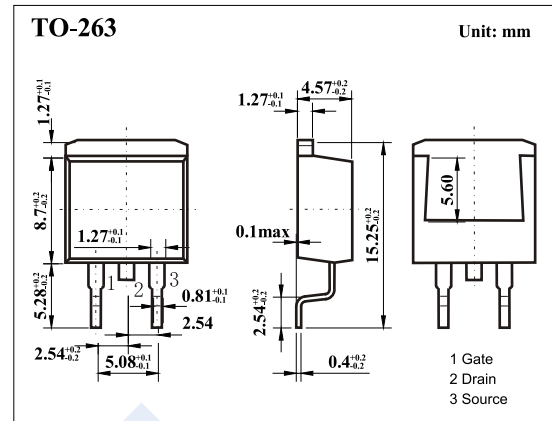
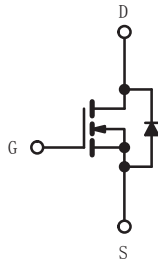


N-Channel MOSFET

IRF830S (KRF830S)

■ Features

- $V_{DS}(V) = 500V$
- $I_D = 4.5 A$ ($V_{GS} = 10V$)
- $R_{DS(ON)} < 1.5 \Omega$ ($V_{GS} = 10V$)
- Fast Switching
- Repetitive Avalanche Rated



■ Absolute Maximum Ratings $T_a = 25^\circ C$

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	V_{DS}	500	V
Gate-Source Voltage	V_{GS}	± 20	
Continuous Drain Current	I_D	4.5	A
		2.9	
Pulsed Drain Current	I_{DM}	18	
Avalanche Current	I_{AR}	4.5	
Power Dissipation	P_D	74	W
		3.1	
Single Pulse Avalanche Energy (Note1)	E_{AS}	280	mJ
Repetitive Avalanche Energy	E_{AR}	7.4	
Peak Diode Recovery dv/dt (Note 2)	dv/dt	3.5	V/ns
Thermal Resistance.Junction- to-Ambient	R_{thJA}	62	$^\circ C/W$
Thermal Resistance.Junction- to-Ambient (PCB Mount)		40	
Thermal Resistance.Junction- to-Case	R_{thJC}	1.7	
Junction Temperature	T_J	150	$^\circ C$
Storage Temperature Range	T_{stg}	-55 to 150	

Note.1: $L = 24mH$, $I_{AS} = 4.5A$, $V_{DD} = 50V$, $R_G = 25 \Omega$, Starting $T_J = 25^\circ C$.

Note.2: $I_{SD} = 4.5A$, $di/dt = 75 A/\mu s$, $V_{DD} = V_{(BR)DSS}$, Starting $T_J = 25^\circ C$.

N-Channel MOSFET

IRF830S (KRF830S)

■ Electrical Characteristics $T_a = 25^\circ\text{C}$

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	V_{DS}	$I_D = 250\ \mu\text{A}$, $V_{GS} = 0\text{V}$	500			V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = 500\text{V}$, $V_{GS} = 0\text{V}$			25	μA
		$V_{DS} = 400\text{V}$, $V_{GS} = 0\text{V}$, $T_J = 125^\circ\text{C}$			250	
Gate-Body Leakage Current	I_{GSS}	$V_{DS} = 0\text{V}$, $V_{GS} = \pm 20\text{V}$			± 100	nA
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}$, $I_D = 250\ \mu\text{A}$	2		4	V
Static Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS} = 10\text{V}$, $I_D = 2.7\text{A}$ (Note.1)			1.5	Ω
Forward Transconductance	g_{FS}	$V_{DS} = 50\text{V}$, $I_D = 2.7\text{A}$ (Note.1)	2.5			S
Input Capacitance	C_{iss}	$V_{GS} = 0\text{V}$, $V_{DS} = 25\text{V}$, $f = 1\text{MHz}$		610		pF
Output Capacitance	C_{oss}			160		
Reverse Transfer Capacitance	C_{rss}			68		
Total Gate Charge	Q_g	$V_{GS} = 10\text{V}$, $V_{DS} = 400\text{V}$, $I_D = 3.1\text{A}$			38	nC
Gate Source Charge	Q_{gs}				5	
Gate Drain Charge	Q_{gd}				22	
Internal Drain Inductance	L_D	Between lead, 6 mm (0.25") from package and center of die contact 		4.5		nH
Internal Source Inductance	L_S			7.5		
Turn-On DelayTime	$t_{d(on)}$	$V_{DD} = 250\text{V}$, $I_D = 3.1\text{A}$, $R_g = 12\Omega$, $R_D = 79\Omega$ (Note.1)		8.2		ns
Turn-On Rise Time	t_r			16		
Turn-Off DelayTime	$t_{d(off)}$			42		
Turn-Off Fall Time	t_f			16		
Body Diode Reverse Recovery Time	t_{rr}	$T_J = 25^\circ\text{C}$, $I_F = 3.1\text{A}$, $dI/dt = 100\text{A}/\mu\text{s}$			640	μs
Body Diode Reverse Recovery Charge	Q_{rr}				2	
Continuous Source-Drain Diode Current	I_S	MOSFET symbol showing the integral reverse p - n junction diode 			4.5	A
Pulsed Diode Forward Current	I_{SM}				18	
Diode Forward Voltage	V_{SD}	$I_S = 4.5\text{A}$, $V_{GS} = 0\text{V}$, $T_J = 25^\circ\text{C}$			1.6	V

Note.1: Pulse Test : Pulse width $\leq 300\mu\text{s}$, Duty cycle $\leq 2\%$.

N-Channel MOSFET

IRF830S (KRF830S)

■ Typical Characteristics

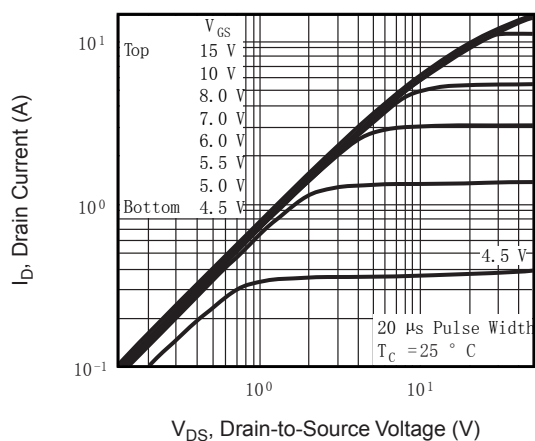
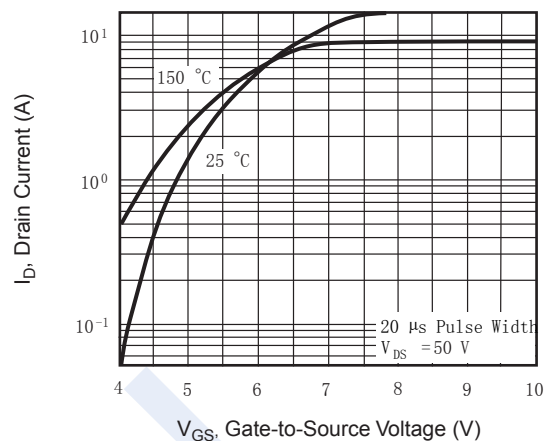
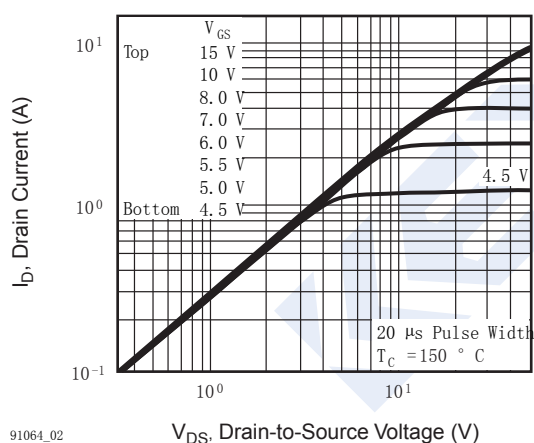
Fig. 1 - Typical Output Characteristics, $T_C = 25^\circ\text{C}$ 

Fig. 3 - Typical Transfer Characteristics



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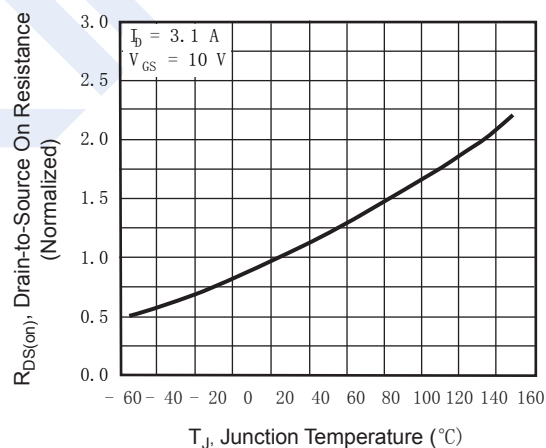
Fig. 2 - Typical Output Characteristics, $T_C = 150^\circ\text{C}$ 

Fig. 4 - Normalized On-Resistance vs. Temperature

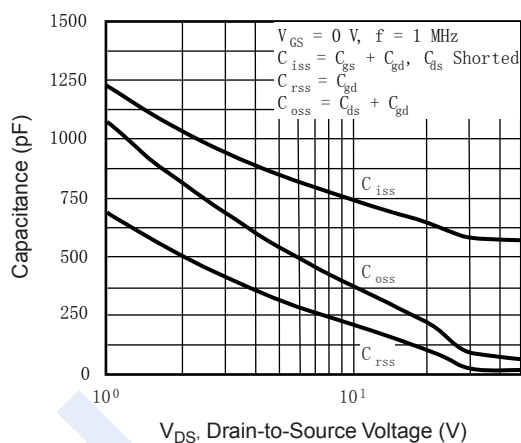


Fig. 5 - Typical Capacitance vs. Drain-to-Source Voltage

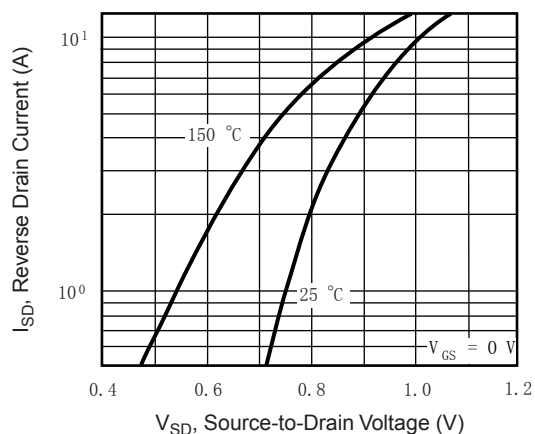


Fig. 7 - Typical Source-Drain Diode Forward Voltage

N-Channel MOSFET

IRF830S (KRF830S)

Typical Characteristics

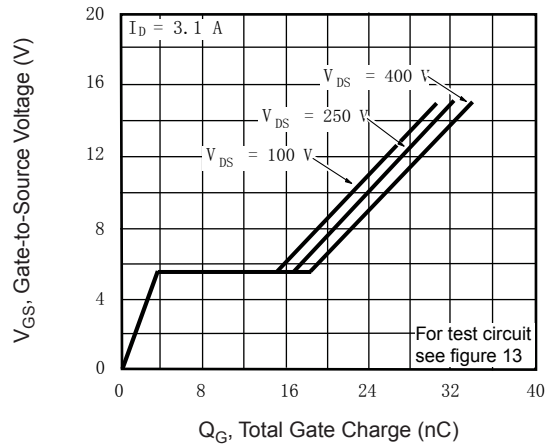


Fig. 6 - Typical Gate Charge vs. Gate-to-Source Voltage

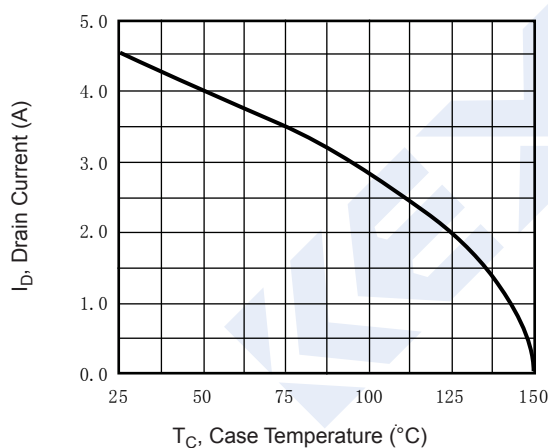


Fig. 9 - Maximum Drain Current vs. Case Temperature

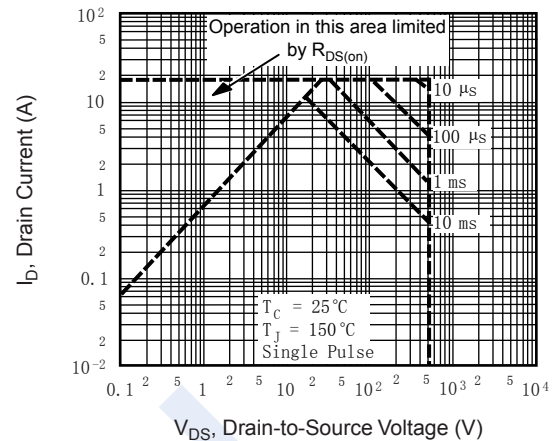


Fig. 8 - Maximum Safe Operating Area

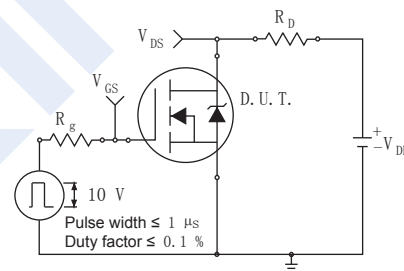


Fig. 10a - Switching Time Test Circuit

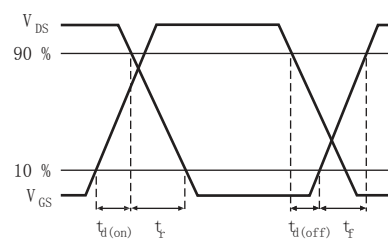


Fig. 10b - Switching Time Waveforms

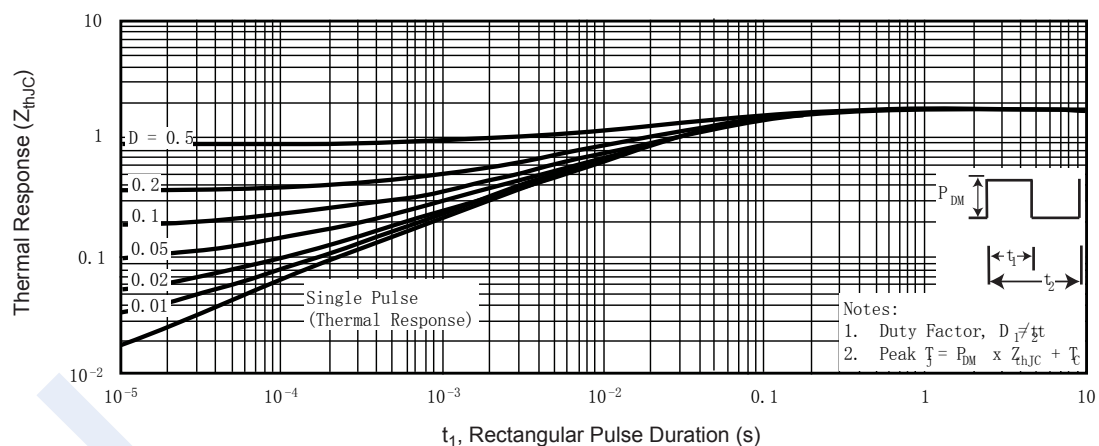


Fig. 11 - Maximum Effective Transient Thermal Impedance, Junction-to-Case

N-Channel MOSFET

IRF830S (KRF830S)

Typical Characteristics

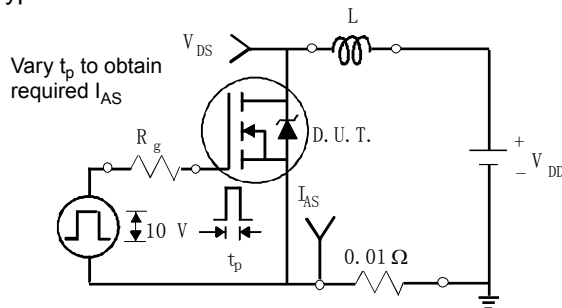


Fig. 12a - Unclamped Inductive Test Circuit

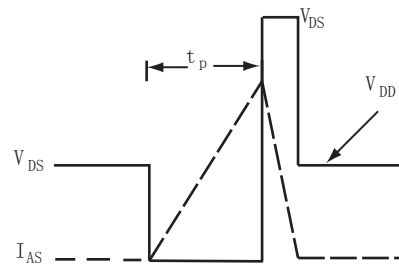


Fig. 12b - Unclamped Inductive Waveforms

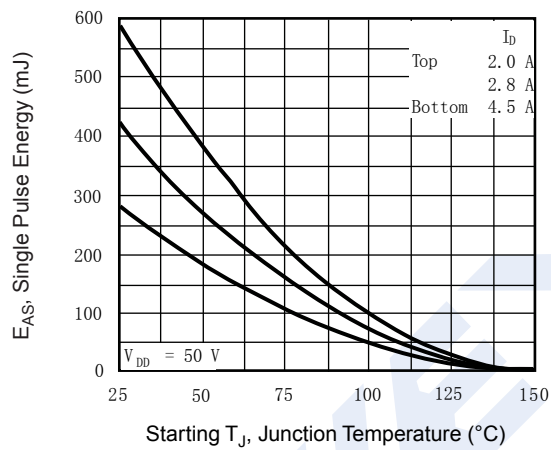


Fig. 12c - Maximum Avalanche Energy vs. Drain Current

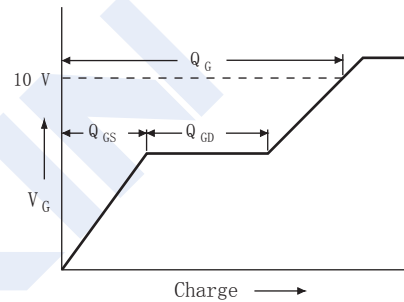


Fig. 13a - Basic Gate Charge Waveform

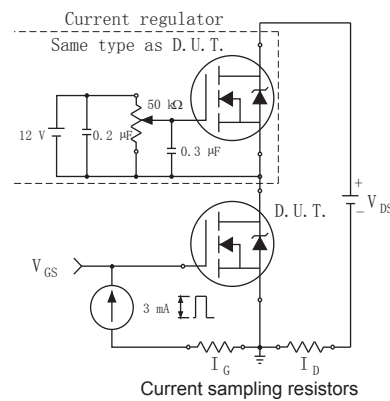
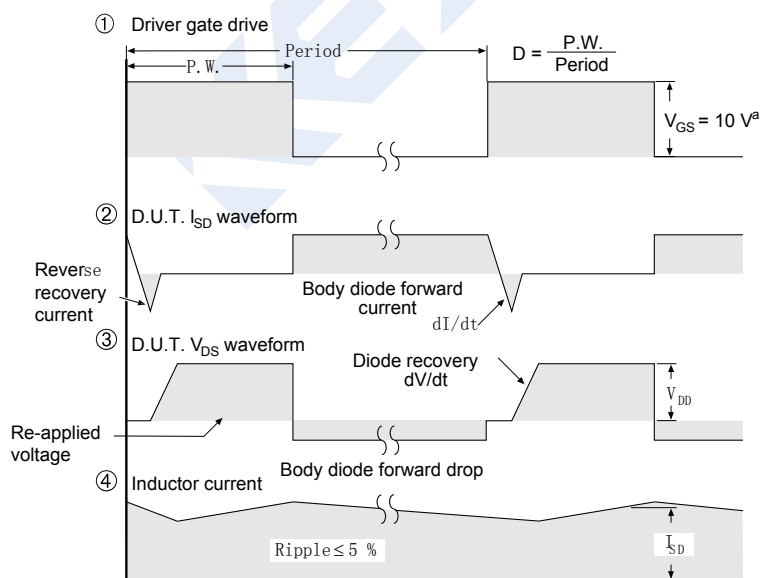
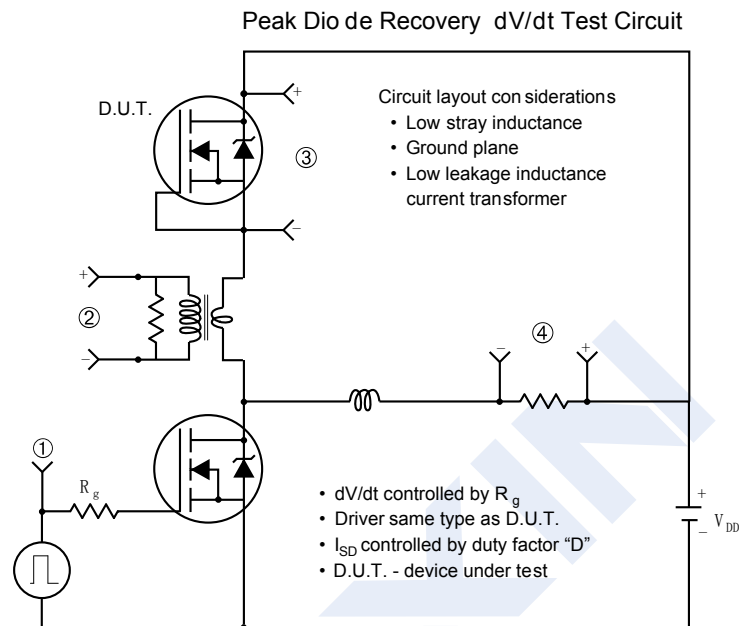


Fig. 13b - Gate Charge Test Circuit

N-Channel MOSFET

IRF830S (KRF830S)

■ Typical Characteristics



Note

a. $V_{GS} = 5 V$ for logic level devices

Fig. 14 - For N-Channel