



SANYO Semiconductors

# DATA SHEET

An ON Semiconductor Company

## 2SC6144SG — NPN Epitaxial Planar Silicon Transistor High-Current Switching Applications

### Applications

- Relay drivers, lamp drivers, motor drivers

### Features

- Adoption of MBIT process
- Low collector-to-emitter saturation voltage ( $V_{CE(sat)}=180mV(\text{typ.})$ )
- High-speed switching ( $t_f=25ns(\text{typ.})$ )
- Large current capacitance ( $I_C=10A$ )

### Specifications

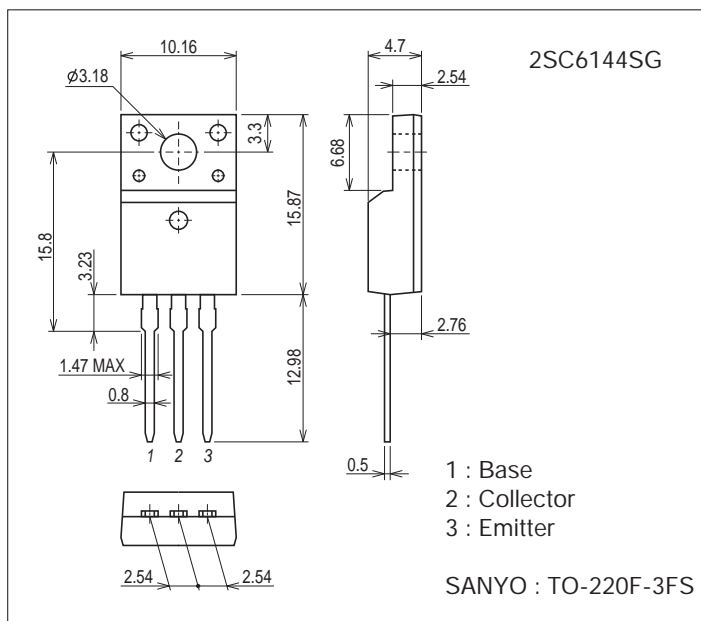
Absolute Maximum Ratings at  $T_a=25^\circ C$

| Parameter                    | Symbol    | Conditions                    | Ratings     | Unit       |
|------------------------------|-----------|-------------------------------|-------------|------------|
| Collector-to-Base Voltage    | $V_{CBO}$ |                               | 60          | V          |
| Collector-to-Emitter Voltage | $V_{CEO}$ |                               | 50          | V          |
| Emitter-to-Base Voltage      | $V_{EBO}$ |                               | 5           | V          |
| Collector Current            | $I_C$     |                               | 10          | A          |
| Collector Current (Pulse)    | $I_{CP}$  |                               | 13          | A          |
| Base Current                 | $I_B$     |                               | 2           | A          |
| Collector Dissipation        | $P_C$     | $T_c=25^\circ C, P_T \leq 1s$ | 25          | W          |
| Junction Temperature         | $T_j$     |                               | 150         | $^\circ C$ |
| Storage Temperature          | $T_{stg}$ |                               | -55 to +150 | $^\circ C$ |

### Package Dimensions

unit : mm (typ)

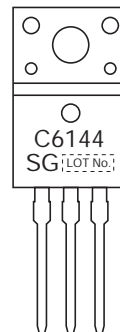
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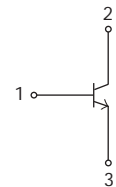
### Product & Package Information

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

### Marking



### Electrical Connection

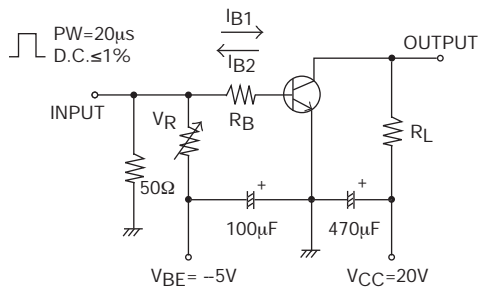


## 2SC6144SG

### Electrical Characteristics at $T_a=25^\circ\text{C}$

| Parameter                               | Symbol        | Conditions                           | Ratings |     |     | Unit          |
|---|---------------|--------------------------------------|---------|-----|-----|---------------|
|   |               |                                      | min     | typ | max |               |
| Collector Cutoff Current                | $I_{CBO}$     | $V_{CB}=40\text{V}, I_E=0\text{A}$   |         |     | 10  | $\mu\text{A}$ |
| Emitter Cutoff Current                  | $I_{EBO}$     | $V_{EB}=4\text{V}, I_C=0\text{A}$    |         |     | 10  | $\mu\text{A}$ |
| DC Current Gain                         | $h_{FE}$      | $V_{CE}=2\text{V}, I_C=270\text{mA}$ | 200     |     | 560 |               |
| Gain-Bandwidth Product                  | $f_T$         | $V_{CE}=10\text{V}, I_C=3\text{A}$   |         | 330 |     | MHz           |
| Output Capacitance                      | $C_{ob}$      | $V_{CB}=10\text{V}, f=1\text{MHz}$   |         | 60  |     | pF            |
| Collector-to-Emitter Saturation Voltage | $V_{CE(sat)}$ | $I_C=6\text{A}, I_B=300\text{mA}$    |         | 180 | 360 | mV            |
| Base-to-Emitter Saturation Voltage      | $V_{BE(sat)}$ | $I_C=6\text{A}, I_B=300\text{mA}$    |         |     | 1.2 | V             |
| Collector-to-Base Breakdown Voltage     | $V_{(BR)CBO}$ | $I_C=100\mu\text{A}, I_E=0\text{A}$  | 60      |     |     | V             |
| Collector-to-Emitter Breakdown Voltage  | $V_{(BR)CEO}$ | $I_C=1\text{mA}, R_{BE}=\infty$      | 50      |     |     | V             |
| Emitter-to-Base Breakdown Voltage       | $V_{(BR)EBO}$ | $I_E=100\mu\text{A}, I_C=0\text{A}$  | 5       |     |     | V             |
| Turn-On Time                            | $t_{on}$      | See specified Test Circuit.          |         | 62  |     | ns            |
| Storage Time                            | $t_{stg}$     |                                      |         | 350 |     | ns            |
| Fall Time                               | $t_f$         |                                      |         | 25  |     | ns            |

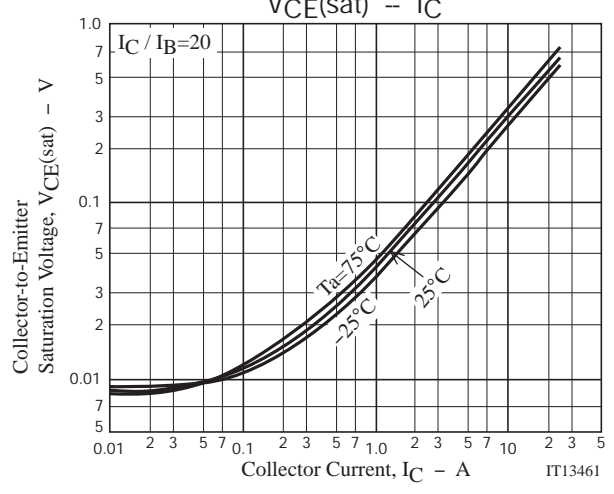
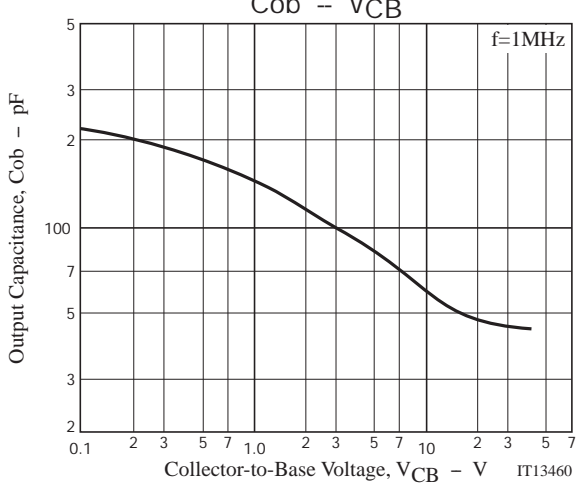
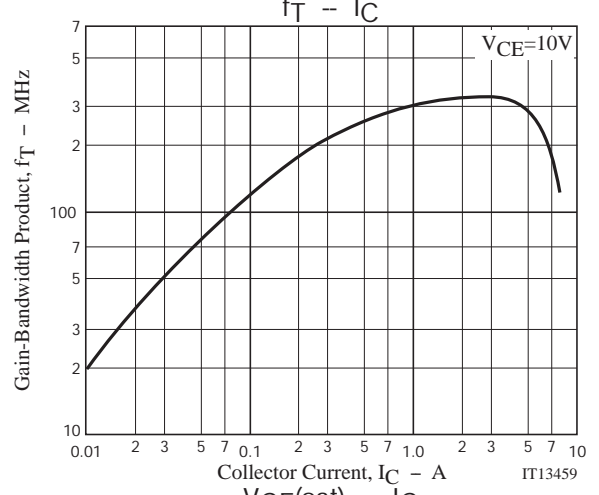
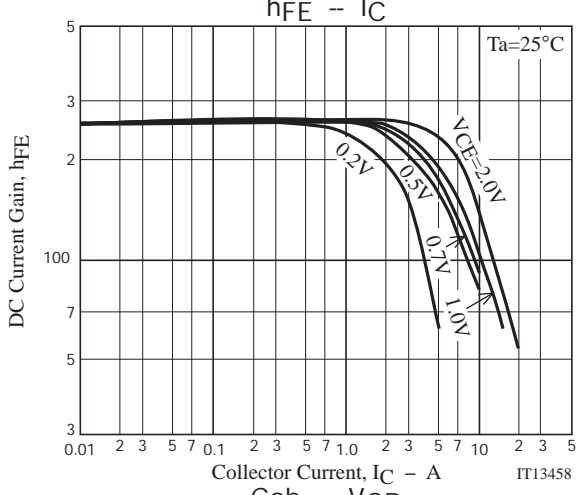
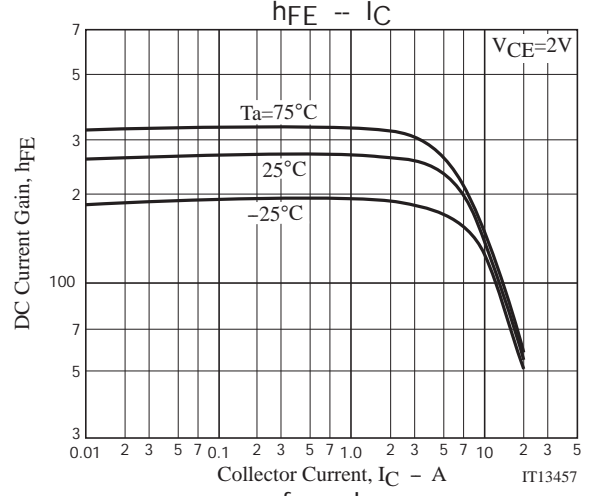
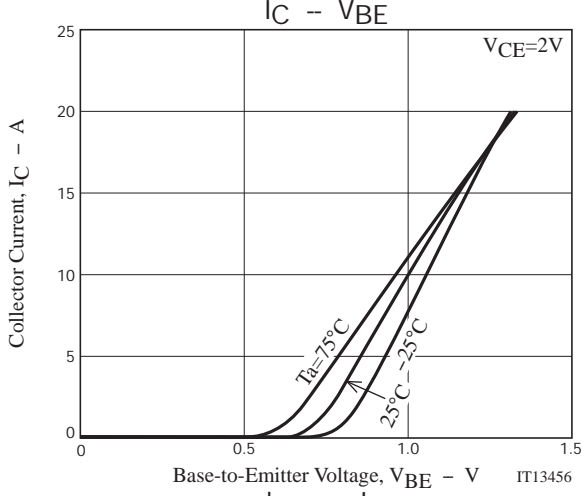
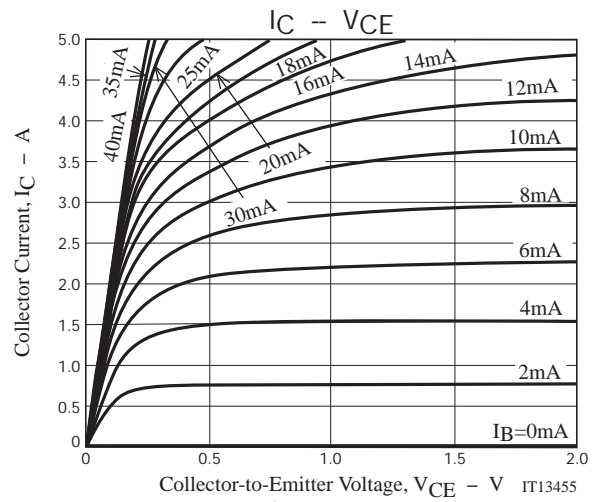
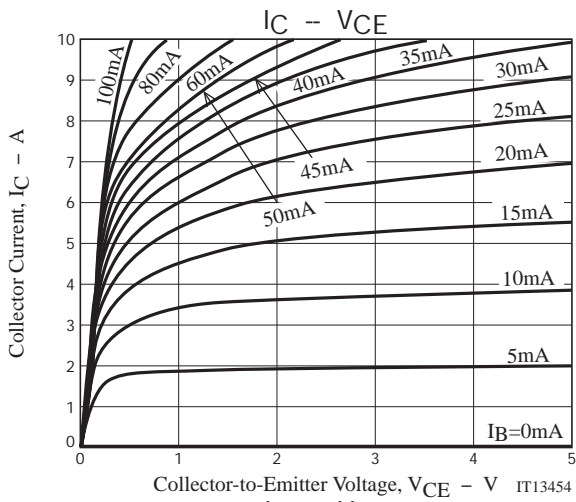
### Switching Time Test Circuit

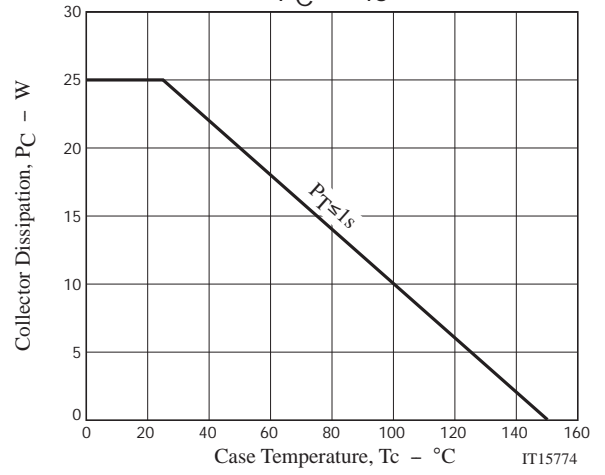
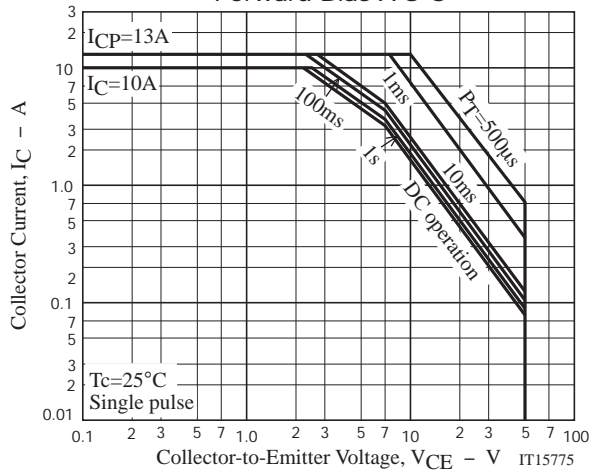
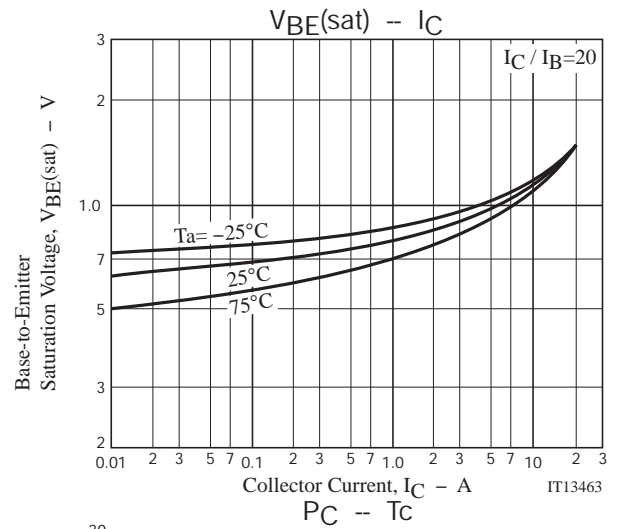
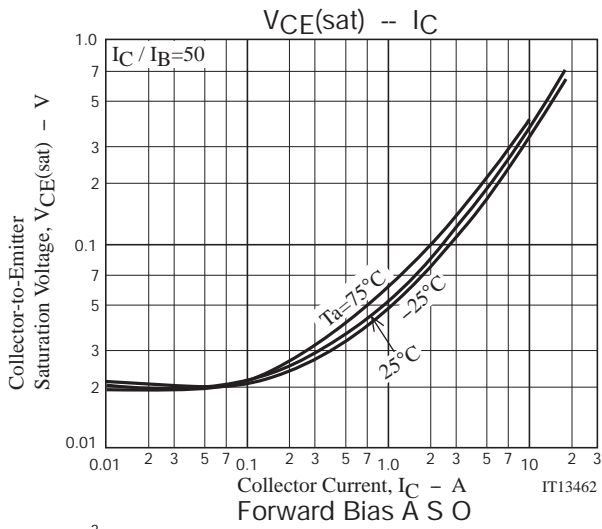


$$I_C = 20I_{B1} = -20I_{B2} = 5\text{A}$$

### Ordering Information

| Device    | Package     | Shipping        | memo    |
|-----------|-------------|-----------------|---------|
| 2SC6144SG | TO-220F-3FS | 50pcs./magazine | Pb Free |





Magazine Specification

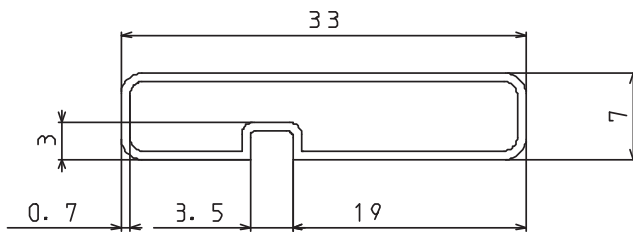
2SC6144SG

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 |

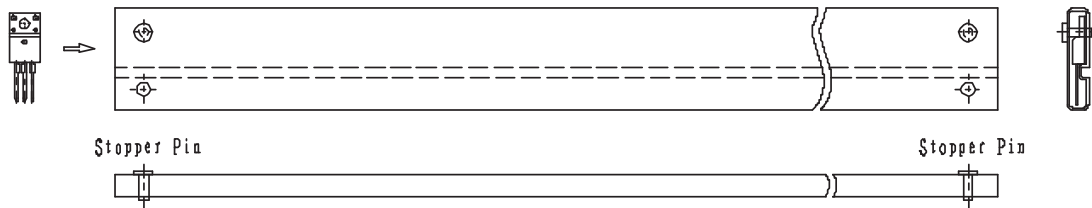
2. Magazine dimensions

(unit:mm)

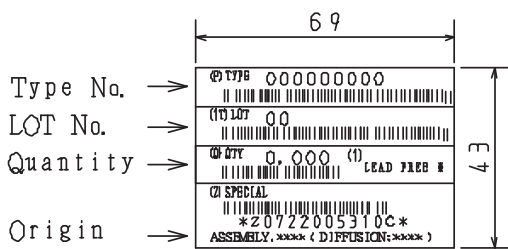


Tolerance=±0.3mm  
 Thickness=0.7±0.2mm  
 Length =532.5±2mm  
 Material =PVC (Antistatic treatment)

3. Storage method to magazine

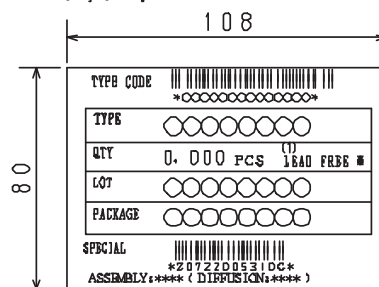


4. Inner box label (unit:mm)



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)

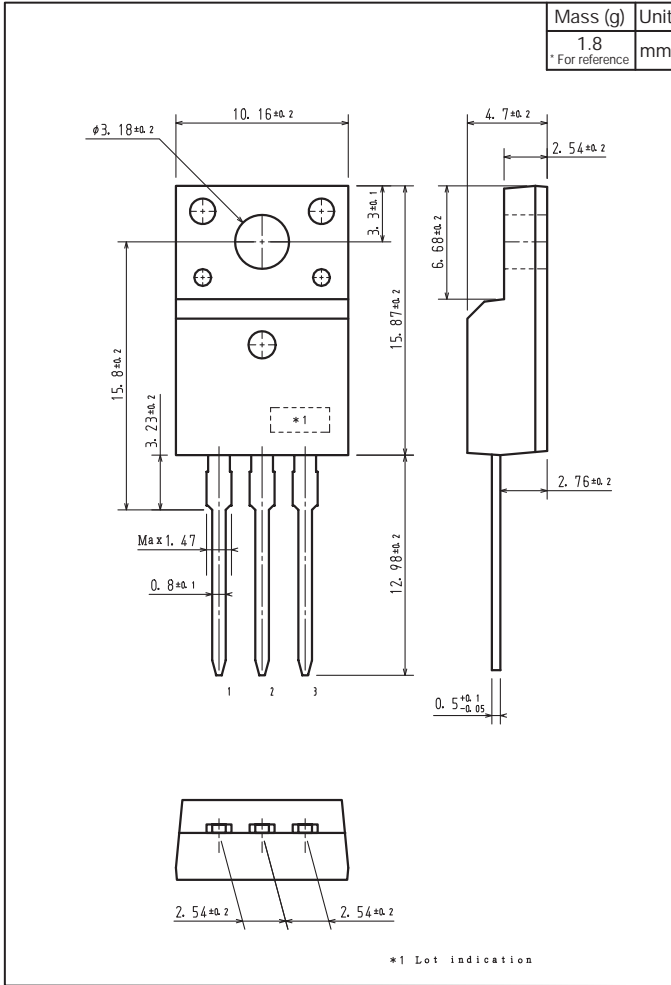
The LEAD FREE \* description shows that the surface treatment of the terminal is lead free.

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

# 2SC6144SG

## Outline Drawing

2SC6144SG



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