NIKO-SEM

N-Channel Enhancement Mode Field Effect Transistor

P2610BD
TO-252
Halogen-Free & Lead-Free

PRODUCT SUMMARY

$V_{(BR)DSS}$	$R_{DS(ON)}$	I_D
100V	26.8mΩ	36A

1. GATE
2. DRAIN
3. SOURCE
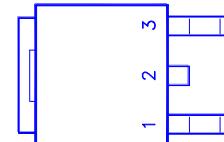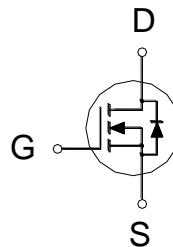
ABSOLUTE MAXIMUM RATINGS (T_A = 25 °C Unless Otherwise Noted)

PARAMETERS/TEST CONDITIONS		SYMBOL	LIMITS	UNITS
Drain-Source Voltage		V_{DS}	100	V
Gate-Source Voltage		V_{GS}	±20	V
Continuous Drain Current[2]	T_C = 25 °C	I_D	36	A
	T_C = 100 °C		23	
Pulsed Drain Current[1]		I_{DM}	80	
Avalanche Current		I_{AS}	13.9	
Avalanche Energy	L = 0.1mH	E_{AS}	9.7	mJ
Power Dissipation	T_C = 25 °C	P_D	78	W
	T_C = 100 °C		31	
Junction & Storage Temperature Range		T_J, T_{stg}	-55 to 150	°C

THERMAL RESISTANCE RATINGS

THERMAL RESISTANCE	SYMBOL	TYPICAL	MAXIMUM	UNITS
Junction-to-Case	$R_{\theta JC}$		1.6	°C / W
Junction-to-Ambient	$R_{\theta JA}$		62.5	

[1]Pulse width limited by maximum junction temperature.
[2]Calculated continuous current based on maximum allowable junction temperature.

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	1.3	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} = 80V, V_{GS} = 0V			1	μA
		V_{DS} = 80V, V_{GS} = 0V, T_J = 125 °C			10	
Drain-Source On-State Resistance[1]	$R_{DS(ON)}$	V_{GS} = 4.5V, I_D = 10A		24	35	mΩ
		V_{GS} = 10V , I_D = 10A		22	26.8	

REV1.0

NIKO-SEM

N-Channel Enhancement Mode
Field Effect Transistor

P2610BD
TO-252
Halogen-Free & Lead-Free

Forward Transconductance[1]	g_{fs}	$V_{DS} = 5V$, $I_D = 10A$		55		S
DYNAMIC						
Input Capacitance	C_{iss}	$V_{GS} = 0V$, $V_{DS} = 25V$, $f = 1MHz$		1918		pF
Output Capacitance	C_{oss}			139		
Reverse Transfer Capacitance	C_{rss}			88		
Gate Resistance	R_g	$V_{GS} = 0V$, $V_{DS} = 0V$, $f = 1MHz$		0.8		Ω
Total Gate Charge[2]	Q_g	$V_{GS} = 10 V$, $V_{DS} = 50V$, $I_D = 10A$		41.5		nC
Gate-Source Charge[2]	Q_{gs}			5.7		
Gate-Drain Charge[2]	Q_{gd}			11.6		
Turn-On Delay Time[2]	$t_{d(on)}$	$V_{DS} = 50V$ $I_D \cong 10A$, $V_{GS} = 10V$, $R_{GEN} = 6\,\Omega$		14		nS
Rise Time[2]	t_r			42		
Turn-Off Delay Time[2]	$t_{d(off)}$			43		
Fall Time[2]	t_f			34		
SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS ($T_J = 25\,°C$)						
Continuous Current[3]	I_S				36	A
Forward Voltage[1]	V_{SD}	$I_F = 10A$, $V_{GS} = 0V$			1.2	V
Reverse Recovery Time	t_{rr}	$I_F = 10A$, $dI_F/dt = 100A / \mu S$		29.3		nS
Reverse Recovery Charge	Q_{rr}			29		nC

[1]Pulse test : Pulse Width $\leq$ 300 μsec, Duty Cycle $\leq$ 2%.
[2]Independent of operating temperature.
[3]Calculated continuous current based on maximum allowable junction temperature.

NIKO-SEM

## N-Channel Enhancement Mode Field Effect Transistor

P2610BD
TO-252
Halogen-Free & Lead-Free

Output Characteristics

VGS=10V
VGS=9V
VGS=8V
VGS=7V
VGS=6V
VGS=5V
VGS=4.5V
VGS=3.5V

VGS=3V

VGS=2.5V

I_D, Drain-To-Source Current(A) vs V_{DS}, Drain-To-Source Voltage(V)
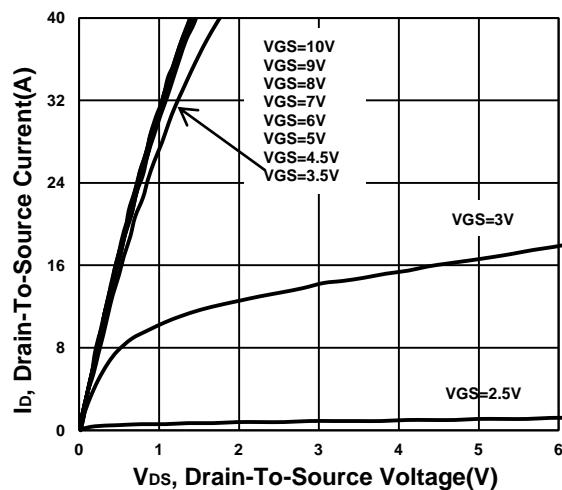
Transfer Characteristics

25℃

125℃   -20℃

I_D, Drain-To-Source Current(A) vs V_{GS}, Gate-To-Source Voltage(V)
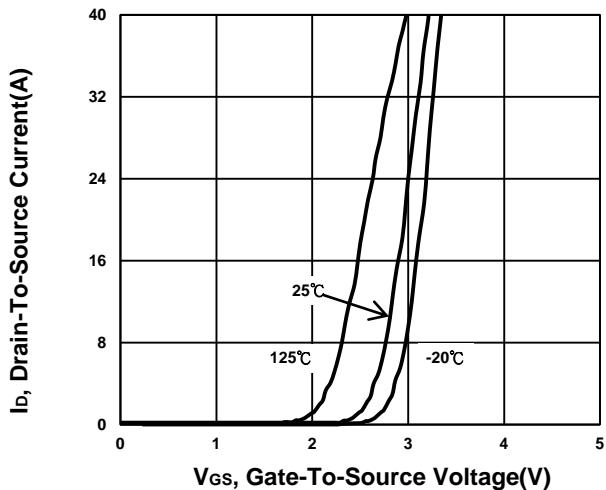
On-Resistance VS Temperature

VGS=10V
ID=10A

Normalized Drain to Source ON-Resistance vs T_J, Junction Temperature(℃)
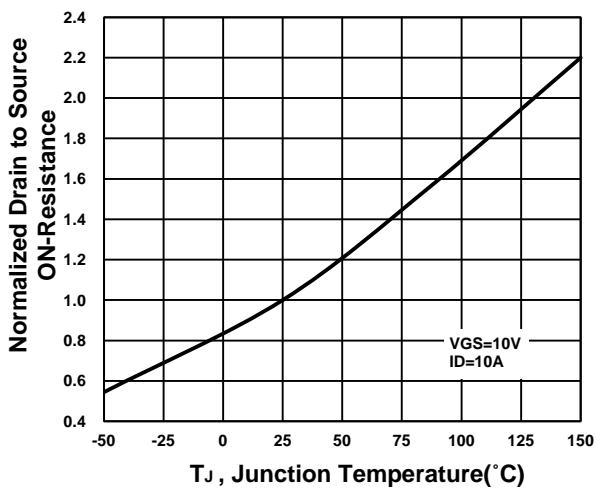
Capacitance Characteristic

CISS

COSS
CRSS

C, Capacitance(pF) vs V_{DS}, Drain-To-Source Voltage(V)
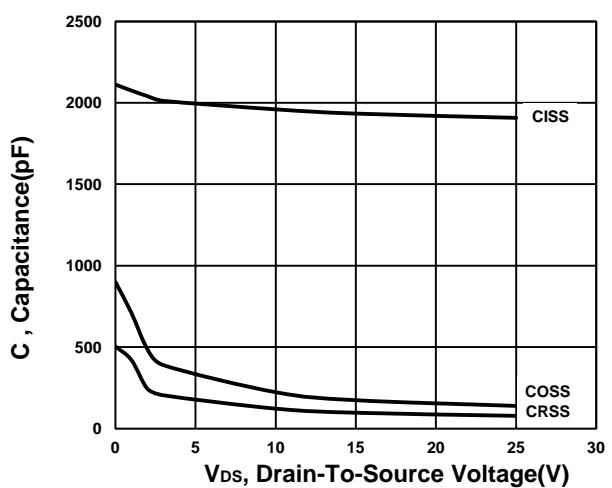
Gate charge Characteristics

VDS=50V
ID=10A

V_{GS}, Gate-To-Source Voltage(V) vs Q_g, Total Gate Charge(nC)
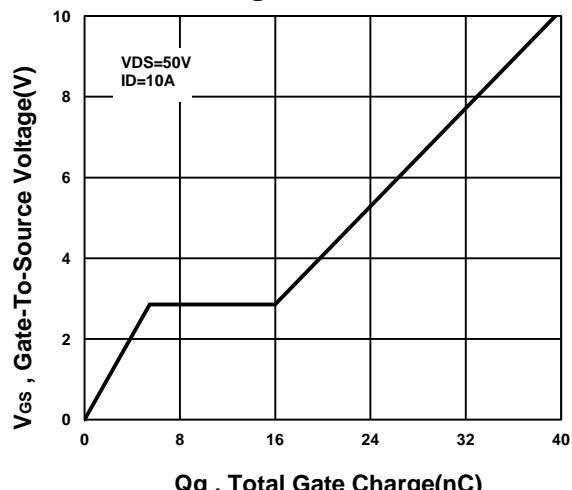
Source-Drain Diode Forward Voltage
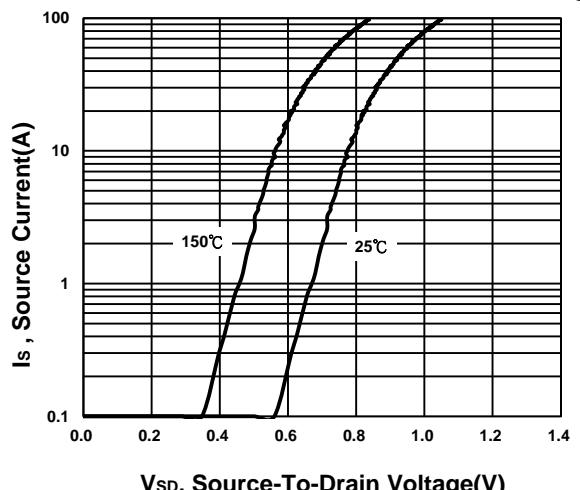
150℃   25℃

I_S, Source Current(A) vs V_{SD}, Source-To-Drain Voltage(V)

REV1.0

E-3-2

3

N-Channel Enhancement Mode Field Effect Transistor

Safe Operating Area

I_D , Drain Current(A)

1ms
10ms
100ms
DC

Operation in This
Area is Limited by
RDS(ON)

NOTE :
1.VGS= 10V
2.TC=25°C
3.RθJC = 1.6°C/W
4.Single Pulse

V$_{DS}$, Drain-To-Source Voltage(V)
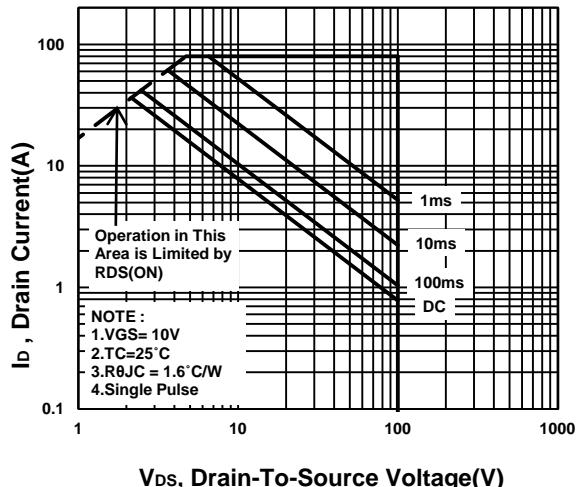
Single Pulse Maximum Power Dissipation

Power(W)

Single Pulse
RθJC = 1.6°C/W
TC=25°C

Single Pulse Time(s)
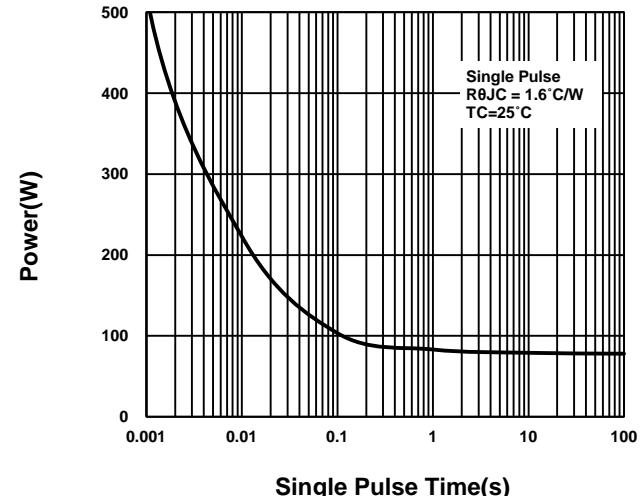
Transient Thermal Response Curve

r(t) , Normalized Effective
Transient Thermal Resistance

Duty cycle=0.5
0.2
0.1
0.05
0.02
0.01

single pulse

Notes

P_{DM}

t1
t2

1.Duty cycle, D= t1 / t2
2.RthJC = 1.6 °C/W
3.TJ-TC = P*RthJC(t)
4.RthJC(t) = r(t)*RthJC

T$_1$, Square Wave Pulse Duration[sec]