NIKO-SEM

N-Channel Enhancement Mode Field Effect Transistor

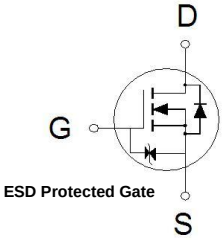
PK5V8EN

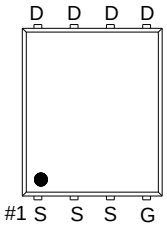
PDFN 5x6P

Halogen-Free & Lead-Free

PRODUCT SUMMARY

$V_{(BR)DSS}$	$R_{DS(ON)}$	I_D
30V	1.9mΩ	171A





G. GATE
D. DRAIN
S. SOURCE

Features

- Pb−Free, Halogen Free and RoHS compliant.
- Low $R_{DS(on)}$ to Minimize Conduction Losses.
- Ohmic Region Good $R_{DS(on)}$ Ratio.
- Optimized Gate Charge to Minimize Switching Losses.
- Products Integrated ESD diode with ESD Protected.
- 100% UIS Tested & Rg Tested.

Applications

- Protection Circuits Applications.
- Logic/Load Switch Circuits Applications.
- Computer for DC to DC Converters Applications.

ABSOLUTE MAXIMUM RATINGS (T_A = 25 °C Unless Otherwise Noted)

PARAMETERS/TEST CONDITIONS		SYMBOL	LIMITS	UNITS
Drain-Source Voltage		V_{DS}	30	V
Gate-Source Voltage		V_{GS}	±20	V
Continuous Drain Current[4]	T_C = 25 °C	I_D	171	A
	T_C = 100 °C		108	
Pulsed Drain Current[1]		I_{DM}	300	
Continuous Drain Current	T_A = 25 °C	I_D	37	
	T_A = 70 °C		30	
Avalanche Current		I_{AS}	97	
Avalanche Energy	L = 0.1mH	E_{AS}	470	mJ
Power Dissipation	T_C = 25 °C	P_D	104	W
	T_C = 100 °C		42	
Power Dissipation[3]	T_A = 25 °C	P_D	5	W
	T_A = 70 °C		3.2	
Operating Junction & Storage Temperature Range		T_j, T_{stg}	-55 to 150	°C

THERMAL RESISTANCE RATINGS

THERMAL RESISTANCE		SYMBOL	TYPICAL	MAXIMUM	UNITS
Junction-to-Ambient[2]	t ≦10s	$R_{\theta JA}$		25	°C / W
Junction-to-Ambient[2]	Steady-State	$R_{\theta JA}$		47	
Junction-to-Case	Steady-State	$R_{\theta JC}$		1.2	

[1]Pulse width limited by maximum junction temperature.
[2]The value of $R_{\theta JA}$ is measured with the device mounted on 1in^2 FR-4 board with 2oz. Copper, in a still air environment with T_A =25°C.
[3]The Power dissipation is based on $R_{\theta JA}$ t ≦10s value.
[4]The maximum current rating is package limited.

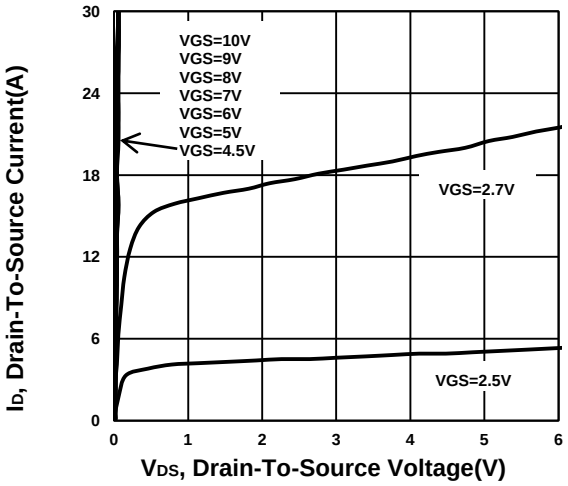
ELECTRICAL CHARACTERISTICS (T_J = 25 °C, Unless Otherwise Noted)

PARAMETER	SYMBOL	TEST CONDITIONS	LIMITS MIN	LIMITS TYP	LIMITS MAX	UNIT
STATIC						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS} = 0V, I_D = 250μA	30			V
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250μA	1.3	1.7	2.3	
Gate-Body Leakage	I_{GSS}	V_{DS} = 0V, V_{GS} = ±16V			±30	μA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 30V, V_{GS} = 0V			1	μA
		V_{DS} = 30V, V_{GS} = 0V, T_J = 55 °C			10	
Drain-Source On-State Resistance[1]	$R_{DS(ON)}$	V_{GS} = 4.5V, I_D = 20A		2	2.8	mΩ
		V_{GS} = 10V, I_D = 20A		1.5	1.9	
Forward Transconductance[1]	g_{fs}	V_{DS} = 5V, I_D = 20A		128		S
DYNAMIC						
Input Capacitance	C_{iss}	V_{GS} = 0V, V_{DS} = 15V, f = 1MHz		6640		pF
Output Capacitance	C_{oss}			1170		
Reverse Transfer Capacitance	C_{rss}			717		
Gate Resistance	R_g	V_{GS} = 0V, V_{DS} = 0V, f = 1MHz		1.7		Ω
Total Gate Charge[2]	Q_g V_{GS} = 10V	V_{DS} = 15V , V_{GS} = 10V, I_D = 20A		145		nC
	Q_g V_{GS} = 4.5V			69		
Gate-Source Charge[2]	Q_{gs}			27		
Gate-Drain Charge[2]	Q_{gd}			25		
Turn-On Delay Time[2]	$t_{d(on)}$	V_{DS} = 15V , I_D ≅ 20A, V_{GS} = 10V, R_{GEN} =6Ω		29		nS
Rise Time[2]	t_r			96		
Turn-Off Delay Time[2]	$t_{d(off)}$			168		
Fall Time[2]	t_f			125		

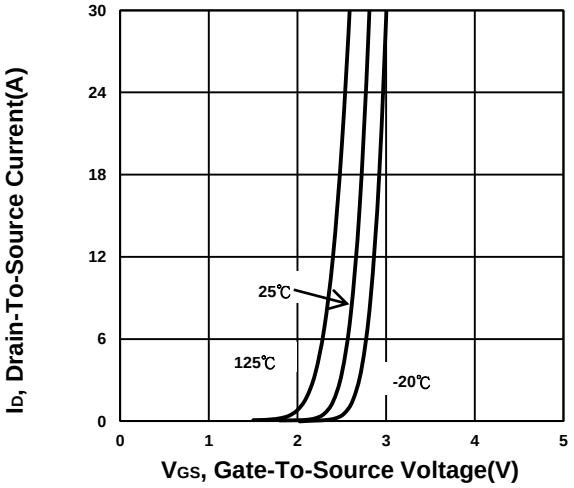
SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS (T_J = 25 °C)						
Continuous Current[3]	I_S				87	A
Forward Voltage[1]	V_{SD}	I_F = 20A, V_{GS} = 0V			1.2	V
Reverse Recovery Time	t_{rr}	I_F = 20A, dI_F/dt = 100A / μS		28		nS
Reverse Recovery Charge	Q_{rr}			19		nC

[1]Pulse test : Pulse Width ≤ 300 μsec, Duty Cycle ≤ 2%.
[2]Independent of operating temperature.
[3]The maximum current rating is package limited.

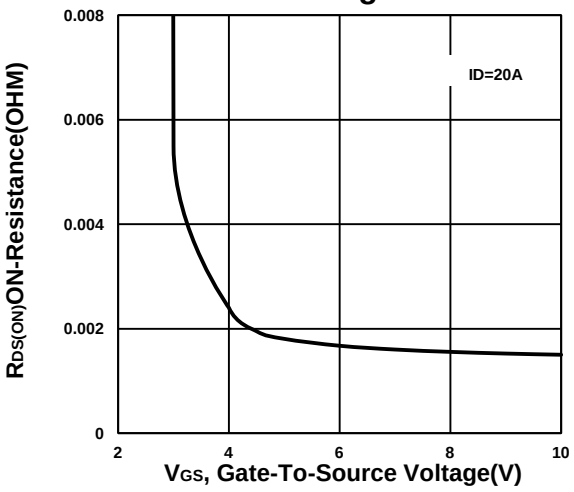
Output Characteristics



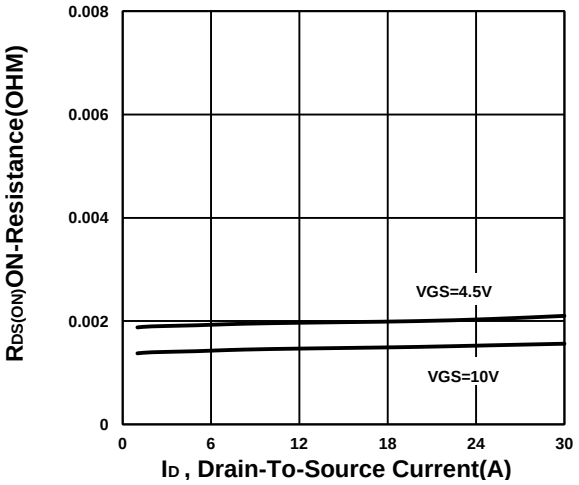
Transfer Characteristics



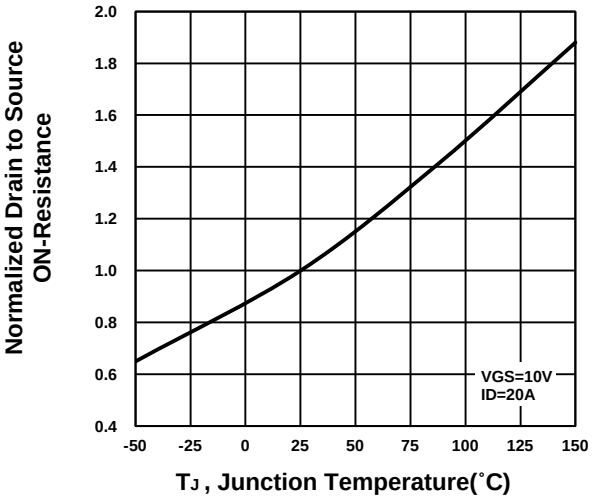
On-Resistance VS Gate-To-Source Voltage



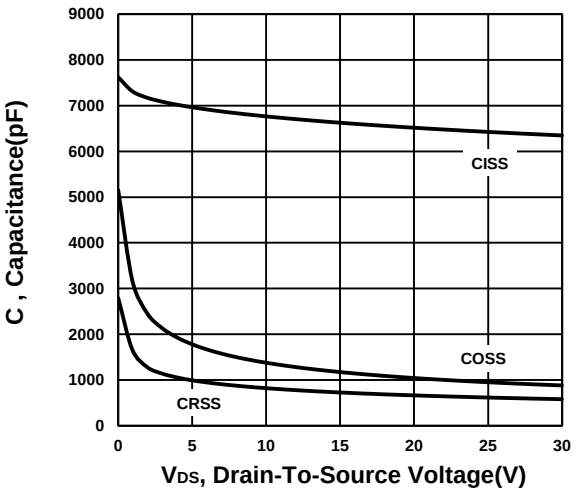
On-Resistance VS Drain Current



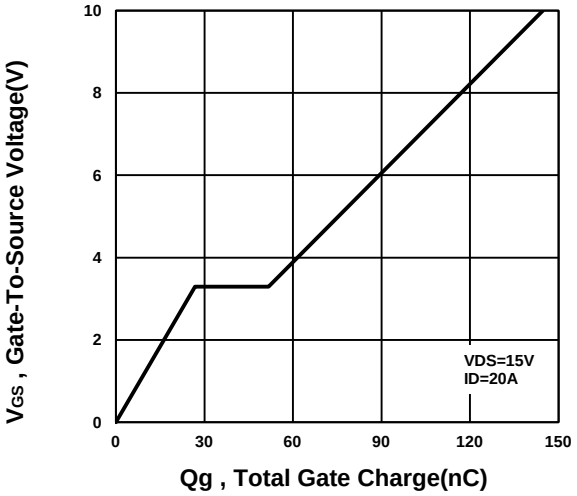
On-Resistance VS Temperature



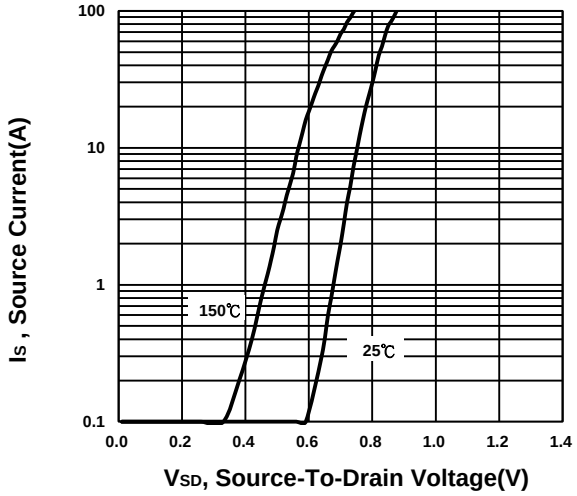
Capacitance Characteristic



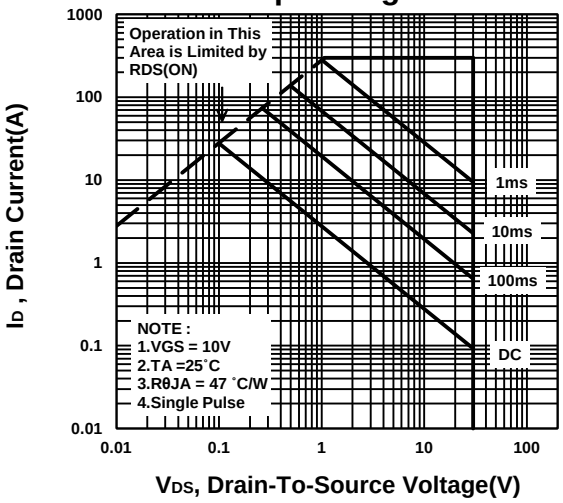
Gate charge Characteristics



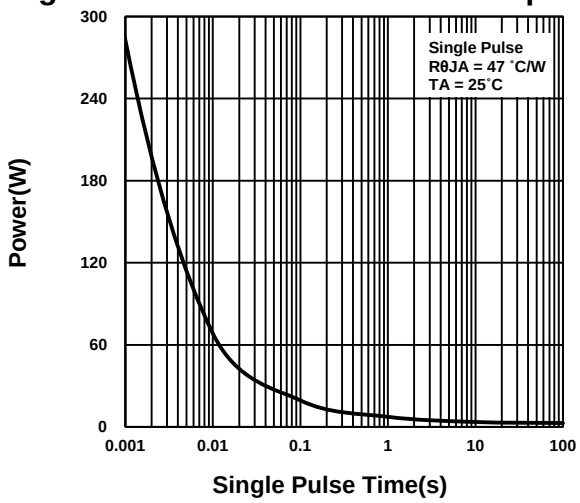
Source-Drain Diode Forward Voltage



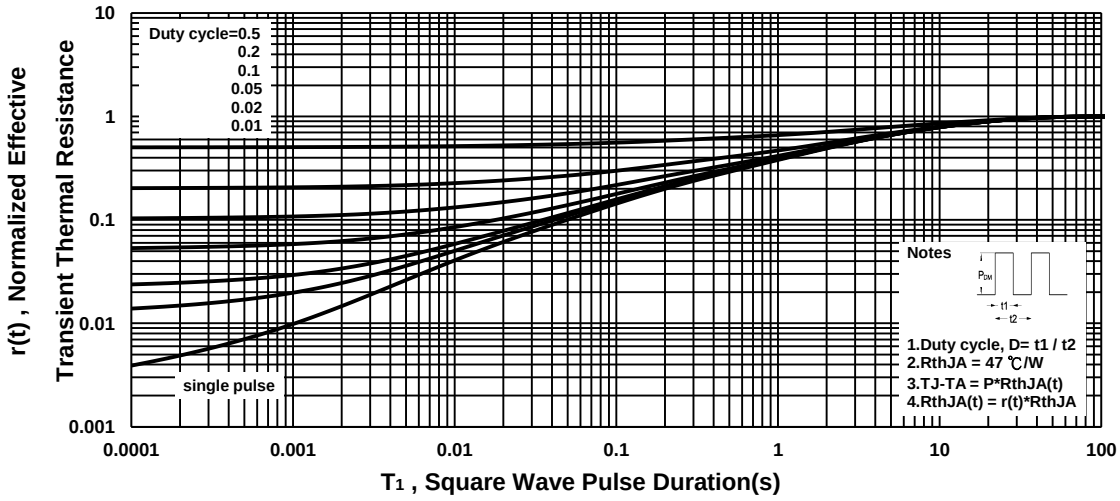
Safe Operating Area



Single Pulse Maximum Power Dissipation



Transient Thermal Response Curve



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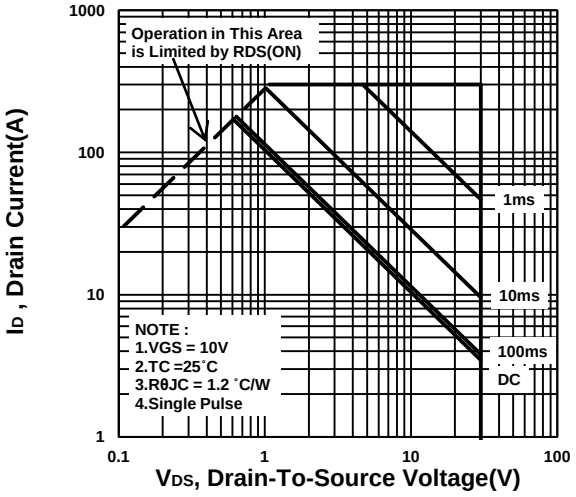
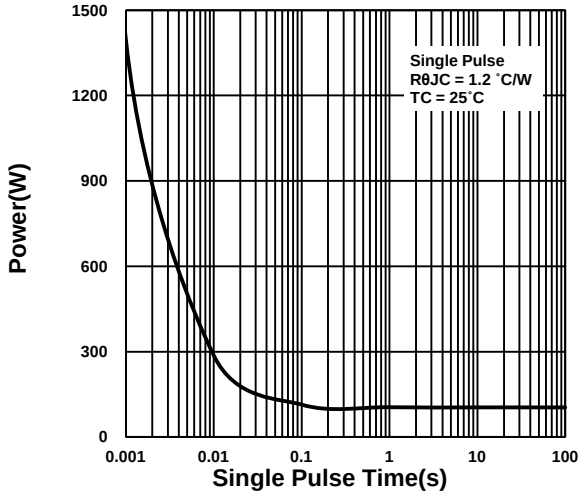
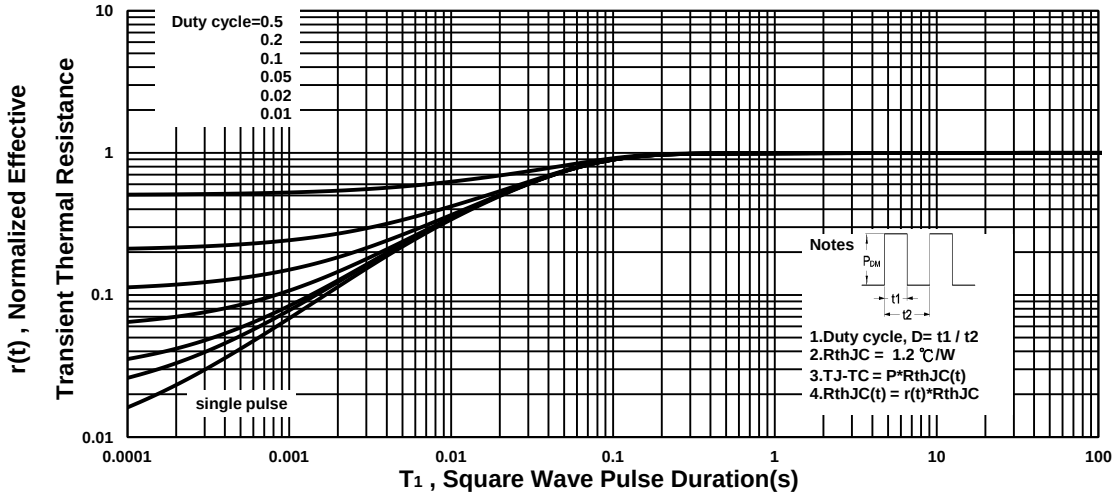


Single Pulse Maximum Power Dissipation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