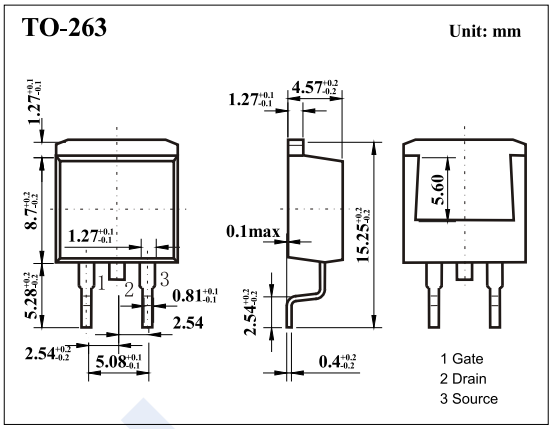
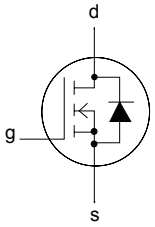
N-Channel MOSFET

IRF840S (KRF840S)



■ Features

- $V_{DS\ (V)}$ =500V
- I_D =8 A (V_{GS} = 10V)
- $R_{DS(ON)}$ ＜0.85Ω (V_{GS} = 10V)
- Fast switching
- Low thermal resistance



■ Absolute Maximum Ratings Ta = 25℃

Parameter		Symbol	Rating	Unit
Drain-Source Voltage		V_{DS}	500	V
Gate-Source Voltage		V_{GS}	±20	
Continuous Drain Current	Ta = 25℃	I_D	8	A
	Ta = 100℃		5.1	
Pulsed Drain Current		I_{DM}	32	
Avalanche Current		I_{AR}	8	
Power Dissipation	Tc = 25℃	P_D	125	W
	Ta = 25℃		3.1	
Non-Repetitive Avalanche Energy (Note.1)		E_{AS}	510	mJ
Repetitive Avalanche Energy		E_{AR}	13	
Peak Diode Recovery dv/dt (Note.2)		dv/dt	3.5	V/ns
Thermal Resistance.Junction- to-Ambient		R_{thJA}	60	℃/W
Thermal Resistance Junction to Mounting Base		R_{thJB}	0.85	
Junction Temperature		T_J	150	℃
Storage Temperature Range		T_{stg}	-55 to 150	

Note.1: L = 14mH, I_{AS} = 8A, V_{DD} = 50V, R_G = 25Ω , Starting T_J = 25°C.

Note.2: I_{SD} ≤ 8 A, di/dt ≤ 100A/μs, V_{DD} ≤ $V_{(BR)DSS}$, Starting T_J ≤ 25°C.

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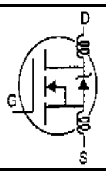
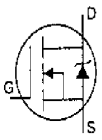
■ Electrical Characteristics Ta = 25℃

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	V_{DSS}	I_D=250μA, V_{GS}=0V	500			V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=500V, V_{GS}=0V			25	uA
		V_{DS}=400V, V_{GS}=0V,T_J=125℃			250	
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	2		4	V
Static Drain-Source On-Resistance	$R_{DS(on)}$	V_{GS}=10V, I_D=4.8A (Note.1)			0.85	Ω
Forward Transconductance	g_{FS}	V_{DS}=50V, I_D=4.8A (Note.1)	4.9			S
Input Capacitance	C_{iss}	V_{GS}=0V, V_{DS}=25V, f=1MHz		1300		pF
Output Capacitance	C_{oss}			310		
Reverse Transfer Capacitance	C_{rss}			120		
Total Gate Charge	Q_g	V_{GS}=10V, V_{DS}=400V, I_D=8A			63	nC
Gate Source Charge	Q_{gs}				9.3	
Gate Drain Charge	Q_{gd}				32	
Internal Drain Inductance	L_D	Between lead, 6 mm (0.25in.) from package and center of die contact 		4.5		nH
Internal Source Inductance	L_S			7.5		
Turn-On DelayTime	$t_{d(on)}$	V_{DD} = 250 V, I_D = 8 A, R_g = 9.1Ω, R_D = 31Ω (Note.1)		14		ns
Turn-On Rise Time	t_r			23		
Turn-Off DelayTime	$t_{d(off)}$			49		
Turn-Off Fall Time	t_f			20		
Body Diode Reverse Recovery Time	t_{rr}	T_J = 25°C, I_F = 8A, dI/dt = 100A/μs			970	
Body Diode Reverse Recovery Charge	Q_{rr}				8.9	uC
Continuous Source-Drain Diode Current	I_S	MOSFET symbol showing the integral reverse p-n junction diode. 			8	A
Pulsed Diode Forward Current	I_{SM}				32	
Diode Forward Voltage	V_{SD}	I_S=8A,V_{GS}=0V,T_J = 25°C			2	V

Note.1: Pulse Test : Pulse width ≤ 300μs, Duty cycle ≤ 2%.

N-Channel MOSFET

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■ Typical Characterisitics

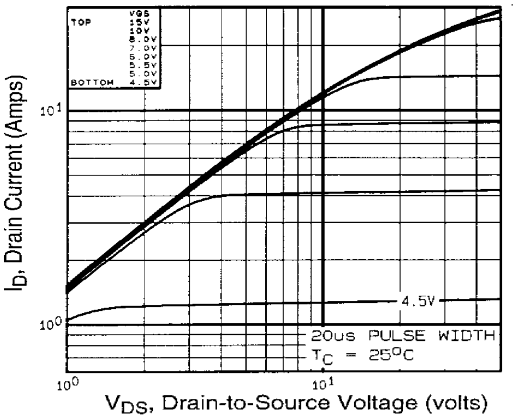

Fig 1. Typical Output Characteristics, T_C=25°C

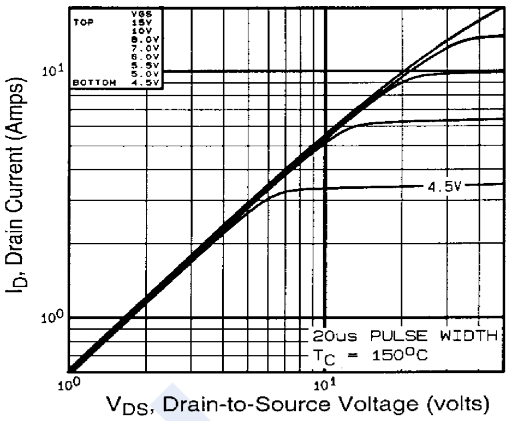

Fig 2. Typical Output Characteristics, T_C=150°C

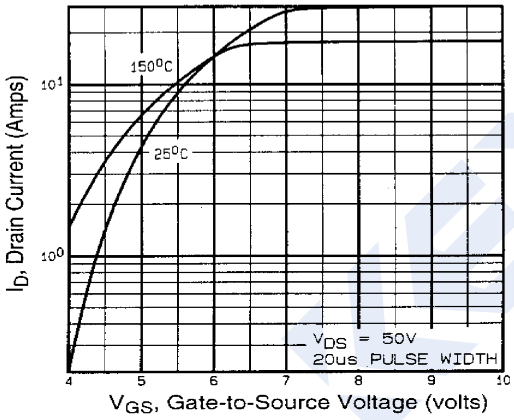

Fig 3. Typical Transfer Characteristics

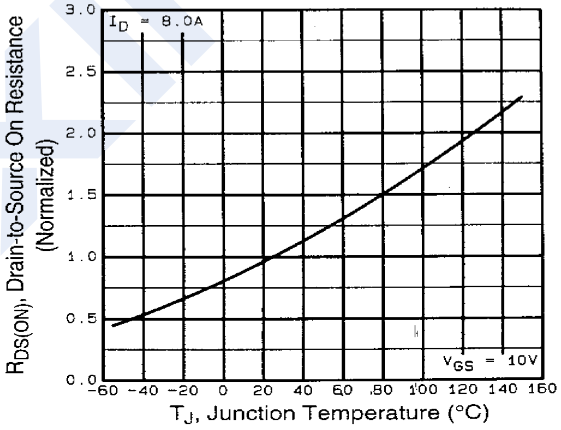

Fig 4. Normalized On-Resistance Vs. Temperature

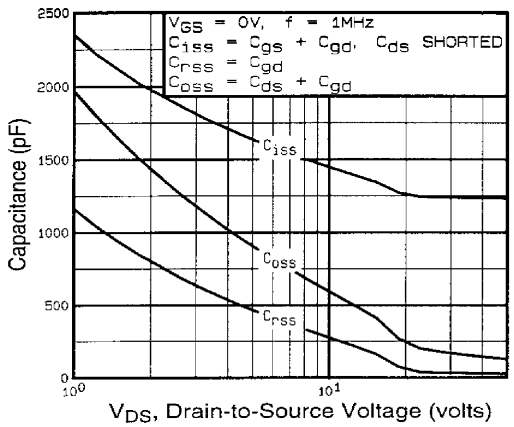

Fig 5. Typical Capacitance Vs. Drain-to-Source Voltage

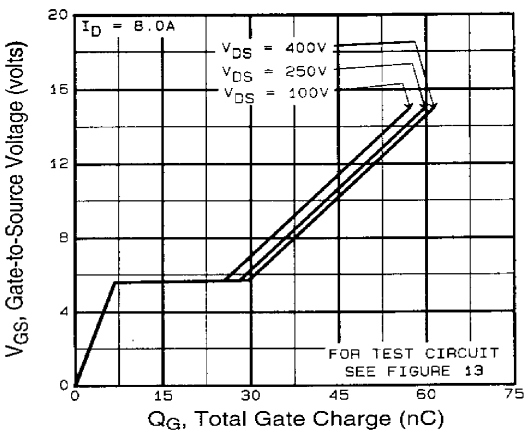

Fig 6. Typical Gate Charge Vs. Gate-to-Source Voltage

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■ Typical Characterisitics

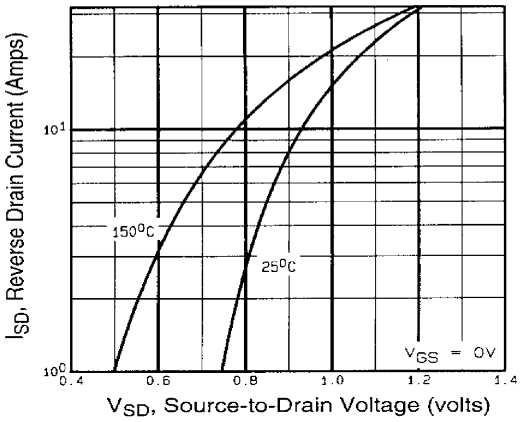

Fig 7. Typical Source-Drain Diode Forward Voltage

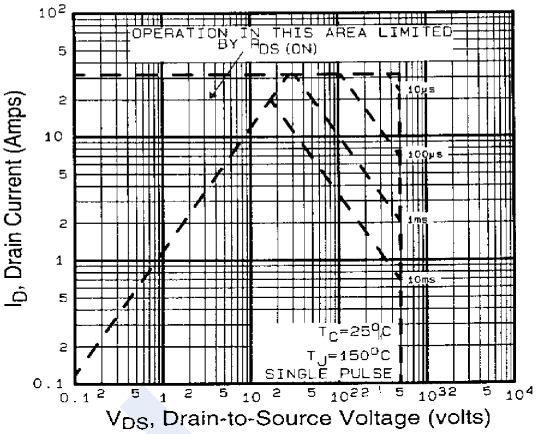

Fig 8. Maximum Safe Operating Area

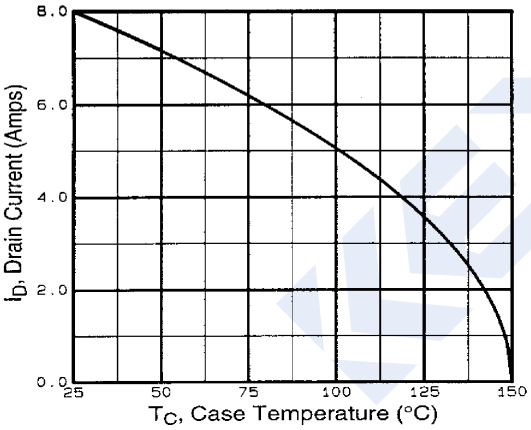

Fig 9. Maximum Drain Current Vs. Case Temperature

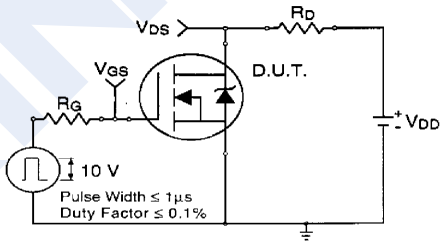

Fig 10a. Switching Time Test Circuit

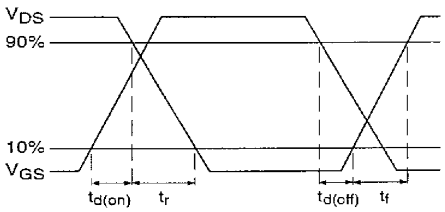

Fig 10b. Switching Time Waveforms

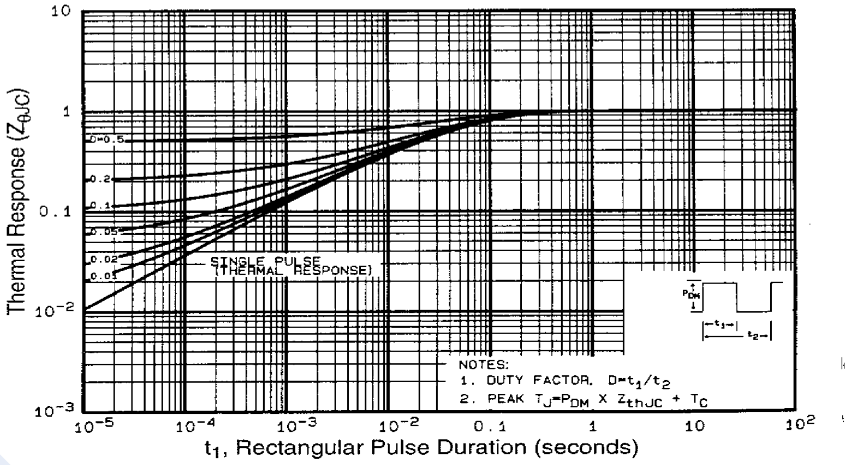

Fig 11. Maximum Effective Transient Thermal Impedance, Junction-to-Case

N-Channel MOSFET

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■ Typical Characterisitics

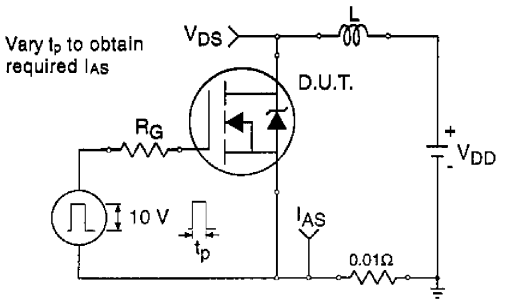

Fig 12a. Unclamped Inductive Test Circuit

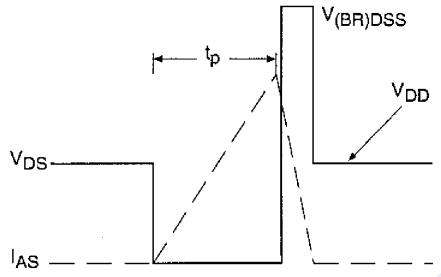

Fig 12b. Unclamped Inductive Waveforms

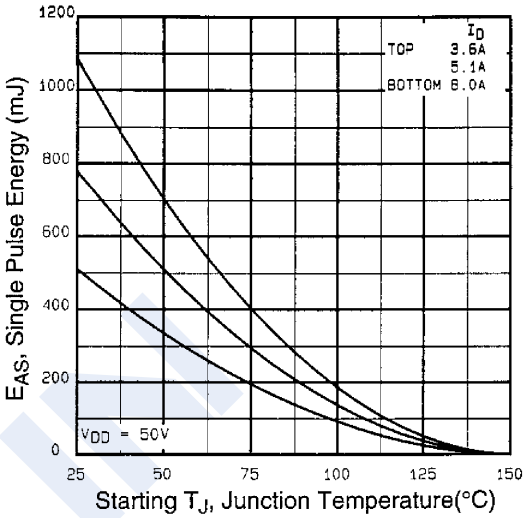

Fig 12c. Maximum Avalanche Energy Vs. Drain Current

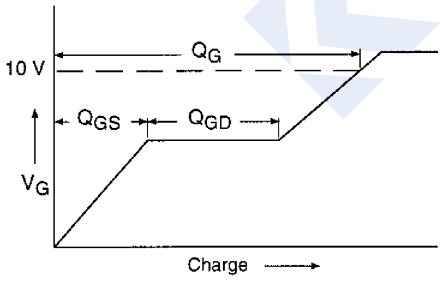

Fig 13a. Basic Gate Charge Waveform

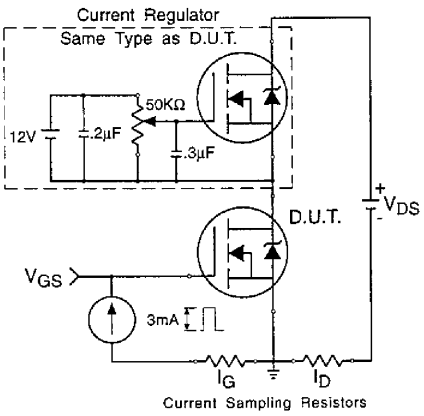

Fig 13b. Gate Charge Test Circuit