BORN SEMICONDUCTOR

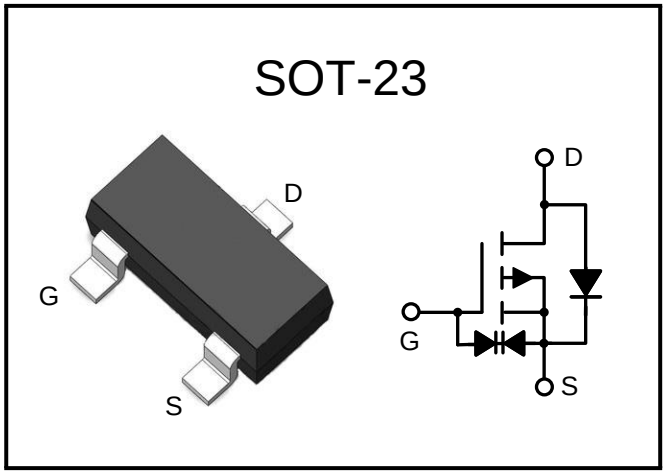
AO3415E

P-Channel MOSFET

Features

- V_{DS}=-20V
- I_D=-5A
- $R_{DS(ON)}$ @V_{GS}=-4.5V, TYP=30mΩ
- $R_{DS(ON)}$ @V_{GS}=-2.5V, TYP=45mΩ

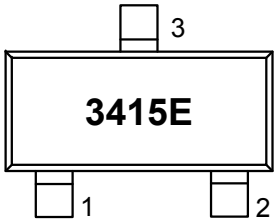
Package



Description

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

Marking



Ordering information

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

Absolute Maximum Ratings (@T_A=25°C unless otherwise noted)

Symbol	Parameter		Value	Unit
BV_{DS}	Drain-Source Voltage		-20	V
V_{GS}	Gate-Source Voltage		±8	V
I_D	Continuous Drain Current	T_A = 25°C	-5.0	A
		T_A = 70°C	-3.6	
I_{DM}	Pulsed Drain Current	T_A = 25°C	-30	
P_D	Maximum Power Dissipation	T_A = 25°C	1.5	W
		T_A = 70°C	1.0	
T_J	Junction		150	°C
T_{stg}	Storage Temperature		-55 to + 150	
$R_{\theta JA}$	ThermalResistanceJunction-Ambient		80	°C/W

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P-Channel MOSFET

Electrical Characteristics @T_A=25°C unless otherwise noted

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Unit
Static Electrical Characteristics@ T_J = 25 °C(unless otherwise stated)						
BV_{DS}	Drain-Source Breakdown Voltage	V_{GS} = 0V, I_D =-250uA	-20	–	–	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS} = -20V, V_{GS} = 0V,T_A = 25 °C	–	–	-1	uA
		V_{DS} = -16V, V_{GS} = 0V,T_A = 125 °C	–	–	-100	
I_{GSS}	Gate-Body Leakage Current	V_{GS} = ±8V, V_{DS} = 0V	–	–	±10	uA
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS} = V_{GS}, I_D = -250uA	-0.4	-0.8	-1.2	V
$R_{DS(on)}$	Drain-Source On-State Resistance(2)	V_{GS} = -4.5V, I_D = -4 A	–	30	40	mΩ
		V_{GS} = -3.3V, I_D = -3A	–	38	54	
		V_{GS} = -2.5V, I_D = -2A	–	45	60	
Dynamic Characteristics @ T_J = 25 °C(unless otherwise stated)						
C_{iss}	Input Capacitance	V_{DS} = -10V, V_{GS} = 0V, f = 1.0MHZ	–	675	–	pF
C_{oss}	Output Capacitance		–	120	–	
C_{rss}	Reverse Transfer Capacitance		–	85	–	
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	–	
Q_{gd}	Gate-Drain Charge		–	5.8	–	
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	–	
$t_{d(off)}$	Turn-Off Delay Time		–	22	–	
t_f	Turn-Off Fall Time		–	35	–	
Drain-Source Diode Characteristics						
I_S	Max. Diode Forward Current	T_A = 25 °C	–	–	-2	A
V_{SD}	Diode Forward Voltage(2)	I_S = -2.0A,V_{GS} = 0V,T_J = 25 °C	–	-0.83	-1.2	V

Note:(1)Pulse width limited by maximum allowable junction temperature

(2)Pulse test: pulse width <= 300us, duty cycle≤ 2%

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AO3415E

P-Channel MOSFET

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

Figure 1 :Typical Output Characteristics

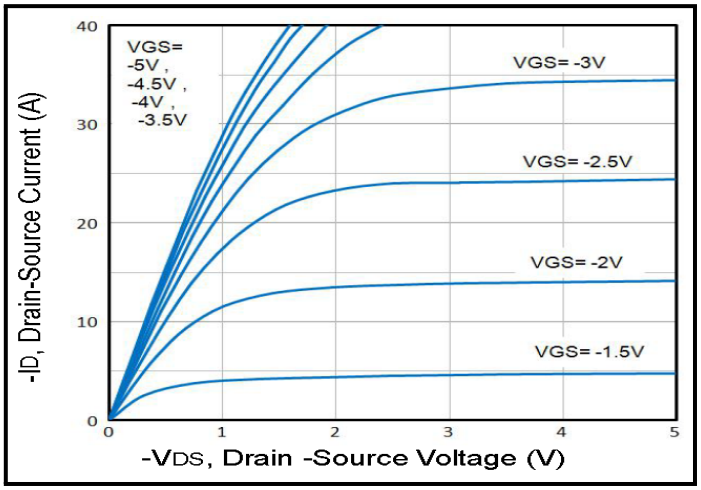


Figure 2 :T_J–$V_{GS(th)}$

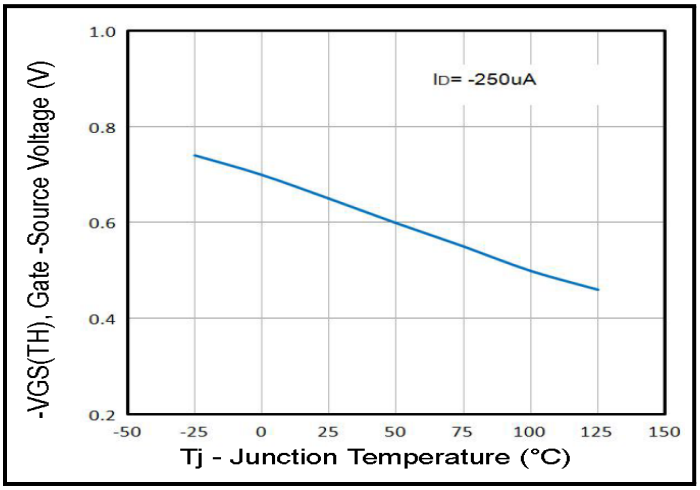


Figure 3 :Typical Transfer Characteristics

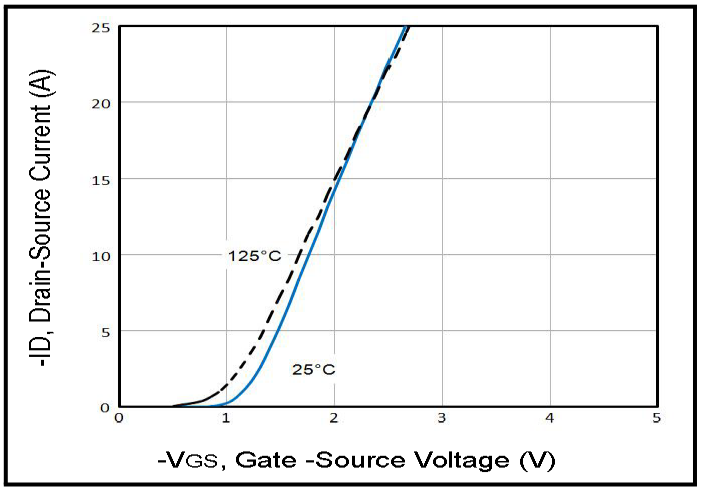


Figure 4 : V_{DS}–V_{GS}

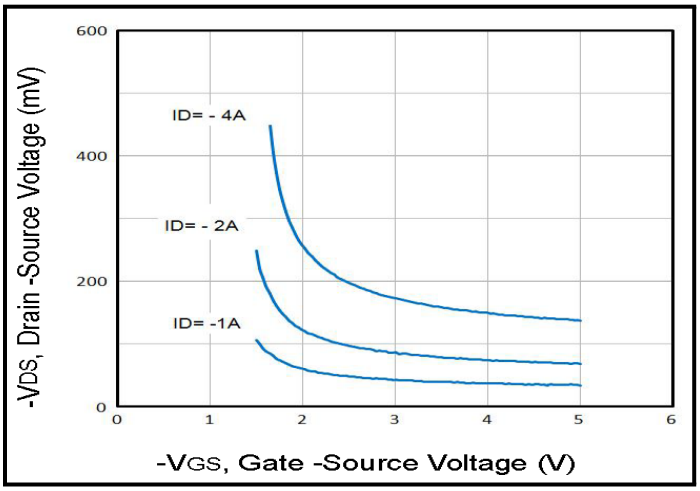


Figure 5 :Typical Source-Drain Diode Forward Voltage

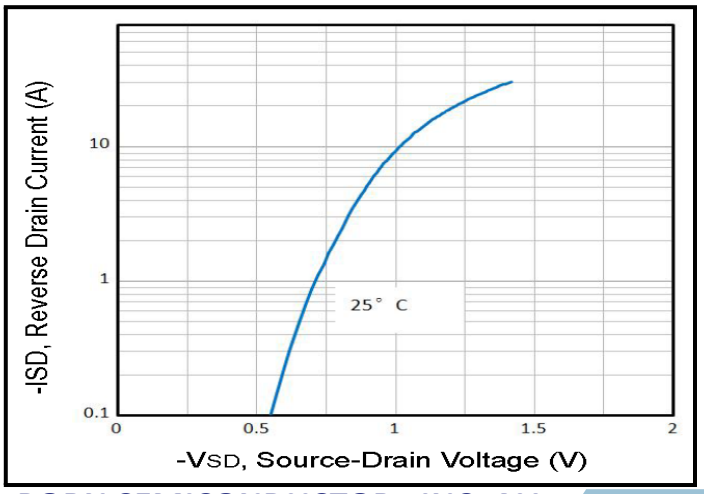
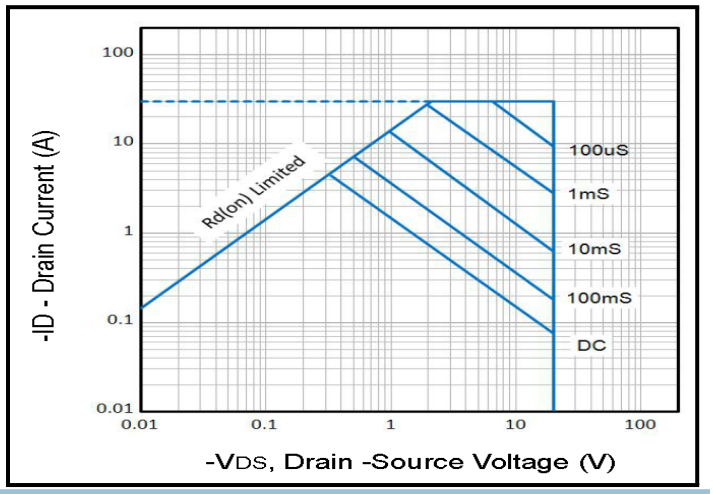


Figure 6 :Maximum Safe Operating Area



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AO3415E

P-Channel MOSFET

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

Figure 7 :Typical Capacitance Vs.Drain-Source Voltage

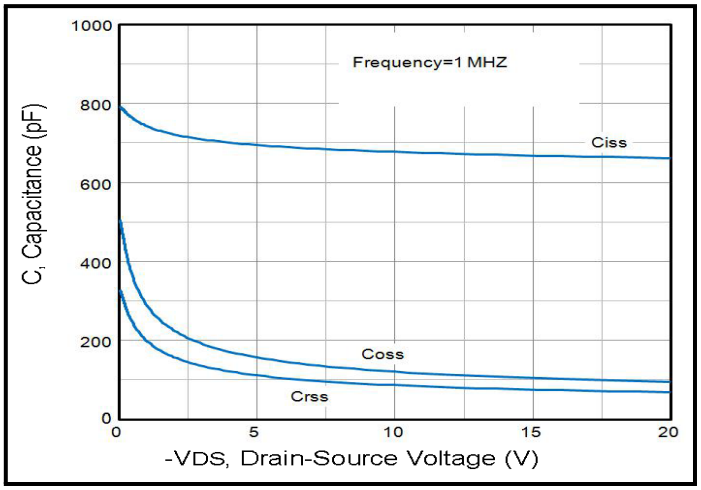


Figure 8 :Typical Gate Charge Vs.Gate-Source Voltage

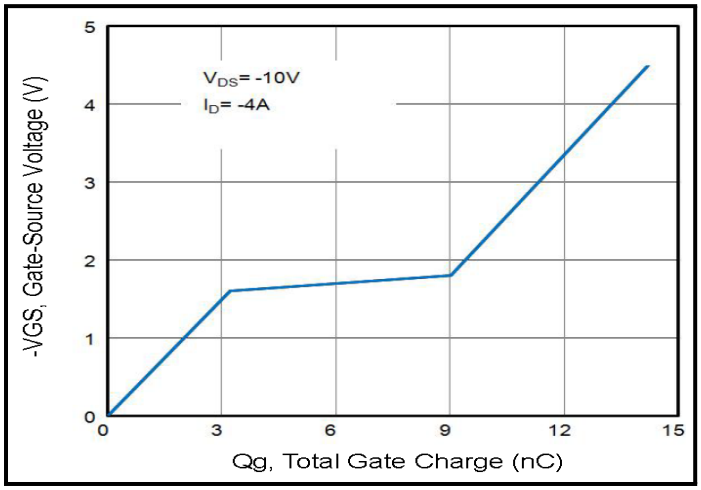
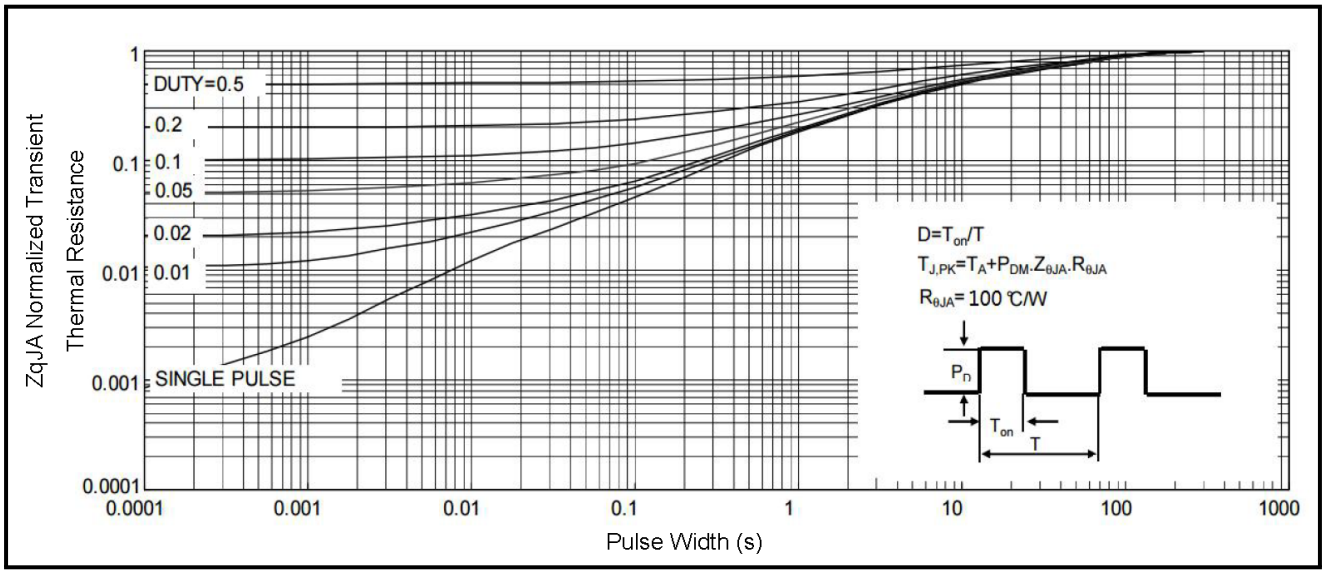


Figure 9 :Normalized Maximum Transient Thermal Impedance



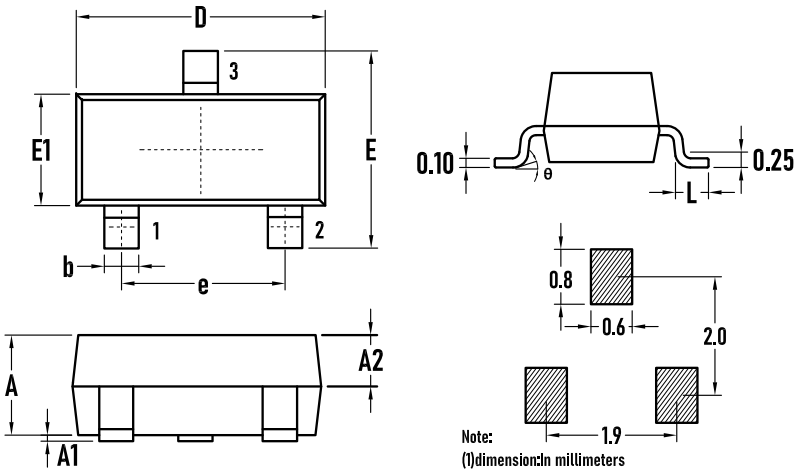
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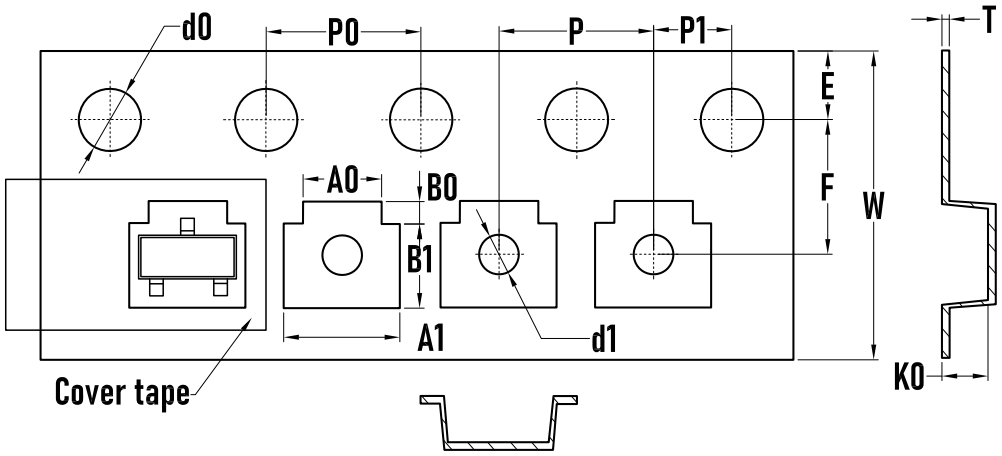
P-Channel MOSFET

Outline Drawing - SOT-23



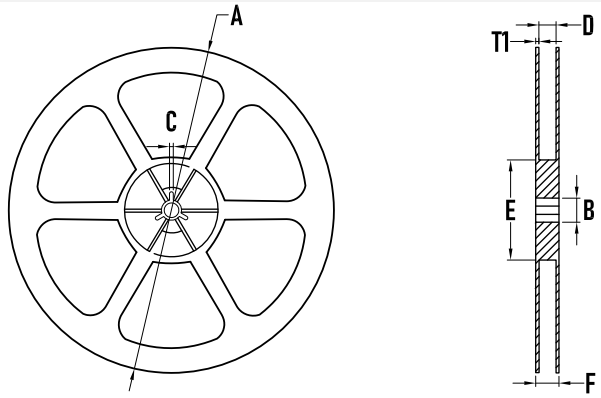
SYMBOL	MILLIMETER		
	MIN.	Typ.	MAX.
A	0.90	1.00	1.10
A1	0.01	–	0.10
A2	0.50	0.60	0.70
D	2.80	2.90	3.00
b	0.25	0.35	0.45
E	2.10	2.30	2.50
E1	1.20	1.30	1.40
e	1.80	1.90	2.00
L	0.25	0.35	0.45
θ	0	–	8°

Packaging Tape - SOT-23



SYMBOL	MILLIMETER
A0	2.10±0.10
A1	3.10±0.10
B0	0.65±0.10
B1	2.75±0.10
d0	1.55±0.10
d1	1.00±0.05
E	1.75±0.10
F	3.50±0.10
K0	1.10±0.10
P	4.00±0.10
P0	4.00±0.10
P1	2.00±0.10
W	8.00±0.30
T	0.20 ±0.05

Packaging Reel



SYMBOL	MILLIMETER
A	177.8±0.2
B	3.1
C	13.50
D	9.6±0.3
E	75±0.2
F	12.3±0.3
T1	1.0±0.2
Quantity	3000PCS

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