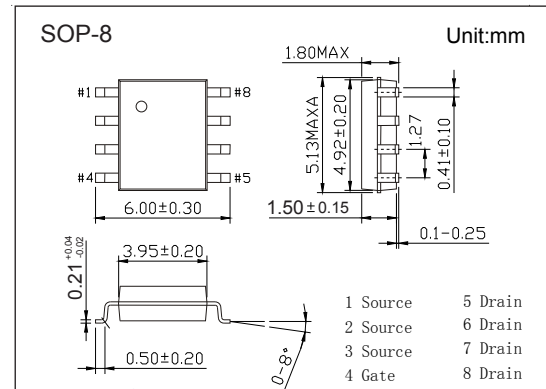
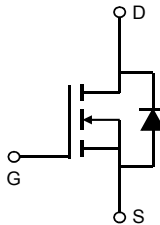


## N-Channel MOSFET

### AO4578 (KO4578)

#### ■ Features

- $V_{DS} (V) = 30V$
- $I_D = 20 A (V_{GS} = 10V)$
- $R_{DS(ON)} < 5.7m\Omega (V_{GS} = 10V)$
- $R_{DS(ON)} < 9m\Omega (V_{GS} = 4.5V)$



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

Parameter	Symbol	Rating	Unit	
Drain-Source Voltage	$V_{DS}$	30	V	
Gate-Source Voltage	$V_{GS}$	$\pm 20$		
$V_{DS}$ Spike	$V_{SPIKE}$	36		
Continuous Drain Current	$I_D$	$T_A=25^\circ C$	20	A
		$T_A=70^\circ C$	15	
Pulsed Drain Current	$I_{DM}$	120		
Avalanche Current	$I_{AS}$	40		
Avalanche Energy	$L=0.1mH$	$E_{AS}$	8	mJ
Power Dissipation	$P_D$	$T_A=25^\circ C$	3.1	W
		$T_A=70^\circ C$	2	
Thermal Resistance.Junction- to-Ambient	$R_{thJA}$	$t \leq 10s$	40	$^\circ C/W$
		Steady-State	75	
Thermal Resistance.Junction- to-Lead	$R_{thJL}$	24		
Junction Temperature	$T_J$	150	$^\circ C$	
Storage Temperature Range	$T_{stg}$	-55 to 150		

## N-Channel MOSFET

## AO4578 (KO4578)

## ■ Electrical Characteristics Ta = 25°C

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	V <sub>DSS</sub>	I <sub>D</sub> =250 μA, V <sub>GS</sub> =0V	30			V
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> =30V, V <sub>GS</sub> =0V			1	μA
		V <sub>DS</sub> =30V, V <sub>GS</sub> =0V, T <sub>J</sub> =55°C			5	
Gate-Body Leakage Current	I <sub>GSS</sub>	V <sub>DS</sub> =0V, V <sub>GS</sub> =±20V			±100	nA
Gate Threshold Voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250μA	1.4		2.2	V
Static Drain-Source On-Resistance	R <sub>DS(on)</sub>	V <sub>GS</sub> =10V, I <sub>D</sub> =20A			5.7	mΩ
		V <sub>GS</sub> =10V, I <sub>D</sub> =20A, T <sub>J</sub> =125°C			7.8	
		V <sub>GS</sub> =4.5V, I <sub>D</sub> =20A			9	
Forward Transconductance	g <sub>FS</sub>	V <sub>DS</sub> =5V, I <sub>D</sub> =20A		62		S
Input Capacitance	C <sub>iss</sub>	V <sub>GS</sub> =0V, V <sub>DS</sub> =15V, f=1MHz		1128		pF
Output Capacitance	C <sub>oss</sub>			435		
Reverse Transfer Capacitance	C <sub>rss</sub>			59		
Gate Resistance	R <sub>g</sub>	V <sub>GS</sub> =0V, V <sub>DS</sub> =0V, f=1MHz	0.7		2.1	Ω
Total Gate Charge (10V)	Q <sub>g</sub>	V <sub>GS</sub> =10V, V <sub>DS</sub> =15V, I <sub>D</sub> =20A		16.2	25	nC
Total Gate Charge (4.5V)				7.4	15	
Gate Source Charge	Q <sub>gs</sub>			4.3		
Gate Drain Charge	Q <sub>gd</sub>			2.3		
Turn-On DelayTime	t <sub>d(on)</sub>		V <sub>GS</sub> =10V, V <sub>DS</sub> =15V, R <sub>L</sub> =0.75Ω, R <sub>GEN</sub> =3Ω		5.5	
Turn-On Rise Time	t <sub>r</sub>			3		
Turn-Off DelayTime	t <sub>d(off)</sub>			22.5		
Turn-Off Fall Time	t <sub>f</sub>			3		
Body Diode Reverse Recovery Time	t <sub>rr</sub>	I <sub>F</sub> =20A, di/dt=500A/μs		13.3		nA
Body Diode Reverse Recovery Charge	Q <sub>rr</sub>			25		
Maximum Body-Diode Continuous Current	I <sub>S</sub>				4.2	A
Diode Forward Voltage	V <sub>SD</sub>	I <sub>S</sub> =1A, V <sub>GS</sub> =0V			1	V

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

## ■ Marking

Marking	4578
	KC****

## N-Channel MOSFET AO4578 (KO4578)

■ Typical Characteristics

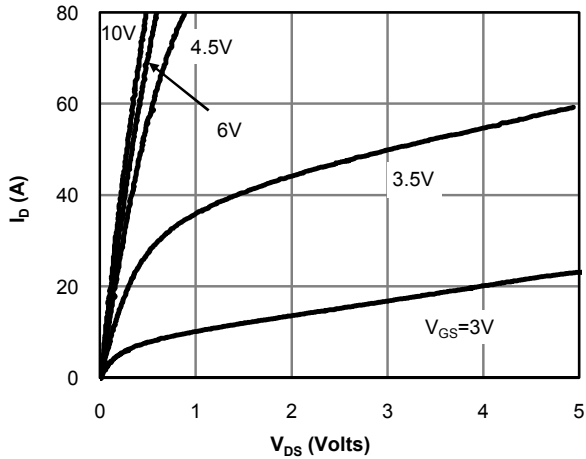


Fig 1: On-Region Characteristics (Note E)

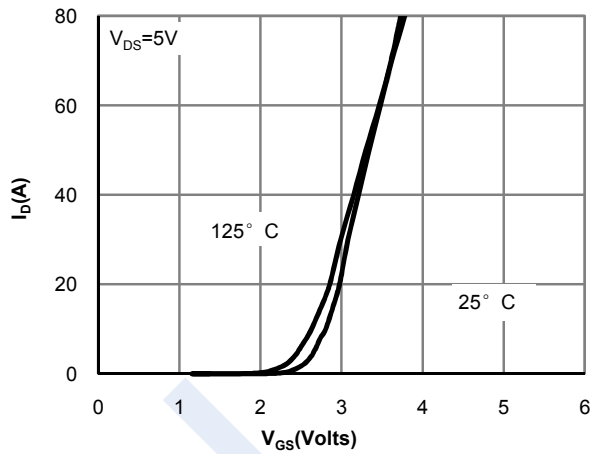


Figure 2: Transfer Characteristics (Note E)

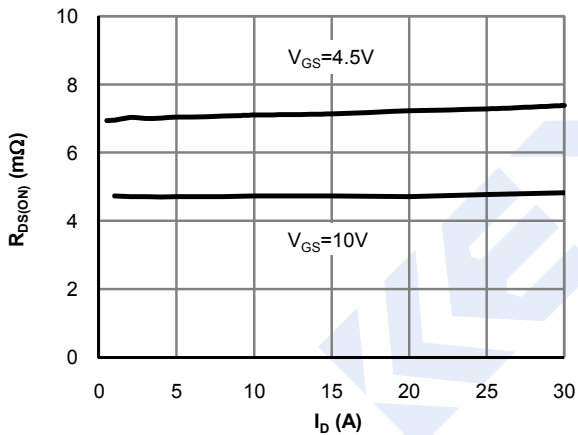


Figure 3: On-Resistance vs. Drain Current and Gate Voltage (Note E)

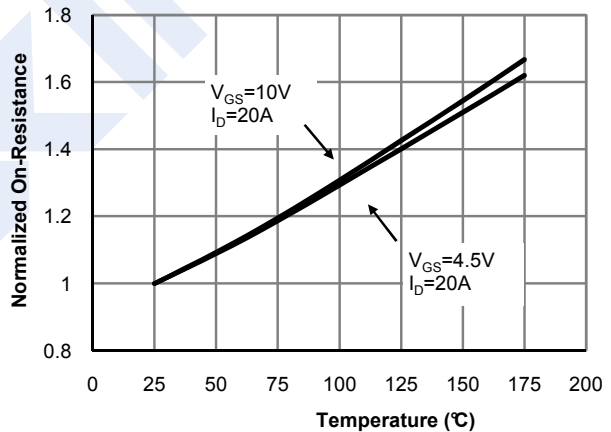


Figure 4: On-Resistance vs. Junction Temperature (Note E)

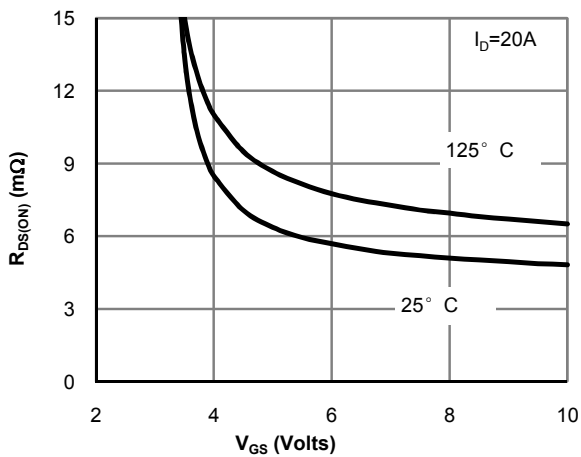


Figure 5: On-Resistance vs. Gate-Source Voltage (Note E)

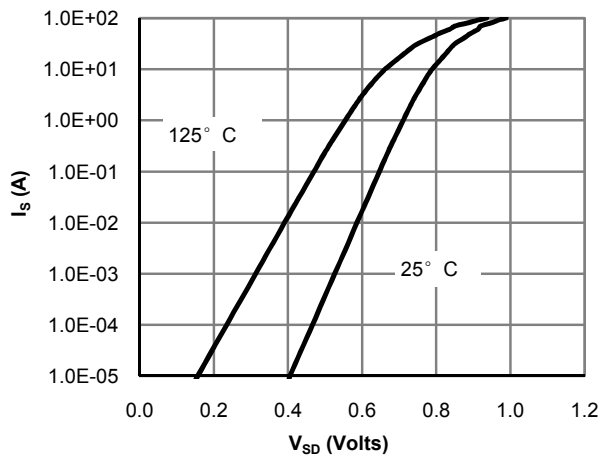


Figure 6: Body-Diode Characteristics (Note E)

## N-Channel MOSFET AO4578 (KO4578)

■ Typical Characteristics

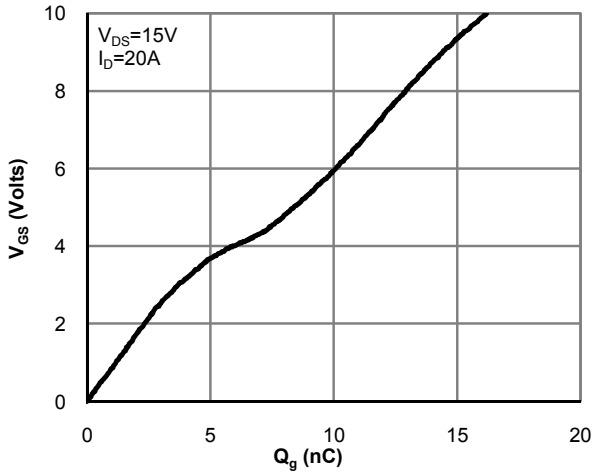


Figure 7: Gate-Charge Characteristics

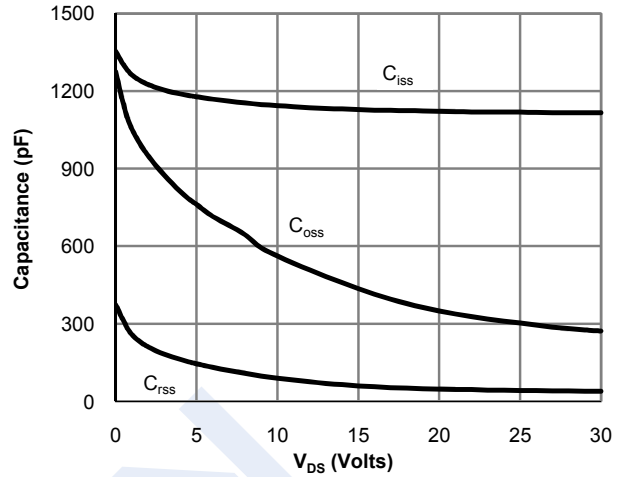


Figure 8: Capacitance Characteristics

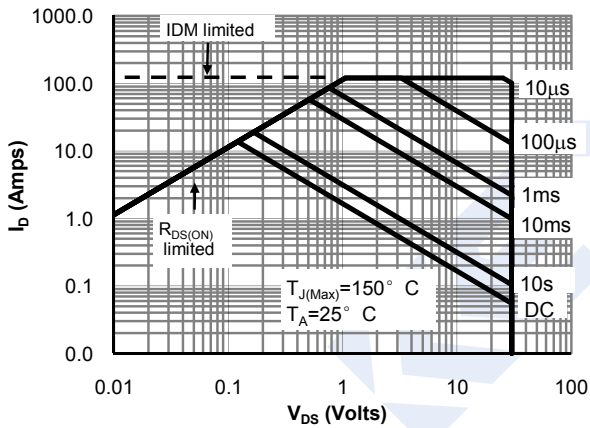


Figure 9: Maximum Forward Biased Safe Operating Area (Note F)

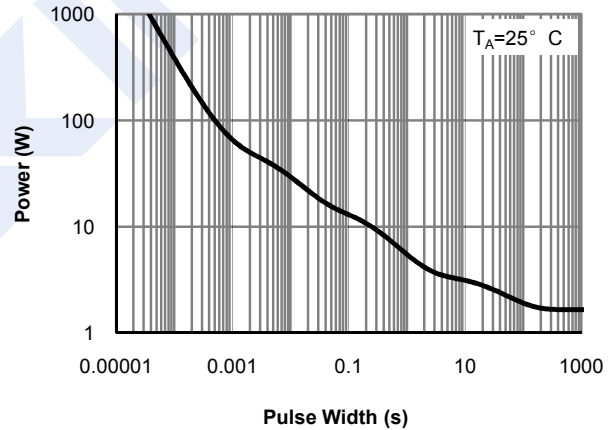


Figure 10: Single Pulse Power Rating Junction-to-Ambient (Note F)

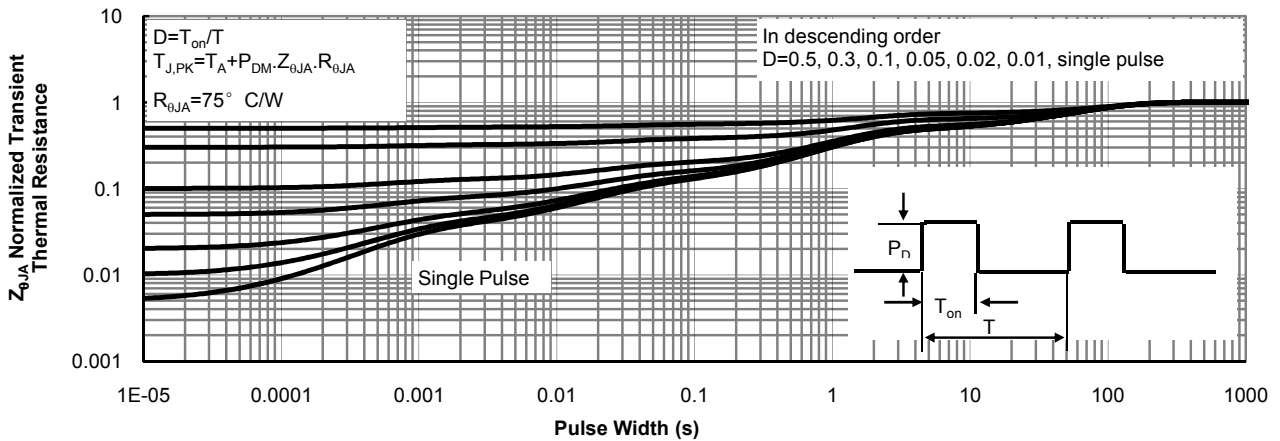


Figure 11: Normalized Maximum Transient Thermal Impedance (Note F)