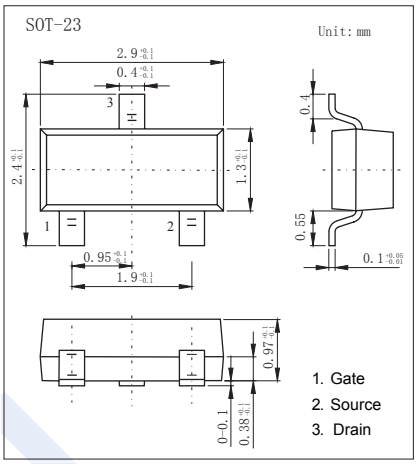
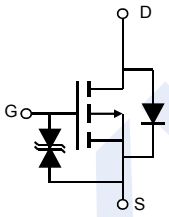
P-Channel MOSFET

KI3415P



■ Features

- $V_{DS\,(V)}$ =-20V
- I_D =-4A (V_{GS} =-4.5V)
- $R_{DS(ON)}$ < 40mΩ (V_{GS} =-4.5V)
- $R_{DS(ON)}$ < 60mΩ (V_{GS} =-2.5V)
- $R_{DS(ON)}$ < 100mΩ (V_{GS} =-1.8V)
- ESD Rating: 2000V HBM



■ Absolute Maximum Ratings Ta = 25℃

Parameter		Symbol	Rating	Unit
Drain-Source Voltage		V_{DS}	-20	V
Gate-Source Voltage		V_{GS}	±10	
Continuous Drain Current	Ta = 25℃	I_D	-4	A
	Ta = 70℃		-3.5	
Pulsed Drain Current		I_{DM}	-30	
Power Dissipation (Note.1)	Ta = 25℃	P_D	1.5	W
	Ta = 70℃		1	
Thermal Resistance.Junction- to-Ambient	t≤ 10s	R_{thJA}	80	℃/W
	Steady-State		100	
Thermal Resistance.Junction- to-Lead		R_{thJL}	52	
Junction Temperature		T_J	150	℃
Junction Storage Temperature Range		T_{stg}	-55 to 150	

Note.1: The power dissipation P_D is based on $T_{J(MAX)}$=150°C, using ≤ 10s junction-to-ambient thermal resistance.

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■ Electrical Characteristics Ta = 25℃

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	V_{DSS}	I_D=-250μA, V_{GS}=0V	-20			V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=-20V, V_{GS}=0V			-1	μA
		V_{DS}=-20V, V_{GS}=0V, T_J=55℃			-5	
Gate-Body leakage current	I_{GSS}	V_{DS}=0V, V_{GS}=±10V			±10	uA
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS} I_D=-250μA	-0.5		-1.0	V
Static Drain-Source On-Resistance	$R_{DS(ON)}$	V_{GS}=-4.5V, I_D=-4A			40	mΩ
		V_{GS}=-4.5V, I_D=-4A T_J=125℃			62	
		V_{GS}=-2.5V, I_D=-4A			60	
		V_{GS}=-1.8V, I_D=-2A			100	
On state drain current	$I_{D(ON)}$	V_{GS}=-4.5V, V_{DS}=-5V	-30			A
Forward Transconductance	g_{FS}	V_{DS}=-5V, I_D=-4A		20		S
Input Capacitance	C_{iss}	V_{GS}=0V, V_{DS}=-10V, f=1MHz		1450		pF
Output Capacitance	C_{oss}			205		
Reverse Transfer Capacitance	C_{rss}			160		
Gate resistance	R_g	V_{GS}=0V, V_{DS}=0V, f=1MHz		6.5		Ω
Total Gate Charge	Q_g	V_{GS}=-4.5V, V_{DS}=-10V, I_D=-4A		17.2		nC
Gate Source Charge	Q_{gs}			1.3		
Gate Drain Charge	Q_{gd}			4.5		
Turn-On DelayTime	$t_{d(on)}$	V_{GS}=-4.5V, V_{DS}=-10V, R_L=2.5Ω, R_{GEN}=3Ω		9.5		ns
Turn-On Rise Time	t_r			17		
Turn-Off DelayTime	$t_{d(off)}$			94		
Turn-Off Fall Time	t_f			35		
Body Diode Reverse Recovery Time	t_{rr}	I_F=-4A, dI/dt=100A/μs		31		
Body Diode Reverse Recovery Charge	Q_{rr}			13.8		nC
Maximum Body-Diode Continuous Current	I_S				-2.2	A
Diode Forward Voltage	V_{SD}	I_S=-1A,V_{GS}=0V		-0.78	-1	V

■ Marking

Marking	3415T.

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■ Typical Characterisitics

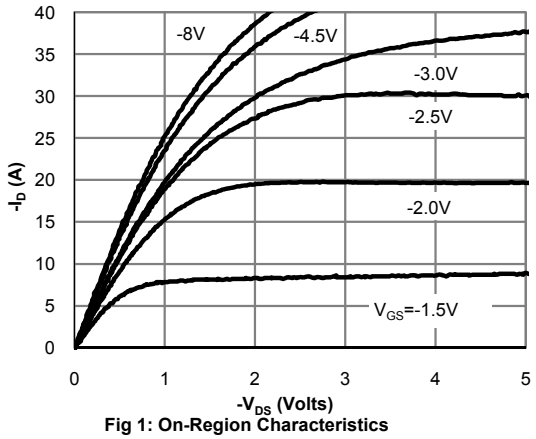

Fig 1: On-Region Characteristics

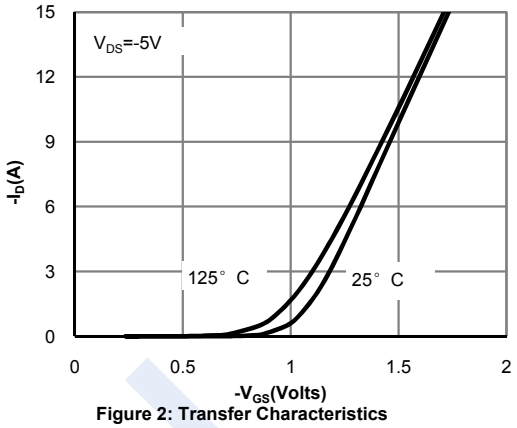

Figure 2: Transfer Characteristics

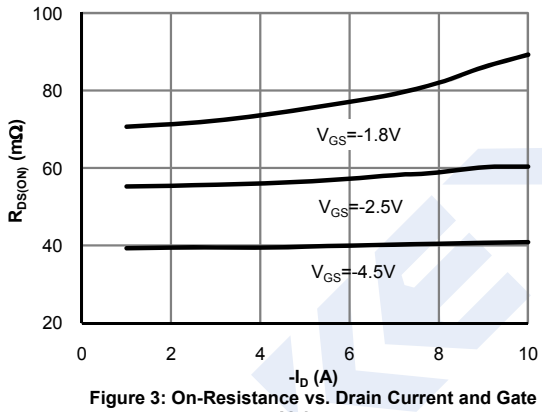

Figure 3: On-Resistance vs. Drain Current and Gate Voltage

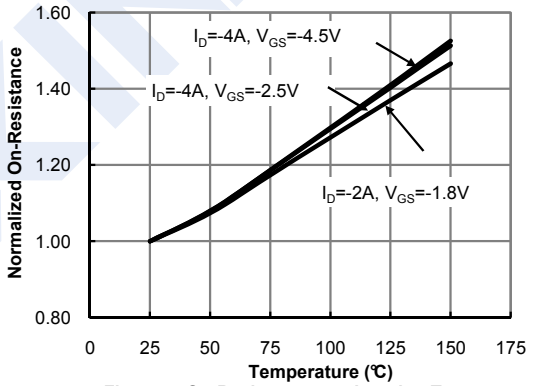

Figure 4: On-Resistance vs. Junction Temperature

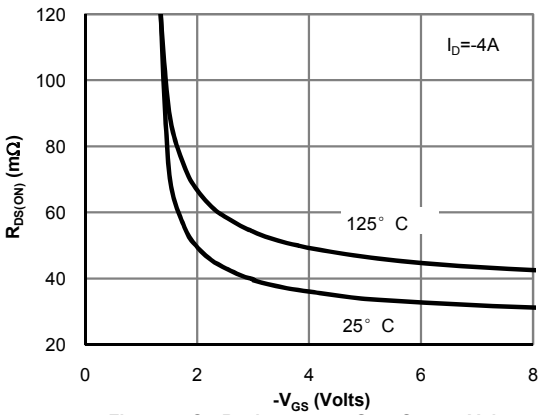

Figure 5: On-Resistance vs. Gate-Source Voltage

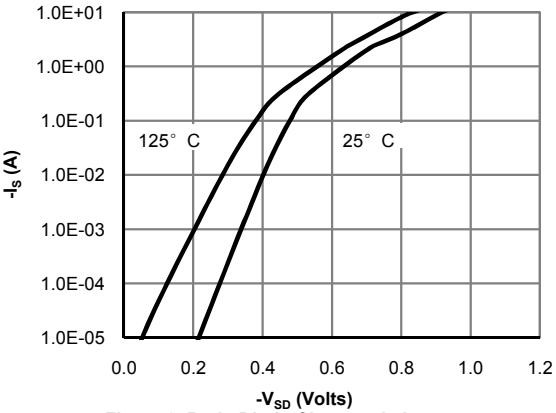

Figure 6: Body-Diode Characteristics

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■ Typical Characterisitics

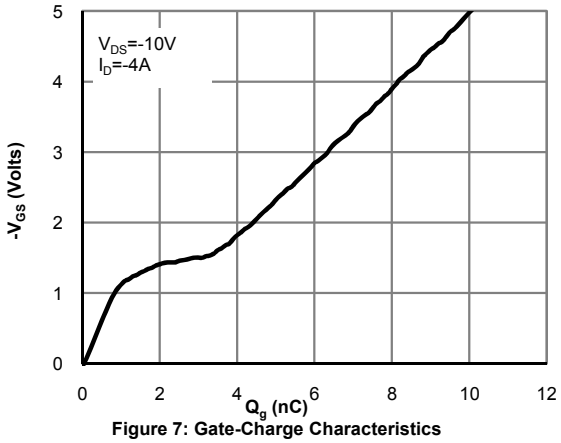

Figure 7: Gate-Charge Characteristics

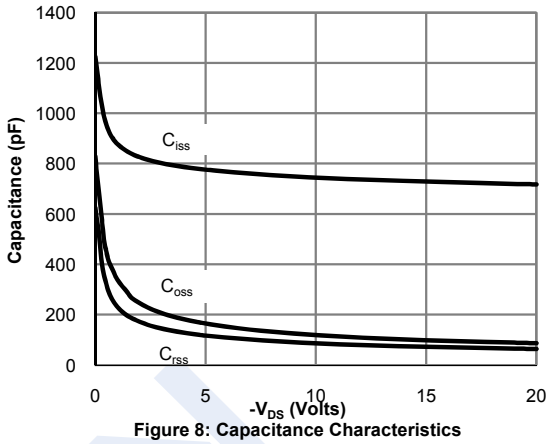

Figure 8: Capacitance Characteristics

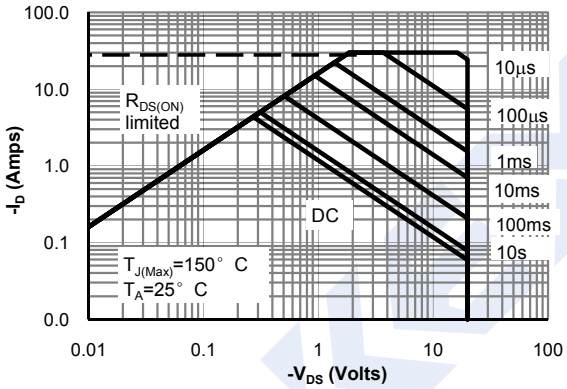

Figure 9: Maximum Forward Biased Safe Operating Area)

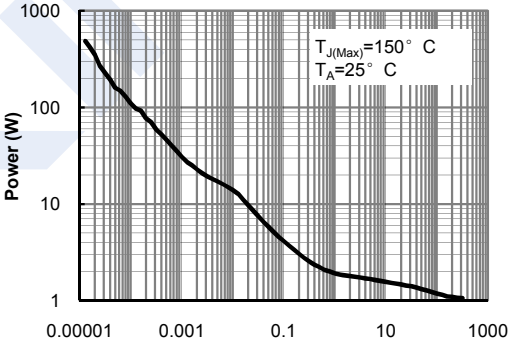

Figure 10: Single Pulse Power Rating Junction-to-Ambient

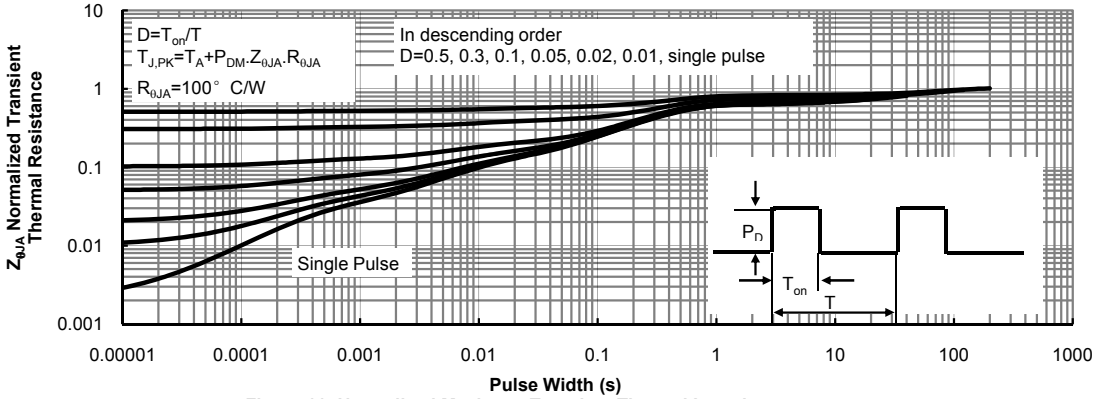

Figure 11: Normalized Maximum Transient Thermal Impedance