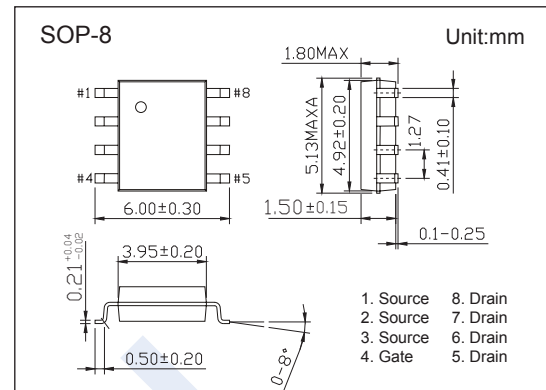
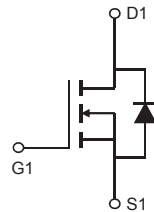


## N-Channel Enhancement MOSFET

### 2KK7104

#### ■ Features

- $V_{DS} (V) = 150V$
- $I_D = 2.8 A (V_{GS} = 10V)$
- $R_{DS(ON)} < 285m\Omega (V_{GS} = 10V)$
- $R_{DS(ON)} < 305m\Omega (V_{GS} = 6V)$



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

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	$V_{DS}$	150	V
Gate-Source Voltage	$V_{GS}$	$\pm 20$	
Continuous Drain Current	$I_D$	$T_a = 25^\circ C$ (Note.1)	2.8
			12
Power Dissipation	$P_D$	$T_a = 25^\circ C$ (Note.1)	2.2
		$T_a = 25^\circ C$ (Note.2)	1.0
Single Pulsed Avalanche Energy (Note.3)	$E_{AS}$	12	mJ
Thermal Resistance.Junction- to-Ambient	$R_{thJA}$	55	$^\circ C/W$
Thermal Resistance.Junction- to-Case	$R_{thJC}$	12	
Junction Temperature	$T_J$	150	$^\circ C$
Storage Temperature Range	$T_{stg}$	-55 to 150	

Note1:  $55^\circ C/W$  when mounted on a 1 in 2 pad of 2 oz copper

Note2:  $118^\circ C/W$  when mounted on a minimum pad of 2 oz copper

Note3: Starting  $T_J = 25^\circ C$ ; N-ch:  $L = 1 mH$ ,  $I_{AS} = 5 A$ ,  $V_{DD} = 135 V$ ,  $V_{GS} = 10 V$ .

## N-Channel Enhancement MOSFET

### 2KK7104

#### ■ 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	150			V
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> =120V, V <sub>GS</sub> =0V			1	μA
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> =250 μA	2.0	3.1	4.0	V
Static Drain-Source On-Resistance	R <sub>DS(on)</sub>	V <sub>GS</sub> =10V, I <sub>D</sub> =2.8A			285	mΩ
		V <sub>GS</sub> =6V, I <sub>D</sub> =2.4A			305	
		V <sub>GS</sub> =10V, I <sub>D</sub> =2.8A, T <sub>j</sub> = 125°C			320	
Forward Transconductance	g <sub>FS</sub>	V <sub>DS</sub> =10V, I <sub>D</sub> =2.8A		4		S
Input Capacitance	C <sub>iss</sub>	V <sub>GS</sub> =0V, V <sub>DS</sub> =75V, f=1MHz		295	395	pF
Output Capacitance	C <sub>oss</sub>			33	45	
Reverse Transfer Capacitance	C <sub>rss</sub>			2.4	5	
Gate Resistance	R <sub>g</sub>			1		Ω
Total Gate Charge	Q <sub>g</sub>	V <sub>GS</sub> =0 to 10V, V <sub>DS</sub> =75V, I <sub>D</sub> =2.8A		4.9	7	nC
		V <sub>GS</sub> =0 to 5V, V <sub>DS</sub> =75V, I <sub>D</sub> =2.8A		2.8	4	
Gate Source Charge	Q <sub>gs</sub>	V <sub>DS</sub> =75V, I <sub>D</sub> =2.8A		1.4		nC
Gate Drain Charge	Q <sub>gd</sub>			1.3		
Turn-On DelayTime	t <sub>d(on)</sub>	I <sub>D</sub> =2.8A, V <sub>DS</sub> =75V, R <sub>GEN</sub> =6Ω, V <sub>DS</sub> =10V		5.3	11	ns
Turn-On Rise Time	t <sub>r</sub>			1.3	10	
Turn-Off DelayTime	t <sub>d(off)</sub>			9.8	20	
Turn-Off Fall Time	t <sub>f</sub>			2.4	10	
Body Diode Reverse Recovery Time	t <sub>rr</sub>			48	77	
Body Diode Reverse Recovery Charge	Q <sub>rr</sub>	I <sub>F</sub> = 2.8A, di/dt= 100A/μs V <sub>GS</sub> =0V		44	70	uC
Maximum Body-Diode Continuous Current	I <sub>S</sub>				2.8	A
Diode Forward Voltage	V <sub>SD</sub>	I <sub>S</sub> =2.8A, V <sub>GS</sub> =0V (Note.1)		0.82	1.3	V

Note.1: .Pulse Test:Pulse width≤300us,Duty cycle≤2%

#### ■ Marking

Marking	K7104 KC****
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## N-Channel Enhancement MOSFET 2KK7104

■ Typical Characteristics

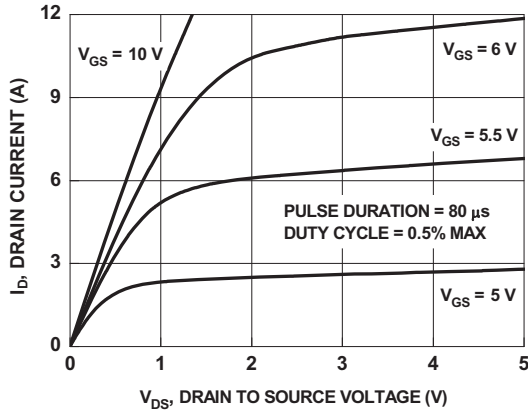


Figure 1. On Region Characteristics

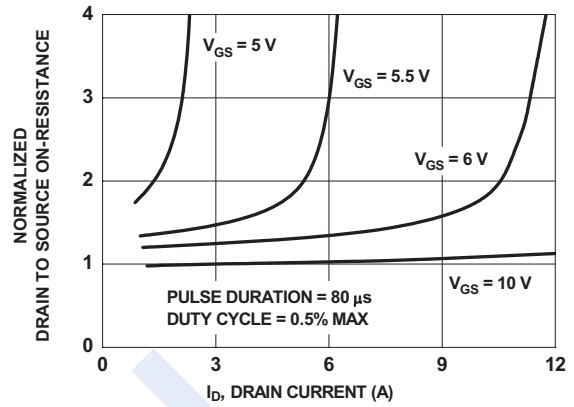


Figure 2. Normalized On-Resistance vs Drain Current and Gate Voltage

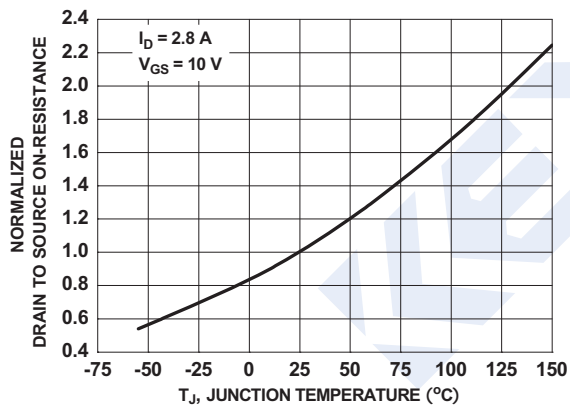


Figure 3. Normalized On Resistance vs Junction Temperature

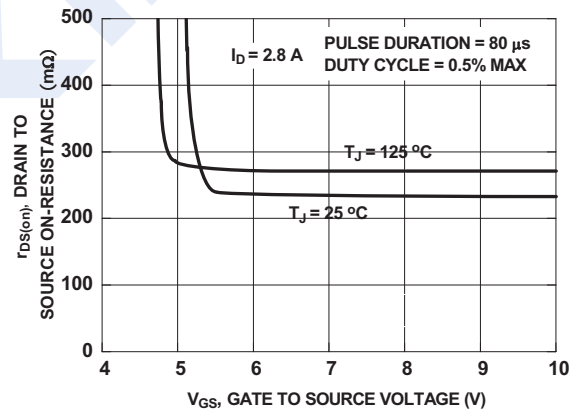


Figure 4. On-Resistance vs Gate to Source Voltage

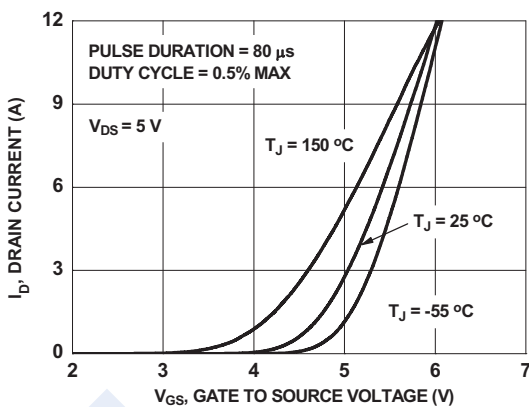


Figure 5. Transfer Characteristics

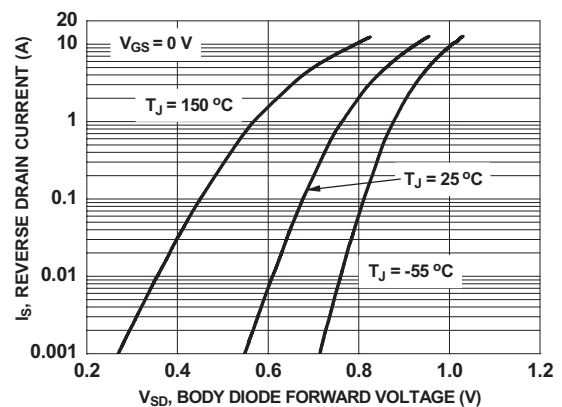


Figure 6. Source to Drain Diode Forward Voltage vs Source Current

## N-Channel Enhancement MOSFET 2KK7104

■ Typical Characteristics

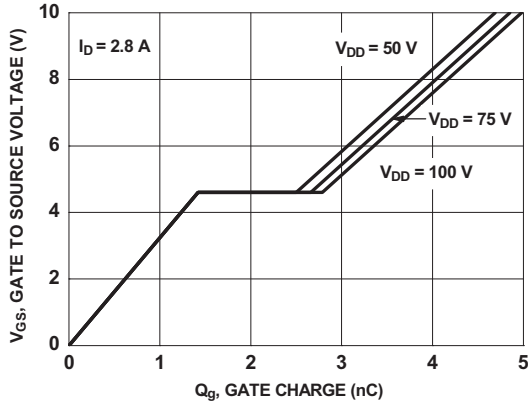


Figure 7. Gate Charge Characteristics

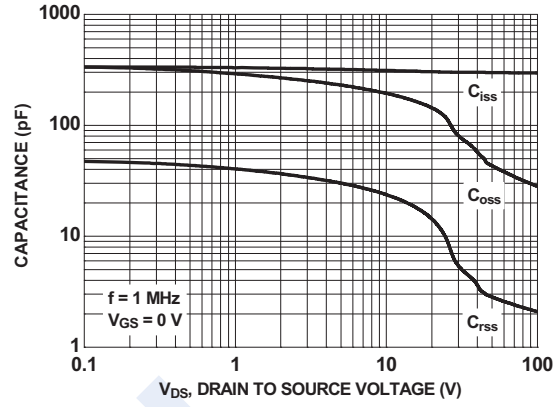


Figure 8. Capacitance vs Drain to Source Voltage

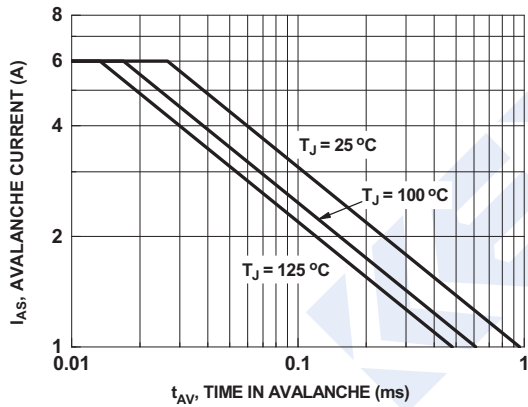


Figure 9. Unclamped Inductive Switching Capability

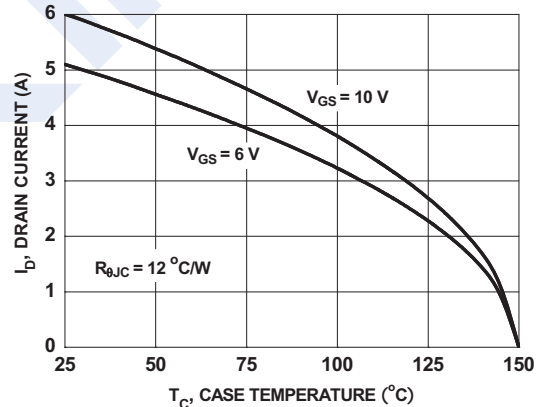
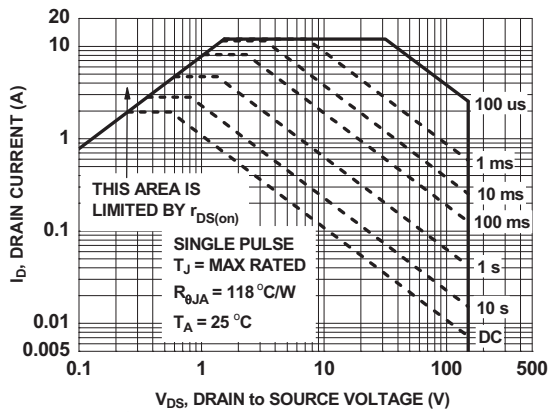


Figure 10. Current vs Case Temperature



Operating Area

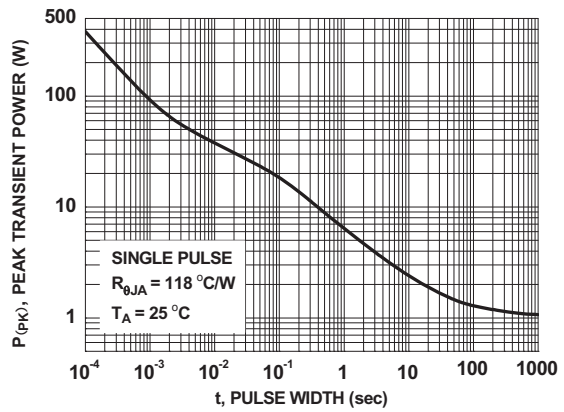


Figure 12. Single Pulse Maximum Power Dissipation

## N-Channel Enhancement MOSFET

### 2KK7104

#### ■ Typical Characteristics

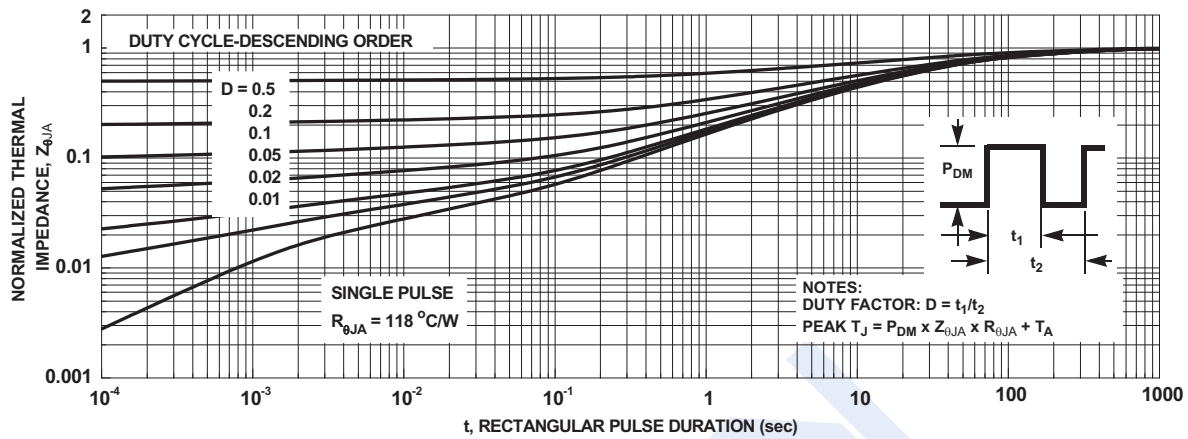


Figure 13. Junction-to-Ambient Transient Thermal Response Curve