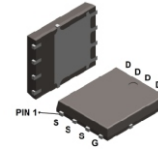


## ACMS38P03H8-HF

**P-Channel**  
**RoHS Device**  
**Halogen Free**

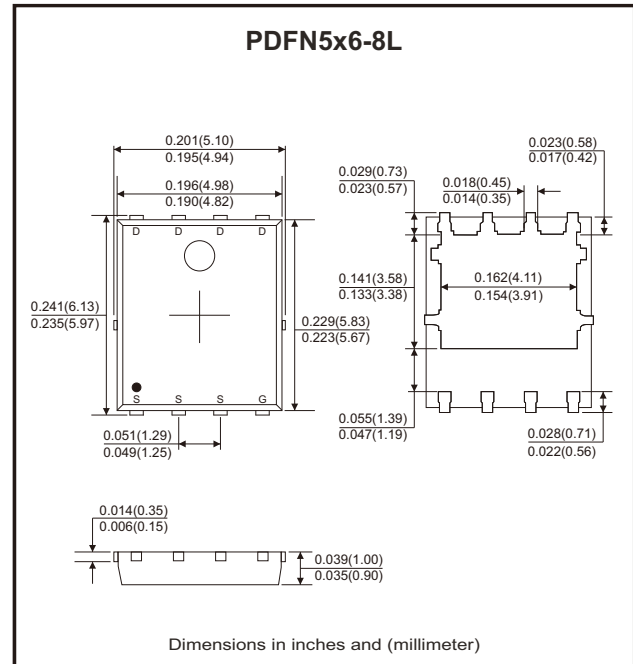


### Features

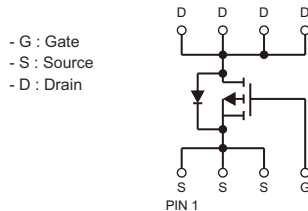
- Super low gate charge.
- 100% EAS guaranteed.
- Excellent  $C_{dv}/dt$  effect decline.
- Advanced high cell density technology.
- AEC-Q101 Qualified.

### 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	$V_{DS}$	-30	V
Gate-source voltage	$V_{GS}$	$\pm 20$	V
Continuous drain current ( $T_C=25^\circ\text{C}$ , $V_{GS}=-10\text{V}$ )	$I_D$	-38	A
Continuous drain current ( $T_C=100^\circ\text{C}$ , $V_{GS}=-10\text{V}$ )	$I_D$	-22	
Pulsed drain current (Note 1)	$I_{DM}$	-88	A
Avalanche energy, single pulsed (Note 2)	$E_{AS}$	15	mJ
Power dissipation ( $T_C=25^\circ\text{C}$ )	$P_D$	50	W
Thermal resistance junction to air (Note 4)	$R_{\theta JA}$	50	$^\circ\text{C}/\text{W}$
Thermal resistance junction to case (Note 4)	Top	20	$^\circ\text{C}/\text{W}$
	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  $T_J=25^\circ\text{C}$  unless otherwise noted)

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
<b>Static Characteristics</b>						
Drain-source breakdown voltage	$BV_{DSS}$	$V_{GS} = 0V, I_D = -250\mu A$	-30			V
Zero gate voltage drain current	$I_{DSS}$	$V_{DS} = -30V, V_{GS} = 0V, T_J = 25^\circ\text{C}$			-1	$\mu A$
		$V_{DS} = -30V, V_{GS} = 0V, T_J = 125^\circ\text{C}$			-100	
Gate-body leakage current	$I_{GSS}$	$V_{GS} = \pm 20V, V_{DS} = 0V$			$\pm 100$	nA
<b>On Characteristics</b>						
Static drain-source on-resistance (Note 3)	$R_{DS(on)}$	$V_{GS} = -10V, I_D = -10A$		18	20	$m\Omega$
	$R_{DS(on)}$	$V_{GS} = -4.5V, I_D = -6A$		27	32	$m\Omega$
Gate threshold voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = -250\mu A$	-1	-1.4	-2.5	V
<b>Dynamic Characteristics</b>						
Input capacitance	$C_{iss}$	$V_{GS} = 0V, V_{DS} = -15V, f = 1\text{MHz}$		1588		$\mu F$
Output capacitance	$C_{oss}$			186		
Reverse transfer capacitance	$C_{rss}$			152		
<b>Switching Characteristics</b>						
Turn-on delay time	$t_{d(on)}$	$V_{GS} = -10V, V_{DD} = -15V, I_D = -10A$ $R_G = 3\Omega$		8.2		ns
Turn-on rise time	$t_r$			18.6		
Turn-off delay time	$t_{d(off)}$			31.8		
Turn-off fall time	$t_f$			18.4		
Total gate charge	$Q_g$	$V_{GS} = -10V, V_{DD} = -15V, I_D = -10A$		31		nC
Gate to source charge	$Q_{gs}$			3.2		
Gate to drain (miller) charge	$Q_{gd}$			6.0		
<b>Source-Drain Diode Characteristics</b>						
Diode forward voltage	$V_{SD}$	$I_{SD} = -10A, V_{GS} = 0V$		-0.88	-1.2	V
Source drain current (body diode)	$I_{SD}$	$T_A = 25^\circ\text{C}$			-36	A

Notes: 1. Repetitive rating; pulse width limited by max. junction temperature.

2. Limited by  $T_J$  max, starting  $T_J=25^\circ\text{C}$ ,  $L=0.5\text{mH}$ ,  $R_G=25\Omega$ ,  $V_{DS}=-10V$ ,  $V_{GS}=-10V$ .

3. The data tested by pulsed, pulse width  $\leq 300\mu s$ , duty cycle  $\leq 2\%$ .

4. Device on 40mm x 40mm x 1.5mm epoxy PCB FR4 with 6 cm<sup>2</sup> (one layer, 70 $\mu\text{m}$  thick) copper area for drain connection. PCB is vertical in still air.

## Rating and Characteristic Curves (ACMS38P03H8-HF)

Fig.1 - On-Region Characteristics

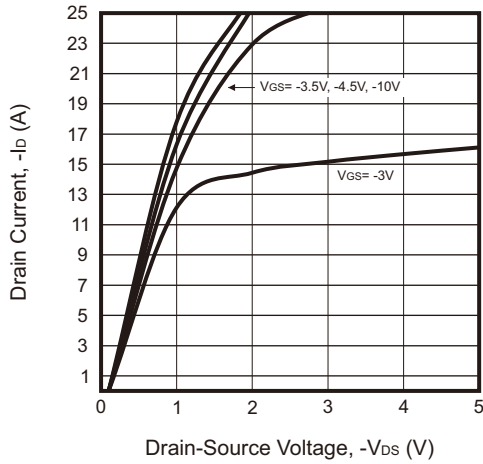


Fig.2 - On-Resistance vs. Drain Current and Gate Voltage

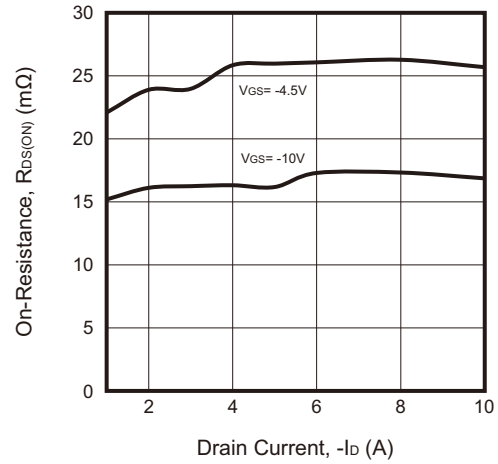


Fig.3 - On-Resistance vs. Gate-Source Voltage

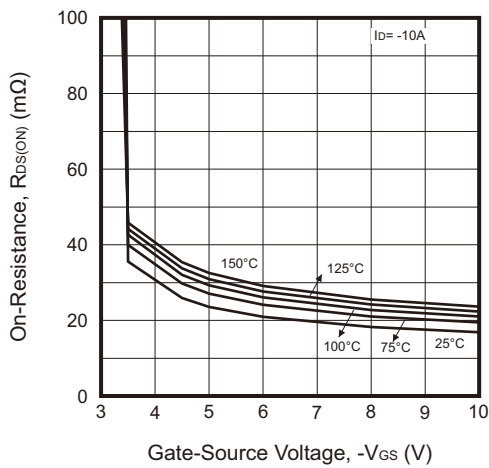


Fig.4 - Body-Diode Characteristics

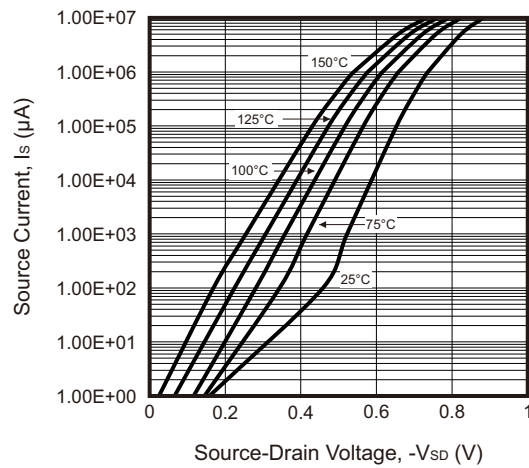


Fig.5 - On-Resistance vs. Junction Temperature

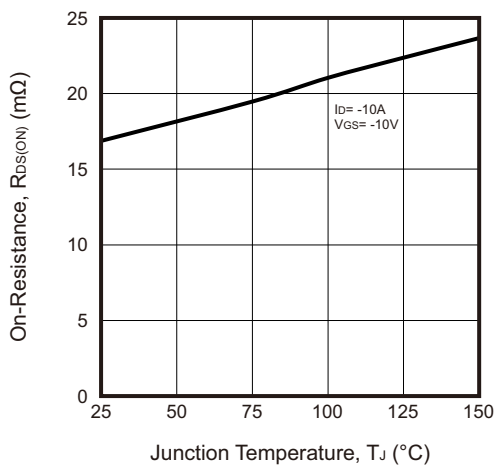
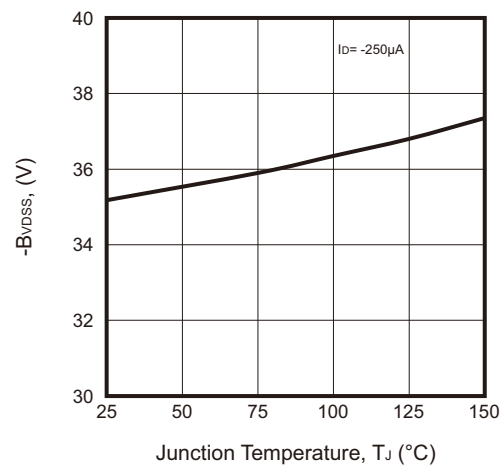


Fig.6 - Drain Source vs. Junction Temperature



## Rating and Characteristic Curves (ACMS38P03H8-HF)

Fig.7 - Capacitance Characteristics

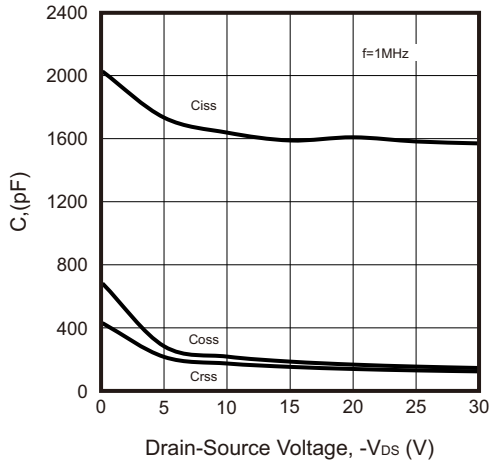


Fig.8 - Gate Voltage vs. Junction Temperature

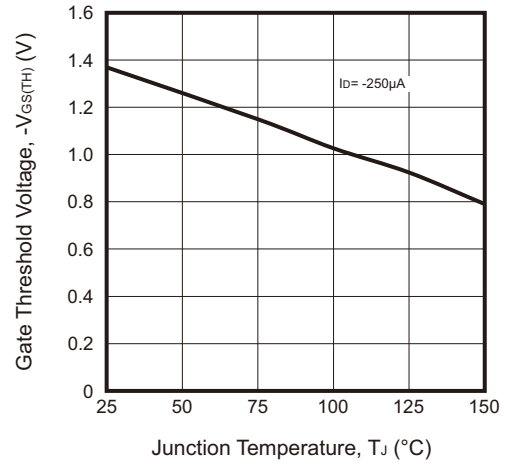


Fig.9 - Transfer Characteristics

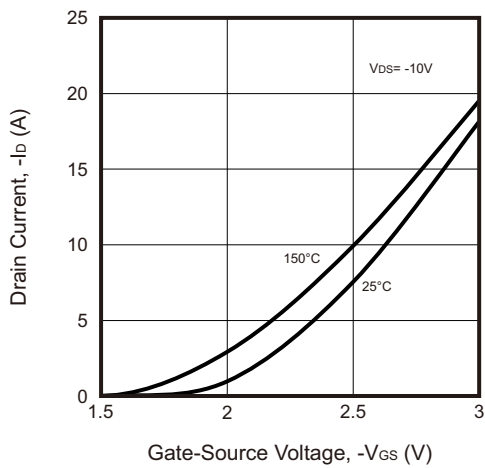
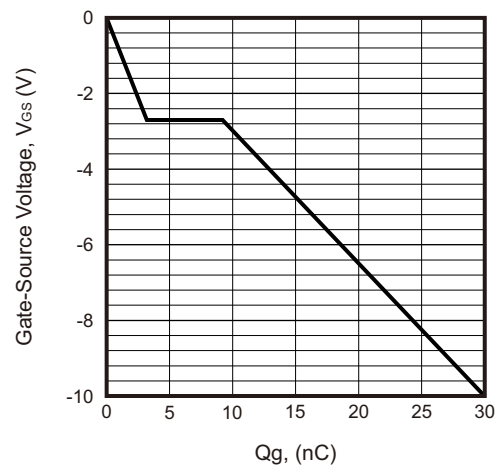
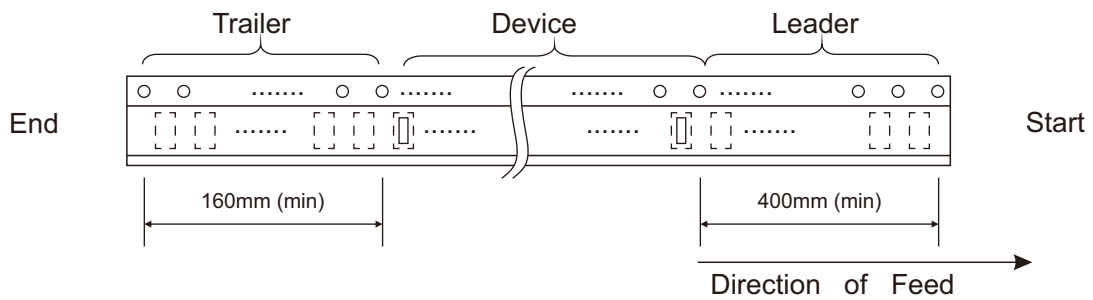
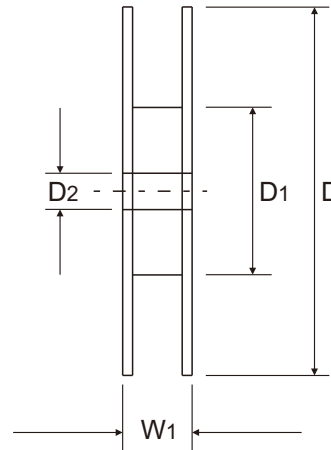
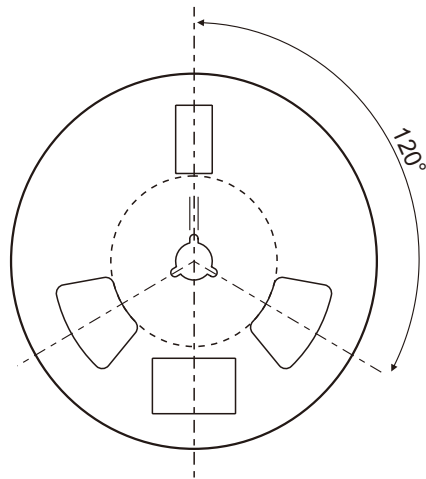
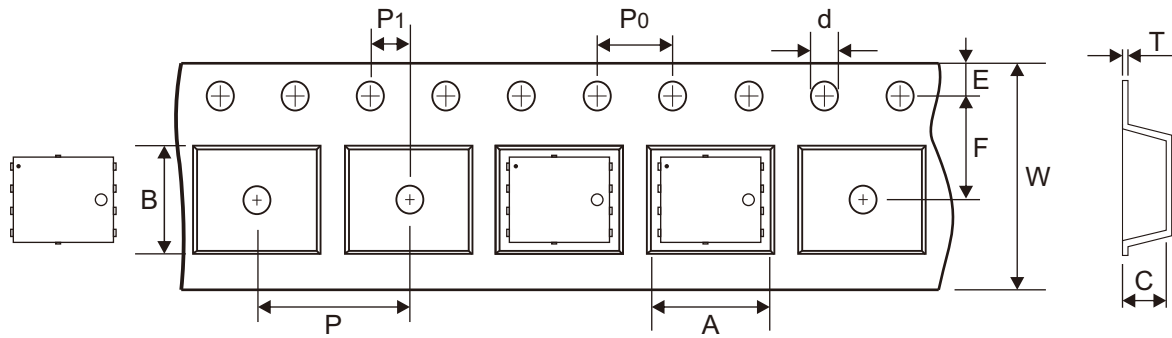


Fig.10 - Gate Charge Characteristics



# Reel Taping Specification

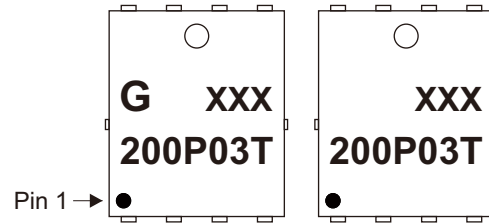


PDFN5x6 -8L	SYMBOL	A	B	C	d	D	D1	D2
	(mm)	6.30 ± 0.10	5.30 ± 0.10	1.20 ± 0.10	1.55 + 0.01	330 ± 1.00	100 ± 1.00	13.00 ± 0.20
	(inch)	0.248 ± 0.004	0.209 ± 0.004	0.047 ± 0.004	0.061 + 0.0004	12.992 ± 0.039	3.937 ± 0.039	0.512 ± 0.008

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

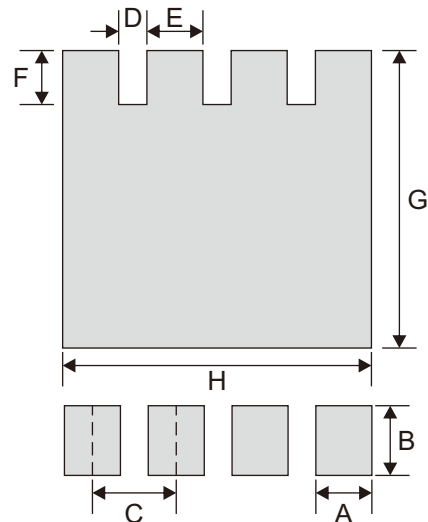
Part Number	Marking Code
ACMS38P03H8-HF	200P03T



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