NIKO-SEM

N-Channel Enhancement Mode Field Effect Transistor

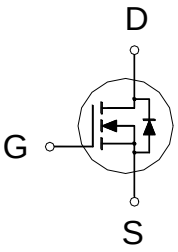
PB5A2BX

PDFN 2x2S

Halogen-Free & Lead-Free

PRODUCT SUMMARY

$V_{(BR)DSS}$	$R_{DS(ON)}$	I_D
20V	9mΩ	11A

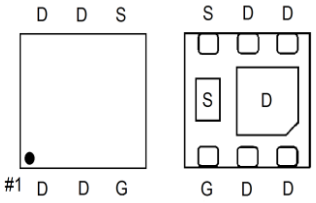


Features

- 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.

Applications

- Protection Circuits Applications.
- Logic/Load Switch Circuits Applications.
- Computer for DC to DC Converters Applications.



G : GATE
D : DRAIN
S : SOURCE

100% RG Test , 100% UIL Test

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

PARAMETERS/TEST CONDITIONS		SYMBOL	LIMITS	UNITS
Drain-Source Voltage		V_{DS}	20	V
Gate-Source Voltage		V_{GS}	±8	V
Continuous Drain Current	T_A = 25 °C	I_D	11	A
	T_A = 70 °C		9	
Pulsed Drain Current[1]		I_{DM}	33	
Power Dissipation	T_A = 25 °C	P_D	2	W
	T_A = 70 °C		1.3	
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]	$R_{\theta JA}$		60	°C／W

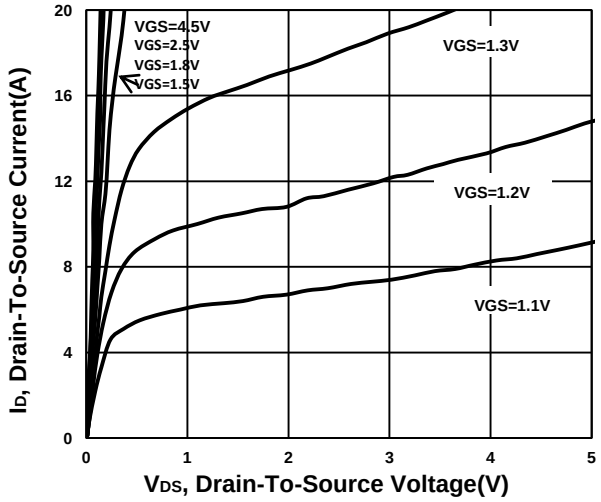
[1]Pulse width limited by maximum junction temperature.
[2]The value of $R_{\theta JA}$ is measured with the device mounted on 1in^2 FR-4 board with 2oz. Coppe.

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

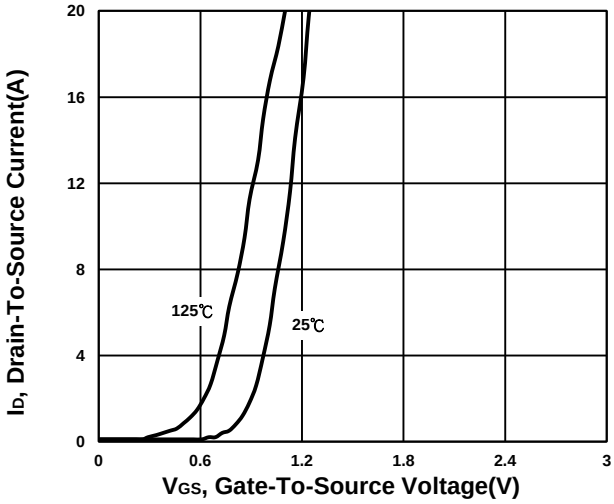
PARAMETER	SYMBOL	TEST CONDITIONS	LIMITS MIN	LIMITS TYP	LIMITS MAX	UNIT
STATIC						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS} = 0V, I_D = 250μA	20			V
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250μA	0.45	0.65	0.9	V
Gate-Body Leakage	I_{GSS}	V_{DS} = 0V, V_{GS} = ±8V			±100	nA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 16V, V_{GS} = 0V			1	μA
		V_{DS} = 10V, V_{GS} = 0V, T_J = 55 °C			10	
Drain-Source On-State Resistance[1]	$R_{DS(ON)}$	V_{GS} = 4.5V, I_D = 11A		6.5	9	mΩ
		V_{GS} = 2.5V, I_D = 9A		7.9	11	
		V_{GS} = 1.8V, I_D = 9A		10.5	15	
Forward Transconductance[1]	g_{fs}	V_{DS} = 10V, I_D = 18A		93		S
DYNAMIC						
Input Capacitance	C_{iss}	V_{GS} = 0V, V_{DS} = 10V, f = 1MHz		1547		pF
Output Capacitance	C_{oss}			227		
Reverse Transfer Capacitance	C_{rss}			203		
Gate Resistance	R_g	V_{GS} = 0V, V_{DS} = 0V, f = 1MHz		2.4		Ω
Total Gate Charge[2]	$Q_{g(V_{GS}=4.5V)}$	V_{DS} = 10V , I_D = 11A		22		nC
	$Q_{g(V_{GS}=2.5V)}$			13		
Gate-Source Charge[2]	Q_{gs}			1.1		
Gate-Drain Charge[2]	Q_{gd}			7.8		
Turn-On Delay Time[2]	$t_{d(on)}$	V_{DD} = 10V, I_D ≅ 11A, V_{GEN} = 4.5V, R_G = 6Ω		25		nS
Rise Time[2]	t_r			20		
Turn-Off Delay Time[2]	$t_{d(off)}$			62		
Fall Time[2]	t_f			45		
SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS (T_J = 25 °C)						
Continuous Current	I_S				1.5	A
Forward Voltage[1]	V_{SD}	I_F = 11A, V_{GS} = 0V			1.3	V
Reverse Recovery Time	t_{rr}	I_F =11A , dI_F/dt = 100A / μS		9.1		nS
Reverse Recovery Charge	Q_{rr}			2.2		nC

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

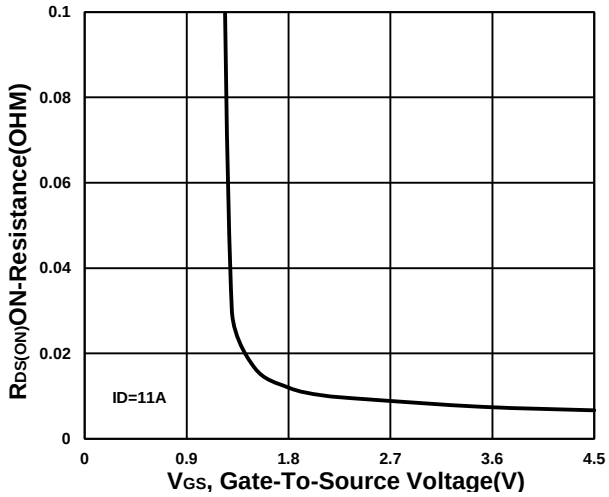
Output Characteristics



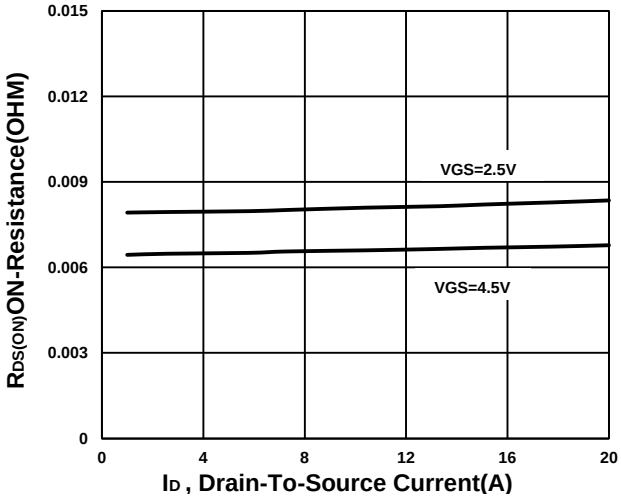
Transfer Characteristics



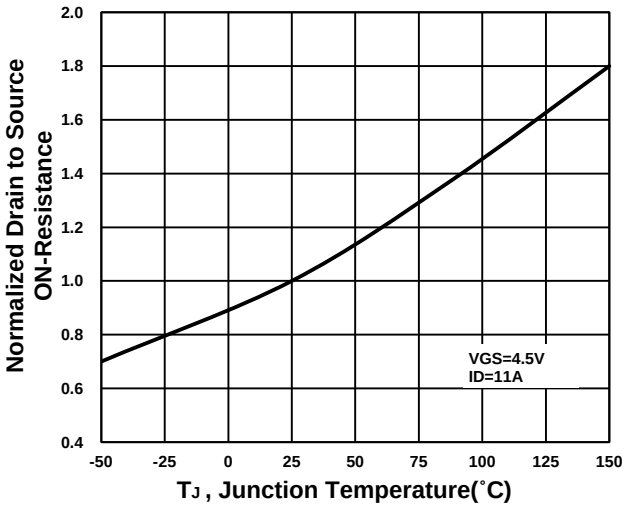
On-Resistance VS Gate-To-Source



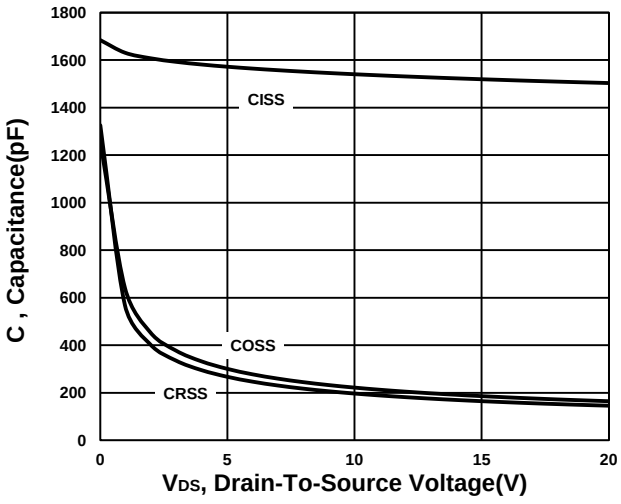
On-Resistance VS Drain Current



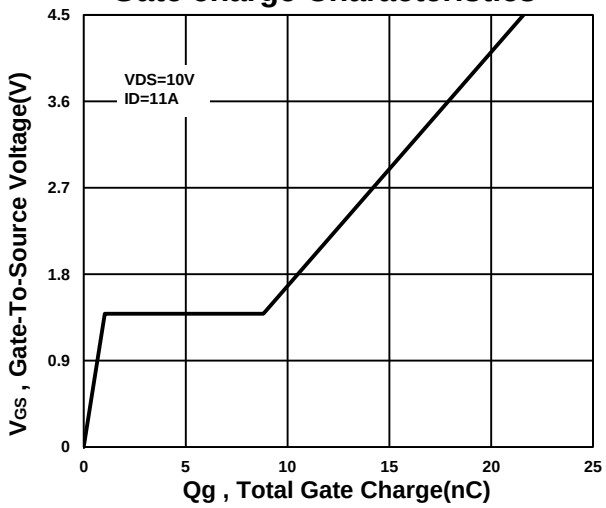
On-Resistance VS Temperature



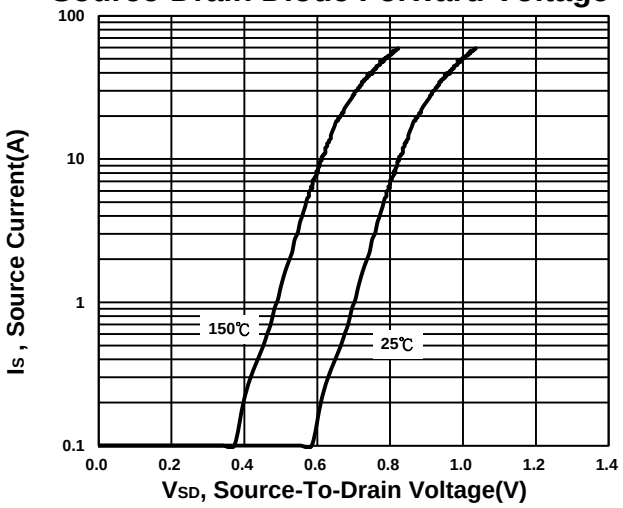
Capacitance Characteristic



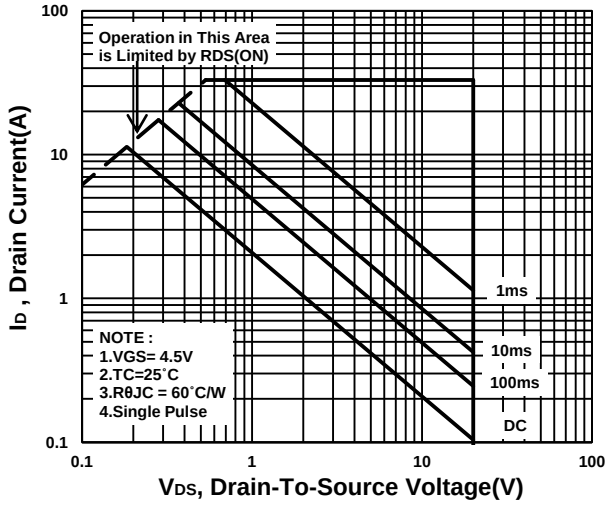
Gate charge Characteristics



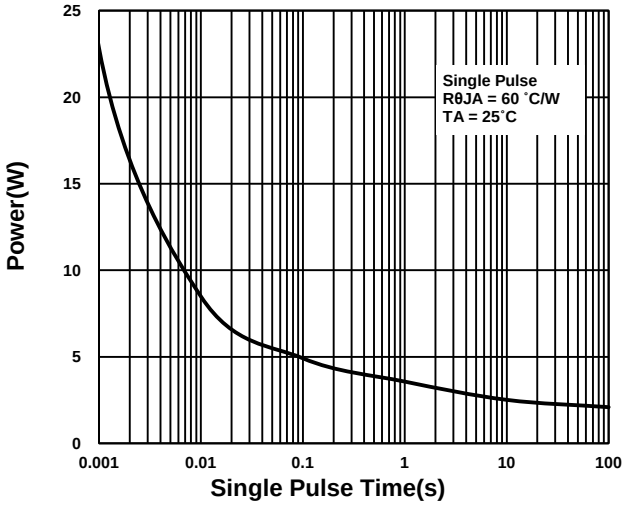
Source-Drain Diode Forward Voltage



Safe Operating Area



Single Pulse Maximum Power Dissipation



Transient Thermal Response Curve