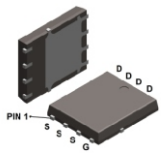
ACMS93P04H8-HF

P-Channel
RoHS Device
Halogen Free



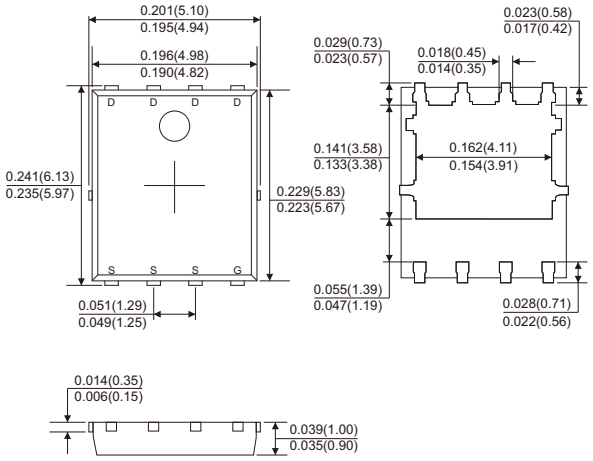
Features

- Advanced trench technology.
- Super low on-resistance.
- Fast switching speed.
- AEC-Q101 Qualified.

Mechanical data

- Case: PDFN5x6-8L, molded plastic.
- Terminals: Matte tin-plated leads, solderability-per MIL-STD-202, method 208.
- Mounting position: Any.

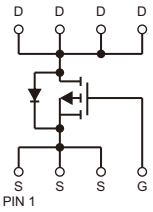
PDFN5x6-8L



Dimensions in inches and (millimeter)

Circuit Diagram

- G : Gate
- S : Source
- D : Drain



Maximum Ratings (at T_C=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 (T_C=25°C)	I_D	-93	A
Continuous drain current (T_C=100°C)	I_D	-59	
Continuous drain current (T_A=25°C) (Note 1)	I_D	-16	
Continuous drain current (T_A=100°C) (Note 1)	I_D	-10	
Pulsed drain current (tp=10μs, T_C=25°C)	I_{DM}	-372	A
Single pulse avalanche energy (Note 3)	E_{AS}	230	mJ
Power dissipation (T_C=25°C)	P_D	96	W
Operating junction temperature range	T_J	-55 to +150	°C
Storage temperature range	T_{STG}	-55 to +150	°C

Thermal Characteristics

Parameter	Symbol	Min	Typ	Max	Unit
Thermal resistance junction to case	$R_{\theta JC}$		0.8	1.3	°C/W
Thermal resistance junction to air (Note 1)	$R_{\theta JA}$		26	40	°C/W

Electrical Characteristics (at T_A=25°C unless otherwise noted)

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Static Characteristics						
Drain-source breakdown voltage	BV_{DSS}	V_{GS} = 0V, I_D = -250μA	-40			V
Zero gate voltage drain current	I_{DSS}	V_{DS} = -40V, V_{GS} = 0V			-1	μA
Gate-body leakage current	I_{GSS}	V_{GS} = ±20V, V_{DS} = 0V			±100	nA
On Characteristics						
Static drain-source on-resistance (Note 2)	$R_{DS(on)}$	V_{GS} = -10V, I_D = -20A		4.7	6.5	mΩ
	$R_{DS(on)}$	V_{GS} = -4.5V, I_D = -10A		6.3	9	mΩ
Gate threshold voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = -250μA	-1	-1.7	-2.5	V
Gate resistance	R_G	V_{GS} = 0V, f = 1MHz		2.9		Ω
Dynamic Characteristics						
Input capacitance	C_{iss}	V_{GS} = 0V, V_{DS} = -25V, f = 100kHz		6237		pF
Output capacitance	C_{oss}			472		
Reverse transfer capacitance	C_{rss}			426		
Switching Characteristics						
Turn-on delay time (Note 4)	$t_{d(on)}$	V_{DD} = -20V, V_{GS} = -10V, R_G = 3Ω I_D = -20A		16		ns
Turn-on rise time (Note 4)	t_r			17		
Turn-off delay time (Note 4)	$t_{d(off)}$			68		
Turn-off fall time (Note 4)	t_f			31		
Total gate charge	Q_g	V_{DD} = -20V, V_{GS} = -10V, I_D = -20A		125		nC
Gate to source charge	Q_{gs}			15.3		
Gate to drain (miller) charge	Q_{gd}			23.2		
Source-Drain Diode Characteristics						
Diode forward voltage (Note 2)	V_{SD}	I_{SD} = -20A, V_{GS} = 0V		-0.8	-1.2	V
Reverse recovery time	t_{rr}	I_F = -20A, V_{GS} = 0V, d_{IF}/d_t = 100A/μs		61		ns
Reverse recovery change	Q_{rr}			52		nC

Notes: 1. The data tested by surface mounted on a 1 inch² FR-4 board with 2OZ copper.

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

3. The E_{AS} data shows max. rating. The test condition is V_{DD}= -30V, V_{GS}= -10V, L=0.5mH.

4. Guaranteed by design, not subject to production.

Typical Rating and Characteristic Curves (ACMS93P04H8-HF)

Fig.1 - Power Dissipation

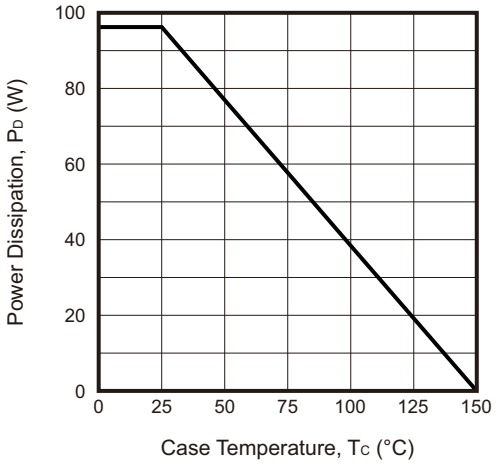


Fig.2 - Drain Current

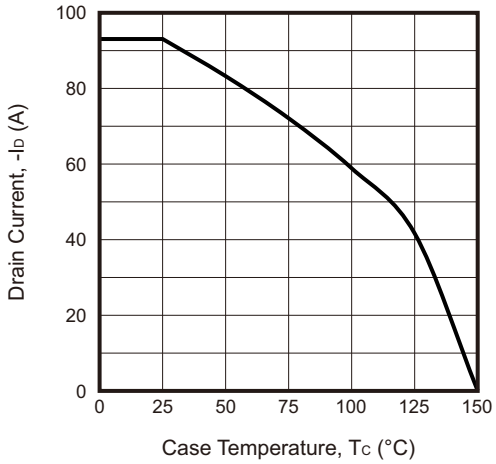


Fig.3 - Typical Output Characteristics

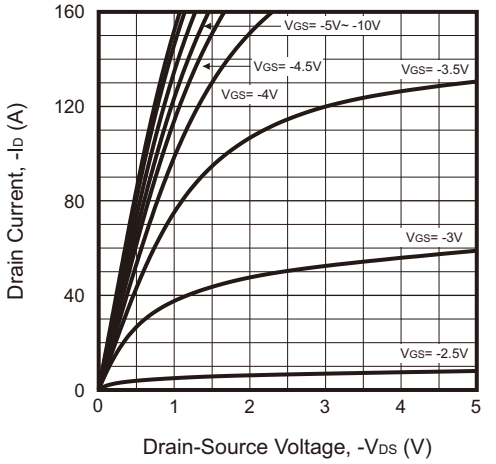


Fig.4 - On-Resistance vs. Drain Current and Gate Voltage

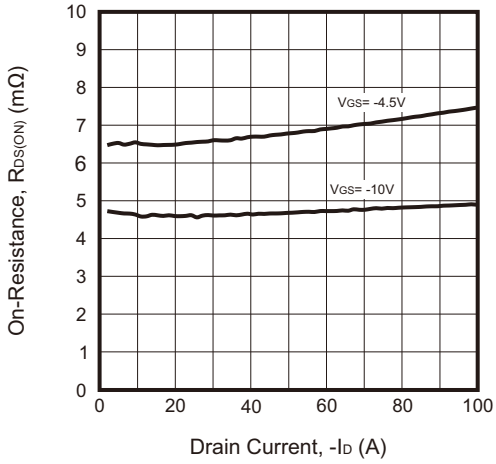


Fig.5 - On-Resistance vs. Gate-Source Voltage

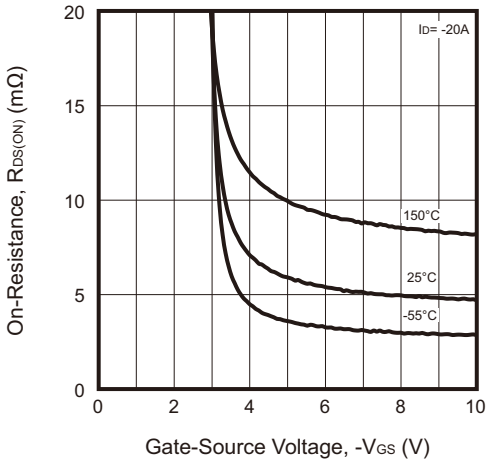
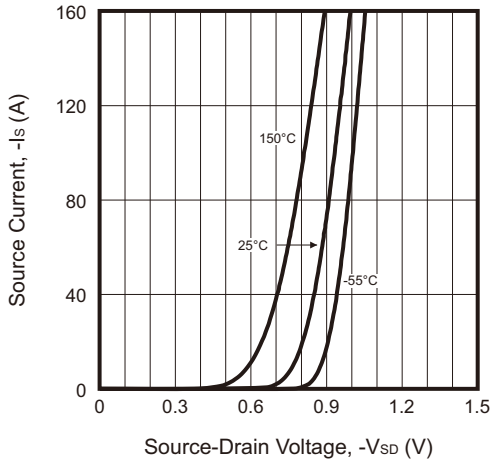


Fig.6 - Body-Diode Characteristics



Typical Rating and Characteristic Curves (ACMS93P04H8-HF)

Fig.7 - Normalized On-Resistance vs. Junction Temperature

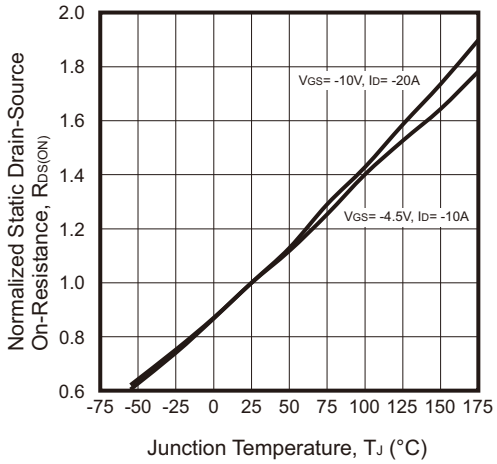


Fig.8 - Transfer Characteristics

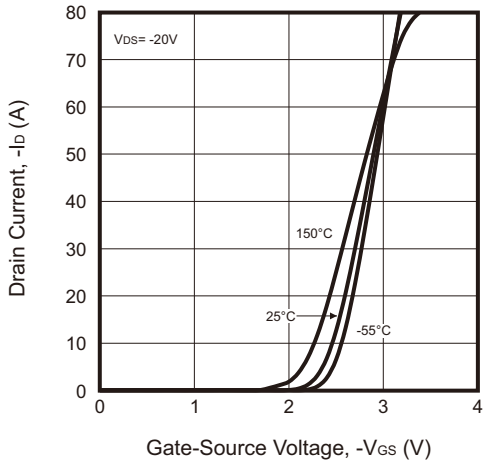


Fig.9 - Capacitance Characteristics

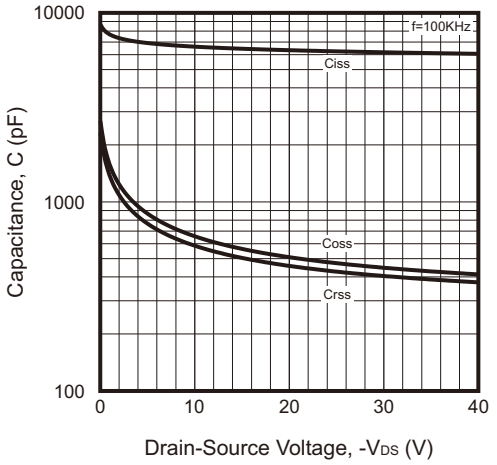


Fig.10 - Gate Charge Characteristics

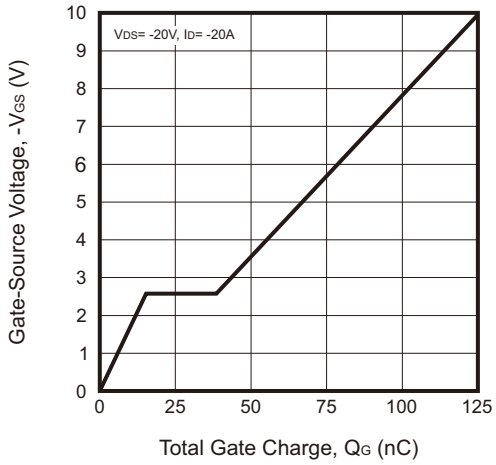


Fig.11 - Normalized Breakdown Voltage vs. Junction Temperature

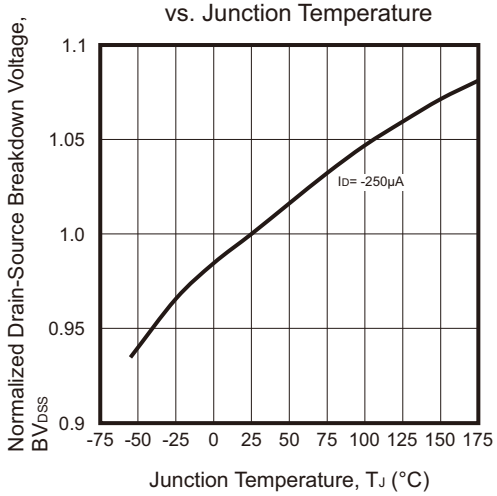
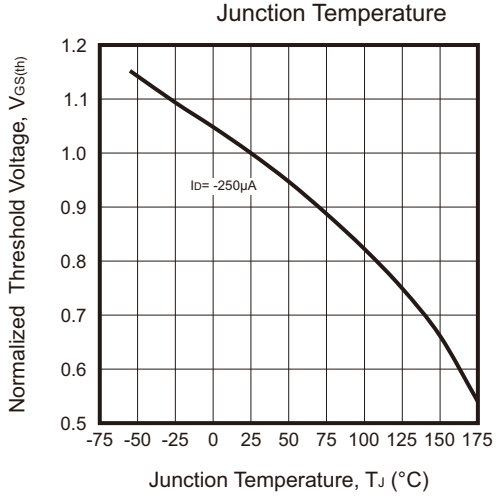
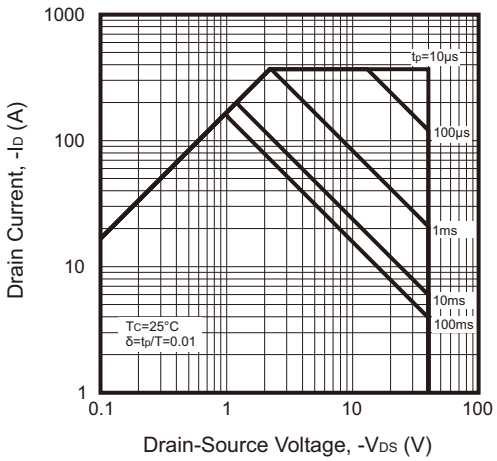


Fig.12 - Normalized VGS(th) vs. Junction Temperature

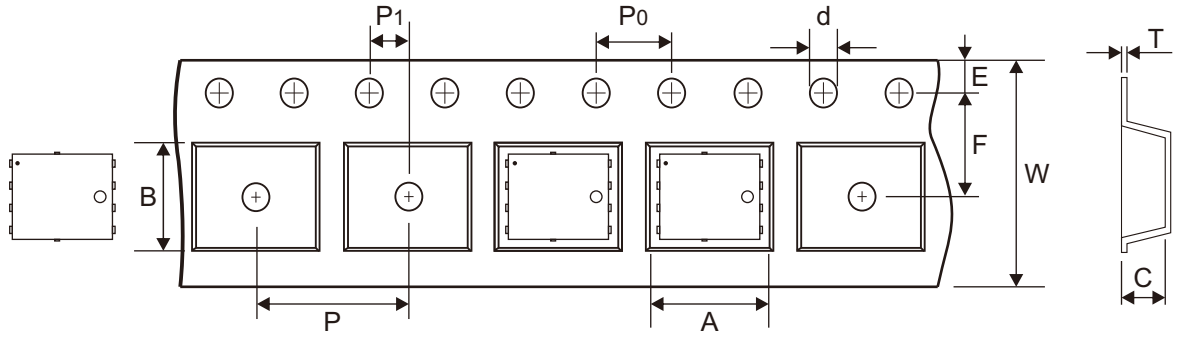


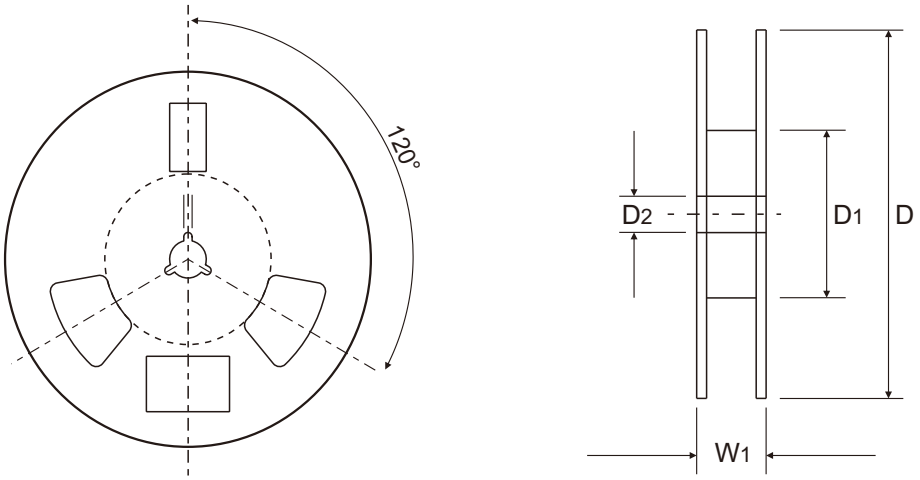
Typical Rating and Characteristic Curves (ACMS93P04H8-HF)

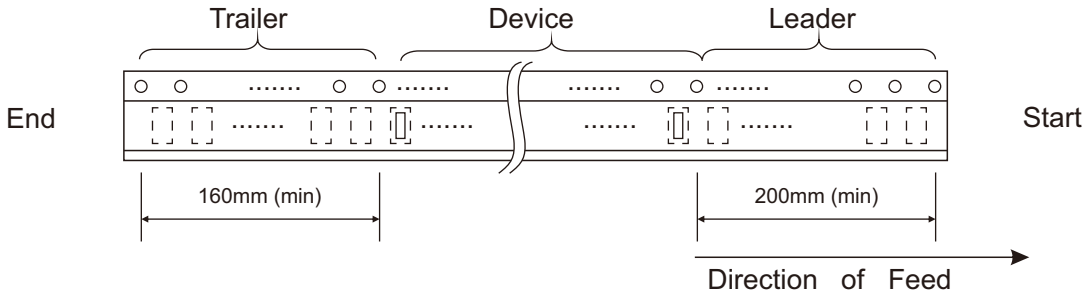
Fig.13 - Safe Operation Area



Reel Taping Specification





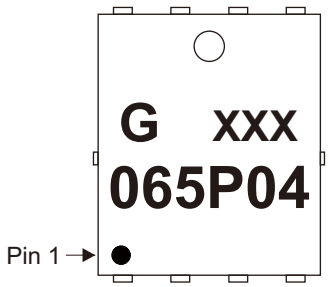


	SYMBOL	A	B	C	d	D	D1	D2
PDFN5x6 -8L	(mm)	6.30 ± 0.10	5.30 ± 0.10	1.20 ± 0.10	1.55 + 0.01 − 0.00	330.00 ± 2.00	100.00 ± 2.00	13.00 ± 0.20
	(inch)	0.248 ± 0.004	0.209 ± 0.004	0.047 ± 0.004	0.061 + 0.0004 − 0.0000	12.992 ± 0.079	3.937 ± 0.079	0.512 ± 0.008

	SYMBOL	E	F	P	P0	P1	T	W	W1
PDFN5x6 -8L	(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	18.50 ± 2.00
	(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	0.728 ± 0.079

Marking Code

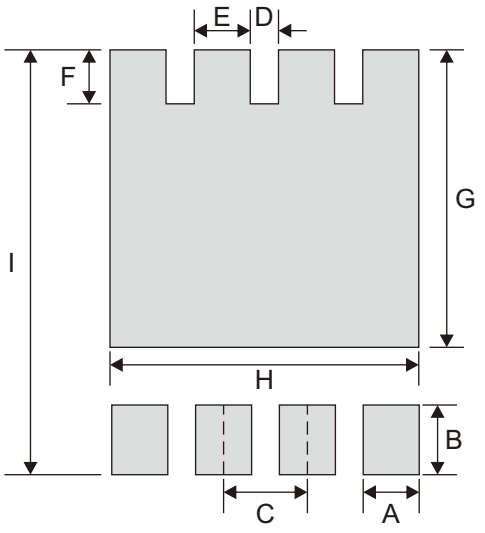
Part Number	Marking Code
ACMS93P04H8-HF	065P04



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	4.61	0.181
I	6.40	0.252



Standard Packaging

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