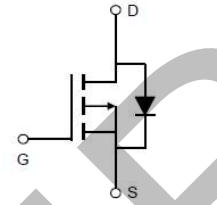


AP2309A

P-Channel Enhancement Mosfet

Features

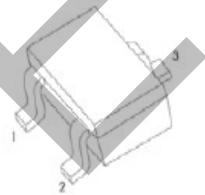
- -60V,-1.9A
 $R_{DS(on)} < 150m\ \Omega @ V_{GS} = -10V$ TYP:125m Ω
 $R_{DS(on)} < 200m\ \Omega @ V_{GS} = -4.5V$ TYP:165m Ω
- Surface-mounted package
- Advanced trench cell design



Schematic diagram

Applications

- Portable appliances
- High speed switch
- Battery management
- Low power DC to DC Converter



SOT23-3

Package Marking and Ordering Information

Device Marking	Device	Device Package	Reel Size	Tape width	Quantity (PCS)
2309	AP2309A	SOT23-3	-	-	3000

ABSOLUTE MAXIMUM RATINGS ($T_a = 25^\circ C$ unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	-60	V
Gate-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current ($T_a = 25^\circ C$)	I_D	-1.9	A
Continuous Drain Current ($T_a = 100^\circ C$)	I_D	-1.2	A
Pulsed Drain Current ⁽¹⁾	I_{DM}	-7.6	A
Power Dissipation ($T_a = 25^\circ C$)	P_D	0.83	W
Junction Temperature	T_J	150	$^\circ C$
Storage Temperature	T_{STG}	-50~ +150	$^\circ C$

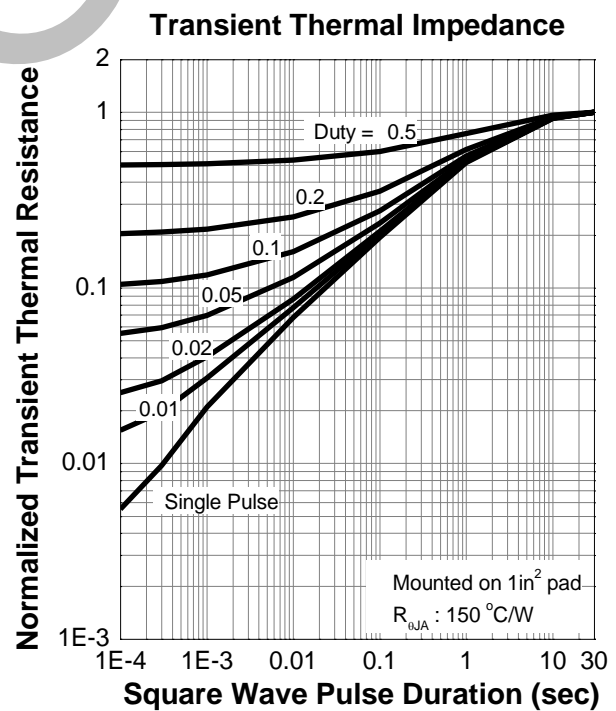
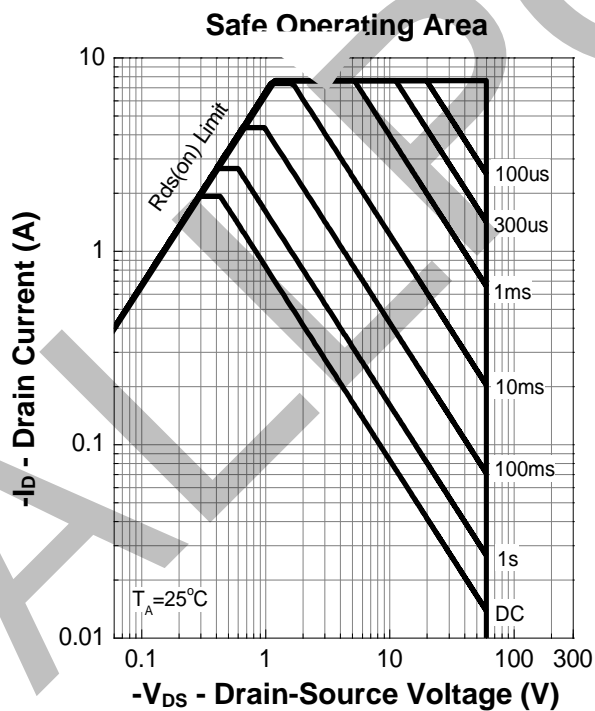
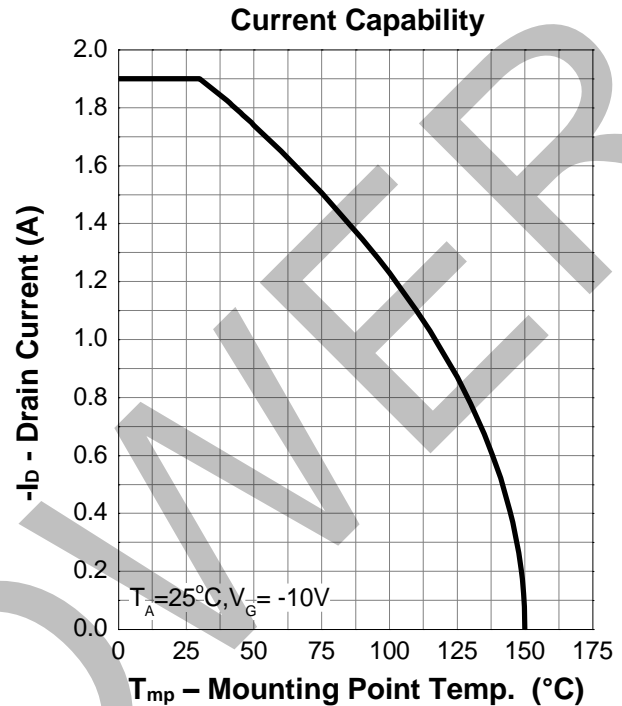
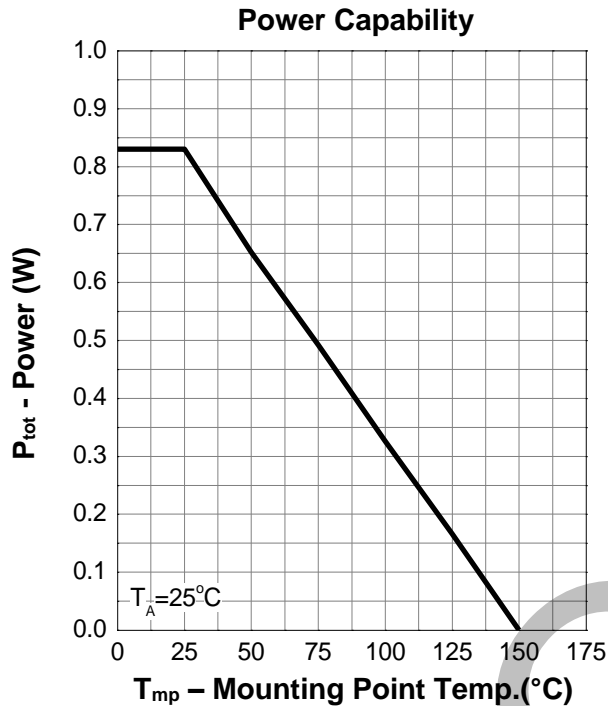
MOSFET ELECTRICAL CHARACTERISTICS($T_a=25^{\circ}\text{C}$ unless otherwise noted)

Parameter	Symbol	Test Condition	Min	Type	Max	Unit
Static Characteristics						
Drain-source breakdown voltage	$V_{(BR)DSS}$	$V_{GS} = 0V, I_D = -250\mu A$	-60	-	-	V
Zero gate voltage drain current	I_{DSS}	$V_{DS} = -48V, V_{GS} = 0V, T_J = 25^{\circ}\text{C}$	-	-	-1	μA
Gate-body leakage current	I_{GSS}	$V_{GS} = \pm 20V, V_{DS} = 0V$	-	-	± 100	nA
Gate threshold voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = -250\mu A$	-1	-2	-3	V
Drain-source on-resistance ⁽²⁾	$R_{DS(on)}$	$V_{GS} = -10V, I_D = -1.5A$	-	125	150	m Ω
		$V_{GS} = -4.5V, I_D = -1A$	-	165	200	
Dynamic characteristics						
Input Capacitance	C_{iss}	$V_{DS} = -15V, V_{GS} = 0V, f = 1.0\text{MHz}$	-	580	-	pF
Output Capacitance	C_{oss}		-	52	-	
Reverse Transfer Capacitance	C_{rss}		-	35	-	
Switching characteristics						
Turn-on delay time	$t_{d(on)}$	$V_{DS} = -15V, I_D = -1A,$ $R_L = 15\Omega, R_G = 3\Omega, V_{GS} = -10V$	-	17.4	-	ns
Turn-on rise time	t_r		-	5.4	-	
Turn-off delay time	$t_{d(off)}$		-	37.2	-	
Turn-off fall time	t_f		-	2.4	-	
Total Gate Charge	Q_g	$V_{DS} = -20V, I_D = -1.5A,$ $V_{GS} = 10V$	-	9.5	-	nC
Gate-Source Charge	Q_{gs}		-	1.52	-	
Gate-Drain Charge	Q_{gd}		-	1.76	-	
Source-Drain Diode characteristics						
Diode Forward voltage	V_{SD}	$T_J = 25^{\circ}\text{C}, V_{GS} = 0V, I_S = -1A$	-	-0.8	-1.4	V

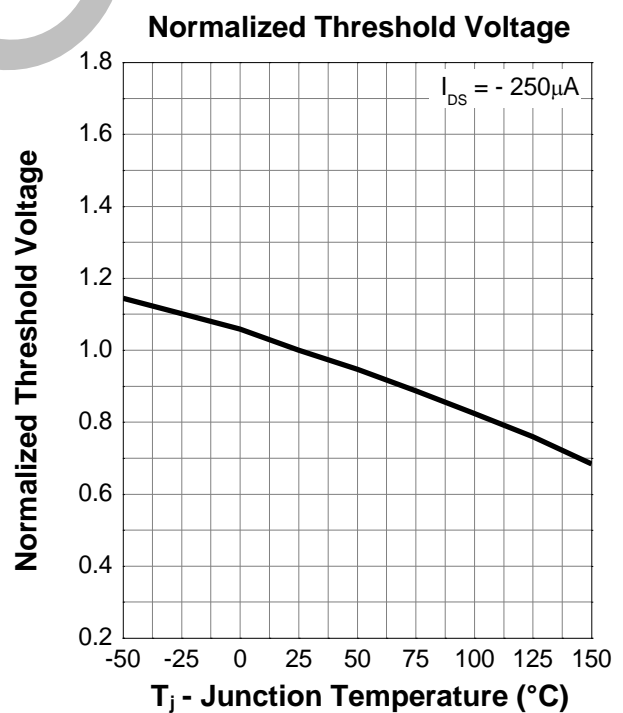
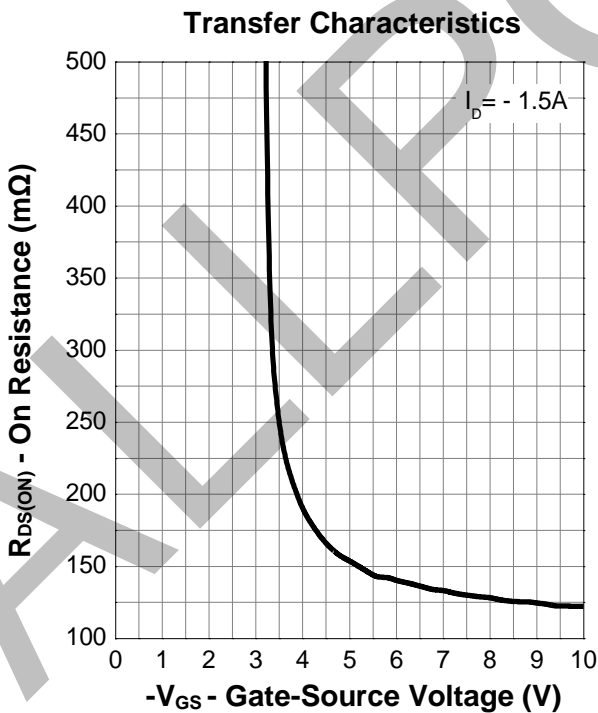
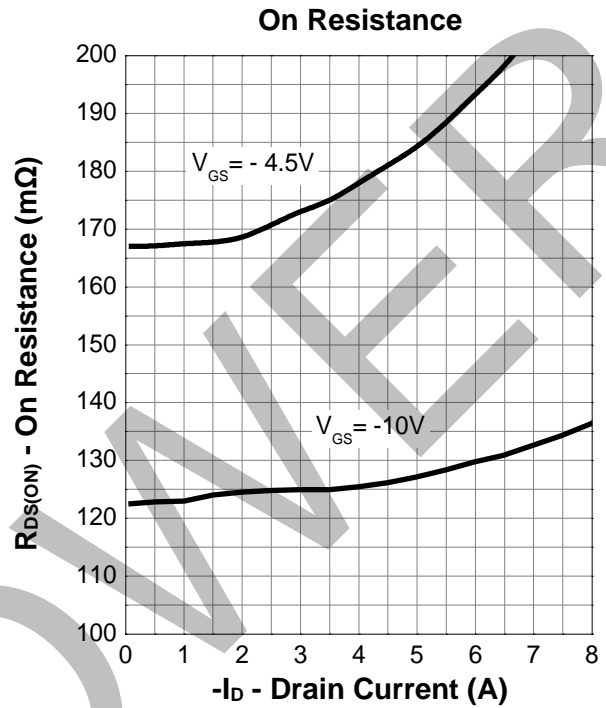
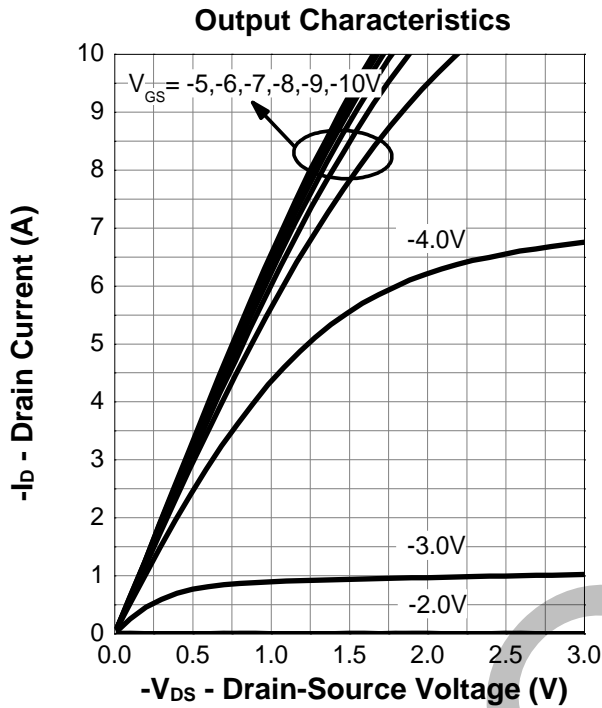
Notes: 1. Pulse test ; pulse width $\leq 300 \mu s$, duty cycle $\leq 2\%$

2. Guaranteed by design, not subject to production testing

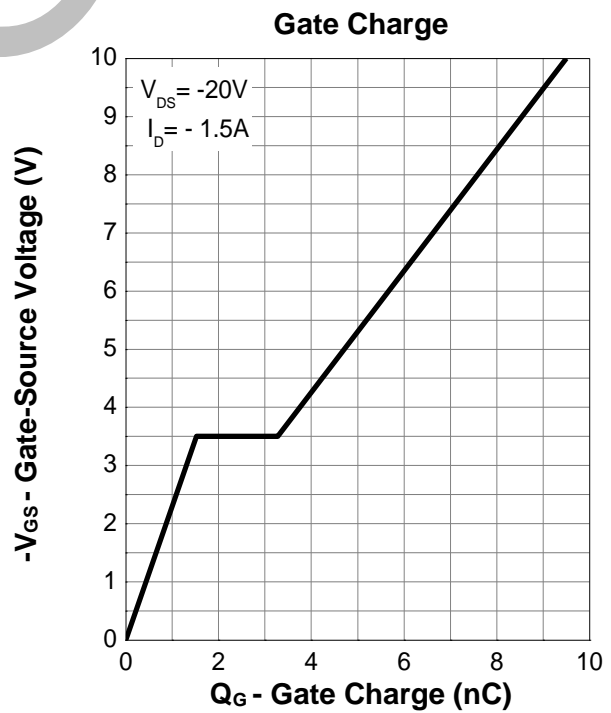
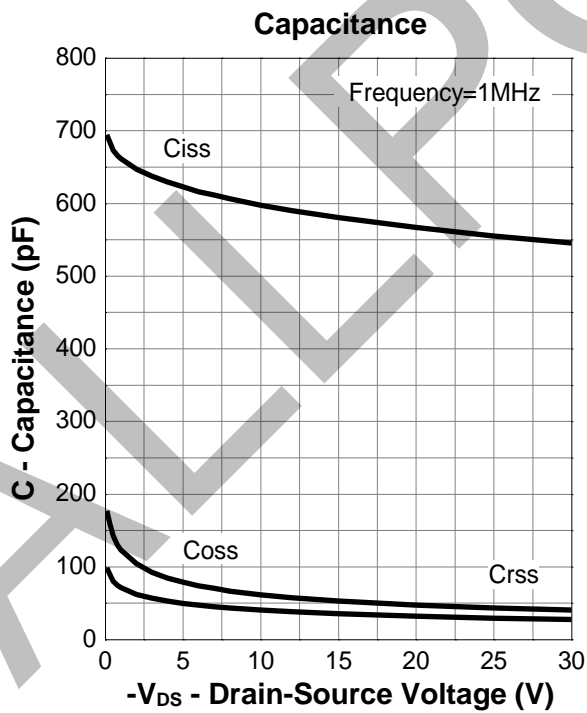
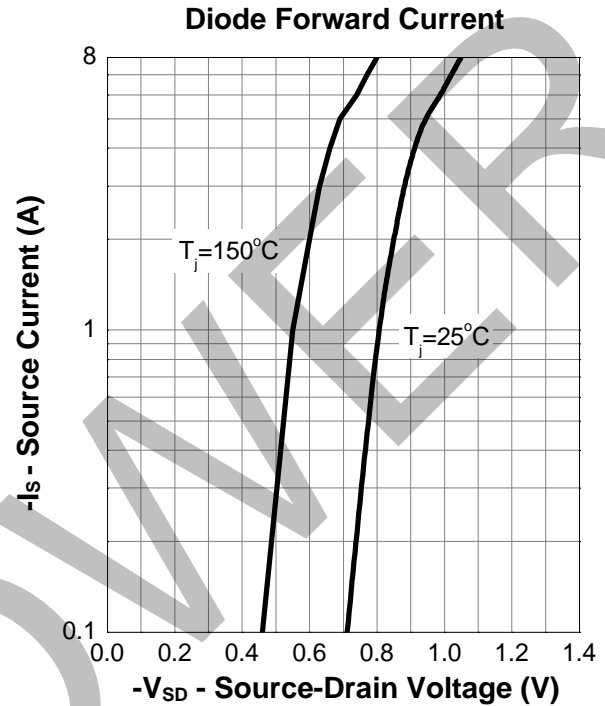
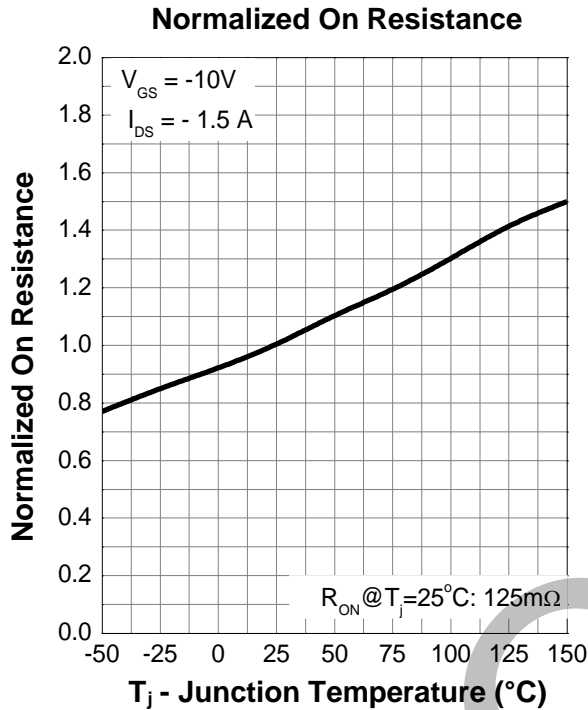
Typical Characteristics



Typical Characteristics (cont.)

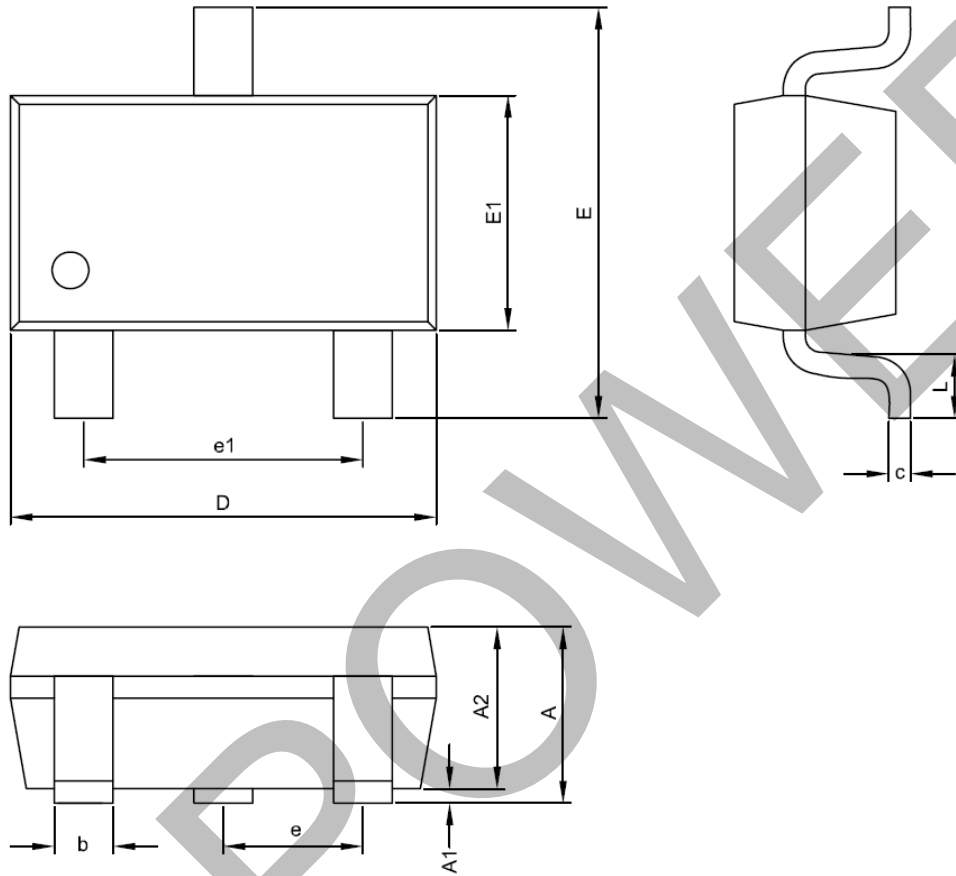


Typical Characteristics (cont.)



Package Dimensions

SOT23-3



Symbol	Dimensions In Millimeters	
	MIN.	MAX.
A	1.00	1.45
A1	0.00	0.15
A2	1.00	1.30
D	2.70	3.10
E	2.60	3.00
E1	1.50	1.70
c	0.08	0.25
b	0.30	0.50
e	0.95 BSC	
e1	1.90 BSC	
L	0.30	0.60