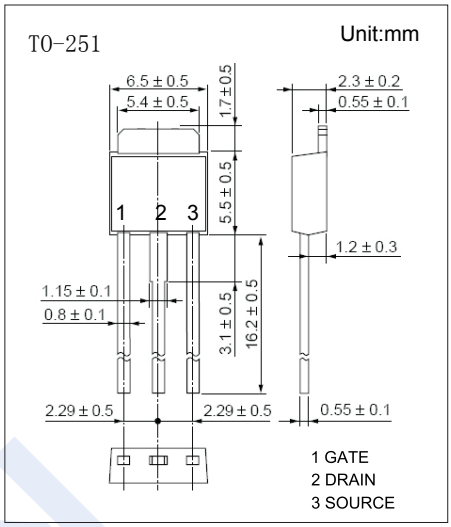
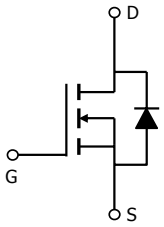
N-Channel MOSFET

AOI444 (KOI444)



■ Features

- $V_{DS\ (V)}$ = 60V
- I_D = 12 A (V_{GS} = 10V)
- $R_{DS(ON)}$ < 60mΩ (V_{GS} = 10V)
- $R_{DS(ON)}$ < 85mΩ (V_{GS} = 4.5V)



■ Absolute Maximum Ratings Ta = 25℃

Parameter		Symbol	Rating	Unit
Drain-Source Voltage		V_{DS}	60	V
Gate-Source Voltage		V_{GS}	±20	
Continuous Drain Current	Tc=25℃	I_D	12	A
	Tc=100℃		9	
	Ta=25℃		4	
	Ta=70℃		3	
Pulsed Drain Current		I_{DM}	30	
Avalanche Current		I_{AS},I_{AR}	19	
Avalanche energy L=0.1mH		E_{AS},E_{AR}	18	mJ
Power Dissipation	Tc=25℃	P_D	20	W
	Tc=100℃		10	
	Ta=25℃		2.1	
	Ta=70℃		1.3	
Thermal Resistance.Junction- to-Ambient	t ≤ 10s	R_{thJA}	30	℃/W
	Steady-State		60	
Thermal Resistance.Junction- to-Case		R_{thJC}	7.5	
Junction Temperature		T_J	175	℃
Storage Temperature Range		T_{stg}	-55 to 175	

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■ Electrical Characteristics Ta = 25℃

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	V_{DSS}	I_D=250μA, V_{GS}=0V	60			V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=48V, V_{GS}=0V			1	uA
		V_{DS}=48V, V_{GS}=0V, T_J=55℃			5	
Gate-Body Leakage Current	I_{GSS}	V_{DS}=0V, V_{GS}=±20V			±100	nA
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS} , I_D=250μA	1		3	V
Static Drain-Source On-Resistance	$R_{DS(ON)}$	V_{GS}=10V, I_D=12A			60	mΩ
		V_{GS}=10V, I_D=12A T_J=125℃			100	
		V_{GS}=4.5V, I_D=6A			85	
On State Drain Current	$I_{D(ON)}$	V_{GS}=10V, V_{DS}=5V	30			A
Forward Transconductance	g_{FS}	V_{DS}=5V, I_D=20A		14		S
Input Capacitance	C_{iss}	V_{GS}=0V, V_{DS}=30V, f=1MHz	360	450	540	pF
Output Capacitance	C_{oss}		40	61	80	
Reverse Transfer Capacitance	C_{rss}		16	27	40	
Gate Resistance	R_g	V_{GS}=0V, V_{DS}=0V, f=1MHz	0.6		2	Ω
Total Gate Charge (10V)	Q_g	V_{GS}=10V, V_{DS}=30V, I_D=12A		7.5	10	nC
Total Gate Charge (4.5V)				3.8	5	
Gate Source Charge	Q_{gs}			1.2		
Gate Drain Charge	Q_{gd}			1.9		
Turn-On DelayTime	$t_{d(on)}$	V_{GS}=10V, V_{DS}=30V, R_L=2.5Ω,R_G=3Ω		4.2		ns
Turn-On Rise Time	t_r			3.4		
Turn-Off DelayTime	$t_{d(off)}$			16		
Turn-Off Fall Time	t_f			2		
Body Diode Reverse Recovery Time	t_{rr}	I_F= 12A, dI/dt= 100A/μs		27	35	
Body Diode Reverse Recovery Charge	Q_{rr}			30		nC
Maximum Body-Diode Continuous Current	I_S				12	A
Diode Forward Voltage	V_{SD}	I_S=1A,V_{GS}=0V			1	V

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■ Typical Characterisitics

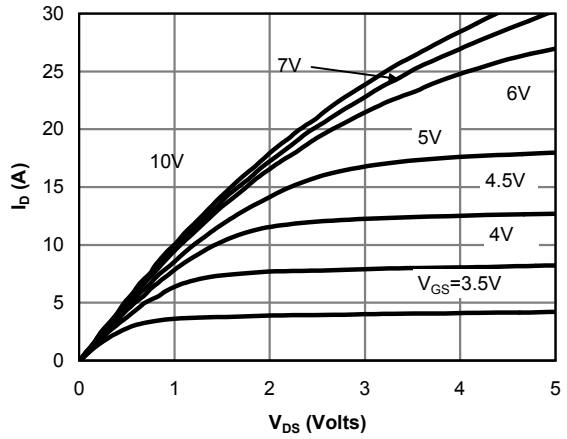

Fig 1: On-Region Characteristics (Note E)

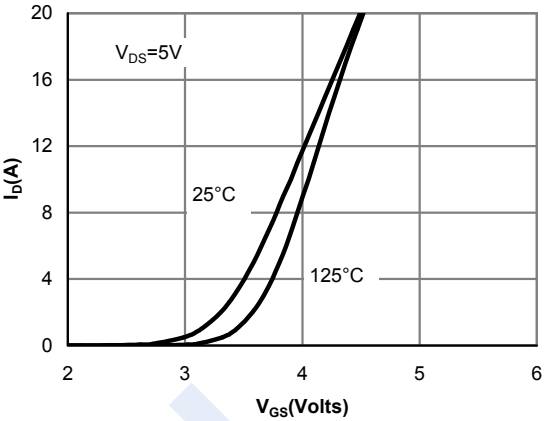

Figure 2: Transfer Characteristics (Note E)

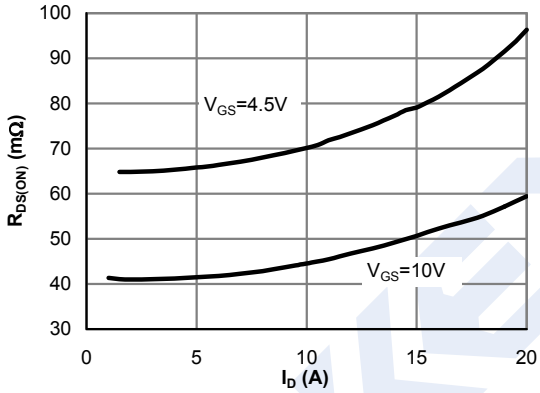

Figure 3: On-Resistance vs. Drain Current and Gate Voltage (Note E)

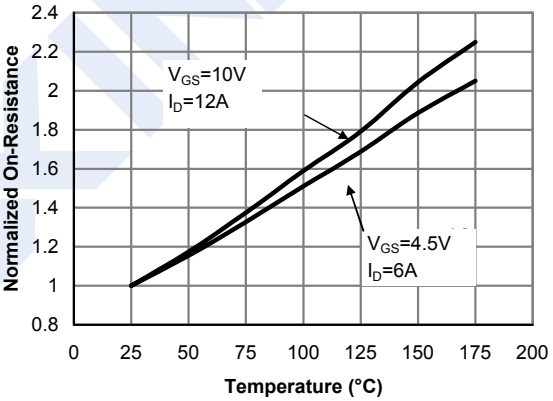

Figure 4: On-Resistance vs. Junction Temperature (Note E)

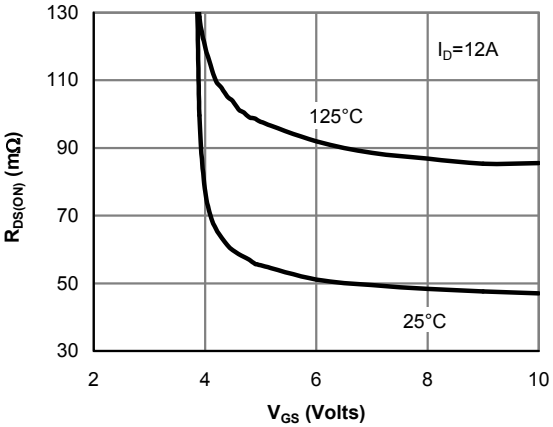

Figure 5: On-Resistance vs. Gate-Source Voltage (Note E)

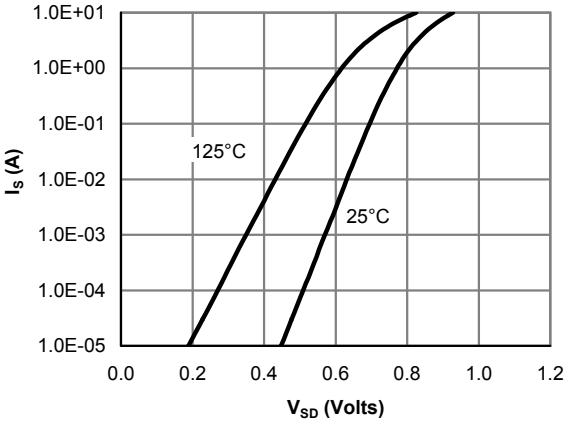

Figure 6: Body-Diode Characteristics (Note E)

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■ Typical Characterisitics

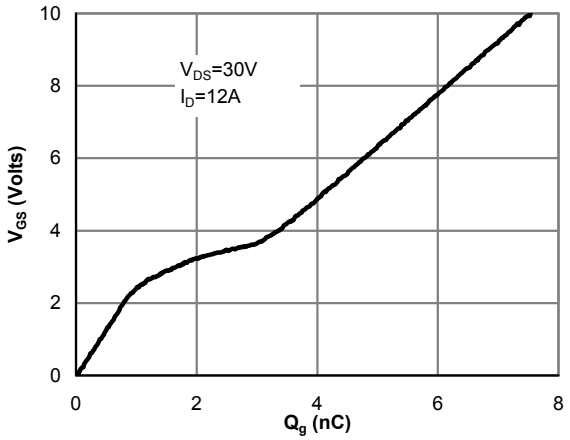

Figure 7: Gate-Charge Characteristics

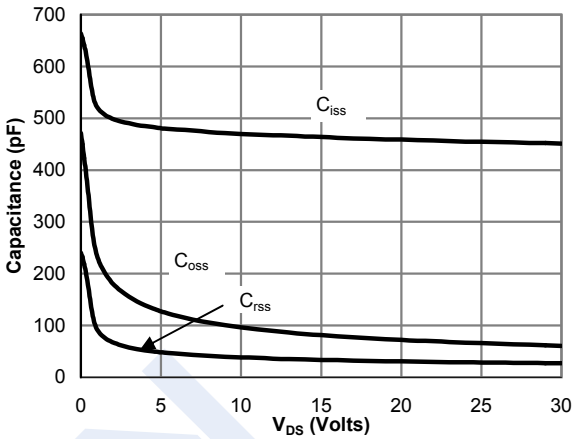

Figure 8: Capacitance Characteristics

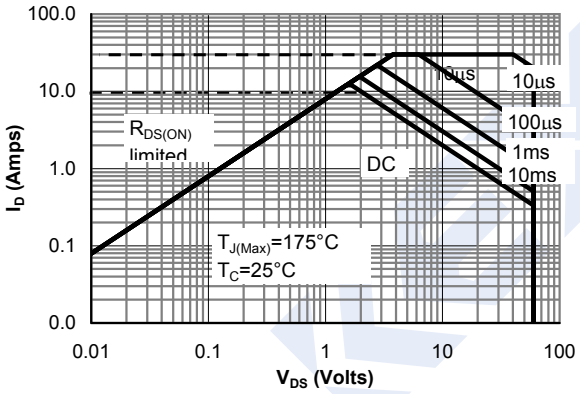

Figure 9: Maximum Forward Biased Safe Operating Area (Note F)

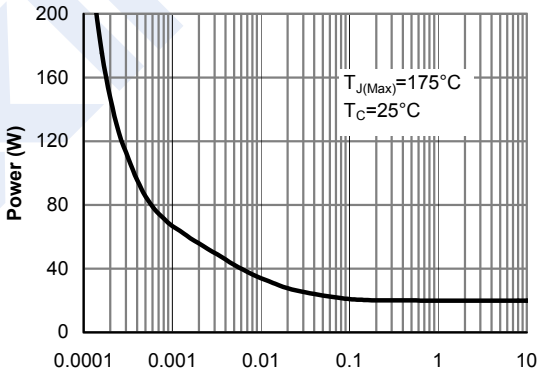

Figure 10: Single Pulse Power Rating Junction-to-Case (Note F)

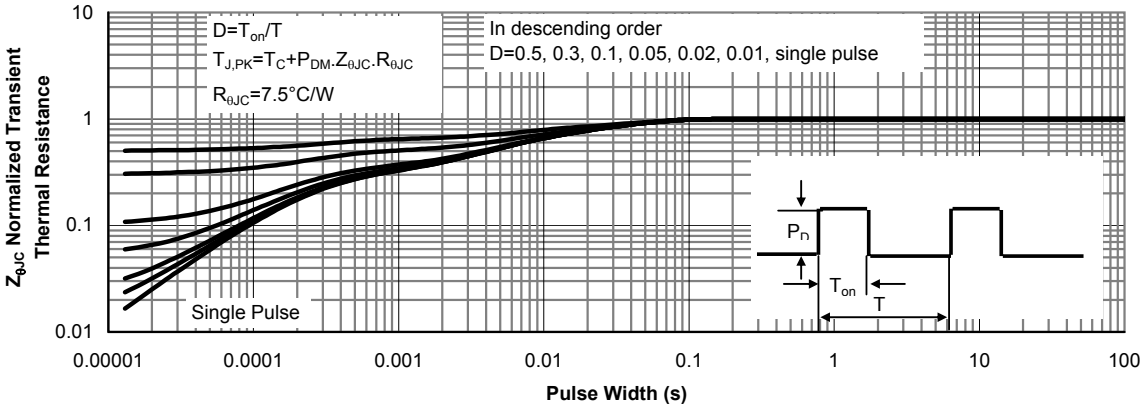

Figure 11: Normalized Maximum Transient Thermal Impedance (Note F)

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■ Typical Characterisitics

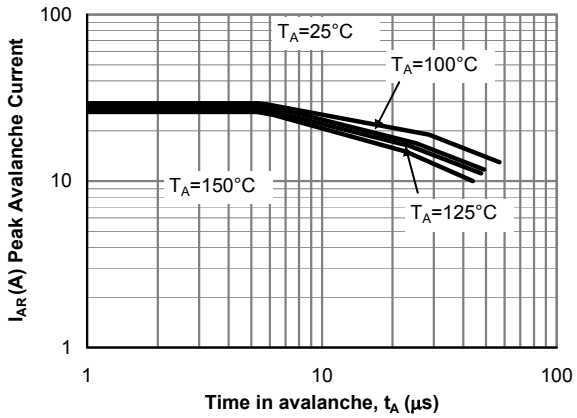

Figure 12: Single Pulse Avalanche capability (Note C)

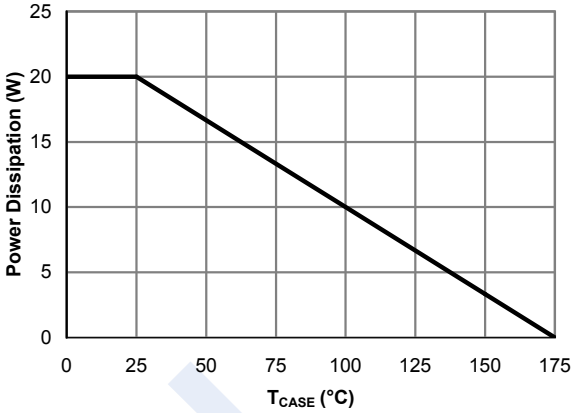

Figure 13: Power De-rating (Note F)

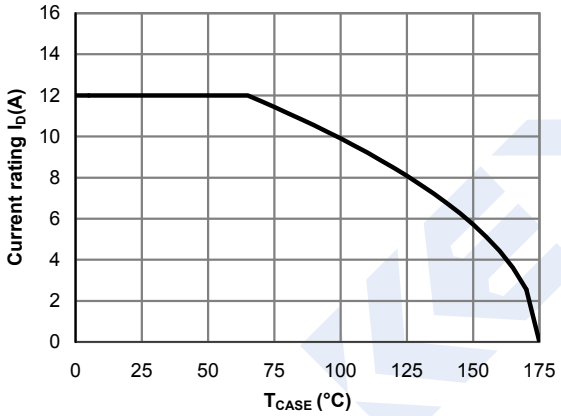

Figure 14: Current De-rating (Note F)

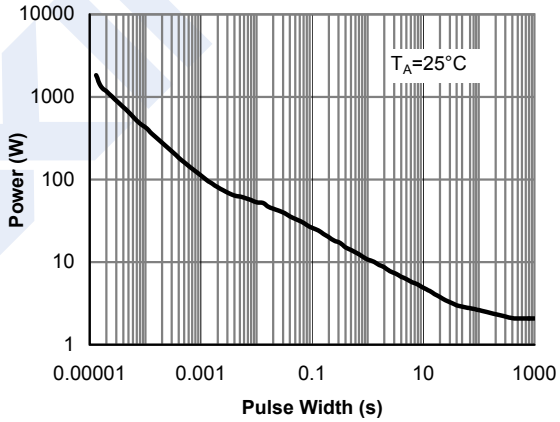

Figure 15: Single Pulse Power Rating Junction-to-Ambient (Note H)

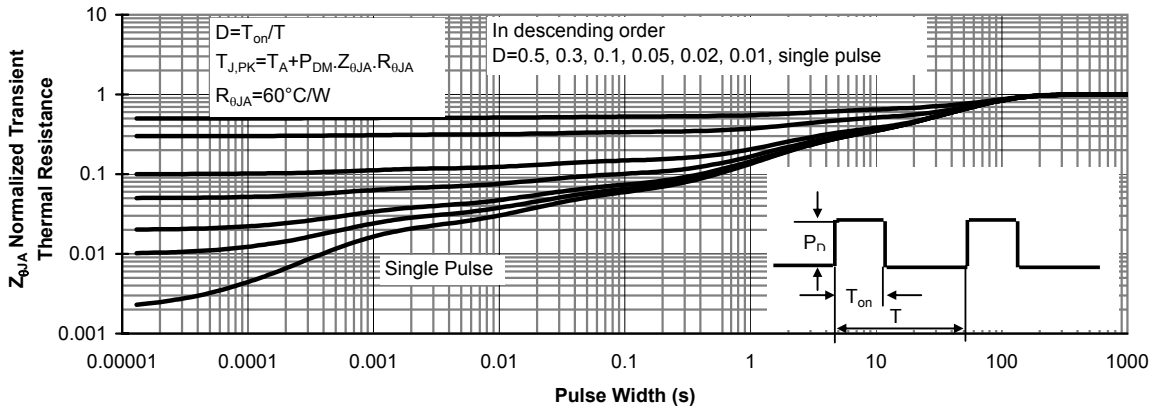

Figure 16: Normalized Maximum Transient Thermal Impedance (Note H)