UNIKC Semiconductor

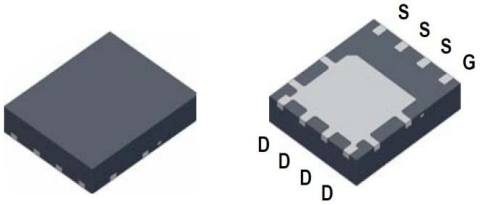
RoHS Compliant

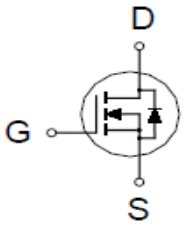
P1006BK

N-Channel Enhancement Mode MOSFET

PRODUCT SUMMARY

$V_{(BR)DSS}$	$R_{DS(ON)}$	I_D
60V	10mΩ @V_{GS} = 10V	43A





PDFN 5X6P

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

PARAMETERS/TEST CONDITIONS		SYMBOL	LIMITS	UNITS
Drain-Source Voltage		V_{DS}	60	V
Gate-Source Voltage		V_{GS}	±20	V
Continuous Drain Current[3]	T_c = 25 °C	I_D	43	A
	T_c = 100 °C		27	
Pulsed Drain Current[1]		I_{DM}	120	
Continuous Drain Current	T_A = 25 °C	I_D	10	
	T_A= 70 °C		8	
Avalanche Current		I_{AS}	38	
Avalanche Energy	L =0.1mH	E_{AS}	72	mJ
Power Dissipation	T_C = 25 °C	P_D	41	W
	T_C = 100 °C		16	
Power Dissipation	T_A = 25 °C	P_D	2.1	W
	T_A = 70 °C		1.4	
Operating Junction & Storage Temperature Range		T_J, T_{stg}	-55 to 150	°C

THERMAL RESISTANCE RATINGS

THERMAL RESISTANCE	SYMBOL	TYPICAL	MAXIMUM	UNITS
Junction-to-Ambient[2]	$R_{\theta JA}$		58	°C / W
Junction-to-Case	$R_{\theta JC}$		3	

[1]Pulse width limited by maximum junction temperature.

[2]The value of $R_{\theta JA}$ is measured with the device mounted on 1in^2 FR-4 board with 2oz. Copper, in a still air environment with T_A =25°C.

[3]Package limitation current is 35A.

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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	60			V
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250μA	1.3	1.6	2.3	
Gate-Body Leakage	I_{GSS}	V_{DS} = 0V, V_{GS} = ±20V			±100	nA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 48V, V_{GS} = 0V			1	μA
		V_{DS} = 40V, V_{GS} = 0V, T_J = 55 °C			10	
Drain-Source On-State Resistance[1]	$R_{DS(ON)}$	V_{GS} = 4.5V, I_D = 10A		9.3	13	mΩ
		V_{GS} = 10V , I_D = 10A		8.2	10	
Forward Transconductance[1]	g_{fs}	V_{DS} = 5V, I_D = 10A		44		S
DYNAMIC						
Input Capacitance	C_{iss}	V_{GS} = 0V, V_{DS} = 25V, f = 1MHz		1865		pF
Output Capacitance	C_{oss}			215		
Reverse Transfer Capacitance	C_{rss}			144		
Gate Resistance	R_g	V_{GS} = 0V, V_{DS} = 0V, f = 1MHz		0.8		Ω
Total Gate Charge[2]	Q_g V_{GS} =10V	V_{DS} = 30V,I_D = 10A		45.3		nC
	Q_g V_{GS} =4.5V			24.7		
Gate-Source Charge[2]	Q_{gs}			5.3		
Gate-Drain Charge[2]	Q_{gd}			13.3		
Turn-On Delay Time[2]	$t_{d(on)}$	V_{DS} = 30V, I_D ≅ 10A, V_{GS} = 10V, R_{GEN} = 6Ω		32		nS
Rise Time[2]	t_r			34		
Turn-Off Delay Time[2]	$t_{d(off)}$			56		
Fall Time[2]	t_f			36		
SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS (T_J = 25 °C)						
Continuous Current[3]	I_S				37	A
Forward Voltage[1]	V_{SD}	I_F = 10A, V_{GS} = 0V			1.3	V
Reverse Recovery Time	t_{rr}	I_F = 10A, dI_F/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.

[3]Package limitation current is 35A.

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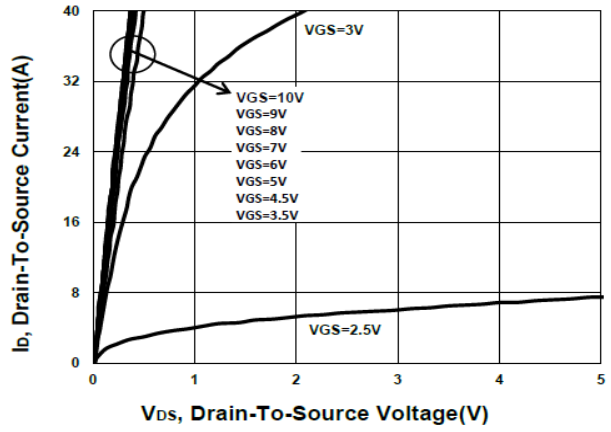
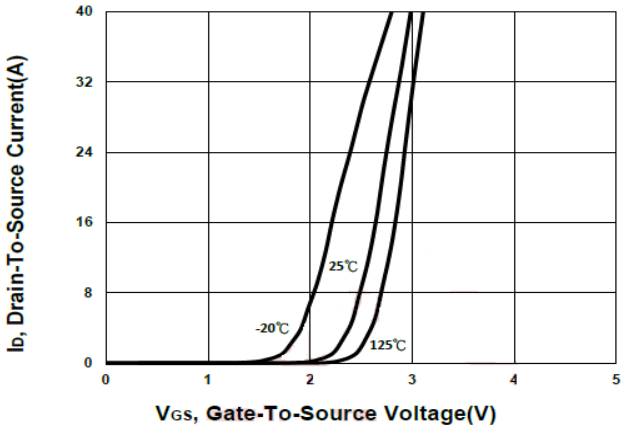
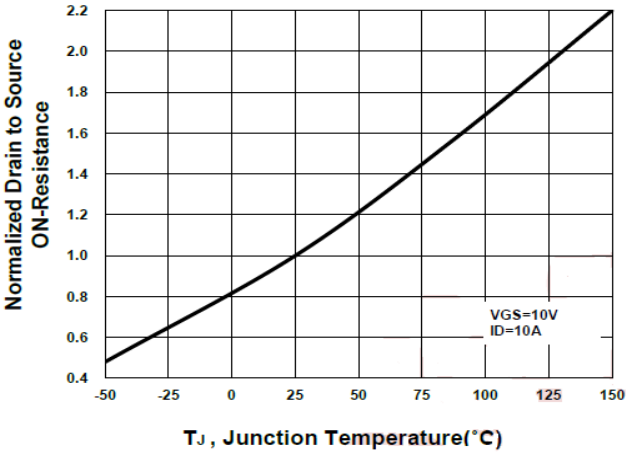
Output Characteristics



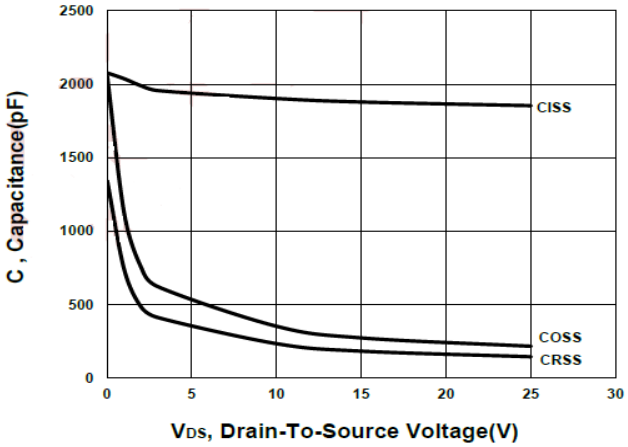
Transfer Characteristics



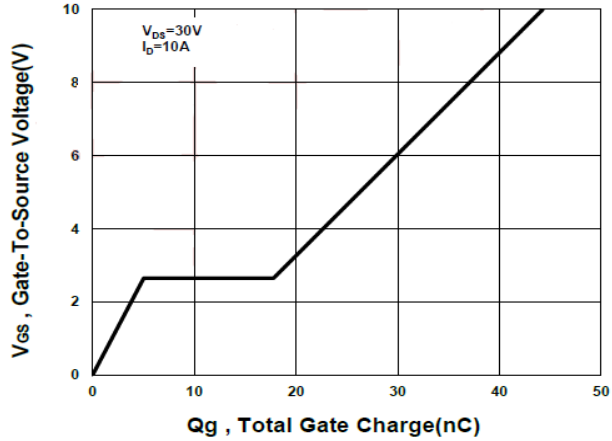
On-Resistance VS Temperature



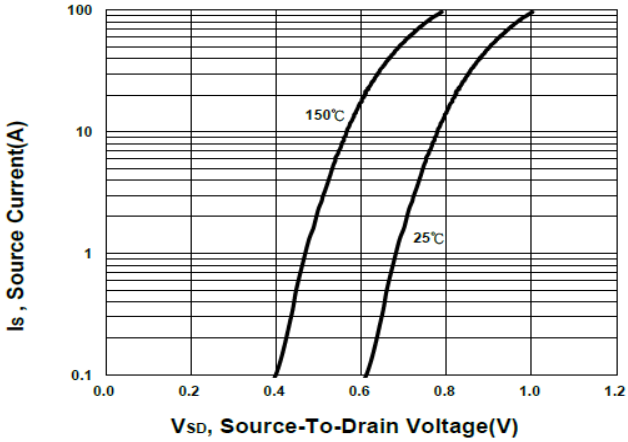
Capacitance Characteristic



Gate charge Characteristics



Source-Drain Diode Forward Voltage



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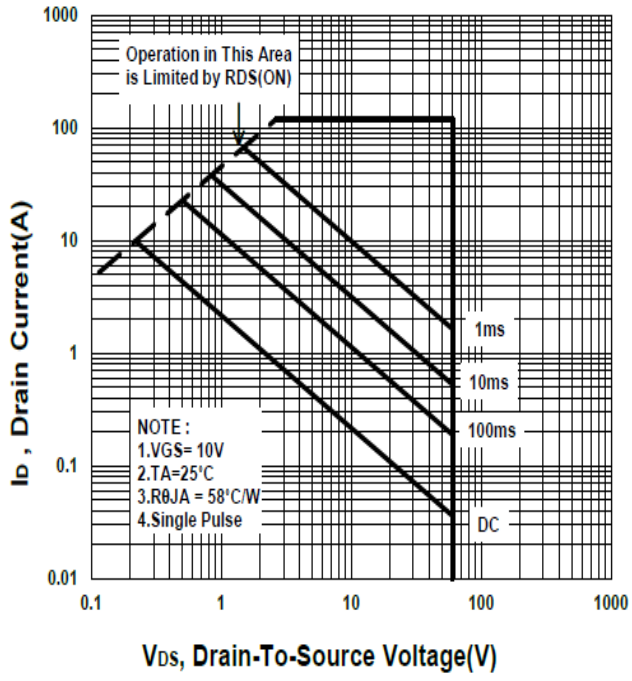
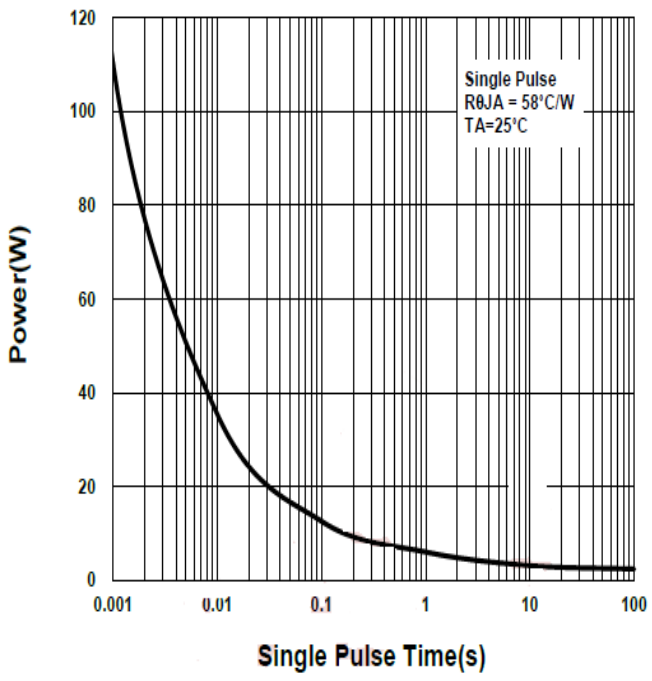
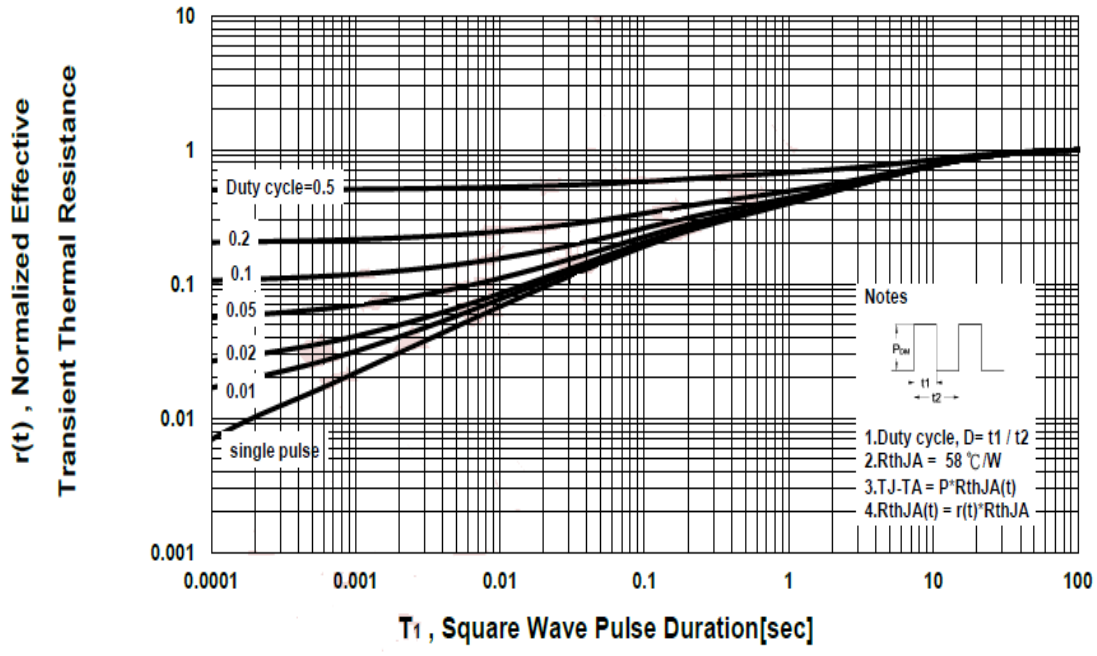
Safe Operating Area



Single Pulse Maximum Power Dissipation



Transient Thermal Response Curve



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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