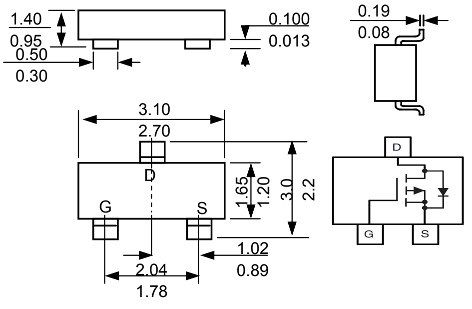
LOW VOLTAGE
MOSFET (P-CHANNEL)

AO3401

SOT-23



Dimensions in millimeters

FEATURES

- V_{DS}=-30V,$R_{DS(ON)}$≤50mΩ@V_{GS}=-10V,I_D=-4A
- Low on-resistance
- For PWM and Load switch applications
- Surface Mount device

MECHANICAL DATA

- Case: SOT-23
- Case Material: Molded Plastic. UL flammability
- Classification Rating: 94V-0

MAXIMUM RATINGS (T_A = 25°C unless otherwise noted)

Parameter		Symbol	Value	Unit
Drain-source voltage		V_{DS}	-30	V
Gate-source voltage		V_{GS}	±12	V
Continuous drain current	T_A=25°C	I_D	-4	A
	T_A=70°C		-3.2	A
Pulsed drain current		I_{DM}	-27	A
Power dissipation	T_A=25°C	P_D	1.4	W
	T_A=70°C		0.9	W
Thermal resistance from Junction to ambient		$R_{\theta JA}$	125	°C/W
Junction temperature		T_J	150	°C
Storage temperature		T_{STG}	-55~+150	°C

ELECTRICAL CHARACTERISTICS (T_A= 25°C unless otherwise specified)

Parameter	Symbol	Min	Typ	Max	Unit	Conditions
Drain-Source breakdown voltage	$V_{(BR)DSS}$*	-30			V	V_{GS}=0V, I_D=-250μA
Zero gate voltage drain current	I_{DSS}*			-1	uA	V_{DS}=-24V, V_{GS}=0V
Gate-body leakage current	I_{GSS}*			±100	nA	V_{DS}=0V, V_{GS}=±12V
Gate-threshold voltage	$V_{GS(th)}$*	-0.7	-0.9	-1.3	V	V_{DS}=V_{GS}, I_D=-250μA
On state drain current	$I_{D(ON)}$*	-27			A	V_{GS}=-10V, V_{DS}=-5V
Drain-source on-resistance	$R_{DS(ON)}$*		40	50	mΩ	V_{GS}=-10V, I_D=-1.0A
			50	65	mΩ	V_{GS}=-4.5V, I_D=-1.0A
			65	90	mΩ	V_{GS}=-2.5V, I_D=-1.0A
Forward transconductance	g_{FS}		10		S	V_{DS}=-5V, I_D=-4.0A
Gate resistance	R_g	4	7.8	12	Ω	V_{DS}=-0V, V_{GS}=0V, f=1MHz
Input capacitance	C_{iss}		645		pF	V_{DS}=-15V, V_{GS}=0V, f=1MHz
Output capacitance	C_{oss}		80		pF	
Reverse transfer capacitance	C_{rss}		55		pF	
Turn-on delay time	$t_{d(on)}$		6.5		nS	V_{GS}=-10V,V_{DS}=-15V, R_{GEN}=3Ω,R_L=3.75Ω
Turn-on rise time	t_r		3.5		nS	
Turn-off delay time	$t_{d(off)}$		41		nS	
Turn-off fall time	t_f		9		nS	
Total gate charge	Q_g		7		nC	V_{DS}=-15V,V_{GS}=-4.5V,I_D=-4A
			14		nC	V_{DS}=-15V,V_{GS}=-10V,I_D=-4A
Gate-source charge	Q_{gs}		1.5		nC	
Gate-drain charge	Q_{gd}		2.5		nC	
Diode forward voltage	V_{SD}		-0.7	-1	V	I_S=-1A, V_{GS}=0V
Diode forward current	I_S			-2	A	T_C = 25°C
Body Diode Reverse Recovery Time	t_{rr}		11		nS	I_F=-4A,dI/dt=100A/μs
Body Diode Reverse Recovery Charge	Q_{rr}		3.5		nC	

* Pulse test ; Pulse width ≤300μs, Duty cycle ≤ 0.5% .

Typical Characteristics

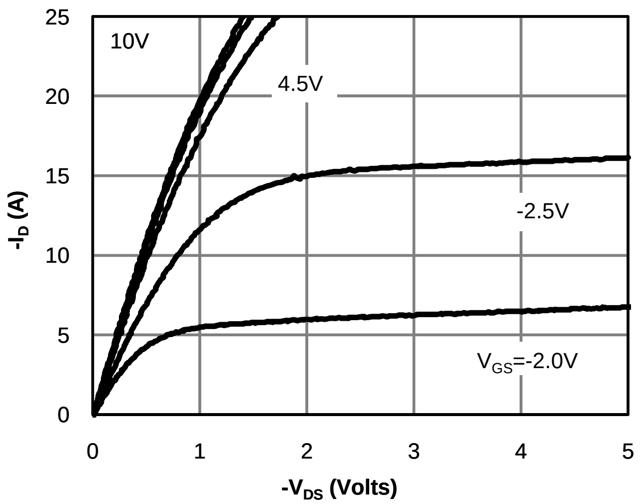


Fig 1: On-Region Characteristics (Note E)

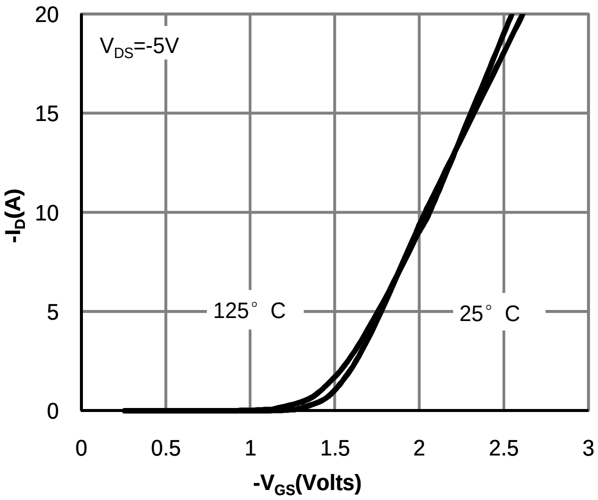


Figure 2: Transfer Characteristics (Note E)

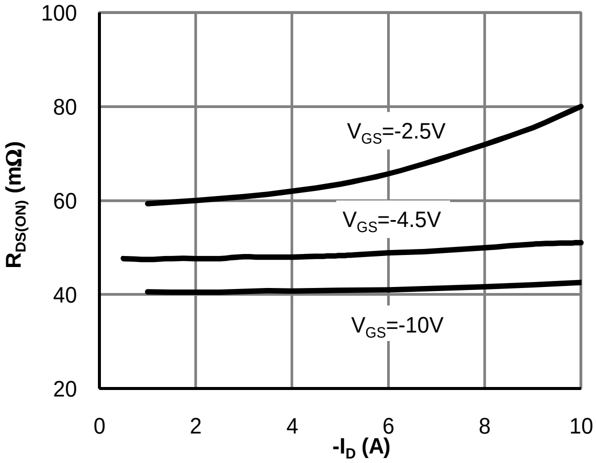


Figure 3: On-Resistance vs. Drain Current and Gate Voltage (Note E)

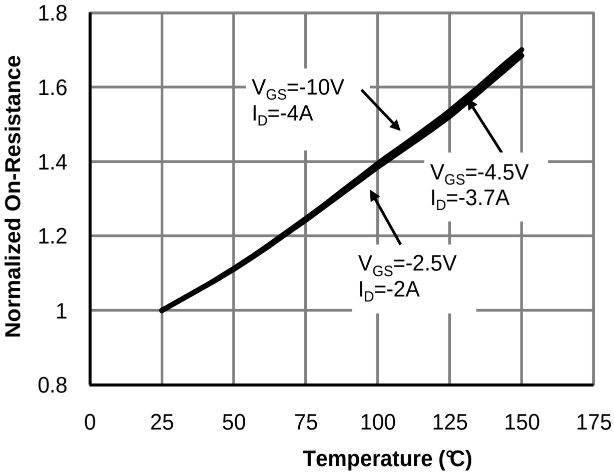


Figure 4: On-Resistance vs. Junction Temperature (Note E)

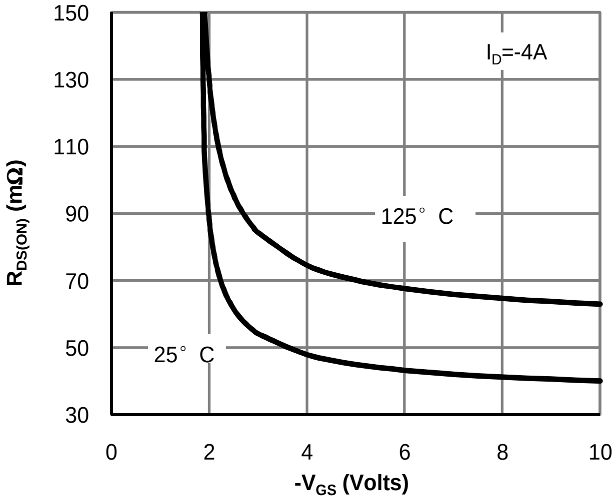


Figure 5: On-Resistance vs. Gate-Source Voltage (Note E)

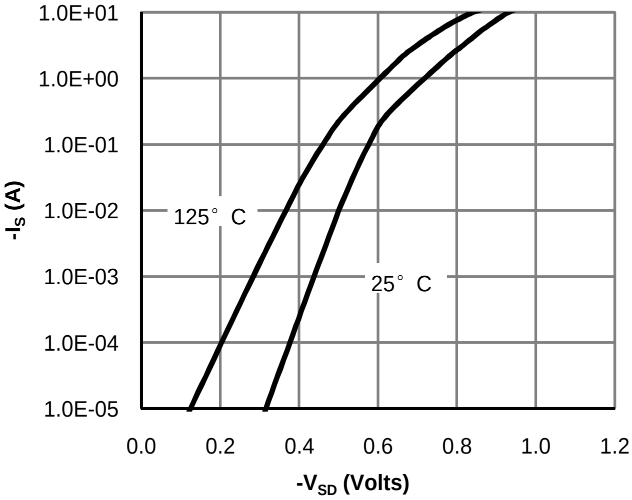


Figure 6: Body-Diode Characteristics (Note E)

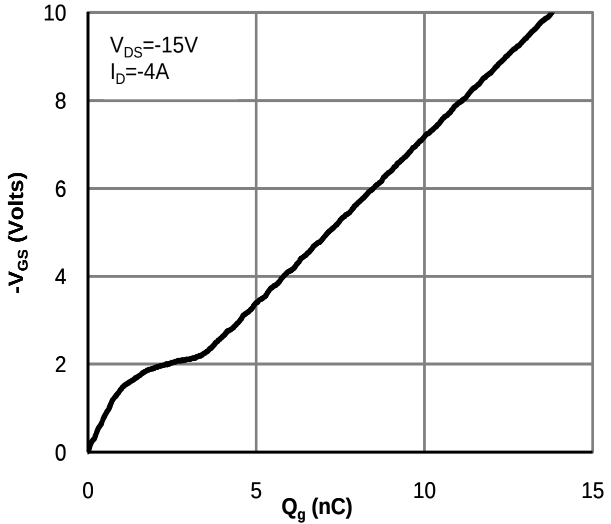


Figure 7: Gate-Charge Characteristics

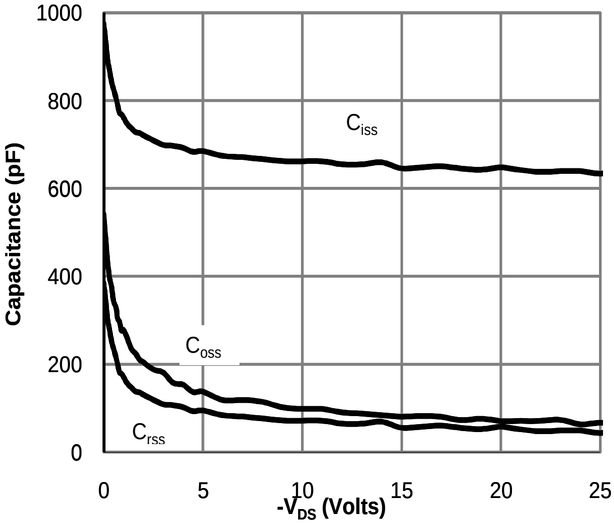


Figure 8: Capacitance Characteristics

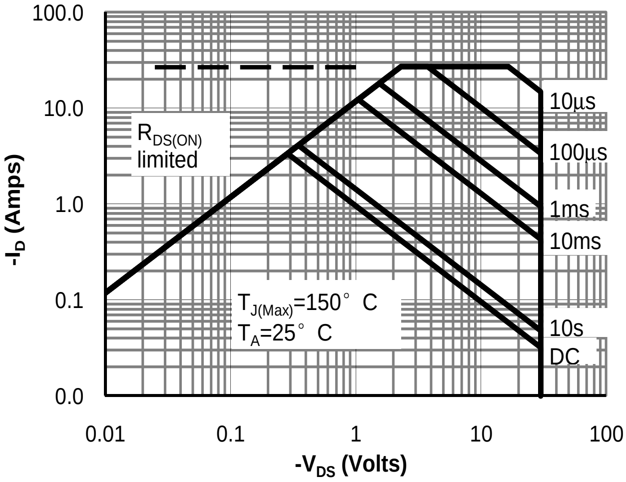


Figure 9: Maximum Forward Biased Safe Operating Area (Note F)

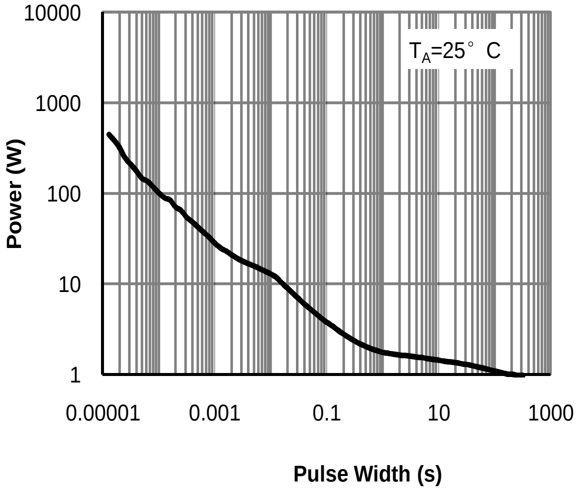


Figure 10: Single Pulse Power Rating Junction-to-Ambient (Note F)

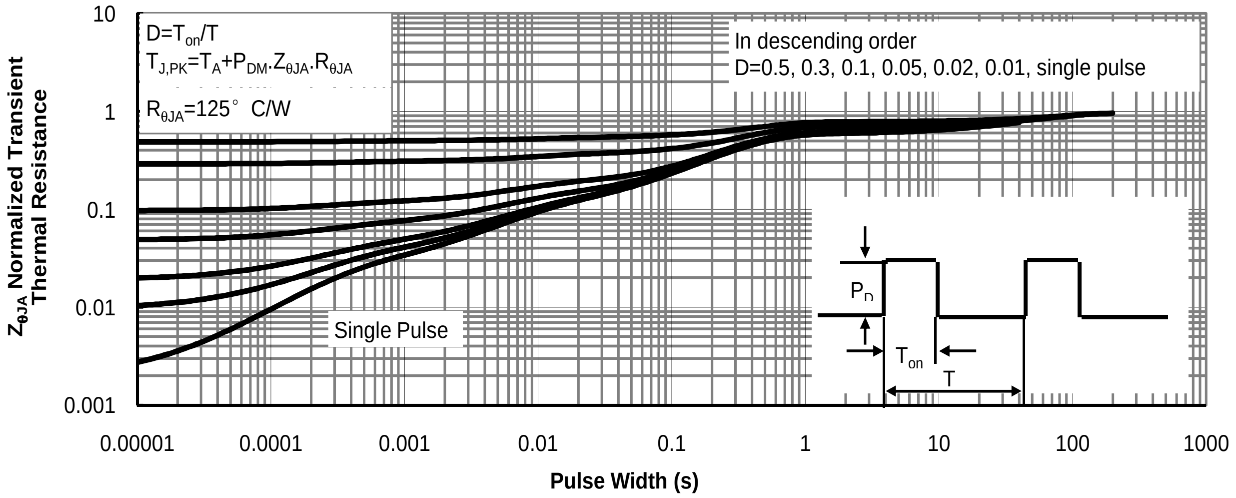
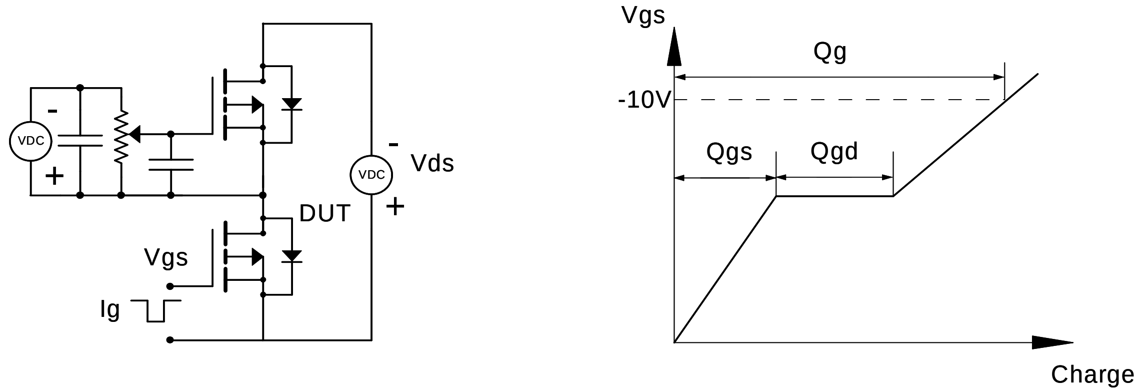
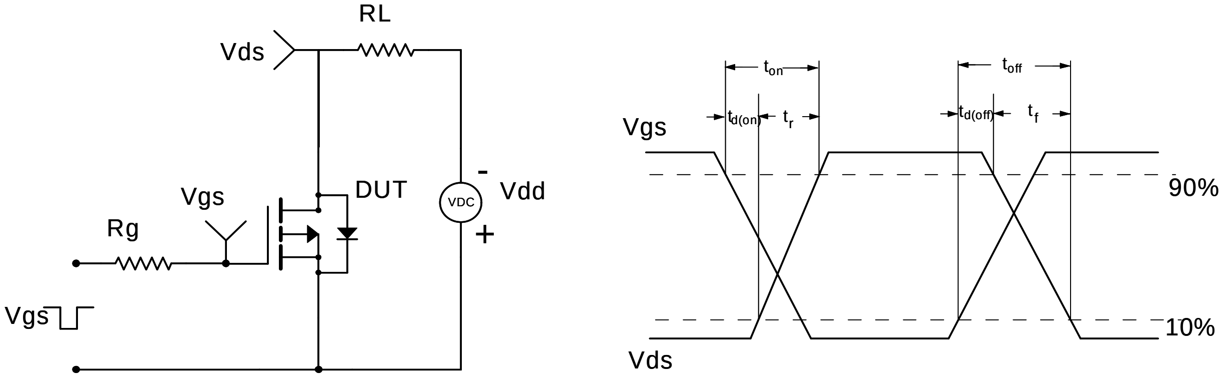


Figure 11: Normalized Maximum Transient Thermal Impedance (Note F)

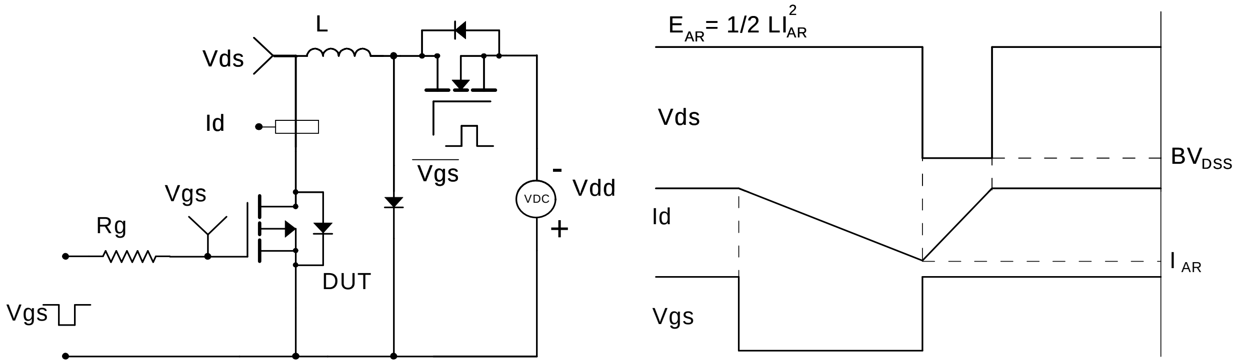
Gate Charge Test Circuit & Waveform



Resistive Switching Test Circuit & Waveforms



Unclamped Inductive Switching (UIS) Test Circuit & Waveforms



Diode Recovery Test Circuit & Waveforms