NIKO-SEM

N-Channel Enhancement Mode Field Effect Transistor

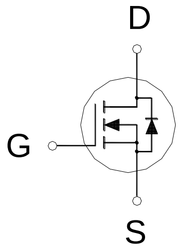
PE5V6BA

PDFN 3x3P

Halogen-Free & Lead-Free

PRODUCT SUMMARY

$V_{(BR)DSS}$	$R_{DS(ON)}$	I_D
30V	4.8mΩ	68A

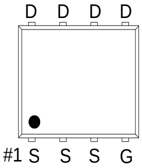


Features

- 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.

Applications

- Protection Circuits Applications.
- Logic/Load Switch Circuits Applications.



G. GATE
D. DRAIN
S. SOURCE

100% UIS Tested
100% Rg Tested

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	68	A
	T_C = 100 °C		43	
Pulsed Drain Current[1]		I_{DM}	110	
Continuous Drain Current[4]	T_A = 25 °C	I_D	18.7	
	T_A = 70 °C		15	
Avalanche Current		I_{AS}	43	
Avalanche Energy	L = 0.1mH	E_{AS}	92.4	mJ
Power Dissipation	T_C = 25 °C	P_D	41	W
	T_C = 100 °C		16	
Power Dissipation[3]	T_A = 25 °C	P_D	3.1	W
	T_A = 70 °C		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	$R_{\theta JA}$		40	°C / W
Junction-to-Ambient[2]	Steady-State	$R_{\theta JA}$		60	
Junction-to-Case	Steady-State	$R_{\theta JC}$		3	

[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] Package limitation current is 33A.

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	30			V
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250µA	1.3	1.8	2.3	
Gate-Body Leakage	I_{GSS}	V_{DS} = 0V, V_{GS} = ±20V			±100	nA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 24V, 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 = 15A		5.5	7	mΩ
		V_{GS} = 10V, I_D = 20A		3.7	4.8	
Forward Transconductance[1]	g_{fs}	V_{DS} = 5V, I_D = 20A		57		S
DYNAMIC						
Input Capacitance	C_{iss}	V_{GS} = 0V, V_{DS} = 15V, f = 1MHz		3135		pF
Output Capacitance	C_{oss}			397		
Reverse Transfer Capacitance	C_{rss}			320		
Gate Resistance	R_g	V_{GS} = 0V, V_{DS} = 0V, f = 1MHz		1.2		Ω
Total Gate Charge[2]	Q_g V_{GS} = 10V	V_{DS} = 15V , V_{GS} = 10V, I_D = 20A		64		nC
	V_{GS} = 4.5V			32		
Gate-Source Charge[2]	Q_{gs}			10		
Gate-Drain Charge[2]	Q_{gd}			15		
Turn-On Delay Time[2]	$t_{d(on)}$	V_{DS} = 15V , I_D ≅ 20A, V_{GS} = 10V, R_{GEN} =6Ω		14		nS
Rise Time[2]	t_r			80		
Turn-Off Delay Time[2]	$t_{d(off)}$			72		
Fall Time[2]	t_f			92		

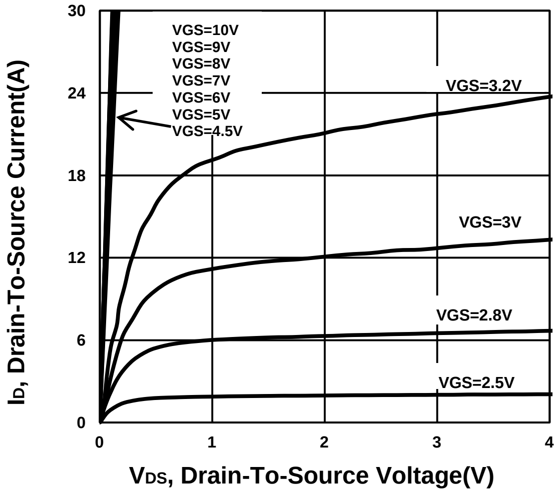
SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS (T_J = 25 °C)

Continuous Current	I_S				34	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		12		nS
Reverse Recovery Charge	Q_{rr}			4.2		nC

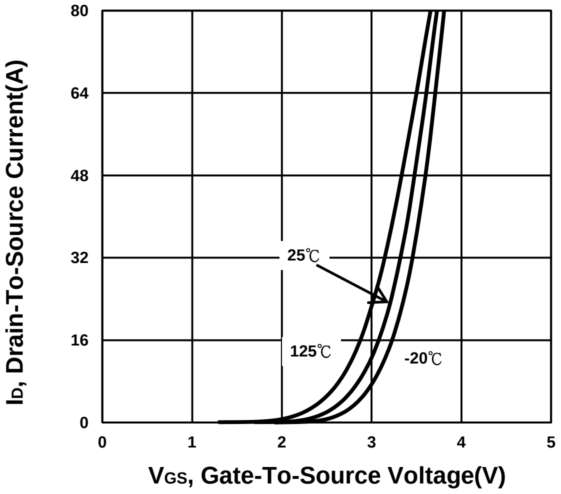
[1] Pulse test : Pulse Width ≤ 300 µsec, Duty Cycle ≤ 2%.

[2] Independent of operating temperature.

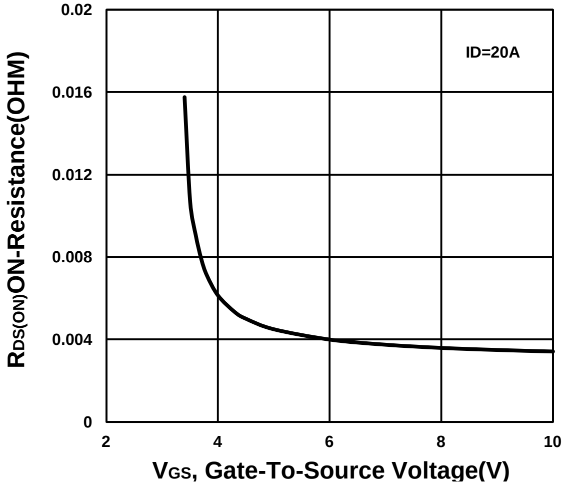
Output Characteristics



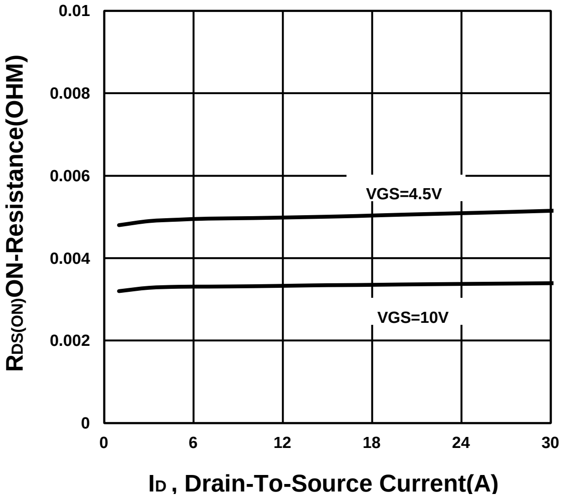
Transfer Characteristics



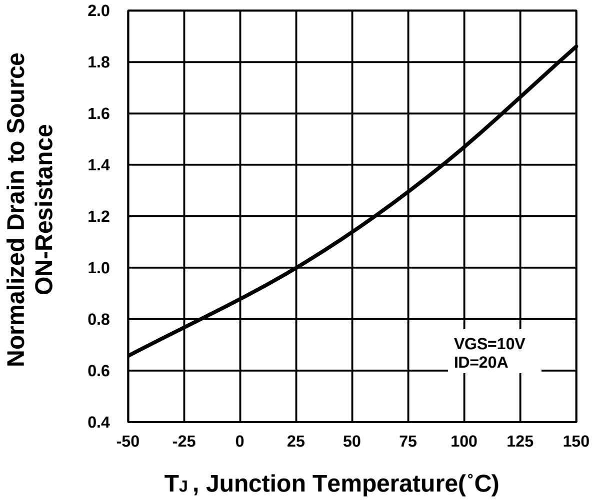
On-Resistance VS Gate-To-Source Voltage



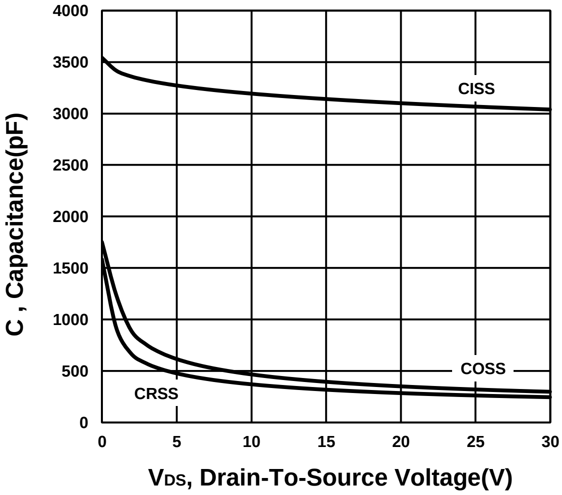
On-Resistance VS Drain Current



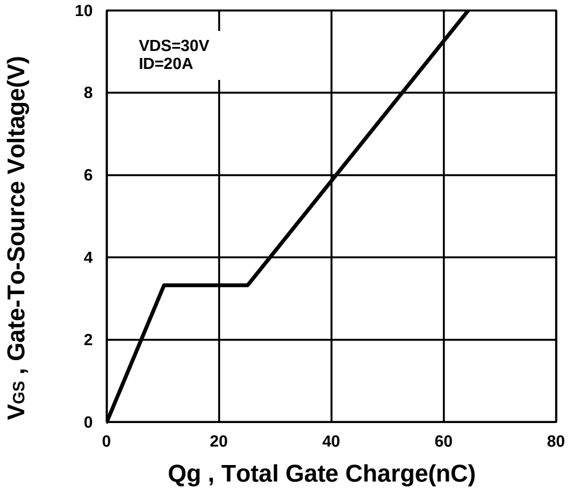
On-Resistance VS Temperature



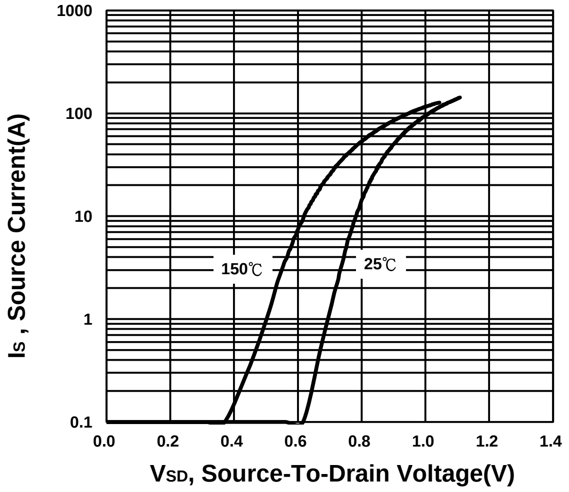
Capacitance Characteristic



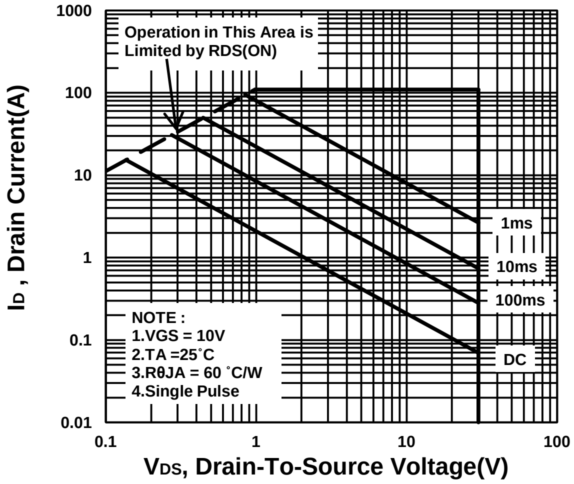
Gate charge Characteristics



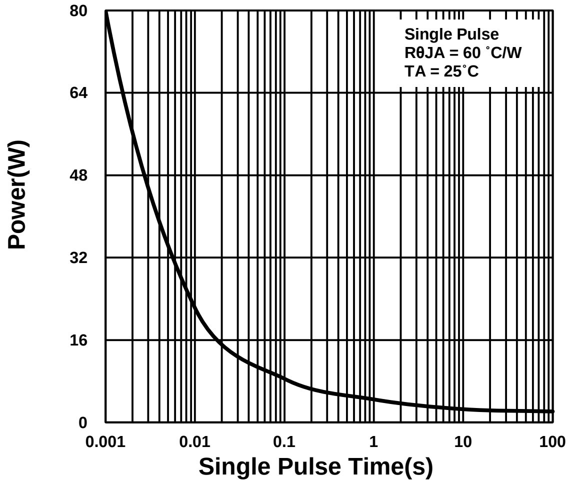
Source-Drain Diode Forward Voltage



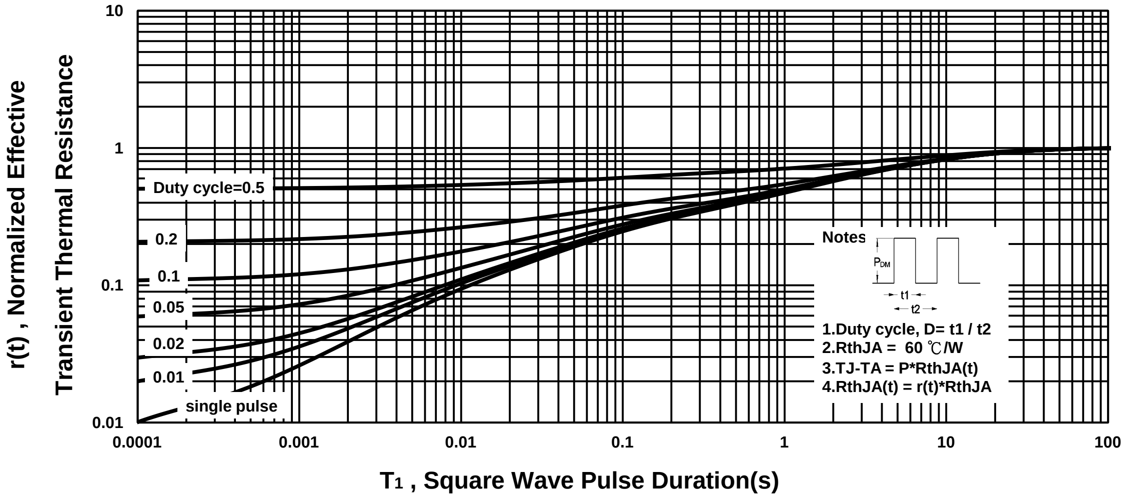
Safe Operating Area



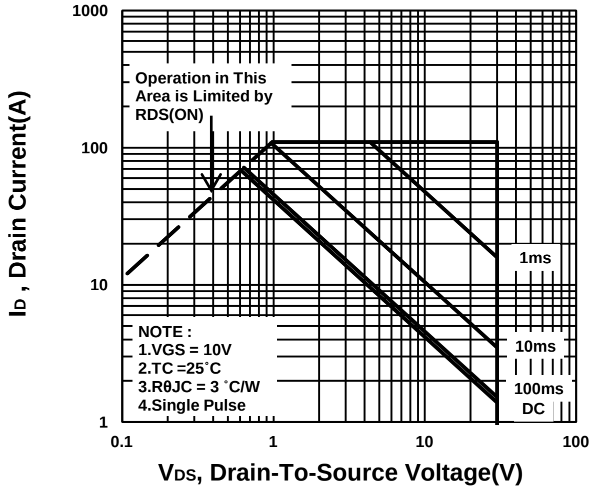
Single Pulse Maximum Power Dissipation



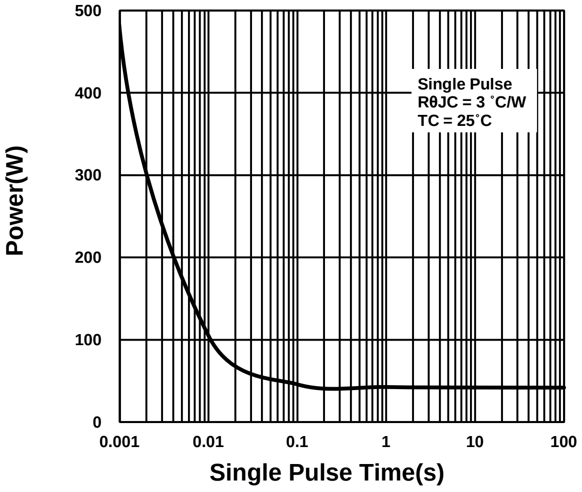
Transient Thermal Response Curve



Safe Operating Area



Single Pulse Maximum Power Dissipation



Transient Thermal Response Curve