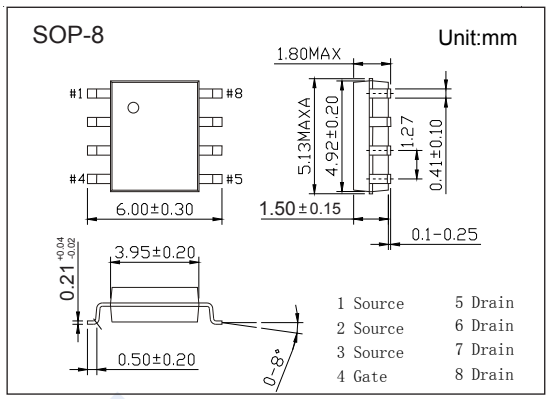
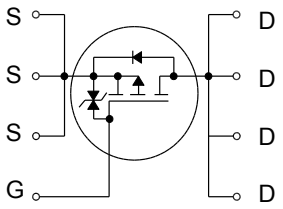
P-Channel MOSFET

RRH040P03 (KRH040P03)



■ Features

- V_{DS} (V) =-30V
- I_D =-4 A (V_{GS} =-10V)
- $R_{DS(ON)}$ < 75mΩ (V_{GS} =-10V)
- $R_{DS(ON)}$ < 115mΩ (V_{GS} =-4.5V)
- $R_{DS(ON)}$ < 125mΩ (V_{GS} =-4V)



■ 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		I_D	±4	A
Pulsed Drain Current (Note.1)		I_{DM}	±16	
Power Dissipation	(Note.2)	P_D	2	W
	(Note.3)		0.65	
Avalanche energy, Single Pulse (Note.4)		E_{AS}	0.1	mJ
Thermal Resistance.Junction- to-Ambient	(Note.2)	R_{thJA}	62.5	℃/W
	(Note.3)		192	
Junction Temperature		T_J	150	℃
Junction Storage Temperature Range		T_{stg}	-55 to 150	

Note.1: Pw≤ 10 us, Duty cycle≤1%

Note.2: Mounted on a ceramic board (30×30×0.8mm)

Note.3 Mounted on a FR4 (20×20×0.8mm)

Note.4: L ≈ 10mH, V_{DD} = -15V, R_g = 25Ω , starting T_J = 25℃

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■ Electrical Characteristics Ta = 25℃

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	V_{DSS}	I_D=-1mA, V_{GS}=0V	-30			V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=-30V, V_{GS}=0V			-1	uA
Gate-Body leakage current	I_{GSS}	V_{DS}=0V, V_{GS}=±20V			±10	uA
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=-10V, I_D=-1mA	-1		-2.5	V
Static Drain-Source On-Resistance	$R_{DS(ON)}$	V_{GS}=-10V, I_D=-4A			75	mΩ
		V_{GS}=-10V, I_D=-4A T_J=125℃			110	
		V_{GS}=-4.5V, I_D=-2A			115	
		V_{GS}=-4V, I_D=-2A			125	
Forward Transconductance	g_{FS}	V_{DS}=-10V, I_D=-4A	3	6		S
Input Capacitance	C_{iss}	V_{GS}=0V, V_{DS}=-15V, f=1MHz		480		pF
Output Capacitance	C_{oss}			70		
Reverse Transfer Capacitance	C_{rss}			70		
Gate resistance	R_g	V_{GS}=0V, V_{DS}=0V, f=1MHz		25		Ω
Total Gate Charge (5V)	Q_g	V_{GS}=-5V, V_{DS}=-15V, I_D=-4A		5.2		nC
Total Gate Charge (10V)		V_{GS}=-10V, V_{DS}=-15V, I_D=-4A		9.6		
Gate Source Charge	Q_{gs}	V_{GS}=-5V, V_{DS}=-15V, I_D=-4A		1.6		
Gate Drain Charge	Q_{gd}			1.6		
Turn-On DelayTime	$t_{d(on)}$	V_{GS}=-10V, V_{DS}=-15V,I_D=-2A, R_L=7.5Ω ,R_{GEN}=10Ω		7		ns
Turn-On Rise Time	t_r			18		
Turn-Off DelayTime	$t_{d(off)}$			50		
Turn-Off Fall Time	t_f			37		
Body Diode Reverse Recovery Time	t_{rr}	I_F=-4A, di/dt=100A/us		20	40	
Body Diode Reverse Recovery Charge	Q_{rr}			10	20	nC
Maximum Body-Diode Continuous Current	I_S				-1.6	A
Diode Forward Voltage	V_{SD}	I_S=-4A,V_{GS}=0V			-1.2	V

■ Marking

Marking	40P03 KC****

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■ Typical Characterisitics

Fig.1 Power Dissipation Derating Curve

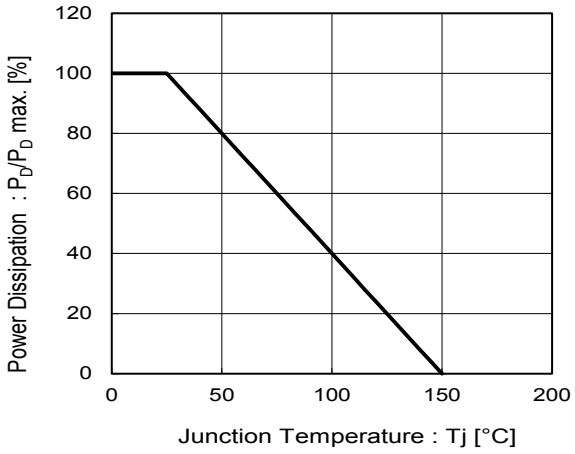


Fig.2 Maximum Safe Operating Area

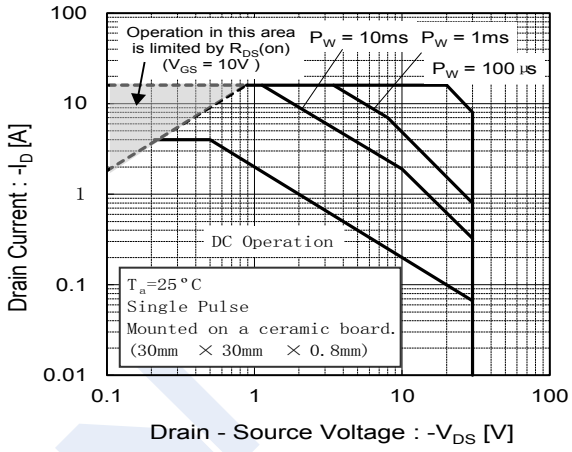


Fig.3 Normalized Transient Thermal Resistance vs. Pulse Width

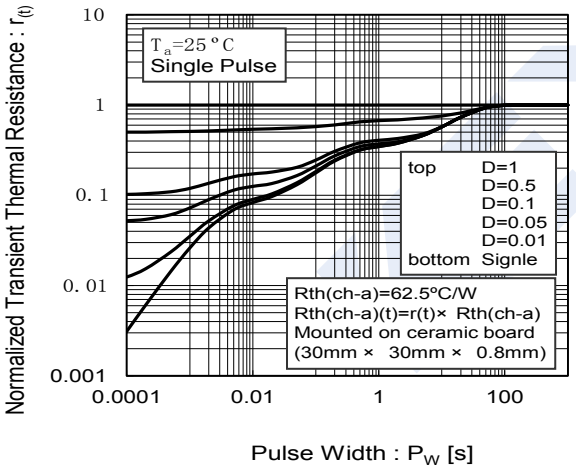


Fig.4 Avalanche Current vs. Power dissipation

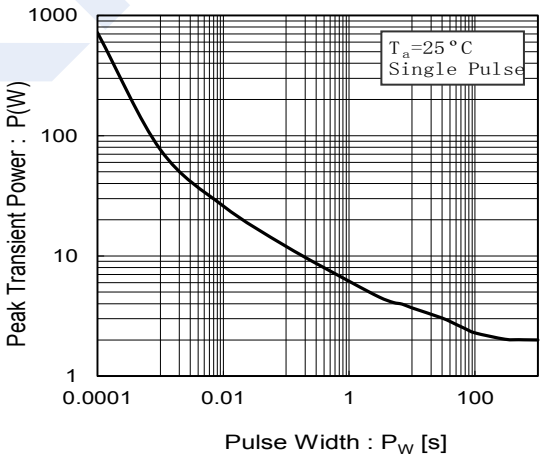


Fig.5 Avalanche Current vs Inductive Load

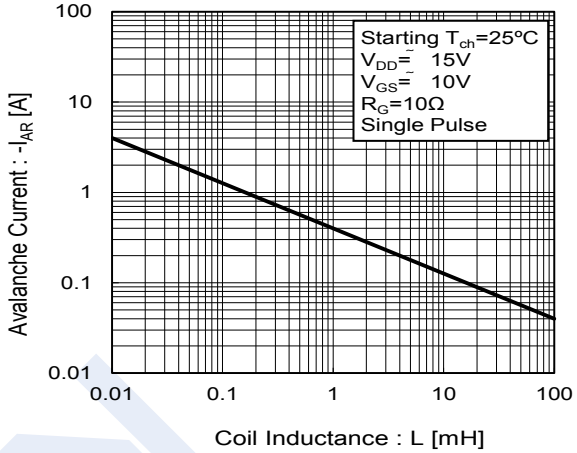
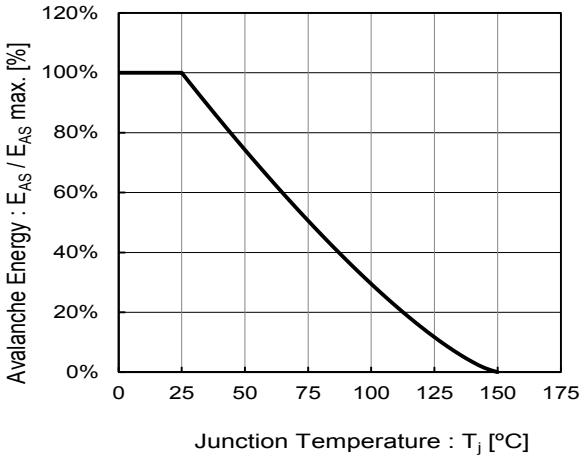


Fig.6 Avalanche Energy Derating Curve vs Junction Temperature



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■ Typical Characterisitics

Fig.7 Typical Output Characteristics(I)

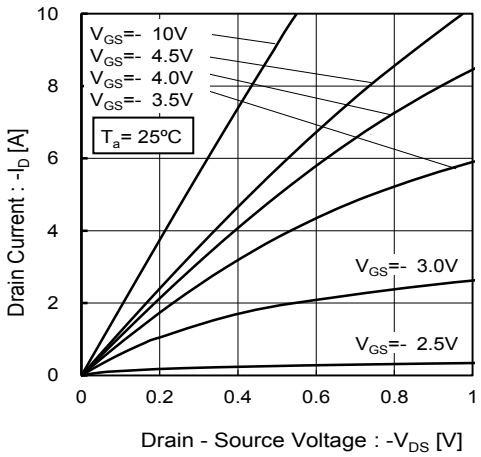


Fig.8 Typical Output Characteristics(II)

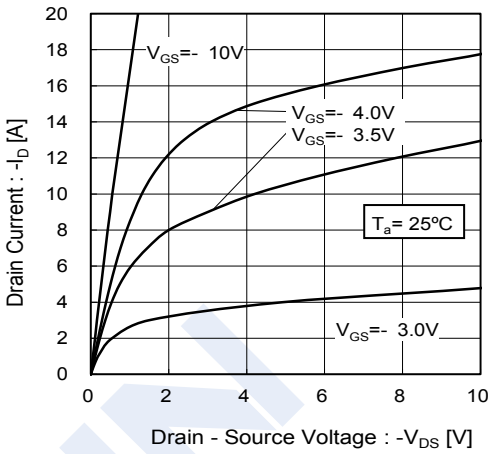


Fig.9 Breakdown Voltage vs. Junction Temperature

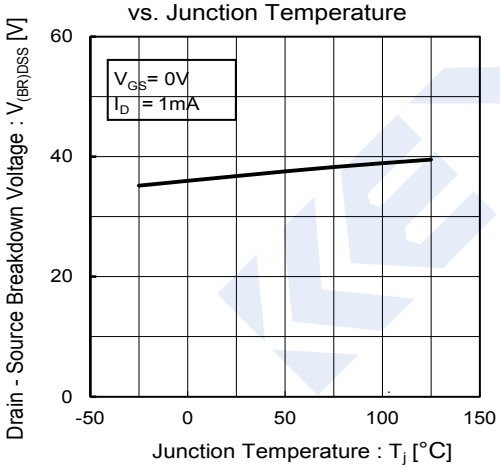


Fig.10 Typical Transfer Characteristics

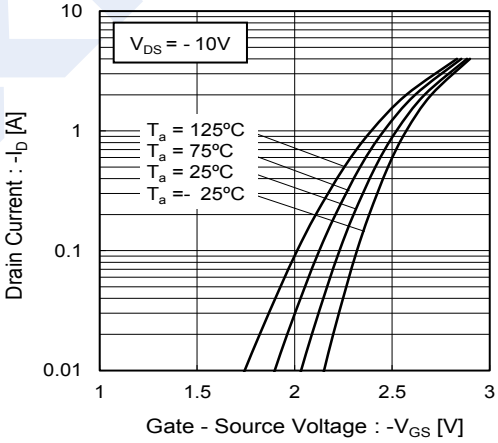


Fig.11 Gate Threshold Voltage vs. Junction Temperature

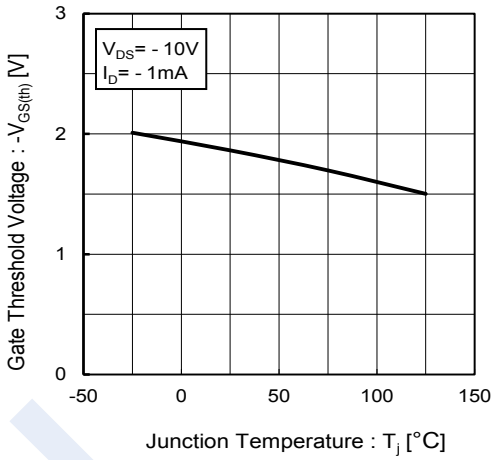
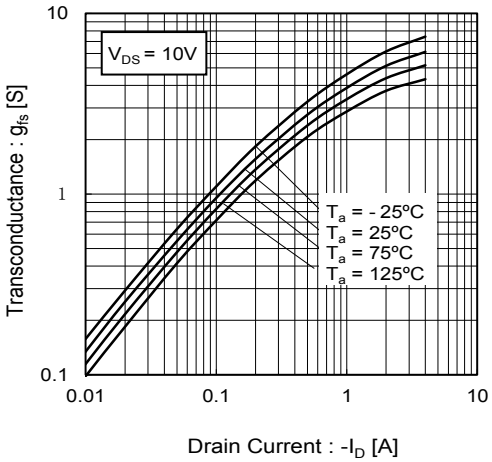


Fig.12 Transconductance vs. Drain Current



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■ Typical Characterisitics

Fig.13 Drain Current Derating Curve

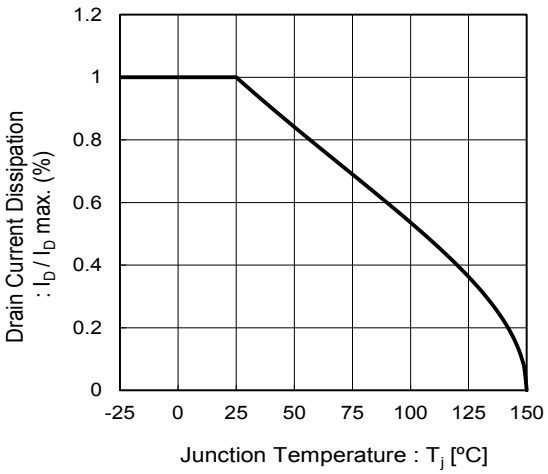


Fig.14 Static Drain - Source On - State Resistance vs. Gate Source Voltage

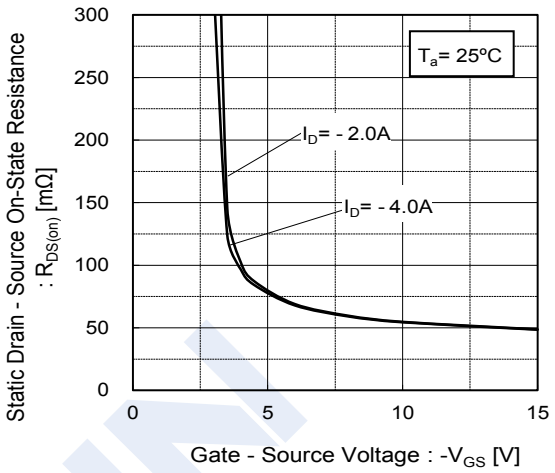


Fig.15 Static Drain - Source On - State Resistance vs. Drain Current(I)

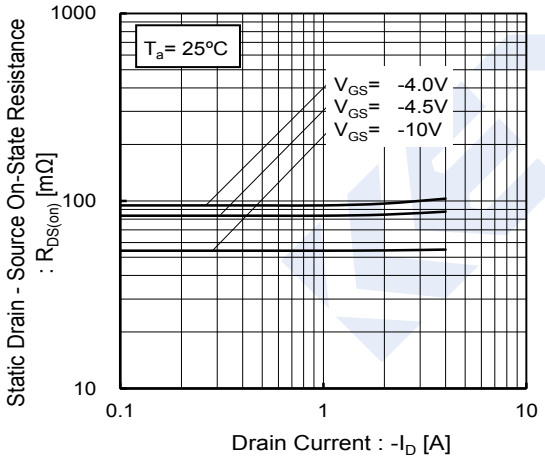


Fig.16 Static Drain - Source On - State Resistance vs. Junction Temperature

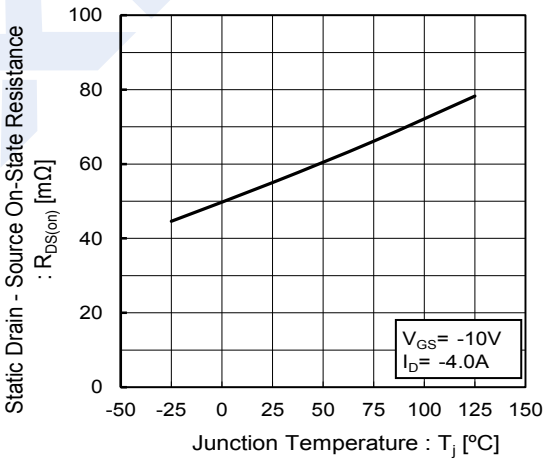


Fig.17 Static Drain - Source On - State Resistance vs. Drain Current(II)

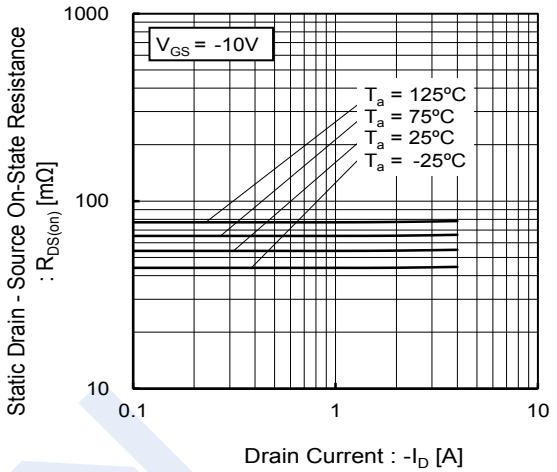
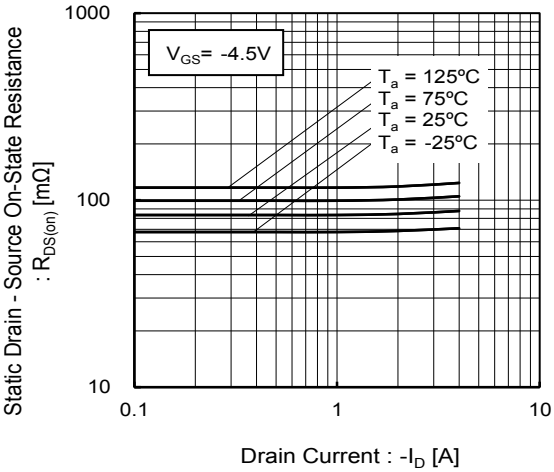


Fig.18 Static Drain - Source On - State Resistance vs. Drain Current(III)



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■ Typical Characterisitics

Fig.19 Static Drain - Source On - State Resistance vs. Drain Current(IV)

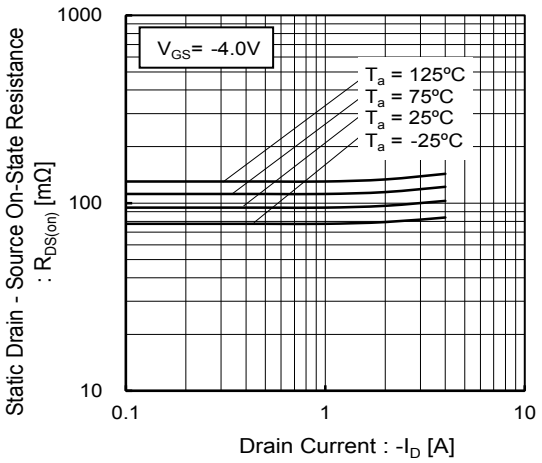

Fig.20 Typical Capacitance vs. Drain - Source Voltage

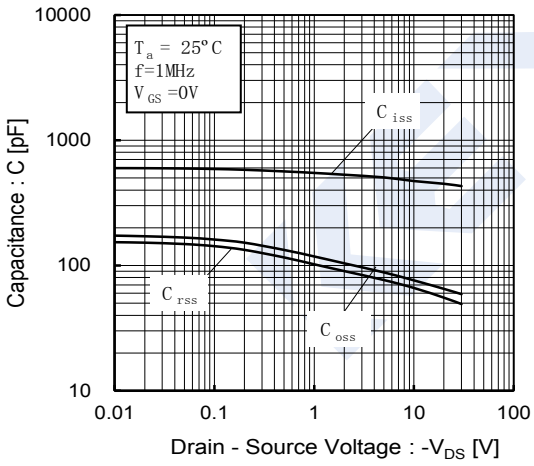

Fig.21 Switching Characteristics

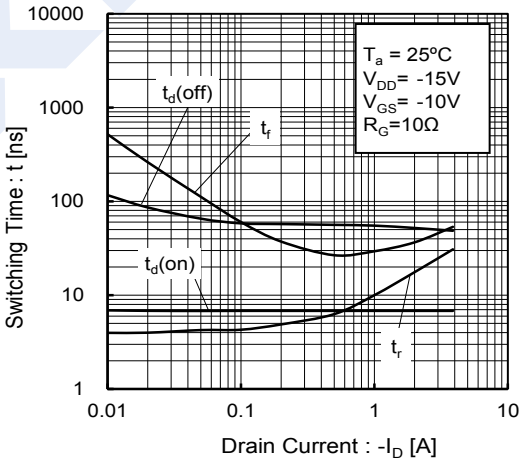

Fig.22 Dynamic Input Characteristics

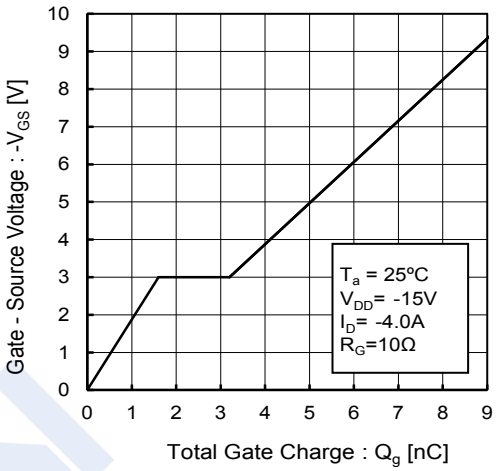

Fig.23 Source Current vs. Source Drain Voltage