

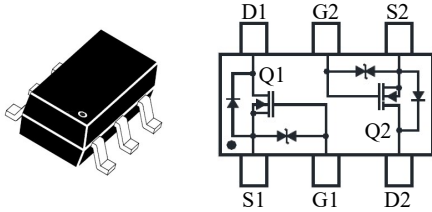


SM2004KDWH

Dual N-Channel Enhancement Mode Field Effect Transistor

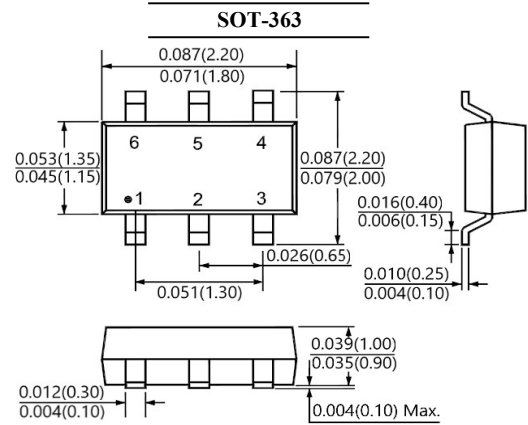
FEATURES

- Low On-Resistance
- Low Gate Threshold Voltage
- Fast Switching Speed
- Suffix "H" indicates Halogen-free parts, ex. SM2004KDWH



TOP VIEW

D	Drain
G	Gate
S	Source



Dimensions in inch and (millimeter)

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

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DSS}	20	V
Gate-Source Voltage	V_{GSS}	± 10	V
Continuous Drain Current Steady State	I_D	$T_A = 25^\circ\text{C}$	540
		$T_A = 85^\circ\text{C}$	390
Pulsed Drain Current (Note 1)	I_{DM}	1.5	A
Power Dissipation	P_D	200	mW
Thermal Resistance, Junction to Ambient (Note 2)	$R_{\theta JA}$	625	$^\circ\text{C} / \text{W}$
Operating and Storage Temperature Range	T_J, T_{stg}	- 55 to + 150	$^\circ\text{C}$

Note:

1. 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.



SM2004KDW H

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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	$I_D = 250\mu\text{A}$	V_{DSS}	20	-	-	V
Gate Threshold Voltage	$V_{DS} = V_{GS}, I_D = 250\mu\text{A}$	$V_{GS(th)}$	0.35	-	1.10	V
Zero Gate Voltage Drain Current	$V_{DS} = 16\text{V}$	I_{DSS}	-	-	1	μA
Gate-Body Leakage Current	$V_{GS} = \pm 10\text{V}$	I_{GSS}	-	-	± 20	μA
Drain-Source On-State Resistance	$V_{GS} = 4.5\text{V}, I_D = 500\text{mA}$	$R_{DS(on)}$	-	-	0.40	Ω
	$V_{GS} = 2.5\text{V}, I_D = 200\text{mA}$		-	-	0.45	
	$V_{GS} = 1.8\text{V}, I_D = 100\text{mA}$		-	-	0.80	
Dynamic						
Gate Resistance	$V_{DS} = 0\text{V}, V_{GS} = 0\text{V}, f = 1\text{MHz}$	R_g	-	112	-	Ω
Total Gate Charge	$V_{DS} = 10\text{V}, I_D = 1\text{A}, V_{GS} = 2.5\text{V}$	Q_g	-	0.6	-	nC
			-	1.1	-	
Gate-Source Charge	$V_{DS} = 10\text{V}, I_D = 1\text{A}, V_{GS} = 4.5\text{V}$	Q_{gs}	-	0.3	-	nC
Gate-Drain Charge		Q_{gd}	-	0.2	-	
Input Capacitance	$V_{DS} = 10\text{V}, V_{GS} = 0\text{V}, f = 1\text{MHz}$	C_{iss}	-	72	-	pF
Output Capacitance		C_{oss}	-	14	-	
Reverse Transfer Capacitance		C_{rss}	-	12	-	
Turn-On Delay Time	$V_{DS} = 10\text{V}, V_{GS} = 4.5\text{V}, I_D = 0.5\text{A}, R_g = 10\Omega$	$t_{d(on)}$	-	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	$I_S = 0.5\text{A}, V_{GS} = 0\text{V}$	V_{SD}	-	0.8	1.3	V
Reverse Recovery Time	$I_S = 1\text{A}, di/dt = 100\text{A}/\mu\text{s}$	t_{rr}	-	5.2	-	ns
Reverse Recovery Charge		Q_{rr}	-	1.2	-	nC



RATINGS AND CHARACTERISTIC CURVES

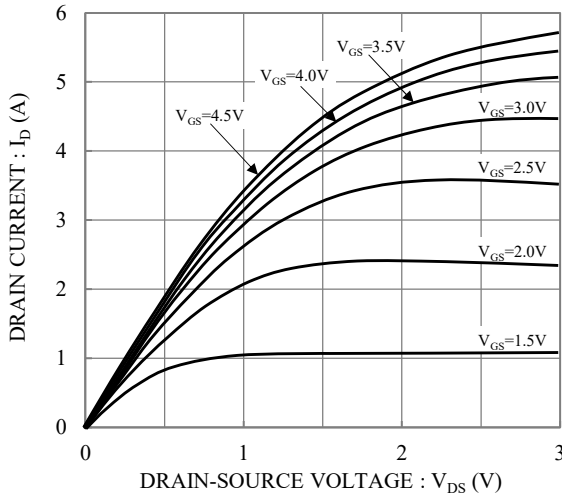


Fig.1 Typical Output Characteristics

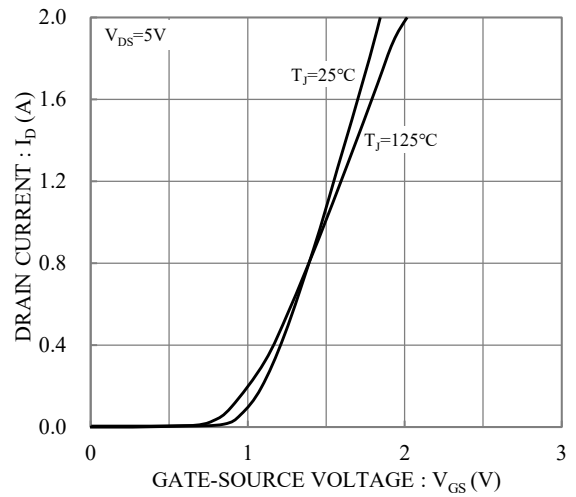


Fig.2 Typical Transfer Characteristics

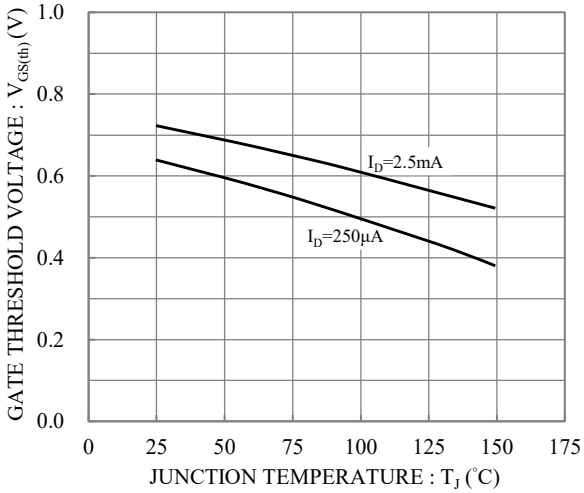


Fig.3 Gate Threshold Voltage vs. Junction Temperature

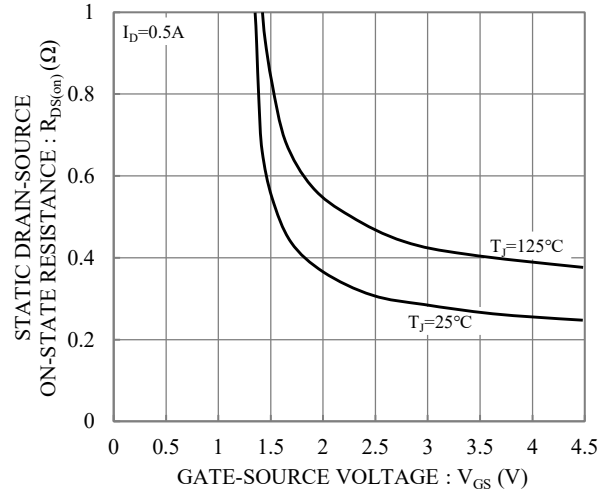


Fig.4 Static Drain-Source On-State Resistance vs. Gate-Source Voltage

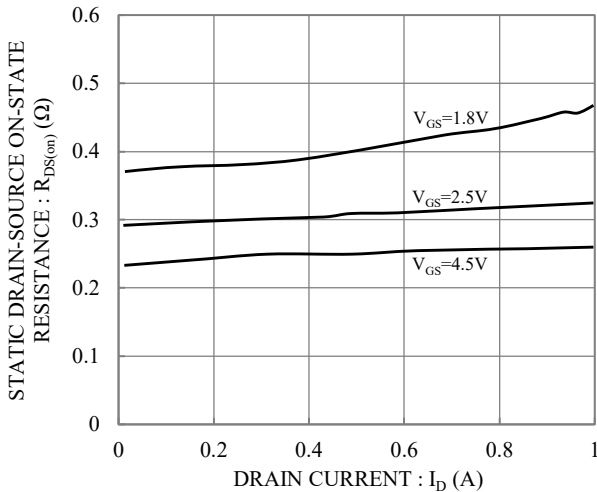


Fig.5 Static Drain-Source On-State Resistance vs. Drain Current

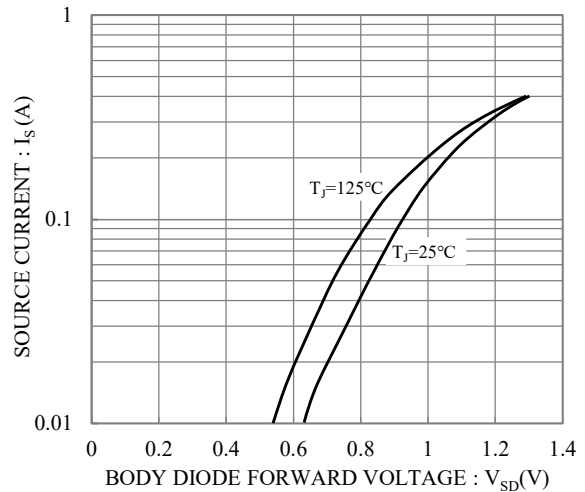


Fig.6 Body Diode Forward Voltage vs. Source Current



SM2004KDW

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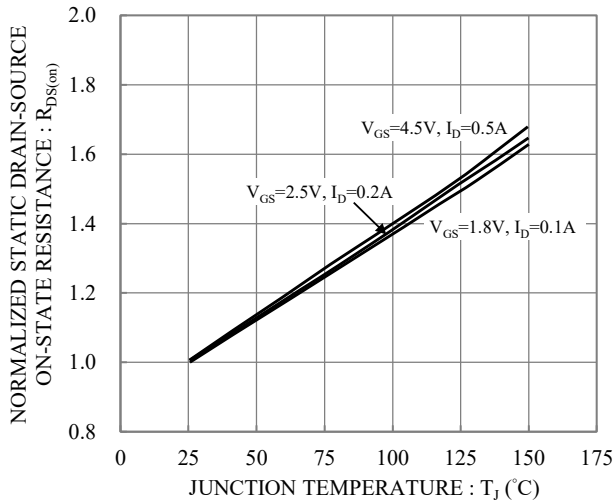


Fig.7 Drain-Source On-State Resistance vs. Junction Temperature

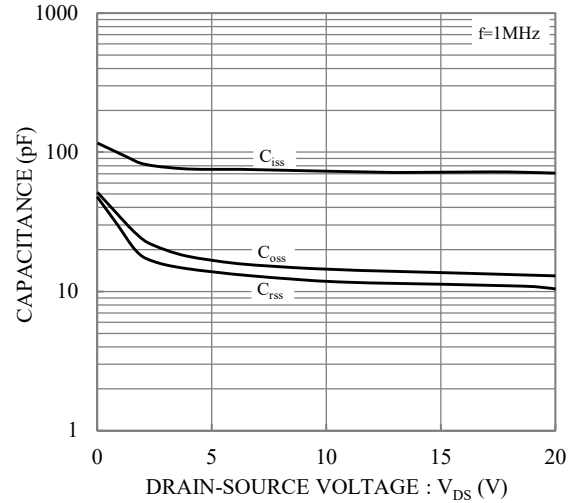


Fig.8 Capacitance vs. Drain-Source Voltage

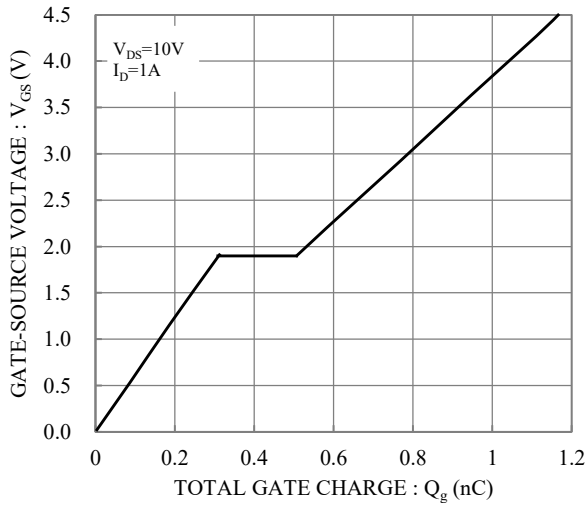


Fig.9 Gate Charge

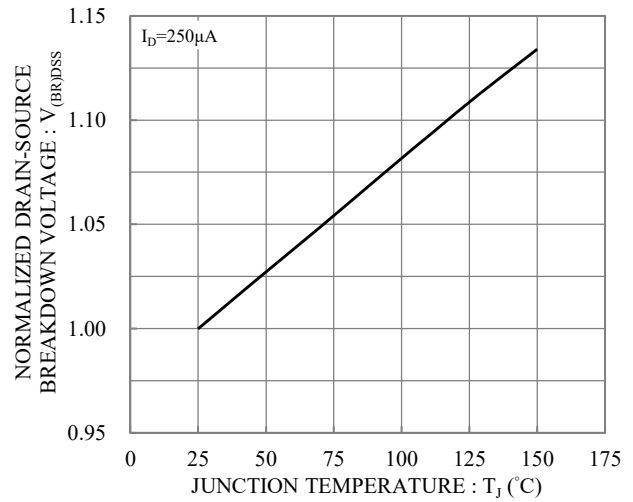


Fig.10 Breakdown Voltage vs. Junction Temperature

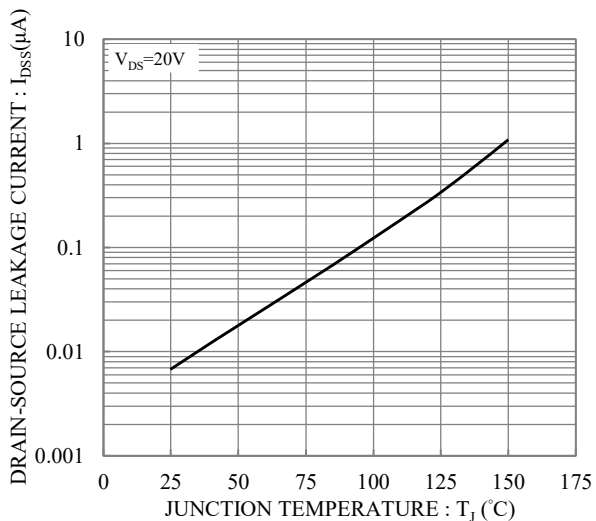


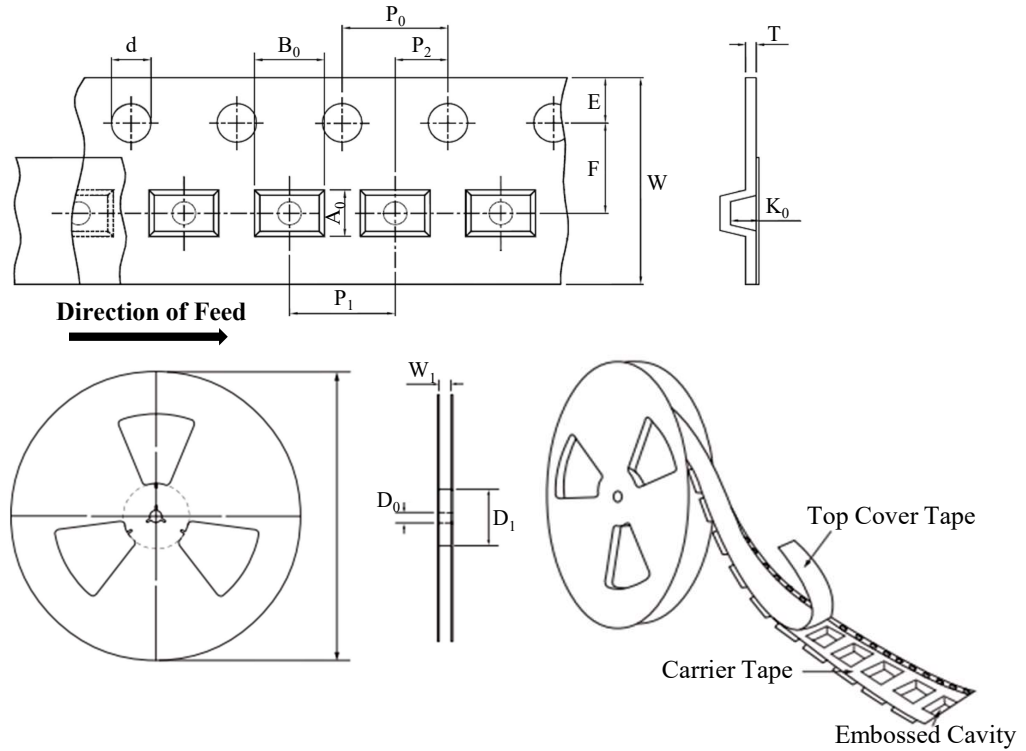
Fig.11 Drain-Source Leakage Current vs. Junction Temperature



SM2004KDW H

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TAPE & REEL SPECIFICATION



Item	Symbol	SOT-363
Carrier width	A_0	2.30 ± 0.10
Carrier length	B_0	2.30 ± 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	0.60 ± 0.10
Tape width	W	8.00 ± 0.30
Reel width	W_1	MAX. 10.00

ORDER INFORMATION

Package	Reel Size	Quantity
SOT-363	7"	3,000

MARKING CODE

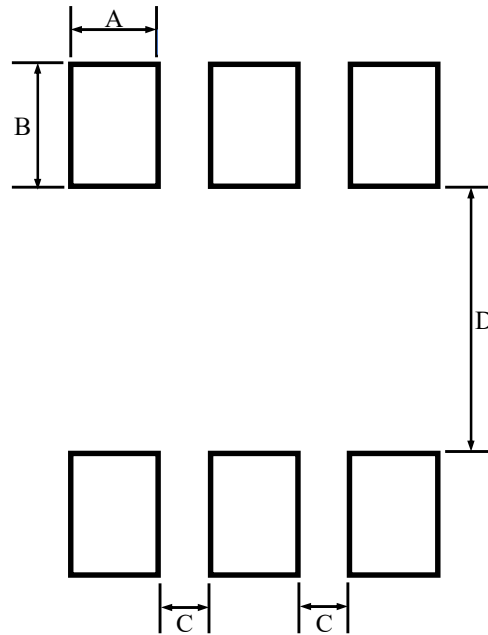
Part Number	Marking Code
SM2004KDW H	MU



SM2004KDW H

Dual N-Channel Enhancement Mode Field Effect Transistor

SUGGESTED SOLDER PAD LAYOUT



Unit :mm

PACKAGE	A	B	C	D
SOT-363	0.42	0.60	0.23	1.30