NIKO-SEM

N-Channel Enhancement Mode Field Effect Transistor

PA110BEA
PDFN 3x3P
Halogen-Free & Lead-Free

PRODUCT SUMMARY

$V_{(BR)DSS}$	$R_{DS(ON)}$	I_D
100V	105mΩ	8.5A

D

G

S

D D D D

#1 S S S G
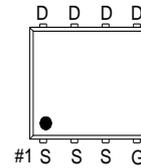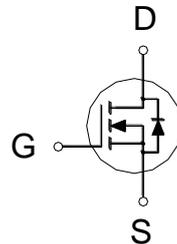
G. GATE
D. DRAIN
S. SOURCE

100% UIS Tested
100% Rg Tested

RoHS Compliant

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

PARAMETERS/TEST CONDITIONS		SYMBOL	LIMITS	UNITS
Drain-Source Voltage		V_{DS}	100	V
Gate-Source Voltage		V_{GS}	±20	V
Continuous Drain Current	T_C = 25 °C	I_D	8.5	A
	T_C = 100 °C		5.4	
Pulsed Drain Current[1]		I_{DM}	15	
Continuous Drain Current	T_A = 25 °C	I_D	3.5	
	T_A = 70 °C		2.8	
Avalanche Current[4]		I_{AS}	5.9	
Avalanche Energy[4]	L = 1mH	E_{AS}	17.5	mJ
Power Dissipation	T_C = 25 °C	P_D	18	W
	T_C = 100 °C		7.3	
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 $\leqq$10s	$R_{\theta JA}$		40	°C / W
Junction-to-Ambient[2]	Steady-State	$R_{\theta JA}$		68	
Junction-to-Case	Steady-State	$R_{\theta JC}$		6.8	

[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 $\leqq$10s value.
[4] V_{DD} = 50V , Rg = 25Ω , L = 1mH , starting T_J = 25°C.

NIKO-SEM

N-Channel Enhancement Mode
Field Effect Transistor

PA110BEA
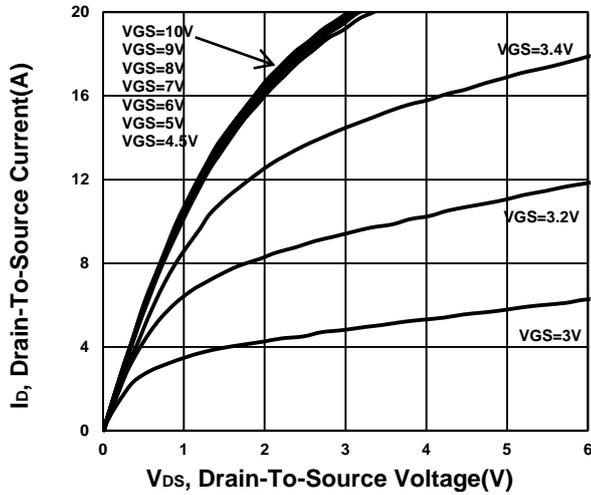**PDFN 3x3P**
Halogen-Free & Lead-Free

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

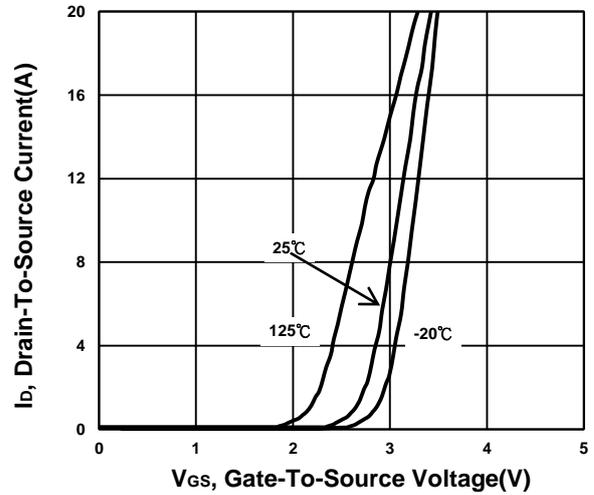| PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
STATIC						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS} = 0V, I_D = 250µA	100			V
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250µA	1	1.8	3	V
Gate-Body Leakage	I_{GSS}	V_{DS} = 0V, V_{GS} = ±20V			±100	nA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 100V, V_{GS} = 0V			1	µA
		V_{DS} = 100V, V_{GS} = 0V, T_J = 55 °C			10	
Drain-Source On-State Resistance[1]	$R_{DS(ON)}$	V_{GS} = 4.5V, I_D = 6A		85	120	mΩ
		V_{GS} = 10V, I_D = 6A		80	105	
Forward Transconductance[1]	g_{fs}	V_{DS} = 5V, I_D = 6A		25		S
DYNAMIC						
Input Capacitance	C_{iss}	V_{GS} = 0V, V_{DS} = 25V, f = 1MHz		617		pF
Output Capacitance	C_{oss}			52		
Reverse Transfer Capacitance	C_{rss}			29		
Gate Resistance	R_g	V_{GS} = 0V, V_{DS} = 0V, f = 1MHz		1.5		Ω
Total Gate Charge[2] (V_{GS} = 10V)	Q_g	V_{DS} = 50V , V_{GS} = 10V, I_D = 6A		13		nC
Total Gate Charge[2] (V_{GS} = 4.5V)				7.5		
Gate-Source Charge[2]	Q_{gs}			1.7		
Gate-Drain Charge[2]	Q_{gd}			4.1		
Turn-On Delay Time[2]	$t_{d(on)}$	V_{DS} = 50V , I_D ≅ 6A, V_{GS} = 10V, R_{GEN} = 6Ω		9		nS
Rise Time[2]	t_r			30		
Turn-Off Delay Time[2]	$t_{d(off)}$			23		
Fall Time[2]	t_f			42		
SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS (T_J = 25 °C)						
Continuous Current[3]	I_S				8.5	A
Forward Voltage[1]	V_{SD}	I_F = 6A, V_{GS} = 0V			1.4	V
Reverse Recovery Time	t_{rr}	I_F = 6A, dI_F/dt = 100A / µS		21		nS
Reverse Recovery Charge	Q_{rr}			12		nC

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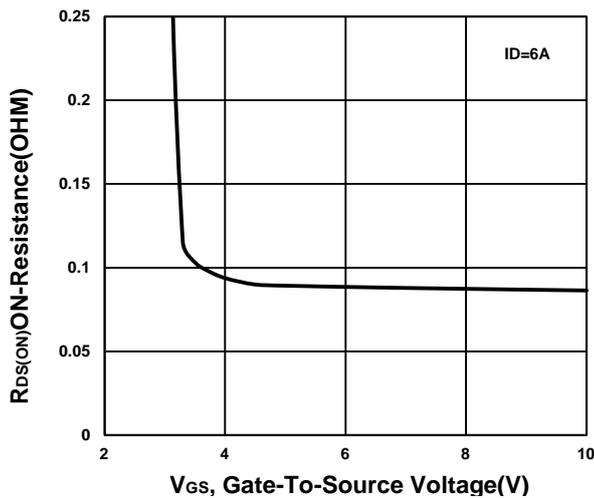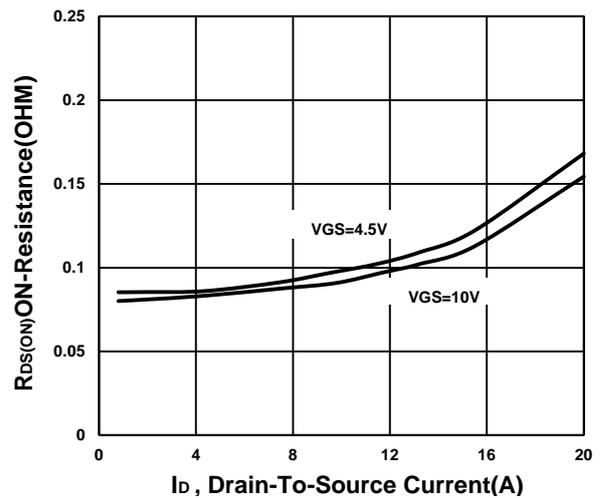[2]Independent of operating temperature.

**N-Channel Enhancement Mode
Field Effect Transistor**

PA110BEA
PDFN 3x3P
Halogen-Free & Lead-Free

Output Characteristics

VGS=10V
VGS=9V
VGS=8V
VGS=7V
VGS=6V
VGS=5V
VGS=4.5V

VGS=3.4V

VGS=3.2V

VGS=3V

I_D, Drain-To-Source Current(A)

V_DS, Drain-To-Source Voltage(V)

Transfer Characteristics

25℃

125℃   -20℃

I_D, Drain-To-Source Current(A)

V_GS, Gate-To-Source Voltage(V)

On-Resistance VS Gate-To-Source

ID=6A

R_DS(ON)ON-Resistance(OHM)

V_GS, Gate-To-Source Voltage(V)

On-Resistance VS Drain Current

VGS=4.5V

VGS=10V

R_DS(ON)ON-Resistance(OHM)

I_D , Drain-To-Source Current(A)

On-Resistance VS Temperature

VGS=10V
ID=6A

Normalized Drain to Source
ON-Resistance

T_J , Junction Temperature(˚C)
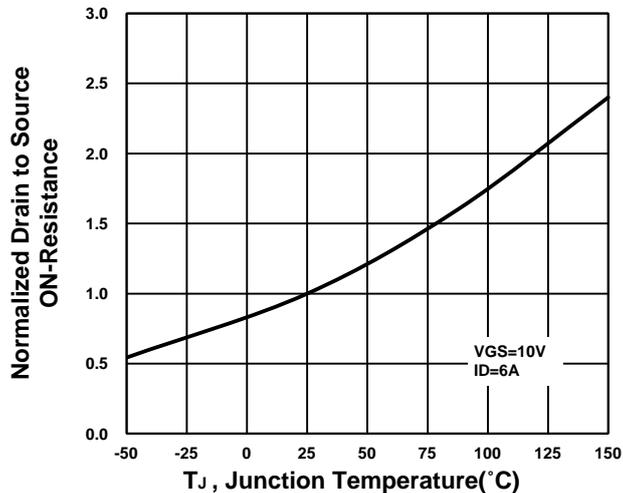
Capacitance Characteristic

CISS

COSS
CRSS

C , Capacitance(pF)

V_DS, Drain-To-Source Voltage(V)

NIKO-SEM

N-Channel Enhancement Mode
Field Effect Transistor

PA110BEA
PDFN 3x3P
Halogen-Free & Lead-Free
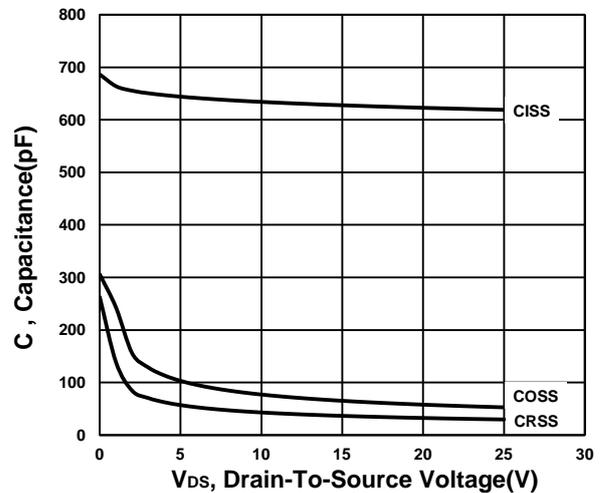
Gate charge Characteristics

VDS=50V
ID=6A
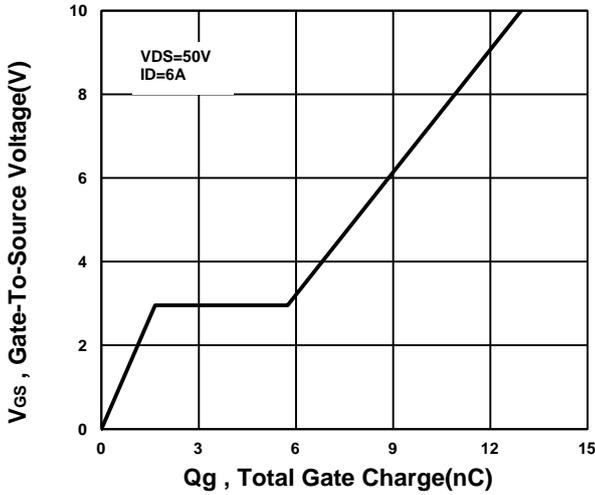
Source-Drain Diode Forward Voltage

150℃   25℃

Safe Operating Area

Operation in This Area is Limited by RDS(ON)

1ms
10ms
100ms
DC

NOTE :
1.VGS= 10V
2.TA=25℃
3.RθJA = 68℃/W
4.Single Pulse
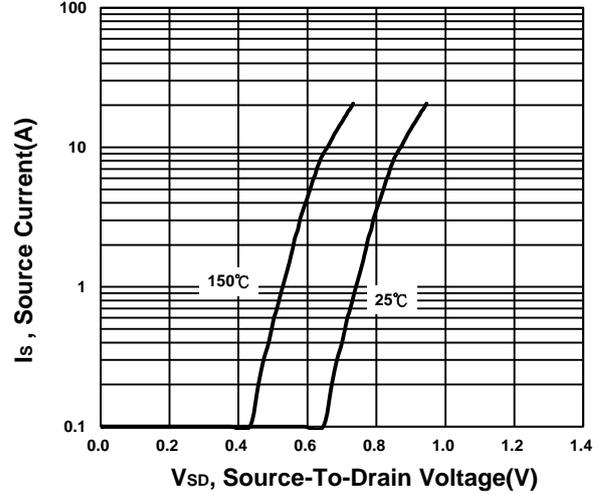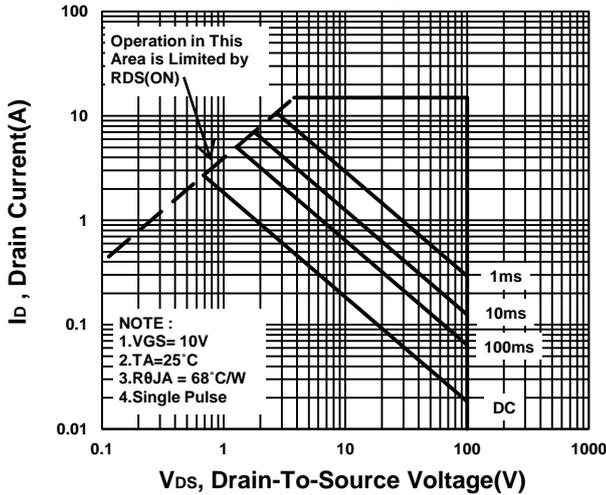
Single Pulse Maximum Power Dissipation

Single Pulse
RθJA = 68℃/W
TA=25℃
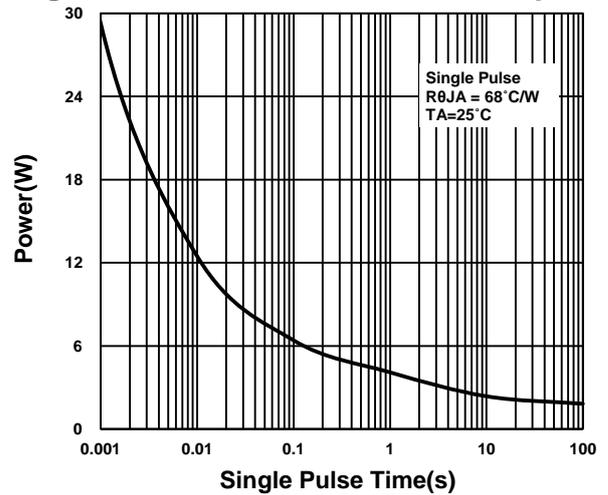
Unclamped Inductive Switching Capability

Tj=25℃
Tj=100℃
Tj=125℃
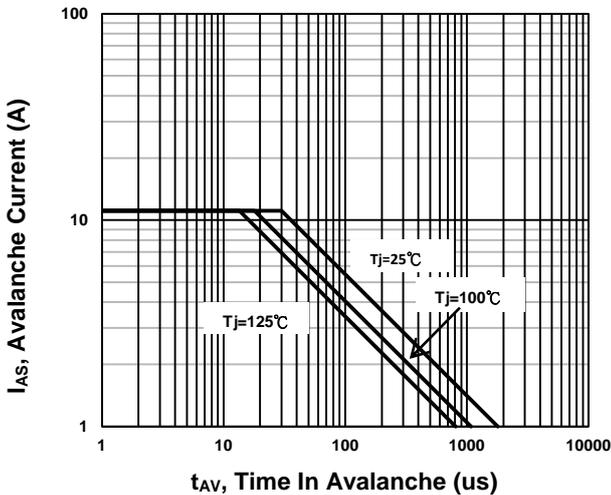
Transient Thermal Response Curve