



# BFL4001

## N-Channel Power MOSFET 900V, 6.5A, 2.7Ω, TO-220F-3FS

ON Semiconductor®

<http://onsemi.com>

### Features

- ON-resistance  $R_{DS(on)}=2.1\Omega$  (typ.)
- 10V drive
- Input capacitance  $C_{iss}=850\text{pF}$  (typ.)

### Specifications

Absolute Maximum Ratings at  $T_a=25^\circ\text{C}$ 

| Parameter                          | Symbol           | Conditions                                                      | Ratings     | Unit             |
|------------------------------------|------------------|-----------------------------------------------------------------|-------------|------------------|
| Drain-to-Source Voltage            | $V_{DS}$         |                                                                 | 900         | V                |
| Gate-to-Source Voltage             | $V_{GS}$         |                                                                 | $\pm 30$    | V                |
| Drain Current (DC)                 | $I_{DC}^{*1}$    | Limited only by maximum temperature $T_{ch}=150^\circ\text{C}$  | 6.5         | A                |
|                                    | $I_{Dpack}^{*2}$ | $T_c=25^\circ\text{C}$ (Our ideal heat dissipation condition)*3 | 4.1         | A                |
| Drain Current (Pulse)              | $I_{DP}$         | $PW \leq 10\mu\text{s}$ , duty cycle $\leq 1\%$                 | 13          | A                |
| Allowable Power Dissipation        | $P_D$            |                                                                 | 2.0         | W                |
|                                    |                  | $T_c=25^\circ\text{C}$ (Our ideal heat dissipation condition)*3 | 37          | W                |
| Channel Temperature                | $T_{ch}$         |                                                                 | 150         | $^\circ\text{C}$ |
| Storage Temperature                | $T_{stg}$        |                                                                 | -55 to +150 | $^\circ\text{C}$ |
| Avalanche Energy (Single Pulse) *4 | EAS              |                                                                 | 223         | mJ               |
| Avalanche Current *5               | $I_{AV}$         |                                                                 | 6.5         | A                |

Note : \*1 Shows chip capability

\*2 Package limited

\*3 Our condition is radiation from backside.

The method is applying silicone grease to the backside of the device and attaching the device to water-cooled radiator made of aluminium.

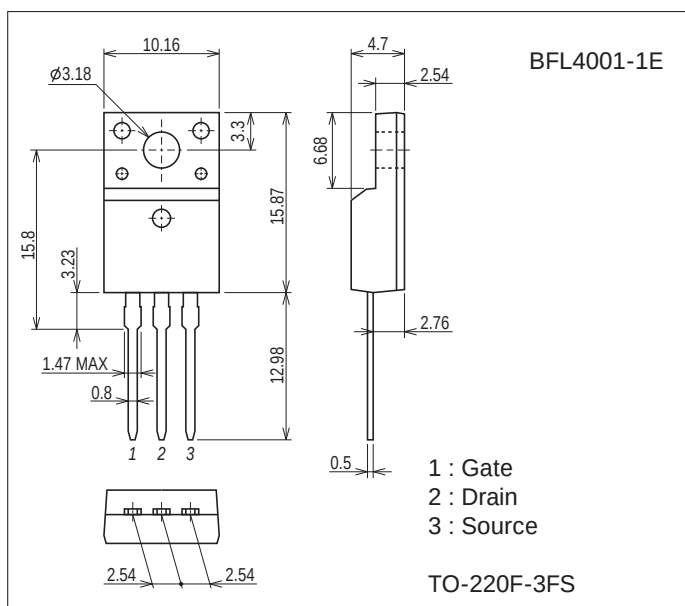
\*4  $V_{DD}=50\text{V}$ ,  $L=10\text{mH}$ ,  $I_{AV}=6.5\text{A}$ \*5  $L \leq 10\text{mH}$ , single pulse

Stresses exceeding Maximum Ratings may damage the device. Maximum Ratings are stress ratings only. Functional operation above the Recommended Operating Conditions is not implied. Extended exposure to stresses above the Recommended Operating Conditions may affect device reliability.

### Package Dimensions

unit : mm (typ)

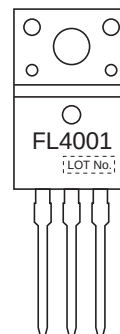
7528-001



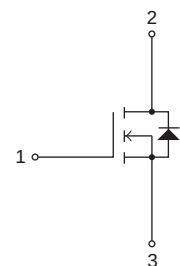
### Product & Package Information

- Package : TO-220F-3FS
- JEITA, JEDEC : SC-67
- Minimum Packing Quantity : 50 pcs./magazine

### Marking



### Electrical Connection

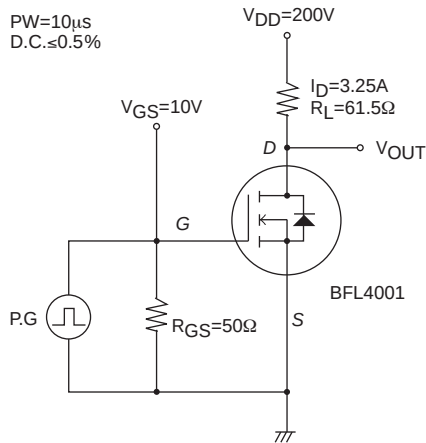


# BFL4001

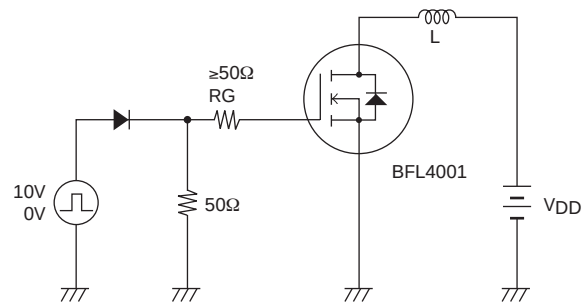
## Electrical Characteristics at Ta=25°C

| Parameter                                  | Symbol        | Conditions                          | Ratings |      |           | Unit     |
|--------------------------------------------|---------------|-------------------------------------|---------|------|-----------|----------|
|                                            |               |                                     | min     | typ  | max       |          |
| Drain-to-Source Breakdown Voltage          | $V_{(BR)DSS}$ | $I_D=10mA, V_{GS}=0V$               | 900     |      |           | V        |
| Zero-Gate Voltage Drain Current            | $I_{DSS}$     | $V_{DS}=720V, V_{GS}=0V$            |         |      | 1.0       | mA       |
| Gate-to-Source Leakage Current             | $I_{GSS}$     | $V_{GS}=\pm 30V, V_{DS}=0V$         |         |      | $\pm 100$ | nA       |
| Cutoff Voltage                             | $V_{GS(off)}$ | $V_{DS}=10V, I_D=1mA$               | 2.0     |      | 4.0       | V        |
| Forward Transfer Admittance                | $ y_{fs} $    | $V_{DS}=20V, I_D=3.25A$             | 1.8     | 3.6  |           | S        |
| Static Drain-to-Source On-State Resistance | $R_{DS(on)}$  | $I_D=3.25A, V_{GS}=10V$             |         | 2.1  | 2.7       | $\Omega$ |
| Input Capacitance                          | $C_{iss}$     | $V_{DS}=30V, f=1MHz$                |         | 850  |           | pF       |
| Output Capacitance                         | $C_{oss}$     |                                     |         | 130  |           | pF       |
| Reverse Transfer Capacitance               | $C_{rss}$     |                                     |         | 43   |           | pF       |
| Turn-ON Delay Time                         | $t_{d(on)}$   | See specified Test Circuit.         |         | 19   |           | ns       |
| Rise Time                                  | $t_r$         |                                     |         | 49   |           | ns       |
| Turn-OFF Delay Time                        | $t_{d(off)}$  |                                     |         | 156  |           | ns       |
| Fall Time                                  | $t_f$         |                                     |         | 52   |           | ns       |
| Total Gate Charge                          | $Q_g$         | $V_{DS}=200V, V_{GS}=10V, I_D=6.5A$ |         | 44   |           | nC       |
| Gate-to-Source Charge                      | $Q_{gs}$      |                                     |         | 7.0  |           | nC       |
| Gate-to-Drain "Miller" Charge              | $Q_{gd}$      |                                     |         | 22   |           | nC       |
| Diode Forward Voltage                      | $V_{SD}$      | $I_S=6.5A, V_{GS}=0V$               |         | 0.85 | 1.2       | V        |

## Switching Time Test Circuit

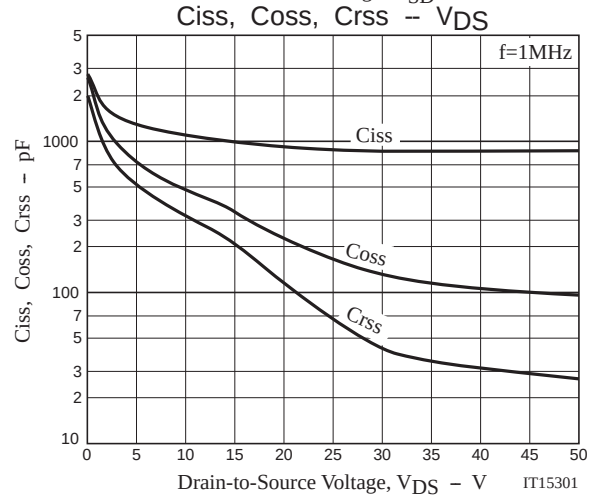
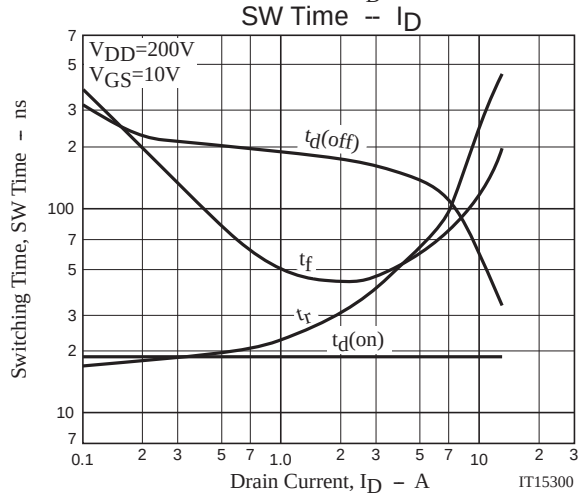
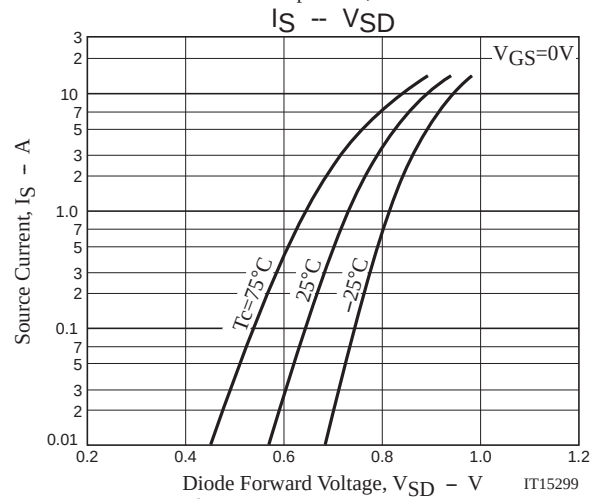
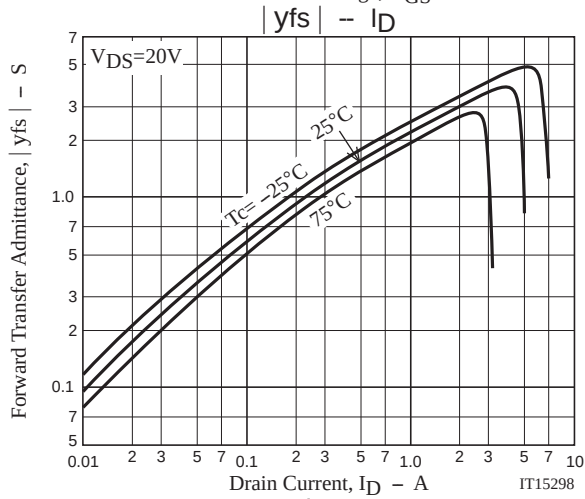
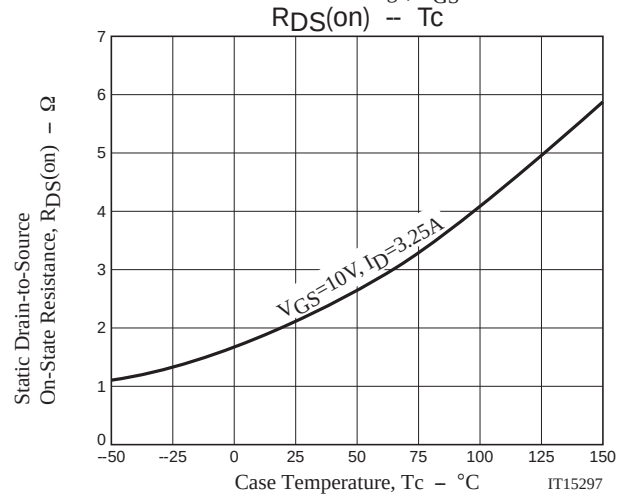
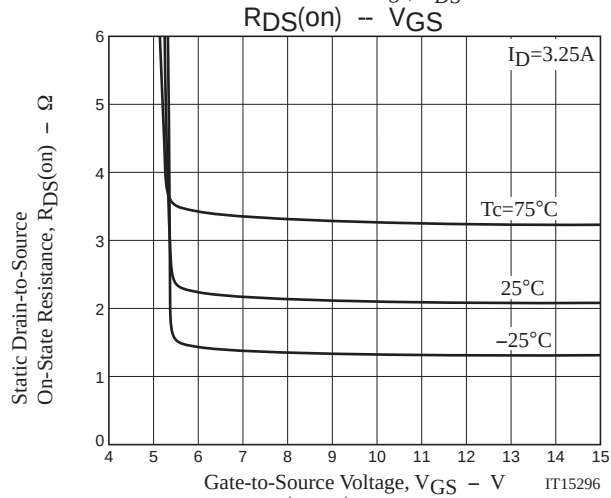
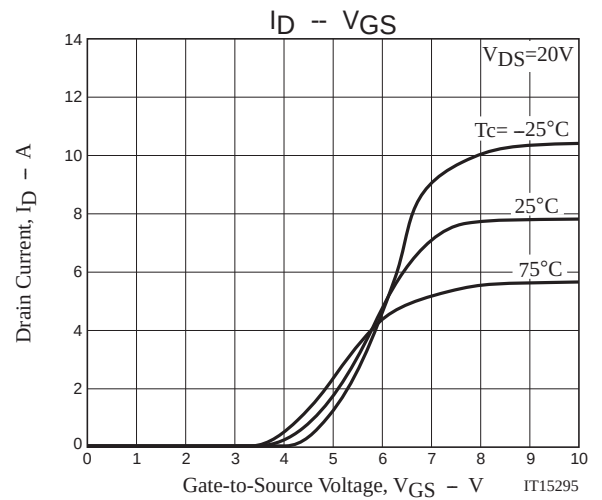
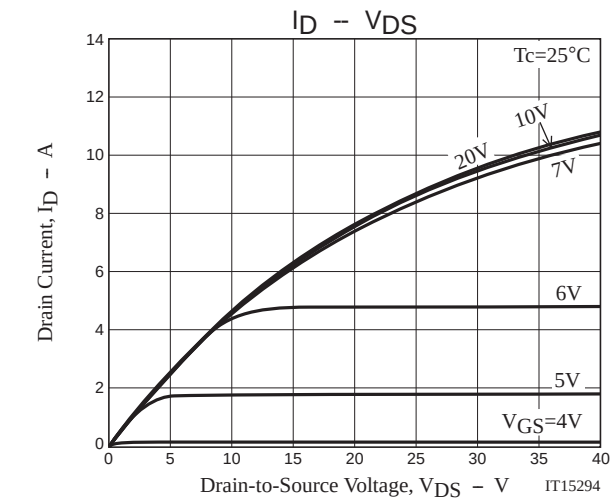


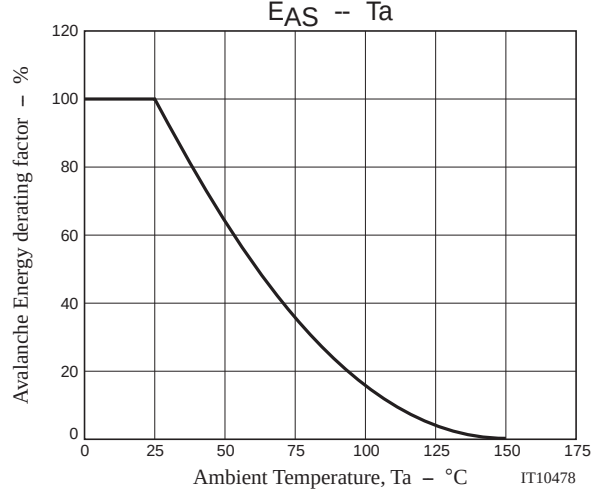
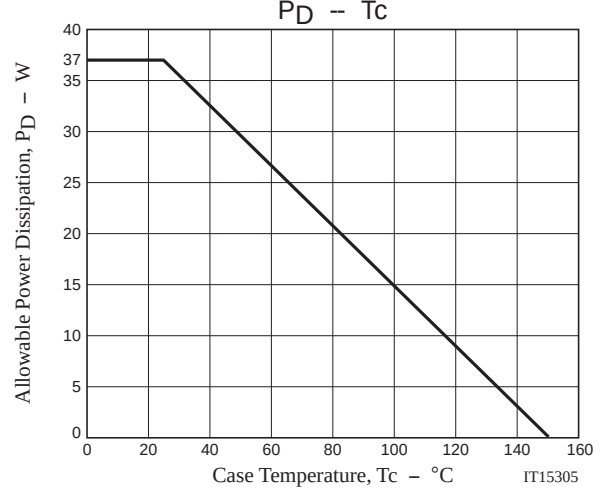
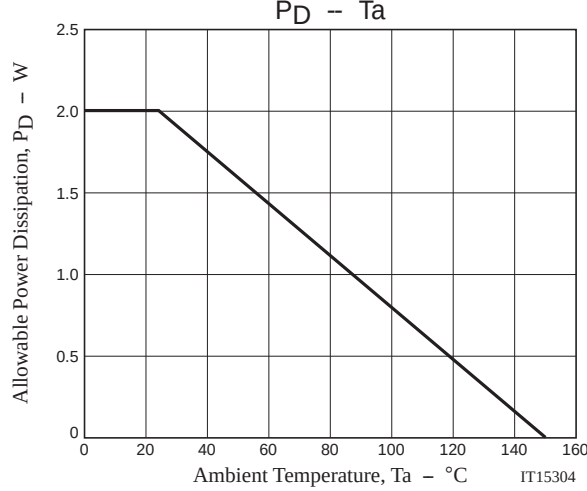
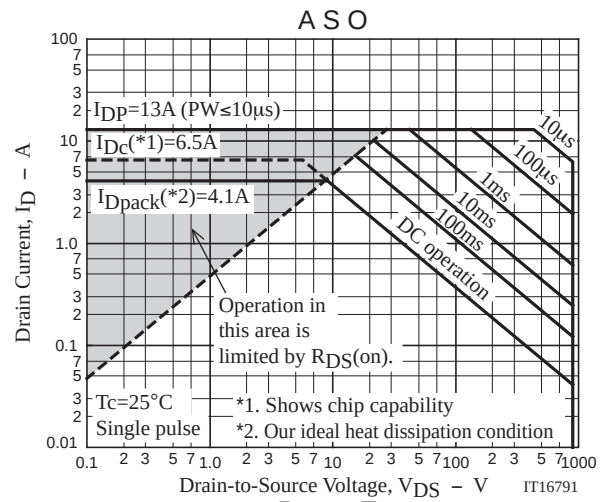
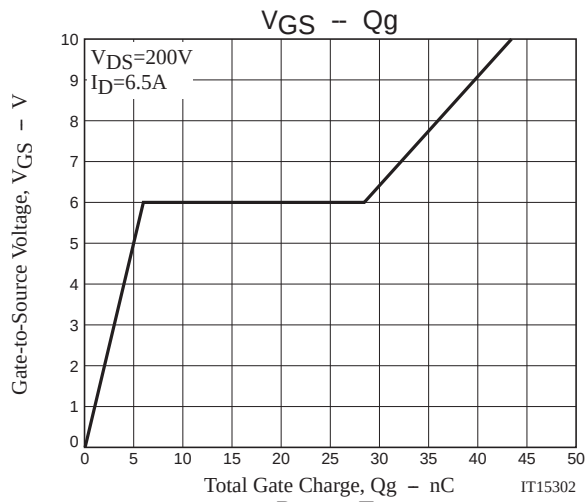
## Avalanche Resistance Test Circuit



## Ordering Information

| Device     | Package     | Shipping        | memo    |
|------------|-------------|-----------------|---------|
| BFL4001-1E | TO-220F-3FS | 50pcs./magazine | Pb Free |





## Magazine Specification

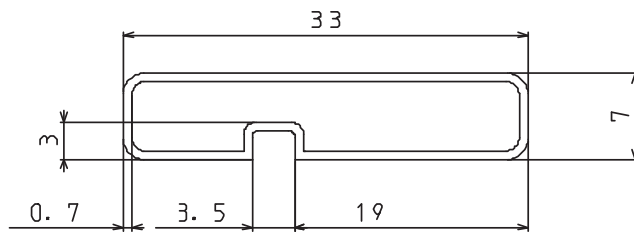
BFL4001-1E

## 1. Packing Format

| Package Name | Magazine Name | Maximum Number of devices contained (pcs) |           |           | Packing format                                                                 |                                                                                  |
|--------------|---------------|-------------------------------------------|-----------|-----------|--------------------------------------------------------------------------------|----------------------------------------------------------------------------------|
|              |               | Magazine                                  | Inner box | Outer box | Inner BOX                                                                      | Outer BOX                                                                        |
| TO-220F-3FS  | TO-220F       | 50                                        | 1,000     | 4,000     | SPD-0V0001<br>20 magazines contained<br>Dimensions:mm {external}<br>568×150×55 | SPT-081029<br>4 inner boxes contained<br>Dimensions:mm {external}<br>590×225×178 |

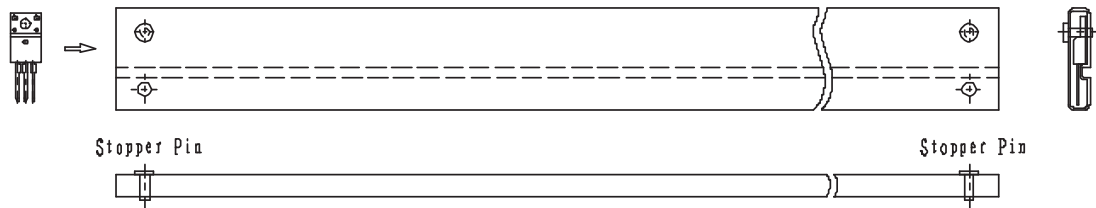
## 2. Magazine dimensions

(unit:mm)

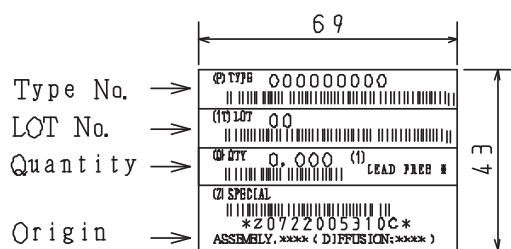


Tolerance=±0.3mm  
 Thickness=0.7±0.2mm  
 Length =532.5±2mm  
 Material =PVC (Antistatic treatment)

## 3. Storage method to magazine

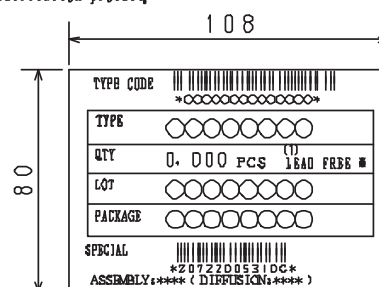


## 4. Inner box label (unit:mm)



## 5. Outer box label (unit:mm)

It is a label at the time of factory shipments.  
 The form of a label may change in physical  
 distribution process.

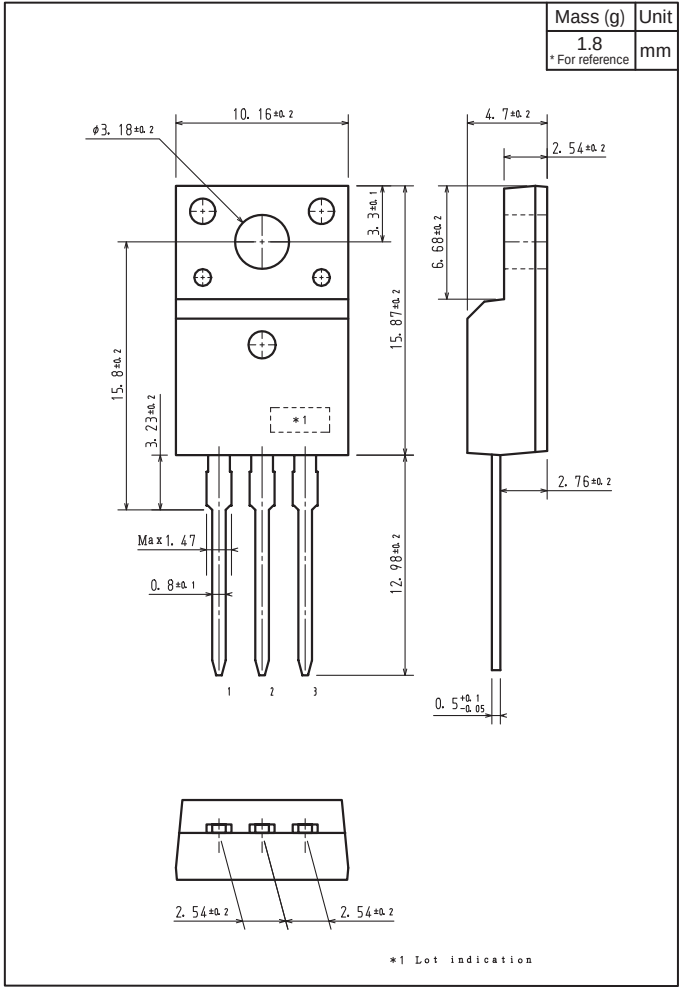


## NOTE (1)

The LEAD FREE \* description shows that the  
 surface treatment of the terminal is lead free.

| Label       | JEITA Phase    |
|-------------|----------------|
| LEAD FREE 3 | JEITA Phase 3A |

Outline Drawing  
BFL4001-1E



Note on usage : Since the BFL4001 is a MOSFET product, please avoid using this device in the vicinity of highly charged objects.

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