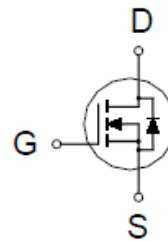
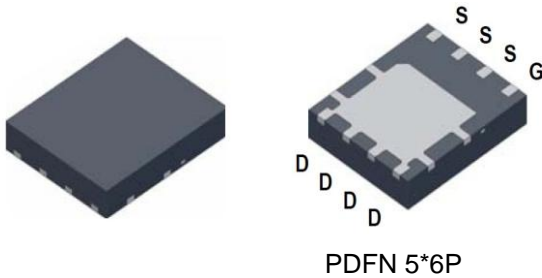


# PK510BA

## N-Channel Enhancement Mode MOSFET

### PRODUCT SUMMARY

$V_{(BR)DSS}$	$R_{DS(ON)}$	$I_D^2$
30V	3.3m $\Omega$ @ $V_{GS} = 10V$	86A



### ABSOLUTE MAXIMUM RATINGS ( $T_A = 25\text{ }^\circ\text{C}$ Unless Otherwise Noted)

PARAMETERS/TEST CONDITIONS		SYMBOL	LIMITS	UNITS
Drain-Source Voltage		$V_{DS}$	30	V
Gate-Source Voltage		$V_{GS}$	$\pm 20$	
Continuous Drain Current <sup>2</sup>	$T_C = 25\text{ }^\circ\text{C}$	$I_D$	86	A
	$T_C = 100\text{ }^\circ\text{C}$		54	
Pulsed Drain Current <sup>1</sup>		$I_{DM}$	150	
Continuous Drain Current	$T_A = 25\text{ }^\circ\text{C}$	$I_D$	21	
	$T_A = 70\text{ }^\circ\text{C}$		16	
Avalanche Current		$I_{AS}$	47	
Avalanche Energy	$L = 0.1\text{mH}$	$E_{AS}$	110	mJ
Power Dissipation	$T_C = 25\text{ }^\circ\text{C}$	$P_D$	41	W
	$T_C = 100\text{ }^\circ\text{C}$		16	
Power Dissipation	$T_A = 25\text{ }^\circ\text{C}$	$P_D$	2.5	
	$T_A = 70\text{ }^\circ\text{C}$		1.6	
Operating Junction & Storage Temperature Range		$T_J, T_{STG}$	-55 to 150	$^\circ\text{C}$

### THERMAL RESISTANCE RATINGS

THERMAL RESISTANCE	SYMBOL	TYPICAL	MAXIMUM	UNITS
Junction-to-Case	$R_{\theta JC}$		3	$^\circ\text{C} / \text{W}$
Junction-to-Ambient <sup>3</sup>	$R_{\theta JA}$		50	

<sup>1</sup>Pulse width limited by maximum junction temperature.

<sup>2</sup>Package limitation current is 50A

<sup>3</sup>The value of  $R_{\theta JA}$  is measured with the device mounted on 1in<sup>2</sup> FR-4 board with 2oz.Copper, in a still air environment with  $T_A=25^\circ\text{C}$

# PK510BA

## N-Channel Enhancement Mode MOSFET

### ELECTRICAL CHARACTERISTICS (T<sub>J</sub> = 25 °C, Unless Otherwise Noted)

PARAMETER	SYMBOL	TEST CONDITIONS	LIMITS			UNIT	
			MIN	TYP	MAX		
<b>STATIC</b>							
Drain-Source Breakdown Voltage	V <sub>(BR)DSS</sub>	V <sub>GS</sub> = 0V, I <sub>D</sub> = 250μA	30			V	
Gate Threshold Voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = 250μA	1.3	1.6	3	V	
Gate-Body Leakage	I <sub>GSS</sub>	V <sub>DS</sub> = 0V, V <sub>GS</sub> = ±20V			±100	nA	
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> = 24V, V <sub>GS</sub> = 0V,			1	μA	
		V <sub>DS</sub> = 20V, V <sub>GS</sub> = 0V, T <sub>J</sub> = 55 °C			10		
Drain-Source On-State Resistance <sup>1</sup>	R <sub>DS(ON)</sub>	V <sub>GS</sub> = 4.5V, I <sub>D</sub> = 16A		3.4	4	mΩ	
		V <sub>GS</sub> = 10V, I <sub>D</sub> = 20A		2.8	3.3		
Forward Transconductance <sup>1</sup>	g <sub>fs</sub>	V <sub>DS</sub> = 5V, I <sub>D</sub> = 20A		100		S	
<b>DYNAMIC</b>							
Input Capacitance	C <sub>iss</sub>	V <sub>GS</sub> = 0V, V <sub>DS</sub> = 15V, f = 1MHz		2623		pF	
Output Capacitance	C <sub>oss</sub>			350			
Reverse Transfer Capacitance	C <sub>rss</sub>			244			
Gate Resistance	R <sub>g</sub>	V <sub>GS</sub> = 0V, V <sub>DS</sub> = 0V, f = 1MHz		1		Ω	
Total Gate Charge <sup>2</sup>	Q <sub>g</sub>	V <sub>GS</sub> =10V	V <sub>DS</sub> = 15V, I <sub>D</sub> = 20A, V <sub>GS</sub> = 10V		66	nC	
		V <sub>GS</sub> =4.5V			34		
Gate-Source Charge <sup>2</sup>	Q <sub>gs</sub>			9			
Gate-Drain Charge <sup>2</sup>	Q <sub>gd</sub>			16			
Turn-On Delay Time <sup>2</sup>	t <sub>d(on)</sub>	V <sub>DS</sub> = 15V, I <sub>D</sub> ≅ 20A, V <sub>GS</sub> =20V, R <sub>GEN</sub> = 6Ω			25		nS
Rise Time <sup>2</sup>	t <sub>r</sub>				12		
Turn-Off Delay Time <sup>2</sup>	t <sub>d(off)</sub>			56			
Fall Time <sup>2</sup>	t <sub>f</sub>			10			
<b>SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS (T<sub>J</sub> = 25 °C)</b>							
Continuous Current <sup>3</sup>	I <sub>S</sub>				86	A	
Forward Voltage <sup>1</sup>	V <sub>SD</sub>	I <sub>F</sub> = 20A, V <sub>GS</sub> = 0V			1	V	
Reverse Recovery Time	t <sub>rr</sub>	I <sub>F</sub> = 20 A, dI <sub>F</sub> /dt = 100A /μS		28		nS	
Reverse Recovery Charge	Q <sub>rr</sub>			15		nC	

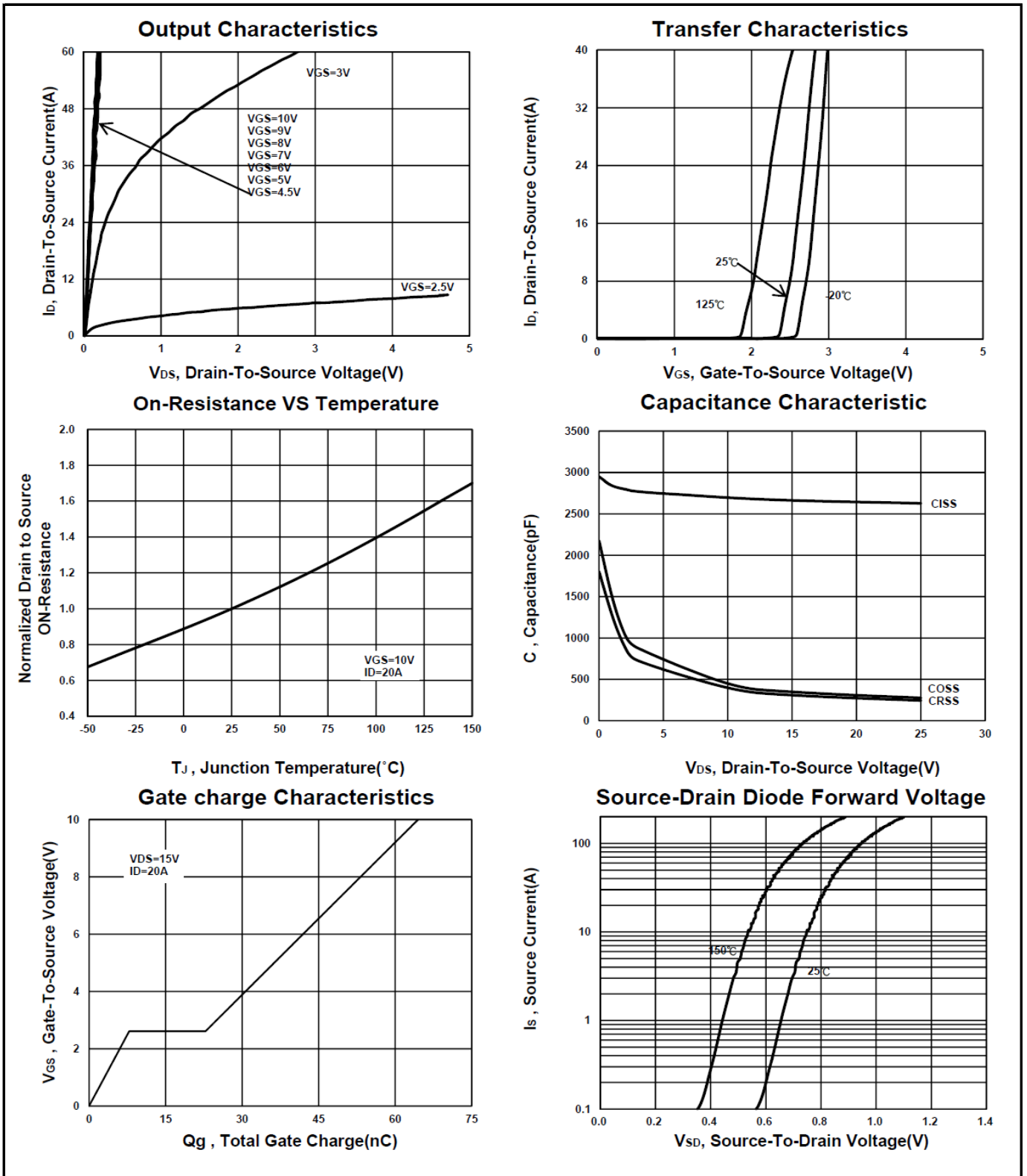
<sup>1</sup>Pulse test : Pulse Width ≤ 300 μsec, Duty Cycle ≤ 2%.

<sup>2</sup>Independent of operating temperature.

<sup>3</sup>Package limitation current is 50A

# PK510BA

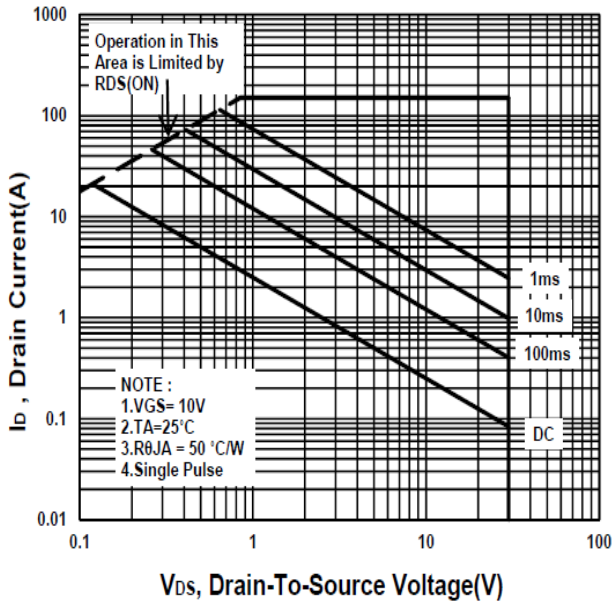
## N-Channel Enhancement Mode MOSFET



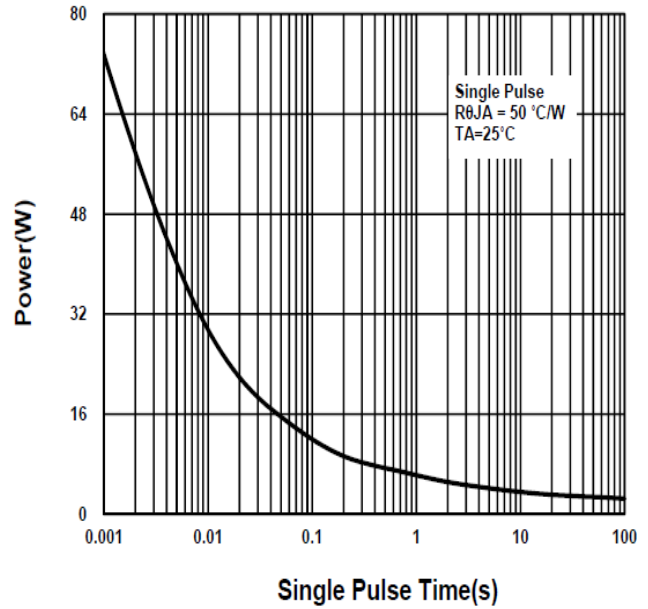
# PK510BA

## N-Channel Enhancement Mode MOSFET

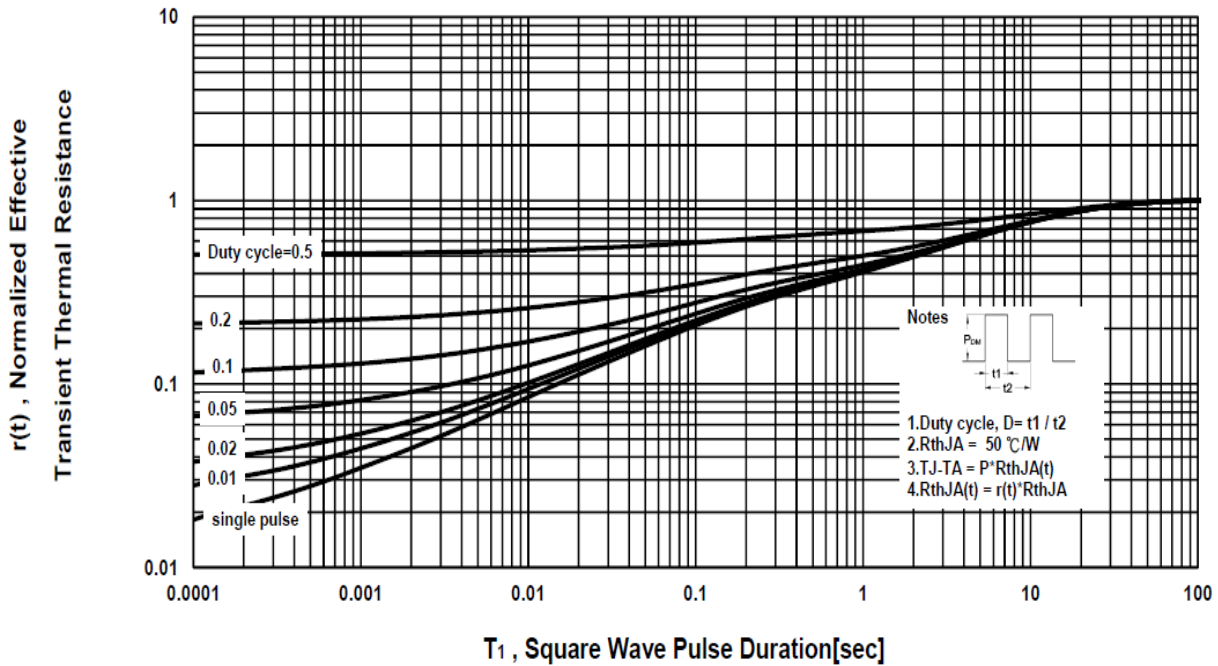
**Safe Operating Area**



**Single Pulse Maximum Power Dissipation**



**Transient Thermal Response Curve**



# PK510BA

## N-Channel Enhancement Mode MOSFET

### 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				

