NIKO-SEM

N-Channel Enhancement Mode Field Effect Transistor

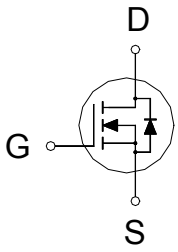
PA610AD

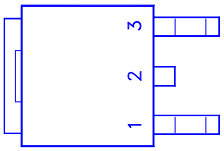
TO-252

Halogen-Free & Lead-Free

PRODUCT SUMMARY

$V_{(BR)DSS}$	$R_{DS(ON)}$	I_D
100	160mΩ	12A





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	T_C = 25 °C	I_D	12	A
	T_C = 100 °C		7	
Pulsed Drain Current[1]		I_{DM}	40	
Avalanche Current		I_{As}	24	
Avalanche Energy	L = 0.1mH	E_{AS}	29	mJ
Power Dissipation	T_C = 25 °C	P_D	42	W
	T_C = 100 °C		17	
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	$R_{\theta JC}$		3	°C / W
Junction-to-Ambient	$R_{\theta JA}$		62.5	

[1]Pulse width limited by maximum junction temperature.

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

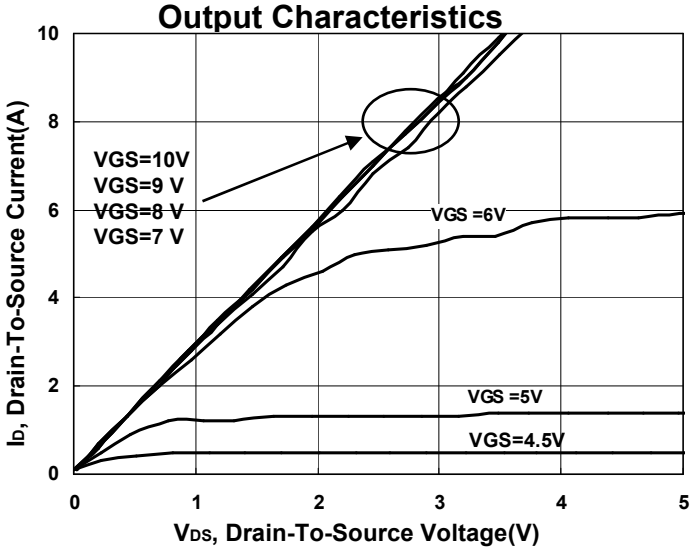
PARAMETER	SYMBOL	TEST CONDITIONS	LIMITS			UNIT
			MIN	TYP	MAX	
STATIC						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS} = 0V, I_D = 250μA	100			V
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250μA	2.0	3.2	4.0	
Gate-Body Leakage	I_{GSS}	V_{DS} = 0V, V_{GS} = ±20V			±250	nA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 80V, V_{GS} = 0V			1	μA
		V_{DS} = 66V, V_{GS} = 0V, T_J = 125 °C			10	
On-State Drain Current[1]	$I_{D(ON)}$	V_{DS} = 10V, V_{GS} = 10V	40			A
Drain-Source On-State Resistance[1]	$R_{DS(ON)}$	VGS = 10V, ID = 5.5A		145	160	mΩ
Forward Transconductance[1]	g_{fs}	V_{DS} = 10V, I_D = 5.5A		2		S

DYNAMIC						
Input Capacitance	C_{iss}	V_{GS} = 0V, V_{DS} = 25V, f = 1MHz		1060		pF
Output Capacitance	C_{oss}			124		
Reverse Transfer Capacitance	C_{rss}			64		
Total Gate Charge[2]	Q_g	V_{DS} =50V, V_{GS} = 10V, I_D = 5.5A		18		nC
Gate-Source Charge[2]	Q_{gs}			5		
Gate-Drain Charge[2]	Q_{gd}			6		
Turn-On Delay Time[2]	$t_{d(on)}$	V_{DD} = 50V, $I_D \cong$ 5.5A, V_{GS} = 10V, R_{GS} = 25Ω		10		nS
Rise Time[2]	t_r			40		
Turn-Off Delay Time[2]	$t_{d(off)}$			30		
Fall Time[2]	t_f			28		
SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS (T_J = 25 °C)						
Continuous Current	I_S				12	A
Forward Voltage[1]	V_{SD}	I_F = 5.5A, V_{GS} = 0V			1.2	V
Reverse Recovery Time	t_{rr}	I_F = 5.5A, dI_F/dt = 100A / μS		92		nS
Reverse Recovery Charge	Q_{rr}			280		nC

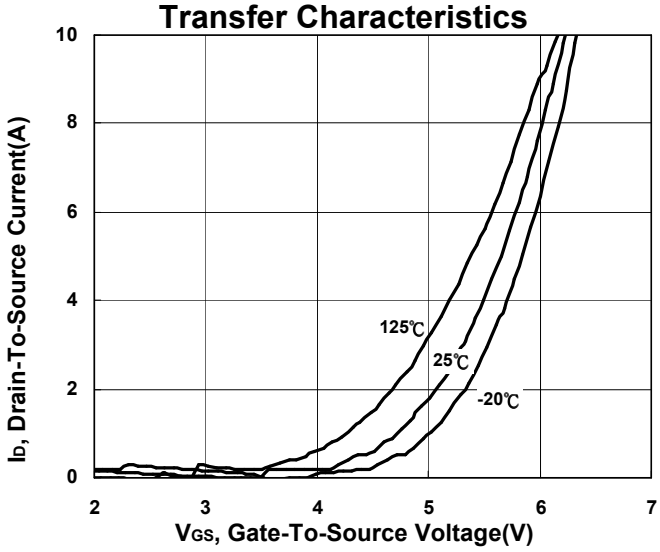
[1]Pulse test : Pulse Width ≤ 300 μsec, Duty Cycle ≤ 2%.
[2]Independent of operating temperature.

REMARK: THE PRODUCT MARKED WITH "PA610AD", DATE CODE or LOT #

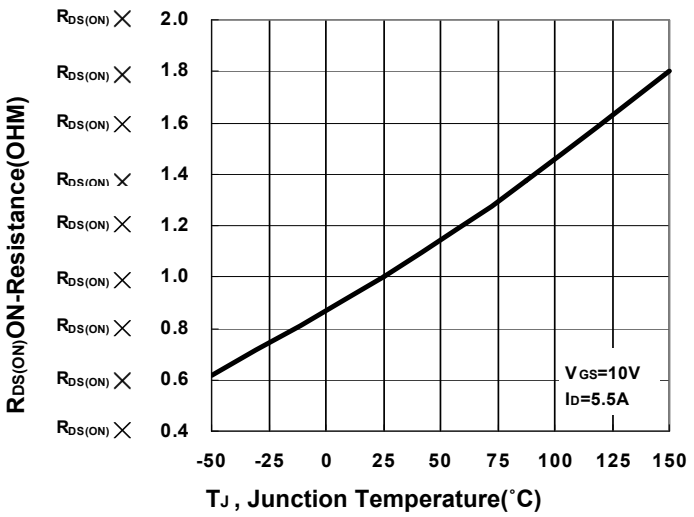
Output Characteristics



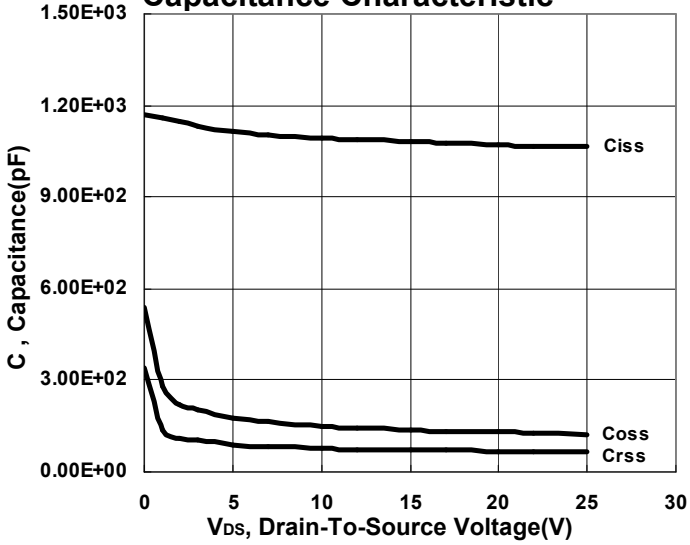
Transfer Characteristics



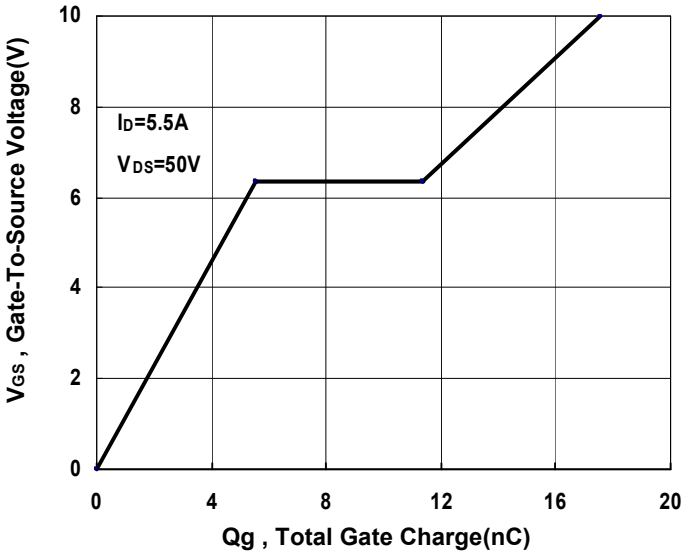
On-Resistance VS Temperature



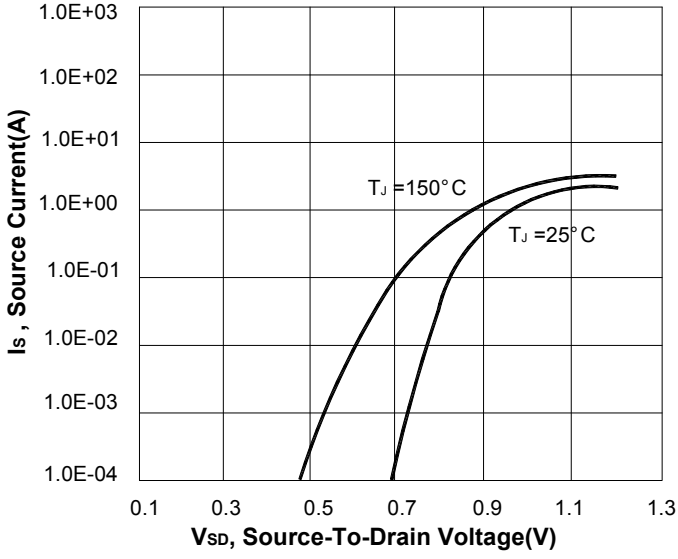
Capacitance Characteristic



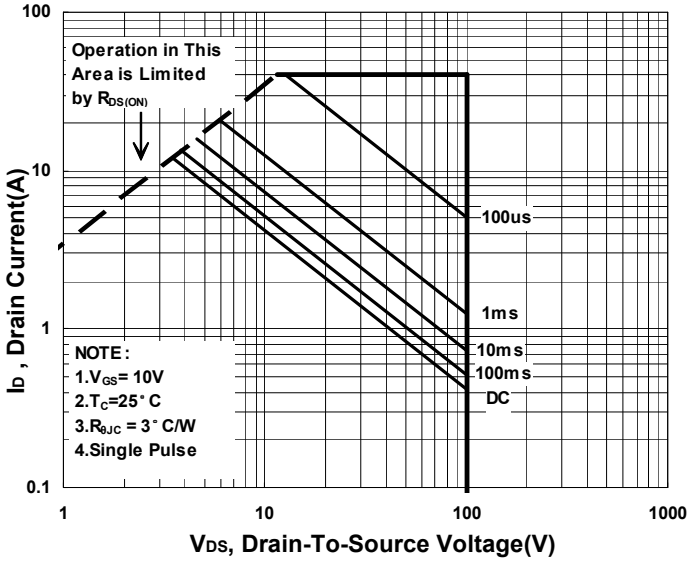
Gate charge Characteristics



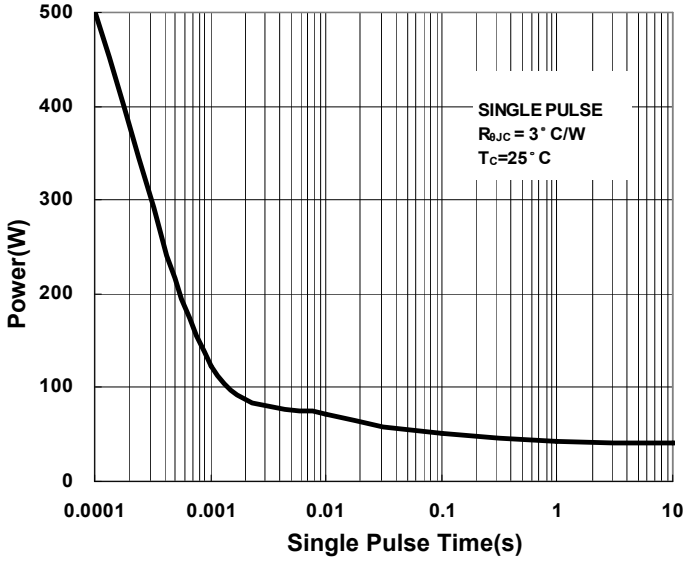
Source-Drain Diode Forward Voltage



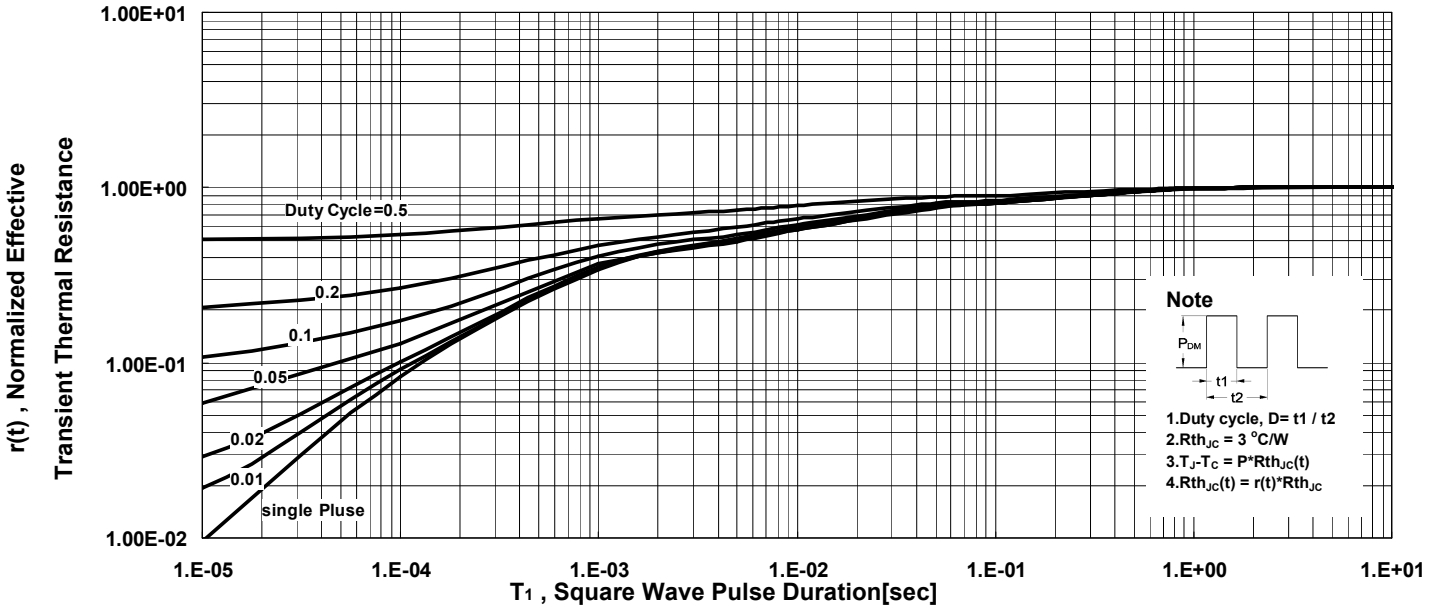
Safe Operating Area



Single Pulse Maximum Power Dissipation



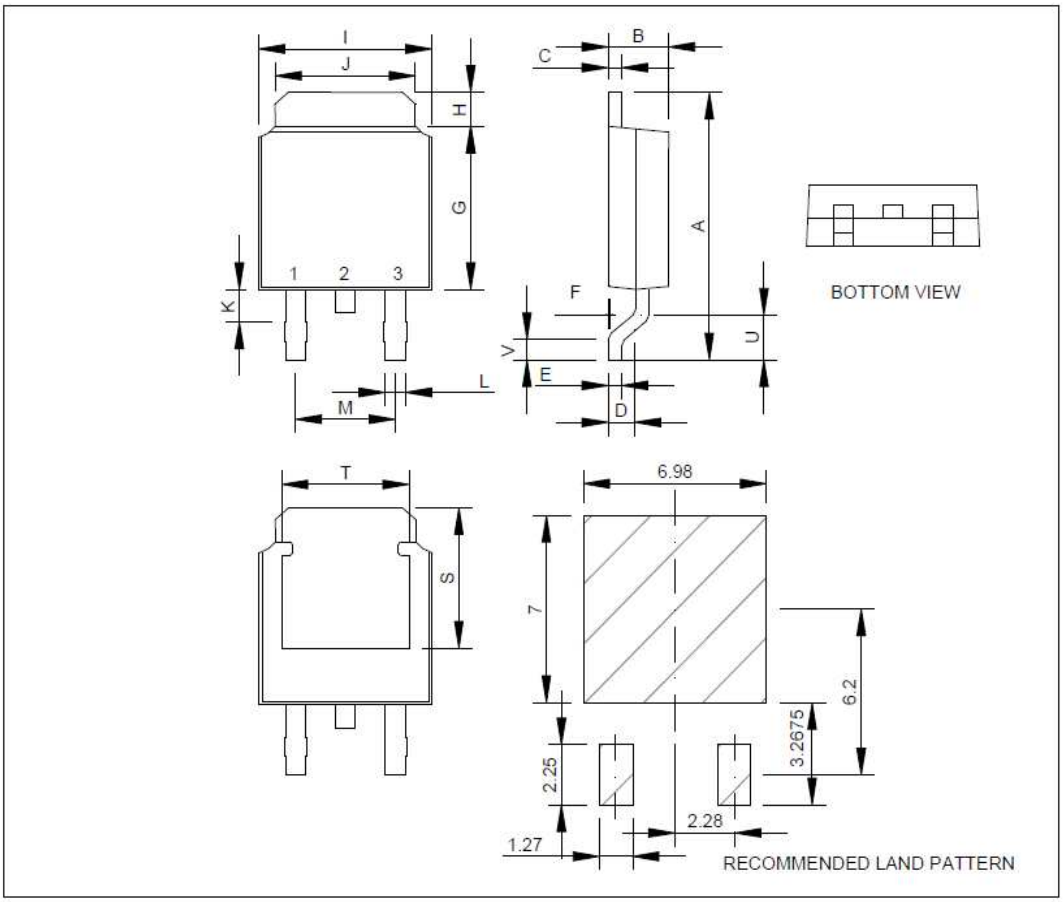
Transient Thermal Response Curve



Package Dimension

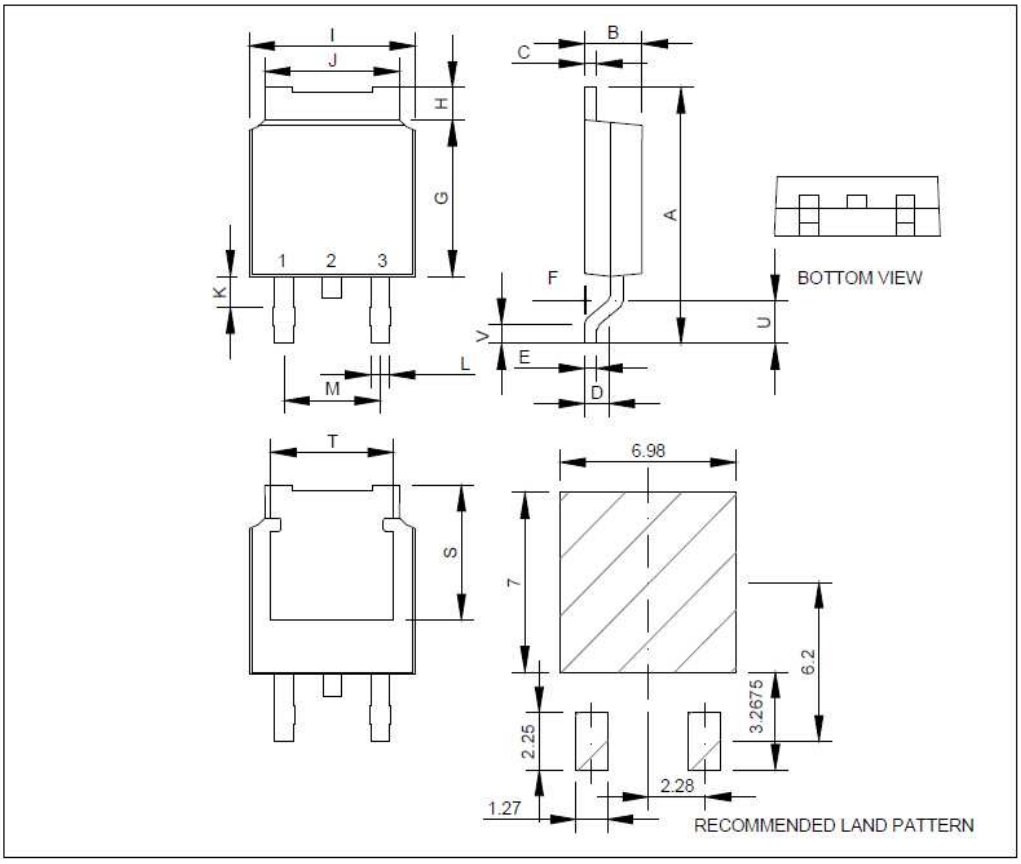
TO-252 (DPAK) MECHANICAL DATA

Dimension	mm			Dimension	mm		
	Min.	Typ.	Max.		Min.	Typ.	Max.
A	9.2		10.2	J	4.8		5.5
B	2.1		2.5	K	0.5		1.1
C	0.4		0.6	L	0.30		0.889
D	1.1		1.3	M	4.58		4.8
E		0.508		S	4.57		5.515
F	0		0.3	T	3.81		5.0
G	5.3		6.2	U	1.4		1.77
H	1.1		1.7	V	0.86		1.5
I	6.3		6.8				



TO-252 (DPAK) MECHANICAL DATA

Dimension	mm			Dimension	mm		
	Min.	Typ.	Max.		Min.	Typ.	Max.
A	8.9	9.5	10.4	J	5.04	5.34	5.64
B	2.2	2.3	2.4	K	0.6		1.0
C	0.4	0.5	0.6	L	0.66	0.76	0.86
D	0.82	1.02	1.22	M	4.372	4.572	4.772
E	0.4	0.5	0.6	S	5.25		
F	0		0.1	T	4.7		5.24
G	5.9	6.1	6.3	U	1.34		1.7
H	0.5		1.25	V	0.55		0.95
I	6.4	6.6	6.8				



TO-252 (DPAK) MECHANICAL DATA all

Dimension	mm			Dimension	mm		
	Min.	Typ.	Max.		Min.	Typ.	Max.
A	9.65		10.41	J	5.21		5.46
B	2.19		2.38	K	0.64		1.01
C	0.46		0.64	L	0.64		0.89
E	0.51			M		4.58	
F			0.13	S	5.21		
G	5.97		6.22	T	4.83		
H	0.89		1.27	U	1.4		1.78
I	6.35		6.73	V	0.75		1.00