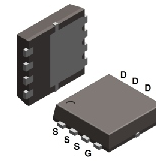


ACMS40N04V8A-HF

N-Channel
RoHS Device
Halogen Free

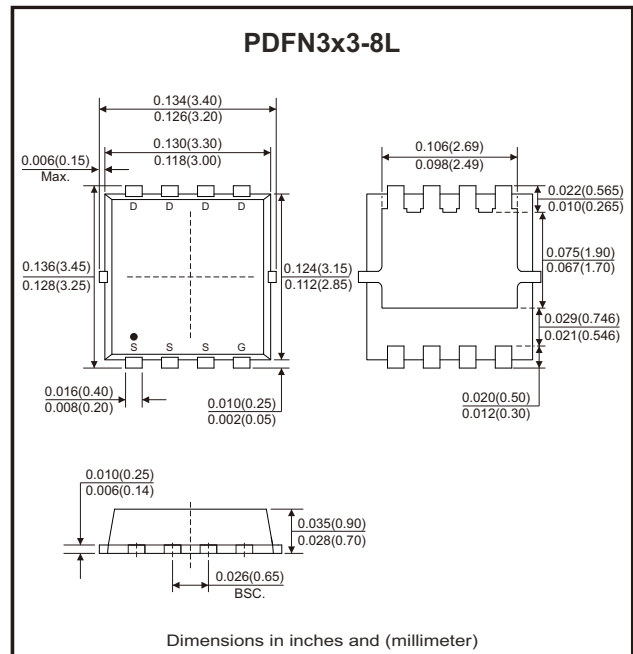


Features

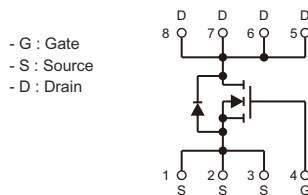
- Good stability and uniformity with high EAS.
- High density cell design for ultra-low RDS(ON).
- Excellent package for good heat dissipation.
- Battery switch.
- Load switch.
- AEC-Q101 Qualified.

Mechanical data

- Case: PDFN3x3-8L, molded plastic.
- Terminals: Solderable per MIL-STD-750, method 2026.
- Mounting position: Any.



Circuit Diagram



Maximum Ratings (at TJ=25°C unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-source voltage	V _{DS}	40	V
Gate-source voltage	V _{GS}	±20	V
Continuous drain current (Note 1)	I _D	40	A
Chip limited drain current	I _D	78	
Pulsed drain current (Note 2)	I _{DM}	312	A
Single pulse avalanche energy (Note 3)	E _{AS}	148	mJ
Maximum power dissipation (T _c =25°C)	P _d	45	W
Thermal resistance junction to case	R _{θJC}	3.3	°C/W
Thermal resistance junction to ambient (Note 4)	R _{θJA}	62.5	°C/W
Operating junction and storage temperature range	T _J , T _{STG}	-55 to +175	°C

Electrical Characteristics (at $T_J=25^{\circ}\text{C}$ unless otherwise noted)

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Static Characteristics						
Drain-source breakdown voltage	BV_{DSS}	$V_{GS} = 0V, I_D = 1mA$	40			V
Zero gate voltage drain current	I_{DSS}	$V_{DS} = 40V, V_{GS} = 0V, T_J = 25^{\circ}\text{C}$			1	μA
		$V_{DS} = 40V, V_{GS} = 0V, T_J = 125^{\circ}\text{C}$			50	
Gate-body leakage current	I_{GSS}	$V_{GS} = \pm 20V, V_{DS} = 0V$			± 100	nA
On Characteristics (Note 5)						
Gate threshold voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 1mA$	1.2	1.7	2.3	V
Static drain-source on-resistance	$R_{DS(on)}$	$V_{GS} = 10V, I_D = 20A$		2.3	3.2	$m\Omega$
	$R_{DS(on)}$	$V_{GS} = 7V, I_D = 20A$		2.7	3.8	$m\Omega$
	$R_{DS(on)}$	$V_{GS} = 4.5V, I_D = 20A$		3.6	5.0	$m\Omega$
Dynamic Characteristics						
Input capacitance	C_{iss}	$V_{DS} = 25V, V_{GS} = 0V, f = 100kHz$		1520		μF
Output capacitance	C_{oss}			480		
Reverse transfer capacitance	C_{rss}			32		
Gate resistance	R_g	$f = 1MHz$		3.2		Ω
Switching Characteristics						
Total gate charge	Q_g	$V_{GS} = 10V, V_{DD} = 32V, I_D = 20A$		23		nC
Gate to source charge	Q_{gs}			4.5		
Gate to drain (miller) charge	Q_{gd}			5.8		
Gate plateau voltage	$V_{plateau}$			2.3		V
Turn-on delay time	$t_{d(on)}$	$V_{GS} = 10V, V_{DD} = 20V, I_D = 20A$ $R_L = 0.4\Omega, R_G = 2.5\Omega$		6		ns
Turn-on rise time	t_r			3.5		
Turn-off delay time	$t_{d(off)}$			18		
Turn-off fall time	t_f			4.6		
Source-Drain Diode Characteristics						
Diode forward voltage (Note 5)	V_{SD}	$V_{GS} = 0V, I_S = 40A$		0.8	1.1	V
Drain continuous forward current (Note 1)	I_S				40	A
Pulsed source drain current (Note 2)	I_{SM}				312	A
Reverse recovery time	t_{rr}	$V_R = 20V, I_F = 40A, di_F/dt = 100A/\mu\text{s}$		24		ns
Reverse recovery charge	Q_{rr}			17		nC

Notes: 1. Current is limited by package; The chip is able to carry 78A at $T_C=25^{\circ}\text{C}$ with $R_{\theta JC}=3.3^{\circ}\text{C/W}$.

2. Limited only by maximum temperature allowed.

3. Test condition: $V_{DD}=50V, V_{GS}=10V, L=0.5mH, R_G=25\Omega$, starting at $T_J=25^{\circ}\text{C}$.

4. Measured with the device mounted on 1 inch² FR-4 board with single sided 2oz copper, in a still air environment with $T_a=25^{\circ}\text{C}$.

5. Pulse test: Pulse width $\leq 300\mu\text{s}$, duty cycle $\leq 2\%$.

Typical Rating and Characteristic Curves (ACMS40N04V8A-HF)

Fig.1 - Output Characteristics

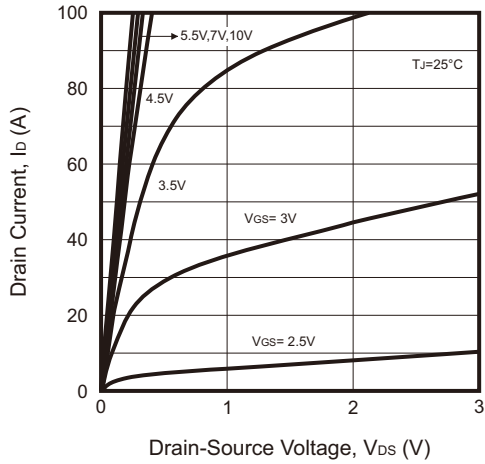


Fig.2 - Output Characteristics

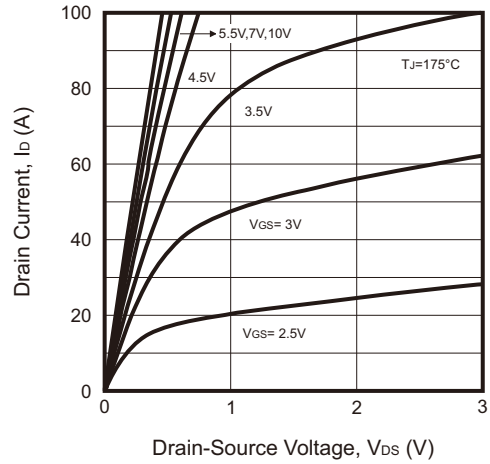


Fig.3 - Transfer Characteristics

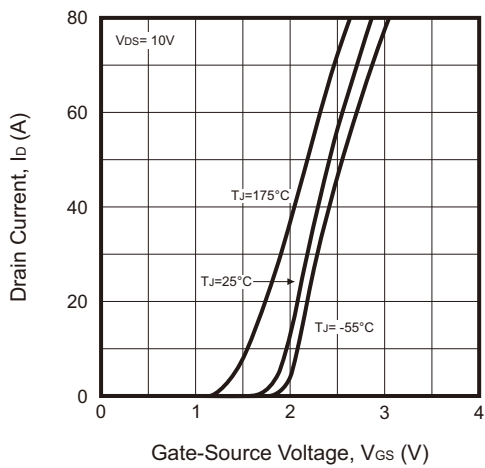


Fig.4 - On-Resistance vs. Drain Current

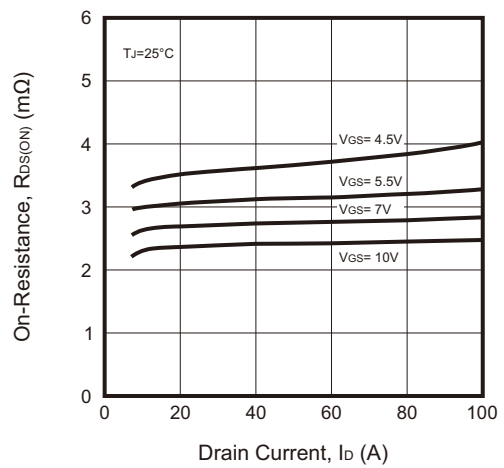


Fig.5 - On-Resistance vs. Junction Temperature

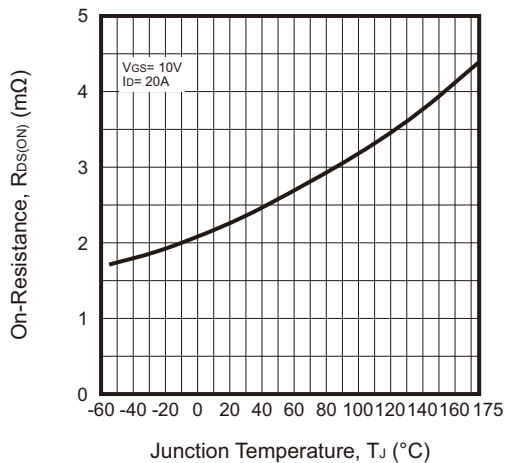
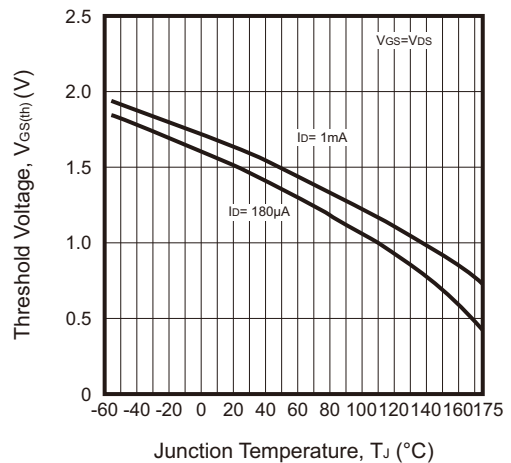


Fig.6 - Gate Threshold vs. Junction Temperature



Typical Rating and Characteristic Curves (ACMS40N04V8A-HF)

Fig.7 - Drain-Source Breakdown Voltage

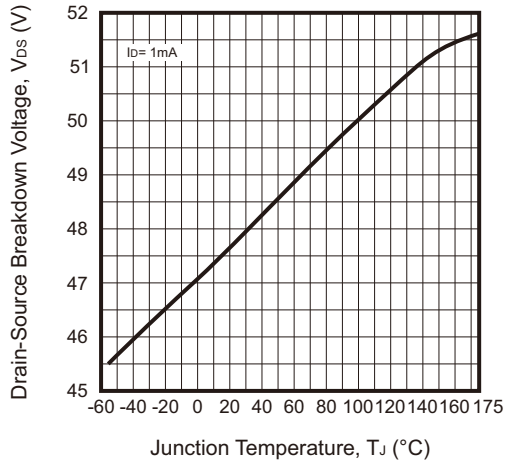


Fig.8 - Forward Diode Characteristics

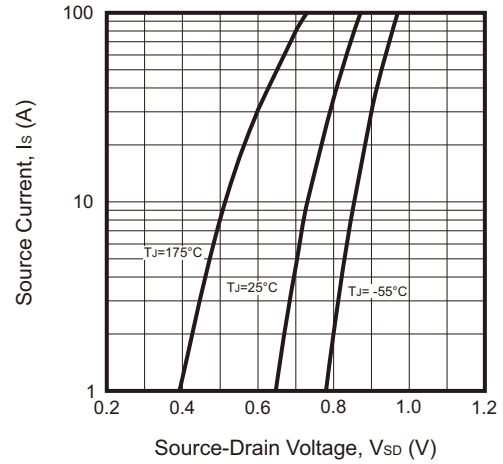


Fig.9 - Typical Capacitance

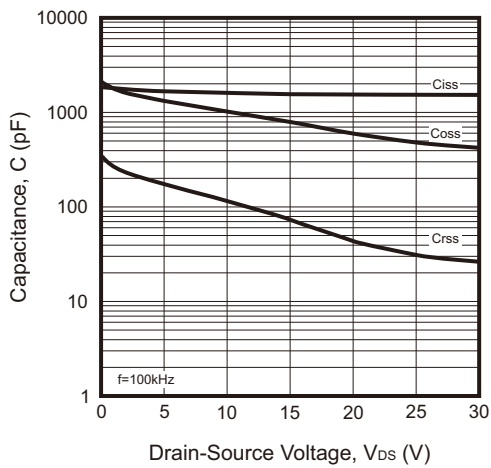


Fig.10 - Gate-Charge Characteristics

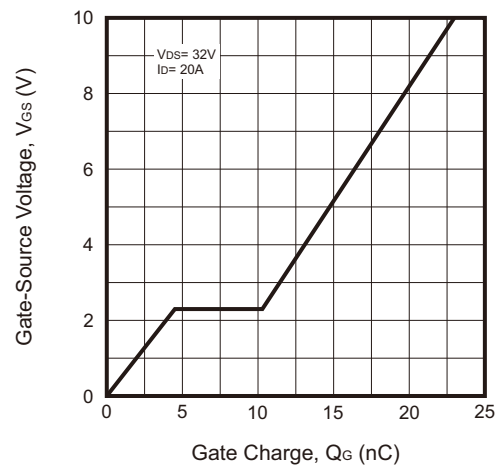


Fig.11 - Power Dissipation

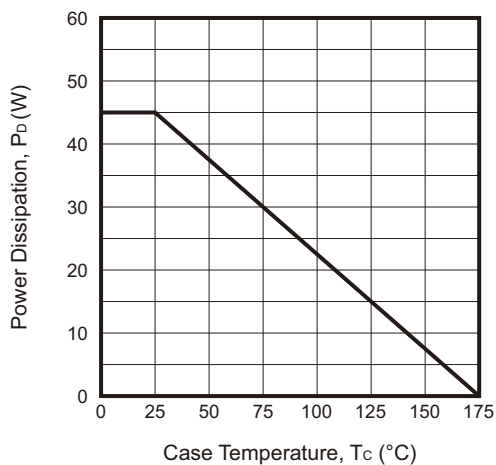
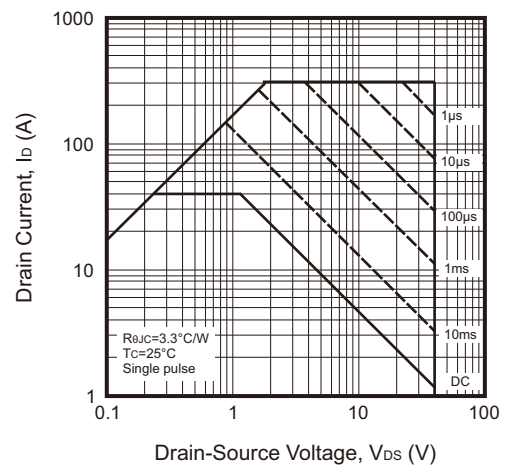
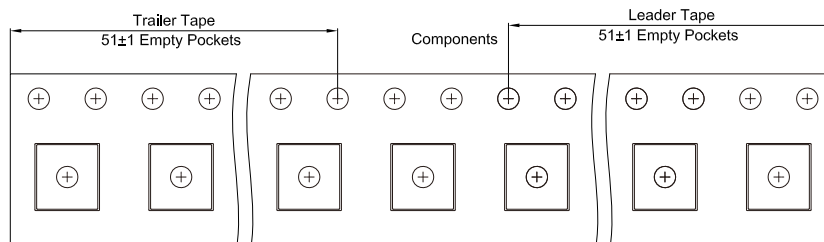
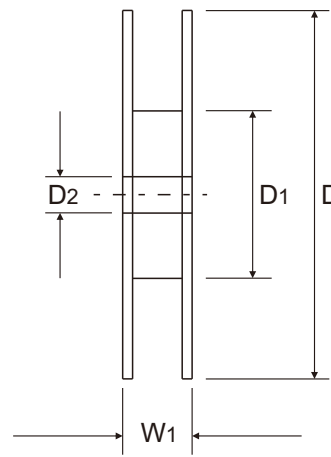
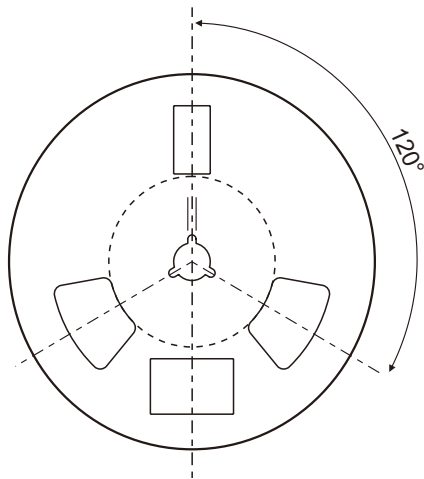
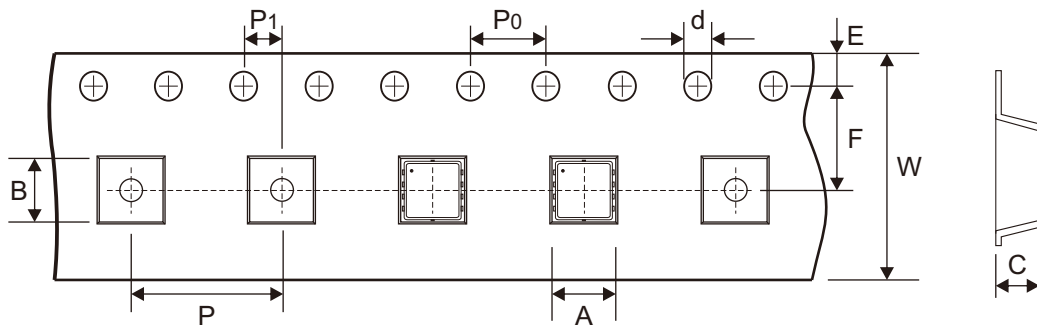


Fig.12 - Safe Operating Area



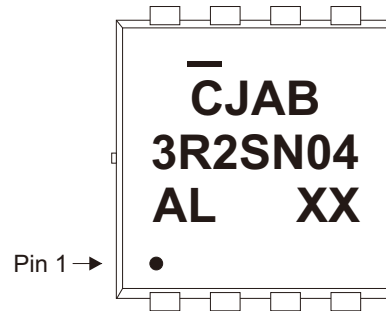
Reel Taping Specification



PDFN3x3 -8L	SYMBOL	A	B	C	d	D	D1	D2
	(mm)	3.55 ± 0.15	3.55 ± 0.15	1.10 ± 0.20	1.50 + 0.10 - 0.00	330.00 ± 2.00	100.00 + 1.00 - 2.50	13.00 + 0.50 - 0.20
	(inch)	0.140 ± 0.006	0.140 ± 0.006	0.043 ± 0.008	0.059 + 0.004 - 0.000	12.992 ± 0.079	3.937 + 0.039 - 0.098	0.512 + 0.020 - 0.008
PDFN3x3 -8L	SYMBOL	E	F	P	P0	P1	W	W1
	(mm)	1.75 ± 0.10	5.50 ± 0.05	8.00 ± 0.10	4.00 ± 0.10	2.00 ± 0.05	12.00 ± 0.30	17.60 + 1.75 - 0.75
	(inch)	0.069 ± 0.004	0.217 ± 0.002	0.315 ± 0.004	0.157 ± 0.004	0.079 ± 0.002	0.472 ± 0.012	0.693 + 0.069 - 0.030

Marking Code

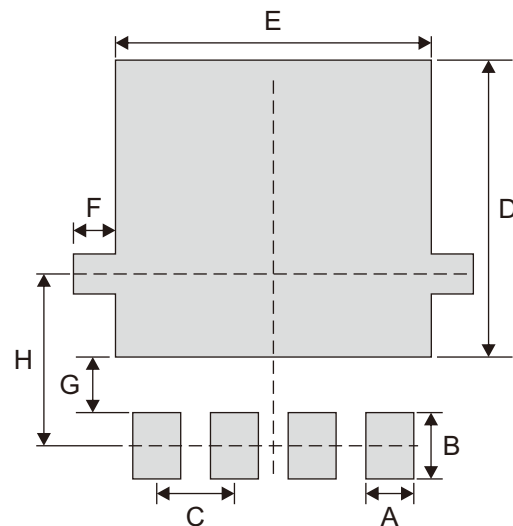
Part Number	Marking Code
ACMS40N04V8A-HF	CJAB3R2SN04AL



XX = Control code

Suggested P.C.B. PAD Layout

SIZE	PDFN3x3-8L	
	(mm)	(inch)
A	0.40	0.016
B	0.56	0.022
C	0.65	0.026
D	2.50	0.098
E	2.65	0.104
F	0.35	0.014
G	0.47	0.019
H	1.45	0.057



Standard Packaging

Case Type	REEL PACK	
	REEL (pcs)	Reel Size (inch)
PDFN3x3-8L	5,000	13