

KY2304

30V N-Channel Mosfet

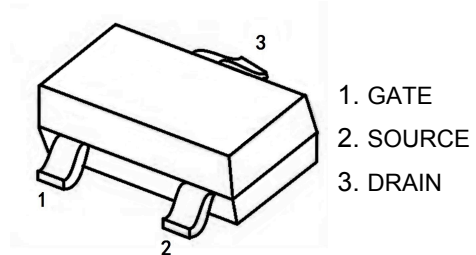
FEATURES

- $R_{DS(ON)} \leq 39m\Omega$ (31m Ω Typ.)
@ $V_{GS}=10V$
- $R_{DS(ON)} \leq 52m\Omega$ (41m Ω Typ.)
@ $V_{GS}=4.5V$

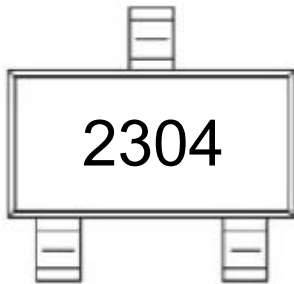
APPLICATIONS

- Load/Power Switching
- Interfacing Switching

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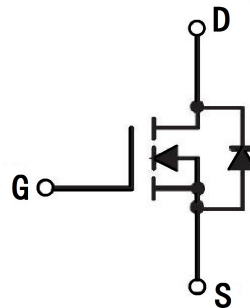


MARKING



2304 :Device Code

N-CHANNEL MOSFET



MAXIMUM RATINGS (Ta=25°C unless otherwise noted)

Symbol	Parameter	Max.	Units
V_{DSS}	Drain-Source Voltage	30	V
V_{GSS}	Gate-Source Voltage	± 20	V
I_D	Continuous Drain Current	$T_a = 25^\circ C$	4.0 A
		$T_a = 100^\circ C$	2.6 A
I_{DM}	Pulsed Drain Current <small>note1</small>	16	A
P_D	Power Dissipation	$T_a = 25^\circ C$	1.0 W
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient	125	$^\circ C/W$
T_J, T_{STG}	Operating and Storage Temperature Range	-55 to +150	$^\circ C$

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MOSFET ELECTRICAL CHARACTERISTICS Ta=25 °C unless otherwise specified

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Units
Off Characteristic						
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	$V_{GS} = 0V, I_D = 250\mu A$	30	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS} = 30V,$ $V_{GS} = 0V, T_J = 25^\circ C$	-	-	1	μA
I_{GSS}	Gate to Body Leakage Current	$V_{GS} = \pm 20V, V_{DS} = 0V$	-	-	± 100	nA
On Characteristics						
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS} = V_{GS}, I_D = 250\mu A$	1.0	1.4	2.2	V
$R_{DS(on)}$	Static Drain-Source On-Resistance ^{note2}	$V_{GS} = 10V, I_D = 4A$	-	31	39	m Ω
		$V_{GS} = 4.5V, I_D = 3A$	-	41	52	
g_{FS}	Forward Transconductance	$V_{DS} = 4.5V, I_D = 2.5A$	-	-	52	S
Dynamic Characteristics						
C_{iss}	Input Capacitance	$V_{DS} = 15V, V_{GS} = 0V,$ $f = 1.0MHz$	-	231	-	pF
C_{oss}	Output Capacitance		-	42	-	pF
C_{rSS}	Reverse Transfer Capacitance		-	17	-	pF
Q_g	Total Gate Charge	$V_{DS} = 15V, I_D = 3A,$ $V_{GS} = 4.5V,$	-	4.1	-	nC
Q_{gs}	Gate-Source Charge		-	0.74	-	nC
Q_{gd}	Gate-Drain("Miller") Charge		-	0.66	-	nC
Switching Characteristics						
$t_{d(on)}$	Turn-On Delay Time	$V_{GS} = 4.5V, V_{DS} = 15V,$ $R_G = 3\Omega, I_D = 3A$	-	11	-	ns
t_r	Turn-On Rise Time		-	48	-	ns
$t_{d(off)}$	Turn-Off Delay Time		-	12	-	ns
t_f	Turn-Off Fall Time		-	19	-	ns
Drain-Source Diode Characteristics and Maximum Ratings						
I_S	Maximum Continuous Drain to Source Diode Forward Current		-	-	4	A
I_{SM}	Maximum Pulsed Drain to Source Diode Forward Current		-	-	16	A
V_{SD}	Drain to Source Diode Forward Voltage	$V_{GS} = 0V, I_{SD} = 2.7A,$ $T_J = 25^\circ C$	-	-	1.2	V

Notes: 1. Repetitive Rating: Pulse width limited by maximum junction temperature

2. Pulse Test: Pulse width $\leq 300\mu s$, Duty Cycle $\leq 2\%$

Typical Performance Characteristics

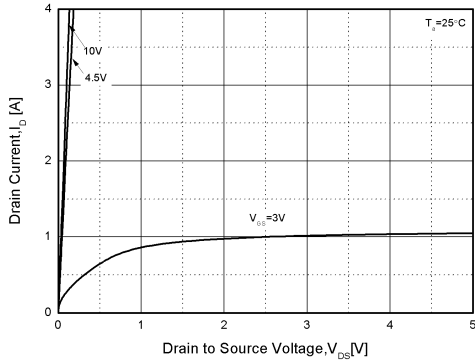


Figure1. Output Characteristics

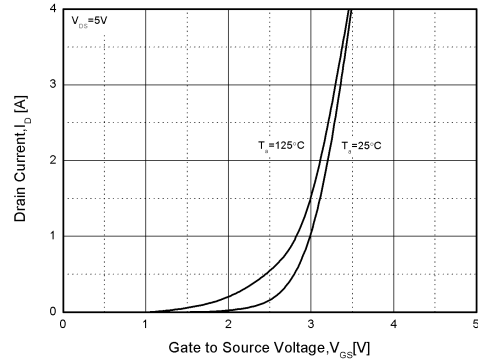


Figure2. Transfer Characteristics

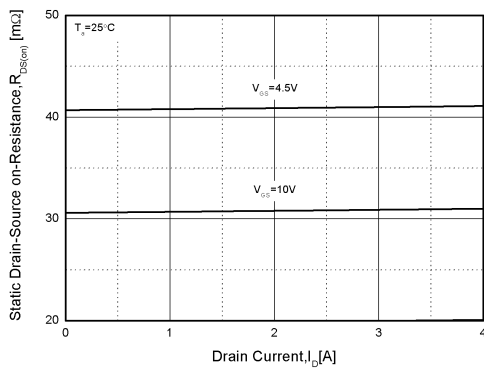


Figure3. Rds(on)-Drain Current

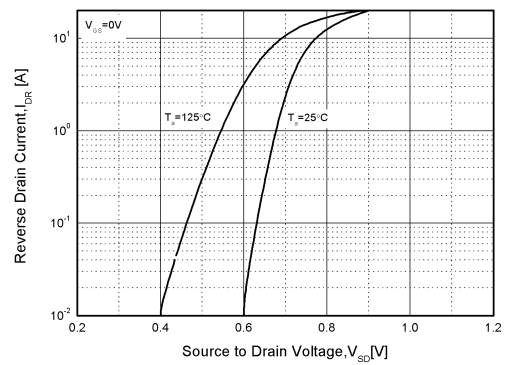


Figure4. Typical Source-Drain Diode Forward Voltage

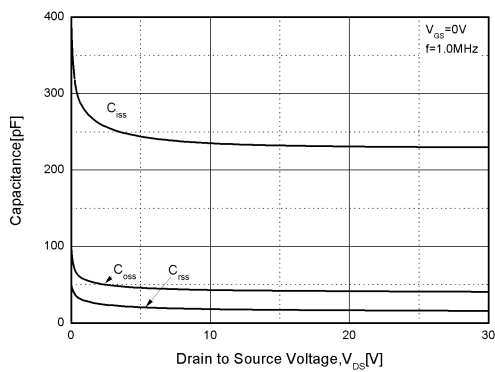


Figure5. Capacitance Characteristics

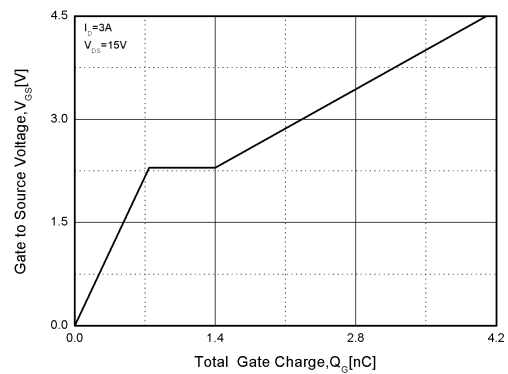


Figure6. Gate Charge

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Typical Performance Characteristics (cont.)

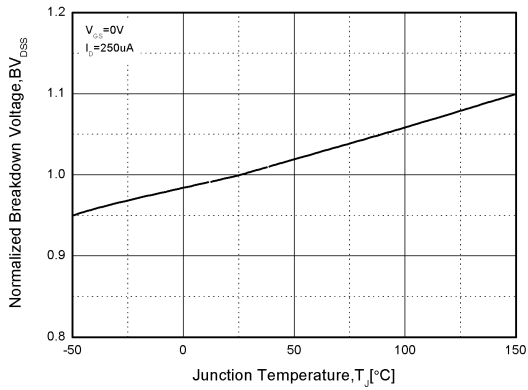


Figure7. Normalized Breakdown Voltage vs. Temperature

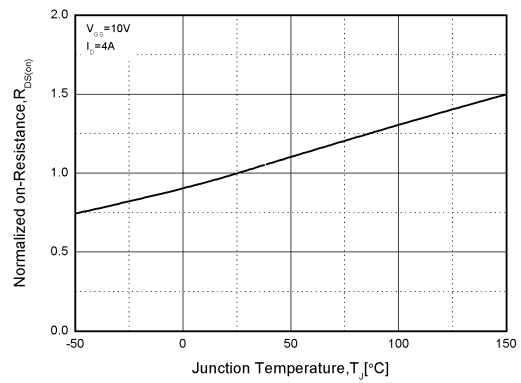


Figure8. Normalized on Resistance vs. Temperature

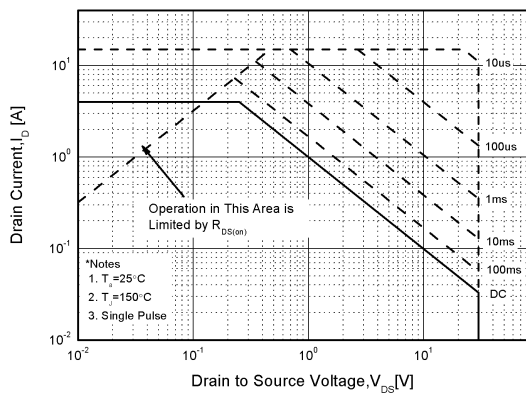


Figure9. Safe Operation Area

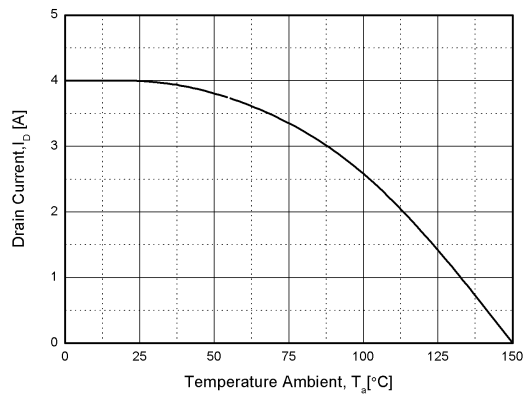


Figure10. Drain Current vs. Ambient Temperature

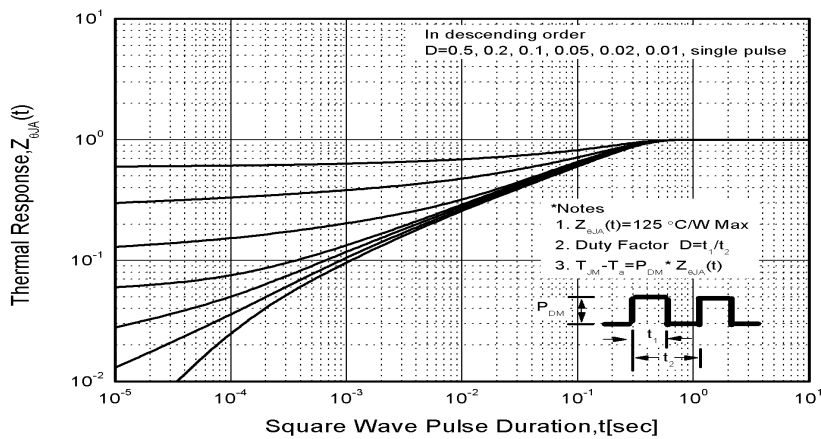
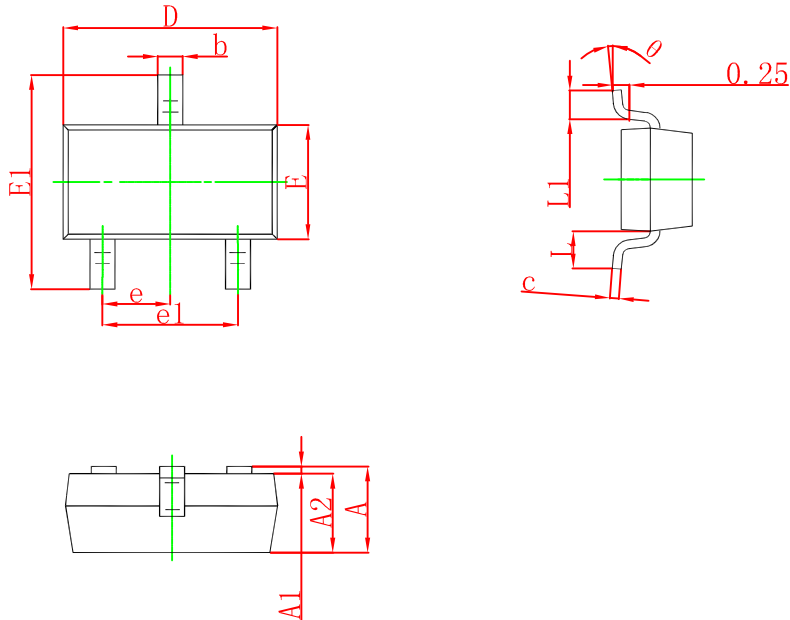


Figure11. Transient Thermal Response Curve

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SOT-23 PACKAGE OUTLINE DRAWING



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	0.900	1.150	0.035	0.045
A1	0.000	0.100	0.000	0.004
A2	0.900	1.050	0.035	0.041
b	0.300	0.500	0.012	0.020
c	0.080	0.150	0.003	0.006
D	2.800	3.000	0.110	0.118
E	1.200	1.400	0.047	0.055
E1	2.250	2.550	0.089	0.100
e	0.950 TYP		0.037 TYP	
e1	1.800	2.000	0.071	0.079
L	0.550 REF		0.022 REF	
L1	0.300	0.500	0.012	0.020
θ	0°	8°	0°	8°