

Dual N-Channel MOSFET

AO4924 (K04924)

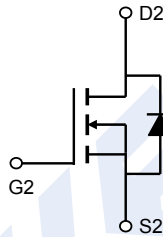
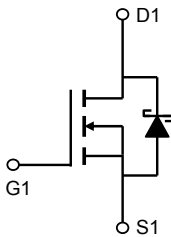
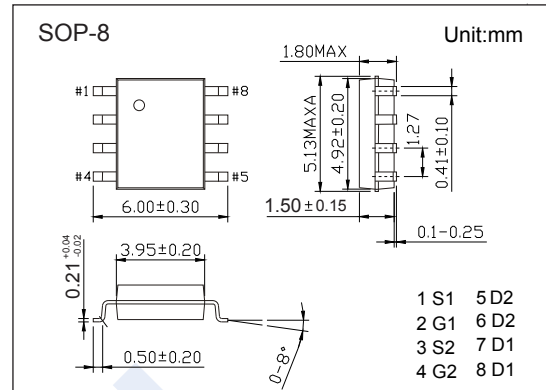
■ Features

N-Channel 1

- $V_{DS} (V) = 30V$
- $I_D = 9 A (V_{GS} = 10V)$
- $R_{DS(ON)} < 15.8m\Omega (V_{GS} = 10V)$
- $R_{DS(ON)} < 19.5m\Omega (V_{GS} = 4.5V)$
- SRFET™ Soft Recovery MOSFET: Integrated Schottky Diode

N-Channel 2

- $V_{DS} (V) = 30V$
- $I_D = 7.3 A (V_{GS} = 10V)$
- $R_{DS(ON)} < 24m\Omega (V_{GS} = 10V)$
- $R_{DS(ON)} < 29m\Omega (V_{GS} = 4.5V)$



■ Absolute Maximum Ratings $T_a = 25^\circ C$

Parameter		Symbol	N-Channel 1	N-Channel 2	Unit
Drain-Source Voltage		V_{DS}	30		V
Gate-Source Voltage		V_{GS}	±12		
Continuous Drain Current	$T_A=25^\circ C$	I_D	9	7.3	A
	$T_A=70^\circ C$		7.2	5.9	
Pulsed Drain Current		I_{DM}	40		
Avalanche Current		I_{AR}	16	12	
Repetitive Avalanche Energy	$L=0.3mH$	E_{AR}	38	22	mJ
Power Dissipation	$T_A=25^\circ C$	P_D	2		W
	$T_A=70^\circ C$		1.3		
Thermal Resistance.Junction- to-Ambient	$t \leq 10s$	R_{thJA}	62.5		$^\circ C/W$
	Steady-State		90		
Thermal Resistance.Junction- to-Lead		R_{thJL}	40		
Junction Temperature		T_J	150		$^\circ C$
Storage Temperature Range		T_{stg}	-55 to 150		

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■ N-Channel 1 Electrical Characteristics Ta = 25°C

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit	
Drain-Source Breakdown Voltage	V _{DSS}	I _D =1mA, V _{GS} =0V	30			V	
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =24V, V _{GS} =0V			0.1	mA	
		V _{DS} =24V, V _{GS} =0V, T _J =55°C			10		
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	1.5		2.4	V	
Static Drain-Source On-Resistance	R _{DS(on)}	V _{GS} =10V, I _D =9A			15.8	mΩ	
		V _{GS} =10V, I _D =9A, T _J =125°C			25		
		V _{GS} =4.5V, I _D =7A			19.5		
On State Drain Current	I _{D(ON)}	V _{GS} =4.5V, V _{DS} =5V	40			A	
Forward Transconductance	g _{FS}	V _{DS} =5V, I _D =9A		64		S	
Input Capacitance	C _{iss}	V _{GS} =0V, V _{DS} =15V, f=1MHz		1450	1885	pF	
Output Capacitance	C _{oss}			224			
Reverse Transfer Capacitance	C _{rss}			92			
Gate Resistance	R _g	V _{GS} =0V, V _{DS} =0V, f=1MHz		1.6	3	Ω	
Total Gate Charge (10V)	Q _g	V _{GS} =10V, V _{DS} =15V, I _D =9A		24	31	nC	
Total Gate Charge (4.5V)				12			
Gate Source Charge			Q _{gs}		3.9		
Gate Drain Charge			Q _{gd}		4.2		
Turn-On DelayTime	t _{d(on)}	V _{GS} =10V, V _{DS} =15V, R _L =1.7Ω, R _{GEN} =3Ω		5.5		ns	
Turn-On Rise Time	t _r			4.7			
Turn-Off DelayTime	t _{d(off)}			24			
Turn-Off Fall Time	t _f			4			
Body Diode Reverse Recovery Time	t _{rr}	I _F =9A, di/dt=300A/μs		10	13	nC	
Body Diode Reverse Recovery Charge	Q _{rr}			6.8			
Maximum Body-Diode Continuous Current	I _S				4.5	A	
Diode Forward Voltage	V _{SD}	I _S =1A, V _{GS} =0V			0.6	V	

Note. The static characteristics in Figures 1 to 6 are obtained using <300μs pulses, duty cycle 0.5% max.

■ Marking

Marking	4924
	KA****

Dual N-Channel MOSFET

AO4924 (K04924)

■ N-Channel 2 Electrical Characteristics Ta = 25°C

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	V _{DSS}	I _D =250 μA, 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°C			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		1.5	V
Static Drain-Source On-Resistance	R _{DS(on)}	V _{GS} =10V, I _D =7.3A			24	mΩ
		V _{GS} =10V, I _D =7.3A, T _J =125°C			34	
		V _{GS} =4.5V, I _D =6A			29	
On State Drain Current	I _{D(ON)}	V _{GS} =4.5V, V _{DS} =5V	40			A
Forward Transconductance	g _{FS}	V _{DS} =5V, I _D =7.3A		26		S
Input Capacitance	C _{iss}	V _{GS} =0V, V _{DS} =15V, f=1MHz		900	1100	pF
Output Capacitance	C _{oss}			88		
Reverse Transfer Capacitance	C _{rss}			65		
Gate Resistance	R _g	V _{GS} =0V, V _{DS} =0V, f=1MHz		0.95	1.5	Ω
Total Gate Charge	Q _g	V _{GS} =4.5V, V _{DS} =15V, I _D =7.3A		10	12	nC
Gate Source Charge	Q _{gs}			1.8		
Gate Drain Charge	Q _{gd}			3.75		
Turn-On DelayTime	t _{d(on)}	V _{GS} =10V, V _{DS} =15V, R _L =2Ω, R _{GEN} =6Ω		3.2		ns
Turn-On Rise Time	t _r			3.5		
Turn-Off DelayTime	t _{d(off)}			21.5		
Turn-Off Fall Time	t _f			2.7		
Body Diode Reverse Recovery Time	t _{rr}	I _F = 7.3A, di/dt= 100A/us		16.8	20	nC
Body Diode Reverse Recovery Charge	Q _{rr}			8	12	
Maximum Body-Diode Continuous Current	I _S				4.5	A
Diode Forward Voltage	V _{SD}	I _S =1A, V _{GS} =0V			1	V

Note.The static characteristics in Figures 1 to 6 are obtained using <300us pulses, duty cycle 0.5% max.

Dual N-Channel MOSFET AO4924 (KO4924)

■ N-Channel 1 Typical Characteristics

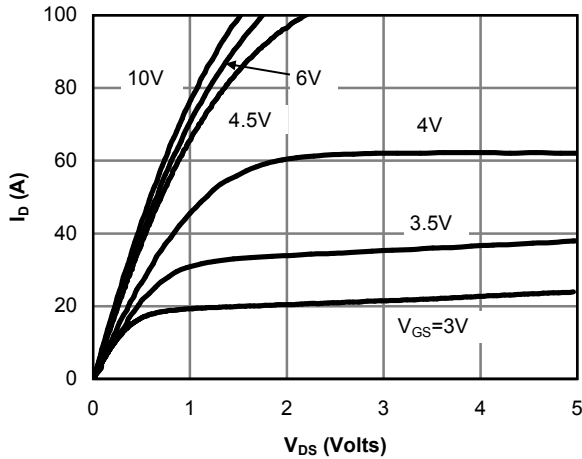


Figure 1: On-Region Characteristics

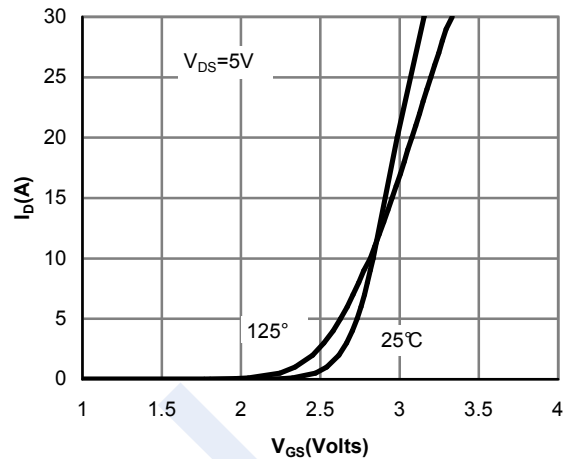


Figure 2: Transfer Characteristics

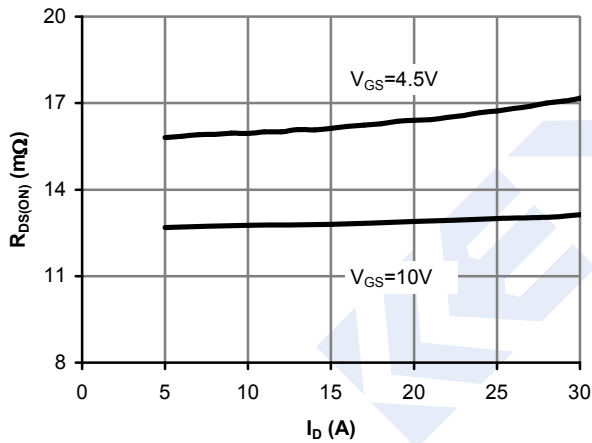


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

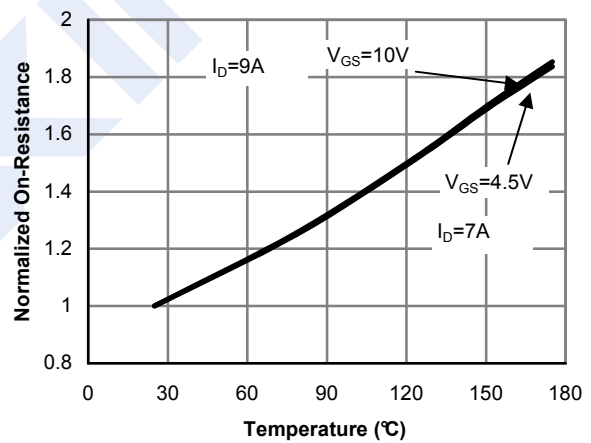


Figure 4: On-Resistance vs. Junction Temperature

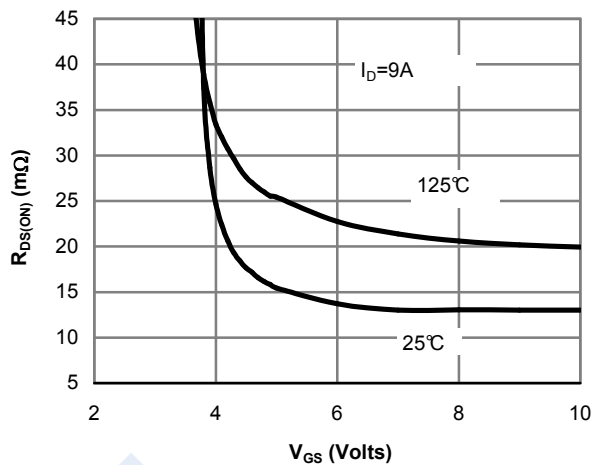


Figure 5: On-Resistance vs. Gate-Source Voltage

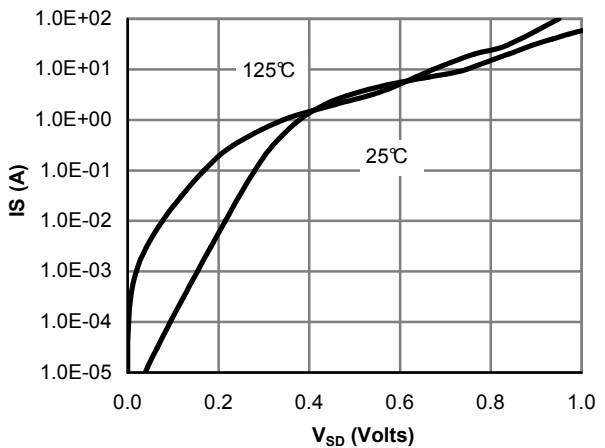


Figure 6: Body-Diode Characteristics

Dual N-Channel MOSFET AO4924 (KO4924)

■ N-Channel 1 Typical Characteristics

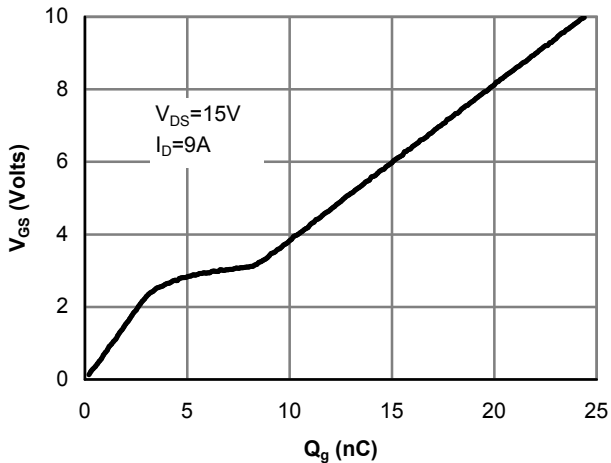


Figure 7: Gate-Charge Characteristics

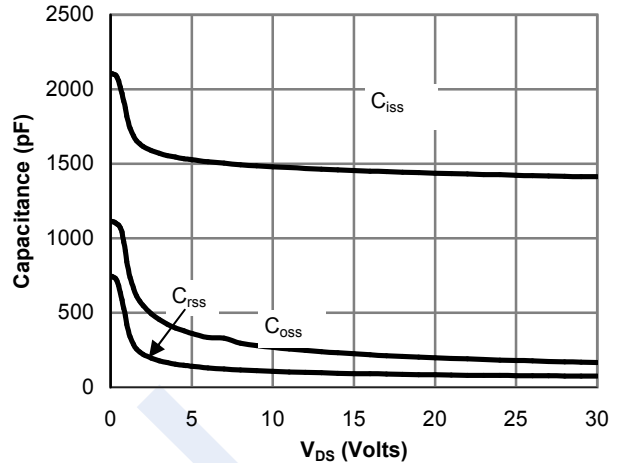


Figure 8: Capacitance Characteristics

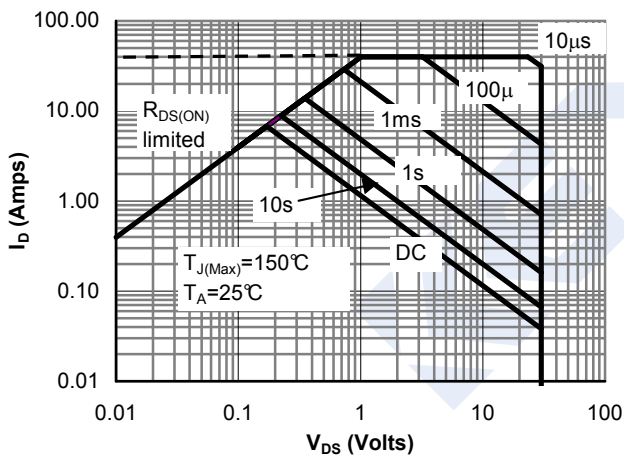


Figure 9: Maximum Forward Biased Safe Operating Area (Note E)

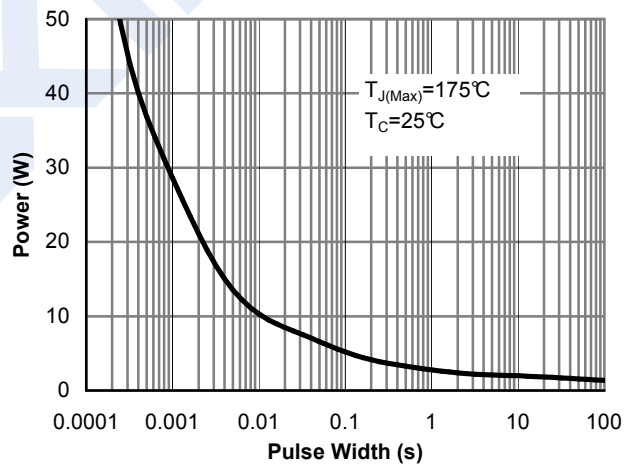


Figure 10: Single Pulse Power Rating Junction-to-Ambient (Note E)

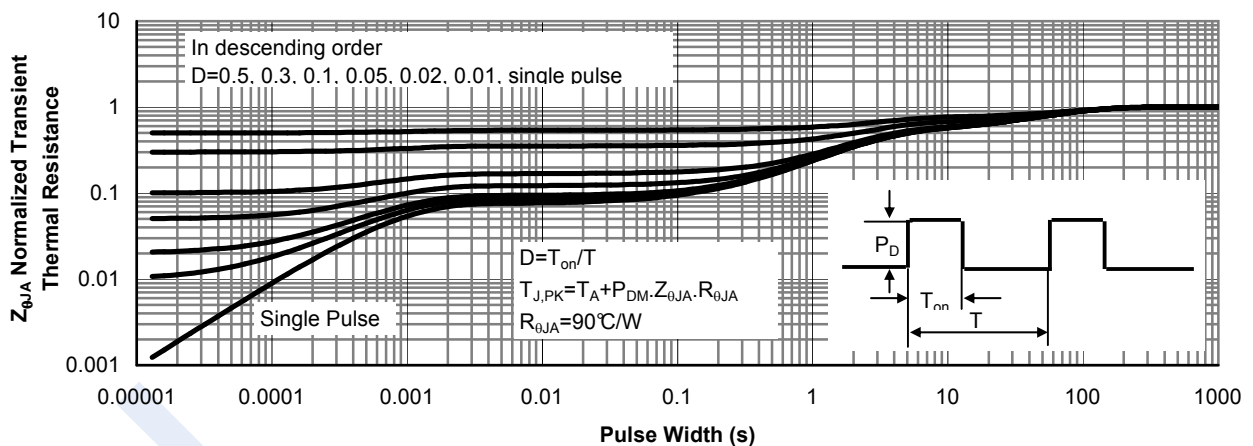


Figure 11: Normalized Maximum Transient Thermal Impedance (Note E)

Dual N-Channel MOSFET AO4924 (KO4924)

■ N-Channel 1 Typical Characteristics

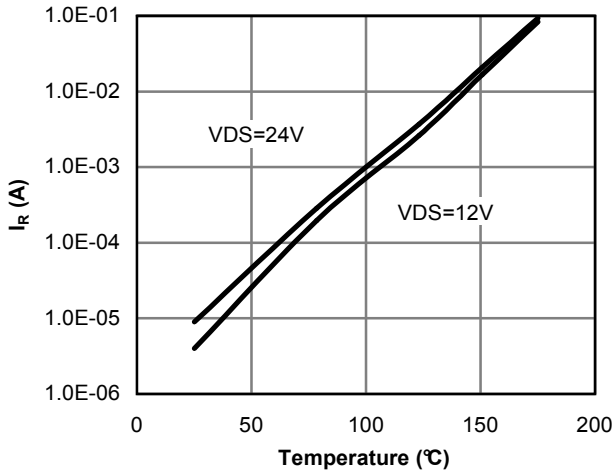


Figure 12: Diode Reverse Leakage Current vs. Junction Temperature

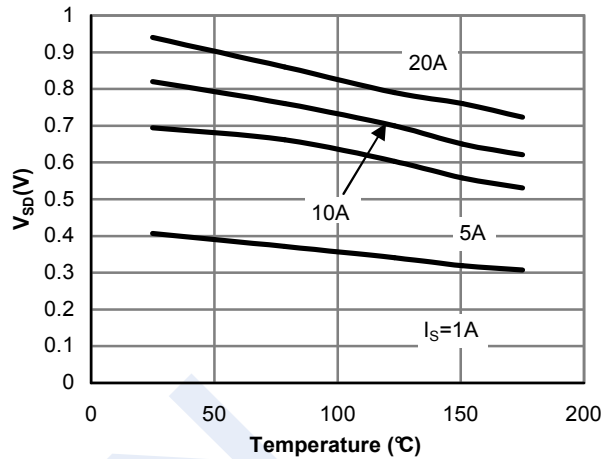


Figure 13: Diode Forward Voltage vs. Junction Temperature

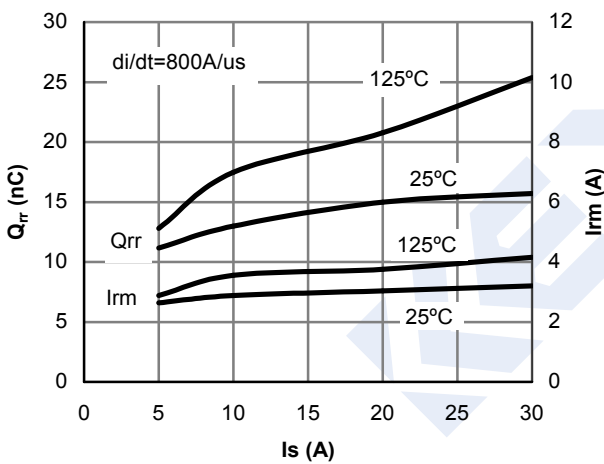


Figure 14: Diode Reverse Recovery Charge and Peak Current vs. Conduction Current

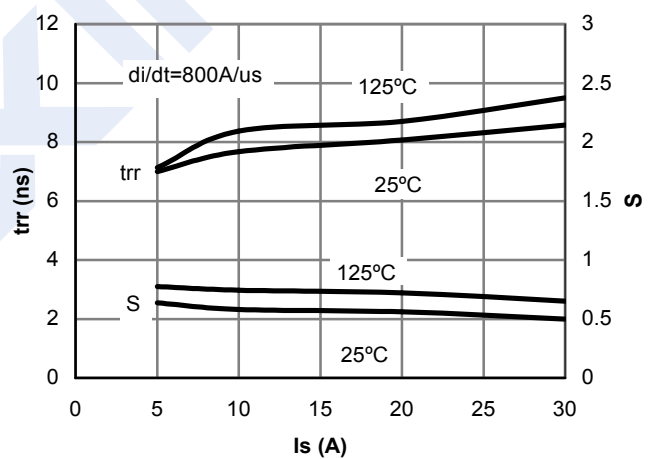


Figure 15: Diode Reverse Recovery Time and Soft Coefficient vs. Conduction Current

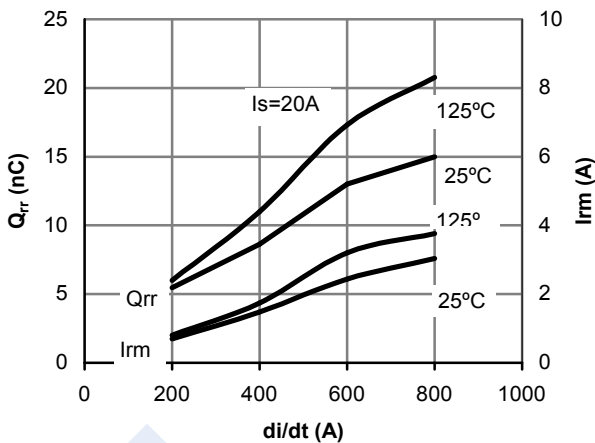


Figure 16: Diode Reverse Recovery Charge and Peak Current vs. di/dt

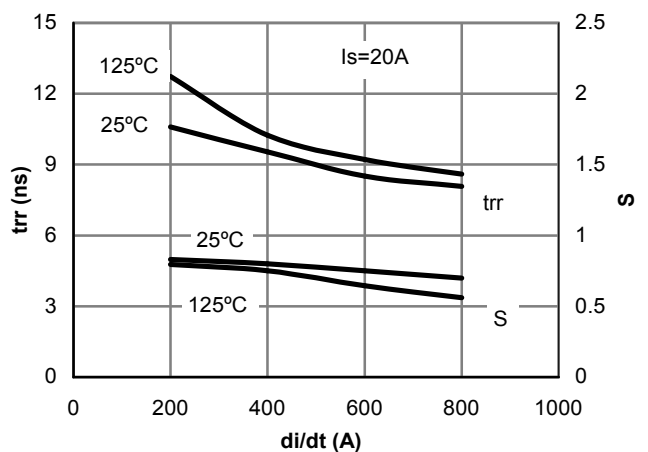


Figure 17: Diode Reverse Recovery Time and Soft Coefficient vs. di/dt

Dual N-Channel MOSFET AO4924 (KO4924)

■ N-Channel 2 Typical Characteristics

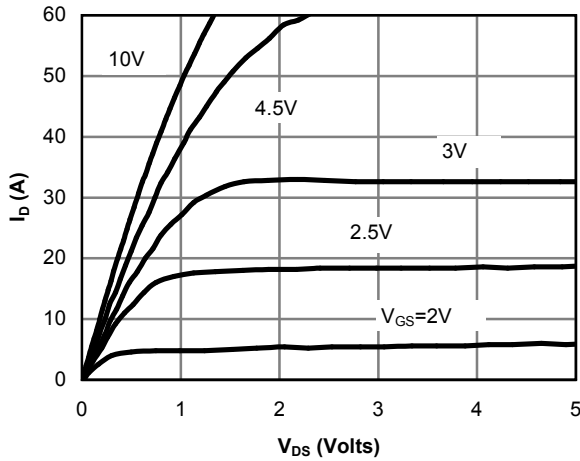


Fig 1: On-Region Characteristics

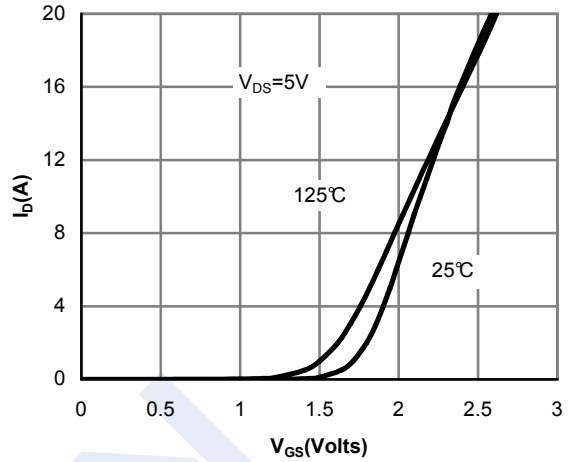


Figure 2: Transfer Characteristics

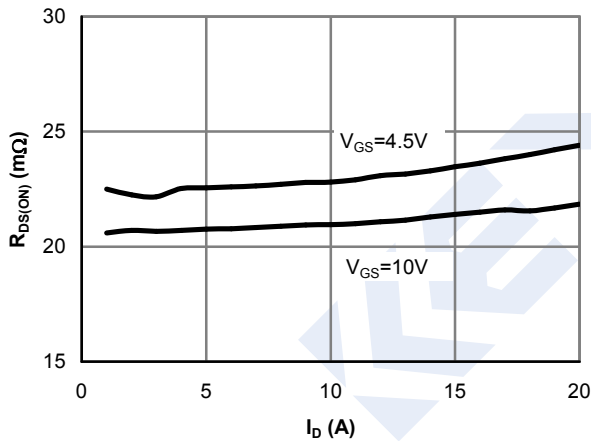


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

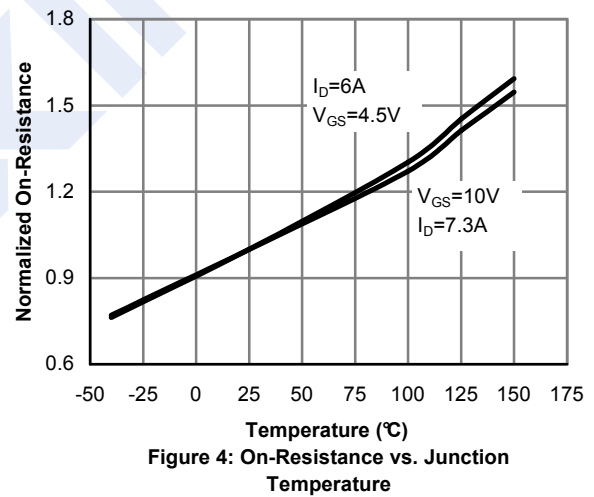


Figure 4: On-Resistance vs. Junction Temperature

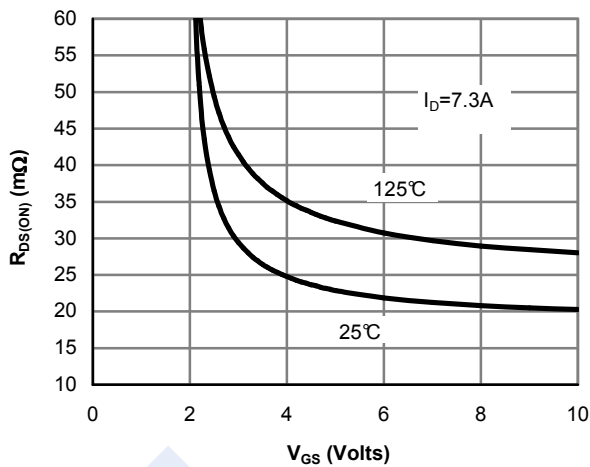


Figure 5: On-Resistance vs. Gate-Source Voltage

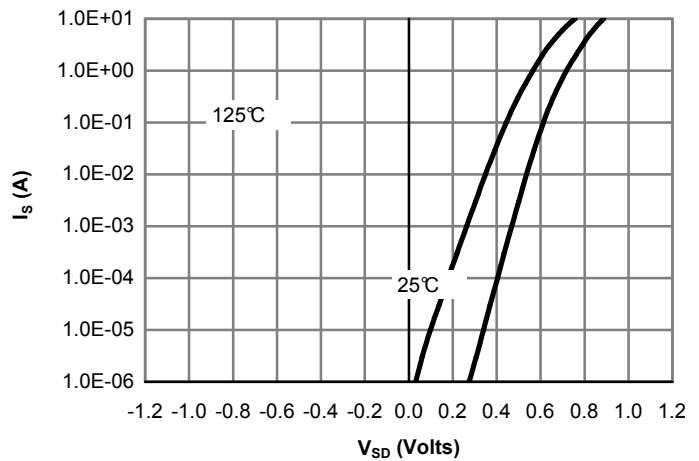


Figure 6: Body-Diode Characteristics

Dual N-Channel MOSFET AO4924 (KO4924)

■ N-Channel 2 Typical Characteristics

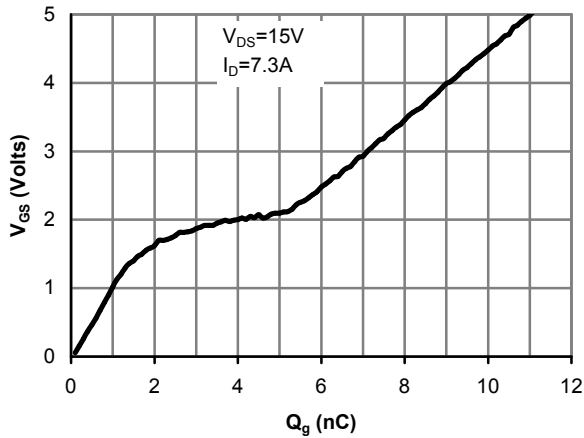


Figure 7: Gate-Charge Characteristics

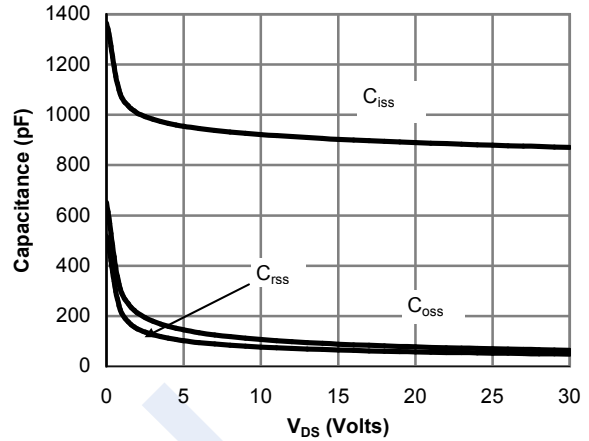


Figure 8: Capacitance Characteristics

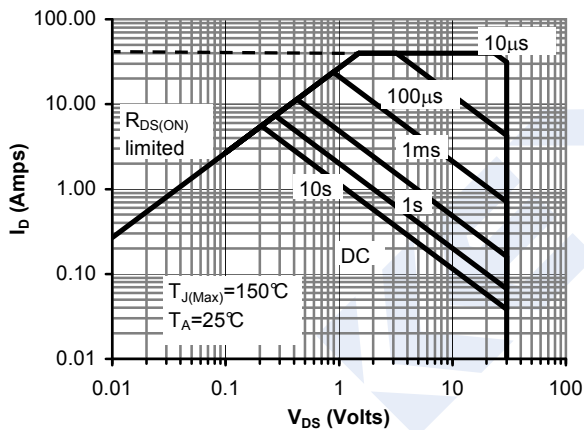


Figure 9: Maximum Forward Biased Safe Operating Area (Note E)

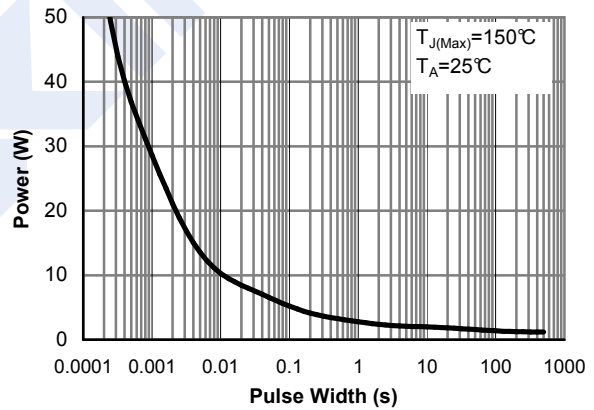


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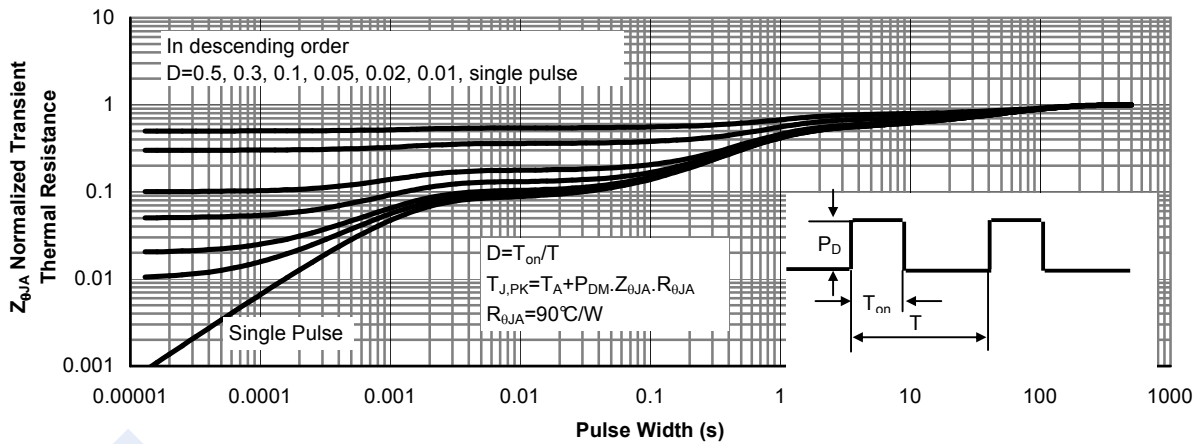


Figure 11: Normalized Maximum Transient Thermal Impedance