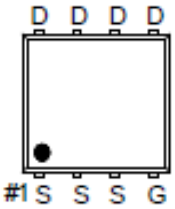
UNIKC Semiconductor

P2003BEA

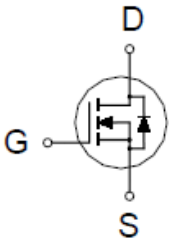
N-Channel Enhancement Mode MOSFET

PRODUCT SUMMARY

$V_{(BR)DSS}$	$R_{DS(ON)}$	I_D
30V	20mΩ @V_{GS} = 10V	10A



PDFN 3x3S



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}	±20	
Continuous Drain Current	T_C = 25 °C	I_D	28	A
	T_C = 100 °C		18	
	T_A = 25 °C		10	
	T_A = 70 °C		8	
Pulsed Drain Current[1]		I_{DM}	70	
Avalanche Current		I_{AS}	21.5	
Avalanche Energy	L = 0.1mH	E_{AS}	23	mJ
Power Dissipation	T_C = 25 °C	P_D	25	W
	T_C = 100 °C		10	
	T_A = 25 °C		3.125	
	T_A = 70 °C		2	
Operating Junction & Storage Temperature Range		T_J, T_{STG}	-55 to 150	°C

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THERMAL RESISTANCE RATINGS

THERMAL RESISTANCE		SYMBOL	TYPICAL	MAXIMUM	UNITS
Junction-to-Ambient	t ≦10s	$R_{\theta JA}$		40	°C / W
Junction-to-Ambient	Steady-State	$R_{\theta JA}$		75	
Junction-to-Case	Steady-State	$R_{\theta JC}$		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	30			V
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250μA	1	1.5	2.5	
Gate-Body Leakage	I_{GSS}	V_{DS} = 0V, V_{GS} = ±20V			±100	nA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 24V, V_{GS} = 0V			1	μA
		V_{DS} = 20V, V_{GS} = 0V , T_J = 55 °C			10	
On-State Drain Current[1]	$I_{D(ON)}$	V_{DS} = 5V, V_{GS} = 10V	70			A
Drain-Source On-State Resistance[1]	$R_{DS(ON)}$	V_{GS} = 4.5V, I_D = 6A		23	31	mΩ
		V_{GS} = 10V, I_D = 8A		14	20	
Forward Transconductance[1]	g_{fs}	V_{DS} = 10V, I_D = 8A		13		S
DYNAMIC						
Input Capacitance	C_{iss}	V_{GS} = 0V, V_{DS} = 15V, f = 1MHz		484		pF
Output Capacitance	C_{oss}			169		
Reverse Transfer Capacitance	C_{rss}			106		
Gate Resistance	R_g	V_{GS} = 0V, V_{DS} = 0V, f = 1MHz		1.75		Ω
Total Gate Charge[2]	Q_g(V_{GS}=10V)	V_{DS} = 0.5$V_{(BR)DSS}$, I_D = 8A		10		nC
	Q_g(V_{GS}=4.5V)			4.4		
Gate-Source Charge[2]	Q_{gs}			2		
Gate-Drain Charge[2]	Q_{gd}			3		
Turn-On Delay Time[2]	$t_{d(on)}$	V_{DD} = 15V,I_D ≅ 8A, V_{GEN} = 10V, R_G = 3Ω		5		nS
Rise Time[2]	t_r			4		
Turn-Off Delay Time[2]	$t_{d(off)}$			16		
Fall Time[2]	t_f			3		

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SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS (T_J = 25 °C)						
Continuous Current	I_S				2.2	A
Forward Voltage[1]	V_{SD}	I_F = 8A, V_{GS} = 0V			1.4	V
Reverse Recovery Time	t_{rr}	IF = 8A, dIF/dt = 100A / μS		20		nS
Reverse Recovery Charge	Q_{rr}			10		nC

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

[2]Independent of operating temperature.

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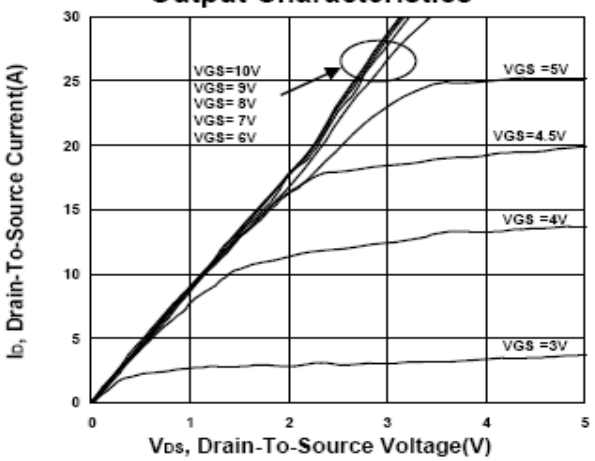
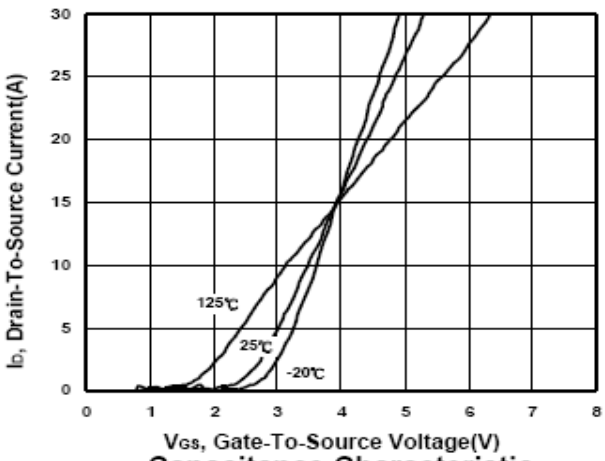
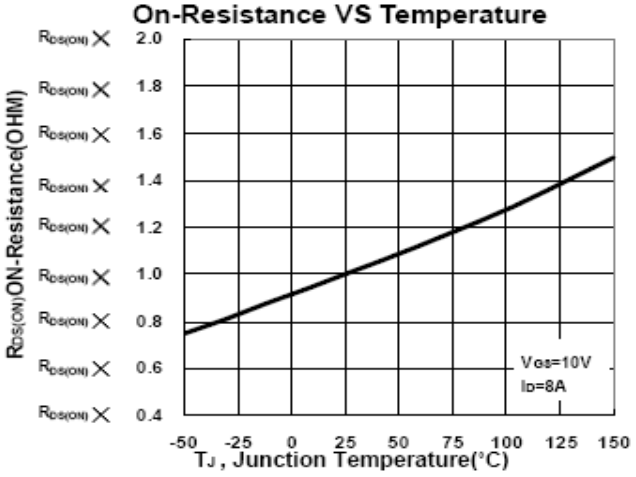
Output Characteristics



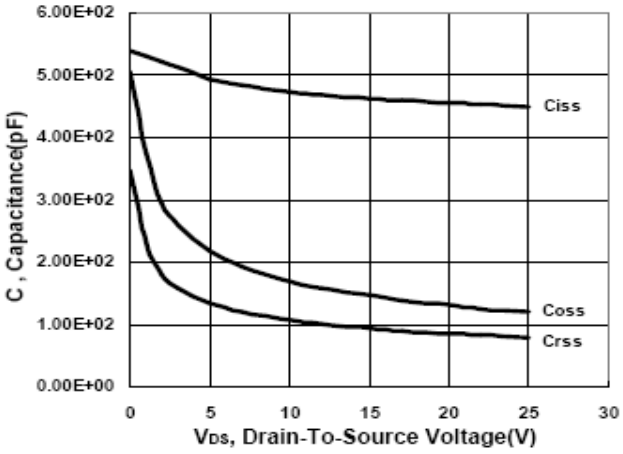
Transfer Characteristics



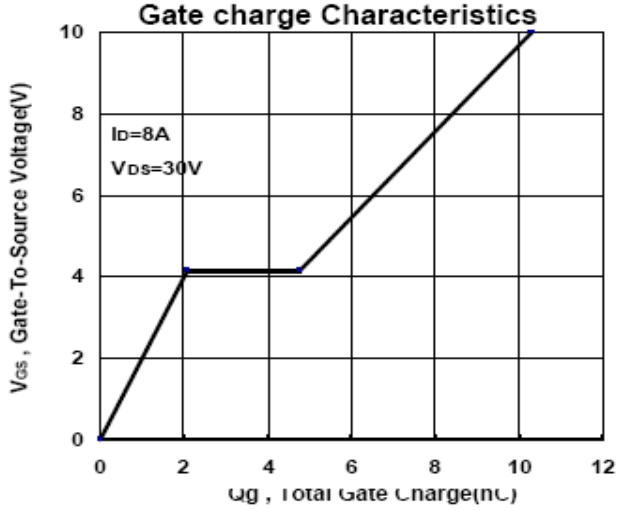
On-Resistance VS Temperature



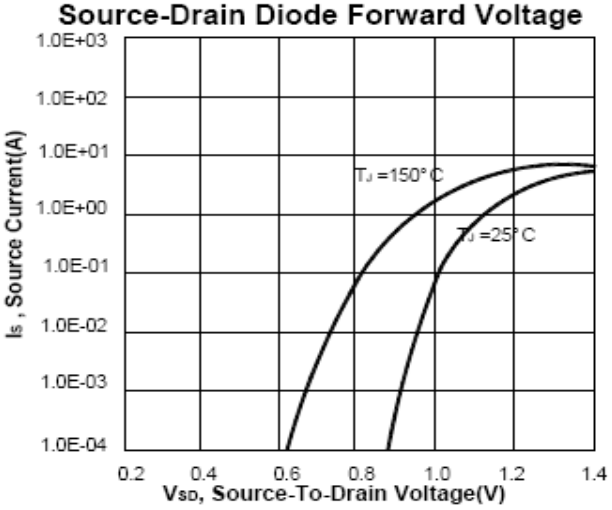
Capacitance Characteristic



Gate charge Characteristics



Source-Drain Diode Forward Voltage



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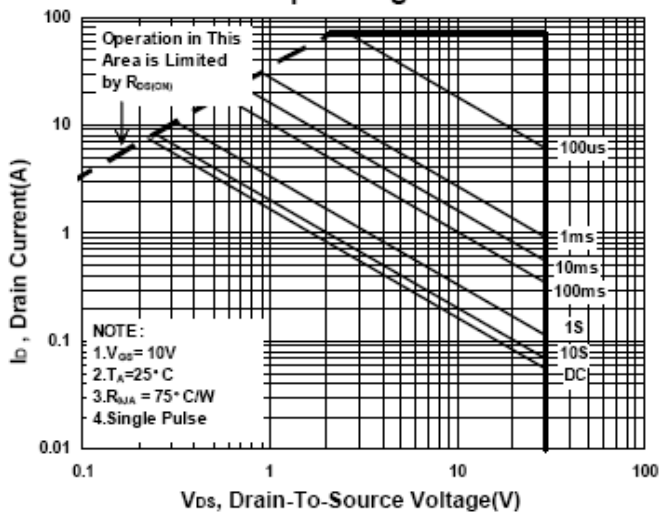
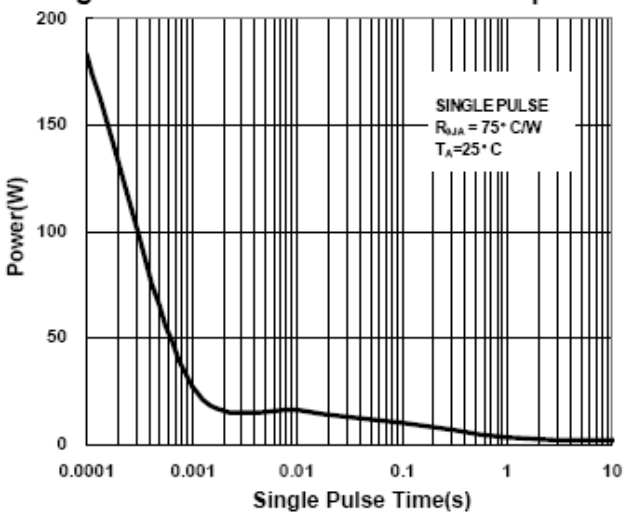
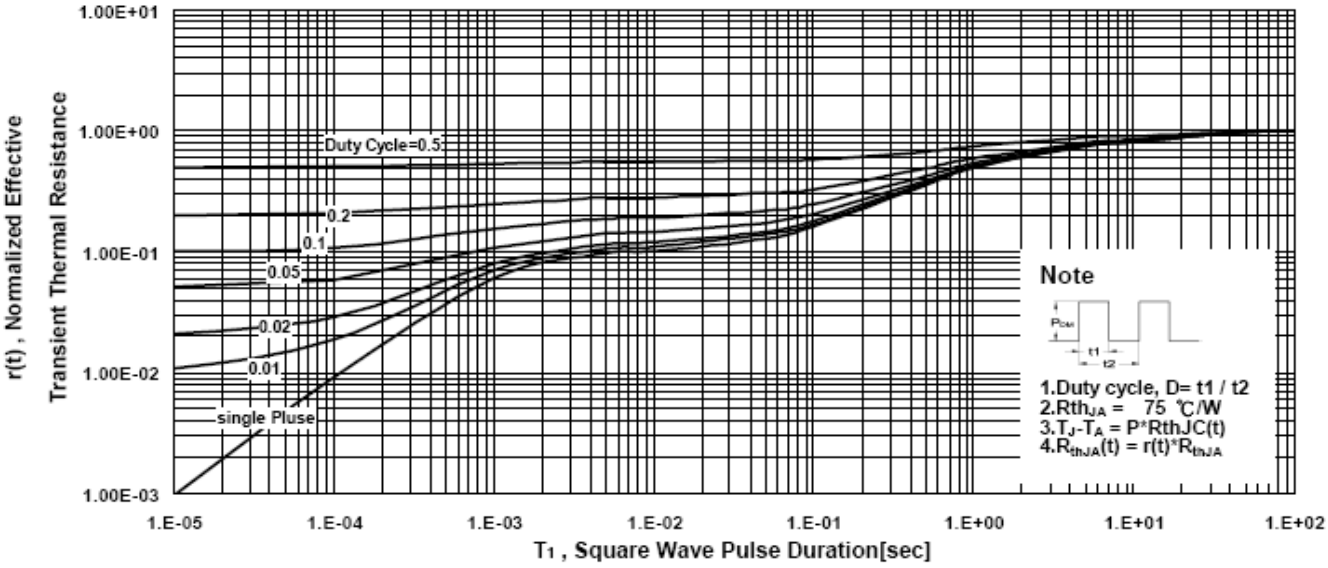
Safe Operating Area



Single Pulse Maximum Power Dissipation



Transient Thermal Response Curve



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Package Dimension

PDFN 3x3S MECHANICAL DATA

Dimension	mm			Dimension	mm		
	Min.	Typ.	Max.		Min.	Typ.	Max.
A	2.9	3.0	3.1	I		0.20	
B	2.35	2.4	2.55	J	0.27	0.35	0.4
C	2.9	3.0	3.1	K		0.45	
D	0.32	0.4	0.45	L	0.7	0.8	0.9
E	2.0	2.1	2.2				
F	0.32	0.42	0.47				
G		0.65					
H	0.27	0.35	0.525