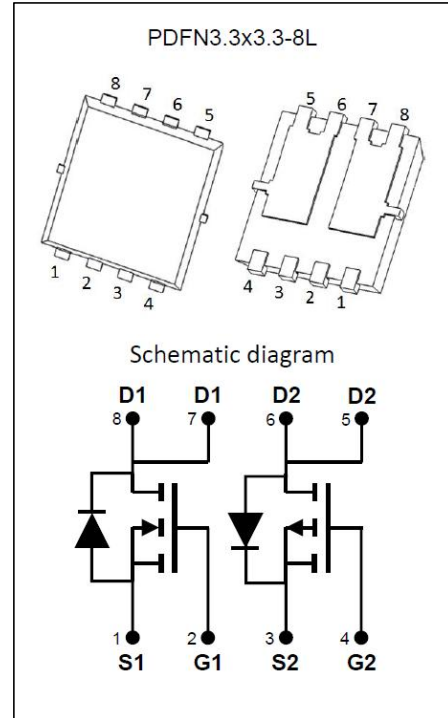




**PDFN3.3×3.3-8L Plastic-Encapsulate MOSFETS**

**CCM30NP16P33 N- and P-Channel Power MOSFET**

V <sub>(BR)DSS</sub>	R <sub>DS(on)TYP</sub>	I <sub>b</sub>
-30V	12mΩ@-10V	-30A
	17mΩ@-4.5V	
30V	10mΩ@10V	31A
	17mΩ@4.5V	



**Feature**

- Low drain-source ON-resistance
- High forward transfer admittance
- Low leakage current
- AEC-Q101 Qualified

**Application**

- Low voltage applications

**MARKING**



30NP16 = Device Code

XX = Date Code

Solid dot = Green Device

**ABSOLUTE MAXIMUM RATINGS (T<sub>a</sub>=25°C unless otherwise noted)**

Parameter	Symbol	Value	Unit	Test Condition
<b>P-MOSFET</b>				
Drain-Source Voltage	V <sub>DS</sub>	-30	V	
Gate-Source Voltage	V <sub>GS</sub>	±20	V	
Continuous Drain Current <sup>(1)</sup>	I <sub>D</sub>	-14	A	T <sub>A</sub> =25°C
		-30		T <sub>C</sub> =25°C
Pulsed Drain Current	I <sub>DM</sub>	-120	A	
<b>N-MOSFET</b>				
Drain-Source Voltage	V <sub>DS</sub>	30	V	
Gate-Source Voltage	V <sub>GS</sub>	±20	V	
Continuous Drain Current	I <sub>D</sub>	14	A	T <sub>A</sub> =25°C
		31		T <sub>C</sub> =25°C
Pulsed Drain Current <sup>(1)</sup>	I <sub>DM</sub>	120	A	
<b>Temperature and Thermal Resistance</b>				
Thermal Resistance <sup>(2)</sup>	R <sub>θJA</sub>	44.6	°C/W	from Junction to Ambient
	R <sub>θJC</sub>	9.2	°C/W	from Junction to Case
Power Dissipation	P <sub>D</sub>	3.36	W	T <sub>A</sub> =25°C
		16.3		T <sub>C</sub> =25°C
Junction Temperature	T <sub>J</sub>	175	°C	
Storage Temperature	T <sub>STG</sub>	-55~ +175	°C	

**P-channel MOSFET ELECTRICAL CHARACTERISTICS(T<sub>a</sub>=25°C unless otherwise noted)**

Parameter	Symbol	Test Condition	Min	Type	Max	Unit
<b>Static Characteristics</b>						
Drain-source breakdown voltage	V <sub>(BR)DSS</sub>	V <sub>GS</sub> = 0V, I <sub>D</sub> = -250μA	-30			V
Zero gate voltage drain current	I <sub>DSS</sub>	V <sub>DS</sub> = -24V, V <sub>GS</sub> = 0V			-1	μA
Gate-body leakage current	I <sub>GSS</sub>	V <sub>GS</sub> = ±20V, V <sub>DS</sub> = 0V			±100	nA
Gate threshold voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = -250μA	-1.0	-1.5	-3.0	V
Drain-source on-resistance <sup>(3)</sup>	R <sub>DS(on)</sub>	V <sub>GS</sub> = -10V, I <sub>D</sub> = -5A		12	16	mΩ
		V <sub>GS</sub> = -4.5V, I <sub>D</sub> = -5A		17	26	
Forward transconductance	g <sub>FS</sub>	V <sub>DS</sub> = -10V, I <sub>D</sub> = -10A	5	16		S
Diode forward voltage <sup>(3)</sup>	V <sub>DS</sub>	I <sub>S</sub> = -5A, V <sub>GS</sub> = 0V			-1.2	V
<b>Dynamic characteristics<sup>(4)</sup></b>						
Input Capacitance	C <sub>iss</sub>	V <sub>DS</sub> = -15V, V <sub>GS</sub> = 0V, F = 1.0MHz		1350		pF
Output Capacitance	C <sub>oss</sub>			215		
Reverse Transfer Capacitance	C <sub>rss</sub>			185		
Total gate charge	Q <sub>g</sub>	V <sub>DS</sub> = -15V, I <sub>D</sub> = -9.1A, V <sub>GS</sub> = -4.5V		15		nC
Gate-source charge	Q <sub>gs</sub>			4		
Gate-drain charge	Q <sub>gd</sub>			7.5		
<b>Switching Characteristics<sup>(4)</sup></b>						
Turn-on delay time	t <sub>d(on)</sub>	V <sub>DD</sub> = -15V, I <sub>D</sub> = -1A V <sub>GS</sub> = -10V, R <sub>GEN</sub> = 1Ω R <sub>L</sub> = 15Ω			15	nS
Turn-on rise time	t <sub>r</sub>				15	
Turn-off delay time	t <sub>d(off)</sub>				70	
Turn-off fall time	t <sub>f</sub>				25	

## N-channel MOSFET ELECTRICAL CHARACTERISTICS( $T_a=25^\circ\text{C}$ unless otherwise noted)

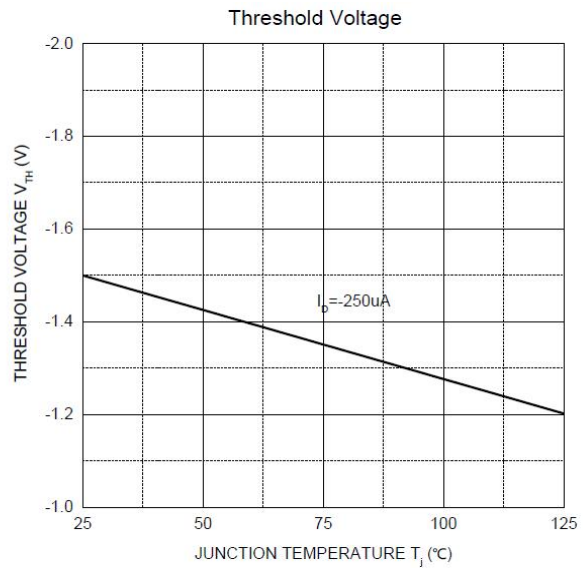
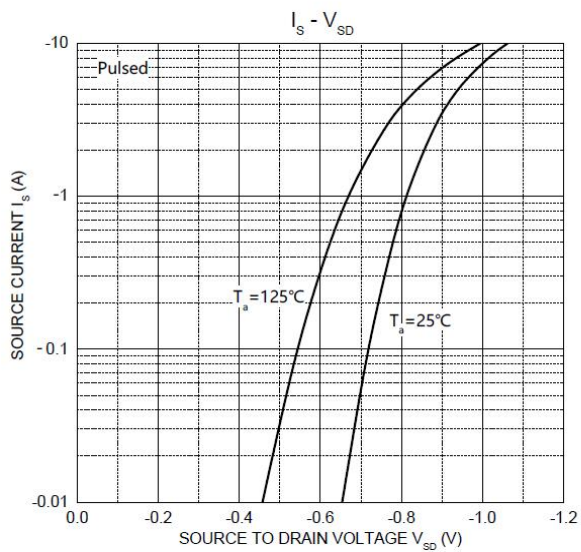
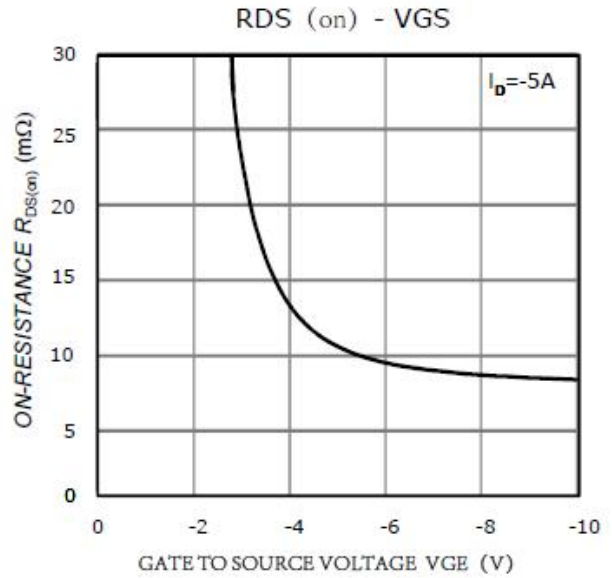
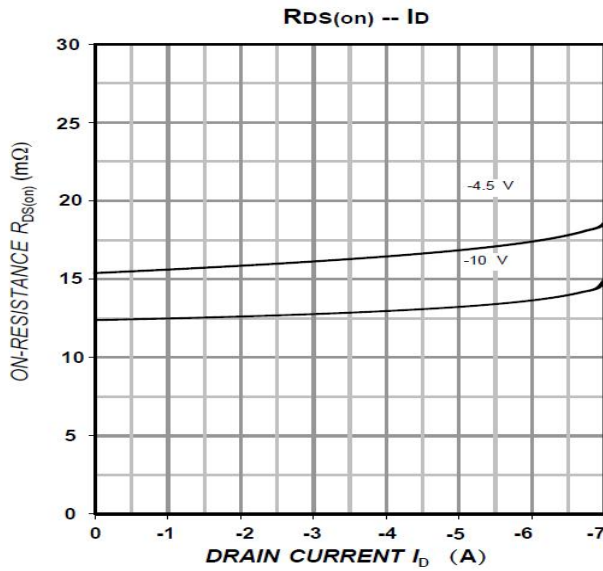
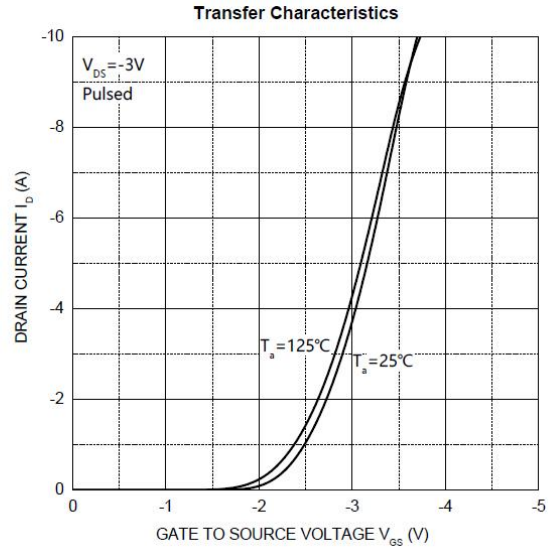
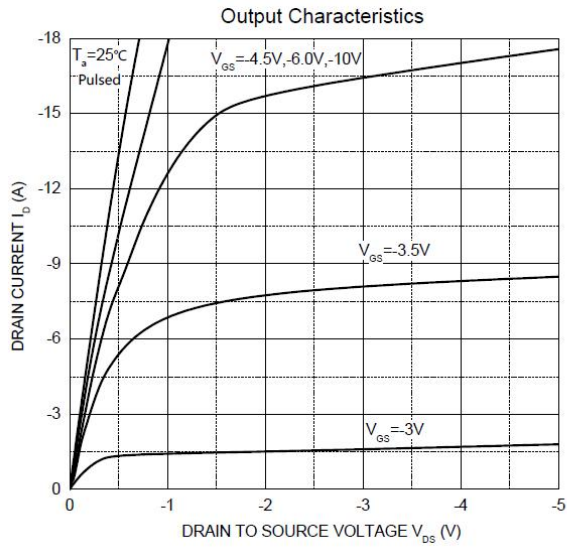
Parameter	Symbol	Test Condition	Min	Type	Max	Unit
<b>Static Characteristics</b>						
Drain-source breakdown voltage	$V_{(BR)DSS}$	$V_{GS} = 0V, I_D = 250\mu A$	30			V
Zero gate voltage drain current	$I_{DSS}$	$V_{DS} = 24V, V_{GS} = 0V$			1	$\mu A$
Gate-body leakage current	$I_{GSS}$	$V_{GS} = \pm 20V, V_{DS} = 0V$			$\pm 100$	nA
Gate threshold voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\mu A$	1.0	1.5	3.0	V
Drain-source on-resistance <sup>(3)</sup>	$R_{DS(on)}$	$V_{GS} = 10V, I_D = 5A$		10	14	m $\Omega$
		$V_{GS} = 4.5V, I_D = 5A$		17	26	
Forward transconductance	$g_{FS}$	$V_{DS} = 5V, I_D = 10A$	10	43		S
Diode Forward voltage <sup>(3)</sup>	$V_{DS}$	$I_S = 5A, V_{GS} = 0V$			1.2	V
<b>Dynamic characteristics<sup>(4)</sup></b>						
Input Capacitance	$C_{iss}$	$V_{DS} = 15V, V_{GS} = 0V, F = 1.0MHz$		968		pF
Output Capacitance	$C_{oss}$			146		
Reverse Transfer Capacitance	$C_{rss}$			136		
Total gate charge	$Q_g$	$V_{DS} = 15V, I_D = 10A, V_{GS} = 10V$		13		nC
Gate-source charge	$Q_{gs}$			3		
Gate-drain charge	$Q_{gd}$			4.5		
<b>Switching Characteristics<sup>(4)</sup></b>						
Turn-on delay time	$t_{d(on)}$	$V_{DD} = 15V, R_L = 1.8\Omega$			10	ns
Turn-on rise time	$t_r$				8	
Turn-off delay time	$t_{d(off)}$	$V_{GS} = 10V, R_{GEN} = 1.8\Omega$			30	
Turn-off fall time	$t_f$				5	

### Notes:

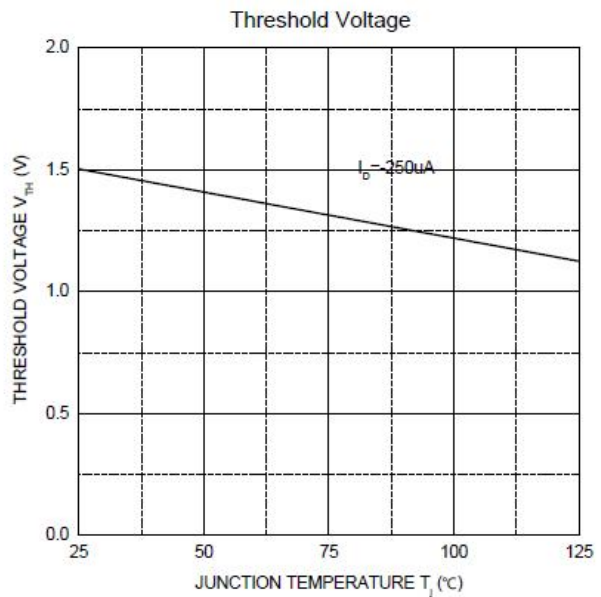
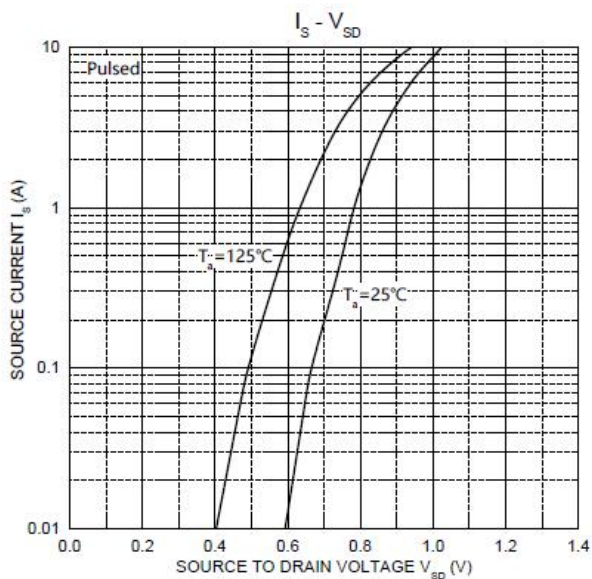
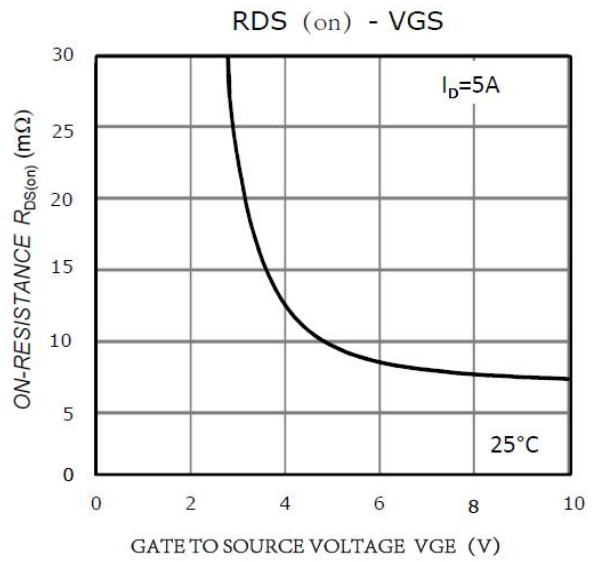
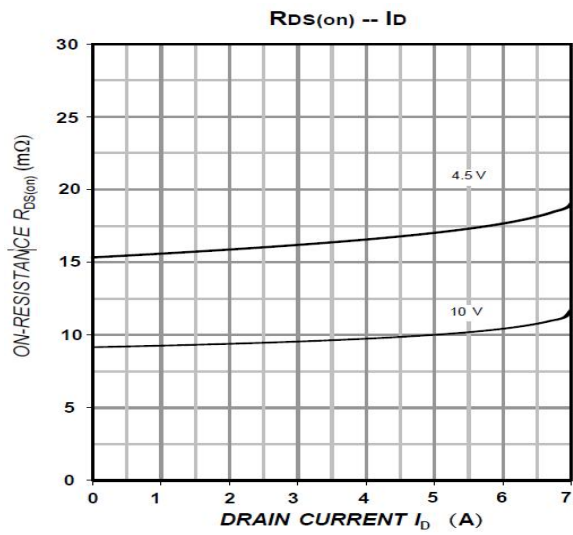
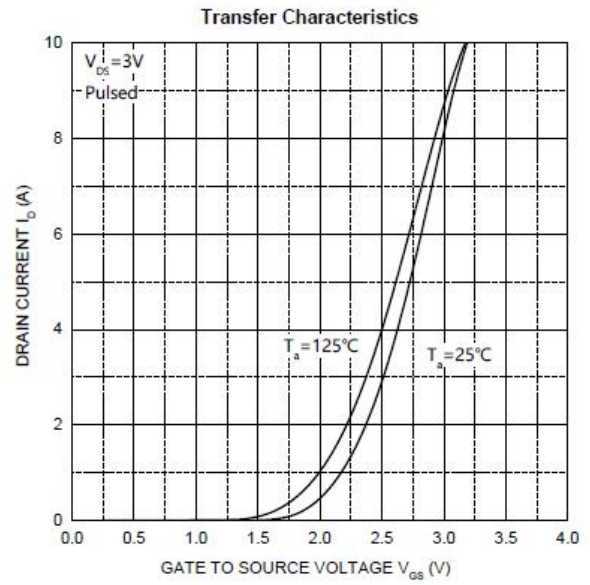
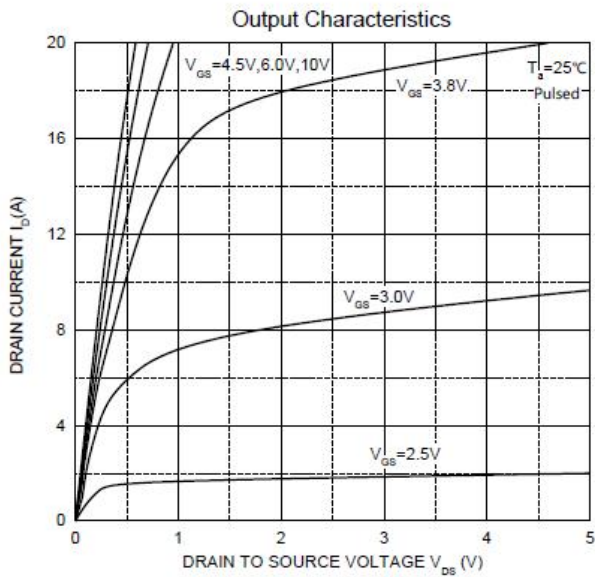
1. Repetitive Rating : Pulse width limited by maximum junction temperature.
2. Surface Mounted on FR4 Board,  $t < 5$  sec.
3. Pulse Test : Pulse Width  $\leq 300\mu s$ , Duty Cycle  $\leq 2\%$ .
4. Guaranteed by design, not subject to production testing.

# Typical Electrical and Thermal Characteristics

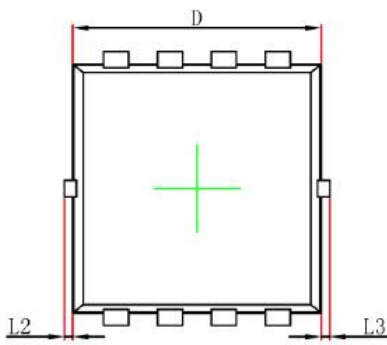
## P-Channel MOS



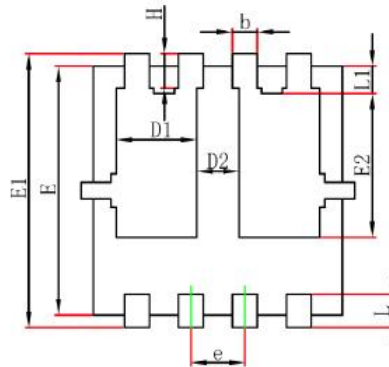
N-Channel MOS



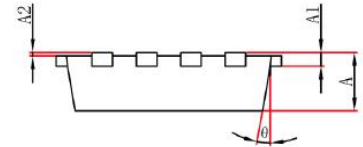
## PDFN3.3X3.3-8L Package Information



Top View  
[顶视图]



Bottom View  
[背视图]



Side View  
[侧视图]

Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.700	0.900	0.028	0.035
A1	0.152REF		0.006REF	
A2	0.000	0.050	0.000	0.002
D	2.900	3.200	0.114	0.126
D1	0.935	1.135	0.037	0.045
D2	0.280	0.480	0.011	0.019
E	2.900	3.200	0.114	0.126
E1	3.150	3.450	0.124	0.136
E2	1.535	1.935	0.060	0.076
b	0.200	0.400	0.008	0.016
e	0.550	0.750	0.022	0.030
L	0.300	0.500	0.012	0.020
L1	0.180	0.480	0.007	0.019
L2	0.000	0.100	0.000	0.004
L3	0.000	0.100	0.000	0.004
H	0.315	0.515	0.012	0.020
$\theta$	0°	12°	0°	12°

### NOTICE

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Date of change	Rev #	revise content
2023/05/10	A/0	/