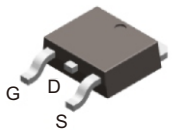
MOSFET

ACMS50P06DA-HF

P-Channel
RoHS Device
Halogen Free



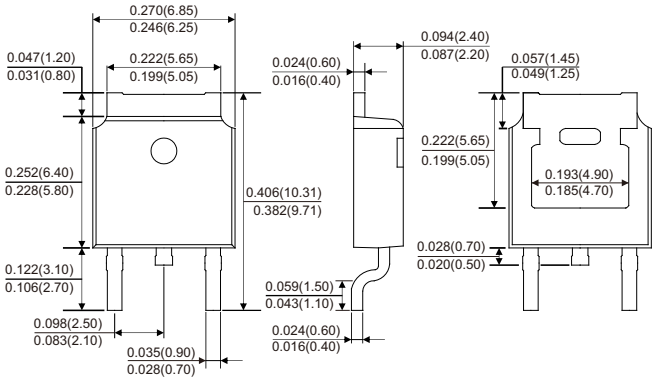
Features

- Low $R_{DS(ON)}$.
- 100% unclamped inductive switching.
- Green device available.
- AEC-Q101 Qualified.

Mechanical data

- Case: TO-252, molded plastic.
- Terminals: Matte tin-plated leads, solderable per MIL-STD-202, method 208.
- Mounting position: Any.

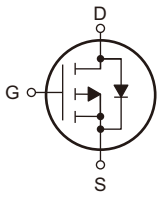
TO-252



Dimensions in inches and (millimeters)

Circuit Diagram

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



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

Parameter	Symbol	Value	Unit
Drain-source voltage	V_{DS}	-60	V
Gate-source voltage	V_{GS}	±20	V
Continuous drain current (T_C=25°C)	I_D	-24	A
Continuous drain current (T_C=100°C)	I_D	-15	
Continuous drain current (T_A=25°C) (Note 1)	I_D	-5.7	
Continuous drain current (T_A=100°C) (Note 1)	I_D	-3.6	
Pulsed drain current (tp=10μs, T_C=25°C)	I_{DM}	-115	A
Single pulse avalanche energy (Note 3)	E_{AS}	50	mJ
Power dissipation (T_C=25°C)	P_D	52	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	$R_{\theta JC}$			2.4	°C/W
Thermal resistance junction to air (Note 1)	$R_{\theta JA}$			42	°C/W

Electrical Characteristics (at T_C=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	-60			V
Zero gate voltage drain current	I_{DSS}	V_{DS} = -48V, 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 = -5A		30	50	mΩ
	$R_{DS(on)}$	V_{GS} = -4.5V, I_D = -4A		39	70	mΩ
Gate threshold voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = -250μA	-1	-1.5	-3	V
Gate resistance	R_G	V_{GS} = 0V, f = 1MHz		10		Ω
Dynamic Characteristics						
Input capacitance	C_{iss}	V_{GS} = 0V, V_{DS} = -30V, f = 1MHz		2163		pF
Output capacitance	C_{oss}			108		
Reverse transfer capacitance	C_{rss}			93		
Switching Characteristics						
Turn-on delay time (Note 4)	$t_{d(on)}$	V_{DD} = -30V, V_{GS} = -10V, R_G = 3Ω		13		ns
Turn-on rise time (Note 4)	t_r			17		
Turn-off delay time (Note 4)	$t_{d(off)}$			50		
Turn-off fall time (Note 4)	t_f			20		
Total gate charge	Q_g	V_{DD} = -30V, I_D = -15A, V_{GS} = -10V		38		nC
Gate to source charge	Q_{gs}			7.6		
Gate to drain (miller) charge	Q_{gd}			6.1		
Source-Drain Diode Characteristics						
Diode forward voltage (Note 2)	V_{SD}	I_{SD} = -15A, V_{GS} = 0V		-0.9	-1.2	V
Reverse recovery time	t_{rr}	I_F = -5A, V_{GS} = 0V, dI/dt = 100A/μs		28.7		ns
Reverse recovery change	Q_{rr}			17.6		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 (ACMS50P06DA-HF)

Fig.1 - Power Dissipation

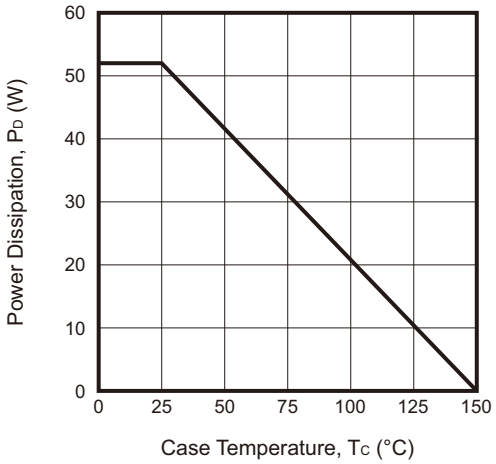


Fig.2 - Drain Current

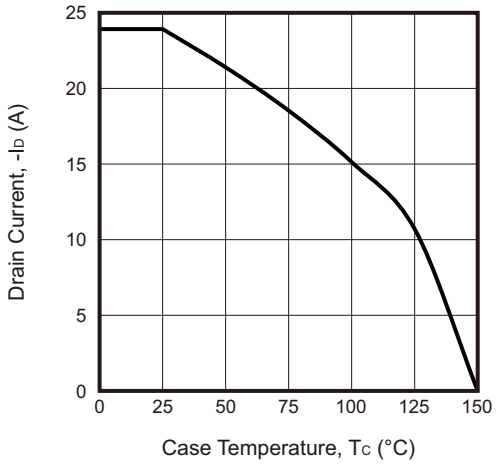


Fig.3 - Typical Output Characteristics

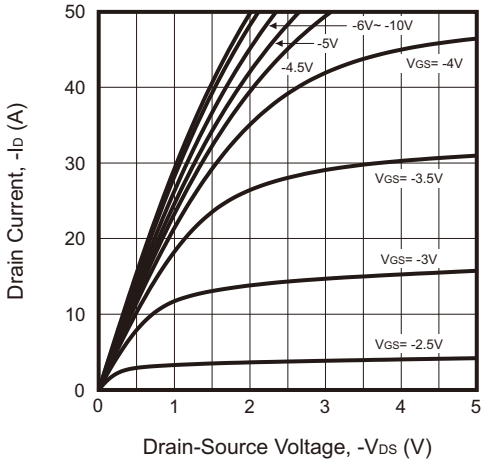


Fig.4 - On-Resistance vs. Drain Current and Gate Voltage

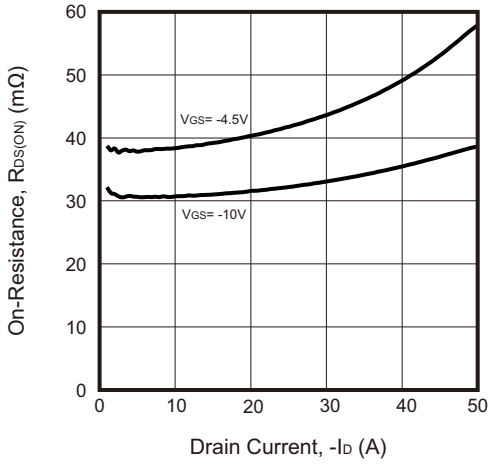


Fig.5 - On-Resistance vs. Gate-Source Voltage

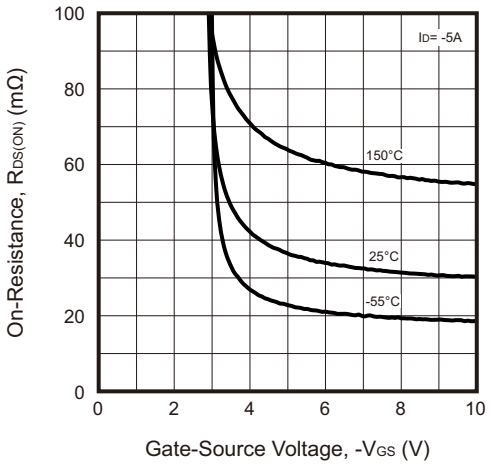
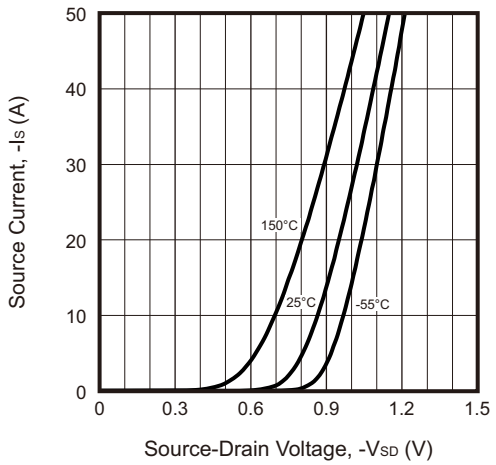


Fig.6 - Body-Diode Characteristics



Typical Rating and Characteristic Curves (ACMS50P06DA-HF)

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

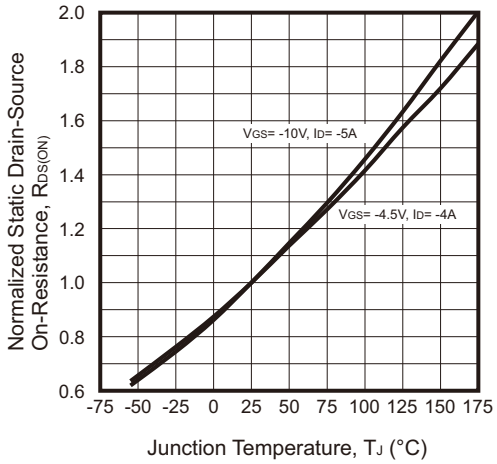


Fig.8 - Transfer Characteristics

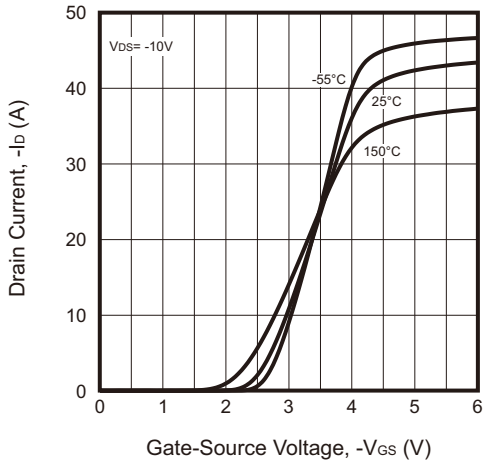


Fig.9 - Capacitance Characteristics

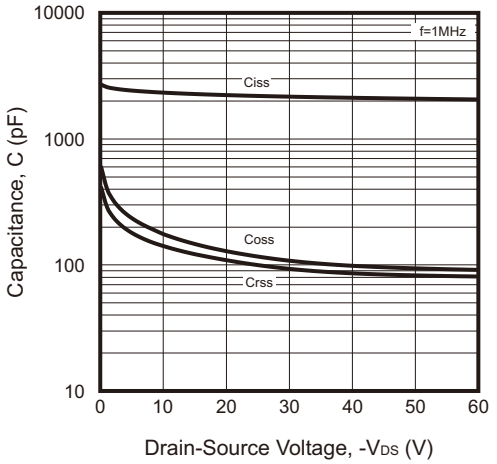


Fig.10 - Gate Charge Characteristics

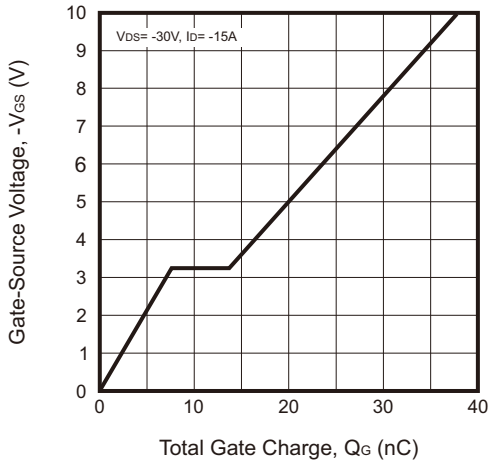


Fig.11 - Normalized Breakdown Voltage vs. Junction Temperature

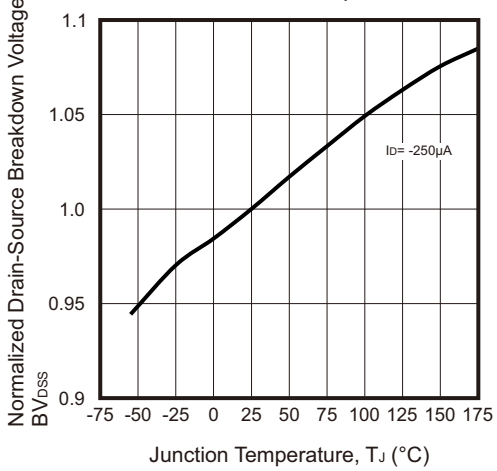
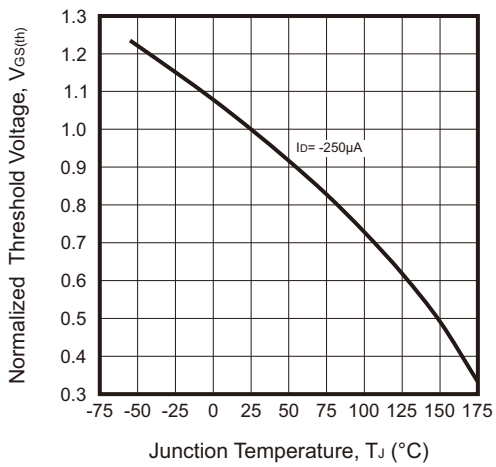
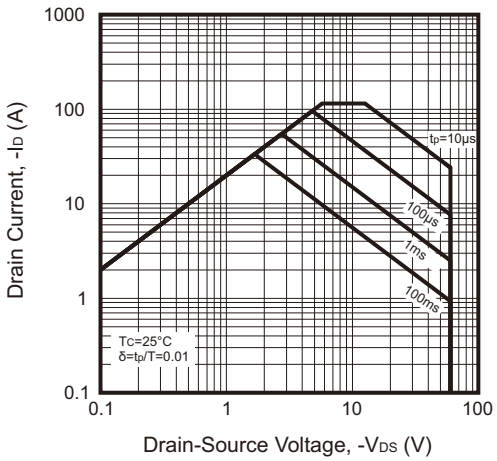


Fig.12 - Normalized VGS(th) vs. Junction Temperature

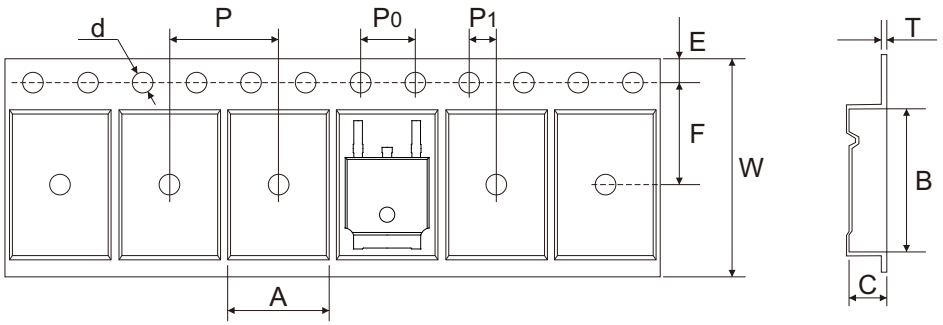


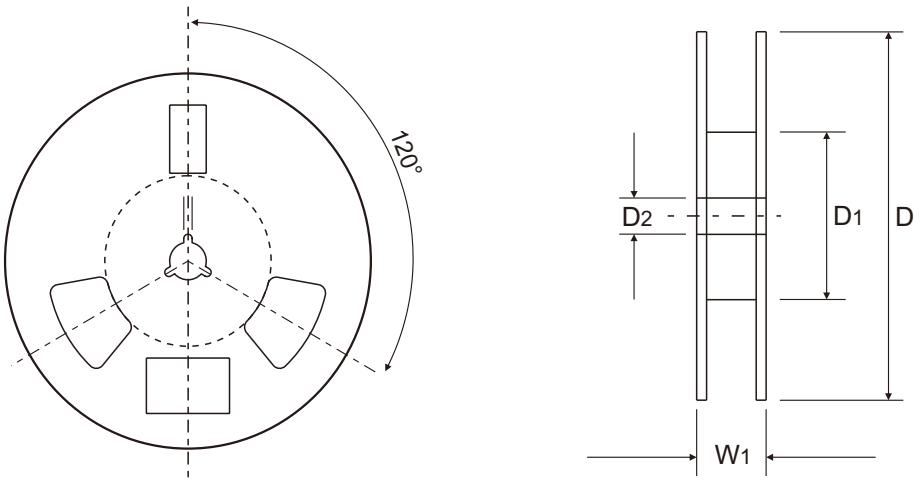
Typical Rating and Characteristic Curves (ACMS50P06DA-HF)

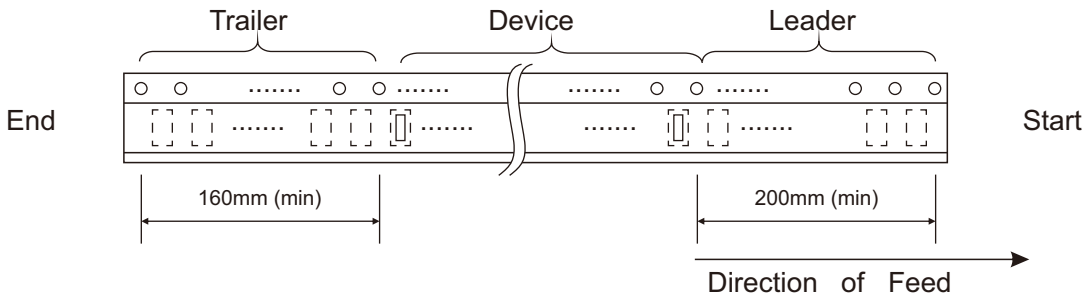
Fig.13 - Safe Operation Area



Reel Taping Specification





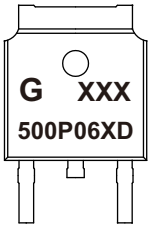


	SYMBOL	A	B	C	d	D	D1	D2
TO-252	(mm)	6.90 ± 0.10	10.50 ± 0.10	2.70 ± 0.10	1.50 + 0.25 − 0.00	330.00 ± 1.00	100.00 ± 1.00	13.00 ± 0.20
	(inch)	0.272 ± 0.004	0.413 ± 0.004	0.106 ± 0.004	0.059 + 0.010 − 0.000	12.992 ± 0.039	3.937 ± 0.039	0.512 ± 0.008

	SYMBOL	E	F	P	P0	P1	T	W	W1
TO-252	(mm)	1.75 ± 0.10	7.50 ± 0.10	8.00 ± 0.10	4.00 ± 0.10	2.00 ± 0.10	0.30 ± 0.05	16.00 + 0.30 − 0.20	21.00 ± 0.30
	(inch)	0.069 ± 0.004	0.295 ± 0.004	0.315 ± 0.004	0.157 ± 0.004	0.079 ± 0.004	0.012 ± 0.002	0.630 + 0.012 − 0.008	0.827 ± 0.012

Marking Code

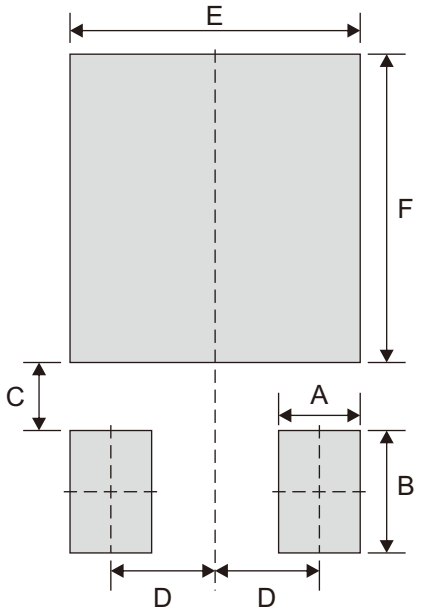
Part Number	Marking Code
ACMS50P06DA-HF	500P06XD



XXX = Control code

Suggested P.C.B. PAD Layout

SIZE	TO-252	
	(mm)	(inch)
A	1.80	0.071
B	2.70	0.106
C	1.50	0.059
D	2.30	0.091
E	6.40	0.252
F	6.80	0.268



Standard Packaging

Case Type	REEL PACK	
	REEL (pcs)	Reel Size (inch)
TO-252	2,500	13