

Silicon NPN Power Transistors

2SC4160

DESCRIPTION

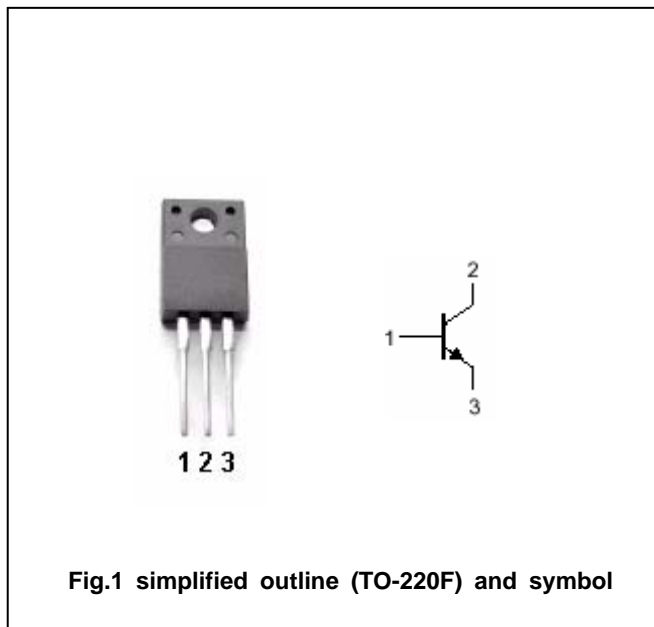
- With TO-220F package
- High breakdown voltage.
- High reliability.
- Fast switching speed
- Wide area of safe operation

APPLICATIONS

- 400V/4A switching regulator applications

PINNING

| PIN | DESCRIPTION |
|-----|-------------|
| 1 | Base |
| 2 | Collector |
| 3 | Emitter |



Absolute maximum ratings (Ta=25)

| SYMBOL | PARAMETER | CONDITIONS | VALUE | UNIT |
|-----------|---------------------------|----------------|---------|------|
| V_{CBO} | Collector-base voltage | Open emitter | 500 | V |
| V_{CEO} | Collector-emitter voltage | Open base | 400 | V |
| V_{EBO} | Emitter-base voltage | Open collector | 7 | V |
| I_C | Collector current | | 4 | A |
| I_{CM} | Collector current-peak | | 8 | A |
| I_B | Base current | | 1.5 | A |
| P_C | Collector dissipation | $T_C=25$ | 25 | W |
| | | | 2 | |
| T_j | Junction temperature | | 150 | |
| T_{stg} | Storage temperature | | -55~150 | |

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CHARACTERISTICS

T_j=25 unless otherwise specified

| SYMBOL | PARAMETER | CONDITIONS | MIN | TYP. | MAX | UNIT |
|----------------------|--------------------------------------|---|-----|------|-----|------|
| V _{(BR)CEO} | Collector-emitter breakdown voltage | I _C =5mA ; R _{BE} = | 400 | | | V |
| V _{(BR)CBO} | Collector-base breakdown voltage | I _C =1mA ; I _E =0 | 500 | | | V |
| V _{(BR)EBO} | Emitter-base breakdown voltage | I _E =1mA ; I _C =0 | 7 | | | V |
| V _{CEsat} | Collector-emitter saturation voltage | I _C =2A ; I _B =0.4A | | | 0.8 | V |
| V _{BEsat} | Base-emitter saturation voltage | I _C =2A ; I _B =0.4A | | | 1.5 | V |
| I _{CBO} | Collector cut-off current | V _{CB} =400V ; I _E =0 | | | 10 | μA |
| I _{EBO} | Emitter cut-off current | V _{EB} =5V ; I _C =0 | | | 10 | μA |
| h _{FE-1} | DC current gain | I _C =0.4A ; V _{CE} =5V | 15 | | 50 | |
| h _{FE-2} | DC current gain | I _C =2A ; V _{CE} =5V | 10 | | | |
| h _{FE-3} | DC current gain | I _C =10mA ; V _{CE} =5V | 10 | | | |
| C _{OB} | Output capacitance | I _E =0 ; V _{CB} =10V ; f=1MHz | | 50 | | pF |
| f _T | Transition frequency | I _C =0.4A ; V _{CE} =10V | | 20 | | MHz |

Switching times

| | | | | | | |
|-----------------|--------------|--|--|--|-----|----|
| t _{on} | Turn-on time | I _C =3A ; I _{B1} =0.6A I _{B2} =-1.2A V _{CC} =200V , R _L =66.6 | | | 0.5 | μs |
| t _s | Storage time | | | | 2.5 | μs |
| t _f | Fall time | | | | 0.3 | μs |

◆ h_{FE-1} Classifications

| L | M | N |
|-------|-------|-------|
| 15-30 | 20-40 | 30-50 |

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PACKAGE OUTLINE

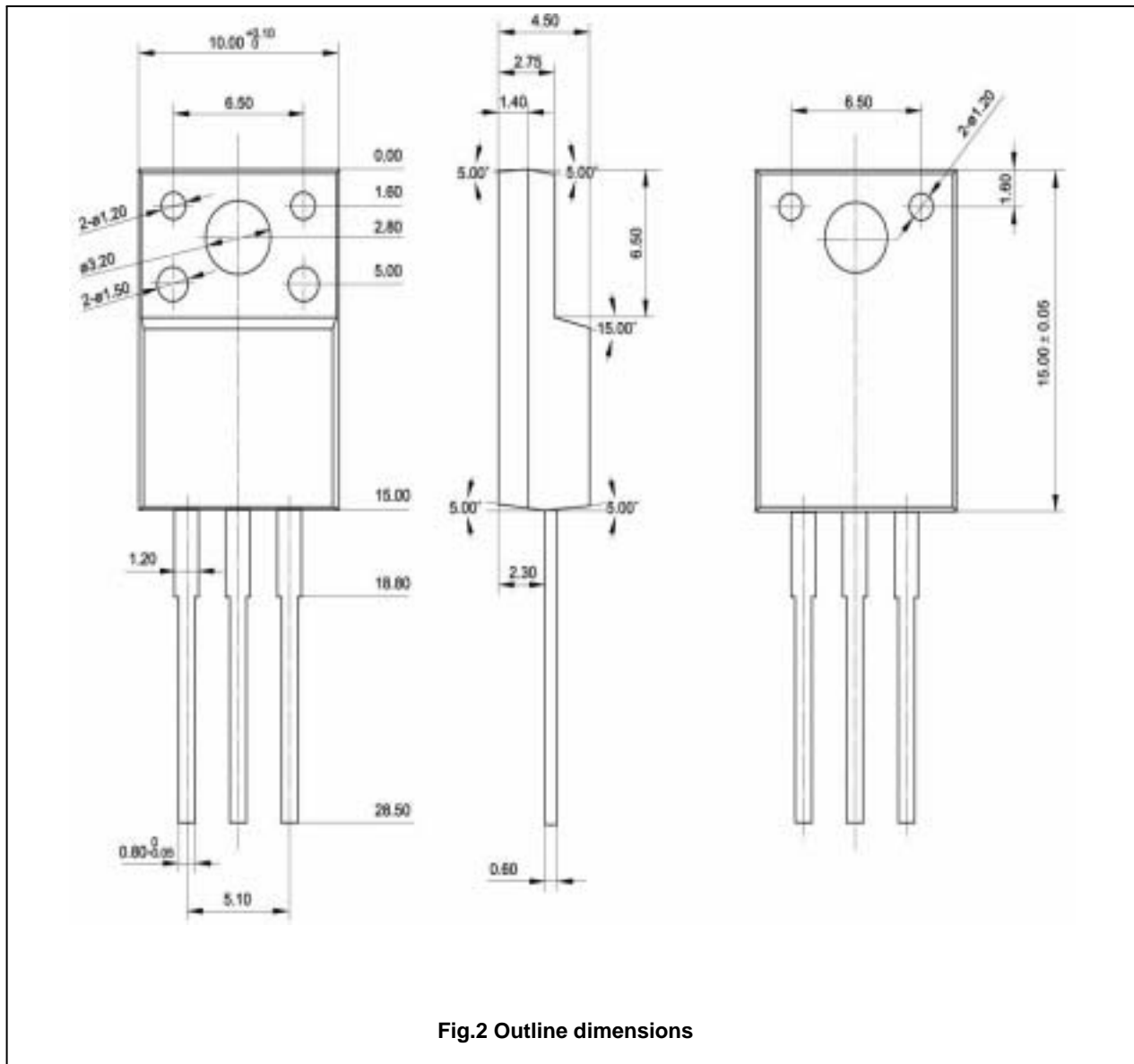


Fig.2 Outline dimensions

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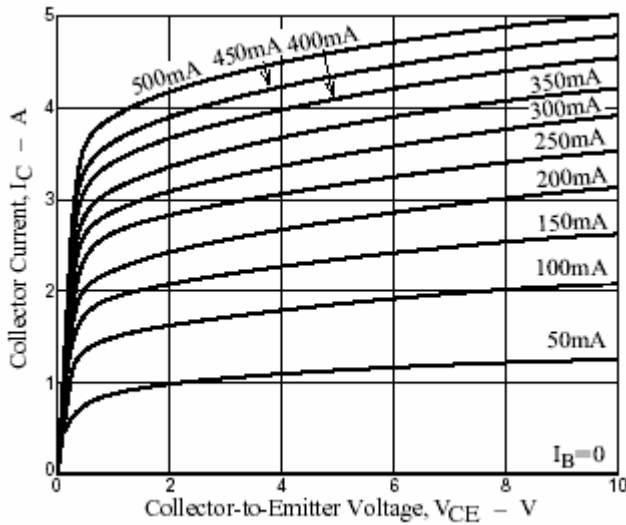


Fig.3 Static Characteristic

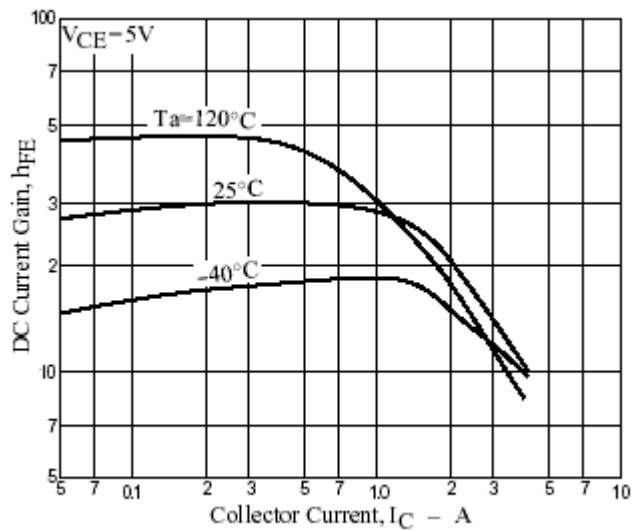


Fig.4 DC current Gain

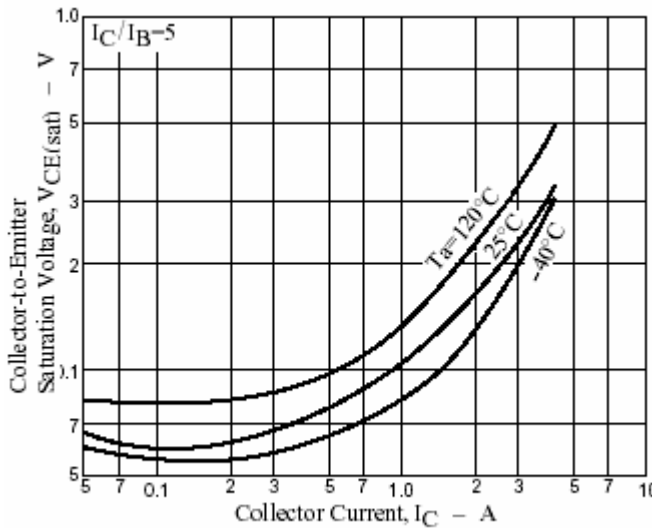


Fig.5 Collector-Emitter Saturation Voltage

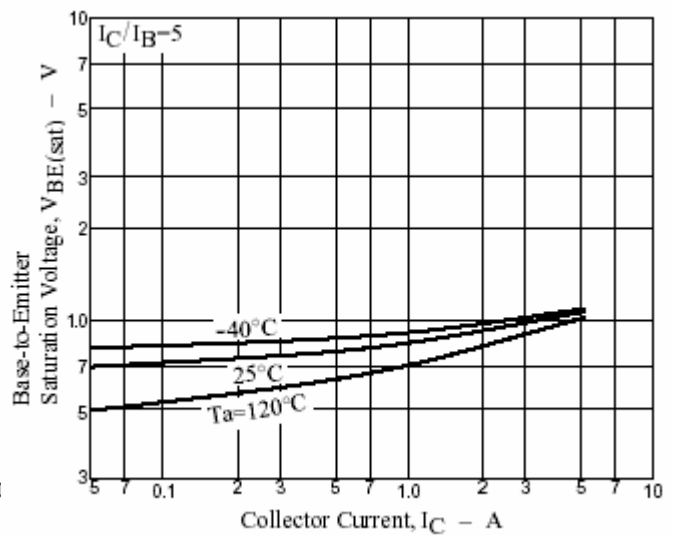


Fig.6 Base-Emitter Saturation Voltage

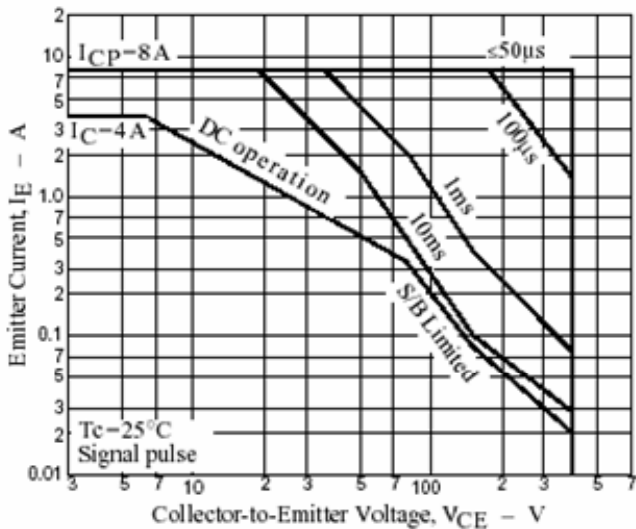


Fig.7 Safe Operating Area