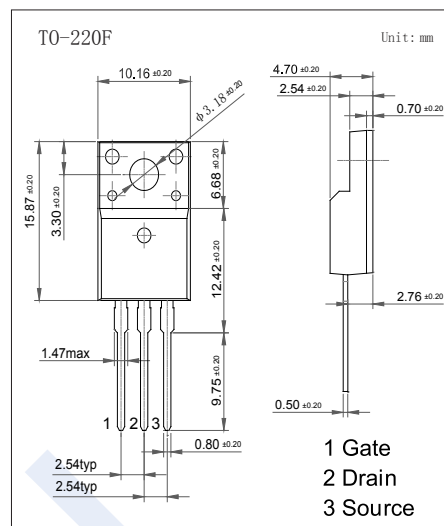
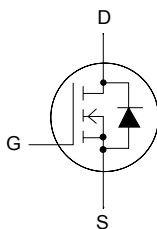


N-Channel MOSFET

KX4N60F

■ Features

- $V_{DS} (V) = 600V$
- $I_D = 2.4 A$ ($V_{GS} = 10V$)
- $R_{DS(ON)} < 2.5 \Omega$ ($V_{GS} = 10V$)



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

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	V_{DS}	600	V
Drain-Gate Voltage	V_{DG}	600	
Gate-Source Voltage	V_{GS}	± 30	
Continuous Drain Current	I_D	2.4	A
		1.5	
Pulsed Drain Current	I_{DM}	18	
Repetitive and Non-Repetitive Avalanche Current	I_{AS}, I_{AR}	4.5	mJ
Power Dissipation	P_D	35	
Non-Repetitive Avalanche Energy	E_{AS}	295	
Repetitive Avalanche Energy	E_{AR}	9	$^\circ C/W$
Thermal Resistance.Junction- to-Ambient	R_{thJA}	55	
Thermal Resistance.Junction- to-Case	R_{thJC}	3.6	
Junction Temperature	T_J	150	$^\circ C$
Storage Temperature Range	T_{stg}	-55 to 150	

N-Channel MOSFET

KX4N60F

■ 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	600			V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =600V, V _{GS} =0V		2	100	μA
		V _{DS} =480V, V _{GS} =0V, T _J =125°C		50	500	
Gate-Body Leakage Current	I _{GSS}	V _{DS} =0V, V _{GS} =±30V		10	200	nA
Gate Threshold Voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250 μA	2	3	4	V
Static Drain-Source On-Resistance	R _{DS(on)}	V _{GS} =10V, I _D =2.25A		2.1	2.5	Ω
Forward Transconductance	g _{FS}	V _{DS} =30V, I _D =2.25A	2	3.4		S
Input Capacitance	C _{iss}	V _{GS} =0V, V _{DS} =25V, f=1MHz		600		pF
Output Capacitance	C _{oss}			80		
Reverse Transfer Capacitance	C _{rss}			46		
Total Gate Charge	Q _g	V _{GS} =10V, V _{DS} =480V, I _D =4.5A		48	60	nC
Gate Source Charge	Q _{gs}			4	6	
Gate Drain Charge	Q _{gd}			24	30	
Turn-On DelayTime	t _{d(on)}	V _{GS} =10V, V _{DS} =300V, R _L =68 Ω, R _G =12 Ω		12		ns
Turn-On Rise Time	t _r			33		
Turn-Off DelayTime	t _{d(off)}			82		
Turn-Off Fall Time	t _f			36		
Body Diode Reverse Recovery Time	t _{rr}	I _F = 4.5A, di/dt= 100A/μs, V _{GS} =0		480		nC
Body Diode Reverse Recovery Charge	Q _{rr}			4		
Internal drain inductance	L _d	Measured from drain lead to centre of die		4.5		nH
Internal source inductance	L _s	Measured from source lead to source bond pad		7.5		
Capacitance from T2 to external heatsink	C _{isol}	f=1MHz		10		pF
R.M.S. isolation voltage from all three terminals to external heatsink	V _{isol}	f = 50-60 Hz; sinusoidal waveform; R.H≤65% ; clean and dustfree			2500	V
Maximum Body-Diode Continuous Current	I _s				4.5	A
Pulsed source current	I _{SM}				18	
Diode Forward Voltage	V _{SD}	I _s =4.5A, V _{GS} =0V			1.2	V

N-Channel MOSFET

KX4N60F

■ Typical Characteristics

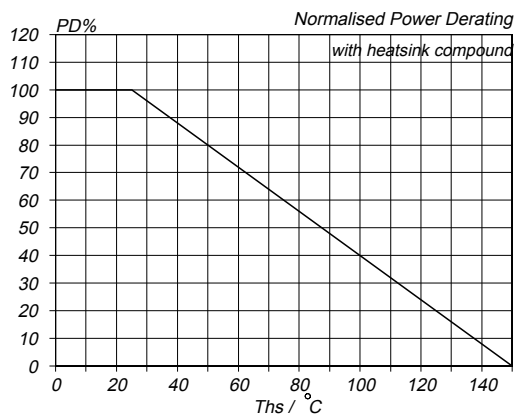


Fig.1. Normalised power dissipation.
 $PD\% = 100 \cdot P_D / P_{D\ 25^\circ\text{C}} = f(T_{hs})$

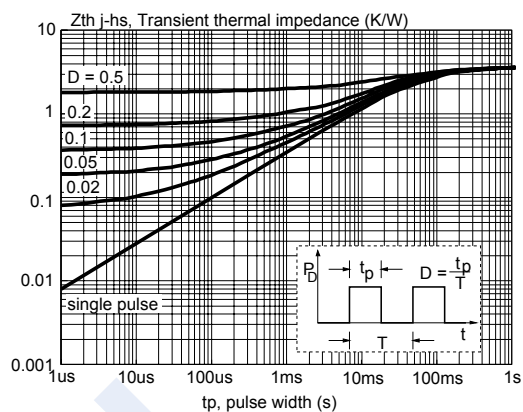


Fig.4. Transient thermal impedance.
 $Z_{th\ j-hs} = f(t)$; parameter $D = t_p / T$

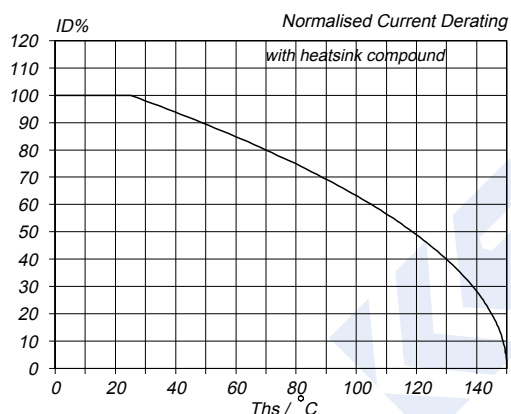


Fig.2. Normalised continuous drain current.
 $ID\% = 100 \cdot I_D / I_{D\ 25^\circ\text{C}} = f(T_{hs})$; conditions: $V_{GS} \geq 10\text{ V}$

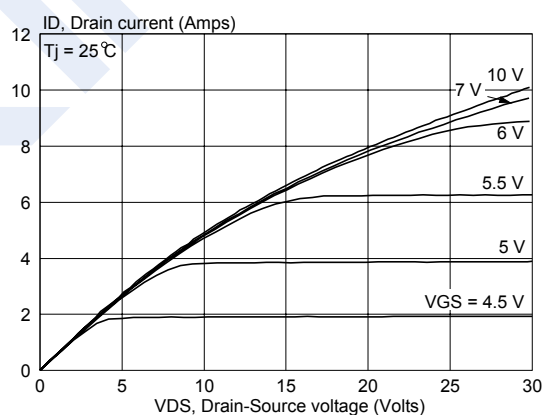


Fig.5. Typical output characteristics.
 $I_D = f(V_{DS})$; parameter V_{GS}

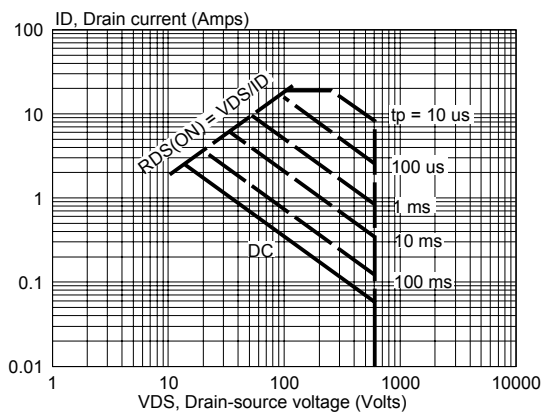


Fig.3. Safe operating area. $T_{hs} = 25^\circ\text{C}$
 $I_D \text{ \& } I_{DM} = f(V_{DS})$; I_{DM} single pulse; parameter t_p

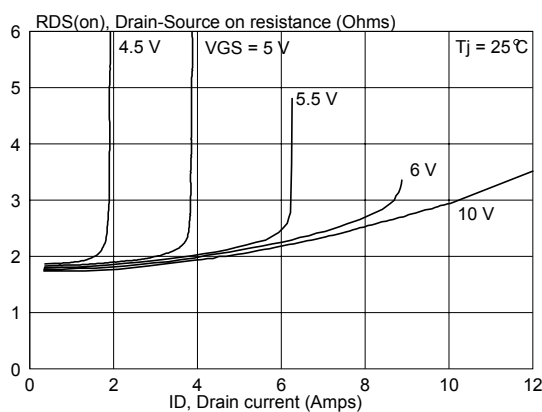


Fig.6. Typical on-state resistance.
 $R_{DS(ON)} = f(I_D)$; parameter V_{GS}

N-Channel MOSFET

KX4N60F

■ Typical Characteristics

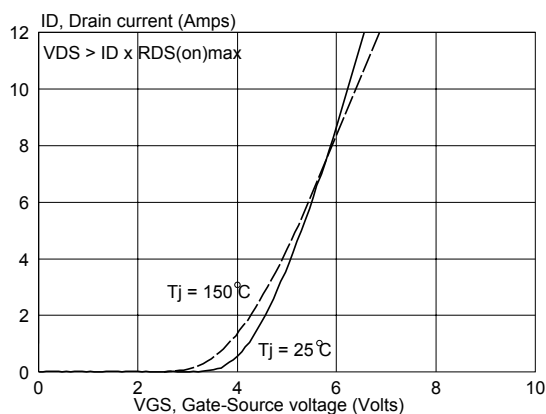


Fig. 7. Typical transfer characteristics.
 $I_D = f(V_{GS})$; parameter T_j

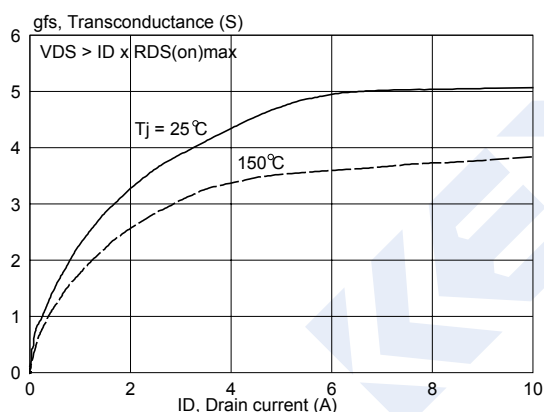


Fig. 8. Typical transconductance.
 $g_{fs} = f(I_D)$; parameter T_j

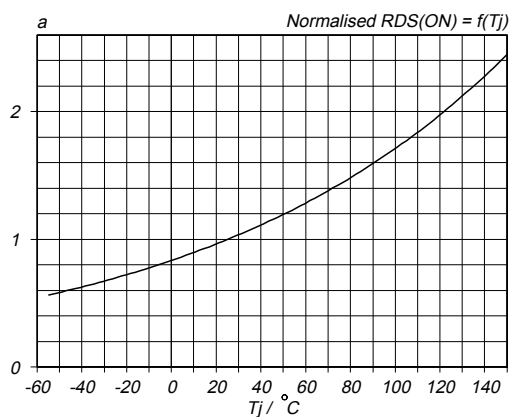


Fig. 9. Normalised drain-source on-state resistance.
 $a = R_{DS(ON)}/R_{DS(ON)25^\circ C} = f(T_j)$; $I_D = 2.25\text{ A}$; $V_{GS} = 10\text{ V}$

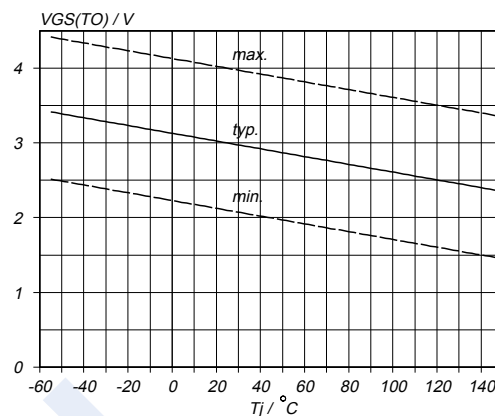


Fig. 10. Gate threshold voltage.
 $V_{GS(TO)} = f(T_j)$; conditions: $I_D = 0.25\text{ mA}$; $V_{DS} = V_{GS}$

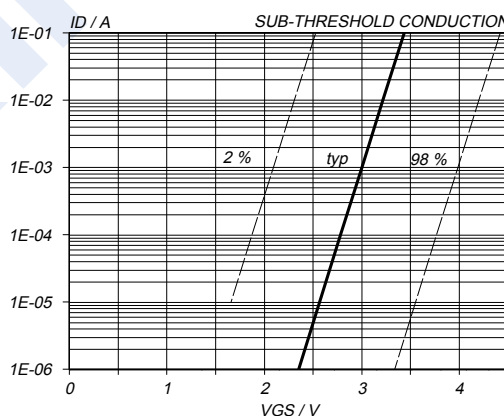


Fig. 11. Sub-threshold drain current.
 $I_D = f(V_{GS})$; conditions: $T_j = 25^\circ C$; $V_{DS} = V_{GS}$

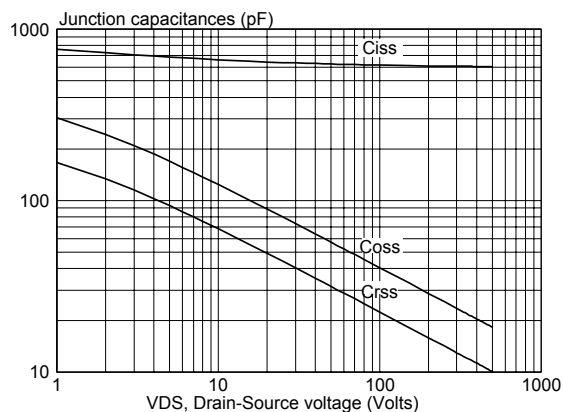


Fig. 12. Typical capacitances, C_{iss} , C_{oss} , C_{rss} .
 $C = f(V_{DS})$; conditions: $V_{GS} = 0\text{ V}$; $f = 1\text{ MHz}$

N-Channel MOSFET

KX4N60F

■ Typical Characteristics

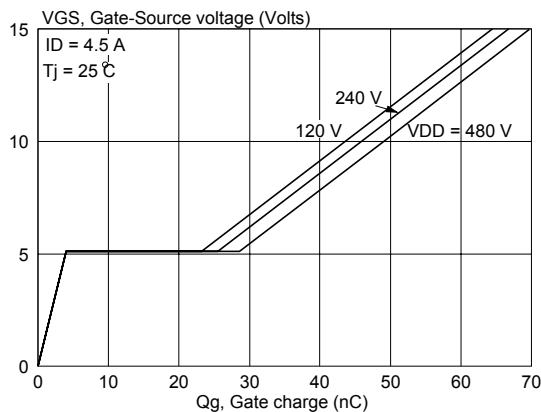


Fig. 13. Typical turn-on gate-charge characteristics.
 $V_{GS} = f(Q_G)$; parameter V_{DS}

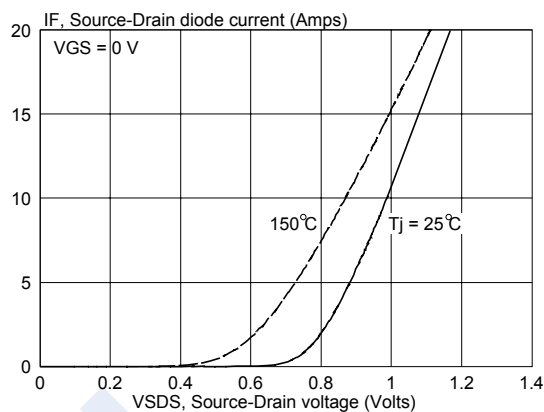


Fig. 16. Source-Drain diode characteristic.
 $I_F = f(V_{SDS})$; parameter T_j

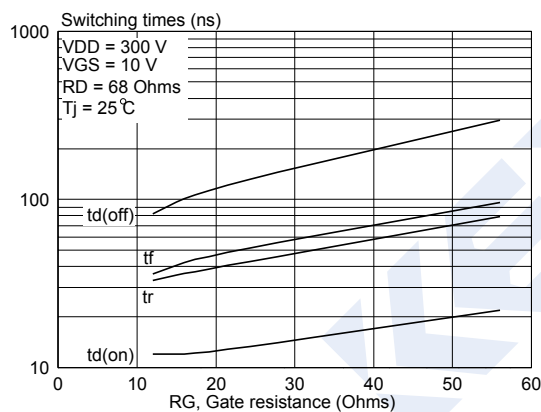


Fig. 14. Typical switching times; $t_{d(on)}$, t_r , $t_{d(off)}$, $t_f = f(R_G)$

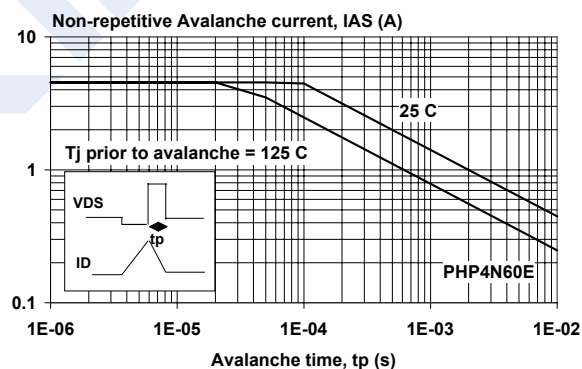


Fig. 17. Maximum permissible non-repetitive avalanche current (I_{AS}) versus avalanche time (t_p); unclamped inductive load

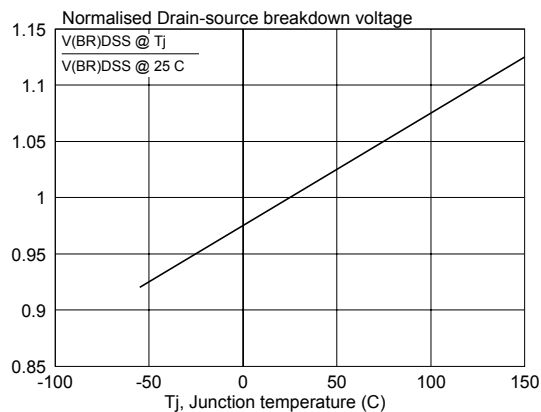


Fig. 15. Normalised drain-source breakdown voltage;
 $V_{(BR)DSS}/V_{(BR)DSS\ 25\ ^\circ C} = f(T_j)$

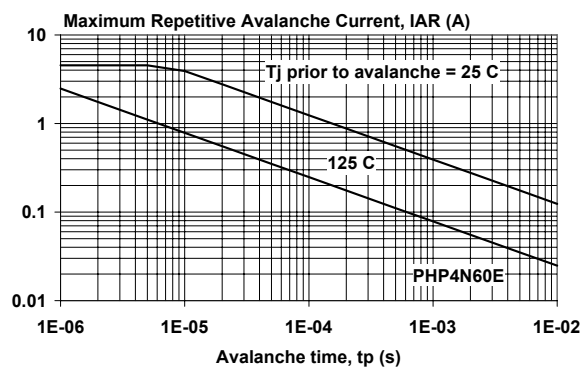


Fig. 18. Maximum permissible repetitive avalanche current (I_{AR}) versus avalanche time (t_p)