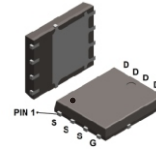


## ACMS68N04H8-HF

**N-Channel  
RoHS Device  
Halogen Free**



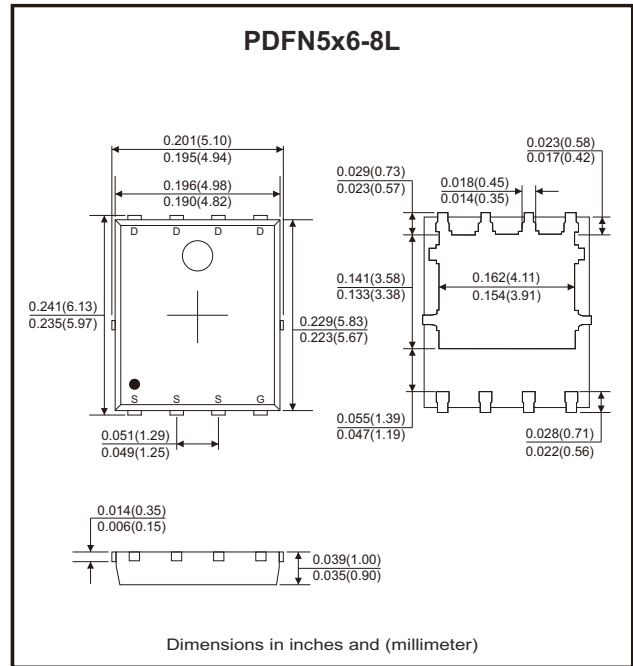
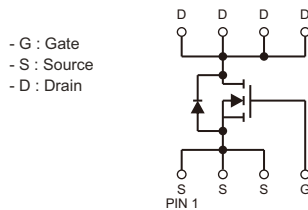
### Features

- Fast switching MOSFET for SMPS.
- Very low on-resistance  $R_{DS(ON)}$ .
- Advanced high cell density technology.
- AEC-Q101 Qualified.

### Mechanical data

- Case: PDFN5x6-8L, molded plastic.
- Molding compound: UL flammability classification rating 94V-0.
- Terminals: Matte tin plated leads, solderability per MIL-STD-202, method 208.

### Circuit Diagram



### Maximum Ratings (at $T_A=25^\circ\text{C}$ unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-source voltage	$V_{DSS}$	40	V
Gate-source voltage	$V_{GSS}$	$\pm 20$	V
Continuous drain current ( $V_{GS} = 10\text{V}$ , $T_c = 25^\circ\text{C}$ )	$I_D$	68	A
Continuous drain current ( $V_{GS} = 10\text{V}$ , $T_c = 100^\circ\text{C}$ )	$I_D$	43	
Continuous drain current ( $V_{GS} = 10\text{V}$ , $T_A = 25^\circ\text{C}$ )	$I_D$	15	
Continuous drain current ( $V_{GS} = 10\text{V}$ , $T_A = 100^\circ\text{C}$ )	$I_D$	9.6	
Pulsed drain current (Note 2)	$I_{DM}$	272	A
Single pulse avalanche energy (Note 3)	$E_{AS}$	94	mJ
Power dissipation ( $T_c = 25^\circ\text{C}$ )	$P_D$	50	W
Thermal resistance junction to air (Note 1)	$R_{\theta JA}$	50	$^\circ\text{C/W}$
Thermal resistance junction to case	Top	20	$^\circ\text{C/W}$
	Bottom	2.5	
Operating junction temperature range	$T_J$	-55 to +150	$^\circ\text{C}$
Storage temperature range	$T_{STG}$	-55 to +150	$^\circ\text{C}$

## Electrical Characteristics (at T<sub>J</sub>=25°C unless otherwise noted)

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
<b>Static Characteristics</b>						
Drain-source breakdown voltage	V <sub>DSS</sub>	V <sub>GS</sub> = 0V, I <sub>D</sub> = 250μA	40			V
Zero gate voltage drain current	I <sub>DSS</sub>	V <sub>DS</sub> = 40V, V <sub>GS</sub> = 0V, T <sub>J</sub> = 25°C			1	μA
		V <sub>DS</sub> = 40V, V <sub>GS</sub> = 0V, T <sub>C</sub> = 125°C			100	
Gate-body leakage current	I <sub>GSS</sub>	V <sub>GS</sub> = ±20V, V <sub>DS</sub> = 0V			±100	nA
<b>On Characteristics</b>						
Static drain-source on-resistance (Note 2)	R <sub>DS(on)</sub>	V <sub>GS</sub> = 10V, I <sub>D</sub> = 30A		4.8	6.2	mΩ
	R <sub>DS(on)</sub>	V <sub>GS</sub> = 4.5V, I <sub>D</sub> = 20A		6.9	11	mΩ
Gate threshold voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = 250μA	1	1.6	2.5	V
Gate resistance	R <sub>G</sub>	V <sub>DS</sub> = 0V, f = 1MHz	0.2	2	5	Ω
<b>Dynamic Characteristics</b>						
Input capacitance	C <sub>iss</sub>	V <sub>GS</sub> = 0V, V <sub>DS</sub> = 20V, f = 1MHz		2832		pF
Output capacitance	C <sub>OSS</sub>			251		
Reverse transfer capacitance	C <sub>rss</sub>			240		
<b>Switching Characteristics</b>						
Turn-on delay time	t <sub>d(on)</sub>	V <sub>DS</sub> = 20V, R <sub>G</sub> = 3.5Ω, V <sub>GS</sub> = 10		8		ns
Turn-on rise time	t <sub>r</sub>			16		
Turn-off delay time	t <sub>d(off)</sub>			21		
Turn-off fall time	t <sub>f</sub>			10		
Total gate charge	Q <sub>g</sub>	V <sub>GS</sub> = 10V, V <sub>DD</sub> = 20V, I <sub>D</sub> = 30A		68		nC
Gate to source charge	Q <sub>gs</sub>			13		
Gate to drain (miller) charge	Q <sub>gd</sub>			15		
<b>Source-Drain Diode Characteristics</b>						
Diode forward voltage (Note 2)	V <sub>SD</sub>	I <sub>SD</sub> = 30A, V <sub>GS</sub> = 0V		0.85	1.2	V
Diode continuous forward current (Note 1, 4)	I <sub>S</sub>				68	A

Notes: 1. Device on 40mm x 40mm x 1.5mm epoxy PCB FR4 with 6 cm<sup>2</sup> (one layer, 70μm thick) copper area for drain connection. PCB is vertical in still air.

2. The data tested by pulsed, pulse width ≤ 300μs, duty cycle ≤ 2%.

3. The EAS data shows Max. rating. The test condition is V<sub>DD</sub>=40V, V<sub>GS</sub>=10V, L=0.5mH.

4. The data is theoretically the same as I<sub>D</sub> and I<sub>DM</sub>, in real applications, should be limited by total power dissipation.

## Rating and Characteristic Curves (ACMS68N04H8-HF)

Fig.1 - On-Region Characteristics

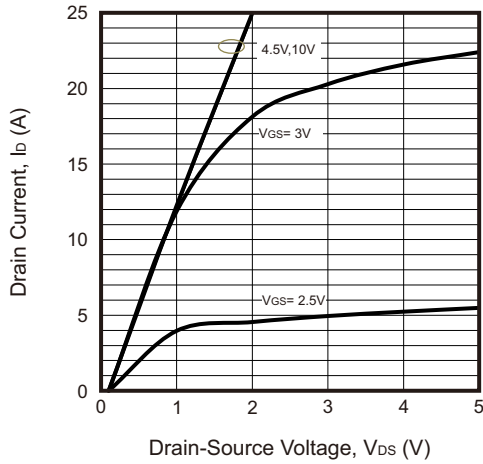


Fig.2 - On-Resistance vs. Drain Current and Gate Voltage

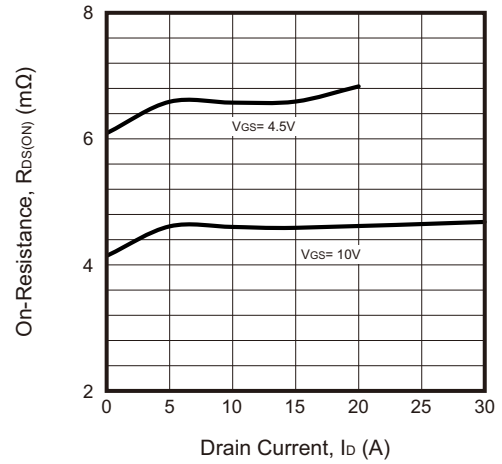


Fig.3 - On-Resistance vs. Gate-Source Voltage

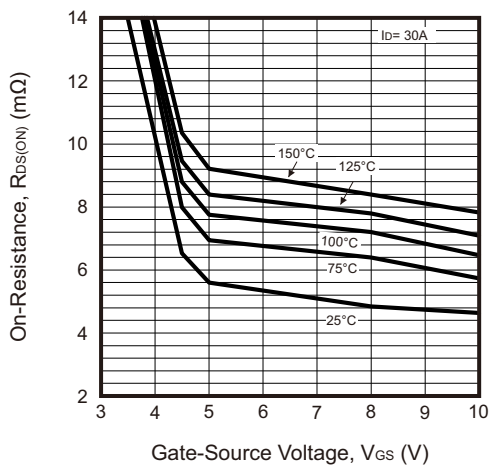


Fig.4 - Body-Diode Characteristics

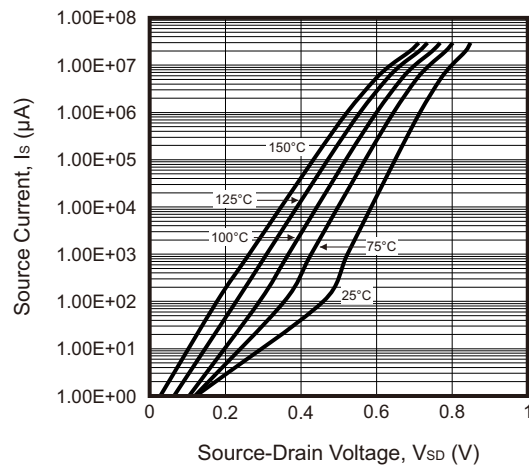


Fig.5 - On-Resistance vs. Junction Temperature

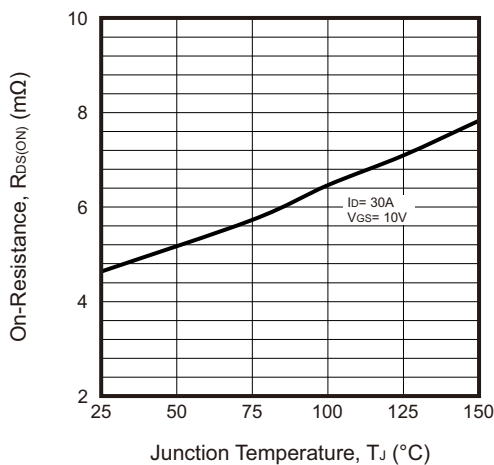
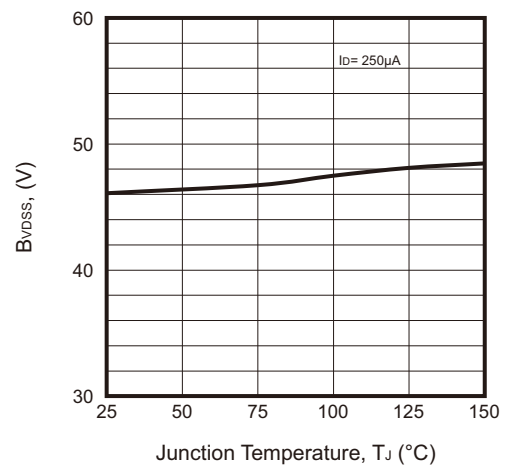


Fig.6 - Drain Source vs. Junction Temperature



## Rating and Characteristic Curves (ACMS68N04H8-HF)

Fig.7 - Capacitance Characteristics

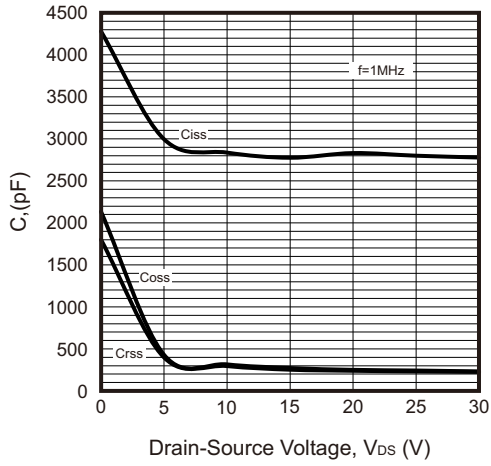


Fig.8 - Gate Voltage vs. Junction Temperature

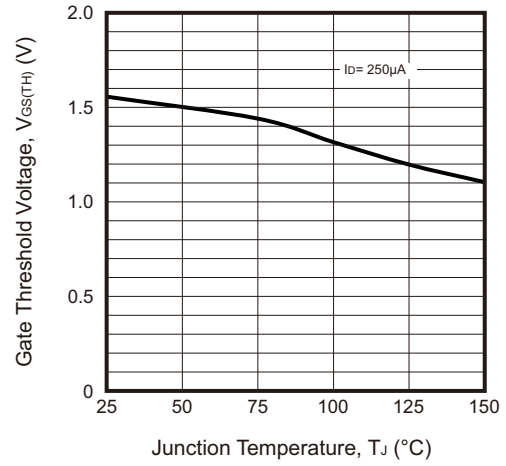


Fig.9 - Gate Charge Characteristics

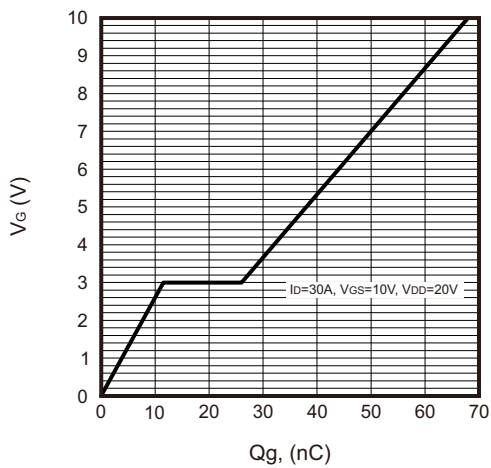
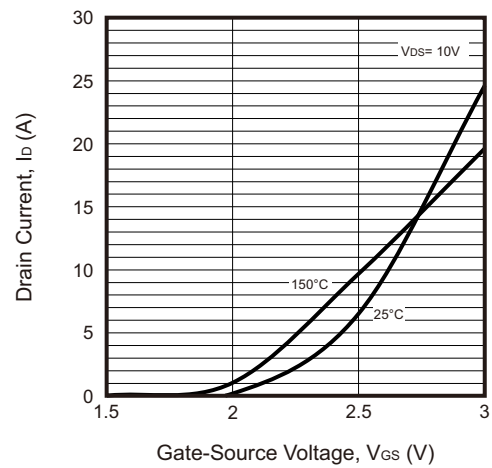
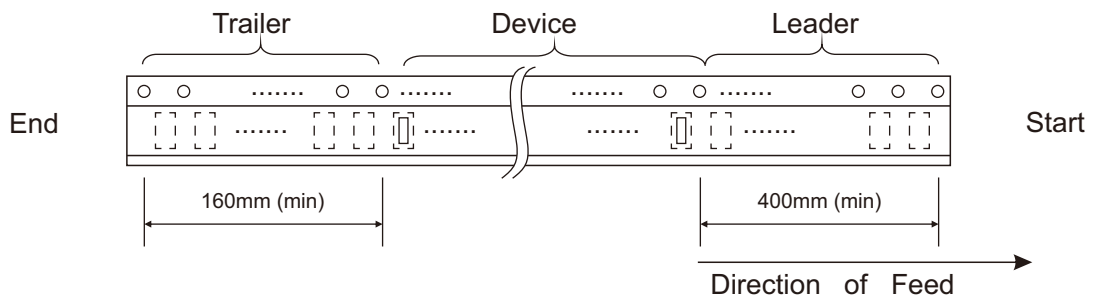
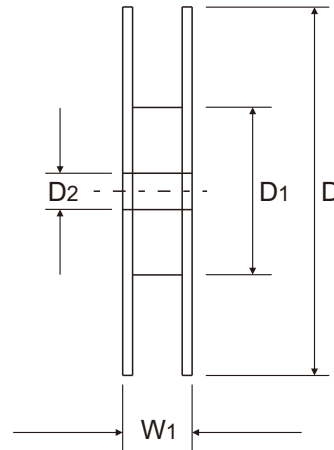
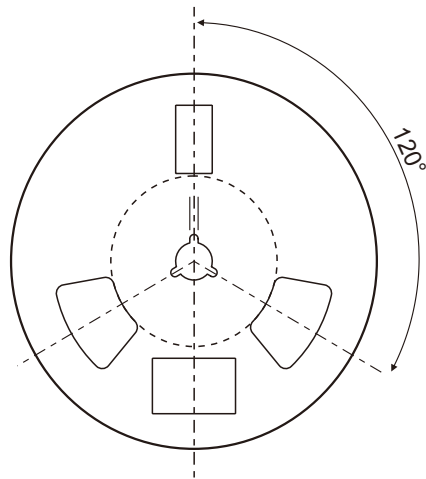
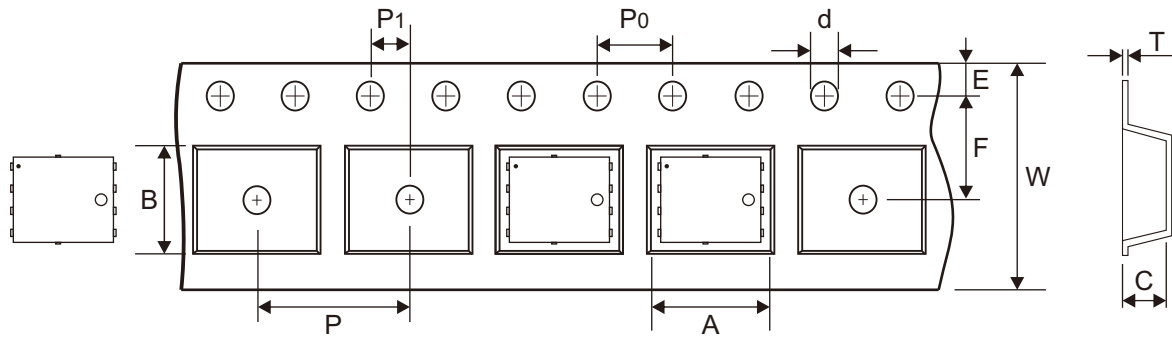


Fig.10 - Transfer Characteristics



Reel Taping Specification

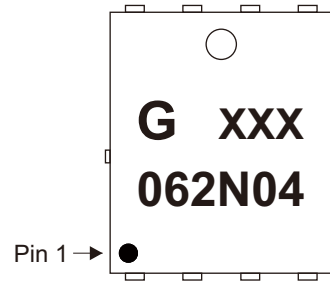


PDFN5x6 -8L	SYMBOL	A	B	C	d	D	D1	D2
	(mm)	6.30 ± 0.10	5.30 ± 0.10	1.20 ± 0.10	1.55 + 0.01	330 ± 1.00	100 ± 1.00	13.00 ± 0.20
	(inch)	0.248 ± 0.004	0.209 ± 0.004	0.047 ± 0.004	0.061 + 0.0004	12.992 ± 0.039	3.937 ± 0.039	0.512 ± 0.008

PDFN5x6 -8L	SYMBOL	E	F	P	P0	P1	T	W	W1
	(mm)	1.75 ± 0.10	5.50 ± 0.10	8.00 ± 0.10	4.00 ± 0.10	2.00 ± 0.05	0.25 ± 0.03	12.00 + 0.30 - 0.10	17.80 ± 0.30
	(inch)	0.069 ± 0.004	0.217 ± 0.004	0.315 ± 0.004	0.157 ± 0.004	0.079 ± 0.002	0.010 ± 0.001	0.472 + 0.012 - 0.004	0.701 ± 0.012

## Marking Code

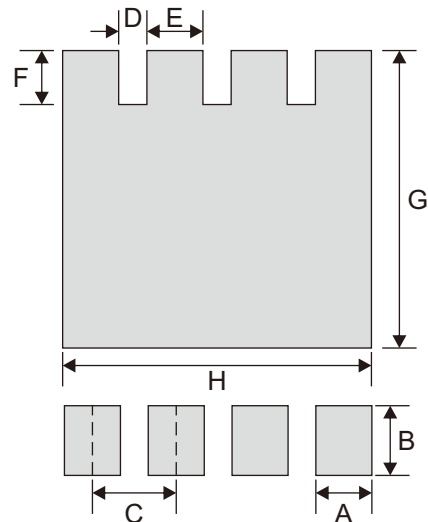
Part Number	Marking Code
ACMS68N04H8-HF	062N04



XXX = Control code

## Suggested P.C.B. PAD Layout

SIZE	PDFN5x6-8L	
	(mm)	(inch)
A	0.80	0.031
B	1.00	0.039
C	1.27	0.050
D	0.47	0.019
E	0.80	0.031
F	0.85	0.033
G	4.50	0.177
H	4.60	0.181



## Standard Packaging

Case Type	REEL PACK	
	REEL (pcs)	Reel Size (inch)
PDFN5x6-8L	5,000	13