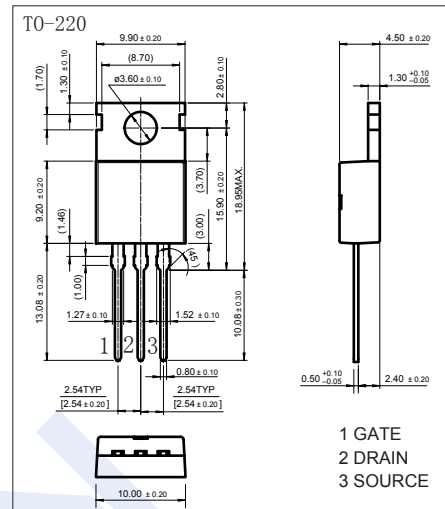


N-Channel MOSFET

IRF1404Z (KRF1404Z)

■ Features

- V_{DS} (V) = 40V
- I_D = 75 A (V_{GS} = 10V)
- $R_{DS(ON)}$ < 3.7m Ω (V_{GS} = 10V)
- Fast Switching
- Repetitive Avalanche Allowed up to T_{jmax}



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

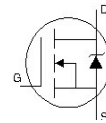
Parameter	Symbol	Rating	Unit
Drain-Source Voltage	V_{DS}	40	V
Gate-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current (Package Limited) (Silicon Limited)	I_D	$T_c=25^\circ\text{C}$	75
		$T_c=25^\circ\text{C}$	180
		$T_c=100^\circ\text{C}$	120
Pulsed Drain Current	I_{DM}	710	A
Avalanche Current	I_{AR}	See Fig.12a, 12b, 15, 16	
Repetitive Avalanche Energy	E_{AR}		
Single Pulse Avalanche Energy	E_{AS}	330	mJ
Single Pulse Avalanche Energy Tested Value		480	
Power Dissipation	P_D	200	W
Thermal Resistance.Junction- to-Ambient (PCB Mount)	R_{thJA}	62	$^\circ\text{C/W}$
		40	
Thermal Resistance.Junction- to-Case	R_{thJC}	0.75	
Junction Temperature	T_J	175	$^\circ\text{C}$
Storage Temperature Range	T_{stg}	-55 to 175	

N-Channel MOSFET

IRF1404Z (KRF1404Z)

■ 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	40			V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =40V, V _{GS} =0V			20	μA
		V _{DS} =40V, V _{GS} =0V, T _J =125°C			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 =250 μA	2		4	V
Static Drain-Source On-Resistance	R _{DS(on)}	V _{GS} =10V, I _D =75A		2.7	3.7	mΩ
Forward Transconductance	g _{FS}	V _{DS} =25V, I _D =75A	170			S
Input Capacitance	C _{iss}	V _{GS} =0V, V _{DS} =25V, f=1MHz		4340		pF
Output Capacitance	C _{oss}			1030		
Reverse Transfer Capacitance	C _{rss}			550		
Output Capacitance	C _{oss}	V _{GS} =0V, V _{DS} =1V, f=1MHz		3300		
Output Capacitance	C _{oss}	V _{GS} =0V, V _{DS} =32V, f=1MHz		920		
Effective Output Capacitance	C _{oss eff}	V _{GS} =0V, V _{DS} =0V to 32V		1350		
Total Gate Charge	Q _g	V _{GS} =10V, V _{DS} =32V, I _D =75A		100	150	nC
Gate Source Charge	Q _{gs}			31		
Gate Drain Charge	Q _{gd}			42		
Turn-On DelayTime	t _{d(on)}	V _{GS} =10V, V _{DS} =20V, I _D =75A, R _G =3 Ω		18		ns
Turn-On Rise Time	t _r			110		
Turn-Off DelayTime	t _{d(off)}			36		
Turn-Off Fall Time	t _f			58		
Body Diode Reverse Recovery Time	t _{rr}	I _F =75A, di/dt=100A/μs, V _{DD} =20V, T _J =25°C		28	42	nC
Body Diode Reverse Recovery Charge	Q _{rr}			34	51	
Internal Drain Inductance	L _D	Between lead, 6mm (0.25in.) from package and center of die contact		4.5		nH
Internal Drain Inductance	L _S			7.5		
Maximum Body-Diode Continuous Current	I _S	MOSFET symbol showing the integral reverse p-n junction diode.			75	A
Pulsed Source Current	I _{SM}				750	
Diode Forward Voltage	V _{SD}	I _S =75A, V _{GS} =0V, T _J =25°C			1.3	V



N-Channel MOSFET IRF1404Z (KRF1404Z)

■ Typical Characteristics

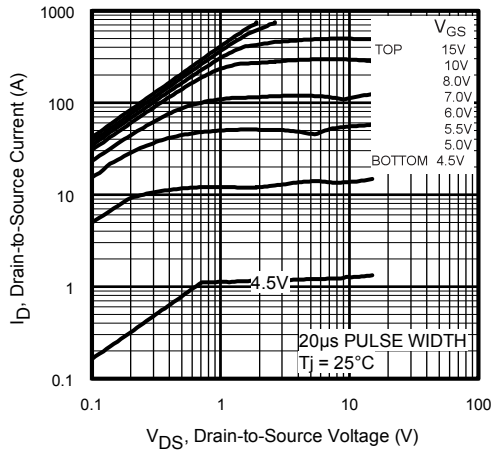


Fig 1. Typical Output Characteristics

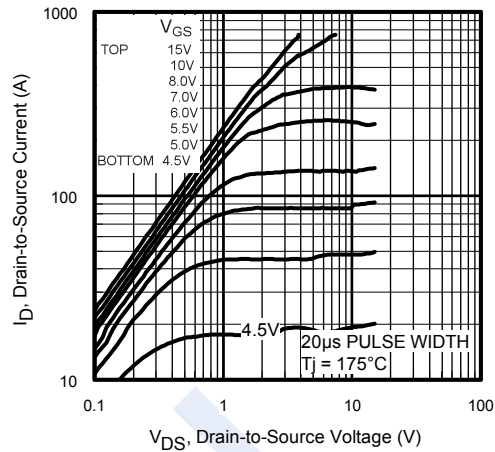


Fig 2. Typical Output Characteristics

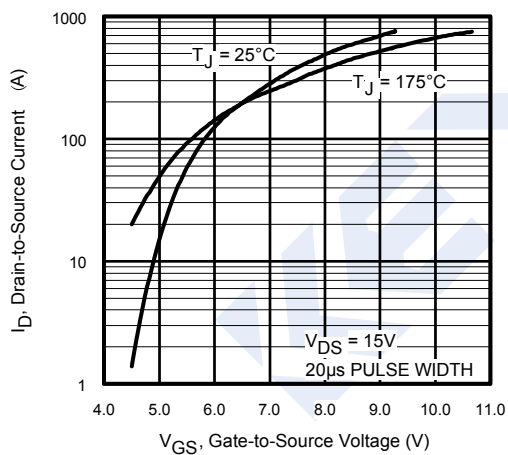


Fig 3. Typical Transfer Characteristics

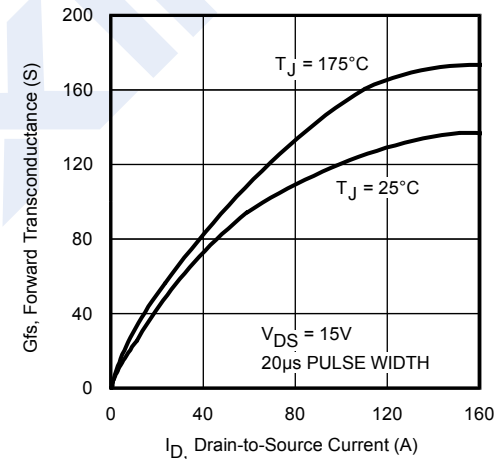


Fig 4. Typical Forward Transconductance Vs. Drain Current

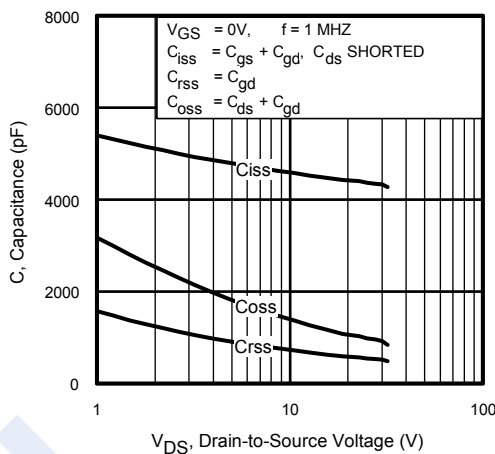


Fig 5. Typical Capacitance Vs. Drain-to-Source Voltage

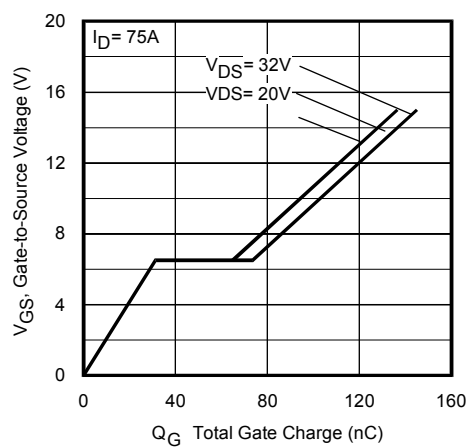


Fig 6. Typical Gate Charge Vs. Gate-to-Source Voltage

N-Channel MOSFET

IRF1404Z (KRF1404Z)

■ Typical Characteristics

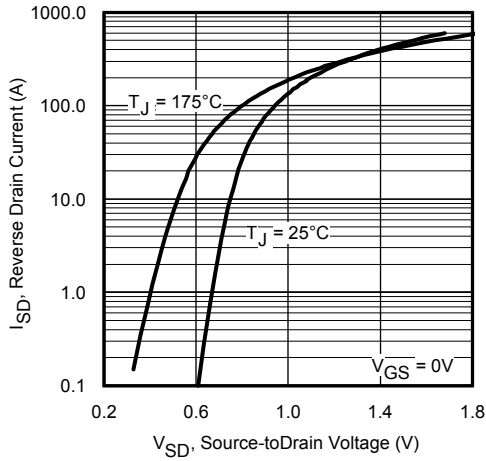


Fig 7. Typical Source-Drain Diode Forward Voltage

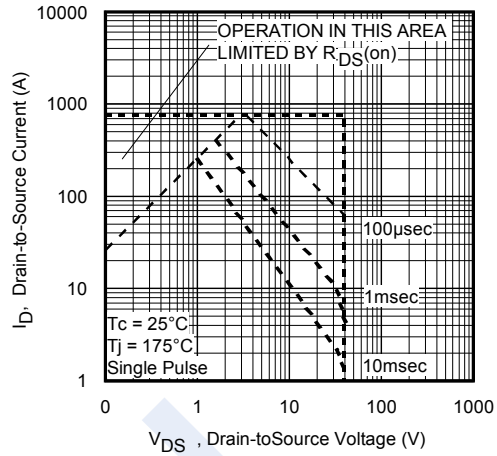


Fig 8. Maximum Safe Operating Area

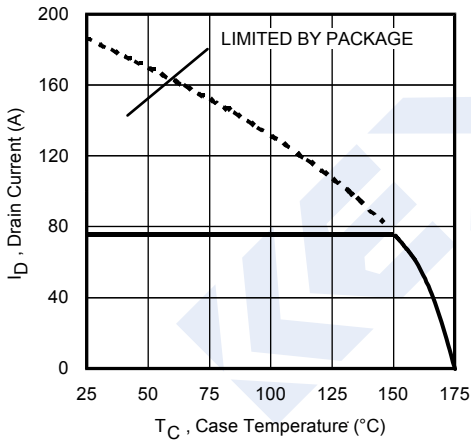


Fig 9. Maximum Drain Current Vs. Case Temperature

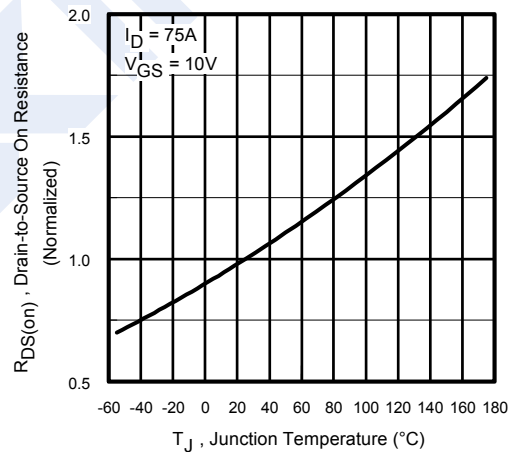


Fig 10. Normalized On-Resistance Vs. Temperature

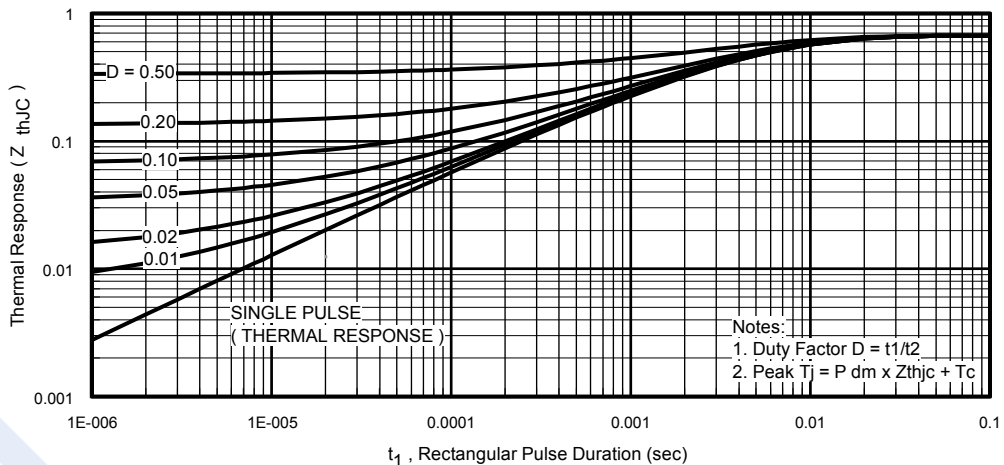


Fig 11. Maximum Effective Transient Thermal Impedance, Junction-to-Case

N-Channel MOSFET IRF1404Z (KRF1404Z)

■ Typical Characteristics

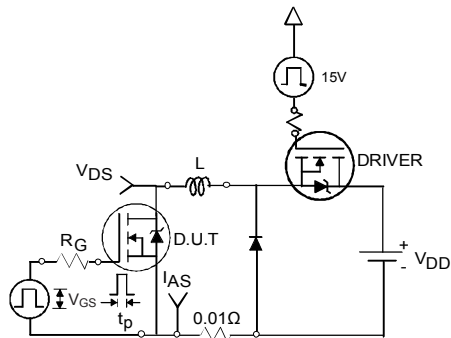


Fig 12a. Unclamped Inductive Test Circuit

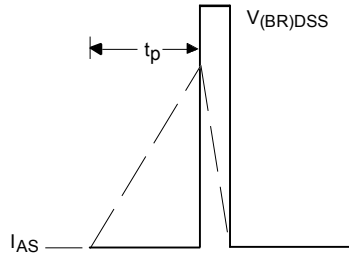


Fig 12b. Unclamped Inductive Waveforms

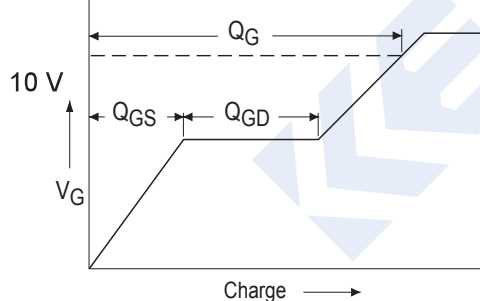


Fig 13a. Basic Gate Charge Waveform

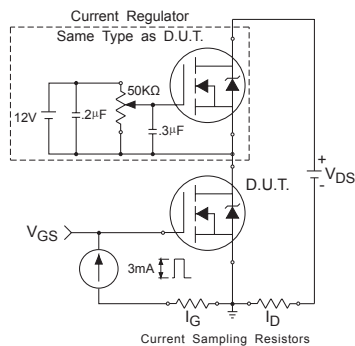


Fig 13b. Gate Charge Test Circuit

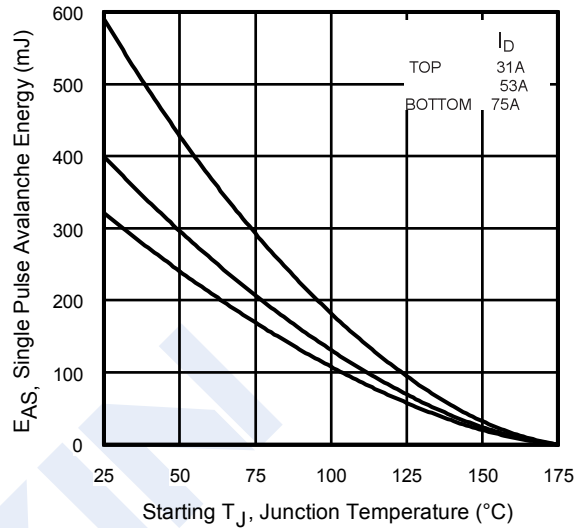


Fig 12c. Maximum Avalanche Energy Vs. Drain Current

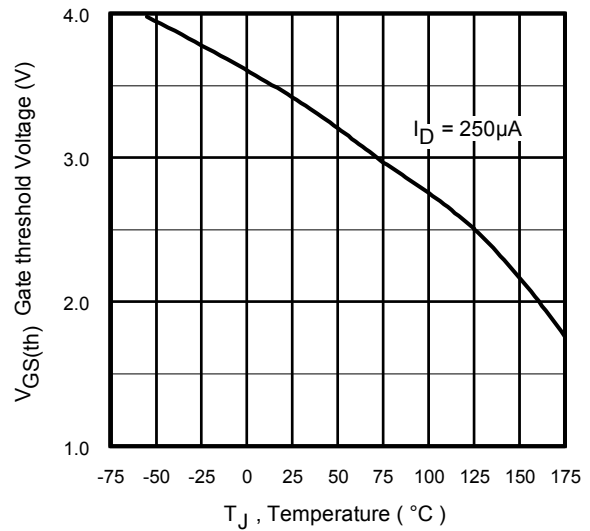


Fig 14. Threshold Voltage Vs. Temperature

N-Channel MOSFET IRF1404Z (KRF1404Z)

■ Typical Characteristics

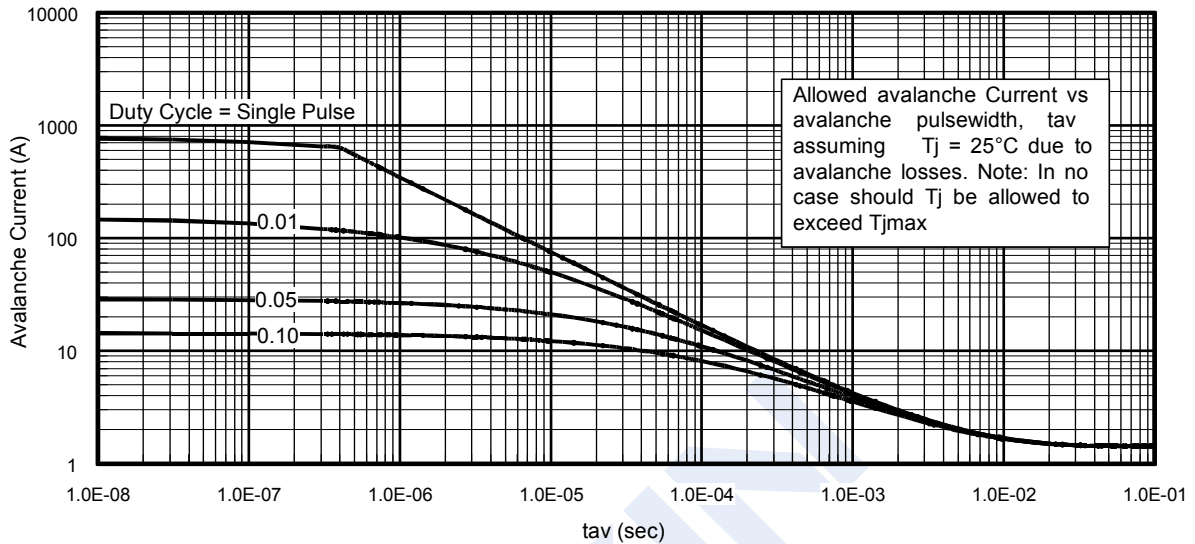


Fig 15. Typical Avalanche Current Vs.Pulsewidth

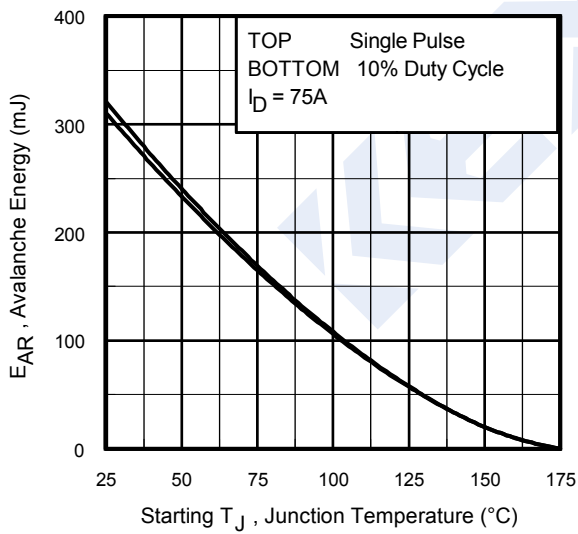


Fig 16. Maximum Avalanche Energy Vs. Temperature