-	8	-	
Turn-On Delay Time	$V_{DD} = 10\text{V}$, $I_D = 1\text{A}$, $V_{GS} = 4.5\text{V}$, $R_{GEN} = 51\Omega$	$t_{d(on)}$	-	13.0	-	ns
Turn-On Rise Time		t_r	-	13.0	-	
Turn-Off Delay Time		$t_{d(off)}$	-	7.7	-	
Turn-Off Fall Time		t_f	-	4.6	-	
Drain-Source Body Diode						
Drain-Source Diode Forward Voltage	$I_S = 115\text{mA}$,	V_{SD}	-	-	1.3	V
Reverse Recovery Time	$I_S = 1\text{A}$, $di/dt = 100\text{A}/\mu\text{s}$	t_{rr}	-	9.0	-	ns
Reverse Recovery Charge		Q_{rr}	-	3.7	-	nC



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RATINGS AND CHARACTERISTIC CURVES

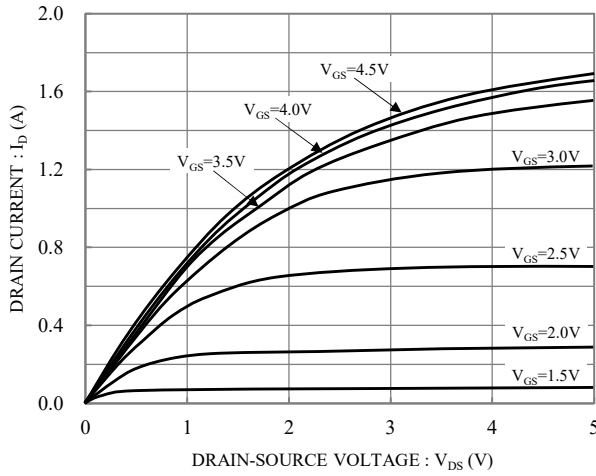


Fig.1 Typical Output Characteristics

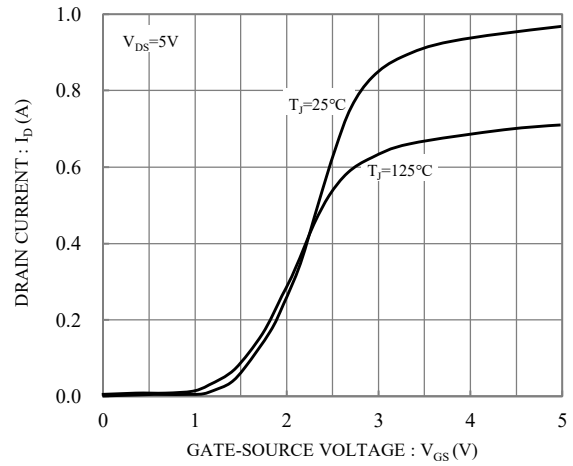


Fig.2 Typical Transfer Characteristics

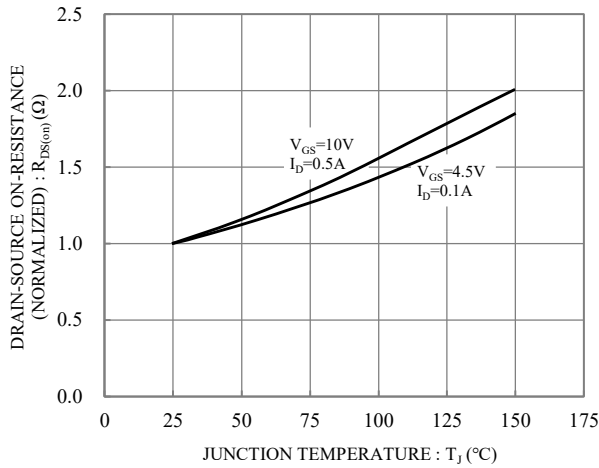


Fig.3 On-Resistance vs Junction Temperature

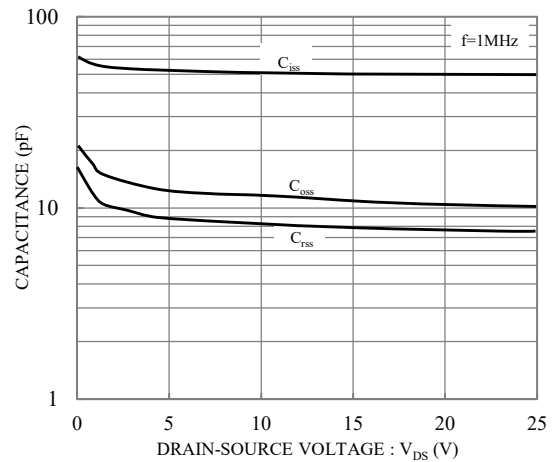


Fig.4 Capacitance vs Drain-Source Voltage

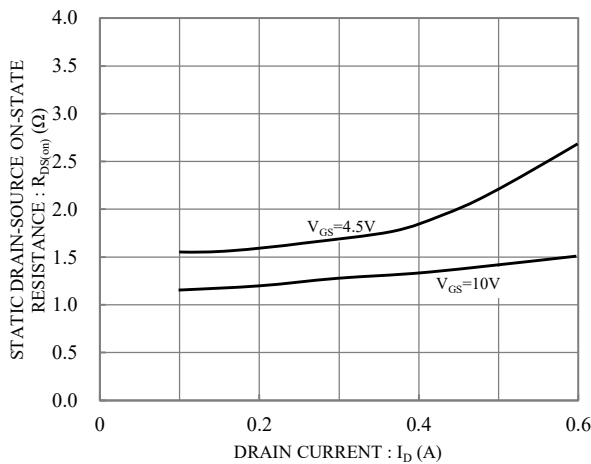


Fig.5 Static Drain-Source On-State Resistance vs. Drain current

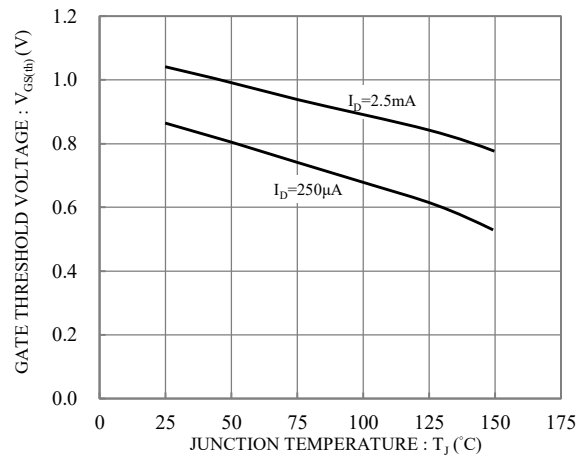


Fig.6 Gate Threshold Voltage vs. Junction Temperature



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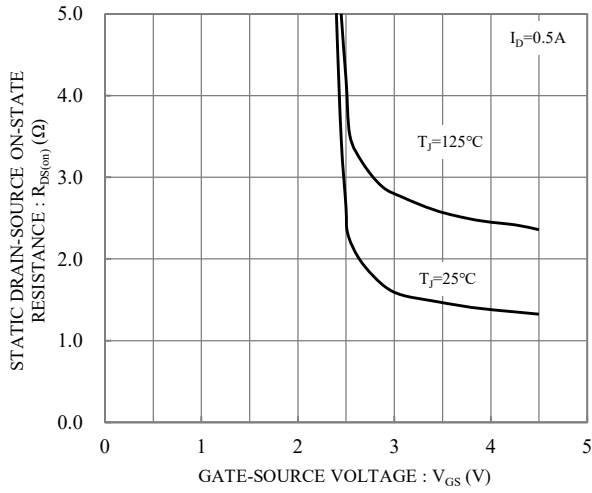


Fig.7 Static Drain-Source On-State Resistance vs Gate-Source Voltage

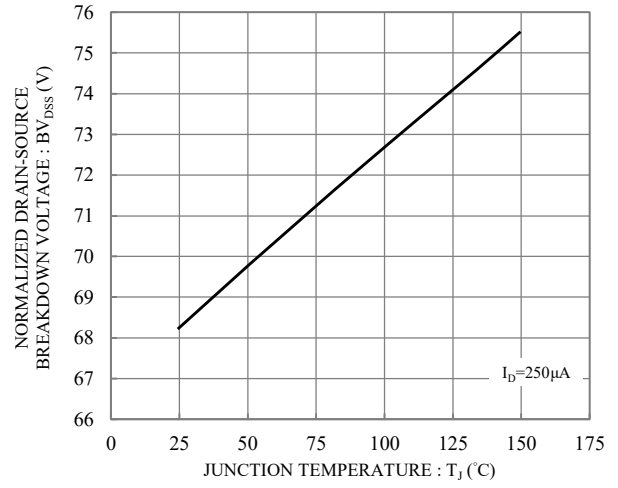


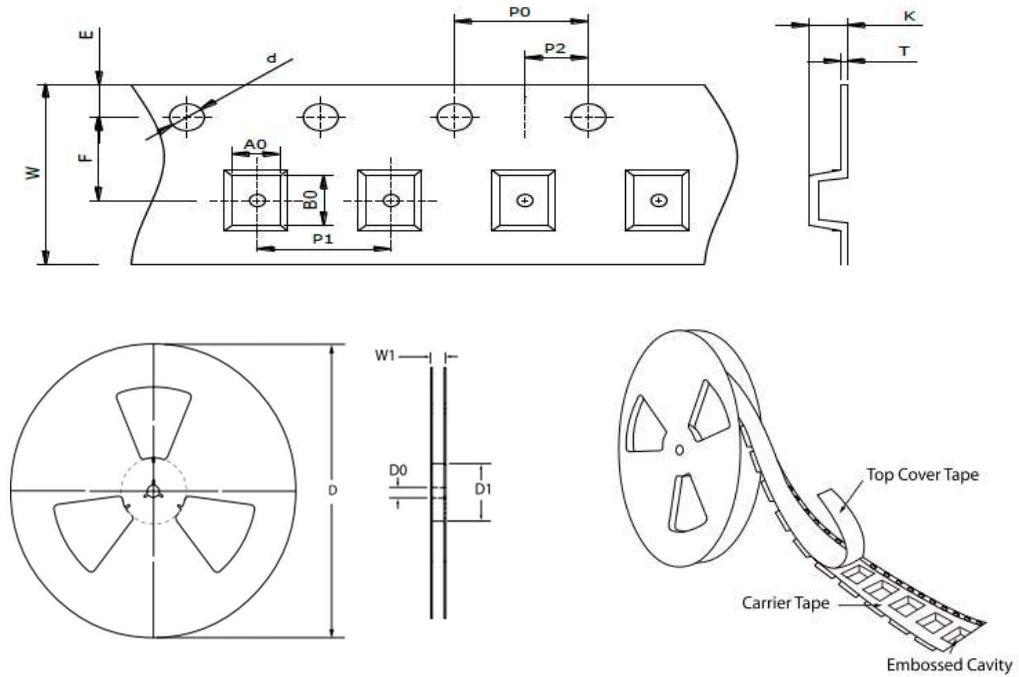
Fig.8 Breakdown Voltage vs Junction Temperature



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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	1.70 ± 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-23	7"	3,000

MARKING CODE

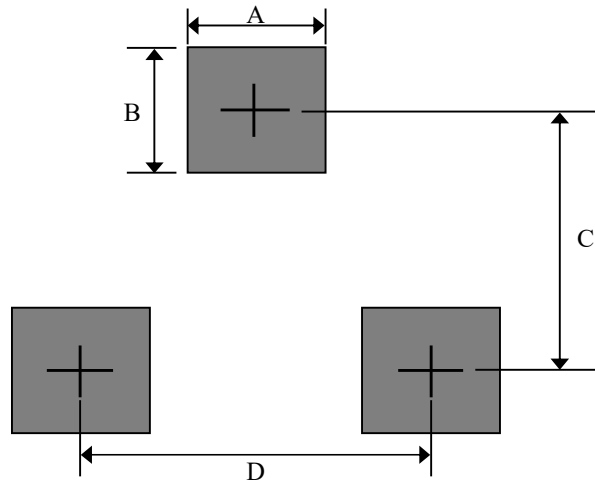
Part Number	Marking Code
SM620KTDS	VD



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SUGGESTED SOLDER PAD LAYOUT



Unit : mm

PACKAGE	A	B	C	D
SOT-23	0.80	1.00	2.40	1.90