



NXP 800 mA low  $V_{CEsat}$   
(BISS) RETs  
PBRN and PBRP series

# Low $V_{CEsat}$ (BISS) RETs optimized for automotive and industrial applications

Developed specifically for the automotive and industrial markets, these 800 mA resistor-equipped transistors (RETs) combine one or two resistors with a low  $V_{CEsat}$  (BISS) transistor to provide an optimal, integrated solution for digital applications.

### Key features

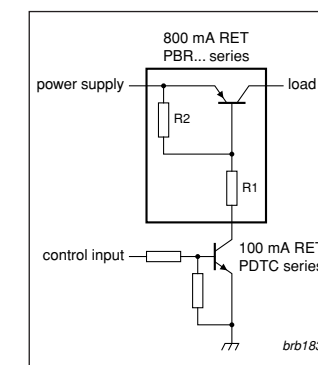
- ▶ Built-in bias resistors
- ▶ High current gain  $h_{FE}$
- ▶ 800 mA repetitive peak output current
- ▶ Low collector-emitter saturation voltage  $V_{CEsat}$
- ▶  $\pm 10\%$  resistor tolerance
- ▶ Four resistor combinations (more on request)

### Key benefits

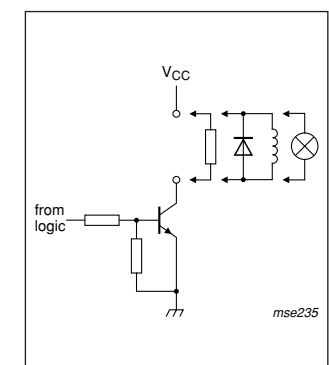
- ▶ Lower handling and inventory costs
- ▶ Reduced board space
- ▶ Shorter assembly times
- ▶ Reduced pick-and-place efforts
- ▶ Simpler design process
- ▶ Increased reliability of end product due to fewer soldering points

### Applications

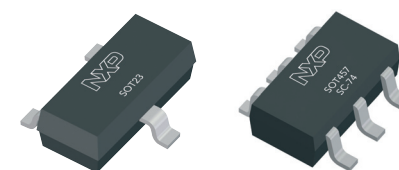
- ▶ Digital applications in automotive and industrial segments
- ▶ Switching loads
- ▶ Controlling IC inputs
- ▶ Medium-current peripheral drivers



RET combination to build an 800 mA loadswitch



RETs to switch loads up to 800 mA



[www.nxp.com](http://www.nxp.com)



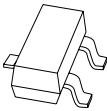
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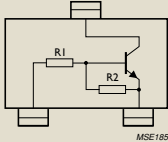
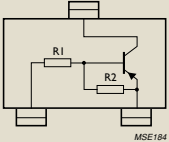
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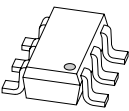
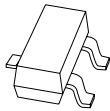


800 / 600 mA low V<sub>CEsat</sub> RETs

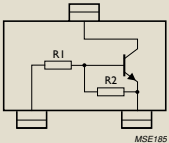
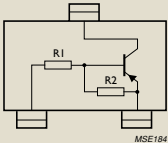
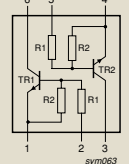


| Package                  |                        |                         |         |            |            | SOT23                                                                                                        |                                                                                                              |
|--------------------------|------------------------|-------------------------|---------|------------|------------|--------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------|
| Size (mm)                |                        |                         |         |            |            | 2.9 × 1.3 × 1.0                                                                                              |                                                                                                              |
| P <sub>tot</sub> (mW)    |                        |                         |         |            |            | 250                                                                                                          |                                                                                                              |
| Polarity                 |                        |                         |         |            |            | NPN                                                                                                          | PNP                                                                                                          |
| I <sub>ORM</sub><br>(mA) | I <sub>O</sub><br>(mA) | V <sub>CEO</sub><br>(V) |         | R1<br>(kΩ) | R2<br>(kΩ) | <br><small>MSE185</small> | <br><small>MSE184</small> |
| 800                      | 600                    | 40                      | R1 = R2 | 1.0        | 1.0        | <b>PBRN113ET</b>                                                                                             | <b>PBRP113ET</b>                                                                                             |
|                          |                        |                         |         | 2.2        | 2.2        | <b>PBRN123ET</b>                                                                                             | <b>PBRP123ET</b>                                                                                             |
|                          |                        |                         | R1 ≠ R2 | 1.0        | 10         | <b>PBRN113ZT</b>                                                                                             | <b>PBRP113ZT</b>                                                                                             |
|                          |                        |                         |         | 2.2        | 10         | <b>PBRN123YT</b>                                                                                             | <b>PBRP123YT</b>                                                                                             |

**bold** types are included as samples



500 mA resistor-equipped transistors (RETs)

| Package                |                         |         |            |            | SOT23                                                                                                        |                                                                                                                | SOT457 (SC-74)                                                                                                 |
|------------------------|-------------------------|---------|------------|------------|--------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------|
| Size (mm)              |                         |         |            |            | 2.9 × 1.3 × 1.0                                                                                              |                                                                                                                | 2.9 × 1.5 × 1.0                                                                                                |
| P <sub>tot</sub> (mW)  |                         |         |            |            | 250                                                                                                          |                                                                                                                | 420                                                                                                            |
| Polarity               |                         |         |            |            | NPN                                                                                                          | PNP                                                                                                            | Double NPN                                                                                                     |
| I <sub>C</sub><br>(mA) | V <sub>CEO</sub><br>(V) |         | R1<br>(kΩ) | R2<br>(kΩ) | <br><small>MSE185</small> | <br><small>MSE184</small> | <br><small>sym083</small> |
| 500                    | 50                      | R1 = R2 | 1.0        | 1.0        | PDTD113ET                                                                                                    | PDTB113ET                                                                                                      |                                                                                                                |
|                        |                         |         | 2.2        | 2.2        | PDTD123ET                                                                                                    | PDTB123ET                                                                                                      |                                                                                                                |
|                        |                         | R1 ≠ R2 | 1.0        | 10         | PDTD113ZT                                                                                                    | PDTB113ZT                                                                                                      | PIMN31                                                                                                         |
|                        |                         |         | 2.2        | 10         | PDTD123YT                                                                                                    | PDTB123YT                                                                                                      |                                                                                                                |
|                        |                         | only R1 | 2.2        | -          | PDTD123TT                                                                                                    | PDTB123TT                                                                                                      |                                                                                                                |
|                        |                         |         |            |            |                                                                                                              |                                                                                                                |                                                                                                                |

Cross reference list

| Device  | NXP replacement |
|---------|-----------------|
| KRC241S | PBRN113ET       |
| KRA221S | PBRP113ET       |
| KRC245S | PBRN113ZT       |
| KRA225S | PBRP113ZT       |
| KRC242S | PBRN123ET       |
| KRA222S | PBRP123ET       |
| KRC246S | PBRN123YT       |
| KRA226S | PBRP123YT       |
|         |                 |

| Device    | NXP replacement |
|-----------|-----------------|
| BCR503    | PDTD123ET       |
| BCR505    | PDTD123YT       |
| PCR521    | PDTD113ET       |
| BCR523    | PDTD113ZT       |
| BRC553    | PDTB123ET       |
| BCR571    | PDTB113ET       |
| BCR573    | PDTB113ZT       |
| DDTB113EC | PDTB113ET       |
| DDTB113ZC | PDTB113ZT       |

| Device    | NXP replacement |
|-----------|-----------------|
| DDTB123EC | PDTB123ET       |
| DDTB123TC | PDTB123TT       |
| DDTB123YC | PDTB123YT       |
| DDTD113EC | PDTD113ET       |
| DDTD113ZC | PDTD113ZT       |
| DDTC123EC | PDTD123ET       |
| DDTC123TC | PDTD123TT       |
| DDTC123YC | PDTD123YT       |
|           |                 |



PBRN113ET

R1 = 1, R2 = 1; NPN



PBRP113ET

R1 = 1, R2 = 1; PNP



PBRN123ET

R1 = 2.2, R2 = 2.2; NPN



PBRP123ET

R1 = 2.2, R2 = 2.2.; PNP



PBRN113ZT

R1 = 1, R2 = 10; NPN



PBRP113ZT

R1 = 1, R2 = 10; PNP



PBRN123YT

R1 = 2.2, R2 = 10; NPN



PBRP123YT

R1 = 2.2, R2 = 10; PNP