UNIKC
Semiconductor

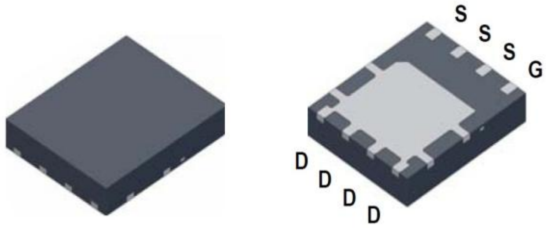
RoHS Compliant

PK516BA

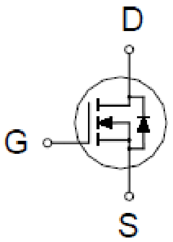
N-Channel Enhancement Mode MOSFET

PRODUCT SUMMARY

$V_{(BR)DSS}$	$R_{DS(ON)}$	I_D
30V	7mΩ @V_{GS} = 10V	51A



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[3]	T_C = 25 °C	I_D	51	A
	T_C = 100 °C		32	
Pulsed Drain Current[1]		I_{DM}	120	
Continuous Drain Current	T_A = 25 °C	I_D	14	
	T_A = 70 °C		11	
Avalanche Current		I_{AS}	27	
Avalanche Energy	L = 0.1mH	E_{AS}	36	mJ
Power Dissipation	T_C = 25 °C	P_D	31	W
	T_C = 100 °C		12	
Power Dissipation	T_A = 25 °C	P_D	2.4	
	T_A = 70 °C		1.5	
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	$R_{\theta JC}$		4	°C / W
Junction-to-Ambient[2]	$R_{\theta JA}$		51	

[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 40A.

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

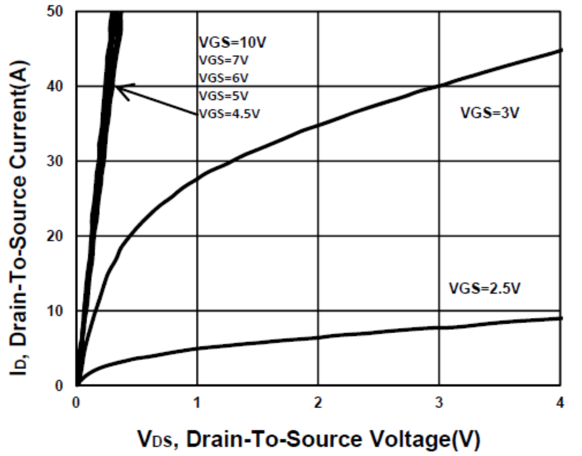
PARAMETER	SYMBOL	TEST CONDITIONS	LIMITS			UNITS
			MIN	TYP	MAX	
STATIC						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS} = 0V, I_D = 250μA	30			V
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250μA	1.5	1.75	2.35	
Gate-Body Leakage	I_{GSS}	V_{DS} = 0V, V_{GS} = ±20V			±100	nA
Zero 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		7	9.5	mΩ
		V_{GS} = 10V, I_D = 20A		5.5	7	
Forward Transconductance[1]	g_{fs}	V_{DS} = 5V, I_D = 20A		60		S
DYNAMIC						
Input Capacitance	C_{iss}	V_{GS} = 0V, V_{DS} = 15V, f = 1MHz		968		pF
Output Capacitance	C_{oss}			162		
Reverse Transfer Capacitance	C_{rss}			116		
Gate Resistance	R_g	V_{GS} = 0V, V_{DS} = 0V, f = 1MHz		1.8		Ω
Total Gate Charge[2]	Q_g V_{GS}=10V	V_{DS} = 15V, I_D = 20A,V_{GS} = 10V		22		nC
	V_{GS}=4.5V			12		
Gate-Source Charge[2]	Q_{gs}			2.4		
Gate-Drain Charge[2]	Q_{gd}			7.1		
Turn-On Delay Time[2]	$t_{d(on)}$	V_{DS} = 15V,I_D ≅ 20A, V_{GS}=10V, R_{GEN}= 6Ω		19		nS
Rise Time[2]	t_r			15		
Turn-Off Delay Time[2]	$t_{d(off)}$			35		
Fall Time[2]	t_f			16		
SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS (T_J = 25 °C)						
Continuous Current[3]	I_S				25	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		16		nS
Reverse Recovery Charge	Q_{rr}			6		nC

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

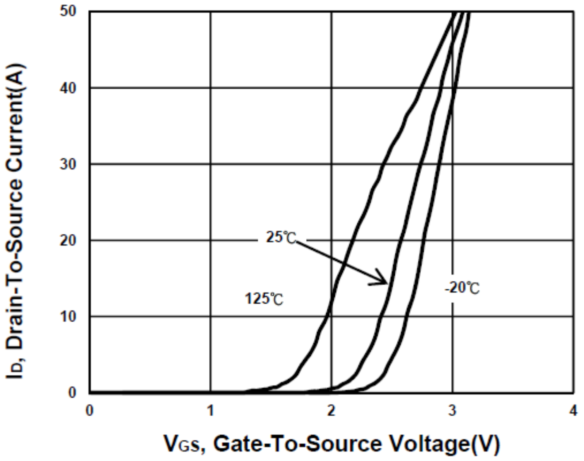
[2] Independent of operating temperature.

[3] Package limitation current is 40A.

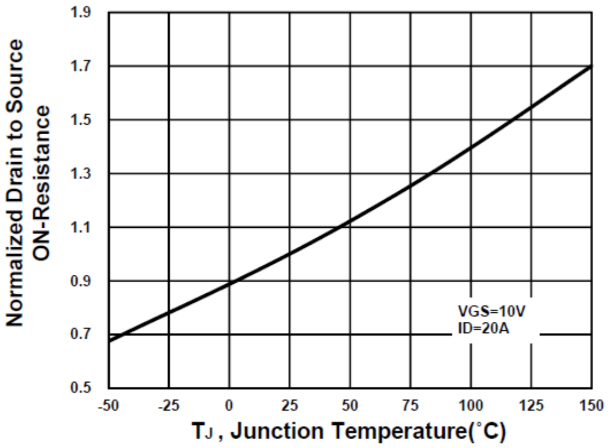
Output Characteristics



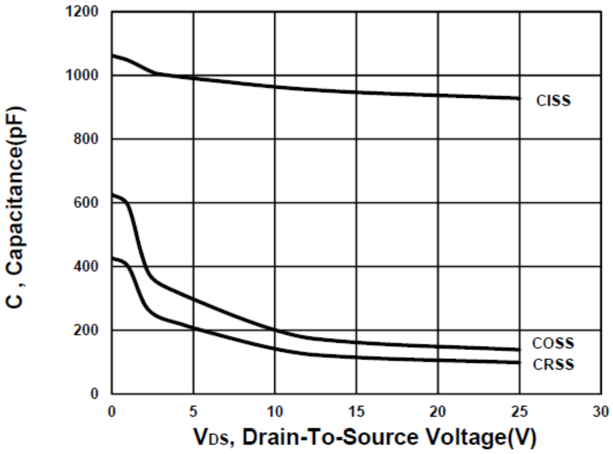
Transfer Characteristics



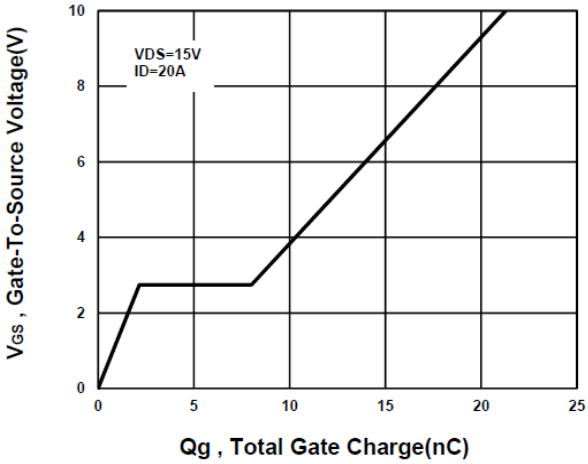
On-Resistance VS Temperature



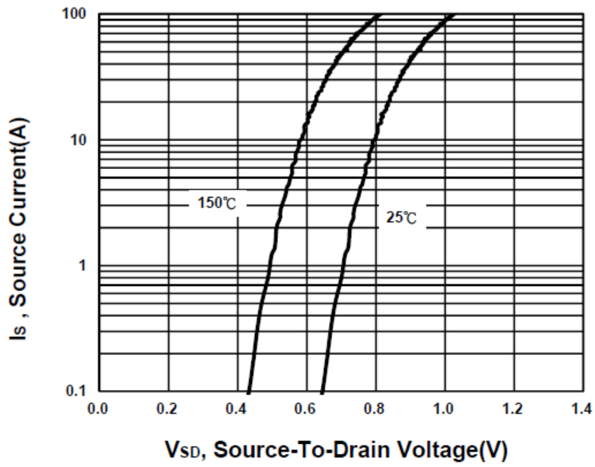
Capacitance Characteristic



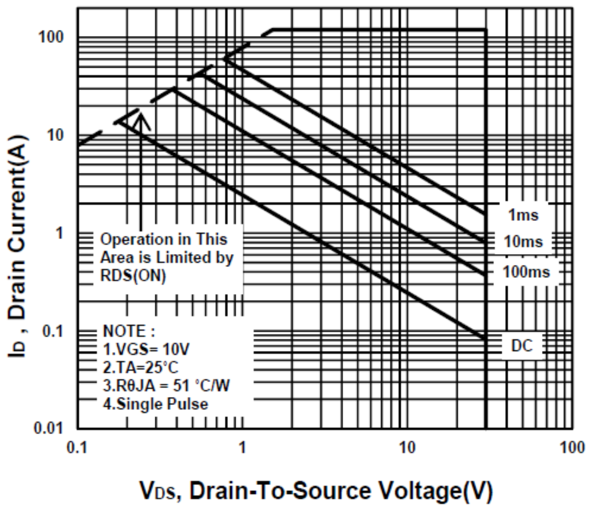
Gate charge Characteristics



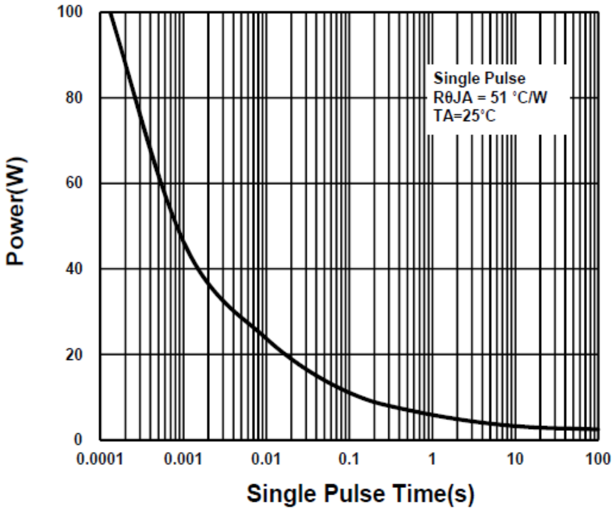
Source-Drain Diode Forward Voltage



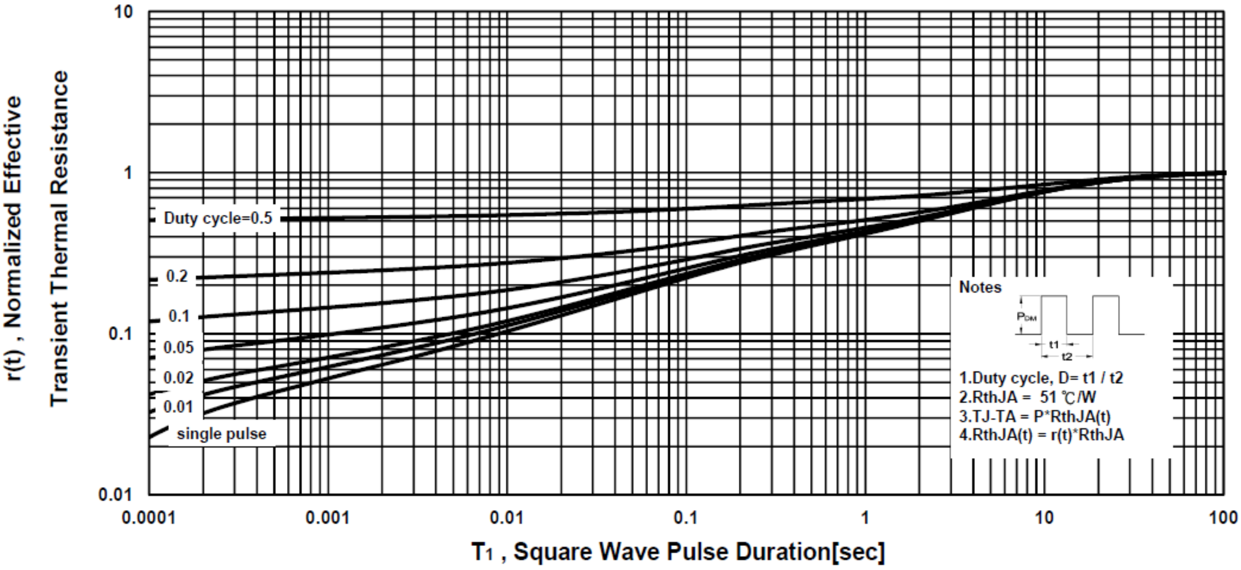
Safe Operating Area



Single Pulse Maximum Power Dissipation



Transient Thermal Response Curve



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