

# KY2304

## 30V N-Channel Mosfet

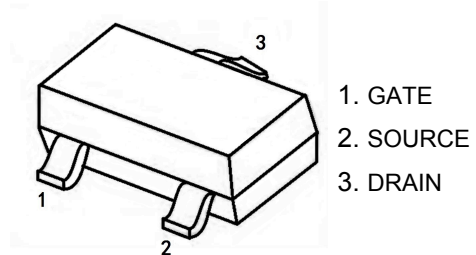
### FEATURES

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

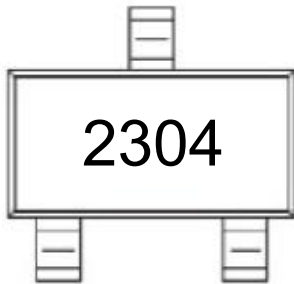
### APPLICATIONS

- Load/Power Switching
- Interfacing Switching

### SOT-23

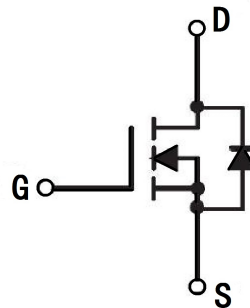


### MARKING



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	$\pm 20$	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
<b>Off Characteristic</b>						
$V_{(BR)DSS}$	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	$\mu A$
$I_{GSS}$	Gate to Body Leakage Current	$V_{GS} = \pm 20V, V_{DS} = 0V$	-	-	$\pm 100$	nA
<b>On Characteristics</b>						
$V_{GS(th)}$	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 <sup>note2</sup>	$V_{GS} = 10V, I_D = 4A$	-	31	39	m $\Omega$
		$V_{GS} = 4.5V, I_D = 3A$	-	41	52	
$g_{FS}$	Forward Transconductance	$V_{DS} = 4.5V, I_D = 2.5A$	-	-	52	S
<b>Dynamic Characteristics</b>						
$C_{iss}$	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
<b>Switching Characteristics</b>						
$t_{d(on)}$	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
<b>Drain-Source Diode Characteristics and Maximum Ratings</b>						
$I_S$	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

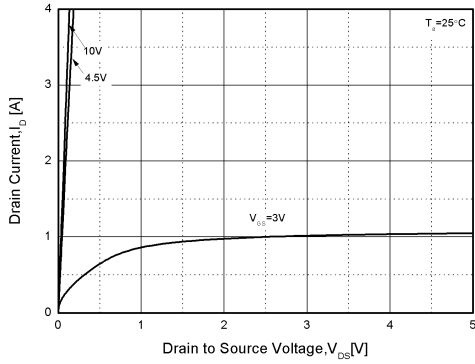


Figure1. Output Characteristics

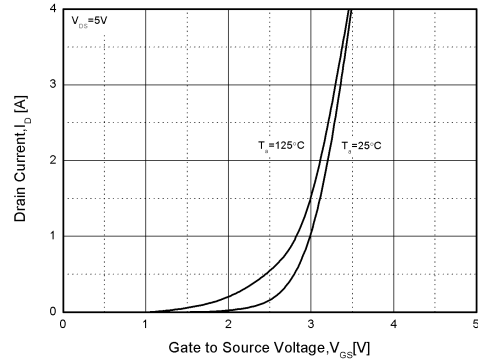


Figure2. Transfer Characteristics

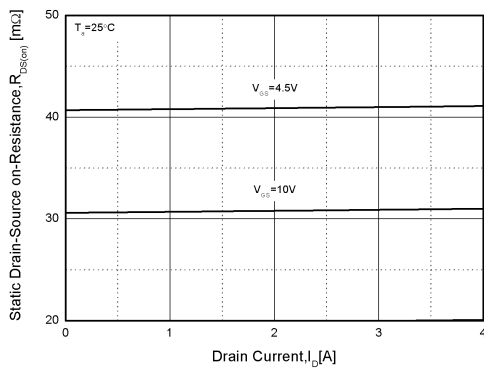


Figure3. Rds(on)-Drain Current

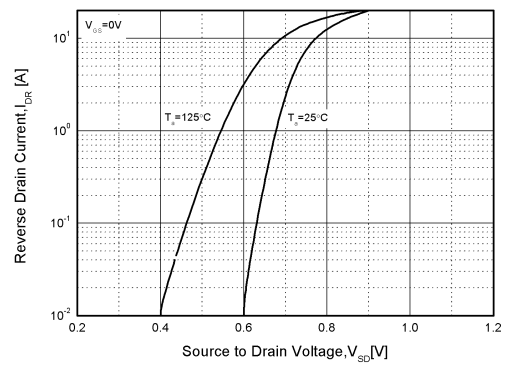


Figure4. Typical Source-Drain Diode Forward Voltage

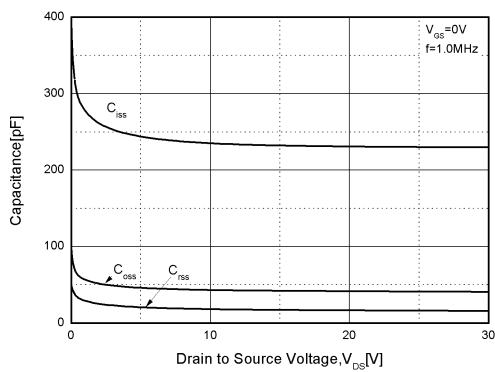


Figure5. Capacitance Characteristics

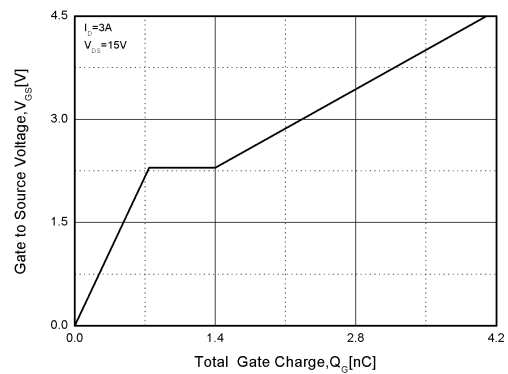


Figure6. Gate Charge

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## Typical Performance Characteristics (cont.)

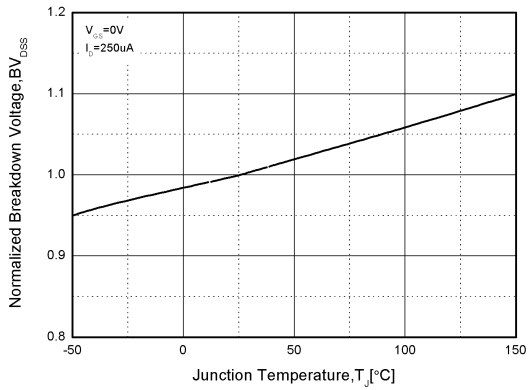


Figure7. Normalized Breakdown Voltage vs. Temperature

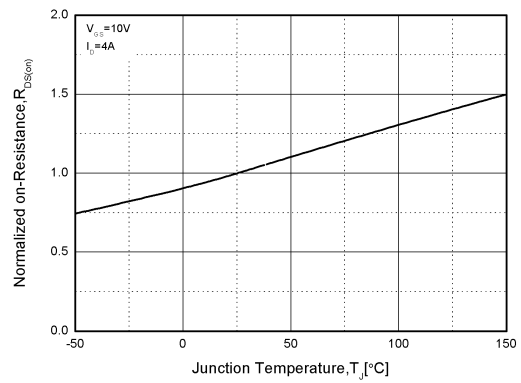


Figure8. Normalized on Resistance vs. Temperature

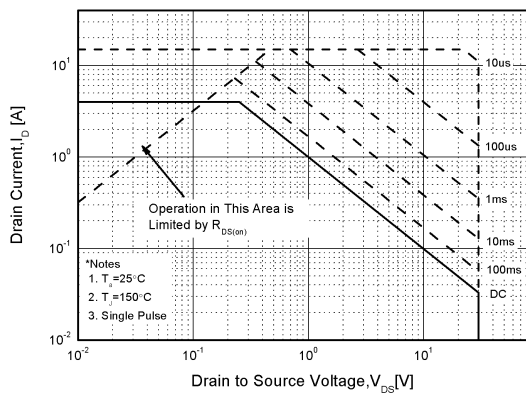


Figure9. Safe Operation Area

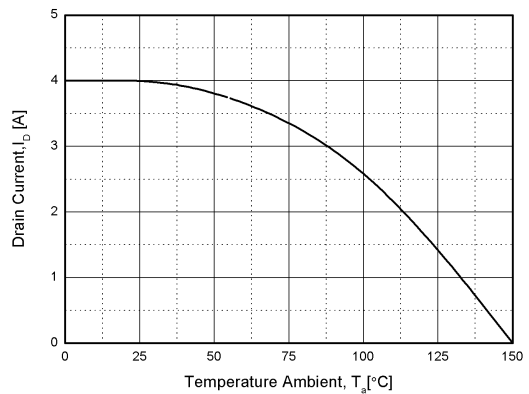


Figure10. Drain Current vs. Ambient Temperature

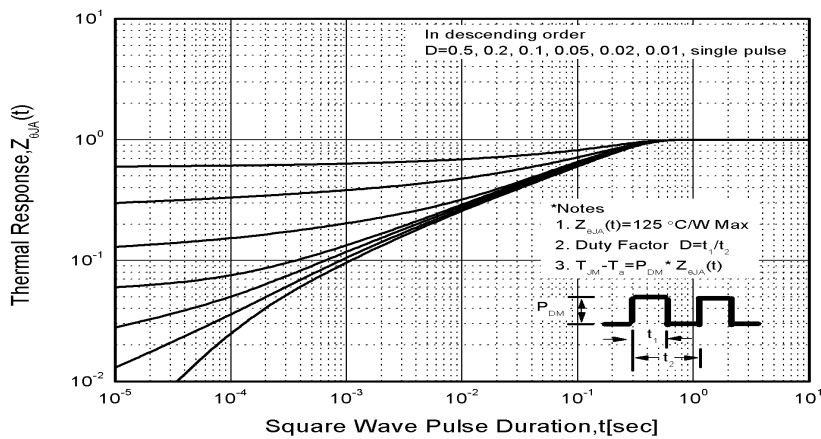
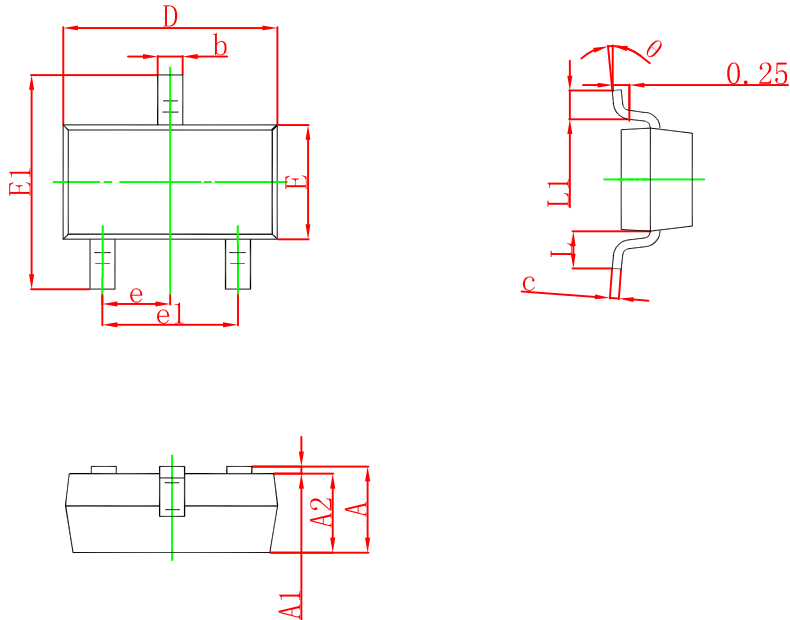


Figure11. Transient Thermal Response Curve

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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°

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