

P-Channel Enhancement Mode Power MOSFET

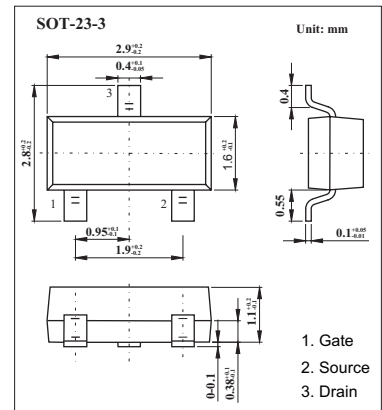
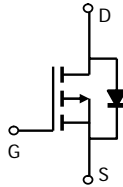
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Features

V_{DS} (V) = -30V

I_D = -4.2 A (V_{GS} = -10V)

- $R_{DS(ON)} < 50m\Omega$ (V_{GS} = -10V)
- $R_{DS(ON)} < 65m\Omega$ (V_{GS} = -4.5V)
- $R_{DS(ON)} < 120m\Omega$ (V_{GS} = -2.5V)

Absolute Maximum Ratings $T_a = 25$

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	V_{DS}	-30	V
Gate-Source Voltage	V_{GS}	± 12	V
Continuous Drain Current *1	I_D	-4.2	A
$T_A=25$		-3.5	
$T_A=70$		-3.5	
Pulsed Drain Current *2	I_{DM}	-30	
Power Dissipation *1	P_D	1.4	W
$T_A=25$		1	
$T_A=70$			
Junction and Storage Temperature Range	T_J, T_{STG}	-55 to 150	

Thermal Characteristics

Parameter	Symbol	Typ	Max	Unit
Maximum Junction-to-Ambient*1	$R_{\theta JA}$	65	90	/W
$t = 10s$		85	125	/W
Maximum Junction-to-Ambient *1	$R_{\theta JL}$	43	60	/W
Steady-State				
Maximum Junction-to-Lead *3				

*1The value of $R_{\theta JA}$ is measured with the device mounted on 1in² FR-4 board with 2oz.

Copper, in a still air environment with $T_A = 25$

*2 Repetitive rating, pulse width limited by junction temperature.

*3 The $R_{\theta JA}$ is the sum of the thermal impedance from junction to lead $R_{\theta JL}$ and lead to ambient.

AO3401

Electrical Characteristics Ta = 25

Parameter	Symbol	Test conditions	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	BV _{DSS}	I _D =-250μA, V _{GS} =0V	-30			V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =-24V, V _{GS} =0V			-1	μA
		V _{DS} =-24V, V _{GS} =0V, T _J =55			-5	
Gate-Body leakage current	I _{GSS}	V _{DS} =0V, V _{GS} =±12V			±100	nA
Gate Threshold Voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =-250μA	-0.7	-1	-1.3	V
On state drain current	I _{D(ON)}	V _{GS} =-4.5V, V _{DS} =-5V	-25			A
Static Drain-Source On-Resistance	R _{DS(ON)}	V _{GS} =-10V, I _D =-4.2A		42	50	m
		V _{GS} =-4.5V, I _D =-4A		53	65	m
		V _{GS} =-2.5V, I _D =-1A		80	120	m
Forward Transconductance	g _{FS}	V _{DS} =-5V, I _D =-5A	7	11		S
Diode Forward Voltage	V _{SD}	I _S =-1A, V _{GS} =0V		-0.75	-1	V
Maximum Body-Diode Continuous Current	I _S				-2.2	A
Reverse Transfer Capacitance	C _{iss}			954		pF
Gate resistance	C _{oss}	V _{GS} =0V, V _{DS} =-15V, f=1MHz		115		pF
Input Capacitance	C _{rss}			77		pF
Output Capacitance	R _g	V _{GS} =0V, V _{DS} =0V, f=1MHz		6		
Total Gate Charge	Q _g			9.4		nC
Gate Source Charge	Q _{gs}	V _{GS} =-4.5V, V _{DS} =-15V, I _D =-4A		2		nC
Gate Drain Charge	Q _{gd}			3		nC
Turn-On Rise Time	t _{D(on)}			6.3		ns
Turn-Off DelayTime	t _r	V _{GS} =-10V, V _{DS} =-15V, R _L =3.6Ω, R _{GEN} =6Ω		3.2		ns
Turn-Off Fall Time	t _{D(off)}			38.2		ns
Turn-On DelayTime	t _f			12		ns
Body Diode Reverse Recovery Time	t _{rr}	I _F =-4A, di/dt=100A/μs		20.2		ns
Body Diode Reverse Recovery Charge	Q _{rr}	I _F =-4A, di/dt=100A/μs		11.2		nC

■ Marking

Marking	A18E
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■ Typical Characteristics

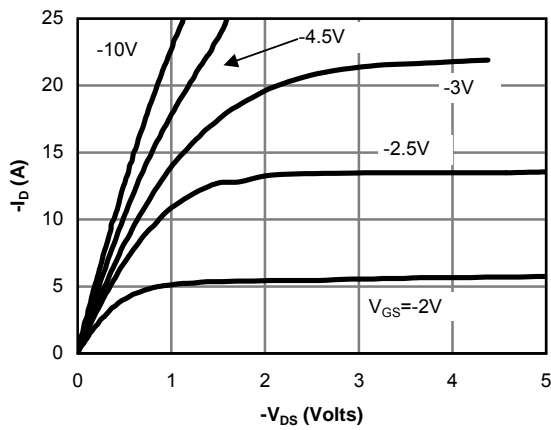


Figure 1: On-Region Characteristics

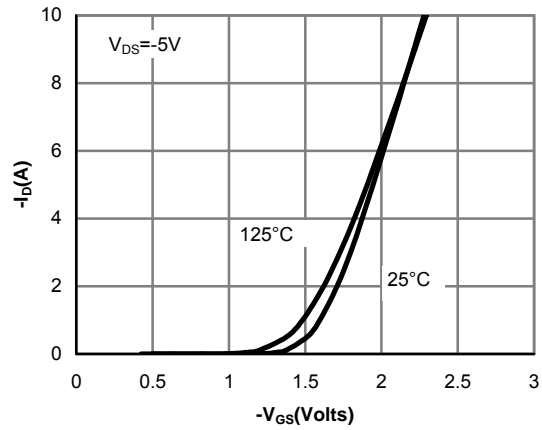


Figure 2: Transfer Characteristics

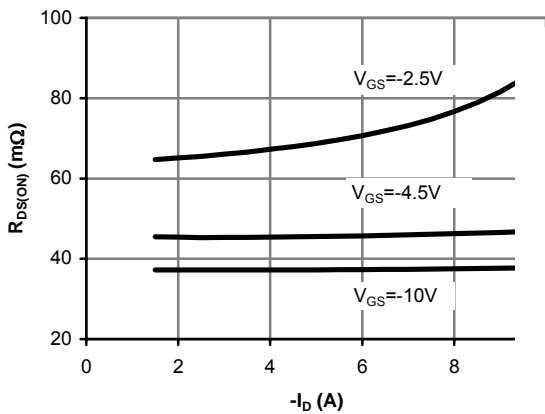


Figure 3: On-Resistance vs. Drain Current at different Gate Voltages

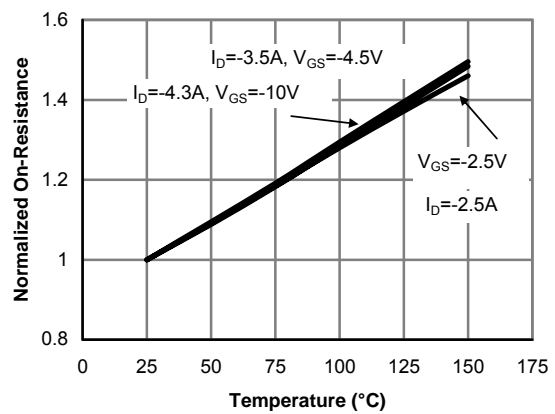


Figure 4: On-Resistance vs. Junction Temperature

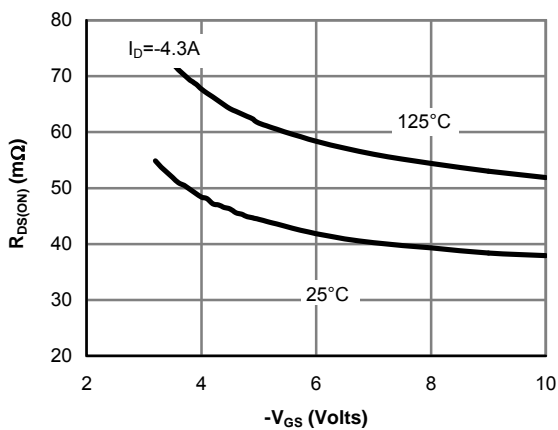


Figure 5: On-Resistance vs. Gate-Source Voltage

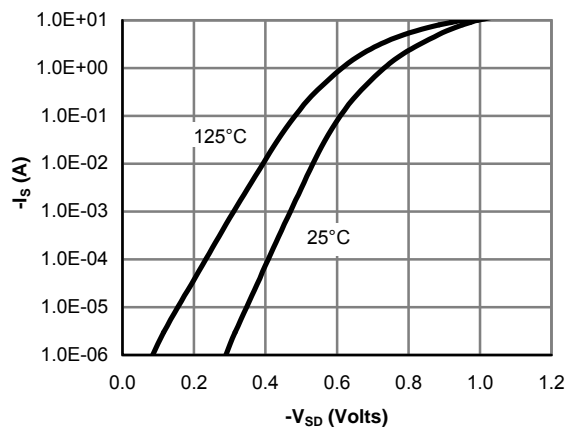


Figure 6: Body-Diode Characteristics

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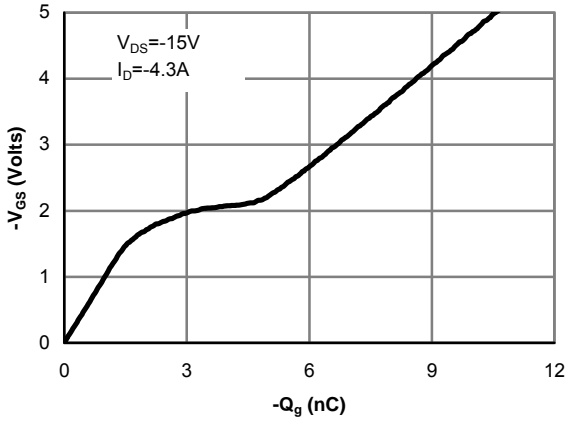


Figure 7: Gate-Charge Characteristics

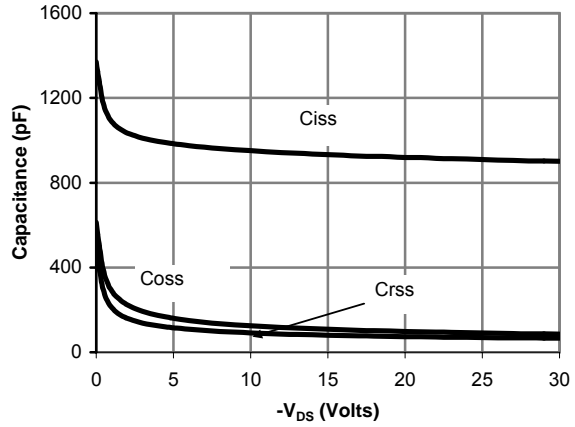


Figure 8: Capacitance Characteristics

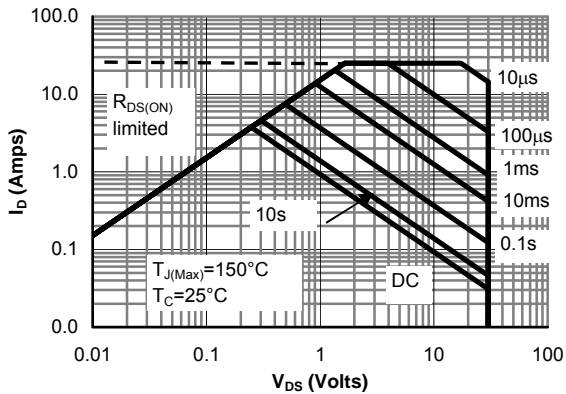


Figure 9: Maximum Forward Biased Safe Operating Area (Note F)

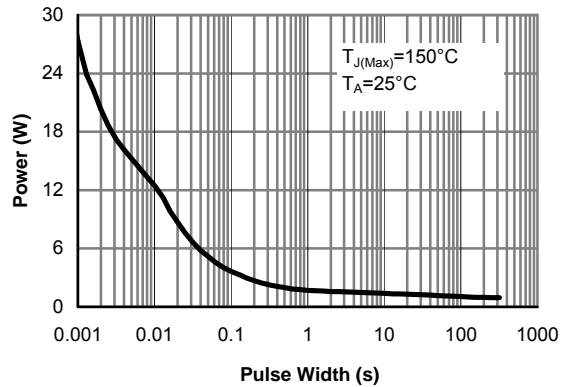


Figure 10: Single Pulse Power Rating Junction-to-Ambient (Note E)

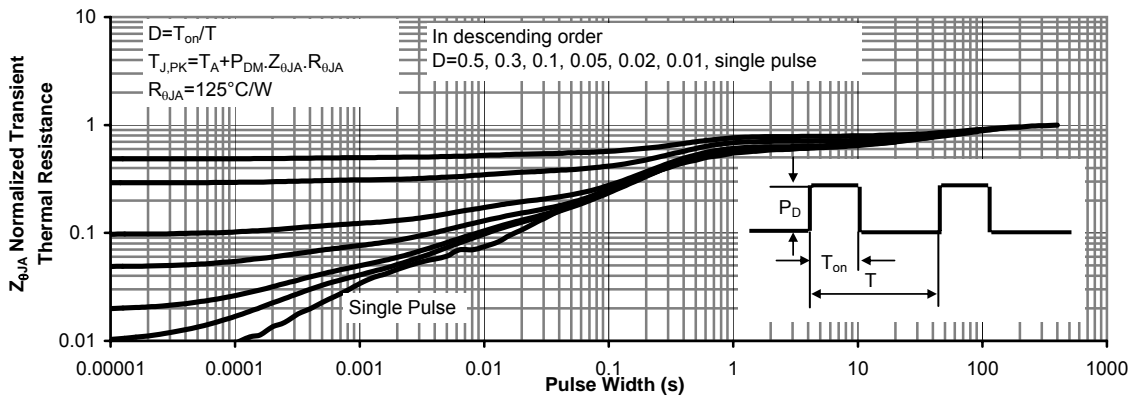


Figure 11: Normalized Maximum Transient Thermal Impedance