## / Descriptions

SOT23-3 ṂṂ Ŀ S ॐ ß ѽ Ẓ ٦

P- CHANNEL MOSFET in a SOT23-3 Plastic Package.

## / Features

$R_{DS(ON)}$< 41 mΩ,$V_{GS}$= -4.5V

$R_{DS(ON)}$< 53 mΩ,$V_{GS}$= -2.5V

ٸ ᵀ DHF0T434 ‰´ ᵪ ᴵ ˎ ớ ɭ ∂ ı ḛ ꜰ ᵝ Qualified to AEC-Q101 Standards for High Reliability, HF Product.

## / Applications

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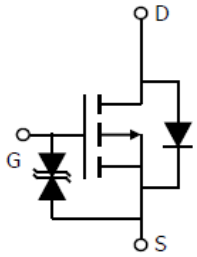
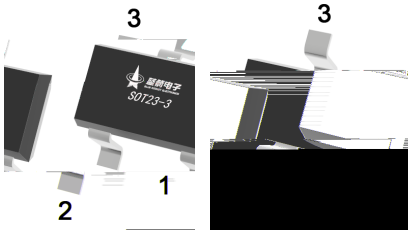
Load switch ı Battery protection, Meet the stringent requirements of automotive applications.

## / Equivalent Circuit




## / Pinning




PIN1 χ G PIN 2 χ S PIN 3 χ D

## / Marking

| | |
|---|---|
| Marking | AFQ |

## / Absolute Maximum Ratings(Ta=25 )

| v ̈Ω<br>Parameter | ϒ N<br>Symbol | ̈Ω Ö<br>Rating | D Ч<br>Unit |
|---|---|---|---|
| Drain-Source Voltage | $V_{DS}$ | -20 | V |
| Gate-Source Voltage | $V_{GS}$ | 8 | V |
| Drain Current-Continuous @ $T_C$ =25°C | $I_D$ | -4 | A |
| Drain Current-Pulsed Note1 @ $T_C$ =25°C | $I_{DM}$ | -30 | A |
| Maximum Power Dissipation | $P_D$ | 1.5 | W |
| Storage Temperature Range | $T_{STG}$ | -55 to +150 | C |
| Operating Junction Temperature Range | $T_J$ | -55 to +150 | C |
| Thermal Resistance, Junction-to-Ambient Note2 | $R_{\theta JA}$ | 100 | C/W |

## / Electrical Characteristics(Ta=25 )

| v ̈Ω<br>Parameter | ϒ N<br>Symbol | ╜ :ϯ ϯ<br>Test Conditions | ω ŋ Ö<br>Min | Ɛ ʒ Ö<br>Typ | ω ᶻ Ö<br>Max | D Ч<br>Unit |
|---|---|---|---|---|---|---|
| Drain-Source Breakdown Voltage | $B_{VDSS}$ | $V_{GS}$=0V $I_{DS}$ =-250μA | -20 | | | V |
| Zero Gate Voltage Drain Current | $I_{DSS}$ | $V_{DS}$=-20V $V_{GS}$=0V | | | -1 | uA |
| Gate-Body Leakage | $I_{GSS}$ | $V_{GS}$=±8V $V_{DS}$=0V | | | 10 | uA |
| Gate Threshold Voltage | $V_{TH}$ | $V_{DS}$=$V_{GS}$ $I_{DS}$=-250μA | -0.3 | -0.6 | -0.9 | V |
| Drain-Source On-State Resistance | $R_{DS}$ | $V_{GS}$=-4.5V $I_{DS}$=-4A | | 35 | 41 | mΩ |
| | | $V_{GS}$=-2.5V $I_{DS}$=-4A | | 45 | 53 | |
| Input Capacitance | $C_{iss}$ | $V_{DS}$=-10V $V_{GS}$=0V f=1MHz | | 750 | | pF |
| Output Capacitance | $C_{oss}$ | | | 110 | | |
| Reverse Transfer Capacitance | $C_{rss}$ | | | 80 | | |
| Turn-On Delay Time | $t_{d(on)}$ | $V_{DS}$=-10V $V_{GS}$=-4.5V $R_G$=3 $R_L$=2.5 | | 15.6 | | ns |
| Rise Time | $t_r$ | | | 11.2 | | |
| Turn-Off Delay Time | $t_{d(off)}$ | | | 23.1 | | |
| Fall Time | $t_f$ | | | 32.7 | | |
| Total Gate Charge at 10V | $Q_g$ | $V_{DS}$=-10V $I_{DS}$=-4A $V_{GS}$=-4.5V | | 10 | | nC |
| Gate to Source Gate Charge | $Q_{gs}$ | | | 1.5 | | |
| Gate to Drain “Miller” Charge | $Q_{gd}$ | | | 2.2 | | |
| Drain-Source Diode Forward Voltage | $V_{SD}$ | $V_{GS}$=0V $I_{DS}$=-1A | | -0.7 | | V |

Notes:

1. Pulse Test: Pulse Width 300μs, Duty Cycle 2%.
2. $R_{\theta JA}$ is the sum of the junction-to-case and case-to-ambient thermal resistance where the case thermal reference is defined as the solder mounting surface of the drain pins.RθJC is guaranteed by design while RθCA is determined by the user's board design. RθJA shown below for single device operation on FR-4 in still air.

## / Electrical Characteristic Curve

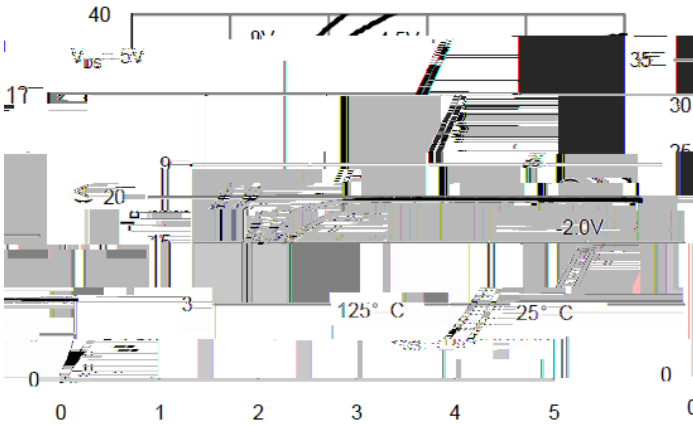



Fig 1: On-Region Characteristics (Note E)

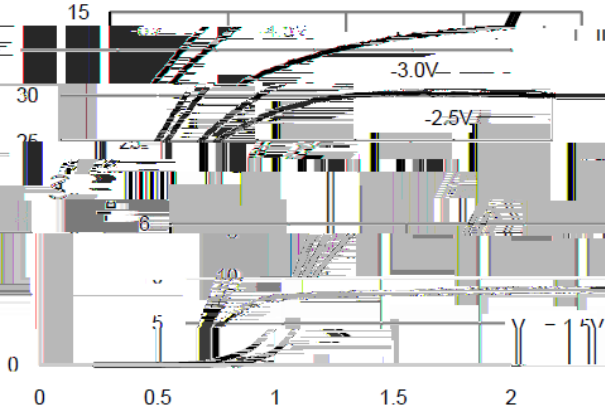
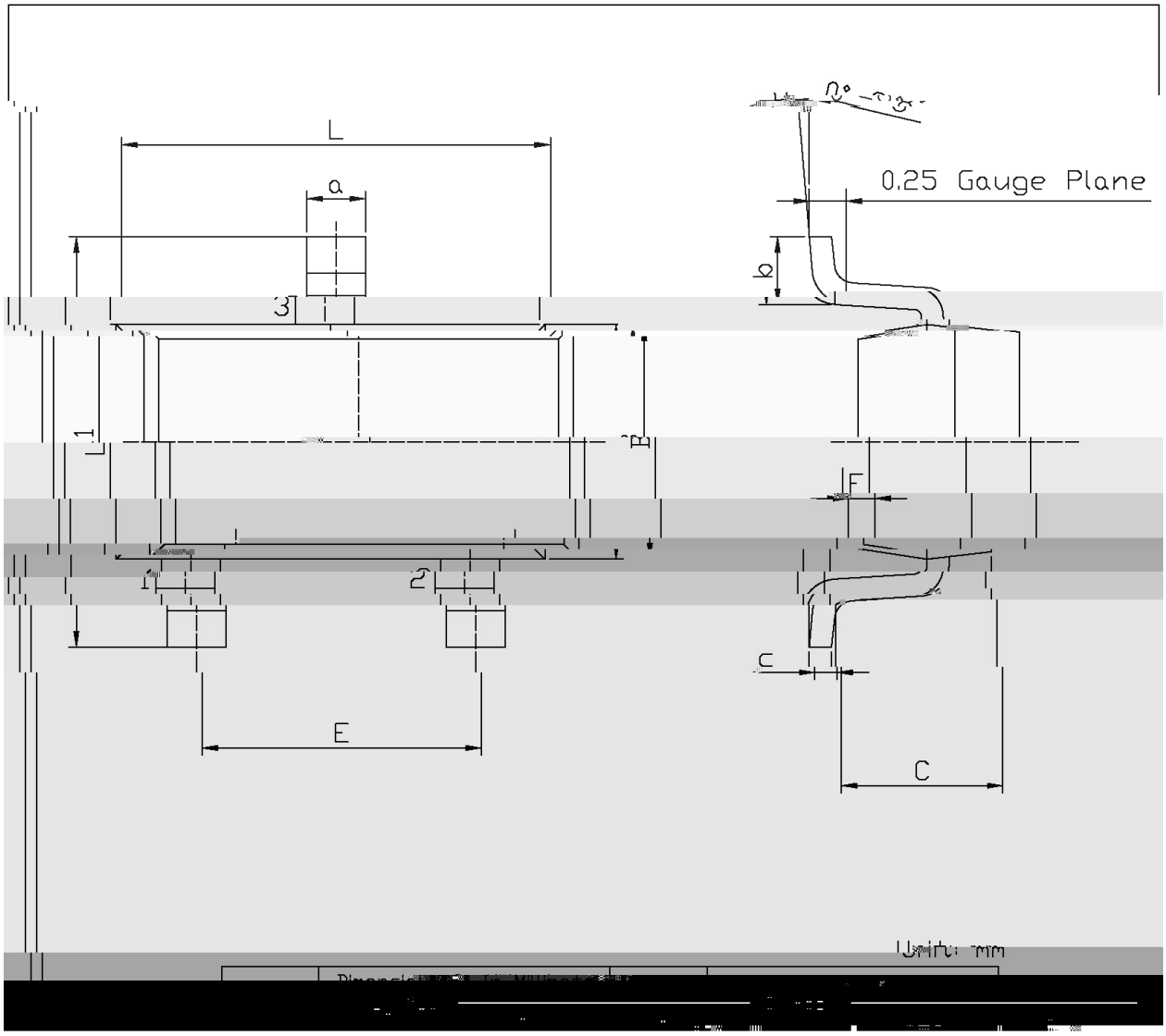
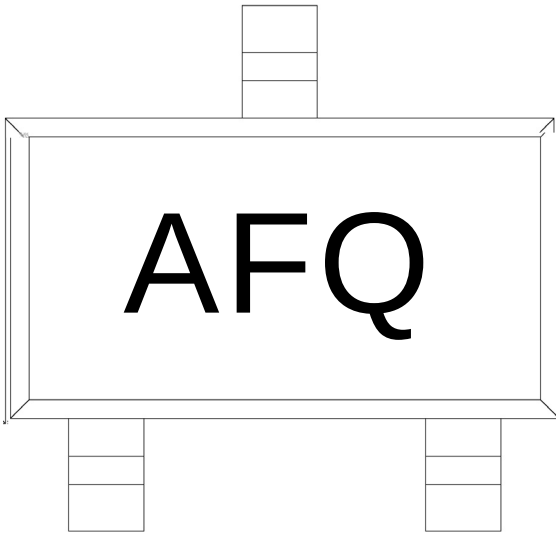



Figure 2: Transfer Characteristics (Note E)

## / Package Dimensions



## / Marking Instructions

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AF: ѭ ȝ ᴺ Ꮁ

Note:

Q: Automobile halogen-free product Code

AF χ Product Type

## ( ) / Temperature Profile for IR Reflow Soldering(Pb-Free)

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ب ˝ χ

1 Ĺ ♬ □ ў 150 Ќ 200 ћ ı `H ڑ 60 Ќ 120sec;

2 Š Ө □ ў 255 ° 5 ћ ı `H ڑ 'Y ﾊ ㎞ 5 ° 0.5sec;

3 ì ˙ ﾘ ˛ ɔ ﻩ ў ㎞ 2 Ќ 10 ћ /sec.

Note:

1.Preheating:150~200 ћ , Time:60~120sec.

2.Peak Temp.:255 ° 5 ћ , Duration:5 ° 0.5sec.

3. Cooling Speed: 2~10 ћ /sec.

## / Resistance to Soldering Heat Test Conditions

| | | | |
|---|---|---|---|
| □ ў χ 260 ° 5 ћ | `H ڑ χ 10 ° 1 sec. | Temp.:260 ° 5 ћ | Time:10 ° 1 sec |

## / Packaging SPEC.

ი ` ﾔ Ь / REEL

| Package Type | Units | Dimension | (unit mm³ |
|---|---|---|---|