NIKO-SEM

P-Channel Logic Level Enhancement Mode Field Effect Transistor

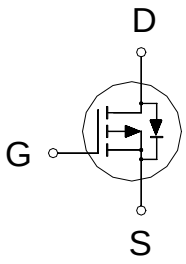
PA102FDG

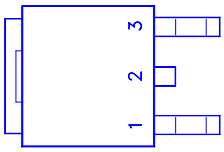
TO-252

Lead-Free

PRODUCT SUMMARY

$V_{(BR)DSS}$	$R_{DS(ON)}$	I_D
-20	115mΩ	-10A





1 :GATE
2 :DRAIN
3 :SOURCE

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

PARAMETERS/TEST CONDITIONS		SYMBOL	LIMITS	UNITS
Drain-Source Voltage		V_{DS}	-20	V
Gate-Source Voltage		V_{GS}	±12	V
Continuous Drain Current	T_C = 25 °C	I_D	-10	A
	T_C = 70 °C		-6.2	
Pulsed Drain Current[1]		I_{DM}	-24	
Power Dissipation	T_C = 25 °C	P_D	25	W
	T_C = 70 °C		9.6	
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	$R_{\theta JC}$		5	°C / W
Junction-to-Ambient	$R_{\theta JA}$		110	

[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			UNIT
			MIN	TYP	MAX	
STATIC						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS} = 0V, I_D = -250μA	-20			V
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = -250μA	-0.45	-0.8	-1.2	
Gate-Body Leakage	I_{GSS}	V_{DS} = 0V, V_{GS} = ±12V			±100	nA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = -16V, V_{GS} = 0V			-1	μA
		V_{DS} = -13.2V, V_{GS} = 0V, T_J = 125 °C			-10	
On-State Drain Current[1]	$I_{D(ON)}$	V_{DS} = -5V, V_{GS} = -4.5V	-24			A
Drain-Source On-State Resistance[1]	$R_{DS(ON)}$	V_{GS} = -2.5V, I_D =-2A		124	180	mΩ
		V_{GS} = -4.5V, I_D = -3A		93	115	
Forward Transconductance[1]	g_{fs}	V_{DS} = -5V, I_D = -3A		4.4		S

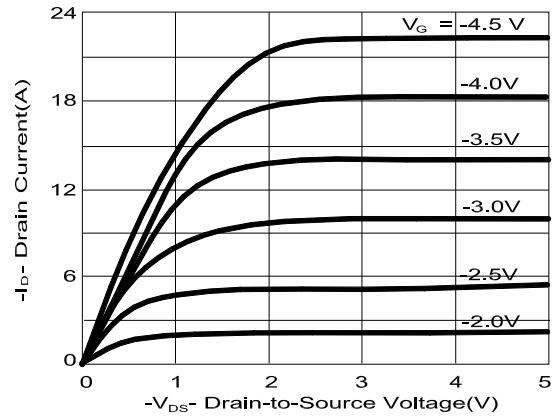
DYNAMIC						
Input Capacitance	C_{iss}	V_{GS} = 0V, V_{DS} = -6V, f = 1MHz		430		pF
Output Capacitance	C_{oss}			235		
Reverse Transfer Capacitance	C_{rss}			95		
Total Gate Charge[2]	Q_g	V_{DS} = 0.5$V_{(BR)DSS}$, V_{GS} = -4.5V, I_D = -3A		7.6	10	nC
Gate-Source Charge[2]	Q_{gs}			3.2		
Gate-Drain Charge[2]	Q_{gd}			2		
Turn-On Delay Time[2]	$t_{d(on)}$	V_{DD} = -10V, $I_D \cong$ -1A, V_{GS} = -5V, R_G = 6Ω			25	nS
Rise Time[2]	t_r				60	
Turn-Off Delay Time[2]	$t_{d(off)}$				70	
Fall Time[2]	t_f				60	
SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS (T_C = 25 °C)						
Continuous Current	I_S				-10	A
Pulsed Current[3]	I_{SM}				-24	
Forward Voltage[1]	V_{SD}	I_F = -10A, V_{GS} = 0V			-1.2	V

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

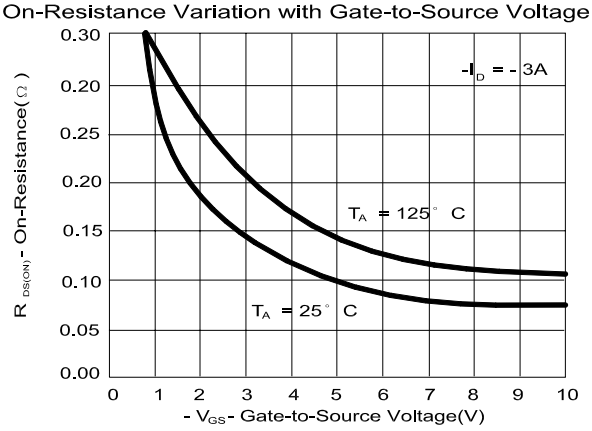
REMARK: THE PRODUCT MARKED WITH PA102FDG, DATE CODE or LOT #

Orders for parts with Lead-Free plating can be placed using the PXXXXXXG parts name.

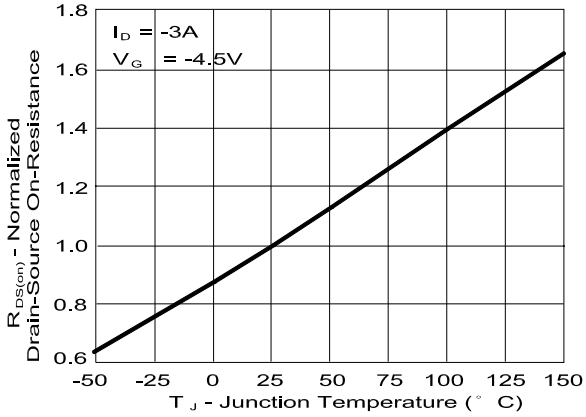
Typical output characteristics



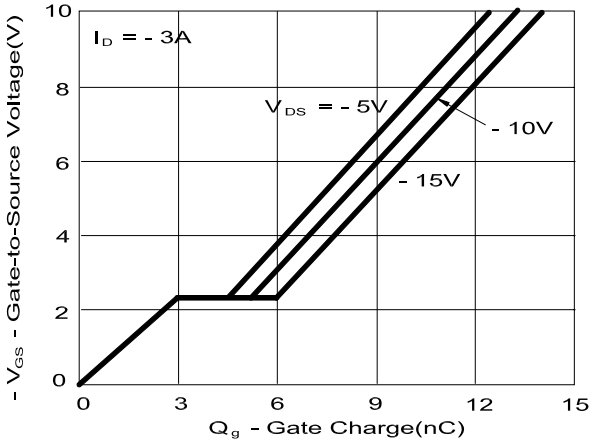
On-Resistance Variation with Gate-to-Source Voltage



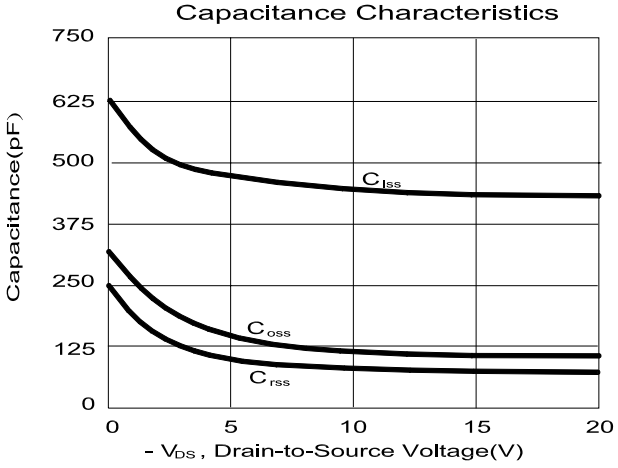
Normalized on-Resistance v.s. Junction Temperature



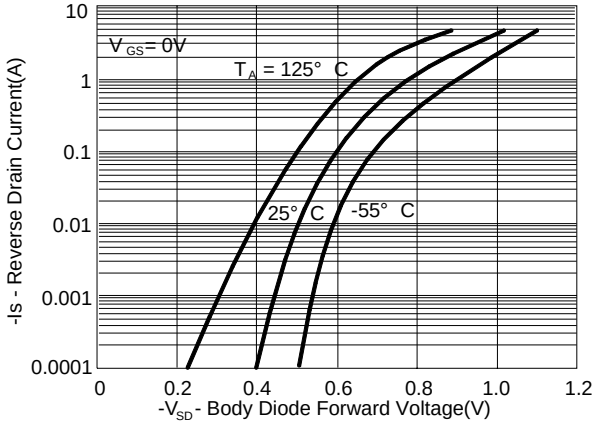
Gate Charge Characteristics



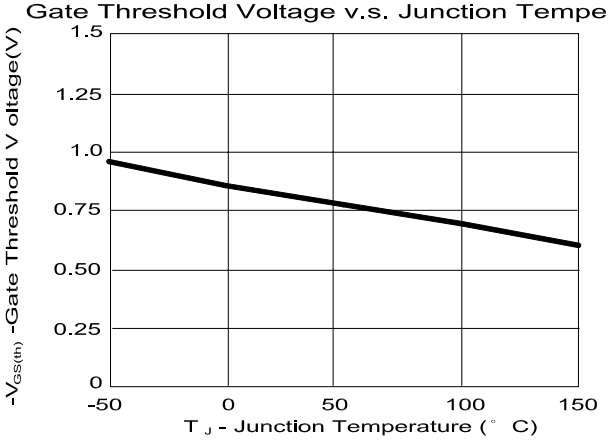
Capacitance Characteristics



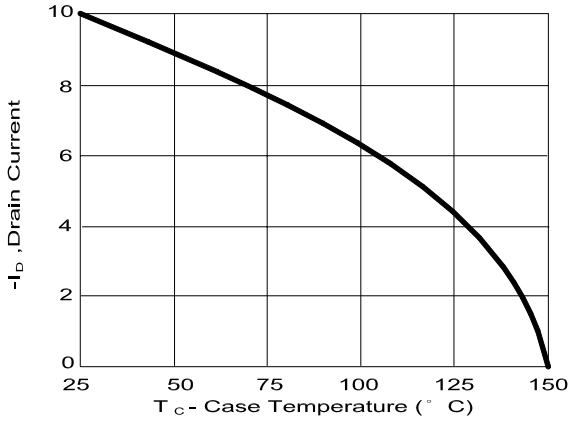
Body Diode Forward Voltage Variation with Source Current and Temperature



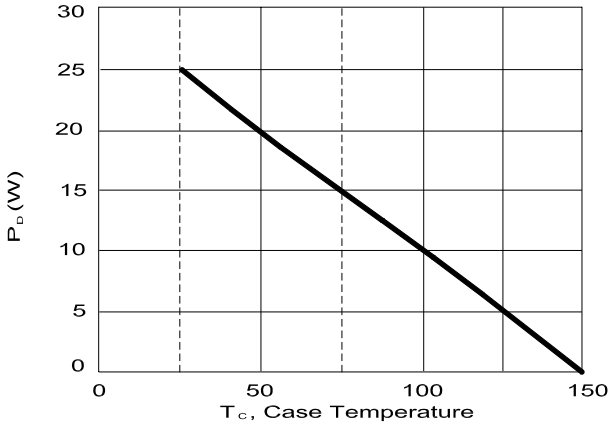
Gate Threshold Voltage v.s. Junction Temperature



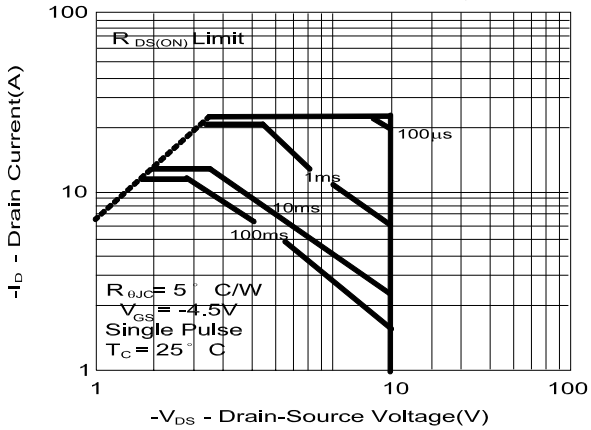
Maximum Drain Current v.s. Case Temperature



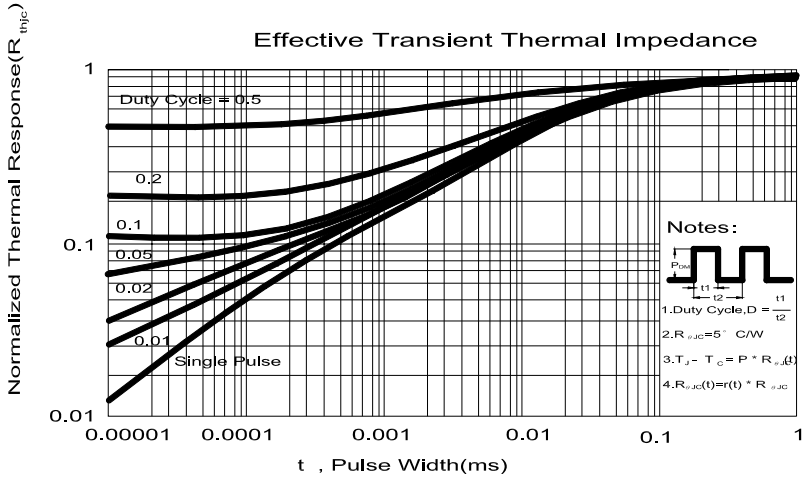
Typical Power Dissipation



Maximum Safe Operating Area



Effective Transient Thermal Impedance



TO-252 (DPAK) MECHANICAL DATA

Dimension	mm			Dimension	mm		
	Min.	Typ.	Max.		Min.	Typ.	Max.
A	9.35		10.4	H	0.89		2.03
B	2.2		2.4	I	6.35		6.80
C	0.45		0.6	J	5.2		5.5
D	0.89		1.5	K	0.6		1
E	0.45		0.69	L	0.5		0.9
F	0.03		0.23	M	3.96	4.57	5.18
G	5.2		6.2	N