NIKO-SEM

P-Channel Logic Level Enhancement Mode Field Effect Transistor

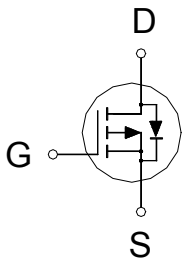
P3506DTF

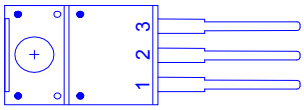
TO-220F

Halogen-Free & Lead-Free

PRODUCT SUMMARY

$V_{(BR)DSS}$	$R_{DS(ON)}$	I_D
-60V	35mΩ	-20A





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}	-60	V
Gate-Source Voltage		V_{GS}	±25	V
Continuous Drain Current	T_C = 25 °C	I_D	-20	A
	T_C = 100 °C		-10	
Pulsed Drain Current[1]		I_{DM}	-100	
Avalanche Current		I_{AS}	-38	
Avalanche Energy	L = 0.1mH	E_{AS}	72	mJ
Power Dissipation	T_c = 25 °C	P_D	26	W
	T_c = 100 °C		10.4	
Junction & Storage Temperature Range		T_J, T_{stg}	-55 to 150	°C

THERMAL RESISTANCE RATINGS

THERMAL RESISTANCE	SYMBOL	TYPICAL	MAXIMUM	UNITS
Junction-to-Case	$R_{\theta JC}$		4.8	°C / W
Junction-to-Ambient	$R_{\theta JA}$		62.5	

[1]Pulse width limited by maximum junction temperature.

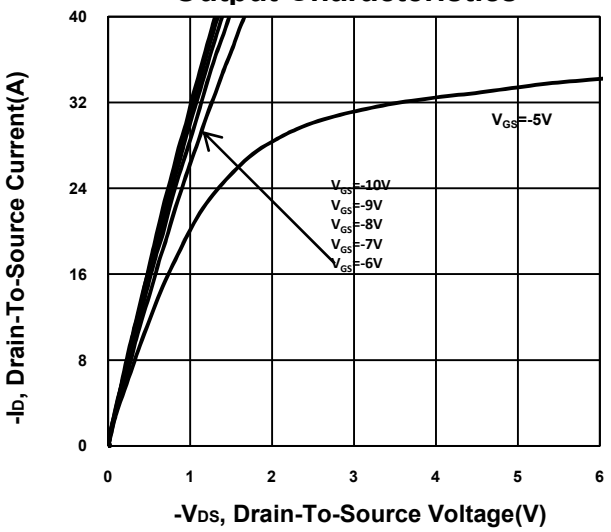
ELECTRICAL CHARACTERISTICS (T_J = 25 °C, Unless Otherwise Noted)

PARAMETER	SYMBOL	TEST CONDITIONS	LIMITS MIN	LIMITS TYP	LIMITS MAX	UNIT
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	-2	-2.7	-4	
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 = 55 °C			10	
Drain-Source On-State Resistance[1]	$R_{DS(ON)}$	V_{GS} = -7V, I_D = -20A		34	55	mΩ
		V_{GS} = -10V, I_D = -20A		29	35	
Forward Transconductance[1]	g_{fs}	V_{DS} = -5V, I_D = -20A		32		S

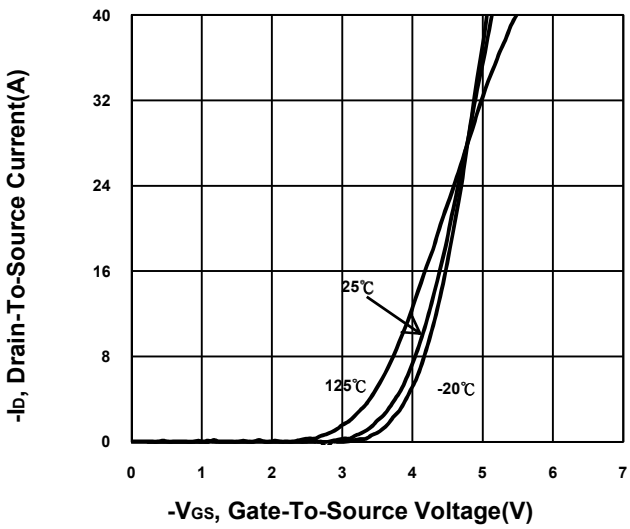
On-State Drain Current[1]	$I_{D(ON)}$	V_{DS} = -5V, V_{GS} = -10V,	-100			A
DYNAMIC						
Input Capacitance	C_{iss}	V_{GS} = 0V, V_{DS} = -25V, f = 1MHz		2320		pF
Output Capacitance	C_{oss}			175		
Reverse Transfer Capacitance	C_{rss}			142		
Gate Resistance	R_g	V_{GS} =0V, V_{DS} = 0V, f = 1MHz		4.8		Ω
Total Gate Charge[2]	Q_g	V_{DS} = 0.5$V_{(BR)DSS}$, V_{GS} = -10V, I_D =-20A		43		nC
Gate-Source Charge[2]	Q_{gs}			11		
Gate-Drain Charge[2]	Q_{gd}			13.5		
Turn-On Delay Time[2]	$t_{d(on)}$	V_{DS} = -30V , $I_D \cong$ -10A, V_{GS} = -10V, R_{GEN} =25Ω		45		nS
Rise Time[2]	t_r			380		
Turn-Off Delay Time[2]	$t_{d(off)}$			70		
Fall Time[2]	t_f			190		
SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS (T_J = 25 °C)						
Continuous Current	I_S				-20	A
Forward Voltage[1]	V_{SD}	I_F = -20A, V_{GS} = 0V			-1.3	V
Reverse Recovery Time	t_{rr}	I_F = -20A, dI_F/dt = 100A / μS		40		nS
Reverse Recovery Charge	Qrr			57		nC

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

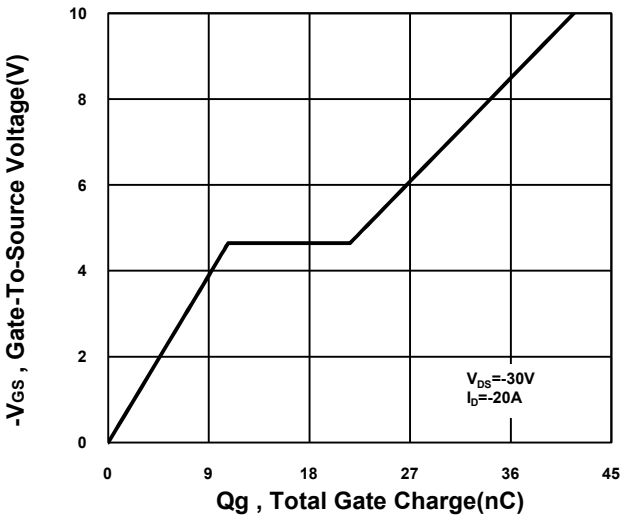
Output Characteristics



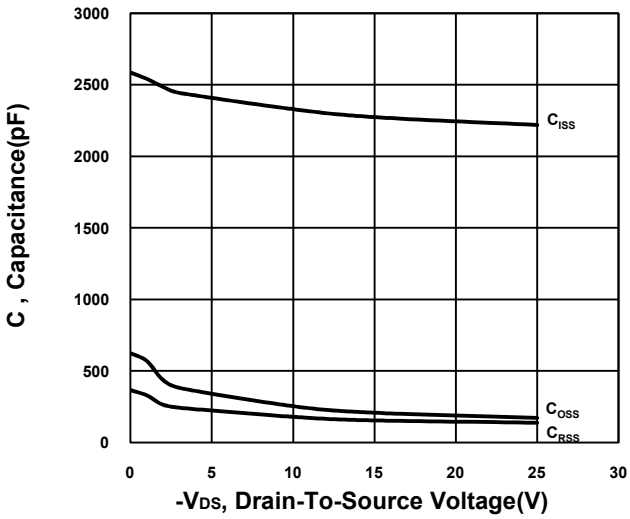
Transfer Characteristics



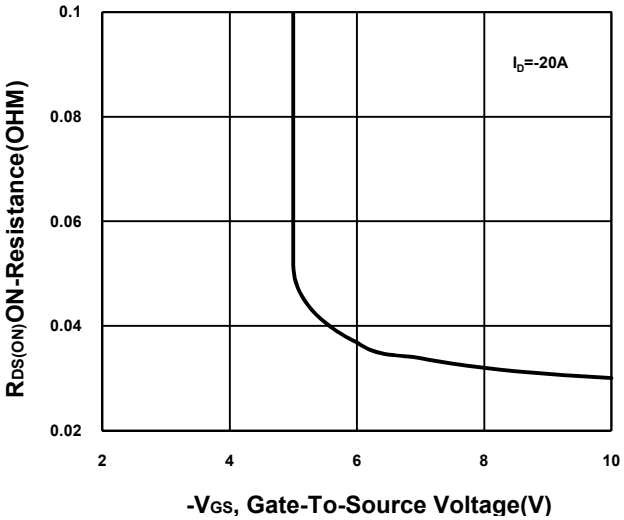
Gate charge Characteristics



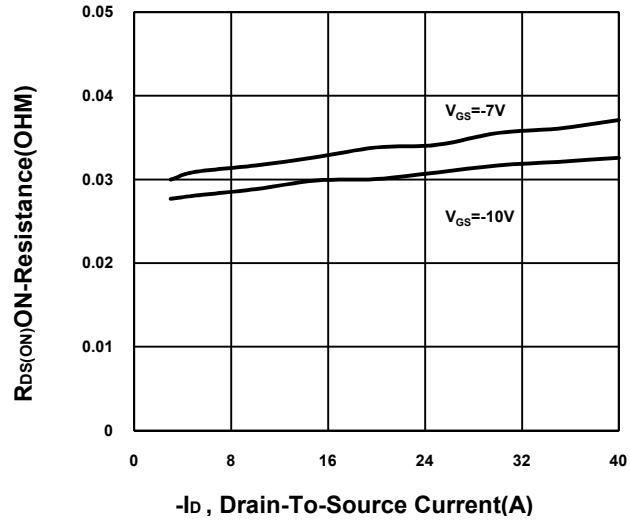
Capacitance Characteristic



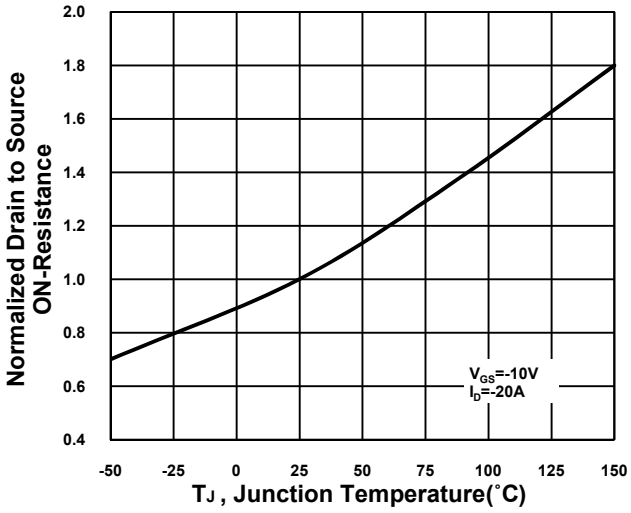
On-Resistance VS Gate-To-Source



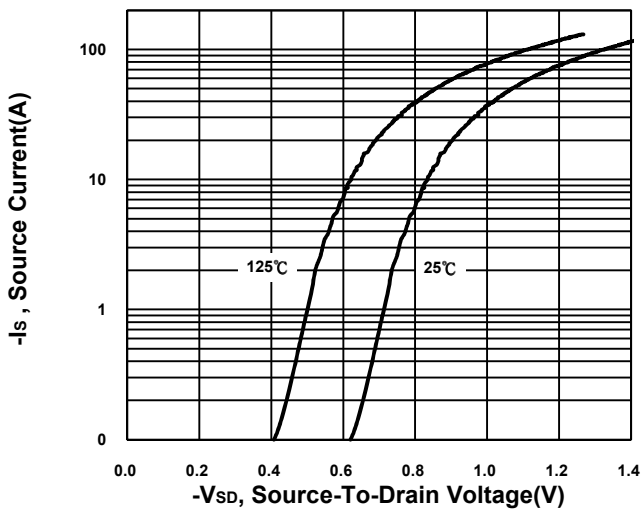
On-Resistance VS Drain Current



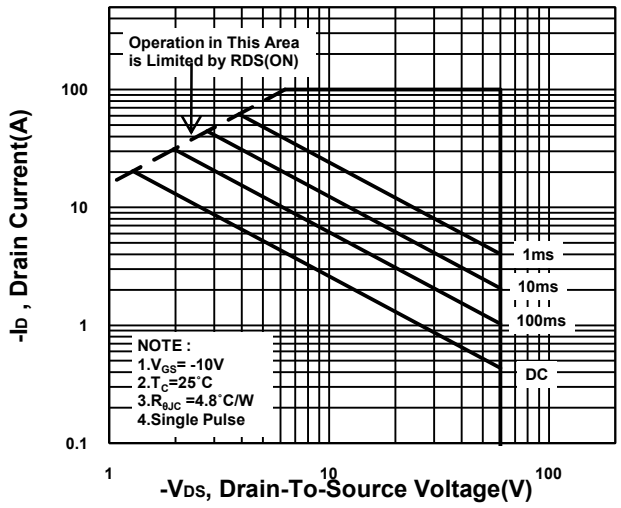
On-Resistance VS Temperature



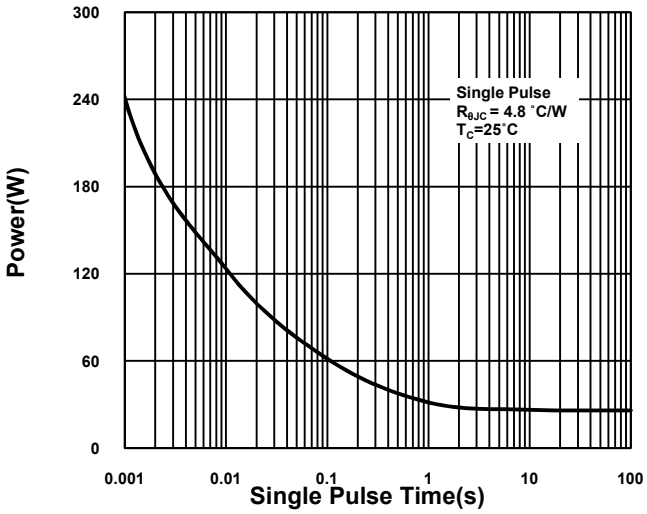
Source-Drain Diode Forward Voltage



Safe Operating Area



Single Pulse Maximum Power Dissipation



Transient Thermal Response Curve