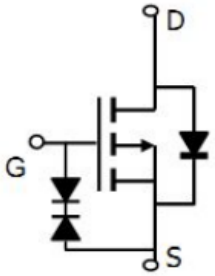
AO3415E

P-Channel MOSFET

»Features

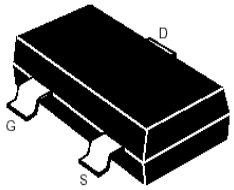
V_{DS} = -20V
I_D = -4.8A
$R_{DS(ON)}$ @V_{GS} = -4.5V, TYP =45mΩ
$R_{DS(ON)}$ @V_{GS} = -2.5V, TYP =65mΩ

»Pin Configurations



»General Description

- Load Switch
- Switching circuits
- High-speed line driver
- HMB ESD Protection 2KV
- SOT-23 for Surface Mount Package.



»Absolute Maximum Ratings @T_A=25℃ unless otherwise noted

Symbol	Parameter		Rating	Unit
Common Ratings (T_A=25°C Unless Otherwise Noted)				
V_{GS}	Gate-Source Voltage		±8	V
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage		-20	V
T_J	Maximum Junction Temperature		150	°C
T_{STG}	Storage Temperature Range		-50 to 150	°C
Mounted on Large Heat Sink				
I_{DM}	Pulse Drain Current Tested①	T_A=25°C	-30	A
I_D	Continuous Drain Current	T_A=25°C	-4.8	A
		T_A=70°C	-3.6	
P_D	Maximum Power Dissipation	T_A=25°C	1.5	W
		T_A=70°C	1.0	
$R_{\theta JA}$	Thermal Resistance Junction-Ambient		80	°C/W

»Electrical Characteristics @T_A=25℃ unless otherwise noted

Symbol	Parameter	Condition	Min	Typ	Max	Unit
Static Electrical Characteristics @ T_J = 25°C (unless otherwise stated)						
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	V_{GS}=0V I_D=-250μA	-20	--	--	V
I_{DSS}	Zero Gate Voltage Drain Current(T_A=25℃)	V_{DS}=-20V, V_{GS}=0V	--	--	-1	μA
	Zero Gate Voltage Drain Current(T_A=125℃)	V_{DS}=-16V, V_{GS}=0V	--	--	-100	uA
I_{GSS}	Gate-Body Leakage Current	V_{GS}=±8V, V_{DS}=0V	--	--	±10	μA
$V_{GS(TH)}$	Gate Threshold Voltage	V_{DS}=V_{GS}, I_D=-250μA	-0.4	-0.7	-1.2	V
$R_{DS(ON)}$	Drain-Source On-State Resistance②	V_{GS}=-4.5V, I_D=-4A	--	37	45	mΩ
$R_{DS(ON)}$	Drain-Source On-State Resistance②	V_{GS}=-3.3V, I_D=-3A	--	43	55	mΩ
$R_{DS(ON)}$	Drain-Source On-State Resistance②	V_{GS}=-2.5V, I_D=-2A	--	52	65	mΩ
Dynamic Electrical Characteristics @ T_J = 25°C (unless otherwise stated)						
C_{iss}	Input Capacitance	V_{DS}=-10V, V_{GS}=0V, f=1MHz	--	675	--	pF
C_{oss}	Output Capacitance		--	120	--	pF
C_{rss}	Reverse Transfer Capacitance		--	85	--	pF
Q_g	Total Gate Charge	V_{DS}=-10V I_D=-4A, V_{GS}=-4.5V	--	14.2	--	nC
Q_{gs}	Gate Source Charge		--	3.2	--	nC
Q_{gd}	Gate Drain Charge		--	5.8	--	nC
Switching Characteristics						
$t_{d(on)}$	Turn on Delay Time	V_{DD}=-10V, I_D=-2A, R_G=3.3Ω, V_{GS}=-4.5V	--	15	--	ns
t_r	Turn on Rise Time		--	11	--	ns
$t_{d(off)}$	Turn Off Delay Time		-	22	--	ns
t_f	Turn Off Fall Time		--	35	--	ns
Source Drain Diode Characteristics						
I_{SD}	Source drain current(Body Diode)	T_A=25℃	--	--	-2	A
V_{SD}	Forward on voltage②	T_j=25℃, I_{SD}=-2A, V_{GS}=0V	--	-0.83	-1.2	V

Notes: ① Pulse width limited by maximum allowable junction temperature

②Pulse test ; Pulse width≤300μs, duty cycle≤2%.

»Typical Performance Characteristics ((TJ = 25 °C, unless otherwise noted))

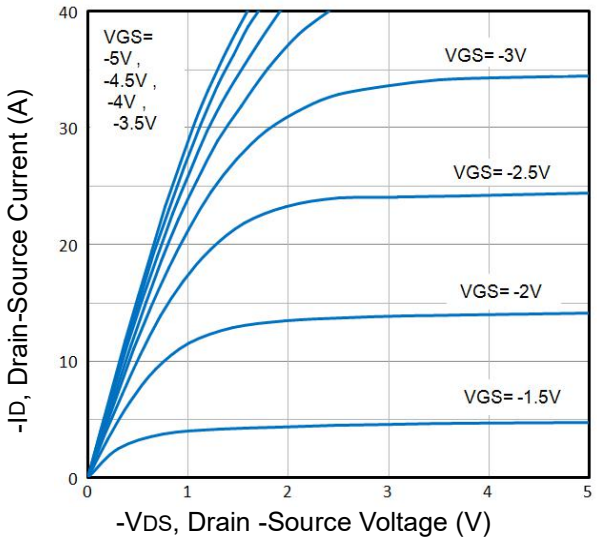


Fig1. Typical Output Characteristics

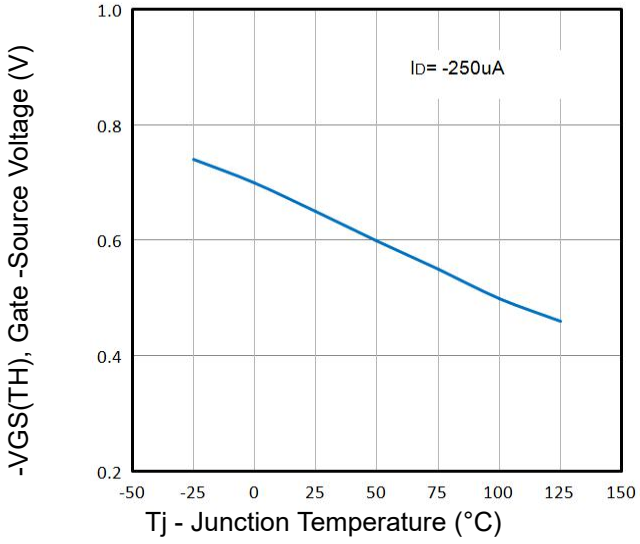


Fig2. Normalized Threshold Voltage Vs. Temperature

Tc, Case Temperature (°C)

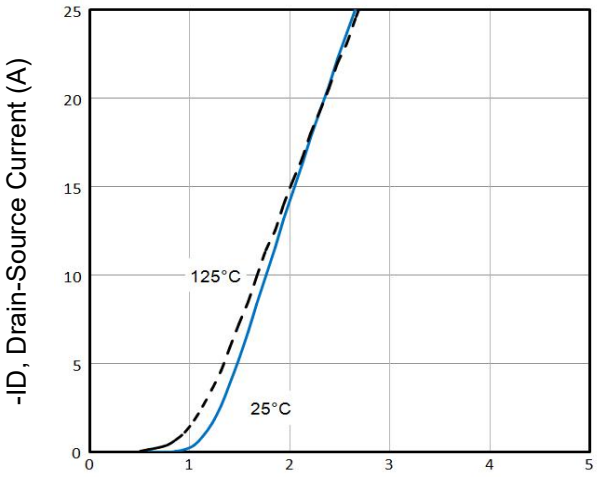


Fig3. Typical Transfer Characteristics

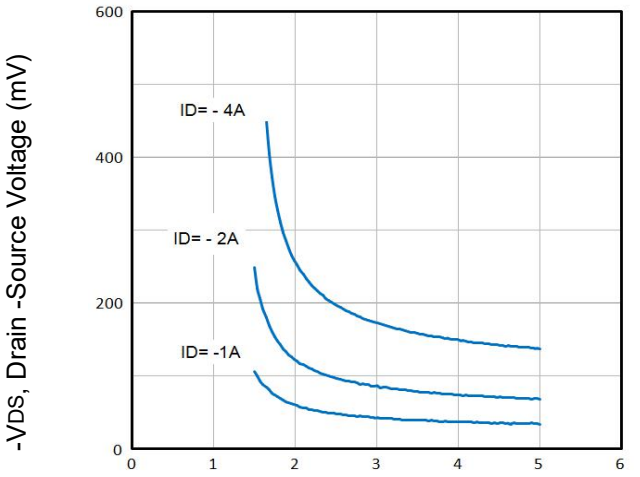


Fig4. Drain -Source Voltage vs Gate -Source Voltage

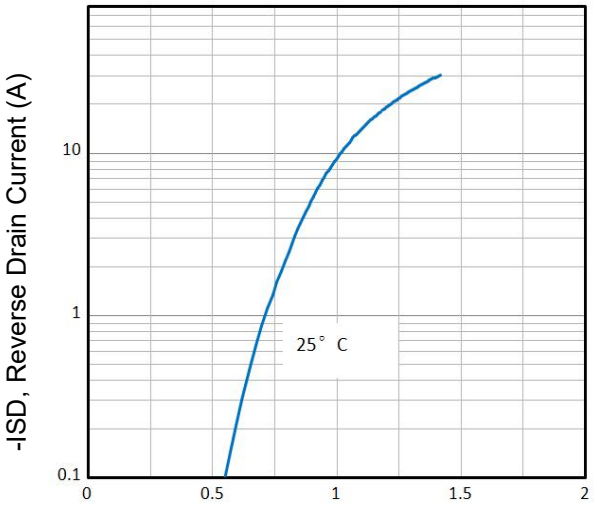


Fig5. Typical Source-Drain Diode Forward Voltage

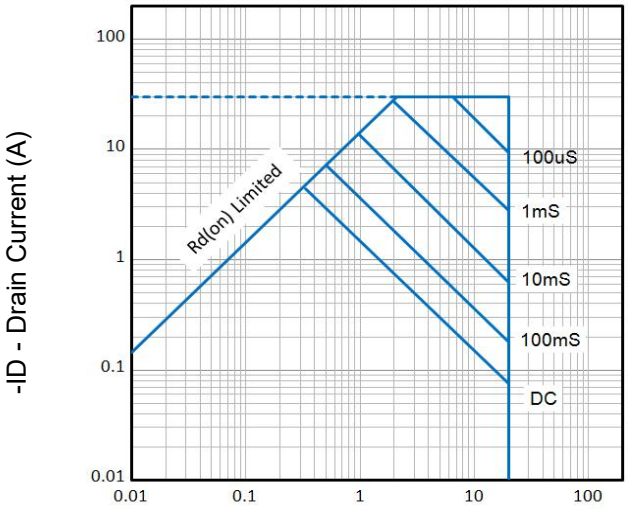


Fig6. Maximum Safe Operating Area

»Typical Performance Characteristics ((TJ = 25 °C, unless otherwise noted))

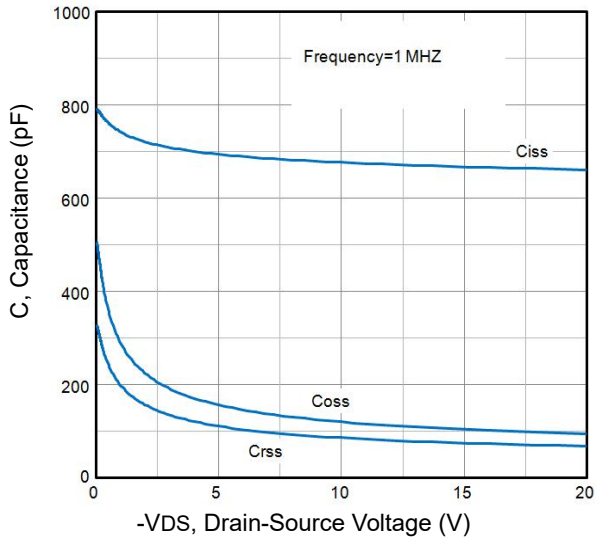


Fig7. Typical Capacitance Vs. Drain-Source Voltage

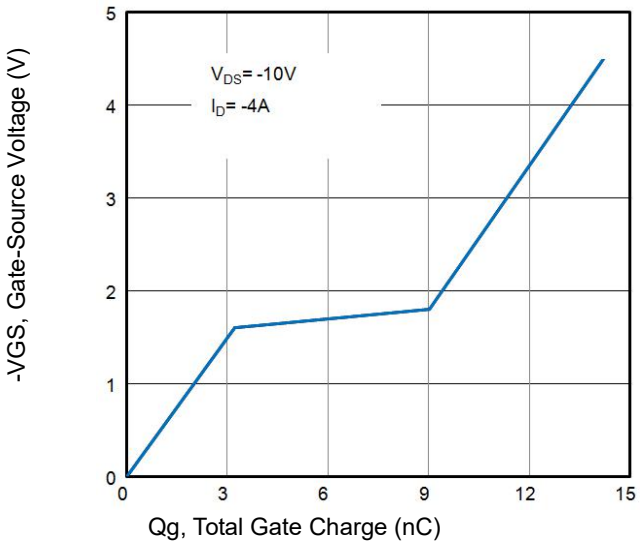


Fig8. Typical Gate Charge Vs. Gate-Source Voltage

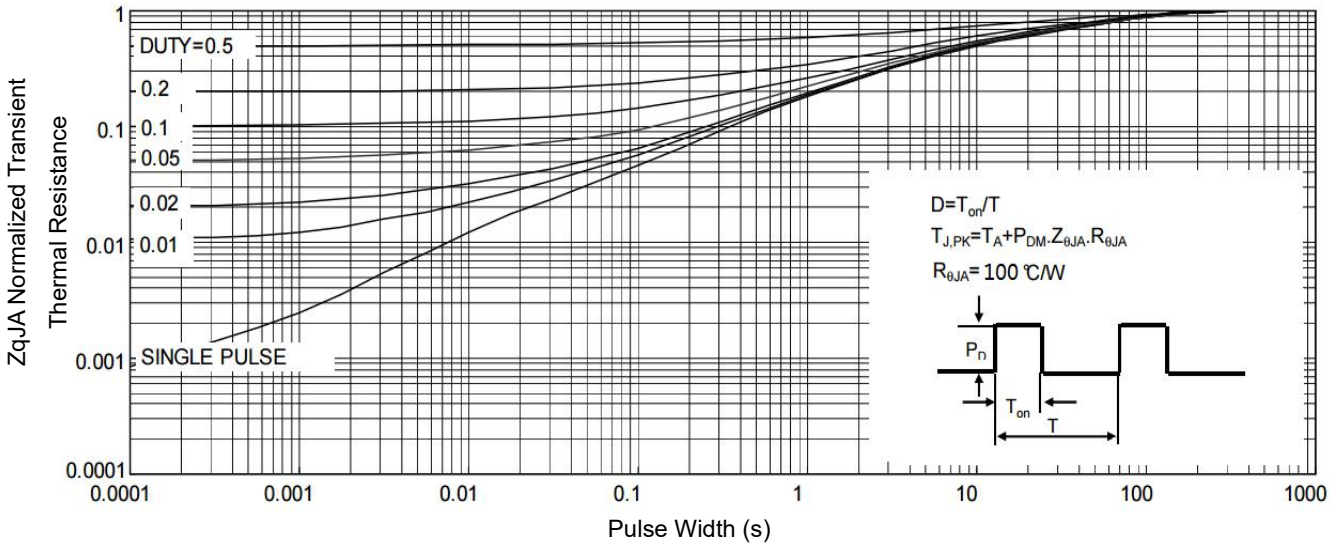
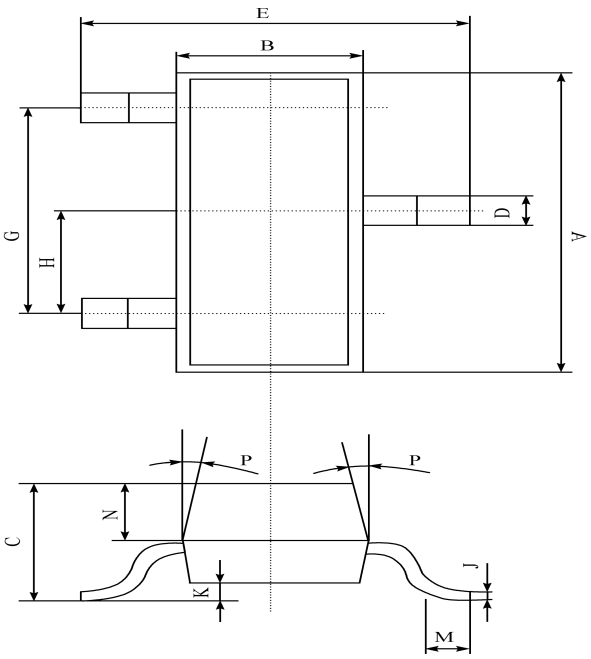


Fig9. Normalized Maximum Transient Thermal Impedance

»Package Information

SOT-23



A	2.90±0.10
B	1.30±0.10
C	1.00±0.10
D	0.40±0.10
E	2.40±0.20
G	1.90±0.10
H	0.95±0.05
J	0.13±0.05
K	0.00-0.10
M	≥0.2
N	0.60±0.10
P	7±2°

»Ordering information

Order code	Package	Marking	Base qty	Delivery mode
AO3415E	SOT-23	3415E	3K	Tape and reel