NIKO-SEM

P-Channel Enhancement Mode Field Effect Transistor

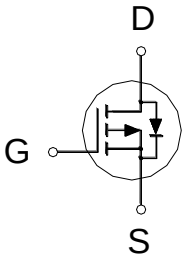
P9006EDA

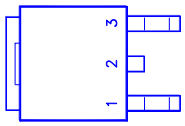
TO-252

Halogen-Free & Lead-Free

PRODUCT SUMMARY

$V_{(BR)DSS}$	$R_{DS(ON)}$	I_D
-60V	90mΩ	-13A





1. GATE
2. DRAIN
3. SOURCE

RoHS Compliant

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

PARAMETERS/TEST CONDITIONS		SYMBOL	LIMITS	UNITS
Drain-Source Voltage		V_{DS}	-60	V
Gate-Source Voltage		V_{GS}	±25	V
Continuous Drain Current[2]	T_C = 25 °C	I_D	-13	A
	T_C = 100 °C		-8.3	
Pulsed Drain Current[1]		I_{DM}	-37	
Avalanche Current		I_{AS}	-17.2	
Avalanche Energy	L = 0.1mH	E_{AS}	14.7	mJ
Power Dissipation	T_C = 25 °C	P_D	31.2	W
	T_C = 100 °C		12.5	
Junction & Storage Temperature Range		T_J, T_{stg}	-55 to 150	°C

THERMAL RESISTANCE RATINGS

THERMAL RESISTANCE	SYMBOL	TYPICAL	MAXIMUM	UNITS
Junction-to-Case	$R_{\theta JC}$		4	°C / W
Junction-to-Ambient	$R_{\theta JA}$		62.5	

[1]Pulse width limited by maximum junction temperature.

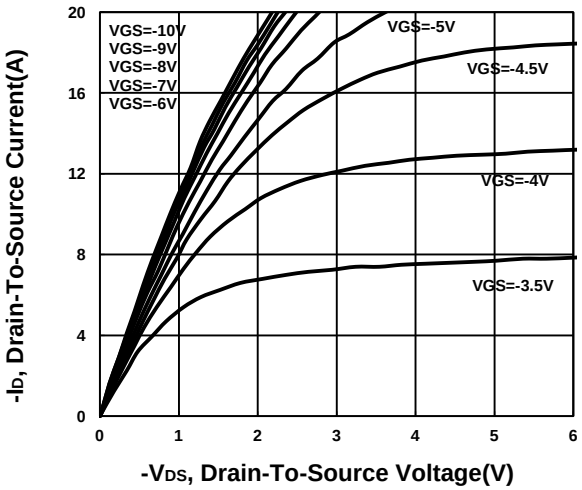
ELECTRICAL CHARACTERISTICS (T_J = 25 °C, Unless Otherwise Noted)

PARAMETER	SYMBOL	TEST CONDITIONS	LIMITS			UNIT
			MIN	TYP	MAX	
STATIC						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS} = 0V, I_D = -250μA	-60			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} = ±25V			±100	nA

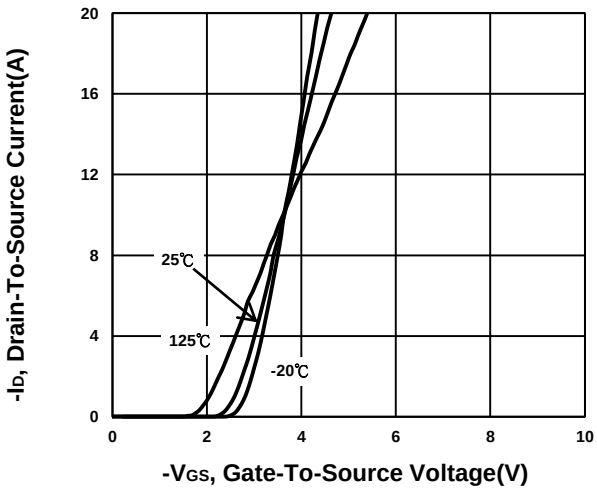
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = -48V, V_{GS} = 0V			-1	μA
		V_{DS} = -40V, V_{GS} = 0V, T_J = 125 °C			-10	
Drain-Source On-State Resistance[1]	$R_{DS(ON)}$	V_{GS} = -4.5V, I_D = -6A		110	135	mΩ
		V_{GS} = -10V, I_D = -7A		78	90	
Forward Transconductance[1]	g_{fs}	V_{DS} = -5V, I_D = -7A		10		S
DYNAMIC						
Input Capacitance	C_{iss}	V_{GS} = 0V, V_{DS} = -25V, f = 1MHz		535		pF
Output Capacitance	C_{oss}			61		
Reverse Transfer Capacitance	C_{rss}			40		
Gate Resistance	R_g	V_{GS} =0V, V_{DS} = 0V, f = 1MHz		9.2		Ω
Total Gate Charge[2]	$Q_{g\ (V_{GS}=-10V)}$	V_{DS} = -30V , V_{GS} = -10V, I_D = -7A		11.6		nC
	$Q_{g(V_{GS}=-4.5V)}$			6.3		
Gate-Source Charge[2]	Q_{gs}			1.6		
Gate-Drain Charge[2]	Q_{gd}			3.4		
Turn-On Delay Time[2]	$t_{d(on)}$	V_{DS} = -30V , $I_D \cong$ -7A, V_{GS} = -10V, R_{GEN} =6Ω		12.3		nS
Rise Time[2]	t_r			33		
Turn-Off Delay Time[2]	$t_{d(off)}$			47		
Fall Time[2]	t_f			51		
SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS (T_J = 25 °C)						
Continuous Current[3]	I_S				-13	A
Forward Voltage[1]	V_{SD}	I_F = -7A, V_{GS} = 0V			-1	V
Reverse Recovery Time	t_{rr}	I_F = -7A, dI_F/dt = 100A / μS		19		nS
Reverse Recovery Charge	Q_{rr}			16		nC

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

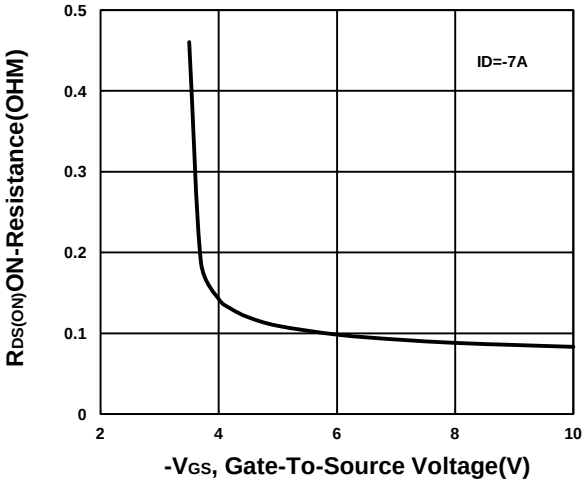
Output Characteristics



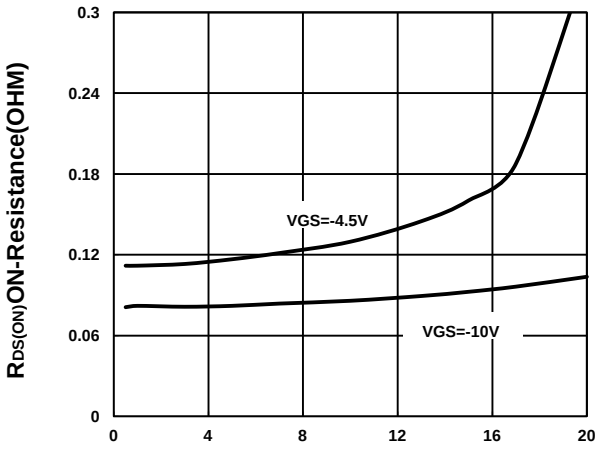
Transfer Characteristics



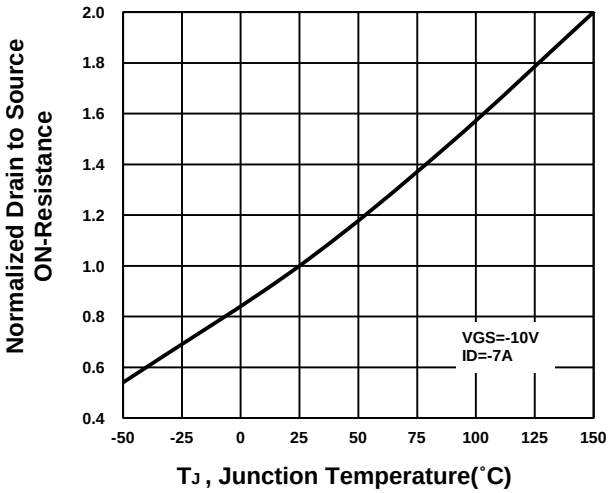
On-Resistance VS Gate-To-Source Voltage



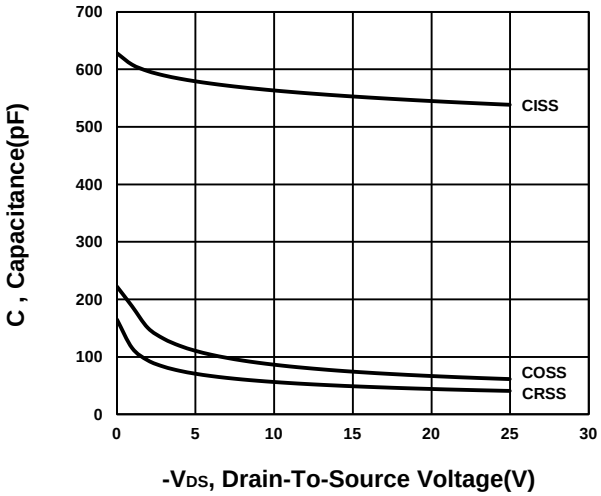
On-Resistance VS Drain Current



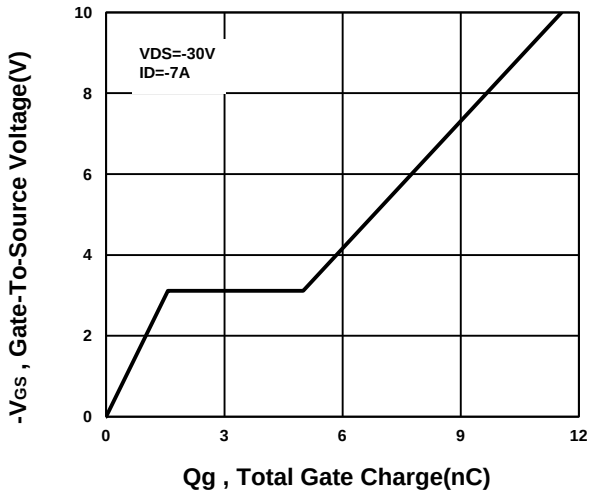
On-Resistance VS Temperature



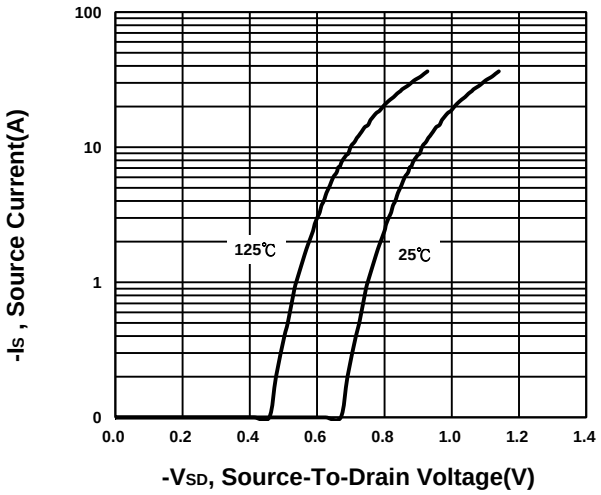
Capacitance Characteristic



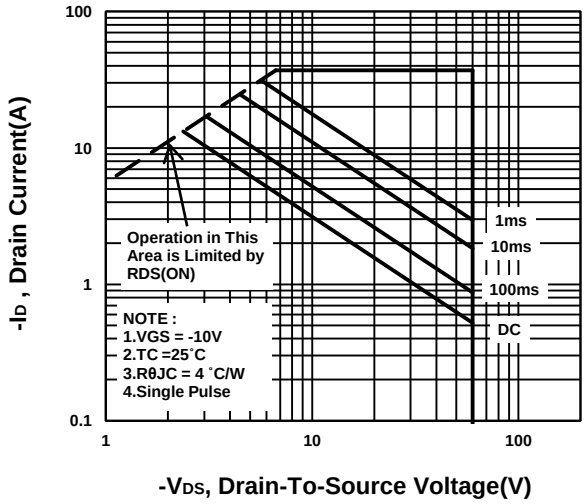
Gate charge Characteristics



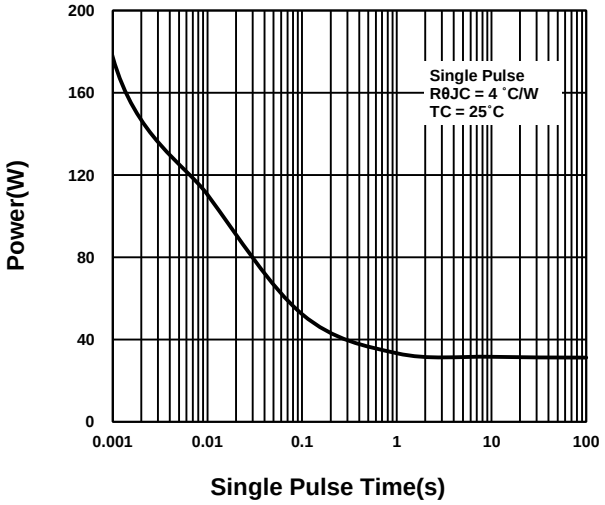
Source-Drain Diode Forward Voltage



Safe Operating Area



Single Pulse Maximum Power Dissipation



Transient Thermal Response Curve