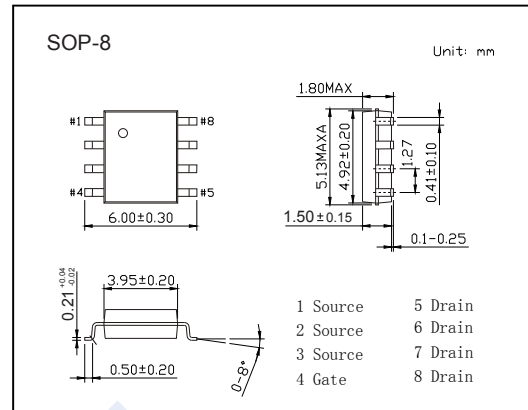
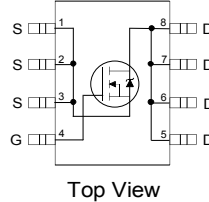


N-Channel MOSFET

IRF7413 (KRF7413)

■ Features

- $V_{DS} (V) = 30V$
- $I_D = 12 A (V_{GS} = 10V)$
- $R_{DS(ON)} < 11m\Omega (V_{GS} = 10V)$



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

Parameter	Symbol	Rating	Unit	
Drain-Source Voltage	V_{DS}	30	V	
Gate-Source Voltage	V_{GS}	± 20		
Continuous Drain Current	I_D	$T_A=25^\circ C$	12	A
		$T_A=70^\circ C$	9.6	
Pulsed Drain Current *1	I_{DM}	96		
Power Dissipation *2	P_D	2.5	W	
Linear Derating Factor		0.02	W/ $^\circ C$	
Single Pulse Avalanche Energy *3	E_{AS}	120	mJ	
Avalanche Current *1	I_{AR}	7.2	A	
Peak Diode Recovery dv/dt *4	dv/dt	1	V/ns	
Thermal Resistance.Junction- to-Ambient *2	R_{thJA}	50	$^\circ C/W$	
Thermal Resistance.Junction- to-Lead	R_{thJL}	20		
Junction Temperature	T_J	150	$^\circ C$	
Storage Temperature Range	T_{stg}	-55 to 150		

*1:Repetitive rating; pulse width limited by max. junction temperature.

*2: When mounted on 1 inch square copper board

*3: Starting $T_J = 25^\circ C$, $L = 4.4mH$ $R_G = 25\Omega$, $I_{AS} = 7.2A$.

*4: $I_{sd} \leq 7.2A$, $di/dt \leq 120A/\mu s$, $V_{DD} \leq V(BR)_{DSS}$, $T_J \leq 150^\circ C$

N-Channel MOSFET

IRF7413 (KRF7413)

■ Electrical Characteristics Ta = 25°C

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	V _{DSS}	I _D =250 μA, V _{GS} =0V	30			V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =24V, V _{GS} =0V			1	μA
		V _{DS} =24V, V _{GS} =0V, T _J =125°C			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 =250 μA	1		3	V
Static Drain-Source On-Resistance	R _{DS(on)}	V _{GS} =10V, I _D =7.2A *1			11	mΩ
		V _{GS} =4.5V, I _D =6A			18	
Forward Transconductance	g _{FS}	V _{DS} =10V, I _D =7.2A	16			S
Input Capacitance	C _{iss}	V _{GS} =0V, V _{DS} =25V, f=1MHz		1670		pF
Output Capacitance	C _{oss}			670		
Reverse Transfer Capacitance	C _{rss}			100		
Output Capacitance	C _{oss}	V _{GS} =0V, V _{DS} =1V, f=1MHz		2290		pF
		V _{GS} =0V, V _{DS} =24V, f=1MHz		680		
Effective Output Capacitance	C _{oss eff}	V _{GS} =0V, V _{DS} =0 to 24V		1020		pF
Total Gate Charge	Q _g	V _{GS} =10V, V _{DS} =24V, I _D =7.2A		44	66	nC
Gate Source Charge	Q _{gs}			7.9		
Gate Drain Charge	Q _{gd}			9.2		
Turn-On DelayTime	t _{d(on)}	V _{GS} =10V, V _{DS} =10V, I _D =7.2A, R _G =6.2Ω *1		8.8		ns
Turn-On Rise Time	t _r			8		
Turn-Off DelayTime	t _{d(off)}			35		
Turn-Off Fall Time	t _f			14		
Body Diode Reverse Recovery Time	t _{rr}	I _F =7.2A, di/dt=100A/μs, T _J =25°C *1		50	75	ns
Body Diode Reverse Recovery Charge	Q _{rr}			74	110	
Maximum Body-Diode Continuous Current	I _S	*2			3.1	A
Pulsed Source Current	I _{SM}				96	
Diode Forward Voltage	V _{SD}	I _S =7.2A, V _{GS} =0V, T _J =25°C *1			1	V

*1: Pulse width ≤ 300μs; duty cycle ≤ 2%.

*2: MOSFET symbol showing the integral reverse p-n junction diode.

N-Channel MOSFET IRF7413 (KRF7413)

■ Typical Characteristics

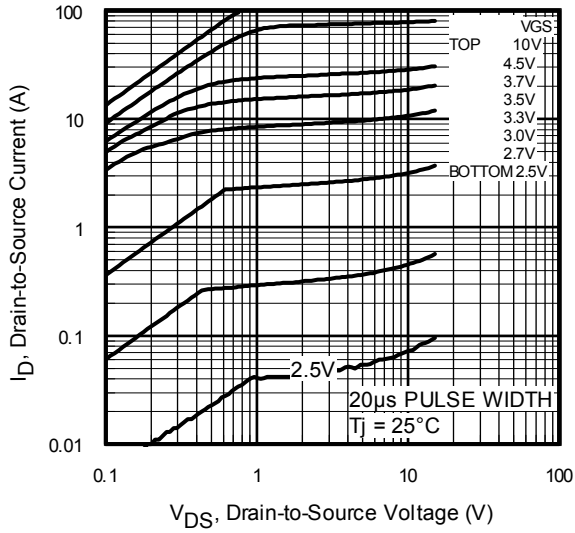


Fig 1. Typical Output Characteristics

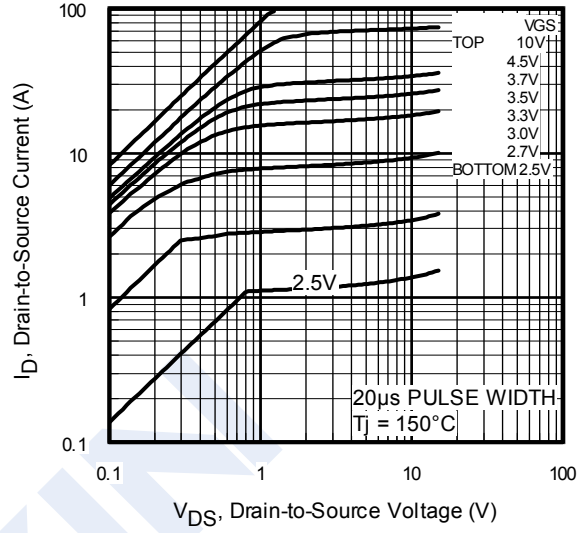


Fig 2. Typical Output Characteristics

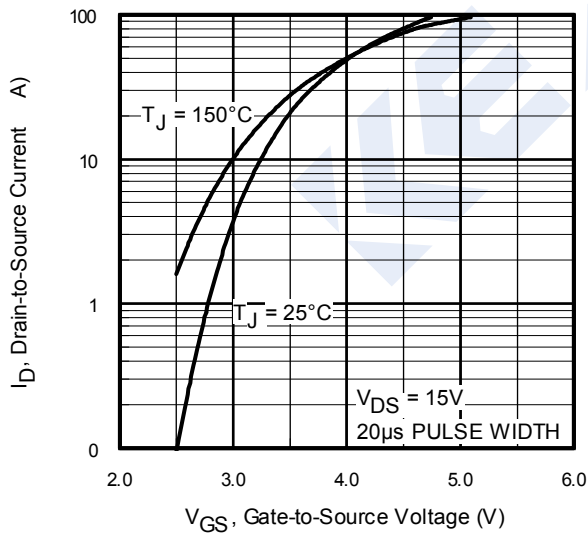


Fig 3. Typical Transfer Characteristics

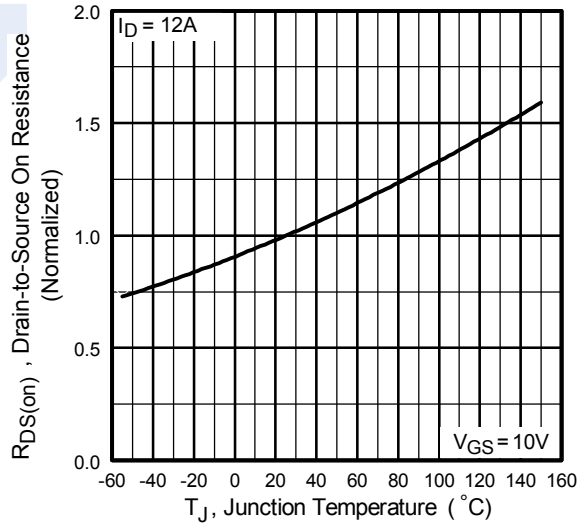


Fig 4. Normalized On-Resistance Vs. Temperature

N-Channel MOSFET IRF7413 (KRF7413)

■ Typical Characteristics

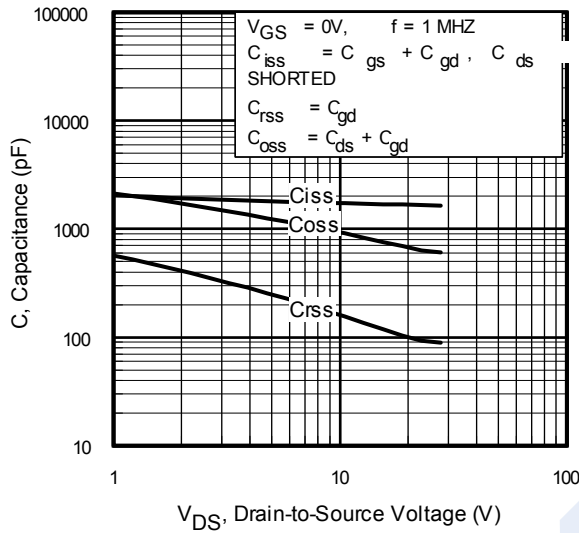


Fig 5. Typical Capacitance Vs. Drain-to-Source Voltage

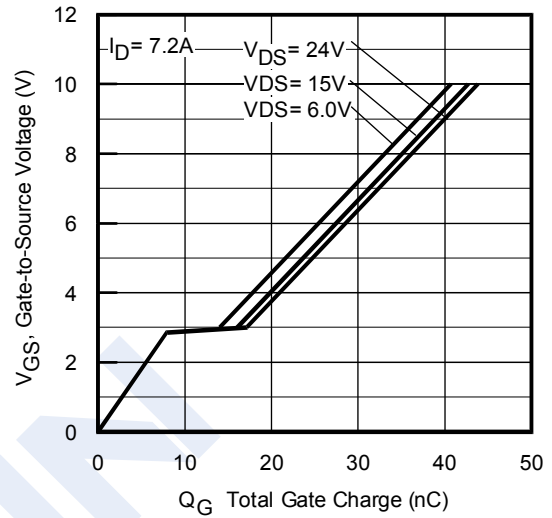


Fig 6. Typical Gate Charge Vs. Gate-to-Source Voltage

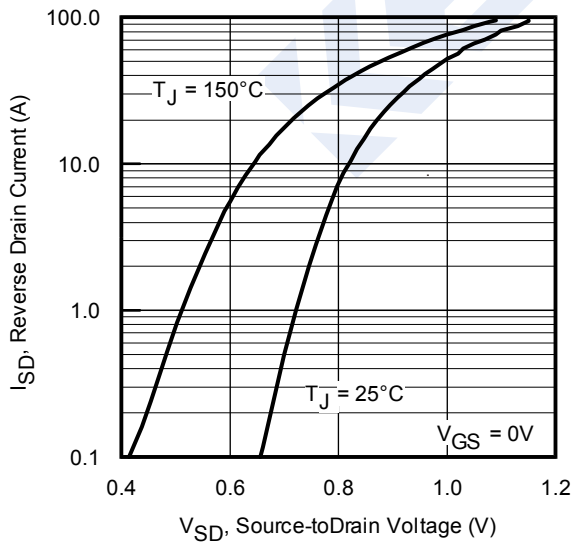


Fig 7. Typical Source-Drain Diode Forward Voltage

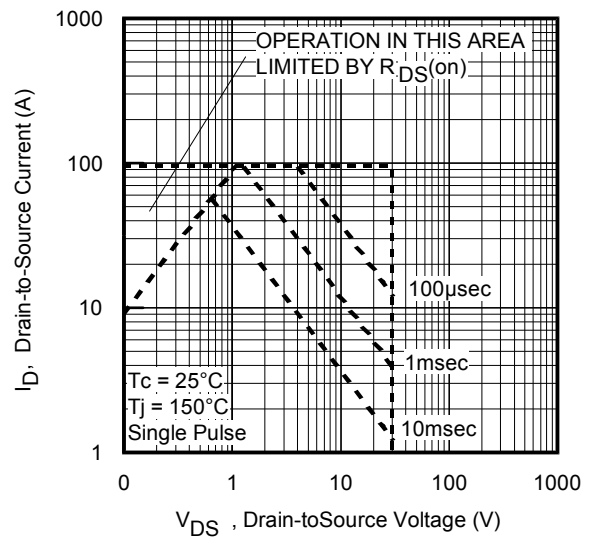


Fig 8. Maximum Safe Operating Area

N-Channel MOSFET IRF7413 (KRF7413)

■ Typical Characteristics

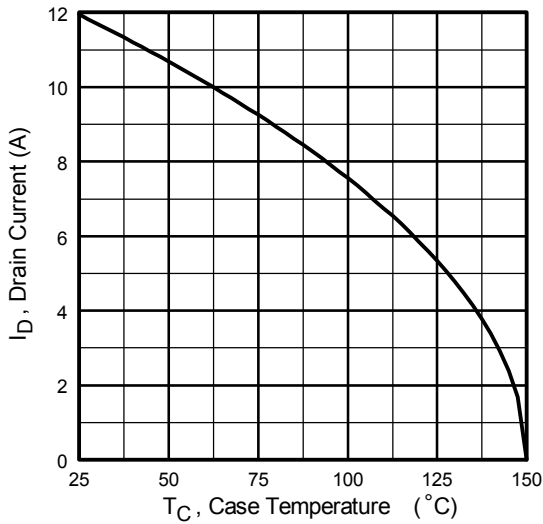


Fig 9. Maximum Drain Current Vs. Ambient Temperature

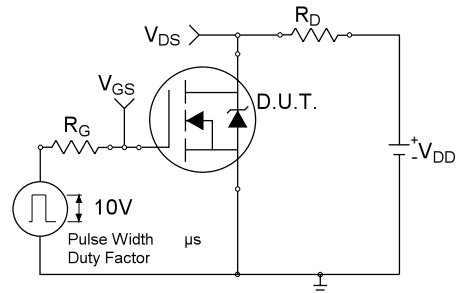


Fig 10a. Switching Time Test Circuit

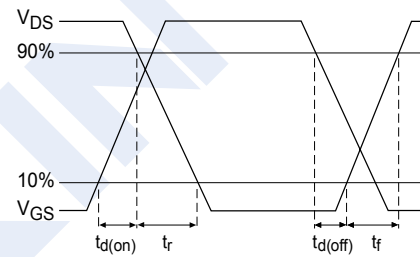


Fig 10b. Switching Time Waveforms

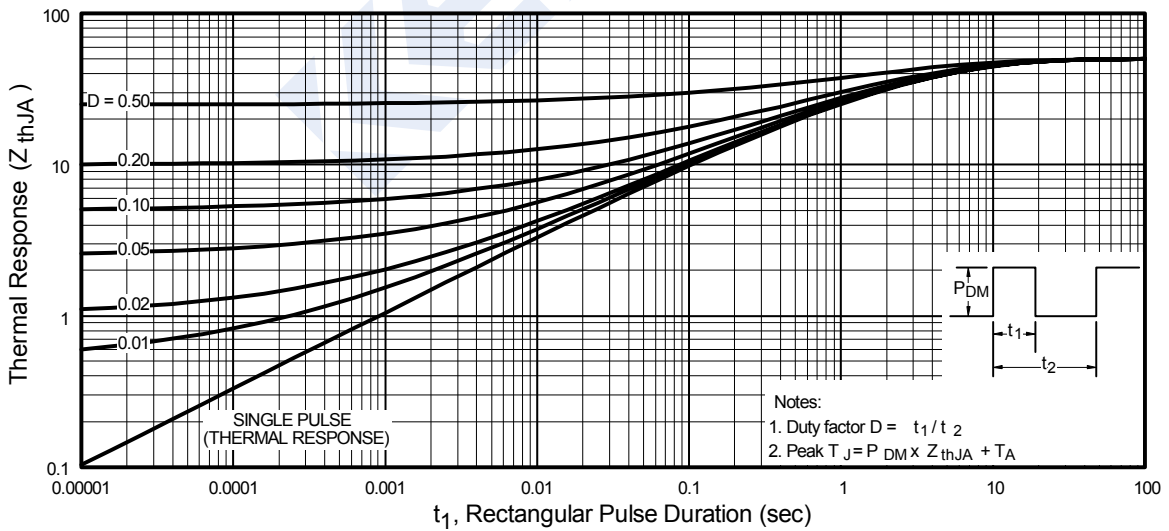


Fig 11. Maximum Effective Transient Thermal Impedance, Junction-to-Ambient

N-Channel MOSFET IRF7413 (KRF7413)

■ Typical Characteristics

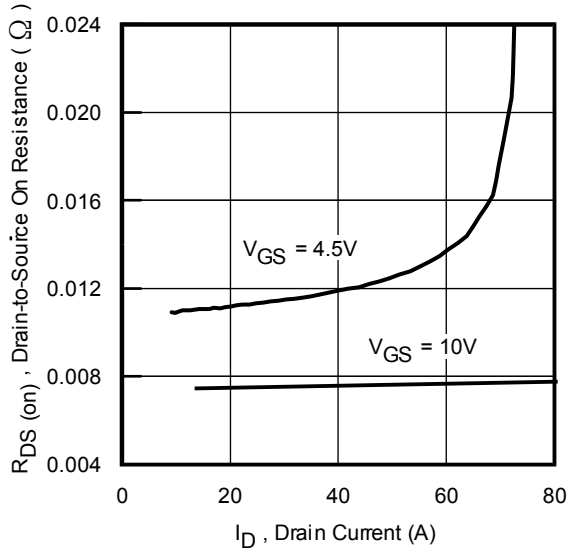


Fig 12. On-Resistance Vs. Drain Current

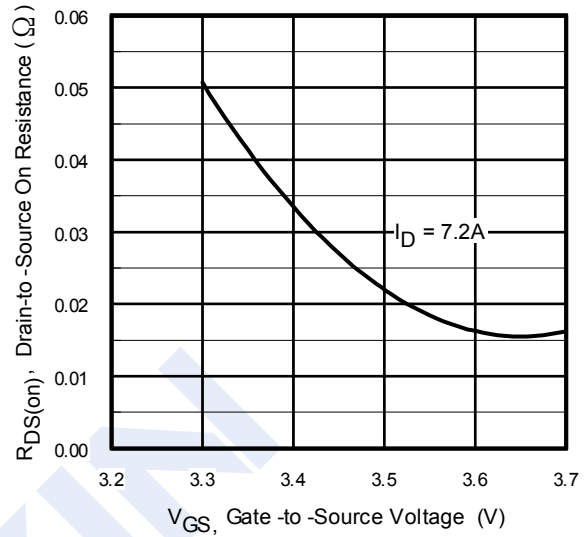


Fig 13. On-Resistance Vs. Gate Voltage

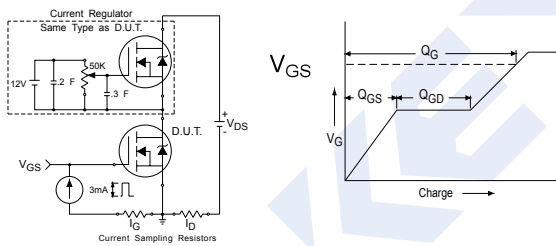


Fig 14a&b. Basic Gate Charge Test Circuit and Waveform

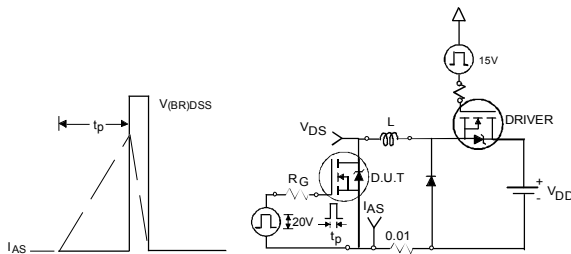


Fig 15a&b. Unclamped Inductive Test circuit and Waveforms

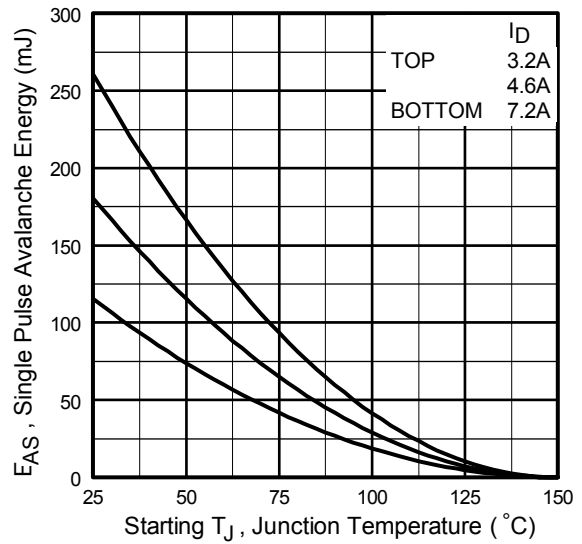


Fig 15c. Maximum Avalanche Energy Vs. Drain Current