

## N-Channel Enhancement Mode Field Effect Transistor KO3416

### Features

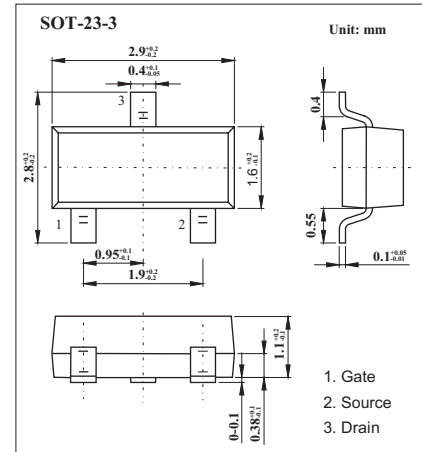
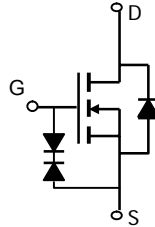
$V_{DS} (V) = 20V$

$I_D = 6.5 A$

$R_{DS(ON)} < 22m$  ( $V_{GS} = 4.5V$ )

$R_{DS(ON)} < 26m$  ( $V_{GS} = 2.5V$ )

$R_{DS(ON)} < 34m$  ( $V_{GS} = 1.8V$ )



### Absolute Maximum Ratings $T_a = 25$

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	$V_{DS}$	20	V
Gate-Source Voltage	$V_{GS}$	$\pm 8$	V
Continuous Drain Current *1 $T_A=25$ $T_A=70$	$I_D$	6.5	A
		5.2	
Pulsed Drain Current *2	$I_{DM}$	30	
Power Dissipation *1 $T_A=25$ $T_A=70$	$P_D$	1.4	W
		0.9	
Thermal Resistance.Junction-to-Ambient *1 $t = 10s$	$R_{JA}$	90	/W
Maximum Junction-to-Lead *3	$R_{JL}$	60	/W
Junction and Storage Temperature Range	$T_J, T_{STG}$	-55 to 150	

\*1: The value of  $R_{JA}$  is measured with the device mounted on 1in<sup>2</sup> FR-4 board with 2oz. Copper, in a still air environment with  $T_A = 25^{\circ}C$ . The value in any a given application depends on the user's specific board design. The current rating is based on the  $t = 10s$  thermal resistance rating.

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

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

## KO3416

Electrical Characteristics Ta = 25

Parameter	Symbol	Testconditons	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	V <sub>DSS</sub>	I <sub>D</sub> =250 μA, V <sub>GS</sub> =0V	20			V
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> =16V, V <sub>GS</sub> =0V			1	μA
		V <sub>DS</sub> =16V, V <sub>GS</sub> =0V, T <sub>J</sub> =55			5	
Gate-Body leakage current	I <sub>GSS</sub>	V <sub>DS</sub> =0V, V <sub>GS</sub> =±8V			±10	μA
Gate Threshold Voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> =V <sub>GS</sub> I <sub>D</sub> =250 μA	0.4	0.6	1	V
Static Drain-Source On-Resistance	R <sub>DS(ON)</sub>	V <sub>GS</sub> =4.5V, I <sub>D</sub> =6.5A		18	22	m
		V <sub>GS</sub> =4.5V, I <sub>D</sub> =6.5A T <sub>J</sub> =125		25	30	
		V <sub>GS</sub> =2.5V, I <sub>D</sub> =5.5A		21	26	m
		V <sub>GS</sub> =1.8V, I <sub>D</sub> =5A		26	34	m
On state drain current	I <sub>D(ON)</sub>	V <sub>GS</sub> =4.5V, V <sub>DS</sub> =5V	30			A
Forward Transconductance	g <sub>FS</sub>	V <sub>DS</sub> =5V, I <sub>D</sub> =6.5A		29		S
Input Capacitance	C <sub>iss</sub>	V <sub>GS</sub> =0V, V <sub>DS</sub> =10V, f=1MHz		1160		pF
Output Capacitance	C <sub>oss</sub>			187		pF
Reverse Transfer Capacitance	C <sub>rss</sub>			146		pF
Gate resistance	R <sub>g</sub>		V <sub>GS</sub> =0V, V <sub>DS</sub> =0V, f=1MHz		1.5	
Total Gate Charge	Q <sub>g</sub>	V <sub>GS</sub> =4.5V, V <sub>DS</sub> =10V, I <sub>D</sub> =6.5A		16		nC
Gate Source Charge	Q <sub>gs</sub>			0.8		nC
Gate Drain Charge	Q <sub>gd</sub>			3.8		nC
Turn-On DelayTime	t <sub>D(on)</sub>		V <sub>GS</sub> =5V, V <sub>DS</sub> =10V, R <sub>L</sub> =1.5 Ω, R <sub>GEN</sub> =3 Ω		6.2	
Turn-On Rise Time	t <sub>r</sub>			12.7		ns
Turn-Off DelayTime	t <sub>D(off)</sub>			51.7		ns
Turn-Off Fall Time	t <sub>f</sub>			16		ns
Body Diode Reverse Recovery Time	t <sub>rr</sub>	I <sub>F</sub> =6.5A, di/dt=100A/μs			17.7	
Body Diode Reverse Recovery Charge	Q <sub>rr</sub>	I <sub>F</sub> =6.5A, di/dt=100A/μs		6.7		nC
Maximum Body-Diode Continuous Current	I <sub>S</sub>				2.5	A
Diode Forward Voltage	V <sub>SD</sub>	I <sub>S</sub> =1A, V <sub>GS</sub> =0V		0.76	1	V

## Marking

Marking	A08K
---------	------

# KO3416

## Typical Characteristics

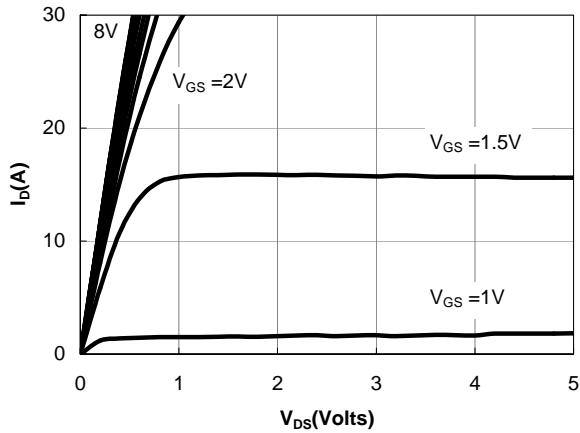


Figure 1: On-Regions Characteristics

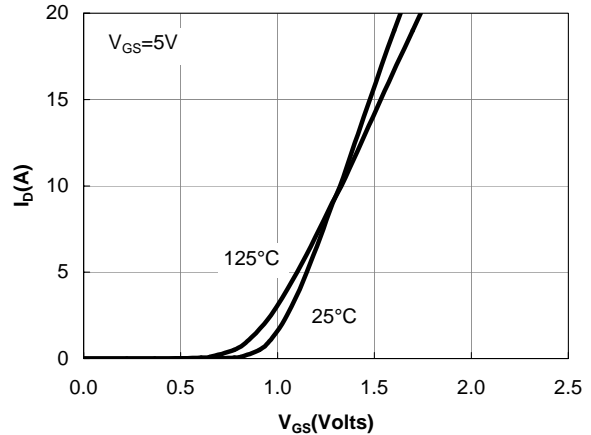


Figure 2: Transfer Characteristics

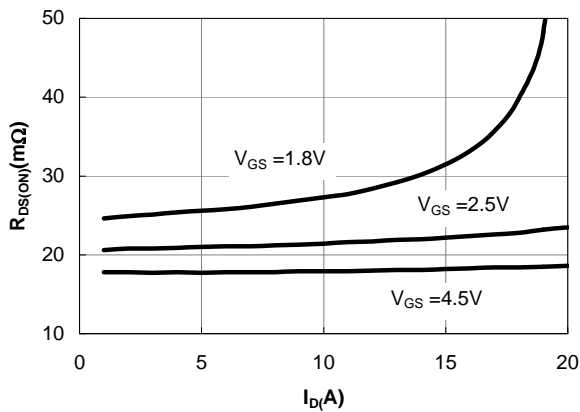


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

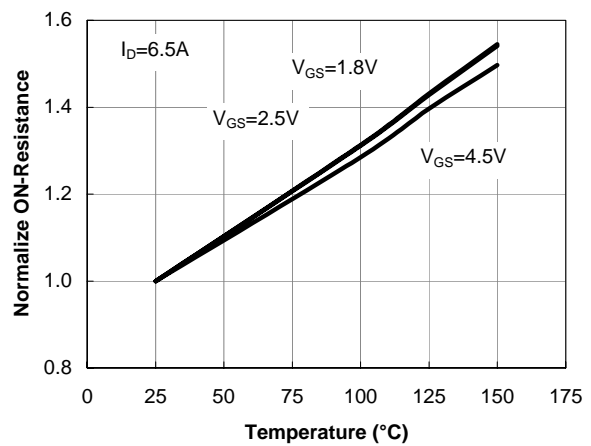


Figure 4: On-Resistance vs. Junction Temperature

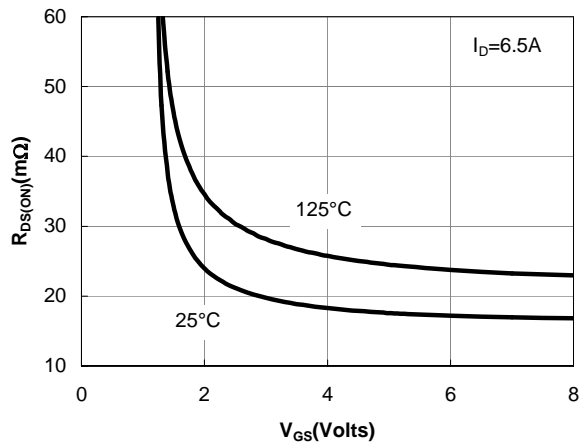


Figure 5: On-Resistance vs. Gate-Source Voltage

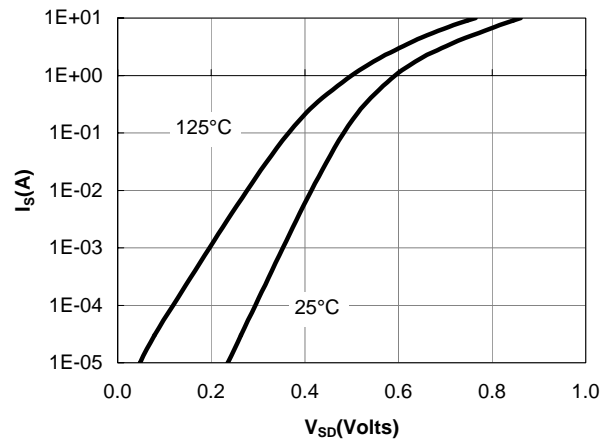


Figure 6: Body-Diode Characteristics

# KO3416

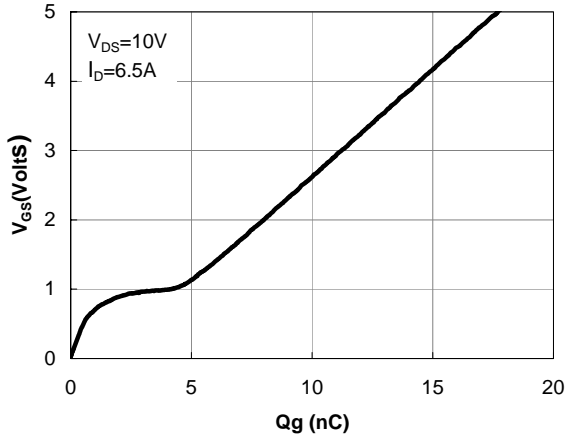


Figure 7: Gate-Charge Characteristics

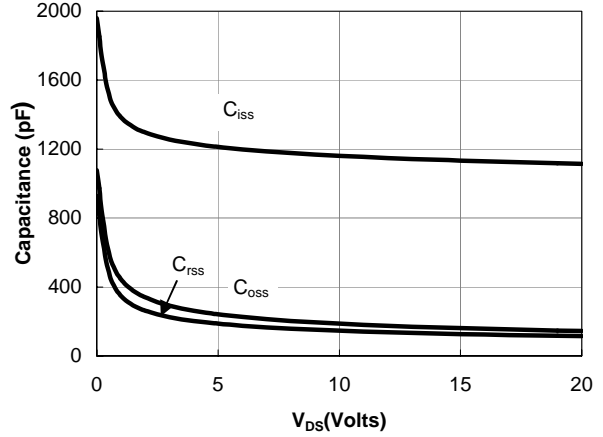


Figure 8: Capacitance Characteristics

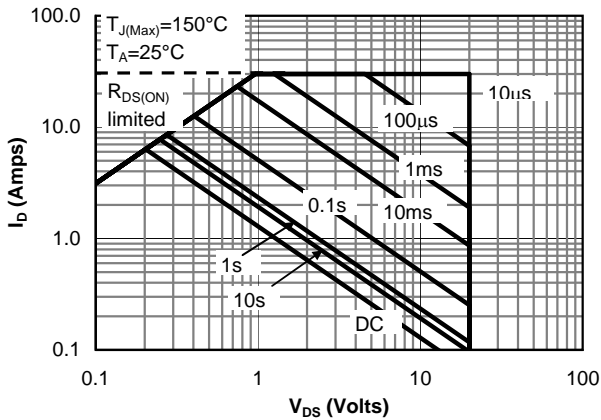


Figure 9: Maximum Forward Biased Safe Operating Area (Note E)

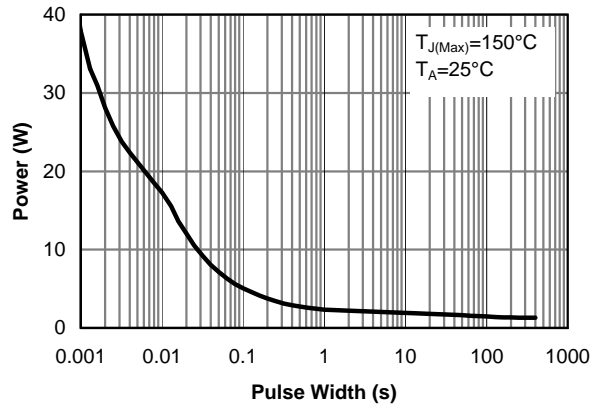


Figure 10: Single Pulse Power Rating Junction-to-Ambient (Note E)

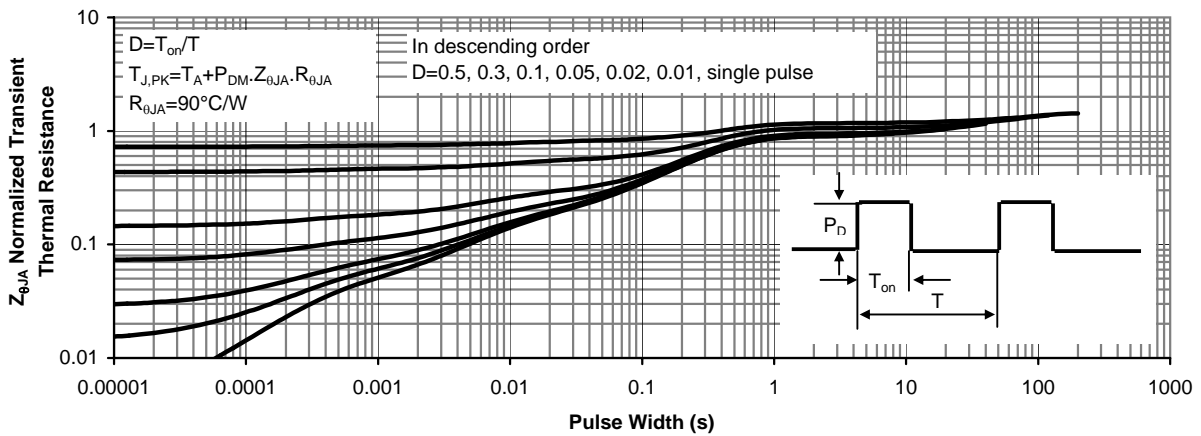


Figure 11: Normalized Maximum Transient Thermal Impedance