NIKO-SEM

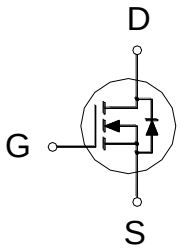
N-Channel Enhancement Mode Field Effect Transistor

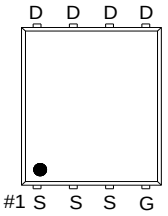
PP1410AK
PDFN 5x6P
Halogen-Free & Lead-Free

RoHS Compliant

PRODUCT SUMMARY

$V_{(BR)DSS}$	$R_{DS(ON)}$	I_D
100V	14mΩ	49A





G. GATE
D. DRAIN
S. SOURCE

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

PARAMETERS/TEST CONDITIONS		SYMBOL	LIMITS	UNITS
Drain-Source Voltage		V_{DS}	100	V
Gate-Source Voltage		V_{GS}	±20	V
Continuous Drain Current	T_C = 25 °C	I_D	49	A
	T_C = 100 °C		35	
Pulsed Drain Current[1]		I_{DM}	78	
Continuous Drain Current	T_A = 25 °C	I_D	9.6	
	T_A = 70 °C		8	
Avalanche Current		I_{AS}	12.7	
Avalanche Energy	L = 1mH	E_{AS}	80.6	mJ
Power Dissipation	T_C = 25 °C	P_D	78	W
	T_C = 100 °C		39	
Power Dissipation[3]	T_A = 25 °C	P_D	3	W
	T_A = 70 °C		2.1	
Operating Junction & Storage Temperature Range		T_j, T_{stg}	-55 to 175	°C

THERMAL RESISTANCE RATINGS

THERMAL RESISTANCE		SYMBOL	TYPICAL	MAXIMUM	UNITS
Junction-to-Ambient[2]	t ≦10s	$R_{\theta JA}$		50	°C / W
Junction-to-Ambient[2]	Steady-State	$R_{\theta JA}$		72	
Junction-to-Case	Steady-State	$R_{\theta JC}$		1.9	

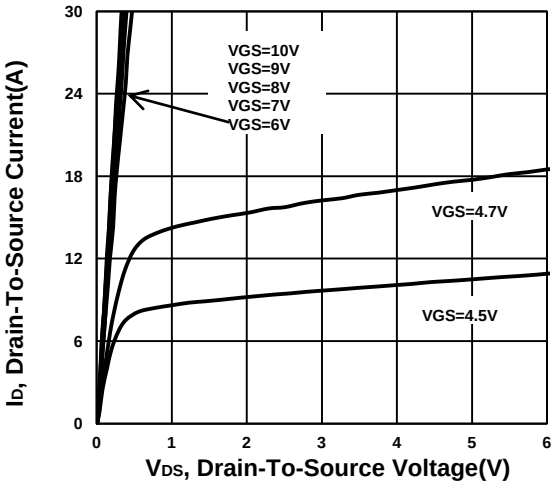
[1]Pulse width limited by maximum junction temperature.
[2]The value of $R_{\theta JA}$ is measured with the device mounted on 1in^2 FR-4 board with 2oz. Copper, in a still air environment with T_A =25°C.
[3]The Power dissipation is based on $R_{\theta JA}$ t ≦10s value.

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

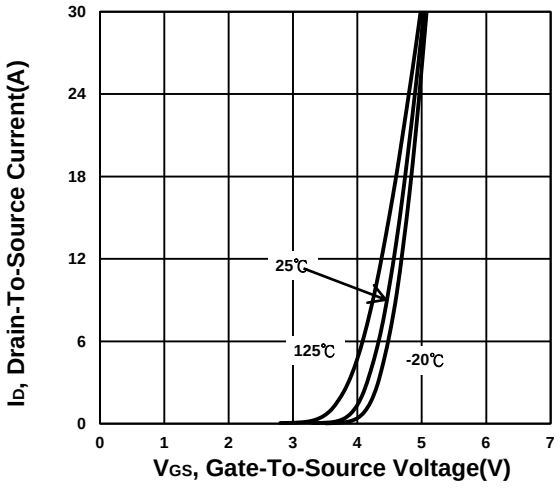
PARAMETER	SYMBOL	TEST CONDITIONS	LIMITS MIN	LIMITS TYP	LIMITS MAX	UNIT
STATIC						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS} = 0V, I_D = 250μA	100			V
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250μA	2	3	4	V
Gate-Body Leakage	I_{GSS}	V_{DS} = 0V, V_{GS} = ±20V			±100	nA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} =100V, V_{GS} = 0V			1	μA
		V_{DS} = 100V, V_{GS} = 0V, T_J = 55 °C			10	μA
Drain-Source On-State Resistance[1]	$R_{DS(ON)}$	V_{GS} = 10V, I_D = 20A		10.5	14	mΩ
Forward Transconductance[1]	g_{fs}	V_{DS} = 5V, I_D = 4A		16.8		S
DYNAMIC[3]						
Input Capacitance	C_{iss}	V_{GS} = 0V, V_{DS} = 50V, f = 1MHz	1190	1488	1785	pF
Output Capacitance	C_{oss}		215	269	322	pF
Reverse Transfer Capacitance	C_{rss}		6	10	14	pF
Gate Resistance	R_g	V_{GS} = 0V, V_{DS} = 0V, f = 1MHz	0.3	0.6	0.9	Ω
Total Gate Charge[2]	Q_g	V_{DS} = 50V , V_{GS} = 10V, I_D = 20A	20	25	30	nC
Gate-Source Charge[2]	Q_{gs}		4.6	5.7	7	nC
Gate-Drain Charge[2]	Q_{gd}		4.7	7.8	11	nC
Turn-On Delay Time[2]	$t_{d(on)}$	V_{DS} = 50V , I_D ≅ 20A, V_{GS} = 10V, R_{GEN} =6Ω		13		nS
Rise Time[2]	t_r			23		nS
Turn-Off Delay Time[2]	$t_{d(off)}$			26		nS
Fall Time[2]	t_f			27		nS
SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS[3] (T_J = 25 °C)						
Continuous Current	I_S				49	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	22	44	66	nS
Reverse Recovery Charge	Q_{rr}		25	51	76	nC

[1]Pulse test : Pulse Width ≤ 300 μsec, Duty Cycle ≤ 2%.
[2]Independent of operating temperature.
[3]Guaranteed by design, not subject to production testing.

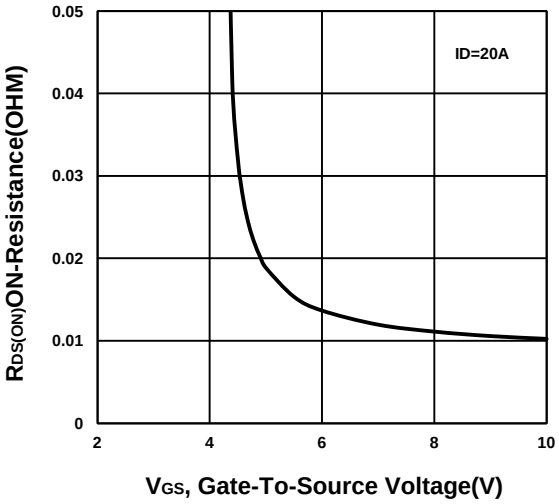
Output Characteristics



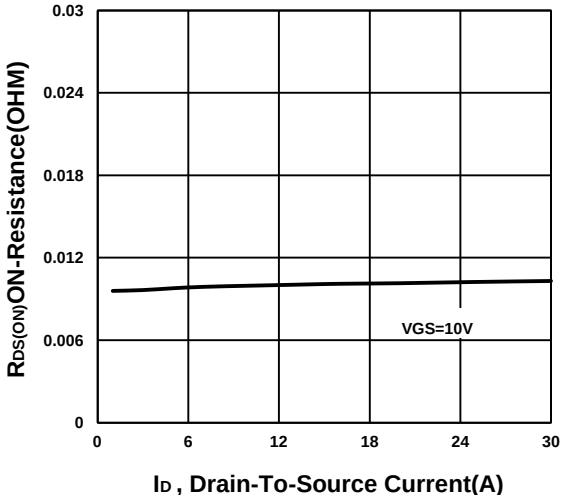
Transfer Characteristics



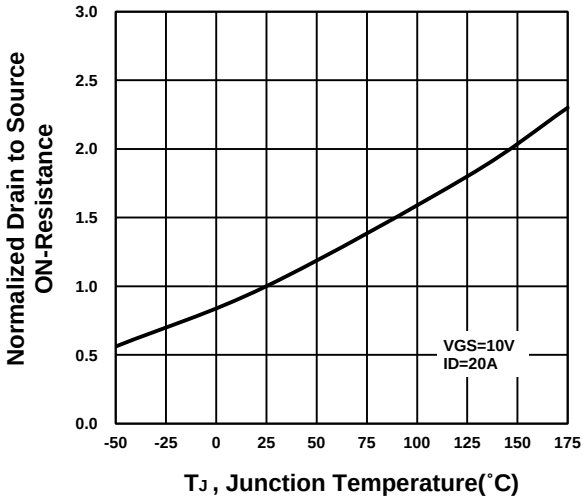
On-Resistance VS Gate-To-Source Voltage



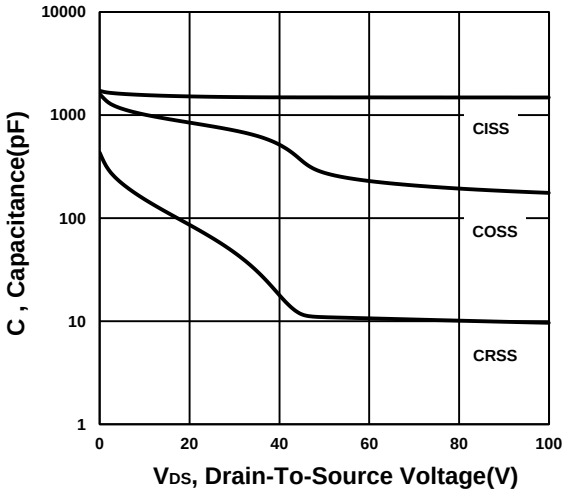
On-Resistance VS Drain Current



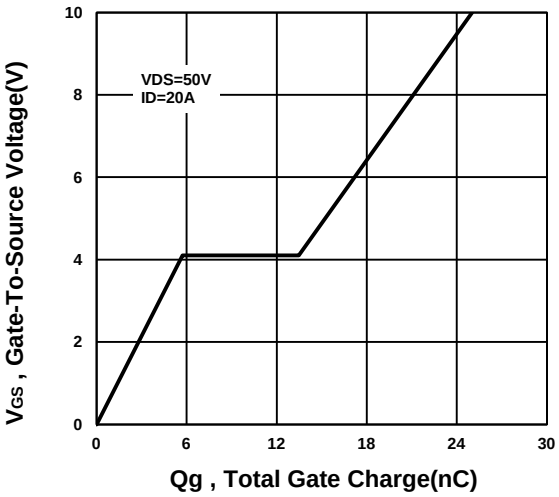
On-Resistance VS Temperature



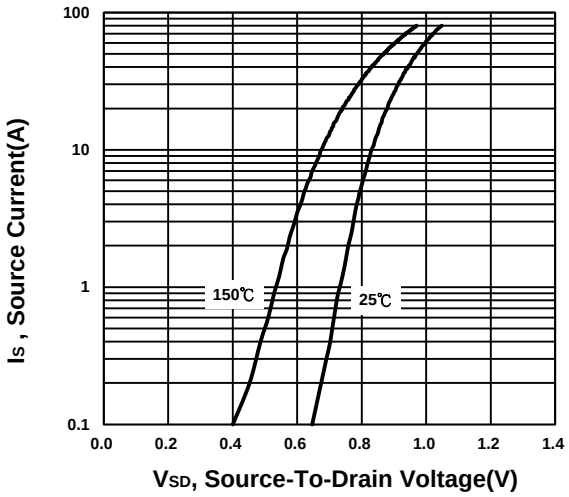
Capacitance Characteristic



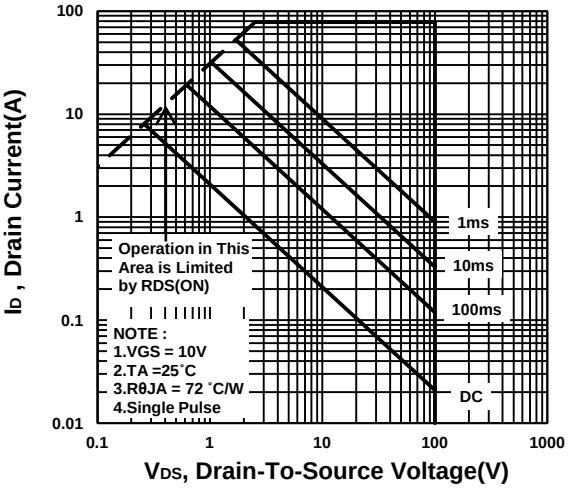
Gate charge Characteristics



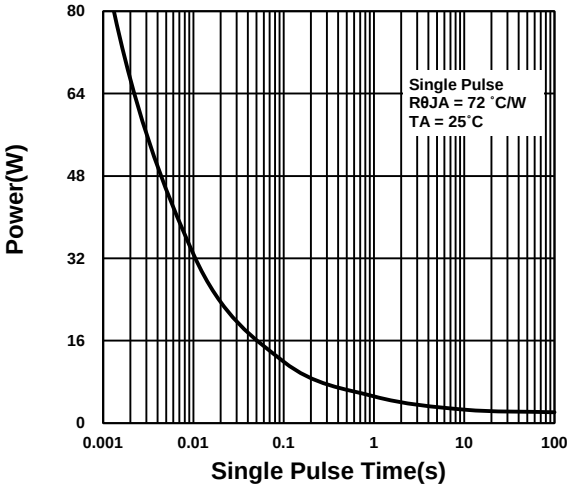
Source-Drain Diode Forward Voltage



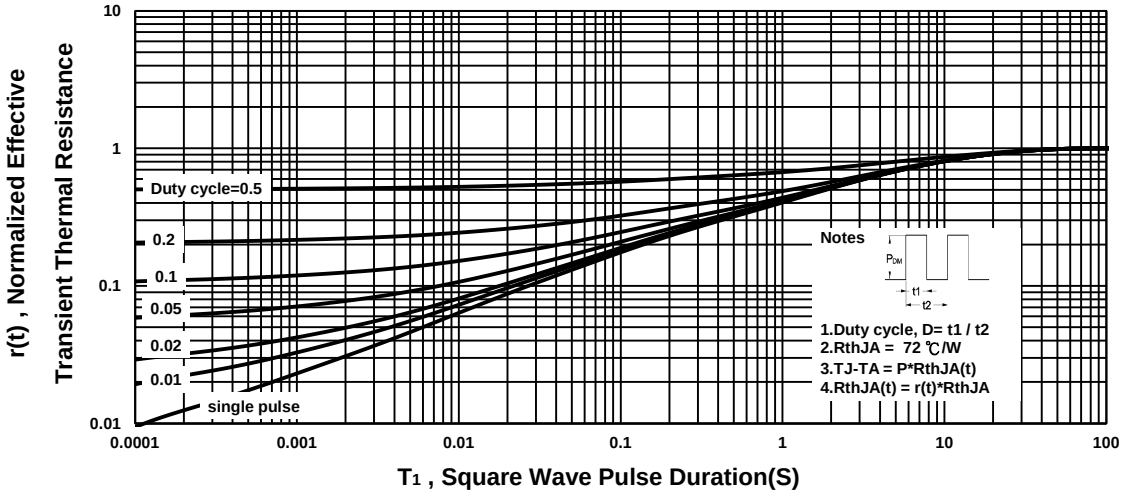
Safe Operating Area



Single Pulse Maximum Power Dissipation



Transient Thermal Response Curve



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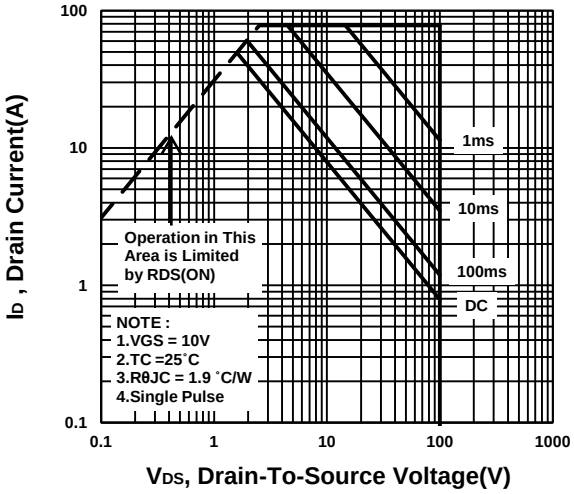

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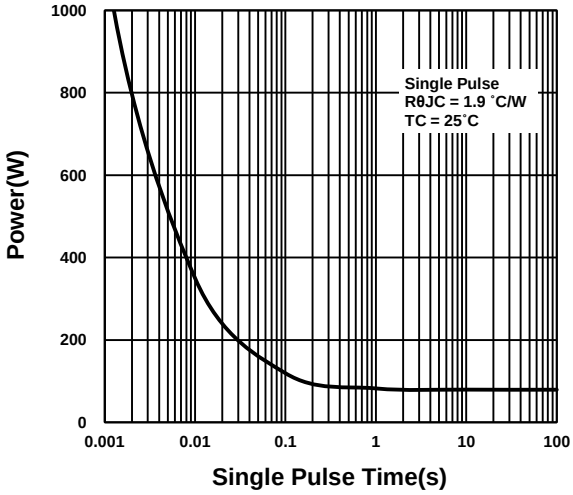
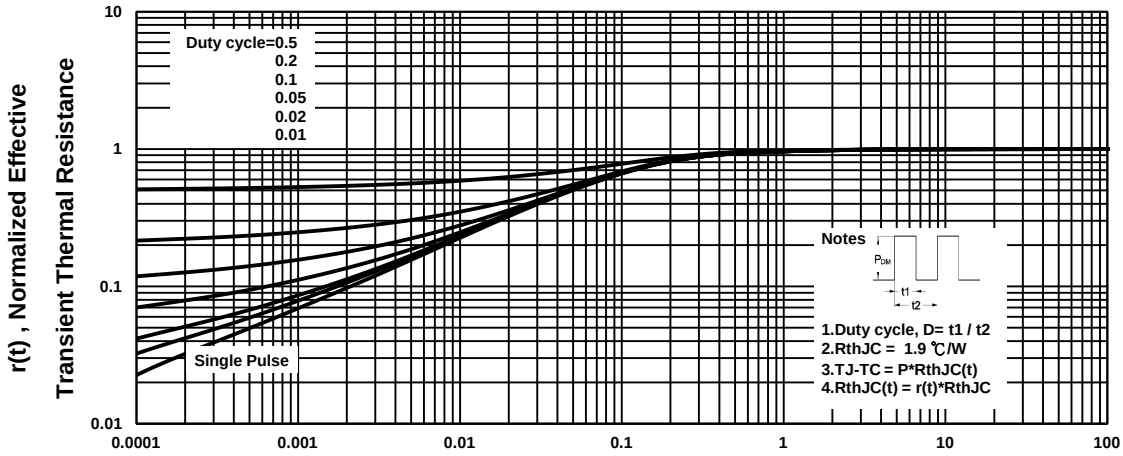
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