NIKO-SEM

N-Channel Enhancement Mode Field Effect Transistor

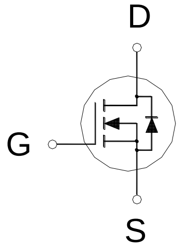
PE8J4BA

PDFN 3x3P

Halogen-Free & Lead-Free

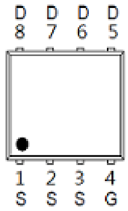
PRODUCT SUMMARY

$V_{(BR)DSS}$	$R_{DS(ON)}$	I_D
40V	6.9mΩ	50A



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.



G. GATE
D. DRAIN
S. SOURCE

100% UIS Tested
100% Rg Tested

Applications

- Protection 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}	40	V
Gate-Source Voltage		V_{GS}	±20	V
Continuous Drain Current[4]	T_C = 25 °C	I_D	50	A
	T_C = 100 °C		32	
Pulsed Drain Current[1]		I_{DM}	70	
Continuous Drain Current	T_A = 25 °C	I_D	15	
	T_A = 70 °C		12	
Avalanche Current		I_{AS}	33	
Avalanche Energy	L = 0.03mH	E_{AS}	16	mJ
Power Dissipation	T_C = 25 °C	P_D	30	W
	T_C = 100 °C		12	
Power Dissipation[3]	T_A = 25 °C	P_D	2.8	W
	T_A = 70 °C		1.8	
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	$R_{\theta JA}$		45	°C / W
Junction-to-Ambient[2]	Steady-State	$R_{\theta JA}$		67	
Junction-to-Case	Steady-State	$R_{\theta JC}$		4.1	

[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.

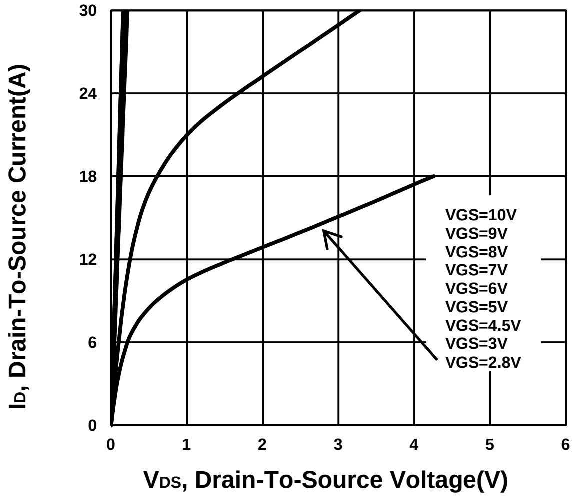
ELECTRICAL CHARACTERISTICS (T_J = 25 °C, Unless Otherwise Noted)

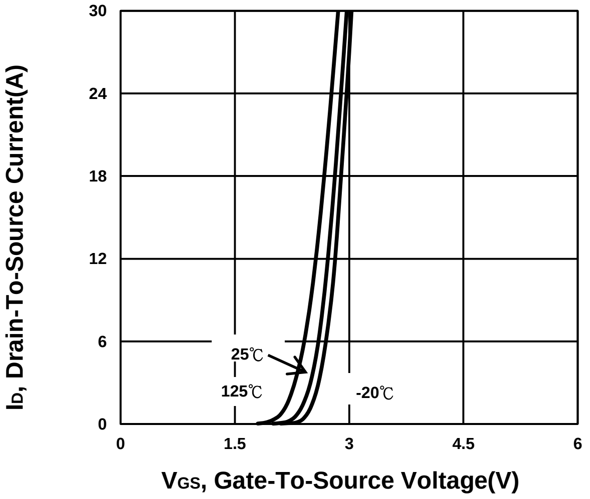
PARAMETER	SYMBOL	TEST CONDITIONS	LIMITS			UNIT
			MIN	TYP	MAX	
STATIC						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS} = 0V, I_D = 250µA	40			V
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250µA	1.3	1.6	2.3	
Gate-Body Leakage	I_{GSS}	V_{DS} = 0V, V_{GS} = ±20V			±100	nA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 40V, V_{GS} = 0V			1	µA
		V_{DS} = 40V, V_{GS} = 0V, T_J = 55 °C			10	
Drain-Source On-State Resistance	$R_{DS(ON)}$	V_{GS} = 4.5V, I_D = 20A		7.1	9.9	mΩ
		V_{GS} = 10V, I_D = 20A		5.1	6.9	
Forward Transconductance	g_{fs}	V_{DS} = 5V, I_D = 20A		75		S
DYNAMIC						
Input Capacitance	C_{iss}	V_{GS} = 0V, V_{DS} = 20V, f = 1MHz		866		pF
Output Capacitance	C_{oss}			228		
Reverse Transfer Capacitance	C_{rss}			9		
Gate Resistance	R_g	f = 1MHz		1.8		Ω
Total Gate Charge[5]	Q_g V_{GS} = 10V	V_{DS} = 20V , V_{GS} = 10V, I_D = 20A		13		nC
	V_{GS} = 4.5V			6		
Gate-Source Charge[5]	Q_{gs}			3.2		
Gate-Drain Charge[5]	Q_{gd}			1.1		
Turn-On Delay Time[5]	$t_{d(on)}$	V_{DS} = 20V , I_D ≅ 20A, V_{GS} = 10V, R_{GEN} =6Ω		8.5		nS
Rise Time[5]	t_r			62		
Turn-Off Delay Time[5]	$t_{d(off)}$			18		
Fall Time[5]	t_f			97		

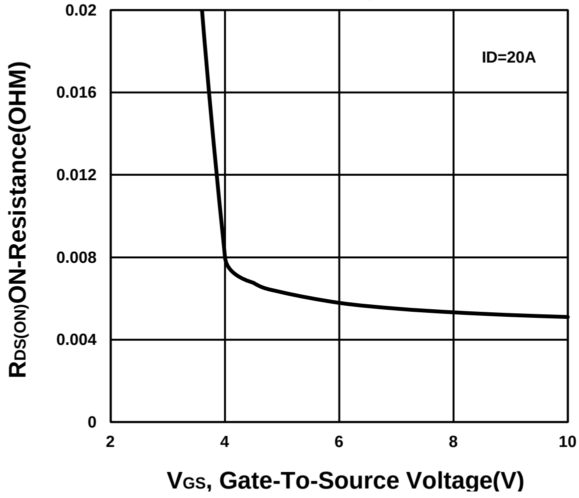
SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS (T_J = 25 °C)						
Continuous Current[6]	I_S				25	A
Forward Voltage	V_{SD}	$I_F = 20A, V_{GS} = 0V$			1.2	V
Reverse Recovery Time	t_{rr}	$I_F = 20A, dI_F/dt = 400A / \mu S$		12		nS
Reverse Recovery Charge	Q_{rr}			15		nC

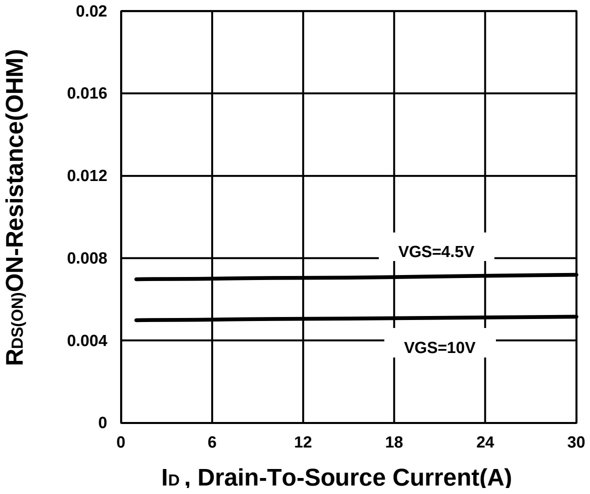
[5] Independent of operating temperature.

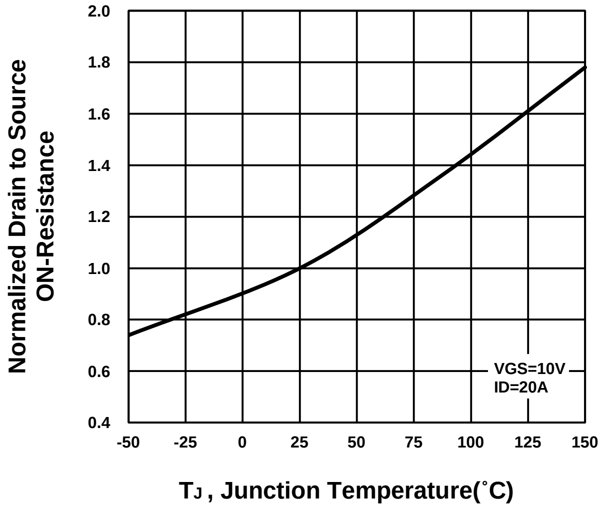
[6] The maximum current rating is package limited.

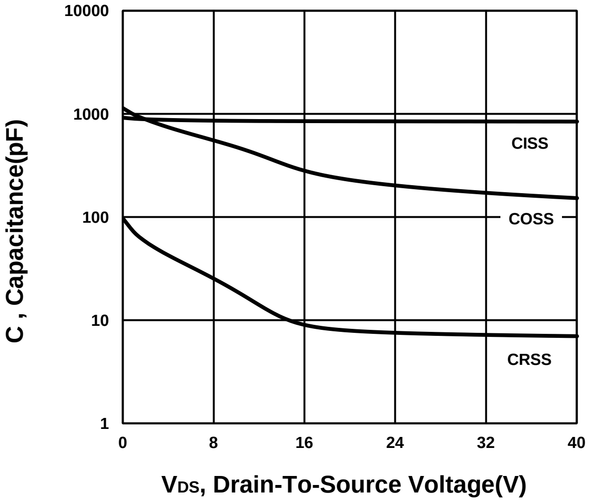

Output Characteristics


Transfer Characteristics

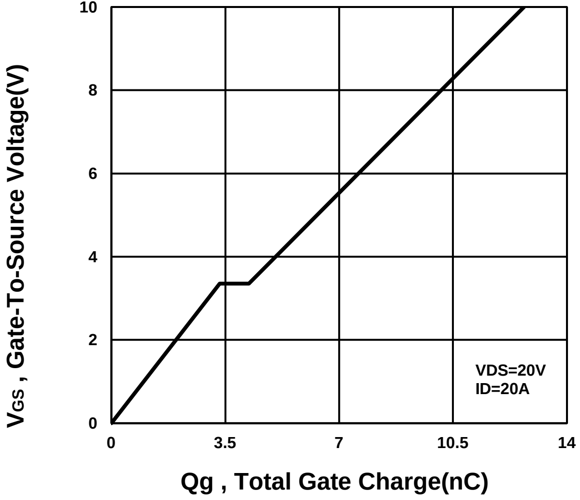

On-Resistance VS Gate-To-Source Voltage


On-Resistance VS Drain Current

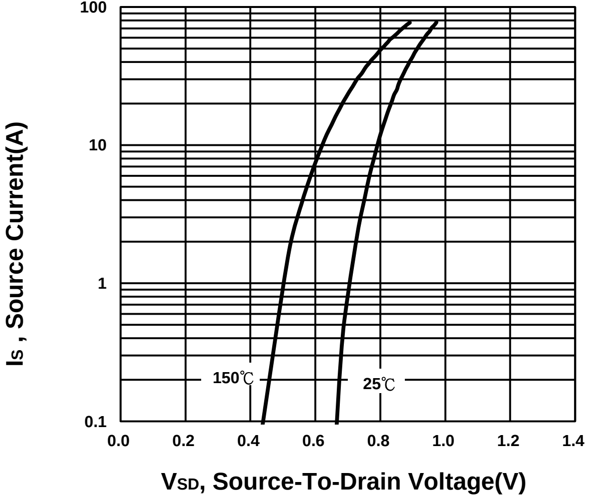

On-Resistance VS Temperature


Capacitance Characteristic

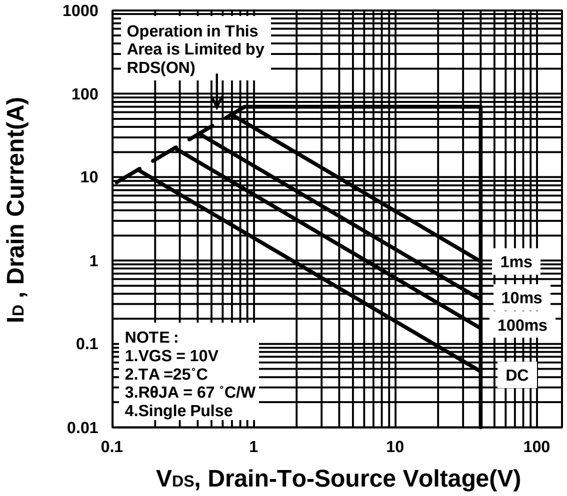
Gate charge Characteristics



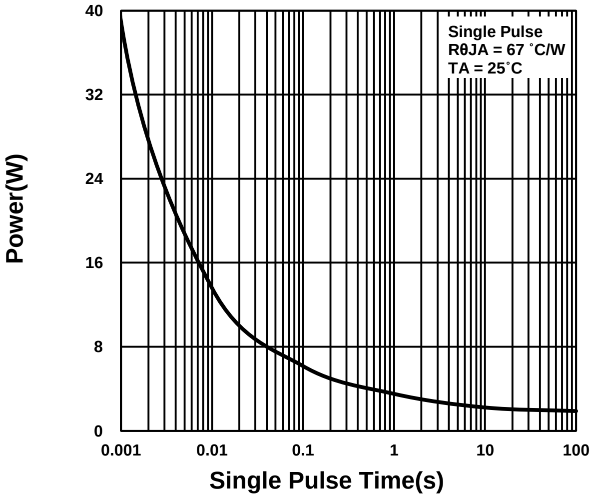
Source-Drain Diode Forward Voltage



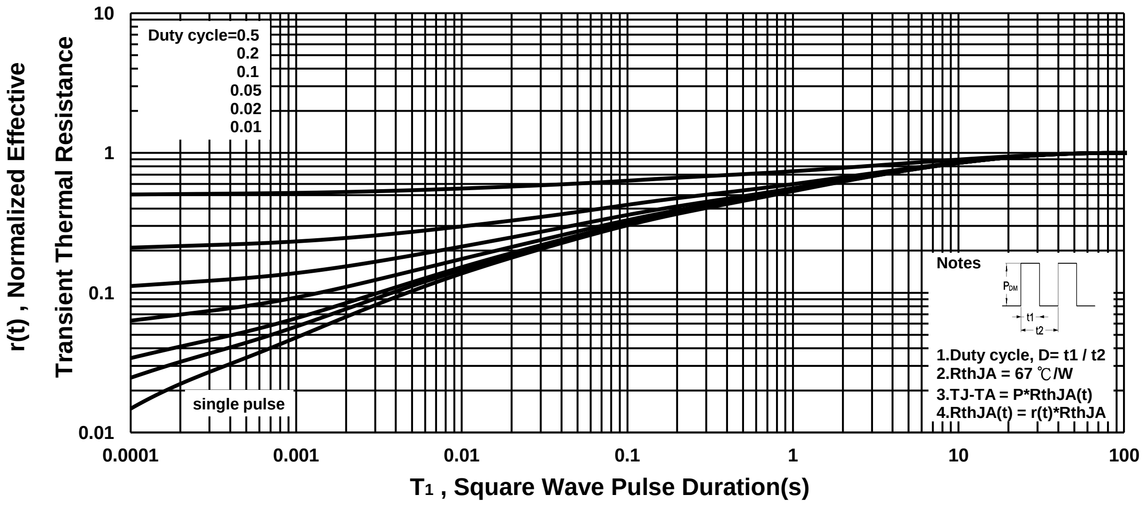
Safe Operating Area



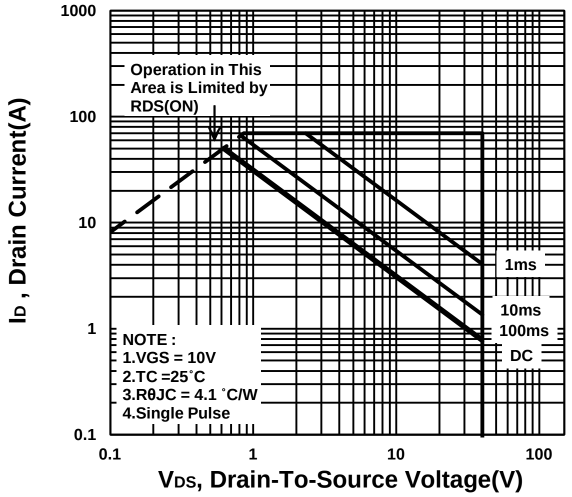
Single Pulse Maximum Power Dissipation



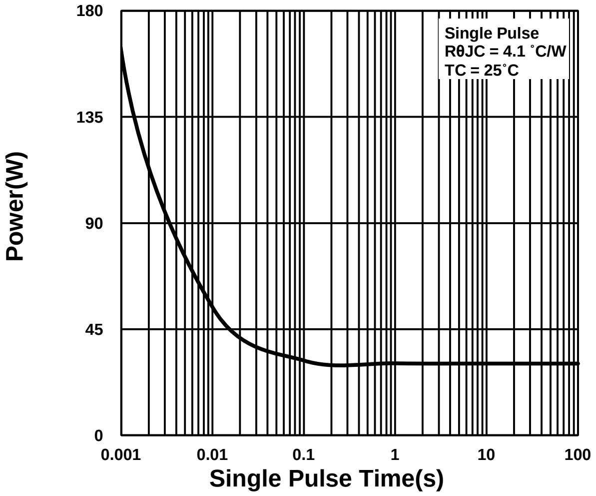
Transient Thermal Response Curve



Safe Operating Area



Single Pulse Maximum Power Dissipation



Transient Thermal Response Curve