UNIKC Semiconductor

RoHS Compliant

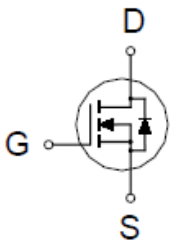
P0903BEA

N-Channel Enhancement Mode MOSFET

PRODUCT SUMMARY

$V_{(BR)DSS}$	$R_{DS(ON)}$	I_D
30V	9mΩ @V_{GS} = 10V	48A

PDFN 3x3P



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[2]	T_C = 25 °C	I_D	48	A
	T_C = 100 °C		30	
	T_A = 25 °C		13	
	T_A = 70 °C		10	
Pulsed Drain Current[1]		I_{DM}	130	
Avalanche Current		I_{AS}	30	
Avalanche Energy	L = 0.1mH	E_{AS}	45	mJ
Power Dissipation	T_C = 25 °C	P_D	33	W
	T_C = 100 °C		13	
	T_A = 25 °C		2.3	
	T_A = 70 °C		1.5	
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[3]	$R_{\theta JA}$		55	°C / W
Junction-to-Case	$R_{\theta JC}$		3.7	

[1]Pulse width limited by maximum junction temperature.

[2]Package limitation current is 30A.

[3]The value of R<JA is measured with the device mounted on 1in2 FR-4 board with 2oz.Copper , in a still air environment with TA=25°C。The value in any given application depends on the user's specific board design

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	1.7	3	
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	130			A
Drain-Source On-State Resistance[1]	$R_{DS(ON)}$	V_{GS} = 4.5V, I_D = 10A		11.2	13	mΩ
		V_{GS} = 10V, I_D = 13A		7	9	
Forward Transconductance[1]	g_{fs}	V_{DS} = 5V, I_D = 13A		45		S
DYNAMIC						
Input Capacitance	C_{iss}	V_{GS} = 0V, V_{DS} = 15V, f = 1MHz		1590		pF
Output Capacitance	C_{oss}			193		
Reverse Transfer Capacitance	C_{rss}			159		
Total Gate Charge[2]	$Q_{g(VGS=10V)}$	V_{DS} = 0.5$V_{(BR)DSS}$, I_D = 13A, V_{GS}=10V		31		nC
	$Q_{g(VGS=4.5V}$			17		
Gate-Source Charge[2]	Q_{gs}			5.5		
Gate-Drain Charge[2]	Q_{gd}			8		
Gate Resistance	R_g	V_{GS} = 0V, V_{DS} = 0V, f = 1MHz		1.7		Ω
Turn-On Delay Time[2]	$t_{d(on)}$	V_{DS} = 0.5$V_{(BR)DSS}$, I_D ≅ 13A, V_{GS} = 10V, R_{GEN} = 3Ω		9		nS
Rise Time[2]	t_r			14		
Turn-Off Delay Time[2]	$t_{d(off)}$			32		
Fall Time[2]	t_f			16		

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SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS						
Continuous Current[3]	I_S				48	A
Forward Voltage[1]	V_{SD}	I_F = 13A, V_{GS} = 0V			1.3	V
Reverse Recovery Time	t_{rr}	I_F = 13A, dI_F/dt = 100A / μS		11.7		nS
Reverse Recovery Charge	Q_{rr}			2		nC

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

[2]Independent of operating temperature.

[3] Package limitation current is 30A.

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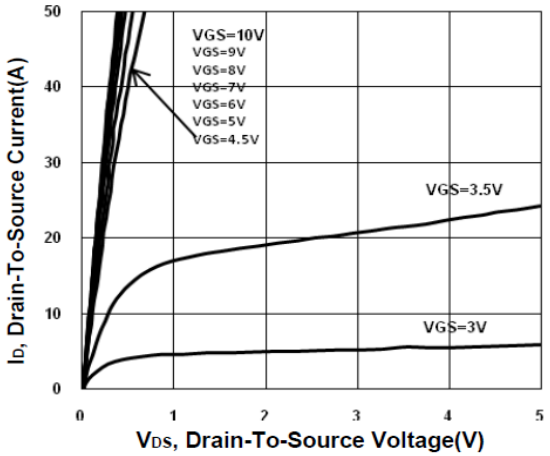
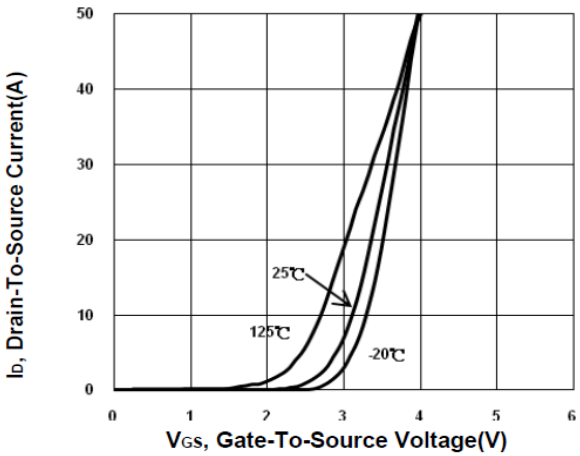
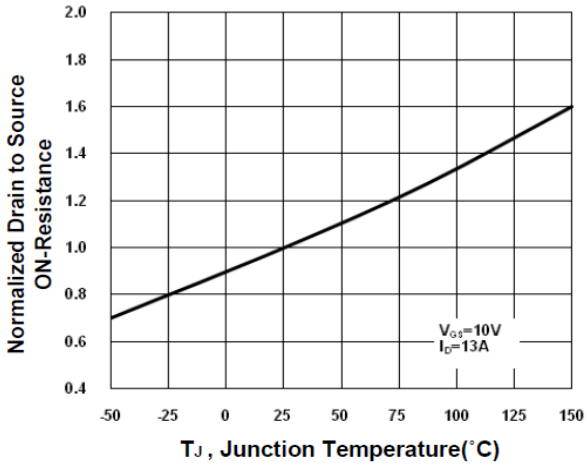
Output Characteristics



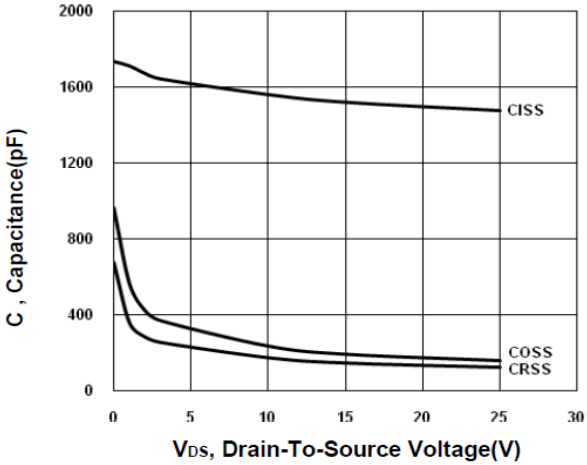
Transfer Characteristics



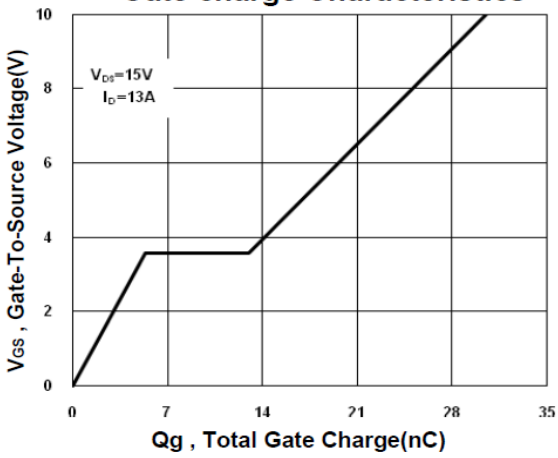
On-Resistance VS Temperature



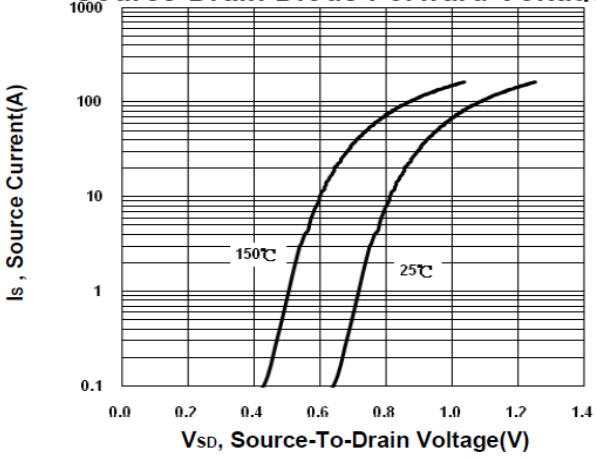
Capacitance Characteristic



Gate charge Characteristics



Source-Drain Diode Forward Voltage



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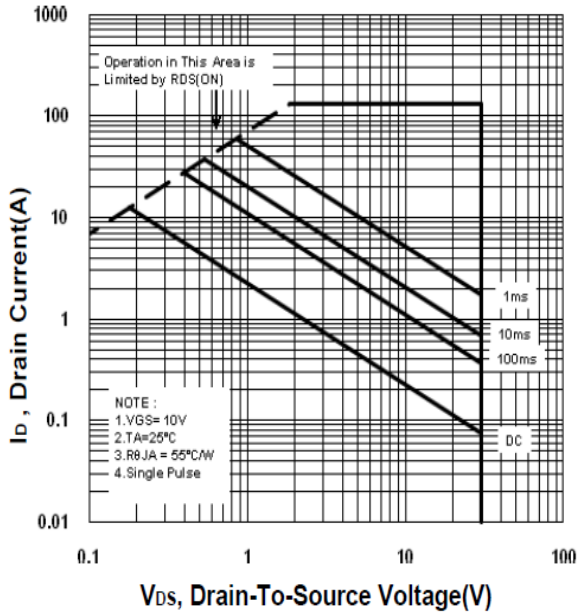
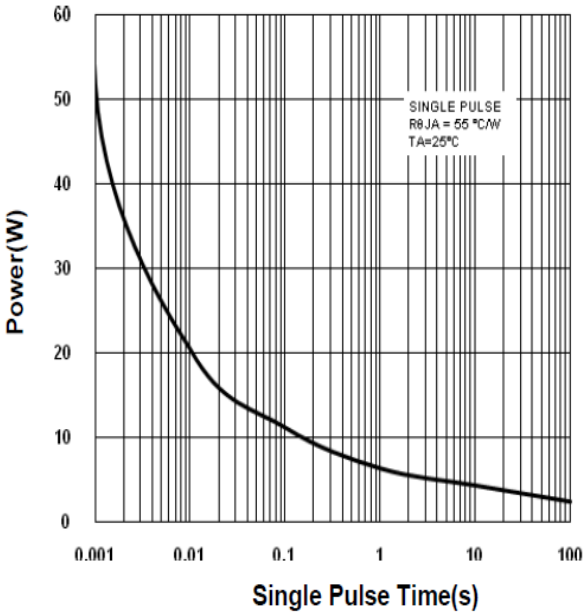
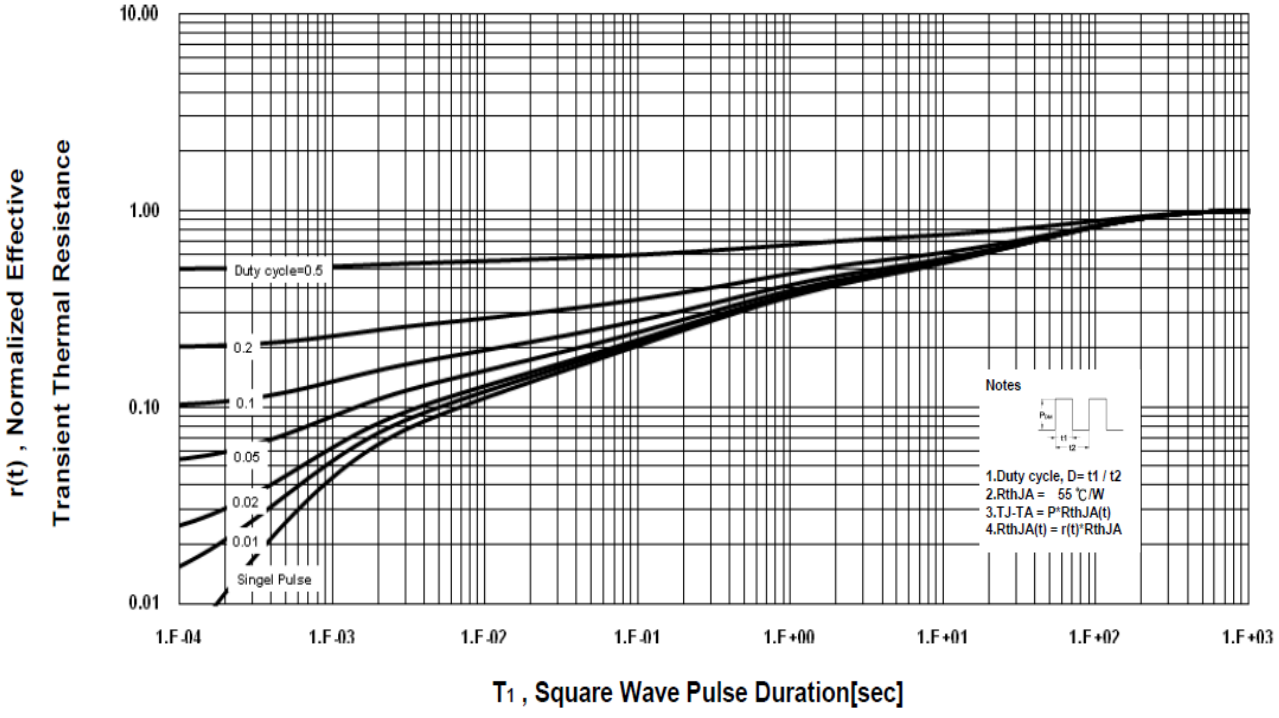
Safe Operating Area



Single Pulse Maximum Power Dissipation



Transient Thermal Response Curve



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Package Dimension

PDFN 3x3P MECHANICAL DATA

Dimension	mm			Dimension	mm		
	Min.	Typ.	Max.		Min.	Typ.	Max.
A	3		3.6	I	0.7		1.12
B	2.88		3.2	J	0.1		0.33
C	2.9		3.2	K	0.6		
D	1.98		2.69	L	0°	10°	12°
E	3		3.6	M	0.14		0.41
F	0		0.455	N	0.6		0.7
G	1.47		2.2	O	0.12		0.36
H	0.15		0.56	P	0		0.2