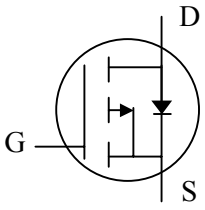
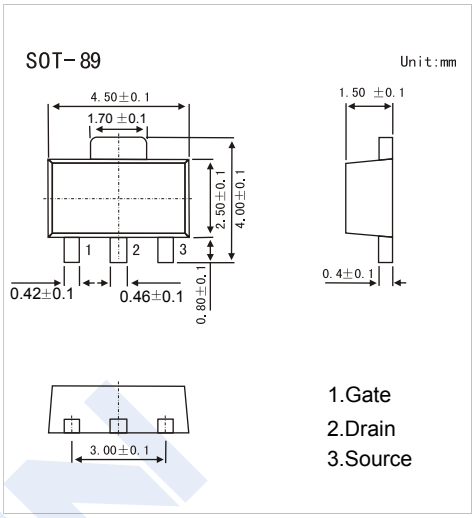
P-Channel Enhancement MOSFET

KX9435

■ Features

- $V_{DS\ (V)}$ =-30V
- I_D =-4.2 A (V_{GS} =-10V)
- $R_{DS(ON)}$ < 55mΩ (V_{GS} =-10V)
- $R_{DS(ON)}$ < 90mΩ (V_{GS} =-4.5 V)
- Low Gate Charge
- Fast Switching Characteristic





■ Absolute Maximum Ratings Ta = 25℃

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	V_{DS}	-30	V
Gate-Source Voltage	V_{GS}	±20	
Continuous Drain Current Ta = 25℃ *	I_D	-4.2	A
Ta = 70℃ *		-3.4	
Pulsed Drain Current	I_{DM}	-20	
Power Dissipation	P_D	1.25	W
Linear Derating Factor		0.01	W/℃
Thermal Resistance.Junction- to-Ambient	R_{thJA}	100	℃/W
Junction Temperature	T_J	150	℃
Junction and Storage Temperature Range	T_{stg}	-55 to 150	

*. Surface mount on FR4 board, t < 10s.

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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	-30			V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=-30V, V_{GS}=0V, T_J=25℃			-1	μA
		V_{DS}=-24V, V_{GS}=0V, T_J=70℃			-25	
Gate-Body leakage current	I_{GSS}	V_{DS}=0V, V_{GS}=±20V			±100	nA
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS} I_D=-250μA	-1		-3	V
Static Drain-Source On-Resistance *1	$R_{DS(ON)}$	V_{GS}=-10V, I_D=-4A			55	mΩ
		V_{GS}=-4.5V, I_D=-2A			90	
Forward Transconductance *1	g_{FS}	V_{DS}=-10V, I_D=-4A		6		S
Input Capacitance	C_{iss}	V_{GS}=0V, V_{DS}=-25V, f=1MHz		520	830	pF
Output Capacitance	C_{oss}			180		
Reverse Transfer Capacitance	C_{rss}			130		
Gate resistance	R_g	f=1MHz		16	24	Ω
Total Gate Charge *1	Q_g	V_{GS}=-4.5V, V_{DS}=-25V, I_D=-4A		10	16	nC
Gate Source Charge	Q_{gs}			2		
Gate Drain Charge	Q_{gd}			6		
Turn-On DelayTime *1	$t_{d(on)}$	V_{GS}=-10V, V_{DS}=-15V, R_D=15Ω,R_G=3.3Ω I_D=1.0A		6.3		ns
Turn-On Rise Time	t_r			3.2		
Turn-Off DelayTime	$t_{d(off)}$			38.3		
Turn-Off Fall Time	t_f			12		
Body Diode Reverse Recovery Time	t_{rr}	I_S=-4A, V_{GS}=0,dI/dt=100A/μs		30		
Body Diode Reverse Recovery Charge	Q_{rr}			24		nC
Maximum Body-Diode Continuous Current	I_S				-1	A
Diode Forward Voltage *1	V_{SD}	I_S=-1A,V_{GS}=0V			-1.3	V

*1.Pulse width <300us , duty cycle <2%.

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■ Typical Characterisitics

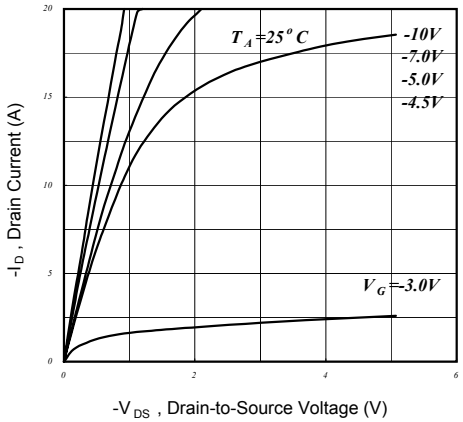

Fig 1. Typical Output Characteristics

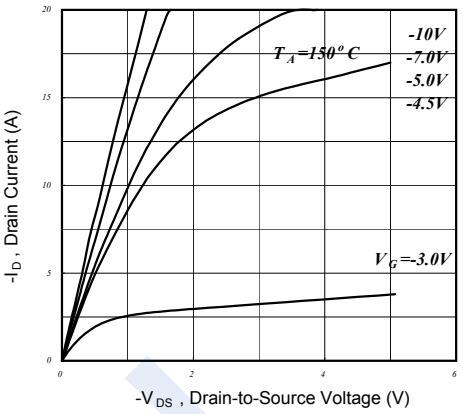

Fig 2. Typical Output Characteristics

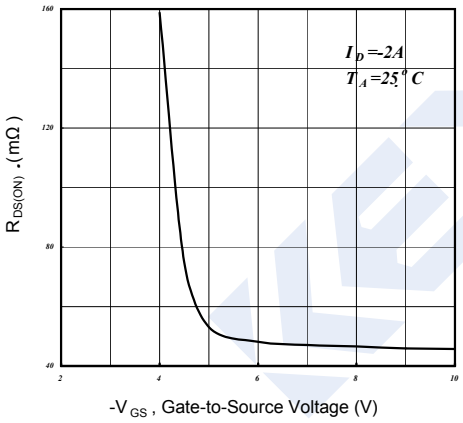

Fig 3. On-Resistance v.s. Gate Voltage

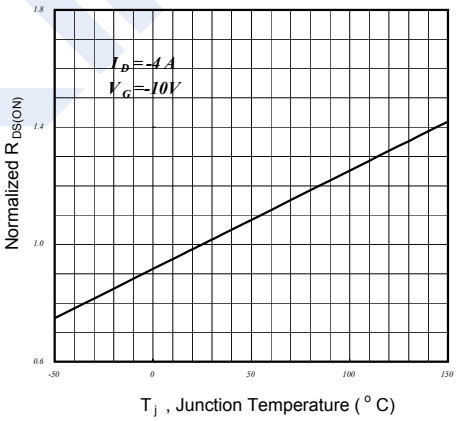

Fig 4. Normalized On-Resistance v.s. Junction Temperature

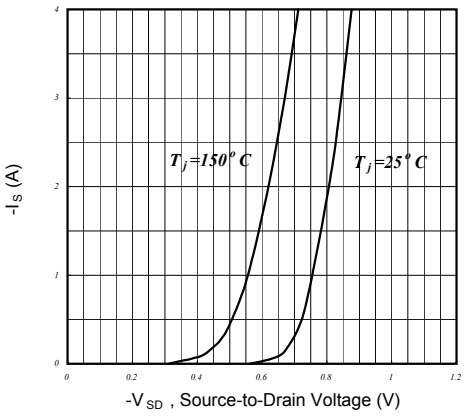

Fig5. Forward Characteristic of Reverse Diode

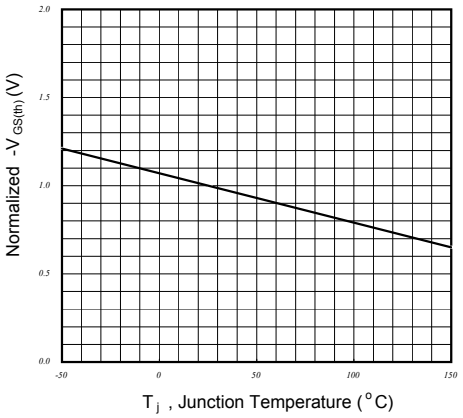

Fig 6. Gate Threshold Voltage v.s. Junction Temperature

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■ Typical Characterisitics

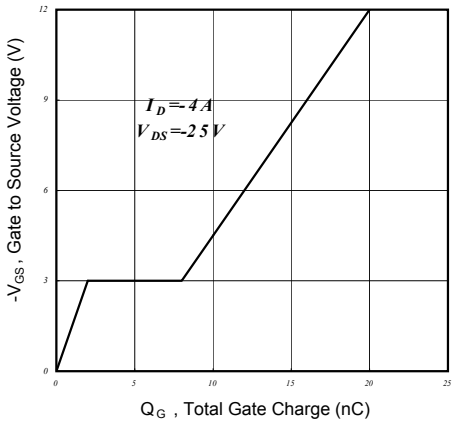

Fig 7. Gate Charge Characteristics

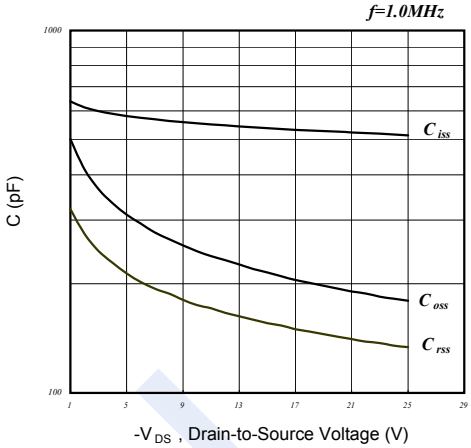

Fig 8. Typical Capacitance Characteristics

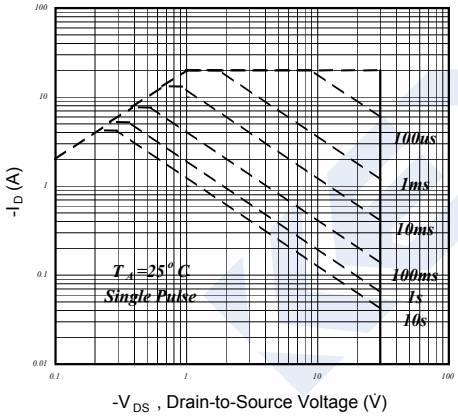

Fig 9. Maximum Safe Operating Area

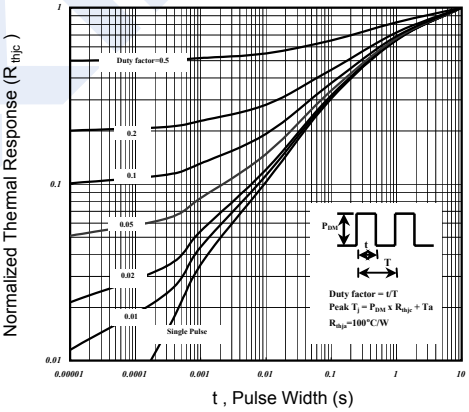

Fig 10. Effective Transient Thermal Impedance

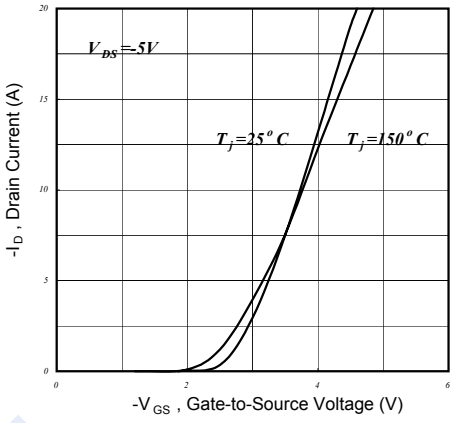

Fig 11. Transfer Characteristics

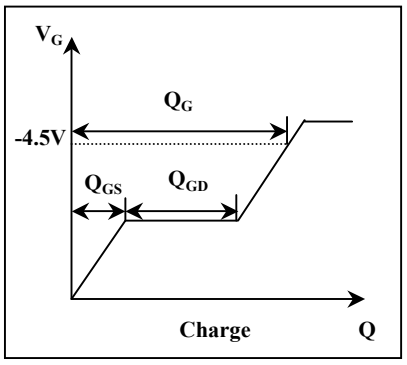

Fig 12. Gate Charge Waveform