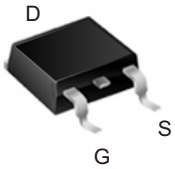
# MOSFET

# ACMS50P06D-HF

## P-Channel
## RoHS Device
## Halogen Free



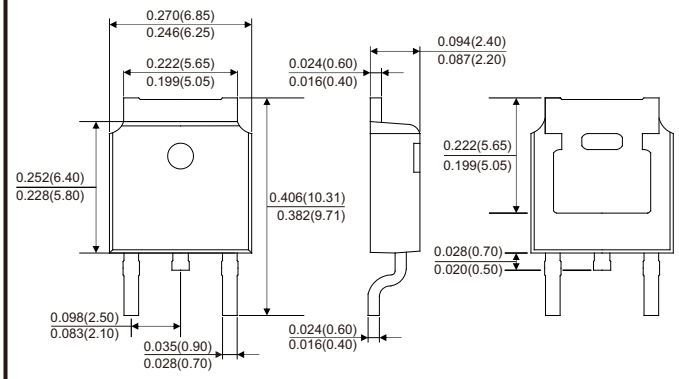

## Features

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

## Mechanical data

- Case: TO-252, molded plastic.
- Molding compound: UL flammability classification rating 94V-0.
- Terminals: Matte tin-plated leads, solderable per MIL-STD-202, method 208.

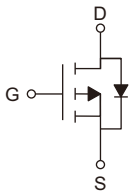
**TO-252**




Dimensions in inches and (millimeters)

## 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 | $V_{DSS}$ | -60 | V |
| Gate-source voltage | $V_{GSS}$ | ±20 | V |
| Continuous drain current (Note 1) | $I_D$ | -50 | A |
| Pulsed drain current (Note 1) | $I_{DM}$ | -200 | |
| Power dissipation (Note 2) | $P_D$ | 125 | W |
| Thermal resistance junction to case | $R_{\theta JC}$ | 1 | °C/W |
| Operating junction temperature range | $T_J$ | -55 to +150 | °C |
| Storage temperature range | $T_{STG}$ | -55 to +150 | °C |

## Electrical Characteristics (at $T_C$=25°C unless otherwise noted)

| Parameter | Symbol | Conditions | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|
| **Static Characteristics** | | | | | | |
| Drain-source breakdown voltage | $V_{DSS}$ | $V_{GS}$ = 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** (Note 3) | | | | | | |
| Static drain-source on-resistance | $R_{DS(on)}$ | $V_{GS}$ = -10V, $I_D$ = -15A | | | 50 | mΩ |
| Gate threshold voltage | $V_{GS(th)}$ | $V_{DS}$ = $V_{GS}$, $I_D$ = -250μA | -1 | | -3 | V |
| **Dynamic Characteristics** | | | | | | |
| Input capacitance | $C_{iss}$ | $V_{GS}$ = 0V, $V_{DS}$ = -30V, f = 1MHz | | 3129 | | pF |
| Output capacitance | $C_{oss}$ | | | 173 | | |
| Reverse transfer capacitance | $C_{rss}$ | | | 162.6 | | |
| **Switching Characteristics** | | | | | | |
| Turn-on delay time | $t_{d(on)}$ | $V_{DD}$ = -30V, $V_{GS}$ = -10V<br>$R_G$ = 3Ω | | 13 | | ns |
| Turn-on rise time | $t_r$ | | | 17 | | |
| Turn-off delay time | $t_{d(off)}$ | | | 50 | | |
| Turn-off fall time | $t_f$ | | | 20 | | |
| Total gate charge | $Q_g$ | $V_{DD}$ = -30V, $I_D$ = -15A, $V_{GS}$ = -10V | | 53 | | nC |
| Gate to source charge | $Q_{gs}$ | | | 15 | | |
| Gate to drain (miller) charge | $Q_{gd}$ | | | 13 | | |
| **Source-Drain Diode Characteristics** | | | | | | |
| Diode forward voltage | $V_{SD}$ | $I_{SD}$ = -15A, $V_{GS}$ = 0V | | | -1.2 | V |

Notes: 1. The maximum current rating is limited by package. And device mounted on a large heatsink.

2. The power dissipation $P_D$ is limited by $T_{J(MAX)}$=150°C. And device mounted on a large heatsink

3. The data tested by pulsed, pulse width ≤ 380μs, duty cycle ≤ 2%.

## Rating and Characteristic Curves (ACMS50P06D-HF)

Fig.1 - Typical Output Characteristics

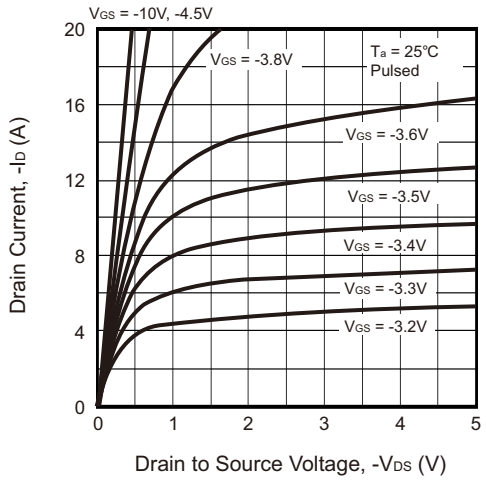



Fig.2 - On-Resistance vs. Continuous Drain Current

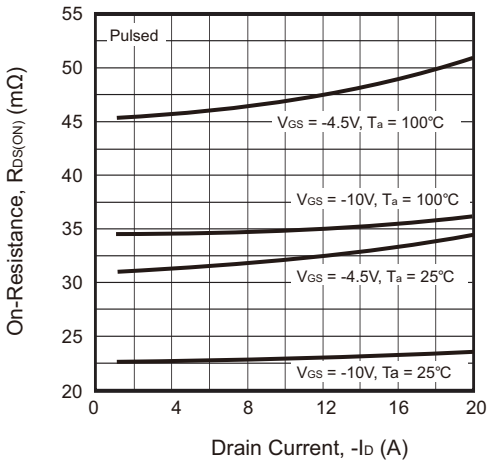



Fig.3 - On-Resistance vs. Gate-Source Voltage

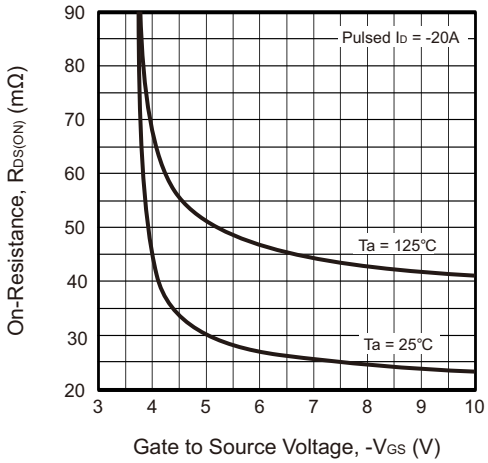



Fig.4 - Body-Diode Characteristics

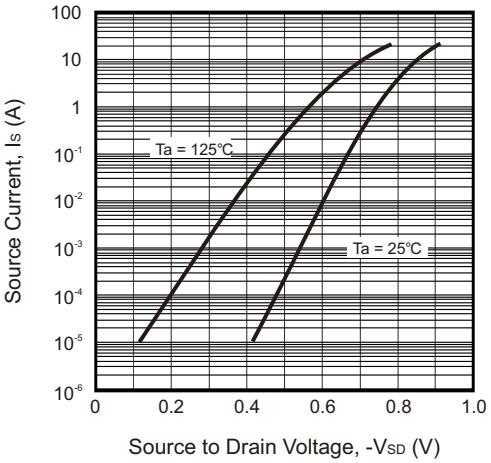



Fig.5 - Gate Threshold Voltage vs. Junction Temperature

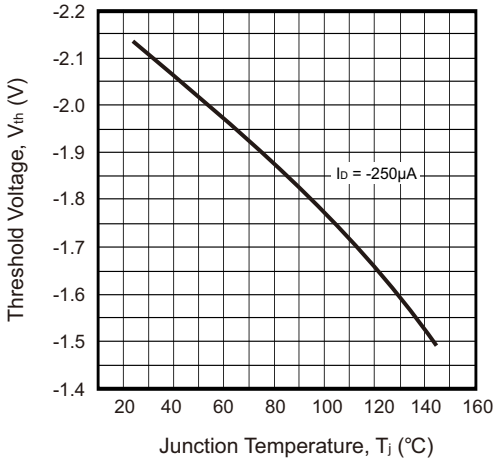
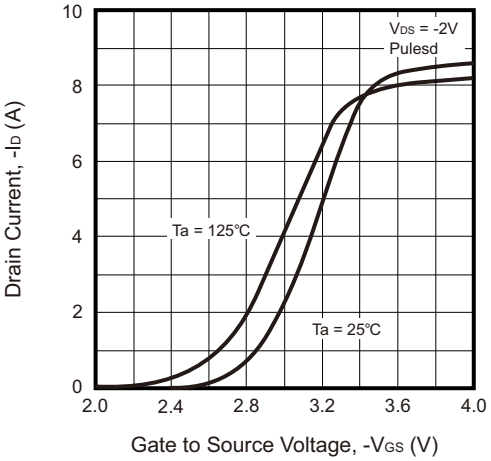
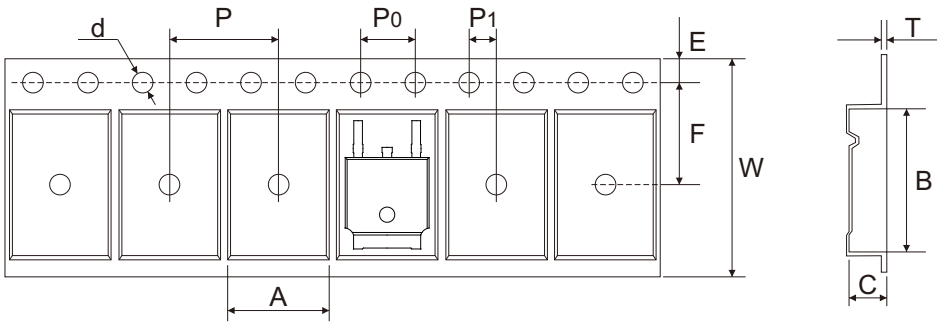
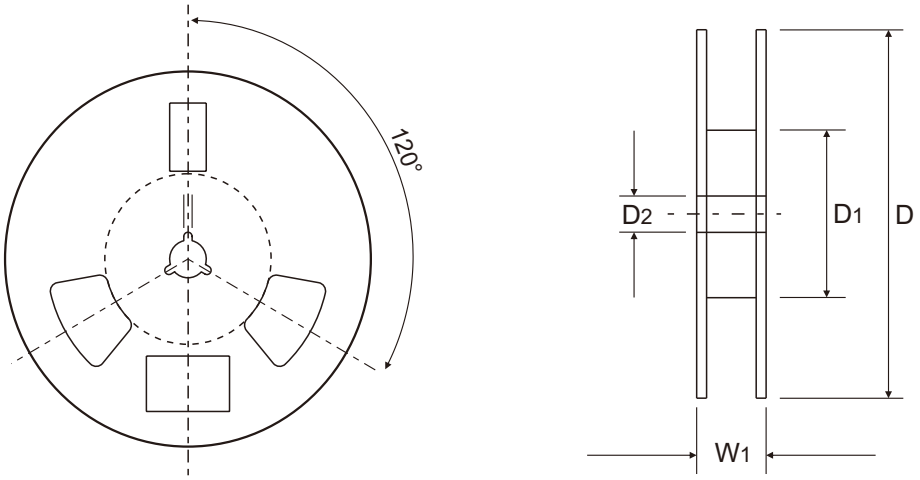


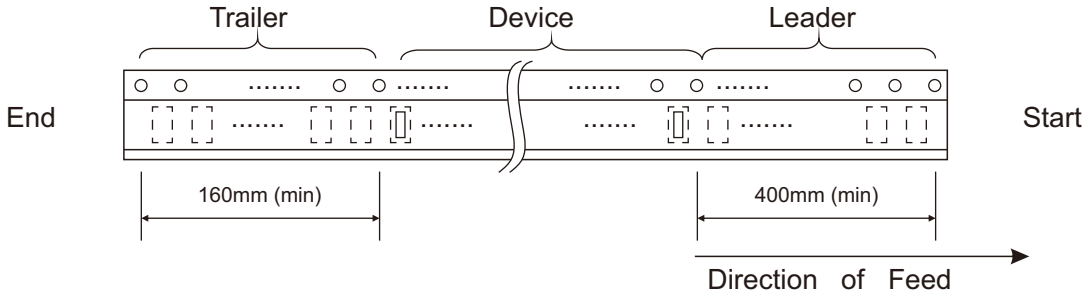

Fig.6 - Transfer Characteristics



# Reel Taping Specification



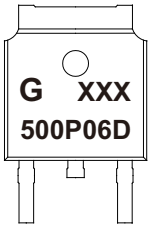




| | SYMBOL | A | B | C | d | D | $D_1$ | $D_2$ |
|---|---|---|---|---|---|---|---|---|
| TO-252 | (mm) | 6.90 ± 0.10 | 10.50 ± 0.10 | 2.70 ± 0.10 | 1.50 + 0.25 | 330 ± 1.00 | 100 ± 1.00 | 13.00 ± 0.20 |
| | (inch) | 0.272 ± 0.004 | 0.413 ± 0.004 | 0.106 ± 0.004 | 0.059 + 0.010 | 12.992 ± 0.039 | 3.937 ± 0.039 | 0.512 ± 0.008 |

| | SYMBOL | E | F | P | $P_0$ | $P_1$ | T | W | $W_1$ |
|---|---|---|---|---|---|---|---|---|---|
| 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

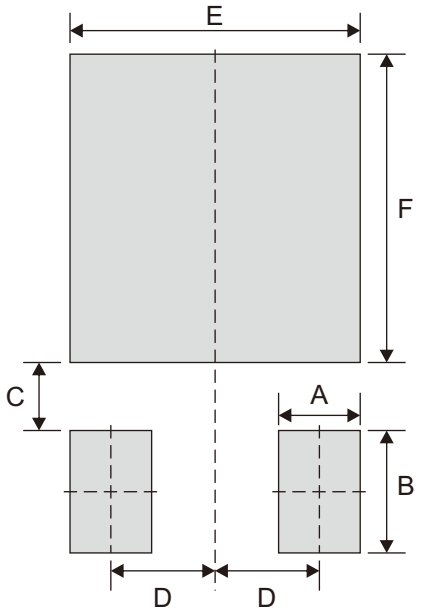
| Part Number | Marking Code |
|---|---|
| ACMS50P06D-HF | 500P06D |




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 |