UNIKC Semiconductor

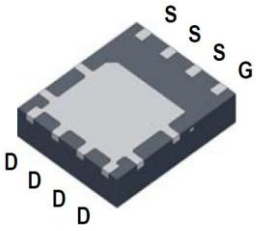
RoHS Compliant

P1003BK

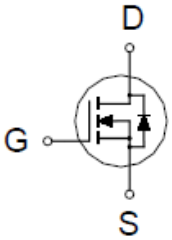
N-Channel Enhancement Mode MOSFET

PRODUCT SUMMARY

$V_{(BR)DSS}$	$R_{DS(ON)}$	I_D
30V	10.5mΩ @V_{GS} = 10V	49A



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}	±20	
Continuous Drain Current	T_C = 25 °C (Package Limited)	I_D	30	A
	T_C = 25 °C(Silicon Limited)		49	
	T_C = 100 °C		31	
Pulsed Drain Current[1]		I_{DM}	120	
Continuous Drain Current	T_A = 25 °C	I_D	13	
	T_A = 70 °C		10	
Avalanche Current		I_{AS}	28	
Avalanche Energy	L = 0.1mH	E_{AS}	40	mJ
Power Dissipation	T_C = 25 °C	P_D	35	W
	T_C = 100 °C		14	
Power Dissipation	T_A = 25 °C	P_D	2.5	
	T_A = 70 °C		1.6	
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	Steady-State	$R_{\theta JC}$		3.5	°C / W
Junction-to-Ambient	Steady-State	$R_{\theta JA}$		50	

[1]Pulse width limited by maximum junction temperature.

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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	3	V
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	
Drain-Source On-State Resistance[1]	$R_{DS(ON)}$	V_{GS} = 4.5V, I_D = 15A		11	14.5	mΩ
		V_{GS} = 10V, I_D = 20A		8.6	10.5	
Forward Transconductance[1]	g_{fs}	V_{DS} = 5V, I_D = 20A		42		S
DYNAMIC						
Input Capacitance	C_{iss}	V_{GS} = 0V, V_{DS} = 15V, f = 1MHz		778		pF
Output Capacitance	C_{oss}			312		
Reverse Transfer Capacitance	C_{rss}			79		
Gate Resistance	Rg	V_{GS} = 0V, V_{DS} = 0V, f = 1MHz		1.7		Ω
Total Gate Charge[2]	Q_g V_{GS}=10V	V_{DS} = 0.5$V_{(BR)DSS}$, I_D = 20A, V_{GS} = 10V		15		nC
	Q_g V_{GS}=4.5V			8		
Gate-Source Charge[2]	Q_{gs}			2.8		
Gate-Drain Charge[2]	Q_{gd}			3.6		
Turn-On Delay Time[2]	$t_{d(on)}$	V_{DS} = 15V,I_D ≅ 20A, V_{GS}=20V, R_{GEN}= 6Ω		17		nS
Rise Time[2]	t_r			10		
Turn-Off Delay Time[2]	$t_{d(off)}$			33		
Fall Time[2]	t_f			10		
SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS (T_J = 25 °C)						
Continuous Current	I_S				26	A
Forward Voltage[1]	V_{SD}	I_F = 20A, V_{GS} = 0V			1.2	V
Reverse Recovery Time	t_{rr}	I_F = 20 A, dI_F/dt = 100A /μS		24		nS
Reverse Recovery Charge	Q_{rr}			13		nC

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

[2]Independent of operating temperature.

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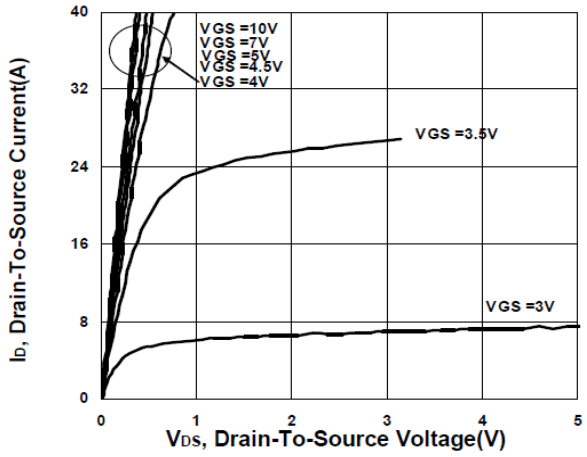
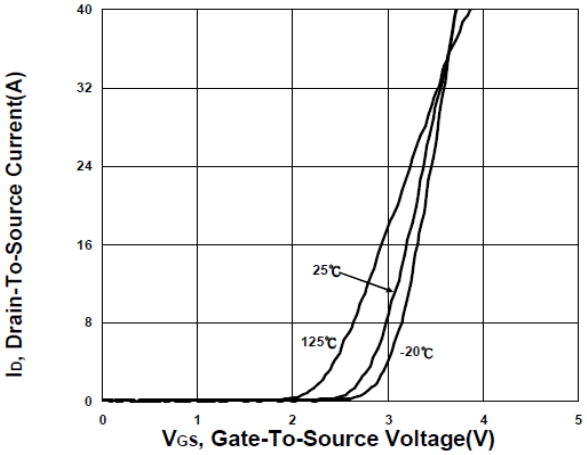
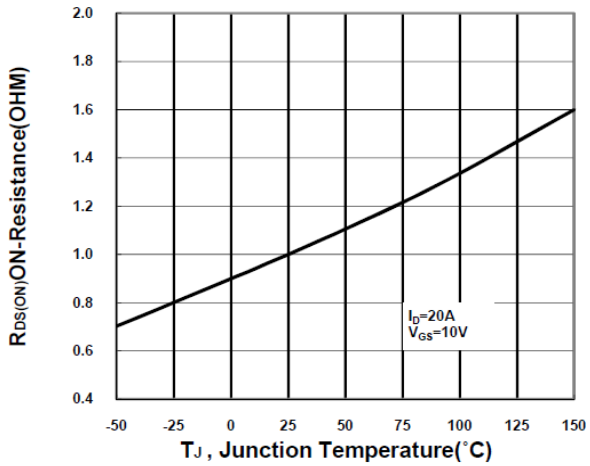
Output Characteristics



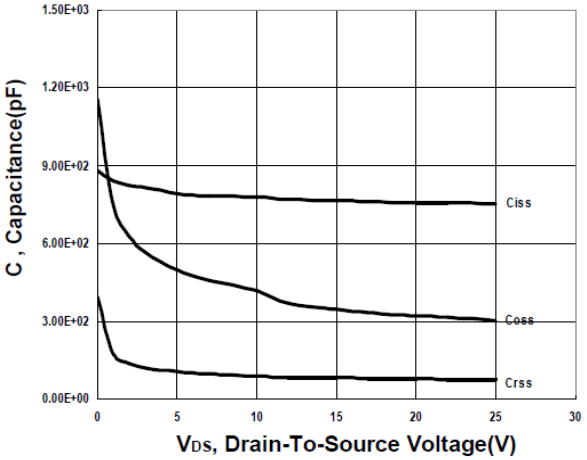
Transfer Characteristics



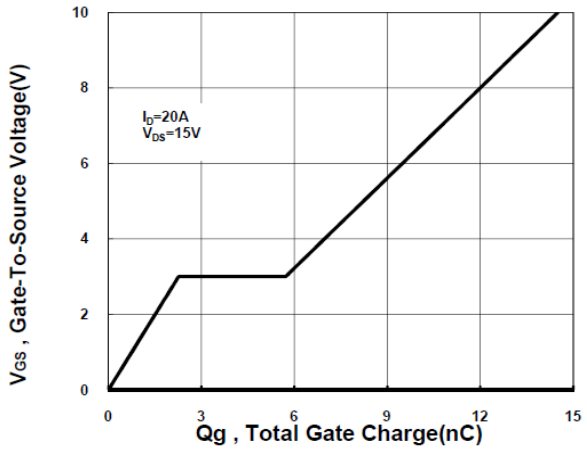
On-Resistance VS Temperature



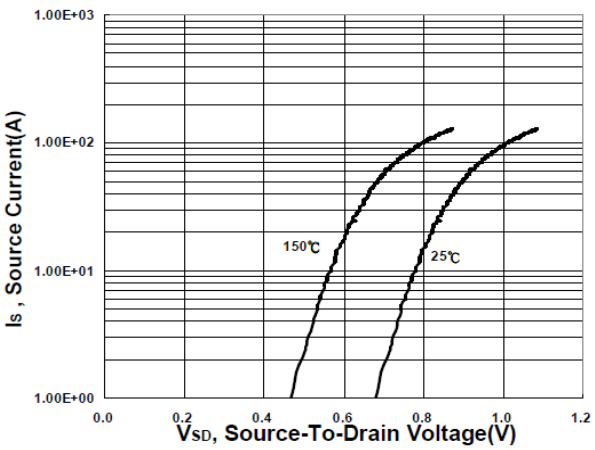
Capacitance Characteristic



Gate charge Characteristics



Source-Drain Diode Forward Voltage



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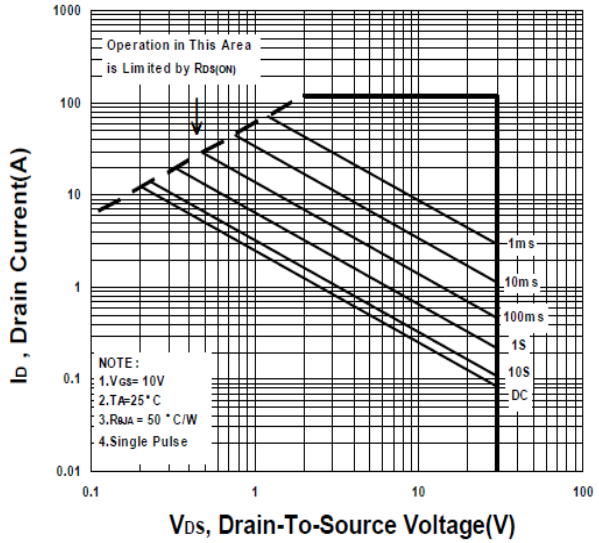
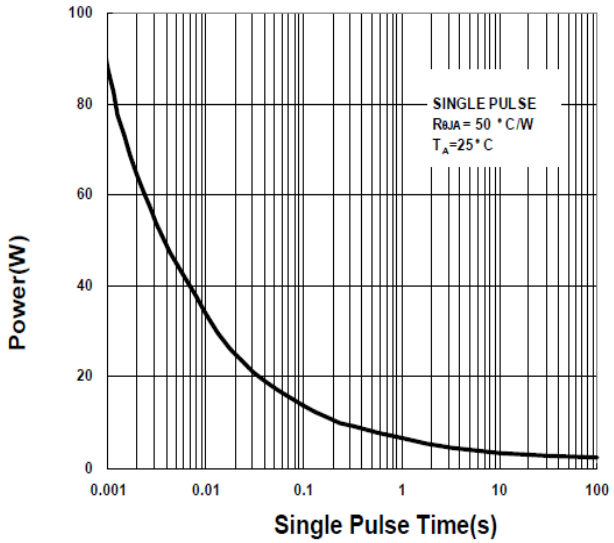
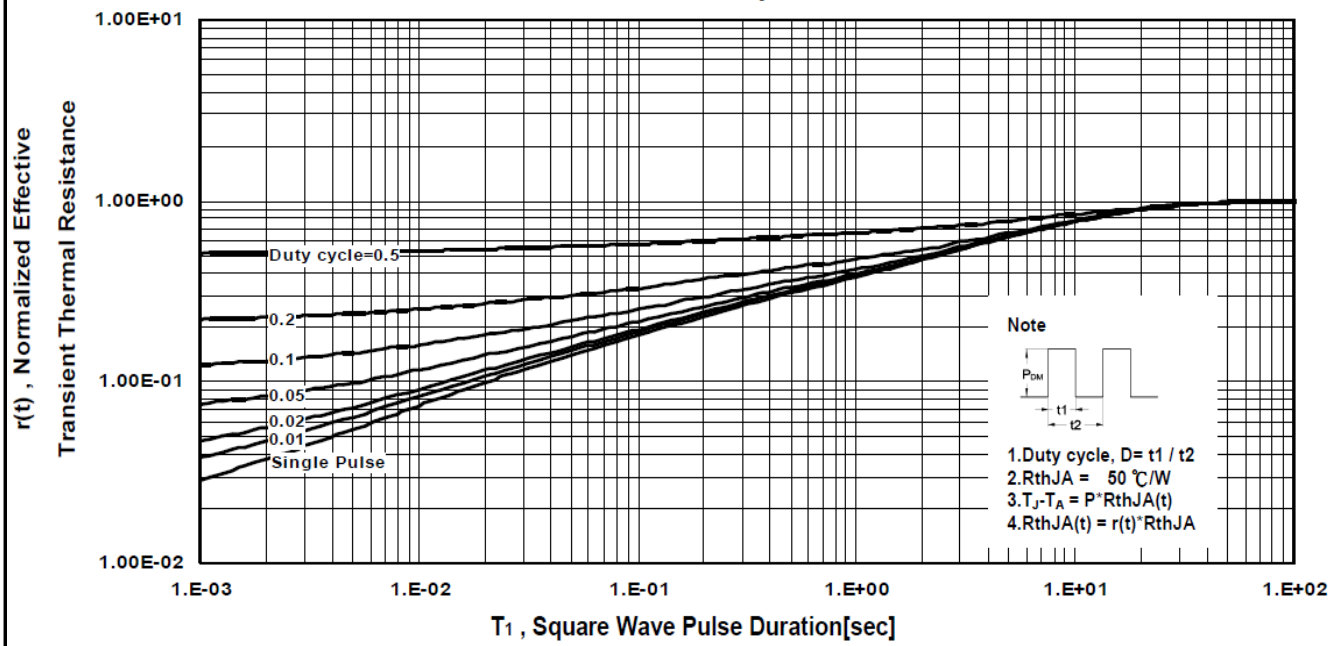
Safe Operating Area



Single Pulse Maximum Power Dissipation



Transient Thermal Response Curve



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Package Dimension

PDFN 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