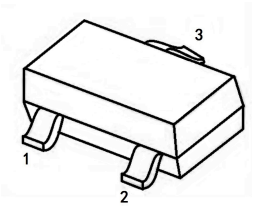
KY3415B

-20V P-Channel Mosfet

FEATURES

- $R_{DS(ON)}$ ≤ 45mΩ (38mΩ Typ.) @V_{GS}=-4.5V
- $R_{DS(ON)}$ ≤ 60mΩ (48mΩ Typ.) @V_{GS}=-2.5V
- ESD Rating: HBM 2.0KV

SOT-23

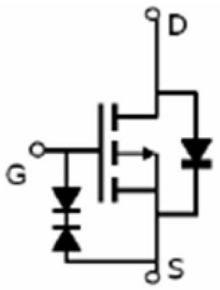


1. GATE
2. SOURCE
3. DRAIN

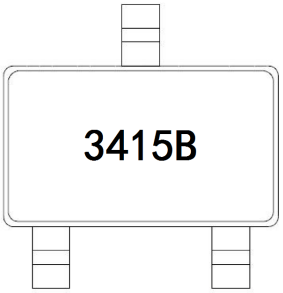
APPLICATIONS

- PWM Applications
- Load Switch
- Power Management

P-CHANNEL MOSFET



MARKING



Other marks: "**3415**" or "**AF4E**"

Absolute Maximum Ratings (T_C=25℃ unless otherwise specified)

Symbol	Parameter		Max.	Units
V_{DSS}	Drain-Source Voltage		-20	V
V_{GSS}	Gate-Source Voltage		±10	V
I_D	Continuous Drain Current	T_C = 25℃	-4	A
		T_C = 100℃	-2.6	
I_{DM}	Pulsed Drain Current note1		-20	A
P_D	Power Dissipation	T_A = 25℃	1.67	W
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient		75	℃/W
T_J, T_{STG}	Operating and Storage Temperature Range		-55 to +150	℃

Electrical Characteristics (T_C=25℃ 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= -250μA	-20	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS} = -20V, V_{GS} = 0V,	-	-	-1	μA
I_{GSS}	Gate to Body Leakage Current	V_{DS} =0V, V_{GS} = ±8V	-	-	±10	μA
On Characteristics						
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}= V_{GS}, I_D= -250μA	-0.4	-	-1.0	V
$R_{DS(on)}$	Static Drain-Source on-Resistance note2	V_{GS} =-4.5V, I_D =-4A	-	38	45	mΩ
		V_{GS} =-2.5V, I_D =-3A	-	48	60	
g_{FS}	Forward Transconductance	V_{DS} =-5V, I_D = -4A	8	-	-	S
Dynamic Characteristics						
C_{iss}	Input Capacitance	V_{DS} = -10V, V_{GS} = 0V, f = 1.0MHz	-	950	-	pF
C_{oss}	Output Capacitance		-	165	-	pF
C_{rss}	Reverse Transfer Capacitance		-	120	-	pF
Q_g	Total Gate Charge	V_{DS} = -10V, I_D = -4A, V_{GS} = -4.5V	-	12	-	nC
Q_{gs}	Gate-Source Charge		-	1.4		nC
Q_{gd}	Gate-Drain(“Miller”) Charge		-	3.6		nC
Switching Characteristics						
$t_{d(on)}$	Turn-on Delay Time	V_{DD}=-10V, V_{GS}=-4.5A, R_L=2.5Ω,R_{GEN}=3Ω	-	12	-	ns
t_r	Turn-on Rise Time		-	10	-	ns
$t_{d(off)}$	Turn-off Delay Time		-	19	-	ns
t_f	Turn-off Fall Time		-	25	-	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		-	-	-20	A
V_{SD}	Drain to Source Diode Forward Voltage	V_{GS} = 0V, I_S = -4A	-	-	-1.2	V

Notes:1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature

2. Pulse Test: Pulse Width≤300μs, Duty Cycle≤2%

KY3415B

Typical Performance Characteristics

Figure1: Output Characteristics

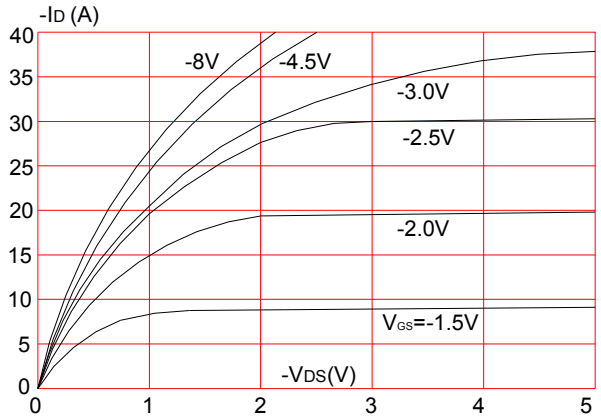


Figure 2: Typical Transfer Characteristics

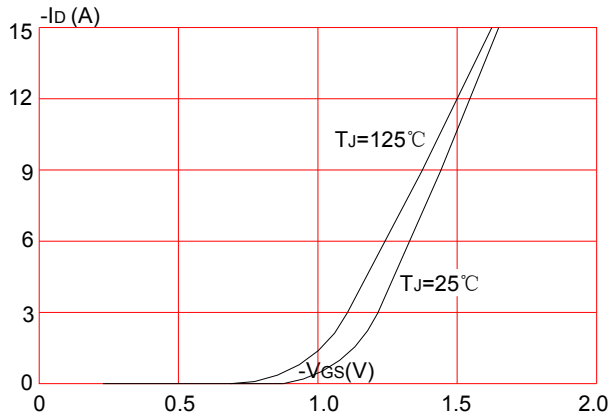


Figure 3: On-resistance vs. Drain Current

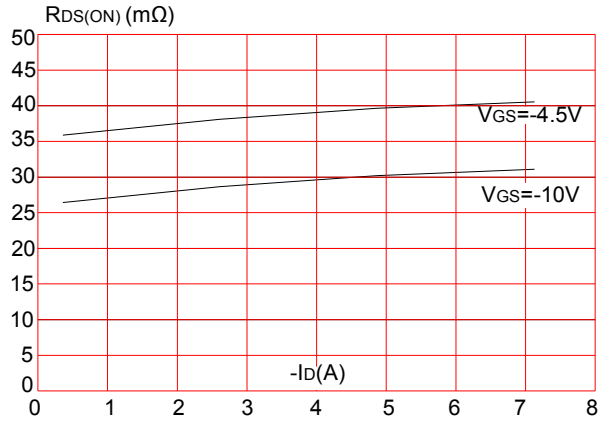


Figure 4: Body Diode Characteristics

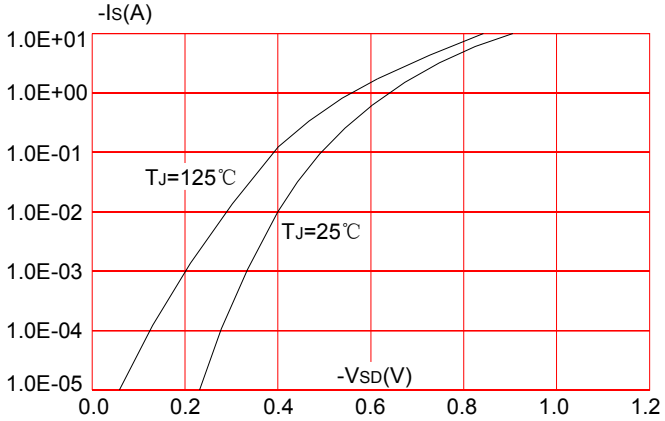


Figure 5: Gate Charge Characteristics

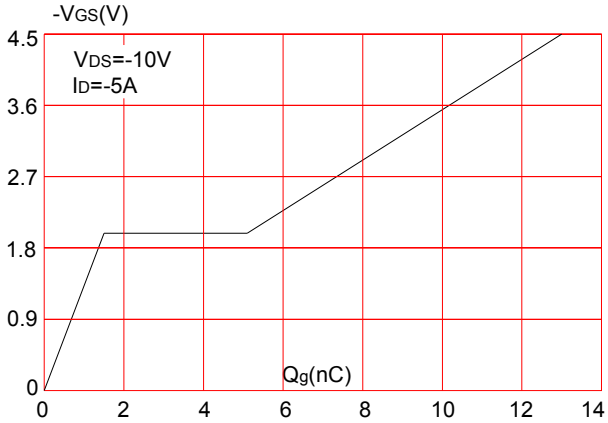
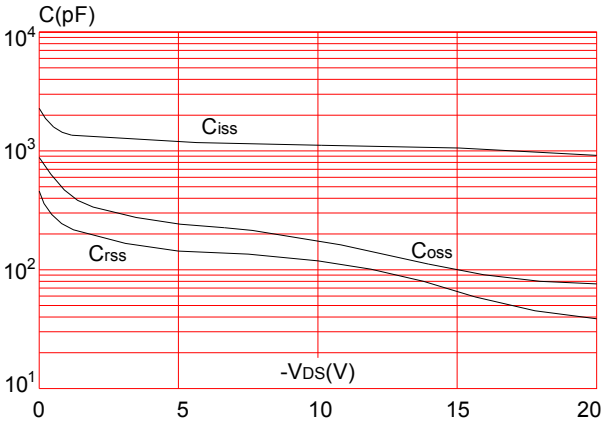


Figure 6: Capacitance Characteristics



Typical Performance Characteristics (cont.)

Figure 7: Normalized Breakdown Voltage vs. Junction Temperature

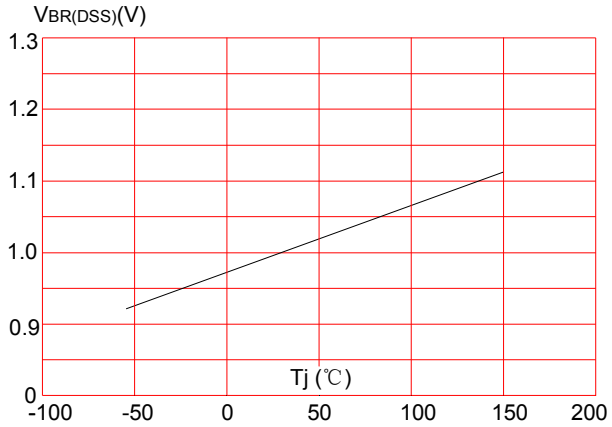


Figure 8: Normalized on Resistance vs. Junction Temperature

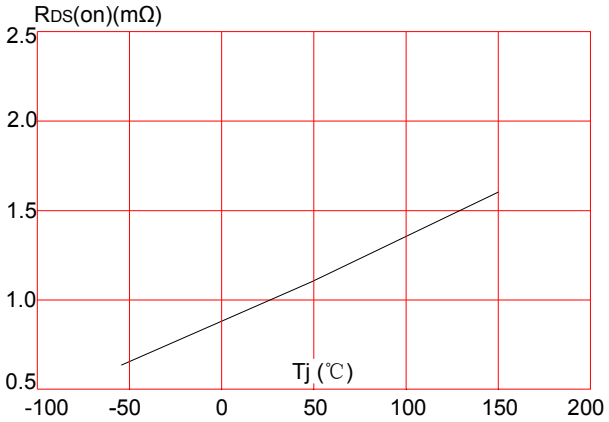


Figure 9: Maximum Safe Operating Area

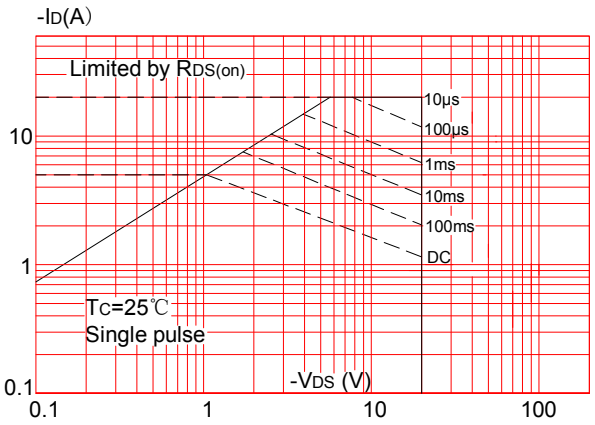


Figure 10: Maximum Continuous Drain Current vs. Case Temperature

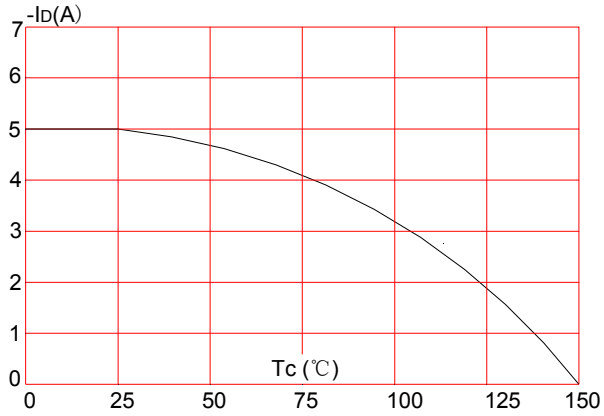
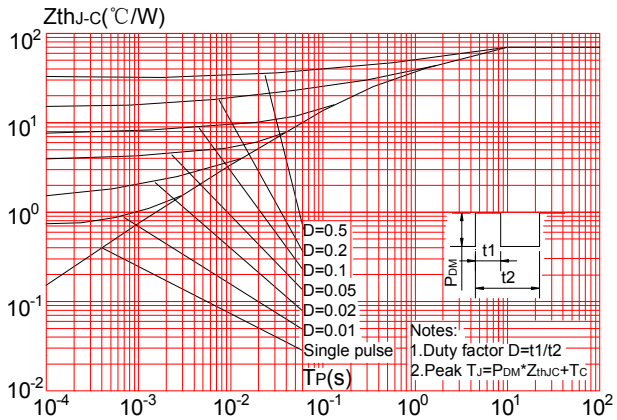
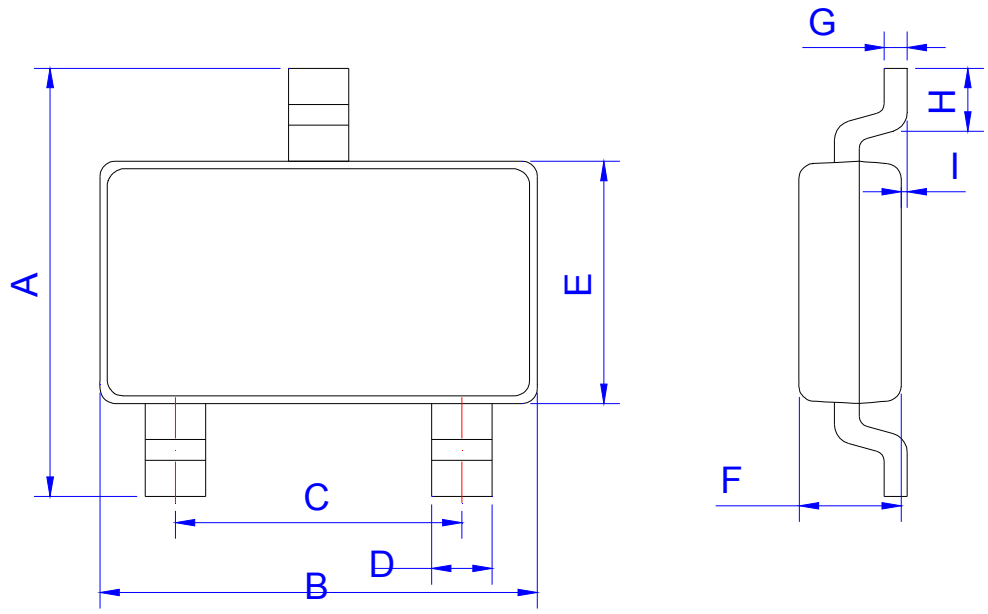


Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to-Ambient (SOT-23)



KY3415B

SOT-23 PACKAGE OUTLINE DRAWING



Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	2.30	2.40	2.50	0.091	0.095	0.098
B	2.80	2.90	3.00	0.110	0.114	0.118
C	1.90 REF			0.075 REF		
D	0.35	0.40	0.45	0.014	0.016	0.018
E	1.20	1.30	1.40	0.047	0.051	0.055
F	0.90	1.00	1.10	0.035	0.039	0.043
G		0.10	0.15		0.004	0.006
H	0.20			0.008		
I	0		0.10	0		0.004