

### / Descriptions

SOT-23                  P    MOS

P- CHANNEL MOSFET in a SOT-23 Plastic Package.

### / Features

MOSFET

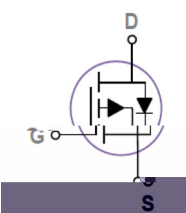
AEC-Q101

Trench Power MOSFET technology, Low  $R_{DS(ON)}$ , Low Gate Charge, Qualified to AEC-Q101 Standards for High Reliability, HF Product.

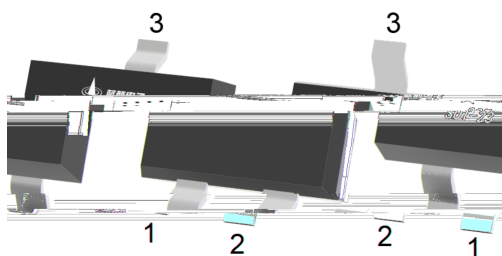
### / Applications

Primarily the display screen drive applications, Meet the stringent requirements of automotive applications.

### / Equivalent Circuit



### / Pinning



PIN1 G

PIN 2 S

PIN 3 D

### / Marking

|         |      |
|---------|------|
| Marking | Q305 |
|---------|------|

## / Absolute Maximum Ratings(Ta=25 )

| Parameter                               | Symbol          | Rating     | Unit |
|-----------------------------------------|-----------------|------------|------|
| Drain-Source Voltage                    | $V_{DS}$        | -20        | V    |
| Gate-Source Voltage                     | $V_{GS}$        | $\pm 12$   | V    |
| Drain Current – Continuous              | $I_D(T_C=25)$   | -4.3       | A    |
| Pulsed Drain Current                    | $I_{DM}$        | -18        | A    |
| Power Dissipation                       | $P_D$           | 1.3        | W    |
| Operating and Storage Temperature Range | $T_J, T_{stg}$  | -55 to 150 |      |
| Junction-to-Ambient                     | $t \leq 10$     | 90         | /W   |
| Junction-to-Ambient                     | Steady-State    |            |      |
| Junction-to-Lead                        | Steady-State    |            |      |
|                                         | $R_{\theta JA}$ | 125        |      |
|                                         | $R_{\theta JL}$ | 80         |      |

## / Electrical Characteristics(Ta=25 )

| Parameter                          | Symbol        | Test Conditions                             | Min  | Typ  | Max       | Unit       |
|------------------------------------|---------------|---------------------------------------------|------|------|-----------|------------|
| Drain–Source Breakdown Voltage     | $V_{(BR)DSS}$ | $V_{GS}=0V$ $I_D=-250\mu A$                 | -20  | -23  |           | V          |
| Gate Threshold Voltage             | $V_{GS(th)}$  | $V_{DS}=V_{GS}$<br>$I_D=-250\mu A$          | -0.4 | 0.75 | -1.0      | V          |
| Static Drain–Source On–Resistance  | $R_{DS(on)1}$ | $V_{GS}=-4.5V$ $I_D=-4.3A$                  |      | 33   | 40        | m $\Omega$ |
|                                    | $R_{DS(on)2}$ | $V_{GS}=-2.5V$ $I_D=-3.0A$                  |      | 45   | 60        | m $\Omega$ |
|                                    | $R_{DS(on)3}$ | $V_{GS}=-1.8V$ $I_D=-2.0A$                  |      | 63   | 85        | m $\Omega$ |
| Zero Gate Voltage Drain Current    | $I_{DSS}$     | $V_{DS}=-20V$ $V_{GS}=0V$                   |      |      | 1         | $\mu A$    |
| Gate–Body Leakage.                 | $I_{GSS}$     | $V_{GS}=\pm 12V$ $V_{DS}=0V$                |      |      | $\pm 0.1$ | $\mu A$    |
| Drain–Source Diode Forward Voltage | $V_{SD}$      | $I_S=-1A$ $V_{GS}=0V$                       |      |      | -1.2      | V          |
| Gate Resistance                    | $R_g$         |                                             |      | 22   |           | $\Omega$   |
| Input Capacitance                  | $C_{iss}$     | $V_{DS}=-5V$ $V_{GS}=0V$<br>$f=1.0MHz$      |      | 450  |           | pF         |
| Output Capacitance                 | $C_{oss}$     |                                             |      | 220  |           |            |
| Reverse Transfer Capacitance       | $C_{rss}$     |                                             |      | 90   |           |            |
| Total Gate Charge                  | $Q_{g(4.5V)}$ | $V_{GS}=-4.5V$ $V_{DS}=-10V$<br>$I_D=-4.3A$ |      | 8.8  |           | nC         |
| Gate Source Charge                 | $Q_{gs}$      |                                             |      | 1.2  |           |            |
| Gate Drain Charge                  | $Q_{gd}$      |                                             |      | 2.5  |           |            |

## / Electrical Characteristics(Ta=25 )

| Parameter           | Symbol       | Test Conditions                                                    | Min | Typ  | Max | Unit |
|---------------------|--------------|--------------------------------------------------------------------|-----|------|-----|------|
| Turn-On Delay Time  | $t_{d(on)}$  | $V_{GS}=-4.5V$ $V_{DS}=-10V$<br>$R_L=2.22\Omega$ $R_{GEN}=3\Omega$ |     | 12   |     | ns   |
| Turn-On Rise Time   | $t_r$        |                                                                    |     | 11.3 |     |      |
| Turn-Off Delay Time | $t_{d(off)}$ |                                                                    |     | 80   |     |      |
| Turn-Off Fall Time  | $t_f$        |                                                                    |     | 32   |     |      |



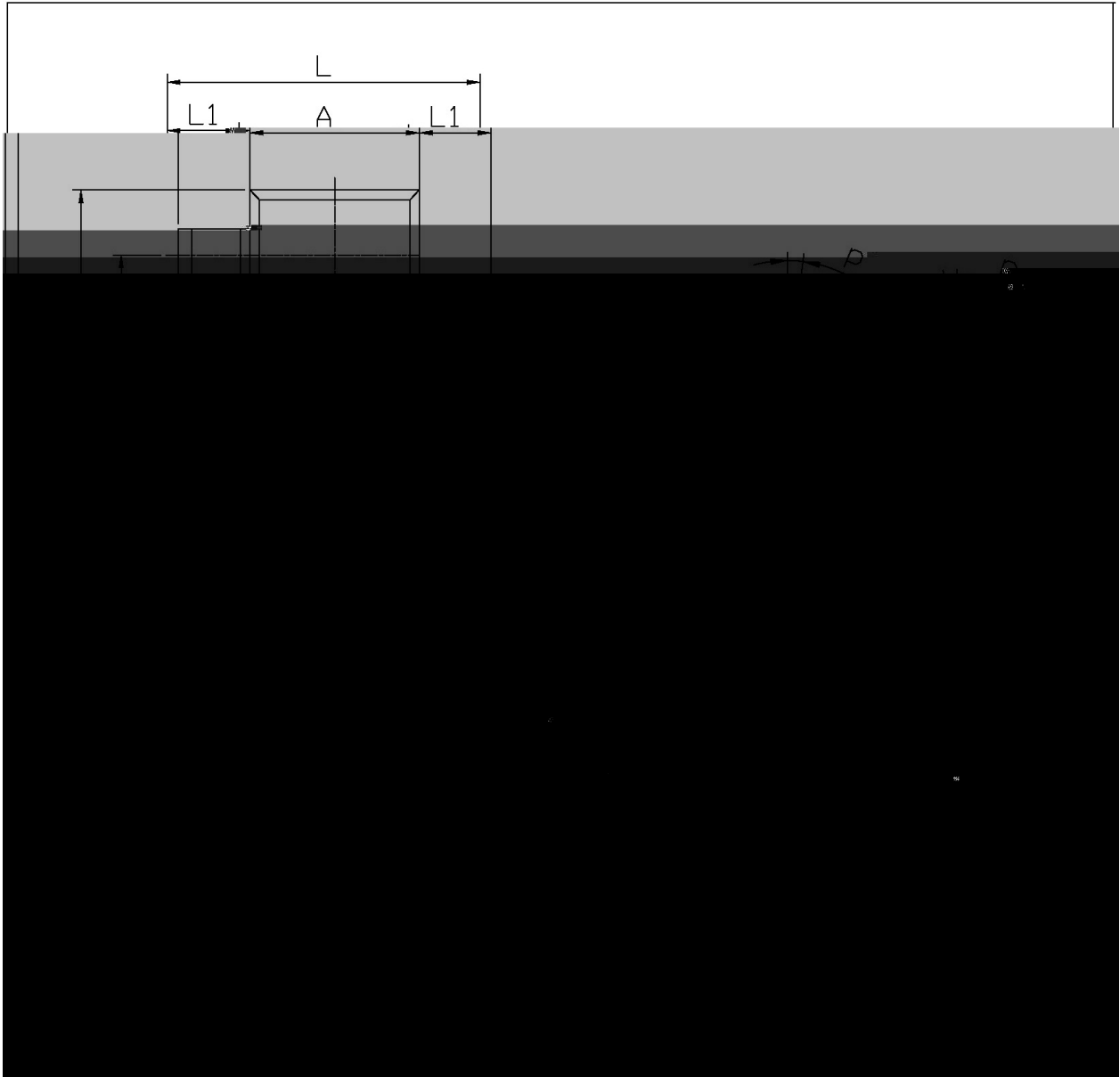




/ Package Dimensions

SOT-23

单位: mm



**/ Marking Instructions**



Q

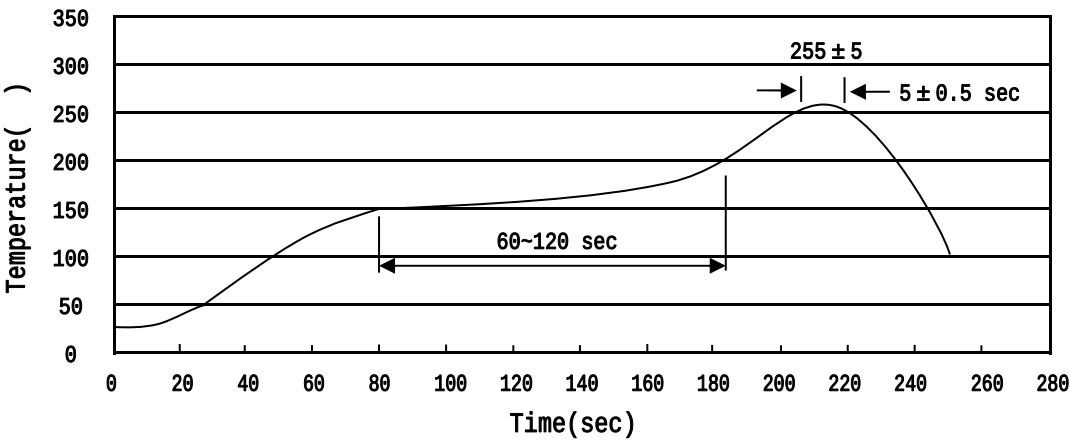
305:

Note:

Q:           Automobile halogen-free product Code

305         Product Type Code

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



Note:

- 1

150 200

60 120sec;

1.Preheating:150~200 , Time:60~120sec.
- 2

255±5

5±0.5sec;

2.Peak Temp.:255±5 , Duration:5±0.5sec.
- 3

2 10 /sec.

3. Cooling Speed: 2~10 /sec.

/ Resistance to Soldering Heat Test Conditions

260±5

10±1 sec.

Temp.:260±5

Time:10±1 sec

/ Packaging SPEC.

/ REEL

| Package Type | Units      |                 |                 |                       |                 | Dimension (unit mm <sup>3</sup> ) |             |             |
|--------------|------------|-----------------|-----------------|-----------------------|-----------------|-----------------------------------|-------------|-------------|
|              | Units/Reel | Reels/Inner Box | Units/Inner Box | Inner Boxes/Outer Box | Units/Outer Box | Reel                              | Inner Box   | Outer Box   |
| SOT-23       | 3,000      | 10              | 30,000          | 4                     | 120,000         | 7 ×8                              | 210×205×205 | 445×435×230 |

/ Notices