UNIKC Semiconductor

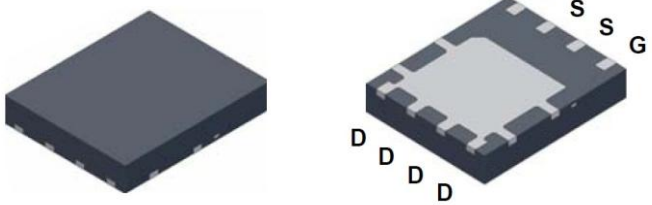
RoHS Compliant

P1003EK

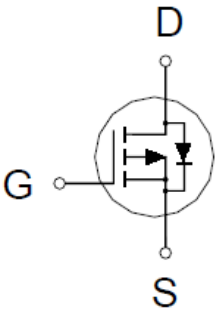
P-Channel Logic Level Enhancement Mode MOSFET

PRODUCT SUMMARY

$V_{(BR)DSS}$	$R_{DS(ON)}$	I_D
-30V	10.5mΩ @V_{GS} = -10V	-30A



PDFN 5*6P



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

PARAMETERS/TEST CONDITIONS		SYMBOL	LIMITS	UNITS
Drain-Source Voltage		V_{DS}	-30	V
Gate-Source Voltage		V_{GS}	±25	
Continuous Drain Current	T_C = 25 °C(Package Limited)	I_D	-30	A
	T_C = 25 °C (Silicon Limited)		-63	
	T_C = 100 °C		-40	
Pulsed Drain Current[1]		I_{DM}	-120	
Continuous Drain Current	T_A = 25 °C	I_D	-12	
	T_A = 70 °C		-10	
Avalanche Current		I_{AS}	-45	
Avalanche Energy	L = 0.1mH	E_{AS}	102	mJ
Power Dissipation	T_C = 25 °C	P_D	62.5	W
	T_C = 100 °C		25	
	T_A = 25 °C		2.5	
	T_A = 70 °C		1.6	
Operating Junction & Storage Temperature Range		T_J, T_{STG}	-55 to 150	°C

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THERMAL RESISTANCE RATINGS

THERMAL RESISTANCE	SYMBOL	TYPICA	MAXIMUM	UNIT
Junction-to-Case	$R_{\theta JC}$		2	°C / W
Junction-to-Ambient	$R_{\theta JA}$		50	

[1]Pulse width limited by maximum junction temperature.

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

PARAMETER	SYMBOL	TEST CONDITIONS	LIMITS			UNITS
			MIN	TYP	MAX	
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	-1.7	-3	
Gate-Body Leakage	I_{GSS}	V_{DS} = 0V, V_{GS} = ±25V			±250	nA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = -24V, V_{GS} = 0V			1	μA
		V_{DS} = -20V, V_{GS} = 0V , T_J = 125 °C			10	
On-State Drain Current[1]	$I_{D(ON)}$	V_{DS} = -5V, V_{GS} = -10V	-120			A
Drain-Source On-State Resistance[1]	$R_{DS(ON)}$	V_{GS} = -4.5V, I_D = -10A		13	16	mΩ
		V_{GS} = -10V, I_D = -13A		8	10.5	
Forward Transconductance[1]	g_{fs}	V_{DS} = -5V, I_D = -13A		10		S
DYNAMIC						
Input Capacitance	C_{iss}	V_{GS} = 0V, V_{DS} = -15V, f = 1MHz		2640		pF
Output Capacitance	C_{oss}			566		
Reverse Transfer Capacitance	C_{rss}			467		
Gate Resistance	R_g	V_{GS} = 0V, V_{DS} = 0V, f = 1MHz		2.9		Ω
Total Gate Charge[2]	Q_g(V_{GS} =-10V)	V_{DS} = 0.5$V_{(BR)DSS}$, V_{GS} = -10V, I_D = -13A		57		nC
	Q_g(V_{GS} =-4.5V)			30		
Gate-Source Charge[2]	Q_{gs}			7		
Gate-Drain Charge[2]	Q_{gd}			16		
Turn-On Delay Time[2]	$t_{d(on)}$	V_{DS} = -20V, I_D ≅ -13A, V_{GS} = -10V, R_{GS} = 6Ω		23		nS
Rise Time[2]	t_r			44		
Turn-Off Delay Time[2]	$t_{d(off)}$			72		
Fall Time[2]	t_f			41		

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SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS (T_J = 25 °C)						
Forward Voltage[1]	V_{SD}	I_F = -13A, V_{GS} = 0V			-1	V
Reverse Recovery Time	t_{rr}	I_F = -13A, dI_F/dt = 100A / µS		32.5		nS
Reverse Recovery Charge	Q_{rr}			17		nC

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

[2]Independent of operating temperature.

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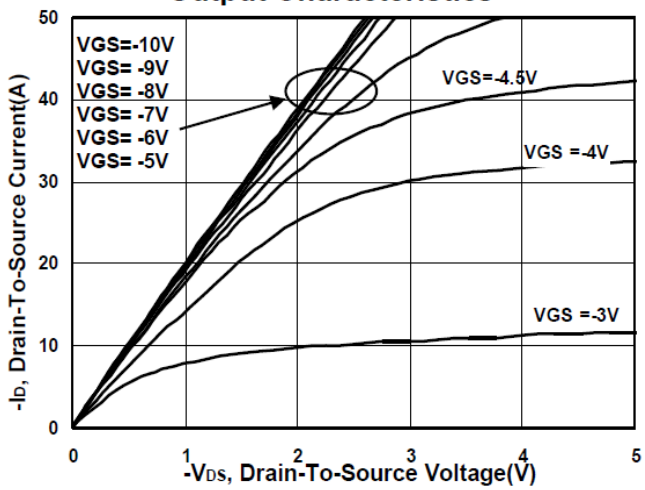
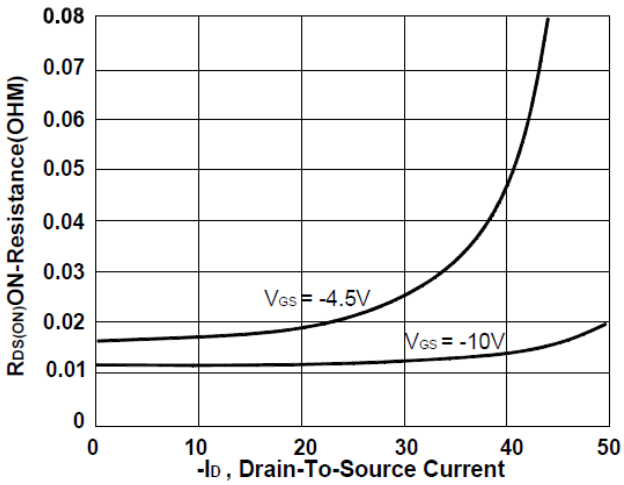
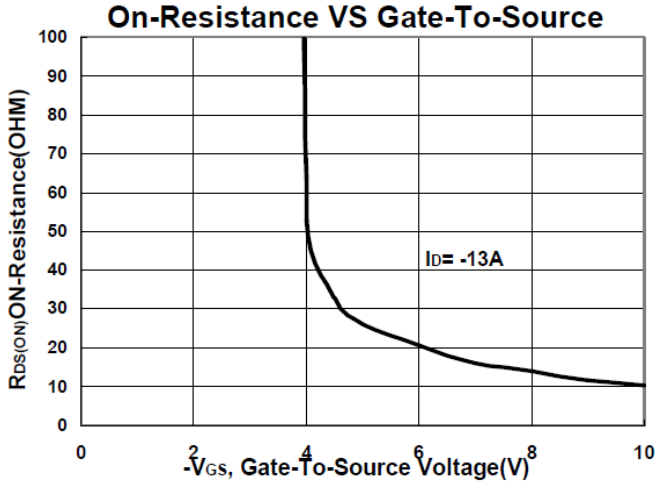
Output Characteristics



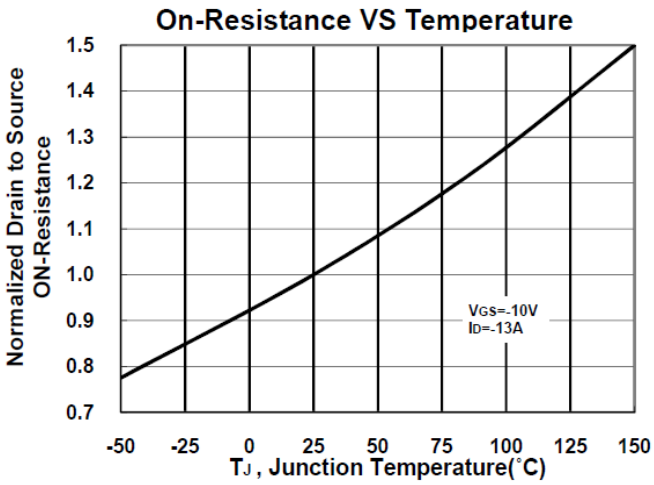
On-Resistance VS Drain Current



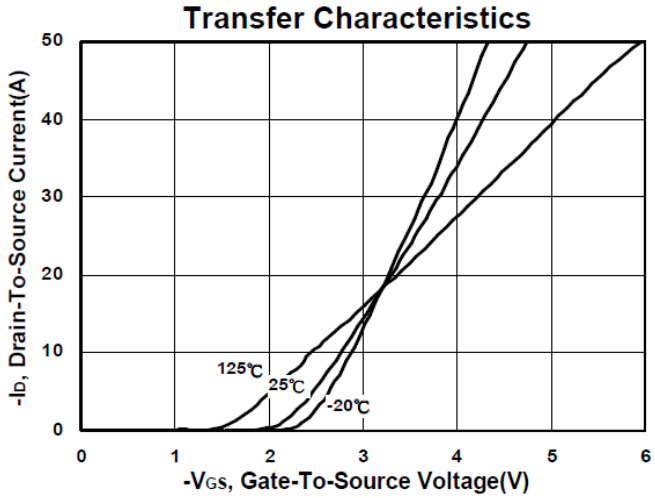
On-Resistance VS Gate-To-Source



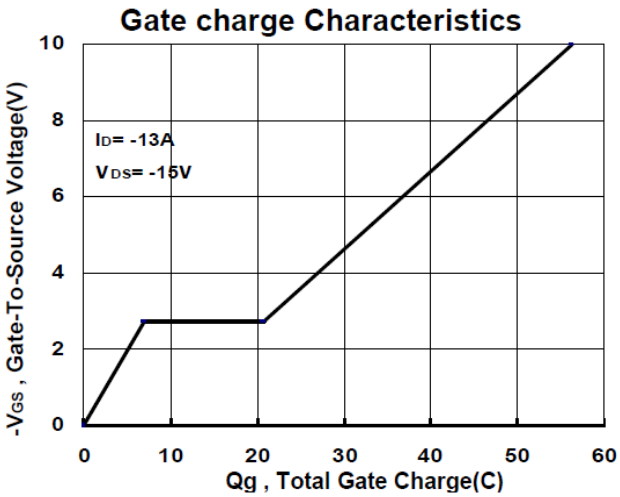
On-Resistance VS Temperature



Transfer Characteristics



Gate charge Characteristics



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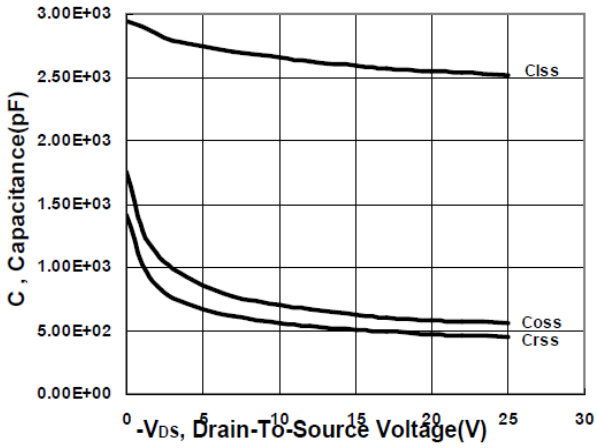
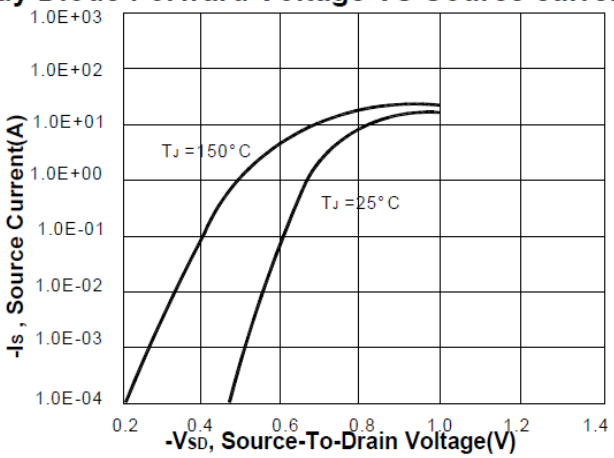
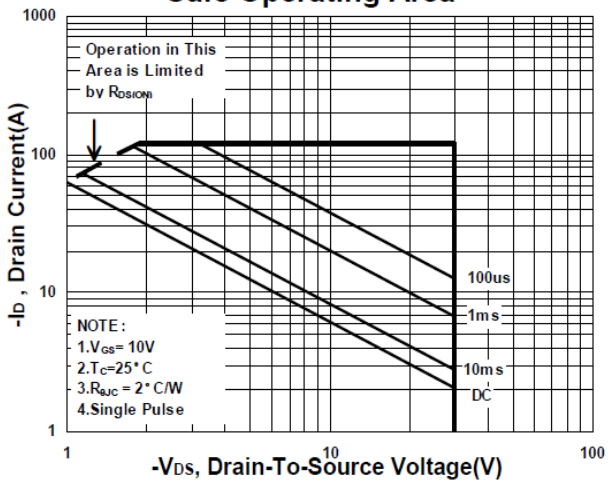
Capacitance Characteristic



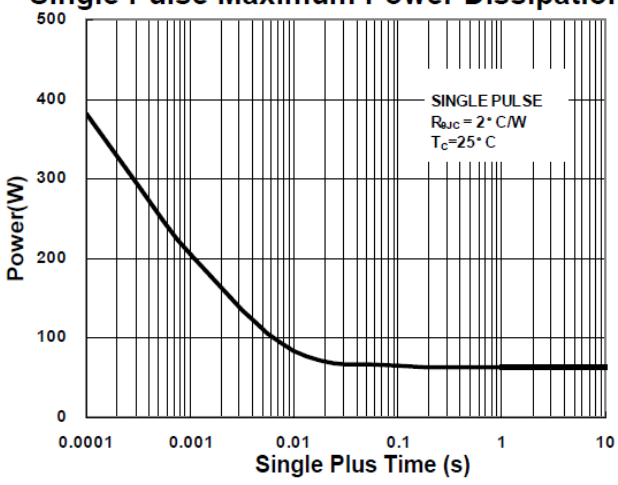
Body Diode Forward Voltage VS Source current



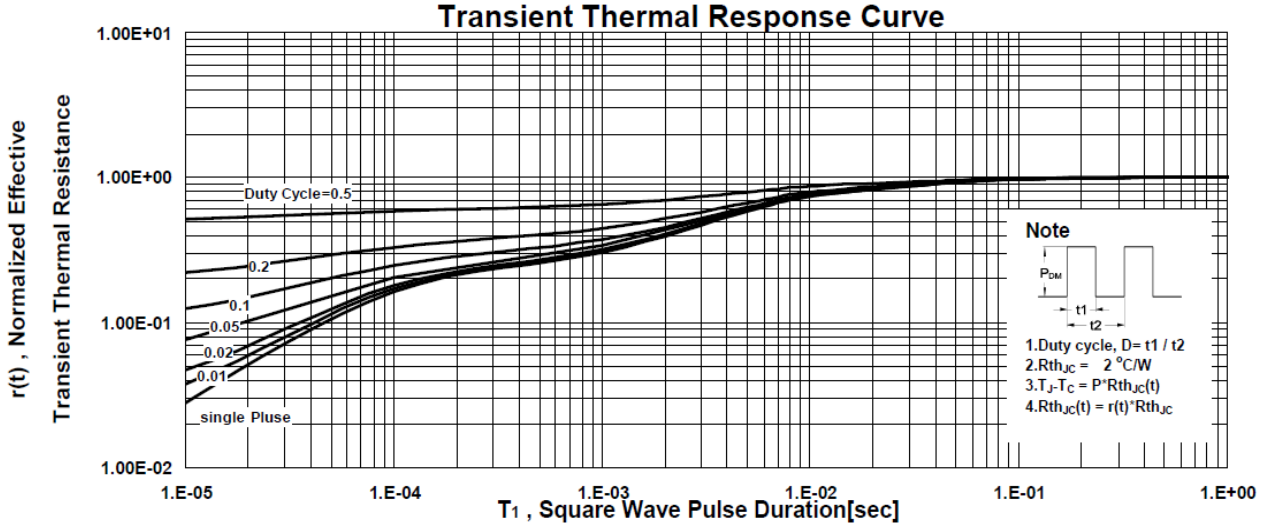
Safe Operating Area



Single Pulse Maximum Power Dissipation



Transient Thermal Response Curve



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Package Dimension

PDFN 5x6P MECHANICAL DATA

Dimension	mm			Dimension	mm		
	Min.	Typ.	Max.		Min.	Typ.	Max.
A	4.8		5.15	J	3.33		3.78
B	5.44		5.9	K	0.9		
C	5.9		6.35	L	0.35		0.712
D	0.33		0.51	M	0°		12°
E		1.27		N	4.8		5.5
F	0.8		1.25	O	0.05		0.3
G	0.15		0.34	P	0.06		0.2
H	3.61		4.31	S	3.69		4.19
I	0.35		0.71