

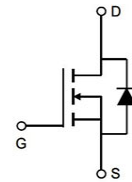
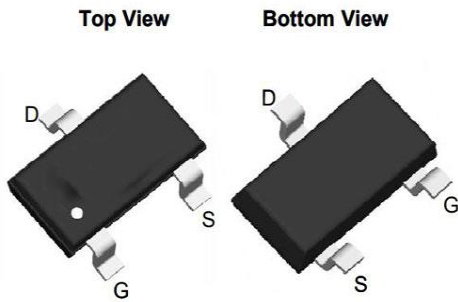
**General Description**

20V /6A Single N Power MOSFET

Very low on-resistance  $R_{DS(on)}$  @  $V_{GS}=4.5\text{ V}$

Pb-free lead plating; RoHS compliant

$V_{DS}$	20	V
$R_{DS(on),TYP@V_{GS}=10V}$	18.9	mΩ
$R_{DS(on),TYP@V_{GS}=4.5}$	42.0	mΩ
$I_D$	6	A



Part ID	Package Type	Marking	Tape and reel information
AC2312	SOT23-3	2312	3000



100% UIS Tested  
100% kg tested

Parameter	Symbol	Maximum	Units
Drain-Source Voltage	$V_{DS}$	20	V
Gate-Source Voltage	$V_{GS}$	12	±V
Continuous Drain Current <sup>A</sup>	$I_D$	$T_A=25^{\circ}\text{C}$	A
		$T_A=70^{\circ}\text{C}$	
Pulsed Drain Current <sup>B</sup>	$I_{DM}$	9.6	
Avalanche Current <sup>G</sup>	$I_{AR}$	1.9	
Repetitive avalanche energy $L=0.1\text{mH}$ <sup>G</sup>	$E_{AR}$	4.4	mJ
Power Dissipation <sup>A</sup>	$P_D$	$T_A=25^{\circ}\text{C}$	W
		$T_A=70^{\circ}\text{C}$	
Junction and Storage Temperature Range	$T_J, T_{STG}$	-55 to 150	°C

**Thermal Characteristics**

Parameter	Symbol	Typ	Max	Units
Maximum Junction-to-Ambient <sup>A</sup>	$R_{\theta JA}$	67	101	°C/W
Maximum Junction-to-Ambient <sup>A</sup>		Steady State	135	
Maximum Junction-to-Lead <sup>C</sup>	$R_{\theta JL}$	40	64	°C/W

**STATIC PARAMETERS**

Symbol	Parameter	Conditions	Min	Typ	Max	Units
BV <sub>DSS</sub>	Drain-Source Breakdown Voltage	I <sub>D</sub> = -250uA, V <sub>GS</sub> = 0V	20			V
I <sub>DSS</sub>	Zero Gate Voltage Drain Current	V <sub>DS</sub> =20V, V <sub>GS</sub> =0V			1	uA
					5	
I <sub>GSS</sub>	Gate-Body leakage current	V <sub>DS</sub> = 0V, V <sub>GS</sub> = ±20V			±100	nA
V <sub>GS(th)</sub>	Gate Threshold Voltage	V <sub>DS</sub> = V <sub>GS</sub> I <sub>D</sub> = 250μA	0.6	0.8	1.1	V
R <sub>DS(on)</sub>	Static Drain-Source On-Resistance	V <sub>GS</sub> =-10V, I <sub>D</sub> =6A		18.9	27.0	mΩ
		V <sub>GS</sub> =4.5V, I <sub>D</sub> =6A		42.0	55.0	
g <sub>FS</sub>	Forward Transconductance	V <sub>DS</sub> =5V, I <sub>D</sub> =6A		82		S
V <sub>SD</sub>	Diode Forward Voltage	I <sub>S</sub> =1A, V <sub>GS</sub> =17V		0.72	1	V
I <sub>S</sub>	Maximum Body-Diode Continuous Current				6	A

**DYNAMIC PARAMETERS**

Symbol	Parameter	Conditions	Min	Typ	Max	Units
C <sub>iss</sub>	Input Capacitance	V <sub>GS</sub> =0V, V <sub>DS</sub> =15V, f=1MHz		525	640	pF
C <sub>oss</sub>	Output Capacitance			95	116	pF
C <sub>rss</sub>	Reverse Transfer Capacitance			75	89	pF
R <sub>g</sub>	Gate resistance	V <sub>GS</sub> =0V, V <sub>DS</sub> =0V, f=1MHz			1	Ω

**SWITCHING PARAMETERS**

Symbol	Parameter	Conditions	Min	Typ	Max	Units
Q <sub>g</sub> (10V)	Total Gate Charge	V <sub>GS</sub> =10V, V <sub>DS</sub> =15V, I <sub>D</sub> =6A		6		nC
Q <sub>g</sub> 4.5V)	Total Gate Charge			3		
Q <sub>gs</sub>	Gate Source Charge			1.4		
Q <sub>gd</sub>	Gate Drain Charge			2		
t <sub>D(on)</sub>	Turn-On DelayTime	V <sub>GS</sub> =10V, V <sub>DS</sub> =15V, R <sub>L</sub> =0.75Ω, R <sub>GEN</sub> =3Ω		7		ns
t <sub>r</sub>	Turn-On Rise Time			5.6		
t <sub>D(off)</sub>	Turn-Off DelayTime			19.6		
t <sub>f</sub>	Turn-Off Fall Time			6.3		
t <sub>rr</sub>	Body Diode Reverse Recovery Time	I <sub>F</sub> =-8A, dI/dt=500A/μs		14		ns
Q <sub>rr</sub>	Body Diode Reverse Recovery Charge	I <sub>F</sub> =18A, dI/dt=500A/μs		6		nC

TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

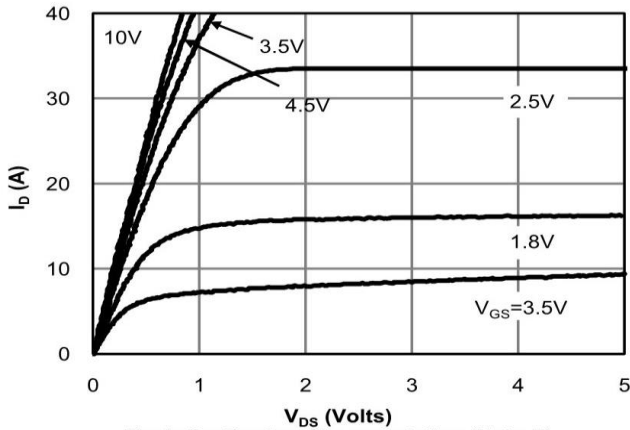


Fig 1: On-Region Characteristics (Note E)

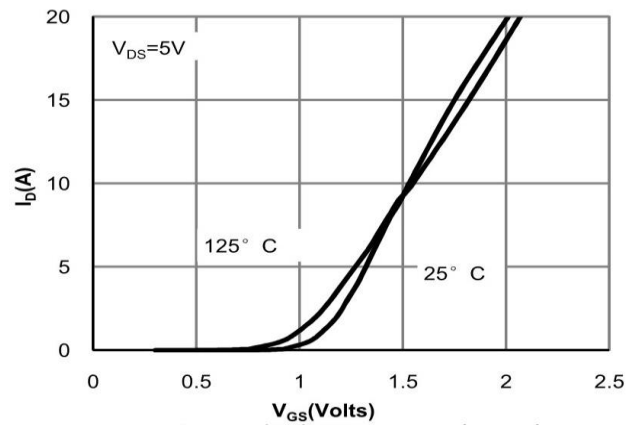


Figure 2: Transfer Characteristics (Note E)

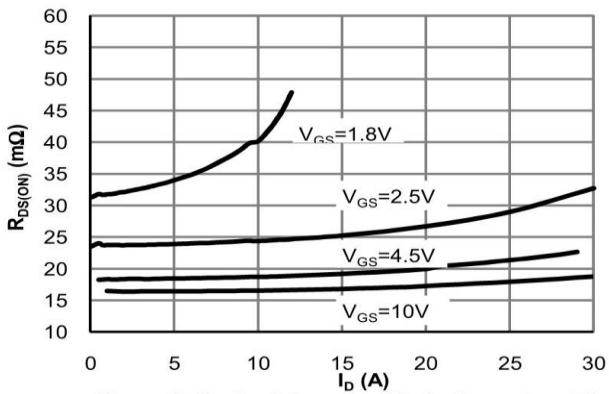


Figure 3: On-Resistance vs. Drain Current and Gate Voltage (Note E)

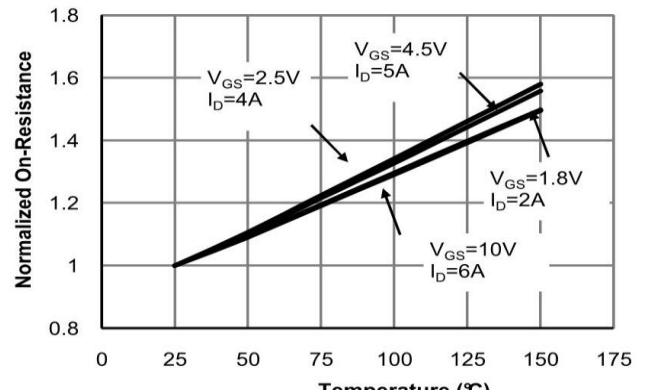


Figure 4: On-Resistance vs. Junction Temperature (Note E)

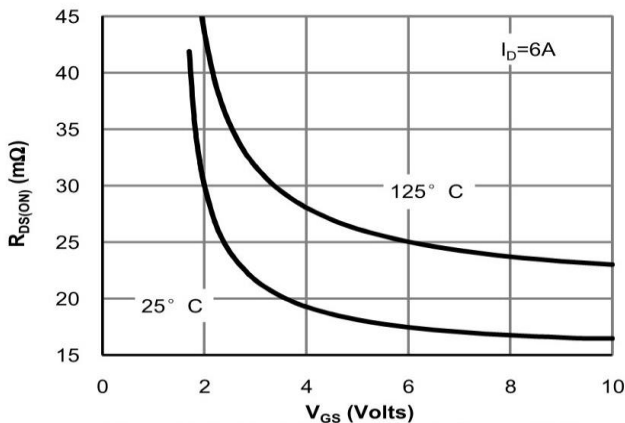


Figure 5: On-Resistance vs. Gate-Source Voltage (Note E)

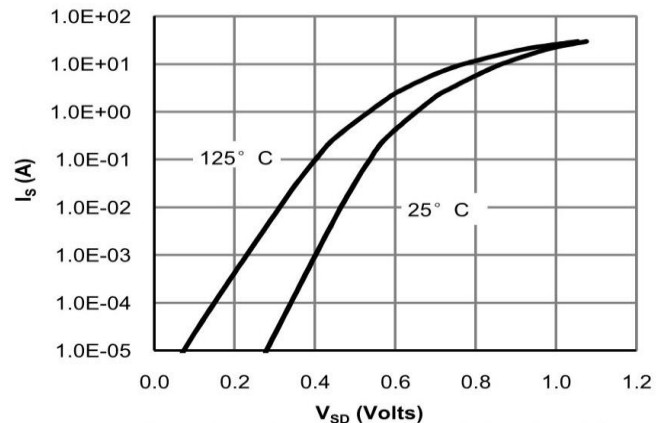


Figure 6: Body-Diode Characteristics (Note E)

TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

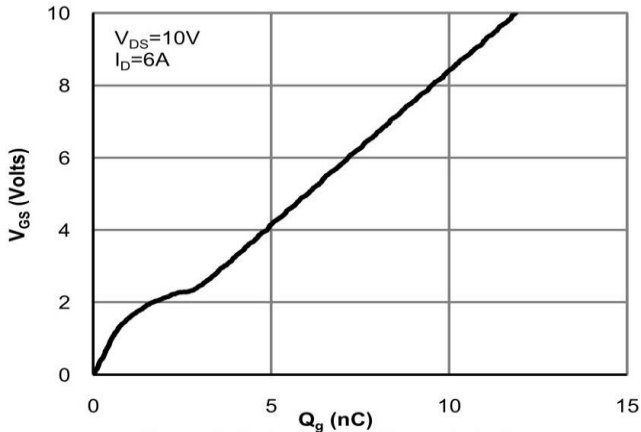


Figure 7: Gate-Charge Characteristics

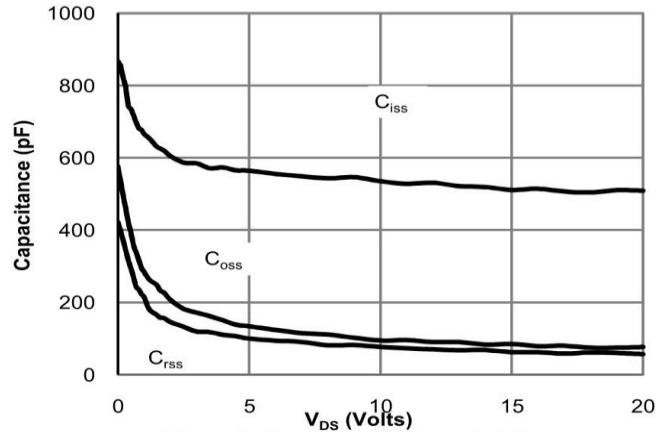


Figure 8: Capacitance Characteristics

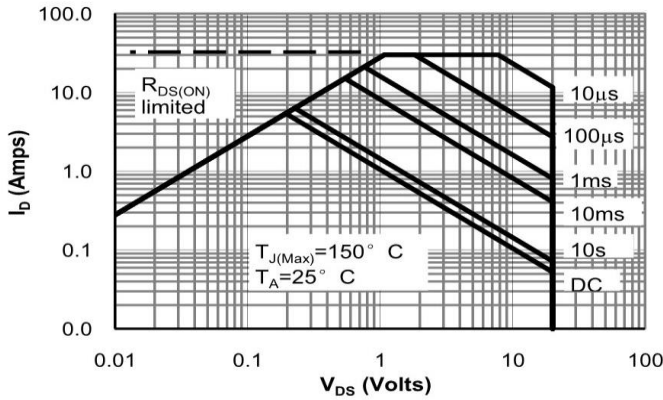


Figure 9: Maximum Forward Biased Safe Operating Area (Note F)

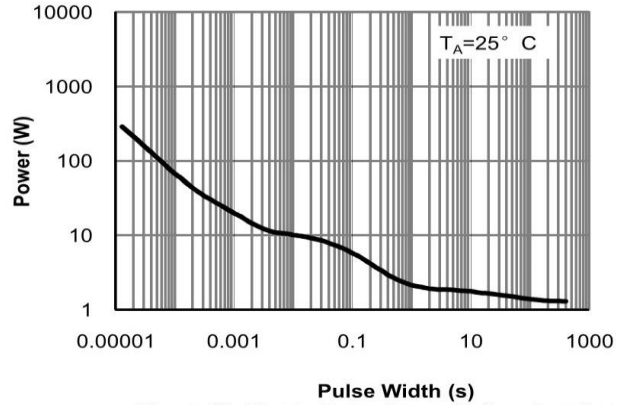


Figure 10: Single Pulse Power Rating Junction-to-Ambient (Note F)

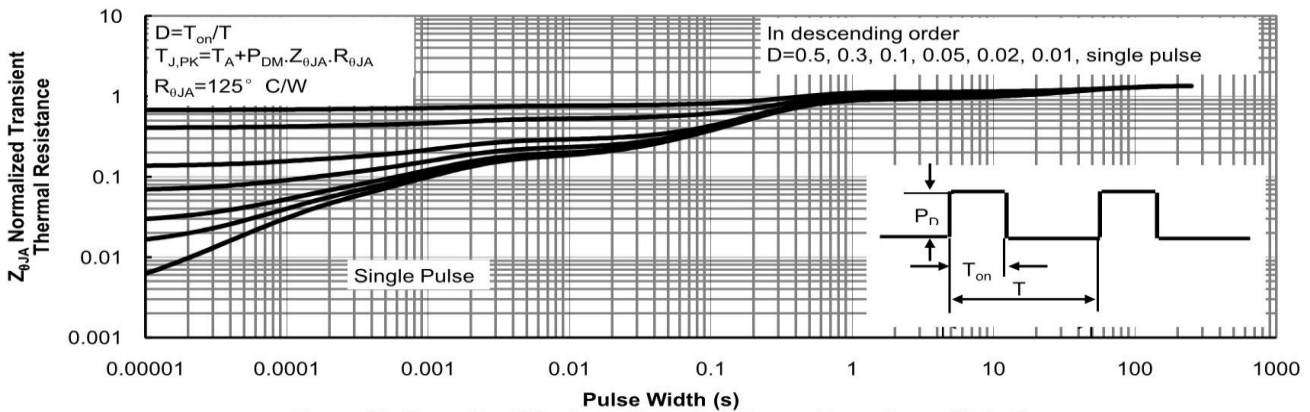


Figure 11: Normalized Maximum Transient Thermal Impedance (Note F)