NIKO-SEM

N-Channel Enhancement Mode Field Effect Transistor

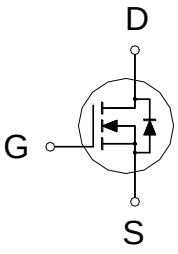
P1160JF

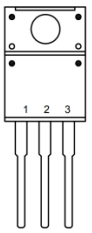
TO-220F

Halogen-Free & Lead-Free

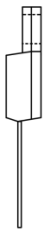
PRODUCT SUMMARY

$V_{(BR)DSS}$	$R_{DS(ON)}$	I_D
600V	400mΩ	11A





Top View


Side View

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}	600	V
Gate-Source Voltage		V_{GS}	±30	V
Continuous Drain Current[2]	T_C = 25 ° C	I_D	11	A
	T_C = 100 ° C		7	
Pulsed Drain Current[1]		I_{DM}	33	
Avalanche Current[3]		I_{AS}	1.4	
Avalanche Energy[3]		E_{AS}	69	mJ
Power Dissipation	T_C = 25 ° C	P_D	30	W
	T_C = 100 ° C		12	
Operating Junction & Storage Temperature Range		T_j, T_{stg}	-55 to 150	° C

THERMAL RESISTANCE RATINGS

THERMAL RESISTANCE	SYMBOL	TYPICAL	MAXIMUM	UNITS
Junction-to-Case	$R_{\theta JC}$		4.2	° C / W
Junction-to-Ambient	$R_{\theta JA}$		62.5	

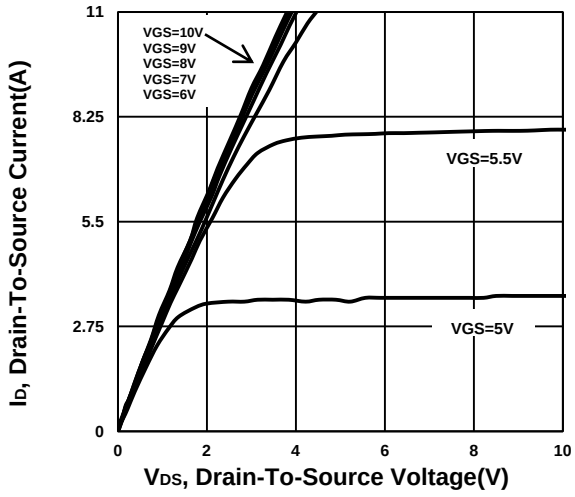
[1]Pulse width limited by maximum junction temperature.
[2]Ensure that the channel temperature does not exceed 150°C.
[3]V_{DD} = 50V , L = 75mH ,starting T_J = 25°C.

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

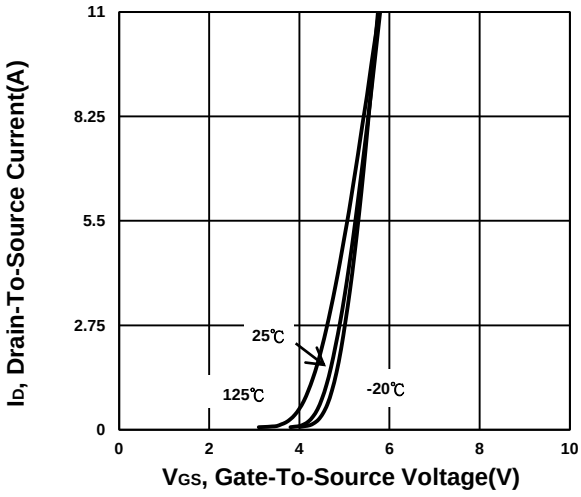
PARAMETER	SYMBOL	TEST CONDITIONS	LIMITS			UNITS
			MIN	TYP	MAX	
STATIC						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS} = 0V, I_D = 250μA	600			V
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250μA	2	3.4	4	
Gate-Body Leakage	I_{GSS}	V_{DS} = 0V, V_{GS} = ±30V			±100	nA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 600V, V_{GS} = 0V			1	μA
		V_{DS} = 480V, V_{GS} = 0V, T_J = 100 ° C			10	
Drain-Source On-State Resistance[1]	$R_{DS(ON)}$	V_{GS} = 10V, I_D = 5.5A		333	400	mΩ
Forward Transconductance[1]	g_{fs}	V_{DS} = 10V, I_D = 5.5A		9.2		S
DYNAMIC						
Input Capacitance	C_{iss}	V_{GS} = 0V, V_{DS} = 100V, f = 250KHz		716		pF
Output Capacitance	C_{oss}			44		
Reverse Transfer Capacitance	C_{rss}			7.2		
Gate Resistance	Rg	V_{GS} = 0V, V_{DS} = 0V, f = 1MHz		20		Ω
Total Gate Charge[2]	Q_g	V_{DS} =480V, V_{GS} = 10V, I_D = 5.5A		20		nC
Gate-Source Charge[2]	Q_{gs}			4		
Gate-Drain Charge[2]	Q_{gd}			8.9		
Turn-On Delay Time[2]	$t_{d(on)}$	V_{DD} = 300V, I_D ≅ 5.5A, V_{GS} = 10V, R_{GEN} =25Ω		22		nS
Rise Time[2]	t_r			37		
Turn-Off Delay Time[2]	$t_{d(off)}$			118		
Fall Time[2]	t_f			44		
SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS (T_J = 25 °C)						
Continuous Current	I_S				11	A
Forward Voltage[1]	V_{SD}	I_F = 11A , V_{GS} = 0V			1.2	V
Reverse Recovery Time	t_{rr}	I_F = 5.5A , dI_F/dt= 100A/μs		230		nS
Reverse Recovery Charge	Q_{rr}			2.3		uC

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

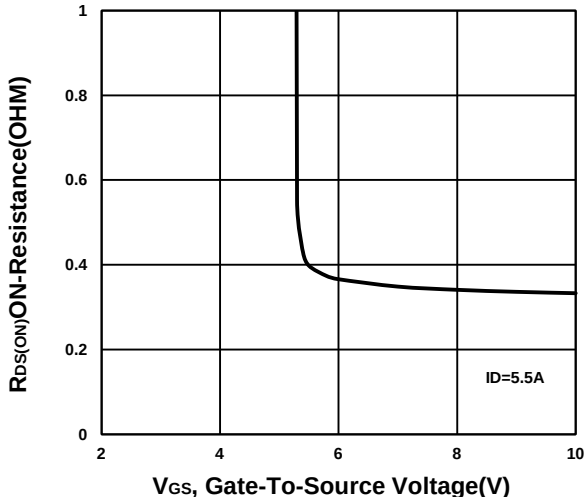
Output Characteristics



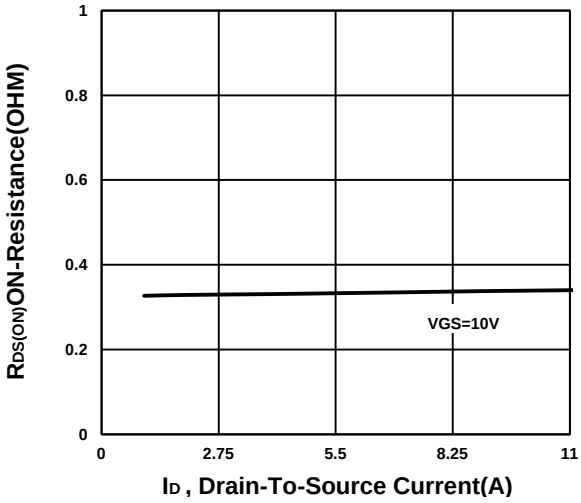
Transfer Characteristics



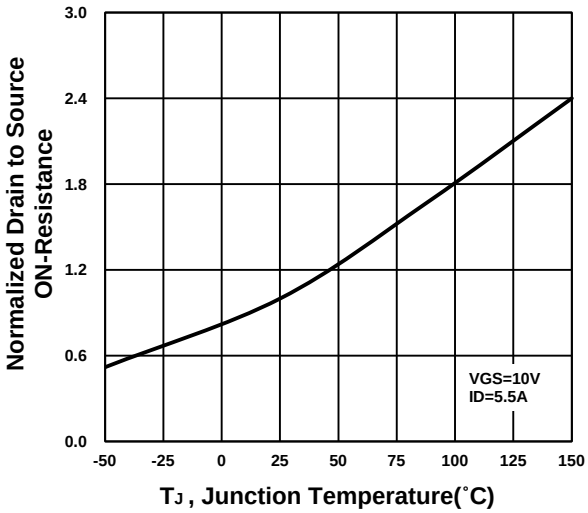
On-Resistance VS Gate-To-Source Voltage



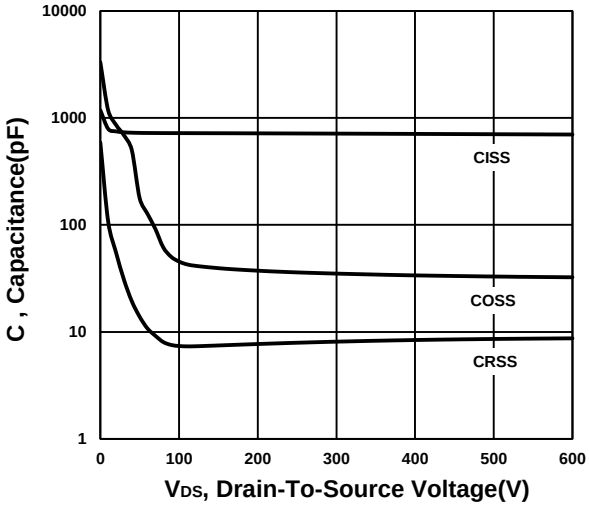
On-Resistance VS Drain Current



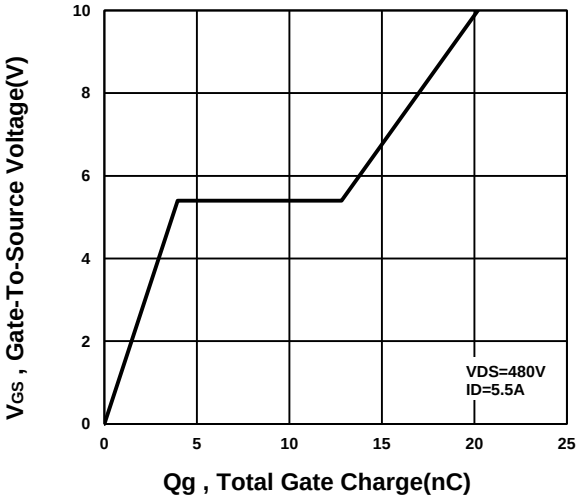
On-Resistance VS Temperature



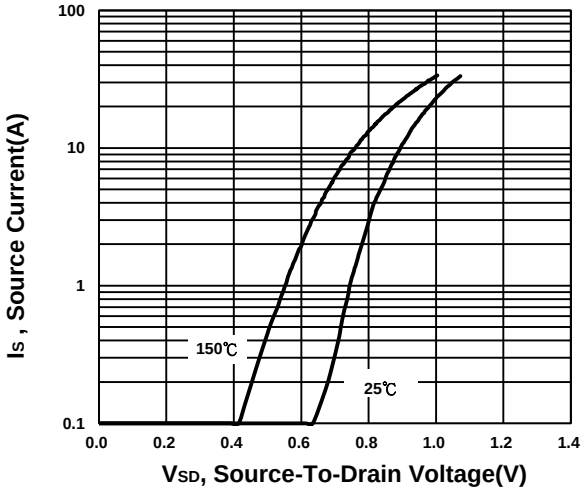
Capacitance Characteristic



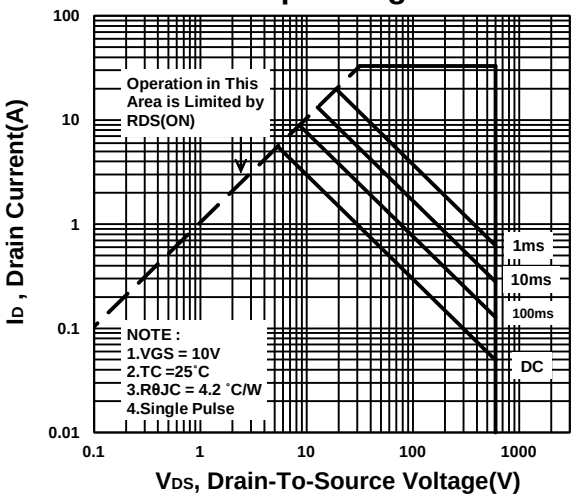
Gate charge Characteristics



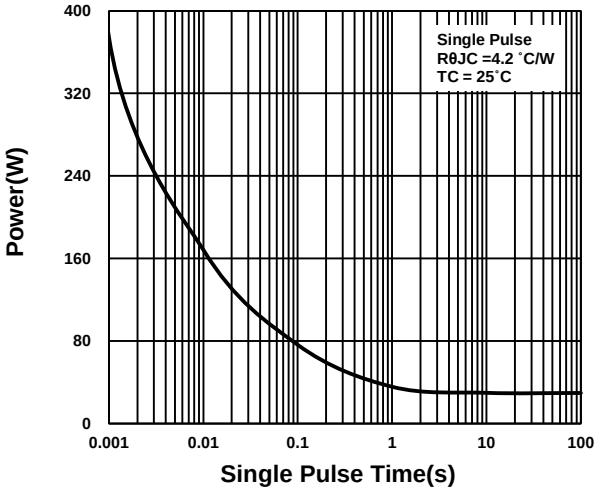
Source-Drain Diode Forward Voltage



Safe Operating Area



Single Pulse Maximum Power Dissipation



Transient Thermal Response Curve