NIKO-SEM

N-Channel Enhancement Mode Field Effect Transistor

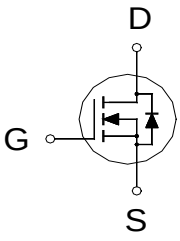
P0603BKE

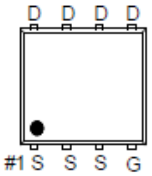
PDFN 5x6P

Halogen-Free & Lead-Free

PRODUCT SUMMARY

$V_{(BR)DSS}$	$R_{DS(ON)}$	I_D
30V	5.8mΩ	65A





RoHS Compliant

G : GATE
D : DRAIN
S : SOURCE

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[2]	T_C = 25 °C	I_D	65	A
	T_C = 100 °C		41	
	T_A = 25 °C		15	
	T_A = 70 °C		12	
Pulsed Drain Current[1]		I_{DM}	180	
Avalanche Current		I_{AS}	35	
Avalanche Energy	L = 0.1mH	E_{AS}	63	mJ
Power Dissipation	T_C = 25 °C	P_D	41	W
	T_C = 100 °C		16	
	T_A = 25 °C		2.2	
	T_A = 70 °C		1.4	
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[3]	$R_{\theta JA}$		55	°C / W
Junction-to-Case	$R_{\theta JC}$		3	

[1]Pulse width limited by maximum junction temperature.
[2]Package limitation current is 30A.
[3]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. The value in any given application depends on the user's specific board design.

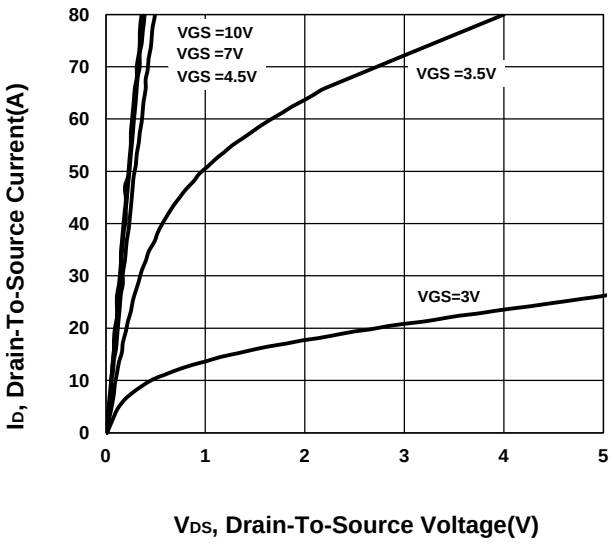
ELECTRICAL CHARACTERISTICS (T_J = 25 °C, Unless Otherwise Noted)

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	1.7	3	
Gate-Body Leakage	I_{GSS}	V_{DS} = 0V, V_{GS} = ±20V			±100	nA

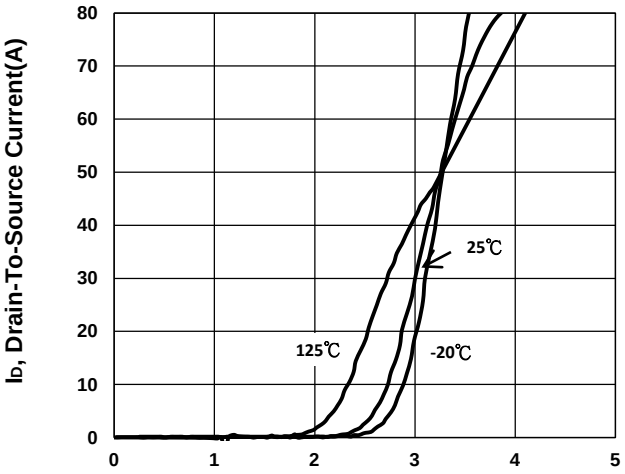
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 24V, V_{GS} = 0V			1	μA
		V_{DS} = 20V, V_{GS} = 0V, T_J = 55 °C			10	
Drain-Source On-State Resistance[1]	$R_{DS(ON)}$	V_{GS} =4.5V, I_D = 15A		5.3	7.8	mΩ
		V_{GS} = 10V, I_D = 20A		4.2	5.8	
Forward Transconductance[1]	g_{fs}	V_{DS} = 5V, I_D = 20A		62		S
DYNAMIC						
Input Capacitance	C_{iss}	V_{GS} = 0V, V_{DS} = 15V, f = 1MHz		1680		pF
Output Capacitance	C_{oss}			246		
Reverse Transfer Capacitance	C_{rss}			234		
Gate Resistance	R_g	V_{GS} = 0V, V_{DS} = 0V, f = 1MHz		0.8		Ω
Total Gate Charge[2]	$Q_{g(V_{GS}=10V)}$	V_{DS} = 0.5$V_{(BR)DSS}$, V_{GS} = 10V, I_D =20A		46.4		nC
	$Q_{g(V_{GS}=4.5V)}$			25		
Gate-Source Charge[2]	Q_{gs}			6.5		
Gate-Drain Charge[2]	Q_{gd}			14.5		
Turn-On Delay Time[2]	$t_{d(on)}$	V_{DS} = 15V , R_L = 1.5Ω I_D ≅ 20A, V_{GS} = 10V, R_{GEN} =6Ω		26		nS
Rise Time[2]	t_r			18		
Turn-Off Delay Time[2]	$t_{d(off)}$			40		
Fall Time[2]	t_f			16		
SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS (T_J = 25 °C)						
Continuous Current	I_S				65	A
Diode 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		26.6		nS
Reverse Recovery Charge	Q_{rr}			13.2		nC

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

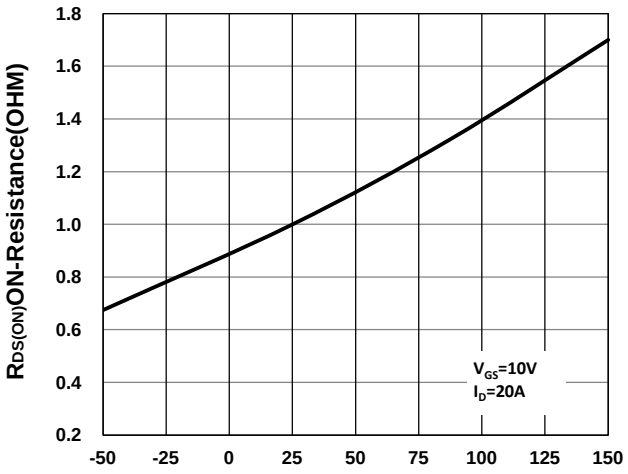
Output Characteristics



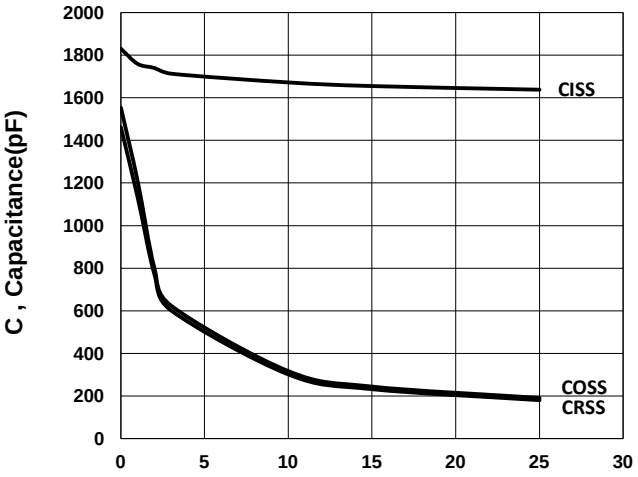
Transfer Characteristics



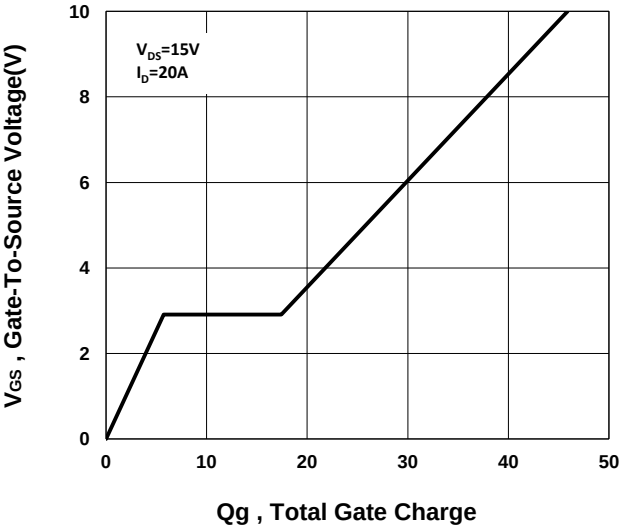
On-Resistance VS Temperature



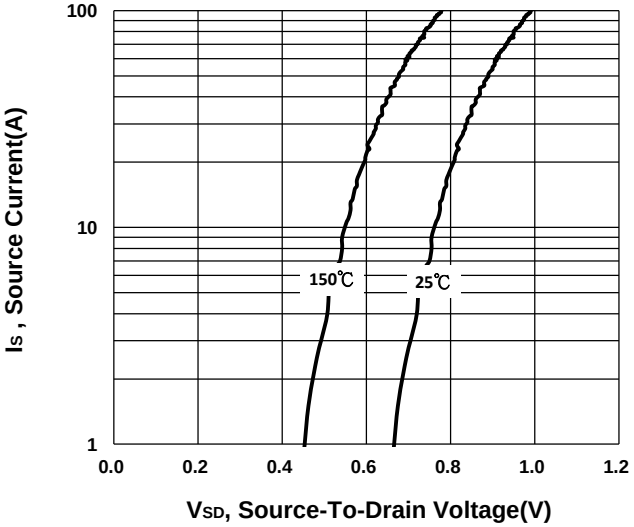
Capacitance Characteristic



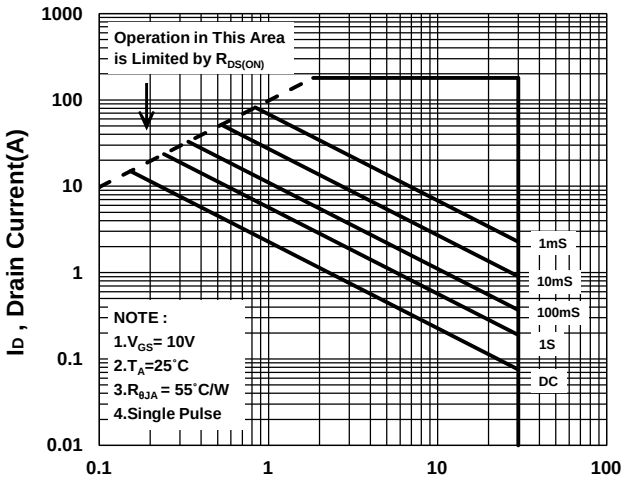
Gate charge Characteristics



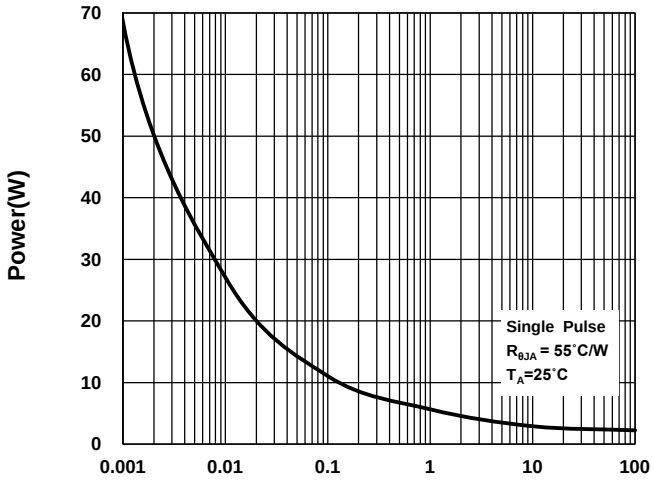
Source-Drain Diode Forward Voltage



Safe Operating Area



Single Pulse Maximum Power Dissipation



Transient Thermal Response Curve