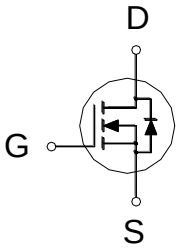
NIKO-SEM

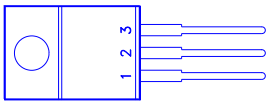
N-Channel Enhancement Mode Field Effect Transistor

P3710BT
TO-220
Halogen-Free & Lead-Free

PRODUCT SUMMARY

$V_{(BR)DSS}$	$R_{DS(ON)}$	I_D
100V	37mΩ	31A





RoHS Compliant

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	T_C = 25 °C	I_D	31	A
	T_C = 100 °C		20	
Pulsed Drain Current[1]		I_{DM}	75	
Avalanche Current		I_{AS}	16	
Avalanche Energy[2]		E_{AS}	128	mJ
Power Dissipation	T_C = 25 °C	P_D	78	W
	T_C = 100 °C		21	
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

[1]Pulse width limited by maximum junction temperature.
[2]Starting T_j =25 °C,L=1mH,V_{DD}=50V

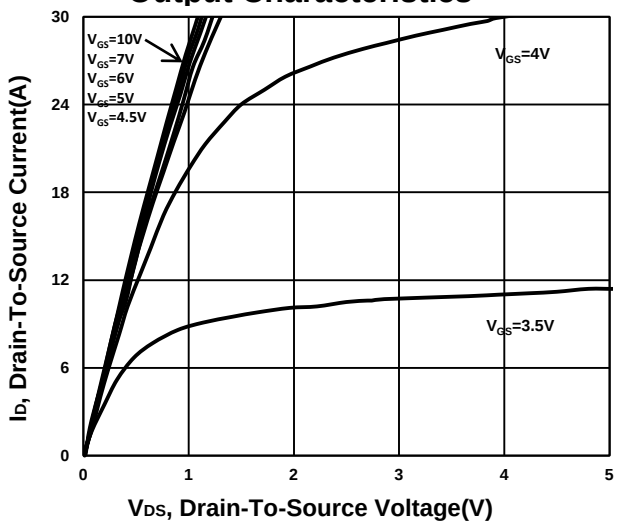
ELECTRICAL CHARACTERISTICS (T_J = 25 °C, Unless Otherwise Noted)

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	100			V
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250μA	1	1.8	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		35	48	mΩ
	$R_{DS(ON)}$	V_{GS} = 10V, I_D = 10A		27	37	mΩ
Forward Transconductance[1]	g_{fs}	V_{DS} = 10V, I_D = 10A		30		S

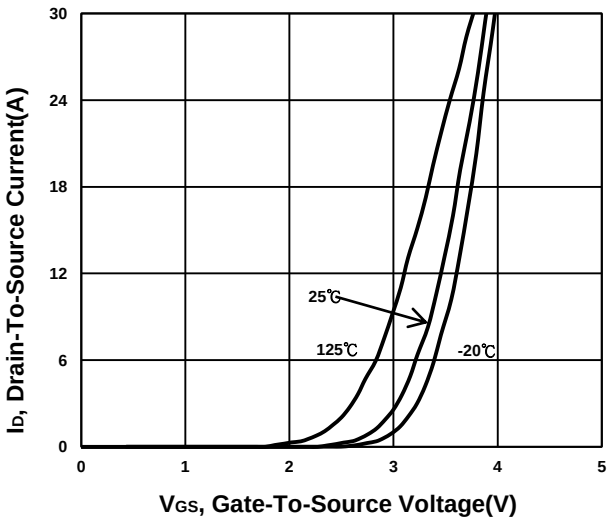
DYNAMIC						
Input Capacitance	C_{iss}	V_{GS} = 0V, V_{DS} = 25V, f = 1MHz		970		pF
Output Capacitance	C_{oss}			129		
Reverse Transfer Capacitance	C_{rss}			59		
Total Gate Charge[2]	Q_g	V_{DS} = 50V, I_D = 10A V_{GS} = 10V		25		nC
Gate-Source Charge[2]	Q_{gs}			4.3		
Gate-Drain Charge[2]	Q_{gd}			8.3		
Turn-On Delay Time[2]	$t_{d(on)}$	V_{DD} = 50V $I_D \cong$ 10A, V_{GS} = 10V, R_{GS} = 6Ω		30		nS
Rise Time[2]	t_r			21		
Turn-Off Delay Time[2]	$t_{d(off)}$			45		
Fall Time[2]	t_f			21		
SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS (T_J = 25 °C)						
Continuous Current	I_S				31	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 / µS		36		nS
Reverse Recovery Charge	Q_{rr}			52		nC

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

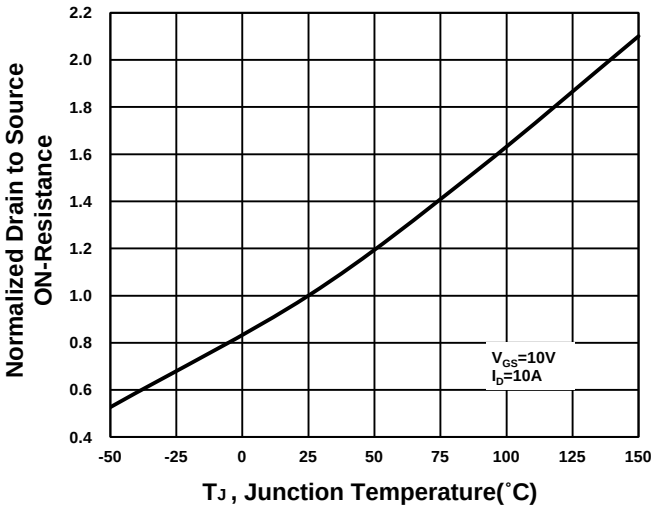
Output Characteristics



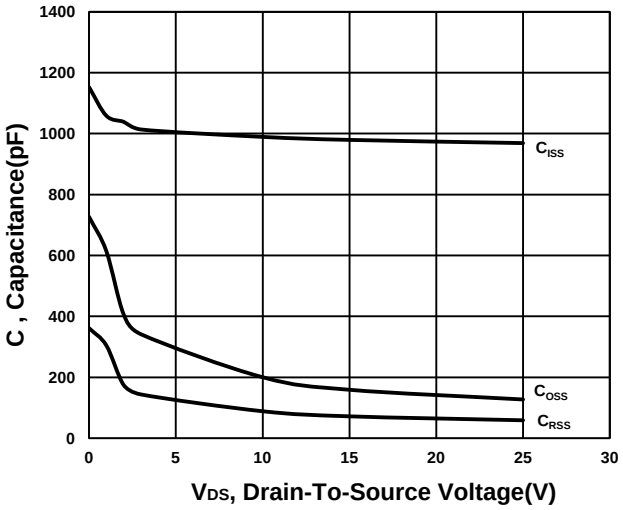
Transfer Characteristics



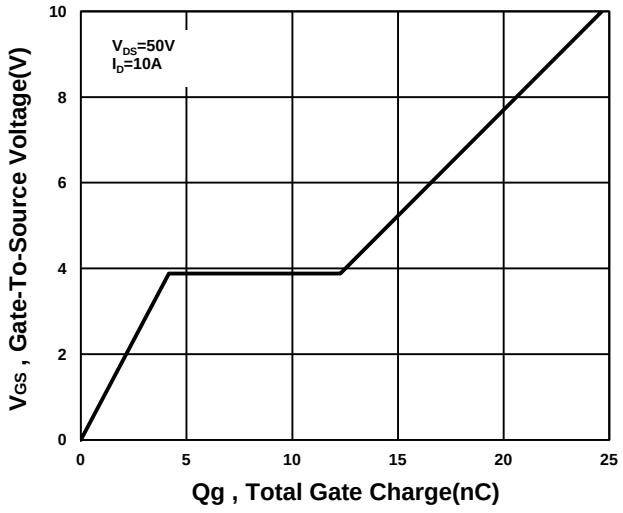
On-Resistance VS Temperature



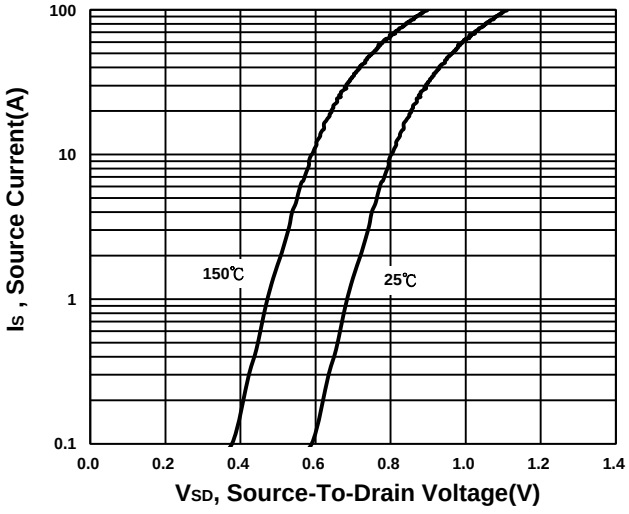
Capacitance Characteristic



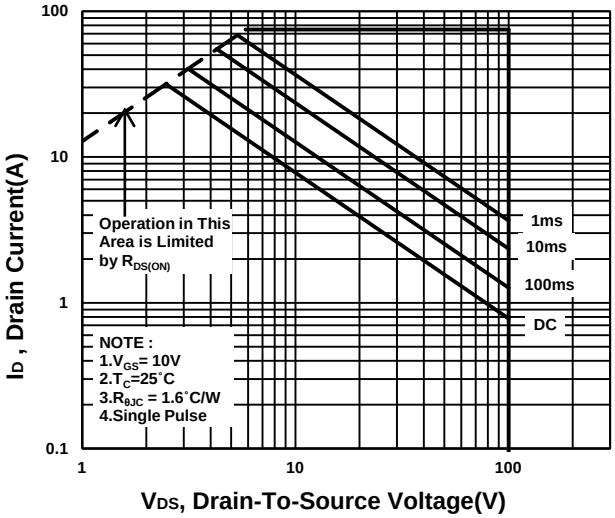
Gate charge Characteristics



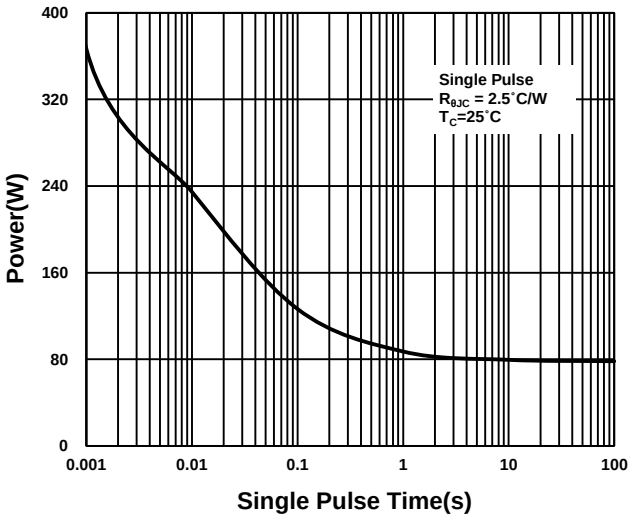
Source-Drain Diode Forward Voltage



Safe Operating Area



Single Pulse Maximum Power Dissipation



Transient Thermal Response Curve