



# 2SK3747

## N-Channel Power MOSFET 1500V, 2A, 13Ω, TO-3PF-3L

ON Semiconductor®

<http://onsemi.com>

### Features

- Low ON-resistance, low input capacitance, ultrahigh-speed switching
- High reliability (Adoption of HVP process)
- Attachment workability is good by Mica-less package
- Avalanche resistance guarantee

### Specifications

Absolute Maximum Ratings at Ta=25°C

| Parameter                          | Symbol           | Conditions             | Ratings     | Unit |
|------------------------------------|------------------|------------------------|-------------|------|
| Drain-to-Source Voltage            | V <sub>DSS</sub> |                        | 1500        | V    |
| Gate-to-Source Voltage             | V <sub>GSS</sub> |                        | ±35         | V    |
| Drain Current (DC)                 | I <sub>D</sub>   |                        | 2           | A    |
| Drain Current (Pulse)              | I <sub>DP</sub>  | PW≤10μs, duty cycle≤1% | 4           | A    |
| Allowable Power Dissipation        | P <sub>D</sub>   |                        | 3.0         | W    |
|                                    |                  | T <sub>c</sub> =25°C   | 50          | W    |
| Channel Temperature                | T <sub>ch</sub>  |                        | 150         | °C   |
| Storage Temperature                | T <sub>stg</sub> |                        | -55 to +150 | °C   |
| Avalanche Energy (Single Pulse) *1 | E <sub>AS</sub>  |                        | 41          | mJ   |
| Avalanche Current *2               | I <sub>AV</sub>  |                        | 2           | A    |

Note : \*1 V<sub>DD</sub>=50V, L=20mH, I<sub>AV</sub>=2A (Fig.1)

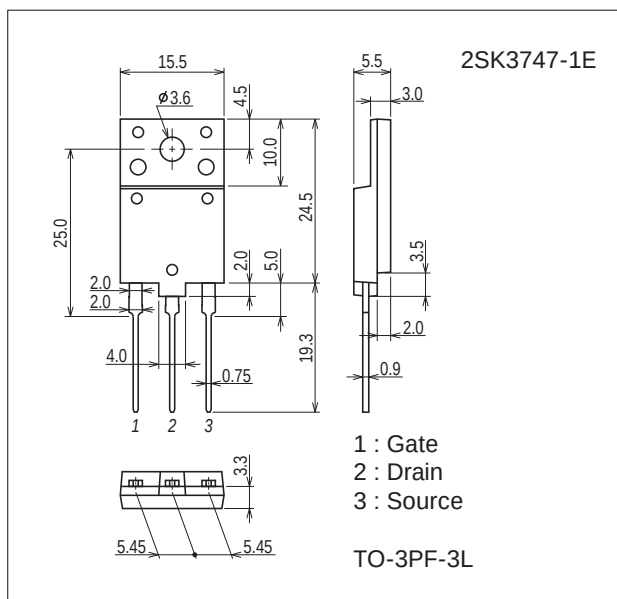
\*2 L≤20mH, single pulse

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)

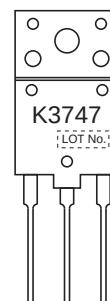
7538A-002



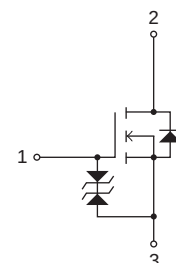
### Product & Package Information

- Package : TO-3PF-3L
- JEITA, JEDEC : SC-94
- Minimum Packing Quantity : 30 pcs./magazine

### Marking



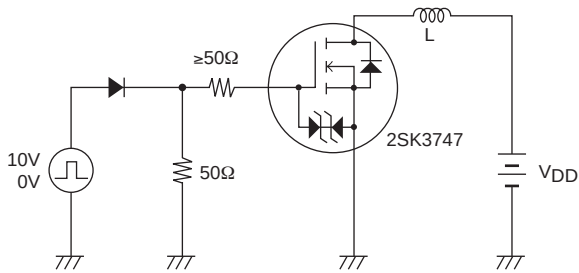
### Electrical Connection



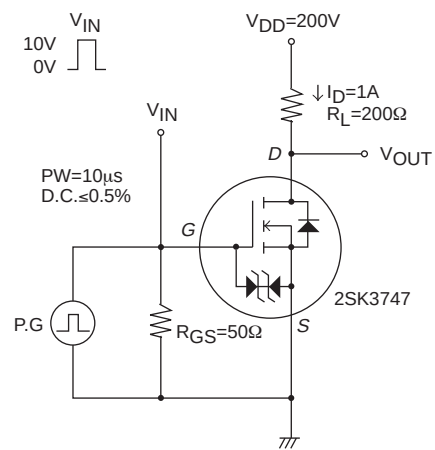
**Electrical Characteristics** at Ta=25°C

| Parameter                                  | Symbol        | Conditions                        | Ratings |      |          | Unit     |
|--------------------------------------------|---------------|-----------------------------------|---------|------|----------|----------|
|                                            |               |                                   | min     | typ  | max      |          |
| Drain-to-Source Breakdown Voltage          | $V_{(BR)DSS}$ | $I_D=1mA, V_{GS}=0V$              | 1500    |      |          | V        |
| Zero-Gate Voltage Drain Current            | $I_{DSS}$     | $V_{DS}=1200V, V_{GS}=0V$         |         |      | 100      | $\mu A$  |
| Gate-to-Source Leakage Current             | $I_{GSS}$     | $V_{GS}=16V, V_{DS}=0V$           |         |      | $\pm 10$ | $\mu A$  |
| Cutoff Voltage                             | $V_{GS(off)}$ | $V_{DS}=10V, I_D=1mA$             | 2.5     |      | 3.5      | V        |
| Forward Transfer Admittance                | $ y_{fs} $    | $V_{DS}=20V, I_D=1A$              | 0.7     | 1.4  |          | S        |
| Static Drain-to-Source On-State Resistance | $R_{DS(on)}$  | $I_D=1A, V_{GS}=10V$              |         | 10   | 13       | $\Omega$ |
| Input Capacitance                          | $C_{iss}$     | $V_{DS}=30V, f=1MHz$              |         | 380  |          | pF       |
| Output Capacitance                         | $C_{oss}$     |                                   |         | 70   |          | pF       |
| Reverse Transfer Capacitance               | $C_{rss}$     |                                   |         | 40   |          | pF       |
| Turn-ON Delay Time                         | $t_d(on)$     | See Fig.2                         |         | 12   |          | ns       |
| Rise Time                                  | $t_r$         |                                   |         | 37   |          | ns       |
| Turn-OFF Delay Time                        | $t_d(off)$    |                                   |         | 152  |          | ns       |
| Fall Time                                  | $t_f$         |                                   |         | 59   |          | ns       |
| Total Gate Charge                          | $Q_g$         | $V_{DS}=200V, V_{GS}=10V, I_D=2A$ |         | 37.5 |          | nC       |
| Gate-to-Source Charge                      | $Q_{gs}$      |                                   |         | 2.7  |          | nC       |
| Gate-to-Drain "Miller" Charge              | $Q_{gd}$      |                                   |         | 20   |          | nC       |
| Diode Forward Voltage                      | $V_{SD}$      | $I_S=2A, V_{GS}=0V$               |         | 0.88 | 1.2      | V        |

**Fig.1 Avalanche Resistance Test Circuit**

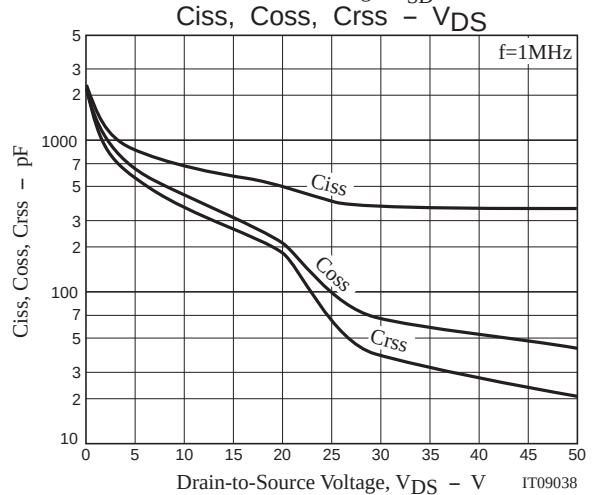
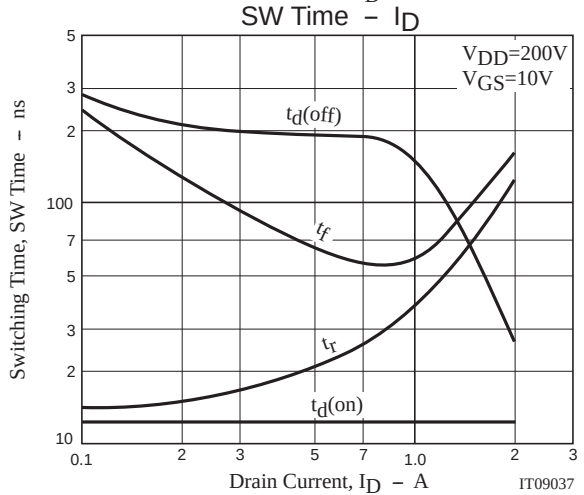
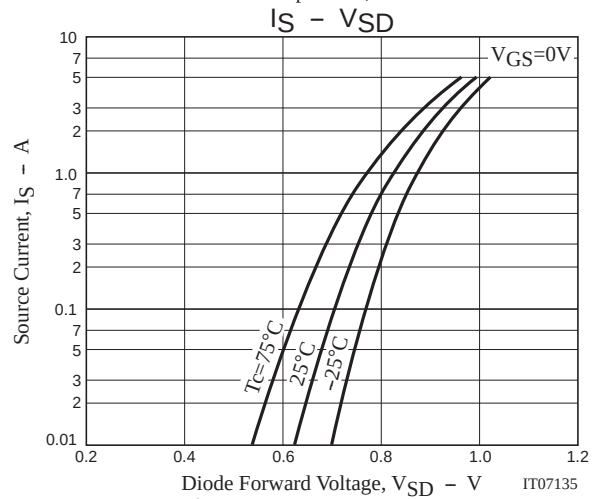
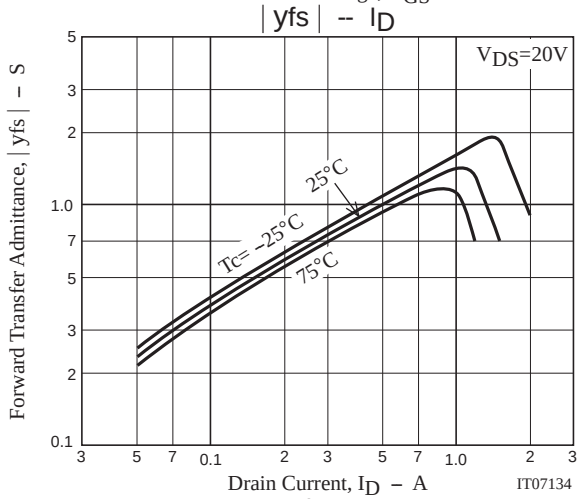
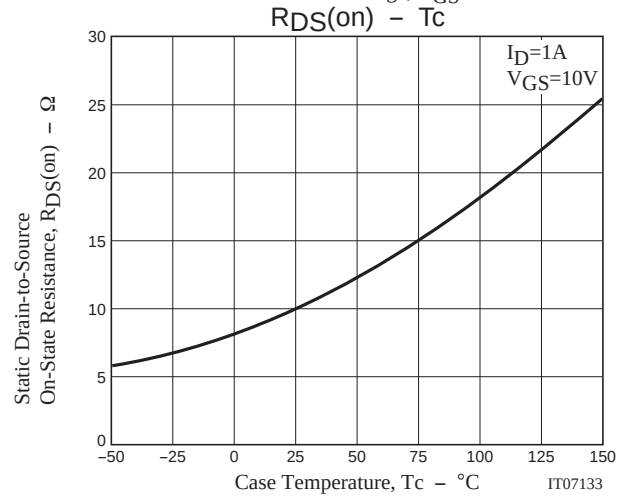
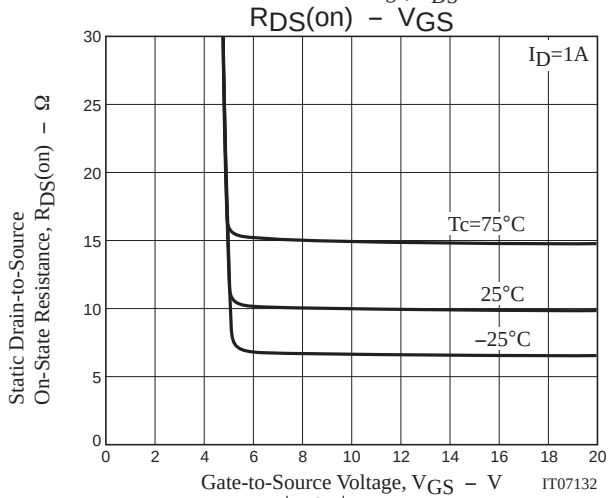
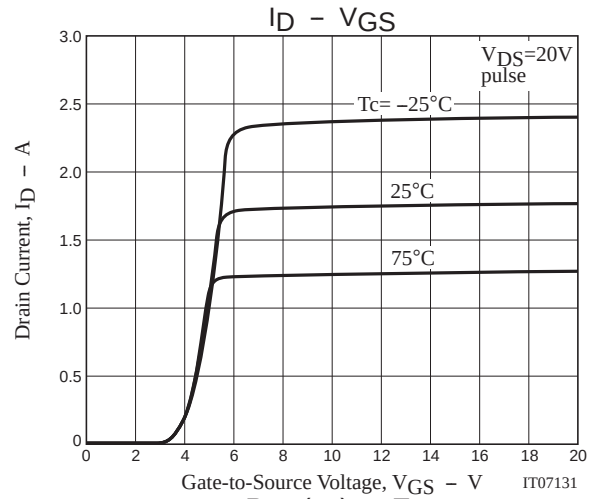
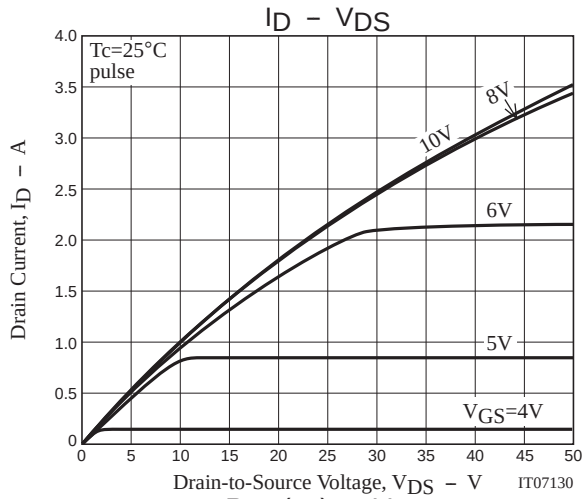


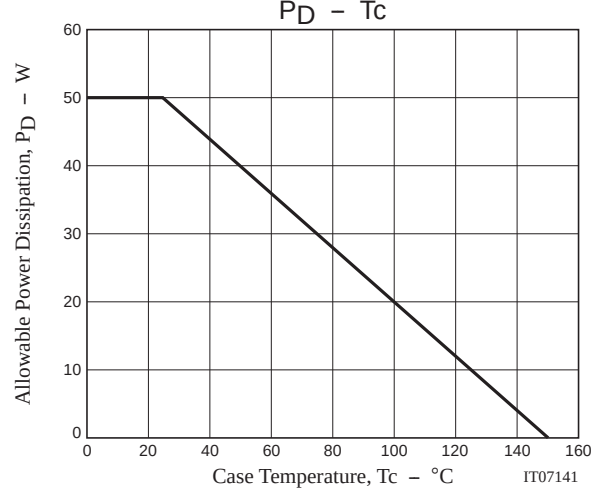
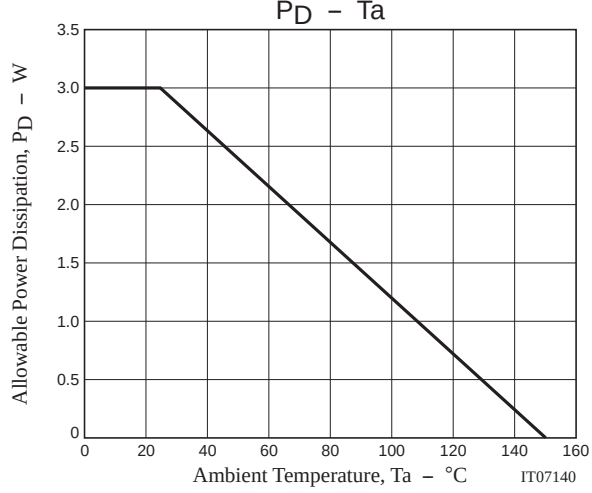
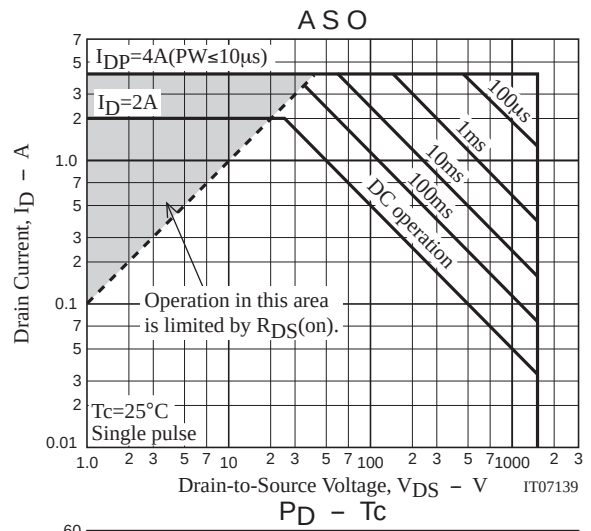
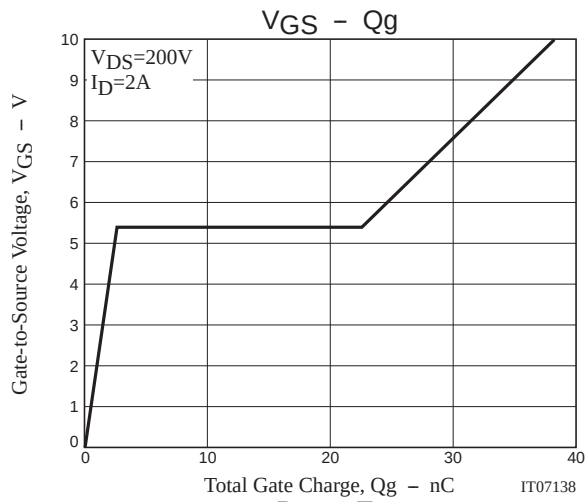
**Fig.2 Switching Time Test Circuit**



**Ordering Information**

| Device     | Package   | Shipping        | memo    |
|------------|-----------|-----------------|---------|
| 2SK3747-1E | TO-3PF-3L | 30pcs./magazine | Pb Free |





## Magazine Specification

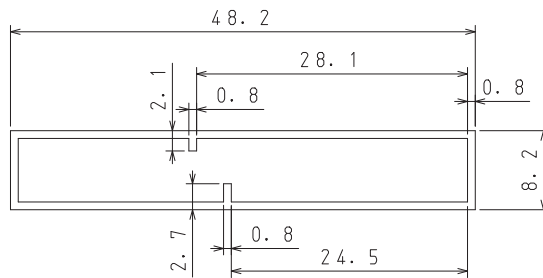
2SK3747-1E

## 1. Packing Format

| Package Name | Maximum Number of devices contained (pcs) |           |           | Packing format                                                                 |                                                                                  |
|--------------|-------------------------------------------|-----------|-----------|--------------------------------------------------------------------------------|----------------------------------------------------------------------------------|
|              | Magazine                                  | Inner box | Outer box | Inner BOX                                                                      | Outer BOX                                                                        |
| TO-3PF-3L    | 30                                        | 360       | 1440      | SPD-0V0001<br>12 magazines contained<br>Dimensions:mm (external)<br>568×150×55 | SPD-LV0010<br>4 inner boxes contained<br>Dimensions:mm (external)<br>590×225×178 |

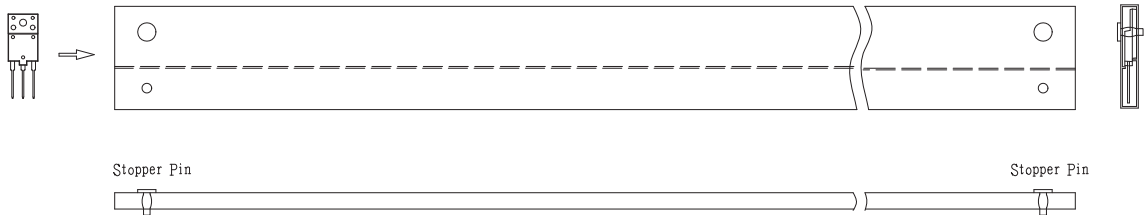
## 2. Magazine dimensions

(unit:mm)



Tolerance=±0.2mm  
 Thickness=0.8±0.2mm  
 Length =508.0±1mm  
 Material =PVC or PET  
 (Antistatic treatment)

## 3. Storage method to magazine



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

|          |   |                                                                |
|----------|---|----------------------------------------------------------------|
| Type No. | → | (P) TYPE 000000000                                             |
| LOT No.  | → | (T) LOT 00                                                     |
| Quantity | → | (Q) QTY 0,000 (1) LEAD FREE *                                  |
| Origin   | → | (Z) SPECIAL<br>*Z0722005310C*<br>ASSEMBLY:*** (DIFFUSION:*** ) |

NOTE (1)

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

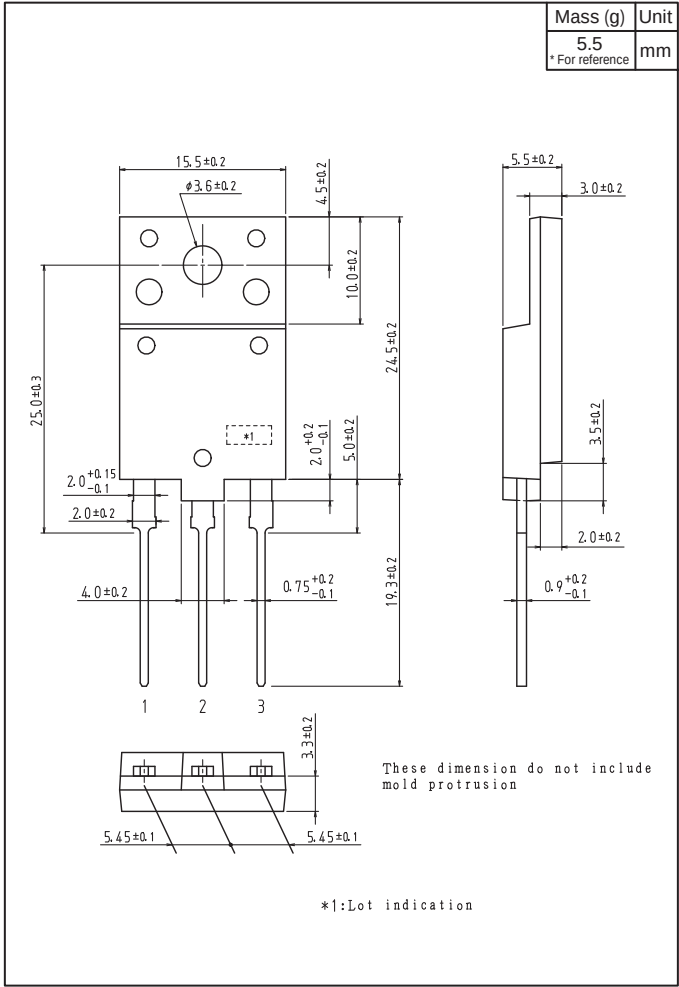
|             |                |
|-------------|----------------|
| Label       | JEITA Phase    |
| LEAD FREE 3 | JEITA Phase 3A |

## 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.

|           |                                                 |
|-----------|-------------------------------------------------|
| TYPE CODE | 108                                             |
| TYPE      | 000000000                                       |
| QTY       | 0,000 PCS (1) LEAD FREE *                       |
| LOT       | 000000000                                       |
| PACKAGE   | 000000000                                       |
| SPECIAL   | *Z0722005310C*<br>ASSEMBLY:*** (DIFFUSION:*** ) |

Outline Drawing  
2SK3747-1E



Note on usage : Since the 2SK3747 is a MOSFET product, please avoid using this device in the vicinity of highly charged objects.

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