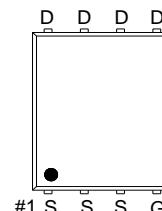
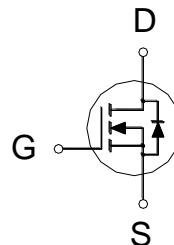


**NIKO-SEM**
**N-Channel Enhancement Mode  
Field Effect Transistor**
**PP4E06BK**  
**PDFN 5x6P**  
**Halogen-Free & Lead-Free**
**PRODUCT SUMMARY**

$V_{(BR)DSS}$	$R_{DS(ON)}$	$I_D$
60V	4.5mΩ	100A


G. GATE  
D. DRAIN  
S. SOURCE
**ABSOLUTE MAXIMUM RATINGS ( $T_A = 25^\circ\text{C}$  Unless Otherwise Noted)**

PARAMETERS/TEST CONDITIONS		SYMBOL	LIMITS	UNITS
Drain-Source Voltage		$V_{DS}$	60	V
Gate-Source Voltage		$V_{GS}$	$\pm 20$	V
Continuous Drain Current	$T_C = 25^\circ\text{C}$	$I_D$	100	A
	$T_C = 100^\circ\text{C}$		70	
Pulsed Drain Current <sup>1</sup>		$I_{DM}$	125	
Continuous Drain Current	$T_A = 25^\circ\text{C}$	$I_D$	18	
	$T_A = 70^\circ\text{C}$		15	
Avalanche Current		$I_{AS}$	39	
Avalanche Energy	$L = 0.1\text{mH}$	$E_{AS}$	76	mJ
Power Dissipation	$T_C = 25^\circ\text{C}$	$P_D$	93	W
	$T_C = 100^\circ\text{C}$		46	
Power Dissipation <sup>3</sup>	$T_A = 25^\circ\text{C}$	$P_D$	3.1	W
	$T_A = 70^\circ\text{C}$		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 <sup>2</sup>	$t \leq 10\text{s}$	$R_{\theta JA}$	$^{\circ}\text{C} / \text{W}$	48	
Junction-to-Ambient <sup>2</sup>	Steady-State	$R_{\theta JA}$		70	
Junction-to-Case	Steady-State	$R_{\theta JC}$		1.6	

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

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**ELECTRICAL CHARACTERISTICS ( $T_J = 25^\circ\text{C}$ , Unless Otherwise Noted)**

PARAMETER	SYMBOL	TEST CONDITIONS	LIMITS			UNIT
			MIN	TYP	MAX	
<b>STATIC</b>						
Drain-Source Breakdown Voltage	$V_{(\text{BR})\text{DSS}}$	$V_{\text{GS}} = 0\text{V}, I_D = 250\mu\text{A}$	60			V
Gate Threshold Voltage	$V_{\text{GS}(\text{th})}$	$V_{\text{DS}} = V_{\text{GS}}, I_D = 250\mu\text{A}$	1.3	1.7	3	
Gate-Body Leakage	$I_{\text{GSS}}$	$V_{\text{DS}} = 0\text{V}, V_{\text{GS}} = \pm 20\text{V}$			$\pm 100$	nA
Zero Gate Voltage Drain Current	$I_{\text{DSS}}$	$V_{\text{DS}} = 60\text{V}, V_{\text{GS}} = 0\text{V}$			1	$\mu\text{A}$
		$V_{\text{DS}} = 60\text{V}, V_{\text{GS}} = 0\text{V}, T_J = 55^\circ\text{C}$			10	
Drain-Source On-State Resistance <sup>1</sup>	$R_{\text{DS}(\text{ON})}$	$V_{\text{GS}} = 10\text{V}, I_D = 10\text{A}$		3.5	4.5	$\text{m}\Omega$
		$V_{\text{GS}} = 4.5\text{V}, I_D = 10\text{A}$		5.4	7	
Forward Transconductance <sup>1</sup>	$g_{\text{fs}}$	$V_{\text{DS}} = 5\text{V}, I_D = 10\text{A}$		55		S
<b>DYNAMIC</b>						
Input Capacitance	$C_{\text{iss}}$	$V_{\text{GS}} = 0\text{V}, V_{\text{DS}} = 30\text{V}, f = 1\text{MHz}$	1660	2076	2491	pF
Output Capacitance	$C_{\text{oss}}$		909	1137	1634	
Reverse Transfer Capacitance	$C_{\text{rss}}$		24	41	75	
Gate Resistance	$R_g$	$V_{\text{GS}} = 0\text{V}, V_{\text{DS}} = 0\text{V}, f = 1\text{MHz}$	0.3	0.5	0.8	$\Omega$
Total Gate Charge <sup>2</sup>	$Q_g$	$V_{\text{GS}} = 10\text{V}$ $V_{\text{GS}} = 4.5\text{V}$	28	36	43	nC
			15	19	23	
Gate-Source Charge <sup>2</sup>	$Q_{\text{gs}}$	$V_{\text{DS}} = 30\text{V}, V_{\text{GS}} = 10\text{V}, I_D = 10\text{A}$	3.7	4.6	5.5	
Gate-Drain Charge <sup>2</sup>	$Q_{\text{gd}}$		5	8.3	11.6	
Turn-On Delay Time <sup>2</sup>	$t_{\text{d}(\text{on})}$	$V_{\text{DS}} = 30\text{V}, I_D \approx 10\text{A}, V_{\text{GS}} = 10\text{V}, R_{\text{GEN}} = 6\Omega$		12		nS
Rise Time <sup>2</sup>	$t_r$			9		
Turn-Off Delay Time <sup>2</sup>	$t_{\text{d}(\text{off})}$			40		
Fall Time <sup>2</sup>	$t_f$			52		
<b>SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS (<math>T_J = 25^\circ\text{C}</math>)</b>						
Continuous Current	$I_S$				77	A
Forward Voltage <sup>1</sup>	$V_{\text{SD}}$	$I_F = 10\text{A}, V_{\text{GS}} = 0\text{V}$			1.2	V
Reverse Recovery Time	$t_{\text{rr}}$	$I_F = 10\text{A}, dI_F/dt = 100\text{A}/\mu\text{s}$	22.5	45	67	nS
Reverse Recovery Charge	$Q_{\text{rr}}$		24	48	72	nC

<sup>1</sup>Pulse test : Pulse Width  $\leq 300\ \mu\text{sec}$ , Duty Cycle  $\leq 2\%$ .

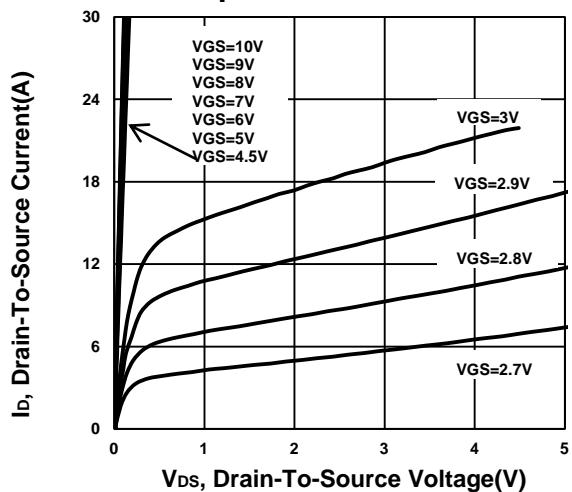
<sup>2</sup>Independent of operating temperature.

**NIKO-SEM**

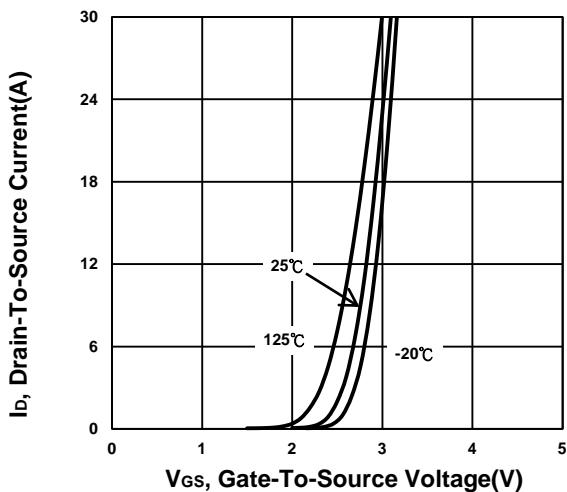
**N-Channel Enhancement Mode  
Field Effect Transistor**

**PP4E06BK**  
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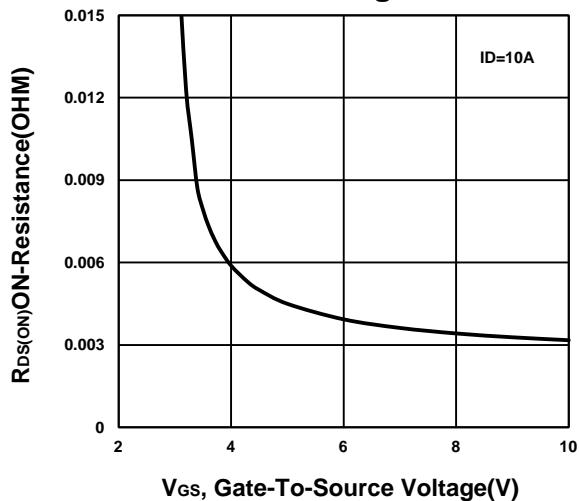
**Output Characteristics**



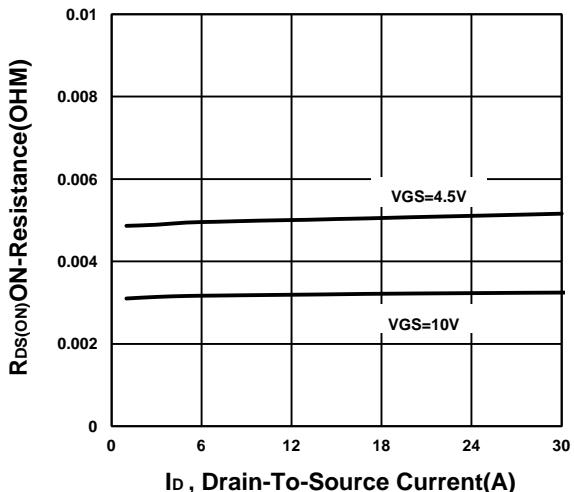
**Transfer Characteristics**



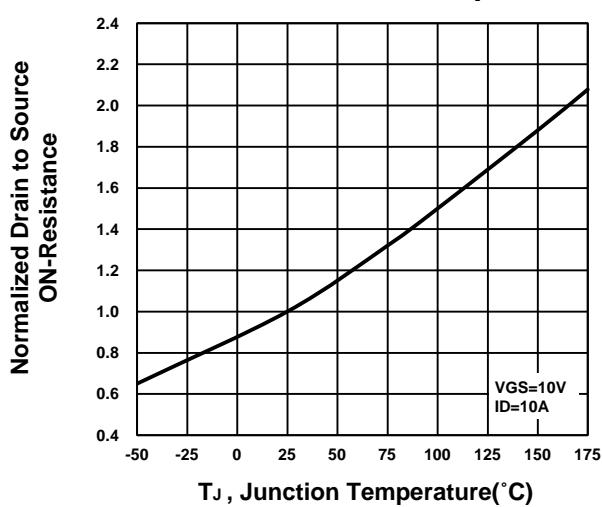
**On-Resistance VS Gate-to-Source Voltage**



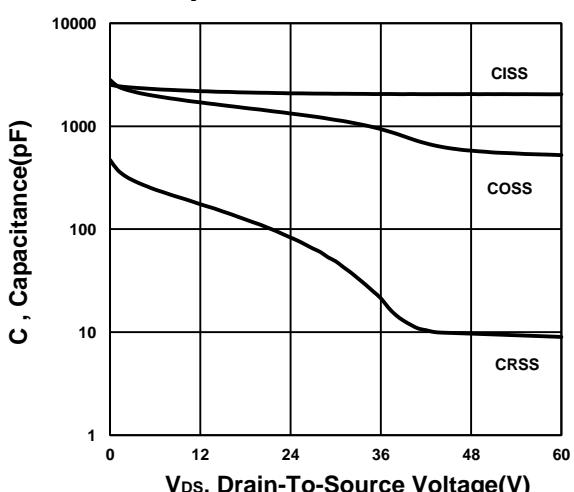
**On-Resistance VS Drain Current**

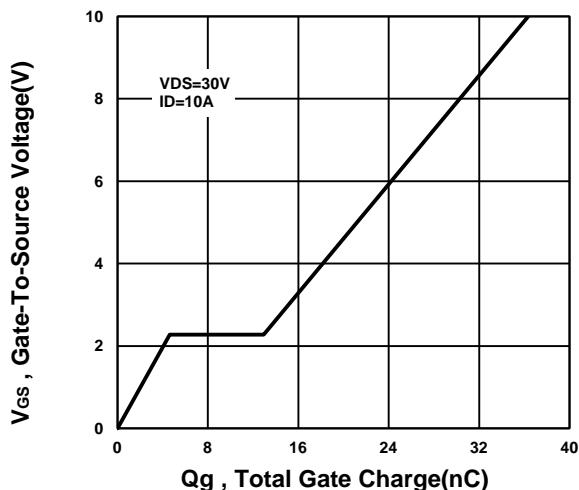
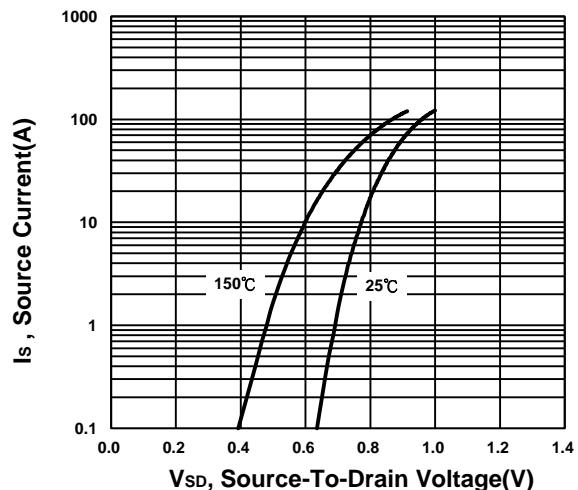
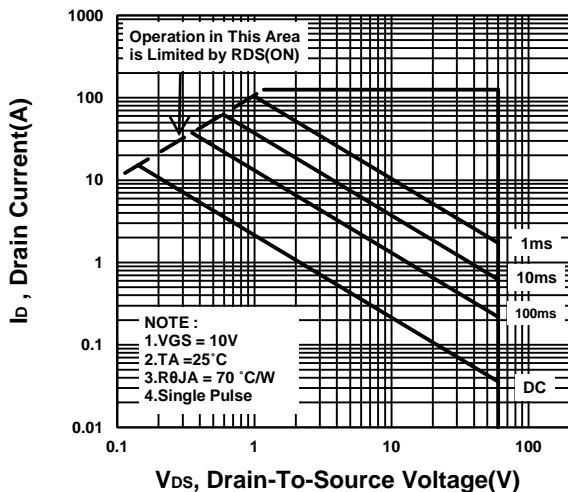
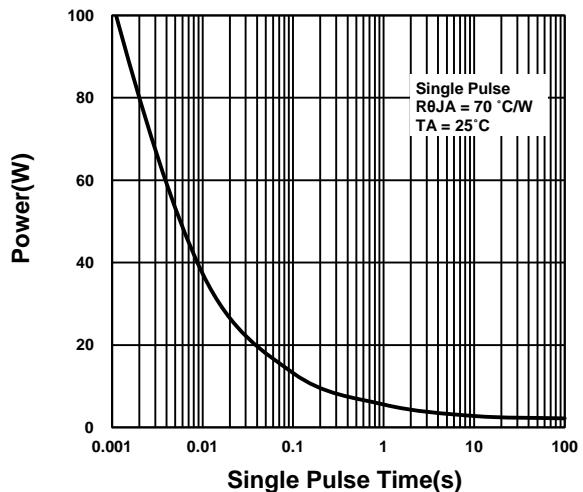
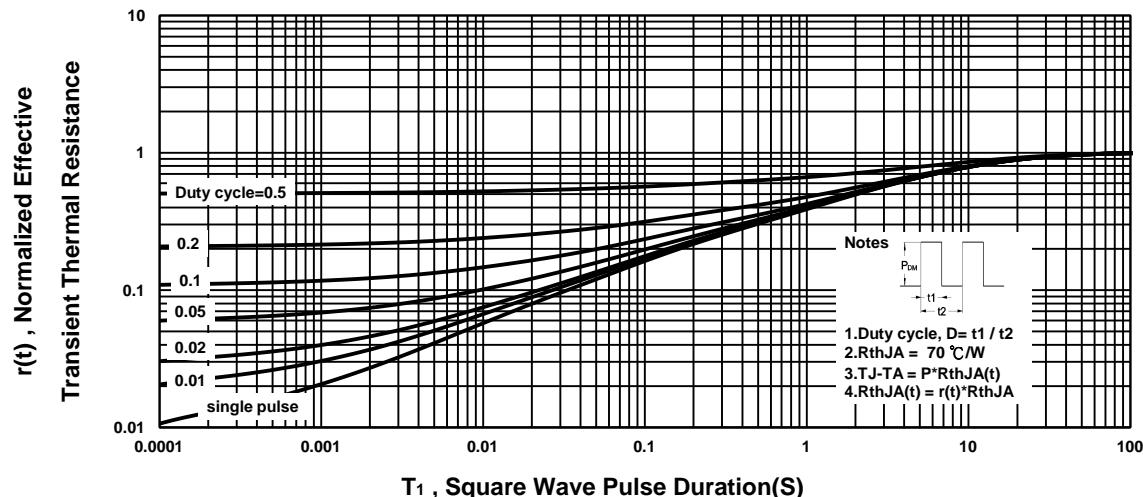


**On-Resistance VS Temperature**



**Capacitance Characteristic**



**NIKO-SEM****N-Channel Enhancement Mode  
Field Effect Transistor****PP4E06BK  
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Halogen-Free & Lead-Free****Gate charge Characteristics****Source-Drain Diode Forward Voltage****Safe Operating Area****Single Pulse Maximum Power Dissipation****Transient Thermal Response Curve**

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