NIKO-SEM

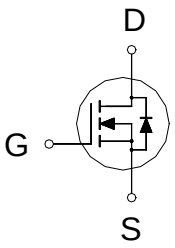
N-Channel Enhancement Mode Field Effect Transistor

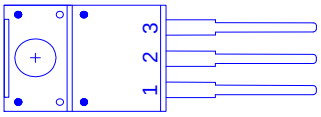
P1610ATF
TO-220F
Halogen-Free & Lead-Free

RoHS Compliant

PRODUCT SUMMARY

$V_{(BR)DSS}$	$R_{DS(ON)}$	I_D
110V	16mΩ	34A





1.GATE
2.DRAIN
3.SOURCE

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

PARAMETERS/TEST CONDITIONS		SYMBOL	LIMITS	UNITS
Gate-Source Voltage		V_{GS}	±20	V
Continuous Drain Current[2]	T_C = 25 °C	I_D	34	A
	T_C = 100 °C		21	
Pulsed Drain Current[1,2]		I_{DM}	120	
Avalanche Current		I_{AS}	12	
Avalanche Energy	L = 1mH	E_{AS}	72	mJ
Power Dissipation	T_C = 25 °C	P_D	48	W
	T_C = 100 °C		19	
Mounting Torque3	Machine Screw		5	Kgf.cm
			0.49	N.m
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	$R_{\theta JC}$		2.6	°C / W
Junction-to-Ambient	$R_{\theta JA}$		62.5	°C / W

[1]Pulse width limited by maximum junction temperature.
[2]Limited only by maximum temperature allowed.
[3]Not suggest using Self-Tapping screw.

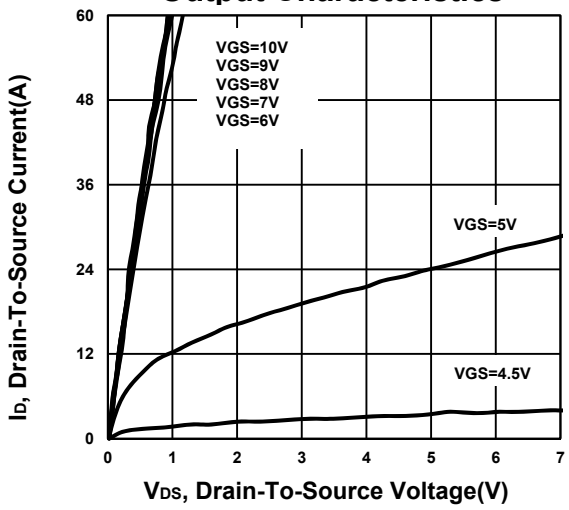
ELECTRICAL CHARACTERISTICS (T_J = 25 °C, Unless Otherwise Noted)

PARAMETER	SYMBOL	TEST CONDITIONS	LIMITS			UNIT
			MIN	TYP	MAX	
STATIC						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS} = 0V, I_D = 250μA	110			V
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250μA	2	3.2	4	
Gate-Body Leakage	I_{GSS}	V_{DS} = 0V, V_{GS} = ±20V			±100	nA

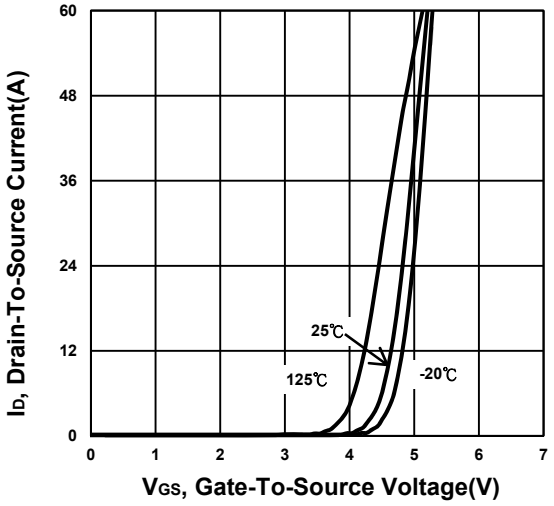
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 88V, V_{GS} = 0V			1	μA
		V_{DS} = 80V, V_{GS} = 0V, T_J = 125 °C			10	
Drain-Source On-State Resistance[1]	$R_{DS(ON)}$	V_{GS} = 7V, I_D = 15A		13.5	21	mΩ
		V_{GS} = 10V, I_D = 20A		12.5	16	
Forward Transconductance[1]	g_{fs}	V_{DS} = 10V, I_D = 20A		80		S
DYNAMIC						
Input Capacitance	C_{iss}	V_{GS} = 0V, V_{DS} = 25V, f = 1MHz		3009		pF
Output Capacitance	C_{oss}			258		
Reverse Transfer Capacitance	C_{rss}			152		
Gate Resistance	R_g	V_{GS} = 0V, V_{DS} = 0V ,f = 1MHz		0.81		Ω
Total Gate Charge[2]	Q_g	V_{DS} = 55V, V_{GS} = 10V, I_D = 20A		57		nC
Gate-Source Charge[2]	Q_{gs}			15.8		
Gate-Drain Charge[2]	Q_{gd}			20		
Turn-On Delay Time[2]	$t_{d(on)}$	V_{DD} = 55V, $I_D \cong$ 20A, V_{GS} = 10V, R_{GEN} = 6Ω		47		nS
Rise Time[2]	t_r			88		
Turn-Off Delay Time[2]	$t_{d(off)}$			86		
Fall Time[2]	t_f			83		
SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS (T_J = 25 °C)						
Continuous Current	I_S				36	A
Forward Voltage[1]	V_{SD}	I_F = 20A,V_{GS} = 0V			1.2	V
Reverse Recovery Time	t_{rr}	I_F = 20A, dI_F/dt = 100A / μS		37		nS
Reverse Recovery Charge	Q_{rr}			50		nC

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

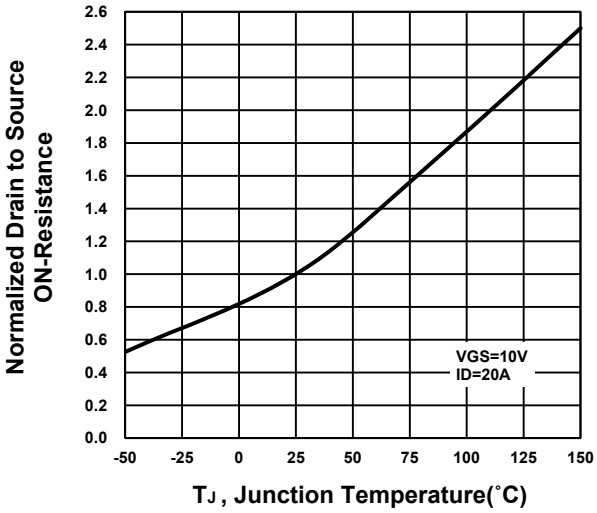
Output Characteristics



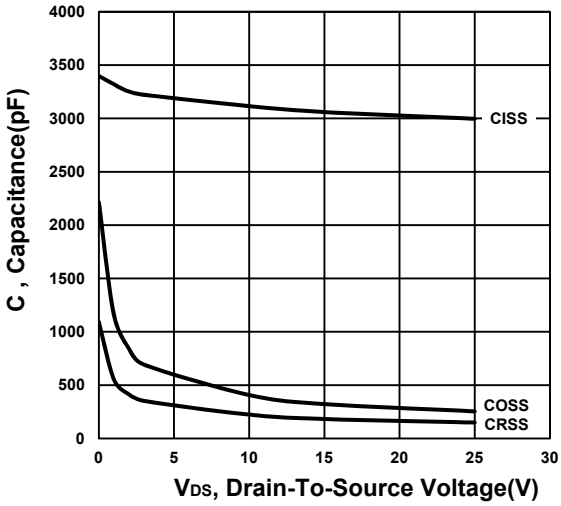
Transfer Characteristics



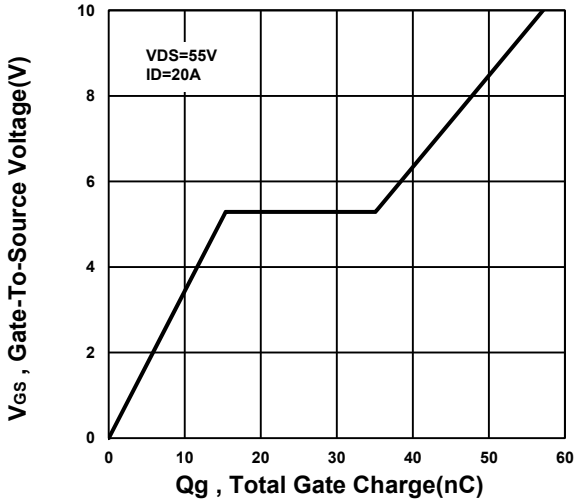
On-Resistance VS Temperature



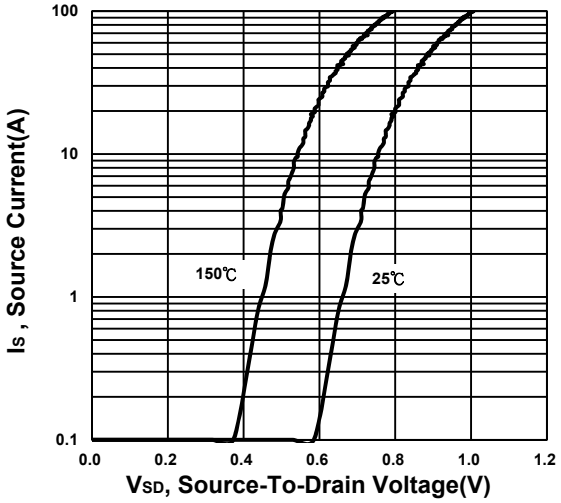
Capacitance Characteristic



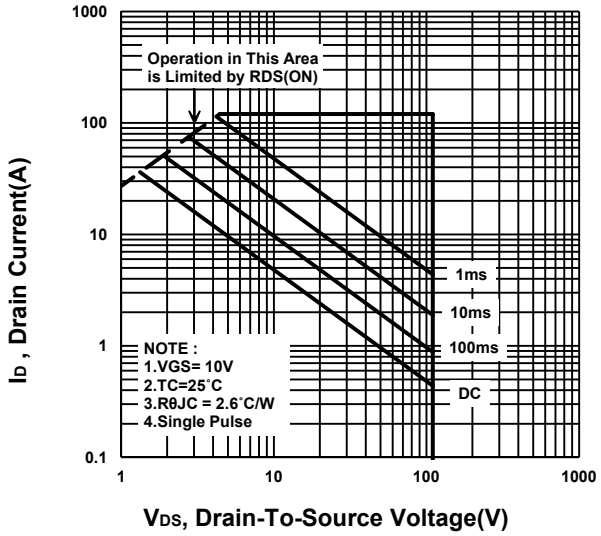
Gate charge Characteristics



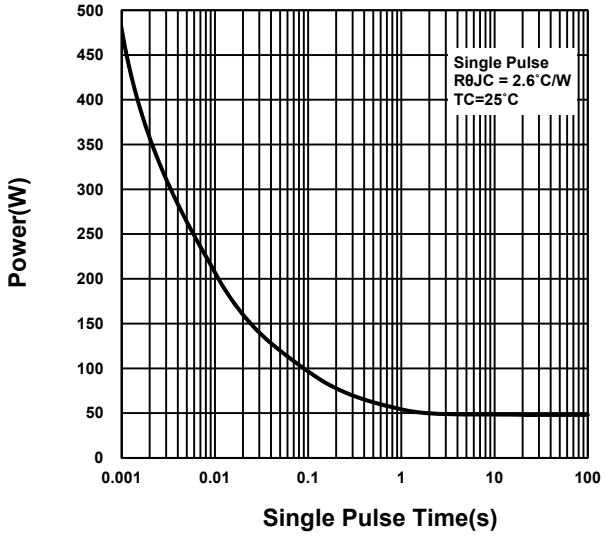
Source-Drain Diode Forward Voltage



Safe Operating Area



Single Pulse Maximum Power Dissipation



Transient Thermal Response Curve