NIKO-SEM

N-Channel Enhancement Mode Field Effect Transistor

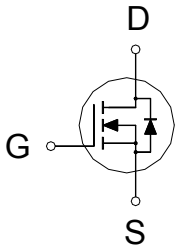
P057AAT

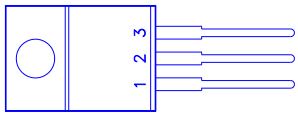
TO-220

Halogen-Free & Lead-Free

PRODUCT SUMMARY

$V_{(BR)DSS}$	$R_{DS(ON)}$	I_D
75	5.8mΩ	129A





1. GATE
2. DRAIN
3. SOURCE

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

PARAMETERS/TEST CONDITIONS		SYMBOL	LIMITS	UNITS
Gate-Source Voltage		V_{GS}	±20	V
Continuous Drain Current[1]	T_C = 25 °C	I_D	129	A
	T_C = 100 °C		82	
Pulsed Drain Current[2]		I_{DM}	410	
Avalanche Current		I_{AS}	60	
Avalanche Energy	L = 0.3mH	E_{AS}	557	mJ
Power Dissipation	T_C = 25 °C	P_D	192	W
	T_C = 100 °C		77	
Operating Junction & Storage Temperature Range		T_j, T_{stg}	-55 to 150	°C
Lead Temperature ($^1/_{16}$" from case for 10 sec.)		T_L	275	

THERMAL RESISTANCE RATINGS

THERMAL RESISTANCE	SYMBOL	TYPICAL	MAXIMUM	UNITS
Junction-to-Case	$R_{\theta JC}$		0.65	°C / W
Junction-to-Ambient	$R_{\theta JA}$		63	

[1]Limited by package.
[2]Pulse width limited by maximum junction temperature.

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

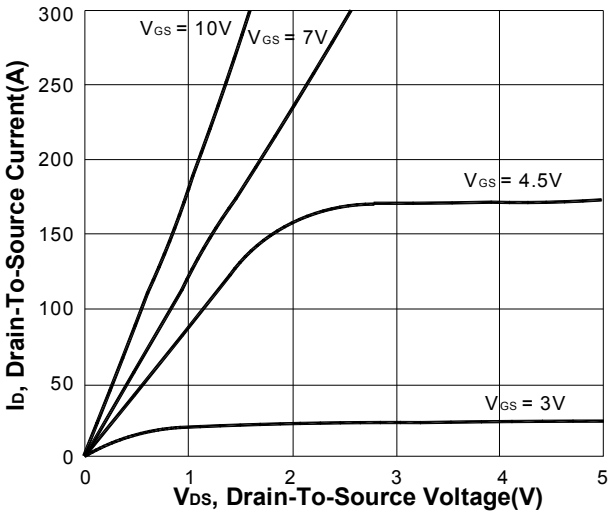
PARAMETER	SYMBOL	TEST CONDITIONS	LIMITS			UNIT
			MIN	TYP	MAX	
STATIC						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS} = 0V, I_D = 250μA	75			V
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250μA	2	2.5	4	
Gate-Body Leakage	I_{GSS}	V_{DS} = 0V, V_{GS} = ±20V			±250	nA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 60V, V_{GS} = 0V			1	μA
		V_{DS} = 60V, V_{GS} = 0V, T_J = 125 °C			10	
On-State Drain Current[1]	$I_{D(ON)}$	V_{DS} = 10V, V_{GS} = 10V	129			A

Drain-Source On-State Resistance[1]	$R_{DS(ON)}$	V_{GS} = 10V, I_D = 100A		4.7	5.8	mΩ
Forward Transconductance[1]	g_{fs}	V_{DS} = 25V, I_D = 50A			100	S
DYNAMIC						
Input Capacitance	C_{iss}	V_{GS} = 0V, V_{DS} = 25V, f = 1MHz		12500		pF
Output Capacitance	C_{oss}			1090		
Reverse Transfer Capacitance	C_{rss}			629		
Gate Resistance	Rg	V_{GS} = 0mV, V_{DS} = 0V, f = 1MHz		3.8	4	Ω
Total Gate Charge[2]	Q_g	V_{DS} =60V, V_{GS} = 10V, I_D = 80A		223		nC
Gate-Source Charge[2]	Q_{gs}			64		
Gate-Drain Charge[2]	Q_{gd}			80		
Turn-On Delay Time[2]	$t_{d(on)}$	V_{DD} = 40V, $I_D \cong$ 40A, V_{GS} = 10V, R_{GS} = 2.5Ω		40		nS
Rise Time[2]	t_r			60		
Turn-Off Delay Time[2]	$t_{d(off)}$			130		
Fall Time[2]	t_f			50		
SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS (T_C = 25 °C)						
Continuous Current[3]	I_S				129	A
Forward Voltage[1]	V_{SD}	I_F = 100A, V_{GS} = 0V			1.3	V
Reverse Recovery Time	t_{rr}			90		nS
Reverse Recovery Charge	Q_{rr}			260		nC

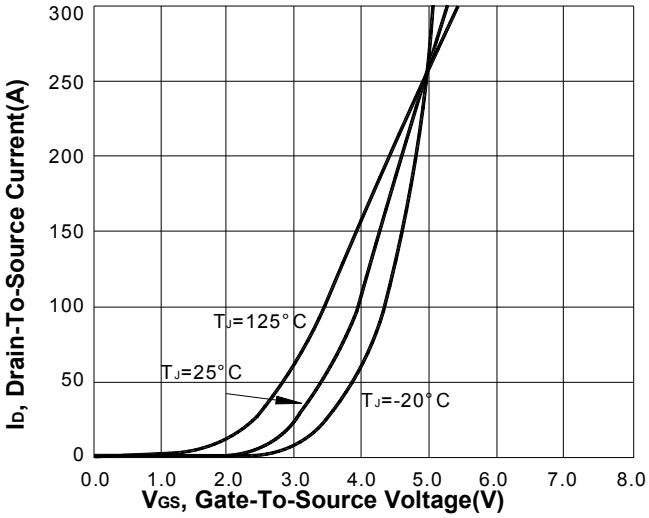
[1]Pulse test : Pulse Width ≤ 300 μsec, Duty Cycle ≤ 2%.
[2]Independent of operating temperature.
[3]Limited by package.

REMARK: THE PRODUCT MARKED WITH "P057AAT", DATE CODE or LOT #

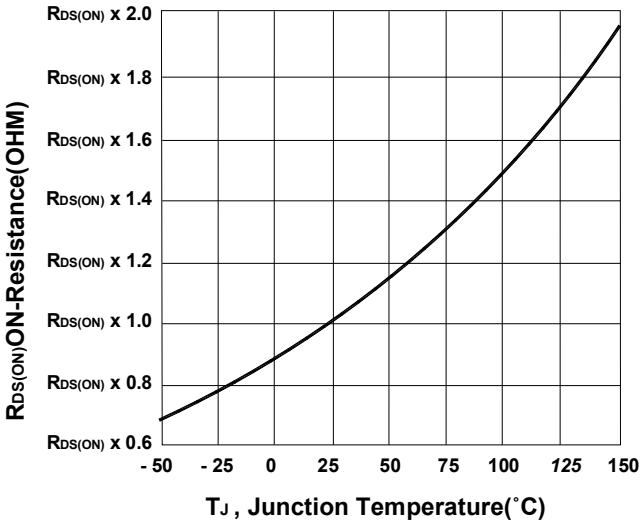
Output Characteristics



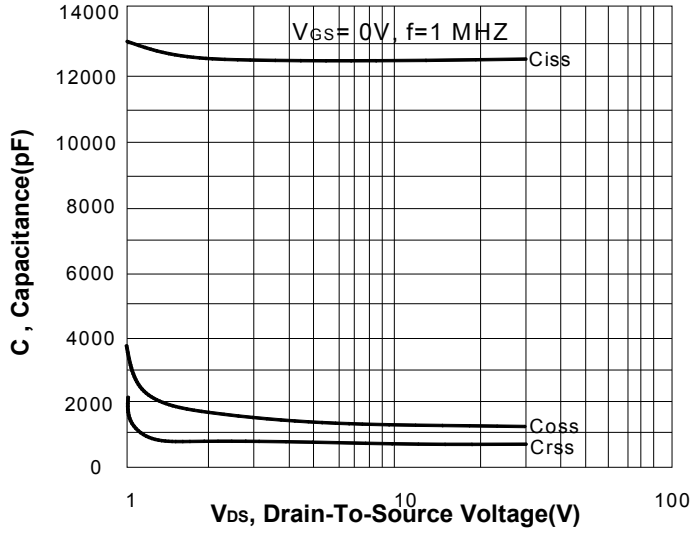
Transfer Characteristics



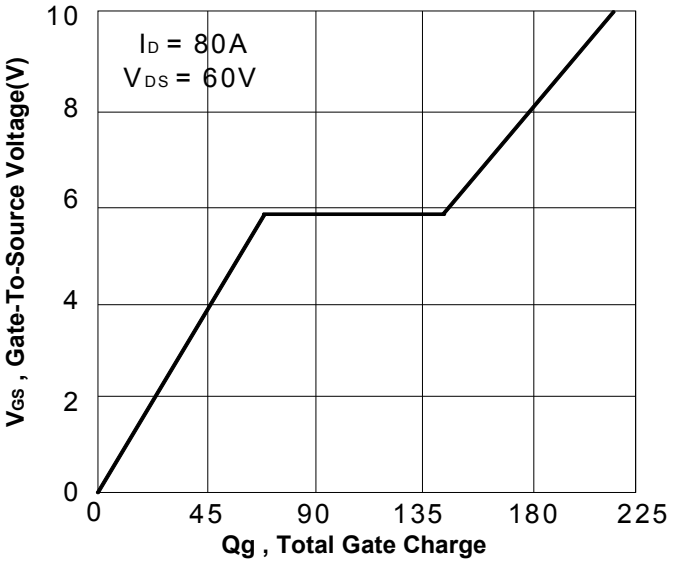
On-Resistance VS Temperature



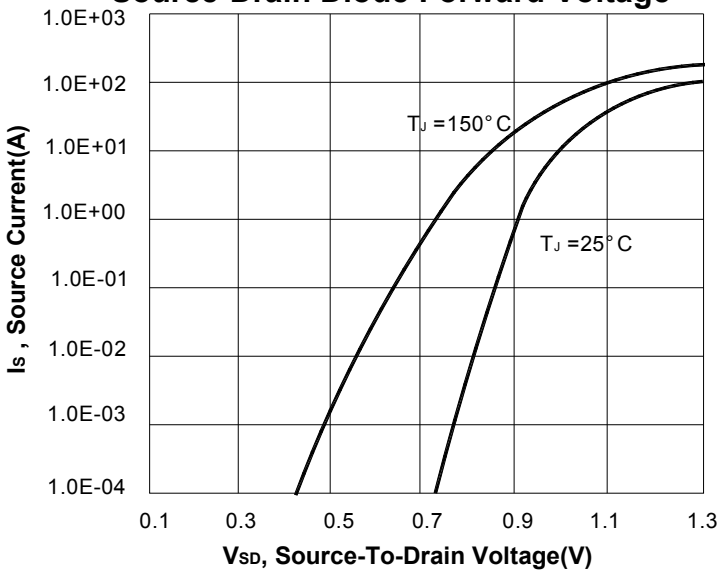
Capacitance Characteristic



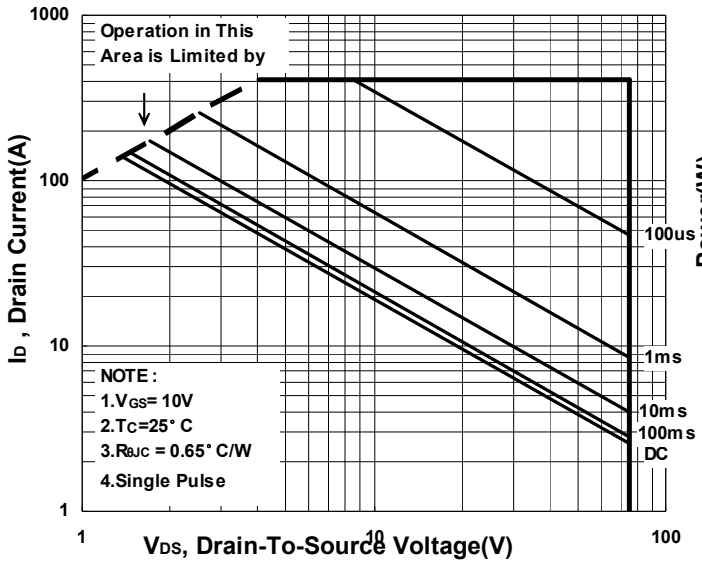
Gate charge Characteristics



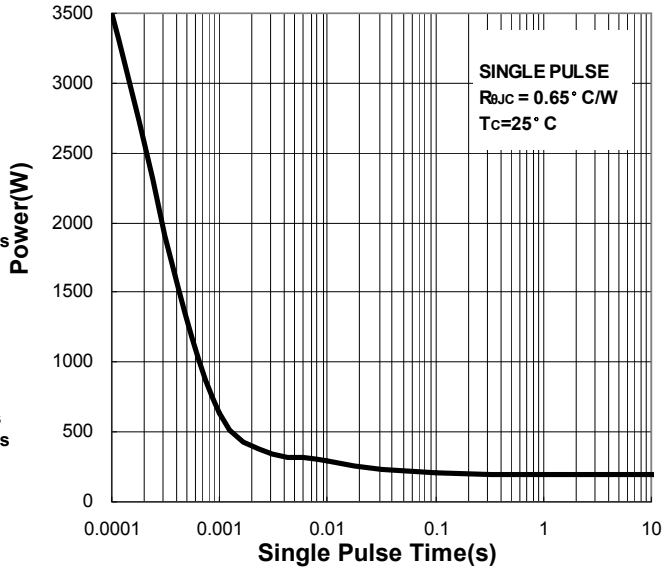
Source-Drain Diode Forward Voltage



Safe Operating Area



Single Pulse Maximum Power Dissipation



Transient Thermal Response Curve