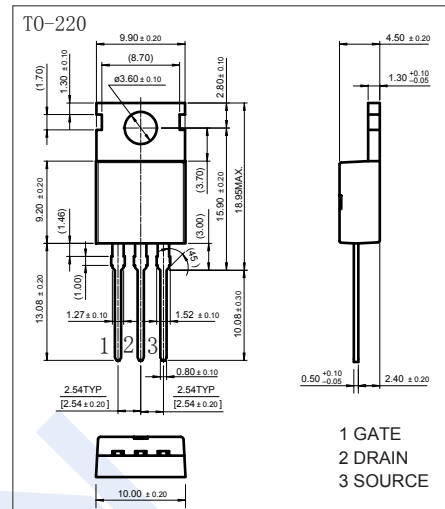


N-Channel MOSFET

IRF1404Z (KRF1404Z)

■ Features

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



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

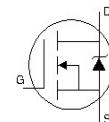
Parameter		Symbol	Rating	Unit
Drain-Source Voltage		V_{DS}	40	V
Gate-Source Voltage		V_{GS}	± 20	
Continuous Drain Current	(Package Limited)	$T_C=25^{\circ}C$	75	A
	(Silicon Limited)	$T_C=25^{\circ}C$	180	
		$T_C=100^{\circ}C$	120	
Pulsed Drain Current		I_{DM}	710	mJ
Avalanche Curren		I_{AR}	See Fig.12a,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

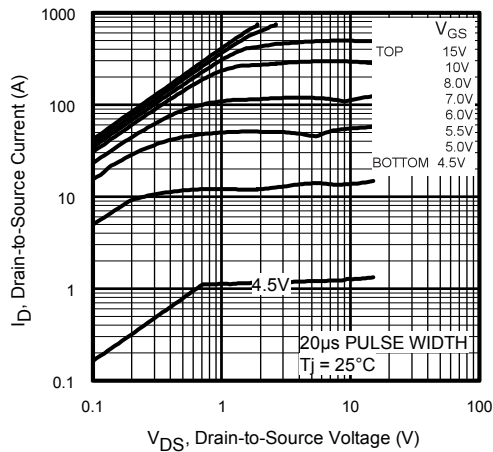


Fig 1. Typical Output Characteristics

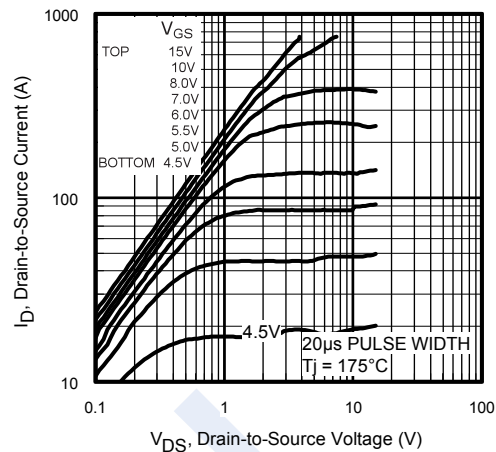


Fig 2. Typical Output Characteristics

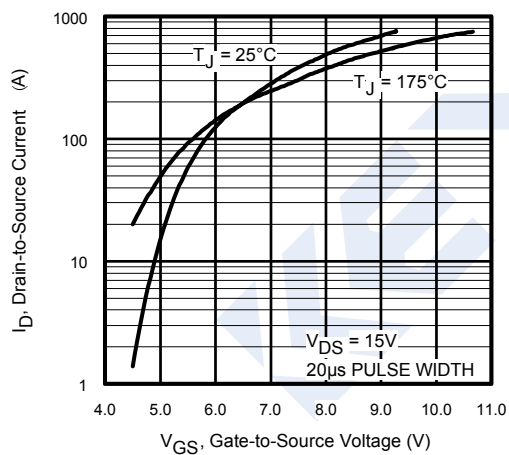


Fig 3. Typical Transfer Characteristics

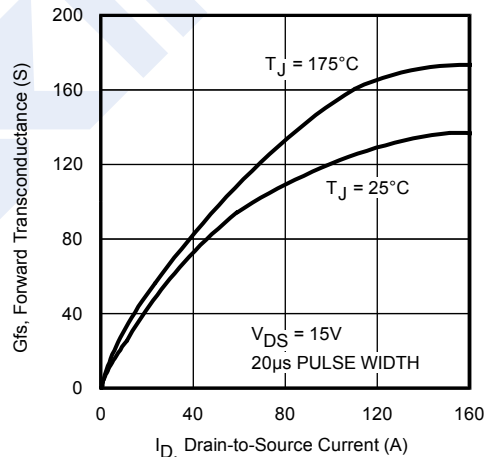


Fig 4. Typical Forward Transconductance Vs. Drain Current

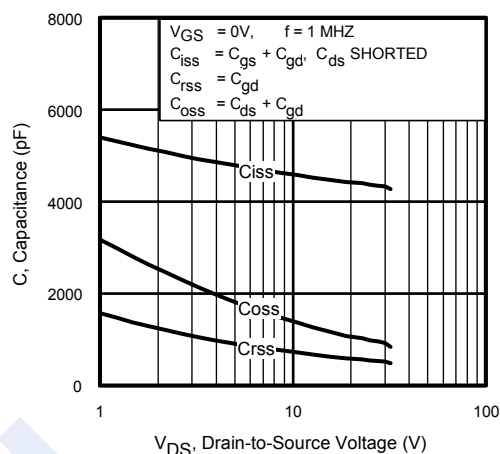


Fig 5. Typical Capacitance Vs. Drain-to-Source Voltage

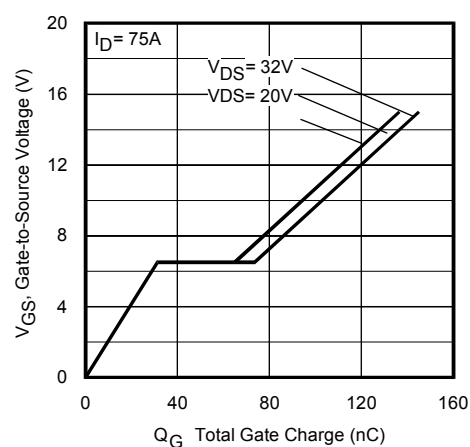


Fig 6. Typical Gate Charge Vs. Gate-to-Source Voltage

N-Channel MOSFET

IRF1404Z (KRF1404Z)

■ Typical Characteristics

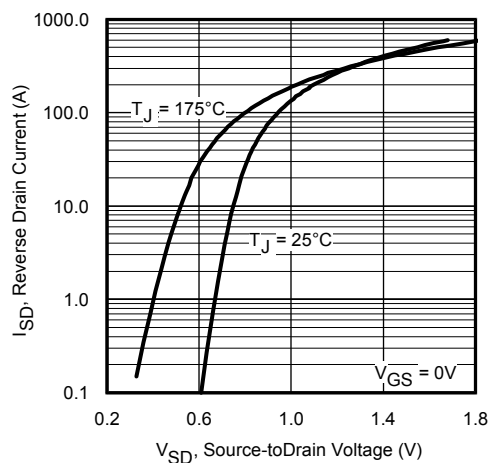


Fig 7. Typical Source-Drain Diode Forward Voltage

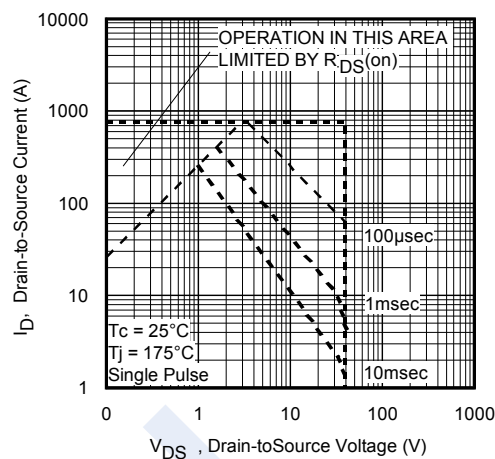


Fig 8. Maximum Safe Operating Area

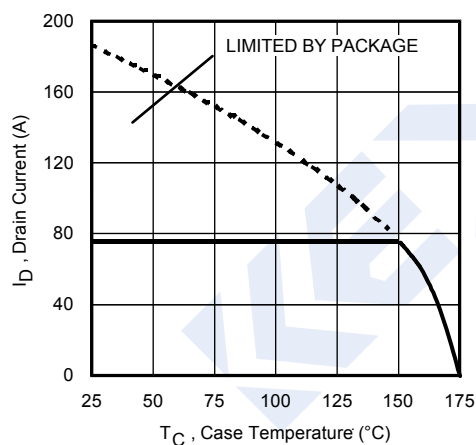


Fig 9. Maximum Drain Current Vs. Case Temperature

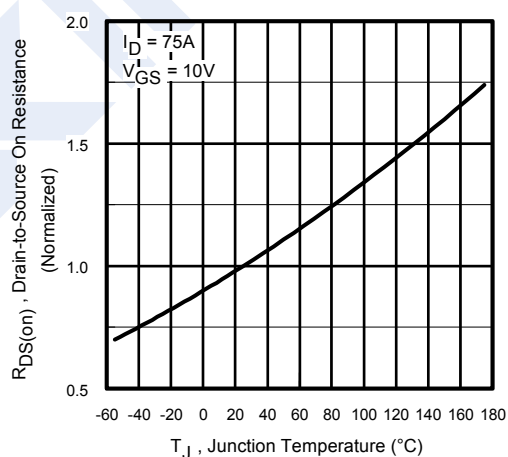


Fig 10. Normalized On-Resistance Vs. Temperature

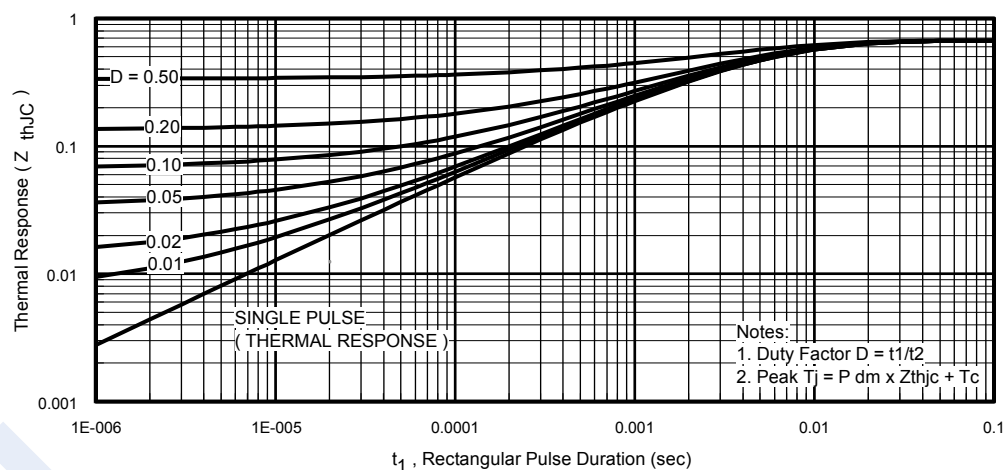


Fig 11. Maximum Effective Transient Thermal Impedance, Junction-to-Case

N-Channel MOSFET

IRF1404Z (KRF1404Z)

■ Typical Characteristics

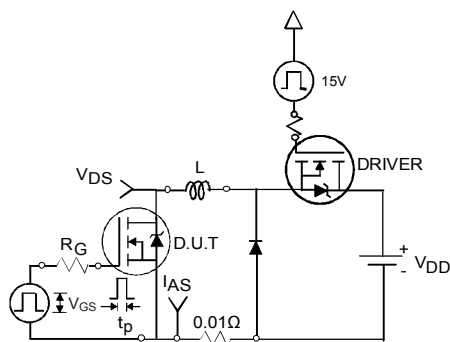


Fig 12a. Unclamped Inductive Test Circuit

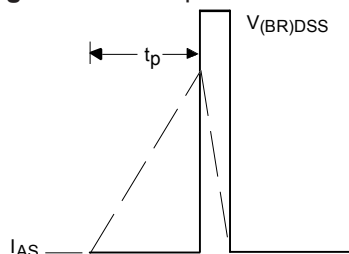


Fig 12b. Unclamped Inductive Waveforms

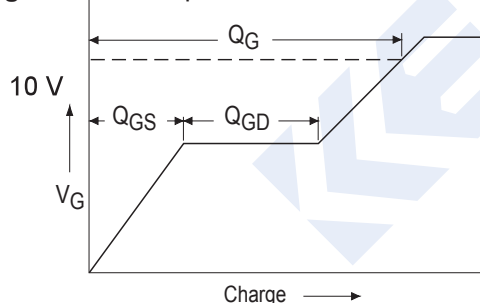


Fig 13a. Basic Gate Charge Waveform

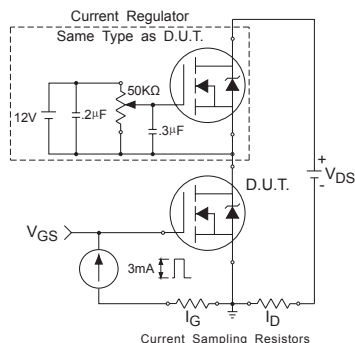


Fig 13b. Gate Charge Test Circuit

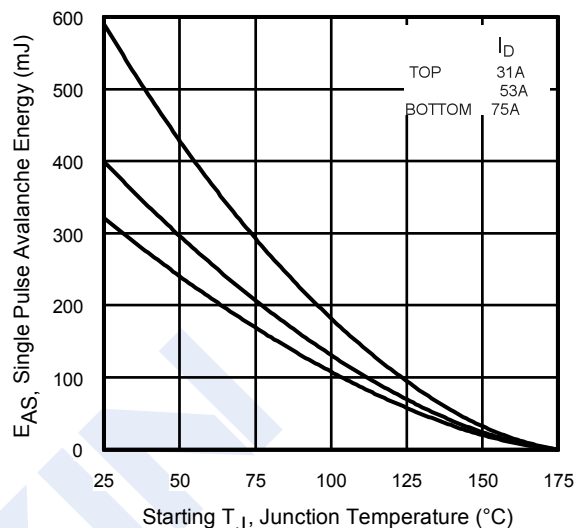


Fig 12c. Maximum Avalanche Energy Vs. Drain Current

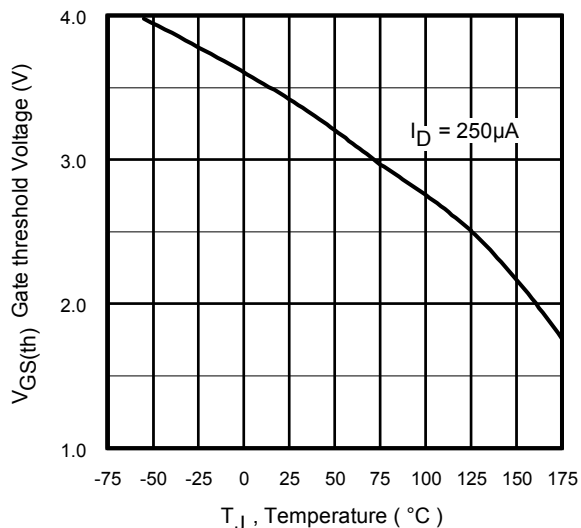


Fig 14. Threshold Voltage Vs. Temperature

N-Channel MOSFET

IRF1404Z (KRF1404Z)

■ Typical Characteristics

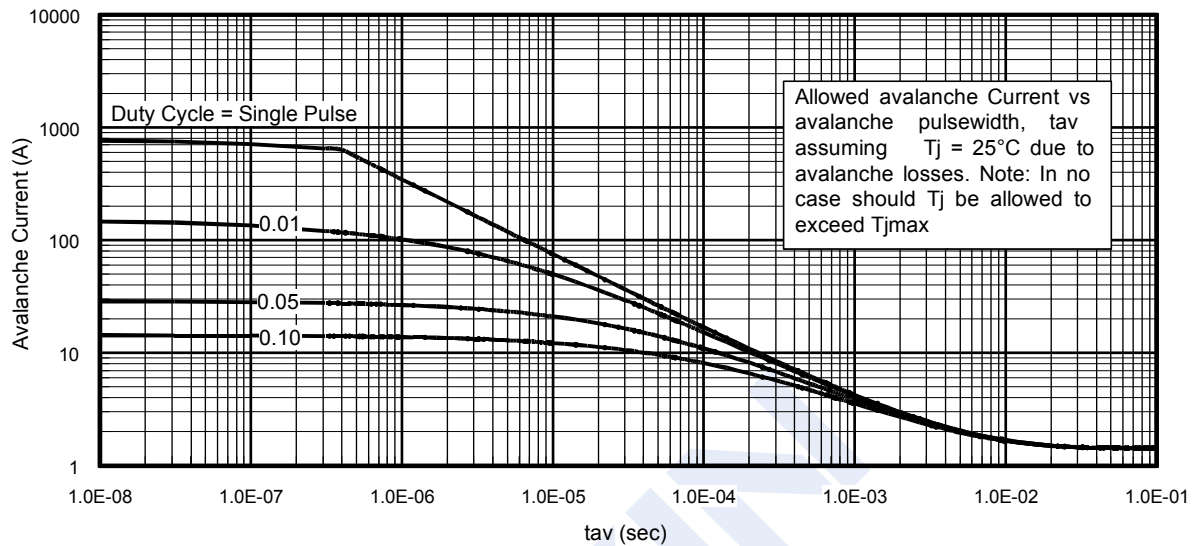


Fig 15. Typical Avalanche Current Vs. Pulsewidth

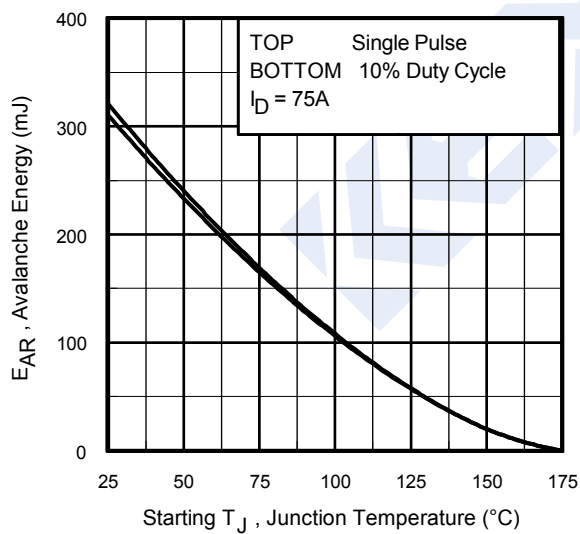


Fig 16. Maximum Avalanche Energy Vs. Temperature