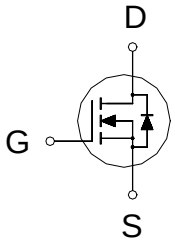
NIKO-SEM

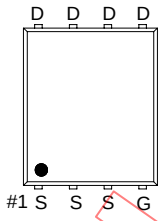
N-Channel Enhancement Mode Field Effect Transistor

P0403BK
NPAK SOP-8
Lead-Free

PRODUCT SUMMARY

$V_{(BR)DSS}$	$R_{DS(ON)}$	I_D
30	4.0mΩ	35A





G : GATE
D : DRAIN
S : SOURCE

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

PARAMETERS/TEST CONDITIONS		SYMBOL	LIMITS	UNITS
Drain-Source Voltage		V_{DS}	30	V
Gate-Source Voltage		V_{GS}	±20	V
Continuous Drain Current	T_C = 25 °C	I_D	35	A
	T_C = 70 °C		26	
Pulsed Drain Current[1]		I_{DM}	50	
Avalanche Current		I_{AR}	25	
Avalanche Energy	L = 0.1mH	E_{AS}	31.5	mJ
Repetitive Avalanche Energy[2]	L = 0.05mH	E_{AR}	1.0	
Power Dissipation	T_C = 25 °C	P_D	4.0	W
	T_C = 70 °C		2.5	
Junction & Storage Temperature Range		T_j, T_{stg}	-55 to 150	°C

THERMAL RESISTANCE RATINGS

THERMAL RESISTANCE	SYMBOL	TYPICAL	MAXIMUM	UNITS
Junction-to-Ambient	$R_{\theta JA}$		31	°C / W

[1]Pulse width limited by maximum junction temperature.
[2]Duty cycle ≤ 1%

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

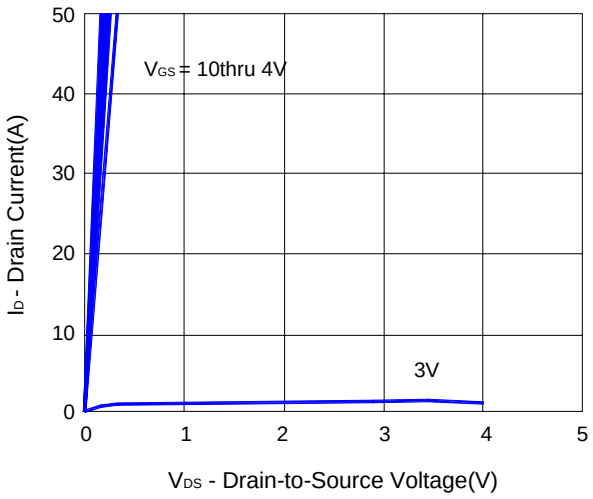
PARAMETER	SYMBOL	TEST CONDITIONS	LIMITS MIN	LIMITS TYP	LIMITS MAX	UNIT
STATIC						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS} = 0V, I_D = 250μA	30			V
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250μA	1	1.5	3.0	
Gate-Body Leakage	I_{GSS}	V_{DS} = 0V, V_{GS} = ±20V			±100	nA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 24V, V_{GS} = 0V			1	μA
		V_{DS} = 20V, V_{GS} = 0V, T_J = 55 °C			10	
Drain-Source On-State Resistance[1]	$R_{DS(ON)}$	V_{GS} = 5.0V, I_D = 22A		5.0	6.8	mΩ
		V_{GS} = 10V, I_D = 27A		3.5	4.0	
Forward Transconductance[1]	g_{fs}	V_{DS} = 15V, I_D = 27A		85		S

DYNAMIC						
Input Capacitance	C_{iss}	V_{GS} = 0V, V_{DS} = 15V, f = 1MHz		5640		pF
Output Capacitance	C_{oss}			1290		
Reverse Transfer Capacitance	C_{rss}			435		
Total Gate Charge[2]	Q_g	V_{DS} = 0.5$V_{(BR)DSS}$, V_{GS} = 10V, I_D = 27A		42	60	nC
Gate-Source Charge[2]	Q_{gs}			17		
Gate-Drain Charge[2]	Q_{gd}			15		
Turn-On Delay Time[2]	$t_{d(on)}$	V_{DS} = 15V , R_L = 15Ω, $I_D \cong$ 1A, V_{GS} = 10V, R_{GEN} = 6Ω		33		nS
Rise Time[2]	t_r			51		
Turn-Off Delay Time[2]	$t_{d(off)}$			125		
Fall Time[2]	t_f			34		
SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS (T_C = 25 °C)						
Continuous Current	I_S				6	A
Pulsed Current[3]	I_{SM}				12	
Forward Voltage[1]	V_{SD}	$I_F = I_S$, V_{GS} = 0V			1.1	V
Reverse Recovery Time	t_{rr}	I_F = 3A, dI_F/dt = 100A / µS		60	95	nS

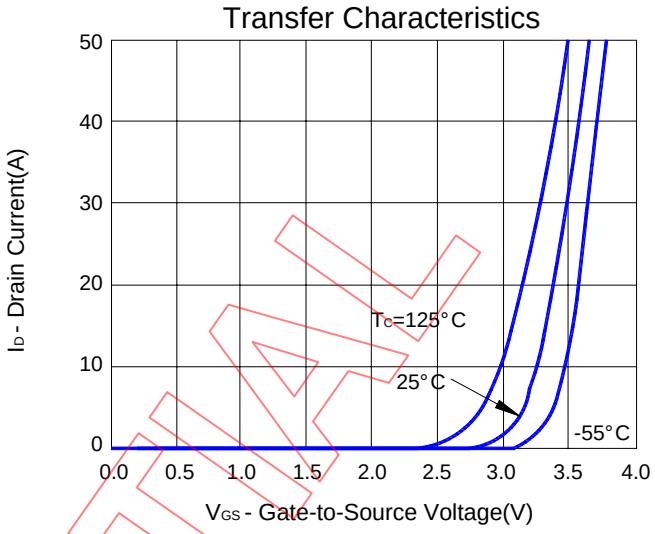
[1]Pulse test : Pulse Width ≤ 300 µsec, Duty Cycle ≤ 2%.
[2]Independent of operating temperature.
[3]Pulse width limited by maximum junction temperature.

REMARK: THE PRODUCT MARKED WITH "P0403BK", DATE CODE or LOT #

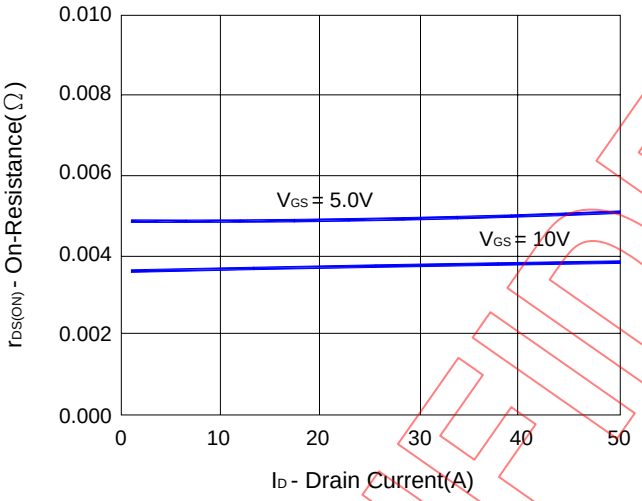
Output Characteristics



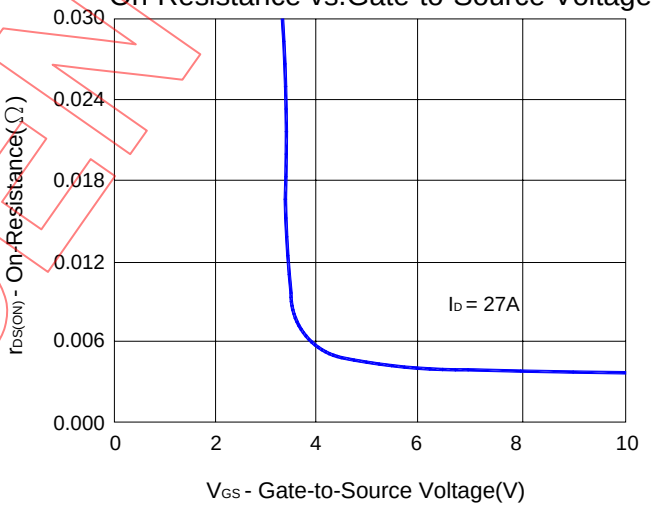
Transfer Characteristics



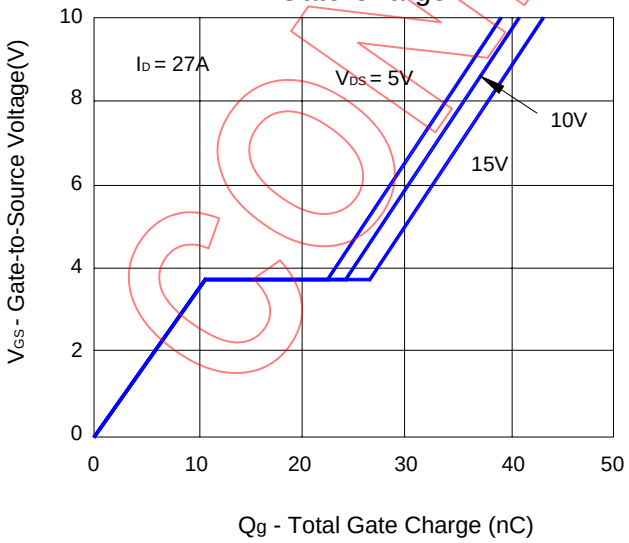
On-Resistance vs.Drain Current



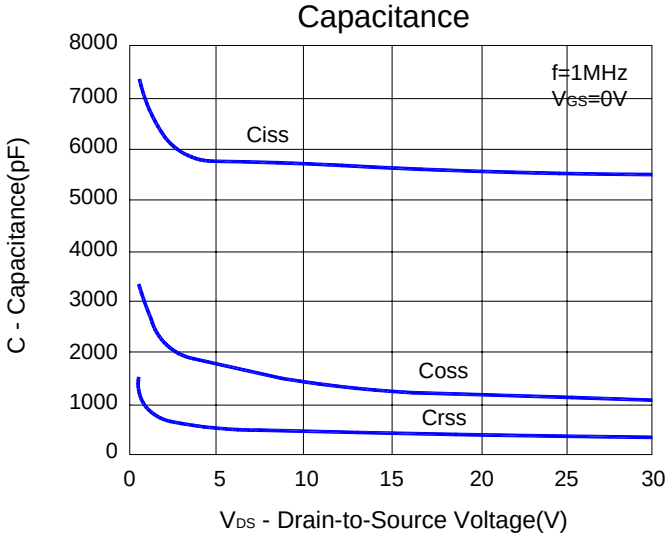
On-Resistance vs.Gate-to-Source Voltage



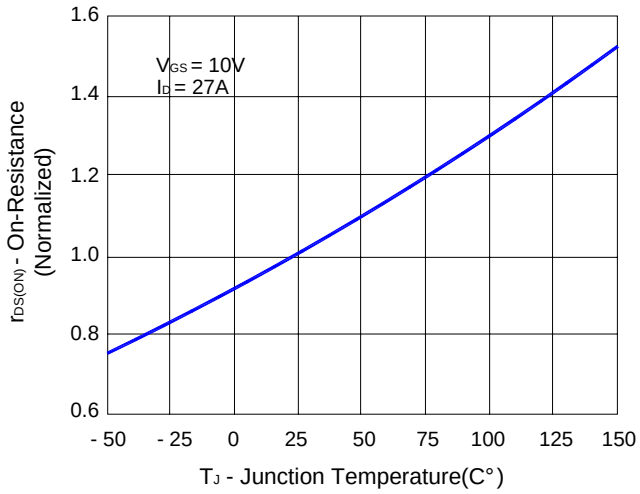
Gate Charge



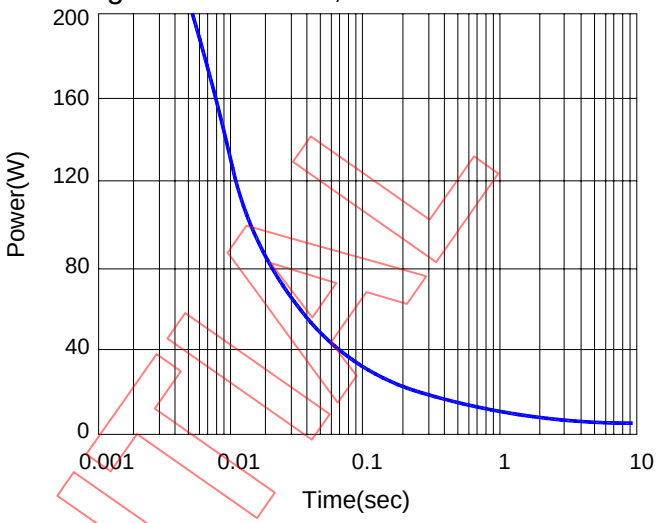
Capacitance



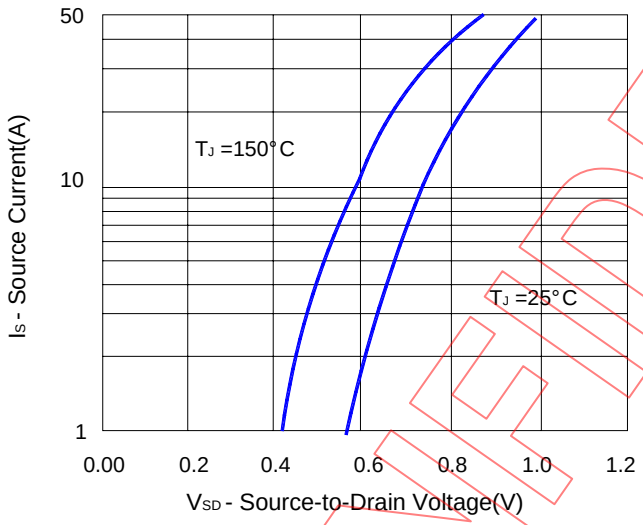
On-Resistance vs. Junction Temperature



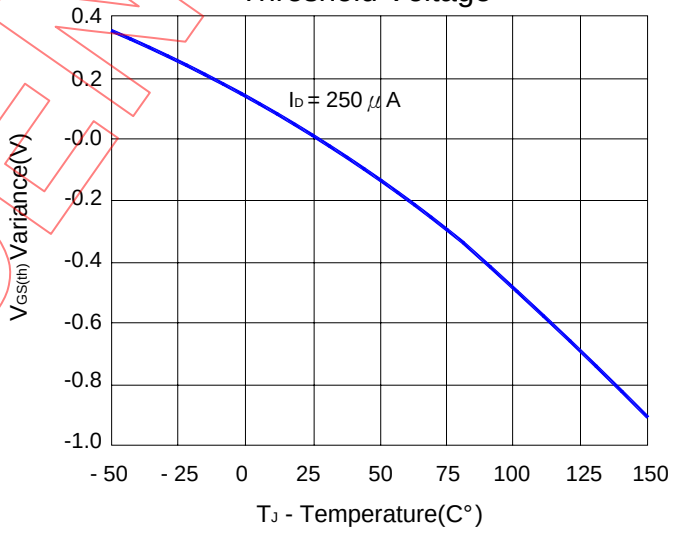
Single Pulse Power, Junction-to-Ambient



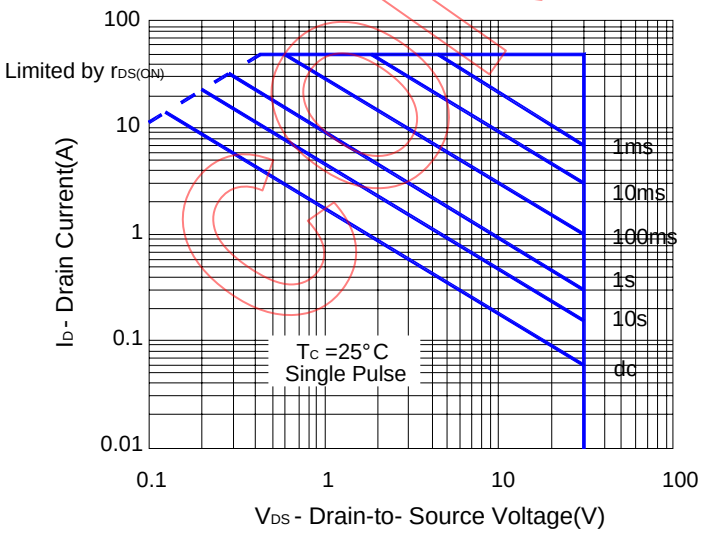
Source - Drain Diode Forward Voltage

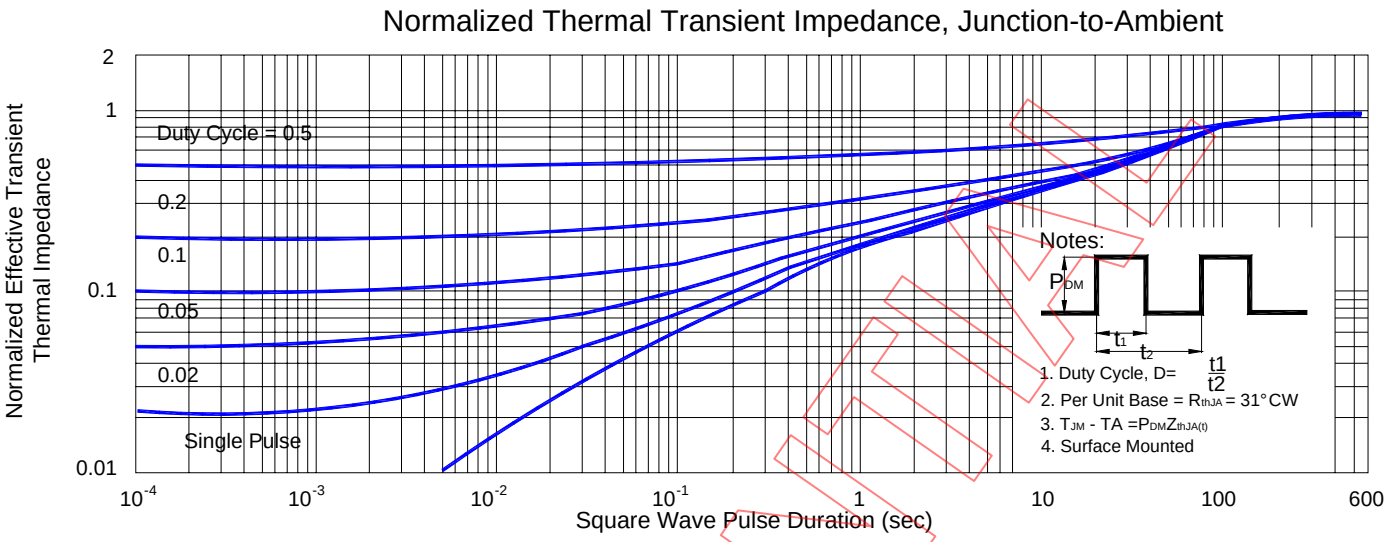


Threshold Voltage



Safe Operating Area, Junction-to-Case





NPAK SOP-8 MECHANICAL DATA

Dimension	mm			Dimension	mm		
	Min.	Typ.	Max.		Min.	Typ.	Max.
A	4.8	4.9	5.0	H	3.67	3.87	4.02
B	5.7	5.75	5.8	I	0.41	0.51	0.61
C	5.9	6.0	6.1	J	3.38	3.58	3.78
D	0.33	0.41	0.51	K	1.1		
E		1.27		L	0.51	0.61	0.71
F	0.9	1.0	1.1	M	0°		12°
G	0.2	0.25	0.3	N