



# MMBTA42

## NPN HIGH VOLTAGE TRANSISTOR

**VOLTAGE** 300 Volts **POWER** 225 mWatts

### FEATURES

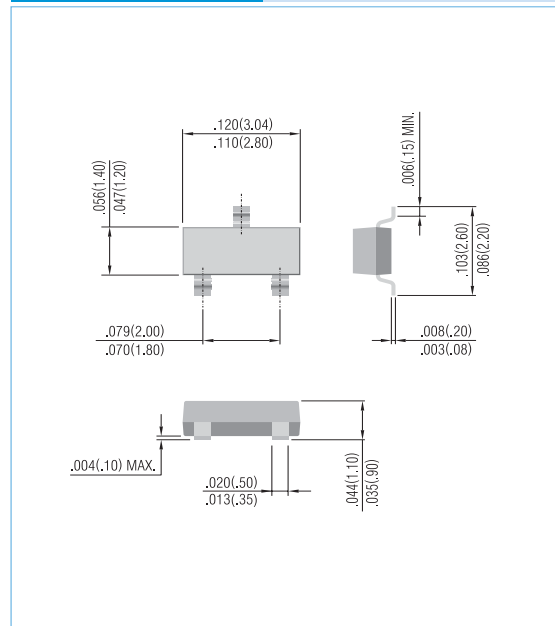
- NPN silicon, planar design
- Collector-emitter voltage  $V_{CE} = 300V$
- Collector current  $I_C = 500mA$
- In compliance with EU RoHS 2002/95/EC directives

### MECHANICAL DATA

- Case: SOT-23, Plastic
- Terminals: Solderable per MIL-STD-750, Method 2026
- Approx. Weight: 0.008 gram
- Marking: A42

SOT-23

Unit: inch ( mm )



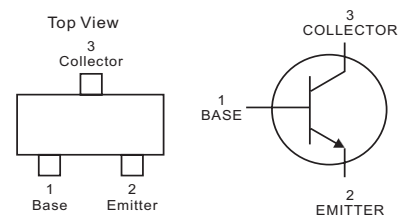
### ABSOLUTE MAXIMUM RATINGS

| PARAMETER                    | Symbol    | Value | Units |
|------------------------------|-----------|-------|-------|
| Collector - Emitter Voltage  | $V_{CEO}$ | 300   | V     |
| Collector - Base Voltage     | $V_{CBO}$ | 300   | V     |
| Emitter - Base Voltage       | $V_{EBO}$ | 6.0   | V     |
| Collector Current Continuous | $I_C$     | 500   | mA    |

### THERMAL CHARACTERISTICS

| PARAMETER                               | Symbol          | Value      | Units         |
|---|-----------------|------------|---------------|
| Max Power Dissipation (Note 1)          | $P_{TOT}$       | 225        | mW            |
| Thermal Resistance, Junction to Ambient | $R_{\theta JA}$ | 556        | $^{\circ}C/W$ |
| Junction Temperature                    | $T_J$           | -55 to 150 | $^{\circ}C$   |
| Storage Temperature                     | $T_{STG}$       | -55 to 150 | $^{\circ}C$   |

Note 1: Transistor mounted on FR-5 board 1.0 x 0.75 x 0.062 in.





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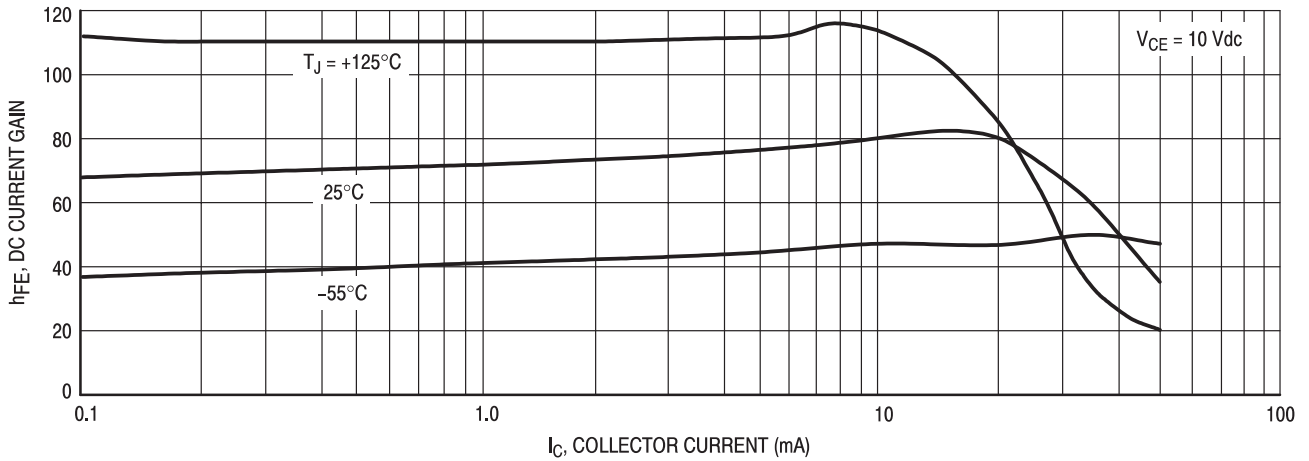
## ELECTRICAL CHARACTERISTICS

| PARAMETER                              | Symbol        | Test Condition  | MIN.           | TYP.        | MAX.        | Units |
|--|---------------|---|----------------|-------------|-------------|-------|
| Collector - Emitter Breakdown Voltage  | $V_{(BR)CEO}$ | $I_C=1.0mA, I_B=0$  | 300            | -           | -           | V     |
| Collector - Base Breakdown Voltage     | $V_{(BR)CBO}$ | $I_C=100\mu A, I_E=0$   | 300            | -           | -           | V     |
| Emitter - Base Breakdown Voltage       | $V_{(BR)EBO}$ | $I_E=100\mu A, I_C=0$   | 6.0            | -           | -           | V     |
| Collector Cut-off Current              | $I_{CBO}$     | $V_{CB}=200V, I_E=0V$   | -              | -           | 100         | nA    |
| Emitter Cut-off Current                | $I_{EBO}$     | $V_{CE}=6.0V, I_C=0$  | -              | -           | 100         | nA    |
| DC Current Gain                        | $h_{FE}$      | $V_{CE}=10V, I_C=1.0mA$<br>$V_{CE}=10V, I_C=10mA$<br>$V_{CE}=10V, I_C=30mA$ | 25<br>40<br>40 | -<br>-<br>- | -<br>-<br>- | -     |
| Collector - Emitter Saturation Voltage | $V_{CE(SAT)}$ | $I_C=20mA, I_B=2.0mA$   | -              | -           | 0.5         | V     |
| Base - Emitter Saturation Voltage      | $V_{BE(SAT)}$ | $I_C=20mA, I_B=2.0mA$   | -              | -           | 0.9         | V     |
| Collector-Base Capacitance             | $C_{CBO}$     | $V_{CB}=20V, I_E=0, f=1MHz$   | -              | -           | 3.0         | pF    |
| Collector Gain - Bandwidth Product     | $F_T$         | $I_C=10mA, V_{CE}=20V,$<br>$f=100MHz$                                       | 50             | -           | -           | MHz   |

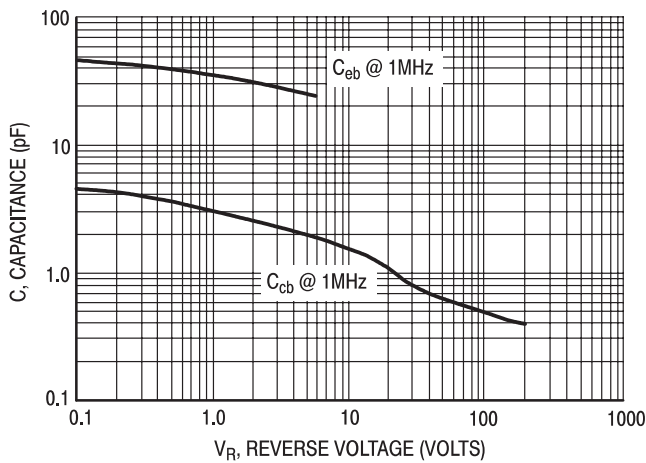


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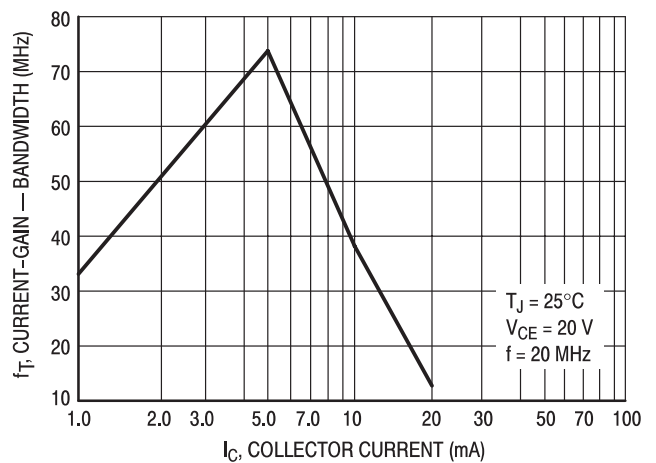
## ELECTRICAL CHARACTERISTICS CURVE



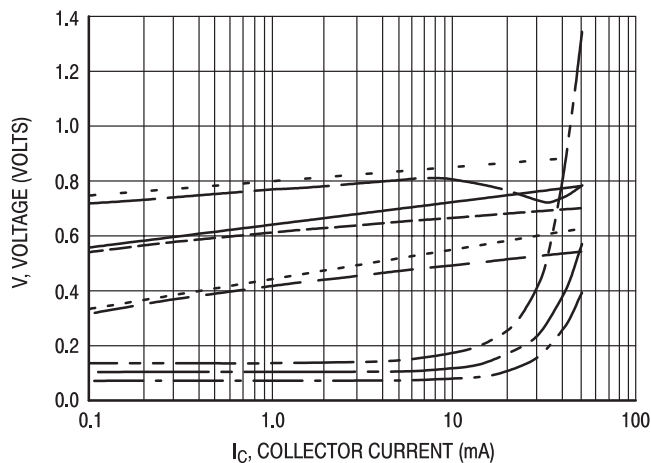
**Figure 1. DC Current Gain**



**Figure 2. Capacitance**



**Figure 3. Current-Gain - Bandwidth**



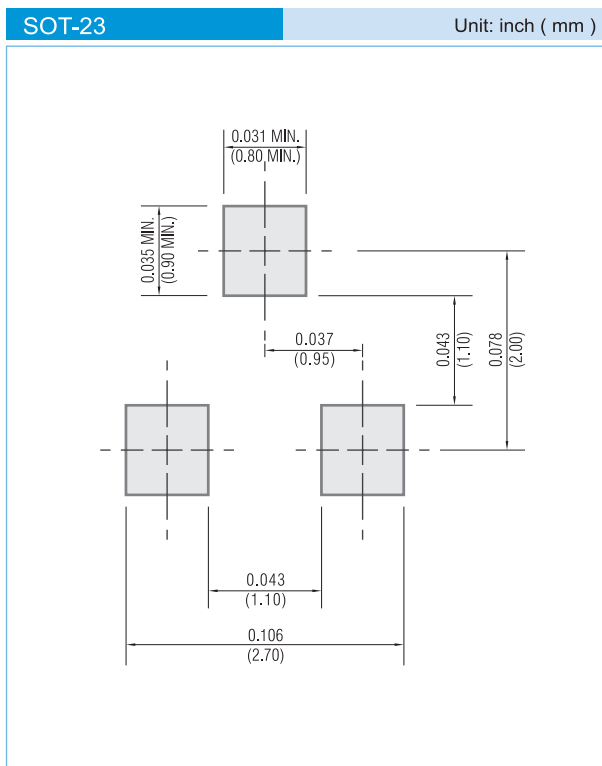
**Figure 4. ON Voltages**

- $V_{CE(sat)}$  @ 25°C,  $I_C/I_B = 10$
- $V_{CE(sat)}$  @ 125°C,  $I_C/I_B = 10$
- $V_{CE(sat)}$  @ -55°C,  $I_C/I_B = 10$
- $V_{BE(sat)}$  @ 25°C,  $I_C/I_B = 10$
- $V_{BE(sat)}$  @ 125°C,  $I_C/I_B = 10$
- $V_{BE(sat)}$  @ -55°C,  $I_C/I_B = 10$
- $V_{BE(on)}$  @ 25°C,  $V_{CE} = 10$  V
- $V_{BE(on)}$  @ 125°C,  $V_{CE} = 10$  V
- $V_{BE(on)}$  @ -55°C,  $V_{CE} = 10$  V



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## MOUNTING PAD LAYOUT



### ORDER INFORMATION

- Packing information
  - T/R - 12K per 13" plastic Reel
  - T/R - 3K per 7" plastic Reel

### LEGAL STATEMENT

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