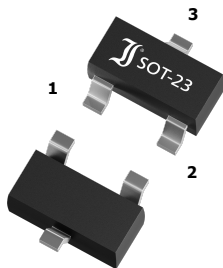
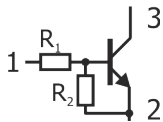


**MMBTRC101SS ... MMBTRC106SS**  
**SMD Digital NPN Transistors**  
**SMD Digital-NPN-Transistoren**
 $I_o = 100 \text{ mA}$   
 $T_{jmax} = 150^\circ\text{C}$ 
 $V_o = 50 \text{ V}$   
 $P_{tot} = 200 \text{ mW}$ 

Version 2021-08-27

**SOT-23**  
 TO-236

**SPICE Model & STEP File** <sup>1)</sup>

**Marking Code**  
 see below | siehe unten

**HS Code** 85412100

**Typical Applications**

 Digital controls  
 Switching, Signal processing  
 Commercial grade  
 Suffix -Q: AEC-Q101 compliant <sup>1)</sup>  
 Suffix -AQ: in AEC-Q101 qualification <sup>1)</sup>
**Features**

 Cost and space savings by integrated bias resistor combinations  
 Compliant to RoHS (w/o exemp.), REACH, Conflict Minerals <sup>1)</sup>
**Mechanical Data** <sup>1)</sup>

 Taped and reeled 3000 / 7"  
 Weight approx. 0.01 g  
 Case material UL 94V-0  
 Solder & assembly conditions 260°C/10s  
 MSL = 1

**Typische Anwendungen**

 Digitale Steuerungen  
 Schalten, Signalverarbeitung  
 Standardausführung  
 Suffix -Q: AEC-Q101 konform <sup>1)</sup>  
 Suffix -AQ: in AEC-Q101 Qualifikation <sup>1)</sup>
**Besonderheiten**

 Platz- und Kosteneinsparung durch integrierte Widerstandskombination  
 Konform zu RoHS (ohne Ausn.), REACH, Konfliktminerale <sup>1)</sup>
**Mechanische Daten** <sup>1)</sup>

 Gegurtet auf Rolle  
 Gewicht ca.  
 Gehäusematerial  
 Löt- und Einbaubedingungen

**Maximum ratings** <sup>2)</sup>
**Grenzwerte** <sup>2)</sup>

|  |           |                      |
|--|-----------|----------------------|
| Output/collector voltage – Ausgangs/Kollektor-Spannung | $V_o$     | 50 V                 |
| Output/collector current – Ausgangs/Kollektor-Strom    | $I_o$     | 100 mA               |
| Power dissipation – Verlustleistung                    | $P_{tot}$ | 200 mW <sup>3)</sup> |
| Junction temperature – Sperrschichttemperatur          | $T_j$     | -55...+150°C         |
| Storage temperature – Lagerungstemperatur              | $T_s$     | -55...+150°C         |

**Characteristics (T<sub>j</sub> = 25°C)**
**Kennwerte (T<sub>j</sub> = 25°C)**

| Type<br>Typ        | Code   | R <sub>1</sub> [kΩ] | R <sub>2</sub> [kΩ] | Input-voltage<br>Eingangs-Spannung |
|--------------------|--------|---------------------|---------------------|------------------------------------|
| MMBTRC101SS        | HP     | 4.7                 | 4.7                 | -10 ... +20 V                      |
| MMBTRC102SS/-Q/-AQ | HN/tbd | 10                  | 10                  | -10 ... +30 V                      |
| MMBTRC103SS/-AQ    | HR/tbd | 22                  | 22                  | -10 ... +40 V                      |
| MMBTRC104SS        | HX     | 47                  | 47                  | -10 ... +40 V                      |
| MMBTRC105SS/-Q     | HY/tbd | 2.2                 | 47                  | -5 ... +12 V                       |
| MMBTRC106SS        | HZ     | 4.7                 | 47                  | -5 ... +20 V                       |

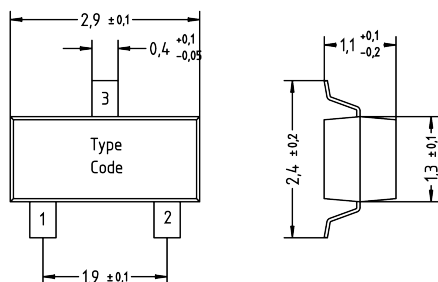
1 Please note the [detailed information on our website](#) or at the beginning of the data book  
 Bitte beachten Sie die [detaillierten Hinweise auf unserer Internetseite](#) bzw. am Anfang des Datenbuches

2 T<sub>A</sub> = 25°C, unless otherwise specified – T<sub>A</sub> = 25°C, wenn nicht anders angegeben

3 Valid, if leads are kept at T<sub>A</sub> at 2 mm distance from case – Gültig wenn die Drähte in 2 mm vom Gehäuse auf T<sub>A</sub> gehalten werden

**Characteristics**
**Kennwerte**

|   |                                     | $T_j = 25^\circ\text{C}$ | <b>Min.</b> | <b>Typ.</b> | <b>Max.</b> |
|---|-------------------------------------|--------------------------|-------------|-------------|-------------|
| DC current gain – Kollektor-Basis-Stromverhältnis<br>1)<br>$V_o = 5\text{ V}, I_o = 10\text{ mA}$ | $G_I$ MMBTRC101SS                   |                          | 30          | –           | –           |
|   | MMBTRC102SS <sup>QA)</sup>          |                          | 50          | –           | –           |
|   | MMBTRC103SS                         |                          | 70          | –           | –           |
|   | MMBTRC104SS                         |                          | 80          | –           | –           |
|   | MMBTRC105SS <sup>Q)</sup>           |                          | 80          | –           | –           |
|   | MMBTRC106SS                         |                          | 80          | –           | –           |
| Output cutoff current – Ausgangs-Reststrom<br>$V_o = 50\text{ V}$                                 | $I_{O(\text{off})}$                 |                          | –           | –           | 500 nA      |
| Input current – Eingangsstrom<br>$V_I = 5\text{ V}$   | $I_I$ MMBTRC101SS                   |                          | –           | –           | 1.8 mA      |
|   | MMBTRC102SS <sup>QA)</sup>          |                          | –           | –           | 0.88 mA     |
|   | MMBTRC103SS                         |                          | –           | –           | 0.36 mA     |
|   | MMBTRC104SS                         |                          | –           | –           | 0.18 mA     |
|   | MMBTRC105SS <sup>Q)</sup>           |                          | –           | –           | 3.6 mA      |
|   | MMBTRC106SS                         |                          | –           | –           | 1.8 mA      |
| Output voltage – Ausgangs-Spannung<br>$I_o = 10\text{ mA}, I_I = 0.5\text{ mA}$                   | $V_{O(\text{on})}$                  |                          | –           | –           | 0.3 V       |
| Input voltage (on) – Eingangsspannung (Ein)<br>$V_o = 0.2\text{ V}, I_o = 5\text{ mA}$            | $V_{I(\text{on})}$ MMBTRC101SS      |                          | –           | –           | 2 V         |
|   | MMBTRC102SS <sup>QA)</sup>          |                          | –           | –           | 2.4 V       |
|   | MMBTRC103SS                         |                          | –           | –           | 3 V         |
|   | MMBTRC104SS                         |                          | –           | –           | 5 V         |
|   | MMBTRC105SS <sup>Q)</sup>           |                          | –           | –           | 1.1 V       |
|   | MMBTRC106SS                         |                          | –           | –           | 1.3 V       |
| Input voltage (off) – Eingangsspannung (Aus)<br>$V_o = 5\text{ V}, I_o = 0.1\text{ mA}$           | $V_{I(\text{off})}$ ..C101...C104.. |                          | 1 V         | –           | –           |
|   | ..C105...C106..                     |                          | 0.5 V       | –           | –           |
| Input resistor tolerance – Toleranz Eingaaswiderstand   | R1                                  |                          | -30%        |             | +30%        |
| Resistance ratio – Widerstandsverhältnis  | R2/R1                               |                          |             |             |             |
|   | MMBTRC101SS                         |                          | 0.8         |             | 1.2         |
|   | MMBTRC102SS <sup>QA)</sup>          |                          | 0.8         |             | 1.2         |
|   | MMBTRC103SS                         |                          | 0.8         |             | 1.2         |
|   | MMBTRC104SS                         |                          | 0.8         |             | 1.2         |
|   | MMBTRC105SS <sup>Q)</sup>           |                          | 0.026       |             | 0.087       |
| MMBTRC106SS   |                                     | 0.055                    |             | 0.185       |             |
| Transition Frequency – Transitfrequenz<br>(Transistor)<br>$V_o = 10\text{ V}, I_o = 5\text{ mA}$  | $f_T$                               |                          | –           | 200 MHz     | –           |

**Dimensions  
Maße  
[mm]**


**Disclaimer:** See data book page 2 or [website](#)  
**Haftungsausschluss:** Siehe Datenbuch Seite 2 oder [Internet](#)

4 Tested with pulses  $t_p = 300\ \mu\text{s}$ , duty cycle  $\leq 2\%$  – Gemessen mit Impulsen  $t_p = 300\ \mu\text{s}$ , Schaltverhältnis  $\leq 2\%$

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