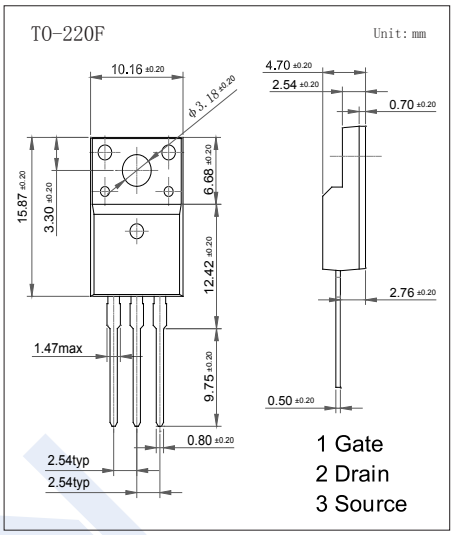
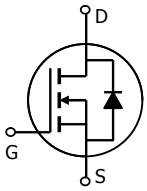
N-Channel MOSFET
KX6N80F



■ Features

- $V_{DS\ (V)}$ = 800V
- I_D = 7 A (V_{GS} = 10V)
- $R_{DS(ON)}$ < 1.9Ω (V_{GS} = 10V)
- Low Gate Charge (Typ. 27 nC)
- Fast switching
- 100% Avalanche Tested



■ Absolute Maximum Ratings Ta = 25℃

Parameter		Symbol	Rating	Unit
Drain-Source Voltage		V_{DS}	800	V
Gate-Source Voltage		V_{GS}	±30	
Continuous Drain Current	Tc=25℃	I_D	7	A
	Tc=100℃		4.2	
Pulsed Drain Current (Note.1)		I_{DM}	28	
Power Dissipation	Tc=25℃	P_D	56	W
- Derate above 25°C			0.44	W/℃
Single Pulsed Avalanche Energy (Note.2)		E_{AS}	650	mJ
Repetitive Avalanche Energy (Note.1)		E_{AR}	16.7	
Peak Diode Recovery dv/dt (Note.3)		dv/dt	4.5	V/ns
Thermal Resistance.Junction- to-Ambient		R_{thJA}	62.5	℃/W
Thermal Resistance.Junction- to-Case		R_{thJC}	2.25	
Junction Temperature		T_J	150	℃
Storage Temperature Range		T_{stg}	-55 to 150	

Note.1: Repetitive Rating : Pulse width limited by maximum junction temperature

Note.2: L = 25mH, I_{AS} = 7A, V_{DD} = 50V, R_G = 25 Ω, Starting T_J = 25°C

Note.3: I_{SD} ≤ 7A, di/dt ≤ 200A/μs, V_{DD} ≤ BV_{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	800			V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=800V, V_{GS}=0V			10	uA
		V_{DS}=640V, V_{GS}=0V, T_C=125℃			100	
Gate-Body Leakage Current	I_{GSS}	V_{DS}=0V, V_{GS}=±30V			±100	nA
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS} , I_D=250μA	3		5	V
Static Drain-Source On-Resistance	$R_{DS(ON)}$	V_{GS}=10V, I_D=3.5A			1.9	Ω
Input Capacitance	C_{iss}	V_{GS}=0V, V_{DS}=25V, f=1MHz		1300		pF
Output Capacitance	C_{oss}			120		
Reverse Transfer Capacitance	C_{rss}			10		
Total Gate Charge	Q_g	V_{GS}=10V, V_{DS}=640V, I_D=7A (Note.1)		27		nC
Gate Source Charge	Q_{gs}			8		
Gate Drain Charge	Q_{gd}			11		
Turn-On DelayTime	$t_{d(on)}$	V_{DS}=400V, I_D=7A,R_G=25Ω (Note.1)		40		ns
Turn-On Rise Time	t_r			100		
Turn-Off DelayTime	$t_{d(off)}$			50		
Turn-Off Fall Time	t_f			60		
Body Diode Reverse Recovery Time	t_{rr}	I_F= 7A, di/dt= 100A/μs,V_{GS}=0 (Note.1)		650		
Body Diode Reverse Recovery Charge	Q_{rr}			7		uC
Maximum Body-Diode Continuous Current	I_S				7	A
Pulsed Drain-Source Diode Forward Current	I_{SM}				28	
Diode Forward Voltage	V_{SD}	I_S=7A,V_{GS}=0V			1.5	V

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

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■ Typical Characterisitics

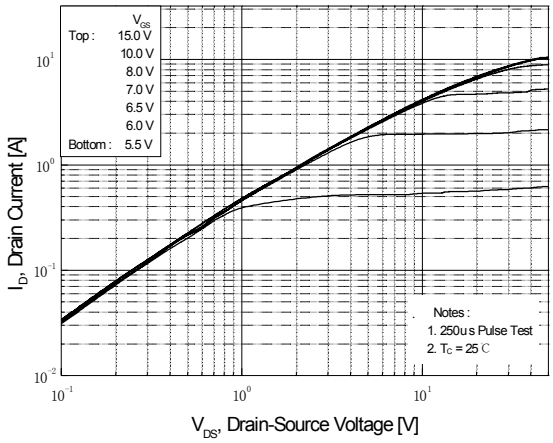

Figure 1. On-Region Characteristics

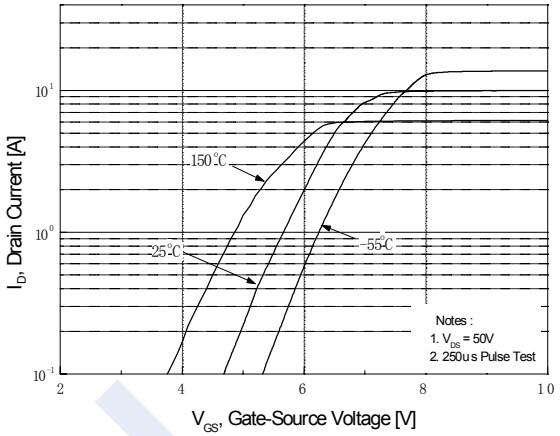

Figure 2. Transfer Characteristics

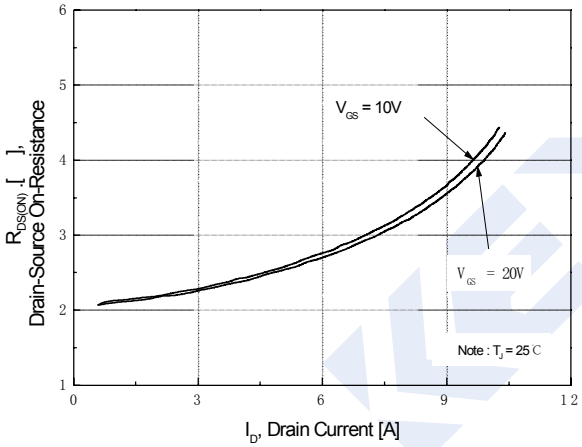

Figure 3. On-Resistance Variation vs Drain Current and Gate Voltage

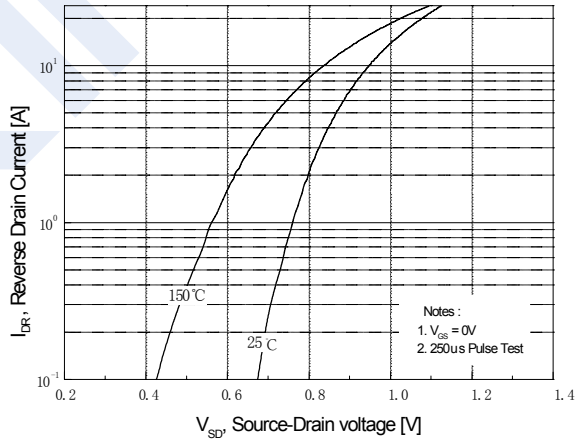

Figure 4. Body Diode Forward Voltage Variation with Source Current and Temperature

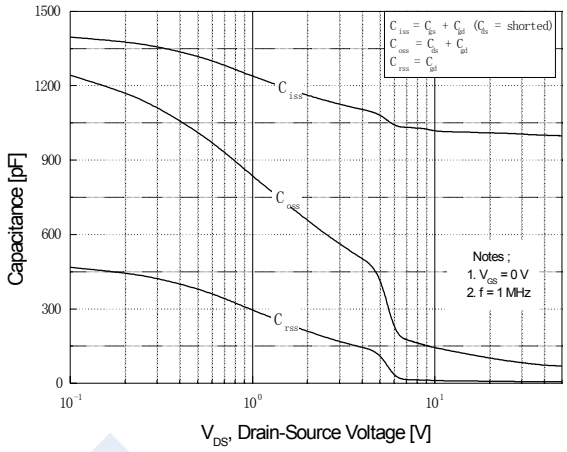

Figure 5. Capacitance Characteristics

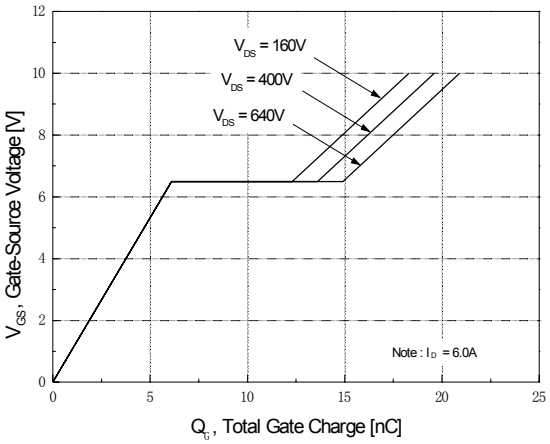

Figure 6. Gate Charge Characteristics

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■ Typical Characterisitics

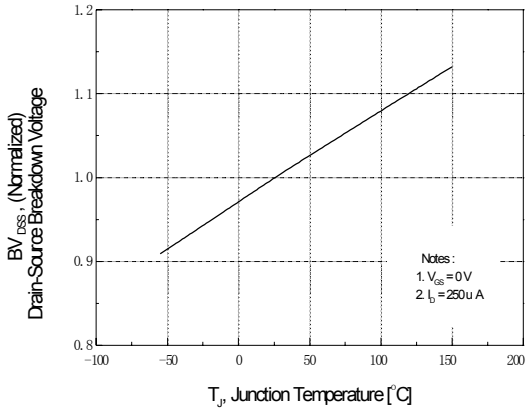

Figure 7. Breakdown Voltage Variation vs Temperature

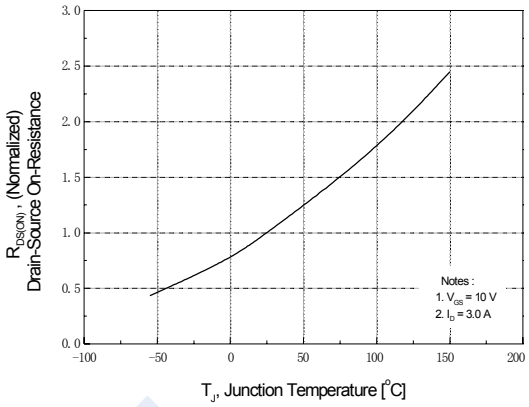

Figure 8. On-Resistance Variation vs Temperature

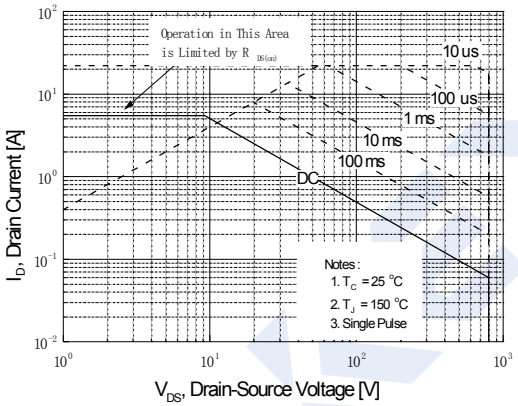

Figure 9. Maximum Safe Operating Area for KX6N80F

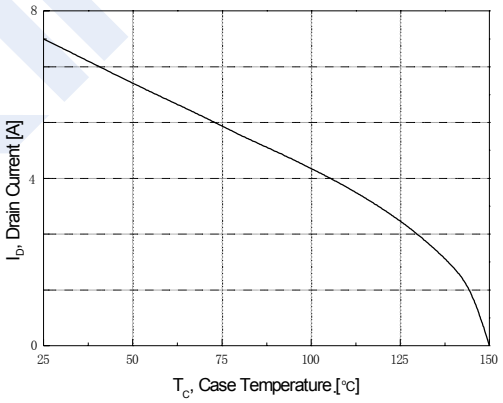

Figure 10. Maximum Drain Current vs Case Temperature

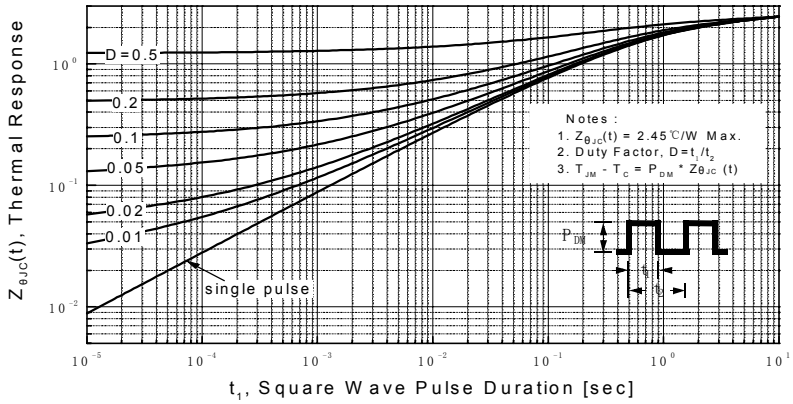

Figure 11. Transient Thermal Response Curve for KX6N80F

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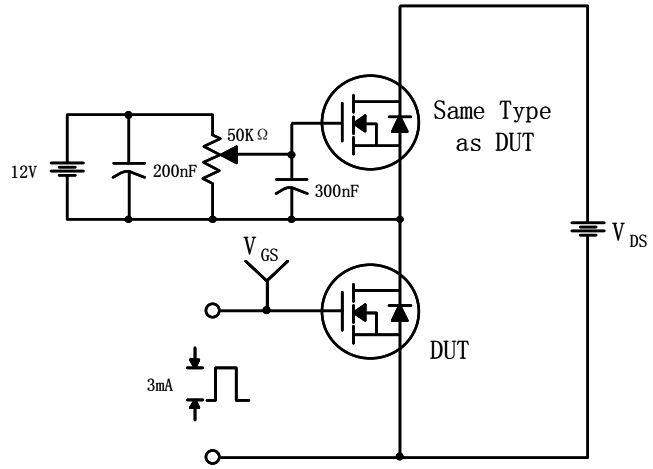
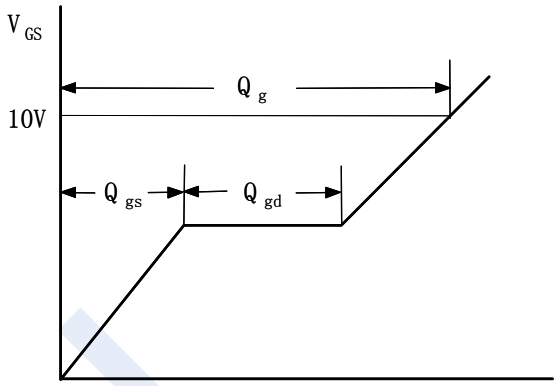
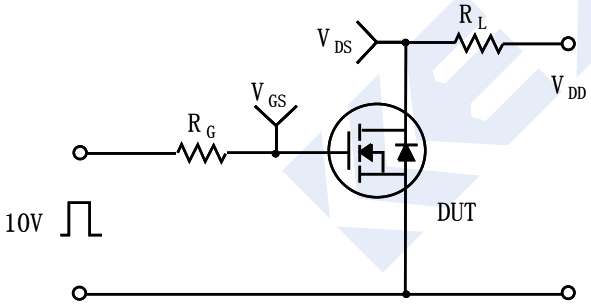
■ Typical Characterisitics

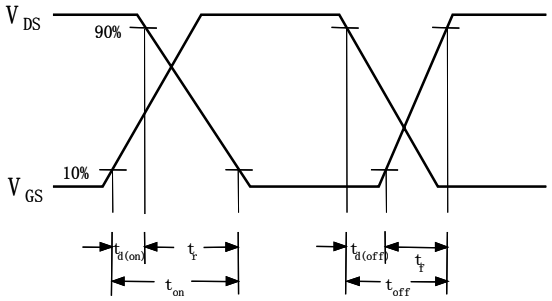




Gate Charge Test Circuit & Waveform

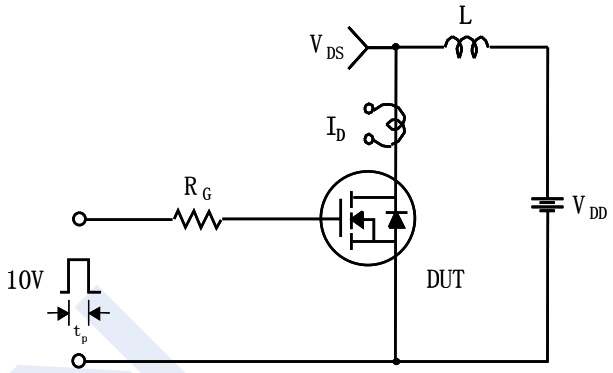
Charge



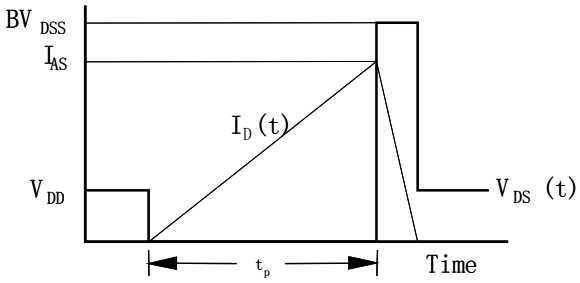


Resistive Switching Test Circuit & Waveforms

Unclamped Inductive Switching Test Circuit & Waveforms



$$E_{AS} = \frac{1}{2} L I_{AS}^2 \frac{BV_{DSS}}{BV_{DSS} - V_{DD}}$$



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■ Typical Characterisitics

Peak Diode Recovery dv/dt Test Circuit & Waveforms