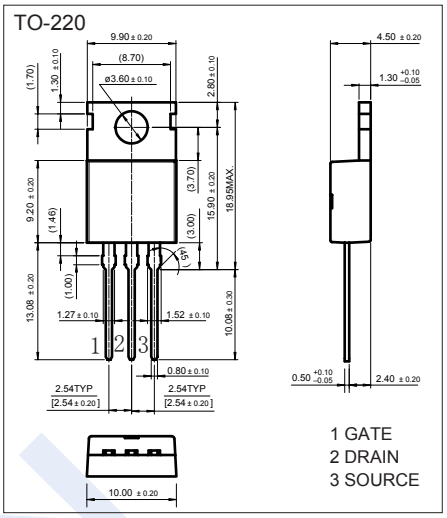
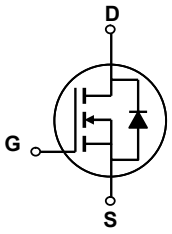
N-Channel MOSFET

KX3N80



■ Features

- $V_{DS\ (V)}$ = 800V
- I_D = 3 A (V_{GS} = 10V)
- $R_{DS(ON)}$ < 5Ω (V_{GS} = 10V)
- Low gate charge (typical 15 nC)
- Low Crss (typical 7.0 pF)
- Fast switching



■ 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	3	A
	Tc=100℃		1.9	
Pulsed Drain Current		I_{DM}	12	
Avalanche Current		I_{AR}	3	
Power Dissipation	Tc=25℃	P_D	75	W
Derate above 25°C			0.6	W/℃
Single Pulsed Avalanche Energy (Note.1)		E_{AS}	120	mJ
Repetitive Avalanche Energy		E_{AR}	12	
Peak Diode Recovery dv/dt (Note.2)		dv/dt	5	V/ns
Thermal Resistance.Junction- to-Ambient		R_{thJA}	62	℃/W
Thermal Resistance.Junction- to-Case		R_{thJC}	1.67	
Thermal Resistance, Case-to-Sink		R_{thJCS}	0.5 (typ)	
Junction Temperature		T_J	150	℃
Maximum lead temperature for soldering purposes, 1/8" from case for 5 seconds		T_L	300	
Storage Temperature Range		T_{stg}	-55 to 150	

Note.1: L = 67mH, I_{AS} = 3A, V_{DD} = 50V, R_G = 25 Ω, Starting T_J = 25°C

Note.2: I_{SD} ≤ 3A, 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	μA
		V_{DS}=640V, V_{GS}=0V, T_J=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	2		4	V
Static Drain-Source On-Resistance	$R_{DS(ON)}$	V_{GS}=10V, I_D=1.5A			5	Ω
Forward Transconductance	g_{FS}	V_{DS}=50V, I_D=1.5A (Note.1)		3		S
Input Capacitance	C_{iss}	V_{GS}=0V, V_{DS}=25V, f=1MHz			690	pF
Output Capacitance	C_{oss}				75	
Reverse Transfer Capacitance	C_{rss}				9	
Total Gate Charge	Q_g	V_{GS}=10V, V_{DS}=640V, I_D=3A (Note.1)			19	nC
Gate Source Charge	Q_{gs}			3.5		
Gate Drain Charge	Q_{gd}			7.7		
Turn-On DelayTime	$t_{d(on)}$	V_{DS}=400V, I_D=3A,R_G=25Ω (Note.1)			40	ns
Turn-On Rise Time	t_r				90	
Turn-Off DelayTime	$t_{d(off)}$				70	
Turn-Off Fall Time	t_f				70	
Body Diode Reverse Recovery Time	t_{rr}	I_F= 3A, V_{GS}=0, di/dt= 100A/μs (Note.1)			810	
Body Diode Reverse Recovery Charge	Q_{rr}				6.1	uC
Maximum Body-Diode Continuous Current	I_S				3	A
Pulsed Drain-Source Diode Forward Current	I_{SM}				12	
Diode Forward Voltage	V_{SD}	I_S=3A,V_{GS}=0V			1.4	V

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

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■ Typical Characterisitics

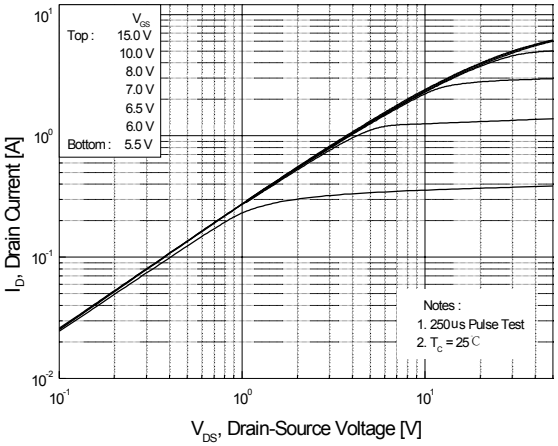

Figure 1. On-Region Characteristics

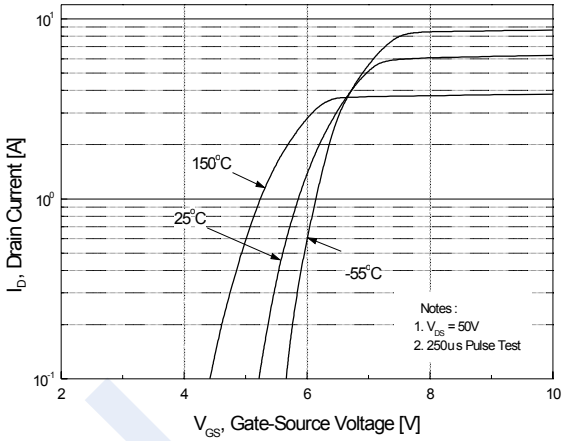

Figure 2. Transfer Characteristics

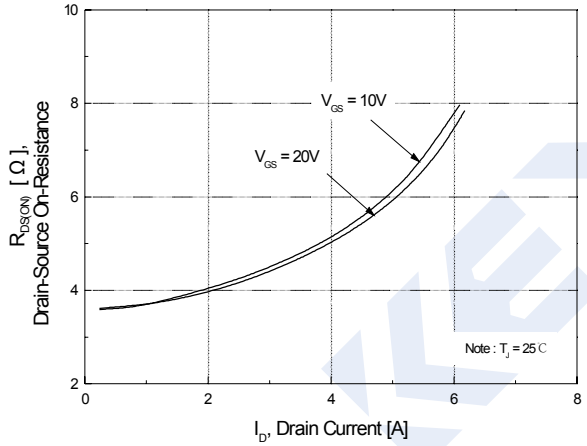

Figure 3. On-Resistance Variation vs Drain Current and Gate Voltage

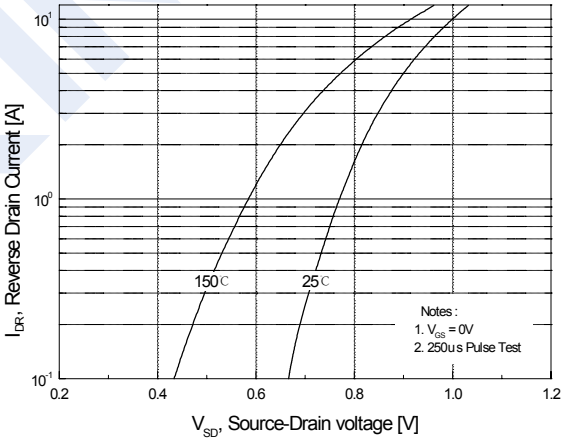

Figure 4. Body Diode Forward Voltage Variation with Source Current and Temperature

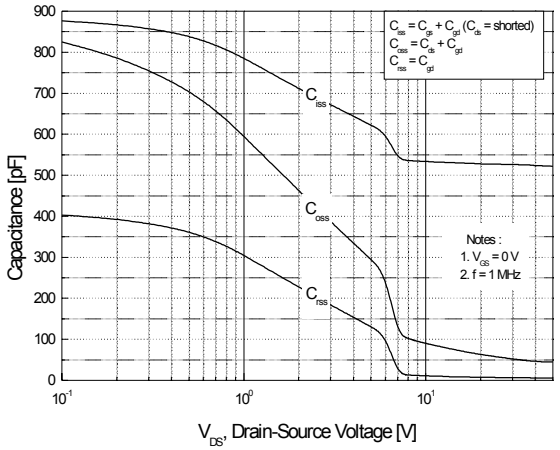

Figure 5. Capacitance Characteristics

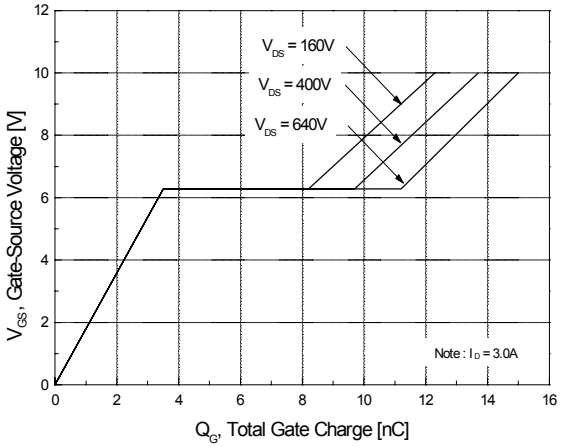

Figure 6. Gate Charge Characteristics

N-Channel MOSFET

KX3N80

■ Typical Characterisitics

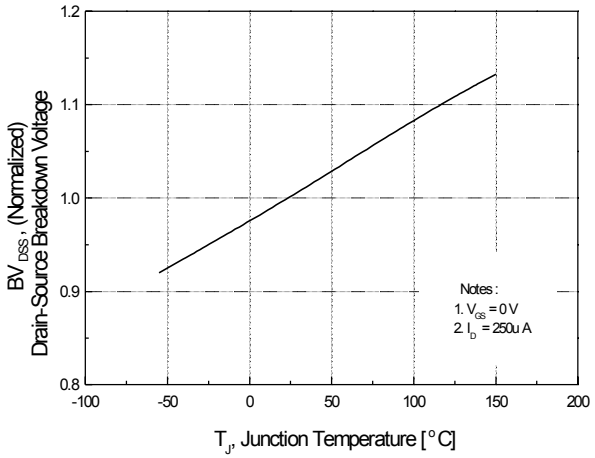

Figure 7. Breakdown Voltage Variation vs Temperature

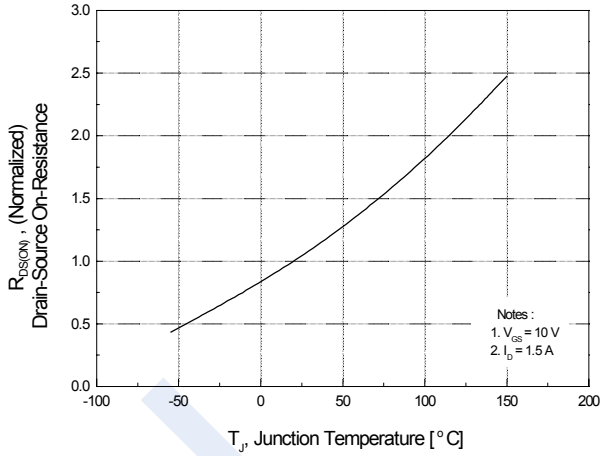

Figure 8. On-Resistance Variation vs Temperature

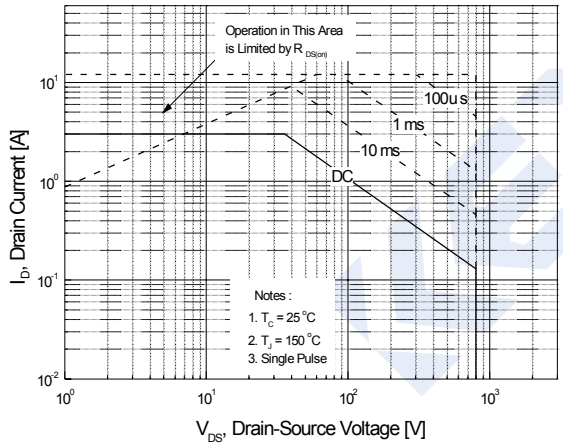

Figure 9. Maximum Safe Operating Area

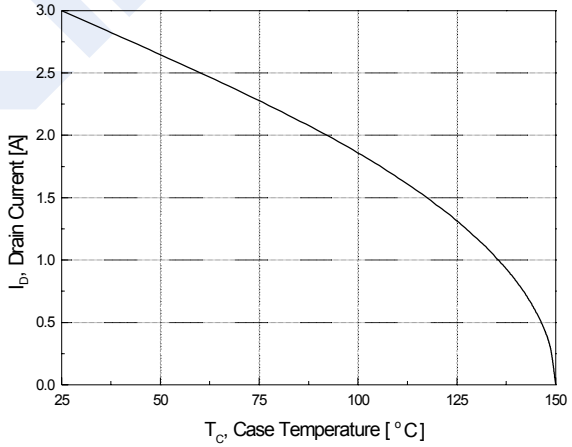

Figure 10. Maximum Drain Current vs Case Temperature

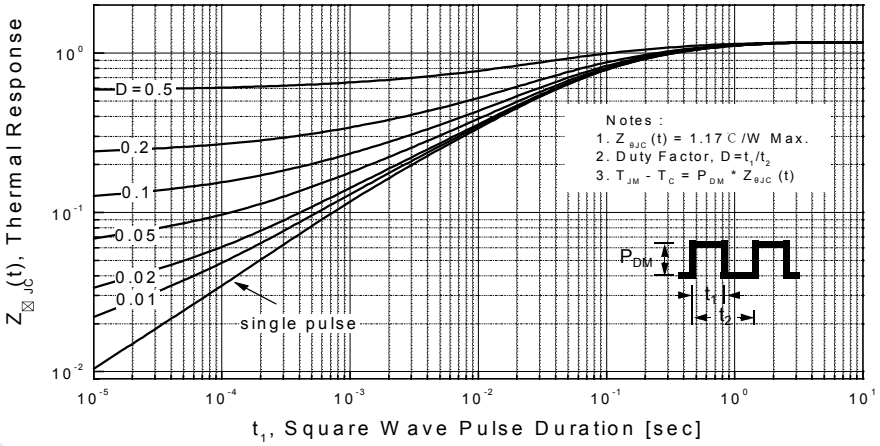

Figure 11. Transient Thermal Response Curve