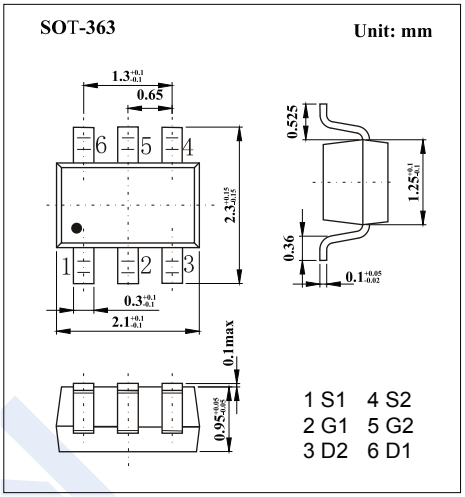
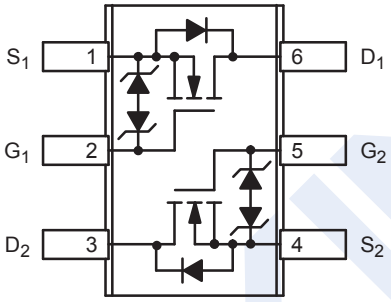
Dual N-channel MOSFET

2KK5101

■ Features

- BV_{DSS} = 20 V
- I_D = 0.9 A @ V_{GS} = 4.5 V
- $R_{DS(ON)}$ < 300 mΩ@ V_{GS} = 4.5 V
- $R_{DS(ON)}$ < 350 mΩ@ V_{GS} = 2.5 V
- $R_{DS(ON)}$ < 450 mΩ@ V_{GS} = 1.8 V
- ESD Protected Gate





■ Absolute Maximum Ratings (T_A = 25℃ unless otherwise stated)

Parameter		Symbol	Rating	Unit
Drain-Source Voltage		V_{DS}	20	V
Gate-Source Voltage		V_{GS}	±8	
Continuous Drain Current (Note 1)	T_A=25℃	I_D	0.9	A
	T_A=70℃		0.7	
Pulsed Drain Current (Note 2)		I_{DM}	5	
Thermal Resistance, Junction- to-Ambient (Note 1)		$R_{\theta JA}$	190	℃/W
Thermal Resistance, Junction- to-Lead (Note 3)		$R_{\theta JL}$	150	
Power Dissipation (Note 1)	T_A=25℃	P_D	0.9	W
	T_A=70℃		0.6	
Junction Temperature		T_J	150	℃
Storage Temperature Range		T_{stg}	-55 to 150	

Notes:

1. The value of $R_{\theta JA}$ is measured with the device mounted on 1in ^{2} FR-4 board with 2oz. Copper, in a still air environment with T_A =25°C. The value in any 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 $R_{\theta JA}$ is the sum of the thermal impedence from junction to lead $R_{\theta JL}$ and lead to ambient.

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

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
OFF Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	I_D = 250 μA, V_{GS} = 0V	20			V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 16 V, V_{GS} = 0 V			1	μA
		V_{DS} = 16 V, V_{GS} = 0 V, T_J=55℃			5	
Gate to Source Leakage Current	I_{GSS}	V_{DS} = 0 V, V_{GS} = ± 8 V			±25	
ON Characteristics						
Gate to Source Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS} , I_D = 250μA	0.5		0.9	V
Static Drain-Source On-Resistance	$R_{DS(ON)}$	V_{GS} = 4.5 V, I_D = 0.9 A			300	mΩ
		V_{GS} = 4.5 V, I_D = 0.9 A, T_J=125℃			350	
		V_{GS} = 2.5 V, I_D = 0.75 A			350	
		V_{GS} = 1.8 V, I_D = 0.7 A			450	
Forward Transconductance	g_{FS}	V_{DS} = 5V , I_D = 0.8 A		2.6		S
Charges and Capacitances						
Input Capacitance	C_{iss}	V_{GS} = 0 V, V_{DS} = 10 V, f = 1 MHz		101	120	pF
Output Capacitance	C_{oss}			17		
Reverse Transfer Capacitance	C_{rss}			14		
Gate resistance	R_g	V_{GS}=0V, V_{DS}=0V, f=1MHz		3	4	Ω
Total Gate Charge	Q_g	V_{GS} = 4.5 V, V_{DS} = 10 V, I_D = 0.8 A		1.57	1.9	nC
Gate Source Charge	Q_{gs}			0.13		
Gate Drain Charge	Q_{gd}			0.36		
Switching Characteristics						
Turn-On DelayTime	$t_{d(on)}$	V_{GS} = 5 V, V_{DS} = 10 V, R_L = 12.5 Ω, R_{GEN} = 6 Ω		3.2		ns
Turn-On Rise Time	t_r			4		
Turn-Off DelayTime	$t_{d(off)}$			15.5		
Turn-Off Fall Time	t_f			2.4		
Drain-Source Diode Characteristics						
Reverse Recovery Time	t_{rr}	I_F=0.8A, dI/dt=100A/μs		6.7	8.1	ns
Reverse Recovery Charge	Q_{rr}			1.6		nC
Diode Forward Voltage	V_{SD}	V_{GS} = 0 V, I_S = 0.5 A		0.8	1.2	V
Maximum Continuous Current	I_S				0.4	A

Notes:

4. The static characteristics in Figures 1 to 6 are obtained using 80 μs pulses, duty cycle 0.5% max.
5. These tests are performed with the device mounted on 1 in ^{2} FR-4 board with 2oz. Copper, in a still air environment with T_A=25°C. The SOA curve provides a single pulse rating.

■ Marking

Marking	KDW

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■ Typical Electrical and Thermal Characteristics

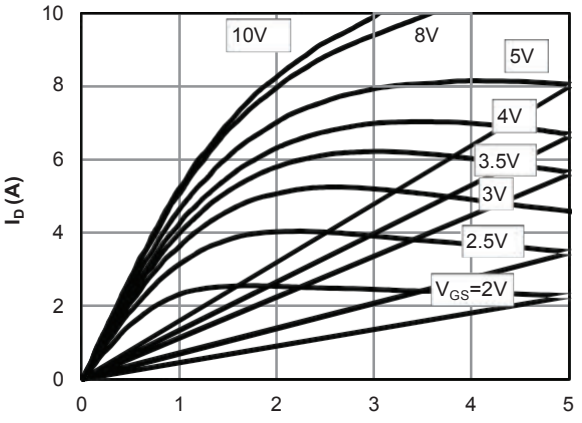

Fig 1: On-Region Characteristics

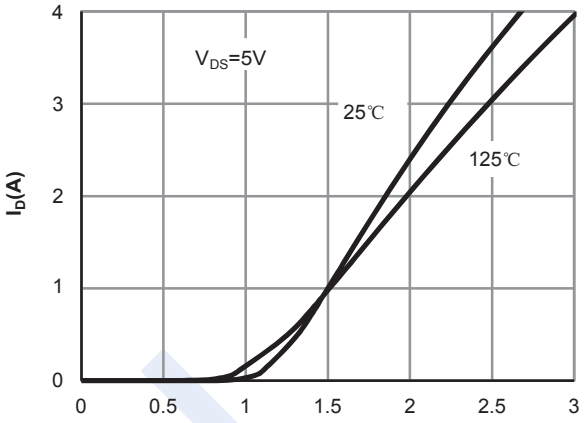

Figure 2: Transfer Characteristics

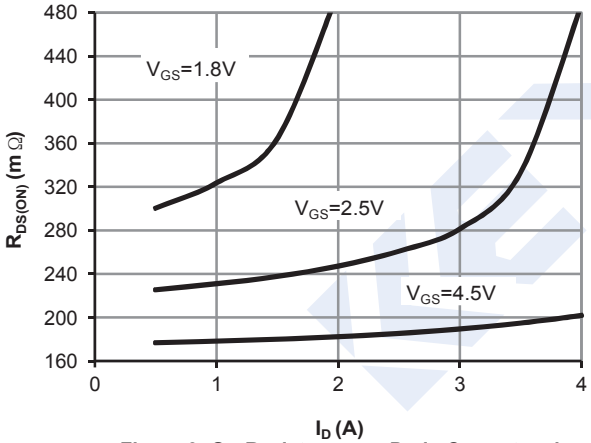

Figure 3: On-Resistance vs. Drain Current and Gate Voltage

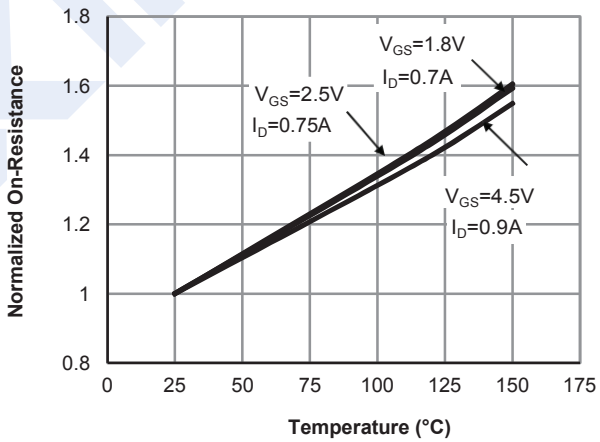

Figure 4: On-Resistance vs. Junction Temperature

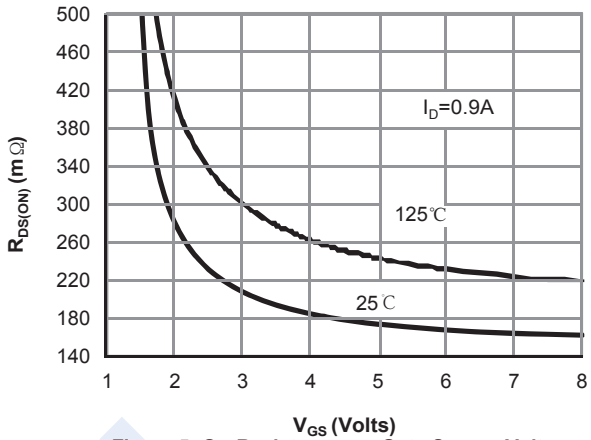

Figure 5: On-Resistance vs. Gate-Source Voltage

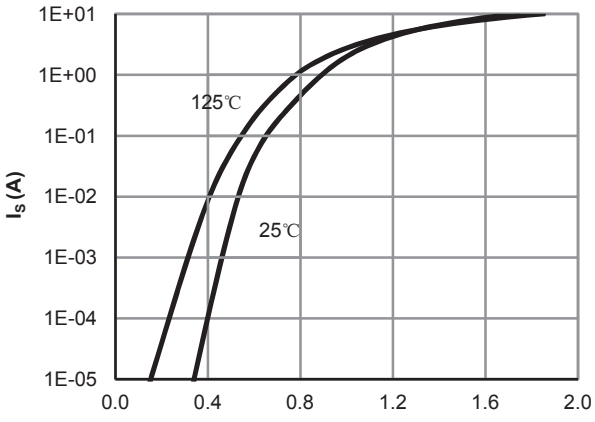

Figure 6: Body-Diode Characteristics

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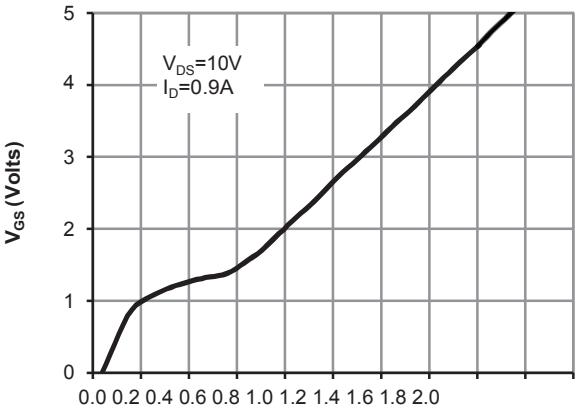

Figure 7: Gate-Charge Characteristics

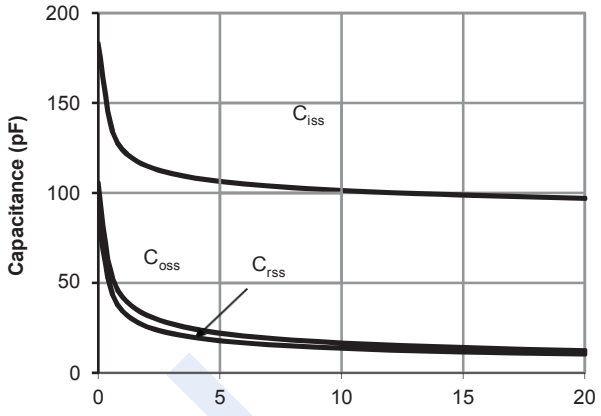

Figure 8: Capacitance Characteristics

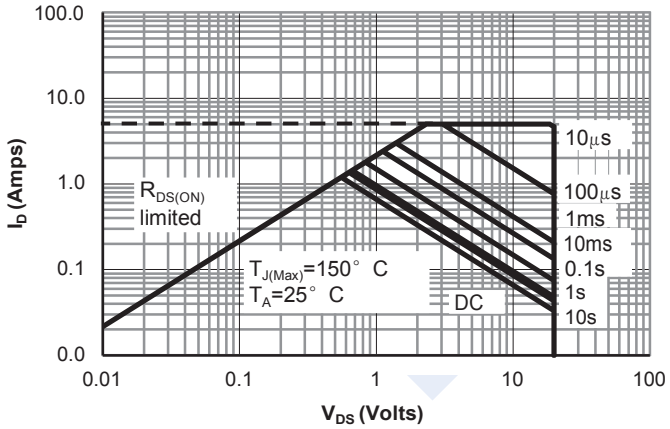

Figure 9: Maximum Forward Biased Safe Operating Area (Note 5)

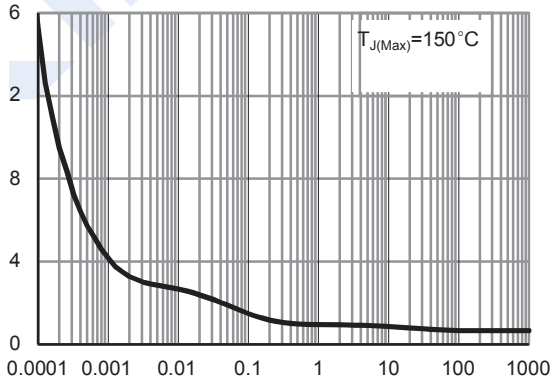

Figure 10: Single Pulse Power Rating Junction-to-Ambient (Note 5)

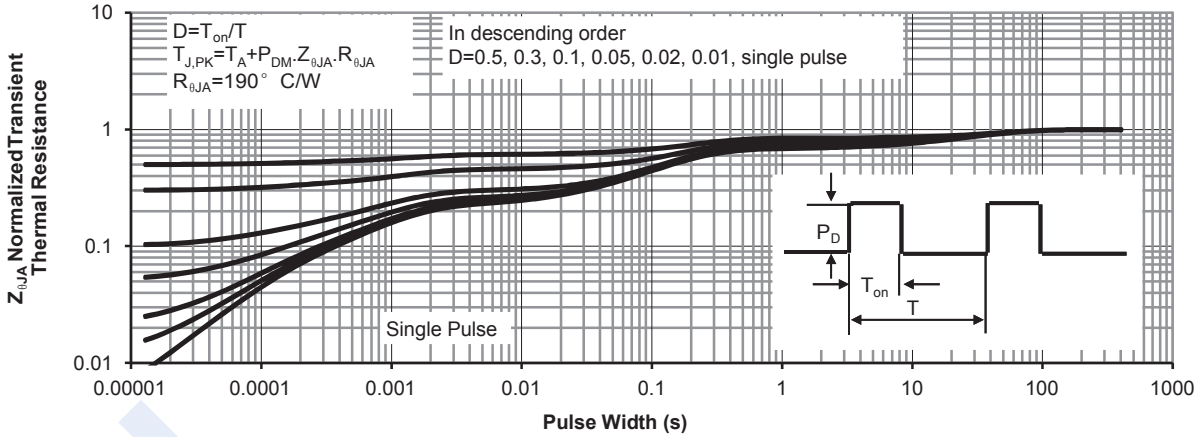

Figure 11: Normalized Maximum Transient Thermal Impedance