

# 2SC2078



2010A

NPN Epitaxial Planar Silicon Transistor

## 27MHz High Frequency Power Amp Applications

①-62D

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

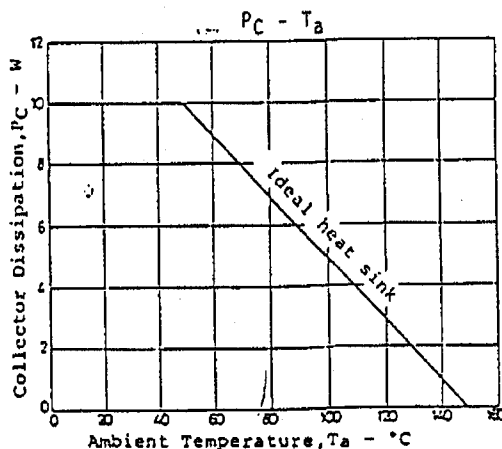
|                              |           |                          |             |                    |
|------------------------------|-----------|--------------------------|-------------|--------------------|
| Collector to Base Voltage    | $V_{CB0}$ | $R_{BE}=150\text{ohm}$   | 80          | V                  |
| Collector to Emitter Voltage | $V_{CER}$ |                          | 75          | V                  |
| Emitter to Base Voltage      | $V_{EBO}$ |                          | 5           | V                  |
| Collector Current            | $I_C$     |                          | 3           | A                  |
| Peak Collector Current       | $i_{cp}$  |                          | 5           | A                  |
| Collector Dissipation        | $P_C$     | $T_c=50^{\circ}\text{C}$ | 1.2         | W                  |
|                              |           |                          | 10          | W                  |
| Junction Temperature         | $T_J$     |                          | 150         | $^{\circ}\text{C}$ |
| Storage Temperature          | $T_{stg}$ |                          | -55 to +150 | $^{\circ}\text{C}$ |

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

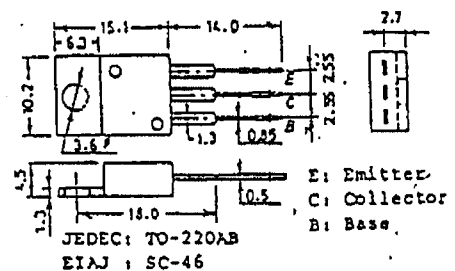
|                             |               |                                                      | min | typ  | max  | unit          |
|-----------------------------|---------------|------------------------------------------------------|-----|------|------|---------------|
| Collector Cutoff Current    | $I_{CBO}$     | $V_{CB}=40\text{V}, I_E=0$                           |     |      | 10   | $\mu\text{A}$ |
| Emitter Cutoff Current      | $I_{EBO}$     | $V_{EB}=4\text{V}, I_C=0$                            |     |      | 10   | $\mu\text{A}$ |
| DC Current Gain             | $h_{FE}$      | $V_{CE}=5\text{V}, I_C=0.5\text{A}$                  | 25* |      | 200* |               |
| Gain Bandwidth Product      | $f_T$         | $V_{CE}=10\text{V}, I_C=0.1\text{A}$                 | 100 | 150  |      | MHz           |
| Output Capacitance          | $c_{ob}$      | $V_{CB}=10\text{V}, f=1\text{MHz}$                   |     | 45   | 60   | pF            |
| C-E Saturation Voltage      | $V_{CE(sat)}$ | $I_C=1\text{A}, I_B=0.1\text{A}$                     |     | 0.15 | 0.6  | V             |
| B-E Saturation Voltage      | $V_{BE(sat)}$ | $I_C=1\text{A}, I_B=0.1\text{A}$                     |     | 0.9  | 1.2  | V             |
| C-B Saturation Voltage      | $V_{(BR)CBO}$ | $I_C=100\mu\text{A}, I_B=0$                          | 80  |      |      | V             |
| C-E Saturation Voltage      | $V_{(BR)CER}$ | $I_C=1\text{mA}, R_{BE}=150\text{ohm}$               | 75  |      |      | V             |
| E-B Saturation Voltage      | $V_{(BR)EBO}$ | $I_E=100\mu\text{A}, I_C=0$                          | 5   |      |      | V             |
| [At specified test circuit] |               |                                                      |     |      |      |               |
| Output Power                | $P_o$         | $V_{CC}=12\text{V}, f=27\text{MHz}, P_i=0.2\text{W}$ | 4.0 |      |      | W             |
| Power Efficiency            | $\eta$        |                                                      | 60  |      |      | %             |

\*:The 2SC2078 is classified by 0.5A  $h_{FE}$  as follows:

|    |   |    |    |   |    |    |   |     |     |   |     |
|----|---|----|----|---|----|----|---|-----|-----|---|-----|
| 25 | B | 50 | 40 | C | 80 | 60 | D | 120 | 100 | E | 200 |
|----|---|----|----|---|----|----|---|-----|-----|---|-----|

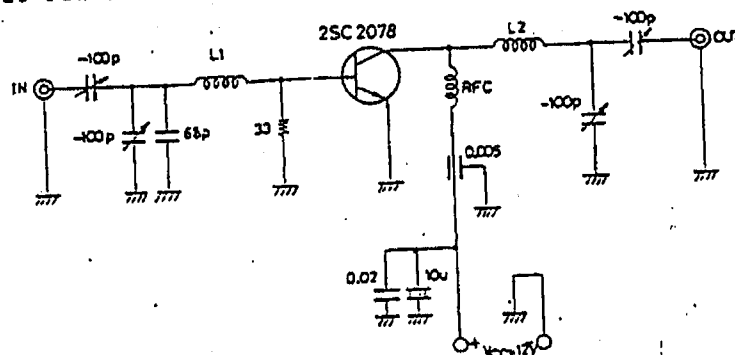


Case Outline 2010A  
(unit:mm)



4147KI/3145KI/2274ki No.462-1/3

## 2SC2078 27MHz Output Power Test Circuit



Coil data L1: 0.3mm tinned wire, 9 $\phi$  4T  
 L2: 0.6mm tinned wire, 9 $\phi$  4T  
 RFC 2.2uH

