

## Features

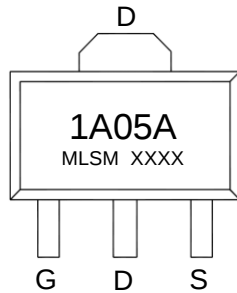
- Trench Power LV MOSFET technology
- Low  $R_{DS(on)}$  & FOM
- Excellent stability and uniformity
- Fast switching and soft recovery

## Application

- Consumer electronic power supply
- Motor control
- Synchronous-rectification
- Isolated DC/DC convertor

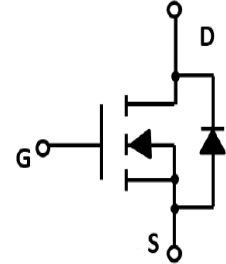
## Product Summary

| $V_{DS}$ | $R_{DS(on)}$ TYP | $I_D$ |
|----------|------------------|-------|
| 100V     | 95mΩ@10V         | 5A    |
|          | 125mΩ@4.5V       |       |



1A05A: Device code  
 XXXX: Code

Marking and pin assignment



Schematic diagram



Halogen-Free

## Absolute Maximum Ratings (TA=25°C unless otherwise noted)

| Symbol                                                 | Parameter                        | Rating                      | Unit |
|--------------------------------------------------------|----------------------------------|-----------------------------|------|
| <b>Common Ratings (TC=25°C Unless Otherwise Noted)</b> |                                  |                             |      |
| $V_{DS}$                                               | Drain-Source Breakdown Voltage   | 100                         | V    |
| $V_{GS}$                                               | Gate-Source Voltage              | ±20                         | V    |
| $T_J$                                                  | Maximum Junction Temperature     | 150                         | °C   |
| $T_{STG}$                                              | Storage Temperature Range        | -50 to 155                  | °C   |
| $I_S$                                                  | Diode Continuous Forward Current | $T_c=25^\circ\text{C}$<br>5 | A    |

## Mounted on Large Heat Sink

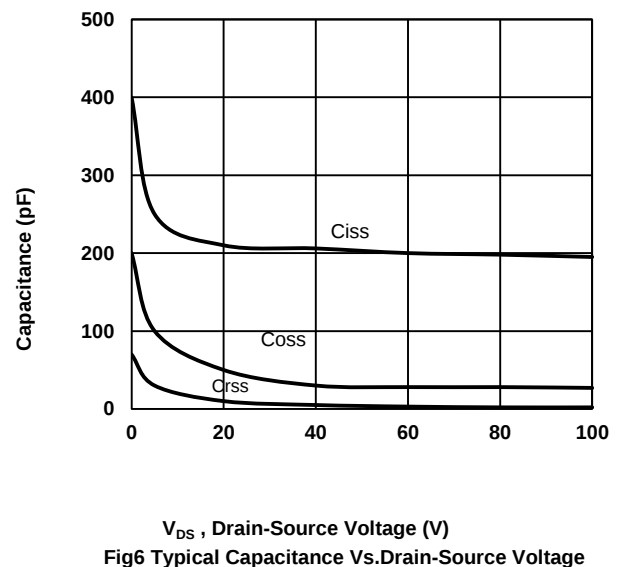
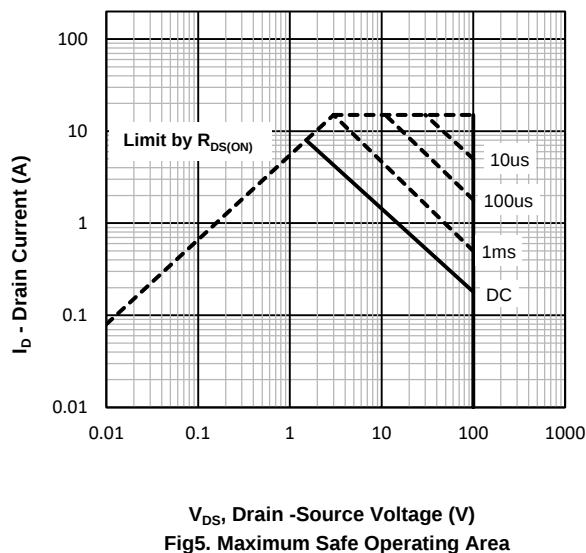
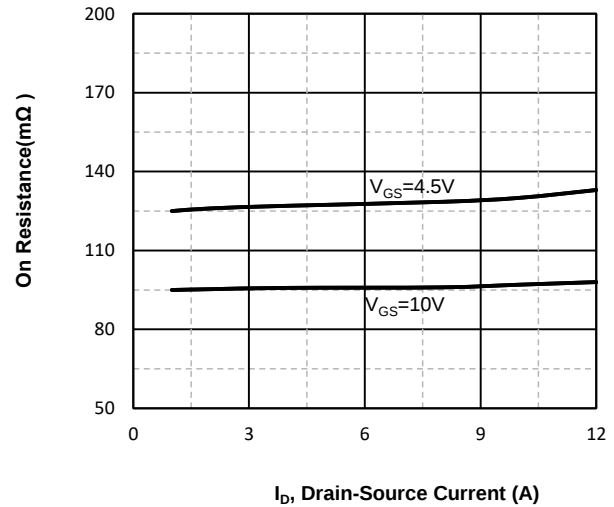
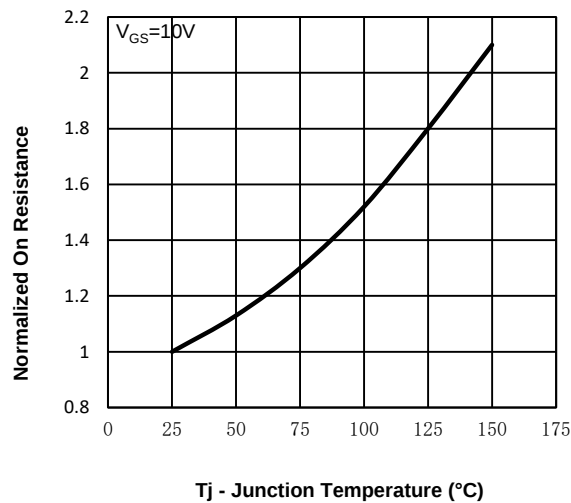
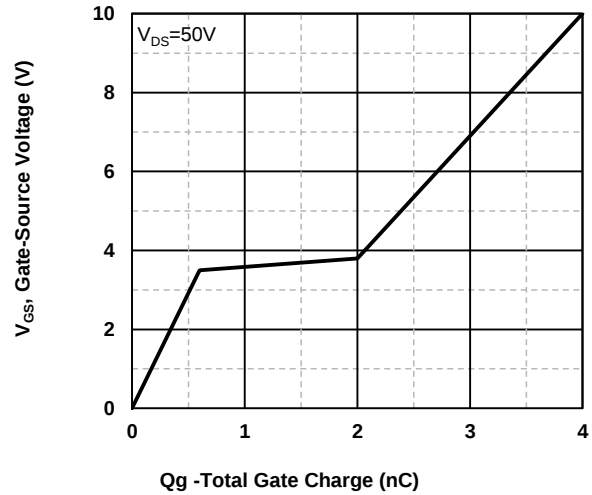
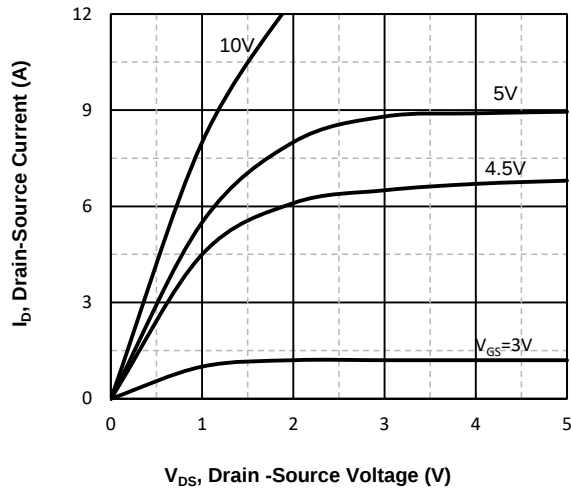
|                 |                                     |                               |      |
|-----------------|-------------------------------------|-------------------------------|------|
| $I_{DM}$        | Pulse Drain Current Tested          | $T_c=25^\circ\text{C}$<br>15  | A    |
| $I_D$           | Continuous Drain Current            | $T_c=25^\circ\text{C}$<br>5   | A    |
| $P_D$           | Maximum Power Dissipation           | $T_c=25^\circ\text{C}$<br>0.5 | W    |
| $R_{\theta JA}$ | Thermal Resistance Junction-Ambient | 85                            | °C/W |

## Ordering Information (Example)

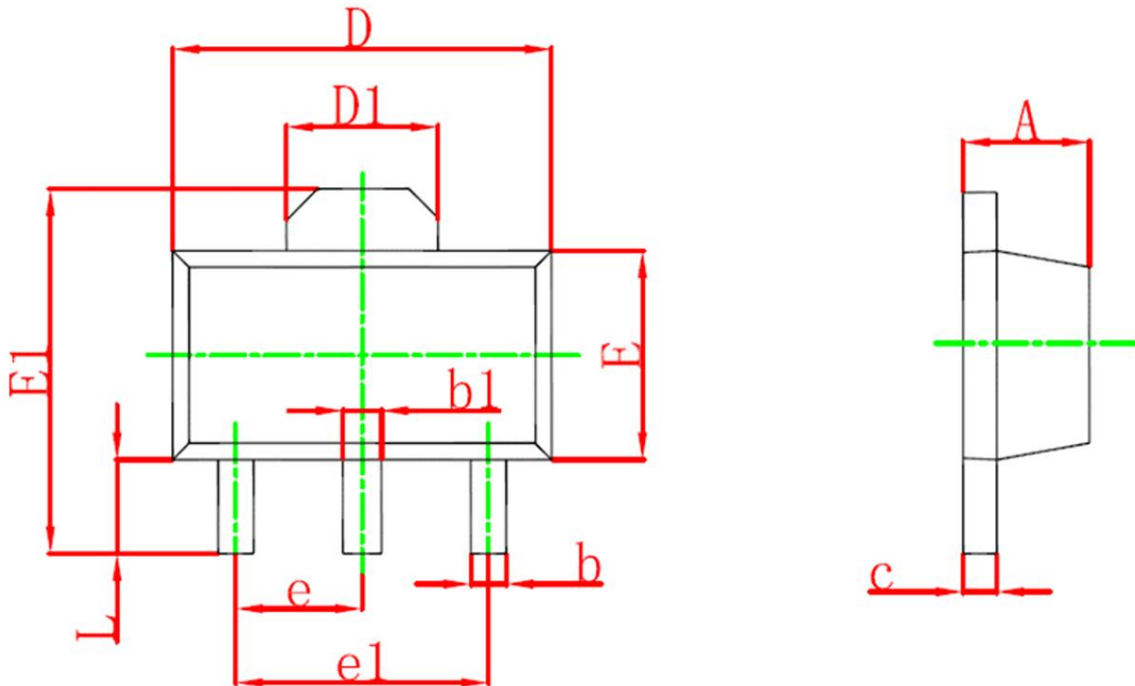
| Type    | Package   | Marking | Minimum Package(pcs) | Inner Box Quantity(pcs) | Outer Carton Quantity(pcs) | Delivery Mode |
|---------|-----------|---------|----------------------|-------------------------|----------------------------|---------------|
| MZ1A05A | SOT-89-3L | 1A05A   | 1,000                | 10,000                  | 40,000                     | 7"reel        |

| Electrical Characteristics (TJ=25℃ unless otherwise noted)              |                                  |                                                                                    |     |      |      |      |
|-------------------------------------------------------------------------|----------------------------------|------------------------------------------------------------------------------------|-----|------|------|------|
| Symbol                                                                  | Parameter                        | Condition                                                                          | Min | Typ  | Max  | Unit |
| Static Electrical Characteristics @ TJ = 25℃ (unless otherwise stated)  |                                  |                                                                                    |     |      |      |      |
| BV <sub>(BR)DSS</sub>                                                   | Drain-Source Breakdown Voltage   | V <sub>GS</sub> =0V, I <sub>D</sub> =250μA                                         | 100 | --   | --   | V    |
| I <sub>DSS</sub>                                                        | Zero Gate Voltage Drain Current  | V <sub>DS</sub> =100V, V <sub>GS</sub> =0V                                         | --  | --   | 1    | μA   |
| I <sub>GSS</sub>                                                        | Gate-Body Leakage Current        | V <sub>GS</sub> =±20V, V <sub>DS</sub> =0V                                         | --  | --   | ±100 | nA   |
| V <sub>GS(th)</sub>                                                     | Gate Threshold Voltage           | V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250μA                           | 1.0 | 1.8  | 2.5  | V    |
| R <sub>DS(on)</sub>                                                     | Drain-Source On-State Resistance | V <sub>GS</sub> =10V, I <sub>D</sub> =3A                                           | --  | 95   | 140  | mΩ   |
|                                                                         |                                  | V <sub>GS</sub> =4.5V, I <sub>D</sub> =2A                                          | --  | 125  | 300  | mΩ   |
| Dynamic Electrical Characteristics @ TJ = 25℃ (unless otherwise stated) |                                  |                                                                                    |     |      |      |      |
| C <sub>ISS</sub>                                                        | Input Capacitance                | V <sub>DS</sub> =50V, V <sub>GS</sub> =0V, f=1MHz                                  | --  | 200  | --   | pF   |
| C <sub>OSS</sub>                                                        | Output Capacitance               |                                                                                    | --  | 30   | --   | pF   |
| C <sub>RSS</sub>                                                        | Reverse Transfer Capacitance     |                                                                                    | --  | 2    | --   | pF   |
| Switching Characteristics                                               |                                  |                                                                                    |     |      |      |      |
| Q <sub>g</sub>                                                          | Total Gate Charge                | V <sub>DS</sub> =50V, I <sub>D</sub> =5A, V <sub>GS</sub> =10V                     | --  | 4    | --   | nC   |
| Q <sub>gs</sub>                                                         | Gate Source Charge               |                                                                                    | --  | 0.5  | --   | nC   |
| Q <sub>gd</sub>                                                         | Gate Drain Charge                |                                                                                    | --  | 1.4  | --   | nC   |
| t <sub>d(on)</sub>                                                      | Turn-on Delay Time               | V <sub>DS</sub> =50V, I <sub>D</sub> =5A, V <sub>GS</sub> =10V, R <sub>G</sub> =2Ω | --  | 12.5 | --   | nS   |
| t <sub>r</sub>                                                          | Turn-on Rise Time                |                                                                                    | --  | 19.3 | --   | nS   |
| t <sub>d(off)</sub>                                                     | Turn-Off Delay Time              |                                                                                    | --  | 20   | --   | nS   |
| t <sub>f</sub>                                                          | Turn-Off Fall Time               |                                                                                    | --  | 28   | --   | nS   |
| Source- Drain Diode Characteristics                                     |                                  |                                                                                    |     |      |      |      |
| V <sub>SD</sub>                                                         | Forward on voltage               | Tj=25℃, Is=5A                                                                      | --  | --   | 1.2  | V    |

## Typical Operating Characteristics



SOT-89-3L Package information



| Symbol | Dimensions in Millimeters(mm) |       | Dimensions in Inches |       |
|--------|-------------------------------|-------|----------------------|-------|
|        | Min                           | Max   | Min                  | Max   |
| A      | 1.400                         | 1.600 | 0.055                | 0.063 |
| b      | 0.320                         | 0.520 | 0.013                | 0.020 |
| b1     | 0.400                         | 0.580 | 0.016                | 0.023 |
| c      | 0.350                         | 0.440 | 0.014                | 0.017 |
| D      | 4.400                         | 4.600 | 0.173                | 0.181 |
| D1     | 1.550 REF                     |       | 0.061 REF            |       |
| E      | 2.300                         | 2.600 | 0.091                | 0.102 |
| E1     | 3.940                         | 4.250 | 0.155                | 0.167 |
| e      | 1.500 TYP                     |       | 0.060 TYP            |       |
| e1     | 3.000 TYP                     |       | 0.118 TYP            |       |
| L      | 0.900                         | 1.200 | 0.035                | 0.047 |