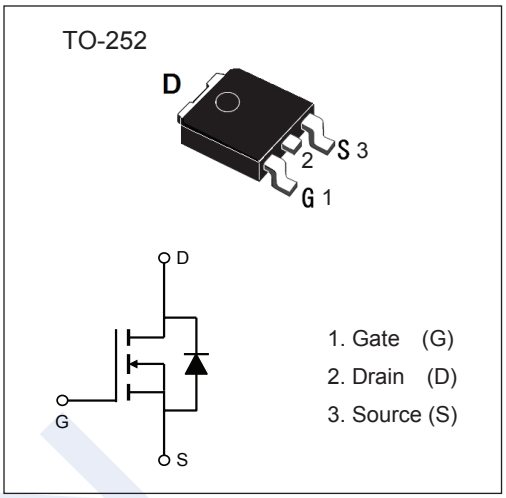
N-Channel MOSFET

2KK5103



■ Features

- V_{DS} = 700 V
- I_D = 7 A
- $R_{DS(ON)}$ (at V_{GS} = 10 V) < 0.6 Ω
- Q_g(typ.) = 13 nC
- 100% avalanche tested

■ Absolute Maximum Ratings (T_C = 25℃ unless otherwise noted)

Parameter		Symbol	Rating	Unit
Drain-Source Voltage		V_{DS}	700	V
Gate-Source Voltage		V_{GS}	±30	
Continuous Drain Current	T_C = 25℃	I_D	7	A
	T_C = 100℃		4.2	
Pulsed Drain Current (Note 1)		I_{DM}	21	
Single Pulse Avalanche Energy (Note 2)		E_{AS}	142	mJ
Repetitive Avalanche Energy (Note 2)		E_{AR}	0.21	
Avalanche Current		I_{AR}	1.3	A
Continuous Body Diode Current		I_S	6	
Pulsed Diode Forward Current (Note 1)		I_{SM}	21	
Thermal Resistance, Junction- to-Ambient		$R_{\theta JA}$	62	℃/W
Thermal Resistance, Junction- to-Case		$R_{\theta JC}$	2.0	
Power Dissipation		P_D	150	W
Junction Temperature		T_J	150	℃
Storage Temperature Range		T_{stg}	-55 to 150	

Notes:

1. Repetitive Rating: Pulse width limited by maximum junction temperature
2. I_{AS} = 2.4A, V_{DD} = 50V, R_G = 25Ω, Starting T_J = 25°C

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■ Electrical Characteristics (T_J = 25℃ unless othewise specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Static Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	I_D = 250 μA, V_{GS} = 0V	700			V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 700 V, V_{GS} = 0 V			1	μA
		V_{DS} = 700 V, V_{GS} = 0 V, T_J=150℃			100	
Gate to Source Leakage Current	I_{GSS}	V_{DS} = 0 V, V_{GS} = ±30 V			±100	nA
Gate to Source Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS} , I_D = 250μA	2.5		4.0	V
Static Drain-Source On-Resistance	$R_{DS(ON)}$	V_{GS} = 10 V, I_D = 3.5 A		0.53	0.6	Ω
Gate resistance	R_G	f = 1.0MHz open drain		7		
Dynamic Characteristics						
Input Capacitance	C_{iss}	V_{GS} = 0 V, V_{DS} = 100 V, f = 1 MHz		509		pF
Output Capacitance	C_{oss}			23		
Reverse Transfer Capacitance	C_{rss}			1.5		
Total Gate Charge	Q_g	V_{GS} = 10V, V_{DD} = 520 V, I_D = 7 A		13		nC
Gate Source Charge	Q_{gs}			2.8		
Gate Drain Charge	Q_{gd}			5.6		
Turn-On DelayTime	$t_{d(on)}$	V_{DD} = 400 V, I_D = 7A, R_{GEN} = 25 Ω		55		ns
Turn-On Rise Time	t_r			61		
Turn-Off DelayTime	$t_{d(off)}$			117		
Turn-Off Fall Time	t_f			42		
Drain-Source Diode Characteristics						
Body Diode Reverse Recovery Time	t_{rr}	I_F = 7A, dI/dt = 100 A/μs, V_R = 400V		321		ns
Body Diode Reverse Recovery Charge	Q_{rr}			3.4		nC
Diode Forward Voltage	V_{SD}	V_{GS} = 0 V, I_S = 3.5 A		0.9	1.2	V

■ Marking

Marking	K5103 KC***

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Figure 1. Output Characteristics

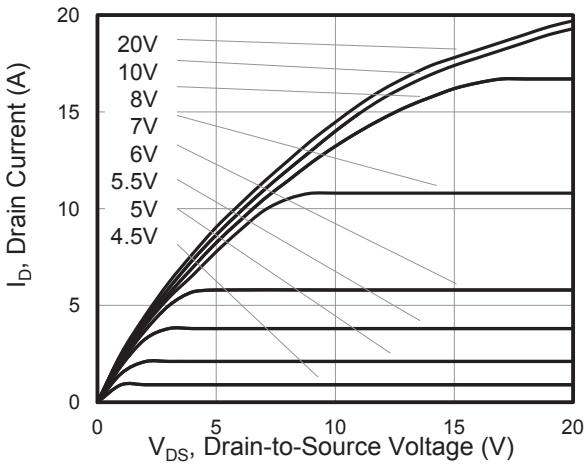

Figure 2. Transfer Characteristics

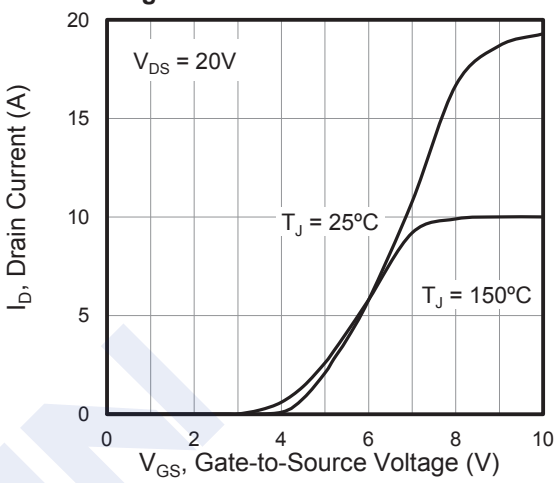

Figure 3. On-Resistance vs. Drain Current

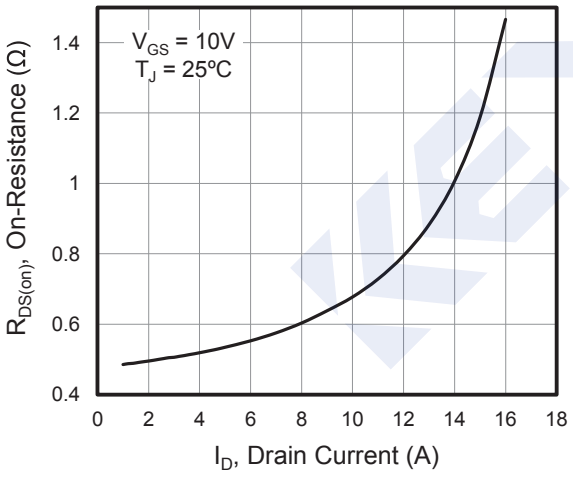

Figure 4. Capacitance

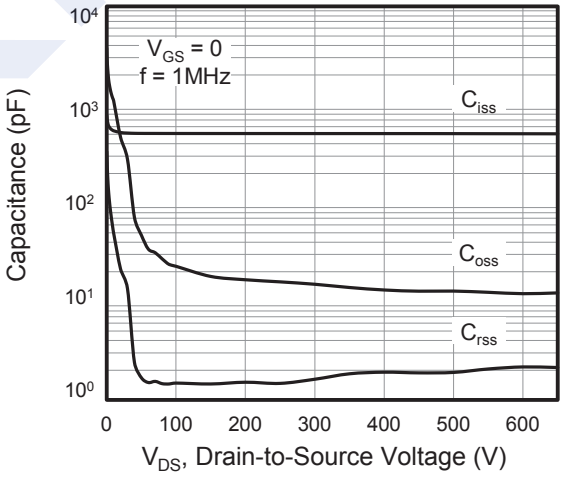

Figure 5. Gate Charge

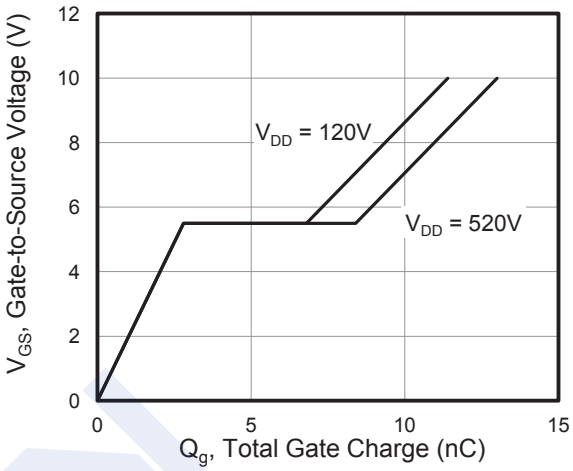

Figure 6. Body Diode Forward Voltage

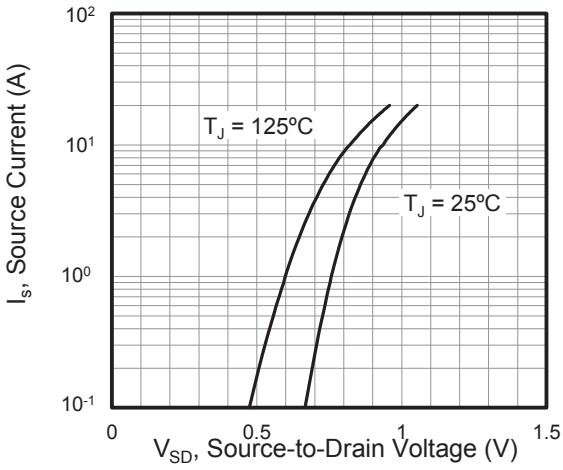

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Figure 7. On-Resistance vs. Junction Temperature

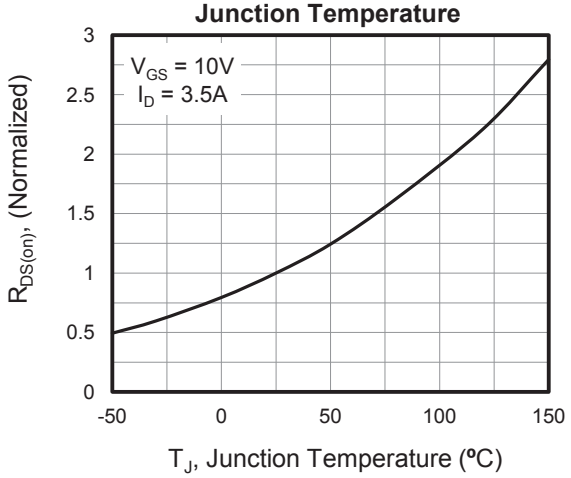

Figure 8.Breakdown voltage vs. Junction Temperature

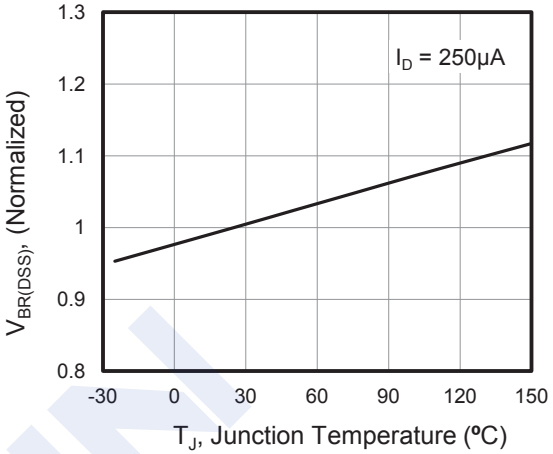

Figure 9. Transient Thermal Impedance TO-252

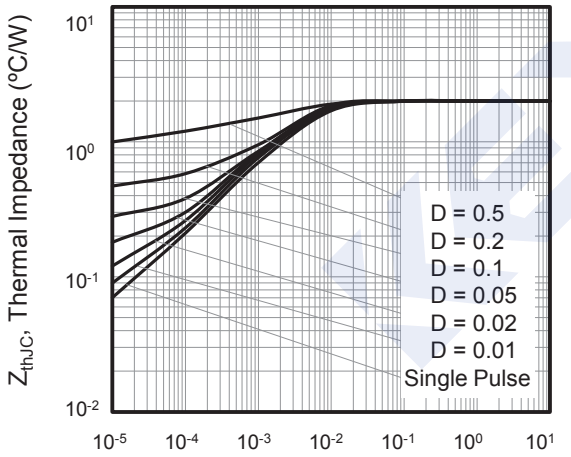

Figure 10. Safe operation area for TO-252

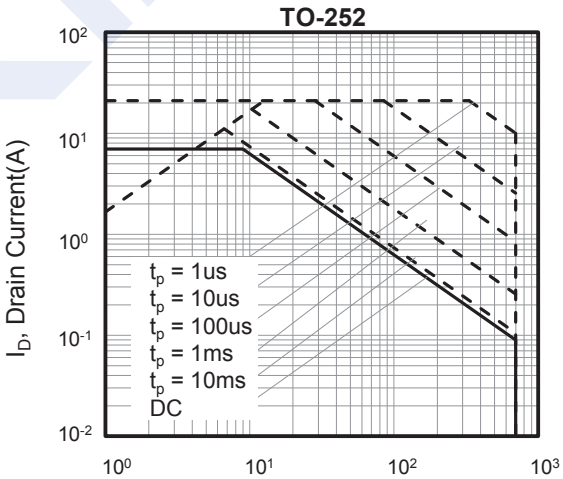

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Figure A：Gate Charge Test Circuit and Waveform

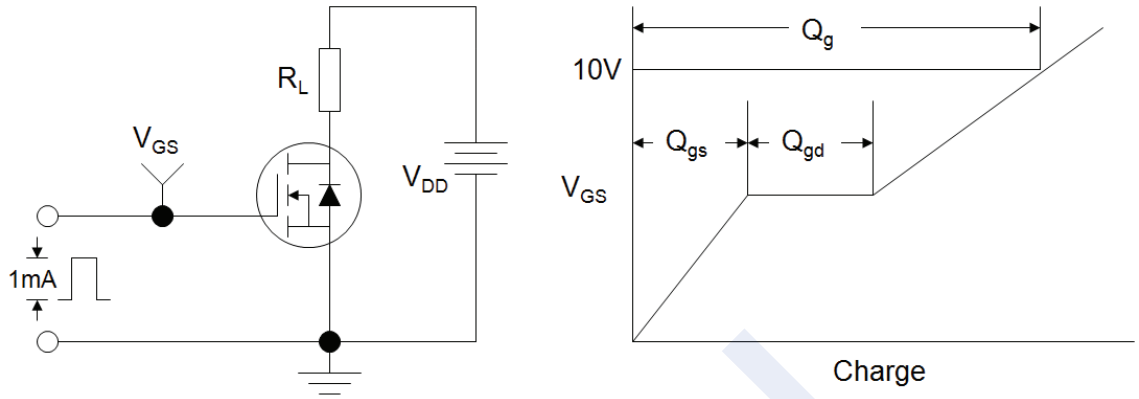


Figure B：Resistive Switching Test Circuit and Waveform

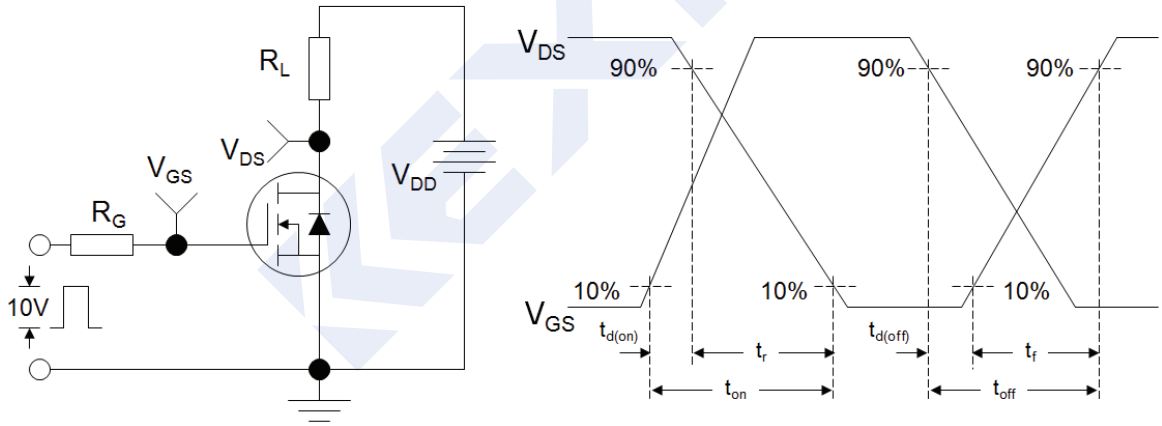
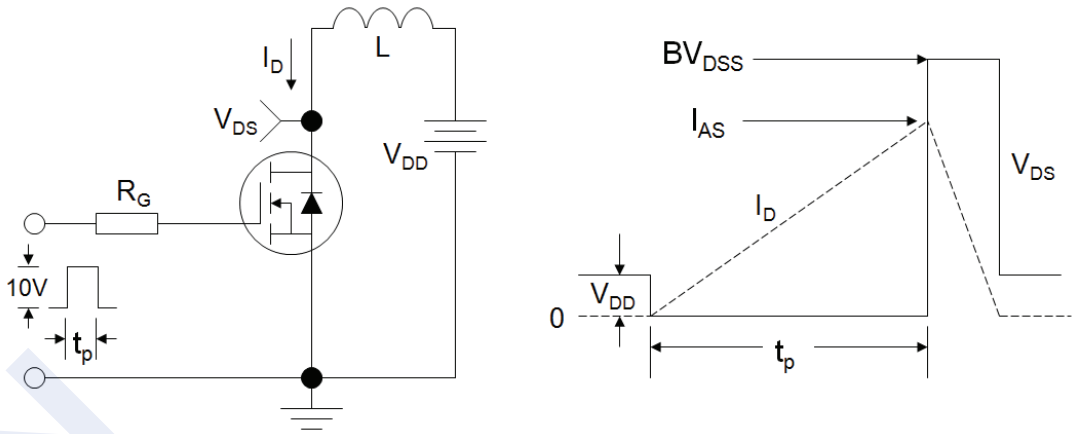


Figure C：Unclamped Inductive Switching Test Circuit and Waveform



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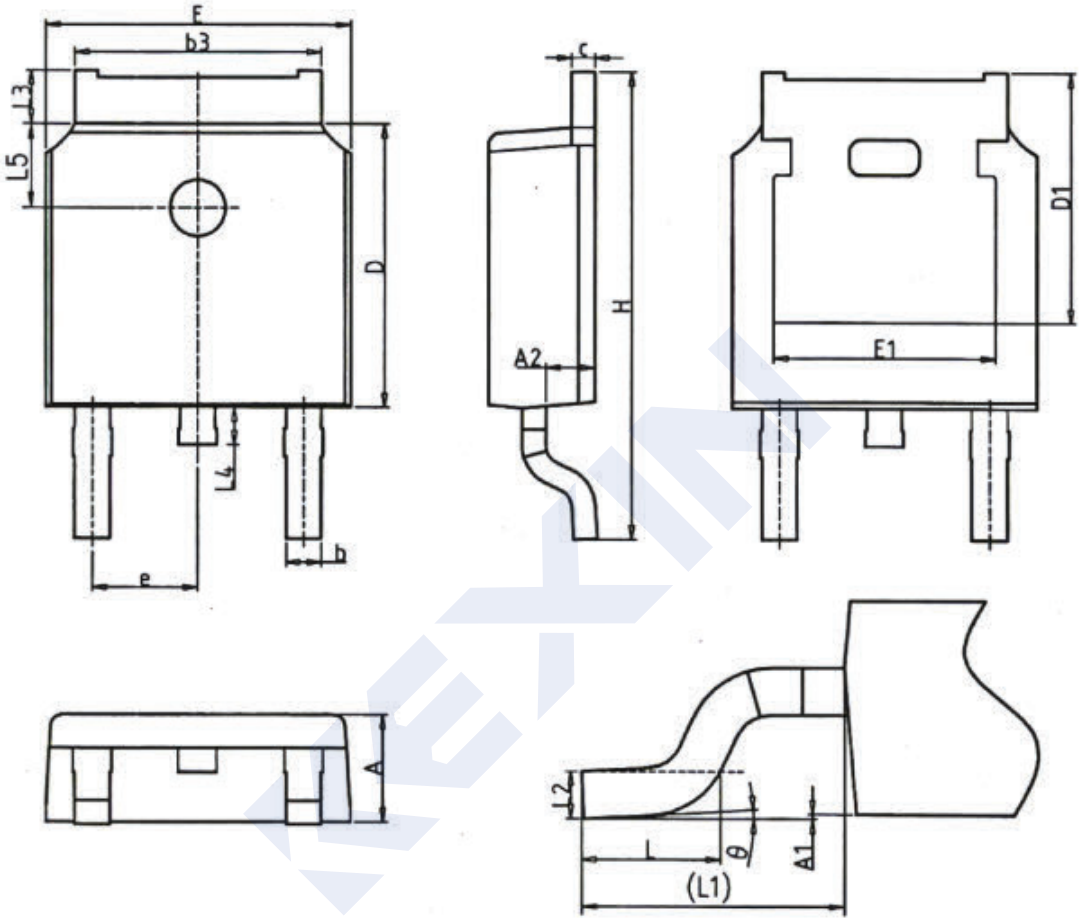
■ Package Dimension

TO-252

Units: mm



Unit:mm			
Symbol	Min.	Nom	Max.
A	2.20	2.30	2.40
A1	0.00	-	0.20
A2	0.97	1.07	1.17
b	0.68	0.78	0.90
b3	5.20	5.33	5.50
c	0.43	0.53	0.63
D	5.98	6.10	6.22
D1	5.30 REF		
E	6.40	6.60	6.80
E1	4.63	-	-

Unit:mm			
Symbol	Min.	Nom	Max.
e	2.286 BSC		
H	9.40	10.10	10.50
L	1.38	1.50	1.75
L1	2.90 REF		
L2	0.51 BSC		
L3	0.88	-	1.28
L4	-	-	1.00
L5	1.65	1.80	1.95
θ	0°	-	8°