NIKO-SEM

N-Channel Enhancement Mode Field Effect Transistor

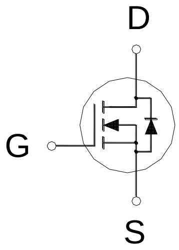
P1610AK

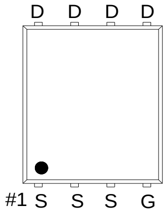
PDFN 5x6P

Halogen-Free & Lead-Free

PRODUCT SUMMARY

$V_{(BR)DSS}$	$R_{DS(ON)}$	I_D
110V	16mΩ	36A





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}	110	V
Gate-Source Voltage		V_{GS}	±20	V
Continuous Drain Current[3]	T_C = 25 °C	I_D	36	A
	T_C = 100 °C		23	
Pulsed Drain Current[1]		I_{DM}	100	
Continuous Drain Current	T_A = 25 °C	I_D	11	
	T_A = 70 °C		8.8	
Avalanche Current		I_{AS}	13.5	
Avalanche Energy	L = 1mH	E_{AS}	91	mJ
Power Dissipation	T_C = 25 °C	P_D	50	W
	T_C = 100 °C		20	
Power Dissipation[4]	T_A = 25 °C	P_D	4.4	W
	T_A = 70 °C		2.8	
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	$R_{\theta JA}$		28	°C / W
Junction-to-Ambient[2]	Steady-State	$R_{\theta JA}$		54	
Junction-to-Case	Steady-State	$R_{\theta JC}$		2.5	

[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] Package limitation current is 25A.

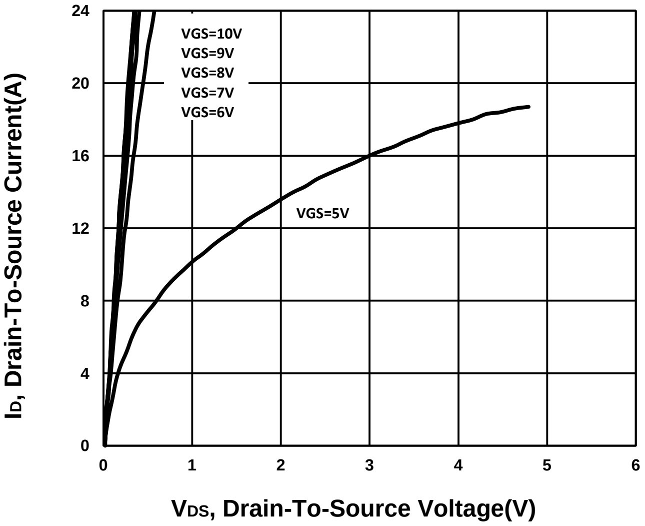
[4] The Power dissipation is based on $R_{\theta JA}$ t ≦10s value.

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

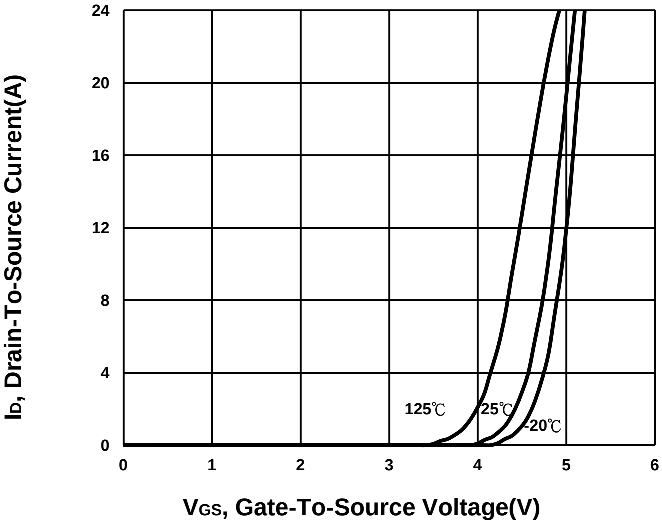
PARAMETER	SYMBOL	TEST CONDITIONS	LIMITS MIN	LIMITS TYP	LIMITS MAX	UNIT
STATIC						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS} = 0V, I_D = 250μA	110			V
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250μA	2	3	4	
Gate-Body Leakage	I_{GSS}	V_{DS} = 0V, V_{GS} = ±20V			±100	nA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 88V, V_{GS} = 0V			1	μA
		V_{DS} = 80V, V_{GS} = 0V, T_J = 55 °C			10	
Drain-Source On-State Resistance[1]	$R_{DS(ON)}$	V_{GS} = 7V, I_D = 11A		14	21	mΩ
		V_{GS} = 10V, I_D = 11A		13	16	
Forward Transconductance[1]	g_{fs}	V_{DS} = 5V, I_D = 11A		45		S
DYNAMIC						
Input Capacitance	C_{iss}	V_{GS} = 0V, V_{DS} = 25V, f = 1MHz		3017		pF
Output Capacitance	C_{oss}			255		
Reverse Transfer Capacitance	C_{rss}			152		
Gate Resistance	R_g	V_{GS} = 0V, V_{DS} = 0V, f = 1MHz		1		Ω
Total Gate Charge[2]	Q_g V_{GS} = 10V	V_{DS} = 55V , V_{GS} = 10V, I_D = 11A		58		nC
	Q_g V_{GS} = 7V			44		
Gate-Source Charge[2]	Q_{gs}			16.5		
Gate-Drain Charge[2]	Q_{gd}			21.5		
Turn-On Delay Time[2]	$t_{d(on)}$	V_{DS} =55V , I_D ≅ 11A, V_{GS} = 10V, R_{GEN} =6Ω		35		nS
Rise Time[2]	t_r			90		
Turn-Off Delay Time[2]	$t_{d(off)}$			78		
Fall Time[2]	t_f			56		
SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS (T_J = 25 °C)						
Continuous Current[3]	I_S				41	A
Forward Voltage[1]	V_{SD}	I_F = 11A, V_{GS} = 0V			1.2	V
Reverse Recovery Time	t_{rr}	I_F = 11A, dI_F/dt = 100A / μS		36		nS
Reverse Recovery Charge	Q_{rr}			41		nC

[1] Pulse test : Pulse Width ≤ 300 μsec, Duty Cycle ≤ 2%.
[2] Independent of operating temperature.
[3] Package limitation current is 25A.

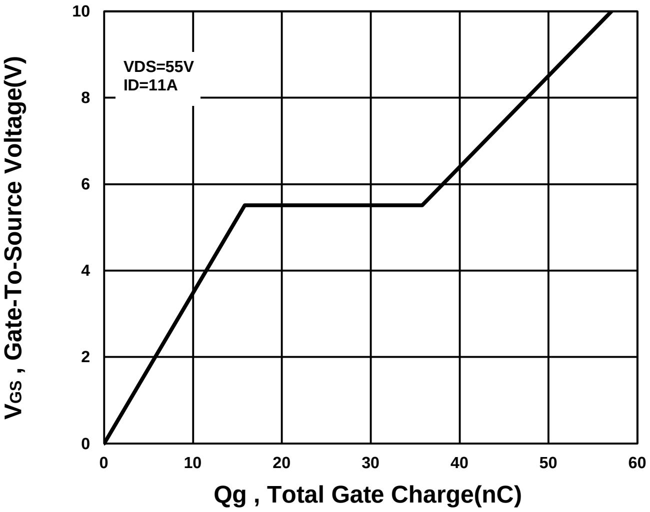
Output Characteristics



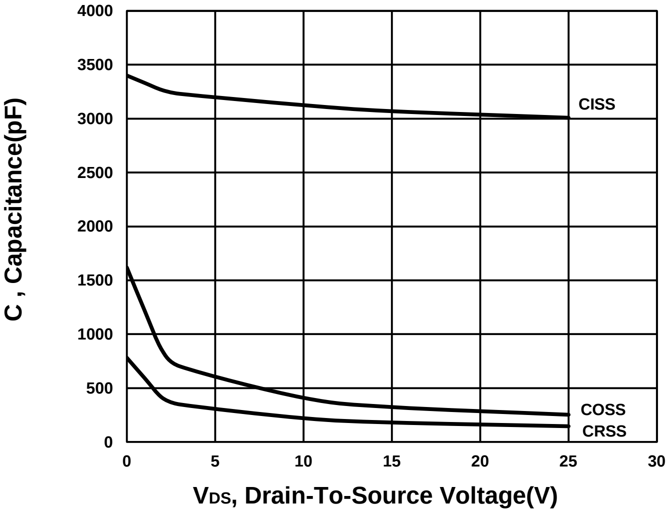
Transfer Characteristics



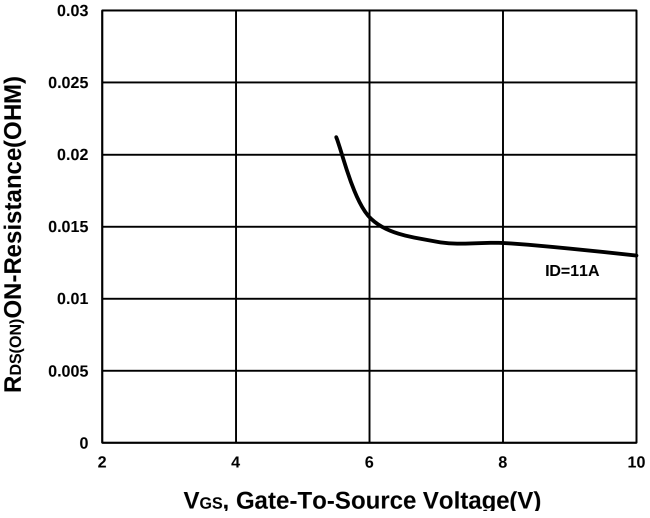
Gate charge Characteristics



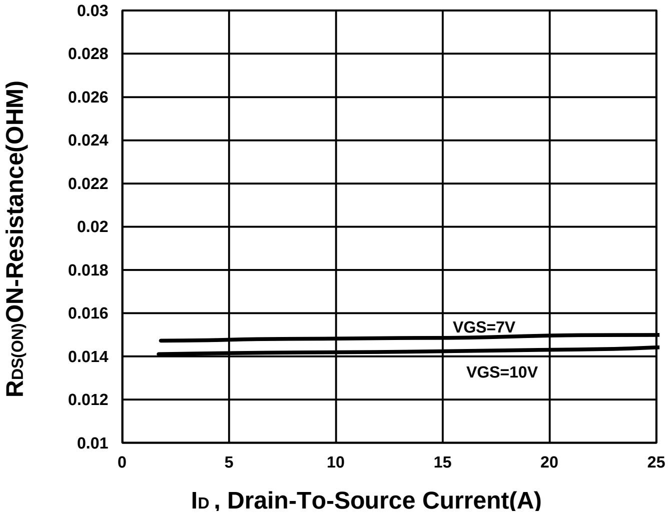
Capacitance Characteristic



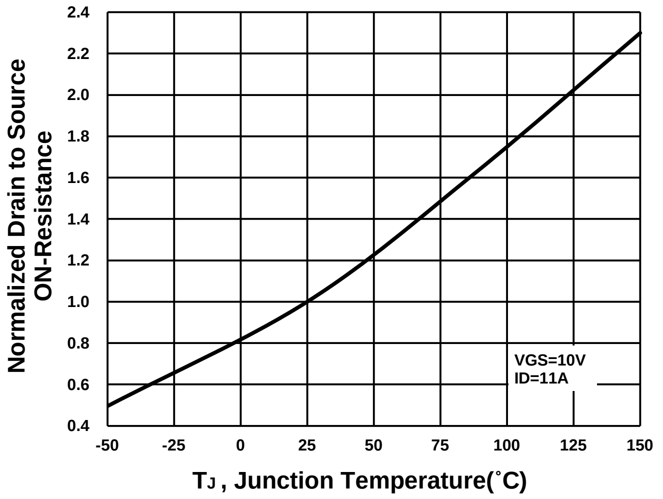
On-Resistance VS Gate-To-Source



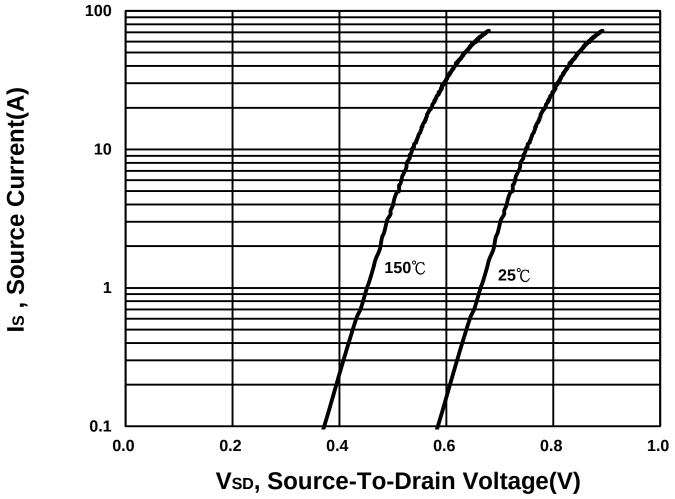
On-Resistance VS Drain Current



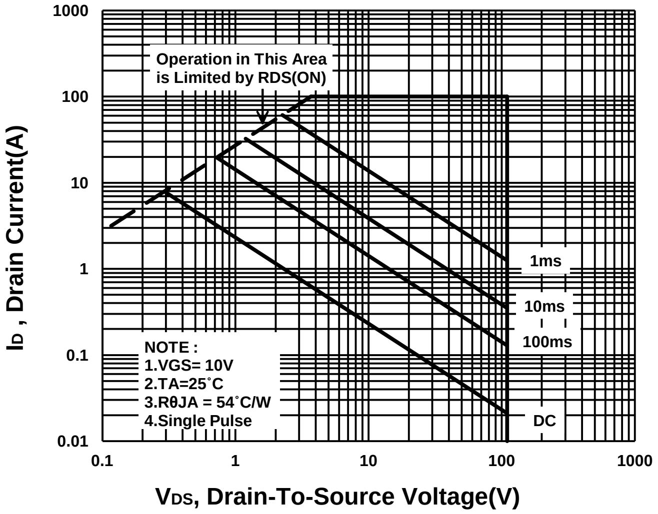
On-Resistance VS Temperature



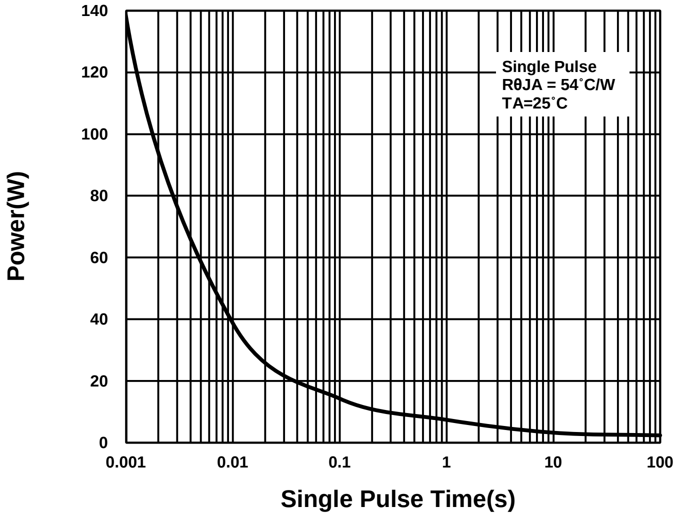
Source-Drain Diode Forward Voltage



Safe Operating Area



Single Pulse Maximum Power Dissipation



Transient Thermal Response Curve