NIKO-SEM

N-Channel Enhancement Mode Field Effect Transistor

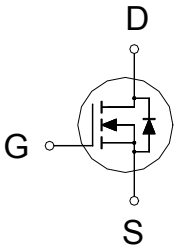
PF608BA

TO-220F

Halogen-Free & Lead-Free

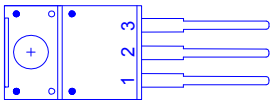
PRODUCT SUMMARY

$V_{(BR)DSS}$	$R_{DS(ON)}$	I_D
40V	6mΩ	58A



Features

- Pb−Free, Halogen Free and RoHS compliant.
- Low $R_{DS(on)}$ to Minimize Conduction Losses.
- Ohmic Region Good $R_{DS(on)}$ Ratio.
- Optimized Gate Charge to Minimize Switching Losses.



1. GATE
2. DRAIN
3. SOURCE

Applications

- Protection Circuits Applications.
- Logic/Load Switch Circuits Applications.

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

PARAMETERS/TEST CONDITIONS		SYMBOL	LIMITS	UNITS
Drain-Source Voltage		V_{DS}	40	V
Gate-Source Voltage		V_{GS}	±20	V
Continuous Drain Current	T_C = 25 ° C	I_D	58	A
	T_C = 100 ° C		37	
Pulsed Drain Current[1]		I_{DM}	150	
Avalanche Current		I_{AS}	48	
Avalanche Energy	L = 0.1mH	E_{AS}	115.2	mJ
Power Dissipation	T_C = 25 ° C	P_D	41	W
	T_C = 100 ° C		16	
Junction & Storage Temperature Range		T_J, T_{stg}	-55 to 150	° C

THERMAL RESISTANCE RATINGS

THERMAL RESISTANCE	SYMBOL	TYPICAL	MAXIMUM	UNITS
Junction-to-Ambient	$R_{\theta JA}$		62.5	° C / W
Junction-to-Case	$R_{\theta JC}$		3	

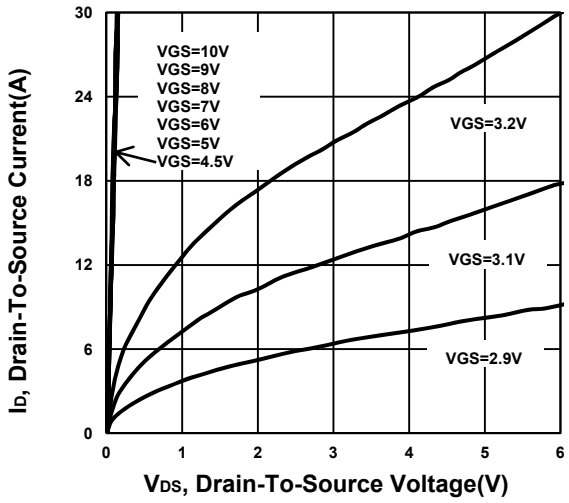
[1]Pulse width limited by maximum junction temperature.

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

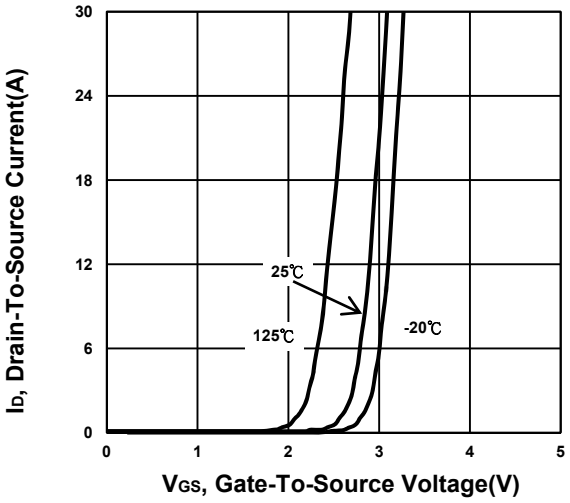
PARAMETER	SYMBOL	TEST CONDITIONS	LIMITS MIN	LIMITS TYP	LIMITS MAX	UNIT
STATIC						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS} = 0V, I_D = 250μA	40			V
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250μA	1.3	1.9	2.3	V
Gate-Body Leakage	I_{GSS}	V_{DS} = 0V, V_{GS} = ±20V			±100	nA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 32V, V_{GS} = 0V			1	μA
		V_{DS} = 30V, V_{GS} = 0V, T_J = 125 ° C			10	μA
Drain-Source On-State Resistance[1]	$R_{DS(ON)}$	V_{GS} =10V, I_D = 20A		4	5.5	mΩ
		V_{GS} =4.5V, I_D = 15A		4.5	6	mΩ
Forward Transconductance[1]	g_{fs}	V_{DS} = 5V, I_D = 20A		78		S
DYNAMIC						
Input Capacitance	C_{iss}	V_{GS} = 0V, V_{DS} = 25V, f = 1MHz		3771		pF
Output Capacitance	C_{oss}			410		pF
Reverse Transfer Capacitance	C_{rss}			258		pF
Total Gate Charge[2]	Q_g	V_{DS} = 20V , I_D = 20A , V_{GS} = 10V		70		nC
Gate-Source Charge[2]	Q_{gs}			11.5		nC
Gate-Drain Charge[2]	Q_{gd}			15		nC
Turn-On Delay Time[2]	$t_{d(on)}$	V_{DS} = 20V , I_D ≅ 20A, V_{GS} = 10V, R_G =6Ω		21		nS
Rise Time[2]	t_r			65		nS
Turn-Off Delay Time[2]	$t_{d(off)}$			95		nS
Fall Time[2]	t_f			100		nS
SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS (T_J = 25 ° C)						
Continuous Current[3]	I_S				31	A
Forward Voltage[1]	V_{SD}	I_F = 20A, V_{GS} = 0V			1.3	V
Diode Reverse Recovery Time	t_{rr}	I_F= 20A, dI/dt=100A/μs		23		nS
Diode Reverse Recovery Charge	Q_{rr}			12		nC

[1]Pulse test : Pulse Width ≤ 300 μsec, Duty Cycle ≤ 2%.
[2]Independent of operating temperature.
[3]Pulse width limited by maximum junction temperature.

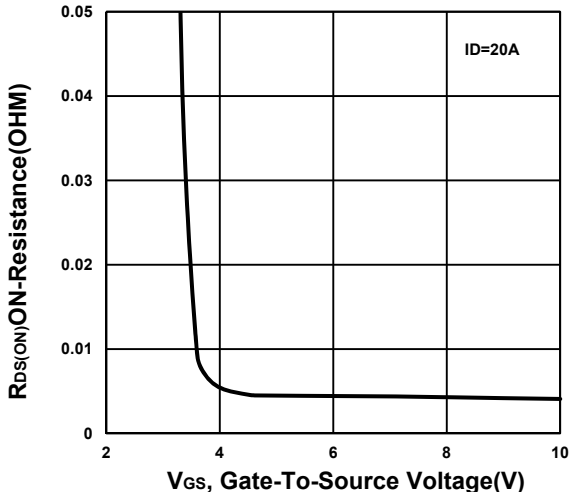
Output Characteristics



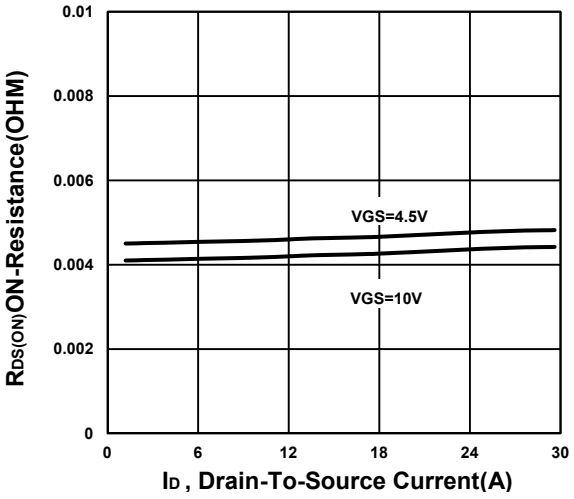
Transfer Characteristics



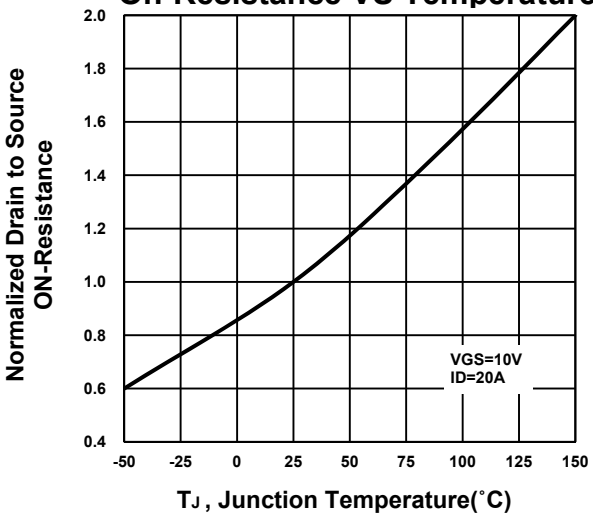
On-Resistance VS Gate-To-Source



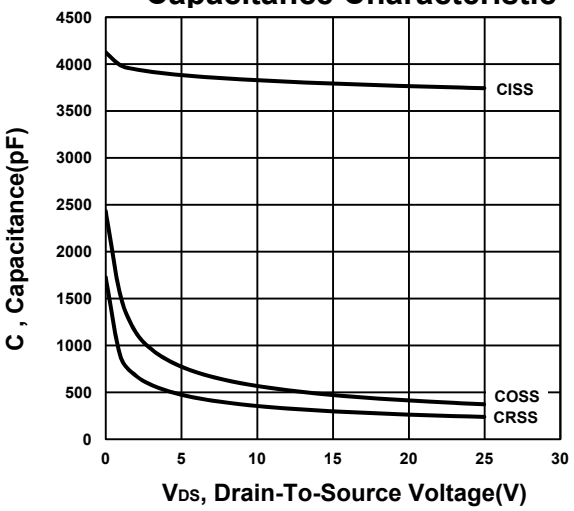
On-Resistance VS Drain Current



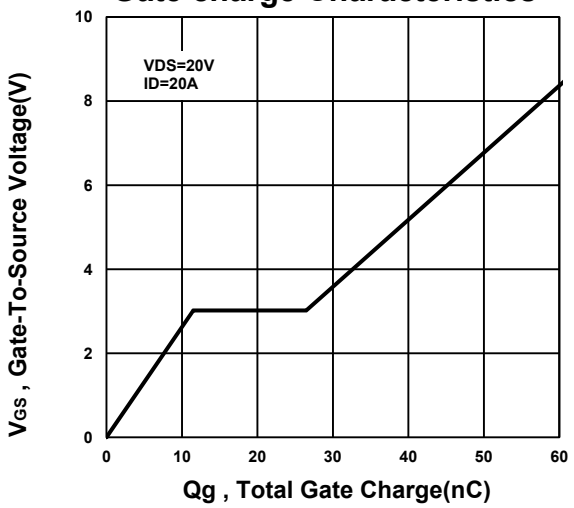
On-Resistance VS Temperature



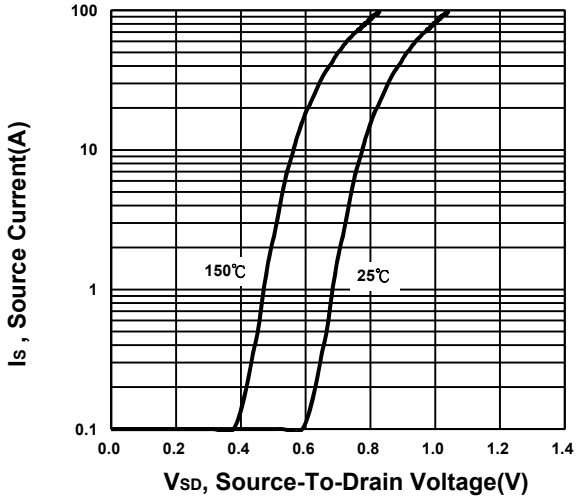
Capacitance Characteristic



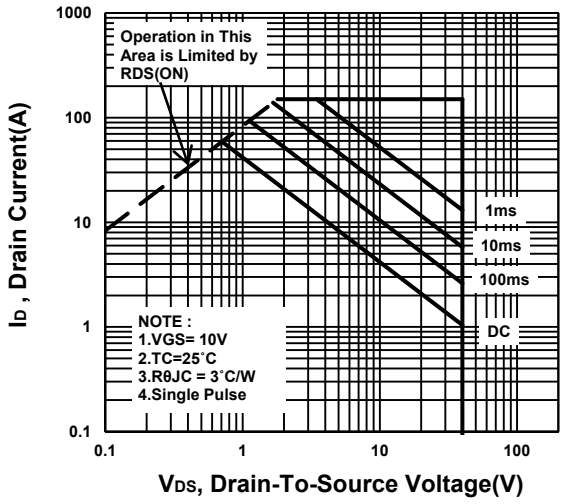
Gate charge Characteristics



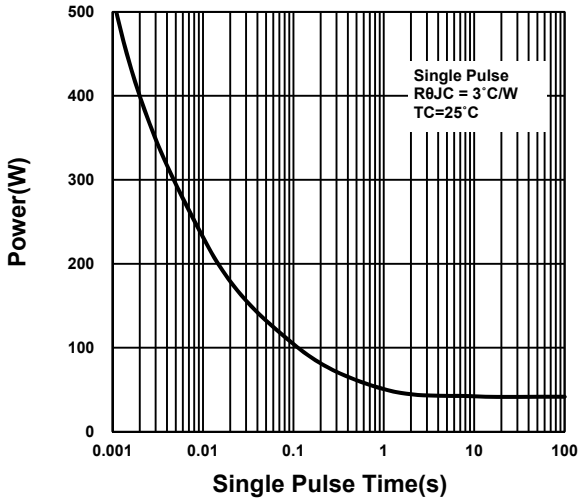
Source-Drain Diode Forward Voltage



Safe Operating Area



Single Pulse Maximum Power Dissipation



Transient Thermal Response Curve